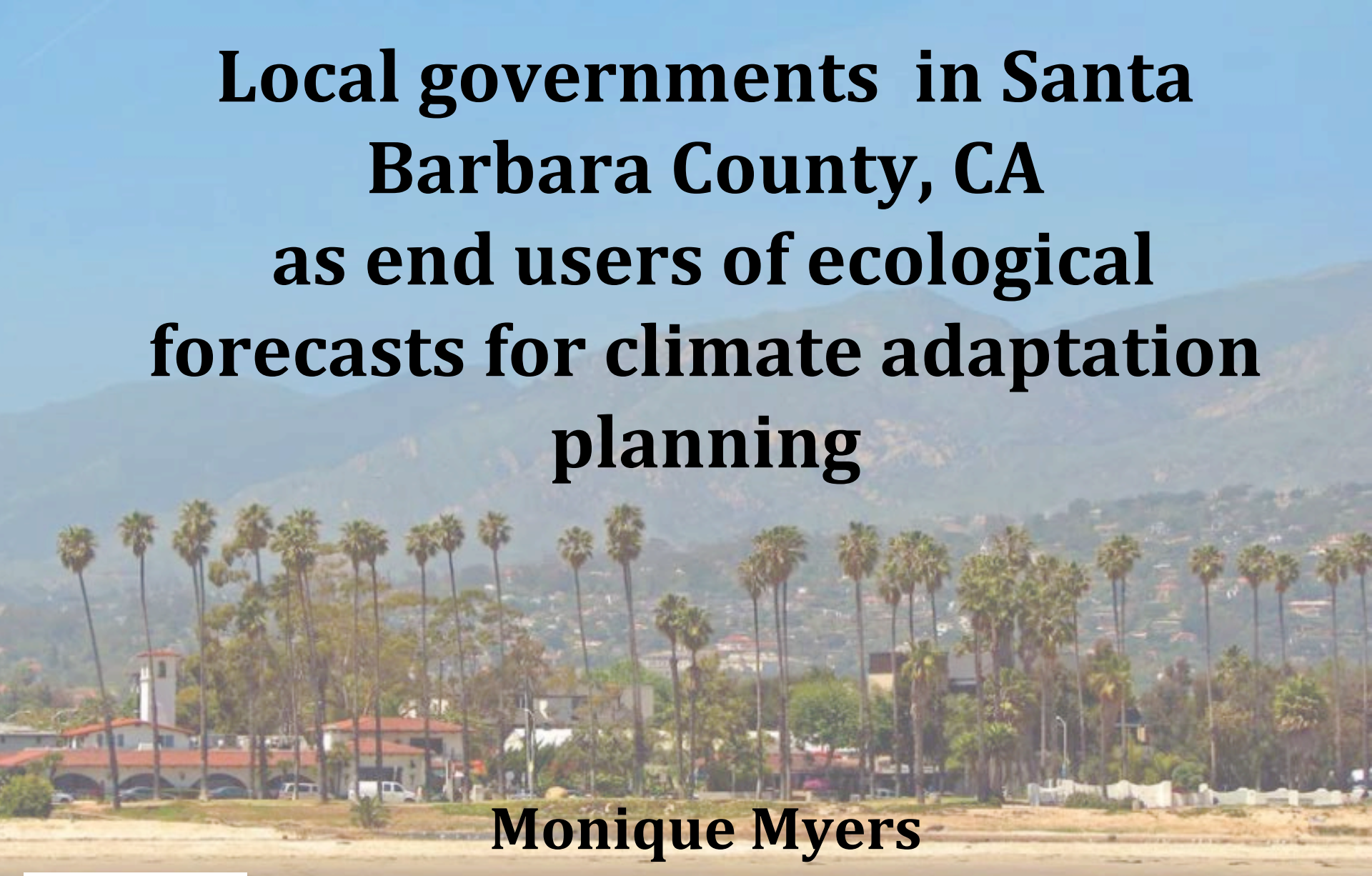
Local governments in Santa Barbara County, CA as end users of ecological forecasts for climate adaptation planning



