The Class of 2019

Doctor of Philosophy Degrees

College of Engineering and Mines

Dr. William E. Schnabel, Dean

Zhili Quan

Ph.D. Engineering

B.E., Shenyang Jianzhu University, 2009; M.S., University of Alaska Fairbanks, 2013.

Thesis: Numerical Simulation of Thermo-Mechanical Behavior of Gypsum

In this study, the author numerically evaluated the fire-resistance rating of a new gypsum board wall assembly proposed by Dr. Leroy Hulsey.

Major Professor: Dr. J. Leroy Hulsey

College of Fisheries and Ocean Sciences

Dr. S. Bradley Moran, Dean

Maggie NgaLai Chan *

Ph.D. Fisheries

B.A., Barnard College, 2008.

Thesis: Using Fishers' Knowledge to Explore Spatial Fishing Patterns, Perceptions of Regulations, and Environmental Change

This dissertation used an interdisciplinary approach with mapping, interviews and analyses to examine fishing patterns of halibut fishers in Alaska. This work looks at variability in perceived trends in abundance and size among fishers with different experiences and highlights the need to include diverse stakeholders in fisheries management.

Major Professor: Dr. Anne Beaudreau

Ellen M. Chenoweth *

Ph.D. ***Fisheries***

B.A., Kalamazoo College, 2008.

Thesis: Bioenergetic and Economic Impacts of Humpback Whale Depredation at Salmon Hatchery Release Sites

Humpback whales were documented depredating hatchery-produced juvenile salmon, a novel prey, at points of their release in Southeast Alaska. Hatchery release sites lost an estimated 23% of revenue from coho salmon associated with whale predation. Whales feed profitably on chum salmon, but coho salmon typically distributed diffusely, limiting energetic benefits.

Major Professors: Dr. Shannon DeMaster and Dr. Megan McPhee

Casey Thomas Clark

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

B.S., University of California, Santa Cruz, 2007; M.S., San Jose State University, 2013.

Thesis: Biogeochemical Tracers of Change in Pacific Walruses Past and Present

This research investigated the impacts of changing Arctic sea ice conditions during the last 4,000 years on the diet of Pacific walruses. Data were gathered to improve the quality and comparability of future walrus research. A new tool was developed for monitoring the walrus population using trace elements in teeth.

Major Professors: Dr. Lara Horstmann and Dr. Nicole Misarti

Andrew P. Cyr

Ph.D. ***Fisheries***

B.S., University of Maine, 2003.

Thesis: Mercury Concentrations and Feeding Ecology of Fishes in Alaska

Mercury is a ubiquitous environmental contaminant that accumulates in fish tissues, causing concern for human and wildlife health when consumed. This research sought to understand fish mercury concentrations in the context of ecological and biological drivers. The measured mercury concentrations were then interpreted in the context of fish consumption advisories.

Major Professor: Dr. J. Andres Lopez

Susan Dale Inglis

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

B.S., University of British Columbia, 1984; M.S., University of British Columbia, 1993.

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

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

Major Professor: Dr. Michael Castellini

Jennifer M. Marsh

Ph.D. ***Fisheries***

B.S., University of Washington, 2005; B.S., University of Washington, 2005; M.S., University of Alaska Fairbanks, 2010.

Thesis: Diets, Distribution and Population Dynamics of Arctic Cod (*Boreogadus saida*) in Arctic Shelf Ecosystems

Arctic cod are the most abundant and widespread forage fish in the Arctic Ocean. An investigation of diets, environmental and biological influences on the distribution and population dynamics of Arctic cod yielded information to aid in the management of Arctic cod in a rapidly changing environment.

Major Professor: Dr. Franz Mueter

Julie K. Nielsen

Ph.D. ***Fisheries***

B.A., Oregon State University, 1992; B.S., University of Alaska Southeast, 2000; M.S., University of Alaska Fairbanks, 2005.

Thesis: Multi-Scale Movement of Demersal Fishes in Alaska

This research developed methods for characterizing seasonal and annual demersal fish movement at multiple scales in space and time, using electronic archival and acoustic tags. The methods were applied to Pacific halibut to provide important insights into migration, site fidelity and potential Marine Protected Area effectiveness.

