

## Natural Resource Economics

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### ERNIE NIEMI (abridged resume)

Ernie formed Natural Resource Economics, Inc. in 2012, following 34 years as a vice president and senior economist at ECONorthwest. He has taught cost-benefit analysis and economic development for the University of Oregon's Department of Planning, Public Policy, and Management. Ernie specializes in applying the principles of cost-benefit analysis, economic valuation, and economic-impact analysis in the context of natural-resource management, economic development, and public-policy decisions.

- He has described the economic importance of a wide range of market and non-market goods and services derived from many types of ecosystems: forest, dryland, montane, riparian, lake, river, grassland, urban, savannah, estuarine, marine, coastal plain, island.
- His analyses have addressed investments and resource-management programs for:
  - Management of lands, waters and species in public ownership.
  - Forest restoration.
  - Production of timber and other forest products.
  - Water quantity, quality, and reliability.
  - Diversion of surface and ground water for irrigation, livestock, domestic, and municipal-industrial uses.
  - In-stream flows and water conservation.
  - Floodplain management.
  - Carbon emissions, sequestration, and storage.
  - Management of climate-related risks—higher temperatures, fire, drought, storms, insects, sea-level rise, etc.—to natural resources.
  - Adaptation of households, businesses, and communities to expected changes in climate.
  - Economic security for at-risk communities.
  - Conservation of at-risk species.
  - Protection and restoration of fish and wildlife habitat
- His descriptions of the economic importance of natural resources have covered market and non-market values; impacts on the level of activity in commercial and subsistence economic systems; and the distribution of positive and negative economic outcomes (among existing groups and across generations).
- Much of his work has entailed describing and monitoring the competition for natural resources. These efforts typically have included describing all the relevant goods and services underlying the competition, and tracing the full set of market and non-market outcomes associated with each of the competing demands.
- He has presented analytical findings on resource-management issues to congressional, judicial, arbitative, administrative, multi-national, and scientific/professional bodies.

### Education

- Master of City and Regional Planning, Harvard University
- Bachelor of Science, Chemistry, University of Oregon

## Advisory Positions

- U.S. Secretary of Agriculture's Large-Cost Fire Independent Review Panel
- Technical Team for the Northern Spotted Owl Implementation Team for the Washington Board of Forestry
- Commission on Ecosystem Management of the International Union for Conservation of Nature (IUCN)
- Technical Advisory Committee on Land Use and Economic Development for the Oregon Department of Land Conservation and Development
- Citizen's Task Force for Developing a Strategic Plan for the Oregon Department of Fish and Wildlife
- Water Marketing Task Force for the Oregon Water Resources Department
- Social, Cultural, and Economic Technical Team, Missouri River Ecosystem Restoration Plan, U.S. Army Corps of Engineers
- Climate Leadership Initiative of the University of Oregon

## Representative Projects

- Co-chaired the Federal Forest Carbon Coalition, which comprises 60+ organizations across the U.S. that encourage federal forest-management agencies to account for the impacts of their actions on the amount of carbon stored on federal forests. *The Resource Innovation Group*
- Described inaccuracies in the government's analysis of the economic consequences of designating critical habitat for the northern spotted owl and made recommendations for correcting the inaccuracies. *American Bird Conservancy*
- Described the potential costs that anticipated changes in climate will impose on Lebanon through 2080. *Government of Lebanon, Ministry of the Environment, and United Nations Development Programme*
- Described the economic value of timber, habitat for the northern spotted owl, water quantity and quality, and carbon storage on federal O&C lands in western Oregon, with and without industrial logging. *Pacific Rivers Council*
- Identified and evaluated potential market-based opportunities for increasing the resilience of Ethiopia's pastoral people to climate-related risks. *Farm Africa*
- Described the factors that have facilitated the expansion in commercial milk production by pastoral people in Uganda, and the impacts of milk-related income on their resilience to climate-related risks. *Technical Centre for Agricultural and Rural Cooperation (European Union)*
- Described the potential external economic costs of the proposed commercial port at Lamu, Kenya. *Natural Justice and Save Lamu*
- Described inaccuracies in the environmental impacts statements prepared by the U.S. Army Corps of Engineers for sediment management in the lower Snake River, and recommended steps for correcting the inaccuracies. *Earthjustice*

