

U.S AQUACULTURE OUTLOOK

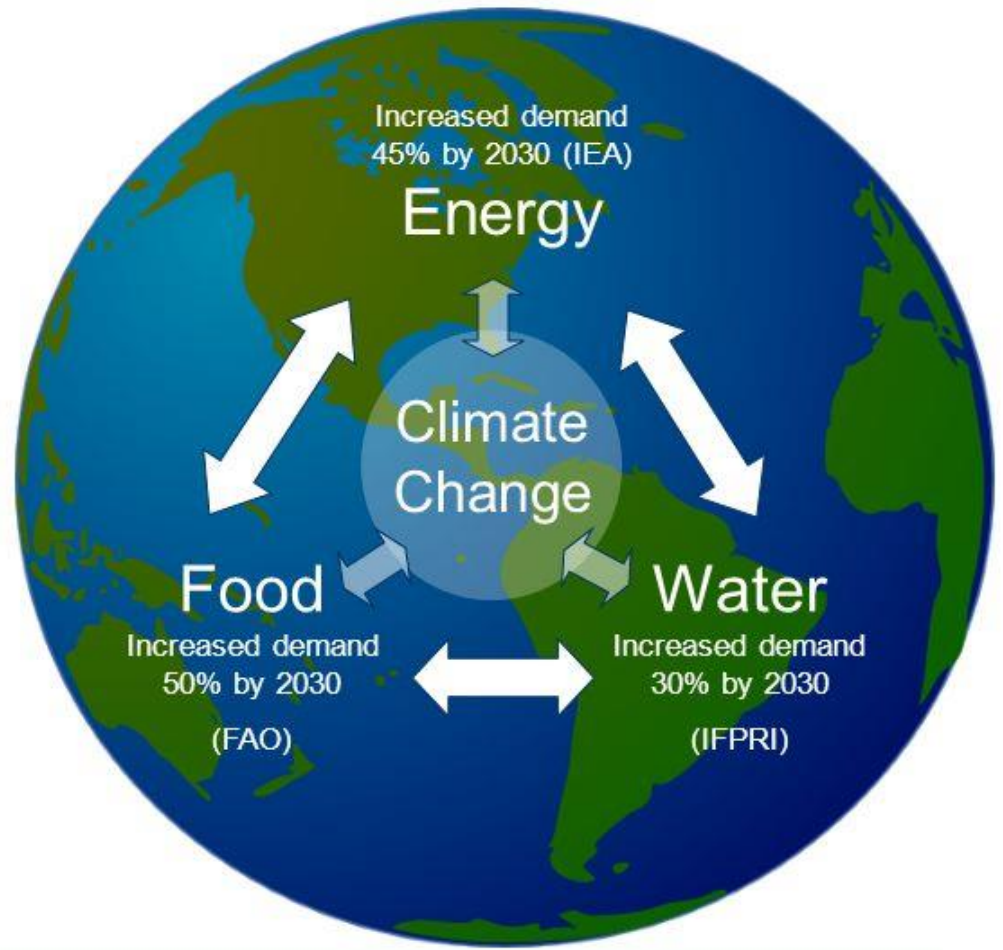
Preserving Working Waterfronts With Healthy Local Food



