

# Socioeconomics of North Coast Fisheries in the Context of Marine Protected Area Formation

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# Study Components

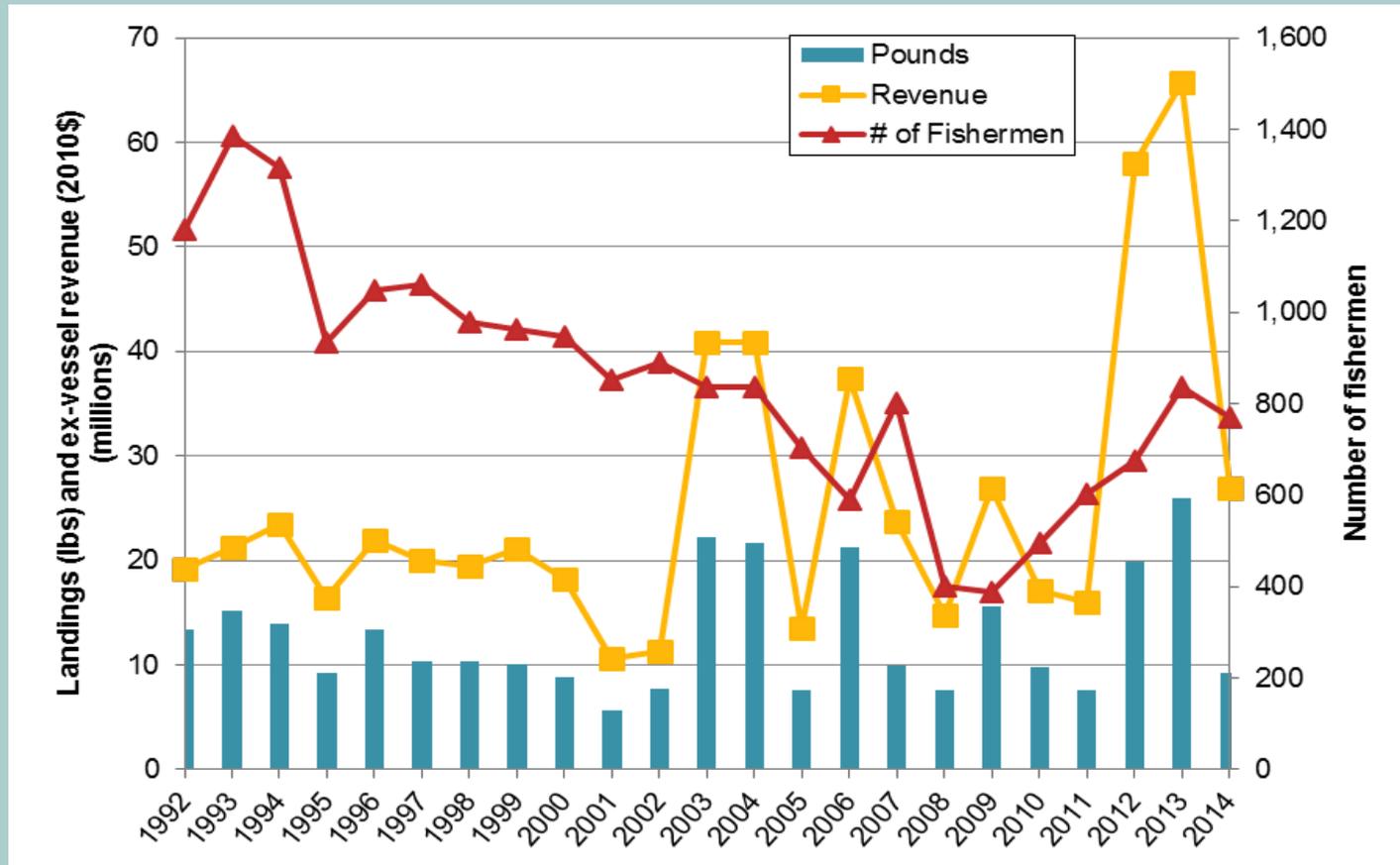
1. A baseline characterization of spatial fishing patterns and socioeconomic status of commercial and CPFV fishermen
2. An assessment of initial spatial and socioeconomic changes following MPA implementation
3. Quantitative assessment of fishermen's perceptions of the ecology and management of the MPA network
4. Qualitative assessment of the socioeconomic context and the impacts of MPAs gathered from focus group meetings held in key regional ports.

# METHODS:

- Fisherman's Advisory Council
  - 8 representatives
- Surveys
  - 163 commercial operators (46%)
  - 15 CPFV operators (60%)
- Focus Groups
  - 5 total
  - 4-12 participants
- Analysis of landings data
  - Baseline conditions
  - Regulatory event study

