

SBA CEVA

→ Santa Barbara Area Coastal Ecosystem Vulnerability Assessment

- ▶ Funders:

- ▶ NOAA Climate Program Office
- ▶ Sea Grant (National Office)

Photo by Dave Hubbard

- ▶ Objective: To provide a vulnerability assessment focused on coastal ecosystems for the Santa Barbara area

Research Team

- ▶ **Scripps/RISA**
 - ▶ Dan Cayan
 - ▶ Sam Iacobelis
- ▶ **California Sea Grant**
 - ▶ Monique Myers
 - ▶ Carey Batha
- ▶ **UCSB Coastal LTER**
 - ▶ Jenny Dugan
 - ▶ Mark Page
 - ▶ John Melack
- ▶ **USGS**
 - ▶ Patrick Barnard

Community Partners

- ▶ **City of Carpinteria**
 - ▶ Jackie Campbell
- ▶ **City of Goleta**
 - ▶ Anne Wells
- ▶ **City of Santa Barbara**
 - ▶ Rosie Dyste
 - ▶ Debra Andaloro
 - ▶ John Ledbetter (retired)
- ▶ **County of Santa Barbara**
 - ▶ Heather Allen

Process

- ▶ Climate downscaling
- ▶ CoSMoS hazard modeling

- ▶ Vulnerability of
 - ▶ Beaches
 - ▶ Wetlands
 - ▶ Watersheds

Geographic scope



Climate downscaling

- ▶ Methodology: Statistical downscaling of GCMs
- ▶ Products: Hourly precipitation and temperature data

Downscaled to
6-km grid



**Downscaling Resolves Regional
Precipitation Features**

Climate downscaling

Annual **Precipitation**: 1970-1999

Climate downscaling

Precipitation:

Projected Period (2070-2099) – Historical Period

RCP45

RCP85



Climate downscaling

Daily T_{MIN} (low temperature):
Historical Period 1970-1999



Climate downscaling

Daily T_{MIN} : Projected Period – Historical Period



CoSMoS

- Physics-based numerical modeling system for assessing coastal hazards on West Coast



Santa Barbara Focus Areas



Beaches

Credits: Dave Hubbard, Alan Pitcairn, Wikipedia Commons, Callie Bowdish

Beaches

Current elevation
range of habitat
“bands”: lower,
mid, and upper
beach biota

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Sea level rise
and shoreline
change
(CoSMos)



Position of
future habitat
bands

Wetlands

Endangered plants & animals

Nursery habitat

Biodiversity



Wetlands

- ▶ Three locations

- ▶ Carpinteria Salt Marsh
- ▶ Goleta Slough
- ▶ Devereux Slough

Inundation regime

Habitat & Vegetation Mix

Attach inundation frequencies to habitat types: subtidal, mudflat, low marsh, mid marsh, high marsh, uplands.

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Credit: Sadro et al. 2007

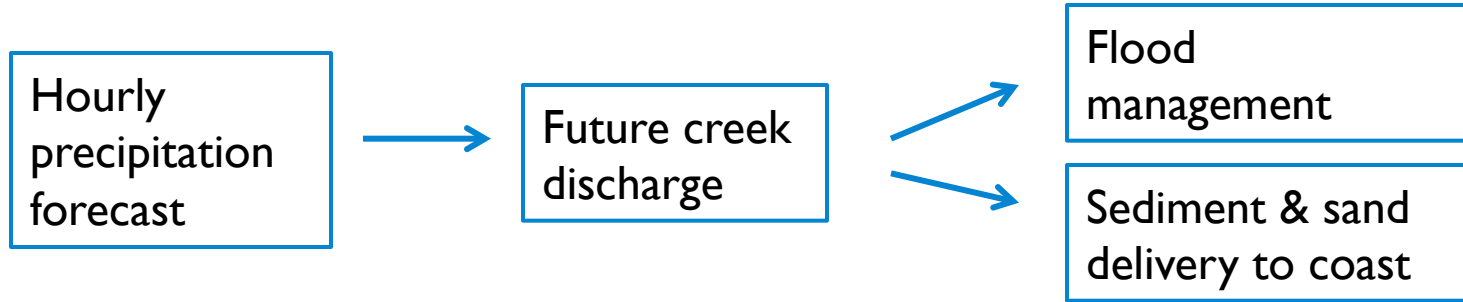
Sea level rise and accretion scenarios



Future habitat distribution

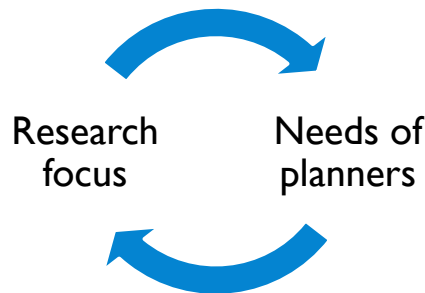
Goleta Slough Vulnerability Assessment

Watersheds



Coordination

- ▶ Review of Draft LCP policies
- ▶ Review City of Santa Barbara's habitat maps
- ▶ Identifying specific focus areas for the report
 - ▶ Pilot project ideas
 - ▶ Specific locations: e.g. access points to Carp Salt Marsh, etc.
 - ▶ Specific policies: e.g. dune policies in Goleta's CAP

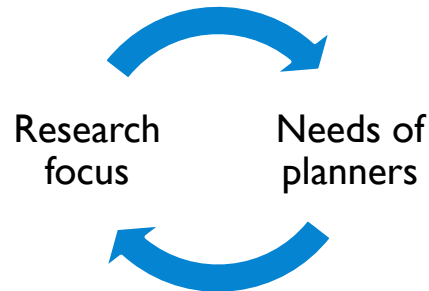


Example: Carpinteria

Credit: Carey Batha

Lessons Learned

- ▶ Flexibility is important
- ▶ Coordinating timelines is important
- ▶ Create opportunities for reciprocal exchange of information between parties involved



Contributors:

Funders:

