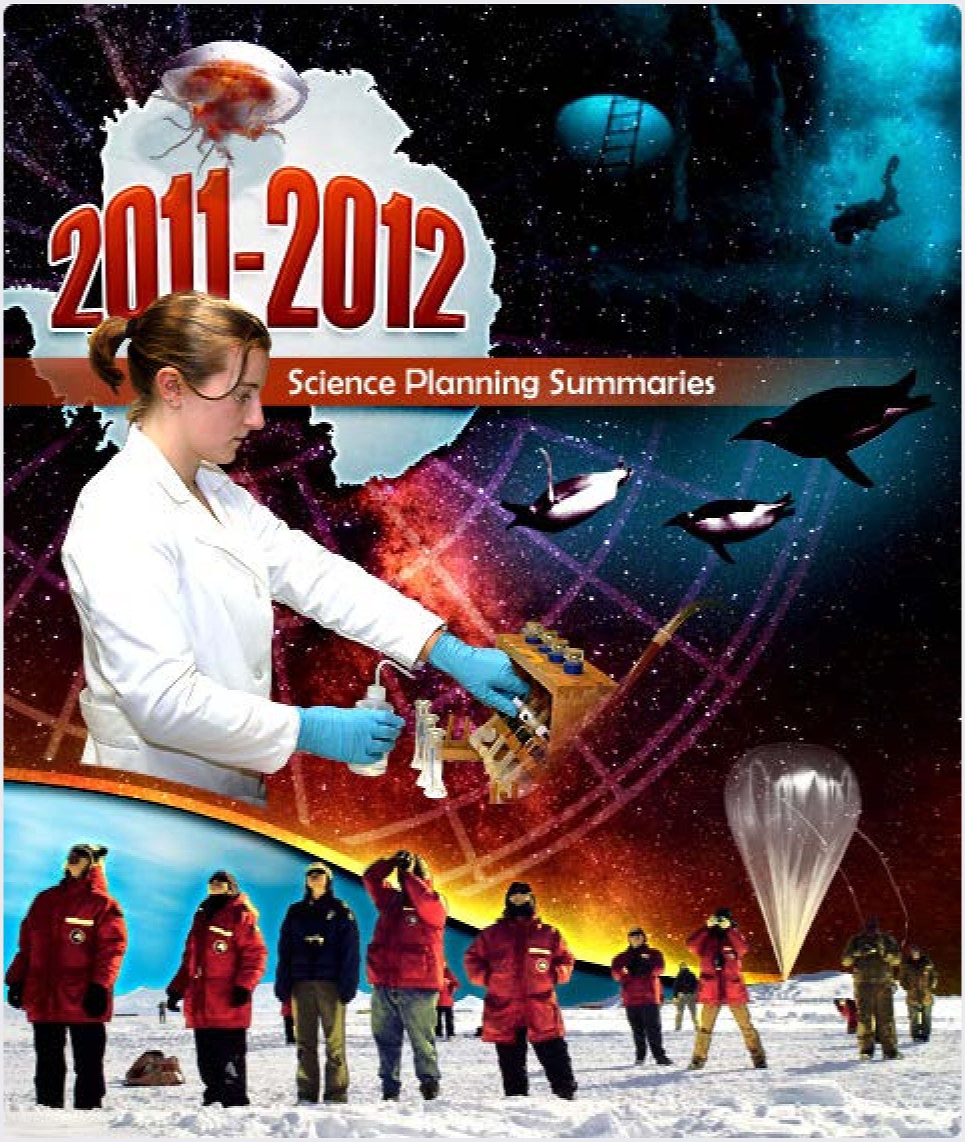

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Anandakrishnan, Sridhar	C-520-M	WISSARD surface geophysics
Ashworth, Allan	G-294-M	Collaborative Research: Integrating geomorphological and paleoecological studies to reconstruct Neogene environments of the Transantarctic Mountains
Barrett, John	B-508-M	McMurdo LTER - Landscape Ecology: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valley LTER Program
Barwick, Steven	A-127-M	Development of hexagonal radio array for the ARIANNA ultra-high energy neutrino detector
Bentley, Charles	T-350-M	Ice Coring and Drilling Services (ICDS) support for WAIS Divide
Bieber, John	A-120-M	Cosmic ray observations at McMurdo Station
Bindschadler, Robert	C-407-M	IPY: Collaborative Research: Ocean-ice sheet interaction in the Amundsen Sea: The keystone of West Antarctic stability
Bockheim, James	G-239-P	Impact of recent climate warming on active-layer dynamics, permafrost, and soil properties on the western Antarctic Peninsula
Bowser, Samuel	B-043-M	Evolution and diversity of Antarctic Rhizarian Protists
Bristow, William	A-369-M/S	McMurdo and South Pole

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		SuperDARN: Investigation of the ionospheric dynamics and magnetosphere-ionosphere coupling in Antarctica
Carlstrom, John	**A-370-S**	Science Coordination Office for Astrophysical Research in Antarctica (SCOARA-II)
Carlstrom, John	**A-379-S**	Cosmological Research with the 10-meter South Pole Telescope
Cassar, Nicolas	**O-405-L**	Physiological and ecosystem structure forcings on carbon fluxes in the Southern Ocean mixed layer
Chereskin, Teresa	**O-313-N**	Collaborative research: Dynamics and transport of the Antarctic Circumpolar Current in the Drake Passage
Chereskin, Teresa	**O-317-L/N**	Collaborative research: 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
Conway, Howard	**I-209-M**	Deglaciation of the Ross Sea Embayment - constraints from Roosevelt Island
Cottle, John	**G-064-M**	Exploring the significance of NA-alkaline magmatism in subduction systems, a case study from the Ross Orogen
Emslie, Steven D	**B-034-E/M**	Stable isotope analyses of pygoscelid penguin remains from active and abandoned colonies in Antarctica
Engebretson, Mark J	**A-102-M/S**	Studies of solar wind - Magnetosphere interactions using observations of ULF waves at an extensive ground array at high latitudes
Evenson, Paul	**A-120-M**	Cosmic ray observations at McMurdo Station

Evenson, Paul	**A-118-S**	Element composition of high-energy solar particles
Foreman, Christine	**B-046-M**	The biogeochemical evolution of dissolved organic matter in a fluvial system on the Cotton Glacier, Antarctica
Fountain, Andrew	**B-504-M**	McMurdo LTER - Glaciers: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valleys LTER Program
Fraser, Bill	**B-013-L/P**	Palmer Long Term Ecological Research (LTER): Looking back in time through marine ecosystem space, apex predator component
Garrott, Robert	**B-009-M**	The demographic consequences of environmental variability and individual heterogeneity in life-history tactics of a long-lived Antarctic marine predator
Gogineni, Prasad	**I-189-M**	Center for Remote Sensing of Ice Sheets (CReSIS) - Basler airborne radar survey
Gogineni, Prasad	**I-185-M**	Center for Remote Sensing of Ice Sheets (CReSIS) - Unmanned Aerial System (UAS) operations
Halzen, Francis	**A-333-S**	IceCube operations and maintenance
Harvey, Ralph	**G-058-M**	Antarctic Search for Meteorites (ANSMET)
Hernandez, Gonzalo	**A-110-M/S**	Austral high-latitude atmospheric dynamics
Hofmann, Gretchen	**B-134-M**	Ocean acidification: Integrated approaches to understanding effects on antarctic sea urchins, Sterechinus neumayeri
Inan, Umran	**A-336-P**	ELF/VLF observation of whistler-mode waves, lightning discharge, and gamma-ray events from Palmer Station
Johns, Bjorn	**T-295-M**	UNAVCO GPS survey support

Karle, Albrecht	A-107-S	Collaborative Research: MRI-R2 instrument development of the Askaryan Radio Array, a large-scale radio Cherenkov neutrino detector at the South Pole
Kemerait, Robert	G-078-M	Dry Valley seismic project
Kennicutt, Mahlon	B-518-M	Temporal variability in natural and anthropogenic disturbance of McMurdo Station
Kovac, John	A-039-S	Collaborative Research: BICEP2 and SPUD - A search for inflation with degree-scale polarimetry from the South Pole
Kulesa, Craig	A-364-S	High Elevation Antarctic Terahertz (HEAT) telescopes for Dome A and Ridge A
Kyle, Phillip	G-081-M	Mount Erebus Volcano Observatory III (MEVO III): Conduit processes and surveillance
LaBelle, James	A-128-S	Outstanding Questions on Auroral Radiation Fine Structure
Lazzara, Matt	O-283-M/S	Antarctic Automatic Weather Station (AWS) program
Lee, Richard	B-256-P	Role of dehydration and photoperiodism in preparing an Antarctic insect for the polar night
Lyons, W. Berry	B-509-M	McMurdo LTER - Geochemistry: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valley LTER Program
Martinson, Doug	B-021-L	Palmer Long Term Ecological Research (LTER): Looking back in time through marine ecosystem space, physical oceanography component
Mayewski, Paul	I-173-M	Roosevelt Island Climate Evolution (RICE) project
McKnight, Diane	B-506-M	McMurdo LTER - Streams: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valley

		LTER Program
Moore, Robert C	A-109-M/P/S	Collaborative Research: Antarctic ELF/VLF observations of lightning and lightning-induced electron precipitation
Morin, Paul	T-434-M/P	The Polar Geospatial Information Center: Joint support
Naveen, Ron	B-044-E	Collaborative Research: Multispecies, multi-scale investigations of long-term changes in penguin and seabird populations on the Antarctic Peninsula
Parker, Timothy	T-299-M	IRIS/PASSCAL seismic support
Place, Sean	B-199-M	Ocean acidification–category 1: Identifying adaptive responses of polar fishes in a vulnerable ecosystem
Priscu, John	B-505-M	McMurdo LTER - Lakes: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valley LTER Program
Pryke, Clement	A-149-S	Collaborative Research: BICEP2 and SPUD - A search for inflation with degree-scale polarimetry from the South Pole
Putkonen, Jaakko	G-501-M	Systematic analysis of the stability and ages of soil surfaces in Transantarctic Mountains
Rack, Frank	C-524-M	WISSARD borehole drill contractor
Severinghaus, Jeffrey	I-476-M	Collaborative Research: Replicate coring at WAIS Divide to obtain additional samples at events of high scientific interest
Sprintall, Janet	O-260-L	The Drake Passage high-density XBT/XCTD program
Steffen, Konrad	I-077-E	IPY: Stability of Larsen C Ice Shelf in a warming climate
Steinberg, Deborah	B-020-L/P	Palmer Long Term Ecological Research (LTER): Looking back in time through marine

		ecosystem space, zooplankton component
Stepp, Bill	**A-145-M**	NASA Long Duration Balloon (LDB) support program
Sweeney, Colm	**O-214-L**	Collaborative research: Biogeochemical controls of the oxygen and carbon system in the Drake Passage
Szuberla, Curt	**T-396-M**	Operation and maintenance of a CTBT class infrasound array at Windless Bight
Taylor, Kendrick	**I-477-M**	WAIS Divide Science Coordination Office (SCO)
Taylor, Michael	**A-119-M/S**	Investigating wave-driven mesospheric dynamics over South Pole using an advanced mesospheric temperature mapper
Taylor, Michael	**A-119-M/S**	Development of an ANtarctic Gravity Wave Imager Network (ANGWIN) for collaborative mesospheric research
Thoman, Bruce	**T-927-M**	NASA/McMurdo Ground Station (MG1)
Wall, Diana	**B-507-M**	McMurdo LTER - Soils: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valley LTER Program
Weatherwax, Allan T	**A-112-M**	Polar experiment network for geospace upper-atmosphere investigations: PENGUIn - A high-latitude window to geospace dynamics
Weatherwax, Allan T	**A-111-M/S**	Studies of the polar Ionosphere and Magnetosphere from measurements in Antarctica
Wilson, Terry	**G-079-M**	Collaborative research, IPY POLENET-Antarctica: Investigating links between geodynamics and ice sheets
Wu, Qian	**A-132-P**	Thermospheric neutral wind observation in the Antarctica

		Peninsula
Zesta, Eftyhia	A-357-M	South American Meridional B-Field Array (SAMBA): An American-Chilean chain

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Station Schedules 2011-2012

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

	Austral Summer Season Openings		Austral Winter Season Openings
	Operational	Science	
McMurdo	20 Aug 2011 (Winfly*)	3 Oct 2011 (Mainbody)	24 Feb 2012
South Pole	17 Oct 2011	1 Nov 2011	15 Feb 2012
Palmer	6 Aug 2011*	13 Oct 2011	18 June 2012
Research Vessels	Year-round operations Vessel schedules on the Internet: http://www.usap.gov/vesselScienceAndOperations/		

*A limited number of science projects deploy at Winfly

	Estimated Population	
	Summer	Winter
McMurdo	950 (weekly average) 2,200 (total)	150 (winter total)
South Pole	250 (weekly average) 820 (total)	50 (winter total)
Palmer	36-44 (weekly average) 140 (total)	20 (winter total)
RV/IB NBP*	39 science and staff / 25 crew	
ARSV LMG**	38 science and staff / 25 crew	

*RV/IB, Research Vessel/Icebreaker

**ARSV, Antarctic Research Support Vessel

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Air Operations 2011-2012

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 will provide helicopter support with five helicopters (two AS-350-B2 "A-Stars" and three Bell 212s) based out of McMurdo Station and Pine Island Glacier (PIG) camp. From the beginning of October to the middle of December the five helicopters will support research in the McMurdo Dry Valleys, Royal Society Range and on Ross Island. From the middle of December through the end of January two AS-350-B2's will be stationed at PIG; leaving the 3 Bell 212's in McMurdo to support the local region. In addition, Antarctic New Zealand will be providing a Eurocopter - EC130 from approximately the beginning of November through the end of January.

http://www.phihelico.com/

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 at deep field locations including Siple Dome, WAIS Divide, Byrd Station, PIG, and various open field landing locations.

http://www-105aw.ang.af.mil/

Kenn Borek Air

Twin Otter and Basler aircraft, operated by Kenn Borek Air, will be used by a number of projects throughout the USAP area of operations.

http://www.borekair.com/

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Staffed Field Camps

Nine field camps will have resident staff to provide logistic and operational assistance to McMurdo-based researchers.

Dry Valleys	77°30 S, 162° E 50 nautical miles from McMurdo Station

Each year numerous groups conduct research throughout the Dry Valleys. Two resident staff will operate the main base camp at Lake Hoare and the other semi-permanent camps at Lake Fryxell, F-6, and Lake Bonney. The Dry Valleys are predominately occupied by the Long Term Ecological Research grantees. Several other groups will operate from small tent camps throughout the region, including project in the Garwood, Meirs, and McKelvey, Wright, and University Valleys and at Lake Joyce and Lake Vanda.

Marble Point	77°41 S, 163°67 E 46 nautical miles from McMurdo Station

Two resident staff and rotating fuels operators maintain the Marble Point Field camp. The main focus of the camp is to support refueling operations for helicopters working in the Dry Valleys and local sea ice. Three traverses from McMurdo will deliver fuel and equipment to Marble Point early in the season.

Siple Dome	81°39 S, 149°04 W 507 nautical miles from McMurdo Station

Siple Dome will have two resident field camp staff. They will provide daily weather observations for planes operating in West Antarctica. Two science groups will base operations from Siple Dome this season: Brown (G-097-M) and IceCap (Blankenship, C-520-M). They will also house and feed Kenn Borek Air pilots that may remain overnight at the camp.

WAIS Divide Field Camp	79°46 S, 112°08 W 924 nautical miles from McMurdo Station

The West Antarctic Ice Sheet (WAIS) Divide field camp with 15 resident staff will support nine projects: Initially, the season will focus on borehole logging projects including temperature logging (Alley/Clow, I-168-M), seismic attenuation measurement (Peters, I-161-M), sonic logging (Waddington, I-162-M) and optical logging (Price/Bay, I-122-M). After initial borehole logging is completed, Taylor (I-477-M) will deepen ice core bore hole to an approximate depth of 3500 m. Severinghaus (I-476-M) will begin replicate coring producing approximately 60 m of core. Charles Bentley with Ice Drilling Design and Operations team (T-350-M) will continue to and operate the DISC Drill. Two other projects will base out of WAIS Divide camp to monitor and maintain instrumentation in the area: Zesta (A-

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357-M) will re-install the SAMBA magnetometer. Bales (A-108-M) will return to WAIS to install a second very low frequency (VLF) array.

Byrd Surface Camp	80° S by 120° W 803 nm from McMurdo Station, and 97 nm from WAIS Divide

Byrd Surface field camp will have fifteen resident staff supporting a peak camp population of fifty. Byrd camp will support four projects: POLENET (Wilson, G-079-M) will complete installation of GPS and seismic array throughout West Antarctica and service or remove existing equipment deployed in previous seasons; Lazzara (O-283-M) will service the automatic weather station (AWS) at Byrd camp and other units in the vicinity; Rupper (I-158) will collect ice core samples from six sites on a snowmobile traverse; and the Pine Island Glacier (PIG) Traverse (R-762-M) will begin and end at Byrd Camp. Its mission is to supply fuel, vehicles, and cargo to the newly-established PIG camp.

Pine Island Glacier (PIG) Traverse	operating in vicinity of Byrd Surface Camp, WAIS Divide Field Camp, and PIG Camp

Five staff will conduct two separate traverses from Byrd Surface Camp to Pine Island Glacier using three CAT 55 Challengers, a Tucker Sno-Cat, and a snow machine. The first traverse will move equipment and fuel to PIG in support of opening a helicopter and fixed wing camp in FY12. The second traverse, at the end of the season, will stage fuel at PIG for the FY13 science season. Between the two aforementioned traverses, the staff will also conduct a science traverse with POLENET staff from Byrd Surface Camp to Mt Sidley to remove seismic equipment for retrograde to McMurdo through Byrd.

Pine Island Glacier (PIG) Camp	-75.80° S by 100.28° E 440 nm west from Byrd Surface Camp

PIG Camp, with a resident staff of eleven and a peak camp population of forty, is being constructed to support Bindschadler (C-407-M). The camp is the staging area for two A-STAR helicopters that will move science equipment, support infrastructure, and scientists to a highly-crevassed location ~45nm from the main camp. At this remote location, C-407-M scientists will drill through 600m of ice to install instrumentation to measure the ocean-ice interface to better understand the contributions to sea level rise. Drilling will occur at three separate sites over the course of two seasons. Additionally, helicopters will move scientists around the areas adjacent to the drill sites to gather data about the cavity beneath the ice shelf through seismic imaging.

AGO Groom Team	-82.00° S by 96.79° E 487 to 1090nm from McMurdo Station

Four staff will groom a ski landing area for the Basler and LC-130 at various AeroGeophysical Observatory (AGO) sites (A-112-M). Last season, landing conditions were too rough for the A-112-M (Weatherwax) grantees to reach some of their research locations. The team will travel to the AGO sites to groom and retro gear that was left at the sites in previous seasons.

CReSIS Groom Team 154nm from McMurdo Station

Three staff will groom a skiway for the Center for Remote Sensing of Ice Sheet (CReSIS) radar equipped Twin Otter (I-189-M, Gogineni). The radar antennae mounted on the underside of the wing are at risk of damage if they contact an irregular, ungroomed snow surface. Skiway grooming reduces the risk of damage to the antennae and the aircraft. They will groom a landing strip at the fuel cache at Roadend Nunatak and another in the Byrd Glacier catchment basin.

Science Event Numbering System 2011-2012

Every project is assigned a unique event number.
The first letter indicates the USAP program funding a project:

Prefix	USAP Program
A	Astrophysics and Geospace Sciences
B	Organisms and Ecosystems
C	Integrated System Science
G	Earth Sciences
I	Glaciology
O	Oceans and Atmospheric Sciences
W	Artists and Writers
T	Technical Event

The suffix represents the supporting station. If field work takes place at more than one location the event number carries more than one suffix separated by a slash.

Suffix	Supporting Station (link to index)
M	McMurdo Station
P	Palmer Station
S	South Pole Station
L	ARSV Laurence M. Gould
N	RV/IB Nathaniel B. Palmer
E	Special projects supported by the USAP. Examples include investigators working with other national Antarctic programs.

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Alley, Richard	I-168-M	Collaborative research: Physical properties of the WAIS Divide deep core
Anandakrishnan, Sridhar	C-520-M	WISSARD surface geophysics
Anderson, Kent	G-090-P/S	Global seismograph station at South Pole and Palmer Station
Ashworth, Allan	G-294-M	Collaborative Research: Integrating geomorphological and paleoecological studies to reconstruct Neogene environments of the Transantarctic Mountains
Avallone, Linnea	O-324-M	Augmenting the Ross Island-area automatic weather station network to develop a tropospheric ozone climatology
Balco, Gregory	I-156-M	Collaborative Research: Last glacial maximum and deglaciation chronology for the Foundation Ice Stream and southeast Weddell Sea Embayment
Barrett, John	B-508-M	McMurdo LTER - Landscape Ecology: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valley LTER Program
Barwick, Steven	A-127-M	Development of hexagonal radio array for the ARIANNA ultra-high energy neutrino detector
Bentley, Charles	T-350-M	Ice Coring and Drilling Services (ICDS) support for WAIS Divide
Bieber, John	A-120-M	Cosmic ray observations at McMurdo Station

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Bowser, Samuel	B-043-M	Evolution and diversity of Antarctic Rhizarian Protists
Bristow, William	A-369-M/S	McMurdo and South Pole SuperDARN: Investigation of the ionospheric dynamics and magnetosphere-ionosphere coupling in Antarctica
Brown, Michael	G-097-M	Collaborative research: Polyphase orogenesis and crustal differentiation in West Antarctica
Buckley, Bradley	B-308-M	The cellular stress response in cold-adapted organisms: Building novel mechanistic links between heat stress, cell cycle arrest and apoptosis in Antarctic fishes.
Bucklin, Ann	B-285-L	Population ecology of Salpa thompsoni based on molecular indicators
Carlstrom, John	A-370-S	Science Coordination Office for Astrophysical Research in Antarctica (SCOARA-II)
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Clauer, C. Robert	A-106-M/S	Collaborative Research: Polar Experiment Network for Geospace Upper-atmosphere Investigations: Interhemispheric investigations along the 40-degree magnetic meridian
Clauer, C. Robert	A-101-M	Collaborative imaging, estimation, and analysis of density distributions in the conjugate polar ionospheres
Comberiate, Mike	T-966-M	TDRSS and NAILS
Conway, Howard	I-209-M	Deglaciation of the Ross Sea Embayment - constraints from Roosevelt Island
Costa, Daniel	B-232-M	Collaborative Research: Weddell seals as autonomous sensors of the winter oceanography of the Ross Sea
Cottle, John	G-064-M	Exploring the significance of NA-alkaline magmatism in subduction systems, a case study from the Ross Orogen
Cottrell, Matthew	B-026-P	Photoheterotrophic microbes in the West Antarctic Peninsula marine ecosystem
Deming, Jody	B-395-M	High resolution genomic and proteomic analyses of a microbial transport mechanism from Antarctic marine waters to permanent snowpack
Emslie, Steven D	B-034-E/M	Stable isotope analyses of pygoscelid penguin remains from active and abandoned colonies in Antarctica
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Holland, David	O-286-M	Collaborative Research: Application of distributed temperature sensors (DTS) for Antarctic ice shelves and cavities
Inan, Umran	A-336-P	ELF/VLF observation of whistler-mode waves, lightning discharge, and gamma-ray events from Palmer Station
Johns, Bjorn	T-295-M	UNAVCO GPS survey support
Joye, Samantha	B-332-M	Distinguishing biotic and abiotic nitrous oxide sources in Mars analog brines, sediments and soils in the McMurdo Dry Valleys, Antarctica.
Karentz, Deneb	B-466-P	Collaborative Research: Functional Genomics and Physiological Ecology of Seasonal Succession in Antarctic Phytoplankton: Adaptations to Light and Temperature
Karle, Albrecht	A-107-S	Collaborative Research: MRI-R2 instrument development of the Askaryan Radio Array, a large-scale radio Cherenkov neutrino detector at the South Pole
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Lee, Richard	B-256-P	Role of dehydration and photoperiodism in preparing an Antarctic insect for the polar night
Levy, Joseph	G-080-M	Rapid landscape change in Garwood Valley: Monitoring buried glacier melt and exploring “Péwé’s Lost Lake”
Lewis, Adam	G-074-M	Collaborative Research: Activation of high-elevation alluvial fans in the Transantarctic Mountains – a proxy for Plio-Pleistocene warmth along East Antarctic ice margins
Lyons, W. Berry	B-509-M	McMurdo LTER - Geochemistry: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valley LTER Program
Marsh, Adam	B-383-M	Polar adaptations in the Antarctic polychaete capitella perarmata
Martinson, Doug	B-021-L	Palmer Long Term Ecological Research (LTER): Looking back in time through marine ecosystem space, physical oceanography component
Mayewski, Paul	I-173-M	Roosevelt Island Climate Evolution (RICE) project
McClintock, James	B-027-P	The effects of ocean acidification and rising sea surface temperatures on shallow-water benthic organisms in Antarctica
McGillicuddy, Dennis	B-318-N	Impact of mesoscale processes on iron supply and phytoplankton dynamics in the Ross Sea
McKnight, Diane	B-506-M	McMurdo LTER - Streams: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valley LTER Program
Mellish, Jo-Ann	B-470-M	Collaborative Research: Thermoregulation in free-living Antarctic seals: the missing link in effective ecological modeling
Mercer, Jennifer	T-940-M	CRREL 09-10 activities

Mikucki, Jill	G-298-M	Resistivity mapping of subsurface microbial habitats in the McMurdo region
Moore, Anna	A-356-S	Analysis of the data from the Gattini Antarctic camera network
Moore, Robert C	A-109-M/P/S	Collaborative Research: Antarctic ELF/VLF observations of lightning and lightning-induced electron precipitation
Morin, Paul	T-434-M/P	The Polar Geospatial Information Center: Joint support
Musser, Jim	A-148-M	Cosmic Ray Electron Synchrotron Telescope (CREST)
Naveen, Ron	B-044-E	Collaborative Research: Multispecies, multi-scale investigations of long-term changes in penguin and seabird populations on the Antarctic Peninsula
Palo, Scott	A-284-S	Collaborative study of the Antarctic mesosphere and lower thermosphere
Parker, Timothy	T-299-M	IRIS/PASSCAL seismic support
Place, Sean	B-199-M	Ocean acidification–category 1: Identifying adaptive responses of polar fishes in a vulnerable ecosystem
Ponganis, Paul	B-197-M	The physiological ecology of two Antarctic icons: Emperor penguins and leopard seals
Price, Buford	I-122-M	Climatology, meteorology, and microbial metabolism with dust loggers and fluorimetry
Priscu, John	B-505-M	McMurdo LTER - Lakes: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valley LTER Program
Pryke, Clement	A-149-S	Collaborative Research: BICEP2 and SPUD - A search for inflation with degree-scale polarimetry from the South Pole
Putkonen, Jaakko	G-501-M	Systematic analysis of the stability and ages of soil surfaces in Transantarctic Mountains

Rack, Frank	C-524-M	WISSARD borehole drill contractor
Rigor, Ignatius G	O-238-E	Interaction of air, sea Ice and ocean around Antarctica
Rupper, Summer	I-158-M	Collaborative Research: Annual satellite era accumulation patterns over WAIS Divide: A study using shallow ice cores, near-surface radar and satellites
Severinghaus, Jeffrey	I-169-M	Collaborative Research: A "horizontal ice core" for large-volume samples of the past atmosphere
Severinghaus, Jeffrey	I-476-M	Collaborative Research: Replicate coring at WAIS Divide to obtain additional samples at events of high scientific interest
Sprintall, Janet	O-260-L	The Drake Passage high-density XBT/XCTD program
Stearns, Leigh	I-351-M	Collaborative Research: Byrd Glacier flow dynamics
Steffen, Konrad	I-077-E	IPY: Stability of Larsen C Ice Shelf in a warming climate
Steinberg, Deborah	B-020-L/P	Palmer Long Term Ecological Research (LTER): Looking back in time through marine ecosystem space, zooplankton component
Stepp, Bill	A-145-M	NASA Long Duration Balloon (LDB) support program
Stone, John	I-414-M	Collaborative Research: Constraints on the last Ross Sea Ice Sheet from glacial deposits in the Southern Transantarctic Mountains
Swanger, Kate	G-085-M	Multinuclide approach to systematically evaluate the scatter in surface exposure ages in Antarctica and to develop consistent alpine glacier chronologies
Sweeney, Colm	O-214-L	Collaborative research: Biogeochemical controls of the oxygen and carbon system in the Drake Passage

Szuberla, Curt	T-396-M	Operation and maintenance of a CTBT class infrasound array at Windless Bight
Taylor, Kendrick	I-477-M	WAIS Divide Science Coordination Office (SCO)
Taylor, Michael	A-119-M/S	Investigating wave-driven mesospheric dynamics over South Pole using an advanced mesospheric temperature mapper
Taylor, Michael	A-119-M/S	Development of an ANtarctic Gravity Wave Imager Network (ANGWIN) for collaborative mesospheric research
Thoman, Bruce	T-927-M	NASA/McMurdo Ground Station (MG1)
Waddington, Edwin	I-162-M	Collaborative research: acoustic logging of the WAIS Divide borehole
Walker, Christopher	A-136-M	Stratospheric Terahertz Observatory (STO)
Wall, Diana	B-507-M	McMurdo LTER - Soils: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valley LTER Program
Wannamaker, Philip	G-494-M	Defining rift mechanisms and the thermal regime of the Lithosphere across Beardmore Glacier region, Central Transantarctic Mountains, using magnetotelluric measurements
Warren, Joseph	B-393-L	Acoustic assessment of Southern Ocean salps and their ecosystem impact
Weatherwax, Allan T	A-112-M	Polar experiment network for geospace upper-atmosphere investigations: PENGUIn - A high-latitude window to geospace dynamics
Weatherwax, Allan T	A-111-M/S	Studies of the polar Ionosphere and Magnetosphere from measurements in Antarctica
Wiens, Douglas	G-089-M/S	Polenet East: An international seismological network for East

		Antarctica
Wilson, Nerida	**B-465-N**	Using molecular data to test connectivity and the circumpolar paradigm for Antarctic marine invertebrates
Wilson, Terry	**G-079-M**	Collaborative research, IPY POLENET-Antarctica: Investigating links between geodynamics and ice sheets
Winberry, Jeremy	**I-181-M**	Collaborative Research: Geophysical study of ice stream stick-slip dynamics
Wu, Qian	**A-132-P**	Thermospheric neutral wind observation in the Antarctica Peninsula
Zesta, Eftyhia	**A-357-M**	South American Meridional B-Field Array (SAMBA): An American-Chilean chain

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Alaska Fairbanks, University of	T-396-M	Szuberla, Curt
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Arizona Tucson, University of	A-136-M	Walker, Christopher
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Brigham Young University	I-158-M	Rupper, Summer
California Berkeley, University of	I-122-M	Price, Buford
California Institute of Technology	A-356-S	Moore, Anna
California Irvine, University of	A-127-M	Barwick, Steven
California Los Angeles, University of	A-357-M	Zesta, Eftyhia
California San Diego, University of	O-313-N	Chereskin, Teresa
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California Santa Barbara, University of	B-134-M	Hofmann, Gretchen
California Santa Barbara, University of	G-064-M	Cottle, John
California Santa Cruz, University of	B-232-M	Costa, Daniel
Case Western Reserve University	G-058-M	Harvey, Ralph
Central Washington University	I-181-M	Winberry, Jeremy
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214	O-214-L	Sweeney, Colm
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333	A-333-S	Halzen, Francis
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Mercer, Jennifer	T-940-M	CRREL 09-10 activities
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Parker, Timothy	T-299-M	IRIS/PASSCAL seismic support
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Albershardt, Lou	I-209-M	Howard Conway
Alger, Russ	T-940-M	Jennifer Mercer
Ameel, Jon	A-148-M	Jim Musser
Amsler, Charles	B-027-P	James McClintock
Amsler, Margaret	B-027-P	James McClintock
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Armstrong, Anne	B-020-L/P	Deborah Steinberg
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Batta Lona, Paola	B-285-L	Ann Bucklin
Bauska, Thomas	I-169-M	Jeffrey Severinghaus
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Bibby, Thomas	B-318-N	Dennis McGillicuddy
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Casassa, Gino	I-077-E	Konrad Steffen
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Chaplin, Gerard	O-313-N	Teresa Chereskin
Charles, Sean	B-318-N	Dennis McGillicuddy
Chen, Ashley	B-465-N	Nerida Wilson
Chen, Cao	A-130-M	Xinzhao Chu
Chen, Pisin	A-107-S	Albrecht Karle
Chidichimo, Maria Paz	O-313-N	Teresa Chereskin
Chiuchiolo, Amy	B-505-M	John Priscu
Christianson, Knut	C-520-M	Sridhar Anandakrishnan
Chu, Xinzhao	A-130-M	Xinzhao Chu
Clevermann, Fabian	A-333-S	Francis Halzen
Clow, Gary	I-168-M	Richard Alley
Conway, Howard	I-414-M	John Stone
Conway, Maurice	I-414-M	John Stone
Cope, Joseph	B-020-L/P	Deborah Steinberg
Cottam, Tiara	A-136-M	Christopher Walker
Cotten, Rex	T-927-M	Bruce Thoman
Coutu, Stephane	A-148-M	Jim Musser
Crites, Abigail	A-379-S	John Carlstrom
Crowe, Reid	I-189-M	Prasad Gogineni
Curtis, Aaron	G-081-M	Phillip Kyle
Czoski, Paige	G-081-M	Phillip Kyle
Dahnert, Kristina	T-350-M	Charles Bentley
de Haan, Tijmen	A-379-S	John Carlstrom
Delacroix, Alexandre	A-356-S	Anna Moore
Delaney, Allan	T-940-M	Jennifer Mercer
DeLizo, Liza	B-318-N	Dennis McGillicuddy
Dengler, Elizabeth	I-414-M	John Stone
Denlinger, David	B-256-P	Richard Lee

DeVoe, Jesse	B-009-M	Robert Garrott
Dickson, James	G-080-M	Joseph Levy
Dilly, Geoff	B-134-M	Gretchen Hofmann
Doan, Hai Nhu	B-318-N	Dennis McGillicuddy
Dobbs, Matthew	A-379-S	John Carlstrom
Dolhi, Jenna	B-247-M	
Dominguez, Ruben	A-136-M	Christopher Walker
Donaldson, Kathleen	B-318-N	Dennis McGillicuddy
Donohue, Kathleen	O-313-N	Teresa Chereskin
Dorsi, Samuel	O-324-M	Linnea Avallone
Dowell, Charles	A-149-S	Clement Pryke
Du Vivier, Alice	O-283-M/S	Matt Lazzara
DuBois, Lauren	B-197-M	Paul Ponganis
Dudycha, Jeffry	B-199-M	Sean Place
Duffy, Brian	A-136-M	Christopher Walker
Dugan, Hilary	B-505-M	John Priscu
Dugger, Katie	B-031-M	David Ainley
Dutton, Geoff	O-257-M/S	
DuVernois, Michael	A-107-S	Albrecht Karle
Dyonisius, Michael	G-294-M	Allan Ashworth
Eaton, Joshua	B-318-N	Dennis McGillicuddy
Eilers, Alice	B-232-M	Daniel Costa
Ellis, Clayton	T-927-M	Bruce Thoman
Enzor, Laura	B-199-M	Sean Place
Estante, Frederico	A-284-S	Scott Palo
Ewing, Mark	I-185-M	Prasad Gogineni
Fain, Xavier Pierre Marcel	I-169-M	Jeffrey Severinghaus
Fairbrother, Debora	A-145-M	Bill Stepp
Fairbrother, Debora	A-145-M	Bill Stepp
Farrer, Jessica	B-009-M	Robert Garrott
Farry, Shawn	B-013-L/P	Bill Fraser

Fegyveresi, John	I-477-M	Kendrick Taylor
Field, Chris	A-145-M	Bill Stepp
Field, Christopher	A-145-M	Bill Stepp
Firing, Eric	O-317-L/N	Teresa Chereskin
Firing, Yvonne	O-313-N	Teresa Chereskin
Fliescher, Stefan	A-149-S	Clement Pryke
Fong, Weichun	A-130-M	Xinzhao Chu
Forsberg, Rene	G-079-M	Terry Wilson
Frazier, Curtis	A-145-M	Bill Stepp
Frechette, Jedediah	G-081-M	Phillip Kyle
Funk, Raymond	T-927-M	Bruce Thoman
Gajewski, Austin	B-466-P	Deneb Karentz
Garzio, Michael	B-019-L/P	
Garzio, Michael	B-019-L/P	
Garzio, Michael	B-019-L/P	
Gebhard, Mark	A-148-M	Jim Musser
Gennaro, Joseph	A-148-M	Jim Musser
George, Elizabeth	A-379-S	John Carlstrom
Geske, Matt	A-148-M	Jim Musser
Geyer, Kevin	B-507-M	Diana Wall
Gibson, Christopher	T-350-M	Charles Bentley
Gibson, Dar	C-524-M	Frank Rack
Gillette, Brandon	I-351-M	Leigh Stearns
Giudice, Gaetano	G-081-M	Phillip Kyle
Giusti, Collin	G-501-M	Jaakko Putkonen
Gleiber, Miram	B-020-L/P	Deborah Steinberg
Glowacki, David	A-333-S	Francis Halzen
Goetz, Kim	B-232-M	Daniel Costa
Gomez-Garcia, Daniel	I-189-M	Prasad Gogineni
Gooday, Andrew	B-043-M	Samuel Bowser

Goodrich, Bethany	B-466-P	Deneb Karentz
Gooseff, Michael	B-508-M	John Barrett
Gorham, Peter	A-107-S	Albrecht Karle
Goto, Shinsuke	B-256-P	Richard Lee
Gottlieb, Jonah	A-136-M	Christopher Walker
Green, Alisa	G-494-M	Philip Wannamaker
Greenan, Blair	B-318-N	Dennis McGillicuddy
Greenbaum, Jamin	G-098-M	Donald Blankenship
Gregg, Gerald	A-145-M	Bill Stepp
Gremillet, David	B-031-M	David Ainley
Greschke, Robert	T-299-M	Timothy Parker
Groppi, Christopher	A-136-M	Christopher Walker
Grossart, Hans-Peter	B-505-M	John Priscu
Grzymski, Joe	B-466-P	Deneb Karentz
Gudbjartsson, Blaine	A-107-S	Albrecht Karle
Guida, Stephanie	B-383-M	Adam Marsh
Hagen-Peter, Graham	G-064-M	John Cottle
Hagg, Robert	B-318-N	Dennis McGillicuddy
Hale, Richard	I-185-M	Prasad Gogineni
Halverson, Nils	A-379-S	John Carlstrom
Hamilton, Gordon	I-351-M	Leigh Stearns
Hansen, Steffen Bo	T-350-M	Charles Bentley
Hanson, Jordan Christian	A-127-M	Steven Barwick
Harr, Natalie	B-256-P	Richard Lee
Harrington, Nicholas	A-379-S	John Carlstrom
Hart, Rory	C-520-M	Sridhar Anandakrishnan
Hassumani, Daniel	B-308-M	Bradley Buckley
Hatchcock, Stephanie	B-318-N	Dennis McGillicuddy
Haus, Nicholas	G-239-P	James Bockheim
Hechtman, Steven	A-136-M	Christopher Walker
Heckler, Greg	T-966-M	Mike Comberiate

Heereman, David	A-333-S	Francis Halzen
Hegland, Matthew	I-156-M	Gregory Balco
Hell, Katherina	B-505-M	John Priscu
Hendy, Chris	I-196-M	Brenda Hall
Henning, Jason	A-379-S	John Carlstrom
Henry, Linda	B-197-M	Paul Ponganis
Hernandez, Gonzalo	A-110-M/S	Gonzalo Hernandez
Herried, Bradley	T-434-M/P	Paul Morin
Herrmann, Nell	B-027-P	James McClintock
Hill, Brian	A-107-S	Albrecht Karle
Hill, Gary	A-107-S	Albrecht Karle
Hill, Roger	B-470-M	Jo-Ann Mellish
Hindle, Allyson	B-470-M	Jo-Ann Mellish
Ho, Colin	C-526-M	
Holst, Jesper	G-058-M	Ralph Harvey
Holzapfel, Bill	A-379-S	John Carlstrom
Homeier, Andreas	A-333-S	Francis Halzen
Hoover, Stephen	A-379-S	John Carlstrom
Horgan, Huw	C-520-M	Sridhar Anandakrishnan
Horning, Markus	B-470-M	Jo-Ann Mellish
Hothem, Larry	G-079-M	Terry Wilson
Hrubes, James	A-379-S	John Carlstrom
Huckstadt, Luis	B-232-M	Daniel Costa
Hudson, Hilary	B-043-M	Samuel Bowser
Hudson, Stan	A-370-S	John Carlstrom
Hummon, Julia	O-317-L/N	Teresa Chereskin
Humphrey, Jim	A-145-M	Bill Stepp
Hunter, Evan	B-134-M	Gretchen Hofmann
Huntington, Channing	A-357-M	Eftyhia Zesta
Hutchinson, Jason	G-078-M	Robert Kemerait
Huybers, Kathleen	I-156-M	Gregory Balco

