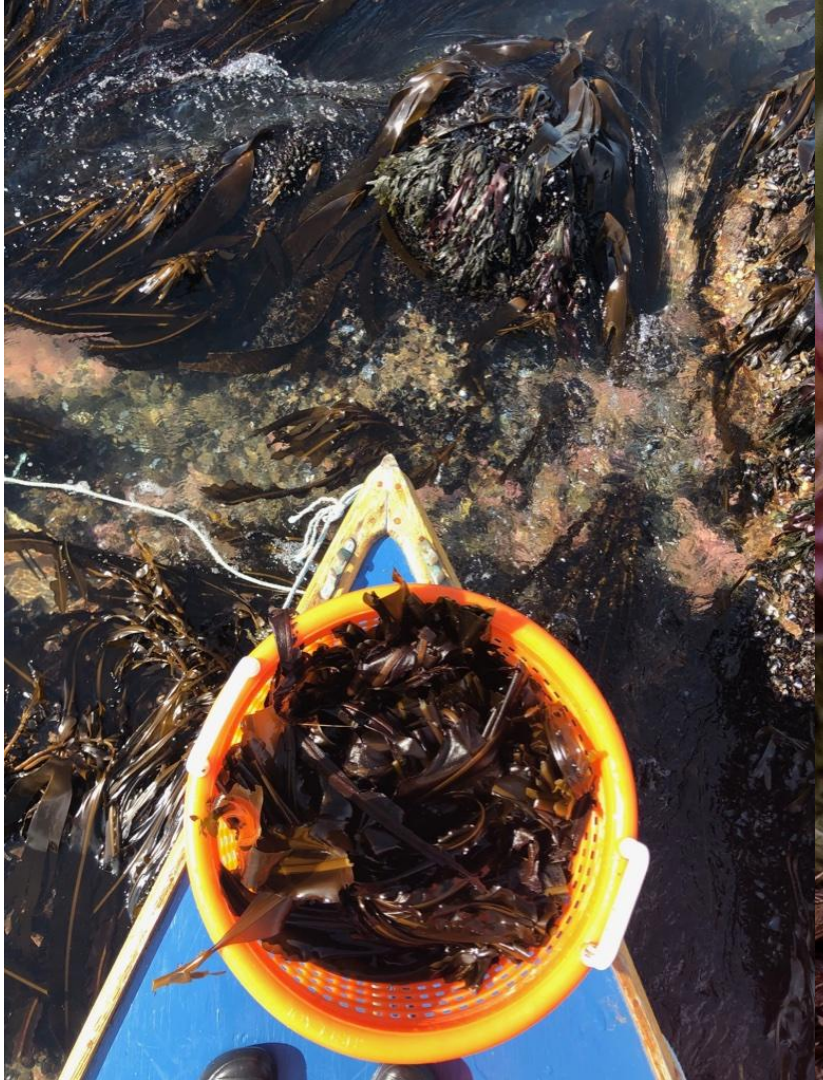
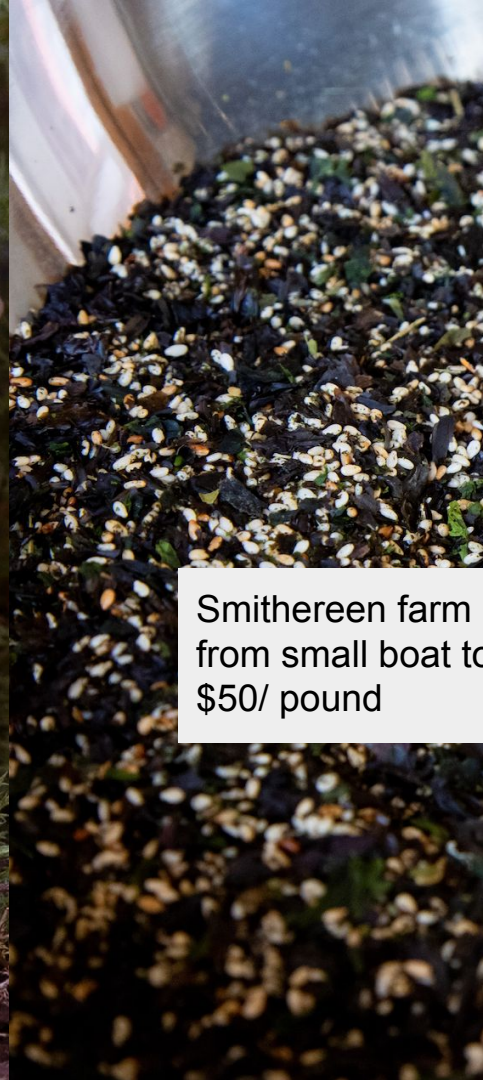
NORTHEAST SARE
Sustainable Agriculture Research & Education

Can a buoy be a beacon?

