

**United States National Report on Activities  
Working Group on Geosciences  
SCAR XXVII  
Shanghai, China  
July 15-19, 2002**

This is a report of geoscientific activities of the United States funded through its Office of Polar Programs - Geology and Geophysics, Dr. Scott Borg, Program Manager. An informal group of scientists has been established as a forum for the U.S. geosciences community to interact with NSF about community concerns as well as provide a resource for the community on current and new activities. This group is named the Antarctic Working Group on Geology and Geophysics (AntWGGG) and has a website at: <http://www.geology.ohio-state.edu/agg-group/> where anyone can access on-going U.S. geoscience activities in Antarctica. You may access more detailed information at that site about the summary below.

**LARGE MULTI-INSTITUTIONAL OR INTERNATIONAL PROJECTS**

The U.S. geoscience community is interested in a number of larger projects that involve collaborative efforts of a number of principle investigators and scientists at various institutions both within the U.S. and internationally. Some have been completed recently or are on-going, others are in the planning phase, that is, future workshops are planned.

**Past or On-going**

**ANTOSTRAT**

The U.S. geoscience community has had a great deal of interest and involvement with the SCAR ANTOSTRAT program. As of this meeting in Shanghai, the efforts of many interested in ANTOSTRAT, and a range of other scientists, will be directed toward ACE (see below).

**ANTIME**

This PAGES/SCAR initiative has had several projects related to it operating in the past (see AntWGGG site) and most future work will hopefully come under the auspices of ACE (see below).

**ANTEC**

This SCAR initiative has significant interest in the U.S. community and had several projects related to it operating in the past, and will continue to do so in the future (see AntWGGG site and the ANTEC site: <http://www.scar-ggi.org.au/geodesy/antec/antec.htm>).

**AGEANT**

This SCAR initiative has had several projects related to it operating in the past (see AntWGGG site) and hopefully in the future.

**WAIS**

The U.S. geoscience community continues to be interested in contributing geoscientific data to the U.S. West Antarctic Ice Sheet Program (WAIS). The current focus is on the Thwaites - Pine Island Glacier area and on offshore marine records. More information is on the WAIS website at: <http://igloo.gsfc.nasa.gov/wais/>.

**Cape Roberts Project**

This international drilling project in which many U.S. scientists participated, has been completed. Further

information can be obtained from the website at: <http://www.geo.vuw.ac.nz/croberts/index.html>. This project is being superseded by ANDRILL (see below).

#### Rock Repository

A new repository for housing Antarctic rock specimens is currently under construction at Ohio State University's, Byrd Polar Research Center (see website: <http://www-bprc.mps.ohio-state.edu/>). Associated with the rock repository will be a geosciences data base for the U.S.

#### SHALDRIL

Plans for investigating Antarctica's climate history as preserved on the Antarctic continental shelf are being developed using a SHALlow DRILLing (SHALDRIL) system from research class icebreakers. Workshops and engineering assessments have been completed. The first trial cruise of the drilling system has not been scheduled, but it is likely to be either April/May 2004 or February, 2005. More information on the project can be seen at: [http://www.geo-prose.com/projects/shaldril\\_broch.html](http://www.geo-prose.com/projects/shaldril_broch.html).

#### ANDRILL

The Antarctic Geological DRILLing (ANDRILL) project is being planned to supersede the Cape Roberts Project by drilling from fast-ice on the continental margin. Many U.S. scientists are hoping to participate in the project to decipher Antarctica's climatic history and relate it to global records. The ANDRILL Science Management Office is at the University of Nebraska (see website at: <http://andrill-server.unl.edu/>).

#### SOAR

The Support Office for Aerogeophysical Research (SOAR), which had been based at the University of Texas, Institute for Geophysics, has closed. Future aerogeophysical research resources required by the US Antarctic research community will be discussed as part of an up-coming workshop (REVEAL - see below).

### **Workshops and Future**

#### ACE

Antarctic Climate Evolution (ACE) is a program designed to address Antarctica's paleoclimate and ice-sheet modeling. A workshop was held May 31-June 2, 2002 at University of Massachusetts (see site <http://www.geo.umass.edu/ace>) to develop this as a future initiative of SCAR to be presented in Shanghai, 2002.

#### FASTDRILL

An interdisciplinary research program based on FAST ice-sheet DRILLing (FASTDRILL) is designed to recover geological cores from beneath the Antarctic Ice Sheet. A workshop is to be held on October 3-6, University of California at Santa Cruz, CA (see website at: <http://www.es.ucsc.edu/~tulaczyk/fastdrill.htm>).

#### IMAGES

An IMAGES (see website: <http://images.pclab.ifg.uni-kiel.de/start.html>) cruise of the R/V Marion DuFresne is being planned for Antarctic/Southern Ocean targets and it is hoped that the U.S. marine geoscience community will be playing a role in those cruises.