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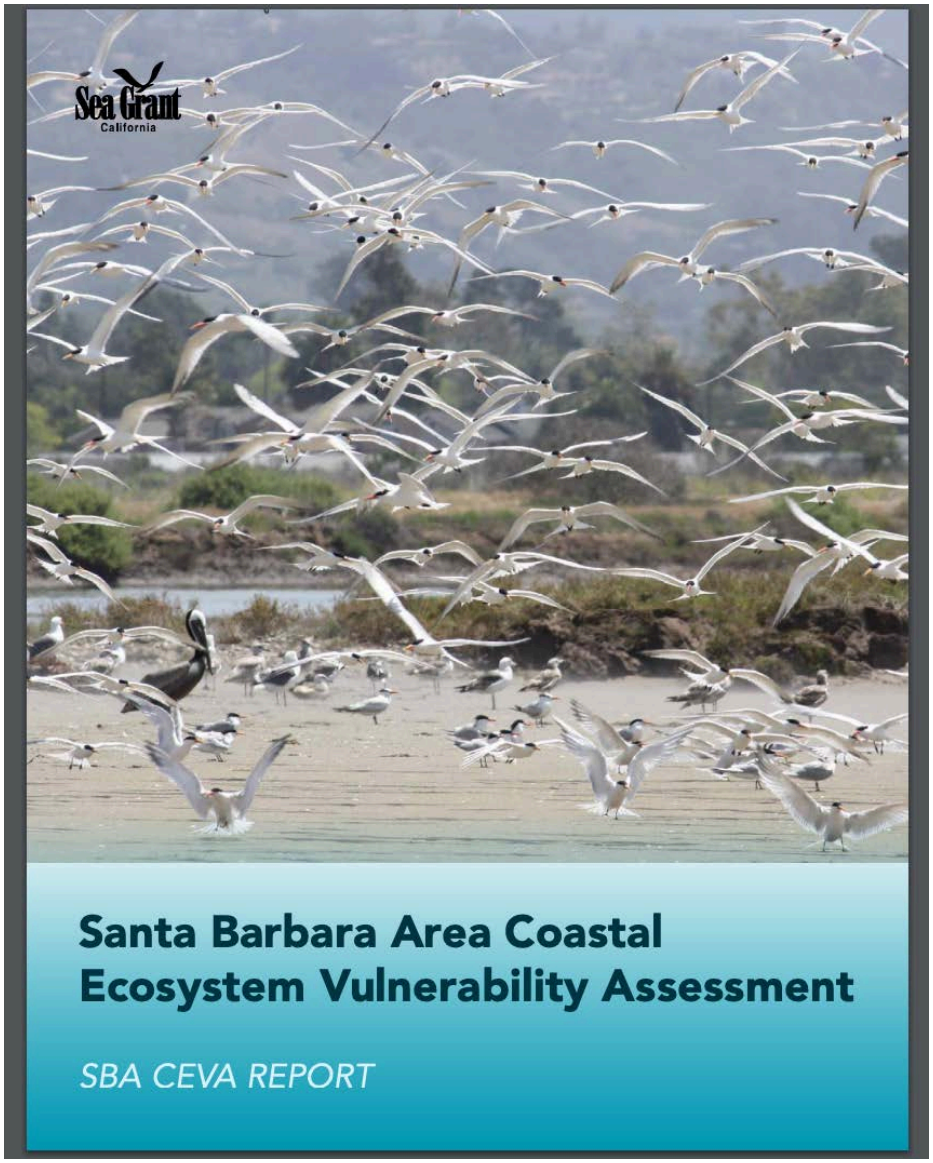
Sea Grant California



https://caseagrant.ucsd.edu/project/santa-barbara-area-coastal-ecosystem-vulnerability-assessment-sba-ceva

SBA CEVA Team

Primary Investigators

Monique Myers, California Sea Grant, UCSB

CLIMATE

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WATERSHEDS

John Melack, Bren School of Envir Sci and Mgt
Edward Beighley, Northeastern University
Dongmei Feng, UMass Amherst

SHORELINE CHANGE & HAZARDS

Patrick Barnard, USGS

BEACHES

Jenifer Dugan, Marine Science Institute, UCSB

WETLANDS

Henry Mark Page, Marine Science Institute, UCSB

SBA CEVA Team

Community Partners

City of Goleta: Anne Wells, Advance Planning Manager; Andy Newkirk, Senior Planner
City of Santa Barbara: Debra Andaloro, Principal Planner; Rosie Dyste, Project Planner;
Karl Treiburg, Waterfront Facilities Manager
City of Carpinteria: Steven Goggia, Community Development Director
Santa Barbara County: Mindy Fogg, Supervising Planner; Selina Evilsizor, Planner; David Lackie, Supervising Planner
UCSB Planning: Alissa Hummer, Director

Former Community Partners

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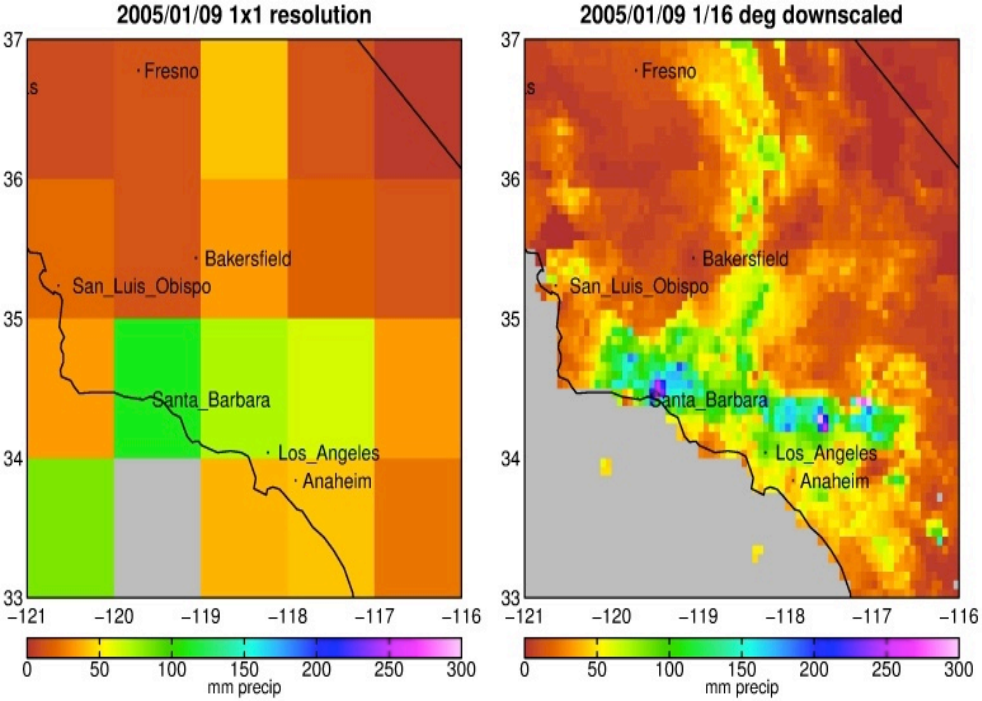
Heather Allen (former County of Santa Barbara Planner)
Jackie Campbell (retired City of Carpinteria Planner)
Katie Hentrich (former County of SB Planner) City of SB (Principal Planner)

