The Class of 2016

Doctor of Philosophy Degrees

College of Engineering and Mines

Dr. Douglas J. Goering, Dean

Vamshi Krishna Avadhanula *

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

B.E., Osmania University, 2006; M.S., University of Alaska Fairbanks, 2010.

Thesis: Evaluation And Parametric Modeling Of 50 kW Organic Rankine Cycle For Waste Heat Recovery From Rural Alaska Diesel Generator Power Plants

Stationary diesel engine waste heat (both jacket water and exhaust heat) to electrical power conversion was experimentally investigated using a 50 kW Organic Rankine Cycle power unit and studied the feasibility, reliability, economic benefit and engine fuel efficiency improvement achieved by installing the power unit in a rural Alaska diesel power plant.

Major Professor: Dr. Chuen-Sen Lin

Matthew Earl Calhoun **

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

B.S., University of Alaska Anchorage, 2002; M.S., University of Colorado Boulder, 2010.

Thesis: Synergistic Effects Among Leading Indicators Of Construction Safety Management

Annual accident statistics indicate the construction industry remains one of the most dangerous for workers. In an effort to help the industry, the Delphi method was used to quantify the pairwise synergistic effects among 13 leading indicators of construction safety management from the perspective of an owner and contractor.

Major Professors: Dr. Robert Perkins and Dr. Herbert Schroeder

Joel W. Homan **

Ph.D. Hydrology: Interdisciplinary Program

B.S., Southern Oregon University, 2005; Gr. Cert., Boise State University, 2007; M.S., Boise State University, 2008.

Thesis: Precipitation In The Alaska Central Arctic

Environmental change currently stimulates much of the interest in high-latitude hydrologic studies, as northern areas are expected to be strongly impacted by warming. A comprehensive assessment of solid and liquid precipitation throughout the Alaska Central Arctic provided spatial and temporal precipitation patterns and location of originating moisture for solid precipitation.

Major Professor: Dr. Douglas Kane

Brandon Ashlee Marken **

Ph.D. Computer Security: Interdisciplinary Program

B.S., University of Alaska Fairbanks, 2006; M.S., University of Alaska Fairbanks, 2010.

Thesis: On The Detection Of Virtual Machine Introspection From Inside A Guest Virtual Machine

This dissertation aims to enable a guest Virtual Machine (VM) to determine if it is under examination by an external Virtual Machine Introspection agent. To determine if a VM is under examination a series of statistical analyses are performed on timing data generated by the guest itself.

Major Professor: Dr. Orion Lawlor

Henry 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

Paul Vincent Perreault

Ph.D. Engineering: Arctic Engineering

B.S., University of Alaska Fairbanks, 1987; M.S., University of Alaska Fairbanks, 1993.

Thesis: Altering The Thermal Regime Of Soils Below Heated Buildings In The Continuous And Discontinuous Permafrost Zones Of Alaska

This research investigated using thermal insulation to alter ground temperatures below heated buildings. It extended frost-protected shallow foundation design methods to colder Interior Alaska climates. For permafrost sites with existing buildings, seasonal insulation, applied in the summer and removed in the winter protected the permafrost — even in a warming climate.

Major Professor: Dr. Yuri Shur

Amani Reddy *

Ph.D. ***Engineering: Electrical Engineering***

B.T., Jawaharlal Nehru Technological University, 2005; M.S., University of Alaska Fairbanks, 2007.

Thesis: Variation Of The Plasmaspheric Field-Aligned Electron Density And Ion Composition As A Function Of Geomagnetic Storm Activity

Whistler-mode radio sounding from the IMAGE satellite has led to the first measurements of plasmaspheric field-aligned plasma density and ion composition in the 90- to 4,000-km altitude range as a function of geomagnetic storm activity.

Major Professor: Dr. Vikas Sonwalkar

Jagannadha Reddy Satti **

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

B.T., Jawaharlal Nehru Technological University, 2009; M.S., University of Alaska Fairbanks, 2012.

Thesis: Studies On Thermophysical Properties Of Nanofluids And Their Application In Ground Source Heat Pump

Nanofluids are dispersions of nanoparticles in heat transfer fluids. The goals of this dissertation were to measure the thermophysical properties of different propylene glycol nanofluids and develop new correlations with the obtained data. A numerical study was performed to study the benefits of nanofluids in cold-climate ground-source heat pumps.

