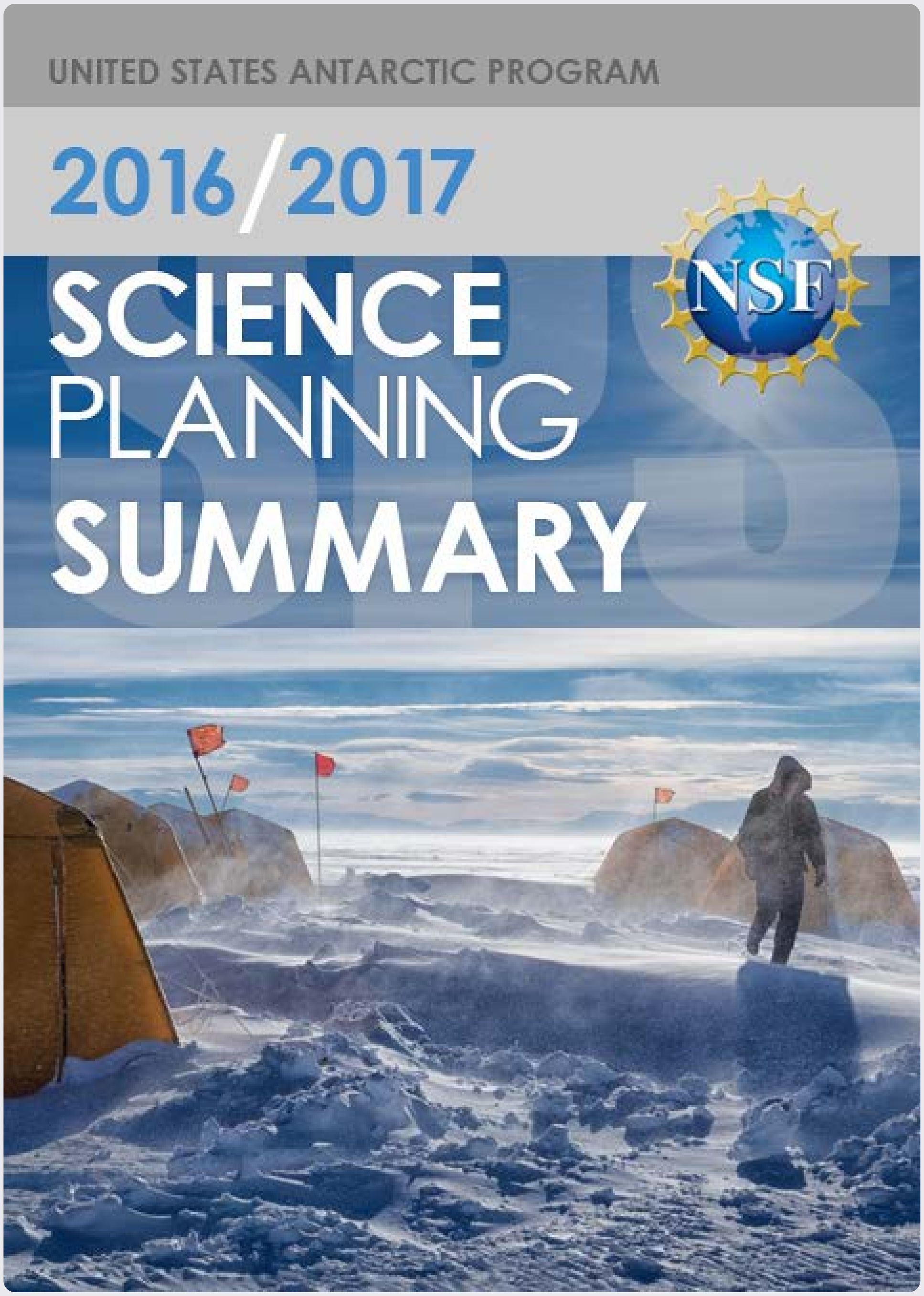

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  - Astrophysics and Geospace Sciences
    Dr. Vladimir Papitashvili, Program Manager
  - Organisms and Ecosystems
    Dr. Chris Fritsen, Program Director
  - Earth Sciences
    Dr. Thomas Wilch, Program Manager
  - Glaciology
    Dr. Julie Palais, Program Manager
  - Ocean and Atmospheric Sciences
    Dr. Peter Milne, Program Manager
  - Integrated System Science
    Dr. Paul Cutler, Program Manager
  - Artists and Writers
    Mr. Peter West, Program Manager
  - Instrumentation and Technology Development Index
    Dr. Michael Jackson, Program Manager
  - Education and Outreach
    Ms. Valentine Kass , Program Manager
- **USAP Station and Vessel Indexes**
  - Amundsen-Scott South Pole Station
  - McMurdo Station
  - Palmer Station
  - RVIB Nathaniel B. Palmer
  - ARSV Laurence M. Gould
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Principal Investigator/Link	Event No.	Project Title
Ainley, David	B-031-M	Adelie penguin response to climate change in the Ross Sea region – a full life-cycle approach
Albert, Mary	T-150-M	IDPO / IDDO - McMurdo
Amsler, Charles	B-022-P	The chemical ecology of shallow-water marine macroalgae and invertebrates on the Antarctic Peninsula
Anderson, Kent	G-090-P/S	Global seismograph station at South Pole and Palmer Stations
Aydin, Murat	I-164-S	A 1,500-meter ice core from South Pole
Barwick, Steven	A-127-M	Precision Operation of Hexagonal Radio Array
Bell, Robin E	C-384-M	A systems approach to understanding the Ross Ocean and ice Shelf Environment and Tectonic setting Through Aerogeophysical surveys and modeling (ROSETTA)
Bowser, Samuel	B-043-M	Assembling and mining the genomics of giant Antarctic foraminifera
Bristow, William	A-369-M/S	McMurdo and South Pole SuperDARN: Investigation of the ionospheric dynamics and magnetosphere-ionosphere coupling in Antarctica
Bromirski, Peter D	I-348-M	Dynamic response of the Ross Ice Shelf to wave-induced vibrations
Burns, Jennifer	B-292-M	The cost of a new fur coat: Interactions between molt and reproduction in Weddell seals
Butler, James Hall	O-257-M/S	South Pole monitoring for climatic change
Butler, James Hall	O-264-P	Collection of atmospheric air for the NOAA/GMD worldwide flask-sampling network

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Butler, James Hall	O-257-M/S	UV measurements at McMurdo Station for the NOAA/Global Monitoring Division (GMD) Antarctic UV network
Carlstrom, John	A-379-S	Cosmological research with the 10-meter South Pole Telescope
Chu, Xinzhao	A-130-M	LiDAR investigation of middle and upper atmosphere temperature, composition, chemistry, and dynamics at McMurdo, Antarctica
Conde, Mark Gerard	A-343-M/S	High-resolution mapping of thermospheric wind and temperature fields near the equatorward edge of the Antarctic polar cap
Cottle, John	G-076-M	Petrologic constraints on subduction termination from lamprophyres, Ross Orogen, Antarctica
Dinn, Michael	X-599-S	British Antarctic Survey (BAS)
Doran, Peter	C-511-M	McMurdo LTER - Lakes: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valleys LTER Program
Ducklow, Hugh William	C-045-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Evenson, Paul	A-120-M	Neutron monitor observations of cosmic rays from Jang Bogo and McMurdo Station
Evenson, Paul	A-118-S	Element composition of high-energy solar particles
Fortescue, Donald	W-467-M/S	Artistic and scientific fieldwork at the South Pole: Inquiry at the edge of possibility
Franco, Hugo	A-145-M	NASA Long Duration Balloon (LDB) support program
Fraser, William Ronald	C-013-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Friedlaender, Ari Seth	C-024-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity,

		ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Goodge, John	D-551-M	Phase 2 development of a Rapid Access Ice Drilling (RAID) platform for research in Antarctica
Goodge, John	D-552-M	Phase 2 development of a Rapid Access Ice Drilling (RAID) platform for research in Antarctica / DOSECC Exploration Services (DES)
Gooseff, Michael N	C-506-M	McMurdo LTER - Streams: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valleys LTER Program
Gooseff, Michael N	C-504-M	McMurdo LTER - Glaciers: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valleys LTER Program
Gorham, Peter W	A-371-M	Antarctic Impulsive Transient Antenna (ANITA III) experiment
Halzen, Francis	A-333-S	IceCube operations and maintenance
Harvey, Ralph	G-058-M	Antarctic Search for Meteorites (ANSMET)
Hebert, Jason Paul	T-299-M/S	IRIS/PASSCAL seismic support
Hofmann, Gretchen	B-134-M	Ocean acidification seascape: linking natural variability and anthropogenic changes in pH and temperature to performance in calcifying Antarctic marine invertebrates
Howkins, Adrian J	C-457-M	Assessing changing patterns of human activity in the McMurdo Dry Valleys using digital photo archive
Karle, Albrecht	A-107-S	Development of the Askaryan Radio Array Ultra-High Energy Neutrino Detector at the South Pole
Kemerait, Robert C	G-078-M	Dry Valley seismic project
Kovac, John	A-149-S	Imaging the beginning of time from the South Pole: Observations with the full SPUD array
Kulesa, Craig	A-364-M/S	High Elevation Antarctic Terahertz (HEAT) telescopes for Dome A and Ridge A

Kurtz, Nathan T	C-529-M	Operation IceBridge
LaBelle, James	A-125-S	Application of the AGO network to energy transfer in the radiation belts and remote sensing of auroral plasma processes
LaBelle, James	A-128-S	Earth's electromagnetic environment: Advancing recent discoveries in auroral plasma radio emission research
Lazzara, Matt	O-283-M	Antarctic Automatic Weather Station Program
Lee, Richard	B-256-P	Winter survival mechanisms and adaptive genetic variation in an Antarctic insect
Lubin, Dan	O-325-M	Department of Energy ARM West Antarctic Radiation Experiment (AWARE)
Lyons, W. Berry	C-509-M	McMurdo LTER - Geochemistry: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valleys LTER Program
MacAyeal, Douglas R	I-190-M	Impact of supraglacial lakes on ice-shelf stability
Martinson, Doug	C-021-L	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Moore, Robert C.	A-109-M/P/S	Antarctic ELF/VLF observations of Q-bursts, radio atmospherics, and energetic particle precipitation
Moran, Amy	B-307-M	Body size, oxygen, and vulnerability to climate change: a physiological study of Antarctic Pycnogonida
Morin, Paul	T-434-M	The Polar Geospatial Information Center: Joint support
Munro, David Russel	O-214-L/N	High-resolution underway air-sea observations in Drake Passage for climate science
Pettit, Erin	I-166-M	Velvet Ice - evolution of fabric and texture in ice at WAIS Divide, West Antarctica
Pettit, Joseph R	T-295-M	UNAVCO GPS survey support

Priscu, John	C-505-M	McMurdo LTER - Lakes: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valleys LTER Program
Rotella, Jay	B-009-M	The demographic consequences of environmental variability and individual heterogeneity in life-history tactics of a long-lived Antarctic marine predator
Saint-Hilaire, Pascal	A-337-M/S	Gamma-Ray Imager/Polarimeter for Solar flares (GRIPS)
Sarmiento, Jorge l	O-271-N	Southern Ocean Carbon and climate Observations and Modeling (SOCCOM)
Schofield, Oscar	C-019-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Seo, Eun-Suk	A-138-M	The Boron And Carbon Cosmic rays in the Upper Stratosphere (BACCUS)
Smith, Craig	B-212-L	Fjord ecosystem structure and function on the Western Antarctic Peninsula - hotspots of productivity and biodiversity
Sprintall, Janet	O-260-L	The Drake Passage high-density XBT/XCTD program
Steinberg, Deborah	C-020-L	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Stephens, Britton B	O-404-L	High-resolution underway air-sea observations in Drake Passage for climate science
Taylor, Michael	A-119-M/P/S	Development of an ANtarctic Gravity Wave Imager Network (ANGWIN) for collaborative mesospheric research
Taylor, Michael	A-119-M/P/S	Investigating wave-driven Mesospheric dynamics over South Pole using an advanced Mesospheric temperature mapper
Taylor, Michael	A-119-M/P/S	Continental-scale studies of Mesospheric dynamics using the Antarctic Gravity Wave Instrument Network (ANGWIN)

Thurber, Andrew	B-001-M	Elucidating the Antarctic Methane Cycle at the Cinder Cones Reducing Habitat
Ulses, Greg A	O-410-N	Ocean Observatories Initiative (OOI) Southern Hemisphere cruises
Wall, Diana	C-507-M	McMurdo LTER - Soils: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valleys LTER Program
Wilson, Terry	G-079-M	POLENET Antarctica: Investigating links between geodynamics and ice sheets - Phase 2

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2016-2017 USAP Field Season
Station and Vessel Schedules

The United States Antarctic Program operates three permanent research stations on the continent and two research vessels.

Opening Dates

	Austral Summer Openings		Austral Winter Openings
	Operational	Science	
McMurdo (Winfly*)	20 Aug 2016	22 Aug 2016	28 Feb 2017
McMurdo (Mainbody)	3 Oct 2016	4 Oct 2016	
South Pole	1 Nov 2016	1 Nov 2016	15 Feb 2017
Palmer	6 Oct 2016	5 Apr 2017	N/A
Research Vessels	Vessels Operate Year-Round (Find Vessel Schedules)		

**A limited number of science projects deploy at Winfly*

Estimated Population

	Summer	Winter
McMurdo	850 (weekly average) 2,300 (total)	180 (winter total)
South Pole	150 (weekly average) 450 (total)	50 (winter total)
Palmer	36-44 (weekly average) 196 (total)	
RV/IB* NBP	39 science and staff / 25 crew	
ARSV** LMG	38 science and staff / 25 crew Total annual science personnel: 50	

**RV/IB, Research Vessel/Icebreaker*
***ARSV, Antarctic Research Support Vessel*

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2016-2017 USAP Field Season
Air Operations

McMurdo Station

McMurdo-based aircraft (Helicopters, Twin Otter, Basler and LC-130 fixed-wing aircraft) will continue to support USAP researchers and program logistical functions.

PHI

PHI, Inc. PHI will provide helicopter support with four helicopters (two AS-350-B2 "A-Stars" and two Bell 212s) based out of McMurdo Station.

The four helicopters will support research in the McMurdo Sound area, the McMurdo Dry Valleys, Royal Society Range, and on Ross Island.

In addition, Antarctica New Zealand will be providing a ZK-IDE B3 Type Squirrel (operated by Southern Lakes Helicopters) from about the beginning of November through the end of January 2016.

New York Air National Guard (ANG)

The New York Air National Guard will provide re-supply and research support to South Pole Station. They will support research activities for aerial surveys and at deep-field locations including Siple Dome, West Antarctic Ice Sheet (WAIS) Divide, Grounding Zone, Shackleton Glacier, Byrd Camp, AGO5, Ross Ice Shelf, Union Glacier, Casey Station, Davis Station, and various open-field landing locations.

Kenn Borek Air

Kenn Borek Air will provide four Twin Otter and one Basler aircraft to support a number of projects throughout the USAP area of operations.

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2016-2017 USAP Field Season
Staffed Field Camps

A total of seven field camps will have resident staff to provide logistical and operational assistance to McMurdo and vessel-based researchers.

Dry Valleys

50 Nautical Miles From McMurdo Station

77.30°S, 162°E

Each year, Long Term Ecological Research (LTER) grantees and other groups conduct research in the Dry Valleys. Two resident staff will operate the main base camp at Lake Hoare and the semi-permanent camps at Lake Fryxell, F-6, and Lake Bonney. Science project teams will erect small tent camps on Lake Meirs, Lake Vanda, near Mount Crean, and in the Beacon and Wright Valleys.

Siple Dome

507 Nautical Miles From McMurdo Station

81.39°S, 149.04°W

This camp serves as a fueling point for aircraft operating between McMurdo Station and West Antarctica or South Pole. Two resident staff will provide daily weather observations and maintain the camp. Siple Dome will also house and feed Kenn Borek Air (KBA) crews as needed. This season, the team will support the science operations of Weins (G-089-M).

WAIS Divide Field Camp

891 Nautical Miles From McMurdo Station

79.46°S, 112.08°W

The WAIS Divide field camp with 15 resident staff will support five science groups working through the site, including Twin Otter missions for Polenet (G-079-M) and Polenet (G-079-M), the deployment of Stone (I-277-M) to the Pirrit Hills, and opening of the arch for borehole logging by Pettit (I-166-M). The West Antarctic Support Traverse and Camping teams will also work through WAIS Divide as they move drill equipment, fuel and cargo to the Pirrit Hills in support of Stone.

Shackleton Camp

459 Nautical Miles From McMurdo Station

85.08°S, 175.38°W

Now in the second of three field seasons of Shackleton camp, a staff of 6 will continue to receive cargo and fuel deliveries from LC-130s to support the science groups working in and around of the mountains over the next two austral summers. The six science groups supported through Shackleton this season include Cottle (G-076-M), ANSMET Harvey (G-058-M), Mukhopadhyay (G-438-M), Taylor (G-135-M), Stone (I-186-M) and Bromley (I-177-M).

Mount Erebus

22 Nautical Miles From McMurdo Station

77.30°S, 167.08°E

Lower Erebus has a large population this summer and

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will once again be staffed by an ASC camp supervisor. Groups supported through Fang Glacier Acclimatization camp and Lower Erebus Hut include MEVO Kyle (G-081-M), Fischer (G-411-M), Carroll (W-487-M), Wicks (W-483-M), and ASC Environmental to continue the clean-up of the Upper Erebus Hut debris.

Groom Team

1,117 Nautical Miles From McMurdo Station

83.6°S, 40.54°W (GRIPS)

85.04°S, 167.10°E (Mill Glacier)

77.13°S, 123.30°E (AGO5)

A team of three will deploy through McMurdo Station to various locations with the same mission, to create a skiway to allow for the necessary airframe to land. Locations and projects supported this season include Ross Ice Shelf Yesterday camp for Wiens (G-089-M), Mill Glacier in combination with ASC Environmental for clean-up retro effort, GRIPS via South Pole for the payload recovery, and AGO 5 with Gerrard (A-112-M/S).

RAID

47 Nautical Miles From McMurdo Station

78.36°S, 166.39°E

The Rapid Access Ice Drill (RAID) will conduct testing of their drill this season on the backside of Minna Bluff. A traverse team of five will make the trip from McMurdo, along a route proven during the 2015-16 season, hauling drill equipment and fuel. A camp staff of two will meet them via helicopter to establish the camp supporting a population near 20, including PI John Goodge (D-551-M) and a team of Drilling, Observation and Sampling of the Earth’s Continental Crust (DOSEC) drillers.

2016-2017 USAP Field Season
Event Numbering System

Every USAP project is assigned a unique event number consisting of three parts: A prefix indicating the USAP program funding the effort, a project number, and a suffix denoting the location where field work will take place. If field work takes place at more than one location the event number will indicate this with multiple suffixes separated by a slash.

Sample Event Number

A – 100 – M

In the example above, the project would be funded by the Astrophysics and Geospace Sciences program, have a project number of *100*, and would consist of field work to be performed at or near McMurdo Station.

Program Prefixes

Prefix	USAP Program
A	Astrophysics and Geospace Sciences Dr. Vladimir Papitashvili, Program Manager
B	Organisms and Ecosystems Dr. Chris Fritsen, Program Director
C	Integrated System Science Dr. Paul Cutler, Program Manager
G	Earth Sciences Dr. Thomas Wilch, Program Manager
I	Glaciology Dr. Julie Palais, Program Manager
O	Oceans and Atmospheric Sciences Dr. Peter Milne, Program Manager
W	Artists and Writers Mr. Peter West, Program Manager
Y	Education and Outreach Ms. Valentine Kass, Program Manager
D	Instrumentation and Technology Development Dr. Michael Jackson, Program Manager
T	Technical Event
X	Other Science Events

Location Suffixes

Suffix	Supporting Location

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M	McMurdo Station
P	Palmer Station
S	South Pole Station
N	RV/IB* Nathaniel B. Palmer
L	ARSV** Laurence M. Gould
E	Special Projects Supported by the USAP (e.g., Investigators working with other national Antarctic programs)

**RV/IB, Research Vessel/Icebreaker*
***ARSV, Antarctic Research Support Vessel*

Principal Investigator Index

Principal Investigator	Event No.	Project Title
Ackley, Stephen	C-531-M/N	Polynyas, Ice Production and seasonal Evolution in the Ross Sea (PIPERS)
Ainley, David	B-031-M	Adelie penguin response to climate change in the Ross Sea region – a full life-cycle approach
Albert, Mary	T-350-M	Ice Drill Design and Operations (IDDO) support for WAIS Divide
Albert, Mary	T-150-M	IDPO / IDDO - McMurdo
Amsler, Charles	B-022-P	The chemical ecology of shallow-water marine macroalgae and invertebrates on the Antarctic Peninsula
Anderson, Kent	G-090-P/S	Global seismograph station at South Pole and Palmer Stations
Anderson, Robert Frederick	G-051-N	Water mass structure and bottom water formation in the ice-age Southern Ocean
Aydin, Murat	I-164-S	A 1,500-meter ice core from South Pole
Barwick, Steven	A-127-M	Precision Operation of Hexagonal Radio Array
Bay, Ryan	I-194-S	Laser dust logging and fluorimetric scanning of SPICE
Bell, Robin E	C-384-M	A systems approach to understanding the Ross Ocean and ice Shelf Environment and Tectonic setting Through Aerogeophysical surveys and modeling (ROSETTA)
Bowser, Samuel	B-043-M	Assembling and mining the genomics of giant Antarctic foraminifera
Bristow, William	A-369-M/S	McMurdo and South Pole SuperDARN: Investigation of the ionospheric dynamics and magnetosphere-ionosphere coupling in Antarctica
Bromirski, Peter D	I-348-M	Dynamic response of the Ross Ice Shelf to wave-induced vibrations
Bromley, Gordon R	I-177-M	Potential direct geologic constraint of ice sheet thickness in the central

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		Transantarctic Mountains during the Pliocene warm period
Burns, Jennifer	B-292-M	The cost of a new fur coat: Interactions between molt and reproduction in Weddell seals
Butler, James Hall	O-257-M/S	South Pole monitoring for climatic change
Butler, James Hall	O-264-P	Collection of atmospheric air for the NOAA/GMD worldwide flask-sampling network
Butler, James Hall	O-257-M/S	UV measurements at McMurdo Station for the NOAA/Global Monitoring Division (GMD) Antarctic UV network
Buys, Emmanuel S	B-267-M	Unraveling the genomic and molecular basis of the dive response: Nitric oxide signaling and vasoregulation in the Weddell seal
Carlstrom, John	A-379-S	Cosmological research with the 10-meter South Pole Telescope
Carroll, Michael W	W-487-M	Alien Landscapes
Cassano, John	O-283-M	Antarctic Automatic Weather Station program (WinFly Component)
Chereskin, Teresa	O-317-L	Southern Ocean current observations from the U.S. Antarctic research vessels
Chu, Xinzhao	A-130-M	LiDAR investigation of middle and upper atmosphere temperature, composition, chemistry, and dynamics at McMurdo, Antarctica
Chu, Xinzhao	A-123-M	High-resolution Na Doppler LiDAR observations of the middle and upper atmosphere at McMurdo, Antarctica
Conde, Mark Gerard	A-343-M/S	High-resolution mapping of thermospheric wind and temperature fields near the equatorward edge of the Antarctic polar cap
Cottle, John	G-076-M	Petrologic constraints on subduction termination from lamprophyres, Ross Orogen, Antarctica
Countway, Peter Dylan	B-028-P	Antarctic Microbial Networks and DMSP: Linking diversity, biogeochemistry, and functional gene expression
Davis, Randall	B-017-M	Geomagnetic navigation by Weddell seals beneath Antarctic ice
Deeb, Elias Joseph	T-942-S	Building envelope and infrastructure

		assessment using an integrated thermal imaging and LiDAR scanning system
Dinn, Michael	X-599-S	British Antarctic Survey (BAS)
Domack, Eugene	C-515-L	Continuation of the LARISSA continuous GPS network in view of observed dynamic response to Antarctic Peninsula mass balance and required geologic constraints
Doran, Peter	C-511-M	McMurdo LTER - Lakes: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valleys LTER Program
Ducklow, Hugh William	C-045-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Eppley, Dr. Sarah Margaretha	B-289-E	The functional role of moss in structuring biotic interactions and terrestrialization of Antarctica
Evenson, Paul	A-120-M	Neutron monitor observations of cosmic rays from Jang Bogo and McMurdo Station
Evenson, Paul	A-118-S	Element composition of high-energy solar particles
Fischer, Tobias P	G-411-M	Erebus volcano: Characterizing a subglacial hydrothermal system and potential effects on CO2 degassing
Fortescue, Donald	W-467-M/S	Artistic and scientific fieldwork at the South Pole: Inquiry at the edge of possibility
Franco, Hugo	A-145-M	NASA Long Duration Balloon (LDB) support program
Fraser, William Ronald	C-013-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Friedlaender, Ari Seth	C-024-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Friedlaender, Ari Seth	C-024-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem

Gao, Yuan	O-231-P	Quantifying atmospheric iron properties over the Western Antarctic Peninsula
Gerrard, Andrew	A-111-M/S	Synoptic geospace systems analysis using instrumentation from South Pole and McMurdo Stations
Gerrard, Andrew	A-112-M/S	Scientific studies from a network of sustainable, robotic observatories across the Antarctic ice shelf: A new approach to polar research
Girton, James Bannister	O-398-N	Pathways of circumpolar deep water to West Antarctica from profiling float and satellite measurements
Girton, James Bannister	O-226-L/N	Sustained measurements of Southern Ocean air-sea coupling from a mobile autonomous platform
Goodge, John	D-551-M	Phase 2 development of a Rapid Access Ice Drilling (RAID) platform for research in Antarctica
Goodge, John	D-552-M	Phase 2 development of a Rapid Access Ice Drilling (RAID) platform for research in Antarctica / DOSECC Exploration Services (DES)
Gooseff, Michael N	C-506-M	McMurdo LTER - Streams: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valleys LTER Program
Gooseff, Michael N	C-504-M	McMurdo LTER - Glaciers: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valleys LTER Program
Gorham, Peter W	A-371-M	Antarctic Impulsive Transient Antenna (ANITA III) experiment
Graham, Rebecca Robinson	G-152-N	A field and laboratory examination of the diatom N and Si isotope proxies: Implications for assessing the Southern Ocean biological pump
Halzen, Francis	A-333-S	IceCube operations and maintenance
Hamilton, Gordon S	I-178-M	Flow and fracture dynamics in an ice shelf lateral margin: Observations and modeling of the McMurdo Shear Zone
Harvey, Ralph	G-058-M	Antarctic Search for Meteorites (ANSMET)
Hebert, Jason Paul	T-299-M/S	IRIS/PASSCAL seismic support
Heine, John N	T-913-M	Rebreather testing for the NSF DPP USAP scientific diving program

Hofmann, Gretchen	B-134-M	Ocean acidification seascape: linking natural variability and anthropogenic changes in pH and temperature to performance in calcifying Antarctic marine invertebrates
Hosticka, Bouvard	T-998-P	Operation and maintenance of a CTBT radionuclide monitoring station at Palmer Station
Howkins, Adrian J	C-457-M	Assessing changing patterns of human activity in the McMurdo Dry Valleys using digital photo archive
Jefferies, Stuart	A-367-M/S	Using gravity waves to probe the solar atmosphere
Jenkins, Bethany Diane	B-230-N	Investigating iron-binding ligands in Southern Ocean diatom communities: The role of diatom-bacteria associations
Johnson, Sarah S	G-062-M	EAGER: Single-molecule sequencing of Antarctic paleolakes
Karle, Albrecht	A-107-S	Development of the Askaryan Radio Array Ultra-High Energy Neutrino Detector at the South Pole
Kemerait, Robert C	G-078-M	Dry Valley seismic project
Kohut, Josh	B-005-L	Impacts of local oceanographic processes on Adélie penguin foraging ecology over Palmer Deep
Koutnik, Michelle R	I-193-M/S	Characterization of upstream ice and firn dynamics affecting the South Pole Ice (SPICE) core
Kovac, John	A-149-S	Imaging the beginning of time from the South Pole: Observations with the full SPUD array
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Ackert, Robert	G-438-M	Sujoy Mukhopadhyay
Adams, Byron	C-507-M	Diana Wall
Aeberhard, Matthew John	Y-328-M	Joseph J Wilson
Ahmed, Zeeshan NMI	A-365-S	Chao-Lin Kuo
Aitchison, John	Y-328-M	Joseph J Wilson
Alexander, Conel M.O'D.	O-399-S	Susan Taylor
Amare, Yonas NMI	A-138-M	Eun-Suk Seo
Amsler, Margaret	B-022-P	Charles Amsler
Anandakrishnan, Sridhar	I-166-M	Erin Pettit
Anderson, Adam NMI	A-379-S	John Carlstrom
Andreas, Amanda Leola	B-043-M	Samuel Bowser
Andriuzzi, Walter Salvatore	C-507-M	Diana Wall
Arroyo, Maria C	O-270-L	Elizabeth Henderson Shadwick
Asefaw, Hanna Fethee	G-056-M	Lisa Tauxe
Auer, Ralf	A-333-S	Francis Halzen
Badgeley, Jessica NMI	I-186-M	John Stone
Bai, Yu NMI	G-062-M	Sarah S Johnson
Bain, Hazel Miller	A-337-M/S	Pascal Saint-Hilaire
Baker, Bill	B-022-P	Charles Amsler
Balco, Gregory A.	I-177-M	Gordon R Bromley
Ballard, Grant	B-031-M	David Ainley
Balter, Allie Michelle	I-177-M	Gordon R Bromley
Banwell, Alison F	I-190-M	Douglas R MacAyeal
Barkats, Denis	A-149-S	John Kovac

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Bergstrom, Anna NMI	C-504-M	Michael N Gooseff
Bernard, Kim	B-006-N	George Watters
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Bertinato, Christopher NMI	C-384-M	Robin E Bell
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Chung, Kelcey Ann Yukie	B-212-L	Craig Smith
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Ilanko, Tehnuka	G-411-M	Tobias P Fischer
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Melville, Bob	A-112-M/S	Andrew Gerrard
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Morton, Elizabeth Tarrant	T-150-M	Mary Albert
Mullin, Matthew Michael	A-145-M	Hugo Franco
Munro, David Russel	O-214-L/N	David Russel Munro
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Nadolski, Andrew Wade	A-379-S	John Carlstrom
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Nelles, Anna NMI	A-127-M	Steven Barwick
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Neuhaus, Sarah Ursula	C-525-M	Susan Schwartz
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Nichols, Erik	A-379-S	John Carlstrom
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Padin, Stephen	A-379-S	John Carlstrom
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365	A-365-S	Kuo, Chao-Lin
367	A-367-M/S	Jefferies, Stuart
369	A-369-M/S	Bristow, William
371	A-371-M	Gorham, Peter
373	A-373-P	Paznukhov, Vadym
379	A-379-S	Carlstrom, John
384	C-384-M	Bell, Robin
396	T-396-M	Szuberla, Curt
398	O-398-N	Girton, James
399	O-399-S	Taylor, Susan
403	O-403-M	Zappa, Christopher
404	O-404-L	Stephens, Britton
410	O-410-N	Ulses, Greg
411	G-411-M	Fischer, Tobias
413	G-413-L	Shuster, David
434	T-434-M	Morin, Paul
438	G-438-M	Mukhopadhyay, Sujoy
456	O-456-M	Seefeldt, Mark
457	C-457-M	Howkins, Adrian
467	W-467-M/S	Fortescue, Donald
469	B-469-N	Rynearson, Tatiana

479	W-479-M	McClure, Glenn
483	W-483-M	Wicks, Maris
487	W-487-M	Carroll, Michael
504	C-504-M	Gooseff, Michael
505	C-505-M	Priscu, John
506	C-506-M	Gooseff, Michael
507	C-507-M	Wall, Diana
509	C-509-M	Lyons, W. Berry
511	C-511-M	Doran, Peter
515	C-515-L	Domack, Eugene
525	C-525-M	Schwartz, Susan
529	C-529-M	Kurtz, Nathan
531	C-531-M/N	Ackley, Stephen
533	C-533-M	Priscu, John
551	D-551-M	Goodge, John
552	D-552-M	Goodge, John
599	X-599-S	Dinn, Michael
605	Y-605-M	Robinson, Kim
913	T-913-M	Heine, John
927	T-927-M	Thoman, Bruce
942	T-942-S	Deeb, Elias
998	T-998-P	Hosticka, Bouvard

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Technical Event

Principal Investigator	Event No.	Project Title
Albert, Mary	T-350-M	Ice Drill Design and Operations (IDDO) support for WAIS Divide
Albert, Mary	T-150-M	IDPO / IDDO - McMurdo
Deeb, Elias	T-942-S	Building envelope and infrastructure assessment using an integrated thermal imaging and LiDAR scanning system
Hebert, Jason	T-299-M/S	IRIS/PASSCAL seismic support
Heine, John	T-913-M	Rebreather testing for the NSF DPP USAP scientific diving program
Hosticka, Bouvard	T-998-P	Operation and maintenance of a CTBT radionuclide monitoring station at Palmer Station
Morin, Paul	T-434-M	The Polar Geospatial Information Center: Joint support
Pettit, Joseph	T-295-M	UNAVCO GPS survey support
Szuberla, Curt	T-396-M	Operation and maintenance of a CTBT class infrasound array at Windless Bight
Thoman, Bruce	T-927-M	NASA / McMurdo Ground Station (MG1)

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Other Science Events

Principal Investigator	Event No.	Project Title
Dinn, Michael	X-599-S	British Antarctic Survey (BAS)

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Astrophysics and Geospace Sciences

Principal Investigator	Event No.	Project Title
Barwick, Steven	A-127-M	Precision Operation of Hexagonal Radio Array
Bristow, William	A-369-M/S	McMurdo and South Pole SuperDARN: Investigation of the ionospheric dynamics and magnetosphere-ionosphere coupling in Antarctica
Carlstrom, John	A-379-S	Cosmological research with the 10-meter South Pole Telescope
Chu, Xinzhao	A-130-M	LiDAR investigation of middle and upper atmosphere temperature, composition, chemistry, and dynamics at McMurdo, Antarctica
Chu, Xinzhao	A-123-M	High-resolution Na Doppler LiDAR observations of the middle and upper atmosphere at McMurdo, Antarctica
Conde, Mark	A-343-M/S	High-resolution mapping of thermospheric wind and temperature fields near the equatorward edge of the Antarctic polar cap
Evenson, Paul	A-120-M	Neutron monitor observations of cosmic rays from Jang Bogo and McMurdo Station
Evenson, Paul	A-118-S	Element composition of high-energy solar particles
Franco, Hugo	A-145-M	NASA Long Duration Balloon (LDB) support program
Gerrard, Andrew	A-111-M/S	Synoptic geospace systems analysis using instrumentation from South Pole and McMurdo Stations
Gerrard, Andrew	A-112-M/S	Scientific studies from a network of sustainable, robotic observatories across the Antarctic ice shelf: A new approach to polar research
Gorham, Peter	A-371-M	Antarctic Impulsive Transient Antenna (ANITA III) experiment
Halzen, Francis	A-333-S	IceCube operations and maintenance
Jefferies, Stuart	A-367-M/S	Using gravity waves to probe the solar

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		atmosphere
Karle, Albrecht	A-107-S	Development of the Askaryan Radio Array Ultra-High Energy Neutrino Detector at the South Pole
Kovac, John	A-149-S	Imaging the beginning of time from the South Pole: Observations with the full SPUD array
Kulesa, Craig	A-364-M/S	High Elevation Antarctic Terahertz (HEAT) telescopes for Dome A and Ridge A
Kuo, Chao-Lin	A-365-S	Science observation with BICEP3 CMB polarization experiment
LaBelle, James	A-125-S	Application of the AGO network to energy transfer in the radiation belts and remote sensing of auroral plasma processes
LaBelle, James	A-128-S	Earth's electromagnetic environment: Advancing recent discoveries in auroral plasma radio emission research
Lessard, Marc	A-102-M/S	Studies of ULF waves associated with solar wind coupling to the magnetosphere and ionosphere
Moore, Robert	A-109-M/P/S	Antarctic ELF/VLF observations of Q-bursts, radio atmospherics, and energetic particle precipitation
Palo, Scott	A-284-M	Lower thermospheric science using new meteor radars at McMurdo and WAIS Divide
Paznukhov, Vadym	A-373-P	Troposphere-ionosphere coupling via atmospheric gravity waves
Saint-Hilaire, Pascal	A-337-M/S	Gamma-Ray Imager/Polarimeter for Solar flares (GRIPS)
Seo, Eun-Suk	A-138-M	The Boron And Carbon Cosmic rays in the Upper Stratosphere (BACCUS)
Taylor, Michael	A-119-M/P/S	Development of an ANtarctic Gravity Wave Imager Network (ANGWIN) for collaborative mesospheric research
Taylor, Michael	A-119-M/P/S	Investigating wave-driven Mesospheric dynamics over South Pole using an advanced Mesospheric temperature mapper
Taylor, Michael	A-119-M/P/S	Continental-scale studies of Mesospheric dynamics using the Antarctic Gravity Wave Instrument Network (ANGWIN)

Walker, Christopher	A-136-M	Stratospheric Terahertz Observatory (STO)

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Organisms and Ecosystems

Principal Investigator	Event No.	Project Title
Ainley, David	B-031-M	Adelie penguin response to climate change in the Ross Sea region – a full life-cycle approach
Amsler, Charles	B-022-P	The chemical ecology of shallow-water marine macroalgae and invertebrates on the Antarctic Peninsula
Bowser, Samuel	B-043-M	Assembling and mining the genomics of giant Antarctic foraminifera
Burns, Jennifer	B-292-M	The cost of a new fur coat: Interactions between molt and reproduction in Weddell seals
Buys, Emmanuel	B-267-M	Unraveling the genomic and molecular basis of the dive response: Nitric oxide signaling and vasoregulation in the Weddell seal
Countway, Peter	B-028-P	Antarctic Microbial Networks and DMSP: Linking diversity, biogeochemistry, and functional gene expression
Davis, Randall	B-017-M	Geomagnetic navigation by Weddell seals beneath Antarctic ice
Eppley, Dr. Sarah	B-289-E	The functional role of moss in structuring biotic interactions and terrestrialization of Antarctica
Hofmann, Gretchen	B-134-M	Ocean acidification seascape: linking natural variability and anthropogenic changes in pH and temperature to performance in calcifying Antarctic marine invertebrates
Jenkins, Bethany	B-230-N	Investigating iron-binding ligands in Southern Ocean diatom communities: The role of diatom-bacteria associations
Kohut, Josh	B-005-L	Impacts of local oceanographic processes on Adélie penguin foraging ecology over Palmer Deep
Lee, Richard	B-256-P	Winter survival mechanisms and adaptive genetic variation in an Antarctic insect

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Moran, Amy	B-307-M	Body size, oxygen, and vulnerability to climate change: a physiological study of Antarctic Pycnogonida
Polito, Michael	B-025-E	Investigating Holocene shifts in the diets and paleohistory of Antarctic krill predators
Postlethwait, John	B-029-P	IcemiR: The Evolution of microRNA control in Antarctic fish
Rotella, Jay	B-009-M	The demographic consequences of environmental variability and individual heterogeneity in life-history tactics of a long-lived Antarctic marine predator
Rynearson, Tatiana	B-469-N	Southern Ocean diatoms and climate change: quantifying the relative roles of diversity and plasticity in evolution
Schmidt, Steven	B-320-M	Stochasticity and cyroconite community assembly and function
Smith, Craig	B-212-L	Fjord ecosystem structure and function on the Western Antarctic Peninsula - hotspots of productivity and biodiversity
Thurber, Andrew	B-001-M	Elucidating the Antarctic Methane Cycle at the Cinder Cones Reducing Habitat
Watters, George	B-006-N	NOAA / AMLR

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Earth Sciences

Principal Investigator	Event No.	Project Title
Anderson, Kent	G-090-P/S	Global seismograph station at South Pole and Palmer Stations
Anderson, Robert	G-051-N	Water mass structure and bottom water formation in the ice-age Southern Ocean
Cottle, John	G-076-M	Petrologic constraints on subduction termination from lamprophyres, Ross Orogen, Antarctica
Fischer, Tobias	G-411-M	Erebus volcano: Characterizing a subglacial hydrothermal system and potential effects on CO2 degassing
Graham, Rebecca	G-152-N	A field and laboratory examination of the diatom N and Si isotope proxies: Implications for assessing the Southern Ocean biological pump
Harvey, Ralph	G-058-M	Antarctic Search for Meteorites (ANSMET)
Johnson, Sarah	G-062-M	EAGER: Single-molecule sequencing of Antarctic paleolakes
Kemerait, Robert	G-078-M	Dry Valley seismic project
Kowalewski, Douglas	G-091-M	Friis Hills drilling project: An international collaboration to examine the Miocene transition in Antarctica
Kyle, Phillip	G-081-M	Mount Erebus Volcano Observatory: Operations, Science, and Outreach (MEVO-OSO)
Mukhopadhyay, Sujoy	G-438-M	Constraining Plio-Pleistocene West Antarctic Ice Sheet behavior from the Ohio Range and Scott Glacier
Shubin, Neil	G-071-M	Middle-late Devonian vertebrates of Antarctica
Shuster, David	G-413-L	Antarctic Peninsula exhumation and landscape development investigated by low-temperature detrital thermochronometry
Tauxe, Lisa	G-056-M	Finding the missing dipole signal in global paleointensity data: Revisiting

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		the high southerly latitudes
Taylor, Edith	G-135-M	Permian and Triassic icehouse to greenhouse paleoenvironments and paleobotany in the Shackleton Glacier Area, Antarctica
Wannamaker, Philip	G-072-M	Magma sources, residence and pathways of Mount Erebus phonolitic volcano, Antarctica, from magnetotelluric resistivity structure
Wiens, Douglas	G-089-M	Mantle structure and dynamics of the Ross Sea from a passive seismic deployment on the Ross Ice Shelf
Wilson, Terry	G-079-M	POLENET Antarctica: Investigating links between geodynamics and ice sheets - Phase 2

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Glaciology

Principal Investigator	Event No.	Project Title
Aydin, Murat	I-164-S	A 1,500-meter ice core from South Pole
Bay, Ryan	I-194-S	Laser dust logging and fluorimetric scanning of SPICE
Bromirski, Peter	I-348-M	Dynamic response of the Ross Ice Shelf to wave-induced vibrations
Bromley, Gordon	I-177-M	Potential direct geologic constraint of ice sheet thickness in the central Transantarctic Mountains during the Pliocene warm period
Hamilton, Gordon	I-178-M	Flow and fracture dynamics in an ice shelf lateral margin: Observations and modeling of the McMurdo Shear Zone
Koutnik, Michelle	I-193-M/S	Characterization of upstream ice and firn dynamics affecting the South Pole Ice (SPICE) core
MacAyeal, Douglas	I-190-M	Impact of supraglacial lakes on ice-shelf stability
Pettit, Erin	I-166-M	Velvet Ice - evolution of fabric and texture in ice at WAIS Divide, West Antarctica
Stone, John	I-277-M	EXPROBE-WAIS: Exposed rock beneath the West Antarctic Ice Sheet, a test for interglacial ice sheet collapse
Stone, John	I-186-M	High-resolution reconstruction of Holocene deglaciation in the southern Ross Embayment

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Ocean and Atmospheric Sciences

Principal Investigator	Event No.	Project Title
Butler, James	O-257-M/S	South Pole monitoring for climatic change
Butler, James	O-264-P	Collection of atmospheric air for the NOAA/GMD worldwide flask-sampling network
Butler, James	O-257-M/S	UV measurements at McMurdo Station for the NOAA/Global Monitoring Division (GMD) Antarctic UV network
Cassano, John	O-283-M	Antarctic Automatic Weather Station program (WinFly Component)
Chereskin, Teresa	O-317-L	Southern Ocean current observations from the U.S. Antarctic research vessels
Gao, Yuan	O-231-P	Quantifying atmospheric iron properties over the Western Antarctic Peninsula
Girton, James	O-398-N	Pathways of circumpolar deep water to West Antarctica from profiling float and satellite measurements
Girton, James	O-226-L/N	Sustained measurements of Southern Ocean air-sea coupling from a mobile autonomous platform
Lazzara, Matt	O-283-M	Antarctic Automatic Weather Station Program
Lubin, Dan	O-325-M	Department of Energy ARM West Antarctic Radiation Experiment (AWARE)
Munro, David	O-214-L/N	High-resolution underway air-sea observations in Drake Passage for climate science
Sarmiento, Jorge	O-271-N	Southern Ocean Carbon and climate Observations and Modeling (SOCCOM)
Sedwick, Peter	O-316-N	Impact of convective processes and sea ice formation on the distribution of iron in the Ross Sea: closing the seasonal cycle.

