

AQUACULTURE FOR THE FUTURE

MAFAC Briefing

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Aquaculture: *“The propagation and rearing of aquatic organisms in controlled or selected environments for any commercial, recreational or public purpose.”*

- National Aquaculture Act, 1980

Aquaculture is a *tool* which can be used for:

- Commercial production



- Enhancement of wild fisheries stocks

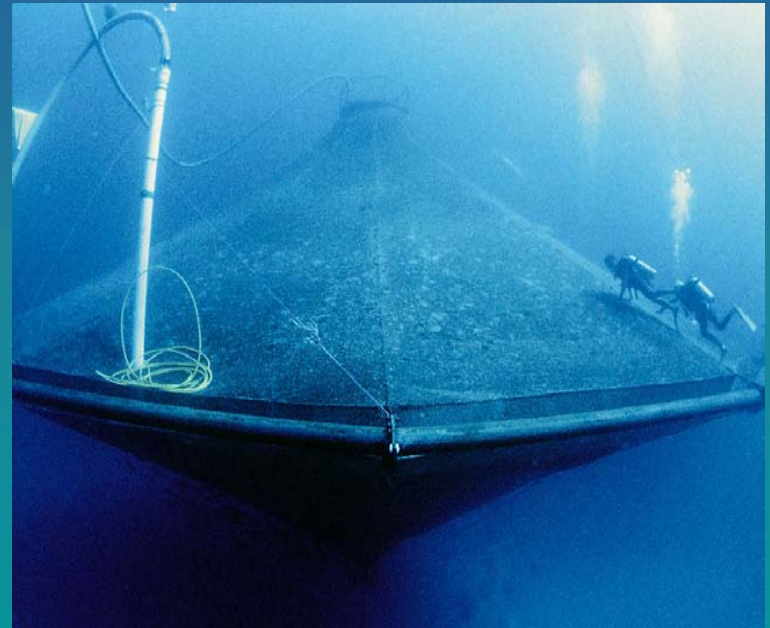


- Recovering endangered species



Overview

- Provide a context for U.S. aquaculture development
- Review Ocean Commission recommendations for aquaculture
- Introduce the National Offshore Aquaculture Act
- Introduce the “Business Case” for aquaculture



Current Situation

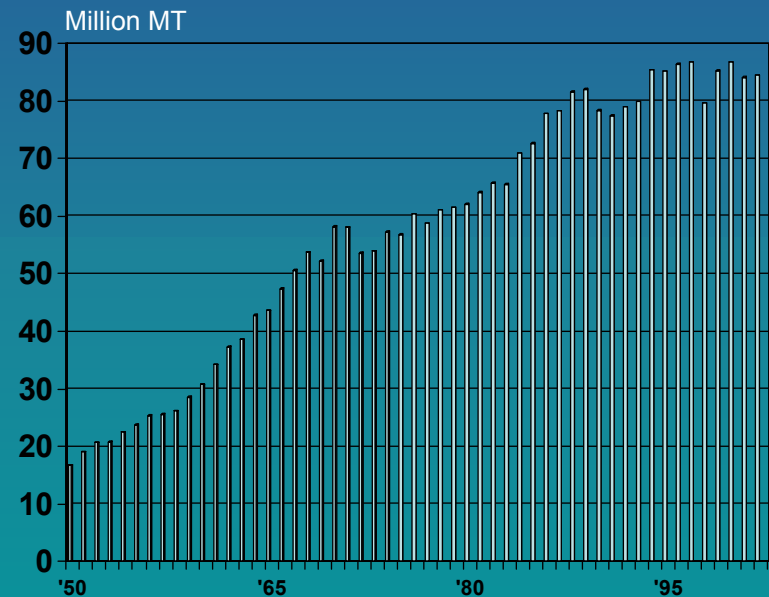
- Wild capture fisheries are static and unlikely to expand significantly
- Seafood demand increasing
- Demand met through \$11B in seafood imports (\$7.8B deficit)
- Safety of some imports uncertain
- Coastal communities economically depressed



