Marine ecosystems and resources are often shared by neighboring states. Moreover, pollution, habitat degradation, and depleted resources in the world's oceans are problems that do not occur in isolation, but transcend national jurisdictions. In recognition of these problems and the plight of the marine environment, a need for the sustainable management of the ocean emerged in recent decades. Yet, due to the shared nature of this common resource, it became apparent that management must be coordinated among states. Regional ocean governance regimes were thus pursued as the appropriate unit for managing a shared ocean area - states neighboring a marine ecosystem or politically defined area began to coordinate their efforts toward mitigating regional ocean issues. The United Nations Environment Programme Regional Seas Programmes and the Large Marine Ecosystem projects, undertaken by countries bordering a Large Marine Ecosystem, and with initial funding provided by the Global Environment Facility, among others, are important regimes that have emerged to answer the call for regional governance. Today, however, in spite of a growing number of regional efforts and agreements, the global oceans community has become aware that we are falling short of meeting the goals of sustainable management and development.

This study expands the knowledge base regarding the formation, dynamics, and effectiveness of regional ocean governance regimes in an effort to better understand when, how, and why these regimes work. Specifically, the research seeks to address the following: what are the "on the ground" effects of regional ocean governance regimes; to what extent do various regime features play a role in increasing or decreasing effectiveness; and which factors determine whether an existing regime becomes effective, and remains so over time?

The literature review within the study investigates existing analyses of effectiveness in international environmental regimes and, further, those specific to ocean governance, to place the dissertation in the context of previous research and identify established factors in regime formation, regime attributes, and regime dynamics that play a key role in regime effectiveness. Based on the literature, definitions that guide the study are developed: (1) Regional Ocean Governance Regime - a regional ocean governance regime is a social institution composed of geographically proximate states that maintain agreed upon principles, norms, rules, procedures, and programs that govern the interactions of actors in their respective ocean area. (2) Effectiveness in Regional Ocean Governance Regimes - a regional ocean governance regime is effective when it changes the behavior of actors in a regional ocean area in such a manner that the problems and issues for which the regime was formed are solved or greatly reduced.
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Abstract (summary)

Offshore wind power is an energy resource whose potential in the US has been recognized only recently. There is now growing interest among the coastal states to harness the resource, particularly in states adjacent to the Mid-Atlantic Bight where the shallow continental shelf allows installation of wind turbines using the existing foundation technology. But the promise of bountiful clean energy from offshore wind could be delayed or forestalled due to policy and regulatory challenges. This dissertation is an effort to identify and address some of the important challenges. Focusing on Delaware as a case study it calculates the extent of the wind resource; considers one means to facilitate resource development—the establishment of statewide and regional public power authorities; analyzes possible regulatory frameworks to manage the resource in state-controlled waters; and assesses the use of distributed storage to manage intermittent output from wind turbines. In order to cover a diversity of topics, this research uses a multi-paper format with four essays forming the body of work.

The first essay lays out an accessible methodology to calculate offshore wind resource potential using publicly available data, and uses this methodology to access wind resources off Delaware. The assessment suggests a wind resource approximately four times the average electrical load in Delaware. The second essay examines the potential role of a power authority, a quasi-public institution, in lowering the cost of capital, reducing financial risk of developing and operating a wind farm, and enhancing regional collaboration on resource development and management issues. The analysis suggests that a power authority can lower the cost of offshore wind power by as much as 1/3, thereby preserving the ability to pursue cost-competitive development even if the current federal incentives are removed. The third essay addresses the existing regulatory void in state-controlled waters of Delaware. It outlines a regulatory framework touching on key elements such as the leasing system, length of tenure, and financial terms for allocating property rights. In addition, the framework also provides recommendations on environmental assessment that would be required prior to lease issuance. The fourth essay analyzes offshore wind power integration using electric thermal storage in housing units. It presents a model of wind generation, heating load and wind driven thermal storage to assess the potential of storage to buffer wind intermittency. The analysis suggests that thermal load matches the seasonal excess of offshore wind during winter months, and that electric thermal storage could provide significant temporal, spatial, and cost advantages for balancing output from offshore wind generation, while also converting a major residential load (space heating) now met by fossil fuels to low carbon energy resources.

Together, the four essays provide new analyses of policy, regulatory, and system integration issues that could impede resource development, and also analyze and recommend strategies to manage these issues.
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Navigating a sea of values: Understanding public attitudes toward the ocean and ocean energy resources


Abstract (summary)

In examining ocean values and beliefs, this study investigates the moral and ethical aspects of the relationships that exist between humans and the marine environment. In short, this dissertation explores what the American public thinks of the ocean. The study places a specific focus upon attitudes to ocean energy development. Using both qualitative and quantitative methods, this research: elicits mental models that exist in society regarding the ocean; unearths what philosophies underpin people's attitudes toward the ocean and offshore energy development; assesses whether these views have any bearing on pro-environmental behavior; and gauges support for offshore drilling and offshore wind development. Despite the fact that the ocean is frequently ranked as a second-tier environmental issue, Americans are concerned about the state of the marine environment. Additionally, the data show that lack of knowledge, rather than apathy, prevents people from undertaking pro-environmental action. With regard to philosophical beliefs, Americans hold slightly more nonanthropocentric than anthropocentric views toward the environment. Neither anthropocentrism nor nonanthropocentrism has any real impact on pro-environmental behavior, although nonanthropocentric attitudes reduce support for offshore wind. This research also uncovers two gaps between scientific and public perceptions of offshore wind power with respect to: 1) overall environmental effects; and 2) the size of the resource. Providing better information to the public in the first area may lead to a shift toward offshore wind support among opponents with nonanthropocentric attitudes, and in both areas, is likely to increase offshore wind support.
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As the world’s most rapidly growing source of energy, wind power has vast potential for mitigating climate change and advancing global environmental sustainability. Yet, the challenges facing wind energy remain both complex and substantial. Two such challenges are: 1) wildlife impacts; and 2) perceived negative effects on tourism. This dissertation examines these challenges in a multi-paper format, and also investigates the role that climate change perceptions play in garnering public support for wind power.

The first paper assesses optimal approaches for addressing wind power’s wildlife impacts. Comparative analysis reveals that avian mortality from turbines ranks far behind avian mortality from a number of other anthropogenic sources. Additionally, although bats have recently emerged as more vulnerable to wind turbines than birds, they are generally less federally protected. The Migratory Bird Treaty Act (MBTA) protects over 800 bird species, regardless of their threatened or endangered status. Moreover, it criminalizes the incidental take of birds without a permit and simultaneously grants no permits for such incidental take, thereby creating a legal conundrum for the wind industry. An examination of the legislative and case history of the MBTA, however, reveals that wind operators are not likely to be prosecuted for incidental take if they cooperate with the U.S. Fish & Wildlife Service (FWS) and take reasonable steps to reduce siting and operational impacts. Furthermore, this study’s analysis reveals modest wildlife impacts from wind power, in comparison with numerous other energy sources.

Scientific-research, legal, and policy recommendations are provided to update the present legal and regulatory regime under the MBTA and to minimize avian and bat impacts. For instance, FWS should: establish comprehensive federal guidelines for wind facility siting, permitting, monitoring, and mitigation; and promulgate regulations under the MBTA for the issuance of incidental take permits at wind facilities. Equal protections for bats are also recommended.

In examining the potential effect of offshore wind power on coastal tourism, the second paper reports the findings of a summer 2007 survey of over 1,000 out-of-state tourists at Delaware beaches. Randomly sampled beachgoers were shown photo-simulations of wind turbines at increasing distances from shore and asked how each simulation would affect visitation. With wind turbines located six miles offshore, approximately one-quarter would switch to a different beach. This stated avoidance, however, diminishes with increasing wind project distance from shore. Additionally, stated avoidance of a beach with turbines six miles offshore is exceeded by: avoidance of a beach with an equidistant, inland, fossil fuel power plant; attraction to a beach in order to see turbines six miles offshore; and the likelihood of paying for an offshore wind boat tour. Further, logistic regression modeling reveals that neither trip cost nor income significantly influences the likelihood of visiting a beach with offshore wind.

These findings suggest that to limit beach avoidance, offshore wind developers could site wind facilities further from shore, particularly in areas with high recreational use. Moreover, with wind turbines six miles offshore serving more as an attraction than as a deterrent, offshore wind development may, in fact, bolster local tourism revenues.

