

SUSTAINABLE
LOCAL
HEALTHY



Promoting healthy oceans with sustainable shellfish aquaculture



Introduction to Shellfish Aquaculture and the Ventura Shellfish Enterprise

www.venturashellfishenterprise.com

Registration/Sign-in

Registration cards can be deposited in the white drop box located near the main conference room entrance

Why register?

Reserves a seat at future VSE workshops

Puts you on our mailing list to receive project news and updates

Helps us plan ahead for future workshops

Links you to our survey system, where you can offer anonymous feedback and express your views on any aspect of the VSE project

The screenshot shows a web form titled "Workshop Registration" with the Ventura Shellfish Enterprise logo on the left. The form contains the following fields:

- Email Address
- Affiliation
- First Name
- Last Name
- In which state do you reside?
- In which city do you reside?
- With which stakeholder group do you most closely identify?
- How did you hear about the workshop?
- Suggest a future workshop topic?

At the bottom right, there is a checkbox for "Join Mailing List?" with "Y" and "N" options.



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Speaker Presentations will be followed by Q & A and Community Discussion

- We ask that you hold your questions until *after* the presentations
- Please complete a speaker card and submit to Brian Pendleton
- As a courtesy to other guests, please keep your questions and comments under 3 minutes
- VSE Team Members will be available for follow-up questions after the workshop

	Q & A Speaker Card
Name	
Organization/Affiliation	





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Speaker Presentations

The Future of Food: The Rise of the Sea

Steve Gaines, Dean and Professor

Bren School of Environmental Science & Management, UCSB

Ventura Shellfish Enterprise: An Overview

Everard Ashworth, Chair

Ventura Port District, Board of Port Commissioners





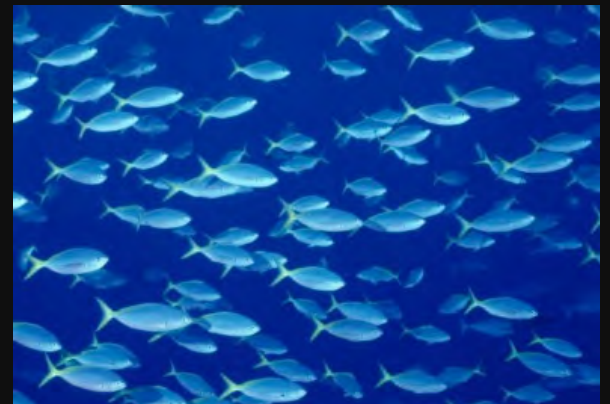
The Future of Food: The Rise of the Sea

Steve Gaines

B. Gentry, D. Tilman, M. Clark



Bren School of
Environmental
Science & Mgmt











Peter Steinhauer Photographs







2 billion hectares

3 gigatons
of greenhouse gases







Less than 5%



Image: [NOAA.gov](https://www.noaa.gov)





