

The Class of 2015

DOCTOR OF PHILOSOPHY DEGREES

COLLEGE OF ENGINEERING AND MINES

Dr. Douglas J. Goering, Dean

Katrina Eleanor Bennett **

Ph.D. Hydrology: Interdisciplinary Program

M.S., University of Victoria, 2006; B.S., University of Victoria, 2000.

Thesis: Changes in Extreme Hydroclimate Events in Interior Alaska Boreal Forest Watersheds

Extreme hydroclimate events in the boreal forest of Interior Alaska have changed in the past and are projected to change in the future. Statistical modeling tools indicate shifting hydrologic regimes from snowmelt toward rainfall-dominated systems. These changes will increase risk to society and the boreal forest environment.

Major Professor: Dr. Larry Hinzman

Charles Edward Jones Jr. **

Ph.D. Hydrology: Interdisciplinary Program

M.S., Northern Arizona University, 2003; B.S., Northern Arizona University, 1998; A.S., Sauk Valley Community College, 1993.

Thesis: The Integrated Hydrologic and Societal Impacts of a Warming Climate in Interior Alaska

Hydrological changes in Alaska associated with climate were examined using interdisciplinary methods. Local knowledge and field measurements informed modeling and remote sensing studies, which showed that summer flooding and winter ice conditions are becoming less predictable. These environmental changes are likely to further challenge the adaptive capacity of northern peoples.

Major Professors: Dr. Knut Kielland and Dr. Larry Hinzman

Lin Li

Ph.D. Engineering: Civil Engineering

M.S., University of Alaska Fairbanks, 2010; B.E., Chang'an University, 2004.

Thesis: Evaluate Unsaturated Soil Behavior Using Constant Water Content

Triaxial Tests

A new triaxial test system was developed to investigate unsaturated soil behaviors through constant water content triaxial tests. In this system, a new type of high-suction tensiometer and a photogrammetry-based method were developed to monitor unsaturated soil suction and volume changes during undrained testing.

Major Professor: Dr. Xiong Zhang

Vaibhav Kumar Raj

Ph.D. Engineering: Mining Engineering

M.S., Indian Institute of Technology Kharagpur, 2010; B.S.E., B.I.T. Sindri Dhanbad, 2006.

Thesis: Three Dimensional Computational Fluid Dynamics Models of Pollutant

Transport in a Deep Open Pit Mine under Arctic Air Inversion and Mitigation Measures

Management of air pollution in deep open pit mines in the Arctic can be challenging in winters due to air inversions. Three dimensional CFD models were developed to study the stable boundary layers of an Arctic open pit mine. Mitigation models show that the pit can be cleared of the pollutants using cloud cover.

Major Professor: Dr. Sukumar Bandopadhyay

Ravikanth Samba Siva Vajjha **

Ph.D. Engineering: Mechanical Engineering

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

Thesis: Experimental and Computational Studies of Nanofluids

This dissertation covered experimental study on the fluid dynamic and heat transfer performance of nanofluids and theoretical study on the influence of temperature and particle volumetric concentration on thermophysical properties and pumping power. It further explored experimentally the rheological properties of nanofluids and investigated computationally the performance in automotive radiators.

Major Professor: Dr. Debendra Das

* Summer degree recipient

** December degree recipient

COLLEGE OF LIBERAL ARTS

Mr. Todd Sherman, Dean

Daniel Barton Curns **

Ph.D. Clinical-Community Psychology

M.A., University of Alaska Fairbanks, 2005; B.A., University of Buffalo, 1997.

Thesis: A Validity Study of the Reasons for Life Scale with Emerging Adult College Students

This study examined the validity of the Reasons for Life Scale (RFLS), an assessment of suicide risk that does not mention suicide, with emerging adult college students.

The RFLS showed significant relationships with other suicide assessments. The

RFLS may be useful in contexts where directly discussing suicide is not appropriate.

Major Professor: Dr. Vivian Gonzalez

David Luke DeHass **

Ph.D. Rural Technology Management: Interdisciplinary Program

M.A., University of Alaska Fairbanks, 2006; B.A., University of Alaska Fairbanks, 2003;

A.A., University of Alaska Fairbanks, 2003.

