

# Stinson Beach ARC

## Cell Phone Study Results

February 22, 2023

Sam Veloz, Leo Salas & Maya Hayden

# Study question #1

Where are beach users coming from?

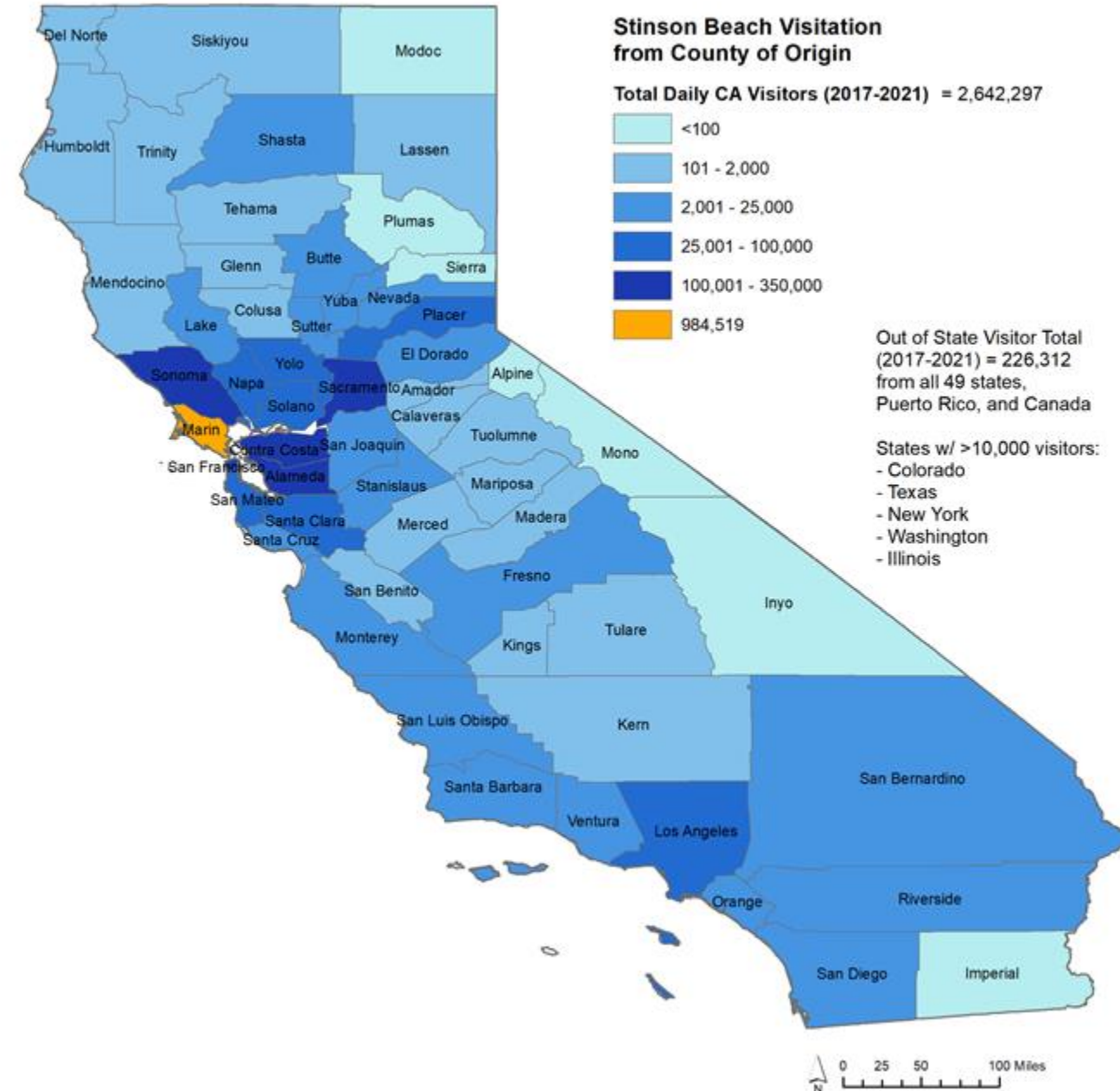
Sub questions

1. Are there particular disadvantaged communities that beach users tend to come from?
2. What are the use patterns (i.e. timing, seasons)?
3. Does use correlate with extreme weather conditions (i.e. heat waves)?
  - If so, are there differences in use during these events between disadvantaged communities and other communities?

# Study question #1

## Where are beach users coming from?

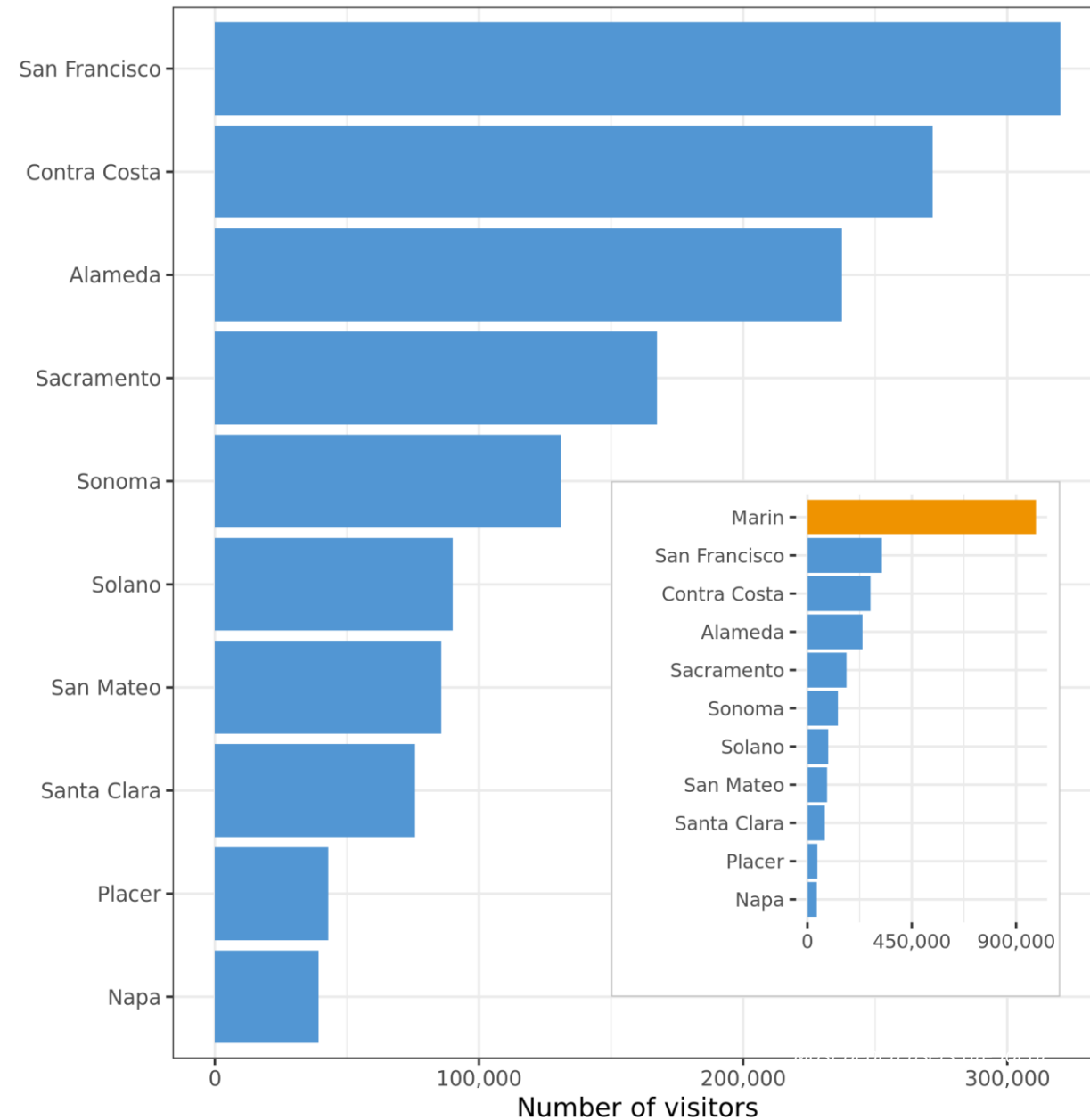
- Almost 3 million daily visitors over the past 5 years
- Visitors from almost every county in CA, but predominantly local (Marin) and Bay Area
- About 1/3 from Marin, 1/3 from other Bay Area counties, and 1/3 rest of the state
- Out of state visitors from all 49 states





# Study question #1

Where are beach users coming from?