Ivanic, Timothy	G-097-M	Michael Brown
Iverson, Nels	G-081-M	Phillip Kyle
Jackson, Margaret	I-196-M	Brenda Hall
Jacobsen, John	A-333-S	Francis Halzen
Jaros, Chris	B-506-M	Diane McKnight
Jayred, Michael	T-350-M	Charles Bentley
Jefferson, Tobee	G-078-M	Robert Kemerait
Jensen, Lars	G-298-M	Jill Mikucki
John, Klinck	B-318-N	Dennis McGillicuddy
Johnson, Jay	T-350-M	Charles Bentley
Jonak, Dominic	T-940-M	Jennifer Mercer
Jørgensen, Jan	G-298-M	Jill Mikucki
Joy, Katherine	G-058-M	Ralph Harvey
Kadokura, Akira	A-111-M/S	Allan T Weatherwax
Kaiser, Henry	B-134-M	Gretchen Hofmann
Kalnajs, Lars	O-324-M	Linnea Avallone
Kambarn, William	T-927-M	Bruce Thoman
Kapsenberg, Lydia	B-134-M	Gretchen Hofmann
Karner, James	G-058-M	Ralph Harvey
Kaufman, Jonathan	A-039-S	John Kovac
Kawamura, Hiroyuki	A-136-M	Christopher Walker
Kawarasaki, Yuta	B-256-P	Richard Lee
Keisler, Ryan	A-379-S	John Carlstrom
Kelleher, Cole	T-434-M/P	Paul Morin
Kendall, Christopher	A-379-S	John Carlstrom
Keshmiri, Shahriar	I-185-M	Prasad Gogineni
Ketchum, Nicholas	B-247-M	
Khan, Alia	B-506-M	Diane McKnight
Killingsworth, Drea	G-081-M	Phillip Kyle
Kim, Hyomin	A-106-M/S	C. Robert Clauer

Kim, Stacy	B-383-M	Adam Marsh
King, Joseph	G-078-M	Robert Kemerait
King, Randy	B-318-N	Dennis McGillicuddy
Klein, Andrew	B-518-M	Mahlon Kennicutt
Kloosterman, Jenna	A-136-M	Christopher Walker
Kluskiewicz, Daniel	I-162-M	Edwin Waddington
Knuth, Margaret	T-940-M	Jennifer Mercer
Koenig, Lora	I-158-M	Summer Rupper
Koffman, Toby	I-196-M	Brenda Hall
Kohler, Tyler	B-506-M	Diane McKnight
Koopmann, Walter	G-298-M	Jill Mikucki
Korhonen, Fawna	G-097-M	Michael Brown
Kosnyrev, Olga	B-318-N	Dennis McGillicuddy
Kosnyrev, Valery	B-318-N	Dennis McGillicuddy
Koutnik, Michelle	I-158-M	Summer Rupper
Kromer, Edward	G-090-P/S	
Kujawski, Joseph	A-111-M/S	Allan T Weatherwax
Kulesa, Craig	A-136-M	Christopher Walker
Kurahashi, Naoko	A-333-S	Francis Halzen
Laird, Robert	B-318-N	Dennis McGillicuddy
Laitsch, Denise	A-333-S	Francis Halzen
Lamp, Jennifer	G-085-M	Kate Swanger
Landsman, Yael Hagar	A-333-S	Francis Halzen
Landsman, Yael Hagar	A-107-S	Albrecht Karle
Lang, Michael	A-148-M	Jim Musser
LaRue, Michelle	T-434-M/P	Paul Morin
Laundrie, Andrew	A-333-S	Francis Halzen
Lawson, Brian	T-396-M	Curt Szuberla
Lawson, Kathleen	T-396-M	Curt Szuberla
League, Michael	B-383-M	Adam Marsh
Lebar, Don	T-350-M	Charles Bentley

Leitch, Erik	A-379-S	John Carlstrom
LeMoigne, Nicolas	G-079-M	Terry Wilson
Lescroel, Amelie	B-031-M	David Ainley
Lesser, David	A-136-M	Christopher Walker
Levy, Joseph	G-080-M	Joseph Levy
Li, Dale	A-379-S	John Carlstrom
Li, Jilu	I-189-M	Prasad Gogineni
Lloyd, Andrew	G-079-M	Terry Wilson
Lopez, Paloma	B-505-M	John Priscu
Love, Michelle	B-465-N	Nerida Wilson
Lueker, Martin	A-149-S	Clement Pryke
Luria, Catherine	B-045-L/P	
Luthra, Tarun	C-520-M	Sridhar Anandakrishnan
Lykins, Ryan	I-185-M	Prasad Gogineni
Lynch, Heather	B-044-E	Ron Naveen
Mackay, Sean	G-294-M	Allan Ashworth
Macon, Joseph	A-106-M/S	C. Robert Clauer
Madigan, Michael	B-332-M	Samantha Joye
Magee, William	G-079-M	Terry Wilson
Manteghi, Majid	A-106-M/S	C. Robert Clauer
Marchant, David	G-294-M	Allan Ashworth
Maris, Virginie	G-494-M	Philip Wannamaker
Marsay, Christopher	B-318-N	Dennis McGillicuddy
Marshall, Benjamin	G-090-P/S	Kent Anderson
Marshall, Greg	B-197-M	Paul Ponganis
Massaro, Melanie	B-031-M	David Ainley
Masters, Otto	A-145-M	Bill Stepp
Matson, Paul	B-134-M	Gretchen Hofmann
Maule, Giles	G-058-M	Ralph Harvey
Mazzocco, Melissa	B-393-L	Joseph Warren
McBrearty, Rob	G-079-M	Terry Wilson

McBrearty, Rob	G-079-M	Terry Wilson
McCarthy, Michael	A-110-M/S	Gonzalo Hernandez
McDonald, Birgitte	B-197-M	Paul Ponganis
McGrath, Daniel	I-077-E	Konrad Steffen
McKay, Luke	B-045-L/P	
McLaren, Campbell	A-364-S	Craig Kulesa
McPherron, Robert	A-106-M/S	C. Robert Clauer
Melendy, Jr., Terry	T-940-M	Jennifer Mercer
Melville, Bob	A-112-M	Allan T Weatherwax
Meures, Thomas	A-107-S	Albrecht Karle
Meyer, Stephan	A-379-S	John Carlstrom
Midon, Marco	T-927-M	Bruce Thoman
Miege, Clement	I-158-M	Summer Rupper
Miki, Christian	A-107-S	Albrecht Karle
Miles, Travis	B-019-L/P	
Millar, Jessica	O-313-N	Teresa Chereskin
Miller, Pnina	T-299-M	Timothy Parker
Miller, Victoria	I-161-M	
Miner, Jeremy	G-079-M	Terry Wilson
Minh, Luong-Van	A-379-S	John Carlstrom
Mitchell, Logan	I-477-M	Kendrick Taylor
Mitchell, Logan	I-169-M	Jeffrey Severinghaus
Mitchell, Michael	A-109-M/P/S	Robert C Moore
Moe, Heather	O-257-M/S	
Monnin, Mee-ya	B-470-M	Jo-Ann Mellish
Moore, Jenna	B-465-N	Nerida Wilson
Morgan, Daniel	G-501-M	Jaakko Putkonen
Morgan-Kiss, Rachael	B-247-M	
Mortensen, Nicolai	T-350-M	Charles Bentley
Morton, Elizabeth	T-350-M	Charles Bentley

Mosby, Anna	B-318-N	Dennis McGillicuddy
Motoba, Tetsuro	A-111-M/S	Allan T Weatherwax
Mullenax, Robert	A-145-M	Bill Stepp
Murgai, Nikhil	B-045-L/P	
Muto, Atsuhiro	C-520-M	Sridhar Anandakrishnan
Natoli, Tyler	A-379-S	John Carlstrom
Neveux, Iva	B-466-P	Deneb Karentz
Newcomb, Matthew	A-333-S	Francis Halzen
Ng, Gregory	G-098-M	Donald Blankenship
Nguyen, Hien	A-149-S	Clement Pryke
Nichols, Erik	A-379-S	John Carlstrom
Nieuwendam, Alexandre	G-239-P	James Bockheim
Nikrad, Mrinalini	B-026-P	Matthew Cottrell
Norman, Bryan	G-064-M	John Cottle
Nutter, Scott	A-148-M	Jim Musser
Nylen, Thomas	B-504-M	Andrew Fountain
Obryk, Maciej	B-505-M	John Priscu
Occhi, Marcie	G-074-M	Adam Lewis
Ogburn, Walter	A-149-S	Clement Pryke
Okal, Marianne	T-295-M	Bjorn Johns
Olson, Elise	B-318-N	Dennis McGillicuddy
Oppenheimer, Clive	G-081-M	Phillip Kyle
Orlando, Angiola	A-039-S	John Kovac
Padin, Stephen	A-379-S	John Carlstrom
Palmer, Terence	B-518-M	Mahlon Kennicutt
Park, Na Hee	A-148-M	Jim Musser
Parker, Tim	G-079-M	Terry Wilson
Pasqualone, Annamarie	B-383-M	Adam Marsh
Patrician, Melissa	B-393-L	Joseph Warren
Pautet, Pierre-Dominique	A-119-M/S	Michael Taylor

Pautet, Pierre-Dominique	A-119-M/S	Michael Taylor
Pawlowski, Jan	B-043-M	Samuel Bowser
Paxton, Dominique	B-020-L/P	Deborah Steinberg
Pearson, Linnea	B-232-M	Daniel Costa
Pedulli, Marco	B-318-N	Dennis McGillicuddy
Pennycook, Jean	B-031-M	David Ainley
Perez Lara, Juan	A-145-M	Bill Stepp
Pernic, David	A-107-S	Albrecht Karle
Pernic, Robert	A-370-S	John Carlstrom
Peslier, Anne	G-058-M	Ralph Harvey
Peters, Brian	B-332-M	Samantha Joye
Peters, Leo	I-161-M	
Peters, Leo	C-407-M	Robert Bindschadler
Peters, Nial	G-081-M	Phillip Kyle
Peterson, Benjamin	C-520-M	Sridhar Anandakrishnan
Petrenko, Vasilii	I-169-M	Jeffrey Severinghaus
Pettersson, Rickard	G-080-M	Joseph Levy
Pettit, Joe	T-295-M	Bjorn Johns
Pettus, Walter	A-333-S	Francis Halzen
Poage, Michael	B-507-M	Diana Wall
Polito, Michael	B-034-E/M	Steven D Emslie
Pollard, Anne	B-031-M	David Ainley
Pomraning, Dale	C-407-M	Robert Bindschadler
Porter, Claire	T-434-M/P	Paul Morin
Porzig, Elizabeth	B-031-M	David Ainley
Price, Lori	B-020-L/P	Deborah Steinberg
Price, Mary Lynn	B-009-M	Robert Garrott
Prince, Joanna	G-064-M	John Cottle
Pritchard, John	I-185-M	Prasad Gogineni
Puetz, Patrick	A-136-M	Christopher Walker
Rand, John	T-940-M	Jennifer Mercer

Richard, Jacob	A-145-M	Bill Stepp
Richter, Steffen	A-039-S	John Kovac
Richter, Thomas	G-098-M	Donald Blankenship
Rider, Melissa	B-044-E	Ron Naveen
Rivest, Emily	B-134-M	Gretchen Hofmann
Roberts, Darren	B-009-M	Robert Garrott
Roberts, J.R.	G-079-M	Terry Wilson
Roberts, Michael	I-351-M	Leigh Stearns
Robertson, Mark	G-090-P/S	Kent Anderson
Robertson, Mark	G-090-P/S	
Robertson, Scott	G-078-M	Robert Kemerait
Robinson, Patrick	B-232-M	Daniel Costa
Rodriguez, Diego	B-318-N	Dennis McGillicuddy
Rodriguez-Morales, Fernando	I-189-M	Prasad Gogineni
Rogister, Yves	G-079-M	Terry Wilson
Rolander, Nathan	A-136-M	Christopher Walker
Rose, Paul	I-169-M	Jeffrey Severinghaus
Roth, James	A-333-S	Francis Halzen
Rotter, Benjamin	A-107-S	Albrecht Karle
Rouse, Gregory	B-465-N	Nerida Wilson
Ruck, Kate	B-020-L/P	Deborah Steinberg
Ruhl, John	A-379-S	John Carlstrom
Rush, Kurt	T-966-M	Mike Comberiate
Ryan-Keogh, Thomas	B-318-N	Dennis McGillicuddy
Salgado, Jose	A-379-S	John Carlstrom
Salm, Jacqueline	B-465-N	Nerida Wilson
Samarkin, Vladimir	B-332-M	Samantha Joye
Sandstrom, Perry	A-333-S	Francis Halzen
Sayre, James	A-379-S	John Carlstrom
Schaefer, Hinrich	I-169-M	Jeffrey Severinghaus
Schmidt, Torsten	A-333-S	Francis Halzen

Schoenrock, Kathryn	B-027-P	James McClintock
Schofield, Oscar	B-019-L/P	
Schrader, Christian	G-058-M	Ralph Harvey
Schram, Julie	B-027-P	James McClintock
Schubnell, Michael	A-148-M	Jim Musser
Schutt, John	G-058-M	Ralph Harvey
Schutte, Charles	B-332-M	Samantha Joye
Schwander, Jakob	I-476-M	Jeffrey Severinghaus
Schwarz, Robert	A-149-S	Clement Pryke
Sedwick, Peter	B-318-N	Dennis McGillicuddy
Seguret, Marie	B-019-L/P	
Selway, Katherine	G-494-M	Philip Wannamaker
Sewell, Mary	B-134-M	Gretchen Hofmann
Shaw, William	C-407-M	Robert Bindschadler
Sheehy, Chris	A-149-S	Clement Pryke
Shero, Michelle	B-232-M	Daniel Costa
Shin, Cecilia	B-043-M	Samuel Bowser
Shoop, Sally	T-940-M	Jennifer Mercer
Shore, Patrick	G-089-M/S	Douglas Wiens
Shore, Patrick	G-079-M	Terry Wilson
Siddoway, Christine	G-097-M	Michael Brown
Siegfried, Matthew	C-520-M	Sridhar Anandakrishnan
Simmons, Beth	B-020-L/P	Deborah Steinberg
Simmons, Christopher	I-156-M	Gregory Balco
Sinkola, Nickolas	T-927-M	Bruce Thoman
Siudzinski, Colleen	B-009-M	Robert Garrott
Skarlupka, Heath	A-333-S	Francis Halzen
Skinner, John	B-470-M	Jo-Ann Mellish
Skinner, Malcolm	I-158-M	Summer Rupper
Sleadd, Isaac	B-308-M	Bradley Buckley

Smalley, Bob	G-079-M	Terry Wilson
Smith, Heidi	B-046-M	Christine Foreman
Smith, Walker	B-318-N	Dennis McGillicuddy
Sohst, Bettina	B-318-N	Dennis McGillicuddy
Sokol, Eric	B-507-M	Diana Wall
Solarz, Michael	I-122-M	Buford Price
Sørensen, Kurt	G-298-M	Jill Mikucki
Sousa, James	O-313-N	Teresa Chereskin
Spaleta, Jeff	A-369-M/S	William Bristow
Spector, Perry	I-414-M	John Stone
St-Laurent, Pierre	B-318-N	Dennis McGillicuddy
Stalder, Brian	A-136-M	Christopher Walker
Stamieszkin, Karen	B-020-L/P	Deborah Steinberg
Staniszewski, Zachary	A-149-S	Clement Pryke
Stanton, Timothy	C-407-M	Robert Bindschadler
Stark, Antony	A-136-M	Christopher Walker
Steffen, Ashley	G-074-M	Adam Lewis
Steinarsson, Einar	C-407-M	Robert Bindschadler
Stern, Alon	O-286-M	David Holland
Stiller, Josefin	B-465-N	Nerida Wilson
Stillinger, Andrew	A-112-M	Allan T Weatherwax
Stockel, James	C-407-M	Robert Bindschadler
Stodt, John	G-494-M	Philip Wannamaker
Stokes, Sarah	A-149-S	Clement Pryke
Story, Kyle	A-379-S	John Carlstrom
Stutz, James	G-079-M	Terry Wilson
Summers, Mindy	B-465-N	Nerida Wilson
Sweet, Stephen	B-518-M	Mahlon Kennicutt
Sylvain, Zachary	B-507-M	Diana Wall
Takacs-Vesbach, Cristina	B-508-M	John Barrett
Tarle, Greg	A-148-M	Jim Musser

Taylor, Michael	A-119-M/S	Michael Taylor
Taylor, Michael	A-119-M/S	Michael Taylor
Teacher, PolarTrek	A-112-M	Allan T Weatherwax
Teply, Grant	A-149-S	Clement Pryke
Teza, James	T-940-M	Jennifer Mercer
Thom, Jonathan	O-283-M/S	Matt Lazzara
Thomas, Thomas	A-145-M	Bill Stepp
Thomas, Thomas	A-145-M	Bill Stepp
Thorson, Phil	B-197-M	Paul Ponganis
Tickner, James	B-465-N	Nerida Wilson
Tift, Michael	B-197-M	Paul Ponganis
Todd, Claire	I-156-M	Gregory Balco
Tolan, James	A-149-S	Clement Pryke
Tracey, Karen	O-313-N	Teresa Chereskin
Truffer, Martin	C-407-M	Robert Bindschadler
Tye, Robert	T-927-M	Bruce Thoman
Tyler, Scott	O-286-M	David Holland
Tytgat, Guy	G-079-M	Terry Wilson
Tytgat, Guy	T-299-M	Timothy Parker
Uhlmann, Daniel	G-097-M	Michael Brown
Urban, Frank	I-168-M	Richard Alley
van Bergen, Tania	A-379-S	John Carlstrom
Vandegehuchte, Martijn	B-507-M	Diana Wall
Vanderlinde, Keith	A-379-S	John Carlstrom
Vaudrin, Cody	A-284-S	Scott Palo
Venema, Bryan	A-110-M/S	Gonzalo Hernandez
Vieira, Goncalo	G-239-P	James Bockheim
Vieregg, Abigail	A-149-S	Clement Pryke
Virginia, Ross	B-507-M	Diana Wall
Voigt, Don	I-477-M	Kendrick Taylor
Von Rosk, Laura	B-043-M	Samuel Bowser

Wahl, Lindsay	G-298-M	Jill Mikucki
Wakely, Scott	A-148-M	Jim Musser
Wall, Candace	B-318-N	Dennis McGillicuddy
Watts, Randolph	O-313-N	Teresa Chereskin
Watts, Sarah	O-313-N	Teresa Chereskin
Wei, Songqiao	G-089-M/S	Douglas Wiens
Weitz, Nora	I-351-M	Leigh Stearns
Welch, Kathy	B-509-M	W. Berry Lyons
Welhouse, Lee	O-283-M/S	Matt Lazzara
Wendell, Edward	T-927-M	Bruce Thoman
Westlund, Randy	T-966-M	Mike Comberiate
Wettergreen, David	T-940-M	Jennifer Mercer
Weygand, James	A-357-M	Eftyhia Zesta
Wharton, Drew	B-232-M	Daniel Costa
White, Seth	T-295-M	Bjorn Johns
White, Seth	G-079-M	Terry Wilson
Whiteside, Robin	A-145-M	Bill Stepp
Whitten, Jennifer	G-085-M	Kate Swanger
Wiebe, Peter	B-285-L	Ann Bucklin
Wilhelm, Kelly	G-239-P	James Bockheim
Willenbring, Jane	G-074-M	Adam Lewis
Williams, Jessica	I-158-M	Summer Rupper
Wilson, Philip	A-370-S	John Carlstrom
Withoff, David	T-396-M	Curt Szuberla
Wolf, Martin	A-333-S	Francis Halzen
Wong, Chin-Lin	A-149-S	Clement Pryke
Wong, Gifford	I-477-M	Kendrick Taylor
Woodward, Danielle	B-043-M	Samuel Bowser
Wu, Qian	A-132-P	Qian Wu
Wurtzell, Katharine	B-393-L	Joseph Warren

Yakymchuk, Chris	G-097-M	Michael Brown
Yarnall, Michael	B-009-M	Robert Garrott
Yoon, Kiwon	A-149-S	Clement Pryke
Young, Abram	A-136-M	Christopher Walker
Young, Abram	A-364-S	Craig Kulesa
Young, Duncan	G-098-M	Donald Blankenship
Young, Robert	A-107-S	Albrecht Karle
Yu, Pauline	B-134-M	Gretchen Hofmann
Yu, Zhibin	A-130-M	Xinzhao Chu
Zagorodnov, Victor	O-286-M	David Holland
Zamora, Felix	G-074-M	Adam Lewis
Zander, Charles	T-350-M	Charles Bentley
Zippay, Mackenzie	B-199-M	Sean Place
Zoet, Lucas	G-079-M	Terry Wilson

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Astrophysics and Geospace Sciences

Principal Investigator ▼	Event No.	Project Title
Barwick, Steven	A-127-M	Development of hexagonal radio array for the ARIANNA ultra-high energy neutrino detector
Bieber, John	A-120-M	Cosmic ray observations at McMurdo Station
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-370-S	Science Coordination Office for Astrophysical Research in Antarctica (SCOARA-II)
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
Clauer, C.	A-106-M/S	Collaborative Research: Polar Experiment Network for Geospace Upper-atmosphere Investigations: Interhemispheric investigations along the 40-degree magnetic meridian
Clauer, C.	A-101-M	Collaborative imaging, estimation, and analysis of density distributions in the conjugate polar ionospheres
Engebretson, Mark	A-102-M/S	Studies of solar wind - Magnetosphere interactions using observations of ULF waves at an extensive ground array at high latitudes
Evenson, Paul	A-120-M	Cosmic ray observations at McMurdo Station
Evenson, Paul	A-118-S	Element composition of high-energy

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		solar particles
Halzen, Francis	A-333-S	IceCube operations and maintenance
Hernandez, Gonzalo	A-110-M/S	Austral high-latitude atmospheric dynamics
Inan, Umran	A-336-P	ELF/VLF observation of whistler-mode waves, lightning discharge, and gamma-ray events from Palmer Station
Karle, Albrecht	A-107-S	Collaborative Research: MRI-R2 instrument development of the Askaryan Radio Array, a large-scale radio Cherenkov neutrino detector at the South Pole
Kovac, John	A-039-S	Collaborative Research: BICEP2 and SPUD - A search for inflation with degree-scale polarimetry from the South Pole
Kulesa, Craig	A-364-S	High Elevation Antarctic Terahertz (HEAT) telescopes for Dome A and Ridge A
LaBelle, James	A-128-S	Outstanding Questions on Auroral Radiation Fine Structure
Moore, Anna	A-356-S	Analysis of the data from the Gattini Antarctic camera network
Moore, Robert	A-109-M/P/S	Collaborative Research: Antarctic ELF/VLF observations of lightning and lightning-induced electron precipitation
Musser, Jim	A-148-M	Cosmic Ray Electron Synchrotron Telescope (CREST)
Palo, Scott	A-284-S	Collaborative study of the Antarctic mesosphere and lower thermosphere
Pryke, Clement	A-149-S	Collaborative Research: BICEP2 and SPUD - A search for inflation with degree-scale polarimetry from the South Pole
Stepp, Bill	A-145-M	NASA Long Duration Balloon (LDB) support program
Taylor, Michael	A-119-M/S	Investigating wave-driven mesospheric dynamics over South

		Pole using an advanced mesospheric temperature mapper
Taylor, Michael	A-119-M/S	Development of an ANtarctic Gravity Wave Imager Network (ANGWIN) for collaborative mesospheric research
Walker, Christopher	A-136-M	Stratospheric Terahertz Observatory (STO)
Weatherwax, Allan	A-112-M	Polar experiment network for geospace upper-atmosphere investigations: PENGUIn - A high-latitude window to geospace dynamics
Weatherwax, Allan	A-111-M/S	Studies of the polar Ionosphere and Magnetosphere from measurements in Antarctica
Wu, Qian	A-132-P	Thermospheric neutral wind observation in the Antarctica Peninsula
Zesta, Eftyhia	A-357-M	South American Meridional B-Field Array (SAMBA): An American-Chilean chain

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Principal Investigator	Event No.	Project Title
Ainley, David	B-031-M	Adelie Penguin response to climate change at the individual, colony and metapopulation levels
Barrett, John	B-508-M	McMurdo LTER - Landscape Ecology: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valley LTER Program
Bowser, Samuel	B-043-M	Evolution and diversity of Antarctic Rhizarian Protists
Buckley, Bradley	B-308-M	The cellular stress response in cold-adapted organisms: Building novel mechanistic links between heat stress, cell cycle arrest and apoptosis in Antarctic fishes.
Bucklin, Ann	B-285-L	Population ecology of Salpa thompsoni based on molecular indicators
Costa, Daniel	B-232-M	Collaborative Research: Weddell seals as autonomous sensors of the winter oceanography of the Ross Sea
Cottrell, Matthew	B-026-P	Photoheterotrophic microbes in the West Antarctic Peninsula marine ecosystem
Deming, Jody	B-395-M	High resolution genomic and proteomic analyses of a microbial transport mechanism from Antarctic marine waters to permanent snowpack
Emslie, Steven	B-034-E/M	Stable isotope analyses of pygoscelid penguin remains from active and abandoned colonies in Antarctica
Foreman, Christine	B-046-M	The biogeochemical evolution of dissolved organic matter in a fluvial

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		system on the Cotton Glacier, Antarctica
Fountain, Andrew	B-504-M	McMurdo LTER - Glaciers: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valleys LTER Program
Fraser, Bill	B-013-L/P	Palmer Long Term Ecological Research (LTER): Looking back in time through marine ecosystem space, apex predator component
Garrott, Robert	B-009-M	The demographic consequences of environmental variability and individual heterogeneity in life-history tactics of a long-lived Antarctic marine predator
Hofmann, Gretchen	B-134-M	Ocean acidification: Integrated approaches to understanding effects on antarctic sea urchins, Sterechinus neumayeri
Joye, Samantha	B-332-M	Distinguishing biotic and abiotic nitrous oxide sources in Mars analog brines, sediments and soils in the McMurdo Dry Valleys, Antarctica.
Karentz, Deneb	B-466-P	Collaborative Research: Functional Genomics and Physiological Ecology of Seasonal Succession in Antarctic Phytoplankton: Adaptations to Light and Temperature
Kennicutt, Mahlon	B-518-M	Temporal variability in natural and anthropogenic disturbance of McMurdo Station
Lee, Richard	B-256-P	Role of dehydration and photoperiodism in preparing an Antarctic insect for the polar night
Lyons, W. Berry	B-509-M	McMurdo LTER - Geochemistry: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valley LTER Program
Marsh, Adam	B-383-M	Polar adaptations in the Antarctic polychaete capitella perarmata
Martinson, Doug	B-021-L	Palmer Long Term Ecological Research (LTER): Looking back in time through marine ecosystem

		space, physical oceanography component
McClintock, James	**B-027-P**	The effects of ocean acidification and rising sea surface temperatures on shallow-water benthic organisms in Antarctica
McGillicuddy, Dennis	**B-318-N**	Impact of mesoscale processes on iron supply and phytoplankton dynamics in the Ross Sea
McKnight, Diane	**B-506-M**	McMurdo LTER - Streams: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valley LTER Program
Mellish, Jo-Ann	**B-470-M**	Collaborative Research: Thermoregulation in free-living Antarctic seals: the missing link in effective ecological modeling
Naveen, Ron	**B-044-E**	Collaborative Research: Multispecies, multi-scale investigations of long-term changes in penguin and seabird populations on the Antarctic Peninsula
Place, Sean	**B-199-M**	Ocean acidification–category 1: Identifying adaptive responses of polar fishes in a vulnerable ecosystem
Ponganis, Paul	**B-197-M**	The physiological ecology of two Antarctic icons: Emperor penguins and leopard seals
Priscu, John	**B-505-M**	McMurdo LTER - Lakes: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valley LTER Program
Steinberg, Deborah	**B-020-L/P**	Palmer Long Term Ecological Research (LTER): Looking back in time through marine ecosystem space, zooplankton component
Wall, Diana	**B-507-M**	McMurdo LTER - Soils: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valley LTER Program
Warren, Joseph	**B-393-L**	Acoustic assessment of Southern Ocean salps and their ecosystem impact

Wilson, Nerida	B-465-N	Using molecular data to test connectivity and the circumpolar paradigm for Antarctic marine invertebrates

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Principal Investigator	Event No.	Project Title
Anderson, Kent	G-090-P/S	Global seismograph station at South Pole and Palmer Station
Ashworth, Allan	G-294-M	Collaborative Research: Integrating geomorphological and paleoecological studies to reconstruct Neogene environments of the Transantarctic Mountains
Blankenship, Donald	G-098-M	International cryospheric exploration through collaborative aerogeophysical profiling/Operation Ice Bridge (OIB)
Bockheim, James	G-239-P	Impact of recent climate warming on active-layer dynamics, permafrost, and soil properties on the western Antarctic Peninsula
Brown, Michael	G-097-M	Collaborative research: Polyphase orogenesis and crustal differentiation in West Antarctica
Cottle, John	G-064-M	Exploring the significance of NA-alkaline magmatism in subduction systems, a case study from the Ross Orogen
Harvey, Ralph	G-058-M	Antarctic Search for Meteorites (ANSMET)
Kemerait, Robert	G-078-M	Dry Valley seismic project
Kyle, Phillip	G-081-M	Mount Erebus Volcano Observatory III (MEVO III): Conduit processes and surveillance
Levy, Joseph	G-080-M	Rapid landscape change in Garwood Valley: Monitoring buried glacier melt and exploring “Péwé’s Lost Lake”
Lewis, Adam	G-074-M	Collaborative Research: Activation of high-elevation alluvial fans in the Transantarctic Mountains – a proxy for Plio-Pleistocene warmth along

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		East Antarctic ice margins
Mikucki, Jill	G-298-M	Resistivity mapping of subsurface microbial habitats in the McMurdo region
Putkonen, Jaakko	G-501-M	Systematic analysis of the stability and ages of soil surfaces in Transantarctic Mountains
Swanger, Kate	G-085-M	Multinuclide approach to systematically evaluate the scatter in surface exposure ages in Antarctica and to develop consistent alpine glacier chronologies
Wannamaker, Philip	G-494-M	Defining rift mechanisms and the thermal regime of the Lithosphere across Beardmore Glacier region, Central Transantarctic Mountains, using magnetotelluric measurements
Wiens, Douglas	G-089-M/S	Polenet East: An international seismological network for East Antarctica
Wilson, Terry	G-079-M	Collaborative research, IPY POLENET-Antarctica: Investigating links between geodynamics and ice sheets

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Principal Investigator ▼	Event No.	Project Title
Alley, Richard	I-168-M	Collaborative research: Physical properties of the WAIS Divide deep core
Balco, Gregory	I-156-M	Collaborative Research: Last glacial maximum and deglaciation chronology for the Foundation Ice Stream and southeast Weddell Sea Embayment
Conway, Howard	I-209-M	Deglaciation of the Ross Sea Embayment - constraints from Roosevelt Island
Gogineni, Prasad	I-189-M	Center for Remote Sensing of Ice Sheets (CReSIS) - Basler airborne radar survey
Gogineni, Prasad	I-185-M	Center for Remote Sensing of Ice Sheets (CReSIS) - Unmanned Aerial System (UAS) operations
Hall, Brenda	I-196-M	Sensitivity of the Antarctic Ice Sheet to global climate change over the last two glacial/interglacial cycles
Mayewski, Paul	I-173-M	Roosevelt Island Climate Evolution (RICE) project
Price, Buford	I-122-M	Climatology, meteorology, and microbial metabolism with dust loggers and fluorimetry
Rupper, Summer	I-158-M	Collaborative Research: Annual satellite era accumulation patterns over WAIS Divide: A study using shallow ice cores, near-surface radar and satellites
Severinghaus, Jeffrey	I-169-M	Collaborative Research: A "horizontal ice core" for large-volume samples of the past atmosphere
Severinghaus, Jeffrey	I-476-M	Collaborative Research: Replicate coring at WAIS Divide to obtain

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		additional samples at events of high scientific interest
Stearns, Leigh	**I-351-M**	Collaborative Research: Byrd Glacier flow dynamics
Steffen, Konrad	**I-077-E**	IPY: Stability of Larsen C Ice Shelf in a warming climate
Stone, John	**I-414-M**	Collaborative Research: Constraints on the last Ross Sea Ice Sheet from glacial deposits in the Southern Transantarctic Mountains
Taylor, Kendrick	**I-477-M**	WAIS Divide Science Coordination Office (SCO)
Waddington, Edwin	**I-162-M**	Collaborative research: acoustic logging of the WAIS Divide borehole
Winberry, Jeremy	**I-181-M**	Collaborative Research: Geophysical study of ice stream stick-slip dynamics

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Ocean and Atmospheric Sciences

Principal Investigator	Event No.	Project Title
Avallone, Linnea	O-324-M	Augmenting the Ross Island-area automatic weather station network to develop a tropospheric ozone climatology
Cassar, Nicolas	O-405-L	Physiological and ecosystem structure forcings on carbon fluxes in the Southern Ocean mixed layer
Chereskin, Teresa	O-313-N	Collaborative research: Dynamics and transport of the Antarctic Circumpolar Current in the Drake Passage
Chereskin, Teresa	O-317-L/N	Collaborative research: Southern Ocean current observations from the U.S. Antarctic research vessels
Holland, David	O-286-M	Collaborative Research: Application of distributed temperature sensors (DTS) for Antarctic ice shelves and cavities
Lazzara, Matt	O-283-M/S	Antarctic Automatic Weather Station (AWS) program
Rigor, Ignatius	O-238-E	Interaction of air, sea Ice and ocean around Antarctica
Sprintall, Janet	O-260-L	The Drake Passage high-density XBT/XCTD program
Sweeney, Colm	O-214-L	Collaborative research: Biogeochemical controls of the oxygen and carbon system in the Drake Passage

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Principal Investigator ▼	Event No.	Project Title
Anandakrishnan, Sridhar	C-520-M	WISSARD surface geophysics
Bindschadler, Robert	C-407-M	IPY: Collaborative Research: Ocean-ice sheet interaction in the Amundsen Sea: The keystone of West Antarctic stability
Rack, Frank	C-524-M	WISSARD borehole drill contractor

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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-370-S	Science Coordination Office for Astrophysical Research in Antarctica (SCOARA-II)
Carlstrom, John	A-379-S	Cosmological Research with the 10-meter South Pole Telescope
Clauer, C.	A-106-M/S	Collaborative Research: Polar Experiment Network for Geospace Upper-atmosphere Investigations: Interhemispheric investigations along the 40-degree magnetic meridian
Engebretson, Mark	A-102-M/S	Studies of solar wind - Magnetosphere interactions using observations of ULF waves at an extensive ground array at high latitudes
Evenson, Paul	A-118-S	Element composition of high-energy solar particles
Halzen, Francis	A-333-S	IceCube operations and maintenance
Hernandez, Gonzalo	A-110-M/S	Austral high-latitude atmospheric dynamics
Karle, Albrecht	A-107-S	Collaborative Research: MRI-R2 instrument development of the Askaryan Radio Array, a large-scale radio Cherenkov neutrino detector at the South Pole
Kovac, John	A-039-S	Collaborative Research: BICEP2 and SPUD - A search for inflation with degree-scale polarimetry from the

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Kulesa, Craig	A-364-S	High Elevation Antarctic Terahertz (HEAT) telescopes for Dome A and Ridge A
LaBelle, James	A-128-S	Outstanding Questions on Auroral Radiation Fine Structure
Lazzara, Matt	O-283-M/S	Antarctic Automatic Weather Station (AWS) program
Moore, Anna	A-356-S	Analysis of the data from the Gattini Antarctic camera network
Moore, Robert	A-109-M/P/S	Collaborative Research: Antarctic ELF/VLF observations of lightning and lightning-induced electron precipitation
Palo, Scott	A-284-S	Collaborative study of the Antarctic mesosphere and lower thermosphere
Pryke, Clement	A-149-S	Collaborative Research: BICEP2 and SPUD - A search for inflation with degree-scale polarimetry from the South Pole
Taylor, Michael	A-119-M/S	Investigating wave-driven mesospheric dynamics over South Pole using an advanced mesospheric temperature mapper
Taylor, Michael	A-119-M/S	Development of an ANtarctic Gravity Wave Imager Network (ANGWIN) for collaborative mesospheric research
Weatherwax, Allan	A-111-M/S	Studies of the polar Ionosphere and Magnetosphere from measurements in Antarctica
Wiens, Douglas	G-089-M/S	Polenet East: An international seismological network for East Antarctica

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Anandakrishnan, Sridhar	C-520-M	WISSARD surface geophysics
Ashworth, Allan	G-294-M	Collaborative Research: Integrating geomorphological and paleoecological studies to reconstruct Neogene environments of the Transantarctic Mountains
Avallone, Linnea	O-324-M	Augmenting the Ross Island-area automatic weather station network to develop a tropospheric ozone climatology
Balco, Gregory	I-156-M	Collaborative Research: Last glacial maximum and deglaciation chronology for the Foundation Ice Stream and southeast Weddell Sea Embayment
Barrett, John	B-508-M	McMurdo LTER - Landscape Ecology: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valley LTER Program
Barwick, Steven	A-127-M	Development of hexagonal radio array for the ARIANNA ultra-high energy neutrino detector
Bentley, Charles	T-350-M	Ice Coring and Drilling Services (ICDS) support for WAIS Divide
Bieber, John	A-120-M	Cosmic ray observations at McMurdo Station
Bindschadler, Robert	C-407-M	IPY: Collaborative Research: Ocean-ice sheet interaction in the Amundsen Sea: The keystone of West Antarctic

		stability
Blankenship, Donald	G-098-M	International cryospheric exploration through collaborative aerogeophysical profiling/Operation Ice Bridge (OIB)
Bowser, Samuel	B-043-M	Evolution and diversity of Antarctic Rhizarian Protists
Bristow, William	A-369-M/S	McMurdo and South Pole SuperDARN: Investigation of the ionospheric dynamics and magnetosphere-ionosphere coupling in Antarctica
Brown, Michael	G-097-M	Collaborative research: Polyphase orogenesis and crustal differentiation in West Antarctica
Buckley, Bradley	B-308-M	The cellular stress response in cold-adapted organisms: Building novel mechanistic links between heat stress, cell cycle arrest and apoptosis in Antarctic fishes.
Chu, Xinzhao	A-130-M	Lidar Investigation of middle and upper atmosphere temperature, composition, chemistry, and dynamics at McMurdo, Antarctica
Clauer, C.	A-106-M/S	Collaborative Research: Polar Experiment Network for Geospace Upper-atmosphere Investigations: Interhemispheric investigations along the 40-degree magnetic meridian
Clauer, C.	A-101-M	Collaborative imaging, estimation, and analysis of density distributions in the conjugate polar ionospheres
Comberiate, Mike	T-966-M	TDRSS and NAILS
Conway, Howard	I-209-M	Deglaciation of the Ross Sea Embayment - constraints from Roosevelt Island
Costa, Daniel	B-232-M	Collaborative Research: Weddell seals as autonomous sensors of the winter oceanography of the Ross Sea
Cottle, John	G-064-M	Exploring the significance of NA-alkaline magmatism in subduction systems, a case study from the Ross Orogen
Deming, Jody	B-395-M	High resolution genomic and

		proteomic analyses of a microbial transport mechanism from Antarctic marine waters to permanent snowpack
Emslie, Steven	B-034-E/M	Stable isotope analyses of pygoscelid penguin remains from active and abandoned colonies in Antarctica
Engebretson, Mark	A-102-M/S	Studies of solar wind - Magnetosphere interactions using observations of ULF waves at an extensive ground array at high latitudes
Evenson, Paul	A-120-M	Cosmic ray observations at McMurdo Station
Foreman, Christine	B-046-M	The biogeochemical evolution of dissolved organic matter in a fluvial system on the Cotton Glacier, Antarctica
Fountain, Andrew	B-504-M	McMurdo LTER - Glaciers: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valleys LTER Program
Garrott, Robert	B-009-M	The demographic consequences of environmental variability and individual heterogeneity in life-history tactics of a long-lived Antarctic marine predator
Gogineni, Prasad	I-189-M	Center for Remote Sensing of Ice Sheets (CReSIS) - Basler airborne radar survey
Gogineni, Prasad	I-185-M	Center for Remote Sensing of Ice Sheets (CReSIS) - Unmanned Aerial System (UAS) operations
Hall, Brenda	I-196-M	Sensitivity of the Antarctic Ice Sheet to global climate change over the last two glacial/interglacial cycles
Harvey, Ralph	G-058-M	Antarctic Search for Meteorites (ANSMET)
Hernandez, Gonzalo	A-110-M/S	Austral high-latitude atmospheric dynamics
Hofmann, Gretchen	B-134-M	Ocean acidification: Integrated approaches to understanding effects on antarctic sea urchins, Sterechinus

