Annual Report – FY2014

Research Activity for the period

July 1, 2013 to June 30, 2014

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2014 Annual Report to the Vice President for Research

i. Executive Summary

Major Accomplishments (overarching):

Climate change is a major security issue for our country and the world. It impacts human and ecosystem health, the economy, causes geopolitical stress, and increases the likelihood of storms, floods, droughts, wildfires and other extreme events. The Climate Change Institute has a legacy of major contributions to the understanding of the physical, chemical, biological and social complexity of climate change and the application of these findings at local to international scales.

One of several transformational contributions made by the Climate Change Institute is the understanding that the wind systems that deliver moisture, heat and pollutants throughout the planet can shift in a matter of a few years with dramatic and sustained changes in water availability, storms and health at local to regional scales. The Institute uses this perspective to understand and aid in prediction of future hemispheric scale weather impacts with the most recent being abrupt Arctic warming and strengthening of winds around Antarctica. To address the likelihood of continued abrupt changes in climate the Institute is developing software to aid in the understanding of non-linear climate responses for use in climate adaptation and sustainability planning.

CCI and SPIA share an NSF IGERT that is the first of its type in the nation – A2C2 (Adaptation to Abrupt Climate Change) that will by the end of its five-year term educate 25 PhD students.

At the CLAS (Climate Adaptation and Sustainability) Conference we launched a framework for developing CLAS plans that include publicly available software to understand past, present and future changes in climate at the level of Maine communities, to develop an understanding of vulnerability to climate change at the community level, and an introduction to a planning system that invokes plausible scenarios at the community level where local knowledge can be applied to produce local solutions. Although the recent CLAS conference was geared to Maine communities the CLAS framework will be expanded in the near future to encompass national to international CLAS planning capability.

Selected examples of additional highlights of major accomplishments specifically related to Maine follow:

- Investigation of the edge of salt marshes impinging on freshwater wetlands, in particular bogs, in eastern coastal Maine, to determine rates of change and mechanisms of change in surficial environments related to sea-level change, coastal processes, paleoecology, and policies of coastal land-use planning.
- Investigation of biogeochemical dynamics at the Bear Brook Watershed in Maine, and climate change adaptation initiatives.

- Demonstration that climate-driven extinction has been widespread shedding light on species' risk of extinction in the future.
- Demonstration that water mass circulation in glacial fjords exerts a complex control on the dynamics of outlet glaciers, and on their flux of solid mass to the ocean with implications for global sea level change.
- Discovery of increasing trends towards compound extreme events along the US coastline.
- Empirical analysis offering insights into the nature of local and remote drivers of sub-Saharan/Sahelian hydroclimate, and prospects for improved seasonal forecasts with geopolitical implications.
- Oversight to data collection program designed to record channel and bank conditions following removal of two dams on the central Penobscot River.
- An alternative formulation for Earth surface evolution involving coupled tectonic and geomorphic processes.
- Continued work on Late Holocene climate variability in several areas, including the Gulf of Maine, North Pacific, South America, Asia, the Arctic and Antarctica.
- Finding that the Gulf of Maine experienced substantial climate change over the past 1000 years, with a 1 degree ocean cooling that appears to correlate with similar changes in the North Atlantic.
- New methodology for capturing and measuring 2-5 microns particles to investigate the impact of volcanism on climate.
- Intensive aerial photography and photographic research to refine settlement pattern locations for the Bull Brook Paleoindian site.
- Investigation into how war and the quest for food interacted in small-scale societies.
- Completed data collection for a study of drug deaths in Maine, funded by the Office of Attorney General.
- Research regarding climate change science, law and policy; renewable energy permitting and regulatory processes, and recommended changes in general statutory schemes for offshore wind power in particular; energy economics; administrative law and policy; domestic experiential education programs; public trust doctrine.
- Initiation of a long-term, interdisciplinary and internationally collaborative program of research designed to utilize the archaeological record of landscape change and human agency to inform on contemporary issues of sustainable development, conservation, and environmental policy.

I. Overview

A. Overview

The Climate Change Institute (CCI) (http://climatechange.umaine.edu), prior to 2002 known as the Institute for Quaternary Studies, is one of the oldest climate research organizations in the world and likely the first with a multi- and inter-disciplinary focus. CCI is a global leader in research and in combination with its University of Maine academic unit partners the institute offers a very strong and unique array of graduate and undergraduate research opportunities. CCI integrates transformational field, laboratory and modeling activities to understand the physical, chemical, biological and socio-cultural components of the climate system of the past and present, to better predict future changes in climate and their impacts here in Maine and across the globe.

Institute investigations span the last 2 million years to the present - a time of multi-millennial to centennial scale climate changes punctuated by abrupt (annual to decadal) shifts in climate. CCI investigations inform predictions for future climate change based upon an understanding of the full dynamic range of the natural climate system and the evolving dramatic influence of human activity. CCI has a legacy of major scientific contributions to understanding the timing, causes, and mechanisms of natural and human-forced climate change, and on the effects of physical and chemical climate changes on the biological, economic, social, and political conditions of humans and the ecosystem.

B. Mission

The mission of the Climate Change Institute is vitally linked to the widely accepted realization that an understanding of climate change (natural and human-forced) and its implications is absolutely critical to the future of society, ecosystems, the economy, and governance. As a consequence CCI continues to experience ever-broadening interaction with other disciplines, with University of Maine research, academic and outreach units, and with local, national and international partners. Because climate change underpins the fabric of our society CCI faces rapidly emerging opportunities for application of its findings and expertise to critical issues including: climate change-induced hazards (e.g., severe storms, floods, sea level rise, coastal erosion, drought, heat waves), health threats (e.g., heat stress, drought/flood, disease, air pollution, storms), other economic and social challenges (e.g., water availability and quality, energy, food security, military security, civil unrest, agriculture, recreation, urbanization), and climate change-based decision-making by individuals, NGOs and governmental units.

C. Vision

The Climate Change Institute's vision for the future is summarized in the following statements:

1. Maintain and expand the Institute's role as a national and international leader in the "exploration and discovery" of the integrated physical, chemical, biological and social components of climate change research, education and outreach.
2. Continue to enhance the quality and expand the scope of the Institute's eight primary themes while continually evaluating the potential and necessity for change and additional themes in one of the world's most rapidly evolving security issues – climate change.
3. Expand upon the Institute's 40+ year, highly successful, role model status of shared faculty partnerships with academic units to build a fully coupled, world-class undergraduate and graduate climate change research and education program at the University of Maine.
4. Develop a point of coordination and an identifiable framework for University of Maine climate change research, education and outreach that includes Institute and non-Institute University of Maine partners so that the University of Maine's full climate change potential and value can be realized.

D. Status of Strategic Plan

CCI routinely develops 5-year plans. Our last was developed in 2011 and we are currently developing one for completion by early 2015. In concert with this CCI is participating in the Blue Sky Signature Research Program White Paper process.

E. Administration and Staffing Structure (CCI Organizational Chart attached – **Appendix A**)

II. Serving Maine

A. Community Engagement

1. Climate and Adaptation (CLAS) conference for Maine communities.
2. Numerous public lectures by all CCI faculty and any graduate students to NGOs, public schools, government.
3. Five-year update of *Maine's Climate Future* which will act as the basis for Maine's (public, private, government) understanding of climate change and impacts.
4. Monitoring past and present state of Maine's lakes, forests, soils and coast to prepare Maine's people and their way of life for the future.
5. Making climate data accessible to the scientific community and public through CCI-produced innovative, highly transparent software and cyberinfrastructure that allows Mainers and the world to make informed decisions related to environmental change (eg., 10green™, Climate Reanalyzer™, p301, CLAS layers).
6. Informing Maine and the nation of health implications of their changing air quality.
7. Monitoring ice sheet and glacier volume changes to assess current and future sea level rise for coastal Maine's coastal societies and ecosystems.
8. Developing local to global scale climate model predictions to evaluate threats to Maine including: in-migration of biological agents such as Lyme tick and frequency of heat waves.
9. Predicting future wind speed distribution for planned deployment of offshore wind power to assure maximum efficiency of this remarkable Maine resource.
10. Establishing the intersection of climate and policy for Maine's natural resource industries, notably: lobster, forestry, agriculture and tourism.
11. Examining past and present Native community interactions with Maine's environment.
12. Developing climate and environmental outreach projects for K-12 students and teachers, the public and tourists through lectures, pamphlets, curricula and maps (eg., ECM, ITEST, Maine's Ice Age Trail).
13. Work with the Maine Office of Chief Medical Examiner and Department of Public Safety in death investigation, disaster response, and related policy analysis.
14. Inquiry into sustainability policy including analysis of efforts to balance social, ecological and economic sustainabilities.

B. Economic Development

1. CCI brings research funding into the State that supports students, technicians including analytical equipment, and fabrication of equipment by local contractors.
2. CCI's CLAS platform and *Maine's Climate Future* provide potential drivers for economic planning at community to State levels.

C. Workforce Development

CCI employs technicians, contractors and students to conduct its research mission.

D. Collaborations with UMaine System Campuses

University of Maine – Presque Isle and the Maine School of Law

E. Collaborations with Other Outside Institutes/Organizations Related to Maine

1. ***Within the University of Maine*** - The Schools of Biology and Ecology, Computing and Information Sciences, Earth and Climate Sciences (half of SECS faculty are also

CCI faculty and SECS offers undergraduate and graduate degrees in climate sciences), Marine Sciences, Forest Resources, Food and Agriculture, Policy and International Affairs (CCI and SPIA share an NSF IGERT that will support 25 PhD graduate students over five years – first ever to address abrupt climate change), Department of Anthropology (half of the Anthropology faculty are associated with CCI and they offer undergraduate and graduate degrees associated with climate science), the Honors College, LASST, the Department of Chemistry, the Department of Physics and Astronomy, the Hudson Museum, the Center for Research in STEM Education (RISE Center), the Foster Innovation Center.

2. ***Emerging Associations Within the University of Maine*** – examples include: climate and health with the School of Biology and Ecology and the National Center for Geographical Information and Analysis (NCGIA), environmental sensor development and data transmission with NCGIA and LAAST, innovations in past, present and future climate visualization with VEMI (Virtual Environment and Multimodal Interaction), *Abrupt Climate Change, Business and Policy* course with the Business School and the School for Policy and International Affairs, and a new joint Climate Change Institute, School of Earth and Climate Sciences, School of Biology & Ecology and Department of Anthropology Graduate Certificate in Interdisciplinary Climate Studies.
3. ***Within Maine*** - Bangor, Lewiston-Auburn and Portland Water Districts, the Department of Water Resources, the Maine Department of the Environmental Protection, the Maine Department of Transportation, the Maine Centers for Disease Control, the Maine Geological Survey, the Maine State Museum, the Lobsterman's Association, the Gulf of Maine Research Institute, The Island Institute, The Nature Conservancy, Audubon, Manomet Observatory, Conservation Law Foundation, Maine Natural Resources Council, Maine Physical Sciences Partnerships, Schoodic Education and Research Center, Acadia National Park, Unity College, College of the Atlantic, Maine Lakes Environmental Association, Kezar Lake Watershed Association, Acadia National Park, Big Reed Forest Reserve, Maine Natural History Observatory, Toothacher Pond Association, Maine Coastal Island Wildlife Reserve, Penobscot Bay Teacher's Collaborative, Preti Flaherty Law, MicMac Environmental Monitoring Laboratory, Maine Lung Association, Eastern Maine Medical Center, Maine Estuarine Research Institute.

F. Collaborations with Other Outside Institutes/Organizations Outside of Maine

1. ***Federal including*** - Acadia National Park, US Department of Agriculture, US Forest Service, US Geological Survey, Oak Ridge Laboratory, National Center for Atmospheric Research, University Corporation for Atmospheric Research, National Weather Center, US Fish and Wildlife, Homeland Security.
2. ***US institutions including*** - Dartmouth College, Harvard University, Lamont-Doherty Earth Observatory, Princeton University, University of Washington, University of Nebraska, University of Oklahoma, Appalachian State University, University of Cincinnati, Texas Tech University, Kansas State University, University of Wisconsin, Brown University, University of Wyoming, Harvard Forest, University of Minnesota Natural Resources Institute, Minnesota Pollution Control Agency, Washington State University, Washington Central University, Konza Prairie Long-Term Ecological

Research Station, McMurdo (Antarctica) Long-Term Ecological Research Station, American Museum of Natural History, Boston Museum of Science, University of California – Santa Cruz, Berkeley, Santa Barbara, Brigham Young University, Michigan Technical University, Woods Hole Oceanographic Institute.

3. ***International including*** - Academic, governmental and non-governmental organizations in Australia, New Zealand, Canada, Brazil, Chile, Colombia, Argentina, Peru, India, Nepal, Czech Republic, Ecuador, China, South Korea, Tajikistan, Kazakhstan, England, Scotland, Ireland, Denmark, Switzerland, Germany, France, Italy, Spain, Sweden, Norway, Greenland, Iceland and most recently: association with the University of the Arctic consortium and the South Atlantic Environmental Research Institute (Falkland Islands).

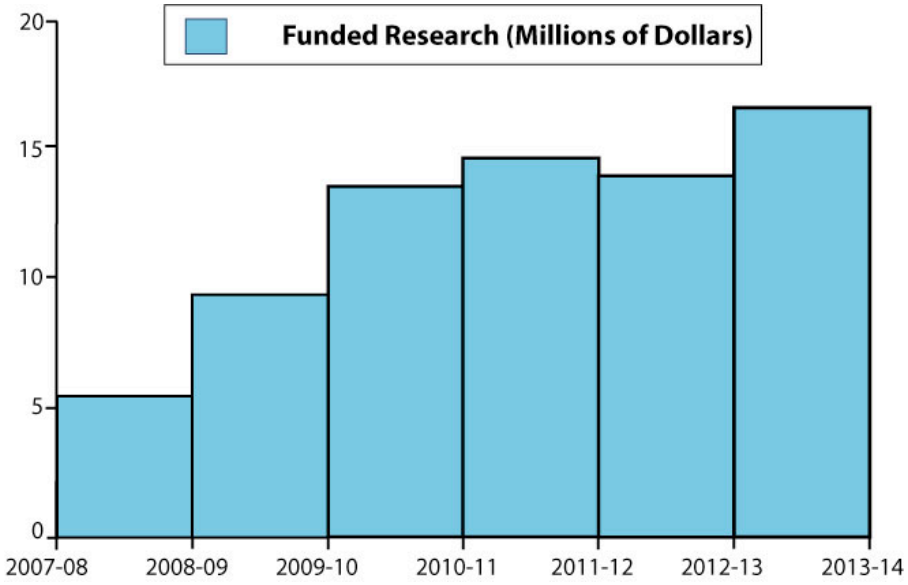
III. Financial Sustainability

A. E&G Support: Salary & Operating Support
E&G Funding for CCI Salaries* (minus fringe): $651,794
E&G Funding for CCI Operating: $16,780

B. MEIF Support
MEIF Funding for CCI Salaries* (minus fringe): $514,311
MEIF Funding for CCI Operating: $28,350

C. Research Funding: Submitted & Awarded, Trends **(Appendix B)**

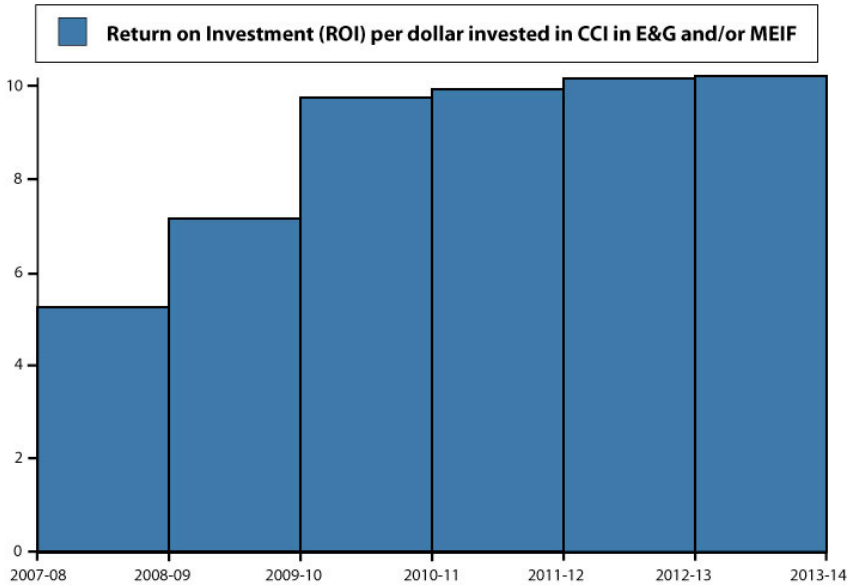
Proposal driven funds (in millions of dollars per year) raised by CCI members.



D. Brief Overview of Each Major New Award (**Appendix C**)

E. Return on Investment

FY2014 ROI is $10.64 dollars per $1 invested in CCI MEIF and CCI E&G.



F. Revenue Centers

NA

G. Private Giving/Alumni Cultivation

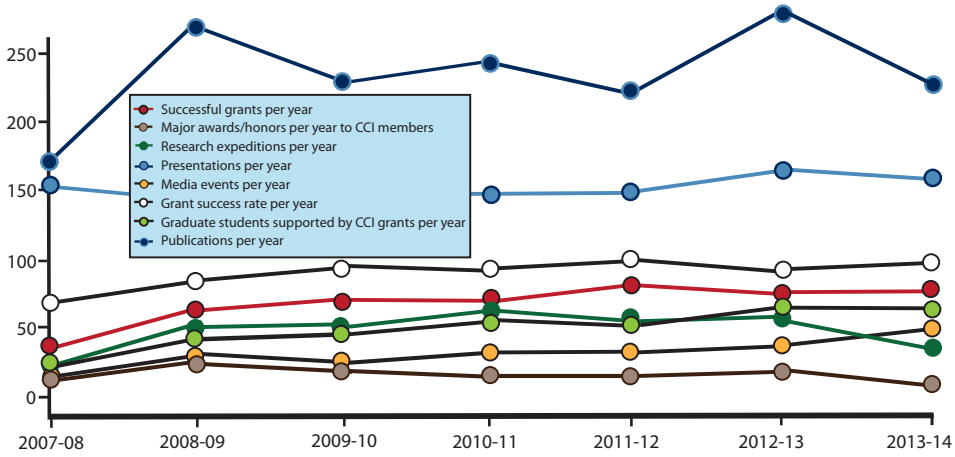
Dan & Betty Churchill Fund
The William Bingham Foundation
Muharram & Barbara Gokcen Fund
Plus several private donors

H. Initiatives to Increase Efficiency

CCI recently discontinued base phone service for all CCI graduate students; toll calls related to research are debited to grants.

I. Other

III. Culture of Excellence



A. Faculty Achievements (e.g. awards, recognitions, prestigious appointments etc.)

Special Recognitions/Awards/Honors Received for Research, Scholarship, Creativity	
Gill, Jacquelyn	Finalist for the New Phytologist's Tansley Medal (decision pending)
Jain, Shaleen	University of Maine Sustainability Solutions Initiative Award of Excellence in advancing the theory and practice of Sustainability Science, December 2013
Kelley, Alice	Named the Golden Undergraduate Coordinator
Sandweiss, Dan	Elected Vice-Chair/Chair Elect, R.S. Peabody Advisory Council (R.S. Peabody Museum of Archaeology, Phillips Academy, Andover MA) Elected to the Board of Directors, Society for American Archaeology Appointed joint editor for Archaeology and Patrimony, Chungara Revista de Antropología Chilena First recipient of the University of Maine "GSG - Dan Sandweiss Grad Advocacy Award", March 2014. Recognition Award from the Executive Committee of the University of Maine Graduate Board, May 2014.

B. Research and Scholarship Summary (e.g., publications, presentations, editorships, exhibits, etc.) (**Appendix D**)

C. Curricular Innovations/Integration with the UMaine Education Mission

CCI Graduate certificate in interdisciplinary climate studies approved by the Graduate School 2014, course credit goes to academic units

V. Student Engagement, Student Success

A. Undergraduate Student Research, Scholarship or Creative Activities

Undergraduate Student Research – Field Expeditions			
# Undergraduate Students	**Advisor**	**Date**	**Description**
1	Hall,	Jan. 2014	Field work in Dry Valleys, Antarctica
10	Kelley,	March 2014	Golden Gift field trip to U.S. Southwest (Grand Canyon, Zion National Parks
1	Kreutz,	May 2014	Glaciological research on the Ruth Glacier, Denali National Park
4	Olsen, Brian	Summer 2013 & 2014	Surveys of tidal marshes from Maine to Virginia
1	Olsen,	Summer 2014	Song sparrow investigations suburban Massachusetts and New Hampshire
10	Robinson,	June 2014	Archaeological field work in Machias Maine
1	Zaro, Gregory	May, June 2014	Interdisciplinary and internationally collaborative research program development, Zadar, Croatia

B. Undergraduate Student Awards – N/A

C. Graduate Student Research, Scholarship or Creative Activities
See Borns Symposium appendix of mini-papers – (**Appendix E**)

D. Graduate Student Awards
The Churchill Award for Outstanding Exploration (2014) - Walter Isle Beckwith & Charles I. Rodda
Harold W. Borns Symposium - Best Presentation Award (2014) - 1st Place: Katharine J. Ruskin; 2nd Place: Samuel L. Belknap III; 3rd Place: Jennifer R. Lennon
Student Outstanding Service Award (2014) - Seth W.Campbell

Graduate Research Excellence Award – College of Natural Sciences, Forestry, & Agriculture - Tobias Koffman
UMaine 2014 Grad Expo – 2nd Place – Natural Sciences Poster Presentation - Donna Kalteyer
Tubingen Prize for Ice Age Research - Kurt Rademaker
Prize Winner in the Olympus FOTOLOTNI Photo Contest 2013; Olympus Poland - Mariusz Potocki, Photo Location: CCI expedition (Kuli South Georgia Expedition 2012)
CUGR showcase poster competition - – *1st Place* - Sam Hatch and Emily Blackwood

E. Retention and Graduation Numbers, Initiatives - n/a since CCI supports graduate students but they get degrees in associated academic units.