Major Professor: Dr. Debendra Das

Feng Xiao ***

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

B.E., 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 Liberal Arts

Mr. Todd Sherman, Dean

Pearl Kiyawn Brower

Ph.D. Indigenous Studies

A.A., Shasta College, 2001; B.A., University of Alaska Fairbanks, 2004; B.A., University of Alaska Fairbanks, 2004; M.A., University of Alaska Fairbanks, 2010.

Thesis: Tumitchiat: Iñuqqaat Aullarrisiatun Iḷisaġviit

A New Pathway: Indigenous Leadership In Higher Education

After centuries of colonization and assimilation, indigenous people are making commitments to nurture the next generation of Indigenous leaders. Focusing on Indigenous leadership through higher education, this dissertation defines Indigenous leadership, and creates a model Indigenous leadership program that has a foundation in Indigenous ways of knowing and learning.

Major Professor: Dr. Theresa John

Courtney Michelle Horwath-Oliver *

Ph.D. Clinical-Community Psychology

B.S., Cincinnati Christian University, 2005; M.A., Cincinnati Christian University, 2007.

Thesis: Parental Perceptions Of Play: The Influences Of Parent Gender, Gender Role Attitudes, And Parenting Styles On Parent Attitudes Toward Child Play

A moderated mediation model explored how parental attitudes about gender roles influence perceptions of play through parenting styles and how this effect differed for fathers and mothers. Analyses were also performed to understand the relationships between parent attitudes and parent play behaviors.

Major Professor: Dr. Kendra Campbell

Stefan Krist **

Ph.D. Anthropology

M.P., University of Vienna, 2000.

Thesis: Wrestling, Archery, And Horse Racing In Buryatia: Traditional Sports Competitions And Social Change

A description and sociocultural analysis of historic and current changes in the rules of, equipment used, and the organization of Buryat traditional sports competitions have shown that Buryat sportspeople's activities reflect as well as stimulate social change, including changes of leadership and the recent revival of Buddhism in Buryatia.

Major Professor: Dr. Peter Schweitzer

* *Summer degree recipient*
** *December degree recipient*
*** *Summer 2016 candidate*

Dinghy Kristine Sharma ***

Ph.D. Clinical-Community Psychology

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

Thesis: Dance/Movement Therapy For Cancer Survivors And Caregivers In Fairbanks

A community-informed, collaborative practice-based study, conducted with the Cancer Center of 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

Norma Ann Shorty *

Ph.D. Indigenous Studies

B.Ed., University of Regina, 1998; M.Ed., University of Hawaii at Manoa, 2004.

Thesis: Inland Tlingit Of Teslin, Yukon: G̲aanax̲.ádi And Kook̲hittaan Clan Origin Stories For The Immediate And Clan Family Of Emma Joanne Shorty (Nee Sidney)

The objective of this thesis is to document the stories and the story-gathering processes associated with published and private holdings of the Kook̲hittaan and G̲aanax̲.ádi clans with connections to the Inland Tlingit from Teslin, Yukon. This indigenous-led research focuses on the traditional clan stories from an insider perspective. As a result of this research, Tlingit ways of documenting history are discovered and a Tlingit research framework is revealed.

Major Professor: Dr. Raymond Barnhardt

Charles Sean Topkok **

Ph.D. Indigenous Studies

B.A., University of Alaska Fairbanks, 1992; M.A., University of Alaska Fairbanks, 2010.

Thesis: Iñupiat Ilitqusiat: Inner Views Of Our Iñupiaq Values

Iñupiat Ilitqusiat: Inner Views of Our Iñupiaq Values examines how Iñupiat pass down our cultural heritage. My doctoral research addresses how we view each Iñupiat Ilitqusiat (Iñupiaq values), how our Iñupiat Ilitqusiat have been passed down, and how we pass down our Iñupiaq cultural heritage to our future culture bearers.

Major Professor: Dr. Beth Leonard

Amy Lynn Wiita **

Ph.D. Anthropology

B.S., Michigan State University, 1998.

Thesis: Visual Artists Experiencing Nature: Examining Human-Environment Relationships

Visual artists' sense of experiencing was examined to understand their process of experiencing nature to produce artwork. Artists experienced nature with purpose and encountered both tension and inspiration. The experiencing formula framework developed may be suitable for describing human-environment relationships beyond the boundaries of artists and nature.