ALTERNATIVES TO PLASTIC IN AQUACULTURE

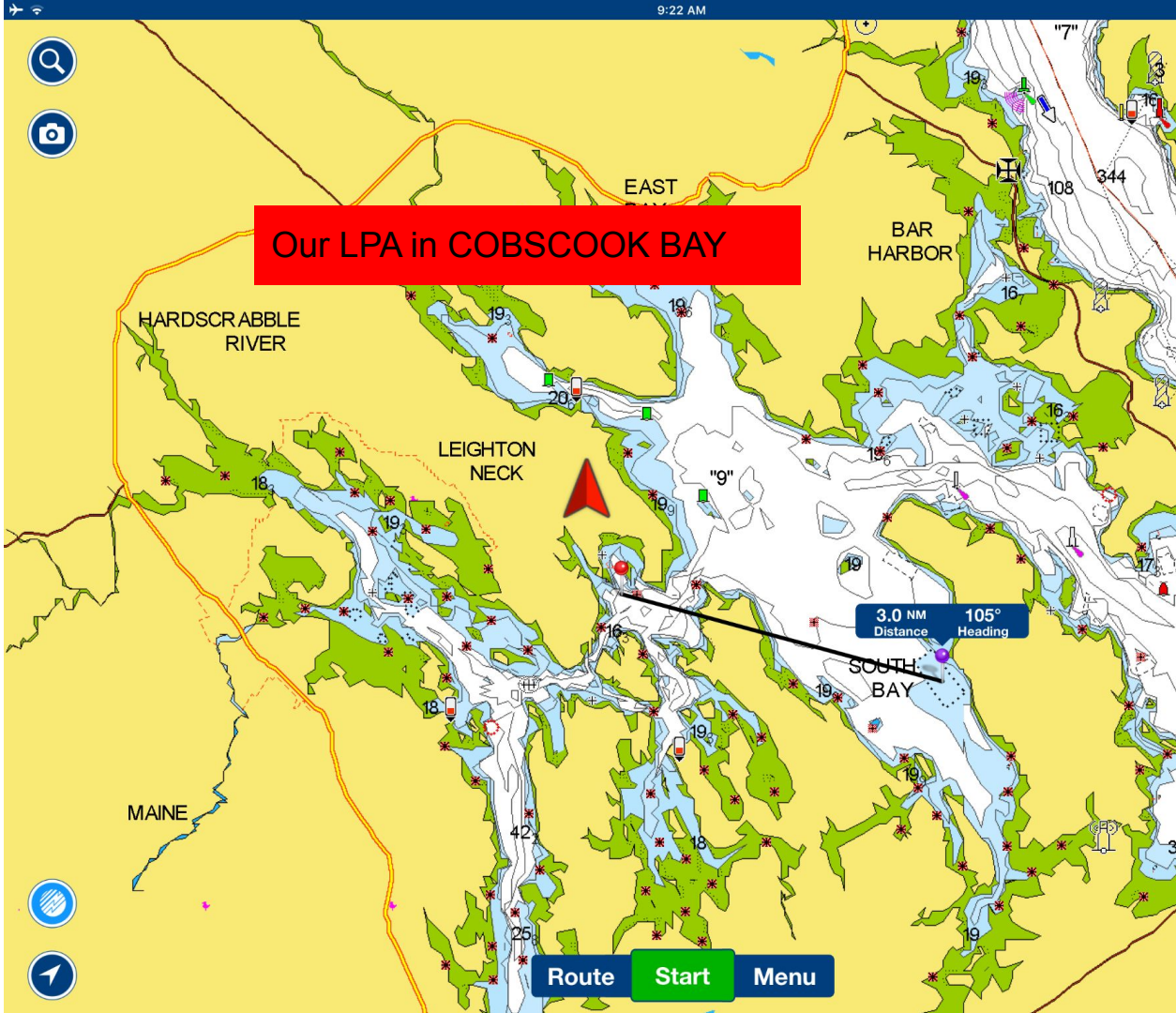
NE SARE FUNDED PROJECT 2021 COLLABORATION
BETWEEN LONG COVE SEA FARM AND SMITHEREEN FARM

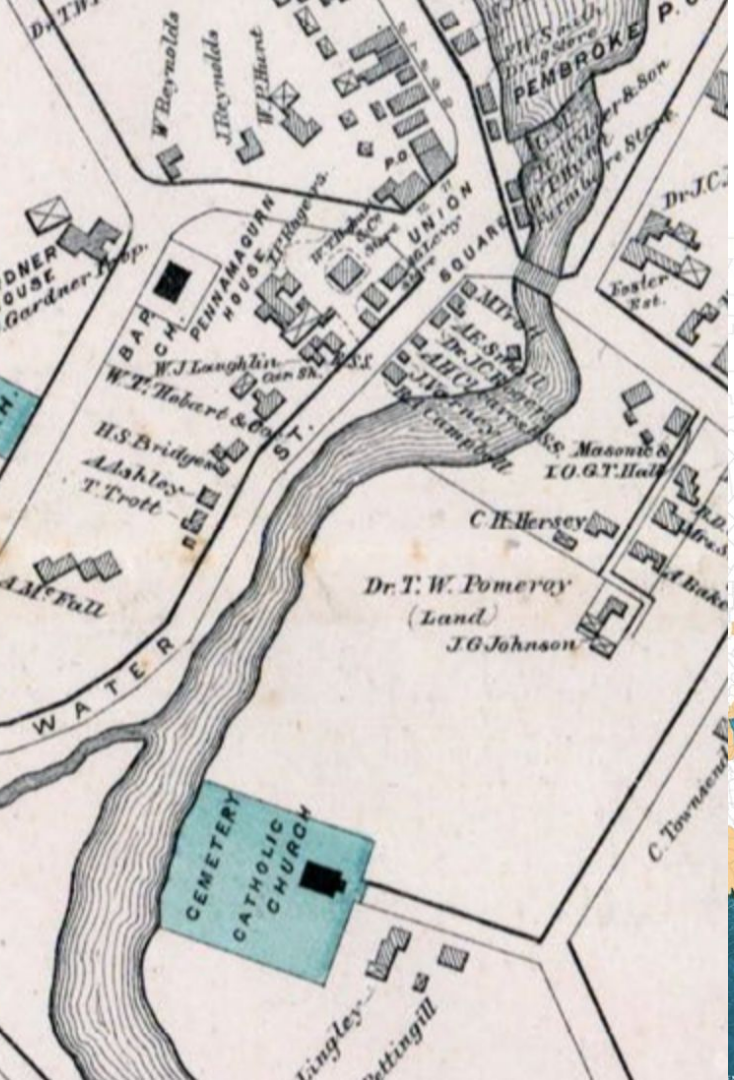




Smithereen farm
from small boat to
$50/ pound


DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
CHARLOTTE
P E M B R O K E
E D M U N D S
DENNYSVILLE
COBSCOOK BAY
LEIGHTON NECK
West Pembroke
Pembroke
Dennysville
Edmunds
Leighton Pt
Commissary Pt


