

A GEOSPATIAL SURVEY OF ANGLERS TO ASSESS FISH CONSUMPTION FROM SAN DIEGO BAY, CALIFORNIA

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<http://www.sccwrp.org/fishconsumption/>

PROJECT OVERVIEW

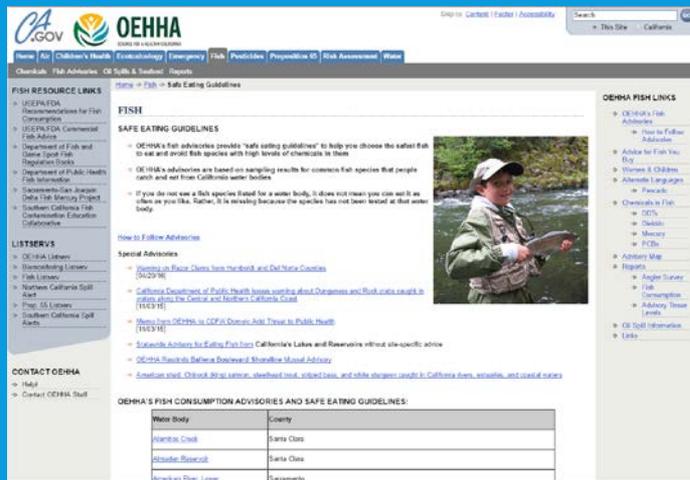


- Goal: Improve understanding of risk to humans from consuming contaminated fish from the Bay.
 - Last such study in San Diego Bay was completed by the Environmental Health Coalition in 2005. (pier focused)
 - SD County Dept. Health Services completed a study in 1990.



KEY QUESTIONS (1)

1. Are anglers **aware of consumption guidelines**?
2. What are **consumption rates** for anglers in San Diego Bay and how do they relate to advisory recommendations?



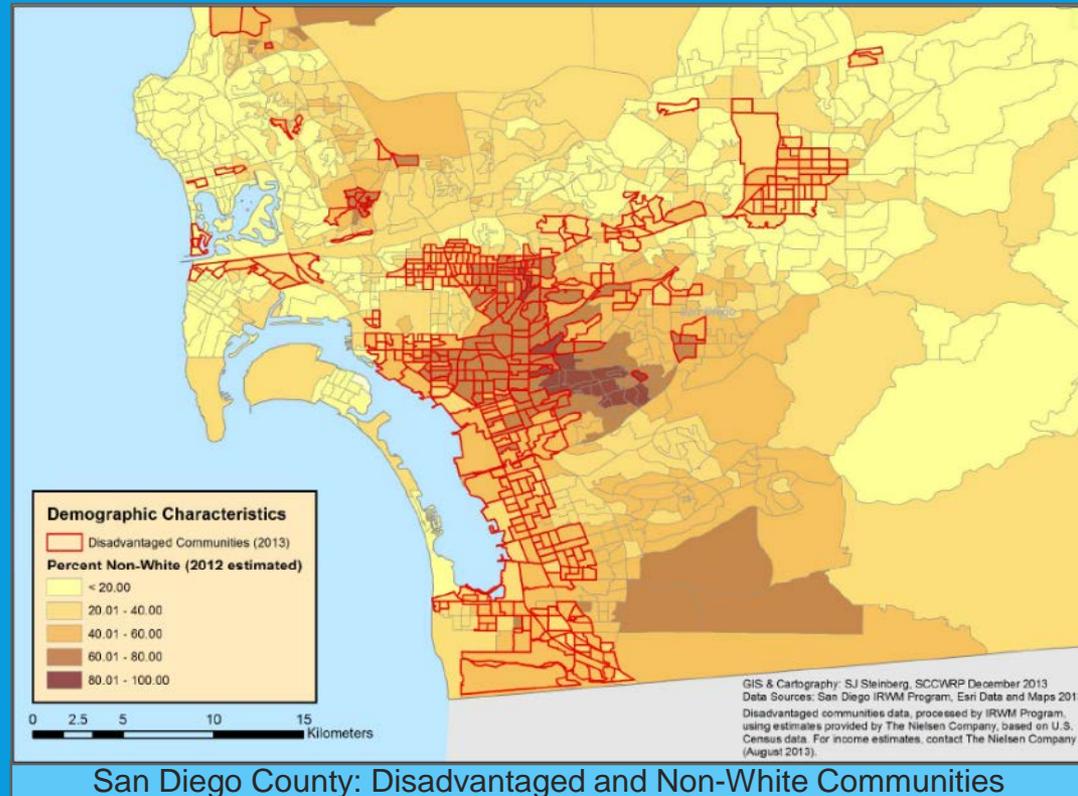
http://oehha.ca.gov/fish/so_cal

Signs in place when survey data collection was initiated May, 2015.

New signs which mimic the OEHA pamphlets installed June 16, 2015

KEY QUESTIONS (2)

3. How do **socioeconomic differences** relate to differences in consumption rates?
4. How do catch and consumption rates **vary in space and time** by location around the bay and time of year?



