The Class of 2014

Doctor of Philosophy Degrees

College of Engineering and Mines

Dr. Douglas J. Goering, Dean

Liangbiao Chen **

Ph.D. ***Engineering: Mechanical Engineering***

B.C.E., Shaghai Jiao Tong University, 2006; M.C.E., University of Alaska Fairbanks, 2011.

Thesis: Using the Generalized Interpolation Material Point Method for Fluid-Solid Interactions Induced by Surface Tension

Numerical algorithms were developed to handle surface tension and contact (wetting) in fluid-solid interaction problems at small scales based on the generalized interpolation material point method. The algorithms generally yielded errors of less than 5 percent in simulating various benchmark problems.

Major Professors: Dr. Jonah Lee and Dr. Cheng-fu Chen

Peng Li *

Ph.D. ***Engineering: Civil Engineering***

B.S., Chang'an University, 2004; M.S., Chang'an University, 2007.

Thesis: Characterization and Implementation of Stress Dependent Resilient Modulus of Asphalt Treated Base for Flexible Pavement Design

The stress-dependent property of resilient modulus (MR) was measured and modeled for four types of asphalt-treated base course materials. The stress-dependent MR was incorporated in pavement analysis using a finite element method. Predictive equations for MR and critical pavement responses were developed. Equivalent MRs were also recommended.

Major Professor: Dr. Jenny Liu

Edda Andrea Mutter

Ph.D. Arctic Environmental Science: Interdisciplinary Program

B.S., University of Alaska Anchorage, 2002; M.S., University of Alaska Anchorage, 2004.

Thesis: Assessment of Contaminant Concentrations and Transport Pathways in Rural Alaska Communities' Solid Waste and Wastewater Sites

Waste management practices currently employed in many rural Alaska communities are potentially impacting human and environmental health. This study investigated soil, surface and subsurface waters in the vicinity of five rural Alaska communities' waste sites for the presence of heavy metals, organic constituents and microbial indicator organisms.

Major Professor: Dr. William Schnabel

Seok J. Yoon

Ph.D. Environmental Health and Safety Management for Mining and Other Industries: Interdisciplinary Program

B.S., Dankook University, 1991; M.S., University of Alaska Anchorage, 1995.

Thesis: Environment, Health and Safety Management for Mining and Other Industries

This study was to investigate the impact of environment and Occupational Health and Safety Management System (OHSMS) on health and safety. Three case studies were conducted to examine the impact of abandoned mines on the environment, the effect of OHSMS implementation on reducing safety risk and the impact of environment on health.

Major Professor: Dr. Hsing Lin

Yongjun Zhang

Ph.D. Materials Science and Engineering: Interdisciplinary Program

B.E., Tongji University, 1995; M.E., Tongji University, 1997; M.E., National University of Singapore, 2002.

Thesis: Correlation of Microstructure and Thermo-Mechanical Properties of a Novel Hydrogen Transport Membrane

DOE's "FutureGen" concept is about production of hydrogen using hydrogen transport membranes (HTM) to fuel a "hydrogen economy." Major technical challenges for efficient and reliable HTM are separation technology, hydrogen flux characterization and mechanical properties. This research provides the thermo-mechanical properties and structural stability of a novel HTM for real-world application.

Major Professor: Dr. Sukumar Bandopadhyay

College of Liberal Arts

Mr. Todd Sherman, Dean

Kathryn Jane Anderson **

Ph.D. Social Marketing: Interdisciplinary Program

B.S., Arizona State University, 1973; M.S., Rutgers University, 1975; M.S., University of Alaska Anchorage, 2009.

Thesis: Tobacco Use and Cessation: What Matters to Southeast Alaska Native Young Adults?

Qualitative research discovered that Southeast Alaska Native young adult smokers wanted to quit but preferred quitting cold turkey to counseling and pharmacotherapy. They were more concerned about short- than long-term health impacts and were sensitive to the impact of smoking on their appearance and on children in their extended family.