9:22 AM
Our LPA in COBSCOOK BAY
EAST
BAR HARBOR
HARDSCRABBLE RIVER
LEIGHTON NECK
SOUTH BAY
MAINE
"7"
"9"
3.0 NM Distance
105° Heading
Route
Start
Menu



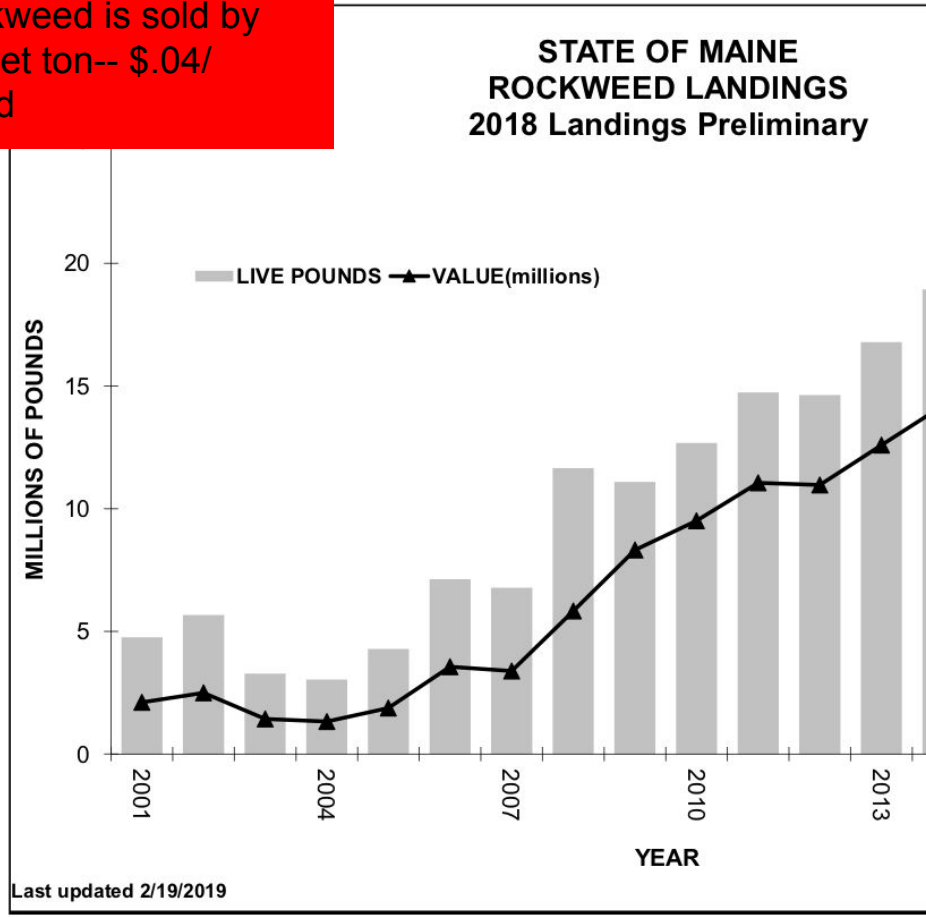
GREENHORNS

TO PROMOTE, RECRUIT, & SUPPORT NEW FARMERS IN AMERICA

A coastline of small bays, small villages, , small businesses. What scale and regulatory framework makes sense here? How can we think about best practices that will allow us to sustain our working waterfront, and differentiate ourselves from the global marketplace?

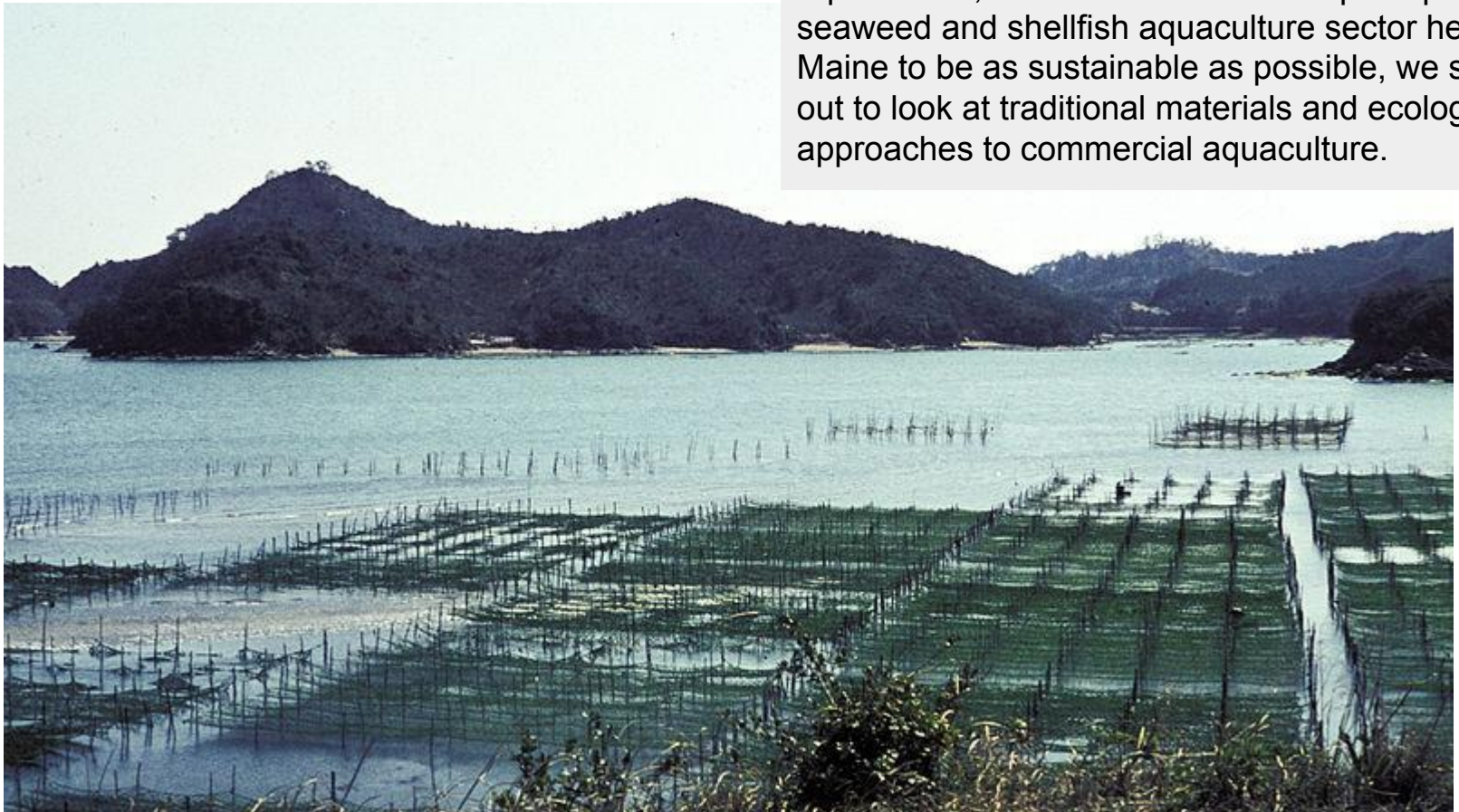
Majority of seaweed harvested in Maine is wild-- only a small amount currently grown