Thesis: Honda Country — Relocalization through Technology in Nanwalek, Alaska

The decline of Kodiak Alutiiq oral traditions and a limited awareness or understanding of archived stories has kept them from being used in schools. This study catalogs an anthology of Alutiiq literature and provides a historical and values-based analysis of the educational significance of stories as tools for well-being.

Major Professors: Dr. Michael Koskey and Dr. Anthony Nakazawa

Michael Wayne Kenyhercz **

Ph.D. Anthropology

M.S., Mercyhurst College, 2010; B.A., Ohio State University, 2008.

Thesis: Molar Size and Shape in the Estimation of Biological Affinity: A Comparison of Relative Cusp Locations Using Geometric Morphometrics and Interlandmark Distances

Biological affinity of the four major ancestries in the U.S. was compared to one another and to parental populations using geometric morphometrics and interlandmark distances. Each of the modern groups was significantly different from their respective parental groups and also from one another, which can be used in forensic applications.

Major Professor: Dr. Joel Irish

Jacqueline Marie Rahm **

Ph.D. Indigenous Studies

M.A., University of Alaska Fairbanks, 1995; B.A., Allegheny College, 1987.

Thesis: Deconstructing the Western Worldview: Toward the Repatriation and Indigenization of Wellness

Through indigenous frameworks and methodologies, this research explores fundamental similarities between pre-Socratic and indigenous epistemologies. It examines historical forces that since shaped Western thought as it diverged and has impacted American indigenous peoples. It suggests the critical need for shifting the dominant paradigm toward an original congruity with indigenous worldviews.

Major Professor: Dr. Michael Koskey

COLLEGE OF NATURAL SCIENCE AND MATHEMATICS

Dr. Paul W. Layer, Dean

Benjamin Walter Abbott **

Ph.D. Biological Sciences

B.S., Utah State University, 2009.

Thesis: Permafrost in a Warmer World: Net Ecosystem Carbon Imbalance

This study investigated the effects of climate change on ecosystem carbon balance in the permafrost region. Permafrost thaw caused substantial hydrologic and gaseous carbon loss. However, results suggest that three-quarters of permafrost carbon release could be avoided if human greenhouse gas emissions are actively reduced before the end of the century.

Major Professor: Dr. Jeremy Jones Jr.

Andrew Wentworth Balser

Ph.D. Biological Sciences

M.S., University of Alaska Fairbanks, 1996; B.A., Middlebury College, 1993.

Thesis: Retrogressive Thaw Slumps and Active Layer Detachment Slides in the Brooks Range and Foothills of Northern Alaska: Terrain and Timing

Active layer detachment slides and retrogressive thaw slumps are important modes of permafrost degradation, affecting ecosystem structure and permafrost carbon release. In the Brooks Range and foothills of northern Alaska, up to 57 percent of terrain may be suitable for these features, and timing of weather influences their occurrence.

Major Professor: Dr. Jeremy Jones Jr.

* Summer degree recipient

** December degree recipient

Andrew P. Baltensperger

Ph.D. Biological Sciences: Wildlife Biology

M.S., Colorado State University, 2009; B.S., University of Michigan - Ann Arbor, 2008.

Thesis: Detecting the Effects of Environmental Change on Alaska's Small Mammal Fauna Using Machine-Learning-Based Geographic and Isotopic Niche Modeling

Stable isotopes, locational records, and machine-learning methods were used to model niches of 17 species of small mammals across Alaska. Dietary niches were segregated among co-occurring species, and geographic models predicted northward, inland, and upward shifts in decreasing species distributions over the coming century as a result of climate change.

Major Professor: Dr. Falk Huettmann

Tapas Bhattacharya *

Ph.D. Physics

M.S., University of Alaska Fairbanks, 2008; M.S., University of Burdwan, 1982;

B. Ed. University of Calcutta, 1988; B.S., University of Calcutta, 1979.

Thesis: Role of Ionospheric Conductance in Magnetosphere-Ionosphere Coupling

This research presents numerical simulations of the magnetospheric and the ionospheric influences on the evolution and modification of field-aligned currents (FACs) and parallel electric fields in an attempt to better understand the information of discrete auroral arcs in response to the evolution of FACs for predetermined ionospheric conductance patterns.

