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- **USAP Program Indexes**
  - Astrophysics and Geospace Sciences
    Dr. Robert Moore and Dr. Vladimir Papatashvili, Program Directors
  - Organisms and Ecosystems
    Dr. Karla Heidelberg and Dr. Maria Vernet, Program Directors
  - Earth Sciences
    Dr. Michael Jackson, Program Director
  - Glaciology
    Dr. Paul Cutler, Program Director
  - Ocean and Atmospheric Sciences
    Dr. Peter Milne and Dr. David Sutherland, Program Directors
  - Integrated System Science
    Dr. Karla Heidelberg and Dr. Francisco (Paco) Moore, Program Directors
- **USAP Station and Vessel Indexes**
  - Amundsen-Scott South Pole Station
  - McMurdo Station
  - Palmer Station
  - RVIB Nathaniel B. Palmer
  - ARSV Laurence M. Gould
  - Special Projects
- Principal Investigator Index
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Project Web Sites

Principal Investigator/Link	Event No.	Project Title
Anderson, Kent	T-299-M	IRIS/PASSCAL seismic support
Bristow, William	A-369-M/S	Antarctic and conjugate research using SuperDARN
Chu, Xinzhao	A-123-M	Simultaneous sodium doppler and iron Boltzmann LiDAR observations and modeling of the middle and upper atmosphere at McMurdo Station, Antarctica
Conde, Mark Gerard	A-343-M/S	High-resolution mapping of thermospheric wind and temperature fields near the equatorward edge of the Antarctic polar cap
Franco, Hugo	A-145-M	NASA Long Duration Balloon (LDB) support program
Hartinger, Michael David	A-110-M/S	NSFGEO-NERC: Conjugate experiment to investigate sources of high-latitude magnetic perturbations in coupled solar wind-magnetosphere-ionosphere-ground system
Kovac, John	A-149-S	Imaging the beginning of time from the South Pole: the next stage of the BICEP program
Moran, Amy	B-307-M	Thermal sensitivity of Antarctic embryos and larvae: effects of temperature on metabolism, developmental rate, and the metabolic cost of development
Rotella, Jay	B-009-M	The consequences of maternal effects and environmental conditions on offspring success in an Antarctic predator
Schofield, Oscar	C-019-N	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Sprintall, Janet	O-260-L	High-resolution underway air-sea observations in Drake Passage for climate science

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Steinberg, Deborah	C-020-N	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Taylor, Michael J	A-119-M/S	Continental-scale studies of Mesospheric dynamics using the Antarctic Gravity Wave Instrument Network (ANGWIN)

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2021-2022 USAP Field Season
Station and Vessel Schedules

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

Opening Dates

	Austral Summer Openings		Austral Winter Openings
	Operational	Science	
McMurdo (Early Season*)	19 Aug 2021	22 Aug 2021 19 Sep 2021	24 Feb 2022
McMurdo (Mainbody)	30 Sep 2021	2 Oct 2021	
South Pole	1 Nov 2021	6 Nov 2021	15 Feb 2022
Palmer	6 Oct 2021	5 Apr 2022	N/A
Research Vessels	Vessels Operate Year-Round (Find Vessel Schedules)		

**A limited number of science projects deploy early*

Estimated Population

	Summer	Winter
McMurdo	650 (weekly average)	140 (winter total)
South Pole	90 (weekly average)	51 (winter total)
Palmer	23-58 (weekly average)	
RV/IB* NBP	39 science and staff	
ARSV** LMG	Capacity per cruise: 27 science and staff Capacity per transit to/from Palmer Station: 37 science and staff with two berthing vans.	

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

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Project Web Sites

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2021-2022 USAP Field Season
Air Operations

McMurdo Station

McMurdo-based aircraft, including helicopters, fixed wing aircraft, and uncrewed aircraft systems (UAS) will continue to support USAP researchers and program logistical functions.

Helicopters

Air Center Helicopters, Inc.

Air Center Helicopters, Inc. (ACHI) is contracted by the NSF to operate up to four helicopters this season in support of approved research and operational efforts in the vicinity of McMurdo Station. Missions typically take place in McMurdo Sound, the McMurdo Dry Valleys, the Royal Society Range, Ross Ice Shelf, and Ross Island regions and will be supported by light (Astar B3es) and/or medium (Bell 412) airframes.

Antarctica New Zealand (ANZ) will be contracting Astar B3s from Southern Lakes Helicopters (SLH) this season, per usual, so USAP aircraft are slated to provide several NSF-approved quid pro quo missions in support of ANZ's 2021-22 field science program as supportable throughout the season.

Fixed Wing Aircraft

New York Air National Guard (ANG)

The New York Air National Guard 109th Airwing LC-130 Hercules aircraft will provide research and operational support to South Pole Station, West Antarctic Ice Sheet (WAIS) Divide, and Siple Dome.

Kenn Borek Air

Kenn Borek Air (KBA) will provide two DHC-6 Twin Otters and one DC-3 Basler aircraft to support a number of USAP operations on continent. The Basler will be based out of McMurdo for the duration of the season, while the Twin Otters will be based out of McMurdo, South Pole, and WAIS Divide at different times throughout the season.

In addition, KBA may be operating one DHC-6 Twin Otter and one DC-3 Basler for Antarctica New Zealand (ANZ) throughout several periods during the season.

Uncrewed Aircraft Systems (UAS)

There will be limited UAS operating in the McMurdo area this season. NIWC Air Traffic Control and ASC Aviation Ops will advise aircraft of all UAS activities and deconflict airspace, as required.

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2021-2022 USAP Field Season
Staffed Field Camps

During the 2021-22 summer season, ASC will operate three staffed field sites to provide science support.

Siple Dome (SDM)

507 Nautical Miles From McMurdo Station

81° 39.840' S 149° 1.050' W

Siple Dome camp serves as the fueling point and weather observation location for aircraft operating between McMurdo Station and WAIS Divide. Three resident staff will provide weather observations, aviation support, and facility upkeep. No residential science projects are planned for this season. Siple Dome will support overnight KBA Twin Otter flight crews as needed.

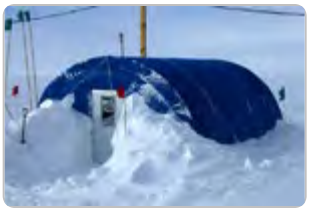
Taylor Valley Camps

~50 Nautical Miles From McMurdo Station

77° 37.380' S 162° 53.990' E (Lake Hoare)

The Tylor Valley camps will open to provide support to ongoing science projects in the McMurdo Dry Valleys. All camps are supported by helicopter operations based at McMurdo Station. This year, two resident staff based at Lake Hoare and Lake Fryxell will oversee operations at Lake Hoare, Lake Fryxell, F6, Lake Bonney, and New Harbor camps. The multiple McMurdo Long Term Ecological Research (MCM LTER) science teams that typically operate under discrete event numbers will deploy under a single event number this season, C-505-M. This 10-perseon combined LTER team will work closely with Taylor Valley camp staff to complete priority LTER science given a constrained season.

WAIS Divide Camp (WSD)



891 Nautical Miles From McMurdo Station

79° 29.000' S 112° 5.000' W

The WAIS Divide camp, with eight resident staff will act as a regional aviation hub for West Antarctica. The camp will support the transit of two Thwaites Glacier science projects: C-445-M (Pettit-TARSAN) and C-446-M (Tulaczyk-TIME) from McMurdo Station to forward field sites. WAIS will also support two residential science groups: O-283-M (Lazzara-AWS) and G-079-M (Wilson-POLENET) with regional day-trips to service installed remote sensing instrumentation. Additionally, the WAIS camp will support the continued maintenance of WAIS Divide camp infrastructure.

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2021-2022 USAP Field Season
Event Numbering System

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

Sample Event Number

A – **100** – **M**

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

Program Prefixes

Prefix	USAP Program
A	Astrophysics and Geospace Sciences Dr. Robert Moore and Dr. Vladimir Papatashvili, Program Directors
B	Organisms and Ecosystems Dr. Karla Heidelberg and Dr. Maria Vernet, Program Directors
C	Integrated System Science Dr. Karla Heidelberg and Dr. Francisco (Paco) Moore, Program Directors
G	Earth Sciences Dr. Michael Jackson, Program Director
I	Glaciology Dr. Paul Cutler, Program Director
O	Oceans and Atmospheric Sciences Dr. Peter Milne and Dr. David Sutherland, Program Directors
T	Technical Event
X	Other Science Events

Location Suffixes

Suffix	Supporting Location
M	McMurdo Station
P	Palmer Station
S	South Pole Station

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

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

Principal Investigator Index

Principal Investigator	Event No.	Project Title
Anderson, Kent	T-299-M	IRIS/PASSCAL seismic support
Ballard, Grant	B-200-M	Population growth at the southern extreme: effects of early life conditions on Adélie penguin individuals and colonies
Banwell, Alison	I-151-E	Ice-shelf instability caused by active surface meltwater production, movement, ponding, and hydrofracture
Bernard, Kim	B-459-L/N/P	The omnivore's dilemma: The effect of autumn diet on winter physiology and condition of juvenile Antarctic krill
Blom, Lukas J	T-396-M	Operation and maintenance of a CTBT class infrasound array at Windless Bight
Bristow, William	A-369-M/S	Antarctic and conjugate research using SuperDARN
Butler, James Hall	O-257-M/S	South Pole monitoring for climatic change: U.S. Department of Commerce NOAA Global Monitoring Division (GMD)
Butler, James Hall	O-264-P	Collection of atmospheric air for the NOAA/GMD worldwide flask-sampling network
Butler, James Hall	O-257-M/S	UV measurements at McMurdo Station for the NOAA/Global Monitoring Division (GMD) Antarctic UV network
Carlstrom, John	A-379-S	Cosmological research with the 10-meter South Pole Telescope
Chereskin, Teresa	O-317-L	Southern Ocean current observations from the U.S. Antarctic research vessels
Christianson, Knut A	I-175-M/S	Ice dynamics at the intersection of the West and East Antarctic Ice Sheets
Chu, Xinzhao	A-123-M	Simultaneous sodium doppler and iron Boltzmann LiDAR observations and modeling of the middle and upper atmosphere at McMurdo Station, Antarctica

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Cimino, Megan A	C-013-N/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Conde, Mark Gerard	A-343-M/S	High-resolution mapping of thermospheric wind and temperature fields near the equatorward edge of the Antarctic polar cap
Courville, Zoe R	T-940-M	Cold Regions Research and Engineering Laboratory (CRREL) activities
Eppley, Dr. Sarah Margaretha	B-289-E	Exploring the functional role of plants during terrestrial succession
Franco, Hugo	A-145-M	NASA Long Duration Balloon (LDB) support program
Friedlaender, Ari Seth	C-024-N/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Gerrard, Andrew	A-111-M/P/S	The next generation of Geospace research facilities at South Pole and McMurdo Stations
Gooseff, Michael N	C-505-M	McMurdo LTER – Limnology: ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Greenbaum, Jamin S	I-122-E	RAPID: International collaborative airborne sensor deployments near Antarctic ice shelves
Halzen, Francis	A-333-S	Management and operation of the IceCube Neutrino Observatory 2016-2021
Harris, Mark	T-927-M	NASA / McMurdo Ground Station (MG1)
Hartinger, Michael David	A-110-M/S	NSFGEO-NERC: Conjugate experiment to investigate sources of high-latitude magnetic perturbations in coupled solar wind-magnetosphere-ionosphere-ground system
Hosticka, Bouvard	T-998-P	Operation and maintenance of a CTBT radionuclide monitoring station at Palmer Station
Huckstadt, Luis Alfredo	B-038-N	NSFGEO-NERC Collaborative Research: Effects of a changing climate on the habitat utilization, foraging ecology and distribution of

		crabeater seals
Hummon, Julia M	T-933-L/N	University of Hawaii Data Acquisition System (UHDAS) support
Kemerait, Robert C	G-078-M	Dry Valley seismic project
Kovac, John	A-149-S	Imaging the beginning of time from the South Pole: the next stage of the BICEP program
Krause, Douglas John	X-591-L	Cape Shirreff
Kromer, Edward Paul	G-090-P	Global seismograph station at South Pole, Scott Base, and Palmer stations
LaBelle, James	A-128-S	Auroral kilometric radiation, substorms, and related phenomena: satellite conjunction and conjugate studies at South Pole
Lazzara, Matthew	O-283-M	Collaborative Research: Antarctic automatic weather station program, 2019-2022
Moffat, Carlos F	C-021-N	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Moran, Amy	B-307-M	Thermal sensitivity of Antarctic embryos and larvae: effects of temperature on metabolism, developmental rate, and the metabolic cost of development
Palo, Scott	A-284-M	Lower thermospheric science using new meteor radar at McMurdo Station
Pettit, Erin	C-445-M/N	Thwaites-Amundsen Regional Survey and Network (TARSAN): integrating atmosphere-ice-ocean processes affecting the sub-ice-shelf environment
Pettit, Joseph R	T-295-M	UNAVCO high-precision GPS and ground-based light detection and ranging (LiDAR) support
Rotella, Jay	B-009-M	The consequences of maternal effects and environmental conditions on offspring success in an Antarctic predator
Schofield, Oscar	C-019-N	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Seunarine, Surujhdeo	A-118-S	Element composition of high-energy

		solar particles
Sprintall, Janet	O-260-L	High-resolution underway air-sea observations in Drake Passage for climate science
Steinberg, Deborah	C-020-N	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Taylor, Michael J	A-119-M/S	Continental-scale studies of Mesospheric dynamics using the Antarctic Gravity Wave Instrument Network (ANGWIN)
Tulaczyk, Slawek M	C-446-E/M	Thwaites Interdisciplinary Margin Evolution (TIME): the role of shear margin dynamics in the future evolution of the Thwaites Drainage Basin
Van Mooy, Benjamin	C-045-N	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Watters, George	B-006-L	NOAA / AMLR
Wellner, Julia Smith	C-447-N	Stability and instability: records of external drivers and the resulting behavior of Thwaites Glacier
Wilson, Terry	G-079-M	Investigating ice sheet - solid Earth feedbacks in West Antarctica: implications for ice sheet evolution and stability
Yager, Patricia	B-465-N	NSFGEO-NERC: Accelerating Thwaites Ecosystem Impacts for the Southern Ocean (ARTEMIS)

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Deploying Team Members Index

Team Member	Event No.	Principal Investigator
Agnew, Ronan Samuel	C-446-E/M	Slawek M Tulaczyk
Amat, Brandon Michael	A-149-S	John Kovac
Auer, Ralf Bernhard	A-333-S	Francis Halzen
Azarias Utsumi, Giovanna Sayuri	B-465-N	Patricia Yager
Ball, Rebecca	B-289-E	Dr. Sarah Margaretha Eppley
Baricevic, Moreno TBA	A-333-S	Francis Halzen
Battaion, Scott Gerard	A-145-M	Hugo Franco
Bayou, Nicolas NM	T-295-M	Joseph R Pettit
Bent, Shavonna Marie	C-045-N	Benjamin Van Mooy
Bernsen, Steven Paul	T-396-M	Lukas J Blom
Bevington, James Lea	A-379-S	John Carlstrom
Boehme, Lars NMI	C-445-M/N	Erin Pettit
Bortolotto de Oliveira, Guilherme Augusto NMI	C-445-M/N	Erin Pettit
Bottensek, Marcus Ramone	G-078-M	Robert C Kemerait
Branning, Kylee Amanda	A-343-M/S	Mark Gerard Conde
Breeding, Garrison Scott	A-145-M	Hugo Franco
Cheshire IV, James Ross	A-149-S	John Kovac
Chokshi, Aman NMI	A-379-S	John Carlstrom
Clark, Rachel Warren	C-447-N	Julia Smith Wellner
Comas, Robert Michael	C-447-N	Julia Smith Wellner
Cope, Joseph	C-020-N	Deborah Steinberg
Cornelison, James Allen	A-149-S	John Kovac
Corso, Andrew Derik	C-020-N	Deborah Steinberg
Costa, Daniel P	B-038-N	Luis Alfredo Huckstadt

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Cotten, Rex	T-927-M	Mark Harris
Coyle, Shane E	A-110-M/S	Michael David Hartinger
Cramer, Avilash Kalpathy	T-299-M	Kent Anderson
Cutter, George Randy	B-006-L	George Watters
Diou-Cass, Quintin Paul	C-019-N	Oscar Schofield
Elrod, Megan Lynn	B-200-M	Grant Ballard
Estrada, Evan Andrew	G-078-M	Robert C Kemerait
Fanelli, Francesco NMI	C-445-M/N	Erin Pettit
Favilla, Arina Bronzatto	B-038-N	Luis Alfredo Huckstadt
Foster, Allen Michael	A-379-S	John Carlstrom
Glastra, Laura Katherine	C-445-M/N	Erin Pettit
Gonzalez, Lucia F	C-446-E/M	Slawek M Tulaczyk
Hall, Robert A	C-445-M/N	Erin Pettit
Herbert, Lisa NMI	B-465-N	Patricia Yager
Hills, Benjamin Hale	I-175-M/S	Knut A Christianson
Holland, Timothy Jani	O-257-M/S	James Hall Butler
Huang, Nicholas Dickey	A-379-S	John Carlstrom
Hunt, Madeline Anna	T-299-M	Kent Anderson
Jackson, Abigail Catherine	C-505-M	Michael N Gooseff
Jorna, Jens Jesse Gerard	C-505-M	Michael N Gooseff
Kambarn, William	T-927-M	Mark Harris
Karplus, Marianne Sherman	C-446-E/M	Slawek M Tulaczyk
Kim, Junhan NMI	A-379-S	John Carlstrom
Kirsten, Steinke Brooke	B-459-L/N/P	Kim Bernard
Kratt, Christopher B	C-445-M/N	Erin Pettit
Landgraf, Victoria Grace	T-927-M	Mark Harris
Law, Harrison Graham	T-396-M	Lukas J Blom
Lawrence, Jade NMI	C-505-M	Michael N Gooseff
Lee, Gareth NMI	C-445-M/N	Erin Pettit
Lehrmann, Asmara Anne	C-447-N	Julia Smith Wellner
Leps, Thomas John Gardstein	A-149-S	John Kovac