ROckweed is sold by the wet ton-- $.04/ pound



PROJECT DESIGN

Knowing that there are impacts caused by aquaculture, and that we want to help shape the seaweed and shellfish aquaculture sector here in Maine to be as sustainable as possible, we set out to look at traditional materials and ecological approaches to commercial aquaculture.



The Maine Microplastics Researcher Reenvisioning Aquaculture

onington's Abby Barrows dialed back a globetrotting research career to take over an oyster farm in her hometown. Now, she's out to refashion tl
equipment of her new profession, to keep Maine's booming aquaculture sector from fouling the waters it relies upon.

Good regional press, edible Maine and Downeast Magazine.

SCIENTIST AND AQUACULTURIST ABBY BARROWS, PICTURED HERE WITH SMITHEREEN FARM SUMMER INTERNS LYDIA LAPPORTE AND MARCUS MAMOURIAN, AND HER PLASTIC-FREE OYSTER FARMING GEAR.

AQUACULTURE AND THE PLASTIC PROBLEM

DOWNEAST OYSTER AND KELP GROWERS TESTING ALTERNATIVE GEAR

WORDS BY COLLEN STOWELL
PHOTOGRAPHY BY ABBY BARROWS AND HUDSON CONN

When teaching students of all ages about the impact humans have on the ocean and the seafood we pull from it, I provide scary statistics like this one: There are over five trillion pieces of plastic floating around in our oceans.

Microplastics (pieces measuring less than five millimeters across) and macroplastics (more than five millimeters) come from all kinds of sources. Some you can easily imagine, like single-use bags, bottles, and utensils, but there are also microbeads from face washes, children's toys, and nylon ropes. An estimated 20% of the eight million tons of plastic added to the oceans annually comes from marine fishing and aquaculture gear.

Since it is counterproductive to scare the hell out of students without giving them a glimmer of hope on how we might remedy the situation, I also mention Maine's bans on plastic grocery bags, polystyrene foam food packaging, and mass balloon releases. And I tell them inspiring stories about innovative Mainers devising other ways to stem the flow of plastics into the Gulf of Maine.

Take Abby Barrows and Severine von Tscharner Fleming, for example. These two Downeast aquaculturists are testing plastic-free materials for use in their oyster and kelp operations.

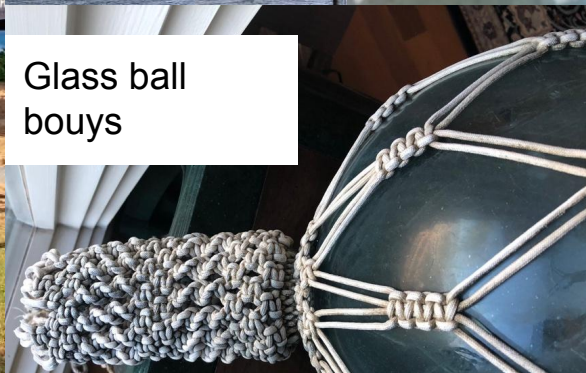
Their dedication is critical given how fast aquaculture is growing. Shellfish leases in Maine rose almost 50% in the last decade. Seaweed-only leases went from one to 29 in the same time frame.

Barrows is a research scientist who's been obsessed with quantifying the extent and impact of oceanic

Beach trash from asian seaweed farms washes up in Hawaii

Japanes wooden buoys a vernacular tradition to explor with maine boat shop lathes and materials exchange

Pacific plastic campaigns more established



Glass ball bouys

Maine Aquaculture Innovation Center

Northeast Aquaculture · CONFERENCE & EXPOSITION ·

NMFS / NEFSC NOAA MILFORD LAB

presentation

Outreach and exposure

How can the conversations about plastic become a wedge to talk about locally owned, conservation minded, suitably sited-- the shape of the seaweed economy and shellfish economy we need in Maine and the regulations to protect small operators from giant foeign fish factories in our waters

webinar

LOCAL CATCH NETWORK

Panels internatio nal and US SLOW FISH

supply chain issues between land and sea…

Podcast about seaweed, standards, and appropriate materials in aquaculture in this national conference hosted by REAL ORGANIC PROJECT, who had been supportive of the NOP ruling at the USDA for higher standards on seaweed wild harvest for organic cultivation (fertiliser) next up could be a standard for seaweed grown without plastic..

