



Portland State  
UNIVERSITY

Sustainability Research at  
Portland State University

**research  
topics**

**research  
faculty**

# Green – it's more than our school color, it's our school spirit

At Portland State we do more than just study sustainability. We engage directly with the community around us to make sustainability real. Our goal is to harness the strengths of our singular urban university - our new ideas, our innovative partnerships, our academic rigor - toward solving the environmental, social, and economic problems of our time.

We aim to be a living laboratory of sustainability, with our efforts at research and education fully integrated with the community around us.

We try to help our students understand the principles of sustainability no matter what field of study they choose. Sustainability is taught not as a separate topic, but integrated into most disciplinary majors and our general education requirements.

# Our Research Topics

PSU's expertise is concentrated in two main, inter-connected areas – *the coupling of human and natural systems*, and *sustainability in urban and urbanizing communities*. PSU also has particular strengths in two cross-cutting topical areas – *metrics and evaluation*, and *mechanisms that effect change and foster engagement at the individual, organizational, societal and ecosystem levels*. This expertise is applied in a number of targeted research areas listed below.

- Community Food Systems
- Economic Sustainability
- Environmental Science & Green Technology Development
- Environmental Sustainability
- Integrated Water Resource Management
- Intelligent Transportation Systems
- Renewable Energy
- Social Sustainability
- Sustainable Business Processes & Practices
- Sustainable Urban Development

# Some of Our Research Faculty

Our sustainability research is focused into four areas: *the integration of human societies and the natural environment*; *creating sustainable urban communities*; *implementing sustainability and mechanisms of change*; and *measuring sustainability*. Below is a selected list of some of our researchers:

- [Jennifer Allen](#)
- [Darrell Brown](#)
- [Jennifer Dill](#)
- [Geoffrey Duh](#)
- [Peter Dusicka](#)
- [Dave Ervin](#)
- [Andrew Fountain](#)
- [Elise Granek](#)
- [Janet Hammer](#)
- [Marcus Ingle](#)
- [Aslam Khalil](#)
- [Barry Messer](#)
- [Madeleine Pullman](#)
- [Scott Reed](#)
- [John Rueter](#)
- [David Sailor](#)
- [Gerald Sheblé](#)
- [Graig Spolek](#)
- [Mark Sytsma](#)
- [Carl Wamser](#)
- [Scott Wells](#)
- [Alan Yeakley](#)

# Community Food Systems

- Addressing Transportation, Packaging, and Waste in the Food Supply Chain
- Assessing the Market Dynamics of “Values-Added” Agriculture and Food Businesses in Oregon: Challenges and Opportunities
- Food Footprint

# Economic Sustainability

- Measuring Ecological, Social & Economic Valuation of Interface Habitats for Coastal Ecosystem-based Management
- Oregon Business Decisions for Environmental Performance
- Portland's Green Building Cluster – Economic Trends and Impacts
- Public Goods and University-Industry Relationships in Agricultural Biotechnology

# Environmental Science & Green Technology Development

- Ballast Water RDTE
- Biological Characterization of Stormwater Facilities
- Conductive Porphyrin Polymers for Solar Cells
- Developing Building Energy Simulation Capabilities for Climate Change Scenarios in California Cities
- Hybrid Organic/Inorganic Solar Cells
- Measurement and Modeling of Green Roof Performance Leading to the Development of an Energy Savings Calculator
- Monitoring and Restoration Following Mangrove Removal, Belize
- Performance Monitoring of Three Eco-roofs in Portland, Oregon
- Toward Adoption of Green Building Structural Systems in Areas of Seismic Risk
- Utilizing Co-Products from Oregon's Biofuel Industry to Build High Value Nanomaterials

# Environmental Sustainability

- Community Watershed Stewardship Program
- Emissions of Methane and Nitrous Oxide from Agricultural Sources: Closing the Gaps in the Budget of Methane and Nitrous Oxide
- Interactions of Land Cover Change and Flood Hazards in North Korea
- Measuring Ecological, Social and Economic Valuation of Interface Habitats for Coastal Ecosystem-based Management
- Measuring Glacier-Climatic Variables in Glacier National Park, North Cascades National Park and Mount Rainier National Park
- Monitoring and Restoration Following Mangrove Removal, Belize
- Spatial Variation of Mount Rainer's Glaciers
- State Aquatic Nuisance Species Management Plan
- Superior Adaptation to Drought in Himalayan Blackberry
- The Influence of Humic Substances on the Ecology of Aphanisomenon Flos-algae in Upper Klamath Lake

# Integrated Water Resource Management

- Ballast Water RDTE
- Biological Characterization of Stormwater Facilities
- CE-QUAL-W2 Modeling, Maintenance, and Support
- Coral Reef Health and Resource Use in the Comoros Islands: Effects of management and community-based monitoring
- Developing a Predictive Model for the Effects of Watershed Land Use on Downstream Coastal Marine Ecosystems
- Hydrodynamic and Water Quality Modeling of Tolt Reservoir
- Identifying Thresholds in Resistance of Reservoir Ecosystems to Natural and Anthropogenic Disturbances
- Investigating the Impact of Roadway and Pavement Design on Stream Temperatures
- Measurement and Modeling of Green Roof Performance Leading to the Development of an Energy Savings Calculator
- Measuring Ecological, Social and Economic Valuation of Interface Habitats for Coastal Ecosystem-based Management
- Modeling Effects of Channel Complexity & Hyporheic Flow on Stream Temperatures
- Modeling the Impact of the Peace Conduit between the Gulf of Aqaba and the Dead Sea
- Performance Monitoring of Three Eco-roofs in Portland, Oregon

