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Investing in Our Self Interest: The Economics of Ocean Politics in Oregon

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Introduction

Oceans provide human services of both measurable and immeasurable worth to local and world economies. The ocean currents regulate the Earth's global temperature; the sea and its ports are byways for transporting goods; and the ocean is the lifeblood of coastal tourism and recreation; a critical source of food, medicine, and energy; and home to tens of millions of species. Much of our nation's wealth is tied to the sea. Yet, only 1 in 10 Americans understand the essential human services we derive from the ocean and threats we must address to restore a healthy, productive and resilient ocean.

The economic value of ecosystem services provided by ocean and coastal habitats in Oregon has not been assessed. Intuitively, however, Oregonians across the state understand the value of the ocean: public opinion polling shows that Oregonians believe that a healthy ocean with abundant marine life is important to the economic and environmental future of Oregon. Ultimately, the challenge is convincing Oregonians that we must invest in Ocean health to sustain essential human services and our way of life. Economics-based policy will be a critical driver to affect needed change. But traditional economics values only those resources with established "market values." This results in a bias that favors certain *provisioning* services (food, medicine and energy) over equally critical *regulating* (climate, floods, coastal erosion), *cultural* (recreational, spiritual, religious), and *supporting* (nutrient cycling, photosynthesis) services, which provide essential natural capital. Oregon Ocean commissioned a study by Earth Economics that profiles the importance of managing for these natural assets in addition to market-valued assets.

AN ECOLOGICAL ECONOMICS APPROACH TO UNDERSTANDING OREGON'S COASTAL ECONOMY AND ENVIRONMENT
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Approach

This report constitutes the first phase of a study to estimate the economic value of ecosystem services provided by Oregon's coastal and marine environment. The study first discusses an ecological economics approach to understanding the role of ecological systems as natural capital and the relationship between productive, resilient natural capital and a functioning economy. The authors provide an original empirical assessment of the contribution of different sectors of Oregon's coastal economy in traditional terms to personal income, describing the proportion that each sector contributes and trends over the past 30 years. A conventional description of the coastal economy sets

up a discussion of the importance of understanding the role that natural capital and ecosystem services plays in supporting the current economic structure. The report then describes Oregon's biophysical coastal and marine setting, including seven eco-types, and the 17 ecosystem services that they provide. The authors give a qualitative assessment of the status of these services, review existing studies on the economic value of coastal and marine ecosystem services, and finally describe two methodological approaches to evaluating their economic value. Phase 2 of this study, to be conducted in the summer and fall of 2007, will provide empirical estimates of the economic value of coastal Oregon's ecosystem services.

Key Themes

The Importance of Ecosystem Services and Biological Diversity

Ecosystem services provide essential support to human well-being and economic activity. In addition to the more familiar services of food and employment value provided by intact fish populations, coastal and marine systems protect coastal areas from storms, stabilize the coastline, contribute to climate stability, provide clean and stable water supplies, contribute to local and global nutrient cycles, provide habitat for species of commercial, recreational, aesthetic, and spiritual value, and provide multiple opportunities for social interaction, recreation, scientific learning, and aesthetic appreciation (Peterson and Lubchenco 1997, UNEP 2005). Maintaining biological diversity is crucial to maintaining ecosystem resilience and thus the provision of ecosystem services (UNEP 2005). A recent meta- analysis of marine data and studies examining the effects of biodiversity on ecosystem services found strong evidence that loss of biodiversity leads to fisheries collapse, lower potential for stock and system recovery, loss of system stability, and lower water quality. The relationship is one of an exponential loss of ecosystem services with declining diversity (Worm et al. 2006). Thus, management actions taken to restore biological diversity are foundational to the continued provision to ecosystem services that support human well-being and economic vitality. Such management actions necessarily include the establishment of marine reserves in areas where over-fishing and habitat destruction have led to loss of marine biodiversity (Roberts 2005).

Relationship Between Ecosystem Services and Oregon's Coastal Economy

Several important observations can be made about the relationship between the ecosystem services and Oregon's coastal economy. The coastal economy is no longer driven by commercial fishing and other direct natural resources extraction. While commercial fishing is still very important in some counties, and remains a component of income for residents that would be hard to replace, the shift to small businesses, tourism and recreation, and retirement income poses a significant set of facts to consider in the context of managing for a full set of marine and coastal ecosystem services.