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Seefeldt, Mark	O-456-M	Implementing low-power, autonomous observing systems to improve the measurement and understanding of Antarctic precipitation
Shadwick, Elizabeth	O-270-L	Resolving CO2 system seasonality in the West Antarctic Peninsula with Autonomous Observations
Sprintall, Janet	O-260-L	The Drake Passage high-density XBT/XCTD program
Stephens, Britton	O-404-L	High-resolution underway air-sea observations in Drake Passage for climate science
Taylor, Susan	O-399-S	Sampling comet dust from Antarctic air
Ulses, Greg	O-410-N	Ocean Observatories Initiative (OOI) Southern Hemisphere cruises
Zappa, Christopher	O-403-M	Oceanic response to a coastal polynya, Terra Nova Bay, Antarctica

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Integrated System Science

Principal Investigator	Event No.	Project Title
Ackley, Stephen	C-531-M/N	Polynyas, Ice Production and seasonal Evolution in the Ross Sea (PIPERS)
Bell, Robin	C-384-M	A systems approach to understanding the Ross Ocean and ice Shelf Environment and Tectonic setting Through Aerogeophysical surveys and modeling (ROSETTA)
Domack, Eugene	C-515-L	Continuation of the LARISSA continuous GPS network in view of observed dynamic response to Antarctic Peninsula mass balance and required geologic constraints
Doran, Peter	C-511-M	McMurdo LTER - Lakes: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valleys LTER Program
Ducklow, Hugh	C-045-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Fraser, William	C-013-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Friedlaender, Ari	C-024-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Friedlaender, Ari	C-024-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Gooseff, Michael	C-506-M	McMurdo LTER - Streams: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valleys LTER Program
Gooseff, Michael	C-504-M	McMurdo LTER - Glaciers: Increased connectivity in a polar desert resulting

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		from climate warming: McMurdo Dry Valleys LTER Program
Howkins, Adrian	C-457-M	Assessing changing patterns of human activity in the McMurdo Dry Valleys using digital photo archive
Kurtz, Nathan	C-529-M	Operation IceBridge
Lyons, W. Berry	C-509-M	McMurdo LTER - Geochemistry: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valleys LTER Program
Martinson, Doug	C-021-L	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Priscu, John	C-505-M	McMurdo LTER - Lakes: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valleys LTER Program
Priscu, John	C-533-M	Subglacial Antarctic Lakes Scientific Access (SALSA): Integrated study of carbon cycling in hydrologically active subglacial environments
Schofield, Oscar	C-019-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Schwartz, Susan	C-525-M	High-resolution heterogeneity at the base of Whillans Ice Stream and its control on ice dynamics
Steinberg, Deborah	C-020-L	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Wall, Diana	C-507-M	McMurdo LTER - Soils: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valleys LTER Program

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Artists and Writers

Principal Investigator	Event No.	Project Title
Carroll, Michael	W-487-M	Alien Landscapes
Fortescue, Donald	W-467-M/S	Artistic and scientific fieldwork at the South Pole: Inquiry at the edge of possibility
McClure, Glenn	W-479-M	Music in the ice: Musical interpretation of, and instructional module on, Ross Ice Shelf wave-induced vibrations
Wicks, Maris	W-483-M	Antarctica comics project: A look at the science in Antarctica through the eyes of a comic book artist

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Instrumentation and Technology Development

Principal Investigator	Event No.	Project Title
Goodge, John	D-551-M	Phase 2 development of a Rapid Access Ice Drilling (RAID) platform for research in Antarctica
Goodge, John	D-552-M	Phase 2 development of a Rapid Access Ice Drilling (RAID) platform for research in Antarctica / DOSECC Exploration Services (DES)

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Education and Outreach

Principal Investigator	Event No.	Project Title
Robinson, Kim	Y-605-M	Smithsonian Magazine “Worst Journey In The World” article
Wilson, Joseph	Y-328-M	Adélie study

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Amundsen-Scott South Pole Station

Principal Investigator	Event No.	Project Title
Anderson, Kent	G-090-P/S	Global seismograph station at South Pole and Palmer Stations
Aydin, Murat	I-164-S	A 1,500-meter ice core from South Pole
Bay, Ryan	I-194-S	Laser dust logging and fluorimetric scanning of SPICE
Bristow, William	A-369-M/S	McMurdo and South Pole SuperDARN: Investigation of the ionospheric dynamics and magnetosphere-ionosphere coupling in Antarctica
Butler, James	O-257-M/S	South Pole monitoring for climatic change
Butler, James	O-257-M/S	UV measurements at McMurdo Station for the NOAA/Global Monitoring Division (GMD) Antarctic UV network
Carlstrom, John	A-379-S	Cosmological research with the 10-meter South Pole Telescope
Conde, Mark	A-343-M/S	High-resolution mapping of thermospheric wind and temperature fields near the equatorward edge of the Antarctic polar cap
Deeb, Elias	T-942-S	Building envelope and infrastructure assessment using an integrated thermal imaging and LiDAR scanning system
Dinn, Michael	X-599-S	British Antarctic Survey (BAS)
Evenson, Paul	A-118-S	Element composition of high-energy solar particles
Fortescue, Donald	W-467-M/S	Artistic and scientific fieldwork at the South Pole: Inquiry at the edge of possibility
Gerrard, Andrew	A-111-M/S	Synoptic geospace systems analysis using instrumentation from South Pole and McMurdo Stations
Gerrard, Andrew	A-112-M/S	Scientific studies from a network of sustainable, robotic observatories across the Antarctic ice shelf: A new

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		approach to polar research
Halzen, Francis	A-333-S	IceCube operations and maintenance
Hebert, Jason	T-299-M/S	IRIS/PASSCAL seismic support
Jefferies, Stuart	A-367-M/S	Using gravity waves to probe the solar atmosphere
Karle, Albrecht	A-107-S	Development of the Askaryan Radio Array Ultra-High Energy Neutrino Detector at the South Pole
Koutnik, Michelle	I-193-M/S	Characterization of upstream ice and firn dynamics affecting the South Pole Ice (SPICE) core
Kovac, John	A-149-S	Imaging the beginning of time from the South Pole: Observations with the full SPUD array
Kulesa, Craig	A-364-M/S	High Elevation Antarctic Terahertz (HEAT) telescopes for Dome A and Ridge A
Kuo, Chao-Lin	A-365-S	Science observation with BICEP3 CMB polarization experiment
LaBelle, James	A-125-S	Application of the AGO network to energy transfer in the radiation belts and remote sensing of auroral plasma processes
LaBelle, James	A-128-S	Earth's electromagnetic environment: Advancing recent discoveries in auroral plasma radio emission research
Lessard, Marc	A-102-M/S	Studies of ULF waves associated with solar wind coupling to the magnetosphere and ionosphere
Moore, Robert	A-109-M/P/S	Antarctic ELF/VLF observations of Q-bursts, radio atmospherics, and energetic particle precipitation
Saint-Hilaire, Pascal	A-337-M/S	Gamma-Ray Imager/Polarimeter for Solar flares (GRIPS)
Taylor, Michael	A-119-M/P/S	Development of an ANtarctic Gravity Wave Imager Network (ANGWIN) for collaborative mesospheric research
Taylor, Michael	A-119-M/P/S	Investigating wave-driven Mesospheric dynamics over South Pole using an advanced Mesospheric temperature mapper
Taylor, Michael	A-119-M/P/S	Continental-scale studies of Mesospheric dynamics using the Antarctic Gravity Wave Instrument Network (ANGWIN)

Taylor, Susan	O-399-S	Sampling comet dust from Antarctic air

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McMurdo Station

Principal Investigator	Event No.	Project Title
Ackley, Stephen	C-531-M/N	Polynyas, Ice Production and seasonal Evolution in the Ross Sea (PIPERS)
Ainley, David	B-031-M	Adelie penguin response to climate change in the Ross Sea region – a full life-cycle approach
Albert, Mary	T-350-M	Ice Drill Design and Operations (IDDO) support for WAIS Divide
Albert, Mary	T-150-M	IDPO / IDDO - McMurdo
Barwick, Steven	A-127-M	Precision Operation of Hexagonal Radio Array
Bell, Robin	C-384-M	A systems approach to understanding the Ross Ocean and ice Shelf Environment and Tectonic setting Through Aerogeophysical surveys and modeling (ROSETTA)
Bowser, Samuel	B-043-M	Assembling and mining the genomics of giant Antarctic foraminifera
Bristow, William	A-369-M/S	McMurdo and South Pole SuperDARN: Investigation of the ionospheric dynamics and magnetosphere-ionosphere coupling in Antarctica
Bromirski, Peter	I-348-M	Dynamic response of the Ross Ice Shelf to wave-induced vibrations
Bromley, Gordon	I-177-M	Potential direct geologic constraint of ice sheet thickness in the central Transantarctic Mountains during the Pliocene warm period
Burns, Jennifer	B-292-M	The cost of a new fur coat: Interactions between molt and reproduction in Weddell seals
Butler, James	O-257-M/S	South Pole monitoring for climatic change
Butler, James	O-257-M/S	UV measurements at McMurdo Station for the NOAA/Global Monitoring Division (GMD) Antarctic UV network
Buys, Emmanuel	B-267-M	Unraveling the genomic and molecular basis of the dive response: Nitric oxide

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		signaling and vasoregulation in the Weddell seal
Carroll, Michael	W-487-M	Alien Landscapes
Cassano, John	O-283-M	Antarctic Automatic Weather Station program (WinFly Component)
Chu, Xinzhao	A-130-M	LiDAR investigation of middle and upper atmosphere temperature, composition, chemistry, and dynamics at McMurdo, Antarctica
Chu, Xinzhao	A-123-M	High-resolution Na Doppler LiDAR observations of the middle and upper atmosphere at McMurdo, Antarctica
Conde, Mark	A-343-M/S	High-resolution mapping of thermospheric wind and temperature fields near the equatorward edge of the Antarctic polar cap
Cottle, John	G-076-M	Petrologic constraints on subduction termination from lamprophyres, Ross Orogen, Antarctica
Davis, Randall	B-017-M	Geomagnetic navigation by Weddell seals beneath Antarctic ice
Doran, Peter	C-511-M	McMurdo LTER - Lakes: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valleys LTER Program
Evenson, Paul	A-120-M	Neutron monitor observations of cosmic rays from Jang Bogo and McMurdo Station
Fischer, Tobias	G-411-M	Erebus volcano: Characterizing a subglacial hydrothermal system and potential effects on CO2 degassing
Fortescue, Donald	W-467-M/S	Artistic and scientific fieldwork at the South Pole: Inquiry at the edge of possibility
Franco, Hugo	A-145-M	NASA Long Duration Balloon (LDB) support program
Gerrard, Andrew	A-111-M/S	Synoptic geospace systems analysis using instrumentation from South Pole and McMurdo Stations
Gerrard, Andrew	A-112-M/S	Scientific studies from a network of sustainable, robotic observatories across the Antarctic ice shelf: A new approach to polar research
Goodge, John	D-551-M	Phase 2 development of a Rapid Access Ice Drilling (RAID) platform for research in Antarctica

Goodge, John	D-552-M	Phase 2 development of a Rapid Access Ice Drilling (RAID) platform for research in Antarctica / DOSECC Exploration Services (DES)
Gooseff, Michael	C-506-M	McMurdo LTER - Streams: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valleys LTER Program
Gooseff, Michael	C-504-M	McMurdo LTER - Glaciers: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valleys LTER Program
Gorham, Peter	A-371-M	Antarctic Impulsive Transient Antenna (ANITA III) experiment
Hamilton, Gordon	I-178-M	Flow and fracture dynamics in an ice shelf lateral margin: Observations and modeling of the McMurdo Shear Zone
Harvey, Ralph	G-058-M	Antarctic Search for Meteorites (ANSMET)
Hebert, Jason	T-299-M/S	IRIS/PASSCAL seismic support
Heine, John	T-913-M	Rebreather testing for the NSF DPP USAP scientific diving program
Hofmann, Gretchen	B-134-M	Ocean acidification seascape: linking natural variability and anthropogenic changes in pH and temperature to performance in calcifying Antarctic marine invertebrates
Howkins, Adrian	C-457-M	Assessing changing patterns of human activity in the McMurdo Dry Valleys using digital photo archive
Jefferies, Stuart	A-367-M/S	Using gravity waves to probe the solar atmosphere
Johnson, Sarah	G-062-M	EAGER: Single-molecule sequencing of Antarctic paleolakes
Kemerait, Robert	G-078-M	Dry Valley seismic project
Koutnik, Michelle	I-193-M/S	Characterization of upstream ice and firn dynamics affecting the South Pole Ice (SPICE) core
Kowalewski, Douglas	G-091-M	Friis Hills drilling project: An international collaboration to examine the Miocene transition in Antarctica
Kulesa, Craig	A-364-M/S	High Elevation Antarctic Terahertz (HEAT) telescopes for Dome A and Ridge A
Kurtz, Nathan	C-529-M	Operation IceBridge

Kyle, Phillip	G-081-M	Mount Erebus Volcano Observatory: Operations, Science, and Outreach (MEVO-OSO)
Lazzara, Matt	O-283-M	Antarctic Automatic Weather Station Program
Lessard, Marc	A-102-M/S	Studies of ULF waves associated with solar wind coupling to the magnetosphere and ionosphere
Lubin, Dan	O-325-M	Department of Energy ARM West Antarctic Radiation Experiment (AWARE)
Lyons, W. Berry	C-509-M	McMurdo LTER - Geochemistry: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valleys LTER Program
MacAyeal, Douglas	I-190-M	Impact of supraglacial lakes on ice-shelf stability
McClure, Glenn	W-479-M	Music in the ice: Musical interpretation of, and instructional module on, Ross Ice Shelf wave-induced vibrations
Moore, Robert	A-109-M/P/S	Antarctic ELF/VLF observations of Q-bursts, radio atmospherics, and energetic particle precipitation
Moran, Amy	B-307-M	Body size, oxygen, and vulnerability to climate change: a physiological study of Antarctic Pycnogonida
Morin, Paul	T-434-M	The Polar Geospatial Information Center: Joint support
Mukhopadhyay, Sujoy	G-438-M	Constraining Plio-Pleistocene West Antarctic Ice Sheet behavior from the Ohio Range and Scott Glacier
Palo, Scott	A-284-M	Lower thermospheric science using new meteor radars at McMurdo and WAIS Divide
Pettit, Erin	I-166-M	Velvet Ice - evolution of fabric and texture in ice at WAIS Divide, West Antarctica
Pettit, Joseph	T-295-M	UNAVCO GPS survey support
Priscu, John	C-505-M	McMurdo LTER - Lakes: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valleys LTER Program
Priscu, John	C-533-M	Subglacial Antarctic Lakes Scientific Access (SALSA): Integrated study of carbon cycling in hydrologically active subglacial environments

Robinson, Kim	Y-605-M	Smithsonian Magazine “Worst Journey In The World” article
Rotella, Jay	B-009-M	The demographic consequences of environmental variability and individual heterogeneity in life-history tactics of a long-lived Antarctic marine predator
Saint-Hilaire, Pascal	A-337-M/S	Gamma-Ray Imager/Polarimeter for Solar flares (GRIPS)
Schmidt, Steven	B-320-M	Stochasticity and cyroconite community assembly and function
Schwartz, Susan	C-525-M	High-resolution heterogeneity at the base of Whillans Ice Stream and its control on ice dynamics
Seefeldt, Mark	O-456-M	Implementing low-power, autonomous observing systems to improve the measurement and understanding of Antarctic precipitation
Seo, Eun-Suk	A-138-M	The Boron And Carbon Cosmic rays in the Upper Stratosphere (BACCUS)
Shubin, Neil	G-071-M	Middle-late Devonian vertebrates of Antarctica
Stone, John	I-277-M	EXPROBE-WAIS: Exposed rock beneath the West Antarctic Ice Sheet, a test for interglacial ice sheet collapse
Stone, John	I-186-M	High-resolution reconstruction of Holocene deglaciation in the southern Ross Embayment
Szuberla, Curt	T-396-M	Operation and maintenance of a CTBT class infrasound array at Windless Bight
Tauxe, Lisa	G-056-M	Finding the missing dipole signal in global paleointensity data: Revisiting the high southerly latitudes
Taylor, Edith	G-135-M	Permian and Triassic icehouse to greenhouse paleoenvironments and paleobotany in the Shackleton Glacier Area, Antarctica
Taylor, Michael	A-119-M/P/S	Development of an ANtarctic Gravity Wave Imager Network (ANGWIN) for collaborative mesospheric research
Taylor, Michael	A-119-M/P/S	Investigating wave-driven Mesospheric dynamics over South Pole using an advanced Mesospheric temperature mapper
Taylor, Michael	A-119-M/P/S	Continental-scale studies of Mesospheric dynamics using the Antarctic Gravity Wave Instrument Network (ANGWIN)

Thoman, Bruce	T-927-M	NASA / McMurdo Ground Station (MG1)
Thurber, Andrew	B-001-M	Elucidating the Antarctic Methane Cycle at the Cinder Cones Reducing Habitat
Walker, Christopher	A-136-M	Stratospheric Terahertz Observatory (STO)
Wall, Diana	C-507-M	McMurdo LTER - Soils: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valleys LTER Program
Wannamaker, Philip	G-072-M	Magma sources, residence and pathways of Mount Erebus phonolitic volcano, Antarctica, from magnetotelluric resistivity structure
Wicks, Maris	W-483-M	Antarctica comics project: A look at the science in Antarctica through the eyes of a comic book artist
Wiens, Douglas	G-089-M	Mantle structure and dynamics of the Ross Sea from a passive seismic deployment on the Ross Ice Shelf
Wilson, Joseph	Y-328-M	Adélie study
Wilson, Terry	G-079-M	POLENET Antarctica: Investigating links between geodynamics and ice sheets - Phase 2
Zappa, Christopher	O-403-M	Oceanic response to a coastal polynya, Terra Nova Bay, Antarctica

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Palmer Station

Principal Investigator	Event No.	Project Title
Amsler, Charles	B-022-P	The chemical ecology of shallow-water marine macroalgae and invertebrates on the Antarctic Peninsula
Anderson, Kent	G-090-P/S	Global seismograph station at South Pole and Palmer Stations
Butler, James	O-264-P	Collection of atmospheric air for the NOAA/GMD worldwide flask-sampling network
Countway, Peter	B-028-P	Antarctic Microbial Networks and DMSP: Linking diversity, biogeochemistry, and functional gene expression
Ducklow, Hugh	C-045-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Fraser, William	C-013-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Friedlaender, Ari	C-024-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Friedlaender, Ari	C-024-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Gao, Yuan	O-231-P	Quantifying atmospheric iron properties over the Western Antarctic Peninsula
Hosticka, Bouvard	T-998-P	Operation and maintenance of a CTBT radionuclide monitoring station at Palmer Station
Lee, Richard	B-256-P	Winter survival mechanisms and adaptive genetic variation in an Antarctic insect

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Moore, Robert	A-109-M/P/S	Antarctic ELF/VLF observations of Q-bursts, radio atmospherics, and energetic particle precipitation
Paznukhov, Vadym	A-373-P	Troposphere-ionosphere coupling via atmospheric gravity waves
Postlethwait, John	B-029-P	IcemiR: The Evolution of microRNA control in Antarctic fish
Schofield, Oscar	C-019-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Taylor, Michael	A-119-M/P/S	Development of an ANtarctic Gravity Wave Imager Network (ANGWIN) for collaborative mesospheric research
Taylor, Michael	A-119-M/P/S	Investigating wave-driven Mesospheric dynamics over South Pole using an advanced Mesospheric temperature mapper
Taylor, Michael	A-119-M/P/S	Continental-scale studies of Mesospheric dynamics using the Antarctic Gravity Wave Instrument Network (ANGWIN)

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RVIB Nathaniel B. Palmer

Principal Investigator	Event No.	Project Title
Ackley, Stephen	C-531-M/N	Polynyas, Ice Production and seasonal Evolution in the Ross Sea (PIPERS)
Anderson, Robert	G-051-N	Water mass structure and bottom water formation in the ice-age Southern Ocean
Girton, James	O-398-N	Pathways of circumpolar deep water to West Antarctica from profiling float and satellite measurements
Girton, James	O-226-L/N	Sustained measurements of Southern Ocean air-sea coupling from a mobile autonomous platform
Graham, Rebecca	G-152-N	A field and laboratory examination of the diatom N and Si isotope proxies: Implications for assessing the Southern Ocean biological pump
Jenkins, Bethany	B-230-N	Investigating iron-binding ligands in Southern Ocean diatom communities: The role of diatom-bacteria associations
Munro, David	O-214-L/N	High-resolution underway air-sea observations in Drake Passage for climate science
Rynearson, Tatiana	B-469-N	Southern Ocean diatoms and climate change: quantifying the relative roles of diversity and plasticity in evolution
Sarmiento, Jorge	O-271-N	Southern Ocean Carbon and climate Observations and Modeling (SOCCOM)
Sedwick, Peter	O-316-N	Impact of convective processes and sea ice formation on the distribution of iron in the Ross Sea: closing the seasonal cycle.
Ulses, Greg	O-410-N	Ocean Observatories Initiative (OOI) Southern Hemisphere cruises
Watters, George	B-006-N	NOAA / AMLR

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ARSV Laurence M. Gould

Principal Investigator	Event No.	Project Title
Chereskin, Teresa	O-317-L	Southern Ocean current observations from the U.S. Antarctic research vessels
Domack, Eugene	C-515-L	Continuation of the LARISSA continuous GPS network in view of observed dynamic response to Antarctic Peninsula mass balance and required geologic constraints
Ducklow, Hugh	C-045-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Fraser, William	C-013-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Friedlaender, Ari	C-024-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Friedlaender, Ari	C-024-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Girton, James	O-226-L/N	Sustained measurements of Southern Ocean air-sea coupling from a mobile autonomous platform
Kohut, Josh	B-005-L	Impacts of local oceanographic processes on Adélie penguin foraging ecology over Palmer Deep
Martinson, Doug	C-021-L	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Munro, David	O-214-L/N	High-resolution underway air-sea observations in Drake Passage for climate science

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Schofield, Oscar	C-019-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Shadwick, Elizabeth	O-270-L	Resolving CO2 system seasonality in the West Antarctic Peninsula with Autonomous Observations
Shuster, David	G-413-L	Antarctic Peninsula exhumation and landscape development investigated by low-temperature detrital thermochronometry
Smith, Craig	B-212-L	Fjord ecosystem structure and function on the Western Antarctic Peninsula - hotspots of productivity and biodiversity
Sprintall, Janet	O-260-L	The Drake Passage high-density XBT/XCTD program
Steinberg, Deborah	C-020-L	Palmer, Antarctica Long-Term Ecological Research (LTER): Land-shelf-ocean connectivity, ecosystem resilience and transformation in a sea-ice influenced pelagic ecosystem
Stephens, Britton	O-404-L	High-resolution underway air-sea observations in Drake Passage for climate science

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Special Projects

Principal Investigator	Event No.	Project Title
Eppley, Dr. Sarah	B-289-E	The functional role of moss in structuring biotic interactions and terrestrialization of Antarctica
Polito, Michael	B-025-E	Investigating Holocene shifts in the diets and paleohistory of Antarctic krill predators

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Project Detail

Project Title

Adelie Penguin Response To Climate Change In The Ross Sea Region – A Full Life-Cycle Approach

Summary

Event Number:
B-031-M
NSF/PLR Award 1543541

Program Manager:
Dr. Chris Fritsen

ASC POC/Implementer:
Jenny Cunningham / Jennifer Blum

Principal Investigator

Dr. David Ainley
dainley@penguinscience.com

H.T. Harvey & Associates
Los Gatos, California

Project Web Site:
http://penguinscience.com

Location

Supporting Stations: McMurdo Station
Research Locations: Capes Crozier and Royds

Description

The Ross Sea is experiencing expanding sea-ice cover, and little is known about how this affects Antarctic marine biota. This study aims to better understand the biotic effects of these changes using a widely-recognized indicator species, the Adélie penguin. Researchers will outfit penguins with time-depth recorders to monitor foraging efforts and record breeding activities of marked individuals. These data will lead to a better understanding of how changing sea ice conditions affect penguins through their annual cycles and through individuals' lifetimes, and will infer how climate change may influence their populations. The project will span four years and will involve collection of new data and extensive retrospective analysis of data gathered from 1996 to 2015.

Field Season Overview

The team will travel by helicopter to their field sites where they will identify previously banded penguins at each colony, collect data about their breeding behaviors, and will outfit them with time-depth recorders to monitor foraging efforts. Additionally, the team will install a new, grantee-built weighbridge scale at Cape Crozier. ASC support for the team will include food, field and living equipment, and solar arrays for power at the Crozier and Royds field camps.

Deploying Team Members

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- TBA 3
- David Ainley (PI)
- Grant Ballard (Co-PI)
- Katie Dugger (Co-PI)
- Megan Elrod
- Dennis Jongsomjit
- Amelie Lescroel (Co-PI)
- Jean Pennycook
- Nathaniel Polish
- Anne Schmidt

2016-2017 USAP Field Season
Project Detail

Project Title

IDPO / IDDO - McMurdo

Summary

Event Number:
T-150-M
NSF Agreement

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
Judy Shiple / Curt Labombard / Matthew Kippenhan

Principal Investigator

Dr. Mary Albert
mary.r.albert@dartmouth.edu

Dartmouth College
Thayer School of Engineering
Hanover, New Hampshire

Project Web Site:
http://www.icedrill.org/

Location

Supporting Stations: McMurdo Station
Research Locations: South Pole / Pirrit Hills / WAIS Divide / Ohio Range / local sites near McMurdo Station

Description

The Ice Drill Design and Operations (IDDO) team is the principal supplier of ice drilling and coring equipment, support, and expertise for NSF-funded research. It is operated under the auspices of the Ice Drilling Program Office (IDPO), which works in close conjunction with the ice coring and drilling research community.

Field Season Overview

Nine individuals will deploy for IDDO during the 2016-2017 field season. One person will deploy with G-438-M (Mukhopadhyay), two with I-193-S (Koutnik), and three with I-277-M (Stone). Two IDDO staff will deploy concurrently with I-164-S (Aydin) and I-194-S (Bay). Another IDDO staff member will deploy with I-166-M (Pettit) and T-350-M (Albert).

Deploying Team Members

- Grant Boeckmann
- Grant Boeckmann
- Tanner Kuhl
- Nicolai Mortensen

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Michael Jayred

- Jay Johnson
- Jay Johnson
- James Koehler

Elizabeth Morton

- Elizabeth Morton
- Mike Waszkiewics

2016-2017 USAP Field Season
Project Detail

Project Title

The Chemical Ecology Of Shallow-Water Marine Macroalgae And Invertebrates On The Antarctic Peninsula

Summary

Event Number:
B-022-P
NSF/PLR Award 1341333

Program Manager:
Mr. David Garrison

ASC POC/Implementer:
Chelsea Wegner / Jamee Johnson

Principal Investigator

Dr. Charles Amsler
amsler@uab.edu

University of Alabama Birmingham
Department of Biology
Birmingham, Alabama

Project Web Site:
http://www.uab.edu/antarctica/

Location

Supporting Stations: Palmer Station
Research Locations: Palmer Station

Description

Researchers will focus on three main objectives that are a direct outcome of their past and current studies of the chemical ecology of shallow-water marine macroalgae and invertebrates on the Antarctic Peninsula. The first objective is to expand the current understanding of an apparent community-wide mutualism between macroalgae and their associated amphipods to include gastropods, which are also abundant on many macroalgae. The second objective focuses on the basis and implications of the substantial chemodiversity the investigators have observed in macroalgal defenses, particularly in the common and heavily defended red alga Plocamium cartilagineum. The third objective looks into understanding the relationship between P. cartilagineum and the amphipod Paradexamine fissicauda, particularly the benefits and costs to P. fissicauda from being uniquely able to consume P. cartilagineum and some other chemically defended red algae. The investigators also seek to definitively demonstrate that P. fissicauda is sequestering secondary metabolite defenses from P. cartilagineum to defend itself from predation.

Field Season Overview

This is year three of this project. As in the past years, a team of divers will deploy to Palmer Station with the goal of collecting frozen algae and enumerating the associated amphipods. Dives will be from shore and from Zodiac inflatable boat. Samples will be analyzed on station and some will be shipped to the home institution for further analysis.

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Deploying Team Members

- Charles Amsler (PI)
- Margaret Amsler
- Bill Baker (Co-PI)
- Sabrina Heiser
- James McClintock (Co-PI)
- Leucas Miller

2016-2017 USAP Field Season
Project Detail

Project Title

Global Seismograph Station At South Pole And Palmer Stations

Summary

Event Number:
G-090-P/S
NSF/EAR 1261681

Program Manager:
Dr. Mark Kurz

ASC POC/Implementer:
Payot Scheibe / Jamee Johnson / Paul Sullivan

Principal Investigator

Mr. Kent Anderson
kent@iris.edu

United States Geological Survey
Albuquerque Seismological Laboratory
Sandia Park, New Mexico

Project Web Site:
http://earthquake.usgs.gov/monitoring/gsn/

Location

Supporting Stations: Palmer Station, South Pole Station
Research Locations: Terra Lab / B2 Science Building / South Pole Remote Earth Science and Seismological Observatory (SPRESSO) Vault

Description

The Incorporated Research Institutions for Seismology (IRIS) is a university consortium sponsored by the NSF and dedicated to the operation of scientific facilities for the acquisition, management, and distribution of freely available seismic data. This project is a long-term study of seismicity and is part of IRIS's 120-plus station Global Seismographic Network (GSN). Seismic stations at Palmer Station and at the Amundsen-Scott South Pole Station are named PMSA and QSPA, respectively. Recently, the South Pole seismic station was moved from the V1 vault (near the old dome site) to SPRESSO to reduce station-related "cultural" noise. The move has made QSPA the quietest seismic station in the entire GSN. Lower background noise levels will allow researchers to see smaller events from farther away and help identify and characterize Antarctic seismicity.

Field Season Overview

No team members will deploy to the South Pole this year. ASC research associates will perform routine maintenance on the instruments.

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2016-2017 USAP Field Season
Project Detail

Project Title

A 1,500-Meter Ice Core From South Pole

Summary

Event Number:
I-164-S
NSF/PLR Award 1142517

Program Manager:
Dr. Julie Palais

ASC POC/Implementer:
Samina Ouda / Paul Sullivan / Leah Street

Principal Investigator

Dr. Murat Aydin
maydin@uci.edu

University of California Irvine
Earth System Science
Irvine, California

Project Web Site:
http://spicecore.org/

Location

Supporting Stations: South Pole Station
Research Locations: Near station

Description

The South Pole Ice Core (SPICE Core) project will collect a 1500-meter ice core from a site within five kilometers of the South Pole Station. The ice core will provide an environmental record spanning approximately 40,000 years that will be used to investigate the magnitude and timing of changes in climate and climate forcing through time. The target of 40,000 years includes the transition from the peak of the last glacial period when ice sheets were at their maximum extent, referred to as the Last Glacial Maximum (LGM), to the present warm period (the Holocene) called an interglacial period. The main activities of this season are the shipping of all remaining ice cores (616 meters of core via three cold-deck LC-130 flights from South Pole to McMurdo Station) that are still onsite, disassembly of all remaining drilling and field equipment, including the drill tent, and concomitant shipping of equipment and cargo to the United States.

Field Season Overview

Participants will reside at the Elevated Station and will make day trip to the drill site. Their work during this, their third field season, will focus on shipping all remaining ice cores (616 meters) from South Pole to McMurdo Station on cold deck LC-130 aircraft. They will also disassemble the remaining drill equipment, core handling equipment, and drill tent, and prepare those items for retrograde to the US.

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Deploying Team Members

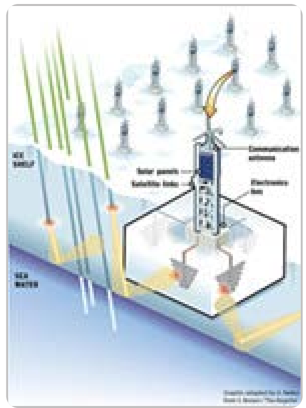
- Murat Aydin (PI)
- Joshua Goetz
- Jay Johnson
- Emma Kahle
- Joseph Souney Jr.

2016-2017 USAP Field Season
Project Detail

Project Title

Precision Operation Of Hexagonal Radio Array

Summary



Event Number:
A-127-M
NSF/PLR Award 1607719

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Matthew Erickson / Jennifer Blum

Principal Investigator

Dr. Steven Barwick
sbarwick@uci.edu

University of California Irvine
Department of Physics and Astronomy
Irvine, California

Project Web Site:
http://arianna.ps.uci.edu/

Location

Supporting Stations: McMurdo Station
Research Locations: ARIANNA site at Moore's Bay

Description

The Antarctic Ross Ice shelf Antenna Neutrino Array (ARIANNA) concept uses the Ross Ice Shelf near the coast of Antarctica to increase the sensitivity to ultra-high-energy cosmogenic neutrinos by roughly an order of magnitude when compared to the sensitivity of existing detectors and those under construction. ARIANNA tests a wide variety of scenarios for neutrino production and probes for physics beyond the standard model by measuring the neutrino cross-section at center of mass energies near 100 Teraelectronvolts (TeV). The recent report by IceCube (A-333-S) of an unsimulated excess of neutrino event above 30 TeV may be the first indication of a non-terrestrial source of high-energy neutrinos. ARIANNA can complement these studies by exploring the spectrum at energies 1,000 times greater than IceCube and in a relatively short time frame. ARIANNA capitalizes on several remarkable properties of the Ross Ice Shelf: Shelf ice is now measured to be relatively transparent to electromagnetic radiation at the radio frequencies of interest and the water-ice boundary below the shelf behaves like a mirror that reflects radio signals from downgoing neutrinos back up to the surface antennas. The high sensitivity of ARIANNA results from nearly six months of continuous operation (or possibly more with wind power addition), a low-energy threshold (~3x1017 eV), and the ability to observe more than half the sky.

Field Season Overview

Three team members will travel by helicopter to the ARIANNA camp site, located at

Project Indexes

Find information about projects approved for the 2016-2017 USAP field season using the available indexes.

Project Web Sites

Find more information about 2016-2017 USAP projects by viewing project web sites.

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Moore's Bay, about 70 miles south of McMurdo Station. They will recieve ASC support for put-in and pull-out of a tent camp where they will reside for approximately three weeks. The tasks they hope to complete this season include: (1) Collecting untransmitted data from the Hexagonal Radio Array (HRA) stations; (2) Raising or replacing three solar panel towers that are now at or below the snow level; (3) Analyzing and interpreting transient events from the Antarctic Impulsive Transient Antenna (ANITA) Hical payload, searching for coincident events between stations, and measuring direction and waveform properties; (4) Continuing to evaluate and characterize external sources of noise, and develop background rejection procedures; (5) Drilling two holes to a depth of 10 to 20 m and inserting radio transmitters to make first precision measurements of attenuation and scattering properties of the firn snow at ARIANNA frequencies; and (6) Continuing precision ice studies with bounce experiments at large angles.

Deploying Team Members

- Steven Barwick (PI)
- Anna Nelles
- Christopher Persichilli

2016-2017 USAP Field Season
Project Detail

Project Title

A Systems Approach To Understanding The Ross Ocean And Ice Shelf Environment And Tectonic Setting Through Aerogeophysical Surveys And Modeling (ROSETTA)

Summary

Event Number:
C-384-M
NSF/PLR Award 1443534

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Judy Shiple / Elizabeth Kauffman

Principal Investigator

Dr. Robin E Bell
robinb@ldeo.columbia.edu

Columbia University
Palisades, New York

Project Web Site:
http://pgg.ldeo.columbia.edu

Location

Supporting Stations: McMurdo Station
Research Locations: Ross Ice Shelf

Description

The Ross Ocean and ice Shelf Environment, and Tectonic setting Through Aerogeophysical surveys and modeling (ROSETTA) project aims to advance understanding of the dynamics of the ice shelf system. To accomplish this, ROSETTA researchers will collect new high-resolution data that will determine the thickness and structure of the Ross Ice Shelf (RIS) and characterize the bedrock and seabed bathymetry under the ice shelf. The ROSETTA surveys will acquire magnetics and gravity data for geologic interpretations, and radar, LiDAR, and imagery for mapping the RIS fine structure, including crevasses and channels, debris, and the distribution of marine ice and accumulation.

Field Season Overview

The ROSETTA team will acquire aerogeophysical data using the IcePod sensor suite and two gravimeters installed in an LC-130 aircraft provided by the New York Air National Guard 109th Airlift Wing.Typical flight times will be approximately six to eight hours, with the goal of two flights per day. The first flight will involve a two to three hour shakedown component to ensure that all instruments are functioning properly. That will be followed by the first data acquisition flight.

Deploying Team Members

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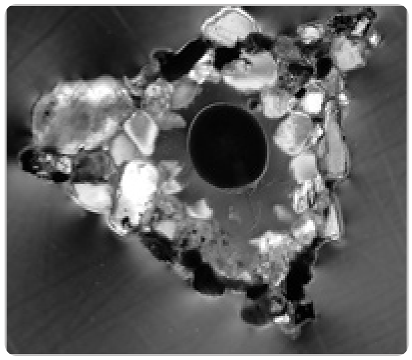
- Christopher Bertinato
- Alexandra Boghosian
- Bethany Burton
- Wing Chu
- Indrani Das
- Tejendra Dhakal
- Nicholas Frearson (Co-PI)
- Helen Fricker
- Jonathan Kingslake
- David Porter
- Scott Springer
- Sarah Starke
- Kirsteen Tinto
- Fabio Tontini

2016-2017 USAP Field Season
Project Detail

Project Title

Assembling And Mining The Genomics Of Giant Antarctic Foraminifera

Summary



Event Number:
B-043-M
NSF/PLR Award 1341612

Program Manager:
Dr. Chris Fritsen

ASC POC/Implementer:
Jenny Cunningham / Elizabeth Kauffman

Principal Investigator

Dr. Samuel Bowser
Samuel.Bowser@health.ny.gov

New York State Department of Health
Wadsworth Center
Schroon Lake, New York

Project Web Site:
http://www.icelabyrinth.blogspot.com

Location

Supporting Stations: McMurdo Station
Research Locations: New Harbor / Explorers Cove / Cape Bernacchi

Description

This project investigates the evolution, genome structure, and associated biomes of foraminiferan protists (forams) belonging to three distinct, early-evolving clades: notodendrodids, crithioninids, and astramminids. Researchers will dive under the sea ice at Explorers Cove, Cape Bernacchi, and McMurdo Station to collect forams and sediment cores. They will use next-generation sequencing (NGS) and simple microdissection methods to obtain and analyze nuclear and mitochondrial genomes of the forams. In an effort to better understand factors involved in both the large-scale and micro-scale distribution of forams, researchers will also use NGS to characterize the in-situ prokaryotic assemblages of notodendrodids and compare them to reference sediment microbiomes.

Field Season Overview

A team of five will travel by helicopter from McMurdo Station to New Harbor where they will stay at an established camp to conduct their dives. From there, they will make day trips by ATV and snowmobile to additional sea-ice dive sites. The divers plan to conduct an estimated 40 dive missions to collect forams and sediment cores.

Deploying Team Members

Project Indexes

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Amanda Andreas

- Samuel Bowser (PI)
- Stephen Clabuesch
- Susan Goldstein

Andrew Gooday

- Kaitlin McConnell
- Jan Pawlowski
- Laura Von Rosk

2016-2017 USAP Field Season
Project Detail

Project Title

McMurdo And South Pole SuperDARN: Investigation Of The Ionospheric Dynamics And Magnetosphere-Ionosphere Coupling In Antarctica

Summary

Event Number:
A-369-M/S
NSF/PLR Award 1443504

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Payot Scheibe / Elizabeth Kauffman / Paul Sullivan

Principal Investigator

Dr. William Bristow
bill.bristow@gi.alaska.edu

University of Alaska Fairbanks
Geophysical Institute
Fairbanks, Alaska

Project Web Site:
http://superdarn.gi.alaska.edu

Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: Building 72

Description

The Super Dual Auroral Radar Network (SuperDARN) is a global international radar network of 22 installations observing high frequency (HF) bands between eight and 22 MHz. Radar systems have been installed at McMurdo Station (2009-10) and South Pole Station (2011-12), extending the global-scale coverage in the southern hemisphere. These systems also help answer questions about geomagnetic conjugacy of global magnetic storms and substorms and differences in the ionospheric plasma convection caused by the asymmetry of solar illumination in both hemispheres. The SuperDARN network, with its ability to observe global-scale convection with excellent temporal and spatial resolution, has proven to be the most powerful tool available for the ground-based research. These qualities allow scientists to address the most fundamental and important questions of space physics. The data are also relevant to important societal issues such as space-weather studies, and they enhance the usefulness of data from other instruments.

Field Season Overview

Each austral summer researchers deploy to McMurdo and South Pole Stations to perform system maintenance such as inspecting the equipment, tightening guy wires and antennas, replacing shackles, re-leveling the radar poles, and updating/repairing the on-site computer system. Throughout the year, contractor staff maintain system components and vehicular

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access to the array.

Deploying Team Members

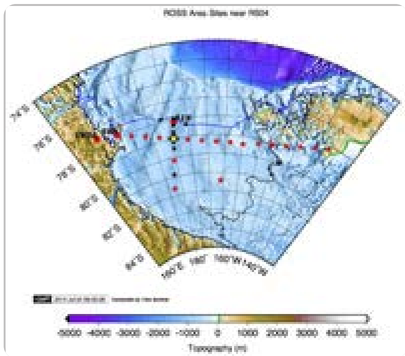
- William Bristow (PI)

2016-2017 USAP Field Season
Project Detail

Project Title

Dynamic Response Of The Ross Ice Shelf To Wave-Induced Vibrations

Summary



Event Number:
I-348-M
NSF/PLR Award 1246151

Program Manager:
Dr. Julie Palais

ASC POC/Implementer:
Judy Shiple / Elizabeth Kauffman

Principal Investigator

Dr. Peter D Bromirski
pbromirski@ucsd.edu

Scripps Institution of Oceanography
Physical Oceanography Research Division
San Diego, California

Project Web Site:
http://scripps.ucsd.edu/centers/iceshelfvibes/

Location

Supporting Stations: McMurdo Station
Research Locations: Ross Ice Shelf

Description

This project will conduct field observations and numerical simulations to discover how ocean-wave induced vibrations on ice shelves in general, and the Ross Ice Shelf (RIS) in particular, can be used to: (1) Infer spatial and temporal variability of ice shelf mechanical properties; (2) Infer bulk elastic properties from signal-propagation characteristics; and (3) Determine whether the RIS response to infragravity (IG) wave forcing, observed distant from the front, propagates as stress waves from the front, or is 'locally' generated by IG wave energy penetrating the RIS cavity. Ocean gravity waves are dynamic elements of the global ocean environment that are affected by ocean warming and changes in ocean and atmospheric circulation patterns. Their evolution may drive changes in ice-shelf stability by both mechanical interactions and potentially increased basal melting, which in turn feed back on sea-level rise.

Field Season Overview

The team will return to the 16 stations that were serviced last season to retrieve data and demobilize the seismic and GPS stations at respective sites. The station visits can be carried out with a combination of Twin Otter flights from McMurdo Station and from a field camp at the Yesterday Camp location previously occupied in the 2014-2015 and 2015-2016 field seasons, and by snowmobile transits from Yesterday Camp to stations within 20 km of camp. This will be a combined operation with G-089-M (Wiens), and Patrick Shore will supervise recovery/demobilization operations. A four-person team will need

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approximately four hours for each station consisting of both seismic and GPS. Three hours will be needed for seismic only stations. This estimate could increase depending on wind conditions and could decrease as the team gains experience.

