Shoreline Preservation Working Group Agenda

Thursday, December 5, 2024
11:30 a.m.

Welcome to SANDAG. The Shoreline Preservation Working Group (SPWG) meeting scheduled for Thursday, December 5, 2024, will be held in person in the SANDAG Board Room. While SPWG members will attend in person, members of the public will have the option of participating either in person or virtually.

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Persons who wish to address the members on an item to be considered at this meeting, or on non-agendized issues, may email comments to the Clerk at clerkoftheboard@sandag.org (please reference SPWG meeting in your subject line and identify the item number(s) to which your comments pertain). Comments received by 4 p.m. the business day before the meeting will be provided to members prior to the meeting. All comments received prior to the close of the meeting will be made part of the meeting record.

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Mission Statement: *We are the regional agency that connects people, places, and innovative ideas by implementing solutions with our unique and diverse communities.*

Our Commitment to Equity: *We hold ourselves accountable to the communities we serve. We acknowledge we have much to learn and much to change; and we firmly uphold equity and inclusion for every person in the San Diego region. This includes historically underserved, systemically marginalized groups impacted by actions and inactions at all levels of our government and society.*

We have an obligation to eliminate disparities and ensure that safe, healthy, accessible, and inclusive opportunities are available to everyone. The SANDAG equity action plan will inform how we plan, prioritize, fund, and build projects and programs; frame how we work with our communities; define how we recruit and develop our employees; guide our efforts to conduct unbiased research and interpret data; and set expectations for companies and stakeholders that work with us.

We are committed to creating a San Diego region where every person who visits, works, and lives can thrive.

Shoreline Preservation Working Group

Thursday, December 5, 2024

Comments and Communications

1. Non-Agenda Public Comments/Member Comments

Members of the public shall have the opportunity to address the Shoreline Preservation Working Group (SPWG) on any issue within the jurisdiction of SPWG that is not on this agenda. Public speakers are limited to three minutes or less per person. Public comments under this agenda item will be limited to five public speakers. If the number of public comments under this agenda item exceeds five, additional public comments will be taken at the end of the agenda. SPWG members and SANDAG staff also may present brief updates and announcements under this agenda item.

Consent

+2. Approval of Meeting Minutes — Approve

Francesca Webb, SANDAG

The SPWG is asked to approve the minutes from its Thursday, September 5, 2024 , meeting.

Meeting Minutes

Reports

+3. Sediment Management Technical Taskforce - Oceanside Littoral Cell Recommendations — Discussion

Keith Greer, SANDAG

The SPWG is asked to provide feedback on the proposed recommendations made by the Sediment Management Technical Taskforce.

SMTT - Oceanside Littoral Cell Recommendations
Att. 1 - SMTT-OLC Meeting Key Takeaways
Presentation

+4. State of California Sea Level Rise Guidance: 2024 Science and Policy Update — Information

Justine Kimball, Ocean Protection Council

Ocean Protection Council staff will present an overview on the recent science and policy updates made to the State of California Sea Level Rise Guidance.

State of California Sea Level Rise Guidance: 2024 Science and Policy Update Presentation

+5. City of San Clemente Beach Nourishment Project Updates & Half-Cent Sales Tax Funding Measure — Information

Leslea Meyerhoff, San Clemente Coastal Administrator

City of San Clemente staff will present an update on the City's sand nourishment projects and recent half-cent sales tax.

San Clemente Beach Nourishment Project Updates and Half-Cent Sales Tax Funding Measure Presentation

6. **Adjournment**
   The next SPWG meeting is scheduled for Thursday, March 6, 2025, at 11:30 a.m.

+ next to an agenda item indicates an attachment
* next to an agenda item indicates that the Board of Directors also is acting as the San Diego County Regional Transportation Commission for that item

December 5, 2024

September 5, 2024, Meeting Minutes

View Meeting Video

Chair Dwight Worden (Del Mar) called the meeting of the Shoreline Preservation Working Group (SPWG) to order at 11:30 a.m.

1. Public Comments/Communications/Member Comments

Public Comments: Steve Maschue, Dirk Ackema, Kathryn Rhodes, and Tom Cook.

Member Comments: Councilmember Mitch McKay (City of Imperial Beach) and Councilmember Joe LaCava (City of San Diego).

Agency Comments: None.

Consent

2. Approval of Meeting Minutes

The SPWG was asked to approve the minutes from its Thursday, March 7, 2024, meeting.

Public Comments: None.

Action: Upon a motion by Councilmember Kristi Becker (City of Solana Beach), and a second by Councilmember McKay, the SPWG voted to approve the Consent Agenda.

The motion passed.

Yes: Chair Worden, Councilmember Mike Donovan (Coronado), Councilmember McKay, Councilmember Jose Rodriguez (National City), Councilmember LaCava, and Councilmember Becker.

No: None.

Abstain: Councilmember Joy Lyndes (Encinitas), Councilmember Eric Joyce (Oceanside), and Jessica Curren (US Navy).

Absent: Carlsbad, Chula Vista, Port of San Diego, and County of San Diego.

Reports

3. FY 2025 Work Plan Overview

Associate Regional Planner Courtney Becker presented an overview of the draft SPWG FY 2025 Work Plan. SPWG members were asked to review and provide any input on the draft FY 2025 Work Plan.

Public Comments: Kathryn Rhodes.

Action: Discussion.

4. Regional Shoreline Monitoring Program: 2023 Annual Report Update

Greg Hearon, Coastal Frontiers Corporation presented an overview of 2023 Regional Shoreline Monitoring Program (RSMP) results and an update on the current RSMP contract.

Public Comments: Kathryn Rhodes.

Action: Information.

5. Regional Beach Sand Project III: Phase I Update

The SPWG members were asked to review the proposed quantities, footprints, and preliminary results from the economic analysis for Regional Beach San Project (RBSP) III for each coastal jurisdiction and provide feedback and recommendations to proceed.

Public Comments: Suzie Whitelaw and Kathryn Rhodes.

Action: Discussion.

6. Adjournment

The next SPWG meeting is scheduled for Thursday, December 5, 2024, at 11:30 a.m.

Chair Worden adjourned the meeting at 1:14 p.m.