STUDY DESIGN

- Used a *total sampling* methodology
- Field sampling plan considering:
 - Mode of fishing (pier, shoreline or boat)
 - Day of week (weekday vs. weekend)
 - Time of year (Spring, Summer, Fall, Winter)
 - Time of day (early morning, mid-day, evening)
 - Location on the bay (North, Mid, South)
 - ***New signs posted by Port*** (before/after)
- The survey also considered a variety of demographic categories (census data)



STUDY PLAN AND SURVEY



Used a total sampling method to capture sociodemographic, spatial and temporal coverage of fishing activity for a full year.

May 1, 2015 – April 30, 2016.



North Bay

Includes one pier and boat ramp (Shelter Island/Shoreline Park), and shoreline access via Harbor Island Park, Liberty Station NTC Park and along Harbor Drive north of downtown San Diego.

Mid Bay

Includes two piers (Coronado Ferry Landing, Embarcadero Marina Park), shoreline sites (Tidelands Park, Glorietta Bay Park & Embarcadero Marina Park), one boat ramp and rental boats (Glorietta Bay).

South Bay

Includes one pier, shoreline sites & two boat ramps (Chula Vista Bayfront Park/Bayside Park and Pepper Park).

NORTH BAY SITES



Site A
Shelter Island

Site B
Harbor Island and Liberty
Station NTC Park

Site C
Harbor Drive



MIDDLE BAY SITES



SOUTH BAY SITES



SURVEY DESIGN



- Administered in sections to get as much data as possible:
 1. Observe and note all fishing activity (date, time, location) [All anglers observed]
 2. Ask if surveyed before and, if YES, how recently (avidity)
 3. Home location and do you/family eat fish caught?
 4. Full survey if willing to complete (21 questions, ~10-15 minutes)
- Used fish photos & sample filets as props



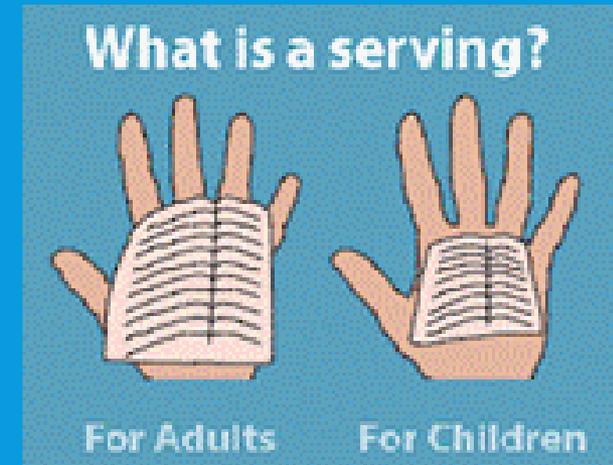
FISH SPECIES PHOTO CARDS

30 species: state listed species, plus others common in S.D. Bay



CONSUMPTION AMOUNT

- Example of sample filets used to establish consistent/actual consumption rates in grams/day



