



Friday March 17, 2023

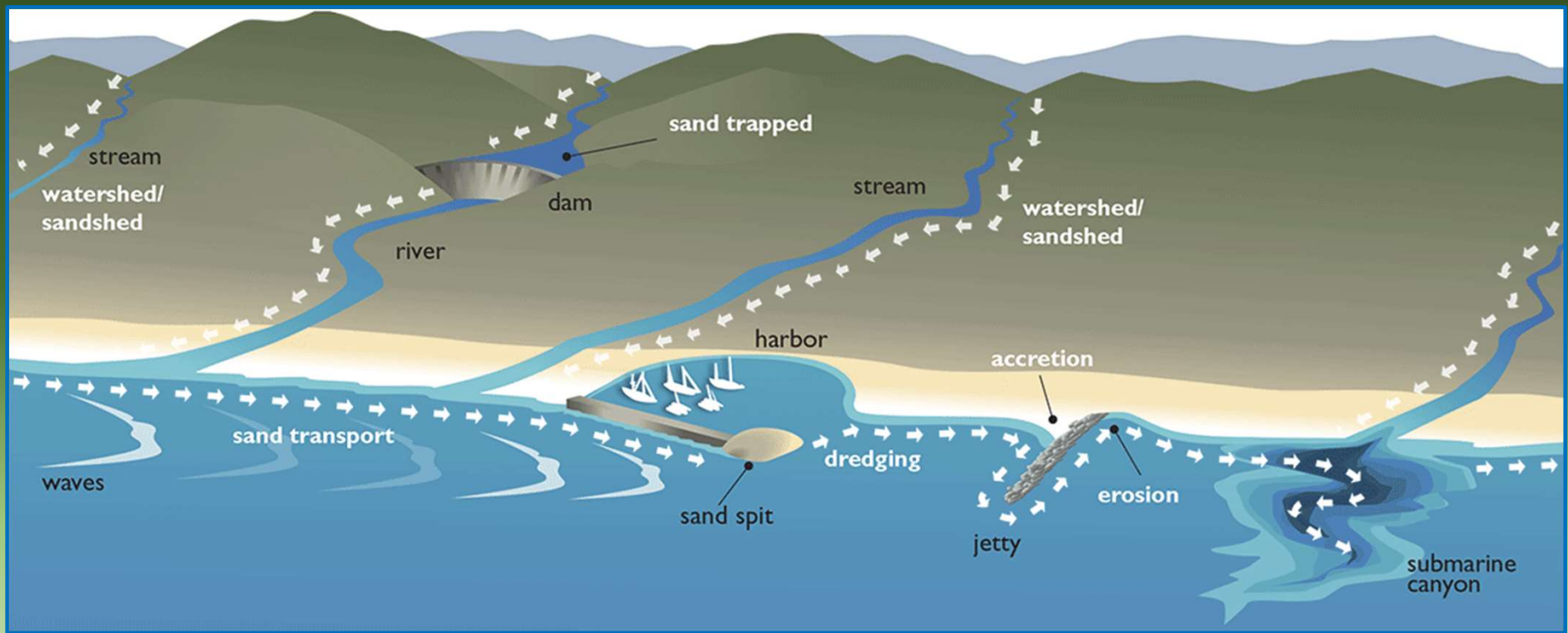
Regional Sand Management: Protecting and Preserving Our Beaches

Presentation to BEACON

**Dr. Kiki Patsch
Co-Chair, BEACON Science Advisory Committee**

**Associate Professor
California State University Channel Islands**

Sand Movement: The River of Sand



[Explore the Beaches, MSI, UCSB](#)

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	1,666,000	1,129,000 (40.4%)

