

**Fin Fish Aquaculture in the Southern California**  
**Joint Fisheries and Aquaculture Committee Hearing**  
**Bodega Bay Marine Laboratory, October 4, 2016**



**Don Kent, M.Sc.**

*President/CEO*

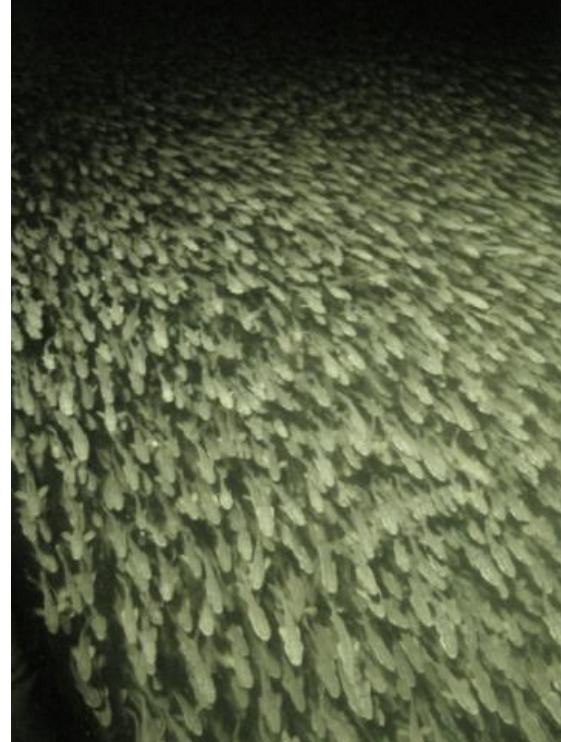
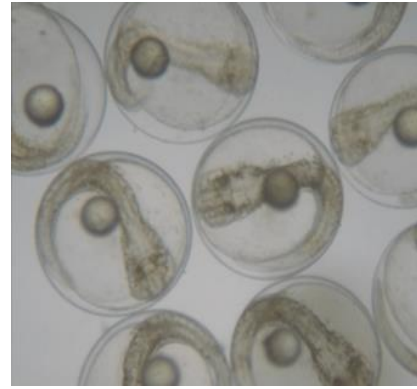
*Hubbs-SeaWorld Research Institute*

