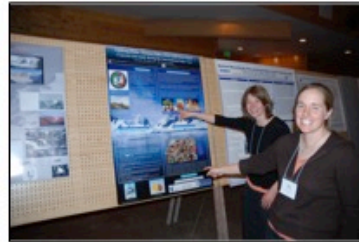
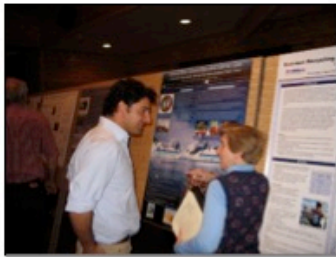


New Generation of Polar Researchers Symposium

4-11 May 2008

La Foret Conference Center, Colorado Springs, Colorado USA

FINAL REPORT



C. Susan Weiler, Whitman College
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Jenny Baeseman, International Arctic Research Center

Support

U.S. National Science Foundation IPY Education
ARC-0632324 to Whitman College, C.S. Weiler PI
ARC-0632312 to University of Colorado, S.D. Drobot PI.

Overview

“The NGPR Symposium was amazing. It inspired me to continue to explore interdisciplinary avenues in my research and helped me realize that the future of science, like everything else, hinges on attitudes and abilities of the next generation.” -- NGPR participant

Physical challenges associated with polar research today are relatively easy compared with what researchers faced 50 years ago during the 1957-1958 International Geophysical Year (IGY). The intellectual terrain is, however, far more demanding now than previously. With nearly every aspect of the Polar Regions changing rapidly due to climate change, a new generation of polar researchers must achieve disciplinary expertise *and* work across traditional disciplinary boundaries to conduct socially relevant, transformative research, and translate it to more effective action.

To learn about the past and better address these new challenges, a select international group of 35 students and early career researchers who are conducting research during the 2007-2009 International Polar Year were brought together May 4-11, 2008, at the La Foret Conference Center for the New Generation Polar Research (NGPR) Symposium. The participants were drawn from professional backgrounds spanning the spectrum of social, natural, and physical sciences and represented the research programs of 7 countries. In addition to the participants, 12 mentors, some of whom participated in the IGY, shared insights, stories, and expertise.

This diverse and ambitious group spent an intensive week learning about many important aspects of IPY history and research, along with communication, outreach, interdisciplinary research and career development. Each of the participants presented a brief (7-minute) overview of his or her IPY research and provided details and discussion in evening poster sessions. Polar history provided an informative and unifying context for discussions of the past, present, and future that lasted throughout the week. Mentors and guest speakers shared insights and advice on media interactions, and many participants were subsequently interviewed for an upcoming radio story to be aired on National Public Radio. Several presentations on outreach were followed by a hands-on session with a group 1st grade students and a few local teachers who were visiting the La Foret Conference Center. The Symposium also featured several break-out sessions, where small groups of participants and mentors discussed challenges related to interdisciplinary research, science advocacy, and maintaining a work/life balance. In addition, each participant was encouraged to video-record a two-minute overview of their research interests to be archived at the American Institute of Physics as a sort of “time capsule” to be shared with students, researchers, historians of science and the general public during the next IPY.

Electronic Resources

The original grant was for the purpose of developing a webpage, e-newsletter and symposium. Dr. Drobot was to take the lead on the webpage, Dr. Weiler the newsletter, and both would work on the symposium. Once the grant was funded, the PIs discovered that Dr. Jenny Baeseman (Kent State University) had been working without support on a separate project to develop an international group of early career polar researchers and a website for their group, which became the Association of Polar Early Career Scientists (APECS). APECS now includes over 1,400 student and early career researchers from over 40 countries. A supplement to ARC 0632324 to Whitman College supported Baeseman to create a long-term home for the NGPR resources within the APECS website. This will enable resources from the NGPR to reach a broad international audience of early career polar researchers. Baeseman was invited to assist with symposium planning and to serve as the APECS representative at the symposium, to ensure close links between the two projects. The NGPR website and the numerous resources generated can be found at: <http://arcticportal.org/apecs/ngpr>. An electronic newsletter informed all interested persons of IPY and NGPR activities. This was eventually merged with the weekly DISCCRS newsletter for post-grant continuity.

NGPR Symposium

May 5 – 11, 2008

La Foret Conference Center, Colorado Springs, CO

“Thank you very, very much that was an amazing week with amazing people. I'm going back home full of hope and dreams and I'm more confident in what I'm doing, then before.”

NGPR participant

1. Application Process

The application process followed the NSF Panel Review model. Advanced students and Ph.D. graduates conducting polar research during the IPY and who completed their degree between Jan. 1, 2002 and Mar. 31, 2009 were eligible to apply. Scholars from the full range of natural and social sciences were eligible, and while the focus was on U.S. research, citizens of all countries were eligible. Applicants were required to submit their Ph.D. dissertation abstract; a 1-page CV; one essay describing their IPY research project with the intention that a well-educated adult, with minimal background in their discipline, would understand; one essay describing their interdisciplinary and/or international collaborations and how they are incorporating other disciplines into their research and outreach; and two letters of recommendation.

Applications were initially ad-hoc reviewed by at least two established polar scientists, and then all applicants were discussed by a 8-member committee of polar scientists over a two-day in-person meeting. The final candidates were competitively selected based on the quality of their research, outreach activities, and their potential to become well respected experts in their field in

the context of collaborative, interdisciplinary research and its impacts with a goal of linking their science research to societal needs.

A total of 101 applications were received by the October 15, 2007 deadline. Participation was limited to 35 scholars likely to be future leaders.

Applicant and Participant Characteristics:

Of the 101 applicants, 73 resided in the USA. Applications were also received from Canada (9), the UK (3), Belgium (2), Brazil (2), Germany (2), Norway (2), Denmark (1), France (1), New Zealand (1), Poland (1), Portugal (1), Russia (1), Spain (1), and Sweden (1). 72 of the applicants either received or are obtaining their Ph.D. in the USA. International Ph.D.s for the applicants included Canada (8) the UK (5), Germany (3), Australia (2), Belgium (2), Brazil (2), Italy (9), New Zealand (1), Norway (1), Poland (1), Russia (1), Sweden (1), and Switzerland (1).

Of the 35 participants, 27 received or are obtaining their Ph.D. in the USA. The remaining eight were completed in the UK (3), Australia (1), Canada (1), Germany (1), New Zealand (1), and Poland (1).

