



A California Joint Powers Agency

Member Agency
Representatives:

Julia Mayer
City of Carpinteria

James Kyriaco
City of Goleta

Gabe Teran
City of Oxnard

Steven Gama, Vice-Chair
City of Port Hueneme

Doug Halter
City of San Buenaventura

Eric Friedman, Chair
City of Santa Barbara

Laura Capps
Roy Lee
County of Santa Barbara

Vianey Lopez
Matt LaVere
County of Ventura

Executive Director
Marc Beyeler

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105 East Anapamu, Suite 201 Santa
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MEETING NOTICE

BEACH EROSION AUTHORITY FOR CLEAN OCEANS AND NOURISHMENT (BEACON)

September 18, 2026

NOTICE IS HEREBY GIVEN of a **MEETING** of the Beach Erosion Authority for Clean Oceans and Nourishment (BEACON). The date, time, and place of the meeting shall be as follows:

DATE: Friday, September 18, 2026

TIME: 9:00 AM

PLACE: IN-PERSON AND TELECONFERENCE (see details below)

The agenda of business to be conducted is below.

Eric Friedman, Chairperson

Members of the public may participate in-person for this meeting at the following locations:

**City of Carpinteria
Carpinteria City Hall
City Council Chambers
5775 Carpinteria Ave
Carpinteria, CA 93013**

Members of the public may also participate via teleconference for this meeting by:

1. You may observe the live meeting of the Board of Directors via Zoom Meeting:
<https://us02web.zoom.us/j/89767482229?pwd=jmGboaIzhhojv1YLa vTdXW4edmwcd.1>

Meeting ID: [897 6748 2229](#)

Passcode: [365989](#)

2. You may call in to listen live to the Board of Directors meeting by dialing [1669 444 9171](tel:16694449171) and then entering the following when prompted:
Meeting ID: [897 6748 2229](tel:89767482229)-and Passcode: [365989](tel:365989).
3. If you wish to make a general public comment or to comment on a specific agenda, the following methods are available:
 - a. Distribution to the Board. Submit comments via email to Staff@Beacon.ca.gov prior to 5:00 p.m. on Wednesday, September 16, 2026, or through mail to BEACON at 501 Poli Street, Ventura, CA 93001 to be received no later than 5:00 p.m. on Wednesday, September 18, 2026. Your comment will be placed into the record and distributed appropriately.
 - b. Read into the record at the meeting. Submit comments of 250 words, or less, via email to Staff@BEACON.ca.gov prior to 5:00 p.m. on Wednesday, September 18, 2026, prior to the Board meeting. Please indicate if you would like to make a general public comment, a comment on a specific agenda item, or both. Please state in your email, or mail, if you would like the comment "read into the record." Every effort will be made to read your comment into the record, but some comments may not be read due to time limitations. Comments timely received on an agenda item will be placed into the record and distributed accordingly.
 - c. By Zoom. Log onto Zoom as described above. The meeting will be controlled by the BEACON Chair. If you wish to make a comment during the meeting, please raise your hand using the Zoom instructions on your computer. By using the typed messaging capability of Zoom you should also indicate to the Chair which Agenda Item you wish to speak on or if you wish to make a general comment that is not specific to an Agenda Item. BEACON Staff will make every effort to call you during the indicated item so that you may comment.

In compliance with the Americans with Disabilities Act, individuals needing special accommodations to participate in the meeting should contact BEACON at least three workingdays prior to the meeting.

MEETING AGENDA

1. Administrative Items

A. Call to Order, Roll Call and Introductions—Chair

Items 1B and 1C listed under Administrative Items constitute a consent agenda and will be acted upon by a single roll call vote of the Board. Matters listed as an Administrative Item will be read only on the request of a member of the Board or the public, in which event the matter shall be removed from the Administrative Agenda and considered as a separate item.

B. Approval of Agenda and Filing of Certificate of Agenda Posting.

C. Consideration and Approval of Minutes of the BEACON Meeting held on July 17, 2026 (Exhibit 1).

2. Public Comment and Other Matters not on the Agenda

3. Presentation

Receive a presentation from Professor Adam Young, University of California, San Diego, Scripps Institution of Oceanography on California Coastal Erosion and Landslide Early Warning Research.

4. Project Update

Receive a presentation on BEACON grants funding and the status of grant project implementation.

5. BEACON Organization and Program

A. Board Member Reports

Directors are invited to provide reports and updates on items of interest in their County or City.

B. BEACON Contracts and Agreements

Recommended Actions:

- i. Approve, ratify, and authorize the Chair to execute an Agreement with Santa Barbara County to provide legal services to BEACON with a period of performance from July 1, 2026, to June 30, 2027, in an amount not to exceed \$20,000 (Attachment I).
- ii. Approve, ratify, and authorize the Chair to execute Amendment No. 1 between BEACON and Jenna Wisnieski to increase the amount by \$7,425 for a revised total not to exceed \$32,425 without a change in the period of performance from July 1, 2026, to June 30, 2027, to support services BEACON will be providing to Santa Barbara County's BeachSMART program. (Attachment II).

6. Executive Director's Report and Communications

The Executive Director will report on recent activities and achievements of BEACON, upcoming events of interest to the Board of Directors and the public, and general status of BEACON major projects, including the status of recent BEACON presentations on activities and accomplishments to our member agencies. There will be no Board discussion except to ask questions or refer matters to Staff; no action will be taken unless listed on a subsequent agenda.

November Meeting Agenda:

- A. Presentations
- B. Project Updates
- C. Review of FY 2027-2028 Budget Proposal and Member Dues

7. Adjourn

Late Distribution of Materials

Any disclosable public records related to an open session item on a regular meeting agenda and distributed by the City Clerk to all or a majority of the members of the BEACON Board less than 72 hours prior to that meeting are available for inspection in the City Clerk Office, at 5775 Carpinteria Ave, Carpinteria, CA 93013 and on the Internet at: BEACON.CA.GOV. Any written



ex-parte communication subject to disclosure by members of the BEACON Board may be published online as an attachment to the corresponding item.



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STAFF REPORT

Meeting Date: September 18, 2026
Agenda Item: 1B-C

To: BEACON Board of Directors
From: Executive Director
Date: September 10, 2026

Subject: Administrative Items

RECOMMENDED ACTIONS:

- B. Approval of Agenda and Filing of Certificate of Agenda Posting.
- C. Consideration and Approval of Minutes of the BEACON Meeting held on July 17, 2026 (Exhibit 1).

ITEM 1C

EXHIBIT 1

Minutes from July 17, 2026, BEACON Board Meeting

BEACON BOARD OF DIRECTORS' MEETING MINUTES FOR

DATE: Friday, July 17, 2026

TIME: 9:00 AM

PLACE: IN-PERSON IN CARPINTERIA & TELECONFERENCE

Item	1A	Call to Order, Roll Call, and Introductions –Chair, Eric Friedman
Minutes/ Actions:	Members Present: • Vianey Lopez (County of Ventura) • Laura Capps (County of Santa Barbara) • Roy Lee (County of Santa Barbara) • Eric Friedman (City of Santa Barbara) • James Kyriaco (City of Goleta) • Doug Halter (City of Ventura) • Gabe Teran, (City of Oxnard) • Steven Gama (City of Port Hueneme) - REMOTE Members Not Present: • Julie Mayer (City of Carpinteria) • Matt LaVere (County of Ventura) participated unofficially as a member of the public	
Item	1B - C	Approval of Administrative Items B. Approval of Agenda and Filing of Certificate of Agenda Posting. C. Consideration and Approval of Minutes of the BEACON Meeting held on May 22, 2026.
Minutes/ Actions:	Board Members Comments: • None. Public Comments: • None. Item 1B and 1C: Motion to approve as set forth in the agenda. Moved by Kyriaco / Second by Teran. Unanimously approved.	

Item	2	Public Comment and Other Matters not on the agenda Receive public comments.
Minutes/ Actions:	Board Members Comments: • None. Public Comments: • None.	

Item	3	Presentations - Presentation on the City of Santa Barbara Waterfront Adaptation Plan Receive a presentation from Timmy Bolton, Senior Climate Adaptation Analyst, on the progress and status of City's Waterfront Adaptation Plan.
Minutes/ Actions:	Executive Director Marc Beyeler introduced presenter Timmy Bolton, Senior Climate Adaptation Analyst from the City of Santa Barbara. Mr. Bolten made a presentation of City of Santa Barbara's Waterfront Adaptation Plan. The presentation is available on the BEACON Website.	

BEACON BOARD OF DIRECTORS' MEETING MINUTES FOR

DATE: Friday, July 17, 2026

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Board Members Comments:

- **Member Teran** asked if other jurisdictions that have taken some of the same strategies to address anticipating for sea level rise and implemented them and if there were certain cities we could look at to see it in practice.
- **Timmy Bolten** responded that City of Santa Barbara is ahead of most California communities in this. Many are still at the high-level, first-order sea-level-rise risk assessment stage rather than moving into implementation. What the City is now doing is beyond that, and it's tied into existing consultant contracts so that once Council blesses a direction, the City can move straight into construction design and build. Not many California communities are at that stage yet. There are some related efforts elsewhere at Oceanside and the City of Alameda.
- **Member Teran** clarified that his question was on a global basis. Are there other cities or jurisdictions, anywhere, that have taken any of these strategies and already implemented them or have them in practice.
- **Timmy Bolten** responded that none of what the City is doing is truly groundbreaking. Many communities have adopted these approaches, such as strategically pulling infrastructure back out of hazard areas. The elevated walking/biking path concept has been branded many ways in different places, but it's essentially a "living levee" concept with multi-benefit components (transportation, adjacent park space). These concepts are applied around the globe, and the City's consulting team has national and global experience to draw on.
- **Member Teran** continued that looking ahead a couple of decades, if there's a societal shift away from private vehicle ownership toward autonomous transportation, public transit, or non-motorized transportation, he wondered about the need for a parking garage, or about the reuse/repurposing of such a structure.
- **Timmy Bolten** acknowledged this point as a fair, forward-looking consideration that is noted as one possible scenario among several.
- **Member Teran** asked if the slide deck be made available through the minutes after this meeting.
- **Timmy Bolten and Executive Director Beyeler** responded that the materials will be made available, and the presentation is also on the City's project website, which was referenced during the presentation.
- **Member Halter** indicated that the City of Ventura very successfully implemented the Surfers Point Project with a managed retreat to address SLR. Also, transportation is certainly a huge challenge worldwide, it would be great to improve mass transportation options.
- **Member Capps** indicated that she would like to follow up separately on this subject since we represent this area, for a deeper dive at some point. She also indicated that she was curious about what the Harbor Commission's role is in the project.
- **Timmy Bolten** responded that the Harbor Commission is one of the many boards/commissions in the project's outreach "roadshow" and staff have presented to them two or three times. The commission has a subcommittee/working group that works

BEACON BOARD OF DIRECTORS' MEETING MINUTES FOR

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	directly with the relevant City director, who is part of the core project team, so the Commission is genuinely integrated into the process. Staff will return to them at every decision point and again when the public draft solution is released. • Member Capps indicated that the presentation mentioned Spanish-language outreach, but she wondered what interface with the Chumas Tribes has occurred. • Timmy Bolten responded that Staff held a dedicated stakeholder/community group meeting with the tribal community that was well attended and very productive. The City wants to elevate and integrate that input throughout the process. Ideas raised include space for Chumash art, improved canoe/paddle storage, and educational or equipment storage • Member Kyriaco indicated that the City of Goleta is going through a Local Coastal Plan development process and wondered how this effort aligns with the City of Santa Barbara's Local Coastal Plan (LCP) or is an amendment to the LCP needed. • Timmy Bolten responded that at a high level, this is already aligned with the City's Land Use Plan. The City was among the first in the state to comprehensively update its Coastal Land Use Plan, in 2017, which built in sea-level-rise development standards and helped lead to the citywide adaptation plan. However, a Local Coastal Program (LCP) Amendment will be needed at the conclusion of this process to incorporate the specific outcomes. The goal is to comprehensively permit the work through a single Coastal Development Permit, with an LCP amendment providing the framework. This is also required because the project is grant-funded by the Coastal Commission. • Member Kyriaco continued that given everything else happening in Santa Barbara, State Street revisioning, re-do of Dwight Murphy Field, a possible eastside pedestrian overcrossing across Highway 101 near the roundabout, how is the City integrating this project with these other projects, particularly for the East Beach and West Beach portions. Is your outreach roadshow talking to the State Street merchants and stakeholders, the hotels around Dwight Murphy, etc., given the opportunity to better connect West Beach and East Beach into those neighborhoods. • Timmy Bolten responded that the City has done direct engagement with the teams responsible for those other projects and a lot of staff-level coordination. The goal is to improve access and connections to key nodes across the city, including the projects mentioned. The transportation focus initially centered on the project's own footprint, but it became clear that access to this area is tied into the broader network. We'll emphasize those connections in the recommended solution, particularly the elevated multimodal path, and are looking at parking-deficient areas where added parking could let people "park once" and then walk or bike to other destinations . • Chair Friedman indicated that he appreciated these comments from Member Teran. The City very much supports the "park once," sustainable transportation notion. • Chair Friedman indicated that the City has multiple plans in progress, and one, related to the waterfront is the infrastructure work addressing the Estero (wastewater treatment plant). Chair Friedman asked if Mr. Bolten could briefly describe how that factors in, since what happens there will directly impact this plan. Some jurisdictions may not understand how that challenge relates to waterfront planning.
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- **Timmy Bolten** responded that everything is fundamentally related to where water wants to flow. The City completed a separate wastewater/water infrastructure study, recently adopted by Council, that looked at all infrastructure including the Estero plant and system. In the near term, that infrastructure is more vulnerable to rain-driven inflow/infiltration (cracked collection pipes, leaky sources) than to coastal flooding. The Estero plant itself was intentionally built on raised fill, so near-term coastal flooding risk to the plant is less. The bigger near-term concern is access and getting workers and chemicals to the site and maintaining operations during storms. The City updates these infrastructure plans on a roughly five to ten year rolling basis based on real-world conditions, not just modeled predictions. Work done under the waterfront plan to protect the lower downtown/inland neighborhoods would also help protect Estero access.