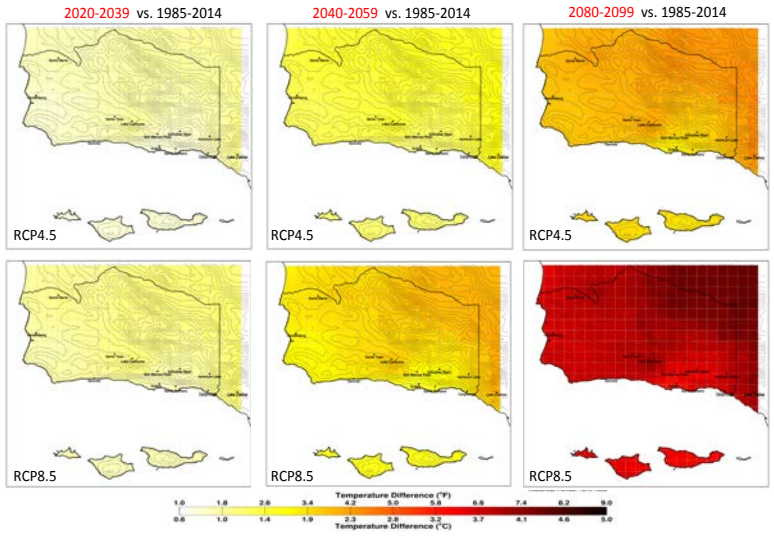
Investigators (Staff, Consultants, Fellows, Graduate Students)

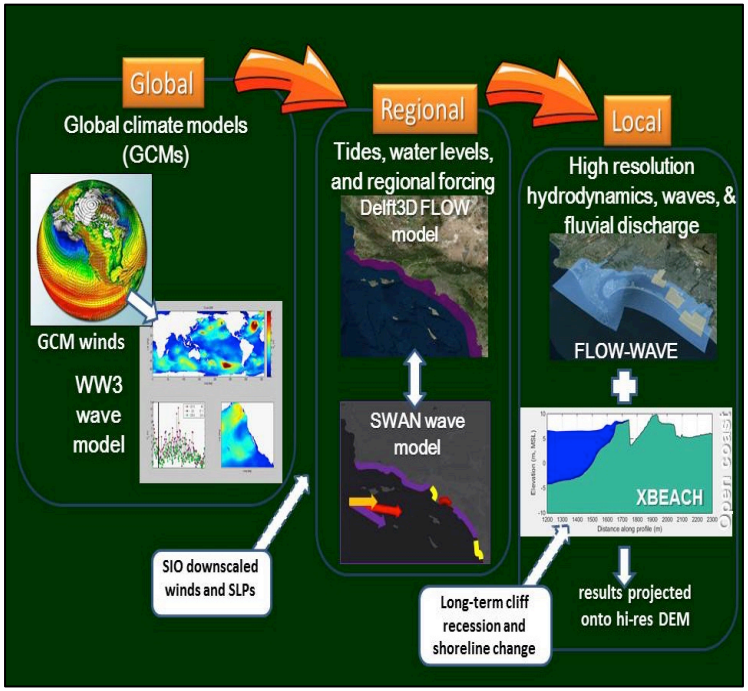
Carey Batha (California Coastal Commission, Former Sea Grant Extension Fellow)
Helen Chen (UCSB Bren PhD Student)
Brandon Doheny (UCSB MSI)
Kyle Emery (UCSB IGPMS)
Dongmei Feng (Northeastern PhD student)
Aaron Howard (CA Sea Grant/UCSB MSI)
Dave Hubbard (UCSB)
Alex Snyder (USGS)

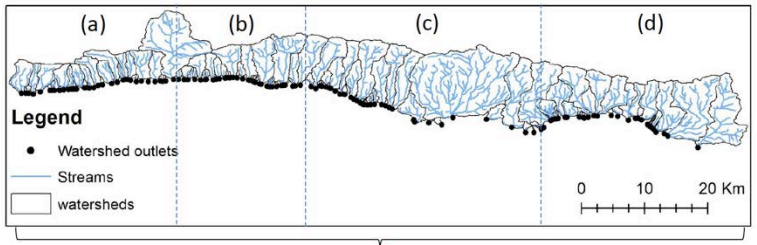
Advisors

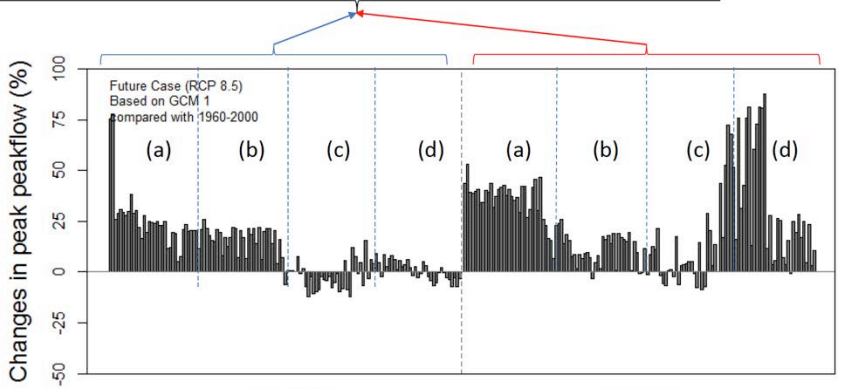
Dan Reed, Research Biologist, Marine Science Institute, UCSB
Jacqueline Campbell (Former City of Carpinteria Planner)





