



Outline

- 1) Introductions
- 2) Program Background
- 3) Frequently Asked Questions
- 4) Data Summaries



Introductions

1. Name
2. Affiliation (e.g. Captain, Deckhand, Volunteer Angler, Science Crew, etc.)
3. Where is your favorite place to fish?



California Collaborative Fisheries Research Program (CCFRP)



- Fishery-independent (catch-and-release) study that combines the expertise and ideas of:
 - the fishing community
 - academic scientists
 - resource managers
- Conducts scientifically rigorous data collection and analyses for MPA monitoring and fisheries management



Benefits of Collaboration

- Engage stakeholders in both science and management
- Utilize different areas of expertise to develop protocols and collect data
- Create a shared understanding of resources and facilitate communication



California Collaborative Fisheries Research Program (CCFRP)



California MPAs

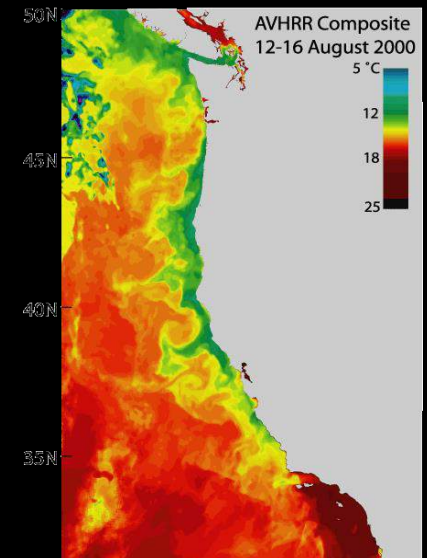
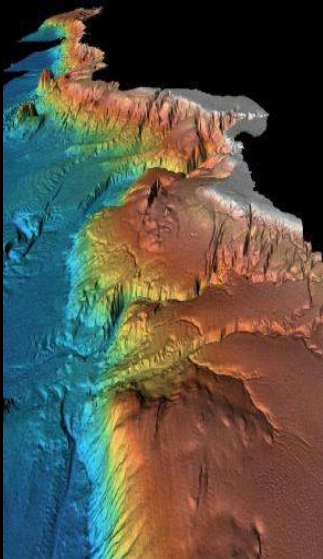
Marine Life Protection Act (MLPA)



passed in 1999



mandated the creation of a network of marine protected areas (MPAs) along the California coast to protect diversity and ecosystem function



Why Monitor MPAs?

1. It is a priority adopted by the state of California
2. It is required by MLPA
3. Critical to seeing the effects of the MPA network in action





Marine Protected Area (MPA) vs. Reference Site (REF)



State Marine Reserve (SMR) – fully protected; all commercial and recreational harvest prohibited



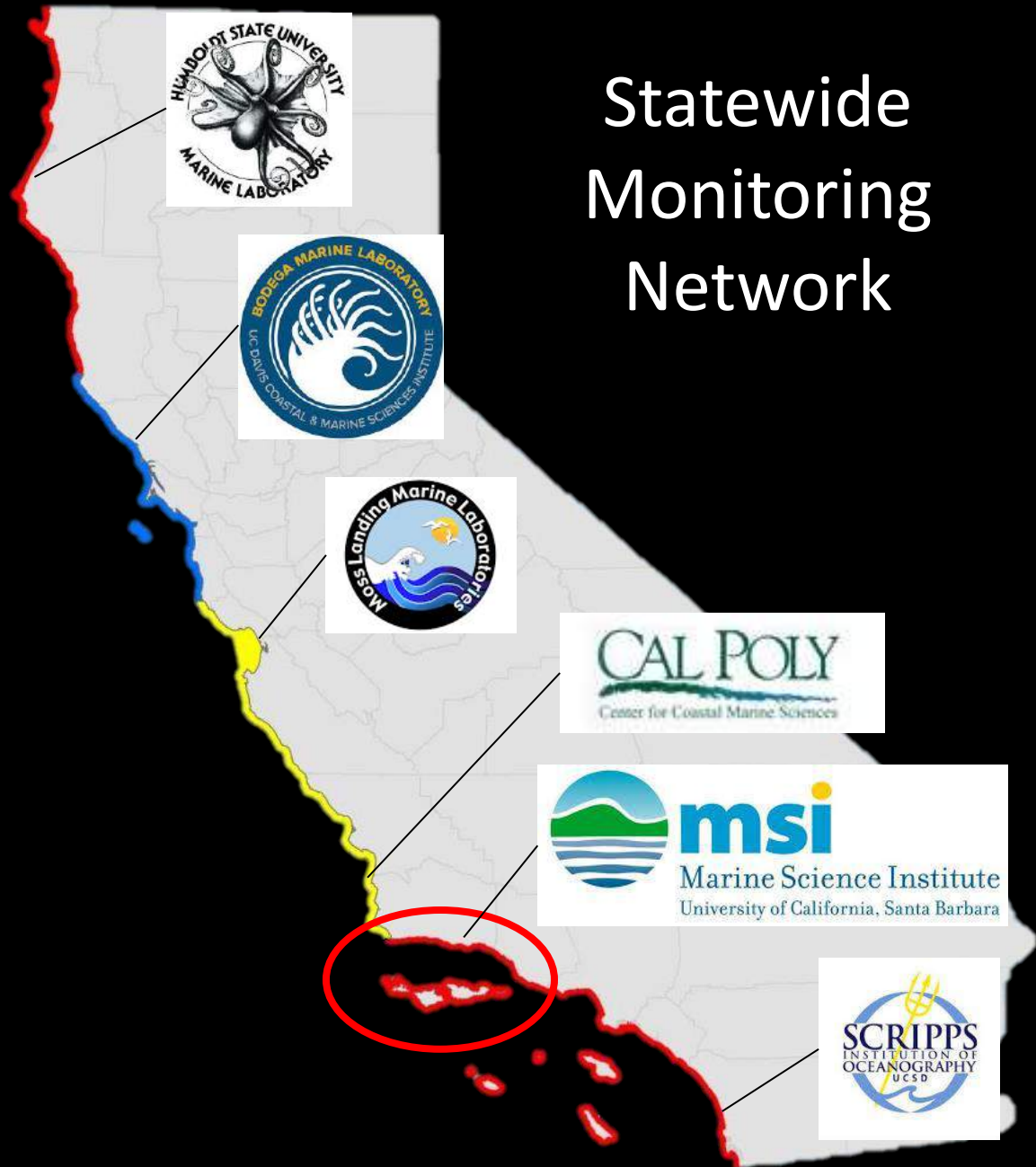
State Marine Conservation Area (SMCA) – limited recreational and/or commercial extraction permitted



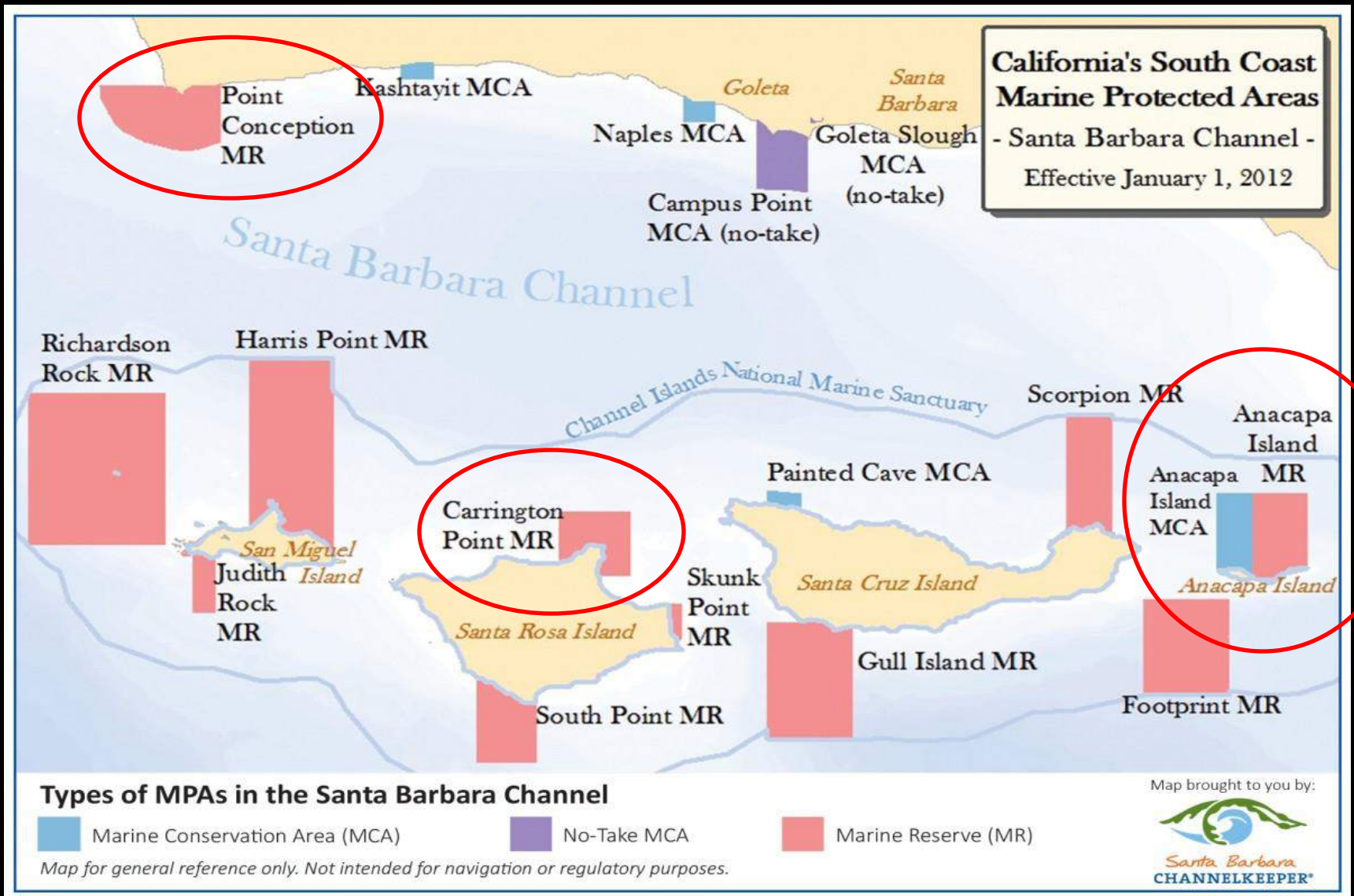
State Marine Park (SMP) – recreational harvest permitted



Fished Areas – areas open to both recreational and commercial fishing; subject to California Dept. of Fish and Wildlife (CDFW) rules and regulations (e.g., minimum/maximum sizes, seasonal closures, daily bag limits)



Channel Islands MPAs



CCFRP Sampling Design

Region

Area

Site

Grid Cell (x4)

Location (x3)

North

Point Conception SMR

MPA

REF

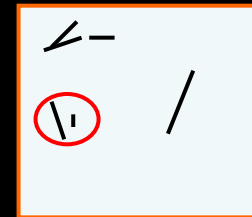
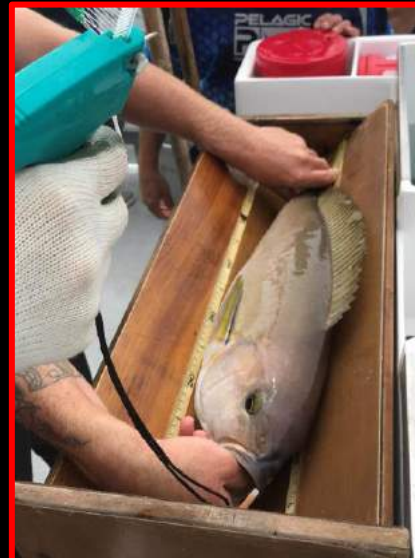
Drift (15 min / location)