The general subject area for the applicants and participants represented a broad cross-section. “Paleostudies” represented the largest category for both applications and participants, but there was significant representation from numerous subject areas (Table 1). The social-science category included anthropologists (5), political scientists (4), sociologists (2) and geographers (1). Eight of the twelve social scientists were invited, but four declined due to time conflicts (field work, family, thesis writing).

Table 1. Subject Areas		
	Applicants	Participants
Atmospheric Science	11	3
Geo/Hydro/Oceanography	9	5
Ice (land or ocean)	12	5
Paleostudies	22	8
Biogeochemistry	13	4
Biology	7	2
Ecology	12	4
Geography	2	0
Social Science	12	4
Other	1	0

In both the applicant and participant pool, there was a higher percentage of people performing Arctic fieldwork than Antarctic fieldwork, although some people did both and a few did neither (Table 2).

Table 2. General location of field work		
	Applicants	Participants
Arctic	48	16
Antarctic	28	10
Arctic & Antarctic	7	2
Non-Polar	4	1
No field work	13	6
No answer	1	

Finally, most of the applicants and participants were Ph.D. students, with others being post-doctoral researchers, and a few being in potentially permanent positions (Table 3).

Table 3. Current Position		
	Applicants	Participants
Ph.D. Student	58	17
Post Doc Researcher	29	13
Potentially Permanent	12	3
Other temp	2	2

2. Symposium

The Symposium agenda is available at the end of this document. Activities began on Sunday, May 4 with registration and an evening plenary talk from Dr. Ronald E. Doel and Dr. Kristine C. Harper on the importance of studying polar history, setting the tone for the week. The full agenda, including participant abstracts and, in some cases, their poster presentations, are available at <http://arcticportal.org/apecs/ngpr/agenda>.

Participant presentations. The first two full days of the Symposium were filled mostly with oral and poster research presentations by the participants. In sharp contrast to the specialized talks presented at most scientific society meetings, each presented their research as a brief (7-minute) overview designed for a non-specialist audience. Their presentations highlighted the impressive quality and diversity of research underway in the polar regions. Late afternoon poster sessions for these two days week provided additional opportunities for the participants to describe their professional backgrounds and current research projects.

Historical links. One of the key concepts of the symposium was the historical link between research conducted in the past, particularly during the 1957/58 International Geophysical year (IGY), and the current IPY. Dr. Donal Manahan described early polar exploration during the “heroic” age (pre 1914). Philip M. Smith and John C. Behrendt, who participated in the IGY as graduate-student researchers during the IGY, presented keynotes on polar science and planning during the 1957-1958 International Geophysical Year (IGY). Philip Smith and Chris Elfring then described planning through the current IPY. David J. Carlson provided an overview of the broad array of research to be conducted during the current IPY.

Symposium Mentors. A notable group of mentors provided critical background information on cutting-edge polar science and keen insights into scientific, political, and economic activities. The mentors also provided advice on early career development including development of collaborative research projects and proposals, the tenure process, and balancing personal and professional life. They also advised scholars individually by providing critical feedback on their presentations and posters. Mentors also participated in small-group and plenary discussion panels, and engaged in numerous informal discussions over meals and poster sessions. The highlights of their presentations are summarized below. Most of the presentations were videotaped in an archival format and will be given to the American Institute of Physics' Center for the History of Physics. Most of the mentors were present for the full week, and engaged with participants during panel discussions, small-group activities, and one-on-one interactions. The retreat-style location provided many opportunities to interact during meals, breaks, evening activities, and in other informal settings.

John C. Behrendt, *University of Colorado*, participated in the discussion on research during the IGY. Dr. Behrendt showed numerous slides from this time on the ice in the late 1950s and early 1960s, and contrasted some of the logistical problems they had in the IGY with modern scientific expeditions. Dr. Behrendt also outlines some of the major scientific endeavors that he was involved in during the IGY, including mapping the Antarctic surface. Behrendt observed that the U.S. could not find sufficient U.S.-resident geophysicists to conduct all the research planned for the IGY, and ended up recruiting scientists from abroad to participate in the U.S. programs. He contrasted that with the situation today, when there is far more research being conducted than previously, and many U.S. students and early career researchers cannot participate due to lack of research funding. Behrendt mentioned several of the NGPR participant presentations in *The Polar Times* (Behrendt 2008).

David J. Carlson, *IPY International Programme Office*, gave a keynote Presentation on some of the research ongoing during the current IPY. Dr. Carlson particularly stressed a number of projects that were both international and interdisciplinary.

Ronald E. Doel, *Oregon State University*, discussed how historians of science collected information during the IGY in comparison to the modern world, and also provided a background on some of the major issues that were discussed as science goals for the IGY.

Chris Elfring, *National Research Council*, outlined how the current IPY was planned at the national level, and also discussed the role of science policy in today's scientific world. She also teamed with Phil Smith to discuss the key characteristics of being a leader.

Kristine C. Harper, *New Mexico Institute of Mining and Technology*, focused her discussion on the history of the atmospheric sciences from pre-IGY through several decades post-IGY. Dr. Harper also provided tips and advice for working with physical and social scientists and interdisciplinary problems.

Donal T. Manahan, *University of Southern California*, outlined some of the trials and tribulations faced by earlier polar explorers in the Antarctic and the Arctic, including Shackleton and Scott. Dr. Manahan also led discussion on the importance of finding a work-life balance.

Mark S. McCaffrey, *University of Colorado*, discussed his role on the IPY Education, Outreach and Communication subcommittee, and provided the participants with advice on media outreach.

Diane M. McKnight, *University of Colorado*, discussed her outreach conducted as part of the NSF Antarctic Dry Valley LTER program. She was instrumental in the development of a children's book, *The Lost Seal*. She also provided advice on the importance of finding a work-life balance, and into developing large-scale science projects and international collaborations.

Ellen Mosley-Thompson, *Ohio State University*, teamed with Dr. Lonnie Thompson to discuss their career path from early in graduate school through today, and provided insights into how to develop personally and professionally as an interdisciplinary researcher.

Donald Perovich, *Cold Regions Research and Engineering Lab*, did not make a formal presentation as he was not able to attend the first couple of days of the symposium. He engaged participants in panel and small-group discussions.

Stephanie Pfirman, *Barnard College*, presented two keynotes, one on how to be an interdisciplinary researcher, and the other on how to overcome some of the common pitfalls and obstacles faced by interdisciplinary researchers in an academic setting.