SURVEY RESPONSES

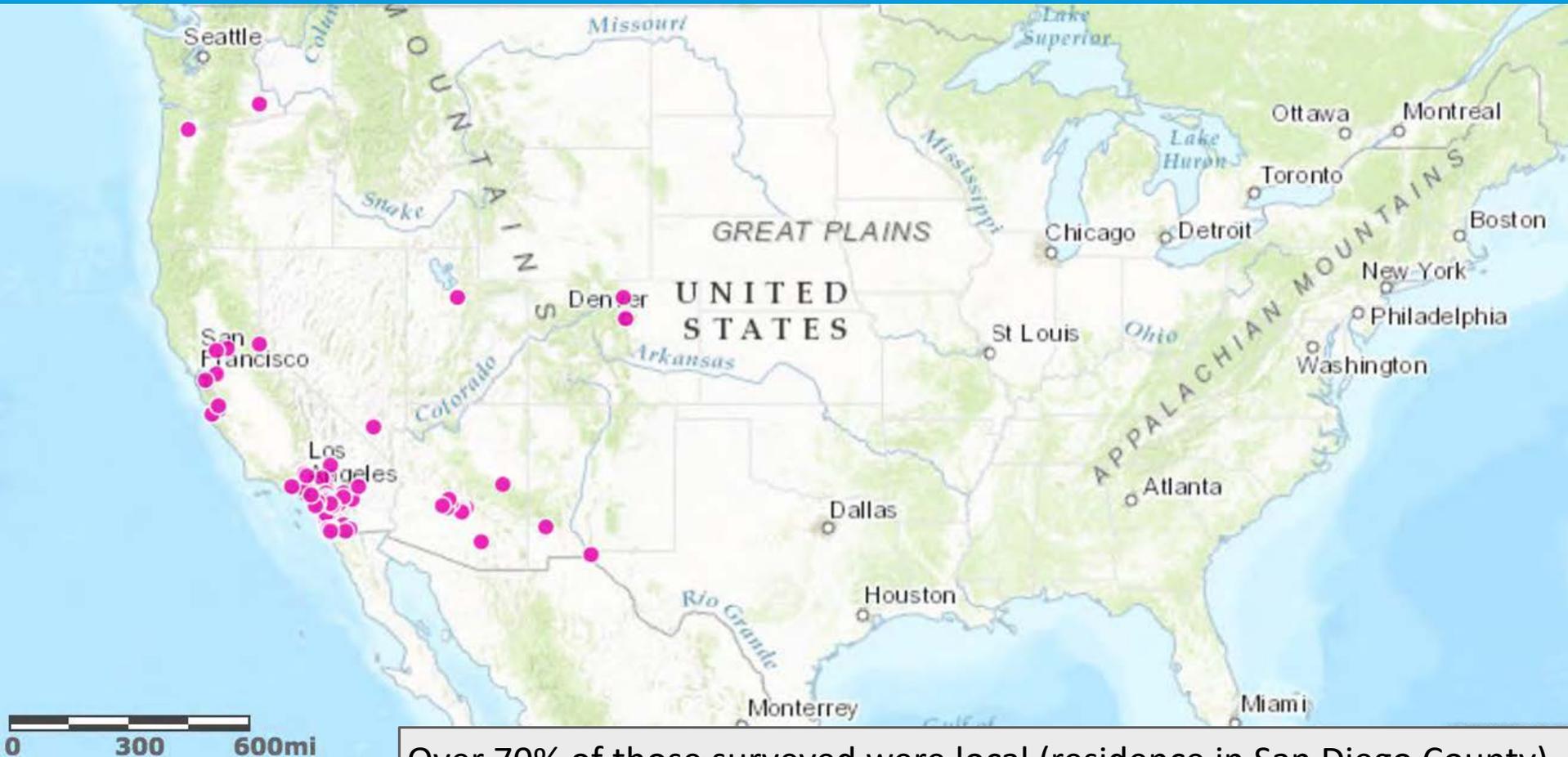


Anglers Approached			Anglers Completing Survey*			% Surveys Completed
Type of Angler	Count	%	Type of Angler	Count	%	
Pier Angler	952	61	Pier Angler	706	65	74
Boat Angler	367	24	Boat Angler	175	16	48
Shoreline Angler	230	15	Shoreline Angler	205	19	89
Total	1549	100	Total	1086	100	70



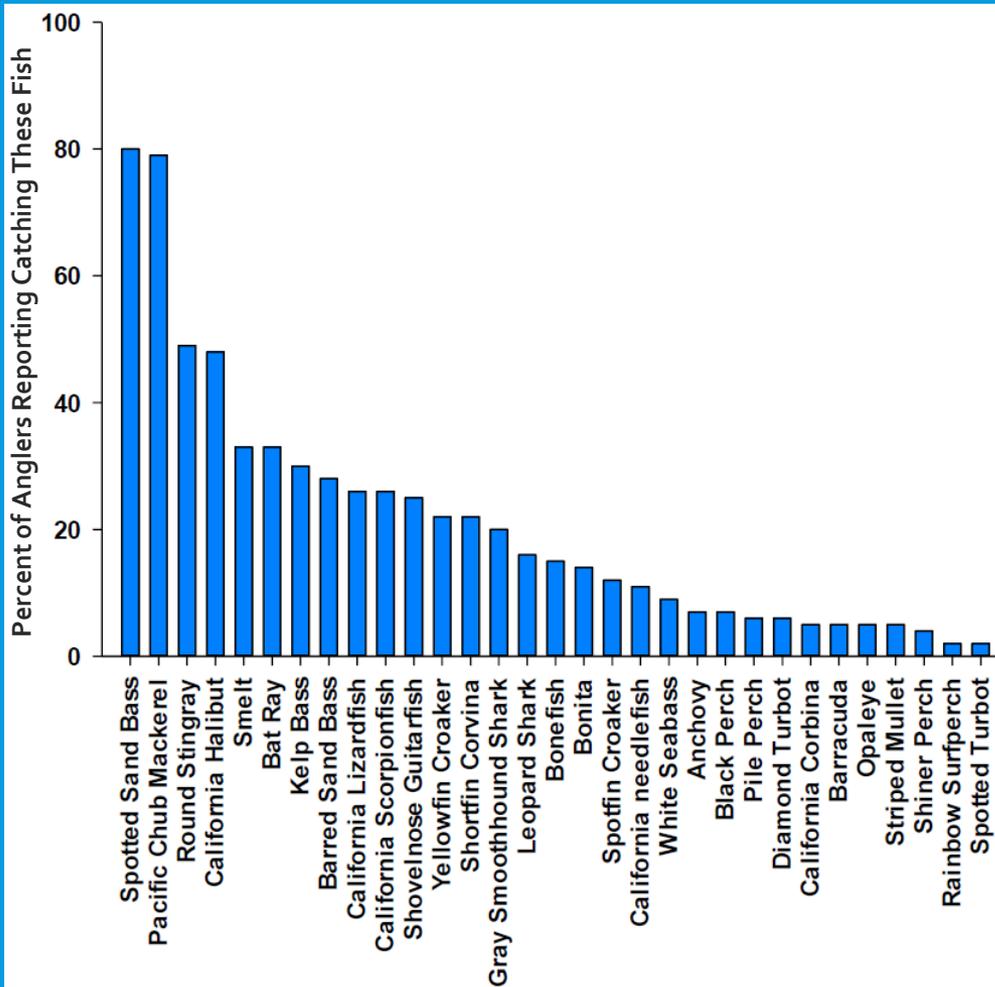
* 294 anglers previously surveyed
93% success for 1st time surveys

WHERE ARE ANGLERS FROM?