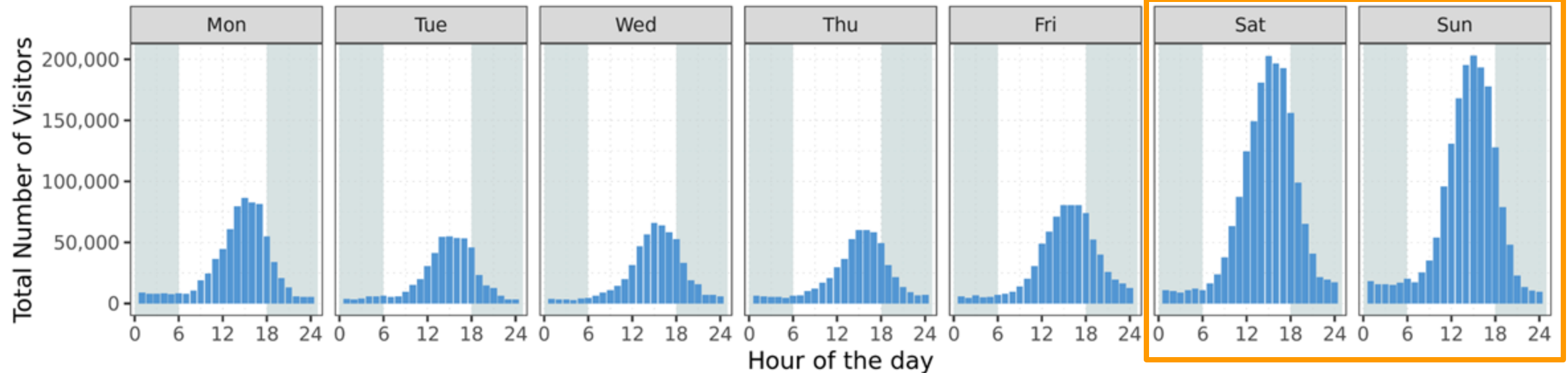
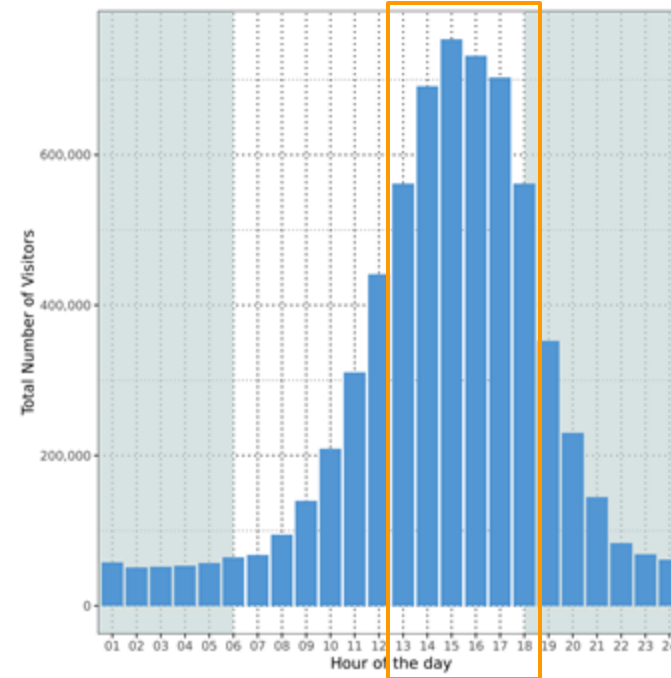