Deploying Team Members

- Laura Stevens
- Jerome Wanatick

2016-2017 USAP Field Season
Project Detail

Project Title

The Cost Of A New Fur Coat: Interactions Between Molt And Reproduction In Weddell Seals

Summary

Event Number:
B-292-M
NSF/PLR Award 1246463

Program Manager:
Dr. Chris Fritsen

ASC POC/Implementer:
Jenny Cunningham / Linnah Neidel

Principal Investigator

Dr. Jennifer Burns
jmburns@uaa.alaska.edu

University of Alaska Anchorage
Anchorage, Alaska

Project Web Site:
http://https://www.facebook.com/weddellsealbiology

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo Sound / Erebus Bay / Scott Base / Hutton Cliffs / Turtle Rock

Description

Researchers will examine mechanisms linking Weddell seal reproduction and molt timing and how late-summer condition impacts next season's reproductive success. They will assess physiological condition at the end of the reproductive period, monitor behavioral activities between reproduction and molt, and assess physiological condition and pregnancy status during the molt. By targeting known-age females with various prior reproductive timing, these measurements can be used to assess whether molt timing is more responsive to hormonal or energy indices. Researchers will characterize the molting process histologically and physiologically and gather new and important data on factors influencing the onset of active gestation and/or miscarriage rates. The data will provide baseline values for models predicting the impacts of changing climate and food availability during the austral summer on molt timing and future reproductive success. Through collaboration with B-009-M (Rotella), molt status will be linked to reproductive performance of individuals over multiple breeding seasons. The data will be used to generate models focusing on whether variation in the timing of an intermediate critical life history event (i.e. reproduction, molt, onset of foraging activities) might influence the trade-off between current and future reproductive success.

Field Season Overview

This team will continue their research of the Weddell Seal population in the Ross Sea to

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better understand the interactions between reproduction, molting, and physiological condition as well as the demographic consequences of trade-offs between these factors. Researchers will deploy twice during the field season in order to assess animal condition at the end of lactation and again during the molt. The team will also continue collaborations with another Weddell Seal research group, B-009-M. During the first deployment, field team members will be based out of McMurdo Station and will take daily trips onto the sea ice by snow machine to locate specific adult female Weddell seals, measure their health and condition, and equip them with tags that will monitor diving patterns and aid in relocation. Researchers hope to handle 15-24 adult females. The work will be focused around the breeding colonies within Erebus Bay. During the second deployment, the team will again be based out of McMurdo Station. They hope to relocate animals handled earlier in the season to assess reproductive condition and health status. Work during this period will be conducted during day trips via snow machine and via helicopter. An ASC mountaineer/field coordinator will provide sea ice support as necessary.

Deploying Team Members

- Roxanne Beltran
- Rachel Berngartt
- Jennifer Burns (PI)
- Amy Kirkham
- Robert McCorkell
- Michelle Shero
- James Testa (Co-PI)
- Skyla Walcott

2016-2017 USAP Field Season
Project Detail

Project Title

South Pole Monitoring For Climatic Change

Summary

Event Number:
O-257-M/S
NSF / NOAA agreement

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
Payot Scheibe / Paul Sullivan

Principal Investigator

Dr. James Hall Butler
James.H.Butler@noaa.gov

National Oceanic and Atmospheric Administration
Global Monitoring Division (GMD)
Boulder, Colorado

Project Web Site:
http://www.esrl.noaa.gov/gmd/

Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: Atmospheric Research Observatory (ARO)

Description

At the South Pole, the National Oceanic and Atmospheric Administration's (NOAA) Global Monitoring Division (GMD) collects year-round, long-term measurements of trace atmospheric constituents that influence climate change. These measurements are part of NOAA's effort to determine and assess the long-term build up of global pollutants in the atmosphere. The measurements are used for time-series analysis of multi-year data records that focus on stratospheric ozone depletion; trans-Antarctic transport and deposition; interplay of the trace gases and aerosols with solar and terrestrial radiation fluxes on the polar plateau; the magnitude of seasonal and temporal variations in greenhouse gases; and the development of polar stratospheric clouds over Antarctica. Other objectives of the research are to determine the rate at which concentrations of these atmospheric constituents change and to examine the sources, sinks, distributions, budgets, and trends. The data help climate modelers and diagnosticians determine how the rate of change of these parameters affects climate, particularly when the data are included in climate-model studies that support this project.

Field Season Overview

One field team member will spend five days at McMurdo Station servicing the UV instrument located at Arrival Heights. The McMurdo Station research assistant will subsequently support the instrument with daily checks, routine calibrations, and troubleshooting.

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Operational requirements will continue as before at South Pole, with the use of the Atmospheric Research Observatory (ARO) for the NOAA instrument suite and the management of the Clean Air Sector. A minimum of two NOAA personnel will staff the observatory year-round. Scientists will deploy for short periods throughout the austral summer performing upgrades and routine maintenance on the instruments at the South Pole and working at the ARO, in addition to the two core staff. At no time will the NOAA/GMD South Pole ARO staffing be less than two. The need for space and logistics support for balloon launching will continue with only minor changes. The use of helium will continue with no changes. Air samples will be returned to NOAA/GMD in Boulder, Colorado on a regular schedule for analysis of carbon dioxide and other trace constituents.

Deploying Team Members

- John Booth
- Gavin Chensue
- Andrew Clarke
- Refael Klein
- David Reibel
- Christine Schultz

2016-2017 USAP Field Season
Project Detail

Project Title

Collection Of Atmospheric Air For The NOAA/GMD Worldwide Flask-Sampling Network

Summary

Event Number:
O-264-P

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
Payot Scheibe / Jamee Johnson

Principal Investigator

Dr. James Hall Butler
James.H.Butler@noaa.gov

National Oceanic and Atmospheric Administration
Global Monitoring Division (GMD)
Boulder, Colorado

Project Web Site:
http://www.esrl.noaa.gov/gmd/

Location

Supporting Stations: Palmer Station
Research Locations: T-5 Building

Description

The National Oceanic and Atmospheric Administration's (NOAA) Global Monitoring Division (GMD) team will continue long-term measurements of trace constituents that influence climate and the ozone layer. The work done at Palmer Station is in conjunction with the ongoing worldwide measurements of carbon dioxide, methane, carbon monoxide, aerosols, water vapor, surface and stratospheric ozone, chlorofluorocarbons, and the ozone layer. The work is part of NOAA's effort to determine and assess the long-term buildup of global pollutants in the atmosphere. Measurements will be used for time-series analysis of multi-year data records that focus on stratospheric ozone depletion; trans-Antarctic transport and deposition; interplay of the trace-gases aerosols with the solar and terrestrial radiation fluxes on the polar plateau; the magnitude of seasonal and temporal variations in greenhouse gases; and the development of polar stratospheric clouds over Antarctica. Other objectives of this research are to determine the rate at which concentrations of these atmospheric constituents change and to examine the sources, sinks, and budgets. Working with the climate modelers and diagnosticians, researchers will use the data to determine how the rate of change of these parameters affects climate, particularly when the data are included in climate-model studies that support this project.

Field Season Overview

Two participants will deploy this season to perform biennial instrument calibration and maintenance activities. The Palmer Station research assistant (RA) will collect one or two weekly air samples year-round from behind the T-5 building using a portable flushing and

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pressurizing apparatus. The RA will log environmental conditions as well. Sampling will occasionally be deferred until certain meteorological criteria are met. All samples are returned to NOAA/GMD in Boulder, Colorado or to Scripps Institution of Oceanography (SIO) on a regular schedule for analysis of carbon dioxide, oxygen, and other trace constituents. The RA will also support the UV instrument with daily checks, routine calibrations, and troubleshooting, as needed.

Deploying Team Members

- Patrick Disterhoft (Co-PI)
- Emiel Hall
- Emiel Hall

2016-2017 USAP Field Season
Project Detail

Project Title

UV Measurements At McMurdo Station For The NOAA/Global Monitoring Division (GMD) Antarctic UV Network

Summary

Event Number:
O-257-M/S
NSF / NOAA agreement

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
Payot Scheibe / Elizabeth Kauffman

Principal Investigator

Dr. James Hall Butler
James.H.Butler@noaa.gov

National Oceanic and Atmospheric Administration
Global Monitoring Division (GMD)
Boulder, Colorado

Project Web Site:
http://www.esrl.noaa.gov/gmd/

Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: Arrival Heights

Description

The National Oceanic and Atmospheric Administration (NOAA) Earth System Research Laboratory (ESRL) Global Monitoring Division (GMD) will continue long-term measurements of ultra-violet (UV) radiation that influences climate and the ozone layer. The work at McMurdo Station is in conjunction with ongoing worldwide measurements of carbon dioxide, methane, carbon monoxide, aerosols, water vapor, surface and stratospheric ozone, chlorofluorocarbons, and the ozone layer at South Pole and Palmer Stations. The measurements will be used for time-series analysis of multi-year data records that focus on stratospheric ozone depletion; trans-Antarctic transport and deposition; interplay of the trace-gases aerosols with the solar and terrestrial radiation fluxes on the polar plateau; the magnitude of seasonal and temporal variations in greenhouse gases; and the development of polar stratospheric clouds over Antarctica. Other objectives of this research are to determine the rate at which concentrations of these atmospheric constituents change and to examine the related sources, sinks, and budgets. Researchers will use the data to determine how the rate of change of these parameters affect climate, particularly when the data are included in climate-model studies that support this project.

Field Season Overview

The McMurdo Station research assistant (RA) will support the UV instrument located at

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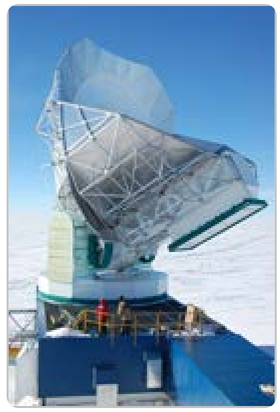
Arrival Heights with daily checks, routine calibrations, and troubleshooting (as needed).

2016-2017 USAP Field Season
Project Detail

Project Title

Cosmological Research With The 10-Meter South Pole Telescope

Summary



Event Number:
A-379-S
NSF/PLR Award 1248097

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Payot Scheibe / Paul Sullivan

Principal Investigator

Dr. John Carlstrom
jc@kicp.uchicago.edu

University of Chicago
Astronomy and Astrophysics
Chicago, Illinois

Project Web Site:
http://pole.uchicago.edu

Location

Supporting Stations: South Pole Station
Research Locations: South Pole Station; instruments operate year around.

Description

The South Pole Telescope (SPT) aids cosmological research by measuring the intensity and polarization anisotropy of the cosmic microwave background (CMB) radiation. The project's goal is detecting all galaxy clusters in this region of the sky through the spectral distortion they impart on the CMB. Called the Sunyaev-Zel'dovich effect, it has the remarkable property of being independent of the distance to the cluster. The second key project started in 2012 with the installation of an ultra-sensitive polarization receiver. Through measurements of the polarization, researchers can determine the sum of the masses of the neutrinos and either detect or set stringent upper limits on the energy scale of inflation. The SPT polarization program will see an order of magnitude increase in sensitivity this season with the SPT-3G deployment, which includes a 16,000-detector focal plane in a new receiver and an optics cryostat.

Field Season Overview

The upcoming season is similar to last year in that SPT team members will conduct CMB measurements and will install the Event Horizon Telescope (EHT). There will be continued use of the MAPO machine shop as an overall station resource, staffed by A-379-S personnel.

Deploying Team Members

Project Indexes

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- Adam Anderson
- Amy Bender
- Bradford Benson
- John Carlstrom (PI)
- Thomas Crawford
- Tijmen de Haan
- Junjia Ding
- Matthew Dobbs
- Daniel Dutcher
- Wendeline Everett
- Jason Henning
- William Holzapfel (Co-PI)
- Nicholas Huang
- Junhan Kim
- Amy Lowitz
- Daniel Marrone
- Joshua Montgomery
- Andrew Nadolski
- Erik Nichols
- Stephen Padin (Co-PI)
- Stephen Padin (Co-PI)
- Zhaodi Pan
- David Pernic
- David Pernic
- Chrystian Posada Arbelaez
- Thakur Ritoban
- James Sayre
- Joshua Sobrin
- Kyle Story
- Nathan Whitehorn

2016-2017 USAP Field Season
Project Detail

Project Title

LiDAR Investigation Of Middle And Upper Atmosphere Temperature, Composition, Chemistry, And Dynamics At McMurdo, Antarctica

Summary

Event Number:
A-130-M
NSF/PLR Award 1246405

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Payot Scheibe / Richard Dean

Principal Investigator

Dr. Xinzhao Chu
xinzhao.chu@colorado.edu

University of Colorado Boulder
CIRES
Boulder, Colorado

Project Web Site:
http://cires1.colorado.edu/science/groups/chu/projects/mcmurdo.html

Location

Supporting Stations: McMurdo Station
Research Locations: On station

Description

This project continues the operation of the Fe-Boltzmann LiDAR instrument installed in the Antarctica New Zealand (ANZ) lab at Arrival Heights. Primary research objectives are to acquire vertical profiles of atmospheric temperature (30–155 kilometers), Fe (iron) density (70–155 kilometers), and polar mesospheric cloud (PMC), to study the chemistry and dynamics of the polar atmosphere and to establish the baseline temperature, Fe, PMC, and gravity wave climatologies. New science discoveries based on the observations and measurements made to date (December 2010 to March 2015) include: (1) Neutral Fe layers and gravity waves well into the thermosphere, from 155 kilometers up to 170 kilometers; (2) Elevated thermospheric temperatures between 110 and 150 kilometers, likely associated with Joule heating; (3) Explosive release of exceptionally large Fe densities between 85 and 95 kilometers during summer, likely from visible and sub-visible ice particles; (4) Significant solar effects on the Fe-layer bottom side during local sunrise and sunset; (5) Strong and nearly persistent inertial gravity waves with cross-Antarctic-continent features; (6) Super-exponential growth of temperature tidal amplitude in the lower thermosphere above 110 kilometers; and (7) Dramatic density variations (about 40 times) of Fe layers over a time scale of multiple days (7-20 days).

Field Season Overview

This is the fourth season in the renewal period and the overall seventh season for the Fe

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Boltzmann LiDAR campaign at Arrival Heights. Since its installation in December 2010, the LiDAR team members have collected data around the clock in both summer and winter. The teams activities this season will include: (1) Continuing data collection in both summer and winter seasons; (2) Refurbishing, maintaining and upgrading the LiDAR system to its optimum status; (3) Upgrading the LiDAR computer, data acquisition system, and wavelength control programs; (4) Training two new LiDAR operators.

Deploying Team Members

- Cao Chen
- Xinzhao Chu (PI)
- Zhengyu Hua
- Anthony Lima
- Zhangjun Wang

2016-2017 USAP Field Season
Project Detail

Project Title

High-Resolution Mapping Of Thermospheric Wind And Temperature Fields Near The Equatorward Edge Of The Antarctic Polar Cap

Summary

Event Number:
A-343-M/S
NSF/PLR Award 1341545

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Judy Shiple / Elizabeth Kauffman / Paul Sullivan

Principal Investigator

Dr. Mark Gerard Conde
mark.conde@gi.alaska.edu

University of Alaska Fairbanks
Physics Department
Fairbanks, Alaska

Project Web Site:
http://sdi_server.gi.alaska.edu/sdiweb/index.asp

Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: Arrival Heights / Atmospheric Research Observatory (ARO)

Description

The project will deploy an all-sky imaging Fabry-Perot Spectrometer at McMurdo Station and at South Pole Station to map the wind and temperature fields that occur in the thermosphere above Antarctica. Data collected from these instruments will be used to test the hypothesis that the thermosphere's most dynamic weather occurs in latitudes just poleward of the boundary between the auroral oval and the polar cap.

Field Season Overview

This season, two team members will perform minor repairs and upgrades to their two Fabry-Perot instruments located at McMurdo and South Pole. Work will include routine mechanical maintenance, optical alignment, and data archiving. They will spend approximately one week working at each station.

Deploying Team Members

- Mark Conde (PI)
- John Elliott

Project Indexes

Find information about projects approved for the 2016-2017 USAP field season using the available indexes.

Project Web Sites

Find more information about 2016-2017 USAP projects by viewing project web sites.

More Information

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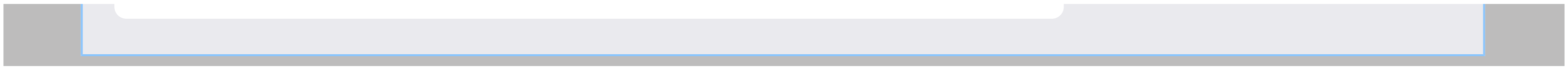

2016-2017 USAP Field Season
Project Detail

Project Title

Petrologic Constraints On Subduction Termination From Lamprophyres, Ross Orogen, Antarctica

Summary

Event Number:
G-076-M
NSF/PLR Award 1443296

Program Manager:
Dr. Thomas Wilch

ASC POC/Implementer:
Judy Shiple / Jennifer Blum / Leslie Blank

Principal Investigator

Dr. John Cottle
cottle@geol.ucsb.edu

University of California Santa Barbara
Department of Geological Sciences
Santa Barbara, California

Project Web Site:
http://www.antarctica360.net/

Location

Supporting Stations: McMurdo Station
Research Locations: Miller Range / Gabbro Hills

Description

Rocks highly enriched in potassium such as lamprophyres potentially provide direct insight into foundering and the processes that occur during, and immediately after, termination of subduction. These enigmatic rocks are important because they represent near-primary mantle-melt compositions and therefore their age, geochemistry, and petrologic evolution reveal key information on both the composition of the upper mantle and its thermal state. Of equal importance, they reveal how these key parameters vary through both space and time. This project will study a suite of lamprophyres spanning approximately 1,300 kilometers along-strike and emplaced during the latest stages of the Neoproterozoic-Ordovician Ross Orogeny. High-precision geochronology, coupled with whole rock and mineral-scale elemental, isotope geochemical, and petrologic analysis, will elucidate the mechanisms for, and the temporal and spatial scales over which, deep crustal foundering/delamination occurred and the processes responsible for the significant isotopic heterogeneities observed in these rocks.

Field Season Overview

Field team members will travel by Basler aircraft to the Transantarctic Mountains where they will establish a light weight field camp in the Miller Range. After three weeks, they will make a camp move by Twin Otter aircraft to the Gabbro Hills. At both locations they will travel by foot and by snowmobile to collect rock samples and conduct geologic mapping.

Project Indexes

Find information about projects approved for the 2016-2017 USAP field season using the available indexes.

Project Web Sites

Find more information about 2016-2017 USAP projects by viewing project web sites.

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They will return to McMurdo via the Shackleton Field Camp. Samples will be returned to the home institution for analyses.

Deploying Team Members

- Nicholas Browne
- John Cottle (PI)
- Demian Nelson (Team Leader)

2016-2017 USAP Field Season
Project Detail

Project Title

British Antarctic Survey (BAS)

Summary

Event Number:
X-599-S
Reciprocity Agreement

Program Manager:
Ms. Jessie Crain

ASC POC/Implementer:
Judy Shiple / Paul Sullivan

Principal Investigator

Mr. Michael Dinn
MEDI@bas.ac.uk

British Antarctic Survey
Cambridge, Undefined

Project Web Site:
http://www.bas.ac.uk/project/low-power-magnetometer-lpm-network/

Location

Supporting Stations: South Pole Station
Research Locations: South Pole Station / Union Glacier

Description

Space-borne synthetic aperture radar (SAR) observations can be used to measure structure and velocity within the Antarctic ice sheet. Most SAR missions to date have used L-band frequencies (1-2 GHz), but interest is now turning to P-band signals (around 430 MHz) because they have greater penetration of the ice. Both the University of Bath and the British Antarctic Survey (BAS) are currently involved in feasibility studies relating to P-band SAR design for future European Space Agency (ESA) satellites. Satellites equipped with P-band SAR in polar orbits have the potential to map out the three-dimensional structure of ice sheets. However, their signals will suffer from significant ionospheric effects, reducing data accuracy. While the ionosphere must be taken into account in system design, the necessary ionospheric measurements to do this do not exist. This project will deliver the measurements for the Antarctic region and lay the foundation for successful P-band SAR missions. The objective of the fieldwork associated with this project is to deploy GPS equipment that will, for the first time, measure total electron content, plasma velocity, and ionospheric scintillation at remote locations across Antarctica. The measurements will be used to develop a multi-scale model of the Antarctic ionosphere. This model will be a critical input to SAR design that will minimize the impact on ice measurements for future satellite missions.

Field Season Overview

British Antarctic Survey (BAS) will provide Twin Otter aircraft to conduct the science for X-599 (Dinn). An electronics engineer, one pilot, and possibly one other person will be

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deployed to South Pole for a period of up to five days to undertake the servicing and data download of the instruments. It will take place sometime within the period of early December to the end of the first week in January. The work is done in conjunction with other BAS support work and will likely continue to be based out of Union Glacier.

2016-2017 USAP Field Season
Project Detail

Project Title

McMurdo LTER - Lakes: Increased Connectivity In A Polar Desert Resulting From Climate Warming: McMurdo Dry Valleys LTER Program

Summary

Event Number:
C-511-M
NSF/PLR Award 1115245

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Jenny Cunningham / Elizabeth Kauffman

Principal Investigator

Dr. Peter Doran
pdoran@lsu.edu

Louisiana State University Baton Rouge
Department of Geology and Geophysics
Baton Rouge, Louisiana

Project Web Site:
http://www.mcmlter.org/

Location

Supporting Stations: McMurdo Station
Research Locations: Dry Valleys

Description

Initially funded in 1980, the U.S. Long-Term Ecological Research (LTER) network is a collaborative effort involving more than 1,800 scientists and students. The McMurdo LTER program is an inter-disciplinary and multi-disciplinary study of the aquatic and terrestrial ecosystems in the ice-free McMurdo Dry Valleys. It is one of 26 LTER sites where researchers are studying ecological processes over long temporal and broad spatial scales. Researchers on this project will focus on the physical limnology of the McMurdo Dry Valleys lakes. This year's goals are: (1) To upgrade and maintain long-term automated lake-monitoring equipment; (2) Carry out manual lake hydrologic balance measurements (lake level and ablation); (3) Measure the movement of surface ice using high-precision GPS; (4) Characterize signatures and patterns of benthic productivity (using SCUBA); and (5) Collect sediment and water samples for a suite of geochemical experiments. This six-year award cycle comprises seven collaborative projects: C-504-M (Gooseff), C-505-M (Priscu), C-506-M (Gooseff), C-507-M (Wall), C-508-M (Barrett), C-509-M (Lyons), and C-511-M (Doran).

Field Season Overview

Participants will be based at the established field camps Fryxell, Bonney, and Hoare, with an extended stay at Lake Miers, and will make day trips by helicopter to Wright and Victoria Valleys. With UNAVCO's assistance, they will also survey established ablation stakes in

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the Taylor Valley. Several sensors and dataloggers on the meteorological and lake stations will be swapped out and sent back to the manufacturer for recalibration. The replaced meteorological sensors and dataloggers will remain in the field for two to five years. The team will also be diving at the narrows between the west and east lobes of Lake Bonney in order to image and survey the lake bottom and to collect samples. This is a collaborative endeavor with Ian Hawes of the Antarctica New Zealand program.

Deploying Team Members

- Peter Doran (PI)
- Krista Myers (Team Leader)
- Jade Lawrence
- Luke Winslow

2016-2017 USAP Field Season
Project Detail

Project Title

Palmer, Antarctica Long-Term Ecological Research (LTER): Land-Shelf-Ocean Connectivity, Ecosystem Resilience And Transformation In A Sea-Ice Influenced Pelagic Ecosystem

Summary

Event Number:
C-045-L/P
NSF/PLR Award 1440435

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Samina Ouda / Jamee Johnson / Adam Jenkins

Principal Investigator

Dr. Hugh William Ducklow
hducklow@ldeo.columbia.edu

Columbia University
Lamont-Doherty Earth Observatory
Palisades, New York

Project Web Site:
http://pal.lternet.edu/

Location

Supporting Stations: ARSV Laurence M. Gould, Palmer Station
Research Locations: LTER study site / Palmer Station

Description

The overall objectives of Palmer LTER research are to document and understand the phenology and variability in sea-ice dynamics, primary production, zooplankton ecology, seabird and marine mammal demography, and microbial and biogeochemical processes in the Antarctica marine ecosystem, including identifying the mechanisms of ecosystem response to rapid climate change. One particularly important objective is to continue the 23-year-long LTER time series on the regional scale grid of hydrographic stations west of the Antarctic Peninsula. The core, long-term data associated with the LTER studies are derived primarily from local populations distributed over approximately 50 square kilometers near Palmer Station. At-sea surveys of abundance and distribution of seabirds over an area of approximately 80,000 square kilometers provide a larger-scale context for these studies. Spanning three decades, this data collection allows researchers to address a broad suite of ecological issues, including interactions between climate migration and community structure, the effects of landscape geomorphology on biological populations, the mechanics of source-sink population dynamics, and the establishing of basic conceptual and empirical links between marine and terrestrial ecology.

Field Season Overview

One component of the C-045 science team will sail on the January to mid-February cruise aboard the ARSV Laurence M. Gould (LMG) to the LTER research grid west of the Antarctic Peninsula. Approximately 70 CTD casts to full depth will be made in collaboration with C-019-L (Schofield) and C-021-L (Martinson).

The other component of the C-045 science team will conduct their studies in the vicinity of Palmer Station from October to March. Once on station, the team will perform several incubation experiments to test specific hypotheses about microbial processes and organic matter cycling. All fieldwork will be performed in Arthur Harbor at the LTER A-G hydrographic stations within the boating area. The research includes some work with soils and glacier runoff in the Palmer region, though no soil samples will be shipped off site. An ASC Research Associate will provide support for over-winter collection of chlorophyll and biogeochemical samples.

Deploying Team Members

- Hugh Ducklow (PI)
- Israela Musan
- Naomi Shelton
- Leigh West
- Leigh West
- Katie Westmoreland

2016-2017 USAP Field Season
Project Detail

Project Title

Neutron Monitor Observations Of Cosmic Rays From Jang Bogo And McMurdo Station

Summary

Event Number:
A-120-M
NSF/PLR Award 1245939

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Samina Ouda / Elizabeth Kauffman

Principal Investigator

Dr. Paul Evenson
evenson@udel.edu

University of Delaware
Physics and Astronomy
Newark, Delaware

Project Web Site:
http://neutronm.bartol.udel.edu/

Location

Supporting Stations: McMurdo Station
Research Locations: Building 84

Description

Installed during the 1959-60 field season, the Cosray Lab is the longest continually running experiment in the U.S. Antarctic Program. This 56-year data set plays a crucial role in understanding the nature and cause of cosmic ray and solar terrestrial variations occurring over the 11-year sunspot cycle, 22-year Hale cycle, and longer time scales. Neutron monitoring provides a three-dimensional perspective of the anisotropic flux of cosmic rays that continuously bombard Earth. The data acquired by this research project will advance the understanding of fundamental plasma processes that occur on the Sun and in interplanetary space. Researchers will analyze data acquired on station, in concert with data from the "Spaceship Earth" neutron monitor network, to understand variations associated with solar energetic particles that occur on time scales of minutes to hours. The observations will also assist space-weather forecasting and specification.

Field Season Overview

Team members will deploy to McMurdo station where they will implement their retrograde plan for this project. There are two distinct components to the plan for this season: (1) Crating and packing the remaining two sections of the neutron monitor into shipping containers for transport to Christchurch, New Zealand, where they will be held for pickup by collaborators from the Korean Antarctic Program; (2) Crating and packing equipment for retrograde to the continental United States.

Project Indexes

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Deploying Team Members

- Paul Evenson (PI)
- James Madsen (Co-PI)
- Samantha Pedek
- Eric Thuma

2016-2017 USAP Field Season
Project Detail

Project Title

Element Composition Of High-Energy Solar Particles

Summary

Event Number:
A-118-S
NSF/PLR Award 1341562

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Samina Ouda / Paul Sullivan

Principal Investigator

Dr. Paul Evenson
evenson@udel.edu

University of Delaware
Physics and Astronomy
Newark, Delaware

Project Web Site:
http://neutronm.bartol.udel.edu/

Location

Supporting Stations: South Pole Station
Research Locations: B2 Science Building

Description

This project will continue operating the suite of neutron monitors at the South Pole Station. Data from the South Pole enhance the worldwide neutron monitor networks with a unique location at high altitude and low cutoff rigidity, a well-established spectral-detection capability, and a very long baseline of existing measurements. The South Pole neutron monitor serves as the linchpin of the worldwide neutron monitor network at low energies. Opening the IceCube Neutrino Observatory has added a new dimension to this capability in the form of the IceTop array of ice Cherenkov detectors. Central to the research is the need to understand the response of these detectors to the radiation environment of the South Pole, particularly to determine the cause of the peculiar secular decline in cosmic ray intensity at South Pole throughout the 50-year operating period of the neutron monitor. Understanding this decline is important because cosmic rays produce radionuclides like Beryllium-10 that become trapped in the ice and are used to determine ice-core ages and precipitation levels over the Earth's polar regions. A full understanding of the production rate is vital to interpreting these data.

Field Season Overview

Three participants will deploy to South Pole Station where they will spend one week do routine servicing and maintenance of the neutron monitor, including the bare counters and data acquisition system in the B2 science lab.

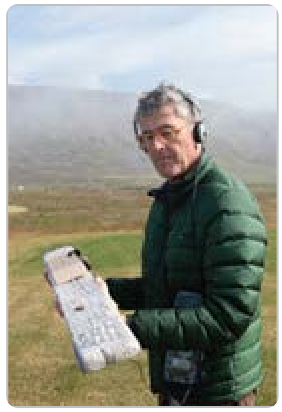
Deploying Team Members

- James Madsen (Co-PI)
- Samantha Pedek
- Eric Thuma

Project Title

Artistic And Scientific Fieldwork At The South Pole: Inquiry At The Edge Of Possibility

Summary



Event Number:
W-467-M/S
NSF/PLR Award 1445057

Program Manager:
Mr. Peter West

ASC POC/Implementer:
Judy Shiple / Elaine Hood

Principal Investigator

Mr. Donald Fortescue
dfortescue@cca.edu

Oakland, California

Project Web Site:
http://donaldfortescue.net

Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: Near stations

Description

The artist will travel to McMurdo Station and Amundsen-Scott South Pole Station to create original artworks and to collaborate with scientists at the South Pole's IceCube Neutrino Observatory (A-333-S). The proposed work will use digital technologies in tandem with older methods and craftsmanship associated with expeditions of discovery from the Enlightenment to the early 20th century.

Field Season Overview

The composer will deploy to McMurdo Station at the same time as the Bromirski team and will take part in USAP field training with them. He will accompany the Bromirski team to camp on the Ross Ice Shelf (RIS), where he will interview the team, observe them doing their science, and record the sounds of man’s interactions with the ice. He also will spend two or more weeks in McMurdo Station, depending on the time spent at the RIS camp, where he will work with his recordings and the science data provided by Dr. Bromirski, as well as conduct outreach through blogging and Skype sessions with his class. McClure will work within the Bromirski fixed wing and snow mobile allocations. See Appendix 1 for the letter of collaborative support from Dr. Bromirski.

Deploying Team Members

- Donald Fortescue (PI)

Project Indexes

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2016-2017 USAP Field Season
Project Detail

Project Title

NASA Long Duration Balloon (LDB) Support Program

Summary

Event Number:
A-145-M
NSF/NASA Agreement

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Samina Ouda / Scott Battaion / Chad Naughton

Principal Investigator

Mr. Hugo Franco
Hugo.Franco@csbf.nasa.gov

Columbia Scientific Balloon Facility
Palestine, Texas

Project Web Site:
http://www.csbf.nasa.gov

Location

Supporting Stations: McMurdo Station
Research Locations: Williams Field

Description

This austral summer the Columbia Scientific Balloon Facility (CSBF) will launch three stratospheric balloons as part of NASA's Long Duration Balloon (LDB) program. The balloons measure 400 feet in diameter, expand to a volume of 40 million cubic feet, and ascend at a rate of about 900 feet per minute to a float altitude of 125,000 feet. Because of the Antarctic wind pattern that starts in early December, the balloons will circumnavigate Antarctica between 70° and 80° south latitude. The payloads are composed of scientific instruments, command and control systems, and solar- and/or battery-powered units. The bulk of the data collected is stored using onboard hard drives, with a small amount sent by radio telemetry to the United States.

Field Season Overview

Field team members will facilitate the preparation, launch, and recovery of NASA-sponsored high-altitude balloons and science payloads. The team will be housed at McMurdo Station and will commute daily to the Long Duration Balloon (LDB) launch facility. Balloon and payload preparations are timed to coincide with favorable weather and wind patterns. Upon termination of the flights, recovery teams will use fixed-wing and/or helicopter support to retrieve the payloads.

Deploying Team Members

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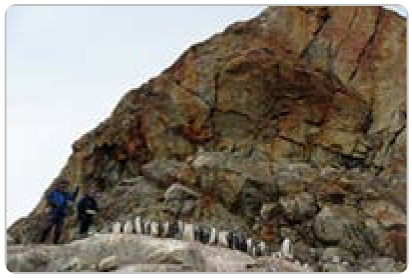
- Alexander Beange
- Garrison Breeding
- Mark Cobble
- Mark Cobble
- Dewell Cooper
- Larry Fox
- Hugo Franco (PI)
- Curtis Frazier
- Gabriel Garde
- Gerald Gregg
- Scott Hadley
- Jack Hays
- Randall Henderson
- Joseph Jones
- Michael Jones
- Joshua King
- Otto Masters
- Randall McDonald
- Scott Miller
- Matthew Mullin
- Jacob Richard
- Delbert Spangler
- David Sullivan (Co-PI)
- Cesar Villasana
- Corey Weber
- Robin Whiteside
- Daniel Willette
- Danny Williams

2016-2017 USAP Field Season
Project Detail

Project Title

Palmer, Antarctica Long-Term Ecological Research (LTER): Land-Shelf-Ocean Connectivity, Ecosystem Resilience And Transformation In A Sea-Ice Influenced Pelagic Ecosystem

Summary



Event Number:
C-013-L/P
NSF/PLR Award 1440435

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Samina Ouda / Jamee Johnson / Adam Jenkins

Principal Investigator

Dr. William Ronald Fraser
bfraser@3rivers.net

Polar Oceans Research Group
Sheridan, Montana

Project Web Site:
http://pal.lternet.edu/

Location

Supporting Stations: ARSV Laurence M. Gould, Palmer Station
Research Locations: Islands near Palmer Station

Description

The overall objectives of Palmer LTER research are to document and understand the phenology and variability in sea-ice dynamics, primary production, zooplankton ecology, seabird and marine mammal demography, and microbial and biogeochemical processes in the Antarctic marine ecosystem, including identifying the mechanisms of ecosystem response to rapid climate change. An important objective is to continue the 23-year long LTER time series on the regional scale grid of hydrographic stations west of the Antarctic Peninsula. The sampling region extends from Palmer Station to Charcot Island and encompasses areas both more and less affected by climate change. Researchers will also continue studying seasonal-scale processes at Palmer Station, with field sampling and specific, focused lab experiments testing hypotheses generated from fieldwork. Palmer Station continues to be the focus of study of Adélie, Gentoo, and Chinstrap penguins and the effects of climate change on their breeding biology, foraging ecology, and population dynamics. Researchers will link visual survey and satellite-based tracking of baleen whales with LTER synoptic data to offer insights into how the distribution and abundance of these krill predators relates to environmental variability and how it will be affected by climate change.

Field Season Overview

One component of the C-013 science team will sail on the January to mid-February cruise

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aboard the ARSV Laurence M. Gould (LMG) to the LTER research grid west of the Antarctic Peninsula. Team members will conduct seabird observations from the ship's bridge throughout the cruise. A group of 2-4 people will establish a tent camp at Avian Island for a five day survey of the local birdlife. Stops of opportunity will take place between Anvers Island and Marguerite Bay to allow the group to complete satellite platform transmitter terminal (PTT) deployments and penguin diet sampling.

The other component of the C-013 science team will conduct their studies in the vicinity of Palmer Station from October to April. The focus of this portion of the project is on the larger seabird community, particularly the three breeding species of Pygoscelid penguins, and is timed to coincide with the entire breeding season. The team plans to establish multi-day field camps at Biscoe Point, Dream Island, and the Joubin Islands. Science team members will concentrate on conducting a census of and mapping seabird colonies, obtaining indices of reproductive success, determining diets and foraging ranges, and examining chick growth and energetics. They will use Palmer Station's lab facilities to house and process GIS and telemetry data, and to analyze diet samples.

Deploying Team Members

- Benjamin Cook
- Shawn Farry
- William Fraser (PI)
- Carrie McAtee
- Donna Patterson-Fraser
- Darren Roberts

2016-2017 USAP Field Season
Project Detail

Project Title

Palmer, Antarctica Long-Term Ecological Research (LTER): Land-Shelf-Ocean Connectivity, Ecosystem Resilience And Transformation In A Sea-Ice Influenced Pelagic Ecosystem

Summary

Event Number:
C-024-L/P
NSF/PLR Award 1440435

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Samina Ouda / Jamee Johnson

Principal Investigator

Dr. Ari Seth Friedlaender
ari.friedlaender@oregonstate.edu

Oregon State University
Marine Mammal Program
Newport, Oregon

Project Web Site:
http://pal.lternet.edu/

Location

Supporting Stations: ARSV Laurence M. Gould, Palmer Station
Research Locations: Palmer Station small-boat operations area

Description

The overall objectives of Palmer LTER research are to document and understand the phenology and variability in sea-ice dynamics, primary production, zooplankton ecology, seabird and marine mammal demography, and microbial and biogeochemical processes in the Antarctic marine ecosystem, including identifying the mechanisms of ecosystem response to rapid climate change. One particularly important objective is to continue the 23-year-long LTER time series on the regional scale grid of hydrographic stations west of the Antarctic Peninsula. Researchers on this project will focus on the dynamics of baleen whale populations. Researchers will link visual survey and satellite-based tracking of baleen whales with LTER synoptic data. The goal is to offer insights into how the distribution and abundance of these krill predators relates to environmental variability and how it will be affected by climate change.

Field Season Overview

The whale component (C-024-P) requires two persons at Palmer Station from late December to May. Deploying team members will conduct visual surveys of marine mammals, biopsy sampling and quantitative prey mapping using small inflatable craft at Palmer Station. Throughout the field season, they will work with the Fraser (C-013-P) team to survey and sample the study area simultaneously to correlate results with their work.

Project Indexes

Find information about projects approved for the 2016-2017 USAP field season using the available indexes.

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The Friedlaender group will be conducting some visual, bioposy, and acoustic surveys outside of the standard boating area in tandem with the Fraser (C-013-P) team members. Prey-mapping surveys can be done from the standard Mark V Zodiacs by mounting hardware to the wooden transom of the boat and attaching a swing-arm and plate with transducers. Whale tagging will not be conducted at Palmer Station. All whale research will be conducted under National Marine Fisheries Service (NMFS), Marine Mammal Protection Act (MMPA), Antarctic Conservation Act (ACA), Convention on International Trade in Endangered Species (CITES), and Institutional Animal Care and Use Committee (IACUC) permits held by the Principal Investigator.

Deploying Team Members

- Heather Foley
- Ladd Irvine

2016-2017 USAP Field Season
Project Detail

Project Title

Phase 2 Development Of A Rapid Access Ice Drilling (RAID) Platform For Research In Antarctica

Summary

Event Number:
D-551-M
NSF/PLR Award 1419935

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
Judy Shiple / Matthew Kippenhan / Colleen Hardiman

Principal Investigator

Dr. John Goodge
jgoodge@d.umn.edu

University of Minnesota
Department of Geological Sciences
Duluth, Minnesota

Project Web Site:
http://www.rapidaccessicedrill.org

Location

Supporting Stations: McMurdo Station
Research Locations: Minna Bluff

Description

The Rapid Access Ice Drill (RAID) aims to rapidly drill to deep ice (up to 3,300-meter depth), followed by the coring of ice, ice-sheet bed interface, and bedrock substrate below. The RAID drilling platform will give the scientific community access to a rich record of geologic and climatic change on a variety of timescales, from the billion-year rock record to thousand-year ice and climate histories. The main objective during the 2016-17 Antarctic summer field season is to conduct a field trial of the drilling system in order to validate its operational readiness for science drilling.

Field Season Overview

The Antarctic Field Trial (AFT) for the 2016-17 austral summer field season will take place at a site near Minna Bluff. The trial will commence in late 2016 after the RAID equipment is moved from winter storage in McMurdo to the nearby ice shelf, where it will be loaded onto ski platforms. After a short traverse of approximately 125 miles from McMurdo Station, the RAID system and a small field camp will be set up for drilling operations. Total time on site should be approximately four weeks. At the conclusion of the drill trial, the equipment will be returned to the McMurdo area and winterized on snow berms at Black Island South Pole (BISP) for storage. In addition, upon completing field work at the South Pole, one participant from T-150 (Ice Drilling Design and Operations, IDDO) and one participant from I-194-S will each spend one to two weeks at the Minna Bluff site observing drilling

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operations and testing a new optical borehole logger that is being designed and built for RAID.

Deploying Team Members

- John Goodge (PI)
- Jeffrey Severinghaus (Co-PI)
- Blaise Stephanus

2016-2017 USAP Field Season
Project Detail

Project Title

Phase 2 Development Of A Rapid Access Ice Drilling (RAID) Platform For Research In Antarctica / DOSECC Exploration Services (DES)

Summary

Event Number:
D-552-M
NSF/PLR Award 1419935

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
Judy Shiple / Matthew Kippenhan / Colleen Hardiman

Principal Investigator

Dr. John Goodge
jgoodge@d.umn.edu

University of Minnesota
Department of Geological Sciences
Duluth, Minnesota

Project Web Site:
http://www.rapidaccessicedrill.org

Location

Supporting Stations: McMurdo Station
Research Locations: Minna Bluff

Description

The Rapid Access Ice Drill (RAID) aims to rapidly drill to deep ice (up to 3,300-meter depth), followed by the coring of ice, ice-sheet bed interface, and bedrock substrate below. The RAID drilling platform will give the scientific community access to a rich record of geologic and climatic change on a variety of timescales, from the billion-year rock record to thousand-year ice and climate histories. The RAID drill was designed and built by DOSECC Exploration Services (DES) under contract to the University of Minnesota Duluth (UMD), and this group will provide technical personnel for the operational test of the drill system.

Field Season Overview

The Antarctic Field Trial (AFT) for the 2016-17 austral summer field season will take place at a site near Minna Bluff. The trial will commence in late 2016 after the RAID equipment is moved from winter storage in McMurdo to the nearby ice shelf, where it will be loaded onto ski platforms. After a short traverse of approximately 125 miles from McMurdo Station, the RAID system and a small field camp will be set up for drilling operations. Total time on site should be approximately four weeks. At the conclusion of the drill trial, the equipment will be returned to the McMurdo area and winterized on snow berms at Black Island South Pole (BISP) for storage. As part of the AFT, DES will provide a bore-hole video logger and

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suitable lost-circulation material. PI Severinghaus (Proposal 1543238) will provide additional equipment for the tests.

Deploying Team Members

- Christopher Delahunty (Team Leader)
- Christian Jensen
- Richard Szentmiklosi
- Jess Valeda
- Anthony Vecchiarelli
- Michael Vinson

2016-2017 USAP Field Season
Project Detail

Project Title

McMurdo LTER - Streams: Increased Connectivity In A Polar Desert Resulting From Climate Warming: McMurdo Dry Valleys LTER Program

Summary

Event Number:
C-506-M
NSF/PLR Award 1115245

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Jenny Cunningham / Elizabeth Kauffman

Principal Investigator

Dr. Michael N Gooseff
michael.gooseff@colorado.edu

University of Colorado Boulder
Institute of Arctic and Alpine Research
Boulder, Colorado

Project Web Site:
http://www.mcmlter.org/

Location

Supporting Stations: McMurdo Station
Research Locations: F6 / Garwood and Wright Valleys / Lakes Bonney, Fryxell, Hoare, and Miers

Description

Initially funded in 1980, the U.S. Long-Term Ecological Research (LTER) network is a collaborative effort involving more than 1,800 scientists and students. The McMurdo LTER program is an inter-disciplinary and multi-disciplinary study of the aquatic and terrestrial ecosystems in the ice-free McMurdo Dry Valleys. It is one of 26 LTER sites where researchers are studying ecological processes over long temporal and broad spatial scales. Streams component researchers will continue to operate a network of 16 stream-flow gauges, collect water quality samples from 30 streams, and make hydrologic measurements. This six-year award cycle comprises seven collaborative projects: C-504-M (Gooseff), C-505-M (Priscu), C-506-M (Gooseff), C-507-M (Wall), C-508-M (Barrett), C-509-M (Lyons), and C-511-M (Doran).

