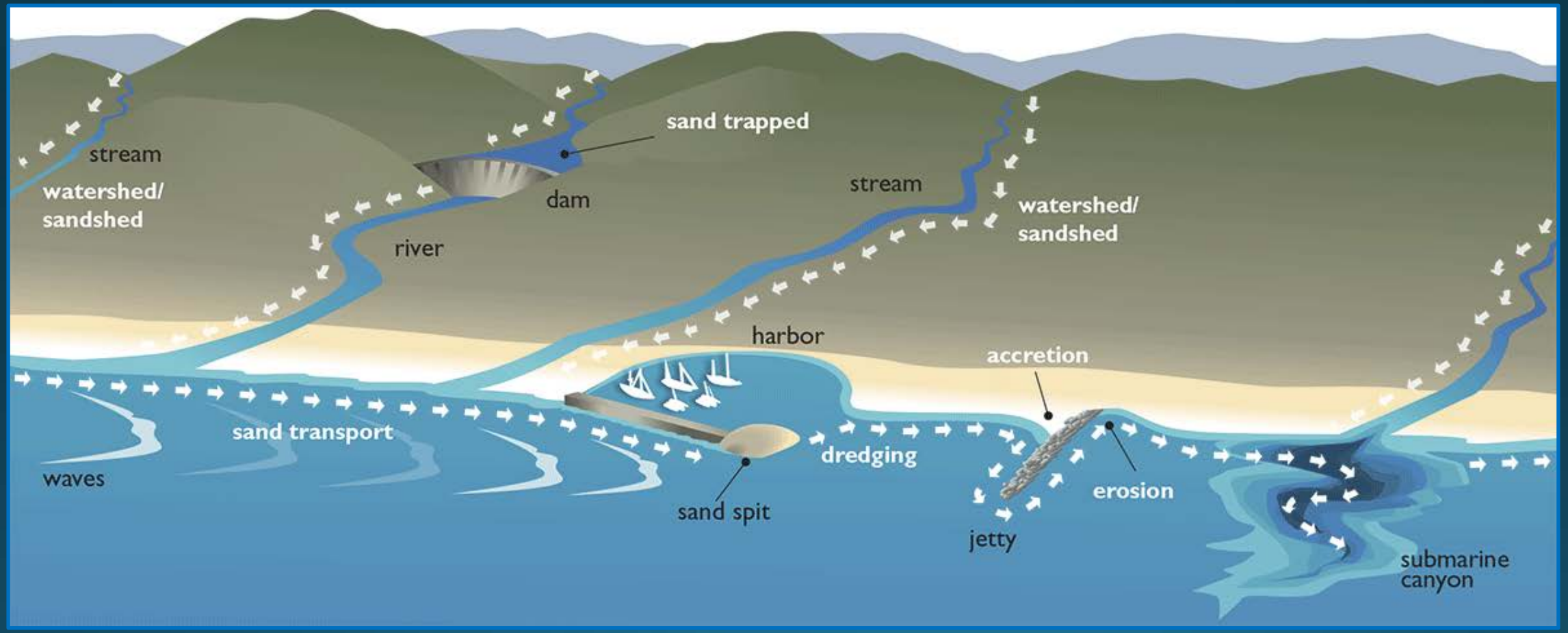
Thursday June 23, 2022

Regional Sediment: Science, Policy, and Programs

Ventura Sand Summit

Dr. Kiki Patsch
Associate Professor
California State University Channel Islands

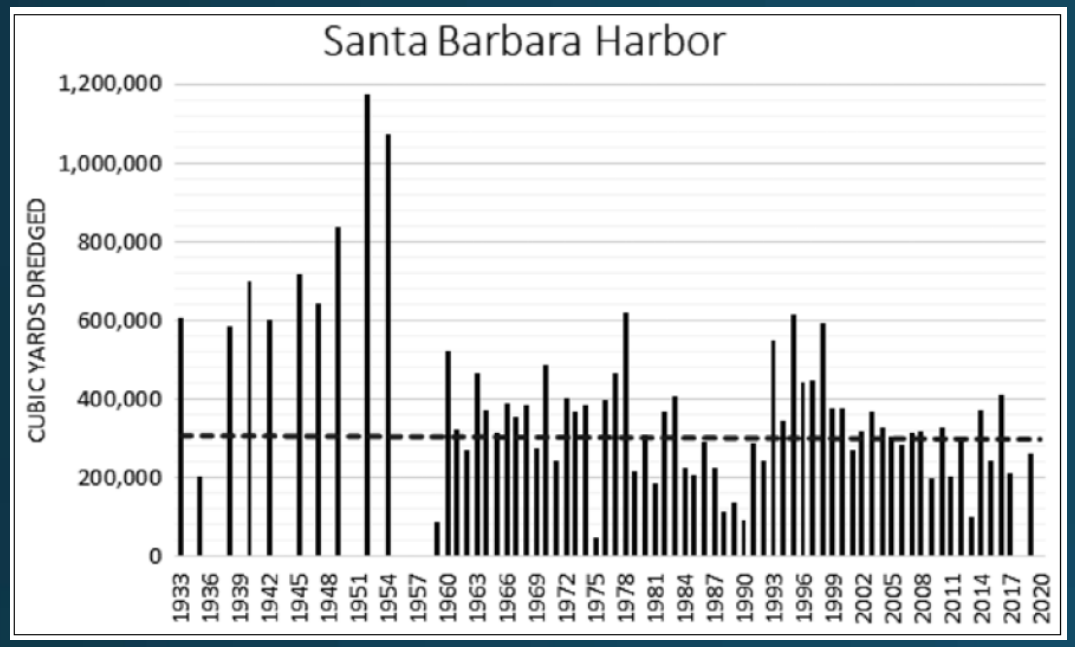
Recap from Last Year: The River of Sand