Basic approach.

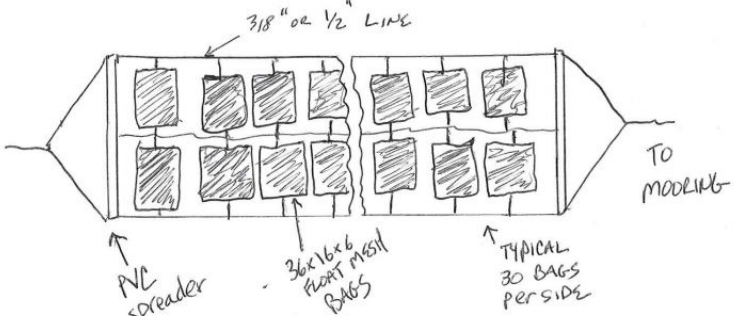
Trial materials, talk to people with experience, get the word out, build network of inquiry and test sites, figure out what else has been done, get lots of people excited to think in this direction collaboratively, create “aspiring for improvement” feelings.

Our prejudice has been towards traditional materials vs. bioplastics/ 3 D printing..

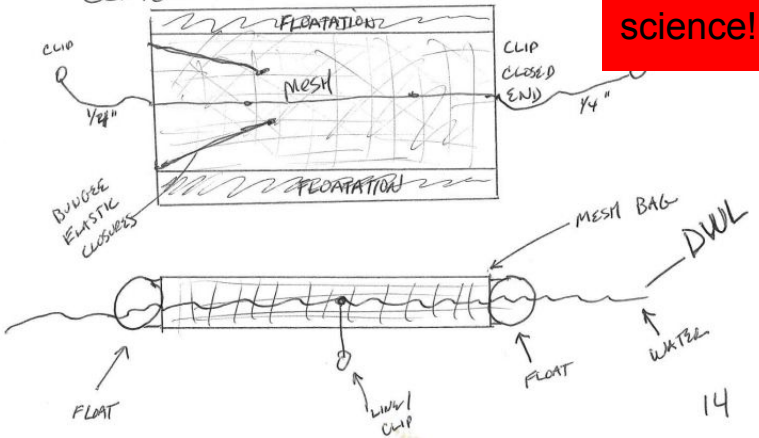
Build cedar cages for oysters, see how they do
Trial basalt mesh for oyster cages
Trial Cork for oyster floats
Trial coir, hemp rope for seaweed
Trial pine tar for bouys

APPENDIX B2

TOP VIEW OF FLOATING SURFACE BAG ARRAY

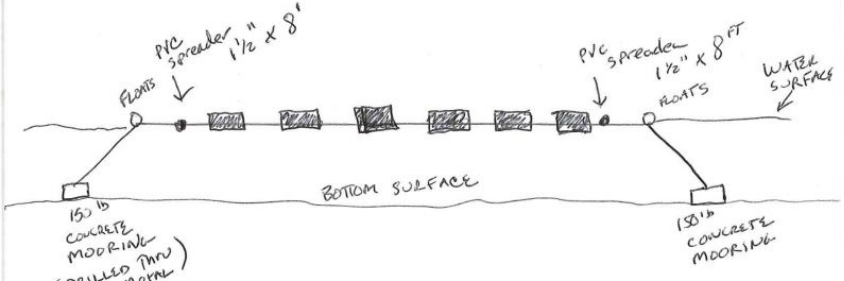


OYSTER BAGS are 36" x 16" x 6". WIDEN BAGS BY 6" to 22" WIDE. ARE CLIPPED TO LINES 2' ON CENTER CENTER AND SIDE LINE APPROX 80



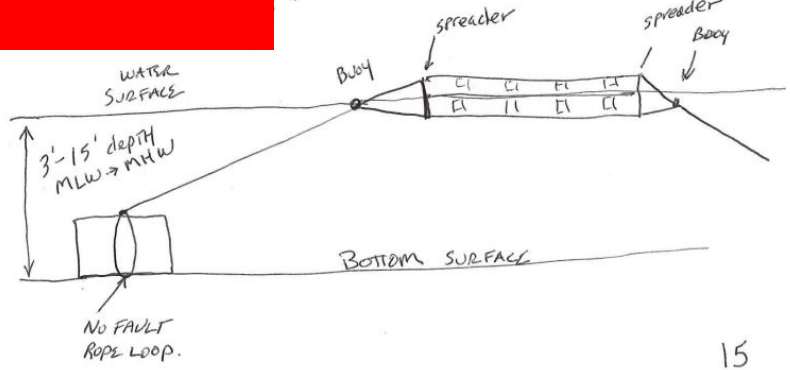
APPENDIX B3

SIDE VIEW AND MOORING SCHEMATIC FOR FLOATING BAG ARRAY - JOHN MARSH LEASE APPLICATION



This is what aquaculture application/ descriptions look like in Maine, it is not rocket science!