# Intelligent Transportation Systems

- Addressing Transportation, Packaging, and Waste in the Food Supply Chain
- Ballast Water RDTE
- Developing Micro-Simulation GIS for Tsunami Evacuation Planning
- Evaluation of Bike Boxes at Signalized Intersections
- Improving Regional Travel Demand Models for Bicycling
- Investigating the Impact of Roadway and Pavement Design on Stream Temperatures
- Understanding and Measuring Bicycling Behavior: Implications for Urban Planning, Health, & Research

# Renewable Energy

- Conductive Porphyrin Polymers for Solar Cells
- Hybrid Organic/Inorganic Solar Cells
- Photovaltaic Test Facility
- Power Extraction Oregon for a Novel, Low-Cost Wind-Power System
- Utilizing Co-Products from Oregon's Biofuel Industry to Build High Value Nanomaterials

# Social Sustainability

- Leadership for Sustainable Development in Post-WTO Vietnam
- Measuring Ecological, Social and Economic Valuation of Interface Habitats for Coastal Ecosystem-based Management
- Mitigating the Environmental Impact of Rapid Urban Development

# Sustainable Business Processes & Practices

- [Addressing Transportation, Packaging, and Waste in the Food Supply Chain](#)
- [CITGO: Do Analysts Care About CER](#)
- [Emissions of Methane and Nitrous Oxide from Agricultural Sources: Closing the Gaps in the Budget of Methane and Nitrous Oxide](#)
- [Evaluating the Social Bottom Line of Development Investment](#)
- [Food Footprint](#)
- [GRI: Driver of Reporting Sustainability](#)
- [Oregon Business Decisions for Environmental Performance](#)
- [Post-Occupancy Performance Assessment of Center for Health and Healing](#)
- [Public Goods and University-Industry Relationships in Agricultural Biotechnology](#)
- [State Aquatic Nuisance Species Management Plan](#)
- [Voluntary Environmental Disclosures](#)

# Sustainable Urban Development

- Developing Building Energy Simulation Capabilities for Climate Change Scenarios in California Cities
- Evaluation of Bike Boxes at Signalized Intersections
- Measurement and Modeling of Green Roof Performance Leading to the Development of an Energy Savings Calculator
- Mitigating the Environmental Impact of Rapid Urban Development
- Performance Monitoring of Three Eco-roofs in Portland, Oregon
- Photovoltaic Test Facility
- Power Extraction Oregon for a Novel, Low-Cost Wind-Power System
- Quantifying the Relative Importance of Urban Heat Island Causal Factors
- Riparian Shade Analysis and Restoration Priorities Report for the Damscus-Boring Concept Planning Area
- Toward Adoption of Green Building Structural Systems in Areas of Seismic Risk
- Understanding and Measuring Bicycling Behavior: Implications for Urban Planning, Health, & Research
- U.S. India Joint Workshop: Coupled Human-Natural Systems and the Challenge of Rapid Urbanization to the Resiliency of Water Resources
- Utilizing Co-Products from Oregon's Biofuel Industry to Build High Value Nanomaterials

# Jennifer Allen

Acting Director, Center for Sustainable Processes and Practices  
jhallen@pdx.edu

## Teaching and Research Interests

- Dr. Allen’s teaching and research focus on sustainability policy and practice, the history of sustainable development, sustainable food systems, the economics of the green building “cluster,” and post-occupancy performance of green buildings.
- Research Projects:
  - Assessing the Market Dynamics of “Values-Added” Agriculture and Food Businesses in Oregon: Challenges and Opportunities
  - Portland’s Green Building Cluster – Economic Trends and Impacts
  - Post-Occupancy Performance Assessment of Center for Health and Healing

# Assessing the Market Dynamics of “Values-Added” Agriculture and Food Businesses in Oregon: Challenges and Opportunities

- Project Description:
  - This research explores the dynamics of progressive agricultural production and food businesses in Oregon, focusing on the producers and businesses that are seeking to distinguish or “de-commodify” their products through the environmental or social aspects of their management practices or other attributes such as location of origin. The range of agricultural products of interest in this assessment is intentionally inclusive, and is based on what markets – as represented by buyers in direct markets, retail, food service, and export markets – are looking for in terms of the values that have been added to products, i.e. what social or environmental attributes purchasers take into consideration beyond product quality and price. The term “values-added” is used to describe products that are being distinguished on the basis of these attributes.
- Collaborators:
  - Jennifer Allen
  - Funding provided by the W.K. Kellogg Foundation through the Oregon Environmental Council. Publication available at <http://www.oeconline.org/our-work/food-and-farms/healthy-food-and-farms-pdfs/valuesaddedreport>
- Needs for this Project:
  - Please contact Jennifer Allen

# Portland's Green Building Cluster – Economic Trends and Impacts

- Project Description:
  - This research offers an initial exploration of the green building cluster in Portland, Oregon. Specific objectives include assessing how the factors identified in Michael Porter's diamond (Porter, 1990) support the green building industry cluster in this region, describing the trends in terms of growth and expansion in the sector, and, where possible, providing quantitative data to document the impact of this industry cluster. The research suggests that Portland has a robust and competitive green building cluster that is supported by local and export demand, a critical mass of leading edge firms, strong supporting institutions, qualified employees, and a robust supply chain. The study also identifies areas in need of additional support to realize the full potential for economic development in this cluster and offers an approach to mapping the green building cluster that may also inform analysis of other emerging sustainability clusters.
- Collaborators:
  - Jennifer Allen
  - Dr. Tom Potiowsky, Oregon State Economist and Professor of economics, Portland State University
- Needs for this Project:
  - Please contact Jennifer Allen