Field Season Overview

The primary activities will be long term stream monitoring and biological surveying conducted in the Dry Valleys from November to February. The team will be the primary occupants of the F6 field camp but will also work from other camps in the Dry Valleys. This project will collaborate with other McMurdo LTER groups, especially the soils (C-507-M, Wall) and biogeochemistry teams (C-509-M, McKnight). One participant conduct nutrient uptake experiments on six streams within the Taylor Valley.

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Deploying Team Members

- Joel Singley
- Eric Sokol (Team Leader)
- Christa Torrens

2016-2017 USAP Field Season
Project Detail

Project Title

McMurdo LTER - Glaciers: Increased Connectivity In A Polar Desert Resulting From Climate Warming: McMurdo Dry Valleys LTER Program

Summary

Event Number:
C-504-M
NSF/PLR Award 1115245

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Jenny Cunningham / Elizabeth Kauffman

Principal Investigator

Dr. Michael N Gooseff
michael.gooseff@colorado.edu

University of Colorado Boulder
Institute of Arctic and Alpine Research
Boulder, Colorado

Project Web Site:
http://www.mcmlter.org

Location

Supporting Stations: McMurdo Station
Research Locations: Dry Valleys

Description

Initially funded in 1980, the U.S. Long-Term Ecological Research (LTER) network is a collaborative effort involving more than 1,800 scientists and students. The McMurdo LTER program is an inter-disciplinary and multi-disciplinary study of the aquatic and terrestrial ecosystems in the ice-free McMurdo Dry Valleys. It is one of 26 LTER sites where researchers are studying ecological processes over long temporal and broad spatial scales. Glacier researchers will continue measurements of physical properties of Dry Valley glaciers and their response to meteorological conditions, with special emphasis on LTER core research areas. This six-year award cycle comprises seven collaborative projects: C-504-M (Gooseff), C-505-M (Priscu), C-506-M (Gooseff), C-507-M (Wall), C-508-M (Barrett), C-509-M (Lyons), and C-511-M (Doran).

Field Season Overview

The team will be based at Lake Hoare camp from early November until late January and may also operate out of F6 during the months of December and/or January. They will make day trips to Commonwealth, Howard, Canada, and Taylor glaciers in the Taylor Valley and to Adams Glacier in the Miers Valley, where they will conduct mass balance measurements and collect melt water and shallow ice cores. Researchers will collect the majority of ice cores in November with less frequent collection in December and January. They will also conduct meltwater sampling along the Canada and Commonwealth Glaciers primarily in

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December and January. They will make day trips to various active layer monitoring stations (ALMSs) in the Taylor Valley including Many Glaciers Pond, F6, Green Creek, the snout of Canada Glacier, and Wormherder Creek. The team will install a new ALMS in the Miers Valley in January. Team members will also deploy a pressure transducer in the Dry Valley Drilling Project (DVDP) borehole at Don Juan Pond in November and plan to revisit the site to download the data logger in January.

Deploying Team Members

- Anna Bergstrom (Team Leader)
- Michael Gooseff (PI)
- Michael Gooseff (PI)

2016-2017 USAP Field Season
Project Detail

Project Title

Antarctic Impulsive Transient Antenna (ANITA III) Experiment

Summary

Event Number:
A-371-M
NSF/NASA Agreement

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Samina Ouda / Scott Battaion / Chad Naughton

Principal Investigator

Dr. Peter W Gorham
gorham@phys.hawaii.edu

University of Hawaii Manoa
Hawaii Institute of Geophysics & Planetology
Honolulu, Hawaii

Project Web Site:
http://www.phys.hawaii.edu/~anita

Location

Supporting Stations: McMurdo Station
Research Locations: Williams Field

Description

The Antarctic Impulsive Transient Antenna (ANITA) project is a long-duration-balloon mission to constrain the origin of the highest energy particles in the universe. Researchers will conduct the third flight of the long-duration balloon payload, ANITA III, above the Antarctic Plateau to observe radio impulses that are thought to originate from both ultra-high-energy cosmic neutrino interactions in the ice and ultra-high-energy cosmic rays in the Antarctic atmosphere. These impulses are observed primarily in reflection from the ice surface. ANITA's payload is a large array of VHF/UHF antennas capable of observing and geolocating these radio impulses and deriving a possible direction and energy for any neutrinos or cosmic rays observed. ANITA is the first NASA mission whose goal is ultra-high-energy cosmic particle detection. This third flight will continue the accumulation of a unique and statistically significant data set of radio-detected cosmic particles.

Field Season Overview

An advance team of three to four will arrive first and begin setup and initial mechanical integration at the Long Duration Balloon (LDB) facility. With ASC assistance, they will unload their equipment and set up power and network distribution. The rest of the team will arrive in November and while they await the OK for launch by the NASA Balloon support team, some of the science team will continue payload integration and testing, while others will deploy several ground calibration systems that will help validate the payload just after it

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reaches float altitude the day of the launch. Once the launch-ready state is attained, the system will be exercised continuously, gathering engineering and calibration data until a successful launch is achieved. After the launch, two groups of two people will deploy to two different locations via fixed-wing aircraft. At that point, the team will begin an intensive 36-48 hour period where the payload is exercised via line-of-sight telemetry and all of the flight systems are tuned for the flight duration. At the end of the line-of-sight period, the team will decrease by about half, and, if the flight continues in good order, the team will decrease down to three or four members who await the landing and recovery, and who will be tasked with the final packing and retrieval of the data vaults. Contractor support required for the final recovery is dependent on the circumstances of the landing.

Deploying Team Members

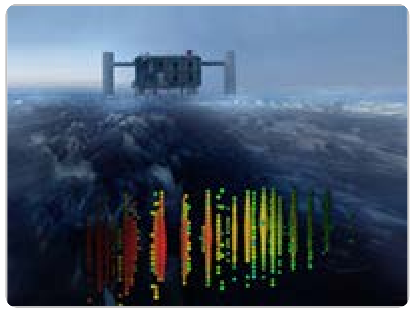
- Luke Batten
- Dana Braun
- Linda Cremonesi
- Peter Gorham (PI)
- Carsten Hast
- Brian Hill
- Andrew Ludwig
- Christian Miki
- Ryan Nichol (Co-PI)
- Alexander Novikov
- Eric Oberla
- Steven Prohira
- Andrew Romero-Wolf (Co-PI)
- David Saltzberg (Co-PI)
- Garry Simburger
- Benjamin Strutt
- Gary Varner (Co-PI)
- Stephanie Wissel (Team Leader)

2016-2017 USAP Field Season
Project Detail

Project Title

IceCube Operations And Maintenance

Summary



Event Number:
A-333-S
NSF/PLR Award 1600823

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Payot Scheibe / Paul Sullivan / Leah Street

Principal Investigator

Dr. Francis Halzen
halzen@icecube.wisc.edu

University of Wisconsin Madison
Physics Department
Madison, Wisconsin

Project Web Site:
http://icecube.wisc.edu

Location

Supporting Stations: South Pole Station
Research Locations: South Pole Station

Description

The IceCube neutrino telescope transforms a cubic kilometer of ice into a Cherenkov detector. Using neutrinos as cosmic messengers, IceCube opens unexplored wavelength bands for astronomy. This long-term project is an international collaboration with the University of Wisconsin-Madison serving as the host institution and providing oversight and staffing.

Field Season Overview

On-Ice activities this season include improvements to the existing IceCube infrastructure located at The South Pole. The team will conduct most of their work in the IceCube Counting Laboratory (ICL). Planned work includes: (1) Upgrading UPSs in the ICL; (2) Installing software upgrades to core computing nodes at the ICL; (3) Training and transition of winterover staff; (4) IceCube Calibration runs; (5) Replacing Acopian power supply; (6) Replacing ATX power supply; (7) Possible materials testing related to future scintillator installations; (8) Installation of 2nd doghouse on the roof of the ICL, and; (9) Investigating the possibility of installing a crane or hoist at the ICL which could be used to deliver cargo to the second floor of the ICL.

Deploying Team Members

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- Ralf Auer
- Jim Braun
- Colin Burreson
- Michael DuVernois

2016-2017 USAP Field Season
Project Detail

Project Title

Antarctic Search For Meteorites (ANSMET)

Summary

Event Number:
G-058-M
NSF / NASA Agreement

Program Manager:
Dr. Thomas Wilch

ASC POC/Implementer:
Samina Ouda / Bija Sass

Principal Investigator

Dr. Ralph Harvey
rph@cwru.edu

Case Western Reserve University
Department of Geological Sciences
Cleveland, Ohio

Project Web Site:
http://www.case.edu/ansmet

Location

Supporting Stations: McMurdo Station
Research Locations: Elephant Moraine / Shackleton, Amundsen, and Devil's Glaciers / Mounts Cecily, Raymond, Wisting and Prestrud / Cumulus Hills / Nodtvedt Nunatak / Roberts Massif

Description

Since 1976, the Antarctic Search for Meteorites (ANSMET) has found more than 17,000 specimens. While meteorites do not fall preferentially on Antarctica, they are just easier to find on the white snow- and ice-scapes and because the ice transport and ablation process leads to accumulation in certain areas. This season, ANSMET will conduct full-scale systematic meteorite recovery and reconnaissance in the Elephant Moraine ice fields northwest of McMurdo Station. In addition, a much larger team will conduct a systematic meteorite recovery to target locations in the southern region of Shackleton Glacier (SHG) camp and two target locations in the northern region of the SHG. They will first conduct an aerial flight survey of target icefields to assess blue ice snow cover and to identify possible landing sites for aircraft. Results from this flight survey will be used to set the itinerary for the two target locations in the northern region and two target locations in the southern region.

Field Season Overview

In the early season, a team to two will travel by Twin Otter aircraft to Elephant Moraine where they will camp in Scott tents for approximately ten days and make day trips by snowmobile to search for and recover meteorites. They will then return to McMurdo by Twin Otter. Later in the season, a team of eight, including two mountaineers, will travel by

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Basler or Twin Otter to Shackleton Glacier Camp. They will split into two teams to continue the search for meteorites at icefields in relatively close proximity to Shackleton, establishing tent camps at various sites for one to two weeks at each site, and making day trips by snowmobile. The teams will be self-sufficient at all of their sites but will move from site to site by Twin Otter. At the end of their site visits, both teams will return to Shackleton Camp for their return flights, by Basler, to McMurdo.

Deploying Team Members

- Ralph Harvey (PI)
- James Karner (Co-PI)
- David Mittlefehldt
- Brian Rougeux
- John Schutt (Team Leader)

2016-2017 USAP Field Season
Project Detail

Project Title

IRIS/PASSCAL Seismic Support

Summary

Event Number:
T-299-M/S
NSF Agreement

Program Manager:
Dr. Thomas Wilch

ASC POC/Implementer:
Judy Shiple / Elizabeth Kauffman / Paul Sullivan

Principal Investigator

Mr. Jason Paul Hebert
jhebert@passcal.nmt.edu

New Mexico Institute of Mining and Technology
IRIS/PASSCAL Instrument Center
Socorro, New Mexico

Project Web Site:
http://www.passcal.nmt.edu/content/polar

Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: As required to support NSF-funded projects

Description

The IRIS Program for Array Seismic Studies of the Continental Lithosphere (PASSCAL), Instrument Center and EarthScope USArray, Array Operations Facility (AOF) at New Mexico Institute of Mining and Technology support cutting-edge seismological research into Earth's fundamental geological structure and processes. Each year, the facility provides instrumentation and support to NSF-funded seismological projects while also developing cold-station deployment strategies, collaborating with vendors to develop and test equipment rated -55° C / -67° F, building an equipment pool, and creating a repository for cold-station techniques.

Field Season Overview

The IRIS/PASSCAL team will provide support to the following groups during the 2016-17 season: C-525-M (Schwartz), G-079-M (Wilson), G-081-M (Kyle), G-089-M (Wiens), I-348-M (Bromirski), as well as any unplanned support as is feasible. Team members will also install and service test stations at the South Pole Remote Earth Science and Seismological Observatory (SPRESSO) and on the road to Castle Rock at the Castle Rock test area, and possibly on Observation Hill.

Deploying Team Members

Project Indexes

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- Dean Childs
- Phililp Chung
- Chuck Dahl
- Jason Hebert (PI)
- Kevin Nikolaus

2016-2017 USAP Field Season
Project Detail

Project Title

Ocean Acidification Seascape: Linking Natural Variability And Anthropogenic Changes In PH And Temperature To Performance In Calcifying Antarctic Marine Invertebrates

Summary

Event Number:
B-134-M
NSF/PLR Award 1246202

Program Manager:
Dr. Chris Fritsen

ASC POC/Implementer:
Samina Ouda / Beverly Walker

Principal Investigator

Dr. Gretchen Hofmann
hofmann@lifesci.ucsb.edu

University of California Santa Barbara
Department of Ecology, Evolution, Marine Biology
Santa Barbara, California

Project Web Site:
http://labs.eemb.ucsb.edu/hofmann/gretchen/

Location

Supporting Stations: McMurdo Station
Research Locations: New Harbor / McMurdo Jetty / Cape Evans

Description

This project will examine the effects of environmental change on a key Antarctic marine invertebrate — a pelagic mollusk, the pteropod, Limacina helicina antarctica. There are two main activities in this project: (1) To deploy oceanographic equipment — in this case, autonomously recording pH sensors called SeaFETs (sea field-effect transistors) and other devices that record temperature and salinity; and (2) To use these environmental data in the laboratory at McMurdo Station to study the response of the marine invertebrates to future changes in water quality that are expected in the next few decades. The researcher's objective this year is an early-season retrieval of three SeaFET sensors from Cape Evans, the Jetty, and New Harbor.

Field Season Overview

Early in the season, ASC Dive Services personnel and one science team member will retrieve three SeaFET sensors from Cape Evans, the Jetty, and New Harbor. Once retrieved at each location, the science team member will dry the sensors, service the instrument, download data, and prepare it to be shipped to the PI's home institution.

Deploying Team Members

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- Umihiko Hoshijima

2016-2017 USAP Field Season
Project Detail

Project Title

Assessing Changing Patterns Of Human Activity In The McMurdo Dry Valleys Using Digital Photo Archive

Summary

Event Number:
C-457-M
NSF/PLR Award 1443475

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Jenny Cunningham / Ryan Wallace

Principal Investigator

Mr. Adrian J Howkins
adrian.howkins@colostate.edu

Colorado State University
Natural Resource Ecology Laboratory
Longmont, Colorado

Project Web Site:
http://www.mcmlter.org

Location

Supporting Stations: McMurdo Station
Research Locations: Dry Valleys

Description

Researchers will be conducting repeat photography of sites of human occupation in the McMurdo Dry Valleys in order to build a digital photo archive of the region. Historical photos are also being collected from archives and from individuals in the United States and New Zealand. Researchers with this project plan to return to the sites where these photographs were taken to collect modern imagery. The photo archive will then be used to assess changing patterns of human activity.

Field Season Overview

Three participants will deploy to Lake Hoare Camp and Lake Vanda Camp, which will be managed by Antarctica New Zealand. From these locations, they will travel by helicopter to numerous sites in the McMurdo Dry Valleys to conduct repeat photography based on archival research. Sites visited may include day trips to New Harbor, Wright Valley and Lakes Bonney and Fryxell in the Taylor Valley. The team may also visit the Miers, Garwood, Victoria, and Wright Valleys. Participants will use existing fixed camps at each location. One team member will begin photographing locations in conjunction with C-504-M (Fountain).The other two members will conduct their field work in January.

Deploying Team Members

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- Adrian Howkins (PI)

2016-2017 USAP Field Season
Project Detail

Project Title

Development Of The Askaryan Radio Array Ultra-High Energy Neutrino Detector At The South Pole

Summary

Event Number:
A-107-S
NSF/PLR Award 1404212

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Judy Shiple / Paul Sullivan / Leah Street

Principal Investigator

Dr. Albrecht Karle
karle@icecube.wisc.edu

University of Wisconsin Madison
Department of Physics
Madison, Wisconsin

Project Web Site:
http://ara.wipac.wisc.edu/home

Location

Supporting Stations: South Pole Station
Research Locations: On station

Description

The Askaryan Radio Array (ARA) is designed to detect and measure high-energy neutrinos from space by observing the radio pulses they generate as they travel through the ice. The research team will probe the nature and cosmic evolution of the accelerators of the highest-energy cosmic rays by observing ultra high-energy neutrinos produced when cosmic rays interact with the microwave background. At these very high energies, neutrinos can be detected in dense, radio-frequency-transparent media, such as ice, by the Askaryan effect. Its origin is an excess negative charge that builds up when electrons are swept out along a shower front advancing relativistically through the ice. The thickness (estimated to be almost two miles) and exceptional radio-frequency clarity makes the south polar ice cap an ideal place to study ultra-high-energy neutrinos.

Field Season Overview

The project will establish two stations (A4 and A5) additional to the existing ARA3 array currently in operation at the South Pole. The existing ARA testbed and stations were installed at the South Pole over the period spanning 2010 through 2013 (Karle, 1002485). ARA is located approximately 6 to 10 km grid-west from the South Pole station in the Dark Sector. This season, ASC will conduct site preparation activities, including surveying the new station locations and roads, track-packing roads from the Ice Cube Laboratory (ICL) to the new sites, and track-packing 3000 ft3 pads at each of the new station locations. The

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science team will prepare the ARA hot water drill (ARAHWD) and other equipment currently stored at the South Pole for the drilling season (2017-18) and will stage equipment at the ICL.

Deploying Team Members

- Ming-Yuan Lu
- Keiichi Mase

2016-2017 USAP Field Season
Project Detail

Project Title

Dry Valley Seismic Project

Summary

Event Number:
G-078-M
NSF/PLR-DoD MOA

Program Manager:
Dr. Thomas Wilch

ASC POC/Implementer:
Jenny Cunningham / Elizabeth Kauffman

Principal Investigator

Dr. Robert C Kemerait
kemerait@tt.aftac.gov

United States Air Force
AFTAC
Patrick AFB, Florida

Project Web Site:
http://www.aftac.gov

Location

Supporting Stations: McMurdo Station
Research Locations: Dry Valleys

Description

The Dry Valley seismic project monitors regional and global seismicity. The Dry Valleys stations are part of the Air Force Technical Applications Center's (AFTAC) southern network, which accumulates near-real-time data from nine locations in the southern hemisphere. The data are transmitted to the National Data Center in Florida and made available to the international scientific community.

Field Season Overview

The team will travel to Bull Pass and Mount Newall to refuel the diesel generators, perform annual engine, electrical, and technical, maintenance and inspections.

Deploying Team Members

- Aaron Boyle
- Michael Farrar
- Dillon Gibbs (Team Leader)
- Richard Westra

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Project Web Sites

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2016-2017 USAP Field Season
Project Detail

Project Title

Imaging The Beginning Of Time From The South Pole: Observations With The Full SPUD Array

Summary

Event Number:
A-149-S
NSF/PLR Award 1638957

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Payot Scheibe / Paul Sullivan

Principal Investigator

Dr. John Kovac
jmkovac@cfa.harvard.edu

Harvard University
Cambridge, Massachusetts

Project Web Site:
http://bicepkeck.org/

Location

Supporting Stations: South Pole Station
Research Locations: MAPO (Martin A. Pomerantz Observatory)

Description

SPUD (Small Polarimeter Upgrade for DASI) is a next-generation instrument following on from the BICEP (Background Imaging of Cosmic Extragalactic Polarization) and BICEP2 program. It consists of multiple receivers similar to BICEP2 on the telescope mount originally built for the Degree Angular Scale Interferometer (DASI) experiment. The research team's objective is the same as BICEP2 - to attempt to measure B-mode polarization caused by gravity waves spawned in the first tiny fraction of a second after the big bang by the process of "inflation." Inflation is the favored cosmogenic model, and finding direct "smoking gun" evidence for it is one of the highest priorities in cosmology today. SPUD increases sensitivity over BICEP2 by increasing the number of detectors and expanding to other frequencies to identify and mitigate possible foreground contamination.

Field Season Overview

At station opening, a team will arrive to perform calibrations on their receivers. The will use the MAPO roof crane to take down three of the receivers for focal-plane replacement. Once that is done, and the receivers are re-mounted, they will run test observations and perform any necessary calibrations.

Deploying Team Members

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- Denis Barkats
- Eric Bullock
- James Cornelison
- Sinan Kefeli
- John Kovac (PI)
- Nicole Larsen
- Hien Nguyen
- Clement Pryke (Co-PI)
- Robert Schwarz
- Michael St Germaine
- Justin Willmert

2016-2017 USAP Field Season
Project Detail

Project Title

High Elevation Antarctic Terahertz (HEAT) Telescopes For Dome A And Ridge A

Summary

Event Number:
A-364-M/S
NSF/PLR Award 0944335

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Samina Ouda / Jennifer Blum / Paul Sullivan

Principal Investigator

Dr. Craig Kulesa
ckulesa@email.arizona.edu

University of Arizona Tucson
Steward Observatory
Tucson, Arizona

Project Web Site:
http://soral.as.arizona.edu/heat/

Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: Dome A / Ridge A

Description

This project is a joint United States and Australian venture to build and deploy a fully automated 0.6-meter terahertz astronomical observatory for remote operation at Ridge A, which is the highest elevation on the Antarctic Plateau. High Elevation Antarctic Terahertz (HEAT) observes in the 350 micron (0.8 THz) through 150 micron (2 THz) atmospheric windows, the latter of which is unique to Ridge A. The HEAT instrument conducts a Galactic Plane survey of atomic carbon, ionized carbon, and carbon monoxide to explore the galaxy-wide evolution of gas and stars, the formation and destruction of interstellar clouds, and the dynamics of star-forming regions. The telescope is mounted on top of the Australian University of New South Wales' PLATeau Observatory (PLATO) module that provides housing for the instrument's electronics and diesel engines used to generate electrical power during winter observations. PLATO and the telescope operate autonomously for more than a year at a time, with commands and data being transmitted from and to the home institutions daily via Iridium satellites.

Field Season Overview

This project will continue operation and maintenance for the High Elevation Antarctic Terahertz Telescope (HEAT) and Plateau Observatory (PLATO-R). Team members will travel via LC-130 aircraft from McMurdo to South Pole Station. After acclimation, preparing the replacement HEAT cryostat, and testing PLATO-R components, two science participants and an ASC mountaineer/field coordinator will be transported by Twin Otter

Project Indexes

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Project Web Sites

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aircraft to Ridge A. The team will tent camp at Ridge A for approximately one week to service the telescope and observatory. An LC-130 fuel drop may occur in mid November to support this project.

Deploying Team Members

- Craig Kulesa (PI)

2016-2017 USAP Field Season
Project Detail

Project Title

Operation IceBridge

Summary

Event Number:
C-529-M
NSF / NASA Agreement

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Judy Shiple / Elizabeth Kauffman / Chad Naughton

Principal Investigator

Dr. Nathan T Kurtz
nathan.t.kurtz@nasa.gov

National Aeronautics and Space Administration
Goddard Space Flight Center, Oceans and Ice
Greenbelt, Maryland

Project Web Site:
http://icebridge.gsfc.nasa.gov/

Location

Supporting Stations: McMurdo Station
Research Locations: On station / Phoenix Runway

Description

Operation IceBridge makes airborne altimetry, radar, and other geophysical measurements to monitor and characterize the cryosphere. Icebridge data will improve knowledge of the contribution of the major Arctic and Antarctic ice sheets and sea ice to sea-level rise. Major goals include: (1) Make airborne altimetry measurements of ice sheets and sea ice to extend and improve the observations begun by the Ice, Cloud, and land Elevation Satellite (ICESat); (2) Link measurements made by historical airborne laser altimeters, ICESat, ICESat-2 and CryoSat-2 to allow accurate comparison and production of a long-term, ice-altimetry record; (3) Monitor key, rapidly changing areas of Arctic and Antarctic ice to maintain a long-term observation record; and (4) Provide data to improve understanding of ice dynamics and better constrain predictive models of sea-level rise and sea-ice cover conditions.

Field Season Overview

Team members will live on station and make day trips by Mattrack and pickup truck to Phoenix runway to conduct site surveys for future work.

Deploying Team Members

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- Nathan Kurtz (PI)
- John Woods

2016-2017 USAP Field Season
Project Detail

Project Title

Application Of The AGO Network To Energy Transfer In The Radiation Belts And Remote Sensing Of Auroral Plasma Processes

Summary

Event Number:
A-125-S
NSF/PLR Award 1141817

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Samina Ouda / Paul Sullivan

Principal Investigator

Dr. James LaBelle
jlabelle@einstein.dartmouth.edu

Dartmouth College
Department of Physics & Astronomy
Hanover, New Hampshire

Project Web Site:
http://www.dartmouth.edu/~spacephy/labelle_group

Location

Supporting Stations: South Pole Station
Research Locations: AGO sites

Description

This project addresses questions about energy transfer in the Earth's radiation belts and auroral plasma physics. Energetic plasma interacting with the geomagnetic field in the near-Earth space (geospace) environment emits electromagnetic waves across the radio spectrum. Ground-based measurements of these waves are used as diagnostic tools to investigate various processes in geospace. This investigation takes advantage of an existing network of radio receivers at Automated Geophysical Observatory (AGO) sites located from -70° to -85° of invariant geomagnetic latitude and operating in the frequency range from extra-low to high frequencies. The Antarctic continent is ideally suited for these types of natural radio wave experiments since it is largely devoid of anthropogenic electromagnetic interference such as radio-frequency broadcast transmissions. The project will focus on studies of three geophysically important plasma waves: chorus waves, auroral hiss, and auroral kilometric radiation (AKR). Chorus waves are believed to be a major driver of radiation belt electron acceleration and loss. The auroral hiss and AKR waves are generated in the auroral acceleration region and have the potential to be used for remote sensing of this complex and poorly understood near-Earth region.

Field Season Overview

No science personnel will deploy this season. On-station science technicians will continue to support instrument calibration and data collection.

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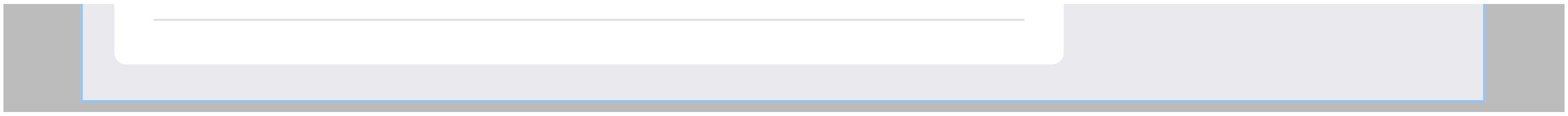

2016-2017 USAP Field Season
Project Detail

Project Title

Earth's Electromagnetic Environment: Advancing Recent Discoveries In Auroral Plasma Radio Emission Research

Summary

Event Number:
A-128-S
NSF/PLR Award 1443338

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Samina Ouda / Paul Sullivan

Principal Investigator

Dr. James LaBelle
jlabelle@einstein.dartmouth.edu

Dartmouth College
Department of Physics & Astronomy
Hanover, New Hampshire

Project Web Site:
http://www.dartmouth.edu/~spacephy/labelle_group

Location

Supporting Stations: South Pole Station
Research Locations: B2 Science Building / V8 Vault

Description

This project will use existing instruments at South Pole Station to answer outstanding questions raised by the discovery of correlations between auroral kilometric radiation (AKR) observed 200,000 kilometers above Earth, and AKR-like signals observed simultaneously at South Pole Station; the discovery of higher electron cyclotron harmonic radiation whose polarization suggests a different and possibly nonlinear generation mechanism; and the discovery of a new type of auroral radio emission at frequencies just above the electron cyclotron frequency. These three phenomena are best observed, and in most cases can only be observed, from Antarctica, making the South Pole a perfect location for the experiment.

Field Season Overview

This year's science objectives require no significant upgrades to the receiving systems now operating at South Pole Station. As in past years, an ASC research associate, and possibly a team member from the A-111-S (Gerrard) project, will provide routine technical support for calibration and data collection.

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2016-2017 USAP Field Season
Project Detail

Project Title

Antarctic Automatic Weather Station Program

Summary

Event Number:
O-283-M
NSF/PLR Award 1245663

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
Samina Ouda / Elizabeth Kauffman

Principal Investigator

Dr. Matt Lazzara
mattl@ssec.wisc.edu

University of Wisconsin Madison
Space Science and Engineering Center/AMRC
Madison, Wisconsin

Project Web Site:
http://amrc.ssec.wisc.edu/

Location

Supporting Stations: McMurdo Station
Research Locations: On station

Description

The Antarctic Automatic Weather Station (AWS) network has been making meteorological observations since the early 1980s. This continent-wide network is positioned to observe significant meteorological events and increase understanding of the climate of the Antarctic surface. Researchers use the AWS network to observe and learn about the Antarctic in a warming world. Given the duration of the AWS program and maintaining AWS sites for many years, many studies have been conducted on the surface climatology of regions of the continent such as the Ross Ice Shelf. This climatology also aids in other studies, like winter-warming events.

Field Season Overview

Four team members will deploy for the second component of the O-283-M event. They will conduct field work on the Ross Ice Shelf and around the local McMurdo Station area. The team will visit and repair AWS stations that develop problems during the Austral winter, and as needed throughout the deployment. Specific location details include: (1) One Twin Otter flight to Tall Tower. The team will require antenna rigger support to raise the lower levels of instrumentation. Two project participants will dig out and raise the power system. (2) Ross Ice Shelf work, based out of McMurdo Station. The following AWS sites are scheduled for maintenance during the 2016-17 season: Gill, Schwerdtfeger, Lettau, Vito, and Sabrina. (3) Ross Island sites including Williams Field, Windless Bight, and Pegasus North can be visited using ground transportation. Helicopter support will be required to access Lorne,

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Linda, Marble Point, Minna Bluff, and Cape Bird sites. One McMurdo research associate (RA) provides support year-round.

Deploying Team Members

- Carol Costanza
- David Mikolajczyk
- Lee Welhouse

2016-2017 USAP Field Season
Project Detail

Project Title

Winter Survival Mechanisms And Adaptive Genetic Variation In An Antarctic Insect

Summary

Event Number:
B-256-P
NSF/PLR Award 1341385

Program Manager:
Dr. Chris Fritsen

ASC POC/Implementer:
Chelsea Wegner / Jamee Johnson

Principal Investigator

Dr. Richard Lee
leere@miamioh.edu

Miami University
Oxford, Ohio

Project Web Site:
http://www.units.muohio.edu/cryolab/education/antarctic.htm

Location

Supporting Stations: Palmer Station
Research Locations: Christine, Cormorant, Hermit, Humble, and Torgersen Islands / Norsel Point

Description

The Antarctic midge can survive even if it loses 70 percent of its body water. Since polar regions are deserts that are not only cold but also lack access to free water, the midge survives in this environment via unique mechanisms that include the ability to tolerate freezing and extensive dehydration. How this is done is of interest for understanding seasonal adaptations of insects and how they respond to climate change. Additionally, the molecular and physiological mechanisms employed may offer valuable insights into more general mechanisms that might be exploited for cryopreservation and long-term storage of human tissue and organs for transplantation and other medical applications.

Field Season Overview

A science team of five will be based at Palmer Station for January and February to collect adult and larvae midges. They will use a Zodiac inflatable boat to access several islands near station. Two team members will remain on station through mid March to continue lab work and field studies, tracking seasonal changes in microclimatic conditions and the physiological state of larvae as they prepare to overwinter. Samples will be returned to the home institution for further study.

Deploying Team Members

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- Josh Benoit
- Josiah Gantz
- Natalie Harr
- Richard Lee (PI)
- Drew Spacht

2016-2017 USAP Field Season
Project Detail

Project Title

Department Of Energy ARM West Antarctic Radiation Experiment (AWARE)

Summary

Event Number:
O-325-M
NSF/DOE Agreement

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
Judy Shiple / Elizabeth Kauffman / Chad Naughton

Principal Investigator

Dr. Dan Lubin
dlubin@ucsd.edu

Scripps Institution of Oceanography
La Jolla, California

Project Web Site:
http://www.arm.gov/campaigns/amf2015aware

Location

Supporting Stations: McMurdo Station
Research Locations: Near station

Description

The Department of Energy (DOE) Atmospheric Radiation Measurement (ARM) program deployed more than 60 atmospheric measuring instruments to McMurdo Station in November and December 2015 to make the first observations of Antarctic cloud microphysics using advanced instrumentation over an entire annual cycle. The McMurdo Station site is staffed by two DOE subcontractors who remain with the facility for the project's duration. The facility will remain in operation for the duration of the 2016 calendar year and will be packed up for shipping off continent aboard the 2017 resupply vessel.

Field Season Overview

The ARM Mobile Facility 2 (AMF-2) is a climate research facility that was installed at the CosRay site in 2015. The facility will continue operating this season with a staff of two US Department of Energy (DOE) subcontractors. Additional personnel will arrive later in the season to assist with packing up the facility and equipment to be shipped off continent. ASC contractors will assist with site removal and remediation.

Deploying Team Members

- Jody Ellis
- Bradley Isom

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- Steele Griffiths
- John Hamelmann
- Amon Haruta
- Krzysztof Krzton
- Paul Ortega
- Heath Powers

2016-2017 USAP Field Season
Project Detail

Project Title

McMurdo LTER - Geochemistry: Increased Connectivity In A Polar Desert Resulting From Climate Warming: McMurdo Dry Valleys LTER Program

Summary

Event Number:
C-509-M
NSF/PLR Award 1115245

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Jenny Cunningham / Elizabeth Kauffman

Principal Investigator

Dr. W. Berry Lyons
lyons.142@osu.edu

Ohio State University
The School of Earth Sciences
Columbus, Ohio

Project Web Site:
http://mcmlter.org

Location

Supporting Stations: McMurdo Station
Research Locations: Dry Valleys

Description

Initially funded in 1980, the U.S. Long-Term Ecological Research (LTER) network is a collaborative effort involving more than 1,800 scientists and students. The McMurdo LTER program is an inter-disciplinary and multi-disciplinary study of the aquatic and terrestrial ecosystems in the ice-free McMurdo Dry Valleys. It is one of 26 LTER sites where researchers are studying ecological processes over long temporal and broad spatial scales. Geochemistry component researchers monitor the inorganic geochemistry of waters and solid samples collected from the glaciers, streams, ponds, lakes, and landscape of the Dry Valleys. They also continue to study the upland seeps and ponds to gain a better understanding of their hydrologic and geochemical controls. This six-year award cycle comprises seven collaborative projects: C-504-M (Gooseff), C-505-M (Priscu), C-506-M (Gooseff), C-507-M (Wall), C-508-M (Barrett), C-509-M (Lyons), and C-511-M (Doran).

Field Season Overview

Field team members will collect water, snow, and sediment samples. They will travel to their sampling sites by foot or by helicopter from McMurdo Station or Lake Hoare. They will work with the limnology and stream teams at Lakes Hoare, Bonney, F6, and Fryxell. At upland pond sites within the Dry Valleys, team members will collect additional water samples. They will return to Crary Lab to perform chemical analysis of lake, stream,

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glacier, and other samples.

Deploying Team Members

- Melisa Diaz
- Sarah Fortner (Team Leader)
- W. Berry Lyons (PI)
- Kathy Welch (Team Leader)

2016-2017 USAP Field Season
Project Detail

Project Title

Impact Of Supraglacial Lakes On Ice-Shelf Stability

Summary

Event Number:
I-190-M
NSF/PLR Award 1443126

Program Manager:
Dr. Julie Palais

ASC POC/Implementer:
Samina Ouda / Jennifer Blum

Principal Investigator

Dr. Douglas R MacAyeal
drm7@midway.uchicago.edu

University of Chicago
Department of Geophysicial Sciences
Chicago, Illinois

Project Web Site:
http://https://www.facebook.com/groups/943052989115686/

Location

Supporting Stations: McMurdo Station
Research Locations: Pegasus Field

Description

Researchers on this project will work to establish a comprehensive theory of how ice shelves catastrophically disintegrate. The key research objectives are to characterize the energy balance and mechanical effects of natural meltwater lakes on the surface of the McMurdo Ice Shelf. The significance of the research is that it will attempt to experimentally verify a theory of ice-shelf instability recently proposed to explain the explosive break-up of Larsen B Ice Shelf in 2002. This theory holds that the filling and draining of supraglacial lakes on floating ice shelves induces sufficient flexure stress as to (a) induce upward/downward propagating fractures originating at the base/surface of the ice shelf that (b) can dissect the ice shelf into fragments of sufficiently small aspect ratio (horizontal to vertical scale ratio) as to promote extensive ice-shelf-fragment capsize during the break-up process (capsize releases gravitational potential energy and promotes explosiveness).

Field Season Overview

This event consists of two field seasons: one in October and November of 2016 and the second in January and February of 2017. The first deployment will focus on installing a variety of instruments at two or three natural lake sites. The team will also do some site-surveying (using LiDAR and GPS). Vehicles used for this deployment include snowmobiles and PistenBullys as surface conditions will allow for more mobility. The second deployment will focus on more site-surveying and also the monitoring of instruments, particularly the water flow meter. At the end of the season, all instruments will be removed. A helicopter

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may be required to access sites in the early part of the second deployment; however, later on overland access with a Hagglund, PistenBully, and/or snowmobiles may be possible depending on how quickly the wet ablation zone of the ice shelf starts to freeze.

Deploying Team Members

- Alison Banwell (Co-PI)
- Rebecca Goodsell
- Douglas MacAyeal (PI)
- Grant Macdonald
- Ian Willis

2016-2017 USAP Field Season
Project Detail

Project Title

Palmer, Antarctica Long-Term Ecological Research (LTER): Land-Shelf-Ocean Connectivity, Ecosystem Resilience And Transformation In A Sea-Ice Influenced Pelagic Ecosystem

Summary

Event Number:
C-021-L
NSF/PLR Award 1440435

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Samina Ouda / Adam Jenkins

Principal Investigator

Dr. Doug Martinson
dgm@ldeo.columbia.edu

Columbia University
Lamont-Doherty Earth Observatory
Palisades, New York

Project Web Site:
http://pal.lternet.edu

Location

Supporting Stations: ARSV Laurence M. Gould
Research Locations: LTER study sites

Description

The overall objectives of Palmer LTER research are to document and understand the phenology and variability in sea ice dynamics, primary production, zooplankton ecology, seabird and marine mammal demography, and microbial and biogeochemical processes in the Antarctic marine ecosystem, including identifying the mechanisms of ecosystem response to rapid climate change. One particularly important objective is to continue the 23-year-long LTER time series on the regional scale grid of hydrographic stations west of the Antarctic Peninsula. Researchers on this project take the responsibility for processing and analyzing hydrographic data. The data are used to describe the hydrography and circulation in the Palmer area in particular, and the Western Antarctic Peninsula region in general, with a focus on developing circulation and coupled physical-biological models. The Antarctic shelf regions are influenced by circumpolar deep waters, and the circulation pattern in the region shows large-scale flows influenced by topography.

Field Season Overview

One person will sail on the January-mid-February cruise aboard the ARSV Laurence M. Gould (LMG) to the LTER research grid west of the Antarctic Peninsula. During the cruise, up to four moorings will be deployed and recovered. Approximately 70 CTD casts to full depth will be made in collaboration with C-019-L (Schofield) and C-045-L (Ducklow).

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Deploying Team Members

- Darren McKee

2016-2017 USAP Field Season
Project Detail

Project Title

Antarctic ELF/VLF Observations Of Q-Bursts, Radio Atmospherics, And Energetic Particle Precipitation

Summary

Event Number:
A-109-M/P/S
NSF/PLR Award 1246275

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Payot Scheibe / Elizabeth Kauffman / Jamee Johnson / Paul Sullivan

Principal Investigator

Dr. Robert C. Moore
moore@ece.ufl.edu

University of Florida
Gainesville, Florida

Project Web Site:
http://www.vlf.ece.ufl.edu/Antarctica/

Location

Supporting Stations: McMurdo Station, Palmer Station, South Pole Station
Research Locations: Arrival Heights / B2 / Terra Lab

Description

Extremely Low Frequency/Very Low Frequency (ELF/VLF) observations at McMurdo, South Pole, and Palmer Stations provide a deeper understanding of lightning and its effects on the Earth's inner radiation belt. Lightning source currents are estimated or directly measured by experimental observations of individual natural and rocket-triggered lightning flashes in North America. Together, the North American and Antarctic datasets are used to experimentally identify and analyze the components of lightning and the effects of lightning that are observed in the Antarctic, more than 10,000 kilometers distant. This project directly supports the continued operation of the ELF/VLF radiometers at all three U.S. Antarctic research stations. At Arrival Heights the radiometer has operated continually for nearly 25 years, providing a unique resource for long-baseline ELF/VLF noise measurements, Schumann resonance observations, and global climate-change parameterization via global lightning detection. The recently upgraded data acquisition system continually records ELF and VLF data streams and provides real-time data processing and access via the Internet.

Field Season Overview

This season, researchers will continually record ELF/VLF data and provide real-time data processing and access via the Internet, when available, in support of coordinated lightning-related experiments to be performed in North-Central Florida. Minor support will be

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provided on station throughout the year by contract research associates. Researchers plan to perform system calibration and maintenance during site visits to McMurdo, South Pole, and Palmer Stations.

Deploying Team Members

- Kim Dooyoung
- Dooyoung Kim
- Robert Moore (PI)

2016-2017 USAP Field Season
Project Detail

Project Title

Body Size, Oxygen, And Vulnerability To Climate Change: A Physiological Study Of Antarctic Pycnogonida

Summary

Event Number:
B-307-M
NSF/PLR Award 1341476

Program Manager:
Dr. Chris Fritsen

ASC POC/Implementer:
Jenny Cunningham / Beverly Walker

Principal Investigator

Dr. Amy Moran
morana@hawaii.edu

University of Hawaii Manoa
Honolulu , Hawaii

Project Web Site:
http://www.polargiants.squarespace.com

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo Sound

Description

Researchers will examine the physiology and scaling of metabolism, cuticular structure, and leg strength in Antarctic pycnogonids (sea spiders) to test the hypothesis that the enhanced size of polar ectotherms makes them particularly vulnerable to global climate change. They will collect pycnogonids of a range of sizes and assess their physiological responses to temperature stress, will measure whole-body drag and behavioral responses to variation in water velocity, and will video-record in-situ locomotion in relation to water velocity. They will also examine the structure, permeability, strength, and flexural stiffness of pycnogonid leg cuticles to determine whether there is a trade-off between cuticular permeability and leg strength and stiffness. In addition, researchers will study the behavior, movement, and oxygen microenvironments of pycnogonids in the field. Using physiological and morphological data, they will also develop mathematical models to predict physiological responses to future climate scenarios.

Field Season Overview

Researchers will make day trips by Pisten Bully to multiple locations around McMurdo Sound, and by helicopter to sites at New and Granite Harbors. They will dive approximately four times a week to video record and collect samples of pycnogonids. They will also deploy and redeploy oxygen and temperature dataloggers, and will perform laboratory respiration, thermal tolerance and biomechanical experiments in Crary lab.

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Deploying Team Members

- Timothy Dwyer
- Steven Lane
- Amy Moran (PI)
- Caitlin Shishido
- Bret Tobalske (Co-PI)
- Arthur Woods (Co-PI)

2016-2017 USAP Field Season
Project Detail

Project Title

The Polar Geospatial Information Center: Joint Support

Summary

Event Number:
T-434-M
NSF/PLR Award 1043681

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
Matthew Erickson / Elizabeth Kauffman

Principal Investigator

Mr. Paul Morin
lpaul@umn.edu

University of Minnesota
Geology & Geophysics
St. Paul, Minnesota

Project Web Site:
http://www.pgc.umn.edu

Location

Supporting Stations: McMurdo Station
Research Locations: On station

Description

The Polar Geospatial Center (PGC) was founded in 2007 as the Antarctic Geospatial Information Center (AGIC) and has since expanded to include both polar regions. PGC provides geospatial support in the form of mapping, data delivery, and geographic information systems (GIS) analysis to science and logistics communities of the NSF's Arctic and Antarctic research programs. Deployed PGC technicians provide on-site cartographic assistance in the form of GIS data formats, maps, and paper documents to science-project grantees and other USAP entities, collect ground-control points to calibrate imagery, and gather satellite and aerial imagery from a variety of national and international sources.

Field Season Overview

Four participants will deploy, with a maximum of two at McMurdo Station at the same time. PGC will maintain a presence in the Crary Lab and will support other field and logistics groups for general mapping and imagery services as needed.