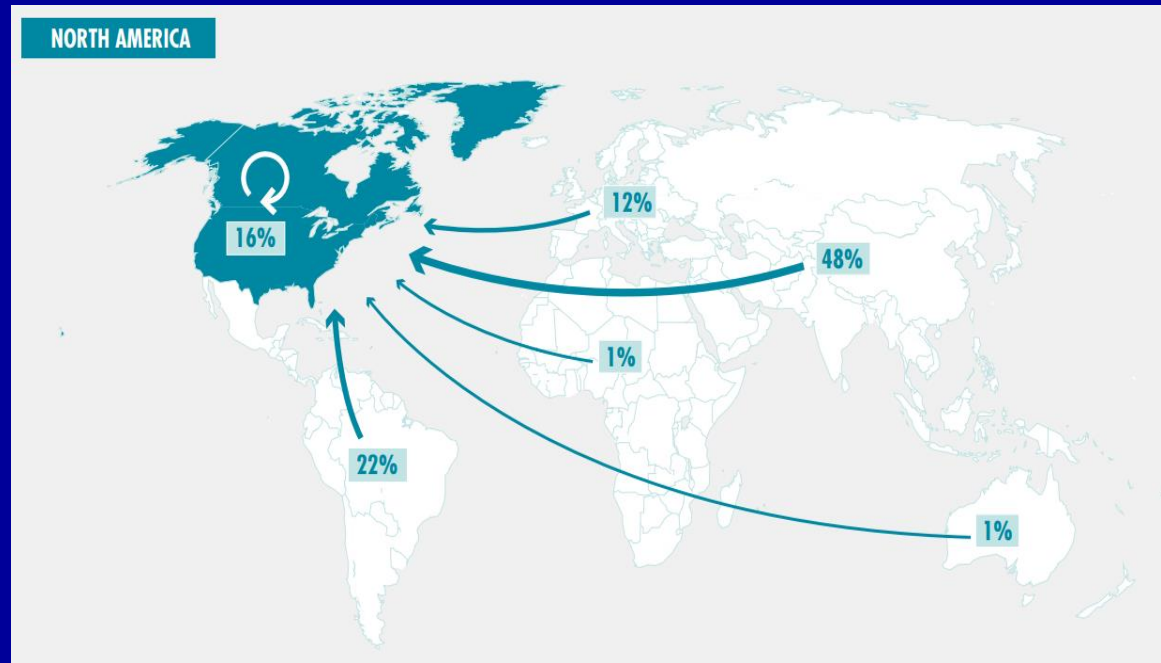
SEBASTIAN BELLE
MAINE AQUACULTURE ASSOCIATION

Global food system – Future projections

1. Increasing population
2. Changing diets
3. Losing land to urbanisation and rising sea levels
4. Water limits
5. Phosphorous limits



3RD LARGEST SEAFOOD MARKET IN WORLD



>75% OF ALL USA SEAFOOD IMPORTED

<2% OF IMPORTS INSPECTED (CONTAMINANTS, RESIDUES)