**&**

*Rose Canyon Fisheries*



# Sustainable Fisheries: *Helping to Feed a Hungry World*



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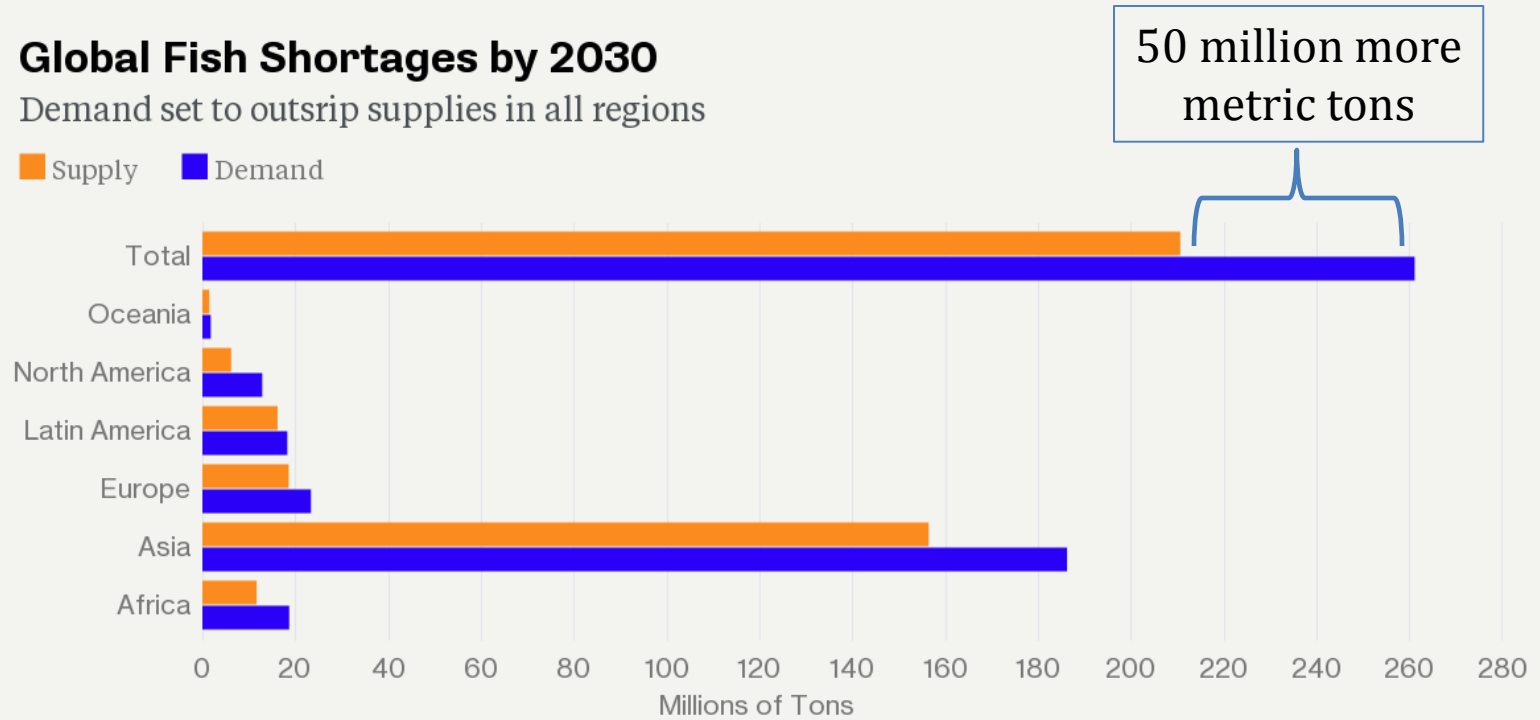


# Worldwide Seafood Supply Shortfall

## Global Fish Shortages by 2030

Demand set to outstrip supplies in all regions

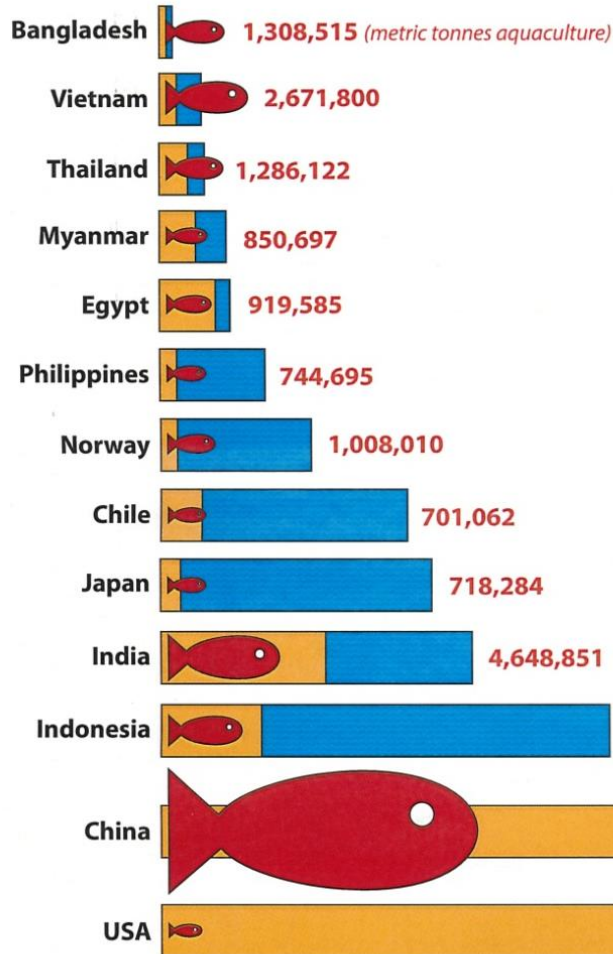
Supply Demand



Source: United Nations' Food and Agriculture Organization.

