The Class of 2017

Doctor of Philosophy Degrees

College of Engineering and Mines

Dr. Douglas J. Goering, Dean

Anthony P. Mullin **

Ph.D. Engineering

B.S., Rutgers, The State University of New Jersey, 1982; B.S., Rutgers, The State University of New Jersey, 1982; M.E., University of Maine, 1996.

Thesis: Evaluation of Crack Sealing Techniques in Alaska's Asphalt Concrete Pavements

Thermal cracking is one of the most prevalent asphalt concrete pavement distresses in Northern states and countries. Field observations were conducted on 91 asphalt concrete rural road sections of the contiguous road system in Alaska where three different evaluation methods were used and statistical methods employed to compare the data.

Major Professor: Dr. Jenny Liu

Henry James Frederick Penn *

Ph.D. Human Dimensions of Engineered Systems: Interdisciplinary Program

M.E., Loughborough University, 2012.

Thesis: Water Security in the Rural North: Responding to Change, Engineering Perspectives, and Community Focused Solutions

The research investigated how people respond to environmental change, with a focus on current climate and social change issues, to address the need for an alternative paradigm through which water security challenges in rural Alaska are understood and solutions developed.

Major Professors: Dr. William Schnabel and Dr. Philip Loring

Timothy Petty

Ph.D. Water Science and Policy: Interdisciplinary Program

B.S., Purdue University, 1987; M.D., International School of Theology, 1995; M.I.M., University of Maryland University College, 1999.

Thesis: Flood Hazard Hydrology: Interdisciplinary Geospatial Preparedness and Policy

Accurate, useful information is crucial for flood event decision-makers and policy-makers. Through researching three areas of flood-related information, predictive data was generated by developing a methodology using machine learning to forecast streamflow, visualized in a decision system for flood event management, and effectively communicated to policy makers through toolsets.

Major Professor: Dr. William Schnabel

Feng Xiao *

Ph.D. Engineering

B.S., Shenyang Jianzhu University, 2010; M.S., University of Alaska Fairbanks, 2012.

Thesis: Structural Health Monitoring and Bridge Condition Assessment

This research is mainly in the field of structural identification and model calibration, optimal sensor placement, and structural health-monitoring application for large-scale structures. The ultimate goal is to evaluate the behavior and condition of large structures through a health-monitoring system.

Major Professor: Dr. J. Leroy Hulsey

College of Fisheries and Ocean Sciences

Dr. S. Bradley Moran, Dean

Mayumi Lynn Arimitsu *

Ph.D. Fisheries

B.A., University of California, Santa Cruz, 1998; M.S., University of Alaska Fairbanks, 2009.

Thesis: The Influence of Glaciers on Coastal Marine Ecosystems in the Gulf of Alaska

I hypothesized there are direct and indirect effects of glacier runoff on coastal ecosystems in the Gulf of Alaska. Abundance of plankton, fish and seabirds was predicted by runoff characteristics, and it was determined that freshwater resources were important to coastal food webs. Glaciers shape marine ecosystems at small, medium and large spatial scales.

Major Professor: Dr. Franz Mueter

Reid Sinclair Brewer *

Ph.D. Marine Biology

B.S., United States Military Academy, 1995; M.S., University of Alaska Fairbanks, 2003.

Thesis: Population Biology and Ecology of the North Pacific Giant Octopus in the Eastern Bering Sea

Though the North Pacific giant octopus represents a significant incidental catch in Alaska, little is known about its ecology, and therefore management is also limited. A three-year mark-recapture study was performed to estimate growth, movement, reproduction, abundance and survival to guide future management of this data-poor species.

Major Professor: Dr. Brenda Norcross

Catherine Patricia Chambers *

Ph.D. Fisheries

B.A., Drake University, 2004; M.S., Southern Illinois University Carbondale, 2008.

Thesis: Fisheries Management and Fisheries Livelihoods in Iceland

Small-scale fishing livelihoods are negatively impacted by fisheries management schemes that prioritize economic goals over other social goals such as access, participation, family, pride and identity. Conclusions from this dissertation underscore the complexity of marine social-ecological systems and the important role equitable governance arrangements can have in sustainable fisheries management.

Major Professor: Dr. Courtney Carothers

Lauren Mallory Divine *

Ph.D. Marine Biology

B.S., Texas A&M University, 2007; M.S., Georgia Southern University, 2011.

Thesis: Trophic Dynamics and Stock Characteristics of Snow Crabs, *Chionoecetes opilio*, in the Alaskan Arctic

An investigation of snow crab position in benthic food webs, its specific dietary habits, and limited life-history and population dynamics data were explored in the Chukchi and Beaufort seas using stomach contents, stable $\delta^{13}C$ and $\delta^{15}N$ isotopes, and fisheries modeling to ensure sound and sustainable future management of this resource.