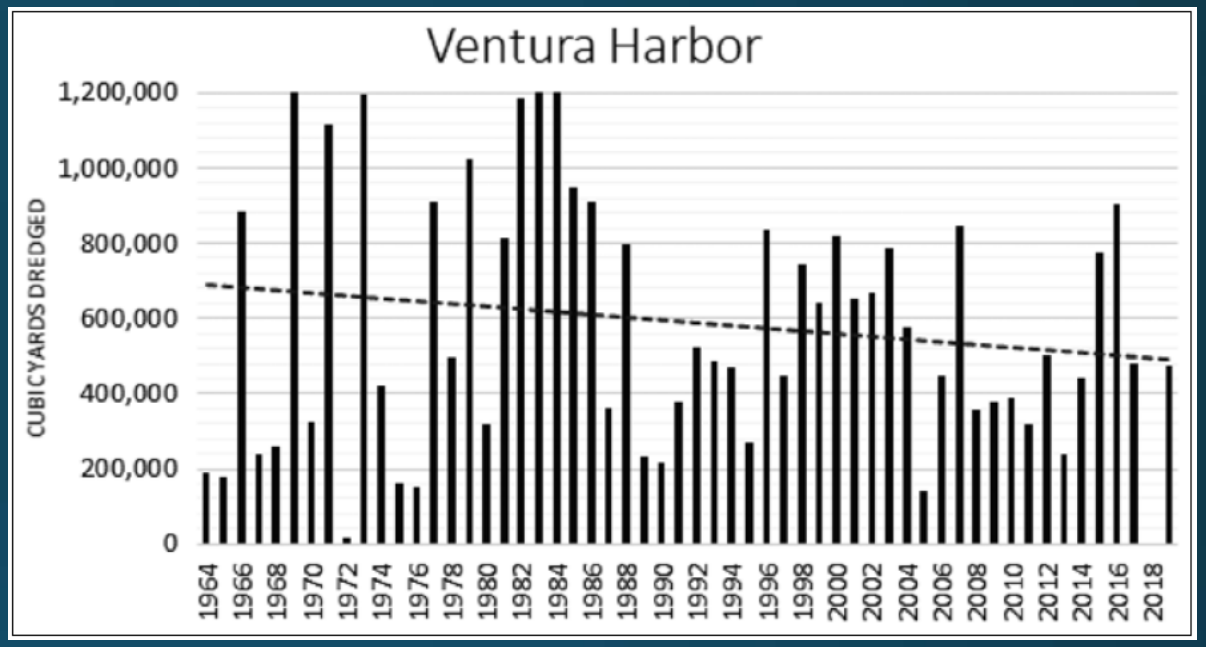


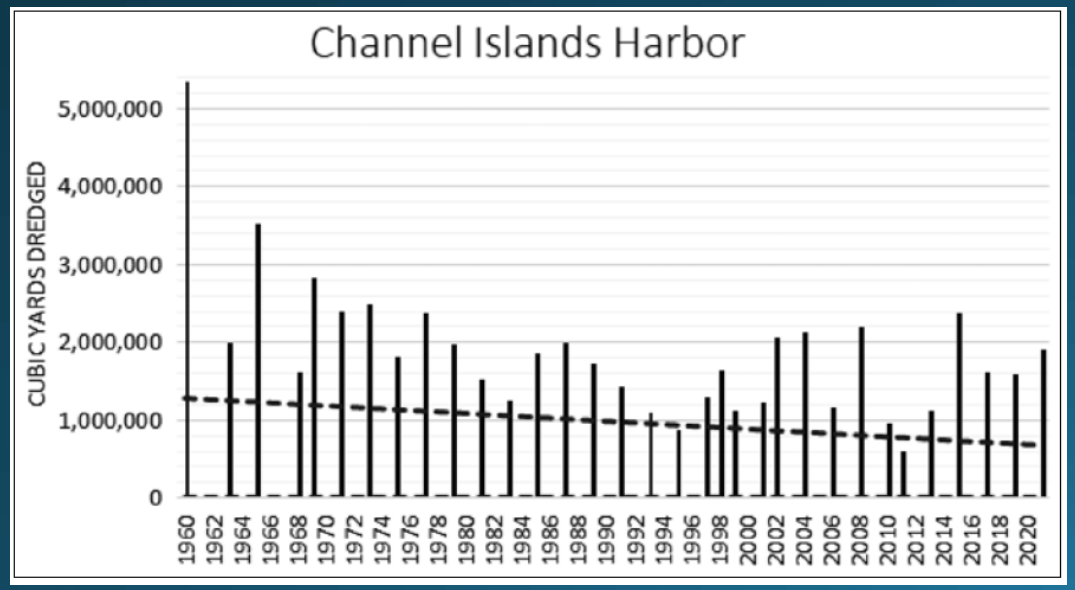
Explore the Beaches, MSI, UCSB

BEACON Landscape:
The Santa Barbara Littoral Cell

Harbor/Sand Trap Dredging







Implications of Harbor Dredging for the Santa Barbara Littoral Cell

Kiki Runyan[1]
Gary Griggs[2]