Carrington Point SMR

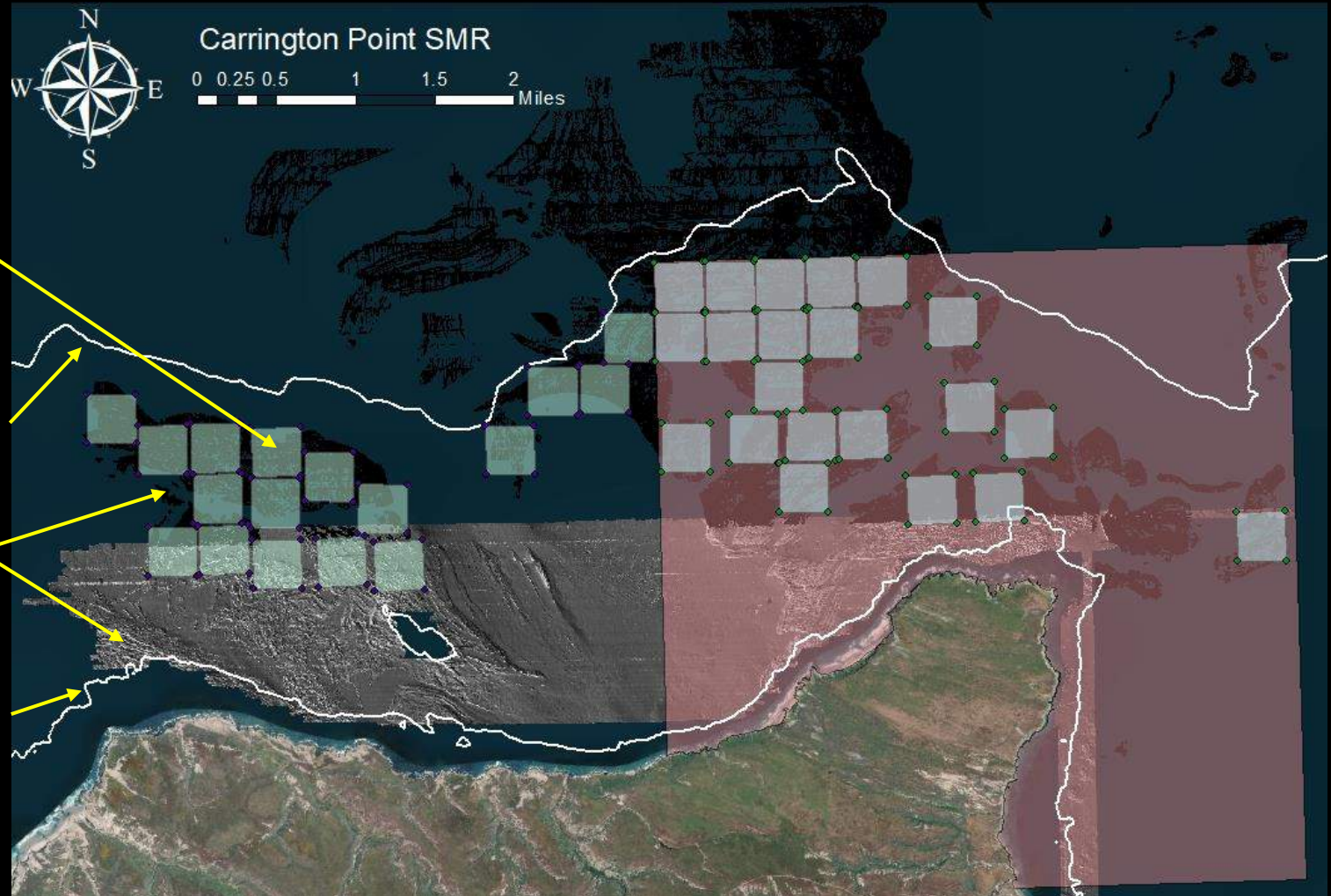
Anacapa SMR & SMCA

Central

South



UCSB Study Sites



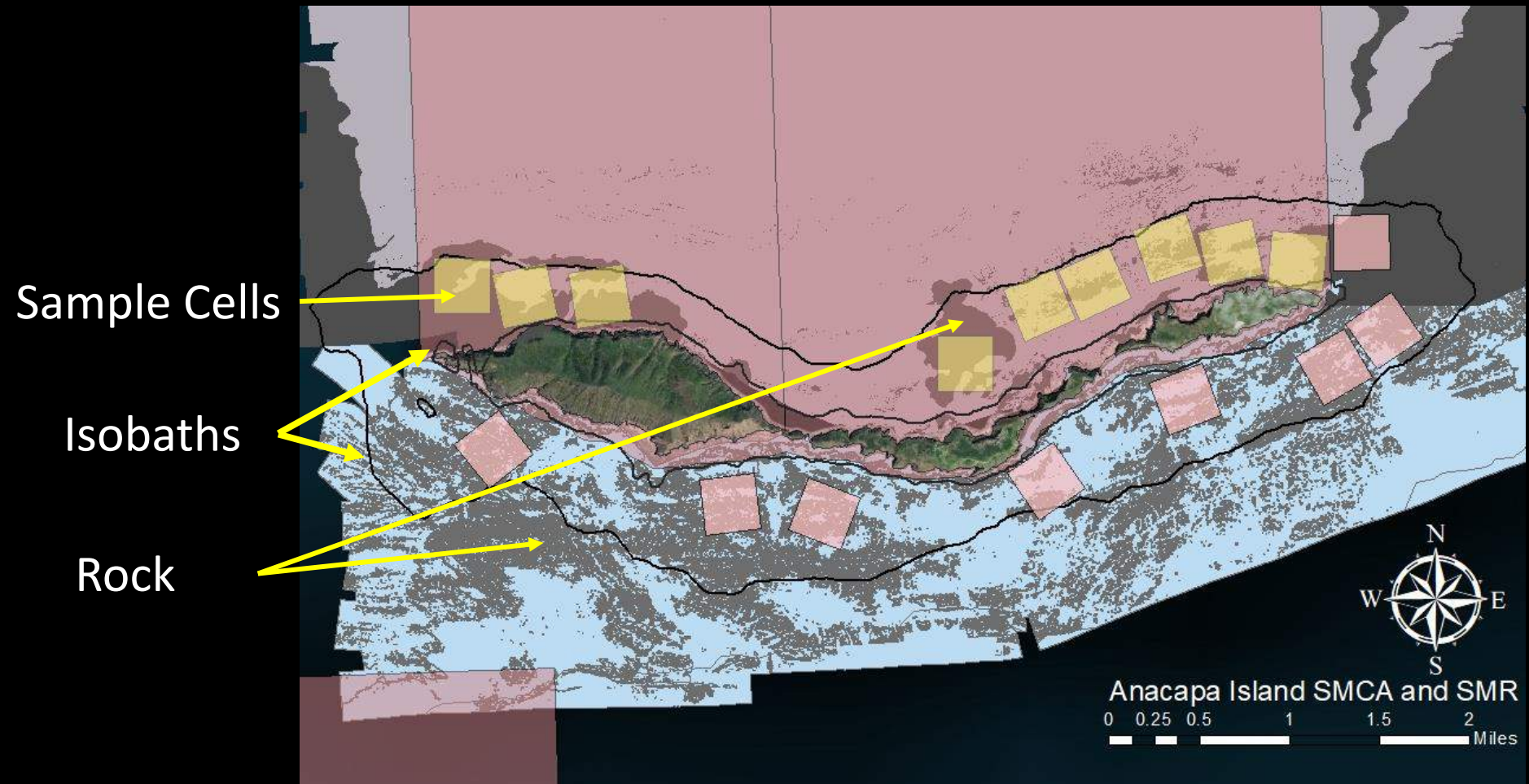
Sample Cells

50 m isobath

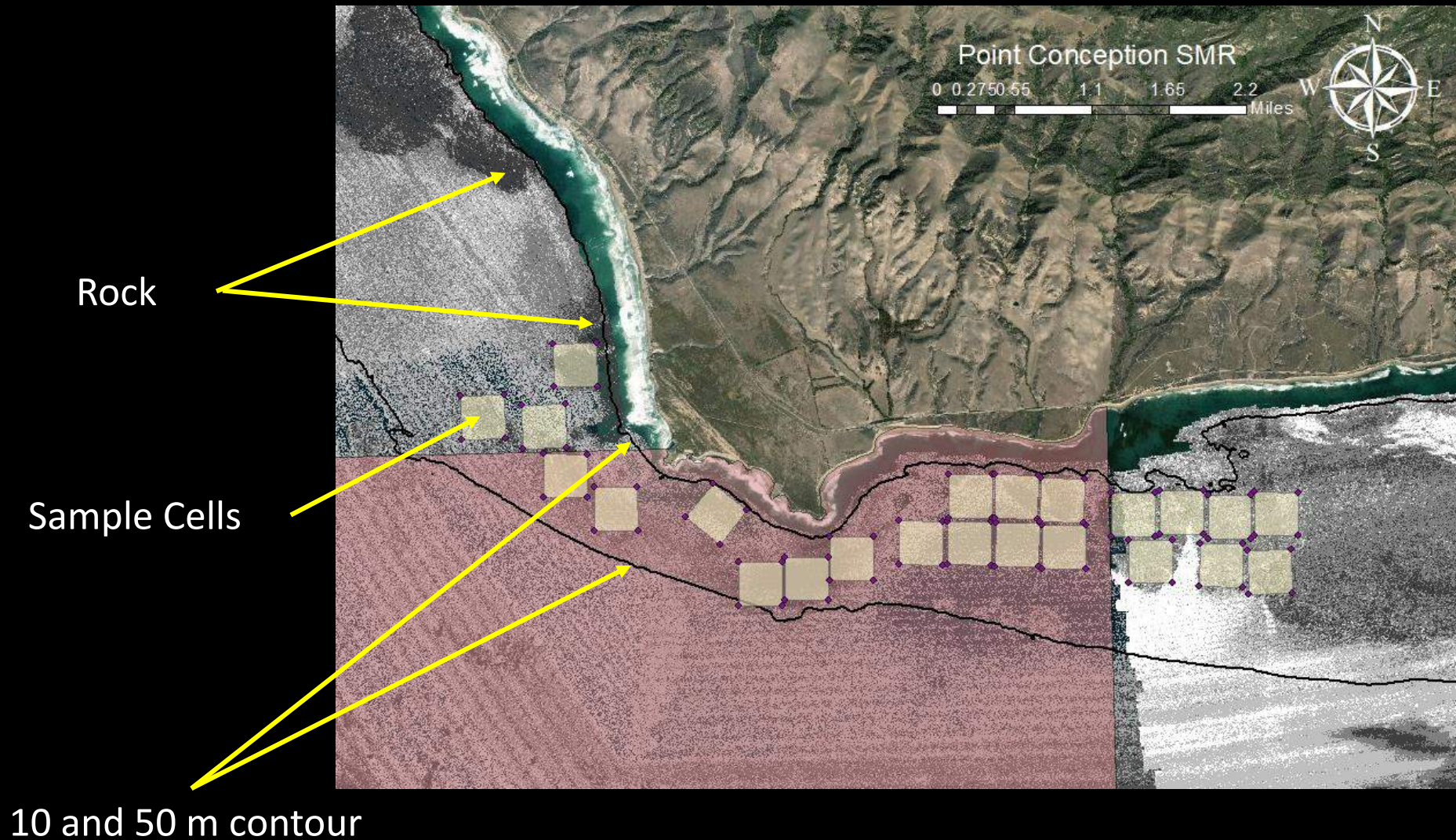
Rocky Reef

10 m isobath

UCSB Study Sites

