HC, CAS, CEOAS & COF
Faculty Research Showcase
Jan. 24, 2023
Rachel Jones, she/her/hers
CAS Student Engagement Coordinator

Contact info:

rachel.jones@oregonstate.edu
Strand Ag Hall 147D
541-737-7410

My role:
• Coordinate 3 CAS undergraduate research programs:
  - Beginning Researchers Support Program
  - Continuing Researchers Support Program
  - Branch Experiment Station Research Internships
• Assist students with finding research opportunities in CAS
• Deliver workshops and trainings for CAS undergraduate students engaging in research
Jennifer Field
Environmental & Molecular Toxicology

**Research Focus:** Per- and polyfluoroalkyl substances (PFAS)
- Chemical discovery
- Fate & transport
- Human exposure
- Firefighting (AFFF)
- Fingerprinting sources (forensics)
- Weapons: thermal degradation
## Past projects

- Economic feasibility of robotic harvesters
- Analysis of manual harvest efficiency
- Organic adoption dynamics
- Analyzing crop insurance programs

## Undergraduate Research Opportunities

- Cost of production studies
- In-field time-studies of harvest, planting, etc.
- Economic impact of wolf depredation on OR livestock
- Other? What are you interested in?

## Courses Taught (here or elsewhere)

- Ag Finance (AEC 465)
- Business Org in the Food System (AEC 440)
- Agribus. Management
- Ag Risk Management
- Quantitative Decision Tools
- Food and Ag Marketing
- Microeconomics
FWCS VIEW Fellowship

“Vanguarding an Inclusive Workforce”
Dept. of Fisheries, Wildlife, and Conservation Sciences

- Supports professional development of future ecologists from historically underrepresented communities

- VIEW Fellows engage in 10-weeks of paid, mentored research with FWCS faculty & participate in professional development activities with their cohort

- No previous experience required! Open to students of all majors who identify as from an underrepresented community, first gen, manages health conditions, LSAMP/TRIO/CAMP…

- Will host 7 students in 2023. $15/hr + housing!

- Submit your interest form now! Student applications open in February.

Shalynn Pack
FW.internship@oregonstate.edu
I would tell any students interested in the program to simply send it and apply. Your experience is valid, your background gives you character, and you have plenty to offer to a program such as this.
- Nat, 2022 Fellow

I am going to remember these months as one of the best summers I have ever had. I not only got to contribute to a conservation effort in my home state and beyond, I also found mentors, considered graduate school in depth for the first time, and saw the importance of representation in this field.
- Carmen, 2022 Fellow

Shalynn Pack, FW.internship@oregonstate.edu
What Do We Do?

Siva K. Kolluri, Ph.D.; Professor, EMT

Kolluri Laboratory investigates

- How do certain chemicals act and investigate their mechanism of action
- Why do ‘normal’ cells lose their normalcy and become abnormal
- How to make abnormal cells normal again
- How to stop the growth of cancer cells or selectively kill them
- Understand how certain proteins protect cancer cells and find means to eliminate them
Loss of AhR in p53-deficient mice results in increased tumorigenesis.
How do insects move at a landscape scale?

Red-tailed bumblebee

Spotted-wing Drosophila

Brownian motion
(10m in day)

directed dispersal
(km in hour)

Timothy Warren
Horticulture IB, BioE
tim.warren@oregonstate.edu
How do insects move at a landscape scale?

- **Computerized Camera Traps**
  - Raspberry Pi camera
  - Bait
  - Camera traps
  - Release
  - 1 km

- **Flight Simulators**
  - Camera
  - 100 cm

- **Bumblebee ID & Foraging**
  - Pi zero computer
  - LiPo solar charger
  - 12.3 MP camera
  - elnk display
  - GPS
  - Temp/humidity sensor
  - Rugged case

Timothy Warren
Horticulture IB, BioE
tim.warren@oregonstate.edu
Fiona Tomas Nash
Fisheries and Wildlife
Fiona.TomasNash@oregonstate.edu
Patterns and drivers of eelgrass wasting disease (EWD) in OR

- How does disease presence and severity vary across space and time?
- Are some eelgrass meadows more vulnerable / resistant to disease?
- What factors drive susceptibility to disease?
  - Plant age
  - Plant physiology
  - Environmental factors

Field work: monitoring of eelgrass health in different OR estuaries
Lab work: analysis of disease and plant traits
Data analysis

(Christina et al. 2021)
Evaluating eelgrass natural recovery potential from seed banks in South Slough and lower Coos Bay, OR

- How do reproductive characteristics of eelgrass vary across space and time?
- Are these differences associated with environmental factors?
- What is the impact of thermal stress on critical life stages (germination, seedling development)?
- Can the seed output in this estuary support a possible seed-based restoration effort?

