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## The Journal of Ocean and Coastal Economics: An Introduction and Invitation

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## **1. INTRODUCTION**

Welcome to the inaugural issue of the Journal of Ocean and Coastal Economics. This introduction lays out the purpose and goals of the Journal as a guide to what we hope to accomplish. The advent of electronic journal publishing has significantly lowered the barriers to entry to scholarly and professional publishing, which makes this Journal possible. At the same time, the reduced barriers to entry raise issues about the proliferation of journals and possible dilution of quality. Those who propose to start a new journal should build on existing intellectual traditions but must have a distinct purpose and the intention to serve a demonstrated need. In this introduction, I will briefly discuss the organizational setting of the Journal, the intellectual traditions it seeks to draw on, enlarge, and enhance, the (fuzzy) boundaries within which the Journal seeks to share information, and the community we seek to support. This paper comprises an extended invitation to join that community through participation in the work of the Journal.

## **2. SETTING**

The Journal's home is the Center for the Blue Economy (CBE) at the Middlebury Institute of International Studies at Monterey in Monterey, California, USA. The Center's mission is to demonstrate the interdependence of a healthy ocean and a strong economy and to make stewarding the "Blue Economy" a top global priority. The Center is also the home to the National Ocean Economics Program (NOEP), which provides data on the ocean and coastal economies of the United States from the national to the regional (county) levels. The Journal was established to provide a means of communicating high quality research about the application of economics to the issues of ocean and coastal resource management and to advance understanding of the connections between those resources and the economies of coastal and other regions.

The Journal has been generously funded by a grant from the Loker Foundation, which is permitting the Journal to be free to subscribers and authors in its early years.

### 3. FORBEARS

The study of economic aspects of the oceans has a lineage that connects to a number of different disciplines. Perhaps the longest trail of thinking is in history, where the role of the oceans in the shaping of nations, economies, and cultures has been either a casual or a focal subject for all periods from the ancient world to the modern. The emphasis on what Lincoln Paine (Paine 2013) terms the study of the “naval-commercial complex” was on how the oceans (and the technologies and organizations associated with them) enabled the expansion and transformation of European economies.

Two of the most widely influential works of history ever written were essentially studies of how the ocean influenced economic and political development. Few works of history have been as widely or profoundly influential as Alfred Thayer Mahan’s *The Influence of Sea Power Upon History* (Mahan 1890). Mahan’s mixture of military, economic, and political history profoundly influenced thinking in the U.S., Britain, and Germany prior to World War I and was a major catalyst in the naval construction race that contributed to the outbreak of war in 1914 (Massie 2003). On a different level, Fernand Braudel revolutionized history itself by considering how the Mediterranean Sea shaped renaissance Europe’s economy and politics and in the process of his wide-ranging exploration of sea and society established the *Annales* school of history, which began to see the entire scope of society as the subject of study.

While maritime history began the process of considering the relationship between people and the ocean, and remains an important area of inquiry in economic history, the link to economics as a field really began in the 1950s with the emergence of discussions at both national and international levels of how international law should apply to the oceans. The “law of the sea” had primarily been the subject of national and customary law, but the United Nations provided a new global forum under which a codified international law of the sea could be established.

While the U.N. provided the institutional framework, economists began to provide a new intellectual framework driven in large part by the emerging problem of fisheries management. In the years after World War II, fishery biologists had begun to identify fisheries that had once been abundant but now showed increasing signs of stress (Scott 2011). With a shift from a perspective of abundance to one of

scarcity, the problem of “common property resources”, a term coined by H. Scott Gordon in 1954 for a study of high seas fisheries (Gordon 1954), began to become the focus of attention. (This attention to marine fisheries came fourteen years before the term received its best-known incarnation in Garret Hardin’s “Tragedy of the Commons” article (Hardin 1968).

The Law of the Sea convention of 1958 and the negotiations leading up to and following it focused attention on the economics of property rights as the key defect of, and ultimate solution to, the management of many ocean resources. Fisheries economics began to develop as a significant field, grounded in issues of property rights, but with an increasing focus on the efficient exploitation of fisheries resources. Fisheries economists extended the biological concept of “maximum sustained yield” based on population dynamics to “optimum sustained yield,” incorporating concepts of biological sustainability and economic efficiency. With the passage of the Magnuson Fisheries Management Act in 1977, economists began to look for alternatives to pure applications of property rights as a solution to fisheries management (Andersen 1977; Scott 2011).