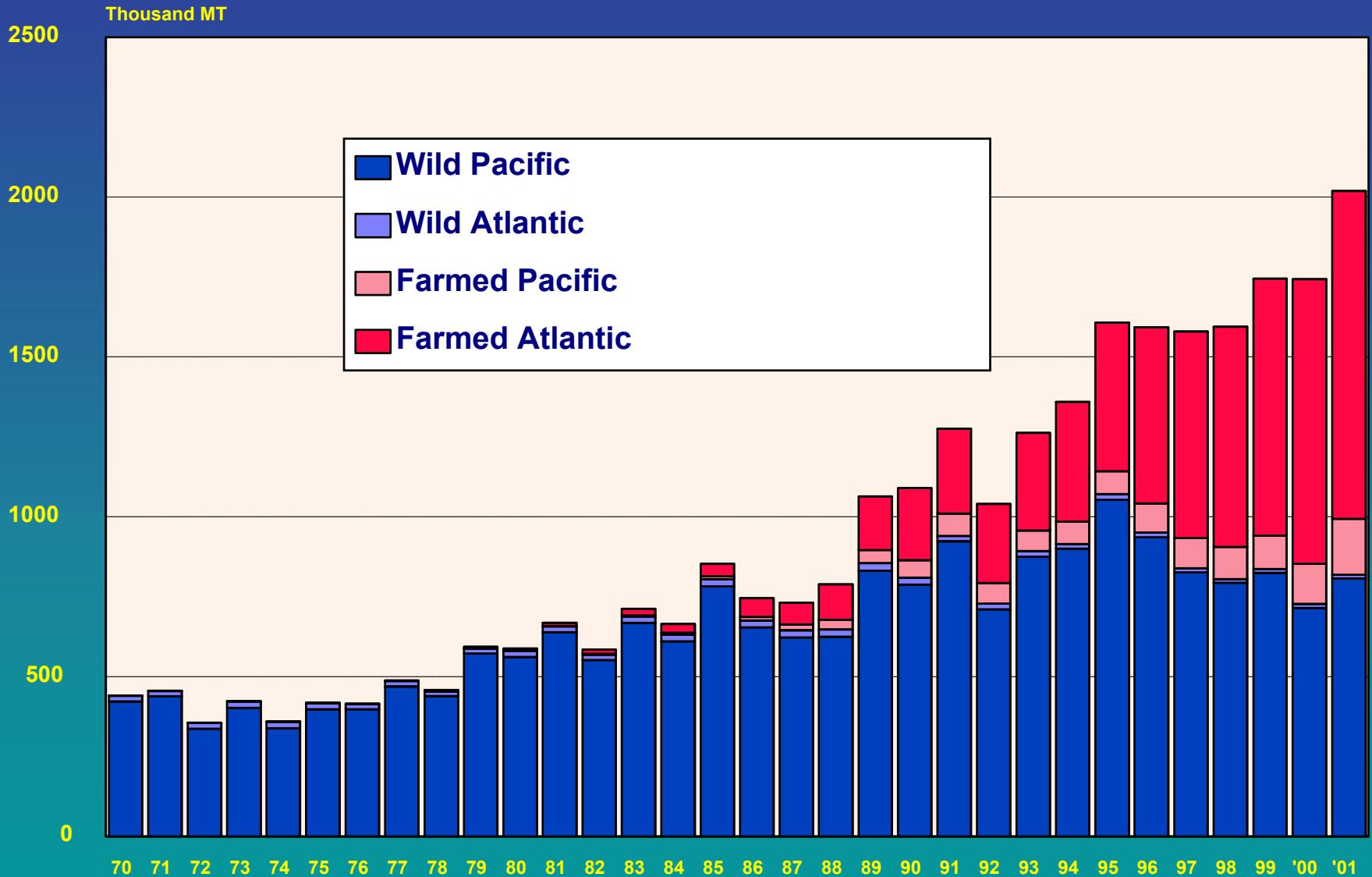
Global Seafood Supply

- Wild harvests have plateaued
- Seafood contribution to protein consumption
 - 20% in developing countries
 - 13% in developed countries
 - Percentage expected to increase by 0.4% per year, globally
- Per capita consumption may increase from 16 to 21 kg/capita by 2030
- 1/3 of supply from aquaculture today
- Source of future supply (2030)
 - Wild harvests: + 14 mmt
 - Aquaculture: + 54 mmt