The third study examines public perceptions of climate change and the link between those perceptions and support for wind power, both in general and with respect to specific offshore sites. Analyzing data from five surveys, this research uncovers low climate awareness and concern levels overall. Respondents demonstrate a poor understanding of climate change impacts and of how to effectively address climate change. In accordance with the New Ecological Paradigm, still fewer are concerned about climate change. The issue ranks 6th in Delaware and 8th in Cape Cod as a reason for local project support, behind such issues as energy independence, electricity rates, air quality, and fishing and boating.

Although disproportionately high percentages in Delaware and Cape Cod support taking climate action now - regardless of significant economic costs - this support appears to stem from the desire for climate mitigation’s co-benefits, rather than from the desire to mitigate climate change itself. Furthermore, strong support for taking gradual or no climate action steps reveals evidence for an inaccurate conceptualization of greenhouse gas accumulation in the atmosphere and of long-term climate change impacts. Nevertheless, those aware of, and concerned about, climate change, exhibit significantly stronger support for wind power.

Climate communicators should therefore: focus on correcting faulty cultural models of climate change, while continuing to provide accurate climate information to the public; and consider discussing the co-benefits of addressing climate change, in addition to the direct, climate mitigation benefits. Through this improved understanding, enhanced political will for addressing climate change through wind energy may be at hand.

Abstract (summary)

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Climate communicators should therefore: focus on correcting faulty cultural models of climate change, while continuing to provide accurate climate information to the public; and consider discussing the co-benefits of addressing climate change, in addition to the direct, climate mitigation benefits. Through this improved understanding, enhanced political will for addressing climate change through wind energy may be at hand.

Indexing (details)

Subject
Climate Change;
Environmental management;
Public policy;
Energy

Classification
0404: Climate Change
0474: Environmental management
0630: Public policy
0791: Energy

Identifier / keyword
Social sciences, Applied sciences, Health and environmental sciences, Earth sciences,
The reduction cost of GHG from ships and its impact on transportation cost and international trade


Abstract (summary)

This dissertation investigates the Greenhouse Gases (GHGs) from ships calling at U.S ports, calculates the marginal abatement cost to reduce vessel-based GHGs, and evaluates the cost-effectiveness of proposed polices targeting at GHGs reduction. The ship profit maximization model is constructed to analyze the reduction cost of CO$_2$ from speed reduction and compare the cost with other estimates. Two econometric models based on gravity model in International Trade are applied to calibrate the CDM distribution, the potential use of the CDM by the shipping industry, and the effects of ship size, power, and speed on transportation cost. The Trade, Ship empirical movement, Ship parameters, and origin-destination Pairs model (TSSP) is developed to estimate the GHGs, GHG reduction costs, and the cost effects on value of trade carried by the international shipping industry.

Results show that the abatement cost of speed reduction policy is higher than the carbon price in a cross-sectoral carbon market. Twenty-percent (20%) CO$_2$ reduction under $250 per ton fuel price generates between $15 per ton and $275 per ton marginal abatement cost. The shipping industry can substantially reduce their compliance cost per ship by investing in CDM projects outside the shipping sector in landside efforts among developing nations. Larger scale CDM projects demonstrate greater cost advantages for investment; therefore the relatively small size of offset in terms of CDM project scale hinders the effectiveness of this strategy for the shipping industry. The econometric model based on gravity theory quantified positive relationship between ship speed and transportation cost and also showed statistically significant coefficients for ship size and power. The cross-sectoral model demonstrates the substitution effects between speed and ship size and shows the speed is not the only factor that influences the long-run ship transportation cost. The TSSP model illustrates that the adherence to the Equal Treatment for All Ships principle in vessel-based GHG reduction may cost developing countries between $17.6 billion and $16.0 billion for ships calling at the U.S ports. Applying the Common but Differentiated Responsibility (CBDR) principle may help developing countries to avoid such cost but may generate other equity problems. Therefore, the policy which requires all ship to reduce GHGs but to subsidize developing countries is likely to be more effective and efficient in GHG reduction from ships.
The demand for conventional and vehicle-to-grid electric vehicles: A latent class random utility model


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Abstract (summary)

I estimated a Latent Class Random Utility Model of conventional and Vehicle-to-Grid electric vehicle choice using stated preference data. I used a web-based national sample to elicit consumer preference in a choice experiment format that includes the respondent's preferred gasoline vehicle and two electric versions of it. The latent class model allowed me to capture preference heterogeneity and identify the source of the heterogeneity. I found consumer preference for electric vehicles (EVs) can be grouped into two preference groups- those who have high proclivity towards EV and those who have low proclivity towards EVs. My analysis shows the primary drive for purchasing EVs is not only to save the environment, but also to save on fuel cost.

I used the model to simulate willingness to pay for several EV designs and found that people who have high interest in EVs are willing to pay substantial premium. However, these premiums are not enough to cover battery cost. My estimates show for EVs to compete on the market, battery costs have to decline from the current level of $100/kWh to the neighborhood of $100 - $200/kWh.

For the Vehicle-to-grid (V2G) EV model, I found people have high discount rate for revenue earned from V2G service and high inconvenience cost for long plug-in time and short guaranteed minimum driving range. These results suggest, for the concept of V2G to help EVs, V2G contract terms should be either completely eliminated or set at very flexible terms.

Indexing (details)

Subject
Environmental economics;
Studies;
Electric vehicles;
Demand

Classification
0438: Environmental economics

Identifier / keyword
Social sciences, Choice experiment, Electric vehicles, Stated preference methods,
Vehicle-to-grid

Title
The demand for conventional and vehicle-to-grid electric vehicles: A latent class random utility model

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abstract (summary)

The ocean beaches in the Mid-Atlantic region are among the largest tourist and recreational day-trip destinations in the United States. Numerous policy issues arise in managing these beaches. How are compensatory values to be set in the event of beach closures due to an oil spill or other environmental disruption? Should eroding beaches be widened to accommodate beach goers and if so by how much? Should beaches be closed to off-road vehicles to protect the habitat of birds species nesting in critical areas on the beach? Each of these issues requires knowledge of the economic value of beaches or attributes of beaches to beach goers. In this thesis, I develop a model to estimate just such values. Using internet-based survey data for 1966 randomly drawn households in the Mid-Atlantic region, I estimate a linked random utility - trip frequency model of beach use in the Mid-Atlantic region. I find that the aggregate value losses from closures of groups of beaches range between $838 million for closure of North Shore sites in New Jersey to $93 million for Long Beach Island sites. Replenishment of beaches to over 150 feet leads to the highest aggregate net benefits with the largest gain for widening the Delaware sites (from $22 million to $149 million depending on the model used). Finally, I find large welfare gains to the general population for closing vehicle access to beaches ($87 million to $164 million for prohibiting vehicle access at all sites). Non-surf fishers have large gains from the access restriction and the surf fishers suffer small losses.
Compensatory restoration of natural resource damages using a travel cost random utility model

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Abstract (summary)
Natural resource damage assessment often requires compensation in non-monetary terms. As one way to meet this requirement, a travel cost random utility maximization model is employed in this study to find a compensatory restoration project under a hypothetical natural resource damage scenario--beaches in the Padre Island National Park, Texas, are closed for one season. A mixed logit site choice model is applied to Texas beach trip data to understand people's preference on beach characteristics and to search for a compensatory restoration project that passes a potential Kaldor-Hicks test. Also, how well a compensatory project targets damaged people is examined after identifying efficient projects. The compensatory restoration projects include cleaning a beach regularly, limiting vehicle access on the beach, providing rest rooms, offering lifeguards, and waiving a beach entrance fee if applicable.

Indexing (details)
Subject
Economics;
Natural Resource Management;
Recreation
Classification
0501: Economics
0528: Natural Resource Management
0814: Recreation
Identifier / keyword
Health and environmental sciences, Social sciences, Compensatory restoration, Nonmarket valuation, Random utility model RUM, Natural resource damages, Travel cost random utility
Title
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Abstract (summary)

The recent Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 has several new provisions relating to the setting of Annual Catch Limits (ACLs) set by Regional Fishery Management Councils. Specifically, ACLs must ensure no overfishing, and the level at which catch levels are set must not exceed the levels recommended by the Scientific and Statistical Committees (SSC). Due to uncertainty in many aspects of stock assessments, including natural and fishing mortality rates and recruitment, it may be necessary to develop buffers that account for uncertainty and variability, so that the risk of overfishing is minimized. The use of a target and limit framework is useful in this context, allowing for target catch levels (such as ACLs) to be reduced below the overfishing level such that the buffer between the two levels is an adequate distance to account for the uncertainty and variability in the biological and management aspects of a fishery.

