



# NOAA's Aquaculture Program

## Developing Sustainable Marine Aquaculture



### National Marine Fisheries Service Office of Aquaculture

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### Oceanic & Atmospheric Research Sea Grant College Program

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The NOAA Aquaculture Program leads NOAA's efforts to support development of sustainable marine aquaculture. Benefits include increasing the nation's seafood supply, creating jobs in coastal communities, enhancing important commercial and recreational fisheries, and restoring depleted species and habitats. The Program includes activities in three NOAA line offices - National Marine Fisheries Service, National Ocean Service, and Oceanic & Atmospheric Research - each with distinct and complementary roles.

**Did You Know? U.S. Marine Aquaculture is growing 8% annually.**

### National Marine Fisheries Service (NMFS) Office of Aquaculture

NMFS focuses on addressing the regulatory, technical, and scientific barriers to domestic marine aquaculture development. The headquarters office and regional aquaculture coordinators address regulatory bottlenecks by implementing permitting efficiencies around the nation. NMFS also comprises the majority of NOAA's in-house aquaculture research, with activities at Science Centers in Milford, CT; Manchester, WA; and La Jolla, CA. Research efforts focus on developing scientific "tools for rules" to inform permitting decisions, and developing new culture techniques and technologies.

### Examples of current efforts at the Office of Aquaculture



#### Gulf of Mexico Aquaculture Plan

In August 2014, NMFS released a proposed rule to implement the first regional fishery management plan for aquaculture in federal waters in the Gulf of Mexico. The Office of Aquaculture is overseeing the rulemaking process and leading efforts to coordinate permits among federal agencies.



#### Shellfish Research

The Northeast Fisheries Science Center's Milford laboratory is a global leader in shellfish research, providing invaluable technology to the industry. Recently, scientists at Milford developed probiotics to aid in oyster larvae survival.

## Oceanic & Atmospheric Research (OAR) National Sea Grant College Program

Sea Grant integrates aquaculture research, extension and education through the national office and 33 state Sea Grant programs across the U.S. coasts and Great Lakes. Sea Grant manages NOAA’s primary extramural grant competition for aquaculture industry development. These grants support research and extension activities at universities, industry, and environmental organizations. Sea Grant extension agents live and work in coastal communities, providing science-based information to local governments and citizen groups, and transferring technologies to industry.

### Example of current efforts at Sea Grant



#### Kelp Aquaculture Extension

Maine marine extension agents developed techniques for kelp farming in the Northeast. Through Sea Grant-funded projects, such as the “Aquaculture in Shared Waters” project, extension agents shared their techniques with local farmers, enabling the startup of seaweed farming companies. Extension agents continue to work with farmers in the area to develop what has become a growing industry, complete with an annual seaweed festival.

## National Ocean Service (NOS) National Centers for Coastal Ocean Science (NCCOS)

NOS’s National Centers for Coastal Ocean Science (NCCOS) provides tools and services for coastal managers empowering them to maintain healthy, resilient ecosystems while supporting aquaculture development in the coastal zone. NOS focuses its resources on developing ecological forecasting models and marine spatial planning tools, and assessing and developing sustainable management practices.

### Examples of current efforts at NCCOS



#### Marine Cage Culture & the Environment

NCCOS scientists analyzed environmental concerns and recommendations related to marine cage culture around the world. The extensive report concluded that proper coastal planning tools and environmental oversight can support sustainable growth of aquaculture in the coastal ocean.



#### CanVis for Aquaculture

NCCOS researchers are adapting CanVis, a visualization software package used in coastal planning, to assess and communicate the visual impacts related to marine aquaculture development. Simulations are being used in regional workshops to support dialogue with coastal managers, industry participants, and stakeholders.

## Success in Collaboration

The success of NOAA’s Aquaculture Program stems from close collaboration among its three line office partners. One such example is the development, validation and application of the science-based tool Aquamodel, which uses computer models to predict and avoid environmental impacts of aquaculture operations. Aquamodel was developed by private sector researchers with support from Sea Grant extramural funding. NCCOS researchers are using Aquamodel to help NMFS develop environmental assessments as part of the permitting process for proposed aquaculture operations in the Gulf of Mexico, California and Hawaii.