Global Harvests, 1950 - 2002



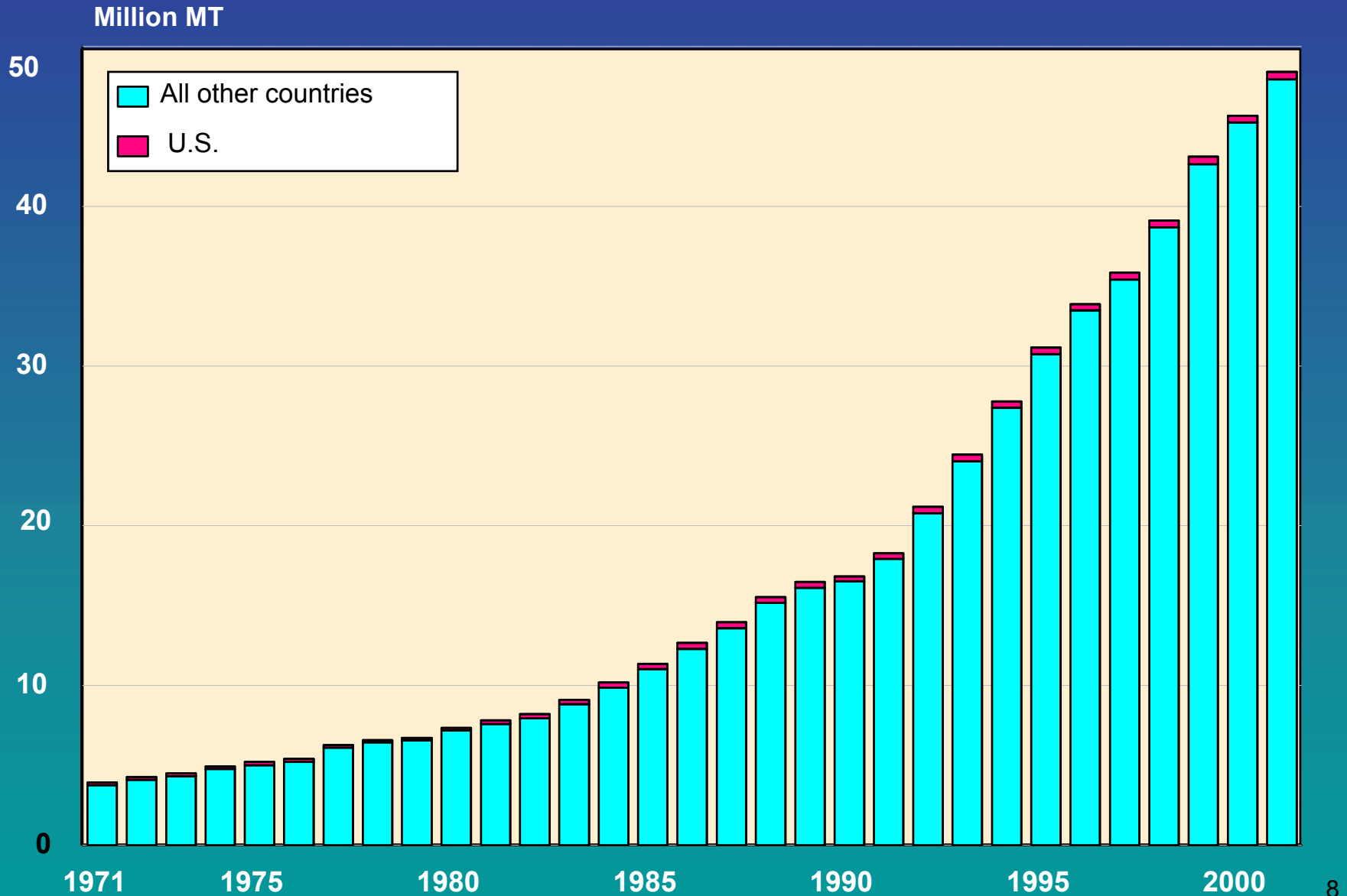
Global Salmon Production, 1970 - 2001



SOURCE: FAO FishStat



Global Aquaculture Production, 1971 - 2001

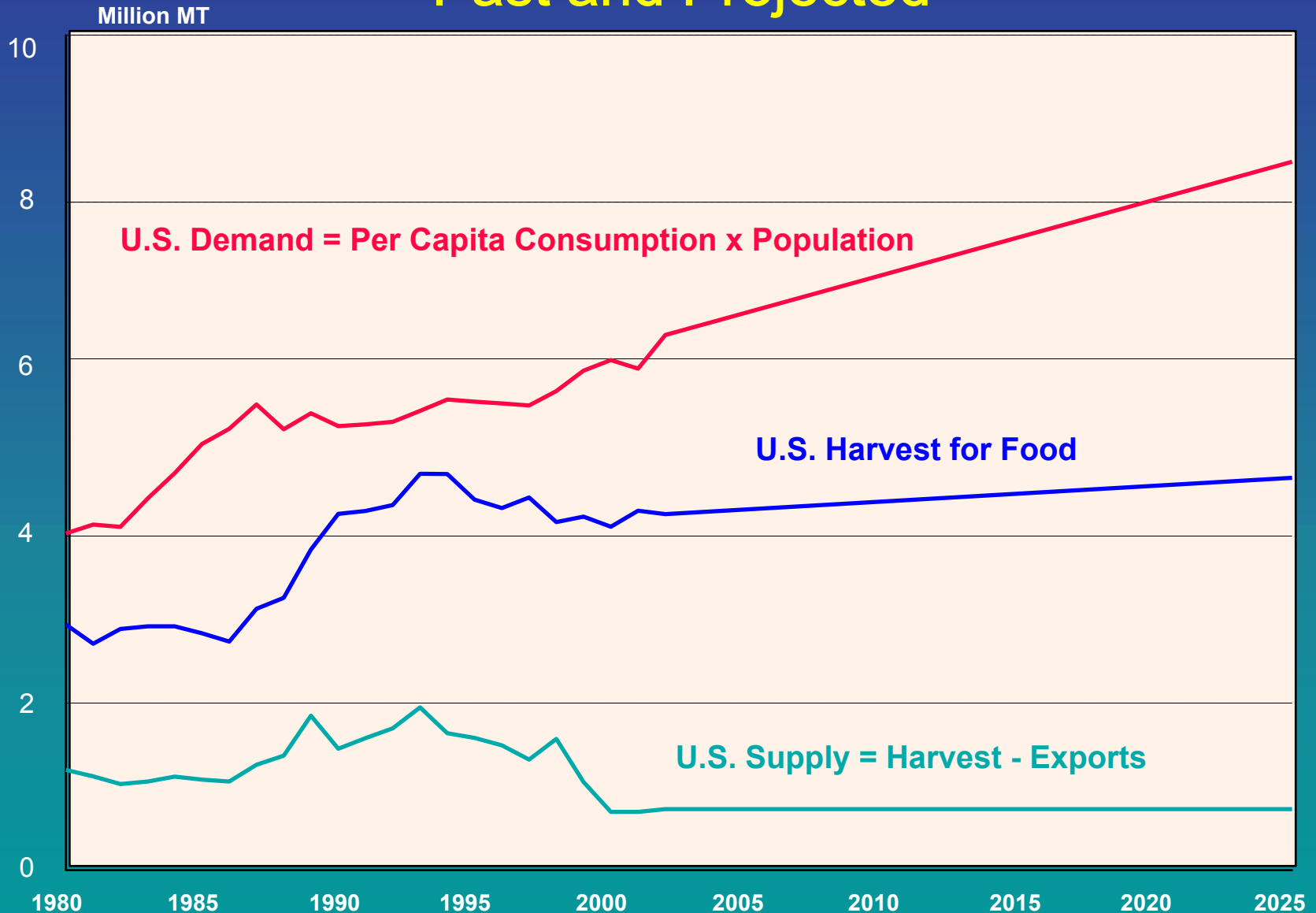


U.S. Seafood Supply

- Per capita consumption
 - Hovered around 15 pounds since late 80's
 - Recent increases due to availability of farmed shrimp, salmon, catfish and tilapia
- Source of U.S. Supply
 - Wild Harvest (~4 mmt/yr)
 - Aquaculture Production (<500K mt/yr)
 - Imports > 5 mmt; of which ~40% is cultured
- Future demand projections
 - Additional 2 mmt needed by 2025