Major Professor: Dr. Katrin Iken

Elizaveta A. Ershova *

Ph.D. Marine Biology

M.S., Lomonosov Moscow State University, 2010.

Thesis: Structure, Inter-Annual Variability, and Long-Term Change in Zooplankton Communities of the Chukchi Sea

The structure of summer zooplankton communities of the Chukchi Sea was described, and their distribution was related to water mass distribution and climate variability. These recent observations were then compared to historical data from the past half-century. Significant changes within the zooplankton communities were demonstrated for this time period.

Major Professors: Dr. Russell Hopcroft and Dr. Ksenia Kosobokova

Thomas Farrugia***

Ph.D. ***Fisheries***

B.S., McGill University, 2005; M.S., California State University, 2009.

Thesis: Interdisciplinary Assessment of the Skate Fishery in the Gulf of Alaska

Skates are common bottom-dwelling fishes and valuable non-target species in Gulf of Alaska fisheries. An investigation of the ecology, population dynamics, nutritional content and bioeconomics of skates and their fisheries provided information about these understudied fishes, helping to improve the sustainability and profitability of skate harvests.

Major Professor: Dr. Andrew Seitz

Susan Inglis***

Ph.D. ***Marine Biology***

B.S., The University of British Columbia, 1986; M.S., The University of British Columbia, 1993.

Thesis: Dietary Effects on Protein Turnover in Three Pinniped Species, *Eumetopias jubatus*, *Phoca vitulina*, and *Leptonychotes weddellii*

The impact of diet on protein metabolism in nonfasting harbor seals, Steller sea lions and Weddell seals was studied using the amino acid ^{15}N glycine. These marine mammals consumed high-quality protein diets, and protein utilization was strongly regulated by developmental, seasonal and metabolic demands.

Major Professor: Dr. Michael Castellini

Jennifer M. Questel *

Ph.D. ***Oceanography***

B.S., State University of New York at Oswego, 2008.

Thesis: Controls on Zooplankton Assemblages in the Northeastern Chukchi Sea

Zooplankton are a vital component of aquatic food webs and play a pivotal role in shaping marine ecosystems. This research investigated zooplankton assemblage within the highly complex Chukchi Sea through physical, chemical and molecular approaches to better understand how climate perturbations are impacting the dynamics of high-latitude ecosystems.

Major Professor: Dr. Russell Hopcroft

Alexandra Marielo Ravelo *

Ph.D. ***Marine Biology***

B.S., National University of Cordoba, 2005.

Thesis: Alaskan Arctic Epibenthic Communities: Distribution Patterns, Links to the Environment, and Brittle Star Population Dynamics

An investigation on the benthic environment of the Alaska Arctic shelves characterized the spatial changes in epibenthic invertebrate biomass, abundance and community composition, the environmental drivers of community patterns, and the growth and age of brittle stars to provide a benchmark of the Alaska Arctic shelf system and epibenthic components.

Major Professor: Dr. Brenda Konar

Charlotte Marie Regula-Whitefield **

Ph.D. ***Marine Biology***

B.S., Roger Williams University, 2008; M.S., University of New England, 2010.

Thesis: Effects of Variable Maternal Diet Conditions on the Reproductive Success and Development of the California Sea Cucumber (*Parastichopus californicus*)

This study examined the effects of maternal diets on reproductive fitness of *Parastichopus californicus*. First, a live-spawning method was developed. Second, feeding experiments explored the effects of algal feeds on female reproduction and larval fitness. Third, field collections assessed patterns in total lipid and fatty acid storage and utilization.

Major Professor: Dr. Sarah Hardy

Imme Rutzen

Ph.D. ***Marine Biology***

M.S., Leibniz University of Hannover, 2008

Thesis: Synthesis and Modelling of Zooplankton at Pan-Arctic Scales

Pan-Arctic abundance modelling of seven copepod species (*Calanus finmarchicus*, *C. glacialis*, *C. hyperboreus*, *Metridia longa*, *M. pacifica*, *Neocalanus cristatus* and *Paraeuchaeta glacialis*) used Arctic zooplankton data and environmental data from numerous sources. The modelling approach was based on geographic information systems and regression tree analysis (bagging and boosting).

Major Professor: Dr. Russell Hopcroft

Suzanne Forrer Teerlink

Ph.D. ***Marine Biology***

B.A., University of Alaska Southeast, 2007; M.S., University of Alaska Fairbanks, 2011.