Major Professor: Dr. Andrew Seitz

Benjamin C. Williams *

Ph.D. ***Fisheries***

B.S., Ohio State University, 1996; M.S., University of Alaska Fairbanks, 2003.

Thesis: The Reproductive Biology and Management of Walleye Pollock (*Gadus chalcogrammus*) in the Gulf of Alaska

This dissertation provides incremental additions to our knowledge of walleye pollock reproductive biology, its spatial and temporal dynamics, and environmental correlates that may serve as ecological indices. These indices, coupled with an improved understanding of the socio-economic examinations of fishery management changes through agent-based modeling, may assist in producing more holistic management strategies.

Major Professor: Dr. Gordon H. Kruse

College of Liberal Arts

Mr. Todd Sherman, Dean

Tayana Biche-Oolovna Arakchaa **

Ph.D. Anthropology

B.A., Irkutsk State Linguistic University, 1995; M.S., Boise State University, 2009.

Thesis: Reindeer, Dogs, and Horses Among the Tozhu Herder-Hunters in the Siberian Taiga

Anthropological studies tend to represent reindeer as the only key animal for Siberian peoples, ignoring other animals that are vital partners of Tozhu reindeer herder-hunters. The Tozhu hunting and reindeer herding economies should be seen through the prism of a reindeer-dog-horse triad. This research examines how humans and three animal species co-exist.

Major Professor: Dr. Patrick Plattet

Zenaida T. Asuncion

Ph.D. Culture and Leadership: Interdisciplinary Program

B.S., University of Santo Tomas, 1970; MBA, University of Guam, 2006.

Thesis: Exploring the Impact of Culture in Strengthening the Stewardship of Compact Funds in the Federal States of Micronesia: A Convergent Parallel Mixed Methods Design

This study explores the impact of culture in strengthening the stewardship of compact funds in the Federated States of Micronesia. Understanding island culture and its influences over FSM leadership and governance are essential in attempting to assist in the federal compliance requirements of the compact trust funds and other federal FSM assistance programs.

Major Professors: Dr. J. Rob Duke and Dr. Ansito Walter

Jacquelyn A. Crace-Murray *

Ph.D. Applied Linguistics: Interdisciplinary Program

B.A., Lewis and Clark College, 1993; B.A., The College of Santa Fe, 2000; M.P.A., University of North Carolina Greensboro, 1998.

Thesis: Teaching English Language Learners in Alaska: A Study of Translanguaging Choices

To improve the researcher's teaching of English language learners, the researcher studied her own teaching practices. From an autoethnographic stance, the researcher focused on how she encouraged or discouraged translanguaging, what factors impacted her attitudes and expectations towards translanguaging, and how those attitudes and expectations changed over the course of the action research.

Major Professors: Dr. Sabine Siekmann and Dr. Joan Parker-Webster

* *Summer degree recipient*
** *Fall degree recipient*
*** *Summer 2019 candidate*

Kitty L. Deal

Ph.D. Indigenous Studies

B.S., The University of Alabama, 1983; M.S., San Francisco State University, 1993.

Thesis: Qik'rtam Litnauwistai (Island's Teachers)

Qik'rtam Litnauwistai (Island's Teachers) was a multitiered, community-based, participatory action research project to examine the institutional practices and teacher education program at the University of Alaska Anchorage's Kodiak College. This focus on recruiting and retaining pre-service teachers addressed the need to "grow our own" educators, especially Alutiiq educators, for Kodiak Island.

Major Professor: Dr. Beth Leonard

Brenda S. Dow

Ph.D. Arctic and Northern Studies: Interdisciplinary Program

B.A., Auburn University, 1974; M.A., University of Alaska Fairbanks, 1997.

Thesis: Quality of Life for Alaskan Individuals with FASD and Their Families

Fetal alcohol spectrum disorder is a lifelong disability caused by prenatal exposure to alcohol. Effects of FASD include physical, mental, behavioral and learning disabilities that impact quality of life. In-depth interviews were used to explore how FASD affects quality of life for both individuals and their families.