Levinson, Parker McCosh	B-009-M	Jay Rotella
Ling, Li NM	C-445-M/N	Erin Pettit
Lobert, Graham Thomas	B-307-M	Amy Moran
Look, Karsten Kay	A-149-S	John Kovac
Lowenstein, Daniel Patton	C-045-N	Benjamin Van Mooy
Lowitz, Amy Elizabeth	A-379-S	John Carlstrom
Lucas, Erica Margaret	G-079-M	Terry Wilson
Ly, Tony Mong	T-998-P	Bouvard Hosticka
Marie Sainte, Wenceslas Max	A-333-S	Francis Halzen
Marlow, Rachel NMI	C-445-M/N	Erin Pettit
Matheny, Peter Ogden	G-079-M	Terry Wilson
McBrearty, Robin J	G-079-M	Terry Wilson
McDonald, Randall Jacob	A-145-M	Hugo Franco
McNulty, Katherine E.	C-505-M	Michael N Gooseff
Medeiros, Patricia Matheus de	B-465-N	Patricia Yager
Mikolajczyk, David	O-283-M	Matthew Lazzara
Moffat, Carlos F	C-019-N	Oscar Schofield
Mohamed, Ahmed Mohamed Soliman	A-149-S	John Kovac
Morris, Ashley William	C-445-M/N	Erin Pettit
Mowatt-Larssen, Tor NMI	C-020-N	Deborah Steinberg
Myers, Krista NMI	C-505-M	Michael N Gooseff
Nell, Nicholas John	A-379-S	John Carlstrom
Nichols, Ross C	C-024-N/P	Ari Seth Friedlaender
Nodal, Andrea Alejandra	B-459-L/N/P	Kim Bernard
Nolan, Meredith Anne	C-020-N	Deborah Steinberg
Okal, Marianne	T-295-M	Joseph R Pettit
Oliver, Hilde NMI	B-465-N	Patricia Yager
Pautet, Pierre-Dominique	A-119-M/S	Michael J Taylor
Pearson, Anna Bryan	B-038-N	Luis Alfredo Huckstadt

Pickup, Daisy Drew	C-445-M/N	Erin Pettit
Platt, Billy NMI	C-445-M/N	Erin Pettit
Pomraning, Dale	T-396-M	Lukas J Blom
Pretorius, Andrew Charles	C-446-E/M	Slawek M Tulaczyk
Provost, Paul Graham	C-445-M/N	Erin Pettit
Reiss, Christian Stefan	B-006-L	George Watters
Reynebeau, Emily R	C-505-M	Michael N Gooseff
Rollo, Callum NMI	C-445-M/N	Erin Pettit
Rosensteil, Todd N	B-289-E	Dr. Sarah Margaretha Eppley
Samaniego, Joseph Isaac	O-257-M/S	James Hall Butler
Sandmeyer, Walter Thurgood	A-379-S	John Carlstrom
Scambos, Ted	C-445-M/N	Erin Pettit
Schillaci, Alessandro NMI	A-149-S	John Kovac
Schmidt, Anne	B-200-M	Grant Ballard
Schmidt, Anne Elizabeth	B-200-M	Grant Ballard
Schreiber, Erika A,P.	T-295-M	Joseph R Pettit
Segabinazzi Dotto, Tiago NMI	C-445-M/N	Erin Pettit
Sherrell, Robert	B-465-N	Patricia Yager
Shields, Evan Michael	B-009-M	Jay Rotella
Sinkola, Nikolas Dondi	T-927-M	Mark Harris
Sjovall, Jan Anders	C-445-M/N	Erin Pettit
Skorski, William Bradley	O-257-M/S	James Hall Butler
Smith, Emma C	C-446-E/M	Slawek M Tulaczyk
Smith, James Frank	O-257-M/S	James Hall Butler
Stammerjohn, Sharon E	B-465-N	Patricia Yager
Steffen, Janelle NMI	B-465-N	Patricia Yager
Stevens, Laura Ann	I-151-E	Alison Banwell
Stone, Michael Stanley	C-505-M	Michael N Gooseff
Summers, Paul Thomas	C-446-E/M	Slawek M Tulaczyk
Symons, Mark William	C-445-M/N	Erin Pettit
Templeton, Robert Paul	C-445-M/N	Erin Pettit

Thomas, Maya India	C-020-N	Deborah Steinberg
Tift, Michael	B-038-N	Luis Alfredo Huckstadt
Toh, Ming-Wei Aaron	B-307-M	Amy Moran
Tsai, Calvin NMI	A-149-S	John Kovac
Turner, Jessie NMI	C-019-N	Oscar Schofield
Vanderwilt, Mia Catherine	C-505-M	Michael N Gooseff
Villalobos, Victor Bobby	B-009-M	Jay Rotella
Villanueva, Carlos Stephen	T-299-M	Kent Anderson
VonLintig, Matthew Ryan	T-396-M	Lukas J Blom
Voss, Nicholas Michael	G-090-P	Edward Paul Kromer
Wahlin, Anna NMI	C-445-M/N	Erin Pettit
Wallin, Bruce Farley	C-445-M/N	Erin Pettit
Weber, Corey	A-145-M	Hugo Franco
Webster, Kaija M	A-145-M	Hugo Franco
Welch, Kathy	C-505-M	Michael N Gooseff
Welhouse, Lee	O-283-M	Matthew Lazzara
Wendell, Edward	T-927-M	Mark Harris
Wild, Christian Thomas	C-445-M/N	Erin Pettit
Willis, Ian C	I-151-E	Alison Banwell
Winkelman, Andrew Thomas	T-396-M	Lukas J Blom
Winquist, Suzanne Sophia Elizabeth	B-200-M	Grant Ballard
Wright, Anna Thrane	C-505-M	Michael N Gooseff
Wyles, Hannah Maria Elizabeth	C-445-M/N	Erin Pettit
Young, Tun Jan nmi	C-446-E/M	Slawek M Tulaczyk
Yu, Cyndia Blaire	A-149-S	John Kovac
Zhang, Cheng NMI	A-149-S	John Kovac
Zhang, Silvia NMI	A-149-S	John Kovac
Zheng, Yixi NMI	C-445-M/N	Erin Pettit

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Alaska Fairbanks, University of	A-343-M/S	Conde, Mark
California San Diego, University of	O-317-L	Chereskin, Teresa
California San Diego, University of	I-122-E	Greenbaum, Jamin
California Santa Cruz, University of	C-013-N/P	Cimino, Megan
California Santa Cruz, University of	C-024-N/P	Friedlaender, Ari
California Santa Cruz, University of	C-446-E/M	Tulaczyk, Slawek
California Santa Cruz, University of	B-038-N	Huckstadt, Luis
Chicago, University of	A-379-S	Carlstrom, John
Colorado Boulder, University of	A-284-M	Palo, Scott
Colorado Boulder, University of	C-505-M	Gooseff, Michael
Colorado Boulder, University of	A-123-M	Chu, Xinzhao
Colorado Boulder, University of	I-151-E	Banwell, Alison
Columbia Scientific Balloon Facility	A-145-M	Franco, Hugo
Dartmouth College	A-128-S	LaBelle, James
Delaware, University of	C-021-N	Moffat, Carlos
Georgia, University of	B-465-N	Yager, Patricia
Harvard University	A-149-S	Kovac, John
Hawaii Manoa, University of	T-933-L/N	Hummon, Julia
Hawaii Manoa, University of	B-307-M	Moran, Amy
Houston, University of	C-447-N	Wellner, Julia
Incorporated Research Institutions for Seismology	T-299-M	Anderson, Kent
Montana State University Bozeman	B-009-M	Rotella, Jay
National Aeronautics and Space Administration	T-927-M	Harris, Mark

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National Oceanic and Atmospheric Administration	O-264-P	Butler, James
National Oceanic and Atmospheric Administration	O-257-M/S	Butler, James
National Oceanic and Atmospheric Administration	B-006-L	Watters, George
National Oceanic and Atmospheric Administration	X-591-L	Krause, Douglas
New Jersey Institute of Technology	A-111-M/P/S	Gerrard, Andrew
Ohio State University	G-079-M	Wilson, Terry
Oregon State University	B-459-L/N/P	Bernard, Kim
Oregon State University	C-445-M/N	Pettit, Erin
Pennsylvania State University	A-369-M/S	Bristow, William
Point Reyes Bird Observatory	B-200-M	Ballard, Grant
Portland State University	B-289-E	Eppley, Dr. Sarah
Rutgers University	C-019-N	Schofield, Oscar
Scripps Institution of Oceanography	O-260-L	Sprintall, Janet
Space Science Institute	A-110-M/S	Hartinger, Michael
UNAVCO Inc.	T-295-M	Pettit, Joseph
United States Air Force	G-078-M	Kemerait, Robert
United States Geological Survey	G-090-P	Kromer, Edward
US Army Cold Regions Research & Engineering Lab	T-940-M	Courville, Zoe
Utah State University	A-119-M/S	Taylor, Michael
Virginia Institute of Marine Sciences	C-020-N	Steinberg, Deborah
Virginia, University of	T-998-P	Hosticka, Bouvard
Washington, University of	I-175-M/S	Christianson, Knut
Wisconsin Madison, University of	A-333-S	Halzen, Francis
Wisconsin Madison, University of	O-283-M	Lazzara, Matthew
Wisconsin River Falls, University of	A-118-S	Seunarine, Surujhdeo
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013	C-013-N/P	Cimino, Megan
019	C-019-N	Schofield, Oscar
020	C-020-N	Steinberg, Deborah
021	C-021-N	Moffat, Carlos
024	C-024-N/P	Friedlaender, Ari
038	B-038-N	Huckstadt, Luis
045	C-045-N	Van Mooy, Benjamin
078	G-078-M	Kemerait, Robert
079	G-079-M	Wilson, Terry
090	G-090-P	Kromer, Edward
110	A-110-M/S	Hartinger, Michael
111	A-111-M/P/S	Gerrard, Andrew
118	A-118-S	Seunarine, Surujhdeo
119	A-119-M/S	Taylor, Michael
122	I-122-E	Greenbaum, Jamin
123	A-123-M	Chu, Xinzhao
128	A-128-S	LaBelle, James
145	A-145-M	Franco, Hugo
149	A-149-S	Kovac, John
151	I-151-E	Banwell, Alison
175	I-175-M/S	Christianson, Knut
200	B-200-M	Ballard, Grant
257	O-257-M/S	Butler, James

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264	O-264-P	Butler, James
283	O-283-M	Lazzara, Matthew
284	A-284-M	Palo, Scott
289	B-289-E	Eppley, Dr. Sarah
295	T-295-M	Pettit, Joseph
299	T-299-M	Anderson, Kent
307	B-307-M	Moran, Amy
317	O-317-L	Chereskin, Teresa
333	A-333-S	Halzen, Francis
343	A-343-M/S	Conde, Mark
369	A-369-M/S	Bristow, William
379	A-379-S	Carlstrom, John
396	T-396-M	Blom, Lukas
445	C-445-M/N	Pettit, Erin
446	C-446-E/M	Tulaczyk, Slawek
447	C-447-N	Wellner, Julia
459	B-459-L/N/P	Bernard, Kim
465	B-465-N	Yager, Patricia
505	C-505-M	Gooseff, Michael
591	X-591-L	Krause, Douglas
927	T-927-M	Harris, Mark
933	T-933-L/N	Hummon, Julia
940	T-940-M	Courville, Zoe
998	T-998-P	Hosticka, Bouvard

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Principal Investigator	Event No.	Project Title
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Blom, Lukas	T-396-M	Operation and maintenance of a CTBT class infrasound array at Windless Bight
Courville, Zoe	T-940-M	Cold Regions Research and Engineering Laboratory (CRREL) activities
Harris, Mark	T-927-M	NASA / McMurdo Ground Station (MG1)
Hosticka, Bouvard	T-998-P	Operation and maintenance of a CTBT radionuclide monitoring station at Palmer Station
Hummon, Julia	T-933-L/N	University of Hawaii Data Acquisition System (UHDAS) support
Pettit, Joseph	T-295-M	UNAVCO high-precision GPS and ground-based light detection and ranging (LiDAR) support

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Principal Investigator	Event No.	Project Title
Bristow, William	A-369-M/S	Antarctic and conjugate research using SuperDARN
Carlstrom, John	A-379-S	Cosmological research with the 10-meter South Pole Telescope
Chu, Xinzhao	A-123-M	Simultaneous sodium doppler and iron Boltzmann LiDAR observations and modeling of the middle and upper atmosphere at McMurdo Station, Antarctica
Conde, Mark	A-343-M/S	High-resolution mapping of thermospheric wind and temperature fields near the equatorward edge of the Antarctic polar cap
Franco, Hugo	A-145-M	NASA Long Duration Balloon (LDB) support program
Gerrard, Andrew	A-111-M/P/S	The next generation of Geospace research facilities at South Pole and McMurdo Stations
Halzen, Francis	A-333-S	Management and operation of the IceCube Neutrino Observatory 2016-2021
Hartinger, Michael	A-110-M/S	NSFGEO-NERC: Conjugate experiment to investigate sources of high-latitude magnetic perturbations in coupled solar wind-magnetosphere-ionosphere-ground system
Kovac, John	A-149-S	Imaging the beginning of time from the South Pole: the next stage of the BICEP program
LaBelle, James	A-128-S	Auroral kilometric radiation, substorms, and related phenomena: satellite conjunction and conjugate studies at South Pole
Palo, Scott	A-284-M	Lower thermospheric science using new meteor radar at McMurdo Station
Seunarine, Surujhdeo	A-118-S	Element composition of high-energy solar particles
Taylor, Michael	A-119-M/S	Continental-scale studies of

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		Mesospheric dynamics using the Antarctic Gravity Wave Instrument Network (ANGWIN)

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Principal Investigator	Event No.	Project Title
Ballard, Grant	B-200-M	Population growth at the southern extreme: effects of early life conditions on Adélie penguin individuals and colonies
Bernard, Kim	B-459-L/N/P	The omnivore's dilemma: The effect of autumn diet on winter physiology and condition of juvenile Antarctic krill
Eppley, Dr. Sarah	B-289-E	Exploring the functional role of plants during terrestrial succession
Huckstadt, Luis	B-038-N	NSFGEO-NERC Collaborative Research: Effects of a changing climate on the habitat utilization, foraging ecology and distribution of crabeater seals
Moran, Amy	B-307-M	Thermal sensitivity of Antarctic embryos and larvae: effects of temperature on metabolism, developmental rate, and the metabolic cost of development
Rotella, Jay	B-009-M	The consequences of maternal effects and environmental conditions on offspring success in an Antarctic predator
Watters, George	B-006-L	NOAA / AMLR
Yager, Patricia	B-465-N	NSFGEO-NERC: Accelerating Thwaites Ecosystem Impacts for the Southern Ocean (ARTEMIS)

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Principal Investigator	Event No.	Project Title
Kemerait, Robert	G-078-M	Dry Valley seismic project
Kromer, Edward	G-090-P	Global seismograph station at South Pole, Scott Base, and Palmer stations
Wilson, Terry	G-079-M	Investigating ice sheet - solid Earth feedbacks in West Antarctica: implications for ice sheet evolution and stability

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Glaciology

Principal Investigator	Event No.	Project Title
Banwell, Alison	I-151-E	Ice-shelf instability caused by active surface meltwater production, movement, ponding, and hydrofracture
Christianson, Knut	I-175-M/S	Ice dynamics at the intersection of the West and East Antarctic Ice Sheets
Greenbaum, Jamin	I-122-E	RAPID: International collaborative airborne sensor deployments near Antarctic ice shelves

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Ocean and Atmospheric Sciences

Principal Investigator	Event No.	Project Title
Butler, James	O-257-M/S	South Pole monitoring for climatic change: U.S. Department of Commerce NOAA Global Monitoring Division (GMD)
Butler, James	O-264-P	Collection of atmospheric air for the NOAA/GMD worldwide flask-sampling network
Butler, James	O-257-M/S	UV measurements at McMurdo Station for the NOAA/Global Monitoring Division (GMD) Antarctic UV network
Chereskin, Teresa	O-317-L	Southern Ocean current observations from the U.S. Antarctic research vessels
Lazzara, Matthew	O-283-M	Collaborative Research: Antarctic automatic weather station program, 2019-2022
Sprintall, Janet	O-260-L	High-resolution underway air-sea observations in Drake Passage for climate science

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Integrated System Science

Principal Investigator	Event No.	Project Title
Cimino, Megan	C-013-N/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Friedlaender, Ari	C-024-N/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Gooseff, Michael	C-505-M	McMurdo LTER – Limnology: ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Moffat, Carlos	C-021-N	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Pettit, Erin	C-445-M/N	Thwaites-Amundsen Regional Survey and Network (TARSAN): integrating atmosphere-ice-ocean processes affecting the sub-ice-shelf environment
Schofield, Oscar	C-019-N	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Steinberg, Deborah	C-020-N	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Tulaczyk, Slawek	C-446-E/M	Thwaites Interdisciplinary Margin Evolution (TIME): the role of shear margin dynamics in the future evolution of the Thwaites Drainage Basin

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Van Mooy, Benjamin	C-045-N	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Wellner, Julia	C-447-N	Stability and instability: records of external drivers and the resulting behavior of Thwaites Glacier

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Amundsen-Scott South Pole Station

Principal Investigator	Event No.	Project Title
Bristow, William	A-369-M/S	Antarctic and conjugate research using SuperDARN
Butler, James	O-257-M/S	South Pole monitoring for climatic change: U.S. Department of Commerce NOAA Global Monitoring Division (GMD)
Butler, James	O-257-M/S	UV measurements at McMurdo Station for the NOAA/Global Monitoring Division (GMD) Antarctic UV network
Carlstrom, John	A-379-S	Cosmological research with the 10-meter South Pole Telescope
Christianson, Knut	I-175-M/S	Ice dynamics at the intersection of the West and East Antarctic Ice Sheets
Conde, Mark	A-343-M/S	High-resolution mapping of thermospheric wind and temperature fields near the equatorward edge of the Antarctic polar cap
Gerrard, Andrew	A-111-M/P/S	The next generation of Geospace research facilities at South Pole and McMurdo Stations
Halzen, Francis	A-333-S	Management and operation of the IceCube Neutrino Observatory 2016-2021
Hartinger, Michael	A-110-M/S	NSFGEO-NERC: Conjugate experiment to investigate sources of high-latitude magnetic perturbations in coupled solar wind-magnetosphere-ionosphere-ground system
Kovac, John	A-149-S	Imaging the beginning of time from the South Pole: the next stage of the BICEP program
LaBelle, James	A-128-S	Auroral kilometric radiation, substorms, and related phenomena: satellite conjunction and conjugate studies at South Pole
Seunarine, Surujhdeo	A-118-S	Element composition of high-energy solar particles
Taylor, Michael	A-119-M/S	Continental-scale studies of