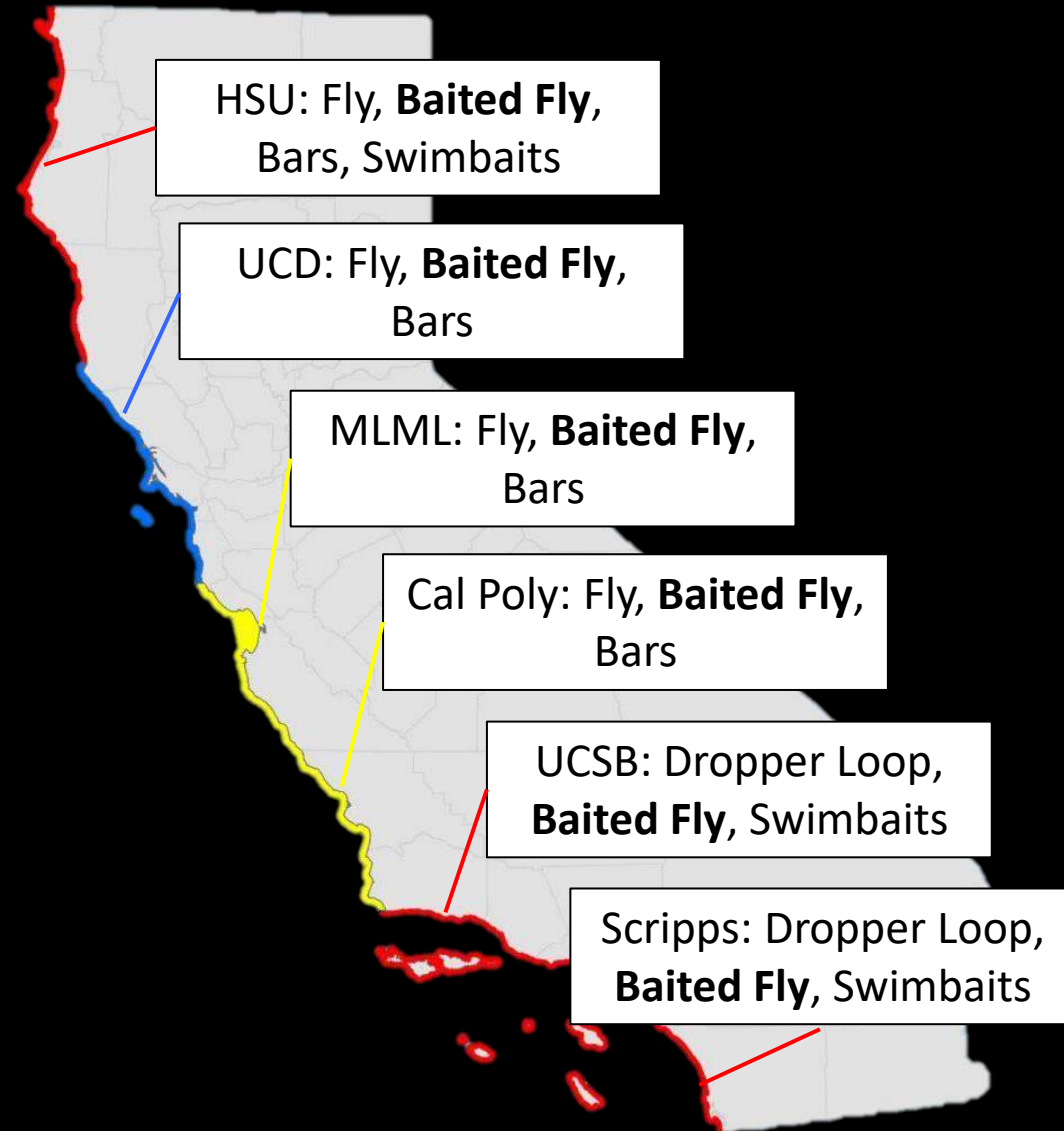


UCSB Study Sites

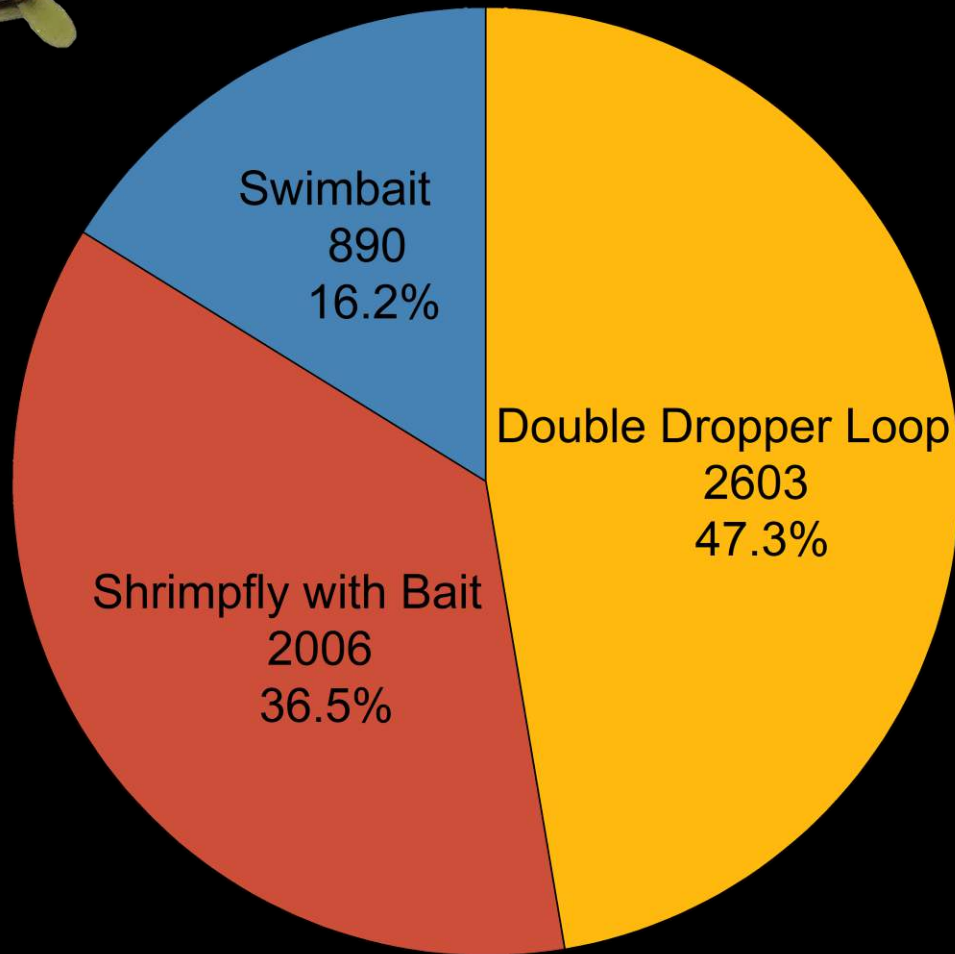


Why Can't I Fish My Own Tackle?

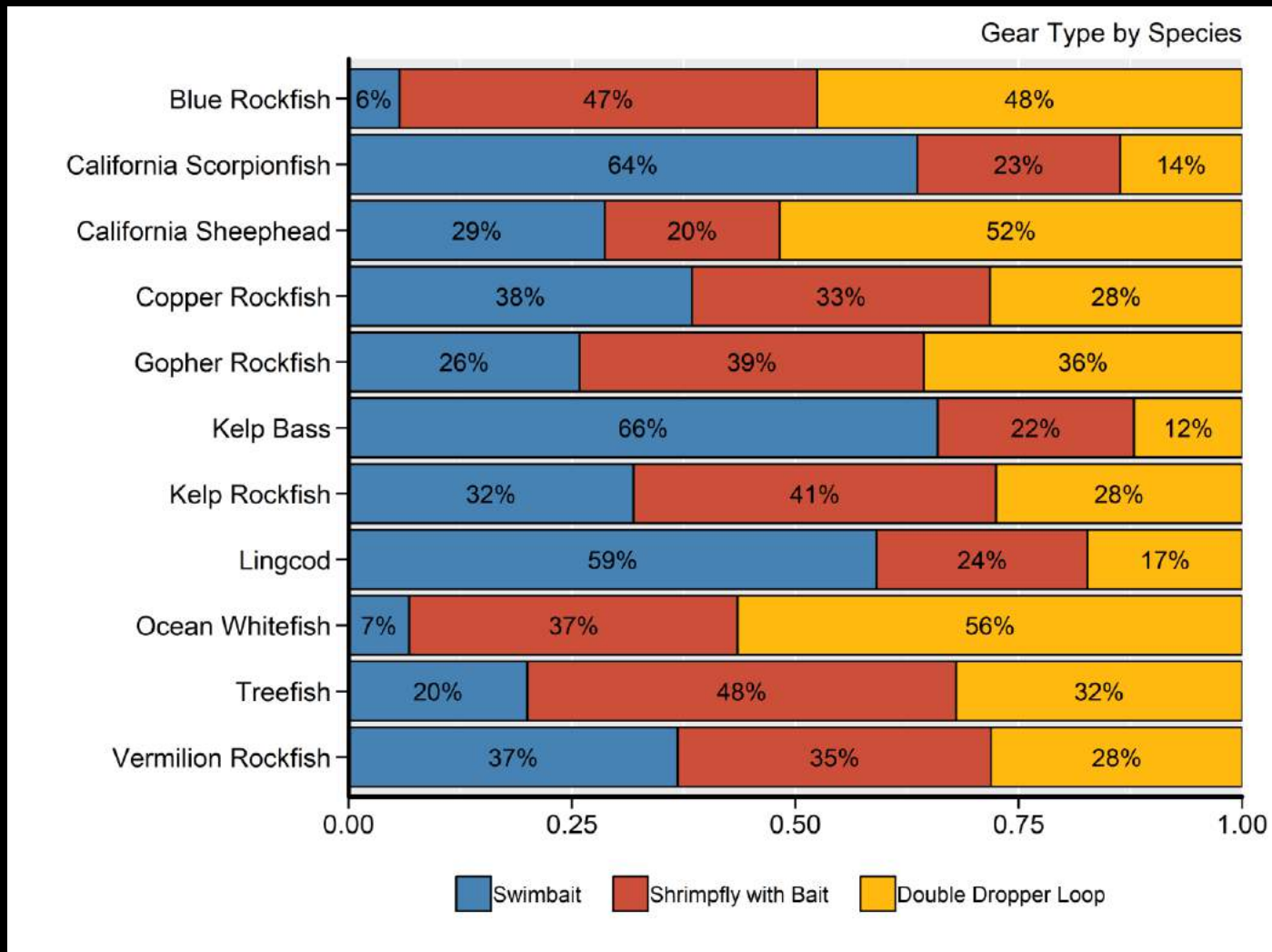
- Standardization, reproducibility, and historical precedent
- Allows us to compare data on a state and regional scale