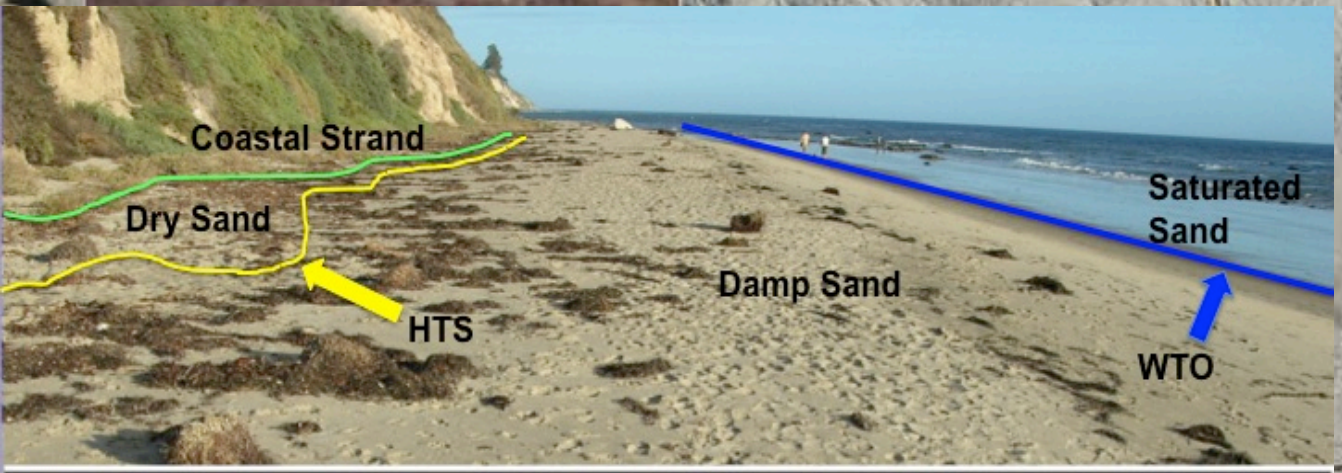


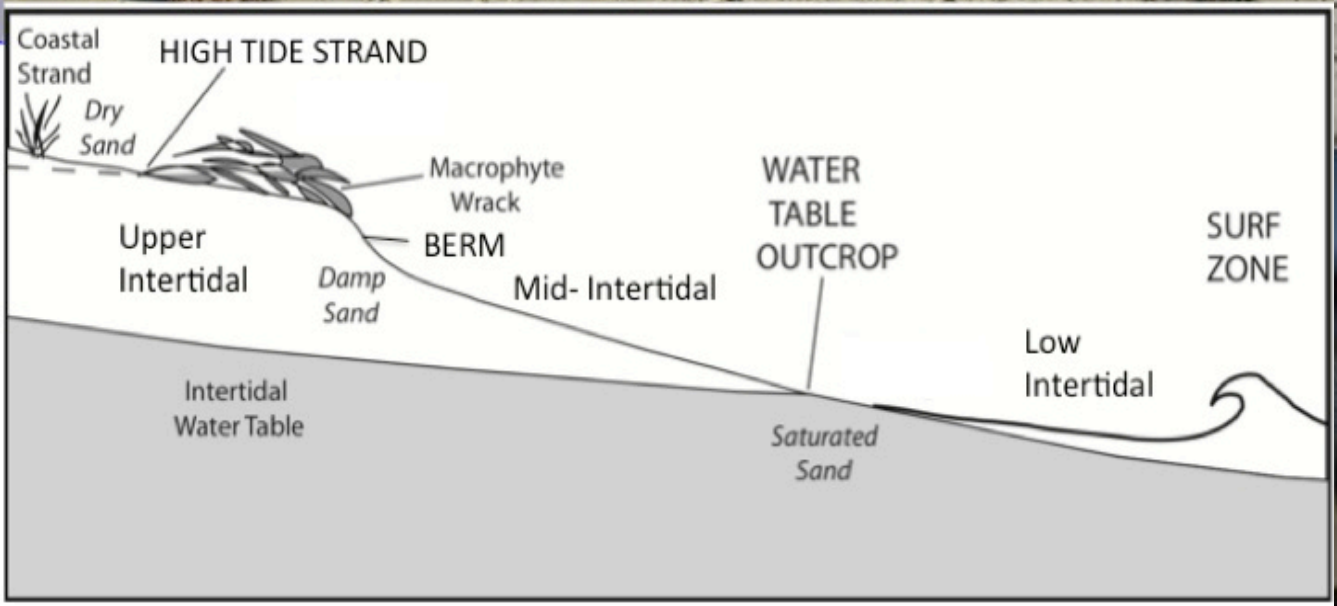




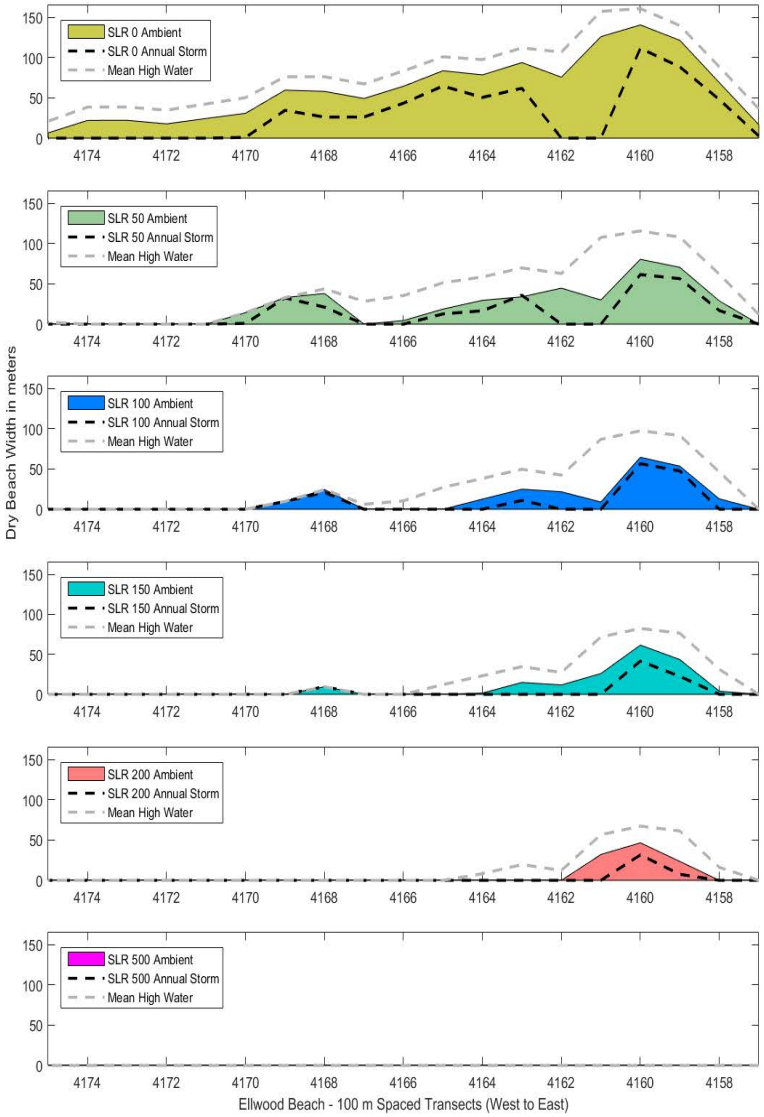
*** The bars represent changes in peak flow for the future periods 2020-2060/2060-2100 based on GCM 1 projections under RCP 8.5 scenario. The bars from left to right correspond the 135 watersheds from west to east throughout the whole SBC basin.

