SHELLFISH AQUACULTURE
BEST MANAGEMENT PRACTICES

MARINE RESOURCES COMMITTEE
UPDATE

17 JULY 2018
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FISH & GAME COMMISSION
DEPARTMENT OF FISH AND WILDLIFE
**Shellfish Aquaculture BMPs Must Balance**

- **Seafood Demand**
- **Business Enterprise**
- **Public Trust Tidelands**

**With Commitment**
**Change is Constant:**

- Methods & Technology
- Market & Business
- Ocean Conditions
- Neighbors & Society

**Anticipate Change & Adaptively Manage**

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**Best Management Practices**

- Public Input
- Lessons from Others
- Scientific Review

UCSB student team funded and focused on this topic
BEST MANAGEMENT PRACTICES FUNDAMENTAL GOALS

- **Locate, design, and operate farms appropriately**
- **Maintain healthy ecosystems:** wildlife, habitat, water quality, and substrate
- **Reduce ocean litter / marine debris / pollution**
- **Prevent disease, invasive species spread (biosecurity)**
- **Be a good neighbor & community citizen**
**Best Management Practices**

**Emergent Themes**

- **Locate, Design, and Operate Farms Appropriately**
  - Siting Considerations (Human Health, Wildlife, Environment, User Conflicts)
  - Gear Design & Installation (Proven? Tested? Compliant? Experimental?)
  - Materials, Fasteners, Durability, Disposal
  - Maintenance & Operational Preparations, Practices, Responses
  - Vessel & Vehicle Use (Water-Land-Air), Foot Traffic
  - Worker Safety
  - Navigational Hazards
  - Public Access (Navigation, Fishing, Recreation, Commerce)

- **Maintain Healthy Ecosystems**
  - Water Quality
  - Substrate & Benthic Impacts
  - Wildlife Interactions (Birds, Whales, Turtles, Other Mammals)
  - Carrying Capacity
  - Ecosystem Services (Nutrient Cycling, Carbon Sequestration, Habitat, etc.)
**Best Management Practices**

**Emergent Themes**

- **Reduce Ocean Litter / Marine Debris / Pollution**

  Practices to reduce ocean litter tied to:

  - Fundamental System Design
  - Operational Practices – Routine and Before/After Storms
  - Company Standards and Worker Training

- **Prevent Disease, Invasive Species Spread (Biosecurity)**

  Control Movements of Stocks
  Seed and Broodstock Sourcing
  Disease Response Measures
  Biofouling Response Measures
BEST MANAGEMENT PRACTICES
EMERGENT THEMES

• BE A GOOD NEIGHBOR & CITIZEN OF COMMUNITY
  PUBLIC’S RECREATIONAL & COMMERCIAL PURSUITS RESPECTED
  GROWERS’ BUSINESS ASSETS PROTECTED
  COMMUNITY-BASED AND GROWER-INITIATED CLEAN-UP PARTICIPATION
  COMPLIANT WITH REGULATORY REQUIREMENTS

BEST MANAGEMENT PRACTICES
EXISTING MANAGEMENT FRAMEWORK

MANY CONCERNS ADDRESSED BY EXISTING CODE & REGULATIONS

FISH & GAME CODE
TITLE 14 REGULATIONS
CEQA
CA COASTAL ACT
CLEAN WATER ACT - WATER BOARDS
RIVERS & HARBORS ACT - US ARMY CORPS OF ENGINEERS
ESA, MMPA, M-S ACT - NOAA PROTECTED RESOURCES DIVISION
US COAST GUARD
CA DEPT OF PUBLIC HEALTH & NATIONAL SHELLFISH SANITATION PROGRAM
### Best Management Practices

#### Existing Management Framework

**Many concerns addressed by existing code & regulations**

- **Siting** - Lease application process (CEQA + F&G Commission Hearings) F&G Commission
- **Sensitive habitat protections** - CEQA + NEPA processes, USACE consultation w/ NOAA
- **Min. navigational hazards** - US Coast Guard permit: private aids to navigation + F&G Code
- **Reasonable public access** - F&G Code Sec. 15411 + 15413; Coastal Act (CCC)
- **Water quality** - Clean Water Act (USACE + Water Boards)
- **Substrate quality & benthic impacts** - Clean Water Act (USACE)
- **Prevent disease, and spread of invasive species** - Title 14 regulations (DFW)
- **Spill prevention and response** - Lease terms & CEQA (FGC)

#### Revised Management Framework

**Remaining themes for possible BMP categories**

- **Reduce ocean litter / marine debris** - Influenced by many practices themes
- **Wildlife interactions** - Intertidal vs. offshore: best practices vary;
  - Birds, whales, seals, turtles, listed species
- **Gear design & installation** - Lease terms (FGC) + Coastal Act (CCC)
  + Flexibility to innovate, adaptively manage
- **Maintenance & operational preparations, practices, responses**
  - Routine, pre- & post-storms,
- **Vessel & vehicle use (water-land-air): foot traffic**
- **Company standards and worker training**
- **Clean-up participation** - Community-based and grower initiated
ROUTE TO RULEMAKING

REMAINING QUESTIONS FOR EFFECTIVE REGULATION:

• Enforceability and commitment (buy-in by growers and agency staff)?
• CEQA question – regular cycle of BMP plan approval - exempt?
• Effective and efficient complement to lease and permit requirements?
• Right themes?

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