

THE CLASS OF 2012

DOCTOR OF PHILOSOPHY DEGREES



COLLEGE OF ENGINEERING AND MINES

Dr. Douglas J. Goering, Dean

Walter J. F. **

Ph.D. Engineering: Environmental Engineering

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

s s c - c s s s r s r
r s

Vaughan, M. G. (2001)

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.

COLLEGE OF NATURAL SCIENCE AND MATHEMATICS

Dr. Paul W. L11U1Qp)-16(1.111 Tr3(a)-125DeJ S2p)9IJETQ

J, ca A, C A

Ph.D. Biological Sciences: Wildlife Biology

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

s s c c s c s rc r

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.

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Ma, a M. Da, -W, *

Ph.D. Biochemistry/Molecular Biology

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

s s I s s r c rs s r s r r
-(- r)- - r s c c (s)

Downregulation 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 desformyl taurine and 4-(2-hydroxyethyl)-1-piperazineethanesulfonic acid (HEPES) interactions with alpha7 and alpha4beta2 nAChRs. Discoveries will facilitate the development of therapeutic ligands.

r r ss r r r c

Ma, La, d D., c c c 81,82895 108 86 129 81850 830 9 5.940.4 388 788

L a Ka O

Ph.D. Geology

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

SS r c r r r s I s c c
SS r s r r r s
SS s I r r s

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.

r r SS r r r s

Sa K a Pa da **

Ph.D. Geology

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

SS r r s s r r r I r r s

The student 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.

r r SS r r r s

P G. R

Ph.D. Geology

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

SS r s r r r c SS s r r r s r r
c c c r s s I c s r c
s r c s

A study of the chemistry and morphology of airborne ash collected from three

* Summer degree recipient
** December degree recipient

Mac, G. S. n
Ph.D. Geology

R b Ed a d W *

Ph.D. Biological Sciences: Biology

* Summer degree recipient
** December degree recipient

Michael A. Johnston

Ph.D. Education and Intercultural Studies: Interdisciplinary Program

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

Research interests: cross-cultural communication, intercultural education, and teacher education.

An exploration of how Ahtna Athabascans have chosen not to become public school teachers used a cross-cultural mixed-method approach including a non-formalised 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.

Research interests: cross-cultural communication, intercultural education, and teacher education.



SCHOOL OF FISHERIES AND OCEAN SCIENCES

Dr. Michael A. Castellini, Dean

Brandon A. Castellini

Ph.D. Fisheries

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

Research interests: salmonid population dynamics, life history, and genetics of *Oncorhynchus keta*.

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.

Research interests: salmonid population dynamics, life history, and genetics of *Oncorhynchus keta*.

Stacy L. Dabada

Ph.D. Oceanography: Physical

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

Research interests: physical oceanography, coastal circulation, and climate change impacts on the Bering Sea.

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 opposing modes of circulation. These results have implications for the advection of oceanic contaminants, heat, freshwater, nutrients, and plankton.

Research interests: physical oceanography, coastal circulation, and climate change impacts on the Bering Sea.

Linda S. a *

Ph.D. Oceanography: Biological

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

s s r s r s r s r s r s

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 March from 1998-2009.

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Janet R. Galtner **

Ph.D. Fisheries

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

s s c r s s r s s r s s s r s s s r s s

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.

r r s s r s r r s r s r r

Patricia J. Edwards H

Ph.D. Fisheries

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

s s c r s I r - r c r s s s s

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 fisheries models and provide guidance on how to include and evaluate uncertainty.

r r s s r r r c II

Madeline J. Kasper *

Ph.D. Marine Biology

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

s s c r I r s I r s

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

* Summer degree recipient

** December degree recipient

Sandra E. Ables-Morse*

Ph.D. Fisheries

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

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(*Oncorhynchus*

gorbuscha) RR

S

RS CC

When stability was below average within Prince William Sound, the relationship between 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.

RRSSRRRI S

Doreen O'Neil

Ph.D. Fisheries

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

SS CR CS

RRR R

RRS

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.

RRSSRRRRR

Tara Madsen-Saunders**

Ph.D. Marine Biology

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

SS CSC SC RR RS S S

RC CS RR

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.

RRSSRRRI

A S a a **

Ph.D. Fisheries

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

(*Gadus macrocephalus*), (*Theragra chalcogramma*), (*Clupea pallasii*)

Nucleic acid ratios (RNA/DNA) were used to compare growth between fed and starved Pacific herring, and Pacific cod and Atlantic 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 stages.

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Na a L d S a **

Ph.D. Marine Biology

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

s s I c r s rc c s r r

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.

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SCHOOL OF NATURAL RESOURCES AND AGRICULTURAL SCIENCES

Dr. Carol E. Lewis, Dean

* Summer degree recipient

** December degree recipient

Ja Ed a d P

Ph.D. Natural Resources and Sustainability

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

s s s r c s s I c rs
r r

This stud sought to identif the conditions for facilitating implementation and use of communit sustainabilit indicator programs. Through an anal sis of sustainabilit acti ities in sample ities across the United States and a case stud of Juneau, Alaska, conditions for effecti e sustainabilit indicator implementation and use ere disco ered.

r r ss r r r S

A Z a *

Ph.D. High Latitude Agriculture: Interdisciplinary Program

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

s s ss ss r c r c
r r rc c s s

The stud as to nd suitable methods to predict potentiall minerali able organic N⁴(PMN) for subarctic Alaska soils. Results showed that PMN in these soils can be estimated b a double e ponential model ith ed rate constants and unknow n pool si e, hot (80 C) ater e tractable or 1 M NaOH h drol sable organic N.

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