*** From this figure, you can see the spatial distribution of the peak flow changes in the future.

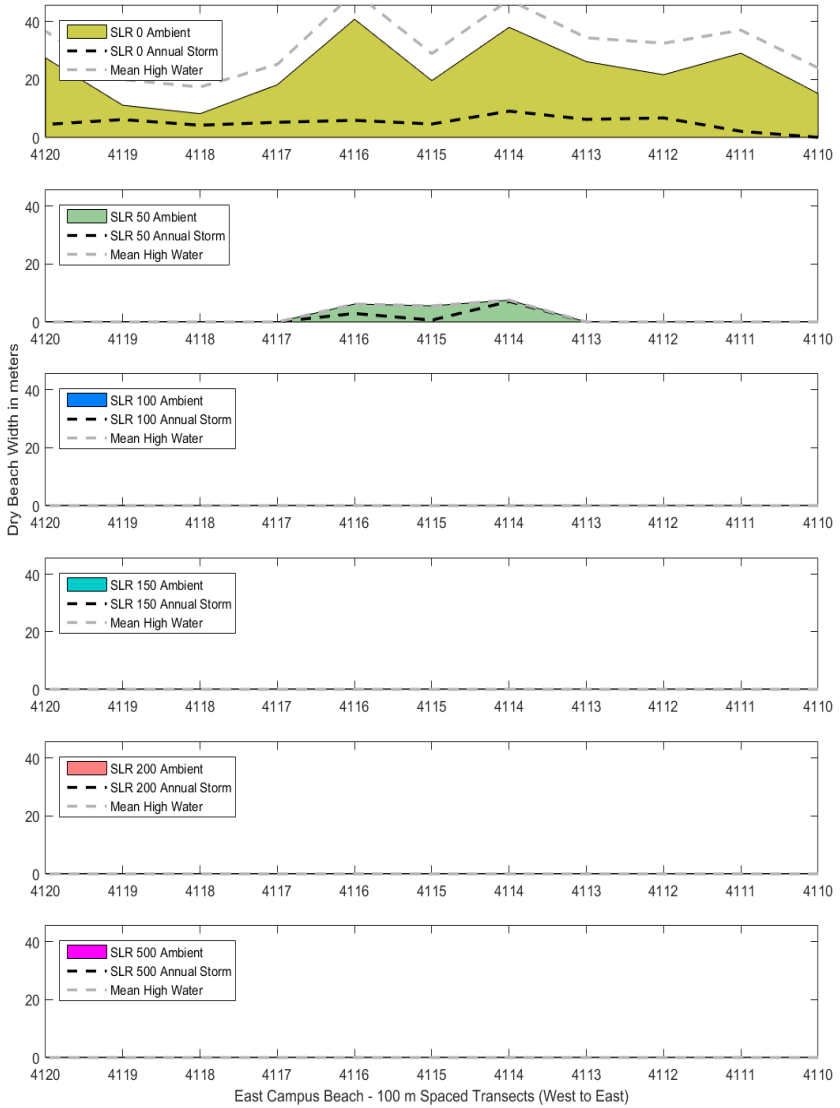

Coastal Strand
Dry Sand
HTS
Damp Sand
Saturated Sand
WTO


Coastal Strand
HIGH TIDE STRAND
Dry Sand
Macrophyte Wrack
Upper Intertidal
BERM
Damp Sand
Mid- Intertidal
WATER TABLE OUTCROP
SURF ZONE
Low Intertidal
Intertidal Water Table
Saturated Sand