Major Professor: Dr. Molly Lee

College of Natural Science and Mathematics

Dr. Paul W. Layer, Dean

Bridget Borg *

Ph.D. ***Biological Sciences: Wildlife Biology and Conservation***

B.S., University of Wisconsin-Madison, 2003.

Thesis: Effects Of Harvest On Wolf Social Structure, Population Dynamics, And Viewing Opportunities In National Parks

An examination of the effect of legal harvest of wolves (*Canis lupus*) along the boundaries of two national parks indicated that consumptive use of wolves adjacent to protected areas may reduce their potential for nonconsumptive use. These tradeoffs should be considered when developing regional wildlife management policies.

Major Professor: Dr. Laura Prugh

Casey 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 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 Professor: Dr. Knut Kielland

Roy Thomas Churchwell **

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

B.S., University of Idaho, 1999; M.S., Oklahoma State University, 2005.

Thesis: Stopover Ecology Of Semipalmated Sandpipers (*Calidris pusilla*) At Coastal Deltas Of The Beaufort Sea, Alaska

Avian migration is one of nature's wonders. Migration stopover ecology of Semipalmated Sandpipers (*Calidris pusilla*) foraging at coastal deltas on the Beaufort Sea coast, Alaska, was investigated during fall migration. Beaufort Sea deltas and their macroinvertbrate community were critical for successful shorebird migration.

Major Professor: Dr. Abby Powell

Manbharat Singh Dhadly **

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

B.S., Panjab University, 2004; M.S., Panjab University, 2006.

Thesis: Local Scale Structures In Earth's Thermospheric Winds And Their Consequences For Wind Driven Transport

This research used remote sensing to investigate local-scale non-uniformities occurring in winds at 250 km altitude above Alaska, and how these structures influence air parcel transport. Results suggested that the upper atmosphere manifests spatial structures at length scales of 40 km or less, indicating considerably more complexity than previously thought.

Major Professor: Dr. Mark Conde

Simon Filhol ***

Ph.D. ***Geophysics***

M.E. Université Joseph Fourier, 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

Sophie L. Gilbert *

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

B.S., University of California, Los Angeles, 2006.

Thesis: Environmental Drivers Of Deer Population Dynamics And Spatial Selection In Southeast Alaska

Deer are the dominant herbivore in Southeast Alaska, yet critical knowledge gaps remain, which this project sought to fill using GPS-collared deer. Female deer selected habitat to meet nutritional needs and minimize predation risk in summer and against deep snow in winter. Snowfall was also a driver of population growth.

Major Professor: Dr. Kris Hundertmark

Vinay Kumar Kayetha *

Ph.D. Atmospheric Sciences

B.T., Jawaharlal Nehru Technological University, 2005; M.T., Indian Institute of Technology Kanpur, 2007; M.S., University of Alaska Fairbanks, 2014.

Thesis: Investigation Of Thin Midlevel Ice Clouds In The Arctic Using Calipso Data And Radiative Transfer Modeling

We investigate the occurrence and properties of optically thin midlevel ice clouds. Globally, we find that these clouds occur at least 5% of the time and represent 7% of all tropospheric clouds. Model simulations show that these clouds have a significant net warming effect during winter in the Arctic.

Major Professor: Dr. Richard Collins

Joseph Huston Kennedy *

Ph.D. Physics

B.S., Western Washington University, 2008.

Thesis: Linking Climate History And Ice Crystalline Fabric Evolution In Polar Ice Sheets

An investigation into the climate-fabric correlation in ice sheets showed that surface variations in ice crystalline fabric persist deep into the ice sheets. Because microstructural processes that control the fabric are influenced by climate at the surface, these variations record past climate information; fabric has a "memory" of past climate.

Major Professor: Dr. Erin Pettit

Sun-Hee Lee *

Ph.D. Space Physics

B.S., Kyung Hee University, 2005; M.S., Ball State University, 2010.

Thesis: Cold Ions Of Ionospheric Origin Observed At The Dayside Magnetopause And Their Effects On Magnetic Reconnection

This dissertation presented case and statistical studies of the characteristics (species, density, velocity, pitch angle, velocity distributions, occurrence rates and dependence on the solar wind/interplanetary magnetic field) of the cold dense ions (of plasmaspheric/ionospheric origin) observed at the dayside magnetopause and their effects on magnetic reconnection by using Cluster spacecraft datasets.