Confirmed Attendance at Shoreline Preservation Working Group Meeting

Jurisdiction	Name	Attended
City of Carlsbad	Councilmember Carolyn Luna	No
	Mayor Keith Blackburn	No
City of Chula Vista	Mayor John McCann	No
	Vacant	n/a
City of Coronado	Councilmember Mike Donovan	Yes
	Councilmember John Duncan	No
City of Del Mar	Councilmember Dwight Worden, Chair	Yes
	Councilmember Terry Gaasterland	No
City of Encinitas	Councilmember Kellie Hinze	No
	Deputy Mayor Joy Lyndes	Yes
City of Imperial Beach	Councilmember Mitch McKay	Yes
	Mayor Paloma Aguirre	No
City of National City	Councilmember Jose Rodriguez	Yes
	Councilmember Marcus Bush	No
City of Oceanside	Deputy Mayor Ryan Keim	No
	Councilmember Eric Joyce	Yes
Port of San Diego	Commissioner Dan Malcolm	No
	Eileen Maher	No
City of San Diego	Councilmember Joe LaCava	Yes
	Councilmember Jennifer Campbell	No
County of San Diego	Supervisor Terra Lawson-Remer	No
	Supervisor Joel Anderson	No
City of Solana Beach	Councilmember Kristi Becker	Yes
	Deputy Mayor David Zito	No
U.S. Navy	Jason Golumbfskie-Jones	No
	Jessica Curran	Yes
Advisory Members		
California Coastal Commission	Kanani Leslie	No
National Marine Fisheries Service	Bryant Chesney	No
State Department of Fish and Wildlife	Leslie Hart	No
State Department of Parks and Recreation	Darren Smith	No
State Lands Commission	Kenneth Foster	No
U.S. Army Corps of Engineers	Heather Schlosser	No

California Coastal Coalition	Steve Aceti	No
California Lobster and Trap Fishermen's Association	Vacant	No
Coastal Environmental Rights Foundation	Marco Gonzalez	No
Scripps Institute of Oceanography	Dr. Reinhard Flick	Yes
Southern California Tribal Chairmen's Association	Michael Connolly	No
Surfrider Foundation	Mitch Silverstein	No
Caltrans	Reece Allen	Yes

December 5, 2024

Sediment Management Technical Taskforce: Oceanside Littoral Cell Recommendations

Overview

A littoral cell is a self-contained coastal unit that includes the sources, transport paths, and sinks of sediment. The San Diego Region has three littoral cells – referred to as the Oceanside, Mission and Silver Strand littoral cells. In 2023, the Shoreline Preservation Working Group formed a Sediment Management Technical Taskforce (SMTT) to understand how sediment moves within the Oceanside Littoral Cell using the best available science, as well as to identify gaps in data or policies, and challenges with sediment management.

After meeting over the past 12 months, the SMTT developed a set of recommendations that will be presented to the Shoreline Preservation Working Group for consideration.

Action: **Discussion**

The Shoreline Preservation Working Group is asked to provide feedback on the proposed recommendations made by the SMTT.

Fiscal Impact:

No impact to Shoreline Management FY 2025 Overall Work Plan. Future work would be considered by the Board of Directors as part of the FY 2026 budget.

Schedule/Scope Impact:

No impact to Shoreline Management FY 2025 Overall Work Plan. Future work would be considered by the Board of Directors as part of the FY 2026 budget.

Key Considerations

- The SMTT was a short term, technical group that allowed for in depth discussions on how sediment moves within the Oceanside Littoral Cell. The SMTT was comprised of technical experts, coastal managers, and interested parties located within the Oceanside Littoral Cell.
- The formation of the SMTT was suggested in 2009 as part of SANDAG's San Diego Coastal Regional Sediment Management Plan (CSMP).
- SANDAG hosted five 90-minute meetings of the SMTT over the course of a year.
- Meeting topics ranged from existing regional shoreline monitoring programs, current understanding of how sediment moves within the littoral cells, lagoon inlets maintenance and challenges, and a review of the existing SANDAG Shoreline Policy documents.
- The SMTT has prepared several recommendations for the Shoreline Preservation Working Group consideration as follows:
    - Update and combine SANDAG Shoreline Policy documents into one comprehensive plan to reflect current science, updated sand retention strategies, new sea level rise policies, and lessons learned from Southern California peer agencies. Form a science and engineering taskforce to help guide the plan development. Include other Southern California peer agencies as advisors.
    - Seek funding to perform a Sand Tracer Study to analyze where sand moves within sub-littoral cells, particularly near lagoon inlets and harbors.
    - Combine SANDAG and Scripps Institution of Oceanography shoreline monitoring data into one online open data portal to holistically visualize sediment movement and beach width trends over time.

- Develop and maintain one regional Sand Compatibility Opportunistic Use Permit (SCOUP) to streamline sand nourishment opportunities rather than each individual coastal city obtaining individual SCOUP permits.
- Develop regional consensus to install and monitor at least one pilot sand retention project to test reducing loss of beach sand while minimizing down shore impacts.

Next Steps

The Shoreline Preservation Working Group is asked to provide feedback on the proposed recommendations made by the SMTT. Based upon the discussion, SANDAG staff will incorporate the recommendations into the workplan for SANDAG Shoreline Management Program for Fiscal Year 2026.

Keith Greer, Deputy Director of Regional Planning

Attachment: 1. SMTT-OLC Meeting Key Takeaways
   a. September 28, 2023, Meeting
   b. January 18, 2024, Meeting
   c. March 21, 2024, Meeting
   d. May 16, 2024, Meeting
   e. August 15, 2024, Meeting

Sediment Management Technical Taskforce (SMTT-OLC) Meeting
Thursday September 28th, 2023
Key Takeaways

An Altered System - Historic input of sediment from rivers (~50-66% of total) and coastal bluffs (33-50% of total) has been largely eliminated (estimated to be 50% reduction of total sediment supply) due to dams and coastal development.

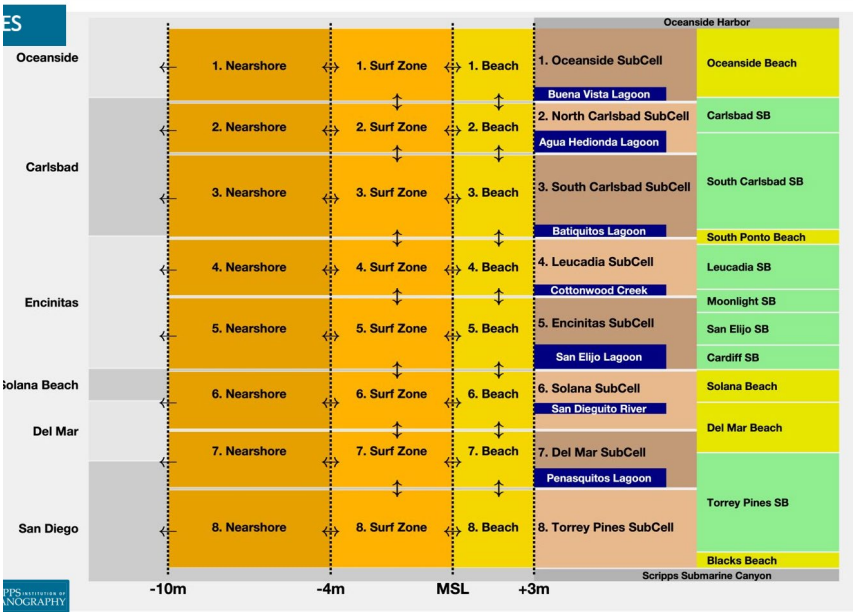
- A significant amount of sand does not move through the system uninterrupted. Some is "lost" offshore, seemingly much more than previously thought, and coastal development impacts sediment movement along the coast.
    a. From 2000-2022, ~6.99 million cubic yards of sand was input (i.e., harbor dredging and beach nourishment) into Oceanside and North Carlsbad, but only ~1.8 million cubic yards was bypassed (i.e., sand placed south of Agua Hedionda Lagoon's cool water jetties/ northern inlet at Middle Beach or South Beach).

