



Completed GCECS Capstone Projects (rev. November 2018)

Nyssa Baechler (School of Marine and Environmental Affairs) and **Katie Keil** (School of Marine and Environmental Affairs) Advised by Ryan Kelly (SMEA)

Project Title: Understanding and advancing natural resource management in the context of changing ocean conditions

Completed: Spring 2018

Nyssa and Katie partnered with individuals from the Washington State Office of the Governor and the Washington Department of Natural Resources (WDNR). Their goal was to find out how climate change is impacting natural resource management in Washington State and what information is lacking but necessary to help managers best respond to current and projected impacts of changing ocean conditions on these resources. They decided to gather first-hand information through numerous interviews of State government and Tribal natural resource managers throughout the state. They then distilled and summarized these interviews to pull out common themes in order to provide guidance on the creation of a survey. The survey aimed at gathering data focused on gaps, barriers and priority needs to a much broader group of natural resource managers, scientists, and end users.

Julie Ann Koehlinger (School of Marine and Environmental Affairs) Advised by Arthur Nowell (OCN)

Project Title: The ocean and us: an experiential workshop in mindfulness and climate science

Completed: Spring 2018

Julie developed a workshop that attempted to place climate science in a framework of mindfulness. The goal was to have a conversation about what it means to have a sense of community, develop a sense of awareness about the present moment, and provide a jumping off point for expanding awareness beyond themselves. Julie proposed a workshop to Rev. Judith Laxter at Gaia's Temple that encompassed a five-minute meditation, and a pre- and post-workshop evaluation. The workshop covered the effects of climate change on the ocean and us.

Diana Perry (School of Marine and Environmental Affairs) Advised by Heidi Roop (CIG) and Jackson Blalock (The Nature Conservancy)

Project Title: Washington coastal resilience project story map on sea-level rise projections

Completed: Spring 2018

Diana developed a story map that helps convey the science behind sea-level rise and why these projections are of use for local Washington residents. The goal was to increase the communication for a range of stakeholders around coastal Washington. The story map included comparison risk maps and climate projections. The map was then accessible through the Washington Coastal Resilience Project website.

Miriam Calkins (Environmental and Occupational Health Sciences) and **Judy Twedt** (Atmospheric Sciences) Advised by Dargan Frierson (ATM S)

Project Title: A Speakers Bureau for a local, worker-centric Climate Caucus: A platform for communicating climate science and engaging in discussions of local effects

Completed: Spring 2018

Miriam and Judy partnered with King County Labor Council to create a climate caucus speakers' bureau to better communicate and discuss climate change. They both developed ways to clarify the underlying science of climate change by bringing together members of the academic and local labor communities. Their talks centered on a "chapters" of climate change that ranged from systemic causes of global warming to PNW symptoms of climate change.

Amy Brodbeck (SMEA) Advised by LuAnne Thompson (OCN)

Project Title: Local Insights: Climate change in small-town Alaska

Completed: Fall 2017

Amy worked as a science communication intern at the Prince William Sound Science Center in Cordova, Alaska with the goal of turning their research and experiences with local climate change impacts into educational videos for kids. She designed the videos to be useful within specific themes — ecosystems/food webs, oceanography/glaciers, and salmon. To do this, she used local footage and local voices with the hope that it would encourage students to see the science of climate change from a different perspective and to realize that it does in fact affect their lives outside the classroom.

Alex Lenferna (Philosophy) and **Karl Lapo** (Atmospheric Sciences) Advised by Yoram Bauman

Project Title: Climate Change in Washington: Impacts and Responses

Completed: Fall 2017

Karl and Alex worked together to develop a joint presentation for general audiences, which provided an interdisciplinary approach to understanding climate change impacts and responses in Washington State. The talks aimed to connect projections of the potential future impacts of climate change in Washington State to proposed state-wide efforts to mitigate climate change. The presentation was separated into two complimentary sections: Karl presented on projected climate impacts in Washington State, while Alex provided an analysis of the need to mitigate greenhouse gas emissions and discussed Washington's proposed carbon tax initiative (Initiative 732). The presentation was aimed at a general audience and was delivered at community colleges, universities and other public venues.