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		Mesospheric dynamics using the Antarctic Gravity Wave Instrument Network (ANGWIN)

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McMurdo Station

Principal Investigator	Event No.	Project Title
Anderson, Kent	T-299-M	IRIS/PASSCAL seismic support
Ballard, Grant	B-200-M	Population growth at the southern extreme: effects of early life conditions on Adélie penguin individuals and colonies
Blom, Lukas	T-396-M	Operation and maintenance of a CTBT class infrasound array at Windless Bight
Bristow, William	A-369-M/S	Antarctic and conjugate research using SuperDARN
Butler, James	O-257-M/S	South Pole monitoring for climatic change: U.S. Department of Commerce NOAA Global Monitoring Division (GMD)
Butler, James	O-257-M/S	UV measurements at McMurdo Station for the NOAA/Global Monitoring Division (GMD) Antarctic UV network
Christianson, Knut	I-175-M/S	Ice dynamics at the intersection of the West and East Antarctic Ice Sheets
Chu, Xinzhao	A-123-M	Simultaneous sodium doppler and iron Boltzmann LiDAR observations and modeling of the middle and upper atmosphere at McMurdo Station, Antarctica
Conde, Mark	A-343-M/S	High-resolution mapping of thermospheric wind and temperature fields near the equatorward edge of the Antarctic polar cap
Courville, Zoe	T-940-M	Cold Regions Research and Engineering Laboratory (CRREL) activities
Franco, Hugo	A-145-M	NASA Long Duration Balloon (LDB) support program
Gerrard, Andrew	A-111-M/P/S	The next generation of Geospace research facilities at South Pole and McMurdo Stations
Gooseff, Michael	C-505-M	McMurdo LTER – Limnology: ecosystem response to amplified

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		landscape connectivity in the McMurdo Dry Valleys, Antarctica
Harris, Mark	T-927-M	NASA / McMurdo Ground Station (MG1)
Hartinger, Michael	A-110-M/S	NSFGEO-NERC: Conjugate experiment to investigate sources of high-latitude magnetic perturbations in coupled solar wind-magnetosphere-ionosphere-ground system
Kemerait, Robert	G-078-M	Dry Valley seismic project
Lazzara, Matthew	O-283-M	Collaborative Research: Antarctic automatic weather station program, 2019-2022
Moran, Amy	B-307-M	Thermal sensitivity of Antarctic embryos and larvae: effects of temperature on metabolism, developmental rate, and the metabolic cost of development
Palo, Scott	A-284-M	Lower thermospheric science using new meteor radar at McMurdo Station
Pettit, Erin	C-445-M/N	Thwaites-Amundsen Regional Survey and Network (TARSAN): integrating atmosphere-ice-ocean processes affecting the sub-ice-shelf environment
Pettit, Joseph	T-295-M	UNAVCO high-precision GPS and ground-based light detection and ranging (LiDAR) support
Rotella, Jay	B-009-M	The consequences of maternal effects and environmental conditions on offspring success in an Antarctic predator
Taylor, Michael	A-119-M/S	Continental-scale studies of Mesospheric dynamics using the Antarctic Gravity Wave Instrument Network (ANGWIN)
Tulaczyk, Slawek	C-446-E/M	Thwaites Interdisciplinary Margin Evolution (TIME): the role of shear margin dynamics in the future evolution of the Thwaites Drainage Basin
Wilson, Terry	G-079-M	Investigating ice sheet - solid Earth feedbacks in West Antarctica: implications for ice sheet evolution and stability

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Palmer Station

Principal Investigator	Event No.	Project Title
Bernard, Kim	B-459-L/N/P	The omnivore's dilemma: The effect of autumn diet on winter physiology and condition of juvenile Antarctic krill
Butler, James	O-264-P	Collection of atmospheric air for the NOAA/GMD worldwide flask-sampling network
Cimino, Megan	C-013-N/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Friedlaender, Ari	C-024-N/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Gerrard, Andrew	A-111-M/P/S	The next generation of Geospace research facilities at South Pole and McMurdo Stations
Hosticka, Bouvard	T-998-P	Operation and maintenance of a CTBT radionuclide monitoring station at Palmer Station
Kromer, Edward	G-090-P	Global seismograph station at South Pole, Scott Base, and Palmer stations

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Principal Investigator	Event No.	Project Title
Bernard, Kim	B-459-L/N/P	The omnivore's dilemma: The effect of autumn diet on winter physiology and condition of juvenile Antarctic krill
Cimino, Megan	C-013-N/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Friedlaender, Ari	C-024-N/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Huckstadt, Luis	B-038-N	NSFGEO-NERC Collaborative Research: Effects of a changing climate on the habitat utilization, foraging ecology and distribution of crabeater seals
Hummon, Julia	T-933-L/N	University of Hawaii Data Acquisition System (UHDAS) support
Moffat, Carlos	C-021-N	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Pettit, Erin	C-445-M/N	Thwaites-Amundsen Regional Survey and Network (TARSAN): integrating atmosphere-ice-ocean processes affecting the sub-ice-shelf environment
Schofield, Oscar	C-019-N	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Steinberg, Deborah	C-020-N	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced

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		pelagic ecosystem
Van Mooy, Benjamin	C-045-N	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Wellner, Julia	C-447-N	Stability and instability: records of external drivers and the resulting behavior of Thwaites Glacier
Yager, Patricia	B-465-N	NSFGEO-NERC: Accelerating Thwaites Ecosystem Impacts for the Southern Ocean (ARTEMIS)

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Principal Investigator	Event No.	Project Title
Bernard, Kim	B-459-L/N/P	The omnivore's dilemma: The effect of autumn diet on winter physiology and condition of juvenile Antarctic krill
Chereskin, Teresa	O-317-L	Southern Ocean current observations from the U.S. Antarctic research vessels
Hummon, Julia	T-933-L/N	University of Hawaii Data Acquisition System (UHDAS) support
Krause, Douglas	X-591-L	Cape Shirreff
Sprintall, Janet	O-260-L	High-resolution underway air-sea observations in Drake Passage for climate science
Watters, George	B-006-L	NOAA / AMLR

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Special Projects

Principal Investigator	Event No.	Project Title
Banwell, Alison	I-151-E	Ice-shelf instability caused by active surface meltwater production, movement, ponding, and hydrofracture
Eppley, Dr. Sarah	B-289-E	Exploring the functional role of plants during terrestrial succession
Greenbaum, Jamin	I-122-E	RAPID: International collaborative airborne sensor deployments near Antarctic ice shelves
Tulaczyk, Slawek	C-446-E/M	Thwaites Interdisciplinary Margin Evolution (TIME): the role of shear margin dynamics in the future evolution of the Thwaites Drainage Basin

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Project Detail

Project Title

IRIS/PASSCAL Seismic Support

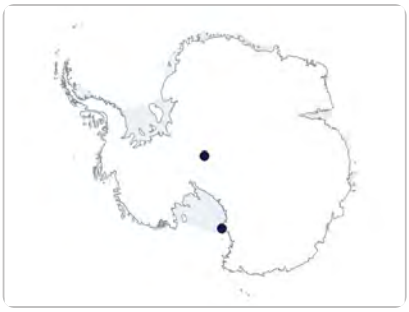
Summary

Event Number:
T-299-M
NSF EAR 1261681

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
John Rand / Jenny Cunningham

Principal Investigator(s)



Mr. Kent Anderson
kent@iris.edu
Incorporated Research Institutions for Seismology
Socorro, New Mexico

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

Location

Supporting Stations: McMurdo Station
Research Locations: Various West Antarctic sites

Description

The Incorporated Research Institutions for Seismology (IRIS) Program for Array Seismic Studies of the Continental Lithosphere (PASSCAL) Instrument Center supports NSF/OPP-funded projects. PASSCAL provides OPP support through: 1) equipment testing as it arrives on continent and rapid deployment to the field; 2) training to researchers; 3) on-continent instrument troubleshooting, performance evaluation, and data QC; 4) assisting researchers with data backup and archiving; and 5) field support, including installation and maintenance as required. Each year, the facility provides instrumentation and support to NSF-funded seismological projects while also developing cold-station deployment strategies, collaborating with vendors to develop and test equipment rated -55° C / -67° F, building an equipment pool, and creating a coldstation techniques repository. The team has been tasked by NSF with installing and maintaining a five-station permanent network on Mount Erebus (see T-312).

Field Season Overview

Due to NSF COVID-19 deployment restrictions, T-299-M/S field support has been reduced for the 2021-22 season. One PASSCAL polar field engineer will deploy to provide equipment and field support for Wilson/POLENET (G-079-M) and also provide equipment for Tulaczyk/TIME (C-446-M).

Deploying Team Members

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- Avilash Cramer
- Madeline Hunt
- Carlos Villanueva

2021-2022 USAP Field Season
Project Detail

Project Title

Antarctic And Conjugate Research Using SuperDARN

Summary

Event Number:
A-369-M/S
NSF/OPP Award 2035105

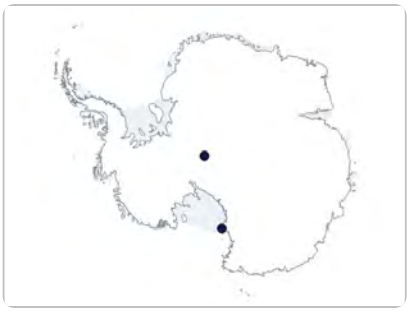
Program Manager:
Dr. Robert Moore

ASC POC/Implementer:
John Rand / Paul Sullivan / Sheryl Seagraves

Principal Investigator(s)

Dr. William Bristow
wab5217@psu.edu
Pennsylvania State University
Fairbanks, Alaska

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



Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: Arrival Heights, B2 Laboratory, and CUSP Antenna Field

Description

The Super Dual Auroral Radar Network (SuperDARN) is a global, international radar network of 32 installations observing high-frequency (HF) bands between eight and 22 MHz. These systems help answer questions about the geomagnetic conjugacy of global magnetic storms and substorms, and the differences in ionospheric plasma convection caused by the asymmetry of solar illumination in both hemispheres. The SuperDARN network can observe global-scale convection with excellent temporal and spatial resolution, which makes it a powerful tool for ground-based research, enabling scientists to address fundamental and important questions of space physics. The data it acquires are also relevant to space-weather studies and enhance the usefulness of data from other instruments.

Field Season Overview

The instrumentation for this project consists of receivers and transmitters located at the Arrival Heights Antarctic Specially Protected Area (ASPA) adjacent to McMurdo Station and in the quiet sector adjacent to South Pole Station. The equipment runs continuously year-round, essentially autonomously, with only limited intervention required by personnel onsite and by the researchers via the internet. No participants will be deploying, however, onsite research associates will provide monitoring, troubleshooting, and the collection and forwarding of data at each site as needed throughout the year.

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Project Title

Simultaneous Sodium Doppler And Iron Boltzmann LiDAR Observations And Modeling Of The Middle And Upper Atmosphere At McMurdo Station, Antarctica

Summary

Event Number:
A-123-M
NSF/OPP Award 2110428

Program Manager:
Dr. Robert Moore

ASC POC/Implementer:
John Rand / Richard Dean

Principal Investigator(s)

Dr. Xinzhao Chu
xinzhao.chu@colorado.edu
University of Colorado Boulder
CIRES
Boulder, Colorado

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

Location

Supporting Stations: McMurdo Station
Research Locations: Arrival Heights - ANZ Lab C

Description

Researchers on this project operate two narrow-band, multi-frequency Doppler LiDARs at McMurdo Station. These LiDARs can make high-resolution observations of winds and temperatures in the middle and upper atmosphere. Simultaneous observations by the two instruments - a sodium LiDAR and an iron Boltzmann LiDAR - provide unprecedented levels of detail to characterize atmospheric conditions. The instruments have been hosted by Antarctica New Zealand (ANZ) in their Arrival Heights laboratory since late 2010. The observations provide critical data to address key science challenges associated with the space-atmosphere interaction region and, in particular, the sparsely observed high-latitude southern hemisphere.

Field Season Overview

The A-123-M LiDAR project is in long-term shutdown to minimize station population and the risk of introducing COVID-19 to the Antarctic continent. No LiDAR team members are planned to be deployed and no data is planned to be collected during the austral summer of 2021-2022. However, Mr. Nikolas Sinkola on event number T-927-M will maintain the two LiDAR systems at Arrival Heights during this time. The project will rely on the Crary Laboratory research associate for this support during the following austral winter.

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2021-2022 USAP Field Season
Project Detail

Project Title

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

Summary

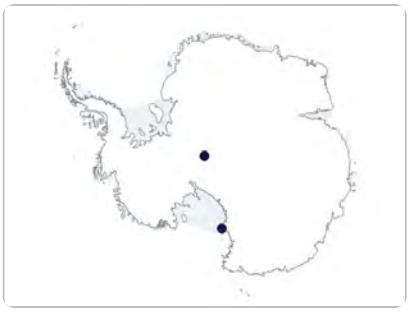
Event Number:
A-343-M/S
NSF/OPP Award 2029459

Program Manager:
Dr. Robert Moore

ASC POC/Implementer:
John Rand / Paul Sullivan / Sheryl Seagraves

Principal Investigator(s)

Dr. Mark Gerard Conde
mgconde@alaska.edu
University of Alaska Fairbanks
Physics Department
Fairbanks, Alaska



Project Web Site:

http://sdi_server.gi.alaska.edu/sdiweb/index.asp

Location

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

Description

This project operates and maintains ground-based Fabry-Perot spectrometers at McMurdo Station and South Pole Station. The instruments measure mesospheric and thermospheric neutral winds and temperatures at heights of around 87 km, 120 km, and 240 km. The study will address both large-scale changes in mean flow and small-scale local perturbations, and it will independently resolve impacts due to forcing from above and from below. Existing instruments will be upgraded by adding a capability to measure winds and temperatures at mesopause heights. The study will be supported by collaborative data from existing mesospheric temperature mapper and SuperDARN radar instruments in Antarctica and will, in turn, provide neutral wind and temperature data for use by our collaborators.

Field Season Overview

One participant will deploy to service the equipment this season. The objective will be to perform urgent maintenance plus minor upgrades. This will involve work on the instruments inside their respective labs at Arrival Heights near McMurdo Station and in the ARO building at South Pole Station. No off-station fieldwork is required. Onsite research associates will provide monitoring, troubleshooting, and the collection and forwarding of data as needed throughout the year.

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Deploying Team Members

- Kylee Branning

2021-2022 USAP Field Season
Project Detail

Project Title

NASA Long Duration Balloon (LDB) Support Program

Summary

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

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
John Rand / Kaija Webster / Chad Naughton

Principal Investigator(s)

Mr. Hugo Franco
Hugo.Franco@nasa.gov
Columbia Scientific Balloon Facility
Palestine, Texas

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

Location

Supporting Stations: McMurdo Station
Research Locations: Long Duration Balloon Facility

Description

Due to the ongoing COVID-19 pandemic, no scientific balloon launches are scheduled at LDB for the 2021-22 season. A small team from the Columbia Scientific Balloon Facility (CSBF), along with the Antarctic Support Contract (ASC) LDB manager, will deploy to McMurdo Station this season to ensure the LDB facility and infrastructure receive the critical inspections, upgrades, and maintenance required to support a full launch season in the 2022-23 season.

Field Season Overview

Five participants will deploy to McMurdo Station to complete inspections and maintenance on Columbia Scientific Balloon Facility (CSBF) assets at LDB. This work will include repairing the launch vehicle and loader, inspecting the helium stores, retrograding equipment, and recovering SuperTIGER2 flight computers. ASC will deploy the LDB facility manager/implementer to McMurdo Station to support CSBF in completing its season objectives, coordinate and support the planned ASC facility upgrades, and prepare the facility for full return to launch capabilities in the 2022-23 season.

Deploying Team Members

- Scott Battaion
- Garrison Breeding
- Corey Weber
- Kaija Webster

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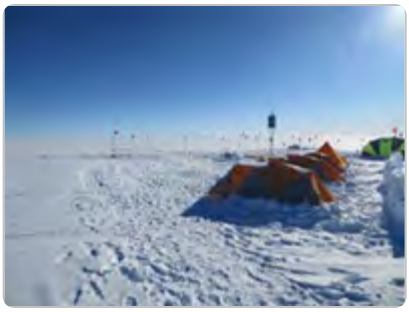
- Randall McDonald

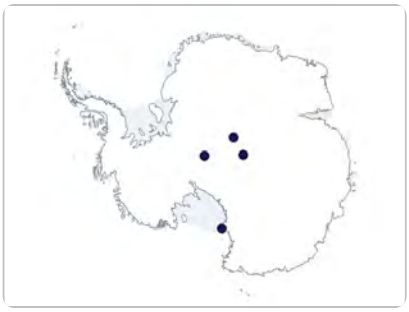
2021-2022 USAP Field Season
Project Detail

Project Title

NSFGEO-NERC: Conjugate Experiment To Investigate Sources Of High-Latitude Magnetic Perturbations In Coupled Solar Wind-Magnetosphere-Ionosphere-Ground System

Summary





Event Number:
A-110-M/S
NSF/OPP Award 2027210

Program Manager:
Dr. Robert Moore

ASC POC/Implementer:
Judy Shiple / Jenny Cunningham / Paul Sullivan

Principal Investigator(s)

Dr. Michael David Hartinger
mdhartin1@gmail.com
Space Science Institute
Encino, California

Project Web Site:
http://mist.nianet.org/

Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: PG0, PG2

Description

This collaborative research project is jointly funded by NSF and the National Environment Research Council of the United Kingdom. Researchers will conduct focused scientific investigations to develop an understanding of the sources of high-latitude magnetic perturbations in the multi-scale, global, solar wind - magnetosphere – ionosphere – ground (SWMIG) system, including during the 2021 solar eclipse. These objectives will be achieved through a network of magnetometers in Antarctica and the Northern Hemisphere near the 40-degree magnetic meridian. The work will include education and outreach efforts.