2004

California harbor dredging: History and trends

By

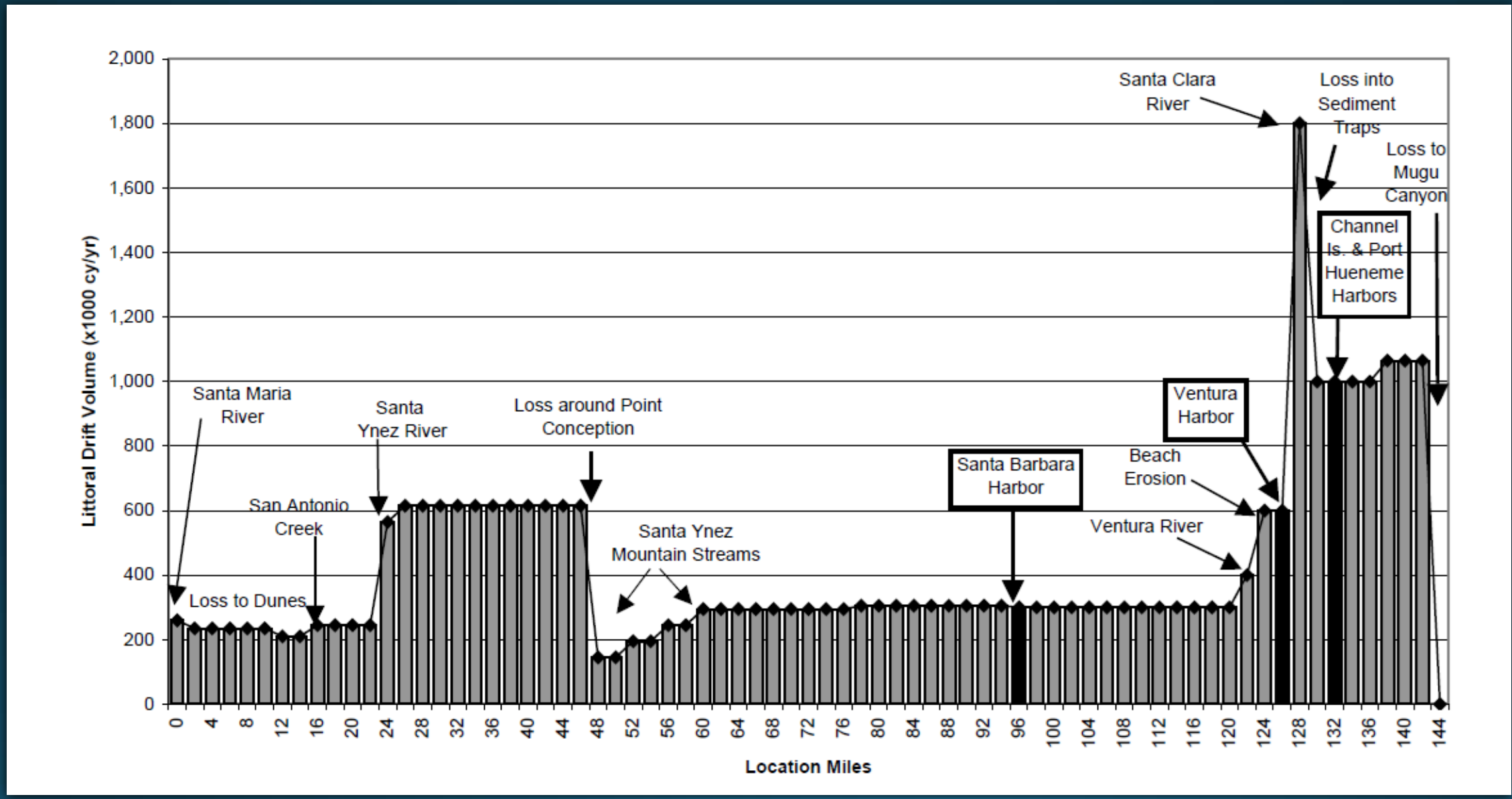
2021

Kiki Patsch[1] and Gary Griggs[2]

1) Department of Environmental Sciences and Resource Management, California State University, Channel Islands, Camarillo, CA 93012

2) Department of Earth and Planetary Sciences, University of California Santa Cruz, Santa Cruz, CA 95064

Understand sand routing along the coast



Sand Sources

Sand Source	Natural (cy/yr)	Actual (cy/yr)	Reduction (cy/yr)
Rivers	2,785,000 (99.6%)	1,658,000 (99.5%)	1,128,000 (49.5%)
Seacliff Erosion	10,700 (0.4%)	8,600 (0.5%)	2,100 (19.6%)
Total Input	**2,796,000(100%)**	**1,666,000**	**1,129,000 (40.4%)**

Eroding bluffs in Santa Barbara

Santa Clara River Mouth, south of Ventura Harbor

Balancing the Budget

- Sources = Sinks Equilibrium
- Sources > Sinks Accretion
- Sources < Sinks Long-term Erosion

Sand is ESSENTIAL to managing coastal systems

Without sand there is NO

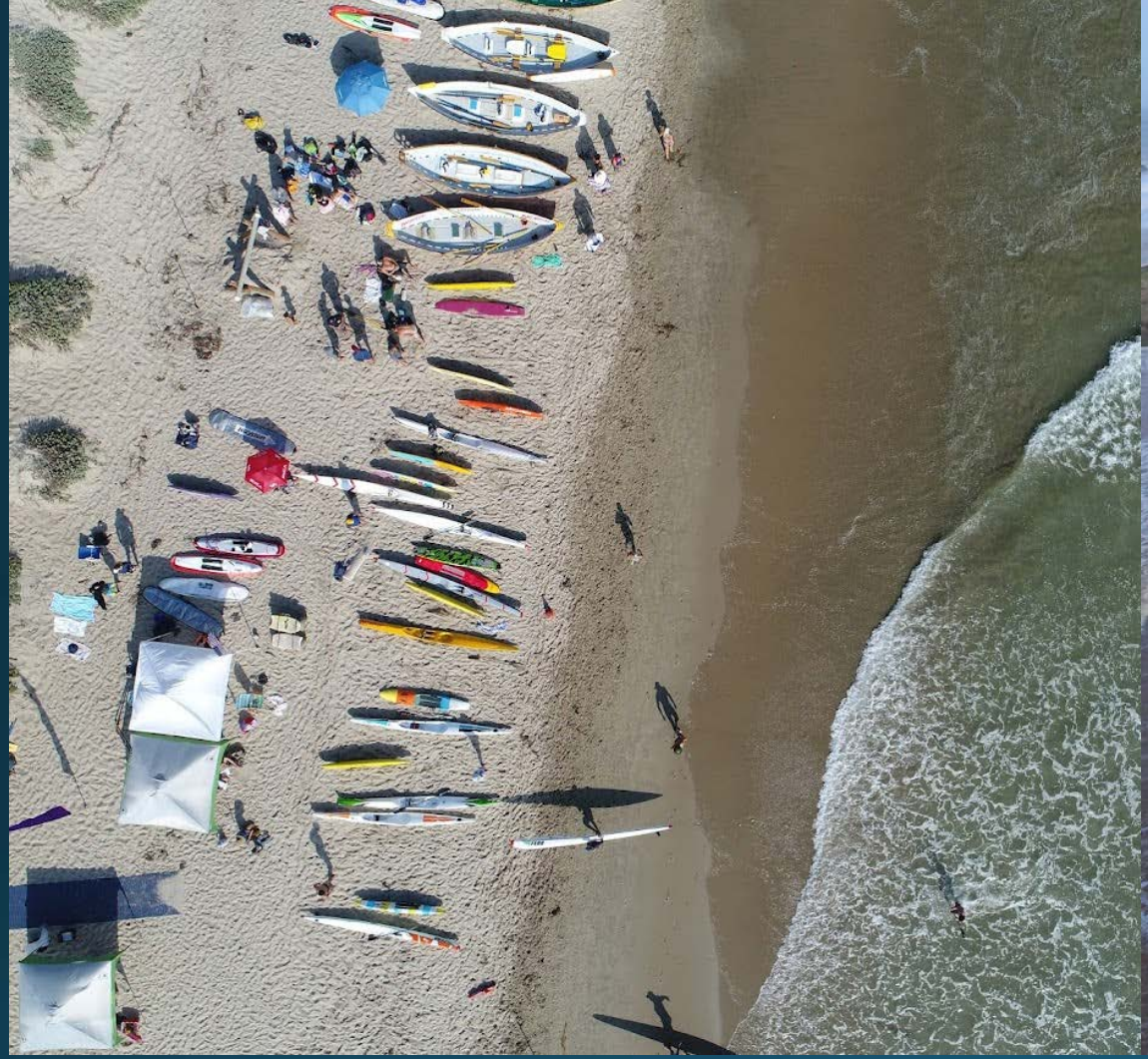
- Public recreation space
- Sandy beach ecosystem
- First line of defense against storm surge and sea level rise