Public Comments:

- **Mark Mosby** indicated that it seems that sea-level-rise projection numbers are all over the place. For example, if you take a seven-foot-high tide today and add five feet, you get a very different number. I'd like to understand the basis for the SLR projection numbers being used by the City.
- **Timmy Bolten** responded that the numbers used are state-provided planning figures that the City is required to use, based on standard state scenarios. The modeling is based on "high tide in the spring" (an elevated but not the most extreme tide condition) and follows standard professional methods required statewide, ensuring consistency across California. Projection ranges have shifted somewhat over the past decade, but the planning amounts used have stayed consistent even as the low/high uncertainty band has changed. The project leans heavily on triggers, monitoring, and phased implementation to right-size investments, and why it uses a shorter (30-year) planning horizon for major infrastructure.
- **Mark Mosby** indicated that regarding sand nourishment, dredging plays a major role in maintaining beaches, but it was not included in the presentation. There are thousands of sand-nourishment projects on the East Coast driven by economic impact and suggest looking into the East Coast experience.
- **Timmy Bolten** responded that sand nourishment is an important topic.
- **Marc Beyeler** noted that Santa Barbara and Ventura County jurisdictions' work is informed by advanced planning happening nationally and globally, and that Santa Barbara is presenting to the Board specifically so other, less-advanced jurisdictions in the region can learn from its experience. Structural interventions considered by one jurisdiction (e.g., groins or reefs) can have cumulative or related effects on neighboring jurisdictions (specifically mentioned in relation to Carpinteria), which is part of why BEACON is involved in coordinating this work. Mr. Beyeler reiterated that BEACON's RCAMP regional monitoring program (discussed further under the Executive Director's report) is central to tracking changing conditions against defined triggers, and that BEACON will bring a fuller options analysis back to the Board once available.

Item	4	Project Update - Goleta Bay Kelp Project
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BEACON BOARD OF DIRECTORS' MEETING MINUTES FOR

DATE: Friday, July 17, 2026

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		<i>Recommended Actions:</i> A. Receive a presentation by Mr. Bob Kiel on the next phase of the Goleta Bay Kelp Project. B. Approve and authorize the Executive Director to execute an agreement, with Gravity Consulting LLC, for an amount of \$8,000, to fund preliminary testing of octo-cylinder installation methods, with a period of performance from July 1, 2026, to June 30, 2027. (Attachment I). C. Approve and authorize the Executive Director to obtain a permit in BEACON's name and fund Permit Fees associated with the implementation of the Phase 2 Goleta Bay Kelp Project for an amount not to exceed \$5,000
Minutes/ Actions:		Executive Director Marc Beyeler introduced Mr. Bob Kiel to make a PowerPoint presentation on the next phase of the Kelp Anchor Project Mr. Kiel's presentation is available on the BEACON Website. Board Members Comments: • Member Teran asked if there are any peripheral effects or lessons learned so far from this project in terms of a ripple effect, further down the coast in the Ventura County coastal cities. • Bob Kiel responded that the primary thing is that "we do no harm", citing Florida's historical practice of dumping tires in the ocean to create fishing reefs as a cautionary example. This practice became a costly environmental problem requiring millions of dollars to remediate, in addition to damage to living reef systems. By contrast, the granite columns and now the vitrified-clay/sulfate-resisting-cement "octo-cylinders" are 100% natural materials chosen specifically to avoid that kind of problem. Core sampling was done in advance to specifically understand episodic wave/current forces on the seafloor, which determined how deep the structures needed to be embedded for stability. This approach replicates a structure that used to exist naturally in Goleta Bay rather than introducing a new type of hard structure and that the proposed 50-foot spacing between units is deliberately wide. The project is trying to jump-start a naturally occurring recovery process (using a known predator, the octopus, to address the kelp grazing by other wildlife. • Member Teran added that he imagined positive outcomes for the project that could be looked at for replication further down the coast. Public Comments: • None. Motion to approve as set forth in the agenda. Moved by Halter/ Second by Lopez. Unanimously approved.

Item	5A	BEACON Organization and Program Board Members Reports
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BEACON BOARD OF DIRECTORS' MEETING MINUTES FOR

DATE: Friday, July 17, 2026

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Minutes/ Actions:	Board Members Comments: • None. Public Comments: • None.
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Item	5B	BEACON Board Actions and Financial Reports Recommended Action: Receive and authorize the Chair to execute an Agreement with Moss, Levy, Hartzheim, LLP to provide financial audit services in an amount not to exceed \$10,375 with a period of performance from July 17, 2026, through March 31, 2027. (Attachment I).
Minutes/ Actions:		The Executive Director presented the presented the proposed audit contract with Moss, Levy, Hartzheim, LLP. This is 4th financial audit engagement for BEACON in the last five years the firm, conducted every other year (covering fiscal years 2025–26), and in collaboration with the Ventura County Auditor-Controller's Office. The value of the contract is approximately \$10,000 and the results are expected by next spring, in time for the next FY budget cycle. Board Members Comments: • None. Public Comments: None. Motion to approve as set forth in the agenda. Moved by Halter/ Second by Lee. Unanimously approved.

Item	5C	BEACON Contracts and Agreements Recommended Actions: i. Approve, ratify, and authorize the Chair to execute an Agreement with Marc Beyeler/Beyeler & Associates to provide Executive Director Services to BEACON with a period of performance from July 1, 2026, to June 30, 2028, with an optional additional one year ending June 30, 2029, upon agreement of the parties, in an amount not to exceed \$171,836.50 for each fiscal year, with a total not to exceed amount of \$515,509,50 inclusive of the optional period. (Attachment I). ii. Approve, ratify, and authorize the Chair to execute Amendment No. 1 between BEACON and Pamela Baumgardner to add administrative, contract, and grant services to the scope of work and to increase the amount by \$30,000 for a revised total not to exceed \$36,000 without a change in the period of performance from July 1, 2026, to June 30, 2027. (Attachment II).
Minutes/		Legal Counsel Susan McKenzie reported that under Government Code Section 54953(c)(3)

BEACON BOARD OF DIRECTORS' MEETING MINUTES FOR

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Actions:	the Board is required to receive a verbal summary of the changes to the Executive Director's compensation prior to taking action. That verbal report included: The Action recommends a salary increase for the Executive Director of \$6,609, effective July 1, 2026, resulting in an annual salary of \$171,837. The total agreement value is approximately \$515,509.50, covering a two-year term with an optional third year. Board Members Comments: • Member Lopez expressed her appreciation for the Executive Director and his "small and mighty" team working across the counties and cities. Member Lopez cited the Santa Barbara presentation as a good example of the work being done to carry out BEACON's mission and appreciated his willingness to continue. • Vice Chair Gama reflected on the complexity of sustainability work across shoreline and kelp-forest topics noting every member city's differing coastal experience. The Executive Director has helped the Board navigate those differences and Mr. Gama expressed his strong support for the compensation agreement. • Chair Friedman conveyed his appreciation to the Executive Director on behalf of the full Board, noting the multi-year agreement reflects the longer time horizon of BEACON's projects, and praised BEACON's regional leadership role (including the RCAMP program). • Executive Director Beyeler clarified that Item 5C covers two agreements, the Executive Director contract, and a contract for a new Administrative Services Specialist position that BEACON has been trying to fill for a long time. The candidate is Pam Baumgardner, who recently retired from the City of Ventura's Public Works Department, and has extensive prior experience with BEACON. Pam has agreed to be trained in the role under Program Manager Gerald Comati. This position is intended to improve efficiency in administering BEACON's grant and project funds and to provide continuity, since current staff (Gerald, Jenna, and the Executive Director) are stretched thin. The motion on the floor was to approve both contracts together. Public Comments: • None. Motion to approve as set forth in the agenda. Moved by Gama/ Second by Lopez. Unanimously approved.
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Item	6	Executive Director's Report and Communications The Executive Director will report on recent activities and achievements of BEACON, upcoming events of interest to the Board of Directors and the public, and general status of BEACON major projects, including the status of recent BEACON presentations on activities and accomplishments to our member agencies. There will be no Board discussion except to ask questions or refer matters to Staff; no action will be taken unless listed on a subsequent agenda.
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BEACON BOARD OF DIRECTORS' MEETING MINUTES FOR

DATE: Friday, July 17, 2026

TIME: 9:00 AM

PLACE: IN-PERSON IN CARPINTERIA & TELECONFERENCE

Minutes/ Actions:	Executive Director Marc Beyeler provided the following report: • Presentation materials from today’s agenda are posted to BEACON's website. • Zoom meeting recordings are retained only by standard business practice and are not available long-term, but detailed written minutes are maintained as the permanent record. • Membership dues have been received to date from three of eight member agencies • The Executive Director provided a report to the Port Hueneme City Council on BEACON's work and dues use and remains available to present to any member jurisdiction's board. Please note that it is sometimes difficult to secure agenda time with member agencies, e.g., the County of Santa Barbara declined an oral update slot this cycle in favor of a written status report). • The Executive Director is meeting with Scripps Institution of Oceanography and NOAA representatives this week to discuss regional buoy/monitoring coverage gaps. • BEACON is coordinating on several other regional initiatives, including a Ventura County grant application for coastal adaptation planning in the Calleguas Creek/Mugu area, and continued discussion of aging groin fields in the region, referencing a recent USGS study of the Pierpont groin field alongside interest in exploring resilient reef alternatives. • BEACON continues to hold an existing permit for potential restoration work at the Ellwood Pier area (previously stalled due to the Great Recession/funding constraints) and continues to partner with the City of Santa Barbara on efforts such as the East Beach living shoreline concept. • The RCAMP (Regional Coastal Adaptation Monitoring Program), funded by the Coastal Commission, is intended to create a shared monitoring framework/template so member jurisdictions do not each have to develop their own. The current four-year RCAMP grant from the Coastal Commission concludes next year; staff will bring a report on outcomes and a plan for institutional continuation. • A joint science-and-policy summit (management committee, city/county representatives, and BEACON's Science Advisory Committee) is planned for fall 2026, likely late October/early November, to review implementation activities and a stakeholder-informed research agenda, including continued Chumash partner engagement. Public Comments: • None.
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The next Board Meeting will be held on September 18, 2026, at 9:00 AM, at the City of Carpinteria City Council Chambers.

Meeting Minutes by Gerald Comati, Program Manager, BEACON.



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STAFF REPORT

Meeting Date: September 18, 2026
Agenda Item: 2

To: BEACON Board of Directors
From: Executive Director
Date: September 10, 2026

Subject: Public Comment and Other Matters not on the Agenda

RECOMMENDED ACTION:

Receive Public Comments.

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STAFF REPORT

Meeting Date: September 18, 2026
Agenda Item: 3

To: BEACON Board of Directors
From: Executive Director
Date: September 11, 2026

Subject: California Coastal Erosion and Landslide Early Warning Research

RECOMMENDED ACTION:

Receive a presentation from Adam Young, University of California, San Diego, Scripps Institution of Oceanography, on California Coastal Erosion and Landslide Early Warning Research

DISCUSSION:

Coastal landslides threaten public resources, coastal infrastructure, and life safety along California's coast, including in our local region. Rising sea levels, intensifying coastal storm events, and growing beach visitation will intensify the risks. Understanding the processes and timing of coastal landslides is critical for improved coastal management and hazard mitigation. Recent state legislation authorized Scripps Institution of Oceanography at UC San Diego to conduct research on coastal cliff landslides and provide recommendations for developing a coastal cliff landslide early warning system.

To better understand the processes leading to cliff failures, Scripps scientists built a research program that included two complementary paths. First, Scripps instrumented three key sites in San Diego County with real-time geotechnical monitoring technology. In most instances, records from in-ground deformation sensors can provide a reliable warning of a site-specific impending dangerous landslide. Scripps data show that in-ground sensors detected signs of cliff failure for five distinct events hours to days before cliff collapse. Scripps recommend continuation of the current study with expansion to other locations.

Second, Scripps established a routine topographic mapping program that provides frequent high-resolution scans of the cliffs, and compiled these measurements into a growing historical database of landslide events and associated environmental conditions such as rainfall. These surveys focused on the San Diego County coast, and the observations provide the foundation for many of the report findings and data to support non-site-specific regional probabilistic warnings. Additional data collection and statistical information will help refine the probabilistic forecasts and gain precision. The program has many



lessons learned for BEACON region, and may be a useful additional to regional monitoring initiatives. BEACON staff are interested in sharing this research with local officials and agency staff.

Exhibit 1 – Project Report

[https://siocpg.ucsd.edu/California Coastal Landslide Early Warning Research.pdf](https://siocpg.ucsd.edu/California%20Coastal%20Landslide%20Early%20Warning%20Research.pdf)

An aerial photograph of a coastal area. On the right, a steep, light-colored cliff face shows signs of erosion and a recent landslide, with a large pile of sand and rocks at its base. To the left of the cliff is a dark, pebbly beach. Further left is the ocean with white-capped waves. Several small figures of people are visible on the beach and near the water's edge.

CALIFORNIA COASTAL LANDSLIDE EARLY WARNING RESEARCH

UC San Diego



SCRIPPS INSTITUTION OF
OCEANOGRAPHY

California Coastal Landslide Early Warning Research

Contact us: adyoung@ucsd.edu

Research on California Coastal Landslide Early Warning System

March 2026

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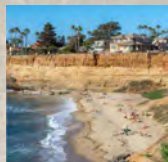
Field Work and Data Management: Carson Black, Jon Curtis, Shane Finnerty, Rob Grenzeback, William Hatfield, David Horwitt, Mele Johnson, Jesse Kerr, Matthew Maclay, Lucian Parry, Kent Smith, Joel White, Brian Woodward, Derek Young

Acknowledgements: Assemblymember Tasha Boerner, California State Legislature, Governor Gavin Newsom, Yehuda Bock, Jessica Carilli, Douglas Darois, Jonathan Edelbrock, Bob Friedman, Jim Knowlton, Jennifer Mathews, Todd Mierau, Kevin O'Callahan, Michele Okihiro, Gerry Rahill, Didi Sheth, Scott Shroyer, Mark Rathsam, Nick Sadrpour, David Schug, Cara Stafford, Darren Smith, Jayme Timberlake, Matt Widelski

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CONTENTS



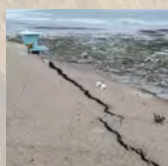
1.0 EXECUTIVE SUMMARY

4



2.0 RECOMMENDATIONS

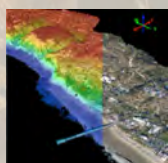
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3.0 THE PROBLEM

3.1 Infrastructure at risk / 3.2 Fatalities

6



4.0 OBSERVATIONS AND WARNINGS

4.1 In-ground sensors / 4.2 Lidar mapping and regional warnings / 4.3 Warning protocols

8



5.0 EDUCATION AND RESEARCH

5.1 Outreach / 5.2 Runout / 5.3 Beach width forecast app

19



APPENDIX AND REFERENCES

Continued research / References

22

1.0 EXECUTIVE SUMMARY

Coastal landslides threaten public resources, coastal infrastructure, and public safety, throughout the state of California. Rising sea levels, coastal populations, and tourism will intensify the risks. Over two dozen people have died from coastal cliff collapses on California beaches. Therefore, understanding the processes and timing of coastal landslides is critical for improved coastal management and hazard mitigation. To address this issue, Assemblymember Tasha Boerner introduced California Assembly Bill 66, and subsequently Assembly Bill 72, which authorized Scripps Institution of Oceanography at UC San Diego to conduct research on coastal cliff landslides and provide recommendations for developing a coastal cliff landslide early warning system.