Major Professor: Dr. Antonius Otto

Matthew A. Campbell *

Ph.D. Biological Sciences

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

Thesis: Polyploidy, Base Composition Bias, and Incomplete Lineage Sorting in Fish Phylogenetics

Understanding evolutionary relationships between organisms is of fundamental importance in biology. Evolutionary relationships are often depicted by constructing trees based on molecular data — molecular phylogenetics. The complexity of biological data challenges phylogeneticists. This study examined three empirical datasets of fishes while addressing three possible issues in phylogenetic inference.

Major Professors: Dr. J. Andres Lopez and Dr. Naoki Takebayashi

Katie Sarah Christie **

Ph.D. Biological Sciences

M.S., University of Victoria, 2005; B.S., University of Victoria, 2000.

Thesis: Trophic Dynamics in a Changing Arctic: Interactions between Ptarmigan and Willows in Northern Alaska

This study quantified the distribution and migration of ptarmigan in northern Alaska, and documented how they regulate their food source to their own benefit. In addition, a synthesis of new and existing information from Arctic ecosystems explored the degree to which herbivores inhibit the expansion of different woody shrub species.

Major Professors: Dr. Roger Ruess and Dr. Mark Lindberg

Christoff Gregory Furin *

Ph.D. Biological Sciences

M.S., *University of Alaska Anchorage*, 2006; B.S., *Western Washington University*, 2000.

Thesis: Perchlorate Toxicity in Fish: Trophic Transfer, Developmental Windows, and Histological Biomarkers

Chemical, histological, morphological, and reproductive endpoints were used to study the bioaccumulation of and toxicodynamics and morphological changes caused by perchlorate exposure to threespine stickleback (*Gasterosteus aculeatus*) and northern pike (*Esox lucius*), particularly during early development, in order to understand when this endocrine disruptor has its greatest effects on fish.

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

Cristina M. Hansen

Ph.D. Biological Sciences

B.S., *University of Illinois at Urbana*, 2003.

Thesis: Novel Methods of Disease Surveillance in Wildlife

Disease agents in wildlife impact human health, and accurate research, monitoring, and diagnostic methods are necessary. Methods for bacterial disease agent and mercury surveillance were developed using wildlife tissue samples, and an investigation of avian embryo mortality was conducted using one of these methods.

Major Professor: Dr. Karsten Hueffer

Susmita Hazra

Ph.D. Space Physics and Remote Sensing: Interdisciplinary Program

M.S., *Gauhati University*, 2005; B.S., *Gauhati University*, 2002.

Thesis: Variation of Electron and Ion Density Distribution Along Earth's Magnetic Field Line Deduced from Whistler Mode (Wm) Sounding of Image/RPI Satellite Below Altitude 5000 Km

This research effort provides a methodology to dynamically generate context-appropriate honeynets. The honeynet conforms to the target environment using passive or increasing degrees of active scanning. The gathered information aids the administrator in creating a network topology and understanding the flux of devices in the network.

Major Professor: Dr. Martin Truffer

Rebecca Eliza Hewitt *

Ph.D. Biological Sciences

B.A., *Middlebury College*, 2005.

Thesis: Fire-Severity Effects on Plant-Fungal Interactions: Implications for Alaskan Treeline Dynamics in a Warming Climate

Major sources of uncertainty in predicting treeline advance are the controls over treeline seedling establishment with climate warming and associated wildfire activity. This study found that, at treeline and in tundra, wildfire severity influenced symbiotic fungal communities, and persistence of critical mycobionts after wildfire facilitated treeline seedling establishment.

Major Professors: Dr. Teresa Hollingsworth and Dr. F. Stuart "Terry" Chapin III

* Summer degree recipient

** December degree recipient

Min Shiu Hsieh *

Ph.D. Space Physics

M.S., National Central University, 2008; B.S., National Central University, 2006.

Thesis: A New Model for the Substorm Growth Phase

The physics of substorm growth phase is still not well understood. A new three-dimensional mesoscale magnetic flux depletion (MFD) model is used to result in a thin current sheet and equatorward motion of strong field-aligned currents during the growth phase. Adiabatic lobe compression in combination with MFD results in a double-current sheet evolution.

Major Professor: Dr. Antonius Otto

Kim Anke Jochum *

Ph.D. Biological Sciences

B.S., University of Hannover, 2008.

