

Science, Service, Stewardship



Innovation and Emerging Technologies in US Marine Aquaculture

Aquaculture Innovation Workshop
Freshwater Institute
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Today's Talk

- Sustainability in aquaculture: what does it mean?
- Eco-efficient and eco-effective design
- Innovation in marine finfish aquaculture in the US





NOAA's Aquaculture Program

- Regulation, Management
- Science, R&D
- Tech Transfer, Outreach and Education
- International





Marine Stewardship at NOAA

- Multiple mandates
- Ecosystem approach
- Ending overfishing
- New aquaculture policy





Definition of Sustainability

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

~ Brundtland Commission report, “Our Common Future” (1987)







*With earth's burgeoning
human population to feed
we must turn to the sea
with new understanding
and new technology.
We need to farm it
as we farm the land.*

Jacques Cousteau, 1973



The Triple Bottom Line







Drivers for Eco-effective, Smart Design

Costs of inputs: energy, feed

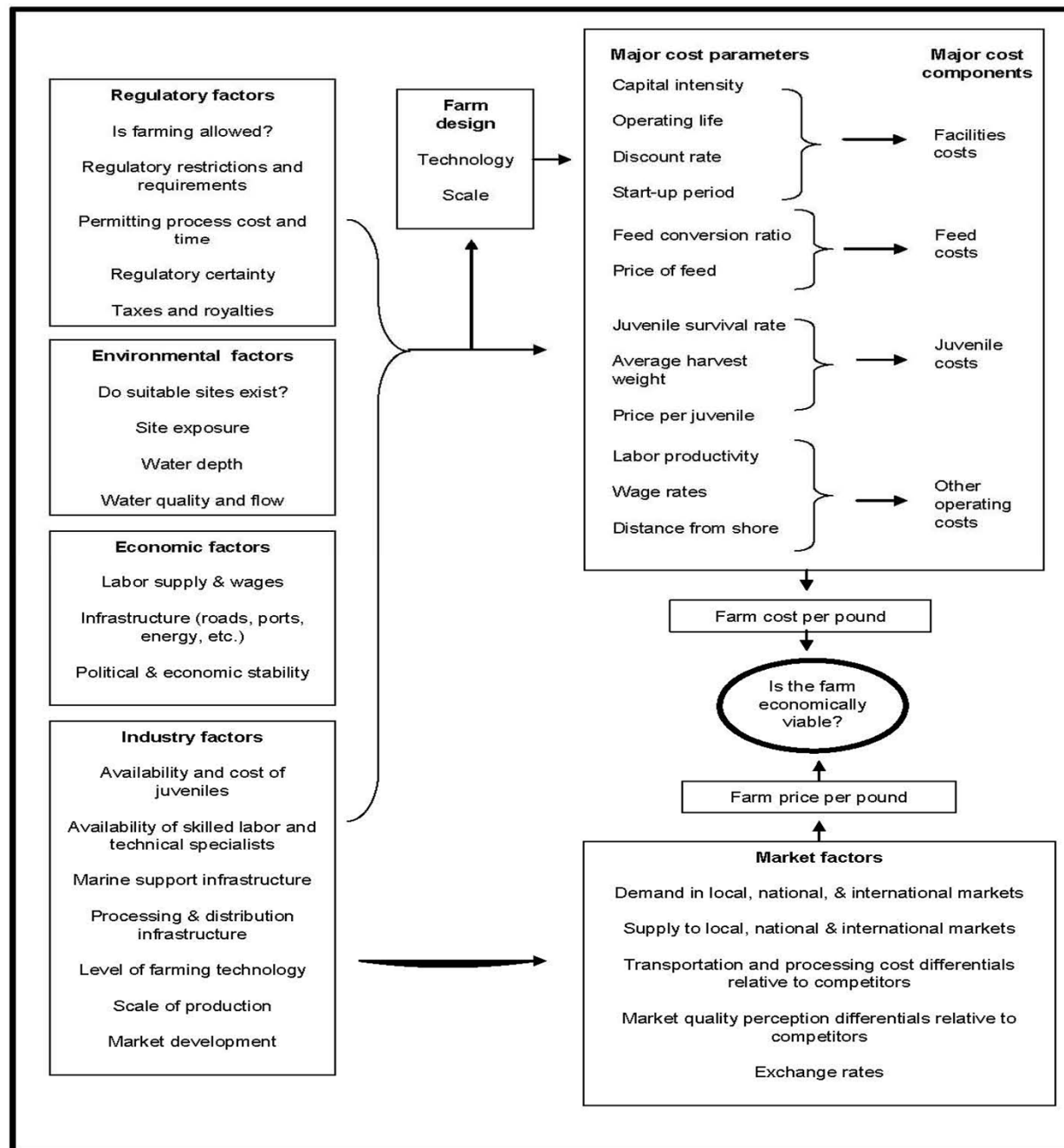
Access to sites

Informed regulations

Science, design innovation

Market demand for certified products

Figure 2.9. Major factors affecting the economic viability of a fish farm.





Social Sustainability





Doctors, Nutritionists Say Eat More Seafood

Lack of dietary seafood is the eighth-highest killer among preventable risk factors for premature mortality in the U.S.

~ Harvard School of Public Health study (2009)

Health benefits address...

- Cognitive function
- Attention/behavior problems in kids
- Dementia
- Cardiac health
- Stroke
- Others including diabetes, menopause, obesity