Major Professor: Dr. Mary Ehrlander

Heather Sauyaq Jean Gordon

Ph.D. Indigenous Studies

B.A., University of Redlands, 2007; M.S., University of Wisconsin–Madison, 2014.

Thesis: Self-Determination, Sustainability, and Wellbeing in the Alaska Native Community of Ninilchik

In this project, the researcher worked with the Ninilchik Village Tribe of Ninilchik, Alaska, to explore how community members utilize self-determination to achieve individual, community, and tribal sustainability and well-being. This project used the method of ethnographic futures research to conduct scenarios about the future.

Major Professors: Dr. Michael Koskey and Dr. C. Sean Asiqłuq Topkok

Daniel John Herman **

Ph.D. Clinical-Community Psychology

B.A., University of Alaska Fairbanks, 2012; M.S., University of Alaska Anchorage, 2015.

Thesis: A Humble Guest: A Phenomenological Exploration Of Success And Competence In Rural Alaskan Mental Health Care

The overall aim of this study was to understand what it means to be successful and competent mental health care providers in rural Alaska. A qualitative phenomenological-hermeneutic methodology was utilized to develop contextual themes that illuminate the phenomena of success and competence from the perspective of experienced providers in rural Alaska.

Major Professor: Dr. Valerie Gifford

Agatha John-Shields *

Ph.D. Applied Linguistics: Interdisciplinary Program

B.Ed., University of Alaska Fairbanks, 1993; M.Ed., University of Alaska Anchorage, 2003.

Thesis: Tangerqengiaraucaraq (Being Present)

This qualitative, participatory action research studied five pre-service teachers in a secondary education master's program at the University of Alaska Anchorage. Data consisted of class recordings, student artifacts, teacher researcher journals and informal interviews. The qasgiq (Indigenous community center) is proposed as a model to support ways to become a culturally responsive teacher.

Major Professors: Dr. Sabine Siekmann and Dr. Joan Parker-Webster

Zachary R. Jones **

Ph.D. Ethnohistory: Interdisciplinary Program

B.A., Utah State University, 2006; M.L.I.S., University of Wisconsin, Milwaukee, 2007; M.A., College of William and Mary, 2008; GRCT, University of Wisconsin, Milwaukee, 2008; GRCT, University of Wisconsin, Milwaukee, 2009.

Thesis: Haa Léelk'w Hás Ji.eetí, Our Grandparents' Art: A Study Of Master Tlingit Artists, 1750-1989

This dissertation examines the lives of 23 historic master Tlingit artists from Southeast Alaska. Biographical examination of Tlingit artists showcases how artists created sacred art objects, which play a central role in Tlingit life, and challenges outdated approaches to the study of Northwest Coast art.

Major Professor: Dr. John Heaton

Liza Marie Mack

Ph.D. Indigenous Studies

B.A., Idaho State University, 2005; M.S., Idaho State University, 2009.

Thesis: Unangam Unikangis: Aleut Stories of Leadership and Knowing

This dissertation uses participant observation, critical case studies, key informant interviews and a survey of Aleut leaders to illustrate the ways Aleut people know and understand their environment and the ways they address natural resource management issues. It highlights the dynamic leadership of Unangan in two Eastern Aleutian communities.

Major Professors: Dr. Raymond Barnhardt and Dr. Courtney Carothers

Hishinlai' R. Peter

Ph.D. Applied Linguistics: Interdisciplinary Program

B.A., University of Alaska Fairbanks, 2000; M.Ed., University of Alaska Fairbanks, 2008.

Thesis: Adult Ancestral Language Learning and Effects on Identity

This qualitative study explored the relationship between Gwich'in adult language learning and identity development. Identity is dynamic and fluid, and reflects how a person positions themselves and is positioned by others. A person's sense of self influences their feelings, actions and behaviors.

Major Professor: Dr. Sabine Siekmann

Julie Raymond-Yakoubian

Ph.D. Anthropology

B.S., The University of New Mexico, 1998; M.A., University of Alaska Fairbanks, 2001; M.A., University of Alaska Fairbanks, 2002.