Major Professors: Dr. Ellen Lopez and Dr. Rhonda Johnson

Edgar Blatchford *

Ph.D. Corporate Governance of ANCSA: Interdisciplinary Program

B.A., Alaska Pacific University, 1973; J.D., University of Washington, 1976; M.S., Columbia University, 1988; M.A., Dartmouth College, 2010; M.P.A., Harvard University, 2011.

Thesis: Alaska Native Claims Settlement Act and the Unresolved Issues of Profit Sharing, Corporate Democracy, and the New Generations of Alaska Natives

The Alaska Native Claims Settlement Act was an experiment and a radical departure from policies in creating corporations with all shareholders being equal. The replication of publicly traded corporate governance has created frustrations, inequities and unintended consequences for thousands of Natives that can be righted only if the experiment is continued.

Major Professors: Dr. S. Craig Gerlach and Dr. Anthony Nakazawa

Andreas Droulias *

Ph.D. Anthropology

B.A., University of Essex, 1999; M.A., University of Essex, 2001.

Thesis: Social Benefits and Cultural Consequences of Basketball in Alaska

Basketball is deeply institutionalized in schools and communities across Alaska. This investigation of the sport examined the role of basketball as a game, a formal and informal competitive sport, a spectator sport and a training regime in the social and cultural life of a rural community in the state.

Major Professor: Dr. David Koester

Tara Jeanette Ford *

Ph.D. Clinical-Community Psychology: Rural Indigenous Emphasis

B.A., University of Alaska Anchorage, 2006; M.S., University of Alaska Anchorage, 2011.

Thesis: Becoming Adults in a Rural Yup'ik Community: A Longitudinal Qualitative Study Exploring Resilience

This qualitative longitudinal study explored strategies for navigating developmental challenges for 15 youth (14–20 years old) in a rural Alaska Yup'ik community. Youth responses emphasized specific challenges and protective resources such as reframing challenges, seeking personal space and social supports. Findings can inform clinical and prevention work in this Yup'ik community.

Major Professors: Dr. James Allen and Dr. Jason Whipple

Cheryl Louise Jerabek

Ph.D. Indigenous Studies

B.S., University of Wisconsin - Green Bay, 2001; M.A., University of Alaska Fairbanks, 2005.

Thesis: Russian Impact on Cultural Identity and Heritage in the Middle Kuskokwim Region of Alaska

Russian heritage, which has been absorbed into the local culture, has played an important role in the individual and group identity of Native people in the middle Kuskokwim River region of Alaska. It is this indigenous rootedness that is at the core of identity in the middle Kuskokwim.

Major Professor: Dr. Raymond Barnhardt

Kimberly Ann Kelly *

Ph.D. Administration from a Social Psychological Perspective: Interdisciplinary Program

B.A., University of Illinois, 1992; M.A., Columbia University, 1994; M.A., New York University, 1996; M.Ed. University of Alaska Anchorage, 1999; M.B.A. University of Alaska Fairbanks, 2012.

Thesis: The Impact of Teacher Achievement Emotions on the Co-Production of Education Services

Educational policy in the United States has evolved into a more intense system of accountability, resulting in an intensification of achievement emotions experienced by teachers. Employing the control-value theory of achievement emotions, this study found that a teacher's sense of control was significantly related to their effectiveness under such policies.

Major Professor: Dr. Cecile Lardon

Seetha Murugesan **

Ph.D. Cross-Cultural Classics and Mythology: Interdisciplinary Program

B.A., University of Madras, 1970; M.A., Madurai Kamaraj University, 1984.

Thesis: Bride Stealing: A Myth of Misogyny

Bride-stealing, an explicit symbolic misogynistic action in *The Iliad* and *The Kamba Ramayanam*, is analyzed from an interdisciplinary stance in a comparative literary style. After examining 5,000 years of history of ancient Greece and India, substantiated by archaeological, anthropological and linguistic evidence, this dissertation concludes that bride-stealing was an outcome of nomadic patriarchs' lust for war and not misogyny.

