

# “A Comparison of Aquaculture Development Areas and Individual Aquaculture Sites”

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## **Background/Introduction**

As the world population continues to increase, the need for further food production does likewise. To meet that need, aquaculture has become an increasingly important sector, and the ocean provides a vast area that can be used to grow food such as finfish, bivalves, crustaceans and seaweed. The United States has encouraged the growth of marine aquaculture, and in the National Aquaculture Act of 1980 the development of aquaculture was declared a “national interest.” However, the bureaucratic permitting process, negative environmental impacts, costs, technology, and coastal spatial conflicts among other issues have all limited industry growth. Numerous proposals for aquaculture development in nearshore and offshore waters have been made with varying degrees of success with the permitting process often cited as the largest barrier to aquaculture development in both state and federal waters.

Seafood production in the United States has been largely unable to satisfy domestic demand especially as wild fisheries have become increasingly overfished, or are rebuilding, and the US aquaculture industry only supplies 5% of US seafood. Imports have increasingly made up the difference. As of 2010, 86% of the seafood consumed is imported, creating a trade deficit of over \$14 billion. Growing calls to reverse this trend have come from the US legislature, seafood industry, and trade reformers (Capps, 2011; Cicin-Sain 2005).

Various government and legislative efforts to spark aquaculture growth specifically through permit reform have languished or failed, but attempts still continue. The Presidential Executive Order 13547, which established a National Policy for the Stewardship of the Ocean, Coasts, and Great Lakes in 2010, is under implementation, and has specifically prioritized the reduction in administrative overlap, redundancies and conflicts starting with aquaculture permitting. This national ocean policy also emphasizes Coastal and Marine Spatial Planning (CMSP) as a tool and process for identifying areas of existing uses and aiding decision-makers working toward spatial management goals. The National Oceanic and Atmospheric Administration (NOAA) released its Marine Aquaculture Policy and National Shellfish Initiative in 2011. Both outline actions the federal agency plans to take in developing aquaculture, while the latter emphasizes the bivalve sector. However, specific regulatory reforms are unspecified.

One possible tool for streamlining the permitting process is the development of shellfish Aquaculture Development Areas (ADAs). Found in Massachusetts, these ADAs allow for single ocean sites to be permitted using the current local, state and federal permitting processes, but are then subleased in ½- 2 acre sections to individual growers while the local township administers the ADA. The growers benefit from this using a much shorter permitting process administered by each township. Also, these ADAs face fewer environmental requirements than those of finfish operations because shellfish do not require feed inputs which impact the environment. This regulatory framework has been in place for over fifteen years, and five ADA sites have been established in Massachusetts, although they have varying degrees of usage.

## **Purpose**

This paper seeks to show how ADAs could address the permitting barriers in the Massachusetts and national marine aquaculture industry, and ultimately achieve the policy goals for increased seafood production. Also few ADA studies exist in the literature. ADAs might be a tool to help physically expand the industry, increase participation and subsequently increase overall production, although a drawback might be lower profits per grower. The growers using current permitting processes on individual Massachusetts sites as large as 25 acres are able to take advantage of economies of scale in comparison to ADA growers, however production is contingent upon first obtaining permits. By examining the current marine policy developments, and conducting a cost effectiveness analysis of the current and ADA permitting processes, this paper seeks to explore the ADA concept as a viable option for Massachusetts and federal marine aquaculture permitting within the bounds of existing legislation. The research involved will:

- Compare and contrast the necessary permitting steps for individual shellfish aquaculture sites and ADAs in Massachusetts;
- Compare and contrast the Massachusetts and federal permitting processes, and examine how the ADA concept might be applied in federal waters;
- Analyze the cost effectiveness of individual aquaculture sites and ADAs of similar size and location in terms of shellfish production, and aquaculture growers;
- Describe how policies and initiatives such as the National Ocean Policy will impact future aquaculture activities.

By addressing these points, this paper seeks to address the following question:

*What advantages, if any, does the Massachusetts shellfish Aquaculture Development Area (ADA) permitting process have over that of individual shellfish sites? Under what circumstances could the ADA framework be applied to federal waters?*

Hypotheses:

- The permitting processes for establishing ADAs and individual aquaculture sites in Massachusetts are similar;
- Permitting any site within federal waters will be difficult, especially for ADAs, and comparisons will be difficult;
- Growers face a less burdensome permitting process within an ADA regulatory regime under the administration of local townships than that of individual aquaculture sites;
- ADAs will be more cost effective in terms of grower numbers since the growers face a reduced permitting process, however, individual aquaculture sites will be more cost effective at production because the plot size will be larger and economies of scale can be better optimized;
- ADAs will contribute more to CMSP efforts due to the shared need for advanced data collection (a goal of the National Ocean Policy) than the individual site permitting process

## **Approach/Method**

The methods for addressing this research question will be three-fold, including a literature and public document review, interviews of Massachusetts aquaculture stakeholders, and a cost effectiveness analysis of shellfish production and grower numbers for both ADAs and individual aquaculture sites.