A glimpse of California without sand and surf

BEACH CLOSURES give Californians a taste of what life will be like when we lose our beaches to climate change. (Allen J. Schaben Los Angeles Times)

BY SEAN ANDERSON, KIKI PATSCH AND DAN REINEMAN

Los Angeles Times OP-ED- April 3, 2020. LINK



Focus on the Sand

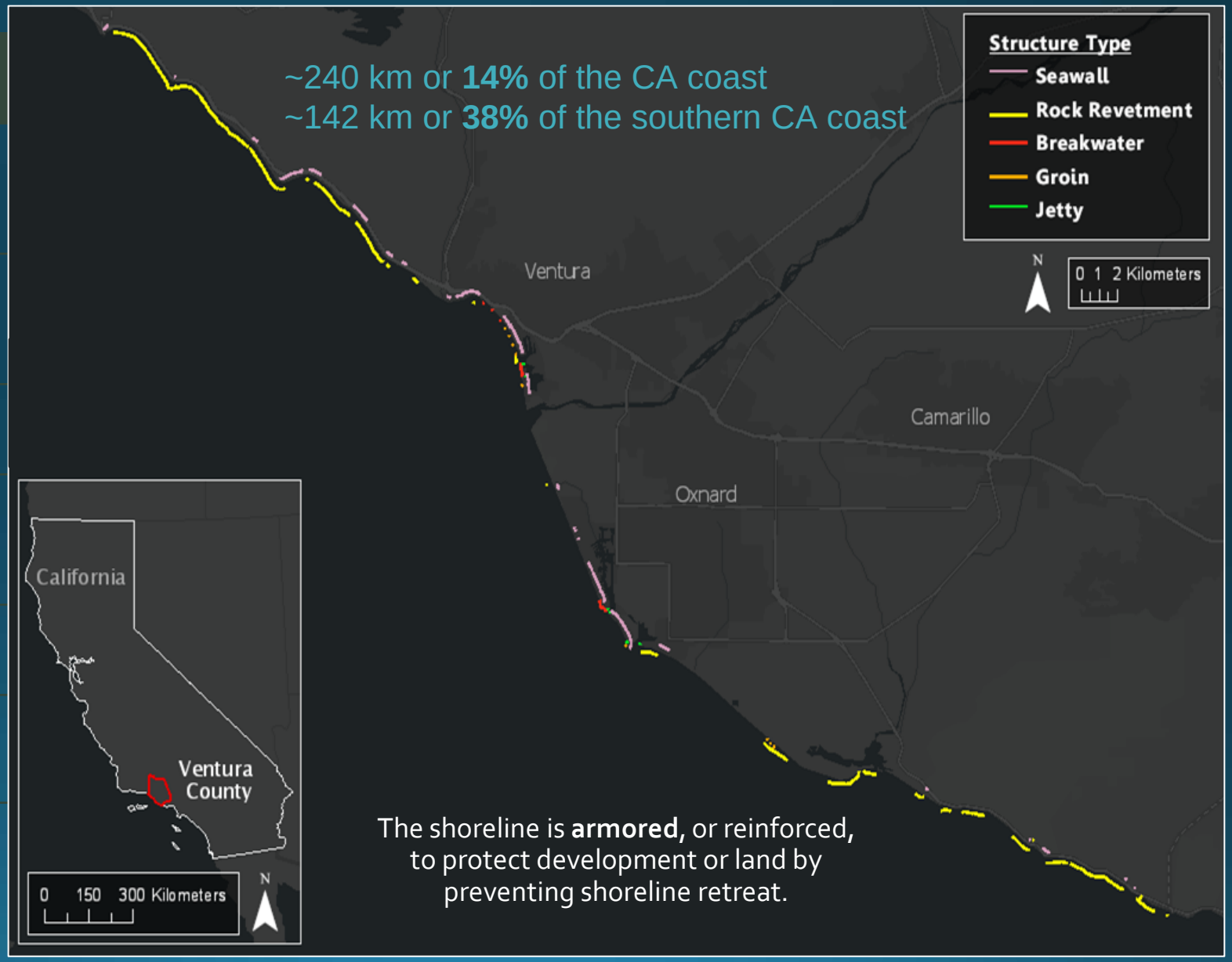
Reduction to the sand supply from armoring sea cliffs

Armoring such as rip-rap or seawalls built in front of a sea cliff hinder erosion and thus prevent a natural source of sand from reaching the beach.