The economics of property rights remained a continuing theme regarding the oceans, with important contributions as the U.S. and other countries extended their national jurisdictions to assure that the property rights to the petroleum resources of the continental shelf were assigned to national governments (Crutchfield 1979). While the property rights perspective remains an important economic perspective (Hallwood 2014), the 1970s saw the beginning of a shift to a significantly broader application of economics to ocean issues beginning with two events in 1969.

The oil spill that occurred 10 kilometers (6 miles) offshore of Santa Barbara, California from January to April 1969 was a seminal event in the emerging awareness of the environment as an issue. That same year, the Commission on Marine Science, Engineering and Resources (better known as the “Stratton Commission after its chair, Julius Stratton, an electrical engineer who had served as President of MIT) published its report *Our Nation and the Sea: A National Plan for Action* (Commission on Marine Science Engineering and Resources 1969). From the Santa Barbara oil spill and succeeding policy actions such as the National Environmental Policy Act (NEPA), the Clean Air and Clean Water acts, and the creation by Executive Order of NOAA and the Environmental Protection Agency (EPA) came a growing field of environmental and, later, “ecological” economics

that would see the resources of the oceans and coasts as significantly more economically important than the previous focus largely on extractive resources.

In the 1960s, economists had begun to consider how the economics of natural resources, which had been primarily concerned with the optimal rates of utilization, needed to be extended to consider the problems of conservation of resources and to the problem of degradation in land, air, and water resources (Barnett and Morse 1963), including what would come to be called non-market values and non-use values, including option and existence values (Krutilla 1967).

Developments in the theory and methods for the valuation of marine resources beyond market priced goods and services in the 1960s and 1970s resulted in significant growth in studies of the economic value of a variety of ocean resources. The three most commonly studied have been wetlands (Gosselink, Odum, and Pope 1974), beaches (Silberman and Klock 1988), and marine recreational fishing (Bell, Soresen, and Leeworthy 1982). In the 1970s and 1980s a wide variety of methodological approaches generated a growing and diverse body of literature, particularly on marine recreational activities (Freeman 1995).

The valuation of non-market resources in the marine context greatly expanded the understanding of the economic values for coastal and marine resources, but the ocean context also provided opportunities to make important advances in economic methodologies. Perhaps the most notable example of this came with the events following the *Exxon Valdez* oil spill in Alaska in 1989. In the following year, Congress passed the Oil Pollution Act of 1990, which authorized the National Oceanic and Atmospheric Administration to assess damages to natural resources from oil spills. The damages to market-traded goods and services such as fisheries and tourism were straightforward but damages to “non-use” values expressed as existence and option values presented a more complicated problem. Such values had been recognized as a legitimate area of claims under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, but the *Exxon Valdez* raised a serious issue about how to estimate these values. Contingent valuation, the survey-based technique that economists had developed to measure non-market values (both use and nonuse) was the obvious choice but it was highly controversial in the context of developing a bill of potentially billions of dollars in damages to oil companies.

NOAA convened a panel of economists led by Kenneth Arrow to review contingent valuation as a technique for assessing damages to be claimed in oil spill assessments. The panel presented a report in 1993 that evaluated the advantages and disadvantages of using contingent valuation and arrived at a set of recommendations for the application of CV methods that would be most likely to yield sufficiently sound results.

Over the same period, the legacy of the Stratton Commission was shaping the understanding of oceans and coasts in additional ways, with economics playing an increasingly critical role. A critical recommendation of the Commission was that the special and unique needs and challenges of the complex resources of the land-sea interface required a new approach to resource management. The result was the Coastal Zone Management Act of 1972, which contained several important innovations, including the establishment of a cooperative state-federal program for land use and resource management. Perhaps the most important innovation was that coastal management was seen as integrating the social and ecological systems in coastal areas. Where other environmental laws of the period such as NEPA and the Clean Air and Clean Water acts made few if any compromises with issues of economic efficiency and growth in order to protect environmental resources (and minimize harmful externalities), Coastal Zone Management challenged governments to seek a more difficult balance among the multiple uses and users of the coastal zone and the ecological systems with which they interact (Forst 2009; Cicin-Sain and Knecht 1998; Turner 2000).