Bloomberg

# Potential for Greater Production

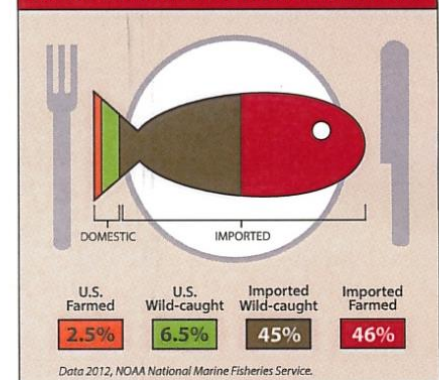


## Top 13 Aquaculture Producers Worldwide

Total aquaculture production in relation to land and water resources



## Sources of all seafood consumed in U.S.



2010, UN Food and Agriculture Organization



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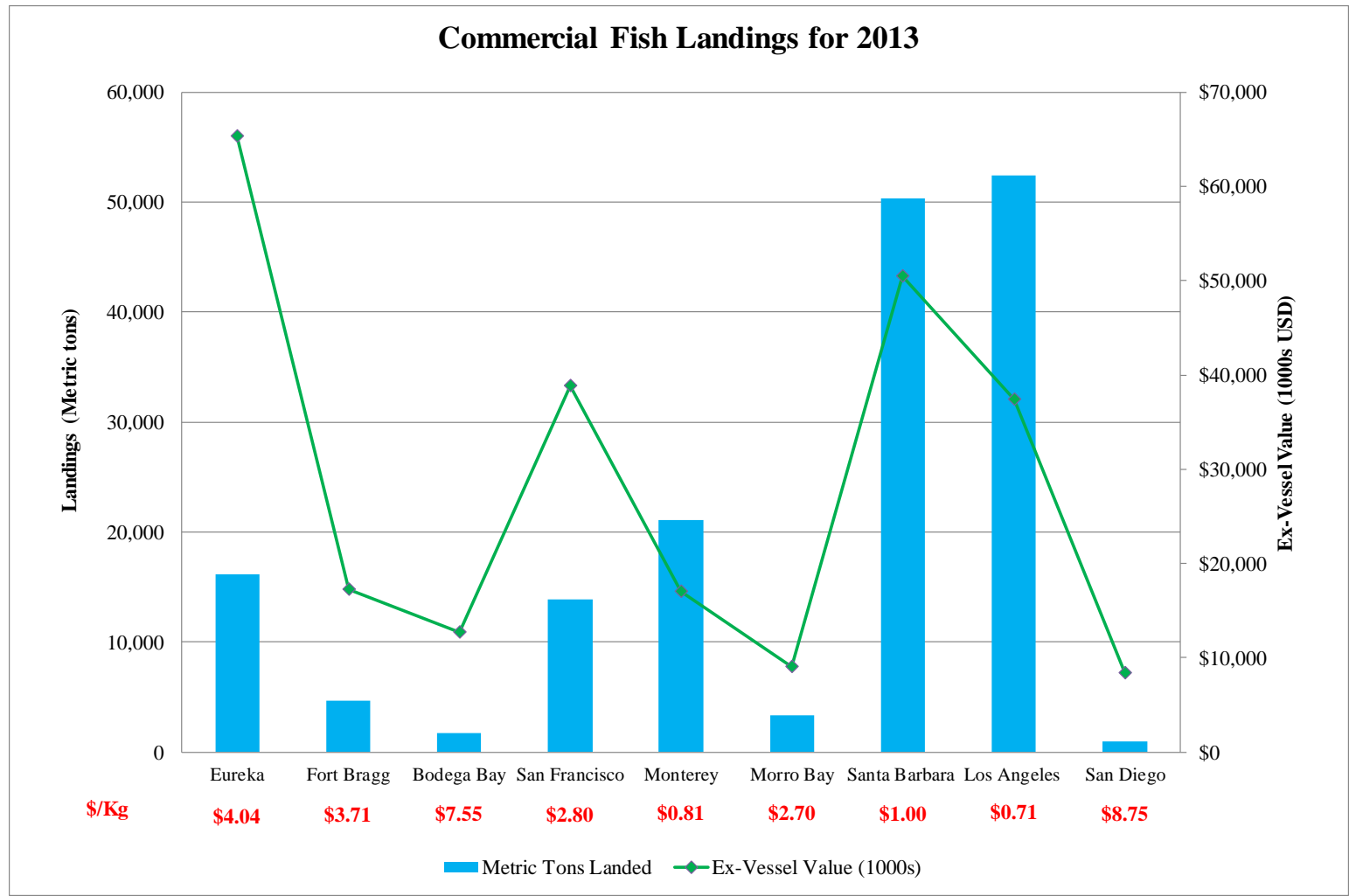