Historical Conceptual Oceanside Littoral Cell Model and understanding of the "River of Sand" is overly simplistic and a better conceptual model, supported with data and observations, is needed. Current project planning, future implementation and monitoring could all benefit from this improved understanding.

Current Conceptual Oceanside Littoral Cell Model – The cell appears to operate in smaller compartments (sub-cells). Between Oceanside Harbor and the Scripps Submarine Canyon there appear to be 8 sub-cells, separated primarily around creek and lagoon inlets.

- Reefs, coastal orientation, wave shadowing, and other offshore characteristics (e.g., Carlsbad Submarine Canyon) affect longshore sediment movement in these cells.
- Cross shore transport is a more significant factor than previously estimated in the littoral cell. The 8 Sub-Cells are thought to include 3 cross-shore zones (Nearshore, Surf Zone, Beach) = 24 Sand Budget Compartments (see Figure 1). Sand movement between these cross-shore zones are understood to operate as follows:
    a. Sand in the Nearshore, between water depths of -4m and -10m (i.e., approximate depth of closure), may take multiple years to move into the Surf Zone and potentially onto Beach, if not lost offshore.
    b. Sand in Surf Zone, between mean sea level (MSL) and -4m can migrate annually migrate onto the beach. The sand may also move deeper into the nearshore during a significant wave event, or alongshore (north or south) into another Surf Zone compartment.

Figure 1. Oceanside Littoral Sub-cells and Cro



Shore Transport
Source: Dr. Bill O'Reilly, SIO Coastal Processing Group

Longshore Transport Potential Observations in the Oceanside Littoral Cell (2001-2023) – Based on an analysis of modeled wave data from local buoys over the last two decades, below area several key findings regarding longshore transport magnitude and directionality in the littoral cell (see Figure 2):

- El Niño winters and atmospheric river conditions support sediment flowing **offshore and southward** (i.e., more like the traditional understanding of the southward migrating river of sand).
- Non-El Niño winters have observed transport reversals around lagoon and creek mouths where sediment flows **northward**.
- Long period swell (T > 11s), on average support more **northward** transport.
- Short period swell (T < 11s), on average support more **southward** transport.
- The magnitude of net sediment transport varies along the coast depending on wave exposure, as a function of coastal orientation (and storm generation area) and nearshore wave refraction along certain reaches of shorelines.
    a. For example, the Oceanside sub-cell has the weakest annual total potential wave-driven sand transport. With trends over the last decade indicating a slightly predominant **northward** transport.
    b. Maximum **southward** transport rates increase as you go from north (Oceanside) to south (Scripps Submarine Canyon).

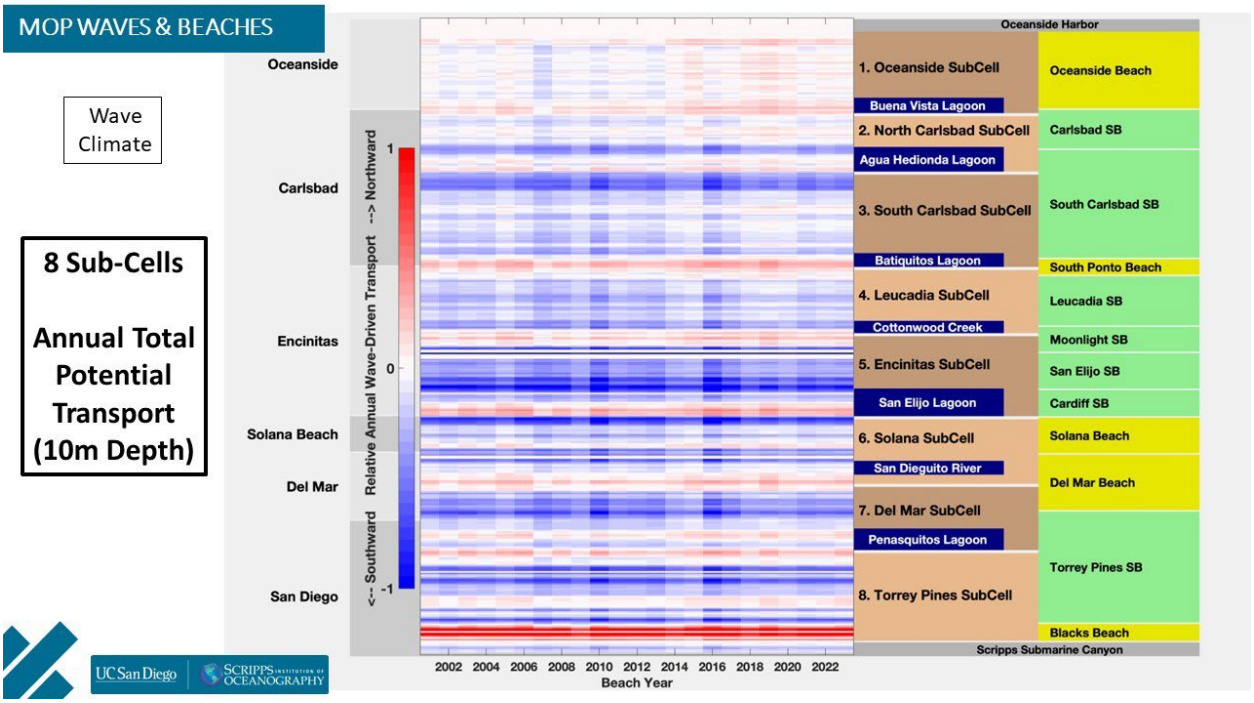


Figure 2. Longshore Transport Potential in the Oceanside Littoral Cell
Source: Dr. Bill O'Reilly, Scripps Coastal Processing Group

Questions, Gaps, and Next Steps

- Can the data from SIO and SANDAG/Coastal Frontiers be integrated to inform sediment management practices?
    a. Timing of activities – Can we be strategic around the timing of beach nourishment project and ongoing sediment management practices, such as the:
        1. Dredging of Oceanside Harbor and Lagoon mouths
        2. USACE Encinitas/Solana Beach Nourishment
        3. RBSP III
    b. Placement location of material – Can we use this information to be more strategic around placement locations to maximize benefits of material placed, such as placing:
        1. Outside of transport reversal points to enhance benefits to the placement site.
        2. At a feeder beach to enhance benefits to the sub-cell.
- Will this understanding help us move to more proactive or responsive coastal management (i.e., prompting actions or inaction prior to El Niño or Atmospheric River winters)?

Sediment Management Technical Taskforce (SMTT-OLC) Meeting
Thursday, January 18, 2024
Key Takeaways

AN ALTERED SYSTEM

Historically, rivers input sediment into the system, but due to dams and coastal development, many of our fluvial and bluff erosion sources in the OLC are largely controlled, causing an upwards of 79% reduction relative to historical sediment yield.

- When comparing fluvial sources with little to no percentage controlled to sources that are largely controlled, it becomes clear that the more controlled, the less sediment enters the system; the less control the more sediment enters the system.

  Example:

  - San Juan-Aliso CR 5% Controlled = 0% Reduction Relative to Historical Yield
  - San Dieguito 89% Controlled = 79% Reduction Relative to Historical Yield

- Precipitation is one of the major influences on fluvial sources, meaning the drought experienced over the past 30 years has likely contributed to diminished fluvial sand supply and less frequent flushing of coastal lagoons.

INFLUENCE OF OCEANSIDE HARBOR

- Del Mar Boat Basin was constructed in 1942 with modifications spanning through the 1960s to create the Oceanside Small Craft Harbor. In total, the project placed ~6 mcy of sand on Oceanside beaches as part of development of the harbor complex.
  - Development of a fillet on the north side of the harbor and erosion of the shoreline to the south of the harbor was noted shortly after construction.
  - 1st seawall was installed in 1949 south of the harbor to protect existing development.
  - 95% of the shoreline between Oceanside to Agua Hedionda currently is armored.

USACE San Diego County Shoreline Study

Phase I: Evaluate Impact of Harbor

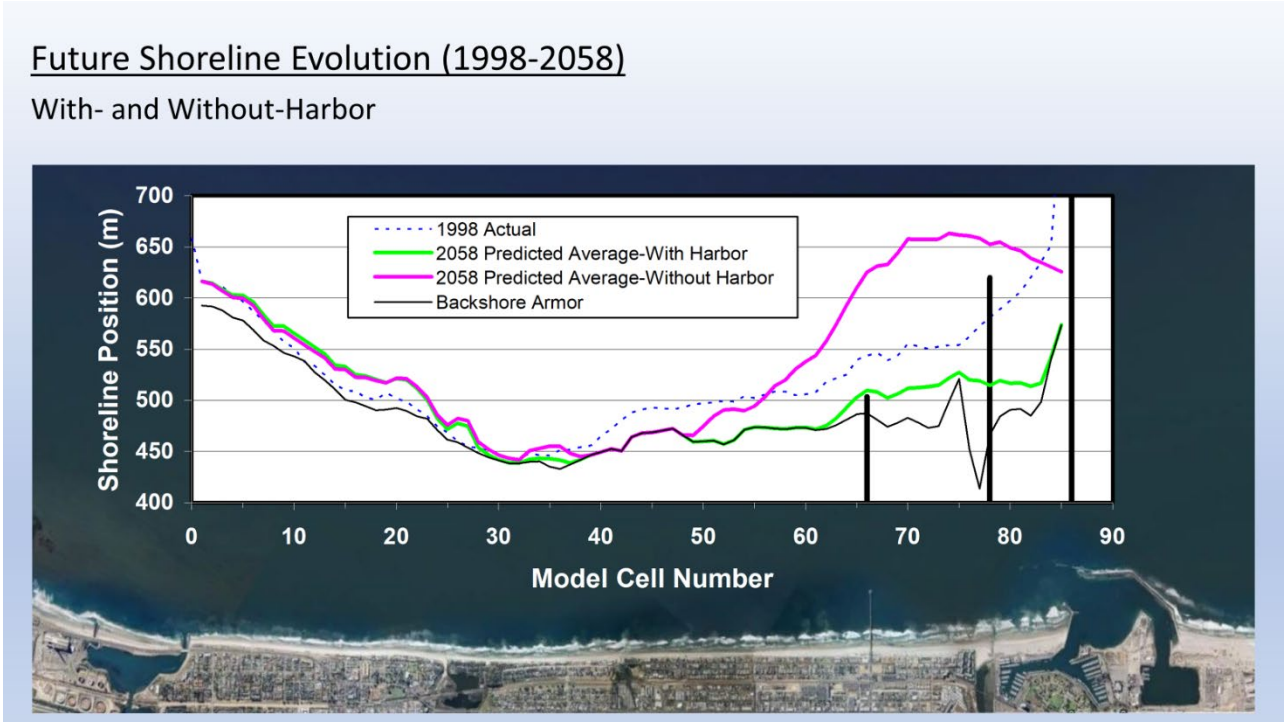
Being analyzed by U.S. Army Corp of Engineers (USACE) per Section 414 of Water Resource Development Act (WRDA) 2000, which directs UASCE to study to impacts and mitigate for erosion impacts from the Camp Pendelton Harbor.

Coastal Frontiers Corporation (CFC) developed a numerical model on behalf of the USACE to evaluate the impacts of the harbor on shoreline evolution. The model investigates shoreline change and coastal storm damage for the region between the

harbor and Agua Hedionda Lagoon for the “with and with-out harbor” scenarios. Results from this effort are used in the USACE Economic Analysis. Two time periods were evaluated:

- Historical shoreline evolution south of the harbor was evaluated over a 64-year period (1934-1998) for with and without harbor scenarios.
    - The model reproduced the 1998 “with-harbor” shoreline with good skill [Root Mean Square (RSM) error of about 20 m].
    - The 1998 “without-harbor” predicted shoreline shows the persistence of the San Luis Rey Delta in the region just south of the harbor. Elsewhere, the predicted with and without shorelines were similar.
- Future shoreline evolution and storm damage over a 60-year period (1998-2058) for with and without harbor scenarios.
    - The predicted 2058 with-harbor shoreline retreats to the coastal armoring along most of the Oceanside reach.
    - The predicted 2058 without-harbor shoreline shows the re-emergence of the San Luis Rey Delta just south of the harbor. As a result, Oceanside beaches are much wider and offer greater protection from storm damage under this scenario.
    - Narrow beaches lead to increased wave overtopping and storm damage in with-harbor case. Impacts are reduced in the without harbor scenario due to the protective capacity of wider beaches. (see Figure 1).

Figure 1. Oceanside Harbor Future Shoreline Evolution (1998-2058)



Phase 2 – Evaluate Coastal Storm Risk Management Projects

The phase is currently underway. The USACE will evaluate an array of coastal storm risk management projects to reduce coastal storm damage.

SAN DIEGO BEACH NOURISHMENT OUTCOMES

Major Projects within the OLC

- Regional Beach Sand Project I [RBSP I] (2001)
- Regional Beach Sand Project II [RBSP II] (2012)
- San Elijo Lagoon Restoration Project [SERLP] (2018)

SAN DIEGO REGION – OCEANSIDE LITTORAL SUB CELLS

**Data is compared to pre-RBSP I conditions to current; refer to Attachment 1 for general location of each sub cell*

Oceanside - (St. Malo to Winward Way)

- RBSP I placed 420,000 cy of coarse sand (0.62 mm)
- RBSP III placed 293,000 cy of slightly less coarse sand (0.50 mm)
- A long-term trend of shoreline erosion has reversed the gains produced by each project.

North Carlsbad – (Tamarack to Buena Vista Lagoon)

- RBSP I placed 255,000 cy of sand that ranged from fine to coarser grain size (0.14-0.62 mm)
  - Sediment was able to be maintained for about 10 years before loss.
- RBSP II placed less sediment into the system (219,000 cy), then compounded by a strong El Niño season, sediment eroded quicker than RBSP I.
  - RBSP II grain size = coarser (0.48-0.57 mm)
- Based on trends, assumption can be made that sediment is entering the system from downcoast movement from Oceanside.

South Carlsbad – (South Carlsbad State Beach to Terramar)

- RBSP I placed 158,000 cy of coarse sand (0.62 mm)
- RBSP II placed 141,000 cy of coarser sand (0.66 mm)
- A clear trend of long-term shoreline loss is apparent despite placement of nourishment.

Leucadia/Encinitas – (Moonlight to Batiquitos Lagoon)

- RBSP I placed 354,000 cy of semi-coarse sand (0.34-0.62 mm)
- RBSP II placed 198,000 cy of coarse sand (0.59 mm)
    - Discrepancy because Leucadia did not receive sand in RBSP II
- Fill volume in RBSP I is comparable to the current USACE Coastal Storm Damage Reduction project.

Cardiff – (Seaside to Cardiff)

- RBSP I placed 101,000 cy of finer grain sand (0.34 mm)
- RBSP II placed 89,000 cy of coarse sand (0.57 mm)
- SELRP placed 300,000 cy of fine grade sand (0.20 mm)
- Among most successful outcomes due to apparent sand retention characteristics of the reach.
- Regular bypassing of material from the San Elijo Lagoon inlet contributed to the long-term gains.
- Finer grain sized sand from SELRP eroded more quickly than the RBSP material.

Solana Beach – (Fletcher Cove)

- RBSP I placed 142,000 cy of very fine sand (0.14 mm)
- RBSP II placed 146,000 cy of coarse sand (0.55 mm)
- SELRP placed 146,000 cy of finer sand (0.20 mm)
- Sustained gains occurred after each nourishment project.
- Similar to Cardiff, the Solana Beach reach appears to retain sand.

Del Mar – (25th Street to San Dieguito Lagoon)

- RBSP I placed 183,000 cy of very fine sand (0.14 mm)
    - Did not maintain gains from the project.
    - Trend of erosion
- Did not receive sand in RBSP II or SELRP, however, it appears that sand placed at Solana Beach as part of these projects has benefited the reach.

La Jolla – (Marine Room to Scripps Pier)

- Did not receive sand from RBSP I, II, or SELRP
- Accreting stable beach
- Sand derived from bluff erosion along the Torey Pines reach likely contributes to the stability of the La Jolla shoreline.

LESSONS LEARNED

Grain size used for nourishment differed by receiver site, but generally, the coarser the grain size, the longer the sediment would/will stay, the finer the grain size, the quicker the sediment erodes.

Fill Size – Larger the project, the longer sediment stays within the system.

Frequency – RBSP I & II were one-off projects, too much time in-between projects. Nourishment should be completed routinely or on a schedule in order to maintain historical shoreline conditions.

Location - Some sites hold sand better (Solana Beach) than others (Encinitas).

DRAWN CONCLUSIONS

- After analyzing the average beach width and shore zone volume change since a beach nourishment project, conclusions can be drawn on how long sediment stays within their sub cell systems.
- Holistically evaluating shoreline change pre & post-RBSP I & II, can help inform how quickly nourished sand stays within the sub cell or if it is moving south of the coast, north of the coast, and/or if it is getting "lost" outside the depth of closure.
    - This then informs the ideal frequency and grain size needs for nourishment cycles at sub cell receiver sites (Figure 2).

Figure 2. Sub Cell Lessons Learned

Sub-Reach Outcome Summary

Sub-Reach	Consecutive Years w/ MSL BW Gain Relative to Pre-Project			Ideal Re-nourishment Interval Based on Past Project Performance	Considerations
	RBSP I	RBSP II	SELRP		
Oceanside	4	4	-	5-yrs	*sand retention candidate; sand bypass management*
N. Carlsbad	11	12	-	10-yrs	*understand communication w/ Oceanside; sand bypass management*
S. Carlsbad	0	0	-	*< 5-yrs*	*Sand retention candidate; modified placement site/multiple sites*
Leucadia/Enc	*3*	*1*	-	*< 5-yrs*	*sand retention candidate; quantity matters*
Cardiff	11	4	3	*5-10 yrs*	*grain size matters*
Solana Beach	6	6+	6	*5-10 yrs*	*grain size less important*
Del Mar	1	-	-	*more info needed*	*use coarser sand*
Torrey Pines	*2*	-	-	*more info needed*	*use coarser sand*
La Jolla	-	-	-	*n/a*	*stable*

QUESTIONS AND NEXT STEPS

- Can the data from SANDAG/Coastal Frontiers be integrated to inform future sediment projects like beach fills and bypassing operations?
  - How does sand move along shore?
  - To what extent does sediment move into lagoons/harbors?
  - To what extent does sediment move offshore?
  - What is the relationship of sediment movement within these sub cells?
  - Some seem to have more success (North Carlsbad) than others (Encinitas/Leucadia). Why is that and how can we treat them differently when taking a regional approach to beach nourishment?
- Can this data be used to inform design and implementation of a sediment retention device?