Age-structured models for the Gulf of Mexico red snapper and red grouper were developed to assess the potential application of an ACL policy under a target/limit framework. Monte Carlo simulations were used to account for recruitment variability and management implementation uncertainty (based on catch overage histories particular to each fishery). After determining the probability of achieving the performance measure of spawning stock size in Year 3 necessary to rebuild to the target stock size in the specified time period, adjustments to catch levels were made. First, catch levels, and the associated fishing mortality rates, were adjusted to account for individual sector's quota overage to address management uncertainty. Then, catch levels were adjusted for an additional buffer of five and ten percent to further improve the probability of reaching the target stock size.

In the red snapper fishery, adjusting for quota overages improved the probability of attaining the performance measure to roughly 50%. In addition, certainty levels were improved to around 90% when both management uncertainty and recruitment variability were accounted for under a ten percent buffer. In contrast to the red snapper which is an overfished stock where the objective is to rebuild, the red grouper is above its target stock size, so that the objective is to fish down the stock to the optimum yield level. As such, the red grouper case highlights the importance of specifying an appropriate performance measure. Measuring the probability of the stock falling in a specific range around the target stock size as opposed to the probability of being at or above a target stock size point estimate significantly changes the results.

Overall the study's results highlight the necessity of considering, measuring, and accounting for uncertainty, variability, and risk in fisheries assessment and management. Importantly, the results suggest that all sources of uncertainty and variability should be assessed together to determine the appropriate buffer, a contrast to the currently suggested separation of biological and management steps where the SSC handles the biological uncertainty buffer and Councils handle the management uncertainty buffer. Here, it is shown that it may be more prudent and efficient to set buffers by adjusting for quota overages by sector after considering all sources of uncertainty. This improves the probability of success in the performance measure and provides for a solid, equitable basis for setting buffers based on past catch histories specific to each sector.

The study provides a basis for risk analysis recommendations, as well as recommendations for clearly defining the objectives and performance criteria of fisheries management. Acceptable risk levels determined a priori, improved monitoring, and continual reassessment all serve to improve the success of fisheries management in ensuring no overfishing, while aiming for optimum yield. Ultimately, this evaluation shows that ACLs, through a limit/target framework, can better inform fisheries policy by accounting for the risk, uncertainty, and variability inherent in fisheries systems, so that the probability of ensuring no overfishing is improved. This study is not meant to provide explicit management advice, rather its purpose is to illustrate the potential process of setting ACLs and highlight the importance of considering risk and uncertainty when making decisions. The model is meant to be a tool that can simulate the effects of a buffer of any size and is meant to be used in the context of a management strategy evaluation to provide pertinent information to decision-makers.
# Abstract (summary)

This dissertation examines the policy and legal issues surrounding the underwater cultural heritage (UCH). One of the primary purposes of this dissertation is the assessment of whether a recent international agreement adopted at the United Nations Educational, Science and Cultural Organization (UNESCO), the 2001 Convention on the Protection of the UCH, is a legally viable modification of the United Nations Convention of the Law of the Sea (UNCLOS) in accordance with international treaty law. This issue is timely as 14 of the necessary 20 States have ratified the Convention.

After identifying that this Convention is not a legally viable modification of UNCLOS under international treaty law, this dissertation assesses how UCH located beyond 24 NM might be governed so as to be in line with UNCLOS, customary international oceans law, and United States law and policy. In assessing the "best" method, this dissertation specifically supports the United States position for the codification and extension of already existing UNCLOS principles to the UCH, predicated upon guidelines attached to the 2001 UNESCO Convention, in combination with bilateral and multilateral agreements. In conclusion, this dissertation examines how United States law and policy relating to the UCH might be better coordinated and integrated in United States waters between 3 and 200 NM. In this identification, this dissertation examines two different approaches: the utilization of currently existing law and policy and its whole-scale revision.

Key to this dissertation is the identification that UNCLOS precludes direct or indirect coastal State regulation of UCH beyond 24 NM. In the United States coastal zone, several marine protected areas are identified as extending into this zone. As a result of this dissertation's analysis, it appears that a way of circumventing this limitation is regulation of cultural resources as they relate to natural resources.

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<td>Advisor</td>
<td>Mangone, Gerard J.</td>
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<td>School</td>
<td>University of Delaware</td>
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<tr>
<td>Department</td>
<td>Marine Studies</td>
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<tr>
<td>School location</td>
<td>United States -- Delaware</td>
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<td>Degree</td>
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<td>Language of publication</td>
<td>English; EN</td>
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<td>Document type</td>
<td>Dissertation/Thesis</td>
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Abstract (summary)

This dissertation research uses a stated preference mail survey to collect data on public preferences for offshore wind development in Delaware. The survey was sent to 2000 randomly selected residents in September, 2006. Response rate was 52 percent.

The primary goal of this research is to shed light on how Delawareans feel about offshore wind development, and more specifically, to value public preferences for different wind development scenarios. This research is the first to use discrete choice mixed logit techniques to examine public preferences for offshore wind power in the United States. Choice experiments are used to predict whether, and if so, how, offshore wind development should proceed in Delaware. Respondents were asked to choose among different offshore wind power scenarios which can differ in five basic characteristics: the location of the wind farm; its distance from shore; the amount of rent/royalty payments made to Delaware; to where those payments would be funneled (e.g. Green Energy Fund, Beach Nourishment Fund, or General Fund); and the amount of a fee, if any, that would be added to consumers' monthly electricity bill for three years.

The data collected in this dissertation research shows overwhelming support for offshore wind power among Delaware residents. Of the approximately 2695 total recorded choice occasions in the dataset, a combined 93 percent chose offshore wind power while 7 percent chose coal or natural gas. While 95 percent of the respondents chose wind power when offered at no cost, more than 91 percent still chose wind power even when told they would have to pay a monthly fee for three years. This suggests that factors other than initial cost may be more important in people's preferences for offshore wind power, such as cleaner air and increased price stability in the long-term.

Results indicate there will be significant social benefits associated with moving wind turbines offshore to reduce visual impacts. Statewide, Delaware residents are willing to pay a grand total of $132, $181, $219, $247, $268 and $296 million dollars to move turbines out from a baseline of 0.9 miles to 3.6, 6, 9, 12, 15, and 20 miles, respectively. Moreover, simulation results indicate a willingness to pay of between $45 and $50/month/household for three years for wind power projects located off the Delaware coast. When aggregated over the total number of households in the State, Delaware residents as a whole show a total willingness to pay of between $500 million and $555 million for wind power projects to be located in Delaware Bay, off of Rehoboth Beach, or off of Fenwick Island, versus expansion of coal or natural gas power.
Collaboration toward a more integrated national ocean policy: Assessment of several United States federal interagency coordination groups


Abstract (summary)

This study assesses four federal interagency coordination groups in the U.S. ocean policy arena to examine the factors that facilitate and hinder interagency collaboration, with the aim of developing policy guidance for achieving effective collaboration across the range of federal agencies involved in ocean policymaking and implementation. The need to improve interagency collaboration among the large number of federal agencies involved in national ocean policy in the United States was a key recommendation of the U.S. Commission on Ocean Policy’s Final Report to the U.S. Congress and the President in 2004, and underscores, as well, President George W. Bush’s response to the U.S. Commission on Ocean Policy establishing a new ocean governance structure through the December 2004 U.S. Ocean Action Plan and Executive Order.

Using the marine policy and interorganizational collaboration literature as a theoretical foundation, complemented by government documents, thirty-six semi-structured interviews were conducted with current and former members of the four federal interagency coordination groups to determine what the groups were established to do, what they accomplished, and what factors promoted and hindered collaboration among the agency members in the groups. The groups were: the National Ocean Research Leadership Council (NORLC); the Interagency Committee on the Marine Transportation System (ICMTS); the Subcommittee on Oceans Policy of the Global Environment Policy Coordinating Committee (Oceans Sub-PCC); and the National Dredging Team (NDT).