Thesis: Humpback Whales and Humans: A Multi-Disciplinary Approach to Exploring the Whale-Watching Industry in Juneau, Alaska

A booming whale-watching industry in Juneau, Alaska, is leading to complicated resource management challenges. Humpback whales in the Juneau area were studied in the context of whale-watching tourism. The research combined population dynamics, physiology and social science methods for a holistic approach to assessing whale-watching tourism sustainability in this area.

Major Professor: Dr. Lara Horstmann

College of Liberal Arts

Mr. Todd Sherman, Dean

Rebekah Lynn Burket

Ph.D. Clinical-Community Psychology

A.A., University of Alaska Southeast, 2001; B.L.A., University of Alaska Southeast, 2004; M.S., University of Alaska Anchorage, 2011.

Thesis: We are the Safety Net: Skills for Suicide Prevention Evaluating a Training to Increase Recognition and Response to Signs of Suicide Among At-Risk Peers

An evaluation of a brief suicide prevention training showed that the intervention increased suicide literacy, confidence about safety planning, and self-efficacy when seeking help on behalf of an at-risk peer. Significant differences were found in the ability to recognize peers at risk for suicide and act effectively on their behalf.

Major Professors: Dr. Kendra Campbell and Dr. Inna Rivkin

Yvette Running Horse Collin

Ph.D. Indigenous Studies

B.A., John Hopkins University, 1996; M.A., New York University, 2000.

Thesis: The Relationship Between the Indigenous Peoples of the Americas and the Horse: Deconstructing a Eurocentric Myth

This project deconstructs the history of the horse and its relationship with the indigenous peoples of the Americas. Critical indigenous research methodologies and grounded theory are utilized in tandem to reconstruct this history to include cross-cultural translation, the traditional knowledge of many indigenous peoples, Western scientific evidence, and historical records.

Major Professors: Dr. Raymond Barnhardt and Dr. Beth Leonard

Charleen Fisher***

Ph.D. Indigenous Studies

B.A., University of Alaska Fairbanks, 1991; M.Ed., University of Alaska Fairbanks, 2004.

Thesis: Diideets'ii In Our Pathway (In Our Future): Gwich'in Educational Philosophy and Transformative Praxis in K-12 Education

Gwich'in pedagogy is largely undocumented in Western academia. Gwich'in epistemology crosses the usual segmented knowledge genres, and intergenerational transmission of Gwich'in knowledge occurs in many places, particularly the natural environment. Complex, relational, place-based, holistic, cooperative, purposeful and subjective, Gwich'in pedagogy emphasizes contextuality, important for both the communal and personal journey.

Major Professor: Dr. Beth Leonard

Valerie M. Hewell *

Ph.D. Clinical-Community Psychology

B.A., Texas Lutheran University, 2009; M.S., University of Alaska Anchorage, 2013.

Thesis: Developing a Patient-Driven Substantive Definition of Office-Based Opioid Treatment Success

Opioid misuse has increased in the U.S. The effective treatment, Suboxone, challenges abstinence as the definition of treatment success. This dissertation qualitatively explored Suboxone patients' definitions of treatment success. Definitions emphasized functioning, accomplishing, relationships, and psychological factors. Participants stressed the need for patient-centered assessments of success along with increased Suboxone accessibility.

Major Professors: Dr. Ellen Lopez and Dr. Vivian Gonzalez

Kevin Hillmer-Pegram *

Ph.D. Resilience and Adaptation: Interdisciplinary Program

B.A., Arizona State University, 2004; M.S., The Pennsylvania State University, 2011.

Thesis: Resilience to Capitalism, Resilience through Capitalism: Indigenous Communities, Industrialization, and Radical Resilience in Arctic Alaska

This dissertation applied a new theory called radical resilience to answer the question: How is global capitalism affecting the social-ecological resilience of Indigenous communities in northern Alaska as the Arctic continues to industrialize? Engaging in capitalism challenges traditional values — including subsistence — but is also a strategy for maintaining adaptive capacity.

Major Professor: Dr. Amy Lovecraft

Davin L. Holen

Ph.D. Anthropology

B.A., University of Alaska Anchorage, 1995; M.A., University of Alaska Anchorage, 2002.

Thesis: Subsistence and Commercial Fisheries Through the Lenses of Culture and Economy in Three Coastal Alaskan Communities

An investigation into the resilient nature of subsistence and commercial fisheries in coastal Alaska communities from Bristol Bay to Southeast Alaska. Residents of these unique places all articulated how participating in salmon fishing is an expression of a placed-based way of life and passing on of cultural traditions.

Major Professor: Dr. Peter Schweitzer

Richard Hum***

Ph.D. Networked Communication: Interdisciplinary Program

B.A., University of California, Santa Cruz, 1996; M.A., University of Alaska Fairbanks, 2013.