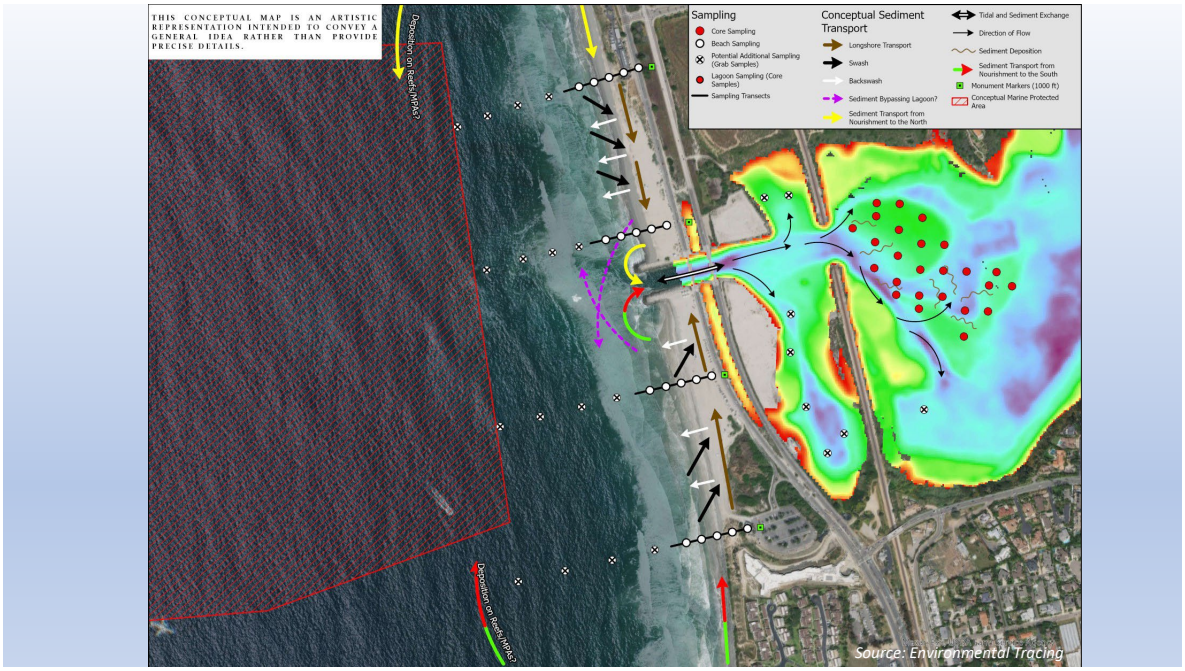
TRACER STUDY

- Tracer Study would help to fill in these knowledge gaps on sediment movement. The information would contribute to the design of beach nourishment programs, sand bypassing operations, and design and siting of sediment retention measures.
- The design of such a study would be most effective as a collaborative effort with the input of several coastal managers, researchers, and practitioners.

Figure 3. Eco Trace Technology

- Study would place small amounts of environmentally, benign florescent colored sand on the beach (Figure 3) and would track those particles spatially over time to build up a map of where the particles were transported and/or deposited (Figure 4).
- Study would add to the body of knowledge and help provide answers to the question: where sand goes, how quickly, and what influences it.

Figure 4. Example Tracer Map Results in Lagoon



Sediment Management Technical Taskforce (SMTT-OLC) Meeting
Thursday, March 21, 2024
Key Takeaways

BEACH CHANGE AND LONGSHORE TRANSPORT IN SOUTHERN CALIFORNIA

(presentation by Daniel Kahl, University of California Irvine)

- Factors that drive changes in beach width include:
  - Seasonal cycles,
  - El Niño,
  - Sand supply, and,
  - Difference in longshore transport.
- Beach change can be interpreted in context of littoral cells; coastal and inland urbanization interrupting sediment processes and complexity of wave climate contributes to fragmentation of littoral cells.
- Within littoral cells, smaller coastal segments can be identified to understand localized beach change.
- **Divergence of Drift (DoD)** is defined as spatial differences in longshore transport within smaller coastal segments.
- Historical aerial imagery shows beach widths were relatively stable during the 20th century, and the benefits of a large nourishment at Doheny State Beach lasted roughly 20 years.
- Historical and satellite imagery highlights that beach erosion has accelerated in recent decades, indicating a recent and growing problem.
- Nearshore wave data at the 10 m isobath provided by the Coastal Data Information Program (CDIP) Monitoring and Prediction (MOPs) for the period 2000-2021 were used to estimate longshore sediment transport potential using the CERC equation developed by the U.S. Army Corps of Engineers. These estimates suggest that the direction and magnitude of longshore transport is highly varied along the coast and point to many areas where transport is more often upcoast than downcoast.
- Longshore transport potential estimates also show that the transport direction reverses seasonally in many locations, with more upcoast transport in summer compared to winter.
- DoD calculated between segments defined by longshore transport characteristics explains up to 93% of beach width changes in the San Pedro Cell and 73% south of Oceanside Harbor.

Capistrano Bight

- Beaches have been relatively stable until the 1990's - erosion rates have accelerated in recent decades.
- Longshore transport is advection dominated and in opposite directions at San Mateo Point.

- DoD within the Capistrano Bight contributes to beach widening when sand is available. Generally, longshore transport estimates suggest that sediment works southward from Dana Point and northward from Cottons point. It is important to note here that cross-shore transport processes pull sand away from the coast during large wave events.

Oceanside Harbor South

- Beaches have been eroding, despite routine nourishment activities.
- Estimates of longshore transport potential suggest that sand moves northward more than southward (the coast here is estimated to be advection dominated to the north).
- The strong influence of advection here points to the importance of a sand retention strategy in addition to a sand replenishment strategy.

DISCUSSION TAKEAWAYS

- CERC equation estimates of longshore transport dynamics differ from analysis of radiation stress.
- The movement of sand along the coast is more variable and fragmented than previously thought (Unidirectional River of Sand concept of sand movement is outdated and overly simplistic).
- A better understanding of littoral cells and subcells is needed to inform Shoreline Management.
- Changes in wave climate over decadal and longer time scales deserve consideration when interpreting longshore transport potential estimated by CERC equation for 2000-2021 time period. Shifts may occur with Pacific Decadal Oscillation, for example.
- Research with new wave data CDIP, MOPs, and Coastal Satellite imagery has added to our understanding of these systems.
    - Beach nourishment adds sand into the system.
    - Some beaches retain sand better than others.
    - Sand retention pilot projects where appropriate should be explored if they can be modified/removed if not working.
- Support was provided for a sand movement tracer study.
- Desire to restore the natural flow of sand to beaches was discussed.
- Resources are available nationally for resilience; however, our region needs to become more competitive for federal funding.

Sediment Management Technical Taskforce (SMTT-OLC) Meeting
Thursday, May 16, 2024
Key Takeaways

EFFECTS OF BEACH NOURISHMENT ON COASTAL LAGOONS

(presentations by Gabriel Peñaflor, California Department of Fish and Wildlife; Doug Gibson, Nature Collective; Mike Hastings, Los Peñasquitos Lagoon Foundation)

BATIQUITOS LAGOON *(Gabriel Peñaflor, California Department of Fish and Wildlife)*

1. How does the California Department of Fish and Wildlife (CDFW) manage the lagoon?
   - Lagoon has hardscape groins
   - Has been open since restoration in 1997
   - 4 successful dredging events have occurred 2002, 2006, 2001, & 2019
   - Dredged sand was placed on South Ponto State Beach
   - Many surveys have been performed including eel grass, Caulerpa, sediment grain size, and surf monitoring

2. What negative impacts occur when sand blocks the Batiquitos Lagoon mouth?

   - Tidal muting occurs in the entire lagoon, but has not resulted in the lagoon mouth being blocked
   - Two rock groins at the lagoon mouth aid in protecting against any blockages (see Figure 1).
   - Fresh water inputs cause habitat type conversion
   - Reduction in dissolved oxygen can result in algae growth and fish kills
     - This has not happened in a long time
   - The groins prevent sand moving due to strong tidal currents

Figure 1- Rock Jetties Protecting Lagoon from Inlet Closure

3. Are there any permit requirements?
    - USACE
    - Coastal Commission
    - Regional Water Quality Control Board
    - CA State Parks & Recreation
    - State Lands Commission
    - CDFW must make sure all permits are in compliance before and after any work is performed
4. How to remove material and where does it go?
    - Dredged with a Barge that is launched from 1-5 Bridge
    - Material is taken from Central and Western Basin using a suction dredge with at least 10" slurry pipe
    - Placed on South Ponto State Beach
5. What regulatory and financial challenges do you face?
    - Multiple permits form different agencies required
    - Extensive lead time required
    - Drastic increase in Dredge Cost
    - Poort market performance of management account
6. What concerns do you have with beach nourishment efforts?
    - Increased nourishment will increase dredge frequency
    - Timing of nourishment efforts
    - Surf zone vs Beach placement
    - Disrupted sediment transfer will increase erosion
    - The expansion of the double track process can increase the time between dredging events

