Slide 1

Slide 2

State of the States Focus

- Farms & Landings
- Permitting & Regulations
  - Note: Seaweed farmers will need to obtain multiple permits and authorizations to get their farms up and running. Only the lead regulatory agency is listed for in each state.
- Post Harvest

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<table>
<thead>
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<th>EAST COAST</th>
<th>WEST COAST</th>
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<td>New Hampshire</td>
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This presentation is an overview and encourage you to reach out to corresponding states SG team lead for questions.
East Coast States
Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, and New York

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MAINE

FARMS & LANDINGS

200+ Sites permitted to grow seaweed or seaweed with shellfish. Large variability in the scale of these farm sites.

325,000 lbs Harvested in the 2019 season (wet weight).

Maine has 6 commercial seaweed nurseries.

Primary species under cultivation: Sugar Kelp (Saccharina latissima), Skinny Kelp (Saccharina angustissima), Winged Kelp (Alopecurus).

Maine also has a wild-harvest seaweed industry, which harvested 22,000,000 lbs in 2019 (mostly Rockweed).

Midcoast and island communities have recently increased and expanded kelp farms, diversifying traditional working waterfronts.

Farm sites are located along Maine's entire coastline, from Casco Bay to Downeast.

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Maine Department of Marine Resources (DMR)
https://www.maine.gov/dmr/aquaculture/
Maine DMR issues licenses and leases for conducting shellfish, seaweed, and finfish aquaculture.

- Licenses: Limited in size, low cost, need to be renewed annually.
- Leases: Larger in size (up to 100 acres) and may require a public hearing. Leases can be granted for up to 20 years and require application fees and rent fees ($100/acre/year).

Seaweed cultivated in Maine must be sourced from/native to Maine waters.

Example lease site
- Multiple parallel submerged longlines
- Marker buoys with lease information
- License sites consist of a single longline

The primary market for Maine seaweed is value-added food products. These are sold through food service, retail, and specialty retail.

Seaweed is sold: raw, dried, blanched, frozen, fermented.

Examples of products produced in Maine include seaweed salads, kelp, raw, seaweed rubs, seaweed jerky, snack bars, tea, and spice blends, as well as dried whole leaf, flakes, powders.

The market for "raw" or "fresh" products and seaweed is growing in Maine.
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NEW HAMPSHIRE

Slide 11

NEW HAMPSHIRE

3 Research Farms.
There are currently no commercial growers in NH.
Two of these farms are submerged longlines, with 6 lines per farm. The third system is an drifting raft that grows kelp, and
planted alongside mussels and finfish.
Primary species under cultivation: Sugar Kelp
(Saccharina latissima)
In fall 2020, NH will be deploying kelp farm 9 miles offshore, as a part of a project funded by the
Department of Energy.

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NEW HAMPSHIRE

PERMITTING & REGULATIONS

Lead Regulator:
New Hampshire Fish and Game (F&G)
https://www.wildlife.state.nh.us/
New Hampshire F&G issues leases for shellfish, seaweed, and finfish aquaculture.
• The fee for conducting aquaculture in NH is $500/submerged acre/year.
• Size of seaweed leases: Currently 1/3rd acre
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**NEW HAMPSHIRE**

**POST HARVEST**

The primary market for New Hampshire seaweed is culinary uses and food products.

- Seaweed is sold to local restaurants and breweries as well as processors in Maine.
- Seaweed is seasonally available in fresh/raw forms.
- Examples of products produced include kelp beer and fresh kelp in restaurant dishes, as well as value-added products produced in Maine.

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**MASSACHUSETTS**

**FARMS & LANDING**

- **4 Farms**
  - Three of these farms are standalone kelp farms and one farm is within an existing shellfish grant. Three of these farms are commercial farms and one is a research farm run by Woods Hole Oceanographic Institute.
  - **<1,000 lbs**
  - Less than 3 farms harvested for 2019 so this number is not official. This is the estimated level of commercial harvest for 2019.

Primary species under cultivation: Sugar Kelp (Saccharina latissima)

There is no commercial wild harvest industry.

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**PERMITTING & REGULATIONS**

- **Lead Regulator:** Massachusetts Division of Marine Fisheries (DMF)
  - [https://www.mass.gov/service-details/soft-shell-fisheries](https://www.mass.gov/service-details/soft-shell-fisheries)

Massachusetts DMF works directly with the municipalities and issues a Class 4, Type 2 Commercial Aquaculture Permit for seaweed.

Size of permitted farms: up to 60 acres.
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**Massachusetts**

The primary market for Massachusetts seaweed is Restaurants.

Seaweed is sold raw and fresh.

In Massachusetts, sugar kelp must be sold directly to a wholesale seafood dealer per Department of Public Health (DPH) food protection and DMF regulations.