Emily Rich (Evans) Advised by LuAnne Thompson (OCN) and Joe Casola (CIG)

Project Title: Development and evaluation of a Climate Impacts Group (CIG) graphic for Washington State Governor Jay Inslee's Staff

Completed: Spring 2017

Emily partnered with the Climate Impacts Group (CIG) to create an infographic for the Washington State government. The purpose of the project was to portray climate change impacts projected for the state in a graphic that was easy for a lay audience to understand. The graphic resulted in a thermometer that visualizes the impacts the state would see at different temperature projections. In the end, she surveyed the graphic with the public to test the effectiveness.

Michelle Dvorak (SMEA) Advised by LuAnne Thompson (OCN) and Tom Leschine (SMEA)

Project Title: Climate change and oil development in the Alaskan Arctic: an economic perspective

Completed: Spring 2017

Michelle chose to study the Arctic because of the large scientific interest, but also intense political debate. The goal of her project was to communicate the nuanced Arctic oil development in the context of a changing climate. She spent the first half of her project and presentation detailing the feedback mechanisms that lead to a sea-ice loss, and the latter half on the economic losses associated with oil development in the region. Michelle presented to the PCC and Future of Ice members at a lunchtime seminar.

Forrest Howk (Public Policy and Governance) Advised by Ann Bostrom (Evans), Amy Snover (SMEA), and LuAnne Thompson (OCN)

Project Title: Sell-by dates for local climate impacts: will Time of Emergence reduce perceived uncertainties?

Completed: Winter 2017

Forrest elected to further investigate the effects of displaying *when* climate change impacts will arrive in the Pacific Northwest in contrast to *if* climate change impacts will arrive at a given time. He used Time of Emergence (ToE) to develop an online survey that investigated user perceptions of certainty, seriousness, trust and need for local action. He then distributed the survey amongst a variety of UW climate-related networks and presented his findings to the Climate Impact Group of the University of Washington to guide the organization's future climate communication work.

Brandon Ray (Atmospheric Sciences) Advised by LuAnne Thompson (OCN)

Project Title: Seminar on Current Research in Climate Change Policy Module

Completed: Winter 2017

Brandon developed and incorporated a policy module into the undergraduate portion of the PCC seminar, so students gain exposure to different formats and styles for communicating climate science. This gave the undergraduates exposure on how to turn their research into something upon which policy-makers can act. Although this module was developed for ATM/OCN/ESS 475, it can be revised for different topics and used in the seminar series every year or incorporated into other classes. His two lectures addressed policy communication, one

focused on written communication and the other focused on oral communication. Both lectures were scaffolded, to build students to a similar level of understanding – regardless of their background knowledge in these topics.

Elizabeth Maroon (Atmospheric Sciences) Advised by LuAnne Thompson (OCN)

Project Title: The Road to Paris: Climate Change Science and Policy

Completed: Spring 2016

Elizabeth, with fellow GCeCS awardee Alison Saperstein, developed an interactive workshop sharing information and perspectives from their different academic backgrounds, covering both science and current policy issues surrounding climate change. Their project was initiated when King County Library System (KCLS) contacted the PCC to find volunteers that would give climate change talks to their newly developed program called Mind Matters. Three presentations were given, each at a different library in the KCLS and their presentation is part of our slide database.

Alison Saperstein (Public Policy and Governance) Advised by LuAnne Thompson (OCN)

Project Title: The Road to Paris: Climate Change Science and Policy

Completed: Spring 2016

Alison, with fellow GCeCS awardee Elizabeth Maroon, developed an interactive workshop sharing information and perspectives from their different academic backgrounds, covering both science and current policy issues surrounding climate change. Their project was initiated when King County Library System (KCLS) contacted the PCC to find volunteers that would give climate change talks to their newly developed program called Mind Matters. Three presentations were given, each at a different library in the KCLS and their presentation is part of our slide database.

