



**NOAA
FISHERIES**

**Office of
Aquaculture**

Making Way for Aquaculture: Expanding Opportunities in Coastal Communities through Collaborative Partnerships, Coordinated Permitting, and “Tools for Rules”

Susan Bunsick

RAE's 8th National Summit on Coastal and
Estuarine Restoration and 25th Biennial Meeting of The Coastal Society
New Orleans, LA

December 14, 2016



Overview

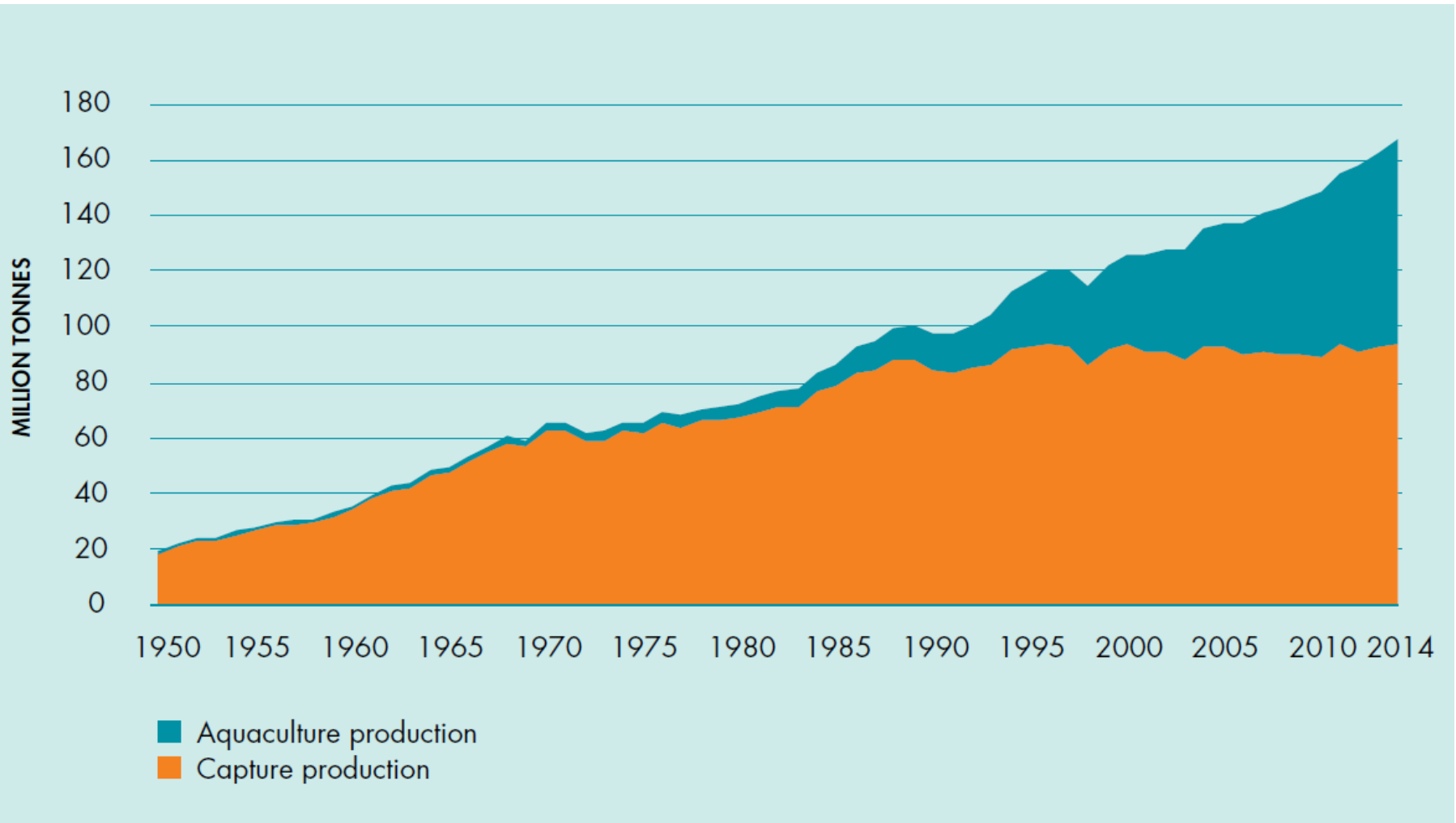
1. Background on U.S. marine aquaculture and NOAA's aquaculture program
2. Highlights of NOAA strategies to advance aquaculture through collaborative partnerships, coordinated permitting, and “tools for rules”
3. Contacts for new partnerships

“Aquaculture is the propagation and rearing of aquatic organisms for any commercial, recreational, or public purpose.”