Field work: monitoring of eelgrass density, flowering, seed banks
Lab work: analyzing flowering shoot characteristics and seed bank cores
Data analysis
2023 Faculty Research Showcase

Sustainable Groundwater Quantity and Quality Innovation Lab

Dr. Salini Sasidharan
(Assistant Professor | Sustainable Groundwater Management Engineer)
Department of Biological & Ecological Engineering, College of Agriculture Science and College of Engineering
Salini.Sasidharan@Oregonstate.edu

Research for Building a Climate-Resilient Water Resource Management

Design Innovative Managed Aquifer Recharge (MAR) Engineering Systems

- Architectures for enhanced nutrient removal and water quality improvement
- Passive management of saltwater intrusion
- Groundwater–stream water exchanges
- Mitigate flooding
- Improved reservoir design to limit evaporation losses
- Secure water supply
- Compensate climate change
- Maintain the quality of groundwater bodies
- Limit the pollution of surface water
- Sustainable groundwater management

Ag and Flood MAR
Aquifer Storage and Recovery (ASR)
Drywells
Infiltration Basin

Low-permeability confining layer
Confined aquifer
Confined groundwater
Subsurface storage
Recharge
Recovery
Pre-treatment
Capture zone
End use
Securing groundwater
Compensate climate change
Maintain the quality of groundwater bodies
Limit the pollution of surface water
Improved reservoir design to limit evaporation losses
Passive management of saltwater intrusion
Groundwater–stream water exchanges
Mitigate flooding
Potential Research Topics

- Development pre- and post treatment systems
- Groundwater modeling for drywell-MAR
- Comparison of various MAR techniques
- Alternative water for groundwater recharge
- Use of geophysical tool for site characterization
Research Interests

Sharmodeep Bhattacharyya
Associate Professor, Department of Statistics
Collaborative Interests

Current

• Human and Rat Brain Analysis based on ECoG Array Data with Kristofer Bouchard, LBNL.
• Mouse Brain Analysis based on optogenetic mesoscale data from Luca Mazzucato, University of Oregon.
• Hops disease network and plant epidemiology with Chris Mundt, OSU and David Gent, USGA and OSU.
• Statistics and Public Policy with the interdisciplinary Covid-19 Statistics group in the Department of Statistics.
David B. Hannaway
Crop & Soil Science

Modeling and Mapping Forage Species
Using Expert Knowledge, Field Data, and Climate and Soil GIS Spatial Data Layers

**Why:** Appropriate forage selection is key to high productivity and persistence of forage stands and to the sustainability of forage-livestock systems

**Goal:** Expand existing selection tools to inform farmers, ranchers, and other land managers for appropriate choice of forage species:

- Modeling and mapping activities incorporate quantitative climatic, soil, and plant tolerance values into high-resolution spatial data overlays

**Student Learning Outcomes:**
- Explain why appropriate selection of forage species is essential to economic and environmental sustainability
- List ecosystem services supported by forage species
- Discuss important climatic and soil factors in forage selection
- Compare and contrast qualitative and quantitative characteristics of forage species
- Describe the process of spatial data layer-based modeling and mapping
- Demonstrate competence in website editing
Research Interests

Foraging ecology and ecosystem impact of sharks
Salmon shark, Broadnose Sevengill shark, White shark, Blue shark

Potential effects of EMF from energy development on movement and distribution
Elasmobranchs, Dungeness crab, salmonids, sturgeon, tunas

Outreach and Education
Public lectures and dissections, popular media, data-driven curriculum
OSU College of Forestry

College programs
- Mentored Employment Program (MEP)
  - Paid student research in college with faculty mentor
  - Fall application cycle, work in Winter/Spring
- Summer Undergraduate Assisted Research (SUGAR)
  - Paid student research in college with graduate student mentor
  - Spring application cycle, work in summer
- Experiential Learning Funds
Timber Structures
Department of Wood Science & Engineering

Arijit Sinha
Arijit.Sinha@oregonstate.edu

Ian Morrell
Ian.Morrell@oregonstate.edu
• Opportunities to work on:
  • Multi-scale material characterization
  • Seismic performance of connectors
  • New product development using renewable resources
  • Durability assessment of materials and connectors

Contact us: Arijit.Sinha@oregonstate.edu
Gerald Presley

Teaching
WSE 111 Renewable Materials for a Green Planet
WSE 520 The Global Forest Sector
WSE 240 Fungal Decay in your World (coming soon)

Title & Discipline
Contact Information
Assistant Professor
Department of Wood Science and Engineering
gerald.presley@oregonstate.edu

Research Foci
Wood durability and wood treatments
Environmental impacts of treated wood
Fungal bioremediation of metals
Fungal decomposition of plastics

Undergraduate Research Opportunities
Using Ectomycorrhizal fungi to remediate metals in the environment
Can we harness ECM fungi to remediate treated wood metals?