Major Professors: Dr. Lawrence Duffy and Dr. David Yesner

Feng Qu *

Ph.D. Anthropology

B.A., Jilin University, 1987; M.A., Leiden University, 2004.

Thesis: The Legacy of Shamans? Structural and Cognitive Perspectives of Prehistoric Symbolism in the Bering Strait Region

Based on ethnographic records and drawing from practice theory and animist ontology, an ethnographic analysis was conducted to explore the symbolic meanings of the prehistoric art in the Bering Strait region. Interpretations of the variants of art productivity, cosmological structures, and relationship between humans and materials were provided.

Major Professors: Dr. Peter Schweitzer and Dr. Ben Potter

Diana G. Redwood **

Ph.D. Public Health: Interdisciplinary Program

B.S., Evergreen State College, 2000; M.P.H., Tufts University, 2004.

Thesis: Use of Family History to Improve Colorectal Cancer Screening Outreach Among Alaska Native People

This study examined predictors of colorectal cancer (CRC) screening adherence among Alaska Native first-degree relatives (FDRs) of CRC patients, the extent to which CRC screening outreach for FDRs is occurring within the Alaska Tribal Health System, barriers and facilitators to increasing outreach efforts, and recommendations for improving FDR screening outreach.

Major Professor: Dr. Ellen Lopez

Lisa Llewellyn Schwarzburg **

Ph.D. Rural and Indigenous Health Policy: Interdisciplinary Program

B.S., University of Tennessee - Knoxville, 1981; M.S., University of Tennessee - Knoxville, 1985.

Thesis: Arctic Passages: Maternal Transport, Iñupiat Mothers, and Northwest Alaska Communities in Transition

This research explores the impact of maternal transport on Iñupiat mothers of differing eras and northwest Alaska villages. By combining medical anthropology and policy analysis methodology, the study found connections among presence of Iñupiat values, community acceptance of maternal transport, and expressed desire for community autonomy in maternal health care.

Major Professors: Dr. Lawrence Duffy and Dr. Philip Loring

College of Natural Science and Mathematics

Dr. Paul W. Layer, Dean

Timothy Chester Bartholomaus **

Ph.D. Geophysics

B.A., Dartmouth College, 2002; M.S., University of Colorado - Boulder, 2007.

Thesis: Seismicity, Seawater, and Seasonality: New Insights Into Iceberg Calving From Yahtse Glacier, Alaska

Icebergs falling from glacier termini produce seismic signals when they impact the ocean. The size of an iceberg can be predicted by its "icequake." With two years of icequake recordings and measurements of seawater properties, the research shows that the ocean controls summer ice mass loss from the Yahtse Glacier terminus.

Major Professor: Dr. Christopher Larsen

Soumik Basu

Ph.D. Atmospheric Sciences

B.S., University of Calcutta, 2006; M.S., University of Calcutta, 2008.

Thesis: Modeling Investigation of Northern Hemisphere Extratropical Storm Variability and Changes in a Warming Climate

A modeling investigation indicated increased number and intensity of storms over the U.S. East and West coasts in response to elevated tropical Pacific sea surface temperature. Reduced arctic sea ice cover caused an increase in storminess over the Arctic but a decrease over Eurasia.

Major Professor: Dr. Xiangdong Zhang

Jennifer Michelle Bell

Ph.D. Environmental Chemistry

A.A., San Bernardino Valley College, 1998; B.S., California State University, San Bernardino, 2001; M.P.A., California State University, San Bernardino, 2004; M.S., California State University, San Bernardino, 2008.

Thesis: Characterization, Composition, and Source Identification of Iraqi Aerosols

Soldiers deployed in Baghdad, Iraq, breathed air containing concentrations of fine particulate matter known to cause adverse health effects in humans. This study examined the concentrations, compositions and sources of the fine particulate matter in Baghdad's air.