- Described the economic costs and benefits of using tidal-marsh restoration to reduce the risks in the San Francisco Bay area from anticipated increases in sea level. *The Bay Institute*
- Described the potential economic costs and benefits of a proposal to increase the use of green infrastructure to manage stormwater in the City of Seattle. *Seattle Public Utilities*
- Described the economic risks and opportunities associated with a strategic review of healthcare services provided by Planned Parenthood in southern Oregon. *Planned Parenthood of Southwestern Oregon*
- Described the potential impacts on economic activity of a proposal to ship crude oil from Grays Harbor, Washington, and the economic costs that might materialize from adverse impacts on the ecosystem. *Earthjustice*
- Described the economic value of goods and services derived from the dryland ecosystems of the IGAD region (Djibouti, Eritrea, Ethiopia, Kenya, Somalia, South Sudan, Sudan, Uganda), with case studies examining the consequences of small-scale diversion for agriculture and urban development of water from streams that support pastoral communities, industrial agricultural development on large landscapes, and oil/gas development. *IUCN*
- Described the economic importance of Alaska's wildlife. *Alaska Department of Fish and Game*
- Described the economic consequences of a proposed road connecting Yupik and Athabascan villages near the site of a proposed surface mine in the headwaters of streams that support a salmon-based ecosystem and subsistence/mixed economy. *Alaska Department of Transportation and Public Facilities*
- Described the potential economic consequences of a proposed large-vessel port at Punta Colonet, Baja Mexico. *Resources Law Group*
- Described the potential economic consequences of a proposal to increase in-stream flows of a river depleted by irrigated agriculture. *Confederated Tribes of the Umatilla Indian Reservation*
- Described the economic harm stemming from an oil spill in a lagoon of the Island of Yap, Federated States of Micronesia, and estimated the compensation required to offset the harm. *A law firm on behalf of the affected Yapese population.*
- Described the positive economic consequences of forest-management approaches emphasizing sustainability and stewardship. *Washington Environmental Council*
- Evaluated the relationships between America's forested ecosystems and regional economies. *National Science Foundation*
- Described the non-timber benefits from federal forestland, and the potential benefits that would materialize from restoration of damage from past logging. *Sierra Club*
- Described the potential economic costs to Montana, New Mexico, Oregon, and Washington of a business-as-usual approach to climate change. *Climate leadership Initiative, University of Oregon*

- Described the economy's response in the Pacific Northwest to logging reductions. *American Fisheries Society*
- Developed an integrated system for identifying areas of greater ecological and socioeconomic potential for restoration of riparian areas. *U.S. Environmental Protection Agency*
- Analyzed issues associated with proposals to move toward sustainable use of water and forestlands. *West Coast Watershed*
- Described the potential economic benefits and costs of proposed actions to improve the reliability and quality of water available for out-of stream uses and for in-stream flows near economically disadvantaged communities in California. *North Coast Integrated Regional Water Resource Management Plan*
- Performed an economic evaluation of watershed-restoration projects in northern California, focusing on the projects' impacts on coastal and estuarine resources. *West Coast Watershed*
- Analyzed issues associated with proposals to move toward sustainable use of water and other resources in Northern California. *West Coast Watershed*
- Described the economic consequences of a proposed integrated plan for managing water and related resources in the Yakima River Basin of Washington, accounting for the values and economic activity associated with higher salmon populations, increased ability of irrigated agriculture to withstand severe drought, and improvements in municipal-industrial water supplies. *U.S. Bureau of Reclamation and Washington Department of Ecology*
- Described economic challenges and opportunities associated with the anticipated impacts of climate change on livestock in dryland areas of western states. *Oregon Natural Desert Association*
- Described the benefits and costs of a proposal for tribal management of federal forestlands in southern Oregon to accelerate habitat restoration and generate biomass for electricity generation. *Confidential client*
- Described the economic consequences of sustainable forest management in the Southern Appalachian Highlands. *U.S. Forest Service*
- Described the economic issues underlying proposals to conduct salvage logging in areas burned by the Biscuit Fire. *Conservation Biology Institute*
- Reviewed the economic elements of the U.S. Forest Service's draft environmental impact statement of salvage logging proposals for the burned areas within the perimeter of the Biscuit Fire in southern Oregon. *Siskiyou Regional Education Project*
- Described the feasibility of proposals to acquire forestland within a watershed and manage the forest and associated water resources to generate revenue. *Confidential client*
- Analyzed economic issues associated with collaborative decision-making to make the process of competition for natural resources more efficient and effective. *Bolle Center for People and Forests*