U.S. Seafood Supply and Demand: Past and Projected



Ocean Commission Recommendations

RECOMMENDATIONS:

- NOAA named lead for marine aquaculture; new office establishment
- Need for regulatory framework
- Increased funding for research, development, training, extension and technology transfer
- International adherence to FAO Code of Conduct

NOAA RESPONSE:

- NOAA supportive of lead role
- National Offshore Aquaculture Act drafted – DOC would lead permitting and regulating in EEZ
- Research plan developed; basic culture technology, pilot projects, environmental issues, etc.; to be conducted through in-house laboratories and public-private partnerships
- Working through FAO and other international fora, and bilateral arrangements

Why NOAA?

- Strategic Plan / Ecosystem Management
 - Reducing pressure on wild stocks
 - Rebuilding depleted stocks
 - Recovering endangered species
 - Revitalizing economically depressed coastal communities
- Stewardship responsibility
- Recognized scientific leadership

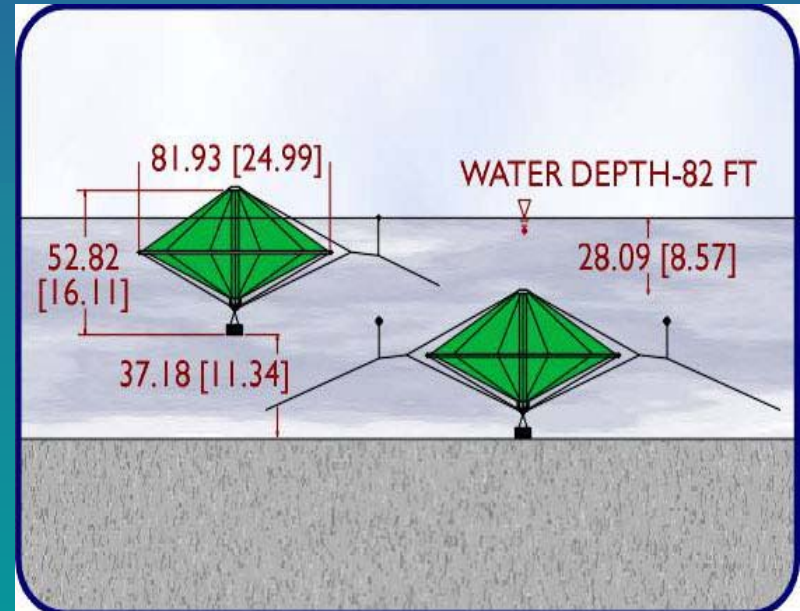


NOAA Aquaculture Policy

- Approved in 1998
- Specifies NMFS, OAR, and NOS programs
- Focus on:
 - Research, development, and technology transfer
 - Financial assistance to businesses
 - Environmental safeguards including regulatory and permit procedures
 - Coordination
- Purpose:
 - Create jobs
 - Revitalize communities suffering from fish stock collapses
 - Resolve natural resource conflicts by using advanced technologies
 - Reduce the fisheries trade deficit
 - Increase domestic production of finfish and shellfish and recreational opportunities
 - Augment restoration efforts of depleted marine stocks
 - Provide safe, high-quality seafood for consumers

Why DOC?

- Foster economic development
 - Create jobs
 - Encourage competitiveness
 - Develop technological excellence
 - Improve food security
- DOC Agencies
 - NIST
 - MBDA
 - ITA
 - EDA
 - NOAA



DOC Aquaculture Policy Goals for 2025

- Policy adopted in 1999
- Develop Code of Conduct for Responsible Aquaculture (Cleared through Joint Subcommittee on Aquaculture; going through final NOAA clearance)
- Develop technologies and methods to improve production and safeguard the environment
- Increase value of domestic production fivefold to \$5 billion
- Increase export of goods and services fivefold to \$2.5 billion
- Increase jobs in the industry from 200,000 to 600,000
- Enhance depleted wild fish stocks



Why Now?



