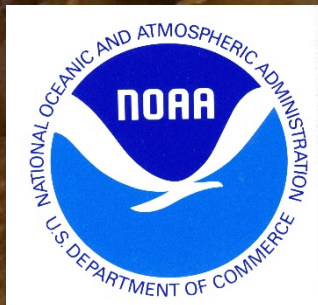


Addressing Public Health Concerns with Seaweed Aquaculture Production and Processing

Connecticut's Story



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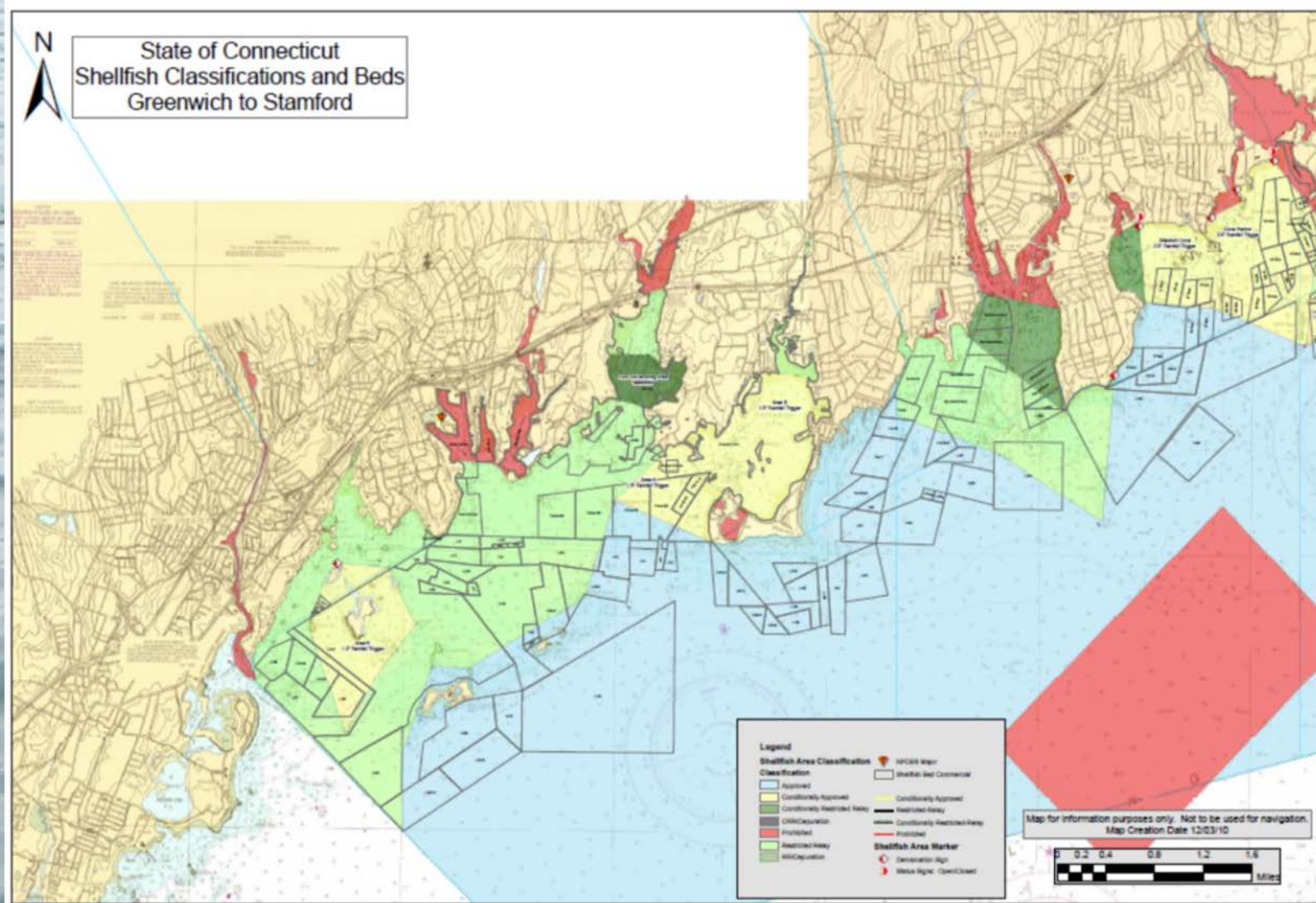