Thesis: Extending Communication Networks in the Anthropocene

The Anthropocene can be defined by an increased coupling of human and environmental systems at the global scale. Many local social-ecological systems are experiencing dramatic changes as a result. This dissertation presents a methodology for strategically using modern communication tools to promote environmental sustainability and resilience throughout these changes.

Major Professor: Dr. Karen Taylor

David Alexander Lukaszek

Ph.D. Anthropology

A.O.S., Bryant and Stratton, 1990; A.A.S., Erie Community College, 1993; B.A., Canisius College, 2002; M.A., University of Montana, 2004.

Thesis: A Metric Investigation of the Cranial Base and Vertebrae Among Extant African Homininae: Discrimination Across Posturo-Locomotory Complexes

Cranial and vertebral measurements were examined among *Homo*, *Gorilla*, *Pan* and *Australopithecus afarensis*. Significant results and correct classification ($p = 0.000 – 0.007$) for vertebral measurements indicated differences among only the extant species. Misclassifications suggest positional-locomotory complexes are not viable. Results for *Pan* and *Gorilla* suggest homoplasy and denote parallelism.

Major Professor: Dr. Joel Irish

Dinghy Kristine B. Sharma *

Ph.D. Clinical-Community Psychology

B.A., University of the Philippines, 1996; M.A., University of the Philippines, 2005; M.S., University of Alaska Anchorage, 2012.

Thesis: Dance/Movement Therapy for Cancer Survivors and Caregivers in Alaska

A community-informed, collaborative practice-based study, conducted with the J. Michael Carroll Cancer Center at Fairbanks Memorial Hospital, used a mixed-methods research approach to explore the therapeutic benefits of a dance movement therapy program for cancer survivors and caregivers on their mood, body awareness, sense of group cohesion, and overall quality of life.

Major Professor: Dr. Ellen Lopez

College of Natural Science and Mathematics

Dr. Paul W. Layer, Dean

Olaniyi Ajadi***

Ph.D. Geophysics

B.S., Federal University of Agriculture Abeokuta, 2009; M.S., Murray State University, 2012.

Thesis: Unsupervised Multi-scale Change Detection from SAR Imagery for Monitoring Natural and Anthropogenic Disasters

An automatic change-detection technique for disaster monitoring was developed that lends itself well for operational implementation. The technique can be broadly described as a combination of an initial data enhancement step followed by the core change detection algorithm, which includes image filtering and automatic multi-scale change detection procedures.

Major Professor: Dr. Franz Meyer

* *Summer degree recipient*
** *Fall degree recipient*
*** *Summer 2017 candidate*

Celso Rodrigo Alvizuri **

Ph.D. Geophysics

B.S., University of California, Santa Barbara, 2005; M.S., University of California, Santa Barbara, 2010.

Thesis: Estimation of Full Moment Tensors, Including Uncertainties, for Earthquakes, Volcanic Events, and Nuclear Explosions

An algorithm to estimate seismic sources with their uncertainties was developed and applied to seismograms from seismic events at a volcano in Bolivia, earthquakes in Alaska, mine collapses in the western U.S., and nuclear explosions at a test site in Nevada.

Major Professor: Dr. Carl Tape

Amanda Jo Barker **

Ph.D. Environmental Chemistry

B.A., West Virginia University, 2009; M.A., University of Alaska Fairbanks, 2009.

Thesis: Speciation, Transport and Mobility of Metals in Pristine Watersheds and Contaminated Soil Systems in Alaska

Arctic surface water metal concentrations were highest in late fall, which correlated with the depth of the active layer. In a central Alaska shooting range, there were significant contributions of lead and antimony to both the soil and soil solution as a result of the weathering of fragmented bullets.

Major Professor: Dr. Thomas Trainor

Casey Lynn Brown *

Ph.D. Biological Sciences

B.A., Prescott College, 2004; M.S., Colorado State University, 2010.

Thesis: Socio-Ecological Drivers of Resource Selection and Habitat Use by Moose in Interior Alaska

An interdisciplinary investigation employed spatial statistics, resource selection functions and social-ecological methods to examine the influence of ecological (fire) and anthropogenic disturbances (hunter activity) on habitat selection and foraging ecology of moose (*Alces alces*) in Interior Alaska.

Major Professors: Dr. Knut Kielland and Dr. Eugenie Euskirchen

Dana Nossov Brown *

Ph.D. Biological Sciences

B.A., The University of North Carolina at Chapel Hill, 2001; M.S., University of Alaska Fairbanks, 2008.

Thesis: Climate-Induced Changes in Ecological Dynamics of the Alaskan Boreal Forest: A Study of Fire-Permafrost Interactions

Wildfire-initiated permafrost degradation and the effects on boreal forest ecology were examined using observational, modeling and remote sensing approaches. Wildfire coupled with climate warming has substantially exacerbated permafrost thaw, though permafrost vulnerability and ecological impacts varied throughout the region due to numerous interacting controls.