A primary goal was to examine if signals exist that can identify areas of increased risk and help forecast where and when collapse might occur. To better understand the processes leading up to cliff failures, we built a research program that included two complementary paths. First, we instrumented three key sites in San Diego County with real-time geotechnical monitoring technology, both with commercially available sensors and with other higher-resolution sensors developed at Scripps. In most instances, records from in-ground deformation sensors can provide a reliable warning of a site-specific impending dangerous landslide. Our data show that in-ground sensors detected signs of cliff failure for five distinct events hours to days before cliff collapse. We recommend continuation of the current study with expansion to other locations.

Second, we established a routine topographic mapping program that provides frequent high resolution scans of the cliffs, and compiled these measurements into a growing historical database of landslide events and associated environmental conditions such as rainfall. These surveys focused on the San Diego County coast, from Torrey Pines State Beach to Encinitas. These observations provide the foundation for many of the report findings and data to support non-site-specific regional probabilistic warnings. Additional data collection and statistical information will help refine the probabilistic forecasts and gain precision.

This report is organized into several sections. First, we provide a summary of our recommendations. Next, we describe infrastructure risk and safety concerns related to coastal landslides in California. The third section details the observations collected and analysis which can help inform development and implementation of warning systems. Lastly, we provide a review of educational and outreach activities related to coastal safety and detailed recommendations for continued research of the topic.



2.0 RECOMMENDATIONS

The following recommendations include potential warning systems, activities, and research to help reduce hazards to people and infrastructure.



(1) Monitoring

In-ground sensors: Initial results indicate that real-time tiltmeters can provide an alert of impending collapse at a specific location.

Remote sensing monitoring: Continued topographic mapping can expand our landslide database leading to improved forecasting.

Routine field inspection: In several of our successful predictions, physical features (e.g. cliff top cracks) appeared preceding collapse and alerted us where to focus attention.

(2) Warnings

Regional Warnings: Forecasts of impending intense rain storms, coupled with surf and tide models, can enhance our capability to identify areas of risk.

Establish warning protocols: If and when a prediction can be made, a plan of action for coastal managers, marine safety, rail operators, and other stakeholders needs to be developed to respond effectively.

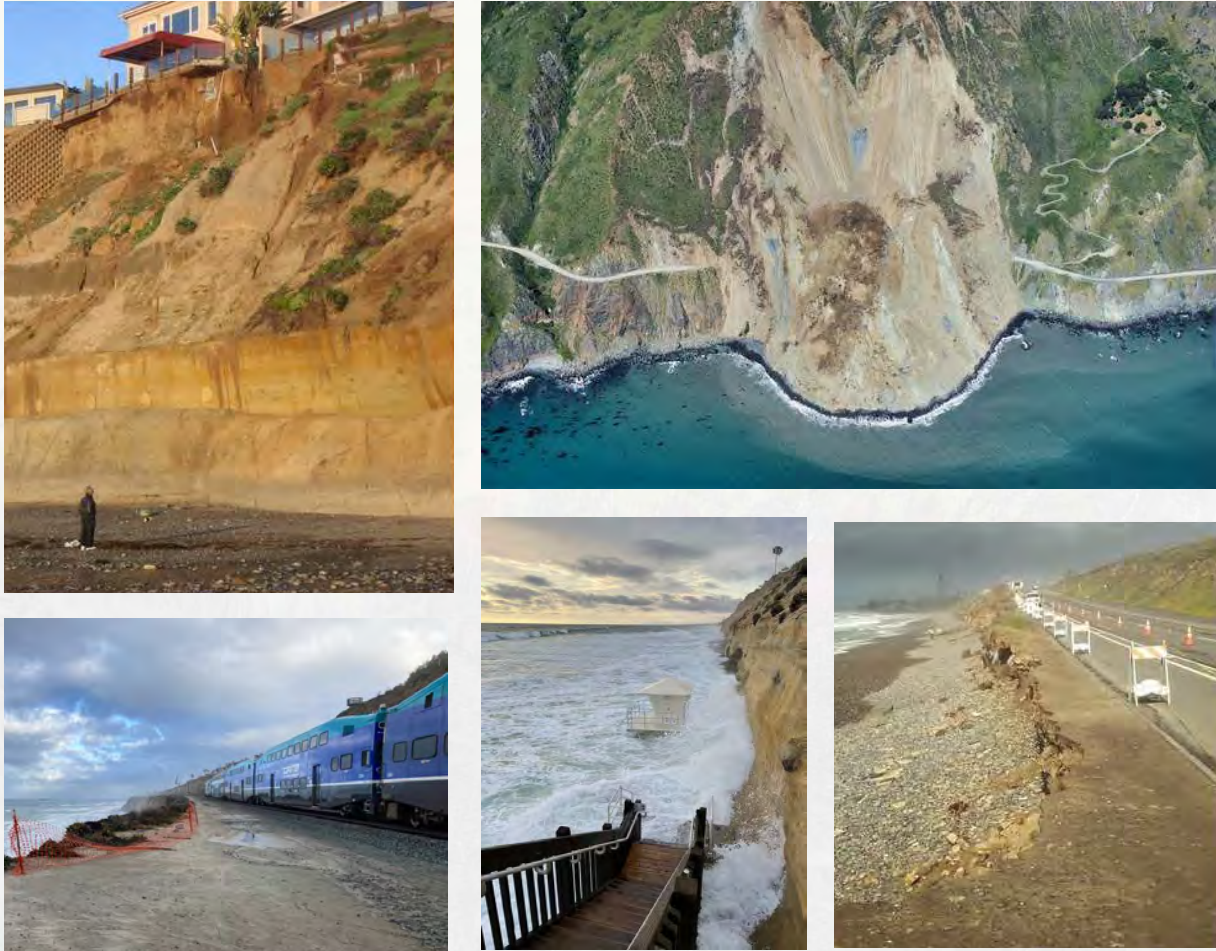
(3) Education

Outreach programs: Reducing the likelihood of injury from landslides can be accomplished by better informing beachgoers of where and when the risk is heightened.

Continued research: While much has been learned in our four-year project, continued data collection and expansion to other regions is necessary to better learn how to make predictions reliably.



3.0 THE PROBLEM



Photos of the California coastline closely bordering property, highways, and railroads.

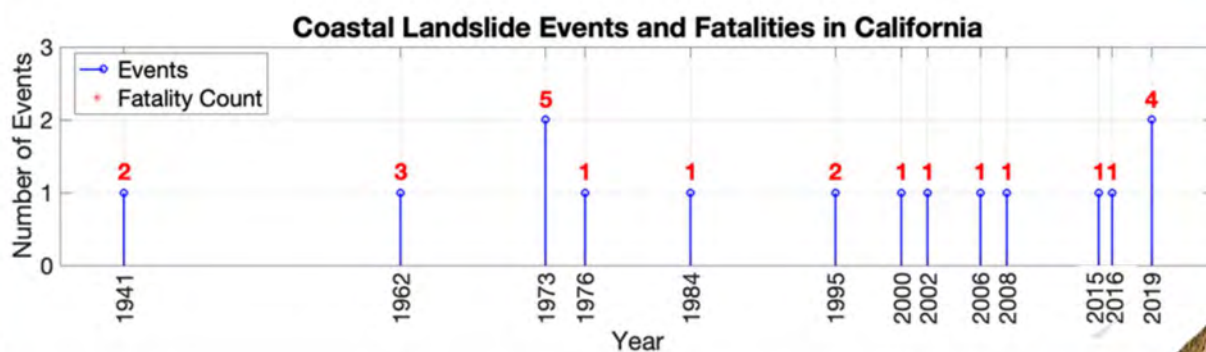
3.1 Infrastructure at Risk

Many of California's eroding coastal bluffs and cliffs contain critical cliff top infrastructure including highways, railways, power plants, wastewater facilities, military installations, universities, housing, businesses, and more¹. In addition, eroding cliffs also threaten important public resources such as parks², coastal access points, and campgrounds. Infrastructure at risk exists throughout the state, but is concentrated in urban areas such as southern California. By 2100 cliff retreat is expected to impact 10,000 parcels, 14,000 residents living on the parcels, 240 miles of roads, and 10 miles of railways in central and northern California³. This does not include the highly densely populated southern coastal California region.

3.2 Fatal Coastal Landslides in California

About 70% of the California coast contains eroding coastal cliffs^{4,5} and provides valuable aesthetic, cultural, touristic, ecological, and scientific resources⁶. However, they also expose visitors to unstable slopes and sudden collapses. Narrow crowded beaches combined with high tides and waves force beachgoers to gather near unstable coastal cliffs. Since 1941, coastal landslides have caused at least 25 fatalities on California beaches⁷. Documented fatal events occurred throughout the year and were spatially concentrated in San Diego County, with 10 events and 19 related fatalities. In the most recent event (August 2019), three women died on Grandview Beach, a popular surfing beach in Encinitas, when a 30' x 25' section of cliff collapsed onto the beach⁸. This case settled recently for \$32M⁹. Other fatal events occurred in Big Sur, Santa Barbara, Point Reyes, and San Francisco. Most fatalities occurred while the victims were enjoying leisure activities on public beaches.

Map of California shows where fatal coastal landslides have occurred from 1941-2026



4.0 OBSERVATIONS AND WARNINGS

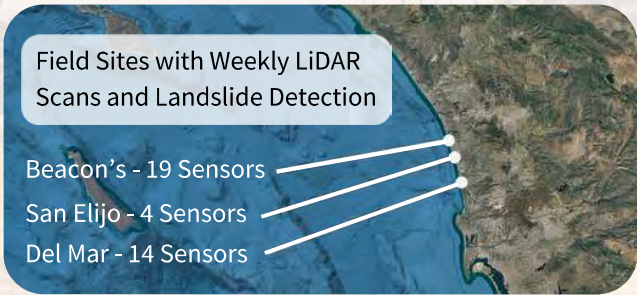
4.1 In-ground sensors

A central component of the research project was to instrument key sites with geotechnical monitoring technology. These sites include:

- **Beacon's Beach (Leucadia State Beach), Encinitas**
 - a popular beach with a public access trail on an intermittently moving complex landslide,
- **Railway Corridor, Del Mar**
 - a critical coastal rail corridor overlooking a frequently visited beach below unstable bluffs,
- **San Elijo State Beach, Encinitas**
 - a frequently visited beach with eroding cliffs and a clifftop campground, park facilities, and public access points.

Sensor types

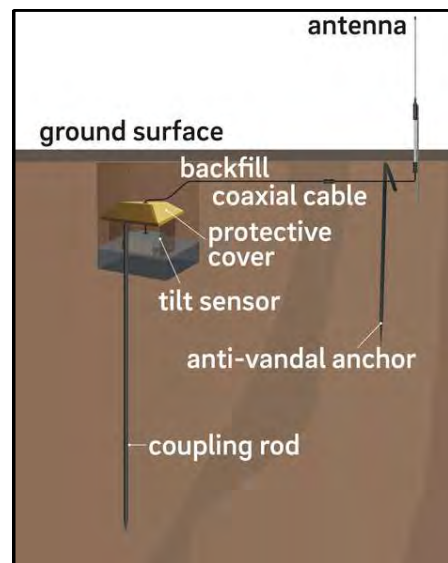
At the beginning of the project it was unknown what sensitivity of in-ground sensors would be needed to collect measurements adequate to make predictions of failures. Consequently a range of sensor types, with varying cost and resolution, were installed.



Sensor Type	Resolution	Relative Cost	Location deployed
MEMS Tiltmeter	0.001°	\$	Beacon's, Del Mar, San Elijo
Electrolytic Tiltmeter	0.000001°	\$\$	Beacon's
Mechanical Extensometer	0.0004 inch (0.01 mm)	\$	Beacon's, Del Mar
Optical Extensometer	0.000004 inch (0.0001 mm)	\$\$\$	Beacon's

Tiltmeters

A *tiltmeter*, also known as an inclinometer, detects very slight changes in slope (in essence, it is an extremely sensitive carpenter's level). The MEMS tilt sensors (Micro-Electro-Mechanical Systems) used in this project are commercially available (from Senceive Ltd.) that transmit data over a wireless mesh network to a data collection hub in real time. For this project, most were modified for burial and attached to a 3-foot-long (1 meter) deep-coupling rod to enhance sensitivity and improve environmental isolation. We installed fourteen modified sensors along the edge of the cliffs in Del Mar, spaced on average 54 feet apart (16.4 meters) adjacent to the rail corridor threatened by erosion, and thirteen spread throughout the unstable slope above Beacon's Beach. Tilt at four locations was recorded on the cliff top ground surface at San Elijo State Beach. We also installed three of the more expensive, highly sensitive electrolytic tilt sensors in the clifftop at the edge of the parking lot at Beacon's.



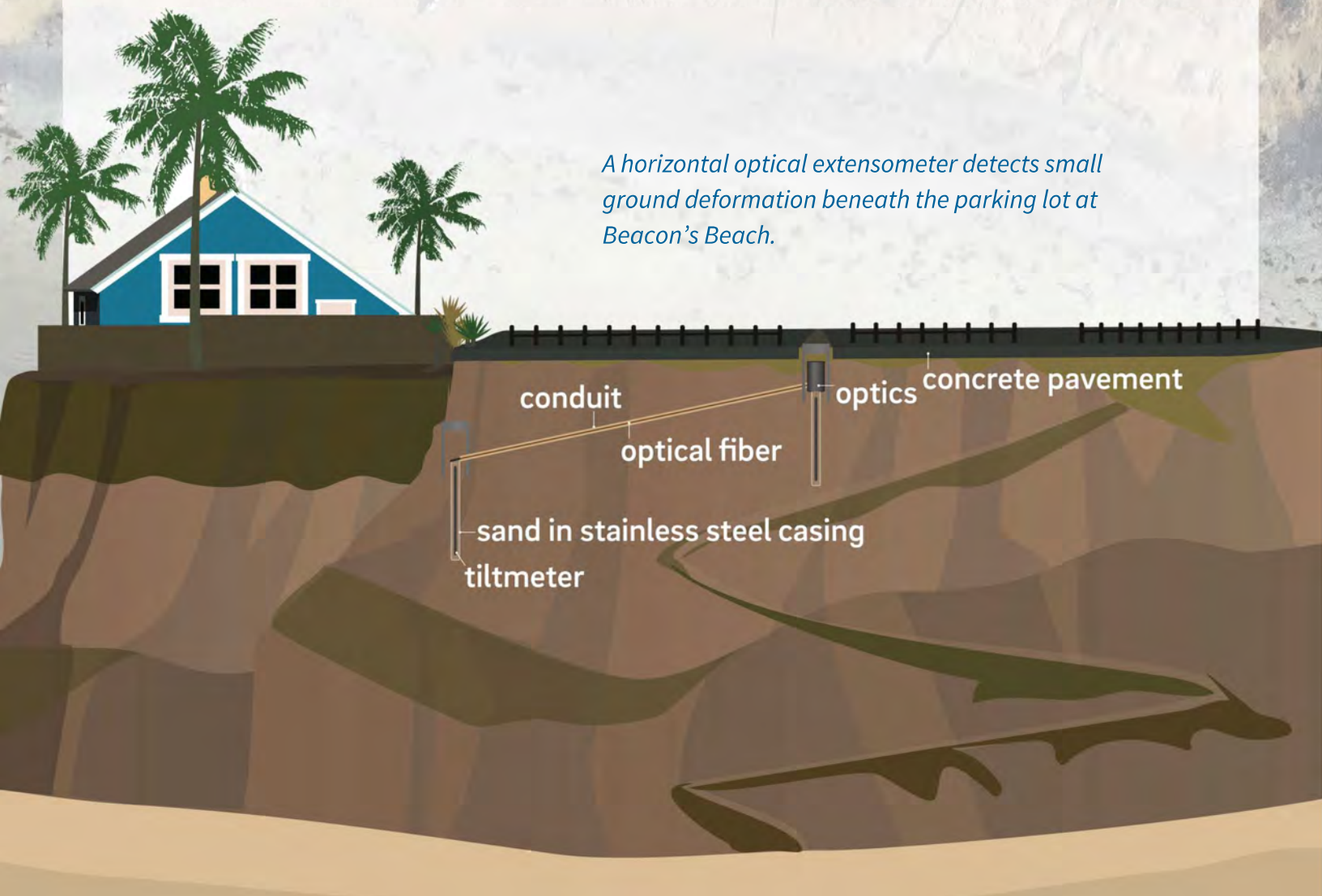
(Left) A commercially available MEMS tiltmeter. The sensor operates on batteries and transmits measurements to a data server every fifteen minutes. (Right) Installation of a MEMS tiltmeter. Normally these tilt sensors are installed on structures above ground. In this project the goal was to detect slight tilts deeper in the ground. To achieve this, the tiltmeter was attached to a 36-inch-long rod (1 m) driven into the ground, then buried. The subsurface installation helped isolate the tiltmeter from large temperature changes and other near-surface noise. The antenna for each sensor was mechanically isolated so that damage by vandals (a frequent occurrence) disturbed only the antenna, not the sensitive tiltmeter.