Major Professor: Dr. Catherine Cahill

Zhipeng Dai **

Ph.D. ***Biochemistry/Molecular Biology***

B.S., Zhengzhou University, 2006.

Thesis: Synthesis of Sphingosine Analogues by Diastereospecific Amination of Enantiopure Trans-Gamma, Delta-Unsaturated-Beta-Hydroxyesters

An effective route to aromatic D-erythro-sphingosine analogues is accomplished. The strategy is based on the diastereospecific amination of enantiopure trans-γ,δ-unsaturated β-hydroxyesters to establish anti, N-Boc-α-hydrazino-β-hydroxyesters. Nonreductive E1cB elimination is essential for the successful N-N bond cleavage of hydrazine. Both (3R, 2S) and (3S, 2R) enantiomers of N-Boc-D-erythro-sphingosine analogues have been synthesized in five steps with >99% e.e. and >99% d.e. with no purification of stereoisomers required.

Major Professor: Dr. Tom Green

Melody S. Durrett

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

B.S., University of Wyoming, 2003.

Thesis: Spatial Variability in Plant and Soil Properties on New Zealand Seabird Islands, and the Effects of Introduced Rats

Seabirds are important ecosystem engineers. To understand their effects on individual islands, the study evaluated the variability in soil and plant properties, how seabirds control these properties and how seabird density alters these mechanisms. Invasive rats reduce seabird populations, dramatically altering island ecosystems.

Major Professor: Dr. Christa Mulder

Wenyu Gong

Ph.D. ***Geophysics***

B.S., Wuhan University, 2006; M.S., Chinese Academy of Surveying and Mapping, 2009.

Thesis: Long-Term Monitoring of Geodynamic Surface Deformation Using SAR Interferometry

This study explores the method to extract accurate ground deformation signals from radar satellite image to facilitate long-term volcano monitoring and study their geophysical signatures. A geophysical case study is performed on the active volcanoes of Unimak Island, Alaska, including Westdahl volcano, Fisher caldera and Shishaldin volcano.

Major Professor: Dr. Franz Meyer

Marijke Habermann **

Ph.D. ***Geophysics***

M.S., Swiss Federal Institute of Technology Zurich, 2007.

Thesis: Basal Shear Strength Inversions for Ice Sheets with an Application to Jakobshavn Isbræ, Greenland

A new iterative inverse method is introduced and effects of regularization are investigated. At Jakobshavn Isbræ, the research finds decreased basal shear strength in the terminus region that agrees with effective pressure changes. Residual patterns of the inversion suggest that ice geometry data and model simplifications are the main error sources.

Major Professor: Dr. Martin Truffer

Rebekah Frances Hare

Ph.D. Biological Sciences

B.S., Washington State University, 2004; M.S., University of Alaska Fairbanks, 2010.

Thesis: Localization of Francisella Pathogenicity Island-Encoded Secreted Proteins and Their Secretion System

The Francisella pathogenicity island (FPI) is linked to virulence, intracellular growth and a type VI secretion system. The hypothesis is that FPI-encoded proteins are secreted during infection. Microscopy showed extracellularly localized FPI-encoded proteins. Extracellular-localization was reduced when expressed in the secretion mutant. These data suggest that FPI encoded proteins are secreted.

Major Professor: Dr. Karsten Hueffer

Joanne Healy

Ph.D. Educational Bioanthropology: Interdisciplinary Program

B.Ed., University of Alaska Fairbanks, 1983; M.S., Western Oregon University, 1987.

Thesis: Observable Effects of Attention, Posture, Ergonomics and Movement in the Classroom

Using quantitative and qualitative approaches, the observable effects of postural education, current state of classroom furniture, classroom arrangements and pedagogical practices in regards to student movement and learning engagement were assessed. Elementary school students and teachers' value of posture, classroom movement and engagement depended on individual teacher pedagogical practices.