Major Professors: Dr. Knut Kielland and Dr. M. Torre Jorgenson

Bonita Hope Dainowski

Ph.D. Forensic Science: Interdisciplinary Program

B.A., Arizona State University, 2003; M.S., Bournemouth University, 2006.

Thesis: Environmental Forensics: An Innovative Technique Using Bone to Identify Mercury and Stable Isotope Levels in Internal Tissues of Wildlife in a Changing Western Alaska Environment

A forensic investigation using various tissues from Alaska red foxes (*Vulpes vulpes*) and Canadian red and Arctic foxes (*Vulpes lagopus*) compared total mercury (THg) concentrations, carbon stable isotopes ($\delta^{13}C$) and nitrogen stable isotopes ($\delta^{15}N$) to better understand animal diets, trophic levels and contaminant biomagnification in changing ecosystems.

Major Professor: Dr. Lawrence Duffy

Dyre Oliver Dammann***

Ph.D. Geophysics

B.S., University of Oslo, 2008; M.S., University of Alaska Fairbanks, 2011.

Thesis: Arctic Sea Ice Trafficability — New Strategies for a Changing Icescape

This work demonstrates an approach to improve knowledge of over-ice travel by outlining steps towards strategies capable of addressing key stakeholder needs. The result is a series of remote sensing techniques capable of evaluating critical parameters to ensure safety of sea ice operations and investigate potential implications of long-term change.

Major Professor: Dr. Hajo Eicken

Arianna Lynn Demmerly **

Ph.D. Biochemistry/Molecular Biology

B.S., Whitworth University, 2009.

Thesis: Mechanisms of Modulation of Nicotinic Acetylcholine Receptors

The effective treatment of nicotine addiction, Alzheimer's disease and other disorders requires the identification and development of better drugs. We determined how a novel drug, desformylflustrabromine, acts on neuronal receptors. Developing an understanding of how drugs change neuronal receptor function provides a baseline for the development of better therapeutic compounds.

Major Professor: Dr. Brian Edmonds

Nilesh Chandrakant Dixit

Ph.D. Geophysics

B.T., University of Pune, 2007; M.S., University of Plymouth, 2010.

Thesis: Tectono-thermal History Modeling and Reservoir Simulation Study of the Nenana Basin, Central Alaska: Implications for Regional Tectonics and Geologic Carbon Sequestration

A comprehensive assessment of the geological risks and economic benefits of carbon sequestration in one of the seismically active, deep sedimentary basins in Alaska was conducted through the development and application of an integrated suite of geological and geophysical methods, with main focus on structural geology, rock mechanics and reservoir characterization.

Major Professor: Dr. Catherine Hanks

Abraham Endalamaw***

Ph.D. ***Atmospheric Sciences***

B.S., Arba Minch University, 2005; M.P.S., Cornell University, 2009.

Thesis: Improved Mesoscale Hydrological Modeling of the Interior Alaska Boreal Forest Ecosystem

This research addressed the limitations of modeling hydrological processes in Interior Alaska boreal forest catchments by simulating small-scale processes to regional-scale catchments via development of a small-scale landscape model. By developing a coupled climate-vegetation-permafrost-hydrology model, this study also quantified the impact of future climate on hydrological processes.

Major Professors: Dr. William Bolton and Dr. Jessica Young-Robertson

Simon Vincent Pierre Filhol *

Ph.D. ***Geophysics***

M.E., University of Grenoble, 2010.

Thesis: From a Snowflake to the Snow Cover: Processes that Shape Polar and Taiga Snowpacks

Polar snow shaped by wind and taiga snow settling throughout the winter in calm conditions are the most widespread types of snow, which covers 11% of Earth. Linking processes occurring at the grain scale to the macro scale provided new insights into the formation of snow cover.

Major Professors: Dr. Matthew Sturm and Dr. Martin Truffer

Victoriya Valerievna Forsythe

Ph.D. ***Space Physics***

A.S., Utah Valley University, 2011; B.S., Utah Valley University, 2013; M.S., Russian State University, 2009.

Thesis: High Frequency Backscatter from the Polar and Auroral E-Region Ionosphere

Production of the decameter-scale irregularities in the ionospheric E-region at high latitudes was investigated both theoretically, using linear fluid theory of plasma instability processes that generate small-scale plasma waves, and experimentally, analyzing data collected with the newly deployed high-southern-latitude radars within the Super Dual Auroral Radar Network.

Major Professor: Dr. William Bristow

Joanne Heslop

Ph.D. ***Geophysics***

B.S., University of Nevada at Reno, 2011; B.S., University of Nevada at Reno, 2011.

