Marine Aquaculture: Building on Policy, Technology & Research

Dr. Michael Rubino Manager NOAA Aquaculture Program

Pew-Woods Hole Marine Aquaculture Task Force March 2006





Overview

- U.S. Marine Aquaculture Definition
- Opportunities and Challenges
- NOAA Aquaculture Program
- Offshore Aquaculture
- Next Steps





U.S. Marine Aquaculture

U.S. Marine Aquaculture is 20% of US Industry ~ 1.5% of US seafood supply

- Shellfish ~ oysters, clams, mussels
- Finfish
- Shrimp
- Ornamentals
- Aquatic Plants ~ algae, grasses



Services global production ~ feed, broodstock, equipment, processing, marketing, investment





U.S. Marine Aquaculture: Stock Enhancement

- Commercial fisheries: salmon, oysters, king crab, blue crab
- Recreational: redfish, Pacific rockfishes
- Habitat restoration: oysters







Why Momentum Now?

- Growing global demand for seafood
- Coastal communities/seafood industry need supply, jobs, economic opportunities
- Nutritionists: eat more seafood!
- New species, technology
- Need for restoration/enhancement
- High-level attention





Aquaculture Gets Attention



AN OCEAN BLUEPRINT



NOAA should expand marine aquaculture research, development, training, extension, and technology transfer ... set priorities for research and technology



DECEMPER 17 20



President's Ocean Action Plan

U.S. Ocean Action Plan, made a commitment to transmit to the 109th Congress legislation to establish a regulatory structure for offshore aquaculture



Where Will Our Seafood Come From?

With increasing demand for seafood:

- US aquaculture production: 500,000 mt (whole weight)
- US wild catch 3million mt (half exported, ~ 22% U.S. mkt)
- Current US consumption: 6 to 7 m mt (70% imported)
- 2025 gap: 2million mt minimum (\$5 billion, 150,000 jobs)

Our choice: Imports or domestic aquaculture?







Likely Sources of 1 MMT Production Increase in U.S. Aquaculture Source: Nash (2004)

Group	Sub-group	Current U.S. Production	Increase	Target for 2025
Mollusks	All	100,000	245,000	345,000
Crustaceans	All	18,000	47,000	65,000
	Crayfish	14,000	35,000	49,000
	Shrimp and Prawns	5,000	11,000	16,000
Fish	All	340,000	760,000	1,100,000
	Freshwater	315,000	70,000	385,000
	Anadromous	25,000	100,000	125,000
	Saltwater	< 1,000	590,000	590,000
TOTALS		458,000	1,052,000	1,510,000





Challenges to Aquaculture

- U.S. laws are cumbersome or non-existent ~ We need a better regulatory framework
- Divergent views ~ We need to build political will
- Lack of understanding about health/safety, environmental and economic effects ~
 Public needs accurate information
 - Need infrastructure, R&D







Marine Stock Enhancement

- Effectiveness, cost, genetics, timescale
- Relation between fishing moratoria, habitat restoration, stock enhancement, and commercial aquaculture
- Need for life history, hatchery and grow-out research







NOAA's Aquaculture Program

NOAA Fisheries ~ regulatory, science centers

Office of Oceanic and Atmospheric Research (OAR) ~ NMAI grant program, coordination with Sea Grant

National Ocean Service (NOS) ~ CZM, sanctuaries, labs, oceans and human health

NESDIS ~ Aquaculture Information Center (web)





NOAA's Aquaculture Program

Purpose of Program

- Well managed and productive marine aquaculture in the U.S.
- Worldwide adoption of environmentally sound marine aquaculture
- Well informed public

Major Activities

- Regulation
- Science, R&D
- Outreach & Education
- International





NOAA's Aquaculture Program: Regulations

- Coastal: Do a better job of review, coordination under existing laws
- Federal:
 - Offshore legislation
 - Gulf of Mexico FMC amendment







Current Regulatory Work

- Develop internal guidelines and tools for review of aquaculture permits under existing laws and regulations
 - Environmental risk management guidelines for aquaculture: new NOAA research publication
 - Water quality and genetics/escapes models
 - Review of regulations in states and other countries
 - Aquaculture in ecosystem management: forthcoming book based on April 05 international conference co-sponsored by NOAA
 - BMPs in aquaculture: forthcoming WAS book with chapter contributed by NOAA staff
- Regional EIS and permit guidelines for offshore aquaculture under Gulf of Mexico FMC rules
- National Aquatic Health Management Plan: work with USDA and FWS on drafting chapters and stakeholder/expert consultations

DORA ATMOSPHERE &



Research and Development in FY06

NOAA science (labs) Support of regulatory work

- Hatchery work: marine stock enhancement (finfish, shellfish)
- Feed, nutrition, aquatic health

External grants

- National Marine Aquaculture Initiative
- Small Business Innovation Research program
- Sea Grant College Program (coordinated with NOAA Aquaculture Program)

Congressionally funded programs

- Stock enhancement (finfish, shellfish)
- Commercial aquaculture





Why R&D?

