

THE CLASS OF 2012

DOCTOR OF PHILOSOPHY DEGREES



COLLEGE OF ENGINEERING AND MINES

Dr. Douglas J. Goering, Dean

Walter Johannes Fourie **

Ph.D. Engineering: Environmental Engineering

B.Eng., University of Pretoria (South Africa), 2001.

Thesis: Micro-Scale Analysis of Fluid Flow and Diffusion in Coarse Grained Porous Media

X-ray computed tomography and finite element analysis were used to visualize the internal geometry of coarse grained porous media and calculate the hydraulic conductivity and the diffusion of a dissolved species through the media. The relative importance of micro-scale parameters such as porosity, tortuosity, connectivity and constrictivity were assessed.

Major Professor: Dr. David Barnes

Donald Bruce Mentch *

Ph.D. Engineering: Electrical Engineering

B.S., United States Air Force Academy (Colorado), 1994; M.S., University of Alabama, 2003.

Thesis: CubeSat Attitude Control Utilizing Low-Power Magnetic Torquers and a Magnetometer

A satellite attitude control system based on a very low-power magnetic torquer was developed. This is the first use of this torquer to stop the satellite from spinning and the first use of a dual axis magnetic bias to point the satellite's camera in the correct direction.

Major Professor: Dr. Denise Thorsen

Zhenhua Rui **

Ph.D. Energy and Mineral Engineering Management: Interdisciplinary Program

B.S., Nanjing Normal University (People's Republic of China), 2004; M.S., University of Alaska Fairbanks, 2009; M.B.A. University of Alaska Fairbanks, 2011.

Thesis: Comprehensive Investigation into Historical Pipeline Construction Costs and Engineering Economic Analysis of Alaska In-State Gas Pipeline

This study analyzes historical cost data of 412 pipelines and 220 compressor stations in terms of various parameters to provide a reference for the pipeline industry. On the basis of this analysis, the study also evaluates the feasibility of an Alaska in-state gas pipeline using Monte Carlo simulation techniques.

Major Professors: Dr. Paul Metz and Dr. Gang Chen



COLLEGE OF LIBERAL ARTS

Dr. Anita Hartmann, Acting Dean

Stephen Walkie Charles *

Ph.D. Applied Linguistics: Interdisciplinary Program

B.Ed., University of Alaska Fairbanks, 1988; M.Ed., University of Massachusetts Amherst, 1993.

Thesis: Dynamic Assessment in a Yugtun Second Language Intermediate Adult Classroom

This study focused on seven college students through Dynamic Assessment. Students were able to accomplish tasks with teacher guidance which they cannot yet do individually. It shows how mediating learners through Yup'ik ways of teaching, they are able to self-correct and play more active roles in their own learning.

Major Professors: Dr. Sabine Siekmann and Dr. Marilee Coles-Ritchie

Cody L. Chipp

Ph.D. Clinical-Community Psychology

(Awarded jointly by the University of Alaska Fairbanks and the University of Alaska Anchorage) B.S., Boise State University (Idaho), 2003; M.S., University of Alaska Anchorage, 2006.

Thesis: Factors Contributing to Weight Gain Among College Freshmen and Beyond

Dietary habits were drivers of weight gain among college students. University stakeholders identified supports for healthy living, including access to nutritious food and physical amenities. Barriers identified were access to high-calorie foods, limited recreation facilities, and policy challenges. Implications for health promotion, food availability, recreation, and physical amenities are discussed.

Major Professor: Dr. Christiane Brems

* Summer degree recipient

** December degree recipient

Valerie M. Gifford

Ph.D. Clinical-Community Psychology

(Awarded jointly by the University of Alaska Fairbanks and the University of Alaska Anchorage)
B.A., University of Alaska Fairbanks, 1997; M.S.W., Yeshiva University (New York), 2001.

Thesis: Factors that Contribute to Rural Provider Retention, Service Utilization, and Engagement in Mentorship by Cultural Experts

An exploratory qualitative study in Alaska's Bering Strait Region utilized grounded theory methods to identify personal qualities of healthcare providers and other factors contributing to provider retention, community member utilization of providers' services, and providers' engagement in cultural mentorship. In addition, factors contributing to local provider retention were examined.