~59% OF ALL SEAFOOD CONSUMED IN US IS FARMED

>20 BILLION \$ CONTRIBUTION TO U.S. TRADE DEFICIT

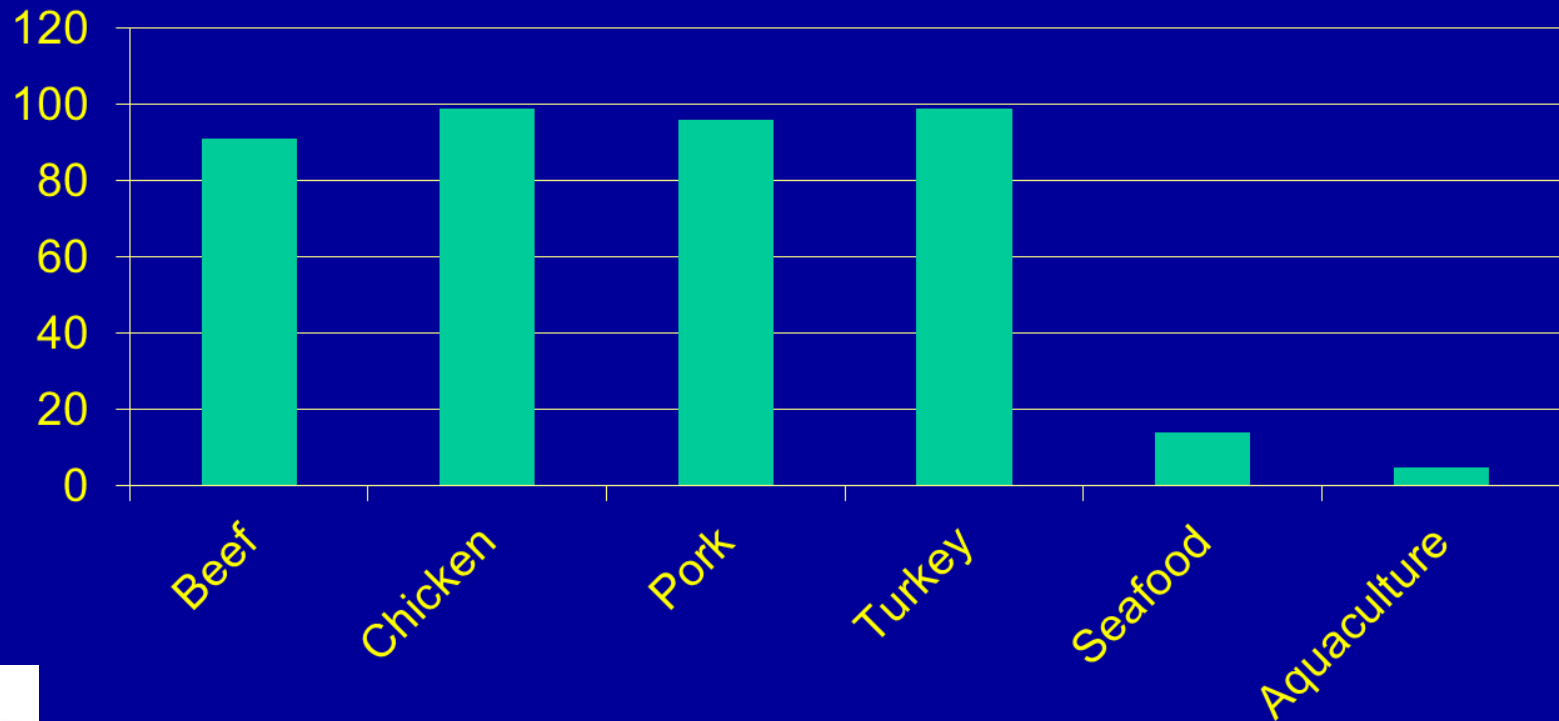
18th IN WORLD AQUACULTURE PRODUCTION



**MAINE
AQUACULTURE
ASSOCIATION**

SHARE OF CONSUMPTION SUPPLIED BY DOMESTIC PRODUCTION

% Domestically Sourced



AQUACULTURE IS AGRICULTURE

HUNTERS



HERDSMEN

- **DEPENDENT ON WILD STOCKS**
- **NO CONTROL OVER ENVIRONMENT**
- **UNPREDICTABLE YIELD**
- **RELATIVELY INEFFICIENT CONVERSION RATIOS**
- **NO DISEASE/HEALTH PROTECTION**
- **NO ANIMAL WELFARE PROTECTION**

- **INDEPENDENT OF WILD STOCKS**
- **VARYING CONTROL OVER ENVIRONMENT**
- **PREDICTABLE YIELD**
- **EFFICIENT CONVERSION RATIOS**
- **ANIMAL HEALTH AND WELFARE PROTECTION**



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U.S. AQUACULTURE

- 5350 FARMS
- > 24 DIFFERENT PRODUCTION METHODS
- ≈1500 SPECIES (??) 285,000MT
- FRESH WATER/SALT WATER 86%:14%
- >\$1.78 BILLION FARM GATE SALES
- ≈ 4500 DIRECT EMPLOYMENT