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Holland, David	O-286-M	Collaborative Research: Application of distributed temperature sensors (DTS) for Antarctic ice shelves and cavities
Johns, Bjorn	T-295-M	UNAVCO GPS survey support
Joye, Samantha	B-332-M	Distinguishing biotic and abiotic nitrous oxide sources in Mars analog brines, sediments and soils in the McMurdo Dry Valleys, Antarctica.
Kemerait, Robert	G-078-M	Dry Valley seismic project
Kennicutt, Mahlon	B-518-M	Temporal variability in natural and anthropogenic disturbance of McMurdo Station
Kyle, Phillip	G-081-M	Mount Erebus Volcano Observatory III (MEVO III): Conduit processes and surveillance
Lazzara, Matt	O-283-M/S	Antarctic Automatic Weather Station (AWS) program
Levy, Joseph	G-080-M	Rapid landscape change in Garwood Valley: Monitoring buried glacier melt and exploring “Péwé’s Lost Lake”
Lewis, Adam	G-074-M	Collaborative Research: Activation of high-elevation alluvial fans in the Transantarctic Mountains – a proxy for Plio-Pleistocene warmth along East Antarctic ice margins
Lyons, W. Berry	B-509-M	McMurdo LTER - Geochemistry: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valley LTER Program
Marsh, Adam	B-383-M	Polar adaptations in the Antarctic polychaete capitella perarmata
Mayewski, Paul	I-173-M	Roosevelt Island Climate Evolution (RICE) project
McKnight, Diane	B-506-M	McMurdo LTER - Streams: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valley LTER Program
Mellish, Jo-Ann	B-470-M	Collaborative Research: Thermoregulation in free-living Antarctic seals: the missing link in effective ecological modeling

Mercer, Jennifer	T-940-M	CRREL 09-10 activities
Mikucki, Jill	G-298-M	Resistivity mapping of subsurface microbial habitats in the McMurdo region
Moore, Robert	A-109-M/P/S	Collaborative Research: Antarctic ELF/VLF observations of lightning and lightning-induced electron precipitation
Morin, Paul	T-434-M/P	The Polar Geospatial Information Center: Joint support
Musser, Jim	A-148-M	Cosmic Ray Electron Synchrotron Telescope (CREST)
Parker, Timothy	T-299-M	IRIS/PASSCAL seismic support
Place, Sean	B-199-M	Ocean acidification–category 1: Identifying adaptive responses of polar fishes in a vulnerable ecosystem
Ponganis, Paul	B-197-M	The physiological ecology of two Antarctic icons: Emperor penguins and leopard seals
Price, Buford	I-122-M	Climatology, meteorology, and microbial metabolism with dust loggers and fluorimetry
Priscu, John	B-505-M	McMurdo LTER - Lakes: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valley LTER Program
Putkonen, Jaakko	G-501-M	Systematic analysis of the stability and ages of soil surfaces in Transantarctic Mountains
Rack, Frank	C-524-M	WISSARD borehole drill contractor
Rupper, Summer	I-158-M	Collaborative Research: Annual satellite era accumulation patterns over WAIS Divide: A study using shallow ice cores, near-surface radar and satellites
Severinghaus, Jeffrey	I-169-M	Collaborative Research: A "horizontal ice core" for large-volume samples of the past atmosphere
Severinghaus, Jeffrey	I-476-M	Collaborative Research: Replicate coring at WAIS Divide to obtain additional samples at events of high

		scientific interest
Stearns, Leigh	I-351-M	Collaborative Research: Byrd Glacier flow dynamics
Stepp, Bill	A-145-M	NASA Long Duration Balloon (LDB) support program
Stone, John	I-414-M	Collaborative Research: Constraints on the last Ross Sea Ice Sheet from glacial deposits in the Southern Transantarctic Mountains
Swanger, Kate	G-085-M	Multinuclide approach to systematically evaluate the scatter in surface exposure ages in Antarctica and to develop consistent alpine glacier chronologies
Szuberla, Curt	T-396-M	Operation and maintenance of a CTBT class infrasound array at Windless Bight
Taylor, Kendrick	I-477-M	WAIS Divide Science Coordination Office (SCO)
Taylor, Michael	A-119-M/S	Investigating wave-driven mesospheric dynamics over South Pole using an advanced mesospheric temperature mapper
Taylor, Michael	A-119-M/S	Development of an ANtarctic Gravity Wave Imager Network (ANGWIN) for collaborative mesospheric research
Thoman, Bruce	T-927-M	NASA/McMurdo Ground Station (MG1)
Waddington, Edwin	I-162-M	Collaborative research: acoustic logging of the WAIS Divide borehole
Walker, Christopher	A-136-M	Stratospheric Terahertz Observatory (STO)
Wall, Diana	B-507-M	McMurdo LTER - Soils: Increased connectivity in a polar desert resulting from climate warming: McMurdo Dry Valley LTER Program
Wannamaker, Philip	G-494-M	Defining rift mechanisms and the thermal regime of the Lithosphere across Beardmore Glacier region, Central Transantarctic Mountains, using magnetotelluric measurements
Weatherwax, Allan	A-112-M	Polar experiment network for

		geospace upper-atmosphere investigations: PENGUIn - A high-latitude window to geospace dynamics
Weatherwax, Allan	A-111-M/S	Studies of the polar Ionosphere and Magnetosphere from measurements in Antarctica
Wiens, Douglas	G-089-M/S	Polenet East: An international seismological network for East Antarctica
Wilson, Terry	G-079-M	Collaborative research, IPY POLENET-Antarctica: Investigating links between geodynamics and ice sheets
Winberry, Jeremy	I-181-M	Collaborative Research: Geophysical study of ice stream stick-slip dynamics
Zesta, Eftyhia	A-357-M	South American Meridional B-Field Array (SAMBA): An American-Chilean chain

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Principal Investigator ▼	Event No.	Project Title
Anderson, Kent	G-090-P/S	Global seismograph station at South Pole and Palmer Station
Bockheim, James	G-239-P	Impact of recent climate warming on active-layer dynamics, permafrost, and soil properties on the western Antarctic Peninsula
Cottrell, Matthew	B-026-P	Photoheterotrophic microbes in the West Antarctic Peninsula marine ecosystem
Fraser, Bill	B-013-L/P	Palmer Long Term Ecological Research (LTER): Looking back in time through marine ecosystem space, apex predator component
Inan, Umran	A-336-P	ELF/VLF observation of whistler-mode waves, lightning discharge, and gamma-ray events from Palmer Station
Karentz, Deneb	B-466-P	Collaborative Research: Functional Genomics and Physiological Ecology of Seasonal Succession in Antarctic Phytoplankton: Adaptations to Light and Temperature
Lee, Richard	B-256-P	Role of dehydration and photoperiodism in preparing an Antarctic insect for the polar night
McClintock, James	B-027-P	The effects of ocean acidification and rising sea surface temperatures on shallow-water benthic organisms in Antarctica
Moore, Robert	A-109-M/P/S	Collaborative Research: Antarctic ELF/VLF observations of lightning and lightning-induced electron precipitation
Morin, Paul	T-434-M/P	The Polar Geospatial Information Center: Joint support
Steinberg, Deborah	B-020-L/P	Palmer Long Term Ecological

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		Research (LTER): Looking back in time through marine ecosystem space, zooplankton component
Wu, Qian	**A-132-P**	Thermospheric neutral wind observation in the Antarctica Peninsula

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RVIB Nathaniel B. Palmer

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Principal Investigator	Event No.	Project Title
Chereskin, Teresa	O-313-N	Collaborative research: Dynamics and transport of the Antarctic Circumpolar Current in the Drake Passage
Chereskin, Teresa	O-317-L/N	Collaborative research: Southern Ocean current observations from the U.S. Antarctic research vessels
McGillicuddy, Dennis	B-318-N	Impact of mesoscale processes on iron supply and phytoplankton dynamics in the Ross Sea
Wilson, Nerida	B-465-N	Using molecular data to test connectivity and the circumpolar paradigm for Antarctic marine invertebrates

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ARSV Laurence M. Gould

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Principal Investigator ▼	Event No.	Project Title
Bucklin, Ann	B-285-L	Population ecology of Salpa thompsoni based on molecular indicators
Cassar, Nicolas	O-405-L	Physiological and ecosystem structure forcings on carbon fluxes in the Southern Ocean mixed layer
Chereskin, Teresa	O-317-L/N	Collaborative research: Southern Ocean current observations from the U.S. Antarctic research vessels
Fraser, Bill	B-013-L/P	Palmer Long Term Ecological Research (LTER): Looking back in time through marine ecosystem space, apex predator component
Martinson, Doug	B-021-L	Palmer Long Term Ecological Research (LTER): Looking back in time through marine ecosystem space, physical oceanography component
Sprintall, Janet	O-260-L	The Drake Passage high-density XBT/XCTD program
Steinberg, Deborah	B-020-L/P	Palmer Long Term Ecological Research (LTER): Looking back in time through marine ecosystem space, zooplankton component
Sweeney, Colm	O-214-L	Collaborative research: Biogeochemical controls of the oxygen and carbon system in the Drake Passage
Warren, Joseph	B-393-L	Acoustic assessment of Southern Ocean salps and their ecosystem impact

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Principal Investigator ▼	Event No.	Project Title
Emslie, Steven	B-034-E/M	Stable isotope analyses of pygoscelid penguin remains from active and abandoned colonies in Antarctica
Naveen, Ron	B-044-E	Collaborative Research: Multispecies, multi-scale investigations of long-term changes in penguin and seabird populations on the Antarctic Peninsula
Rigor, Ignatius	O-238-E	Interaction of air, sea Ice and ocean around Antarctica
Steffen, Konrad	I-077-E	IPY: Stability of Larsen C Ice Shelf in a warming climate

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Adelie Penguin Response To Climate Change At The Individual, Colony And Metapopulation Levels

Program Manager:
Dr. Charles Amsler

Event Number: B-031-M
NSF/PLR Award 0944411

ASC POC/Implementer:
Eric Pohlman

Dr. David Ainley (Principal Investigator)
dainley@penguinscience.com
http://www.penguinscience.com

H.T. Harvey & Associates
Los Gatos, California

Supporting Stations: McMurdo Station
Research Locations: Beaufort, Franklin, and Inexpressible Islands, Capes Bird, Crozier, Royds

Project Description:

Since 1996, this study has involved novel technology and experimentation including natural experiments and long hours finding banded birds at three colonies of widely disparate sizes occurring in a metapopulation. While changes in populations typically are tracked to gauge response to climate or habitat change, the process actually involves the response of individuals as each copes with an altered environment. During this study spanning 15 breeding seasons, researchers have found that 20 percent of individuals within a colony successfully raise offspring, and that they do so because of exemplary foraging proficiency. Moreover, foraging requires more effort at the largest colony, where intra-specific competition is higher than at small colonies, and requires more proficiency during periods of environmental stress (e.g., anomalous sea-ice conditions). Not only is breeding success and eventual recruitment involved in this species' response to environmental change, but, when conditions are particularly daunting, so is emigration as it dramatically increases, countering the long-standing assumption that Adélie penguins are highly philopatric. This project is a collaboration of six co-PIs from the US, New Zealand and France and will continue the outreach and education program, including webisodes and PenguinScience.com.

Field Season Overview:

The project continues an effort begun in 1996. Based out of McMurdo

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Station, researchers will deploy camps to Capes Crozier and Royds, and will make a few day trips to Cape Bird, and Beaufort Island if sea ice early in season allows helo support. Otherwise, researchers will remain mostly at the two field camps, with different team members at each location. The project will also work in collaboration with biologists from New Zealand (who will be at Cape Bird). Our field season will be timed to match the Adélie Penguin nesting season. Research team members will spend a significant amount of time hiking about looking for penguins banded as chicks and logging their breeding status. To investigate foraging effort, as it affects breeding effort, team members will be deploying time-depth-recorders from each site. They will also continue the operation of computerized weighbridges to log trip duration and food loads, although not at Cape Royds. Researchers also plan to make weekly helo flights, as last year, in order to census cetaceans (and penguins) along the fast ice edge and in the channel during late December and into January. Work in past seasons revealed that cetacean foraging can greatly affect the variation in penguin foraging effort. Work on the educational 'Penguin Science' webisodes and website will continue. The educational program developed in previous seasons will continue during this one as well.

Deploying Team Members:

- David Ainley (PI)
- Lisa Ballance
- Katie Dugger (Co-PI)
- David Gremillet
- Amelie Lescroel (Team Leader)
- Melanie Massaro
- Jean Pennycook
- Anne Pollard
- Elizabeth Porzig

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Project Details 2011-2012

WISSARD Surface Geophysics

Program Manager:
Dr. Lisa Clough

Event Number: C-520-M
NSF/PLR Award 0838763, 0838764

ASC POC/Implementer:
Chad Naughton

Dr. Sridhar Anandakrishnan (Principal Investigator)
sak@essc.psu.edu
http://www.wissard.org

Pennsylvania State University
Department of Geosciences and Environment Instit
University Park, Pennsylvania

Supporting Stations: McMurdo Station
Research Locations: Whillans Ice Stream Grounding Zone

Project Description:

This research project represents the surface geophysics component of Whillans Ice Stream Subglacial Access Research Drilling (WISSARD). WISSARD is a collaborative, multi-disciplinary research project aimed at answering key questions directly relevant to: 1. Marine ice sheet stability; and 2. Biotic ecosystems in Antarctic subglacial environments

Researchers will perform the proposed geophysical surveys on the lower portion of the Whillans Ice Stream, where three critical subglacial environments can be investigated within a relatively small area: 1. Sub-ice-shelf cavity; 2. grounding-zone wedge; and 3. subglacial (ice-stream environment) drainage system including several lakes.

Surface geophysics is intended to enable site-selection and the extrapolation of borehole and observations into a regional framework..

Field Season Overview:

In the 2011-2012 season, the team will deploy to the grounding line of Whillans Ice Stream, where they will undertake a comprehensive geophysical survey and service and relocate an existing GPS network. The research team will conduct radio-echo-sounding along regional profiles and in a high-resolution grid totaling approximately 500 line kilometers. Active source seismology will also be performed along profiles totaling approximately 60

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line kilometers, sampling the grounding line and potential drill sites.

Deploying Team Members:

- Lucas Beem
- Knut Christianson
- Rory Hart
- Huw Horgan (Team Leader)
- Tarun Luthra
- Atsuhiro Muto
- Benjamin Peterson
- Matthew Siegfried

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Collaborative Research: Integrating Geomorphological And Paleoecological Studies To Reconstruct Neogene Environments Of The Transantarctic Mountains

Program Manager:
Dr. Alexandra Isern

Event Number: G-294-M

ASC POC/Implementer:
Chad Naughton

Dr. Allan Ashworth (Principal Investigator)
allan.ashworth@ndsu.edu
http://people.bu.edu/marchant/research/lacdeposits.html

Geosciences, Stevens Hall
Fargo, North Dakota

Supporting Stations: McMurdo Station
Research Locations: McMurdo Dry Valleys

Project Description:
Ancient lake sediments deposited on the margins of former outlet and alpine glaciers in the Dry Valleys region are proving to be an invaluable archive for studies of past climatic and ecological changes. Using a numerical chronology based on analyses of interbedded volcanic ashfall, lake sediments greater than 13 million years ago contain fossils of exceptionally well-preserved mosses, diatoms, ostracods, Nothofagus leaves, wood, and insect remains. Lake sediments from less than 13 million years ago appear to lack all such organic matter. Researcher objectives include: 1. Developing a better characterization of the areal distribution of ancient lakes; 2. Securing a more refined lake chronology; 3. Developing a better characterization of the flora and fauna within each lake system; 4. Producing a geochemical signature for tephra within ice-marginal lakes; and 5. Providing a comparison for terrestrial vegetation mapped previously in the central Transantarctic Mountains.

Field Season Overview:
While co-investigators Allan Ashworth and Adam Lewis have completed field studies for their portion of the research and will not conduct fieldwork in 2011-2012, the Boston University (BU) team still requires this third season to complete all field objectives. This austral summer, the research team plans to test the hypothesis that all young lake deposits are devoid of vegetation.

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Researchers will work from small research camps (three tents at each site) at the following regions: 1. Within the Quartermain Mountains: Mullins Valley, Friedman Valley, Beacon Valley, and Beacon Saddle; 2. Within the central Taylor Valley, including Rhone Platform; 3. Within Pearse Valley and adjacent Friis Hills; and 4. Within the western Olympus Range. At each site, researchers anticipate completion of the following tasks: 1a. Mullins and Friedman valleys: Sample sediments on valley walls to determine the possible existence of paleo lakes impounded by Mullins and Friedman glaciers during late Miocene to Pliocene time. 1b. Central Beacon Valley: Collect shallow, near-surface ice, greater than 8 million years old, for analyses of possible fossil content. 1c. Beacon Saddle: Collect and map sediment from ancient moraines, provisionally dated to greater than 14 million years ago, for analyses of possible fossil content. 2. Central Taylor Valley: Collect and map sediment from Miocene age lakes and examine for possible fossil content. 3. Pearse Valley and Friis Hills: Collect and map sediment from late Miocene and Pliocene age lakes and examine for possible fossil content. 4. Olympus Range: Collect and map undated sediment from ancient moraines near Bull Pass and examine for possible fossil content.

Deploying Team Members:

- Michael Dyonisius
- Sean Mackay (Team Leader)
- David Marchant (Co-PI)

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Project Details 2011-2012

McMurdo LTER - Landscape Ecology: Increased Connectivity In A Polar Desert Resulting From Climate Warming: McMurdo Dry Valley LTER Program

Program Manager:
Dr. Peter Milne (acting)

Event Number: B-508-M

ASC POC/Implementer:
Beth Watson

Dr. John Barrett (Principal Investigator)
jebarre@vt.edu
http://www.mcmlter.org/

Virginia Tech
Department of Biological Science
Blacksburg, Virginia

Supporting Stations: McMurdo Station
Research Locations: F6, Taylor Valley, Lakes Fryxell and Bonney

Project Description:
The McMurdo Long Term Ecological Research (LTER) projects will continue to investigate the McMurdo Dry Valleys as an end-member ecosystem and focus on the relative roles of legacy and extant processes on current biodiversity and ecosystem structure and function. The McMurdo-LTER project will expand to include the more southerly Miers and Garwood Valleys. Because wind-borne transport of biota is a key aspect of enhanced connectivity from katabatic winds, new monitoring will include high-resolution measurements of aeolian particle flux. Importantly, integrative genomics will be employed to understand the responses of specific organisms to the increased connectivity. The project will also include a novel social science component that will use environmental history to examine interactions between human activity, scientific research, and environmental change in the McMurdo Dry Valleys over the past 100 years. In much the same way as the simplicity of the Dry Valleys' ecosystems makes the area an ideal location for exploring ecological theory, the simplicity of the area's human history – in terms of its short timeframe and the small number of people involved – makes it an excellent location for integrating the theory and practice of environmental history with the ecological research of the LTER network.

Field Season Overview:

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Find more information about USAP projects by viewing individual project web sites.

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A three-member research team will deploy this austral summer to perform integrated experiments that address the overarching hypothesis regarding increased connectivity among landscape units, enhanced coupling of nutrient cycles across landscapes, and increased biodiversity and productivity. The team members will be based out of established camps in the Taylor Valley with day trips by foot or helo to other camps, areas, or sampling sites. Two team members will be based at the F6, Lake Fryxell, and Bonney camps, while another team member will be at Lake Bonney. One team will install a water-diversion experiment in the Lake Fryxell basin and potentially the Lake Bonney Basin. The water diversion experiment will consist of pumping water from natural sources at each sites to shallow trenches uphill of instrumented plots.

Deploying Team Members:

- John Barrett (PI)
- Michael Gooseff (Co-PI)
- Cristina Takacs-Vesbach

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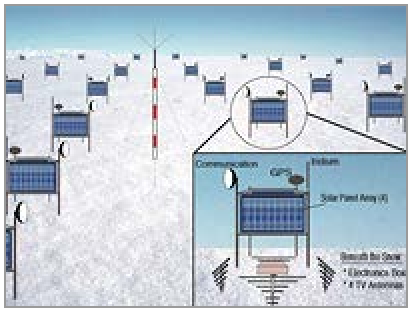
Project Details 2011-2012

Development Of Hexagonal Radio Array For The ARIANNA Ultra-High Energy Neutrino Detector



Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-127-M
NSF/PLR Award 0970175 / 1126672

ASC POC/Implementer:
Beth Watson

Dr. Steven Barwick (Principal Investigator)
barwick@cosmic.ps.uci.edu
http://arianna.ps.uci.edu/

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

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

Project Description:
The idea of using a surface array of radio receivers to search for astrophysical sources has a long history. The ARIANNA concept utilizes 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. Therefore, ARIANNA can test a wide variety of scenarios for neutrino production and probe for physics beyond the standard model by measuring the neutrino cross-section at center of mass energies near 100 Tera-electron-Volts. 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 ability to operate continuously for nearly six months (or possibly more with the addition of wind power), the low energy threshold (~3x1017 electron-Volts), and a field of view of more than half the sky, combine to make ARIANNA a highly sensitive neutrino detector.

Field Season Overview:
During a two-week window in November and December, the researchers plan to send two team members to the ARIANNA camp site located at

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Moore's Bay. They expect to complete the following tasks in the field during the upcoming field season: 1. Uncover and refurbish existing ARIANNA station 2. Install ARIANNA test station number 2; This station will contain new technology prototypes for data acquisition, wireless network communication, and power systems. They plan to leave this new station to operate during the year. 3. Perform gain and timing calibration tests for both the existing and new station 4. Measure ice attenuation and shadowing effects in the horizontal direction 5. Improve system monitoring and data archiving software 6. Analyze and interpret transient events; search for coincident events between the two stations. 7. Evaluate wind contributions to power generation

Deploying Team Members:

- Steven Barwick (PI)
- Steven Barwick (PI)
- Jordan Hanson

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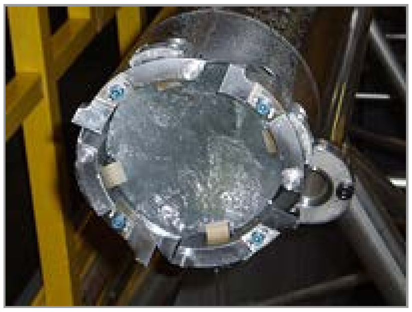
Ice Coring And Drilling Services (ICDS) Support For WAIS Divide



Program Manager:
Dr. Julie Palais

Event Number: T-350-M
NSF/OPP Contract

ASC POC/Implementer:
Deb Roth

Dr. Charles Bentley (Principal Investigator)
bentley@geology.wisc.edu
http://waisdivide.unh.edu

University of Wisconsin Madison
Ice Core Drilling Services
Madison, Wisconsin

Supporting Stations: McMurdo Station
Research Locations: WAIS Divide

Project Description:
WAIS Divide is a collaboration of about 40 separate but synergistic projects funded by NSF to collect deep ice cores from the West Antarctic Ice Sheet (WAIS). Work began with construction of a field camp in 2005-06 and the first cores were recovered in 2006-07. On December 31, 2011 drillers reached the final depth goal of 3,405 meters, and recovered the longest U.S. ice core to date from the polar regions. Other deploying projects this year are the Science Coordination Office (SCO, Kendrick Taylor) I-477 and and Jeff Severinghaus I-476-M. IDDO (Ice Drill Design and Operations) was established by NSF in 2008 to coordinate long- and short-term planning in collaboration with the US ice science community. IDDO is the principle supplier of ice drilling and coring equipment, support and expertise for NSF-funded research.

Field Season Overview:
The DISC drill team will deploy to WAIS Divide to provide drilling support at the WAIS Divide borehole for I-476-M, and I-477-M.

Deploying Team Members:

- Charles Bentley (PI)
- Kristina Dahnert (Team Leader)

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- Christopher Gibson
- Steffen Bo Hansen
- Michael Jayred
- Jay Johnson (Team Leader)
- Don Lebar
- Nicolai Mortensen
- Elizabeth Morton
- Charles Zander

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Cosmic Ray Observations At McMurdo Station

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-120-M

ASC POC/Implementer:
Leslie Blank

Dr. John Bieber (Principal Investigator)
jwbieber@bartol.udel.edu
http://neutronm.bartol.udel.edu

University of Delaware
Bartol Research Institute
Newark, Delaware

Supporting Stations: McMurdo Station
Research Locations: McMurdo Station

Project Description:

Installed during the 1959-60 field season, the Cosray lab is the longest continuous-running experiment in the US Antarctic Program. This 52-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. In a new application made possible by real-time data availability, the observations will also assist space weather forecasting and specification.

Field Season Overview:

The CosRay experiment is housed in a heated facility at McMurdo Station Building 84; however, to reduce McMurdo energy consumption, NSF/OPP is allowing the building to "go cold." To maintain the experiment operational status in this location, the project will complete the program begun in previous seasons to separately insulate and heat the active components of the experiment to allow it to operate in an unheated building. One team

Project Indexes

Find information about current USAP projects using the principal investigator, event number station, and other indexes.

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member will deploy to McMurdo Station to supervise the construction effort and to make the required modifications to the data acquisition system. The dates for the A-120-M deployment to McMurdo Station have been chosen to coincide with the researcher's deployment to South Pole to work on CosRay there.

The specific planned activities are: 1) General system checkout 2) Installation of new heater controllers in detector units 3) Repair of three detector tubes (working but with issues) 4) Test everything in preparation for "going cold" in the building

This project also requires research associate support for the equipment throughout the year and for a maintenance plan that specifically addresses inspection for, and remediation of, any snow infiltration in the unheated building.

Deploying Team Members:

- Paul Evenson (PI)

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IPY: Collaborative Research: Ocean-Ice Sheet Interaction In The Amundsen Sea: The Keystone Of West Antarctic Stability

Program Manager:
Dr. Sonia Esperanca

Event Number: C-407-M

ASC POC/Implementer:
Chad Naughton

Dr. Robert Bindschadler (Principal Investigator)
Robert.A.Bindschadler@nasa.gov
http://pigiceshelf.nasa.gov

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

Supporting Stations: McMurdo Station
Research Locations: Pine Island Glacier

Project Description:
Rapid changes to the West Antarctic ice sheet (WAIS) where it flows into the Amundsen Sea may be caused by weakening of the floating ice shelf that helps hold the ice sheet in place. Researchers hypothesize that warm water is melting the undersides of these ice shelves decreasing the back pressure, allowing the ice sheet to flow faster and leading to a smaller ice sheet which eventually leads to higher sea levels and slow motion coastal flooding worldwide. Satellite observations can identify ice sheet changes but they cannot reveal conditions under the ice. This fieldwork will make direct observations of the ice beneath the Pine Island Glacier (PIG) including geophysical features of the sub-shelf cavity and cavity bed, water properties within the ice cavity, flow geometry, and visual appearance (using photography). These direct measurements will be fed into advanced computer models of ocean and ice characteristics to shed light on these changes.

Field Season Overview:
A large multidisiplinary team will deploy to the ice shelf at a location (Site A) where the initial hot water hole will be drilled. Videography within and beneath the hole will precede the deployment of a custom built ocean profiler. In an adjacent hole (required for a electrical ground) a second ocean

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measuring system wll be frozen to the basal ice to measure heat and conductivity fluxes. Remote seismic teams of two people each will be deployed to selected sites to gather additional information on the shape of the sub-ice cavity and the ice shelf thickness. Repeat measurements at some of these sites with radar will be attempted to measure basal melt rates. Additional surface geophysics will occur near Site A to assess the local strain field and the location of nearby crevasse events. An 8-kilometer traverse from Site A upstream to a second drill site (Site B) will gather information on the geometry and composition of a seabed ridge. If time alows, a second profiler will be installed at Site B. Nearby Automatic Weather Stations will be maintained. All field transport will be provided by helicopters based at a nearby field camp (Site C).

Deploying Team Members:

- Robert Bindschadler (PI)
- Leo Peters
- Dale Pomraning
- William Shaw
- Timothy Stanton (Co-PI)
- Einar Steinarsson
- James Stockel
- Martin Truffer (Co-PI)

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Project Details 2011-2012

Impact Of Recent Climate Warming On Active-Layer Dynamics, Permafrost, And Soil Properties On The Western Antarctic Peninsula

Program Manager:
Dr. Alexandra Isern

Event Number: G-239-P

ASC POC/Implementer:
John Evans

Dr. James Bockheim (Principal Investigator)
bockheim@wisc.edu
https://mywebspace.wisc.edu/krwilhelm/web/Antarctica%20Website/peninsula.html

University of Wisconsin Madison
Department of Soil Science
Madison , Wisconsin

Supporting Stations: Palmer Station
Research Locations: Palmer Station; Field Camp in the vicinity of the Argentine station Primavera, Hughes Bay

Project Description:

This is a three-year collaborative project with CALM (Circumpolar Active Layer Monitoring, funded in part by a grant from the NSF's Arctic Research and Logistics program) and PERMANTAR (Permafrost and Active Layer Monitoring in the Maritime Antarctic, funded by Portuguese and Spanish programs). Researchers will establish permafrost and soil monitoring stations on Livingston and Deception Islands, at Palmer Station, and on an island site (to be selected) between Palmer Station and Livingston Island. Soil and permafrost are sensitive indicators of climate change and these new sites are particularly significant because recent climate change is exceptionally evident here. Each soil-climate/active-layer monitoring station comprises an array of shallow boreholes with sensors that record soil temperatures year-round. Permafrost is monitored through a 10-15-meter-deep borehole.

Field Season Overview:

In the second year of this project, the principal Investigator, two Portugese colleagues, and two graduate students will deploy to Palmer Station for a two-week period, where they will collect data from the soil-climate and active-layer monitoring stations established at Old Palmer in 2011. The group will then deploy to a field camp for four weeks in the vicinity of the Argentine station Primavera before returning to South America around March 30, 2012.

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Deploying Team Members:

- James Bockheim (PI)
- Nicholas Haus
- Alexandre Nieuwendam
- Goncalo Vieira
- Kelly Wilhelm

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Project Details 2011-2012

Evolution And Diversity Of Antarctic Rhizarian Protists

Program Manager:
Dr. Peter Milne (acting)

Event Number: B-043-M

ASC POC/Implementer:
Addie Coyac

Dr. Samuel Bowser (Principal Investigator)
bowser@wadsworth.org
http://www.bowserlab.org

New York State Department of Health
Wadsworth Center
Albany, New York

Supporting Stations: McMurdo Station
Research Locations: Explorers Cove, Granite Harbor

Project Description:
This research project addresses the cell biology, ecophysiology, and evolution of foraminiferan protists ("forams"), focusing on endemic Antarctic species. Researchers will continue studying modern representatives of the early-evolving foraminiferal clades, at both multi-gene molecular and ultrastructural levels, in order to generate more robust and detailed phylogenies of these ecologically important organisms. The research team will also extend these studies to include members of the enigmatic genus Gromia, found in great abundance in McMurdo Sound, to better define their ecological significance and placement within the protist supergroup Rhizaria. Together, researchers will use the structural and molecular data to complete taxonomic descriptions of more than 20 new rhizarian species identified in prior research.

Field Season Overview:
A 10-week field season for a team of six based at New Harbor field camp will include the PI plus three other divers, i.e., a total of 4 divers, and two additional researchers. Logistically, the project is dive-intensive and will require melting 10 access holes through the sea ice using two dedicated ice melters ("hotsies"). Most of the work will be conducted at established collection sites in Explorers Cove and nearby Cape Bernacchi, with daily transportation to these sites by snowmobile and all-terrain vehicles. One remote sampling station, accessed by Helicopter, will be established at

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Salmon Bay. In addition to use of the New Harbor shore camp (Jamesways, lab module), the research group will require contractor support for construction of an eight section Jamesway (or equivalent) on the sea ice in Explorers Cove to support dive operations. The Polarhaven structure currently staged at New Harbor will be used to support dive operations at Cape Bernacchi and Salmon Bay.

Deploying Team Members:

- Samuel Bowser (PI)
- Andrew Gooday
- Hilary Hudson
- Jan Pawlowski
- Cecilia Shin
- Laura Von Rosk
- Danielle Woodward

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Project Details 2011-2012

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

Program Manager:
Dr. Alexandra Isern

Event Number: A-369-M/S
NSF/PLR Award 0944270

ASC POC/Implementer:
Julie Bonneau

Dr. William Bristow (Principal Investigator)
bill.bristow@gi.alaska.edu
http://SuperDARN.jhuapl.edu

University of Alaska Fairbanks
Geophysical Institute
Fairbanks, Alaska

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

Project Description:

The Super Dual Auroral Radar Network (SuperDARN) is a global international radar network of 22 installations observing high frequency (HF) bands between 8 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 and helping 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, allowing scientists to address the most fundamental and important questions of space physics. These 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:

During this field season, field team members will perform maintenance of the McMurdo SuperDARN radar. In addition, a SuperDARN radar system will be installed at South Pole Station.

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Deploying Team Members:

- William Bristow (PI)
- Jeff Spaleta

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Science Coordination Office For Astrophysical Research In Antarctica (SCOARA-II)

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-370-S
NSF/PLR Award 0750083

ASC POC/Implementer:
Julie Bonneau

Dr. John Carlstrom (Principal Investigator)
jc@kicp.uchicago.edu
http://astro.uchicago.edu/scoara/

University of Chicago
Astronomy and Astrophysics
Chicago, Illinois

Supporting Stations: South Pole Station
Research Locations: Dark Sector

Project Description:

Antarctica's tremendous potential for cosmology and astrophysics can be realized best if the scientists involved understand and participate in the management, planning and oversight of the shared resources and logistical support necessary to conduct research. The Science Coordination Office for Astrophysical Research in Antarctica (SCOARA) is an intellectual partnership composed of and directed by these scientists to ensure that the highest quality astrophysical research is conducted at the South Pole.

Field Season Overview:

Project team members will continue their operational support of astrophysical research at South Pole Station. This will include technical support for the following projects: IceCube, South Pole Telescope (SPT), Background Imaging of Cosmological Extragalactic Polarization (BiCEP-2), Small Polarimeter Upgrade for DASI* (SPUD)-Keck, the Askaryan Radio Array (ARA), and general Martin A. Pomerantz Observatory (MAPO) shop and Dark Sector Laboratory (DSL) spares resupply. SCOARA also provides general machine shop support for South Pole Station and performs oversight of test and measurement equipment for astrophysical research, including vacuum pumps, leak checkers, thermal imagers, and other supplies.

*Degree Angular Scale Interferometer

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Deploying Team Members:

- Stan Hudson
- Robert Pernic
- Philip Wilson

Project Details 2011-2012

Cosmological Research With The 10-Meter South Pole Telescope

Program Manager:
Dr. Vladimir Papitashvili

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

ASC POC/Implementer:
Julie Bonneau

Dr. John Carlstrom (Principal Investigator)
jc@kicp.uchicago.edu
http://pole.uchicago.edu

University of Chicago
Astronomy and Astrophysics
Chicago, Illinois

Supporting Stations: South Pole Station
Research Locations: Dark Sector Lab

Project Description:

The South Pole Telescope (SPT) project conducts cosmological research by measuring the intensity and polarization anisotropy of the Cosmic Microwave Background (CMB). By surveying 4,000 square degrees of the sky with high sensitivity in three wavelength bands, the telescope can detect galaxy clusters through the spectral distortion they impart on the CMB. Researchers will use the resulting catalog of galaxy clusters to set constraints on the mysterious dark energy that dominates the mass-energy density of the universe and is causing the expansion of the universe to accelerate.

Field Season Overview:

Following the replacement of the SPT azimuth bearing during the 2010-2011 austral season, the new bearing is performing better than the old one ever did. Researchers do not expect to have to replace it during the life of the telescope. This coming austral summer season is going to be a very busy and important one for the South Pole Telescope (SPT) team. Researchers are planning to deploy a new receiver and readout to enable polarization measurements of the cosmic microwave background radiation. They will also rebuild the optics cryostat on which the receiver mounts. The new receiver doubles the data transmission bandwidth requirement from 30 GigaBytes to 60 GigaBytes per day but requires slightly less station power than the present system. The major new tasking for 2011 are enumerated below: 1.

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Support for a remote calibration source and "blocking" fence. Researchers need to calibrate the new SPT polarimeter using a thermal source located 3 Kilometers from the DSL. Researchers will work with the support contractor to identify the exact location, but because a clear line of sight from SPT to the source is required, directions away from the station are favored. 2. The research team is also in the process of designing and building new co-moving reflective shielding to replace the current shielding on the telescope. The need for this has been demonstrated through extensive mapping of the SPT beam response at large offset angles. Without improving the shielding it does not appear possible to obtain our goal of measuring the inflationary gravitational wave signature in the polarization of the background. The new shield design includes an aluminum structure that surrounds the 10 meter primary reflector of the SPT. It also includes reflecting side-shields that extend from the side of the extended primary to the end of the receiver cabin support, similar to the side-shields that are in place now. The research team also plans to conduct routine yearly SPT maintenance tasks: Inspection of the telescope backing structure, cover-plates and insulation, Service and maintain the telescope components, computer systems and power load-leveler, and Winterover training. Early in the season, researchers also plan to coordinate a week of filming for a wide-reaching education and outreach project focused on cosmology research at the South Pole.

Deploying Team Members:

- Ken Aird
- Jason Austermann
- Bradford Benson
- John Carlstrom (PI)
- Clarence Chang
- Abigail Crites
- Tijmen de Haan
- Matthew Dobbs
- Elizabeth George
- Nils Halverson (Co-PI)
- Nicholas Harrington
- Jason Henning
- Bill Holzapfel (Co-PI)
- Stephen Hoover
- James Hrubes
- Ryan Keisler
- Christopher Kendall
- Erik Leitch
- Dale Li
- Stephan Meyer (Co-PI)

- Luong-Van Minh
- Tyler Natoli
- Erik Nichols
- Stephen Padin (Co-PI)
- John Ruhl (Co-PI)
- Jose Salgado
- James Sayre
- Kyle Story
- Tania van Bergen
- Keith Vanderlinde

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Project Details 2011-2012

Physiological And Ecosystem Structure Forcings On Carbon Fluxes In The Southern Ocean Mixed Layer

Program Manager:
Dr. Peter Milne

Event Number: O-405-L
NSF/PLR Award 1043339

ASC POC/Implementer:
Eric Pohlman

Dr. Nicolas Cassar (Principal Investigator)
nicolas.cassar@duke.edu
http://www.nicholas.duke.edu/people/faculty/cassar/projects.htm

Duke University
Nicholas School of Environment
Durham, North Carolina

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

Project Description:

This project will advance our understanding of Southern Ocean biogeochemistry by investigating some of the physiological and ecosystem mechanisms governing the interannual variability in mixed layer carbon fluxes in the Southern Ocean. More specifically, researchers will address the following postulates: (1) the well documented influence of iron on primary production reverberates onto carbon export production in the Southern Ocean; (2) carbon export production and efficiency are not dependent on the presence of diatoms in the Southern Ocean; (3) grazers enhance carbon export production and efficiency in some regions of the Southern Ocean.

Field Season Overview:

An underway seawater sampling package to characterize the ecosystem and physiological controls on carbon fluxes in the Southern Ocean will be installed aboard the ARSV Laurence M. Gould (LMG). Data will be collected when the ship is underway from late December to early February on the 2012 Long-Term Ecological Research (LTER) cruise. The principal investigator or a designated technician will install the system in Punta Arenas, Chile during the LTER pre-cruise port call and sail the LTER cruise. Measurements will be performed on the underway seawater lines. The following instruments will be installed: equilibrator-inlet mass spectrometer, underway transmissometer, flow cytometer, and a fast repetition-rate

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fluoremeter (FRRF). The principal investigator or his designated technician will remove the sampling package from the vessel at the conclusion of the cruise.