# Study question #1

## Sub 2: Usage patterns

Usage peaks afternoons and on weekends

All visitors from 2017- 2021

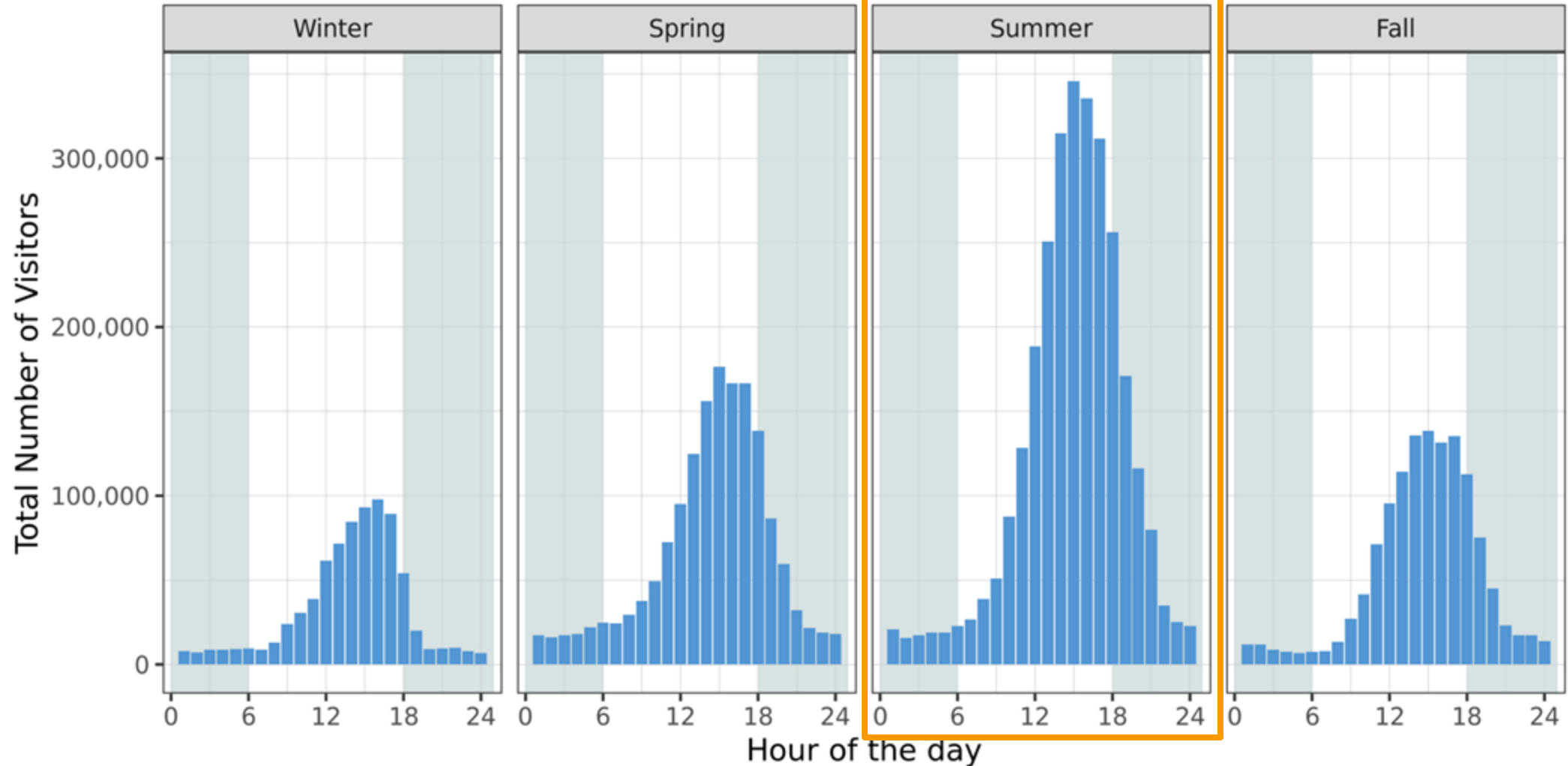


# Study question #1

## Sub 2: Usage patterns

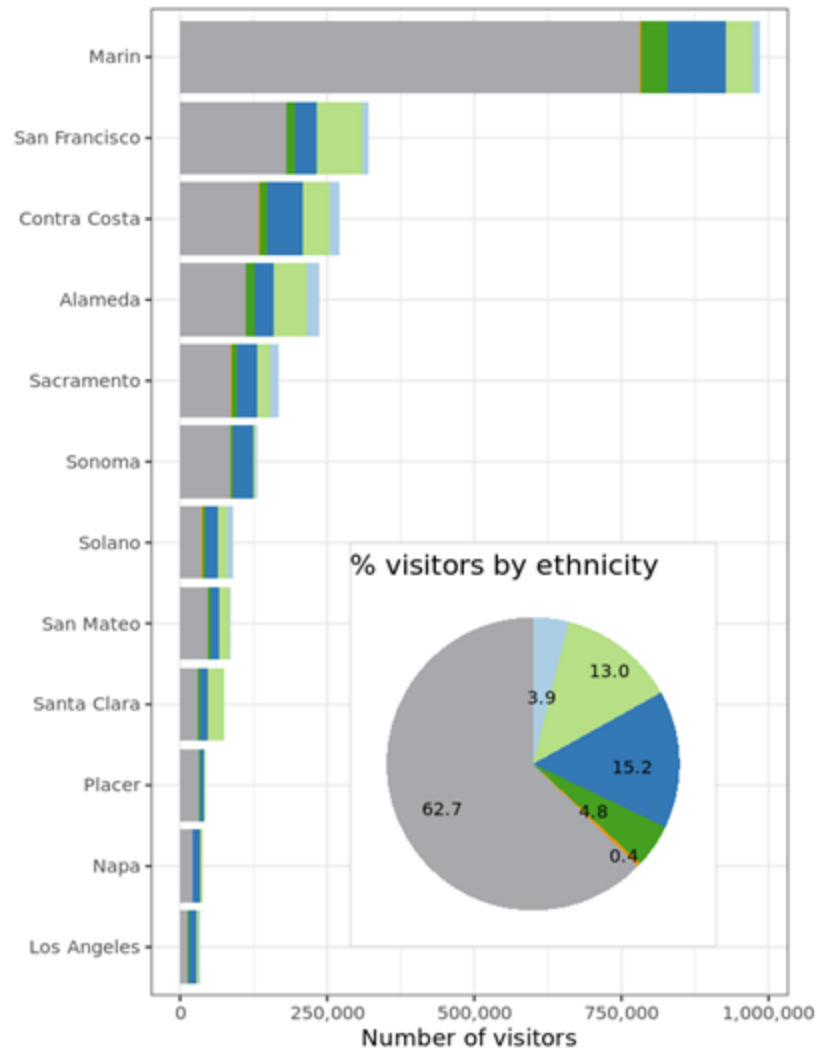
All visitors from 2017- 2021

Usage peaks in the summer



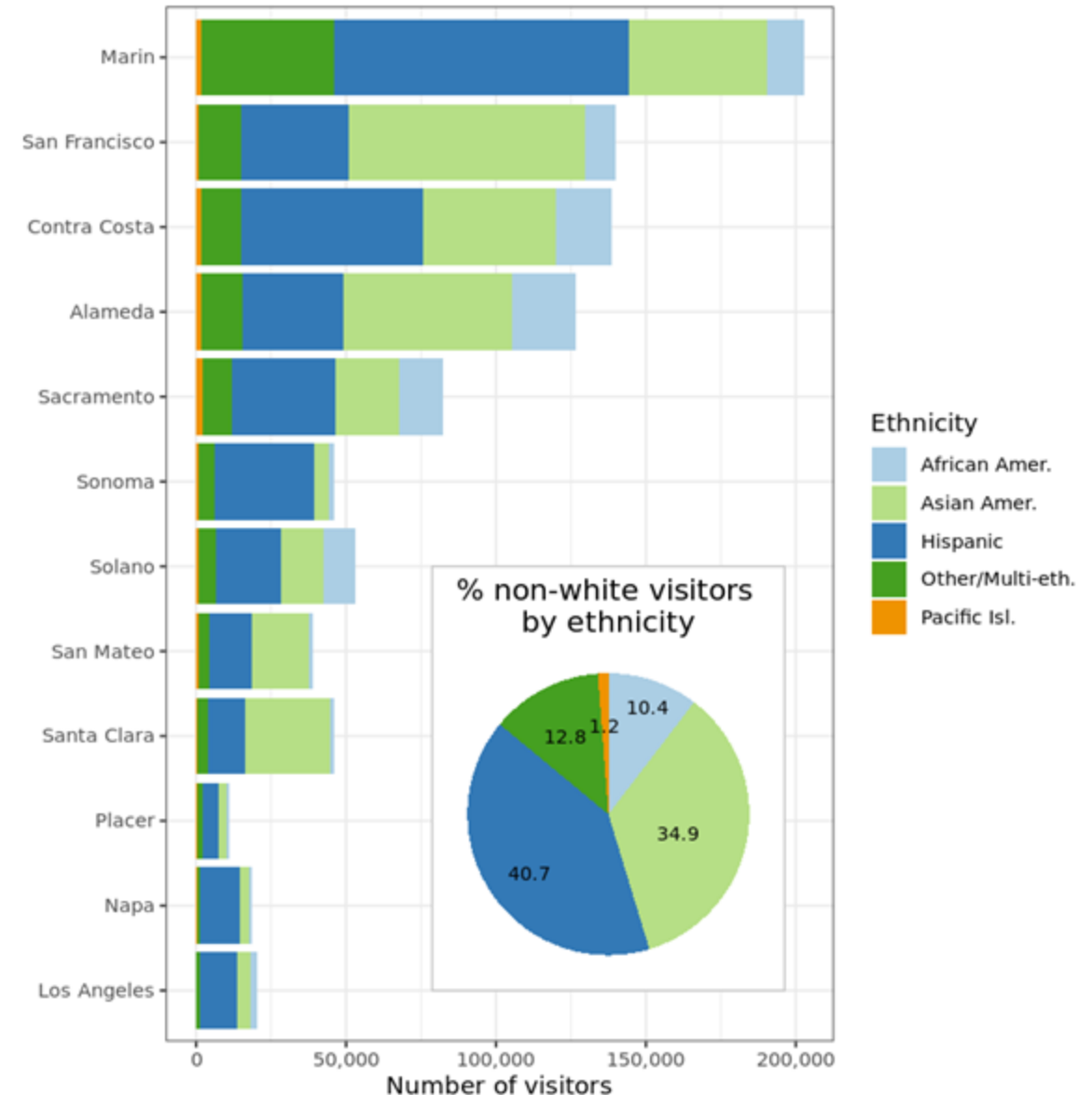
# Study question #1

## Demographics of beach users



37% of visitors are non-white

The majority of non-white visitors are Hispanic (41%) and Asian (35%)