20 YEAR AVERAGE ANNUAL GROWTH RATE



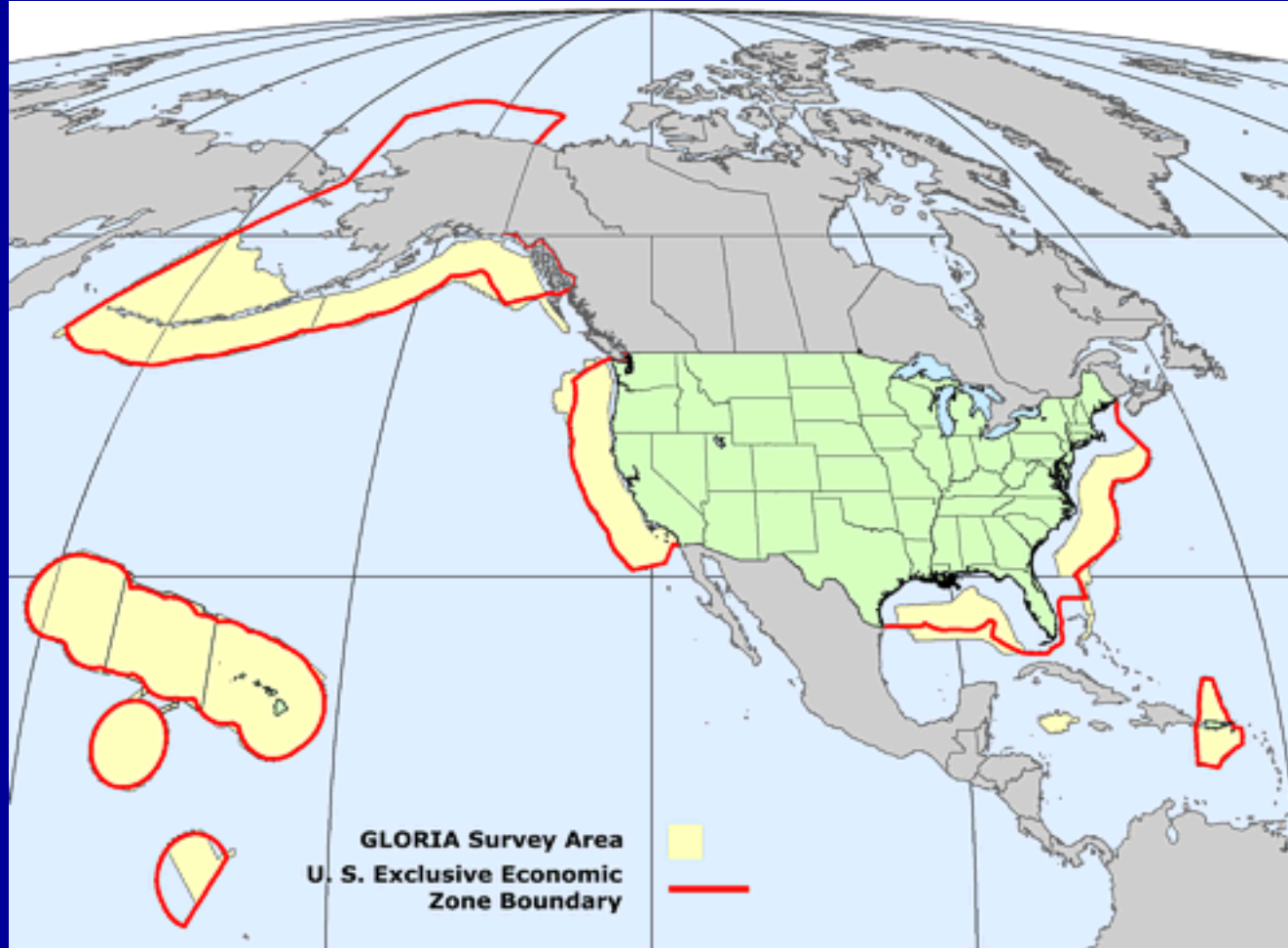
8%



1%



U.S. HAS MORE AREA IN IT'S EEZ THAN LANDMASS



“U.S. ranks first of all nations in offshore potential when considering environmental and economic factors”