The need to think about the coasts and ocean resources in terms of values contributed to the rise of non-market valuation studies that economists began to deploy in the 1970s, but it also raised another question: what is the value of the ocean and coasts in terms of the market economy? What do these resources, regions, and industries contribute to the national and regional economies? The first attempt to answer this question came in a 1974 study for the Bureau of Economic Analysis, the agency responsible for the national income and product accounts (Nathan Associates 1974). Little would come of the idea of integrating the oceans and marine resources into the national accounts although there would be attempts to expand and refine the ideas laid out in 1974 (Pontecorvo, Wilkinson, and et Al. 1980). Efforts to define the market value of coastal areas from the perspective of regional economies began to appear as well (Luger 1991; C. Colgan 1992). In 1998, President Clinton included among his commitment to the oceans a program to study

the economics of the ocean and coasts. From that speech was born the National Ocean Economics Program, founded at MIT by Dr. Judith Kildow. That program has resulted over the last fifteen years in a number of studies at the regional and national level measuring the ocean and coastal economies (Kildow and Colgan 2004; Kildow, Colgan, and Pendleton 2009; C. S. Colgan 2013). These studies also began to expand around the world (Morrissey and O'Donoghue 2012; Kaladjian 2007; Allen Consulting Group 2004).

This brief and highly incomplete review points to the many strands of research that have come together to show the different ways that economics expands and deepens our understandings of oceans and coastal areas. Much of the literature, as might be expected, is grounded in natural resource and environmental economics, but the field is far more than the theoretical and methodological approaches in these fields applied to oceans. Regional economics, macroeconomics, national income accounting, and economic history all make important contributions to the economic study of oceans and coasts. All of these perspectives will shape the next generation of literature in ocean and coastal economics as new subjects and new challenges in the resources and regions of the coasts and oceans are examined from an economic perspective. Among these emerging fields, perhaps three warrant attention for future research:

### **3.1 Climate Change**

Certainly the most important issue facing ocean and coastal economics is climate change. Changes in ocean chemistry and temperature will alter fisheries and coral reefs, in some cases dramatically. Sea level rise will alter coastlines, affecting everything from beaches and wetlands to entire cities. Much of the discussion about the economics of climate change has focused on the costs, benefits, and means of mitigating climate change, but attention is now turning to the economics of adapting to the changes already baked into the global climate-ocean systems. The costs and benefits of adaptation strategies and the financing of adaptation measures are large questions touching on frontiers of the economics of risk and uncertainty. Equally important, and perhaps more challenging, is creating models that will permit envisioning what ocean and coastal economies will look like after mitigation and adaptation steps are taken.

Another consequence of climate change is the opening of the Arctic Ocean to economic exploitation at industrial rather than subsistence scales. The story of the

opening of the Arctic will recapitulate the last sixty years of economic (and political) issues in the oceans. Questions of national and international jurisdictions, the issue of property rights for mobile resources such as fisheries and transportation routes, and the exploitation of fishery and fossil fuel resources as the leading sectors will be revisited. But questions of scarcity and environmental sensitivity, once secondary in what were perceived as the vast and inexhaustible expanses of the Atlantic or Pacific, will arrive much sooner and with much greater urgency in the fragile ecosystems of the Arctic.

### **3.2 National Income Accounting**

The measurement of the ocean's contribution to national and regional economies is now occurring on either an occasional or regular basis in countries in Asia, North America, and Europe. These efforts are part of a rising awareness of the importance of oceans, but they are also part of a larger debate about whether national income accounting as it has been implemented over the past sixty years fully reflects the concept of economic well-being in a nation. In particular, attention has been paid to the incorporation of "natural capital" in the national accounts in order to reflect the state of both renewable and nonrenewable resources (Nordhaus and Kokklenberg 1999).

There are a number of challenges in incorporating the oceans in the national income accounts, particularly internationally. Different definitions and methods of industries and geographies are barriers to creating larger scale estimates of the importance of the ocean at the international level, with Europe furthest along. Europe has an advantage in having supranational institutions that other regions lack, though the creation of the North American Industrial Classification System (NAICS) among the United States, Canada, and Mexico, indicates that common statistical systems are possible even without the equivalent of the European Union. More challenging will be the extension of ocean-based income accounting in developing countries, where understanding the role of the ocean may be even more critical to understanding national economies as a whole.