Field Season Overview

Two participants will deploy to McMurdo and South Pole stations in mid-November, 2021. The team will make day trips from South Pole Station to the PG2 site to service and repair instruments. The overarching goals are to (1) diagnose and repair the magnetometer at site PG2 to enable scientific investigations related to the eclipse on December 4, and (2) if possible, to repair the partially functioning magnetometer at site PG0 by replacing a severed GPS cable and outdated antenna. The team will likely be able to accomplish the repairs at PG2 and PG0 with two to three day-trips.

Deploying Team Members

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- Shane Coyle
- Michael Hartinger (PI)

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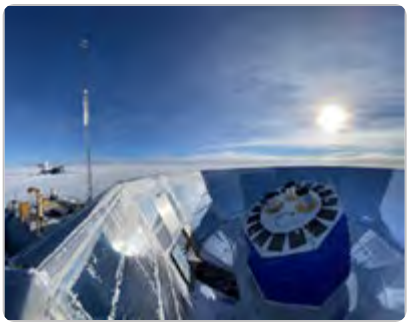
Project Detail

Project Title

Imaging The Beginning Of Time From The South Pole: The Next Stage Of The BICEP Program

Summary

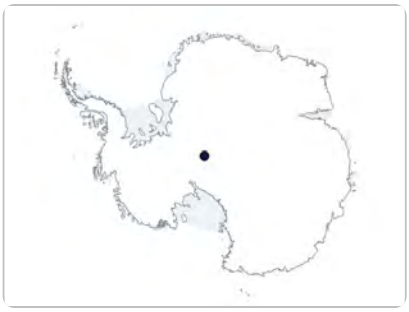


Event Number:
A-149-S
NSF/OPP Award 1638957

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Paul Sullivan / Sheryl Seagraves / Leah Street

Principal Investigator(s)



Dr. John Kovac
jmkovac@cfa.harvard.edu
Harvard University
Department of Astronomy
Cambridge, Massachusetts

Project Web Site:
http://bicepkeck.org

Location

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

Description

This project continues the Background Imaging of Cosmic Extragalactic Polarization (BICEP)/Keck/BICEP3 program of observing the cosmic microwave background (CMB) mm-submm radiation, while also initiating the phased upgrade to the BICEP Array of four newly developed receivers. This upgrade follows the tradition of improving upon the previous generation's detectors: the Digital Angular Scale Interferometer (DASI), the Small Polarimeter Upgrade for DASI (SPUD), and, most recently, the BICEP/Keck Array.

Field Season Overview

Six participants will deploy to the South Pole. The two winter-over team members currently onsite will remain there to train their two replacements. The goals for the season will include replacing detector tiles in BICEP Array1 and continuing support of the BICEP3 experiment.

Deploying Team Members

- Brandon Amat
- James Cheshire IV
- Alessandro Schillaci
- Calvin Tsai

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- James Cornelison
- Thomas Leps
- Karsten Look
- Ahmed Mohamed
- Cyndia Yu
- Cheng Zhang
- Silvia Zhang

2021-2022 USAP Field Season
Project Detail

Project Title

Thermal Sensitivity Of Antarctic Embryos And Larvae: Effects Of Temperature On Metabolism, Developmental Rate, And The Metabolic Cost Of Development

Summary

Event Number:
B-307-M
NSF/OPP Award 1745130

Program Manager:
Dr. Karla Heidelberg

ASC POC/Implementer:
Jenny Cunningham / Dave Ferris

Principal Investigator(s)

Dr. Amy Moran
morana@hawaii.edu
University of Hawaii Manoa
Department of Biology
Honolulu, Hawaii

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

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo Station sea ice

Description

Cold-blooded animals (ectotherms) in the Antarctic ocean have survived in near-constant cold conditions for millions of years and are sensitive to even small changes in water temperature. However, the consequences of this thermal sensitivity for the energetics, development, and survival of developing embryos is not well understood. Researchers will investigate the effect of temperature on the metabolism, growth rate, developmental rate, and developmental energetics of embryos and larvae of Antarctic marine ectotherms. The project will also measure annual variations in temperature and oxygen at different sites in McMurdo Sound and compare embryonic and larval metabolism in winter and summer to determine the extent to which these life stages can acclimate to seasonal shifts. This research will provide insight into the ability of polar marine animals and ecosystems to withstand warming conditions.

Field Season Overview

Three team members will deploy to McMurdo Station in early October. They will use PistenBullys to access diving sites around McMurdo Sound and will travel via helicopter on day trips to New Harbor and Granite Harbor, where they will deploy and collect dataloggers and collect marine invertebrates. They will maintain collected specimens in the Crary Laboratory aquarium and conduct analyses in the lab. One team member will redeploy in early December, with two remaining through February to monitor long-term experiments. ASC personnel will assist with additional sample measurements over winter, as time

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allows.

Deploying Team Members

- Graham Lobert
- Amy Moran (PI)
- Ming-Wei Toh

2021-2022 USAP Field Season
Project Detail

Project Title

The Consequences Of Maternal Effects And Environmental Conditions On Offspring Success In An Antarctic Predator

Summary

Event Number:
B-009-M
NSF/OPP Award 1640481

Program Manager:
Dr. Karla Heidelberg

ASC POC/Implementer:
Jenny Cunningham / Dave Ferris

Principal Investigator(s)

Dr. Jay Rotella
rotella@montana.edu
Montana State University Bozeman
Ecology
Bozeman, Montana

Project Web Site:
http://www.montana.edu/weddellseals/ ;
http://weddellsealscience.com/

Location

Supporting Stations: McMurdo Station
Research Locations: Erebus Bay

Description

The consequences of variations in maternal effects on the ability of offspring to survive, reproduce, and contribute to future generations have rarely been evaluated in polar marine mammals. This is because of inadequate data on the survival and reproductive outcomes of offspring born in diverse environmental conditions to mothers with known and diverse sets of traits. This project will evaluate the survival and reproductive consequences of early-life environmental conditions and offspring traits related to maternal attributes (e.g. birth date, birth mass, weaning mass, and swimming behavior) in a population of individually marked Weddell seals in the Ross Sea.

Field Season Overview

Support scope is reduced this season due to COVID-19 impacts. Three participants will deploy to McMurdo Station in early October 2021 and will redeploy in mid-December 2021. The team will make day trips from McMurdo onto the sea ice to find, tag, and weigh seal pups with their mothers. They will work out of two "Apple" shelters placed near Big Razorback Island and Turtle Rock. The team will also make four to five helicopter trips to survey seal colonies and locate pups.

Deploying Team Members

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- Parker Levinson
- Evan Shields
- Victor Villalobos

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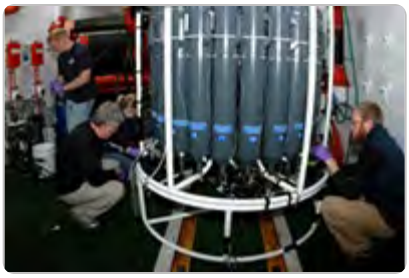
Project Detail

Project Title

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

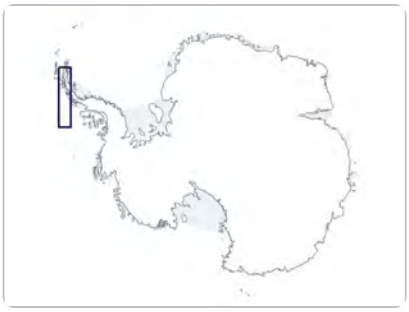
Summary



Event Number:
C-019-N
NSF/OPP Award 1440435

Program Manager:
Dr. Francisco (Paco) Moore / Dr. Karla Heidelberg

ASC POC/Implementer:
Samina Ouda / Bruce Felix



Principal Investigator(s)

Dr. Oscar Schofield
oscar@marine.rutgers.edu
Rutgers University
Institute for Marine & Coastal Sciences
New Brunswick, New Jersey

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

Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: Palmer Station and Western Antarctic Peninsula

Description

Palmer Long-Term Ecological Research (PAL-LTER) started in 1990 to address the hypothesis that the annual sea-ice cycle may be the major determinant of spatial/temporal changes in the structure and function of Antarctic marine communities. Research now includes bacteria, viruses, phytoplankton, krill, macrozooplankton, penguins, seabirds, and marine mammals. The PAL-LTER model traces the effects of changing climate and the extent, duration, and seasonality of sea ice on ecosystem composition and dynamics in the Western Antarctic Peninsula, where satellite observations over the past 35 years indicate the average duration of sea ice cover is now about 90 days shorter. Six collaborative projects on the RV/IB Nathaniel B. Palmer cruise and at Palmer Station will use moorings, numerical modeling, oceanographic cruises, and environmental sampling to address core hypotheses.

Field Season Overview

Five participants will sail on the RV/IB Nathaniel B. Palmer to the LTER research grid in the West Antarctic Peninsula region. At sea, they will use conductivity-temperature-depth (CTD) casts, bio-optical profiling instruments, and autonomous gliders. They will also collect data from moored sediment traps and physical oceanographic moorings and use other profiling sensors to assess phytoplankton community structure and abundance.

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Underway seawater filtration, 14C radioisotope work, and on-deck incubation experiments will be undertaken to investigate the stress responses of phytoplankton throughout the Western Antarctic Peninsula.

Deploying Team Members

- Quintin Diou-Cass
- Carlos Moffat
- Oscar Schofield (PI)
- Jessie Turner

2021-2022 USAP Field Season
Project Detail

Project Title

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

Summary

Event Number:
O-260-L
NSF/OPP Award 2001646

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
Rachel Shackelford / Bruce Felix

Principal Investigator(s)

Dr. Janet Sprintall
jsprintall@ucsd.edu
Scripps Institution of Oceanography
Physical Oceanography Research Division
La Jolla, California

Project Web Site:
http://www.hrx.ucsd.edu/ax22.html

Location

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

Description

In collaboration with Chereskin (O-217-L), this project continues a long-term study of ocean properties and variability in the Antarctic Circumpolar Current (ACC) by repeat transects across the Drake Passage from Punta Arenas, Chile to Palmer Station. This aspect of the project measures the seasonal to interannual variability of upper-ocean temperature and geostrophic transport through the Drake Passage with closely spaced eXpendable BathyThermograph (XBT) deployments.

Field Season Overview

This project continues the collection, quality control and public dissemination of the XBT, Acoustic Doppler Current Profiler (ADCP), and other underway data on the ARSV Laurence M. Gould. For 2021-22, Drake Passage Surveys, will be supported outside of foreign Exclusive Economic Zones (EEZs) on two crossings.

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Project Detail

Project Title

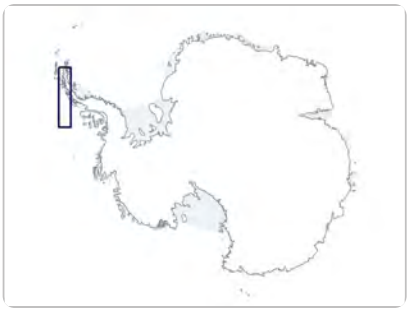
Palmer, Antarctica Long-Term Ecological Research (LTER): Land-Shelf-Ocean Connectivity, And Ecosystem Resilience And Transformation, In A Sea-Ice Influenced Pelagic Ecosystem

Summary

Event Number:
C-020-N
NSF/OPP Award 1440435

Program Manager:
Dr. Francisco (Paco) Moore / Dr. Karla Heidelberg

ASC POC/Implementer:
Samina Ouda/Bruce Felix



Principal Investigator(s)

Dr. Deborah Steinberg
debbies@vims.edu
Virginia Institute of Marine Sciences
Department of Biological Sciences
Gloucester Point, Virginia

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

Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: Palmer Station and Western Antarctic Peninsula

Description

Palmer Long-Term Ecological Research (PAL-LTER) started in 1990 to address the hypothesis that the annual sea-ice cycle may be the major determinant of spatial/temporal changes in the structure and function of Antarctic marine communities. Research now includes bacteria, viruses, phytoplankton, krill, macrozooplankton, penguins, seabirds, and marine mammals. The PAL-LTER model traces the effects of changing climate and the extent, duration, and seasonality of sea ice on ecosystem composition and dynamics in the Western Antarctic Peninsula, where satellite observations over the past 35 years indicate the average duration of sea ice cover is now about 90 days shorter. Six collaborative projects on the RV/IB Nathaniel B. Palmer cruise and at Palmer Station will use moorings, numerical modeling, oceanographic cruises, and environmental sampling to address core hypotheses.

Field Season Overview

In this zooplankton component of the LTER, a team of five researchers will sail on the RV/IB Nathaniel B. Palmer (NBP) to the LTER research grid west of the Antarctic Peninsula. The team will collect data with a conductivity-temperature-depth (CTD) rosette and from the NBP's hull-mounted EK60 sonar system, and each study station will consist of approximately three net tows. The team will also collect and sort live zooplankton,

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conduct microscope work, and preserve samples in formalin.

Deploying Team Members

- Joseph Cope
- Andrew Corso
- Tor Mowatt-Larssen
- Meredith Nolan
- Maya Thomas

2021-2022 USAP Field Season
Project Detail

Project Title

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

Summary

Event Number:
A-119-M/S
NSF/OPP Award 2029318

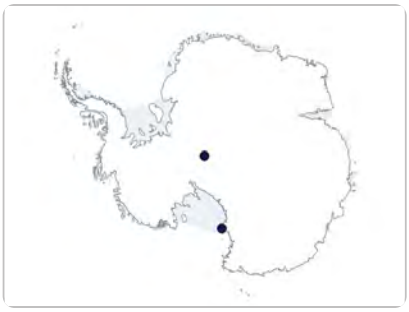
Program Manager:
Dr. Robert Moore

ASC POC/Implementer:
John Rand / Paul Sullivan / Sheryl Seagraves

Principal Investigator(s)

Dr. Michael J Taylor
mike.taylor@usu.edu
Utah State University
Center for Atmospheric and Space Sciences
Logan, Utah

Project Web Site:
http://digitalcommons.usu.edu/ail/



Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: Amundsen-Scott South Pole Station - B2 Laboratory

Description

The Antarctic Gravity Wave Imaging Network (ANGWIN) is a cooperative effort between six international Antarctic programs to collect continent-wide gravity wave measurements. This network capitalizes on existing optical and radar measurement capabilities at McMurdo, South Pole, and six other research stations: Halley (UK), Syowa (Japan), Davis (Australia), Rothera (UK), and Ferraz (Brazil). Infrared, all-sky, mesospheric hydroxyl imagers are installed at Davis, McMurdo, and Halley stations. The network quantifies the properties, variability, and momentum fluxes of short-period mesospheric gravity waves and their dominant sources and effects over the Antarctic continent. Measurements at South Pole focus on quantifying the temperature signatures of gravity waves deep within the polar vortex and on complementing the ANGWIN sites around the continent.

Field Season Overview

The instruments for this project, an all-sky airglow imager and an advanced mesospheric temperature mapper (AMTM), are located on the B2 mezzanine at South Pole Station. They run continuously during the dark periods of winter, essentially autonomously, with only limited intervention required by an onsite research associate and by the science party via the internet. One participant will deploy from mid-January until early February to service instruments at both South Pole and McMurdo stations.

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Deploying Team Members

- Pierre-Dominique Pautet
  (Co-PI)

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Ocean and Atmospheric Sciences

Principal Investigator	Event No.	Project Title
Butler, James	O-257-M/S	South Pole monitoring for climatic change: U.S. Department of Commerce NOAA Global Monitoring Division (GMD)
Butler, James	O-264-P	Collection of atmospheric air for the NOAA/GMD worldwide flask-sampling network
Butler, James	O-257-M/S	UV measurements at McMurdo Station for the NOAA/Global Monitoring Division (GMD) Antarctic UV network
Chereskin, Teresa	O-317-L	Southern Ocean current observations from the U.S. Antarctic research vessels
Lazzara, Matthew	O-283-M	Collaborative Research: Antarctic automatic weather station program, 2019-2022
Sprintall, Janet	O-260-L	High-resolution underway air-sea observations in Drake Passage for climate science

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Project Title

Population Growth At The Southern Extreme: Effects Of Early Life Conditions On Adélie Penguin Individuals And Colonies

Summary

Event Number:
B-200-M
NSF/OPP Award 1935870

Program Manager:
Dr. Karla Heidelberg

ASC POC/Implementer:
Jenny Cunningham

Principal Investigator(s)

Dr. Grant Ballard
gballard@pointblue.org
Point Reyes Bird Observatory
San Francisco, California

Location

Supporting Stations: McMurdo Station
Research Locations: Cape Crozier, Cape Royds

Description

In the Ross Sea region, one of the largest Adélie penguin colonies in the world is growing quickly, despite signs of negative density dependence. Building on a long-term biologging and demographic datasets, this team will integrate the role of environmental factors with information on penguin foraging behavior, diet, growth, and survival at Cape Crozier and Cape Royds. Data will be used to evaluate how early-life conditions and penguin behavior relate to penguin energetics and population size. Results from this study will enhance the scientific understanding of important penguin and prey populations and provide important information that will feed into the conservation of sea-ice ecosystems. The team will also lead a diverse training and public outreach program.

Field Season Overview

The support scope for this season is reduced due to COVID-19 impacts. Five participants will deploy over the course of the season. The group will occupy the hut at Cape Crozier and conduct penguin monitoring activities there, with occasional day trips to work in the colony at Cape Royds. Field activities will include installing weighbridges, re-sighting banded birds, drone surveys, and following birds through incubation and chick-rearing into late January. The group will also attach GPS tags and dive recorders on adults and juveniles.

Deploying Team Members

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- Grant Ballard (PI)
- Megan Elrod (Team Leader)
- Anne Schmidt (Co-PI)
- Anne Schmidt (Co-PI)
- Suzanne Winquist

2021-2022 USAP Field Season
Project Detail

Project Title

Ice-Shelf Instability Caused By Active Surface Meltwater Production, Movement, Ponding, And Hydrofracture

Summary

Event Number:
I-151-E
NSF/OPP Award 1841607

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Samina Ouda / Cara Ferrier

Principal Investigator(s)

Dr. Alison Banwell
alison.banwell@colorado.edu
University of Colorado Boulder
CIRES
Boulder, Colorado

Location

Supporting Stations: Special Project
Research Locations: George VI Ice Shelf

Description

This project is a collaboration with a UK Natural Environment Research Council (NERC)-supported scientist with field support from the British Antarctic Survey (BAS). The objective is to investigate how surface meltwater production could drive ice-shelf breakup, similar to the type Larson B demonstrated prior to its collapse. The proposal aims to study break-up by investigating the George VI Ice shelf, which is currently forming surface melt ponds but is in a somewhat stable condition because of its compressional-ice-flow configuration. This work builds on understanding from the team's previous McMurdo Ice Shelf project and focuses on understanding ice-shelf collapse dynamics through a study of (1) ice-shelf flexure and fracturing, (2) surface melt and hydrology, (3) small-scale ponding and drainages, and (4) process-scale modeling of ice-shelf flexure, fracture, and hydrology.

