

Ronda Strauch

Ecologist Engineer

Impact Assessment Research Modeling

CONTACT

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Objective

Support community adaptation and resilience to climate change, translate science into tangible actions, and foster growth and development of dynamic and effective climate scientists.

Profile

- Strong relationships with resource experts at the local, state, and federal level that facilitates co-production of adaptation strategies
- Unique blend of ecological and engineering education and experience applied to climate science and policy
- Passion for integrating climate science into educational curriculum

Education

- **Ph.D.** (Hydrology) University of Washington, Civil and Environmental Engineering (2017)
- **M.S.** (Ecosystem Analysis) University of Washington, College of Forest Resources (1992)
- **B.S.** (Environmental Planning & Management) University of California at Davis (1989)

Experience

- **Associate** – Oak Strategic (Sept. – Present)
- **Research Assistant** – University of Washington, Civil & Environmental Engineering (June 2011 – Aug. 2017)
- **Supervising Engineer** – King County Department of Transportation, Road Services Division (May 1999 – June 2011)
- **Project Manager** – ENSR Consulting and Engineering (Dec. 1994 – May 1999)
- **Wildlife Biologist** – U.S. National Park Service, Mt. Rainier National Park (June – Sept. 1994)
- **Fire Ecologist** – U.S. Forest Service, Pacific Northwest Research Station (Sept. 1989 – Aug. 1990)

Teaching

- **Workshop** – Landslide hazards using Landlab, CUASHI Biennial Colloquia on Water Science Shepherdstown, WV (July 2016)
- **Teaching Assistant** – Physical Hydrology at University of Washington – Civil & Enviro. Eng. (Fall 2015 & 2016)
- **Workshop** – “Bringing Climate Change into Your High School Science Classroom”, Washington State Teachers Association with UW *Program on Climate Change* (Oct. 2015)
- **Guest lecturer** – Climate Boot Camp, USGS’s Northwest Climate Science Center, Eatonville, WA (Aug. 2015)
- **Guest lecturer** – “Math science upward bound,” advancement of students in STEM majors, University of Washington (July 2014)
- **Exhibit** – Watershed physical model at Engineering Discovery Days, University of Washington, Seattle, WA (April 2014).
- **Guest lecturer** – “Watershed Dynamics”, Columbia Elementary School in Mukilteo for Mr. Jon Melby (March 2014)

Publications *(maiden name Little)*

- Strauch, R.L.**, Istanbuluoglu, E., et al. (2017 in review) A hydro-climatological approach to predicting regional landslide probability using Landlab, Earth Surface Dynamics. <https://doi.org/10.5194/esurf-2017-39>.
- Strauch, R.L.**, Istanbuluoglu, E., Rochefort, R., Duran, Z. & Purnell, K. (in revision) Developing a GIS-based Geospatial Decision Support Tool for Assessing Climate Change Impacts on Flood Risks in Northern Cascadia Road Networks. U.S. Department of Interior, National Park Service, Natural Resources Report NPS/NOCA/NRR.
- Strauch, R.L.** (2015) How will climate change affect landslides, erosion, and sediment transport? In: [State of Knowledge Report: Climate Change in Puget Sound](#), UW Climate Impacts Group
- Strauch, R. L.**, Raymond, C. L., Rochefort, R. M., Hamlet, A. F., & Lauver, C. (2015) Adapting transportation to climate change on federal lands in Washington State, USA. *Climatic Change*, 130(2), 185-199.
- Strauch, R. L.**, Raymond, C. L., & Hamlet, A. F. (2014) Climate change, hydrology, and access in the North Cascade Range. Climate change vulnerability and adaptation in the North Cascade Region, Washington. Gen Tech Rep PNW-GTR-892. Portland, OR: USDA, Forest Service, Pacific Northwest Research Station.
- Albano, C. M., Angelo, C. L., **Strauch, R. L.**, & Thurman, L. L. (2013) Potential effects of warming climate on visitor use in three Alaskan national parks. *Park Science*, 30(1), 37-44.
- Little, R.L.**, D.L. Peterson, D.G. Silsbee, and L.J. Shainsky. (1995) Effects of climate on radial growth of Douglas fir (*Pseudotsuga menziesii*) in the Siskiyou Mountains, OR, *Canadian Journal of Forest Research* 25: 724-735, Seattle, WA.
- Little, R.L.**, D.L. Peterson, and L.L. Conquest. (1994) Regeneration of subalpine fir (*Abies lasiocarpa*) following fire: effects of climate and other factors, *Canadian Journal of Forest Research* 24: 934-944, Seattle, WA.
- Rochefort, R. M., R.L. **Little**, A. Woodward, and D.L. Peterson. (1994) Changes in subalpine tree distribution in western North America: a review of climate and other factors, *Holocene* 4: 89-100, Seattle, WA.

