

College of Natural Science and Mathematics

Dr. Paul W. Layer, Interim Dean

Baccalaureate Degrees

Michelle Antoinette Augustyn

B.S., Biological Sciences

Melanie Bakker

B.S., Wildlife Biology

Andrea Elizabeth Bartusch **

magna cum laude, B.S., Biological Sciences

Jolie Tarin Billings *

B.S., Biological Sciences

Rachael Billups *

B.S., Biological Sciences

Naomi Brodersen

B.S., Biological Sciences. Honors Program. *Golden Key Honor Society*

Kyle Kasza Campbell

cum laude, B.S., Biological Sciences. *Golden Key Honor Society*

Michelle Cason

cum laude, B.S., Wildlife Biology. *Golden Key Honor Society*

Sophie Chowdhury *

B.S., Biological Sciences. *Student Ambassador*

Gregg Christopher

B.S., Computer Science

Carolynn J. Coghlin

B.S., Wildlife Biology

Christine Corwin

B.A., Biological Sciences

Daniel S. David **

B.S., Biological Sciences

Daniel De Bord

B.S., Wildlife Biology

Jeremiah Drewel

B.S., Geology

Kimberly Nicole Dullen **

B.S., Biological Sciences

Laura Ellsworth **

B.A., Biological Sciences

Christopher Eversman

magna cum laude, B.S., Chemistry. *Golden Key Honor Society*

Marshall Ezelle

B.S., Geology

Aimee Marie Fogler

B.S., Biological Sciences

James Steven Frost

B.S., Statistics

Joseph David Fuller *

B.A., Biological Sciences. *Golden Key Honor Society*

Patricia Elizabeth Gallagher

magna cum laude, B.S., Geology. *Golden Key Honor Society*

Spencer Lawrence Giles

cum laude, B.S., Chemistry. *Golden Key Honor Society*

Karina Signio Gonzales

B.A., Biological Sciences; Psychology

Christopher E. Granade

cum laude, B.S., Mathematics; Computer Science. *Golden Key Honor Society*

Christopher E. Granade

cum laude, B.S., Physics. *Honors Program. Golden Key Honor Society*

Hope M. Gray **

B.S., Biological Sciences

Laurinda R. Hill

B.S., Biological Sciences

Dawn Elaine Hughes

magna cum laude, B.S., Biological Sciences. *Golden Key Honor Society. Phi Kappa Phi Honor Society*

Stephen Christopher Hummel

B.S., Chemistry: Biochemistry/Molecular Biology

Sayuri Ito

B.S., Biological Sciences

Raymond Todd Jacobus

B.S., Geology

Matthew H. Jones

magna cum laude, B.S., Geology; Computer Science. *Golden Key Honor Society*

Lisa Kangas **

B.S., Biological Sciences

Keegan Keplinger

B.S., Physics

Cole Girard Kingsbury

B.S., Geology

Katie May Kokx

B.S., Wildlife Biology

Anne E. Kornkven

cum laude, B.S., Mathematics. *Golden Key Honor Society*

Kandace L. Krejci

B.S., Wildlife Biology

Rachel M. Krieg

B.S., Statistics; Mathematics

Mindona Marie Krzykowski

cum laude, B.A., Physics. *Golden Key Honor Society*

Juan D. Leon Guerrero, Jr.

B.S., Wildlife Biology

Amanda Longbrake

cum laude, B.S., Mathematics. *Golden Key Honor Society*

Leda Eleanor Lotspeich-Cole

magna cum laude, B.S., Biological Sciences. *Golden Key Honor Society*

Anna Maguire **

B.S., Wildlife Biology

Janne Holmberg Maier **

magna cum laude, B.S., Biological Sciences

Kiana Mann *

B.A., Biological Sciences

Charles J. Mantei

cum laude, B.S., Biological Sciences. *Golden Key Honor Society*

Jamie Marie McKellar **

B.A., Biological Sciences

Ben Meyer

cum laude, B.S., Biological Sciences. *Golden Key Honor Society*

Ben Meyer

cum laude, B.S., Chemistry: Biochemistry/Molecular Biology. *Golden Key Honor Society*