Field Season Overview

This project will have three science team members plus one BAS field mountaineer deploying to the George VI Ice Shelf on the Antarctic Peninsula. BAS will provide field and safety gear, communications, and other support. The U.S. Antarctic Program will provide cargo support for the team. Once the team members arrive at Rothera Station and complete the required safety courses, they will be flown to Fossil Bluff Station in early November for approximately three weeks. Fieldwork will be based out of the BAS Fossil Bluff hut and restricted to previously visited field sites within 30 km of Fossil Bluff. As before, the BAS field mountaineer will conduct a safety assessment of all sites. The project seeks to extract firn/ice cores to depths of 10 m to measure seasonal variations in vertical density profiles. These cores will be left in the field. The team will also download data from and service the instruments already deployed. Some instruments that may have been

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damaged due to meltwater will be replaced, as required.

Deploying Team Members

- Laura Stevens
- Ian Willis (Co-PI)

2021-2022 USAP Field Season
Project Detail

Project Title

The Omnivore's Dilemma: The Effect Of Autumn Diet On Winter Physiology And Condition Of Juvenile Antarctic Krill

Summary

Event Number:
B-459-L/N/P
NSF/OPP Award 1753101

Program Manager:
Dr. Karla Heidelberg

ASC POC/Implementer:
Rachel Shackelford / Jamee Johnson

Principal Investigator(s)

Dr. Kim Bernard
kim.bernard@oregonstate.edu
Oregon State University
College of Oceanic and Atmospheric Sciences
Corvallis, Oregon

Location

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

Description

Antarctic krill are essential in the Southern Ocean for supporting marine mammals, seabirds, and fishes. Antarctic krill are also a target species for industrial fisheries. The success of Antarctic krill populations is largely determined by the ability of their young to survive the long, dark winter when food is scarce. To survive the winter, young krill must have a high-quality diet in autumn. However, warming in certain parts of Antarctica is changing the dynamics and quality of the polar food web, resulting in a shift in the available food type. This project will study how warming is affecting young krill survival. The results derived from this work will contribute to the development of improved bioenergetic, population, and ecosystem models and will advance the current scientific understanding of this critical Antarctic species.

Field Season Overview

This project will deploy three people, Kim Bernard and two students, to Palmer Station. The first two field seasons will feature long-term feeding experiments and all three field seasons will include in situ sampling of local krill populations. Krill caught on the southbound voyage in April 2022 will be subjected to four different feeding treatments in the four large aquarium tanks in the Aquarium Room. If no krill are caught on the southbound voyage, the researchers will collect krill near Palmer Station either using the Rigid Hull Inflatable Boat (RHIB), or from the ARSV Laurence M. Gould or RV/IB Nathaniel B. Palmer.

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Deploying Team Members

- Kim Bernard (PI)
- Steinke Kirsten
- Andrea Nodal

2021-2022 USAP Field Season
Project Detail

Project Title

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

Summary

Event Number:
T-396-M
NSF / DTRA Agreement

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
John Rand / Curt LaBombard

Principal Investigator(s)

Mr. Lukas J Blom
ljblom@alaska.edu
University of Alaska Fairbanks
Geophysics Institute
Fairbanks, Alaska

Location

Supporting Stations: McMurdo Station
Research Locations: Windless Bight

Description

This project operates, maintains, upgrades, calibrates, and services the joint U.S. Comprehensive Nuclear Test Ban Treaty (CTBT) infrasound array at Windless Bight. Windless Bight's location on the Ross Ice Shelf is unique for its low wind levels, which makes infrasound detection possible. Infrasound can detect volcanic eruptions, winds over distant mountain ranges, large storms at sea, auroral and meteor events, earthquakes, and avalanches, as well as human-caused events, like large explosions, at great distances from the sound-producing events. Detection of events occurring worldwide are routinely made at the Windless Bight site.

Field Season Overview

T-396 will be combining teams with G-078 this year, and the combined personnel will be working on both projects. Four participants will service the infrasound array and hybrid power system over approximately three weeks. The team will typically stay at the field site but will intermittently return two team members to McMurdo Station for supplies and overnight stays. The site is accessed by snowmobiles and Mattrack vehicles. The U.S. Antarctic Program also provides year-round, onsite support by the Antarctic Support Contract (ASC) research associate, who occasionally visits the site during winter months for maintenance and troubleshooting.

Deploying Team Members

- Steven Bernsen
- Matthew VonLintig

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- Harrison Law
- Dale Pomraning
- Andrew Winkelman

Project Title

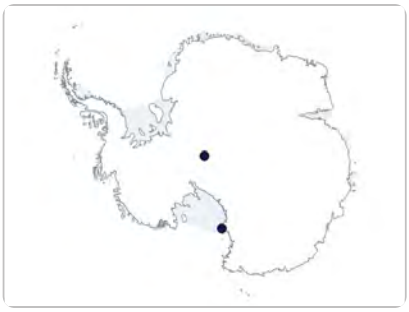
South Pole Monitoring For Climatic Change: U.S. Department Of Commerce NOAA Global Monitoring Division (GMD)

Summary

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

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
John Rand / Paul Sullivan / Sheryl Seagraves



Principal Investigator(s)

Dr. James Hall Butler
james.h.butler@noaa.gov
National Oceanic and Atmospheric Administration
Global Monitoring Division (GMD)
Boulder, Colorado

Location

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

Description

The National Oceanic and Atmospheric Administration (NOAA) Earth System Research Laboratory Global Monitoring Division (ESRL-GMD) will continue long-term measurements of ultra-violet (UV) radiation that influences climate and the ozone layer. The observations are made in conjunction with ongoing worldwide measurements of carbon dioxide, methane, carbon monoxide, aerosols, water vapor, surface and stratospheric ozone, chlorofluorocarbons, and the ozone layer. The measurements are used for time-series analysis of multi-year data focusing on stratospheric ozone depletion;, trans-Antarctic transport and deposition; the interplay of trace-gas aerosols with the solar and terrestrial radiation fluxes on the polar plateau; the magnitude of seasonal and temporal variations in greenhouse gases; and the development of polar stratospheric clouds over Antarctica.

Field Season Overview

At South Pole Station, this project operates a variety of instruments located in the Atmospheric Research Observatory (ARO) and mounted on an adjacent tower. The equipment runs continuously year-round and is operated and maintained by deployed NOAA personnel. A minimum of two NOAA personnel will staff the ARO year-round and perform upgrades, routine maintenance, and operation of the instruments. Project personnel also launch weather balloons daily.

Deploying Team Members

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- Timothy Holland
- Joseph Samaniego
- William Skorski
- James Smith

2021-2022 USAP Field Season
Project Detail

Project Title

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

Summary

Event Number:
O-264-P
NSF / NOAA Agreement

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
John Rand / Jamee Johnson

Principal Investigator(s)

Dr. James Hall Butler
james.h.butler@noaa.gov
National Oceanic and Atmospheric Administration
Global Monitoring Division (GMD)
Boulder, Colorado

Location

Supporting Stations: Palmer Station
Research Locations: Palmer Station

Description

The National Oceanic and Atmospheric Administration (NOAA) Earth System Research Laboratory Global Monitoring Division (ESRL-GMD) will continue long-term measurements of ultra-violet (UV) radiation that influences climate and the ozone layer. The observations are made in conjunction with ongoing worldwide measurements of carbon dioxide, methane, carbon monoxide, aerosols, water vapor, surface and stratospheric ozone, chlorofluorocarbons, and the ozone layer. The measurements are used for time-series analysis of multi-year data focusing on stratospheric ozone depletion;, trans-Antarctic transport and deposition; the interplay of trace-gas aerosols with the solar and terrestrial radiation fluxes on the polar plateau; the magnitude of seasonal and temporal variations in greenhouse gases; and the development of polar stratospheric clouds over Antarctica.

Field Season Overview

No team members will deploy. The Palmer Station research associate provides year-round support for the UV monitoring instruments. Scripps Institution of Oceanography air sampling takes place in Terra Lab, while sampling of halocarbons and other atmospheric trace species (HATS) and carbon-cycle greenhouse gases (CCGG) is performed with a mobile sampling unit at various places around station, depending on wind conditions. A site visit to the NOAA Boulder location is required prior to research associate deployment. Additional training is provided during turnover between research associates at Palmer Station.

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Project Detail

Project Title

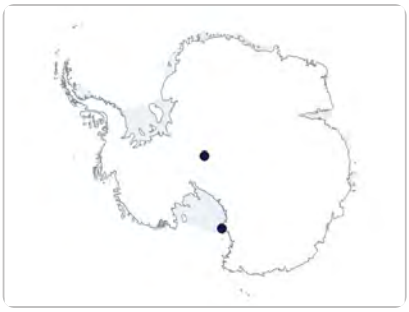
UV Measurements At McMurdo Station For The NOAA/Global Monitoring Division (GMD) Antarctic UV Network

Summary

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

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
John Rand / Paul Sullivan



Principal Investigator(s)

Dr. James Hall Butler
james.h.butler@noaa.gov
National Oceanic and Atmospheric Administration
Global Monitoring Division (GMD)
Boulder, Colorado

Location

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

Description

The National Oceanic and Atmospheric Administration (NOAA) Earth System Research Laboratory Global Monitoring Division (ESRL-GMD) will continue long-term measurements of ultra-violet (UV) radiation that influences climate and the ozone layer. The observations are made in conjunction with ongoing worldwide measurements of carbon dioxide, methane, carbon monoxide, aerosols, water vapor, surface and stratospheric ozone, chlorofluorocarbons, and the ozone layer. The measurements are used for time-series analysis of multi-year data focusing on stratospheric ozone depletion;, trans-Antarctic transport and deposition; the interplay of trace-gas aerosols with the solar and terrestrial radiation fluxes on the polar plateau; the magnitude of seasonal and temporal variations in greenhouse gases; and the development of polar stratospheric clouds over Antarctica.

Field Season Overview

At McMurdo Station, NOAA operates a high-resolution UV spectroradiometer at the Arrival Heights lab. No team members will deploy. An onsite research associate will collect and forward data during the austral summer and continue maintenance and operation during the winter months.

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Project Detail

Project Title

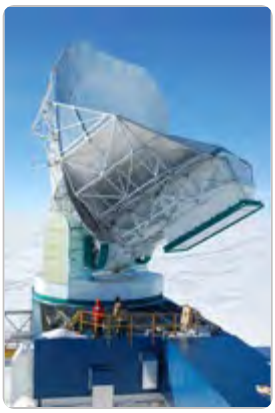
Cosmological Research With The 10-Meter South Pole Telescope

Summary

Event Number:
A-379-S
NSF/OPP Award 1852617

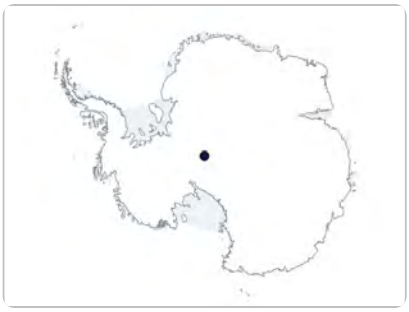
Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Paul Sullivan / Sheryl Seagraves / Leah Street



Principal Investigator(s)

Dr. John Carlstrom
jc@kicp.uchicago.edu
University of Chicago
Astronomy and Astrophysics
Chicago, Illinois



Location

Supporting Stations: South Pole Station
Research Locations: South Pole Station - Dark Sector Lab (DSL)

Description

This project will conduct measurements of the 14-billion-year-old cosmic microwave background (CMB) with the South Pole Telescope (SPT) to address some of the most basic and compelling questions regarding the origin and composition of the universe. The telescope's siting is ideal for ultra-low-noise imaging surveys of the sky at the millimeter and submillimeter radio wavelengths. This unique geographical location allows SPT to obtain extremely sensitive 24/7 observations of targeted, low-galactic, foreground regions of the sky. The telescope's third-generation SPT-3G receiver has 16,000 detectors configured for polarization-sensitive observations in three millimeter-wave bands. The proposed operations also support SPT's critical role in the Event Horizon Telescope (EHT), a global array of telescopes to image the event horizon around the black hole at the center of the Milky Way Galaxy.

Field Season Overview

A seven-person team will deploy from the beginning to mid-austral summer. A four-person team (including the 2022 SPT winter-overs) will continue SPT observations during the start of the austral summer and begin training of the new SPT winter-overs. A three-person team arriving during the second half of the season will include the 2022 winter-over science machinist and two people to train the SPT winter-overs on EHT observations. Other taskings will include servicing and maintaining the telescope components and computer systems, upgrading and servicing the computers, and cryogenic maintenance of the SPT and optics cryostats.

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Deploying Team Members

- James Bevington
- Aman Chokshi
- Allen Foster
- Nicholas Huang
- Junhan Kim
- Amy Lowitz
- Nicholas Nell
- Walter Sandmeyer

2021-2022 USAP Field Season
Project Detail

Project Title

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

Summary

Event Number:
O-317-L
NSF/OPP Award 2001646

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
Rachel Shackelford / Bruce Felix

Principal Investigator(s)

Dr. Teresa Chereskin
tchereskin@ucsd.edu
University of California San Diego
Scripps Institution of Oceanography
La Jolla, California

Location

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

Description

The Antarctic Circumpolar Current (ACC) is the strongest ocean current in the world, with a flow rate over 100 times greater than all the rivers on earth combined. This project continues a long-term study of ocean properties and variability in the ACC by repeat transects across the Drake Passage from Punta Arenas, Chile to Palmer Station. This project will provide information about long-term trends and variability in Southern Ocean fronts, surface water mass properties, heat, and salinity budgets. This study will contribute to understanding the ACC response to atmospheric forcing on climate-relevant time scales, and its role in driving the Southern Ocean's meridional overturning circulation. This aspect of the project focuses on collecting acoustic Doppler current profiler (ADCP), thermosalinograph (TSG), fluorometer, and meteorological data on all ARSV Laurence M. Gould (LMG) cruises.

Field Season Overview

This science event collects ocean current and acoustic backscatter measurements from hull-mounted acoustic Doppler current profilers (ADCPs) onboard the LMG. Data are collected on all cruises with support from the shipboard electronics technicians (ETs). The ETs will start and stop data acquisition and monitor and archive data while at sea. During cruises, contractor support may be required, as time allows, in the event that system maintenance or software changes need to be made while underway.

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Project Detail

Project Title

Ice Dynamics At The Intersection Of The West And East Antarctic Ice Sheets

Summary

Event Number:
I-175-M/S
NSF/OPP Award 1744649

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Jenny Cunningham

Principal Investigator(s)

Dr. Knut A Christianson
knut@uw.edu
University of Washington
Earth and Space Sciences
Seattle, Washington

Location

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

Description

Researchers will use ground-based, ice-penetrating radar to survey the stratigraphy and bed topography at Hercules Dome, and infer changes in ice dynamics and ice-sheet elevation. The work will help determine past ice-sheet changes that may relate to the collapse of the West Antarctic Ice Sheet. Additionally, the work may verify the existence of a divide flow and internal stratigraphy that could help determine whether this site is suitable for a deep ice-core drilling project. This year's focus will be on taking repeat englacial velocity measurements with phase-sensitive, ice-penetrating radar, and measuring surface velocities with GPS sensors.

Field Season Overview

A team of two, one science participant and one Antarctic Support Contract (ASC) field safety coordinator, will make day trips by Twin Otter from South Pole Station to Hercules Dome to conduct repeat stationary, phase-sensitive radar (ApRES), and repeat global navigation satellite system (GNSS) measurements to collect 3-dimensional ice-velocity measurements. The team members will also service the fuel and equipment cache at Hercules Dome.

Deploying Team Members

- Benjamin Hills (Team Leader)

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Project Detail

Project Title

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

Summary

Event Number:
C-013-N/P
NSF/OPP Award 1440435

Program Manager:
Dr. Francisco (Paco) Moore / Dr. Karla Heidelberg

ASC POC/Implementer:
Samina Ouda / Bruce Felix

Principal Investigator(s)

Dr. Megan A Cimino
megan.cimino@noaa.gov
University of California Santa Cruz
Monterey, California

Location

Supporting Stations: RV/IB Nathaniel B. Palmer, Palmer Station
Research Locations: West Antarctic Peninsula, Palmer Station

Description

Palmer Long-Term Ecological Research (PAL-LTER) started in 1990 to address the hypothesis that the annual sea-ice cycle may be the major determinant of spatial/temporal changes in the structure and function of Antarctic marine communities. Research now includes bacteria, viruses, phytoplankton, krill, macrozooplankton, penguins, seabirds, and marine mammals. The PAL-LTER model traces the effects of changing climate and the extent, duration, and seasonality of sea ice on ecosystem composition and dynamics in the Western Antarctic Peninsula, where satellite observations over the past 35 years indicate the average duration of sea ice cover is now about 90 days shorter. Six collaborative projects on the RV/IB Nathaniel B. Palmer cruise and at Palmer Station will use moorings, numerical modeling, oceanographic cruises, and environmental sampling to address core hypotheses.

Field Season Overview

Two participants will embark on the RV/IB Nathaniel B. Palmer cruise, boarding the ship in Punta Arenas. The vessel will drop two or three researchers at Avian Island, where they will establish a field camp and conduct research for five days. The team may also conduct population censuses at Charcot Island or at other accessible islands of interest along the Western Antarctic Peninsula, as possible. When onboard and underway, the participants will record observations from the bridge and conduct echo-sounder measurements of the prey field. When in the vicinity of Palmer Station, participants will go on day trips to conduct surveys of seabird colonies and collect other demographic measures on multiple islands in

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the area. Wildlife tracking tags will be deployed on Adelie penguins and diet samples will be taken.

Three wildlife cameras on tripods were installed at Torgeson and Humble Islands at the end of the 2021 season. The Palmer ASC research associate will replace batteries and monitor the system during the duration of pier construction during the 2021-22 season. The cameras will be retrograded at the end of the pier construction.