- Evaluated alternatives for reforestation of marginal agricultural land in the Lower Mississippi River Delta. *Business Council for Sustainable Development*
- Developed recommendations for improving the design and implementation of policies for managing complex forest resources, and for monitoring their effectiveness. *U.S. Forest Service*
- Characterized the economic benefits, costs and risks – and their distribution among different income and ethnic groups – of alternatives for managing flooding in the Green River Basin. *King County, Washington*
- Analyzed the costs and benefits, and the implementation and monitoring requirements of options for restoring the ecosystem of the Puget Sound Basin. *Puget Sound Partnership*
- Described the different aspects of the relationship between irrigated agriculture and the economy of Montana. *Montana Department of Natural Resources and Conservation*
- Described the value of water in the Green River Basin by inventorying the various categories of uses and functions of water and determining the economic value of each use and function. *Wyoming Water Development Commission*
- Calculated the benefits that a public water utility could realize by planting riparian trees rather than expanding its wastewater-treatment plant to meet water-quality objectives. *Confidential client*
- Analyzed the positive and negative economic consequences of proposals for restoring natural streamflows in the Eel River, California. *Center for Environmental Economic Development*
- Described the competition for water in the Upper Klamath River Basin of Oregon and California. *Private foundations*
- Analyzed and commented on a draft report regarding economic, social, and institutional issues with water allocation in the Klamath Basin. *Institute for Fisheries Resources*
- Described the economic consequences of a pesticide spill in the Sacramento River. *Affected business owners and landowners*
- Described economic injury to natural resources of the Oregon Coast from the abandoned section of the *New Carissa* shipwreck. *State of Oregon*
- Described the economic injury to natural resources of a 40-square-mile area contaminated by pollution from a lead mine in Oklahoma. *Affected landowners*
- Described the economic consequences to local households and subsistence communities of the *Kyowa Violet* oil spill in the coastal waters of Yap, Federated States of Micronesia. *Affected individuals and community leaders*
- Described the economic consequences to local municipalities, fishermen, and subsistence communities of the *Exxon Valdez* oil spill. *Consortium of affected municipalities*
- Described the socioeconomic consequences of ecological restoration projects in the Vermillion River Basin, South Dakota. *U.S. Environmental Protection Agency*

- Determined the share of natural and actual streamflow that originates on national-forest lands in Oregon's Willamette River Basin. *U.S. Environmental Protection Agency*
- Reviewed water management and allocation policies in the Upper Rio Grande. *U.S. Bureau of Reclamation Western Water Policy Commission*
- Developed an integrated system for identifying areas of greater ecological and socioeconomic potential for restoration of riparian areas. *U.S. Environmental Protection Agency*
- Directed a seminar aimed at providing staff with information, tools, and skills to apply adaptive management to the Missouri River Recovery Plan. *U.S. Army Corps of Engineers*
- Managed the drafting of a letter signed by more than 100 leading economists regarding the economic importance of the West's natural environment. *Center for Watershed and Community Health, University of Oregon*
- Described the potential economic consequences of alternatives for generating electricity in Arkansas. *Sierra Club*
- Evaluated the economic importance of environmental externalities associated with alternative technologies for generating electricity. *National Association of Regulatory Utility Commissioners*
- Assessed the local economic impacts associated with the construction, operation, and decommissioning of the coal-fired electricity generating facility at Boardman, Oregon. *Bonneville Power Administration*
- Analyzed the economic impacts of the effects of a proposed energy transmission line through Montana and Idaho. *U.S. Bureau of Land Management and Montana Department of Environmental Quality*
- Analyzed the economic impacts of a proposed transmission line from Longview, Washington, to Troutdale, Oregon. *Bonneville Power Administration*
- Worked with representatives of organized labor, distressed rural communities, and urban neighborhoods to identify potentially feasible sustainable industries and jobs. *Center for Watershed and Community Health, University of Oregon*
- Described relationships between land-use policy and economic development. *Oregon Department of Land Conservation and Development*
- Described the role of environmental amenities in Nebraska's economy. *Nebraska Game and Parks Commission*
- Described the common interests of business, labor, and communities in a healthy environment. *Louisiana State University, Department of Environmental Studies*
- Described the relationships between land-use policy and economic development. *Oregon Department of Land Conservation and Development*
- Analyzed the pending closure of a lumber mill in northeastern Washington. *Wilderness Society*
- Developed a legislative plan for dislocated timber workers. *Oregon Joint Legislative Interim Committee on Forest Products Policy*