Deploying Team Members:

- Bruce Barnett
- Nicolas Cassar (PI)
- Nicolas Cassar (PI)

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Project Details 2011-2012

Collaborative Research: Dynamics And Transport Of The Antarctic Circumpolar Current In The Drake Passage

Preparing a Current and Pressure recording Inverted Echo Sounder (CPIES) for deployment in Drake Passage. Photo by Teresa Chereskin.

Program Manager:
Dr. Peter Milne

Event Number: O-313-N

ASC POC/Implementer:
Patricia Jackson

Dr. Teresa Chereskin (Principal Investigator)
tchereskin@ucsd.edu
http://cdrake.org

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

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: Drake Passage (LMG)

Project Description:

The Southern Ocean is especially sensitive to climate change, responding to winds that have increased over the past 30 years and warming significantly more than the global ocean over the past 50 years. The Antarctic Circumpolar Current (ACC) is the pulse of the Southern Ocean, and the Drake Passage chokepoint is well-suited geographically for measuring its time-varying transport. Observations and computer models also suggest that the dynamic balances that control ACC transport are particularly effective through the Drake Passage. Researchers seek to quantify the transport and dynamics of the ACC by means of a 30-mooring array in the Drake Passage over five years. Each year, data from the CPIES (Current-and-Pressure-recording, Inverted Echo Sounders) will be collected via acoustic telemetry, leaving the instruments undisturbed until recovered.

Field Season Overview:

In this fifth and final year of the project, researchers will recover 45 CPIES at 44 sites in Drake Passage. A full-ocean-depth CTD cast will be conducted at

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each instrument site. The PI's LADCP (Lowered Acoustic Doppler Current Profiler) will be installed on the CTD rosette.

Deploying Team Members:

- Gerard Chaplin
- Teresa Chereskin (PI)
- Maria Paz Chidichimo
- Kathleen Donohue (Co-PI)
- Yvonne Firing
- Jessica Millar
- James Sousa
- Karen Tracey
- Randolph Watts (Co-PI)
- Sarah Watts

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Project Details 2011-2012

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

Program Manager:
Dr. Peter Milne

Event Number: O-317-L/N
NSF/PLR Award 0838750

ASC POC/Implementer:
Patricia Jackson

Dr. Teresa Chereskin (Principal Investigator)
tchereskin@ucsd.edu
http://currents.soest.hawaii.edu/antarctic/

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

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

Project 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 NBP and 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 150kHz NB ADCPs (running since the start of the project) and newer 38kHz phased array ADCPs (installed on the LMG in 2004 and on the NBP in 2009). The collected, QC'ed data is used by a wide variety of Antarctic science programs and is easily accessible for retrospective analyses, planning future observations and validating numerical models.

Field Season Overview:

Hull-mounted Acoustic Doppler Current Profilers (ADCPs) record data during all cruises of both USAP research vessels. Onboard technicians monitor

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equipment and send data to the co-PIs. Project team members deploy to the vessels during port calls to upgrade computer hardware and software.

Deploying Team Members:

- Teresa Chereskin (PI)
- Eric Firing (Co-PI)
- Julia Hummon (Team Leader)

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

Two lidar beams shooting to the sky from Arrival Heights. The photo was taken by Zhibin Yu -- the first winter-over scientist of A-130-M LIDAR project -- on May 2nd, 2011. This Fe Boltzmann temperature lidar developed by Dr. Xinzhao Chu and her colleagues is used to make year-round and full-diurnal measurements of polar middle and upper atmosphere for the studies of atmosphere temperature, composition, chemistry and dynamics at McMurdo, Antarctica.

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-130-M

ASC POC/Implementer:
John Rand

Dr. Xinzhao Chu (Principal Investigator)
xinzhao.chu@colorado.edu
http://cires.colorado.edu/science/groups/chu/projects/mcmurdo.html

University of Colorado Boulder
CIRES
Boulder, Colorado

Supporting Stations: McMurdo Station
Research Locations: Mcmurdo Station

Project Description:
This project continues the operation of the Fe Boltzmann lidar installed in the Antarctica New Zealand (ANZ) lab at Arrival Heights near McMurdo Station. The initial instrument installation took place during the 2010-11 summer season. Science objectives include: (1) Exploring the recently discovered thermosphere Fe layers to at least 155 kilometers, deriving neutral temperatures from these layers, and developing a model to quantitatively explain the observations; (2) Developing the climatology of gravity wave

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potential energy from the lower atmosphere to the middle atmosphere and lower thermosphere, investigating wave dissipation, and characterizing high frequency and inertial gravity waves by combining lidar, radar and imager data with modeling; (3) Studying the mechanisms behind the inter-hemispheric difference and latitudinal dependence of PMC characteristics, exploring the summer-time extreme Fe events and their possible link to polar mesospheric clouds (PMCs), aurora particle precipitation and meteor smoke particles; (4) Developing the climatology of temperature from the surface to 110 kilometers, characterizing its diurnal, seasonal and inter-annual variations, and exploring various mechanisms that affect the thermal balance of the polar atmosphere on both long and short time scales; and (5) Developing the climatology of the mesospheric Fe layers, including their chemical vertical flux, characterize the diurnal, seasonal, inter-annual and solar cycle variations of the Fe layers, and developing a comprehensive model that accurately reproduces the observations.

Field Season Overview:

This is the second season for the Fe Boltzmann LIDAR campaign at Arrival Heights, McMurdo Station. The LIDAR was successfully installed in the first summer season of 2010-2011, with much data collected starting mid-December 2010 and into the winter operation. Therefore, this second field season will be focused on the continued collection of as much LIDAR data as possible, training the second winter-over scientist, and maintaining the system to acheive optimum performance. Besides the winter-over researcher, this project will deploy four people during the 2011-2012 season. This number will be reduced to one winter-over scientist in winter starting mid-February 2012. The summer research team members will deploy to McMurdo Station by mid-October. After getting the LIDAR optimized and helping the new winter-over scientist to settle in, the Principal Investigator (PI) will leave by early November. The other three team members will remain at McMurdo Station for extensive summer observations. The PI will then deploy again in late January until mid-February to help finalize the winter plan and continue the winter-over training program. The project's scientific goals require LIDAR operation covering both day and night through an entire year.

Deploying Team Members:

- Cao Chen
- Xinzhao Chu (PI)
- Xinzhao Chu (PI)
- Weichun Fong
- Zhibin Yu

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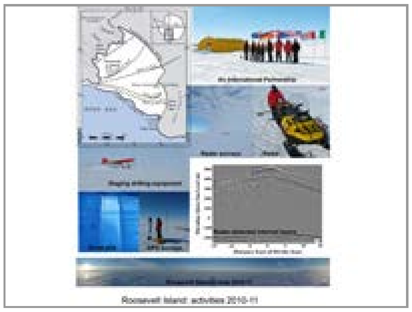
Deglaciation Of The Ross Sea Embayment - Constraints From Roosevelt Island



Activities by the international partnership on Roosevelt Island during 2010-11 included: Staging drilling equipment (Antarctica NZ scientists), snow pits and short firn cores (Antarctica NZ scientists), GPS and radar surveys (USAP and British Antarctic Survey scientists). Drilling to date the radar-detected layers needed to infer histories of climate and ice dynamics will start in October 2011. Photos by Brad Markle and H. Conway; map and radar layers from Conway et al., 1999.

Program Manager:
Dr. Julie Palais

Event Number: I-209-M
NSF/PLR Award 0944307

ASC POC/Implementer:
Chad Naughton

Dr. Howard Conway (Principal Investigator)
conway@ess.washington.edu
http://www.ess.washington.edu/Surface/Glaciology/projects/ross_sea_history/

University of Washington
Earth and Space Sciences
Seattle, Washington

Supporting Stations: McMurdo Station
Research Locations: Roosevelt Island

Project Description:
This international ice core drilling project on Roosevelt Island is a partnership with New Zealand, UK, Denmark, Germany and China. Researchers seek to understand past, present and future environmental changes in the Ross Sea sector of West Antarctica. The scientific objectives are to determine histories of climate and ice thickness for Roosevelt Island, and to develop an updated model of the configuration and thickness of the ice in the Ross Sea Embayment during the last glacial maximum. The project's New Zealand partners have started drilling

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a 750-meter ice core using their new intermediate-depth drill. They expect to complete the drilling in early January 2013. After drilling is complete, researchers will conduct borehole logging measurements and geophysical measurements to characterize spatial variations in ice thickness and surface velocities across the island.

Field Season Overview:

This field season, the research team will resurvey a network of poles - set across the island during the previous season - in order to calculate surface motion. They will also complete radar surveys across the island to characterize the spatial pattern of accumulation and the spatial pattern of ice thickness and internal stratigraphy. Researchers will collect several 10-meter firn cores to help date near-surface radar layers and the spatial and temporal patterns of accumulation. As part of the collaborative effort with Denmark and New Zealand, researchers with this project will also help their Danish and New Zealand partners set up and start drilling an ice core. The expected depth to reach this year is about 500 meters; drilling to the bedrock will be completed the following season.

Deploying Team Members:

- Lou Albershardt
- Howard Conway (PI)

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Project Details 2011-2012

Exploring The Significance Of NA-Alkaline Magmatism In Subduction Systems, A Case Study From The Ross Orogen

Field camp on Mounts Discovery and Huggins; TransAntarctic Mountains in the background. Photo by John Cottle.

Program Manager:
Dr. Alexandra Isern

Event Number: G-064-M

ASC POC/Implementer:
Leslie Blank

Dr. John Cottle (Principal Investigator)
cottle@geol.ucsb.edu
http://www.antarctica360.net

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

Supporting Stations: McMurdo Station
Research Locations: Koettlitz, Radian, and Foster Glaciers

Project Description:

This project will map and study basement rocks exposed in the Royal Society Range (2011/2012 season) and the Darwin Glacier regions (2012/2013 season) of the TransAntarctic Mountains. The Royal Society Range lies approximately 90 kilometers east-southeast of McMurdo Station in the TransAntarctic Mountains while the Darwin Glacier area is 200 kilometers southwest of McMurdo Station, immediately north of the Byrd Glacier. Researchers hypothesize that these two areas represent the northern and southern boundaries of a geologically distinct segment within the southern Victoria Land sector of the 550-500 Ma Ross Orogen. This hypothesis will be tested in the field by conducting detailed geologic mapping and sample collecting. In subsequent laboratory work researchers will determine the ages and chemistry of the basement rocks. These two datasets combined will thus build up a more complete picture of the geologic evolution of this part of the Transantacrtic Mountains.

Field Season Overview:

During the 2011-2012 field season, four participants, including one project

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mountaineer, will deploy to conduct detailed geologic mapping and collect samples of exposed basement rock in the Royal Society Range of the Transantarctic Mountains. The team size will drop to three after approximately two weeks of field time following the redeployment of the principle investigator. The team will operate out of two small tent camps established by helicopter in the Royal Society Range immediately north of the Koettlitz Glacier, approximately 90 km ESE of McMurdo Station. Snow machines will be used for travelling overland in the study areas, and additional helicopter support will be used to conduct studies of outlying outcrops on two day-trips with close support from the camp sites. An additional day of Twin Otter support will be used to conduct reconnaissance of the 2012-2013 landing sites.

Deploying Team Members:

- John Cottle (PI)
- Graham Hagen-Peter
- Bryan Norman
- Joanna Prince

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Project Details 2011-2012

Stable Isotope Analyses Of Pygoscelid Penguin Remains From Active And Abandoned Colonies In Antarctica

Program Manager:
Dr. Peter Milne (acting)

Event Number: B-034-E/M

ASC POC/Implementer:
Addie Coyac / John Evans

Dr. Steven D Emslie (Principal Investigator)
emslies@uncw.edu
http://www.uncw.edu/penguins

Department of Biological Sciences
Wilmington, North Carolina

Supporting Stations: Special Project, McMurdo Station
Research Locations: Various islands in the Antarctic Peninsula area

Project Description:

This project involves an international collaboration with Chinese, Spanish, and Polish scientists to investigate the stable isotope record of abandoned and active penguin colonies in Antarctica. The researchers will be working in two major regions of the Antarctic: The Antarctic Peninsula and the Ross Sea. During four field seasons, researchers will collect samples of penguin tissue, e.g., bone, eggshell, feathers; guano from sediments; and prey remains for radiocarbon and stable-isotope analyses. Researchers will use the data to test hypotheses on occupation history, population movements, and diet of Adélie Penguins in relation to climate change over the past 45,000 years in Antarctica.

Field Season Overview:

The 2011-2012 Antarctic Peninsula field season will be similar to 2010-2011, except that no deployment to China's Great Wall Station is planned. Two research team members will deploy to the Antarctic Peninsula to complete research in collaboration with project B-044-E on various tour ships. These B-034-E researchers plan to deploy for a two to four week period between November 2011 and February 2012. Support for this portion of the season will include transportation to and from Ushuaia, Argentina, and/or Punta Arenas, Chile, depending on ship schedules, where they will join their ships. In addition, through existing collaborations, National Oceanographic and

Atmospheric Administration (NOAA) personnel will once again collect samples for this project at the Copacabana and Cape Shirreff field camps.

Deploying Team Members:

- Rebecka Brasso
- Michael Polito (Co-PI)

Studies Of Solar Wind - Magnetosphere Interactions Using Observations Of ULF Waves At An Extensive Ground Array At High Latitudes

The vault at Arrival Heights, near McMurdo, that contains our 3-axis search coil sensors. Photo provided by Marc Lessard, the Co-PI for A-102.

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-102-M/S

ASC POC/Implementer:
Beth Watson

Dr. Mark J Engebretson (Principal Investigator)
engebret@augsburg.edu
http://space.augsburg.edu

Augsburg College
Department of Physics
Minneapolis, Minnesota

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: Arrival Heights and B2 Science Lab

Project Description:

This project is a continuation of current studies using search coil magnetometers already installed and operating at South Pole Station's Cusp Lab and Arrival Heights at McMurdo Station, as well as at Halley (a UK base in Antarctica) and two sites in the Arctic. Researchers use time-series data from magnetometers at these and other Antarctic sites (including the 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:

As in previous years, the Arrival Heights science technician will conduct routine maintenance, changing of data media, and occasional troubleshooting on an ongoing basis. Data from the research group's South Pole instrument are recorded by a computer supplied by the University of Maryland and Siena College. During the coming year routine monitoring will continue to be provided by a research associate.

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Project Details 2011-2012

Element Composition Of High-Energy Solar Particles

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-118-S
NSF/PLR Award 0838839

ASC POC/Implementer:
Chad Naughton

Dr. Paul Evenson (Principal Investigator)
evenson@udel.edu
http://neutronm.bartol.udel.edu

University of Delaware
Physics and Astronomy
Newark, Delaware

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

Project Description:
This project is part of the University of Delaware's Bartol Research Institute neutron monitor program. One of the program's 11 monitors is installed at the South Pole. This season, researchers will focus on enhancing the ability of IceTop—the surface component of the IceCube neutrino observatory—to determine element composition of solar energetic particles in the energy range of 1-10 Giga-electron-Volts (GeV). Using many components of the former South Pole neutron monitor, researchers will construct an enhanced suite of neutron detectors whose response functions (primarily due to hadrons) have a different dependence on energy and element composition from those of IceTop (primarily due to photons and leptons).

Field Season Overview:
During this field season, detectors will be subject to routine testing, evaluation, and (if necessary) repair; heaters on the outside platform will be replaced with redesigned versions; and grounding scheme for outside detectors will be investigated and revised as appropriate to limit static electricity sensitivity.

The requested dates for deployment have been chosen to coincide with the deployment of the PI (Paul Evenson) to McMurdo to work on CosRay there.

Deploying Team Members:

Project Indexes
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- Paul Evenson (PI)

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The Biogeochemical Evolution Of Dissolved Organic Matter In A Fluvial System On The Cotton Glacier, Antarctica

Program Manager:
Dr. Peter Milne (acting)

Event Number: B-046-M

ASC POC/Implementer:
Beth Watson

Dr. Christine Foreman (Principal Investigator)
cforeman@montana.edu
http://www.montana.edu/cforeman

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

Supporting Stations: McMurdo Station
Research Locations: Crary Lab, Cotton Glacier

Project Description:
Dissolved organic matter (DOM) is an important component of the global carbon cycle and provides a carbon source for microbial activity. Much of this carbon pool is composed of predominantly recalcitrant organic matter derived from microorganisms (most global DOM is of marine origin) that has been extensively worked over by microbial activity and/or humification. A recent sample of a supraglacial stream formed on the Cotton Glacier in the Transantarctic Mountains indicated the presence of DOM that more closely resembles an assemblage of characterizable precursor organic compounds. Based on the changing spectrum of the samples, researchers hypothesize that the DOM from this water evolved to resemble materials present in marine and many inland surface waters. The interdisciplinary team will study the biogeochemistry of the Cotton Glacier and this progenitor DOM. They will isolate the DOM by reverse-osmosis for purposes of studying its chemical composition. Water samples will also be aged and the DOM isolated over time to determine how the material changes structurally.

Field Season Overview:
In 2011, the research team will take one day trip, with ground time, from McMurdo Station to the Cotton Glacier to collect streamwater and enrich for microbes.

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Deploying Team Members:

- Christine Foreman (PI)
- Heidi Smith

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

Program Manager:
Dr. Lisa Clough

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

ASC POC/Implementer:
Beth Watson

Dr. Andrew Fountain (Principal Investigator)
andrew@pdx.edu
http://www.mcmlter.org/

Portland State University
Geology
Portland, Oregon

Supporting Stations: McMurdo Station
Research Locations: McMurdo Dry Valleys

Project Description:
In 1980, the National Science Foundation (NSF) funded the US Long Term Ecological Research (LTER) Network, a collaborative effort involving more than 1,800 scientists and students. The McMurdo LTER is one of 26 sites that investigates ecological processes over long temporal and broad spatial scales. The McMurdo Station LTER program is an inter-disciplinary and multi-disciplinary study of the aquatic and terrestrial ecosystems in the ice-free McMurdo Dry Valleys. This six-year award cycle comprises seven collaborative projects: Andrew Fountain B-504, John Priscu B-505, Diane McKnight B-506, Diana Wall B-507, Jeb Barrett, B-508, Berry Lyons B-509, and Peter Doran B-511. This project is the “glaciers and meteorology” component of the McMurdo LTER. Researchers will continue measurements of physical properties of Dry Valley glaciers and meteorology, with special emphasis on LTER core research areas.

Field Season Overview:
Researchers will occupy the Lake Hoare camp from late November to the end of January, making day trips to the Commonwealth, Howard, Canada, and Taylor glaciers to conduct mass balance measurements and biological studies. Day trips will also be made to various meteorological stations in Taylor, Beacon, Wright, Victoria, and Garwood Valleys. Several sensors and

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dataloggers on the meteorological stations will be swapped out and sent back to the manufacturer for recalibration as in previous seasons. The replacement meteorological sensors and dataloggers will remain in the field for two to five years.

Deploying Team Members:

- Alexandre Anesio
- Andrew Fountain (PI)
- Thomas Nylen (Team Leader)

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Project Details 2011-2012

Palmer Long Term Ecological Research (LTER): Looking Back In Time Through Marine Ecosystem Space, Apex Predator Component

LM GOULD 1, Rothera 0! LMG team defeats British Antarctic Survey in annual soccer game at Rothera Station, 22 January, 2011. Photo by Grace Saba, Rutgers University.

Program Manager:
Dr. Lisa Clough

Event Number: B-013-L/P
NSF/PLR Award 0823101

ASC POC/Implementer:
Eric Pohlman

Dr. Bill Fraser (Principal Investigator)
bfraser@3rivers.net
http://pal.lternet.edu/

Polar Oceans Research Group
Sheridan, Montana

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

Project Description:
The core, long-term data associated with these Long Term Ecological Research (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:
Team members will deploy in and out of Palmer Station beginning in early October, and some team members will stay until April 2012. Researchers will conduct Zodiac boat operations within the local islands, to Dream Island, Biscoe Point and the Joubin Islands, as well as further surveying to Cape

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Monaco and the Wauwermans Islands as opportunity allows. Field research also includes work aboard the ARSV Laurence M. Gould as part of the annual Long-Term Ecological Research (LTER) cruise in January. Aboard the research vessel, personnel will focus on seabird and marine mammal censuses to determine how oceanographic conditions, including sea-ice and prey availability, influence their abundance and distribution. Part of this effort will also involve day excursions via Zodiac boat to Renaud and other nearby islands to census and diet-sample penguins and other seabirds, and a field camp of several days duration on Avian Island to census and map Adélie Penguin colonies, obtain diet samples, and instrument birds with satellite transmitters and dive-depth recorders. A sediment trap mooring will be recovered and re-deployed at the LTER site near Hugo Island. Five physical oceanographic moorings will also be serviced on the cruise. Two fully-equipped radioisotope vans, one for Carbon 14 and one for Tritium work, will be used by the research team during the cruise. Support contractor assistance will also be required to deploy eXpendable BathyThermograph (XBT) and eXpendable Conductivity, Temperature and Depth (XCTD) probes, current drifters, conduct mooring operations, and perform other over-the-side operations. Work in the Palmer vicinity will complement that aboard the research vessel, but the focus will be on the larger seabird community, especially the three breeding species of Pygoscelid penguins, and is timed to coincide with the entire October-March breeding season. Although most of the work will be accomplished by using Zodiac boats for daily travel to nearby seabird colonies, researchers will also establish multi-day field camps at more remote locations to meet some program objectives. Team members will concentrate on censusing and mapping seabird colonies, obtaining indices of reproductive success, determining diets and foraging ranges, and examining chick growth and energetics. Palmer Station's laboratory facilities will be used to house and process geographic information systems (GIS) and telemetry data, and to analyze diet samples.

Deploying Team Members:

- Jennifer Blum
- Shawn Farry
- Bill Fraser (PI)

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

Program Manager:
Dr. Diana Nemergut

Event Number: B-009-M

ASC POC/Implementer:
Addie Coyac

Dr. Robert Garrott (Principal Investigator)
rgarrott@montana.edu
http://www.montana.edu/rgarrott/antarctica/index.htm

Montana State University Bozeman
Ecology
Bozeman, Montana

Supporting Stations: McMurdo Station
Research Locations: Big Razorback Island

Project 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, so their field studies include collecting data on seal body mass – a surrogate for annual variation in marine food resources. The 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:
During the upcoming field season, team members will set up a field camp on Big Razorback Island as done during recent field seasons. The researchers will also work out of a lab in the Crary Science and Engineering Center (CSEC) during part of their deployment. Additionally, the group will be conducting helicopter reconnaissance surveys from October through December over their study area and to look for tagged seals outside the study area. Also, as part of the group's outreach program, they will be continuing work on a series of education videos about their long-term

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Weddell seal ecology studies.

Deploying Team Members:

- Thierry Chambert (Team Leader)
- Jesse DeVoe
- Jessica Farrer
- Robert Garrott (PI)
- Mary Lynn Price
- Darren Roberts
- Colleen Siudzinski
- Michael Yarnall

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Project Details 2011-2012

Center For Remote Sensing Of Ice Sheets (CReSIS) - Basler Airborne Radar Survey

Program Manager:
Dr. Julie Palais

Event Number: I-189-M
NSF/PLR Award 0852697

ASC POC/Implementer:
Leslie Blank

Dr. Prasad Gogineni (Principal Investigator)
gogineni@cresis.ku.edu
https://www.cresis.ku.edu/

University of Kansas Lawrence
Lawrence, Kansas

Supporting Stations: McMurdo Station
Research Locations: Byrd Glacier, Pegasus Airfield

Project Description:
The Center for Remote Sensing of Ice Sheets (CReSIS) will focus the 2013-14 airborne-radar survey mission on Whillans (B) and Bindschadler (D) ice streams on the Siple Coast of West Antarctica. By flying new lines that cross historical survey lines, the reliability of the historical data can be improved and the effective survey area can therefore be expanded by combining both datasets. Researchers also plan to collect survey data over ice-core drilling sites and sites sounded by their surface-based accumulation radar being used this season by the I-188-M (Gogineni) team, so that internal layers mapped by the different radars can be cross-correlated and validated.

Field Season Overview:
The radar aerial survey and data processing team will arrive at McMurdo Station in mid-November and begin outfitting a Twin Otter aircraft as a science platform. This effort will take about two weeks. After installation, the team will begin conducting day trips to survey Byrd Glacier in early December. About five days are needed to remove the radar equipment from the Twin Otter aircraft after the survey is completed in mid-January.

Deploying Team Members:

- Chad Brown
- Reid Crowe

Project Indexes
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- Daniel Gomez-Garcia
- Jilu Li
- Fernando Rodriguez-Morales

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Project Details 2011-2012

Center For Remote Sensing Of Ice Sheets (CReSIS) - Unmanned Aerial System (UAS) Operations

Program Manager:
Dr. Julie Palais

Event Number: I-185-M
NSF/PLR Award 0852697

ASC POC/Implementer:
Leslie Blank

Dr. Prasad Gogineni (Principal Investigator)
gogineni@cresis.ku.edu
https://www.cresis.ku.edu/

University of Kansas Lawrence
Lawrence, Kansas

Supporting Stations: McMurdo Station
Research Locations: Pegasus Airfield, Byrd Glacier

Project Description:

Fine-resolution, Unmanned Aerial System (UAS) ice-penetrating radar surveys of the Siple Coast ice streams, most notably Whillans (B), are the focus of the Center for Remote Sensing of Ice Sheets (CReSIS) airborne missions in 2013. The goal of these measurements is to improve bed and surface topographic maps, leading to a more accurate assessment of the hydropotential field. Previous airborne-radar surveys from which bed conditions were measured years ago likely have large uncertainties because of the less accurate navigational data available at that time. By flying new lines with closer spacing that also cross these historic survey lines, researchers can examine important bed features in great detail and use the old data to expand our analysis.

Field Season Overview:

This season, the field team will deploy to McMurdo Station in early December for a two-month flight test program that includes three major, sequential objectives. The first objective is to conduct basic performance flight tests within line of sight. The purpose of these tests is to confirm proper operation of the basic aircraft system. The second test objective involves science payload verification flights. This will also be accomplished within line of sight and will test the ice-penetrating radar. The third test objective involves over-the-horizon testing for both the platform and science payload and may potentially include radar survey work of features of interest near

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McMurdo Station.

Deploying Team Members:

- Austin Arnett
- Emily Arnold
- Nicholas Brown
- Mark Ewing
- Richard Hale (Co-PI)
- Shahriar Keshmiri
- Ryan Lykins
- John Pritchard

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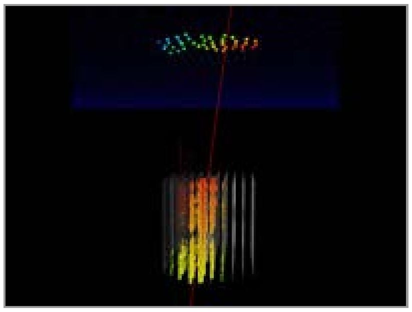
Project Details 2011-2012

IceCube Operations And Maintenance



Completed in December of 2010, IceCube Neutrino Observatory uses over 5,000 detectors embedded in the ice to detect particle events. Above, a reconstruction of an atmospheric muon event. Cosmic rays interacting in the atmosphere produced a muon, detected first by the IceTop array 1.5 km above IceCube. Although the muon loses energy traveling from the top to the bottom of the in-ice detector, more light is detected at the bottom because of the exceptional optical clarity of the ice. It has an average absorption length of 200m and scattering length of 50m. Using 32 billion muons, like the one shown in the picture, the experiment discovered anisotropies in the arrival directions of the highest energy Galactic cosmic rays with an angular scale ranging from degrees to tens of degrees. Their origin is a mystery.

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-333-S
NSF/PLR Award 0937462

ASC POC/Implementer:
Julie Bonneau

Dr. Francis Halzen (Principal Investigator)
halzen@icecube.wisc.edu
http://icecube.wisc.edu

University of Wisconsin Madison
Physics Department
Madison, Wisconsin

Supporting Stations: South Pole Station

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Project Web Sites

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Research Locations: South Pole Station

Project Description:

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

Field Season Overview:

On-Ice activities for the 2011-2012 season include maintenance and operations improvements to the existing IceCube infrastructure at South Pole. This work will take place primarily in the IceCube Counting Laboratory (ICL).

Deploying Team Members:

- Ralf Auer
- Laurel Bacque
- David Besson
- David Besson
- Sebastian Boeser
- Fabian Clevermann
- David Glowacki
- David Heereman
- Andreas Homeier
- John Jacobsen
- Naoko Kurahashi
- Denise Laitsch
- Yael Hagar Landsman
- Andrew Laundrie
- Matthew Newcomb
- Walter Pettus
- James Roth
- Perry Sandstrom
- Torsten Schmidt
- Heath Skarlupka
- Martin Wolf

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Antarctic Search For Meteorites (ANSMET)

Recovery of a meteorite from a moraine by ANSMET field party members Photo by Linda Welzenbach, National Museum of Natural History, Smithsonian Institution

Program Manager:
Dr. Mark Kurz

Event Number: G-058-M

ASC POC/Implementer:
Chad Naughton

Dr. Ralph Harvey (Principal Investigator)
rph@cwru.edu
http://www.case.edu/ansmet

Case Western Reserve University
Department of Geological Sciences
Cleveland, Ohio

Supporting Stations: McMurdo Station
Research Locations: Miller Range

Project Description:
Since 1976, the Antarctic Search for Meteorites (ANSMET) has found more than 17,000 specimens. Meteorites do not fall preferentially on Antarctica; they're 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. One of those areas is the extreme southern end of the Transantarctic Mountains. This year, the ANSMET reconnaissance team will explore the Graves Nunataks and Upper Robison Glacier region and the Amundsen and Devil's Glacier region. Spanning about 100 kilometers from end to end, these areas are about 200 kilometers from South Pole Station and about 900 kilometers from McMurdo Station.

Field Season Overview:
The goal of the ANSMET program for the 2011-2012 field season is full-scale systematic meteorite recovery from the Miller Range Icefields in the Transantarctic Mountains. Three previous seasons of systematic searching as well as several shorter reconnaissance visits have resulted in the recovery of more than 2,000 meteorite specimens from these icefields, including many

rare meteorites such as martian and lunar samples. A large region of blue ice remains unsearched, including small icefields on the northern end of the range and a larger icefield on the southern end of the range. The ANSMET field team will attempt to cover as much of this as possible through overlapping systematic transects. A field team of eight will be equipped with standard remote field equipment, living in Scott tents and conducting searches on snowmobiles. Fixed-wing support will either take the team and its gear directly to an open field landing site adjacent to the target icefield, or the team will be staged to the Central Transantarctic Mountains (CTAM) camp and then shuttled out to Miller Range. Once in the field, the team will generally be self-sufficient, with one camp move supported by fixed-wing aircraft and at least two resupply flights in mid-season.

Deploying Team Members:

- Joe Boyce
- Ralph Harvey (PI)
- Jesper Holst
- Katherine Joy
- James Karner
- Giles Maule
- Anne Peslier
- Christian Schrader
- John Schutt

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Project Details 2011-2012

Austral High-Latitude Atmospheric Dynamics

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-110-M/S

ASC POC/Implementer:
Beth Watson

Dr. Gonzalo Hernandez (Principal Investigator)
hernandez@uw.edu
http://cedarweb.hao.ucar.edu/

University of Washington
Earth and Space Sciences
Seattle, Washington

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

Project Description:
This project continues long-term observation, characterization, and understanding of high-latitude atmospheric motions, in particular mesospheric motions and thermospheric persistent vertical winds near Arrival Heights and simultaneously with those at South Pole and Mount John, NZ. Wintertime mesospheric kinetic temperature observations have shown the presence of dynamical coupling between the stratosphere and the upper regions of the atmosphere in the Southern Hemisphere. Results indicate that the dynamical processes leading to the stratospheric warming or cooling are already in place during the austral winter and the early mesospheric signals lead to the potential capability to estimate the springtime ozone hole.

Field Season Overview:
The major activities at both McMurdo Station's Arrival Heights and South Pole's Atmospheric Research Observatory (ARO) are the observational phase during the austral winter and the calibration phase during the rest of the year. This austral summer, the researchers will again deploy to perform maintenance, repair, and calibrations at both McMurdo and South Pole Stations. Since the same research team calibrates and maintains the experiments at both Arrival Heights and at South Pole, visits to the two sites are done both serially and in parallel, starting at Arrival Heights and

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proceeding to the South Pole ARO. Upon return to McMurdo Station, the research team will conduct any further maintenance at Arrival Heights, if needed. Otherwise, the team will leave the Ice shortly upon returning to McMurdo Station. The field-season dates are estimates only and will likely to change as the observing season comes to a close in late October. Annually, the research team will require year-round technical support of about one hour per day on site at Arrival Heights and about two hours per day for the ARO installation at South Pole.

Deploying Team Members:

- Stephen Barlow
- Gonzalo Hernandez (PI)
- Gonzalo Hernandez (PI)
- Michael McCarthy (Co-PI)
- Bryan Venema

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Project Details 2011-2012

Ocean Acidification: Integrated Approaches To Understanding Effects On Antarctic Sea Urchins, Sterechinus Neumayeri

Program Manager:
Dr. Diana Nemergut

Event Number: B-134-M

ASC POC/Implementer:
John Rand

Dr. Gretchen Hofmann (Principal Investigator)
hofmann@lifesci.ucsb.edu
http://hofmannlab.msi.ucsb.edu/

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

Supporting Stations: McMurdo Station
Research Locations: Crary Lab, Arrival Heights, Big Razorback Island, Cape Evans

Project Description:
This project studies the effects of ocean acidification on embryos and larvae of the Antarctic sea urchin, Sterechinus neumayeri. One group of larvae will be raised under high carbon dioxide (CO2) conditions to mimic the high CO2/low pH ocean expected in the future. Another group will be raised under present-day ambient conditions. The physiology and response of two groups will be compared with the aim of understanding how the larvae are able to calcify and make their calcium carbonate skeletons at low pH. In the lab researchers will prepare samples to assess changes in protein content of the larval skeleton. RNA samples will enable them to use a DNA microarray during subsequent work at their home institution to assess patterns of gene expression for genes involved in biomineralization or in other important biochemical pathways. Other research in the lab includes measuring oxygen consumption with a micro-respirometry unit, and testing thermotolerance of the embryos and larvae.

Field Season Overview:
This is the second field season for this project and the activites planned for 2011-2012 are very similar to the fieldwork of the first season. For this season's field activities, researchers have three objectives, all of which

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involve sea ice travel, the need for research huts on the sea ice, and transportation needs to the field locations. 1. With the support of the RPSC dive team at McMurdo Station, the research team will collect adult sea urchins at a couple sites within the local area. 2. Researchers will deploy pH sensors (SeaFETs) in three McMurdo Sound locations. These deployments will require dive support, but it will be limited, requiring support when the sensors are deployed at the beginning of the season (early October), and then again when the sensors are retrieved at the end of the season (early to mid-December). Based upon last seasons data and activities, the field team will deploy one sensor on the benthos at Cape Evans (where the researchers collect most of the adults that are spawned to support the developmental experiments and create the cultures raised in the lab). They will deploy another sensor further back in the sound near the permanent ice shelf, and one sensor will be deployed at New Harbor in order to characterize the seawater in that area (working with B-043-M (Bowser) to deploy this instrument). Finally, if the sensors hold up, the research team plans to leave one at Cape Evans until February and one field team member will deploy to McMurdo Station to retrieve it with the assistance of support contractor dive personnel. 3. To complement the pH data from the SeaFET, and to calibrate the instrument, researchers will also sample water from one or two locations at McMurdo Station on a nearly daily basis (as weather and sea-ice conditions allow). The water will be processed in the lab for carbonate chemistry.

Deploying Team Members:

- Geoff Dilly
- Gretchen Hofmann (PI)
- Evan Hunter
- Henry Kaiser
- Lydia Kapsenberg
- Paul Matson
- Emily Rivest
- Mary Sewell
- Pauline Yu

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Project Details 2011-2012

ELF/VLF Observation Of Whistler-Mode Waves, Lightning Discharge, And Gamma-Ray Events From Palmer Station

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-336-P

ASC POC/Implementer:
Eric Pohlman

Dr. Umran Inan (Principal Investigator)
inan@nova.stanford.edu
http://vlf.stanford.edu/research/whistler-mode-wave-studies-palmer-station-antarctica

Stanford University
Department of Electrical Engineering
Stanford, California

Supporting Stations: Palmer Station
Research Locations: International Monitoring System (IMS) Building

Project Description:
Whistler-mode waves play a major role in controlling the dynamic evolution of relativistic electron populations in the Earth's radiation belts. They regularly penetrate the ionosphere and can be detected at ground-based stations. Because of its remoteness from anthropogenic electromagnetic noise sources, Palmer Station remains one of the most electromagnetically quiet ELF/VLF receiving sites in the world, allowing researchers to take full advantage of this extremely sensitive receiver system. The system records broadband data (full waveform data sampled at 100 kHz) as well as narrowband data (the demodulated amplitude and phase of narrowband VLF transmitter signals) 24 hours a day, 365 days a year. The scientific investigations involving these data are focused on magnetospherically generated whistler-mode waves; global lightning and thunderstorm activity; the characteristics of lightning discharges associated with terrestrial gamma ray flashes; and the ionospheric effects of gamma ray

Field Season Overview:
The research team's experiment requires keeping the VLF antenna and receiver in good working condition. This season, with the troubling condition of the system, two researchers will deploy to Palmer Station. The yearly

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maintenance and calibration will still be in the normal April time-frame, but in addition, a team member will deploy in the October time-frame (or even earlier) to work on the system to bring it up to full operation. The day-to-day maintainence of the electronics will still be performed by the science technician in the International Monitoring System (IMS) Building.

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UNAVCO GPS Survey Support

Program Manager:
Dr. Alexandra Isern

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

ASC POC/Implementer:
Chad Naughton

Mr. Bjorn Johns (Principal Investigator)
johns@unavco.org
http://facility.unavco.org/project_support/polar/

UNAVCO
Wellington, Undefined

Supporting Stations: McMurdo Station
Research Locations: On station, Transantarctic locations

Project 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 supporting 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 Mt Erebus for GPS data retrieval from the Transantarctic Mountains and an Iridium satellite communications hub in Colorado. Technical support is provided for the Palmer Station GPS surveying system. Operation and maintenance is provided as needed for the NASA IGS stations MCM4 and PALM, the POLENET (ANET) remote GPS stations and GPS reference stations at WAIS Divide and South Pole Station.

Field Season Overview:

This support project will have personnel on the ice throughout the 2011-2012 field season to provide technical support and manage the UNAVCO equipment pool. Field team members will occasionally travel to field locations as support requirements dictate. The timing of the support work is dependent on pending discussions with the individual science events. A majority of the event's cargo will arrive at McMurdo Station by the first week of October in time for the arrival of the field engineers. Field equipment will be requisitioned from the Berg Field Center (BFC), and occasional use of a

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pool truck, Mattrack, and snowmobiles are required from the Mechanical Equipment Center (MEC). At McMurdo Station, the project team members will work out of a Crary Lab office, equipment staging area, and equipment testing/repair space.

Deploying Team Members:

- Marianne Okal (Team Leader)
- Joe Pettit
- Seth White (Team Leader)

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Project Details 2011-2012

Collaborative Research: MRI-R2 Instrument Development Of The Askaryan Radio Array, A Large-Scale Radio Cherenkov Neutrino Detector At The South Pole

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-107-S
NSF/PLR Award 1002485

ASC POC/Implementer:
Julie Bonneau

Dr. Albrecht Karle (Principal Investigator)
Karle@icecube.wisc.edu
http://ara.physics.wisc.edu

University of Wisconsin Madison
Department of Physics
Madison, Wisconsin

Supporting Stations: South Pole Station
Research Locations: Dark Sector

Project Description:
Dr. Karle and his international collaborators 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. This project will develop and deploy a limited number of radio detector stations which will provide the basis for development of a much larger array. The work builds upon past and current neutrino observations including the IceCube and AMANDA Cherenkov observatories and the RICE and ANITA radio Askaryan telescopes in Antarctica as well as the Pierre Auger cosmic ray observatory in western Argentina.

Field Season Overview:
During the 2011-2012 season one ARA station, which consists of an antenna

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system, will be deployed in the ice approximately two kilometers grid-west from the IceCube Lab (ICL). A cable will connect this system to one of the three wind turbines erected last year. These turbines will also be visually inspected and repaired if needed.