# San Diego's Fishing History

- After WW II, the tuna industry expanded so that by 1975 tuna fishing supported 16 canneries and employed 40,000 people.
- Southern California was known as the **Tuna Capital of the World.**



# California's Commercial Fishing



**2013 Total: \$256 Million, 165K Metric Tons**

# California Agriculture (2012 statistics)

- 81,500 farms
- Over 400 commodities
- \$43.5 billion total revenue
- #1 state with 11.3% of U.S. farm cash receipts
  - 11% for crops
  - 7.1% for livestock
- \$12 billion in livestock sales
- <0.5% is aquaculture

Source of Income	Sales
Aquaculture	\$54
Chickens, All	\$720
Cattle and Calves	\$3,299
Eggs, Chicken	\$393
Hogs and Pigs	\$39
Honey	\$23
Milk and Cream	\$6,900
Turkeys	\$311
Wool and Mohair	\$5
Other Livestock	\$412
<b>Total</b>	<b>\$12,155</b>



CALIFORNIA DEPARTMENT OF  
FOOD & AGRICULTURE

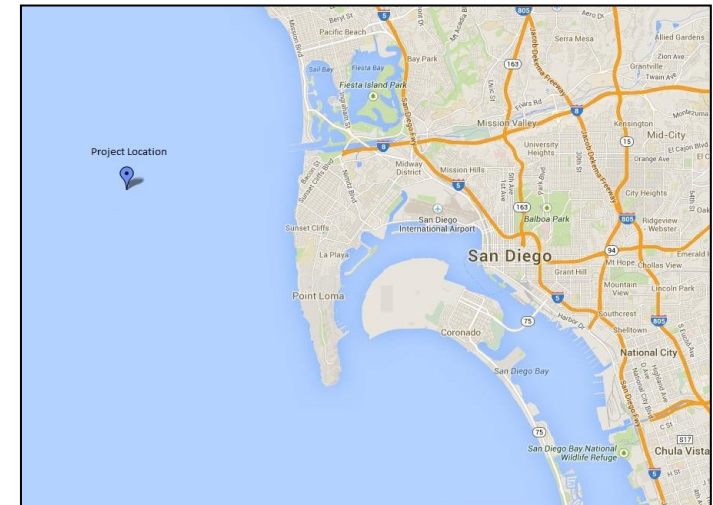
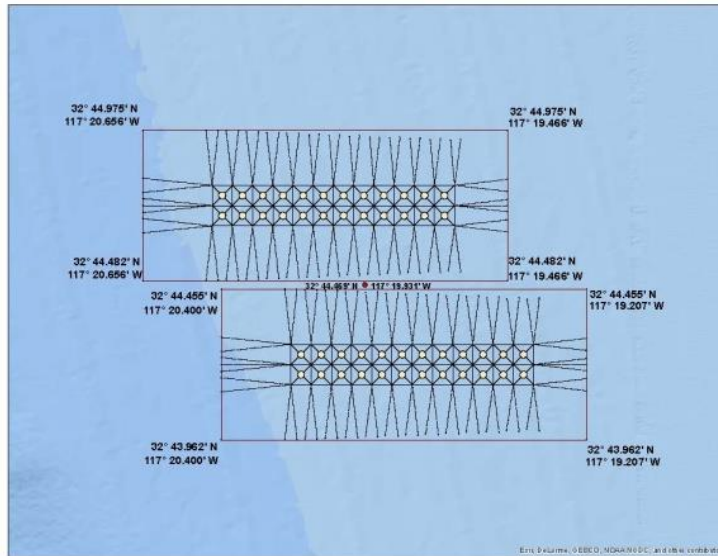