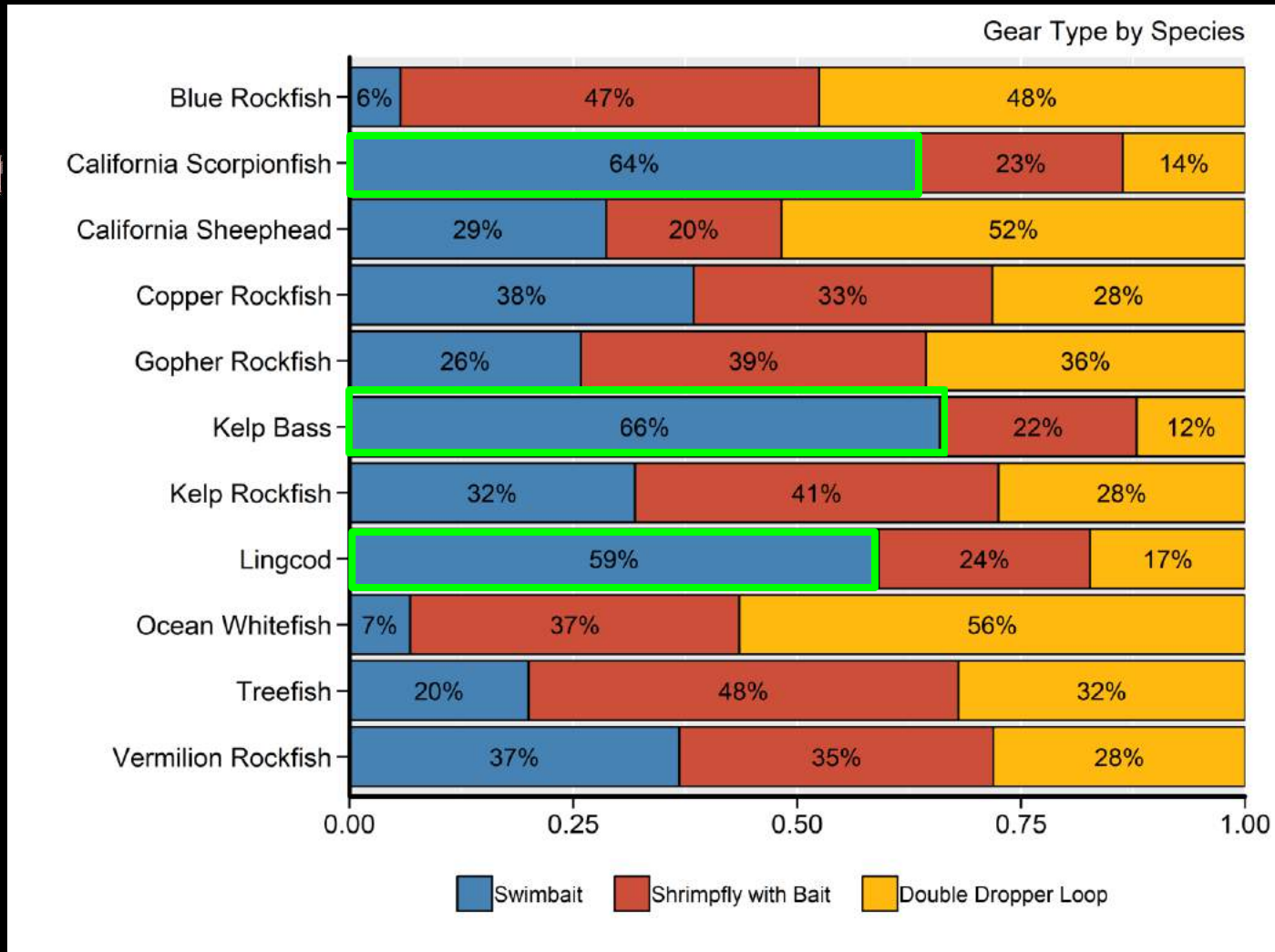
Catch by Gear Type 2017 & 2018



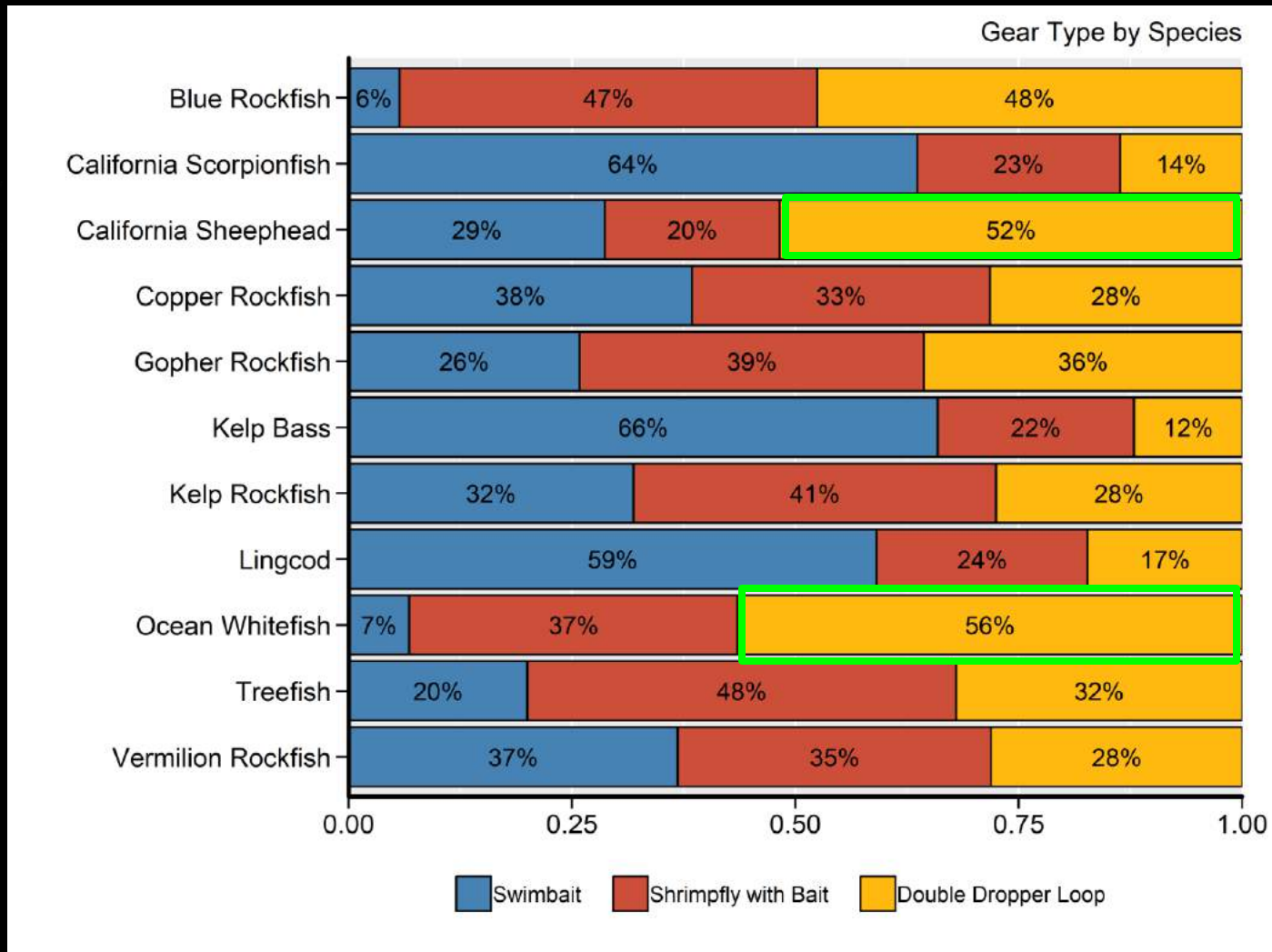
Catch by Gear Type 2017 & 2018



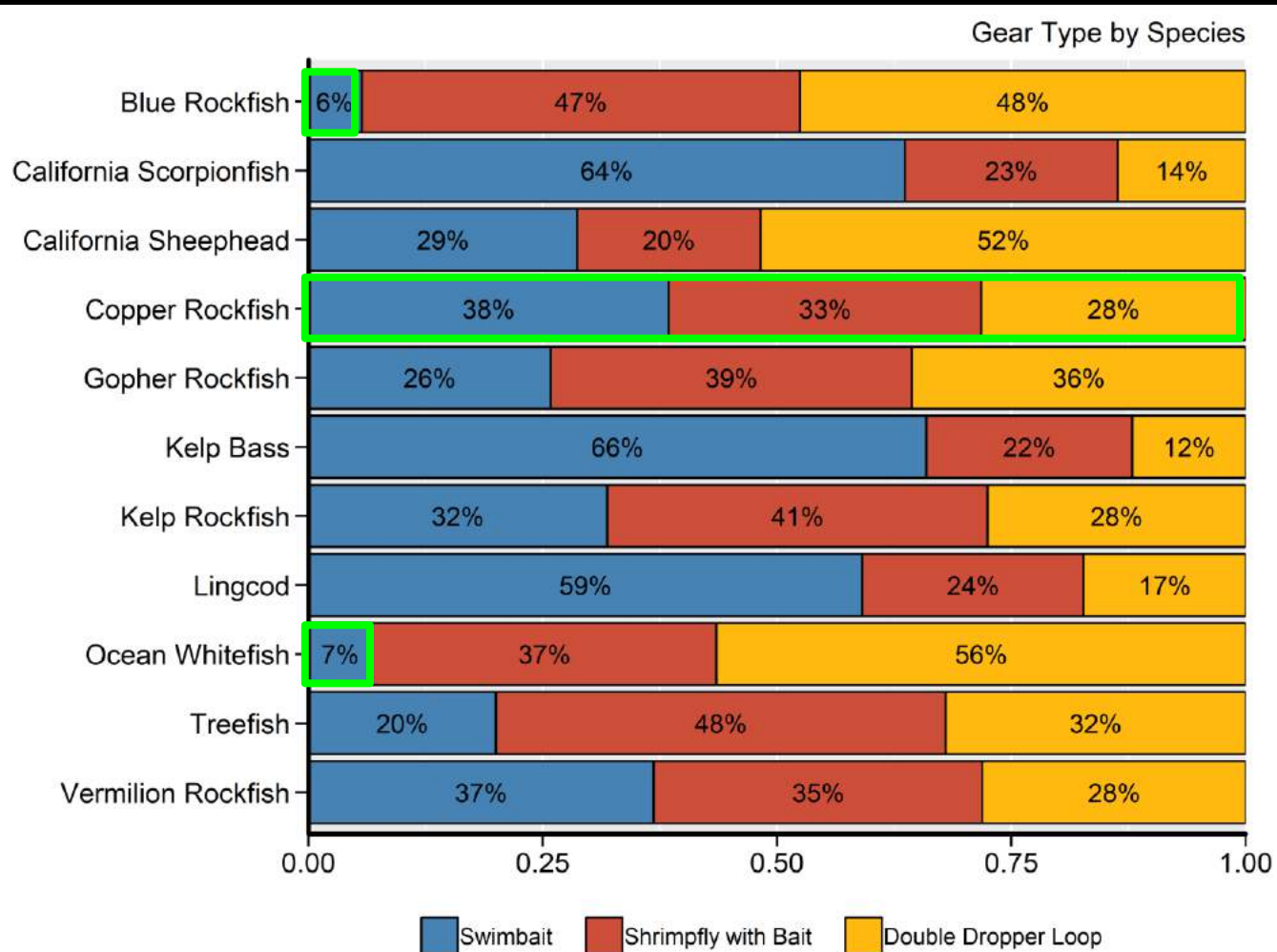
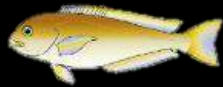
Catch by Gear Type 2017 & 2018



Catch by Gear Type 2017 & 2018

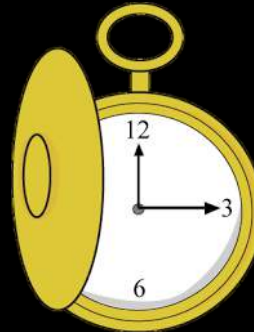


Catch by Gear Type 2017 & 2018



Why Doesn't Chris Handle any Fish?

- Data is important!
- The data recorder is responsible for:
 - Tracking angler on/off time
 - Ensuring drift is within cell coordinates
 - Keeping an eye out for incorrect tackle types, uncrimped hooks, etc.



The Data Sheet

California Collaborative Fisheries Research Program (Hook-and-Line)

Location: ROSH Vessel: SL-81 Date: 9/10/18 Area: Carrizosa Year: 2018 Page: 27 of
 Start Time: 2:58:00 End Time: 3:12:00 Start/End Depth: 120 / 1200 ft Site (circle one) MPA / REF Grid #: 3 Drift #: 3
 No. of Anglers: 12 Recorder: CB Tag Crew: PC, TK, KD Sur. Water Temp (°F): 65 End Lat/Long: 34° 06'28.7" N 120° 07'10.8" W (045)
 Cloud Cover: 0 Relief: 1 No. Seals/Sea Lions: 019 Wind Speed/Direction: 5 KCLW Swell Height/Direction: 1 Weights/Bars: 2 1 (67)

Str #	Species	TL (cm)	Tag ID	Sex	Cond.	Lat	Long	WP #	Comments
1	CPR	31	3015		1			46	
2	BLU	38	3083		1				
3	GPH	27	3014		5				
4	CPR	38	3082		5				
5	CR	38	3013		5				
6	OW	46	3012		1			47	
7	OW	44	3011		1				GLUT OUT GILLS
8	BLU	16	—		5				
9	CPR	41	3011		1				
10	CR	41	3081		1			48	
11	GPH	27	3010		1				
12	OW	47	3009		1				
13	CPR	32	3080		1				
14	OW	39	3008		1				
15	VER	46	3007		1			49	
16	CPR	41	30079		1				
17	CPR	38	3006		1				
18	VER	43	3005		1				
19	OW	51	3004		1				
20	OW	36	3078					50	

Comments (e.g., anglers under/over time; station rotations; GPS unit #; jellies; kelp; red tide; rewrite each page, except angler over/under times):
 GPS # 1

The Data Sheet

Drift data

Fish data

Notes

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Cloud Cover: 0 Relief: 1 No. Seals/Sea Lions: 0 / 1 Wind Speed/Direction: 5 KCLW Swell Height/Direction: 1 Weights/Bars: 2 / 1 (67)

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GPS #

The Data Sheet

California Collaborative Fisheries Research Program (Hook-and-Line)

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Start Time: 2:58:00 End Time: 3:12:00 Start/End Depth: 120 / 1200 ft Site (circle one) MPA / REF Grid #: 3 Drift #: 3

No. of Anglers: 12 Recorder: CB Tag Crew: PC, TK, KD Sur. Water Temp (°F): 65 End Lat/Long: 11° 07' 10.8" N / 124° 04' 10.8" E (045)

Cloud Cover: 0 Relief: 1 No. Seals/Sea Lions: 0 / 1 Wind Speed/Direction: 5 KCLW Swell Height/Direction: 1 Weights/Bars: 2 / 1 (67)

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Comments (e.g., anglers under/over time; station rotations; GPS unit #; jellies; kelp; red tide; rewrite each page, except angler over/under times)

GPS # _____

Total length of each fish

Shorthand for each species

Station number for each catch

The Data Sheet

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Comments (e.g., anglers under/over time; station rotations; GPS unit #; jellies; kelp; red tide; rewrite each page, except angler over/under times):

GPS #

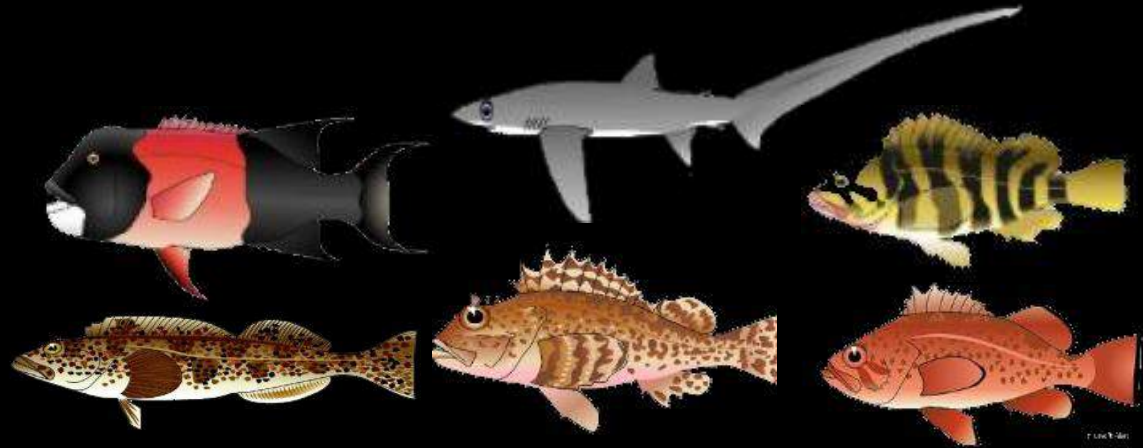


Here Comes the Data!

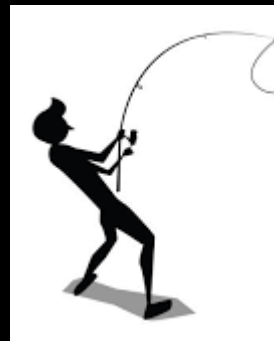


Catch Per Unit Effort (CPUE)

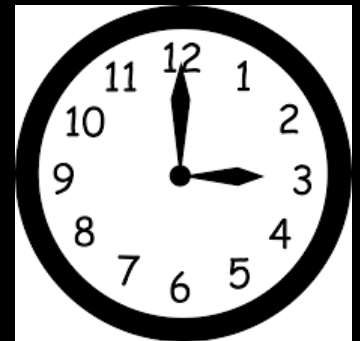
- One of the best ways to assess a fishery is to look at relative fish abundance
- How we measure it:



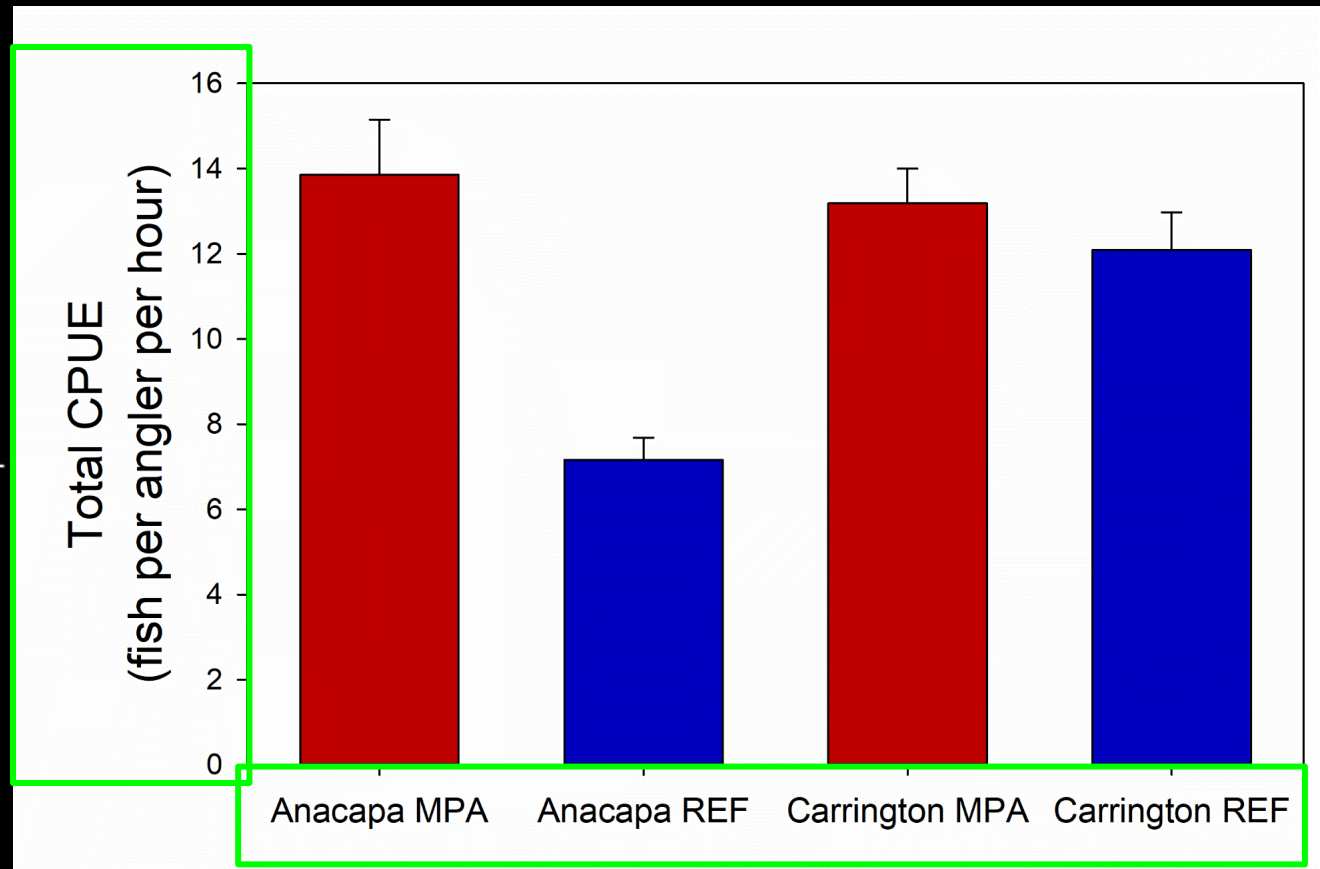
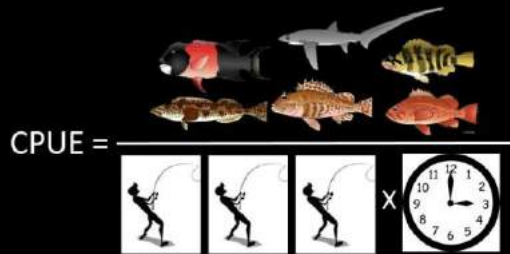
$$\text{CPUE} = \frac{\text{Catch}}{\text{Effort}}$$