Major Professor: Dr. Abel Bult-Ito

Benjamin M. Jones **

Ph.D. Geoscience: Interdisciplinary Program

B.S., University of Cincinnati, 2003; M.A., University of Cincinnati, 2006.

Thesis: Remote Sensing of Arctic Landscape Dynamics

Remote sensing provides an excellent tool for observing, documenting and better understanding landscape change in the Arctic at a variety of spatial and temporal scales. Remote sensing tools and techniques were used to study a permafrost coastline, thermokarst lakes, tundra fires and vertical surface dynamics of a coastal lowland landscape.

Major Professor: Dr. Guido Grosse

Corrine Noel Knapp **

Ph.D. Environmental Change and Human Adaptation: Interdisciplinary Program

B.A., University of Colorado - Denver, 1999; M.S., Colorado State University, 2008.

Thesis: Engaging Local Perspectives for Improved Conservation and Climate Change Adaptation

Climate change is a global process that has heterogeneous local impacts. This dissertation explores what local knowledge can contribute to conservation and climate adaptation planning. It highlights how perceptions influence social-ecological feedbacks and how science can be more relevant to decision-makers in the context of climate change.

Major Professor: Dr. F. Stuart "Terry" Chapin III

Mary-Cathrine Christina E. Leewis

Ph.D. Biological Sciences

B.S., Northern Michigan University, 2004; M.S., Northern Michigan University, 2006.

Thesis: Ecological Mechanisms and Effectiveness of Bioremediation in Alaska

Plant-microbe interactions are important to biogeochemical cycling and can be harnessed to bioremediate environmental contaminants. In Alaska soils, microbial community structure and functional potential were found to be driven by vegetation type, and that planting and fertilization determine the trajectories of local plant and microbial succession over the long term.

Major Professor: Dr. Mary Beth Leigh

Robert Whitfield McNabb *

Ph.D. Geophysics

B.A., Kalamazoo College, 2008.

Thesis: On the Frontal Ablation of Alaska Tidewater Glaciers

The study investigated the frontal ablation of 50 Alaska tidewater glaciers using topographic maps and Landsat imagery to derive glacier length change over the period of 1948–2012. Landsat imagery was used to derive surface velocity fields, and with estimates of ice thickness, frontal ablation for 20 Alaska tidewater glaciers.

Major Professor: Dr. Regine Hock

Hirotsugu Mori

Ph.D. Geology

B.S., Kyushu University, 2006; M.S., Brigham Young University, 2009.

Thesis: Osteology, Relationships and Paleoecology of a New Arctic Hadrosaurid (Dinosauria: Ornithopoda) from the Prince Creek Formation of Northern Alaska

Fossils from a Late Cretaceous duck-billed dinosaur from northern Alaska are described. Based on several analyses a new species of Edmontosaurus is recognized. Analysis of strontium isotopes in the teeth and bones reveals that the dinosaur did not migrate during the last four months of life.

Major Professor: Dr. Patrick Druckenmiller

Bryan Patrick Mosher

Ph.D. Biological Sciences

B.A., University of British Columbia, 2010.

Thesis: Intermittent Hypercapnia Induces Long-Lasting Ventilatory Plasticity to Enhance CO_2 Responsiveness to Overcome Dysfunction

An intermittent hypercapnia protocol induced long-term ventilatory plasticity to enhance CO_2/pH responsiveness regardless of the developmental period in which it was administered. Resulting plasticity was capable of overcoming a chronic, mild ventilatory dysfunction induced by maternal dietary tryptophan deficiency as well as an acute, profound ventilatory dysfunction induced by pharmacological blockade.

Major Professor: Dr. Michael Harris

Amelia Phillips *

Ph.D. Computer Security: Interdisciplinary Program

B.S, Massachusetts Institute of Technology, 1981; M.B.A., University of Phoenix, 1998.