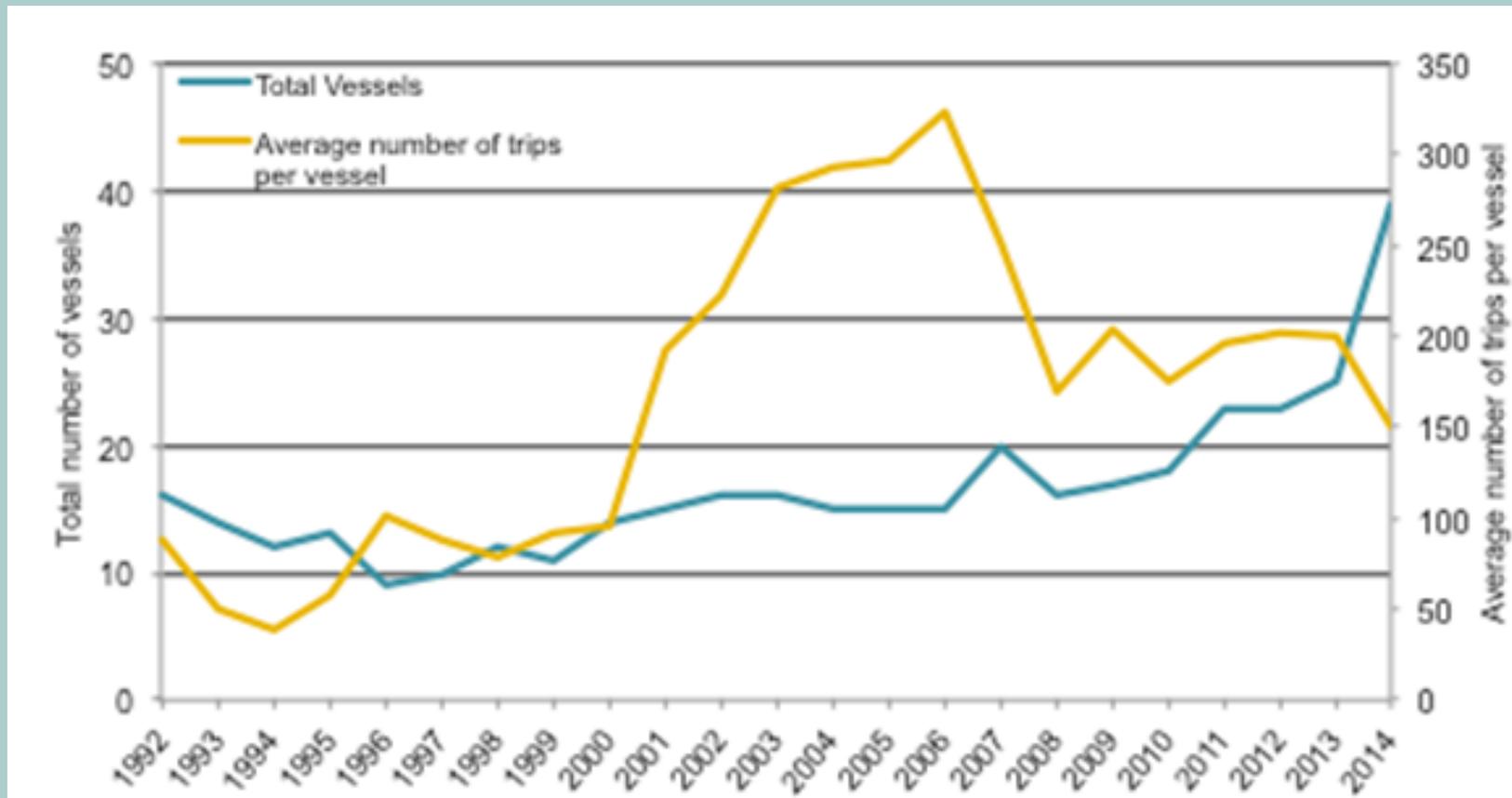


# Trends in NC Commercial Fishing



North Coast region commercial landings, ex-vessel revenue, and number of fishermen, fisheries of interest, 1992–2014

# Trends in NC CPFV Fishing



Total number of CPFV vessels and average number of trips per vessel, North Coast region, 1992-2014

# Demographics

Average age and years of experience commercial fishing in 2013, North Coast region

Fishery	Age			Years of experience		
	n	Average	St.Dev	n	Average	St. Dev
Dungeness crab - trap	126	52.7	13.5	126	27.8	11.8
Nearshore finfish- dead - hook and line	12	59.9	13.7	12	31.2	12.9
Nearshore finfish dead - longline	3	65.3	21.7	3	32.0	8.0
Nearshore finfish live - hook and line	15	57.0	10.5	15	28.1	7.1
Nearshore finfish live - longline	5	63.0	16.3	5	34.0	6.4
Nearshore finfish live - trap	3	61.7	12.2	3	27.7	0.6
Salmon – troll	87	50.1	15.5	87	25.6	13.7
Urchin – dive	18	55.5	13.3	18	24.9	11.2
<b>All target fisheries (unique individuals)</b>	<b>148</b>	<b>53.9</b>	<b>12.2</b>	<b>148</b>	<b>27.6</b>	<b>14.2</b>

Source: Current study.