#### REVEAL

REmote Views and Exploration of Antarctic Lithosphere (REVEAL) Workshop: Tools for mapping the last

continental frontier, will discuss the future of U.S. geophysical surveying in Antarctica. The workshop is to be held at USGS Denver, CO August 2002 (see website at: <http://crustal.usgs.gov/antarctica>).

#### SALE

U.S. geoscientists are very interested in the developments within the SCAR SALE GoS and are pursuing both research (see AntWGGG site and listings below) and the establishment of an international program. See website at: <http://salegos-scar.montana.edu/>.

#### SEAP

Structure and Evolution of the Antarctic Plate (SEAP) is being initiated through a workshop being planned for March 3-5, 2003, in Boulder, CO.

### INDIVIDUAL PROJECTS

This list of project summaries is taken from the AntWGGG website given above and is presented by being grouped in regional activities. Note that the award numbers in the following list can be used to get more information about the projects at the following NSF URL:

<https://www.fastlane.nsf.gov/a6/A6AwardSearch.htm>. Just use the project number in the box that accepts "keywords". You can use multiple numbers separated by commas and get several projects at once. The information provided on the website is the abstract of the award, the PI name and institution, Program Officer name, and anticipated award amount and duration.

#### Mount Erebus Work

Project OPP 9814921

Philip Kyle and Richard Aster: New Mexico School of Mines and Technology, NM  
Mount Erebus Volcanic Observatory: Gas Emissions and Seismic Studies.

Project OPP 0126269 and OPP 0125744

Kenneth Sims, Woods Hole Oceanographic Institute, MA; Philip Kyle, New Mexico School of Mines and Technology, NM

U-Series Isotopic Constraints on the Rates of Magma Genesis Evolution and Degassing at Mt. Erebus, Antarctica.

Project MRI 0116577

Philip Kyle and Richard Aster, New Mexico School of Mines and Technology, NM  
MRI - Development of integrated seismic, geodetic, and volcanic gas surveillance instrumentation for volcanic research.

#### Work in the Dry Valleys and southern Victoria Land

Project OPP 0125194

Paul Renne, Berkley Geochronology Center, University of California at Berkley, CA  
Calibration of Cosmogenic Argon Production Rates in Antarctica.

Project OPP 0087919

David Elliot, Byrd Polar Research Center, Ohio State University, OH  
Ferrar basaltic tuff-breccias formed by direct eruption: Evaluating an hypothesis.

Project OPP 0088136

Nicholas Lancaster and William Gilles University of Nevada Reno, Desert Research Institute, Reno NV.

Aeolian processes in the McMurdo Dry Valleys, Antarctica.

Project OPP 0087915 and OPP 0087994

Berry Lyons, Byrd Polar Research Center, Ohio State University, OH; Brent McKee, Tulane University, LA  
Chemical weathering in Taylor Valley Streams: Sources, mechanisms and global implications.

Project OPP 0125842 and OPP 0125330

Huiming Bao, Louisiana State University, LA; Dave Marchant, Boston University, MA  
Multiple Isotope Analyses of Soil Sulfate and Nitrate in the Antarctic Dry Valleys.

Project OPP 9909637 and OPP 9909749

John Isbell, University of Wisconsin, Milwaukee, WI; Rosemary Askin, Byrd Polar Research Center, Ohio State University, OH  
Permian-Triassic Basin History of Southern Victoria Land and the Darwin Mountains.

Project OPP 9909770 and OPP 9910879

Terry Wilson, Byrd Polar Research Center, Ohio State University, OH; Tim Paulsen, University of Wisconsin at Oshkosh  
Antarctic Stress Map Project Phase I: Neogene -Quaternary Volcanic Alignments in the Transantarctic Mountains and Ross Sea Region.

Project OPP 0126106, OPP 0125634 and OPP 0125737

Thomas Fleming, Southern Connecticut State University, CT; Stephen Marshak, University of Illinois, Urbana-Champaign, IL; Anne Grunow, Byrd Polar Research Center, Ohio State University, OH  
Emplacement of the Ferrar Mafic Igneous Province: A Pilot Study of Intrusive Architecture and Flow Directions in Southern Victoria Land.

Project OPP 9814332

Bruce Marsh, John Hopkins University, MD  
The Ferrar Magmatic Mush Column System, Dry Valleys, Antarctica.

### **Central Transantarctic Mountains Work**

Project OPP 0126146 and OPP 0126086

Molly Miller, Vanderbilt University, TN; John Isbell, University of Wisconsin, Milwaukee, WI  
Late Paleozoic-Mesozoic Fauna, Environment, Climate and Basinal History: Beardmore Glacier Area, Transantarctic Mountains

Project OPP 0126230

Edith Taylor and Thomas Taylor, University of Kansas, KS  
Permian and Triassic Floras of the Beardmore Glacier Area: Icehouse or Greenhouse?