Jill Christine Michalak **

B.A., Earth Science

Jason Minné **

B.S., Wildlife Biology

Sarah Elizabeth Moore

B.S., Biological Sciences

Cassandra Lynn Morgan *

B.S., Geology

Linda Jean Morin

B.S., General Science. *Golden Key Honor Society*

Kirsten Anne Eaton Mycko

cum laude, B.A., Biological Sciences. *Golden Key Honor Society*

Jonathan Nigg

magna cum laude, B.S., Chemistry: Environmental Chemistry. *Golden Key Honor Society. Phi Kappa Phi Honor Society*

Brian M. Paden

B.S., Computer Science

Nils Pedersen

B.A., Biological Sciences

Tyler Benjamin Polum **

B.S., Biological Sciences

Emily A. Potter

B.S., Biological Sciences

Cortney Lorraine Pylant

magna cum laude, B.S., Wildlife Biology. Honors Program. Golden Key Honor Society

Will Calmes Quintal

cum laude, B.S., Computer Science

Keira Elizabeth Rainey

magna cum laude, B.A., Biological Sciences. Golden Key Honor Society

Farrin A. Reid

B.S., Computer Science

Christopher Reynolds **

B.A., Biological Sciences

Christopher J. Rodriguez *

B.S., General Science

Luiz Sergio Santana

B.S., Computer Science

Martin David Schuster **

B.S., Biological Sciences

Sumiyo Sekine

B.S., Wildlife Biology

Antonio L. Silva

B.S., Wildlife Law Enforcement: Interdisciplinary Program

Melissa Lynn Smith **

B.S., Wildlife Biology

Melissa Rae Smith **

B.S., Biological Sciences

Suntrana F. Smyth

cum laude, B.S., Physics. Honors Program. Golden Key Honor Society

William Christopher Start

B.S., Computer Science

Jill Maria Stockbridge

B.S., Biological Sciences

Kimberly A. Streeter

B.S., Geology

Jennifer Lynn Stuvek

B.S., Biological Sciences

Eric Keith Taylor

B.S., Computer Science

Kevin D. Taylor

B.S., Physics. *Golden Key Honor Society*

Ryan Turnquist

B.S., Computer Science

Joel Vonnahme **

B.A., Biological Sciences

Joel Vonnahme **

B.S., Biological Sciences

Arianne Renee Wadeson

B.S., Biological Sciences

George S. Walker V

cum laude, B.S., Mathematics; Physics. *Golden Key Honor Society*

James Webber II

cum laude, B.S., Computer Science. *Golden Key Honor Society*

Jeffrey Wells **

magna cum laude, B.S., Wildlife Biology

Rachel Erin Westbrook **

cum laude, B.A., Earth Science

Kili Grace Wetherell

cum laude, B.S., Biological Sciences. *Golden Key Honor Society*

David A. Wilkinson

summa cum laude, B.S., Chemistry: Environmental Chemistry. *Honors Program. Golden Key Honor Society*

Jeffrey T. Williams

B.S., Wildlife Biology

Jeffrey Yacevich

cum laude, B.S., Wildlife Biology. *Golden Key Honor Society*

Sarah Youngren **

magna cum laude, B.S., Biological Sciences

Nicole Song Zonzel **

B.A., Biological Sciences

Master's Degrees

James Becwar **

M.S.E., Software Engineering. *B.S., University of Alaska Fairbanks, 2005. B.S., University of Alaska Fairbanks, 2006*

Tapas Bhattacharya

M.S., Physics. *B.S., University of Calcutta (India), 1979. M.S., University of Burdwan (India), 1982*

Stefanie Mae Bourne *

M.S., Atmospheric Sciences. *B.S., James Madison University (Virginia), 2005*

Matthew L. Bowser

M.S., Biology. *B.S., University of Florida, 2001*

Morgan E. Brown *

M.S., Atmospheric Sciences. *B.S., Iowa State University, 2006*

B. Luke Bruner

M.S., Biology. *B.S., College of William & Mary (Virginia), 1996*

Justin C. Buehner **

M.S., Biology. *B.S., University of Alaska Fairbanks, 2006*

Suraj Cherian *

M.S., Biochemistry and Molecular Biology. *B.S., Kerala Agricultural University (India), 2002*