Deploying Team Members

- Michael Cloutier
- Cole Kelleher

Project Indexes

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- Bradley Herried
- Carl Reim

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Project Detail

Project Title

High-Resolution Underway Air-Sea Observations In Drake Passage For Climate Science

Summary

Event Number:
O-214-L/N
NSF/PLR Award 1543457

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
Chelsea Wegner / Bruce Felix

Principal Investigator

Dr. David Russel Munro
david.munro@colorado.edu

University of Colorado Boulder
INSTAAR
Boulder, Colorado

Project Web Site:
http://www.ldeo.columbia.edu/res/pi/CO2/

Location

Supporting Stations: ARSV Laurence M. Gould, RV/IB Nathaniel B. Palmer
Research Locations: Drake Passage / Southern Ocean Pacific Sector

Description

The Antarctic Circumpolar Current is the strongest wind-driven ocean current on the planet. Encircling the entire continent, it has a natural “chokepoint” at the Drake Passage between South America and the Antarctic Peninsula. Since 1994, this project has collected data during all Drake Passage crossings, first on the R/V Polar Duke, then the ARSV Laurence M. Gould. The installed equipment measures underway surface partial pressure of carbon dioxide (pCO2) and takes discrete samples of other parameters of interest to studying the carbon system, e.g., total carbon dioxide (TCO2) and isotopic (13C/12C and 14C/12C) ratios in surface TCO2. During selected southbound Drake Passage transects of O-260-L (Sprintall), this group also obtains direct measurements from seawater samples and collects physical hydrographic data using eXpendable BathyThermograph (XBT) and eXpendable Conductivity, Temperature, Depth (XCTD) probes. Since 2012, this group has also conducted underway measurements of atmospheric oxygen and nitrogen. The measurement set provides an opportunity to increase understanding of the major processes that control spatial, seasonal, and inter-annual variability of dissolved carbon dioxide in the waters of the Drake Passage as well as biogeochemical fluxes in the Southern Ocean.

Field Season Overview

Project participants deploy to one port call each year for each vessel to perform maintenance on their underway instrument. For most of the year, onboard ASC technicians

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monitor the equipment, turn it on and off to avoid data collection in other nations' Exclusive Economic Zones (EEZ), and perform maintenance as needed. At the end of each cruise the data is distributed to the project PIs and collaborators as well as the onboard science parties.

Deploying Team Members

- David Munro (PI)
- David Munro (PI)
- Tim Newberger
- Taro Takahashi (Co-PI)
- Chelsea Wegner (Team Leader)
- Sonja Wolter

Project Title

Velvet Ice - Evolution Of Fabric And Texture In Ice At WAIS Divide, West Antarctica

Summary

Event Number:
I-166-M
NSF/PLR Award 1142167

Program Manager:
Dr. Julie Palais

ASC POC/Implementer:
Judy Shiple / Ryan Wallace

Principal Investigator

Dr. Erin Pettit
ecpettit@alaska.edu

University of Alaska Fairbanks
Fairbanks, Alaska

Project Web Site:
http://waisartcontest.org

Location

Supporting Stations: McMurdo Station
Research Locations: WAIS Divide

Description

Velvet Ice is a project linking the microstructure of ice to the modern deformation and climate history at West Antarctic Ice Sheet (WAIS) Divide. Researchers will use an acoustic televiewer downhole instrument to measure the shape and tilt of the borehole at high resolution to form a basis for measuring future changes in borehole shape and tilt. The acoustic televiewer can also provide information to map tilted layers or other anomalies in the borehole wall. Researchers will correlate these measurements with laboratory measurements of ice microstructure and the other ice core and borehole measurements from other WAIS Divide projects.

Field Season Overview

Researchers with this project will fly by LC-130 aircraft to the WAIS Divide Field Camp, where they will reside for the duration of their stay. They will be logging the WAIS borehole with two different instruments and will also make day trips by snowmobile to collect phase-sensitive radar measurements.

Deploying Team Members

- Sridhar Anandakrishnan
- Elena Bird
- Erin Pettit (PI)
- Anny Sainvil

Project Indexes

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Project Web Sites

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- Rachel Obbard (Co-PI)
- Emilie Sinkler

2016-2017 USAP Field Season
Project Detail

Project Title

UNAVCO GPS Survey Support

Summary

Event Number:
T-295-M
NSF/PLR Award 1261833

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
Judy Shiple / Elizabeth Kauffman

Principal Investigator

Mr. Joseph R Pettit
pettit@unavco.org

UNAVCO
Boulder, Colorado

Project Web Site:
http://www.unavco.org/projects/project-support/polar/polar.html

Location

Supporting Stations: McMurdo Station
Research Locations: Crary Lab / field sites

Description

UNAVCO provides technical support and equipment for precision geodetic observations using GPS and terrestrial LiDAR technologies. Survey-grade GPS receivers, terrestrial laser scanners, and power and communications systems for both high-precision campaign surveying and continuous data collection are available to project researchers. Infrastructure for this support includes a Real-Time Kinematic (RTK) differential GPS broadcasting station covering McMurdo Sound, a repeater on Mount Erebus for GPS data retrieval from the Transantarctic Mountains, and an Iridium satellite communications hub in Colorado. Technical support is also provided for the Palmer Station GPS surveying system. Operation and maintenance is provided as needed for the NASA International Global Navigation Satellite System (GNSS) Service (IGS) stations MCM4 and PALM, the POLENET (ANET) remote GPS stations, and GPS reference stations on the West Antarctic Ice Sheet (WAIS) Divide and at South Pole Station.

Field Season Overview

This field season, UNAVCO staffers will provide technical and field engineering support and will manage the UNAVCO equipment pool. Field team members will occasionally travel to field locations as project support requirements dictate. Detailed logistical support is arranged directly between UNAVCO and the science project team. With the deployment of new satellites by the US and other nations, a new GPS antenna to provide full GNSS coverage needs to be installed in McMurdo. The UNAVCO staff will work with the Antarctic Support Contractor (ASC) surveyor to find the best location in McMurdo. The IT

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Communications department may also be called upon to assist with the antenna installation.

Deploying Team Members

- Nicolas Bayou
- Brendan Hodge
- Spencer Niebuhr
- Spencer Niebuhr
- Thomas Nylen
- Joseph Pettit (PI)
- Anne Zaino

2016-2017 USAP Field Season
Project Detail

Project Title

McMurdo LTER - Lakes: Increased Connectivity In A Polar Desert Resulting From Climate Warming: McMurdo Dry Valleys LTER Program

Summary

Event Number:
C-505-M
NSF/PLR Award 1115245

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Jenny Cunningham / Elizabeth Kauffman

Principal Investigator

Dr. John Priscu
jpriscu@montana.edu

Montana State University Bozeman
Land Resources and Environmental Sciences
Bozeman, Montana

Project Web Site:
http://www.mcmlter.org

Location

Supporting Stations: McMurdo Station
Research Locations: Dry Valleys

Description

Initially funded in 1980, the U.S. Long-Term Ecological Research (LTER) network is a collaborative effort involving more than 1,800 scientists and students. The McMurdo LTER program is an inter-disciplinary and multi-disciplinary study of the aquatic and terrestrial ecosystems in the ice-free McMurdo Dry Valleys. It is one of 26 LTER sites where researchers are studying ecological processes over long temporal and broad spatial scales. Researchers focusing on lakes will continue their long-term measurements of biological, chemical, and physical limnological properties of Dry Valley lakes and lake ice, with special emphasis on LTER core research areas. This six-year award cycle comprises seven collaborative projects: C-504-M (Gooseff), C-505-M (Priscu), C-506-M (Gooseff), C-507-M (Wall), C-508-M (Barrett), C-509-M (Lyons), and C-511-M (Doran).

Field Season Overview

Participants will make routine lake measurements, periodically occupying field camps at Lakes Bonney, Hoare, and Fryxell from early November to early January in two rounds of site visits. The team will retrieve and re-deploy sediment traps in East and West Lake Bonney and will camp for at least five nights at Lake Miers to measure biological, chemical, and physical limnological properties. They will also collect samples from Lake Chad at the end of the first round of site visits. Team members will work with C-511-M (Doran) on the Autonomous Lake Profiling and Sampling (ALPS) project, retrieving and deploying the

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automated samplers in Lake Bonney. The project also aims to collect ice cores from the lake ice covers on Lakes Fryxell and Hoare, East and West Lake Bonney, the Canada and Commonwealth Glaciers, and the New Harbor sea ice.

Deploying Team Members

- Heather Buelow
- Amy Chiuchiolo (Team Leader)
- John Priscu (PI)
- Madelyne Willis

2016-2017 USAP Field Season
Project Detail

Project Title

The Demographic Consequences Of Environmental Variability And Individual Heterogeneity In Life-History Tactics Of A Long-Lived Antarctic Marine Predator

Summary

Event Number:
B-009-M
NSF/PLR Award 1141326

Program Manager:
Dr. Chris Fritsen

ASC POC/Implementer:
Jenny Cunningham / Beverly Walker

Principal Investigator

Dr. Jay Rotella
rotella@montana.edu

Montana State University Bozeman
Ecology
Bozeman, Montana

Project Web Site:
http://www.montana.edu/weddellseals/index.html

Location

Supporting Stations: McMurdo Station
Research Locations: Big Razorback Island / McMurdo Sea Ice / Hutton Cliffs / Turtle Rock

Description

Since 1968, this group of researchers has studied a breeding population of Weddell seals (a prominent Antarctic apex predator associated with fast ice) in Erebus Bay. Using data synthesis and modeling techniques, researchers can evaluate a variety of hypotheses regarding effects of environmental variation on life-history evolution and population dynamics. Researchers are also interested in the influence of physical drivers on ecosystem dynamics from the bottom up. Their field studies include collecting data on seal body mass – a surrogate for annual variation in marine food resources. This study's broad objective is to evaluate how temporal variation in the marine environment affects a long-lived mammal's population dynamics.

Field Season Overview

The team will establish a field camp at Big Razorback Island to continue their long-term population studies of the local Weddell seal population. They may also make short reconnaissance trips by helicopter to look for tagged seals outside of the study area. Work this season will include marking all seal pups born within Erebus Bay during the early field season (October through November), with a smaller effort to mark adults seals that have not been marked previously. After pupping is over, the team will conduct six to eight population wide surveys of marked and unmarked seals in Erebus Bay. A sample of adults and pups will be physically weighed and their tissue sampled. The team will also deploy 35-day temperature loggers on a sample of pups to obtain swimming pattern data. All field gear will be returned at the end of this field season.

Deploying Team Members

- Robert Garrott (Co-PI)
- Kaitlin Macdonald
- John Paterson
- Jay Rotella (PI)

2016-2017 USAP Field Season
Project Detail

Project Title

Gamma-Ray Imager/Polarimeter For Solar Flares (GRIPS)

Summary

Event Number:
A-337-M/S
NSF / NASA Agreement

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Samina Ouda / Ryan Wallace / Chad Naughton

Principal Investigator

Dr. Pascal Saint-Hilaire
shilaire@ssl.berkeley.edu

University of California Berkeley
Space Sciences Laboratory
Berkeley, California

Project Web Site:
http://grips.ssl.berkeley.edu

Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: Williams Field

Description

The Gamma-Ray Imager/Polarimeter for Solar flares (GRIPS) is a high-altitude balloon-borne experiment. GRIPS will provide detailed high-resolution spectroscopy, imaging, and polarimetry of the gamma/hard X-Ray (HXR) spectrum over wide ranges of energy (20 kilo-electron-Volts to 10 million-electron-Volts) and spatial resolutions (quasi-continuously from 12.5 - 162 arcseconds). GRIPS will shed light on a number of solar flare mysteries: (1) Do all flares accelerate ions? (2) Which ions are accelerated and when? (3) What causes the separation between the ion-produced gamma rays and energetic electron HXR emissions in the foot points of flares? (4) Are the accelerated electrons anisotropic? and (5) What are the properties of coronal gamma-ray sources?

Field Season Overview

At McMurdo, field team members will facilitate the preparation, launch, and recovery of NASA-sponsored high-altitude balloons and science payloads. They will be housed at McMurdo Station and will commute daily to the Williams Field launch facility. Balloon and payload preparations are timed to coincide with favorable weather and wind patterns. Upon termination of the flights, recovery teams will use fixed-wing and/or helicopter support to retrieve the payloads.

At the South Pole this season researchers will recover the GRIPS gondola and science equipment from its 2015-16 flight. Over the course of approximately one week, two GRIPS

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team members will camp and make multiple trips by Twin Otter aircraft between the balloon payload impact site and South Pole Station until all their equipment is recovered.

Deploying Team Members

- Hazel Bain
- Nicole Duncan (Team Leader)

2016-2017 USAP Field Season
Project Detail

Project Title

Southern Ocean Carbon And Climate Observations And Modeling (SOCCOM)

Summary

Event Number:
O-271-N
NSF/PLR Award 1425989

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
Chelsea Wegner / Adam Jenkins

Principal Investigator

Dr. Jorge I Sarmiento
jls@Princeton.edu

Princeton University
Department of Geosciences
Princeton, New Jersey

Project Web Site:
http://soccom.princeton.edu

Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: Transit from Punta Arenas, Chile to McMurdo Station

Description

The Southern Ocean surrounding Antarctica is the primary window through which the intermediate, deep, and bottom waters of the ocean interact with the surface and thus the atmosphere. In the past 20 years, observational analyses and model simulations have transformed understanding of the Southern Ocean, suggesting that the ocean south of 30° S, occupying just 30% of the total surface ocean area, has a profound influence on the Earth's climate and ecosystems. The SOCCOM (Southern Ocean Carbon and Climate Observations and Modelling) project is implementing sustained observations of the carbon cycle, together with mesoscale eddying models linked to the observations. The deployment of autonomous profiling floats with biogeochemical sensors and sea-ice avoidance software will extend current seasonally limited observations of biogeochemical properties into nearly continuous coverage in time, with horizontal spatial coverage over the entire Southern Ocean and vertical coverage to 2000 meters.

Field Season Overview

SOCCOM will deploy up to 12 biogeochemical Argo-equivalent floats from NBP17-01, at locations just north of the sea ice zone along the cruise track. Each float deployment requires a nearly simultaneous CTD/rosette cast from the RVIB Nathaniel B. Palmer (NBP), to at least 2000 m depth, to collect water column calibration profiles of chemistry, optical properties, and T/S. The CTD/rosette station will be occupied first, and then the float deployed as the ship moves slowly away from the station. Four of these locations will be in

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the Drake Passage. Two of these floats will likely be in the Argentine EEZ and will require clearance. Team members will deploythe remaining eight along the track to McMurdo. In addition, the team will deploy eight core Argo floats that do not require a CTD station.

Deploying Team Members

- Susan Becker
- Ellen Briggs
- Joseph Gum
- Melissa Miller
- Stephen Riser
- Greta Shum

2016-2017 USAP Field Season
Project Detail

Project Title

Palmer, Antarctica Long-Term Ecological Research (LTER): Land-Shelf-Ocean Connectivity, Ecosystem Resilience And Transformation In A Sea-Ice Influenced Pelagic Ecosystem

Summary

Event Number:
C-019-L/P
NSF/PLR Award 1440435

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Samina Ouda / Jamee Johnson / Adam Jenkins

Principal Investigator

Dr. Oscar Schofield
oscar@marine.rutgers.edu

Rutgers University
Institute for Marine & Coastal Sciences
New Brunswick, New Jersey

Project Web Site:
http://pal.lter.net

Location

Supporting Stations: ARSV Laurence M. Gould, Palmer Station
Research Locations: LTER study site / Palmer Station

Description

The overall objectives of Palmer LTER research are to document and understand the phenology and variability in sea-ice dynamics, primary production, zooplankton ecology, seabird and marine mammal demography, and microbial and biogeochemical processes in the Antarctic marine ecosystem, including identifying the mechanisms of ecosystem response to rapid climate change. One particularly important objective is to continue the 23-year-long LTER time series on the regional scale grid of hydrographic stations west of the Antarctic Peninsula. Researchers on this project seek to understand how changes in phytoplankton dynamics, such as an increase in fresh water due to melting ice, propagate through the ecosystem, ultimately affecting fish, seabirds, and marine mammals. Because photosynthesis is driven by sunlight, characterizing the quality and quantity of light available for use by phytoplankton is important. Researchers will deploy a wide range of sensors to measure these optical properties, which, in turn, will help understand the underlying role of light variability in phytoplankton dynamics. In addition to their role at the base of the marine ecosystem, the fate of phytoplankton biomass is important to understanding climate-change feedback. By conducting experiments to study phytoplankton physiology, researchers hope to develop a clear picture of the fate of phytoplankton biomass once it enters the Antarctic ecosystem.

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Field Season Overview

One component of the C-019 science team will sail on the January to mid-February cruise aboard the ARSV Laurence M. Gould (LMG) to the LTER research grid west of the Antarctic Peninsula. The team will use a variety of techniques while at sea including net and acoustic tows, CTD casts, Slocum gliders, and other profiling sensors.

The other component will be based at Palmer Station from October through March. The team's main research objectives while at Palmer Station are to: (1) maintain the Palmer phytoplankton time series measurements at LTER stations B and E; (2) launch of two gliders; (3) define temperature impact on overall community ecology and physiology of phytoplankton populations collected from stations B and E; and, (4) continue to conduct several videoconferences with classrooms and other groups as part of the LTER mandated educational outreach effort.

Deploying Team Members

- Oscar Schofield (PI)

2016-2017 USAP Field Season
Project Detail

Project Title

The Boron And Carbon Cosmic Rays In The Upper Stratosphere (BACCUS)

Summary

Event Number:
A-138-M
NSF/NASA Agreement

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Samina Ouda / Scott Battaion / Chad Naughton

Principal Investigator

Dr. Eun-Suk Seo
seo@umd.edu

University of Maryland
Institute for Physical Science and Technology
College Park, Maryland

Project Web Site:
http://cosmicray.umd.edu/cream/

Location

Supporting Stations: McMurdo Station
Research Locations: Williams Field

Description

In order to test models of cosmic ray acceleration and propagation, the Boron And Carbon Cosmic rays in the Upper Stratosphere (BACCUS) project will investigate high-energy cosmic-ray nuclei arriving at the top of the Earth's atmosphere. BACCUS will extend direct measurements of cosmic-ray composition to energies capable of generating gigantic air showers in the atmosphere, which have previously been observed in significant numbers only with large ground-based arrays. By directly measuring the elemental spectra of cosmic-ray nuclei from Li to Fe over the energy range about 10^12 to 10^15 electron-Volts, and comparing the results to those predicted by various models, e.g., supernova remnant shock acceleration, re-acceleration, etc., researchers are able to verify if the expected features in the single-element spectra are indeed found in nature. Measurements of the energy dependence of some different element ratios (mostly focusing on the Boron and Carbon ratio) provide information about the source, acceleration mechanism, and propagation history of these particles over an approximately 10-million-year journey through the cosmos from their acceleration site to the Earth.

Field Season Overview

Field team members will be housed at McMurdo Station and transported daily to and from the balloon launch site at the Long Duration Balloon Facility (LDB) located near Williams Field. Following a successful flight, they hope to recover the science instrument payload.

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Deploying Team Members

- Yonas Amare
- Gwangho Choi
- Michael Copley
- Hyun Gue Huh
- Ki Chun Kim
- Samuel Mognet
- Il Hung Park
- Ryu-Sung Weinmann

2016-2017 USAP Field Season
Project Detail

Project Title

Fjord Ecosystem Structure And Function On The Western Antarctic Peninsula - Hotspots Of Productivity And Biodiversity

Summary

Event Number:
B-212-L
NSF/PLR Award 1443680

Program Manager:
Dr. Chris Fritsen

ASC POC/Implementer:
Matthew Erickson / Adam Jenkins

Principal Investigator

Dr. Craig Smith
craigsmi@hawaii.edu

University of Hawaii Manoa
Department of Oceanography
Honolulu, Hawaii

Project Web Site:
http://fjordeco.wordpress.com

Location

Supporting Stations: ARSV Laurence M. Gould
Research Locations: Andvord Bay and Gerlache Strait

Description

Western Antarctic Peninsula (WAP) fjords are intense potentially climate-sensitive hotspots of biological production and biodiversity, yet the structure and dynamics of these fjord ecosystems are very poorly understood. The goals of this project are to: (1) Determine whether sub-polar WAP fjords are regionally significant hotspots of productivity and biodiversity; (2) Elucidate and model the physical, biological, and chemical processes that interact in these fjords to enhance productivity and biodiversity; and (3) Evaluate, through dynamic modeling, the sensitivity of physical, chemical, and biological processes driving WAP fjord productivity/diversity to changes in meltwater and sediment input. To complete project goals, the team will recover equipment and conduct calibration measurements.

Field Season Overview

On this, the third FjordEco cruise, the research team will sail from Punta Arenas, Chile to the Western Antarctic Peninsula area. There they will: (1) Recover a sediment trap mooring at Station B; (2) Recover two physical oceanographic moorings (GT-20 and GT-200) in the Gerlache Strait; (3) Recover two physical oceanographic moorings (FJ-20 and FJ-200), the sediment trap mooring, and the time-lapse camera mooring in the middle basin of Andvord Bay; (4) Recover two glacier time-lapse cameras in inner Andvord Bay; (5) Travel from the LMG by Zodiac to make two full-day trips to recover Automatic Weather Stations (AWS) at Neko Harbor and Useful Island; (6) Conduct Conductivity Temperature Depth (CTD) casts

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at mooring stations in the Gerlache Strait and the middle basin of Andvord Bay; and (7) Conduct limited yoyo-camera surveys and trawling to correlate with mooring data collected over the year-long deployment.

Deploying Team Members

- Colin Butler
- Katy Christensen
- Kelcey Ann Chung
- Emily Eidam
- Astrid Leitner
- Øyvind Lundesgaard
- Craig Smith (PI)
- Andrew Sweetman
- Amanda Ziegler

2016-2017 USAP Field Season
Project Detail

Project Title

The Drake Passage High-Density XBT/XCTD Program

Summary

Event Number:
O-260-L
NSF/PLR Award 1542902

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
Chelsea Wegner / Bruce Felix

Principal Investigator

Dr. Janet Sprintall
jsprintall@ucsd.edu

Scripps Institution of Oceanography
Physical Oceanography Research Division
La Jolla, California

Project Web Site:
http://www-hrx.ucsd.edu

Location

Supporting Stations: ARSV Laurence M. Gould
Research Locations: Drake Passage

Description

The objective of the eXpendable BathyThermograph / eXpendable Conductivity Temperature Depth (XBT/XCTD) program is to measure the seasonal to interannual variability of upper-ocean temperature and geostrophic transport through the Drake Passage. Closely spaced XBT (temperature) and XCTD (salinity) measurements are collected underway on six to eight Drake Passage crossings of the ARSV Laurence M. Gould (LMG) per year. The project has been ongoing since 1996. With the multi-year time series, researchers have observed substantial variability in circulation, transport, and water properties on time scales from seasonal to interannual, and spatial scales from mesoscale eddies to the Antarctic Circumpolar Current cores.

Field Season Overview

ARSV Laurence M. Gould personnel and passenger volunteers will hand-launch approximately 70 XBTs at predetermined locations on each of six Drake Passage crossing of the LMG. Salinity bottle samples will be collected at various sites. This bottle data will be used to calibrate the underway thermosalinograph (TSG) data. One project participant may visit the vessel every other year while in port at Punta Arenas, Chile for system maintenance.

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Project Detail

Project Title

Palmer, Antarctica Long-Term Ecological Research (LTER): Land-Shelf-Ocean Connectivity, Ecosystem Resilience And Transformation In A Sea-Ice Influenced Pelagic Ecosystem

Summary

Event Number:
C-020-L
NSF/PLR Award 1440435

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Samina Ouda / Adam Jenkins

Principal Investigator

Dr. Deborah Steinberg
debbies@vims.edu

Virginia Institute of Marine Sciences
Department of Biological Sciences
Gloucester Point, Virginia

Project Web Site:
http://pal.lternet.edu/

Location

Supporting Stations: ARSV Laurence M. Gould
Research Locations: LTER study site / Palmer Station

Description

The overall objectives of Palmer LTER research are to document and understand the phenology and variability in sea ice dynamics, primary production, zooplankton ecology, seabird and marine mammal demography, and microbial and biogeochemical processes in the Antarctic marine ecosystem, including identifying the mechanisms of ecosystem response to rapid climate change. One particularly important objective is to continue the 23-year-long LTER time series on the regional scale grid of hydrographic stations west of the Antarctic Peninsula. Zooplankton and micro-nekton provides the main trophic link between primary producers and apex predators in the Southern Ocean. Researchers on this project will focus on: (1) Trophic cascading and food-selectivity experiments; (2) Determining the target strength and backscattering cross section of krill in response to data from an acoustic Doppler current profiler (ADCP) deployed on the bio-acoustic Slocum Webb Glider; (3) Characterizing the microzooplankton community present in local waters to better understand their grazing impact on primary producers; and (4) Characterizing the quality and quantity of total lipids and fatty acids in zooplankton in the region.

Field Season Overview

Five team members will sail on the January-mid-February cruise aboard the ARSV Laurence M. Gould (LMG) to the LTER research grid west of the Antarctic Peninsula. The

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group aims to do approximately three net tows at each station: one tow with a 1 m square net to a depth of 300 m and one or two tows with a 2 m net to a depth of 120 m. The 1 m MOCNESS will be used to sample discrete depth horizons at the process study stations and a few of the regular grid stations if possible. An acoustic tow fish will be used at process study stations to detect krill aggregations. The team will be conducting dual-stressor temperature and ocean acidification incubation experiments with zooplankton as well. The group also plans to spend a short amount of time at Palmer Station in order to test zooplankton tows for future seasons' use of the new rigid hulled inflatable boat (RHIB).

Deploying Team Members

- John Conroy
- Joseph Cope
- Deborah Steinberg (PI)
- Patricia Thibodeau

2016-2017 USAP Field Season
Project Detail

Project Title

High-Resolution Underway Air-Sea Observations In Drake Passage For Climate Science

Summary

Event Number:
O-404-L
NSF/PLR Award 1543511

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
Chelsea Wegner / Bruce Felix

Principal Investigator

Dr. Britton B Stephens
stephens@ucar.edu

University Corporation for Atmospheric Research, UCAR/NCAR
Boulder, Colorado

Project Web Site:
http://www.eol.ucar.edu/homes/stephens/GO2

Location

Supporting Stations: ARSV Laurence M. Gould
Research Locations: Drake Passage

Description

Since June 2012, this project has collected underway atmospheric oxygen and carbon dioxide concentration measurements from the ARSV L.M. Gould (LMG) in collaboration with the longer-running efforts collecting partial pressure carbon dioxide (pCO2), eXpendable BathyThermograph (XBT), and acoustic Doppler current profiler (ADCP) measurements. The objectives of these atmospheric oxygen and carbon dioxide measurements are to improve our understanding of the large-scale thermal and biological forcing of Southern Ocean seasonal air-sea carbon dioxide fluxes, to help in assessing the scaling of the Drake Passage underway pCO2 and discrete measurements to basin scales, and to explore short-term oxygen variations as a diagnostic of local-scale productivity.

Field Season Overview

This project will conduct ongoing measurements of atmospheric O2 and CO2 in the Drake Passage from the LMG. Measurements are conducted on every cruise as “underway science” by semi-automated underway systems that require minimal intervention from staff technicians. Data is sent to the PI daily by email, and at the end of each cruise by mailing a USB pen drive. A team member will attend two port calls in August and February to perform system maintenance.

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Project Web Sites

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2016-2017 USAP Field Season
Project Detail

Project Title

Development Of An ANtarctic Gravity Wave Imager Network (ANGWIN) For Collaborative Mesospheric Research

Summary

Event Number:
A-119-M/P/S
NSF/PLR Award 1443730

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Payot Scheibe / Elizabeth Kauffman

Principal Investigator

Dr. Michael Taylor
mike.taylor@usu.edu

Utah State University
Center for Atmospheric and Space Sciences
Logan, Utah

Project Web Site:
http://ail.usu.edu/Data/Data.html

Location

Supporting Stations: McMurdo Station, Palmer Station, South Pole Station
Research Locations: Arrival Heights

Description

The primary goal of this research is to quantify the properties, variability, and momentum fluxes of short-period (less than an hour) mesospheric gravity waves and their dominant sources and effects over Antarctica. To achieve this, researchers have implemented an ANtarctic Gravity Wave Imaging Network (ANGWIN) that provides an exceptional capability for investigating mesospheric gravity waves over selected regions around the Antarctic continent and deep in the interior, essentially creating continent-wide coverage of gravity-wave measurements. The specific research goals are: (1) Exploit one of the world's most intense gravity-wave sources, the Antarctic Peninsula, to investigate the effects of orographic forcing on mesospheric dynamics; (2) Quantify longitudinal variations in mesospheric gravity-wave activity and propagation headings around Antarctica and associated momentum flux variability; (3) Investigate the propagation and ducting of gravity waves capable of traveling large distances over the Antarctic continent; and (4) Identify dominant wave sources using combined instrument data sets together with state-of-the-art ray techniques.

Field Season Overview

Two science team members will deploy to McMurdo Station to install an Advance Mesospheric Temperature Mapper (AMTM) at Arrival Heights. The team members will also travel to South Pole to service the ANGWIN instruments. The research team will receive

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ASC construction support to help secure the AMTM, and throughout the year an ASC research associate will perform system maintenance, troubleshooting, and data downloads.

Deploying Team Members

- Pierre-Dominique Pautet (Co-PI)
- Michael Taylor (PI)

2016-2017 USAP Field Season
Project Detail

Project Title

Investigating Wave-Driven Mesospheric Dynamics Over South Pole Using An Advanced Mesospheric Temperature Mapper

Summary

Event Number:
A-119-M/P/S
NSF/PLR Award 1443730

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Payot Scheibe / Paul Sullivan

Principal Investigator

Dr. Michael Taylor
mike.taylor@usu.edu

Utah State University
Center for Atmospheric and Space Sciences
Logan, Utah

Project Web Site:
http://ail.usu.edu/Data/Data.html

Location

Supporting Stations: McMurdo Station, Palmer Station, South Pole Station
Research Locations: B2 Science Building

Description

The Antarctic Gravity Wave Imaging Network (ANGWIN) is a cooperative effort of six international Antarctic programs to collect continent-wide gravity wave measurements. The network capitalizes on existing optical and radar measurement capabilities at McMurdo, Palmer, South Pole, and six other research stations: Halley (UK), Syowa (Japan), Davis (Australia), Rothera (UK), and Ferraz (Brazil). Infrared (IR) all-sky mesospheric OH (hydroxyl) imagers are installed at Davis, McMurdo, and Halley Stations. An all-sky near-IR imager is also installed at Palmer Station to augment the existing instrumentation and create a capability for studying gravity wave properties at each site. The network quantifies the properties, variability, and momentum fluxes of short-period (less than one hour) mesospheric gravity waves and their dominant sources and effects over the Antarctic continent. Measurements at South Pole focus on quantifying the temperature signatures of gravity waves deep within the polar vortex and complementing the ANGWIN sites around the continent.

Field Season Overview

In the coming year, the AMTM at South Pole will continue to collect climatology data on the effects of gravity waves and their impact on the upper atmosphere over Antarctica. While on station this season, the team hopes to perform an extensive cleaning of the camera's optics and would like to repeat a successful procedure, last performed by them in 2012, to

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address a frost problem inside the dome by resealing it and purging it with dry nitrogen. They will also service their computers, update acquisition software, and will provide training for the ASC research assistant on how to run and troubleshoot the instrument.

Deploying Team Members

- Pierre-Dominique Pautet (Co-PI)
- Michael Taylor (PI)

2016-2017 USAP Field Season
Project Detail

Project Title

Continental-Scale Studies Of Mesospheric Dynamics Using The Antarctic Gravity Wave Instrument Network (ANGWIN)

Summary

Event Number:
A-119-M/P/S
NSF/PLR Award 1443730

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Payot Scheibe / Jamee Johnson

Principal Investigator

Dr. Michael Taylor
mike.taylor@usu.edu

Utah State University
Center for Atmospheric and Space Sciences
Logan, Utah

Project Web Site:
http://ail.usu.edu/Data/Data.html

Location

Supporting Stations: McMurdo Station, Palmer Station, South Pole Station
Research Locations: Terra Lab / Vernadsky Station

Description

The Antarctic Gravity Wave Imaging Network (ANGWIN) is a cooperative effort of six international Antarctic programs to collect continent-wide gravity wave measurements. The network capitalizes on existing optical and radar measurement capabilities at McMurdo, Palmer, South Pole, and six other research stations: Halley (UK), Syowa (Japan), Davis (Australia), Rothera (UK), and Ferraz (Brazil). Infrared (IR) all-sky mesospheric OH (hydroxyl) imagers are installed at Davis, McMurdo, and Halley Stations. An all-sky near-IR imager is also installed at Palmer Station to augment the existing instrumentation and create a capability for studying gravity wave properties at each site. The network quantifies the properties, variability, and momentum fluxes of short-period (less than one hour) mesospheric gravity waves and their dominant sources and effects over the Antarctic continent.

Field Season Overview

A new all-sky near-IR imager was installed at Palmer station in May 2016. Researchers do not plan to deploy to Palmer Station this season. An ASC research associate will perform routine monitoring and maintenance on the instrument, and will download acquired image data and send it to the home institution for further analysis.

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2016-2017 USAP Field Season
Project Detail

Project Title

Elucidating The Antarctic Methane Cycle At The Cinder Cones Reducing Habitat

Summary

Event Number:
B-001-M
NSF/PLR Award 1642570

Program Manager:
Dr. Chris Fritsen

ASC POC/Implementer:
Jenny Cunningham / Elizabeth Kauffman

Principal Investigator

Dr. Andrew Thurber
athurber@coas.oregonstate.edu

Oregon State University
College of Oceanic & Atmospheric Sciences
Corvallis, Oregon

Project Web Site:
http://blogs.oregonstate.edu/colddarkbenthos/

Location

Supporting Stations: McMurdo Station
Research Locations: Cinder Cones / Little Razorback Island / Turtle Rock

Description

Methane is a greenhouse gas that exists in vast reservoirs within the marine realm. Microbial communities in ocean sediments produce methane as they break down organic compounds and also mitigate its release through oxidation. The mechanisms of methane cycling by these benthic microbes are poorly understood. Prior research suggests that methane cycling in polar oceans is particularly dynamic, and microbial oxidation rates occasionally fail to keep up with methane production, resulting in massive methane release to the atmosphere. As climate change alters the rate and variance of methane release, it is important to understand how the microbial methane 'filter' responds to fluctuations in methane cycles in polar regions. An expansive microbial mat containing methanogenic archaea and bacteria was recently discovered at the underwater Cinder Cones area. This site provides a unique opportunity to study a benthic Antarctic habitat with active methane cycling. This research will identify the concentration and source of methane within this site and analogous sites in the southern Ross Sea. Researchers will characterize the microbial communities and will quantify the time scales in which the communities respond to methane input. This work could inform future research into the dynamics of early recruitment and community succession of these methane-cycling microbes.

Field Season Overview

Team members are planning a total of 12 dives over the course of their deployment. Most of the dives will be at the Cinder Cones site, with some dives at Little Razorback Island and

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Turtle Rock towards the end of the deployment. Field sites will be primarily accessed by Pisten Bully, and a fish hut will be provided to cover dive holes. In the event that sea ice conditions do not allow Piston Bully and/or Reed Drill access to the site at Cinder Cones the team will determine another site to access by snow mobile, will create a dive hole using a Hotsy (i.e. hole melter), and will use a Tomato Hut to cover the hole. On each of the dives they will collect sediment samples using small push cores. They will transport those samples back to station in a cooler and will keep them in a small flow through aquarium while processing. Some samples will need to stay frozen (at -80°) and cold (not frozen) during their return to the home institution.

Deploying Team Members

- Sarah Seabrook
- Andrew Thurber (PI)

2016-2017 USAP Field Season
Project Detail

Project Title

Ocean Observatories Initiative (OOI) Southern Hemisphere Cruises

Summary

Event Number:
O-410-N
NSF-OOI Agreement

Program Manager:
Dr. Jean McGovern

ASC POC/Implementer:
Chelsea Wegner / Adam Jenkins

Principal Investigator

Mr. Greg A Ulses
Gulses@oceanleadership.org

Consortium for Ocean Leadership
Washington, District of Columbia

Project Web Site:
http://oceanobservatories.org/

Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: Argentine Basin / Southern Ocean

Description

The Ocean Observatories Initiative (OOI) has constructed a networked infrastructure of sensor systems to measure physical, chemical, geological, and biological variables in the ocean and on the seafloor. In 2015, two Coastal & Global Scale Nodes (CGSN) were deployed at Global Site 42° S, 42° W (Argentine Basin) and Global Site 55° S, 90° W (Southern Ocean). Two cruises are scheduled for late 2016 to recover and redeploy the arrays, consisting of four moorings and up to four gliders at each location. The platforms carry multidisciplinary instrumentation and provide the capability for real-time communication of data and control of sampling. The surface mooring captures the surface forcing and upper-ocean variability. The profiling mooring measures the entire water column. Additionally, three sub-surface moorings and the gliders will obtain vertical profiles and sample the mesoscale variability at each site.

Field Season Overview

Participants will sail on the RVIB Nathaniel B. Palmer on cruise NBP16-10, from Punta Arenas, Chile. While on board they will conduct the following activities: (1) Survey the bathymetry of the site to establish the positions for the four moorings; (2) Deploy the four replacement moorings; (3) Recover the four existing moorings; (4) Recover and deploy gliders in support of horizontal and vertical sampling in and around the array; (5) Carry out shipboard sampling in support of calibration and validation of the deployed sensors on the moorings and gliders.

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Deploying Team Members

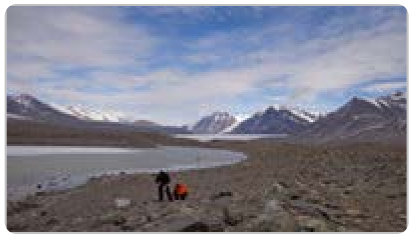
- Sebastien Bigorre

2016-2017 USAP Field Season
Project Detail

Project Title

McMurdo LTER - Soils: Increased Connectivity In A Polar Desert Resulting From Climate Warming: McMurdo Dry Valleys LTER Program

Summary



Event Number:
C-507-M
NSF/PLR Award 1115245

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Jenny Cunningham / Elizabeth Kauffman

Principal Investigator

Dr. Diana Wall
diana.wall@colostate.edu

Colorado State University
Natural Resource Ecology Laboratory
Fort Collins, Colorado

Project Web Site:
http://wp.natsci.colostate.edu/walllab/

Location

Supporting Stations: McMurdo Station
Research Locations: Dry Valleys

Description

Initially funded in 1980, the U.S. Long-Term Ecological Research (LTER) network is a collaborative effort involving more than 1,800 scientists and students. The McMurdo LTER program is an inter-disciplinary and multi-disciplinary study of the aquatic and terrestrial ecosystems in the ice-free McMurdo Dry Valleys. It is one of 26 LTER sites where researchers are studying ecological processes over long temporal and broad spatial scales. Researchers focusing on soils will maintain (through application of water and nutrients), monitor (soil moisture and temperature), and sample in their long-term experimental plots near Lakes Bonney, Fryxell, and Hoare. The project aims to determine the impacts of natural factors and those associated with potential climate change on the abundance, distribution, and diversity of soil biota. This six-year award cycle comprises seven collaborative projects: C-504-M (Gooseff), C-505-M (Priscu), C-506-M (Gooseff), C-507-M (Wall), C-508-M (Barrett), C-509-M (Lyons), and C-511-M (Doran).

Field Season Overview

Participants will travel by helicopter for brief (one to seven days) trips to the Dry Valleys for monitoring, maintenance and sampling of their long term experiments. They will also collect soil samples to support developing work on the N and P cycles, turnover of organic matter, and moss-soil interactions in the field. They will return to the Crary Laboratory at McMurdo Station for sample processing and initial analysis, as well as to perform incubation assays

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on selected soils.

Deploying Team Members

- Byron Adams (Co-PI)
- Walter Andriuzzi
- John Barrett (Co-PI)
- Daniel Bransford
- Joshua Heward
- Andrew Thompson
- Ross Virginia (Co-PI)
- Diana Wall (PI)

2016-2017 USAP Field Season
Project Detail

Project Title

POLENET Antarctica: Investigating Links Between Geodynamics And Ice Sheets - Phase 2

Summary

Event Number:
G-079-M
NSF/PLR Award 1249631

Program Manager:
Dr. Thomas Wilch

ASC POC/Implementer:
Samina Ouda / Elizabeth Kauffman

Principal Investigator

Dr. Terry Wilson
wilson.43@osu.edu

Ohio State University
Geological Sciences and Byrd Polar
Columbus, Ohio

Project Web Site:
http://polenet.org

Location

Supporting Stations: McMurdo Station
Research Locations: Byrd Camp / Union Glacier / WAIS Divide

Description

Phase 2 of the Antarctic-POLENET project (ANET) will continue and expand GPS and seismic studies to advance understanding of geodynamic processes and their influence on the West Antarctic Ice Sheet (WAIS). The Phase 2 ANET instrumentation will add nine remote continuous GPS stations, to be deployed in collaboration with UK and Italian partners. In partnership with UK colleagues, a high-resolution crustal and mantle seismic array will traverse the deep subglacial basins underlying the catchments of the glacio-dynamically critical Pine Island and Thwaites Glaciers. Absolute gravity data will provide independent data on crustal uplift and mass change, helping discriminate rebound driven by modern versus ancient ice-mass change. The integrated geodetic and geophysical data will allow testing of key hypotheses about the history and dynamics of the WAIS and interactions with the solid earth beneath. Both the viscoelastic response of the solid earth, constraining mass change since the Last Glacial Maximum, and the elastic response, resulting from mass change within the last few decades, can be modeled from these measurements together with earth properties derived from seismic data. The ice mass change estimates will allow better estimates of Antarctic ice sheet contributions to global sea level change.

Field Season Overview

Field team members this season will service existing GPS/seismic stations, remove the mini-array of 10 seismic stations on ice, and remove three GPS and three seismic systems

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from remote field sites. The group will conduct their work with fixed-wing aircraft support from Antarctic Logistics and Expedition's (ALE) Union Glacier field camp and from West Antarctic Ice Sheet (WAIS) Divide field camp. They will have a combination of fixed-wing and helicopter support from McMurdo Station. The team will service ten stations from Union Glacier. They will visit 16 stations in the Amundsen Embayment and Marie Byrd Land sectors for maintenance and data retrieval. McMurdo Station will be the hub for servicing six-to-eight existing GPS/seismic stations. There will be a number of flights (helicopter and fixed wing) from McMurdo to retrieve all site equipment, including the large number of batteries. A twin otter will be used to decommission the mini array seismic network from West Antarctic Ice Sheet (WAIS) Divide. The priority for GPS/seismic site visits is: (1) Sites that are not fully operational; (2a) Sites that have known problems and/or have not been visited in two years; (2b) Sites selected for decommissioning and removal from the field; and (3) Fully-functioning sites needing minor maintenance and/or visits to download seismic data.

Deploying Team Members

- Audrey Huerta
- J.R. Roberts
- Michael Roberts
- David Saddler
- Mark Whetu
- Terry Wilson (PI)
- J. Paul Winberry

2016-2017 USAP Field Season
Project Detail

Project Title

Mantle Structure And Dynamics Of The Ross Sea From A Passive Seismic Deployment On The Ross Ice Shelf

Summary

Event Number:
G-089-M
NSF/PLR Award 1142518

Program Manager:
Dr. Thomas Wilch

ASC POC/Implementer:
Judy Shiple / Elizabeth Kauffman

Principal Investigator

Dr. Douglas Wiens
doug@wustl.edu

Washington University
Department of Earth and Planetary Sciences
St. Louis, Missouri

Location

Supporting Stations: McMurdo Station
Research Locations: Ross Ice Shelf / Siple Dome

Description

Last austral summer this research project deployed 18 broadband seismographs across the Ross Ice Shelf (RIS) to constrain the seismic structure associated with the Ross Sea extension. The presence of the RIS provides an outstanding opportunity to instrument this region without the expense and logistical issues associated with ocean-bottom seismograph deployments in polar regions. Previous deployments of broadband seismographs on the RIS show that seismic P waves and Rayleigh waves can be well-recorded despite the underlying ice and water layers, permitting P-wave and surface-wave tomography and noise-correlation studies. Tomographic models developed from these data will be used to choose between competing models for the dynamics of the Ross Sea. In particular, researchers will investigate whether low-velocity hot mantle is localized in the vicinity of Ross Island and the Marie Byrd Land dome. Alternatively, a broad region of hot mantle, including the Eastern Ross Sea, would indicate distributed recent tectonic activity and call into question models stating that Eastern Ross Sea extension largely ceased during the Mesozoic. The data will also allow researchers to investigate the deeper structure (greater than 200 kilometers) to evaluate the possible role of mantle plumes and/or small-scale convection in driving regional volcanism and tectonism across the region.