Presentations *(selected)*

- Strauch, R.L.** and Istanbuluoglu E. (2016) Landslide hazard probability derived from inherent and dynamic determinants. Poster presentation at European Geosciences Union General Assembly 2016 (17 – 22 Apr 2016), Vienna, Austria.
- Strauch, R.L.**, Istanbuluoglu, E. and Nudurupati, S. (2015) Landslide Hazard from Coupled Inherent and Dynamic Probabilities. Presentation at American Geophysical Union (AGU) Fall Meeting (Dec. 14-18, 2015), San Francisco, CA.
- Strauch, R.L.**, Istanbuluoglu, E. & Rochefort, R. (2015). Geospatial tools for future peak streamflow estimation in culvert management at North Cascades National Park Complex. Special Session: Water Crossing Design and Decision-Making. Oral presentation at 6th Annual Pacific Northwest Climate Science, Conference. Coeur D'Alene, ID. Video - <https://goo.gl/3zGyZY>
- Strauch, R.L.** and Istanbuluoglu, E. (2015). Landslide Hazard from Bayesian Coupling of Inherent and Dynamic Probabilities. Poster presentation at 2015 AEG Professional Landslide Forum (Feb. 26-28), Seattle, WA.
- Strauch, R.L.** and Istanbuluoglu, E. (2014). Rainfall-triggered landslides in the PNW: Future hazards and risks. [Oral presentation](#) at 5th Annual Pacific Northwest Climate Science, Conf. Seattle, WA.
- Strauch, R.L.** & Hamlet, A.F., (July 2012) Quantifying Climate Change Impacts on Access to Forest Service and Park Service Lands in the North Cascades, Washington, Presentation at 4th International Conference on Climate Change: Impacts and Responses, Seattle, WA.

Awards

- Best in Public Communication - 2017 Civil and Environmental Engineering Film Contest, [Ronda and Sai - Follow your path](#)
- Top 13 Esri Climate Resilience App Challenge 2014, Culvert Inventory for Climate Resilience
- Graduate Fellowships to attend 4th & 5th PNW Climate Conference (2013 & 2014)
- Graduate Scholar Award, (2012) International Conference on Climate Change: Impacts and Responses, Seattle, WA

Expanded Experience Descriptions

Research Assistant/Teaching Assistant – University of Washington, Civil & Environmental Engineering, Seattle, Washington

Completed a Ph.D. in Civil and Environmental Engineering aimed to improve mapping landslide hazard by integrating data-driven statistical and process-based models. Dissertation is entitled: *Probabilistic Modeling of Shallow Landslides at Regional Scales*. My research addressed concerns about landslide hazards identified during a transportation vulnerability assessment conducting for four federal jurisdictions in Washington State. I developed a hydro-climatological approach to modeling regional shallow landslide initiation that integrates spatial and temporal dimensions of parameter uncertainty to estimate an annual probability of landslide initiation. The model solves the infinite slope stability equation coupled to steady-state topographic flow routing using a Monte Carlo approach. Uncertainty of soil depth is constrained by a soil development model, and subsurface flow recharge is obtained from the Variable Infiltration Capacity (VIC) macro-scale hydrologic model. Thus, the model design allows for use of future hydrologic projections to estimate changes in landslide probability. The physically-based landslide model is available as a component in Landlab, an open-source, Python-based landscape earth systems modeling environment. It is designed to be easily reproduced and applied in various locations utilizing HydroShare cyberinfrastructure. To better understand landslide transport and deposition impacts, I developed empirically-based probability hazard maps from a statistically-derived susceptibility index. This empirical model integrates the influence of seven site attributes on observed landslides using a frequency ratio approach. The physically-based and empirically-based models are then combined to produce an integrated probabilistic map of landslide hazard for initiation, transport, and deposition processes. We demonstrate the model in North Cascades National Park Complex in northern Washington. Improved tools such as these with less uncertainty can be used to reduce system vulnerabilities and lead to adaptations that allow continue use of natural areas with reduced risks. Funded by NWCSS and NSF.