Major Professor: Dr. Inna Rivkin

Jaymes R. Gonzales

Ph.D. Clinical-Community Psychology

(Awarded jointly by the University of Alaska Fairbanks and the University of Alaska Anchorage)
B.A., University of Alaska Anchorage, 2001; M.S., University of Alaska Anchorage, 2003.

Thesis: Concurrent Validation of Alaska's Juvenile Justice Suicide Risk Screening Measure

The concurrent validity of Alaska's Division of Juvenile Justice Mental Health/Suicide Screening (MHSS) measure was examined by exploring its relationship with measures of suicidal risk and suicidal protective factors. The obtained correlations were not large enough to suggest concurrent validation or to advise the continued use of the MHSS.

Major Professor: Dr. Robert Boeckmann

Alison Dawn Laybolt

Ph.D. Anthropology

B.A., University of Waterloo (Canada), 1997; M.A., Memorial University of Newfoundland (Canada), 1999.

Thesis: Site Formation Processes and Environmental Reconstruction at the Mink Island Archaeological Site (XMK-030), Katmai National Park and Preserve, Alaska

Research was initiated to document climate and weather through geoarchaeological data, and possibly identify any related changes in human behaviors at an archaeological site in Katmai National Park and Preserve, Alaska. Results illustrated that the employed techniques were best suited to determining site formation processes, not broader climate events.

Major Professor: Dr. Maribeth Murray

Virginia Cress Parret *

Ph.D. Clinical-Community Psychology

B.S., University of Alaska Anchorage, 2002; M.S., University of Alaska Anchorage, 2005.

Thesis: Meeting the Needs of Breast Cancer Survivors in Alaska: Survivors' and Healthcare Providers' Perspectives

The study sought to identify and bring awareness to the needs of Alaskan breast cancer survivors. Results from 309 breast cancer survivors and 31 healthcare providers revealed key barriers and services gaps along with ways to improve services for breast cancer survivors living in Alaska.

Major Professor: Dr. Christiane Brems



COLLEGE OF NATURAL SCIENCE AND MATHEMATICS

Dr. Paul W. Layer, Dean

Eric Thomas Adamson

Ph.D. Space Physics

B.S., University of Alaska Anchorage, 2003.

Thesis: Magnetohydrodynamic Simulations of Plasma Dynamics in the Magnetospheric Cusp Region

The Earth's geomagnetic cusps pose a significant challenge for global magnetospheric models due to their relatively small scale. A mesoscale model was developed in order to address such characteristically small-scale structures. It was found that magnetic reconnection plays a crucial role in the structuring and dynamics of this region.

Major Professor: Dr. Antonius Otto

Michael Anderson **

Ph.D. Biological Sciences: Biology

B.S., University of Alaska Fairbanks, 2002.

Thesis: Sources of Variation in the Symbiotic Association between *Alnus* and *Frankia* in Interior Alaska

A field investigation of symbiotic interactions between two species of alder and nitrogen-fixing *Frankia* bacteria was conducted. Differences between alder species in genetic diversity and taxonomy of symbiotic *Frankia* were examined, as well as differences in the structure and diversity of *Frankia* in alder nodules across both primary and secondary successional series.

Major Professors: Dr. Roger Ruess and Dr. Donald Taylor

Jeff Benowitz *

Ph.D. Geology

B.S., University of Alaska Fairbanks, 1992; M.F.A., University of Alaska Fairbanks, 2004.

Thesis: The Topographically Asymmetrical Alaska Range: Multiple Tectonic Drivers Through Space and Time

The topographically segmented ~700 km long Alaska Range evolved over the last ~50 megannumin response to both far-field driving mechanisms and near-field boundary conditions. Periods of mountain building within the Alaska Range are related to Paleocene-Eocene ridge subduction, Neogene flat-slab subduction of the Yakutat microplate, and block rotation/migration.

Major Professor: Dr. Paul Layer

* Summer degree recipient

** December degree recipient

Jessica Anne Coltrane

Ph.D. Biological Sciences: Wildlife Biology

B.S., Davidson College (North Carolina), 1994; M.S., University of Florida, 1998.