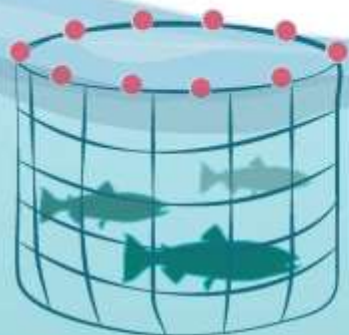
- NOAA Marine Aquaculture Policy, 2011



Aquaculture is critical to future seafood supply



2014 Aquaculture Production **Highlights**



Marine and Freshwater National Totals

U.S. Value

\$1.3
billion
dollars

20%
of total U.S.
seafood production
& fishery products
by value

U.S. Production

607
million
pounds

15th
in global
aquaculture
production

Marine Species Totals

\$169 million
33 million pounds

Oysters

\$121 million
10 million pounds

Clams

\$76 million
41 million pounds

Salmon

\$10 million
5 million pounds

Shrimp

\$10 million
0.7 million pounds

Mussels

Regional Marine Totals

Pacific
37%
by value

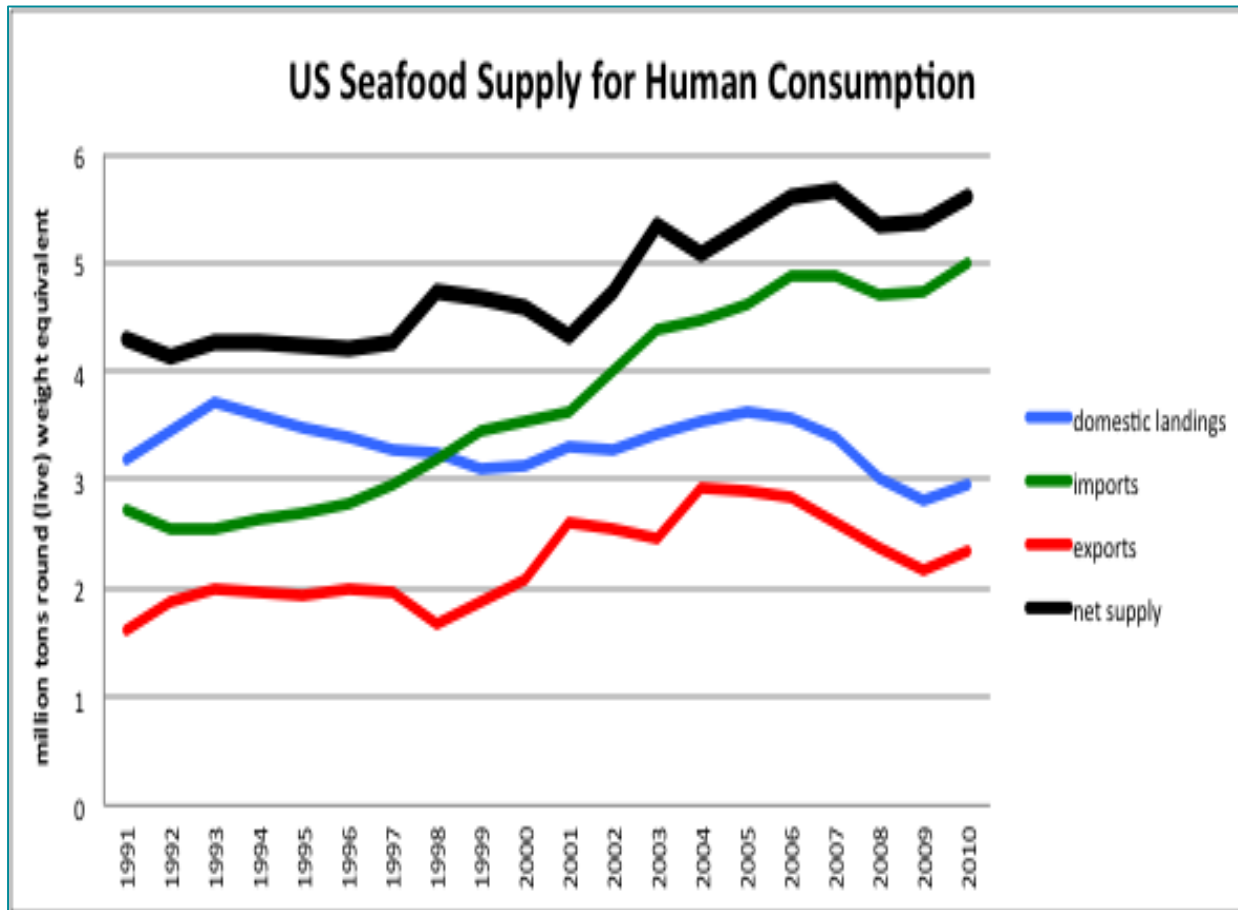
Atlantic
49%
by value

Gulf of Mexico
14%
by value



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Where does our seafood come from?



Current consumption: 6 million tons/year (Black line)

~90% is imported; half farmed (Green Line)

Level of imports creating a \$12+ billion trade deficit