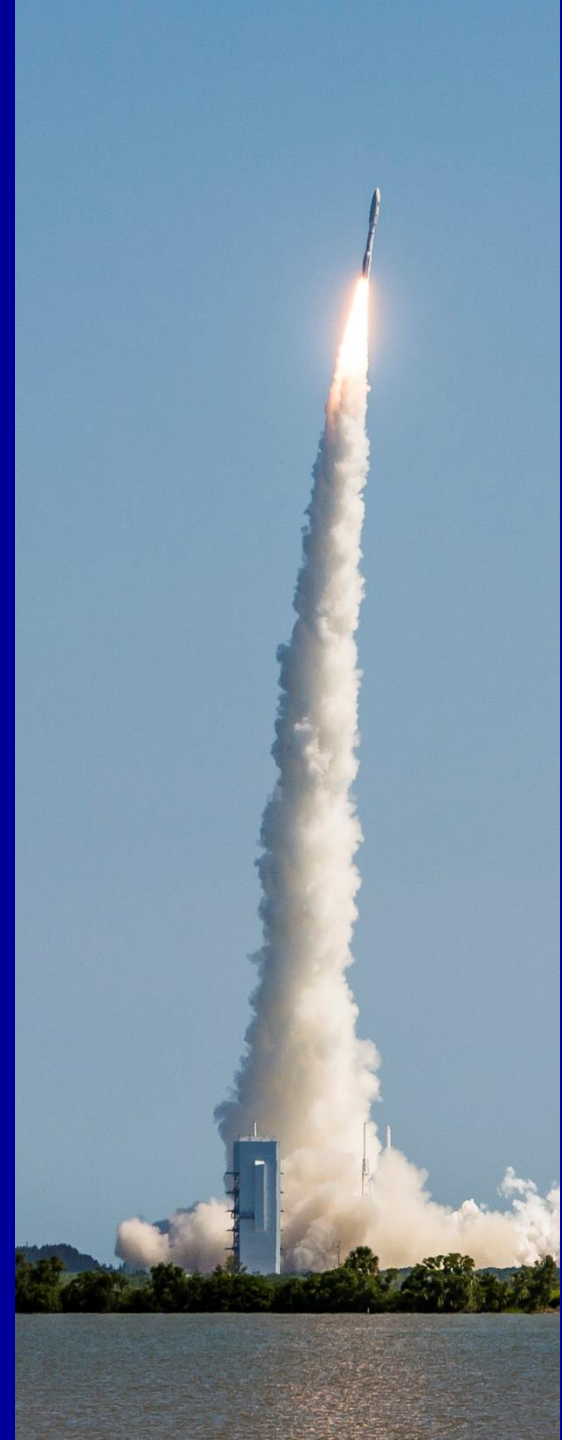
KAPETSKY ET. AL. 2013
(UN FAO)



ITS NOT ROCKET SCIENCE.....



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CURRENT REGULATORY AUTHORITIES FOR AQUACULTURE INDUSTRY

NATIONAL AUTHORITIES

- National Marine Fisheries Service
- U.S. Fish and Wildlife Service
- Army Corps of Engineers
- Environmental Protection Agency
- Department of Agriculture
- U.S. Department of Commerce
- U.S. Coast Guard
- U.S. Department of Labor
- FDA
- ISSC