F. Degrees Granted - n/a since CCI supports graduate students but they get degrees in associated academic units.

G. Highlighted Student Profile: Samuel Belkap III – A2C2 IGERT Fellow (**Appendix F**)

VI. Preserving-Restoring Infrastructure

A. Renovation /Construction Projects Initiated/Completed
B. Renovation/Construction Projects Planned for Coming Year (i.e., vetted with Facilities Management)

VII. Summary of Anticipated Challenges

For climate change and the Climate Change Institute at the University of Maine to continue to function at the cutting edge of climate change and continue to thrive and lead in the nation and the world requires the following:

- Continued growth in tenure track faculty positions shared between CCI and its legacy academic partners (School of Earth and Climate Sciences, Department of Anthropology, School of Biology and Ecology) and continued collaboration between CCI and cooperating faculty in several academic and research units such as: School of Computing and Information Sciences, the Department of Chemistry, School of Marine Sciences, School of Forest Resources.

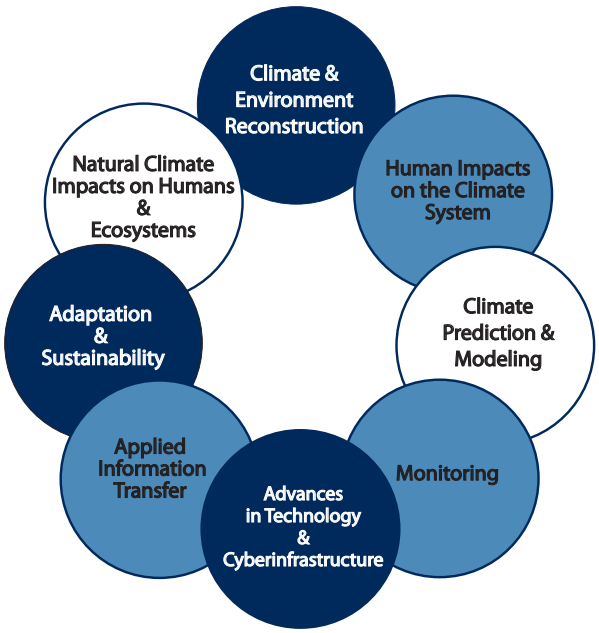
- Addition to CCI of research faculty supported at least partially by E&G and/or MEIF with compensation for teaching.

- Expansion and/or addition of transformative new directions for CCI and climate change at the University of Maine including cyberinfrastructure with an emphasis on data integration, analysis and visualization.

- Resources to enhance outreach via CCI and CCI partners to address the increasing demand for climate information, mitigation support, and adaptation and sustainability strategies.

VIII. Summary of New Initiatives

1. Climate change and CCI are now a UM Signature Research program.
2. The Institute has eight major themes that together describe its breadth of contributions and linkages across the University of Maine and at state, national and international levels, and expectations for the future of CCI and climate change at the University of Maine. These eight themes represent the current evolution of the Institute's approach to the rapidly emerging understanding of climate change and the implications of change.
3. Joint CCI-School of Business course in "Abrupt Climate Change, Business and Policy".
4. Potential for future University programs, research and education emanating from the NSF IGERT A2C2 (Adaptation to Abrupt Climate Change) shared between CCI and School for Policy and International Affairs.



APPENDIX A: ADMINISTRATION & STAFFING STRUCTURE

CLIMATE CHANGE INSTITUTE

ORGANIZATIONAL CHART

REVISED
10/7/2014

DIRECTOR
P. MAYEWSKI

ASSOCIATE DIRECTOR
J. SAROS

ASSISTANT DIRECTOR
B. LEE

POLICY ADVISORY COMMITTEE
P. KOONS (CHAIR, FY14)
G. DENTON (FY13)
D. SANDWEISS (FY13)
D. BELKNAP (FY15)
K. MAASCH (FY 15)

PEER REVIEW COMMITTEE
G. HAMILTON (CHAIR, FY14)
J. KELLEY (FY15)
B. HALL (FY15)
I. FERNANDEZ (FY14)

GRADUATE COMMITTEE
K. KREUTZ (GRADUATE COORDINATOR, FY15)
B. HALL (FY14)
J. SAROS (FY14)
G. ZARO (FY17)

ADMINISTRATION & OUTREACH
R. ADDESSI
M. SCHAUFFLER (RAsP)
M. SAROS (A2CA IGERT PROGRAM COORDINATOR)
G. JACOBSON (*MAINE STATE CLIMATOLOGIST*)

ANALYTICAL LABORATORY STAFF

S. SNEED D. INTRONE M. HANDLEY	IC, LA-ICP-MS STABLE ISOTOPE LABORATORY ICP-MS ARCHAEOLOGY LABORATORY

RESEARCH THEMES

	Physical & Chemical Climate Reconstruction	Glacial Geology & Climate Reconstruction	Paleoecology & Environmental Reconstruction	Anthropology & Archaeology	Glaciology	Marine Geology	Ecosystems & Environmental Change	Renewable Energy & Environmental Monitoring	Cyberinfrastructure	Climate Prediction & Modeling	Climate Change Impacts, Policy & Sustainability
THEME PRINCIPAL	P. MAYEWSKI (P) K. KREUTZ (P) D. MEESE (RP) N. BERTLER, (RAsP) W. SAYRE (AdP) A. SEIMON (AdP) J. SIMOES (AdP) D. DIXON (RAsP) S. BIRKEL (RAsP)	G. DENTON (P), (FD) B. HALL (P) H. BORNS, JR. (PE), (HD) G. BROMLEY (RA) A. PUTNAM (RA) R. HOOKE (CP)	J. SAROS (P) J. GILL (AsP) A. DIEFFENBACHER-KRALL (RAsP) A. NURSE (RS) C. STAGER (AdP) M. VANDERGOES (AdP) M. LAGERKLINT (RAsP)	D. SANDWEISS (P) B. ROBINSON (AP) G. ZARO (AP) M. SORG (RAP) A. KELLEY (RAP) D. SANGER (PE) D. KEEFER (AdP) M. NISBET (AdP) K. SOBOLIK (AdP) P. ROSCOE (CP)	T. HUGHES (PE) G. OSWALD (RP) G. HAMILTON (AP)	D. BELKNAP (CP) J. KELLEY (CP)	I. FERNANDEZ (CP) S. NORTON (CPE) B. MCGILL (CAP) A. PERSHING (CAP) B. OLSEN (AsP) M. SCHAUFFLER (RAsP)	M. PETERSON (CP) J. THALER (CP)	S. CHAWATHE (CAP) A. KURBATOV (RAP)	P. KOONS (P) K. MAASCH (P) F. CHAI (CP) J. FASTOOK (CP) S. JAIN (CAP)	G. JACOBSON (PE), (FD) R. KATES (PP) L. McNALLY (RAsP)
THEME SECOND	G. HAMILTON (AP) J. GILL (AsP) A. DIEFFENBACHER-KRALL (RAsP) A. KURBATOV (RAP) M. VANDERGOES (AdP) D. BELKNAP (CP) J. KELLEY (CP) I. FERNANDEZ (CP) A. NURSE (RS)	A. KELLEY (RAP)	D. SANDWEISS (P) K. SOBOLIK (AdP) G. JACOBSON (PE), (FD) R. DAVIS (PE) J. KELLEY (CP) S. NORTON (CPE) A. KELLEY (RAP) M. SCHAUFFLER (RAsP) B. OLSEN (AsP)	H. BORNS, JR. (PE), (HD) R. KATES (PP) D. BELKNAP (CP) J. KELLEY (CP) J. GILL (AsP)	P. KOONS (P) P. MAYEWSKI (P) H. BORNS, JR. (PE), (HD) B. HALL (P) K. KREUTZ (P) R. HOOKE (CP) J. FASTOOK (CP)	A. KELLEY (RAP)	J. SAROS (P) G. ZARO (AP) J. GILL (AsP) A. DIEFFENBACHER-KRALL (RAsP) L. McNALLY (RAsP) M. SORG (RAP) K. SOBOLIK (AdP) A. SEIMON (AdP) M. VANDERGOES (AdP) R. HOOKE (CP) J. KELLEY (CP) S. JAIN (CAP)	P. KOONS (P) P. MAYEWSKI (P) I. FERNANDEZ (CP) L. McNALLY (RAsP)	P. KOONS (P) P. MAYEWSKI (P) J. FASTOOK (CP)	P. MAYEWSKI (P) G. HAMILTON (AP) A. PERSHING (CAP) A. SEIMON (AdP) S. BIRKEL (RAsP)	G. ZARO (AP) P. ROSCOE (CP) I. FERNANDEZ (CP) J. KELLEY (CP) J. GILL (AsP) S. JAIN (CAP) S. CHAWATHE (CAP) A. PERSHING (CAP) M. SORG (RAP) B. OLSEN (AsP) M. NISBET (AdP) A. SEIMON (AdP)
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	J. Auger, MS - Quaternary T. Beers, MS - Earth Sciences S. Haines, MS - Quaternary B. Grigholm, PhD - Earth Sciences B. Koffman, PhD - Earth Sciences E. Korotkikh, PhD - Earth Sciences M. Potocki, PhD - Earth Sciences C. Rhodda, MS - Earth Sciences N. Spaulding, PhD - Earth Sciences N. Whitney, MS - Quaternary	S. Braddock, MS - Earth Sciences B. Chase, MS - Quaternary C. Dowey, MS - Earth Sciences C. King, PhD - Earth Sciences J. Lennon, MS - Quaternary T. Koffman, MS - Earth Sciences P. Strand, MS - Earth Sciences	D. Groff, PhD - Ecology & Env. Scs. R. Dicker, PhD - Ecology & Env. Scs. A. Kireta - PhD - Ecology & Env. Scs. H. Malik, MS - Ecology & Env. Scs.	W. Beckwith, MS - Quaternary S. Belknap, PhD - Antrop./Env. Pol. K. Bird, MS Quaternary A. Heller, PhD - Quaternary A. Mauricio, iPhD- Quaternary P. Pluta, MS - Quaternary	T. Godaire, MS - Quaternary S. Campbell, PhD - Earth Sciences J. Scheick, PhD - Earth Sciences W. Sneed, PhD - Earth Sciences N. Weitz, PhD - Physics	R. Arnold, MS - Earth Sciences E. Chandler, MS - Earth Sciences	E. Adams, PhD - Ecology & Env. Scs. B. Burpee, MS - Ecology & Env. Scs. M. Correll, PhD - Ecology & Env. Scs. M. Conway, PhD - Ecology & Env. Scs. M. Fuller, MS - Ecology & Env. Scs. L. Garey, MS - Ecology & Env. Scs. M. Gruselle, (PD) M. Jakubowski, MS - Plant, Soil & Env. Scs. B. Johnson, PhD - Forest Resources J. McCabe, PhD - Ecology & Env. Scs. R Northington (PD) K. Patel, PhD - Ecology & Env. Scs. A. Ren, PhD - Oceanography K. Ruskin, PhD - Ecology & Env. Scs. B. Seliger, MS - Ecosystems & Env. Scs. K. Tanaka, PhD - Ecology & Evn. Scs. N. Theodore, MS - Ecology & Env. Scs. K. Warner, PhD - Ecology & Env. Scs.	A. Demeo, iPhD - Ocean Engineering S. Winchenbach, iPhD - Ocean Engineering	E. Albert, PhD - Computer Science M. Royer, PhD - Computer Science	Y. Yang, MS - Quaternary	

Legend

P - Professor	CAP - Cooperating Associate Professor
AP - Associate Professor	CAsP - Cooperating Assistant Professor
AsP - Assistant Professor	CPE - Cooperating Professor Emeritus
PE - Professor Emeritus	PD - Post Doctoral Research Associate
PP - Presidential Professor	RS - Research Scientist
RP - Research Professor	RA - Research Associate
RAP - Research Associate Professor	AdP - Adjunct Professor
RAsP - Research Assistant Professor	HD - Honorary Director
CP - Cooperating Professor	FD - Former Director

APPENDIX B: RESEARCH FUNDING: SUBMITTED & AWARDED GRANTS - CLIMATE CHANGE INSTITUTE - FY2014

LISTING INCLUDES ALL ACTIVE CCI GRANT AWARDS (ADDED IN AS CONTINUATION GRANTS)

Fullname	Title	Role	Unit_Name	RESP	SP_Name	FYSubmitted	Status	Request_Amount_!	Request_Amount_U	ProposalType
Birkel, S.	Building Resilience Against Climate Effects (BRACE)	PI	Climate Change Institute	1	US Dept of Health & Human Services	2014	Funded	10,000	1,763.00	New
Birkel, S.	Coll. Res.: A Test of the Orbital Theory of Ice Ages from Glacial Deposits	PI	Climate Change Institute		National Science Foundation	2014	FundedC	21,450		Continuation
Birkel, S.	Generating Models through Synthesis	Co-PI (Capps)	Center for Research in STEM Education	0.1	National Science Foundation	2014	Declined	433,444	0.00	New
Birkel, S.	Glaciological and hydrological reconstruction of LGM and Termination climates	PI	Climate Change Institute	0.95	The Comer Science and Education Foundation	2014	Funded	25,261	10,812.00	New
Birkel, S.	Glaciological and Mass Balance Modeling of Walker Basin, Nevada	PI	Climate Change Institute	1	University of Nevada, Reno	2014	Pending	42,130	0.00	New
Birkel, S.	GreenTrACS: a Greenland Traverse for Accumulation and Climate Studies	PI	Climate Change Institute	1	National Science Foundation	2014	Funded	169,567	0.00	New
Birkel, S.	Maine Heat Wave Duration and Intensity	PI	Climate Change Institute		Maine Dept. of Health & Human Services	2014	FundedC	9,838		Continuation
Chai, F.	Collaborative Research: Ocean Acidification: The mosaic of ocean acidification	PI	School of Marine Sciences	1	National Science Foundation	2014	Declined	224,900	0.00	New
Chai, F.	FSML Planninig for the Future of the Darling Marine Center	PI	School of Marine Sciences		National Science Foundation	2014	Funded	24,993		New
Chai, F.	II-EN: Research/Education Infrastructure for Computation, Visualization	Co-PI (Segee)	Lead PI's Department	0.11	National Science Foundation	2014	Withdrawn	394,578	0.00	New
Chai, F.	Impacts of Population Growth on the San Francisco Bay & Delta Ecosystem	PI	School of Marine Sciences		National Aeronautics & Space Administration	2014	Funded	132,747		New
Chai, F.	Integrated Rapid-Response Observations and Ocean Ensemble Optimization	Co-PI (Xue)	School of Marine Sciences	0.5	US Dept of Commerce	2014	Funded	339,500	0.00	New
Chai, F.	Using NASA Data and Models to Predict Variations in Salmon Yr 3	PI	School of Marine Sciences	0.75	National Aeronautics & Space Administration	2014	FundedC	95,000	0.00	Continuation
Chawathe, S.	Air Quality Detectives (AirQd)	Co-PI (Mayewsl	Climate Change Institute	0.3	US Environmental Protection Agency	2014	Declined	75,000	25,135.00	New
Chawathe, S.	CDI-Type I: CiiWork: An Interactive Workbench for Integration..	PI	Climate Change Institute		National Science Foundation	2014	FundedC	451,742		Continuation
Chawathe, S.	Meaningful, Expressive Dissemination of Scientific Datasets (MePods)	PI	Climate Change Institute	0.6	National Science Foundation	2014	Declined	295,025	0.00	New
Chawathe, S.	NRT-DESE: Science-Oriented Change Analysis in Heterogeneous and Complex Datasets	Co-PI (Beard-Ti	National Center for Geographic Information and	0	National Science Foundation	2014	Pending	2,999,661	0.00	New
Denton, G.	Putting the WAIS into Context	PI	Climate Change Institute		National Science Foundation	2014	FundedC	379,130		Continuation
Denton, G.	Quesada Fund: Furthering Gary Comer's Work	PI	Climate Change Institute		Quesada Fund	2014	FundedC	250,000		Continuation
Denton, G.	The Last Glacial Termination in Southern Mid-Latitudes	PI	Climate Change Institute		National Science Foundation	2014	FundedC	393,844		Continuation
Denton, G.	The Last Termination in the MacKenzie Valley, Southern Alps, New Zealand	PI	Climate Change Institute	1	The Comer Science and Education Foundation	2014	Funded	56,763	24,295.00	New
Dieffenbacher-Krall, A.	Decadal Cycles in NAO Proxies from Northwest Iceland Lake and Soil Sediment	PI	Climate Change Institute	1	National Science Foundation	2014	FundedC	64,249	0.00	Continuation
Enderlin, E.	Application of Novel Technologies to Investigate Ocean Forcing of Large Calving	PI	Climate Change Institute	1	L'Oreal Corporate Foundation	2014	Pending	53,345	132.00	New
Enderlin, E.	Intra-annual Force Balance Analysis of Tidewater Glacier	PI	Climate Change Institute		National Aeronautics & Space Administration	2014	Funded	10,000		New
Enderlin, E.	Quantifying Greenland Iceberg Melt Rates using Remotely-sensed Data	PI	Climate Change Institute	0.95	National Science Foundation	2014	Funded	172,371	0.00	New
Fastook, J.	MRI: Development of a high-power, large antenna array and ultra-wideband	PI	Climate Change Institute	1	National Science Foundation	2014	FundedC	150,315	26,140.00	Continuation
Hall, B.	Coll. Res: Assesing the Antarctic contribution to sea-level changes during the last...	PI	Climate Change Institute		National Science Foundation	2014	FundedC	200,803		Continuation
Hall, B.	Coll. Res: Exploring the vulnerability of Southern Ocean Pinnipeds to Climate Change	PI	Climate Change Institute		National Science Foundation	2014	FundedC	269,584		Continuation
Hall, B.	Coll. Res: Timing and Structure of the Last Glacial Maximum and Termination in S. Peru	PI	Climate Change Institute		National Science Foundation	2014	FundedC	217,013		Continuation
Hall, B.	Coll. Res: Constraints on the last Ross Sea Ice Sheet from Glacial Geology...	PI	Climate Change Institute		National Science Foundation	2014	FundedC	273,136		Continuation
Hall, B.	Collaborative Research: High-resolution reconstruction of Holocene deglaciation	PI	Climate Change Institute	1	National Science Foundation	2014	Pending	199,935	0.00	New
Hall, B.	Collaborative Research: Response of Greenland outlet glaciers to warming	PI	Climate Change Institute	1	National Science Foundation	2014	Declined	276,004	0.00	New
Hall, B.	Sensitivity of the Antarctic Ice Sheet to Global Climate Change over the last two ...	PI	Climate Change Institute		National Science Foundation	2014	FundedC	354,181		Continuation
Hall, B.	Termination of the last ice age in the southern high latitudes	PI	Climate Change Institute	0.5	National Science Foundation	2014	Pending	643,410	0.00	New
Hall, B.	The Termination of the Last Ice Age in the Falkland Islands	PI	Climate Change Institute	1	National Geographic Society	2014	Pending	20,625	8,828.00	New
Hamilton, G.	BIGDATA:F:DKM:DKA:Collaborative Research: Cross-Layer Semantics- and	Co-PI (Zhu)	Climate Change Institute	0.33	National Science Foundation	2014	Declined	447,295	0.00	New
Hamilton, G.	Coll. Res: Flow and Fracture Dynamics in an Ice Shelf Lateral Margin	PI	Climate Change Institute		National Science Foundation	2014	FundedC	357,356		Continuation
Hamilton, G.	Coll. Res: Glacier-ocean coupling in a large East Greenland fjord	PI	Climate Change Institute		National Science Foundation	2014	FundedC	624,540		Continuation
Hamilton, G.	Development and Deployment of an Autonomous Greenland Outlet Glacier Observing	PI	Climate Change Institute	1	Heising-Simons Foundation	2014	Funded	558,718	39,825.00	New
Hamilton, G.	Glaciological Analysis in Support of Greenland Activities	PI	Climate Change Institute		National Aeronautics & Space Administration	2014	FundedC	24,013		Continuation
Hamilton, G.	Goll. Res: Byrd Glacier Flow Dynamics	PI	Climate Change Institute		National Science Foundation	2014	FundedC	239,521		Continuation
Hamilton, G.	Inland Migration of Crevasses on the Greenland Ice Sheet	PI	Climate Change Institute		National Science Foundation	2014	FundedC	77,304		Continuation
Hamilton, G.	Linking Greenland Ice Sheet Mass Loss to Decadal Circulation Changes	PI	Climate Change Institute	1	National Aeronautics & Space Administration	2014	FundedC	217,421	0.00	Continuation
Hamilton, G.	MRI: Acquisition of Terrestrial LiDAR Scanning Instrumentation for High-Res	PI	Climate Change Institute	0.6	National Science Foundation	2014	Declined	348,393	149,312.00	New
Isenhour, C.	ISENHOUR_NSF_IBSS_Residential Energy Choice	PI	Lead PI's Department	1	National Science Foundation	2014	Pending	54,163	0.00	New
Isenhour, C.	Residential Energy Choice	PI	Lead PI's Department	1	National Science Foundation	2014	Declined	142,652	0.00	New
Jain, S.	Engineering Innovative Solutions to Storm Water Problems	Co-PI (Musavi)	Lead PI's Department	0.05	National Science Foundation	2014	Funded	735,316	0.00	New
Jain, S.	Using Hydroclimatic Thresholds and Changing Baselines to Develop Decision Tools..	PI	Lead PI's Department		National Science Foundation	2014	Funded	49,431		New
Kelley, A.	Penobscot River Geomorphic Monitoring	PI	Lead PI's Department		US Dept. of Commerce	2014	Funded	22,859		New
Koons, P.	CDI-Type I: GPU-Accelerated Interactive Supercomputing for Climate Studies	Co-PI	Climate Change Institute		National Science Foundation	2014	Funded	454,580		New
Koons, P.	Coll. Res: Modeling Sediment Production from Glaciers off the Alaska Peninsula...	PI	Climate Change Institute		National Science Foundation	2014	Funded	165,005		New
Koons, P.	Coll. Res: Rivers, Fault, and Growlng Mountains: Dynamic Feedback between...	PI	Climate Change Institute		National Science Foundation	2014	Funded	169,044		New
Koons, P.	Coll. Res: ST. Elias Erosion and Tectonics Project (STEEP)	PI	Climate Change Institute		National Science Foundation	2014	FundedC	167,318		Continuation
Kreutz, K.	Collaborative Research: SPICE core chronology and climate records using chemical	PI	Climate Change Institute	0.8	National Science Foundation	2014	Pending	428,481	0.00	New
Kreutz, K.	Construction of a Continuous, High Resolution and Absolutely-Dated Marine Chronology	PI	Climate Change Institute		National Science Foundation	2014	FundedC	245,570		Continuation
Kreutz, K.	Improved ice core-based hydroclimate reconstructions in the Northeast Pacific	PI	Climate Change Institute	1	National Science Foundation	2014	Declined	252,395	0.00	New
Kreutz, K.	P2C2 CR: Reconstructing Central Alaskan Precipitation	PI	Climate Change Institute		National Science Foundation	2014	FundedC	364,770		Continuation
Kurbatov, A.	Coll. Res: Developing an Antarctic tephra database for interdisciplinary paleoclimate	PI	Climate Change Institute		National Science Foundation	2014	FundedC	365,096		Continuation
Kurbatov, A.	Collaborative research: Global and Antarctic tephrochronology of a South Pole	PI	Climate Change Institute	1	National Science Foundation	2014	Pending	163,553	0.00	New
Kurbatov, A.	Searching for Abrupt Climate Change Precursors Using Ultra High Resolution Ice Core Analysis	PI	Climate Change Institute		National Science Foundation	2014	FundedC	796,560		Continuation
Mayewski, P.	Arcadia Ice Core Proposal - Initiatives on the Science of the Human Past - YR1	PI	Climate Change Institute	1	Arcadia Fund	2014	Funded	160,956	68,889.00	New
Mayewski, P.	Arcadia Ice Core Proposal - Initiatives on the Science of the Human Past Yr2	PI	Climate Change Institute	1	Arcadia Fund	2014	Funded	135,956	58,238.00	New
Mayewski, P.	Collaborative Research: Window into the 40 kyr world from climate records	PI	Climate Change Institute	0.6	National Science Foundation	2014	Pending	168,367	0.00	New
Mayewski, P.	Collaborative Research: Investigating Hypothesized Bolide Signatures	PI	Climate Change Institute	0.5	National Science Foundation	2014	Funded	33,587	0.00	New
Mayewski, P.	COLLABORATIVE RESEARCH: Pleistocene/Holocene Climate Reconstruction	PI	Climate Change Institute	0.51	National Science Foundation	2014	Funded	590,831	0.00	New
Mayewski, P.	Collaborative Research: ULTRA-HIGH-RESOLUTION INVESTIGATION OF CENTRAL ANDES	PI	Climate Change Institute	0.75	National Science Foundation	2014	Declined	920,604	0.00	New
Mayewski, P.	Roosevelt Island Climate Evolution Project: US Deep Ice Core Glaciochemistry	PI	Climate Change Institute		National Science Foundation	2014	FundedC	609,949		Continuation

