



Marine Aquaculture



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Presentation to the North Central Coast Regional Stakeholder Group
July 10, 2007 • Pacifica, CA

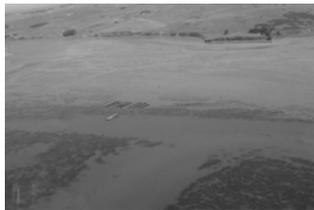
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Marine Region
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Registered Marine Aquaculturists

- > 230 registered aquaculturists in California
 - 39 aquaculturists approved for marine species
 - 36 approved for bivalve shellfish or abalone
 - 6 are approved to rear marine algae
 - 3 are approved to rear marine fish
 - 2 are approved to rear shrimp

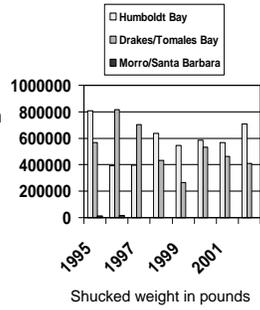
Oyster Culture

- 14 aquaculturists actively growing oysters for retail or wholesale markets
- One raises shellfish seed for domestic and foreign aquaculturists
- Species Cultured
 - Pacific oyster (non-native)
Most sold as shucked product
 - European flat (non-native)
Sold live/whole
 - Kumamoto (non-native)
Sold shucked & live/whole
 - Olympia or native oyster
Sold shucked & live/whole

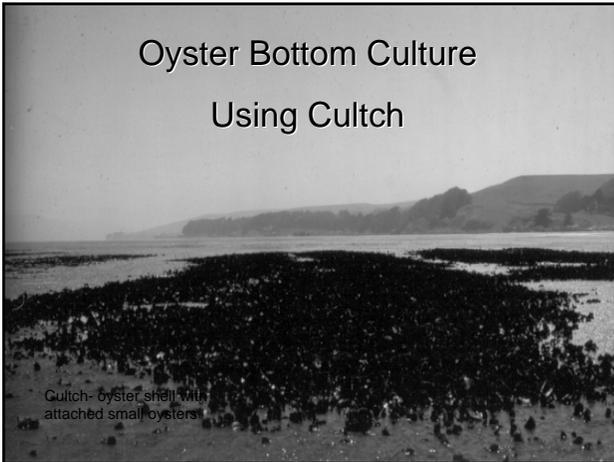


California Oyster Production by Area

- Humboldt Bay leading oyster producing area
- Economic and disease impacts resulted in production decline in Drakes/Tomales Bay area
- Morro/Santa Barbara area production bottomed-out with death of a long-time oyster grower



Oyster Bottom Culture Using Cultch



Off-Bottom Culture Using Cultch-Longline on Stakes



Off-Bottom Culture Using Single Oysters- Rack and Bag



Off-Bottom Culture Using Single Seed- Floating Bags on Longlines



Mussel Culture

- 17 aquaculturists approved to rear mussels
- 11 actively rearing or harvesting mussels
- One harvests wild mussels from offshore oil platforms
- Mussels cultured in Tomales Bay



Clam Culture

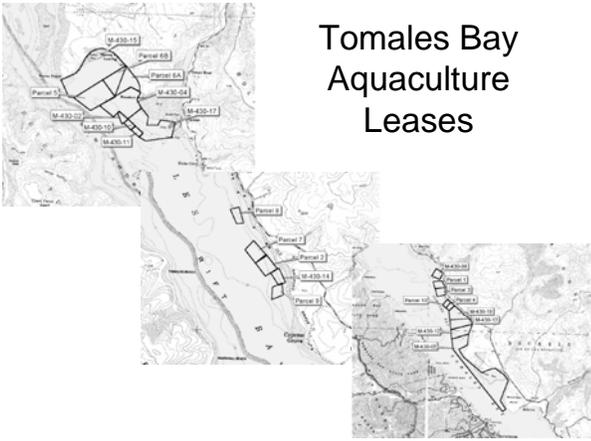
- 17 aquaculturists approved to rear clams
- About half actively rearing clams
- Clams cultured in Drakes Estero and Tomales Bay



Bivalve Shellfish Culture - Industry Issues

- Biggest issue is water quality
 - Seasonal closures
 - Growing area classification
- Disease – summer mortality syndrome
- Environmental impacts
 - Eelgrass

Tomales Bay Aquaculture Leases



Abalone Culture

- 17 aquaculturists approved to grow abalone
- 12 actively rearing abalone
- 6 rearing abalone on a commercial scale
- 1 aquaculturist in Half Moon Bay



Abalone Culture - Industry Issues

- Disease
 - Withering syndrome - affects wild and cultured abalone
 - Sabellid polychaete - non-native parasite
- Commercial fishery closure in 1997 resulted in high market demand and good price to growers

Finfish Culture

- No marine finfish are being produced on a commercial scale
- A few land-based commercial aquaculture facilities are currently in the research and development phase
- The Ocean Resources Hatchery Enhancement Program (ORHEP) evaluating feasibility of stock enhancement using white seabass and California halibut

Aquaculture Leases in the Region

Lessee	Total Lease Acreage*	Acreage in Use (estimate)	Approved Species For Cultivation in Lease Agreement
TOMALES BAY			
Marin Oyster Company	30	6	Oysters, Manila Clam, and Blue Mussels
Charles Friend	62	10	Oysters, Manila Clam, and Blue Mussels
Cove Mussel Company	10	5	Bay Mussels, Pacific Oyster, and Clam
Hog Island Oyster Company	163	55	Oysters, Clams, and Bay Mussels
Point Reyes Oyster Company	92	~16	Oysters, Clams, Scallops, Mussels, and Abalone
Tomales Bay Shellfish Farms Inc.	156	60	Oysters and Bay Mussels
DRAKES ESTERO			
Drakes Bay Oyster Company (formerly Johnson Oyster Company)	1,060		Oysters, Rock Scallops, and Manila clam

*Some multiple leases
