Point Sources and Pollutants: Using the Clean Water Act to Regulate Offshore Aquaculture Discharges

Environmental Law Institute

Webinar

December 5, 2012

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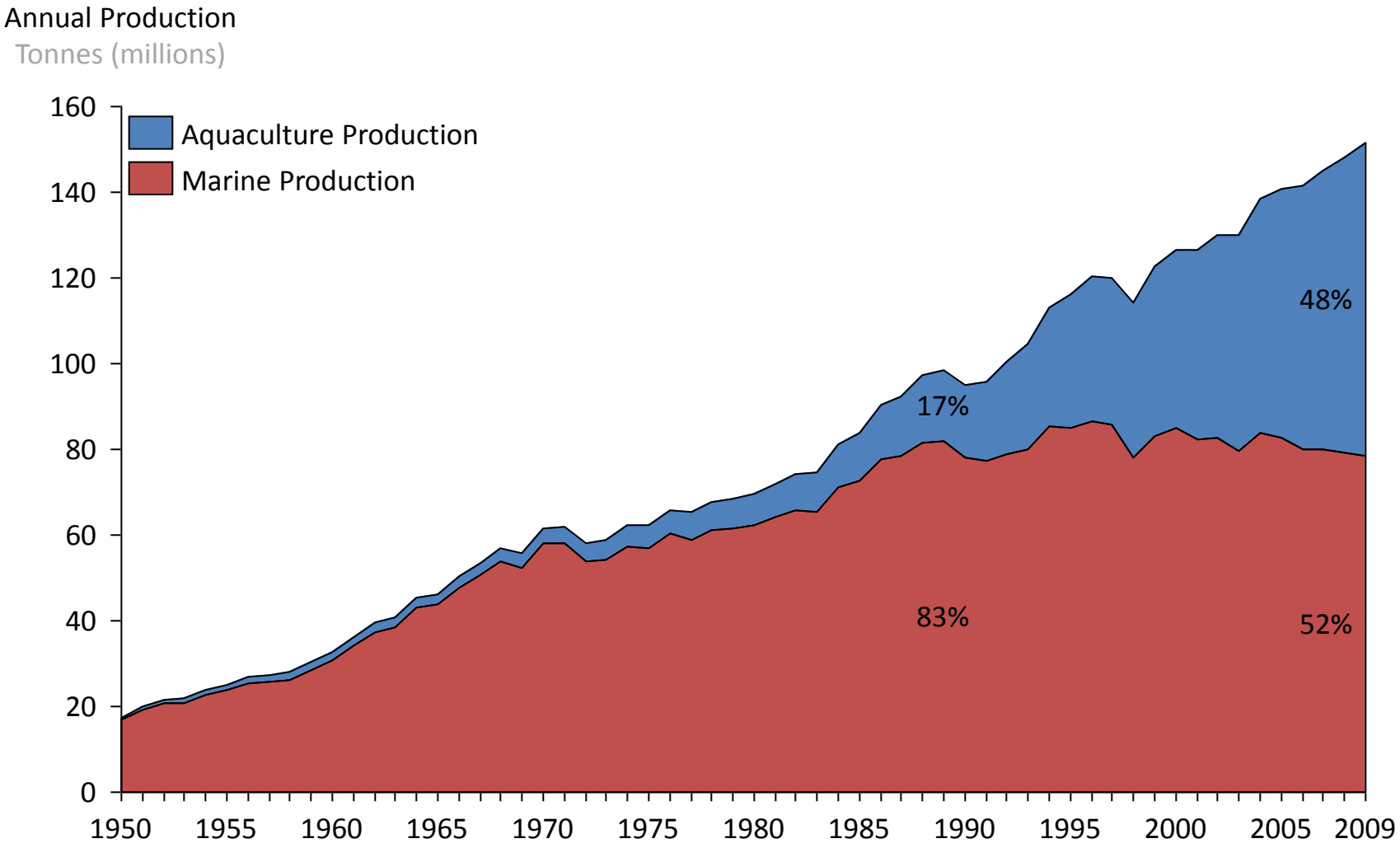
Introduction to Offshore Aquaculture and the Clean Water Act

Read Porter
Environmental Law Institute

www.eli-ocean.org/fish/offshore-aquaculture

Over the last 20 years, the share of total seafood production from aquaculture has increased from 17% to 48%. Probably over half of total food fish today.