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# The Rose Canyon Fisheries

- A commercial, state-of-the-art, offshore aquaculture project
  - Evaluate both economic and environmental sustainability
  - Scale up to 5,000 metric tons (11 million pounds) annual production



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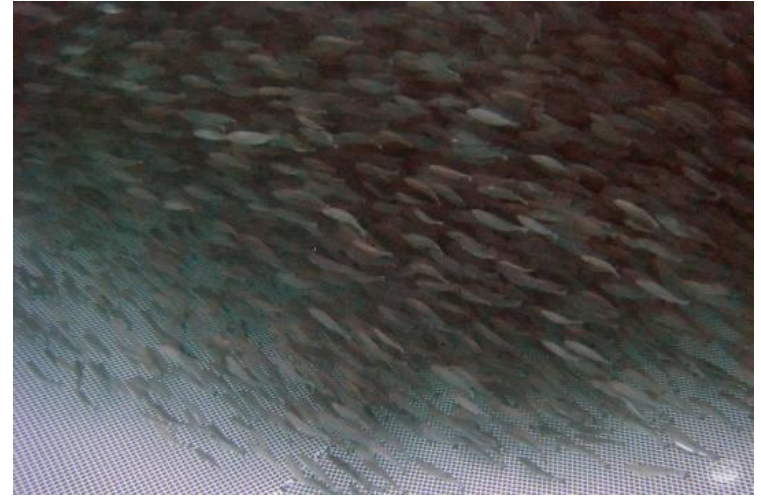


# Species to be Cultured

- Yellowtail Jack (*Seriola lalandi*)
  - Native to California Coast
  - Sold as “Hamachi” from Japanese fish farms
  - HSWRI has been culturing this species since 2003
- White Seabass (*Atractoscion nobilis*)
  - Native to California Coast
  - Commercially and recreationally important
  - HSWRI has been rearing this species for three decades
- Striped Bass (*Morone saxatilis*)
  - “Common” within project range
  - Anadromous (spawns in fresh water and matures in sea water)
  - Cannot be caught commercially
  - HSWRI has cultured this species since early 1970s