REGIONAL AUTHORITIES

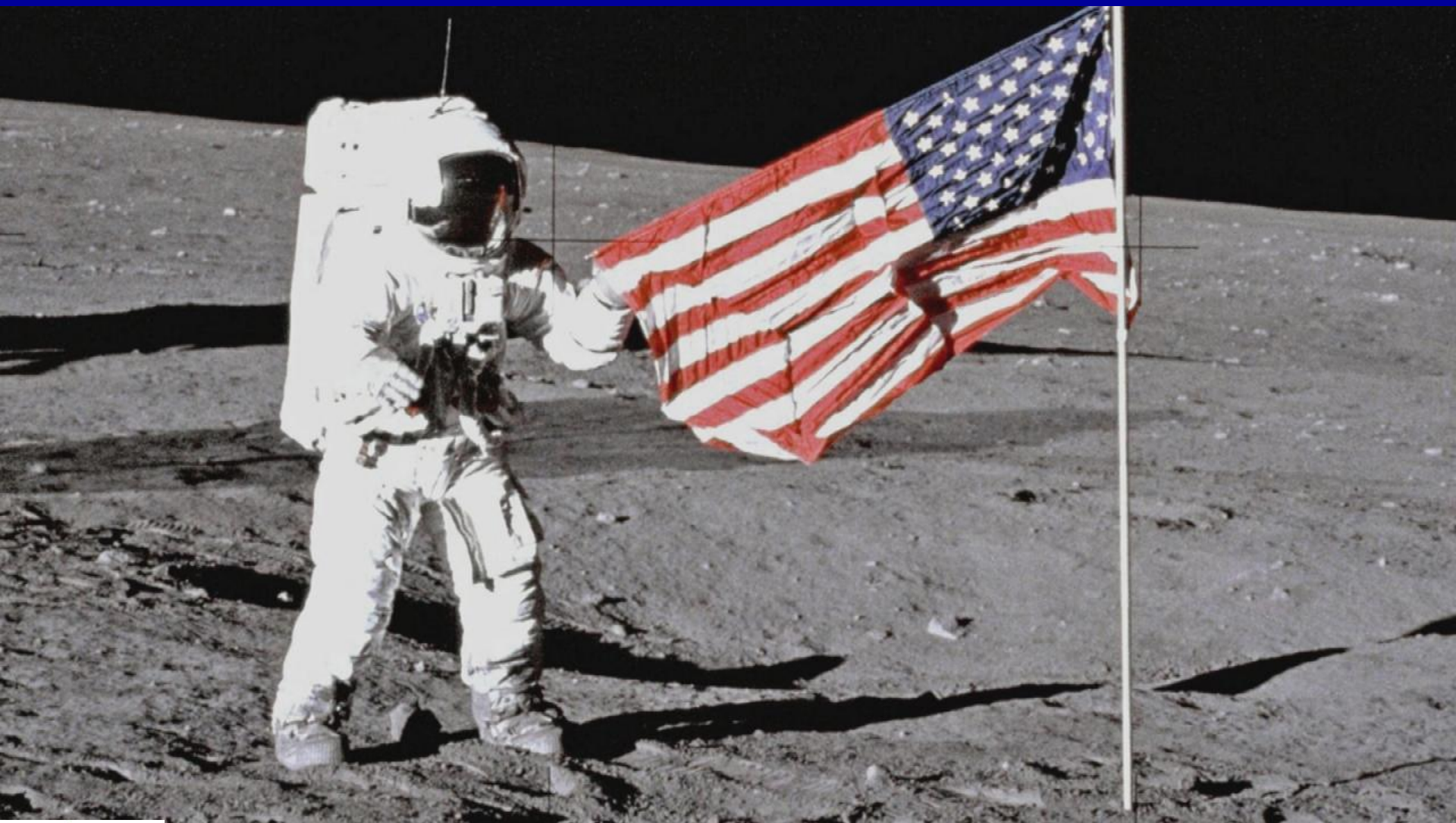
- New England Fisheries Management Council
- Atlantic States Marine Fisheries Commission

STATE AUTHORITIES

- Department of Environmental Protection
- Department of Marine Resources
- Inland Fish and Wildlife
- Department of Agriculture
- Department of Health and Human Services

FEDERAL OVERSIGHT

- Clean Water Act
- National Environmental Policy Act
- Coastal Zone Management Act
- Rivers and Harbors Act
- Endangered Species Act
- Lacey Act
- Migratory Bird Treaty Act
- Marine Mammal Protection Act
- Magnuson-Stevens Fisheries & Conservation Act
- Sustainable Fisheries Act
- Food Drug & Cosmetic Act
- Nonindigenous Aquatic Nuisance Prevention & Control Act
- Federal Insecticide, Fungicide and Rodenticide Act
- Virus-Serum-Toxin Act
- Federal Sanitation Standards (HACCP) Regulations
- National Food Safety Act
- National Marine Sanctuary Act.



.....OR IS IT?

MAINE AQUACULTURE ASSOCIATION

NATIONAL AQUACULTURE ECONOMIC DEVELOPMENT PROGRAM

STRUCTURE

- PUBLIC/PRIVATE PARTNERSHIP
- MULTIAGENCY WITH AG AND COMMERCE LEADERSHIP
- SPECIFIC GOALS AND TIMELINES
- ASSIGNED RESPONSIBILITIES WITH RESOURCES
- REGULAR ASSESSMENT SCHEDULE WITH METRICS
- SCIENTIFIC AND ECONOMIC ADVISORY BOARDS



NATIONAL AQUACULTURE ECONOMIC DEVELOPMENT PROGRAM

CORE COMPONENTS

- INVESTMENT INCENTIVES
- RISK MANAGEMENT PROGRAMS
- FINANCING MECHANISMS
- TRAINING PROGRAMS
- BROODSTOCK AND HATCHERY PROGRAM





Directing the Future of Maine's
Aquaculture Industry:
An Economic Development Plan



- INDUSTRY DRIVEN
- COMPREHENSIVE
- BASELINE SWOT
- CLUSTER ANALYSIS
- FORESIGHT VISIONING 20YR.
- SCENARIO PLANNING
- SPECIFIC GOALS
- REQUIRED RESOURCES
- MEASUREMENT METRICS

20 YEAR AVERAGE ANNUAL GROWTH RATE



8%



1%



2%



WHAT IS IT GOING TO TAKE?