Source – FAO FISHSTAT. Excludes freshwater wild capture landings and higher order ISSCAAP groups from wild capture landings

Open Ocean Aquaculture

- Pelagic fish in net pens in the EEZ
- Shellfish

Image credit: deconcrete (available at http://www.deconcrete.org/wp-content/uploads/2010/11/fish-farming-nationalgeographic.jpg)

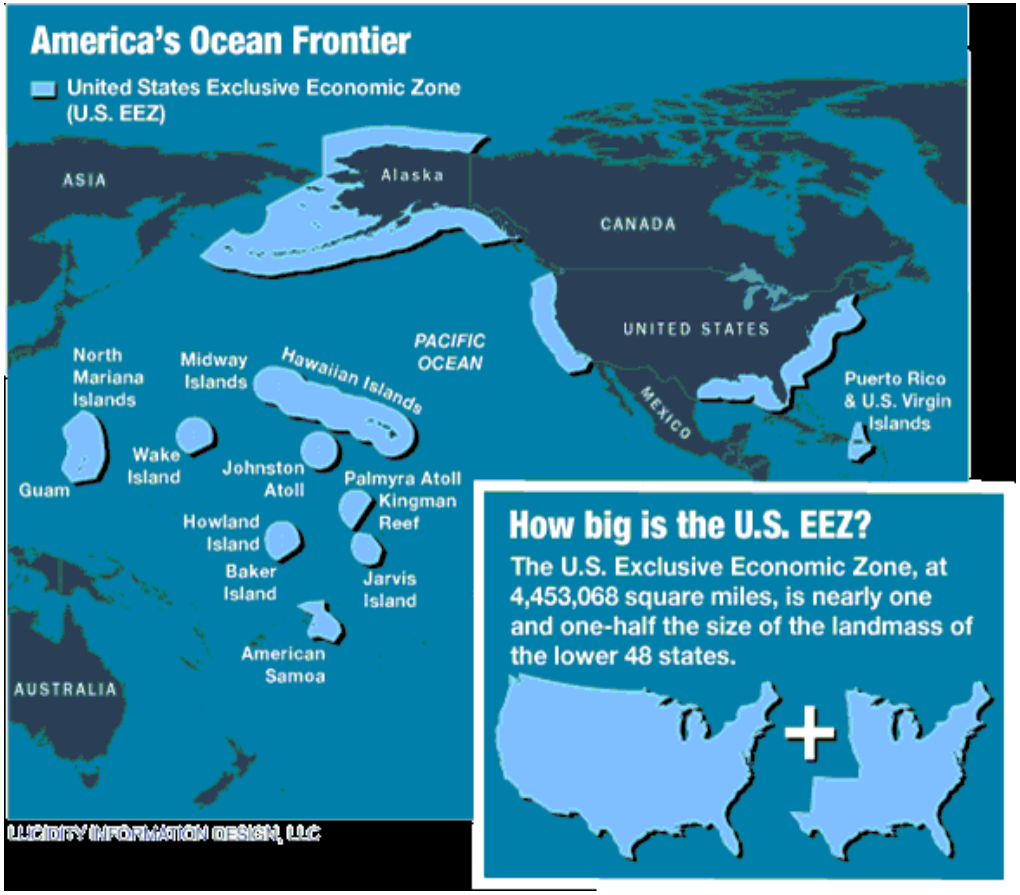
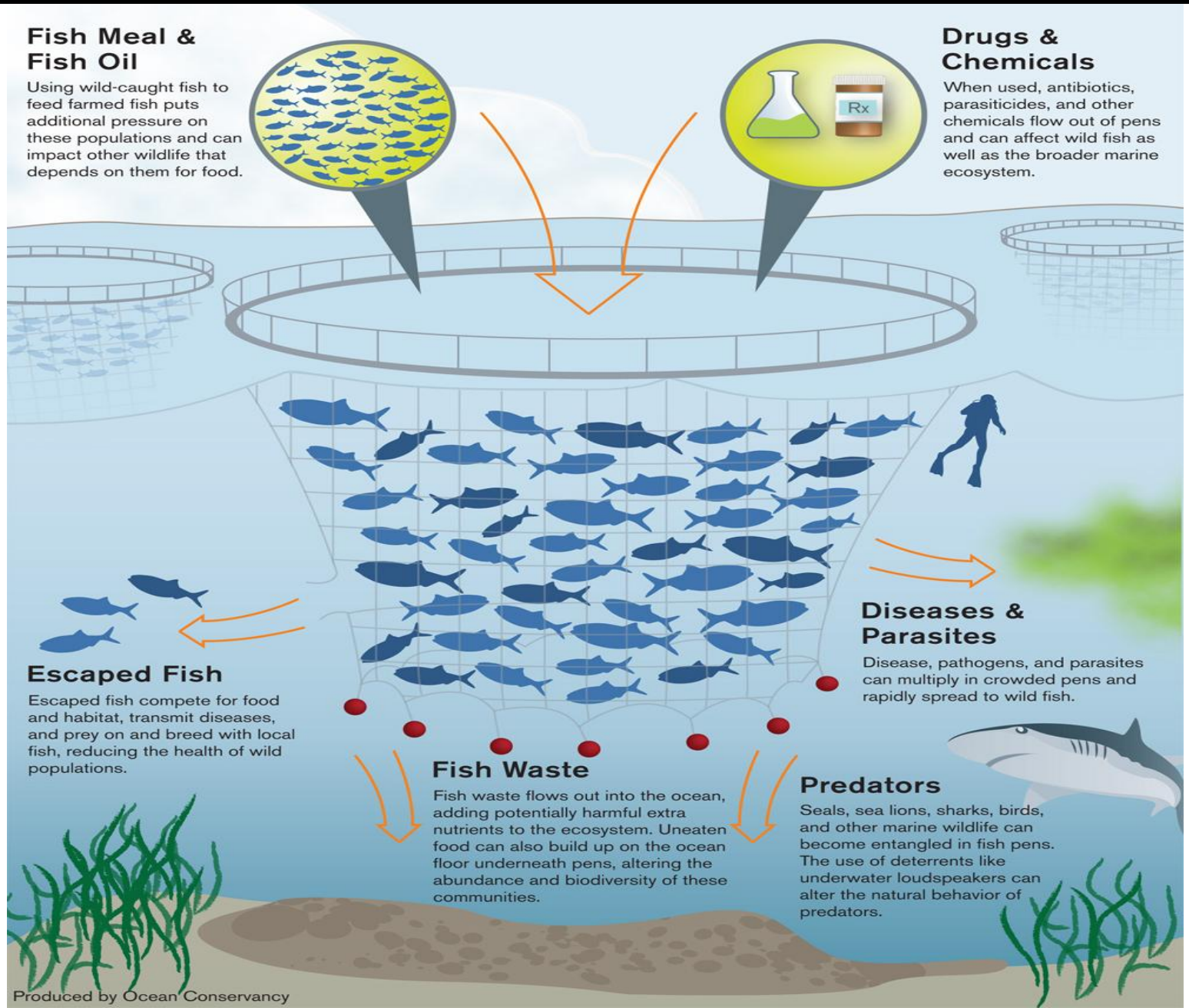
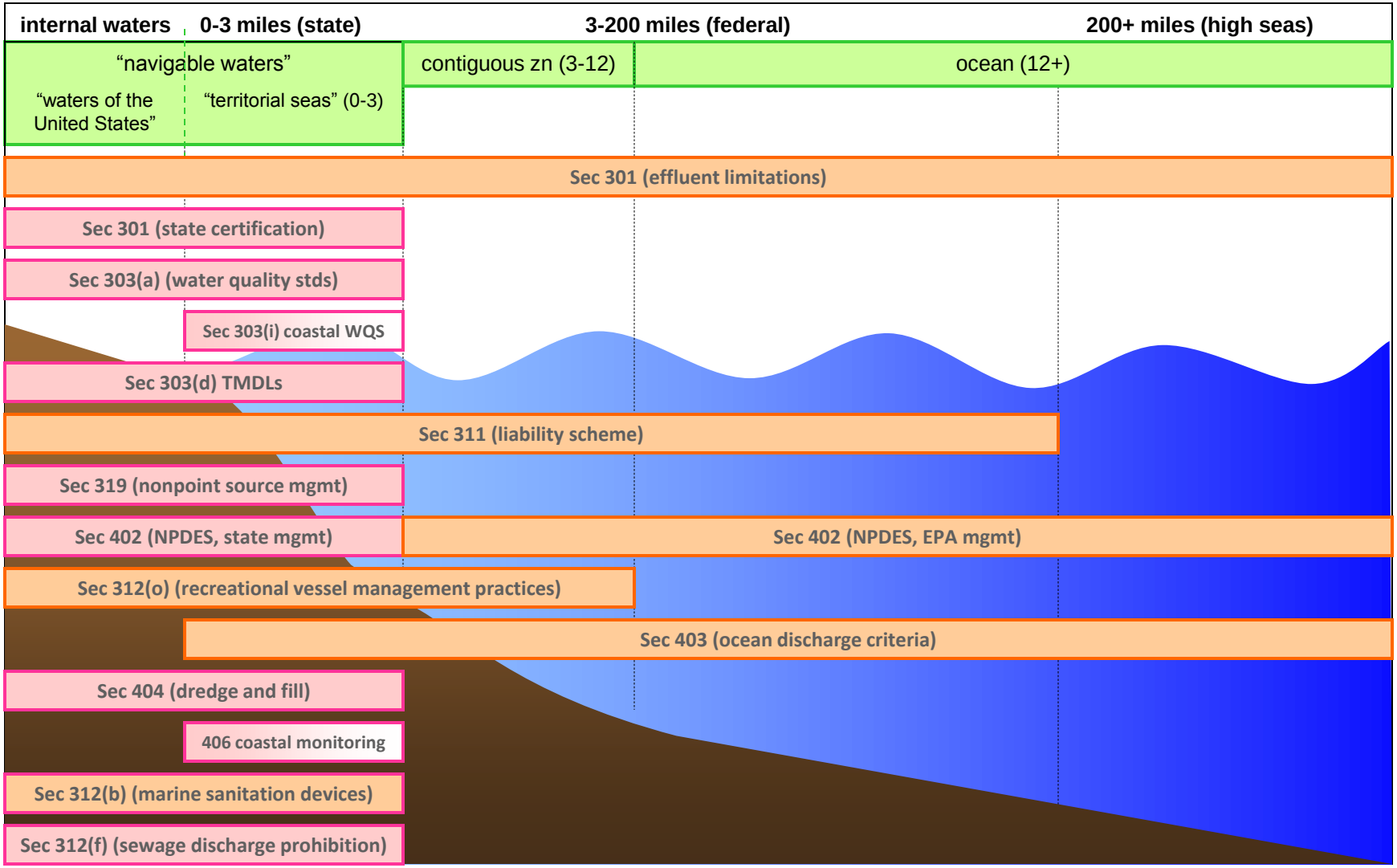