# Post-Occupancy Performance Assessment of Center for Health and Healing

- Project Description:
  - The energy savings and occupant productivity effects of green buildings are critical factors that influence the diffusion of new high performance building technologies. Owners, developers, and others in the building industry need credible information on occupant productivity effects to make sound financial decisions. This project is evaluating the energy and occupant productivity effects of a state-of-the-art green building in Portland, Oregon, the Center for Health and Healing (CHH) of Oregon Health and Science University.
- Collaborators:
  - Jennifer Allen
  - Gerding Edlen Development, Northwest Energy Efficiency Alliance, the Energy Trust of Oregon, Oregon Health and Science University, Dr. Judith Heerwagen, J.H Heerwagen & Associates, Inc., Dr. Ihab Elzeyadi, University of Oregon
- Needs for this Project:
  - Please contact Jennifer Allen

# Darrell Brown

Associate Dean, School of Business  
darrellb@sba.pdx.edu

- Teaching and Research Interests:
  - Dr. Brown's teaching interests deal with measurement issues and institutional behaviors. His current research interests include measurement issues related to organizational impacts on social and natural systems. In particular, he studies corporate social and environmental reporting, the relationship business reporting and business transparency, and the relationship between social and environmental reporting and firm performance.
- Research Projects:
  - CITGO: do analysts care about CER
  - Food Footprint
  - GRI: Driver of reporting or sustainability
  - Voluntary environmental disclosers

# CITGO: Do Analysts Care about CER

- Project Description:
  - Investigate the use of voluntary environmental disclosures by corporations as they are considered by firm analysts. Interview preparers and users of environmental disclosures to determine their value for firm analysts.
- Collaborators:
  - Darrell Brown
  - Scott Marshall, Marlene Plumlee
- Needs for this Project:
  - Data
  - Contacts in firms

# Food Footprint

- Project Description:
  - Describe and analyze the impact of different food delivery methods and packaging on the environmental footprint of food at Universities and Hospitals.
- Collaborators:
  - Darrell Brown
  - Madeleine Pullman
  - Scott Marshall, Wayne Wakeland
- Needs for this Project:
  - Data
  - Contacts in organizations

# GRI: Driver of Reporting or Sustainability

- Project Description:
  - Identifying the conditions under which the Global Reporting Initiative promulgates its reporting standards and determining how likely GRI success will drive sustainability.
- Collaborators:
  - Darrell Brown
  - Scott Marshall
- Needs for this Project:
  - Please contact Darrell Brown

# Voluntary Environmental Disclosers

- Project Description:
  - Identify cost of capital impacts and/or expected cash flow impacts that relate to quality of voluntary corporate disclosures of environmental behaviors.
- Collaborators:
  - Darrell Brown
  - Scott Marshall
  - Madeleine Pullman
- Needs for this Project:
  - Please contact Darrell Brown

# Jennifer Dill

Associate Professor, Urban Studies & Planning

[jdill@pdx.edu](mailto:jdill@pdx.edu)

- Teaching and Research Interests:
  - Dr. Dill teaches courses in transportation policy, transportation and land use, and planning methods. Her research interests focus on transportation and environmental planning, travel behavior, air quality, and transportation-land use interactions. She is interested in answering these questions: How do people make their travel and location decisions? How do those decisions impact the environment and people's health? How do our planning decisions impact people's travel and location decisions?
- Research Projects:
  - Evaluation of Bike Boxes at Signalized Intersections
  - Improving Regional Travel Demand Models for Bicycling
  - Understanding and measuring bicycling behavior: Implications for urban planning, health, and research

# Evaluation of Bike Boxes at Signalized Intersections

- Project Description:
  - This is a comprehensive observational before-after study of the effectiveness of installed experimental traffic control “bike boxes” and their impact on potential conflicts and driver, bicyclist and pedestrian behavior.
- Collaborators:
  - Jennifer Dill
- Needs for this Project:
  - Please contact Jennifer Dill

# Improving Regional Travel Demand Models for Bicycling

- Project Description:
  - Using data collected by GPS, develop an in depth bicycle component for the Portland area travel demand model by estimating the relative utilities of various types of facilities and factors, e.g. bike boulevards, arterials with and without bike lanes, low traffic streets, hills, etc.
- Collaborators:
  - Jennifer Dill
  - John Gliebe
- Needs for this Project:
  - Please contact Jennifer Dill

# Understanding and measuring bicycling behavior: Implications for urban planning, health, & research

- Project Description:
  - This research is answering three questions: 1) Examine the relationship between community environmental factors and people's decision to bicycle, including network connectivity, bicycle infrastructure, and land use; 2) Examine other intervening factors influencing the decision to bicycle, such as weather, topography, attitudes and perceptions of subjective and objective factors, and socio-demographics; and 3) Test the use of readily available technology to objectively measure physical activity of bicyclists.
- Collaborators:
  - Jennifer Dill
- Needs for this Project:
  - Please contact Jennifer Dill

# Geoffrey Duh

Assistant Professor & Director of GIS Programs, Geography  
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- Teaching and Research Interests:
  - Dr. Duh focuses his teaching on the theory and applications of geospatial technologies and analyses. In his research, Dr. Duh concentrates on developing theory and applications of GIS and remote sensing techniques in geographic education and interdisciplinary geographic analysis. Specific projects focus on developing geovisualization tools and applying spatial simulation and optimization techniques to study land-use and land-cover change and its interaction with the natural environment.
- Research Projects:
  - Developing Micro-Simulation GIS for Tsunami Evacuation Planning
  - Interactions of Land Cover Change and Flood Hazards in North Korea
  - U.S., India Joint Workshop: Coupled Human-Natural Systems and the Challenge of Rapid Urbanization to the Resiliency of Water Resources