Thesis: Salmon, Cosmology, and Identity in Elim, AK

This dissertation is the result of sociocultural anthropological research in the village of Elim, Alaska, a small Indigenous community on the coast of Norton Sound. This research demonstrated that identity and cosmology are co-created, and that this co-constructed landscape is a picture of a heteroglossic field with a dominant Christian discourse.

Major Professors: Dr. Peter Schweitzer and Dr. David Koester

Ashley Woods *

Ph.D. Clinical-Community Psychology

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

Thesis: Historical Trauma and Approaches to Healing Among Choctaw American Indians

Native Americans exhibit extraordinary resilience and cultural strengths despite a collective experience of historically traumatic events. Interviews and focus groups were completed with Choctaw American Indians using a qualitative, phenomenological and community-based participatory research approach to produce Choctaw-specific conceptualizations of historical trauma, well-being and enculturation.

Major Professor: Dr. Inna Rivkin

College of Natural Science and Mathematics

Dr. Leah Berman, Interim Dean

Katherine Anderson ***

Ph.D. Geosciences

B.S., University of Michigan, 2012.

Thesis: Paleobiology of Ichthyosaurs: Using Osteohistology to Test Hypotheses of Growth Rates and Metabolism in a Clade of Secondarily Aquatic Marine Tetrapods

Ichthyosaurs are a group of secondarily aquatic reptiles that globally dominated the oceans during the Mesozoic Era. Multiple lines of evidence suggest ichthyosaurs experienced elevated growth rates, body temperatures and metabolic rates. This thesis sought to test these hypotheses using osteohistological methods and examination of bone microstructure.

Major Professor: Dr. Patrick Druckenmiller

Roxanne Santina Beltran *

Ph.D. Biological Sciences: Wildlife Biology and Conservation

B.S., University of California, Santa Cruz, 2013; M.S., University of Alaska Anchorage, 2015.

Thesis: Bridging the Gap Between Pupping and Molting Phenology: Behavioral and Ecological Drivers in Weddell Seals

This thesis describes the Weddell seal molt and shows that phenology is driven by reproductive success. It also reports a midsummer shallowing of seal dive depths that appears to mirror a vertical migration of fishes during the phytoplankton bloom. Finally, it suggests that linked life-history events are strongly affected by ice break-out.

Major Professors: Dr. Jennifer Burns and Dr. Greg Breed

Hector Daniel Baños Cervantes

Ph.D. Mathematics

B.A., Autonomous University of Queretaro, 2014; M.S., University of Alaska Fairbanks, 2016; M.S., University of Alaska Fairbanks, 2018.

Thesis: Species Network Inference Under the Multispecies Coalescent Model

When hybridization plays a role in evolution, networks are necessary to describe species-level relationships. Under the Network Multispecies Coalescent model, it is proved that most topological features of a phylogenetic network are identifiable. A new practical method of network inference is developed based on insights from the proof.

Major Professors: Dr. John Rhodes and Dr. Elizabeth Allman

Kathryn Michelle Everson *

Ph.D. Biological Sciences

B.S., The Ohio State University, 2012.

Thesis: The Evolutionary History of Madagascar's Tenrecs (Mammalia: Tenrecidae): Systematics, Phylogeography, and Species Delimitation

This research studied the natural history of a family of mammals from Madagascar, the tenrecs, using genetic, morphometric and geographic data. This research clarified tenrec taxonomy and phylogenetic relationships, elucidated key drivers of speciation on Madagascar, revealed several new species and reaffirmed the importance of specimen collection for conservation.

Major Professor: Dr. Link Olson

Carla Frare ***

Ph.D. Biochemistry and Neuroscience with Neuroscience Concentration

B.S., University of Padova, 2007; M.S., University of Trieste, 2010.

Thesis: Mechanisms Regulating the Circannual Rhythm of Hibernation

This research investigated the neuronal pathways activated in adenosine A1 receptor agonist-induced hibernation in the arctic ground squirrel (*Urocitellus parryii*). Thermoregulatory pathways are modulated to reduce body temperature and increase vasoconstriction during the hibernation season. Thus, the adenosine A1 receptor agonist promotes hibernation by the further suppression of thermogenesis and wakefulness.