Impacts Dominate Discussion

Global Warming Potential

KG of Carbon Dioxide per KG
of Protein



Area for Food

New Area for Food
Production - km²



Freshwater

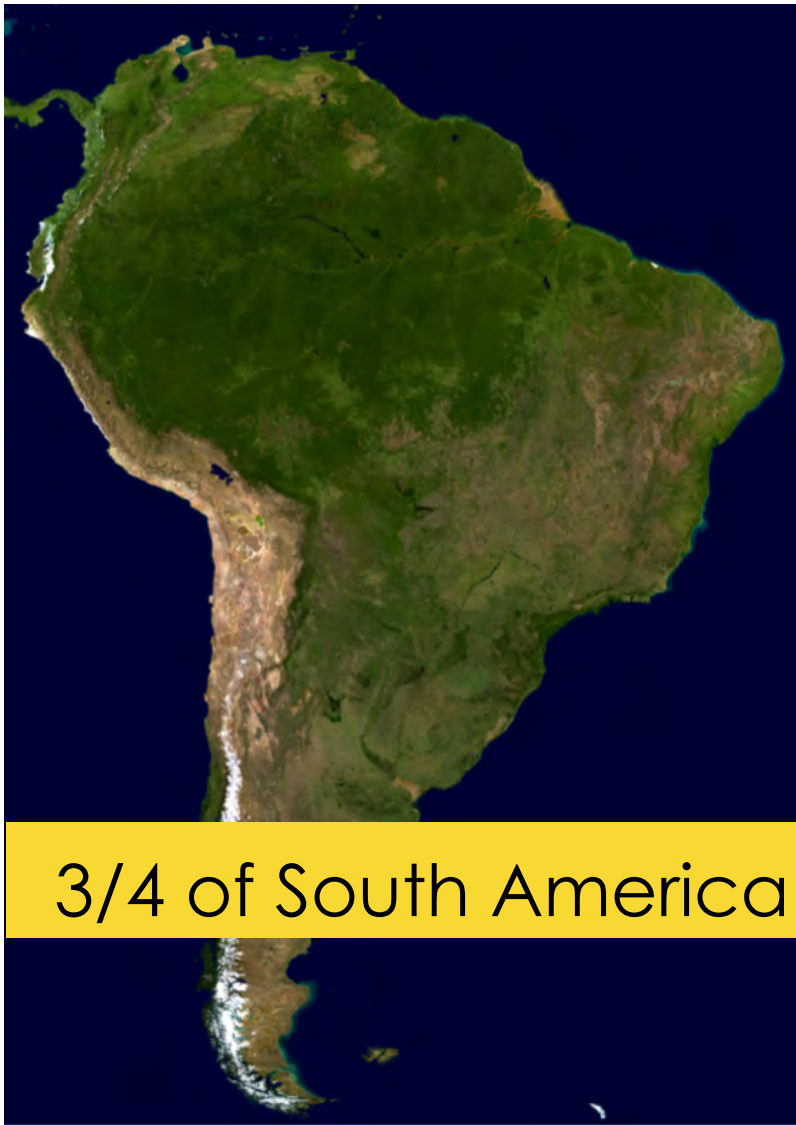
New Freshwater Needed -
km³





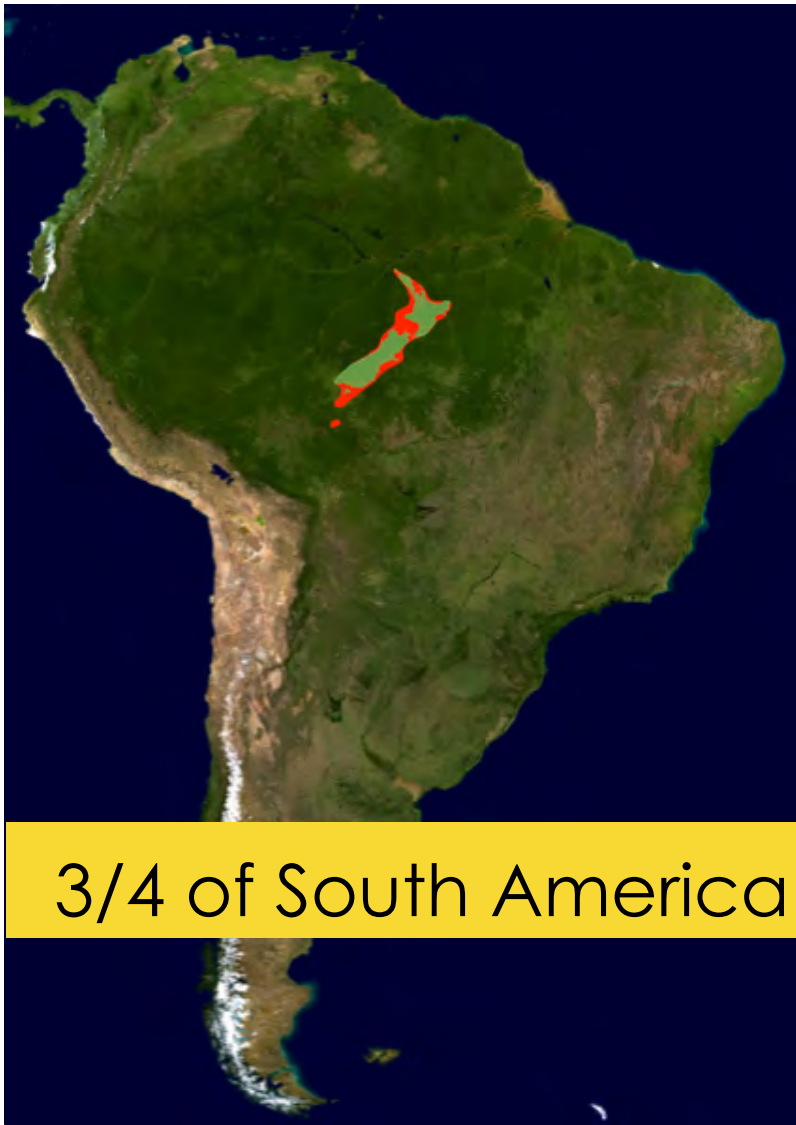
Thought Experiment