Thesis: Permafrost Organic Matter Quality and Biolability in the Vault Lake Thermokarst Environment, Interior Alaska, USA

Permafrost warming and thawing removes a major barrier to organic carbon (OC) mineralization. Permafrost OC characterization was used in conjunction with anaerobic incubations to better constrain the biodegradability of thawed permafrost OC from two depth profiles. OC mineralization potentials varied with depth and correlated with selected OC characterization parameters.

Major Professor: Dr. Katey Walter Anthony

Christian Kienholz **

Ph.D. ***Geophysics***

B.S., University of Bern, 2007; M.S., University of Bern, 2010; M.S., University of Alaska Fairbanks, 2013.

Thesis: Current State of Alaska's Glaciers and Evolution of Black Rapids Glacier Constrained by Observations and Modeling

A new complete glacier inventory for Alaska and neighboring Canada was derived and analyzed. The mass change of Black Rapids Glacier, Alaska, was calculated for 1980-2010, taking into account rockslide deposits and earthquake displacements. A glacier model was used to project the glacier's mass changes and retreat until 2100.

Major Professor: Dr. Regine Hock

Yekaterina Y. Kontar

Ph.D. ***Disaster Risk Communication and Policy: Interdisciplinary Program***

B.A., The University of Findlay, 2007; MBA, The University of Findlay, 2009.

Thesis: Comparative Analysis of Spring Flood Risk Reduction Measures in Alaska, United States, and the Sakha Republic, Russia

This bilateral and interdisciplinary comparative analysis revealed that spring flood risk in rural Northern communities results from complex interactions among a series of natural processes and human actions. The risk can be reduced by managing conditions of ice-jam floods, and decreasing exposure and vulnerability of at-risk populations.

Major Professor: Dr. John Eichelberger

Leslie Jean Lamarche

Ph.D. ***Physics***

B.A., University of New Hampshire, 2013.

Thesis: Plasma Irregularity Production in the Polar Cap F-Region Ionosphere

Plasma irregularities in the Earth's polar ionosphere can scatter radio waves resulting in disruptions to navigation/communication systems. It is demonstrated that small-scale irregularities depend on the propagation direction in accordance with gradient-drift instability theory, although large-amplitude perturbations are controlled by more complicated processes.

Major Professor: Dr. Roman Makarevich

Amanda Lindoo*

Ph.D. ***Geology***

B.A., Augustana College, 2011.

Thesis: Causes and Consequences of Coupled Crystallization and Vesiculation in Ascending Mafic Magmas

The explosivity of a volcanic eruption is governed by how easily gases migrate through and out of magma along with the speed at which magma rises. This thesis explores the effect of crystals on the degassing process via laboratory experiments and analysis of eruption products from the Kasatochi 2008 eruption.

Major Professor: Dr. Jessica F. Larsen

* *Summer degree recipient*
** *Fall degree recipient*
*** *Summer 2017 candidate*

Kelly Marie McFarlin

Ph.D. Biological Sciences

B.S., Michigan Technological University, 2004; B.S., Michigan Technological University, 2004; M.S., University of Alaska Fairbanks, 2010.

Thesis: The Biodegradation of Oil and the Dispersant Corexit 9500 in Arctic Seawater

The risk of oil spills in the Arctic Ocean is increasing in parallel with shipping traffic and oil exploration. Microorganisms indigenous to Arctic seawater were found to biodegrade crude oil and the chemical dispersant Corexit 9500, with some oil-degrading microbes and genes being similar to those in temperate marine environments.

Major Professors: Dr. Mary Beth Leigh and Dr. Robert Perkins

James A. McKee *

Ph.D. Environmental Chemistry

B.A., Dickinson College, 1998; B.S., University of the Sciences in Philadelphia, 2004; M.S., University of the Sciences in Philadelphia, 2007.

Thesis: Synthesis and Characterization of Polymer-Supported Cyclodextrin Nanoscaffolds for use in Future Environmental Studies

Sodium heptakis (2,3-O-dibenzyl-6-O-sulfobutyl) cyclomaltoheptaose (DBSBB) and the alpha cyclodextrin analog were synthesized and found to produce micelles at approximately 0.1 mM. Highly charged monodisperse polystyrene latex nanoparticles were produced using DBSBB as a surfactant in emulsion polymerization. These nanoparticle-supported cyclodextrins show promise as prototypes for future environmental remediation nanoscaffolds.

Major Professor: Dr. Tom Green

Linda Nicholas-Figueroa

Ph.D. Science Education: Interdisciplinary Program

B.S., University of Alaska Fairbanks, 2000; M.A., University of Alaska Fairbanks, 2009.