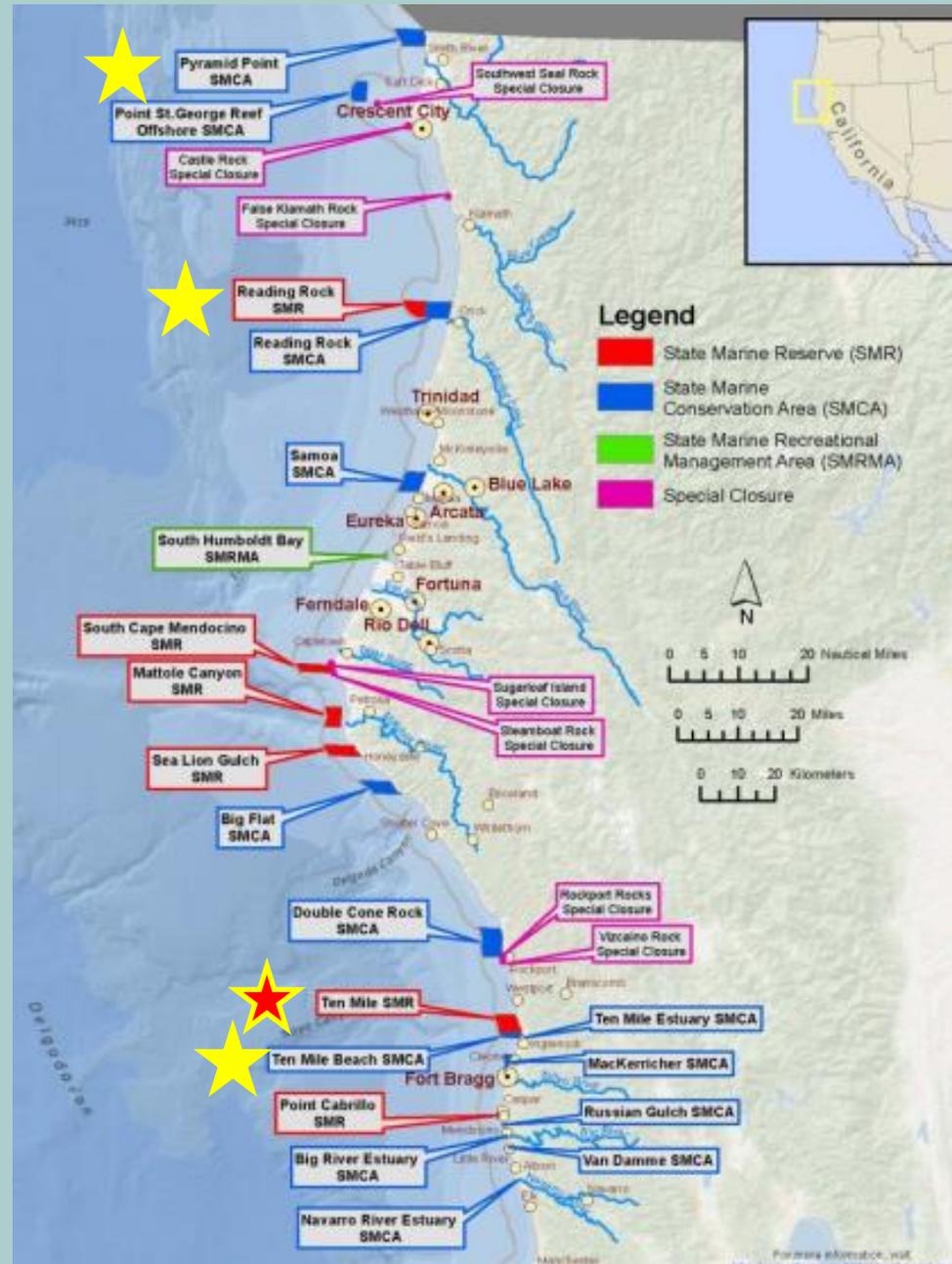
# Perceived Impacts from MPAs

Row Labels	Number responding	Have MPAs affected your fishing?	Have MPAs affected your fishing?				
			A	B	C	D	E
Dungeness crab - trap	126	47%	41%	11%	3%	4%	27%
Nearshore finfish- dead - hook and line	12	67%	58%	33%	25%	33%	25%
Nearshore finfish dead - longline	3	67%	67%	33%	0%	33%	33%
Nearshore finfish live - hook and line	15	53%	40%	13%	13%	7%	33%
Nearshore finfish live - longline	5	60%	60%	0%	20%	0%	40%
Nearshore finfish live - trap	3	67%	33%	33%	33%	0%	33%
Salmon - troll	87	68%	63%	19%	15%	8%	29%
Urchin - dive	18	88%	75%	25%	19%	25%	56%
<b>All target fisheries (unique individuals)</b>	<b>148</b>	<b>73%</b>	<b>65%</b>	<b>21%</b>	<b>13%</b>	<b>10%</b>	<b>42%</b>

- A** Cannot fish in or go to traditional grounds/areas
- B** Need to travel longer distances to fish in other areas
- C** Shifted fishing effort into areas in which weather is less predictable
- D** Moved homeport location or fish out of another port
- E** Other ways directly/indirectly effected by MPAs