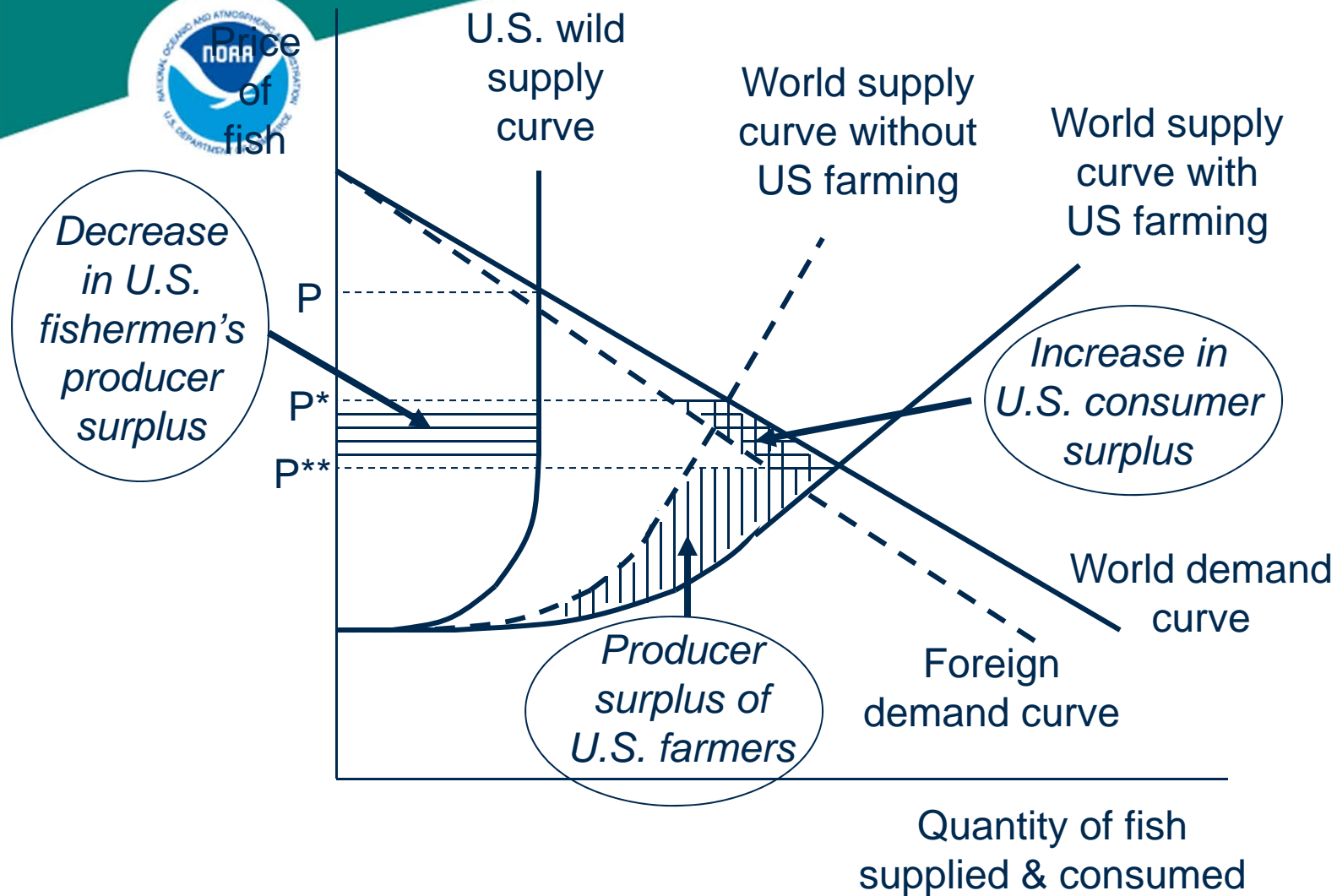


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Competition





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Center of the Plate



