

UC San Diego

Research Final Reports

Title

Evaluating Ocean Management Systems to Facilitate the Development of Ecosystem-Based Management

Permalink

<https://escholarship.org/uc/item/6n43g6ch>

Author

Young, Oran R

Publication Date

2009-02-16

**California Sea Grant Sea Grant
Annual Project Progress Report**

02/16/2009

R/OPC-ENV-02

03/23/2007-1/31/2010

Evaluating Ocean Management Systems to Facilitate the Development of
Ecosystem-Based Management

Preparer Information: Julia Ekstrom
jaekstrom@gmail.com
805-689-7449

Project Leader: Oran R. Young
UC Santa Barbara
Bren School of Environmental Science & Management
young@bren.ucsb.edu
805-893-8747

Project Hypotheses

The hypothesis of this project is that information about how the oceans are governed can be gleaned from text analysis of laws and regulations.

Project Goals and Objectives

The objective of this project is to improve the understanding of existing ocean governance to assist ecosystem-based management initiatives and ocean stakeholders. The project goals include: (1) to compile a database of laws and regulations relevant to the California Current; (2) to develop techniques that quantitatively and objectively provide information about gaps and overlaps in management (using laws and regulations as proxy to represent management); (3) to ground-truth the utility of the techniques and format of results with feedback from government agencies and other ocean stakeholders; (4) disseminate synthesized results in useful format for ocean managers; (5) to make compilation of laws and regulations freely accessible and searchable by the public.

Briefly describe project methodology

1. Select and compile coastal and ocean relevant laws and regulations representative of the California Current Large Marine Ecosystem. This geographic scope represents the geopolitical jurisdictions of the States of Washington, Oregon, and California, and federal levels of United States and Mexico.
2. Develop methods to generate information from the laws about gaps and overlaps in ocean management.
3. Test the utility and accuracy of these methods with ocean stakeholders.
4. Generate a sample of cases demonstrating the utility of the analyses.
5. Disseminate results in a useful format (such as graphical displaying quantitative information)
5. Create publicly accessible searchable database of ocean law compilation

Describe progress and accomplishments toward meeting goals and objectives
We have completed selecting and compiling laws and regulations for the California Current. With the input of government agency personnel and other ocean stakeholders, we developed techniques to identify and measure gaps and overlaps in ocean management using text analysis of laws. We have begun to disseminate initial findings of how these techniques work in appropriate conferences (Coastal Zone 2007, Digital Government Research Conference 2008,

Society for Conservation Biology, and National Council for Science and the Environment) and have submitted reports of these techniques to peer-reviewed journals. Two articles were published in February 2009 of Marine Policy journal, and one is in review.

Project modifications

Ancillary research topic: Gaps in management in the terms that it is used was not originally part of the project objective. In addition, the definition of an "overlap" has substantially changed, and incorporates agencies as a dimension of the laws and regulations. Feedback from interviews with ocean stakeholders drove these changes.

The major problem encountered in the project was the identification of inconsistent regulations was not a straight-forward task. The definition of "inconsistent" differs widely depending on the user. Therefore, we adjusted the investigation to focus identification of where agencies jurisdictionally overlap. Similarly, this focus also arises the challenge that agencies overlap in different ways (depending, again, on the user's point of view). Thus, we worked to develop the overlaps technique that is dynamic so that it allows a user to input any issue of interest. Then for any given topic (or set of topics), this analysis reveals what agencies overlap and through what laws.

The final major modification in the research plan was that we did not pursue the geospatial proposed research. We found that the National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center was in the middle of such a project. Therefore, our compilation of the same data (for federal and west coast states) would have been unnecessary and redundant. Instead we kept in close communication with the NOAA Coastal Services Center to develop our analyses in a way that they could be interoperated with NOAA's Digital Legislative Atlas geospatial data in the future.

Project outcomes

Dataset of laws and regulations compiled for federal US and Mexico, and states of California, Oregon, and Washington

- Shared for research: KNB NCEAS Data Repository as term counts of every document
- Year 1 developed an interim project website to search document collection and communicate project to interested public
- Year 2 developed final project website with free embedded search engine (based on MySQL and PHP) for searching text of document collection, viewing list of documents included, and generating "agency involvement" bar charts based on user-defined queries. This site is free and publicly available:

<http://cclme.org>.

- Dataset description and discussion of uses is a peer-reviewed journal article in Marine Policy (2009).

Techniques: We developed techniques to examine gaps and overlaps in ocean management using the dataset.

- Overlaps technique is published in Marine Policy
- Gaps analysis technique article is in review at the Ecology and Society journal

Impacts of project

This project developed methods to identify and measure the extent of institutional interplay and the problem of fit (mismatch between institutions and the relevant ecosystem) that have only been investigated through qualitative

means in past academic literature. We are in the middle of disseminating these findings academically and will notify CASG as soon as the work is published.

Benefits, commercialization and application of project results

The following is a sample of institutions that have visited the search engine (<http://cclme.org>) between December 2008 and February 15 2009:

NOAA

Monterey Bay Aquarium Research Institute (MBARI)

UC San Diego

University of British Columbia

Woods Hole Oceanographic Institute

Cornell University

California State University Monterey Bay

Food and Agriculture Organization of the United Nations (FAO)

UC Davis

University of Kansas

University of Massachusetts Dartmouth

NOAA - National Marine Fisheries Service

Arkansas Public School Computer Network

Economic benefits generated by discovery

N/A

Issue-based forecast capabilities

As future reports will show, the techniques developed to identify gaps and overlaps can be applied to emerging environmental problems. When a management problem arises, the tools can be used to predict where and how the gaps in management need to be filled in order to adequately address the emerging problem. Therefore, managers can use the techniques developed in the project to prepare for and preempt predicted environmental stressors or larger disasters.

