

2012 NPS George Melendez Wright Climate Change Youth Initiative Fellowship and Internship Program



PI ACCOMPLISHMENT REPORT

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**Submitted by the University of Washington
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2012 NPS GEORGE M. WRIGHT CLIMATE CHANGE YOUTH INITIATIVE: FELLOWSHIP PROGRAM

The University of Washington College of the Environment assumed co-sponsorship of the National Park Service George Melendez Wright Climate Change Fellowship in the fall of 2010. Lisa Graumlich, Dean of the UW College of the Environment, had been the Principal Investigator for the inaugural year of the program (2010) while at the University of Arizona as Director of the School of Natural Resources and Environment.

During the period October 1, 2011 – September 30, 2012, the UW continued to manage the 2011 GMW Fellowship program. In addition, we organized the recruitment, application, review process, and selection of the 2012 fellowship awardees and continue to manage it in its first year.

We are now making preparations to expand the program to include the GMW Climate Change Internships at the request of the National Park Service. Therefore the program will be called the NPS George M. Wright Climate Change Youth Initiative (CCYI) and will include both fellowships for graduate students, and internships for undergraduates or new graduate students. A new website for the CCYI program can be found at ccyi.org.

2011 Fellowships:

During the first year of the program, eleven GMW Climate Change Fellows were selected in April of 2011. Those students will be completing their research projects by December 31, 2012 with the submission of their Final Research Report after which the remaining 25% of their award will be disbursed to them. (This amount is \$49,979.)

There are some stellar young scientists among these fellows as demonstrated in their research reports, products, and presentations. Many of them we back out in the field in the summer finishing up their data collection. We supported three students to attend the 2012 Ecological Society of America meeting in Portland, Oregon (Sarah Bisbing, Kristen Kaczynski, and Caitlin McDonough MacKenzie). And we expect to send several fellows to the March 2013 George M. Wright Society Meeting in Denver, Colorado to present their research and meet as a group with Tim Watkins and other NPS staff.

Fellows' Highlights:

- NPS produced "Climate Change in America's National Parks" webinar series featuring three of the 2011 fellows: Caitlin McDonough, Lydia Kapsenberg, and Krista Slemmons. Below is the information that was disseminated through the NPS networks:

**Climate Change Research from the Next Generation:
George Melendez Wright
Climate Change Fellowship Science in Parks**

Thursday, June 14th, 2012
2:00 p.m. - 3:30 p.m. ET

Overview: Often the most innovative work in climate change science is led by student researchers. The NPS welcomes and facilitates this research in national parks in order to strengthen the role of parks in science and education, increase the knowledge and information available to protect park resources, enhance the professional and academic excellence of youth, and make parks more personally relevant to the next generation of scientists. Beginning in 2010, the NPS George Melendez Wright Climate Change Fellowship Program awards competitive fellowships to support graduate students' independent research. This month's presentation is a sneak peak into some of the exciting research our fellows are conducting within national parks. Three climate change fellows will share their projects representing a broad range of geographical and ecological topics related to climate change in national parks:

120 Years of changes in flora and flowering phenology in Acadia National Park:

Climate change has the potential to shift the timing of flowering (phenology) and the communities of flowers (the flora) in Acadia National Park. But in order to monitor for these changes, we need historical data to build a baseline comparison. Caitlin McDonough's project used historic books, botanical collections, and field notes to reconstruct a history of the flowers once found in the park, and to compare these to the communities we find here today.

Ocean Change: pH monitoring and sea urchin fertilization in Channel Islands

National Park:

Ocean acidification is a pressing issue in climate change research, yet little is known about the pH of near-shore marine communities. For the first time ever, Lydia Kapsenberg recorded pH at two locations in Channel Islands National Park. This data is used to parameterize laboratory-based experiments assessing the effects of temperature and pH on the fertilization success of local sea urchin populations, which are an important food source for many species.

Investigating how climate induced changes in alpine glaciers alter phytoplankton communities and lake habitat in Glacier National Park:

Evaluating the response of alpine lakes to changing glacial runoff is an imperative step toward understanding the future of life in these lakes as well as water clarity as glaciers disappear. Lakes that are glacially fed are biologically and physically different to those that are snow fed, however the degree of these differences is poorly understood. Krista Slemmon's project investigates how climate-induced changes in alpine

glaciers have altered lake habitat in Glacier National Park over the last 150 years by examining lake sediment cores from six watersheds and identifying how algae communities have changed over time as glaciers have receded.

About the Speakers:

Caitlin McDonough, Boston University: Caitlin just completed her first year as a PhD student at Boston University in the Department of Biology.