# Punta Bandera, Baja Calif. Test Site



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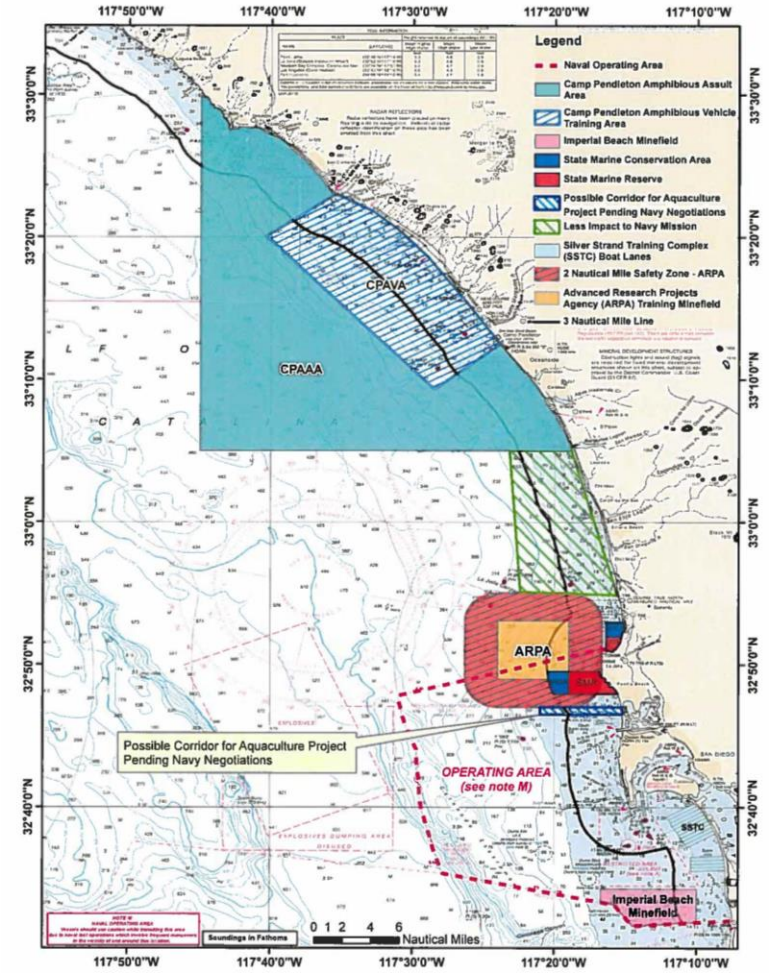
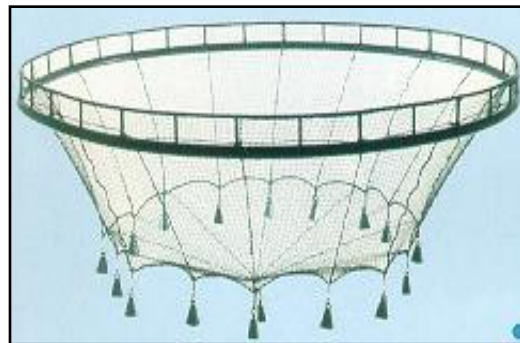
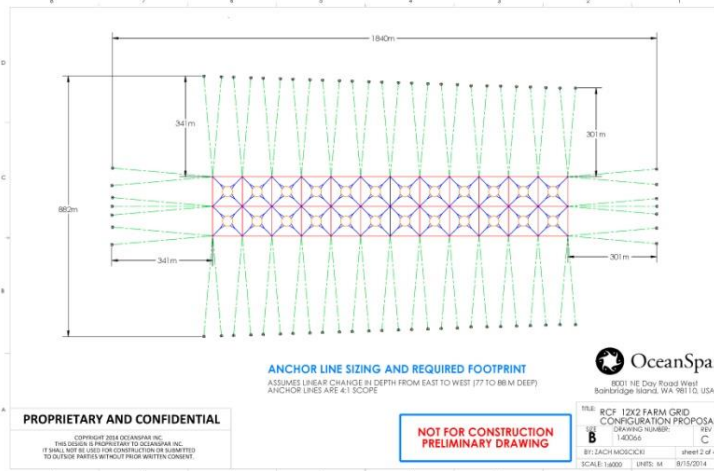