Phillip M. Smith, *former executive director of the National Research Council of the National Academies*, provided a history for science planning from the IGY through to today, and teamed with Chris Elfring to discuss the key characteristics of being a leader.

Lonnie G. Thompson, *Ohio State University*, presented a keynote on understanding climate change and teamed with Dr. Ellen Modley-Thompson to discuss their career path from early in graduate school through today. They also provided insights on how to develop an interdisciplinary research career. They also stressed the importance of work-life balance.

Outreach. Plans for outreach as well as research were included in the application package and review process. In line with the commitment of the participants to public outreach during the IPY, sessions were devoted to this topic to enhance the participants' existing and planned outreach activities. These are highlighted below.

Audio and Video recordings. Throughout the symposium, most of the formal sessions were audiotaped and videotaped for public distribution via the NGPR webpage and archiving at the American Institute of Physics. In addition, the 34 early career scholars were invited to record brief (2-minute maximum) video summaries of their research plans for the IPY and impressions of what being part of the IPY means to them. Fourteen of the participants made such videos, and these will be turned over to the American Institute of Physics as a "time capsule" to be opened during the next IPY. However, the best recordings were made informally by one of the participants, William D'Andrea!

As a serendipitous coincidence, NGPR participant William D'Andrea, had participated in a NSF/OPP sponsored project, Ice Stories, run through the San Francisco Exploratorium (see <http://icestories.exploratorium.edu/dispatches/author/billy-dandrea/>). During the NGPR symposium, he used the equipment and training he had received to record participants at the NGPR: "To get a feel for some of the questions motivating young polar scientists, I asked each workshop participant to tell me (in one sentence!) what they hope to understand through their research." These informal clips recorded by a peer were far more successful than the more formal sessions that were part of the initial agenda. D'Andrea's recordings are available on the above website and are also displayed on the NGPR website as a short film (see <http://arcticportal.org/apecs/ngpr/videos>). These brief clips provide a dynamic and inspiring look at this new generation of polar researchers.

Participant Outreach Activities. A panel led by Baeseman and including six of the scholars with the most outreach experience shared their activities and insights gained through their efforts. The panel included Nerile Abram (media; radio and TV), Zoe Courville (elementary and high schools), Michele Koppes (Congressional science Fellow), Christina Riesselmann (science museum), Heidi Swanson (Inuit communities), Michael Willis (under-represented minorities), and José Xavier (children and general public). These first-hand accounts by peers were extremely helpful in showing participants how they might get started, while the training and insights by established scholars provided useful "tricks of the trade" for use as they progress with their projects.

Interacting with Policy Makers and the Media. Mentors participated in panels to describe their experiences working with media and policy makers. Insights were offered in these formal sessions as well as meals and other informal times throughout the week.

Media Training. Media expert and science writer Molly Bentley led a session on interacting with the media. Mentors offered their insights as well. Barbara Bogaev, producer of a NSF-funded series of public radio documentaries about early polar science, interviewed some of the mentors and participants for inclusion in the series.

Hands-on training and interactions with first-grade students. All of the invited scholars had expressed interest in conducting some form of outreach and had developed specific plans, but roughly thirty percent had not conducted K-12 outreach prior to the workshop and were eager to learn the skills needed. To better demonstrate how to do k-12 outreach, Jenny Baeseman developed and led a hands-on activity session where the participants worked directly with a group of first-grade students who were participating in a 2-day “field camp” at the La Foret Center, plus local teachers who had been invited to the event. The young researchers and students worked in small groups using a variety of activities including materials developed by ANDRILL’s “Antarctica’s Climate Secrets” program, also funded through the NSF OPP. This allowed for personal relationships to develop between the students and the scientists, which is critical to help turn kids on to science. This session not only educated the students, it gave the young researchers the opportunity to develop the skills needed for K-12 outreach in a simple way.

Interdisciplinary Research Issues. Several topics related to interdisciplinary research were discussed in plenary panels and small-group format. Presentations by Dr. Lonnie G. Thompson, Dr. Ellen Mosley-Thompson, and Dr. Stephanie Pfirman provided the participants with advice on developing their scientific goals, and how to work effectively on interdisciplinary projects.

The participants are currently drafting summaries of these sessions, so although these summaries are not complete, we can provide an overview of the major highlights. One of the main sessions was *Interdisciplinary Research (IDR)*. A central theme among the discussions was: How do early careers scholars manage a successful IDR career? There was an implied concern among all participants---both student scholars and mentors---that there are many potential pitfalls to conducting IDR, and that adequate forethought is required to be successful. Indeed, the traditional university structure is often an impediment to IDR, with college departments strictly developed along disciplinary lines and often housed in different buildings on campus with little chance for interactions. In beginning their discussions on challenges in IDR, one breakout group developed a “mock panel” to consider the case of a tenure-review committee considering whether to promote a scholar with a few co-authored papers which were IDR, or another with many first author papers which were traditional disciplinary studies. Which candidate most deserves to be promoted? The group considering this case did not reach a consensus and could not agree which assistant professor would be a better choice. They concluded that it is indeed difficult to make these evaluations. This helped set the stage for further debate on challenges in IDR. A group of participants are working on a journal article summarizing the results of these discussions.

Professional Development. The participants also received information on group dynamics, collaborative team work and facilitation techniques from expert trainer Chris Olex (The Point). Dr. Julie Palais provided an overview of the National Science Foundation’s Office of Polar Programs (OPP). She also described the NSF proposal review process and characteristics of

successful proposals. Sue Weiler led a session on distilling science for a non-specialist audience, and Sheldon Drobot led a session on catalyzing change. All shared their knowledge and insights during panel discussions, meals, and other informal interactions during the full week. Participants were keenly aware of the challenges facing interdisciplinary researchers (need for breadth as well as depth, identifying potential collaborators and developing cross-discipline collegial relationships, developing successful research proposals, gaining funding, and identifying appropriate journals for interdisciplinary research; and, last but not least, finding jobs and navigating promotion as an interdisciplinarian. Most if not all were struggling to find an appropriate work-life balance. Mentors recognized the importance of this balance, and most addressed it in their talks or during informal interactions. Given the global economy and funds available for research, this will be a continuing challenge.