Over 70% of those surveyed were local (residence in San Diego County).

WHAT DO ANGLERS CATCH?

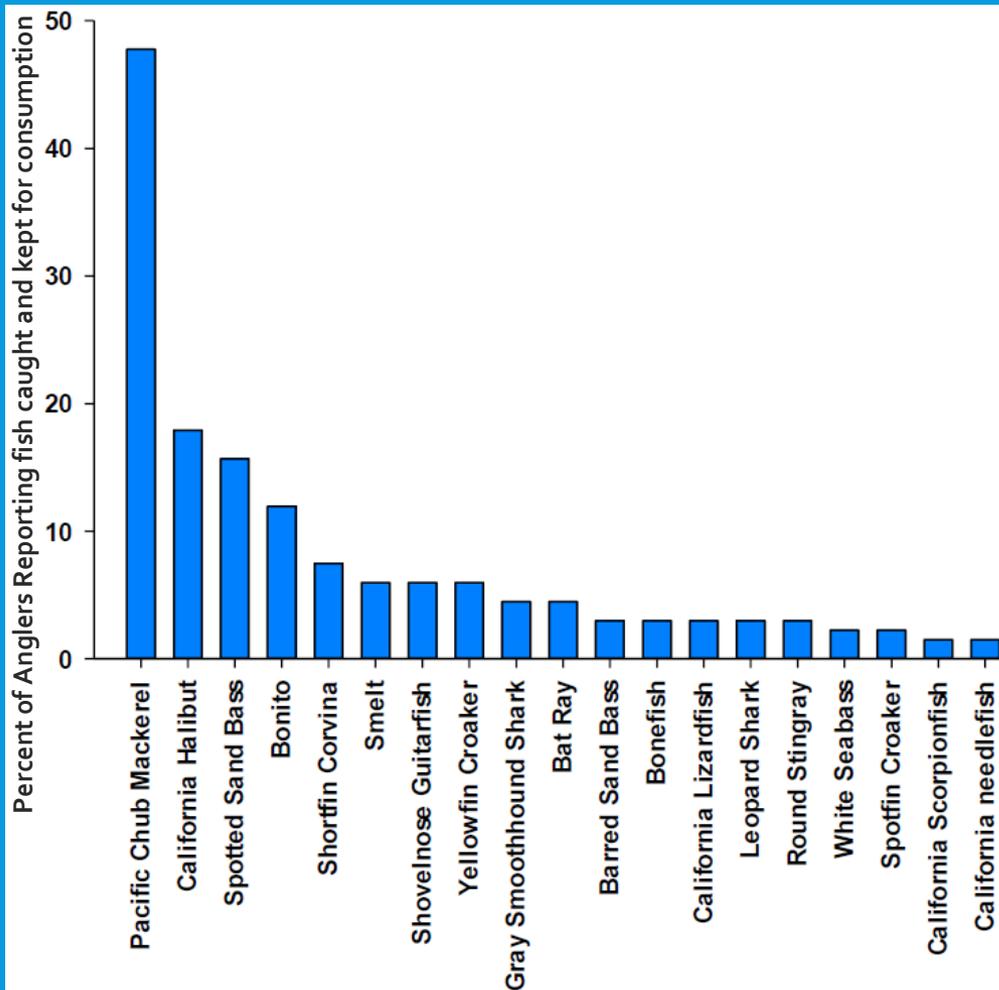


Fish Reported Caught

Fish Name	Percent
Spotted Sand Bass*	80
Pacific Chub Mackerel*	79
Round Stingray*	49
California Halibut	48
Topsmelt*	33
Bat Ray	33
Kelp Bass	30
Barred Sand Bass*	28
California Lizardfish*	26
California Scorpionfish	26

* indicates inclusion on the fish consumption advisory guidelines

WHAT DO ANGLERS EAT?