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**Rhode Island**

Juvenile Kelp

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**Rhode Island**

10 Permitted Farms

10 farms are permitted in Rhode Island, but only 3 are growing kelp this year.

13,447 lbs

Sugar kelp landings for 2019.

Primary species under cultivation:

*Sugar kelp* (*Saccharina latissima*)

There is no commercial wild harvested industry.
PERMITTING & REGULATIONS

Lead Regulator:
Rhode Island Coastal Resources Management Council (CRMC)
http://www.crmc.ri.gov/aquaculture.html

Rhode Island CRMC issues shellfish and seaweed leases on state submerged land.
- Leases can be for 15 years, with yearly lease fees.
- Due to growth in shellfish aquaculture, the state caps the acreage of aquaculture activities in coastal ponds at 5% of the total open water surface area.

Size of permitted farms: 2 to 9.6 acres

FARMED SEAWEED IN RHODE ISLAND PRIMARILY GOES TO:
- Processors

Seaweed is sold: freshly harvested / raw.

A 2017 RI market study found that there was high interest from institutional buyers, but these buyers needed shelf-stable products at high volumes.

In Rhode Island, kelp processors ability to purchase fresh product is the limiting factor for kelp farms.
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Connecticut

Photo: Judy Benson / Connecticut Sea Grant

Gracilaria Research

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Connecticut

15 Permitted Sites.

Of these sites, 4 farms deployed sugar kelp seed string this year. In addition, Connecticut has 13 companies and 1 nursery.

Landings unknown: Connecticut does not require landings to be reported.

Species under cultivation: Sugar Kelp (Saccharina latissima) and Gracilaria (Gracilaria tikvahiae), in tank cultures only.

There is no commercial wild harvest industry.
Lead Regulator: Connecticut Department of Agriculture, Bureau of Aquaculture
https://portal.ct.gov/DOAG/Aquaculture1/Aquaculture/Seaweed/Seaweed

- Kelp only licenses are issued and are good for 5 years.
- Cultivation for seaweed is based on the Connecticut shellfish model and can only occur in approved or conditionally approved waters.
- Size of permitted farms: 2-9 acres.

The primary market for CT seaweed is Food and food products. Seaweed is sold: raw, blanched, and cut. Seaweed in Connecticut is sold as a Raw Agricultural Commodity. In addition, seaweed is sold as kelp noodles. Some of the product is sold as fertilizer.

Connecticut is investigating kelp powder for use as a food additive and in cosmetics.
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New York does not have any permitted commercial seaweed farms, but does have two research sites at Stony Brook University’s School of Marine and Atmospheric Sciences.

1000 lbs of sugar kelp was cultivated at 3 oyster farm sites.

Major species under cultivation: Sugar kelp (Saccharina latissima) and Gracilaria (Gracilaria tikvahiae). New York’s first kelp hatchery is located at SBU’s Southampton Marine Station. In 2019, the hatchery produced over 40 spools.
New York does not currently permit seaweed farms.

Prospective Lead Regulator:
New York State Department of Environmental Conservation
http://www.dec.ny.gov/63.html

Commercial seaweed cultivation in New York requires a change to the state Environmental Conservation Law (612).
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West Coast States
Alaska, Washington, Oregon, and California

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Photo: Gary Freitag
Kelp Nursery

Note: processing bottleneck; only two facilities (Kodiak & Ketchikan)

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22 Permitted Sites
As of May 2019, Alaska had 14 additional proposed farm projects, including amendments to existing farm operations.
~250,000 lbs
Produced in 2019-2018 landings were 68,276 lbs.
Primary species under cultivation: Sugar Kelp (Saccharina latissima) and Ribbon Kelp (Alaria marginata), and Bull Kelp (Nereocystis leutkeana)
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Photo: Alaska bull kelp farm showing lines of bull kelp and floatation

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Photo: Close up of bull kelp on the line

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PERMITTING & REGULATIONS

Lead Regulator:
Alaska Department of Natural Resources (DNR)
http://dnr.alaska.gov/mlw/aquatic/

Alaska DNR issues leases for aquatic farm sites in the state, including sites for aquatic plants.
- The lease term is 10 years.
- Lease fee is $650 for the first acre, $125 for each additional acre.

Alaska Department of Fish and Game issues permits for commercial wild harvest of seaweeds.
**Slide 37**

**Alaska**

**Post Harvest**

- **Food-use**
  - The primary market for Alaska seaweed is for human consumption.
  - Companies produce
  - **Value-added food products**
    - Roe seaweed salsa, hot sauce, and dried kelp seasonings.
    - Seaweed is sold: dried, blanched, and frozen.