3. Summary

Humanity needs to respond more quickly and appropriately to challenges imposed by our rapidly changing global environment. These changes affect the physical, natural and human dimensions of our Earth. The U.S. population and its government are increasingly aware that human-induced climate change can now be observed above the noise of “normal” variability. Polar regions are like the canaries in the coal mine, as effects are currently more rapid and severe than in other areas.

Solutions to these global challenges will require natural and social scientists to work together across disciplinary boundaries. This will require them to forge lasting collegial bonds with their peers from other disciplines and other parts of the world. In addition, it is critically important that we train scientists to effectively communicate their findings to educators, policy makers, and the general public who ultimately determine policy through their elected representatives. The NGPR symposium addressed these needs. Scholars who are better prepared for outreach activities through symposium participation should be more likely to participate in outreach activities concerning polar regions. This will provide a mechanism to better educate students, teachers, media, policy makers and other members of the general public about polar regions and issues of societal concern.

Part of the NGPR is to prepare recent grads to communicate beyond the scientific community – with k-grey, the media, policy makers, and the general public. The symposium specifically included training on communicating beyond the scientific community. The net result should be a cadre of highly trained polar scientists who are prepared to explain their work to specialists within and outside their discipline, to educators, policy makers, managers and the general public – and who are also motivated to develop effective outreach activities.

The IGY generation was facing the aftermath of a world war and escalating tensions between two super-powers, but the outlook for scientific research was quite bright. This new generation is dealing with change on a global scale, increasing terrorist activities and a deteriorating global economy. Scientific knowledge has never been greater and important new research directions are identified with increasing frequency. But the funding outlook, for this new generation, is not so bright. John Behrendt mentioned that, during the IGY, the US could not find sufficient students and researchers to conduct all the research planned for the IGY, and scientists were recruited

from abroad. Today, there are far more researchers than can be accommodated. Fortunately, members of this new generation have the sense of wonder, intelligence, drive and persistence in the face of adversity that marked the IGY generation. They are establishing connections across national boundaries and across disciplines. Women and under-represented groups are participating as never before. The future of polar research is in good hands.

4. Publications and Presentations from the Symposium

Public webpage: <http://arcticportal.org/apecs/ngpr>

Behrendt, J. 2008. President's Letter. *The Polar Times* 3(13):2.

Drobot, S.D., C.S. Weiler, and J. Baeseman, 2008: New Generation Polar Researcher Symposium Expands Early Career Network. Available at http://www.ipy.org/index.php?ipy/detail/new_generation_polar_researcher_symposium_expands_early_career_network/. Accessed October 3, 2008.

Drobot, S.D., C.S. Weiler, and J. Baeseman, 2008: NGPR Symposium - Training the New Generation of Polar Researchers in IPY. Available at <http://www.uarctic.org/singleNewsArticle.aspx?m=83&amid=5115>. Accessed October 8, 2008.

Drobot, S.D. and C.S. Weiler 2008. Training the new generation of polar researchers. AGU fall meeting, December 17, San Francisco, CA. Poster.

Wardell, L., C.S. Weiler, S. Drobot, and J. Baeseman. 2008. Preparing new polar researchers to lead the next International Polar Year. *Eos*. 89(33):305.

Weiler, C.S. 2007. Meeting Ph.D. Graduates' needs in a changing global environment. *Eos* 88(13): 149, 151.

5. Symposium Evaluations

The agenda included time for daily assessments. Participants were encouraged to make suggestions for improvements; these were then discussed and the agenda modified by consensus. For example, the original agenda included time for participants to share their 2-minute statements for the IPY time capsule in a plenary session on the last day. The participants felt uncomfortable giving these in front of a group, and so this was made optional, with the videotaping done singly during "spare" time. Serendipitously, participant William D'Andrea had received training in videorecording through participation in the NSF-funded Ice Stories project at the San Francisco Exploratorium. He had brought the video equipment he had received from the Exploratorium, and offered to do brief, private recordings of each participant. This was an unexpected and much-appreciated outcome. The time that would have been devoted to the video segments was used instead for more plenary and small-group sessions on professional development. Written evaluations from participants on the last day of the symposium were

overwhelmingly positive – almost all gave 4s and 5s on a 5-point scale with 1= Not at all pertinent or effective and 5 = Extremely pertinent or effective. The average for overall program value was 4.50 with eighteen 5’s, fourteen 4’s, and one 3. The average score for individual sessions is listed in Table 4.

Table 4. Participant evaluations (35 total)	
Scale	
1 = Not effective	
5 = Extremely pertinent or effective	
Topic	Average Score
Overall value	4.50
Participant Orals	4.79
Participant Posters	4.17
Mentors	4.77
Keynote Talks (mentors)	4.36
NSF, Proposals	3.94
Panel Discussions	3.83
Discussion Groups	4.29
Team / Facilitation	4.12
K-12 Outreach	3.57
Media Training	3.88
2-min Video	3.35
Networking Opportunities	4.43
Fireside Discussions	3.40

IPY NGPR Symposium Agenda

See <http://arcticportal.org/apecs/ngpr/agenda>

for interactive version with links to abstracts and some presentations

Sunday, May 4, 2008

4:30 p.m. **Reception**

7:30 p.m. **Doel**, Ronald E., and Kristine C. **Harper**: Why History Matters

Monday, May 5, 2008

8:30 a.m. **Overview & Participant Introductions.** Participant introductions in alphabetical order: Maximum 2 minutes and one image

10:30 a.m. Break

11:00 a.m. **Carlson**, David J.: Scientific Impacts and Opportunities - IPY 2007-2008

12:30 p.m. Lunch

1:30 p.m. **Oral Presentations** (7-minute Maximum)

Davis, Jason M. Governance of Antarctic bioprospecting: Scientific contribution to the geopolitics of property and territory
Xavier, José C. POLAR - Predator prey interactions in the Antarctic during the International Polar Year
Lovenduski, Nicole S. Determining the future behavior of the Southern Ocean CO₂ sink
Koppes, Michele N. Controls on sediment yields from tidewater glaciers from Patagonia to Antarctica
Swanson, Heidi K. Effects of anadromous Arctic charr (*Salvelinus alpinus*) on food web structure and contaminant concentrations in coastal Arctic lakes
Johnson, Cody R. Geomorphic trophic hypothesis
Laney, Samuel R. Improving the use of satellite ocean color data in Arctic coastal ecosystems

3:00 p.m.

Break

3:30 p.m.