Supervising Engineer – King County Department of Transportation, Seattle, Washington

Supervised up to 20 environmental professionals who provided scientific, technical, and regulatory support for the planning, design, construction, and maintenance of transportation improvements. Staff work on interdisciplinary project teams to ensure regulatory compliance and to minimize adverse impacts by analyzing environmental issues, acquiring permits and approvals, and evaluating pending regulations. Guided staff in facilitating solutions to environmental challenges by modifying projects and programs to increase environmental benefit and enhance the sustainability of transportation improvements. Duties included: performing technical and management oversight for environmental reviews, natural resource studies, permitting, and construction oversight of transportation improvements throughout county. Also co-led the King County Interdepartmental Workgroup on Climate Change Consideration in State Environmental Policy Act (SEPA) environmental reviews. Additionally, piloted the division's climate change response, including writing portions of the King County Climate Plan, participated on the Department's Climate Change Team, created a division Climate Change Steering Committee, and facilitated climate initiative teams designed to reduce emissions and energy use and help prepare for climate change. One initiative targeted at climate change, a division-wide Environmental Management System (EMS), which provides an umbrella agency strategy to prioritize actions, monitor their effectiveness, and revise actions to continuously improve environmental performance.

Project Manager – ENSR Consulting and Engineering, Seattle, Washington

Conducted feasibility studies for natural gas pipelines to address potential permitting, construction, and cost issues related to various new pipeline construction projects. Performed the following tasks: acquired federal, state, and local permits; conducted biological and physical assessments of sensitive areas, sensitive plants and animals, and slope stability concerns along proposed utility routes; prepared erosion and sediment control, wetland delineation and mitigation, and restoration and monitoring plans; guided the contractor during construction to comply with easements and permits; negotiated with various agencies and tribal representatives; and directed implementation of field-adapted mitigation measures. Also supported U.S. Department of Defense natural resource management. Conducted a 2-year extensive survey of wetlands on the Fort Lewis Army Reservation. Wetlands were classified and mapped using a Global Positioning System (GPS). A total of 108.3 ha of wetland habitat, containing 289 individual wetland communities, were surveyed. Provided the Department of the Army with recommendations for managing wetland habitat and surrounding buffers. Additionally, conducted a study to document the historical occurrence and present status of raptors, amphibians, and reptiles on the Army Yakima Training Center Expansion Area. Discovered species that had not been previously found on the military training base and developed recommendations for protecting these species and enhancing their habitat.

Research Assistant – University of Washington, Seattle, Washington

Conducted a study on the effects of climate and other factors on the regeneration of subalpine conifers following wildfire. Trees were found to establish in association with different microsite features. Establishment was positively correlated with warm, dry springs with low snow accumulation, and cool, wet summers. Compiled data and summarized changes in the distribution of subalpine tree species in western North America due to climate change and other factors. Tree-line fluctuations and recent tree invasion of subalpine meadows were found to be caused primarily by changes in various climatic elements depending on the geographical region. Also studied the dendroecology of Douglas fir growing in southern Oregon and discovered that coastal Douglas fir basal tree growth is sensitive to drought and other climatic elements. Additionally, collected baseline data on small mammal and amphibian populations on U.S. Forest Service lands in the Cascade Mountains to evaluate their response to alternative silvicultural treatments. Project involved establishing traps in a grid pattern, systematically monitoring traps, and collecting baseline data on species encountered.

Wildlife Biologist – U.S. National Park Service, Longmire, Washington

Developed and implemented an inventory and monitoring program for northern spotted owls and marbled murrelets at Mount Rainier National Park. Conducted backcountry surveys to identify and evaluate these rare birds and their habitat, and to provide recommendations to the park on environmental compliance with the Endangered Species Act (ESA) for agency actions that might affect these species. Discovered the first positive detection of marbled murrelet nesting in the park.

Biologist – The Nature Conservancy, Seattle, Washington

Assessed the current and historical presence of western pond turtles, spotted frogs, and western gray squirrels on McChord Air Force Base. This work identified the presence or absence of species through a systematic survey of suitable habitat and evaluated potential habitat for each species in order to provide recommendations for future monitoring and for species management compatible with military maneuvers. Discovered that western gray squirrels were still present on the base in small numbers.

Fire Research Technician – U.S. Forest Service, Seattle, Washington

Studied prescribed burning in Washington and Oregon forest. Established research plots in clearcuts that were broadcast burned to collect data on the effects of burning regime and clearcut treatments on woody fuel consumption. Also evaluated the effects of wildfire on fuel consumption, smoke production, and other site characteristics.

Student Intern – University of California at Davis, Davis, California

Examined the interagency fire management agreement and policies of adjacent land management agencies, Lassen Volcanic National Park and Lassen National Forest, in California. Determined that the land management strategies and goals of one agency can have a large influence on the land management strategies and goals and, thus, the habitat characteristics of adjacent land jurisdictions.