Field Season Overview

This season, the field team will be based out of two small field camps; one on the Ross Ice Shelf, the other at Siple Dome. They will use a combination of fixed-wing support (Basler, Twin Otter, and LC-130 aircraft) to return to the 18 seismic sites installed in 2014. They will

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remove the stations and all associated materials for retrograde to the US.

Deploying Team Members

- Patrick Shore (Team Leader)

2016-2017 USAP Field Season
Project Detail

Project Title

EXPROBE-WAIS: Exposed Rock Beneath The West Antarctic Ice Sheet, A Test For Interglacial Ice Sheet Collapse

Summary

Event Number:
I-277-M
NSF/PLR Award 1341728

Program Manager:
Dr. Julie Palais

ASC POC/Implementer:
Judy Shiple / Ryan Wallace / Leslie Blank

Principal Investigator

Dr. John Stone
stone@ess.washington.edu

University of Washington
Department of Earth and Space Sciences
Seattle, Washington

Location

Supporting Stations: McMurdo Station
Research Locations: Pirrit Hills

Description

Researchers with this project seek to determine whether the West Antarctic Ice Sheet (WAIS) has collapsed in the past, exposing bedrock that is currently covered by the ice sheet. The project will involve drilling through the ice sheet to recover cores from underlying bedrock. These cores will be analyzed for isotopes produced by cosmic radiation, thus testing whether bedrock surfaces beneath the ice sheet have ever been exposed during warm climatic periods in the past. Multiple cosmogenic isotopes will be measured on recovered cores to constrain the timing of last exposure, duration of past exposure periods, and whether surfaces have been exposed one time or many. Stable isotope measurements on ice from above the bedrock surfaces will provide additional constraints on the timing of last exposure. Results will indicate whether warm interglacial periods such as Marine Isotope Stages 5e, 11, or 31 produced significant WAIS deglaciation. By pointing to the paleoclimatic conditions associated with past thinning of the ice sheet, these results will help to identify future climatic factors and thresholds likely to endanger the WAIS.

Field Season Overview

Three scientists and three drillers from T-150-M (Albert) will be supported by a traverse crew of four and one mountaineer at a field camp close to Pirrit Hills, in the Weddell Sea catchment of the West Antarctic Ice Sheet (WAIS). The site is 530 km beyond WAIS Divide camp. The traverse crew will travel from McMurdo Station to WAIS Divide in early November to prepare equipment. Drillers and scientists will deploy to McMurdo in early November to receive cargo and organize onwards shipment of drilling and camp supplies

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and equipment to WAIS Divide. This group will move to WAIS Divide in late November as the traverse finalizes preparations and departs. Cargo and passengers will be transported from McMurdo to WAIS Divide by LC-130. The traverse will take approximately one week to travel from WAIS Divide to the Pirrit Hills region. During this time scientists will deploy to Pirrit Hills by Twin Otter in order to establish a light camp and prepare for the arrival of the traverse. The full project team will converge at the drill site in early December. Drilling operations are expected to take three to four weeks, concluding in late December. This includes drill set-up, drilling and casing the pilot hole, access and core drilling, and breaking down the drill at each of the two drill sites. This allows two to three days to move the drill and set up at the second site, approximately 500 m away from the first location. After drilling is complete, the traverse will reload and will depart for WAIS Divide during the week ending 7 January. The drillers will return to WAIS Divide by Basler at this time, along with rock and ice cores. A mountaineer will move to Pirrit Hills with the outbound aircraft to join the science team for their final geological fieldwork. After returning to WAIS Divide, drillers will return to McMurdo by LC-130. The traverse will arrive back at WAIS Divide around 7 January. Cargo will return to McMurdo by LC-130 during the following week. In McMurdo drillers will re-pack the drill for northbound vessel shipment, completing this during the week ending 21 January. After completion of drilling, scientists will stay on at Pirrit Hills for approximately one week to complete geological fieldwork from a light camp. Three Twin Otter flights or two Basler missions will be needed during the week ending 14 January to pull out the camp and return the scientists and mountaineer to WAIS Divide. These participants will then move back to McMurdo by LC-130 during the week ending 21 January. In McMurdo scientists will organize and consign northbound cargo and return field equipment before departing around the end of January.

Deploying Team Members

- Trevor Hillebrand
- Trevor Hillebrand
- Perry Spector
- John Stone (PI)

2016-2017 USAP Field Season
Project Detail

Project Title

Constraining Plio-Pleistocene West Antarctic Ice Sheet Behavior From The Ohio Range And Scott Glacier

Summary

Event Number:
G-438-M
NSF/PLR Award 1341658

Program Manager:
Dr. Thomas Wilch

ASC POC/Implementer:
Judy Shiple / Elizabeth Kauffman

Principal Investigator

Dr. Sujoy Mukhopadhyay
sujoy@eps.harvard.edu

Harvard University
Cambridge, Massachusetts

Location

Supporting Stations: McMurdo Station
Research Locations: Ohio Range

Description

This project aims to place constraints on interior West Antarctic Ice Sheet (WAIS) elevations during the mid-Pliocene, when atmospheric carbon dioxide levels were similar to today's. Researchers will collect surface and subglacial bedrock samples over the course of this two-year project for analysis of cosmogenic nuclides.

Field Season Overview

Team members will travel by LC-130 aircraft to Shackleton Glacier Camp. From there they will fly by Twin Otter and Basler aircrafts to their field camp location in the Ohio Range. They will use snowmobiles to move their drilling equipment from the camp put-in site to the field site, and to conduct their Ground Penetrating Radar (GPR) work. Other work this season will include sampling subglacial bedrock using the new Ice Drilling Design and Operations (IDDO) Winkie drill, which has been modified for this purpose. Collected rock samples will be shipped to the home institution for further analyses.

Deploying Team Members

- Robert Ackert (Team Leader)
- Grant Boeckmann
- Seth Campbell
- Jennifer Erxleben
- Sujoy Mukhopadhyay (PI)

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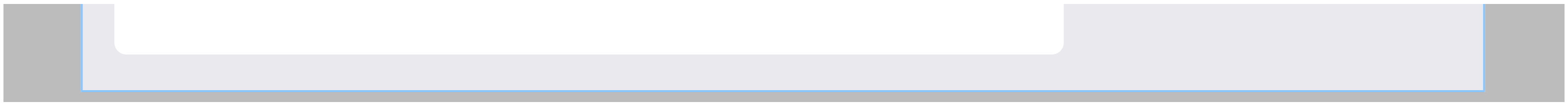

Project Title

Permian And Triassic Icehouse To Greenhouse Paleoenvironments And Paleobotany In The Shackleton Glacier Area, Antarctica

Summary

Event Number:
G-135-M
NSF/PLR Award 1443546

Program Manager:
Dr. Thomas Wilch

ASC POC/Implementer:
Judy Shiple / Meghan Walker / Leslie Blank

Principal Investigator

Dr. Edith Taylor
etaylor@ku.edu

University of Kansas Lawrence
Department of Ecology and Evolutionary Biology
Lawrence, Kansas

Location

Supporting Stations: McMurdo Station
Research Locations: Shackleton Camp / Shroeder Hill / Nilsen Plateau

Description

The research focus of this collaborative proposal is to collect fossil plants, fossil wood, stratigraphic, sedimentologic, paleosol, and geochemical data from plants and the rocks that contain them in order to reconstruct the extent of the Gondwana glaciation in the Shackleton Glacier (SHG) area, the invasion and subsequent flourishing of life following glacial retreat, and the eventual recovery of plant life after the Late Permian biotic events. Only in Antarctica does a complete polar-to-near-polar succession occur across this climatic and biologic transition. The SHG area is an important one as it is one of the few regions in the world where the Permian-Triassic Boundary (PTB) is exposed within terrestrial rocks. In addition, outcrops in the SHG area extend from the glacigenic deposits of the Upper Carboniferous-Lower Permian through to the Upper Triassic and thus record ecosystems and the plants that inhabited them from the Gondwana icehouse into the Late Permian-Early Triassic greenhouse and into presumed "full recovery" of floras from the PTB extinctions in the Late Triassic.

Field Season Overview

The field team will deploy to Shackleton Camp by LC-130 aircraft and will then fly by Twin Otter to two satellite camps, Alfie's Elbow (Site 1) and Nilsen Plateau (Site 2), where they will collect fossilized plants, rocks, and fossil logs. Three scientists and a project mountaineer will begin the season at Site 1; a fourth scientist will join the team during the camp move to Site 2. The team will spend one-to-two weeks at Site 1, and will access most sampling sites by foot. If possible, there will be one Twin Otter reconnaissance flight to survey a potential camp site and cache for snow mobiles and sampling locations at Site 2.

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Most sampling sites at Site 2 will be accessed by snowmobile. Approximately 800 pounds of rocks and fossil logs will be retrograded to Shackleton Camp.

Deploying Team Members

- Peter Braddock
- Anne-Laure Decombeix
- Erik Gulbranson (Co-PI)
- John Isbell (Team Leader)
- Rudolph Serbet

2016-2017 USAP Field Season
Project Detail

Project Title

High-Resolution Reconstruction Of Holocene Deglaciation In The Southern Ross Embayment

Summary

Event Number:
I-186-M
NSF/PLR Award 1443346

Program Manager:
Dr. Julie Palais

ASC POC/Implementer:
Judy Shiple / Meghan Walker / Leslie Blank

Principal Investigator

Dr. John Stone
stone@ess.washington.edu

University of Washington
Department of Earth and Space Sciences
Seattle, Washington

Location

Supporting Stations: McMurdo Station
Research Locations: Paradise Ridge / Witalis Peak / Robinson Bluff

Description

In previous work, researchers with this project have shown that grounded ice in the Ross Sea receded rapidly from Terra Nova Bay to Beardmore Glacier in the early Holocene. Subsequent retreat to Scott Glacier occurred more gradually, but there is no geological or dating control from this 400 kilometer sector of the Transantarctic Mountains. In this project, researchers will map and date glacial deposits on coastal mountains that constrain the thinning history of Liv and Amundsen Glaciers. By dating glacial erratics in elevation transects extending down to the level of floating ice at the mouths of these glaciers, the research team plans to obtain constraints on migration of the grounding line southwards along the Transantarctic Mountains. High-resolution dating will come from Be-10 surface exposure ages as well as from C-14 dates of algae within shorelines from ice-dammed ponds. Sites have been chosen to allow close comparison of these two dating methods, which will constrain Antarctic Be-10 production rates.

Field Season Overview

Five people will deploy for a five week field season on lower Amundsen Glacier where their movements will be supported by Twin Otter aircraft. The team will first travel to Robinson Bluff and then will travel by snowmobile to Witalis Peak. In late December, a Twin Otter will move the camp across Amundsen Glacier to Paradise Ridge. The team will use snowmobiles and Siglin sleds to move equipment from landing sites to camp sites and to daily work locations. Team members will work from a standard lightweight tent camp. They will collect rock, sediment and algae samples. They will store some frozen samples in the Crary lab before shipping them back to the home institution.

Deploying Team Members

- Jessica Badgeley
- Joel Gombiner (Team Leader)
- Joel Gombiner (Team Leader)
- Brenda Hall (Co-PI)
- Jillian Pelto

2016-2017 USAP Field Season
Project Detail

Project Title

Potential Direct Geologic Constraint Of Ice Sheet Thickness In The Central Transantarctic Mountains During The Pliocene Warm Period

Summary

Event Number:
I-177-M
NSF/PLR Award 1443321

Program Manager:
Dr. Julie Palais

ASC POC/Implementer:
Judy Shiple / Jennifer Blum / Leslie Blank

Principal Investigator

Dr. Gordon R Bromley
gordon.r.bromley1@maine.edu

The University of Maine
IQCS/ Department of Geological Sciences
Orono, Maine

Location

Supporting Stations: McMurdo Station
Research Locations: Roberts Massif / Dominion Range

Description

This project proposes to reconstruct the long-term history of glacier variability in the upper Beardmore and Shackleton Glaciers during periods of warmer-than-present climate. Beardmore and Shackleton Glaciers are major outlets of the East Antarctic Ice Sheet with extensive ice-free terrain located close to the ice-sheet margin. Resolving the history of ice-surface-elevation change in these regions will: (1) Help identify periods during which the East Antarctic Ice Sheet was at least as extensive as today; (2) Potentially provide insight into ice-sheet behavior on time scales longer than the late Pleistocene; and (3) Provide a benchmark for ice-sheet geometry in long-term Antarctic ice-sheet models.

Field Season Overview

The field team will travel by Twin Otter aircraft from McMurdo Station to field camps at the head of Beardmore Glacier. The first camp will be at the Dominion Range where team members will map and collect samples from Pliocene-age glacial deposits of the East Antarctic Ice Sheet. They will then fly by Twin Otter to the Roberts Massif, where they will conduct similar work. They will use snowmobiles for field camp operations. All samples will be shipped to the home instution at the end of the season.

Deploying Team Members

- Gregory Balco (Co-PI)
- Christopher Simmons

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- Allie Balter
- Gordon Bromley (PI)
- Christopher Simmons

2016-2017 USAP Field Season
Project Detail

Project Title

Mount Erebus Volcano Observatory: Operations, Science, And Outreach (MEVO-OSO)

Summary

Event Number:
G-081-M
NSF/PLR Award 1142083

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
Jenny Cunningham / Meghan Walker

Principal Investigator

Dr. Phillip Kyle
kyle@nmt.edu

New Mexico Institute of Mining and Technology
Department of Earth & Environmental Science
Socorro, New Mexico

Location

Supporting Stations: McMurdo Station
Research Locations: Mount Erebus

Description

Mount Erebus is the most active volcano in Antarctica. It is unique in containing a persistent convecting lava lake of anorthoclase phonolite magma. Degassing of the lake and underlying magmatic system emits volcanic gases into the pristine Antarctic atmosphere. Because of the excellent access and the nature of the small Strombolian eruptions, Mount Erebus has become a model volcano for volcanological studies. This project continues long-term surveillance using geophysical, geodetic, and geochemical observatories, and measures the seismicity, infrasound, gas emissions, and deformation using GPS observations of the volcano.

Field Season Overview

Starting in late November the field team will tent camp at Fang Glacier for acclimatization and then move to the Lower Erebus Hut (LEH) for five weeks and use it as a base of operations for work in the surrounding area. They will travel from site to site by snowmobile; day trips from McMurdo will be completed by helicopter. As this is the final field season, the team will focus on removing all of their previously-installed equipment in addition to continuing their studies of lava-lake dynamics, gas observations, and ice cave orgins. Antenna riggers will assist in removing towers and tower components from E1, Nausea Knob, Cones, and Hooper Shoulder. Some members of the team may spend 10-14 days at the South Korean Jang Bogo station to complete work started in the 2015-16 field season. The team will be assisted by ASC Riggers, Field Safety and Training (FS&T) Field Safety Coordinators, an ASC Camp Manager, UNAVCO, and ASC Environmental. An NSF-funded Artist and Writer will accompany the team for part of their field season.

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Deploying Team Members

- Timothy Burton
- Timothy Burton
- Timothy Burton
- Aaron Curtis
- Phillip Kyle (PI)
- Nial Peters

2016-2017 USAP Field Season
Project Detail

Project Title

Erebus Volcano: Characterizing A Subglacial Hydrothermal System And Potential Effects On CO2 Degassing

Summary

Event Number:
G-411-M
NSF/PLR Award 1443633

Program Manager:
Dr. Thomas Wilch

ASC POC/Implementer:
Jenny Cunningham / Meghan Walker

Principal Investigator

Dr. Tobias P Fischer
fischer@unm.edu

University of New Mexico
Albuquerque, New Mexico

Location

Supporting Stations: McMurdo Station
Research Locations: Lower Erebus Hut Ice Caves

Description

Erebus Volcano is a natural laboratory of magmatic processes and the ideal place to investigate magma degassing. Although the degassing processes from the active lava lake have been studied in detail over the past decades, comparatively little work has been done on the processes that affect flank degassing. Erebus is glaciated and is the site of ice towers and caves that are the surface expression of heat and volatiles escaping from the edifice into the atmosphere. Contrary to non-glaciated volcanoes where flank degassing is often diffuse and challenging to identify, the ice caves provide visible clues to the escape of gases and heat. Preliminary gas sampling from five of the estimated 100 ice caves shows that gas compositions are dominated by a fractionated air component, with minor amounts of carbon dioxide, methane, and dihydrogen. Significantly, the relative abundance of air-derived gases strongly suggests the presence of an aqueous phase below the surface. Into this liquid, magmatic- and air-derived gases dissolve. As the liquid moves away from the crater area, it cools, eventually freezes, and, during this process, releases the gases through the ice caves. The goal of this project is to better characterize the liquid phase in terms of temperatures, gas contents, and its effect on carbon dioxide dissolution and degassing.

Field Season Overview

Team members will deploy by helicopter to the Lower Erebus Hut (LEH) for three weeks to collect gas samples. With the assistance of an ASC mountaineer, they will collect samples from approximately 20 to 25 previously-visited caves along ice-tower ridge, in the Sauna cave region, and close to the main crater rim. They will also deploy a small portable gas sensor at the crater rim to measure the CO2 and SO2 concentration in the plume. This

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data, combined with SO_2 flux measurements, will enable the researchers to calculate crater CO_2 flux and compare it to the data they obtain from the ice caves. In the caves, they will leave each vent sampling device in situ for 24 hours, with four vent sampling instruments deployed concurrently. In the caves and in warm ground areas, they will take CO_2 flux samples along a grid area. Some gas samples will be analyzed on site at LEH with a laser spectrometer; others will be transported back to the home institution for analyses.

Deploying Team Members

- Tobias Fischer (PI)
- Tehnuka Ilanko

2016-2017 USAP Field Season
Project Detail

Project Title

Alien Landscapes

Summary

Event Number:
W-487-M
NSF/PLR Award 1444657

Program Manager:
Mr. Peter West

ASC POC/Implementer:
Jenny Cunningham / Michael Lucibella

Principal Investigator

Mr. Michael W Carroll
cosmicart@stock-space-images.com

Littleton, Colorado

Location

Supporting Stations: McMurdo Station
Research Locations: Lower Erebus Hut

Description

The otherworldly landscapes of Antarctica inspire both artists and scientists, each seeking to understand how they came to be and where else in the universe one might find similar icy, alien geology and even microbial lifeforms. The overall goal of this project is to bring together art and science to produce a book in which both subjects will inspire greater understanding of our world and others. One participant will use acquired knowledge of planetary geology to seek out landscapes and geologic features in Antarctica that are analogous to those in distant worlds, advising the other participant as they depict these scenes in paintings. The group aims to paint and photograph the landscapes of Antarctica that are analogous to those of other worlds and use them to visualize what could be seen in distant worlds.

Field Season Overview

Two participants will acclimatize at Fang Camp before spending a week at Lower Erebus Hut (LEH). They will be transported to and from the Mount Erebus camps by helicopter. The team will use snowmobiles as available to access sites around LEH including the crater rim, Tower Ridge, and non-pristine/non-technical ice caves. A staff member of Field Safety and Training will accompany the participants to field sites.

Deploying Team Members

- Michael Carroll (PI)
- Rosaly Lopes

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2016-2017 USAP Field Season
Project Detail

Project Title

Antarctica Comics Project: A Look At The Science In Antarctica Through The Eyes Of A Comic Book Artist

Summary

Event Number:
W-483-M
NSF/PLR Award 1544371

Program Manager:
Ms. Valentine Kass

ASC POC/Implementer:
Samina Ouda / Michael Lucibella

Principal Investigator

Undefined Maris Wicks
mariswicks@gmail.com

Somerville, Massachusetts

Location

Supporting Stations: McMurdo Station
Research Locations: Cape Royds / Dry Valleys / Mount Erebus / New Harbor

Description

The proposed project is the creation of a 200+ page graphic novel that highlights the six major disciplines studied in Antarctica: Astrophysics and Geospace Sciences, Organisms and Ecosystems, Integrated System Science, Earth Sciences, Glaciology, and Oceans and Atmospheric Sciences. Within each of these six disciplines, the artist will engage with the research team and will directly observe and document their research. The experiences of the artist in Antarctica will serve as a connecting narrative for the book, allowing readers to witness the science from a first-person perspective. The artist's aim is to give an overview of each discipline, and to emphasize the importance of each field's research both locally and globally.

Field Season Overview

The artist will deploy to McMurdo Station to observe scientists and their projects. Her work will be a combination of person-to-person interactions (interviews, conversations), documentation (photography, notes, field sketches), and preliminary research. The artist has confirmed participation from the Principal Investigator's (PIs) of the following groups: A-123-M (Chu), A-343-M (Conde), B-031-M (Ainley), B-043-M (Bowser), C-384-M (Bell), C-507-M (Wall), and G-081-M (Kyle).

Deploying Team Members

- Maris Wicks (PI)

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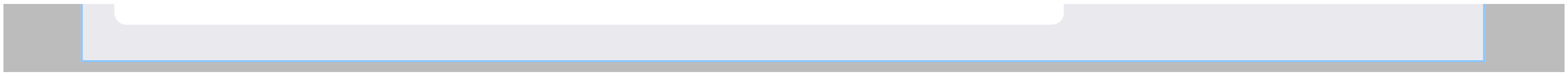

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Project Detail

Project Title

Scientific Studies From A Network Of Sustainable, Robotic Observatories Across The Antarctic Ice Shelf: A New Approach To Polar Research

Summary

Event Number:
A-112-M/S
NSF/PLR Award 1443507

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Samina Ouda / Elizabeth Kauffman / Paul Sullivan

Principal Investigator

Dr. Andrew Gerrard
gerrard@njit.edu

New Jersey Institute of Technology
Department of Physics
Newark, New Jersey

Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: AGO sites / AGO5

Description

The Automatic Geophysical Observatories (AGOs) are five unmanned observatories that provide power and data transmission capabilities for instrumentation on the Antarctic plateau. Historically, the AGO program has collected magnetospheric research data in the polar cap and auroral zone, with each AGO unit housing fluxgate and search-coils magnetometers, a riometer, a VHF antenna, and all-sky imagers. However, in the past five years the AGO platforms have attracted the attention of the broader scientific community and now the AGO facilities also support seismometers, GPS receivers, and automatic weather stations. In the past few years, the research team has developed the AGO program to provide power at the approximately 100-Watt level with about 90 percent year-around uptime, the only limitation on power availability being a lack of wind during the austral winter.

Field Season Overview

A three-person science team and one dedicated ASC mountaineer, will visit AGO sites for two to three days to replace the Data Acquisition (DAQ) system cards. The team will be raising and shoveling the shelters at each AGO site. They will travel by Twin Otter aircraft from South Pole to AGOs 1-4, and by LC-130 aircraft from McMurdo Station to AGO 5. At all five AGO sites the team will remove snow from the shelters and inspect the condition of the solar panels. The team will also inspect the wind turbines, batteries, and the general power system to verify that all are operating properly, and will perform any necessary instrument calibrations and field upgrades/repairs. In addition, they will install a new Iridium

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Short-Burst Data (SBD) system at AGO 5, and will retrograde old propane tanks.

Deploying Team Members

- Gilbert Jeffer
- Bob Melville (Team Leader)
- Andrew Stillinger

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Ocean and Atmospheric Sciences

Principal Investigator	Event No.	Project Title
Butler, James	O-257-M/S	South Pole monitoring for climatic change
Butler, James	O-264-P	Collection of atmospheric air for the NOAA/GMD worldwide flask-sampling network
Butler, James	O-257-M/S	UV measurements at McMurdo Station for the NOAA/Global Monitoring Division (GMD) Antarctic UV network
Cassano, John	O-283-M	Antarctic Automatic Weather Station program (WinFly Component)
Chereskin, Teresa	O-317-L	Southern Ocean current observations from the U.S. Antarctic research vessels
Gao, Yuan	O-231-P	Quantifying atmospheric iron properties over the Western Antarctic Peninsula
Girton, James	O-398-N	Pathways of circumpolar deep water to West Antarctica from profiling float and satellite measurements
Girton, James	O-226-L/N	Sustained measurements of Southern Ocean air-sea coupling from a mobile autonomous platform
Lazzara, Matt	O-283-M	Antarctic Automatic Weather Station Program
Lubin, Dan	O-325-M	Department of Energy ARM West Antarctic Radiation Experiment (AWARE)
Munro, David	O-214-L/N	High-resolution underway air-sea observations in Drake Passage for climate science
Sarmiento, Jorge	O-271-N	Southern Ocean Carbon and climate Observations and Modeling (SOCCOM)
Sedwick, Peter	O-316-N	Impact of convective processes and sea ice formation on the distribution of iron in the Ross Sea: closing the seasonal cycle.

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Seefeldt, Mark	O-456-M	Implementing low-power, autonomous observing systems to improve the measurement and understanding of Antarctic precipitation
Shadwick, Elizabeth	O-270-L	Resolving CO2 system seasonality in the West Antarctic Peninsula with Autonomous Observations
Sprintall, Janet	O-260-L	The Drake Passage high-density XBT/XCTD program
Stephens, Britton	O-404-L	High-resolution underway air-sea observations in Drake Passage for climate science
Taylor, Susan	O-399-S	Sampling comet dust from Antarctic air
Ulses, Greg	O-410-N	Ocean Observatories Initiative (OOI) Southern Hemisphere cruises
Zappa, Christopher	O-403-M	Oceanic response to a coastal polynya, Terra Nova Bay, Antarctica

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Project Detail

Project Title

Polynyas, Ice Production And Seasonal Evolution In The Ross Sea (PIPERS)

Summary

Event Number:
C-531-M/N
NSF/PLR Award 1341717

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Matthew Erickson / Elizabeth Kauffman / Adam Jenkins

Principal Investigator

Dr. Stephen Ackley
stephen.ackley@utsa.edu

University of Texas
San Antonio, Texas

Location

Supporting Stations: McMurdo Station, RV/IB Nathaniel B. Palmer
Research Locations: McMurdo Station / Ross Sea

Description

In-situ observations of air-sea-ice interactions are paramount for improving estimates of sea-ice production and water-mass transformation in the Ross Sea. The principal objective of this scientific cruise is to fully capture the space/time evolution of the air-sea-ice interactions initiated during autumn and tracked into winter/spring in the Ross Sea. This project will deploy on the Nathaniel B. Palmer (NBP) no earlier than 1 April to provide first-time measurements of autumn/winter conditions by deploying autonomous buoy arrays in young ice. Sea ice concentrations during this time of the year may make some of the sample sites difficult to access. Vessel movements will be reviewed by the captain, marine project coordinator and the science team with approval from the NSF/PLR and the ASC Marine Area manager.

Field Season Overview

A NSF New York Air National Guard (NYANG) LC-130 aircraft mounted with the integrated ice imaging system, IcePod (run by Lamont-Doherty Earth Observatory) will conduct one survey flight over the general area where the three buoy arrays will be deployed during an April - June 2017 RVIB Nathaniel B. Palmer cruise. The buoy arrays will be placed in the western Ross Sea; one near Terra Nova Bay (TNB) polynya, and two in front of the Ross Ice Shelf polynya. The flight will make one pass along the 1000 meter bathymetric contour at the shelf-slope break in the western Ross Sea. The IcePod system will be equipped with remote sensing devices, airborne Lidar, digital photography, IR imager and shallow ice radar. A collaboration with Antarctic New Zealand to conduct ground truth on fast ice and conduct IcePOD over flights over the ground truth sites is also planned for the season.

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Deploying Team Members

- Liuxi Tian
- Hongjie Xie (Co-PI)

2016-2017 USAP Field Season
Project Detail

Project Title

Ice Drill Design And Operations (IDDO) Support For WAIS Divide

Summary

Event Number:
T-350-M
NSF Agreement

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
Judy Shiple / Ryan Wallace / Matthew Kippenhan

Principal Investigator

Dr. Mary Albert
mary.r.albert@dartmouth.edu

Dartmouth College
Thayer School of Engineering
Hanover, New Hampshire

Location

Supporting Stations: McMurdo Station
Research Locations: WAIS Divide Camp

Description

The Ice Drill Design and Operations (IDDO) team is the principal supplier of ice drilling and coring equipment, support, and expertise for NSF-funded research. It is operated under the auspices of the Ice Drilling Program Office (IDPO), which works in close conjunction with the ice coring and drilling research community. IDDO's objective for the 2016-2017 field season at WAIS Divide is to support the I-166-M (Pettit) logging project and to assist in returning the remaining deep ice sheet coring (DISC) Drill cargo to Madison, Wisconsin.

Field Season Overview

One participant from T-150 (Albert) will deploy to West Antarctic Ice Sheet (WAIS) Divide to operate an IDDO logging winch for this project. ASC will provide heavy equipment support to move the Deep Ice Sheet Coring (DISC) Drill equipment.

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Project Title

Water Mass Structure And Bottom Water Formation In The Ice-Age Southern Ocean

Summary

Event Number:
G-051-N
NSF/PLR Award 1542962

Program Manager:
Dr. Thomas Wilch

ASC POC/Implementer:
Chelsea Wegner / Adam Jenkins

Principal Investigator

Dr. Robert Frederick Anderson
boba@ldeo.columbia.edu

Columbia University
Lamont-Doherty Earth Observatory
Palisade, New York

Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: Southern Ocean transect: 54-67S, 170W

Description

The objective of this project is to collect sediment cores from the Southwest Pacific sector of the Southern Ocean in order to measure radiocarbon ages in contemporary benthic and planktonic foraminifera. These measurements will establish glacial-to-Holocene changes in the age structure of the water column in a critical region for the ventilation of the deep Pacific Ocean. Core samples will include both Jumbo Piston Cores that reach about 20 meters in depth to capture the Last Glacial Maximum, and gravity cores that reach approximately three meters in depth. The radiocarbon ages of the foraminifera collected from these cores will be interpreted to discriminate between two proposed mechanisms of ice-age deepwater formation: (1) Coastal processes around Antarctica; and (2) Open-ocean deepwater polynyas. This work will advance interpretations of the ice-age carbon cycle and provide a benchmark for the development of models used to simulate ice-age climate. The science team will also collect water samples to measure the flux of dissolved thorium (Thorium-232), which will be used to develop a tracer for the supply of essential nutrient metals to the ocean by dust. Collecting dissolved thorium samples will complement related work funded by the NSF in the tropical Pacific (Award #1233688) and in the subtropical Pacific (Award #1555726), enabling the comparison of fluxes of dissolved metals from dust across diverse regions of extremely low dust flux to the ocean.

Field Season Overview

Team members with this project will sail from McMurdo Station and will share ship time with another science project, Robinson (G-152-N). The team will collect six gravity cores (three meters) and two piston cores (15-20 meters) from five different sites along the cruise transect, at depths ranging from 3000-4000 m. All of these coring locations are

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approximately co-located with the Robinson sampling locations. The cruise transect will run approximately along the 170°W longitude line between 54°S and 66°S at each degree of latitude. The science team will revisit two sites along this transect that were previously cored on the Joint Global Ocean Flux Study (JGOFS) cruise (NBP98-02), and will collect two gravity cores per site. They will also collect two additional gravity cores at one or two sites between 63°S and 61°S, and two piston cores at 61°S. One memeber of the science team will be highly trained in core collection; additional coring support will come from ASC Marine Technicians. The science team will provide a gravity corer from Lamont-Doherty Earth Observatory (LDEO) and will use the USAP Jumbo Piston corer. Cores will be stored in the walk-in cooler for the duration of the cruise and then transferred to a USAP-provided refrigerated van for shipping back to the Lamont-Doherty Core Repository.

Deploying Team Members

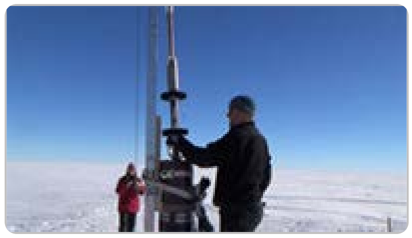
- Martin Fleisher (Co-PI)
- Frank Pavia

2016-2017 USAP Field Season
Project Detail

Project Title

Laser Dust Logging And Fluorimetric Scanning Of SPICE

Summary



Event Number:
I-194-S
NSF/PLR Award 1443566

Program Manager:
Dr. Julie Palais

ASC POC/Implementer:
Samina Ouda / Paul Sullivan

Principal Investigator

Dr. Ryan Bay
bay@berkeley.edu

University of California Berkeley
Physics
Berkeley, California

Location

Supporting Stations: South Pole Station
Research Locations: Near station

Description

The goal of this project is to examine the South Pole borehole using in-ice particle detectors to determine the stratigraphy in more detail than possible by other more traditional methods. The project's borehole laser dust logger produces a more stratigraphically coherent environmental record than ice-core measurements, responds markedly to thin volcanic ash layers, and in deep, clear ice is a nearly direct tracer of ash and continental mineral dust. The logger reveals repeatable structures at the sub-centimeter depth scale for synchronizing records and, by comparing a borehole log from the SPICE Core project (NSF Award #1142517) with the existing South Pole data set, the project will be able to immediately determine the depth-age scale for the SPICE core and identify candidate ash horizons for sampling.

Field Season Overview

One participant will deploy to South Pole Station in the 2016-17 season. One person from T-150-M/S (Albert, Ice Drilling Design and Operations - IDDO) will be supporting I-164-S (Aydin, SPIceCore) and will then operate an IDDO-supplied winch at South Pole for this event. IDDO intends to use the Intermediate Depth Drill winch and tower, which is currently onsite at South Pole, to support this logging. The IDDO-supplied Intermediate Depth Logging Winch (IDLW) will be deployed as a backup winch for this project. The IDLW will need to be transported from South Pole to McMurdo when the sole participant for this group redeploys. All equipment and cargo will be removed from South Pole Station at the end of the season.

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Deploying Team Members

- Ryan Bay (PI)

2016-2017 USAP Field Season
Project Detail

Project Title

Unraveling The Genomic And Molecular Basis Of The Dive Response: Nitric Oxide Signaling And Vasoregulation In The Weddell Seal

Summary

Event Number:
B-267-M
NSF/PLR Award 1443554

Program Manager:
Dr. Chris Fritsen

ASC POC/Implementer:
Jenny Cunningham / Beverly Walker

Principal Investigator

Dr. Emmanuel S Buys
ebuys@partners.org

Massachusetts General Hospital
Boston, Massachusetts

Location

Supporting Stations: McMurdo Station
Research Locations: On station / Big Razorback Island

Description

A key component of the dive response exhibited by Weddell seals and other diving animals is strong cardiovascular regulation, with tissue-specific control of blood flow. This control likely results from varied sympathetic innervation and also from differential production of local modulators by endothelial cells (such as nitric oxide (NO)). The goal of this project is to obtain biosamples from Weddell seals to support an investigation of the NO-cGMP (cyclic guanosine monophosphate) system and other complementary pathways at both the genomic and molecular levels. Researchers working on the sea ice will collect tissue by performing opportunistic necropsies of pups and adults found dead of natural causes in the colonies. These measures will be verified in biopsy and blood samples collected from living adult seals and weaned pups in the prior season. Researchers will also collect placental tissue to develop Weddell seal cell lines that will be used in further laboratory experiments at their home institution.

Field Season Overview

Field team members will be housed on station and will make day trips by snowmobile to scout for freshly dead seals and unfrozen (recently delivered) seal placental tissue for sampling. Samples will be processed and stored in Crary Lab.

Deploying Team Members

- Emmanuel Buys (PI)
- Luis Huckstadt

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- Allyson Hindle (Co-PI)

2016-2017 USAP Field Season
Project Detail

Project Title

Antarctic Automatic Weather Station Program (WinFly Component)

Summary

Event Number:
O-283-M
NSF/PLR Award 1245663

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
Samina Ouda / Elizabeth Kauffman

Principal Investigator

Dr. John Cassano
john.cassano@colorado.edu

University of Colorado Boulder
CIRES
Louisville, Colorado

Location

Supporting Stations: McMurdo Station
Research Locations: Pegasus Field

Description

The Antarctic Automatic Weather Station (AWS) network is the largest in the Antarctic and has the broadest spatial coverage. As the AWS program reaches its 35th year, the primary focus is measuring Antarctica's surface climatology using the lengthy datasets (20 to 30 years in some cases) collected by the stations. A second focus is an investigation of the surface-wind regime of the Ross Ice Shelf. In the Antarctic, short observational records and large spacing between available observations have limited the ability to observe and detect climate change. The AWS network is now capable of providing critical observational records that will allow researchers to assess the near-surface climate of the Antarctic and begin to identify signs of climate change in the Antarctic. AWS measurements also provide the verification for satellite studies and model forecasts. The University of Colorado team will observe the late winter atmospheric boundary layer using unmanned aerial systems (UAS). These observations will complement summertime boundary layer measurements made in January 2014 as part of this project. The work to be conducted during WinFly 2016 is a continuation of the 2013-16 Antarctic automatic weather station project.

Field Season Overview

The University of Colorado will deploy two people during WinFly 2016. The field team will use small unmanned aerial systems (UAS) to observe the late winter atmospheric boundary layer in the vicinity of McMurdo Station. Flights will be conducted from Pegasus.

Deploying Team Members

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- John Cassano (PI)
- Mark Seefeldt

2016-2017 USAP Field Season
Project Detail

Project Title

Southern Ocean Current Observations From The U.S. Antarctic Research Vessels

Summary

Event Number:
O-317-L
NSF/PLR Award 1341431

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
Chelsea Wegner / Bruce Felix

Principal Investigator

Dr. Teresa Chereskin
tchereskin@ucsd.edu

University of California San Diego
Scripps Institution of Oceanography
La Jolla, California

Location

Supporting Stations: ARSV Laurence M. Gould
Research Locations: Drake Passage

Description

This project builds upon a successful 13-year collaboration that developed the capability to routinely acquire, process, and archive ocean-current measurements from hull-mounted shipboard acoustic Doppler current profilers (ADCPs) onboard the RVIB Nathaniel B. Palmer (NBP) and ARSV Laurence M. Gould (LMG) research vessels. The long-term science objectives are to measure the seasonal and interannual variability of upper-ocean currents within the Drake Passage, to combine this information with similar temperature observations to study the variability in the heat exchange, and to characterize the velocity and acoustic backscatter structure in the Southern Ocean on a variety of time and space scales. The onboard equipment includes 150 kHz narrow-band ADCPs (running since the start of the project) and newer 38 kHz phased-array ADCPs (installed on the LMG in 2004 and on the NBP in 2009). The collected, QC'ed data are used by a wide variety of Antarctic science programs and are easily accessible for retrospective analyses, planning future observations, and validating numerical models.

Field Season Overview

This science event collects ocean current and acoustic backscatter measurements from hull-mounted shipboard acoustic Doppler profilers (ADCPs) onboard the LMG. Data is collected on all cruises with support from the shipboard electronic technicians (ETs). That support consists of starting and stopping data acquisition, and monitoring and archiving data while at sea. During cruises events, ET or IT support may be required, as time allows, in the event that system maintenance or software changes need to be made while underway.

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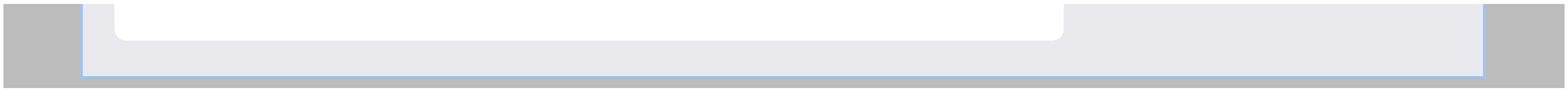

2016-2017 USAP Field Season
Project Detail

Project Title

High-Resolution Na Doppler LiDAR Observations Of The Middle And Upper Atmosphere At McMurdo, Antarctica

Summary

Event Number:
A-123-M
NSF/PLR Award 1443726

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Payot Scheibe / Richard Dean / Chad Naughton

Principal Investigator

Dr. Xinzhao Chu
xinzhao.chu@colorado.edu

University of Colorado Boulder
CIRES
Boulder, Colorado

Location

Supporting Stations: McMurdo Station
Research Locations: Arrival Heights

Description

The project will deploy a narrowband, three-frequency Na (Sodium) Doppler LiDAR to McMurdo Station that is capable of measuring both winds and temperatures vertically. This LiDAR will make high-resolution observations of the middle and upper atmosphere and simultaneous observations with the co-located Fe Boltzmann LiDAR, which has been hosted by Antarctica New Zealand (ANZ) in their Arrival Heights building since late 2010. The Na Doppler observations will provide critical data to address key science challenges associated with the space-atmosphere interaction region.

Field Season Overview

This season, the team will make modifications to Antarctica New Zealand's Lab C at Arrival Heights to prepare for the Student Training and Atmospheric Research (STAR) Na Doppler LiDAR deployment in the 2017-18 season. The work on Lab C will include: adding electrical power, making modifications to accommodate the STAR Na Doppler LiDAR telescope hatch and outgoing laser beam, and adding an HVAC system for heat dissipation and room temperature stabilization. The team will also address electromagnetic interference (EMI) issues with the laser transmitter installation using RF filters, as was done for the existing Fe Boltzmann LiDAR.

Deploying Team Members

Project Indexes

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- Xinzhao Chu (PI)
- John Smith

2016-2017 USAP Field Season
Project Detail

Project Title

Antarctic Microbial Networks And DMSP: Linking Diversity, Biogeochemistry, And Functional Gene Expression

Summary

Event Number:
B-028-P
NSF/PLR Award 1543450

Program Manager:
Dr. Chris Fritsen

ASC POC/Implementer:
Chelsea Wegner / Jamee Johnson

Principal Investigator

Dr. Peter Dylan Countway
pcountway@bigelow.org

Bigelow Laboratory for Ocean Sciences
East Boothbay, Maine

Location

Supporting Stations: Palmer Station
Research Locations: Palmer LTER stations B and E

Description

The objective of this project is to link the molecular microbial ecology of the Western Antarctic Peninsula and/or Ross Sea to the regionally-relevant (and crucial) biogenic dimethylsulfoniopropionate (DMSP) cycle that may influence the biological structure and function of this sensitive marine ecosystem.

Field Season Overview

Researchers will deploy to Palmer Station to conduct incubation experiments using water collected from Stations B and E. They will use Zodiacs and rigid-hulled inflatable boats to access their research areas and will use standard 5-L Go-Flo sampling bottles to collect water samples. The team will perform on-station incubations in their own Ecostat incubator. Lab-based activities will include water filtration for various types of samples, sample processing for measurement on gas chromatograph equipment, chlorophyll and bacterial productivity measurements, and preservation of samples for flow-cytometry and microscopy. At the end of the season, samples will be shipped to the home institution for further analyses.

Deploying Team Members

- Peter Countway (PI)
- Patricia Matrai (Co-PI)
- Kathryn Moore
- Carlton Rauschenberg

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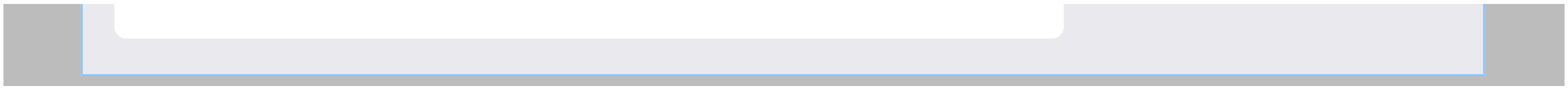

2016-2017 USAP Field Season
Project Detail

Project Title

Geomagnetic Navigation By Weddell Seals Beneath Antarctic Ice

Summary

Event Number:
B-017-M
NSF/PLR Award 1341469

Program Manager:
Dr. Chris Fritsen

ASC POC/Implementer:
Jenny Cunningham / Beverly Walker

Principal Investigator

Dr. Randall Davis
davisr@tamug.edu

Texas A & M University
Dept. of Marine Biology
League City, Texas

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo Sound

Description

Do Weddell seals possess a magnetic sense and use it to sense Earth's geomagnetic field for navigating under sea ice over small spatial scales? The primary objectives are to determine: (1) Whether Weddell seals diving under shore-fast sea ice respond predictably to spatial variations in Earth's magnetic field; (2) How the seals use information obtained from earth's magnetic field to return to the vicinity of known breathing holes; (3) Whether light intensity and day length affect seal responses to differences in earth's magnetic field; and (4) Whether energetic efficiency of navigation by Weddell seals is altered by differences in earth's magnetic fields. To achieve those objectives, researchers will conduct experiments on translocated Weddell seals in which they will measure changes in behavioral and energetic responses of individuals to different geomagnetic field properties and test those responses against precise predictions. By conducting experiments during periods of high light intensity and long day length (October and November) and low light intensity and reduced day length (mid August and September), and by documenting the orientation of fixed sound sources and water currents, the experiment should identify a geomagnetic response and eliminate other sensory modalities.