Image credit: The Ocean Doctor (available at http://oceandoctor.org/wp-content/uploads/2007/07/eez-usa.gif)

Environmental Impacts of Ocean Aquaculture



CLEAN WATER ACT AND THE OCEAN



KEY

- general CWA definitions
- State delegated authority
- Federal agency is primary authority

For coastal water WQS & monitoring, limited to areas of contact (swimming, bathing, surfing, etc)

NPDES Permits for offshore aquaculture

- A permit is required for:
  - **Addition**
  - of a **pollutant**
  - from a **point source**
  - into federal ocean waters.
- *Most discharges from aquaculture constitute "addition of a pollutant"*
  - Excess food
  - Waste / Fecal matter
  - Chemical applications
  - **Escaped organisms?**

Aquaculture facilities are point sources if they exceed size thresholds ("CAAP facilities")

Annual Production	Point Source?	Basis for Permit Limitations
0-20,000 lbs	Case-by-case determination	N/A
20,000 – 100,000 lbs (coldwater facilities)	Yes; CAAP	Best Professional Judgment + Ocean Discharge Criteria
> 100,000 lbs	Yes; CAAP	Effluent Limitation Guidelines + Ocean Discharge Criteria

Most aquaculture permits based on Effluent Limitation Guidelines (ELGs)…

- Narrative ELGs require creation of a Best Management Plan
- States often add site-specific numeric limits - not available in federal ocean waters.

…and must comply with Ocean Discharge Criteria (§403)

- EPA must determine if discharge will cause "**unreasonable degradation** of the marine environment" before issuing a permit.

Find out more:

www.eli-ocean.org/fish/offshore-aquaculture

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Fish as Pollutants:
Limitations of and Crosscurrents in Law, Science and Management

Jeremy Firestone
University of Delaware, School of Marine Science and Policy

Broad Questions

- Are/should fish be treated as Clean Water Act "pollutants" in some contexts?
  - Aquaculture Escapes?
  - Sport Fish Introductions?
  - Ballast Water Introductions?
- What are the biological, legal, and philosophical implications of such a notion for the above activities?
- Should a new policy instrument be designed to regulate these non-conventional "pollutants"?

Research Context: Atlantic Salmon (Salmo Salar) Mariculture

- In net pens located off the Maine coast in state waters
- Appealing milieu to consider questions
  - Use of non-native stocks
  - Judicial developments
  - Documented escapes
  - Endangered native/wild populations

Native Range of Wild Atlantic Salmon Populations

- New England Rivers
  - Over 200 years ago, more than 500,000 returned each year to spawn

- Numbers now in 100s
  - Include wild & hatchery origin

Atlantic Salmon Mariculture at turn of the Century

- Worldwide
  - Increased in value nearly 1,600 percent from 1984 to 1999 in Marine and Brackish waters
    - From $150 million to almost $ 2.5 billion
- US
  - Increased 595 percent by weight from 1989-99
- Maine
  - About 20% of US industry
  - ~$60M in value

Farmed Atlantic Salmon Current Worldwide Picture

- Production exceeds 1M tonnes

- > 50% of total global salmon market

Some Maine Escapes

- 170,000 non-North American origin at Stone Island off of Maine (Dec 2000)
- 2000 at Birch Point (Nov 2003)
- Recently three farmed salmon were found in the Dennys River in Maine

Some Potential Impacts of Escapees

- Genetic contamination of the wild genome
- Competition w/wild fish for food & favorable space
- Predation on wild fish
- Disease and parasite transmission

What is a CWA "Pollutant"?

"dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, *biological materials*, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water."