Thesis: Applying a Social-Ecological Systems Approach to Human-Bear Encounters Across the Pacific Rim: Advancing Resilient Human-Wildlife Management Strategies

This study explores resilience in coupled human-wildlife systems of south Sakhalin Island, Russia, and Southcentral Alaska. Findings reveal spatially explicit social and ecological factors contributing to perceptions of positive and negative human-bear encounters, while impacts vary within urban and nonurban areas. Findings promote the integration of human dimensions in wildlife management.

Major Professors: Dr. Lilian Alessa and Dr. Kris Hundertmark

Takeshi Kammae **

Ph.D. Physics

B.S., Tokyo University of Science, 2004.

Thesis: Spectroscopic Study of Sprites

Sprites are large electric discharges in the mesosphere. Their possible consequences to the environment have been proposed, but the characteristics of sprites have to be better understood. A series of spectroscopic observations confirmed that they are similar to a type of electric discharges, called streamer discharges, observed in laboratory experiments.

Major Professor: Dr. Hans Nielsen

James Long

Ph.D. Computational Genomics: Interdisciplinary Program

M.S., University of Alaska Fairbanks, 2000; B.S., University of Alaska Fairbanks, 1997.

Thesis: A Sensitivity Analysis of a Biological Module Discovery Pipeline

An open-source CODENSE implementation enumerates groups of genes having high expression correlation over collections of data representing different cellular states. Synthetic expression data used as input to the algorithm are generated from a known transcription network described in a language that compiles to a Systems Biology Markup Language model.

Major Professor: Dr. Mitchell Roth

Kumar Mayank

Ph.D. *Space Physics and Remote Sensing: Interdisciplinary Program*

M.S., University of Lucknow, 2004; B.S., University of Lucknow, 2002.

Thesis: Measurement of Field Aligned Electron Density Distribution, Ducts, and Z Mode Cavities from Ducted and Nonducted Fast Z Mode Echoes Observed on the Image Satellite

A new Z mode (ZM) sounding method has been developed to measure the electron density (N_e), ducts, and ZM cavities in the magnetosphere from ZM echoes observed on the IMAGE satellite. These measurements are important for building empirical models of N_e and ducts, and play an important role in satellite communications and forecasting of space weather.

Major Professor: Dr. David Newman

Timothy Carl Mullet **

Ph.D. *Biological Sciences*

M.S., Sul Ross State University, 2008; B.S., Ohio State University, 2003.

Thesis: Effects of Snowmobile Noise and Activity on a Boreal Ecosystem in Southcentral Alaska

The effects of snowmobiles in the Kenai National Wildlife Refuge, Alaska, on plants, moose, wilderness character, and the soundscape were studied. Snowmobile activity negatively affected wilderness character, moose distributions, and plants. Noise was an appreciable contributor to remote soundscapes. Moose along noisy snowmobile trails did not exhibit higher stress levels.

Major Professor: Dr. Falk Huettmann and Dr. John Morton

Jason R. Neuswanger *

Ph.D. *Biological Sciences: Biology*

B.A., Cornell University, 2006.

Thesis: New 3-D Video Methods Reveal Novel Territorial Drift-Feeding Behaviors that Help Explain Environmental Correlates of Chena River Chinook Salmon Productivity

The recent decline of Chena River chinook salmon was associated with a pattern of low returns per spawner in years when juvenile salmon experienced sustained high stream flow or high population density. New 3-D video methods linked these trends to 3-D territorial competition and effects of debris on foraging success.

Major Professors: Dr. Amanda Rosenberger and Dr. Mark Wipfli

William Loren Overbaugh *

Ph.D. *Outdoor Recreation and Community Resilience: Interdisciplinary Program*

M.S., University of New Mexico, 1995; B.S., University of Michigan Ann Arbor, 1981.

Thesis: The Role of Outdoor Recreation in Building Community Resilience and Adaptive Capacity

Recreation theory was applied within resilience theory. The Recreation-System Community-Resilience Framework emerged to demonstrate the linkages. Anchorage, Alaska, neighborhoods were chosen to test the operational relationship between recreation diversity and community resilience and adaptive capacity. The findings indicate support for the hypothesis that community resilience increases as recreation diversity increases.

Major Professors: Dr. Lilian Alessa and Dr. F. Stuart "Terry" Chapin III

* Summer degree recipient

** December degree recipient

Peter K. Peterson

Ph.D. Environmental Chemistry

B.S., Eastern Washington University, 2008; B.S., Eastern Washington University, 2008.