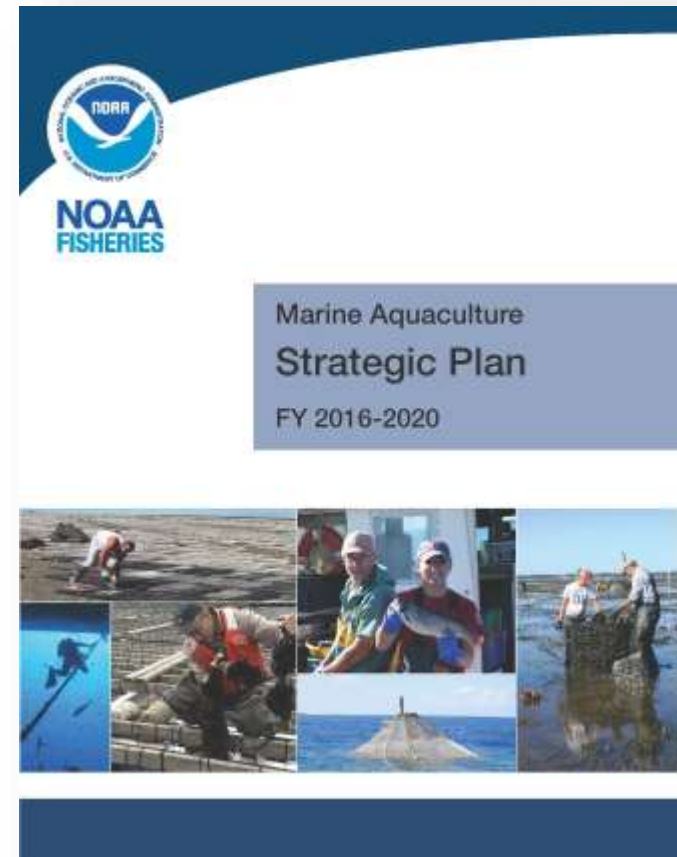
NOAA's Aquaculture Program

Vision: A robust U.S. marine aquaculture sector that creates jobs, provides sustainable seafood, and supports healthy oceans

Mission: To provide science, services, and policies to support significant growth of responsible U.S. marine aquaculture

Goals:

- Regulatory Efficiency
- Tools for Sustainable Management
- Technology Development and Transfer
- Informed Public



Internal Partnerships:
NMFS, NOS, OAR/Sea Grant

Partnerships: National Shellfish Initiative

Goal: Increase populations of bivalves through shellfish farming & restoration

Spatial planning and efficient permitting

Research on environmental effects

Technologies for restoration and farming

Coordinated and innovative financing



Benefits of shellfish initiative partnerships

Jobs

Habitat improvement

Species Protection

Domestic Seafood

Shoreline Protection



Partnerships: Washington Shellfish Initiative



Plus activities in more states and regions....