McGill, B.	Integrating Global Species Distribution Data Yr 3	PI	Senator George J. Mitchell Center	1	National Aeronautics & Space Administration	2014	FundedC	62,805	0.00	Continuation
McGill, B.	Varying patterns and processes in the distribution and abundance of saguaros	PI	Senator George J. Mitchell Center	0.7	National Science Foundation	2014	Pending	289,706	0.00	New
McGill,B.	Coll. Res.: Strengthening the Scientific Basis for Decision-Making: Advancing Sustainability	PI	Lead PI's Dept.		National Science Foundation	2014	Pending	3,000,000		New
Northington, R.	COLLABORATIVE RESEARCH: EVALUATION OF LANDSCAPE CONTROLS OF METHANE PRODUCTION	PI	Climate Change Institute	0.9	National Science Foundation	2014	Declined	363,155	0.00	New
Norton, S.	Controls of phosphorus cycling in Lake Auburn, Maine, USA	Co-PI (Amirbah	Senator George J. Mitchell Center	0.5	US Dept of the Interior	2014	Funded	27,027	59,802.00	New
Norton, S.	LTREB: Renewal: Biogeochemical Mechanisms of Response Yr3	Co-PI (Fernand	Lead PI's Department	0.25	National Science Foundation	2014	FundedC	89,974	0.00	Continuation
Norton, S.	Sediment phosphorus cycling in Lake Auburn, Maine, USA: Possible linkages	Co-PI (Amirbah	Cooperative Extension	0.5	US Environmental Protection Agency	2014	Funded	8,138	0.00	New
Norton, S.	Sediment phosphorus cycling in Lake Auburn, Maine, USA: Possible linkages among	Co-PI (Amirbah	Cooperative Extension	0.5	ME Dept of Inland Fisheries & Wildlife	2014	Funded	26,000	0.00	New
Olsen, B.	Assessing Change in the New England Tidal Marsh Bird Community	PI	Climate Change Institute		US Fish & Wildlife - Dept. of Interior	2014	FundedC	47,420		Continuation
Olsen, B.	Assessing the resiliency and ecosystem services of tidal marshes	PI	Climate Change Institute	1	US Dept of the Interior	2014	Pending	208,978	50,518.00	New
Olsen, B.	Ecological Resistance of Multiple Stressed Populations: The response of Tidal Marsh Birds	PI	Climate Change Institute		National Science Foundation	2014	FundedC	279,336		Continuation
Olsen, B.	Implementing the USFWS Salt March Integrity Monitoring Protocol	PI	Climate Change Institute	1	US Dept of the Interior	2014	Pending	142,493	0.00	New
Olsen, B.	Quantifying the Short-term Impacts of Hurricane Sandy on Tidal-marsh Birds	PI	Climate Change Institute	1	US Dept of the Interior	2014	Funded	569,346	0.00	New
Olsen, B.	Resilience of the Tidal Marsh Bird Community to Hurricane Sandy and Assessment	PI	Climate Change Institute	1	US Dept of the Interior	2014	Funded	1,409,127	87,448.00	New
Olsen, B.	Schoodic Migratory Bird Monitoring	PI	Climate Change Institute		Schoodic Education & Res. Ctr. Institute	2014	Funded	10,000		New
Oswald, G.	A Mission for Fine-Resolution Mapping of Bed Topography, Basal Conditions	PI	Climate Change Institute	1	National Aeronautics & Space Administration	2014	Pending	638,241	0.00	New
Pershing, A.	Coastal SEES (Track 2), Coll. Res: Resilience and Adaptation of a Coastal Ecological	PI	School of Marine Sciences		National Science Foundation	2014	Funded	310,470		New
Pershing, A.	Collaborative Research: Linking planktonic community ecology to ocean biogeochem	PI	School of Marine Sciences	0.8	National Science Foundation	2014	Declined	396,861	0.00	New
Pershing, A.	GMRI Inshore Gulf of Maine Herring Acoustic Survey +$	PI	School of Marine Sciences	1	US Dept of Commerce	2014	Funded	2,155	0.00	Supplemental
Peterson, M.	Autonomous System for Biophysical Monitoring at Marine Renewable Energy Sites	Co-PI (Zydlewsk	School of Marine Sciences	0.15	US Dept of Energy	2014	Declined	999,702	157,956.00	New
Peterson, M.	Northeast Marine Energy Consortium (NEMEC)	Co-PI (Maynard	Lead PI's Department	0.09	US Dept of Energy	2014	Pending	1,317,295	393,006.00	New
Peterson, M.	Surface Proprioception in the Equine Athlete	PI	Lead PI's Department	0.5	Grayson Jockey Club Research Foundation	2014	Pending	75,955	22,649.00	New
Saros, J.	Deciphering the Ecology of Key Diatom Taxa to Understand Cliamte-Induced changes	PI	Climate Change Institute		National Science Foundation	2014	FundedC	353,980		Continuation
Saros, J.	Drinking Water Quality	PI	Climate Change Institute		WRRI - Dept. of Interior	2014	FundedC	35,900		Continuation
Saros, J.	EPA IAG for Clean Air Act trends research, 2014-2015	Co-PI (Nelson)	Senator George J. Mitchell Center	0.2	US Dept of the Interior	2014	Pending	55,000	0.00	New
Saros, J.	IGERT: Adaptation to Abrupt Climate Change	PI	Climate Change Institute	0.4	National Science Foundation	2014	FundedC	2,929,087	0.00	Continuation
Saros, J.	Lakes as Sentintels of Climate Change	PI	Climate Change Institute	1	National Science Foundation	2014	Pending	483,616	0.00	New
Saros, J.	Predicting the response of boreal lakes to climate change: in-lake and watershed	PI	Climate Change Institute	1	National Science Foundation	2014	Declined	345,942	0.00	New
Saros, J.	The Future of Four SeasOns in Maine: A Scientist-Teacher-Student Partnership	CO-PI	Senator George J. Mitchell Center		US Dept. of Commerce	2014	Funded	78,801		New
Saros, J.	Understandng Climate-Driven Change in Lake Habitat Structure in Isle Royale Nat. Park	PI	Climate Change Institute		National Park Service	2014	FundedC	18,065		Continuation
Schauffler, M.	Extended Data Literacy Yr 3	PI	Climate Change Institute	0.5	US Dept of Education	2014	FundedC	18,432	5,805.00	Continuation
Schauffler, M.	The Maine Data Literacy Project: scaling up for statewide dissemination	PI	Center for Research in STEM Education	1	Davis Family Foundation	2014	Funded	40,292	0.00	New
Sorg, M.	Maine-Vermont Violent Death Reporting System	PI	Margaret Chase Smith Center	1	US Dept of Health & Human Services	2014	Pending	706,106	0.00	New
Spaulding, N.	Collaborative Research: Allan HILLs Englacial Site (AHILLES) Selection	Co-PI (Spauldin	Climate Change Institute	0.3	National Science Foundation	2014	Pending	35,594	0.00	New
Zaro, G.	Urban Transformation at the Nadin Archaeological Site, Croatia	PI	Lead PI's Department	1	National Geographic Society	2014	Pending	18,800	8,046.00	New

35,214,947

TOTAL SUBMISSIONS
INCLUDES FUNDED, PENDING, CONTINUATION
DECLINED, WITHDRAWN GRANTS

COUNT = 102

APPENDIX C: BRIEF OVERVIEW OF EACH MAJOR NEW AWARD

(This listing includes only the listing of new grant awards for FY2014. A listing of continuing awards through FY2014 are included in the supplemental listing at the end of this document).

Project Title: Maine Heat Wave Duration and Intensity
Maine Dept. of Health and Human Services
$9,838 (Year one)
PI: Sean Birkel

Maine's climate has changed considerably since the 19th century in response to natural and anthropogenic factors. Although the overall trend is known – shorter, warmer winters, and longer, hotter summers – it remains uncertain how the intensity and duration of high heat events (i.e., heat waves) has evolved. Moreover, how might high heat events change in the coming decades in response to continued industrial greenhouse gas warming? The Maine Department of Health and Human Services would like to know answers to these questions in an effort to help craft health guidelines for a future wherein illness from heat stress becomes an increasing concern.

Project Title: Building Resilience Against Climate Effects (BRACE)
Maine Dept. of Health and Human Services
$10,000 (Year one)
PI: Sean Birkel

The proposed focus in the first year is on two broad objectives. The first broad objective is to develop qualitative climate and health profiles and vulnerability assessments for key climate-related health impacts in Maine, as described in the first step of the BRACE framework (i.e., Forecasting Climate Impacts and Assessing Vulnerabilities). These profiles will draw from previous climate reports compiled nationally and in Maine, as well as from climate and health expertise in the state and the region. This work will form the baseline characterization of climate and health in Maine, which will be used in the planning and implementation of our intervention activities. The second broad objective will be to build on our previous grant effort, and investigate a more complete list of climate-related health impacts within the subsequent steps of the BRACE framework beyond the climate profiles and vulnerability assessments.

Project Title: Glaciological and hydrological reconstruction of LGM and Termination Climates in the Western U.S. and Central Asia
Comer Science and Education Foundation
$25,261 (Year one)
PI: Sean Birkel

Preserved glacier moraines and lake shorelines hold important clues about the character of past climate. Using numerical models, it is possible to translate these geomorphic features into information about paleo surface mass-balance and hydrology, thereby leading to a framework for understanding past large-scale atmospheric circulation. Here, we propose to produce numerical glacier-hydrology-climate reconstructions for geomorphic study sites in the western U.S. and central Asia that have emerging ^{10}Be surface exposure-age controls. This work will involve

close collaboration between research contingents at the University of Maine CCI (mass balance and ice sheet modeling), University of Nevada, Reno (hydrological modeling), and Columbia University LDEO (geomorphic interpretation and chronology). We anticipate this collaborative effort will lead to robust estimates of temperature and precipitation climatology across the western U.S. and central Asia during the Last Glacial Maximum and late glacial period. Our results can then be used to help further scientific understanding of Ice Age climate.

Project Title: Collaborative Research: A Test of the Orbital Theory of Ice Ages from Glacial Deposits in southern South America, based on GIS Mapping, Modeling, and Dating Perspectives
National Science Foundation
$21,450 (Year one)
PI: Sean Birkel
Mercer (1984) identified a major problem in the widely-accepted Milankovitch theory, which is still arguably the best explanation for what paces Ice Age climates. That is, the intensity of solar insolation received is out of phase between the hemispheres and thus it cannot explain how glaciers around the world experience near-synchronous ice age advance and retreat – if this is correct. Our aim is to deepen understanding of what causes ice ages in the Southern Hemisphere and by implication both hemispheres – with study of a spatial distribution of carefully-selected field sites in the Southern South America – by obtaining observations of landscape (geomorphology), quantitative state-of-the-art chronology, and numerical modeling of past climates, tied to interdisciplinary efforts with international collaborations.

Project Title: FSML Planning for the Future of the Darling Marine Center
National Science Foundation
$24,993 (Year one)
PI: Fei Chai
Darling Marine Center (i.e., 'the Center', <http://www.dmc.maine.edu/>). The Center has excellent facilities to support and expand these activities. Its close proximity to the Gulf of Maine, a basin that has been experiencing seawater warming and dramatic shifts in pelagic species assemblages, makes it an ideal logistical location from which to base climate change and ecosystem response studies. The Center is in a state of transition, with planned turnover of the Center directorship at the end of the current academic year, departure of five former resident scientists in the last decade, recent addition of new, junior resident scientists, inevitable, demographically driven departure of senior resident scientists in the not too distant future, and a new University upper administration that recognizes the importance and potential of the Center. This proposal seeks funding to help accomplish the goal of enhanced use of the Center, specifically by supporting a deliberate planning process that will develop a strategic plan for the next decade and identify infrastructure changes and research, educational, and outreach opportunities that will allow the Center to better serve users from Maine and around the nation. The planning will include evaluations and recommendations by a Committee of Visitors from other marine laboratories and input from local stakeholders, and domain experts (for example, in affordable and flexible data management). The expected outcome of the planning process is a written plan with both long-term decadal goals and clearly identified actions to be accomplished

over a five-year time scale.

Project Title: Impacts of Population Growth on the San Francisco Bay and Delta Ecosystem
National Aeronautics & Space Administration
$132,747 (Year one)
PI: Fei Chai
One challenge facing NASA Earth System Science is to understand and quantify the impacts and feedbacks of human influences on rivers and estuaries and coastal zone biology and ecology. This collective system has important interplay with human population and economics, especially in regions of high population density like the San Francisco Bay and Delta Ecosystem (SFE). Our goal is to put in place an approach and modeling framework for the scientific basis of an ecosystem approach to the stewardship of the SFE including freshwater and marine resources within the SFE and adjacent ocean ecosystems. This will combine four components: (1) satellite observations, (MODIS, MERIS, HICO on the international space station, and in the future Sentinel-3 OLCI and PACE); (2) field observations (nutrients, phytoplankton, suspended sediments, CDOM and optical properties); (3) the CoSiNE ecological model integrated with (4) a SELFE hydrological model of SFE. This project builds upon long established remote sensing and field programs in the SFE and on the physical and biological models of the SFE being developed as part of the current NASA Interdisciplinary Science SESAME project to understand and predict variations in central California salmon populations.

Project Title: Integrated Rapid-Response Observations and Ocean Ensemble Optimization
$164,538 (Year one)
PI: Fei Chai
We are glad to participate in the NOAA project "Integrated Rapid-Response Observations and Ocean Ensemble Optimization to Improve Storm Intensity Forecasts in the Northeast U.S." and intend to carry out the following responsibilities as identified for us in the proposal.

1. Ensemble Modeling – Chai and Xiu will work with Curchitser (Rutgers) model the large scale North Atlantic circulation to provide outer boundary conditions for subsequent downscaling by the regional modeling effort from Wilkin. All other data routinely available in real-time will also be assimilated in downscaled model: in situ observations from vessels, floats and moorings from NOAA's OSMC, the HF radar network, and satellite sea surface temperature and coastal corrected sea level from altimetry.
2. Ocean inundation forecast simulation sensitivities with FVCOM – Xue and Rao will provide inundation forecasts of southern Maine coastal regions with FVCOM modeling. The high-resolution model will use data from the low-cost moorings and the data-assimilative ROMS system to provide sea level at the open boundary. We will coordinate with other inundation forecast teams and NOAA partners and conduct 1) baseline simulations with the purpose of fine-tuning the model setup to produce water level forecasts that meet the NOS established metrics for errors and uncertainties; and 2) ensemble forecasts corresponding to the intensive observation periods of both years.

Project Title: The Last Termination in the MacKenzie Valley, Southern Alps, New Zealand
Comer Science & Education Foundation
$56,763 (Year one)
PI: George Denton

Over the past 23 years we have mapped and dated glacial landforms in the Andes of South America (Southern Chilean Lake District and Isla Grande de Chiloe, Lago Argentino region, and southernmost Patagonia) and the central Southern Alps of New Zealand. Buttressed by 750 radiocarbon ages and numerous ^{10}Be surface-exposure dates, all tied to detailed maps and stratigraphy, the results show multiple glacier maxima at southern mid-latitudes during Stages 4, 3, and 2 of the last glacial cycle. Each maximum corresponded with a northward shift of the Subtropical Front (STF) as recorded by Patrick DeDeckker in the Pacific south of Australia and by Steve Barker in the South Atlantic. Each maximum was also accompanied in the records of Antarctic ice cores by cooling and a drop of atmospheric CO_2. The reverse occurred during intervals of glacier recession in southern middle latitudes. The tie with the Northern Hemisphere seems to be that recession of mountain glaciers in southern middle latitudes was coeval with the northern Heinrich stadials, whereas southern glacier maxima corresponded to the intervals between northern Heinrich stadials. This relationship is most easily seen during the last glacial termination, when marked recession of ice fields in Patagonia and the Southern Alps coincided with the northern Heinrich stadial 1, followed after the Antarctic Cold Reversal (ACR) by modest recession during the time of northern Heinrich stadial 0 (Younger Dryas as registered in the Greenland ice cores). The late-glacial advances in both New Zealand and Patagonia are ACR in age and correspond in timing with the northern Bolling and Allerod events as recorded in Greenland ice cores. How the chronology of the late-glacial moraines of the southern middle latitudes compares to that of late-glacial moraines of the Northern Hemisphere is a long-standing issue that remains unresolved. Years ago, on the basis of radiocarbon dates available at the time in both hemispheres, I suggested that the Waiho Loop moraine in New Zealand was coeval with late-glacial moraines in Europe thought to be of Younger Dryas age. Based on present-day chronologies one could now as well say that the northern late-glacial moraines are ACR in age. Either way. Such a confusing situation arises because it has not been demonstrated, only assumed, that the so-called "Younger Dryas" moraines in Europe correspond with the Younger Dryas isotopic signal in Greenland ice cores. This may or may not be true.

Project Title: Intra-annual Force Balance Analysis of Tidewater Glaciers
National Aeronautics & Space Administration
$10,000 (Year one)
PI: Ellyn Enderlin

The primary mechanisms responsible for uncertainty in sea level rise (SLR) projections are the dynamic acceleration and thinning of tidewater glaciers (TWG). TWG acceleration is likely triggered by external controls like atmospheric and oceanographic perturbations, but internal controls, like differences in outlet glacier geometry and ice rheology, likely influence the sensitivity of TWGs to such perturbations. Consequently, understanding the relative roles of internal and external controls in modulating the TWG force balance is a key step towards modeling the long-term evolution of glacier behavior and associated sea level change.
The primary objective of understanding the internal and external controls of TWG dynamics will be achieved by synthesizing a near-daily, high resolution, 2-D force balance time series for two

glaciers that have rapidly retreated through basal depressions: Helheim Glacier, Greenland and Columbia Glacier, Alaska. These glaciers share several key characteristics (e.g. width, speed, large and unchanging accumulation zones) that are similar enough to facilitate comparison, but have other characteristics (e.g. ice temperature, pinning points, total area) that can be used to elucidate the mechanics of unsteady dynamics that characterize calving glaciers.

Not only do the two glaciers provide recent behavior ideal for analysis, these two glaciers have robust existing data sets assembled for an examination of TWG dynamics with unprecedented detail. Our group will construct force balance time series, extending from 2010-2015 from near-continuous 11-day TSX pairs, satellite-derived digital elevation models and IceBridge altimetry data. Sub-daily time-lapse records will be leveraged to significantly increase the temporal resolution of the remote sensing series. Data exists to characterize and constrain environmental processes including tides, hydrography, meteorology and mass balance to assess how external perturbations modify the balance of forces. The data resources available for this project represent the most comprehensive existing dataset for TWG. Our team has rich experience working on TWG in Greenland and AK, and focused attention to these data will enable new understanding of force balance evolution, unsteady TWG dynamics, and in turn, improved SLR projections.

Project Title: Linking Greenland Ice Sheet Mass Loss to Decadal Circulation Changes in the Ocean and Atmosphere
National Aeronautics and Space Administration
$66,800 (Year one)
PI: Gordon Hamilton
A team of oceanographers and glaciologists propose to leverage key NASA assets to vastly improve the science of decadal ice sheet-ocean interactions around the Greenland Ice Sheet (GrIS), and associated GrIS mass drainage. The work consists of connecting observations and modeling of the large-scale circulation to the detailed processes on Greenland's continental shelf, in the outlet glacier fjords, and at the ice sheet-ocean interface. At the heart of the modeling are the MIT ocean general circulation model (MITgcm), JPL & UCI's Ice Sheet System Model (ISSM), and the state estimation infrastructure developed by the NASA-funded "Estimating the Circulation and Climate of the Ocean" (ECCO) consortium. Various satellite data already used in ECCO and ISSM, new data becoming available through NASA's Operation IceBridge, together with dedicated in-situ observations near Greenland will be used for an improved synthesis, and will be linked to detailed process studies.