Thesis: Ecological and Physiological Adaptations of the Porcupine to Winter in Alaska

Captive and field studies were conducted to determine the physiological and ecological adaptations of the North American porcupine (*Erethizon dorsatum*) to winter in Alaska. Porcupines were able to efficiently digest low quality forage and conserve energy by maintaining low field metabolic rates, while utilizing fat stores to conserve lean tissue.

Major Professors: Dr. Peregrine Barboza and Dr. Donald Spalinger

Maegan M. Daniello-Weltzin *

Ph.D. Biochemistry/Molecular Biology

B.S., University of Alaska Fairbanks, 2006.

Thesis: Investigation of the Allosteric Modulators Desformylflustrabromine and 4-(2-Hydroxyethyl)-1- Piperazineethanesulfonic Acid (Hepes) Interactions on Nicotinic Acetylcholine Receptors

Dysregulation of neuronal nicotinic acetylcholine receptors (nAChRs) can lead to pathologies including Alzheimer's disease, autism and nicotine addiction. New therapeutic avenues are positive allosteric modulators (PAMs). This thesis investigates the PAMs desformylflustrabromine and 4-(2-hydroxyethyl)-1-piperazineethanesulfonic acid (HEPES) interactions with $\alpha 7$ and $\alpha 4\beta 2$ nAChRs. Discoveries will facilitate the development of therapeutic ligands.

Major Professor: Dr. Marvin Schulte

Matthew Langdon Druckenmiller *

Ph.D. Geophysics

B.S., Pennsylvania State University, 2004.

Thesis: Alaska Shorefast Ice: Interfacing Geophysics with Local Sea Ice Knowledge and Use

This thesis interfaces geophysics with local and traditional knowledge of indigenous ice experts from Barrow, Alaska, to monitor processes that govern the state and dynamics of shorefast sea ice in the Chukchi Sea. Ice stability and strategies for safe hunting provide a framework for data collection and knowledge sharing.

Major Professor: Dr. Hajo Eicken

Julie Elliott *

Ph.D. Geophysics

B.A., Whitman College (Washington), 1999; M.S., University of Alaska Fairbanks, 2005.

Thesis: Active Tectonics in Southern Alaska and the Role of the Yakutat Block Constrained by GPS Measurements

This thesis presents a new, expanded GPS dataset for southern Alaska and eastern Canada and uses it to constrain a tectonic model for the Yakutat block collision with southern Alaska and its effects on the region.

Major Professor: Dr. Jeffrey Freymueller

Oceana Puananilei Francis

Ph.D. Atmospheric Sciences

B.S., University of Nebraska-Lincoln, 1995; B.S., University of Alaska Anchorage, 2002; M.S., University of Alaska Anchorage, 2004.

Thesis: Atmospheric Forcing of Wave States in the Southeast Chukchi Sea

Investigation of Chukchi Sea wave states through wave modeling and in situ and satellite observations was conducted which determined model/data suitability for this region due to increased wave activity affecting local operations, and explained how environmental parameters, i.e. diminishing sea ice or extratropical storms, were related to this wave activity.

Major Professor: Dr. Uma Bhatt

Heather Jay Huson *

Ph.D. Molecular Genetics: Interdisciplinary Program

B.A.S., Cornell University (New York), 1997.

Thesis: Genetic Ancestry Modeling and Performance Association in the Alaskan Sled Dog

Alaskan sled dogs present us with the unique opportunity to study the development of a population of dogs produced from the selective breeding of high performance athletes. I established population structure, inbreeding values, and modeled ancestry. I also determined genetic loci and purebred breeds potentially influencing their athletic performance.

Major Professor: Dr. Jonathan Runstadler

Kyle Christian Joly *

Ph.D. Biological Sciences: Wildlife Biology

B.S., Syracuse University (New York), 1992; M.S., Pennsylvania State University, 1996.