Major Professor: Dr. Kelly Drew

Ibrahim Ilhan *

Ph.D. Geophysics

B.S., Dokuz Eylul University, 2007; M.E., Pukyong National University, 2010.

Thesis: History of The Chukchi Borderland and the Amerasia Basin, Arctic Ocean

Structural and stratigraphic interpretation of 2D multichannel seismic reflection profiles through recognition of the subsurface reflection patterns and integration of the seismic interpretation with the other geophysical and geological data reveal the history of the Chukchi Borderland. This investigation provides new constraints for the tectonic development of the Amerasia Basin.

Major Professor: Dr. Bernard Coakley

Christopher P. Kasanke

Ph.D. Biological Sciences

B.S., University of Alaska Fairbanks, 2012.

Thesis: Microbial Ecology and Biodegradation Potential of a Sulfolane-Contaminated, Subarctic Aquifer

Sulfolane is an emerging contaminant that is associated with one of the largest contaminated groundwater plumes in the state of Alaska. This research investigated the biodegradation of sulfolane by the microbial community indigenous to this aquifer to better understand the mechanisms and rates of loss, and the environmental factors controlling them.

Major Professor: Dr. Mary Beth Leigh

Stephanie Nicole Kennedy

Ph.D. Environmental Chemistry

B.S., Colorado State University, 2006; M.S., San Jose State University, 2012.

Thesis: Determining the Immune Status of Steller Sea Lions (*Eumetopias jubatus*): An Environmental Agents of Disease Perspective

The integrity of the immune system is paramount for preserving the overall health of organisms. This dissertation assessed immune cells and proteins of Steller sea lions, and supports that the immune status of pups differs regionally. Certain aspects of neonatal immunity may be influenced by in utero exposure to mercury.

Major Professors: Dr. Todd O'Hara and Dr. Andrea Ferrante

Richard Lader *

Ph.D. Atmospheric Sciences

B.S., Cornell University, 2008; B.S., State University of New York at Oswego, 2010; M.S., University of Alaska Fairbanks, 2014.

Thesis: Emergent Impacts of Rapidly Changing Climate Extremes in Alaska

The frequency and intensity of extreme weather events in Alaska is changing due to climate warming. Unprecedented heat and precipitation are expected to occur, such that future distributions of meteorological variables are outside of those previously observed. This dissertation applies new downscaled model simulations to enhance understanding of these extremes.

Major Professors: Dr. Uma Bhatt and Dr. John E. Walsh

Shanshan Li *

Ph.D. ***Geophysics***

B.S., Wuhan Institute of Technology, 2011; M.E., Wuhan University, 2013.

Thesis: Spatial and Temporal Variations in Slip Behavior Beneath Alaska-Aleutian Subduction Zone

This research investigated the dynamic mechanisms related to slow and fast earthquakes, and the spatial and temporal variations in slip behavior along the Aleutian megathrust, using modern geodetic data.

Major Professor: Dr. Jeffrey Freymueller

Heming Liao *

Ph.D. ***Geophysics***

B.S., Wuhan University, 2010; M.E., Wuhan University, 2012.

Thesis: Ionospheric Correction of Interferometric SAR Data with Application to the Cryospheric Sciences

This research developed advanced techniques for the correction of ionospheric distortions in spaceborne radar observations. In addition to developing robust algorithms, the dissertation demonstrates that the proposed technology can substantially improve glacier-velocity and permafrost-deformation measurements derived from spaceborne radar data.

Major Professor: Dr. Franz Meyer

Malabika Maulik **

Ph.D. ***Biochemistry and Neuroscience***

B.S., University of Gauhati, 2004; M.S., Bangalore University, 2006.

Thesis: Role of Dietary Fat and Supplementation in Modulating Neurodegenerative Pathology in Two Animal Model Systems

Parkinson's disease is a common age-related disease, characterized by toxic protein accumulation leading to neuronal degeneration. This research examines the effect of different diets and indigenous Alaska bog blueberry on key molecular pathologies of Parkinson's-like neurodegenerative disorder in two different animal model systems.