Major Professor: Dr. Hui Zhang

Tyler Lance Lewis *

Ph.D. Biological Sciences

B.S., University of Oregon, 2000; M.S., Simon Fraser University, 2006.

Thesis: Trophic Dynamics Of Boreal Lakes In A Changing Northern Landscape — Impacts Of Lake Drying And Forest Fires

This study examined effects of wildfires and lake drying on ecosystems of sub-Arctic lakes in the Yukon Flats, Alaska. Nutrient, chlorophyll, invertebrate and waterbird abundance were all unaffected by a wildfire. On drying lakes, nitrogen and phosphorus increased >200% and >100%, respectively, yet phytoplankton, invertebrates and waterbirds were largely unaffected.

Major Professors: Dr. Mark Lindberg and Dr. Joel Schmutz

Prajna Regmi Lindgren

Ph.D. Geophysics

B.E., Kathmandu University, 2004; M.A., Clark University, 2009.

Thesis: Remote Sensing Of Lake Dynamics In Alaska

Remote-sensing data were utilized in conjunction with field observations to study lake dynamics in Alaska associated with methane ebullition from a thermokarst lake, post-drainage succession patterns in drained thermokarst lake basins, and lake area change.

Major Professors: Dr. Guido Grosse and Dr. Katey Walter Anthony

James A. McKee ***

Ph.D. Environmental Chemistry

B.A., Dickinson College, 1998; B.S., University of the Sciences, 2004; M.S., University of the Sciences, 2008.

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. Thomas Green

Jordan S. Metzgar

Ph.D. Biological Sciences

B.S., Cornell University, 2003.

Thesis: Diversification Of The Fern Genus *Cryptogramma* Across Time And Space

Genetic differentiation in the boreal parsley ferns (genus *Cryptogramma*) was explored using plastid and nuclear DNA sequence data. Nine species of parsley fern were identified, including one of hybrid origin in Alaska. The parsley ferns most likely originated in Asia before spreading to North America and then Europe.

Major Professor: Dr. Stefanie Ickert-Bond

Justin J. Oldham **

Ph.D. Physics

B.S., University of Alaska Fairbanks, 2009.

Thesis: Characterization And Diagnostic Methods For Geomagnetic Auroral Infrasound Waves

Geomagnetic auroral infrasound waves are frequently observed by the infrasonic station at College, Alaska, yet the fundamental generating mechanisms remain poorly understood. This research documents a large number of auroral infrasonic events and quantifies ionospheric and geomagnetic conditions necessary for wave generation and propagation to the ground.

Major Professor: Dr. Curt Szuberla

Canrong Qiu **

Ph.D. Environmental Chemistry

B.S., Xiamen University, 2006; M.S., Xiamen University, 2010.

Thesis: Structural Study Of Pb(II) And Sb(V) Adsorption On The Hydroxylated Hematite(1$\bar{1}$02) Surface

Structural studies of Pb(II) and Sb(V) adsorption on hematite (1$\bar{1}$02) was undertaken using crystal truncation rod X-ray diffraction to reveal the surface structure and surface reactivity relationship. The model results gave rise to the binding of Pb(II) and Sb(V) in a bidentate edge-sharing mode and tridentate mode, respectively.

Major Professor: Dr. Thomas Trainor

Celso Guillermo Reyes *

Ph.D. Geophysics

A.A., Miami Dade Community College, 1991; B.S., Northern Arizona University, 2002.

Thesis: Deciphering Okmok Volcano's Restless Years (2002-2005)

Between 1997 and 2008 a volcano's eruptive center changed locations, accompanied by ~3 years of patterned tremor. A widely shared package of seismology computational tools was created and used to catalog and locate tremor using relative amplitude techniques. Results were combined with other observations to interpret this change in activity.

Major Professors: Dr. Michael West and Dr. Stephen McNutt

Melanie M. Richter *

Ph.D. Biological Sciences

B.S., Colorado State University, 2007.

Thesis: Factors Controlling The Phenology And Limits Of Hibernation In A Sciurid

The lower ambient temperature limit of hibernation and maximum torpid metabolic rate was defined. Peaks in androgens correlated with male aggression and determined spring euthermy in males. Cache accumulation increased male reproductive development without ensuring it; access to food in spring did not ensure reproductive development, restriction did not prevent it.