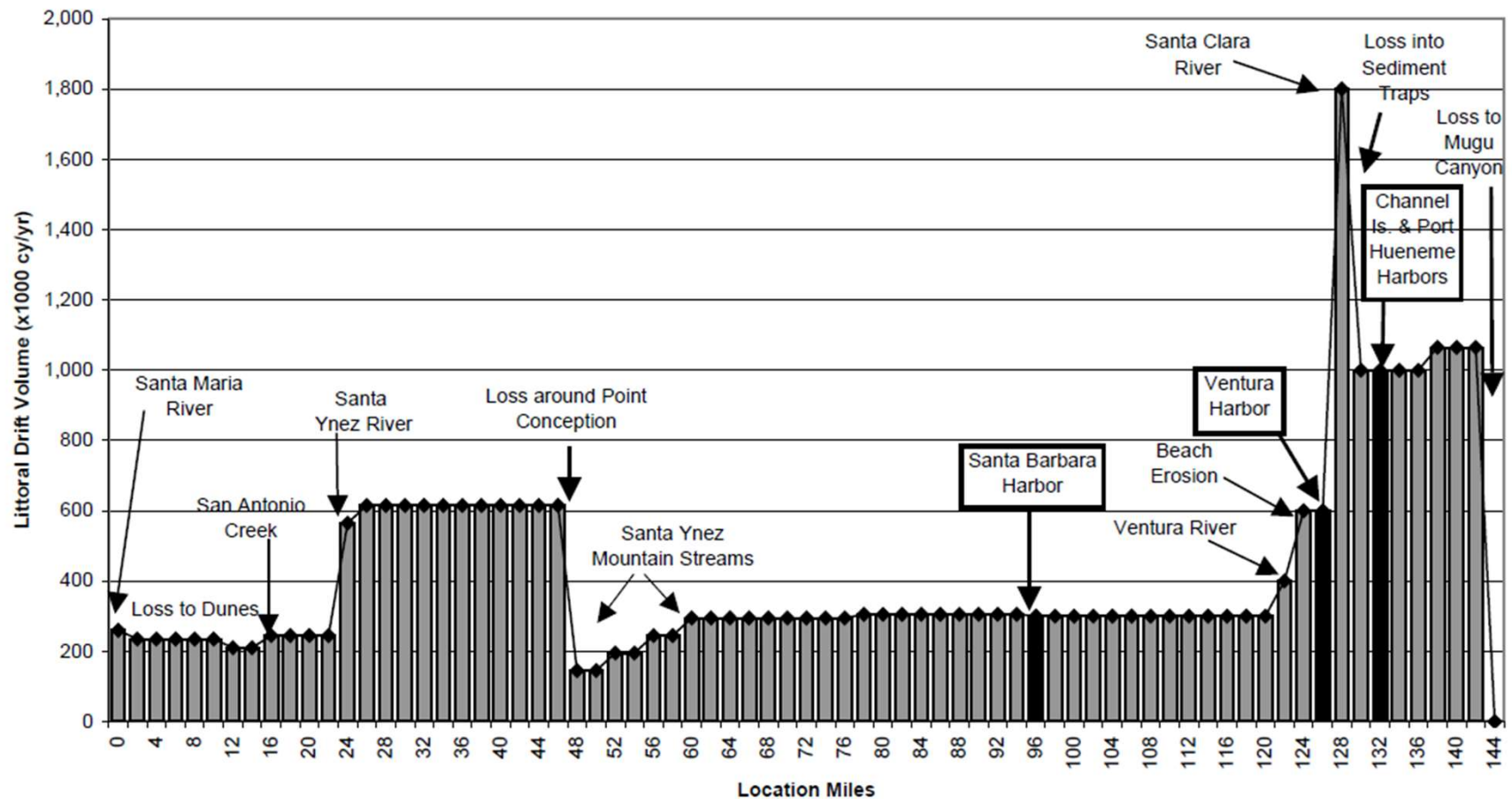


Eroding bluffs in Santa Barbara

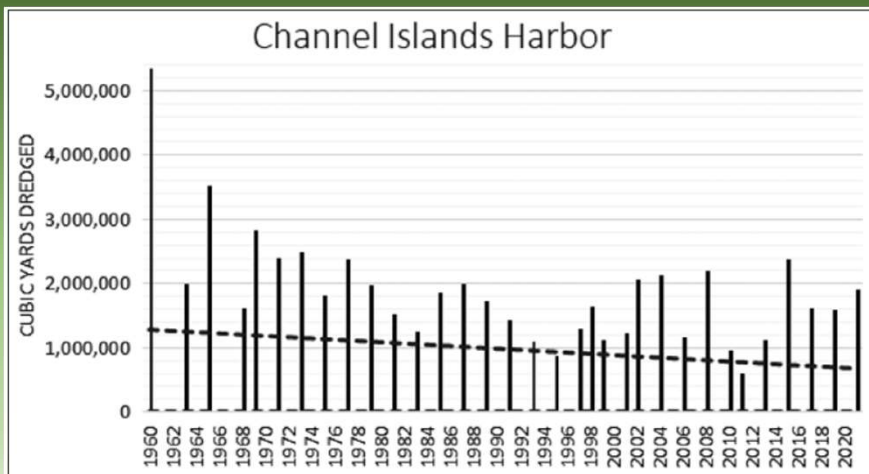