Deploying Team Members

- Megan Cimino (PI)

2021-2022 USAP Field Season
Project Detail

Project Title

Cold Regions Research And Engineering Laboratory (CRREL) Activities

Summary

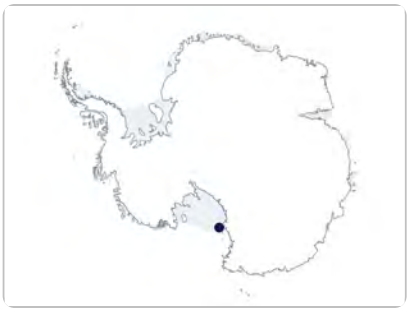
Event Number:
T-940-M
NSF Agreement

Program Manager:
Ms. Margaret Knuth

ASC POC/Implementer:
Samina Ouda / Jessica Palen

Principal Investigator(s)

Dr. Zoe R Courville
Zoe.R.Courville@usace.army.mil
US Army Cold Regions Research & Engineering Lab
Hanover, New Hampshire



Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo Shear Zone Camp

Description

Cold Regions Research and Engineering Laboratory (CRREL) activities encompass engineering and basic research in support of a variety of projects at both McMurdo and South Pole Stations. At McMurdo Station, CRREL supports ground-penetrating radar (GPR) work with the South Pole Traverse and support for the McMurdo Station airfields. CRREL also provides general engineering analysis for projects at McMurdo and South Pole Stations.

Field Season Overview

One participant will deploy to conduct three weeks of fieldwork at the McMurdo Shear Zone Camp. Daily work will consist of GPR surveys and crevasse mitigation.

Deploying Team Members

- Zoe Courville (PI)

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Project Title

Exploring The Functional Role Of Plants During Terrestrial Succession

Summary

Event Number:
B-289-E

Program Manager:
Dr. Karla Heidelberg

ASC POC/Implementer:
David Rivera / Cara Ferrier

Principal Investigator(s)

Dr. Dr. Sarah Margaretha Eppley
eppley@pdx.edu
Portland State University
Department of Biology
Portland, Oregon

Location

Supporting Stations: Special Project
Research Locations: King George Island

Description

This collaborative research project builds on a 2019 pilot study to evaluate the effects of climate change on terrestrial carbon balance in tractable deglaciated sere in an area on the Antarctic Peninsula that provides a strong gradient in primary productivity. The team will be evaluating the effects of warming on soil carbon loss and clarifying the major microbial and plant controls on the process. Team members will use a controlled study of environmental chambers arrayed along a productivity gradient to measure carbon flux change with temperature. The goal is to tie shifts in net ecosystem carbon balance to warming effects on individual soil microbes and plant types. The study will further assess the photosynthetic uptake of carbon by the vegetation and its sensitivity to warming. Results will advance research on climate change, plant and soil microbial ecology, and in ecosystem modeling.

Field Season Overview

Up to four participants will travel to King George Island (KGI) during the austral summer as part of a collaborative project supported by the Chilean Antarctic Institute (INACH). The U.S. Antarctic Program support will include travel to and from Punta Arenas for the US-based participants, laboratory supplies (chemicals and consumables), extreme cold weather (ECW) gear, medical physical qualification, cargo, and northbound sample shipping. INACH will provide logistical field support, including all equipment and transportation between Punta Arenas and KGI. The field team will be based at the Chilean Base Profesor Julio Escudero on KGI and will camp at Robert Island if possible.

Deploying Team Members

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- Rebecca Ball (Co-PI)
- Todd Rosensteil (Co-PI)

2021-2022 USAP Field Season
Project Detail

Project Title

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

Summary

Event Number:
C-024-N/P
NSF/OPP Award 1440435

Program Manager:
Dr. Francisco (Paco) Moore / Dr. Karla Heidelberg

ASC POC/Implementer:
Samina Ouda / Bruce Felix

Principal Investigator(s)

Dr. Ari Seth Friedlaender
ari.friedlaender@ucsc.edu
University of California Santa Cruz
Institute of Marine Sciences
Santa Cruz, California

Location

Supporting Stations: RV/IB Nathaniel B. Palmer, Palmer Station
Research Locations: Palmer Station and Western Antarctic Peninsula

Description

Palmer Long-Term Ecological Research (PAL-LTER) started in 1990 to address the hypothesis that the annual sea-ice cycle may be the major determinant of spatial/temporal changes in the structure and function of Antarctic marine communities. Research now includes bacteria, viruses, phytoplankton, krill, macrozooplankton, penguins, seabirds, and marine mammals. The PAL-LTER model traces the effects of changing climate and the extent, duration, and seasonality of sea ice on ecosystem composition and dynamics in the Western Antarctic Peninsula, where satellite observations over the past 35 years indicate the average duration of sea ice cover is now about 90 days shorter. Six collaborative projects on the RV/IB Nathaniel B. Palmer cruise and at Palmer Station will use moorings, numerical modeling, oceanographic cruises, and environmental sampling to address core hypotheses.

Field Season Overview

Up to two team members will deploy on the annual LTER cruise aboard the Nathaniel B. Palmer. Throughout the cruise, they will use small boats to deploy suction-cup tags and collect biopsy samples and photo-ID data on individual whales. They will also collect underway echo sounder data from the hull-mounted SIMRAD EK60. In the vicinity of Palmer Station, they will recover and redeploy two passive, acoustic, sound-trap moorings. Additionally, they will use a dedicated small boat for visual surveys of marine mammals, quantitative prey mapping, biopsy sampling, and suction-cup tag deployment and recovery. When a second small boat is able to accompany the team, these studies will take place in

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the extended boating area around Palmer Station.

Deploying Team Members

- Ross Nichols

2021-2022 USAP Field Season
Project Detail

Project Title

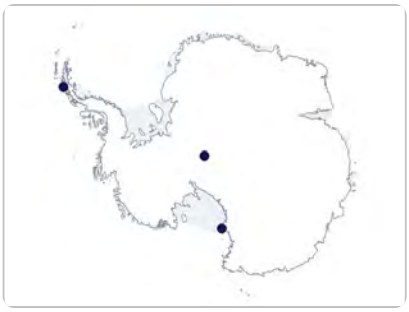
The Next Generation Of Geospace Research Facilities At South Pole And McMurdo Stations

Summary

Event Number:
A-111-M/P/S
NSF/OPP Award 1643700

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
John Rand / Elizabeth Kauffman / Jamee Johnson / Paul Sullivan / Sheryl Seagraves



Principal Investigator(s)

Dr. Andrew Gerrard
gerrard@njit.edu
New Jersey Institute of Technology
Department of Physics
Newark, New Jersey

Location

Supporting Stations: McMurdo Station, Palmer Station, South Pole Station
Research Locations: Field Local, Arrival Heights, Terra Lab

Description

The geomagnetic field protects life on Earth from geomagnetic storms and coronal mass ejections. These events could also affect satellites and disrupt communication with ground stations. The polar caps are specific areas around the geomagnetic poles where geomagnetic field lines are open and directly interact with the interplanetary magnetic field. There are many Geospace-monitoring stations over the northern polar cap but far fewer on the southern polar cap. This project integrates clustered instrumentation at all three USAP stations to examine solar-wind interactions within the entire Geospace system. Instruments include ground-based fluxgate and search-coil magnetometers, extremely low frequency (ELF) and very-low-frequency (VLF) receivers, imaging and broadband riometers, sky-looking optical systems, and GPS scintillation-rated receivers.

Field Season Overview

McMurdo and South Pole Stations

The 2021-2022 field season may involve one person traveling to McMurdo and South Pole Stations to do yearly maintenance on the systems at each station. The reduced operational footprint is due to ongoing COVID-19 impacts, eliminating additional team members from both the U.S. and Japan.

Palmer Station

This year, there will be no additional activities at Palmer Station. The project's fluxgate

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magnetometer and VLF receiver will be run by a Research Associate as in past years.

Project Title

McMurdo LTER – Limnology: Ecosystem Response To Amplified Landscape Connectivity In The McMurdo Dry Valleys, Antarctica

Summary

Event Number:
C-505-M
NSF/OPP Award 1637708

Program Manager:
Dr. Maria Vernet / Dr. Karla Heidelberg

ASC POC/Implementer:
Jenny Cunningham

Principal Investigator(s)

Dr. Michael N Gooseff
michael.gooseff@colorado.edu
University of Colorado Boulder
Institute of Arctic and Alpine Research
Boulder, Colorado

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo Dry Valleys

Description

The McMurdo Dry Valleys Long-Term Ecological Research (MCM-LTER) program is an interdisciplinary and multidisciplinary study of the aquatic and terrestrial ecosystems in an ice-free region of Antarctica. The MCM-LTER has studied Dry Valleys ecosystems since 1993 and observed their responses to climate variations over time. Landscape connectivity, such as streams connecting glaciers to lakes, and lake level rise connecting upland soils, is recognized to be influenced by climate and geological drivers. This physical connectivity facilitates biotic linkages and enables gene flow among the endemic microbial communities. Researchers hypothesize that increased ecological connectivity within the Dry Valleys will amplify exchange of biota, energy, and matter, homogenizing ecosystem structure and functioning. Results will inform understanding of ecosystem response to climate drivers and will be directly transferrable to other ecosystems, especially those undergoing rapid climate variation.

Field Season Overview

The scope for this season is reduced due to COVID-19 impacts. (Note: All MCM-LTER support for this season is captured under event number C-505-M). Ten participants will deploy in late October. Similar to past seasons, the field teams will be based out of Taylor Valley fixed camps and will rotate among the different lake basins to conduct high-priority field work. They will conduct typical lake monitoring activities, service meteorological stations and stream gages, and conduct glacier mass-balance measurements. In January, the focus will shift from lake and meteorological station work to streams, algae operations, lake benthic mats, and moats and soils. One team member will stay in McMurdo to work on sample analysis and provide support and direction for the field teams.

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Deploying Team Members

- Abigail Jackson
- Jens Jorna (Team Leader)
- Jade Lawrence (Team Leader)
- Katherine McNulty
- Krista Myers (Team Leader)
- Emily Reynebeau
- Michael Stone
- Mia Vanderwilt
- Kathy Welch
- Anna Wright (Team Leader)

2021-2022 USAP Field Season
Project Detail

Project Title

RAPID: International Collaborative Airborne Sensor Deployments Near Antarctic Ice Shelves

Summary

Event Number:
I-122-E
NSF/OPP Award 2114454

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
John Rand / Cara Ferrier

Principal Investigator(s)

Dr. Jamin S Greenbaum
jsgreenbaum@ucsd.edu
University of California San Diego
Scripps Institution of Oceanography
La Jolla, California

Location

Supporting Stations: Special Project
Research Locations: Thwaites Glacier Tongue, Shackleton Ice Shelf, Cook Ice Shelf

Description

This project will acquire snapshot profiles of ocean temperature, salinity, and velocity, and it will improve bathymetry knowledge where there are no prior data near three glaciers draining substantial sea level potential from the East and West Antarctic Ice Sheets. In West Antarctica, we will use helicopters operated from the RV Araon Icebreaker to deploy airborne expendable conductivity, temperature, and depth (AXCTD) and airborne expendable current profiler (AXCP) sensors into perennial rifts in an area of the Thwaites Glacier Tongue experiencing high basal melt rates. In East Antarctica, we will use a fixed-wing aircraft to deploy grids of AXCTD, AXCP, and airborne expendable Bathy-Thermograph (AXBT) sensors and acquire new airborne gravity data useful for inferring seafloor bathymetry, near the Shackleton Ice Shelf and Cook Ice Shelf. We will use high-resolution, MIT general circulation model (MITgcm) simulations to optimize sensor targeting and improve the interpretation of results.

Field Season Overview

This project does not require logistical support from the USAP. However, the USAP will provide advice and assistance with physical qualifications, travel (self-ticket), accommodation, quarantine, training, and other project related matters where practical and feasible. The West Antarctic work will be conducted with the Korea Polar Research Institute (KOPRI), which will provide cold weather clothing and other necessary supplies related to the helicopter fieldwork. The East Antarctic work (now delayed by COVID by at least one season) will be conducted with the Australian Antarctic Division, which will provide clothing and related supplies.

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Deploying Team Members

- Jamin Greenbaum (PI)

2021-2022 USAP Field Season
Project Detail

Project Title

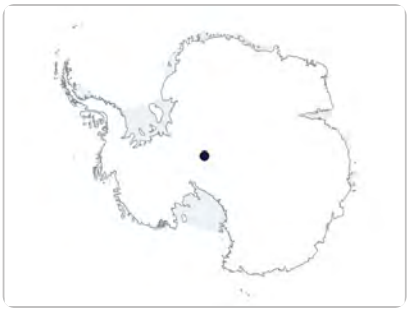
Management And Operation Of The IceCube Neutrino Observatory 2016-2021

Summary

Event Number:
A-333-S
NSF/OPP Award 2042807

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Paul Sullivan / Sheryl Seagraves / Leah Street



Principal Investigator(s)

Dr. Francis Halzen
halzen@icecube.wisc.edu
University of Wisconsin Madison
Department of Physics
Madison, Wisconsin

Location

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

Description

The IceCube neutrino telescope transformed a cubic kilometer of deep ice into a Cherenkov detector of high-energy particles of the cosmic origin. The project is an international collaboration, and the University of Wisconsin-Madison serves as the host institution providing operations, oversight, and staffing for this NSF's Majjor Mulriuser Facility. IceCube's extremely broad science program has opened previously unexplored window on the Universe using neutrinos as cosmic messengers and has emerged as a particle physics detector providing precision measurements in the neutrino sector. The goal of IceCube management and operational support is to ensure the reliable operation of the IceCube Neutrino Observatory and enable the production of physics-quality data in a reliable and cost-effective manner.

Field Season Overview

Three participants are scheduled to deploy to South Pole Station to conduct maintenance and operational improvements to the existing IceCube infrastructure. The following is planned: (1) training and transition of winter-over personnel; (2) SPS OS / Puppet upgrade; (3) data acquisition support and DOMHub maintenance; (4) consolidation of rack space in the IceCube Laboratory (ICL); (5) retrograde of JADE archival disks; (6) drift and snow access ramp management by ASC personnel; (7) investigation and repair of an ICL wall crack; (8) extensions and maintenance of IceTop marker poles; (9) surface enhancement field hub maintenance, and; (10) deployment and testing of a mini wind turbine on the ICL roof.

Deploying Team Members

Project Indexes

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- Ralf Auer
- Moreno Baricevic
- Wenceslas Marie Sainte

Project Title

NASA / McMurdo Ground Station (MG1)

Summary

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

Program Manager:
Mr. Pat Smith

ASC POC/Implementer:
Carrie Piesen

Principal Investigator(s)

Mr. Mark Harris
mark.a.harris@nasa.gov
National Aeronautics and Space Administration
Wallops Flight Facility
Wallops Island, Virginia

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo Station

Description

The National Aeronautics and Space Administration (NASA) McMurdo Ground Station (MG1) is a 10-meter antenna housed in a white radome, which is visible on the hill above McMurdo Station. It is used primarily for data recovery from polar-orbiting science satellites. MG1 also provides launch and early operations phase (LEOP) support for launches from Vandenberg Space Force Base involving satellite missions that require downrange telemetry (example from September 2021 – Landsat 9 satellite); telemetry and command for satellite housekeeping; recovery from satellite operational emergencies; and, in collaboration with the National Oceanic and Atmospheric Administration (NOAA) National Environmental Satellite and Data Information Service, recover data for the EUMETSAT MetOp polar weather satellites. NASA also has a McMurdo Tracking and Data Relay Satellite (TDRS) Relay System (MTRS) ground terminal at Crater Hill for high-speed data transfers of MG1 data. MTRS uses high-inclination TDRS satellites visible above the local horizon.

Field Season Overview

The MG1 activity is a year-round effort for which two NASA technicians are deployed to McMurdo Station to operate and maintain the systems. During the austral summer, additional personnel deploy to support special projects, perform systems and infrastructure checks, and conduct crew turnovers.

Deploying Team Members

Project Indexes

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- Rex Cotten
- William Kambarn
- Victoria Landgraf
- Nikolas Sinkola
- Edward Wendell

2021-2022 USAP Field Season
Project Detail

Project Title

Operation And Maintenance Of A CTBT Radionuclide Monitoring Station At Palmer Station

Summary

Event Number:
T-998-P
NSF / CTBTo MOA

Program Manager:
Mr. Tim McGovern

ASC POC/Implementer:
John Rand / Jamee Johnson

Principal Investigator(s)

Mr. Bouvard Hosticka
bouvard.hosticka@gd-ms.com
University of Virginia
Charlottesville, Virginia

Location

Supporting Stations: Palmer Station
Research Locations: Palmer Station

Description

This project services and calibrates the automated radionuclide air-particulate (RN73 RASA) monitoring system in the International Monitoring Station (IMS) building (Terra Lab) at Palmer Station. The IMS continuously collects and automatically analyzes daily air samples for radiation. The collected filter-media samples from the radionuclide aerosol sampler/analyzer (RASA) are sent to Vienna, Austria quarterly for archiving. Additionally, single samples are shipped, upon request, to various laboratories elsewhere in the world.

Field Season Overview

The U.S. Antarctic Program provides year-round, onsite support through an Antarctic Support Contract research associate to help operate and maintain the RASA. Extensive upgrades to the RASA air-sampling system were planned for 2020 but were delayed due to Covid-19 restrictions and are now planned for 2022. This will include replacing the main frame internals and cabinet, as well as making repairs to the inlet ducting. The major equipment is on site for this upgrade and, if possible, two General Dynamics engineers will deploy to help execute the work.

Deploying Team Members

- Bouvard Hosticka (PI)
- Tony Ly

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Project Detail

Project Title

NSFGEO-NERC Collaborative Research: Effects Of A Changing Climate On The Habitat Utilization, Foraging Ecology And Distribution Of Crabeater Seals

Summary

Event Number:
B-038-N
NSF/OPP Award 2042032

Program Manager:
Dr. Karla Heidelberg

ASC POC/Implementer:
Rachel Shackelford / Cara Ferrier

Principal Investigator(s)

Dr. Luis Alfredo Huckstadt
lahuckst@ucsc.edu
University of California Santa Cruz
Long Marine Lab
Santa Cruz, California

Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: Bransfield Strait and Marguerite Bay

Description

This project will focus on crabeater seal ecology to examine how seals may be affected by climate-induced match-mismatch interactions with their prey. The main aim of this study is to determine how match-mismatch between seals and krill relate to the predictability of ice cover in time and space, which, in turn, acts to enhance the availability of krill.