Project Title: Using Hydroclimatic Thresholds and Changing Baselines to Develop Decision Tools for Adaptive Water Use Policy
National Science Foundation
$49,431 (Year one)
PI: Shaleen Jain
The proposed activity will involve active collaborative work with Prof. Gooch and his colleagues in the Integrated Water Resources Management area, where the Dundee Centre has UK and worldwide research project and expertise. Past and recent field-based projects by Dundee researchers will provide a diverse set of test cases (with imbedded, diverse water policy prescriptions) to generate a systematic synthesis and typology of climate-water-ecosystems

policy complexes in the UK and African watersheds that can benefit from integrated decision support tools. This work directs complements and informs the ongoing research pursued by Jain and his students supported by the NSF CAREER award. We expect that the award supplement will stimulate: (a) significant new ideas and applications for the our comprehensive water policy decision tool, as well as analysis and synthesis across US, UK, African, and Australian sustainable water policy and (b) afford unique learning and collaboration opportunities to graduate students and PI.

Project Title: Engineering Innovative Solutions to Storm Water Problems through Diverse Community Participation
National Science Foundation
$735,315 (multiple years)
PI: Shaleen Jain
Using the latest technology in sensors for data collection and computer modeling for data analysis, underrepresented high school and college students will address the pervasive problem of storm water management. Participants will use cutting-edge sensor technology, microprocessor boards, data analysis tools, and information technology to monitor and map water quality around 6 diverse Maine locations. The students will use engineering design and science to create innovative solutions to local storm water problems. The project will include Native American, African American, rural, and female high school and college students, parents and caregivers, university engineers and environmental scientists, city planners, engineering and science consulting companies, non-profit organizations, and community groups. The overall educational objective of this program is to empower underrepresented and underserved students, and their communities, to find creative solutions to a local problem by actively engaging with STEM professionals in a project-based instructional environment.

Project Title: Penobscot River Geomorphic Monitoring
US Dept. of Commerce
$22,859 (Year one)
PI: Alice Kelley
With removal of the Great Works dam in summer of 2012, it was anticipated that significant movement of channel material would not take place until the spring freshet the following spring. This project seeks to:
1. Provide field support for planned, seasonal photographic monitoring of the affected area, as well as continue monitoring in the entire project area. Established monitoring cross sections will be reoccupied for this effort.
2. Characterize channel morphology following the spring freshet using previously established methods used by the USGS (Augusta ME) office at previously established cross sections.
3. Build a research relationship with the USGS Grand Canyon Group, for collaborative work on geomorphic analysis of large rivers, particularly sediment size analyses.

Project Title: Collaborative Research: Rivers, Faults, and Growing Mountains: Dynamic Feedback between Crustal Deformation, Rock Strength, and Erosion
National Science Foundation
$147,365 (Year one)
PI: Peter Koons

The topography of most active mountain ranges shows a clear link between deformation and erosion, in the form of valley networks that align closely with faults and shear zones. We propose that this association is the signature of dynamic feedback between deformation, rock damage, and surface erosion, and that this feedback plays a fundamental role in the evolution of orogens. We hypothesize that variance of the surface material strength field in active orogens is strongly influenced by strain-related defect production associated with localized mechanical weakening along frictional:brittle fault zones. The magnitude and orientation of these mechanically weak, high strain zones reflect orogen deformation driven by far field plate velocities and, consequently, are generally predictable from three dimensional (3D) mechanical solutions of orogen evolution. Anisotropy and heterogeneity of material strength and grain size fields are, consequently, intrinsic features of landscape evolution of active orogens and are omnipresent in both controlling physics and geomorphic form of the landscape. We assume that erosion occurs predominantly through repetitive impact, fragmentation, and transport of substrate by grains entrained by surface discharge, and that cohesion, coefficient of friction, and grain size are therefore important parameters of substrate erodibility. To test this hypothesis, we propose a program that combines advanced numerical modeling and field data collection in the Southern Alps of New Zealand, where the kinematic history is relatively simple. In particular, we will evaluate two testable predictions: (1) that there should exist a correlation between topography and rock strength, as reflected in properties such as bulk cohesion, fracture density, friction coefficient, tensile strength and grain size; and (2) that a coupled model of 3D deformation and erosion, based on our current understanding of the relevant physics, should produce patterns of topography, erosion, and strain that are both consistent with observations and substantially different from the case of uniform rock strength.

Project Title: COLLABORATIVE RESEARCH: Pleistocene/Holocene Climate Reconstruction at Mid Low- Latitudes of the Northern Hemisphere Using a Pamir High Resolution Deep Ice Core
National Science Foundation
$195,688 (Year one)
PI: Paul Mayewski

The unique, high resolution, complementary data sets and expected results obtained using this collaborative research will allow us to develop more comprehensive estimates and understanding of modern and future climate, tropical and extra-tropical atmospheric circulation variability over a significant part of Asia with its consequent global impacts. We will develop glacio-chemical time series and integrate–with existing Asian, South American, Arctic and Antarctic ice core data to extend our knowledge of recent and past climate and atmospheric circulation changes and to better predict the future consequences of the environmental changes in a context of global and regional scale social-economic development. By developing a robust assessment of the vulnerabilities and risks in these highly stressed, glacier-driven hydrological systems the proposed research will contribute extensively to the understanding of contemporary and past climate of vast arid and sub-arid regions of mid- low- latitudes of the northern Hemisphere on the scale of hundreds to thousands of years. Central Asia is one of the World's most dependent on glacier meltwater regions. It's high mountains hold a great volume of glacier ice and seasonal snow melt is supplying up to 80% of the fresh water needed for local communities. However, central Asian glaciers are rapidly diminishing. Since the 1960s, central Asia has lost over 12% of its glacier covered area or ~18% of its ice volume. Our recent analysis of surface to bedrock ice cores from Altai and Tien Shan glaciers in central Asia revealed that glaciers did not exist in these mountain systems in the warm Bølling-Allerød period (BA).

Project Title: Arcadia Ice Core Proposal - Initiatives on the Science of the Human Past - The last two thousand years of European history and environmental change (Harvard University)
Arcadia Fund
$160,956 (Year one)
PI: Paul Mayewski
Through a multi-year record of interdisciplinary collaboration of Michael McCormick (Goelet Professor of Medieval History; Chair, Initiative for the Science of the Human Past at Harvard University) and Paul Mayewski (Director and Professor of the Climate Change Institute (CCI) at the University of Maine) have been exploring the impacts of environmental change (including climate change) on human civilization throughout Europe over the past 2000 years. This period includes the last naturally warm and cold periods experienced by humans and offers significant analogs for assessing future climate change impacts (notably response to extreme climate events, outbreaks of disease and natural hazards). The project will integrate under the SHP the historical, Geographic Information Systems and analytical capacities of McCormick's team at Harvard, the laboratory, analytical, and intellectual capacities of Mayewski's team at CCI, and the laboratory, logistical, and local expertise – recovering glacier ice cores from mountaintops is a challenging and sometimes dangerous business – of Dietmar Wagenbach's team at the Institute for Environmental Physics (Institut für Umweltphysik, IUP) of the University of Heidelberg. SHP is uniquely positioned to lead this world-class team.

Project Title: Coll. Res. Strengthening the Scientific Basis for Decision-Making: Advancing Sustainability Science and Knowledge-action Capacities in Coupled Coastal Systems
National Science Foundation
$3,000,000 (multiple years)
PI: Brian McGill
Improving the scientific basis of decision-making regarding challenges related to sustainable development is an urgent research priority. Mounting evidence reveals disconcerting gaps between scientific knowledge and public and private decision-making. Concomitantly, grand scientific challenges such as the pursuit of sustainability underscore the growing demand for innovative, interdisciplinary science, education, and workforce development, especially approaches that give stronger emphasis to systems-based research, training, technology, networks, and public participation. Coastal zones are a key nexus for significant global changes in social and ecological systems, with major demographic and population flows coupled with changes in climate, land use and land cover. Coastal systems are also on the forefront of the imperative to adapt to these complex changes, requiring new decision-support tools to protect vital ecosystem services and promote human well-being despite high levels of scientific uncertainty. The proposed research and integrated workforce development program focuses on the closure of shellfish beds (wild harvest and aquaculture) and beaches due to poor water quality.

Project Title: Sediment Phosphorus Cycling in Lake Auburn, Maine, USA
US Environmental Protection Agency
$26,000
ME Dept. of Inland Fisheries & Wildlife
$8,138 (Year one)
PI: Steve Norton
The overall objective of this project is to assess the vulnerability of Lake Auburn, a threatened public water supply, to algal blooms. We will accomplish this by a) determining the mechanisms that lead to release of sediment phosphorus (P), the limiting nutrient for algal growth in most freshwater systems, b) quantifying the release of sediment P flux for the duration of anoxia in the hypolimnion, and c) determining the extent to which sediment P may be mobilized depending on the vertical extent of hypolimnetic anoxia. In particular, we will conduct a study to (a) characterize the forms in which sediment P exists using sequential chemical extractions and ^{31}P nuclear magnetic resonance (NMR) spectroscopy, and (b) collecting and analyzing the relevant species in the water column several times during the season. The results of this investigation will be used by the Auburn Water District and the DEP to make informed decisions regarding future treatments of the lake, and other similar water supplies.

Project Title: Controls of phosphorus cycling in Lake Auburn, Maine, USA: Spatial and Temporal Interactions among Sediment, Water Column, and Climate Change
US Dept. of Interior
$27,027 (Year one)
PI: Steve Norton
Lake Auburn, Maine, serves as the major drinking water source to the cities of Lewiston and Auburn. It has historically had high water quality, as characterized by consistent low turbidity and a nonexistent or mild hypolimnetic anoxia; as a result, the water from the lake has been exempt from filtration by the EPA. In 2011 and 2012, however, summer epilimnetic phosphorus (P) concentrations increased significantly resulting in hypolimnetic dissolved oxygen loss and higher turbidity. A sustained increase in lake turbidity will compromise public health and eventually result in filtration requirement for water treatment at a great cost to the community. Excess P concentrations are brought about by (1) prolonged periods of hypolimnetic anoxia, partly caused by a warming temperature, and (2) the susceptibility of sediment P release that is controlled by P speciation. The proposed project investigates P speciation in Lake Auburn sediment using sequential chemical extractions and ^{31}P nuclear magnetic resonance (NMR) spectroscopy, and collects and analyzes the relevant species in the water column. These two data sets enable modeling of future behavior of Lake Auburn under various climate scenarios, and provide the basis for more generalized prediction of lake behavior in the northeastern U.S. This work supplements the existing knowledge of the lake, and its results will enhance lake and water supply management strategies.

Project Title: LTREB Renewal: Biogeochemical Mechanisms of Response in the Third Decade of Whole-Ecosystem Experimental Manipulations at the Bear Brook Watershed in Maine (BBWM)
National Science Foundation
$89,974 (Year one)

PI: Steve Norton

The Bear Brook Watershed in Maine (BBWM) is a long-term (1987-present) paired, forested watershed research site with each watershed drained by a first order stream through a v-notch weir. One watershed (West Bear) has been treated bimonthly for 22 years with $(NH_4)_2SO_4$ by helicopter applications; the second watershed (East Bear) serves as the reference watershed. The *intellectual merit* of the proposed research results from a unique, long-term experimental approach to understanding whole-ecosystem response to elevated N and S in a changing chemical and physical climate. Research has extended from precipitation through to the weirs, including chemistry and fluxes of all important compartments. This LTREB renewal will build on the initial 5 year period of findings to conduct a program of research that is defining the mechanisms of ecosystem response emerging at the beginning of the third decade of experimentation. In addition, research on the reference watershed is giving us valuable insight into the recovery of forested watersheds, as ambient S deposition declines in the northeastern U.S. The BBWM program has a long history of contributions to issues of acidification, N-enrichment, base cation depletion and S sinks in soils, tree and microbial responses, C sequestration, and controls of P bioavailability to aquatic ecosystems. The proposed research will advance our understanding of unique mechanisms of ecosystem response at the decadal time scale to both ambient and experimental changes in the chemical and physical environment . This LTREB renewal will provide a framework for additional research about ecosystem function, as has been the case during the first 5 year period of this LTREB (e.g., NSF DEB 0415348, 0414144, and 0841571). BBWM results will be disseminated immediately on the web (e.g., streamflow), shared in regional projects and web sites, and displayed on the project web site.

Project Title: <u>Schoodic Migratory Bird Monitoring</u>
Schoodic Education and Research Center Institute
$10,000 (Year one)
PI: Brian Olsen
Birds migrate through unfamiliar areas and face the risks of predation and starvation as well as time constraints along the way. It is unclear how individuals' behavioral decisions to mitigate these risks shape patterns of stopover during autumn migration. The proposed project will conduct an experiment to examine behavioral tradeoffs between foraging and predator avoidance made by birds migrating through Downeast Maine. A series of phylogenetic and physiological contrasts will isolate behavioral differences due to migratory strategy and fat load. The results will help quantify the costs of behavioral tradeoffs inherent in migratory behavior, knowledge that is necessary to understand how changing migratory habitats and community membership will impact both the fitness of individuals and the viability of migratory populations.

Project Title: <u>Quantifying the Short-term Impacts of Hurricane Sandy on Tidal-marsh Birds and their Habitats</u>
US Fish & Wildlife Service
$569,346 (Year one)
PI: Brian Olsen

A thorough understanding of the effects of Hurricane Sandy on tidal marshes and the wildlife they support is needed to direct conservation actions where they will have the greatest efficacy toward increasing the resilience of green infrastructure. Local and severe alteration of individual

marshes is apparent, but the extent of the damage across thousands of hectares of marsh habitat within the storm's path and the impacts on wildlife remain unknown. Many bird species of conservation concern breed and winter in tidal marshes (American Black Duck, Clapper, King and Black rails, Willet, Seaside, Nelson's and Saltmarsh sparrows) and face additional threats from sea-level rise. Understanding plant community and bird responses to this extreme storm will ensure that: 1) immediate action can be directed to areas that will provide the greatest benefit to improving the function of coupled human-natural systems, 2) planned restoration can adopt an adaptive management approach that is data-driven and scientifically rigorous, and 2) conservation priorities and institutional interventions for increasing resource resilience can be developed for future planning.

Project Title: Coastal SEES (Track 2), Collaborative Research: Resilience and Adaptation of a Coastal Ecological-Economic System in Response to Increasing Temperatures and Increased Temperature Variability.
National Science Foundation
$310,470 (Year one)
PI: A. Pershing
Intellectual Merit: 2012 was the warmest year on record in the United States. It was also the warmest year ever over a broad area of the Northwest Atlantic stretching from Cape Hatteras to Iceland. The "ocean heatwave" in 2012 was characterized by surface temperature anomalies 1-3°C above the 1981-2011 climatology. This discrete event is superimposed on a secular warming trend observed throughout the region, with the mouth of the Labrador Sea exhibiting the strongest trend anywhere in the global ocean. We propose a multidisciplinary study to examine how warming events like 2012, as well as more gradual temperature trends, alter the dynamics of a complex ecological and economic system. We will use the Gulf of Maine fishery ecosystem as our model system. This system includes the economically and culturally valuable lobster and groundfish fisheries, and these fisheries are linked through predation on lobsters by many commercial fish. The Gulf of Maine region has strong gradients in temperature, and interannual temperature changes are sensitive to local heating as well as remote forcing, notably from the Labrador Sea. We will examine the impact of warm events, like the 2012 heatwave, as well as more gradual trends on abundance, distribution, and phenology of fish and invertebrates (squid and lobsters) and then quantify the impact of the biological changes on the fisheries and their attached economic systems.

Project Title: EPA IAG for Clean Air Act trends research, 2012-2013 (Determining the effectiveness of the Clean Air Act and Amendments on the recovery of surface waters in the northeastern US)
US Dept. of Interior
$50,000 (Year one)
Co-PI: Dr. Jasmine Saros
This research is part of EPA CAMD programs that are verifying the effectiveness of emission controls at reducing acidification of surface waters. Our approach is to collect long-term high-quality data that characterize the trends and patterns of response in low ionic-strength surface waters that are classified as sensitive to acidic deposition and a sample of lakes across the Northeast in varying landscape settings. This subcontract covers activities that are relevant to detecting chemical and biological recovery of aquatic systems in the northeast following controls

on acid deposition following passage of the Clean Air Act Amendments (CAAA). The main activity is to continue on-going long-term water chemistry trends monitoring designed to detect (a) the response of northeast lakes to the CAAA and (b) chemical responses to the long-term acidification experiment at Bear Brook, Maine. We will provide logistics and organizational support, field sampling assistance for sample collection, laboratory analyses for East Bear Brook, data management, quality assurance reports, and collaborate in data analysis, interpretation, and publication. Nelson will also work with partners at EPA and UNH to streamline data reporting and discuss potential sample site or frequency changes. Nelson will work with the project team in preparing final reports, databases, and peer-reviewed publications as the result of these activities.

Project Title: The Future of Four Seasons in Maine: a Scientist-Teacher-Student Partnership to Investigate Climate Change in Seasonally Snow-Covered Watersheds
US Dept. of Commerce
$78,801 (Year one)
Co-PI: Dr. Jasmine Saros
This project will engage 1,275 students and 30 high school teachers with professional scientists in research regarding the changing nature of snowpack across Maine, emphasizing the coastal climate zone where snowmelt provides cues for diadromous fish migration. Future 4SM is part of 'Acadia Learning', which applies the MWEE frame to provide students with experience of the interconnectedness of coastal watershed systems. We will provide professional development (PD) in summer institutes and school-year workshops to assist teachers in: (1) mastering content knowledge to support student understanding of Climate Literacy Principles, with special focus on spatio-temporal variation and roles of observation and modeling, and (2) improving pedagogical practice to help students formulate hypotheses, make sense of data, and present findings. Our website and video sharing techniques enable students in geographically dispersed schools to share data and engage in peer review. The project will produce snow data useful to partners and scientists, who will interact directly with teachers throughout the project.
Primary objectives: Y1: Develop, deliver and test curriculum materials and PD with 6 teachers; implement field research with ~150 students; evaluate teacher use of materials, tools, and practices. Y2: Refine PD and curriculum materials; deliver and test PD with 9 additional teachers; implement field research with ~375 students. Y3: While continuing program improvement, initiate outreach to engage a total of 30 teachers and ~750 students to create sustainable, ongoing programs in at least six school districts. We estimate 50 contact hours per teacher per year.

CONTINUING GRANT AWARDS – FY2014

Project Title: Coll. Res.: Decadal Cycles in NAO Proxies from Northwest Iceland Lake and Soil Sediment
National Science Foundation
$64,249 (YR1, YR2, YR3, YR4)
PI: Ann Dieffenbacher-Krall

Project Title: CDI-Type I: CiiWork: an interactive workbench for integration,

exploration, and analysis of chronological information
National Science Foundation
$451,742 (YR1, YR2, YR3)
PI: Sudarshan Chawathe

Project Title: Quesada Fund: Furthering Gary Comer's Work
Quesada Fund
$250,000 (multiple years)
PI: George Denton

Project Title: Putting the WAIS into Context
National Science Foundation
$379,130 (YR1, YR2, YR3)
PI: George Denton

Project Title: The Last Glacial Termination in Southern Mid-Latitudes
National Science Foundation
$393,844 (YR1, YR2, YR3)
PI: George Denton

Wideband Radar for a Basler for Sounding and Imaging for Fast Flowing Glaciers and Mapping Internal Layers
National Science Foundation
$150,315 (YR1, YR2, YR3)
PI: James Fastook

Project Title: Collaborative Research: Assessing the Antarctic contribution to sea-level changes during the last deglaciation: Constraints from Darwin Glacier
National Science Foundation
$200,803 (YR1, YR2, YR3)
PI: Brenda Hall

Project Title: Collaborative Research: Exploring the vulnerability of Southern Ocean pinnipeds to climate change - an integrated approach
National Science Foundation
$269,584 (YR1, YR2, YR3)
PI: Brenda Hall

Project Title: Collaborative Research: Timing and structure of the last glacial maximum and termination in southern Peru
National Science Foundation
$217,013 (YR1, YR2, YR3)
PI: Brenda Hall

Project Title: Collaborative Research: Constraints on the last Ross Sea Ice Sheet from glacial geology in the southern Transantarctic Mountains
National Science Foundation
$273,136 (YR1, YR2, YR3)
PI: Brenda Hall

Project Title: Sensitivity of the Antarctic Ice Sheet to global climate change over the last two glacial/interglacial cycles
National Science Foundation
$354,181 (YR1, YR2, YR3)
PI: Brenda Hall

Project Title: Linking Greenland Ice Sheet Mass Loss to Decadel Circulation Changes in the Ocean and Atmosphere.
National Aeronautics and Space Administration
$217,421 (YR1, YR2, YR3)
PI: Gordon Hamilton

Project Title: Glaciological analysis in support of Greenland activities
US Army Engineering Research and Development Center
$24,013 (YR1)
PI: Gordon Hamilton

Project Title: Collaborative Research: Flow and Fracture Dynamics in an Ice Shelf Lateral Margin: Observations and modeling of the McMurdo Shear Zone
National Science Foundation
$357,356 (YR1, YR2, YR3, YR4)
PI: Gordon Hamilton

Project Title: Inland Migration of Crevasses on the Greenland Ice Sheet
National Science Foundation
$77,304 (YR1)
PI: Gordon Hamilton

Project Title: Collaborative Research: Byrd Glacier Flow Dynamics
National Science Foundation
$239,521 (YR1, YR2, YR3)
PI: Gordon Hamilton

Project Title: Collaborative research: Glacier-ocean coupling in a large East Greenland fjord
National Science Foundation
$624,540 (YR1, YR2, YR3)
PI: Gordon Hamilton

Project Title: Collaborative Research: Rivers, Faults, and Growing Mountains: Dynamic Feedback between Crustal Deformation, Rock Strength, and Erosion
National Science Foundation
$169,044 (YR1, YR2)
PI: Peter Koons

Project Title: Collaborative Proposal: Modeling Sediment Production from Glaciers off the Alaska Peninsula during Quaternary Climate Oscillations
National Science Foundation
$165,005 (YR1, YR2)
PI: Peter Koons

Project Title: CDI-Type I: GPU-Accelerated Interactive Supercomputing for Climate Studies in the Northern Environment
National Science Foundation
$454,580 (YR1, YR2, YR3)
PI: Peter Koons

Project Title: Collaborative Research: ST. Elias Erosion and tectonics Project (STEEP)
National Science Foundation
$167,318 (YR1, YR2)
PI: Peter Koons

Project Title: Collaborative research: Developing an Antarctic tephra database for interdisciplinary paleoclimate research (AntT)
National Science Foundation
$365,096 (YR1, YR2, YR3)
PI: Andrei Kurbatov