Deploying Team Members:

- David Besson
- Pisin Chen
- Michael DuVernois
- Peter Gorham (Co-PI)
- Blaine Gudbjartsson
- Brian Hill
- Gary Hill
- Yael Hagar Landsman
- Thomas Meures
- Christian Miki
- David Pernic
- Benjamin Rotter
- Robert Young

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Project Details 2011-2012

Dry Valley Seismic Project

Program Manager:
Dr. Mark Kurz

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

ASC POC/Implementer:
John Rand

Dr. Robert Kemerait (Principal Investigator)
kemerait@tt.aftac.gov
http://www.afisr.af.mil/units/aftac/index.asp

United States Air Force
AFTAC
Patrick AFB, Florida

Supporting Stations: McMurdo Station
Research Locations: McMurdo Dry Valleys

Project Description:
The Dry Valleys 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 is telemetered to the National Data Center in Florida and made available to the international scientific community.

Field Season Overview:
The team will be traveling to Bull Pass and Mt Newall to refuel the diesel generators, perform annual engine, electrical, and technical, maintenance and inspections.

Deploying Team Members:

- Jason Hutchinson
- Tobee Jefferson
- Joseph King (Team Leader)
- Scott Robertson

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Project Details 2011-2012

Temporal Variability In Natural And Anthropogenic Disturbance Of McMurdo Station

Program Manager:
Dr. Polly Penhale

Event Number: B-518-M

ASC POC/Implementer:
Addie Coyac

Dr. Mahlon Kennicutt (Principal Investigator)
m-kennicutt@tamu.edu
http://antarctica.geog.tamu.edu

Texas A & M University
Oceanography
College Station, Texas

Supporting Stations: McMurdo Station
Research Locations: On station

Project Description:
Antarctica represents perhaps one of the most carefully tended and strictly monitored habitats on Earth. Aside from the manifest desire to protect the flora, fauna and the atmosphere of a relatively pristine environment, there is the value the extreme southern latitudes provide as a virtual baseline barometer of global pollution. The Antarctic Treaty's Protocol on Environmental Protection, supplemented by the policies and practices of the nations who work and do science there, have combined to focus scrutiny on any anthropogenic impacts that can be foreseen or detected. This project collects a system of observations that should enable scientists to be more aware of any such impacts on both marine and terrestrial habitats in and around McMurdo Station. The observations are located precisely and tracked over time. Researchers use geographic information systems (GIS) techniques and geostatistical methods to organize these diverse data sets into a coherent, coordinated framework. The results should provide additional fundamental scientific information for developing a long-term strategy to document and minimize the impacts of future science and support operations on Antarctic resources and values.

Field Season Overview:
Researchers will need the same GPS support as last season, with dedicated use of a backpack GPS unit. The marine portion of the project will require

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diving support, the services of the Reed Drill, a dive hut, and use of a Pisten Bully. The terrestrial portion of the project will require a few days use of a pick-up truck for sample collection. In McMurdo Station, the research team will also need a staging area, office space, and laboratory space for performing toxicity tests.

Deploying Team Members:

- Michelle Brown
- Andrew Klein (Co-PI)
- Terence Palmer
- Stephen Sweet

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Project Details 2011-2012

Collaborative Research: BICEP2 And SPUD - A Search For Inflation With Degree-Scale Polarimetry From The South Pole

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-039-S

ASC POC/Implementer:
Julie Bonneau

Dr. John Kovac (Principal Investigator)
jmkovac@cfa.harvard.edu
http://www.cfa.harvard.edu/CMB/bicep2/

Harvard University
Cambridge, Massachusetts

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

Project Description:

The Cosmic Gravitational-wave Background (CGB) imprints a signature in the polarization of the Cosmic Microwave Background (CMB). Detecting that signature is arguably the most important goal in cosmology today. BICEP is the first CMB polarimeter specifically designed to search for the signature of the CGB. Since 2006, BICEP has mapped about 2% of the sky that is uniquely free of galactic confusion. SPUD (Pryke A-149-S, aka "The Keck Array") is an array of receivers similar to BICEP2 and together they provide a further increase in mapping speed and the possibility of multiple frequencies. These receivers are more compact, use pulse tube cryogenic refrigerators rather than liquid helium, and share the former DASI mount near MAPO. This work comprises two projects: Clem Pryke's SPUD/Keck Array component (A-149), and John Kovac's BICEP2 component (A-039).

Field Season Overview:

Following BICEP2's second successful season, work on BICEP2 during this field season will focus on preparations for a third and final season. Summer activities include yearly instrument calibrations, maintenance and optics upgrades, and a thorough instrument characterization prior the the start of the 2012 winter observations. In early November, the first BICEP2 team members will arrive to relieve the winterover grantee and begin season-end calibrations, which require use of the Martin A. Pomerantz Observatory

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(MAPO) and Dark Sector Laboratory (DSL) masts as in past seasons. Continuous liquid helium supply from the winter through late November is necessary for these calibrations, which must be completed before any maintenance or upgrades to the BICEP2 receiver are performed.

In late November, researchers will decide whether to warm the BICEP2 receiver for optics maintenance and upgrades, or to maintain the receiver at 4 degrees Kelvin throughout the summer as was done last year. In the case of warming the receiver, it will be unloaded from the mount and disassembled in the DSL's BICEP work area. A new focal plane and optics set with improved yield and beam performance will be installed. This delicate work will take place entirely within the BICEP area of the DSL. The receiver will be reassembled and cooled starting around mid-December. Each cooldown requires 150 Liters of liguid nitrogen, 300 Liters of liquid helium, and five days. After testing in the BICEP lab area, by 25 December BICEP2 will be re-installed on the BICEP telescope mount.

Beginning late December, the integrated BICEP2 telescope will be tested for mechanical, cryogenic, and electronic noise performance in simulated observing conditions. January will be dedicated to calibrations using sources mounted on the rooftop mast of DSL and astronomical sources. February, through the end of the summer season, will be spent optimizing astronomical calibrations, using the telescope in the mode in which it will continue for winter operations.

Deploying Team Members:

- Randol Aikin
- Jonathan Kaufman
- John Kovac (PI)
- Angiola Orlando
- Steffen Richter

Project Details 2011-2012

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

Program Manager:
Dr. Vladimir Papitashvili

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

ASC POC/Implementer:
Julie Bonneau

Dr. Craig Kulesa (Principal Investigator)
ckulesa@email.arizona.edu
http://soral.as.arizona.edu/heat/

University of Arizona Tucson
Steward Observatory
Tucson, Arizona

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

Project Description:
This project is a joint US/Australian venture to build and deploy a fully automated, 0.6-meter terahertz astronomical observatory for remote operation at Ridge A – the highest elevation on the Antarctic Plateau. High Elevation Antarctic Terahertz (HEAT) will observe in the 350 micron (0.8 THz) through 150 micron (2 THz) atmospheric windows, the latter of which is unique to Ridge A. HEAT will initiate 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. This will be the largest survey of its kind and will serve as a pathfinder for future astronomical observatories on the Plateau. The telescope will be mounted on top of the Australian University of New South Wales' PLATeau Observatory (PLATO) module that provide housing for the instrument's electronics and diesel engines used to generate electrical power during winter observations. PLATO and the telescope will operate autonomously for over a year at a time, with commands and data being transmitted from and to the home institutions via Iridium satellites daily.

Field Season Overview:
Researchers will deploy the High Elevation Antarctic Terahertz (HEAT) telescope and Plateau Observatory (PLATO) to South Pole for final

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integration and testing, followed by a field deployment via Twin Otter aircraft to the remote Ridge A site. South Pole assembly and testing of PLATO and HEAT will be done in the Dark Sector, using a modest amount of indoor space within the Martin A. Pomerantz Observatory (MAPO) (old AMANDA control room suggested) and outdoor space on the downwind side of MAPO. Field deployment to Ridge A via Twin Otter will be kept to a minimum of equipment and personnel, wIth three to four personnel deploying into the field. A two to three day field deployment is planned to maximize the probability of success given the remoteness of the site, necessary attention to safety, and accounting for difficult working conditions at altitude.

Deploying Team Members:

- Michael Ashley
- Yael Augarten
- Luke Bycroft
- Craig Kulesa (PI)
- Campbell McLaren
- Abram Young

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Mount Erebus Volcano Observatory III (MEVO III): Conduit Processes And Surveillance

Program Manager:
Dr. Alexandra Isern

Event Number: G-081-M

ASC POC/Implementer:
John Rand

Dr. Phillip Kyle (Principal Investigator)
kyle@nmt.edu
http://erebus.nmt.edu

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

Supporting Stations: McMurdo Station
Research Locations: Mount Erebus

Project Description:
Mount Erebus—the southernmost active volcano in the world—has been the subject of NSF-sponsored research since the early 1970s. It is one of only a handful of volcanoes worldwide with a long-lived convecting lava lake. Access to this remote site made possible by McMurdo Station-based resources and the nature of the small Strombolian eruptions has made Mount. Erebus a model for volcanologists and their students. This project continues long-term surveillance using geophysical, geodetic and geochemical observatories to measure the seismicity, infrasound, gas emissions and deformation of the volcano. Researchers also continue investigations of the origin and nature of the ice cave systems on Mount. Erebus as an analog for possible cave systems on Mars. Ground-based LIDAR observations have recently been added to the project's suite of tools and techniques, enabling three-dimensional mapping of the crater, ice caves, and ice towers.

Field Season Overview:
In late November, researchers will service an array of five seismometers installed around the flanks of Mount Erebus by helicopter. Also starting in late November, a large field team will occupy the Lower Erebus Hut (LEH). They will occupy the LEH for four to six weeks and use it as a base of operation for work on Mount Erebus and the surrounding areas of interest. In

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preparation for this, a tent camp to accomodate six people for acclimatization will be established by Berg Field Center (BFC) personnel at Fang Glacier. Snowmobiles will be used for travel in the summit area. A small tent camp of two people will also be established on the flanks of Mount Erebus to sample and examine volcanic ash layers in the ice. Planned work to map and examine some ice caves will require the support of field safety personnel for about a week. This research project will also continue to require year-round maintenance of video and seismic data acquisition systems at McMurdo Station by the Crary Lab science technician.

Deploying Team Members:

- Aaron Curtis
- Paige Czoski
- Jedediah Frechette
- Gaetano Giudice
- Nels Iverson
- Drea Killingsworth
- Phillip Kyle (PI)
- Clive Oppenheimer
- Nial Peters

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Outstanding Questions On Auroral Radiation Fine Structure

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-128-S
NSF/PLR Award 1043230

ASC POC/Implementer:
Julie Bonneau

Dr. James LaBelle (Principal Investigator)
jlabelle@einstein.dartmouth.edu
http://www.dartmouth.edu/~spacephy/

Dartmouth College
Department of Physics & Astronomy
Hanover, New Hampshire

Supporting Stations: South Pole Station
Research Locations: B2 Science Lab, V8 Vault

Project Description:
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 AGO sites (Weatherwax A-112) located from -70 to -85 degrees 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 such anthropogenic electromagnetic interference as power-line harmonics and radio-frequency broadcast transmissions. Researchers will focus on studies of three geophysically important plasma waves. Chorus waves are believed to be a major driver of radiation belt electron acceleration and loss. The other two waves, auroral hiss and auroral kilometric radiation (AKR), 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:
This field season researchers will conduct software upgrades to a newly developed software-defined receiver designed for studying ground-level

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AKR. In addition, standard antenna maintenance will be performed. As in previous years, data taking occurs during the austral winter for the direction-finding receiver and year-round for the swept-frequency receiver. The direction-finding receiver system will be controlled remotely, from Dartmouth College, over the Internet. The swept programmable receiver automatically transfers its data to the central server at South Pole for transfer to the continental U.S.

Deploying Team Members:

- Matthew Broughton

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Project Details 2011-2012

Antarctic Automatic Weather Station (AWS) Program

Program Manager:
Dr. Peter Milne

Event Number: O-283-M/S

ASC POC/Implementer:
John Rand

Dr. Matt Lazzara (Principal Investigator)
mattl@ssec.wisc.edu
http://amrc.ssec.wisc.edu/

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

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: Ross Ice Shelf, West Antarctica, South Pole Station, McMurdo Station and surrounding area

Project 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 32nd 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 has limited our 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.

Field Season Overview:
The field work for O-283-M/S will work out of the following Antarctic regions: Ross Ice Shelf, West Antarctica, South Pole Station, and the local McMurdo Station area. Researchers will continue theirr collaborative arrangements with other international Antarctic Programs as their logistical support capabilities allow. Primary field activies for 2011-2012 include consolidating and upgrading the AWS at Cape Hallett; visiting and repairing AWS stations that developed problems during the previous austral winter; removing up to

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three sites in West Antarctica-depending on time constraints and Twin Otter aircraft support availability; continuing the transition of McMurdo Station area AWS to Freewave radio modems to reduce data telemetry costs; test flights of unmanned aerial vehicles (UAVs) at Alexander AWS (Tall Tower) and other AWS sites that are visited during the season - researchers will also conduct UAV flights at Windless Bight and in the McMurdo Station area. Researchers plan to be based out of Byrd Camp for their West Antarctica field work. The two priority sites in this area are Siple Dome and the new installation at the I-157-M fuel cache. Siple Dome AWS will be relocated closer to the skiway and the electronics will be upgraded. The continuation of the conversion to Freewave radio modems from Argos transmitters in the McMurdo Station area will include moving the base station from the Crary Lab to T-site. The installation at T-site will include a network connection so that researchers can remotely access the computer. The locations that will be converted to radio-modem communications this year are Willie Field, Pegasus North, and possibly Windless Bight. The stations that currently need to be visited for repair are Cape Bird, Lorne, Ferrell, Linda, Marble Point, Minna Bluff, Laurie II, Willie Field, Windless Bight, and Pegasus North. Island sites scheduled for site visits include Hugo and Peter I Islands, which will be reached by ship and small-boat operations once in the area. Work based out of South Pole Station includes removing the temperature radiation shield test site as the environment of South Pole was not an ideal location to perform this test. This work will be done by support contractor personnel.

Deploying Team Members:

- John Cassano (Co-PI)
- Alice Du Vivier
- Jonathan Thom
- Lee Welhouse (Team Leader)

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Role Of Dehydration And Photoperiodism In Preparing An Antarctic Insect For The Polar Night

Program Manager:
Dr. Peter Milne (acting)

Event Number: B-256-P

ASC POC/Implementer:
Eric Pohlman

Dr. Richard Lee (Principal Investigator)
leere@muohio.edu
http://www.units.muohio.edu/cryolab/education/antarctic.htm

Miami University
Oxford, Ohio

Supporting Stations: Palmer Station
Research Locations: Palmer Station local islands

Project Description:

On the Antarctic Peninsula, climatic warming and glacial retreat have exacerbated both thermal and hydric stresses for terrestrial communities of plants and microarthropods. Winter survival for many polar organisms depends on a coordinated transition from feeding, growth, and reproduction during short summers, to an energy-conserving dormancy coupled with enhanced resistance to environmental extremes during winter. Many temperate species rely on photoperiodic cues to trigger physiologic retooling in advance of winter. However, few studies specifically address the role of photoperiodic timers in polar animals.

The midge, Belgica antarctica, is the southernmost free-living terrestrial insect. This extremophilic species and its location on the Antarctic Peninsula provide an excellent model system for investigating mechanisms of stress tolerance and the role of extreme photoperiodic changes in coordinating these seasonal adaptations. Researchers will use genomic and proteomic approaches to investigate the seasonal role of dehydration and photoperiodic cues in preparing a polar insect for winter survival. Specifically, they will study: 1. The role of aquaporins, dehydrins and cryoprotective dehydration in seasonal survival; and 2. the role of photoperiodism in preparing for winter.

Field Season Overview:

During each of three field seasons (2009-2012) at Palmer Station, we plan to deploy 4-5 persons for ~4 weeks in summer (January to February), when we will collect larvae of this locally abundant species and begin experimentation. After the first field season all team members will leave Palmer in early February to return to our home laboratories to begin cloning and sequencing of larval aquaporins, dehydrins and clock genes that will provide us with tools for extended field studies during years 2 and 3. We had excellent larval survival after return to our laboratories, which allowed us to continue experiments for >12 months. In addition, in years 2-3 we wish to deploy ~2 persons later in the season, i.e. March-April.

Deploying Team Members:

- David Denlinger (Co-PI)
- Shinsuke Goto
- Natalie Harr
- Yuta Kawarasaki
- Richard Lee (PI)

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Project Details 2011-2012

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

Program Manager:
Dr. Lisa Clough

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

ASC POC/Implementer:
Beth Watson

Dr. W. Berry Lyons (Principal Investigator)
lyons.142@osu.edu
http://mcmlter.org

Ohio State University
Byrd Polar Research Center
Columbus, Ohio

Supporting Stations: McMurdo Station
Research Locations: F6, Lakes Hoare, Bonney, and Fryxell

Project Description:
In 1980, the National Science Foundation (NSF) funded the US Long Term Ecological Research (LTER) Network, a collaborative effort involving more than 1,800 scientists and students. The McMurdo LTER is one of 26 sites that investigates ecological processes over long temporal and broad spatial scales. 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. This six-year award cycle comprises seven collaborative projects: Andrew Fountain B-504, John Priscu B-505, Diane McKnight B-506, Diana Wall B-507, Jeb Barrett, B-508, Berry Lyons B-509, and Peter Doran B-511. This project is the “geochemistry” component of the McMurdo LTER. Researchers monitor the inorganic geochemistry of waters and solid samples collected from the glaciers, streams, ponds, lakes and landscape of the Dry Valleys. They continue to study the upland seeps and ponds to gain a better understanding of their hydrologic and geochemical controls.

Field Season Overview:
During the upcoming McMurdo LTER field season, researchers plan to travel to various sites within the Dry Valleys to collect water, snow, and sediment samples. The sampling can be achieved on foot or by taking day trips by

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helicopter from McMurdo Station or Lake Hoare to the sampling sites. The research team will also be moving to Lake Hoare, Lake Bonney, F6 and Lake Fryxell to work with the limnological and stream teams. They will travel to upland pond sites within the Dry Valleys to collect additional water samples as necessary.

Deploying Team Members:

- Julie Brown
- W. Berry Lyons (PI)
- Kathy Welch (Team Leader)

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Project Details 2011-2012

Palmer Long Term Ecological Research (LTER): Looking Back In Time Through Marine Ecosystem Space, Physical Oceanography Component

Program Manager:
Dr. Lisa Clough

Event Number: B-021-L
NSF/PLR Award 0823101

ASC POC/Implementer:
Eric Pohlman

Dr. Doug Martinson (Principal Investigator)
dgm@ldeo.columbia.edu
http://www.lternet.edu/sites/pal/

Columbia University
Lamont-Doherty Earth Observatory
Palisades, New York

Supporting Stations: ARSV Laurence M. Gould
Research Locations: Western Antarctic Peninsula, Adelaide Island

Project Description:
This LTER component takes 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:
Researchers with this LTER group plan to recover, service, and redeploy three physical oceanographic moorings and to perform about 80 Conductivity-Temperature-Depth (CTD) casts at regular LTER hydrographic and process site locations.

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Roosevelt Island Climate Evolution (RICE) Project

I-173M is the U.S. glaciochemical contribution to RICE. Photo by N.A.N. Bertler.

Program Manager:
Dr. Julie Palais

Event Number: I-173-M

ASC POC/Implementer:
Chad Naughton

Dr. Paul Mayewski (Principal Investigator)
paul.mayewski@maine.edu
http://www.victoria.ac.nz/antarctic/research/research-prog/rice/

University of Maine
Climate Change Institute
Orono, Maine

Supporting Stations: McMurdo Station
Research Locations: Roosevelt Island Ice Core Site

Project Description:
This award supports a project to analyze a deep ice core which will be drilled by a New Zealand research team at Roosevelt Island. Researchers will process the ice core at very high resolution. Results from the RICE deep ice core are expected to provide a 30,000-year and possibly 150,000-year long extremely high-resolution view of climate change in the Ross Sea Embayment. Ice core processing and analysis will be performed jointly by University of Maine and the collaborators from New Zealand. Co-registered sampling for all chemical analyses will be accomplished by a joint laboratory effort at the IGNS NZ ice core facility using a continuous melter system developed by the University of Maine. The RICE deep ice core record will help unravel the significance of multi-millennial underpinning for climate change and in the understanding of observed and projected climate change in light of current dramatic human impact on Antarctica and the Southern Ocean.

Field Season Overview:
In this season, the research team will be receiving USAP support for intercontinental travel, physical qualification for deployment, and cold weather clothing for one Climate Change Institute (CCI) investigator. Under the ANZ/NSF agreement, this CCI investigator will be trained under the ANZ

safety guidelines by ANZ.

Deploying Team Members:

- Tom Beers

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Project Details 2011-2012

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

Program Manager:
Dr. Lisa Clough

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

ASC POC/Implementer:
Beth Watson

Dr. Diane McKnight (Principal Investigator)
diane.mcknight@colorado.edu
http://www.mcmlter.org/

University of Colorado Boulder
Institute of Arctic and Alpine Research (INSTAAR)
Boulder, Colorado

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

Project Description:

In 1980, the National Science Foundation (NSF) funded the US Long Term Ecological Research (LTER) Network, a collaborative effort involving more than 1,800 scientists and students. The McMurdo LTER is one of 26 sites that investigates ecological processes over long temporal and broad spatial scales. The MCM LTER program is an inter-disciplinary and multi-disciplinary study of the aquatic and terrestrial ecosystems in the ice-free McMurdo Dry Valleys. This six-year award cycle comprises seven collaborative projects: Andrew Fountain B-504, John Priscu B-505, Diane McKnight B-506, Diana Wall B-507, Jeb Barrett, B-508, Berry Lyons B-509, and Peter Doran B-511. This project is the "streams" component of the MCM LTER. Researchers operate a network of 16 stream flow gauges, collect water quality samples from 30 streams and make hydrologic measurements.

Field Season Overview:

Monitoring Activities During the 2011-2012 field season, researchers will continue to operate a network of 18 stream-flow gauges, collect water quality samples from 30 streams, and make necessary hydrologic measurements. Most monitoring will take place in Taylor Valley, with monitoring continuing in Wright Valley and being initiated or renewed at one or two sites in Miers and

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Garwood Valleys. Researchers will continue to upgrade temperature and specific-conductance probes at several gauges in order to minimize the loss of data collected during the season. Activities to relocate upstream gauging sites that are at risk of being submerged due to lake level rise, associated with the recent high flows of the 2008-2009 and 2010-2011 seasons, will be conducted for several gauges including Priscu Stream, Von Guerard Stream, Huey Creek, and Aiken Creek. Team members will also establish new gauging sites and algal monitoring transects in the Miers and Garwood Valleys. As part of a continuing collaboration with the USGS, researchers will operate the Onyx River Gauges in the Wright Valley so that the data are automatically transmitted each day to a USGS Water Science Center office, allowing for real-time flow monitoring that will be used for field-season planning. Researchers will also measure lake levels at Lakes Vida, Vanda, and Don Juan Pond. Also, as part of their long-term monitoring of the algal transects, researchers will visit 16 stream sites in mid-January to collect algal mat samples and water quality and to conduct LIDAR surveys. Experimentation Activities The B-506-M research team will continue to collaborate with the Wall group on sampling the reactivated relict channel experiment. In January 1995, a short sandbag control structure was built that diverted water to an abandoned stream channel in the Lake Fryxell basin that had not received substantial flow in approximately two decades. Biological and chemical observations have been made to see how the stream system responded to the renewal of flow. This season, researchers will continue baseline measurements in the reactivated channel to determine the amount of streamflow and will focus on three of the sites to observe changes in endemic diatoms following the high flows of the 2010-2011 season. These measurements may involve the installation of monitoring wells and temperature and specific-conductance probes, and the collection of streamwater, hyporheic water, algal mat, and soil organism samples. The operational support needed for this season will be similar to last year with the addition of activities to relocate sites and establish new sites in Miers and Garwood Valleys. The primary activities will be long-term stream monitoring and biological surveying conducted in the Dry Valleys. The work from November to February will involve collaboration with other events in the McMurdo-LTER project, especially the soils and biogeochemistry teams, and with several support contractor units, including Environmental, Berg Field Center, MACOPS, and helicopter support.

Deploying Team Members:

- Emily Bernzott
- Chris Jaros
- Alia Khan
- Tyler Kohler
- Diane McKnight (PI)

Project Details 2011-2012

Collaborative Research: Antarctic ELF/VLF Observations Of Lightning And Lightning-Induced Electron Precipitation

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-109-M/P/S

ASC POC/Implementer:
Julie Bonneau

Dr. Robert C Moore (Principal Investigator)
moore@ece.ufl.edu
http://www.vlf.ece.ufl.edu/Antarctica/

University of Florida
Gainesville, Florida

Supporting Stations: McMurdo Station, Palmer Station, South Pole Station
Research Locations: Arrival Heights, CUSP Laboratory, Terra Lab

Project Description:
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 US Antarctic research stations. At Arrival Heights, the radiometer has operated continuously 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 continuously records ELF and the VLF data streams and provides real-time data processing and access via the Internet. Researchers in north-central Florida use the data for coordinated lightning-related experiments.

Field Season Overview:
McMurdo Station This season the research team will provide and install

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cabling and antenna replacements for the ELF/VLF system to ensure the integrity of the ELF and VLF signals for future years. The recently upgraded data acquisition system that continuously records both the ELF and the VLF data streams will continue to 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. Researchers will perform annual maintenance and calibration at Arrival Heights and prepare the system for winter operation. Data recording will be performed continuously throughout the year with minor support provided by the RPSC research associate.

Palmer and South Pole Stations As at McMurdo Station, the ELF/VLF data recording system at Palmer and South Pole will continue to be supplemented with a system that continuously records the ELF/VLF data streams and provides 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. Data recording will be performed continuously throughout the year with minor support provided by the station research associate.

Deploying Team Members:

- Michael Mitchell

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Project Details 2011-2012

The Polar Geospatial Information Center: Joint Support

Program Manager:
Dr. Alexandra Isern

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

ASC POC/Implementer:
Chad Naughton

Mr. Paul Morin (Principal Investigator)
lpaul@umn.edu
http://www.pgc.umn.edu

University of Minnesota
Geology & Geophysics
St. Paul, Minnesota

Supporting Stations: McMurdo Station, Palmer Station
Research Locations: McMurdo Dry Valleys

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

Field Season Overview:
The 2011-2012 field season for the PGC will entail five personnel deploying over four months to provide support to USAP science and logistics, with a maximum of three people at McMurdo Station at the same time (early November). The field work will include the use of snowmobiles to travel along the east side of Ross Island and to islands within Erebus Bay to gather additional control points in November and early December. During late December and early January, researchers will require helicopter support (day trips only) to a few locations north and south of the Dry Valleys and a couple locations on Ross Island, to fill in a few areas where ground control points are lacking.

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Deploying Team Members:

- Bradley Herried
- Cole Kelleher
- Michelle LaRue
- Paul Morin (PI)
- Claire Porter

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Collaborative Research: Multispecies, Multi-Scale Investigations Of Long-Term Changes In Penguin And Seabird Populations On The Antarctic Peninsula

Program Manager:
Dr. Diana Nemergut

Event Number: B-044-E

ASC POC/Implementer:
John Evans

Mr. Ron Naveen (Principal Investigator)
oceanites.mail@verizon.net
http://www.oceanites.org

Oceanites, Inc.
Chevy Chase, Maryland

Supporting Stations: Special Project
Research Locations: ARSV Laurence M. Gould, Various islands in the Antarctic Peninsula area

Project Description:
This is the final year of a five-year award to characterize decadal scale changes in penguin and seabird populations on the Antarctic Peninsula. Discerning how Antarctic species are changing in abundance and relative abundance, and more importantly, identifying the factors driving these long-term changes, are key steps toward improved understanding of the Antarctic ecosystem. This understanding is essential for effective stewardship of Antarctica's unique resources. The project entails two interconnected research activities: (1) Continued long-term monitoring and censusing of penguin and seabird populations including access to and landings at census sites, and (2) Synthesis and quantitative analyses of datasets detailing long-term changes in five penguin and seabird species from diverse sites throughout the Antarctic Peninsula. When complete, the penguin/seabird database will incorporate data from a variety of sources including ASI (Antarctic Site Inventory), CCAMLR (Commission for the Conservation of Antarctic Marine Living Resources), US AMLR (US Antarctic Marine Living Resources), Palmer LTER (Long Term Ecological Research), British and Argentine researchers, historic census data compiled by SCAR (Scientific Committee on Antarctic Research, and, when possible, additional privately held datasets.

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Field Season Overview:

As before, monitoring work will involve 42 different census locations in the Antarctic Peninsula. Collaborations with commercial tour operators will be used to achieve a substantial proportion of this, but the limitations of tour operations precludes achieving all Antarctic Site Inventory data priorities. Therefore, two team members will work from the ARSV Laurence M. Gould in the November to December 2011 time frame. As in previous seasons, this project collaborates with project B-034-E in regards to radioisotopic analyses of penguin eggshells. Members of the B-034-E team will assist with Antarctic Site Inventory data collection this season at a wide range of sites.

Deploying Team Members:

- Heather Lynch (Co-PI)
- Ron Naveen (PI)
- Melissa Rider

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Project Details 2011-2012

IRIS/PASSCAL Seismic Support

Program Manager:
Dr. Alexandra Isern

Event Number: T-299-M
NSF/EAR Award 1261681

ASC POC/Implementer:
Chad Naughton

Undefined Timothy Parker (Principal Investigator)
tparker@passcal.nmt.edu
http://www.passcal.nmt.edu/content/polar

Socorro, New Mexico

Supporting Stations: McMurdo Station
Research Locations: On Station, Transantarctic locations

Project 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. The facility provides instrumentation to NSF-funded seismological projects in Antarctica and elsewhere. Antarctic and arctic projects comprise five to ten percent of all the projects PASSCAL supports worldwide.

Field Season Overview:
This season, support will be provided to T-295-M, G-079-M, C-407-M, LARISSA, WISSARD (C-520-M), G-081-M, I-161-M, I-181-M and other events requesting PASSCAL support.

Deploying Team Members:

- Brian Bonnett
- Robert Greschke
- Pnina Miller
- Guy Tytgat

Project Indexes

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Project Details 2011-2012

Ocean Acidification–Category 1: Identifying Adaptive Responses Of Polar Fishes In A Vulnerable Ecosystem

Program Manager:
Dr. Diana Nemergut

Event Number: B-199-M

ASC POC/Implementer:
Eric Pohlman

Dr. Sean Place (Principal Investigator)
places@mailbox.sc.edu
http://ww2.biol.sc.edu/~placelab/Place_Lab/Home.html

University of South Carolina
Department of Biological Sciences and Marine Science
Columbia, South Carolina

Supporting Stations: McMurdo Station
Research Locations: Crary Lab, Cape Evans, Inaccessible Island, New Harbor Sea Ice

Project Description:
This project aims to understand the interaction of two oceanographic features—ocean acidification and the projected rise in mean sea surface temperature—on the performance of Notothenioids, the dominant fish of the Antarctic marine ecosystem. Understanding the physiological trade-offs that may occur under certain conditions will provide valuable insight into the capacity for fish species to cope with rapid environmental changes such as those expected under global climate change scenarios. Analysis will include whole organism performance metrics, along with standard molecular and cell biology approaches to assess cellular damage. Researchers will employ evolutionary approaches to map variation in physiological responses onto the phylogeny of these fishes and characterize genetic diversity within species.

Field Season Overview:
The project's primary activities will be fishing on the sea ice, and laboratory work in Crary Lab. The research team plans to arrive on station with Mainbody deployment flights (about September 27) to late December to take full advantage of sea ice travel for fishing. The requested timeframe on the ice is important as the field team needs access to sea ice travel for the entire field season (thus the September arrival date), and all members need to return to the U.S. by mid-to-late December.

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Deploying Team Members:

- Jeffry Dudycha (Co-PI)
- Laura Enzor
- Sean Place (PI)
- Mackenzie Zippay

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

Program Manager:
Dr. Lisa Clough

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

ASC POC/Implementer:
Beth Watson

Dr. John Priscu (Principal Investigator)
jpriscu@montana.edu
http://www.mcmlter.org/index.html

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

Supporting Stations: McMurdo Station
Research Locations: McMurdo Dry Valleys

Project Description:
In 1980, the National Science Foundation (NSF) funded the US Long Term Ecological Research (LTER) Network, a collaborative effort involving more than 1,800 scientists and students. The McMurdo LTER is one of 26 sites that investigates ecological processes over long temporal and broad spatial scales. 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. This six-year award cycle comprises seven collaborative projects: Andrew Fountain B-504, John Priscu B-505, Diane McKnight B-506, Diana Wall B-507, Jeb Barrett, B-508, Berry Lyons B-509, and Peter Doran B-511. This project is the “Lakes 1” component of the McMurdo LTER. Researchers 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.

Field Season Overview:
This field season there will be two main research groups with this project making routine lake measurements from October through early January. Group 1 will periodically occupy the field camps at Lakes Bonney, Hoare, and Fryxell from early November to early January. The field rotation will begin at Lake Fryxell in early November, move to Lake Hoare the second

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week of November, and to Lake Bonney the third week of November. The second round of sampling will occur in early December and will follow the same lake rotation. A four-day sampling trip to Lakes Fryxell, Hoare, and Bonney will be made during late December and early January and will be based out of Lake Hoare and Lake Bonney camps. Researchers will also visit Lake Vanda and Lake Miers to take biological, chemical, and physical measurements, and the ice edge or an ice hole in McMurdo Sound to calibrate their Seabird CTD instrument. Researchers may also visit Blood Falls, the Canada Glacier, and Don Juan Pond. The group 2 field season this year will require operational support in terms of helicopter hours (day trips and sample returns to McMurdo Station), cargo support, and allocation of space in Phase II and freezer and environmental rooms at Crary Lab. Group 2 will be working out of established field camps at Lakes Fryxell, Bonney, and Hoare, with planned day trips by means of helicopter support to Wright Valley, Victoria Valley, and Miers Valley. The group will also be surveying ablation stakes on the ice surface at Lakes Hoare, Fryxell, and Bonney, which entails the assistance of UNAVCO.

Deploying Team Members:

- Amy Chiuchiolo (Team Leader)
- Hilary Dugan
- Hans-Peter Grossart
- Katherina Hell
- Paloma Lopez
- Maciej Obryk (Team Leader)
- John Priscu (PI)

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Collaborative Research: BICEP2 And SPUD - A Search For Inflation With Degree-Scale Polarimetry From The South Pole

The first three receivers of the SPUD-Array observing in the deep Antarctic night. Photo by Robert Schwarz

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-149-S

ASC POC/Implementer:
Julie Bonneau

Dr. Clement Pryke (Principal Investigator)
pryke@physics.umn.edu
http://www.astro.caltech.edu/~lgg/keck/keck_front

University of Chicago
Astronomy & Astrophysics
Chicago, Illinois

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

Project Description:
The Cosmic Gravitational-wave Background (CGB) imprints a signature in the polarization of the Cosmic Microwave Background (CMB). Detecting that signature is arguably the most important goal in cosmology today. BICEP is the first CMB polarimeter specifically designed to search for the signature of the CGB. Since 2006, BICEP has mapped about 2% of the sky that is uniquely free of galactic confusion. SPUD (Pryke A-149-S, aka "The Keck Array") is an array of receivers similar to BICEP2 and together they provide a further increase in mapping speed and the possibility of multiple frequencies. These receivers are more compact, use pulse tube cryogenic refrigerators rather than liquid helium, and share the former DASI mount near MAPO. This work comprises two projects: Clem Pryke's SPUD/Keck Array component (A-149), and John Kovac's BICEP2 component (A-039).

Field Season Overview:
Early in the season, a research team will arrive to perform season-ending calibrations of the three SPUD receivers installed last season. In November, two new receivers will arrive and the existing ones will be taken down for

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service and upgrade. Each of the new receivers will then be tested in the lab before being put on the telescope mount and tested again using the far-field flat mirror. This is a substantial effort that will continue through the entire season.

In addition, an upgrade to the air-handling system in the compressor room is required to improve its efficiency and allow for operation of five compressors. Careful planning will be required to ensure this project has an acceptable impact on the receiver testing program.

Deploying Team Members:

- Collin Bischoff
- Jamie Bock (Co-PI)
- Charles Dowell
- Stefan Fliescher
- Martin Lueker
- Hien Nguyen
- Walter Ogburn
- Clement Pryke (PI)
- Robert Schwarz
- Chris Sheehy
- Zachary Staniszewski
- Sarah Stokes
- Grant Teply
- James Tolan
- Abigail Vieregg
- Chin-Lin Wong
- Kiwon Yoon

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Systematic Analysis Of The Stability And Ages Of Soil Surfaces In Transantarctic Mountains

Students making geological measurements in Moraine Canyon, southern Transantarctic Mountains. Photo by Jaakko Putkonen.

Program Manager:
Dr. Alexandra Isern

Event Number: G-501-M

ASC POC/Implementer:
John Rand

Dr. Jaakko Putkonen (Principal Investigator)
jaakko.putkonen@und.edu
http://www.geology.und.edu/cosmo

Grand Forks, North Dakota

Supporting Stations: McMurdo Station
Research Locations: Transantarctic Mountains

Project Description:
The researchers will seek to determine the landscape evolution in the Transantarctic Mountains in time scales from years to millions of years.

Field Season Overview:
This research project will deploy researchers to two remote field camps, spending about three weeks at each site for field work and data collection.

Deploying Team Members:

- Theodore Bibby
- Collin Giusti
- Daniel Morgan
- Jaakko Putkonen (PI)

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Project Details 2011-2012

WISSARD Borehole Drill Contractor

Program Manager:
Dr. Lisa Clough

Event Number: C-524-M
Subaward to NSF/PLR Awards 0839142, 0839107, 08389

ASC POC/Implementer:
Chad Naughton

Dr. Frank Rack (Principal Investigator)
frack2@unl.edu
http://www.wissard.org

University of Nebraska Lincoln
Department of Geosciences
Lincoln, Nebraska

Supporting Stations: McMurdo Station
Research Locations: McMurdo Station, Subglacial Lake Whillans

Project Description:

The aim of the Whillans Ice Stream Subglacial Access Research Drilling (WISSARD) project is to drill into the hydrological system beneath the Whillans Ice Stream at three different locales: Into subglacial Lake Whillans at the top of the system; into the subglacial river/stream between the lake and the grounding line; and into the ocean beneath where the Whillans Ice Stream flows into the Ross Ice Shelf. This campaign will require three field seasons: During the first month of the 2012-13 field season, the drill system was tested on the McMurdo Ice Shelf. Later that season, the system was traversed to the top of the Whillans Ice Stream to begin penetration into subglacial Lake Whillans. The drill system was left on site and the rest of the project will be carried out over the next two field seasons.

Field Season Overview:

The WISSARD drill contractor will ship the components of the hot water drill (HWD) to McMurdo Station via USAP supply vessel, arriving February 2012 for preparation for drilling work that will begin the following austral summer. Additionally, several components of the Ice Cube Enhanced Hot Water Drill system will be transferred from South Pole to McMurdo Station for use with the hot water drill system. Two WISSARD drillers will deploy to McMurdo Station to oversee staging of the Ice Cube materiel and to outfit the MECC (Mobile Expandable Container Configuration) as a workshop in preparation for the first drilling season in 2012-2013.

Deploying Team Members:

- Dar Gibson

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Collaborative Research: Replicate Coring At WAIS Divide To Obtain Additional Samples At Events Of High Scientific Interest

Program Manager:
Dr. Julie Palais

Event Number: I-476-M

ASC POC/Implementer:
Deb Roth

Dr. Jeffrey Severinghaus (Principal Investigator)
jseveringhaus@ucsd.edu
http://waisdivide.unh.edu/

Scripps Institution of Oceanography
Geosciences Research Division
La Jolla, California

Supporting Stations: McMurdo Station
Research Locations: WAIS Divide

Project Description:

WAIS Divide is a collaboration of about 40 separate but synergistic projects funded by NSF to collect deep ice cores from the West Antarctic Ice Sheet (WAIS). Work began with construction of a field camp in 2005-06 and the first cores were recovered in 2006-07. On December 31, 2011 drillers reached the final depth goal of 3,405 meters, and recovered the longest U.S. ice core to date from the polar regions. Other deploying projects this year are the drilling contractor, IDDO T-350, and the Science Coordination Office (SCO, Kendrick Taylor) I-477. This associated project will acquire second and third ice cores from the borehole wall in order to replicate the main WAIS Divide ice core in areas of key scientific interest such as abrupt climate changes and volcanic sulfate horizons. These replicate cores will permit measurements that are currently impossible because of limited sample volume, and allow for validation of key scientific findings. Field activity will take place at the WAIS Divide ice core site using the established camp and support infrastructure, including a version of the DISC (Deep Ice Sheet Coring) drill with modifications for replicate coring.