The literature review covering academic white papers, journal articles and the regulations themselves will be used to explain the permitting process for aquaculture on the federal and Massachusetts state level. By examining the state and federal regulations, they can be compared in terms of agencies involved and overall effort exerted. The literature review will also indicate how the aquaculture industry and regulatory process might change given the recent implementation of pertinent policies and initiatives such as the National Ocean Policy, NOAA Aquaculture Policy, and National Shellfish Initiative. Also the review will frame the problems which the industry has historically faced, and also illustrate the timeline required for obtaining an aquaculture permit for both an individual site and ADA.

The interviews will include stakeholders directly involved in the operation of the individual and ADA sites. The growers, individuals who helped establish the ADAs, and the federal, state and local regulatory agency representatives who handle aquaculture permitting will be interviewed. Obtaining cost data will be the main focus of these interviews. Data will include real and opportunity costs spent on aspects of the permitting and production process including administration, site selection research, capital equipment, labor, and fees. However data for ADA sites is scarce due to the small number of sites. Interviews of the Northeast Regional Ocean Council and Regional Planning Body staff involved with ocean planning in the area will also be conducted to reveal how the development of ADAs and CMSP might influence each other in the near future.

A cost effectiveness analysis will help determine the efficacy of ADAs compared to the current permitting processes given the policy goals of the decision-makers. This analysis will compare the cost of attracting growers and producing the same amount of shellfish by an ADA and similarly sized individual site. The results will help determine the differing costs of the two permitting processes to achieve the same goal of increasing seafood production.

## **References**

Cicin-Sain, B., S.M. Bunsick, J. Corbin, R. DeVoe, T. Eichenberg, J. Ewart, J. Firestone, K. Fletcher, H. Halvorson, T. MacDonald, R. Rayburn, R. Rheault, B. Thorne-Miller. 2005. "Recommendations for an Operational Framework for Offshore Aquaculture in U.S. Federal Waters." Gerard J. Mangone Center for Marine Policy, University of Delaware.

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Nichols, O. 2011. Enhancing Farmer Access to Sustainable Shellfish Aquaculture Areas: An Ecosystem Approach. Sustainable Agriculture Research & Education Grant 2011 Final Report. Accessed April 4, 2012 from: <http://mysare.sare.org/mySARE/ProjectReport.aspx?do=viewRept&pn=CNE10-078&y=2011&t=1>

Northeastern Regional Aquaculture Center (NRAC). 2010. 2009 Aquaculture Situation And Outlook Report 2009: Massachusetts. State Situation and Outlook Reports. Accessed April 10, 2012 from [http://www.nrac.umd.edu/files/Factsheets/NRAC1032009\\_MA.pdf](http://www.nrac.umd.edu/files/Factsheets/NRAC1032009_MA.pdf)

## **Target Journals**

### *Marine Policy*

Link to aims and scope- <http://www.journals.elsevier.com/marine-policy/#Scope>

Link to submission guidelines- <http://www.elsevier.com/journals/marine-policy/0308-597X/guide-for-authors>

### *Ocean and Coastal Management*

Link to aims and scope- <http://www.journals.elsevier.com/ocean-and-coastal-management/>

Link to submission guidelines- <http://www.elsevier.com/journals/ocean-and-coastal-management/0964-5691/guide-for-authors>

## **Tasks**

Literature review

Data collection

Interviews

## **Due dates**

February 1 (Friday), 2013- Submit analytical paper (AP) outline

February 8 (Friday), 2013- Receive comments on outline

March 22 (Friday), 2013- AP 1<sup>st</sup> draft due

April 5 (Friday), 2013- Receive comments on 1<sup>st</sup> draft

April 19 (Friday), 2013- Final draft due

May 3 (Friday), 2013- Last comments before defense due

May 10 (Friday), 2013- Target AP defense date; receive comments on final draft

May 17 (Friday), 2013- Submit edited final draft for grading

May 25 (Saturday), 2013- Deadline for spring semester grades to be posted to UDSIS

## **Committee Composition**

Dr. Biliانا Cicin-Sain (Major advisor)

Dr. George Parsons

Ms. Susan Bunsick