Area needed by 2050

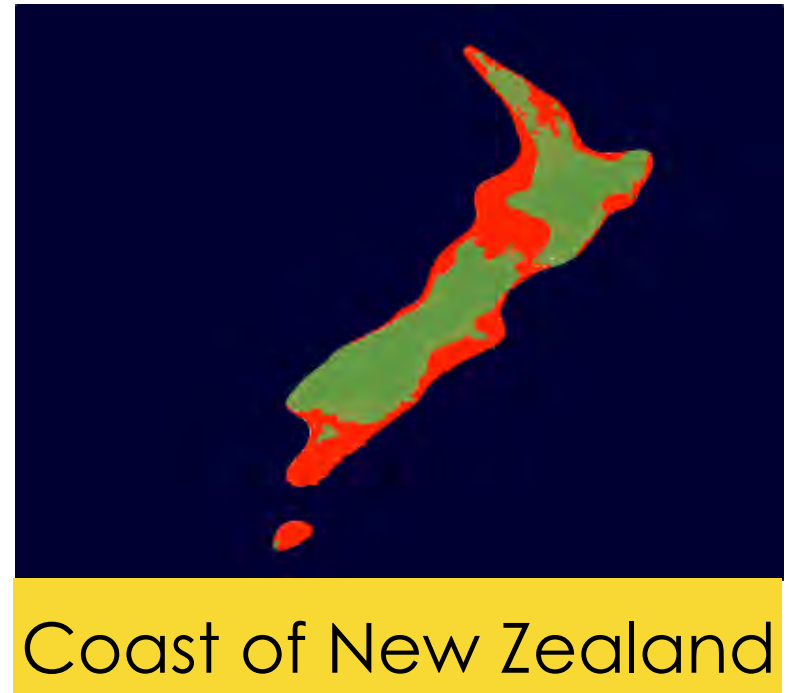


Thought Experiment

Area needed by 2050



Thought Experiment

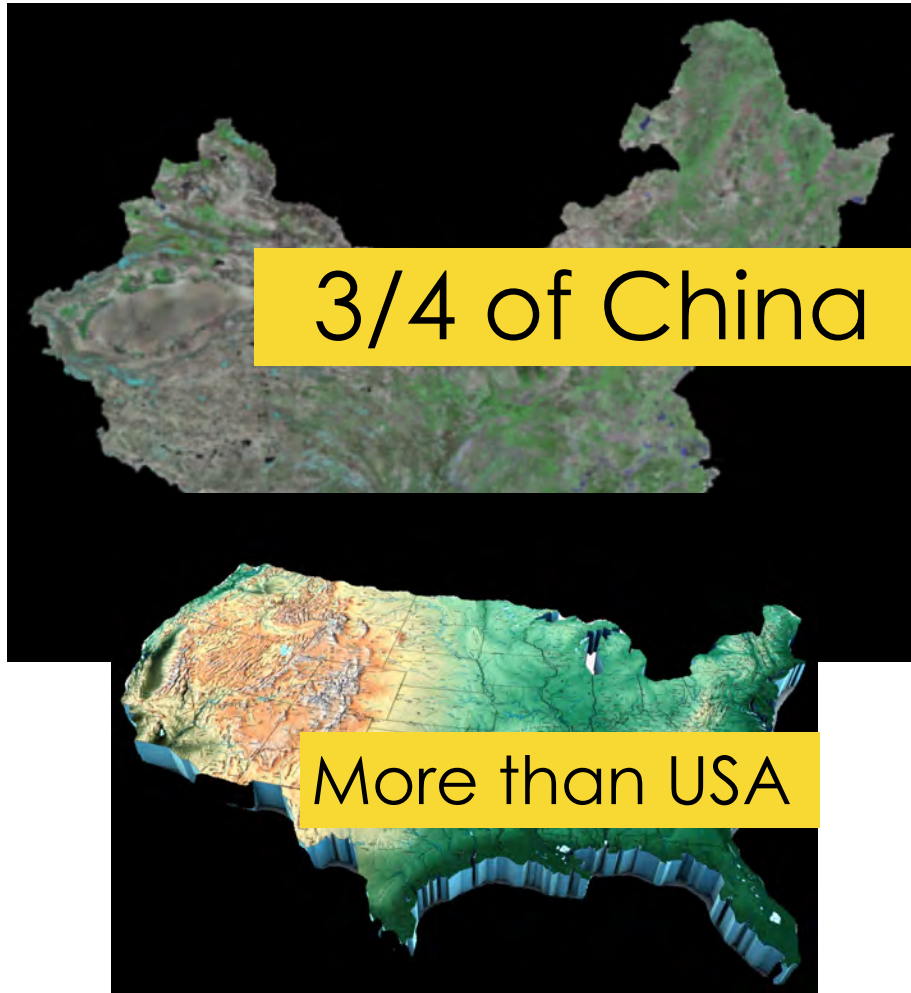


Area needed by 2050



Thought Experiment #2

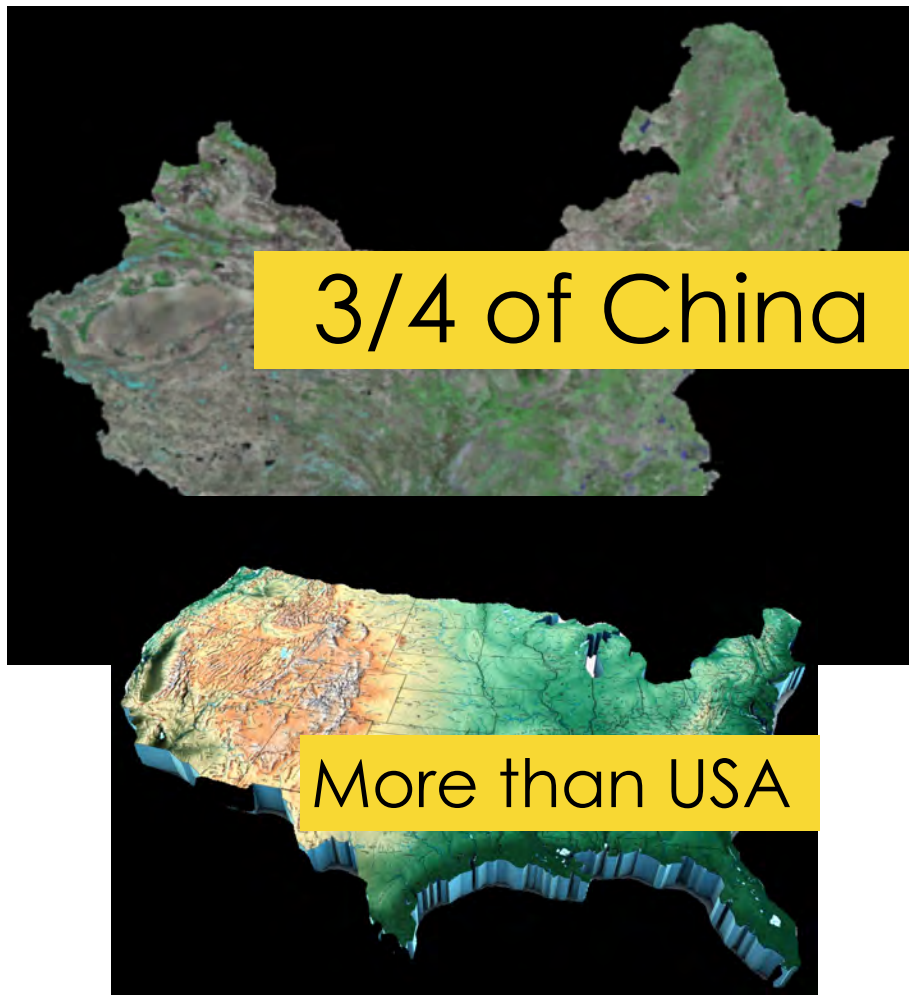
Greenhouse Warming
Potential
(Gigatons CO₂ Equiv) by 2050