Using fungi to remediate polyethylene mulch
Can we use fungi in combination with physical pretreatment to remediate plastic?

- Treated wood waste
- Metals can leach into groundwater
- ECM fungi can transport or immobilize metals
- Polyethylene mulch is pervasive in fruit and vegetable agriculture
- Some of this ends up distributed in soil as pollution
- Decay fungi have unique biochemistry
Erin Lieuallen, M.S.

Courses
ATS/ENSC/GEO/GEOG/OC
• 410
• 004

Experiential Learning Coordinator
Wilkinson 102
541-737-1267
erin.lieuallen@oregonstate.edu

I work with CEOAS Undergrads on:
• Internships
• Research
• SURP (Support for Undergraduate Research Program)
• Mentoring Programs
• Mentor of the Year Nominations (Due Feb 13)

Resources
• SURP Funding for research costs due Friday Week 2
• Academic credit for research or internship due Wednesday Week 1
• Non-credit for research or internship due Wednesday Week 1

See ‘Beyond the Classroom’
Project: Transboundary Freshwater Dispute Diplomacy Database
Professor: Aaron Wolf (Geography)
Grad Students: Alexandra Caplan, Database Manager
Zoe Rosenblum, Grant Manager

Research Foci
• Water resources politics
• Environmental conflict management

Research Opportunities
• Treaty coding
• Hydropolitical assessment
• GIS projects
• Desk research on water resources & int'l relations

Interested in joining our team?
caplana@oregonstate.edu
rosenblz@oregonstate.edu
Teaching and Research Foci

• Undergraduate physical oceanography (Dever)
• Coastal physical oceanography
• Ocean observing (collecting and making-available continuous long-term time series data from autonomous gliders, moorings, and profilers)

Title & Discipline, Contact Information

• Ed – Professor, Physics Oceans Atmospheres (POA) Edward.Dever@oregonstate.edu
• Jon – Associate Professor Senior Research, POA jonathan.fram@oregonstate.edu
• Endurance Array, Ocean Observatories Initiative
• Ocean Observing Center (126 SW McKenzie Ave.)
• www.oceanobservatories.org

Undergraduate Research Opportunities

• We employ 3 students who refurbish our moorings and profilers. Will advertise for one person to start this summer.
• With collaborator Leif Rasmuson (Oregon Department of Fish & Wildlife), Jon is hiring one undergraduate to study water clarity off the Oregon coast using ODFW ROV surveys, OOI cameras, and ODFW & OOI environmental data. See OSU job announcement P09479SE just posted.
Brian Katz, MS Geography

Teaching

GEOG 370: Cartography (TA)  
GEOG 462/562: GIS III: Programming for Geospatial Analysis (TA)  
GEOG 300: Sustainability for the Common Good (TA)

Contact Information

Brian G. Katz  
Faculty Research Assistant  
Geography and Geospatial Science  
katzbr@oregonstate.edu  
https://briangkatz.github.io  
Strand Hall 348

Research Foci

- Web mapping  
- Coastal livelihoods  
- Social vulnerability  
- Social-ecological systems  
- Human migration  
- Geovisualization  
- Spatialized interviews  
- Adaptation to stressors  
- Habitability  
- Social media

Undergraduate Research Opportunities

- Creating interactive data explorer maps  
- Creating story maps  
- Conducting social science with mapping tools  
- Predicting effects of multiple stressors on livelihoods  
- Collecting and analyzing Twitter data for research
Two Undergraduate Opportunities:

1. **International, Cross-cultural, Undergraduate Research on Estuarine Health.**
   - University of Ghana, Hampton University, and Oregon State University,
   - Field work in Ghana (summer of 2023),
   - OSU Internship (summer of 2024),
   - Application due February 17.

2. **Research in Yaquina Bay estuary (physical oceanography, biogeochemistry, habitat health).**
   - Field work and data analysis, collaboration.

For more information and to apply:

https://beav.es/5cz

Application due: February 17, 2023
Frank Sousa

**Assistant Professor**

**GEOLOGY**

francis.sousa@oregonstate.edu

114 Burt Hall

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**Research Opportunities**

- Field projects in Oregon
- Bayesian Monte Carlo Markov Chain inverse modeling of geologic data
- 3D micro tomography of crystals
Intro to Geospatial Sciences (Geog 201)
Geographic Information Systems I (Geog 360)
Cartography (Geog 370)
Conflict, Cooperation & Control of Water in the U.S. (Geog 440)

Research:
Plant-river interactions & river restoration
How can plants drive river evolution?
How does river hydrology & environment drive plant species patterns?
Middle Fork John Day River, Santiam Basin
?Willamette, McKenzie, Umpqua

Undergraduate Research Opportunities
Topo-bathymetric channel surveys
Riparian plant surveys
Remote sensing of key species expansion
Monitoring of river restoration projects using aerial imagery & field sampling
Your ideas?