The study identified seventy factors that promote collaboration and ninety-two factors that hinder it, which represent a mix of structural factors, which describe organizational characteristics, non-structural factors, which describe characteristics of organizational interactions and group member behavior, and some external/political factors, which describe influences on organizations from outside the groups and their memberships. In addition, the study developed a Continuum of Collaboration to provide a framework for categorizing concepts defined in the literature on interorganizational collaboration, including communication, cooperation, coordination, harmonization, and integration. (Abstract shortened by UMI.)

Indexing (details)

Subject
- Public administration

Classification
- 0617: Public administration

Identifier / keyword
- Social sciences, Collaboration, Ocean policy, Interagency coordination groups, Federal policy

Title
- Collaboration toward a more integrated national ocean policy: Assessment of several United States federal interagency coordination groups

Author
- Kuska, Gerhard F

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Analyzing the frequency and severity of recreational boating accidents in Atlantic coast inlets of the United States from New York to Florida


Abstract (summary)

For the 47 Atlantic Ocean inlets from New York to Florida examined in this study, the U.S. Coast Guard Office of Boating Safety recorded 493 recreational boating accidents from 1995 to 2001. These accidents involved 617 vessels and resulted in 19 deaths, 188 severe injuries, and more than $2,334,000 in property damage.

The goals of this study are twofold. First, in an exploratory sense, this study seeks to determine the factors—whether human error, environmental conditions, or vessel-related problems—primarily responsible for these accidents and their severe outcomes. Second, in an investigative sense, this study seeks to determine if the presence of jetties at an inlet is a significant predictor of either boating accident frequency or severity. Much debate, indeed, has arisen over jetty construction in the United States, with the traditional argument citing the need for jetties from a navigational safety standpoint and a newer argument contending that jetties could, in fact, lead to increased boating accidents as well as increased severity of those accidents. (Abstract shortened by UMI.)

Indexing (details)

Subject
Statistics;
Ocean engineering

Classification
0463: Statistics
0547: Ocean engineering

Identifier / keyword
Applied sciences, Pure sciences

Title
Analyzing the frequency and severity of recreational boating accidents in Atlantic coast inlets of the United States from New York to Florida

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Blaydes, Meredith Leigh

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A study of geographical characterization of ship traffic and emissions and cost-effectiveness of reducing sulfur emissions from foreign waterborne commerce for the United States west coast


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Abstract (summary)

This dissertation enhances existing methods and develops the Waterway Network Ship Traffic and Air Emissions Model (WWN-STAEM) to improve the accuracy of spatially resolved emissions inventories. Global empirical ship traffic networks were built based on historical ship locations. Sulfur emissions from ship movements in the U.S. Foreign Commerce Entrances and Clearances data set were estimated and assigned spatially based on the statistically most probable routes solved with ArcGIS Network Analyst. Ships carrying U.S. foreign commerce burned about 38 million tons of heavy fuel oil, emitted about 2 million tons of SO2 in 2002, about 14% of SO2 emissions from all sources in the U.S. in the same year. About 88,000 tons of SO2 were discharged in the area approximating the U.S. West Coast Exclusive Economic Zone (EEZ).

Cost-effectiveness of technology-based regulation, performance-based regulation, and market-based approach for controlling SO2 emissions were evaluated. The SOx Emissions Control Area Marine Emissions Optimization Model (SECA-MEOM) was developed to simulate the optimal SO2 emissions reduction from ships in SOx Emissions Control Areas (SECA). The General Algebraic Modeling System (GAMS) was used to implement the optimization model.

Results show that the price premium of low sulfur fuel can drive the fleetwide average costs of SO2 reduction. For some individual ships, the capital costs are more critical. The performance-based regulation can reduce more SO2 with overall cost-savings up to $247 million in a year for the SECA fleet than the technology-based regulation. A market-based policy can achieve the overall SO2 reduction goal for SECA with one out of 10 SECA ships scrubbing exhaust gas. Compared with the performance-based regulation, a market-based control policy could save up to $154 million or save about 59% of the total costs to reduce 38,700 tons of SO2 emissions in the U.S. West Coast EEZ SECA in a year. With more SO2 emissions reductions in the U.S. West Coast SECA and more reductions closer to the land, the market-based instruments can likely yield more benefits with lower overall costs than the command-and-control regulations and may be favored by both environmental interests and the shipping industry.

Indexing (details)

Subject
Ocean engineering;
Transportation;
Geography;
Environmental engineering

Classification
0547: Ocean engineering
0709: Transportation
0366: Geography
0775: Environmental engineering

Identifier / keyword
Social sciences, Applied sciences, Ship traffic, Emissions, Cost-effectiveness, Sulfur, Foreign waterborne commerce, West Coast

Title
A study of geographical characterization of ship traffic and emissions and cost-effectiveness of reducing sulfur emissions from foreign waterborne commerce for the United States west coast

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Wang, Chengfeng

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Corbett, James J

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Abstract (summary)

Off the eastern coast of the United States lies a unique and untapped natural resource that has only recently been recognized: offshore wind energy. Hailed by many as a clean, virtually limitless source of renewable energy, offshore wind energy has great potential for reducing air pollution, lessening the United States' dependence on foreign oil supply, and mitigating the impacts of global climate change. The promises of offshore wind energy, however, are not without pitfalls. Potential adverse impacts on local and migrating wildlife species are frequently cited as an important issue of concern when considering the development and siting of an offshore wind facility. These concerns are not without merit: impacts to wildlife species may occur during all phases of offshore wind development, and include habitat alteration, habitat displacement, increased levels of underwater noise and vibration, and in some cases, mortality.

This research concludes that from a quantitative perspective, Brayton Point has a larger impact on wildlife species than Cape Wind. The former includes hundreds of birds killed by oil spills, thousands of acres of land disturbed, and billions of fish, fish larvae, and fish eggs killed annually by entrainment, impingement, and thermal discharge. The effects of acid precipitation and heavy metal contamination are also known to have long-lasting impacts on wildlife species, including habitat exclusion, physical impairment, and reduced breeding potential. While offshore wind facilities are not without their own set of adverse impacts on wildlife species, these impacts must not be viewed in isolation. It is only when the wildlife impacts of offshore wind development are compared relative to those from fossil fuel power production can they be truly understood. (Abstract shortened by UMI.)
Energy consumption behavior in the commercial sector: An ethnographic analysis of utility bill information and customer comprehension in the workplace


Abstract (summary)

The commercial and industrial sectors of the United States compose roughly one-third of total United States energy consumption. Many studies have suggested that significant cost-effective energy savings opportunities exist in this sector, but there is a gap between predictions of potential and actual investment in energy-efficient technologies. Very few studies have been conducted to examine the decision-making environment of the business sector. In particular, there is essentially no information about how small-business decision-makers make choices about energy consumption. My research is intended to begin the process of understanding this important arena of energy consumption behavior.

Using semi-structured interview techniques, I interviewed forty-four businesses in ten states. The focus of the interviews was the business decision-maker's handling and use of the utility bill---the main (often sole) piece of information that links energy consumption to cost. Through the interviews, I collected information about how utility bills are understood and misunderstood, what components of the bill are seen as useful or confusing, and how energy consumption was seen in the context of larger business decision-making.

In addition, I collected data on two forms of energy consumption feedback: historic consumption feedback, in which informants compared their current energy use to patterns of their own energy consumption over time; and group comparison consumption feedback, in which informants compared their energy consumption to the consumption of a group of similar energy consumers. Finally, I collected data on sources of information to which decision-makers turned when they wanted to seek more information about energy consumption alternatives.

Overall, my findings suggest that the current utility bill format is often misunderstood. In many cases, particularly in the small-business and medium-size-business categories, the link between energy consumption and energy cost is broken. The result is a sense of disempowerment for many consumers. Rather than seeing their energy consumption as something under their control, they instead view the energy bill as an unavoidable component of operating a business, comparing it to other required expenses like rent or taxes.

Reaction to changes in the utility bill to provide consumption feedback were mixed. Improvements to self-comparison information provided on the bill were generally viewed positively. On the other hand, energy consumption comparisons with similar groups of customers were viewed with a great deal of skepticism. The idea of group comparison was generally discarded as impractical or invalid.