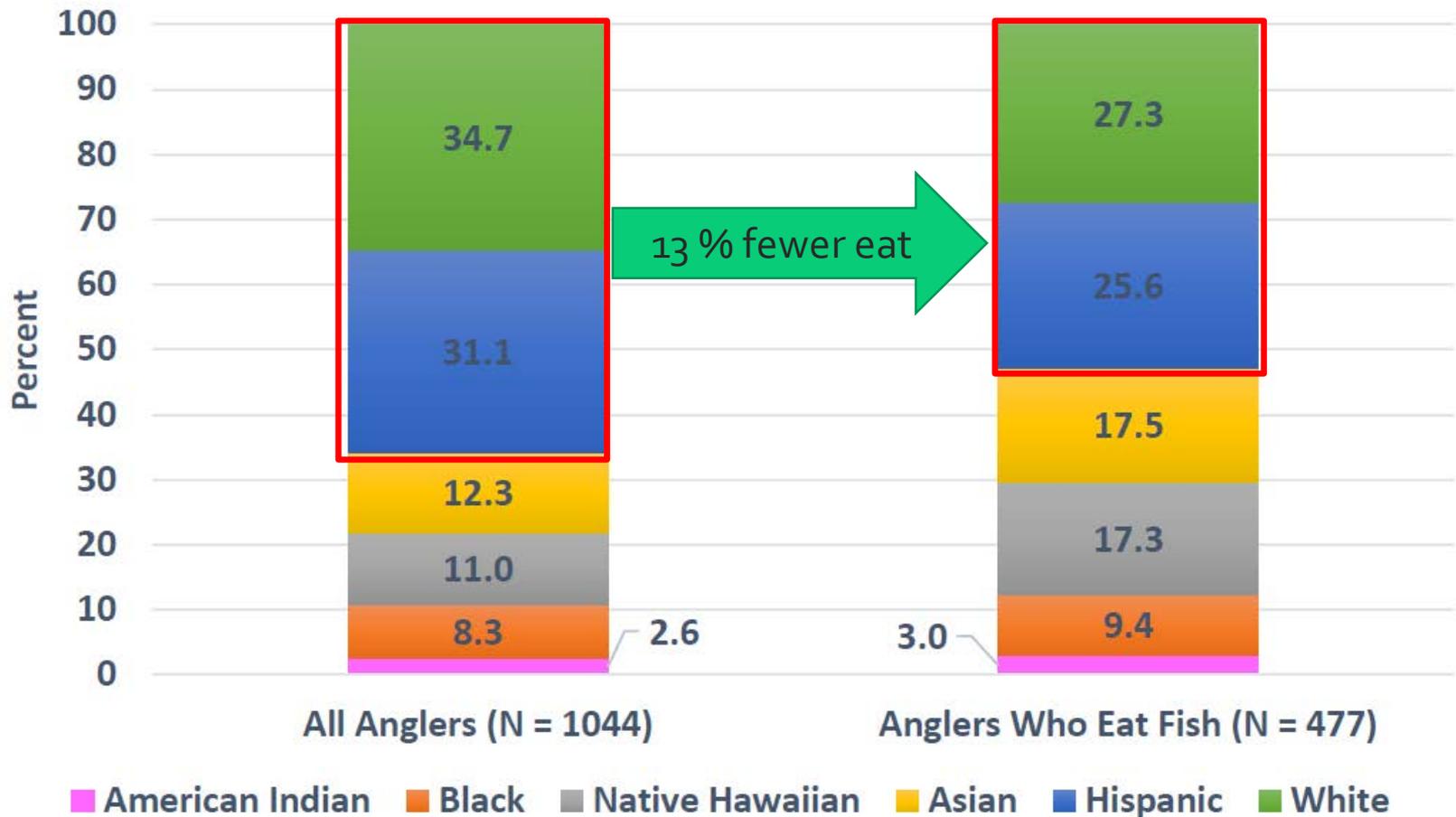


Fish Kept to Consume

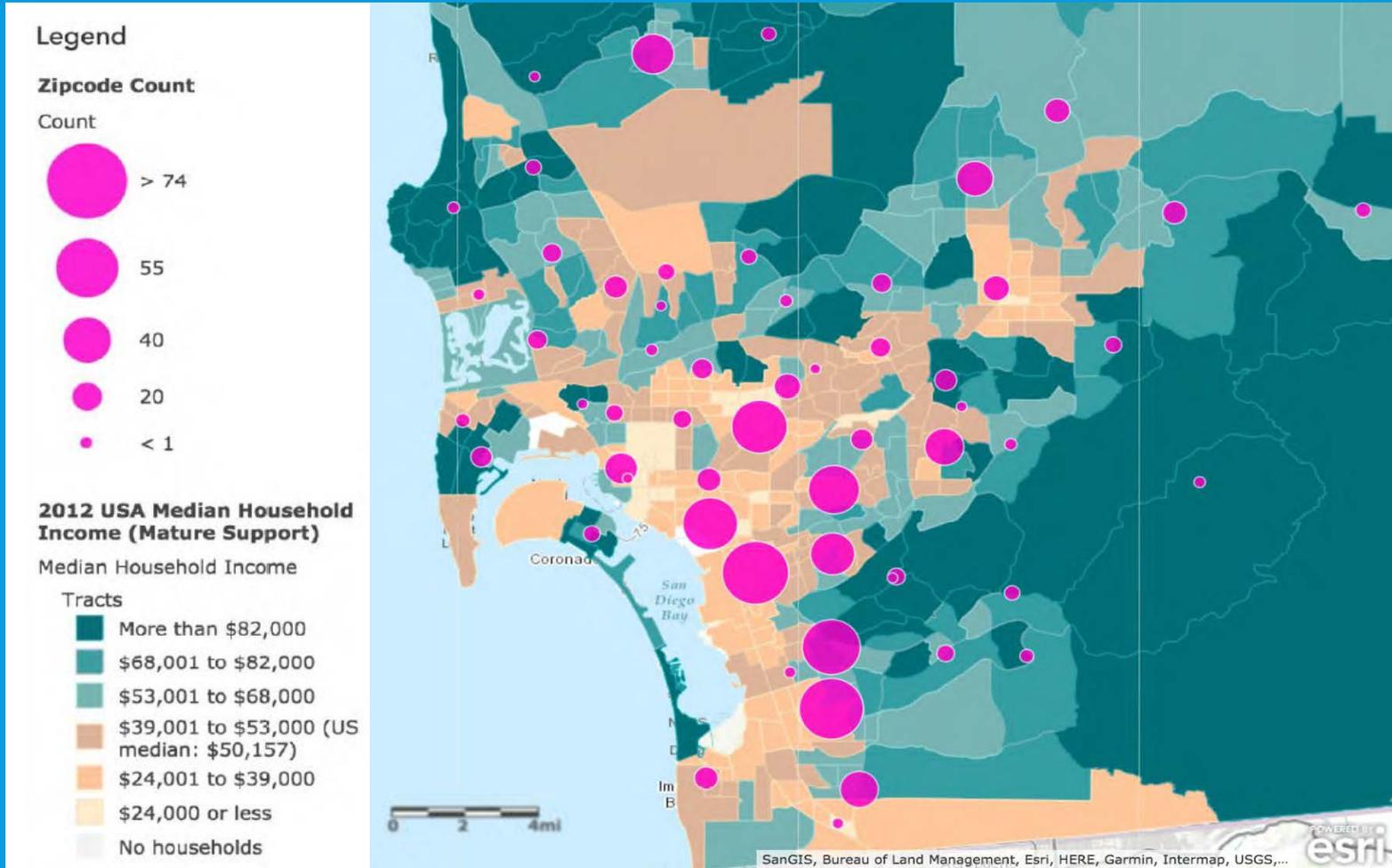
Fish Name	Percent
Pacific Chub Mackerel*	48
California Halibut	18
Spotted Sand Bass*	16
Bonito	12
Shortfin Corvina	8
Topsmelt*	6
Shovelnose Guitarfish*	6
Yellowfin Croaker*	6
Gray Smoothhound Shark*	5
Bat Ray	5