# Disadvantaged Communities Index

From CalEnviroScreen4.0

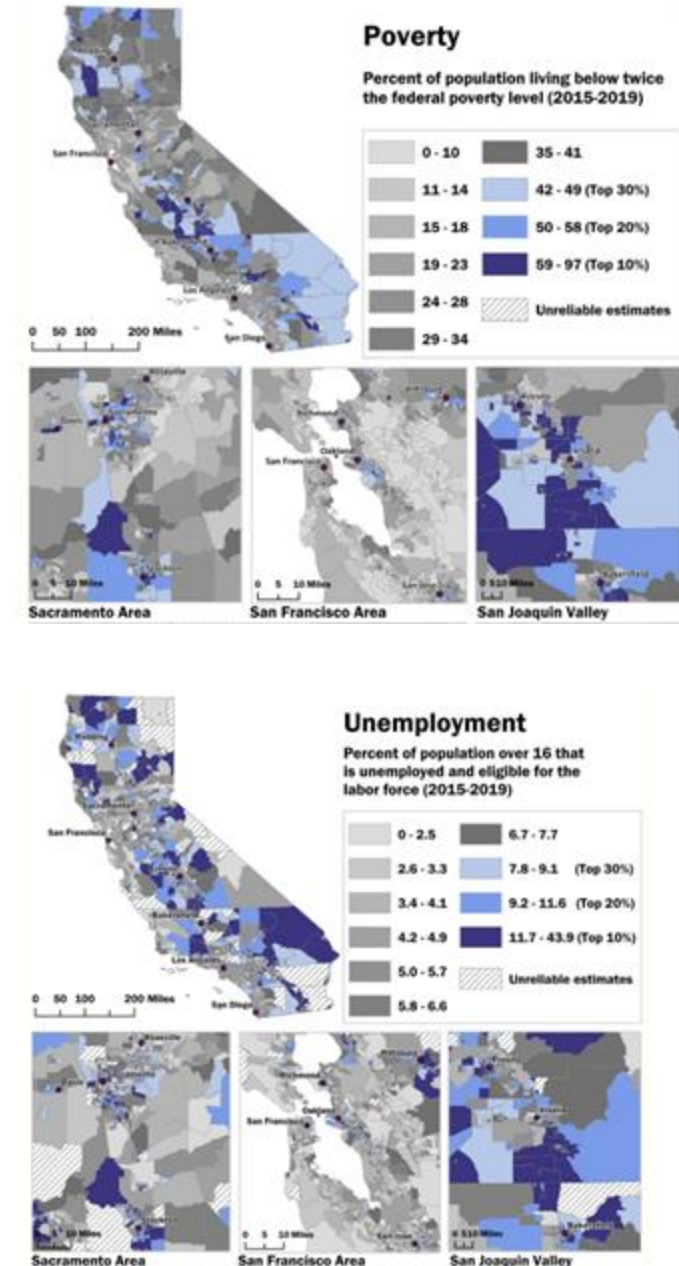
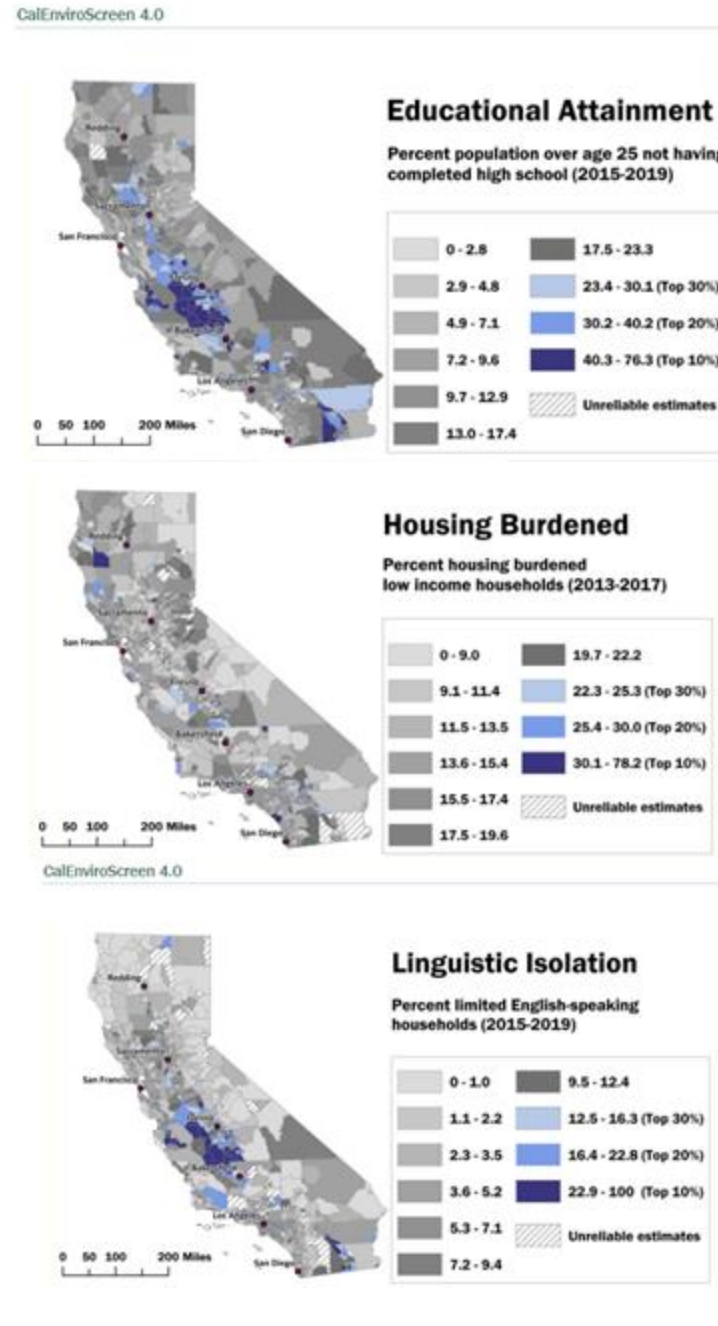
Index: Average percentile rank of 5 socioeconomic factors

By Census Tract, derived from ACS data

- Educational Attainment
- Housing-Burdened Low-Income Households\*
- Linguistic Isolation
- Poverty
- Unemployment

\*Comprehensive Housing Affordability Strategy – Housing and Urban Development

Disadvantaged Tracts scored 70% or higher (upper 30%)



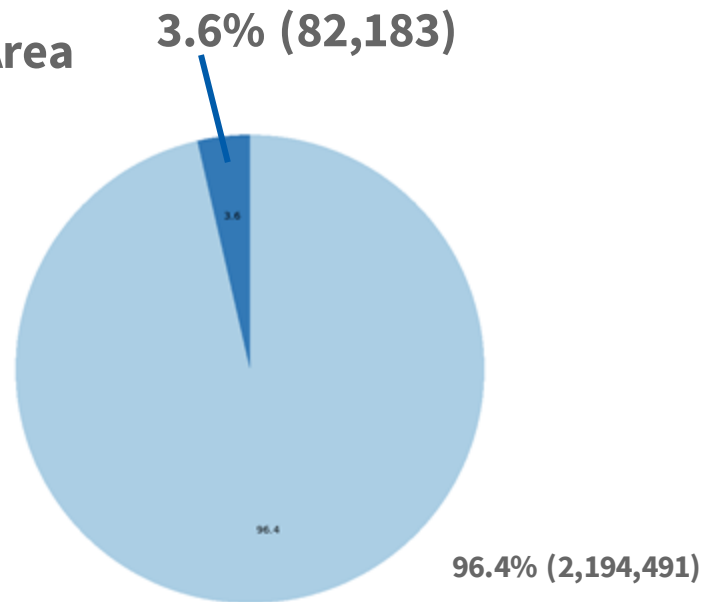


# Study question #1

## Demographics of beach users

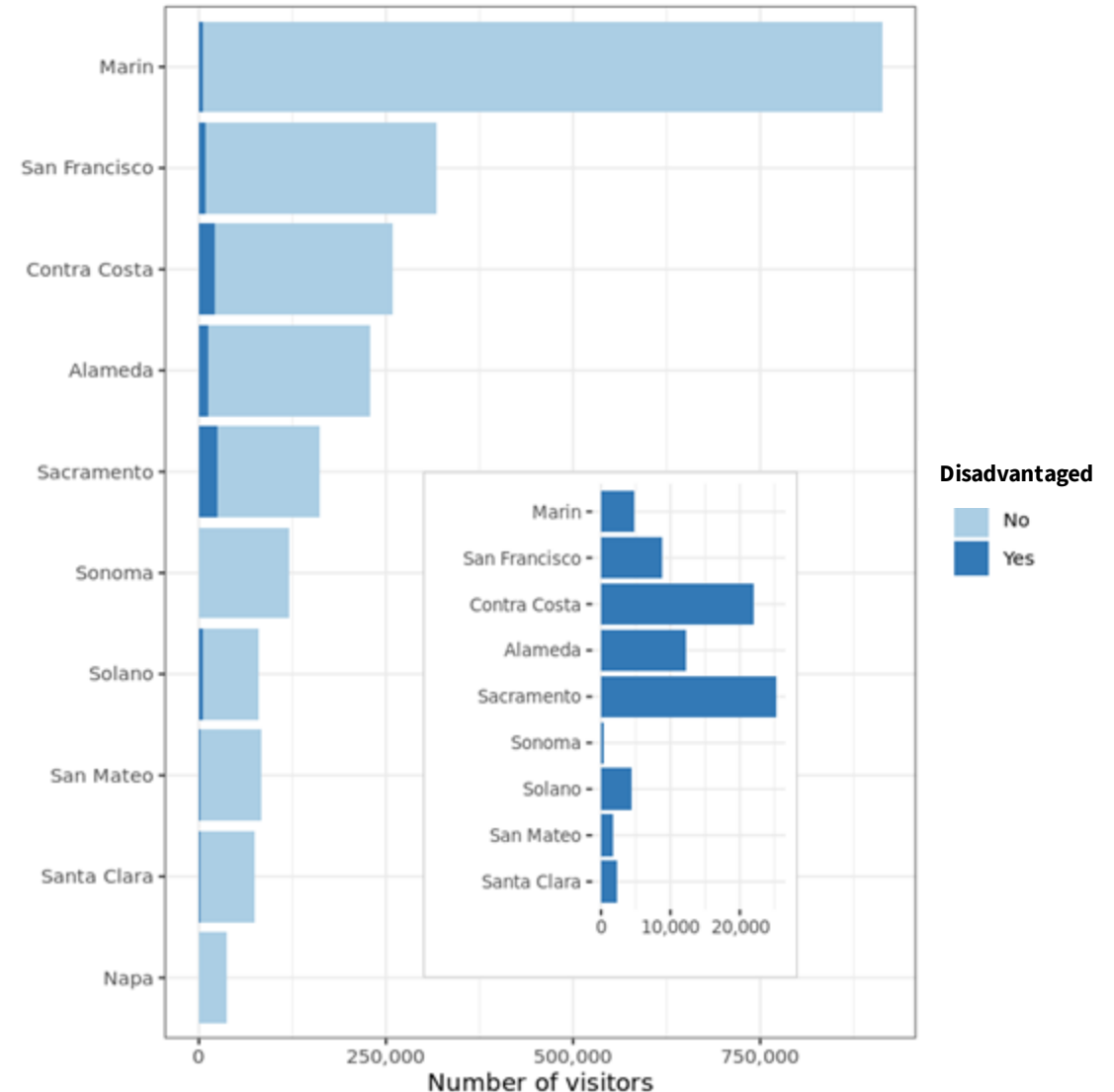
Percent of beach visitors coming from Bay Area\* tracts with high socioeconomic (disadvantaged) index