Extensometers

Extensometers measure minute variation in the length of a sensor, typically buried in a horizontal trench or deployed in a vertical borehole. A commercially available (Deformetrics, Inc.) mechanical sensor monitored the cliff top at Beacon's Beach over a 23 foot (7 meter) baseline perpendicular to the cliff edge. We also installed a temporary extensometer in Del Mar to monitor a visible fissure that preceded a cliff collapse. The optical extensometers are unique instruments, developed at Scripps, that use laser light to measure changes in length of an optical fiber. We installed two of these at Beacon's Beach; one in a 96 foot (29 meter) vertical borehole in the cliff top, the second along a 30 foot (9 meter) cross-shore, horizontal trench in the cliff top.

Other monitoring included a seismometer at Beacon's Beach, an optical height sensor at San Elijo State Beach, two optical displacement sensors in Del Mar, and a weather station in Del Mar. Conventional surveying of the slope at Beacon's Beach to monitor the cumulative evolution of the intermittent landsliding has been carried out several times each year. Precise leveling measurements were conducted regularly to keep track of parking-area ground stability.

A horizontal optical extensometer detects small ground deformation beneath the parking lot at Beacon's Beach.



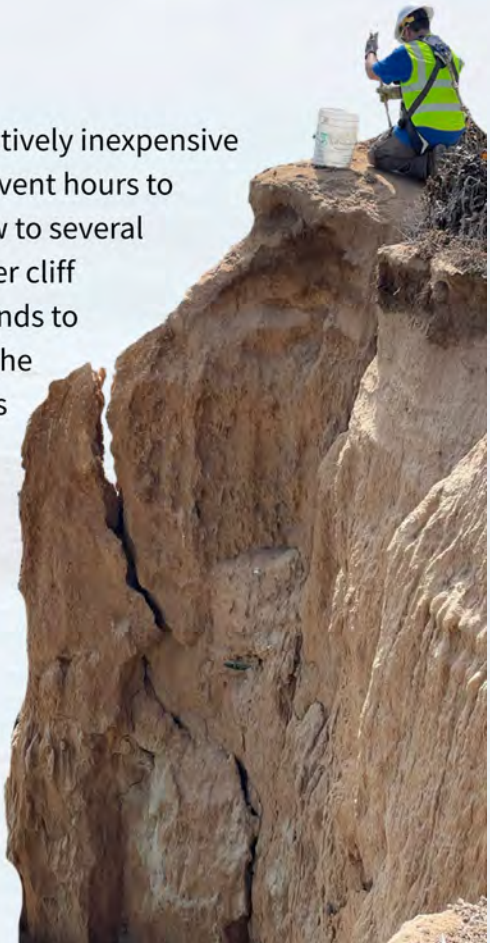


(Left) In-ground sensor installation in Del Mar. (Right) cliff top cracks and sensors at San Elijo State Beach and a total station cliff survey at Beacon's.

Findings from in-ground sensors

In five collapses, two at Del Mar and three at San Elijo, the relatively inexpensive MEMS tilt sensors detected local ground tilt prior to a failure event hours to days prior to collapse. The landslides ranged in size from a few to several hundred cubic yards of material typically falling from the upper cliff down to the beach below. At San Elijo, asphalt pavement extends to the cliff top edge, and visible cracks in the asphalt parallel to the cliff edge became apparent many months before the collapses suggesting a future failure could be expected. Similarly, in Del Mar, visible ground fissures in the cliff top several feet inland from the cliff edge signaled that monitoring might capture the accelerating ground deformation preceding a cliff failure event.

A Scripps technician installing a tiltmeter in a shallow hole at the edge of a Del Mar cliff.



Del Mar Failure Event April 21, 2024

The most significant collapse (out of five) and the key tilt record leading up to it is described here. Details on the others can be found in a scientific journal article reporting on the research project¹⁰.

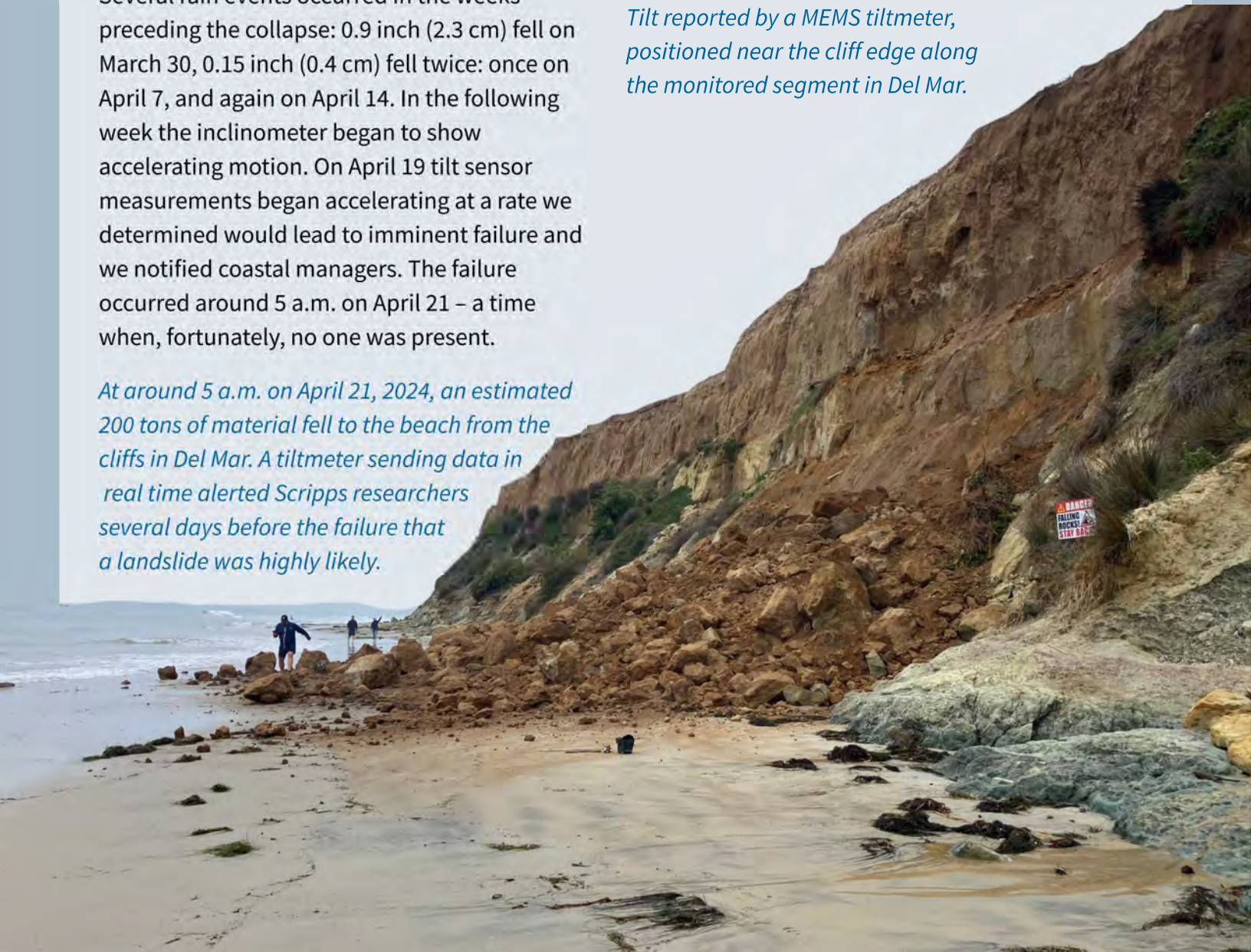
During a maintenance visit to the Del Mar site in early April, 2024, we observed a crack in the cliff top, 0.1 inch [2.5 mm] wide, extended for about 30 feet (10 meters) parallel to the cliff edge, and 3 to 6 feet inland of the cliff edge. Over the next several weeks, the tilt records suggest the crack slowly widened about 0.015 inch per day (0.4 mm per day), a rate not visible to the eye. Several rain events occurred in the weeks preceding the collapse: 0.9 inch (2.3 cm) fell on March 30, 0.15 inch (0.4 cm) fell twice: once on April 7, and again on April 14. In the following week the inclinometer began to show accelerating motion. On April 19 tilt sensor measurements began accelerating at a rate we determined would lead to imminent failure and we notified coastal managers. The failure occurred around 5 a.m. on April 21 – a time when, fortunately, no one was present.

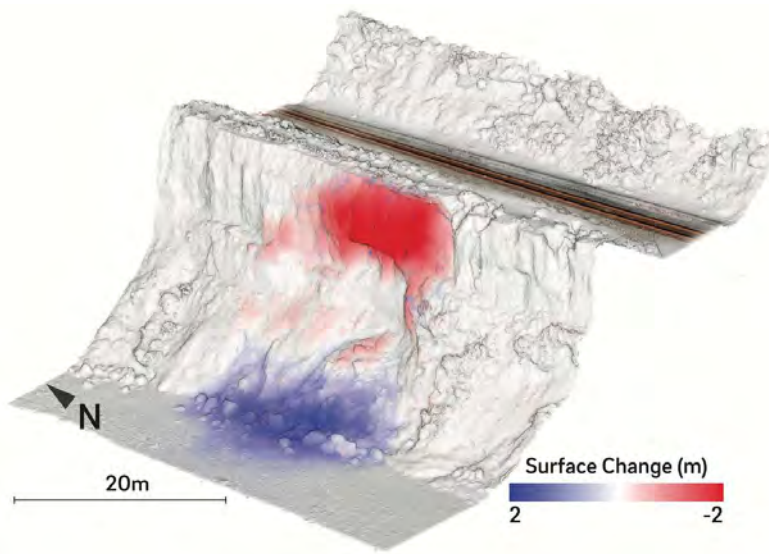
At around 5 a.m. on April 21, 2024, an estimated 200 tons of material fell to the beach from the cliffs in Del Mar. A tiltmeter sending data in real time alerted Scripps researchers several days before the failure that a landslide was highly likely.

The graph below shows the change in tilt leading up to the landslide. The accelerating rate of tilt (still an amount that would not be recognizable to a human observer) is the key signal indicating that a collapse is expected to occur within days.



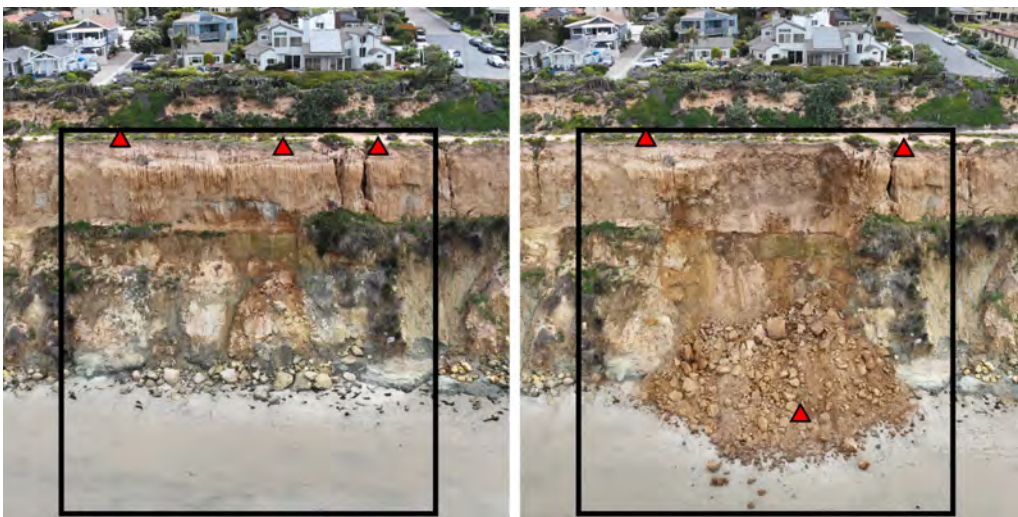
Tilt reported by a MEMS tiltmeter, positioned near the cliff edge along the monitored segment in Del Mar.