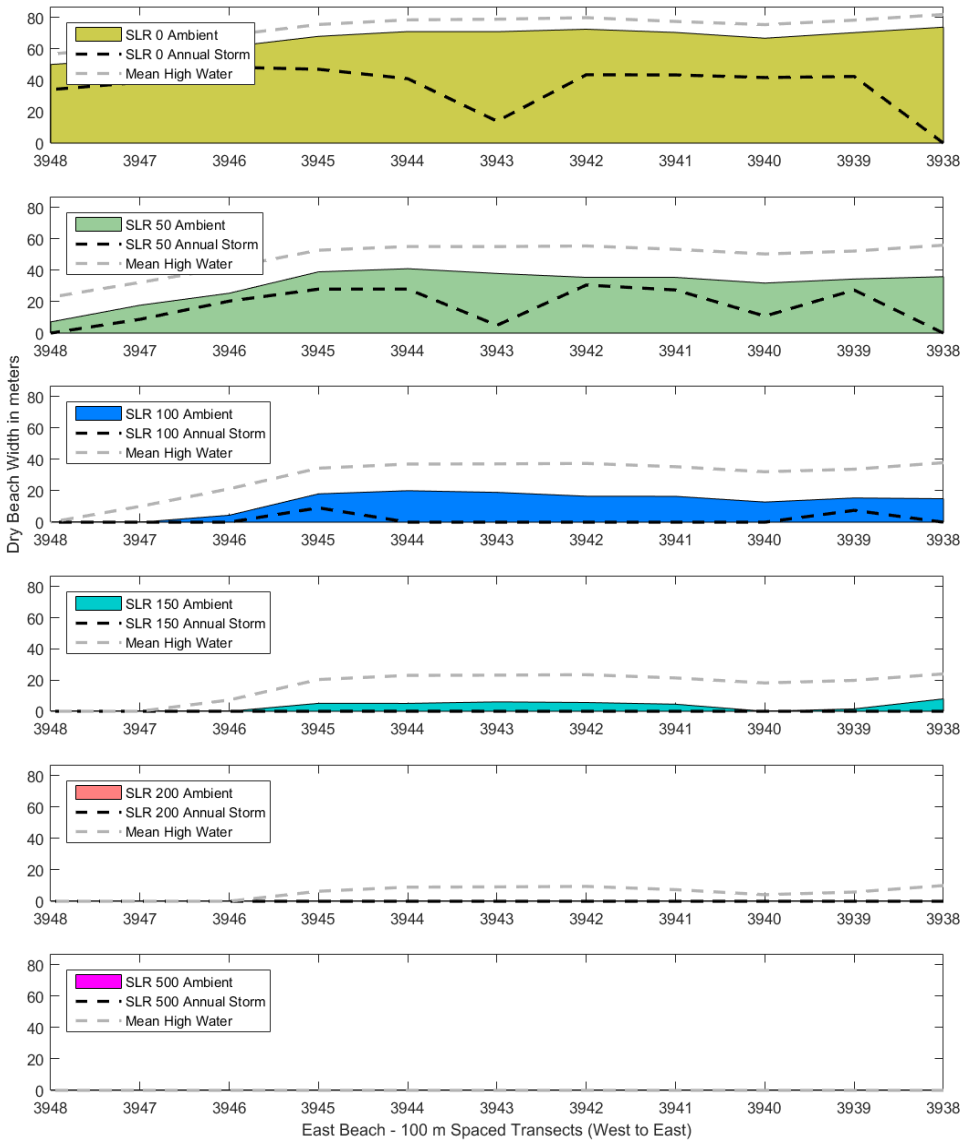
Dune-backed beach

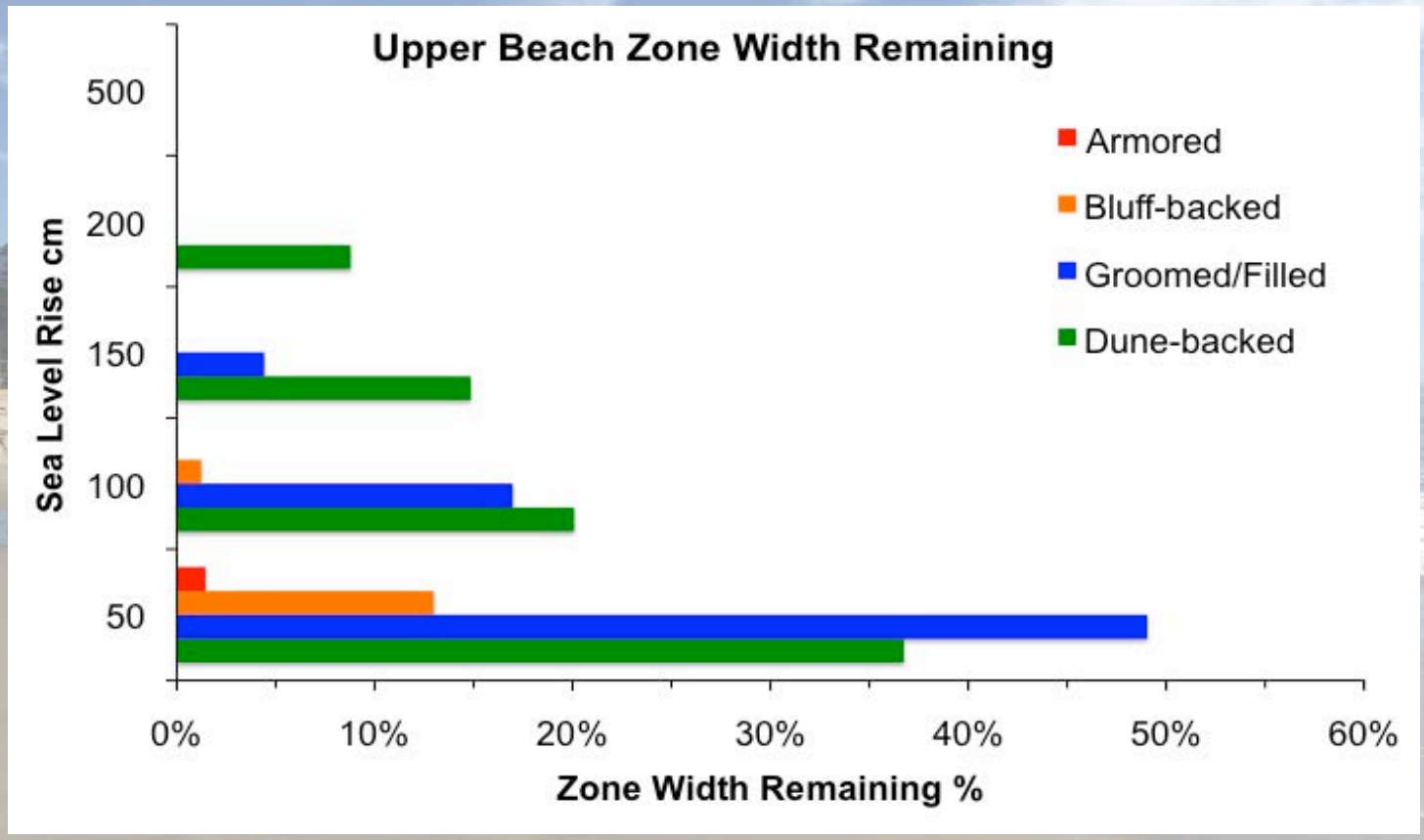


Bluff-backed beach



East Beach, managed for recreation




Upper Beach Zone Width Remaining
Sea Level Rise cm
500
200
150
100
50
Armored
Bluff-backed
Groomed/Filled
Dune-backed
0%
10%
20%
30%
40%
50%
60%
Zone Width Remaining %