Nic Wayand (Civil and Environmental Engineering) Advised by Jessica Lundquist (CEE)

Project Title: Rain-on-Snow Floods

Completed: Winter 2016

Nic used his project to understand effective ways to increase children's interest in science. He took his knowledge in snowpack and taught children the change that occurs in local PNW regions to show the importance of understanding that change for planning purposes (i.e. drinking water).

Kristin Poinar (Earth and Space Sciences) Advised by LuAnne Thompson (OCN)

Project Title: Climate Change and Restoration along the Burke-Gilman Trail

Completed: Autumn 2015

Kristin brought climate and earth lessons to elementary, middle, and high school classrooms in the Seattle community. She taught short, interactive lessons on local climate and climate change and land restoration in the Puget Sound region.

Hayley Dossier (School of Oceanography) Advised by LuAnne Thompson (OCN) and Luc Rainville (OCN)

Project Title: Connecting an Observational Oceanography Cruise to Climate Research through Outreach

Completed: Autumn 2015

Hayley highlighted the importance of having a direct connection between the classroom and active climate research. She used a month long T-Beam cruise aboard the R/V Falkor to complete this capstone project and interacted with many high school students to gauge what knowledge is suitable for each age.

Katherine Heal (School of Oceanography) Advised by LuAnne Thompson (OCN) and Susan Auld (Sehome High School)

Project Title: Introducing the biological pump to high school students

Completed: Winter 2015

Katherine developed and tested a module with three components consisting of an introductory lecture, student-led research and presentations that are followed by a class discussion. She tested this module with a group of high school students and provided additional support during lab sessions with the students.

Pamela Barrett (School of Oceanography) advised by Nives Dolsak, SMEA

Project Title: Climate Change Policy in the US Congress (1993-2012)

Completed: Fall 2014

Pamela completed her project, with fellow GCeCS awardee Megan Gambs, on public policy proposed by US Congress in response to the issue of climate change over the last 20 years. They looked at when and who proposed the climate change bills and the issues that each bill addressed, in regards to climate policy.

Megan Gambs (School of Oceanography) advised by Nives Dolsak, SMEA

Project Title: Climate Change Policy in the US Congress (1993-2012)

Completed: Fall 2014

Megan completed her project, with fellow GCeCS awardee Pamela Barrett, on public policy proposed by US Congress in response to the issue of climate change over the last 20 years. They looked at when and who proposed the climate change bills and the issues that each bill addressed, in regards to climate policy.

Spruce Schoenemann (Earth and Space Sciences) advised by Eric Steig, ESS

Project Title: From Water Isotopes To Temperature: Climate Reconstructions From Ice Cores

Completed: Summer 2014

Spruce created a module for high school students to learn to use ice cores to infer past temperatures and the primary Earth processes responsible for the climate changes. Students in the UWHS ATMOS 211 class were targeted as the test group for this module, since they already had background on some of the concepts.

Bryce Harrop (School of Atmospheric Sciences) advised by Dargan Frierson, Atmos

Project Title: PCC Climate Scientist Interviews in Youtube

Completed: Summer 2014

Bryce produced a series of student interviews that could be easily accessible, for audiences of varying background knowledge. The interviews were based on what the graduate students are currently doing their research on and any relevant interests they have about what their studying.

Kelly Hall (Evans School of Public Affairs) advised by LuAnne Thompson, PCC/Ocean

Project Title: Climate Science in Sammamish High School AP Environmental Science Classes

Completed: Summer 2014

Kelly created a variety of climate science lectures for high school students in AP Environmental Science classes. In addition to presenting the materials she created, Kelly also acted as an in-class expert for several classes in which climate science was the main topic of the day.