Thought Experiment #2



Greenhouse Warming
Potential
(Gigatons CO₂ Equiv) by 2050



Thought Experiment #2



Greenhouse Warming
Potential
(Gigatons CO₂ Equiv) by 2050



Thought Experiment #3

Freshwater



Thought Experiment #3

Freshwater



Thought Experiment #3

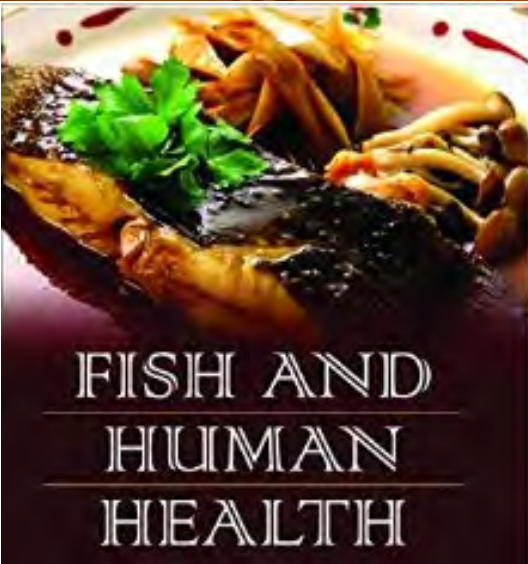
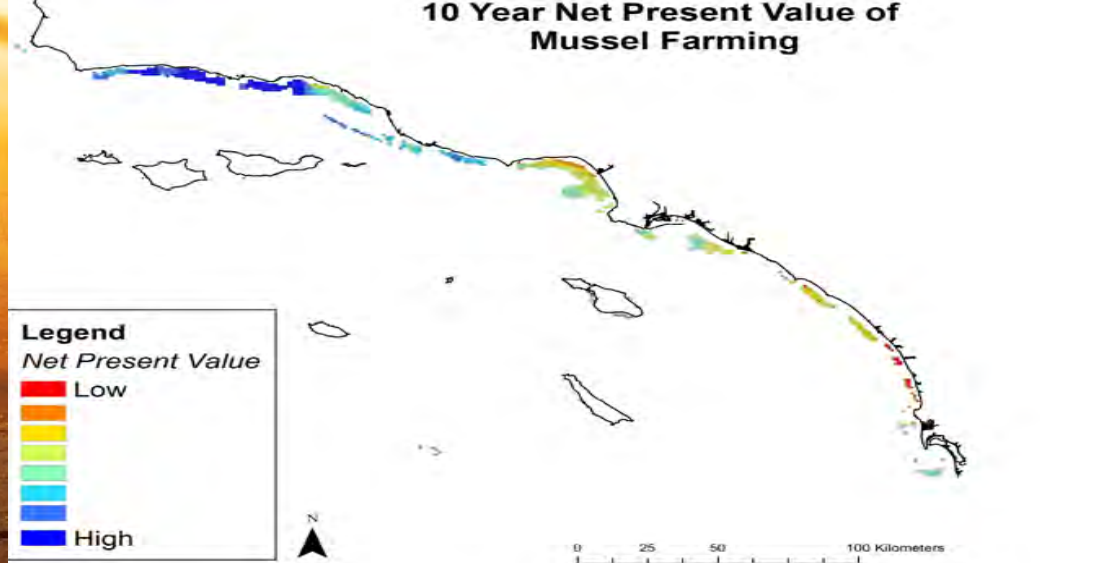


A Drop in the Bucket

Freshwater

A close-up photograph of a gourmet surf and turf meal. The dish is served on a white plate and includes a baked potato with a golden-brown skin and a slit on top, a thick cut of seared steak with a dark, charred crust, a bunch of bright green asparagus spears, and a large, succulent lobster tail with its characteristic orange-red shell. In the background, a small woven basket containing bread is visible.

No Debate
SURF >> TURF



FRESH
LOCAL
SEAFOOD



Paths to Change





Ventura Shellfish Enterprise – An Overview

Ev Ashworth
Chair, Ventura Port District



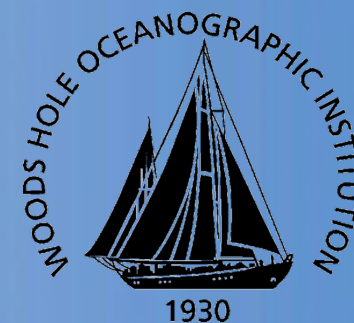
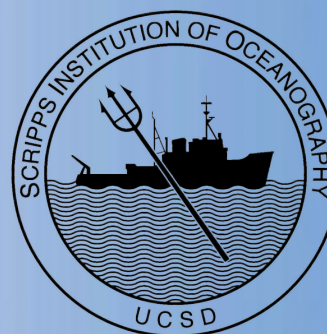
VSE Overview

- VSE Partners
- VSE Objectives
- Project Overview
- Public Outreach





VSE Partners





Objectives

- To increase the supply of safe, sustainably produced, and locally-grown shellfish
- To sustain Ventura Harbor as a major west coast fishing port and support the local economy & working waterfront
- To provide an entitlement and permitting template for aquaculture projects state-wide
- To provide economies of scale & technical support to small producers who would not otherwise be able to participate in shellfish aquaculture
- To enhance public knowledge and understanding of sustainable shellfish farming practices