Field Season Overview:

The first-half of the 2011-2012 field season will be dedicated to borehole logging of the WAIS Divide borehole as proposed by the I-122-M, I-161-M, I-

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162-M, and I-168-M projects. After the initial borehole logging, this project will deepen the borehole until scientific returns are diminished and/or a maximum environmentally safe depth has been reached. Researchers estimate that no more than 160 meters of ice core will be collected while deepening the main borehole. The borehole logging groups will then return to get measurements of the freshly deepened portion of the borehole. Following that, this project will begin replicate coring, which will result in no more than 60 meters of replicate coring ice being collected this field season. All ice drilled this season (estimated not to exceed 220 meters) will be returned to McMurdo Station for subsequent transport to the National Ice Core Laboratory.

Deploying Team Members:

- Jakob Schwander
- Jeffrey Severinghaus (PI)

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Project Details 2011-2012

The Drake Passage High-Density XBT/XCTD Program

Program Manager:
Dr. Peter Milne

Event Number: O-260-L
NSF/PLR Award 0943818

ASC POC/Implementer:
Patricia Jackson

Dr. Janet Sprintall (Principal Investigator)
jsprintall@ucsd.edu
http://www-hrx.ucsd.edu

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

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

Project Description:
The objective of the XBT/XCTD program is to measure the seasonal to interannual variability of upper ocean temperature and geostrophic transport through Drake Passage. Closely spaced XBT (temperature) and XCTD (salinity) measurements are collected underway on six to eight L.M. Gould crossings per year. The project has been ongoing since 1996. With the multi-year time series we 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:
Onboard technicians will conduct XBT and XCTD surveys during selected Drake Passage crossings.

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IPY: Stability Of Larsen C Ice Shelf In A Warming Climate

Field camp on Larsen C ice shelf with radar sledge to monitor the shelf ice thickness. The sledge which is pulled by a skidoo along 500 km transects has a rough terrain 25 MHz antenna attached in the back. Photo by Konrad Steffen, CIRES/University of Colorado at Boulder.

Program Manager:
Dr. Julie Palais

Event Number: I-077-E

ASC POC/Implementer:
John Evans

Dr. Konrad Steffen (Principal Investigator)
konrad.steffen@colorado.edu
http://cires.colorado.edu/science/groups/steffen/larsenC/index.html

University of Colorado Boulder
CIRES
Boulder, Colorado

Supporting Stations: Special Project
Research Locations: Larsen C Ice Shelf via Rothera Base

Project Description:
Following the collapse of the Larsen A ice shelf in 1995 and the Larsen B ice shelf in 2002, it has been demonstrated that the much larger Larsen C ice shelf is thinning, and various data suggest that it will break up as well. The goal of this project is to determine the state and stability of the Larsen C shelf. To that end, the researchers will combine existing data with new measurements to assess what physical processes are controlling the weakening of the ice shelf and whether a break up is likely. This work will provide baseline data to quantify the consequences of a breakup.

Field Season Overview:
The main objective for the 2012 field season will be repeating several of the ground-penetrating-radar profiles collected during the 2011 season. At each site, researchers will collect several shallow 10-15 meter firn cores and test

the ground-penetrating-radar profiles in north, south, east, and west directions. At the camp sites, the research team will retrieve 10-meter firn cores to analyze the density and precipitation rates on site. Firn core analysis will be done in the field, no cores will be flown out. Researchers will also do the same measurements (as well as performing maintenance) at all three automated weather station (AWS) sites on the Larsen C ice shelf about 190-250 kilometers from Rothera Base. This will require about one week at each location. As in the past, all support south of Punta Arenas will be provided by British Antarctic Survey (BAS), which will provide round-trip air transport from Punta Arenas to Rothera Base, and from there to the work sites on the Larsen Ice Shelf.

Deploying Team Members:

- Gino Casassa
- Daniel McGrath
- Konrad Steffen (PI)

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Project Details 2011-2012

Palmer Long Term Ecological Research (LTER): Looking Back In Time Through Marine Ecosystem Space, Zooplankton Component

LM GOULD 1, Rothera 0! LMG team defeats British Antarctic Survey in annual soccer game at Rothera Station, 22 January, 2011. Photo by Grace Saba, Rutgers University.

Program Manager:
Dr. Lisa Clough

Event Number: B-020-L/P
NSF/PLR Award 0823101

ASC POC/Implementer:
Eric Pohlman

Dr. Deborah Steinberg (Principal Investigator)
debbies@vims.edu
http://pal.lternet.edu/

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

Supporting Stations: ARSV Laurence M. Gould, Palmer Station
Research Locations: Western Antarctic Peninsula, Adelaide Island

Project Description:
Zooplankton and micro-nekton provides the main trophic link between primary producers and apex predators in the Southern Ocean. Researchers will focus on: (1) Trophic cascading and food selectivity experiments; (2) Determining the target strength and backscattering cross section of krill in response to the Acoustic Doppler Current Profiler (ADCP) that will be used 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:
As part of the LTER project, this research team participates in the 28-day LTER cruise aboard the LMG between early January and early February each Austral summer. Research activities on the cruise include deploying and retrieving nets; about three net tows will be done at each station during the upcoming cruise: one tow with a 1-meter square net to a depth of 300

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meters and one or two tows with a 2-meter net to a depth of 120 meters. The researchers will also use the 1-meter MOCNESS to sample discrete depth horizons at the process study stations and possibly a few of the regular grid stations. The Biosonics acoustic towfish will be used at the process study stations to detect krill aggregations. Research for the B-020 project at Palmer Station will focus on intensive bioacoustic surveys with the aim of identifying krill patches and improving the understanding of krill distribution patterns in the nearshore. The bioacoustic surveys will be conducted using the Biosonics echosounder at least three times per week. In addition to bioacoustic surveys, researchers will collect live krill using a plankton net deployed from a Zodiac boat. These krill will be used for experiments in the station aquarium to determine their acoustic properties. These experiments will provide data that can be used to improve models used to estimate krill biomass and numerical density from acoustic backscatter data.

Deploying Team Members:

- Anne Armstrong
- Kim Bernard
- Joseph Cope
- Miram Gleiber
- Dominique Paxton
- Lori Price
- Kate Ruck
- Beth Simmons
- Karen Stamieszkin

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NASA Long Duration Balloon (LDB) Support Program

Program Manager:
Dr. Vladimir Papitashvili

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

ASC POC/Implementer:
Addie Coyac

Mr. Bill Stepp (Principal Investigator)
Bill.Stepp@csbf.nasa.gov
http://www.csbf.nasa.gov

Columbia Scientific Balloon Facility
Palestine, Texas

Supporting Stations: McMurdo Station
Research Locations: Williams Field

Project 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. 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 on onboard hard drives, with a small amount sent by radio telemetry to the United States. Because of the Antarctic wind pattern that starts in early December, the balloons will circumnavigate Antarctica between 70 and 80 degrees south latitude.

Field Season Overview:
Snow removal from the LDB facility and maintenance throughout the season will be required. The new LDB facility should be on site and operational for this season so the requirements should be different than in previous seasons. Assistance from fleet ops will still be required on launch days to operate the heavy equipment nesseccary to conduct the launch operation. The kitchen jamesway will need to be erected and have a cook provided for the season. During launch operations food service will be required for up two meals a day during these periods. At other times the science teams may work back late and require additional meals. Power heat and water facilities will need to be provided for the whole facility. Our cargo will need to be on

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site upon our arrival, a tracked heavy lift forklift will be needed to move cargo and equipment on site. The heavy forklift will be needed during the unpacking stages of our operation and the packing up stage at the end of our season. We will need intermittent heavy lifts through out the season. A POC will need to be provided. Compation maintenance and preparation of the launch pad will be required. Air support will be required for the testing of the termination equipment, for termination and recovery of the experiments including the balloon. Some assistance from the Met department will be required. Assistance with the close out of the facility will be required. Transport from McMurdo to the site and return will need to be provided on a daily basis. There may be requirements for transport at irregular hours. For this season we will also need weather sones to 5mb between the dates of 15th November through to the 15th January

Deploying Team Members:

- Alexander Beange
- Michael Benham
- Paul Brasfield
- Henry Cathey
- Henry Cathey, Jr.
- Debora Fairbrother
- Debora Fairbrother
- Chris Field
- Christopher Field
- Curtis Frazier
- Gerald Gregg
- Jim Humphrey
- Otto Masters
- Robert Mullenax
- Juan Perez Lara
- Jacob Richard
- Thomas Thomas
- Thomas Thomas
- Robin Whiteside

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Project Details 2011-2012

Collaborative Research: Biogeochemical Controls Of The Oxygen And Carbon System In The Drake Passage

Program Manager:
Dr. Peter Milne

Event Number: O-214-L
NSF/PLR Award 0944761

ASC POC/Implementer:
Patricia Jackson

Dr. Colm Sweeney (Principal Investigator)
colm.sweeney@noaa.gov
http://www.ldeo.columbia.edu/CO2

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

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

Project Description:

The Antarctic Circumpolar Current is the strongest wind-driven ocean current on the planet. Encircling the entire continent, it has a natural “chokepoint” in the form of the Drake Passage lying between South America and the Antarctic Peninsula. Since 1994, this project has collected data during all cruises of the ARSV Laurence M. Gould (LMG). The installed equipment measures the underway surface partial pressure of carbon dioxide (pCO_2) and takes discrete samples of other parameters of interest to studying the carbon system such as total CO_2 (TCO_2), and isotopic ($^{13}C/^{12}C$ and $^{14}C/^{12}C$) ratios in surface TCO_2. During the selected southbound Drake Passage transects of Janet Sprintall’s O-260, this group also obtains direct measurements from seawater samples and collects physical hydrographic data from the launched XBT and XCTD probes. The measurement set provides an opportunity to increase our understanding of the major processes that control spatial, seasonal and inter-annual variability of dissolved carbon dioxide (CO_2) in the waters of the Drake Passage and biogeochemical fluxes in the Southern Ocean.

Field Season Overview:

This year project team members visited both vessels during a port call to install additional instrumentation that measures atmospheric CO_2 and O_2. During normal operations, onboard technicians monitor and troubleshoot

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equipment, collect water and air samples during Sprintall (O-260) Drake Passage transects, and send data and samples to grantees at the end of the cruises.

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Operation And Maintenance Of A CTBT Class Infrasound Array At Windless Bight

Program Manager:
Mr. Pat Smith

Event Number: T-396-M
NSF/CTBT MOA

ASC POC/Implementer:
John Rand

Dr. Curt Szuberla (Principal Investigator)
cas@gi.alaska.edu
http://www.gi.alaska.edu/infrasound/

University of Alaska Fairbanks
Geophysical Institute
Fairbanks, Alaska

Supporting Stations: McMurdo Station
Research Locations: Windless Bight

Project 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 volcano 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:
Cargo requirements for the coming season will be higher than normal as the project team is sending down upgrade equipment. The group of four will be equipped with standard remote field equipment (including snow machines, Pisten Bully, and Mattrack) to stay at Windless Bight. The team will not remain continuously in the field and one or two participants may stay at McMurdo Station to coordinate data acquisition in the CTBT Hub room. The support contractor winter-over research associate (RA) that will be maintaining the system during the austral winter will travel to Fairbanks, Alaska for Infrasound training before deployment to McMurdo Station.

Deploying Team Members:

- Don Byrd
- Brian Lawson
- Kathleen Lawson
- David Withoff

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WAIS Divide Science Coordination Office (SCO)

Program Manager:
Dr. Julie Palais

Event Number: I-477-M

ASC POC/Implementer:
Deb Roth

Dr. Kendrick Taylor (Principal Investigator)
kendrick@dri.edu
http://waisdivide.unh.edu/

Desert Research Institute
Division of Hydrological Science
Reno, Nevada

Supporting Stations: McMurdo Station
Research Locations: WAIS Divide

Project Description:

WAIS Divide is a collaboration of about 40 separate but synergistic projects funded by NSF to collect deep ice cores from the West Antarctic Ice Sheet (WAIS).Work began with construction of a field camp in 2005-06 and the first cores were recovered in 2006-07. On December 31, 2011 drillers reached the final depth goal of 3,405 meters, and recovered the longest U.S. ice core to date from the polar regions.

This project represents the Science Coordination Office (SCO) for WAIS Divide, providing scientific and field oversight. An SCO representative and science technicians will deploy to the field camp. Other deploying projects this year are the drilling contractor, IDDO T-350, and Jeff Severinghaus I-476-M.

Field Season Overview:

Goals for WAIS Divide collaborative projects for the 2011-2012 season include: 1. Conduct the complete borehole logging program as proposed by Alley/Clow (I-168-M), Peters (I-161-M), Waddington (I-162-M), and Price/Bay (I-122-M). This includes the temperature, vertical seismic profile, sonic, and optical logging. 2. Deepen the main borehole until scientific returns are diminished and/or a maximum environmentally safe depth has been reached. 3. Conduct additional borehole logging as required to get measurements of the freshly deepened portion of the hole. 4. Start replicate

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coring. All ice drilled this season (estimated not to exceed 220 meters) will be shipped back to the National Ice Core Laboratory for further analysis.

Deploying Team Members:

- John Fegyveresi
- Logan Mitchell
- Don Voigt (Team Leader)
- Gifford Wong

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Project Details 2011-2012

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

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-119-M/S
NSF/PLR Award 1045356

ASC POC/Implementer:
Chad Naughton

Dr. Michael Taylor (Principal Investigator)
mike.taylor@usu.edu
http://ail.usu.edu/Data/Data.html

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

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: Arrival Heights, B2 Science Lab

Project Description:

The novel infrared Advanced Mesospheric Temperature Mapper (AMTM), operated at the South Pole Station over last few years, has advanced scientific exploration capabilities by enabling scientists to measure gravity waves in the high-latitude Antarctic Mesosphere and Lower Thermosphere (MLT, ~80-100 km altitude) region in a new spectral range that is not dominated by aurora, and with a much higher temporal resolution than was previously possible. This research will contribute to a greater understanding of the diversity and variability of gravity waves over the Antarctic continent and their associated momentum transport in the MLT region, and acquire new knowledge of the gravity waves most copious sources at the high-latitudes. These data will contribute significantly to the ANtarctic Gravity Wave Imaging Network (ANGWIN) program that brings together multi-instrument measurements from eight key sites around the Antarctic continent, including South Pole.

Field Season Overview:

Given the success of previous year measurements, researchers submitted a follow-on proposal to NSF/OPP in early 2011 for the continued operation of the AMTM at South Pole for the next three years to obtain climatology data on the affects of gravity waves and their impact on the upper atmosphere over Antarctica. Planned field operations this year will include one of the following scenarios: If continued operations of the AMTM at South Pole are authorized, researchers will, during the 2012 winter, install a specially made glass double dome that will be purged with dry nitrogen and sealed to act as a thermal barrier to prevent icing to further mitigate problems encountered with ice build up on the glass observing dome during the winter season 2010.

During January 2011 the research team installed heaters and fans inside the dome that were regularly purged with dry nitrogen to limit frosting during the winter season 2011. However the double dome is expected to completely solve this problem. The research team will also service the camera, optics, filter wheel and computer and update acquisition software during the 2011 austral summer deployment.

If continued operations are not further supported, one research team member will deploy to South Pole to dismantle the camera and optics in B2, pack it up and make it ready for shipment back to the USA. The decision to retrograde or continue operations and upgrade the system will be made after the new proposal is reviewed by November 2011.

Deploying Team Members:

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

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

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-119-M/S
NSF/PLR Award 1045356

ASC POC/Implementer:
John Rand

Dr. Michael Taylor (Principal Investigator)
mike.taylor@usu.edu
http://ail.usu.edu/Data/Data.html

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

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: Arrival Heights, B2 Science Lab

Project 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 plan to implement an ANtarctic Gravity Wave Imaging Network (ANGWIN) that will provide 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:
As part of this collaborative program, Researchers will install a new infrared (IR) all-sky imager at Arrival Heights, McMurdo Station. The IR camera is a

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commercially available robust device of the same type currently in use at South Pole Station. The facility at Arrival Heights is fully equipped to support these new measurements, and researchers anticipate a smooth installation and subsequent operations. Setup and testing at McMurdo Station will take about two to four days. Some technical support from support contractor personnel will be needed for mounting the camera and dome in the roof and setting up data transfers. The collected data will be made available on the research team's website along with existing South Pole data.

Deploying Team Members:

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

Project Details 2011-2012

NASA/McMurdo Ground Station (MG1)

Program Manager:
Mr. Pat Smith

Event Number: T-927-M
NASA/NSF Agreement

ASC POC/Implementer:
Julie Bonneau

Mr. Bruce Thoman (Principal Investigator)
bruce.e.thoman@nasa.gov
http://scp.gsfc.nasa.gov/gn/

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

Supporting Stations: McMurdo Station
Research Locations: On station

Project 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, both of NASA and of foreign entities (esp. where NASA has a hosted instrument on-board a foreign satellite). MG1 provides launch and early operations phase (LEOP) support for launches from Vandenberg AFB for satellite missions that require downrange telemetry support from McMurdo. MG1 also provides telemetry and command for satellite housekeeping and recovery from satellite operational emergencies. MG1 provides data recovery for the EUMETSAT MetOp polar weather satellite constellation, in collaboration with NOAA National Environmental Satellite and Data Information Service, which reduces by a factor of 2 the time latency for data ingest into U.S. and European weather forecasting models, improving forecasting accuracies.

Field Season Overview:
T-927-M will continue its ongoing support of collecting a variety of data from orbiting satellites and providing it to clients as needed.

Deploying Team Members:

- Mark Burns
- Susan Chang

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- Rex Cotten
- Clayton Ellis
- Raymond Funk
- William Kambarn
- Marco Midon
- Nickolas Sinkola (Co-PI)
- Robert Tye
- Edward Wendell

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

Program Manager:
Dr. Lisa Clough

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

ASC POC/Implementer:
Beth Watson

Dr. Diana Wall (Principal Investigator)
diana.wall@colostate.edu
http://wp.natsci.colostate.edu/walllab/

Colorado State University
Natural Resource Ecology Laboratory
Fort Collins, Colorado

Supporting Stations: McMurdo Station
Research Locations: McMurdo Dry Valleys, Lakes Fryxell, Hoare, and Bonney

Project Description:

In 1980, the National Science Foundation (NSF) funded the US Long Term Ecological Research (LTER) Network, a collaborative effort involving more than 1,800 scientists and students. The McMurdo LTER is one of 26 sites that investigates ecological processes over long temporal and broad spatial scales. 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. This six-year award cycle comprises seven collaborative projects: Andrew Fountain B-504, John Priscu B-505, Diane McKnight B-506, Diana Wall B-507, Jeb Barrett, B-508, Berry Lyons B-509, and Peter Doran B-511. This project is the “soils” component of the McMurdo LTER. Researchers maintain (through application of water and nutrients), monitor (soil moisture and temperature) and sample (soils) in their long-term experimental plots near Lakes Fryxell, Hoare and Bonney. 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.

Field Season Overview:

Biological activity in soil is at a peak in December and January. Therefore

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deployment during this period is essential to the continued success of this project.Research activities this field season will consist of brief trips, ranging from one day to one week, to the Dry Valleys for monitoring, maintenance, and sampling of long-term experiments, and sampling of soil to support developing work on the Nitrogen and Phosphorus cycles, turnover of organic matter, and moss-soil interactions in the field. Researchers will require field camp and helicopter support for activities 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 on selected soils.

Deploying Team Members:

- Byron Adams
- Kevin Geyer
- Michael Poage
- Eric Sokol
- Zachary Sylvain
- Martijn Vandegehuchte
- Ross Virginia (Team Leader)
- Diana Wall (PI)

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Project Details 2011-2012

Polar Experiment Network For Geospace Upper-Atmosphere Investigations: PENGUIn - A High-Latitude Window To Geospace Dynamics

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-112-M
NSF/PLR Award 0840158

ASC POC/Implementer:
Julie Bonneau

Dr. Allan T Weatherwax (Principal Investigator)
aweatherwax@siena.edu
http://antarcticgeospace.org

Siena College
Loudonville, New York

Supporting Stations: McMurdo Station
Research Locations: AGO1, AGO2, AGO3, AGO4, AGO5

Project Description:
The Polar Experiment Network for Geospace Upper-atmosphere Investigations (PENGUIn) project is a multi-university collaborative effort dedicated to better understanding the dynamics of Earth's high-latitude ionosphere and magnetosphere systems, including their interaction with the high-latitude thermosphere and mesosphere. A central part of the project is to understand the coupled response of the entire upper atmosphere and magnetosphere to space weather disturbances across all spatial and temporal scales.

Field Season Overview:
An essential component of the researchers' field season will be preparation of various field sites before the arrival of the engineering team. This will include runway groom and fuel caching at or close to several of the AGO sites. The three-person A-112-M team plans to visit all five AGO sites via various fixed-wing aircraft where routine maintenance on power system and science instruments will be conducted. Additional time may be needed at AGO4 to support continuing revival efforts that were begun last season, and the engineering team will attempt to raise the shelter at AGO1.

Deploying Team Members:

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Find information about current USAP projects using the principal investigator, event number station, and other indexes.

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- Bob Melville (Team Leader)
- Andrew Stillinger
- PolarTrek Teacher

Studies Of The Polar Ionosphere And Magnetosphere From Measurements In Antarctica

Program Manager:
Dr. Vladimir Papitashvili

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

ASC POC/Implementer:
Julie Bonneau

Dr. Allan T Weatherwax (Principal Investigator)
aweatherwax@siena.edu
http://www.antarcticgeospace.org

Siena College
Loudonville, New York

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: Arrival Heights, Atmospheric Research Observatory, B2 Science Lab

Project Description:
Since the advent of space flight, it has become increasingly important to understand the Earth's space environment. The Polar Regions, and especially Antarctica, play a crucial role in this research. The Antarctic is magnetically connected to vast regions of the magnetosphere and solar wind, and provides the only practical locations for Earth-based measurements at the highest magnetic latitudes. At lower magnetic latitudes, Antarctic observatories are essential for efforts to understand global processes occurring in conjugate ionospheres. This collaborative project will continue studies of the polar ionosphere and magnetosphere from South Pole and McMurdo Stations. Magnetometer observations, high frequency (HF) cosmic noise absorption measurements (riometry) and auroral luminosity measurements will form the basis of these investigations, and will include collaboration with other investigators using complementary data sets. Specifically, this project maintains and operates magnetometers at South Pole and McMurdo stations, as well as imaging and broadbeam riometers and 2-wavelength zenith photometers. Researchers also provide and operate the data acquisition systems at South Pole and McMurdo for the common recording of other geophysical data and the provision of these data to all investigators.

Field Season Overview:

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In this ongoing project, the magnetometer, riometer, and photometer systems at both McMurdo and South Pole Stations will continue to continuously collect data and storing it on a common data recording system at both research locations. In addition to the above data collection, the South Pole field season primary objectives this year include upgrading the Optical Imager in the B2 Science Lab. The researchers will be attaching a water-based cooling device to the instrument's camera, which will improve the camera's signal-to-noise ratio.

Station science technicians support these research efforts year around.

Deploying Team Members:

- Akira Kadokura
- Joseph Kujawski
- Tetsuro Motoba
- Allan Weatherwax (PI)

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Collaborative Research, IPY POLENET-Antarctica: Investigating Links Between Geodynamics And Ice Sheets

Program Manager:
Dr. Alexandra Isern

Event Number: G-079-M

ASC POC/Implementer:
Chad Naughton

Dr. Terry Wilson (Principal Investigator)
twilson@mps.ohio-state.edu
http://www.polenet.org

Ohio State University
Geological Sciences and Byrd Polar
Columbus, Ohio

Supporting Stations: McMurdo Station
Research Locations: McMurdo Station area, Transantarctic Mountains, and West Antarctica (Byrd, Pine Island Glacier, and Union Glacier camps)

Project Description:

The behavior of the polar ice sheets has immense societal impact because of its potential to affect sea level. This project observes Antarctica's glaciological and geological systems using an extensive GPS-Seismic network installed in West Antarctica. This cross-disciplinary group of researchers has almost completed installation of a backbone network of co-located, continuously-recording GPS and broadband seismic sensors with real-time data telemerty at sites across West Antarctica and the Transantarctic Mountains. Additional GPS and seismic stations have been deployed to improve station density and test key hypotheses about the history and dynamics of the West Antarctic Ice Sheet (WAIS) and the solid Earth beneath.

Field Season Overview:

During this project year five field season, researchers will complete the four GPS installations remaining, all in the broadly defined Pine Island Bay region. These systems will be deployed either from the Union Glacier or Byrd Field Camp. In addition, existing network sites will be visited for required maintenance and to obtain seismic data that is not yet transferred automatically via satellite. These sites will be reached from Byrd Camp, from

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South Pole Station-coordinated through Antarctica's Gamburtsev Province Project (AGAP), from Union Glacier Camp, and from McMurdo Station. Researchers will also retrieve nine seismic transect sites using either A) two separate southbound and northbound ground traverses or B) flights from Byrd Camp. The three northernmost seismic transect stations must be retrieved via Twin Otter or Basler aircraft from Byrd Camp because of possible crevassing along the Marie Byrd Land coast. Priorities for site visits are: 1A) New installations; 1B) Sites that are not fully operational, have not been visited in two years, and where upgrades were not fully completed last season, i.e., Union Glacier region; and 1C) Pull out of the seismic transect sites; and 2) Fully operational sites in the Transantarctic Mountains, Marie Byrd Land, Union Glacier, and Amundsen Embayment regions for minor maintenance and to acquire seismic data, if necessary. Similar to the 2009-2010 POLENET field season, absolute gravity measurements are planned at POLENET sites in collaboration with French and Danish scientists, who are partners in the international POLENET project. With support from the USAP and Antarctica New Zealand, a French-owned gravity meter will be used to make measurements at McMurdo Station, Scott Base, and Cape Roberts. The French-USGS team will travel to Mario Zuchelli Station to make measurements, supported by the USAP and the Italian and French Antarctic programs. This team may travel onward to Durmont D'urville Station for measurements or may return to McMurdo Station. In addition, measurements using gravity meters supplied by USGS and/or the Danish research team may make additional measurements at remote POLENET sites.

Deploying Team Members:

- Brian Bagley
- Rene Forsberg
- Larry Hothem
- Nicolas LeMoigne
- Andrew Lloyd
- William Magee
- Rob McBrearty
- Rob McBrearty
- Jeremy Miner
- Tim Parker
- J.R. Roberts
- Yves Rogister
- Patrick Shore
- Bob Smalley (Co-PI)
- James Stutz
- Guy Tytgat (Team Leader)
- Seth White
- Terry Wilson (PI)

- Lucas Zoet

Project Details 2011-2012

Thermospheric Neutral Wind Observation In The Antarctica Peninsula

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-132-P
NSF/PLR Award 0839119

ASC POC/Implementer:
Eric Pohlman

Dr. Qian Wu (Principal Investigator)
qwu@ucar.edu
http://fpi.hao.ucar.edu

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

Supporting Stations: Palmer Station
Research Locations: Palmer Station

Project Description:

This Palmer Station research project is a collaboration with Australian scientists who have Fabry-Perot interferometer (FPI) instruments at the Australian Mawson and Davis Stations to jointly analyze the neutral wind and temperature data to address the following issues: (1) Thermospheric neutral wind effect on the Weddell Sea Anomaly; (2) Lower thermosphere wind effect on shuttle plume drift; (3) Non-migrating tides in the mesosphere and lower thermosphere; and (4) Geomagnetic effect on the thermospheric wind.

Field Season Overview:

During the 2011-2012 field season two field team members will travel to Palmer Station to service the interferometer instrument.

Deploying Team Members:

- Qian Wu (PI)
- Qian Wu (PI)

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Project Details 2011-2012

South American Meridional B-Field Array (SAMBA): An American-Chilean Chain

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-357-M

ASC POC/Implementer:
John Rand

Dr. Eftyhia Zesta (Principal Investigator)
Eftyhia.Zesta@hanscom.af.mil
http://samba.atmos.ucla.edu

University of California Los Angeles
Los Angeles, California

Supporting Stations: McMurdo Station
Research Locations: McMurdo Station, WAIS Divide

Project Description:

Through remote sensing, the South American Meridional B-field Array (SAMBA) studies ultra-low frequency (ULF) waves and mass density in the inner magnetosphere during geomagnetically active periods. Science objectives for SAMBA are: 1. Determining the effect solar wind dynamic pressure enhancements have on the asymmetric ring current; 2. Determining field-line resonances (FLR); 3. Investigating constraints on models used to derive equatorial mass density from FLRs; 4. Monitoring inner magnetospheric mass density during storms, in conjunction with the Time History of Events and Macroscale Interactions during Substorms (THEMIS) satellite mission; and 5. Making auroral conjugate observations of substorms, also in conjunction with THEMIS.

Field Season Overview:

During the upcoming field season, researchers will spend three weeks to a month in Antarctica. The first week in McMurdo Station will be primarily for training and also for testing the system in the Crary Lab. The research team will then travel to WAIS Divide for about a week to install the repaired system at the magnetometer site (about 2 kilometers from the field camp).

Deploying Team Members:

- Channing Huntington

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- James Weygand

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Avallone, Linnea	O-324-M	Augmenting the Ross Island-area automatic weather station network to develop a tropospheric ozone climatology
Cassar, Nicolas	O-405-L	Physiological and ecosystem structure forcings on carbon fluxes in the Southern Ocean mixed layer
Chereskin, Teresa	O-313-N	Collaborative research: Dynamics and transport of the Antarctic Circumpolar Current in the Drake Passage
Chereskin, Teresa	O-317-L/N	Collaborative research: Southern Ocean current observations from the U.S. Antarctic research vessels
Holland, David	O-286-M	Collaborative Research: Application of distributed temperature sensors (DTS) for Antarctic ice shelves and cavities
Lazzara, Matt	O-283-M/S	Antarctic Automatic Weather Station (AWS) program
Rigor, Ignatius	O-238-E	Interaction of air, sea Ice and ocean around Antarctica
Sprintall, Janet	O-260-L	The Drake Passage high-density XBT/XCTD program
Sweeney, Colm	O-214-L	Collaborative research: Biogeochemical controls of the oxygen and carbon system in the Drake Passage

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Principal Investigator	Event No.	Project Title
Bentley, Charles	T-350-M	Ice Coring and Drilling Services (ICDS) support for WAIS Divide
Comberiate, Mike	T-966-M	TDRSS and NAILS
Johns, Bjorn	T-295-M	UNAVCO GPS survey support
Mercer, Jennifer	T-940-M	CRREL 09-10 activities
Morin, Paul	T-434-M/P	The Polar Geospatial Information Center: Joint support
Parker, Timothy	T-299-M	IRIS/PASSCAL seismic 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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Project Details 2011-2012

Collaborative Research: Physical Properties Of The WAIS Divide Deep Core

Program Manager:
Dr. Julie Palais

Event Number: I-168-M

ASC POC/Implementer:
Beth Watson

Dr. Richard Alley (Principal Investigator)
ralley@essc.psu.edu

Pennsylvania State University
Dept. of Geosciences & Earth System Science Center
University Park, Pennsylvania

Supporting Stations: McMurdo Station
Research Locations: WAIS Divide

Project Description:
As part of the West Antarctic Ice Sheet (WAIS) Divide deep ice-coring program, this project seeks to acquire a high-resolution climate record from WAIS that will be commensurate in scope to the record provided from the Greenland Ice Sheet Project 2 (GISP2) ice core. Researchers will catalog ice core visible stratigraphy, the depth evolution of ice grain size and orientation, bubble sizes, and the size distributions and characteristics of specific, verified event depths such as the onset of enclathratization and the climate transition from the end of the last glacial period into the Holocene.

Field Season Overview:
The focus of this field season will be the acquisition of temperature measurements in the 3.3-kilometer deep WAIS-Divide borehole using the U.S. Geological Survey (USGS) polar temperature logging system. The field team will also support other projects making geophysical measurements in the WAIS-Divide borehole. Those projects are: I-122-M, I-161-M, and I-162-M.

Deploying Team Members:

- Gary Clow (Team Leader)
- Frank Urban

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Project Details 2011-2012

Global Seismograph Station At South Pole And Palmer Station

Program Manager:
Dr. Mark Kurz

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

ASC POC/Implementer:
Chad Naughton

Mr. Kent Anderson (Principal Investigator)
kent@iris.edu

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

Supporting Stations: Palmer Station, South Pole Station
Research Locations: TerraLab Seismic Vault, Quiet Sector

Project Description:

Field Season Overview:
The research team plans to complete the Q330 upgrade this season by deploying to Palmer Station on the LMG12-02 Cruise. This will consist of replacing the existing digitizer/acquisition system, installing a secondary broadband sensor, an accelerometer, and microbarograph. Some of power equipment will be upgraded as well.

Deploying Team Members:

- Benjamin Marshall
- Mark Robertson

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Augmenting The Ross Island-Area Automatic Weather Station Network To Develop A Tropospheric Ozone Climatology

Program Manager:
Dr. Peter Milne

Event Number: O-324-M

ASC POC/Implementer:
John Rand

Dr. Linnea Avallone (Principal Investigator)
linnea.avallone@lasp.colorado.edu

University of Colorado Boulder
Laboratory for Atmospheric and Space Physics
Boulder, Colorado

Supporting Stations: McMurdo Station
Research Locations: McMurdo Station area AWS sites

Project Description:

The Antarctic troposphere has the least anthropogenically influenced surface air on Earth and presents a unique opportunity for the study of naturally occurring processes that control the chemical composition of our atmosphere. Of particular interest to the study of high latitude atmospheric chemistry is tropospheric ozone (O3), which exhibits predictable seasonal variations as well as poorly understood anomalies at polar sunrise. Using the existing Automatic Weather Stations (AWS) network in the McMurdo Ross Sea region, a number of photometric based ozone meters will be deployed, in order to establish a multi-season record of surface level ozone distributions in the McMurdo area. This in turn will allow a record of seasonal surface ozone variability in the Ross Sea region to be assembled.

Field Season Overview:

A group of three scientists will assemble and test six ozone instrument packages in Crary Lab (four for deployment and two spares), and deploy them to the following AWS locations: Cape Byrd, Marble Point, Minna Bluff, and Linda. In addition to the Ozone instruments, autonomous power systems will be assembled and tested in the Crary Lab, then broken down and deployed via helicopter to the AWS sites listed above. Some initial testing of the system may be carried out on the sea ice in the local vicinity of McMurdo Station. During the installation of the ozone instruments, voice

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communications will be required with a team member at McMurdo Station to ascertain correct function of the instruments and telemetry system. Once deployed, the instruments will collect data and relay it back to McMurdo Station via FreeWave radio modem.

Deploying Team Members:

- Patrick Brown
- Samuel Dorsi
- Lars Kalnajs (Co-PI)

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Project Details 2011-2012

Collaborative Research: Last Glacial Maximum And Deglaciation Chronology For The Foundation Ice Stream And Southeast Weddell Sea Embayment

Program Manager:
Dr. Julie Palais

Event Number: I-156-M

ASC POC/Implementer:
Adam Jenkins

Dr. Gregory Balco (Principal Investigator)
balcs@bgc.org

Berkeley, California

Supporting Stations: McMurdo Station
Research Locations: Rambo Nunataks, Thomas Hills

Project Description:
This project aims to reconstruct ice-surface elevation change between the last glacial maximum (about 15,000 years ago) and the present at the Foundation Ice Stream in the Pensacola Mountains. Researchers with this project will visit nunataks adjacent to the ice stream, mapping the glacial geology of these nunataks to find deposits that record past ice marginal positions, and then dating these ice marginal positions using cosmogenic-nuclide exposure dating. By dating ice-marginal deposits at different elevations, researchers can build up a picture of how the ice-surface elevation has changed over thousands to tens of thousands of years. The research team will also make glaciological observations on the Foundation Ice Stream, Academy Glacier, and smaller glaciers and icefields in the area in an effort to understand the present glacier dynamics. They will then use all this information in glaciological models to determine what past ice sheet configurations are most consistent with these observations.

Field Season Overview:
The geological fieldwork is straightforward and simply involves visiting as many nunataks in the field area as possible, making geological observations, and collecting small (1 kg) rock samples. The glaciological fieldwork will involve ice-penetrating radar traverses, installation and surveying of stakes and markers, digging snow pits, and collecting shallow snow and ice cores.

In the first field season (last year, 2010-11) we put in camp via LC-130 landing at Camp Neptune, which is east of the Foundation Ice Stream and north of the Academy Glacier. From this landing site, we used Ski-doos to establish two outlying camps at field areas called the Schmidt Hills and the Williams Hills. At these sites we collected geological samples, made ice-penetrating radar observations, and installed marker stakes in several glaciers to measure glacier flow and snow accumulation.

In the second field season (this season, 2011-12) we have three tasks. The primary task is to carry out similar geologic fieldwork at a third site, the Thomas Hills. The second is to return to the marker stake arrays we established in the previous season to resurvey their locations, measure snow accumulation over the past year, and recover the markers. The third is to visit several nunataks within the Rambo Nunataks, west of the Foundation Ice Stream, where we may be able to collect additional geologic samples.

Unlike the sites we visited in the first season, the Thomas Hills lie south of the heavily crevassed Academy Glacier, which cannot be crossed by Ski-doo without unacceptable hazard and/or time committment. Thus we cannot use Camp Neptune as the landing site again, but must land near the Thomas Hills instead. There is no established LC-130 landing site in the Thomas Hills, although it is possible that landings were made there during major mapping programs active in the area in the late 1960's. In addition, we require Twin Otter support to travel from our base in the Thomas Hills to reoccupy the marker stake arrays in the Schmidt and Williams Hills.

The region of the Foundation Ice Stream that lies between the Thomas Hills and the Rambo Nunataks was safely crossed by a BAS field party on Ski-doos in the 2009-10 field season. However, this crossing would involve some risk and would require much more time than justified by the probable extent of the geological sites in the Rambo Nunataks. Thus, we intend instead to use Twin Otter close support to make brief (i.e., hours) visits to these sites.

To summarize, our plan for the upcoming field season is as follows:

1. LC-130 put-in of the entire field party, camp, Ski-doos, and fuel at the Thomas Hills.

2. Approximately 30-35 day field season at the Thomas Hills, during which time we will most likely establish one or two temporary outlying camps by Ski-doo for most efficient access to the entire field area.

3. During this time, we will use Twin Otter support to reoccupy the survey sites at the Schmidt and Williams Hills, as well as to make the reconaissance visit to the Rambo Nunataks. Although there would be several ways to accomplish this, currently we think the most efficient use of Twin Otter time would be as follows. First, a Twin Otter moves half the field party (3 pax) as well as a camp, food, two Ski-doos, and fuel from the Thomas Hills to the Schmidt Hills (a distance of 100 km). This would require at least two trips. This group then carries out the measurements at the Schmidt Hills, moves camp by Ski-doo 60 km to the second site in the Williams Hills, and does the measurements in the Williams Hills. On a second day, the Twin Otter picks up the group, ski-doos, and equipment at the WIlliams Hills and returns them to the Thomas Hills (distance 60 km).

In addition, on one of these days, presumably on the second, pull-out, day where the camp move distance is less, the Twin Otter will also pick up the second half of the field party at the Thomas Hills and fly them across the Foundation Ice Stream to the Rambo Nunataks for reconnaissance. If any of the nunataks are of geological interest and can be landed at safely, this party will land there, spend approximately 2-4 hours ground time collecting samples, and then return to the Thomas Hills.

This plan requires two days of Twin Otter support. It will most likely require staging of Twin Otter fuel somewhere in the area, presumably at the Thomas Hills.