Where's the beef?

10

Smoked Creek Catfish

Don't let the
Damascus River
Jumble select
We have order forms

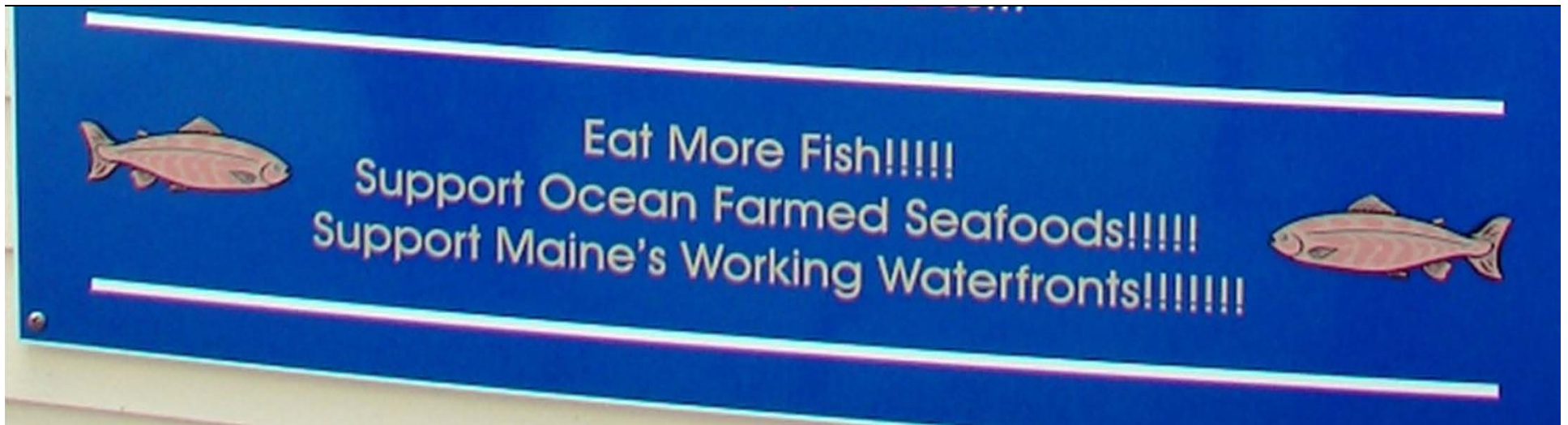
SEAFOOD



MAD.