Percent of Bay Area visitors from Disadvantaged Communities



\*Bay Area includes 9 Bay counties + Sacramento

Disadvantaged Communities in **Sacramento** and **Contra Costa** counties account for the highest proportion



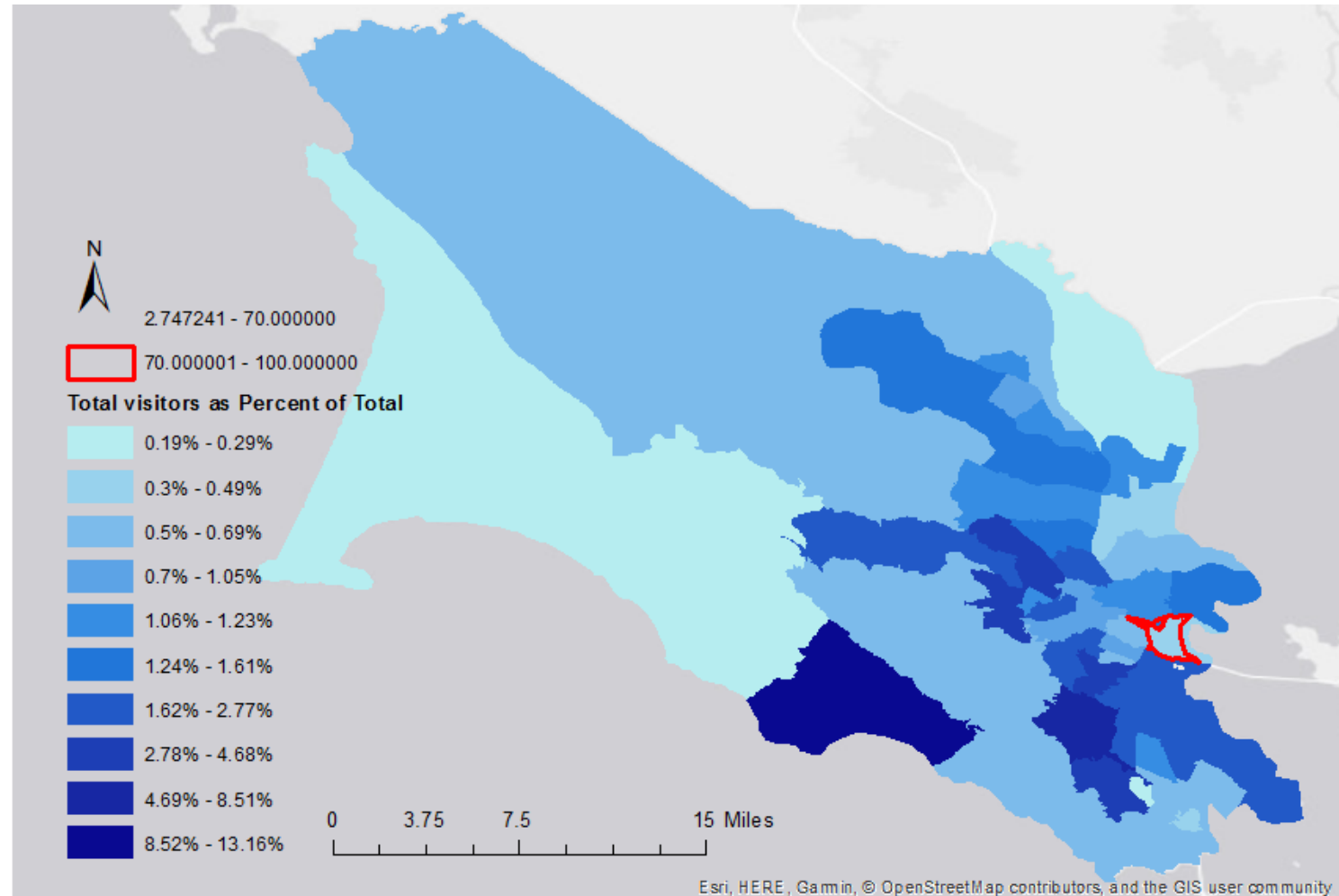
# Study question #1

## Marin County by Tract

Sub 1: Are there particular disadvantaged communities that beach users tend to come from?

Darker blue = More visitors

Red outline = DAC



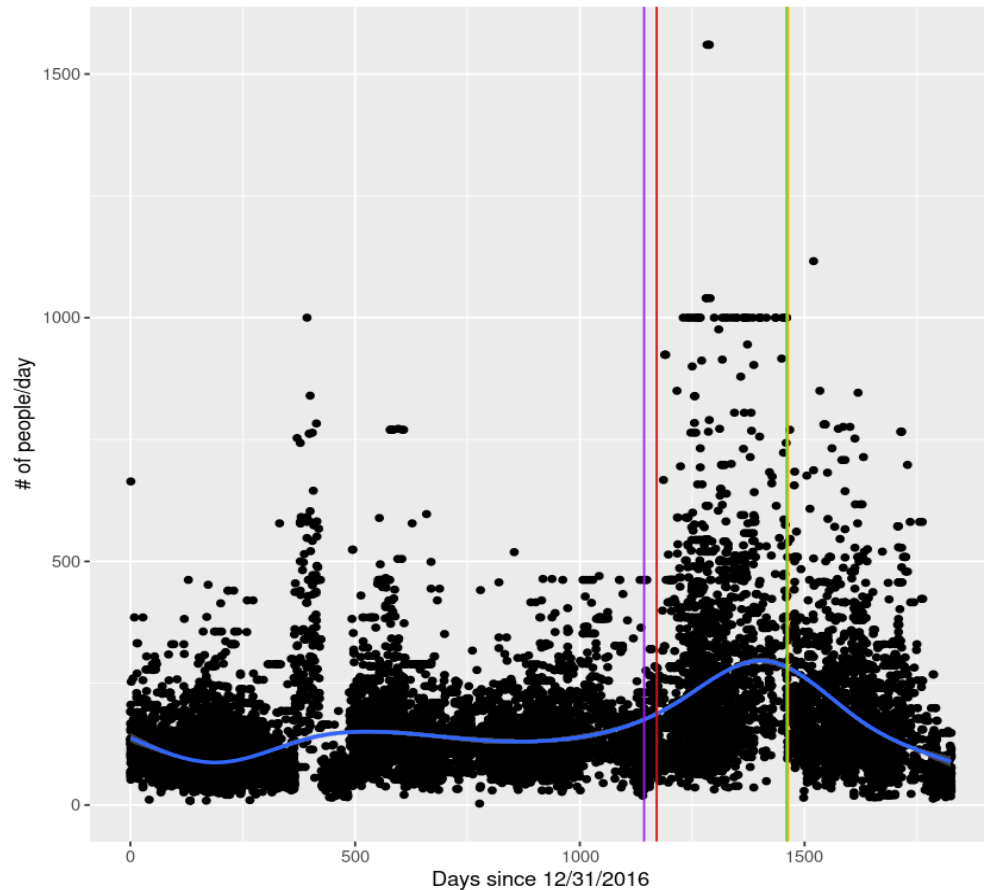
# Study question #1

Census Tract Name	Approximate Location	Total Visitors	Education Attainment	Housing-burdened low-income households	Linguistic isolation	Poverty	Unemployment	Point Blue CalEnviroScreen 4.0	DAC
Census Tract 1122.01	San Rafael	13,548	98.73	99.20	98.97	95.84		98.19	Yes
Census Tract 1122.02	San Rafael	4,842	85.59	92.71	90.34	84.21	48.26	80.22	Yes