# Which MPAs Had the Most Impact?

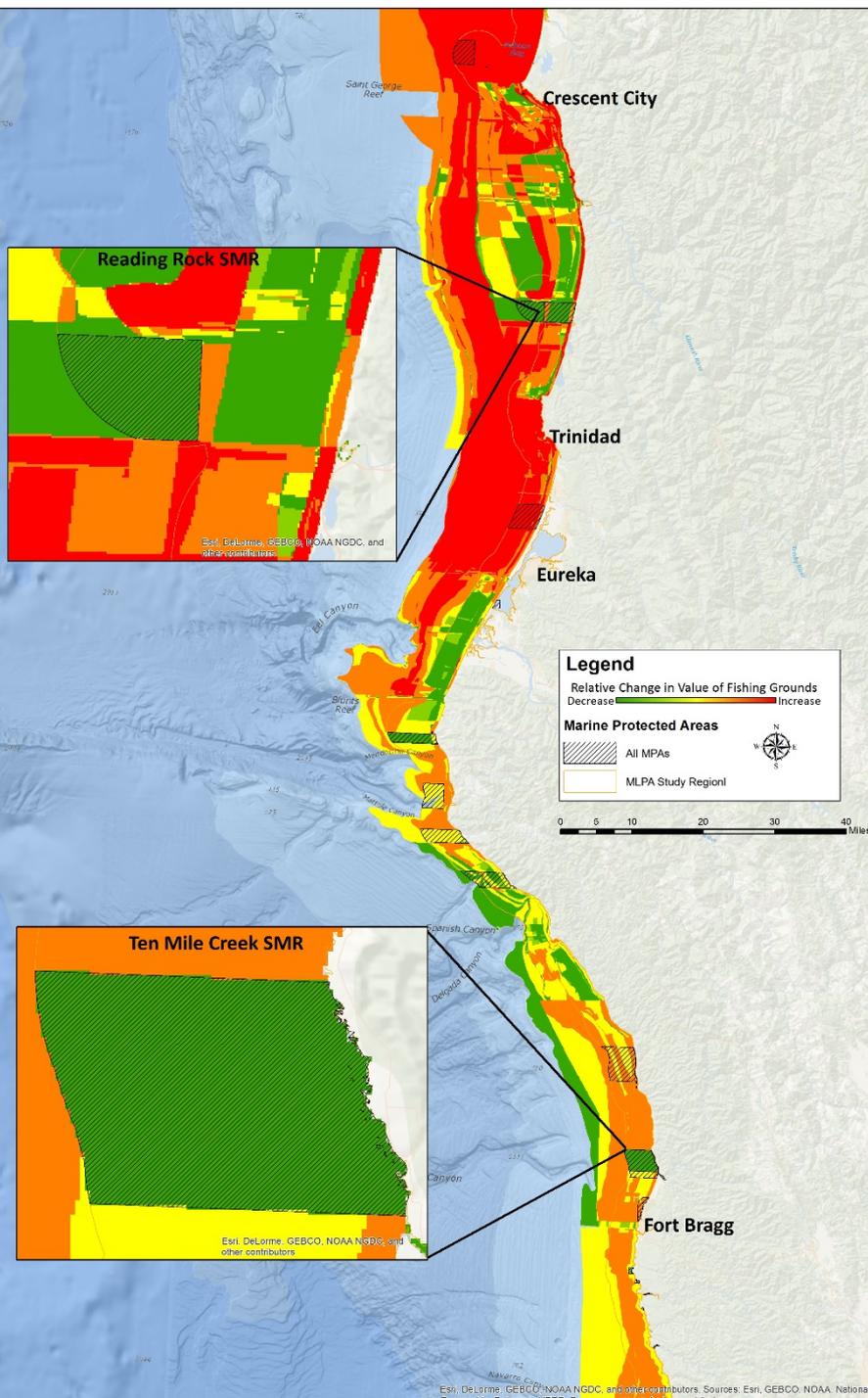
- Ten Mile SMR
  - 77 commercial; 43 salmon; 18 crab; 4 CPFV
- Reading Rock SMR
  - 40 commercial; 26 crab; 3 CPFV
- Ten Mile Beach SMCA
  - 38 commercial; 29 salmon; 1 CPFV
- Pyramid Point SMCA
  - 19 commercial; 13 crab



# Spatial Change

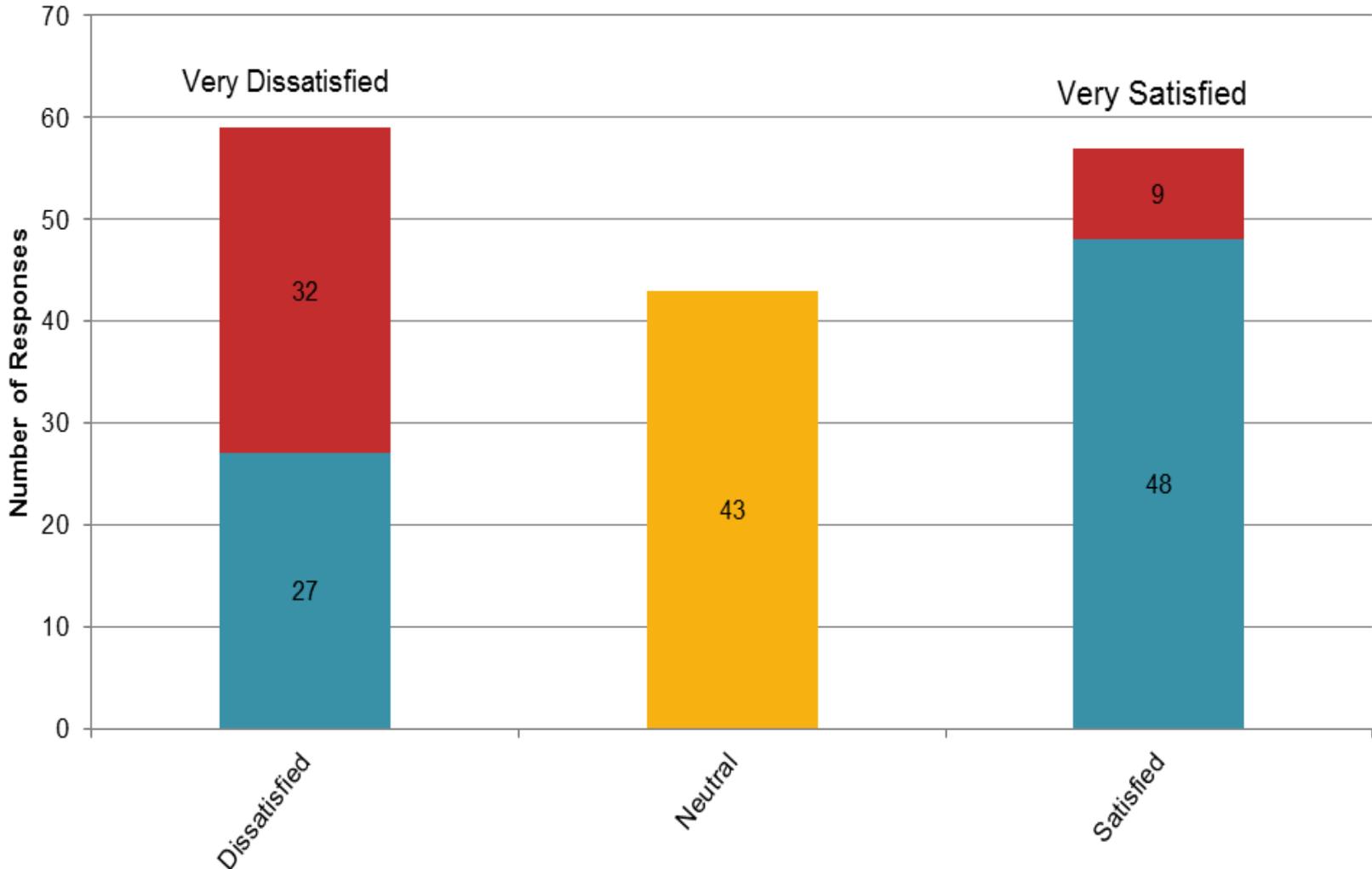
Between pre MPA 2000-2009  
yearly average and post MPA 2013