Instructor: Geospatial Sciences (Geography)
Matthew.Goslin@oregonstate.edu
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<tr>
<th><strong>Teaching</strong></th>
<th><strong>Contact Information</strong></th>
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| OC 350 Chemical Oceanography  
OC 498 Grand Challenges in Oceanography | Associate Professor, Chemical Oceanography  
kristen.buck@oregonstate.edu  
Burt 244 |

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<th><strong>Research Foci</strong></th>
<th><strong>Undergraduate Research Opportunities</strong></th>
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| Chemical speciation, bioavailability, and biogeochemical cycling of trace metals in seawater | • Analyze archived samples for Ni, Cu speciation  
• Model metal-ligand laboratory experiments  
• Characterize metals in biological particles  
• Assess metals in clays used for HAB mediation |
Pieter-Ewald Share  Geophysicist

My Teaching

- eGEO100 – Natural Disasters
- GEO463/563 – Geophysics & Tectonics
- GPH650 – Geophysical Inverse Theory
- GPH665 – Geophysical Field Techniques*
- GEO380 – Earthquakes in the PNW*
  *earmarked to be taught in future

Who and Where am I?

Assistant Professor Geophysics
pieter.share@oregonstate.edu
Weniger Hall Room #507
https://pshare.weebly.com

What do we study?

1. Multi-geophysical imaging
2. Active plate tectonic margins
3. Fault zones properties
4. Physics of earthquakes
5. Seismic hazard & risk

UG Research Opportunities

- Geophysical field data acquisition
- Analysis of seismic array data
- Joint inversions of diverse data
- ML-based earthquake detection
What will your summer research experience be like?

• 10 weeks of research work at a COLDEX institution (includes OSU)

• Help us find the oldest ice in Antarctica!

• Stay involved year-round

• $6,000 stipend, round-trip travel to host institution, funds towards housing costs, round-trip travel to the Fall 2023 COLDEX annual meeting at OSU

Questions? Contact me: kristen.rahilly@oregonstate.edu
Do you like to play with mud? Do you like magnets?

How about using mud and magnets to understand some of Earth’s most important problems?

Monitoring Earth’s Magnetic Field

Reconstructing past climates

Tracing the past retreat of ice sheets

Prof. Joseph Stoner
Deepa Dwyer
Sami Cargill

joe.stoner@oregonstate.edu
shahde@oregonstate.edu
cargills@oregonstate.edu

Research Opportunities

- Exploring geomagnetic field
- Exploring EQ’s with magnetism
- Exploring sediments with magnetism (PNW, Baffin Bay and more...)

Projects

- Climate and Magnetic History of the Pacific Northwest
- North Atlantic Records of the Greenland Ice Sheet
# George Waldbusser

## Teaching
- OEAS540-Biogoechemical Earth
- GEO484- Intro to Biogeochemistry
- OEAS500- Cascadia Fieldcourse

## Research Foci
- Ocean Acidification (in estuaries)
- Sediment & Estuarine Biogeochemistry
- Biocalcification and Bivalves
- Calcium carbonate cycling in estuaries
- Acidification mitigation

## Title & Discipline
**Professor of Ocean Ecology and Biogeochemistry**

Graduate Program Director for OEAS

george.waldbusser@oregonstate.edu

Office: Burt 200
Lab: Burt 236

## Contact Information

## Undergraduate Research Opportunities
- Controls on oyster growth in Yaquina Bay
- Alkalinity cycling in tidal sediments
- Shell lifetime, degradation, endobionts
Responses of birds, butterflies, and vegetation to natural and human-caused environmental change in the Great Basin

Community science at Yakona Nature Preserve

Responses of natural and human systems to climate change
# Emily Eidam

## Teaching

OC 360 – Geological Oceanography (Marine Geology)

## Research Foci

- Estuarine sedimentation and anthropogenic disturbance
- Arctic coastal ocean and continental shelf dynamics (modern geological perspective)
- Low-cost, open-source instrumentation

## Undergraduate Research Opportunities

- Instrumentation construction and applications (water-level and turbidity monitoring)
- Sedimentology analyses

## Title & Discipline

Assistant Professor

coastal & fluvial sedimentology

emily.eidam@oregonstate.edu

https://blogs.oregonstate.edu/coastalseds/
Thank You

Enjoy conversations and snacks outside room