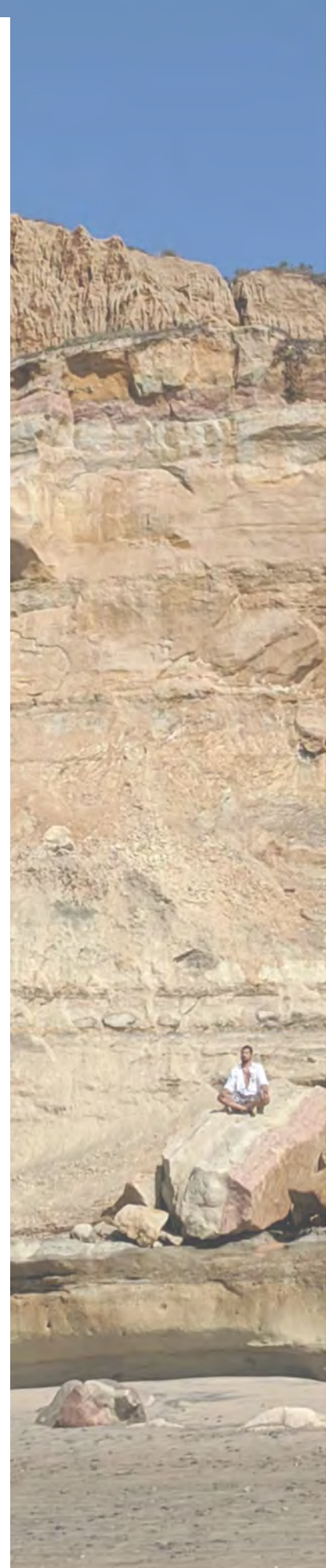


Lidar data, collected just before and just after the rockslide described above, reveals the extent of the failure.

The accelerating rate of change in deformation (represented by tilt in this instance) allows a prediction of the approximate time of a collapse. Unlike earthquakes, which so far have not revealed telltale signals prior to their occurrences, landslides behave in a way that invites monitoring, enabling prediction. In the other collapses observed during this project, very similar records were obtained. In all five cases, it was clear days before the actual collapse that the failure was imminent. In all cases, visible cracks in the ground paralleling the cliff edge occurred. In one of the events, however, the tilt record leading up to the failure was different and would have led to false alarm predictions prior to the failure. The tilt rate accelerated towards failure, but then stabilized, only to accelerate again and stabilize again, repeating the pattern several times before actually failing. The four-year project only captured five events – many more instances of this behavior need examination before reliable predictions become routine.



Before and after oblique images of the landslide with red triangles representing the locations of MEMS tilt sensors.





The collapse events observed at San Elijo and Del Mar typically consisted of upper cliff sections detaching and falling onto the beach. Landsliding at Beacon's during the study period differs. The Beacon's landslide is a recurring, complex deep seated rotational landslide occasionally reactivated along an existing slip surface. Recent movement includes a major landslide on the northern half of the slope in May 2022 that resulted in the closure of the beach access trail. No monitoring sensors had been deployed at the time but were promptly installed immediately following this event. Repairs to the trail were made and access was restored later that summer. This landslide was reactivated in January 2024 and moved several feet causing damage to and closure of the public access trail. Future landsliding and trail closures should be expected at the site.



At Beacon's Beach, a combination of MEMS tilt sensors (red triangles), extensometers (blue lines and blue circle for the vertical one), and high sensitivity electrolytic tilt sensors (blue triangles).

Complications obtaining a construction permit from the City of Encinitas delayed the installations of the high resolution sensors; as a result, the time series of deformation does not become available until 2025, the final year of the project. Some MEMS tilt sensors were emplaced in 2024 and observed anomalous tilts prior to the landslide in January 2024. A longer observation period is needed at Beacon's to determine if the high-resolution sensors are useful in predicting failures at the site.

Conclusions regarding the use of in-ground sensors for predictions:

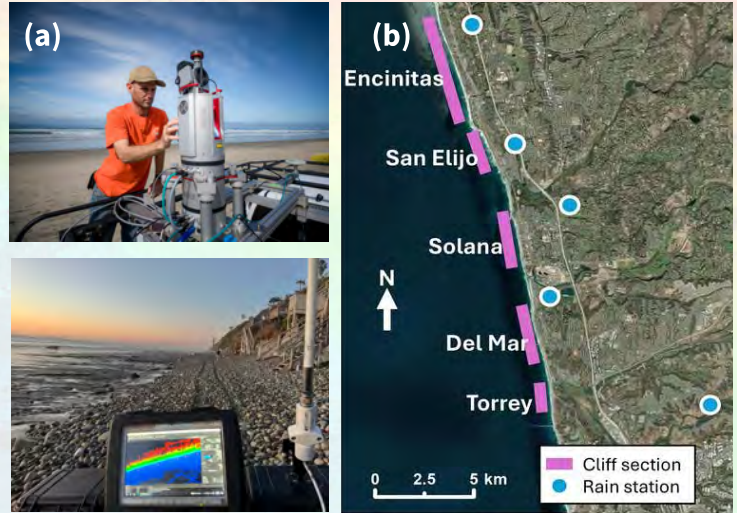
- Crack formation prior to failure indicates that routine visual inspections is useful
- Continuous monitoring in the days before a failure is needed
- There is a need for the State to establish a process where local authorities can take action if in-ground monitoring indicates that imminent failure is likely

4.2 Lidar mapping and regional warnings

Regional Probabilistic Warnings

Primary drivers of coastal cliff erosion processes include wave and rainfall^{11,12}. Waves erode the cliff base, causing cliff steepening, and increased cliff instability. Rainfall and associated groundwater can trigger landslides in unstable cliffs. To better understand the timing of cliff failure and rainfall triggering thresholds we conducted weekly topographic cliff mapping of five cliff sections from 2022-2025 along 20 km (~12 miles) of San Diego County coast from Torrey Pines State Beach to Encinitas. Mapping used mobile lidar systems and drone photogrammetry to provide detailed spatial maps (with resolution measured in inches). In total, the multiple repeated surveys accumulated about 4,000 total km (2500 miles) alongshore.

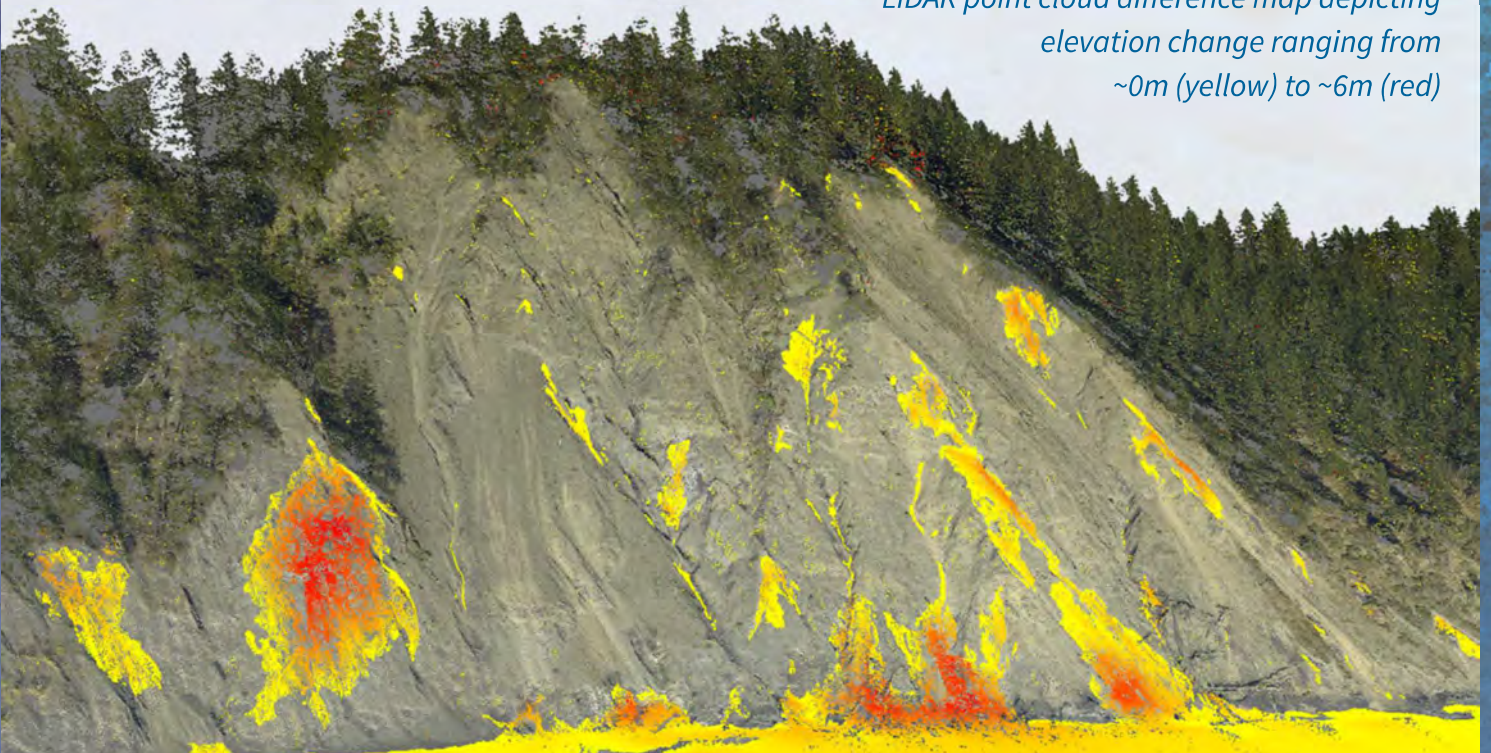
Analysis of these surveys shows the location and timing of the coastal landslides. The landslides were compiled into a regional database and compared to rainfall conditions during and prior to the landslide events.

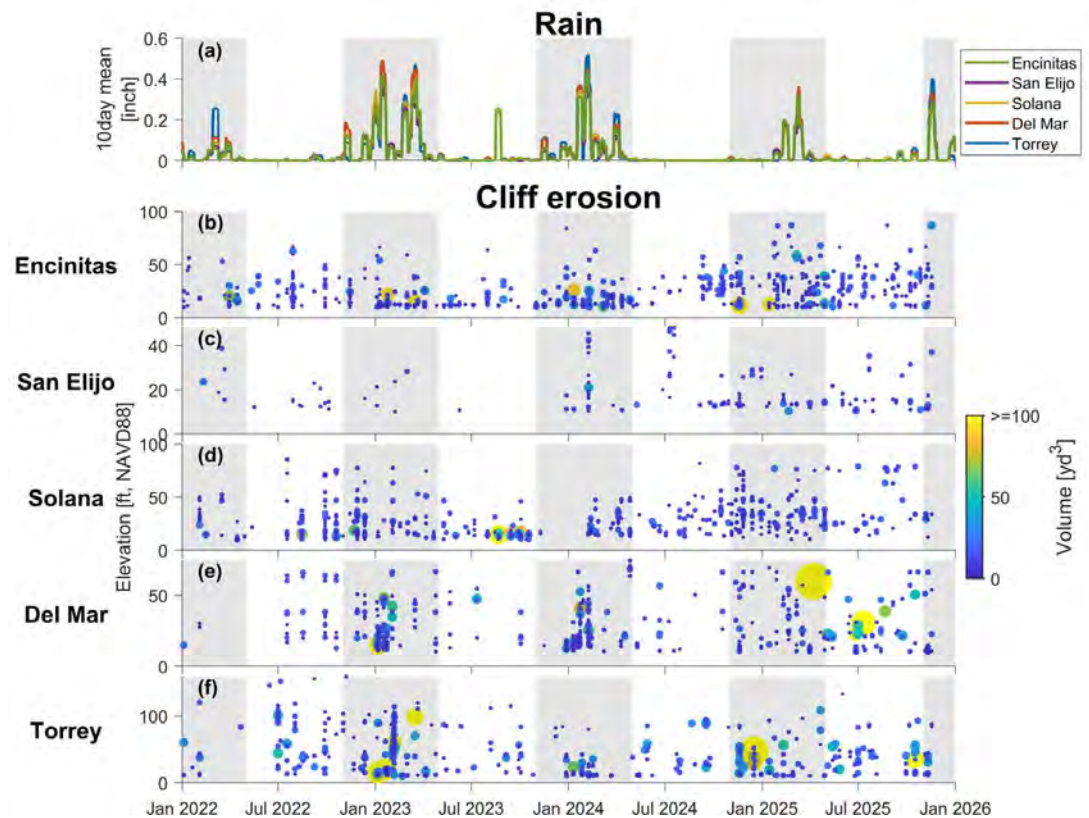


(a) Mobile LiDAR systems, and (b) study cliff and rain station locations.

A key component of this monitoring is the high temporal frequency that allows comparison with environmental conditions. The results provide preliminary environmental thresholds related to elevated coastal landslide activity and the foundation for a probabilistic, data-based, regional coastal landslide warning system.

LiDAR point cloud difference map depicting elevation change ranging from ~0m (yellow) to ~6m (red)



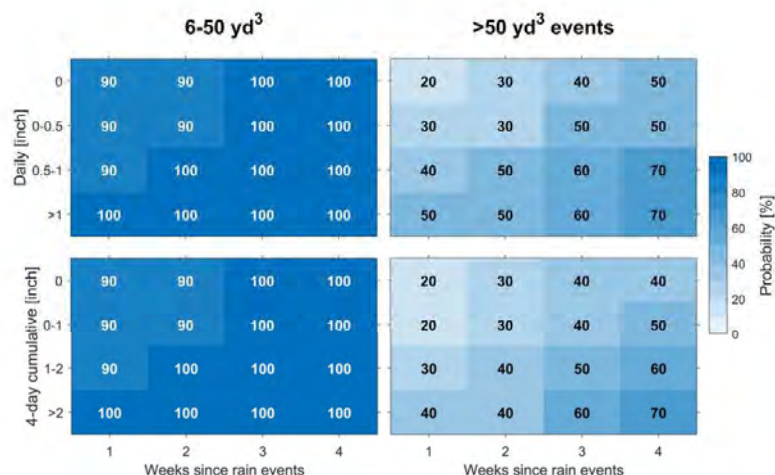


(a) Time series of 10-day average rainfall. (b-f) Cliff erosion events versus time and elevations. Marker size and color indicate erosion event volume. Vertical gray shades indicate winter months (Nov-Apr).

About 4,300 cliff erosion events were identified with a semi-automated method¹³ and manually inspected. Note, some erosion events involve the same landslide as failed material sometimes moves downslope in phases. The study focused on rainfall driven upper cliff erosion events greater than 6 yd³, originating at elevations >10 ft. Cliff erosion events plotted against elevation and time show complex space and time patterns of cliff erosion across the five study sections. Erosion events were generally concentrated during the winter months (gray shading), coinciding with periods of elevated rainfall. However, some erosion events also occurred during summer months with generally low rainfall.

Previous studies of the region show that rainfall strongly influences coastal cliff erosion¹⁴. In this study, we examined the probability of cliff erosion as a function of rainfall and the time elapsed following rainfall events. Five rain stations near the study sites provided daily rainfall observations data (blue markers).

The results indicate that higher rainfall and longer elapsed time since rainfall events increase the probability of a landslide. However, small to moderate magnitude erosion events (e.g. 6-50 yd³) are common and occur with relatively high probability (>90%), even under minimal rainfall. Large (e.g. >50 yd³) events are more episodic (3.6% of the database), and more sensitive to elevated rainfall conditions that increase the probability of the upper cliff failures. For example, there is a 70% probability of a large cliff failure in the study area within four weeks after a day with >1" rainfall. The results are based on a relatively short time period and should be considered preliminary.