4. LC-130 pull-out of the entire field party, camp, Ski-doos, etc., from the Thomas Hills.

Deploying Team Members:

- Gregory Balco (PI)
- Seth Campbell
- Matthew Hegland
- Kathleen Huybers
- Christopher Simmons
- Claire Todd (Co-PI)

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International Cryospheric Exploration Through Collaborative Aerogeophysical Profiling/Operation Ice Bridge (OIB)

Shown is the ICECAP (Investigating the Cryospheric Evolution of the Central Antarctic Plate) aerogeophysical survey aircraft just after takeoff from Rothera Research Station in West Antarctica. One of two underwing ice-penetrating radar antennas can be seen under the left wing and the magnetometer boom can be seen on the rear of the aircraft. Other instruments within the airplane include a gravimeter, two laser altimeters, and several GPS receivers. Photo by Jens Emil Nielsen

Program Manager:
Dr. Alexandra Isern

Event Number: G-098-M

ASC POC/Implementer:
Leslie Blank

Dr. Donald Blankenship (Principal Investigator)
blank@ig.utexas.edu

University of Texas Austin
Institute for Geophysics
Austin, Texas

Supporting Stations: McMurdo Station
Research Locations: McMurdo Station, Siple Dome, Casey and Davis Stations

Project Description:
Data on changes in ice sheet surface elevation is a critical component of an extended time series dataset which will help resolve questions about the social impact of global warming. The collection of this data has been interrupted with the 2009 failure of the Ice, Cloud, and land Elevation Satellite (ICESat) and the replacement satellite will not be ready for launch until 2015. In the interim, NASA has initiated Operation Ice Bridge (OIB) to collect

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surface elevation data in critical regions using NASA's DC-8 long-range aircraft. Departing from the tip of South America (Punta Arenas, Chile), the DC-8's range is limited to coastal regions of West Antarctica. Using McMurdo-based logistics and resources this project will collect collect up to seven hours (covering 2,000 kilometers) of high resolution, multi-instrumented data per flight in the East Antarctica interior. This aerial capability eliminates the need for deep field support, greatly reducing both transit costs and logistical burdens.

Field Season Overview:

The core of this season's field operations consists of 28 aerogeophysical survey flights by the Kenn Borek Air (KBA) Basler BT-67 aircraft. As in the 2010-2011 season, the KBA Basler will operate the following active emitters: VHF ice-penetrating radar; HF ice-penetrating radar; and a scanning lidar. The period of flight operations is early November through late December, with operations conducted successively at McMurdo Station, the Australian Casey and Davis Stations, and Siple Dome Camp. Flight numbers by operating base are: McMurdo Station: 15 flights; Casey and Davis Stations: 10 flights; Siple Dome: three flights.

Deploying Team Members:

- Donald Blankenship (PI)
- Jamin Greenbaum
- Gregory Ng
- Thomas Richter
- Duncan Young (Team Leader)

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Project Details 2011-2012

Collaborative Research: Polyphase Orogenesis And Crustal Differentiation In West Antarctica

Program Manager:
Dr. Alexandra Isern

Event Number: G-097-M

ASC POC/Implementer:
Leslie Blank

Dr. Michael Brown (Principal Investigator)
mbrown@geol.umd.edu

University of Maryland
College Park, Maryland

Supporting Stations: McMurdo Station
Research Locations: Fosdick Mountains, Siple Dome

Project Description:

Recent research in the Fosdick Mountains in west Antarctica shows that it is an exceptional place to study the process of crustal differentiation and the linkage from partial melting of existing rock (migmatization) to granite formation. This process promoted growth and stabilization of new continental crust upon the Gondwana margin. This research project examines the migmatite source rocks, granite melt products, and the vein networks that acted as conduits to move granite melt. Researchers will sample the rocks in a detailed and comprehensive fashion to acquire materials for study to investigate details of high-temperature metamorphism, melt mobilization and coalescence that led to crustal differentiation during the two major cycles in the Devonian–Carboniferous and Jurassic–Cretaceous periods. Researchers will use the samples for major, trace, and isotope chemistry; precise metamorphic petrology and microstructural analysis; and geochronology. The results will advance understanding of the chemical differentiation process of the Earth's crust, as a part of the physical evolution of the planet, specifically regarding melt production and movement mechanisms critical to understanding the physical behavior of the melt-bearing horizons associated with active mountain belts and orogenic plateaus.

Field Season Overview:

After a difficult season in 2010-2011, the research team is hoping to complete all science objectives this upcoming field season. To achieve these goals, the researchers are altering their original field plan by extending the

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field team's deployment and increasing its size, implementing a personnel change midway through the season, adding a second mountaineer for the entire field season, and conducting self-supported over-glacier traverses with snowmobiles and sleds in order to reduce the reliance on air support and maximize opportunities for self-supported field work given the variable weather conditions of the region. The project's ground-based field work involves detailed mapping and sampling, augmented by a few days of Twin Otter aircraft close support. After caching fuel at the study site by Basler aircraft during the early summer season, a party of five will put-in via either Basler or LC-130 aircraft to the Fosdick Mountains at the start of November. An estimate of three Basler flights will be required to put in the required gear and personnel. The team will then be self sufficient and work from tent camps in the area for one month. Samples will be retrograded by Twin Otter when a personnel exchange takes place at the start of December, and the new party of five will continue operations in the Fosdick Mountains for four more weeks until the entire team pulls out to Siple Dome in late December. The group will have five days of Twin Otter close support from Siple Dome to sample other sites in the region before returning to McMurdo Station in early January. Laboratory studies on the samples will include geochemistry and isotopic work at the researchers' home institutions following the Antarctic field season.

Deploying Team Members:

- Michael Brown (PI)
- Timothy Burton
- Timothy Ivanic
- Fawna Korhonen (Co-PI)
- Christine Siddoway (Co-PI)
- Daniel Uhlmann
- Chris Yakymchuk

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Project Details 2011-2012

The Cellular Stress Response In Cold-Adapted Organisms: Building Novel Mechanistic Links Between Heat Stress, Cell Cycle Arrest And Apoptosis In Antarctic Fishes.

Several species of fish caught in the near-freezing waters of McMurdo Sound, Antarctica. Photo by Brad Buckley, PI for B-308-M

Program Manager:
Dr. Diana Nemergut

Event Number: B-308-M

ASC POC/Implementer:
Eric Pohlman

Dr. Bradley Buckley (Principal Investigator)
bbuckley@pdx.edu

Portland State University
Department of Biology
Portland, Oregon

Supporting Stations: McMurdo Station
Research Locations: Sea ice at Cape Evans, Inaccessible Island, McMurdo Sound

Project Description:

The primary goals of this project concern the biology of the cold-adapted fishes of Antarctica, specifically those that inhabit the waters of McMurdo Sound. The specific research objectives are to determine the impact that elevated (but not lethal) temperatures have on the cellular biology and physiology of common McMurdo Sound fish species. The goal is to determine the impact that rising seawater temperatures may have on the ecology of these important and environmentally sensitive species.

Field Season Overview:

This research group will deploy to McMurdo Station during Mainbody in October 2011, with the preferred target date being as early as possible. Since the field work associated with this project depends upon extensive work and travel on the sea ice, early-season deployment will offer the best sea-ice conditions for the research team's planned work. Early in the season, they will be placing fish huts on the sea ice for use in collecting common local fish species by hook and line through holes that will be drilled through

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the ice. Primary collection sites are the McMurdo Jetty, Cape Evans, and the north side of Inaccessible Island. Fish will be collected, brought back to McMurdo Station, and maintained in running seawater tanks until used in experiments. For specific experiments, the researchers will transfer individual fish into smaller heat exposure tanks which will be ramped up to elevated but sub-lethal temperatures. Following these exposures, fish will be euthanized according to the approved Animal Care Protocols from the principal investigator's home institution. Tissue samples will be taken, including both protein and nucleic acids (RNA and DNA). Lab work will be ongoing during the field season, with a two- or three-person field team out fishing while one or two people remain in the lab to conduct various analyses. By early to mid-December, fishing operations will stop and the fish huts removed from the sea ice. Lab operations will then be shut down and samples prepared for shipment home. The researchers plan to redeploy in mid- to late December when sea ice conditions begin to deteriorate.

Deploying Team Members:

- Allison Barden
- Bradley Buckley (PI)
- Daniel Hassumani
- Isaac Sleadd

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Project Details 2011-2012

Population Ecology Of Salpa Thompsoni Based On Molecular Indicators

Program Manager:
Dr. Peter Milne (acting)

Event Number: B-285-L

ASC POC/Implementer:
John Evans

Dr. Ann Bucklin (Principal Investigator)
ann.bucklin@uconn.edu

University of Connecticut
Groton, Connecticut

Supporting Stations: ARSV Laurence M. Gould
Research Locations: Western Antarctic Peninsula

Project Description:
The overall objectives of this effort are to examine genome-wide patterns of gene expression, target gene expression levels, and patterns of population genetic diversity and structure of the Antarctic salp, Salpa thompsoni, in relation to biological and physical environmental parameters in the Western Antarctic Peninsula region. Researchers hypothesize that: 1. Deep analysis of the Salpa thompsoni transcriptome will reveal significant associations among selected set of differentially-expressed genes and critical life-history stages and events, e.g., ontogenetic maturation, sexual reproduction, and senescence of the salp; and 2. The species will show variable levels of clonal diversity and significant genetic differentiation among salp populations in different regions of the Southern Ocean.

Field Season Overview:
This field season, a research team will deploy on the ARSV Laurence M. Gould in November 2011from Punta Arenas, Chile. Field collecting will be carried out in the Western Antarctic Peninsula (WAP) region; collections will be made from continental shelf and deeper ocean waters between 0 and 2,000 meters in depth. Sampling will take place at selected stations within the Palmer Long-Term Ecological Research (LTER) grid. High-frequency acoustics data will be collected while transiting between stations to provide information about the distribution of salps, krill, and other zooplankton. The hull-mounted Simrad system will be used for normal cruising speeds to gather qualitative data. A Hydroacoustic Technology, Inc. (HTI) sonar

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system will be used at slower ship speeds to obtain quantitative data on animal distributions. Work on station will include collections using the one-meter MOCNESS to characterize the planktonic assemblage and a Reeve net to collect live material for molecular and biochemical analysis. Environmental parameters to be measured by the MOCNESS include standard hydrographic variables (temperature, salinity, depth), as well as fluorescence and turbidity. Water samples will be collected using a Conductivity-Temperature-Depth (CTD) rosette to determine chlorophyll concentration.

Deploying Team Members:

- Paola Batta Lona
- Leocadio Blanco-Bercial
- Ann Bucklin (PI)
- Peter Wiebe (Co-PI)

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Project Details 2011-2012

Collaborative Research: Polar Experiment Network For Geospace Upper-Atmosphere Investigations: Interhemispheric Investigations Along The 40-Degree Magnetic Meridian

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-106-M/S

ASC POC/Implementer:
Leslie Blank

Dr. C. Robert Clauer (Principal Investigator)
rclauer@vt.edu

Virginia Tech
Hampton, Virginia

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: (McMurdo Station, South Pole Station, two field camp sites

Project Description:

The solar wind-magnetosphere-ionosphere system and the space weather it controls is a complex and dynamic environment that affect critical infrastructure such as satellite communications and power grids. To forecast, and thus adapt to, the effects of weather events researchers must develop accurate geomagnetic models of the Sun-Earth environment. The northern hemisphere is relatively well instrumented, however the southern hemisphere is not. Over the course of four years, this project will establish a chain of Autonomous Adaptive Low-Power Instrument Platforms (AAL-PIP) along the 40-degree magnetic meridian to obtain measurements conjugate to the west coast of Greenland for the investigation of interhemispheric electrodynamic coupling.

Field Season Overview:

During the upcoming field season, deploying team members will repack the two Autonomous Adaptive Low-Power Instrument Platforms (AAL-PIP) installed at South Pole for testing purposes. A sub-set of the field team will then deploy these tested units by Twin Otter to remote locations on the Antarctic Plateau as part of the 40-degree magnetic meridian chain. To improve flight planning efficiency, the remote locations for these installations in the chain will be selected to take advantage of other USAP field activity in

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the area.

The researchers will also deploy two new AAL-PIP platforms at the same South Pole Station sites that were used for testing the previous stations. Although each platform is expected to operate autonomously, testing them at this location allows South Pole technicians to provide inspections and reports regarding the physical condition of the instrumentation before these platforms are redeployed to their more-remote field installation sites along the magnetic meridian the following year.

Deploying Team Members:

- Gary Bust
- C. Clauer (PI)
- Hyomin Kim (Team Leader)
- Joseph Macon
- Majid Manteghi
- Robert McPherron

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Collaborative Imaging, Estimation, And Analysis Of Density Distributions In The Conjugate Polar Ionospheres

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-101-M

ASC POC/Implementer:
Julie Bonneau

Dr. C. Robert Clauer (Principal Investigator)
rclauer@vt.edu

Virginia Tech
Hampton, Virginia

Supporting Stations: McMurdo Station
Research Locations: AGO1, AGO2, AGO3, and AGO5

Project Description:
This project will add dual-frequency GPS receiver instrumentation to the currently active Automatic Geophysical Observatory (AGO) sites near the South Pole. Increasing the GPS receiver total electron content (TEC) measurement spatial density in Antarctica will improve imaging of electron density in three dimensions, and in time, and will allow for improved polar wind estimation. Conjugate comparisons will then be made between the southern and northern polar regions.

Field Season Overview:
Two researchers deploying for A-101-M will be assisting the A-106-S field team with deployment of instruments at South Pole. The GPS Total Electron Count measurements will be obtained by personnel from the A-112-M project.

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Project Details 2011-2012

TDRSS And NAILS

Program Manager:
Mr. Pat Smith

Event Number: T-966-M

ASC POC/Implementer:
Julie Bonneau

Mr. Mike Comberiate (Principal Investigator)
michael.a.comberiate@nasa.gov

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

Supporting Stations: McMurdo Station
Research Locations: On station

Project Description:
Black Island hosts an uplink station to the Tracking and Data Relay Satellite System (TDRSS). TDRSS is a communication signal relay system that provides tracking and data acquisition services between low-earth orbiting spacecraft and the stateside control and data processing facilities of NASA and NOAA. The orange-and-white radome at T-Site above McMurdo hosts the NASA Antarctic Interactive Launch Support (NAILS) two-meter satellite tracking station. This technical project maintains and upgrades these systems.

Field Season Overview:
This field season the T-966-M project team will perform routine maintenance to the NAILS system.

Deploying Team Members:

- Mike Comberiate (PI)
- Greg Heckler
- Kurt Rush
- Randy Westlund

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Project Details 2011-2012

Collaborative Research: Weddell Seals As Autonomous Sensors Of The Winter Oceanography Of The Ross Sea

Program Manager:
Dr. Diana Nemergut

Event Number: B-232-M

ASC POC/Implementer:
Leslie Blank

Dr. Daniel Costa (Principal Investigator)
costa@biology.ucsc.edu

University of California Santa Cruz
Long Marine Lab
Santa Cruz, California

Supporting Stations: McMurdo Station
Research Locations: Sea Ice in McMurdo Sound, Terra Nova Bay

Project Description:
Recent advances in satellite-linked data logging have made it possible to correlate foraging behavior with environmental variables. These technological advances also enable marine mammals to be used as cost-effective platforms from which to collect detailed oceanographic data on a scale not possible with conventional methods. This project will address two complementary themes: (1) The winter foraging behavior and habitat utilization of the Weddell seal, and (2) the use of oceanographic data collected by the seals to better understand the dynamics of the upper water column of Ross Sea. Using these technologies over two years, researchers will measure animal physiological condition in the austral spring and fall. They can then correlate diving patterns with aerobic capacity and patterns of mass and body condition change.

Field Season Overview:
The group will deploy a field team to McMurdo Station in late October to recover instruments deployed in January 2011 and to measure the physiological status of seals in the austral spring for comparative purposes. They will deploy a second field team in late January 2012 to deploy Conductivity-Temperature-Depth Satellite Relay Data Loggers (CTD-SRDLs) tags on molted adult Weddell seals. During both deployments, seal capture and tagging locations will vary based on ice conditions and seal locations. As in previous seasons, the researchers will attempt to tag seals in January-

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February in a variety of locations including the ice shelf near Scott Base, in Erebus Bay, along the Victoria Land Coast, in Granite Harbor, and northwards along the coast to Tripp Bay. Based on their experience over the past two seasons, the group anticipates the earliest date they will be able to deploy tags will be the last week of January due to the timing of the molt. Helicopter support as late as possible will be required to complete this tasking. In order to better characterize certain sites as either seal colonies or haulout areas, the research group has also requested to make three reconnaissance flights over these areas that see heavy use by seals.

Deploying Team Members:

- Christopher Burns
- Jennifer Burns (Co-PI)
- Daniel Costa (PI)
- Alice Eilers
- Kim Goetz
- Luis Huckstadt
- Linnea Pearson
- Patrick Robinson
- Michelle Shero
- Drew Wharton

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Photoheterotrophic Microbes In The West Antarctic Peninsula Marine Ecosystem

Program Manager:
Dr. Peter Milne (acting)

Event Number: B-026-P

ASC POC/Implementer:
Eric Pohlman

Dr. Matthew Cottrell (Principal Investigator)
mattcott@udel.edu

University of Delaware
College of Marine Studies
Lewes, Delaware

Supporting Stations: Palmer Station
Research Locations: On station

Project Description:

This research project seeks to examine the relationship of microbes to light (summer) and dark (winter) conditions in the coastal waters of the western Antarctic Peninsula. The work will target microbes that have the ability to use organic substrates and to harvest light energy for growth. Researchers will determine if these photoheterotrophic microbes are present and active both in winter and in summer and will compare the abundance and diversity of photoheterotrophs in the winter and summer. The metabolic activity of photoheterotrophs will be assessed to determine if they are more active in assimilating organic compounds in the light or in the dark. Finally, researchers will determine if these microbes maintain their photoheterotrophic metabolism and are immediately able to respond to light during the winter.

Field Season Overview:

In this second and final year of this project, the research team will be conducting two sampling trips to Palmer Station, one in the summer season and another during the winter season. For the winter sampling, researchers will conduct seawater sampling and collect four 20-liter containers of seawater for study back at the station. For the summer sampling, researchers will need boat support to sample seawater from the coastal zone in the same region sampled during the winter. They will also be collecting four 20-liter containers of seawater. In the lab, researchers will perform

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seawater filtration. They will also conduct experiments using beta emitting radioisotopes, a circulating water bath for temperature control, and an artificial light source to simulate sunlight. Space (approx. 8 cu. ft each) for sample storage at 4, -20 and -80 degrees C will be necessary.

Deploying Team Members:

- Matthew Cottrell (PI)
- Mrinalini Nikrad

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Project Details 2011-2012

High Resolution Genomic And Proteomic Analyses Of A Microbial Transport Mechanism From Antarctic Marine Waters To Permanent Snowpack

Program Manager:
Dr. Peter Milne (acting)

Event Number: B-395-M

ASC POC/Implementer:
Beth Watson

Dr. Jody Deming (Principal Investigator)
jdeming@u.washington.edu

University of Washington
School of Oceanography
Seattle, Washington

Supporting Stations: McMurdo Station
Research Locations: McMurdo Station Sea Ice, Taylor Glacier

Project Description:

Participants will collect large volumes of seawater, first year sea ice, young sea ice, and frost flowers from an area offshore of McMurdo Station. Additionally, participants will collect pristine snow from a site between McMurdo and Taylor Glacier, and firn and glacial ice from the surface of Taylor Glacier. At McMurdo Station, frozen samples will be melted and filtered for later molecular analysis, with the goal of illustrating a transport path for bacteria and biogenic material from the sea ice surface to the glacial ice surface.

Field Season Overview:

Due to the cold temperatures needed for frost flower formation, participants will sample in the area around McMurdo before moving on to Taylor Glacier. Young ice around such floes, disconnected from the pressure associated with shorefast ice, is the best place to find the quantities of frost flowers needed. Alternate locations include open leads within shorefast ice, and flooded portions of shorefast ice. The researchers will sample the young ice and seawater at the same time as frost flowers. First year ice will be sampled from an appropriate location nearby or from within the shorefast ice. Pristine snow will be sampled from a location between McMurdo Station and Taylor Glacier. Firn, snow, and blue ice will be sampled from the surface of Taylor Glacier.

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Deploying Team Members:

- Jeff Bowman
- Shelly Carpenter

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Sensitivity Of The Antarctic Ice Sheet To Global Climate Change Over The Last Two Glacial/Interglacial Cycles

Program Manager:
Dr. Julie Palais

Event Number: I-196-M

ASC POC/Implementer:
Eric Pohlman

Dr. Brenda Hall (Principal Investigator)
brendah@maine.edu

The University of Maine
Inst for Quat./Climate Stud. and Dept of Geol Sci
Orono, Maine

Supporting Stations: McMurdo Station
Research Locations: Brown Pen, Heald Island, Garwood, Hidden, Marshall, Miers Valleys, The Bulwark, Walcott Glacier

Project Description:
The research team's goal is to document the glacial history of the valleys fronting the Royal Society Range and, by doing so, constrain the history of the Ross Sea ice sheets over the last two glacial/interglacial cycles. This knowledge is key for assessing the relationship between the Antarctic ice sheets and global climate and sea-level changes. To reach this goal, researchers will produce a detailed chronology from radiocarbon and uranium-thorium dating of the last two advances of Ross Sea ice lobes into valleys adjacent to the Royal Society Range.

Field Season Overview:
Researchers on this project will be operating out of a small, independent tent camp in the Royal Society Range and carry out most work on foot. They will also take day trips (morning drop off, evening pick up) by helicopter to locations too far to walk to from camp.

Deploying Team Members:

- Brenda Hall (PI)
- Chris Hendy
- Margaret Jackson

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- Toby Koffman

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Collaborative Research: Application Of Distributed Temperature Sensors (DTS) For Antarctic Ice Shelves And Cavities

Program Manager:
Dr. Peter Milne

Event Number: O-286-M

ASC POC/Implementer:
Chad Naughton

Dr. David Holland (Principal Investigator)
dmh4@nyu.edu

Department of Earth Sciences
New York, New York

Supporting Stations: McMurdo Station
Research Locations: Windless Bight

Project Description:

This project will test the feasibility of using distributed temperature sensors (DTS) to monitor water temperature beneath the ice shelf in West Antarctica. A fiber optic cable, which will measure the temperature at 1-meter intervals, will be depoloyed downhole through a 40-millimeter hole drilled by the new hot point drill. The cable will hang from the surface of the ice into the ocean cavity below, reaching the seafloor. This system is expected to be lightweight and field-portable, making it logistically feasible to deploy at remote research sites to provide high-accuracy long-term observations of warmer water temperatures beneath ice shelves.

Field Season Overview:

A research team of four will deploy in early November and depart about one month later. They will travel to Windless Bight with a Tucker Sno-Cat and sleds, drill a small hole through the ice shelf using their custom hot water drill, and deploy a fiber-optic cable down the hole and freeze it in.

Deploying Team Members:

- David Holland (PI)
- Alon Stern
- Scott Tyler (Co-PI)

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- Victor Zagorodnov (Co-PI)

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Distinguishing Biotic And Abiotic Nitrous Oxide Sources In Mars Analog Brines, Sediments And Soils In The McMurdo Dry Valleys, Antarctica.

Program Manager:
Dr. Peter Milne (acting)

Event Number: B-332-M

ASC POC/Implementer:
Beth Watson

Dr. Samantha Joye (Principal Investigator)
mjoye@uga.edu

University of Georgia
Marine Sciences
Athens, Georgia

Supporting Stations: McMurdo Station
Research Locations: Cape Bird, Garwood, Taylor, and Wright Valleys, Crary Lab

Project Description:
The project will examine nitrous oxide dynamics in Antarctic environments through the collection and examination of soil and water/brine samples. The goal of the work is to conduct a systematic study of nitrous oxide emissions in contrasting habitats to determine: 1. Whether nitrous oxide is produced by way of biologically-mediated or abiotic processes; 2. To determine the mechanism(s) of abiotic nitrous oxide production and characterize how this nitrous oxide differs isotopically from biologically produced gas; and 3. To quantify landscape fluxes of N2O to the atmosphere. The experimental techniques developed during this field season will develop a means to distinguish biotic from abiotic nitrous oxide that can be applied to other habitats on Earth as well as habitats on Mars.

Field Season Overview:
This field season, most team members will travel in day-trip deployments to five field sites to collect samples and to perform short-term in-situ experiments. These include Don Juan Pond (Wright Valley); Labyrinth (Don Juan Pond); Cape Bird penguin colony; Lake Colleen (Garwood Valley); Lake Bonney (Taylor Valley); Lake Vanda (Wright Valley). Work at Crary Lab will involve processing samples, establishing short-term laboratory incubations to parallel and complement field experiments, and culturing of

bacteria at low temperatures.

Deploying Team Members:

- Michael Madigan
- Brian Peters
- Vladimir Samarkin (Co-PI)
- Charles Schutte

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Collaborative Research: Functional Genomics And Physiological Ecology Of Seasonal Succession In Antarctic Phytoplankton: Adaptations To Light And Temperature

Micrograph of Antarctic phytoplankton. Photo by Deneb Karentz.

Program Manager:
Dr. Peter Milne (acting)

Event Number: B-466-P

ASC POC/Implementer:
Eric Pohlman

Dr. Deneb Karentz (Principal Investigator)
karentzd@usfca.edu

University of San Francisco
Department of Biology
San Francisco, California

Supporting Stations: Palmer Station
Research Locations: Arthur Harbor

Project Description:
The focus of this project will be to identify and evaluate changes that occur in genomic expression and physiology of phytoplankton during the transition from winter to spring, i.e., cellular responses to increasing light and temperature. Natural populations of phytoplankton species will be collected during a seasonal time series to assess how environmental gradients of light and temperature influence the species diversity, abundance, and photosynthetic potential of the phytoplankton community.

Field Season Overview:
The research team will deploy in early August to late Nov 2011 at Palmer Station. This time frame will allow the researchers to start the study with winter phytoplankton collections and follow the progression of the early bloom into late spring. The research team plans to collect water samples from the seawater intake system and from areas around Arthur Harbor by Zodiac boat. Laboratory activities will include preparing samples of the phytoplankton, executing experiments on photosynthesis, routine analyses of nutrient and pigment concentrations, and microscopic enumeration of plankton species. Some of this work will be done in collaboration with the

Palmer Long-Term Ecological Research project (LTER).

Deploying Team Members:

- Austin Gajewski
- Bethany Goodrich
- Joe Grzymski (Co-PI)
- Deneb Karentz (PI)
- Iva Neveux

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Project Details 2011-2012

Rapid Landscape Change In Garwood Valley: Monitoring Buried Glacier Melt And Exploring “Péwé’s Lost Lake”

Buried ice deposits from the last glacial maximum are catastrophically melting in Garwood Valley, McMurdo Dry Valleys. The collapse of these ice deposits is a signpost for the rapid landscape change that may occur across the Antarctic Dry Valleys as ground ice warms and becomes unstable. The ice in Garwood Valley (exposed above the talus piles) was deposited during the last glacial maximum as Ross Sea ice filled the valley. It was then buried by sediments from the paleo-Garwood river (top of the outcrop). The modern Garwood river (bottom of the outcrop) is speeding the melting of this unusual permafrost feature. Photo by Joseph Levy

Program Manager:
Dr. Mark Kurz

Event Number: G-080-M
NSF/PLR Award 1212307

ASC POC/Implementer:
John Rand

Dr. Joseph Levy (Principal Investigator)
joe.levy@utexas.edu

University of Texas Austin
Corvallis, Oregon

Supporting Stations: McMurdo Station
Research Locations: Garwood Valley

Project Description:
This field work has three objectives: (1) Buried Ice Inventory: Comprehensively map and sample the buried ice record present in Garwood Valley in three spatial dimensions, distinguishing buried glacier ice from

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interbedded river ice; (2) Buried Ice Loss: Quantify the current rate of buried ice removal where ice is exposed, being eroded by the Garwood River, or being removed through thermokarst formation; and (3) Paleo-Landscape Change: Map the sedimentary sequence overlying the buried ice, and extract datable material for environmental change-rate calculations. The work entails extensive mapping and sampling activities throughout the valley and neighboring coastal sites. An autonomous meteorological station will be deployed and maintained throughout the duration of the project, including over the winter.

Field Season Overview:

A four-person team will deploy to Garwood Valley during January 2012 to establish a tent camp for about one month. The camp will serve as a base for installing station instruments, collecting soil samples and shallow ice cores, conducting surface mapping, and conducting day trips via helicopter to proximal coastal sites to map paleo-ice flow paths based on geological evidence. In addition, an autonomous meteorological station will be deployed and maintained throughout the duration of the project, including over winter.

Deploying Team Members:

- James Dickson
- Joseph Levy (PI)
- Joseph Levy (PI)
- Rickard Pettersson

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Project Details 2011-2012

Collaborative Research: Activation Of High-Elevation Alluvial Fans In The Transantarctic Mountains – A Proxy For Plio-Pleistocene Warmth Along East Antarctic Ice Margins

Program Manager:
Dr. Alexandra Isern

Event Number: G-074-M

ASC POC/Implementer:
Beth Watson

Dr. Adam Lewis (Principal Investigator)
adam.r.lewis.1@ndsu.edu

North Dakota State University
Department of Geosciences
Fargo, North Dakota

Supporting Stations: McMurdo Station
Research Locations: Olympus Range, Pivot Peak

Project Description:
The western Olympus Range is an east-west oriented mountain chain in the west-central Dry Valleys, dividing upper Wright Valley and McKelvey Valley. Our previous work in the range focused on well-preserved sequences of tills and fossil-rich proglacial lake sediments, which together register a marked climatic cooling in the region 14 million years ago. After this climate cooling, the absence of melt water greatly slowed rates of erosion and deposition in the western Olympus Range, leaving most landscape surfaces preserved over million-year timescales. However, on north-facing slopes in the range, a few small debris-flow channels and alluvial fans rest just below snowbanks and niche glaciers. Their presence indicates that surface melting of ice and snow does take place periodically at high elevation. Researchers plan to date individual beds in these small-scale sedimentary archives as a proxy for melt water production under warmer-than-present climate conditions. They will also use optically stimulated luminescence dating of sandy beds and exposure-age dating of gravels and buried surface clasts to build a chronology. Finally, the researchers will tie their results to other climate records and to climate models in an effort to understand what brings about these periods of climatic warmth.

Field Season Overview:

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A four-person field team will deploy to the western Olympus Range in mid-November, with a fifth person added in early December. The camp site rests at the mouth of a north-facing valley just to the west on Bull Pass. The research team will work near their campsite, using a jackhammer to excavate pits into frozen soils. Helicopter flights will be used to make several day trips in the range to map and sample moraines on south-facing slopes. Additionally, researchers plan one research trip to Beacon Valley and one to Pivot Peak.

Deploying Team Members:

- Adam Lewis (PI)
- Marcie Occhi
- Ashley Steffen
- Jane Willenbring (Co-PI)
- Felix Zamora

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Polar Adaptations In The Antarctic Polychaete Capitella Perarmata

Program Manager:
Dr. Peter Milne (acting)

Event Number: B-383-M

ASC POC/Implementer:
Eric Pohlman

Dr. Adam Marsh (Principal Investigator)
amarsh@udel.edu

University of Delaware
College of Marine Studies
Lewes, Delaware

Supporting Stations: McMurdo Station
Research Locations: McMurdo Sound

Project Description:

The goal of this research project is to identify patterns of cold-adaptation in gene expression levels in the Antarctic polychaete, Capitella perarmata by conducting the following operations: 1. Collect polychaetes from under the sea ice near McMurdo Station; 2. Establish cultures of these worms in the Crary Lab aquarium room; 3. Conduct temperature experiments on these worms; and 4. Collect RNA and DNA for later analysis back at the researchers' home institution.

Field Season Overview:

This season's work will consist of SCUBA collections of worms around McMurdo Station. SCUBA activity will depend on the success of the in-lab cultures that will be established. Crary Lab work will consist mainly of the extraction and isolation of nucleic acids and preparation for shipment back to the principal investigator's lab in Delaware.

Deploying Team Members:

- Stephanie Guida
- Stacy Kim
- Michael League
- Adam Marsh (PI)

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- Annamarie Pasqualone

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Project Details 2011-2012

The Effects Of Ocean Acidification And Rising Sea Surface Temperatures On Shallow-Water Benthic Organisms In Antarctica

Program Manager:
Dr. Diana Nemergut

Event Number: B-027-P

ASC POC/Implementer:
Eric Pohlman

Dr. James McClintock (Principal Investigator)
mcclinto@uab.edu

University of Alabama Birmingham
Department of Biology
Birmingham, Alabama

Supporting Stations: Palmer Station
Research Locations: On station

Project Description:

The benthic flora and fauna of the shallow nearshore waters of the Antarctic Peninsula are uniquely vulnerable to the impacts of climate change. The Southern Ocean is predicted to become undersaturated in terms of both aragonite and calcite within 50 and 100 years, respectively, challenging calcification processes. Moreover, antarctic peninsular marine benthic organisms are essentially stenothermal, yet are being subjected to rising seawater temperatures. Adding to the problem, antarctic calcified benthic marine organisms are more vulnerable to ocean acidification than temperate and tropical species because they are generally weakly calcified. In a recent study researchers found that post-mortem thalli of antarctic benthic crustose algae and shells of macroinvertebrates are highly susceptible to rapid dissolution under the predicted regime of ocean acidification. The present study will extend this important analysis to living benthic macroalgae and invertebrates. It will provide an evaluation of the individual and combined effects of rising ocean acidification and sea surface temperatures on shallow-water calcified benthic organisms in western Antarctic Peninsula (WAP) marine communities.

Field Season Overview:

The research team will be on station about three months each of their two seasons. In each year, two team members who are divers will be deployed the entire season. At the beginning of each season, one of the principal investigators (PI) will deploy for the first month to help set up. In both seasons, the co-PI and a lab technician will also deploy at the beginning of the season. Each would be on site for a month to six weeks in year one and about two months in year two. After the co-PI and lab technician redeploy each year, limited diving will continue about once every week to collect algae to feed experiment animals. Because of this low diving frequency, the research project will rely on station staff for dive tending help. In both years, researchers will also be conducting microcosm experiments at two temperatures and three pH levels.

Deploying Team Members:

- Charles Amsler (Co-PI)
- Margaret Amsler
- Nell Herrmann
- James McClintock (PI)
- Kathryn Schoenrock
- Julie Schram

Project Details 2011-2012

Impact Of Mesoscale Processes On Iron Supply And Phytoplankton Dynamics In The Ross Sea

Logo for the PRISM project. Artist: Kathleen Donaldson, Virginia Institute of Marine Science.

Program Manager:
Dr. Peter Milne (acting)

Event Number: B-318-N

ASC POC/Implementer:
Adam Jenkins

Dr. Dennis McGillicuddy (Principal Investigator)
dmcgillicuddy@whoi.edu

Woods Hole Oceanographic Institution
AOP&E
Woods Hole, Massachusetts

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

Project Description:

Available evidence points to four major sources of iron to surface waters of the Ross Sea during the Austral summer: Circumpolar deep water (CDW) from the shelf edge, shallow bank sediments and nearshore sediments along the western periphery of the basin, melting sea ice, and glacial ice-shelf meltwater. The Processes Regulating Iron Supply at the Mesoscale (PRISM) cruise is organized around assessing these sources, with particular emphasis on the role of mesoscale processes in transporting iron from these sources to surface waters of the Ross Sea polynya during austral summer: H1: Iron is supplied via episodic intrusions of Circumpolar Deep Water (CDW) at specific sites along the shelf break; H2: Iron is supplied by sediment on banks and in nearshore areas; H3: Iron is supplied to the surface waters of the Ross Sea via melting of sea ice on the polynya perimeter; H4: Iron is supplied to the Ross Sea through glacial ice-shelf meltwater.

Field Season Overview:

The research team's sampling plan will need to be flexible to allow for the ship to avoid ice during underway sampling operations with the trace metal towfish and moving vessel profiler to avoid damage to those instruments; secondly, the sampling strategy must be intrinsically adaptive, focused on

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maximizing the research team's ability to discern the proposed sources of iron. They will approach this task via two distinct objectives: 1. regional-scale high-resolution transects to characterize the hypothesized iron sources; and 2. mini-process studies to examine selected mesoscale features in detail. Key areas to be sampled during this cruise include: The channel between Mawson and Pennell Banks, which simulations suggest is a pathway for CDW flow onto the shelf (H1); this area is also likely to contain sea ice (H3). Iron-rich waters along the western periphery of the basin (H2, H3). A north-south transect across Pennell and Ross Banks to assess sedimentary iron sources (H2). The above transect will terminate at the Ross Ice Shelf, allowing iron sampling in both ISW and surface glacial meltwater along the ice shelf (H4). An east-west transect along 76º 30’ S, providing an additional crossing of Ross Bank. This zonal transect has been occupied repeatedly in the past with lower resolution, and previous data will provide valuable context for interpreting the high-resolution survey.

Deploying Team Members:

- Pamela Barrett
- Jennifer Bennett
- Thomas Bibby
- Sean Charles
- Liza DeLizo
- Hai Nhu Doan
- Kathleen Donaldson
- Joshua Eaton
- Blair Greenan
- Robert Hagg
- Stephanie Hatchcock
- Klinck John
- Randy King
- Olga Kosnyrev
- Valery Kosnyrev
- Robert Laird
- Christopher Marsay
- Dennis McGillicuddy (PI)
- Anna Mosby
- Elise Olson
- Marco Pedulli
- Diego Rodriguez
- Thomas Ryan-Keogh
- Peter Sedwick (Co-PI)
- Walker Smith (Co-PI)

- Bettina Sohst
- Pierre St-Laurent
- Candace Wall

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Project Details 2011-2012

Collaborative Research: Thermoregulation In Free-Living Antarctic Seals: The Missing Link In Effective Ecological Modeling

A Weddell seal female receives a health check and a variety of telemetry equipment that will allow researchers to track her diving effort, heart rate and heat loss. NMFS permit #1034-1854. Photo by team B-041.

Program Manager:
Dr. Diana Nemergut

Event Number: B-470-M

ASC POC/Implementer:
John Rand

Dr. Jo-Ann Mellish (Principal Investigator)
b470.mellish@gmail.com

University of Alaska Fairbanks
School of Fisheries and Ocean Sciences
Seward, Alaska

Supporting Stations: McMurdo Station
Research Locations: McMurdo Station Sea Ice

Project Description:
Thermoregulation is an important physiological component of life in polar regions, yet little is known about the energetic requirements for thermoregulation in either air or water for polar species. The Weddell seal of the Ross Sea provides a unique model to investigate typical costs and the limits of thermoregulation for polar phocids due to the wide range of sizes and body condition available from pups to adults. These research objectives are based on the varied demographics of seals in the Erebus Bay population (size and body condition), and the ability to track and recapture these seals, and collect data recorded from free-ranging animals. This is a valuable model system with results that may be adapted to other polar species. Data of this quality simply cannot be collected elsewhere in either polar region. Researchers will deploy and recover telemetry instruments on 40 Weddell seals in Erebus Bay. The instruments will record heat flux and temperature, foraging behavior, and swim speed of free-ranging seals. Each telemetered animal will be evaluated for overall health (by analysis of a blood sample and

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infrared thermography), body size, density, quantity of insulation (blubber depth measurements through imaging ultrasound) and quality of insulation (fat content of a blubber biopsy).

Field Season Overview:

This project will take place during two summer (October-December) field seasons in and around McMurdo Station, at sea ice locations mainly in the vicinity of the Delbridge Islands and the Erebus Glacier Tongue. Field efforts will be based out of the Crary Laboratory with a fish hut on the sea ice for gear staging, shelter, and operations requiring close support, e.g., processing biological samples. A field team of six will perform day trip field activities, including an initial deployment of two team members to McMurdo Station to prepare the field equipment and laboratory space prior to full team deployment. After final sampling, two team members will remain at McMurdo Station to facilitate sample shipment, field gear and laboratory cleanup. The sampling design involves a capture and sedation of Weddell seals for health assessments and placement of telemetry gear and data recorders. Telemetered seals will have VHF and ARGOS (satellite) transmitters attached for relocation and instrument recovery. The research team will also be scouting the Delbridge Islands and surrounding areas frequently, while based from McMurdo Station, using snowmobiles and a larger tracked vehicle (Pisten Bully or Mattracks).