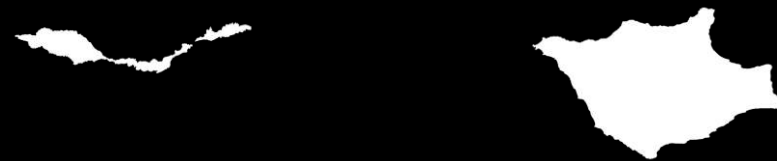
X



Total CPUE by Site

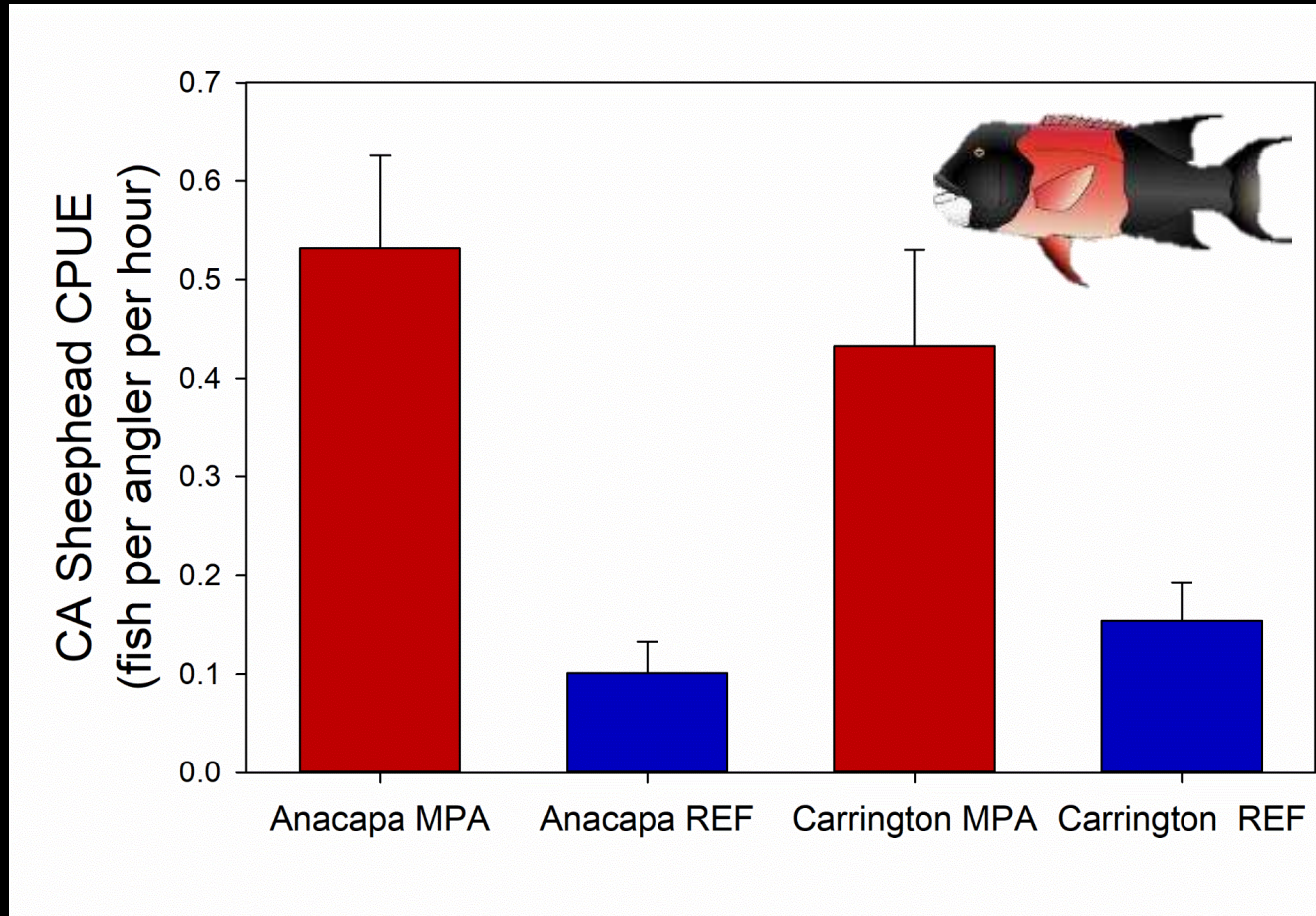


Units and scaling
may change from
plot to plot!



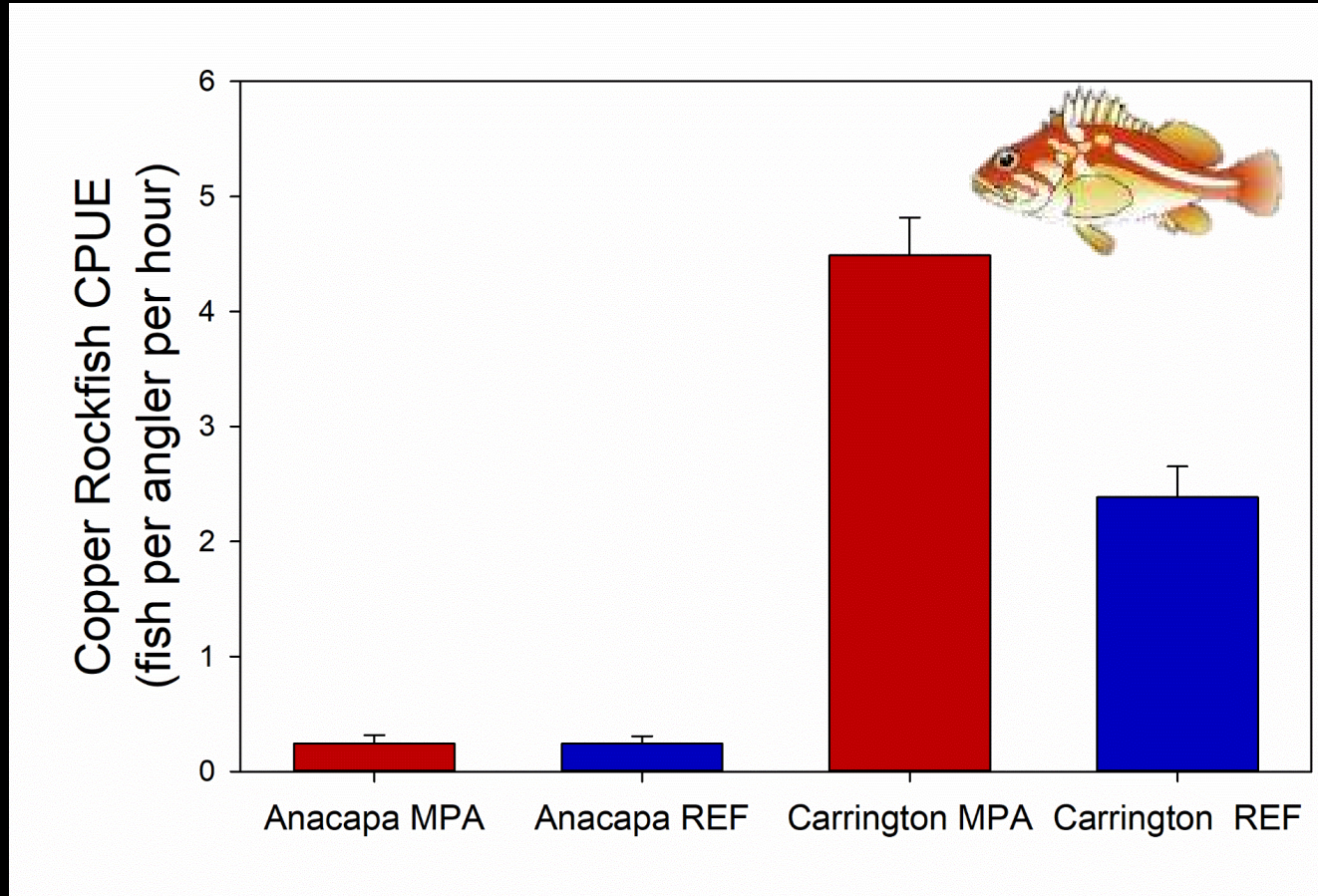
“Warmer” → “Colder”

CA Sheephead CPUE



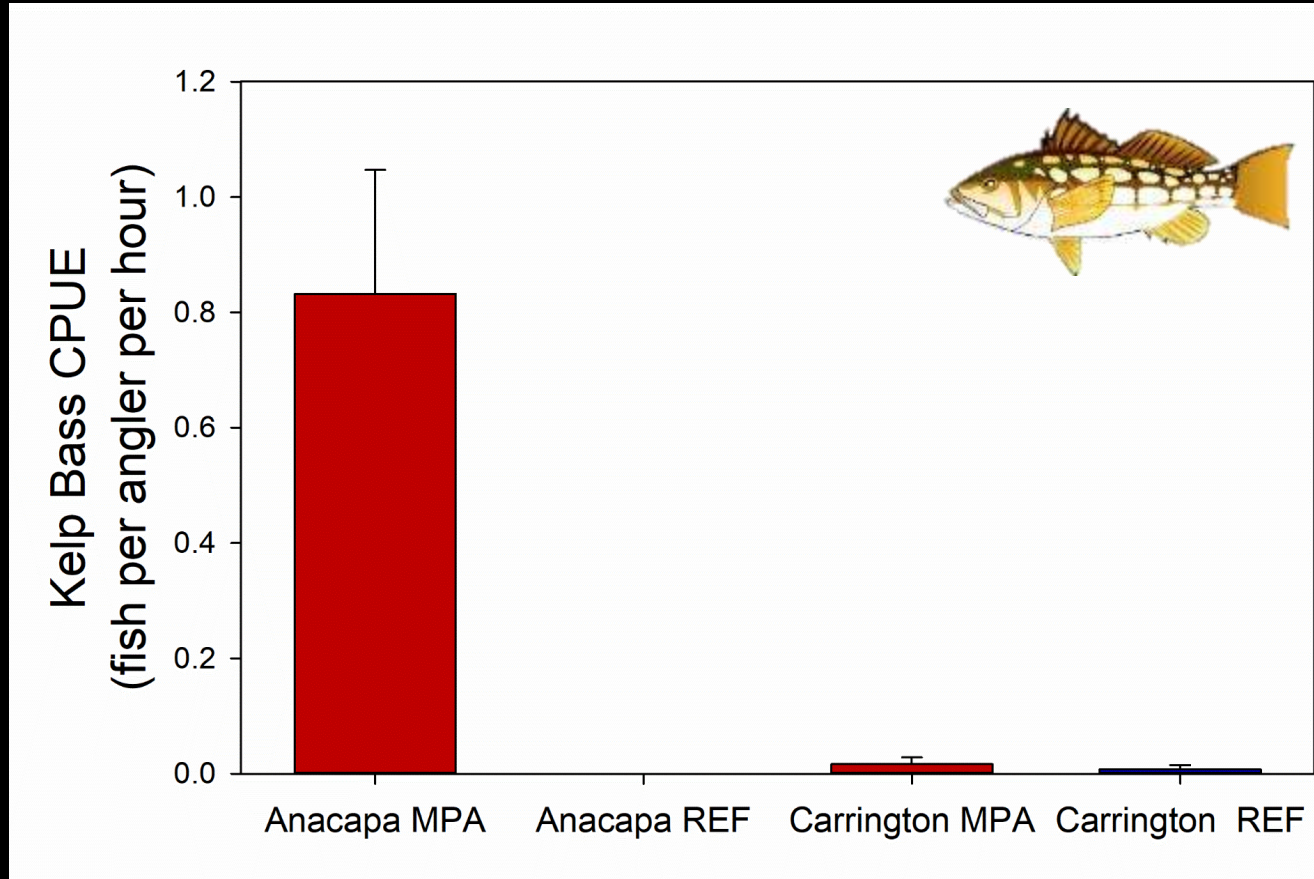
- We can also look at CPUE for individual species
- Strong differences in MPA and REF CPUE may signal an MPA effect