# Developing Micro-Simulation GIS for Tsunami Evacuation Planning

- Project Description:
  - Developing spatial simulation tools for assessing emergency evacuation plans and infrastructures in the City of Seaside, Oregon, in the event of a local tsunami. The tools use population distribution, evacuation routes, and evacuation destinations data in spatial simulation for identifying potential evacuation choke points and rates of evacuation. Results could be used for adding new evacuation routes and destinations.
- Collaborators:
  - Geoffery Duh
- Needs for this Project:
  - Equipment

# Interactions of Land Cover Change and Flood Hazards in North Korea

- Project Description:
  - Using remote sensing and GIS to investigate the interactions of land cover change and the dynamics of hydrological systems in North Korea. Specifically, examining whether the geographic distribution of flooded areas was related to the conversion of natural land cover types (e.g., forest) to urban, agricultural, or other uses in the up stream areas of the watershed.
- Collaborators:
  - Geoffery Duh
  - Heejun Chang
- Needs for this Project:
  - Data
  - Equipment

# U.S., India Joint Workshop: Coupled Human-Natural Systems and the Challenge of Rapid Urbanization to the Resiliency of Water Resources

- Project Description:
  - We propose to convene a five-day workshop focused on developing research and education collaborations on coupled human-natural systems in an Indian context. By examining how Indian and U.S. scientists have studied the ecological and socio-economic coupling, we aim to contribute to the theoretical and methodological understanding of urban ecosystems.
- Collaborators:
  - Geoffery Duh
  - Vivek Shandas, Heejun Chang, L. George
- Needs for this Project:
  - Channels for dissemination
  - Collaborators in the area of policy, natural and social sciences

# Peter Dusicka

Assistant Professor, Civil & Environmental Engineering  
dusicka@pdx.edu

- Teaching and Research Interests:
  - Dr. Dusicka's areas of interest are focused on infrastructure durability under extreme loading and on application of innovative materials to improve structural performance. These topics include seismic performance and design of structures, lifelines and non-structural components; high performance steel and fiber reinforced composites for bridge and building structural systems; large-scale and shake table testing.
- Research Projects:
  - Toward Adoption of Green Building Structural Systems in Areas of Seismic Risk

# Toward Adoption of Green Building Structural Systems in Areas of Seismic Risk

- Project Description:
  - The general goal for the principal investigator is to develop a research program centered on sustainable structural systems that are effective in resisting extreme loads. By concentrating on a subset of this theme, the aim of this proposal is to experimentally investigate the seismic performance of a recently emerged structural system - the grid insulated concrete form wall. This system has the potential for simultaneously achieving high degree of sustainability and desirable seismic performance. While collaborating with an Oregon based company, the intent is to use the results generated by this research to attract follow-on external funding through industry sponsorship and grow the program to include other types of green building structural systems.
- Collaborators:
  - Peter Dusicka
  - Local Industry Collaborator (Manufacturer of Green Building Materials)
- Needs for this Project:
  - Data

# Dave Ervin

Professor, Environmental Sciences & Management  
dervin@pdx.edu

- Teaching and Research Interests:
  - Dr. Ervin's teaching and research projects focus on the economics of environmental management and sustainability.
- Research Projects:
  - Measurement and Modeling of Green Roof Performance Leading to the Development of an Energy Savings Calculator
  - Oregon Business Decisions for Environmental Performance
  - Public Goods and University-Industry Relationships in Agricultural Biotechnology

# Oregon Business Decisions for Environmental Performance

- Project Description:
  - A growing body of literature offers insights into the motivations for firms to participate in such public and private programs, and to adopt environmental practices. Yet, relatively few studies have tested the impact of such ‘voluntary’ initiatives on environmental performance. Three objectives will guide the proposed research: 1) Examine the environmentally friendly practices adopted by a sample of Oregon firms and the motivations for their adoption. 2) Examine the impact of adoption of environmental practices on environmental performance of firms. 3) Determine the features of voluntary programs that contribute both directly and indirectly to improvements in environmental performance.
- Collaborators:
  - Dave Ervin
  - University of Illinois and Oregon State University
- Needs for this Project:
  - Channels for dissemination

# Public Goods and University-Industry Relationships in Agricultural Biotechnology

- Project Description:
  - This project's central goal is to assess the effects of university-industry relationships on the provision of public goods in agricultural biotechnology. A public good is nonexcludable (preventing its consumption is impossible) and nonrival (one's consumption doesn't impair another's), so that private firms have no incentive to produce it.
- Collaborators:
  - Dave Ervin
  - Clarkson University, Farm Foundation, Oregon State University, University of California, Davis, Wallace Center for Agricultural & Environmental Policy
- Needs for this Project:
  - Channels for dissemination

# Andrew Fountain

Professor, Geology  
andrew@pdx.edu

- Teaching and Research Interests:
  - Dr. Fountain examines the physical processes that control glacial meltwater supply to the ecosystem. In 2004, the U.S. Geological Survey (USGS) honored Fountain's decade of work in Antarctica by naming a glacier after him, the Fountain Glacier.
- Research Projects:
  - Measuring Glacier-Climatic Variables in Glacier National Park, North Cascades National Park and Mount Rainier National Park
  - Spatial Variation of Mount Rainier's Glaciers

# Measuring Glacier-Climate Variables in Glacier National Park, North Cascades National Park and Mount Rainier National Park