California Coastal Armoring Database

Previous Inventory: 2003

County	% Armored
San Luis Obispo	52%
Santa Barbara	11%
Ventura	56%
Los Angeles	28%
Orange	40%
San Diego (excluding bay)	39%



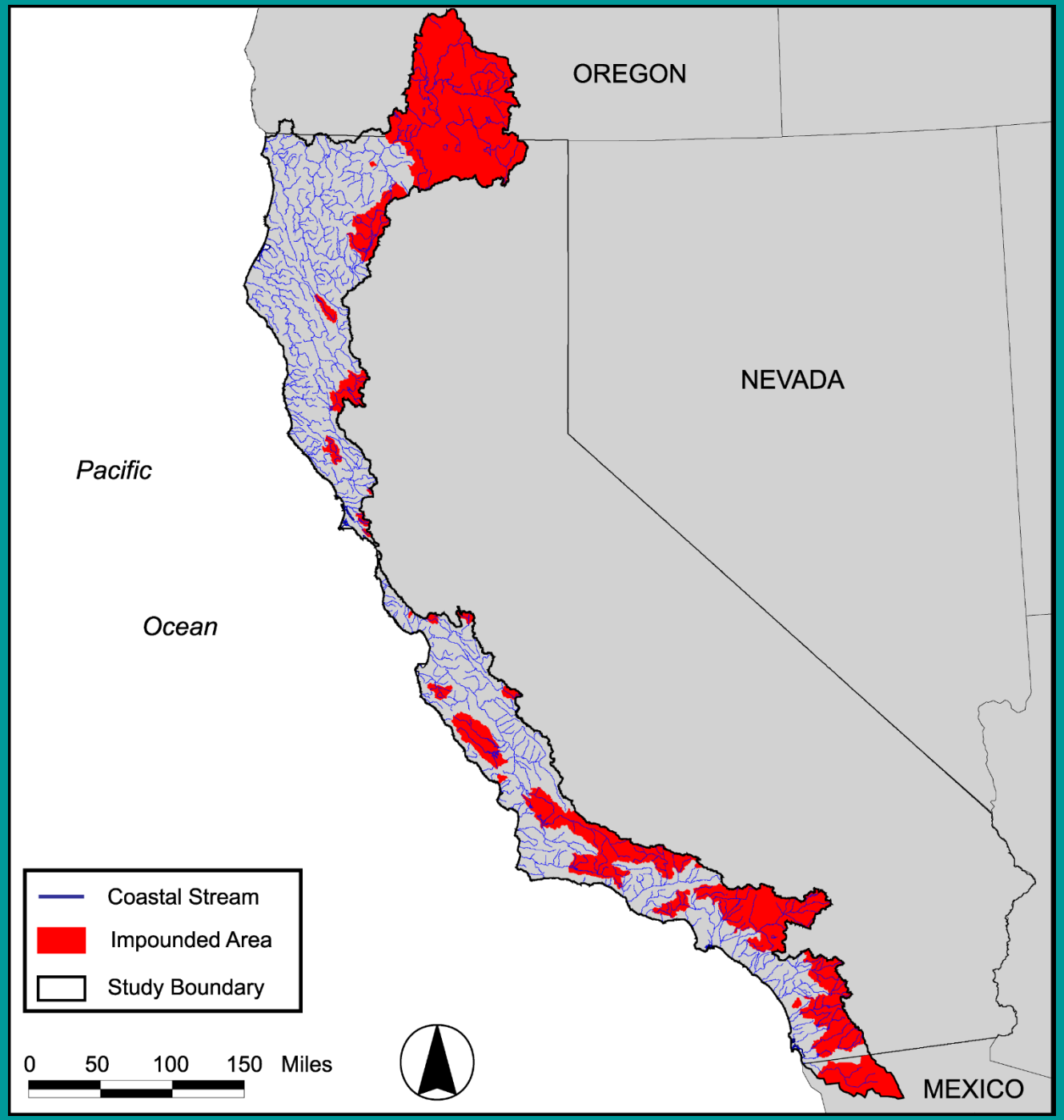

JCR
www.JCRonline.org
REVIEW ARTICLES
www.cerf-jcr.org
The Protection/Hardening of California's Coast: Times Are Changing
Gary Griggs[†*] and Kiki Patsch[‡]

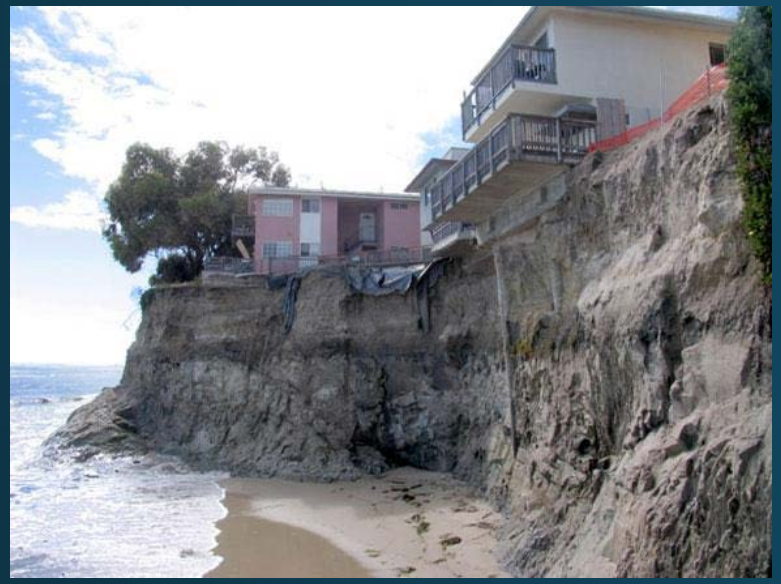
Cumulative Impacts of Coastal Dams in California

- 480 major dams have been built in California's coastal watersheds, primarily for water supply, irrigation, and flood control

- 38% of coastal watersheds (16,300 mi^2) are impounded by dams (area equal to Massachusetts and New Hampshire combined)

- Average annual sand supply has been reduced by **26%** (or 3.7 million yd^3/yr)


OREGON
NEVADA
Pacific
Ocean
MEXICO
Coastal Stream
Impounded Area
Study Boundary
0 50 100 150 Miles