Brittany L. Davies *

M.S., Biology. *B.S., University of Alaska Fairbanks, 2007*

Abigail Lynn Gleason *

M.S., Geophysics: Solid-Earth Geophysics. *B.S., University of California-Santa Barbara, 2005*

Vasil Godabrelidze **

M.S., Mathematics. *B.S., Tbilisi State University (Russia), 2004*

Brian Guzzetti *

M.S., Biology. *B.S., Rowan University (New Jersey), 2000*

Abraham E. Harms-Smyth **

M.S., Biochemistry and Molecular Biology. *B.S., University of Alaska Fairbanks, 2001*

Katie K. Hessen **

M.S., Geophysics: Remote Sensing. *B.S., University of Houston (Texas), 2003*

Jiaqi Huang

M.S., Statistics. *B.E., Shanghai Jiao Tong University (People's Republic of China), 2005 and M.S., University of Alaska Fairbanks, 2007*

Larry Paul Huff

M.S., Mathematics. *B.S., University of Virginia's College at Wise, 2005*

Elizabeth Marella Humphries **

M.S., Biology. *B.A., University of Maryland, 2004. B.S., University of Maryland, 2004*

Katrina M. Jacobs *

M.S., Geophysics: Solid-Earth Geophysics. *B.S., University of South Dakota, 2005. B.F.A., University of South Dakota, 2005*

Constantine Khroulev *

M.S., Mathematics. *B.S., St. Petersburg University of Information Technologies (Russia), 2004*

James P. Lawless **

M.S., Mathematics. *B.S., Richard Stockton College (New Jersey), 2006*

Michael James Lelevier *

M.S., Biology. *B.S., University of Alaska Fairbanks, 2005*

Hui Liu *

M.S., Statistics. *B.A., Ocean University of Qingdao (People's Republic of China), 1992. Ph.D., University of Alaska Fairbanks, 2006*

Emma F. Mayfield

M.A., Neuroscience: Interdisciplinary Program. *B.A., University of Alaska Fairbanks, 2007*

Heike Merkel *

M.S., Geophysics: Snow, Ice and Permafrost Geophysics. *Golden Key Honor Society. B.S., Northeastern Lower Saxony Technical University (Germany), 1996. M.S., University of Alaska Anchorage, 2001*

Dana Rachel Nossov **

M.S., Biology. *B.A., University of North Carolina, 2001*

Oralee N. Nudson

M.S., Computer Science. *B.S., Boise State University (Iowa), 2003*

Nathan J. Pamperin **

M.S., Wildlife Biology. *B.S., University of Alaska Fairbanks, 2002*

Kristin Amber Papp *

M.S., Geology: Remote Sensing. *B.S., University of Alaska Fairbanks, 2004*

Renee Leigh Pasker **

M.S., Biology. *B.A., University of Northern Iowa, 2005*

Chloe Peterson **

M.S., Geophysics: Solid-Earth Geophysics. *B.S., University of New Mexico, 2005*

Stacy Porter

M.S., Atmospheric Sciences. *Phi Kappa Phi Honor Society. B.S., University of North Carolina Asheville, 2006*

Sudipta Sarkar **

M.S., Geology: Remote Sensing. *B.S., University of Calcutta (India), 2002. M.S., Indian Institute of Technology (India), 2004*

Colin S. Shanley **

M.S., Wildlife Biology. *B.S., Western Washington University (Washington), 2005*

Grant Thomas Shimer

M.S., Geology. *B.A., Beloit College (Wisconsin), 2003*

Seth Frank Snedigar

M.S., Computer Science. *B.S., University of Montana, 2001*

Timothy E. Stern **

M.S., Physics. *B.S., University of Alaska Fairbanks, 1996. B.S., University of Alaska Fairbanks, 2004*