Project Description

Twenty 100 acre growing sites

Sites to be located within the 3-mile limit of State Waters of California

Product to be landed in Ventura Harbor

Ventura Port District will obtain all permits and sublease to producers





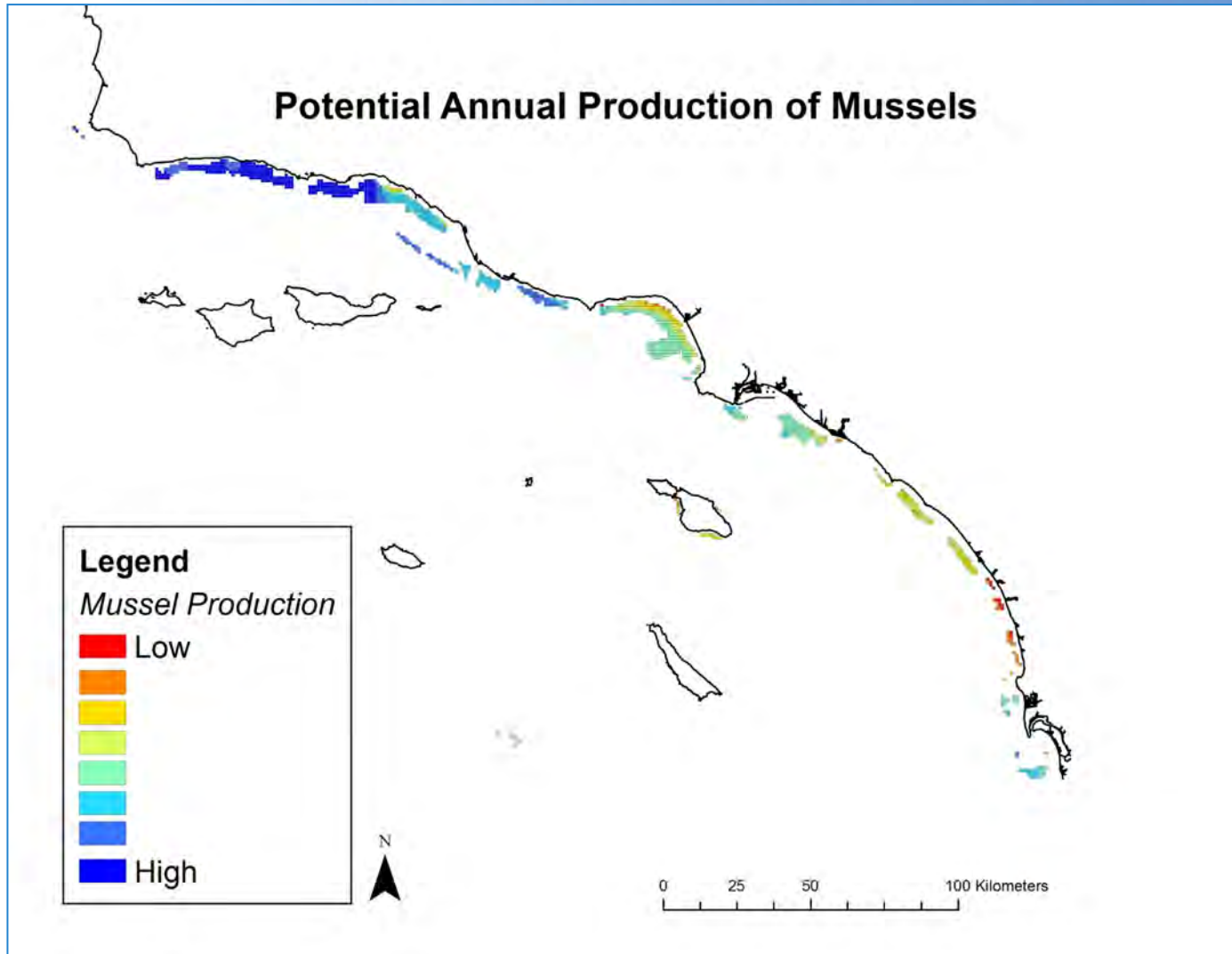
Site Selection Process & Project Location

- **Two step process:**
 - **Step 1:** Identify candidate area of 18,533 acres (300 25 hectare cells)
 - **Step 2:** With stakeholder engagement, site twenty 100 acre growing sites
- UCSB Bren School methodology – maps marine environment with respect to suitability for shellfish
- Possible interaction with recreational, halibut trawl, wetfish, and crab fisheries – to be considered in final siting decisions