Thesis: An Investigation of Digital Forensic Concepts in an International Environment: The U.S., South Africa, and Namibia

A qualitative study of digital evidence in the United States, South Africa and Namibia demonstrated that the only significant difference was in the privacy laws. The investigation compared constitutional, civil, criminal, privacy, evidence, hearsay and extradition law. A database prototype was generated to assist in evaluation of other common-law nations.

Major Professor: Dr. Kara Nance

David Bryan Podrasky **

Ph.D. Geophysics

B.A., University of Montana, 2006.

Thesis: Jakobshavn ISBRÆ: Velocity Variations From Hourly to Decadal Time Scales at Greenland's Fastest Tidewater Glacier

Velocity variations on Jakobshavn Isbræ, in West Greenland, occur over decadal to hourly time scales. However, the long-term evolution of speeds is driven by changes in glacier geometry, and the associated rates of ice loss have the potential to contribute significantly to sea level rise over the next century.

Major Professor: Dr. Martin Truffer

Susana Salazar Jaramillo

Ph.D. Geology

B.A., Universidad Nacional de Colombia, 2003.

Thesis: Paleoclimate and Paleoenvironment of the Prince Creek and Cantwell Formations, Alaska: Terrestrial Evidence of a Middle Maastrichtian Greenhouse Event

Data were collected from a ~ 69.5 Ma radiometric age pollen analysis, clay mineral analysis and stable isotope analysis of clay minerals and organic matter to reconstruct the paleoclimate and paleoenvironment of the Prince Creek and Cantwell formations, Alaska. The data show evidence of a terrestrial Late Cretaceous greenhouse event called "The Middle Maastrichtian Event."

Major Professors: Dr. Sarah Fowell and Dr. Paul McCarthy

Grant T. Shimer *

Ph.D. Geology

B.A., Beloit College, 2003; M.S., University of Alaska Fairbanks, 2009.

Thesis: Sedimentology and Stratigraphy of the Nanushuk Formation and Related Foreland Basin Deposits, Central Brooks Range Foothills, Alaska

The Cretaceous Nanushuk Formation from the North Slope of Alaska contains potential untapped hydrocarbon reservoirs. Data and observations from subsurface wells in the National Petroleum Reserve – Alaska were used to interpret the sedimentology and stratigraphy of the Nanushuk Formation in the Brooks Range foothills of the central North Slope.

Major Professor: Dr. Paul McCarthy

Torge S. Steensen **

Ph.D. Geophysics

B.S., Westfälische Wilhelms-Universität Münster, 2007; M.S., University of Bristol, 2009.

Thesis: Satellite to Model Comparisons of Volcanic Ash Emissions in the North Pacific

A comparative analysis of quantitative and qualitative determinations for volcanic ash emissions has been conducted using satellite remote sensing data sets and volcanic ash transport and dispersion models to enhance the near real-time forecast of volcanic ash dispersion and to mitigate potential hazards.

Major Professor: Dr. Peter Webley

Ina Timling **

Ph.D. Biological Sciences

M.S., University of Rostock, 1994; M.S. University of Minnesota, 2004.

Thesis: Peeking Through a Frosty Window: Molecular Insights Into the Communities of Arctic Soil Fungi

Fungi are thought to be one of the most diverse groups of organisms in the Arctic. This research used molecular methods to explore the biodiversity and distribution patterns of soil fungal communities as well as their environmental drivers across a bioclimatic gradient in the North American Arctic.

Major Professors: Dr. Donald Walker and Dr. Lee Taylor

Trang Thu Tran *

Ph.D. Environmental Chemistry

B.S., Ho Chi Minh University of Natural Science, 2005; M.S., Asian Institute of Technology, 2008.

Thesis: Air Quality Degradation in Alaska Wilderness Areas Due to Emission Changes

A numerical modeling approach was used to identify the impacts of emission increases on the aerosol concentration in the wilderness areas of Alaska. This study helps policy makers plan appropriate emission control strategies to prevent air quality of wilderness areas from degrading.