- Project Description:
  - Test glacier-climate model by measuring air temperature, solar radiation, winds, albedo (surface reflectance), and ablation on glaciers in 3 different National Parks.
- Collaborators:
  - [Andrew Fountain](#)
- Needs for this Project:
  - Please contact Andrew Fountain

# Spatial Variation of Mount Rainer's Glaciers

- Project Description:
  - In an effort to survey Mount Rainier National Park, document archaeological resources, and better understand human land-use patterns, this project intends to create a GIS model of paleo-glaciers and environmental patterns at Mount Rainier for the late Pleistocene – Holocene climate sequences.
- Collaborators:
  - [Andrew Fountain](#)
- Needs for this Project:
  - Please contact Andrew Fountain

# Elise Granek

Assistant Professor, Environmental Sciences & Management  
graneke@pdx.edu

- Teaching and Research Interests:
  - Dr. Granek's teaching interests are in environmental sustainability and marine conservation. Her research examines the effects of mangrove disturbance, sustainable coral reef management, and the effects of land use on marine systems.
- Research Projects:
  - Coral Reef Health and Resource Use in the Comoros Islands: Effects of management and community-based monitoring
  - Developing a Predictive Model for the Effects of Watershed Land Use on Downstream Coastal Marine Ecosystems
  - Measuring Ecological, Social and Economic Valuation of Interface Habitats for Coastal Ecosystem-based Management
  - Monitoring and Restoration Following Mangrove Removal, Belize

# Coral Reef Health and Resource Use in the Comoros Islands: Effects of management and community-based monitoring

- Project Description:
  - Examination of whether a community-based monitoring program can enhance coral conservation and sustainable resource use.
- Collaborators:
  - Elise Granek
  - Veronica Dujon, Sarah Freed, Said Ahamada, Mohamed, Moutu
- Needs for this Project:
  - Collaborator in the area of community-based management

# Developing a Predictive Model for the Effects of Watershed Land Use on Downstream Coastal Marine Ecosystems

- Project Description:
  - Examining how land use within watersheds is affecting coastal marine systems. Based on data collected, develop a predictive model of how intertidal systems in other areas may be affected given known land use patterns.
- Collaborators:
  - Elise Granek
  - John Harrison and Steve Sylvester (WSU Vancouver); Brad Buckley (PSU)
- Needs for this Project:
  - Test Users

# Measuring Ecological, Social and Economic Valuation of Interface Habitats for Coastal Ecosystem-based Management

- Project Description:
  - Examining how ecological, social and economic factors affect ecosystem services in coastal zones; shortcomings in available science and economic valuation process for coastal zone services; irreversibility of lost ecosystem services in some systems.
- Collaborators:
  - Elise Granek
- Needs for this Project:
  - Data
  - Physical location for use/experimentation
  - Workers for project
  - Channels for dissemination

# Monitoring and Restoration Following Mangrove Removal, Belize

- Project Description:
  - Where mangroves have been cleared, seedlings that settle have limited success at recolonizing. Study will examine factors limiting mangrove regeneration to provide 'best practices' for seedling restoration projects.
- Collaborators:
  - Elise Granek
  - Birgit Winning, Virginia Vasquez, George Hanson, Heather Hayden
- Needs for this Project:
  - Data
  - Equipment
  - Workers for project
  - Channels for dissemination

# Janet Hammer

Program Director, College of Urban & Public Affairs

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- Teaching and Research Interests:
  - Dr. Hammer applies systems thinking to the development of healthy communities. With a strong commitment to service learning and service scholarship, her teaching and research is anchored in understanding and improving regional sustainability. Her work focuses on multi-stakeholder process – in particular, the convening of diverse groups to build understanding about community issues and develop individual and collective responses.
- Research Projects:
  - Evaluating the Social Bottom Line of Development Investment

# Evaluating the Social Bottom Line of Development Investment

- Project Description:
  - Triple bottom line accounting aims to account for economic, environmental, and social dimensions of investment. This project advances thinking and practice regarding the social bottom line of triple bottom line development investment.
- Collaborators:
  - Janet Hammer
- Needs for this Project:
  - Peer exchange on specifications & measurement

# Marcus Ingle

Director for International Public Service, Executive Leadership Institute,  
Public Administration Division, Hatfield School of Government

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- Teaching and Research Interests:
  - Dr. Ingle teaches several courses related to institutional sustainability in the context of public sector projects, programs and policies. His research interest is on the relationship between public leadership, governance and sustainable development domestically and globally. He also does community engagement programs with urban sustainability issues.
- Research Projects:
  - Leadership For Sustainable Development in Post-WTO Vietnam
  - Mitigating the Environmental Impact of Rapid Urban Development

# Leadership For Sustainable Development in Post-WTO Vietnam

- Project Description:
  - Leadership reform for public government, party and mass organization officials.
- Collaborators:
  - Marcus Ingle
  - Ho Chi Minh National Academy of Politics and Public Administration, Hanoi Vietnam
- Needs for this Project:
  - Channels for dissemination

# Mitigating the Environmental Impact of Rapid Urban Development

- Project Description:
  - This is a community-based service-learning program focused on having university faculty and students work with communities to address environmental urban issues.
- Collaborators:
  - Marcus Ingle
  - University of Natural Sciences, Ho Chi Minh City, Vietnam
- Needs for this Project:
  - Channels for dissemination

