Graduate Study in Natural Sciences

Come explore science in the Pacific Northwest
Interdisciplinary research in pursuit of great discoveries

Take part in exciting research that can change the world. Join world-class faculty at the only Carnegie Tier 1 research institution in Southwest Washington. In search of new insights, we strongly encourage interdisciplinary thinking. Our current research—from aquatic ecology to mathematical biology to zebrafish genetics—involves cross-collaboration among four primary disciplines: biology, environmental science, mathematics and neuroscience.

Aquatic Ecology Laboratory
Steve Bollens and Gretchen Rollwagen-Bollens

Explore the ecology of marine and estuarine zooplankton and fish, including behavior, population biology, community ecology and ecosystem dynamics. Join field work that could take you from the northeast Pacific to the Florida Keys and beyond to investigate conservation biology, restoration ecology, fisheries oceanography or global change.

Gretchen Rollwagen-Bollens and Steve Bollens research aquatic ecology around the globe.
Conservation Biology Laboratory
Cheryl Schultz

Examine the recovery of rare species and restoration of their habitats using field and quantitative methods. Develop an understanding of how individual, population and landscape-level processes contribute to the population viability of endangered species and how they are affected by conservation interventions.

Disturbance Ecology
John Bishop

Learn about the forces that shape the development of biological communities and associated ecosystems on landscapes left barren by Mount St. Helens’ 1980 eruption. Investigate the implications of our recent discovery that animals that feed on colonizing plants shape the development of plant communities and soils to an extent never before realized.
Environmental Chemistry and Molecular Toxicology

Steve Sylvester

Look at the world at the molecular level, focusing in particular on reproductive processes. Help identify molecules in the environment that may alter reproductive processes in plants and animals, such as pheromones in a predatory snail that costs the oyster industry millions of dollars per year. Study how to regulate reproduction in fish, or how contaminants accumulate in human breast milk.

Global Change and Watershed Biogeochemistry

John Harrison

Largely due to human activities associated with food and energy production, nutrients such as nitrogen and phosphorus are flowing at unprecedented rates into streams, rivers and coastal waters, with marked environmental consequences. Use a suite of experimental, remote sensing and computer modeling approaches to learn how nutrients are mobilized, transported and transformed as they move through watersheds, and how these nutrients are affecting aquatic ecosystems along the way.
Hair Cells and Hearing Laboratory
Allison Coffin

Hearing is one of our basic senses, allowing us to communicate and to perceive the world around us. Study hair cells—not the hair cells on your head but the hair cells in your inner ears—to address two major questions: 1) What cellular and molecular events trigger hair cell death following a toxic insult? 2) How do endogenous hormones influence hair cell death and proliferation?

Zebrafish Genetics Laboratory
Cynthia Cooper

Join in researching the biology of pigmentation, using zebrafish to ask questions regarding the cell biology and genetics of pigment and skin cell development in humans. Black pigment cells, or melanocytes, reside throughout human skin, in hair follicles and eyes, and are essential in providing color to those features and tanning the skin. Similar cells are present throughout the animal kingdom and serve a variety of purposes, including mate choice in ducks, warning response in frogs and social behavior in fish.

Hearing and Communication Laboratory
Christine Portfors

Get involved in research designed to lead to a better understanding of how the auditory system processes complex sounds and how age-related hearing loss impacts this processing. Help determine how to characterize the neural mechanisms that underlie encoding of complex sounds.
Mathematical Biology

*Alexander Dimitrov*

Explore neural information processing, neural coding and information representation in biological systems. Learn about the information processing functions of neural ensemble activity and the biological mechanisms through which these functions are implemented.

*Nikolay Strigul*

Mathematical methods in concert with field and experimental studies can improve understanding of multiple-scale biological phenomena. Bring mathematical biology to bear on specific areas of ecology and environmental science, such as ecotoxicology, soil, microbial and avian ecology, and the self-organization patterns of forested ecosystems.

*Steven Henderson investigates the ecology of coastal pollution, flooding and erosion.*

Waves, Currents and Sediment Transport in the Coastal Waters

*Steven Henderson*

Get involved in the geophysics lab, which combines field measurements with theoretical models and computer simulations to shed light on natural water flows, mixing and sediment transport. An improved understanding of these subjects might ultimately help solve such problems as coastal pollution, flooding and erosion, and might lead to better coastal structures, such as jetties and breakwaters.

CAS.VANCOUVER.WSU.EDU/SCIENCE-GRADUATE-PROGRAMS
Drug Abuse Laboratory
Barbara Sorg

Be part of a team investigating the prevention of drug relapses. Study drug addiction and how to diminish drug-associated memories that are thought to cause relapse behavior. For example, even after learning that cocaine is no longer available, laboratory rats may seek it out when subject to stress and other stimuli.

Drug and Opioid Tolerance Laboratory
Michael Morgan

Opiates such as morphine are the most effective treatment for pain. But with repeated doses, their effectiveness is diminished. Join research to determine the mechanism for tolerance so that long-lasting and effective pain treatments can be developed.
Cross-collaborate

As a graduate student in the natural sciences at WSU Vancouver, you will take a multidisciplinary approach to research. Different areas of study overlap and touch upon each other to yield new insights.
Degree programs

Biology and Environmental Science

DEGREES:
- M.S. and Ph.D. in botany and zoology
- M.S. in environmental science
- Ph.D. in environmental and natural resource science

RESEARCH AREAS IN VANCOUVER
- Animal behavior
- Butterfly ecology
- Conservation biology
- Disturbance ecology
- Ecology of aquatic invasive species
- Ecosystems ecology
- Environmental chemistry
- Environmental physics
- Evolutionary ecology
- Global change biology
- Marine and freshwater plankton ecology
- Oceanography
- Plant ecology
- Plant-herbivore interactions
- Plant-insect interactions
- Restoration ecology
- Successional dynamics
- Watershed biogeochemistry

Mathematics

DEGREES:
- Ph.D. in mathematics

RESEARCH AREAS IN VANCOUVER
- Applied math
- Computational neuroscience
- Ecological modeling
- Mathematical biology

Neuroscience and Biomedical Sciences

DEGREES:
- Ph.D. in neuroscience
- M.S. and Ph.D. in zoology

RESEARCH AREAS IN VANCOUVER
- Cell and developmental biology
- Computational neuroscience
- Drug abuse
- Drug and opioid tolerance
- Experimental psychology
- Hair cells and hearing
- Hearing and communication
- Molecular biology
- Molecular toxicology
- Neuroscience
- Zebrafish genetics

Questions?

Contact Cheryl Schultz
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CAS.VANCOUVER.WSU.EDU/SCIENCE-GRADUATE-PROGRAMS
Get started

For admission to graduate study in the natural sciences at WSU Vancouver, you must have a faculty advisor. Please contact a faculty member whose research matches your interests before you apply.

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**DRUG and OPIOID TOLERANCE**
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**ENVIRONMENTAL CHEMISTRY and MOLECULAR TOXICOLOGY**
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**WAVES, CURRENTS and SEDIMENT TRANSPORT in the COASTAL WATERS**
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**ZEBRAFISH GENETICS**
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A BEAUTIFUL PLACE FOR WORLD-CLASS RESEARCH.
WSU Vancouver is only 20 minutes from Portland, 90 minutes from the Pacific coast and boasts gorgeous views of Mount St. Helens, Mount Hood and Mount Adams.