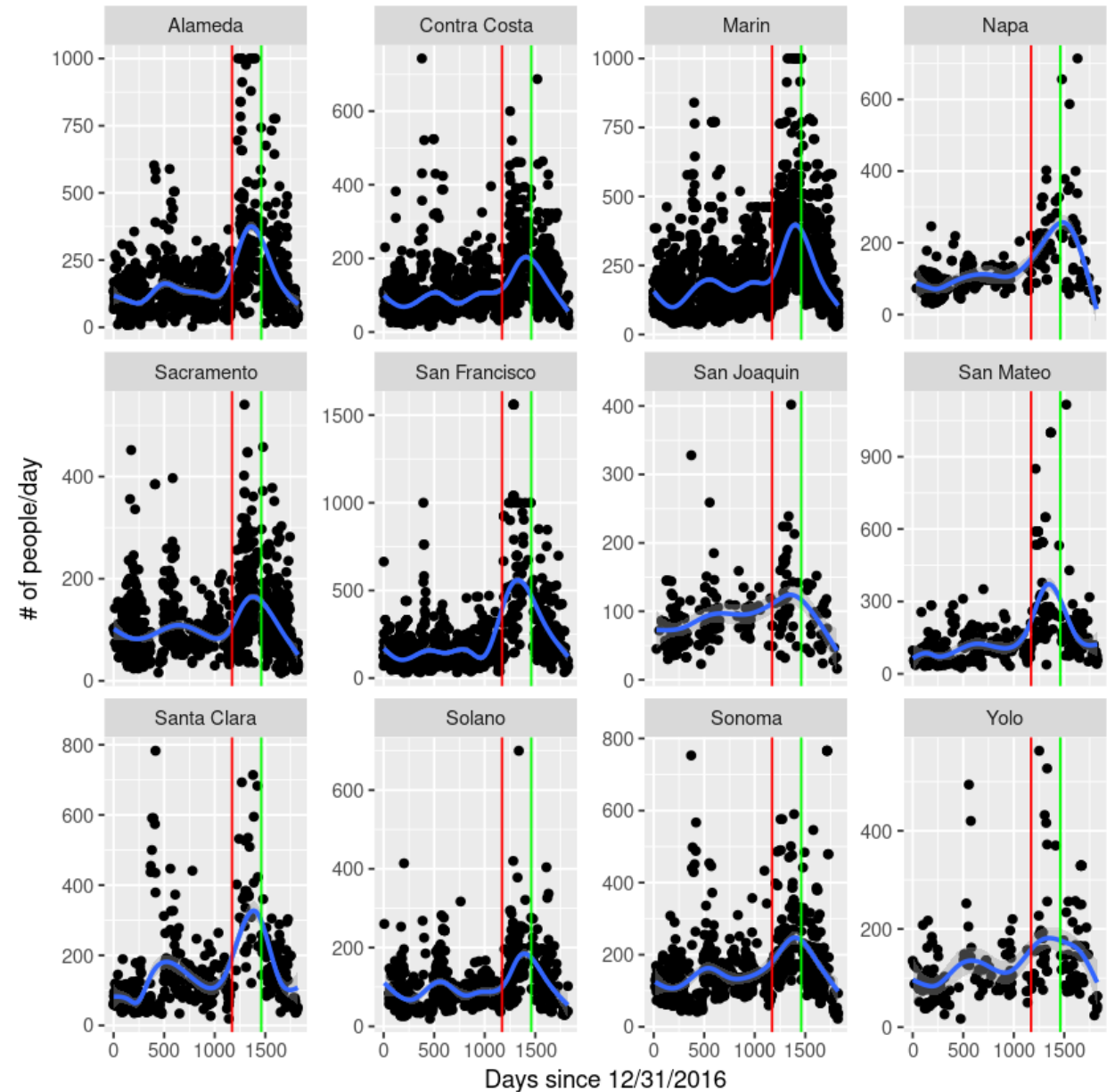
# Study question #1

## Sub 3: Impact of COVID

Beach was a valuable resource during COVID



## Visitors from county of origin





# Study question #1

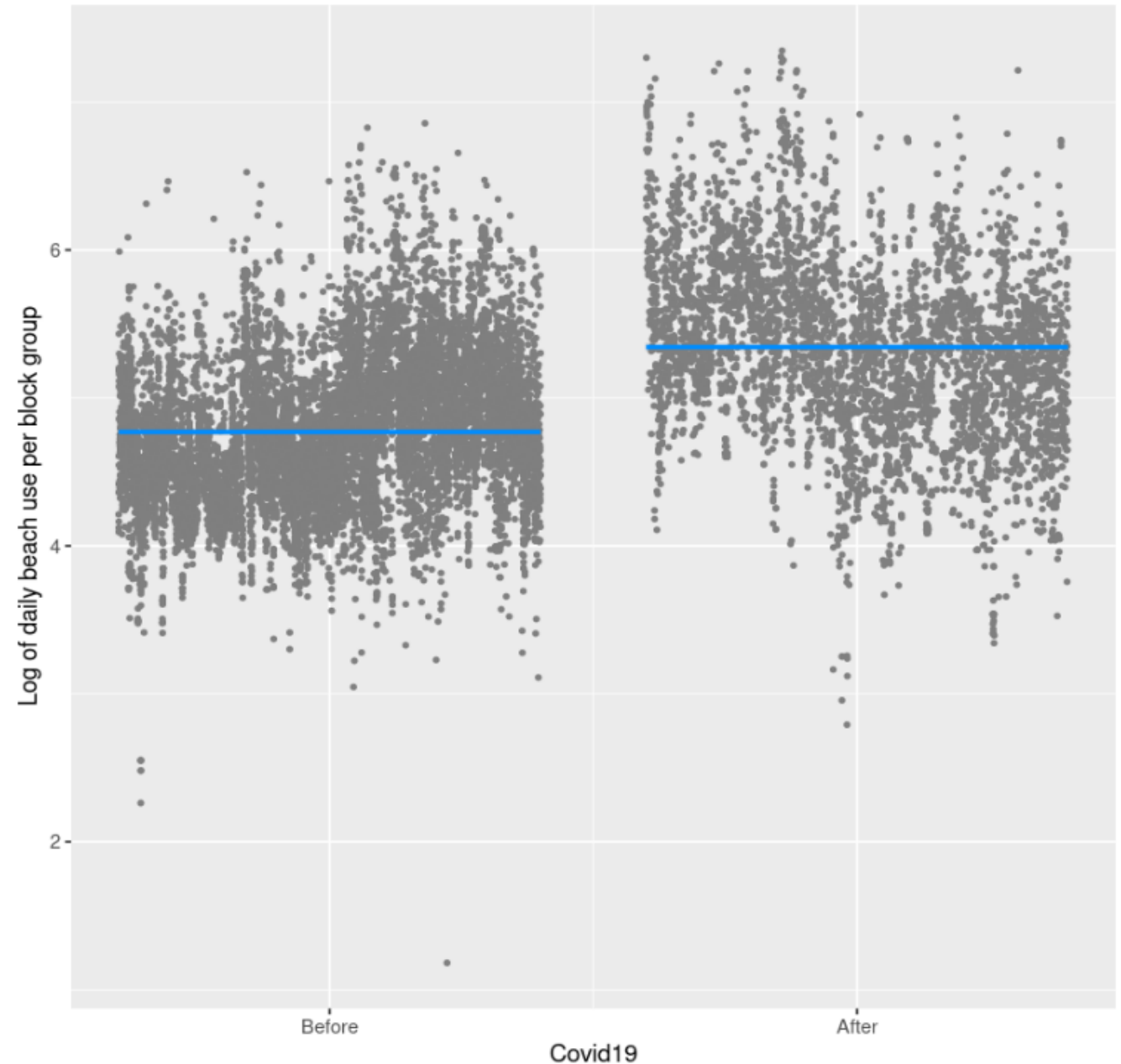
## Sub 3: Impact of Extreme Heat Days and COVID19 on beach visitation

	Df	Sum Squares	Mean square error	F value	Probability > F
County	11	765	69.5	258.221	< 0.001
Month	11	204	18.6	69.058	< 0.001
Day of the week	6	25	4.2	15.712	< 0.001
COVID19	1	1039	1038.8	3858.7	< 0.001
Extreme heat	1	2	1.9	7.206	0.007
DAC	1	1	0.8	3.133	0.077
Month x Heat	11	9	0.8	3.091	<0.001
Day of the week x extreme heat	6	3	0.4	1.636	0.133
County x Extreme heat	11	2	0.2	0.816	0.624
Extreme heat x DAC	1	0	0.2	0.72	0.396
COVID19 x DAC	1	6	6.1	22.507	< 0.001
Residuals	16961	4566	0.3		

# Study question #1

## Sub 3: Impact of COVID

Beach use did increase following the Covid19 pandemic and this difference was significant.