# Aslam Khalil

Professor, Physics

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- Teaching and Research Interests:
  - Dr. Khalil is well known for his pioneering research and influence in the area of trace gas chemistry and physics. His interests center on how the earth's global systems are determined by physics and chemistry, but he says that this understanding will not be enough to mitigate global warming or manage the future of the earth's environment. That will require consideration of at least culture and economics, if not other sociological phenomena. This integration of social and physical science is one of the challenges that Dr. Khalil and his research group currently are working on.
- Research Projects:
  - Emissions of Methane and Nitrous Oxide from Agricultural Sources: Closing the Gaps in the Budget of Methane and Nitrous Oxide

# Emissions of Methane and Nitrous Oxide from Agricultural Sources: Closing the Gaps in the Budget of Methane and Nitrous Oxide

- Project Description:
  - This is an ongoing project to determine solutions to better manage greenhouse gas emissions resulting from agricultural activity. Dr. Khalil and his colleagues have previously worked to pinpoint the factors that contribute to the Methane and Nitrous Oxide budget.
- Collaborators:
  - [Aslam Khalil](#)
- Needs for this Project:
  - Please contact Aslam Khalil

# Barry Messer

Assistant Professor, Urban Studies and Planning  
messerb@pdx.edu

- Teaching and Research Interests:
  - Dr. Messer's research interests are in urban environmental education and community development. He knows why healthy rivers make healthy communities. His teaching includes concepts of community development, healthy people/healthy places, community leadership and neighborhoods, and a watersheds capstone.
- Research Projects:
  - Community Watershed Stewardship Program

# Community Watershed Stewardship Program

- Project Description:
  - The Community Watershed Stewardship Program (CSWP) was developed in response to a pressing community need. As the Portland metro region has urbanized, its streams, rivers and lakes have become increasingly polluted and storm-water runoff has overloaded the city's drainage infrastructure. The CWSP engages and supports the community and neighborhood residents in watershed improvement projects through campus-community partnerships. CSWP was recently awarded the C. Peter Magrath/W.K. Kellogg Foundation Engagement Award, a new national designation for outstanding community-university outreach and engagement.
- Collaborators:
  - Barry Messer
  - Kevin Kecskes, City of Portland, Portland Bureau of Environmental Services
- Needs for this Project:
  - Please contact Barry Messer

# Madeleine Pullman

Associate Professor, Supply Chain Management, School of Business  
mpullman@pdx.edu

- Teaching and Research Interests:
  - Dr. Pullman's interests include regional and sustainable food supply chain issues, new product and service design, recreation and experience design, and operations/marketing interdisciplinary issues.
- Research Projects:
  - Addressing Transportation, Packaging, and Waste in the Food Supply Chain

# Addressing Transportation, Packaging, and Waste in the Food Supply Chain

- Project Description:
  - The project examines the purchasing decisions made by institutional food buyers as they relate to carbon footprint and life cycle.
- Collaborators:
  - Madeleine Pullman
- Needs for this Project:
  - Data
  - Test Users

# Scott Reed

Assistant Professor, Chemistry  
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- Teaching and Research Interests:
  - Dr. Reed's research is centered in an emerging scientific field at the interface between chemistry, biology, and nanotechnology. He uses the tools of nanoscience and organic synthesis to solve problems in medicinal and environmental chemistry.
- Research Projects:
  - Utilizing Co-Products from Oregon's Biofuel Industry to Build High Value Nanomaterials

# Utilizing Co-Products from Oregon's Biofuel Industry to Build High Value Nanomaterials

- Project Description:
  - The primary objective of this project is to investigate potential synergies between Oregon's emerging nanotechnology and biofuel industries. This project will result in new market opportunities for Oregon based products using local renewable resources. The immediate goal of the proposed research is to expand on a successful ONAMI project in which we identified extracts from soybeans as inexpensive, renewable, and safe components for nanomaterial synthesis.
- Collaborators:
  - Scott Reed
- Needs for this Project:
  - Please contact Scott Reed

# John Rueter

Professor, Environmental Sciences & Management  
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- Teaching and Research Interests:
  - Sustainability is a key organizing principle in the introductory courses that Dr. Rueter teaches. In his research, a key driving question is how to restore Upper Klamath Lake into a sustainable natural resource.
- Research Projects:
  - The Influence of Humic Substances on the Ecology of Aphanisomenon Flos-alquae in Upper Klamath Lake

# The Influence of Humic Substances on the Ecology of Aphanisomenon Flos-alquae in Upper Klamath Lake

- Project Description:
  - Examining the impact of wetlands on algae in this hyper-eutrophic lake with the goal of suggesting new ways to mitigate high productivity/crash cycles.
- Collaborators:
  - John Rueter
  - Tamara Wood, USGS
- Needs for this Project:
  - Please contact John Rueter

# David Sailor

Associate Professor, Mechanical and Materials Engineering  
sailor@pdx.edu

- Teaching and Research Interests:
  - Dr. Sailor's teaching interests are in building energy simulation with an emphasis on energy efficiency and green buildings. His research is in the general area of energy and the environment. In recent years the focus of his work has been on modeling the urban climate, with applications in air quality, building energy consumption, human health, and climate change; the urban heat island effect; urban atmospheric modeling; green roofs, and energy modeling.
- Research Projects:
  - Developing Building Energy Simulation Capabilities for Climate Change Scenarios in California Cities
  - Measurement and Modeling of Green Roof Performance Leading to the Development of an Energy Savings Calculator
  - Quantifying the relative importance of urban heat island causal factors

# Developing Building Energy Simulation Capabilities for Climate Change Scenarios in California Cities

- Project Description:
  - Energy efficient building designs and projections of energy use are currently based on climate data for the climate of the past. We are interested in developing Typical Meteorological Year (TMY) data under scenarios of climate change.
- Collaborators:
  - David Sailor
- Needs for this Project:
  - Please contact David Sailor