Major Professors: Dr. C. Loren Buck and Dr. Brian Barnes

Courtney Rose Scerbak

Ph.D. Biological Sciences

B.S., University of Alaska Fairbanks, 2011.

Thesis: Modulating Neuronal Aging: Insights From Insulin Signaling Genes And Alaskan Nutraceuticals

An investigation of the intricate relationship between genetics and diet in the aging process evaluated the association of age-related mechanosensory neuron morphology with overall health, the influence of genetics and nutrition on neuron morphology, and the specific molecular mechanisms underlying changes in morphology using the model nematode *Caenorhabditis elegans*.

Major Professors: Dr. Barbara Taylor and Dr. Elena Vayndorf

Aditi Shenoy

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

B.S., University of Mumbai, 2001; M.S., Ohio State University, 2005.

Thesis: Role Of Fire Severity In Controlling Patterns Of Stand Dominance Following Wildfire In Boreal Forests

The relationship between fire severity and tree species dominance, and the drivers of post-fire stand dominance patterns were investigated in burned Alaska black spruce forests. Variations in fire severity and associated changes in soil and vegetation processes altered the relative dominance of deciduous versus coniferous tree species in post-fire forests.

Major Professor: Dr. Knut Kielland

Kendra Diane Sticka

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

B.S., Montana State University,1997; M.S., Central Michigan University, 2002; M.Ed., University of Alaska Anchorage, 2009; Gr. Cert., University of Alaska Anchorage, 2010.

Thesis: Glucose Transporter-4 On Peripheral Blood Mononuclear Cells In Conditioned Vs. Sedentary College Students

Peripheral blood mononuclear cells (PBMCs) were investigated as a potential proxy tissue for skeletal muscle to study the effects of exercise and diet on glucose transporter-4 (GLUT-4) protein and gene activity. Relationships between PBMC GLUT-4 and indicators of insulin resistance were also assessed.

Major Professors: Dr. Kriya Dunlap and Dr. Cindy Knall

Erin Dawn Trochim **

Ph.D. ***Remote Sensing and Hydrology: Interdisciplinary Program***

B.S., University of Calgary, 2006; M.S. University of Alaska Fairbanks, 2008.

Thesis: Bridging Arctic Pathways: Integrating Hydrology, Geomorphology And Remote Sensing In The North

This work improved approaches for integrating patterns and processes within hydrology, geomorphology, ecology and permafrost on Arctic landscapes. Surficial drainage patterns were classified and mapped using robust, repeatable methods. Variability in vegetation characteristics was explored in satellite data. Permafrost was characterized using geophysical methods for Arctic road design and engineering.

Major Professors: Dr. Anupma Prakash and Dr. Douglas Kane

School of Fisheries and Ocean Sciences

Dr. S. Bradley Moran, Dean

Rachael Elise Blevins **

Ph.D. ***Fisheries***

B.S., The University of Alabama, 2009.

Thesis: Sound And Human Impacts On Beluga Whales In Cook Inlet, Alaska

A study of underwater sound and its potential to affect endangered beluga whales (*Delphinapterus leucas*) in Cook Inlet, Alaska, utilized passive acoustic monitoring and local knowledge to evaluate variation in beluga acoustic behavior, to measure underwater sound levels, and to document beluga reactions to noise disturbance.

Major Professor: Dr. Shannon DeMaster

Reid S. 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

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

Adrian Elizabeth Gall **

Ph.D. ***Oceanography: Biological***

B.S., Cornell University, 1997; M.S., Oregon State University, 2004.

Thesis: Influence Of Physical And Biological Oceanography On The Structure Of The Seabird Community In The Northeastern Chukchi Sea

Ship-based surveys of seabirds and physical oceanography in the eastern Chukchi Sea revealed that the seabird community was dominated by planktivorous seabirds, a change from the dominance of piscivorous birds in the 1970s. The associations of seabirds with water temperature and fronts varied with their foraging method and preferred prey.

Major Professor: Dr. Arny Blanchard

* *Summer degree recipient*
** *December degree recipient*
*** *Summer 2016 candidate*

Brandon T. Hassett

Ph.D. Marine Biology

B.S., La Roche College, 2007; M.S., Texas A&M University, 2012.