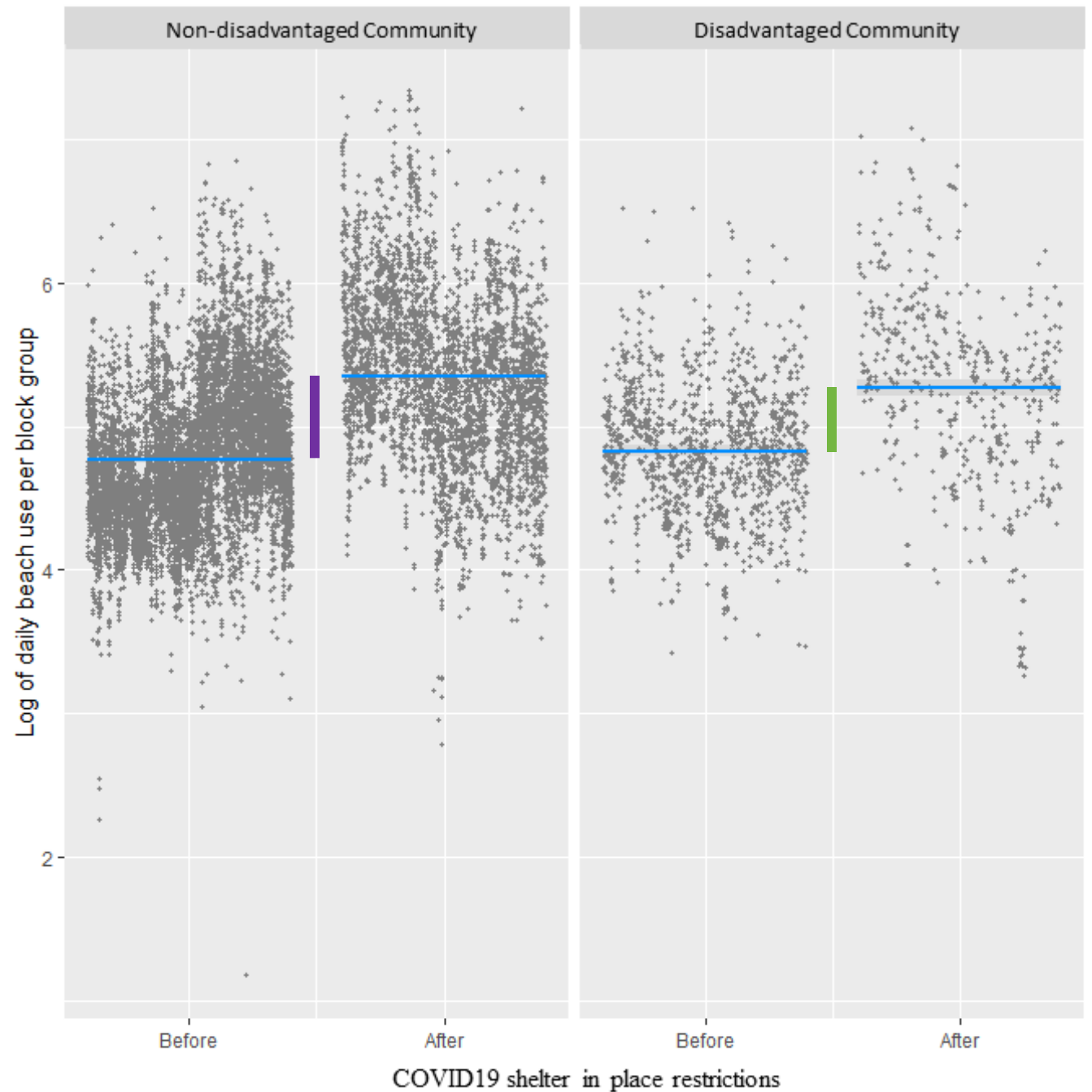


# Study question #1

## Sub 3: Impact of COVID

Patterns in the change in beach use between DAC and non-DAC communities is similar but there are significant differences.

Beach use increased more for non-DAC then DAC following COVID19.



# Study question #2

Where are the locations on the beach with the greatest use density?