Thesis: Traditional Ecological Knowledge of STEM Concepts in Informal and Place-Based Western Education Systems: Lessons from the North Slope, Alaska

Methods to encompass Indigenous knowledge, placed-based and informal lessons, along with real-world issues into the Western education system were achieved at Iḷisaġvik College, such as incorporating field trips and discussions with elders on the importance of animal migration and the significance of sea-ice conditions, which are important community concerns.

Major Professor: Dr. Lawrence Duffy

Douglas Ogata

Ph.D. Physics

B.S., University of California, Berkeley, 2008; M.S., Ghent University, 2011.

Thesis: Exploring the Mechanisms Behind Nondiffusive Transport in a Simple Turbulence Model

Turbulent transport remains an outstanding limitation towards sustainable nuclear fusion as an energy source. A simple flux-driven turbulence model was developed to investigate and demonstrate the nondiffusive transport characteristics of turbulent transport in fusion plasmas. A flux-driven setup is an essential ingredient for nondiffusive transport.

Major Professor: Dr. David Newman

Daniel Jeffrey Rizzolo

Ph.D. Biological Sciences

B.A., Saint Anselm College, 1996; M.S., Oregon State University, 2004.

Thesis: Contrasting Diet, Growth, and Energy Provisioning in Loons Breeding Sympatrically in the Arctic

This research investigated the consequences of resource partitioning on diet, body condition and reproductive success in Pacific and red-throated loons breeding on the coast of the Chukchi Sea. Results indicated that differential reliance on marine resources was associated with differences in diet, breeding success and, potentially, adaptive capacity.

Major Professor: Dr. Mark Lindberg

Colin Charles Triplett *

Ph.D. Atmospheric Sciences

B.S., University of Michigan, 2008; M.S., Florida Institute of Technology, 2011.

Thesis: Rocket and Lidar Studies of Waves and Turbulence in the Arctic Middle Atmosphere

Multiyear lidar and MTeX rocket measurements were used at Poker Flat Research Range to investigate waves and turbulence in the Arctic middle atmosphere. Systematic relationships between large-scale meteorology, wave activity and turbulence were found. These results have implications for current climate models and understanding atmospheric transport.

Major Professor: Dr. Richard Collins

Amanda Kay Walch *

Ph.D. Public Health Nutrition: Interdisciplinary Program

B.S., University of Minnesota, 1997; M.P.H., University of Alaska Anchorage, 2009.

Thesis: Traditional Food Security and Diet Quality in Alaska Native Women

Traditional foods positively influence the health of low-income Alaska Native women receiving food assistance. Participants believe traditional foods are healthier than store-bought foods, and they consumed an average of 3.7 percent of their calories from traditional foods. Increasing traditional food intake was positively associated with higher diet-quality scores.

Major Professor: Dr. Andrea Bersamin

Paul Wilcox***

Ph.D. ***Geology***

B.S., Middle Tennessee State University, 2010; M.S., University of Cincinnati, 2013.

Thesis: 60,000 Year Vegetation and Climate History of Southeast Alaska

Pollen in sediment cores and stable isotopes from speleothems were used to reconstruct vegetation and climate of coastal Southeast Alaska during the last glacial/interglacial transition. Continuous stalagmite growth indicates areas free of ice, and appearance of tree pollen immediately following deglaciation suggests proximity to ice age forest refugia.

Major Professor: Dr. Sarah Fowell

Alexis Prostel Will

Ph.D. ***Biological Sciences***

B.S., Bucknell University, 2006.

Thesis: An Ecological-Physiology Perspective on Seabird Responses to Contemporary and Historic Environmental Change

The study examined how seabird foraging behavior and nutritional status change at the interannual, decadal and multidecadal scale using stable isotope analysis and measuring the concentration of stress hormones in feathers. To do so, it was validated that this measure is indicative of exposure to nutritional stress in the study species.

Major Professor: Dr. Alexander Kitaysky

School of Education

Dr. Steve Atwater, Interim Dean

Carol Gering***

Ph.D. ***Online Education and Psychology: Interdisciplinary Program***

A.A.S., University of Alaska Fairbanks, 2000; B.S., Southern Nazarene University, 1980; M.Ed., University of Alaska Fairbanks, 2008.

Thesis: Strengths-Based Analysis of Student Success in Online Courses

Online student success was evaluated through analysis of personal, circumstantial and course-related variables among 27,000 postsecondary enrollments. Additional data on noncognitive attributes and perceptions, as well as personal interviews with individual students, supported a comprehensive, contextually rich understanding. Predictive models of success were generated for each level of class standing.

Major Professors: Dr. Dani Sheppard and Dr. Allan Morotti

Melissa Marie Hill

Ph.D. Education and Communication: Interdisciplinary Program

A.A., Spokane Community College, 1996; B.A., Eastern Washington University, 1999; M.Ed., University of Alaska Anchorage, 2008.