Shellfish Initiatives

- Washington (2016 re-launch)
- Alaska (2016)
- Connecticut (2016)
- California (planning)
- South Atlantic (workshop)

Related Actions

- Oregon
- Maryland
- Rhode Island
- Hawaii
- Gulf of Mexico

Partnership Results: Washington Initiative

- New hatchery at NMFS Manchester Lab for native Olympia oysters with Puget Sound Restoration Fund
- Federal/State regulatory task force to streamline permitting
- State funds and a Blue Ribbon Panel on ocean acidification
- Sea Grant funding for University of Washington-led work to study impacts of geoduck culture
- EPA funds for Puget Sound water quality work



Partnerships: Collaborations With Other Institutions

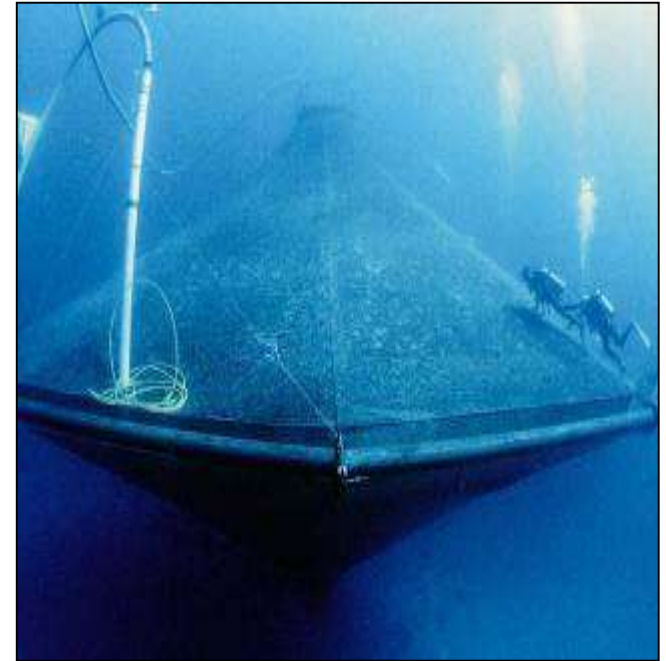


- USDA-NOAA Alternative Feeds Initiative with the Soy Aquaculture Alliance to break dependence of fed aquaculture on limited supply of forage fish
- Project with University of California-Santa Barbara and Nature Conservancy on offshore aquaculture siting and monitoring science
- King Crab enhancement in Alaska initially funded by NOAA and Sea Grant, then transitioned to industry support

Partnerships: Other Examples

Gulf Seafood Roundtable (November 2016) - Brought together influential stakeholders from all areas of the seafood industry, government, eNGOs, finance and science to define key challenges to the development of offshore finfish aquaculture in the Gulf of Mexico and outline realistic strategies to resolve each challenge.

Marine Fisheries Advisory Committee – Draft paper on “Aquaculture-based tools to enhance fisheries resiliency during climate change”



Coordinated Permitting: Major Challenges

- Multiple agencies/mandates, complicated permitting
- Environmental concerns
- ‘Social license’
- Crowded coastlines



Coordinated Permitting: Gulf of Mexico

http://sero.nmfs.noaa.gov/sustainable_fisheries/gulf_fisheries/aquaculture/

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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Home » Fisheries » Gulf Fisheries

PROGRAMS

- Fishing Permit Applications
- Fisheries
- Grants
- Habitat Conservation
- Highly Migratory Species
- Office of Law Enforcement
- Operations, Management & Information Services
- Protected Resources
- Commercial Fishing
- Recreational Fishing
- Reef Fish
- Fishery Subplans
- Stock Assessments
- Annual Catch Limits (ACL) Monitoring
- Outreach & Education
- National Environmental Policy Act (NEPA)
- Freedom of Information Act (FOIA)
- Aquaculture
- Maps & GIS Data
- Other NOAA Offices Located in: Saint Petersburg
- Casualties & Commissions
- Deepwater Horizon

Photo Credit: Shappertam

Fishery Management Plan for Regulating Offshore Marine Aquaculture in the Gulf of Mexico (Gulf Aquaculture Plan)

The purpose of the Gulf Aquaculture Plan is to maximize benefits to the Nation by establishing a regional permitting process to manage the development of an environmentally sound and economically sustainable aquaculture industry in federal waters of the Gulf of Mexico. The Gulf Aquaculture Plan allows up to 20 offshore aquaculture operations to be permitted in federal waters of the Gulf over a 10-year period.

The final rule published on January 13, 2016. To download a copy of the final rule, see the [Rulemaking](#) section below.