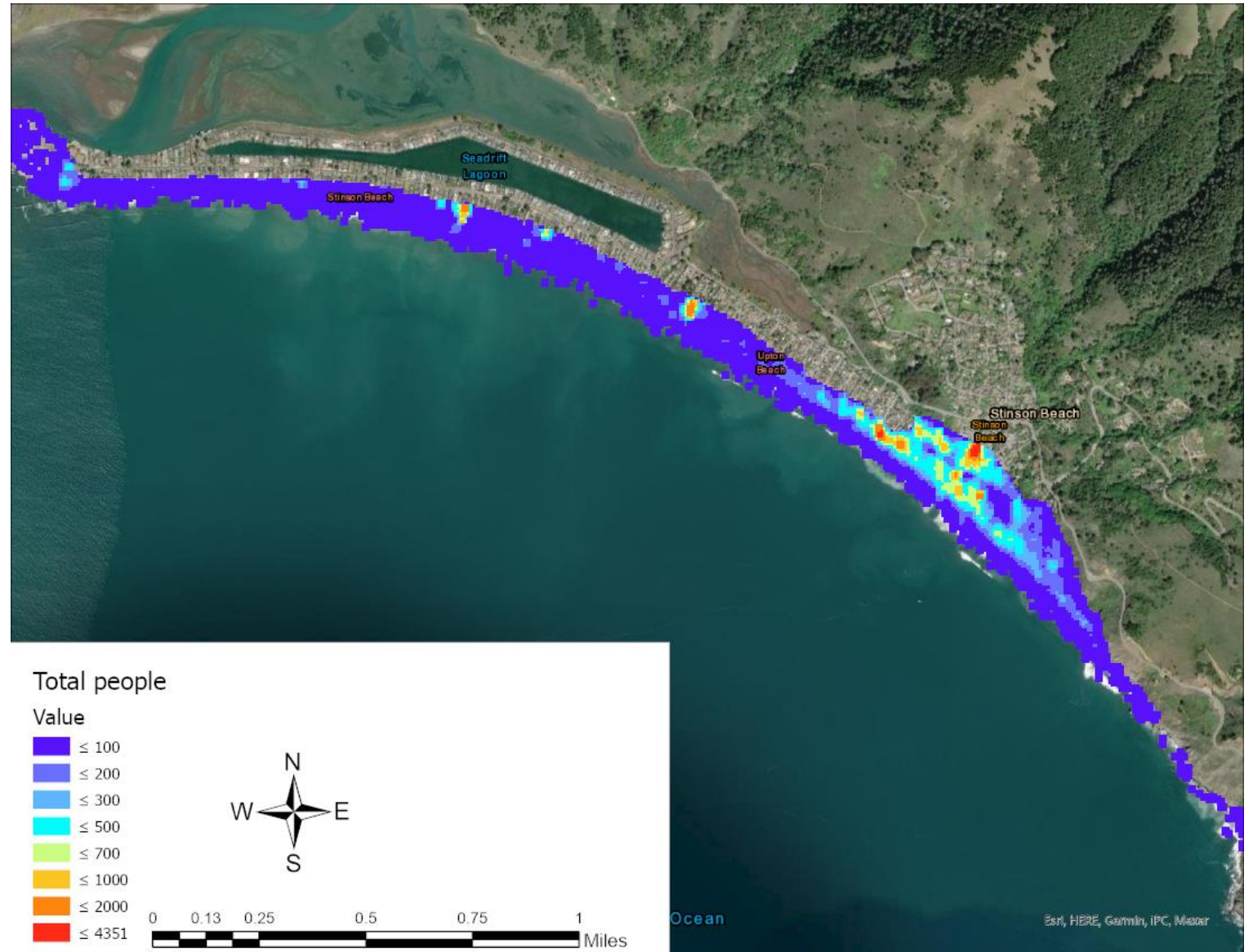
Sub questions

1. How vulnerable are these locations to sea-level rise?



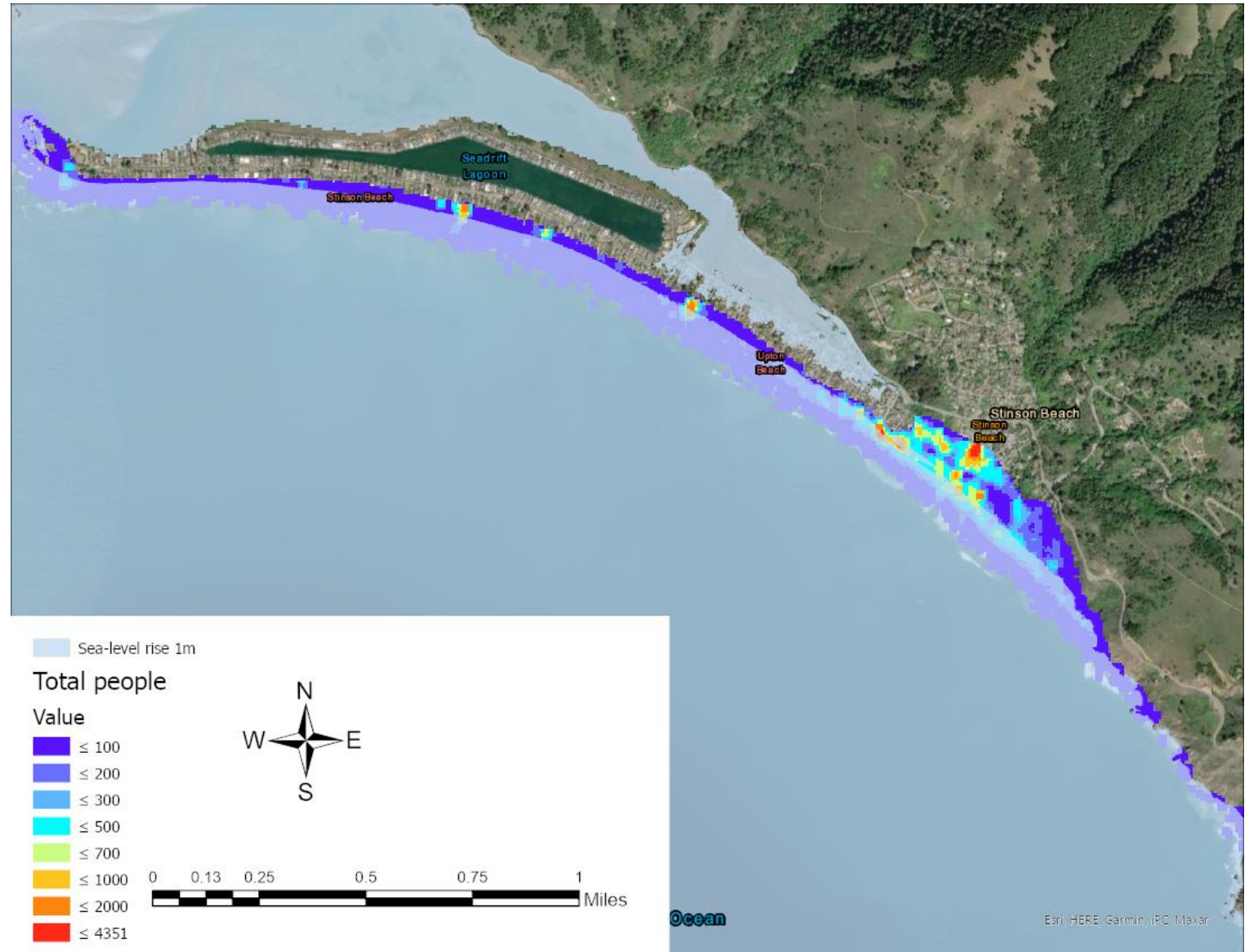
# Study question #2

Where are the locations on the beach with the greatest use density?



# Study question #2

Where are the locations on the beach with the greatest use density vulnerable to sea-level rise?



# Conclusions

1. Visitors come from all over the state and country but majority from Bay Area Counties
2. Stinson Beach is a valuable community resource that shows increased use during the COVID19 pandemic and during heat waves
3. Sea-level rise will reduce the availability of desirable beach areas



# Thank You!

**Sam Veloz**

Director, Ecoinformatics  
and Climate Solutions  
sveloz@pointblue.org

**Leo Salas**

Senior Quantitative Ecologist  
lsalas@pointblue.org

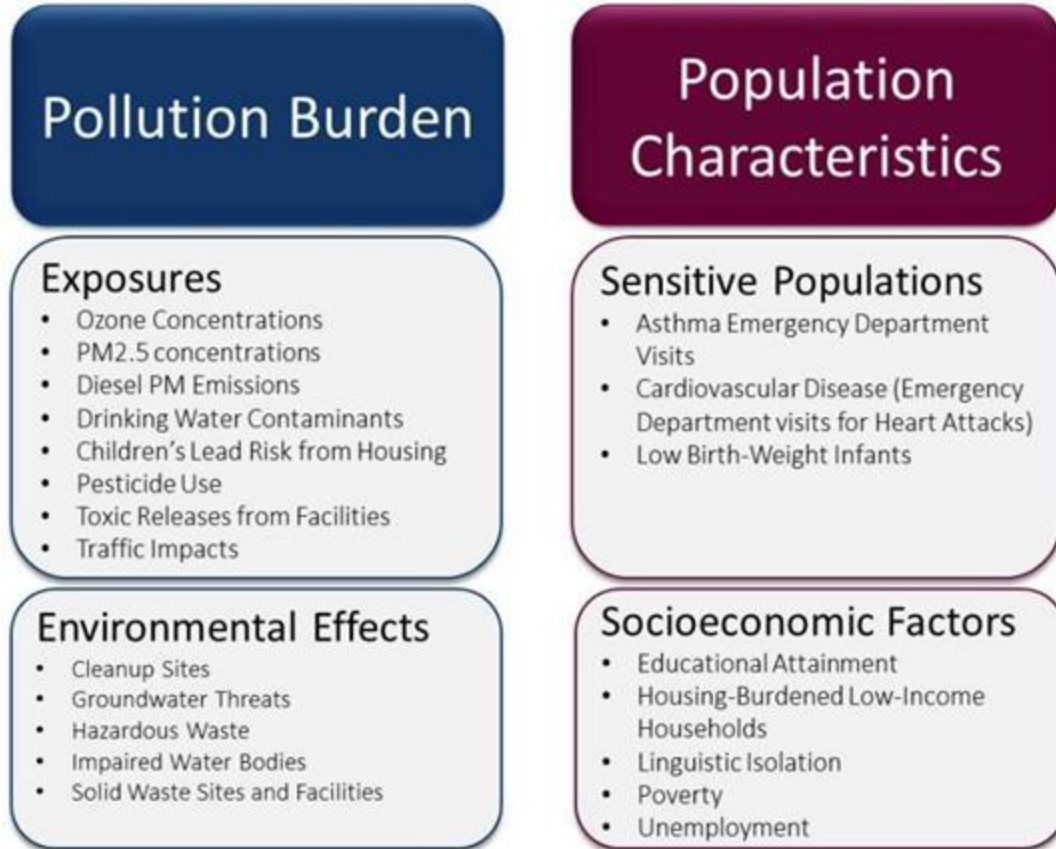
**Maya Hayden**

Oceanographer  
mkhayden@usgs.gov



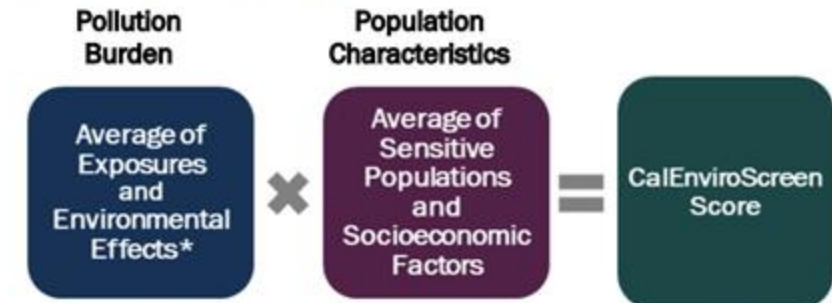
# CalEnviroScreen 4.0

Data by census tract



Formula for  
Calculating  
CalEnviroScreen  
Score

After the components are scored within Pollution Burden or Population Characteristics, the scores are combined as follows to calculate the overall CalEnviroScreen Score:



\* The Environmental Effects score was weighted half as much as the Exposures score.

Component Group	Maximum Score*
<b>Pollution Burden</b>	
Exposures and Environmental Effects	10
<b>Population Characteristics</b>	
Sensitive Populations and Socioeconomic Factors	10
<b>CalEnviroScreen Score</b>	Up to 100 (= 10 × 10)

\* Enough decimal places were retained in the calculation to eliminate ties.

Could use overall Index, or  
component metrics

# State Parks Community FactFinder

## Income-based categories

- Disadvantaged (MHHI < \$56,982)
- Severely Disadvantaged (MHHI < \$42,737)

Thresholds are derived from American Community Survey 2014-18 (ACS 2014-18) 5-year estimates at the block-group geographic level and the California State Median Household Income of \$71,228.

## Data by census block group