SAN ELIJO LAGOON *(Doug Gibson, The Nature Collective)*

1. How does Nature Collective manage the lagoon?

Annual maintenance dredging, typically in May

- ~20-25k yards of sand removed over 7-8 days to complete

Emergency dredging

- Will perform emergency dredging, but the restoration of the lagoon is supposed to expand the timing between dredging events
- For when the inlet is closed
- Needed to resolve water quality issues from the closure
- 1-2 days to complete
- Builds two berms to control water and pumped area to drive under the bridge

2. What negative impacts occur when sand blocks the San Elijo Lagoon mouth?
   - Dissolved oxygen is the primary concern
   - Lagoon will eventually go hypoxic (see Figure 2).
     - Can occur within 48-72 hours
     - Up to a month in cool, rainy season months
   - Without intervention, fish kill would occur.

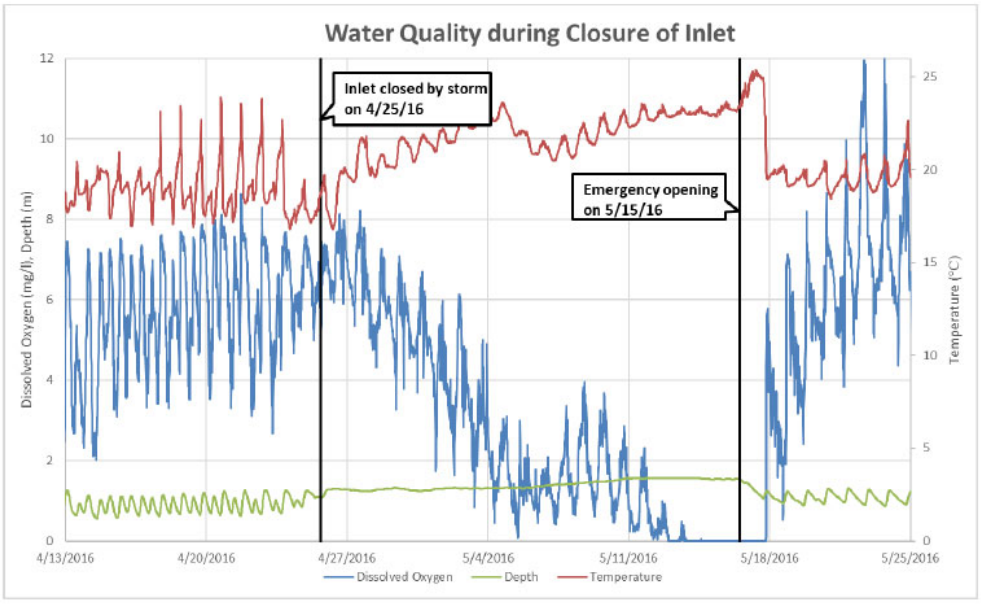


Figure 2- Inlet Closure Relationship with Dissolved Oxygen, Depth, and Temperature

3. Factors for Inlet Maintenance

Annual Maintenance

- After winter storms are complete and typically before Memorial Day
- Favorable tide cycle (neap) usually in April/May

Emergency Maintenance

- No rain/storms forecast with no chance of natural breach
- Water quality parameters degrading to where intervention is necessary

4. Challenges Faced
    - Funding!
    - Only partial endowment for the dredging from the Southern California Coastal Conservancy
    - Significantly more sand is needed to be dredged than in years past
    - New inlet dynamics
    - A larger tidal prism causes sand shoaling farther into the lagoon (see Figure 3).
    - Needs a floating dredge solution instead of land-based equipment.

Figure 3 - Shoaling in the San Elijo Lagoon

5. Beach Nourishment Concerns
    - Need additional funding!
    - When beach nourishment occurs, mitigation funding needs to go to lagoons to cover the cost of removing that additional sand that will eventually move from littoral drift

LOS PEÑASQUITOS LAGOON *(Mike Hastings, Los Peñasquitos Lagoon Foundation)*

1. HISTORY/BACKGROUND
   - Part of the Torrey Pines State Natural Reserve
   - 303 (d)-listed impaired water body with a sediment and bacteria TMDL
   - 35 sensitive plant species and 6 listed bird species
   - Key stopover for migratory birds along the Pacific Flyway
   - Provides Ecosystem Services and Beneficial Uses (San Diego Basin Plan)
   - LPLF has been adaptively managing the inlet since 1985 as a management priority.
2. Maintaining Tidal circulation
   - Historically a marine dominate system, but hydromodification caused by urban encroachment has resulted in frequent and, at times, prolonged inlet closures.
   - Inlet maintenance identified as a management priority in the lagoon's enhancement plan and supported by over 37 years of continuous monitoring data.
   - Maintains soil salinity levels to protect native salt marsh plants (halophytes) from habitat conversion and colonization/establishment of non-native species.
   - Maintains salinity and dissolved oxygen levels that support native aquatic species.
   - Protects surrounding urban and commercial areas from flooding.
   - Supports climate change abatement through sequestration of carbon in biomass and soils at higher levels than fresh water and terrestrial systems.
   - Protects community from vector-borne illnesses that includes West Nile virus
3. What are the negative impacts that occur when sand blocks the Los Peñasquitos Lagoon mouth?
   - Fish kills and loss invertebrates, which serve as a vital food source for endemic and migratory fowl.
   - Loss of native plants to habitat conversion.
   - Destruction of property and impairment to transportation facilities (e.g., rail) due to flooding.
   - Impacts to listed bird species that include Belding's savannah sparrow and Ridgway's rail due to loss of nesting and foraging habitat.
   - Exposure to human populations to West Nile virus within a 2-mile radius of the lagoon.
   - Response time to inlet closures can be critical to avoid the impacts listed above.

Figure 4 - Inlet Closed

4. How to manage inlet openings?
    - Seasonality and tides determine windows of opportunity for inlet maintenance.
    - Grain size analysis to determine suitability for beach disposal.
    - Grunion monitoring to avoid/mitigation impacts during spawning season.
    - Bird surveys and monitoring to protect listed species.
    - Funding is always critical to maximize benefits and ensure an open inlet during summer months when impacts from inlet closures are more severe.
5. Regional Sand Project Impacts
    - Increase in larger grain sizes indicative of sand from nourished beaches that is more resistant to erosive processes that scour the inlet (e.g., lagoon outflows).
    - Increased beach elevations and profiles that preclude tidal flushing of lagoon channels.
    - Increased volume of sand within the lagoon inlet that must be removed mechanically.
    - Increased frequency and duration of inlet closures that can exhaust inlet maintenance funding (only have funding for one inlet opening per year).
    - Mitigation funds need to be available in the near-term to avoid temporary and permanent impacts to coastal estuaries and exposure of human populations to West Nile virus and other vector-borne illnesses. Endowments have proven to be an effective mechanism.
    - USACE beach nourishment project in Solana Beach and Encinitas lacks sufficient monitoring and does not provide mitigation funds before 2 years of monitoring and determination by USACE that impacts are from their project.