* indicates inclusion on the fish consumption advisory guidelines

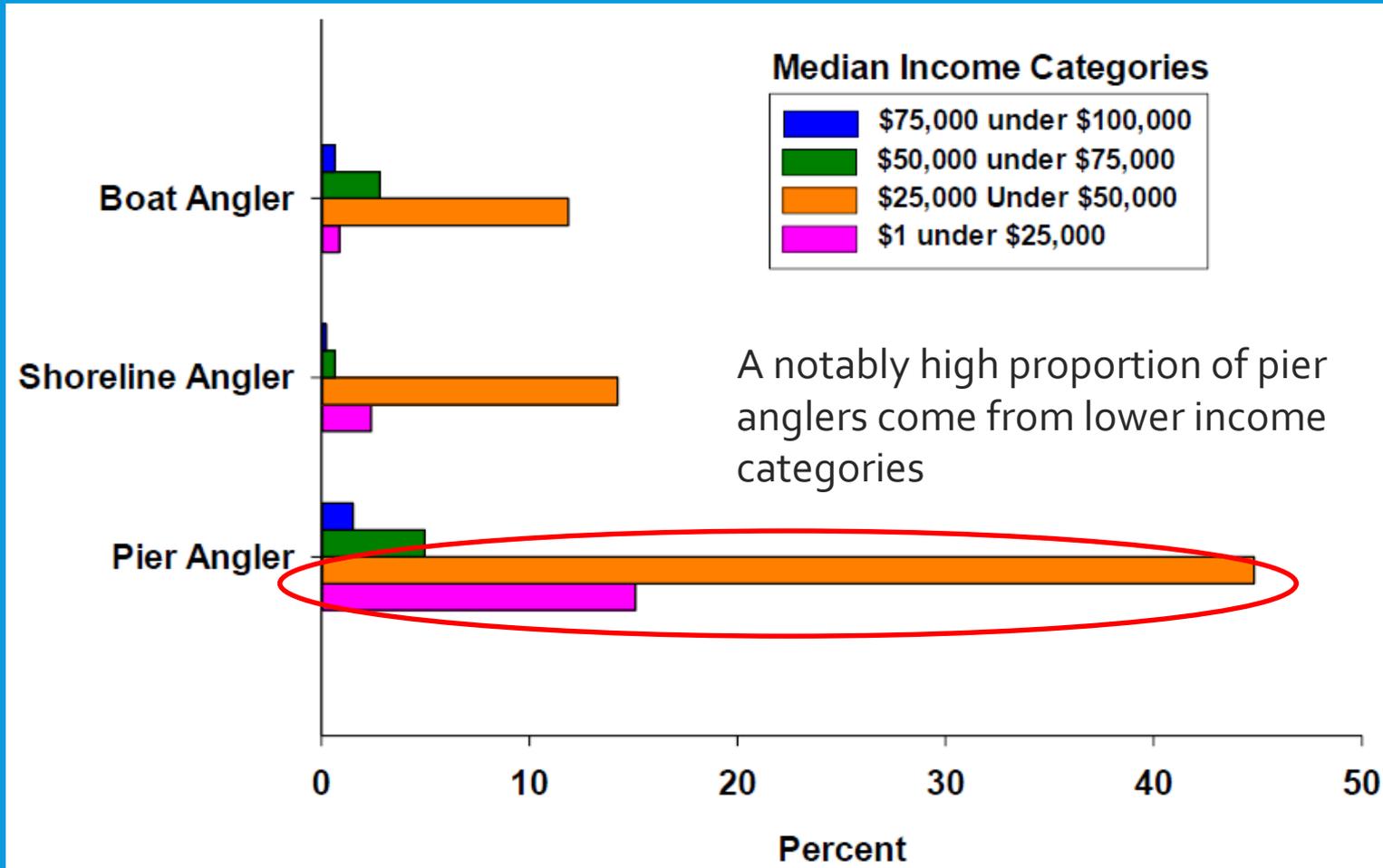
ETHNICITY



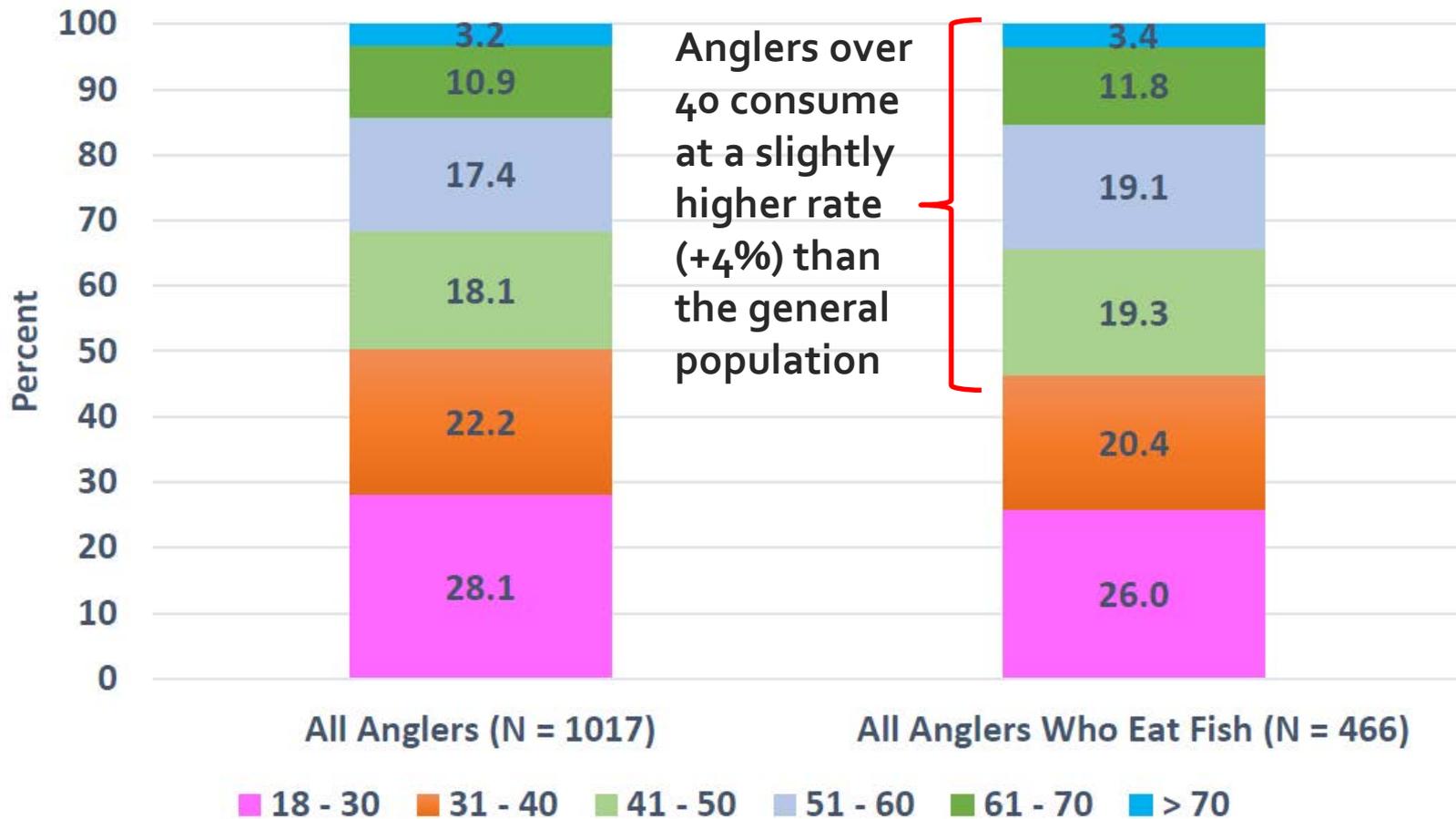
HOUSEHOLD INCOME



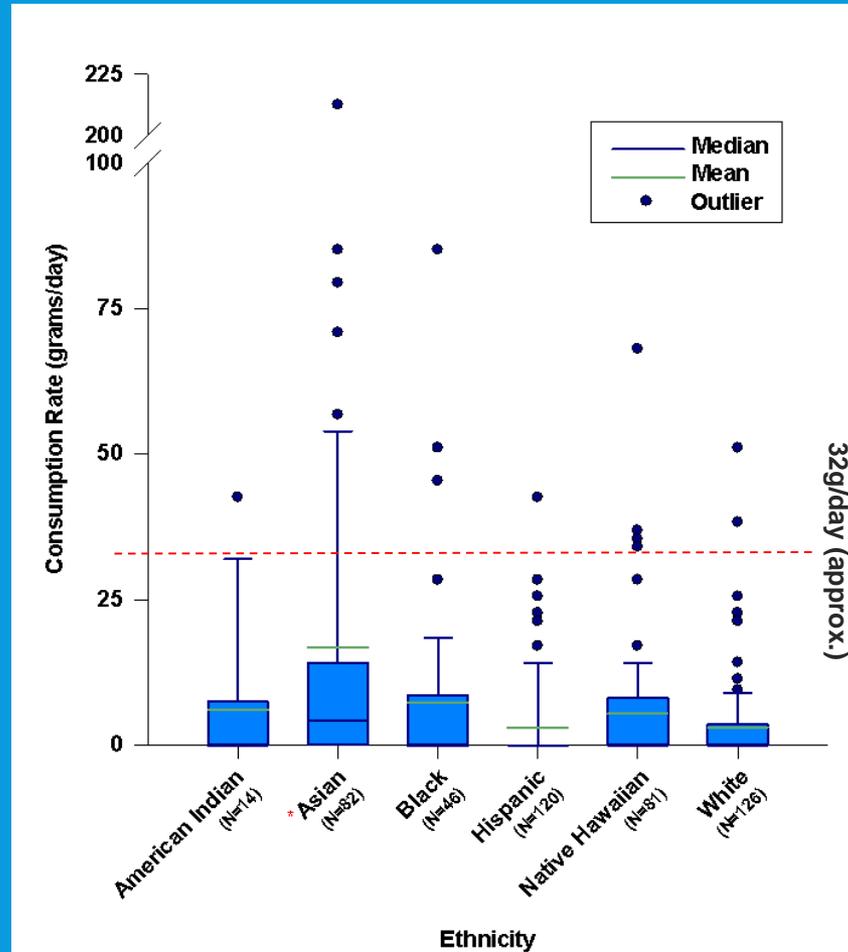
FISHING LOCATION BY INCOME



AGE



CONSUMPTION RATES (GRAMS/DAY)



CONSUMPTION RATES

(GRAMS/DAY)



Statistic	All Anglers	Asians	> 60 years
Mean (Standard Deviation)	6.3 (18.14)	19.9 (39.40)	12.0 (28.67)
Minimum Value	0.0	0.0	0.0
Maximum Value	212.6	212.6	212.6
Median (50th Percentile)	0.0	8.5	4.3
95th Percentile	28.3	76.8	42.5
N	468	67	70

KEY QUESTIONS REVISITED