Thesis: Examining the Role of Sea Ice and Meteorology in Arctic Boundary Layer Halogen Chemistry

The return of sunlight to the Arctic releases halogen radicals, altering the chemistry of the Arctic boundary layer. Measurements of BrO showed variations in atmospheric stability cause the vertical distribution of these halogen radicals to shift between shallow events and distributed events, which have lower concentrations but increased vertical extent.

Major Professor: Dr. William Simpson

Troy Lee Ritter *

Ph.D. Environmental Public Health: Interdisciplinary Program

M.P.H., University of Massachusetts, 2006; B.S., Eastern Kentucky University, 1999; A.S., Vincennes University, 1993.

Thesis: Water, Behavior and Health in Alaska

This dissertation addressed the need for a better understanding of how water infrastructure and water use behaviors come together to influence health in Alaska. Participants reported increased water use, increased consumption of treated water and domestic hygiene measures, and better community health following provision of piped water and health promotion.

Major Professor: Dr. Andrea Bersamin

Katie L. Spellman

Ph.D. Biological Sciences

M.S., University of Alaska Fairbanks, 2008; B.A., Whitman College, 1999.

Thesis: Invasive Plants and Pollination of Alaskan Berry Species: Integrating Ecology and Education

A rapidly changing climate and human disturbances have accelerated the spread of invasive plants in Alaska. This research investigated the impacts of invasive plants on pollination of berry species in boreal ecosystems and the education strategies that could best prepare Alaskans to respond to the issue.

Major Professor: Dr. Christa Mulder

Derek P. Starkenburg

Ph.D. Atmospheric Sciences

M.A., University of Northern Colorado, 2009; M.Arch., North Carolina State University, 1999; B.E.D.-A., North Carolina State University, 1997.

Thesis: The Analysis of Turbulent Sensible Heat Fluxes Within a Heterogeneous Black Spruce Boreal Forest in Alaska

Surface energy exchanges are important for climate. Sensible heat fluxes within the black spruce boreal forest were evaluated at three scales. Local values had significant differences over short distances (~ 600 m), and the local flux captured about 82 percent of the large-scale flux (~ 1.4 km).

Major Professors: Dr. Anupma Prakash and Dr. Gilberto Fochesatto

COLLEGE OF RURAL AND COMMUNITY DEVELOPMENT

Mr. Evon Peter, Vice Chancellor

Norma Ann Shorty

Ph.D. Indigenous Studies

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

Thesis: Inland Tlingit of Teslin, Yukon: Gaanax̓.ádi and Kookhittaana Clan

The objective of this thesis is to document the stories and the story-gathering processes associated with published and private holdings of the Kookhittaana and Gaanax̓.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

SCHOOL OF EDUCATION

Dr. Allan Morotti, Dean

Barbara Josephine Amarok **

Ph.D. Indigenous Studies

M.Ed., University of Alaska Anchorage, 2003. B.S., The University of Albuquerque, 1977.

Thesis: An Indigenous Vision of 21st Century Education in the Bering Strait Region

This research synthesized personal and professional experiences, similar to research methodologies such as triangulation, auto-ethnography, mixed methods, and various indigenous research methodologies that focus on webs of relationship. It makes recommendations relating to the effectiveness of formal elementary and secondary schooling of indigenous children in Alaska.

Major Professors: Dr. Eric Madsen and Dr. Bryan Brayboy

* Summer degree recipient

** December degree recipient

SCHOOL OF FISHERIES AND OCEAN SCIENCES

Dr. Joan Braddock, Interim Dean

Sean Reiss Brennan *

Ph.D. Oceanography

B.S., University of Utah, 2007.

Thesis: Using Strontium Isotopes to Track Pacific Salmon Migrations in Alaska

Alaska is geographically vast, geologically diverse, and home to abundant runs of Pacific salmon. Strontium isotope variation is driven by geologic heterogeneity. This work showed how, in geologically diverse habitats, strontium isotopes recorded in salmon otoliths could apportion fishery harvests to the sub-basin level of salmon biodiversity and elucidate freshwater movements.

Major Professor: Dr. Matthew Wooller

Trevor Bruce Haynes **

Ph.D. Fisheries

M.Sc., University of Victoria, 2006; B.S., Simon Fraser University, 2001.