Matthew R. Urschel *

M.S., Biology. *Golden Key Honor Society. B.A., Colorado State University, 1998*

Bradley Randall Wendling **

M.S., Wildlife Biology. *B.S., University of Idaho, 1998*

Kathleen McGlone West

M.S., Biology. *B.A., Oberlin College (Ohio), 2003*

Brian D. Young

M.S., Biology. *B.S., Lewis and Clark College (Oregon), 1996*

Beth Zirbes

M.S., Mathematics. *B.A., Gustavus Adolphus College (Minnesota), 2006*

Doctoral Degrees

Laura Alvarez-Avilés *

Ph.D. Environmental Chemistry

B.S., Universidad de Puerto Rico, 2003

Thesis: Chemical Composition of Ice Surfaces: Implications for Springtime Bromine Chemistry

This research focused on the ionic composition of snow, aerosol particles and frost flowers to understand production of reactive halogens, ozone destruction and deposition of mercury in the Arctic.

Major Professor: Dr. William R. Simpson

Randy Lee Apodaca *

Ph.D. Environmental Chemistry

B.S., Texas Tech University, 1996. M.S., Texas Tech University, 2003

Thesis: Nocturnal Processing of Nitrogen Oxide Pollution at High Latitudes: Off-Axis Cavity Ring-Down Spectroscopy Method Development and Field Measurement Results

Nitrogen oxides play a central role in ozone and nitric acid pollution in the atmosphere. The results of this dissertation research indicate that reaction of dinitrogen pentoxide on ice surfaces is largely responsible for processing nitrogen oxides and forming nitric acid in high latitude pollution plumes.

Major Professor: Dr. William R. Simpson

Jason B. Fellman **

Ph.D. Biogeochemistry: Interdisciplinary Program

B.S., University of Scranton (Pennsylvania), 1995. M.S., Washington State University, 2000

Thesis: Dissolved Organic Matter in Wetland Soils and Streams of Southeast Alaska: Sources, Concentration and Chemical Quality

Dissolved organic matter exported from coastal temperate watersheds was examined to determine if wetland soils are a source of biodegradable dissolved organic carbon to aquatic ecosystems. Findings show that wetlands contribute substantial biodegradable dissolved organic matter to streams and the delivery changes seasonally, with soil type and during stormflows.

Major Professors: Dr. Richard D. Boone and Dr. Eran Hood

Thomas J. Fournier **

Ph.D. Geophysics

B.A., University of California Berkeley, 2001

Thesis: Analysis and Interpretation of Volcano Deformation in Alaska: Studies from Okmok and Mt. Veniaminof Volcanoes

Four studies focused on the deformation at Okmok Volcano, the Alaska Peninsula and Mt. Veniaminof. The main focus was an examination of the magma plumbing system at Okmok Volcano. An investigation of the subduction zone dynamics along the Alaska Peninsula sheds light on the earthquake potential of the region.

Major Professor: Dr. Jeffrey Freymueller

Madeline N. Grant-Hoffman

Ph.D. Biological Sciences: Biology

B.S., Florida Atlantic University, 2000. M.S., Colorado State University, 2003

Thesis: The Effects of Invasive Rats and Burrowing Seabirds on Seed and Seedling Communities on New Zealand Islands

Invasive rat consumption of plants and burrowing seabirds affects vegetation. Seabirds affect vegetation through allochthonous inputs and disturbance. This research examined seed and seedling communities on New Zealand islands with different rat histories and seabird densities. It was determined that invasive rats and burrowing seabirds affect species richness and diversity on islands.

Major Professor: Dr. Christa P. H. Mulder

Daniel L. Kirschner

Ph.D. Bioanalytical Chemistry: Interdisciplinary Program

B.S., University of Alaska Fairbanks, 2004

Thesis: Bioanalytical Development of Charged Cyclodextrin Capillary Electrokinetic Chromatography and Microperfusion Sampling to Study Endogenous D-serine and L-glutamate Efflux in Brain

This dissertation describes new sensitive bioanalytical capillary electrophoresis approaches for investigating excitotoxic neurochemicals D-serine and L-glutamate in the central nervous system. Charged cyclodextrins were developed for chiral bioanalysis of amino acids for the first time and approaches were coupled to microperfusion sampling to study modeled ischemia in a rat brain.