- SECURITY OF TENURE
- REASONABLE NONDUPLICATIVE ENVIRONMENTAL REGULATIONS
- DEMONSTRATION/TRAINING FARMS
- SUBSIDIZED HATCHERIES & BREEDING PROGRAMS
- RISK MANAGEMENT TOOLS
- INVESTMENT INCENTIVES
- POLITICAL WILL AND LEADERSHIP



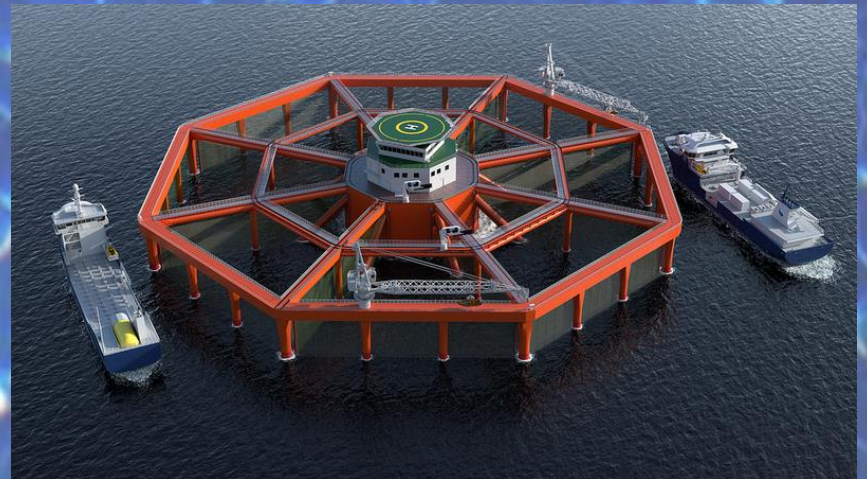
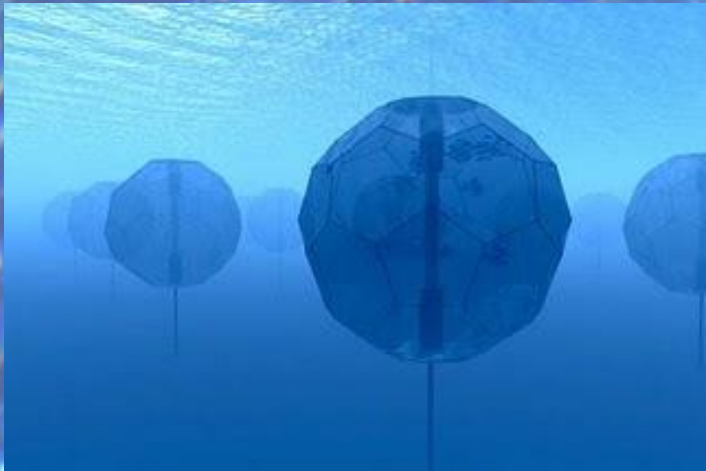
WHERE IS THE SCIENCE NOW?