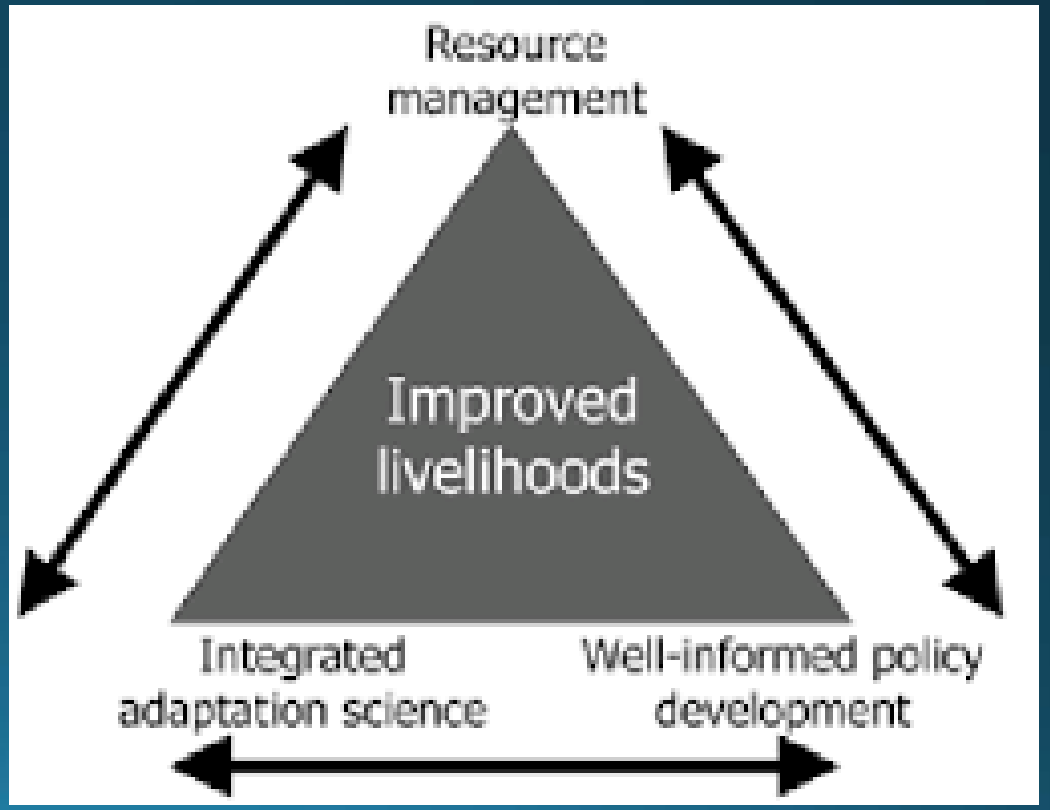





With the reductions to sand supply and an increasing sea level, what do we do to maintain our beach width?

Regional Sand Management involves Researchers, Managers, and State Agencies

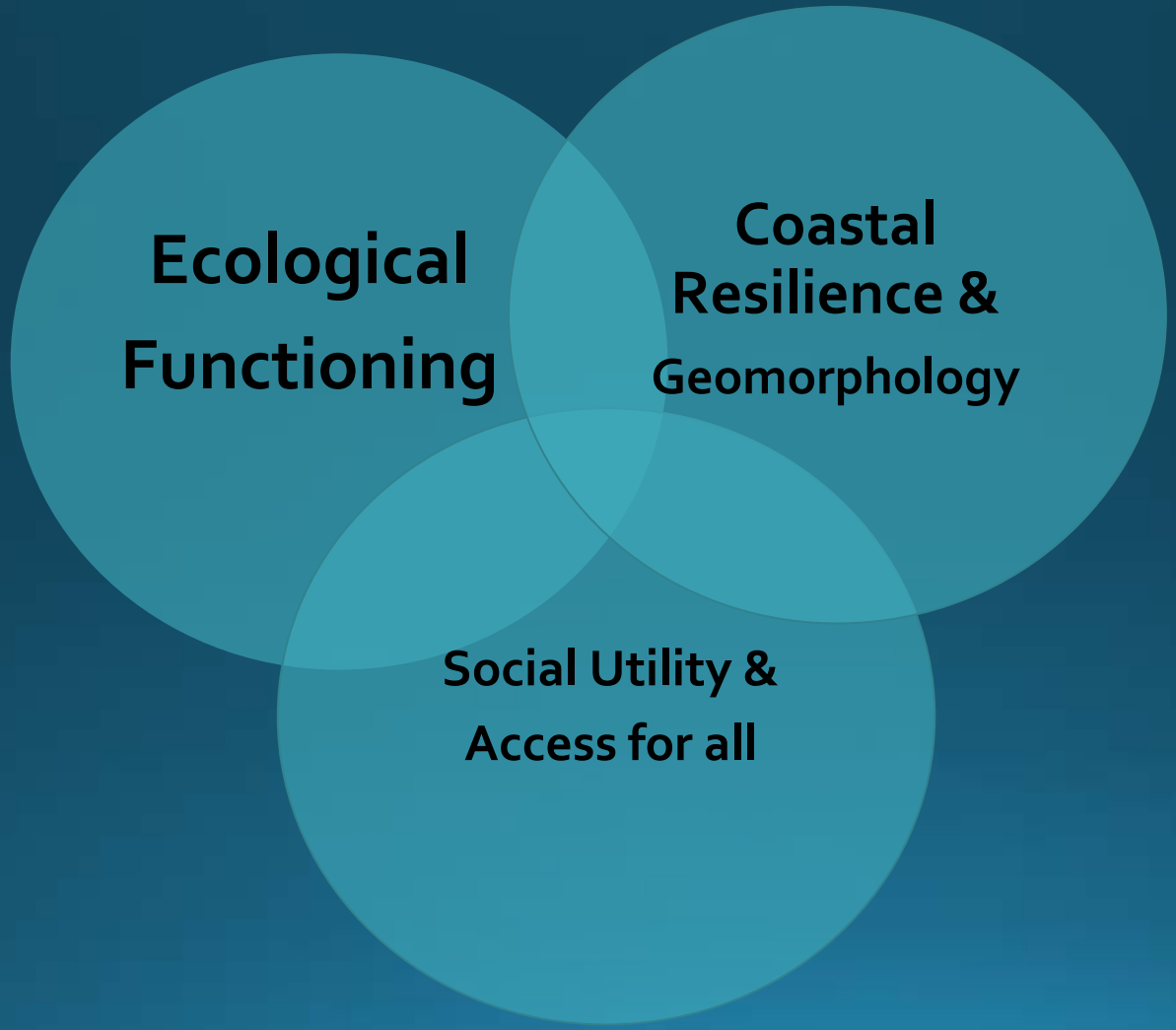
- Science to inform policy
- Science in the hands of the policy makers
- BEACON's science advisory group aims to do just that