To reach the Regional Aquaculture Coordinator, please call 727-324-5201. Ann.Berk@noaa.gov

Gulf Aquaculture Permit (GAP) Application Information

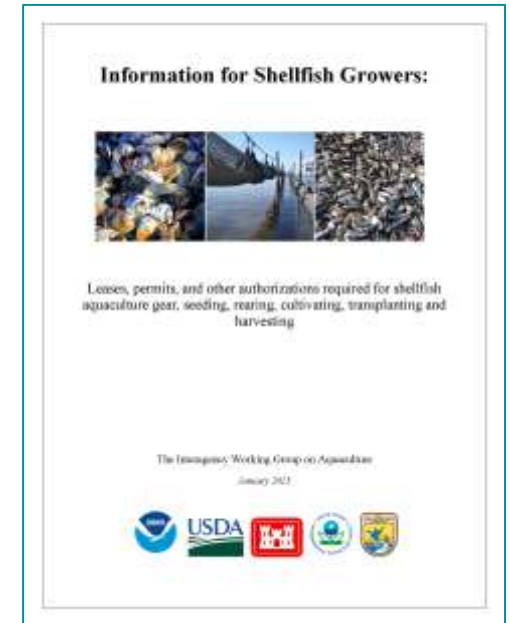
- Permit Applicant Guide
- Pre-Application Meeting Checklist
 - Example of Checklist Information (Contingency)
- GAP Application Forms
 - Federal Permit Application for Offshore Aquaculture in the Gulf of Mexico
 - Certification for Broodstock and Juveniles
- Outlines Documents
 - Baseline Environmental Survey
 - Assurance Bond

Rulemaking

- Final Rule
 - Press Release
 - Fishery Bulletin
- Frequently Asked Questions (January 2016)
- NOAA Fisheries Announcement Page
- Proposed Rule

Coordinated Permitting: Shellfish

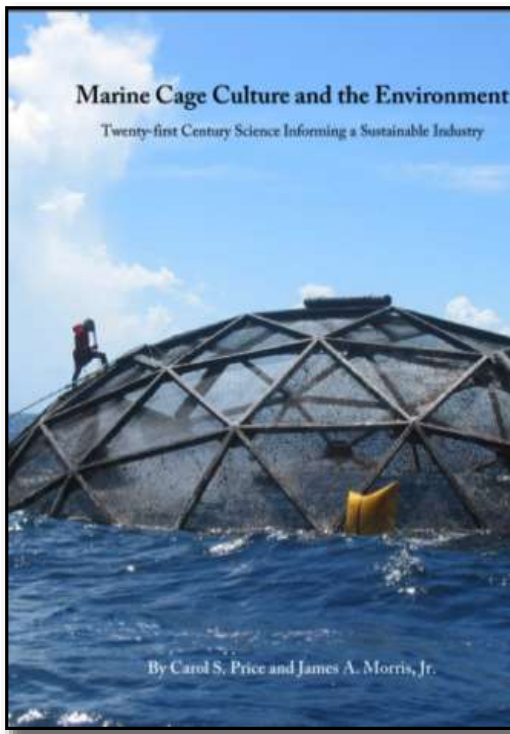
- Permitting guides
 - Interagency guides for federal agencies
 - Shellfish Growers Guide to permitting
- Coordination on Corps of Engineers permits
 - Permits for restoration of traditional fish ponds in Hawaii
 - Nationwide Permit 48 (commercial aquaculture) and regional conditions
- Programmatic approaches
 - Biological opinion for commercial shellfish production in Washington



“Tools for Rules” – Finfish Farming

OMEGA model –
estimating genetic
impacts of escapes

Regional
implementation of
water quality/benthic
models



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FEATURE

Environmental Performance of Marine Net-Pen Aquaculture in the United States

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The scientific results and conclusions, as well as any views or opinions expressed herein, are those of the authors and do not necessarily reflect the views of NOAA or the Department of Commerce.

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ABSTRACT: The United States has a small net-pen salmon industry dating back over 40 years and a nascent net-pen industry for other marine fish. The United States net-pen aquaculture sector has improved its resource efficiency in terms of the amount of fish meal and fish oil used in feeds and reduced its environmental impacts in terms of the mass loading and impact of nutrient discharge on the receiving ecosystem, the incidence and treatment of fish diseases, the use of antibiotics, and the number and impact of fish escapes, while increasing production. These changes can be attributed to a combination of advances in science and technology, rising cost of fish meal/oil, improved management, and informed regulatory practices. Net-pen aquaculture has become an efficient food production system. Existing laws and regulations in the United States effectively address most of the potential adverse environmental effects of net-pen aquaculture.