Coastal Wetland Ecosystem

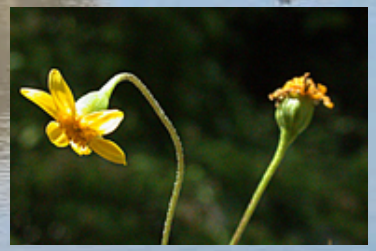
High Salt Marsh – Upland Transition

Pigmy Blue Butterfly

Salt Marsh Wandering Skipper

Salt Marsh Bird's Beak

Coulter's Goldfields

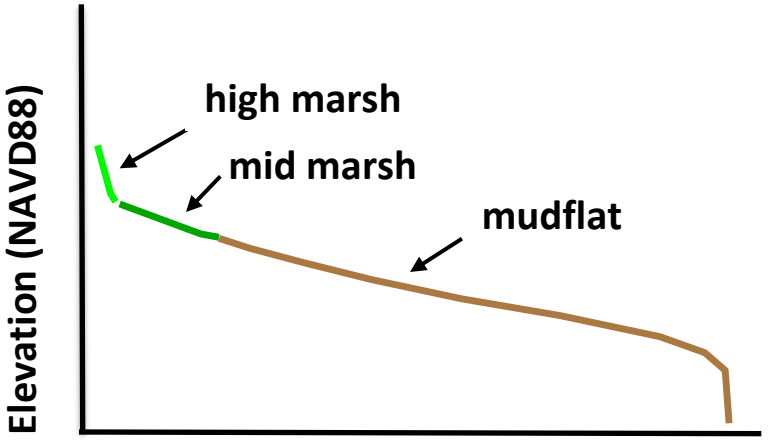


From Mark Page

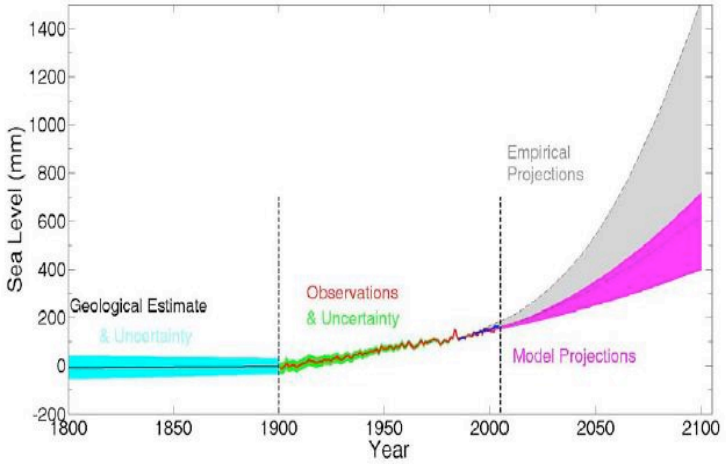
Spatial analysis and inundation modeling