Hilary Palevsky (School of Oceanography) advised by LuAnne Thompson, PCC/Ocean

Project Title: Ocean Acidification Data Analysis Teaching Module

Completed: Summer 2014

Hilary created a module for high school students to learn about ocean acidification. Students associated with the NASA UW in High School program were targeted as potential participants, however the module was created as a potential lab for any level of high school student.

Katie Fellows (Environmental and Occupational Health Sciences) advised by Richard Fenske,

Project Title: Current Topics in Environmental and Occupational Health Sciences: Climate Risk in the Pacific Northwest- Journal Club

Completed: Spring 2014

Katie developed a course on the public health risks of climate change that was targeted towards graduate students within the University of Washington. The course consisted of weekly discussions based on climate and health.

Ashley Maloney (School of Oceanography) advised by LuAnne Thompson, PCC/Ocean

Project Title: UWHS Ice Core Lab

Completed: Summer 2012

Ashley created a hands-on ice core lab tailored to the UWHS ATMS 211 curriculum that allows students to examine the character of glacial-interglacial cycles during the last 800,000 years by dissecting homemade ice cores, gathering and entering data, and comparing the natural variability to recent anthropogenic change.

Sarah Purkey (School of Oceanography) advised by LuAnne Thompson, PCC/Ocean

Project Title: Historical Temperature Records Lab

Completed: Spring 2012

Sarah developed a hands-on learning module for the UWHS ATMS 211 course where students analyze past and future century-long surface temperature time series at different locations around the world. The lab was piloted in two classrooms, informing modifications.

Kelsey McDuffee (OCN) Advised by Ed Waddington (ESS) and Julia Pinnix (East District Mt. Rainier Lead Interpreter)

Project Title: Notebook: Climate change impacts on Mt. Rainier NP

Kelsey worked with Interpretive Rangers at the park to develop materials for distribution to the general public at the Sunrise visitor center about climate change. The final product of this project was a notebook that includes information about basic climate science, PNW impacts, climate change impacts specific to Mount Rainier, current research efforts, and mitigation.

Lia Slemons (OCN) Advised by Richard Gammon (OCN), Leesa Wright, Public Policy Coordinator for Mountaineers and Sonya Remington, UW Program on the Environment

Project Title: Communicating Climate Science with your Hands: Design, Assessment, and Implementation of inquiry-based science workshops in the 2009 Mountaineers Environmental Issues Course

Lia worked to develop and implement six 2-hour sessions about the science of climate change as part of the Mountaineers Environmental Issues Course, aiming to give participants an understanding of climate science through scientific inquiry. A key component of the capstone was the development of new hands-on demos and experiments that can be translated to other venues, including the high school classroom.

Andrea Fassbender (OCN), **Alyssa Atwood** (OCN) and **Kirsten Feifel** (SMA/OCN), Advised by LuAnne Thompson (OCN), Brad Gaolach, King County Extension and Gabrielle Roesch, Snohomish County Extension.

Project Title: WSU Carbon Masters Program Development

Alyssa, Andrea and Kirsten developed a training session for the Carbon Masters volunteer education program for the general public offered through UW, WSU Extension, and CIG. Their contribution was to develop an educational module around the physical science of climate change: "Climate Change 101" The training was presented to an existing volunteer class, the Master Gardeners and several "classes" in the growing WSU Carbon Masters Program.

Brian Smoliak (Atm S), Advised by Alison Cullen (Evans School of Public Affairs)

Project Title: Climate and Agriculture in Sub-Saharan Africa: Communicating Climate Science to Public Policy Students and NGOs

Brian partnered with the University of Washington Evans School Policy Analysis and Research Group (EPAR) to produce a set of research briefs on the topic of climate and agriculture in Sub-Saharan Africa. The research briefs were co-authored with current students in the Evans School without a strong background in climate science and presented to the Agricultural Policy and Statistics group at the Bill & Melinda Gates Foundation.