Project Title: Searching for Abrupt Climate Change Precursors Using Ultra High Resolution Ice Core Analysis
National Science Foundation
$796,560 (YR1, YR2, YR3)
PI: Andrei Kurbatov and P.A. Mayewski

Project Title: Construction of a continuous, high resolution and absolutely-dated marine chronology from the Gulf of Maine during the last millennium
National Science Foundation (YR1, YR2, YR3)
$245,570 (multiple years)
PI: Karl Kreutz

Project Title: P2C2 CR: Reconstructing Central Alaskan Precipitation
National Science Foundation
$364,770 (YR1, YR2, YR3)
PI: Karl Kreutz

Project Title: Roosevelt Island Climate Evolution Project: US Deep Ice Core Glaciochemistry
National Science Foundation
$609,949 (YR1, YR2, YR3)
PI: Paul Mayewski and A. Kurbatov

Project Title: COLLABORATIVE RESEARCH: Pleistocene/Holocene Climate Reconstruction at Mid Low- Latitudes of the Northern Hemisphere Using a Pamir High Resolution ..
National Science Foundation
$580,835 (YR1, YR2, YR3)
PI: Paul Mayewski and A. Kurbatov

Project Title: The Conservation of Tidal Marsh Birds: Prioritizing action at the intersection of our changing land and seascapes
Maine Department of Inland Fisheries and Wildlife
$279,336 (YR1, YR2, YR3)
PI: Brian Olsen

Project Title: Assessing Change in the New England Tidal Marsh Bird Community
US Fish & Wildlife – Dept. of Interior
$47,420 (YR1, YR2)
PI: Brian Olsen

Project Title: Schoodic Migratory Bird Monitoring
Schoodic Education and Research Center Institute
$10,000 (YR1)
PI: Brian Olsen

Project Title: Ecological Resistance of Multiply Stressed Populations: the response of tidal marsh birds and plants to Hurricane Sandy
National Science Foundation
$279,336 (YR1, YR2, YR3)
PI: Brian Olsen

Project Title: Deciphering the Ecology of Key Diatom Taxa to Understand Climate-Induced Changes in West Greenland Lakes
National Science Foundation
$353,980 (YR1, YR2, YR3)
PI: Jasmine Saros

Project Title: Understanding Climate-Driven Change in Lake Habitat Structure in Isle Royale National Park
National Park Service
$18,065 (YR1)
PI: Jasmine Saros

Project Title: Drinking Water Quality
WRRI – US Dept. of Interior
$35,900 (YR1)
PI: Jasmine Saros

Project Title: IGERT: Adaptation to Abrupt Climate Change
National Science Foundation
$2,929,087 (YR1, YR2, YR3, YR4, YR5)
PI: Jasmine Saros

APPENDIX D: RESEARCH & SCHOLARSHIP SUMMARY

PUBLICATIONS: ABSTRACTS/BOOKS/BOOK CHAPTERS/JOURNAL ARTICLES/POSTERS/PROCEEDINGS/TECHNICAL REPORTS

Name	Type	Status	Citation	Refereed	Category	GS	US
Belknap, Daniel	Journal Article	Published	Belknap, D.F. and Sandweiss, D.H., 2014, Effect of the Spanish Conquest on coastal change in northwestern Peru: Proceedings of the National Academy of Sciences, www.pnas.org/cgi/doi/10.1073/PNAS.1404568111. 4 pp. www.pnas.org/cgi/doi/10.1073/PNAS.1404568111.	Yes	Basic	0	0
Belknap, Daniel	Journal Article	Submitted	Wilson, K.R., Kelley, J.T., and Belknap, D.F., 2014, Fine-scale patterns in pool water level, temperature, and salinity, Wells, Maine, USA. In review Estuaries and Coasts.	Yes	Basic	0	0
Belknap, Daniel	Book Chapter	Submitted	Brothers, L.L., Legere, C., Hughes Clarke, J.E., Kelley, J.T., Barnhardt, W.A., Andrews, B.D., and Belknap, D.F., 2014, Pockmarks in Passamaquoddy Bay, New Brunswick Canada, in: Dowdeswell, J.A. Canals, M., Jakobsson, M., Todd, B.J., Dowdeswell, E.K., and Hogan, K. A., eds., Atlas of Submarine Glacial Landforms: Modern, Quaternary and Ancient, Geological Society, London, Memoirs, v. p. .	Yes	Basic	0	0
Belknap, Daniel	Abstract	Published	Kelley, A.R., Mauricio, A.C., Sandweiss, D.H., Kelley, J.T. and Belknap, D.F., 2013, New geoarchaeological and environmental insights at the Preceramic-age Los Morteros archaeological site, north coast Peru: Geological Society of America Abstracts with Programs, v. 45, no. 7 (GSA Annual Meeting), Abstract 62-3, p. 178. https://gsa.confex.com/gsa/2013AM/webprogram/Paper230609.html	Yes	Basic	1	0
Belknap, Daniel	Abstract	Published	Cooper, J.A.G., Long, A.J., Callard, L., Kelley, J.T., Belknap, D.F., Quinn, R., Edwards, R., Jackson, D.W.T. and Long, D., 2013, New postglacial relative sea-level change records from the British and Irish continental shelf: Geological Society of America Abstracts with Programs, v. 45, no. 7 (GSA Annual Meeting), Abstract 62-3, p. 178. https://gsa.confex.com/gsa/2013AM/webprogram/Paper228388.html	Yes	Basic	0	0
Belknap, Daniel	Abstract	Published	Plets, R., Callard, L., Cooper, J.A.G., Long, A.J., Belknap, D.F., Edwards, R., Jackson, D.W.T., Kelley, J.T., Long, D., Milne, G., Monteys, X., and Quinn, R., 2013, Post-glacial sea-level history for SW Ireland (Bantry Bay) based on offshore evidence: American Geophysical Union Fall Meeting, San Francisco, Paleoceanography and Paleontology, PP53B-1999 Poster. https://live.blueskybroadcast.com/bsb/client/_new_default.asp?action=SEARCH&Client=483862	Yes	Basic	0	0
Belknap, Daniel	Abstract	Published	Quinn, R., Plets, R., Callard, L., Cooper, J.A.G., Long, A.J., Belknap, D.F., Edwards, R., Jackson, D.W.T., Kelley, J.T., Long, D., Milne, G., and Monteys, X., 2013, Post-glacial sea-level history for NE Ireland (Belfast Lough) based on offshore evidence: American Geophysical Union Fall Meeting, San Francisco, Paleoceanography and Paleontology, PP53B-2003 Poster.	Yes	Basic	0	0

Belknap, Daniel	Abstract	Published	Belknap, D.F., and Wilson, K.R, 2014, Invasive green crab impacts on salt marshes in Maine - sudden increase in erosion potential : Geological Society of America Abstracts with Programs, v. 46, no. 1, (NE Section Meeting), Abstract 55-9, p. 104.	Yes	Basic	0	0
Belknap, Daniel	Abstract	Published	Cooper, J.A.G., Long, A.J., Plets, R., Callard, L., Quinn, R., Kelley, J.T., Belknap, D.F., Jackson, D.W.T., Edwards, R., and Long, D., 2014, New Observations on lower than present sea-levels since the Late Glacial from the British Isles: European Geophysical Union General Assembly 2014, Vienna, April 27 - May 02, Geophysical Research Abstracts, v. 16, EGU20014-6200.	Yes	Basic	0	0
Belknap, Daniel	Abstract	Published	Plets, R., Callard, L., Cooper, J.A.G., Long, A.J., Belknap, D.F., Edwards, R., Jackson, D.W.T., Kelley, J.T., Long, D., Milne, G., Monteys, X., and Quinn, R., 2014, Deglacial and post-glacial sea-level history for Bantry Bay (SW Ireland) based on offshore evidence: European Geophysical Union General Assembly 2014, Vienna, April 27 - May 02, Geophysical Research Abstracts, v. 16, EGU20014-5164.	Yes	Basic	0	0
Belknap, Daniel	Abstract	Published	Quinn, R., Plets, R., Callard, L., Cooper, J.A.G., Long, A.J., Belknap, D.F., Edwards, R., Jackson, D.W.T., Kelley, J.T., Long, D., Milne, G., and Monteys, X., 2014, Post-glacial sea-level history for NE Ireland (Belfast Lough) based on offshore evidence: European Geophysical Union General Assembly 2014, Vienna, April 27 - May 02, Geophysical Research Abstracts, v. 16, EGU20014-5150.	Yes	Basic	0	0
Chai, Fei	Journal Article	Published	Nan F., H. Xue, F. Chai, D. Wang, F. Yu, M. Shi, G. Guo (2013): Weakening of the Kuroshio intrusion into the South China Sea over the past two decades. Journal of Climate, Vol. 26, 8097-8110. DOI: 10.1175/JCLI-D-12-00315.1	Yes	Basic	1	0
Chai, Fei	Journal Article	Published	Wang, J., H. Hong, Y. Jiang, F. Chai (2013): Summer nitrogenous nutrient transport and its fate in the Taiwan Strait: a coupled physical-biological modeling approach. Journal of Geophysical Research - Oceans, Vol. 118, 4184-4200, doi:10.1002/jgrc.20300	Yes	Basic	1	0
Chai, Fei	Journal Article	Published	Xiu, P. and F. Chai (2014): Connections between physical, optical and biogeochemical processes in the Pacific Ocean. Progress in Oceanography, Vol. 122, page 30-53.	Yes	Basic	0	0
Chai, Fei	Journal Article	Published	] W. Ma, F. Chai, P. Xiu, H. Xue, J. Tian (2013): Modeling the seasonal and inter-annual phytoplankton dynamics in the South China Sea during 1958-2009. Journal of Oceanography, 69.527-544. DOI 10.1007/s10872-013-0190-8.	Yes	Basic	0	0
Chai, Fei	Journal Article	Published	Xiu, P. F. Chai, A.C. Thomas (2013): Remote sensing of phytoplankton blooms induced by natural and artificial iron addition in the Gulf of Alaska. Remote Sensing of Environment, 145 (2014) 38-46.	Yes	Basic	0	0
Chai, Fei	Journal Article	Published	Fiechter, J., E. N. Curchitser, C. A. Edwards, F. Chai, N. L. Goebel and F. P. Chavez (2014): Air-sea CO2 fluxes in the California Current: Impacts of model resolution and coastal topography DOI: 10.1002/2013GB004683.	Yes	Basic	0	0
Chai, Fei	Journal Article	Published	Chu, X., H. Xue, Y. Qi, G. Chen, Q. Mao, D. Wang and F. Chai (2014): An	Yes	Basic	0	0

			exceptional anticyclonic eddy in the South China Sea in 2010. Journal of Geophysical Research – Oceans. DOI: 10.1002/2013JC009314				
Chai, Fei	Journal Article	Published	Lin, P., F. Chai, H. Xue, and P. Xiu (2014): Modulation of Decadal Oscillation on Surface Chlorophyll in the Kuroshio Extension. Journal of Geophysical Research – Oceans, DOI: 10.1002/2013JC009359.	Yes	Basic	0	0
Chai, Fei	Journal Article	Published	Zhou, K., M. Dai, S. Kao, L. Wang, P. Xiu, F. Chai, J. Tian, and Y. Liu (2013): Apparent enhancement of 234Th-based particle export associated with anticyclonic eddies. Earth and Planetary Science Letters 381, 198-209.	Yes	Basic	1	0
Chai, Fei	Journal Article	Published	Huff, D., M.M. Yoklavich, M.S. Love, D.L. Watters, F. Chai, and S.T. Lindley (2013): Environmental factors that influence the distribution, size, and biotic relationships of the Christmas tree coral Antipathes dendrochristos in the Southern California Bight. Mar Ecol Prog Ser (MEPS), Vol. 494, 159-177. doi: 10.3354/meps10591.	Yes	Basic	0	0
Chai, Fei	Journal Article	Published	Guo, L., F. Chai, P. Xiu, H. Xue, S. Rao, Y. Liu, and F.P. Chavez (2014): Seasonal dynamics of physical and biological processes in the central California Current System: A modeling study. Ocean Dynamics, DOI 10.1007/s10236-014-0721-x.	Yes	Basic	1	0
Chai, Fei	Journal Article	Published	Y. Shu, H. Xue, D. Wang, F. Chai, Q. Xie, J. Yao, and J. Xiao (2014): Meridional overturning circulation in the South China Sea envisioned from the high resolution global reanalysis data GLBa0.08, J. Geophys. Res., 119, doi:10.1002/2013JC009583.	Yes	Basic	0	0
Chai, Fei	Journal Article	Submitted	Xu, Y., K.A. Rose, F. Chai, F.P. Chavez, and P. Ayon (submitted): Does spatial variation in environmental conditions affect recruitment? A study using a 3-D model of Peruvian anchovy. Progress in Oceanography, submitted in May 2014.	Yes	Basic	1	0
Chai, Fei	Journal Article	Submitted	Ma, W., F. Chai, P. Xiu, H. Xue, J. Tian (submitted): Simulation of export production and biological pump structure in the South China Sea. Geo-Marine Letters (submitted in May 2014)	Yes	Basic	1	0
Chai, Fei	Journal Article	Submitted	M. Gehlen, R. Barciela, L. Bertino, P. Brasseur, M. Butenschön, F. Chai, A. Crise, Y. Drillet, D. Ford, D. Lavoie, P. Lehodey, C. Perruche, A. Samuelsen (submitted): Building the capacity for forecasting marine biogeochemistry and ecosystems: recent advances and future developments.	Yes	Basic	0	0
Chai, Fei	Abstract	Published	Pan, G.; Chai, F.; Tang, D.; WHICH TYPE TYPHOONS CAN TRIGGER PHYTOPLANKTON BLOOMS IN THE SOUTH CHINA SEA (Abstract ID: 13095 - Ocean Sciences Meeting 2014)	Yes	Basic	0	0
Chai, Fei	Abstract	Published	Zhang, W.; Chai, F.; Hong, H.; Xue, H.; SEASONAL VOLUME TRANSPORT THROUGH THE TAIWAN STRAIT AND THE EFFECT OF SYNOPTIC EVENTS (Abstract ID: 13466 - Ocean Sciences Meeting 2014)	Yes	Basic	0	0
Chai, Fei	Abstract	Published	Danner, E.; Chao, Y.; Chai, F.; Chavez, F.; Nisbet, R.; FROM RIVERS TO THE OCEAN: USING HABITAT MODELS TO UNDERSTAND AND PREDICT VARIATIONS IN CENTRAL CALIFORNIA SALMON (Abstract ID: 13644 - Ocean	Yes	Basic	0	0

			Sciences Meeting 2014)				
Chai, Fei	Abstract	Published	Shu, Y.; Xue, H.; Wang, D.; Chai, F.; Yao, J.; THE SOUTH CHINA SEA MERIDIONAL OVERTURNING CIRCULATION DERIVED FROM THE GLOBAL REANALYSIS DATA GLBA0.08 (Abstract ID: 14898 - Ocean Sciences Meeting 2014)	Yes	Basic	0	0
Chai, Fei	Abstract	Published	Kudela, R. M.; Anderson, C. R.; Kahru, M.; Chao, Y.; Chai, F.; WATER QUALITY PREDICTIONS FROM A NOVEL BLENDING OF SATELLITE DATA AND NUMERICAL MODELS FOR COASTAL CALIFORNIA (Abstract ID: 15170 - Ocean Sciences Meeting 2014)	Yes	Basic	0	0
Chai, Fei	Abstract	Published	Xiu, P.; Chai, F.; Guo, L.; Chavez, F. P.; Chao, Y.; SEASONAL VARIATIONS OF ECOSYSTEM STRUCTURES IN THE CENTRAL CALIFORNIA CURRENT SYSTEM (Abstract ID: 15585 - Ocean Sciences Meeting 2014)	Yes	Basic	0	0
Chai, Fei	Abstract	Published	Rao, S. A.; Chai, F.; Xue, H.; Chao, Y.; Dugdale, R. C.; A STUDY OF NUTRIENT AND BIOMASS CYCLES IN THE SAN FRANCISCO BAY USING THE SELFE-COSINE ECOSYSTEM MODEL (Abstract ID: 16244 - Ocean Sciences Meeting 2014)	Yes	Basic	0	0
Chai, Fei	Abstract	Published	Chai, F.; Xiu, P.; XUe, H.; Mobley, C.; Chao, Y.; INCORPORATING OPTICAL PROCESSES INTO PHYSICAL-BIOGEOCHEMICAL MODELS IN THE PACIFIC OCEAN (Abstract ID: 17073 - Ocean Sciences Meeting 2014)	Yes	Basic	0	0
Chai, Fei	Abstract	Published	Chai, F.; Xiu, P.; XUe, H.; Mobley, C.; Chao, Y.; INCORPORATING OPTICAL PROCESSES INTO PHYSICAL-BIOGEOCHEMICAL MODELS IN THE PACIFIC OCEAN (An invited talk at GODAE OceanView Symposium 2013)	Yes	Basic	0	0
Chai, Fei	Abstract	Published	Chai, F.: Coastal and Marine Ecosystems in a Changing World (An invited talk at the World Ocean Week in Xiamen - November 2013).	Yes	Basic	0	0
Chai, Fei	Abstract	Published	Chai, F., P. Xiu, and A. Thomas: Satellite bio-optical and altimeter comparisons of phytoplankton blooms induced by natural and artificial iron addition in the Gulf of Alaska. (A plenary invited talk at 10th Cross-Strait Ocean Research in Taiwan)	Yes	Basic	0	0
Chawathe, Sudarshan	Proceedings	Published	Erik Albert and Sudarshan Chawathe. Deploying a Multi-Interface RESTful Application in the Cloud. Proceedings of the 6th International Conference on Data Management in Cloud, Grid and P2P Systems (Globe-2013). August 26--29, 2013. Prague, Czech Republic.	Yes		1	0
Chawathe, Sudarshan	Other	Published	Mark Royer, Sudarshan S. Chawathe, Andrei V. Kurbatov, Paul A. Mayewski. A Java library for dynamically loading and executing remote Octave functions. Borns Symposium, April 2014.			1	0
Denotn, George	Journal Article	Published	Vandergoes, M.J., Hogg, A.G., Lowe, D.J., Newnham, R.M., Denton, G.H., Southon, J., Barrell, D.J.A., Wilson, C.J.N., McGlone, M.S., Allan, A.S.R., Almond, P.C., Petchey, F., Dabell, K., Diffenbacher-Krall, A., Blauw, M., 2013, A revised age for the Kawakawa/Oruani tephra, a key marker for the Last Glacial Maximum in New Zealand. Quaternary Science Reviews 74, 195-201.	Yes	Basic	0	0

Denotn, George	Journal Article	Published	Vandergoes, M.J., Newnham, R.M., Denton, G.H., Blaauw, M., and Barrell, D.J.A., 2013, The anatomy of Last Glacial Maximum climate variations in south Westland, New Zealand, derived from pollen records. Quaternary Science Reviews 74, 215-229.	Yes	Basic	0	0
Denotn, George	Journal Article	Published	Doughty, A.M., Anderson, B.M., Mackintosh, A.N., Kaplan, M.R., Vandergoes, M.J., Barrell, D.J.A., Denton, G.H., Schaefer, J.M., Chinn, T.J.H., Putnam, A.E., 2013, Evaluation of Lateglacial temperatures in the Southern Alps of New Zealand based on glacier modelling at Irishman Stream, Ben Ohau Range. Quaternary Science Reviews 74, 160-169.	Yes	Basic	2	0
Denotn, George	Journal Article	Published	Kaplan, M.R., Schaefer, J.M., Denton, G.H., Doughty, A.M., Barrell, D.J.A., Chinn, T.J.H., Putnam, A.E., Andersen, B.G., Mackintosh, A., Finkel, R.C., Schwartz, R., Anderson, B., 2013, The anatomy of long-term warming since 15 ka in New Zealand based on net glacier snowline rise. Geology 41, 887-890.	Yes	Basic	2	0
Denotn, George	Journal Article	Published	Putnam, A.E., Schaefer, J.M., Denton, G.H., Barrell, D.J.A., Andersen, B.G., Koffman, T.N., Rowan, A.V., Finkel, R.C., Rood, D.H., Schwartz, R., Vandergoes, M.J., Plummer, M.A., Brocklehurst, S.H., Kelley, S.E., Ladig, K.L., 2013, Warming and glacier recession in the Rakaia Valley, Southern Alps of New Zealand, during Heinrich Stadial 1. Earth and Planetary Sciences 382, 98-110.	Yes	Basic	4	0
Denotn, George	Journal Article	Published	Golledge, N.R., Levy, R.H., McKay, R.M., Fogwill, C.J.H., White, D.A., Graham, A.G.C., Smith, J.A., Hillenbrand, C.-D., Licht, K.J., Denton, G.H., Ackert, R.P.,Jr., Maas. S.M., amd Hall, B.L., 2013, Glaciology and geological signature of the Last Glacial Maximum Antarctic ice sheet. Quaternary Science Reviews 78, 225-247.	Yes	Basic	0	0
Denotn, George	Journal Article	Published	Lowell, T.V., Hall, B.L., Kelly, M.A., Bennike, O., Lusas, A.R., Honsaker, W., Smith, C.A., Levy, L.B., Travis, S., amd Denton, G.H., 2013, Late Holocene expansion of Istorvet ice cap, east Greenland. Quaternary Science Reviews 63, 128-140.	Yes	Basic	4	0
Denotn, George	Journal Article	Published	Lowell, T.V., Hall, B.L., Kelly, M.A., Bennike, O., Smith, C.A., Denton, G.H., 2013, Reply to Miller et al. (2013) Substantial agreement on the timing and magnitude of Late Holocene ice cap expansion between east Greenland and the eastern Canadian Arctic: a commentary on Lowell et al. (2013). Quaternary Science Reviews 77, 246-247.	Yes	Basic	0	0
Denotn, George	Journal Article	Accepted	Kelley, S.E., Kaplan, M.R., Schaefer, J.M., Putnam, A.E., Barrell, D.J.A., Denton, G.H., Schwartz, R., Andersen, B.G., Finkel, R.F., and Doughty, A.M., 2014, New Zealand moraine record of a Southern Hemisphere cold episode 41,000 years ago. Earth and Planetary Science Letters, accepted.	Yes	Basic	3	0
Denotn, George	Journal Article	Accepted	Strelin, J., Kaplan, M.R., Vandergoes, M.J., Denton, G.H., and Schaefer, J.M., 2014, Holocene glacier history of the Lago Argentino basin, Southern Patagonian Icefield. Quaternary Science Reviews, accepted.	Yes	Basic	0	0
Denotn, George	Journal Article	Submitted	Doughty, A.M., Schaefer, J.M., Putnam, A.E., Kaplan, M.R., Denton, G.H., Barrell, D.J.A., Andersen, B.G., Kelley, S.E., Finkel, R.C., and Schwartz, R., 2014, Mismatch of glacier extent and summer insolation in Southern Hemisphere mid-latitudes.	Yes	Basic	3	0