Thesis: Molecules To Marinescapes: The Characterization Of Microbial Life In The Arctic Ocean

An investigation of microbial diversity in the Arctic Ocean and Bering Sea used molecular markers and culturing surveys to describe two new species (*Sphaeroforma napiecek* and *S. sirkka*), assemble a genome, describe the life history of Arctic marine fungi from sea ice, and assess spatial distribution of eukaryotic microbes.

Major Professor: Dr. Rolf Gradinger

Zachary Nathan Hoyt **

Ph.D. Fisheries

B.S., University of Alaska Fairbanks, 2000; M.S., University of Alaska Fairbanks, 2003.

Thesis: Resource Competition, Space Use And Forage Ecology Of Sea Otters, *Enhydra lutris*, In Southern Southeast Alaska

Sea otters in Southeast Alaska are impacting shellfish except where heavily hunted for subsistence. Fisheries, sea otter geo-location, abundance and foraging datasets were analyzed to inform this marine mammal fisheries conflict. This sea otter population will continue to grow, and current shellfisheries cannot coexist with sea otters under existing management.

Major Professor: Dr. Ginny Eckert

Emily A. Lescak *

Ph.D. Fisheries

B.A., Clark University, 2007; M.A.T., Clark University, 2008; M.S., University of Alaska Anchorage, 2010.

Thesis: Contemporary Evolution In Threespine Stickleback From Uplifted Islands In Alaska

By analyzing phenotypic and genetic divergence between resident freshwater and oceanic threespine stickleback fish from terraces uplifted by the 1964 Alaska Earthquake, we support the hypothesis that freshwater populations have evolved from oceanic ancestors within 50 years and have differentiated to nearly the same extent as populations founded thousands of years ago.

Major Professors: Dr. Frank von Hippel and Dr. Juan Lopez

Joseph B. Liddle *

Ph.D. Fisheries

B.S., Northern Michigan University, 1986; M.S., Western Washington University, 1991.

Thesis: Population Dynamics Of Pacific Herring And Humpback Whales, Sitka Sound, Alaska 1981-2011

Humpback whales congregate in Sitka Sound each spring to consume Pacific herring. Whale abundance was estimated for 1981-2011. Age-structured assessment models, which included humpback whale abundance, showed there was no effect on herring mortality. Pacific herring and humpback whale abundance increased together, reaching their maximum values in 2011.

Major Professor: Dr. Terrance Quinn II

Courtney Doreen Lyons *

Ph.D. Fisheries

A.A., Skagit Valley College, 2000; B.S. Seattle Pacific University, 2002; M.S., Alaska Pacific University, 2006.

Thesis: Understanding Place In Fisheries Management: An Examination Of Ecological And Social Communities In The Pribilof Islands, Alaska

This interdisciplinary project blended insights from ecology and critical social science to inform fisheries management. Specific findings included insight into the ecology of local king crab stocks, indication that local empowerment increases rural development project success, and evidence that qualitative social data is essential for management of sustainable fishing communities.

Major Professors: Dr. Ginny Eckert and Dr. Courtney Carothers

Christopher V. Manhard

Ph.D. Fisheries

B.S., University of New Hampshire, 2006; M.S., University of Alaska Fairbanks, 2012.

Thesis: Environmental, Biological, And Genetic Factors Influencing Local Adaptation Of Pink Salmon (*Oncorhynchus gorbuscha*) In Auke Creek, Alaska

Analyses of multiple data sets, which included measurements of environmental variables, salmonid censuses and experimental observations, were conducted to describe local adaptation of Pink Salmon (*Oncorhynchus gorbuscha*) that spawn in Auke Creek, Alaska. The results indicated that fine-scale local adaptation supports productivity and sustainability in salmonid populations.

Major Professor: Dr. Anthony J. Gharrett

Laura Elizabeth Oxtoby

Ph.D. Marine Biology

B.A., Carleton College, 2008.

Thesis: Carbon Sources And Trophic Connectivity In Seafloor Food Webs In The Alaska Arctic And Sub-Arctic

Molecular and elemental analyses offer critical insight into organic matter pathways that sustain and link consumers in high-latitude environments. This investigation used novel applications of stable isotope analysis, including compound-specific analysis of fatty acids, to describe trophic structure and connectivity among benthic fauna in the Bering, Chukchi and Beaufort seas.

Major Professor: Dr. Matthew Wooller

Linnea E. Pearson *

Ph.D. Marine Biology

B.S., Colorado State University, 2006.