This research improves academic understanding of the energy consumption decision-making environment in the business sector. By developing a better understanding of the context in which these energy consumption decisions are made, the research suggests opportunities for improvements to the mechanisms by which business decision-makers gain information about energy consumption alternatives and energy efficiency opportunities. Improvements to the information provided on the utility bill could enhance the linkage between energy consumption and energy cost for commercial-sector decision-makers, particularly in the small business sector. This could, in turn, lead to greater attention to economic opportunities for energy consumption reduction. Ultimately, improved utility bill information could result in energy and cost savings to business consumers.
Using indicators for improving the performance of integrated coastal management efforts: Towards a common framework

Abstract (summary)
Regarding the more than 700 efforts and significant investments in integrated coastal management (ICM) initiated in over 140 countries since the 1960s, typically only limited anecdotal information exists on their environmental, socioeconomic, and institutional impacts. To date, only a few examples exist of development and application of indicators to support ICM, and to facilitate accountability and adaptive management. To fill this gap, this dissertation analyzes the use of indicators for ICM assessment in two cases: The United States and the European Union. In the United States, indicators have been developed at the request of Congress to improve the accountability of the Coastal Zone Management Program, while in the EU indicators have been developed as information tools to assist with the implementation of a Council and Parliament recommendation on ICM.

The dissertation reviews environmental, socioeconomic, and governance performance indicators used for ICM. Notwithstanding socioeconomic and political differences, analysis of the two case studies reveals a number of commonalities in the approach taken and the indicators utilized. A framework tailored to the different stages and elements of the ICM policy cycle helps track the progress and institutionalization of ICM at different spatial scales. A set of indicators for the state of the coast, driving forces, and pressures helps to place ICM efforts in context, while more specific indicators on outcomes and impacts can guide the measurement of ICM results. Crucial in the determination of results is the availability of baseline information and time series on the state of the coast and the assessment of the contribution of ICM initiatives to change human behaviors and their impact on coastal conditions. In terms of further research, this dissertation underscores the need to articulate ICM goals and objectives to monitor and evaluate progress and performance, review program logic and assumptions, and adapt to changing conditions and progressive achievements. Despite preliminary experimentation, further efforts are required to refine the use of indicators to help isolate the effects of human activities on coastal ecosystems, balancing development and economic priorities with long-term environmental sustainability.

Indexing (details)
Subject
Public administration;
Urban planning;
Area planning & development;
Environmental science

Classification
0617: Public administration
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Identifier / keyword
Health and environmental sciences, Social sciences, Integrated coastal management,
Coastal management, Environmental indicators, Socioeconomic indicators,
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Valuing recreational benefits in coral reef marine protected areas: An application to the Bonaire National Marine Park


Abstract (summary)

Coral reefs, among the most spectacular of all the world’s ecosystems, are increasingly threatened by human activity. Many have advocated marine protected areas (MPAs), a spatially explicit form of resource management, as a mechanism to preserve threatened coral reefs. However, despite their potential benefits, the majority of MPAs have failed to meet their conservation objectives. A lack of knowledge concerning the economic benefits provided by MPAs coupled with the generally insufficient levels of funding for preservation initiatives combine to inhibit the effectiveness of their management. This study seeks to partially remedy this information deficiency by estimating the recreational benefits enjoyed by scuba divers in the Bonaire National Marine Park (BNMP). Such estimates would represent a vital component of benefit-cost analyses of MPAs, could assist resource managers in setting appropriate access fees, and provide a starting point for natural resource damage assessments following coral reef degradation. Data was collected via a stated preference survey of 211 recreational scuba divers that visited the island of Bonaire in the southern Caribbean in 2001. The core of this survey was a series of contingent valuation and conjoint analysis questions examining divers’ willingness to pay for access to the BNMP. A random utility model framework was used to analyze the data. The models were estimated using traditional multinomial and mixed logit techniques. Median annual access values ranged from $61 to $134 depending on question format. In addition, the conjoint analysis questions provided data to model divers’ reactions to hypothetical declines in environmental quality in the BNMP. A mixed logit model was used to estimate the welfare losses associated with these declines. The model indicates that the BNMP provides significant recreational benefits, even when incorporating the most conservative assumptions about environmental decline in the absence of the marine park. Depending on the magnitude of hypothetical environmental decline, the median individual would lose between $55 and $129 in annual recreational benefits. These per-person losses correspond to aggregate annual losses of between $1.5 and $3.4 million.

Indexing (details)

Subject
- Economics;
- National parks;
- Coral reefs;
- Wildlife conservation;
- Recreation;
- Studies

Classification
- 0501: Economics

Identifier / keyword
- Social sciences, Recreational benefits, Coral reef, Marine protected areas,
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Title
- Valuing recreational benefits in coral reef marine protected areas: An application to the Bonaire National Marine Park

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The role of regional economic agreements in marine resource conservation

Abstract (summary)
This dissertation analyzes the potential of regional economic agreements (REAs) to develop and promote programs and institutions that help protect marine resources. The analysis takes into account the global context of trade liberalization and increased attention to trade-environment issues, and it focuses on Latin America. The marine conservation aspect of trade has been identified as an emerging issue, and this dissertation is intended to provide an initial approach to the topic, thus laying groundwork for further research.

First, the research determined that, out of the major REAs operating in Latin America, the Asia-Pacific Economic Cooperation (APEC) and the North American Free Trade Agreement (NAFTA) have the greatest potential to advance marine resource conservation. Then, APEC and NAFTA were used as case studies, and data were collected from two principal sources: a literature review from official and specialized publications, and in-person, unstructured interviews with high-level officials from Chile and Mexico who are involved with APEC and/or NAFTA marine work. Participant observations from relevant APEC and NAFTA meetings complemented these data.

The findings and analysis cover the integration of economic and environmental issues within REAs; relationships between REAs and multilateral environmental agreements (MEAs); and the steps that countries and REAs can take to make their marine conservation work effective. Based on the case studies, this dissertation concludes that REAs can be effective instruments for advancing marine resource conservation. Six main characteristics are likely to allow REAs to succeed in this area, and they include: structures that ensure the involvement of high-level decision makers; procedures for developing, supporting, and evaluating marine programs; and environmental dispute-resolution or enforcement mechanisms that accommodate the differing capabilities of developed and developing countries. REAs should also determine how to take regional action that effectively complements global environmental governance such as MEAs, while individual member countries should be sure to devote the necessary resources to their participation in REA marine conservation work.

Many pressing marine environmental issues are exacerbated by, and in turn affect, international trade. The current explosion of REAs makes this an ideal time to shape new and existing REAs into tools for marine resource conservation.

Indexing (details)
Subject
Environmental science;
International law;
International relations

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Cid, Gonzalo A

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Document type
Dissertation/Thesis
Game-theoretic approaches to the joint management of chub mackerel in northeast Asian seas

Abstract (summary)
This purpose of this dissertation is to study the prospects of cooperative management of chub mackerel by China, Japan and Korea in northeast Asian seas. The dissertation involves three parts. First, there is the construction and calibration of an age-structured bioeconomic model that monitors the biological and economic effects of various fishing patterns. Second, the model is used to predict the outcomes of different coalitions and patterns of fishing. Third, using game theory analysis the results are used to examine the possibility of cooperative management of chub mackerel.

Two cooperative games are defined. Two joint management goals are set in the games. One is to achieve profit maximization. The other is to achieve maximum sustainable harvest. The impacts of the discount rates on the game and the implications of the stochastic nature of the stock biomass for the game are considered as well.

In the deterministic model, the results show, as expected, that significant gains can be attained from cooperation. The different sharing rules for the distribution of gains provide different returns to each player. The solutions meet the core, have various ranges of propensity to disrupt and provide for a rather stable agreement. However, a simple look at cheating benefits, given no detection of cheating, indicates no or weak stability of cooperative management. This points out the underlying weakness of joint management. Therefore, it is essential to establish an enforcement mechanism to ensure compliance. Among the solutions, it is hard to distinguish which solution likely works the best. The impact of the discount rate is not significant on the sharing solutions. However, a higher discount rate, as expected, is more likely to induce cheating behavior.