33 U.S.C. §1362(6)

USPIRG Cases (District of Maine, Feb. 20, 2002)

- "Conventional" pollutants are regulated under CWA
  - Feces
  - Uneaten feed, pigments and antibiotics
  - Pesticide (to kill sea lice)
  - Copper (net anti-foulant)

USPIRG Cases (2)
Escapes

- Escapees regulated under the CWA given origin and distinguishable from wild stocks
  - Non-native stocks
  - Blunt fins—due to stress associated with crowded pens
  - Deformities—due to physical injuries or unbalanced nutrition

USPIRG Cases (3)

- Court did not rely on
  - Potential for genetic pollution
  - Endangered status of wild Atlantic Salmon stocks

USPIRG v. Heritage Settlement

- Heritage Settlement
  - Forego non-North American stocks & transgenics
  - Limit stocking densities
  - Fallow salmon farms
  - Undertake measures to prevent escapes
  - Pay $750,000

USPIRG v. Atlantic Salmon of Maine

- Feb. 2003 Order preventing introduction of new fish
  - ASM Stocks 100,000 smolt in net pens (April)
  - Held in contempt (May)
  - Maine General Permit – Non-native Provisions (June)
    - Authorizes to July 31, 2004
    - Thereafter permittee must prove that native stock is not available in sufficient quantities to match prior stocking level
  - Affirmed by First Circuit (August)
    - "Companies do not challenge the ultimate finding that non-native species are a pollutant and can be banned."

National Academies (Spring 2002)

- Gulf of Maine Distinct Population Segment (DPS) is genetically distinct

- Farmed Fish Differ in Genetic Makeup
  - Nonnative strains
  - Breeder selection
  - Inadvertent selection due to novel environment

APHETI(Taylor Mussel Farm) 299 F.3d 1007 (9th Cir. 2002)

- "Biological materials" (and hence CWA "pollutants") are limited to waste products of some human or industrial process

- Mussel shells, feces and other byproducts are
  - From "natural growth and development of mussels" rather than from a "waste product of a transformative human process"

APHETI (Taylor Mussel Farm continued)

- 9th Circuit implies term includes the discharge of "live fish, dead fish and fish remains"
  - Relying on NWF v Consumers Power (6th Cir. 1988)
- Followed by Northwest Environmental Advocates v. EPA
  - Includes discharge of ballast water containing introduced species (9th Cir. 2008)

Taylor Mussel Farm 2012 Expansion Request

- Proposal to add 58 rafts denied
  - Failure to properly consider ***cumulative impacts*** on:
    - Dissolved Oxygen levels
    - Benthic Life
    - Potential for genetic pollution by Gallo mussels

NOAA Code of Conduct for Mariculture Operations (2003)

- Precautionary approach as guiding principle
- Emphasis on preventing escapes
- Remedial action to address significant escape incidents

EPA ***Proposed*** Effluent Guidelines and Performance Standards (2002)

- Persons operating certain net pen systems must use best management practices to minimize the potential unintended escape of non-native species.
  - E.g., installing double netting on net pens
- Would mandate non-native escapement plans

Non-native aquatic animal species

- An individual, group, or population of a species:
  - (1) Introduced from outside its historic or native geographic range; **and**
  - (2) Threatens native aquatic biota

The term excludes species raised for stocking by public agencies [Proposed 40 CFR 451.2(k)]

EPA Final Effluent Limitations and Performance Standards

- Eliminated requirements regarding escapes

Management Implications

1. Atlantic salmon hatchery operations that support mariculture should relocate to rivers outside of the Gulf of Maine DPS

   – Will not be biologically imprinted with the same biological markers as endangered wild populations

2. In the short-term, Atlantic salmon mariculture facilities should move further offshore into federal waters to minimize potential ecological harm and water-use conflicts

Management Implications (2)

3. In the long-term, offshore cage aquaculture should be phased out unless bio-security can be ensured

4. Congress should consider passing separate legislation regulating the intentional and unintentional introduction of fish to US waters

Management Implications (3)

5. Focus on improving water quality to the point where native fish that historically were dominant are once again abundant rather than managing those ecosystems for fish that are relatively unaffected by degraded water quality

Questions and Comments

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I acknowledge the contribution of Robert Barber, article co-author