## Commercial Dungeness crab



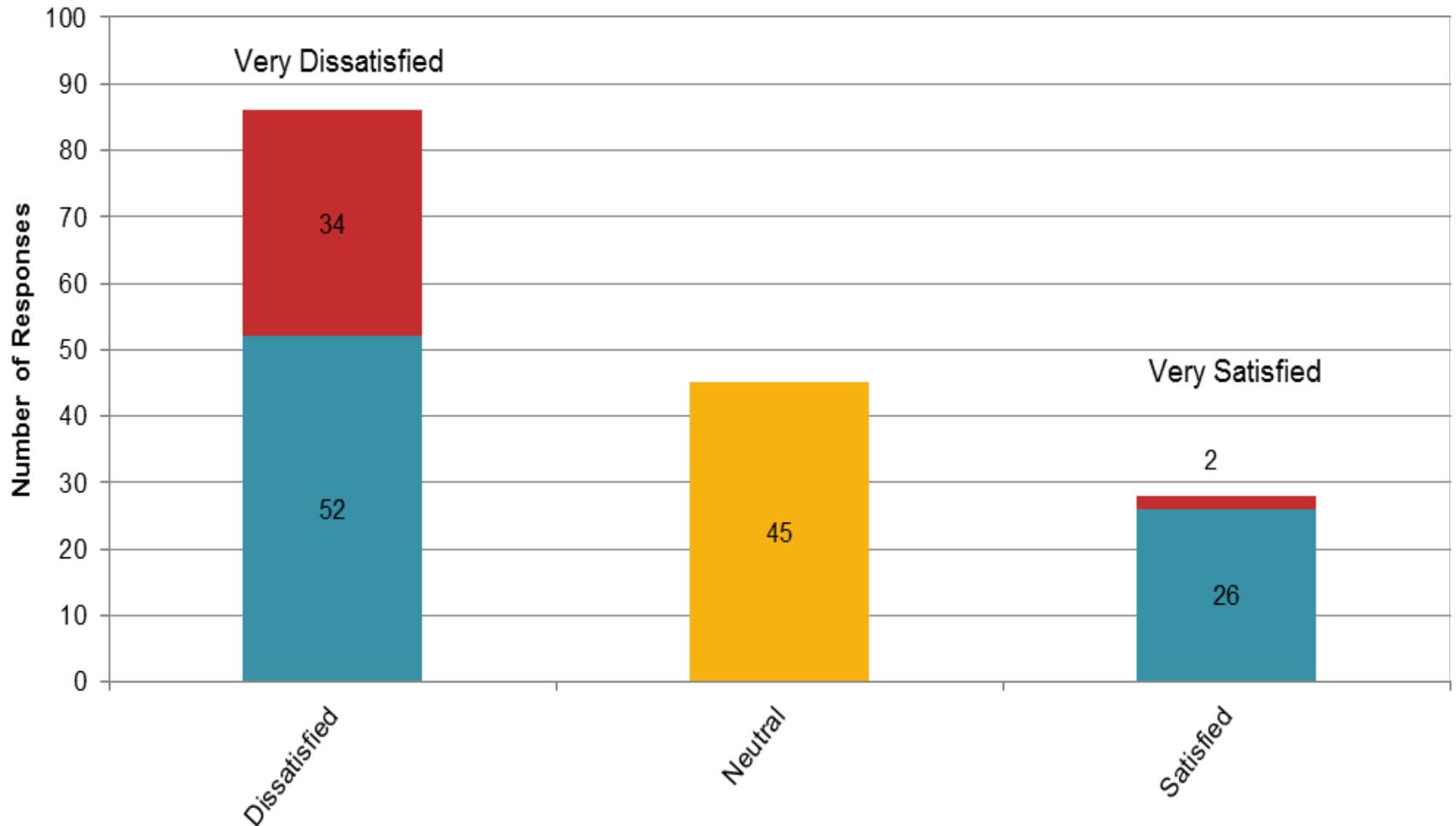
# Perceptions of Management:

Satisfaction with the inclusion of local input in the North Coast MPA Planning Process