- Analyzed the strengths, weaknesses, opportunities, and threats of cities responding to mill closures. *Oregon Business Development Department*
- Developed a methodology for analyzing the economic impacts associated with changes in forest-practices rules. *Washington Department of Natural Resources*
- Assessed the fiscal impact of proposed alterations to timber-sales contracts for state-owned timber. *Oregon State Land Board*
- Developed a method for determining the sediment-related costs imposed on the City of Salem and its industrial/commercial water users during and following a major flood event in the North Santiam watershed. *U.S. Environmental Protection Agency and National Science Foundation*
- Described the economy's response to logging reductions in the Pacific Northwest. *Earthlife Canada Foundation and Sierra Club of British Columbia*
- Described the economic consequences of alternative hatchery-management programs. *Columbia Basin Fish and Wildlife Authority*
- Reviewed the proposed economic-evaluation procedures for allocating unappropriated water in the Snake River Basin. *State of Idaho Office of the Governor*
- Evaluated alternative plans to manage watersheds affected by the eruption of Mount St. Helens. *Cowlitz County*
- Evaluated recreational fisheries in the Flathead Lake area. *State of Montana*
- Evaluated proposed policies for leasing wetlands. *Oregon Division of State Lands*
- Conducted an economic analysis of alternative plans associated with the restoration of sage-steppe ecosystems. *California Bureau of Land Management*
- Described the economic tradeoffs of allowing, limiting, or prohibiting development in significant riparian areas and wildlife habitat in the Portland metropolitan area. *Portland Metro*
- Described the economic benefits of protecting natural resources in the Sonoran Desert. *Coalition for Sonoran Desert Protection*
- Analyzed Louisiana's economy to help local stakeholders implement a strategy for moving the state toward conservation-based development. *Ford Foundation*
- Evaluated the economic consequences of different approaches to managing the environmental resources of Southern Louisiana, particularly its coastal wetlands. *W. Alton Jones Foundation*
- Described the economic effects of designating critical habitat for the marbled murrelet in Oregon, Washington, and California. *U.S. Fish and Wildlife Service*
- Described the economic effects of designating critical habitat to support the recovery of two endangered species of fish in the Klamath Basin of Oregon and California. *U.S. Fish and Wildlife Service*
- Described the economic effects of designating critical habitat to support the recovery of an endangered species of fish in New Mexico. *U.S. Fish and Wildlife Service*