Major Professor: Dr. Thomas K. Green

Amanda M. Kolker **

Ph.D. Geology

B.A., Oberlin College (Ohio), 2000

Thesis: Geologic Setting of the Central Alaskan Hot Springs Belt: Implications for Geothermal Resource Capacity and Sustainable Energy Production

This study examined the geologic setting and geochemical characteristics of Chena and other hot springs in Central and Western Alaska in the context of geothermal energy production. The sustainability of energy extraction from this low-temperature geothermal resource was evaluated, using Chena Hot Springs as a model.

Major Professors: Dr. John C. Eichelberger and Dr. Rainer J. Newberry

Meagan Boltwood Krupa

Ph.D. Biological Sciences: Biology

B.A., Prescott College (Arizona), 1998. M.S., University of Montana, 2002

Thesis: Urban Stream Management: Interdisciplinary Assessment of an Alaskan Salmon Fishery

This interdisciplinary research on Anchorage's Ship Creek utilized the robustness framework to examine how socio-economic and ecological constraints influence the management of the creek's semi-engineered fishery. The research concluded that the Lower Ship Creek Fishery could benefit from a new cost structure, increased user and biophysical monitoring, and collective choice agreements.

Major Professor: Dr. Mark S. Wipfli

Jack W. McFarland **

Ph.D. Biological Sciences: Biology

B.A., University of Virginia, 1993

Thesis: Latitudinal Patterns of Amino Acid Cycling and Plant N Uptake Among North American Forest Ecosystems

Experimental additions of glycine and NH_4^+ were traced in situ through fine root and soil nitrogen pools for six North American forest ecosystems in an effort to define patterns of plant and microbial N utilization among divergent forest types. Plants in all stands were able to utilize intact amino acids, but their relevance to plant nutrition varies as a function of microbial demand for C as well as N.

Major Professor: Dr. Roger W. Ruess

Matthew Miller **

Ph.D. Biological Sciences: Biology

B.A., Swarthmore College (Pennsylvania), 1996. M.S., University of Arizona, 2001

Thesis: Ecological Evolutionary Genetics of Some Neotropical Birds

The first step in biological diversification is the formation of genetically isolated populations. Using neotropical bird species as models, this study found that lineage

diversity was promoted by repeated dispersal across the Andes, that mid-range populations had higher within-population genetic diversity than range-edge populations, and that insectivorous species maintained greater geographic isolation than species of frugivores and nectivores.

Major Professor: Dr. Kevin S. Winker

Joanna Mongrain *

Ph.D. Geophysics

M.S., Oxford University (United Kingdom), 1999. M.E., Heriot Watt University (United Kingdom), 2000

Thesis: Critical Parameters in Magmatic Degassing

This investigation of the parameters critical in determining the style of magmatic degassing used high pressure-high temperature experiments on volcanic samples which mimic the conditions felt by a magma as it ascends to the surface. Analysis of the bubbly products aids in predicting whether a volcano will erupt explosively.

Major Professor: Dr. Jessica Larsen

Steffen Oppel **

Ph.D. Biological Sciences: Wildlife Biology

M.S., Carl-von-Ossietzky University of Oldenburg (Germany), 2003

Thesis: King Eider Migration and Seasonal Interactions at the Individual Level

This dissertation explores how winter, spring and summer are linked in King Eiders (*Somateria spectabilis*). The research found individual variation in movement and breeding strategies, and little evidence for seasonal interactions. King Eiders are a flexible species that may be able to respond to challenges that will result from climate change.

Major Professor: Dr. Abby N. Powell

Debasish Pai Mazumder

Ph.D. Atmospheric Sciences

B.S., University of Calcutta (India), 2002

Thesis: A Concept to Assess the Performance of a Permafrost Model Run Fully Coupled with a Climate Model

Soil-temperatures simulated by the fully coupled Community Climate System Model version 3 were evaluated using gridded Russian soil-temperature climatologies. The performance of a permafrost/soil model fully coupled with a climate model depends partly on the permafrost/soil model itself, the accuracy of the forcing data and design of observational network.