1. Are anglers aware of consumption guidelines?

YES, but...

Awareness of consumption guidelines **DOES NOT** appear to affect on an individual's decision to consume/not consume fish from the bay.

KEY QUESTIONS REVISITED



2. What are consumption rates for anglers in San Diego Bay and how do they relate to advisory recommendations?

Generally, **CONSUMPTION RATES ARE LOW** for fin fish taken from San Diego Bay.

KEY QUESTIONS REVISITED



3. How do socioeconomic differences relate to differences in consumption rates?

Some **SELECT POPULATIONS** consume fish at rates greater than current guidance

In particular, socioeconomically disadvantaged, Asian men > 60 y.o.

KEY QUESTIONS REVISITED



4. How do catch and consumption rates vary in space and time by location around the bay and time of year?

NO SIGNIFICANT DIFFERENCES in spatial or temporal data were observed.

PARTING COMMENTS

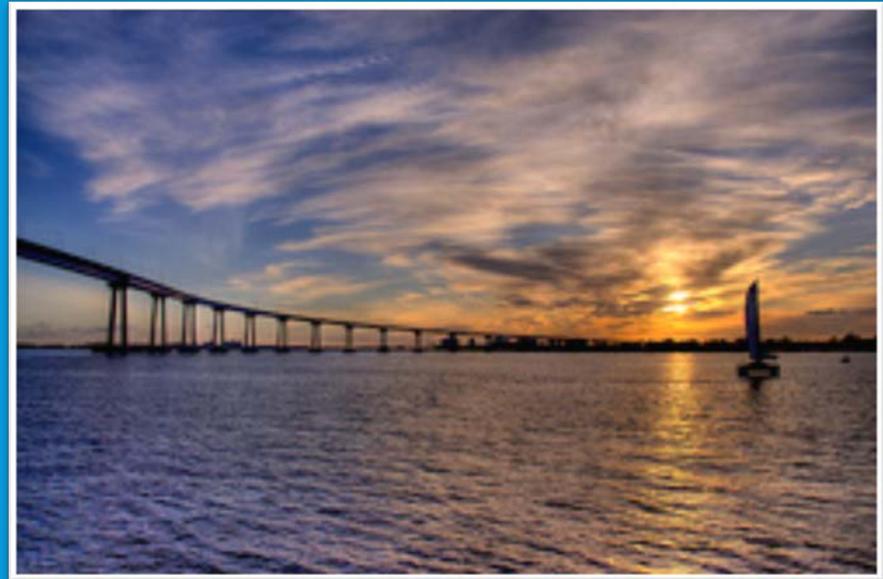


We believe these study findings provide valuable information regarding **actual consumption rates** for San Diego Bay.

This will be useful to inform decision-making and policy appropriate to the local context.



THANK YOU



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