Oral Presentations *continued*

Abram, Nerilie J. BAS CACHE (Climate And CHEmistry research program)
D'Andrea, William J. High-resolution late Holocene temperature and biogeochemical reconstructions from southwestern Greenland
Belicka, Laura L. An integrated molecular and isotopic approach to assess organic sources and carbon sequestration over the Holocene Arctic Ocean
Hill, Jenna C. Late Pleistocene and Holocene sea level and climate history of the Chukchi Sea
Mason, Arthur L. Collaborative study of the nearly developing Arctic natural gas industry
Baker, Narelle P. Assessing the role of subglacial hydrology on the flow of West Antarctic ice streams: A numerical modelling approach
Tape, Kenneth D. Identifying areas prone to shrub expansion, and the role of snow, Arctic Alaska. Book: "Climate Warming and the Changing Landscape of Northern Alaska"

5:00 p.m.

Breen, Amy L. Late Quaternary history of balsam poplar in North America
Poster Session (Monday presenters)

6:30 p.m.

Dinner

7:30 p.m.

Smith, Philip M. and **Chris Elfring:** Planning the IGY, IPY & Future

Tuesday, May 6

9:00 a.m.

Palais, Julie: NSF, Office of Polar Programs (OPP) and Polar Research. Overview of NSF and OPP, and NSF review process with tips on successful proposal development.

10:30 a.m.

Break

11:00 a.m.

Oral Presentations *continued*

Fietz, Susanne S. Climate control on Holocene variability in Arctic sea-ice and marine carbon export production (ICECARB); Climate variability and ecological consequences in the Arctic

- Hebert, Karen E.** Contradictions of Consolidation: Labor, Nature, and Fishery Restructuring in Bristol Bay, Alaska
- Wobus, Cameron W.** Toward a predictive model of Arctic coastal retreat in a warming climate, Beaufort Sea, Alaska
- Schneider, David P.** Collaborative Research: A synthesis of the last 2000 years of climate variability from Arctic lakes
- Haase, Daniela.** The effectiveness of the current regulatory regime for Antarctic tourism
- Rennermalm, Åsa K.** The role of spatial and temporal variability of pan-Arctic river discharge and surface hydrological processes on climate
- Willis, Michael J.** POLENET GPS component - Arctic and Antarctic
- Courville, Zoe R.** Collaborative Research: Firn structure, interstitial processes and the composition of firn air at Summit, Greenland
- 12:30 p.m. Lunch
- 1:00 p.m. **Oral Presentations** *continued*
- Liu, Jiping.** Arctic regional climate model intercomparison project: Evaluation and interpretation of cloud and radiation fields using data products from FIRE.ACE
- Fogt, Ryan L.** An investigation of long-term Southern Annular Mode variability
- Rawlins, Michael A.** Application of Remote Sensing and Land Surface Modeling for Understanding Northern High-Latitude Hydrology and Climatic Change
- Sjostedt, Steven J.** Canadian Arctic SOLAS Network
- Meir, Jessica U.** The aerobic dive limit: Oxygen transport and depletion in emperor penguins; Characterization of the oxygen affinity of emperor penguin hemoglobin
- 3:00 p.m. Break
- 3:30 p.m. **Oral Presentations** *continued*
- Strzelecki, Mateusz C.** Morphodynamics of the coast geocosystem of two polar archipelagos Svalbard and South Shetlands
- Dieser, Markus.** Response of dissolved organic matter and microorganisms to environmental changes during the Austral summer in Pony Lake, Antarctica
- Bagshaw, Elizabeth A.** Biogeochemistry of cryoconite holes in Taylor Valley, Antarctica
- Wardell, Lois J.** Collecting multi-sensor data from UAV's in Greenland for ice sheet dynamics modeling
- Rose, Julie M.** Microzooplankton grazing and algal blooms in the Ross Sea: Interactive effects of temperature, carbon dioxide and phytoplankton community composition
- Cassar, Nicolas M.** Studies of net and gross production in the Southern Ocean: Controls and scaling
- Riesselman, Christina R.** ANDRILL -- Investigating Antarctica's role in Cenozoic global environmental change; Plio-Pleistocene evolution of sea-ice and nitrate utilization in the Ross Sea, Antarctica
- 5:00 p.m. **Baeseman, Jenny L.** The Association of Polar Early Career Scientists (APECS)
- 5:15 p.m. **Poster Session** (Tuesday presenters)
- 6:30 p.m. Dinner

- 7:30 p.m. **Behrendt, John C., and Philip M. Smith:** IGY Remembered - Eye- witness Accounts
Doel, Ronald E., and Kristine C. Harper: IGY Remembered - Perspectives by Historians of Science
- 9:00 p.m. **Fireside Discussions**

Wednesday, May 7

- 9:00 a.m. **Thompson, Lonnie G. and Ellen Mosley-Thompson:** Understanding Climate Change -- Stories from the Ice
- 10:30 a.m. Break
- 11:00 a.m. **Olex, Christina:** Teambuilding
- 1:00 p.m. **Field Trip,** Garden of the Gods and Manitou Springs

Thursday, May 8

- 9:00 a.m. **Thompson, Lonnie G. and Ellen Mosley-Thompson:** Climbing Your Mountains -- and Keeping Your Balance!
- 10:00 a.m. Break
- 10:30 a.m. **Discussion Groups:** Maintaining a work/life balance
- 12:30 p.m. Lunch
- 2:00 p.m. **Weiler, C. Susan:** Distilling Your Science
- 2:15 p.m. **Olex, Christina:** Facilitation
- 3:15 p.m. Break
- 3:30 p.m. **Panel, Polar Education and Outreach: Baeseman, Jenny L., Nerille J. Abram, Michele N. Koppes, Christina R. Riesselmann, Heidi K. Swanson, Michael J. Willis, Zoe R. Courville and José C. Xavier**
- 6:00 p.m. **Baeseman, Jenny:** Hands-on Activity with on-site 1-st grade students participating in a 2-day field camp at the La Foret center
- 7:00 p.m. Dinner
- 8:00 p.m. **Manahan, Donal T.** Early Polar Exploration

Friday, May 9

- 9:00 a.m. **Pfirman, Stephanie:** Research Productivity, Recognition and Life
- 9:45 a.m. **Panel: Interdisciplinary Science - Challenges and Opportunities: McKnight, Diane M., Ellen Mosley-Thompson, Donald K. Perovich, Stephanie Pfirman, Lonnie G. Thompson**
- 10:30 a.m. Break
- 11:00 a.m. **Pfirman, Stephanie:** Making Interdisciplinarity Work
- 12:30 p.m. Lunch
- 2:00 p.m. **Panel: Media and Policy - Challenges and Opportunities: Manahan, Donal T., Stephanie Pfirman, Donald K. Perovich and Mark McCaffrey**