A related issue that will affect all countries and regions is how to accommodate new industries in the measurements of the ocean economy. While energy from fossil fuels is well established in measurements of the ocean economy, the generation and transmission of electricity from wind, wave, and tidal energy or similar processes is well established in some areas but barely begun in others.



Moreover, other energy technologies, such as deriving energy from temperature or salinity gradients, may lie in the future. The problems of identifying technologies with marine applications are another area that requires development, as well as the subset of sustainable ocean industries that are being promoted under various names such as the “New Blue Economy” or “Blue Growth” (European Union 2015).

### **3.3 Socio-ecological Modeling**

Ultimately underlying the study of ocean and coastal economics is the desire to better understand the nature of coupled socio-ecological systems. Whether implicitly or explicitly, the ecological health of the oceans is assumed to be coupled with the economic health of the regional or national economies. Transforming this assumption into formal computational models of the interactions between ecological and economic systems are, not surprisingly, becoming widespread in fisheries. Such coupled systems models will need to be extended beyond fisheries if the full benefits of more precise measurement of the economic values of oceans and coasts are to be realized.

Where does the Journal of Ocean and Coastal Economics fit into this evolving field of inquiry? To address this question, we explore the boundaries of the Journal’s work, its roles in the emerging community of scholars and practitioners in the field, and how the journal proposes to meet the challenges that lie on the horizon.

## **4. BOUNDARIES**

Even a cursory survey of the forbears of current research shows that it is difficult to define the precise boundaries of inquiry and subject matter appropriate to a journal of this type. Boundaries are needed to guide authors and readers, but they are inevitably somewhat amorphous. We can define four boundary types, even if the precise positions cannot be established:

*Geography* What does “ocean” mean? At one level the answer is obvious enough, but what about bodies of water such as the North American Great Lakes or the Caspian Sea or Lake Baikal? And what is the inland boundary of the influence of the ocean? How far up the major rivers such as the Hudson, Columbia, Thames, Yangtze or Rhine should the boundary be drawn? Are major bays such as

the Chesapeake or Puget Sound included? We use the general guideline that salt water and estuaries are included along with major fresh water bodies that have the same general economic characteristics as the ocean, but we leave to authors the option of proposing other boundaries that may be appropriate for some purposes.

*Industries* As with geography, there are a number of economic activities that are fairly obviously ocean related, e.g. shipping or fisheries. Many industries have significant ocean and non-ocean elements and the challenge is to separate the ocean from the non-ocean component. Industries such as minerals extraction or tourism and recreation can be identified as ocean related by using the location of their economic activity as a proxy for “ocean”, but this brings into play the questions about geography noted above. For other types of economic activities, such as the development of new technologies in fields such as search and navigation, observation and monitoring equipment, the “ocean” component is not always defined in industrial taxonomies and geography is of little help since such technologies can be produced anywhere.

The question of the industries to be included in the discussion of “ocean and coastal economics” is also continually evolving and different approaches to economic data in different countries provide a variety of perspectives on industries. Consequently, perhaps the fewest boundaries are needed here. However, it is important to note the relationship between research presented in this journal relative to marine fisheries and transportation. Both of these fields, particularly fisheries are already covered by journals with long and distinguished records of publishing research and are the standard outlets for communicating research to these specialized communities. We recognize that *The Journal of Ocean and Coastal Economics* may not be the appropriate outlet for research addressing these communities. However, if authors believe their research is appropriate for a broad audience of scholars and practitioners interested in the wider range of subjects considered in this journal, we welcome submissions.

*Disciplines* We are a journal of economics, but there are many perspectives from which economists view the world, including regional, macro, resource, environmental, ecological, behavioral, and others. We place no limitations on the theoretical or methodological perspectives as long as the research is recognizably within a field of economics. Our interest is in contemporary applications of economics to ocean issues, so works of economic or maritime history are appropriate for consideration when they are clearly linked to contemporary issues.

As with fisheries and transportation, we do not seek to duplicate the work of other journals in the fields of maritime and economic history.

We are also interested in learning how economics is linked to and used in decisions affecting resources, industries and regions. Such research often employs the theoretical and methodological perspectives of fields such as political science, public policy, planning, finance, and decision sciences. We encourage submissions in this area so long as the theoretical or methodological elements of the research are rooted in some field of economics or the subject of the research is clearly the development or application of economics to ocean related subjects.