Major Professor: Dr. Catherine Cahill

Barbara Lea Truessel **

Ph.D. Geophysics

M.S., Swiss Federal Institute of Technology Zurich, 2007.

Thesis: Rapid Thinning and Collapse of Lake Calving Yukutat Glacier, Southeast Alaska

Yakutat Glacier is a low-elevation lake-calving glacier. It experienced rapid thinning between 2000–2010 and terminus retreat since the early 20th century. Starting in 2010, increased retreat was caused by the disintegration of a floating tongue into large tabular icebergs. Melt modeling showed that rapid thinning will increase in the future.

Major Professor: Dr. Martin Truffer

Shannon Renae Uffenbeck *

Ph.D. Biochemistry/Molecular Biology

B.S., University of Alaska Anchorage, 2000; M.S., University of Alaska Anchorage, 2008.

Thesis: Histone H2A-S122 is Required for Nuclear and Mitochondrial Genome Stability

Organization and maintenance of mitochondrial and nuclear genomes are vastly different, yet this research has shown that a single serine in the H2A C-terminal tail (H2A-S122) is critical for stability of both genomes in budding yeast. H2A-S122 mutation results in increased nuclear chromosome abnormalities and complete loss of the mitochondrial genome.

Major Professors: Dr. Thomas Kuhn and Dr. Jocelyn Krebs

James Joseph Willacker **

Ph.D. Biological Sciences

B.S., State University of New York, 2006; M.S., University of Alaska Anchorage, 2009.

Thesis: Ecological Drivers of Mercury Accumulation in Threespine Stickleback Fish

This study utilized the ecological diversity of threespine stickleback fish (*Gasterosteus aculeatus*) to examine the relative importance of various biological factors in determining mercury accumulation within and between populations. There was substantial variation in the importance of individual factors; however, trophic factors were important in all groups examined.

Major Professors: Dr. Todd O'Hara and Dr. Frank von Hippel

Rebecca C. Young

Ph.D. Biological Sciences

B.S., Indiana University - Bloomington, 2007.

Thesis: Behavior, Physiology, Biological Age, and Cultural Role of Long-Lived Bering Sea Seabirds

Biological age measures progress through life, incorporating individual variation. It is a good predictor of foraging behavior in the thick-billed murre (*Uria lomvia*), strongly mediated by sex and environmental conditions. We also confirm seabirds as an important cultural resource, with economic potential, to the people of the Pribilof Islands.

Major Professor: Dr. Alexander Kitaysky

School of Education

Dr. Allan Morotti, Dean

Amy Elizabeth Barnsley

Ph.D. Mathematics Education: Interdisciplinary Program

B.S., University of Alaska Fairbanks, 1993; M.A., University of Alaska Fairbanks, 2007.

Thesis: Analysis of the Effects of Online Homework on the Achievement, Persistence, and Attitude of Developmental Mathematics Students

An investigation of the effects of online homework on the achievement, persistence and attitude of developmental mathematics students used a matched-pair experimental design. A postsurvey was used to explore opinions of students and instructors. Special analysis was done on data from Alaska Native and nontraditional students.

Major Professor: Dr. Ute Kaden

School of Fisheries and Ocean Sciences

Dr. Michael A. Castellini, Dean

Jessica Nicole Cross **

Ph.D. Oceanography: Chemical

B.S., Rhodes College, 2008.

Thesis: Carbon Biogeochemistry of the Eastern Bering Sea Shelf

Recent observations of the Bering Sea carbon cycle and anthropogenic ocean acidification processes indicate that a significant reduction in pH has caused shallow-water dissolution of carbonate minerals in some commercially valuable areas. The accumulation of anthropogenic CO_2 could cause these conditions to become widespread across this area by 2100.