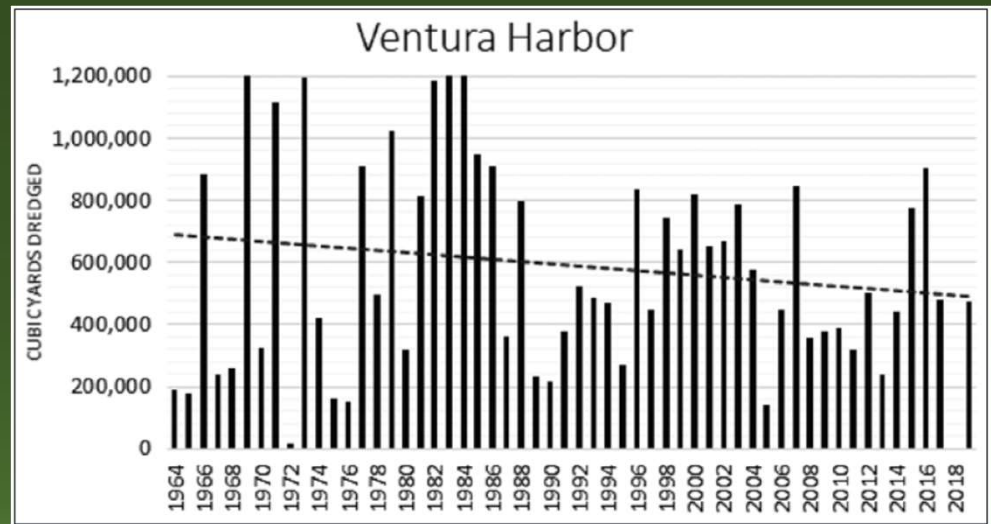
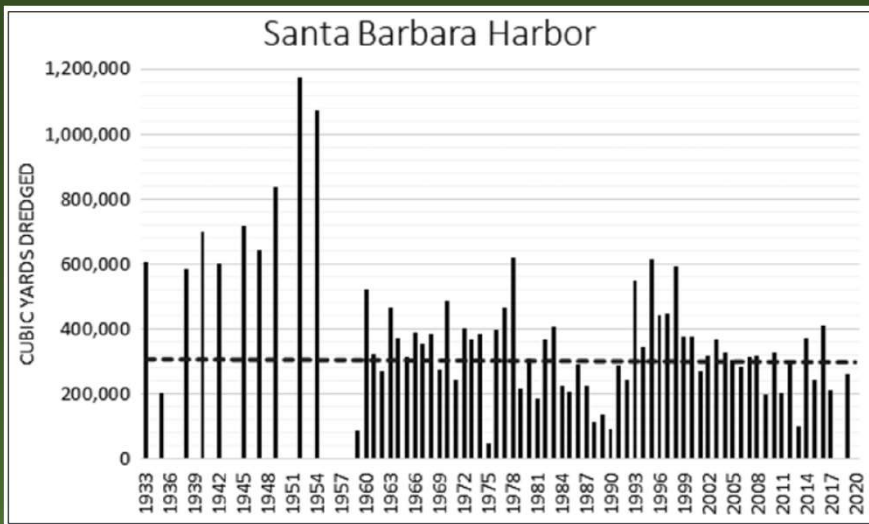