- No clear permitting authority for aquaculture to locate in the EEZ
- Jobs and trade
- Ocean Commission affirms importance of aquaculture; legislation is responsive to USCOP recommendations
- Competition for use of the coastal zone
- Coastal communities reliant on seasonal fisheries
- Environmental standards need definition

The National Offshore Aquaculture Act

Legislation Highlights

Gives DOC authority to issue offshore aquaculture permits

- Site permits
- Operating permits
- Exemption of offshore aquaculture from Magnuson-Stevens Act
- Streamlined permitting process

Provides environmental and other safeguards

- Environmental requirements
- Monitoring, evaluation, enforcement
- Authority to suspend, modify, revoke permits
- Bonds or other financial guarantees
- Consultations with Federal agencies, FMCs, states, tribes

Supports development of offshore aquaculture

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

Provides funding via fees and annual appropriations

- Offshore Aquaculture Fund
- Appropriations authorized; no dollar amount specified

Challenges

- Opposition from commercial fishermen
- Perception of high risk by financial community
- Private use of the commons
- Fishmeal controversy
- Organic waste deposits
- Disease transmission to wild fish
- Human health risk
- Introduction of non-indigenous species
- Impact of escaped fish
- Genetically Modified Organisms
- Engineering cage systems for offshore environment

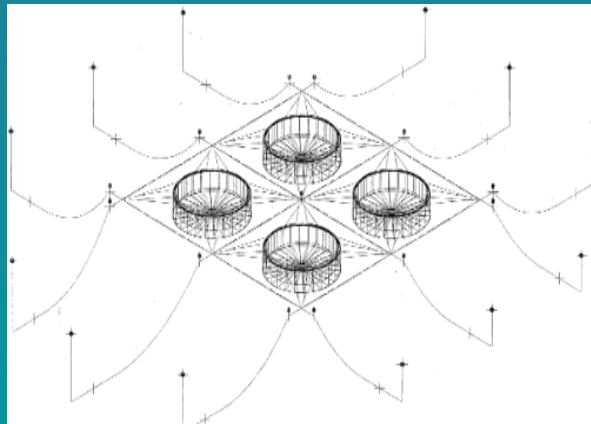


Economic Opportunities

- Job creation
 - Range of 10 – 60 direct jobs/1000 mt production depending on species and location
 - Up to 100 indirect jobs (hatcheries, processing, distribution, marketing, etc.)
- Revitalization of depressed communities
 - Employment; opportunity for displaced fishermen (e.g. Florida, Maine, British Columbia)
 - Year-round employment
 - Tax revenue
 - Employee income double the average for agriculture, fishing and forestry jobs
- Stabilization of growing seafood trade deficit

Florida

- 400 jobs for fishermen displaced by 1995 net ban
- 600 leases on 1600 acre
- \$34 million in sales
- \$9 million in labor income
- \$12 million in value added
- Hard clams



Maine

- 1400 jobs
- \$10 million/year tax revenue
- \$130 million total impact in 2002
- Productivity double the average of all Maine businesses
- Salmon, trout, shellfish

Next Steps - Legislation

- Interagency review comments being incorporated into draft legislation
- Review by Office of Management and Budget
- Administration decision
- Congressional action



Aquaculture “Business Case”