Copper Rockfish CPUE



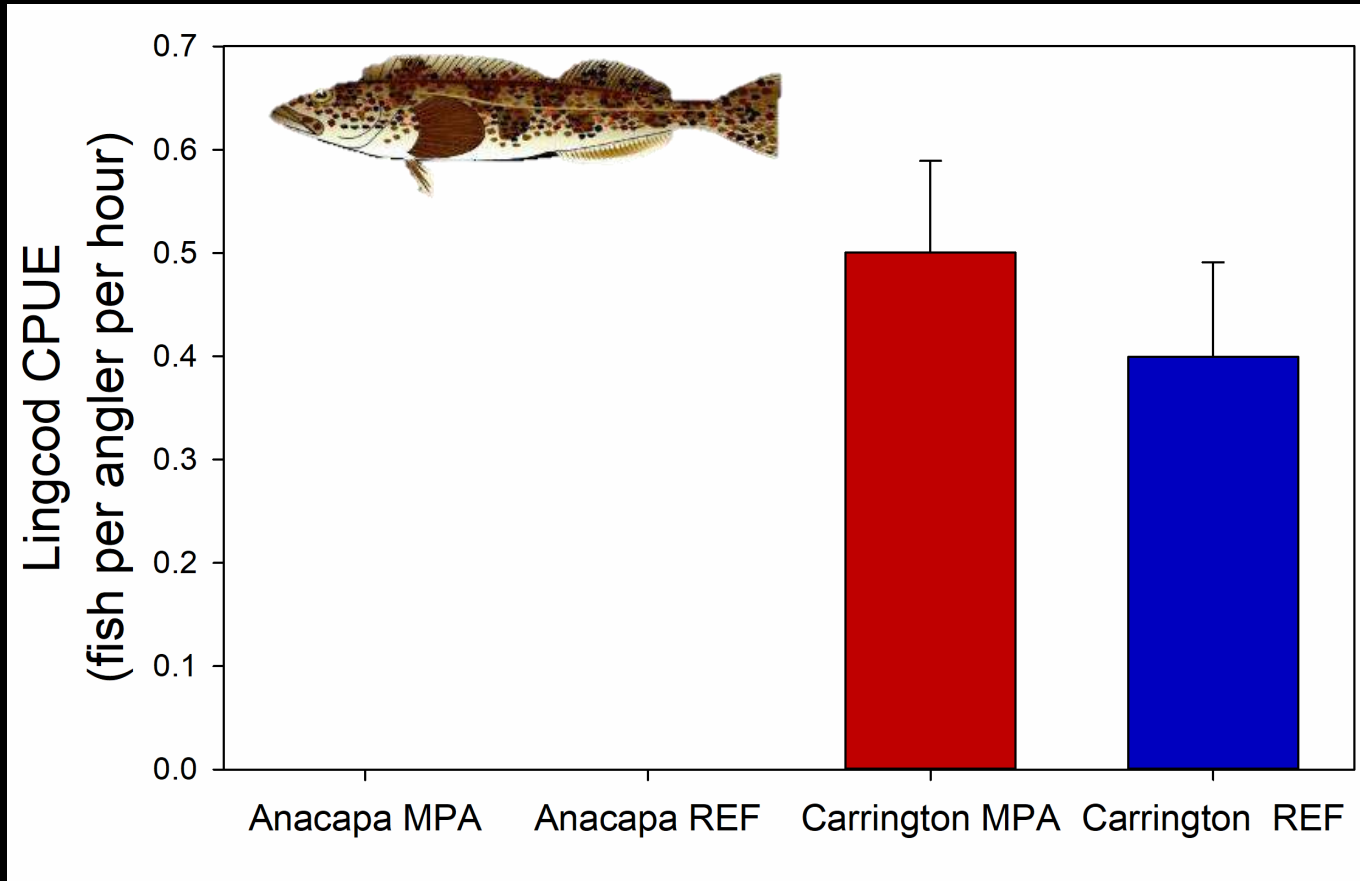
- Some species prefer certain oceanographic conditions

Kelp Bass CPUE



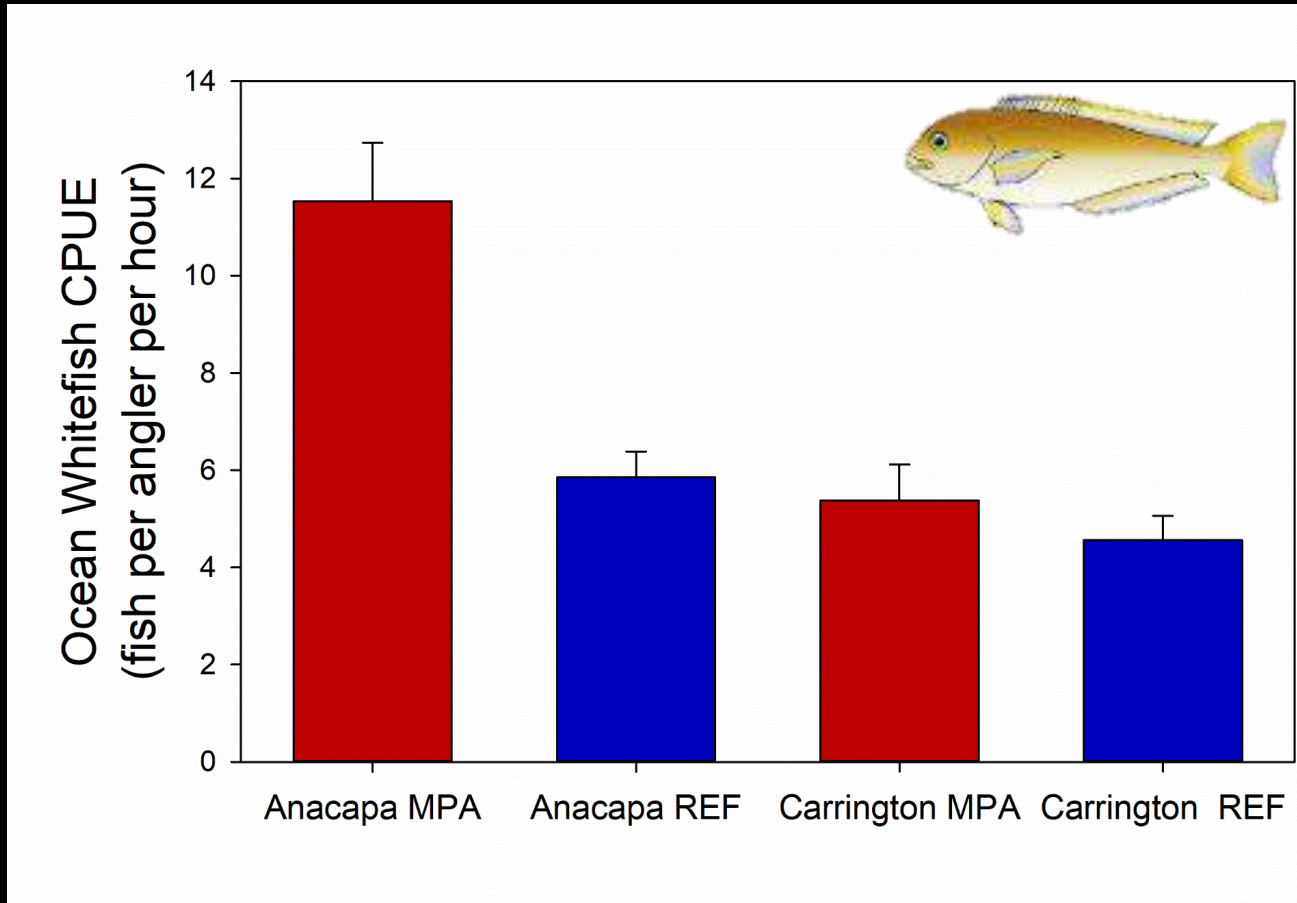
- Targeted species may show a strong response to protection

Lingcod CPUE



- Other targeted species may not show a response at all

Ocean Whitefish CPUE

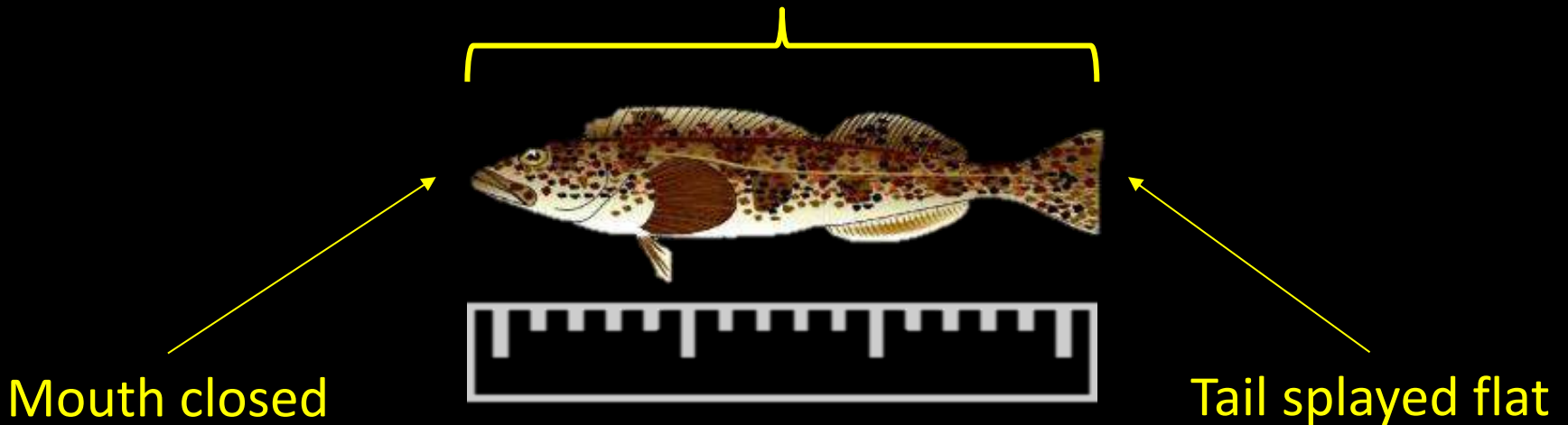


- Differences in CPUE between islands may reflect differences in fishing pressure

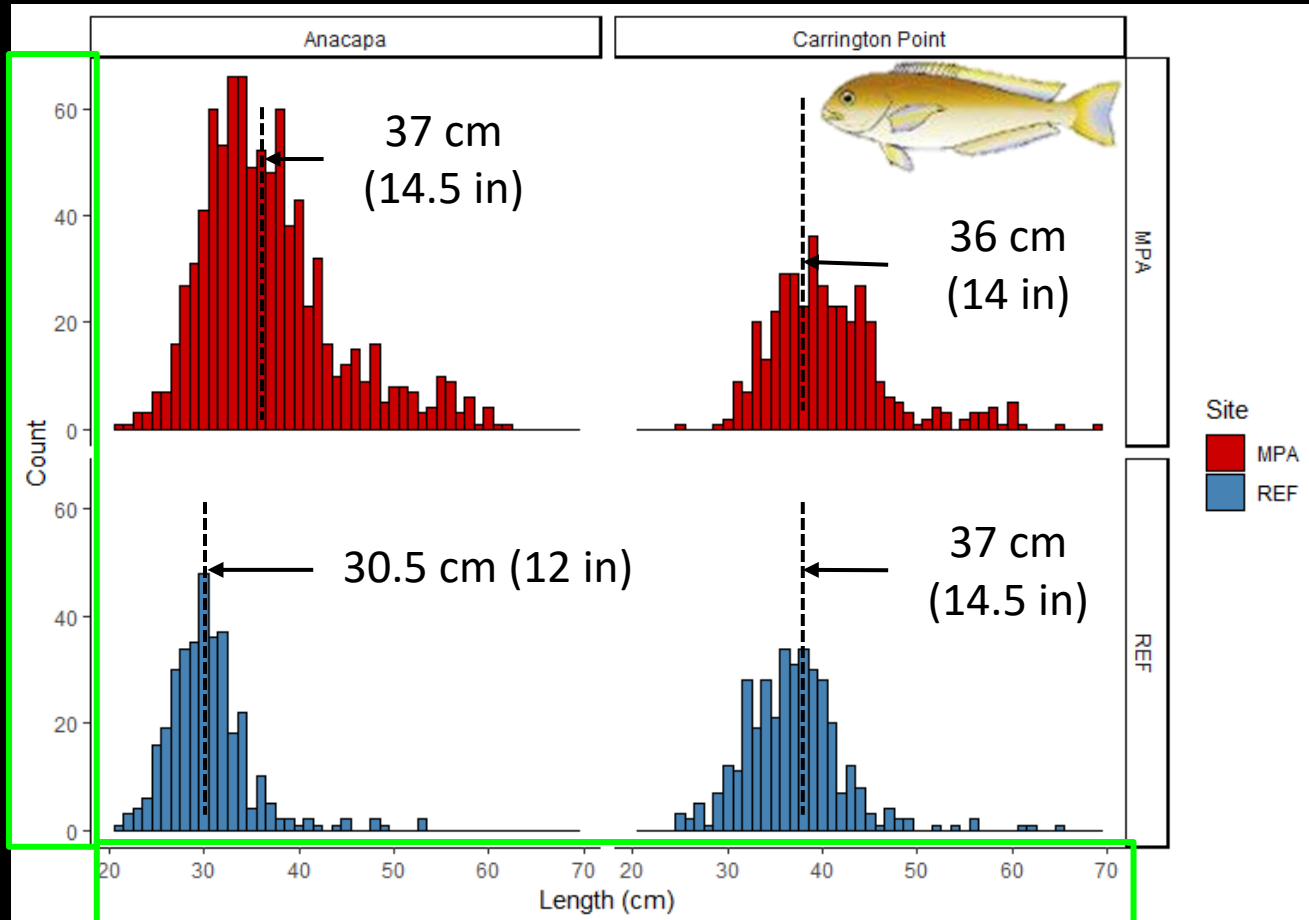
Fish Length

- Size is often one of the first metrics to respond to protection
- We measure fish by their Total Length (TL) to the nearest centimeter