Field Season Overview

Researchers will make day trips by Pisten Bully to two sea ice camps on McMurdo Sound during Winfly and three locations during Mainbody. The team will capture Wedell seals, perform controlled releases, take metabolic measurements and recover instrumentation temporarily mounted on the seals. Each location will have a fish hut placed over a 1.2 meter diameter hole in the sea ice. Instrumented seals will be consecutively released into each of the three holes in order to observe their behavior as they experience different

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geomagnetic fields.

Deploying Team Members

- Georgina Davis
- Randall Davis (PI)
- Erin Frolli
- Lee Fuiman (Co-PI)
- Jason John
- Traci Kendall
- Kristen McGovern
- Beau Richter
- Michael Walker
- Terrie Williams (Co-PI)

2016-2017 USAP Field Season
Project Detail

Project Title

Building Envelope And Infrastructure Assessment Using An Integrated Thermal Imaging And LiDAR Scanning System

Summary

Event Number:
T-942-S
EP-ANT-16-06

Program Manager:
Ms. Jessie Crain

ASC POC/Implementer:
Samina Ouda / Bob DeValentino

Principal Investigator

Dr. Elias Joseph Deeb
Elias.J.Deeb@erdc.dren.mil

US Army Cold Regions Research & Engineering Lab
Hanover, New Hampshire

Location

Supporting Stations: South Pole Station
Research Locations: On station

Description

The goal of this project is to deploy integrated thermal infrared/LiDAR instrumentation platforms at South Pole and McMurdo Stations. Team members will use those platforms to conduct surveys of building infrastructure/envelopes. These surveys will provide comprehensive three-dimensional thermal models to assess thermal efficiency and discover potential areas for energy-efficiency improvements.

Field Season Overview

The team will deploy mid-January for an, approximately, three-day LIDAR survey of the elevated station perimeter. While awaiting transport to South Pole, or Christchurch, and only if time permits, similar surveys will be conducted of the facilities at Williams Field, McMurdo Station.

Deploying Team Members

- David Finnegan (Co-PI)
- Adam Lewinter (Co-PI)

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Project Detail

Project Title

Continuation Of The LARISSA Continuous GPS Network In View Of Observed Dynamic Response To Antarctic Peninsula Mass Balance And Required Geologic Constraints

Summary

Event Number:
C-515-L
NSF/PLR Award 1143981

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Matthew Erickson / Adam Jenkins

Principal Investigator

Dr. Eugene Domack
edomack@usf.edu

University of South Florida
College of Marine Science
St. Petersburg, Florida

Location

Supporting Stations: ARSV Laurence M. Gould
Research Locations: Hugo Island / Hughes and Andvord Bays / Duthier's, Spring, and Prospect Points / Vernadsky Station

Description

This interdisciplinary field program addresses the rapid, system-level changes now taking place in the Larsen B Embayment, Weddell Sea region of the Antarctic Peninsula, where the ice shelf underwent a spectacular collapse in 2002. Ice core scientists, glaciologists, oceanographers, marine geologists and biologists are collaborating to characterize the effects of the collapse on the marine ecosystem as well as on glacial dynamics and interactions between the ocean, ice, geology and biology. The project aims to place these changes in the context of past changes in the region occurring on timescales ranging from decadal to the penultimate interglacial (125,000 years before present) when it is thought to have been warmer, and the sea level higher than today.

Field Season Overview

Team participants will sail on the LMG from Punta Arenas, Chile to various locations in the Western Antarctic Peninsula. They will make day trips by Zodiac to sites where they have previously installed automated weather stations (AWS) to repair, update, or remove them. They will also collect rock samples that will be returned to the home institution for further analysis.

Deploying Team Members

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- Eugene Domack (PI)
- Ryan Venturelli

Project Title

The Functional Role Of Moss In Structuring Biotic Interactions And Terrestrialization Of Antarctica

Summary

Event Number:
B-289-E
NSF/PLR Award 1341742

Program Manager:
Dr. Chris Fritsen

ASC POC/Implementer:
Chelsea Wegner / Cara Ferrier

Principal Investigator

Dr. Dr. Sarah Margaretha Eppley
eppley@pdx.edu

Portland State University
Department of Biology
Portland, Oregon

Location

Supporting Stations: Special Project
Research Locations: King George and Livingston Islands

Description

Despite the harsh abiotic conditions, more than 100 moss species occur in Antarctica (compared with only two flowering plants). As the continent becomes warmer and wetter, mosses are colonizing newly exposed ground and are predicted to become even more dominant. Researchers will test hypotheses concerning the effects of warming on how Antarctic mosses structure terrestrial ecosystems. Using open-top chamber passive-warming experiments previously installed by a Chilean collaborator on King George and Livingston Islands, researchers will concentrate on how warming impacts bryophyte productivity, sexual systems, and secondary chemistries, and how these changes affect community processes. They will pursue three integrated research hypotheses: (1) Warming will alter moss species composition, moss sex ratio, and deferentially impact moss productivity and reproductive success in Antarctica; (2) Warming will impact the production of moss secondary compounds, influencing the dynamics of biotic interactions and biosphere-atmosphere exchange in terrestrial Antarctica; and (3) Warming will alter moss-microbe interactions, resulting in alterations to the moss food web and community dynamics in terrestrial Antarctica. The data will be the first comprehensive measures of how Antarctic mosses engineer their environment and thereby drive terrestrial responses to global warming.

Field Season Overview

Researchers with this project, in collaboration with Chilean scientists from the University of Santiago, will travel to Antarctica from Chile with support from the Chilean Antarctic Institute (INACH). They will reside on the Chilean base Profesor Julio Escudero on King

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George Island where they have long-term Open Top Chamber (OTC) warming experiments from which they will collect terrestrial moss and air samples. They will also collect samples from the moss Ceratodon purpureus at other terrestrial sites on KGI, which they will reach by Zodiac inflatable boat.

Deploying Team Members

- Maria Casanova-Katny
- Hannah Prather
- Todd Rosenstiel (Co-PI)

2016-2017 USAP Field Season
Project Detail

Project Title

Quantifying Atmospheric Iron Properties Over The Western Antarctic Peninsula

Summary

Event Number:
O-231-P
NSF/PLR Award 1341494

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
Matthew Erickson / Jamee Johnson

Principal Investigator

Dr. Yuan Gao
yuangaoh@andromeda.rutgers.edu

Rutgers University
Newark, New Jersey

Location

Supporting Stations: Palmer Station
Research Locations: On station

Description

The primary goal of this project is to quantify atmospheric iron properties in the marine atmospheric boundary layer over the Western Antarctic Peninsula (WAP). The specific objectives are to: (1) Identify the sources of atmospheric iron; (2) Determine iron solubility and aerosol composition; (3) Measure the temporal variability of atmospheric iron/dust deposition; and (4) Examine the iron-sulfur relationships. To accomplish these objectives, researchers will collect atmospheric samples, namely aerosol particles and atmospheric deposition, at Palmer Station, using two sampling plans. The first plan is intensive austral summer field atmospheric sampling to be made in two successive field seasons. This will be accomplished using seven air samplers controlled by a wind sector to measure chemical and physical properties of the atmospheric samples. The second plan is for inter-annual measurements of aerosols and atmospheric deposition. This plan will collect total atmospheric deposition monthly and atmospheric aerosols weekly.

Field Season Overview

This will be the second field season for this event, and the general sampling framework used in the first field season will apply. One team member will live and work at Palmer Station from early November to early February. This person will reinstall air samplers plus associated electronic devices such as pumps on the platform behind station, where they will then take air samples.

This event will require support from Palmer Station during the instrument install and uninstall after field work is finished. Support from the electrician and research associate (RA) in regards to the power supply and weather station connection is also needed during the operation of air sampling. There is also a need for assistance with on-site

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meteorological data for better interpretation of chemistry data.

Deploying Team Members

- Yuan Gao (PI)
- Shun Yu
- Zhou Wanchang

2016-2017 USAP Field Season
Project Detail

Project Title

Synoptic Geospace Systems Analysis Using Instrumentation From South Pole And McMurdo Stations

Summary

Event Number:
A-111-M/S
NSF/PLR Award 1247975

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Samina Ouda / Elizabeth Kauffman / Paul Sullivan

Principal Investigator

Dr. Andrew Gerrard
gerrard@njit.edu

New Jersey Institute of Technology
Department of Physics
Newark, New Jersey

Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: Arrival Heights (ASPA 122) / B2 Science Building / Atmospheric Research Observatory

Description

The ionosphere-thermosphere-magnetosphere (ITM) region of Earth's atmosphere, which is part of the larger geospace environment, is the portal through which the solar wind can enter and impact our planetary system. Though space weather research over the past decades has greatly increased our understanding of a wide variety of phenomena associated with ITM physics, the sum of these individual processes occurring in the geospace environment does not replicate the rich diversity and scope of this complex region. Thus, a more holistic approach to ITM research is necessary, one that integrates clustered instrumentation at multiple locations to simultaneously look at the interactions within the entire system. Using coordinated and collaborative instrumentation currently installed in Antarctica, researchers will study interrelated ITM phenomena observed at high latitudes with the goal of better understanding the energy transfer and modulation of the geospace system.

Field Season Overview

Field team members on this project will: (1) Check on all instrumentation and update firmware and data acquisition (DAQ) as needed; (2) Install new photometers at Arrival Heights and in B2, and package the old photometers for retrograde to the home institution; (3) Check the riometer system and repair as needed. (4) Train ASC science technicians to perform routine maintenance on the equipment; (5) Check the installation/operation of the all-sky imagers; (5) Transfer GPS data; and, (6) Install an Absolute Field Magnetometer.

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Deploying Team Members

- Gilbert Jeffer
- Joseph Kujawski
- Bob Melville
- Andrew Stillinger

2016-2017 USAP Field Season
Project Detail

Project Title

Pathways Of Circumpolar Deep Water To West Antarctica From Profiling Float And Satellite Measurements

Summary

Event Number:
O-398-N
NSF/PLR Award 1341496

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
Chelsea Wegner / Adam Jenkins

Principal Investigator

Dr. James Bannister Girton
girton@apl.washington.edu

University of Washington
Seattle, Washington

Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: Southern Ocean / Amundsen Sea

Description

Researchers plan to investigate the Amundsen Sea pathways of circumpolar deep water (CDW) transport from the open ocean to the Antarctic continental shelf. Subsurface profiling floats equipped to operate under sea ice will be deployed south of the polar front and will measure shear, turbulence, temperature, and salinity to 2,000-meter depth on a two-year mission following the CDW layer. Aided by the velocity measurement technique of motional induction to improve under-ice navigation, the subsurface data collected by the floats will also be used to extrapolate the spatial and temporal coverage of satellite-derived surface currents to the deeper levels where CDW is found.

Field Season Overview

Participants will sail on the RVIB Nathaniel B Palmer on transit cruise NBP17-01 from Punta Arenas, Chile to McMurdo Station, Antarctica. En route, they will deploy three Electromagnetic Autonomous Profiling Explorer (EM-APEX) profiling floats in an ice free region of the seasonal ice zone in the Amundsen Sea sector. The target sites for these deployments will be along the cruise track planned for the transit at the intersection with primary satellite derived frontal pathways toward the continental slope. The team will also attempt to recover four EM-APEX floats that were deployed in previous years.

Deploying Team Members

- Avery Snyder

Project Indexes

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Project Detail

Project Title

Sustained Measurements Of Southern Ocean Air-Sea Coupling From A Mobile Autonomous Platform

Summary

Event Number:
O-226-L/N
NSF/PLR Award 1558448

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
Chelsea Wegner / Adam Jenkins

Principal Investigator

Dr. James Bannister Girton
girton@apl.washington.edu

University of Washington
Seattle, Washington

Location

Supporting Stations: ARSV Laurence M. Gould, RV/IB Nathaniel B. Palmer
Research Locations: Drake Passage / Ocean Observatories Initiative (OOI) Southern Ocean Array

Description

The coupled air-sea dynamics of the Southern Ocean play a critical role in the ocean's transport and storage of heat and carbon dioxide and the response of these processes to climate change. This project seeks to enhance the capability to observe these dynamics with autonomous technology by deploying a Liquid Robotics Wave Glider SV3 for five months to measure surface waves, temperature and salinity, upper-ocean currents, barometric pressure, and winds. The Wave Glider will be deployed at the Ocean Observatories Initiative (OOI) Southern Ocean array from the RVIB Nathaniel B. Palmer (NBP). For the first two to three months of its deployment, the glider will study spatial structure and will cross-calibrate the various sensors at the OOI array and their responses to vehicle heading and wind and wave conditions. For the next two months, the glider will transit to the Drake Passage and conduct an underway downstream grid survey of the Antarctic Circumpolar Current (ACC). Next, it will collect time-series measurements in the weak-current region between the Polar Front and the southern ACC. The glider will be recovered by the ARSV Laurence M. Gould (LMG) in late March or early April.

Field Season Overview

Two participants will sail on the OOI Southern Ocean cruise (NBP16-10). The team will deploy the Wave Glider using a mechanical wire from the starboard A-frame upon first arrival at the OOI Array. This will allow sufficient time to review the performance and data quality of the Wave Glider before OOI operations are concluded and the NBP leaves the area. The deployment will require approximately one hour of ship time. The team will also compare wind and other measurements gathered by the Wave Glider against those

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gathered by the NBP. In the event that the Wave Glider is damaged on deployment or while the NBP is on site at the OOI Array, inspection by small boat operations or recovery by the research vessel will be attempted as conditions allow.

Deploying Team Members

- Alex de Klerk
- Avery Snyder

2016-2017 USAP Field Season
Project Detail

Project Title

A Field And Laboratory Examination Of The Diatom N And Si Isotope Proxies: Implications For Assessing The Southern Ocean Biological Pump

Summary

Event Number:
G-152-N
NSF/PLR Award 1341464

Program Manager:
Dr. Thomas Wilch

ASC POC/Implementer:
Chelsea Wegner / Adam Jenkins

Principal Investigator

Dr. Rebecca Robinson Graham
rebeccar@gso.uri.edu

University of Rhode Island
Graduate School of Oceanography
Narragansett, Rhode Island

Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: Southern Ocean transect: 54-67S, 170W

Description

Diatom nitrogen (N) and silicon (Si) isotopes are important paleoceanographic tools used to investigate the role of the Southern Ocean biological pump in regulating atmospheric CO_2. Existing calibrations, including culture experiments, surface sediment data and downcore reconstructions, suggest that nutrient utilization is the primary driver of Southern Ocean N and Si. However, a strong species effect is implied by recent culture results. Moreover, field and laboratory studies present contradictory results on the relative importance of inter-specific variation and diagenetic alteration of nutrient isotope signals to isotope records. This project is a first-order test of N and Si diatom nutrient isotope paleo-proxies using field sampling of natural diatom assemblages and laboratory culturing of field-isolates. Researchers need natural samples to test the relationships between dissolved nitrate, organic matter, and diatom-bound N isotopes as well as silicic acid and diatom Si isotopes, and to verify culture observations. To that end, the science team will collect Southern Ocean water, biomass, live diatoms, and fossil diatoms to investigate species and assemblage related variability in diatom N and Si isotopes and their relationship to surface nutrient fields and early diagenesis.

Field Season Overview

Researchers will board the vessel at McMurdo Station and will sail to Lyttelton, New Zealand. They will sample at intervals of approximately 1 degree of latitude along 170°W between 54 and 66°S. The actual site locations will depend upon the availability of coring locations and sediments adequate for coring. They will sample the water column for dissolved phases using Niskin casts (12 depths/cast), for particulates using large volume

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McLane filtration pumps (4 depths/cast), and will sample the underlying sediments at each station using a Mega-Corer. They will also conduct several incubation experiments in the constant temperature cold room facilities on board.

Deploying Team Members

- Mark Brzezinski (Co-PI)
- Ivia Closset
- Jessica Freedman
- Marlo Garnsworthy
- Rebecca Graham (PI)
- Diana Gutierrez Franco
- Colin Jones
- Janice Jones
- Roger Kelly
- Heather McNair

2016-2017 USAP Field Season
Project Detail

Project Title

Flow And Fracture Dynamics In An Ice Shelf Lateral Margin: Observations And Modeling Of The McMurdo Shear Zone

Summary

Event Number:
I-178-M
NSF/PLR Award 1246400

Program Manager:
Dr. Julie Palais

ASC POC/Implementer:
Judy Shiple / Elizabeth Kauffman

Principal Investigator

Dr. Gordon S Hamilton
gordon.hamilton@maine.edu

University of Maine
Climate Change Institute
Orono, Maine

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo Shear Zone

Description

The McMurdo Shear Zone (SZ) is a five-kilometer wide swath of intensely and extensively crevassed ice about 40 kilometers from McMurdo Station. At present, there is little understanding of its dynamics with regard to how often, how wide, and where crevasses form, other than a general knowledge of the mechanics of fracture. It is unknown if the SZ is a stable or a transient and chaotic boundary layer evolving into even more chaotic flow that will eventually degrade and separate the Ross and McMurdo Ice Shelves. During this three-year project, researchers hope to answer this question of present and future stability by gathering observations required for the development of a three-dimensional finite element time-dependent model of the McMurdo SZ stress fields. To accomplish this objective, the science team will establish a GPS network and perform ground-penetrating radar (GPR) surveys both within and outside the SZ. The Yeti robot will be used to obtain GPR profiles, particularly in crevassed terrain.

Field Season Overview

A team of seven, including three scientists, two robot operators, a mountaineer, and a PolarTREC teacher, will camp near the McMurdo Shear Zone (SZ) for three weeks. The team will conduct repeat GPS surveys to obtain surface strain rates and will perform robotic GPR surveys within the SZ. Two days of helicopter support will be needed to resurvey the GPS network. Two 150 lb. battery-powered robots will be deployed in the field. The robots navigate autonomously along pre-set routes comprised of GPS waypoints to conduct transect and grid surveys in the SZ. The range of these robots is approximately 18 km. The GPS network was established in the first field season and has been resurveyed

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in subsequent seasons.

Deploying Team Members

- Peter Braddock
- Joshua Elliott
- Gordon Hamilton (PI)
- Lynn Kaluzienski
- James Lever (Co-PI)
- David Thesenga
- Benjamin Walker

2016-2017 USAP Field Season
Project Detail

Project Title

Rebreather Testing For The NSF DPP USAP Scientific Diving Program

Summary

Event Number:
T-913-M
NSF/PLR Award 1553824

Program Manager:
Dr. Chris Fritsen

ASC POC/Implementer:
Jenny Cunningham / Rob Robbins

Principal Investigator

Mr. John N Heine
jheine@ucsd.edu

Jacksonville University
Jacksonville, Florida

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo Sea Ice

Description

The use of closed-circuit rebreathers has been increasing in the recreational and scientific diving communities over the past decade. With the advent of a variety of commercially available systems at reasonable cost, rebreathers can be considered a useful tool for extended range and technical scientific diving in certain environments. Open-circuit scuba diving, evolving from the double-hose to single-hose regulator, and twin cylinders to large single cylinders, has been the main mode of diving in Antarctica for more than 40 years. While scuba will remain the preferred mode for relatively shallow, no-decompression diving, the use of rebreathers involves a much different approach, which will become more desirable for some researchers, especially as the units become smaller and easier to use. The scientific advantages of rebreathers include extended range, decompression optimization, extended underwater times, reduced logistical needs at remote sites, and reduced disturbance because of quiet operation and little-to-no air bubble production. Before rebreathers can be approved for USAP scientific diving use, they must be evaluated to be safe and reliable. This project will test and evaluate rebreathers with the aim of eventually gaining Scientific Diving Control Board approval for their use. The use of rebreathers could facilitate several avenues of Antarctic research, including, but not limited to: (1) Behavioral studies; (2) Studies of sea-ice-bottom communities, where bubbles from open circuit scuba can disrupt the platelet ice community; (3) Studies of highly stratified lake communities; and (4) Studies requiring deeper and/or longer exposures.

Field Season Overview

The team will work with three Antarctic Support Contractor (ASC) divers while based at McMurdo Station for six weeks. The group will require Reed-drilled holes in the ice. They will conduct work at established dive sites in the vicinity of McMurdo Station.

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Deploying Team Members

- Jeffrey Bozanic
- John Heine (PI)
- Christian McDonald

2016-2017 USAP Field Season
Project Detail

Project Title

Operation And Maintenance Of A CTBT Radionuclide Monitoring Station At Palmer Station

Summary

Event Number:
T-998-P
NSF/PLR CTBTo MOA

Program Manager:
Mr. Pat Smith

ASC POC/Implementer:
Samina Ouda / Jamee Johnson

Principal Investigator

Mr. Bouvard Hosticka
bh@virginia.edu

University of Virginia
Charlottesville, Virginia

Location

Supporting Stations: Palmer Station
Research Locations: Terra Lab

Description

This project services and calibrates the automated radionuclide air-particulate monitoring system in the International Monitoring Station (IMS) building (Terra Lab) at Palmer Station.

Field Season Overview

An engineer will visit Palmer Station for a brief deployment to maintain and upgrade the installed monitoring equipment. The Palmer Research Associate (RA) will provide ongoing support throughout the year. Logistical support involves shipping supplies, such as filter media and replacement equipment, to the station, as well as sending the samples on a quarterly basis to Vienna, Austria. Occasionally single samples must be sent to laboratories elsewhere in the world for reanalysis.

Deploying Team Members

- Bouvard Hosticka (PI)
- Edward Tillistrand

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2016-2017 USAP Field Season
Project Detail

Project Title

Using Gravity Waves To Probe The Solar Atmosphere

Summary

Event Number:
A-367-M/S
NSF/PLR Award 1341755

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Samina Ouda / Paul Sullivan / Leah Street

Principal Investigator

Dr. Stuart Jefferies
sjefferies@gsu.edu

University of Hawaii
Pukalani, Hawaii

Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: South Pole Solar Observatory

Description

Researchers on this project will measure and characterize internal gravity waves omnipresent in the Sun's atmosphere, identify their role in transporting energy and momentum, and use the properties of those waves to provide a mapping of the structure and dynamics of the Sun's atmosphere. The data necessary to achieve these goals will come from two high-sensitivity and high-stability Doppler-magnetographs. The first is located at a remote site three to four kilometers from the South Pole; the second from the Helioseismic Magnetic Imager instrument located in outer space. The goal is to image the velocity fields with high spatial resolution at three heights in the solar atmosphere. The image data will allow the project to make the first detailed characterization of the properties of the internal gravity waves and to take a first step toward capitalizing on their potential as a diagnostic tool for probing the solar atmosphere.

Field Season Overview

In this, the first of two seasons, a team of four will deploy to South Pole Station at the beginning of the field season to assemble and test the instruments, and to deploy them to the South Pole Solar Observatory (SPSO), three to four kilometers from South Pole station. They will travel by snowmobile to and from their field site each day. Later in the season, two additional team members will arrive at South Pole and two from the original team will return to McMurdo. The four remaining at Pole will work as two-person teams, each covering 12-hour shifts at SPSO until the end of the season.

Deploying Team Members

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- Bernhard Fleck
- William Giebink
- Stuart Jefferies (PI)
- Neil Murphy (Co-PI)
- Garry Nitta

2016-2017 USAP Field Season
Project Detail

Project Title

Investigating Iron-Binding Ligands In Southern Ocean Diatom Communities: The Role Of Diatom-Bacteria Associations

Summary

Event Number:
B-230-N
NSF/PLR Award 1443474

Program Manager:
Dr. Chris Fritsen

ASC POC/Implementer:
Matthew Erickson / Adam Jenkins

Principal Investigator

Dr. Bethany Diane Jenkins
jenkins.bethany@gmail.com

University of Rhode Island
Richmond, Rhode Island

Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: Western Antarctic Peninsula

Description

This project will combine expertise in trace-metal biogeochemistry, phytoplankton cultivation and molecular biology to address questions regarding iron-binding ligand production and the role of diatom-bacterial interactions in a well-established iron-limited region, the Southern Ocean. Team members will conduct field-incubation experiments in both the low-iron, high-nutrient, low-chlorophyll waters of the Drake Passage and in the naturally iron-enriched waters of the Western Antarctic Peninsula. They will conduct the incubations in early austral spring and will collect all seawater for experiments with trace-metal-clean sampling and techniques to minimize contamination risks. They will conduct three incubation experiments over the course of one cruise using shipboard incubators set to the ambient seawater temperature and light cycles.

Field Season Overview

Fieldwork includes repeated seawater collection with trace metal and conventional sampling conductivity-temperature-depth (CTD) rosettes at three stations for a series of shipboard incubation experiments designed around ambient biological communities. The team will use three weeks of ship time aboard the RVIB Nathaniel B. Palmer (NBP) for their shipboard field incubation experiments. At the start of the cruise, the science team will sample an offshore station in the South Drake Passage. At the beginning of the second week, they will sample an inshore station within the Palmer-Long-Term Ecological Research (PAL-LTER) inshore sampling grid, and at the beginning of the third week, they will resample the initial South Drake Passage site to complete their third incubation experiment.

Deploying Team Members

- Kristen Buck (Co-PI)
- Phoebe Chappell (Co-PI)
- Laura Filliger
- Bethany Jenkins (PI)

2016-2017 USAP Field Season
Project Detail

Project Title

EAGER: Single-Molecule Sequencing Of Antarctic Paleolakes

Summary

Event Number:
G-062-M
NSF/PLR Award 1620976

Program Manager:
Dr. Thomas Wilch

ASC POC/Implementer:
Jenny Cunningham / Meghan Walker

Principal Investigator

Dr. Sarah S Johnson
sj599@georgetown.edu

Washington, District of Columbia

Location

Supporting Stations: McMurdo Station
Research Locations: Lake Vida / Mount Boreas / Pyramid Trough

Description

Despite recent advances, we still know little about how life and its traces persist in extremely harsh conditions. What survival strategies do cells employ when pushed to their limit? During this field season, researchers will sample paleolake facies using sterile techniques from multiple Dry Valleys sites and extract DNA from entombed organic material. Genetic material will then be sequenced using Pacific Biosciences' Single Molecule, Real-Time DNA sequencing technology, which sequences native DNA as opposed to amplified DNA, thereby eliminating PCR primer bias, and enables read lengths that have never before been possible. The data will be analyzed with a range of bioinformatic techniques, with results that will likely impact our understanding of cell biology, Antarctic microbiology and biogeography, biotechnology, and planetary science.

Field Season Overview

Field team members will make day trips by helicopter from station to various sites in the McMurdo Dry Valleys. They will travel on foot and collect microbial mat, geologic, and sediment samples from lake edges and from nearby upslope deposits. They will use small spades, hand shovels, and sterile spatulas to collect small samples and deposit them in Whirl-Paks, vials, or bottles. The samples will be immediately placed on ice or in a cryoshipper. They will also collect some lake water samples. They will process samples and perform some extractions to assess DNA quality and do preliminary sequencing analyses in the Crary Lab but the majority of their samples will be prepared for shipment to the home institution for further analyses.

Deploying Team Members

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- Yu Bai
- David Goerlitz
- Sarah Johnson (PI)
- Scott Tighe

2016-2017 USAP Field Season
Project Detail

Project Title

Impacts Of Local Oceanographic Processes On Adélie Penguin Foraging Ecology Over Palmer Deep

Summary

Event Number:
B-005-L
NSF/PLR Award 1327248

Program Manager:
Dr. Chris Fritsen

ASC POC/Implementer:
Samina Ouda / Cara Ferrier

Principal Investigator

Dr. Josh Kohut
kohut@marine.rutgers.edu

Rutgers University
Institute for Marine & Coastal Sciences
New Brunswick, New Jersey

Location

Supporting Stations: ARSV Laurence M. Gould
Research Locations: Joubin and Wauwerman Islands

Description

The application of innovative ocean-observing and animal-telemetry technology over Palmer Deep (Western Antarctic Peninsula; WAP) is leading to new understanding and also to many new questions related to polar ecosystem processes and their control by bio-physical interactions in the polar environment. This multi-platform field study will investigate the impact of coastal physical processes, e.g., tides, currents, upwelling events, and sea ice, on Adélie penguin foraging ecology in the vicinity of Palmer Deep off Anvers Island, WAP. Research efforts will be guided by real-time surface convergences and divergences based on remotely sensed surface-current maps derived from a coastal network of high-frequency radars. The multidisciplinary research team will adaptively sample the distribution of phytoplankton and zooplankton, which influence Adélie penguin foraging ecology, to understand how local oceanographic processes structure the ecosystem.

Field Season Overview

The field team will sail on the ARSV Laurence M. Gould (LMG) to Palmer Station, with stops at Joubin and Wauwermans Islands. They will disassemble the three currently deployed codar sites (5 days each) and return the equipment by Zodiac to the LMG where it will be stored in two, 20 ft. shipping containers for transport back to Punta Arenas, Chile, and eventually to the home institution.

Deploying Team Members

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- Hank Statscewich
- Peter Winsor

2016-2017 USAP Field Season
Project Detail

Project Title

Characterization Of Upstream Ice And Firn Dynamics Affecting The South Pole Ice (SPICE) Core

Summary

Event Number:
I-193-M/S
NSF/PLR Award 1443471

Program Manager:
Dr. Julie Palais

ASC POC/Implementer:
Judy Shiple / Jennifer Blum / Paul Sullivan

Principal Investigator

Dr. Michelle R Koutnik
mkoutnik@uw.edu

University of Washington
Department of Earth and Space Sciences
Seattle, Washington

Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: SPICE core upstream catchment

Description

The goal of this project is to improve the ice and gas chronologies for the South Pole Ice core (SPICE core) by making in-situ measurements of firn compaction in the upstream catchment area. The upstream catchment area is a 110 kilometer by 70° wedge between 110° E and 180° E, situated to the northeast of South Pole Station. The research team will measure the modern gradients in accumulation rate, surface temperature, and water-stable isotopes to separate spatial (advection) variation from temporal (climate) variations in the ice-core records.

Field Season Overview

This is the second of four seasons for this event. Seven participants (including two IDDO drillers) will spend time working at South Pole Station, but the majority of their time will be spent at the remote field camp. A PistenBully will be used to travel between station and camp. The team will resurvey the GPS network to determine flowline and will collect ice penetrating radar data along the established flowline. They will drill up to 14 holes to depths ranging from 5-120 meters using an IDDO 4-inch drill system. The team will also hand-auger ten 12-meter cores and will collect and process one 120-meter firn core. Up to 24 ice cores in boxes will be transported from camp to station by approximately January 10. Team members will construct instrument platforms and install up to 12 strain meters and a 40-meter thermistor string as well.

Deploying Team Members

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- Howard Conway (Co-PI)
- Maurice Conway
- Christopher Stevens

2016-2017 USAP Field Season
Project Detail

Project Title

Friis Hills Drilling Project: An International Collaboration To Examine The Miocene Transition In Antarctica

Summary

Event Number:
G-091-M
NSF/PLR Award 1638954

Program Manager:
Dr. Thomas Wilch

ASC POC/Implementer:
Jenny Cunningham / Elizabeth Kauffman

Principal Investigator

Undefined Douglas Edward Kowalewski
douglas.kowalewski@worcester.edu

Worcester, Massachusetts

Location

Supporting Stations: McMurdo Station
Research Locations: Friis Hills

Description

Ancient and well-preserved glacial lake sediments have proven to be a valuable terrestrial paleoclimate record in Antarctica. For this project, a U.S. research team will join scientists supported by Antarctica New Zealand (ANZ) to reconstruct past climate and glacial response from a terrestrial perspective using data derived from coring paleolake sediments in the Friis Hills. The ANZ team will lead the drilling operations and the US team will aid in core interpretation and correlation of core intervals to local surficial geology deposits. Paleoclimate indicators and timing of events derived from terrestrial layers will be directly compared to the marine sediment core record (ANDRILL and IODP), allowing synthesis of environmental data across a broad onshore-offshore transect. The goal is to better understand Antarctica's mid-Miocene transition from a vegetated to glaciated landscape.

Field Season Overview

Participants will work with a team supported by Antarctica New Zealand (ANZ) to recover approximately 200 meters of sediment cores from the Friis Hills. The USAP team will join the established ANZ campsite in the Dry Valleys at Friis Hills. The USAP group will require their own logistical support, including personal tents, kitchen, toileting, other field camp equipment, and food. USAP helicopters will facilitate camp put-in and pull-out, camp resupply, and an aerial survey. The teams will work together to drill and recover sediment cores from three sites near the camp, and a fourth sampling site located in eastern Friis Hills. They will access all sites by foot. ANZ will supply and manage all drilling equipment and operations. They will also be responsible for managing, storing and shipping off continent any acquired sediment cores. The USAP group will establish chronology of the sediment core layers and use them to determine the location of Friis Hills volcanic ash surface outcrops to be sampled. Collected ash samples will be shipped to the Principal

Investigator’s home institution through the USAP cargo system. The USAP group will also set up meteorological stations that will remain in place for the duration of field deployment.

Deploying Team Members

- Anna Halberstadt
- Douglas Kowalewski (PI)

2016-2017 USAP Field Season
Project Detail

Project Title

Science Observation With BICEP3 CMB Polarization Experiment

Summary

Event Number:
A-365-S
NSF/PLR Award 1313010

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Payot Scheibe / Paul Sullivan

Principal Investigator

Dr. Chao-Lin Kuo
clkuo@stanford.edu

Stanford University
Stanford, California

Location

Supporting Stations: South Pole Station
Research Locations: Dark Sector Lab

Description

Background Imaging of Cosmic Extragalactic Polarization (BICEP) is an experiment designed to measure the polarization of the cosmic microwave background (CMB) to unprecedented precision, and, in turn, answer crucial questions about the beginnings of the Universe. BICEP3 is the latest upgrade to the BICEP/Keck series of refractor experiments that study degree-scale B-mode polarization from inflation. Compared to BICEP2 and SPUD (Small Polarimeter Upgrade for DASI), BICEP3's aperture is twice as large, allowing for a much larger focal plane area. BICEP3 doubles the survey speed of SPUD and focuses the sensitivity at 100 GHz, a frequency that is much less affected by dust foregrounds. BICEP3 is a powerful instrument to test whether BICEP2's measured signal is indeed of cosmological origin.

Field Season Overview

The team will remove the receiver from the BICEP mount, warm it up and replace four detector tiles. They will then cool it down again and load it back onto the mount. After verifying its performance, they will spend the remainer of their time on station measuring the beam response of the detectors.

Deploying Team Members

- Zeeshan Ahmed
- Hans Boenish
- Bryan Steinbach
- Keith Thompson

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- Howard Hui
- Jae Hwan Kang
- Ethan Karpel
- Christopher Pentacoff
- Alessandro Schillaci
- James Tolan
- Albert Wandui
- Kimmy Wu
- Eric Yang
- Kiwon Yoon

2016-2017 USAP Field Season
Project Detail

Project Title

Studies Of ULF Waves Associated With Solar Wind Coupling To The Magnetosphere And Ionosphere

Summary

Event Number:
A-102-M/S
NSF/PLR Award 1341677

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Payot Scheibe / Elizabeth Kauffman / Paul Sullivan

Principal Investigator

Dr. Marc Lessard
marc.lessard@unh.edu

University of New Hampshire
Space Science Center
Durham, New Hampshire

Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: Cusp Lab / Arrival Heights

Description

This project is a continuation of current studies using search-coil magnetometers previously installed and operating at South Pole Station's Cusp Lab, McMurdo Station's Arrival Heights, and Halley Station, a British Antarctic Survey base. Researchers use time-series data from magnetometers at these and other Antarctic sites, including the Polar Experiment Network for Geospace Upper-atmosphere Investigations (PENGUIn) Automated Geophysical Observatories, often in conjunction with data from other Arrival Heights instruments, to study the dynamics of the Earth's ionosphere and magnetosphere.

Field Season Overview

No project participants deploy in support of this project. Staff Research Associates (RAs) perform routine monitoring of the equipment and computers.

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Project Title

Music In The Ice: Musical Interpretation Of, And Instructional Module On, Ross Ice Shelf Wave-Induced Vibrations

Summary

Event Number:
W-479-M
NSF/PLR Award 1544439

Program Manager:
Ms. Valentine Kass

ASC POC/Implementer:
Judy Shiple / Elaine Hood

Principal Investigator

Mr. Glenn L McClure
mcclure@geneseo.edu

State University of New York Geneseo
Geneseo, New York

Location

Supporting Stations: McMurdo Station
Research Locations: On station

Description

Composer Glenn McClure will produce original musical compositions through translation of wave-vibration data into melodies, harmonies, and rhythms. He also will make field recordings of environmental sounds that will accompany the live performances of the resulting musical work. He will accompany the Bromirski (I-348-M) science group, whose work uses wave vibrations (at frequencies below the hearing threshold) to measure the movement of the Ross Ice Sheet as it relates to global warming. McClure's data-driven musical sketches and field recordings will serve as the foundation for a new choral/orchestral work that transports the wave vibrations detected by Bromirski's group into the hearing range within a musical narrative that dramatizes the effects of global warming.

Field Season Overview

The composer will deploy to McMurdo Station at the same time as the Bromirski (1246151/I-348-M) team and will take part in USAP field training with them. He will accompany them to a camp on the Ross Ice Shelf (RIS), where he will interview the team, observe them doing their science, and record the sounds of man's interactions with the ice. He will also spend two or more weeks at McMurdo Station, depending on the time spent at the RIS camp, where he will work on his recordings with the science data provided by Dr. Bromirski, as well as maintain communication, through blogging and Skype sessions, with his class.

Deploying Team Members

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- Glenn McClure (PI)

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Project Detail

Project Title

Lower Thermospheric Science Using New Meteor Radars At McMurdo And WAIS Divide

Summary

Event Number:
A-284-M
NSF/PLR Award 1543446

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Samina Ouda / Elizabeth Kauffman / Chad Naughton

Principal Investigator

Dr. Scott Palo
scott.palo@colorado.edu

University of Colorado Boulder
Department of Aerospace Engineering Sciences
Boulder, Colorado

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo Station

Description

The primary goal of this research is to observe, quantify, model, and further understand the spatial-temporal structure and variability of the mesosphere and lower thermosphere (MLT) circulation above Antarctica with a specific focus on four questions: (1) What are the zonal phase speeds and directions of individual spectral wave components? (2) What are the relationships between variations in the wave spectrum and meteorological conditions in the stratosphere and mesosphere? (3) To what degree are the various wave components consistent with proposed sources of excitation and with intervening wave propagation conditions? (4) What parts of the observed wave spectrum propagate into the space-atmosphere interaction region (SAIR) system with significant amplitudes, and what roles might they play in terms of SAIR variability or net momentum and heat deposition?

Field Season Overview

A science team of four participants will be at McMurdo Station in November 2016 to install a meteor radar at McMurdo. The installation should take approximately three to four weeks, followed on by a three to four week system testing and burn-in period. They will need a 50 m x 50 m area and an area or small dedicated building where the radar transmitter, computer and receiver can be located. It will need to be temperature controlled and large enough that a technician can work comfortably. Internet access is necessary to monitor the radar remotely and uplink data. Between 10MB and 1GB/day is required for the data uplink. Raw data will be stored on site and collected annually. Power required between 3 to 5kW at either 110 or 220VAC. Research Associate support will be required every season and during the winter. The Research Associate will be trained for overseeing the radar over

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the winter for approximately four hours per week. The system can be monitored remotely by the PI. Approximately 200GB/year of data will be collected.

Deploying Team Members

- Scott Palo (PI)
- Damian VanBuren

2016-2017 USAP Field Season
Project Detail

Project Title

Troposphere-Ionosphere Coupling Via Atmospheric Gravity Waves

Summary

Event Number:
A-373-P
NSF/PLR Award 1341557

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
Samina Ouda / Jamee Johnson

Principal Investigator

Dr. Vadym V Paznukhov
vadym.paznukhov@bc.edu

Chestnut Hill, Massachusetts

Location

Supporting Stations: Palmer Station
Research Locations: On station

Description

The goal of this project is to enhance the comprehensive understanding of troposphere-ionosphere coupling via atmospheric gravity waves (AGWs) in the Antarctic region. The Antarctic Peninsula offers a unique opportunity for studying troposphere-ionosphere interaction via AGWs since this region was shown to have a significant presence of tropospherically generated AGWs. Researchers will use both experimental and modeling efforts to investigate the efficiency and main characteristics of such coupling and will address several questions remaining in the current understanding of this coupling process.

Field Season Overview

No team members will deploy this season. The system installed at Palmer station in the 2015-16 season has been operating in automatic mode and requires only minor maintenance by an ASC Research Associate to visually inspect the outside installation for possible physical damage from the environment or wildlife, and occasionally troubleshooting the operating system.

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Project Detail

Project Title

Investigating Holocene Shifts In The Diets And Paleohistory Of Antarctic Krill Predators

Summary

Event Number:
B-025-E
NSF/PLR Award 1443585

Program Manager:
Dr. Chris Fritsen

ASC POC/Implementer:
Chelsea Wegner / Cara Ferrier

Principal Investigator

Dr. Michael John Polito
mpolito@lsu.edu

Louisiana State University Baton Rouge
Baton Rouge, Louisiana

Location

Supporting Stations: Special Project
Research Locations: Antarctic Peninsula

Description

Researchers will sample active and abandoned penguin colonies for sediments and tissues and conduct radiocarbon, stable isotope, and mercury analyses to investigate paleohistory and diet of penguins. Sediments will be analyzed by Chinese collaborators for bio-elements from past penguin occupations. Data will be correlated with paleoclimatic signals to assess population movement and occupation history in penguins. This project will also involve international collaborations to investigate the underlying mechanisms behind shifts in the diets and paleohistory of Antarctic krill predators in concert with climate variability and anthropogenic harvesting during the Holocene. Modern and ancient Antarctic krill predator tissues from penguins, seals, and squid recovered during this project will be combined with historic museum specimens and modern and ancient tissues available from previous paleoecological excavations.

Field Season Overview

Researchers will sample locations that have active penguin colonies in the northern Antarctic Peninsula region. They will access those locations using existing collaborations with private tour ship companies.

Deploying Team Members

- Kelton McMahon (Co-PI)
- Chantel Michelson
- Michael Polito (PI)
- Michael Polito (PI)

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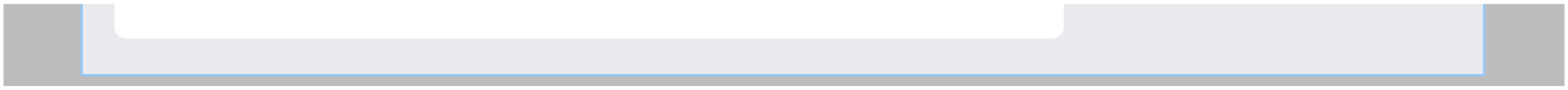

2016-2017 USAP Field Season
Project Detail

Project Title

IcemiR: The Evolution Of MicroRNA Control In Antarctic Fish

Summary

Event Number:
B-029-P
NSF/PLR Award 1543383

Program Manager:
Dr. Chris Fritsen

ASC POC/Implementer:
Matthew Erickson / Jamee Johnson

Principal Investigator

Dr. John Harvey Postlethwait
jpostle@uoneuro.uoregon.edu

University of Oregon
Eugene, Oregon

Location

Supporting Stations: Palmer Station
Research Locations: Western Antarctic Peninsula

Description

MicroRNAs (miRNAs) are key post-transcriptional regulators of gene expression that modulate development and physiology in animals inhabiting temperate climates. miRNAs have yet not been studied in Antarctic animals, including Notothenioid fish, which dominate the Southern Ocean. This project will compare miRNA regulation in (1) Antarctic vs. temperate fish to learn the roles of miRNA regulation in adaptation to constant cold and (2) In bottom-dwelling, red-blooded Nototheniods vs. high-buoyancy white-blooded icefish to understand miRNA regulation after loss of hemoglobin genes and red blood cells, enlarged heart and vasculature, and increased buoyancy due to decreased bone mineralization and increased lipid deposition.