Thesis: Biotic and Abiotic Influences on the Use of Arctic Lakes by Fish and Loons

Distribution and habitat use of freshwater fishes and yellow-billed loons in Arctic Alaska were examined. Results offer insights into the ecological mechanisms that determine how fish and loons are distributed across the Arctic landscape and add to our understanding of how to manage these poorly studied species.

Major Professors: Dr. Amanda Rosenberger and Dr. Mark Lindberg

John Michael Maniscalco

Ph.D. Marine Biology

M.S., University of Alaska Fairbanks, 1997; B.S., University of Alaska Southeast, 1992.

Thesis: Population Dynamics of Steller Sea Lions, *Eumetopias jubatus*, in the

Eastern Gulf of Alaska

Vital rates and population trends of endangered Steller sea lions (*Eumetopias jubatus*) were investigated in the eastern Gulf of Alaska to determine the strength of the recovery. Juvenile survival and female reproductive rates were greatly improved since the period of decline, exemplifying a significantly increasing population in recent years.

Major Professor: Dr. Alan Springer

Jonathan I. Richar *

Ph.D. Fisheries

B.S., University of Alaska Fairbanks, 2008.

Thesis: Recruitment Mechanisms of Tanner Crab in the Eastern Bering Sea

Potential recruitment mechanisms for eastern Bering Sea Tanner crab were investigated through multiple approaches, including a 3-D hydrodynamic model, in an attempt to explain recruitment variability. Findings suggest that larval retention is important to local recruitment, while predation by groundfish, near-bottom temperature, and female spawner abundance may influence survival.

Major Professor: Dr. Gordon Kruse

Vanessa Rebeca von Biela

Ph.D. Fisheries

M.S., University of Alaska Anchorage, 2007; B.S., University of California Santa Barbara, 2004.

Thesis: Examining Sources of Primary Production and Bottom-Up Limitations in Nearshore Ecosystems of the Northeast Pacific Ocean Using Fish-Based Indicators

This dissertation examines the energy pathways and oceanographic influences in nearshore kelp forests. Stable isotope analysis indicated the importance of kelp in nearshore food webs. The width of annual growth rings in fish ear bones were correlated with local oceanography and revealed which conditions were associated with faster fish growth.

Major Professor: Dr. Gordon Kruse

Shiway Wei Wang *

Ph.D. Marine Biology

M.S., University of Alaska Fairbanks, 2005; B.S., University of Colorado, 1996.

Thesis: Tracking Carbon Sources through an Arctic Marine Food Web: Insights from Fatty Acids and Their Carbon Stable Isotopes

An investigation of the Bering-Chukchi Sea food web used molecular and elemental biomarkers to describe the diets of zooplankton and ice-associated seals, and quantify the importance of sea ice algae to them to better predict the effects of climate-induced changes of Arctic sea ice on these animals.

Major Professor: Dr. Matthew Wooller

Joel B. Webb **

Ph.D. Fisheries

M.S., University of Alaska Fairbanks, 2005; B.S., University of Washington, 2000; A.A., Grays Harbor College, 1997.

Thesis: Reproductive Potential of Snow and Tanner Crab in Alaska

Reproductive potential of female snow (*Chionoecetes opilio*) and Tanner (*C. bairdi*) crabs, measured as female fecundity and stored sperm reserves, is influenced by female size, reproductive history, and recent mating success. These factors ultimately impact population productivity, with implications for sustainable management of large male-only crab fisheries in Alaska.

Major Professors: Dr. Ginny Eckert and Dr. Gordon Kruse

* Summer degree recipient

** December degree recipient

SCHOOL OF NATURAL RESOURCES AND EXTENSION

Dr. Stephen D. Sparrow, Interim Dean

Watcharee Ruairuen

Ph.D. Natural Resources and Sustainability

M.S., Walailak University, 2006; B.S., Walailak University, 2002.

**Thesis: Evapotranspiration in a Subarctic Agroecosystem: Field Measurements,
Modeling and Sustainability Perspectives**

Surface energetics is central to understanding vulnerabilities of Alaska agriculture to climate change. Numerical and experimental methods were used to integrate data from disparate sources. Evapotranspiration was found to represent a large portion of the energy balance. Surface heterogeneities due to soil moisture and temperature drove differences in energy balance at various scales.

Major Professors: Dr. Gilberto Fochesatto and Dr. Elena Sparrow