# Southern California is Ideal

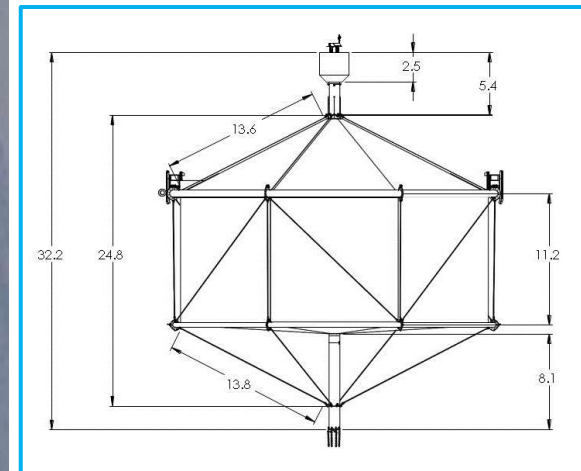
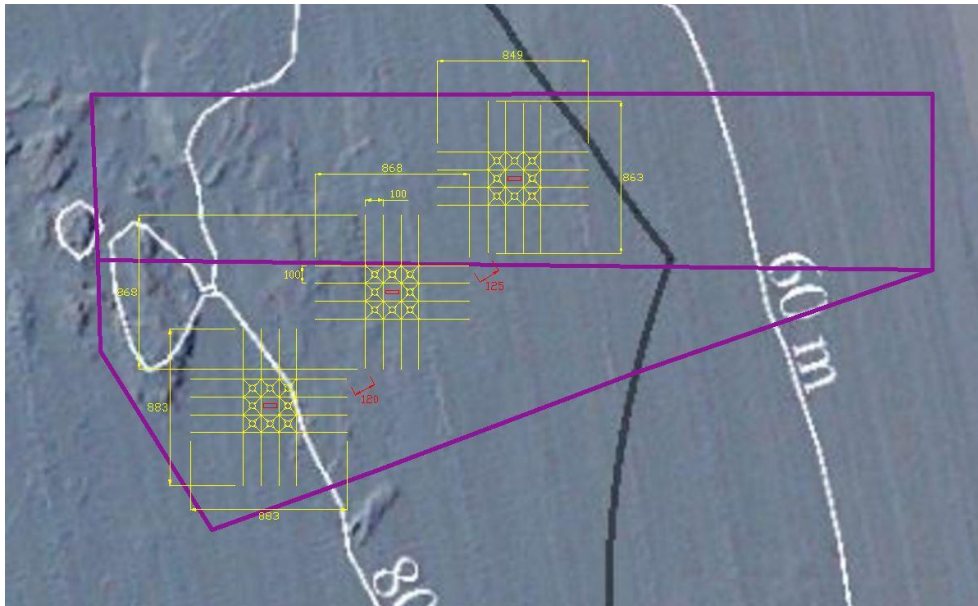
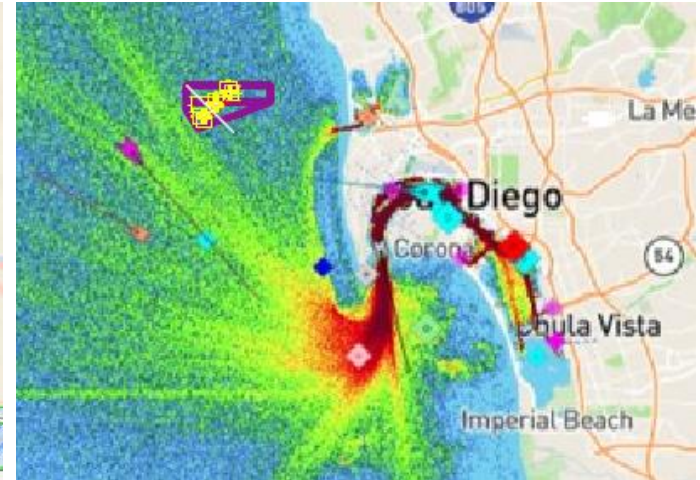
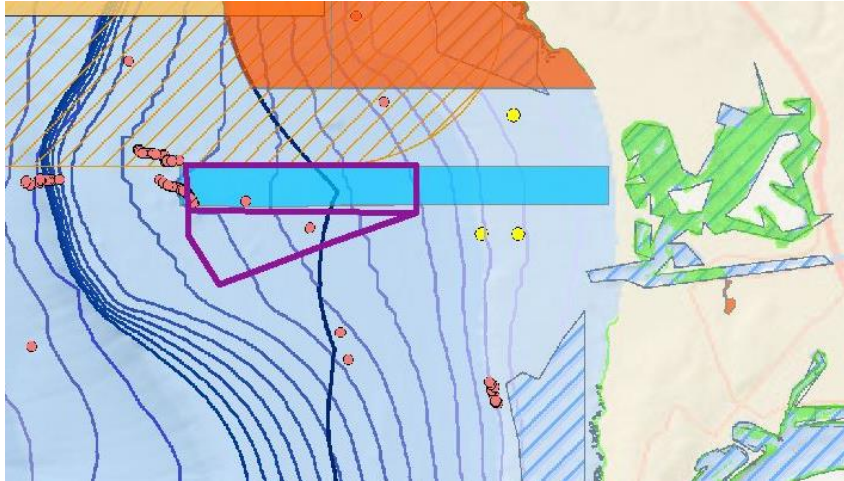
- Mild Mediterranean climate
  - Protected from storm events
  - Low wave heights
- Existing commercial fishing
- Proximity to markets