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Our Crowded Coastlines





Listening Sessions for New NOAA Aquaculture Policy

Farm more seafood in the US

Protect wild stocks and the marine environment

Science knowledge

Local and regional solutions

Aquaculture supports local culture

Integrate fishing and aquaculture to sustain coastal communities

Address competition between fishing and aquaculture

Foster innovative sustainable designs

More shellfish

Pro and con offshore aquaculture



Environmental Sustainability in Marine Aquaculture

Ecosystem management – CMSP – siting

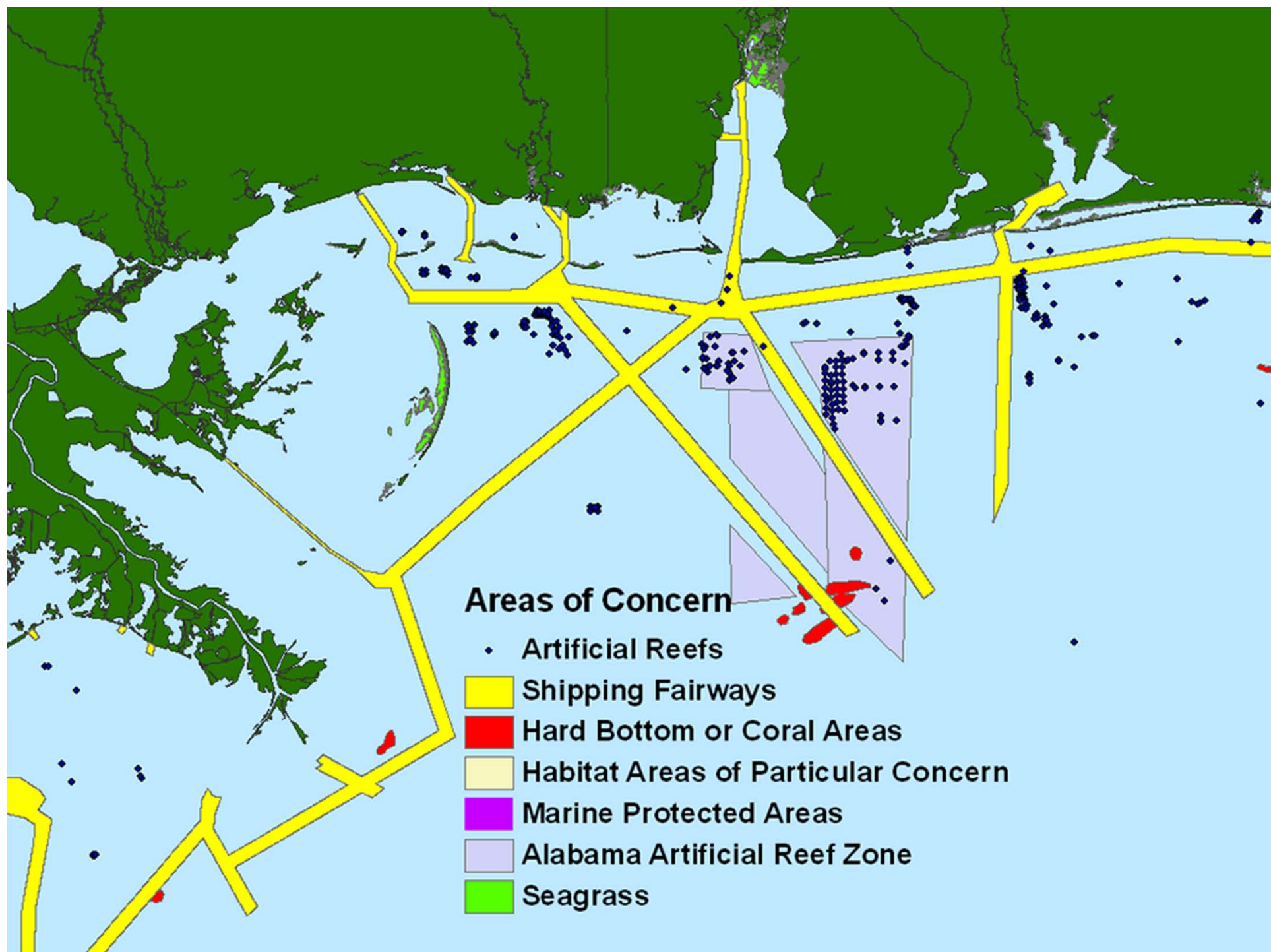
Water quality and benthic effects

Genetics

Alternative feeds

Aquatic health management

Design: hatcheries, RAS, cages, ponds, IMTA





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SOURCES: ESRI; TeleAtlas;
Cape Wind

AP

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**Open for public
comment right
now!**