In the stochastic model, a Monte Carlo simulation is conducted, and for each coalition, 100 estimates of the simulation outcomes are obtained. The results show that the chances that there will be net gains from cooperation are very high. Using the average to analyze the game, the findings are similar to the deterministic model. Thus, the impact of uncertainty in stock estimates is not significant on average.

Indexing (details)
Subject
- Agricultural economics;
- Aquaculture;
- Fish production;
- Studies;
- Game theory

Classification
- 0503: Agricultural economics
- 0792: Aquaculture
- 0792: Fish production

Identifier / keyword
- Social sciences, Biological sciences, Joint management, Chub mackerel, Asian seas, Game theory, Shared fisheries

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Game-theoretic approaches to the joint management of chub mackerel in northeast Asian seas

Author
Chen, Chung-ling

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Document type
Dissertation/Thesis
A random utility model for measuring the recreation economic benefits of water quality improvements in New England


Abstract (summary)

In this dissertation the per trip and seasonal water based recreation benefits of the Clean Water Act (CWA) are computed utilizing the two stage budgeting approach described in Hausman et al. (1995). These benefits are computed for a set of alternative water pollution scenarios and four recreation types: viewing, boating, fishing, and swimming. A random utility logit model is used in the site choice component of the analysis. In this RUM model a random draw technique proposed by McFadden (1978), and Parsons and Kealy (1992) is used to narrow an individual's choice set. The study also estimates the participation decision with a Poisson count data model. These two stages are estimated separately, but linked through a computed inclusive term.

The data utilized in this analysis comes from the National Water Based Recreation Survey, which was collected in 1994. In addition to this survey instrument, information from the U.S. Census Bureau and the U.S. EPA's Reach File 1 are integral to this study. The Clean Water Act Effects Model developed by researchers at the Research Triangle Institute is also used in the simulations needed in the determination of per trip and seasonal recreational welfare benefits attributable to the Clean Water Act.

Indexing (details)

Subject
- Economics;
- Water quality;
- Recreation;
- Studies

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Identifier / keyword

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- Helm, Erik Christian

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Abstract (summary)
Since the red grouper stock was initially declared to be overfished by the NMFS in October 2000, the Gulf of Mexico Fishery Management Council must prepare a red grouper rebuilding plan considering the following alternative management measures: TAC, 5-month season closure, 1800-pound trip limit, and 50-fathom line. The purpose of this study is to evaluate the combined biological and economic effects of management policies considered by the Council for rebuilding the red grouper stock in a 10-year rebuilding period by developing a bioeconomic model using 1999 and 2002 Red Grouper Stock Assessment (1999 LEM model and 2002 LEM model). The second purpose is to consider the impacts of the red grouper regulations on the yellowedge grouper by developing a joint red grouper and yellowedge grouper bioeconomic model.

In the single red grouper models, because of the different results of the 1999 red grouper stock assessment and the 2002 stock assessment, models showed somewhat different results. The target red grouper spawning stock goal was not achieved during the rebuilding period in all policies, with the sole exception of the TAC policy in the 1999 LEM model. However, the target SS goal was attained under all management policies in the 2002 LEM model. In both models, the NPV was the largest in the 5-month season closure policy if the output price did not fall. There were distributional effects on the different components of the fleet in the 1800-pound trip limit policy and the 50-fathom policy.

In a multispecies model, the effects of management measures were somewhat different from those analyzed by a single red grouper model. It was found that the 1800-pound trip limit policy was more effective, while the 5-month season closure was less effective. Without a TAC on the yellowedge grouper fishery, red grouper regulations adversely affected the yellowedge grouper stock.

Indexing (details)
Subject
Agricultural economics;
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Management;
Studies
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0792: Aquaculture
0792: Fish production
Identifier / keyword
Social sciences, Biological sciences, Fisheries, Bioeconomics, Alternative management,
Policies, Gulf of Mexico, Reef fish fishery
Title
Bioeconomic analysis of alternative management policies for the United States Gulf of Mexico reef fish fishery
Author
Kim, Dohoon
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This study measures the potential biological and economic benefits of using MPAs in the red grouper fishery in Yucatan, Mexico. In addition, MPAs are compared to other regulations including partial area closures, seasonal closures, quotas and minimum sizes. The analysis is completed using an age-structured spatial simulation model, which separates the population into four different areas, selected on the basis of distribution and migration patterns. Previous studies have documented an aggregation of the species in west deep waters during January and February, and a homogeneous distribution from March to December. The model simulates this spatial pattern using one month as a time unit. The results show that MPAs have the potential to increase both the spawning biomass and NPV depending on the location and the timing of the area closures. Permanent MPAs in shallow waters were shown to increase spawning stock biomass; however, they had significant distribution effects. These distribution effects can be addressed by switching to a seasonal MPA; however the biological effectiveness is reduced. Permanent MPAs in deep waters were also shown to increase spawning stock biomass; however, they had significant distribution effects. In this case the distribution effects cannot be addressed by switching to a seasonal MPA; hence biological effectiveness is reduced. The results also showed that depending on the length, seasonal closures could produce higher increases in spawning stock and NPV than MPAs. Quotas could produce higher spawning stocks but always resulted in a small decrease in NPV.

Abstract (summary)
International aid: Assessment of coastal and marine management initiatives in the Latin American and Caribbean region


Abstract (summary)

While funding of coastal management projects by international aid organizations has increased dramatically since the 1992 United Nations Conference on Environment and Development in various regions of the world, there have been few efforts to ascertain trends and patterns of foreign assistance at the regional level. This dissertation seeks to redress this gap in the context of foreign assistance for coastal management in the Latin American and Caribbean region. In this area, international organization assistance for coastal management has been especially important in getting coastal management started and implemented in various countries.

Results of this research show that there are at least thirty-six international organizations that are actually funding or conveying funds for coastal management projects in the study region. Six of the 36 are considered by this study as the major donors for the region: Global Environment Facility, Inter-American Development Bank, United Nations Environment Programme, Organization of American States, United Nations Educational, Scientific and Cultural Organization, and the World Bank. There are four major categories of the most critical coastal issues facing the region: social issues, institutional issues, conflicts among coastal activities, and environmental issues. Of these, donor funding focuses primarily on the last category—environmental issues. All of these issues, together with culture, historical background, and social, political and economic instability, affect the underlying processes that ultimately are shaping the allocation of foreign aid. These underlying processes are contributing to make Latin America and the Caribbean highly aid-dependent. One funding pattern shows that the international donors are investing in projects addressing global issues—such as adaptation to climate change—or in regional-level issues involving transboundary environmental impacts. Another pattern is the growing collaboration among international organizations in funding projects. Trend data show a constant increase in the funding of coastal projects through time, reflecting the increased interest of governments to address coastal issues.
Abstract (summary)

This dissertation involves the pursuit of a primary goal: to draw lessons from the formulation and implementation of coastal resource management programs in the Philippines that would be useful in informing a sustained implementation of these programs and in formulating and implementing other coastal resource management programs in the Philippines and elsewhere. An attempt was made to extensively study a community-based resource management project to determine whether it is prepared to achieve its objectives. The findings of the study indicate that the lack of an effective strategy in achieving intermediate objectives such as capability-building of local government units and communities has jeopardized the accomplishment of the project's primary goal of environmental rehabilitation and poverty alleviation. Despite such a major constraint, a common recognition of a crisis in environmental degradation and natural resources depletion has motivated a dedicated effort to achieve the project objectives by management staff and local government clients. Formal and informal adaptive strategies at various levels in the implementing structure were adopted to address constraints and problems of implementation, albeit suboptimally due to delays in the implementation of a monitoring and evaluation system developed for the project. However, there is an apparent neglect of lessons learned from past coastal resources management projects, including: (1) there is no phasing of activities that could have allowed ample room for preparation, learning and adjustments; and (2) subprojects are not given sufficient time to demonstrate measurable impacts of project implementation.
The Straits question revisited: Legal and policy dimensions of the current dispute over the Straits of Istanbul, Chanakkale, and the Sea of Marmara


Abstract (summary)

The purpose of this dissertation work is to examine the changes in the navigation regime of the Straits of Istanbul, Chanakkale, and the Sea of Marmara (commonly known as the Bosphorus and the Dardanelles) initiated in the last decade of the 20th century and the dispute brought about by these changes. Focused exclusively on the technical aspects of the navigation in the Straits, the dispute-resolution efforts of the International Maritime Organization (IMO) have succeeded in avoiding open conflict and buying time, but have failed to achieve a lasting resolution. Driven by the belief that an adequate understanding of all facets of the dispute is paramount for its neutralization, this work has attempted to unravel the intricate web of technical, legal, economic, and security factors woven in the most recent dispute over the Straits.