Field Season Overview

A six-member science team will deploy on the RV/IB Nathaniel B. Palmer (NBP) to outfit at least 40 crabeater seals with satellite tags in the pack ice. A minimum of ten individual seals will be sampled at each of two areas – one in the northern Bransfield Strait area and one in the southern area west of Alexander Island. The team will use a combination of Unoccupied Aerial System (UAS) surveys and satellite imagery to census the population of seals across a latitudinal gradient along the western Antarctic Peninsula (WAP).

Deploying Team Members

- Daniel Costa (Co-PI)
- Arina Favilla
- Luis Huckstadt (PI)
- Anna Pearson
- Michael Tift (Co-PI)

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Project Detail

Project Title

University Of Hawaii Data Acquisition System (UHDAS) Support

Summary

Event Number:
T-933-L/N
NSF / UH Agreement

Program Manager:
Mr. Tim McGovern

ASC POC/Implementer:
Rachel Shackelford / Bruce Felix

Principal Investigator(s)

Dr. Julia M Hummon
hummon@hawaii.edu
University of Hawaii Manoa
Joint Institute for Marine and Atmospheric Research (JIMAR)
Honolulu, Hawaii

Location

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

Description

This project maintains the Acoustic Doppler Current Profiler (ADCP) computer systems on the RV/IB Nathaniel B. Palmer (NBP) and the ARSV Laurence M. Gould (LMG). These systems are used to manage and post-process data from the ADCP sonars on both vessels. On the LMG, the ADCP data is specifically collected and managed under the Chereskin (O-317-L) project, but it is available to all cruise participants. On the NBP, the systems are maintained for general grantee requests.

Field Season Overview

No grantee deployments are expected this year, but ADCP data will be collected when both ships are underway outside of exclusive economic zones (EEZs).

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Project Detail

Project Title

Dry Valley Seismic Project

Summary

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

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
Curt LaBombard

Principal Investigator(s)

Dr. Robert C Kemerait
robert.kemerait@us.af.mil
United States Air Force
AFTAC
Patrick AFB, Florida

Location

Supporting Stations: McMurdo Station
Research Locations: Bull Pass, Mount Newall

Description

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

Field Season Overview

Two personnel will deploy from October to early December. Due to COVID-19 restrictions, they will be assisting T-396 with the maintenance of the I55US infrasound site before moving to the Dry Valleys as a combined team. Participants will then refuel diesel generators and perform annual equipment maintenance and inspections at the Bull Pass (Wright Valley) seismic and Mount Newall repeater sites. The team will camp at each site for approximately 12 days. Camp put-ins and pull-outs will be by helicopter. A research associate will ensure connection to the sites are maintained year-round so data can be collected remotely.

Deploying Team Members

- Marcus Bottensek
- Evan Estrada

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Project Detail

Project Title

Cape Shirreff

Summary

Event Number:
X-591-L
NSF / NOAA-AMLR Interagency Agreement

Program Manager:
Mr. Tim McGovern

ASC POC/Implementer:
David Rivera / Cara Ferrier

Principal Investigator(s)

Dr. Douglas John Krause
douglas.krause@noaa.gov
National Oceanic and Atmospheric Administration
AMLR - Antarctic Ecosystem Research Division (SW Fisheries Sci Ctr)
La Jolla, California

Location

Supporting Stations: ARSV Laurence M. Gould
Research Locations: Cape Shirreff, Livingston Island

Description

Cape Shirreff is located on Livingston Island in Antarctic Specially Protected Area (ASPA) 149. The facility at this site, also referred to as Cape Shirreff, is owned by the National Oceanic and Atmospheric Administration (NOAA), and maintained and operated by NOAA with support from the National Science Foundation. Specifically, research is conducted by the Antarctic Marine Living Resource (AMLR) program of NOAA's Southwest Fisheries Science Center (SWFC). Cape Shirreff currently supports a NOAA-funded project conducting seabird and marine mammal research. The facility was built in the 1996-97 austral summer at NOAA direction and supported by Antarctic Support Associates, the NSF Antarctic contractor at that time. Since then, it has been NOAA-occupied with U.S. Antarctic Program (USAP) support limited to personnel transport and camp openings and closings.

Field Season Overview

Over the last decade, the ARSV Laurence M. Gould and RV/IB Nathaniel B. Palmer have supported Cape Shirreff camp opening, resupply and closing operations. In 2021-22, the camp is scheduled to open in November and close in December. The camp will support six NOAA personnel. USAP expedition participants, both contractors and science team members, will assist camp operations by providing labor for cargo transport to and from the field camp.

Deploying Team Members

Project Indexes

Find information about projects approved for the 2021-2022 USAP field season using the available indexes.

Project Web Sites

Find more information about 2021-2022 USAP projects by viewing project web sites.

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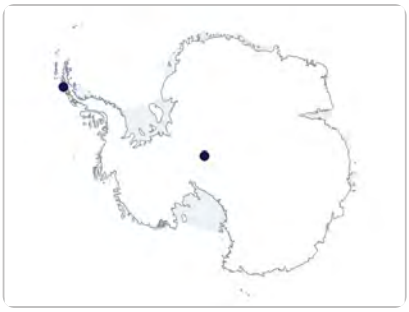
- Douglas Krause (PI)

2021-2022 USAP Field Season
Project Detail

Project Title

Global Seismograph Station At South Pole, Scott Base, And Palmer Stations

Summary



Event Number:
G-090-P
NSF / USGS Agreement

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
John Rand / Jamee Johnson

Principal Investigator(s)

Mr. Edward Paul Kromer
ekromer@contractor.usgs.gov
United States Geological Survey
Albuquerque Seismological Laboratory
Albuquerque, New Mexico

Location

Supporting Stations: Palmer Station
Research Locations: Palmer Station Terra Lab, Scott Base, South Pole

Description

The United States Geological Survey's Albuquerque Seismological Laboratory (USGS-ASL), in collaboration with the NSF-sponsored Incorporated Research Institutions for Seismology consortium's portable network's instrumentation center (IRIS-PASSCAL), maintains and operates seismometers at South Pole in the South Pole Remote Earth Science and Seismological Observatory (SPRESSO) vault, and Palmer Station (at the Terra Lab). ASL equipment engineers will also provide service to other installed seismometers, such as the two USAP seismometers located at New Zealand's Scott Base. The data from these instruments is provided to a number of data archives and real-time users world-wide.

Field Season Overview

The project has space in Terra Lab for data analyzer hardware. All other hardware and the seismometer are housed in the seismic vault behind Terra Lab. Two participants will deploy to Palmer Station for three weeks to replace the instruments in the seismic vault. Planned activities include using a USGS-provided rock drill to site new instruments. No team members will deploy to Scott Base or South Pole this season. The Antarctic Support Contract will provide year-round, onsite support by a research associate.

Deploying Team Members

- Edward Kromer (PI)
- Nicholas Voss

Project Indexes

Find information about projects approved for the 2021-2022 USAP field season using the available indexes.

Project Web Sites

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More Information

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2021-2022 USAP Field Season
Project Detail

Project Title

Auroral Kilometric Radiation, Substorms, And Related Phenomena: Satellite Conjunction And Conjugate Studies At South Pole

Summary

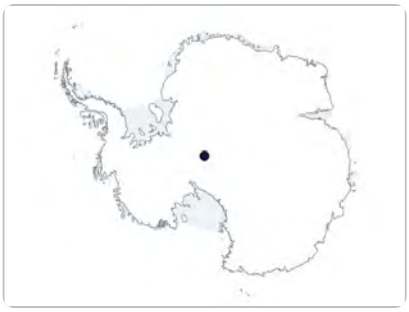
Event Number:
A-128-S
NSF / OPP Award 1911335

Program Manager:
Dr. Robert Moore

ASC POC/Implementer:
John Rand / Paul Sullivan / Sheryl Seagraves

Principal Investigator(s)

Dr. James LaBelle
jlabelle@aristotle.dartmouth.edu
Dartmouth College
Department of Physics & Astronomy
Hanover, New Hampshire



Location

Supporting Stations: South Pole Station
Research Locations: South Pole Station - B2 Laboratory, V8 Vault

Description

This project operates instruments at South Pole Station to answer outstanding questions raised by the discovery of correlations between auroral kilometric radiation (AKR) observed 200,000 kilometers above Earth and AKR-like signals observed simultaneously at South Pole Station. The higher electron cyclotron harmonic radiation is polarized, which suggests a different and possibly nonlinear generation mechanism. These phenomena are best observed, and in most cases can only be observed, from Antarctica, making the South Pole a perfect location for this research.

Field Season Overview

The instrumentation for this project is located in the B2 Lab and V8 vault. It runs continuously year-round, essentially autonomously, with only limited intervention required by personnel onsite and by the science party via the internet. No field team members will deploy this season. An onsite research associate will provide monitoring, troubleshooting, and the collection and forwarding of data as needed throughout the year.

Project Indexes

Find information about projects approved for the 2021-2022 USAP field season using the available indexes.

Project Web Sites

Find more information about 2021-2022 USAP projects by viewing project web sites.

More Information

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2021-2022 USAP Field Season
Project Detail

Project Title

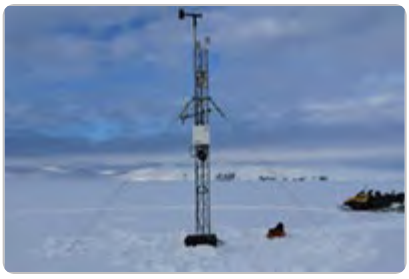
Collaborative Research: Antarctic Automatic Weather Station Program, 2019-2022

Summary

Event Number:
O-283-M
NSF/OPP Award 1924730

Program Manager:
Dr. Peter Milne

ASC POC/Implementer:
Judy Shiple / Jenny Cunningham



Principal Investigator(s)

Dr. Matthew Lazzara
mattl@ssec.wisc.edu
University of Wisconsin Madison
Space Science and Engineering Center/AMRC
Madison, Wisconsin

Location

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

Description

The Antarctic Automatic Weather Stations (AWS) network has been making meteorological observations since the early 1980s. This continent-wide network is positioned to observe significant meteorological events and increase understanding of the Antarctic surface climate, helping researchers observe and learn about the Antarctic in a warming world. Numerous studies of surface climatology in regions around the continent, such as the Ross Ice Shelf, have been possible because of the long duration of the AWS project and regular AWS maintenance. AWS-based climatology also aids in other studies, such as winter warming events.

Field Season Overview

A science team of two will deploy from late-November to mid-January. Team members will visit the AWS sites on Ross Island, West Antarctica, the Ross Ice Shelf, Williams Field, Phoenix airfield, and Windless Bight. Antenna rigger and vehicle support will be provided at the Alexander Tall Tower AWS. The team will repair any AWS stations that developed problems during the austral winter and will make upgrades, if time allows. One McMurdo Station research associate provides year-round support.

Deploying Team Members

- David Mikolajczyk
- Lee Welhouse (Co-PI)

Project Indexes

Find information about projects approved for the 2021-2022 USAP field season using the available indexes.

Project Web Sites

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2021-2022 USAP Field Season
Project Detail

Project Title

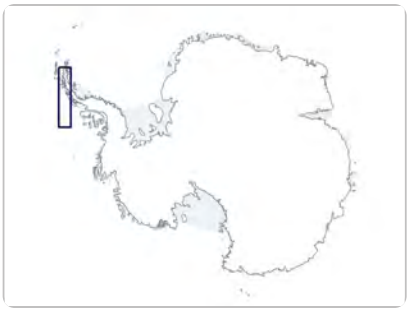
Palmer, Antarctica Long-Term Ecological Research (LTER): Land-Shelf-Ocean Connectivity, And Ecosystem Resilience And Transformation, In A Sea-Ice Influenced Pelagic Ecosystem

Summary

Event Number:
C-021-N
NSF/OPP Award 1440435

Program Manager:
Dr. Francisco (Paco) Moore / Dr. Karla Heidelberg

ASC POC/Implementer:
Samina Ouda / Bruce Felix



Principal Investigator(s)

Mr. Carlos F Moffat
cmoffat@udel.edu
University of Delaware
Newark, Delaware

Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: Palmer Station and Western Antarctic Peninsula

Description

Palmer Long-Term Ecological Research (PAL-LTER) started in 1990 to address the hypothesis that the annual sea-ice cycle may be the major determinant of spatial/temporal changes in the structure and function of Antarctic marine communities. Research now includes bacteria, viruses, phytoplankton, krill, macrozooplankton, penguins, seabirds, and marine mammals. The PAL-LTER model traces the effects of changing climate and the extent, duration, and seasonality of sea ice on ecosystem composition and dynamics in the Western Antarctic Peninsula, where satellite observations over the past 35 years indicate the average duration of sea ice cover is now about 90 days shorter. Six collaborative projects on the RV/IB Nathaniel B. Palmer cruise and at Palmer Station will use moorings, numerical modeling, oceanographic cruises, and environmental sampling to address core hypotheses.

Field Season Overview

During the annual LTER cruise aboard the RV/IB Nathaniel B. Palmer, vessel marine technicians will assist one participant from C-021 to deploy two new new moorings, one at the southern edge of Gerlache Strait (GS-1 moorings) and another off Anvers Island (AI-1). They will also recover and re-deploy the 300.100 mooring deployed in the 2019/20 season. The team will also program instruments, prepare the mooring deployments, recover data from recovered instruments, and conduct conductivity-temperature-depth (CTD) profiling and water sampling.

Project Indexes

Find information about projects approved for the 2021-2022 USAP field season using the available indexes.

Project Web Sites

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Deploying Team Members

- Carlos Moffat (PI)

2021-2022 USAP Field Season
Project Detail

Project Title

Lower Thermospheric Science Using New Meteor Radar At McMurdo Station

Summary

Event Number:
A-284-M
NSF/OPP Award 1543446

Program Manager:
Dr. Robert Moore

ASC POC/Implementer:
John Rand / Paul Sullivan

Principal Investigator(s)

Dr. Scott Palo
scott.palo@colorado.edu
University of Colorado Boulder
Department of Aerospace Engineering Sciences
Boulder, Colorado

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo Station

Description

This project will observe the mesosphere and lower thermosphere (MLT) between 80 and 120 kilometers above the earth. This is a highly dynamic region that couples the lower terrestrial atmosphere with the upper atmosphere near-earth space environment. Of particular importance in this region are the upward propagating thermally-forced atmospheric tides, global-scale planetary waves, and small-scale gravity waves. All these phenomena transport heat and momentum from the lower atmosphere into the upper atmosphere. The primary goal of this research is to observe, quantify, model, and further understand the spatial-temporal structure and variability of the MLT circulation above Antarctica.

Field Season Overview

The instrumentation for this project is located in the pass area between McMurdo and Scott Base stations. It runs continuously year-round, essentially autonomously, with only limited intervention required by personnel onsite and by the researchers via the internet. As the radar is continuously performing within established operating parameters and being regularly monitored by our on-site research associates, no grantee field visit is required this season. A detailed annual site inspection and data retrieval dispatch will be coordinated remotely between the on-site staff and the grantee research institution.

Project Indexes

Find information about projects approved for the 2021-2022 USAP field season using the available indexes.

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2021-2022 USAP Field Season
Project Detail

Project Title

Thwaites-Amundsen Regional Survey And Network (TARSAN): Integrating Atmosphere-Ice-Ocean Processes Affecting The Sub-Ice-Shelf Environment

Summary

Event Number:
C-445-M/N
NSF/OPP Award 1738992 / NERC Award NE/S006419/1

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Judy Shiple / Jenny Cunningham / Chad Naughton

Principal Investigator(s)

Dr. Erin Pettit
pettiter@oregonstate.edu
Oregon State University
College of Earth, Ocean, and Atmospheric Sciences
Corvallis, Oregon

Dr. Karen Heywood
k.heywood@uea.ac.uk
University of East Anglia
School of Environmental Sciences
Norwich, United Kingdom

Location

Supporting Stations: McMurdo Station, RV/IB Nathaniel B. Palmer
Research Locations: Thwaites and Dotson Ice Shelves

Description

The Thwaites-Amundsen Regional Survey and Network (TARSAN) is a part of the International Thwaites Glacier Collaboration (ITGC), a multi-disciplinary effort led by the US and UK Antarctic programs. TARSAN has both ocean and ice-shelf components with the goal of assessing the regional climate, ice, and ocean conditions and processes that govern the retreat and acceleration of Thwaites Glacier. On the ocean side, the project combines extensive data from casts, moorings, gliders, and instrumented seals. On the ice shelf side, the Automated Meteorology-Ice-Ocean Geophysics Systems (AMIGOS) installations measure the ocean, ice, and weather conditions. A set of geophysical surveys of the Thwaites Eastern Ice Shelf (TEIS) and Dotson Ice Shelf are characterizing the ice shelf stability and sub-ice-shelf structure. The geophysical surveys include radar profiles, phase-sensitive radar vertical profiles (ApRES), seismic profiles, and detailed GPS measurements.

Field Season Overview

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As part of the ITGC, the TARSAN land-ice team will consist of four researchers and a field safety mountaineer deploying for at least two weeks onsite. They will revisit, resurvey, and recover instruments at Cavity Camp and Channel Camp AMIGOS sites, as well as on the Dotson Ice Shelf. They will also drill a 10m firn core for density profiling and melt-layer determination. The field deployment expects ten workable science days on TEIS and one workable day during take-out at Dotson, minimum. The 20-person TARSAN vessel team will participate in the 2021-22 Thwaites expedition aboard the RV/IB Nathaniel B. Palmer to measure ocean properties on the continental shelf adjacent to ice-shelf fronts using seal tagging, glider-based and ship-based surveys, and existing moored and CTD-cast data, and into sub-ice-shelf cavities via autonomous underwater vehicles to provide details on ocean transports and heat fluxes.