Preliminary probability of a cliff somewhere within the study area failing as a function of (top panels) daily and (bottom panels) 4-day cumulative rainfall and elapsed time since preceding rain events. Numbers and colors represent percentage probabilities. Low-elevation (<10 ft) erosion events not included. Data was statistically smoothed and rounded.



4.3 Warning Protocols

When a prediction can be made, a plan of action for coastal managers, marine safety, rail operators, and other stakeholders needs to be developed to respond effectively. Currently no consistent protocols exist, in part because of liability issues and lack of response mechanisms. In some cases, response personnel are unable to take action because no prescribed procedure exists. A plan of action and protocols could involve several agencies and organizations such as:

- Marine safety units
- Offices of emergency management
- California Geological Survey
- National Weather Service

Possible actions for imminent failures:

- Temporary partial or full beach closure
- Temporary partial or full closure of the cliff top area
- Continuous monitoring
- Controlled proactive rockfall detachment
- Signage added to specific, at-risk locations (e.g., caution tape attached to cliffside)



Torrey Pines, 3 August 2007
Photo by Herb Knüfken

5.0 EDUCATION AND RESEARCH

5.1 Outreach

Reducing the likelihood of injury from landslides can be accomplished by better informing beachgoers. Below is a list of existing potential strategies and examples that could be expanded or implemented to increase hazard awareness.

Signage

Signage varies widely in placement, symbology, and messaging. Public perception of the cliff hazard ranges extensively in response to different signs¹⁵. Too many signs can be counterproductive and require consistent maintenance⁶. Effective signage includes both pictures and writing¹⁵, and pictorial and/or multilingual signage for non-native speakers. Signs should be eye-catching, depict real danger, include urgent language or images, for example, depictions of recent landslides ('15 days since last landslide', 'In 2020 two people died here'). Signage placement often includes beach entry locations, recent landslide locations, and on the cliff face. The most effective signage and placement locations are unknown and additional research is needed.

Public Service Announcements

Example: City of Encinitas safety PSA

Social Media Posts

Pop-up Events

Temporary pop-up events at popular beach entry points.

Example: CA Shark Beach Safety Program

Curricular Programs

Education programs targeted to youth at elementary schools and summer beach camps

Example: Encinitas Junior Lifeguard Handbook

Beach Safety Guides

Example: Encinitas Safe Beach Day Guide

Cliff Safety Awareness Month

Could be included into existing US National Beach Safety Week.

Example: Australia Cliff Safety Month (February)

California Cliff Failure Event Website

Lifeguard and State Parks Staff Training Programs

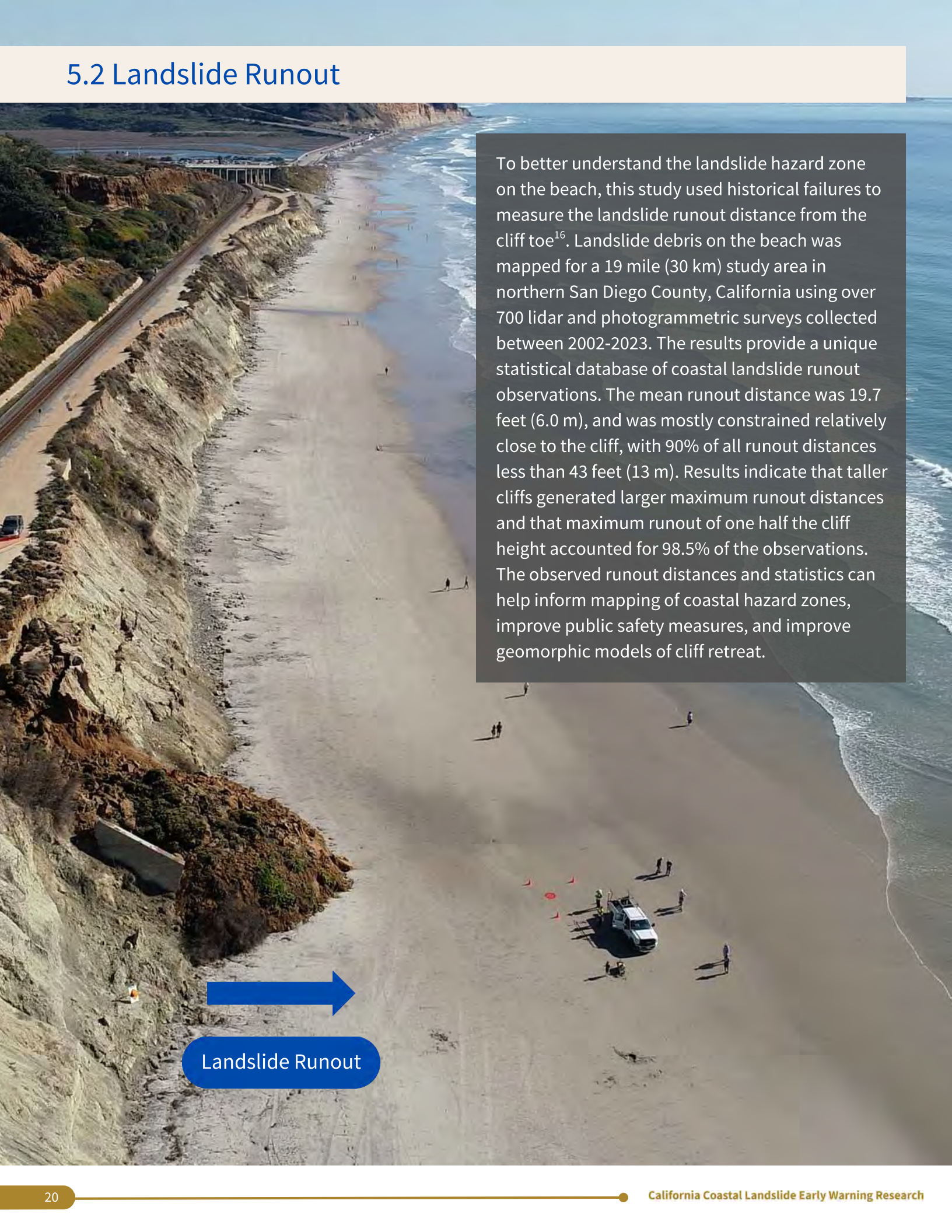
Consistent training programs could be developed and coordinated with the United States Lifesaving Association and CA State Parks Office of Community Involvement.

Media Engagement



5.2 Landslide Runout

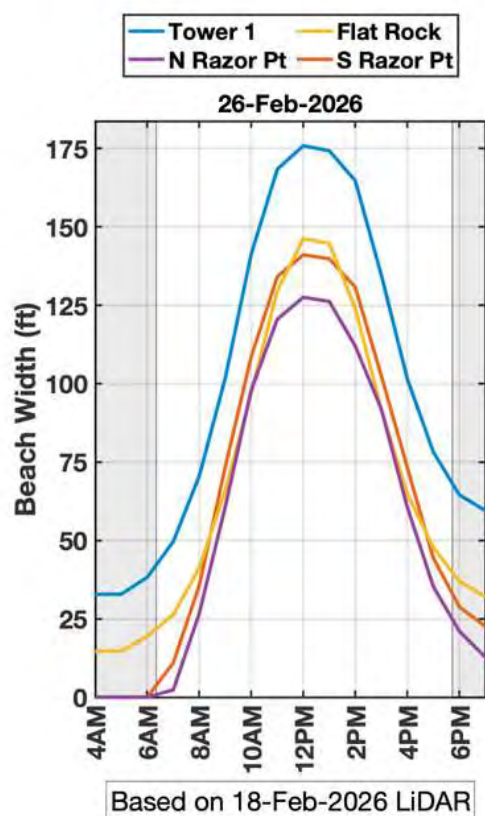
To better understand the landslide hazard zone on the beach, this study used historical failures to measure the landslide runout distance from the cliff toe¹⁶. Landslide debris on the beach was mapped for a 19 mile (30 km) study area in northern San Diego County, California using over 700 lidar and photogrammetric surveys collected between 2002-2023. The results provide a unique statistical database of coastal landslide runout observations. The mean runout distance was 19.7 feet (6.0 m), and was mostly constrained relatively close to the cliff, with 90% of all runout distances less than 43 feet (13 m). Results indicate that taller cliffs generated larger maximum runout distances and that maximum runout of one half the cliff height accounted for 98.5% of the observations. The observed runout distances and statistics can help inform mapping of coastal hazard zones, improve public safety measures, and improve geomorphic models of cliff retreat.

An aerial photograph showing a steep, eroded cliff on the left side of the frame. A sandy beach runs along the base of the cliff, meeting the ocean on the right. Several people are visible on the beach, and a white vehicle is parked near some orange survey markers. A large blue arrow points from the cliff face towards the beach, indicating the direction of landslide runout.

Landslide Runout

5.3 Beach Width Forecast Smartphone App

The ability to stay a safe distance from the coastal cliffs requires adequate beach width, which varies depending on the beach profile, incident wave conditions, and tide level. To help California State Parks staff and visitors plan beach walks, an experiential tool was developed to forecast the hourly beach width three days in advance at Torrey Pines State Beach. The beach width forecasts use the most recent Scripps beach survey, the latest nearshore wave forecast, and the predicted tide heights. The modeled forecast width represents the estimated distance from the cliff base to the wet/dry beach boundary and was calibrated to the site using over 100 GPS based walking tracks provided by a Torrey Pines docent. The three day beach width forecasts are provided in real time at four locations: Flat Rock Beach Stairs, South Razor Point, North Razor Point, and Lifeguard Tower 1 on the [Scripps Coastal Processes Group website](#). Razor Point is typically the beach walk “pinch point” with the narrowest dry widths. The tool provides an experimental example that could be applied to areas of interest.



Example of experimental mobile phone-friendly beach width forecast and associated map of Torrey Pines State Beach and beach width forecast locations.



CONTINUED RESEARCH

Our focused studies on landslides have been limited to San Diego County. There are numerous other coastal locations in California that pose threats to safety and infrastructure, necessitating an expanded research program. Some of the most significant landslides occur infrequently, requiring years of observations to understand them. Identifying the best observation strategy and measurement tools with the required sensitivity, deployment coverage, and affordable cost, can become more clear as longer records are collected. For example, our most sensitive sensors were installed at Beacon's Beach. As no significant failure occurred there since the instruments were in place, we don't yet know if their higher level of sensitivity (and higher cost) will prove useful for prediction. A statistical approach using historical data requires a lengthy period of time to acquire data to become practical.

Exactly what variables are best incorporated into a probabilistic prediction method will only become comprehensive as more data is collected, and will change over time as new observational methods and capabilities appear.

We recommend continuation of the current study with expansion to other locations. Some example candidates include Orange County, Palos Verdes, Santa Barbara County, Pismo/Shell Beach, Big Sur, Santa Cruz, Pacifica, Sonoma County, Fort Bragg, Lost Coast Headlands, and others. We also recommend establishing a long term funding source and Coastal Landslide Research Center to manage and distribute data products and coordinate statewide research activities.

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California Coastal Landslide Early Warning Research

UC San Diego



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adyoung@ucsd.edu



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STAFF REPORT

Meeting Date: September 18, 2026

Agenda Item: 4

To: BEACON Board of Directors
From: Marc Beyeler, BEACON Executive Director
Date: September 11, 2026

Subject: Grant Project Funding

RECOMMENDED ACTION:

Receive a presentation on BEACON grant funding and the status of grant project implementation.

DISCUSSION:

In order to undertake any projects, BEACON must rely on funding from other public agencies. Grant funding is essential to the successful implementation of BEACON planning and capital projects. In the past five years, BEACON has successfully competed for several grant awards from a range of state and federal agencies. Specifically, in the past two years, BEACON staff have completed multiple grant projects briefly described below. In addition, BEACON staff are currently administering multiple ongoing grants, also briefly described below. Periodically, BEACON staff brief the Board on grant funding.

Completed Grants 2025-2026

• **Debris Basin Project**

BEACON, working closely with Santa Barbara County Flood Control Agency, prepared through a consultant contract, the Debris Basin Best Practices Manual, which describes efforts in the south Coast to modify existing debris basins to minimize impacts to the natural environment and provide for improved sediment transport that nourishes local beaches.

• **Coastal Resilience Project**

The BEACON Coastal Resilience Project was established to address coastal resilience challenges by developing criteria for regional-scale sediment management and beach nourishment to support coastal adaptation. This innovative pilot program aimed to enhance regional sediment management practices while integrating nature-based solutions as part of multi-benefit coastal restoration projects, such as beach and dune restoration within the Santa Barbara Littoral Cell (SBLC).

The project report, produced in coordination with scientists at the USGS, the United States Geological Survey, Pacific Coastal and Marine Science Center, scientists at the University of California, including from both University of California Santa Barbara and the University of California San Diego and California Sea Grant, and California State University Channel Islands, outlines regional monitoring needs and opportunities for regional coastal adaptation and regional sediment management. The project report addresses essential adaptation monitoring topics, including physical, ecological, environmental, and social, identifying a select number of projects and initiatives underway or proposed to fill in these gaps in our data and information.

- **Governance Study**

A recent BEACON analysis, completed for BEACON by Integral Consulting, examined options for better integrating regional sediment management with climate and sea-level-rise (SLR) adaptation in California. The study reviewed regional sediment management plans (RSMs), local adaptation plans, BEACON member agencies' climate-vulnerability assessments, and completed a statewide practitioner survey, uncovering gaps, barriers, and coordination opportunities. Key findings highlight: integration of sediment-adaptation planning; governance and permitting obstacles; need to account for sediment variability in plans; funding and public-outreach challenges. The governance study recommended several activities that could aid in advancing RSM and coastal resilience. Two current initiatives supported by BEACON include the federal-state Coastal Sediment Management Workgroup (CSMW) implementing the California Sediment Master Plan, and regional sediment efforts in Southern California to form the Southern California Sand Collaborative (SCSC).

- **Coastal Access and Beach Visitation Research Pilot Project**

The pilot project sought to leverage cellphone-derived location data to estimate beach visitation, understand large-scale beach use patterns, and collect information on the origin and demographics of visitors. Initial research and analysis suggest that cellphone location-derived mobility data is a valuable addition to current beach use and user information under specific conditions. Importantly, cell data (or other mass or big data) was incorporated into an ongoing beach user monitoring program, supported by traditional on-the-ground beach count information. The pilot project revealed the need to develop elements of an integrated regional monitoring program that addresses data acquisition and data sharing protocols, as well as data hosting, accessibility, transparency, and usability.