Santa Clara River Mouth, south of Ventura Harbor

Understand sand routing along the coast



Harbor/Sand Trap Dredging



Implications of Harbor Dredging for the Santa Barbara Littoral Cell

Kiki Runyan¹
Gary Griggs² **2004**

California harbor dredging: History and trends

By Kiki Patsch¹ and Gary Griggs² **2021**

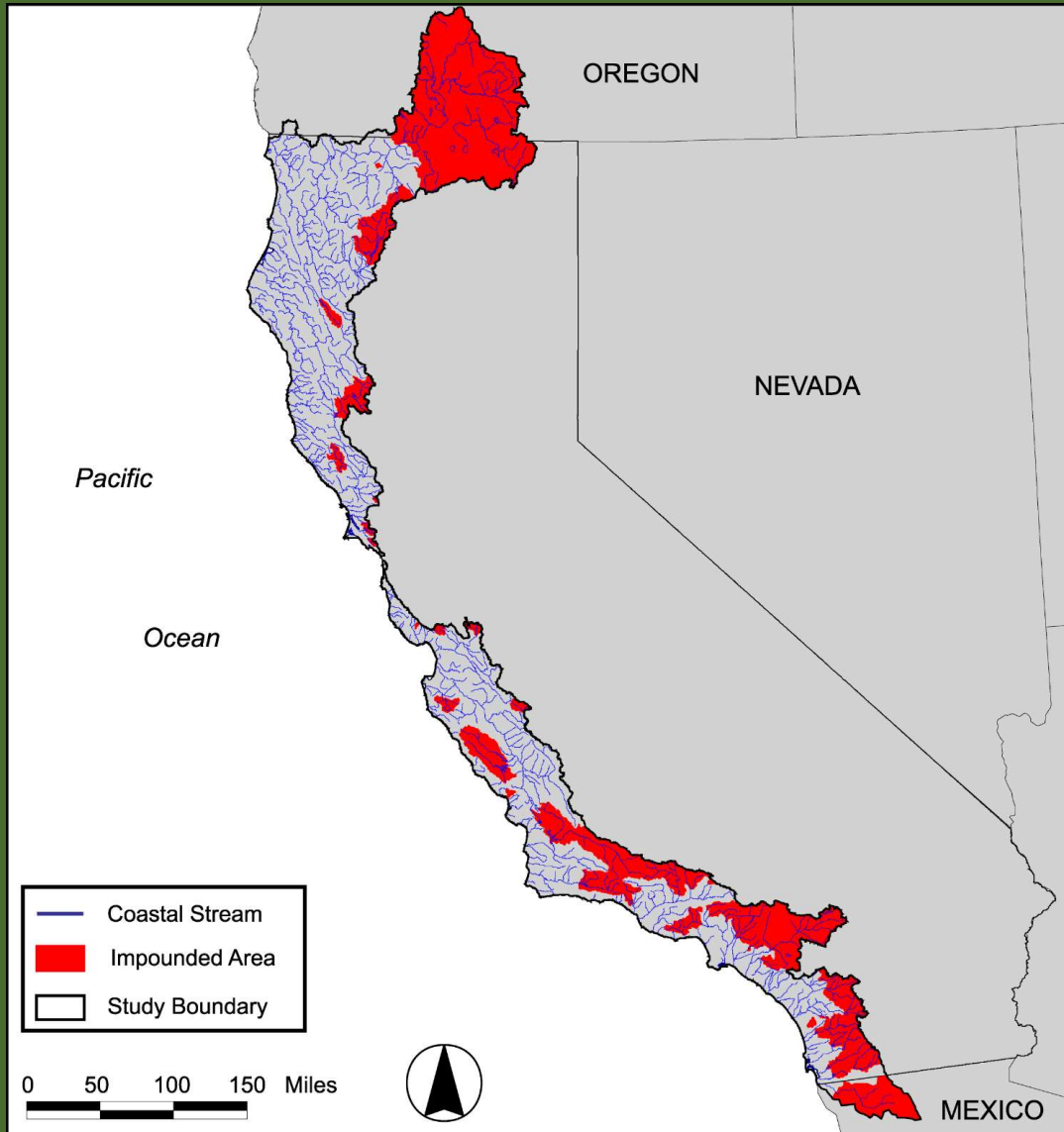
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2) Department of Earth and Planetary Sciences, University of California Santa Cruz, Santa Cruz, CA 95064

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 mi²) 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 yd³/yr.)