3:00 p.m. Break
3:30 p.m. **Bentley, Molly:** Media Training and Mock Interviews
6:30 p.m. Dinner
9:00 p.m. **Fireside Discussions**

Saturday, May 10

9:00 a.m. **Discussion-Group Reports**
10:30 a.m. Break
11:00 a.m. **Debrief**
12:00 p.m. Lunch
1:30 p.m. **Drobot, Sheldon D.** Catalyzing Change
2:30 p.m. **Ropes Course**
6:00 p.m. Dinner
7:00 p.m. **Fireside Discussions**



Abram, Nerilie J

PhD Thesis:

2004. Holocene climate and reef growth in the eastern Indian Ocean.
Research School of Earth Sciences, Australian National University (Australia)

Currently: British Antarctic Survey

Research focus:

My polar research focuses on developing reconstructions of Antarctic sea ice – a critical but poorly understood component of the Earth's climate system. To do this I am studying the chemistry of ice cores from a network of sites around coastal Antarctica.



Bagshaw, Elizabeth A

PhD Thesis:

2008. (anticipated) The Biogeochemistry of Cryoconite Holes in Taylor Valley, Antarctica.
School of Geographical Sciences, University of Bristol (UK)

Currently: University of Bristol

Research focus:

I am a glacial biogeochemist, with particular interest in the interaction between micro-organisms, sediments and liquid water on the surface of polar glaciers. I am currently researching the biogeochemical evolution of cryoconite holes on the surface of glaciers in the McMurdo Dry Valleys of Antarctica.



Baker, Narelle P

PhD Thesis:

2008. (anticipated) Assessing the role of subglacial hydrology on the flow of West Antarctic ice streams: A numerical modelling approach.
Geography, Cambridge University (UK)

Currently: University of Cambridge

Research focus:

My research investigates the flow of the Siple Coast ice streams in West Antarctica. I use a numerical ice stream model to gain a better understanding of the influence of water at the bed of ice streams. I am also passionate about the behaviour and history of past and present ice sheets, satellite remote sensing and the role of the glaciers and ice sheets in Earth's climate system.



Belicka, Laura L

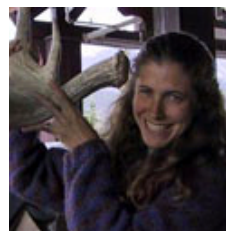
PhD Thesis:

2008. (anticipated) A molecular and isotopic approach to examine the role of terrestrial organic matter in the carbon cycle of the Arctic Ocean.
Marine, Estuarine, and Environmental Sciences, University of Maryland at College Park (USA)

Currently: University of Maryland Center for Env. Sci.

Research focus:

The broad scope of my research focuses on the past and present organic carbon cycle of the Arctic Ocean. Specifically, I am interested in the sources (marine, terrestrial, anthropogenic) and fate (burial, transport, recycling) of organic matter and how climate change may affect the production and long-term storage of organic carbon in the Arctic.



Breen, Amy L

PhD Thesis:

2008. (anticipated) Late quaternary history of balsam poplar in North America.
Biology and Wildlife Department & Institute of Arctic Biology, University of Alaska Fairbanks (USA)

Currently: University of Alaska at Fairbanks

Research focus:

I am interested in the origin, history and evolution of the arctic flora. My dissertation research investigates the origin of balsam poplar, the northern-most tree species in North America, among the tundra in Arctic Alaska. To meet this objective, I am drawing upon evidence from the diverse field of ecological genetics, plant biogeography and community ecology.

Cassar, Nicolas M



PhD Thesis:

2003. Carbon-Concentrating Mechanisms and beta-Carboxylation: Their potential contribution to Marine Photosynthetic Carbon Isotope Fractionation.
Oceanography, University of Hawaii (USA)

Currently: Princeton University

Research focus:

I am interested in several aspects of phytoplankton ecology and the biogeochemistry of the polar surface oceans. My research interests recently gravitated toward in situ O₂/Ar productivity estimates and the phytoplankton's response to varying CO₂ availability in the Southern Ocean.

Courville, Zoe R



PhD Thesis:

2007. Gas diffusivity and air permeability of the firm from cold polar sites.
Thayer School of Engineering, Dartmouth College (USA)

Currently: Cold Regions Research and Engineering Laboratory

Research focus:

I am studying the physical properties of snow and ice, how these properties influence the climate record contained in ice cores, and what impact these properties have on remote sensing imagery of polar areas. I work in the field and in the laboratory studying snow and ice, and use computer simulation to help illuminate certain snow processes.

D'Andrea, William J



PhD Thesis:

2008. (anticipated) High-resolution late Holocene temperature and biogeochemical reconstructions from southwestern Greenland.
Geological Sciences, Brown University (USA)

Currently: Brown University

Research focus:

I am interested in understanding the forcing mechanisms and spatial patterns of natural climate variability in the Arctic. Toward this goal, I use novel organic geochemical approaches to reconstruct decadal-scale climate variability from the sediments of Arctic lakes.

Davis, Jason M



PhD Thesis:

2008. (anticipated) Governance of Antarctic bioprospecting: Scientific contribution to the geopolitics of property and territory.
Geography, Ohio State University (USA)

Currently: Ohio State University

Research focus:

My research challenges assumptions of how power and politics work both by using the critical perspectives garnered from science policy and geopolitics with the unique political situation in Antarctica. The current focus of my research is on the regulation of the commercial uses of Antarctic biological processes, which exists at the intersection of the realms of commerce, politics, and science.

Dieser, Markus



PhD Thesis:

2008. (anticipated) Response of dissolved organic matter and microorganisms to environmental changes during the Austral summer in Pony Lake, Antarctica.
Land Resources and Environmental Science, Montana State University (USA)

Currently: Montana State University

Research focus:

The focus of my research is on microbially dominated lake and ice ecosystems in Antarctica. I study the impact of environmental stresses like solar radiation and temperature on bacterial processes, bioavailability of food sources and potential adaptation mechanisms. In general, I always want to know which microorganisms can be found inhabiting these extreme environments.