			Geology, submitted				
Denotn, George	Journal Article	Submitted	Schaefer, J.M., Putnam, A.E., Denton, G.H., Kaplan, M.R., Birkel, S., Doughty, A.M., Kelley, S.E., Barrell, D.J. A., Finkel, R.C., Winckler, G., Anderson, R.F., Ninneman, U.S., Barker, S., Schwartz, R., Andersen, B.G., and Schluechter, C., 2014, The southern glacial maximum 65,000 years ago and its unfinished termination. Quaternary Science Reviews, submitted.	Yes	Basic	2	0
Dieffenbacher-Krall, Ann	Journal Article	Published	Massaferro, J., I. Larocque-Tobler, S.J. Brooks, M. Vandergoes, A. Dieffenbacher-Krall, and P. Moreno. 2014. Quantifying climate change in Huelmo mire (Chile, Northwestern Patagonia) during the Last Glacial Termination using a newly developed chironomid-based temperature model. Palaeogeographjy, Palaeoclimateology, Palaeoecology 399: 214-224.	Yes	Basic	0	0
Fastook, James	Journal Article	Published	R. A. Bindschadler, S. Nowicki, A. Abe-Ouchi, A. Aschwanden, H. Choi, J. Fastook, G. Granzow, R. Greve, G. Gutowski, U. Herzfeld, C. Jack- son, J. Johnson, C. Khroulev, A. Levermann, W. H. Lipscomb, M. A. Martin, M. Morlighem, B. R. Parizek, David Pollard, S. F. Price, D. Ren, Saito F, T. Sato, H. Seddik, H. Seroussi, K. Takahashi, R. Walker, and W. L. Wang. Ice-sheet model sensitivities to environmental forcing and their use in projecting future sea level (the SeaRISE project). Journal of Glaciology, 58(214):195–224, 2013.	Yes		0	0
Fastook, James	Journal Article	Published	J. L. Fastook, J. W. Head, and D. R. Marchant. Formation of Lo- bate Debris Aprons on Mars: Assessment of regional ice sheet collapse and debris-cover armoring. Icarus, 228:54–63, doi: http://dx.doi.org/ 10.1016/j.icarus.2013.09.025, 2013.	Yes		0	0
Fastook, James	Journal Article	Published	J. L. Fastook and T J Hughes. New perspectives on pa- leoglaciology. Quaternary Science Reviews, 80:169–194, http://dx.doi.org/10.1016/j.quascirev.2013.08.023, 2013.	Yes		0	0
Fastook, James	Journal Article	Published	S. Nowicki, R. A. Bindschadler, A. Abe-Ouchi, A. Aschwanden, E. Bueler, H. Choi, J. Fastook, G. Granzow, R. Greve, G. Gutowski, U. Herzfeld, C. Jackson, J. Johnson, C. Khroulev, E. Larour, A. Lev- ermann, W. H. Lipscomb, M. A. Martin, M. Morlighem, B. R. Parizek, D. Pollard, S. F. Price, D. Ren, E. Rignot, F. Saito, T. Sato, H. Seddik, H. Seroussi, K. Takahashi, R. Walker, and W. L. Wang. Insights into spa- tial sensitivities of ice mass response to environmental change from the SeaRISE ice sheet modeling project I: Antarctica. Journal of Geophysical Research: Earth Surface, 118:1002–1024, doi:10.1002/jgrf.20081, 2013.	Yes		0	0
Fastook, James	Journal Article	Published	S. Nowicki, R. A. Bindschadler, A. Abe-Ouchi, A. Aschwanden, E. Bueler, H. Choi, J. Fastook, G. Granzow, R. Greve, G. Gutowski, U. Herzfeld, C. Jackson, J. Johnson, C. Khroulev, E. Larour, A. Lev- ermann, W. H. Lipscomb, M. A. Martin, M. Morlighem, B. R. Parizek,D. Pollard, S. F. Price, D. Ren, E. Rignot, F. Saito, T. Sato, H. Seddik, H. Seroussi, K. Takahashi, R. Walker, and W. L. Wang. Insights into spa- tial sensitivities of ice mass response to environmental change from the SeaRISE ice sheet modeling project II: Greenland. Journal of Geophys- ical	Yes		0	0

			Research: Earth Surface, 118:1025–1044, doi:10.1002/jgrf.20076, 2013.				
Fastook, James	Journal Article	Published	J. Kleman, J. Fastook, K. Ebert, J. Nilsson, and R. Caballero. Pre- LGM Northern Hemisphere ice sheet topography. Climate of the Past, 9:2365–2378, doi:10.5194/cp–9–2365–2013, 2013.	Yes		0	0
Fastook, James	Journal Article	Published	S. J. Kadish, J. W. Head, J. L. Fastook, and D. R. Marchant. Middle to Late Amazonian tropical mountain glaciers on Mars: The ages of the Tharsis Montes fan-shaped deposits. Planetary and Space Science, 91:52–59 http://dx.doi.org/10.1016/j.pss.2013.12.005, 2014.	Yes		0	0
Fastook, James	Journal Article	Published	J. L. Fastook and J. W. Head. Amazonian mid- to high-latitude glacia- tion on Mars: Supply-limited ice sources, ice accumulation patterns, and concentric crater fill glacial flow and ice sequestration. Planetary and Space Science, 91:60–76 http://dx.doi.org/10.1016/j.pss.2013.12.002, 2014.	Yes		0	0
Fastook, James	Abstract	Published	J. L. Fastook and J. W. Head. Amazonian non-polar glaciation: Supply- limited glacial history and the role of ice sequestration. Lunar and Planetary Science XXXXIV, #1256, 2013.	Yes		0	0
Fastook, James	Abstract	Published	J. L. Fastook and J. W. Head. Concentric crater fill: Rates of glacial accumulation, infilling and deglaciation in the amazonian and noachian of mars. Lunar and Planetary Science XXXXV, #1227, 2014.	Yes		0	0
Fastook, James	Abstract	Published	J. P. Cassanelli, J. W. Head, and J.L. Fastook. Late noachian “icy highlands” mars: Implications for melting and ground- water recharge across the tharsis rise. Lunar and Planetary Science XXXXV, #1501, 2014.	Yes		1	0
Fastook, James	Abstract	Published	J. L. Fastook and J. W. Head. Late noachian icy highlands: Patterns of ice accumulation and flow. Lunar and Planetary Science XXXXV, #1115, 2014.	Yes		0	0
Fernandez, Ivan	Journal Article	Published	Mineau M. M., F. R. Fatemi, I. J. Fernandez and K. S. Simon. 2014. Microbial enzyme activity at the watershed scale: Response to chronic nitrogen deposition and acute phosphorous enrichment. Biogeochemistry 117:131-142.	Yes	Applied	1	0
Fernandez, Ivan	Journal Article	Published	Morse, Jennifer, Jorge Duran, Fed Beall, Eric M. Enanga, Irena F. Creed, Ivan J Fernandez, Peter M. Groffman. 2014. Soil denitrification fluxes from three northeastern North American forests ranging in nitrogen availability. Oecologia (in press).	Yes	Applied	1	0
Fernandez, Ivan	Journal Article	Published	Raymond, Jay E., Ivan J. Fernandez, Tsutomu Ohno, and Kevin Simon. 2013. Soil drainage class influences on soil carbon in a New England Forested Watershed. Soil Sci. Soc. Am. J. 77:307–317.	Yes	Applied	1	0
Fernandez, Ivan	Journal Article	Published	Lawrence, Gregory B., Ivan J. Fernandez, Daniel D. Richter, Donald S. Ross, Paul W. Hazlett, Scott W. Bailey, Rock Ouimet, Richard A. F. Warby, Arthur H. Johnson, Henry Lin, James M. Kaste, Andrew G. Lapenis, and Timothy J. Sullivan. 2013. Measuring environmental change in forest ecosystems by repeated soil sampling: A North American Perspective. J. Environ. Qual.42:623-639.	Yes	Applied	0	0

Fernandez, Ivan	Journal Article	Published	Fatemi, Farrah R., Ivan J. Fernandez, Stephen A. Norton and Lindsey E. Rustad. 2013. Soil solution response to two decades of experimental acidification at the Bear Brook Watershed in Maine. Water Air Soil Pollut. 223:6171–6186.	Yes	Applied	1	0
Fernandez, Ivan	Book Chapter	Accepted	Norton, S. A., Kopácek, J., and Fernandez, I. J., 2014, in press, Acidification and Acid Rain: in Holland, H. D. and Turekian K. K. (eds.), Treatise on Geochemistry, 9, 2nd Edition, Chapter, Pergamon Press.	Yes	Applied	0	0
Gill, Jacquelyn	Journal Article	Published	Gill, J. L., K. K. McLauchlan, A. M. Skibbe, S. J. Goring, John W. Williams. (2013). Linking abundances of the dung fungus Sporormiella to the density of American bison (Bison bison): implications for assessing grazing by megaherbivores in the paleorecord. Journal of Ecology 101(5): 1125-1136.	Yes		0	0
Gill, Jacquelyn	Journal Article	Published	J. W. Williams, J. L. Blois, J. L. Gill, L. M. Gonzales, E. C. Grimm, S. T. Jackson, A. Ordonez, B. Shuman, S. D. Veloz. (In Press, Annals of the New York Academy of Sciences). Modeling no-analog species associations under no-analog environments: Insights from the last deglaciation. (doi: 10.1111/nyas.12226)	Yes		0	0
Gill, Jacquelyn	Journal Article	Published	Gill, J. L., 2013. The ecological legacy of the late Quaternary extinctions of megaherbivores. New Phytologist (early online).	Yes		0	0
Gill, Jacquelyn	Journal Article	Submitted	Seddon, A. W. R., A. Baker, A. W. Mackay, E. E. Ellis, L. Gillson, E. Johnson, S. Juggins, K. Willis, C. Buck, C. A. Froyd, V. Jones, M. Macias-Fauria, D. Nogues-Bravo, S. Punyasena, E. Breman, J. L. Gill, K. Mills, J. Morris, A. Tanentzap, T. Roland, and the Palaeo50 Working Group. Journal of Ecology. Looking forward through the past: The 50 priority research questions in palaeoecology. Early Online.	Yes		0	0
Hall, Brenda	Journal Article	Accepted	The RAISED Consortium, 2014. A community based reconstruction of Antarctic Ice Sheet deglaciation since the last glacial maximum. Quaternary Science Reviews, in press.	Yes	Basic	0	0
Hall, Brenda	Journal Article	Accepted	Anderson, J., Conway, H., Bart, P., Kirshner, A., Greenwood, S., McKay, R., Hall, B., Ackert, R., Licht, K., Jakobsson, M., and Stone, J., 2014. Ross Sea paleodrainage and deglacial history during and since the LGM. Quaternary Science Reviews, in press.	Yes	Basic	0	0
Hall, Brenda	Journal Article	Published	Bromley, G., Putnam, A., Rademaker, K., Lowell, T., Schaefer, J., Hall, B., Winckler, G., Birkel, S., and Borns, H.W., Jr., 2014. Younger Dryas deglaciation of Scotland driven by warming summers. PNAS, doi: 10.1073/pnas1321122111.	Yes	Basic	3	0
Hall, Brenda	Journal Article	Published	De Bruyn, M., Pinsky, M., Hall, B., Koch, P., Baroni, C., and Hoelzel, A.R., 2014. Rapid increase in southern elephant seal genetic variation after a founder event. Proceedings of the Royal Society of London B, 281, 20133078.	Yes	Basic	0	0
Hall, Brenda	Journal Article	Published	Golledge, N., Levy, R., McKay, R., Fogwill, C., White, D., Graham, A., Smith, J., Hillenbrand, C.D., Licht, K., Denton, G., Ackert, R., Maas, S., and Hall, B., 2013. Glaciology and geological signature of the last glacial maximum Antarctic ice sheet. Quaternary Science Reviews 78, 225-247.	Yes	Basic	0	0

Hall, Brenda	Journal Article	Published	Lorenzini, S., Baroni,C., Baneschi, I., Salvatore, M.C., Fallick, A., and Hall, B., 2014. Adelie penguin dietary remains reveal Holocene environmental changes in the western Ross Sea (Antarctica). Palaeogeography, Palaeoclimatology, Palaeoecology 395, 21-28.	Yes	Basic	0	0
Hall, Brenda	Journal Article	Published	Marra, K., Soreghan, G., Elwood-Madden, M., Keiser, L., and Hall, B., 2014. Trends in grain size and BET surface area in cold-arid versus warm-semiarid fluvial systems. Geomorphology 206, 483-491.	Yes	Basic	1	0
Hall, Brenda	Journal Article	Published	Garcia, J.L., Hall, B., Kaplan, M., Vega, R., and Strelin, J., 2014. Glacial geomorphology of the Torres del Paine region: Implications for glaciation, deglaciation, and paleolake history. Geomorphology 204, 599-616.	Yes	Basic	1	0
Hall, Brenda	Journal Article	Published	Lowell, T., Hall, B., Kelly, M., Bennike, O., Smith, C., and Denton, G., 2013. Reply to Miller et al. (2013) Substantial agreement on the timing and magnitude of Late Holocene ice cap expansion between east Greenland and the eastern Canadian Arctic: A commentary on Lowell et al. (2013). Quaternary Science Reviews 77, 246-247.	Yes	Basic	0	0
Hall, Brenda	Journal Article	Accepted	Levy, L., Kelly, M., Lowell, T., Hall, B., Hempel, L., Honsaker, W., Lusas, A., Howley, J., and Axford, Y., 2014. Holocene fluctuations of Bregne Ice Cap, Scoresby Sund, east Greenland: a proxy for climate along the Greenland Ice Sheet margin. Quaternary Science Reviews, 92, 357-368.	Yes	Basic	3	1
Hall, Brenda	Journal Article	Published	Hall, B., Denton, G., Stone, J., and Conway, H., 2013. History of the grounded ice sheet in the Ross Sea sector of Antarctica during the last glacial maximum and the last termination. Geological Society of London, doi: 10.1144/SP381.5.	Yes	Basic	0	0
Hall, Brenda	Journal Article	Published	Konfal, S., Wilson, T., and Hall, B., 2013. Paleoshoreline records of glacial isostatic adjustment in the Dry Valleys region, Antarctica. Geological Society of London, doi: 10.1144/SP381.26.	Yes	Basic	1	0
Hall, Brenda	Abstract	Accepted	Elwood-Madden, M., Funderburg, R., Yoo, Y., Madden, A., Hall, B., Marra, K., and Soreghan, L., 2014. Assessing reactive surface areas in glacial sediments. Goldschmidt Conference.	Yes	Basic	1	0
Hall, Brenda	Abstract	Published	Putnam, A., Schaefer, J., Denton, G., Hall, B., Lowell, T., Porter, C., Barrell, D., Anderseon, B., Koffman, T., Lennon, J., Roway, A., Finkely, R., Rood, D., Schwartz, R., Vandergoes, M., Plummer, M., Brocklehurst, S., Kelley, S., and Ladig, K., 2013. Warming and extensive glacier recession at Southern Hemisphere middle latitudes during Heinrich Stadial 1. American Geophysical Union Fall Meeting, San Francisco, CA.	Yes	Basic	5	0
Hall, Brenda	Abstract	Published	Axford, Y., Bigl, M., Carrio, C., Corbett, L., Francis, D., Hall, B., Kelly, M., Levy, L., Lowell, T., Osterberg, E., Richter, N., Roy, E., and Schellinger, G., 2013. Insect-based Holocene (and Last Interglacial?) paleothermometry from the E and NW Greenland Ice Sheet margins: A fly's eye view of warmth in Greenland. American Geophysical Union Fall Meeting, San Francisco, CA.	Yes	Basic	2	0

Hall, Brenda	Abstract	Published	Lowell, T., Wilcox, P., Hall, B., Medford, A., Kelly, M., and Levy, L., 2013. Late Holocene expansion of the Greenland Ice Sheet and implications for its current decay. CLIVAR meeting, Boston, MA.	Yes	Basic	3	0
Hall, Brenda	Abstract	Published	Kelly, M., Levy, L., Lowell, T., and Hall, B., 2013. Late glacial-early Holocene fluctuations of the Greenland Ice Sheet outlet glaciers and adjacent local ice caps in central east Greenland. CLIVAR Meeting, Boston, MA.	Yes	Basic	1	0
Hall, Brenda	Abstract	Published	Levy, L., Kelly, M., Lowell, T., Hall, B., Applegate, P., Axford, Y., and Howley, J., 2013. A comparison of Holocene fluctuations of the eastern and western margins of the Greenland Ice Sheet. American Geophysical Union Fall Meeting, San Francisco, CA.	Yes	Basic	1	0
Hall, Brenda	Abstract	Published	Garcia, J.L., Hall, B., Kaplan, M., Vega, R., Binnie, S., Hein, A., Gomez, G., and Ferrada, J., 2013. Geomorphological and geochronological constrains of the last glacial period in southern Patagonia, southern South America. American Geophysical Union Fall Meeting, San Francisco, CA.	Yes	Basic	0	0
Hamilton, Gordon	Journal Article	Published	Khan, S. A., J. Wahr, I.R. Joughin, J.L. Bamber, L.A. Stearns, G.S. Hamilton & B.M. Csatho. 2013. Recurring dynamically induced thinning during 1985 to 2010 on Upernavik Isstrom, West Greenland. Journal of Geophysical Research, 118, doi:10.1029/2012JF002481.	Yes	Basic	0	0
Hamilton, Gordon	Journal Article	Published	Schild, K.M & G.S. Hamilton. 2013. Seasonal variations in outlet glacier terminus positions in Greenland. Journal of Glaciology, 59(216), 759-770, doi:10.3189/2013/JoG12J238.	Yes	Basic	1	0
Hamilton, Gordon	Journal Article	Published	Straneo, F., P. Heimbach, O. Sergienko, G.S. Hamilton, G. Catania, S. Griffies, R. Hallberg, A. Jenkins, I. Joughin, R. Motyka, W. T. Pfeffer, S. F. Price, E. Rignot, T. Scambos, M. Truffer, A. Vieli. 2013. Challenges to understand the dynamic response of Greenland's marine terminating glaciers to oceanic and atmospheric forcing. Bulletin of the American Meteorological Society, doi:10.1175/BAMS-D-12-00100.	Yes	Basic	0	0
Hamilton, Gordon	Journal Article	Submitted	De Juan, J., M. Nettles, P. Elosegui, J.L. Davis, T.B. Larsen, G.S. Hamilton, L.A. Stearns. 2014. Modulation of flow by ocean tides at Helheim Glacier, East Greenland, Journal of Geophysical Research.	Yes	Basic	0	0
Hamilton, Gordon	Journal Article	Submitted	Sneed, W.A., G.S. Hamilton and J.E. Box. 2014. Increase in the basal melting of Nioghalvfjerdsfjorden Glacier's (79N) floating Ice Tongue, Northeast Greenland: 1996-1998 vs 2010-2012. Journal of Glaciology.	Yes	Basic	1	0
Hamilton, Gordon	Journal Article	Submitted	Enderlin, E.M and G.S. Hamilton. 2014. A novel method for deriving submarine melt rates in glacial fjords using repeat very high resolution stereo satellite images. Journal of Glaciology.	Yes	Basic	0	0
Jain, Shaleen	Journal Article	Submitted	Wahl, T., S. Jain, J. Bender, S. Meyers, and M. Luther, Increasing risk of compound flooding from storm surge and rainfall for major US coastal cities. Nature (under review).	Yes	Basic	0	0

Kelley, Alice	Journal Article	Published	Kelley, A. and Sanger, D. 2014, Holistic geoarchaeology in the Penobscot Valley, Maine, USA: context, scale and interpretation, Archaeological and Anthropological Science, April 2014, pp. 1866-9557. http://link.springer.com/article/10.1007/s12520-014-0187-2#	Yes	0	0
Kelley, Alice	Abstract	Published	Kelley, Alice R., Mauricio-Llonto, Ana Cecilia, Sandweiss, Daniel H., Kelley, Joseph T., and Belknap, Daniel F., October 27, 2013, New Geological And Environmental Insights At The Preceramic Los Morteros Archaeological Site, North Coast Peru, Geological Society of America, GSA Abstracts with Programs, v. 45, p. 239. https://gsa.confex.com/gsa/2013AM/webprogram/Paper230609.html	Yes	1	0
Kelley, Alice	Abstract	Accepted	Kelley, Alice R., Kelley, Joseph T., Belknap, Daniel F., and Claesson, Stefan. Preservation Potential of Submerged Archaeological Sites in the Gulf of Maine: Bass Harbor and Green Ledges Examples, November 2, 2013, Eastern States Archaeological Federation Meeting, Portland, ME	Yes	0	0
Kelley, Alice	Abstract	Accepted	Kelley, Alice R., Kelley, Joseph T., Sorrell, Lee M., Bigelow, Gerald, Timing and Stratigraphy of a Large Coastal Sand Invasion: Shetland Islands, NW Europe, November 5. 2013, Global Human Ecodynamics Alliance, College Park, MD.	Yes	1	0
Kelley, Alice	Abstract	Accepted	Kelley, Alice R., Kelley, Joseph T., Sorrell, Lee M., Bigelow, Gerald, Timing and Stratigraphy of a Large Coastal Sand Invasion: Shetland Islands, NW Europe, Geological Society of Maine November 14, 2014		1	0
Kelley, Alice	Other	Published	Kelley, A., Caron, L., and Weddle, T., Surficial Geology of the Horseback 7.5' Maine Quadrangle, Maine Geological Survey, Open File Map. 1:2400, 1 sheet	Yes	0	0
Kelley, Joseph	Journal Article	Published	Kelley, J.T., 2013, Popham Beach, Maine: an example of engineering activity that saved beach property without harming the beach. Geomorphology, 199: 171-178.	Yes	0	0
Kelley, Joseph	Journal Article	Published	Kelley, J.T., Belknap, D.F., Kelley, A.R., and Claesson, S., 2013, A site model for drowned terrestrial habitats with associated archeological remains: northwestern Gulf of Maine, Marine Geology, v. 338, p. 1-16.	Yes	0	0
Kelley, Joseph	Journal Article	Accepted	Hein, C.J., FitzGerald, D.M., Buynevich, I.V., Van Hereren, S. and Kelley, J.T., 2014. Evolution of paraglacial coasts in response to changes in fluvial sediment supply. In Martini, I.P. (ed.), Sedimentary Coastal Zones from High to Low Latitudes: Similarities and Differences.Geological Society of London Special Paper. (accepted and in press).	Yes	0	0
Kelley, Joseph	Journal Article	Submitted	Plets, R., Callard, L., Cooper, J.A.G., Long, A.J., Belknap, D.F., Edwards, R., Jackson, D.W.T., Kelley, J.T., Long, D., Milne, G.,Monteys, X., and Quinn, R., 2013, Post-glacial sea-level history for SW Ireland (Bantry Bay) based on offshore evidence: Submitted to Marine Geology	Yes	0	0
Kelley, Joseph	Book Chapter	Accepted	Kelley, J.T., Belknap, D.F., and Walsh, J.A., 2014, Tidal Flat-Barrier Spit Interactions in a Fetch-Limited, Macro-Tidal Embayment, Lubec, Maine, USA. In	Yes	1	0