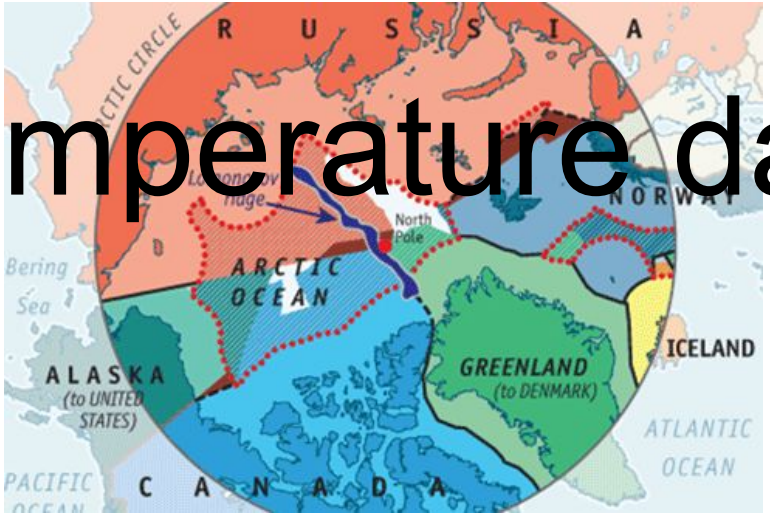
s 2-5 FT. MHW is 15 FT. MOORING
e set at approximately 2 to 1 scope.
ARE 150 lb 18" DRILLED CONCRETE



FINDINGS

Basalt mesh not durable enc

Temperature data



Heavy metals data, how do aquaculture decisions happen in an ecosystem management context? What other interest groups are involved here?

FISH FARM PROPOSALS

EEL grass beds

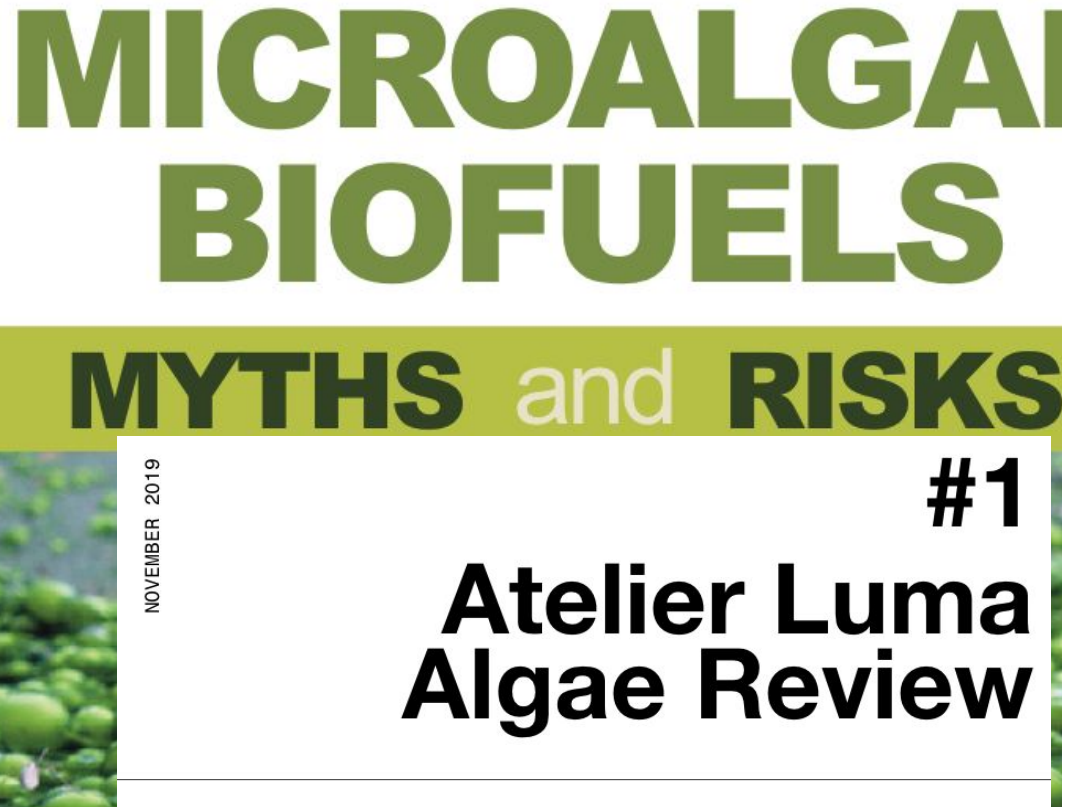
Climate change/ sea temperature changes

Big market prices for Seafood products

Investor interest

Positives and negatives

WHAT QUESTIONS TO ASK



GreenWav

There are many moving p
going on these days with
CLIMATE SOLUTIONS, t
contamination of wild alga
control, already we have
lawsuits, patents and inac

December 11, 2018

Dear Farmer-in-Training,

We're excited to have you join
training, you are an integral pa
farmers.

The goal of the GreenWave Fl
this program, GreenWave provides you with personal support and tec
selection, permitting, and gear setup for your ocean farm—as well as
floating classroom, where you will learn about kelp seeding and harv
Ocean Farming techniques.

This memorandum of understanding (MOU) outlines the terms of Gr
program. Please review, sign, and return this MOU in person or via e

For FIT program participants, GreenWave agrees to provide:

- monthly check-ins to gauge your progress;
- model farm diagrams and other relevant templates for p
- free sugar kelp (*Latissima saccharina*) seed string for yo
  ocean farmers south of Cape Cod Bay;
  - contingent upon hatchery conditions, four 200' spools
    year of operation (2018) and eight 200' spools of seed
    operation (2019);
  - for farmers in Cape Cod Bay and points north, pendin
    and/or subsidize your purchase of seed from other sup

Pleasant Point Reser
P.O. Box 343 • Perry, Maine 04
Tel. (207) 853-2600

TRIBAL COUNCIL RESOLUTION # 12/16/08

WHEREAS, the Pleasant Point Passamaquoddy Tribal Council is the recognized governing body of the Passamaquoddy Tribe at the Pleasant Point Reservation; and