Thesis: Winter Range Studies of the Western Arctic Caribou Herd, Northwest Alaska

Wildfires are relatively common in northwest Alaska. They destroy lichens that are important caribou winter forage. Tundra is capable of re-burning more rapidly than forested areas. Burned areas are avoided by caribou for decades due to reduced lichen abundance. Climate change may increase wildfires and thus limit caribou range.

Major Professors: Dr. T. Scott Rupp and Dr. F. Stuart Chapin III

Katrina Kay Knott **

Ph.D. Biological Sciences: Biology

B.A., University of Minnesota, 1997; M.S., University of Alaska Fairbanks, 2004.

Thesis: Contaminant Exposure and Associated Biological Responses in Southern Beaufort Sea Polar Bears

Female and young polar bears are the cohorts of concern for chronic low-level exposure to mixtures of mercury and polychlorinated biphenyls. Relationships between contaminants and physiologically-based biomarkers (e.g., selenium and thyroid hormone status) could not exclude natural variations and equally possible impacts of nutritional stress and changes in physiological status.

Major Professor: Dr. Todd O'Hara

* Summer degree recipient

** December degree recipient

Trixie Nicole Lee

Ph.D. Biological Sciences: Biology

B.S., *Harding University (Arkansas)*, 2006.

Thesis: Expression and Mechanisms of Hibernation in the Arctic: The Alaska Marmot and Arctic Ground Squirrel

I investigated hibernation under extreme, arctic conditions, both in the lab and field. I compared hibernation strategies between two related species with different social systems and studied metabolic fuel use in hibernation by developing stable isotopes as tools to monitor tissue metabolism and differentiate mixed fuel use in animals.

Major Professors: Dr. Diane M. O'Brien and Dr. C. Loren Buck

Karen H. Mager

Ph.D. Biological Sciences: Wildlife Biology

B.A., *Earlham College (Indiana)*, 2004.

Thesis: Population Structure and Hybridization of Alaskan Caribou and Reindeer: Integrating Genetics and Local Knowledge

Using oral history interviews to understand historical interactions of caribou and reindeer, and genetic markers to detect reindeer-caribou hybrids and analyze patterns of genetic differentiation among 20 caribou herds, this interdisciplinary study determined geographic, demographic, behavioral, and anthropogenic factors that influence genetic exchange among caribou and reindeer populations.

Major Professor: Dr. Kris J. Hundertmark

Irina Andrea Mueller

Ph.D. Biochemistry/Molecular Biology

B.S., *Eberhard Karls University Tübingen (Germany)*, 2008.

Thesis: The Effect of Mitochondrial Ultrastructure on Function and Thermal Tolerance in Antarctic Notothenioid Fishes

Antarctic notothenioid fishes are well adapted to the constantly cold environment of the Southern Ocean, which makes them vulnerable to elevations in temperature. The role of cellular adaptations in defining the thermal sensitivity of Antarctic notothenioid fishes was investigated.

Major Professor: Dr. Kristin M. O'Brien

Marc Mueller-Stoffels

Ph.D. Physics

D.P., *University of Konstanz (Germany)*, 2002; M.S., *University of Otago (New Zealand)*, 2006.

Thesis: Reversibility of Arctic Sea Ice Retreat - A Conceptual Multi-Scale Modeling Approach

Arctic summer sea ice has retreated at record rates over the past decade. It is shown that the mode of sea ice retreat strongly depends on the albedo parametrization. The model shows that sea ice retreat can be bistable locally, but in a regional model lateral interactions extinguish this bistability.

Major Professor: Dr. Renate Wackerbauer

Lola Kay Oliver

Ph.D. Geology

B.A., *University of Alaska Fairbanks*, 1969; M.S., *University of Alaska Fairbanks*, 1971.

Thesis: Characterization of Permafrost Development by Isotopic and Chemical Analysis of Soil Cores Taken From the Copper River Basin and an Upland Loess Deposit in Interior Alaska

Chemical and isotopic analyses of pore water from permafrost cores taken from the dry lake bed of ancient Lake Atna in the Copper River Basin and from an upland loess deposit northeast of Fairbanks, Alaska, reveal information about the local past environments not available by other means.

Major Professor: Dr. Vladimir Romanovsky

Santosh Kumar Panda **

Ph.D. Geology

B.S., *Sambalpur University (India)*, 2001; M.S., *Indian Institute of Technology Roorkee (India)*, 2003.