			Randazzo, G., Cooper, J.A.G., and Jackson, D., 2014, Gravel spits, Springer Publishing Company, Berlin, Germany, accepted and in press.			
Kelley, Joseph	Book Chapter	Accepted	Cheryl Hapke, Peter Adams, Jonathan Allan, Andrew Ashton, Gary Griggs, Monty Hampton, Joseph Kelley, and Adam Young, 2014, Rock Coast Geomorphology: A Global Synthesis - The USA, Geological Society of London Memoir 40, accepted and in press.	Yes	0	0
Kelley, Joseph	Abstract	Published	Cooper, J.A.G., Long, A.J., Callard, L., Kelley, J.T., Belknap, D.F.,Quinn, R., Edwards, R., Jackson, D.W.T. and Long, D., 2013, New postglacial relative sea-level change records from the British and Irish continental shelf: Geological Society of America Abstracts with Programs, v. 45, no. 7 (GSA Annual Meeting), Abstract 62-3, p. 178. https://gsa.confex.com/gsa/2013AM/webprogram/Paper228388.html	Yes	0	0
Kelley, Joseph	Abstract	Published	Plets, R., Callard, L., Cooper, J.A.G., Long, A.J., Belknap, D.F., Edwards, R., Jackson, D.W.T., Kelley, J.T., Long, D., Milne, G.,Monteys, X., and Quinn, R., 2013, Post-glacial sea-level history for SW Ireland (Bantry Bay) based on offshore evidence: American Geophysical Union Fall Meeting, San Francisco, Paleoceanography and Paleontology, PP53B-1999 Poster. https://live.blueskybroadcast.com/bsb/client/_new_default.asp?action=SEARCH&Client=483862	Yes	0	0
Kelley, Joseph	Abstract	Published	Quinn, R., Plets, R., Callard, L., Cooper, J.A.G., Long, A.J., Belknap, D.F., Edwards, R., Jackson, D.W.T., Kelley, J.T., Long, D., Milne, G., and Monteys, X., 2013, Post-glacial sea-level history for NE Ireland (Belfast Lough) based on offshore evidence: American Geophysical Union Fall Meeting, San Francisco, Paleoceanography and Paleontology, PP53B-2003 Poster.	Yes	0	0
Kelley, Joseph	Abstract	Published	Cooper, J.A.G., Long, A.J., Plets, R., Callard, L., Quinn, R., Kelley, J.T., Belknap, D.F., Jackson, D.W.T., Edwards, R., and Long, D., 2014, New Observations on lower than present sea-levels since the Late Glacial from the British Isles: European Geophysical Union General Assembly 2014, Vienna, April 27 - May 02, Geophysical Research Abstracts, v. 16, EGU20014-6200.	Yes	0	0
Kelley, Joseph	Abstract	Published	Plets, R., Callard, L., Cooper, J.A.G., Long, A.J., Belknap, D.F., Edwards, R., Jackson, D.W.T., Kelley, J.T., Long, D., Milne, G., Monteys, X., and Quinn, R., 2014, Deglacial and post-glacial sea-level history for Bantry Bay (SW Ireland) based on offshore evidence: European Geophysical Union General Assembly 2014, Vienna, April 27 - May 02, Geophysical Research Abstracts, v. 16, EGU20014-5164.	Yes	0	0
Kelley, Joseph	Abstract	Published	Quinn, R., Plets, R., Callard, L., Cooper, J.A.G., Long, A.J., Belknap, D.F., Edwards, R., Jackson, D.W.T., Kelley, J.T., Long, D., Milne, G., and Monteys, X., 2014, Post-glacial sea-level history for NE Ireland (Belfast Lough) based on offshore evidence: European Geophysical Union General Assembly 2014, Vienna, April 27 - May 02, Geophysical Research Abstracts, v. 16, EGU20014-5150.	Yes	0	0
Kelley, Joseph	Abstract	Published	Sorrell, L.M., Kelley, J.T., and Kelley, JA.R., 2013. The timing and stratigraphy of a	Yes	1	0

			large coastal sand invasion: Shetland Islands, NW Europe. Geological Society of America, GSA Abstracts with Programs, v. 45, p. 239.				
Kelley, Joseph	Abstract	Published	Kelley, A.R., Mauricio, A.C., Sandweiss, D.H., Kelley, J.T., and Belknap, D.F., 2013. New geoarchaeological and environmental insights at the preceramic-age Los Morteros archaeological site, North Coast, Peru. Geological Society of America, GSA Abstracts with Programs, v. 45, p. 178.	Yes		1	0
Kelley, Joseph	Abstract	Published	Bigelow, G.F., Jones, M.E., Retelle, M., Ambrose, W., Johnston, B., Kelley, J.Y., Kelley, A.R., Sorrell, L.M., Simpson, I., Friel, R., Outram, Z., 2013. Climate changes, chronologies and geocatastrophes: assessing the roles of extreme eventsd in the development of sustainable human adaptations. XIII Nordic TAG in Reykjavik, University of Iceland.	Yes		1	0
Kelley, Joseph	Abstract	Published	Kelley, J.T., 2013, Popham Beach, Maine: An example of engineering activity that saved beach property without harming the beach. 44th Annual Binghampton Geolomorphology Conference, New Jersey Institute of Technology, October 19-20, 2013. http://web.njit.edu/~jacksonn/	Yes		0	0
Kelley, Joseph	Abstract	Published	Kelley, Alice R., Kelley, Joseph T., Sorrell, Lee M., Bigelow, Gerald, November 14, 2013, Geological Society of Maine Annual Fall Meeting, Augusta, ME	Yes		0	0
Koons, Peter	Journal Article	Accepted	Campbell, S.,S. Roy, K. Kreutz, S.A. Arcone, E.C. Osterberg, P.O. Koons, 2013, Strain-rate estimates for crevasse formation at an alpine ice divide: Mount Hunter, Alaska, Annals of Glaciology 54(63) 2013 doi:10.3189/2013AoG63A266	Yes	Basic	1	0
Koons, Peter	Journal Article	Submitted	Roy, S.G.; Koons, P.O.; Upton, P.; Tucker, G; Crustal strength anisotropy influences landscape form and longevity. Submitted to: Earth Planetary Science Letters			1	0
Koons, Peter	Journal Article	Published	Gorman, A.R., M.G. Hill, A.R. Orpin, P.O. Koons, C.A. Landis, T.M.H. Allan, T. Johnstone, F.L. Gray, D. Wilson, E.C. Osterberg, Quaternary shelf structures SE of the South Island, imaged by high-resolution seismic profiling, New Zealand Journal Geology and Geophysics, v. 56. p. 68-82 DOI:10.1080/00288306.2013.772906	Yes		8	0
Kreutz, Karl	Journal Article	Published	Mayewski, P.A., Maasch, K., Dixon, D., Sneed, S., Oglesby, R., Korotkikh, E., Potocki, M., Grigholm, B., Kreutz, K., Kurbatov, A., Spaulding, N., Stager, C., Taylor, K., Steig, E., White, J., Bertler, N.A.N., Goodwin, I., Simoes, J., Jana, R., Kraus, S., Fastook, J., 2013, West Antarctica's sensitivity to natural and human forced climate change over the Holocene, Journal of Quaternary Science, 28(1), 40-48.	Yes	Basic	3	0
Kreutz, Karl	Journal Article	Published	Campbell, S., Roy, S., Kreutz, K., Arcone, S., Osterberg, E., and Koons, P., 2013, Strain-rate estimates for crevasse formation at an alpine ice divide: Mount Hunter, Alaska, Annals of Glaciology, 54(63), 200-208.	Yes	Basic	2	0

Kreutz, Karl	Journal Article	Published	Koffman, B.G., Kreutz, K.J., Kurbatov, A.V., and Dunbar, N.W., 2013, Impact of known local and tropical volcanic eruptions of the past millennium on the WAIS Divide microparticle record, Geophysical Research Letters, 40, 1-5, doi:10.1002/grl.50822.		Basic	1	0
Kreutz, Karl	Journal Article	Published	Koffman, B.G., Kreutz, K.J., Breton, D.J., Kane, E.J., Winski, D.A., Birkel, S.D., Kurbatov, A.V., and Handley, M.J., 2013, Centennial-scale shifts in the position of the Southern Hemisphere westerly wind belt over the past millennium, Climate of the Past Discussion, 9, 2135-3174.	Yes	Basic	3	1
Kreutz, Karl	Journal Article	Published	Koffman, B.G., M. Handley, E. Osterberg, M. Wells, and K.J. Kreutz, 2014, Dependence of ice-core relative trace- element concentration on acidification, Journal of Glaciology, 60(219), 1-10, doi:10.3189/2014JoG13J137.	Yes	Basic	1	0
Kreutz, Karl	Book Chapter	Published	Kreutz, K.J., and Koffman, B., 2013, Glaciochemistry. In Elias, S.A. (ed.) The Encyclopedia of Quaternary Science Vol. 2, pp. 326-333.	Yes	Basic	1	0
Kurbatov, Andrei	Journal Article	Published	B. Koffman, K. Kreutz, A. Kurbatov, and N. Dunbar. Impact of known local and tropical volcanic eruptions of the past millennium on the WAIS Divide microparticle record. Geophysical Research Letters 09/2013; 40(17):4712-4716.	Yes	Basic	1	0
Kurbatov, Andrei	Journal Article	Published	E. V. Korotkikh, P. A. Mayewski, D. Dixon, A. V. Kurbatov, and M. Handley. Recent increase in Ba concentrations as recorded in a South Pole ice core. Atmospheric Environment, 89:683–687, 2014. http://adsabs.harvard.edu/abs/2014AtmEn..89..683K	Yes	Basic	1	0
Kurbatov, Andrei	Journal Article	Published	Koffman, B. G., Kreutz, K. J., Breton, D. J., Kane, E. J., Winski, D. A., Birkel, S. D., Kurbatov, A. V., and Handley, M. J.: Centennial-scale shifts in the position of the Southern Hemisphere westerly wind belt over the past millennium, Clim. Past Discuss., 9, 3125-3174, doi:10.5194/cpd-9-3125-2013, 2013. http://www.clim-past-discuss.net/9/3125/2013/cpd-9-3125-2013.html	Yes	Basic	2	0
Kurbatov, Andrei	Journal Article	Published	P. A. Mayewski, S. B. Sneed, S. D. Birkel, A. , and K. A. Maasch. Holocene warming marked by abrupt onset of longer summers and reduced storm frequency around Greenland. Journal of Quaternary Science, 29(1):99–104, January 2014 http://onlinelibrary.wiley.com/doi/10.1002/jqs.2684/full	Yes	Basic	0	0
Kurbatov, Andrei	Journal Article	Submitted	A. Y. Borisova, K. P. Jochum, S. Gouy, N. W. Dunbar, and A. V. Kurbatov. The Allan Hills tephra (Victoria Land, Antarctica): Evidence for a hot spot origin and deep carbonated crust assimilation. Geology, 2014, submitted	Yes	Basic	0	0
Maasch, Kirk	Journal Article	Published	Mayewski, P.A., S.B. Sneed, S.D. Birkel, A.V. Kurbatov, K.A. Maasch, 2014. Holocene warming marked by abrupt onset of longer summers and reduced storm frequency around Greenland. Journal of Quaternary Science, 29, 99-104.	Yes	Basic	0	0
Maasch, Kirk	Journal Article	Submitted	E.C. Osterberg, Mayewski, P.A., Fisher, D.A., Kreutz, K.J., Maasch, K.A., Sneed, S.B., and Kelsey. E., 2014. Mt. Logan Ice Core Record of Tropical and Solar Influences on Aleutian Low Variability: 500-1998 AD. Journal of Geophysical Research,	Yes	Basic	0	0

			submitted.			
Maasch, Kirk	Journal Article	Submitted	B. Grigholm, Mayewski, P.A., Kang, S., Aizen,, V., Zhang, Y., Morgenstern, U., Kaspari, S., Takeuchi, N., Maasch, K.A., Birkel, S., Handley, M. and Sneed, S., 2014. 20th Century Atmospheric Dust Lows and the Weakening of the Westerly Winds over the Tibetan Plateau. Nature Climate Science, submitted.	Yes	0	0
Mayewski, Paul	Journal Article	Accepted	Aizen, V.B., Aizen, E.M., Takeuchi, N., Mayewski, P.A., Grigholm, B., Joswiak, D.R., Fujita, K., Nikitin, S. and Nakawo, M., in press 2014, Abrupt and moderate climate changes at high mid-latitudes of Asia during the Holocene, Journal of Glaciology.	Yes	1	0
Mayewski, Paul	Journal Article	Accepted	Sneed, S.B., Mayewski, P.A., Sayre, W.G., Handley, M.J. and Taylor, K.C., in review, Micrometer resolution chemical analysis of ice cores by LA-ICP-MS.	Yes	1	0
Mayewski, Paul	Journal Article	Published	Turner, J., Barrand, N., Bracegirdle, T., Convey, P., Hodgson, D., Jarvis, M., Jenkins, A., Marshall, G., Roscoe, H., Shanklin, J., Wolff, E., French, J., Goose, H., Guglielmin, M., Gutt, J., Jacobs, S., Kennicutt, C., Masson-Delmotte, V., Mayewski, P., Navarro, F., Robinson, S., Scambos, T., Sparrow, M., Speer, K., Summerhayes, C., Thompson, D. and Klepikov, A., 2013, Antarctic climate Change and the Environment – An Update, The Polar Record, 1-23, doi:10.1017/S0032247413000296.	Yes	0	0
Mayewski, Paul	Journal Article	Accepted	Korotkikh, E. V., Mayewski, P.A., Dixon, D., Potocki, Handley, M., Introne, D. and Kurbatov, A.V., 2014, Recent increase in Ba and As concentrations as recorded in a South Pole ice core, Atmospheric Environment 89, 683-687.	Yes	1	0
Mayewski, Paul	Journal Article	Accepted	Pang, H., Hou, S., Kaspari, S. and Mayewski, P.A., 2014, Influence of regional precipitation patterns on stable isotopes in ice cores from the central Himalayas, The Cryosphere 8, 289-301. doi:10.5194/tc-8-289-2014.	Yes	0	0
Mayewski, Paul	Journal Article	Submitted	Osterberg, E.C., Mayewski, P.A., Kreutz, K.J., Fisher, D.A., Maasch, K.A., Sneed, S.B., in review. Ice core record of Aleutian Low variability and tropical teleconnections since 500 AD, J. Geophys. Res.	Yes	1	0
Mayewski, Paul	Journal Article	Submitted	Kelsey, E., Wake, C., Osterberg, E., Kreutz, K., Mayewski, P., in review JGR Atmospheres. Mt. Logan ice core record of tropical and solar influences on Aleutian Low variability: 500-1998 AD..	Yes	0	0
Mayewski, Paul	Journal Article	Published	Zdanowicz, C., Fisher, D., Bourgeois, J., Demuth, M., Zheng, J., Mayewski, P.A., Kreutz, K., Osterberg, E., Yalcin, K., Wake, C., Steig, E., Froese, D. and Goto-Azuma, K., 2013, Ice cores from the St. Elias Mountains, Yukon Territory, Canada: Their significance for climate, atmospheric composition and volcanism in the North Pacific region, Arctic Special Issue KLRS Anniversary, http://dx.doi.org/10.14430/arctic.2013.13-109.	Yes	0	0
Mayewski, Paul	Journal Article	Accepted	Spaulding, N. E., Higgins, J., Kurbatov, A.V., Bender, M.L., Arcone, S.A., Campbell, S., Dunbar, S., Dunbar, N.W., Chimiak, L.M., Introne, D.S. and Mayewski, P.A., 2013, Climate archives from 90 to 250 ka in horizontal and vertical ice cores	Yes	1	0

			from the Allan Hills Blue Ice Area, Antarctica, Quaternary Research, doi10.1016/j.yqres.2013.07.004.			
Mayewski, Paul	Journal Article	Accepted	Mayewski, P.A., Sneed, S.B., Birkel, S.D., Kurbatov, A.V. and Maasch, 2013, Holocene warming marked by longer summers and reduced storm frequency around Greenland, Journal of Quaternary Science, 267-8179. DOI: 10.1002/jqs.2684	Yes	1	0
Mayewski, Paul	Journal Article	Submitted	Birkel, S.D., Mayewski, P.A. and Maasch, K.A., in review, Exploring the consequences of poleward-shifted westerly winds in the Southern Hemisphere over recent decades.	Yes	0	0
Mayewski, Paul	Journal Article	Submitted	Jenkins, M., Kaspari, S., Kang, S., Grigholm, B. and Mayewski, P.A., in review, Black carbon concentrations from a Tibetan Plateau ice core spanning 1843-1982: Recent increases due to emissions and glacier melt.	Yes	2	0
Mayewski, Paul	Journal Article	Submitted	Zhang, Y.L., Kang, S.C., Grigholm, B., Zhang, Y.J., Kaspari, S., Morgenstern, U., Ren, J.W., Qin, D.H., Mayewski, P.A., Zhang, Q.G., Cong, Z.Y. and Chen, F., in review, The 20th century warming preserved in a Mt. Geladaindong ice core, central Tibetan Plateau.	Yes	1	0
Mayewski, Paul	Journal Article	Submitted	Grigholm, B., Mayewski, P.A., Kang, S., Aizen, V., Zhang, Y., Zhang, Q., Morgenstern, U., Kaspari, S., Takeuchi, N., Maasch, K., Dixon, D., Birkel, S., Handley, M. and Sneed, S., in review, 20th century weakening of the westerly winds over the Tibetan Plateau.	Yes	1	0
Mayewski, Paul	Proceedings	Accepted	Haines, S., Mayewski, P.A., Kurbatov, A., Maasch, K. and Sneed, S., 2014, Investigation of Greenland and Antarctic ice core recorded abrupt climate change using ultra-high resolution laser sampling, Climate Change Institute Mini Paper, University of Maine.	Yes	2	0
Mayewski, Paul	Proceedings	Accepted	Beers, T.M., Mayewski, P.A., Kern, S., Birkel, S. and Dixon, D., 2014, A Ross Sea polyna proxy produced from the RICE ice core record, Roosevelt Island, Antarctica, Climate Change Institute Mini Paper, University of Maine.		1	0
Mayewski, Paul	Proceedings	Accepted	Potocki, M. , Mayewski, P.A., Kurbatov, A.V., Dixon, D.A., Grigholm, B., Casassa, G., Zamora, R., Korotkikh, E., Handley, M., Introne, D. and Sneed, S., 2014, A new ice core from the Central Andes, (Tupungatito), Climate Change Institute Mini Paper, University of Maine.		0	0
Mayewski, Paul	Proceedings	Accepted	Korotkikh, E., Mayewski, P.A., Handley, M. and Introne, D., 2014, A 1000-year high resolution record of climate variability developed from a South Pole ice core, Climate Change Institute Mini Paper, University of Maine.		0	0
Mayewski, Paul	Proceedings	Accepted	Spaulding, N.E., Bohleber, P., Sneed, S.B., Wagenbach, D., Mayewski, P.A. and McCormick, M., 2014, Combining novel ice core analysis with ancient historical records: first results from Colle Gnifetti ice core project, European Alps, Climate Change Institute Mini Paper, University of Maine.		0	0

Mayewski, Paul	Proceedings	Accepted	Rodda, C., Mayewski, P.A., Haines, S., Sneed, S., Introne, D., Seimon, A. and Baker, P., 2014, Paleoclimate reconstruction in the Peruvian Andes: Reconnaissance of a new field site, Climate Change Institute Mini Paper, University of Maine.			0	0
Mayewski, Paul	Technical Report	Accepted	SCAR ACCE Advisory Group (Turner, J., Summerhayes, C., Sparrow, M., Mayewski, P.A., Convey, P., di Prisco, G., Gutt, J., Hodgson, D., Speich, S., Worby, T., Bo, S. and Klepikov, A., in press, Antarctic climate change and the environment – 2014 update, Antarctic treaty Meeting Report 2014.	Yes		0	0
McGill, Brian	Journal Article	Accepted	Hulshof, Catherine M; Cyrille Violle, Marko J Spasojevic, Brian McGill, Ellen Damschen, Susan Harrison, Brian J Enquist - "Intra-specific and inter-specific variation in specific leaf area reveal the importance of abiotic and biotic drivers of species diversity across elevation and latitude" (Journal of Vegetation Science 2013 24:921-931)	Yes	Basic	1	0
McGill, Brian	Journal Article	Accepted	Feldman, Richard and Brian J. McGill – "How important is nectar in shaping spatial variation in the abundance of temperate breeding hummingbirds?" (Journal of Biogeography in press)	Yes	Basic	1	0
McGill, Brian	Journal Article	Accepted	Feldman, Richard and Brian J. McGill – "How competitive trade-offs limit elevation ranges for temperate breeding hummingbirds" (Canadian Journal of Zoology in press)	Yes	Applied	1	0
McGill, Brian	Journal Article	Accepted	Morueta-Holmes, Naia; Enquist, Brian J; McGill, Brian J followed by 15 other members of BIEN working group and Jens-Christian Svenning – "Habitat area and climate stability determine geographic variation in plant species range sizes" (Ecology Letters)	Yes	Basic	1	0
McGill, Brian	Journal Article	Accepted	Nekola, Jeffrey C; McGill Brian J –" Scale dependency in the functional form of the distance decay relationship" (Ecography in press)	Yes	Basic	0	0
McGill, Brian	Journal Article	Published	58. Dornelas, Maria; Nicholas J. Gotelli; Brian. McGill; Hideyasu Shimadzu; Faye Moyes; Caya Sievers; Anne E. Magurran – "Assemblage Time Series Reveal Biodiversity Change but Not Systematic Loss" (Science 2014 344(18 Apr):296-299)	Yes	Applied	0	0
McGill, Brian	Journal Article	Published	Dalby, Larsß, McGill; Brian J. McGill; Fox, Anthony David; Svenning, ; Jens-Christian - "'Seasonality drives global-scale diversity patterns in waterfowl (Anseriformes) via temporal niche exploitation" (Global Ecology and Biogeography 2014 231(5):550-562)	Yes	Basic	1	0
Norton, Stephen	Journal Article	Submitted	Norton, S. A., Kopácek, J., Pierret, M-C, and Handley, M., submitted, Long-term evolution of leaching and lake sediment sequestration of rare earth elements from deglaciated mountain watersheds. Geochim. Cosmochim. Acta.	Yes	Basic	0	0
Olsen, Brian	Journal Article	Published	Olsen, BJ, R Greenberg, JR Walters, RC Fleischer. 2013. Sexual dimorphism in a feeding apparatus: Ecological niche partitioning or sexual selection on an honest indicator? Behavioral Ecology 24:1327-1338.	Yes	Basic	0	0