Project OPP 9980452

Ralph Harvey, Case Western Reserve University, OH  
ANSMET (The Antarctic Search for Meteorites)

### **East Antarctic Work**

Project OPP 9978236

Robin Bell and Michael Studinger, Lamont Loherty Earth Observatory, Columbia University, NY  
LExEn: Understanding the boundary conditions of the Lake Vostok Environment: A site survey for future work.

Project OPP 9909603, OPP 9909648, and OPP 0226538

Douglas Weins, Washington University at St Louis, MO; Sridhar Anandakrishnan and Andrew Nyblade, Pennsylvania State University, PA

A broadband seismic investigation of deep continental structure across the East-West Antarctic boundary.

### **East Antarctic Continental Margin: Marine Work**

Project OPP 0202771, OPP 0200632, OPP 0207305 and OPP 0202075

Amy Leventer, Colgate University, NY; Stefanie Brachfeld, Ohio State University; Robert Dunbar, Stanford University, CA; Patricia Manley, Middlebury College, VT

Quaternary Glacial History and Paleoenvironments of the East Antarctic Margin.

### **Ross Sea: Marine Work**

Project OPP 0202911

Charles Hart, Colorado University, The Institute of Arctic and Alpine Research, CO

SGER - Amino acid geochronology of Ross Sea carbonates: Collaborative with Marco Taviani/PNRA cruise in 2002.

Project OPP 0125624 and OPP 0126279

Terry Wilson, Ohio State University, Byrd Polar Research Center, OH; Lawrence Lawver, University of Texas, Institute of Geophysics, TX

Neotectonic Structure of Terror Rift, Western Ross Sea.

Project OPP 0088143, OPP 0087392 and OPP 0087983

Bruce Luyendyk, University of California at Santa Barbara, CA; Louis Bartek, University of North Carolina, NC; John Diebold, Lamont Doherty Earth Observatory, Columbia University, NY

Antarctic Cretaceous-Cenozoic Climate, Glaciation, and Tectonics: Site Surveys for drilling from the edge of the Ross Ice Shelf.

### **West Antarctic Work**

Project OPP 0003619, OPP 0003861 and OPP 0003834

Ian Dalziel and Frederick Taylor, University of Texas Institute of Geophysics, TX; Mike Bevis, University of Hawaii, HI; Robert Smalley, University of Memphis, TN

WAGN - A GPS Network to determine crustal motions in the bedrock of the West Antarctic Ice Sheet: Phase 1 - Installation

Project OPP 9814774 and OPP 9814816

Sridhar Anandakrishnan and Richard Alley; Pennsylvania State University, PA; Donald Blankenship, University of Texas Institute of Geophysics, TX

Characterizing the Onset of Ice Stream Flow: A Ground Geophysical Field Program.

### **West Antarctica and Peninsula: Marine Work**

Project OPP 9909734

John Anderson, Rice University, TX

Last Glacial Maximum: Late Pleistocene to Holocene Glacial History of West Antarctica.

Project OPP 9909665 and OPP 0003060

Glenn Berger, University of Nevada Reno, Desert Research Institute, Reno NV; Eugene Domack ,

Hamilton College, NY

Development of a Luminescence dating capability for Antarctic glaciomarine sediments: Tests of signal zeroing at the Antarctic Peninsula.

Project OPP 0094078

Philip Bart, Louisiana State University, LA.

PECASE: Relative frequency and phase of extreme expansions of the Antarctic Ice Sheets during the late Neogene.

Project OPP 0125922, OPP 0125480, OPP 0125526 and OPP 0125562

John Anderson, Rice University, TX; Patricia Manley, Middlebury College, VT; Sherwood Wise and Thomas Janecek, Florida State University, FL; James Zachos, University of California, Santa Cruz, CA  
SHALDRIL, A Demonstration Drilling Cruise to the James Ross Basin.

### **Antarctic Peninsula Region: Terrestrial Work**

Project OPP 9814622

Douglas Weins, Washington University in St. Louis

Acquisition and Operation of Broadband Seismograph Equipment at Chilean Bases in the Antarctic Peninsula region.

Project OPP 9908828 and OPP 9908856

Daniel Blake, University of Illinois, Champagne, Urbana; Richard Aronson, The Dauphin Island Sea Lab, AL

Global Climate Change and the Evolutionary Ecology of Antarctic Mollusks in the Late Eocene.

Project OPP 0003844 and OPP 0087972

Judd Case, St. Mary's College, CA; James Martin, South Dakota School of Mines and Technology.  
Evolution and biogeography of Late Cretaceous vertebrates from the James Ross Basin, Antarctic Peninsula.

Project OPP 0126472

Fred Taylor and Ian W. D. Dalziel, University of Texas, Institute of Geophysics

The Scotia Arc GPS Project: Focus on the Antarctic Peninsula and the South Shetland Islands.

### **Southern Ocean: Marine Work**

Project OPP 0126334 and OPP 0126340

Joann Stock, CalTech, CA; Steve Cande, Scripps Institute of Oceanography, CA  
Improved Cenozoic Plate Reconstructions of the Circum-Antarctic Region.