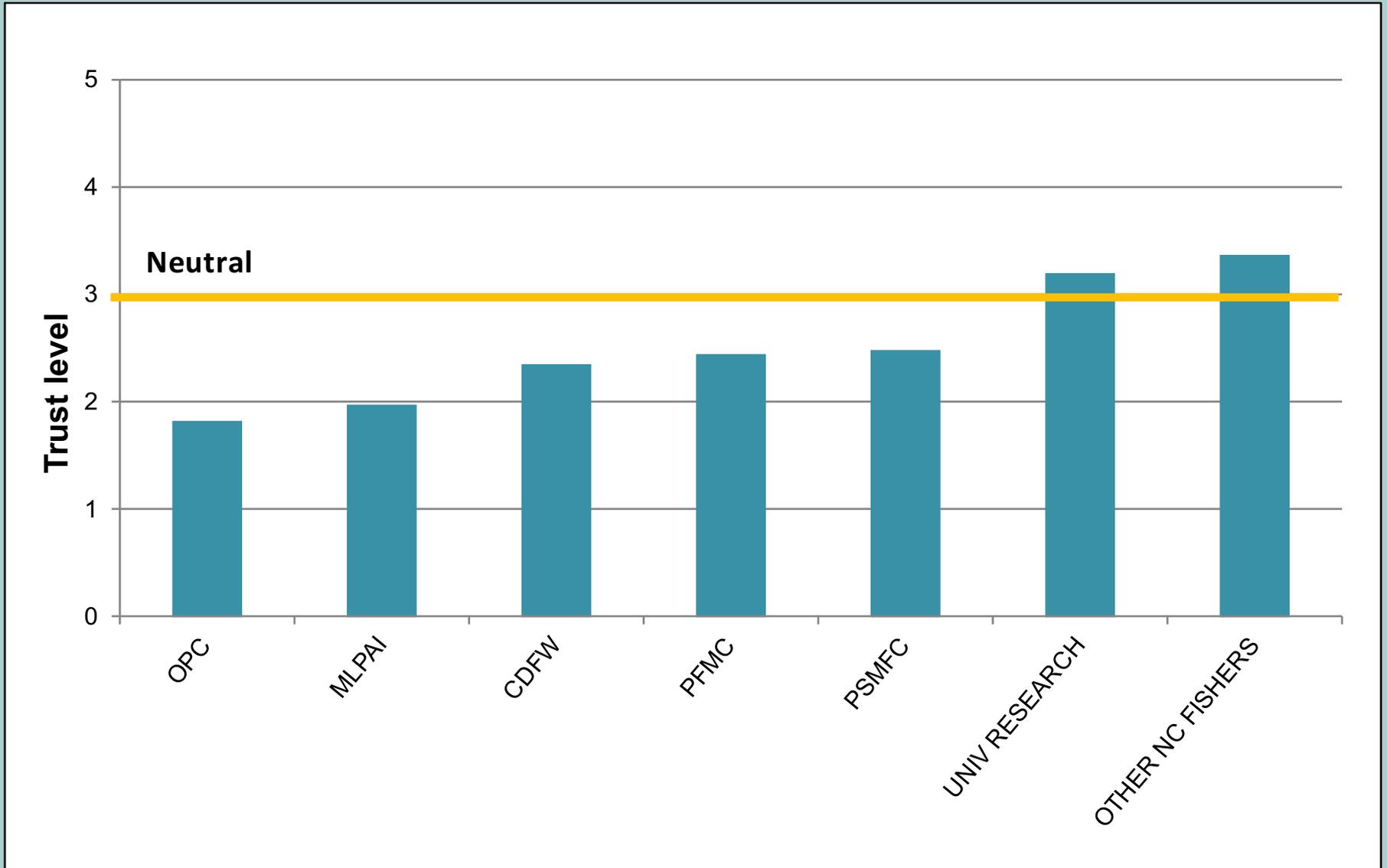
# Perceptions of Management:

Satisfaction with the overall planning process for the North Coast MPA network



# Perceptions of Management:

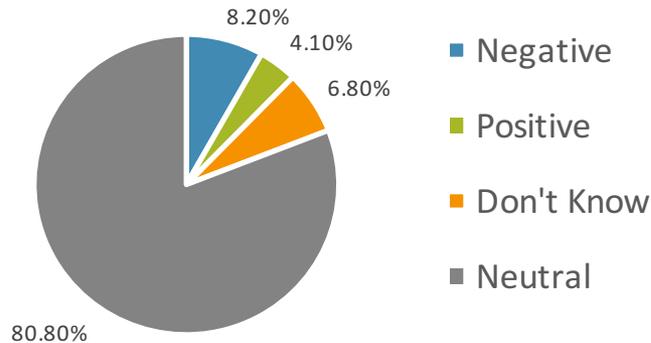
Mean levels of trust in marine management entities



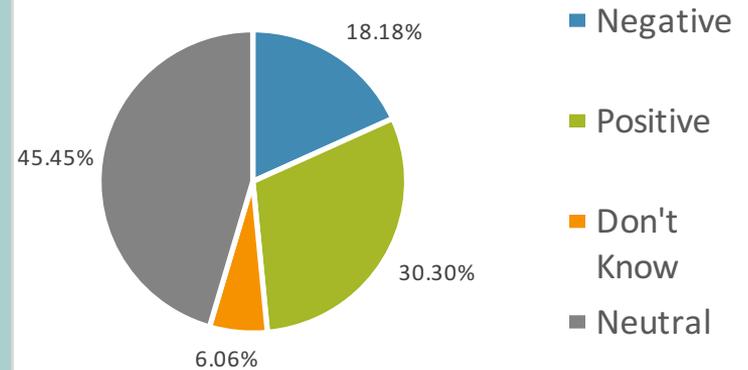
# Perceptions of Ecology:

What effect do you think the North Coast MPA network will have on the health of this resource?