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**Washington**

- **Open water farm = Hood Canal Mariculture**

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**Washington**

- **1 Open water Farm**
  - In 2019, this farm became Washington’s first open water commercial facility in 30 years.
  - 14,000 lbs were harvested in 2017.
  - Primary species under cultivation: Sugar Kelp (Saccharina latissima) and Bull Kelp (Nereocystis leutkeana).
- SolSea:
  - A tank culture operation and propagation facility at NOAA’s Manchester Research Facility. The system’s annual production is 28 metric tons of *Chondrus crispus*. 
Seaweed farm permitting in Washington State currently follows the Joint Aquatic Resource Permit Application (JARPA) path—the same process used for shellfish permitting. The Washington Interagency Shellfish Permitting Team (SIP) developed this flowchart and attendant narrative in 2014 to help growers navigate the process. NOTE: on June 11, 2020, a federal judge ‘vacated’ (i.e. revoked) all Nationwide 48 permits (one of the two types of permits available to Washington state growers) issued to Washington growers since 2017. Under this decision (reported by KNKX radio) all shellfish and seaweed farms must obtain ‘Individual’ Permits by the end of the year to continue operating.

CONTINUED NOTES SLIDE 41
The WA Dept. of Natural Resources is suggested here as an initial point of contact for people interested in farming seaweed in Washington state. As in other states, the WDNR is the leasing authority for state-owned lands, and is a thus a key gatekeeper for many forms of aquaculture. However, because WDNR does not have jurisdiction over the roughly half of Washington tidelands under private, federal or tribal ownership, this agency is not an appropriate starting point for all permit-seekers.

Ownership of the Washington state permitting process is murky. In 2016,
the SIP recommended that the state “designate a lead agency to manage shellfish aquaculture”, but this has not been accomplished. Local governments (i.e. county level and below) on the other hand, review all permits. The flowchart narrative states “the local government review process can be the most detailed and time consuming part of an aquaculture application. A pre-submission conference will explain the review process and help ensure that the applicant understands what information must be included in the application.” So ‘Local Planning Office’ might be a very good place for an applicant to start. A state-level agency with regulatory authority is the Washington Dept of Fish & Wildlife, which issues the ‘Aquatic Farm Registration Permit required of all commercial growers and sellers of shellfish and seaweed. The roles of counties and the WDFW (as well as all the other entities on the flowchart) are summarized in this table.
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Chris Langdon, lead researcher, holding a piece of west coast dulse bred at the Hatfield Marine Science Center.

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Currently, there are no ocean-based seaweed farms permitted in Oregon.

3 Land-Based Farms
Since 2016, there has been significant growth in land-based dulse farming in Oregon. Access to a consistent supply of high-quality seawater is the main limiting factor for these land-based systems.

Primary species under cultivation:
Dulse (Palmaria mollis)

The land-based farms consist of anywhere between 5 and 10,000 liter tanks.

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Leasing/Permitting Agency for State Tidelands:
Oregon Department of State Lands (DSL)
https://www.oregon.gov/DSL/Pages/Waterways.aspx

Oregon DSL issues special use leases or licenses.
- Leases can be from 1-30 years.
- Licenses grant non-exclusive use of state lands. A lease can only be granted for less than 5 years.
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Seaweed grown in tank systems goes primarily to local restaurants and is shipped out of state.

Seaweed is sold fresh/raw and dried.

The seaweed is used as ingredients in restaurant dishes and in health food supplements.

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Photo: Close-up of red ogo produced in tank system

Red Ogo Produced in Tank System

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California also has tank culture operations, like Monterey Bay Seaweeds. No ocean farmed seaweed is available.

Primary species under cultivation: red ogo (Gracilaria species), sea lettuce (Ulva spp.), dulse (Palmaria mollis).

Giant Kelp: Commercial wild/harvest exists for giant kelp (Macrocystis pyrifera), 25 metric tons of edible algae were wild-harvested in 2015.
PERMITTING & REGULATIONS

Lead Regulator:
California Department of Fish and Wildlife (DFW)
http://wildlife.ca.gov/aquaculture

- California DFW administers the lease process for state-owned submerged lands. In some cases, however, the local harbor master or a federal agency may administer the lease.
- Maximum lease term is 25 years (10 for marine finfish aquaculture).
- Lease process triggers an environmental review under CA law.
- California requires an Aquaculture Registration through the DFW for aquaculture on private and state-owned submerged lands.
- California also regulates the harvest of kelp and other aquatic plants.

CALIFORNIA POST HARMEST

Seaweed in California is a niche market, sold to restaurants and direct to consumers.
Seaweed sold for food purposes is mostly fresh/活.
Some of California’s wild forest kelp is not used for food purposes (has wildlife).