*Contributions to knowledge* As with all journals we exist to bring new contributions to knowledge to a broad community, and we conduct a peer review process to assess these contributions and their values to the body of literature and to the communities we serve. But unlike many journals, we do not limit our concept of contributions to knowledge to questions of theoretical or methodological-empirical innovations. For the broad community of people interested in oceans and coasts, the findings of research applying economics to understanding values or changes in values of resources, or the influence of oceans on regional economies, or the role of oceans in national economies may be as, or more valuable than a paper explaining a new innovation. For this reason, the journal has an “applications” section to which authors are encouraged to submit papers that may range from relatively brief summaries of research to longer explanations of research projects that may be of interest to others confronting the same issues in other contexts.

## **5. COMMUNITY**

Scholarly journals serve the vital function of communicating the results of research in a way that provides information in a standard format so that readers can access the information at a level of detail appropriate to their needs and with assurance that others with expertise in a field have determined that the information warrants consideration as a contribution to the literature and was arrived at through generally accepted methods. But this is only part of what journals do or should do. Journals associated with professional societies are part of multiple communications networks, which include newsletters, annual conferences, websites, and other channels. The field of ocean and coastal economics has no single professional

society; multiple associations in a variety of disciplines and subject areas legitimately lay claim to being part of the “ocean and coastal” community.

This diversity places an extra burden on the Journal as a more solitary communications channel for a large and widespread community. As noted earlier, an important part of the Journal’s role is to be a forum for those interested in advancing the applications of economics to oceans and coasts, for those who must develop new economic information for use in decisions, for those who wish to reflect on these connections, and for those who want to link economics to the information derived from other social, physical, and biological science disciplines. These cross-disciplinary and cross-professional linkages will require extending the concept of the scholarly journal.

The use of a Web-based medium offers much greater flexibility than traditional print journals, including the ability to continually update the journal as new papers are presented and reviewed. Authors do not need to wait for a new issue as their material can appear as soon as it is ready. Special issues can be published alongside the regular annual volume without diverting timely material while an issue is devoted to a special topic. Technologies such as RSS, email, and social media feeds provide updates on material, and online discussion sections for articles and topics offers a way to connect community members in ways that supplement traditional peer review. Continuous innovation in web-based communications will allow further refinement of communication strategies.

We believe that another key part of community building is to commit to open communications among authors, editors, and reviewers. The blind peer review process that has dominated the process of quality control in scholarly publishing for many decades had some important advantages but those came too often at the cost of obscurity and misunderstanding. As the paper by Pendleton in this volume argues, an open communication process encourages reviewers to be helpful as well as critical and helps authors to better understand the implications of their reviews for their own communications. The Journal seeks to publish high quality papers but it will be the job of the reviewers and editors to serve as more than gatekeepers simply holding up a STOP or a GO sign. At the nexus of an important communications network, we must be active in helping all members of the community maximize the quality and quantity of information flowing through the network.

Finally, the community we seek to support is truly international. The Journal is housed in an institution with a specific focus on international and transboundary issues and a long and distinguished history (as both the Monterey Institute, and Middlebury College) in promotion of a global perspective and fostering communications through language education. While the language of the Journal will remain English, we will publish the abstracts of each of the articles in multiple languages and work to have the Journal indexed in multiple languages.

## 6. INVITATION

On behalf of the Middlebury Institute of International Studies at Monterey, the Center for the Blue Economy, our distinguished colleagues who have volunteered their time to serve on the editorial board, and our staff, as Editor-in-Chief I invite you to join our community. In this inaugural volume, we present papers by Park and Kildow and by Foley et al. that explore the development of ocean accounts in Asia and Europe and, given the historical role that oil spills have played in the shaping of ocean economics, a paper by Petrolia exploring the implications of the most recent major oil spill, the *Deepwater Horizon*. Lipton et al. consider how the field of non-market valuation has evolved for the federal government in the years since the Arrow report. In an applications report, Zhang discusses economic damages from pollution in the Yangtze estuary.

Whether as a reader, author, reviewer, or simply someone who joins our email list for updates, we hope you will follow the Journal, contribute whenever possible, and help broaden our understanding of how economics can provide critical insights into the way humans interact, for good and ill, with the 70% of the planet's surface that is the global ocean. It is certainly an understatement to say that the economists' perspectives on the understanding of scarcity have never been more needed even for so seemingly vast a resource.

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