Deploying Team Members:

- Roger Hill
- Allyson Hindle (Co-PI)
- Markus Horning (Co-PI)
- Jo-Ann Mellish (PI)
- Mee-ya Monnin
- John Skinner

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CRREL 09-10 Activities

Program Manager:
Mr. George Blaisdell

Event Number: T-940-M
NSF Agreement

ASC POC/Implementer:
John Rand

Dr. Jennifer Mercer (Principal Investigator)
Jennifer.L.Mercer@usace.army.mil

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

Supporting Stations: McMurdo Station
Research Locations: McMurdo Station sea ice, WAIS Divide, South Pole, South Pole Traverse

Project Description:
There are several objectives expected for the T-940 activities during the 2013-14 Antarctic Field Season. We expect to be advised which projects will be funded in mid to late-August. The potential projects include engineering and basic research in support of the following: South Pole Traverse (SPoT); Support to McMurdo Airfields Improvements (SMAI); Under-Ice Exploration of SBT (SBT); South Pole Station Operations (SPSO); Sea-Ice Thickness Survey (SITS); Snow Road GPR Robotic Survey (GPR); Albedo Surveys on Pegasus Runway Using a Robot (ASPRR); Development of Fleet Management Plan (DFMP); Drainage Solutions Implementation (DSI); South Pole Utility Tunnel Maintenance (SPUTM); and McMurdo Master Planning - Drainage Study (MCMMP-DS)

More specific objectives for these projects are:

South Pole Traverse (SPoT): CRREL POC: James Lever 1) Assess route safety in areas where crevasses may be present by GPR and physical characterization. 2) Continued tests of a prototype cargo sled 3) Continued tests for sled performance and mobility improvements. 4) Experiments for Autonomous Guided Traverse Vehicles.

Support to McM Airfield CRREL POC: Chris Hiemstra & TJ Melendy 1) Ice/snow core surveys betweeen Pegasus and Mile Post 7 on Pegasus road

Fleet Management CRREL POC: TJ Melendy 1) Heavy equipment analysis

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South Pole Station Operations (SPSO): CRREL POC: Lynette Barna 1) Work with NSF's Dick Armstrong and CRREL contractor John Rand on specified South Pole operations issues.

Field Season Overview:

Deployments: Seven team members, early season for SPoT, SAC and SR&T, including subsurface radar surveys; four team members, mid-season for SR&T & SPSO evaluation, and continued work for SAC; and six team members, late-season for continued SAC & SRT evaluation and SPoT Robotics. Project team members will need trucks, tracked vehicles, and snowmobiles to complete required tasking. Additionally, surveying support will also be used for various tasks (minimal time expected).

Deploying Team Members:

- Russ Alger
- Lynette Barna
- Allan Delaney
- Dominic Jonak
- Margaret Knuth (Co-PI)
- Terry Melendy, Jr.
- John Rand
- Sally Shoop (Co-PI)
- James Teza
- David Wettergreen

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Project Details 2011-2012

Resistivity Mapping Of Subsurface Microbial Habitats In The McMurdo Region

Aerial photo of Blood Falls, a subglacial outflow at the snout of the Taylor Glacier, McMurdo Dry Valleys, Antarctica. Photo by Jill Mikucki.

Program Manager:
Dr. Alexandra Isern

Event Number: G-298-M

ASC POC/Implementer:
Beth Watson

Dr. Jill Mikucki (Principal Investigator)
jmikucki@utk.edu

University of Tennessee
Microbiology
Knoxville, Tennessee

Supporting Stations: McMurdo Station
Research Locations: Taylor Glacier, Marble Point, Hut Point

Project Description:
This project aims to map subsurface resistivity using the Time Domain Electromagnetic (TEM) method, which offers a non-invasive and efficient way to determine the subsurface distribution of water salinity, hydrogeologic connectivity, buried geomorphic surfaces, including buried ice and permafrost extent. A newly developed transient electromagnetic system is ideal for use in Antarctica for distinguishing between high-resistivity (glacier ice and bedrock, permafrost) and low-resistivity materials (geologic materials that are clay-rich and/or saturated by salty water) to a depth of 300 meters. The SkyTEM system can be mounted under a helicopter for an extensive geophysical survey to generate three-dimensional maps of subsurface resistivity structure over inaccessible terrain. Despite the high potential for TEM to address important science questions in geobiology and the earth sciences, Heli-borne TEM to date has not been deployed in the polar regions. Thus, researchers propose this as a proof-of-concept for the applicability of the TEM method in Antarctic subglacial and subsurface environments. Prioritized targets include: 1. Taylor Glacier and the Bonney Basin, 2. Hut Point and Peninsula/Cape Barne marine intrusions, and 3. Marble Point/Fryxell Basin - into the Wright Valley. These targets represent a

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range of Antarctic environments and provide data on the validity of this method to the broader scientific community.

Field Season Overview:

The McM SkyTEM project will map subsurface resistivity using the Time Domain Electromagnetic (TEM) method to determine subsurface distribution of water salinity, hydrogeologic connectivity, buried geomorphic surfaces, including buried ice and permafrost extent. The instrument is sling mounted on a helicopter, with monitoring instruments located inside the aircraft.

The project will deploy seven participants to McMurdo during the 2011-2012 summer season. One participant will be a SkyTEM experienced pilot who will assist in the training of helicopter personnel. The instrument and framework will be constructed on the sea ice in front of McMurdo Station and later staged at the survey sites by helicopter. The three survey sites are Taylor Glacier/Bonney Basin, Marble Point/Fryxell Basin and Hut Point/Cape Barne. The participants will move with the instrument and stay in established camps at Lake Bonney and Lake Fryxell. Biological samples-of-opportunity will be taken to ground truth the TEM findings and address questions of geomicrobiology in relation to parameters elucidated by the SkyTEM, including water distribution and salinity. Two members of the field team will be involved in geomicrobiological sampling and remain beyond the survey portion of the field campaign to collect and process samples.

Deploying Team Members:

- Esben Auken
- Lars Jensen
- Jan Jørgensen
- Walter Koopmann
- Jill Mikucki (PI)
- Kurt Sørensen
- Lindsay Wahl

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Project Details 2011-2012

Analysis Of The Data From The Gattini Antarctic Camera Network

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-356-S
NSF/PLR Award 0839136

ASC POC/Implementer:
Julie Bonneau

Dr. Anna Moore (Principal Investigator)
amoore@astro.caltech.edu

California Institute of Technology
Astronomy
Pasadena, California

Supporting Stations: South Pole Station
Research Locations: Dark Sector

Project Description:
The Gattini network consists of three cameras located at the high-altitude Antarctic sites Dome C, Dome A, and South Pole. These star transit cameras monitor wide areas of the southern sky, taking an image every five to 15 minutes throughout the entire Antarctic winter season. The network has been in operation since the 2006 austral winter season, collecting data sets totalling in excess of three Terabytes. The project's data reduction and analysis effort will focus on two distinct areas: (1) Obtaining photometric light curves of the brightest and most interesting long-period variable stars in the southern sky, which have known parallaxes and other parameters and are unique stars with no counterparts in the Kepler spacecraft field; and (2) Producing astronomical site testing results that are critical for validating high-altitude Antarctic sites to allow planning of future large astronomical facilities.

Field Season Overview:
The Gattini-SP instrument was installed successfully in January 2011 and has been operational since February 2011 under remote access. If necessary, one team member will deploy to South Pole in January 2012 to perform repairs on the instrument.

Deploying Team Members:

- Alexandre Delacroix

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Project Details 2011-2012

Cosmic Ray Electron Synchrotron Telescope (CREST)

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-148-M

ASC POC/Implementer:
Addie Coyac

Undefined Jim Musser (Principal Investigator)
jmusser@indiana.edu

tbd, Indiana

Supporting Stations: McMurdo Station
Research Locations: Williams Field

Project Description:

The CREST (Cosmic Ray Electron Synchrotron Telescope) is a balloon-borne instrument designed to measure the flux of ultra-high-energy electrons from nearby cosmic ray sources, using a technique based on the observation of synchrotron radiation generated by these electrons as they pass through the Earth's magnetic field. This technique provides the CREST instrument with unprecedented sensitivity and the potential for extending cosmic ray electron flux measurements beyond the expected high-energy spectral cut off. The shape of the electron spectrum at these energies is sensitive to the number, age, and local environment of nearby cosmic ray sources.

Field Season Overview:

The operational support necessary for the CREST project includes allocation of about 500 square feet in one of the Columbia Scientific Balloon Facility (CSBF) payload buildings and daily transportation to and from Williams Field and on an as-needed basis. Following a successful balloon flight, complete recovery of the ballooncraft is highly desirable. If the recovery window becomes short, researchers will identify priority components for partial recovery.

Deploying Team Members:

- Jon Ameel
- Thomas Bishay
- Stephane Coutu (Co-PI)

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- Mark Gebhard
- Joseph Gennaro
- Matt Geske
- Michael Lang
- Jim Musser (PI)
- Scott Nutter (Co-PI)
- Na Park
- Michael Schubnell
- Greg Tarle (Co-PI)
- Scott Wakely (Co-PI)

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Project Details 2011-2012

Collaborative Study Of The Antarctic Mesosphere And Lower Thermosphere

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-284-S

ASC POC/Implementer:
Julie Bonneau

Dr. Scott Palo (Principal Investigator)
scott.palo@colorado.edu

University of Colorado Boulder
Department of Aerospace Engineering Sciences
Boulder, Colorado

Supporting Stations: South Pole Station
Research Locations: Meteor Radar Building

Project Description:
Using a meteor radar (a very-high frequency VHF system capable of measuring the spatial structure and temporal evolution of the horizontal wind field), researchers will measure winds in the mesosphere and lower thermosphere (MLT) atmospheric region to understand the processes controlling the neutral dynamics and chemistry of the Antarctic MLT. They specifically seek to understand: 1. The space-time decomposition of wave motions; 2. Delineation of the spatial climatology over Antarctica with emphasis on the structure of the polar vortex; 3. Dynamical response to energetic events; and 4. Inter-annual variability.

Field Season Overview:
The research team will complete the following tasks during the 2011-2012 season: 1. Annual all-sky camera maintenance 2. Annual meteor radar system maintenance 3. Annual meteor radar system calibration 4. Transmit and receive antenna experiments

Deploying Team Members:

- Frederico Estante
- Scott Palo (PI)
- Cody Vaudrin

Project Details 2011-2012

The Physiological Ecology Of Two Antarctic Icons: Emperor Penguins And Leopard Seals

Program Manager:
Dr. Diana Nemergut

Event Number: B-197-M

ASC POC/Implementer:
Addie Coyac

Dr. Paul Ponganis (Principal Investigator)
pponganis@ucsd.edu

Scripps Institution of Oceanography
CMBB (Center for Marine Biotechnology and Biomedicine)
La Jolla, California

Supporting Stations: McMurdo Station
Research Locations: Beaufort Island, Capes Crozier and Washington

Project Description:

Emperor penguins and leopard seals are iconic, top predators in Antarctica. Their environment now faces the potential threats of climate change, pollution, and overfishing. The physiological ecology of these two species is key to the assessment of their adaptability to environmental change and alterations in prey distribution. Because of the difficulty of studying these animals, many details of their natural history and roles in the Antarctic ecosystem are as yet undocumented. Even less is known about the physiological adaptations that underlie their foraging success and diving behavior at sea. This project will expand knowledge of emperor penguin diving physiology to foraging dives at sea, and to initiate investigation of the foraging behavior/prey intake rate of the rarely studied leopard seal. The work will continue the trend analysis of the Ross Sea emperor penguin population that was begun by Dr. Gerald Kooyman in the 1980's and continued by this PI through 2008. Such long-term monitoring is needed and is of exceptional value in light of the potential linkage of declines in other emperor penguin populations to climate change.

Field Season Overview:

During the 2011-2012 field season, a field camp will be set up at the Cape Washington emperor penguin colony. Camp put-in will be in late October to early November. SCUBA diving will be conducted at Cape Washington. The camp pull out will be in late December. In addition to the Cape Washington

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camp, aerial censuses of all the emperor penguin colonies will be conducted via Twin Otter or DC-3 aircraft. These locations include Beaufort Island, Franklin Island, Cape Washington, Coulman Island, Cape Roget, and Cape Colbeck. The colonies at Cape Crozier and Beaufort Island (sea-ice permitting) will also be visited for censusing. These visits will occur earlier in October prior to the camp put-in at Cape Washington. In addition, a new complementary component has been added to the upcoming field season activities. The new proposal involves the export of 10 emperor penguin chicks from Cape Washington for eventual research in San Diego. This will require an extra Twin Otter flight to Cape Washington for transport of the chicks in early December. As in the past, chicks will be transported in large rubber garbage cans. The Twin Otter flight will be coordinated with the landing of a C-17 aircraft at McMurdo Station so that the chicks and the project principal investigator (PI) can be transferred directly to the C-17 for transport back to Christchurch, New Zealand. For off-continent transport, the chicks will be transferred to five refrigeration units provided by SeaWorld of San Diego. At least one SeaWorld employee will travel on the C-17 to oversee the operation of the units and to accompany the chicks, with the PI, back to Christchurch. In Christchurch, the chicks in the refrigeration units will be transferred directly to an awaiting SeaWorld plane for transport back to the United States.

Deploying Team Members:

- Lauren DuBois
- Linda Henry
- Greg Marshall (Team Leader)
- Birgitte McDonald
- Paul Ponganis (PI)
- Phil Thorson
- Michael Tift

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Climatology, Meteorology, And Microbial Metabolism With Dust Loggers And Fluorimetry

Program Manager:
Dr. Julie Palais

Event Number: I-122-M

ASC POC/Implementer:
Beth Watson

Dr. Buford Price (Principal Investigator)
bprice@uclink4.berkeley.edu

University of California Berkeley
Physics Department
Berkeley, California

Supporting Stations: McMurdo Station
Research Locations: WAIS Divide

Project Description:

In 2011-12, researchers will log the WAIS Divide borehole using a laser-optical logger. The log will provide millimeter-scale depth resolution of dust concentration and volcanic ash layers down the entire depth of the three-kilometer borehole. This will rapidly provide the WAIS project with information about the age versus depth of the core, locations for replicate coring, and whether or not the stratigraphic record has been disturbed.

Field Season Overview:

The University of California, Berkeley optical logging tool will attach to the USGS logging winch. As this project will be interspersed with the other borehole logging operations, the I-122-M participants will be at WAIS Divide for several weeks to complete the work.

Deploying Team Members:

- Ryan Bay (Co-PI)
- Michael Solarz

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Interaction Of Air, Sea Ice And Ocean Around Antarctica

Program Manager:
Dr. Peter Milne

Event Number: O-238-E

ASC POC/Implementer:
Patricia Jackson

Dr. Ignatius G Rigor (Principal Investigator)
ignatius@apl.washington.edu

University of Washington
Seattle, Washington

Supporting Stations: Special Project
Research Locations: Ross and Amundsen Seas

Project Description:

The potential collapse of the Western Antarctic Ice Sheet (WAIS) poses one of the greatest threats of climate change. There is some debate and uncertainty as to how the winds and temperature over the surrounding sea ice may affect the future of the WAIS. This three-year project will address this debate by deploying a network of drifting buoys that collect data on surface air pressure (SAP) and surface air temperature (SAT). These basic variables are monitored elsewhere on the globe by weather stations, moored buoys along the coast, and drifting buoys in most of the world’s oceans. However, the Southern Ocean and the sea ice around Antarctica is one of the least sampled areas. Project researchers will deploy a network of drifting buoys on sea ice in the Amundsen and Ross seas which measure SAP, SAT, sea ice motion, and ocean temperatures down to 200 meters. The data will be contributed to the World Climate Research Programme (WCRP), Scientific Committee on Antarctic Research (SCAR), International Programme for Antarctic Buoys (IPAB), and the Antarctic Meteorological Research Center (AMRC), where the data may be obtained for operational weather forecasting for the USAP.

Field Season Overview:

Non-retrievable buoys will be provided by the project for opportunistic deployment from vessels in the Ross and Amundsen Seas. This is science-of-opportunity and no personnel deployments are required.

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Collaborative Research: Annual Satellite Era Accumulation Patterns Over WAIS Divide: A Study Using Shallow Ice Cores, Near-Surface Radar And Satellites

Program Manager:
Dr. Julie Palais

Event Number: I-158-M

ASC POC/Implementer:
John Rand

Dr. Summer Rupper (Principal Investigator)
summer_rupper@byu.edu

Brigham Young University
Provo, Utah

Supporting Stations: McMurdo Station
Research Locations: WAIS Divide

Project Description:
The main research objective of this project is to characterize annual to near-annual accumulation patterns and trends across the West Antarctic Ice Sheet (WAIS) Divide over the past 50 years using shallow ice cores, near-surface radar and satellite data. Researchers will ask the following questions: 1. Does stratigraphy information collected by UHF radars correspond to annual cycles as determined by visual, chemical, and isotopic analysis from shallow ice cores or can the high-resolution UHF radars image additional sub-annual layers that need to be considered when converting layers into annual accumulation rates? 2. Do annual to near-annual accumulation rates derived from the existing and proposed near-surface radars and shallow ice cores correlate with temporal variations in the passive microwave time series? 3. Have accumulation rates or patterns changed over the past 50 years with the warming temperatures over Antarctica? 4. Do modeled precipitation fields over WAIS Divide mimic the proposed accumulation measurements?

Field Season Overview:
In this second year of this project, researchers will deploy to the Byrd camp and conduct an approximately 500-kilometer radar traverse using four snowmobiles and six sleds. This traverse should take about four weeks plus put in and take out time in McMurdo Station, and eight to 10, 15-meter ice

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cores will be collected. Fuel and ice-core boxes will need to be cached before the traverse and recovered after the traverse to speed the science traverse.

Deploying Team Members:

- Ludovic Brucker
- Lora Koenig (Co-PI)
- Michelle Koutnik
- Clement Miege (Team Leader)
- Malcolm Skinner
- Jessica Williams

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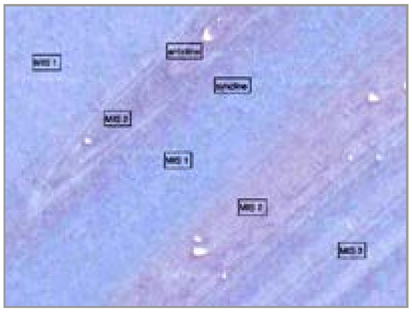
Project Details 2011-2012

Collaborative Research: A "Horizontal Ice Core" For Large-Volume Samples Of The Past Atmosphere



Program Manager:
Dr. Julie Palais

Event Number: I-169-M

ASC POC/Implementer:
John Rand

Dr. Jeffrey Severinghaus (Principal Investigator)
jseveringhaus@ucsd.edu

Scripps Institution of Oceanography
Geosciences Research Division
La Jolla, California

Supporting Stations: McMurdo Station
Research Locations: Taylor Glacier

Project Description:

This research project aims to develop a precise chronology of the exposed ice in the 20-kilometer Taylor Glacier ablation zone. Prior research has shown that this ablation zone contains a unique, stratigraphically-ordered sequence of ice at the surface, dating from approximately 80,000 to 70,000 years ago. Project team members will obtain a horizontal ice core that will provide easily-accessed, large-volume samples of the past atmosphere and microparticles that are not currently available from other ice cores.

Field Season Overview:

This project's third and final field season will be about six weeks long, similar to previous deployment timeframes. Researchers will put in to their field camp at Taylor Glacier via Helicopter support, which will also be used for several sampling trips throughout the field season. However, the primary mode of transportation while on the glacier will be overland via snowmobile. Aspects of the project that are new this season include the development of a custom ice core drill by Ice Design and Drilling Operations (IDDO) to take a 10-inch-diameter shallow core down to 12 meters depth. This will greatly expedite the recovery of the large-volume ice samples, which, during the teams's similar research project in Greenland, were collected using electric chainsaws and excavation of three-meter-deep trenches. Researchers have worked with Ice Core and Drilling Services (ICDS) to plan this drilling operation, and ICDS will be sending an engineer to the field to assist the

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research team with operating the drill. As in past seasons, the research team will also bring 2,500 pounds of propane gas extraction and analysis equipment to the field to be used to melt large volumes of ice to extract the gases on site.

Deploying Team Members:

- Daniel Baggenstos
- Thomas Bauska
- Christo Buizert
- Xavier Fain
- Logan Mitchell
- Vasilii Petrenko (Team Leader)
- Paul Rose
- Hinrich Schaefer

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Project Details 2011-2012

Collaborative Research: Byrd Glacier Flow Dynamics

Mountaineer Peter Braddock and University of Maine graduate student Kristin Schild installing a GPS unit on the surface of Byrd Glacier, East Antarctica (Nov., 2010). These units are designed to collect data throughout the year, to determine annual and seasonal flow speed variations on Byrd. We deployed similar units over two subglacial lakes in the catchment, along with 23 summer-only units along the trunk of Byrd Glacier. We will deploy a similar network of GPS units in 2011/12. Photo by Leigh Stearns.

Program Manager:
Dr. Julie Palais

Event Number: I-351-M

ASC POC/Implementer:
Leslie Blank

Dr. Leigh Stearns (Principal Investigator)
stearns@ku.edu

University of Kansas Lawrence
Department of Geology
Lawrence, Kansas

Supporting Stations: McMurdo Station
Research Locations: Byrd Glacier

Project Description:
The overall aim of this project is to improve our understanding of outlet glacier dynamics in East Antarctica through an in-depth field study of Byrd Glacier. Project researchers will test several hypotheses: (1) Byrd Glacier experiences variability in flow speed at a variety of timescales (daily to seasonal to annual) as a response to tidal and hydrological forcings; (2) the configuration of Byrd Glacier's grounding line makes it susceptible to rapid retreat up the fjord; and (3) subglacial lakes in the catchment fill and drain on a regular basis and provide periodic forcing of a glacier flow response. This multi-disciplinary project will install a dense network of GPS receivers on the

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grounded glacier and floating ice shelf. The GPS observations will be merged with remote sensing datasets to examine spatial and temporal variability in glacier flow, and constrain a numerical model of the glacier's dynamics. This work will provide new insights into the basal boundary conditions of "isbrae"-type outlet glaciers, and the e ffect of transient perturbations (e.g., ocean tides, subglacial floods) on their flow regime.

Field Season Overview:

The project will again deploy a network of GPS receivers along the trunk of Byrd Glacier in November. Summer-only measurements will be collected by the full array of 31 receivers and year-round measurements will be collected by a subset of 8 receivers. During the team's first deployment this season, in mid-November, they will establish the full network and revisit and service the eight sites that were operating over the austral winter. A second visit in early-February 2012 will be used to recover most of the network and to service the receivers that will again continue to collect data over the 2012 austral winter period. Because Byrd Glacier is an intensely-crevassed fast-flowing outlet glacier with speeds of 500-850 meters per year, the only practical way to access the glacier surface is with close helicopter support. Therefore, the GPS network deployment will be accomplished as helicopter-supported day-trips from McMurdo Station. The researchers expect to deploy approximately 10 receivers per day on average, based on their experience during their previous Antarctic field season. In addition to their project work, the I-351-M field team will also deploy 10-15 passive seismic receivers supplied by CReSIS (I-188-M) at several of their summer-only GPS sites.

Deploying Team Members:

- Peter Braddock
- Brandon Gillette
- Gordon Hamilton (Co-PI)
- Michael Roberts
- Leigh Stearns (PI)
- Nora Weitz

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Project Details 2011-2012

Collaborative Research: Constraints On The Last Ross Sea Ice Sheet From Glacial Deposits In The Southern Transantarctic Mountains

Program Manager:
Dr. Julie Palais

Event Number: I-414-M

ASC POC/Implementer:
Chad Naughton

Dr. John Stone (Principal Investigator)
stone@ess.washington.edu

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

Supporting Stations: McMurdo Station
Research Locations: Gemini and Taylor Nunataks, Mounts Franke, Heekin, and Speed

Project Description:
This project’s goal is to determine the thickness and retreat history of Shackleton and Beardmore Glaciers during and since the last glaciation of the southern Ross Sea. Researchers will map and date lateral moraine deposits along the lower reaches of these glaciers, determining the age of the last glaciation and the thickness of ice where it flowed into the Ross Sea. The researchers will date erratics and recessional moraines below the level of the last glaciation to establish the timing of ice thinning. Coherence between the record from these glaciers in the southern Ross Sea, and behavior at the grounding line far to the north, will show whether the ice sheet was lightly grounded in the Ross Sea and able to transmit longitudinal stresses over long distances upstream. By extending the age transects down to the floating ice at the mouth of each glacier, scientists will date the migration of the grounding line into the southern Ross Sea. These dates will allow researchers to distinguish between ice-retreat models, which have implications for past ice configuration and dynamics, and constrain the contribution of Ross Sea deglaciation to sea levels over the last 10,000 years.

Field Season Overview:
This year's field season, from mid-November to mid-December, is scheduled

to avoid summer fog over the ice shelf, and researchers will be working from three tent camps on lower and middle Shackleton Glacier. Camps are planned at Nilsen Peak/Waldron Spur, Mounts Franke and Wasko, and Mount Heekin. Based on a reconnaissance flight during the previous austral summer season, researchers expect to be able to cover a lot of territory around each camp on foot and using snow machines. Glacier travel is expected to be much easier than on Beardmore, Scott, or Reedy Glaciers where the researchers have worked previously. When working from a single camp (most of the season) four team members will work on mapping and sample collection for exposure dating, while two will make ice-penetrating radar measurements along and across the glacier using snow machines. Planned field activities also include a day trip to either Taylor Nunatak or Matador Mountain, depending on what the researchers find at Mount Heekin. Estimated rock sample weight for return to McMurdo is 1000 pounds, but rocks will be transported in stages through the austral summer season.

Deploying Team Members:

- Howard Conway
- Maurice Conway
- Elizabeth Dengler
- Perry Spector
- John Stone (PI)

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Multinuclide Approach To Systematically Evaluate The Scatter In Surface Exposure Ages In Antarctica And To Develop Consistent Alpine Glacier Chronologies

Drop moraine associated with Stocking Glacier in upper Taylor Valley. G-085 is combining multi-cosmogenic-nuclide techniques, field-based experiments and numerical modeling to investigate the impacts of earth-surface processes, such as weathering and burial, on exposure dating in Antarctica. We also plan to generate an alpine glacier chronology (via exposure dating) that will serve as a robust record of climate variation in the McMurdo Dry Valleys region over the last several million years. Photo by Kate Swanger.

Program Manager:
Dr. Mark Kurz

Event Number: G-085-M
NSF/PLR Award 1043724

ASC POC/Implementer:
Addie Coyac

Dr. Kate Swanger (Principal Investigator)
Kate_Swanger@uml.edu

University of Massachusetts
Lowell, Massachusetts

Supporting Stations: McMurdo Station
Research Locations: Olympus Range, Stocking Glacier, McMurdo Dry Valleys

Project Description:
By combining a multinuclide approach, detailed field experiments, glacial geologic mapping, rock-mechanics studies and climate modeling, researchers plan to investigate the impact of polar surface processes (weathering, burial by cold-based glaciers) on the application of cosmogenic exposure dating. The project has two specific goals: (1) generate an alpine glacier chronology as a robust record of regional climate variation in the

McMurdo Sound region over the past few million years; and (2) evaluate effects of weathering, burial and pre-exposure on exposure ages in polar deserts. To achieve these research goals, the field team plans to gather rock samples for exposure dating from multiple alpine moraine systems in Taylor and Wright valleys, the western Olympus Range and Quartermain Range. They will also gather samples from glaciers in Taylor and Wright valleys in order to address pre-exposure of rock samples and will perform in-situ experiments and analyses designed to quantify present-day weathering processes and rates in each location. In addition, they will gather meteorology data from each location for use in rock-weathering models.

Field Season Overview:

For the 2011-2012 field season, five people will deploy to Antarctica to conduct helicopter-supported fieldwork in the Dry Valleys region. The five-person team will set up remote camps at four locations in the Dry Valleys, remaining at each location for about 10 days. Remote field camp locations will be upper Taylor Valley, central Wright Valley, western Olympus Range and Beacon Valley. On or around 14 December 2011, two field party members will return to the USA. The remaining three field party members will remain in the Dry Valleys until early January 2012, departing McMurdo Station on or around 7 January 2012. This three-person team will be conducting a few helicopter-supported day trips to lower Taylor Valley, Pearse Valley, and Beacon Valley to retrieve data from long-term meteorologic stations originally deployed during 2004 and 2006, as well as to complete retrieval of weathering and meteorological equipment for short-term monitoring sites at the four 2011-2012 field locations.

Deploying Team Members:

- Jennifer Lamp
- Kate Swanger (PI)
- Jennifer Whitten

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Project Details 2011-2012

Collaborative Research: Acoustic Logging Of The WAIS Divide Borehole

Program Manager:
Dr. Julie Palais

Event Number: I-162-M

ASC POC/Implementer:
Beth Watson

Dr. Edwin Waddington (Principal Investigator)
edw@uw.edu

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

Supporting Stations: McMurdo Station
Research Locations: WAIS Divide

Project Description:

This project's research objective is to infer the depth variations of preferred orientation distribution (fabric) of ice crystals in the vicinity of the West Antarctic Ice Sheet (WAIS) Divide core hole. To achieve this objective, researchers plan to continuously measure the speed of sound at 11 frequencies, and at a spatial resolution of approximately one meter along the borehole wall, using a Mount Sopris sonic logging tool and the U.S. Geological Survey (USGS) winch.

Field Season Overview:

A project team of three researchers will travel to WAIS-Divide camp to conduct the borehole logging program, which will take eight or nine days in the hole, probably divided before and after the hole is deepened by this season's drilling efforts. The USGS winch that will be used to deploy the logging tool should be in place and ready to start logging by December 1. All three team members will conduct the logging runs in the hole at its current depth of 3,331 meters. Assuming that there will be a break of about one week while the hole is deepened, one of the team members will leave WAIS Divide in mid-to-late December to join another deployed project. The remaining team members will carry out further logging (over about one week) after the hole has been deepened, and plan on leaving WAIS Divide in mid-January.

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Deploying Team Members:

- Sridhar Anandakrishnan (Co-PI)
- Daniel Kluskiewicz
- Edwin Waddington (PI)

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Project Details 2011-2012

Stratospheric Terahertz Observatory (STO)

Program Manager:
Dr. Vladimir Papitashvili

Event Number: A-136-M

ASC POC/Implementer:
Addie Coyac

Dr. Christopher Walker (Principal Investigator)
cwalker@as.arizona.edu

University of Arizona Tucson
Steward Observatory
Tucson, Arizona

Supporting Stations: McMurdo Station
Research Locations: Williams Field area

Project 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:
STO has three major components; the LDB gondola, telescope, and instrument. There will initially be 11 team members deployed to unpack and begin assembly. Additionally, six personnel will arrive by mid-November to assist in pre-launch testing. Once the STO is launched in early December, five personnel will remain for in-flight check-out and the initiation of observations. During a two-week period, science flight operations will be monitored and controlled from the Applied Physics Lab (APL) and the University of Arizona. Two team members (one from APL and one from the University of Arizona) will remain to assist in the recovery and retrograde shipment of STO at the end of the season.

Deploying Team Members:

- Michael Borden

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- Michael Brasse
- Bliss Carkhuff
- Tiara Cottam
- Ruben Dominguez
- Brian Duffy
- Jonah Gottlieb
- Christopher Groppi
- Steven Hechtman
- Hiroyuki Kawamura (Co-PI)
- Jenna Kloosterman
- Craig Kulesa (Co-PI)
- David Lesser
- Patrick Puetz
- Nathan Rolander
- Brian Stalder
- Antony Stark (Co-PI)
- Christopher Walker (PI)
- Abram Young

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Project Details 2011-2012

Defining Rift Mechanisms And The Thermal Regime Of The Lithosphere Across Beardmore Glacier Region, Central Transantarctic Mountains, Using Magnetotelluric Measurements

Final stages of deployment of Phoenix Inc magnetotelluric (MT) geophysical instrument by John Stodt and Virginia Maris at site near TAM-Ross Sea transition. The project is meant to estimate the deep thermal regime of the TAM crust and upper mantle and thus narrow the range of explanations for mountain range uplift. Phoenix receiver in gray crate by Maris; tall cardboard box to left used to carry Ti sheet electrodes. Double battery and double solar panel used here as insurance against common fog conditions in this area. Mountaineer Danny Uhlmann in background by helicopter. Photo by Phil Wannamaker, University of Utah.

Program Manager:
Dr. Alexandra Isern

Event Number: G-494-M

ASC POC/Implementer:
Chad Naughton

Dr. Philip Wannamaker (Principal Investigator)
pewanna@egi.utah.edu

University of Utah
EGI
Salt Lake City, Utah

Supporting Stations: McMurdo Station
Research Locations: Beardmore Glacier

Project Description:
The investigators will compare competing hypotheses for the mechanism of extension and creation of the Transantarctic Mountains, and the general

thermal regimes of rifted West Antarctica and stable East Antarctica, from a magnetotelluric profile. The effort will consist of approximately 54 sites over a length of 400-500 kilometers with 15-kilometer average spacing, oriented perpendicular to the Transantarctic Mountains.

Field Season Overview:

In 2011-2012, this project will be supported at two remote camp locations by LC-130 open-field landings for put in and take out and by Twin Otter aircraft support for day trips to four or five MT receiver sites. The research team plans to deploy four MT recorders per day, primarily via snowmobile traverse, but no less than two recorders per day. Each recorder will stay in place at least one week under battery and solar panel power. The researchers plan to operate from temporary tent camps located in the center of each string, with the recorders collected back to that center at the end of their recording time using the snowmobile traverse. The temporary camp and instruments will then move to a new centrally located camp and researchers will repeat the deployment and recovery process. One base camp will be in the Ross Ice Shelf area and one on the Polar Plateau.

Deploying Team Members:

- Alisa Green
- Virginie Maris
- Katherine Selway
- John Stodt
- Philip Wannamaker (PI)

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Acoustic Assessment Of Southern Ocean Salps And Their Ecosystem Impact

Program Manager:
Dr. Peter Milne (acting)

Event Number: B-393-L

ASC POC/Implementer:
Adam Jenkins

Dr. Joseph Warren (Principal Investigator)
joe.warren@stonybrook.edu

State University of New York Stony Brook
Marine Sciences Research Center
Southhampton, New York

Supporting Stations: ARSV Laurence M. Gould
Research Locations: Bransfield Strait, Livingston Island

Project Description:

Researchers will collect zooplankton samples via net tow and hydrographic and acoustic backscatter data from about 25 stations in areas around the South Shetland Islands and western Antarctic Peninsula. These data will then be used to measure the acoustic scattering properties of salps, develop a physics-based scattering model, and investigate how environmental conditions may affect salp backscatter. The overall goal is to develop a method so that acoustics can be used to assess the abundance and distribution of salps in the Southern Ocean.

Field Season Overview:

Researchers on this project will be conducting net tow sampling, conductivity-temperature-depth (CTD) casts, and collecting acoustic backscatter data. This research project plans to conduct a detailed survey that will allow extensive sampling of the waters around the South Shetland Islands and Western Antarctic Peninsula. The exact locations of the sampling sites are to be determined as ship operations permit and depending on the needs of other projects sailing the cruise. On board the vessel, researchers will be maintaining live salps in aquaria and conducting experiments on them in the Wet Lab, a controlled-environment room, or on deck.

Deploying Team Members:

- Melissa Mazzocco
- Melissa Patrician
- Joseph Warren (PI)
- Katharine Wurtzell

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Project Details 2011-2012

Polenet East: An International Seismological Network For East Antarctica

Program Manager:
Dr. Alexandra Isern

Event Number: G-089-M/S

ASC POC/Implementer:
Leslie Blank

Dr. Douglas Wiens (Principal Investigator)
doug@wustl.edu

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

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: Gamburtsev Mountains

Project Description:
This is a continuation of the passive seismic study of the Gamburtsev Mountains which collects data contemporaneously with other Antarctic programs seismic arrays. The research addresses the following questions: (1) How have the Gamburtsev Mountains formed? (2) What is the role of topography and heat flow in the formation of continental ice sheets in East Antarctica? (3) What is the geologic and tectonic history of the East Antarctic craton? (4) How do tectonics and regional heat flow control the formation, distribution and stability of subgalcial lakes in East Antarctica?

Up to this point the data return has been excellent. This analysis is providing the first detailed seismic constraints on crustal and upper mantle structure beneath and surrounding the Gamburtsev Mountains, on the processes which support the high elevation of this region, on the regional distribution of heat flow, and on the tectonic framework of the interior of the East Antarctic shield.

Field Season Overview:
The POLENET EAST/AGAP seismic array consists of eight broadband seismic stations. Servicing during the 2010-2011 summer season only included data retrieval. This season, researchers wish to visit each of the sites to collect the data acquired over the past year and also to replace the batteries at each site. Each site consists of three parts, a seismic sensor

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buried in the ice, an instrument housing, and a set of solar panels. The instrument housing contains the data logger, batteries, and power distribution systems. This is a single cube nearly three-feet in size weighing 400 lbs. and is buried in the ice. To replace the batteries, researchers will dig up the instrument housing and replace it with another instrument housing fitted with a new set of batteries. Ground time is expected to be two to three hours in each location.

Deploying Team Members:

- Patrick Shore (Team Leader)
- Songqiao Wei

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Project Details 2011-2012

Using Molecular Data To Test Connectivity And The Circumpolar Paradigm For Antarctic Marine Invertebrates

crinoid, Promachocrinus kerguelensis Photo by Nerida Wilson

Program Manager:
Dr. Charles Amsler

Event Number: B-465-N

ASC POC/Implementer:
Patricia Jackson

Dr. Nerida Wilson (Principal Investigator)
ngwilson@ucsd.edu

Scripps Institution of Oceanography
Marine Research Division
La Jolla, California

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: Burdwood Bank, South America Continental Shelf, Antarctic Peninsula

Project Description:

This group will concurrently assess species complexes in Antarctic benthic marine invertebrates and the connectivity among the constituent populations. One of the major objectives is to understand how the Scotia Arc may connect populations of species that occur from South America to Antarctica. Researchers will also critically examine the idea that many benthic invertebrates show a circum-Antarctic distribution. Samples collected will be compared to existing collections from broad geographic areas. Technical objectives include sampling benthic invertebrates from the continental shelf of South America, along the Scotia Arc, and on to the Antarctic Peninsula.

Field Season Overview:

This research cruise will take place in mid-September to early November 2011 and will sample Shag Rocks, South Georgia, the South Sandwich islands, Elephant Island, and the Bransfield Strait. The majority of operations will consist of Blake trawls, which will be interspersed with occasional use of a Smith-Mac grab, epibenthic sled, or rock dredge. Researchers will also bring a rock-hopper Otter Trawl as a back up. They also plan to deploy baited traps at some sites.

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Deploying Team Members:

- Narissa Bax
- Ashley Chen
- Michelle Love
- Jenna Moore
- Gregory Rouse (Co-PI)
- Jacqueline Salm
- Josefin Stiller
- Mindy Summers
- James Tickner
- Nerida Wilson (PI)

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Project Details 2011-2012

Collaborative Research: Geophysical Study Of Ice Stream Stick-Slip Dynamics

Program Manager:
Dr. Julie Palais

Event Number: I-181-M

ASC POC/Implementer:
Leslie Blank

Mr. Jeremy Winberry (Principal Investigator)
winberry@geology.cwu.edu

Central Washington University
Ellensburg, Washington

Supporting Stations: McMurdo Station
Research Locations: Ice Stream B

Project Description:
Researchers on this project will study the ongoing deceleration and stick-slip motion of Whillans Ice Stream (WIS) in West Antarctica. Understanding the dynamic behavior of ice streams is essential for predicting the future of the West Antarctic Ice Sheet (WAIS). Despite being one of the best-studied ice streams in Antarctica, the surprising flow characteristics of WIS continue to demand interdisciplinary research. Recent estimates indicate that the WIS may stagnate within 50 years, resulting in a significant change to the mass balance of the Siple Coast sector of West Antarctica. The reasons for the ongoing stagnation are not well known and are possibly linked (causally or coincidentally) to the stick-slip behavior. The research team's recent work on WIS stick-slip motion suggest that all slip events nucleate from a common location on the ice stream and that a relatively small region exerts fundamental control over the flow of this large ice stream. Researchers will deploy a series of GPS receivers and seismometers on the ice stream to locate the nucleation region so that a comprehensive ground-based geophysical survey can be conducted to determine the physical properties of the bed at the nucleation point. The ground-based geophysical work will consist of reflection seismic and ice-penetrating radar studies that will better constrain the properties of both the hypothesized higher-friction nucleation zone and the surrounding regions.

Field Season Overview:
This field season, researchers will conduct a ground-based geophysical

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survey to determine the physical properties of the bed at the nucleation point of stick-slip events of Whillans Ice Stream. Four team members will put in to the field by Basler or LC-130 aircraft open-field landing to conduct reflection seismic and ice-penetrating radar studies by snow machine from a small camp on the ice stream. The I-181-M field team will use explosives and a hot-water shot-hole drill provided by the C-520-M Anandakrishnan field team for the survey work.

Deploying Team Members:

- Jeremy Winberry (PI)

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