Teamwork, Teamwork, Teamwork

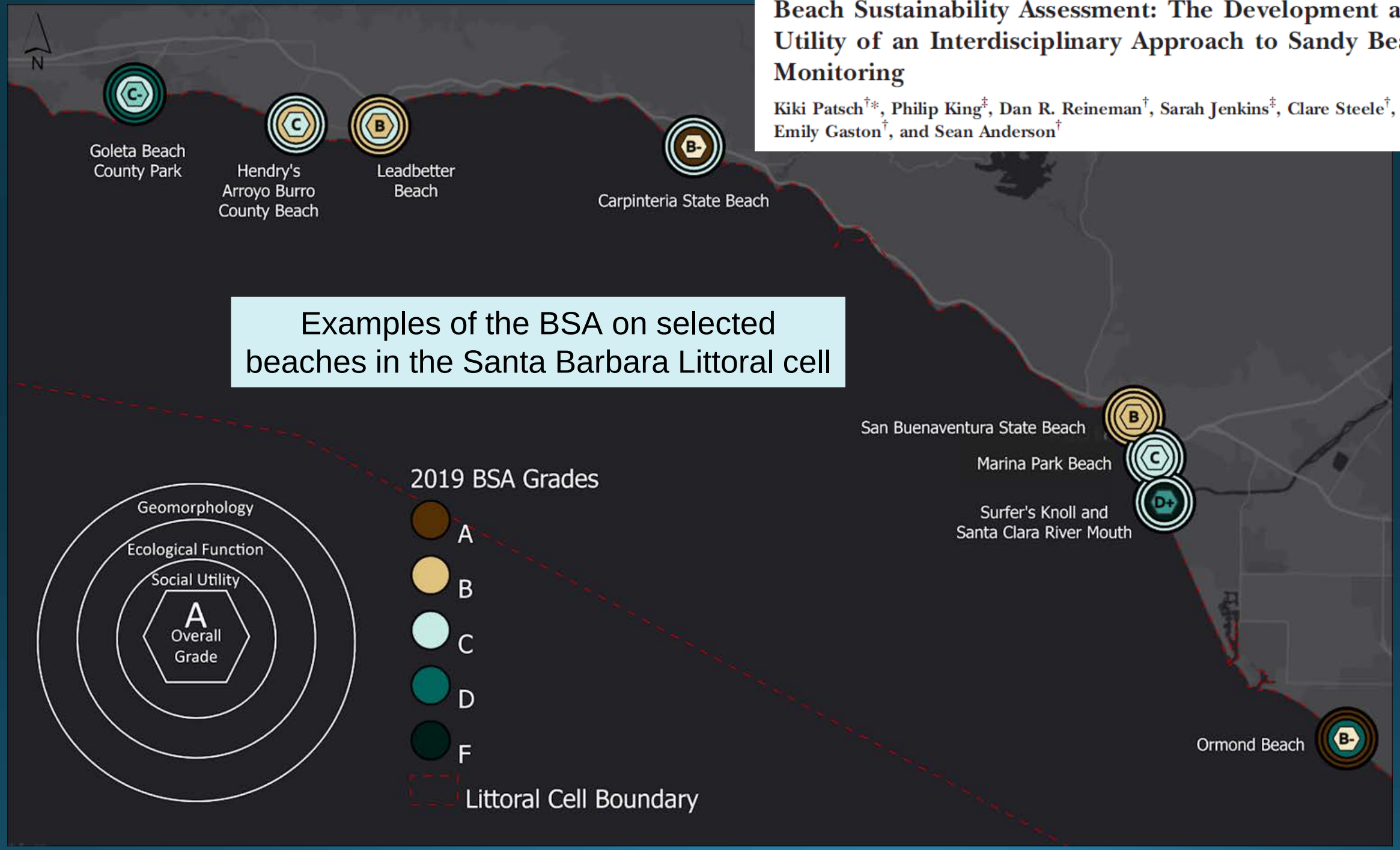
- Work as a regional team
- Scientists working together on interdisciplinary and multidisciplinary teams
- Connecting science to policy, managers and planners

Beach Sustainability Assessment



Beach Sustainability Assessment: The Development and Utility of an Interdisciplinary Approach to Sandy Beach Monitoring

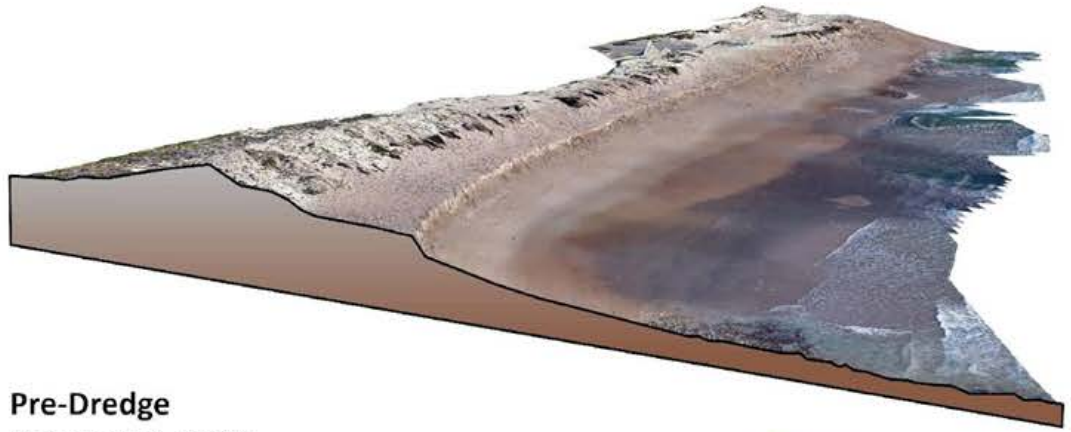
Kiki Patsch[†*], Philip King[‡], Dan R. Reineman[†], Sarah Jenkins[‡], Clare Steele[†], Emily Gaston[†], and Sean Anderson[†]