Thesis: Permafrost Distribution Mapping and Temperature Modeling Along the Alaska Highway Corridor, Interior Alaska

The study employed a combination of field data and remote sensing techniques to generate a near-surface permafrost map for a part of the Alaska Highway corridor. It also modeled the effects of past and future changes in air temperature and winter snow precipitation on permafrost temperature and active-layer thickness.

Major Professor: Dr. Anupma Prakash

Peter G. Rinkleff

Ph.D. Geology

B.S., *Bemidji State University (Minnesota)*, 1996; M.S., *New Mexico Institute of Mining and Technology*, 1999.

Thesis: Transport and Formation Processes for Fine Airborne Ash from Three Recent Volcanic Eruptions in Alaska: Implications for Detection Methods and Tracking Models

A study of the chemistry and morphology of airborne ash collected from three volcanic eruptions in Alaska (Augustine 2006, Pavlof 2007, Redoubt 2008) demonstrated that atmospheric fate and transport processes influence removal rates of volcanic ash and impact the detection of ash by standard satellite remote sensing observation methods.

Major Professors: Dr. Catherine F. Cahill and Dr. Jonathan Dehn

Jennifer Roach **

Ph.D. Biological Sciences: Biology

B.S., *Boston College (Massachusetts)*, 1998.

Thesis: Lake Area Change in Alaskan National Wildlife Refuges: Magnitude, Mechanisms, and Heterogeneity

The magnitude and mechanisms of lake area change for study areas and individual lakes in Alaska were estimated. Lake area trends were heterogeneous but net trends for the state and some study areas were declining. Dominant mechanisms for decreasing and increasing lake area were terrestrialization and thermokarst formation, respectively.

Major Professor: Dr. Brad Griffith

* Summer degree recipient

** December degree recipient

Maciej G. Śliwiński

Ph.D. Geology

B.S., University of Washington, 2007.

Thesis: Geochemistry of the Late Devonian 'Punctata' Event in the Western Canada Sedimentary Basin

This work interprets geochemical records of the global Late Devonian 'punctata event' – a prominent paleoceanographic perturbation characterized by rapid, wide-spread marine eutrophication, petroleum source rock deposition and climatic cooling, related to the evolution of the first terrestrial forests and complex soils.

Major Professors: Dr. Michael T. Whalen and Dr. Rainer J. Newberry

John M. Styers **

Ph.D. Computational Auroral Studies: Interdisciplinary Studies

B.S., Rochester Institute of Technology (New York), 1992. M.S., State University of New York Binghamton, 1995.

Thesis: An Interdisciplinary Computational Study of Magnetosphere-Ionosphere Coupling and its Visual and Thermal Impact in the Auroral Region

A computational study of magnetosphere-ionosphere coupling was performed with an explicitly parallelized, three-dimensional, three-fluid simulation. The model reproduced some of the characteristics of discrete auroral arcs. Visualization of the data had the appearance of discrete aurora in nature.

Major Professor: Dr. Gregory Newby

Kenneth Drury Tape **

Ph.D. Biological Sciences

B.A., Carleton College (Minnesota), 1999; M.S., University of Alaska Fairbanks, 2004.

Thesis: Arctic Alaskan Shrub Growth, Distribution, and Relationships to Landscape Processes and Climate During the 20th Century

The primary change underway in the tundra of arctic Alaska is the increase in air temperature and expansion of deciduous shrubs since 1980. Shrub growth rings, site characteristics, and temporal series of imagery show that soil conditions predispose alder shrubs associated with disturbance to respond to warming.

Major Professors: Dr. Roger W. Ruess and Dr. Jeffrey Welker

Caroline R. Van Hemert

Ph.D. Biological Sciences: Wildlife Biology

B.S., University of Arizona, 2000; M.A., Western Washington University, 2005.