Caitlin's research interests center on plants and plant communities in New England, and how they are affected by climate change and land use change. She is excited to return to Acadia this summer and continue this research; the island is also a great place for some of her favorite hobbies: trail running, kayaking, and eating ice cream.

Lydia Kapsenberg, UC Santa Barbara: Lydia is a 2nd year PhD student at the University of California Santa Barbara, Department of Ecology, Evolution and Marine Biology. She is interested in understanding the effects of ocean acidification on developmental physiology of marine invertebrates through field- and laboratory-based research in different ecosystems. Currently, her dissertation research takes place in Channel Islands National Park and McMurdo Sound, Antarctica.

Krista Slemmons, University of Maine: Krista is completing her third year as a PhD student at the University of Maine, Climate Change Institute and School of Biology and Ecology. By using both paleo and modern techniques within the arctic lakes of East Greenland and the alpine lakes of the Rocky Mountains, her doctoral research involves examining how aquatic biodiversity and lake clarity have not only changed through time but how both of these features are affected by modern human activity. When Krista is not traveling and having new adventures with her husband and two young boys she enjoys playing the violin, knitting, working in the garden, exploring the prospect of raising chickens and starting projects that she never has time to complete.

- **Sarah Bisbing:**

Sarah Bisbing and some of her colleagues have initiated the 'Early Career Ecologists' blog to provide a venue for early-career ecologists to communicate their science and increase public awareness of ecological issues and science. This blog is hosted, managed, and written by an impressive group of early-career scientists working all across the globe (from Alaska to the Atlantic, and Antarctica to East Africa).

<http://earlycareerecologists.wordpress.com/>

- **Lauren Oakes:**

GMW Fellow Lauren Oakes is conducting research on the Yellow Cedar in the Alexander Archipelago of Alaska, including Glacier Bay National Park. She has written a series of articles for the New York Times' Green Blog detailing her research and journey.

<http://green.blogs.nytimes.com/author/lauren-e-oakes/>

One of the 2011 Fellows, Jackson Webster, shared this about his experience of the broader impacts of the GMW Fellowship program:

“One of the neat aspects of this work has been the involvement of many students and multiple institutions. The first year of the project I was able to leverage our collaboration with the Mountain Studies Institute (Silverton, Colorado) to bring two undergraduate students onto the project; Crystal Kelly, from Fort Lewis College (Durango, Colorado) and Doug Winter from the University of Colorado, Boulder. Both were participating in a summer internship at Mountain Studies Institute and their involvement in the sampling effort was a major factor in the success of this project. Doug Winter has continued to work on wild fire related projects and is currently an intern at the U.S. Geological Survey in Boulder, CO. Secondly, each summer I have been able to bring on a Research Experiences for Undergraduates (REU, funded by the NSF) student to gain laboratory experience. Chelsea Ottenfeldt from Tennessee Technological University (Cookeville, Tennessee) and Michelle Hummel from Case Western Reserve University (Cleveland, Ohio) have both contributed to this body of work and were able to develop their own summer projects from different aspects of this project.”

2012 Fellowships:

Efforts for the second year of fellowships began in the fall of 2011 with upgrades and improvements made to the web-interfaced database application and review system using Filemaker Pro. We were careful to integrate the comments of the users (students and reviewers, as well as the program administrator) into these improvements. At the suggestion of the reviewers, we decreased the page requirement of the proposal narrative to 8 pages. And we created some better report templates in the database adding better capacity to collect demographic data.

The program announcement was again disseminated widely throughout the United States using networks of university and college deans, student advisors, student professional programs, conferences and meetings, the George M. Wright Society, NCSE, etc. The Parks distributed it widely through their networks including the CESUs, and internal NPS communications. Over 105 students completed applications by January 18, 2012, each required to submit an 8-page proposal including an abstract, a project narrative, budget, budget justification, references, and resume. They were required to request at least two academic letters of recommendation, including their advisor, and a letter of support from their NPS sponsor(s). Ultimately 87 students were forwarded for review.

In order to determine the expertise that the reviewers would need in order to rank them, the proposals were categorized into themes (i.e., human dimensions, plant ecology,

biology, landscape ecology, hydrology, paleoecology, etc.) Reviewers with the necessary knowledge and expertise were then recruited, 20 from the NPS and 26 non-NPS, primarily from academic institutions. Each student proposal was assigned three reviewers with one being a NPS employee.

The reviewers used an online system that interfaced with the database so that they could access all of the students' documents, read, review, and indicate their critique and ranking of the proposal by answering seven questions that are on a likert scale about quality, feasibility, and relevance. They also had the opportunity to add comments if they chose.