Major Professors: Dr. Barbara Taylor and Dr. Abel Bult-Ito

Rebecca Janet Rolph *

Ph.D. ***Geophysics***

B.S., McGill University, 2012; M.S., The University of Hamburg, 2014.

Thesis: Mechanisms and Implications of Changes in the Timing of Ocean Freeze-up

As delayed freeze-up of the seas bordering Alaska shift into the fall storm season, wind speeds are increasing in the period prior to freeze-up. Wind energy input into the ocean has regionally varying impacts on freeze-up timing. Consequences of the lengthened open-water period are explored for three Alaska coastal communities.

Major Professor: Dr. Andrew Mahoney

Alexander Semenov

Ph.D. Atmospheric Sciences

B.S., Lomonosov Moscow State University, 2011; M.S., Lomonosov Moscow State University, 2011.

Thesis: Modelling Investigation of Interaction Between Arctic Sea Ice and Storms: Insights from Case Studies and Climatological Hindcast Simulations

An investigation of sea-ice response to Arctic cyclones used various climate models to better understand the forces that drive sea ice-ocean-storm interaction in the context of Arctic climate change and explain how decreasing sea ice area and higher cyclone count can be a positive Arctic climate feedback.

Major Professor: Dr. Xiangdong Zhang

Vipul Silwal *

Ph.D. Geophysics

B.S., Indian Institute of Technology, 2012; M.S., Indian Institute of Technology, 2012.

Thesis: Earthquake Source Mechanisms and Three-Dimensional Wavefield Simulations in Alaska

Source mechanisms and uncertainties are estimated to understand the tectonics of Southcentral Alaska. Radiated seismic waves from earthquake sources are simulated within a three-dimensional velocity model of Alaska to investigate the effects of topography, subducting Pacific slab and major sedimentary basins.

Major Professor: Dr. Carl Tape

Jacob Nathaniel Stroh

Ph.D. Numerical Ice/Ocean Modeling and Data Assimilation: Interdisciplinary Program

B.S., York College of Pennsylvania, 2001; M.S., University of Alaska Fairbanks, 2006.

Thesis: Data Analysis and Data Assimilation of Arctic Ocean Observations

Maximizing the information content of observations through analysis and synthesis is crucial for modern geoscience, particularly in the largely unobserved Arctic Ocean, where data is sparse. In addition to classical techniques of analysis, variational data assimilation combines models and observations on the basis of their uncertainties to achieve this goal.

Major Professors: Dr. Carmen Nicole Mölders and Dr. Gleb Panteleev

School of Education

Dr. Amy Vinlove, Director

Karen Leslie Roth

Ph.D. Cross-Cultural Education and Indigenous Studies: Interdisciplinary Program

B.A., Eastern Washington University, 1982; M.Ed., University of Alaska Anchorage, 2003.

Thesis: Coming Together at the Table: Partnering with Urban Alaska Native Families for Their Children's School Success

Research has established the positive impact of family engagement in P-12 student success. Outreach practices by non-Native educators may fail to build meaningful collaborations with Alaska Native families, creating barriers to student success. This mixed-methods study sought to identify school outreach that employs relational approaches to partnering with Native families.

Major Professor: Dr. Amy Vinlove

School of Management

Dr. Mark Herrmann, Dean

Gerald S.A. Pérez

Ph.D. Tourism Rural Economic Development: Interdisciplinary Program

B.S., University of Idaho, 1965; M.S., University of Idaho, 1969.

Thesis: Tourism Development and Public Policy: Perceptions of the Chuukese Community

Tourism is a widely used tool for economic development in small insular communities. This mixed-methods study examines factors that influence residents' perceptions toward tourism development in Chuuk, Federated States of Micronesia, and the relevance of "complexity theory" in describing the island's stage of tourism development.

Major Professors: Dr. Jungho Baek and Dr. Fred Schumann

* *Summer degree recipient*
** *Fall degree recipient*
*** *Summer 2019 candidate*