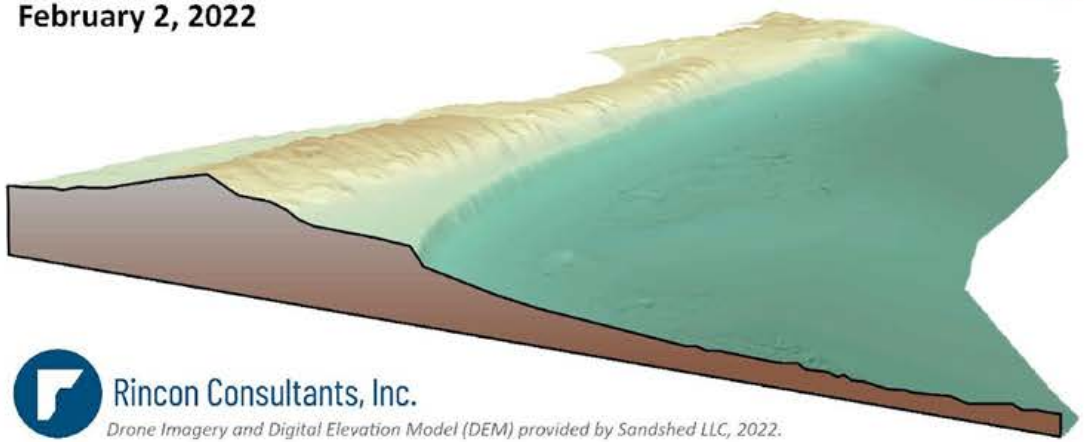
Siloed Monitoring for Permits Should be replaced by regional multidisciplinary monitoring

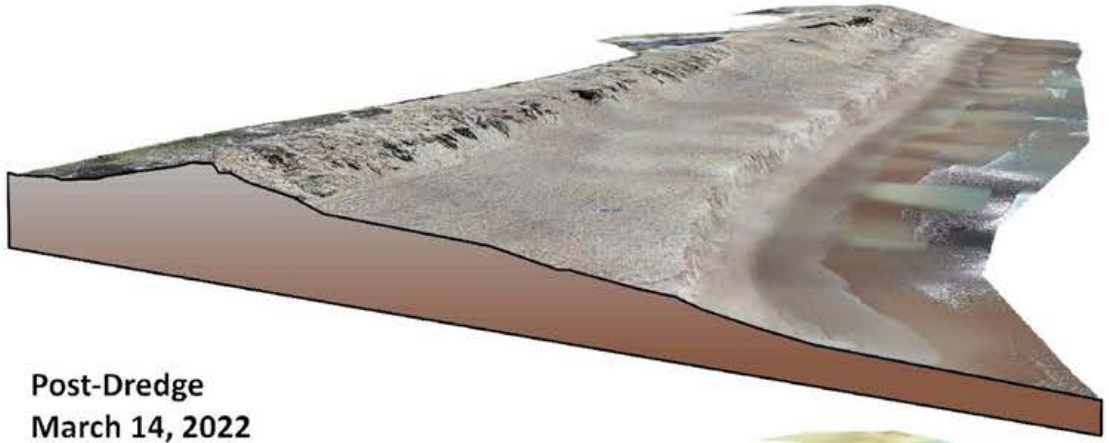
Figure 1. Ventura Harbor Maintenance Dredging Regional Location with Inner and Outer Harbors Maintenance Dredging Areas and Approved Dredge Material Placement Locations

Figure 2. Ventura Outer Harbor Dredge Material Placement Location and Pipelines Implemented from February to March 2022

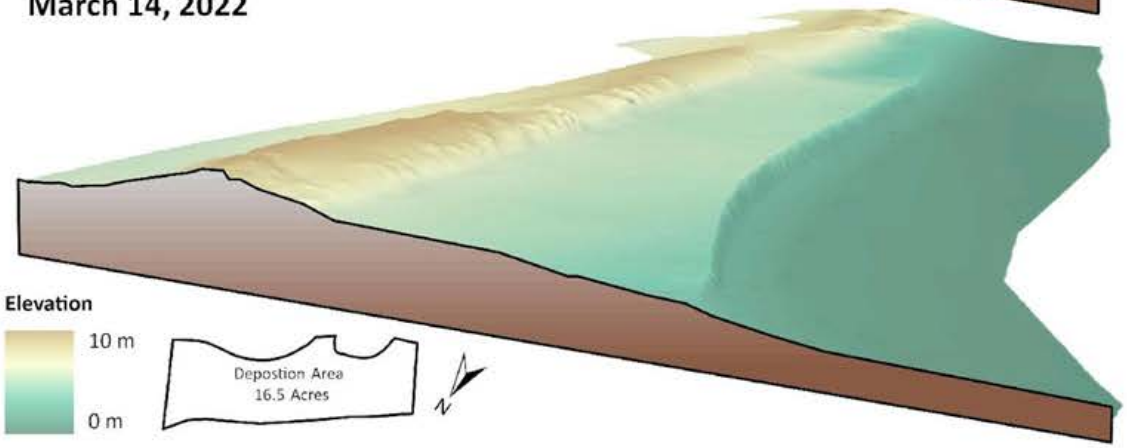


Pre-Dredge
February 2, 2022





Post-Dredge
March 14, 2022



Rincon Consultants, Inc.

Drone Imagery and Digital Elevation Model (DEM) provided by Sandshed LLC, 2022.

By **Communications and Publishing** March 27, 2017

Using a newly-developed computer model called "CoSMoS-COAST" (Coastal Storm Modeling System – Coastal One-line Assimilated Simulation Tool) scientists predict that with limited human intervention, 31 to 67 percent of Southern California beaches may become completely eroded (up to existing coastal infrastructure or sea-cliffs) by the year 2100 under scenarios of sea-level rise of one to two meters.

Adapting to shoreline retreat: Finding a path forward

By

Ryan Anderson[1], Kiki Patsch[2], Charles Lester[3], and Gary Griggs[4]

1) Department of Anthropology, Santa Clara University
2) Environmental Science and Resource Management Department, California State University Channel Islands
3) Ocean and Coastal Policy Center, University of California Santa Barbara
4) Earth and Planetary Sciences Department, University of California Santa Cruz

California's coastal development: Sea-level rise and extreme events — where do we go from here?

By

Gary Griggs[1] and Kiki Patsch[2]

Groins, sand retention, and the future of Southern California's beaches

By

Gary Griggs,[1] Kiki Patsch,[2] Charles Lester,[3] and Ryan Anderson[4]

Conclusion

- BEACON is bringing together the best:
  - available science
  - available policy
  - available decision support tools
  - analysis

- Bringing together individual cities, counties, harbors etc. within the Santa Barbara Littoral cell to reduce the knowledge gaps, coordinate efforts, and streamline coastal management to the regional scale.