Olsen, Brian	Journal Article	Accepted	Robertson, EP and BJ Olsen. In Revision. Density, sex, and nest stage affect rail broadcast survey results. Journal of Wildlife Management.	Yes	Applied	1	0
Olsen, Brian	Journal Article	Accepted	Olsen, BJ, JD McCabe, EM Adams, DP Grunzel, and AJ Leppold. In Press. Matching ephemeral resources on autumnal stopover and the potential for mismatch in Phenological Synchrony of North American Bird Migration with Seasonal Resources in a Changing Climate (E Wood and J Kellermann, eds.). Studies in Avian Biology.	Yes	Basic	4	0
Olsen, Brian	Journal Article	Accepted	Greenberg, R, AG Wilson, BJ Olsen, B Ballentine, N Rotzel McInerney, RC Fleischer. In Revision. Geographic population structure and subspecific boundaries in a tidal marsh sparrow. Conservation Genetics.	Yes	Basic	0	0
Olsen, Brian	Journal Article	Submitted	Cattrano, K, N Perlut, BJ Olsen, and JD McCabe. In Review. Increased social information does not benefit body condition of long-distance migrants during migration stopover. Canadian Journal of Zoology.	Yes	Basic	1	1
Olsen, Brian	Journal Article	Submitted	McCabe, JM, and BJ Olsen. In Review. Landscape-scale habitat availability, and not local geography, predicts migratory landbird stopover across the Gulf of Maine. The Auk: Ornithological Advances.	Yes	Basic	1	0
Olsen, Brian	Journal Article	Submitted	Robertson, EP and BJ Olsen. In Review. Behavioral plasticity for nest-building increases fecundity in marsh birds. Auk.	Yes	Basic	1	0
Olsen, Brian	Journal Article	Submitted	Correll, M, BJ Olsen, TP Hodgman, WA Wiest, SA Sader. In Review. Predicting Tidal Marsh Communities via Remote Sensing: A potential tool for adaptive coastal conservation. Maine Agricultural and Forest Experimental Station Technical Bulletin.	Yes	Applied	2	0
Olsen, Brian	Journal Article	Submitted	Adams, E and BJ Olsen. In Revision. Using a hierarchical modeling framework to estimate abundance and detection bias in surveys of migrating animals. Ecosphere.	Yes	Basic	1	0
Peterson, Michael	Journal Article	Published	Anne E. Demeo and Michael L Peterson, “Small Organic Farm Renewable Energy Demonstration Project Based on Incremental Capital Investment and Community Participation”, Journal of Agriculture, Food Systems, and Community Development, Vol. 1, #2, pp. 141–154 DOI:	Yes	Applied	1	0
Peterson, Michael	Journal Article	Published	Lin, L; Peterson, M L; Greenberg, A R, “Use of the ultrasonic slow wave to identify pore closure caused by deposition of a polymeric surface layer”, Insight - Non-Destructive Testing and Condition Monitoring, Volume 56, Number 4, April 2014 , pp. 183-188(6), DOI: http://dx.doi.org/10.1784/insi.2014.56.4.183	Yes	Applied	1	0
Peterson, Michael	Journal Article	Published	Elmira Kujundzic, Alan R. Greenberg & Michael Peterson,”Review: ultrasonic characterization of membranes”, Desalination and Water Treatment, DOI: 10.1080/19443994.2013.874132, Volume 52, Issue 7-9, 2014, pp. 1217-1249	Yes	Applied	0	0
Peterson, Michael	Journal Article	Published	Northrop, A. J., Dagg, Laura-Ann, Martin, J. H., Brigden, C. V., Owen, A. G., Blundell, E., Peterson, M. L. and Hobbs, S.J., “The Effect of Two Maintenance Procedures on an Equine Arena Surface in Relation to Motion of the Hoof and	Yes	Applied	2	0

			Metacarpophalangeal Joint", The Veterinary Journal, 2013 Dec;198 Suppl 1:e137-42. DOI: 10.1016/j.tvjl.2013.09.048				
Peterson, Michael	Journal Article	Published	Anna E. Demeo and Michael L Peterson, "Community Smart Grid Utilizing Dynamic Demand Response and Tidal Power for Grid Stabilization", Smart Grid and Renewable Energy, 2013, 4, 465-472, http://dx.doi.org/10.4236/sgre.2013.47053 Published Online October 2013	Yes	Applied	1	0
Peterson, Michael	Journal Article	Published	Moorman VJ, Reiser RF, Peterson ML, McIlwraith CW, Kawcak CE. "The effect of equine forelimb lameness on hoof kinematics at the trot", Am J Vet Res. September 2013, Vol. 74, No. 9, Pages 1183-1191, DOI: 10.2460/ajvr.74.9.1183	Yes	Applied	1	0
Peterson, Michael	Journal Article	Published	Moorman VJ, Reiser RF, Peterson ML, McIlwraith CW, Kawcak CE. "The effect of equine forelimb lameness on hoof kinematics at the walk", Am J Vet Res. September 2013, Vol. 74, No. 9, Pages 1192-1197, DOI: 10.2460/ajvr.74.9.1192	Yes	Applied	1	0
Peterson, Michael	Journal Article	Published	Moorman VJ, Reiser RF, Peterson ML, McIlwraith CW, Kawcak CE. "The effect of equine forelimb lameness on hoof kinematics at the walk", Am J Vet Res. September 2013, Vol. 74, No. 9, Pages 1192-1197, DOI: 10.2460/ajvr.74.9.1192	Yes	Applied	1	0
Robinson, Brian	Book Chapter	Accepted	Robinson, Brian S. In press, Foundations of Northeast North American Archaeology. In The Singular History of the Robert S. Peabody Museum of Archaeology, edited by Malinda S. Blustain and Ryan Wheeler, Robert S. Peabody Museum of Archaeology, Phillips Academy, Andover, MA.	Yes		0	0
Robinson, Brian	Book Chapter	Published	Robinson, Brian S. and Jennifer Ort 2013 Spatial Organization at Bull Brook. In the Eastern Fluted Point Tradition, edited by Joseph Gingerich, pp.104-120. The University of Utah Press, Salt Lake City.	Yes		1	0
Roscoe, Paul B	Journal Article	Published	Cooperation and Collective Action in the Cultural Evolution of Complex Societies. Journal of Archaeological Method and Theory (2014) 21:98–133.	Yes	Basic	0	0
Roscoe, Paul B	Journal Article	Accepted	THE END OF WAR IN PAPUA NEW GUINEA: 'CRIME' AND 'TRIBAL WARFARE' IN POST-COLONIAL STATES, Anthropologica.	Yes	Basic	0	0
Roscoe, Paul B	Journal Article	Accepted	A CHANGING CLIMATE FOR ANTHROPOLOGICAL AND ARCHAEOLOGICAL RESEARCH? IMPROVING THE CLIMATE-CHANGE MODELS. American Anthropologist (Fall, 2014)	Yes	Applied	0	0
Roscoe, Paul B	Book Chapter	Accepted	WAR AND THE FOOD QUEST IN SMALL-SCALE SOCIETIES: SETTLEMENT-PATTERN FORMATION IN CONTACT-ERA NEW GUINEA. To appear in WAR AND THE FOOD QUEST: ARCHAEOLOGICAL PERSPECTIVES, Amber Vandewerker and Gary Wilson, eds.	Yes	Basic	0	0
Roscoe, Paul B	Book Chapter	Accepted	ETHNOGRAPHIC GIFTS: SOME CAUTIONS ON THE USE OF ETHNOGRAPHIC ANALOGIES FROM CONTEMPORARY CULTURAL ANTHROPOLOGY. To appear in: Fremdheit – Perspektiven auf das Andere, edited by Tobias Kienlin. Beiträge zu den Kölner Interdisziplinären Vorlesungen. Universitätsforschungen zur prähistorischen Archäologie (Habelt Verlag, Bonn)	Yes	Basic	0	0

Roscoe, Paul B	Book Chapter	Accepted	Military Strength, Material Distribution, and Monument Construction: Status Pursuits in Contact-era New Guinea. For the volume, Feasting, Famine, and Fighting, eds. Richard Chacon and Ramon Mendosa.	Yes	Basic	0	0
Roscoe, Paul B	Book Chapter	Accepted	Foragers and War in Contact-Era New Guinea. IN Violence and Warfare among Hunter-Gatherers, eds Mark W. Allen and Terry L. Jones. Left Coast Press.	Yes	Basic	0	0
Roscoe, Paul B	Book Chapter	Accepted	PARTICIPANT OBSERVATION. IN Vocabulary for the Study of Religion. Eds, Robert Segal & Kocku von Stuckrad. Brill Academic.	Yes	Basic	0	0
Roscoe, Paul B	Other	Accepted	Review of G.Gerritts, The Haus Tambaran of Bongiora. Pacific Viewpoint.		Basic	0	0
Sanweiss, Dan	Book	Published	Monica Barnes and Daniel H. Sandweiss, eds, 2013. Andean Past 11. Ithaca, NY: Cornell University Latin American Studies Program. x + 308 pp.	Yes	Basic	0	0
Sanweiss, Dan	Journal Article	Published	Rademaker, K., G.R.M. Bromley, and D.H. Sandweiss, 2013. Peru Archaeological Radiocarbon Database, 13,000-7000 14C B.P. In Quaternary International 301:34-45.	Yes	Basic	0	0
Sanweiss, Dan	Journal Article	Accepted	Belknap, D.F. and D.H. Sandweiss, in press. The Effect of the Spanish Conquest on Coastal Change in Northwestern Peru. Proceedings of the National Academy of Sciences.	Yes	Basic	0	0
Sanweiss, Dan	Journal Article	Accepted	Reitz, E.J., S.D. deFrance, D.H. Sandweiss, and H. McInnis, in press. Flexibility in Southern Peru Coastal Economies: A Vertebrate Perspective on the Terminal Pleistocene/Holocene Transition. Journal of Island and Coastal Archaeology.	Yes	Basic	0	0
Sanweiss, Dan	Book Chapter	Published	Anderson, D.G, K.A. Maasch, and D.H. Sandweiss, 2013. Climate Change and Cultural Dynamics: Lessons from the Past for the Future. In Humans and the Environment: New Archaeological Perspectives for the Twenty-First Century, ed. by M.I.J. Davies and F.N. M'mbogori, pp. 243-256. Oxford: Oxford University Press.	Yes	Basic	0	0
Sanweiss, Dan	Book Chapter	Published	Sandweiss, D.H., 2014. Early Occupation of the Central Andean Coast. In The Cambridge Prehistory, ed. By C. Renfrew and P. Bahn, pp. 1058-1074. Cambridge: University of Cambridge Press.	Yes	Basic	0	0
Sanweiss, Dan	Book Chapter	Published	Hunter, S.J., K.J. Libby, and D.H. Sandweiss, 2013. The Global Financial Crisis: Impact on Higher Education. Emirates Lecture Series 104. Abu Dhabi, United Arab Emirates: The Emirates Center for Strategic Studies and Research.		Basic	1	0
Sanweiss, Dan	Book Chapter	Accepted	Sandweiss, D.H., in press. Climate, Catastrophe and Culture in the Ancient Americas: the case of the Pacific Coast. In UNESCO HEADS (Human Evolution: Adaptations, Dispersals and Social Developments) 5 World Heritage Papers, ed. by N. Sanz.		Basic	0	0
Sanweiss, Dan	Other	Published	Sandweiss D.H. and K. Rademaker, 2014. Agriculture and Domestication at Waynuna. In Encyclopedia of Global Archaeology, ed. by C. Smith, pp. 7714-7717. Springer.		Basic	0	0

Sanweiss, Dan	Other	Published	Sandweiss, D.H. (translator from Spanish to English), Alberto Rex González (November 16, 1918 - March 28, 2012), by Luis Alberto Borrero. Andean Past 11:39-47 (2013).		Basic	0	0
Saros, Jasmine	Journal Article	Published	Tuckett, Q., Simon, K.S., Saros, J.E., Halliwell, D.B. & M.T. Kinnison. 2013. Fish trophic divergence along a lake productivity gradient revealed by historic patterns of invasion and eutrophication. Freshwater Biology 58: 2517-2531.	Yes	Basic	1	0
Saros, Jasmine	Journal Article	Published	Slemmons, K.E.H., Saros, J.E. & K.S. Simon. 2013. The influence of glacial meltwater on alpine aquatic ecosystems: a review. Environmental Science: Processes & Impacts 15: 1794-1806.	Yes	Basic	1	0
Saros, Jasmine	Journal Article	Published	Saros, J.E., Strock, K.E., McCue, J., Hogan, E. & N.J. Anderson. 2014. Response of Cyclotella species to nutrients and incubation depth in Arctic lakes. Journal of Plankton Research 36: 450-460.	Yes	Basic	1	1
Saros, Jasmine	Journal Article	Published	Wigdahl, C.R., Saros, J.E., Fritz, S.C., Stone, J.R. & D.R. Engstrom. 2014. The influence of basin morphometry on the regional coherence of patterns of diatom-inferred salinity in lakes of the northern Great Plains (USA). The Holocene 24: 603-613.	Yes	Basic	1	0
Saros, Jasmine	Journal Article	Published	Apollonio, S. & J.E. Saros. 2014. Temporal and spatial dynamics of ice-covered Upper Dumbell Lake (Ellesmere Island, Arctic Canada) during the summer of 1959. Arctic, Antarctic & Alpine Research 46: 1-15.	Yes	Basic	0	0
Saros, Jasmine	Journal Article	Published	Strock, K.E., Nelson, S.J., Kahl, J.S., Saros, J.E. & W.H. McDowell. 2014. Decadal trends reveal recent acceleration in the rate of recovery from acidification in the Northeastern U.S. Environmental Science & Technology, dx.doi.org/10.1021/es404772n	Yes	Basic	1	0
Sorg, Marcella	Journal Article	Accepted	Crist, Thomas and Marcella H. Sorg. Adult Scurvy in New France: Samuel de Champlain's "Mal de la terre" at Saint Croix Island, 1604-1605. International Journal of Paleopathology. http://dx.doi.org/10.1016/j.ijpp.2014.04.002	Yes		0	0
Sorg, Marcella	Book Chapter	Published	Sorg, Marcella H. and William D. Haglund (2013) Forensic Anthropology. In Stuart H. James, Jon J. Nordby and Suzanne Bell, Editors, Forensic Science: An Introduction to Scientific and Investigative Techniques. Boca Raton, FL: CRC Press.			0	0
Sorg, Marcella	Proceedings	Published	Patterns and Trends of Drug Abuse in Maine, 2012 and Early 2013. Epidemiologic Trends in Drug Abuse: Proceedings of the Community Epidemiology Work Group, Volume II, June 2013. U.S. Dept. of Health and Human Services, National Institutes of Health, Division of Epidemiology, Services and Prevention Research, National Institute on Drug Abuse, pp. 159-171. (http://www.drugabuse.gov/sites/default/files/cewgjune2011_vol_ii_508.pdf)			0	0
Sorg, Marcella	Proceedings	Published	Drug Abuse Patterns and Trends in Maine – Update: January 2013. Epidemiologic Trends in Drug Abuse: Proceedings of the Community			0	0

			Epidemiology Work Group, Highlights and Executive Summary. U.S. Dept. of Health and Human Services, National Institutes of Health, Division of Epidemiology, Services and Prevention Research, National Institute on Drug Abuse, pp 76-77. (http://www.drugabuse.gov/sites/default/files/cewg_january_2013_vol1_508.pdf)					
Sorg, Marcella	Proceedings	Published	Sorg, Marcella H. (2014) Drug Abuse Patterns and Trends in Maine –Update: January 2014. National Institute on Drug Abuse, Community Epidemiology Work Group Meeting Report. http://www.drugabuse.gov/about-nida/organization/workgroups-interest-groups-consortia/community-epidemiology-work-group-cewg/meeting-reports/highlights-summaries-january-2014/maine				0	0
Sorg, Marcella	Proceedings	Published	Sorg, Marcella H., Marie A. Abate, D. Leann Long, Lan Hu, James C. Kraner, James A. Kaplan, and Jamie A. Wren (2014) Accidental Opioid-Induced Deaths: Modeling Relationships of Postmortem Opioid Levels to Co-Intoxicant Benzodiazepine and Alcohol Presence and Selected Decedent Characteristics. Proceedings of the American Academy of Forensic Sciences 20: 343-344.	Yes			1	0
Thaler, Jeffrey	Journal Article	Published	"Roadmap for Permitting and Leasing for Maine Offshore Wind Energy Projects" and "Roadmap for Permitting and Leasing For Maine Marine Hydrokinetic (MHK) Power Projects" http://www.e2tech.org/projects/wind-energy		Applied		0	0
Thaler, Jeffrey	Journal Article	Published	"In the Public Trust: Climate Changed Sea Levels and Ocean Wind Power", 31 Delaware Lawyer 20 (No. 4 Winter 2014) http://www.delawarebarfoundation.org/delaware-lawyer-publication/		Applied		0	0
Thaler, Jeffrey	Journal Article	Accepted	"Hubris Games: Analyzing Success and Failure of Large-scale Energy Projects", forthcoming book review Spring 2014 in Energy Research and Social Science (Issue 1)		Applied		0	0
Thaler, Jeffrey	Journal Article	Accepted	"Ocean-Based Renewable Energy and the Public Trust Doctrine: Better Empowering the Sea to Protect Itself from the Impacts of Climate Change", forthcoming Spring 2014 in the Ocean and Coastal Law Journal		Applied		0	0
Thaler, Jeffrey	Book Chapter	Under Contract	Uncomfortable Learning Through Immersion Programs Within the United States: 40 Years of Proven Experience and Success		Pedagogical		0	0
Zaro, Gregory	Journal Article	Published	Sullivan, Lauren A., B.A. Houk, G. Zaro, and L. R. Moats (2013). Deciphering a Terminal Classic surface artifact deposit at Courtyard 100, La Milpa: The view from the ceramic data. Research Reports in Belizean Archaeology 10:211–218.	Yes			1	0
Zaro, Gregory	Journal Article	Published	Zaro, Gregory, K. Nystrom, and D. Keefer (2013). Environmental catastrophe and the archaeological record: Complexities of volcanism, floods, and farming in south coastal Peru, A.D. 1200-1700. Andean Past 11:233-262.	Yes			0	0
Zaro, Gregory	Book Chapter	Published	Zaro, Gregory (2014). From terraces to trees: Ancient and historical landscape	Yes			0	0

changes in southern Peru. In Landesque Capital: The Historical Ecology of Enduring Landscape Modifications, edited by N. Thomas Håkansson and Mats Widgren, pp. 232-250. Left Coast Press, Walnut Creek, CA.

APPENDIX F: HIGHLIGHTED STUDENT PROFILE

CLIMATE CHANGE INSTITUTE

Bringing Global Science to Solutions for Maine

Planning for a Changing Climate: A Participatory Approach To Fishing Community Adaptation

Samuel L. Belknap III[1,2], Thomas Webler[3], Seth Tuler[3], Esperanza Stancioff[4], Jess Whitehead[5]

1. Climate Change Institute, University of Maine
2. Department of Anthropology, University of Maine
3. Social and Environmental Institute
4. UMaine Extension & Maine Sea Grant
5. North & South Carolina Sea Grant

The Problem

Climate change threatens the lives and livelihoods of those who depend on marine species for a living. Maine's coastal towns are heavily reliant on the harvesting of marine resources. Due to overfishing individual fishermen and their communities have become reliant on a few select species, most significant is the effort dedicated to harvesting the American Lobster (Homarus americanus). Maine's coastal communities' focus on this single species places them in a precarious position. Minor changes to the Gulf of Maine can have significant impacts on fisheries as evidence by the 2012 lobster price 'crash' caused by a minor increase in the Gulf of Maine's winter water temperature. To support these communities it is necessary to record how resource harvesters view the future of their industries, the threats of climate change, and what opportunities for adaptation exist.

The Science

The knowledge and practices of individuals dealing with marine resources for a living provides information that is qualitatively and quantitatively useful in understanding community vulnerability and developing case-specific adaptation plans. Answering four questions will help communities prepare for a changing climate:

- What are the community's climate change concerns?
- What are their consequences?
- What can be done regarding these consequences?
- How can these thoughts be transformed into actionable items?

The Solution

Through the use of anthropological research protocols, including participant observation, interviews and community participant modeling I propose that marine resource harvesters and their communities can both help researchers understand community specific climate change concerns and describe appropriate ways to prepare for and deal with these changes. A multi-step process takes us from community concern to community-based action, the necessary path for successful adaptation to a rapidly changing world.

- Vulnerability and Consequence Adaptation and Planning Scenarios (VCAPS) develops a local picture of climate change threats, helping direct a communities adaptation efforts.
- Systems Dynamic (SD) modeling allows adaptation methods to be tested prior to on the ground implementation.

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