WHEREAS, the shores of the Passamaquoddy Bay and Cobscook Bay border the Pleasant Point Reservation and are a major constituent of the traditional hunting and fishing areas of Tribal members for thousands of years; and

WHEREAS, rockweed is the single largest component of these shores, providing sustenance and protection to at least 22 species of fish, numerous species of birds, and shellfish including the commercially important perriwrinkles and clams to Tribal members; and

WHEREAS, rockweed is the single largest source of nutrients to Passamaquoddy Bay, Cobscook Bay, Bay of Fundy, and Gulf of Maine; and

WHEREAS, Commercial harvesting of thousands of tons of Rockweed is being conducted in Cobscook Bay without any regulations or oversight from Maine DMR other than voluntary reporting by the harvesters and an attempt to minimize close cropping of the rockweed to retain 16" of the plant; and

WHEREAS, the damage to the environment from this harvest, including loss of habitat and habitat disruption, loss of nutrients, destruction of numerous animals in the by-catch, damage to the rockweed from harvesting during its reproductive season are all unknown at this time;

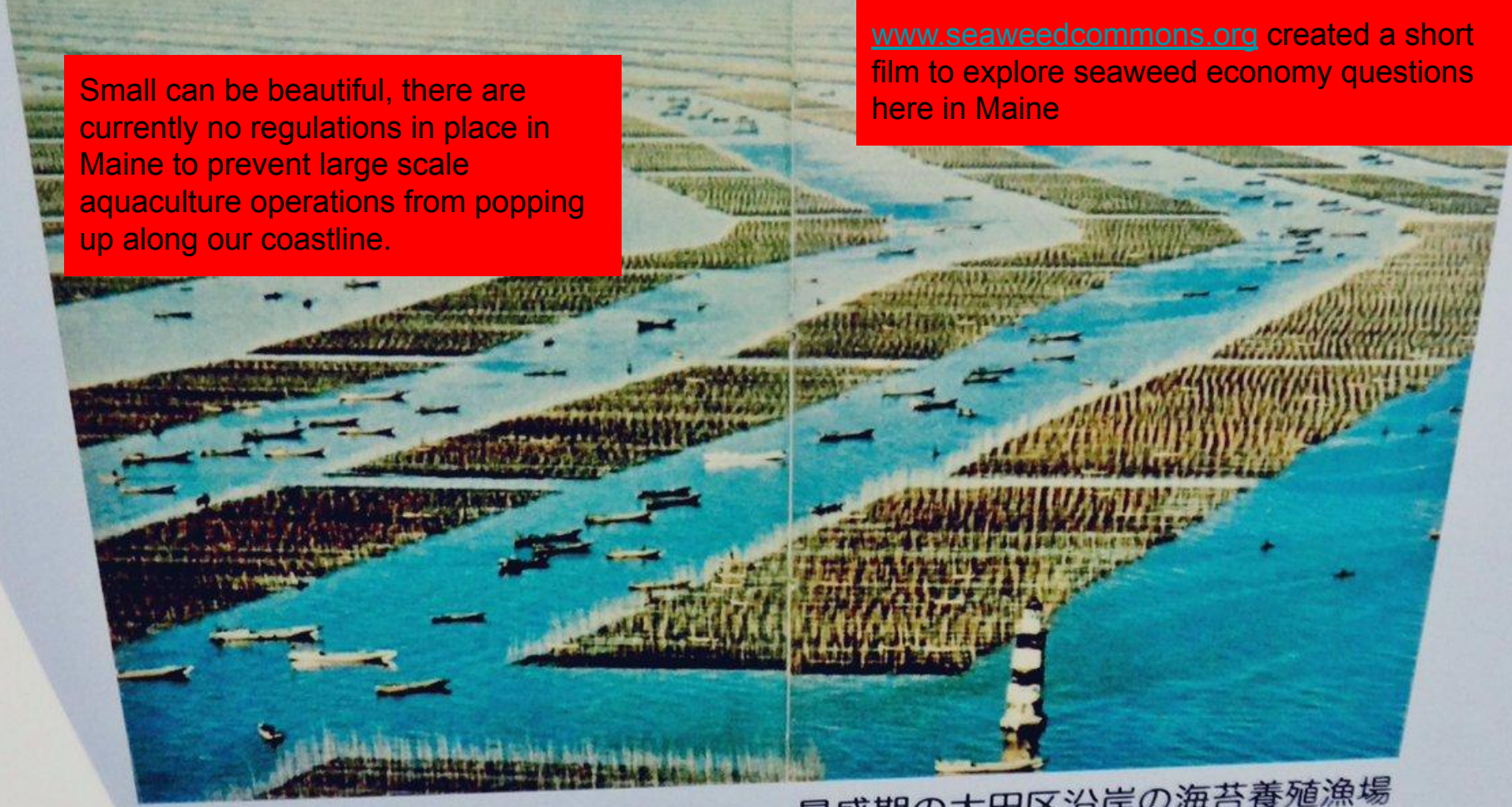
NOW, THEREFORE BE IT RESOLVED, that a moratorium of commercial rockweed harvest in Tribal reservation and traditional hunting and fishing waters be enforced until adequate studies of impacts of commercial rockweed harvests are completed, and regulatory agencies develop sustainable harvest protocols that ensure that there is no damage to the environment.

Passamaquoddy tribe has taken action to stop over harvest in their bays and sovereign areas.

Use of pesticides in Wilapa Bay, WA and with Salmon pen farms in Cobscook Bay, ME have caused serious consequences.

Small can be beautiful, there are currently no regulations in place in Maine to prevent large scale aquaculture operations from popping up along our coastline.

www.seaweedcommons.org created a short film to explore seaweed economy questions here in Maine



最盛期の大田区沿岸の海苔養殖漁場
(昭和34年3月『サンデー毎日』より)

Small community of practitioners many with very high ethical and environmental standards makes this a postivie environment for improvement and standard setting, can we get organized enough with our practices, social commitments, regulations and the story we tell about ourselves not to lose the water to big operators from outside who foul up the water?