Current On-going Grants 2026-2027

- **RCAMP-Regional Coastal Adaptation Monitoring Program Grant Project**

RCAMP is a collaborative project of BEACON, the City of Santa Barbara, and the California Coastal Commission. The Regional Coastal Adaptation Monitoring Program (RCAMP) will provide consistent data and analysis to implement coastal adaptation in the BEACON region, which encompasses Santa Barbara and Ventura Counties. The objectives of the program are to provide local management agencies with the information needed to assess whether changed conditions warrant new adaptation approaches and if implementation actions are resulting in regional resilience benefits or impacts. The RCAMP Monitoring Plan provides a roadmap for BEACON, its members, and

stakeholders to implement the RCAMP by establishing recommended monitoring strategies and pilot projects. The Monitoring Plan was developed in collaboration with BEACON members, a Science Advisory Committee, and stakeholders. Various monitoring parameters supporting physical, ecological, socioeconomic, and Chumash cultural purposes are evaluated and prioritized based on key objectives of the RCAMP. This phase of the grant project is to be completed in 2027.

- **BeachSMART Grant Project**

BeachSMART is a collaboration to inform and improve the way sediment is managed in Santa Barbara County. By focusing on natural watershed processes and exploring nature-based solutions, the project aims to build long-term resiliency for our beaches, creeks, and coastal communities like those in and around Goleta Slough. The BeachSMART Project is being led by the Santa Barbara County Flood Control District, with the support of State Coastal Conservancy, and in collaboration with BEACON, the County Planning and Development Department, County Parks Department, Santa Barbara County Promotores Network, and the County Sustainability Division.

In June, the BeachSMART project released its initial report focused on Data Analysis and Synthesis. The report summarizes available data and past sediment management efforts in Santa Barbara County to help inform future planning and decision-making. The findings will support the development of strategies that improve coastal resilience, beach health, and the beneficial reuse of sediment resources. Goleta Beach and Carpinteria City Beach are two beach placement sites identified in the report where sediment from debris basins is strategically placed for beach nourishment. At the end of August, the BeachSMART project released its Alternatives and Feasibility Draft Report. The draft report is currently being reviewed by BEACON staff and consultants, along with County staff and stakeholders. This fall the County will be organizing community outreach and input meetings on the draft report to support development of a final plan. This phase of the BeachSMART program to be completed in 2027.

- **Coastal Access and Beach Visitation Research Grant Project**

The current research phase to be completed by the end of 2026 will report on updated efforts to estimate beach visitation and to conduct on-the-ground coastal beach visitation counts and intercept surveys. A primary goal of BEACON's efforts is to improve the accuracy of beach visitation estimates by combining on-the-ground beach visitation data collection with new, novel data sources and methods, including large-scale mobility data, to create a more holistic view and set of data collection and monitoring methods to capture the social dimensions of beach use and access in Southern California.

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STAFF REPORT

Meeting Date: September 18, 2026
Agenda Item: 5A

To: BEACON Board of Directors
From: Executive Director
Date: September 10, 2026

Subject: Board Member Reports

Directors are invited to provide reports and updates on items of interest in their County or City.

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STAFF REPORT

Meeting Date: September 18, 2026
Agenda Item: 5B

To: BEACON Board of Directors
From: Executive Director
Date: September 11, 2026

Subject: Professional and Technical Services Contracts and Agreements

RECOMMENDED ACTIONS:

- i. Approve, ratify, and authorize the Chair to execute an Agreement with Santa Barbara County for Legal Services to BEACON with a period of performance from July 1, 2026, to June 30, 2027, in an amount not to exceed \$20,000 (Attachment I).
- ii. Approve, ratify, and authorize the Chair to execute Amendment No. 1 between BEACON and Jenna Wisnieski to increase the amount by \$7,425 for a revised total not to exceed \$32,425 without a change in the period of performance from July 1, 2026, to June 30, 2027, to support services BEACON will be providing to Santa Barbara County's BeachSMART program. (Attachment II).

DISCUSSION:

Operational Professional and Technical Services Agreements

BEACON supports its operational needs through a series of annual contracts and agreements for specialist services. BEACON staff is recommending that the Board approve a set of contracts and agreements that support the annual operations of BEACON. All BEACON organizational staff and professional services are conducted by contract consultants, or in the case of financial and legal services, under agreements with member agencies.

The important organizational agency and consultant agreements include an agreement with Santa Barbara County for legal services during FY 26/27, and an amendment to the FY26/27 agreement with Jenna Wisnieski for additional technical services to support BEACON participation on the Santa Barbara County Flood Control's BeachSMART Project.

ITEM 5B

ATTACHMENT I

FY26/27 Agreement with Santa Barbara County to provide Legal Services

AGREEMENT TO PROVIDE LEGAL SERVICES TO BEACH EROSION AUTHORITY FOR CLEAN OCEANS AND NOURISHMENT

This Agreement is made by and between the County of Santa Barbara for services of the County Counsel's Office ("County") and Beach Erosion Authority for Clean Oceans and Nourishment, a Joint Powers entity ("BEACON") (collectively referred to as, "Parties" or individually as, "Party").

WHEREAS, BEACON is in need of legal services in connection with the execution of its duties;

WHEREAS, the County, has been and is currently providing legal services to BEACON and BEACON desires to continue to receive legal services only through the County; and

WHEREAS, the County is authorized to provide legal services to BEACON at a cost not to exceed the actual costs of providing similar services to County departments, and at rates effective during the term of the Agreement.

NOW THEREFORE, to accomplish these objectives, County and BEACON enter into this service agreement ("Agreement"), as follows:

1. **Term of Agreement.** The Agreement shall cover the period of time from and including July 1, 2026 to and including June 30, 2027. This Agreement will renew each fiscal year thereafter with an annual amendment for each fiscal year's costs to update Section 4 of this Agreement and as agreed to by both Parties. Early termination may be made by either Party upon ninety (90) days notice in writing.
2. **Scope of Services.** County, through the County Counsel's Office, shall provide legal services as requested by BEACON, including: legal counsel, contract review, and liaison with BEACON Board and member agency staff as necessary.
3. **Legal Services and Costs.**
 - a. General Legal Services. Direct staff legal services and costs incurred shall be billed at actual hours at County Board approved contract service rates. Management services are covered within the participating staff contract rates as overhead, except for special projects if required. On signing the Agreement, the billing rate will be the County's various contract service rates adopted by the Board of Supervisors of the County effective during the term of the Agreement.
 - b. Other Legal Services. Other specialized services, litigation or special consulting services beyond the scope of Section 2 shall be provided at an additional cost to be agreed to in advance through an Amendment in accordance with Section 8 to this Agreement.
 - c. Billing. The method of billing for the costs of services under this Agreement shall be consistent with the normal billing processes established by the County Counsel's Office. The billing shall be presented with hours detail on the calendar quarter, approved by the BEACON Executive Director.

4. **Fiscal year 2026-27 Agreement Costs.** Legal services costs for FY2025-26 are not to exceed \$20,000 for legal services identified in Section 2. County agrees to notify BEACON if actual costs are within 10 percent of the not to exceed amount. If both Parties agree in writing to actual costs in excess of \$20,000 those costs will be authorized for reimbursement through an Amendment of the not to exceed amount or through an Amendment indicating that excess actual costs will be paid in the subsequent fiscal year.
5. **Policies and Procedures.** BEACON agrees that, for the services rendered under this Agreement, the County will not be required to establish separate policies and procedures from those applicable to the County. Such policies and procedures include but are not limited to guidelines on contracts, County ordinances, claims against the County reimbursement for County employee expenses, etc. Authorized travel shall be paid by County as part of overhead and will be reimbursed to staff members serving BEACON in accordance with County's travel policy in effect as of the date of the travel for which reimbursement is sought.
6. **Communication.** The County shall maintain an ongoing relationship with BEACON by providing a designated liaison from the management of the County Counsel's organization who will have the primary responsibility for providing the legal services. The designated liaison may meet as needed with the BEACON Executive Officer to review the services provided.
7. **Indemnification.** In lieu of and notwithstanding the pro rata risk allocation which might otherwise be imposed between the Parties pursuant to California Government Code Section 895.6, the Parties agree that all losses or liabilities incurred by a Party shall not be shared pro rata but instead all Parties agree that pursuant to California Government Code Section 895.4, each of the Parties hereto shall fully indemnify and hold each of the other Parties, their officers, board members, employees and agents, harmless from any claim, expense or cost, damage or liability imposed for injury (as defined by California Government Code Section 810.8) occurring by reason of the negligent acts or omissions or willful misconduct of the indemnifying Party, its officers, board members, employees or agents, under or in connection with or arising out of any work, authority or jurisdiction delegated to such Party under this Agreement. No Party, nor any officer, board member, employee or agent thereof shall be responsible for any damage or liability occurring by reason of the negligent acts or omissions or willful misconduct of other Parties hereto, their officers, board members, employees or agents, under or in connection with or arising out of any work, authority or jurisdiction delegated to such other Parties under this Agreement.
8. **Amendment.** Except as otherwise provided herein, this Agreement may be modified or amended only in writing and with the written consent of both Parties.
9. **Severability.** If any provision of this Agreement, or any portion thereof, is found by any court of competent jurisdiction to be unenforceable or invalid for any reason, such

provision shall be severable and shall not in any way impair the enforceability of any other provision of this Agreement.

10. **Venue.** The venue for any legal action filed by either Party in State court to enforce any provision of this Agreement shall be Santa Barbara County, California.
11. **Entirety of Agreement.** This Agreement constitutes the entire Agreement between the Parties relating to the specific subject of this Agreement and supersedes all previous agreements, promises, representations, understanding and negotiation, whether written or oral, among the Parties with respect to the subject matter hereof.
12. **Remedies Not Exclusive.** No remedy herein conferred upon or reserved to BEACON is intended to be exclusive of any other remedy or remedies, and each and every such remedy, to the extent permitted by law, shall be cumulative and in addition to any other remedy given hereunder or now or hereafter existing at law or in equity or otherwise.
13. **Execution of Counterparts.** This Agreement may be executed in any number of counterparts and each of such counterparts shall for all purposes be deemed to be an original; and all such counterparts, or as many of them as the parties shall preserve undestroyed, shall together constitute one and the same instrument.
14. **Survival.** All provisions of this Agreement which by their nature are intended to survive the termination or expiration of this Agreement shall survive such termination or expiration.

[This area intentionally left blank. Signatures on following page.]

IN WITNESS WHEREOF, this Agreement was executed by the Parties hereto and effective as of July 1, 2026.

Attest:

Jana Petersen
County Executive Officer
Clerk of the Board

**COUNTY OF SANTA BARBARA, a
political Subdivision of the State of
California**

By: _____
Deputy Clerk

By: _____
Name: Bob Nelson
Title: Chair, Board of Supervisors
Date: _____

Recommended for Approval:

Rachel Van Mullem
County Counsel

Approved as to Accounting Form:

Betsy Schaffer, CPA
Auditor-Controller

By: _____
Department Head

By: _____

Approved as to Form:

Risk Management

By: _____
Deputy

BEACON, a California Joint Powers Agency

By: _____
Name: Eric Friedman
Title: Chair, BEACON
Date: _____

Attest:

By: _____
Name: Marc Beyeler
Title: Executive Director

ITEM 5B

ATTACHMENT II

**FY2627 Amendment 1 to Agreement with Jenna Wisniewski for Technical
Support Services**

**Amendment No. 1
Between
Beach Erosion Authority for Clean Oceans and Nourishment
And
Jenna Wisniewski**

THE AGREEMENT (hereafter, "Agreement") made on May 22, 2026 by and between the BEACH EROSION AUTHORITY FOR CLEAN OCEANS AND NOURISHMENT (hereafter, "BEACON") and Jenna Wisniewski (hereafter, "CONTRACTOR"), individually referred to as Party, or collectively as Parties, is hereby amended ("Amendment No. 1") as follows:

Agreement Exhibit B, Payment Arrangements, Section A, and E are deleted in its entirety and replaced with:

- A. For CONTRACTOR services to be rendered under this Agreement, CONTRACTOR shall be paid a total Agreement amount, not including cost reimbursements, unless other described, up to but not to exceed \$32,425.
- E. Payment for services shall be fully loaded rate that includes, but not limited to, all overhead charges and indirect costs. The hour rate shall not exceed \$95.00. Payment for reimbursement of direct costs shall be at cost.

Ratifications. The terms and provisions set forth in this Amendment No. 1 shall modify and supersede all inconsistent terms and provisions set forth in the Agreement. The terms and provisions of the Agreement, except as expressly modified and superseded by this Amendment No. 1 are ratified and confirmed and shall continue in full force and effect, and shall continue to be legal, valid, binding, and enforceable obligations of the parties.

Counterparts. This Amendment No.1 may be executed in several counterparts, all of which taken together shall constitute a single agreement between the parties.

[Signatures on following page.]

IN WITNESS WHEREOF, this Amendment was executed by the Parties hereto and shall be effective as of September 18, 2026.

CONTRACTOR:

Jenna Wisniewski

**THE BEACH EROSION AUTHORITY FOR
CLEAN OCEANS AND NOURISHMENT:**

By: _____
Authorized Representative

Name: _____

Title: _____

By: _____
Chair
Board of Directors

Date: _____

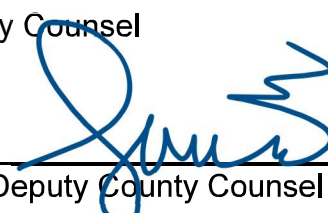
ATTEST:

Marc Beyeler
BEACON Executive Director
Clerk of the Board

By: _____

APPROVED AS TO FORM:

Rachel Van Mullem
County Counsel

By:  _____
Deputy County Counsel

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STAFF REPORT

Meeting Date: September 18, 2026

Agenda Item: 6

To: BEACON Board of Directors
From: Executive Director
Date: September 10, 2026

Subject: Executive Director's Report and Communications

The Executive Director will report on recent activities and achievements of BEACON, upcoming events of interest to the Board of Directors and the public, and general status of BEACON major projects, including the status of recent BEACON presentations on activities and accomplishments to our member agencies. There will be no Board discussion except to ask questions or refer matters to Staff; no action will be taken unless listed on a subsequent agenda.

September Meeting Agenda:

- A. Presentation
- B. Project Updates
- C. Review of FY 2027-2028 Budget Proposal and Member Dues

COASTAL MONITORING

Needs Assessment For California Communities



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About the California Coastal Accelerator

The Coastal Accelerator is an initiative that supports five coastal communities across California – Alameda, Fort Bragg, Oceanside, Santa Barbara, and Santa Cruz – to advance resilience projects and strengthen coastal leadership in five coastal communities across California. The Coastal Accelerator is working with five diverse coastal communities, spanning the entire state, that represent the array of coastal challenges California faces. Their challenges vary based on the geography, region, and community dynamics, but they all represent important issues to address to prevent the impacts of climate change on their local environments, economies, and people. Each community receives support tailored to its unique needs and local context - meaning no two cohort members will have the same experience. The Coastal Accelerator is designed to be adaptive, with programming that evolves in response to stakeholder input and on-the-ground realities. This approach ensures that each community maximizes the impact of the partnership while contributing to a broader, collaborative model that spreads best practices for coastal resilience across California.