Tools, technologies and information services developed

Techniques developed to visualize and quantify aspects about ocean governance. The next stage of this project involves providing educational materials for marine policy courses and lectures, as well as for the general public through the online project site (<http://www.cclme.org>).

Publications

Conference papers, proceedings, symposia

Title: Text Mining of Ocean Law to Measure Overlapping Agency and Legal Jurisdictions

Authors: Julia A Ekstrom, Gloria T. Lau

Date: 5/19/2008

Conference Title: Digital Government Research Conference

Location: Montreal, Canada

Title:

Authors: Julia A Ekstrom

Date: July 2008

Conference Title: Coastal Zone

Location: Portland, Oregon

Peer-reviewed journal articles or book chapters

Title: California Current Large Marine Ecosystem: Publicly Available Dataset of State and Federal Laws and Regulations

Authors: Julia A. Ekstrom

Date: 2009

Journal Name: Marine Policy

Issue/Page Numbers: 33, pp. 528-531

Title: A Tool to Navigate Overlaps in Fragmented Ocean Governance

Authors: Julia Ekstrom, Oran Young, Steve Gaines, Maria Gordon, Bonnie McCay

Date: 2009

Journal Name: Marine Policy

Issue/Page Numbers: 33, pp. 532-535

Electronic publications

Title: Governance of the California Current (<http://www.cclme.org>)

Authors: Julia Ekstrom, Daniel Spiteri

Date: 2007-2009

Title: Digital Library of Ocean Management Laws: California Current Large Marine Ecosystem

(dataset from laws available through KNB NCEAS Data Repository)

Authors: Julia Ekstrom

Date: 2007

Theses, dissertations

Title: Navigating Fragmented Ocean Law: Tools to Identify and Measure Gaps and Overlaps for Ecosystem-Based Management

Authors: Julia Ekstrom

Schools: UC Santa Barbara

Miscellaneous documents

Title: Poster: A Technique to Identify Potentially Overlapping Jurisdictions in Ocean Management

Date: December 2008 (National Council for Science and the Environment, Washington DC)

Please list any workshops/presentations given

Coastal Zone 2007, Portland, Oregon: Ekstrom presented the method and utility of the gaps analysis (July 2007); ~100 session attendees

Digital Government Research Conference, Montreal, Canada (May 2008): Ekstrom presented the technical method of the overlaps analysis; 25 session attendees.

Informal presentation to Santa Barbara High School students at UCSB (March 2008): Introduction to human dimensions of ocean research to high school students interested in marine conservation; 8 attendees

Marine Science PhD Exit Seminar (UCSB): Ekstrom presented results of dissertation in public seminar; approximately 40 seminar attendees.

Society for Conservation Biology Conference (Tennessee): Ekstrom presented gaps analysis method and applications in student award symposium (July 2008, 100 attendees)

National Council for Science and the Environment (Washington DC): Ekstrom presented overlaps analysis method in poster (December 2008, uncounted poster viewers, have received ~15 emails from interested parties from NGOs, government agencies, and academic scientists).

Dissemination of results

One-on-one interviews and meetings with government agency personnel, non-government agency personnel, and other ocean stakeholders from June 2007 through May 2008. Names and places cannot be divulged in accordance with the UCSB Human Subjects Protocol.

Students

Julia A. Ekstrom
UC Santa Barbara
Bren School

Degree program enrolled in: PhD

Theses/dissertation title: Navigating Fragmented Ocean Law: Tools to Identify and Measure Gaps and Overlaps for Ecosystem-Based Management

Supported by Sea Grant funds? [X] yes [] no

Start date: 09/15/2002

End date: 06/01/2008

Cooperating organizations

Federal

NOAA

- Northwest Fisheries Science Center: Ecological modeling and methodological utility
- National Marine Sanctuary: Problem definition and conceptual development of methods
- Northeast Fisheries Science Center: Problem definition, conceptual development, and utility
- NOAA Coastal Services Center: Data sharing, conceptual development

Local and state

California Coastal Conservancy: Technical assistance

Washington Department of Ecology: Conceptual development, accuracy of data

California Ocean Science Trust

Nongovernmental

Point Reyes Bird Observatory: Conceptual development and gaps case verification

The Nature Conservancy: Utility and ground-truthing

Gordon and Betty Moore Foundation: Utility/conceptual development; potential users

EBM Tools Network

Other Sea Grant programs

Washington Sea Grant: Ground-truthing and delivery of results

Academic Institutions

University of Washington: Conceptual development and problem definition;

Stanford University: Technical development

Other organizations not listed above.

National Center for Ecological and Analytical Synthesis (NCEAS): Technical and conceptual development, data management advice and infrastructure

Communication Partnership for Science and the Sea (COMPASS): Conceptual development, potential users

International implications

Have discussed future collaboration with the University of British Columbia's Lenfest Oceans Program to interoperate the gaps analysis method with their ecosystem modeling software, EcoPath with EcoSim.

Awards

Ecosystem-Based Management Tools Initiative Fund, David and Lucile Packard Foundation (subcontractor: Duke University), 6/1/08-8/1/09

Keywords

Governance, California Current, marine policy, marine affairs, law, legislation, regulation, statute, Large Marine Ecosystem, California, Oregon, Washington, institutions, ecosystem-based management, EBM, human dimension, social science

Notes

The California Sea Grant Trainee for this project is now working as a postdoctoral scholar at Stanford University, supported by a Packard Foundation grant. Her work includes making the gaps analysis (developed as a Sea Grant Trainee) into a free open source software. This software application is being built to provide managers, scientists, and other coastal and ocean stakeholders view management from an ecosystem perspective.