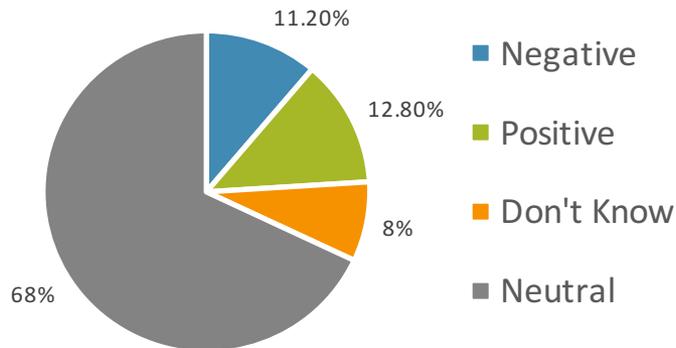
## MPA EFFECTS ON SALMON



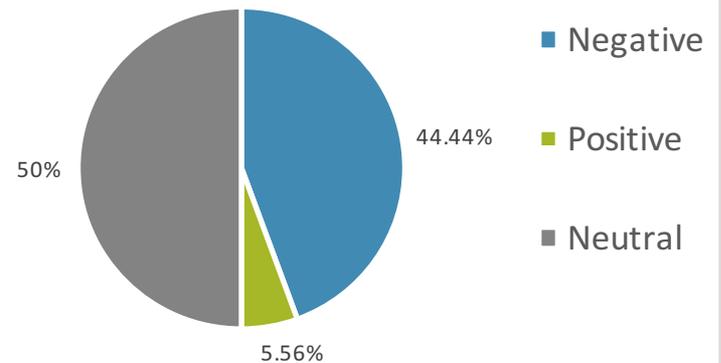
## MPA EFFECTS ON ROCKFISH



## MPA EFFECTS ON CRAB



## MPA EFFECTS ON URCHIN



# Focus Group Results

- Importance of historical context
  - “In my fishery where there were 70 people doing what I did in mid-nineties, there is now 4 to 8 people that on the water...because of the way we've lost our infrastructure.”
- Perceptions of MPA effects and process
  - “We are not happy with anything about the MLPA initiative. I'm very thankful that our stakeholders minimized the damage to the extent they did.”
  - “I think there's a consensus that it was a serious railroad job all the way through.”
- Visions for the future
  - “You want to base your management for the health of the species too but also for the people to continue to make a living, to increase your economy of the town, the bars, the restaurants, motels, everything”
  - “It would be nice if they [scientists] would collaborate with us because then we're gonna know that the science is real or not.”

# Urchin Regulatory Event Study

- Comparing 37 urchin divers 5-years prior to MPA formation with 2-years post MPA formation
  - No evidence for significantly lower post-MPA fishing revenue
  - No evidence of changes in the level of dependence on the urchin fishery
  - No evidence of changes in spatial dependence on the key urchin ports of Fort Bragg and Albion

## Distribution of income increases or decreases pre/post MPA

	Increased	Decreased	Did Not Change
<b>Average Annual Income</b>	26	11	0
<b>Category</b>	11	3	23

# Fisheries Data Explorer



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## California Fisheries Data Explorer



### Explore California's State Fisheries

This interactive Fisheries Data Explorer allows you to visualize data from commercial fisheries and commercial passenger fishing vessels, across the State. Using data collected and managed by the California Department of Fish and Wildlife (CDFW), the Explorer lets you dynamically view summarized data from the commercial fishing sector (i.e., number of fishermen, pounds of fish landed, and revenue from fish landed) and from the commercial passenger fishing sector (i.e., the number of anglers, vessels, trips, and fish caught from specific fisheries and ports).

Funded by the California Ocean Protection Council, and developed in partnership with CDFW and the California Ocean Science Trust, the Explorer was developed through the California's Marine Protected Area Monitoring Program, to ensure that the State's decision-makers, stakeholders, and the public have ready access to data and information that support the health and management of California's ocean.

[Learn more about confidentiality and the process of collecting.](#)

[Key Terms & Information](#)

[Full Data Package](#)