Thesis: Blubber And Beyond: The Role Of Lipids In Thermoregulation And Energy Reserves Of Phocid Seals

An investigation into the role of blubber and skeletal muscle lipids in thermoregulation and energy reserves of phocid seals compared species and ontogeny of polar phocids to better understand variation in regulation, allocation and interactions among lipid stores, and how these varied among species with differing life history strategies.

Major Professors: Dr. Jennifer Burns and Dr. Larissa-Ariane Horstmann-Dehn

Jennifer 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 ecosystem. 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

Joshua Taylor Ream

Ph.D. Ethnobiology: Interdisciplinary Program

B.S., The Pennsylvania State University, 2006; M.S., Austin Peay State University, 2008.

Thesis: Local Herpetological Knowledge In The North

Six species of amphibians are native to Alaska, but knowledge of their populations and their role in social-ecological systems is limited. Using local knowledge, citizen science and traditional field surveys I documented 3,645 amphibian observations as well as ethnozoological relationships with and attitudes toward these species.

Major Professors: Dr. Juan Lopez and Dr. Scott Gerlach

Michelle Rebecca Shero *

Ph.D. Marine Biology

B.A., St. Mary's College of Maryland, 2010.

Thesis: To Pup Or Not To Pup? Using Physiology And Dive Behavior To Answer The Weddell Seal's Overwinter Question

This dissertation demonstrates that the austral winter is an important time for the most southerly-breeding pinniped, the Weddell seal, to acquire energy stores. Body condition did not predict subsequent parturition rates, but hormones regulating energy allocation did. Gestating females also increased foraging efforts across the winter, exceeding aerobic dive capacities.

Major Professors: Dr. Jennifer Burns and Dr. Jo-Ann Mellish

School of Natural Resources and Agricultural Sciences

Dr. David W. Valentine, Director of Academic Programs

Archana Bali *(Posthumous)*

Ph.D. ***Wildlife and Culture: Interdisciplinary Program***

B.C., Barkatullah University Bhopal, 1998; M.S., Manipal University, 2006.

Thesis: The Study Of Human-Caribou Systems In The Face Of Change: Using Multiple Disciplinary Lenses

Multiple disciplinary lenses were used to study human-caribou systems of North America. Meteorological and biological data were integrated to examine implications of climate change on the potential of mosquitoes to harass caribou in the four herds of Arctic Alaska. Participatory videography with Caribou People of North America was used to produce a film to document and analyze indigenous knowledge.

Major Professor: Dr. Gary Kofinas

John James Duffy *

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

B.A., University of Alaska Anchorage, 1979; M.U.P.P., University of Illinois at Chicago, 1983.

Thesis: What Variables Foster The Adoption And Implementation Of Sustainable Practices By Local Governments

Local governments are important for developing sustainable communities, yet most are not pursuing sustainability. A multicase study of local governments was undertaken to understand why. This exploratory research identified the three variable categories as having strong to moderate association with local government pursuit of sustainability.

Major Professor: Dr. Susan Todd

Benjamin Vitaliano Gaglioti

Ph.D. ***Paleoecology: Interdisciplinary Program***

B.A., Sterling College, 2007.

Thesis: Landscape Sensitivity To Climate Change In Northern Alaska: Lessons From The Past

This dissertation uses biogeochemical proxies to reconstruct climate changes and environmental responses in Northern Alaska over the last 40,000 years. I test how sensitive permafrost, vegetation and aeolian activity were to past warming events. The results will be useful for understanding how these systems will respond in the future.

Major Professors: Dr. Daniel Mann and Dr. Matthew Wooller

* *Summer degree recipient*
** *December degree recipient*
*** *Summer 2016 candidate*

Miho Morimoto ***

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

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

Thesis: Implementing Adaptive Forest Harvest Management In Boreal Alaska Under Rapid Global 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. We offer adaptive management planning approaches.

Major Professor: Dr. Glenn Patrick Juday

Josephine-Mary Sam

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

B.A., Kwame Nkrumah University of Science and Technology, 2005; M.S., University of Alaska Fairbanks, 2011.

Thesis: What Community Characteristics Lead To The Successful Outcome Of Rural Water Projects?

The sustainability of rural safe-water projects has been elusive. An examination of successful rural water projects showed that community characteristics such as a demonstrated ability to manage local projects, sound financial management, community support and an active role of women are as essential to success as sound infrastructure.

Major Professor: Dr. Susan Todd