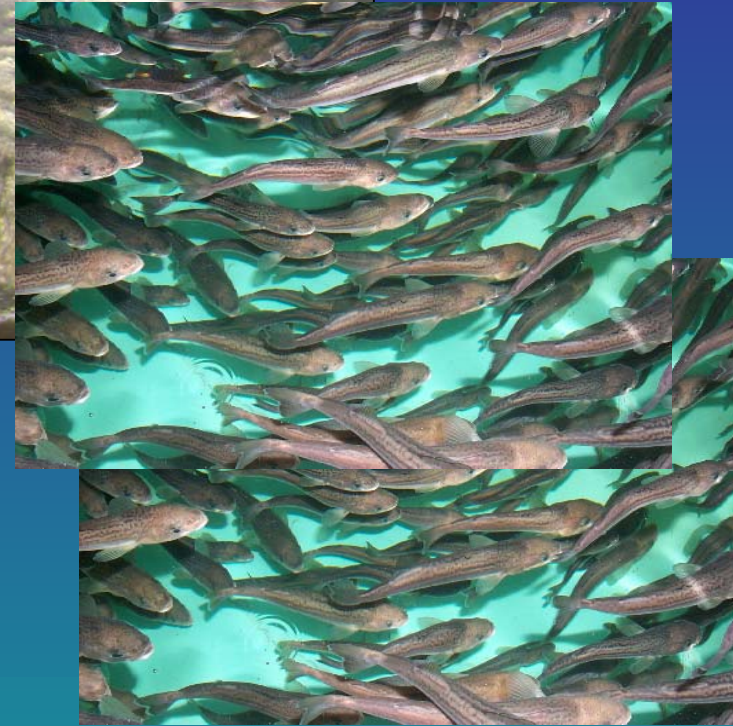
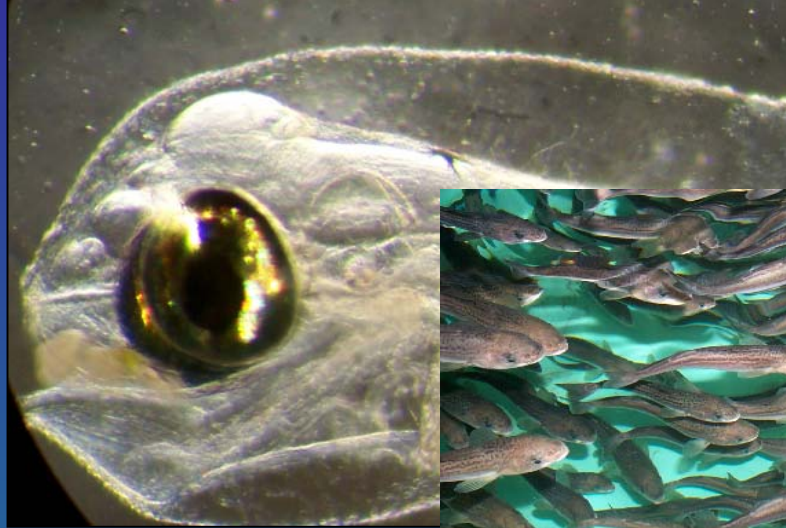
- Request by NOAA to develop brief document explaining the business case for aquaculture
- Identification of some of the issues surrounding aquaculture
- Discussion of possible costs and revenues for implementation
- Document **IS**:
 - Explanation of why NOAA/DOC should pursue legislation
 - Draft document
 - Intended primarily for internal use
 - Overview only
 - Responsive to the Ocean Commission
- Document **is NOT**
 - Definitive work on economics of aquaculture
 - Identification of all contentious issues
 - Discussion of actual costs/benefits to industry
 - Not an outline for future development
 - Not a tool to promote aquaculture

Next Steps – Business Case

- Review and incorporate comments into short report
- Identify additional topics to be included in longer, robust analysis
- Prepare detailed economic overview

Thank you!





PCB LEVELS IN OTHER FOODS

| | |
|------------------------------------|-----|
| Butter, salted | 70 |
| Tuna, canned in oil | 45 |
| Chicken breast, roasted | 32 |
| Brown gravy, homemade | 30 |
| Salmon steak or fillet, baked | 26* |
| Pancake, from mix | 24 |
| Meatloaf | 23 |
| Beef steak, pan-cooked | 22 |
| Pork chop, pan-cooked | 21 |
| Egg, fried | 19 |
| Pork roast, baked | 18 |
| Popcorn, popped in oil | 17 |
| Biscuit, refrigerated dough, baked | 16 |
| Veal cutlet, pan-cooked | 13 |
| Cornbread | 11 |
| Chuck roast, baked | 10 |
| English muffin, plain, toasted | 10 |
| Raisin | 10 |
| Chicken, fried | 9 |
| Caramel candy | 6 |

Few foods are immune from contamination by PCBs, which have spread worldwide despite bans in the United States and most other countries. These foods have been tested by the Food and Drug Administration. Figures in parts per billion.

*Puget Sound salmon tested higher.
Source: FDA

SEATTLE POST-INTELLIGENCER