ESCAPES: MANAGEABLE, GOOD MODELS, CMS

NUTRIENTS: MANAGEABLE, BUT DON'T REINVENT WHEEL

DISEASE: MANAGEABLE, BREEDING VACCINES, PHAGES

USER CONFLICTS: SPACE & MARKETS, OVERHYPED

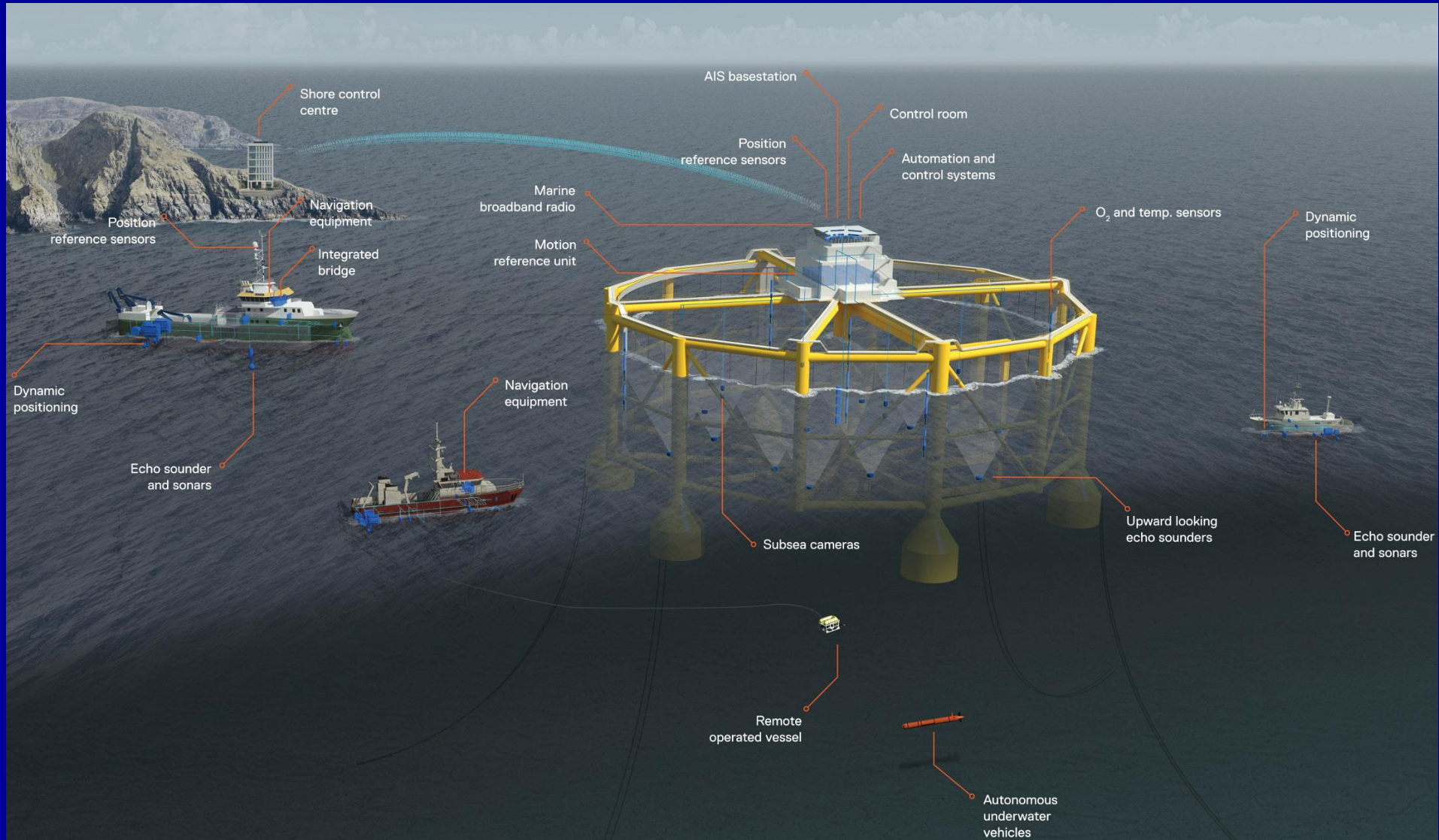


10 KEY FARM BMP COMPONENTS

- **SITE SELECTION**
- **AREA MANAGEMENT AGREEMENT**
- **SOLID AND LIQUID WASTE MANAGEMENT**
- **NOISE/VISUAL IMPACT MANAGEMENT**
- **HUSBANDRY/OPS MANAGEMENT**
- **ANIMAL/PLANT HEALTH MANAGEMENT**
- **ESCAPE PREVENTION AND RESPONSE**
- **PREDATOR DETERRENCE/MANAGEMENT**
- **COMMUNITY ENGAGEMENT**
- **COMMUNICATIONS PLAN**



WHAT'S IT GOING TO LOOK LIKE?





藍晴



LONG: The vessel Høydal is 70 meters long. (Illustration: NSK Ship Design)

Contact us



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