Article available at 78 Wash. L. Rev. 693 (2003) and upon request

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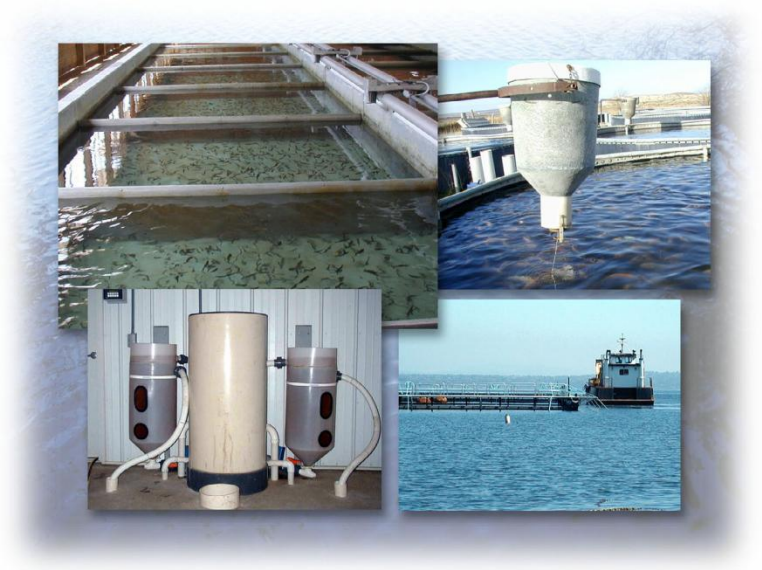
Office of Science & Technology

… applying science & technology to protect water quality

Effluent Guidelines Regulation of the Concentrated Aquatic Animal Production Point Source Category



Janet Goodwin, Chief
Technology & Statistics Branch
December 5, 2012

Outline

- Overview of the Clean Water Act and the Effluent Limitations Guidelines (ELG) Program
- Definition of Concentrated Aquatic Animal Production (CAAP) Facilities
- Overview of the CAAP Effluent Guideline
- ELG Requirements for Open Water (Net Pen) Facilities
- Questions

The Clean Water Act

- Established a technology-based approach for controlling discharges from point source categories
  - ❑ Called Effluent Limitations Guidelines
- Considers several levels of control
  - ❑ Best Practicable Control Technology (BPT)
  - ❑ Best Available Technology Economically Achievable
  - ❑ Best Conventional Pollutant Control Technology (BCT)
  - ❑ Best Available Demonstrated Technology applied to new sources

Effluent Limitations Guidelines

- National industrial wastewater regulations for direct discharges and indirect discharges to municipal treatment facilities
- Control the discharge of pollutants to waters of the United States
- Technology-based - - limits are determined by assessment of the pollution reduction capability of wastewater treatment technologies
- Economically Achievable
- *Not* based on the water quality of individual receiving waters

Concentrated Aquatic Animal Production

- CAAPs are point sources defined at 40 CFR 122.24

"means a hatchery, fish farm, or other facility which meets the criteria in appendix C, or which the Director designates under paragraph (c) of this section"

Appendix C states, " A hatchery, fish farm, or other facility is a concentrated aquatic animal production facility for purposes of Section 122.24 if it contains, grows, or holds aquatic animals in either of the following categories:

(a) Cold water fish species or other cold water aquatic animals in pond, raceways, or other similar structures which discharge at least 30 days per year but does not include:

(1)Facilities which produced less than 20,000 pounds of aquatic animals per year and

(2) Facilities which feed less than 5,000 pounds of food during the calendar months of maximum feeding

Concentrated Aquatic Animal Production

- Appendix C continued:

(b) Warm water fish species or other warm water aquatic animal in pond, raceways or other similar structures with discharge at least 30 days per year, but does not include:

(1) Closed ponds which discharge only during periods of excess runoff; or

(2) Facilities which produce less than 100,000 pounds of aquatic animals per year.