Site Selection Process

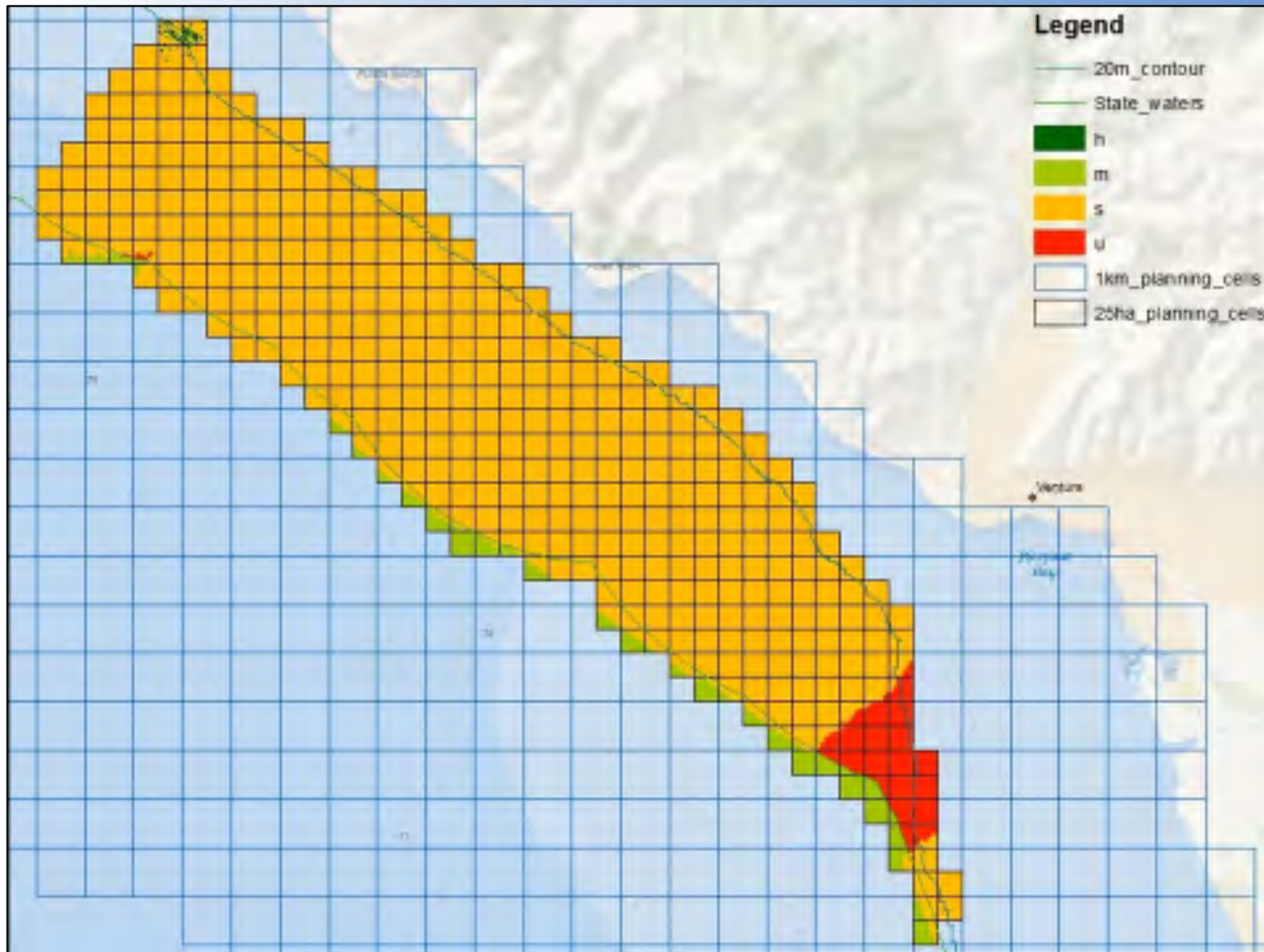


Results of UC, Santa Barbara Bren School Study





Site Selection Process – Candidate Growing Area





Species Selection/Cultivation

- Mediterranean mussels (*Mytilus galloprovincialis*)
- Spat from land-based hatcheries registered with CDFW
- Juvenile mussels on rope are cleaned, separated, and graded then restocked on clean rope
- At market size, mussels are again stripped from line



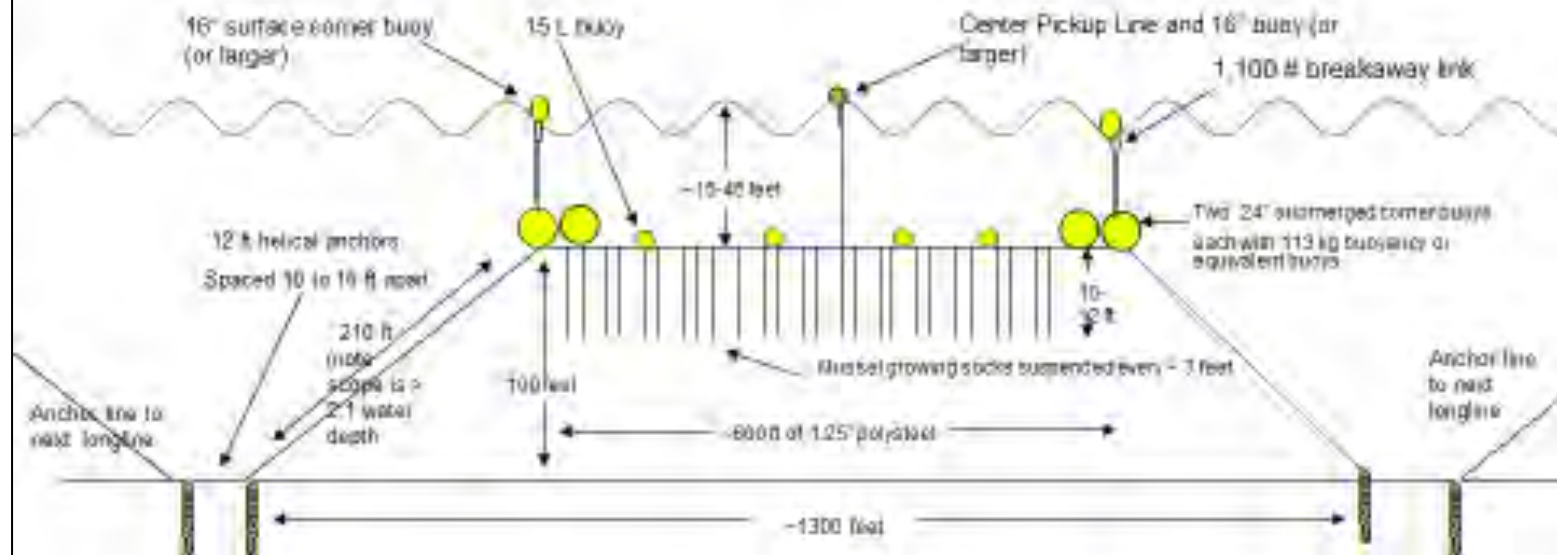


Long Line Growing Method

- Mature technology, used around the world
- Helical anchors are used to hold the anchor lines to the sandy bottom
- Heavy duty floats are used to suspend anchor lines and center line
- Corners are marked with buoys/radar reflectors
- Growing lines are suspended off center line 15-45 feet below surface