Context and Framing

The California Coastal Accelerator brought together cohort members to discuss their individual and collective challenges to coastal monitoring practices, identifying gaps and surfacing common needs. This report synthesizes insights from the Cohort detailing existing monitoring mechanisms, data quality and accessibility, governance and funding challenges to identify opportunities to streamline and scale processes, expand access, and facilitate greater statewide alignment. While local contexts vary—from urban Southern California beaches to rural Northern California bluffs—common themes emerged around the need for consistent baselines, regional coordination, sustained funding, and better translation of data into decision-making.

Key Takeaways

California's coastal communities, experts, funders, and regulators consistently agree that monitoring is foundational infrastructure for climate adaptation, yet the practice remains fragmented, underfunded, and inconsistently supported at the state level. Across diverse community types, local governments are collecting significant amounts of coastal data, often driven by permitting requirements or short-term grants, but lack the sustained funding, analytical capacity, and statewide coordination needed to translate data into adaptive management and decision-making.

Across the Accelerator Cohort, municipal leaders identified the need for long-term, consistent monitoring programs to deliver the greatest value, even when methods are imperfect, and acknowledged that the primary bottleneck is no longer data collection, but data processing, analysis, and operational use.

The underlying request from these communities uniformly reiterated: local jurisdictions cannot effectively address their monitoring needs alone. Statewide coordination, supported by the Ocean Protection Council (OPC), the State Coastal Conservancy (SCC), and the Natural Resource Agency more broadly, is needed to define priorities, standardize metrics, and fund core monitoring capacity.

Existing monitoring approaches and persistent challenges faced by California's diverse coastal communities, represented by the Coastal Cohort, are detailed below, along with opportunities for statewide action to be considered by state policymakers and agencies that influence coastal resilience and/or require coastal monitoring.

Community Monitoring Landscape: High Level Overview

Location	Current Strengths	Remaining Gaps	Primary Need
Oceanside	Long-running SANDAG transects; Surfline data; drones; regional approach	Data processing capacity; CoastSnap backlog	Scalable analytics + adaptive management integration
Alameda	Permit-driven beach surveys; scientific advisor (SFEI); adaptation planning, targeted studies	No monitoring for hard shorelines, wetlands, groundwater	Clear governance + expanded scope funding
Santa Barbara	15 years of USGS transects; regional partnerships	Data largely unanalyzed; groundwater monitoring absent	State-funded data analysis + regional coordination
Fort Bragg	Grant-based baselines; county coordination; NOAA/C(O)OS	No sustained funding; rural capacity limits	State-led monitoring support for rural/tribal areas
Santa Cruz	Advanced decision-support concept; multiple data feeds	Tool development dormant; minimal operational funding	State-defined metrics, data analysis + funding to operationalize

Cross-Cutting Themes and Gaps

1. Baseline Consistency and Longevity

The most valued monitoring programs (e.g., SANDAG, USGS, etc.) are those that have been maintained consistently over decades, even if methods are imperfect. Long-term continuity enables identification of big trends and builds scientific and political credibility.

2. Data Collection vs. Data Use

Across regions, data are often collected but not processed, analyzed, or translated into actionable insights. Image-based tools (e.g., CoastSnap, cameras, satellites) generate vast datasets without sufficient capacity, automation, or funding for analysis.

3. Regional Scale Matters

Natural systems (e.g., littoral cells, sediment transport) do not align with jurisdictional boundaries. Regional approaches reduce conflict, improve scientific validity, and offer cost savings, but require governance structures and facilitation.

4. Funding Misalignment

State agencies have historically shown a reluctance to fund ongoing monitoring or decision-support tools. Local jurisdictions bear the burden of proving that existing data are insufficient, even when consultants and scientists agree otherwise. In the past, federal agencies have shown more investment in monitoring efforts, through NOAA, USGS, and other agencies, allowing for state agencies to continue preferencing project-based and short-term funding, and intermittent, “emergent” funding needs for projects like coastal armoring, over long-term, sustained monitoring investments. This reactive versus preventative approach has proven less effective and often short-sighted, but recent policy and legislative trends, both at the state and national level, have signaled an opportunity for California to consider new approaches.

5. Governance and Ownership Challenges

Unclear management authority (e.g., Alameda beaches, Santa Barbara regional programs) undermines accountability and follow-through. Joint Power Authorities (JPAs) and regional entities often lack the ability to directly receive or manage funds.

6. Technology and AI: Opportunity with Caution

Participants see potential for AI, satellite data, and automated analytics to dramatically reduce processing burdens, but emphasize the need for consistent inputs, clear state guidance, and consideration of environmental and energy impacts.

Opportunities for Scaling and Statewide Action

- **State-Funded Data Analysis:** Invest in processing and standardizing existing datasets before commissioning new data collection.
- **Regional Monitoring Frameworks:** Encourage and fund monitoring at the littoral cell or regional scale, with clear governance and shared ownership.
- **Standard Metrics and Guidance:** Define a core set of required or recommended monitoring practices (e.g., shoreline position, groundwater rise, wave climate) informed by pilots and best practices.
- **Capacity Building Models:** Framing monitoring as workforce development, tribal stewardship, or community science where appropriate may better create opportunities for supporting statewide initiatives. Lack of capacity to process and manage existing coastal monitoring data indicates opportunity for growth statewide.
- **Collective Advocacy:** Coordinate a multi-jurisdictional ask to the Governor’s Office, OPC, and State Coastal Conservancy—particularly as Prop 4 funding is deployed—to elevate monitoring as foundational coastal infrastructure.

Strategic Recommendations and State-Level Asks

The following recommendations are concrete actions for the Ocean Protection Council (OPC), State Coastal Conservancy (SCC), and the Governor's Office, recognizing their complementary roles in science, funding, and statewide coordination. Importantly, they are not new obligations, and instead operationalize existing mandates and funding authorities, particularly under Proposition 4, the California Climate Adaptation Strategy, and OPC's science mandate.

1. Treat Coastal Monitoring as Core Climate Infrastructure

The Governor's Office, in coordination with OPC, should formally recognize coastal monitoring as foundational infrastructure for climate adaptation—on par with flood mapping or wildfire risk assessment.

- Establish a statewide mandate or directive that monitoring is a prerequisite for adaptive management, not an optional project add-on.
- Reduce the burden on local jurisdictions to repeatedly justify why existing data are insufficient when scientific consensus already supports this need.

Policy Alignment

- Monitoring is prerequisite infrastructure for effective deployment, according to Prop 4 which seeks to advance climate resilience investments that protect communities and natural systems
- Directly advances the CA Climate Adaptation Strategy's goal of grounding adaptation in best available science and actionable information
- Positions OPC as the science-to-decision bridge for coastal resilience

2. Fund Data Analysis and Operationalization—Not Just Collection

OPC and SCC should dedicate funding explicitly for processing, analyzing, and operationalizing existing datasets, including imagery, transects, and groundwater information. Data collection has been relatively successful at the municipal level, but lack of capacity to process and use data renders it irrelevant.

- Prioritize unlocking value from decades of existing data (e.g., USGS transects, CoastSnap, SCOOOS/C(O)OS cameras).
- Support automation, analytics, and decision-support tools that convert raw data into actionable insights.

Policy Alignment

- Eligible as climate resilience implementation support under Prop 4, maximizing ROI of prior public investments
- Supports the CA Climate Adaptation Strategy's Actionable Science priority: translating data into decisions
- Aligns with OPC's role to ensure science & data is not just collected, but also used

3. Define a Statewide Set of Standard Monitoring Metrics

OPC, with Ocean Science Trust and California Council on Science and Technology, should convene a technical process to define core coastal monitoring metrics. This would reduce bespoke local systems, increase transferability, and provide clarity for permitting and funding. Examples of potential core metrics could include:

- Shoreline position and erosion rates
- Beach volume and sediment transport
- Bluff edge position and retreat
- Wave climate and extreme events
- Groundwater rise and salinity in coastal zones

Policy Alignment

- Creates efficiency and consistency for Prop 4-funded projects statewide
- Advances statewide coordination and consistency across regions
- Core to OPC's coordination and standard-setting role

4. Invest in Regional Monitoring Frameworks Aligned with Natural Systems

SCC should prioritize funding for regional monitoring entities aligned with littoral cells or coastal systems, rather than individual jurisdictions.

- Build on successful models like SANDAG and BEACON (with improved governance).
- Provide facilitation and consensus-building resources that demonstrate unbiased data based on the coastal geography over city, county, or regional designations, to address cross-jurisdictional concerns.

Policy Alignment

- Enables regional-scale resilience investments and cost savings for Prop 4 funding
- Supports system-scale adaptation beyond jurisdictional boundaries
- Reinforces OPC's mandate to coordinate across agencies and regions

5. Support Rural, Tribal, and Capacity-Limited Communities

The Governor's Office and the State Coastal Conservancy should create dedicated pathways for rural and tribal coastal monitoring, framed as capacity building and stewardship.

- This support will facilitate better workforce development, tribal monitoring, and long-term stewardship.
- Work should be framed as on-going stewardship rather than Operations & Maintenance, since "O&M" has historically been difficult to fund and maintain support for.

- Ensures large counties and remote coastlines are not structurally disadvantaged.
- Approaches must be nuanced, based on the geography and communities involved. Tribes have varying degrees of resources for monitoring, and some already actively engage in monitoring practice, but don't regularly share that data.

Policy Alignment

- Aligns with Prop 4 equity and capacity-building intent
- Advances equitable adaptation and avoids structural disadvantage
- Supports inclusive science access and participation

6. Leverage Emerging Technology for Public Benefit

The Governor's Office, along with the State Attorney General's Office should explore mechanisms to negotiate public-benefit data contributions from tech and AI organizations operating in California, including:

- Aligned with SB53 legislation, coastal monitoring efforts could present a great use case in public application of data and help define clear legal parameters for State agencies managing data and technology.
- Apply emerging satellite, AI, and automated analytics to reduce local capacity burdens.
- Ensure guidance on best practices, energy use, and environmental impacts accompanies deployment.

Policy Alignment

- Maximizes public return from private-sector innovation
- Encourages innovation in climate tools and methods
- Fits OPC's science innovation and evaluation role

Conclusion

Ultimately, all these actions require a statewide body to manage them, and together could result in the establishment of a California Coastal Monitoring Initiative, in order to best align science, funding, and governance across regions, synthesizes lessons from pilot projects, and more directly feed into permitting, adaptation planning, and asset management. This approach not only will operationalize the CA Climate Adaptation Strategy's science and monitoring goals, but also provide an implementation vehicle for Prop 4 coastal investments and consequently will establish OPC as the coordinating science authority for California.



Addendum: Detailed Existing Monitoring Approaches

Alameda (San Francisco Bay)

Alameda's shoreline monitoring is fragmented and largely project- or permit-driven:

- BCDC Permit Requirements: Twice-annual beach surveys tied to shoreline permits; data analyzed by SFEI as part of a grant-funded scope of work.
- Sand Management by East Bay Regional Park District: Periodic sand replenishment and redistribution, though without a broader adaptive monitoring framework.
- Adaptation Planning Support: CMG Landscape & Pathways Climate Institute coordinates adaptation projects, with SFEI serving as a scientific advisor.

Significant gaps exist outside the sandy beach area, including hard shoreline infrastructure, wetlands, groundwater rise and salinity, and bayfront erosion along trails. Governance complexity—particularly unclear roles between the City and EBRPD—complicates both monitoring and adaptation implementation.

Fort Bragg (North Coast)

Fort Bragg represents the challenges of small, rural jurisdictions:

- Grant-Funded Baseline Studies: Sea level rise analyses and LCP Round 8 grants coordinated with Mendocino County to ensure consistent datasets.
- NOAA / C(N)OOS Data: Anticipated integration with regional ocean observation systems, though spatial gaps and lag times remain an issue.
- Project-Driven Monitoring: Water quality monitoring tied to aquaculture feasibility and wave-powered desalination pilots, often at high cost (\$40k/year) unless managed locally or through nonprofits.

Key issues include lack of sustained funding, limited local capacity, and difficulty accessing nearby data sources. There is strong interest in state-led or tribally-framed monitoring initiatives that emphasize capacity building rather than traditional “operations and maintenance.”

Oceanside (Greater San Diego)

Oceanside benefits from a relatively robust monitoring ecosystem anchored by regional and private-sector partnerships. Key mechanisms include:

- SANDAG Shoreline Monitoring Program: Biannual beach width and volume surveys along established transects since 1997, providing one of the longest continuous datasets in the state.
- Surfline / Coastal Intelligence Program: Surf and beach attendance data, public-facing cameras, and analytics, funded in part through a California Coastal Commission RE:BEACH grant to establish pre-project baselines.
- Drone Surveys: Quarterly drone-based shoreline monitoring extending into Carlsbad to capture down-coast impacts, integrated through an existing prime contract with GHD.

Strengths include long-term consistency, regional scale, and integration with nourishment and bypass projects. Challenges center on data processing capacity (e.g., CoastSnap images), reliance on consultants, and the need for adaptive management plans tied to baseline monitoring.

Santa Barbara (South Central Coast)

Santa Barbara illustrates both the promise and pitfalls of regional monitoring:

- BEACON Partnership: A regional collaboration across Santa Barbara and Ventura counties, similar in concept to SANDAG.
- USGS Field Transects: Nearly 15 years of beach and shoreline data collected, but largely unprocessed and underutilized;
- NOAA: Historically robust federal monitoring programs, but collaboration is challenged by governance and prioritization constraints and funding eligibility (including, but not limited to, JPA limitations)
- RCAMP (Regional Coastal Adaptation and Monitoring Program): Intended to align data for regional adaptation decision-making, but challenged by staffing capacity, funding, and unclear role of state and federal partners

Despite substantial data collection, the region faces a critical bottleneck in data analysis and application. The City is currently paying significant consultant costs for basic shoreline metrics, while groundwater rise and salinity—already affecting wastewater systems— remain largely unmonitored. There is strong consensus that data exist, but state-level investment is needed to analyze, standardize, and operationalize it.

Santa Cruz (Central Coast)

Santa Cruz has invested heavily in planning and conceptual monitoring tools, but struggles with implementation:

- LCP Amendment (Beaches and Bluffs): Recently completed, incorporating adaptation pathways and coastal monitoring specifications.
- Existing Data Sources: Tidal gauge data, SCOOS cameras at the wharf, surf community monitoring, potential use of Surfline cameras and CoastSnap via university partnerships.
- Coastal Change Monitoring Network & Decision Support Tool: A public-facing dashboard and backend analytics engine developed through prior grants, currently development is dormant due to lack of funding.

The City estimates an initial \$350k to operationalize the system, with relatively low ongoing costs but a need for at least 0.25 FTE staff capacity. Santa Cruz is cautious about bespoke systems that cannot be scaled or transferred statewide, and prefers state-defined metrics, data analysis and funding to support consistent implementation.