Transfer payments and investment income make up over 46 percent of individual income in five coastal counties. Small businesses (not directly associated with natural resource extraction or heavy industry) comprise nearly another 27 percent. Tourism, while making up 8 percent of total income in Clatsop County, constitutes only 5.6 percent of income coast-wide. It is however, a growing sector of the economy. Commercial fishing accounts for 9.6 percent of income in Clatsop County, but only 3.6 percent coast-wide, and the trend for employment and income is projected to decline for this

industry. Other natural resource-based industries are locally important as well, but also declining overall since 1990.

The large amount of retiree income as a proportion of total income source in the coastal counties indicates that high quality of life is a large draw to the Oregon Coast. There are convincing analyses from other parts of the county that have had large natural resource-based industries in the past, that high environmental quality is a key factor in drawing entrepreneurs to start up small businesses (Power 1991, 2001). Recent survey data in Oregon to indicate that residents value a healthy ocean environment for its economic and recreational opportunities, though specific economic valuation survey data is not available. However, it is a fairly safe conclusion to state that Oregon's beautiful coastline, accessible beaches, relatively high air and water quality, watchable marine and coastal bird and mammal life, and recreational hunting and fishing opportunities are a big draw to retirees and would be business owners as well. Therefore, maintaining ecosystem services that support a high natural aesthetic and recreational opportunities, in additional to the health and safety of coastal residents should be of high overall value to the coastal economy and the quality of life of its residents.

Valuation Approaches

Preliminary estimates of economic value of coastal and marine ecosystems on a global scale demonstrate that these areas provide a substantial amount of total economic value of the world's natural capital (Costanza et al. 1997). An estimate of the value of ecosystem services will at this point necessarily entail use of value-transfer methodology. This method uses existing valuation data gathered in similar settings and adapts it to a local policy site, using GIS analysis to give values a spatial dimension (Desvouges et al. 1998, Loomis 1992, Wilson et al. 2005). Such methods are helpful when time and funding limit the ability to conduct all new empirical studies – which can cost millions of dollars and take several years to complete. However, even this approach will eventually need to be supplemented with new research as our literature review showed several gaps in knowledge for important ecosystems and their services in the coastal and marine environment in places where the results would be applicable to Oregon. On the other hand, dynamic modeling tools are under development that will allow for higher quality estimates of these values and will aid in gathering original empirical data on how residents of Oregon value restoration and protection of marine ecosystems (Gund Institute of Ecological Economics, 2006). Next steps for this project are to conduct a value transfer study and to have coastal Oregon be a case study site for a dynamic ecological-economic modeling project.

Literature Cited

Costanza, R., d'Arge, R., de Groot, R., Farber, S., Grasso, M., Hannon, B., Limburg, K., Naeem, S., O'Neill, R. V., Paruelo, J., Raskin, R. G., Sutton, P., & Belt, M. van den (1997). The value of the world's ecosystem services and natural capital. *Nature*, 38, 253-260.

Desvouges, W. H., Johnson, F. R., & Banzhaf, H. S. (1998). Environmental Policy Analysis with Limited Information: Principles and Applications of the Transfer Method. Northhampton, MA: Edward Elgar.

Gund Institute for Ecological Economics. 2006. Ecosystem services: Dynamics, modeling, and valuation for conservation. A report to the Gordon and Betty Moore Foundation. December 28, 2006.

Loomis, J. B. (1992). The evolution of a more rigorous approach to benefit transfer: benefit function transfer. Water Resources Research, 28(3), 701-705.

Peterson and Lubchenco. 1997. Marine Ecosystem Services. In, Daily, G.C. (1997). Nature's Services: Societal Dependence on Natural Ecosystems. Washington D.C.: Island Press.

Power, Thomas Michael 1991. Ecosystem preservation and the economy in the Greater Yellowstone Area. *Conservation Biology* 5 (3), 395–404.

Power, Thomas Michael 2001. Post-cowboy Economics. Island Press, Washington D.C.

Roberts, Callum. 2005. Marine protected areas and biodiversity conservation. In, Marine Conservation Biology: The Science of Maintaining the Sea's Biodiversity. Elliott Norse and Larry Crowder, eds. Island Press, Washignton, D.C.

United Nations Environmental Program. 2005. Millennium Ecosystem Assessment: Volume 1 Current Status and Trends. Island Press, Washington D.C.

Wilson, M.A, A. Troy, and R. Costanza 2005. The Economic Geography of Ecosystem Goods and Services: Revealing the Monetary Value of Landscapes through Transfer Methods and Geographic Information Systems. In Dietrich and Van Der Straaten (eds.) Cultural Landscapes and Land Use. Kluwer Academic Publishers.

Worm, Boris, Edward Barbier, Nicola Beaumont et al. 2006. Impacts of biodiversity loss on ocean ecosystem services. *Science* 314:787-790.