# Avoiding Other User Groups



# Finding the Right Farm Site



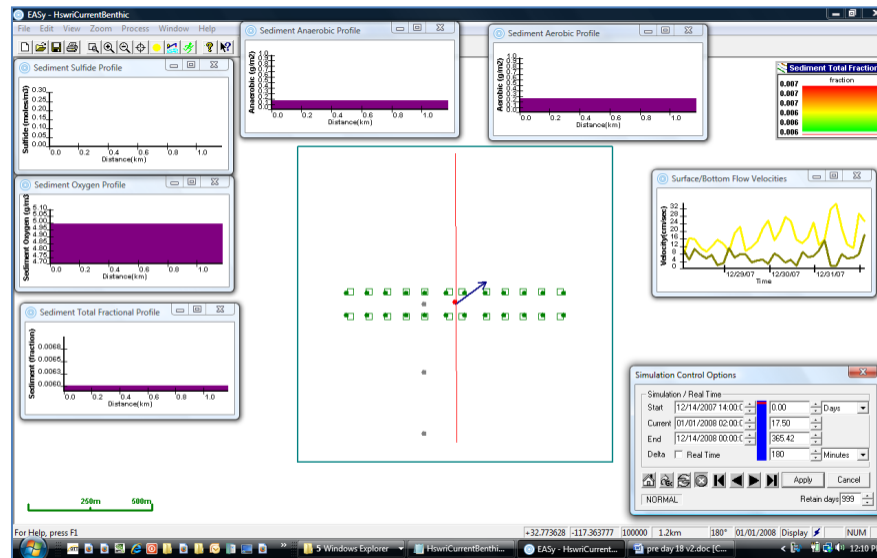
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# Bottom Sediment Simulation

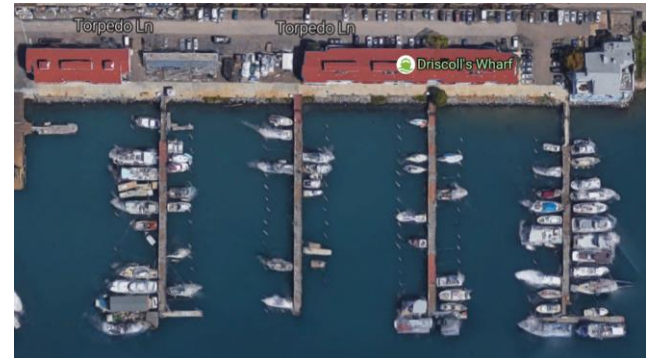
## Results:

1. Simulation scale is amplified 30x in order to show dispersion
2. Depth and current combine to disperse carbon to very low levels
3. Peak TOC within footprint is 0.0062g C/g sediment (~1%) above ambient
4. Increased TOC is probably not detectable using existing analytical standards



# Potential Economic Benefits

- RCF Project
  - Sales from \$50 million annually
  - 5x San Diego's commercial landings
  - Supporting over 300 seafood jobs (wages ~2x regional average) and the working waterfront
- Region
  - Generate over \$50 million in Total Economic Impact annually
  - New spending in excess of \$100 million annually
- State
  - Represent a 20% increase in seafood ex-vessel sales
- Nation
  - Help to reduce the growing trade deficit in seafood imports



Source: San Diego Regional Economic Development Corporation



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# What is the Potential?

- What does CA need?
  - 2014 Population of California: 38.8 million
  - 2012 Seafood consumption was 14.6 lbs/person
  - CA needs 257K MTs or ~500K MTs of whole fish
  - At 20 kg/M<sup>3</sup> and cage depth=10M →  
1.2 mile diameter cage
- What could be the result?
  - At \$6/kg ex-vessel value ⇒ \$3 billion in annual sales
  - At 43 jobs/1,000MT = 21,500 CA jobs
  - Total economic benefit to CA economy ⇒\$6 billion



# Challenges and Actions

## Challenges to Growth:

- **An undefined permitting process that causes US investment in aquaculture to be driven to other countries**
- **Lack of leadership in promoting a permitting process**
- **Largest opportunity for California development lies in State waters, but the required Programmatic EIR is still incomplete**

## Possible Legislative Actions:

- **Provide funding and direct DFW to finalize the PEIR**
- **Task State Lands with identifying Aquaculture Development Areas to minimize the site review process**
- **Direct the Administrative agencies (Agriculture, State Lands, DFW, CCC, etc.) to develop a coordinated process for permitting**
- **Provide programs for the CA research community (e.g., universities) to promote the scientific and support infrastructure needed to advance a sustainable aquaculture industry**



# Thank You!



*"With Earth's burgeoning populations to feed, we must turn to the sea with new understanding and new technology. We must learn to farm the sea as we have farmed the land"*

Capt. Jacques Cousteau



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