TL (cm) = Tip of the snout to the end of the caudal fin

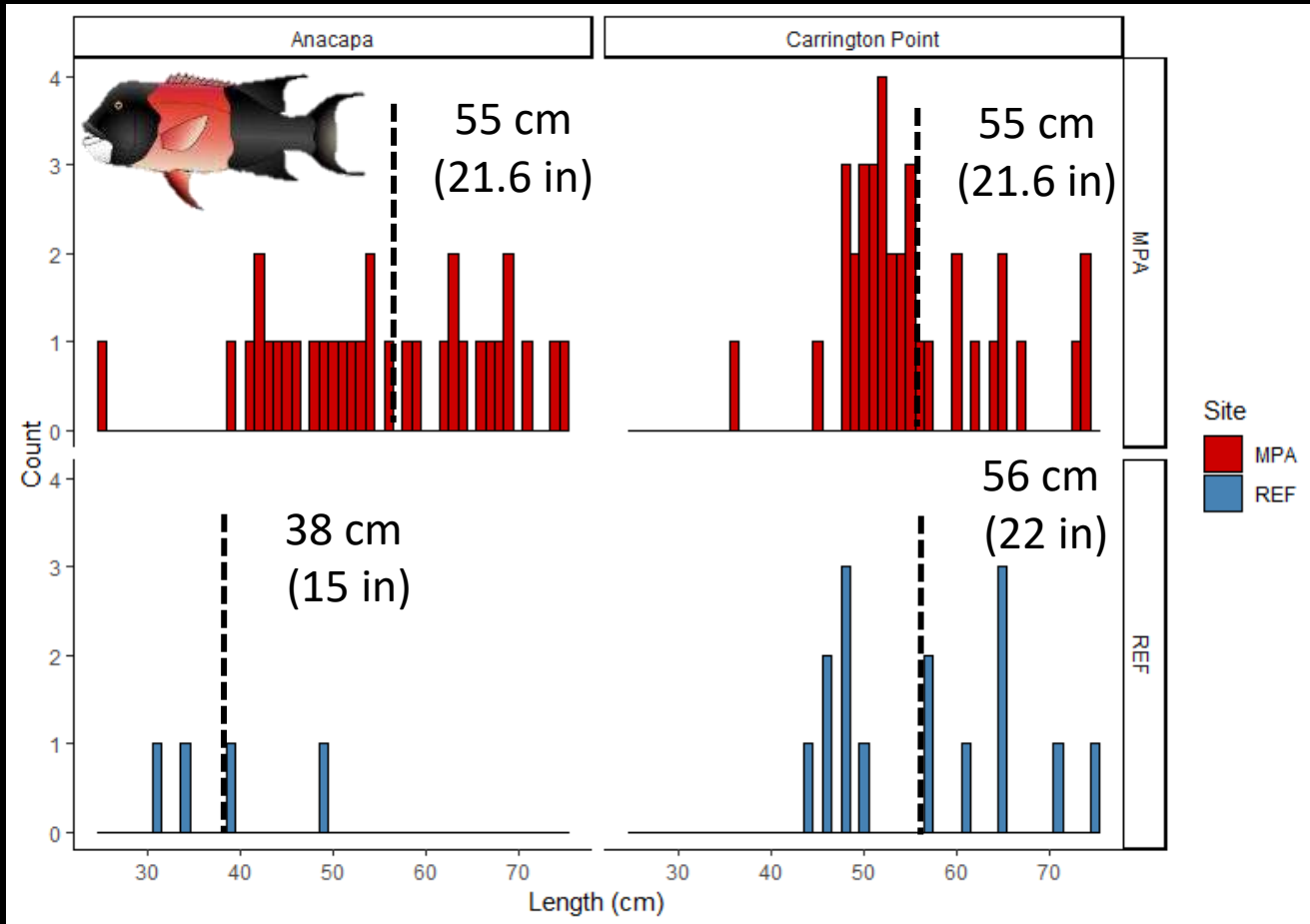


Ocean Whitefish Length



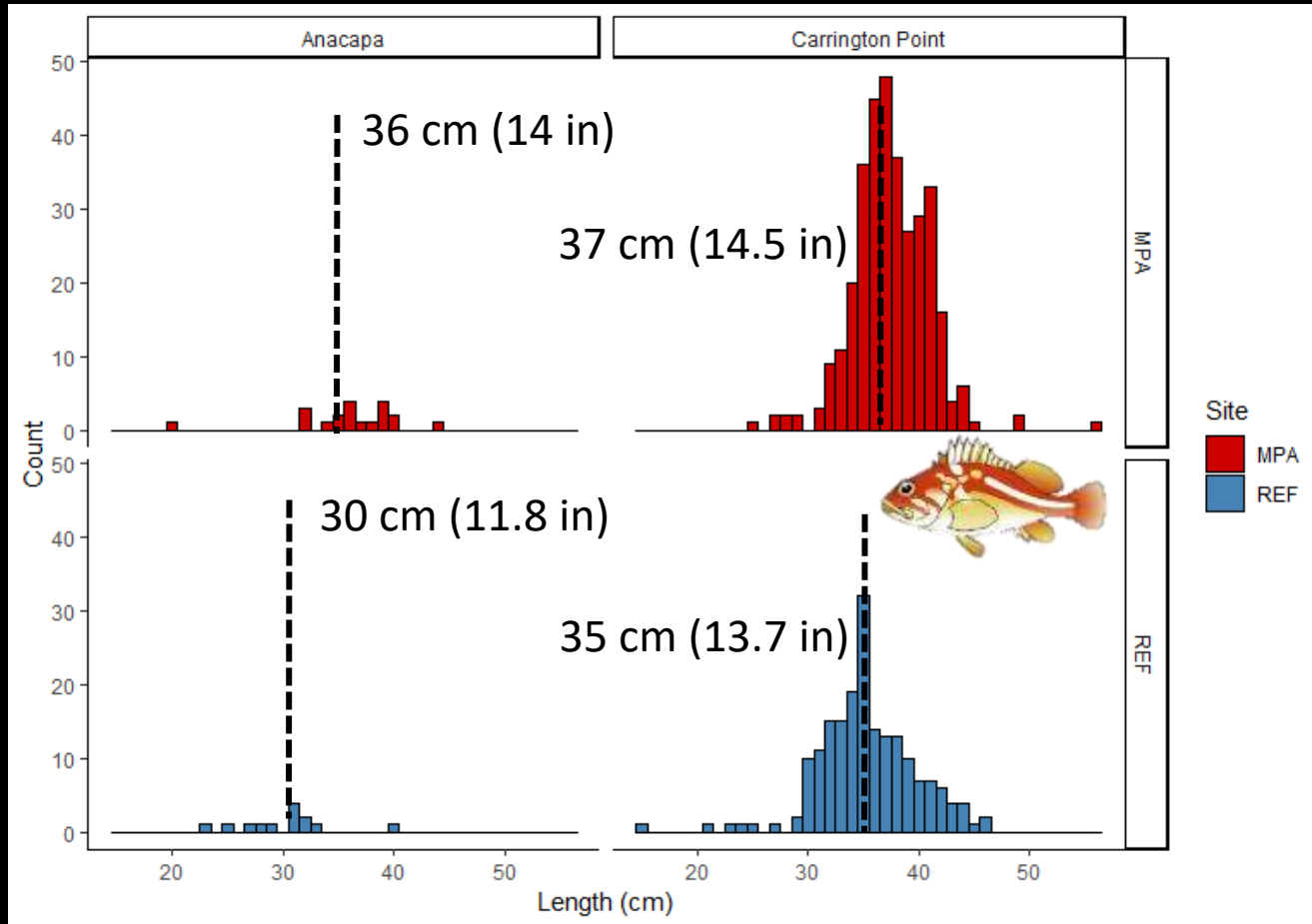
- Differences in mean length between MPA and Reference sites may indicate a potential MPA effect

CA Sheephead Length



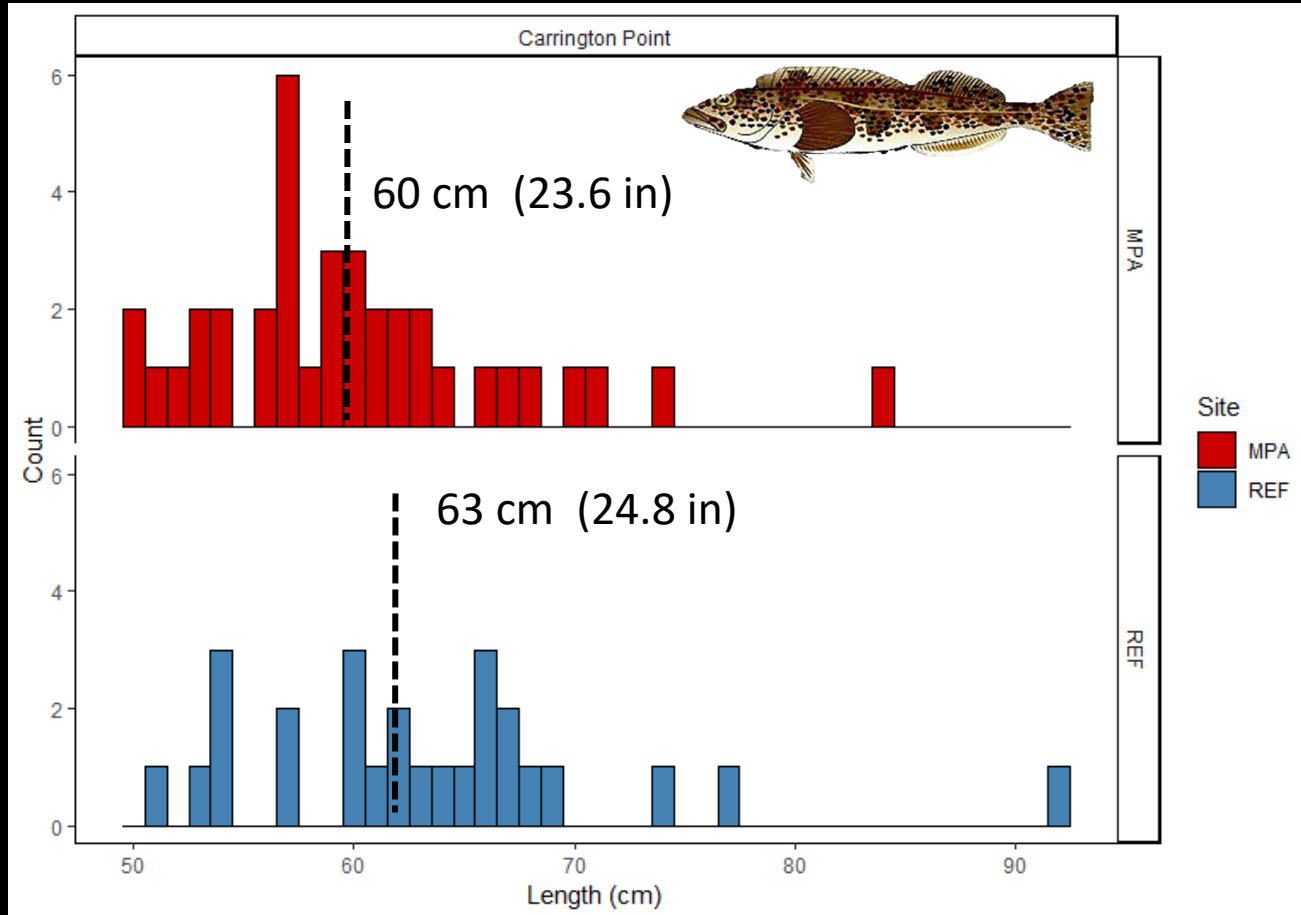
- Like with CPUE, some species may respond strongly to protection at certain sites

Copper Rockfish Length



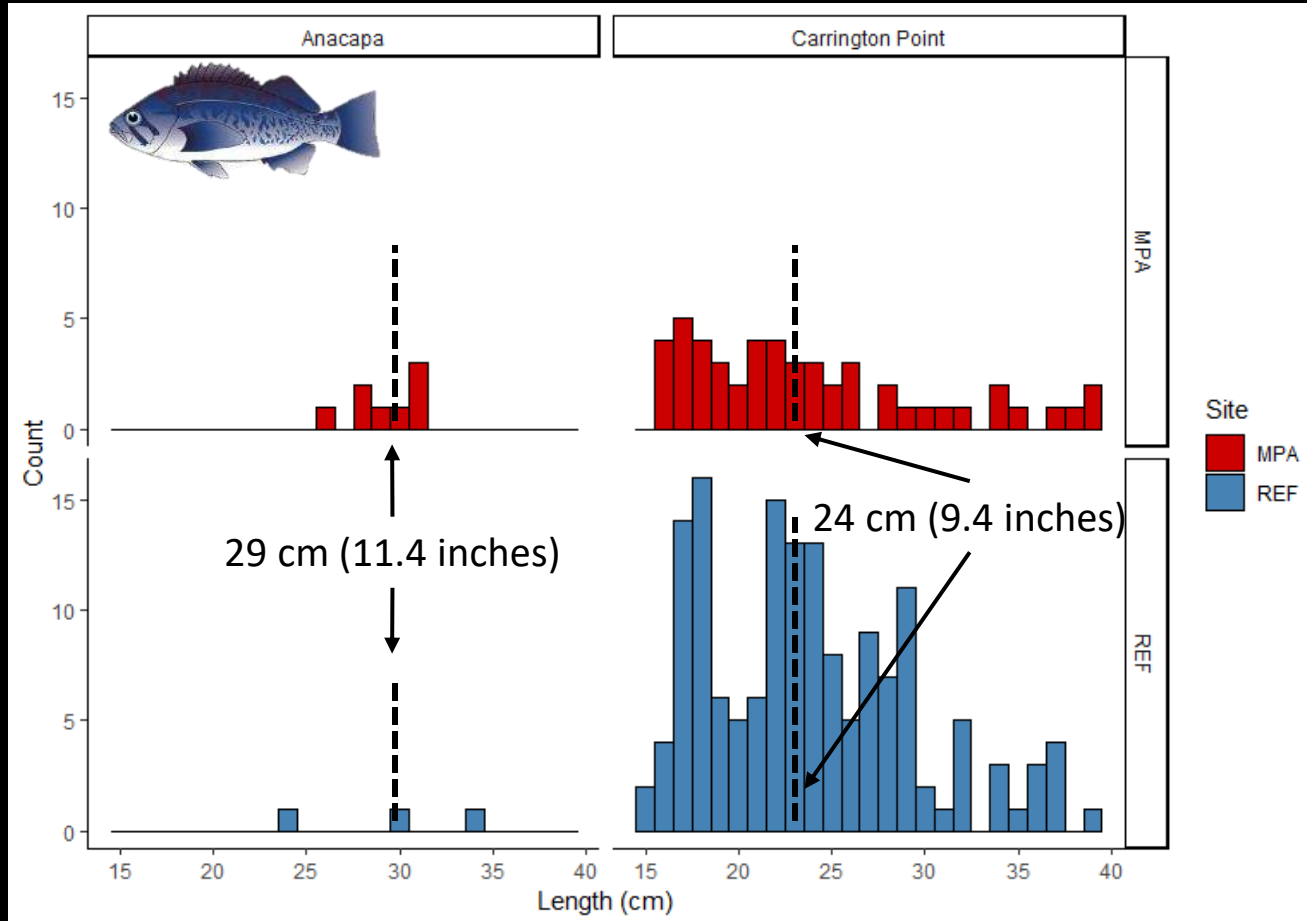
- The more individuals we catch, the cleaner the distribution becomes