## Fisheries Mapped by Port Group

### Select Fishery

Dungeness Crab  
TRAP



### Select Data

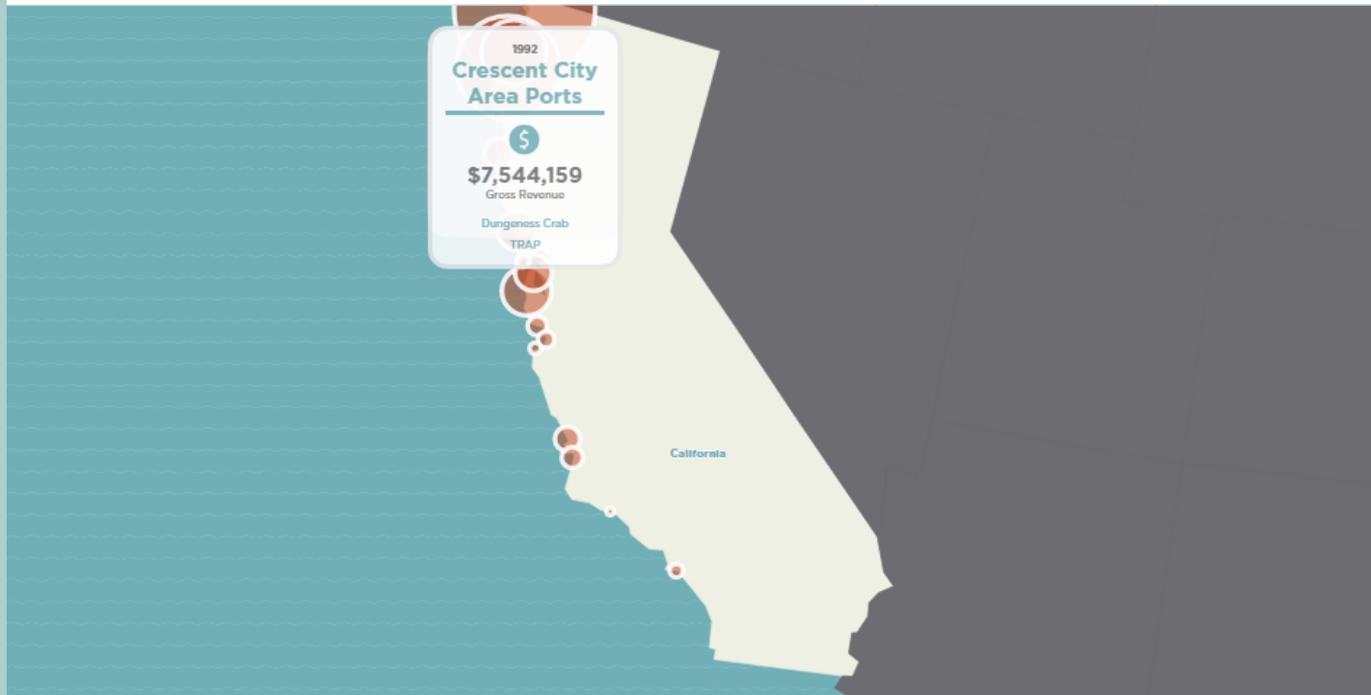
Gross Revenue



1992

1992

2014



Fisheries Mapped  
by Port Group

Port Group  
Summary

How Fisheries  
Compare

How Port  
Groups Compare



## Port Group Summary

Select Port Group

Eureka Area Ports



Select Year



2011

2012

2013

2014



\$13,017,412

Gross Revenue



323

Fishermen



14,785,049

Pounds Landed



Top Fisheries by Revenue

\$4,770,189

Market Squid  
Seine/Net

\$3,245,682

Other Flatfish  
Bottom Trawl

\$2,109,683

Shrimp/Prawn  
Bottom Trawl

\$1,599,994

Dungeness Crab  
Trap

\$800,061

Thornyhead  
Bottom Trawl

Download Visualization



## How Fisheries Compare

### Select Port Group

Fort Bragg Area Ports



### Select Fisheries



Select All

Clear All

California Halibut  
HOOK-LINE

California Halibut  
LONGLINE

Coastal Pelagics  
BRAIL/DIP NET

Coastal Pelagics  
SEINE/NET

Dungeness Crab  
TRAP

Lobster  
TRAP

Market Squid  
BRAIL/DIP NET

Market Squid  
SEINE/NET

Nearshore Finfish  
HOOK-LINE

Nearshore Finfish  
HOOK-LINE - DEAD

Nearshore Finfish  
HOOK-LINE - LIVE

Nearshore Finfish  
LONGLINE - DEAD

Nearshore Finfish  
LONGLINE - LIVE

Nearshore Finfish  
TRAP - LIVE

Red Urchin  
DIVING

Rock Crab  
TRAP

Salmon  
TROLL

Sea Cucumber  
BOTTOM TRAWL

Sea Cucumber  
DIVING

Shelf-Slope Rockfish  
HOOK-LINE

Shelf-Slope Rockfish  
LONGLINE

Shelf-Slope Rockfish  
TRAP

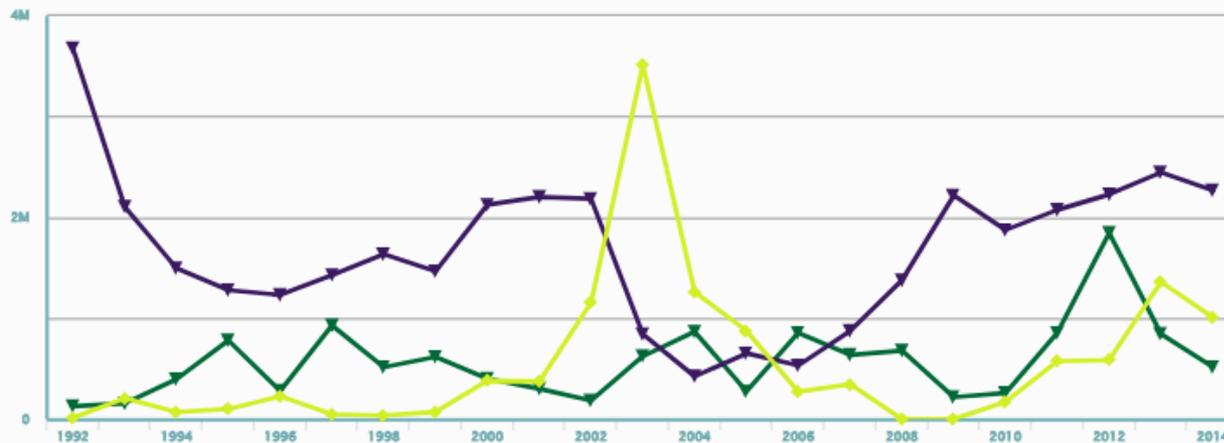
Spot Prawn  
BOTTOM TRAWL

Spot Prawn  
TRAP



### Pounds Landed

Number of Fishers



# Recommendations/Next Steps

- Importance of fishing community engagement
- Gaps in existing data collection (landing receipts, log books)
- Socioeconomic monitoring metrics
- Commercial and CPFV fishing industries face challenges
  - Leveraged MPA research/data to get grant to support Fishing Community Sustainability Planning

# Acknowledgements

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