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

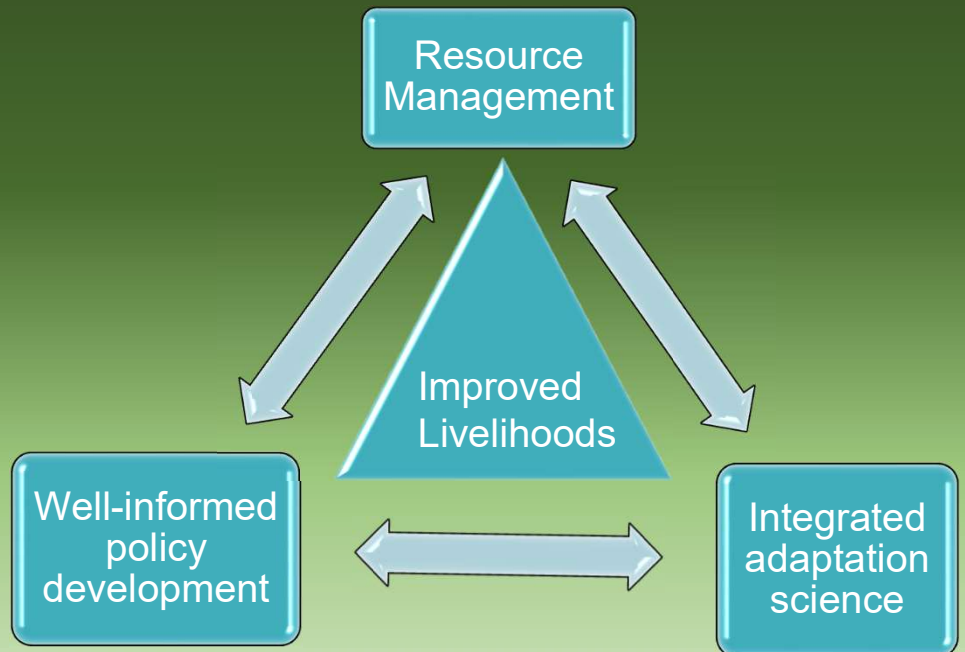


With the reductions to sand supply and an increasing sea level, what do we do to maintain our beach width?



Regional Sand Management involves Researchers, Managers, and State Agencies

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



04 • 25 • 2018

Will California's Beaches Go Extinct?

By msackett

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 Anderson¹, Kiki Patsch², Charles Lester³, and Gary Griggs⁴

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 Griggs¹ and Kiki Patsch²

Journal of Coastal Research

38

6

1207-1230

Coconut Creek, Florida

November 2022



www.JCRonline.org

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Shoreline Retreat in California: Taking a Step Back

Charles Lester[†], Gary Griggs^{**}, Kiki Patsch[§], and Ryan Anderson^{††‡‡}

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

By

Gary Griggs,¹ Kiki Patsch,² Charles Lester,³ and Ryan Anderson⁴

Teamwork, Teamwork, Teamwork

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





Ventura Harbor: Pre-dredging beach monitoring. March 2, 2023

Monitoring
required for
project permits
should be
replaced by
regional
monitoring

Project Level
Permit Approvals
should be
Integrated with
Regional Level
Permit Programs



Goleta Beach, March 13, 2023, Photo by Seth Shank, SB Flood control

Conclusion

- BEACON is bringing together the:
 - Best available science
 - Best available policy
 - Improved decision support tools
 - Interdisciplinary and Multidisciplinary analyses
 - Accessible and Transparent venues for stakeholder and public input to regional planning