Carpinteria Salt Marsh

Existing habitat distribution



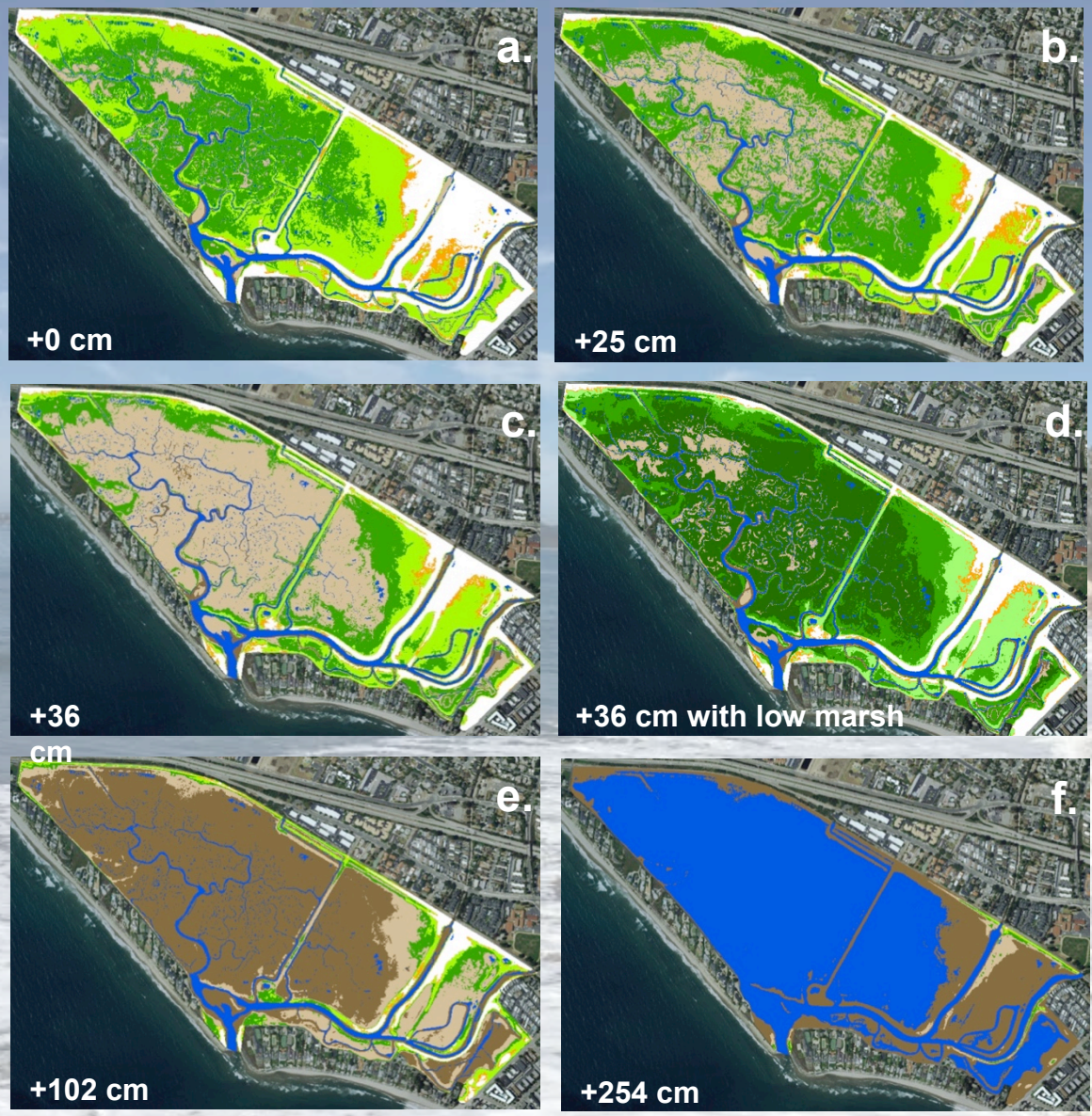
Relationship between habitat, tidal elevation, and inundation frequency



Sea level rise scenarios

Projected future habitat distribution

From Mark Page



Tipping point for beach and wetland ecosystems ~30cm sea level rise

Upper beach zones and high marsh habitat, most biodiverse, are projected to be mostly lost by 2050

2/3 southern California beaches lost over next century

El Niño impacts provided a window to future climate change impacts of sea level rise

Massive fire followed by Montecito debris flow

Working with local government as an 'end user of ecological forecasts'

- Timing is important for informing policy (e.g. planners/ managers need the research for a specific purpose)
- Difficult to reach all the groups of people necessary to make change (e.g. public works, emergency services)
- Good to involve stakeholders in the research (early) so results are useable to them (e.g. climate files converted to GIS; timeframe of projections in sync with planning horizon)
- Boundary organizations (Sea Grant) helpful -bridge research and decision-making

Thank you!

Sea Grant
California

CITY OF GOLETA

UCSB

USGS
science for a changing world

msi
Marine Science Institute

SCRIPPS
INSTITUTION OF
OCEANOGRAPHY
UCSD

Santa Barbara Coastal
Long Term Ecological Research

NSF

Funders:

NOAA
CLIMATE PROGRAM OFFICE
Advancing scientific understanding of climate, improving society's ability to plan and respond

Sea Grant

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