# Quantifying the Relative Importance of Urban Heat Island Causal Factors

- Project Description:
  - Making detailed urban thermal climate measurements and linking these with GIS data resources regarding land use, albedo, vegetation, impervious surface, sky view factor, and anthropogenic heating.
- Collaborators:
  - David Sailor
- Needs for this Project:
  - Data
  - Physical location for use/experimentation
  - Collaborator in the area of urban management

# Gerald Sheblé

Professor, Engineering & Computer Science  
gbsheble@ece.pdx.edu

- Teaching and Research Interests:
  - When it comes to energy systems, Dr. Sheblé focuses on what's critical: energy market design, competitive information, expansion, renewable resources, and sustainable development. His research interests are in the field of energy systems, information flow and analysis, auction markets, and financial engineering.
- Research Projects:
  - Power Extraction Oregon for a Novel, Low-Cost Wind-Power System

# Power Extraction Oregon for a Novel, Low-Cost Wind-Power System

- Project Description:
  - The proposed project will evaluate the best options for producing electricity from a new, lower-cost wind-power system called the “Wind Fin.” Specifically, it will identify the most promising power-extraction options for the Wind Fin and analyze the technical and economic advantages/disadvantages of each of these options.
- Collaborators:
  - Gerald Sheblé
- Needs for this Project:
  - Please contact Gerald Sheblé

# Graig Spolek

Professor, Mechanical & Materials Engineering  
grraig@cecs.pdx.edu

- Teaching and Research Interests:
  - Dr. Spolek researches the energy and water performance of ecoroofs. In order to further develop ecoroofs, his team has simulated the outdoor environment in a wind tunnel and is working to identify how much moisture the soil can hold, the type of soil and plants that work best in an ecoroof setting, and the level of irrigation needed.
- Research Projects:
  - Measurement and Modeling of Green Roof Performance Leading to the Development of an Energy Savings Calculator
  - Performance Monitoring of Three Eco-roofs in Portland, Oregon

# Measurement and Modeling of Green Roof Performance Leading to the Development of an Energy Savings Calculator

- Project Description:
  - The project involves model and pilot-scale testing to improve the design of green roofs. The pilot scale testing will evaluate green roof designs includes plant type, soil type and depth, and the influence of temperature and humidity on efficiency. The modeling study will develop a simulation program for green roof design.
- Collaborators:
  - Graig Spolek
  - David Sailor
  - David Ervin
- Needs for this Project:
  - Workers for project
  - Channels for dissemination

# Performance Monitoring of Three Eco-roofs in Portland, Oregon

- Project Description:
  - Monitoring in situ performance of green roofs located in Portland, OR. Continuously measure rainwater retention for three different roofs ranging in size from 3,000 - 5,000 sq ft. Also perform energy monitoring on one of these roofs.
- Collaborators:
  - Graig Spolek
- Needs for this Project:
  - Channels for dissemination

# Mark Sytsma

Associate Professor, Environmental Sciences & Management  
sytsmam@pdx.edu

- Teaching and Research Interests:
  - Dr. Sytsma's primary research interest is in limnology and the biology and management of aquatic invasive species. Long-term, ongoing projects include the limnology of Waldo Lake, an ultraoligotrophic lake in the Cascade Mountains; aquatic plant surveys in Pacific Northwest lakes; invasive species in the Columbia River; dreissenid mussel monitoring in western states; spartina management in Oregon estuaries; ballast water transport of aquatic invasive species; and ballast water management policy development.
- Research Projects:
  - Ballast Water RDTE
  - Biological Characterization of Stormwater Facilities
  - State Aquatic Nuisance Species Management Plan

# Ballast Water RDTE

- Project Description:
  - Creation of a Research, Development, Test & Evaluation (RDTE) Facility that serves the Pacific Coast and focuses on organisms and waters that are most likely to be brought into the region from Pacific Rim countries and through coastal shipping from other regions. Also, develop new testing protocols to provide a long-term standardized dataset of technology trials.
- Collaborators:
  - Mark Sytsma
- Needs for this Project:
  - Please contact Mark Sytsma

# Biological Characterization of Stormwater Facilities

- Project Description:
  - An analysis of West Nile virus risk associated with retention/detention ponds and development of management measures to reduce risk by 1) characterizing the aquatic invertebrate populations of detention/retention ponds in Clackamas County, 2) describing environmental, ecological, and physical influences on mosquito larvae abundance, and 3) describing possible predator-prey relationships present in the ponds, especially as they relate to predation on mosquitoes.
- Collaborators:
  - Mark Sytsma
  - Y. Pan and J. Maser
- Needs for this Project:
  - Please contact Mark Sytsma

# State Aquatic Nuisance Species Management Plan

- Project Description:
  - Implement Aquatic Nuisance Species (ANS) Management Plan, including a symposium on ballast water exchange zones, investigate non-shipping vectors for intentional and unintentional ANS risks, develop outreach and education materials.
- Collaborators:
  - Mark Sytsma
- Needs for this Project:
  - Please contact Mark Sytsma

# Carl Wamser

Professor, Chemistry

wamserc@pdx.edu

- Teaching and Research Interests:
  - Dr. Wamser's teach interests are focused on organic chemistry. Research in Dr. Wamser's laboratory is on solar energy conversion, using an approach called artificial photosynthesis. The long-term goal is development of a solar cell that efficiently collects solar energy and converts it to a useful form of chemical energy, such as the decomposition of water into hydrogen and oxygen using the energy of sunlight.
- Research Projects:
  - Conductive Porphyrin Polymers for Solar Cells
  - Hybrid Organic/Inorganic Solar Cells
  - Photovoltaic Test Facility