Desempeño ambiental de la acuicultura marina con jaulas de red en los Estados Unidos de Norteamérica

RESUMEN: Los Estados Unidos de Norteamérica (EE. UU.) poseen una pequeña industria de acuicultura de salmones mediante jaulas de red que data desde hace cuarenta décadas y una incipiente industria de cultivo con jaulas de otros especies de peces marinos. El sector de la acuicultura con jaulas de red en los EE.UU. ha mejorado la eficiencia de sus recursos en términos de cantidad de carne y aceite de pescado utilizados para la ración y en cuanto a la reducción de sus impactos negativos: el aumento de la producción versus la carga de nutrientes y el impacto de la descarga de nutrientes en los ecosistemas receptores, la incidencia y tratamiento de enfermedades de peces, uso de antibióticos y el impacto del escape de peces. Estos cambios son atribuibles a la combinación de avances científicos y tecnológicos, el incremento en el costo de la carne y aceite de pescado, un mejor manejo y prácticas regulatorias informadas. La acuicultura con jaulas de red se ha convertido en un sistema eficiente de producción de alimentos. Las leyes y regulaciones estatales en los EE.UU. abordan de forma efectiva los efectos adversos potenciales de la acuicultura con jaulas de red.

INTRODUCTION

Aquaculture is likely to supply most of the projected increased need for seafood over the next few decades (United Nations 2011; Food and Agriculture Organization of the United Nations [FAO] 2012; World Bank 2013). With available land and freshwater becoming scarce, marine aquaculture (finfish, shellfish, and seaweeds) will be an increasingly important contributor to the world's future food supply (World Bank 2013; Organization for Economic Co-operation and Development [OECD]/FAO 2014). Aquaculture is well established in many countries and continues to grow worldwide (FAO 2012). The United States is a global leader in aquaculture technologies and scientific advances (Natalie et al. 2012) but has a relatively small aquaculture industry (National Oceanic and Atmospheric Administration [NOAA] 2012; World Bank 2013), providing less than 5% of the seafood consumed nationally (NOAA 2012). We estimate that the U.S. net-pen salmon industry (Atlantic Salmon, *Salmo salar*, and steelhead *Oncorhynchus mykiss*) produced about 12,000 tons (live weight) in Maine (US\$28 million) and around 8,000 tons in Washington State (\$52 million) in 2010. In the same year, the United States also imported over 280,000 tons of farmed salmon (NOAA 2012). We estimate that another