To this end, the Straits' navigation and geopolitical situation are laid out, followed by a review and analysis of the elements of the existing international legal regime that governs them. Particular attention is given to the implications of UNCLOS and its treatment of straits used for international navigation governed by long-standing international conventions. A detailed synopsis of the dispute and the IMO role in it is offered and the Turkish and the IMO regulations are reviewed for their consistency with existing international law. Elaborating on the modalities and ramifications of the Turkish and the IMO regulatory efforts, this work has identified the restoration of the integrity of the 1936 Montreux Convention as key to successfully bridging the safety, environmental, economic, and geopolitical interests of all involved parties. A procedural framework is suggested to allow for the Convention's security provisions to be aligned with contemporary environmental and navigation safety law without being unduly compromised.

Subject
International law;
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Transportation;
Political science

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Identifier / keyword
Social sciences, Straits, Istanbul, Chanakkale, Sea of Marmara, International Maritime Organization, Navigation, Turkey

Title
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Dyoulgerov, Milen Filipov

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Abstract (summary)

Fishery management theory has been evolving since the United Nations Conference on the Law of the Sea (1973-82) and Rio Conference on Environment and Development (1992) which recognized the need for better management of living sea resources. The major achievements in this field are the adoption of the Responsible Fisheries Convention (1993) and the Straddling and High Sea Stocks Convention (1995). These conventions recognize the need for a precautionary approach to fisheries management to achieve sustainable harvest levels.

This dissertation has two objectives. One is to build a more comprehensive model of a fishery by including the processing sector. With the inclusion of this, a better understanding of the economic sector of the fishery is achieved. The interaction between the harvesters and processors within the model and the regulation of the price for raw fish are demonstrated. For this purpose, a mathematical and computer deterministic model is developed. Once this is created the second objective is developed: adding risk and uncertainty. This stochastic model with risk represents a practical approach that incorporates the concepts of limited and target reference points (LPR and TRP). When stochasticity and risk are added to the fishery model, traditional management, implemented in the model as a constant total allowable catch (TAC) equal to the fishery maximum sustained yield, is ineffective preventing the fishery collapse.

Therefore, to support the precautionary approach concept and to perform experiments with the fishery model, two different TAC devices are implemented. The two TACs are a function of stock size and growth, following Hommans and Wilen (1997). One of the functions is calculated based upon the expected growth parameters (basic case or BC), and is different every season (depending upon the stock size). The other TAC function assumes that resource managers have additional information allowing them to predict in advance the level of growth (considering three different states of nature associated with three growth levels). Thus, this additional information allows calculating a TAC for every season for an expected growth level (low growth, medium growth, or high growth) to create an improved information management (IIM). The results are analyzed regarding the risk of fishery collapse with each of the management options.

The IIM results are a better management option in the presence of uncertainty in the biological and economic sub-models. Nevertheless, in the model, the risk is not completely eliminated. To add more precaution, the TAC was recalculated by aiming for different stock sizes. With this dynamic TAC, the risk can be eliminated from the fishery. The results of the fishery model are discussed.

Indexing (details)

Subject
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- Fish production
- Agricultural economics
- Business community
- Biostatistics
- Economic models
- Studies
- Simulation

Classification
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- 0792: Fish production
- 0503: Agricultural economics
- 0310: Business community
- 0308: Biostatistics

Identifier / keyword
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- Biological sciences
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- Total allowable catch
- Information management
- Risk
- Uncertainty
- Sustainable fisheries

Title
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An efficient response to beach erosion: A cost effectiveness analysis employing hedonic pricing techniques


Abstract (summary)

I estimate the 50-year social cost of allowing Delaware's Atlantic coast to migrate inland. These "retreat costs" are divided into three categories: capital loss, land loss, and transition loss. Capital loss measures the welfare reduction associated with condemning a structure before the end of its useful life. Land loss measures the value of acreage lost to the sea. Transition loss measures the costs likely to be incurred when coastal structures are removed. The counterfactual for all estimates is an otherwise similar coast that experiences no net erosion or accretion.

I compare the social cost of strategic retreat to the social cost of maintaining Delaware's current coastal profile and position. These "stabilization costs" are divided into two categories: project loss and environmental impact. Project loss quantifies the value of the land, labor, and capital required to maintain the coast's current width and position. Environmental impact quantifies the value of ecosystem alterations attributable to stabilization efforts.

The social cost strategic retreat is estimated to be between $242 and $485 million over the next fifty years. Over the same time, the social cost of coastal stabilization is estimated to be between $48 and $139 million. Estimates are extremely sensitive to assumed erosion rate. When similar erosion rates are used to compare coastal stabilization and beach migration, coastal stabilization is consistently identified as Delaware's socially efficient erosion response.

Indexing (details)

Subject
- Economics;
- Oceanography;
- Environmental engineering;
- Shorelines;
- Studies;
- Cost analysis

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Identifier / keyword
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An efficient response to beach erosion: A cost effectiveness analysis employing hedonic pricing techniques

Author
Wakefield, Jeffrey Robert

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Abstract (summary)

This dissertation investigates how citizens and government understand and react to a novel environmental threat—*Pfiesteria piscicida*. It explores how government and members of the public react to the organism, how the residents of the Delaware’s Inland Bays’ watershed understand the threat and the institutions that address it, and what relationships exist between their cultural models, economic interests, values and policy preferences. The initial goal of the dissertation was to investigate whether cultural models of *Pfiesteria*, science and government affect policy preferences. During this research an even more interesting observation emerged—collaborative processes can lead to the formation of more harmonious cultural models of issues and institutions and thus, shared policy preferences.

The data collected and analyzed include forty semi-structured interviews with members of the public as well as various groups involved with *Pfiesteria*: federal, state and county government officials, environmentalists, farmers, golf course superintendents, and recreational fishers. The interview data was supplemented with two years of participant observation of a collaborative process designing nutrient load reduction strategies for achieving Total Maximum Daily Loads in the Inland Bays of Delaware.

From this data, the cultural models of *Pfiesteria piscicida*, science and government were gleaned. Utilizing the data, this dissertation also provides an analysis of the collaborative effort used to create a nutrient reduction strategies. These results lead to recommendations for policy in three areas. First, through examining how people attempt to influence policy and how people understand government and science, recommendations for future public participation efforts are made, emphasizing collaborative processes. Second, recommendations to improve communication between experts and the lay public are presented. Third, based on the analysis of cultural models of *Pfiesteria*, recommendations are made for environmental managers designing responses to novel environmental threats.

Indexing (details)

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<td>Identifier / keyword</td>
<td>Social sciences, Cultural models, Public participation, Nonpoint source pollution, Delaware, Inland Bays, Pfiesteria piscicida, Environmental policy</td>
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<td>Title</td>
<td>Cultural models, public participation, and policy: <em>Pfiesteria piscicida</em> and nonpoint source pollution in Delaware's Inland Bays</td>
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<td>Author</td>
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<td>Document type</td>
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Abstract (summary)

This dissertation evaluates the implementation of coastal management functions by the Department of Conservation in New Zealand under the Resource Management Act 1991. The Minister and Department of Conservation are required by the Resource Management Act to prepare a New Zealand Coastal Policy Statement, monitor the effectiveness of the New Zealand Coastal Policy Statement, approve regional coastal plans and restricted coastal activities, to allocate coastal space through a coastal tendering process, and decide on appropriate compensation for vesting of reclamations that remove land from the coastal marine area.

The influence of four institutional factors (intergovernmental relations, intra-departmental relations, resource allocation, and legislative conflicts) on implementation of each function was assessed to identify whether, and to what degree, institutional factors affect implementation. Following the implementation analysis, the study addressed the overall influence of the institutional factors, and recommended changes to allow more effective implementation of coastal management functions to occur.