Thesis: Epizootic of Beak Deformities in Alaska: Investigation of an Emerging Avian Disease

An epizootic of beak deformities was recently documented among Black-capped Chickadees (*Poecile atricapillus*), Northwestern Crows (*Corvus caurinus*), and other resident bird species in Alaska. A multi-disciplinary investigation combined research techniques from ecology and diagnostic pathology and provided insights about the causes and consequences of this novel disease in wild birds.

Major Professors: Dr. Todd O'Hara and Dr. Diane M. O'Brien

Robert Edward Wilson *

Ph.D. Biological Sciences: Biology

B.S., University of Minnesota Twin Cities, 1997.

Thesis: Genetic and Phenotypic Divergence Within and Between Cinnamon Teal (*Anas cyanoptera*) and Blue-winged Teal (*A. discors*)

Heterogeneity in selection pressures resulted in morphological and genetic differentiation among South American Cinnamon Teal subspecies. The recently diverged Cinnamon Teal and Blue-winged Teal are distinct morphologically and genetically. Paraphyletic populations suggest multiple North America colonizations by Cinnamon Teal, enabling the formation of Blue-winged Teal and North American Cinnamon Teal.

Major Professor: Dr. Kevin McCracken

Jiang Zhu *

Ph.D. Atmospheric Sciences

B.E.E., Southeast University (People's Republic of China), 1985; M.E.E., Nanjing Aeronautical Institute (People's Republic of China), 1988.

Thesis: Investigation on Cirrus Clouds by Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation Data

Cirrus clouds are investigated globally in terms of their macro and bulk-micro physical properties, as well as the linear depolarization ratios derived from the Cloud Aerosol Lidar and Infrared Pathfinder Satellite Observation dataset. The radiative effects of cirrus clouds are evaluated using a radiative transfer model.

Major Professor: Dr. Kenneth Sassen



SCHOOL OF EDUCATION

Dr. Allan Morotti, Interim Dean

David M.Q. Herbert

Ph.D. Educational Leadership: Interdisciplinary Program

B.S., Northern Arizona University, 1993; M.Ed., Northern Arizona University, 1997.

Thesis: Alaskan Superintendent Turnover: Is There a Correlation Between Anticipated Turnover and the Organizational Culture of School Boards in the State of Alaska

A quantitative study assessed whether type of school board culture predicts Alaskan public school superintendents' intention to leave their position, using Cameron and Quinn's types of organizational culture — hierarchy, market, clan, and adhocracy. Participants (47) completed the Anticipated Turnover Scale and Organizational Culture Assessment Instrument. No statistically significant correlations were found.

Major Professor: Dr. Gary Jacobsen

* Summer degree recipient

** December degree recipient

Michael Alan Johnson

Ph.D. Education and Intercultural Studies: Interdisciplinary Program

B.A., Columbia International University (South Carolina), 1994; M.A., Columbia International University (South Carolina), 1997.

Thesis: Barriers to Ahtna Athabascans Becoming Public School Educators

An exploration of why Ahtna Athabascans have chosen not to become public school teachers used a cross-cultural mixed-method approach including a non-formalized survey and phenomenological interviews. A thematic analysis identified barriers such as negative K-12 experiences, financial disincentives, and the lack of culturally appropriate guidance counseling programs.

Major Professor: Dr. Gary Jacobsen



SCHOOL OF FISHERIES AND OCEAN SCIENCES

Dr. Michael A. Castellini, Dean

Beverly Ann Agler

Ph.D. Fisheries

B.A., College of the Atlantic (Maine), 1981; M.S., University of Maine, 1992.

Thesis: Growth of Western Alaska and Asian Chum Salmon (*Oncorhynchus keta*) in Relationship to Climatic Factors and Inter- and Intraspecific Competition

Climate shifts and interspecific interactions with Russian pink and Asian chum salmon influenced chum salmon growth. Warmer ocean temperatures led to faster first-year scale growth, but Asian chum salmon abundance negatively affected third year growth. These results suggest competition among salmon, potentially affecting chum fecundity by 3 percent.

Major Professor: Dr. William Smoker

Seth Lombard Danielson

Ph.D. Oceanography: Physical

B.S., Lehigh University (Pennsylvania), 1990; M.S., University of Alaska Fairbanks, 1996.