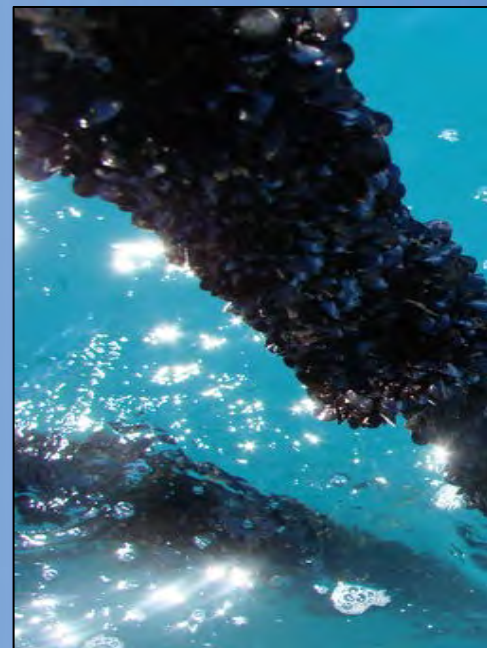
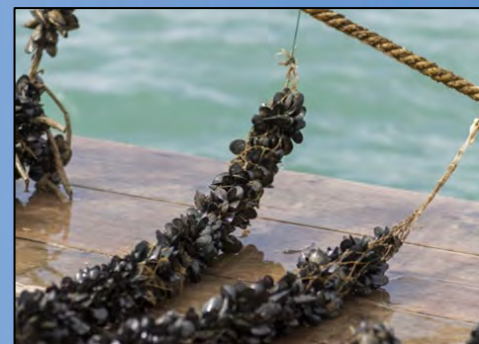
Schematic of long line growing method





Best Management Practices

- Use existing/proven Best Management Practices (BMPs)
- BMPs will be selected from other successful growing regions and certified by national & international aquaculture organizations
- Once agreed upon, BMPs will be incorporated into permits





Monitoring

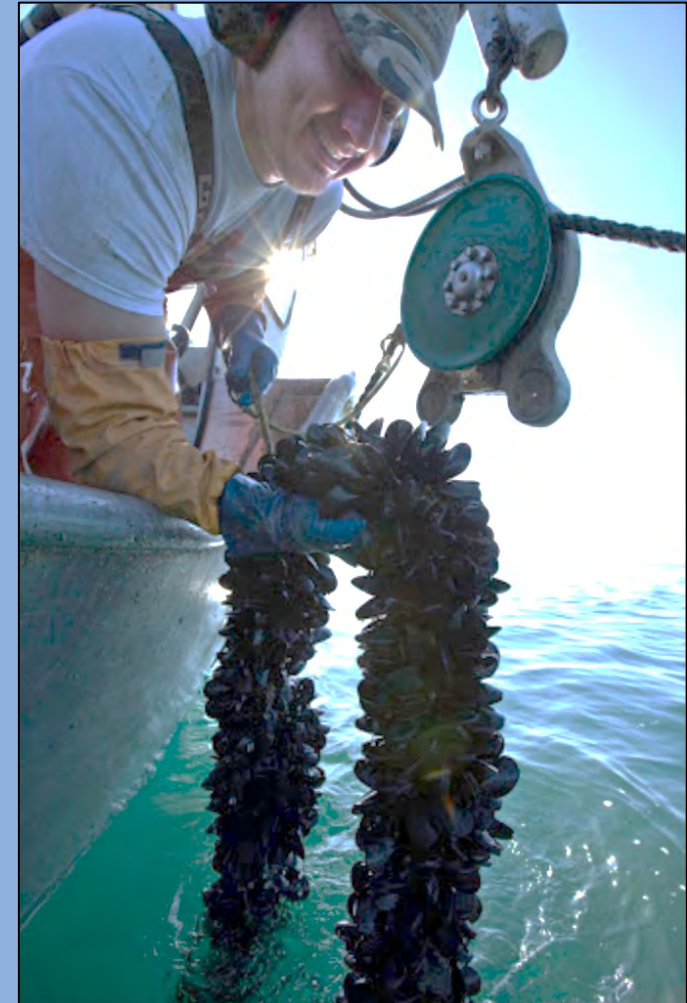
- Monitoring will be required to assure
 - Shellfish safety
 - Water quality
 - Compliance with permit requirements
 - Other agency requirements
- Project will provide for integration of aquaculture research with UC Bren School, UC Scripps, Woods Hole Oceanographic Institute, and other academic/research institutions





Public Workshops:

- 2/16** | Introduction to Shellfish Aquaculture and the Ventura Shellfish Enterprise
- 2/23** | Biology of Bivalve Shellfish, Mussel Growing Technology and Equipment
- 3/16** | VSE Economic Impacts and Benefits
- 4/11** | Environmental Effects and Best Management Practices
- 5/11** | VSE Production Site Selection
- 6/1** | Becoming a VSE Shellfish Producer
- 6/15** | VSE Shellfish Quality and Safety Assurance
- TBD** | Shellfish: Local, Sustainable, Delicious and Nutritious





Key Project Features

- **Low impact/high yield, sustainable mussel aquaculture**
- **Ventura Port District will obtain and provide umbrella permits for producers**
- **Project will achieve economies of scale – monitoring, product safety testing, product marketing**
- **Early and regular input sought from regulatory agencies**
- **Ability for small individual growers to participate**
- **Economic benefits to Ventura Harbor and the community**





Q & A and Community Discussion

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Guidelines



If you haven't done so already, please complete a speaker card and hand over to Brian Pendleton



When your name is called, please use the microphone so that everyone in the audience can hear your questions and/or comments



