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## **AAC Aquaculture and Coastal Planning Workshop**

### **Workshop Report**

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Critical to the development and expansion of marine aquaculture is proper site placement. Of major consideration are issues such as environmental interactions, animal health, and competition among users of the space in question. Often, the collection of information regarding the suitability of a site for marine farming and the optimal use of a coastal or marine space is the responsibility of the proponent of a proposed aquaculture site. However, information required to make a responsible decision regarding such optimal use is either lacking or otherwise difficult to obtain. It can also lead to the duplication of efforts should two or more marine farms (or other industries) be proposed for the same geographic area, such as a bay or estuary. It can be a benefit to all if the governmental agencies take the responsibility of data collection and subsequent mapping. GIS-based mapping tools, which have been useful in countries such as the USA, Germany, and Norway, inform the decision-making process by providing access to marine and coastal datasets (e.g. existence of commercial fishing activities, presence of ecologically or biologically sensitive areas, etc.). The resolution of data is important and must begin at a broad scale and then narrow on specific locations that are of interest. For example, in Maine, broad areas are prioritized for aquaculture development before engaging in the collection of fine-scale data, such as local user conflicts. Local user conflicts are often one of the most challenging obstacles to overcome when introducing or expanding aquaculture in an area.

Marine spatial planning (MSP) is a public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives that usually have been specified through a political process. Federal, provincial, and local governments have a variety of roles and responsibilities regarding the ocean and make decisions daily that impact ocean resources, industries, and coastal communities. Regions that choose to do MSP are guaranteeing that the public and marine stakeholders will shape these decisions early on, promoting better outcomes for everyone. Regions can define what they want to address and how they do so, in ways that reflect their unique interests and priorities. At the same time, some components of planning – such as making sure the public and stakeholders have a chance to engage – are common to all regions.

In order to implement MSP for a region, cumulative impact assessments for all activities are required. From these assessments, pressure maps can be produced and added together. The concept of risk and exposure to activities becomes important. If broad maps of cumulative impacts become available, perhaps acceptable thresholds can then be developed. Priorities are set through inclusive ecosystem-level planning whereby



visions, goals, and objectives are identified and linked to targets and indicators. The process of decision making then becomes transparent.

In order to implement MSP in Canada, several tools which allow for spatial suitability assessments based on environmental constraints, economic factors, and social issues are essential. Some of these essentials include:

- 1) Identification of desired social and economic outcomes for a region
- 2) Identification of broad areas for aquaculture development based on information such as:
  - a. Oceanographic qualities (e.g. temperature, dissolved oxygen, currents, salinity, sea ice) that would support a certain aquaculture activity
  - b. Significant and sensitive habitats
  - c. Significance of areas to species at risk
- 3) Collection of high-quality geospatial data of human commercial and recreational uses and values in the local scale
- 4) GIS-mapping tool development to provide access to the marine and coastal datasets
- 5) Cumulative impact assessments for all activities identified in and planned for an area

Understanding the environmental effects of farm-related activities at a bay-wide scale is essential for informing the MSP process. However, our understanding of the full suite of environmental effects of aquaculture (both positive and negative) is not complete.

Research priorities which would serve to inform the MSP process include:

- A more robust, set of tools for accurate assessment of benthic impacts of aquaculture on hard seafloors (e.g. cobble, boulder, ledge), soft seafloors (e.g. mud, silt, fine sand), and mixed-type seafloors (e.g. mud/sand/gravel mix)
- Better understanding of wild species interactions with farm sites (e.g. lobsters, herring, scallops)
- Identification of ecosystem services that most readily negate the effects of biological oxygen demanding materials from aquaculture
- Development of spatially-explicit tools and indicators to progress to more ecosystem-based management of aquaculture
- Use of model outputs to 'fill in' GIS layers or hard-to-measure variables (e.g. waste plumes)
- Identification of collaborative projects within the Galway cooperation to address these issues