Thesis: Variability in the Circulation, Temperature, and Salinity Fields of the Eastern Bering Sea Shelf in Response to Atmospheric Forcing

Synoptic, seasonal and inter-annual variations in the Bering shelf temperature, salinity and circulation fields are driven by the Aleutian Low position and strength. Wind-driven surface Ekman divergence reorganizes currents into two opposing modes of circulation. These results have implications for the advection of oceanic contaminants, heat, freshwater, nutrients, and plankton.

Major Professor: Dr. Thomas Weingartner

Leandra de Sousa *

Ph.D. Oceanography: Biological

B.S., University of Sao Paulo (Brazil), 1997.

Thesis: Seabird Habitat Use and Zooplankton Abundance and Biomass in Relation to Water Mass Properties in the Northern Gulf of Alaska
I investigated seasonal changes in seabird abundance and zooplankton biomass in the Gulf of Alaska from 1998-2003. Furthermore I investigated the association of seabird foraging guilds with oceanic and coastal domains. Lastly, I investigated climate related variability of zooplankton abundance in relation to water mass properties during May from 1998-2009.

Major Professors: Dr. Kenneth Coyle and Dr. Thomas Weingartner

Jason R. Gasper **

Ph.D. Fisheries

B.S., University of Alaska Southeast, 2002; M.S., University of Washington, 2004.

Thesis: Policy and Market Analysis of World Dogfish Fisheries and an Evaluation of the Feasibility of a Dogfish Fishery in Waters of Alaska, USA
Spiny dogfish is a valuable commodity on the world market and has a global capture distribution. Results indicate that the dogfish market is adulterated, supplied by both sustainable and non-sustainable sources. Overcoming the loss of market share may require eco-labeling to inform consumers about sustainable dogfish stocks.

Major Professors: Dr. Gordon Kruse and Dr. Joshua Greenberg

Peter-John Frederick Hulson

Ph.D. Fisheries

B.A., University of Pennsylvania, 2004; M.S., University of Alaska Fairbanks, 2007.

Thesis: Dealing with Uncertainties in Integrated Age-Structured Assessment Models
Dealing with uncertainties in mathematical models to estimate fish abundance has become a central focus at all levels of fisheries stock assessment and management. My goal in this dissertation was to uncover the layers of uncertainty in fishery models and provide guidance on how to include and evaluate uncertainty.

Major Professor: Dr. Terrance Quinn II

Mandy J. Keogh *

Ph.D. Marine Biology

B.S., Texas A&M University, 1999; M.S., San Diego State University (California), 2006.

Thesis: Endocrine and Immune Profiles of Immature Pinnipeds
There is increasing interest in the health of pinnipeds due to population declines and conservation concerns. This study assessed the "health" of animals by quantifying hormones associated with fat mass, lipid and water metabolism, and growth as well as leukocyte counts and in vitro proliferation of peripheral blood mononuclear cell.

Major Professor: Dr. Shannon Atkinson

* Summer degree recipient

** December degree recipient

Sara Elizabeth Miller *

Ph.D. Fisheries

B.A., University of Colorado Boulder, 2000; M.S., University of Alaska Fairbanks, 2007.

Thesis: Physical Mechanisms for Variation in Pink Salmon (*Oncorhynchus gorbuscha*) Survival Within the Upwelling and Downwelling Domains of the Northeast Pacific

When stability was below average within Prince William Sound, the relationship between fish condition and survival was positive. Our findings were similar between the upwelling and downwelling domains, but differed by the distance offshore. Marine survival rates increased for pink salmon that experienced below-average stability on the inner shelf during early marine residence.

Major Professor: Dr. Milo D. Adkison

Dion Seth Oxman

Ph.D. Fisheries

B.S., California State University Long Beach, 1987; M.S., California State University Stanislaus, 1995.

Thesis: Genetic and Environmental Effects on Developmental Timing, Otolith Formation, and Gill Raker Development in Pink Salmon from Auke Creek, Alaska

The influences of incubation temperature and genetics on hatching time and development of otoliths and gill rakers were examined in native and hybrid pink salmon. Their development was influenced by temperature. Hatching had weak genetic influences. Otolith development was canalized. Hybridization prolonged development times but did not alter gill raker development.