The database was used to generate reports of the rankings that were then reviewed by the program leadership at NPS and the UW. By April 25, 2012, fourteen students were selected and awarded fellowships totaling \$260,374. (**See appendix A.**)

The fellows' research projects geographical range includes five NPS regions:

- AKR (2)
- IMR (1)
- PWR (8)
- MWR (2)
- NER (1)

The program administrator tracked the fellows' progress and fielded any questions from the students' regarding their awards and their research. Where necessary, she interfaced with the fellows' institutions to ensure that their award accounts were set up to meet the fellowship requirements and approved any changes to their budgets. She generated reports from the database and maintained all relevant student and program documents.

Students were required to submit Research Status Reports indicating their progress and a timeline for completion of their research and project deliverables. A majority of the fellows will be continuing their work through 2013, taking advantage of another field season to conduct their research. (**See separate document for the Status Reports.**)

Expenditures:

Students received their first award allocations (75%) for a total disbursement of \$195,281. They will receive the final 25% of their award after they have submitted a draft of their Final Research Report (fall of 2013). (**See appendix B** for expenditure report.)

Fellows' Highlights:

Joseph Stewart:

Joseph Stewart (2012 NPS George M. Wright Climate Change Fellow) was featured on this segment of the Quest Radio show.

“The American pika is a little mammal that lives at high elevations in mountains in the West. It could one day have a huge influence on America’s battles over climate change. A new program is enlisting students to help scientists learn more about the cute critters. We tagged along with middle school students from Oakland, on their first adventure in the High Sierra.”

<http://www.kqed.org/a/quest/R201210010833>

Leveraged Funding 2011 Fellows: (as interpreted by the students)

Sarah Bisbing:

- Gloria Barron Wilderness Society Fellowship: Conserving the adaptive potential of western forests: Using range-wide patterns of genetic population structure and niche modeling to predict the response of *Pinus contorta* to climatic change, \$10,000. 2012 – 2013

Kirsten Feifel:

- Processing of the Olympic Coast sediment cores was completed with the help of an undergraduate assistant. He was awarded a \$4,000 Mary Gates Research Scholarship through the Mary Gates Endowment at the University of Washington to support his research efforts.
- Support from the GMW Climate Change Fellowship provided the catalyst for my research. In 2011, I was awarded an NSF IGERT on Ocean Change, which provides me with two years of support (~\$64,000) and tuition (~\$30,000) to complete the research that I have started under the GMW Fellowship

Christopher Jury:

- Preparation and funding via the GMWCCFP was very helpful in securing additional funding through the UH Sea Grant College Program (see status report). UH Sea Grant is providing funding of \$61,438 which is enhanced by a 50% non-federal in-kind match.

Kristen Kaczynski:

- I received the 2012 Rocky Mountains Cooperative Ecosystems Studies Unit student award for my research on willow decline in RMNP (nominated by resource managers at RMNP).

Caitlin McDonough:

- I received a travel scholarship from the Phenology 2012 Meeting to fly to Milwaukee and present my research, which included work completed during my GMWCCFP Fellowship in an oral session

Lauren Oakes:

- Gloria Barron Scholarship, The Wilderness Society

- Morrison Institute for Population and Resource Studies
- USDA Forest Service, Forest Health
- Emmett Interdisciplinary Program in Environment and Resources
- Stanford School of Earth Sciences
- National Forest Foundation

Krista Slemmons:

- University of Maine, Graduate School Grant, \$638.00
- University of Maine, Dan and Betty Churchill Exploration Fund, \$2,517.00
- University of Maine, Alston and Ada Lee Correll Fellowship, \$26,400.00

Kristie Wendelberger:

- Florida International University Kelly Tropical Botany Scholarship: \$500.
- National Science Foundation, Florida Coastal Everglades Long-term Ecological Research, Research Experience for Undergraduates: \$8,000.

Leveraged Funding 2012 Fellows: (as interpreted by the students)

Rachael Bay:

- Dr. Earl H. Myers & Ethel M. Myers Oceanographic and Marine Biology Trust Award (\$1,500)

Brian Harvey:

- The GMW Fellowship will be augmented by a separate award from the Joint Fire Sciences Program (Graduate Research Innovation Award) and a graduate teaching assistantship from the University of Wisconsin---Madison.

Margot Higgins:

- Murie Science and Learning Center, \$5,000.

Michael Lukens:

- Central Washington Masters Research Grant - \$750

Lisa Marrack:

- Funding for sea level rise predictions and some travel is also provided from a cooperative agreement between UC Berkeley and the NPS (CCESU Task Agreement J8C07100018). This funding began in Sept, 2011 ends in July, 2013.