**NOAA/USDA
Alternative Feeds Initiative**

The Future of Aquafeeds

November 2010

DRAFT
for Public Comment



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IMTA





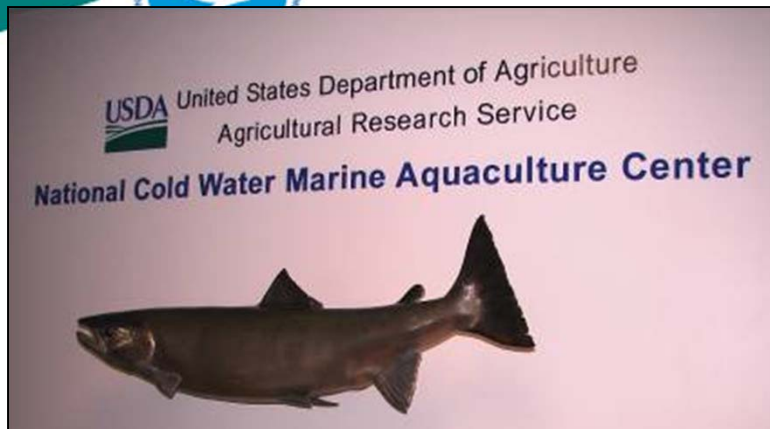
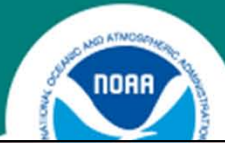
Innovation in U.S. Marine Finfish Aquaculture

With stops in ...

- Maine
- New Hampshire
- North Carolina
- Florida
- Mississippi
- Louisiana
- California
- Hawaii
- Washington
- Alaska

Maine





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New Hampshire





North Carolina





Florida



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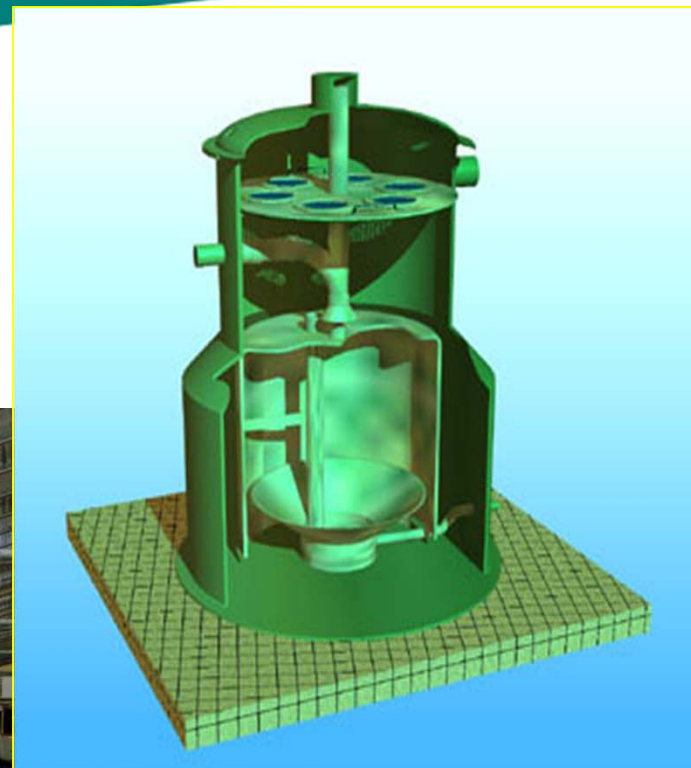
Mississippi



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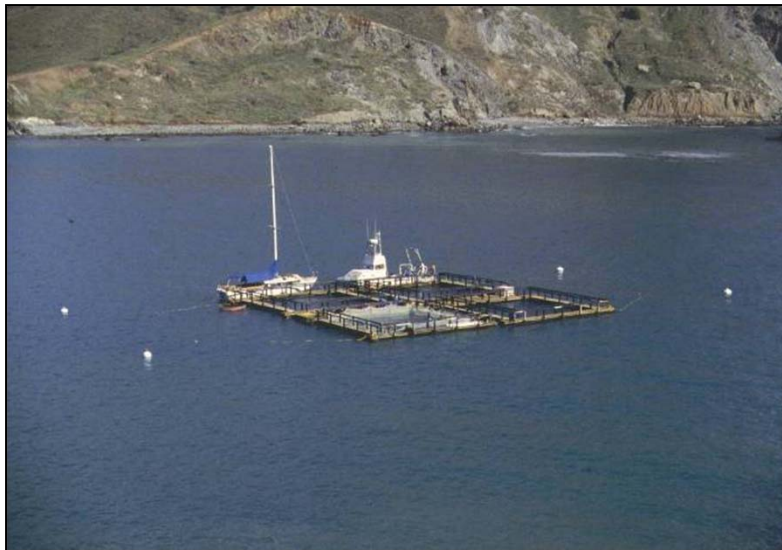
Louisiana



**NOAA
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California



Hawaii



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Washington



Alaska







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Questions?

<http://aquaculture.noaa.gov>