Thesis: Schools in Rural Alaska with Higher Rates of Student Achievement: A Search for Positive Deviance in Education

This study sought to identify schools in rural Alaska with higher rates of student achievement and study what factors contribute to that success. Using an advocacy worldview, the study concludes that schools in rural Alaska may never perform as a collective as well as or better than their urban counterparts.

Major Professor: Dr. Gary Jacobsen

Alice Pips Danielson Veazey

Ph.D. Science of Team Science: Interdisciplinary Program

B.A., University of Hartford, 1983; B.A., Bates College, 1987; M.S., University of Alaska Fairbanks, 1994.

Thesis: Management of Large Interdisciplinary Team Science Projects: A Multi-Methods Approach to Examining Competencies

A mixed-methods investigation used group concept mapping revealed five major competencies critical for team science managers: project management, shared leadership, personal competence, social competence and communication. Content analysis of position descriptions concluded that this suite of competencies is not reflected in current hiring practices for team science management positions.

Major Professor: Dr. John Monahan

School of Management

Dr. Mark Herrmann, Dean

Cameron D. Carlson

Ph.D. Security and Disaster Management : Interdisciplinary Program

A.S., Brookdale Community College, 1984; B.S., Monmouth College, 1986; M.A., Weber University, 1995.

Thesis: Homeland Security and Emergency Management Education: An Investigation Into Workforce Needs

This study investigates the workforce needs of an integrated homeland security and emergency management education. In a post-9/11 environment, public safety and security challenges have become increasingly frequent and complex. Practitioners defined the basis for the core educational needs of an integrated and interdisciplinary program at the baccalaureate level.

Major Professors: Dr. Kevin Berry and Dr. O. Shawn Cupp

Dominique Joyelle Pride

Ph.D. Natural Resources and Sustainability

B.B.A., Marshall University, 2007; M.S., University of Alaska Fairbanks, 2010.

Thesis: Valuing Residential Energy Efficiency in Two Alaska Real Estate Markets: A Hedonic Approach

The relationship between residential energy efficiency and the transaction prices of single-family homes in the Fairbanks and Anchorage, Alaska, real estate markets was analyzed using a hedonic pricing framework and difference-in-differences analysis. In both markets, energy-efficient homes sell for a price premium over less energy-efficient homes.

Major Professor: Dr. Joseph Little

Tobias Schwoerer

Ph.D. Socio-bioeconomics: Interdisciplinary Program

B.A., University of Alaska Anchorage, 2003; M.S., Simon Fraser University, 2007.

Thesis: Invasive Elodea Threatens Remote Ecosystem Services in Alaska: A Spatially-Explicit Bioeconomic Risk Analysis

A spatially explicit bioeconomic risk analysis combined expert elicitation with economic valuation and ecological modeling to estimate risk of elodea, Alaska's first invasive aquatic plant. Economic loss to fisheries and floatplane pilots — partly responsible for elodea's dispersal — is estimated at $100 million annually if no management occurs.

Major Professor: Dr. Joseph Little

School of Natural Resources and Extension

Dr. David W. Valentine, Director of Academic Programs

Miho Morimoto *

Ph.D. ***Natural Resources and Sustainability***

B.S., Hokkaido University, 2009; M.S., Hokkaido University, 2011.

Thesis: Past, Current, and Future Forest Harvest and Regeneration Management in Interior Alaska Boreal Forest: Adaptation under Rapid Climate Change

Forest harvest management has a 40-year history in boreal Alaska. Historical forest harvest is much smaller than the allowable cut. Only white spruce receives regeneration assistance. Management affects regeneration weakly compared to landscape environmental factors. Regeneration, largely successful now, would begin to fail with warming. Adaptive management planning approaches are offered.

Major Professor: Dr. Glenn Juday

Jon Albert Skinner **

Ph.D. ***Polar Geography and Strategic Studies: Interdisciplinary Program***

A.A., University of Alaska Anchorage, 1986; B.A., University of Alaska Fairbanks, 1981; B.A., University of Alaska Fairbanks, 1983; M.S., Naval Postgraduate School, 1993.

Thesis: Russian Capacity to Develop its Offshore Hydrocarbon Resources in the Kara Sea: Arctic and Global Implications

The Kara Sea represents the largest unexploited oil and gas potential remaining for Russia. Failure to achieve production at the pace they envision could impact its strategic stability. Scenario narratives were developed to explore the complex drivers of hydrocarbon development in the Kara Sea.

Major Professor: Dr. Lawson Brigham

* *Summer degree recipient*
** *Fall degree recipient*
*** *Summer 2017 candidate*