"Cold water aquatic animals" include but are not limited to, the *Salmonidae* family or fish; e.g., trout and salmon

"Warm water aquatic animals" include but are not limited to, the *Ameiuride*, *Centrarchidae* and *Cyprinidae* families of fish; e.g., respectively, catfish, sunfish and minnows.

The CAAP ELGs

- EPA completed this rule on June 20, 2004, 40 CFR Part 451
- The ELGs require *management practices and record-keeping activities* rather than numeric limits
- The rule applies to
  1. Flow through and recirculating facilities (Subpart A)
  2. Net pen facilities (Subpart B)

Net Pen ELG Requirements

•Net pen facilities are defined as a culture system that uses suspended or floating systems to culture fish or shellfish. These systems may be located along a shore or pier or may be anchored and floating offshore. Net pens and cages rely on tides, currents and other natural water movement to provide a continual supply of high-quality water to the cultured animals

Net Pen ELG Requirements

- Net pen systems are unique point sources because there is not defined point of discharge

- Issues that have been raised by this type of aquaculture include:
  - ❑ Discharge of excess feed and feces causing benthic smothering
  - ❑ Escape of the cultured species interfering and competing with native species
  - ❑ Spread of disease or parasites to native species
  - ❑ Release other inputs (e.g., drugs) used in the production of the species

Net Pen ELG Requirements

- The ELG established best management practices and recordkeeping requirements to ensure the net pens are managed in a way that minimizes the discharge of pollutants and ensures proper tracking of activities to determine compliance

Net Pen ELG Requirements

- Controls on feed and other solids discharges:
  - ❑ Employ efficient feed management
  - ❑ Employ active feed monitoring
  - ❑ Collect, return to shore all feed packaging materials, and waste rope and netting
  - ❑ Remove and dispose of mortalities on a regular basis
  - ❑ Minimize any discharge associated with transport or harvesting the aquatic animals

Automatic feeder

Net Pen ELG Requirements

- Controlling escapes—reporting failure or damage to the containment structure
  - ❑ The permitting authority defines what is reportable damage
  - ❑ Oral report within 24 hours of discovery
    - Must report the cause of the failure
    - Identify the materials that have been released
  - ❑ Written report within 7 days
    - Document the cause of the failure
    - Estimate the time elapsed until the failure was repaired
    - Estimate the materials released
    - Describe steps being taken to prevent a recurrence

Net Pen ELG Requirements

- Use of Drugs
  - ❑Report within 7days of agreeing to participate in a study of Investigational New Animal Drugs (INAD) study
    - Identify the INAD to be used, the method of use, the dosage and the disease or condition to be treated
  - ❑Oral report preferably in advance but no later than 7days after initiating the use of an INAD or extralabel drug
  - ❑Written report within 30 days after initiating use

Net Pen ELG Requirements

- Good Housekeeping
  - ❑Materials storage: in a manner designed to prevent spills
    - Implement procedures for properly containing, cleaning, and disposing of any spilled material
  - ❑Maintenance: inspect production system on a routine basis, identify and repair any damage to the facility

Net Pen ELG Requirements

- Reporting Spills
  - ❑Oral report within 24 hours any spill of drugs, pesticides, or feed that results in a discharge
    - Identify material spilled and quantity
  - ❑Written report within 7days

Net Pen ELG Requirements

- Record Keeping, Training and Reporting
  - ❑ Maintain records for net pens documenting feed amounts, estimates of the number and weight of the aquatic animals in order to calculate representative feed conversion ratios
  - ❑ Keep records of net changes, inspections and repairs
  - ❑ Train all relevant personnel in spill prevention and how to respond to spills, also train staff on proper operation and cleaning of the net pen including feeding procedures and equipment
  - ❑ Document all these practices in a Best Management Practices Plan and certify that the plan has been developed

Questions?

- For more information see our website:

http://water.epa.gov/scitech/wastetech/guide/aquaculture/index.cfm

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