Field Season Overview

To achieve the aims as detailed below, we require several fishing trips and time at Palmer Station to acclimate animals and perform the temperature change experiments, as well as equipment on station to perform the temperature change experiments. Aim 1 is to compare four Antarctic Notothenioid species to two temperate Notothenioids and two temperate laboratory species for gene expression patterns under different temperature conditions.. Aim 1A requires the collection of samples for genome sequencing of four species of Antarctic fish: Gobionotothen gibberifrons (humped rockcod), Notothenia coriiceps (bullhead notothen), Champocephalus gunnari (mackerel icefish), and Chaenocephalus aceratus (blackfin icefish), all abundant near Palmer Station. Aim 1B requires the gradual acclimation of G. gibberifrons and N. coriiceps to their Critical Temperature Minima (CTMin) to test if they respond to colder-than-normal water, then isolation of miRNAs and mRNAs from adult brain, liver, pancreas, and gills of acclimated fish and controls held at normal temperatures to assess gene expression patterns. Aim 1C requires giving Antarctic

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fish a heat shock and a cold shock to test for changes in gene expression. Aim 2 is to compare gene miRNA and mRNA gene expression profiles of various tissues from white-blooded, osteopenic Antarctic icefish to red-blooded, well mineralized Antarctic fish. Aim 2A requires adult Antarctic fish of the species listed above, from which we will dissect head kidney, heart, cranium, pectoral girdle, and skeletal muscle. Aim 2B requires no work in Antarctica; it involves testing Antarctic fish genes in transgenic zebrafish.

Deploying Team Members

- Thomas Desvigne
- Bill Detrich (Co-PI)
- John Postlethwait (PI)

2016-2017 USAP Field Season
Project Detail

Project Title

Subglacial Antarctic Lakes Scientific Access (SALSA): Integrated Study Of Carbon Cycling In Hydrologically Active Subglacial Environments

Summary

Event Number:
C-533-M
NSF/PLR Award 1543537

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Judy Shiple / Jennifer Blum / Matthew Kippenhan

Principal Investigator

Dr. John Priscu
jpriscu@montana.edu

Montana State University Bozeman
Land Resources and Environmental Sciences
Bozeman, Montana

Location

Supporting Stations: McMurdo Station
Research Locations: Whillans Ice Plain

Description

This project is the surface geophysics component of the Subglacial Antarctic Lakes Scientific Access (SALSA) project, which will drill into Subglacial Lake Mercer during the 2017-18 field season. To prepare for the drilling season, researchers will rearrange the existing WISSARD GPS array (eight stations total) in line with the SALSA project goals. These continuous GPS (cGPS) stations will monitor subglacial lake activity and related ice-dynamic changes. Of the eight existing stations, three will be moved while the other five will be serviced. The research team will also implement two temporary GPS experiments to "fill in the gaps" of their permanent cGPS array.

Field Season Overview

Field team members travel by LC-130 aircraft from McMurdo to the Whillans Ice Stream where they will establish a base tent camp for approximately six weeks, making trips by snowmobile to other tent camp locations. They will collaborate with team members from event C-525-M (Schwartz) to remove all seismic equipment and to service and reposition GPS stations. The combined, five-person field team plus a mountaineer will visit three different sites: The ACT ski way (put-in location), grounding zone location WG (seismic array location), and central sticky region WS (seismic array location).

Deploying Team Members

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- Matthew Siegfried (Team Leader)

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Project Detail

Project Title

Smithsonian Magazine “Worst Journey In The World” Article

Summary

Event Number:
Y-605-M

Program Manager:
Mr. Peter West

ASC POC/Implementer:
Elaine Hood / Jenny Cunningham

Principal Investigator

Undefined Kim Stanley Robinson
kimstanleyrobinson@gmail.com

Davis, California

Location

Supporting Stations: McMurdo Station
Research Locations: Capes Crozier, Evans and Royds

Description

Mr. Kim Stanley Robinson will visit McMurdo station for ten to fourteen days to inspire composition of a Smithsonian Magazine article on the "Worst Journey in the World" expedition. In his writings, Mr. Robinson will integrate outreach commentary on McMurdo-based science in the context of the Antarctic Infrastructure Modernization for Science (AIMS) project.

Field Season Overview

While based in McMurdo, the writer will make day trips by snowmobile to Cape Evans, and by helicopter to Stone Igloo at Cape Crozier and to Shackleton's Nimrod Hut at Cape Royds. An ASC photographer may accompany Mr. Robinson on his site visits to obtain photographs for the Smithsonian Article. Mr. Robinson will also explore the facilities at McMurdo and converse with scientists and support staff. He may also deliver a scheduled evening talk during his stay on station.

Deploying Team Members

- Kim Robinson (PI)

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Project Detail

Project Title

Southern Ocean Diatoms And Climate Change: Quantifying The Relative Roles Of Diversity And Plasticity In Evolution

Summary

Event Number:
B-469-N
NSF/PLR Award 1543245

Program Manager:
Dr. Chris Fritsen

ASC POC/Implementer:
Chelsea Wegner / Adam Jenkins

Principal Investigator

Dr. Tatiana A Rynearson
rynearson@mail.uri.edu

University of Rhode Island
Graduate School of Oceanography
Narragansett, Rhode Island

Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: Transit from Punta Arenas, Chile to McMurdo Station

Description

The objective of this project is to characterize the physiological and genetic diversity of Southern Ocean diatoms along a transect from Punta Arenas, Chile to McMurdo Station. These characterizations will quantify the capacity of this type of phytoplankton to adapt to environmental change. The transect crosses five oceanographically distinct regions that vary in their carbonate chemistry and temperature and are thus likely to contain populations that differ in their plastic responses to environmental change. The evolutionary response of cold-adapted, biogeochemically important phytoplankton is essentially unknown and represents a knowledge gap that hampers the ability to predict future changes at the base of the marine food web. This work expands the understanding of evolutionary potential of diatoms by examining the interplay of plasticity and diversity in determining how natural selection acts on these populations.

Field Season Overview

Team members will sail on the RVIB Nathaniel B. Palmer (NBP) on a transit cruise (NBP17-01) to sample water along a transect from Punta Arenas, Chile to McMurdo Station. The transect will run through five regions: the Drake Passage, the Palmer Long-Term Ecological Research (PAL-LTER) grid, the Amundsen Sea, the Ross Sea Gyre, and the Ross Sea Continental Shelf. A conductivity, temperature, depth (CTD) sensor and rosette package will be used to collect diatoms and analyze the surface water column. They will conduct CTD casts to a maximum depth of 200 meters and will collect samples at two depths, including the surface (five meters) and at the subsurface chlorophyll maximum (estimated at no deeper than approximately 60 meters). Ideally, the team will conduct five

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to seven casts per region, with a greater frequency in the Drake Passage region. The team will also use a bucket to capture any particularly important phytoplankton samples on the ocean surface. Water sample analyses will include phytoplankton, chlorophyll a, and nutrients (nitrogen, phosphorus, silica). Analysis of the nutrient samples will occur at the home institution. On arrival at McMurdo, the science team will offload their samples and cargo on to station. They will store live cultures in a light and temperature (0-4°C) controlled incubator at Crary Lab in a ready-to-ship state. Crary Lab staff will assist with preparing their samples to return to the home institution.

Deploying Team Members

- Sinead Collins (Co-PI)
- Tatiana Rynearson (PI)

2016-2017 USAP Field Season
Project Detail

Project Title

Stochasticity And Cyroconite Community Assembly And Function

Summary

Event Number:
B-320-M
NSF/PLR Award 1443578

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Jenny Cunningham / Jennifer Blum

Principal Investigator

Dr. Steven K Schmidt
schmidts@colorado.edu

University of Colorado Boulder
EPOB
Boulder, Colorado

Location

Supporting Stations: McMurdo Station
Research Locations: Lake Hoare / Commonwealth and Canada Glaciers

Description

Cyroconite is a combination of dust and microbial material that can absorb solar radiation and cause localized melting when deposited on glacial surfaces. These melt areas, called cyroconite holes, become hosts to ice-bound microbe communities that feature a complex array of primary producers and consumers. Low temperatures in the McMurdo Dry Valleys cause ice lids to form over the holes and entomb the communities, which can persist for decades. The holes melt internally each summer, and during very warm summers the ice lid can melt, creating an open ecosystem that can allow transfer of biological material and potential reorganization of the community. Through field sampling and creation of experimental cyroconite holes, researchers will investigate how the stochastic processes that guide microbial community assembly will affect patterns in biodiversity and ecosystem processes in the McMurdo Dry Valleys.

Field Season Overview

Team members will travel by helicopter to field camps in the McMurdo Dry Valleys. Their primary objectives are to sample naturally occurring cryoconite holes, and to test methods of creating experimental holes. The group will work out of Lake Hoare fixed camp for the month of November. They will make helicopter day trips to sample Taylor and Commonwealth glaciers, collect microbial mat material at Green Creek, and to sample and drop equipment at their primary site, Canada glacier. They will access Canada glacier by foot and will conduct numerous sampling and experimental activities there. These activities will include: sampling naturally occurring cryoconite holes, using a hand auger to collect small ice cores and create artificial experimental holes, introducing local sediments to the experimental holes, deploying data loggers in some holes, and monitoring and sampling the experimental holes. In December, the group will return to McMurdo Station to process samples in the Crary laboratory. Laboratory activities will include: isolating microbial sediments from ice cores, incubations, DNA extractions, microscopy, and other biogeochemical analyses. The group will return to Lake Hoare fixed camp for two stays of four days each in December and January to monitor and sample the developing experimental cryoconite holes on Canada glacier.

Deploying Team Members

- John Darcy
- Andrew Fountain (Co-PI)
- Dorota Porazinska (Team Leader)
- Pacifica Sommers
- Thomas Yulsman

2016-2017 USAP Field Season
Project Detail

Project Title

High-Resolution Heterogeneity At The Base Of Whillans Ice Stream And Its Control On Ice Dynamics

Summary

Event Number:
C-525-M
NSF/PLR Award 1443525

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Judy Shiple / Jennifer Blum

Principal Investigator

Dr. Susan Schwartz
syschwar@ucsc.edu

University of California Santa Cruz
Earth Sciences
Santa Cruz, California

Location

Supporting Stations: McMurdo Station
Research Locations: Whillans Ice Stream

Description

This project is a two-year extension of the geophysical monitoring of the Whillans Ice Stream (WIS) initiated in 2012-13 as an addition to the Whillans Ice Stream Subglacial Access Research Drilling (WISSARD) project. The research team's primary objective is investigating basal sliding of the WIS, both near and far, from regions known to be underlain by subglacial water, and to assess the role that hydrologic and mechanical properties of the ice-bed interface play in ice-stream motion.

Field Season Overview

Field team members will travel by LC-130 aircraft from McMurdo to the Whillans Ice Stream where they will establish a base tent camp for approximately six weeks, making trips by snowmobile to other tent camp locations. They will collaborate with team members from event C-533-M (Priscu) to remove all seismic equipment and to service and reposition GPS stations. The combined, five-person field team plus a mountaineer will visit three different sites: The ACT ski way (put-in location), grounding zone location WG (seismic array location), and central sticky region WS (seismic array location).

Deploying Team Members

- Sarah Neuhaus
- Sarah Neuhaus
- Jorge Protti Quesada
- Jake Walter (Team Leader)

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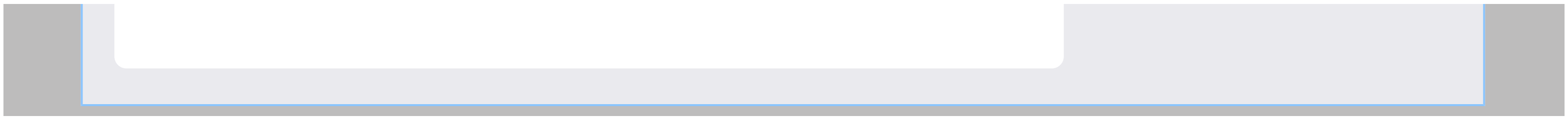

2016-2017 USAP Field Season
Project Detail

Project Title

Impact Of Convective Processes And Sea Ice Formation On The Distribution Of Iron In The Ross Sea: Closing The Seasonal Cycle.

Summary

Event Number:
O-316-N
NSF/PLR Award 1543483

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
Matthew Erickson / Adam Jenkins

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Principal Investigator

Dr. Peter Sedwick
psedwick@odu.edu

Old Dominion University
Norfolk, Virginia

Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: Ross Sea

Description

This project aims to fill a crucial gap in the understanding of the biogeochemistry of the Ross Sea continental shelf, by assessing the roles of the late-fall convective processes and sea-ice formation in the seasonal dynamics of dissolved iron, an essential micronutrient for phytoplankton. Water column and newly formed sea-ice samples will be collected for analysis of iron and other trace metals within and en route to coastal polynyas in the southern Ross Sea during the late fall-early winter, when convective overturn and sea-ice formation begins. The samples will be collected and processed at sea and analyzed post-cruise at the scientist's home institution.

Field Season Overview

Team members will embark from and return to Lyttelton, New Zealand on the RVIB Nathaniel B. Palmer (NBP17-04) during the Polynyas, Ice production and seasonal evolution in the Ross Sea (PIPERS) cruise (C-531-N/Ackley). The team will collect and process samples from the water column, surface waters and newly formed sea ice. Sampling operations will include five to ten stations located within the coastal polynyas, and four to six stations along both inbound and outbound cruise tracks. The team will coordinate their sampling locations with the PIPERS project team. Sampling operations will employ trace-metal clean methods. The team will collect water column hydrographic data and water column/frazil ice samples using their own trace-metal clean conductivity-temperature-depth (CTD) rosette system and water samplers. They will also collect near-surface waters and frazil ice using their own trace-metal clean towfish system. In addition, if weather, sea ice, and sea conditions allow, they will collect surface seawater and frazil ice/unconsolidated sea ice by Zodiac inflatable boat. Finally, in collaboration with a Belgian group associated with the PIPERS project, they will collect samples of first-year sea ice from several locations using a power-driven trace-metal ice corer. All seawater and sea ice will be processed immediately after collection inside a shipboard trace metal clean laboratory space. Once prepped, samples will be shipped back to the project’s home institution for further analysis.

Deploying Team Members

- Peter Sedwick (PI)
- Bettina Sohst

2016-2017 USAP Field Season
Project Detail

Project Title

Implementing Low-Power, Autonomous Observing Systems To Improve The Measurement And Understanding Of Antarctic Precipitation

Summary

Event Number:
O-456-M
NSF/PLR Award 1543377

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
Samina Ouda / Elizabeth Kauffman

Principal Investigator

Dr. Mark W Seefeldt
mark.seefeldt@colorado.edu

University of Colorado Boulder
CIRES
Boulder, Colorado

Location

Supporting Stations: McMurdo Station
Research Locations: Williams Field / Phoenix Airfield / Alexander Tall Tower / Elaine AWS

Description

The objectives of the project are focusing on improving measurement of precipitation in Antarctica, advancing understanding of precipitation processes, and using this knowledge to evaluate weather and climate models. The basic measurement of precipitation in Antarctica is exceedingly difficult because of the separation of falling snow from blowing snow and the relatively small amount of annual precipitation. An accurate measurement of precipitation is critical for calculating Antarctica's mass balance and contribution to global sea-level rise, interpreting ice-core records, and providing benchmarks for promising model- and satellite-based precipitation estimates. Researchers on this project will install four low-power, autonomous polar-grade instrument suites referred to as an Antarctic Precipitation System (APS). The APSs are designed with an integrated sensor approach to provide multiple types of observations of snow accumulation at a given site. The resultant observations from the four sites will directly improve knowledge of seasonal and spatial precipitation variability at locations on the Ross Ice Shelf and will be the basis of an evaluation of weather and climate models' ability to simulate regional precipitation.

Field Season Overview

The goals for the field season are to install the Antarctic Precipitation Systems (APS) at four sites co-located with automatic weather stations (AWS) on the Ross Ice Shelf. The four sites are at Williams Field AWS, Alpha (Phoenix) Runway, Alexander Tall Tower, and Elaine AWS. The suite of instruments at each site includes: precipitation gauge, laser snow height sensor, laser-based disdrometer for particle size and fall velocity, optical

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precipitation detector, visible/infrared web cam, datalogger, and Iridium communications. The Williams Field AWS location will be the premiere measurement site and will include additional information for cross-instrument evaluation. The four sites will be installed and operated using a solar/battery power system for continuous operation and collection of observations throughout the year. Iridium communications will be included in the installation to monitor the data collection and update the measurement algorithms, if needed, during the polar night. Helicopters and Twin Otter aircraft will assist with personnel and equipment transport during the installations.

Deploying Team Members

- Scott Landolt (Co-PI)
- Mark Seefeldt (PI)

2016-2017 USAP Field Season
Project Detail

Project Title

Resolving CO2 System Seasonality In The West Antarctic Peninsula With Autonomous Observations

Summary

Event Number:
O-270-L
NSF/PLR Award 1543380

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
Chelsea Wegner / Adam Jenkins

Principal Investigator

Dr. Elizabeth Henderson Shadwick
shadwick@vims.edu

College of William and Mary
Gloucester Point, Virginia

Location

Supporting Stations: ARSV Laurence M. Gould
Research Locations: Palmer Long-Term Ecological Research (LTER) site 300.100

Description

The circumpolar Southern Ocean connects the major ocean basins. It returns carbon and nutrients to the surface ocean and transports heat and carbon to the ocean interior. Understanding the Southern Ocean response to both natural and human changes is critical to understanding changing global biogeochemical cycles. However, major uncertainties persist in our knowledge of the Southern Ocean carbon budget due in part to unresolved variability at the seasonal scale, and in part to a significant lack of observations in coastal regions. The goal of this project is to make a contribution to the understanding of coastal Southern Ocean CO2 system variability by delivering new autonomous observations that will allow the full CO2 system seasonality to be resolved. Using a moored observing system (to measure pH, CO2 partial pressure, temperature, salinity and dissolved oxygen) on the West Antarctic Peninsula continental shelf, the proposed research will characterize diurnal and seasonal variability and identify the dominant physical and biological controls on the seasonal variations in the CO2 system and the net annual air-sea exchange.

Field Season Overview

A science team of two people will use four days of ship time per cruise on three total cruises aboard the ARSV Laurence M. Gould (LMG) in December, April, and May. The first cruise will deploy a mooring at a site in the Palmer Long Term Ecological Research (PAL-LTER) grid, and team members will recover mooring M1 and deploy mooring M2 at the same location on the second cruise. At the time of mooring recovery and deployment, discrete samples will be collected from a full vertical profile at the station for sensor calibration purposes. A 24-bottle CTD and rosette system will be used to collect water samples with higher vertical resolution in the upper water column. A mercuric chloride

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solution will be added to the DIC/TA samples to halt biological activity and they will be stored at 4°C to be shipped back to the home institution. The team will ship M1 to the home institution for cleaning, calibration and changing of batteries.

Deploying Team Members

- Maria Arroyo
- Elizabeth Shadwick (PI)

2016-2017 USAP Field Season
Project Detail

Project Title

Middle-Late Devonian Vertebrates Of Antarctica

Summary

Event Number:
G-071-M
NSF/PLR Award 1543367

Program Manager:
Dr. Thomas Wilch

ASC POC/Implementer:
Jenny Cunningham / Bija Sass

Principal Investigator

Dr. Neil H Shubin
nshubin@uchicago.edu

University of Chicago
Chicago, Illinois

Location

Supporting Stations: McMurdo Station
Research Locations: Mounts Fleming and Crean / Quartermain Mountains

Description

The discovery, description, and analysis of Middle to Late Devonian (390-355 million years ago) vertebrates and deposits provide important data on the emergence of anatomical structures, faunas, and habitats during a critical interval in the history of life and Earth. Biological innovation during this time includes the early evolution of freshwater fish, the origins of major groups of vertebrates, e.g., sharks, lobe- and ray-finned fish, and tetrapods, and the expansion and elaboration of non-marine ecosystems. This project aims to maximize the potential to identify new fossiliferous units, to recover fossil taxa from units already known, and to perform stratigraphic and sedimentological studies of Devonian sediments at fossil-bearing sites. Researchers hope to uncover fossilized vertebrates that may provide data on the emergence of anatomical structures, fauna, and habitats during a critical moment of evolution.

Field Season Overview

Team members will make an initial helicopter recconaissance flight from McMurdo to the Dry Valleys to select three separate field camp sites, and to determine the best sampling locations. A group of six, including one mountaineer, will then tent camp at the chosen sites for eight days at a time. They will travel by foot from their field camps to their sampling locations, where they will use hand tools (crowbars, sledge hammers, and chisels) to unearth and remove exposed fossils. Collected fossils will be transported to back to McMurdo Station by helicopter between campsite moves.

Deploying Team Members

Project Indexes

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- Edward Daeschler (Co-PI)
- John Long
- Adam Maloof
- Neil Shubin (PI)
- Senden Timothy

2016-2017 USAP Field Season
Project Detail

Project Title

Antarctic Peninsula Exhumation And Landscape Development Investigated By Low-Temperature Detrital Thermochronometry

Summary

Event Number:
G-413-L
NSF/PLR Award 1543256

Program Manager:
Dr. Thomas Wilch

ASC POC/Implementer:
Matthew Erickson / Adam Jenkins

Principal Investigator

Dr. David Lawrence Shuster
dshuster@bgc.org

Berkeley, California

Location

Supporting Stations: ARSV Laurence M. Gould
Research Locations: Andvord, Bigo, Darbel, and Square Bays / Murphy Glacier

Description

Researchers will collect marine sediment samples and conduct geochemical measurements on these samples to learn about the geological history of ice-covered areas of the Antarctic Peninsula. Over the course of the project, the research team will sample about 10 sites near glacier margins in fjords on the west side of the Antarctic Peninsula.

Field Season Overview

Two participants will sail from Punta Arenas, Chile on the ARSV Laurence M. Gould to sampling sites along the west side of the Antarctic Peninsula. They will collect marine sediment samples from several fjord systems using a Box Corer and a Smith-Mcintyre grab. Their goal is to collect at least 10 kg of sediment from each site. Samples will be processed on board the vessel and then packed in five-gallon buckets for return to the home institution.

Deploying Team Members

- Anna Clinger

Project Indexes

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2016-2017 USAP Field Season
Project Detail

Project Title

Operation And Maintenance Of A CTBT Class Infrasound Array At Windless Bight

Summary

Event Number:
T-396-M
NSF/CTBT MOA

Program Manager:
Mr. Pat Smith

ASC POC/Implementer:
Jenny Cunningham / Elizabeth Kauffman

Principal Investigator

Dr. Curt Szuberla
cas@gi.alaska.edu

University of Alaska Fairbanks
Geophysical Institute
Fairbanks, Alaska

Location

Supporting Stations: McMurdo Station
Research Locations: Windless Bight

Description

This project operates, maintains, upgrades, calibrates, and services the joint U.S. Comprehensive Nuclear Test Ban Treaty (CTBT) station at Windless Bight. Windless Bight's location on the Ross Ice Shelf is unique for its very-low wind levels, which makes infrasound detection possible. Infrasound can detect volcanic eruptions, winds over distant mountain ranges, large storms at sea, auroral and meteor events, earthquakes, avalanches, and human-caused events such as very large explosions.

Field Season Overview

A group of six will be equipped with standard remote field equipment (including snowmobiles, PistenBully, and Mattrack) to stay in a self-supporting field camp at Windless Bight for four weeks.

Deploying Team Members

- Lukas Blom
- Don Byrd
- Jay Helmericks (Team Leader)
- Andrew Winkelman

Project Indexes

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2016-2017 USAP Field Season
Project Detail

Project Title

Finding The Missing Dipole Signal In Global Paleointensity Data: Revisiting The High Southerly Latitudes

Summary

Event Number:
G-056-M
NSF/PLR Award 1541285

Program Manager:
Dr. Thomas Wilch

ASC POC/Implementer:
Jenny Cunningham / Bija Sass

Principal Investigator

Dr. Lisa Tauxe
ltauxe@ucsd.edu

Scripps Institution of Oceanography
Geoscience Research Division
La Jolla, California

Location

Supporting Stations: McMurdo Station
Research Locations: Ross and Black Islands / Mount Discovery / Royal Society Range / Taylor Valley

Description

The geomagnetic field is decreasing rapidly, leading some to propose that it will undergo collapse followed by a return to its usual strength but in the opposite direction, a phenomenon known as a "polarity reversal" which last happened about 800,000 years ago. Such a collapse would have a potentially devastating effect on the ability of the magnetic field to shield us from cosmic ray bombardment. The probability of such a drastic event happening depends on the average strength of the magnetic field. If the average is approximately equal to the present field, then the fact that the field is dropping rapidly would be more alarming than if the magnetic field is quite a bit higher than average, as implied by the current data for the ancient magnetic field from Antarctica. The argument over the average field strength stems from the difficulty of its estimation. To that end, researchers will re-sample ancient lava flows for which directional data are already available to explore the earth's magnetic field strength and variation through time.

Field Season Overview

The science team will collect small paleomagnetic rock samples from 132 lava flows in the McMurdo area and analyze them to determine precise values of ancient geomagnetic field intensity. They will travel to most of their sites by helicopter, but will access some by foot and snowmobile. Time spent locating and sampling from each site will be roughly 30-45 minutes.

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Deploying Team Members

- Hanna Asefaw
- Hubertus Staudigel (Co-PI)
- Lisa Tauxe (PI)

2016-2017 USAP Field Season
Project Detail

Project Title

Sampling Comet Dust From Antarctic Air

Summary

Event Number:
O-399-S
NSF / NASA Agreement

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
Samina Ouda / Paul Sullivan

Principal Investigator

Dr. Susan Taylor
susan.taylor@erdc.dren.mil

US Army Cold Regions Research & Engineering Lab
Hanover, New Hampshire

Location

Supporting Stations: South Pole Station
Research Locations: Clean Air Sector

Description

Analyses of interplanetary dust particles (IDPs) collected in the stratosphere by high-flying aircraft have shown that some of these particles, the chondritic porous IDPs (CP-IDPs), are primitive materials. They contain vapor-deposited minerals that are silicates thought to be preserved interstellar materials transported to the inner solar system by comets. Past researchers have collected rare ultra-carbonaceous micrometeorites and particles indistinguishable from CP-IPDs from melted Antarctic snow. These particles have shown affinities to CP-IDPs and grains of the Wild 2 comet. This project aims to collect samples at the South Pole in order to analyze the isotopic and elemental composition and to describe their microstructure. The results will be used to catalogue the diversity of the primitive materials, origin of the comets, and increase the permanent collection for the extraterrestrial materials community.

Field Season Overview

This is the first of three seasons for this project. Participants will travel to South Pole by fixed wing aircraft and spend three weeks working with ASC carpenters and electricians to install the dust collecter in Building 80, 250 feet from the Atmospheric Research Observatory (ARO).

Deploying Team Members

- Conel Alexander (Co-PI)
- James Lever (Co-PI)
- Susan Taylor (PI)

Project Indexes

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2016-2017 USAP Field Season
Project Detail

Project Title

NASA / McMurdo Ground Station (MG1)

Summary

Event Number:
T-927-M
NSF / NASA Agreement

Program Manager:
Mr. Tim Howard

ASC POC/Implementer:
Payot Scheibe / Bill Jirsa

Principal Investigator

Mr. Bruce Thoman
bruce.e.thoman@nasa.gov

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland

Location

Supporting Stations: McMurdo Station
Research Locations: On station

Description

NASA's McMurdo Ground Station (MG1) is a 10-meter antenna housed in a white radome visible on the hill above McMurdo Station. It is used primarily for data recovery from polar-orbiting science satellites. MG1 also provides Launch and Early Operations Phase (LEOP) support for launches from Vandenberg Air Force Base involving satellite missions that require downrange telemetry support; telemetry and command for satellite housekeeping and recovery from satellite operational emergencies; and data recovery for the EUMETSAT MetOp polar weather satellite constellation; in collaboration with the National Oceanic and Atmospheric Administration (NOAA) National Environmental Satellite and Data Information Service.

Field Season Overview

The MG1 activity is a year-round effort, for which two NASA technicians are deployed to McMurdo Station to operate and maintain the systems. During the austral summer, additional personnel deploy to support special projects, perform systems and infrastructure checks, and conduct crew turnovers.

Deploying Team Members

- Rex Cotten
- Jennifer Cox
- Nickolas Sinkola (Co-PI)
- Bruce Thoman (PI)

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- Raymond Funk
- William Kambarn
- Edward Wendell

2016-2017 USAP Field Season
Project Detail

Project Title

Stratospheric Terahertz Observatory (STO)

Summary

Event Number:
A-136-M
NSF / NASA Agreement

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Samina Ouda / Scott Battaion / Chad Naughton

Principal Investigator

Dr. Christopher Walker
cwalker@as.arizona.edu

University of Arizona Tucson
Steward Observatory
Tucson, Arizona

Location

Supporting Stations: McMurdo Station
Research Locations: Williams Field

Description

The Stratospheric Terahertz Observatory (STO) is a Long Duration Balloon (LDB) experiment designed to address a key problem in modern astrophysics: Understanding the life cycle of the Interstellar Medium (ISM). During its upcoming science flight from Williams Field, STO will survey a section of the Milky Way using a balloon-borne, 0.8-meter optical telescope and ultra-high-frequency receivers tuned to monitor the emission from interstellar clouds containing carbon and nitrogen atoms.

Field Season Overview

This project will use the Long Duration Balloon (LDB) payload facility on the permanent ice shelf beyond Williams Field. Field team members will set up a workspace, unpack equipment, and begin to commission the LDB payload systems comprised of the gondola, telescope, pointing systems, telecommunications, SIP interface, and science instrument and cryogenic systems. Once each subsystem is validated, the team will work toward the goal of being ready for flight by the first week of December. After the mission launch, the majority of the technical team will redeploy, leaving the missions operations and science team, with the final remaining participants consisting of the payload recovery team, if applicable.

Deploying Team Members

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- Michael Carpenter
- Kristina Davis
- Ruben Dominguez
- Brian Duffy
- Christopher Groppi
- Darren Hayton
- Craig Kulesa (Co-PI)
- William Peters
- Jose Siles Perez
- Antony Stark
- Peter Thompson
- Christopher Walker (PI)
- Abram Young

2016-2017 USAP Field Season
Project Detail

Project Title

Magma Sources, Residence And Pathways Of Mount Erebus Phonolitic Volcano, Antarctica, From Magnetotelluric Resistivity Structure

Summary

Event Number:
G-072-M
NSF/PLR Award 1443522

Program Manager:
Dr. Thomas Wilch

ASC POC/Implementer:
Samina Ouda / Jennifer Blum

Principal Investigator

Dr. Philip Wannamaker
pewanna@egi.utah.edu

University of Utah
EGI
Salt Lake City, Utah

Location

Supporting Stations: McMurdo Station
Research Locations: Erebus

Description

This project will collect approximately 100 magnetotelluric (MT) soundings over the active phonolitic volcano Mount Erebus and Ross Island in cooperation with Antarctica New Zealand, GNS Science, and Tokyo Institute of Technology. Analysis of these data will yield a three-dimensional tomographic model of electrical resistivity through the crust and into the uppermost mantle. This physical property will provide inferences on location of the upper-middle crustal magma chamber implied from petrology, the staging volume of parental melts near Moho levels, and the magma/volatile conduit through the crust and volcanic edifice. The entire MT sounding number is meant to be achieved over three field seasons. One season, carried out within the Antarctica New Zealand program has been completed (2014-15). In that season, 52 site occupations were made, including the reference, of which 45 are of high quality. A similar data collection regimen is planned for the 2015-16 season. Researchers anticipate that a third, lesser season (2016-17) will be required pending results to date in terms of site quality and sampling needs.

Field Season Overview

Field data collection is an international collaboration between the PI Dr. Phil Wannamaker and Dr. Graham Hill of Gateway Antarctica/University of Canterbury, deploying under the Antarctica New Zealand (AntNZ) project number K-108 supported by a Marsden Fund award. International collaborators bringing essential instrumentation include Prof. Yasuo Ogawa of Tokyo Inst of Tech (TITECH), Prof. Martyn Unsworth of Univ. of Alberta and Prof. Kevin Mickus of Missouri State Univ. In 2016-17, PIs Wannamaker and Hill will work together with an USAP supplied moutaineer Danny Uhlmann to collect at least 24 new MT

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soundings, at select locations over Ross Island to fill holes in coverage.

Helicopter will be the mode of transport to almost all sounding sites, although two nearer McMurdo are accessible by Hagglund. At each site, about two hours are needed for a team of three (including mountaineer/field safety trainer) to set up the MT recording components. The site needs to record for at least 48 hours assuming calm weather, before take-down in preparation for the next deployment. However, our experience with typical weather translates to recording intervals of several days before return is possible. Take down typically requires ~45 min. The group will operate as one team of three and plans on two installations per team per day under favorable logistics. The helicopter may shut down in close support of a site, or it may leave for other work. Field safety training personnel would be the responsibility of USAP.

This the third season of fieldwork on Erebus and will be operated this time out of McMurdo. Clothing and other equipment for Wannamaker will be issued from USAP stores with augmentation from the AntNZ stores. We request 25 flight hours of helicopter time from the USAP while AntNZ is providing 21 hours of helicopter flight for a total of 46 hours in the 2016-17 season. USAP night flights are quite suitable for our operations if daytime ops become busy and were very effective last season. The AntNZ helo request is to allow some access to their A-Star B3 machines for toe-in landings.

Berthing, deployment space, and Crary office space for three people (two science, one mtnr) are requested at McMurdo. Some project personnel will have their computers networked into the USAP system with a login account accessible from public terminals at McMurdo for all. Because of possible flights with the USAP, it also would be helpful to have midrats meal cards for Wannamaker, Bedrosian, Hill and Uhlmann.

Deploying Team Members

- Paul Bedrosian
- Daniel Uhlmann
- Philip Wannamaker (PI)

2016-2017 USAP Field Season
Project Detail

Project Title

NOAA / AMLR

Summary

Event Number:
B-006-N
NSF/NOAA Agreement

Program Manager:
Undefined

ASC POC/Implementer:
Matthew Erickson / Adam Jenkins

Principal Investigator

Dr. George Watters
george.watters@noaa.gov

National Oceanic and Atmospheric Administration
La Jolla, California

Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: South Shetland Islands Vicinity

Description

National Oceanic and Atmospheric Administration (NOAA) Fisheries' AMLR (Antarctic Marine Living Resources) program supports the development of U.S. policy regarding the conservation and management of the marine living resources in the Southern Ocean. For the past 25 years, the AMLR field program has been conducted in the vicinity of Elephant Island, the South Shetland Islands, and the Antarctic Peninsula during the austral summer. This austral winter, researchers will conduct a 27-day cruise to continue testing U.S. AMLR sampling protocols and procedures during the winter and in the sea ice. The broad-scale survey will be augmented to better understand the small scale patterns of krill distribution in relation to circulation, and to understand habitat use in enclosed bays.

Field Season Overview

Field team members will sail on the RVIB Nathaniel B. Palmer from Punta Arenas, Chile, to their research area in the South Shetland Islands. There they will: (1) Conduct a bio-acoustic, oceanographic and net-based krill survey to map meso-scale features of water mass structure, phytoplankton biomass and productivity, zooplankton and bacterioplankton composition, and the dispersion and population demography of krill during mid-winter; (2) Calibrate shipboard acoustic systems; (3) Collect continuous measurements of ship's position, sea surface temperature, salinity, turbidity, fluorescence, air temperature, barometric pressure, relative humidity, and wind speed and direction; (4) Collect underway observations of seabirds and marine mammals; (5) Collect data to characterize the sea ice, including thickness, type, color and other qualitative components with the goal of deriving a standardized description of ice during the survey; (6) Deploy drifter buoys (number to be determined); (7) Deploy expendable bathythermographs (XBTs) or expendable conductivity/temperature/depth (XCTDs) during the crossing of the Drake Passage and

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elsewhere in the survey area; (8) Quantify sea ice algae community by collecting ice cores at select stations; (9) Measure water column irradiance using a hand held Profiling Reflection Radiometer (PRR); (10) Extend their acoustic, net, and oceanographic study through the Gerlache Strait and down to Andvord Bay; (11) Deliver food to the Polish station, Arktowski; and (12) Have outreach with PEW.

Deploying Team Members

- Kim Bernard
- Anthony Cossio
- Adrian Dahood-Fritz
- Kimberly Dietrich
- Ryan Driscoll
- Rachel Pound
- Christian Reiss (Co-PI)
- Jarrod Santora
- Jennifer Walsh
- Elliot Weiss

2016-2017 USAP Field Season
Project Detail

Project Title

Adélie Study

Summary

Event Number:
Y-328-M
NSF/PLR Award 1544170

Program Manager:
Ms. Valentine Kass

ASC POC/Implementer:
Jenny Cunningham / Jennifer Blum

Principal Investigator

Mr. Joseph J Wilson
jeff.wilson@silverbackfilms.tv

Bristol, Undefined

Location

Supporting Stations: McMurdo Station
Research Locations: Cape Crozier / icebreaker channel

Description

This project plans to create "Penguin," a feature length nature documentary highlighting the ecology and behavior of Adélie penguins in Antarctica through a character narrative. The planned release date in cinemas is 2019. The project's goal is to capture the entire breeding cycle of the Adélies from Cape Crozier and Cape Royds, use aerial photography to capture the landscape of the Ross Sea ecosystem, and use polecam photography to work on the ice edge and capture Orca behavior transiting through McMurdo Sound. Combined, the project team hopes to deliver the most extensive insight into Adélie penguin behavior and ecology ever attempted.

Field Season Overview

The team will fly by helicopter to three different locations on Ross Island. Two to three team members will be at Cape Crozier at a time, with three separate groupings deploying to this field camp throughout the season. A film crew of two, based out of McMurdo Station, will use a gyro-stabilised externally-mounted camera system to film 20 hours of aerial footage in the area. A third crew will film at the ice edge. The crew will also film for a period of one week or less at Cape Royds, depending on the amount of time required on the ice edge.

Deploying Team Members

- Matthew Aeberhard
- John Aitchison
- Mark Linfield (Team Leader)
- Julie Moniere (Team Leader)

- Thomas Beldam
- Sophia Darlington
- Michael Kelem
- Mark Smith
- Jesse Wilkinson
- Joseph Wilson (PI)

2016-2017 USAP Field Season
Project Detail

Project Title

Oceanic Response To A Coastal Polynya, Terra Nova Bay, Antarctica

Summary

Event Number:
O-403-M
NSF/PLR Award 1341688

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
Matthew Erickson / Adam Jenkins

Principal Investigator

Undefined Christopher J Zappa
zappa@ldeo.columbia.edu

Columbia University
Lamont Doherty Earth Observatory
Palisades, New York

Location

Supporting Stations: McMurdo Station
Research Locations: Terra Nova Bay

Description

Researchers seek to simultaneously identify the mechanisms responsible for water-mass modification within the Terra Nova Bay polynya and document all aspects of dense shelf water formation within an Antarctic polynya system. This study will characterize the water masses within Terra Nova Bay over the course of two annual cycles using in-situ near-surface oceanic observations. With the use of enhanced automated weather stations (AWS) and satellite imagery, an observing period will be conducted that will quantify the surface energy budget components over the polynya and adjacent sea ice; describe the forcing for, and near surface properties of, the katabatic wind field responsible for polynya formation; and document the oceanic response to these flows at high vertical and temporal resolution. The proposed measurements will build upon the successful deep-ocean moorings in Terra Nova Bay that took place since 1995 by the Italian CLIMA program. Data collected will provide the first near-surface oceanic observations of an Antarctic polynya to be made and will provide an unprecedented view of the coupled atmospheric and oceanic processes acting at the polynya.

Field Season Overview

Two team members will sail on the South Korean Research Vessel, Araon from Christchurch, New Zealand to the South Korean antarctic station, Jang Bogo. While underway, they will recover and re-deploy a mooring previously deployed by Lamont-Doherty Earth Observatory (LDEO). They will disembark at Jang Bogo and will then fly by USAP helicopter to McMurdo Station where they will catch a flight north to Christchurch. One team member will remain in Christchurch to await their cargo coming north on the RV Araon and facilitate its transport back to the US.

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Deploying Team Members

- Scott Brown
- Christopher Zappa (PI)

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Project Detail

Project Title

Summary

Event Number:

Program Manager:

ASC POC/Implementer:

Principal Investigator

,

Location

Supporting Stations:
Research Locations:

Description

Deploying Team Members

- Lindsey Ekern
- Kiefer Forsch
- Diana Gutierrez Franco
- Lauren Manck
- Boyang Pan
- Maria Stenzel
- Maria Vernet (PI)

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Project Title

Summary

Event Number:

Program Manager:

ASC POC/Implementer:

Principal Investigator

,

Location

Supporting Stations:
Research Locations:

Description

Deploying Team Members

- Michael Hartinger
- Zhonghua Xu

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Project Title

Summary

Event Number:

Program Manager:

ASC POC/Implementer:

Principal Investigator

,

Location

Supporting Stations:
Research Locations:

Description

Deploying Team Members

- Steven Barwick (PI)
- Anna Nelles
- Christopher Persichilli

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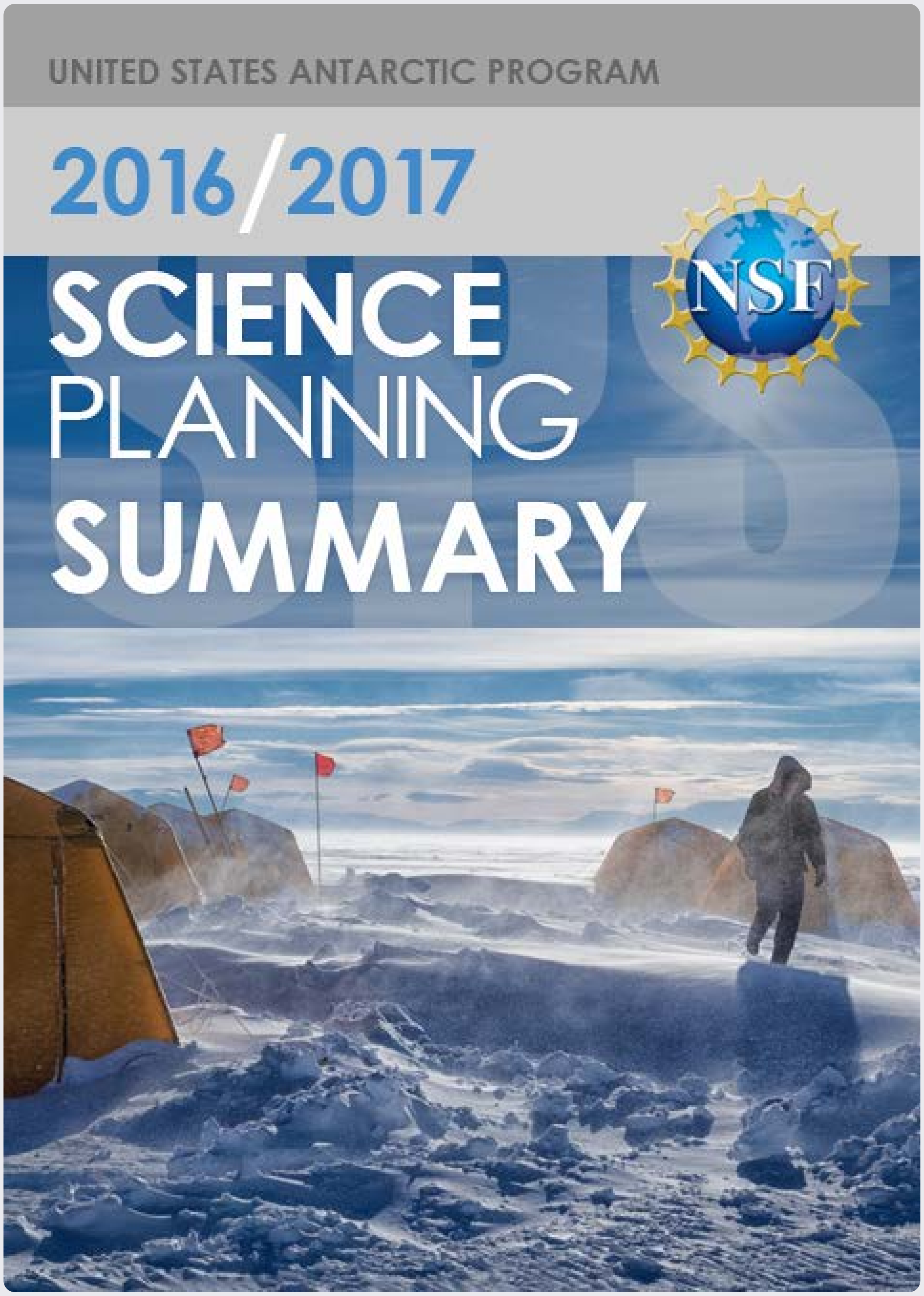

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