Fietz, Susanne S

PhD Thesis:

2005. Recent and fossil phytoplankton pigments in Lake Baikal as markers for community structure and environmental changes.

Institute of Biology, Humboldt Universität zu Berlin (Germany)

Currently: Autonomous University of Barcelona

Research focus:

My research focuses on biogeochemistry and survival strategies of microbial organisms in the harsh Polar sea ice habitats as well as on palaeoclimate and ecosystem responses in the Polar Regions.



Fogt, Ryan L

PhD Thesis:

2007. Investigation of the Southern Annular Mode and the El-Niño Southern Oscillation interactions.

Geography, Atmospheric Sciences Program, Ohio State University (USA)

Currently: National Oceanic and Atmospheric Administration (NOAA)

Research focus:

My research investigates the atmospheric variability, impacts, and interactions of the Southern Hemisphere Annular Mode (SAM) and the El Niño- Southern Oscillation on decadal and longer time scales in the high southern latitudes. I use observations and global climate models to study the long-term fluctuations of these dominant polar climate modes during the 19th and 20th centuries.



Haase, Daniela

PhD Thesis:

2008. (anticipated) Antarctic tourism - Modi Operandi and Regulatory Effectiveness.

Gateway Antarctica, University of Canterbury (New Zealand)

Currently: University of Canterbury

Research focus:

My primary polar research interests are the regulation of commercial activities in Antarctica, with particular reference to tourism. Additional research interests include, but are not limited to, the politics of the international regime governing Antarctica and resource management in the Antarctic and Arctic.



Hebert, Karen E

PhD Thesis:

2008. (anticipated) Wild Dreams: Reinventing the Salmon Industry in Bristol Bay, Alaska.

Anthropology, University of Michigan at Ann Arbor (USA)

Currently: University of Michigan at Ann Arbor

Research focus:

I am a cultural anthropologist whose research addresses economic and environmental change in Alaska. I am especially interested in the creation and consequences of market-driven restructuring and ecological risk in economies and cultures closely bound to natural resources.



Hill, Jenna C

PhD Thesis:

2007. Continental margin architecture: Sea level and climate.

Scripps Institution of Oceanography, University of California at San Diego (USA)

Currently: Coastal Carolina University

Research focus:

The overarching goal of my research is to constrain the timing and climatic implications of ice scour, meltwater drainage, and the subsequent sedimentation history associated with sea level change on the Chukchi shelf.



Johnson, Cody R

PhD Thesis:

2008. (anticipated) Landscape control of Arctic lake nutrient availability and limitation through consumer driven nutrient recycling.

Watershed Sciences, Utah State University (USA)

Currently: Utah State University

Research focus:

I am interested in the study of arctic lakes from an ecosystem perspective, linking aquatic biogeochemical cycles to terrestrial inputs, physical drivers, and food web composition.



Koppes, Michele N

PhD Thesis:

2007. Glacier erosion and response to climate, from Alaska to Patagonia.

Earth & Space Sciences, University of Washington (USA)

Currently: University of British Columbia

Research focus:

My primary interest is in the links between climate, tectonics and landform evolution as embodied by glacier change and glacial erosion in temperate and polar climates. I am interested in quantifying recent ice fluxes and sediment fluxes using climate data and the glaciomarine record, which provides a tool to use the glacial sedimentary record as a climate proxy.



Laney, Samuel R

PhD Thesis:

2006. Rapid photosynthetic responses in marine microalgae.

COAS, Oregon State University (USA)

Currently: Woods Hole Oceanographic Institution

Research focus:

My polar research focuses on developing and using optical techniques to monitor changes in coastal Arctic marine ecosystems. The color of seawater tells us much about the physics and ecology of the coastal ocean, and I am using satellite ocean color imagery as well as in-water measurements to explore ways to use this information to identify ecologically important changes in this largely inaccessible ocean region.



Liu, Jiping

PhD Thesis:

2003. Sea ice climatology: Variations and teleconnections: Observational and modeling studies.

Earth and Environmental Sciences, Columbia University (USA)

Currently: Georgia Institute of Technology

Research focus:

My research includes polar climate modeling and variability, atmospheric-ice-ocean interaction, and satellite remote sensing in ice and ocean.



Lovenduski, Nicole S

PhD Thesis:

2007. Impact of the Southern Annular Mode on Southern Ocean circulation and biogeochemistry.

Atmospheric and Oceanic Sciences, University of California at Los Angeles (USA)

Currently: Colorado State University

Research focus:

In my current research, I strive to make better predictions of the future of the Southern Ocean sink for atmospheric carbon dioxide, using numerical and theoretical models of the ocean.

Mason, Arthur L



PhD Thesis:

2004. Transporting Natural Gas from the Arctic.
Anthropology, University of California at Berkeley (USA)

Currently: Arizona State University

Research focus:

I work on the history, politics and culture of arctic natural gas development, and particularly of Alaska and Western Canada. I am working on my first book, Alaska Modern and the Import of Expertise which is a study of energy market restructuring and the politics of Alaska natural gas pipeline development and is based on ethnographic fieldwork at various urban and village sites in Alaska and Western Canada.

Meir, Jessica U



PhD Thesis:

2009. (anticipated) Oxygen depletion in consummate diving animals.
Marine Biology Research Division, Scripps Institution of Oceanography (University of California, San Diego) (USA)

Currently: Scripps Institution of Oceanography (UCSD)

Research focus:

My polar research interests focus on the physiology of diving animals in the extreme polar environments. I have three years of field experience working with diving emperor penguins in McMurdo Sound, involving studies of heart rate and oxygen depletion while diving, and hope to apply similar techniques to other polar species (Weddell seals, Antarctic fur seals, etc.).

Rawlins, Michael A



PhD Thesis:

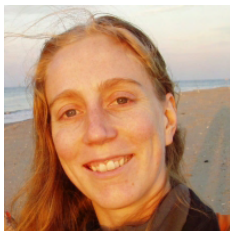
2006. Characterization of the spatial and temporal variability in pan-Arctic, terrestrial Hydrology.
Natural Resources & Earth Science Departments, University of New Hampshire (USA)

Currently: Jet Propulsion Laboratory

Research focus:

My research focus is arctic hydroclimatology, climatic change, and spatial statistics and models. I investigate the terrestrial water cycle by combining remote sensing tools, process-based models, and observational data sets. In my studies I often apply a synthesis approach which spans traditional earth science disciplines such as physical geography, atmospheric and ocean sciences, and terrestrial ecology.