Please try to keep your questions and comments under 3 minutes so that everyone will have a chance to provide their feedback



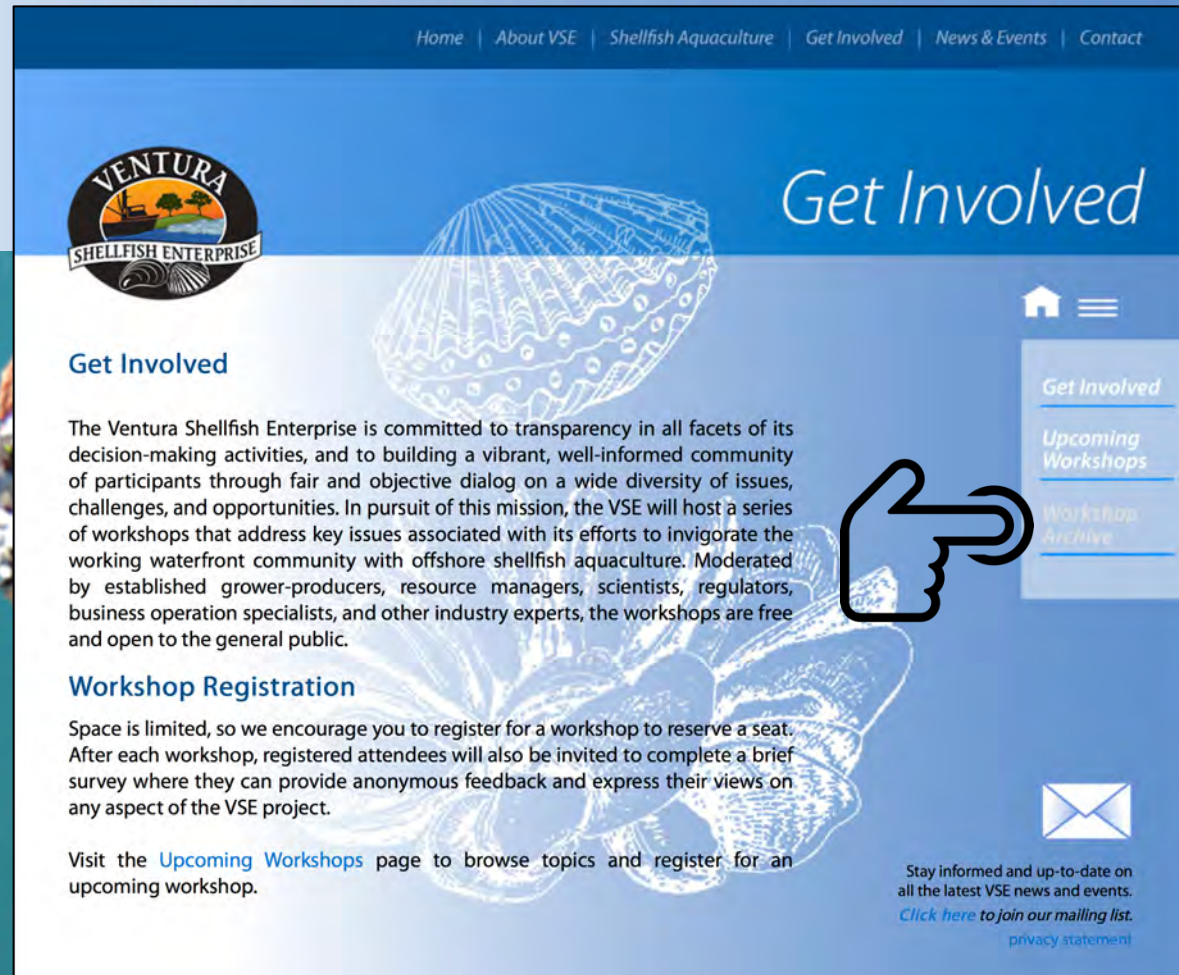


Workshop Archive

www.venturashellfishenterprise.com

Workshop Video and Presentation Slides

A workshop video and presentation slides will be posted on the *Get Involved* page of the VSE website for future reference



Home | About VSE | Shellfish Aquaculture | Get Involved | News & Events | Contact

Get Involved

The Ventura Shellfish Enterprise is committed to transparency in all facets of its decision-making activities, and to building a vibrant, well-informed community of participants through fair and objective dialog on a wide diversity of issues, challenges, and opportunities. In pursuit of this mission, the VSE will host a series of workshops that address key issues associated with its efforts to invigorate the working waterfront community with offshore shellfish aquaculture. Moderated by established grower-producers, resource managers, scientists, regulators, business operation specialists, and other industry experts, the workshops are free and open to the general public.

Workshop Registration

Space is limited, so we encourage you to register for a workshop to reserve a seat. After each workshop, registered attendees will also be invited to complete a brief survey where they can provide anonymous feedback and express their views on any aspect of the VSE project.

Visit the [Upcoming Workshops](#) page to browse topics and register for an upcoming workshop.

Get Involved
Upcoming Workshops
Workshop Archive
Stay informed and up-to-date on all the latest VSE news and events. [Click here to join our mailing list.](#) [privacy statement](#)



Next Workshop

www.venturashellfishenterprise.com

Biology of Bivalve Shellfish, Mussel Growing Technology and Equipment

When: January 23, 2017 | 7:00 to 8:30 p.m.

Where: Robert J. Lagomarsino Auditorium of the Channel Islands Visitor Center

Speakers

Doug Bush, Partner and General Manager
The Cultured Abalone Farm, Goleta, CA

Scott Lindell, Visiting Scientist
Biology Department, Woods Hole Oceanographic Institute

Visit the <Get Involved> page of the VSE website for more information on all workshops