Lingcod Length



- Large individuals outside of the MPA may indicate a possible spillover effect of certain targeted species

Blue Rockfish Length



- Other species may not show a response to protection at all

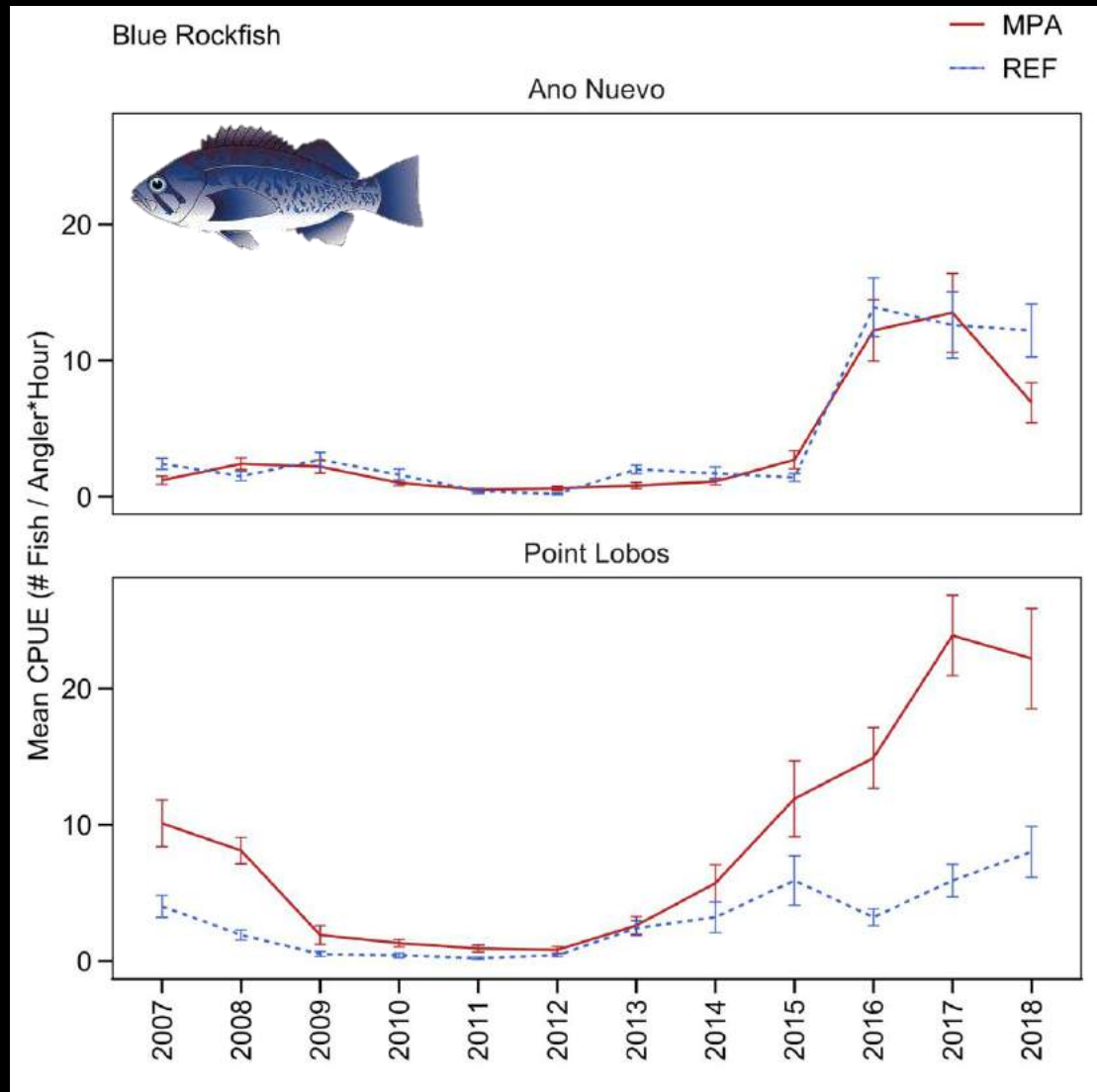
Going Forward

- CCFRP is designed as a long term monitoring project
- MLML and Cal Poly have been monitoring MPAs on the central coast since 2007
- Let's look at some of their data



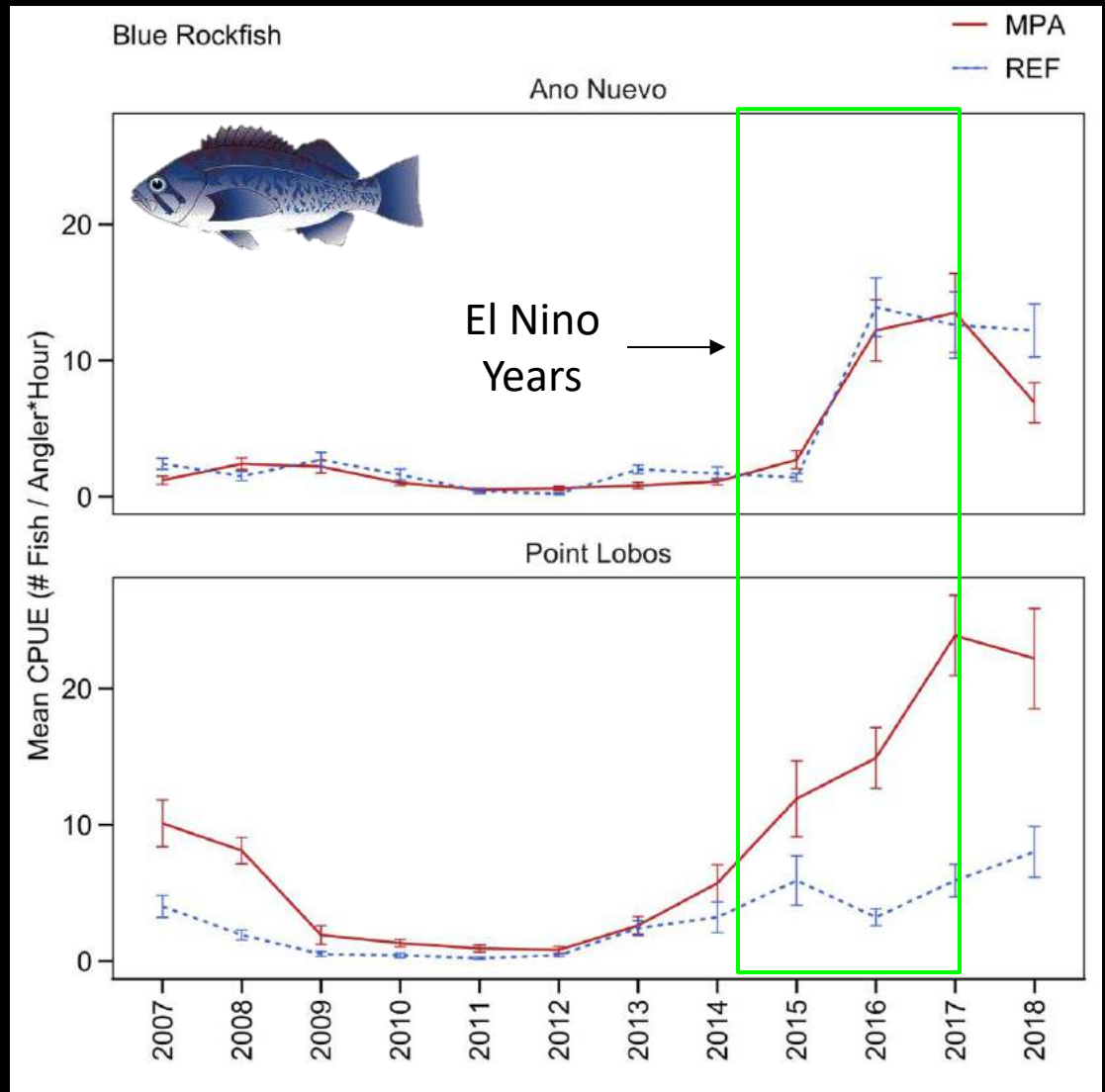
Blue Rockfish Mean CPUE

- These time series plots allow us to track change over time
- Once again we can see if MPAs appear to be affecting CPUE



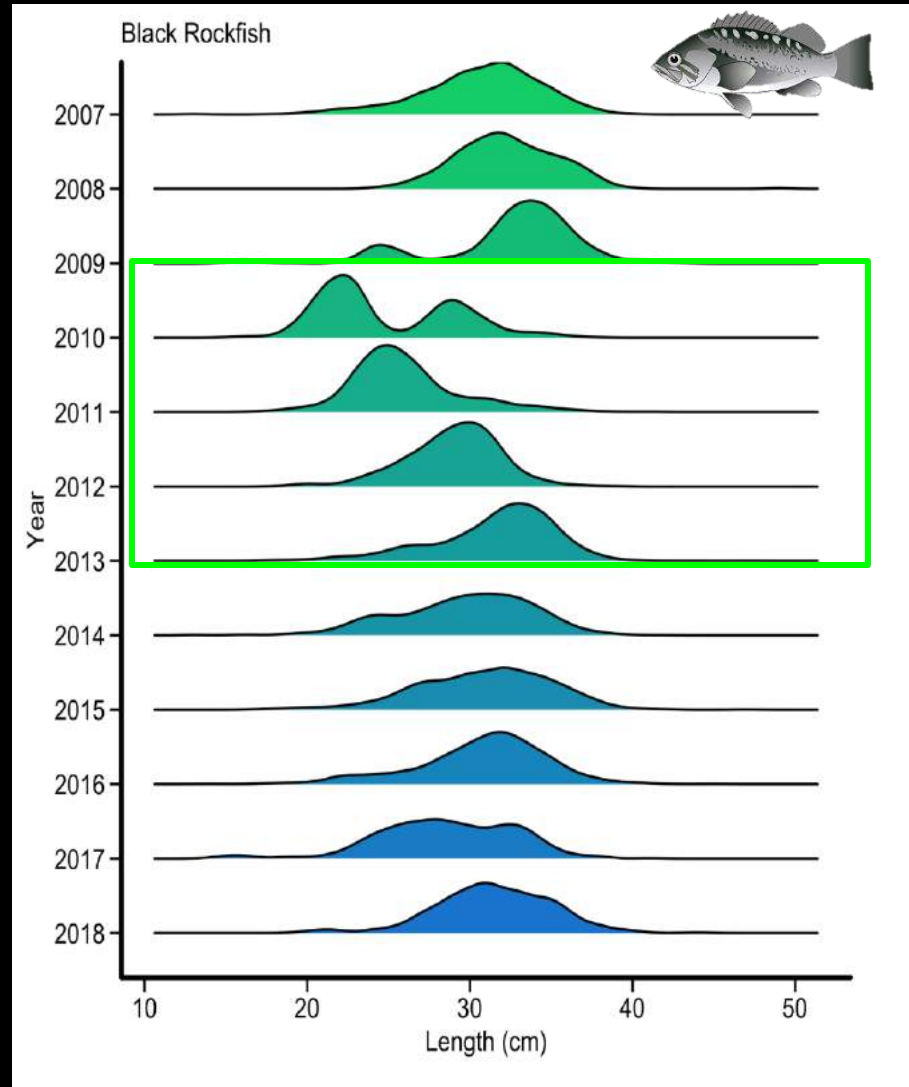
Blue Rockfish Mean CPUE

- These plots track responses to large scale events and environmental disasters such as climate change and oil spills



Black Rockfish Size Structure

- We can also gather interesting information on the life history of different species
- This can in turn be used to inform policy and regulation





But one metric is clearly the most important....



Who Caught the Most Fish?

Angler	Number of Fish Caught in 2018
John H.	191
John S.	188
Wayne K.	177
Bill P.	148
Gavin C.	141
Russel P.	137
Whitney U.	129
Jim S.	119
April B.	111
Rudy T.	102
Hannah K.	101

Who Caught the Biggest Fish?

Angler	Winning Catch by Species
John T.	Thresher Shark (210 cm/83 in)
Butch B.	Soupfin Shark (160 cm/63 in)
Russel P.	Lingcod (92 cm/36 in)
Zack E.	Halibut (86 cm/34 in)
Whitney U.	Lingcod (77 cm/30 in)
Jim S.	California Sheephead (75 cm/30 in)



Who Caught the smallest Fish?

Angler	Trophy Catch by Species
Rudy T.	Pacific Sanddab (10 cm)
Wayne K.	Blue Rockfish (10 cm)
John S.	Vermillion Rockfish (10 cm)
Jim S. Sr	Pacific Sanddab (11 cm)
Andy M.	Blue Rockfish (15 cm)



Follow Us!
@Casellelab
and
@CCFRP



Thanks for
joining us!



Why Don't We Tag All the Fish?

- Maximize survivorship and minimize stress
- Not tagged if:
 - Less than 25 cm
 - Experiencing injury or barotrauma
 - Species not of interest (i.e. Mackerel, Sanddabs, etc.)



Tag Returns Highlights From 2017!



Amazing recapture from Bodega Bay! They recaptured a Copper Rockfish at Stewart's Point that was originally tagged by Cal Poly in the Piedras Blancas MPA on 8/20/13! In its 1,500 days (4+ years) at liberty, it swam ~220 miles and grew 13 cm!