Major Professor: Dr. Jeremy Mathis

Megan Jane Peterson

Ph.D. Fisheries

B.A., University of California - Davis, 2002; M.O., University of California - San Diego, 2007.

Thesis: Toothed Whale Interactions with Longline Fisheries in Alaska

Whale depredation occurs when whales damage/remove fish caught on fishing gear. A mixed-methods approach incorporating statistical modeling and social research evaluated spatio-temporal depredation trends, depredation effects on groundfish catches, and socio-economic implications of depredation for commercial longline fleets in western Alaska. Depredation impacted longline fishing practices and profitability.

Major Professors: Dr. Franz Mueter and Dr. Courtney Carothers

Jill-Marie Seymour

Ph.D. Marine Biology

B.A., Mills College, 2006.

Thesis: Pacific Walrus Use of Higher Trophic Level Prey and the Relation to Sea Ice Extent, Body Condition, and Trichinellosis

An investigation of walruses' (*Odobenus rosmarus divergens*) reliance on higher trophic level prey used stable isotope analysis, disease surveillance, and measurements of body condition and stress proxies to evaluate impacts to walrus health. Results suggested that there are currently no adverse effects to walruses from consuming higher trophic level prey.

Major Professor: Dr. Larissa-Ariane Horstmann-Dehn

Elizabeth Calvert Siddon *

Ph.D. Fisheries

B.S., University of New Hampshire, 2000; M.S., University of Alaska Fairbanks, 2005.

Thesis: Ecology and Energetics of Early Life Stages of Walleye Pollock in the Eastern Bering Sea: The Role of Spatial Variability Across Climatic Conditions

This dissertation examines climate-driven spatial and temporal dynamics in the ecology of early life stages of walleye pollock in the eastern Bering Sea, including patterns of community structure, prey dynamics, and physical oceanographic conditions that influence the growth and survival of this important gadoid population in a sub-arctic marine ecosystem.

Major Professor: Dr. Franz Mueter

Ellen Martinson Yasumiishi **

Ph.D. Fisheries

B.S., University of Alaska Southeast, 1996; M.S., University of Idaho, 2004.

Thesis: Growth of Chum Salmon in Relation to Population Abundance and Climate in the Eastern North Pacific Ocean and the Recruitment of Pollock in the Eastern Bering Sea

Size at maturity of chum salmon was linked to growth during the immature stages in offshore waters of the North Pacific Ocean. Growth varied with both climate variability and fish production. Growth of chum salmon captured in the pollock fishery and summer sea temperature were indicators for age-1 pollock recruitment.

Major Professor: Dr. Keith Criddle

School of Natural Resources and Agricultural Sciences

Dr. Stephen D. Sparrow, Interim Dean

Cindy E. Fabbri *

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

B.A., Miami University, 1994; M.Ed., University of Alaska Fairbanks, 2002.

Thesis: A Model for Sustainability Science in Higher Education: Water Research, Science and Sustainability Literacy, and Community Adaptive Capacity

Conceptual and applied models that emphasize the integration of research, learning and community for implementing sustainability science were developed. The applied model was examined and found to be effective in generating knowledge about freshwater systems and increasing students' science and sustainability literacy. The model also slightly enhanced community adaptive capacity.

Major Professor: Dr. Elena Sparrow

Susan Ferguson Loshbaugh

Ph.D. ***Environmental History: Interdisciplinary Program***

B.A., Carleton College, 1976; M.S., University of Minnesota - Twin Cities, 1981.

Thesis: The History of Land Use on Alaska's Kenai River and its Implications for Sustaining Salmon

Environmental history and landscape analysis showed that development near Kenai, Soldotna and Sterling threatens the Kenai River's famous salmon. Delayed effects may mask past damage from bygone boom years. Now strong community stewardship offers hope that Alaskans will learn from mistakes elsewhere and preserve critical fish habitat.

Major Professors: Dr. Susan Todd and Dr. Falk Huettmann