- Need science and R&D to be effective regulator
- Answer environmental, economic social, and ecosystem management questions
- Develop species, technologies, and BMPs for marine stock enhancement and commercial aquaculture
- Foster pilot and demonstration partnerships





Current Research Partners: Examples

- NMAI ~ over 200 pre-proposals in review, open to all forms of marine aquaculture
- Stock Enhancement ~ multiple institutions
- Offshore Demo Projects ~ New Hampshire, Hawaii, Puerto Rico/Florida
- Chesapeake Bay ~ crab and oyster stock enhancement





Current Outreach & Education: Examples

- Stakeholder consultations: aquaculture and seafood industry, fisheries and coastal communities, environmental NGOs, and others
- MAFAC: NOAA advisory committee 10 yr. plan
- Consultations with state agencies
- Compass experts meeting, WWF-US dialogs
- Plant based feeds R&D strategy
- New website coming





Offshore Aquaculture: *Millions of Square Miles*





Frontier of Technology











Summary of Legislation

Grant NOAA authority to issue offshore permits

- c NOAA coordinates permit process (other permits still required)
- c Aquaculture products not subject to fishing definitions that restrict size, season, and harvest methods
- c NOAA to ensure that aquaculture operations do not interfere with wild stock conservation and management

Provide environmental and other safeguards

- c Environmental requirements, monitoring, enforcement
- c Authority to suspend, modify, revoke permits
- c Bonds or other financial guarantees
- c Consultations with FMCs, states, federal agencies, stakeholders
- c Consistency with state plans

Support development of offshore aquaculture

- c R&D industry partnerships
- c Biological, social, production and economic data collection





Statement by U.S. Secretary of Commerce Carlos Gutierrez

"I am convinced that the United States must explore the potential of offshore aquaculture to help meet the growing demand for seafood in this country and to create jobs and economic opportunity for coastal communities. To support that, we are making the National Offshore Aquaculture Act of 2005 a priority for this department and this country. We need to create this opportunity now."



February 13, 2006



NOAA's Past Preparations for Offshore Aquaculture

- National commissions urge increased marine aquaculture production in Federal waters
- National Aquaculture Act of 1980, DOC/NOAA policies
- Stakeholder and expert consultations
- University of Delaware study
- R&D, hatchery, and environmental monitoring work sponsored by NOAA competitive grants and Congressional appropriations



Marine stock enhancement research



Current NOAA Preparations: Regulatory

- See Current Regulatory Work: especially development of internal guidelines and tools, Gulf of Mexico regional EIS and FMC rules
- Outline of EIS and regulatory design steps to be taken if legislation is passed
- Working with FMC chairs to outline consultation process for design of regs and permit review
- Consultations with communities and businesses in Gulf of Mexico and elsewhere on pilot projects





Current Preparations: Science and Technology

- Continuing research in NH, PR, and HI on offshore finfish and shellfish farming
- Marine stock enhancement and hatchery research
- FY06 National Marine Aquaculture Initiative and Small Business Innovation Research Grants may have production, hatchery, environmental analysis, or regional mapping awards pertinent to offshore aquaculture
- International meetings on aquaculture technology and environmental effects/BMPs
- Economic analysis of offshore aquaculture: September 2006 completion date





Steps to Develop Offshore Regulations if Law is Enacted

- Programmatic EIS
- Regional mapping
- State, FMC, stakeholder and expert consultations
- Interagency consultations



- Drafting of permit requirements with Federal Register process
- Stepped up R&D program, funding permitted, to address research needs





Next Steps:

- Work with Congress on offshore legislation
- Foster R&D partnerships
- Continue to address socioeconomic and BMP issues
- Develop NOAA's Aquaculture Program and Federal interagency coordination through JSA
- Learn by doing
- Broadcast results







Key Messages

- Enhance domestic supply with safe, healthy seafood to meet growing demand
- Opportunity for coastal communities
- Enable aquaculture, but within context of stewardship
- Strong role for states, FMCs, stakeholders
- Strong environmental guidelines used in NOAA's current review of permits and in the offshore bill
- Open to working with Congress on language in the bill
- Economic questions being addressed
- Research underway on relationships between fishing, habitat, stock enhancement, and aquaculture



Not a rush to offshore, balanced program



To Find Out More ...

www.aquaculture.noaa.gov

Michael Rubino – Aquaculture Program Manager

Susan Bunsick – Policy Analyst

Kate Naughten – Outreach Coordinator

Jim McVey – National Sea Grant Program

PHONE: (301) 713-9079