Major Professor: Dr. Carmen Nicole Mölders

John Maunsel Pearce **

Ph.D. Biological Sciences: Biology

B.S., Lewis and Clark College (Oregon), 1990. M.S., University of Idaho, 1996

Thesis: Site Fidelity: Definition, Measurement and Implications for Population Structure Using Mark-Recapture, Genetic, and Comparative Data in the Hooded, Red-Breasted, and Common Mergansers

This dissertation examined the behavior of site fidelity: terminology, measurement and implications for population structure using mark-recapture, genetic, and comparative data in the Hooded, Red-breasted and Common Merganser (Anseriformes). Results suggest that multiple data types are needed to accurately quantify and assess the impact of site fidelity on population structure.

Major Professors: Dr. Mark S. Lindberg and Dr. Kevin G. McCracken

Valentina Radić *

Ph.D. Geophysics

M.S., University of Zagreb (Croatia), 2004

Thesis: Modeling Future Sea Level Rise from Melting Glaciers

The aim is to project 21st century volume changes of all mountain glaciers and ice caps outside Greenland and Antarctica and to provide systematic analysis of uncertainties originating from different sources in the calculation. Projected total volume loss is in the range from 0.039 to 0.150 m sea level equivalent.

Major Professor: Dr. Regine M. E. Hock

Martin D. Robards *

Ph.D. Biological Sciences: Wildlife Biology

B.S., University of Liverpool (United Kingdom), 1988. M.S., Memorial University of Newfoundland (Canada), 2000

Thesis: Perspectives on the Dynamic Human-Walrus Relationship

Changes in sea ice conditions have direct bearing on species such as walrus, which are an important component of subsistence for Alaska Natives in the Bering Sea. This research explored how government and Alaska Native co-management partners might foster resilience and adaptation of both walrus and the communities dependent on them.

Major Professors: Dr. F. Stuart Chapin III and Dr. Peter P. Schweitzer

Joshua H. Schmidt *

Ph.D. Biological Sciences: Wildlife Biology

B.S., Michigan State University, 1998. M.S., University of Alaska Fairbanks, 2004

Thesis: The Effects of a Changing Environment on the Population Dynamics of Trumpeter Swans in Alaska

This work rigorously analyzed trumpeter swan survey data collected in Alaska since 1968. Using advanced statistical methods, the researcher determined rates of population change, the effects of environmental change on habitat use, and the influences of habitat features on habitat occupancy throughout the state.

Major Professor: Dr. Mark S. Lindberg

Kunaljeet S. Tanwar **

Ph.D. Environmental Chemistry

B.T., Institute of Technology Banaras Hindu University (India), 2003. M.S., University of Alaska Fairbanks, 2004

Thesis: Surface Structure of Hydrated and Fe(II) Reacted Hematite (1102) and (0001)

A detailed experimental investigation of molecular scale structure of the hematite surfaces under hydrated conditions in absence and presence of aqueous Fe(II) is presented. The structural characterization will provide a basis to elucidate surface structure-reactivity relationships for hematite and will aid in developing models of mineral-water interfacial reactivity.

Major Professor: Dr. Thomas P. Trainor

Yiming Wang *

Ph.D. Geology

B.S., Beijing University (People's Republic of China), 1999. M.S., University of Alaska Fairbanks, 2004

Thesis: The Development and Application of Stable Oxygen and Hydrogen Isotope Analyses of Chironomidae (Diptera) as Indicators of Past Environmental Change

The researcher optimized a new method for analyzing the $d^{18}O$ and dD of chironomid chitin for paleoecology research; evaluated the degree to which water and diet influence $d^{18}O$ and dD of chironomids; and then applied this approach to a lake sediment core from southwest Alaska to reconstruct past environmental changes.

Major Professor: Dr. Matthew J. Wooller