Major Professor: Dr. Anthony Gharrett

Tania Marie Spurkland **

Ph.D. Marine Biology

B.A., Western Washington State University, 1971; M.S., University of Alaska Anchorage, 1988.

Thesis: Effects of Glacial Discharge on Kelp Bed Organisms in an Alaskan Subarctic Estuary

This study determined how changing environmental conditions due to glacial melting affect subarctic nearshore kelp bed community structure and organism fitness. Kelps showed some resilience to glacial melt stressors through phenotypic plasticity within a genetically fixed seasonal growth cycle, but overall community composition declined.

Major Professor: Dr. Katrin Iken

Ashwin Sreenivasan **

Ph.D. Fisheries

B.S., Bangalore University (India), 1997; B.S., Florida Atlantic University, 2002.

Thesis: Nucleic Acid Ratios as an Index of Growth and Nutritional Ecology in Pacific Cod (*Gadus macrocephalus*), Walleye Pollock (*Theragra chalcogramma*), and Pacific Herring (*Clupea pallasii*)

Nucleic acid ratios (RNA/DNA) were used to compare growth between fed and starved Pacific herring, and Pacific cod and walleye pollock larvae. Changes in herring RNA/DNA indicated terminal starvation and resource allocation. Colder temperatures increased RNA/DNA in cod and pollock. Cod nucleic acid patterns were used to identify growth stanzas.

Major Professor: Dr. William Smoker

Nathan Lord Stewart **

Ph.D. Marine Biology

B.A., Carleton College (Minnesota), 1996.

Thesis: The Influence of Habitat Complexity, Prey Quality, and Predator Avoidance on Sea Otter Resource Selection in Alaska

Sea otters forage selectively in a variety of nearshore habitat types in Alaska. The focus of this dissertation was to examine the influence of benthic habitat complexity, prey quality, and predator avoidance on sea otter foraging site selection in populations inhabiting the Aleutian Islands and Lower Cook Inlet.

Major Professor: Dr. Brenda Konar



SCHOOL OF NATURAL RESOURCES AND AGRICULTURAL SCIENCES

Dr. Carol E. Lewis, Dean

David Vincent D'Amore *

Ph.D. Natural Resources and Sustainability

B.A., University of Virginia, 1984; M.S., Oregon State University, 1994.

Thesis: Hydrologic Controls of Carbon Fluxes in Alaskan Coastal Temperate Rainforest Soils

Northern temperate ecosystems play an important role in the global balance of carbon flows between atmospheric and terrestrial pools. Measurements of soil respiration and DOC flux from soil combined with values of net primary productivity were used to calculate a net ecosystem production of 2.04 ± 0.81 Mg C ha⁻¹ y⁻¹ in the Alaskan coastal temperate rainforest.

Major Professor: Dr. David Valentine

* Summer degree recipient

** December degree recipient

James Edward Powell

Ph.D. *Natural Resources and Sustainability*

B.A., Rochester Institute of Technology (New York), 1973; M.P.A., University of Alaska Southeast, 1994.

Thesis: Conditions for Effective Use of Community Sustainability Indicators for Adaptive Learning

This study sought to identify the conditions for facilitating implementation and use of community sustainability indicator programs. Through an analysis of sustainability activities in sample cities across the United States and a case study of Juneau, Alaska, conditions for effective sustainability indicator implementation and use were discovered.

Major Professor: Dr. Gary Kofinas

Aiqin Zhao *

Ph.D. *High Latitude Agriculture: Interdisciplinary Program*

B.S., Shanxi Agricultural University (People's Republic of China), 2002; M.S., China Agricultural University, 2005.

Thesis: Assessment and Prediction of Potentially Mineralizable Organic Nitrogen for Subarctic Alaska Soils

The study was to find suitable methods to predict potentially mineralizable organic N (PMN) for subarctic Alaska soils. Results showed that PMN in these soils can be estimated by a double exponential model with fixed rate constants and unknown pool size, hot (80° C) water extractable or 1 M NaOH hydrolysable organic N.

Major Professor: Dr. Mingchu Zhang