## Representative Publications and Presentations

- “Climate Change Implications for Ecological Restoration.” in Dave Egan et al. (ed), *Human Dimensions of Ecological Restoration*. Island Press. 2011. With Mark Buckley.
- *Land/Water Eternal Costs and Electricity Planning: Accounting for Nature’s Value when Evaluating Options for the Eastern Interconnection Electricity System*. Lands Committee of the NGO Caucus for the Eastern Interconnection Planning Collaborative (EIPC) (lead author) 2011.
- *The Economic Value of Beaver Ecosystem Services: Escalante River Basin, Utah*. (co-author) 2011.
- *Economic Importance of Goods and Services Derived from Drylands in the IGAD Region*. IUCN With Jacob Manyindo. 2010.
- “Using Economics to Move from Conflict to Cooperation.” Presentation to the Regional Multi-Stakeholder Forum on the Benefits of Regional Cooperation. Cairo, Egypt. Nile Basin Discourse (network of civil society organizations from the 10 countries of the Nile Basin: Burundi, DRC, Egypt, Eritrea, Ethiopia, Kenya, Sudan, Rwanda, Tanzania and Uganda) 2009.
- *Fiscal Year 2008 Large-Cost Fire Independent Review*. U.S. Secretary of Agriculture. With panel members: Sharon Caudel, Michael Frank, Richard Haynes, and Ian Munn. 2009.
- “Economics as a Tool for Adaptive Management, River Restoration, and River Management.” Presentation to the Adaptive Management Standards of Practice Seminar. U.S. Army Corps of Engineers. Omaha, Nebraska. 2009.
- *An Overview of Potential Economic Costs to New Mexico of a Business-As-Usual Approach to Climate Change*. Climate Leadership Initiative, University of Oregon, With Mark Buckley, Cleo Neculae, and Sarah Reich. 2009.
- “Natural Resources and the Economy: Implications for Puget Sound.” Presentation to Puget Sound Energy Corp. Seattle, Washington. 2008.
- “Economics and the Designation of Critical Habitat.” Presentation to the Land, Air, Water Public Interest Environmental Law Conference. University of Oregon Law School. 2008.
- “Secondary Economic Impacts of Coastal Spills.” Presentation to the Coastal Zone Conference. Portland, Oregon. 2007.
- “Climate Change Economics in the Pacific Northwest.” Presentation to the Climate Change Research Needs Workshop. Sponsored by the Western States Water Council and the California Department of Water Resources. Irvine, California. 2007.
- “Framework for Estimating the Economic Benefits of Ecosystem Restoration.” Presentation to the 2<sup>nd</sup> National Conference on Ecosystem Restoration. Sponsored by the U.S. Army Corps of Engineers, U.S. Geological Survey, and the University of Florida. Kansas City, Missouri. 2007.

- “Future Water Allocation and In-Stream Values in the Willamette River Basin: A Basin-Wide Analysis.” *Ecological Applications*. 14 (2): 355-367. With David Dole. 2004.
- “Economic Evolution: The Transition from Abundance to Scarcity.” Presentation to the River Management Society/Missouri River Natural Resources Conference. Sioux City, Nebraska. 2006.
- *Goods and Services Provided by Forest Lands that Would Be Protected under the Cooper Spur Settlement Agreement: An Economic Assessment*. Cooper Spur Wild and Free Coalition. 2006.
- “Evolving Competition for Water.” Presentation to the Dividing the Waters: A Conference for Judges, Masters, and Referees Involved in Western General Stream Adjudications and Other Complex Water Litigation. Jackson Hole, Wyoming. 2005.
- *Regional Wetland Mitigation Bank: Financial Overview*. Portland, Oregon, Metro Regional Parks and Greenspaces. 2004.
- *Valuing the Benefits of Earthquake Protection: Literature Review and Recommendations*. Seattle Public Utilities. 2004.
- *Comparative Valuation of Ecosystem Services: Lents Project Case Study*. City of Portland Watershed Management Program. (co-author) 2004.
- “The High Cost of Free Water.” *Oregon Quarterly*. With Ed Whitelaw. 2003.
- “Economic Transitions and Natural Resource Managers.” Presentation to the Midwest Association of Fish and Wildlife Agencies, Directors’ Meeting. Omaha, Nebraska. 2003.
- *Full-Cost Accounting for Washington’s State-Owned Forests: An Overview*. Washington Environmental Council and Seattle Audubon Society. 2003.
- “Economic Transitions and Natural Resource Managers.” Presentation to the U.S. Fish and Wildlife Service, Project Leaders’ Meeting. New Orleans, Louisiana. 2002.
- “Looking Forward the Change: Making the Most of Economic Change in the Columbia River Basin.” Presentation to the Multidisciplinary Conference on Toward Ecosystem-Based Management. Spokane, Washington. 2002.
- *Wildfire and Poverty: An Overview of the Interactions among Wildfires, Fire-Related Programs, and Poverty in the Western States*. Ford Foundation. With Kristin Lee. 2001.
- *Competition Matters: An Economist’s Perspective of Collaboration and the National Forests*. With Ed Whitelaw. 2001.
- *Muddy Waters: How Floods Clarify Evolving Relationships among Landscape Processes and Resource Management Decision-Making in Municipal Watersheds*. U.S. Environmental Protection Agency. 2001
- *Protecting Roadless Areas and Montana’s Economy: An Assessment of the Forest Service Roadless Initiative*. The Wilderness Society. 2001