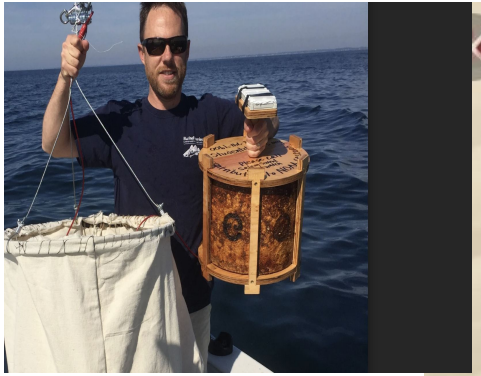
The Ellsworth Amer

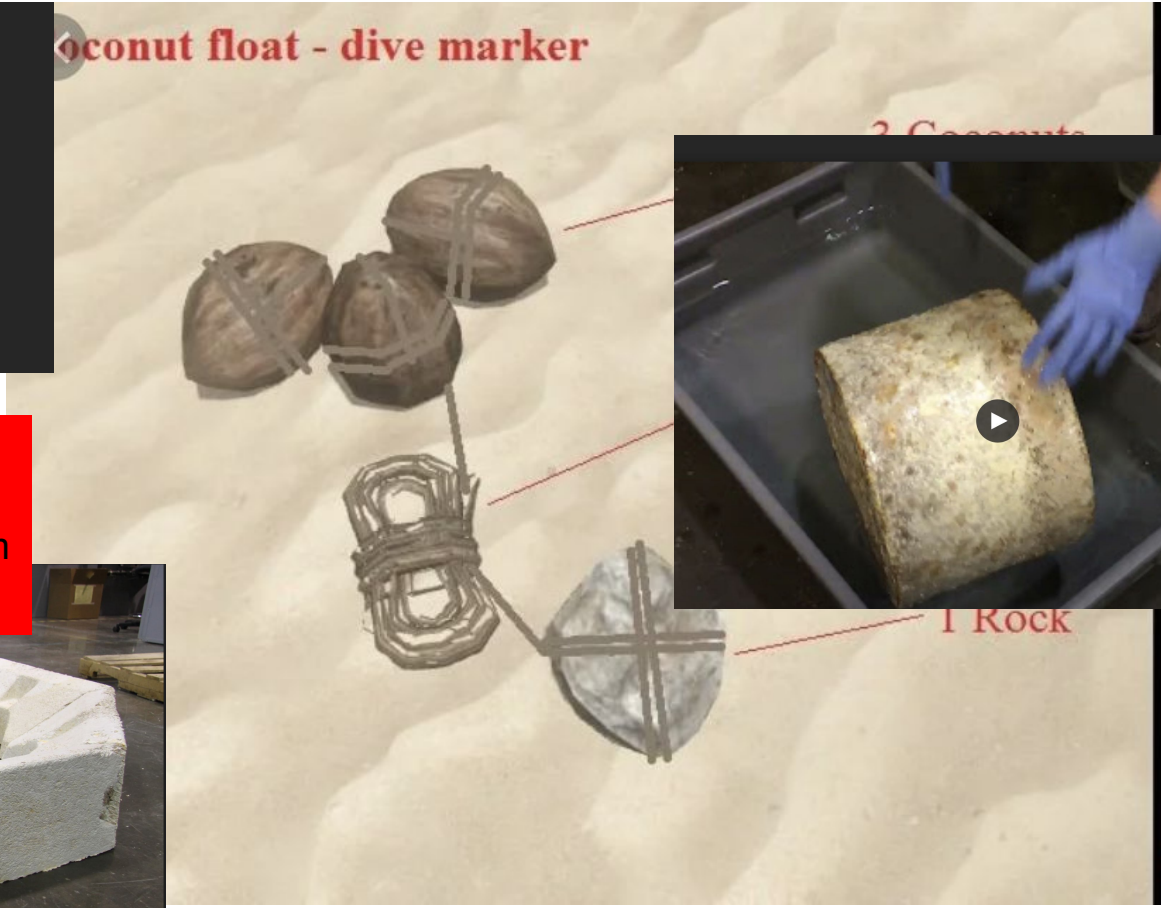
~ | Tuesday - Feb 25, 2020

Deer Isle's Micah Woodcock says he can "look at a chart of where I harvest and tell you what species grow there, what each species is doing now, where it is in its growth cycle, when I plan to harvest it and when I last harvested it." He is one of 22 Maine producers featured in Kelleher's new book, "Handcrafted Maine: Art, Life, Harvest & Home." PHOTO BY GRETA REYBUS

Growing popularity of kelp and seaweed treats is driving market expansion and a new sector is growing up, FAST. This is the time for setting high standards

FIRST DRAFTS and refining research questions





Prototypes of Sue Van Hook, myco foam made from hemp!

PREMISE

CAPE
Coalition pour des Accords de Pêche Equitables

CFFA
Coalition for Fair Fisheries Arrangements

Away from Blue Growth and towards the Blue Commons?

By Andre Standing — March, 2019

Overview: This paper presents a critique and alternative perspective to the mainstream 'blue economy' growth model, and is in part a reflection on the presentations and outcomes of the Nairobi 'sustainable blue economy' conference of November 2018. The blue economy concept, and strategies of 'blue growth', are failing small-scale fisheries. While originally intended to shift the ocean economy towards ecological sustainability and poverty reduction, it is now promoting investment in sectors that threaten SSF and coastal communities in many parts of the world. What is now known as 'blue growth' is based on the claim that transitioning to a blue economy must be driven by private investors, and is a tremendous business opportunity. But it is unlikely