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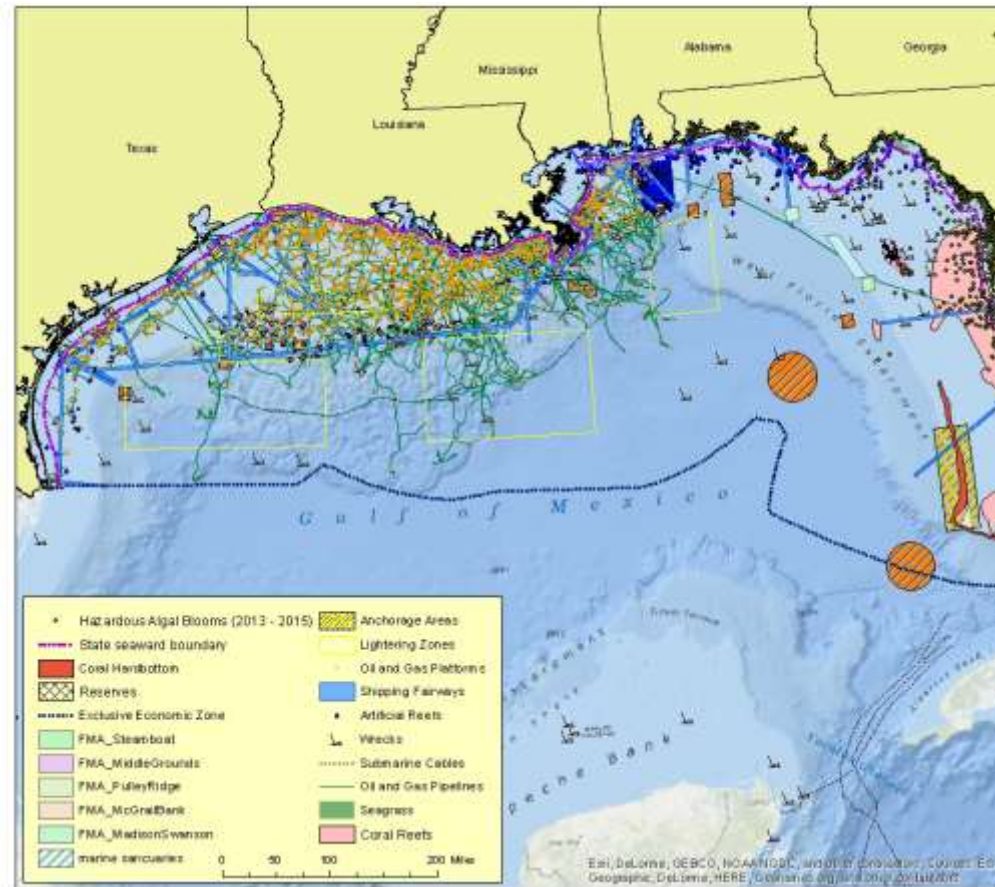
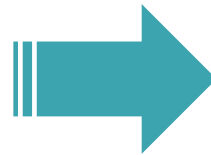
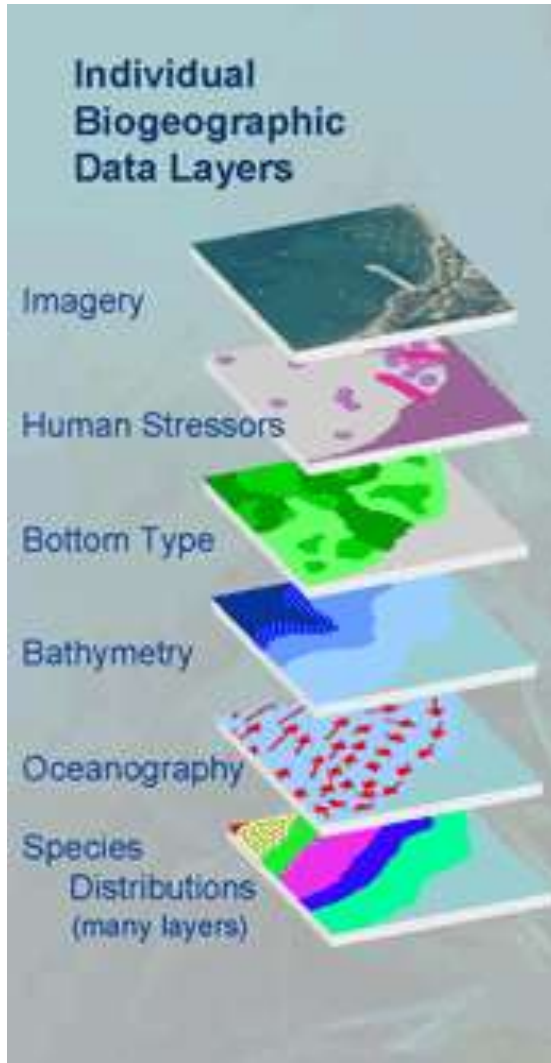
NOAA Technical Memorandum NMFS F/SPO-124

NOAA/USDA
Alternative Feeds Initiative

The Future of Aquafeeds

December 2011

“Tools for Rules” – GIS Models



Take Home Message

1. Expansion of marine aquaculture in the United States supports people, the environment, and the economy.
2. Aquaculture science, tools, and techniques contribute to healthy oceans and coastal resilience, including jobs and preservation of working waterfronts.
3. The aquaculture community (researchers, industry, government) contribute to many goals and priorities discussed at this Summit.
4. Opportunities exist for more proactive engagement with NOAA and its marine aquaculture stakeholders. For example:
 - Ecosystem services of shellfish
 - Impacts of ocean acidification on shellfish
 - Aquaculture as a tool to mitigate ocean acidification
 - Aquaculture as a tool to restore habitat and species, help coastal communities

For more information

NMFS Office of Aquaculture (Silver Spring, MD)

- Michael Rubino (Director)
- David O'Brien (Deputy Director)

NMFS Regional Aquaculture Coordinators

- West Coast –
 - Laura Hoberecht (WA/OR)
 - Diane Windham (CA)
- Greater Atlantic – Kevin Madley
- Southeast/Caribbean – Jess Beck
- Pacific Islands – David Nichols

NOS/NCCOS

- Coastal Aquaculture Planning and Environmental Sustainability program – James Morris

Office of Aquaculture Web site
www.nmfs.noaa.gov/aquaculture

THANK YOU!

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