# Conductive Porphyrin Polymers for Solar Cells

- Project Description:
  - Novel polymers based on porphyrins (analogs of chlorophyll) have been synthesized to serve as the basis for organic solar cells. The polymers have a nanostructured fibrous morphology, are strongly light-absorbing, and are electronically conductive.
- Collaborators:
  - Carl Wamser
- Needs for this Project:
  - Please contact Carl Wamser

# Hybrid Organic/Inorganic Solar Cells

- Project Description:
  - Dye-sensitized solar cells are being developed that incorporate nanoparticulate semiconductor materials (TiO<sub>2</sub> or ZnO) as well as organic conductive polymers.
- Collaborators:
  - Carl Wamser
  - Rolf Könenkamp (PSU Physics), Glen Fryxell (Pacific Northwest National Laboratory)
- Needs for this Project:
  - Please contact Carl Wamser

# Photovoltaic Test Facility

- Project Description:
  - The objective of this project is to demonstrate the viability of solar energy in the Pacific Northwest. A photovoltaic test facility will be installed at PSU. It will consist of at least nine different arrays representing different manufacturers and technologies, including three on simulated rooftops (shingles, tiles, and laminates).
- Collaborators:
  - Carl Wamser
  - EC Electric Company (general contractor), Energy Trust of Oregon, Portland General Electric, OMSI, Vernier Software, UO Solar Radiation Monitoring Lab
- Needs for this Project:
  - Collaborator in area of web display
  - Channels for dissemination
  - Equipment
  - Workers for project

# Scott Wells

Chair and Professor, Civil and Environmental Engineering  
wells@pdx.edu

- Teaching and Research Interests:
  - Dr. Wells specializes in developing computer models for the temperature, oxygen levels, algae, plants, and fish in reservoirs, lakes, and rivers in order to maintain their quality. His research interests are in the water quality of surface waters and determination of the assimilative capacity of surface water systems to pollution.
- Research Projects:
  - CE-QUAL-W2 Modeling, Maintenance, and Support
  - Hydrodynamic and Water Quality Modeling of Tolt Reservoir
  - Identifying Thresholds in Resistance of Reservoir Ecosystems to Natural and Anthropogenic Disturbances
  - Investigating the Impact of Roadway and Pavement Design on Stream Temperatures
  - Modeling Effects of Channel Complexity and Hypoheic Flow on Stream Temperatures
  - Modeling the Impact of the Peace Conduit between the Gulf of Aqaba and the Dead Sea

# CE-QUAL-W2 Modeling, Maintenance, and Support

- Project Description:
  - Theoretical development of computer simulation models for hydrodynamics and water quality of surface water systems.
- Collaborators:
  - Scott Wells
  - Corps of Engineers, Waterways Experiment Station, Vicksburg, MS
- Needs for this Project:
  - Please contact Scott Wells

# Hydrodynamic and Water Quality Modeling of Tolt Reservoir

- Project Description:
  - Evaluation of techniques to assess how to use additional water storage from drinking supply reservoirs for the City of Seattle.
- Collaborators:
  - Scott Wells
  - Dr. C. Berger, Dr. R. Annear
- Needs for this Project:
  - Please contact Scott Wells

# Identifying Thresholds in Resistance of Reservoir Ecosystems to Natural and Anthropogenic Disturbances

- Project Description:
  - Evaluating the response of biological systems (primarily fish) to reservoir systems.
- Collaborators:
  - Scott Wells
  - Dr. L. Saito, University of Nevada
- Needs for this Project:
  - Please contact Scott Wells

# Investigating the Impact of Roadway and Pavement Design on Stream Temperatures

- Project Description:
  - Quantifying the link between surface runoff and temperature increases in surface waters.
- Collaborators:
  - Scott Wells
- Needs for this Project:
  - Please contact Scott Wells

# Modeling Effects of Channel Complexity and Hyporheic Flow on Stream Temperatures

- Project Description:
  - Impact of hyporheic flow on stream temperatures.
- Collaborators:
  - Scott Wells
  - Dr. C. Berger
- Needs for this Project:
  - Please contact Scott Wells

# Modeling the Impact of the Peace Conduit between the Gulf of Aqaba and the Dead Sea

- Project Description:
  - Because of the shrinkage of the Dead Sea by over 1m/year, there is a plan to build a 'Peace' conduit between Israel and Jordan to bring water from the Gulf of Aqaba. This project is looking at modeling the impact of that project.
- Collaborators:
  - Scott Wells
  - Israeli Geologic Survey, Hebrew University
- Needs for this Project:
  - Please contact Scott Wells

# Alan Yeakley

Associate Professor, Environmental Sciences and Management  
yeakley@pdx.edu

- Teaching and Research Interests:
  - Dr. Yeakley's research interests are in urban ecology, ecosystem management, and restoration ecology. His teaching interests include environmental sustainability, environmental systems, watershed biogeochemistry and hydrology, and ecosystem services.
- Research Projects:
  - Superior Adaptation to Drought in Himalayan Blackberry

# Superior Adaptation to Drought in Himalayan Blackberry

- Project Description:
  - At present, very little data exists on the topic of water relations of the Himalayan blackberry (*Rubus armeniacus*), and if water is a factor in the plants invasiveness in the Pacific Northwest. The primary objective of this research is to determine if the Himalayan blackberry is better adapted to more xeric water regimes than are its native Pacific Northwest competitors. The second objective is to determine if it's water relations help it outgrow native Pacific Northwest competitors.
- Collaborators:
  - [Alan Yeakley](#)
- Needs for this Project:
  - Please contact Alan Yeakley