Rennermalm, Åsa K



PhD Thesis:

2007. (anticipated) Pan-arctic land surface hydrology: Patterns of change and global implications.
Civil and Environmental Engineering, Princeton University (USA)

Currently: University of California at Los Angeles

Research focus:

I am interested in understanding the state and dynamics of pan-arctic (p-a) land surface hydrology, its interaction with ecosystems and the climate system, and how changes in p-a land surface hydrology might influence climate outside the pan-arctic. My research includes: description and understanding of p-a river discharge trends, influence of hydrologic variability on peatland ecosystems, & influence of p-a river discharge on the thermohaline circulation.

Riesselman, Christina



PhD Thesis:

2009. (anticipated) From greenhouse to icehouse: Diatom and stable isotope based reconstructions of Antarctic paleoenvironmental evolution across Cenozoic intervals of change. Geological and Environmental Sciences, Stanford University (USA)

Currently: Stanford University

Research focus:

My polar research interests center around the use of biological and geochemical proxies in marine sediments to investigate threshold intervals in the development of the Antarctic cryosphere. Currently, I am working with light stable isotopes to help constrain the development of the initial permanent Antarctic ice sheet, and with diatoms to investigate community response to CO₂ and to reconstruct sea-ice and nutrient utilization in the Pliocene.

Rose, Julie M



PhD Thesis:

2007. Physiological and ecological consequences of environmental temperature on Antarctic protists. Marine Environmental Biology, University of Southern California (USA)

Currently: Woods Hole Oceanographic Institution

Research focus:

I am interested in microbial community dynamics in the Antarctic marine environment. Currently I am studying the effects of climate change factors such as temperature, CO₂, iron concentrations and light on microbial food webs of the Ross Sea.

Schneider, David P



PhD Thesis:

2005. Antarctic climate of the past 200 years from an integration of instrumental, satellite and ice core proxy data. Earth and Space Sciences, University of Washington (USA)

Currently: National Center for Atmospheric Research

Research focus:

I am interested in the climate history of both polar regions. I have used observational records, high-resolution ice cores, and climate models to expand our understanding of climate variability and climate change in the Antarctic and the Arctic.

Sjostedt, Steven J



PhD Thesis:

2006. Investigation of photochemistry at high latitudes: Comparison of model predictions to measurements of short lived species. School of Earth and Atmospheric Science, Georgia Institute of Technology (USA)

Currently: University of Toronto

Research focus:

My research during IPY has been focused on the measurement of trace gases at high latitudes utilizing a proton transfer mass spectrometer. Species of particular interest include dimethyl sulfide and volatile organic compounds due to their potential effect on the radiative balance in the Northwest Passage.

Strzelecki, Mateusz C



PhD Thesis:

2008. (anticipated) Morphodynamics of the coast geoecosystem of two polar archipelagos Svalbard and South Shetland. Faculty of Geographical and Geological Sciences, UAM Poznan (Poland)

Currently: UAM Poznan University

Research focus:

I'm interested in polar geomorphology especially in fluvial and coastal geoecosystems and their interactions with the permafrost and ice processes. I'm also curious to know the place for polar regions in modern, globalized world.



Swanson, Heidi K

PhD Thesis:

2008. (anticipated) Effects of anadromous Arctic charr (*Salvelinus alpinus*) on food web structure and contaminant concentrations in coastal Arctic lakes.

Biology, Canadian Rivers Institute, University of New Brunswick at Saint John (Canada)

Currently: University of New Brunswick**Research focus:**

Arctic charr is a species that migrates between the Arctic Ocean and freshwater lakes in the circumpolar north. My research addresses the potential for this species to affect contaminant transport and contaminant bioaccumulation in freshwater lakes and investigates life-history characteristics that will aid in the design of habitat enhancement programs.



Tape, Kenneth D

PhD Thesis:

2008. (anticipated) Identifying areas prone to shrub expansion, and the role of snow, Arctic Alaska.

Biology and Wildlife, University of Alaska Fairbanks (USA)

Currently: University of Alaska Fairbanks**Research focus:**

I am interested in terrestrial responses to climate warming in polar regions, and in revealing these changes to the broader public.



Wardell, Lois J

PhD Thesis:

2002. Volcanic carbon dioxide and trace metal emissions from Mt Erebus, Antarctica and White Island, New Zealand: Contributions and implications to global atmospheric budgets.

Earth & Environmental Science, New Mexico Tech (USA)

Currently: Arapahoe SciTech**Research focus:**

Small unmanned aerial systems (UAS) can provide ways of gathering data that have previously been inaccessible or limited by hazardous conditions. Collaboratively developing UAS capabilities as tools for polar research allows me to work with a wide range of scientific investigations in the Arctic and Antarctic.



Willis, Michael J

PhD Thesis:

2008. (anticipated) Crustal Motion in the Antarctic Interior from a Decade of Globalpositioning System Measurements.

School of Earth Sciences, Ohio State University (USA)

Currently: Ohio State University**Research focus:**

I am interested in figuring out how, and by how much, the polar ice sheets are changing. My research uses geodetic techniques to observe the Earth's crustal response to varying ice loads. I test Glacial Isostatic Adjustment models against my measurements in order to see how ice loads have changed in the past, clarify what the ice is doing at the present, and provide insight into how the mass of the ice sheets may change in the future.



Wobus, Cameron W

PhD Thesis:

2005. Geomorphic and thermochronologic signatures of active tectonics in the central Nepalese Himalaya.

Earth, Atmospheric and Planetary Sciences, Massachusetts Institute of Technology (USA)

Currently: University of Colorado

Research focus:

Arctic coastlines lie at a crucial interface between the sea ice-ocean system and the landscapes of polar regions. My project is focused on understanding how climate change is influencing rates of coastal erosion in northern Alaska, which we hope will help us to predict future changes in Arctic landscapes, hydrology, and ecology.



Xavier, José C

PhD Thesis:

2003. Predator-prey interactions: Feeding and foraging strategies of albatrosses in polar regions. Zoology, University of Cambridge (UK)

Currently: University of Algarve, Portugal and British Antarctic Survey, UK

Research focus:

I'm a marine biologist focused on food web interactions in relation to climate change in the Polar regions. Currently I am investigating the feeding and foraging strategies of top predators, including penguins and albatrosses, in relation to prey abundance at various temporal and spatial scales in the marine ecosystems.