Twila Moon (ESS), Advised by Suzi Taylor (Montana State University's Extended University) and Julian Sachs (Oceanography)

Project Title: Climate Science Explained: Understanding Current Issues on Climate Change

Twila partnered with Montana State University Extended University to develop a non-credit course in climate science for the general public, titled "Climate Science Explained." The main

objective of the class was to provide participants with enough knowledge to understand basic climate science and to better understand climate topics in current news and politics.

Rei Ueyama (Atm S), Advised by Michael Lazarus (Stockholm Environmental Institute; adjunct Evans School of Public Affairs) and Sivan Kartha (Stockholm Environmental Institute)

Project Title: Educating Japanese laypeople/students about climate change and greenhouse development rights framework

Rei created a 45-minute presentation to educate the Japanese public on the basics of climate science and to introduce them to the Greenhouse Development Rights (GDRs) framework as a way of looking at Japan's role in the global effort to mitigate climate change. An underlying goal of her talks was to motivate her audience to engage in the global effort to mitigate climate change. The presentation and slides were in Japanese.

Mark Zelinka (Atmos), advised by Alison Cullen, Evans School of Public Affairs

Project Title: Perception and Reality of Environmental Risk Among the Ha Tinh Population of Vietnam

Mark partnered with the Evans School of Public Affairs on a project aiming to determine how perception of risk among the population of Ha Tinh, Vietnam affects their likelihood to participate in job training programs and access loans offered by the International Fund for Agricultural Development (IFAD). Mark's role was to analyze meteorological data for the Ha Tinh region to determine whether the perceived changes in weather were supported by observations. Mark presented his results to the Evans School at the culmination of his project.

Reddy Yatavelli (Atmos), advised by Gerard Roe, ESS.

Project Title: Greenhouse Gas Mitigation Options for a Community Action Plan

Reddy partnered with four other graduate students from the UW Evans School of Public Affairs and the UW Foster School of Business to develop a list of GHG reduction policy options for the City of Bellevue, WA. With the group, Reddy contributed to a final report of the possible impacts of climate change the City of Bellevue and also drafted a handout directed towards a non-science audience summarizing local climate change impacts and emphasizing the need for GHG mitigation policies. With the group, Reddy presented the final project to the City of Bellevue.

Tania Busch Isaakson (Environmental and Occupational Health Science), advised by LuAnne Thompson (PCC/Ocn).

Project Title: Confronting Climate Change Health Risks in the Pacific Northwest-Communicating Study Findings to Local Health Department Partners.

Tania's research group utilized a state-of-the-art regional climate model to quantify the historical extreme heat-related association between heat events and all non-traumatic deaths and hospitalizations in King, Clark, and Spokane Counties from 1980 to 2006 and 1990 to 2006, respectively. The analysis also projected the mortality and hospitalization risks for 2025 and 2045. Based on formative research conducted with the practice community and public health partners, the scientific findings were translated into materials suitable for use by local health departments in communicating specific climate-related health risks. This completed capstone

project addressed one aspect of communicating the scientific findings: the design of county-specific standalone PowerPoint slide decks.

Elly Walsh (College of Education), advised by LuAnne Thompson, PCC/Ocean and Phil Bell (Ed).

Project Title: Strategies for Teaching Climate Science in the High School

Elly supported the efforts of graduate students developing modules for the UWHS ATMS 211 course by advising on science learning by (1) creating written and oral presentations on national and state science standards (2) science epistemology and (3) creating a framework guiding climate scientists in their engagement with high school teachers and students. Elly incorporated observations done during our workshops with teachers in her PhD dissertation.

Kevin Ford (Biology), advised by Janneke Hille Ris Lambers.

Project Title: Communicating the impacts of climate change on Mount Rainier National Park

Kevin developed a written report and fact sheet on the impacts of climate change on Mount Rainier National Park. These reports were distributed to the Park's interpretive rangers who use the information when discussing climate change with Park visitors.