Aquaculture in Connecticut

- Mostly shellfish, some finfish and some seaweed
- > 70,000 acres leased grounds used for cultivation
- Some for more than 100 years
- \$30M industry
- 300+ jobs – small, family-owned
- 95% bottom culture
- Clams (450k bushels) and oysters (200k bushels)



Shellfish Classification Area



Background

- 2013 - Outbreak of *Vibrio parahaemolyticus* in shellfish
 - Same growing areas for kelp
- All aquaculture products require HACCP plan
 - Kelp sold as a Raw Agricultural Commodity
- Lack of federal food safety guidelines

A person wearing a blue cap and sunglasses is holding a large piece of seaweed. The background shows a vast ocean under a clear blue sky. The seaweed is long and thin, with a ruffled, leaf-like texture, and is held vertically. The person is wearing a white shirt and a blue cap. The overall scene is outdoors, likely on a boat or a pier, with the ocean and sky visible in the background.

Need for Guidance

- First commercial harvest in 2013
- No comparison of food safety hazards
 - Production
 - Processing
- Research – focusing on bioextraction
 - Raises additional food safety concerns
- Follow shellfish standards
 - Approved/Conditionally approved waters

Preliminary Research

- Sea Grant Development funds
- Analyze raw kelp
 - Chemicals (heavy metals, PCBs, pesticides)
 - Pathogens (*Vibrio sp.*, *E.coli*, *Shiga*, *Salmonella*, *Shigella*, HPC Standard Plate Count, Total Coliform, Fecal Coliform)
- Results – harvest and sale as a raw agricultural commodity

Shelf-life Studies

- Time/temperature abuse
 - 8hr, 24hr, 48hr
 - *Vibrio* detected
 - Other pathogens increased
 - Chemicals
 - Within acceptable levels for consumption
- Collect data for 3 additional years
- Developed guidance for raw kelp production

The background of the slide is a close-up photograph of seaweed, likely kelp, floating in clear blue water. The seaweed is a golden-brown color and has a textured, fibrous appearance. The water is bright and clear, with some light reflections. The overall scene is natural and serene.

Processed Kelp

- Blanched kelp noodles
 - Drying/dehydration
 - Pathogens within acceptable levels with adequate storage post-processing
-
- Repeated processing trials for additional 3 years
 - Commercial food manufacturer
 - Investigated processing costs
 - Developed guidance for processing

Gracilaria tikvahiae

- Analyze chemicals and pathogens
 - Freshwater dips
- *Lyngbya* sp.
- Pb, Cr, As above acceptable levels for shellfish
- Pathogens
 - *Vibrio* detected
 - Others increased with temperature

- Dehydration analysis
 - Tank-cultivated only
 - Established food safety protocol for processing
- Guidance
 - Open-water *Gracilaria* **NOT** approved for human consumption
 - Serving size?

Guidance for Connecticut

- Cultivate in approved/conditionally approved waters
- 2 hours of harvest, keep on ice/mechanized refrigeration
- Maintain temperature control

- Tank-cultivated *Gracilaria* approved for consumption
- Maintain temperature control
- *Sea Vegetable Production and Processing in Connecticut: A Guide to Understanding and Controlling Potential Food Safety Hazards*

https://seagrant.uconn.edu/wp-content/uploads/sites/1985/2020/01/Seaweed-Hazards-Guide_Jan2020_accessible.pdf

Additional Challenges

- Post-harvest opportunities and infrastructure
- Available, established market outlets
- Production systems



www.SeaweedHub.org



NEEDS ASSESSMENT



SEAWEED SYMPOSIUM



STAKEHOLDER WORK
GROUPS



PRODUCTS



OUTCOME



Thank you!