Deploying Team Members

- Lars Boehme (Co-PI)
- Guilherme Augusto Bortolotto de Oliveira
- Francesco Fanelli
- Laura Glastra
- Robert Hall (Co-PI)
- Christopher Kratt
- Gareth Lee
- Li Ling
- Rachel Marlow
- Ashley Morris
- Daisy Pickup
- Billy Platt
- Paul Provost
- Callum Rollo
- Ted Scambos (Co-PI)
- Tiago Segabinazzi Dotto
- Jan Sjovall
- Mark Symons
- Robert Templeton
- Anna Wahlin (Co-PI)
- Bruce Wallin
- Christian Wild
- Hannah Wyles
- Yixi Zheng

Project Title

UNAVCO High-Precision GPS And Ground-Based Light Detection And Ranging (LiDAR) Support

Summary

Event Number:
T-295-M
NSF / EAR Award 1724794

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
John Rand / Jenny Cunningham

Principal Investigator(s)

Mr. Joseph R Pettit
pettit@unavco.org
UNAVCO Inc.
Boulder, Colorado

Location

Supporting Stations: McMurdo Station
Research Locations: Continent-wide, McMurdo-based

Description

UNAVCO provides geodetic observations support and equipment. Surveygrade GPS, terrestrial laser scanners, unmanned aerial vehicles (UAVs), power and communications systems for high-precision campaign surveying and continuous data collection are available. UNAVCO operates a network of Global Navigation Satellite System (GNSS) stations on Ross Island and in the Dry Valleys. Support infrastructure includes a real-time kinematic differential GPS broadcasting station covering McMurdo Sound, a Mount Erebus repeater for GPS data retrieval from the Transantarctic Mountains, and an Iridium satellite hub in Colorado. Support is also provided for Palmer Station's GPS survey system. Operation and maintenance is provided for NASA's GNSS service stations MCM4 and PALM, POLENET (ANET), West Antarctic Ice Sheet Divide, South Pole GPS stations, and as-yet-unplanned support, as feasible.

Field Season Overview

One participant will deploy primarily to support G-079-M POLENET in the deep field. The participant may provide some technical and engineering support to other grantees, as well as manage the on-Ice UNAVCO equipment pool while in McMurdo Station, if time allows.

Deploying Team Members

- Nicolas Bayou
- Erika Schreiber

Project Indexes

Find information about projects approved for the 2021-2022 USAP field season using the available indexes.

Project Web Sites

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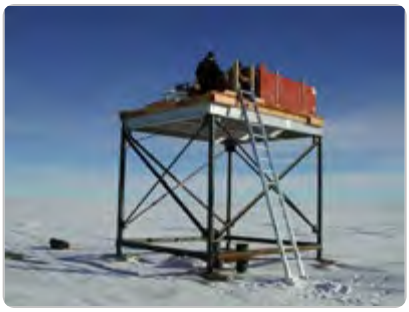
Marianne Okal (Team Leader)

2021-2022 USAP Field Season
Project Detail

Project Title

Element Composition Of High-Energy Solar Particles

Summary

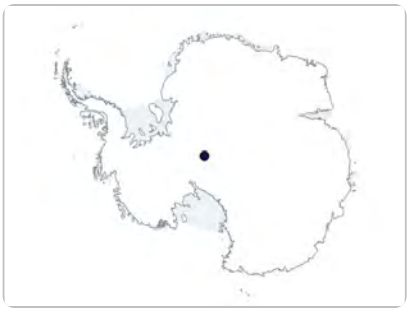


Event Number:
A-118-S
NSF/OPP Award 2112437

Program Manager:
Dr. Robert Moore

ASC POC/Implementer:
John Rand / Paul Sullivan / Sheryl Seagraves

Principal Investigator(s)



Dr. Surujhdeo Seunarine
surujhdeo.seunarine@uwrf.edu
University of Wisconsin River Falls
Department of Physics
River Falls, Wisconsin

Location

Supporting Stations: South Pole Station
Research Locations: Amundsen-Scott South Pole Station - B2 Laboratory

Description

This project operates a neutron-monitor suite at South Pole Station. The science thrust of the project is an understanding of Solar Energetic Particles using neutron monitor data complemented with data from the nearby IceTop air shower detector. Another focus involves understanding the nature of multiple coincident particles observed in the neutron monitors, which extend the reach of the South Pole neutron monitor as a single station capable of doing cosmic ray spectral studies. Also central to the research is understanding the response of these detectors to the radiation environment of the South Pole, particularly in determining the cause of the decline in cosmic ray intensity at the South Pole over the last 50 years. Understanding this decline is important because cosmic rays produce radionuclides such as Beryllium-10 that become trapped in the ice and are used to determine ice-core ages and precipitation levels over Earth's polar regions. An understanding of the production rate is vital to interpreting these data.

Field Season Overview

The instrumentation for this project is located on an elevated platform outside the South Pole Station and in the B2 Laboratory, near the V8 vault. It runs continuously year-round, essentially autonomously, with only limited intervention required by personnel onsite and by the science team via the internet. Onsite research associates will provide monitoring, troubleshooting, and the collection and forwarding of data as needed. The project can continue data collection and data transmission without science deployers and without deploying additional staffing.

Project Indexes

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2021-2022 USAP Field Season
Project Detail

Project Title

Thwaites Interdisciplinary Margin Evolution (TIME): The Role Of Shear Margin Dynamics In The Future Evolution Of The Thwaites Drainage Basin

Summary

Event Number:
C-446-E/M
NSF/OPP Award 1739027 / NERC Award NE/S006788/1

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Judy Shiple / Jenny Cunningham / Chad Naughton

Principal Investigator(s)

Dr. Slawek M Tulaczyk
stulaczy@ucsc.edu
University of California Santa Cruz
Earth Sciences
Santa Cruz, California

Dr. Poul Christoffersen
pc350@cam.ac.uk
Cambridge University
Scott Polar Research Institute
Cambridge, United Kingdom

Location

Supporting Stations: Special Project, McMurdo Station
Research Locations: Thwaites Glacier Eastern Shear Margin

Description

The Thwaites Interdisciplinary Margin Evolution (TIME) is a part of the International Thwaites Glacier Collaboration (ITGC), a multi-disciplinary effort led by the US and UK Antarctic programs. The project will test the overarching hypothesis that shear-margin dynamics may exert powerful control over the evolution of ice flow in the Thwaites Drainage Basin. The work will combine geophysical data collection on the Eastern Shear Margin (ESM) of Thwaites Glacier with shear margin modeling and basin-scale numerical investigations of future sea-level contributions. Fieldwork includes data collection from passive seismic instrument arrays, as well as from active seismic experiments and radar surveys.

Field Season Overview

This project is an international collaboration, with support provided by the U.S. Antarctic Program and the British Antarctic Survey (BAS). Four participants and two mountaineers will deploy to the T1 site on Thwaites Glacier from McMurdo Station to establish camp and retrieve data and equipment from seismic, GPS, and radar installations. From there, the

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participants will traverse to the T2 site to perform similar work. Concurrently, three participants plus one BAS field guide will deploy to the TIME T2a site from Rothera Station to establish camp and retrieve data and equipment from seismic, GPS, and radar installations. From there, they will traverse to the TIME T1 site to perform similar work.

Deploying Team Members

- Ronan Agnew
- Lucia Gonzalez
- Marianne Karplus (Co-PI)
- Andrew Pretorius
- Emma Smith
- Paul Summers
- Tun Jan Young

2021-2022 USAP Field Season
Project Detail

Project Title

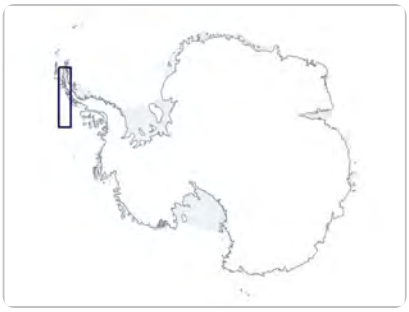
Palmer, Antarctica Long-Term Ecological Research (LTER): Land-Shelf-Ocean Connectivity, And Ecosystem Resilience And Transformation, In A Sea-Ice Influenced Pelagic Ecosystem

Summary

Event Number:
C-045-N
NSF/OPP Award 1440435

Program Manager:
Dr. Francisco (Paco) Moore / Dr. Karla Heidelberg

ASC POC/Implementer:
Samina Ouda / Bruce Felix



Principal Investigator(s)

Dr. Benjamin Van Mooy
bvanmooy@whoi.edu
Woods Hole Oceanographic Institution
Marine Chemistry & Geochemistry
Woods Hole, Massachusetts

Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: Western Antarctic Peninsula

Description

Palmer Long-Term Ecological Research (PAL-LTER) started in 1990 to address the hypothesis that the annual sea-ice cycle may be the major determinant of spatial/temporal changes in the structure and function of Antarctic marine communities. Research now includes bacteria, viruses, phytoplankton, krill, macrozooplankton, penguins, seabirds, and marine mammals. The PAL-LTER model traces the effects of changing climate and the extent, duration, and seasonality of sea ice on ecosystem composition and dynamics in the Western Antarctic Peninsula, where satellite observations over the past 35 years indicate the average duration of sea ice cover is now about 90 days shorter. Six collaborative projects on the RV/IB Nathaniel B. Palmer cruise and at Palmer Station will use moorings, numerical modeling, oceanographic cruises, and environmental sampling to address core hypotheses.

Field Season Overview

In collaboration with the Schofield group, four participants will sail on the RV/IB Nathaniel B. Palmer and conduct on-deck incubations to investigate the stress responses of phytoplankton throughout the Western Antarctic Peninsula. Incubations will be conducted throughout the cruise and may require additional CTD casts to collect water. Repeated sampling with the CTD Rosette will be performed at historical LTER grid stations and other locations. The team will also deploy PI-supplied sediment net traps and sample seasonal sea-ice to assess the input of calorie-rich phytoplankton biomass into the West Peninsula Antarctic marine ecosystem.

Project Indexes

Find information about projects approved for the 2021-2022 USAP field season using the available indexes.

Project Web Sites

Find more information about 2021-2022 USAP projects by viewing project web sites.

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Deploying Team Members

- Shavonna Bent
- Daniel Lowenstein

2021-2022 USAP Field Season
Project Detail

Project Title

NOAA / AMLR

Summary

Event Number:
B-006-L
NSF / NOAA Agreement

Program Manager:
Mr. Tim McGovern

ASC POC/Implementer:
David Rivera / Cara Ferrier

Principal Investigator(s)

Dr. George Watters
george.watters@noaa.gov
National Oceanic and Atmospheric Administration
La Jolla, California

Location

Supporting Stations: ARSV Laurence M. Gould
Research Locations: Livingston Island

Description

The National Oceanic and Atmospheric Administration (NOAA) Fisheries' Antarctic Marine Living Resources (AMLR) program collects data and provides scientific information to better inform decision making by the Commission for the Conservation of Antarctic Living Marine Resources. For the past 25 austral summers, the AMLR field program has been conducted in the vicinity of Elephant Island, the South Shetland Islands, and the Antarctic Peninsula. This year, researchers will collaborate with the Palmer Long Term Ecological Research (LTER) program on one expedition aboard the RV/IB Nathaniel B. Palmer to collect data using moored and autonomous platforms.

Field Season Overview

Project personnel, in collaboration with Palmer LTER program personnel, will deploy up to six subsurface moorings and two Slocum gliders. Time on station for each mooring operation is expected to be approximately two to three hours. Subsurface floats will be connected to a terminal top-side assembly, which will be outfitted with an acoustic package consisting of an upward-facing sonar, a conductivity temperature depth (CTD) instrument, and an acoustic doppler current profiler (ADCP).

Deploying Team Members

- George Cutter
- Christian Reiss (Co-PI)

Project Indexes

Find information about projects approved for the 2021-2022 USAP field season using the available indexes.

Project Web Sites

Find more information about 2021-2022 USAP projects by viewing project web sites.

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2021-2022 USAP Field Season
Project Detail

Project Title

Stability And Instability: Records Of External Drivers And The Resulting Behavior Of Thwaites Glacier

Summary

Event Number:
C-447-N
NSF/OPP Award 1738942 / NERC Award NE/S006664/1

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Samina Ouda / Jamee Johnson

Principal Investigator(s)

Dr. Julia Smith Wellner
jswellne@central.uh.edu
University of Houston
Department of Geosciences
Houston, Texas

Dr. Robert Larter
rdla@bas.ac.uk
British Antarctic Survey
Cambridge, United Kingdom

Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: Thwaites Glacier

Description

The Thwaites Glacier Offshore Research (THOR) project is a part of the International Thwaites Glacier Collaboration (ITGC), a multi-disciplinary effort led by the US and UK Antarctic programs. This project will conduct marine and sub-ice shelf research to (1) establish boundary conditions seaward of the Thwaites Glacier grounding line, (2) obtain records of past external drivers of glacier change, and (3) determine the history of past changes in grounding-line migration and conditions at the glacier base. These objectives will be achieved through high-resolution geophysical surveys of the seafloor and analysis of sediment cores from the inner shelf seaward of the Thwaites Glacier grounding line. The team will use ship-based equipment aboard the RV/IB Nathaniel B. Palmer and a corer deployed through the ice shelf through hot-water drill holes. The results will be incorporated into numerical ocean and ice-sheet models, and will improve projections of ice loss and sea-level rise originating from the glacier.

Field Season Overview

The THOR team on board the RV/IB Nathaniel B. Palmer will collect kasten cores, megacores, and box cores offshore from Thwaites Glacier, including at sites as close to the glacier as possible. They will describe and sample all the collected cores on board. The

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Project Web Sites

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four-person team will also run the multibeam bathymetry and sub-bottom profiler systems when the ship is in transit, particularly targeting gaps in existing coverage in the area offshore from Thwaites Glacier.

Deploying Team Members

- Rachel Clark
- Robert Comas
- Asmara Lehrmann
- Julia Wellner (PI)

2021-2022 USAP Field Season
Project Detail

Project Title

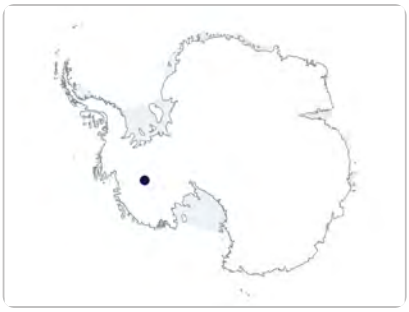
Investigating Ice Sheet - Solid Earth Feedbacks In West Antarctica: Implications For Ice Sheet Evolution And Stability

Summary

Event Number:
G-079-M
NSF/OPP Award 1745074

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
Judy Shiple / Jenny Cunningham



Principal Investigator(s)

Dr. Terry Wilson
wilson.43@osu.edu
Ohio State University
Geological Sciences and Byrd Polar and Climate Research Center
Columbus, Ohio

Location

Supporting Stations: McMurdo Station
Research Locations: West Antarctic Ice Sheet (WAIS)

Description

The Polar Earth Observing Network-Antarctic Network (POLENET-ANET) autonomous GPS and seismic network has been reconfigured to acquire higher-resolution in-situ data around the Amundsen Embayment. The network captures spatially varying crustal motions and Earth structure in a region where the ice sheet is rapidly changing. Observations will be integrated into three-dimensional modeling to investigate the solid-earth cryosphere feedback processes that influence the past, present, and future behavior of the West Antarctic Ice Sheet (WAIS). Advanced models, constrained by the new observations, will improve estimates of West Antarctic ice-mass changes, establish where the WAIS may be stabilized by ongoing Earth deformation, and reduce uncertainties in future sea-level-change projections.

Field Season Overview

In the 2021-22 season, the POLENET project will aim to service project sites meeting ‘Tier 2’ criteria for the preservation of scientific data and infrastructure. A team of six will deploy through McMurdo Station to the WAIS Divide and make day trips by Twin Otter to their sites. The goals of this season are to service sites that are non-operational, at risk of burial by snow, or at risk of power loss, potentially resulting in the loss of instruments and data.

Deploying Team Members

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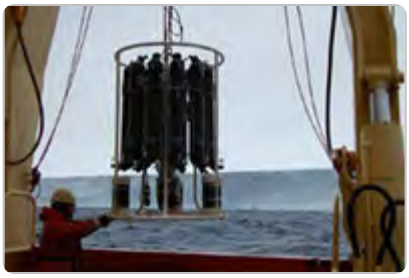
- Erica Lucas
- Peter Matheny
- Robin McBrearty

2021-2022 USAP Field Season
Project Detail

Project Title

NSFGEO-NERC: Accelerating Thwaites Ecosystem Impacts For The Southern Ocean (ARTEMIS)

Summary



Event Number:
B-465-N
NSF/OPP Award 1941483

Program Manager:
Dr. Karla Heidelberg

ASC POC/Implementer:
David Rivera / Jamee Johnson

Principal Investigator(s)

Dr. Patricia Yager
pyager@uga.edu
University of Georgia
Marine Sciences
Athens, Georgia

Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: Thwaites Glacier

Description

In collaboration with a UK-funded physical oceanographic sampling program, this team is using biogeochemical sampling to evaluate the contributions of iron, carbon, and microorganisms from both glacial meltwater and upwelling deep water on ecosystem productivity and carbon cycling. Measurements will be incorporated into models to better predict ecosystem responses to increased glacial melting. Results will help predict future impacts on the region and determine whether the climate sensitivity of the Amundsen Sea ecosystem represents the front line of processes generalizable to the greater Antarctic. This study is aligned with the large International Thwaites Glacier Collaboration (ITGC). The program will provide training for undergraduate, graduate, post-doctoral, and early-career scientists in both science and communication. The team will also develop out-of-school science experiences for middle and high schoolers related to climate change and Antarctica.

Field Season Overview

As part of a collaborative effort with the International Thwaites Glacier Collaboration (ITGC), an eight-person ARTEMIS team will join the 2021-22 Thwaites expedition aboard the RV/IB Nathaniel B. Palmer to characterize the glacial meltwater-driven iron, carbon, and microbial contributions that support primary productivity and atmospheric CO2 drawdown in the Amundsen Sea. This effort will occur through the addition of biogeochemical observations to the already funded Thwaites-Amundsen Regional Survey and Network Integrating Atmosphere-Ice-Ocean (TARSAN) program currently scheduled for the expedition. Four additional ship days will be allocated to the cruise for this project to complete shipboard Trace Metal Clean (TMC) CTD surveys along the north to south transit

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between the Antarctic Circumpolar Current and the ice shelf. The team will also deploy an underway towfish for surface water sampling and deploy two Seagliders with the TARSAN team to augment shipboard TMC surveys.

Deploying Team Members

- Giovanna Azarias Utsumi
- Lisa Herbert
- Patricia Medeiros (Co-PI)
- Hilde Oliver
- Robert Sherrell (Co-PI)
- Sharon Stammerjohn (Co-PI)
- Janelle Steffen
- Patricia Yager (PI)