Overall, implementation is poor, with New Zealand Coastal Policy Statement implementation and effectiveness-monitoring, and coastal tendering having very little implementation at all. Resource allocation and intra-departmental issues particularly affect these functions. Regional coastal plan interaction with regional councils is spatially and temporally variable, with intergovernmental relations and resource allocation key to the quality and extent of implementation. Restricted coastal activity approval has been implemented largely in congruence with intent, due to the greater degree of central control in this function through a series of Head Office prepared guidelines to ensure consistency in approach. Vesting of reclamations is implemented in general congruence with intent.

A combination of intra-departmental and resource allocation issues are the key barriers to implementation, with a lack of management interest in the coastal management functions manifested in poor resource allocation. Intergovernmental relations are less important overall, although they have been important for some functions. The dual legislative mandate of the Department of Conservation has not been a significant barrier to implementation. Remedies to improve implementation include greater emphasis on staff training, increasing staffing at the regional and conservancy levels, creating more specific implementation frameworks for each function, and greater collaboration with other entities.
Toward the practicable control of marine fisheries bycatch: A public policy analysis

Abstract (summary)
In October 1996, amendments to the federal fisheries management statute, the Magnuson-Stevens Act, established a new national standard relating to marine fisheries bycatch. Fisheries management plans now must be made consistent with this new standard. Specifically, the standard requires that "conservation and management measures shall, to the extent practicable (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch." In this study, we explore the meaning of the practicable minimization of bycatch in marine fisheries.

Adopting a positive analytical perspective, we identify several "features of interest" that participants in decision-making are likely to regard as important. We develop three generic economic models of fisheries bycatch, and we compare the effects on the features of interest of the implementation of a range of management measures to achieve either a fixed bycatch reduction goal or a fixed target "optimal yield" over varying time horizons. Importantly, we assume that practicability relates fundamentally to the choice of management measure, not to the choice of an overall bycatch reduction goal.

The results of the modeling efforts are used to answer a set of policy questions relating to the features of interest as well as to the practicability of implementing bycatch reduction devices, the effect of the state of the fishery (e.g., underexploited versus overexploited), and the effects on one fishery of regulation in another.

Government guidelines for the interpretation of the national standard relating to bycatch are unnecessarily ambiguous. We attempt to develop a general classification of the kinds of factors that should be considered by fishery management Councils as they move forward to evaluate alternative bycatch control measures. Further, we show how the outputs of the models developed in this study may be useful in providing qualitative and quantitative information about these factors. The Councils have come under sharp criticism recently from environmental interests because of purported insufficient attention to the implementation of bycatch reduction measures. We conclude that, unless the national standard guidelines are made less ambiguous, the practicable minimization of marine fisheries bycatch may be unachievable.
Cooperation in marine affairs: Evidence from the Gulf of Thailand

Abstract (summary)
This study argues that the evolving process of interstate cooperation based upon power interests could operate regardless of the formal or expressed will of governments to make binding agreements. The study developed a comprehensive model for interstate cooperation in which state interests were part of conditions for the mutual problem-solving process. The model was then tested against three marine issues in the Gulf of Thailand: offshore hydrocarbon development associated with maritime boundary delimitation, marine fisheries, and marine pollution. Literature review, newspapers and periodicals, on-line databases, and unstructured interviews were primary sources of data.

The analysis found that consultation accounted for cooperative interaction among the realist Gulf of Thailand states. Evidence from three tested marine issues suggested that frequent contact and subsequent effects of a greater exchange of knowledge and information can at least stabilize relationships between the states. Informality and non-binding nature of the interactive process offered the states the needed flexibility in designing and implementing effective marine management in the Gulf of Thailand. The study discussed a modified realist framework and some implications for a future study of informal regimes and compliance with interstate agreements.

Indexing (details)
Subject
International law;
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0791: Energy
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Abstract (summary)

The United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks was negotiated in six sessions over three years. Its outcome, the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (the Straddling Stocks Agreement) marks a watershed in the management of fisheries on the high seas. While it builds on the jurisdictional framework of the United Nations Convention of the Law of the Sea (UNCLOS), the Straddling Stocks Agreement sets up new rights and obligations for both coastal states and distant water fishing nations, embodies new norms and rules of procedure, and thus constitutes a new regime. The Straddling Stocks Agreement is truly the result of negotiations and bargaining among the negotiating states, and its content reflects the balance that was struck between the divergent interests of coastal states, distant water fishing nations, and a handful of states with special interests. In contrast, the interests of the developing countries appear to have been sacrificed, and the special needs of these countries are recognized on paper, but are likely to be ignored at the implementation stage. A comparison of the negotiations of this Conference and the traditional models of regime building in international relations theory shows that the straddling stocks regime did not follow one of the three traditional modes of formation (imposition, spontaneity/maturation and negotiation), but rather resulted from a combination of these three approaches. The analysis further shows that these three modes of formation should not be regarded as mutually exclusive since, in the creation of this regime, they combined and built on one another. The lessons one may draw from such mode of formation, however, are limited, as the eventual success of the Conference and the value of the Straddling Stocks Agreement cannot be ascertained until the negotiating states reveal their true political intentions at the implementation stage.
An analysis of the use of marine protected areas to preserve and enhance marine biological diversity: A case study approach

Abstract (summary)

The establishment of marine protected areas (MPAs) to protect marine biological diversity is a global phenomenon. MPA management often targets the preservation of endangered and native species, and the maintenance of important habitats and communities. However, many question the value of marine protected areas for biodiversity conservation. Prevailing oceanographic conditions, inadequate governance, ineffective or nonexistent management, and poor national infrastructures can all inhibit an MPA’s ability to protect living marine resources.

A survey of different MPA case studies, and key elements of their implementation and management is presented. A comparative analysis of these elements is then correlated with the effectiveness of specific MPAs to preserve marine biodiversity to yield results aimed at proving that there exist a finite number of crucial political, social and economic MPA characteristics that are essential to this protection regardless of locale.
"Oil and fish" conflict: Implications for ocean management

Abstract (summary)
Ocean management seeks to increase net benefits from overall resource allocations for the various marine uses, e.g., in offshore petroleum, fisheries, shipping and waste disposal, through fostering policy integration on the ocean dimension. This concept, however, has been challenged for cutting off links of these uses along their respective functional or sectoral lines. While the sectoral approach still dominates the marine management, the degree of the need for policy integration on the ocean dimension, its scope and form, becomes a fundamental marine policy issue.

The present dissertation explores this issue though assessing the level of the conflict between marine fisheries and offshore oil development and its implication for ocean management within the United States context. The conflicts assessed are related to offshore installations, debris, collision and geophysical survey, as well as operational discharges, oil spill and onshore impacts, (on coastal habitats and competition for space, services and labor). Criteria for the assessment include probability and intensity of biogeochemical interactions, the associated socioeconomic impacts, the related concerns, and the tractability of the consequences. Some interconnections of the existing management systems which have important bearings on the resolution of the conflict, are characterized and evaluated as to their adequacies.

In the United States, "oil and fish" conflict largely concerns the impacts of Outer Continental Shelf (OCS) activities on the coastal fisheries. The study found that the conflict is either regionally significant or locally serious; and that costs of the conflict, including the costs of conflict resolution (management) efforts themselves, have not been fully incorporated in the existing decision-making premises in managing the uses concerned. These conclusions do not support the overhauling of the existing management systems on the federal level, but demonstrate a need for establishing an inter-disciplinary and inter-sectoral mechanism to monitor and evaluate the level of multiple use consequences, and for further marine policy integration on the regional basis, particularly through improving federal-state partnership.
Pricing offshore wind power

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Abstract

Offshore wind offers a very large clean power resource, but electricity from the first US offshore wind contracts is costlier than current regional wholesale electricity prices. To better understand the factors that drive these costs, we develop a pro-forma cash flow model to calculate two results: the levelized cost of energy, and the breakeven price required for financial viability. We then determine input values based on our analysis of capital markets and of 35 operating and planned projects in Europe, China, and the United States. The model is run for a range of inputs appropriate to US policies, electricity markets, and capital markets to assess how changes in policy incentives, project inputs, and financial structure affect the breakeven price of offshore wind power. The model and documentation are made publicly available. © 2011 Elsevier Ltd.

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Breakeven price; Levelized cost of energy; Offshore wind power; Wind power

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