Figure 5 - Post RBSP II

OVERALL TAKEAWAYS

- Lagoon managers request to be involved in any sand nourishment project to discuss sediment management and request that funding be set aside for potential increased inlet maintenance as inlet maintenance is very costly. It has been analyzed that sediment will migrate into the lagoon channels, which then requires regular dredging.
- Extensive permits are required for inlet maintenance; Lagoon managers request to have streamlined process for acquiring permits to open inlets.
- By letting lagoon inlets remain closed, many species, habitats, and important infrastructure will be negatively impacted. This requires regular maintenance to keep lagoon inlets open to avoid these negative impacts including dissolved oxygen depleting, increased vector born illnesses, and fish and bird species die off or migration to other areas.
- More scientific studies need to be performed showing when and how quickly sediment migrates into lagoon inlets that cause the need for emergency maintenance dredge and regular annual maintenance.

Sediment Management Technical Taskforce (SMTT-OLC) Meeting
Thursday, August 15, 2024
Key Takeaways

SANDAG SHORELINE POLICY DOCUMENTS & SMTT RECOMMENDATIONS

(presentations by Chris Webb, Moffatt & Nichol & Keith Greer, SANDAG)

HISTORY OF SANDAG SHORELINE POLICY DOCUMENTS *(Chris Webb, Moffatt & Nichol)*

- 1982 & 1983 Winter El Niño storms were very damaging, which lead to the creation of SANDAG's Shoreline Erosion Working Group. In addition, the cities of Encinitas and Solana Beach experienced significant erosion which led the public to desire shoreline protection strategies like sea walls and revetment.

SHORELINE PRESERVATION STRATEGY (1993)

- Shoreline erosion problem areas (Figure 1) were identified in the SANDAG Shoreline Preservation Strategy (Strategy) for the San Deigo Region (1993).

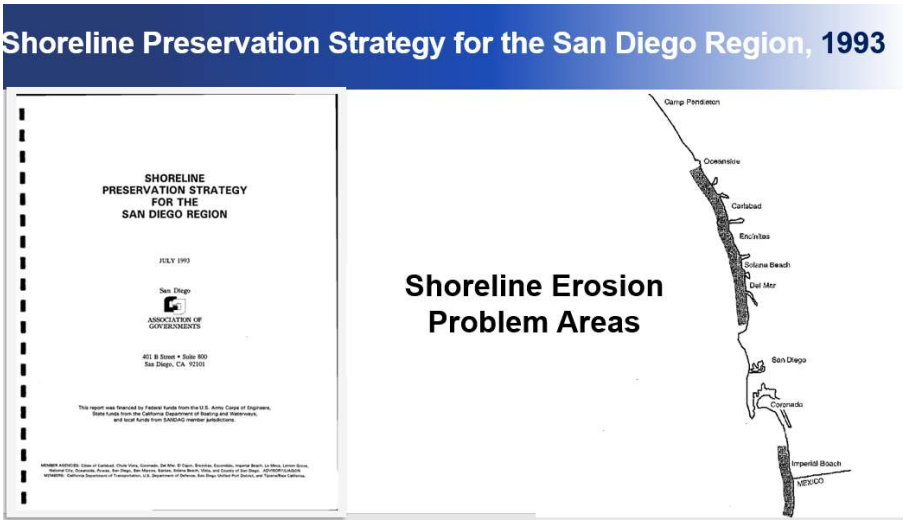


Figure 1 - Shoreline Erosion Problem Areas

- Three littoral cells were identified in the Shoreline Preservation Strategy (Figure 2)
  - Oceanside Littoral Cell (Dana Point Harbor to La Jolla)
  - Mission Beach Littoral Cell (La Jolla to Point Loma)
  - Silver Strand Littoral Cell (Coronado to past US /Mexico Border)

Figure 2 - Identified Littoral Cells

- The Strategy identified problems and solutions for each Littoral Cell
- Recommended to have at least a 250ft wide beach for a sufficient buffer against storms and sea level rise

Silver Strand Littoral Cell

- Require 3 million cubic yards of sand to meet 250 ft buffer
- Silver Strand to Tijuana
- Renourishment cycle of 90,000 cubic yards per year
- Sources of sediment: offshore dredging, Tijuana estuary, San Diego Bay, reservoirs, and sand bypassing from Zuniga Shoal

Mission Bay Littoral Cell

- Require 500,000 to 6.2 million cubic yards of sand to meet 250 ft buffer
- Pacific Beach Point to Ocean Beach Pier
- Renourishment cycle of 5,000 cubic yards per year
- Sources of sediment: offshore dredging, Mission Bay, San Diego Riverbed, and reservoirs

South Oceanside Littoral Cell (Oceanside to San Diego)

- Require 25 million cubic yards of sand to meet 250 ft buffer
- Oceanside Harbor to La Jolla Shores
- Renourishment cycle of 320,000 cubic yards per year
- Sources: offshore dredging, lagoons, rivers, upland, reservoirs, and bypassing of the Oceanside Harbor

North Oceanside Littoral Cell

- Require 5 million cubic yards of sand to meet 250 ft buffer
- Dana Point to San Mateo Point
- Renourishment cycle of 40,000 cubic yards per year
- Sources: offshore dredging, lagoons, rivers, upland, and reservoirs

REGIONAL SHORELINE MONITORING PROGRAM (1996)

- As a result of the policy, the regional shoreline monitoring program was implemented in 1996 and has been operating since.
- The purpose of the program is to measure changes in beach width and nearshore sand volume over time to evaluate the change in erosion, sand transport, and document the benefits of sand replenishment projects.

REGIONAL BEACH SAND PROJECTS I & II

- What followed the monitoring program was the implementation of Regional Beach Sand Projects

Regional Beach Sand Project I (2001)

  - 2.1 million cubic yards of sand was placed at 12 beaches in 7 coastal cities in San Diego
  - Total cost $18 million
  - Participating coastal cities paid for planning
  - Engineering, environmental, and construction was paid 60% from federal funding and 40% from state funding

Regional Beach Sand Project II (2012)

  - 1.4 million cubic yards of sand was placed at 8 beaches in 5 coastal cities.
  - Total cost $26 million
  - Participating coastal cities paid for Planning
  - Engineering, Environmental, and Construction was paid 85% from State Funding and 15% from Local Funding

SAN DIEGO REGIONAL BEACH SAND RETENTION STRATEGY (2001)

- The San Diego Regional Beach Sand Retention Strategy (RBSRS) identified areas to implement sand retention strategies such as breakwaters, reefs and groins (Figure 3) and recommended pilot project locations.

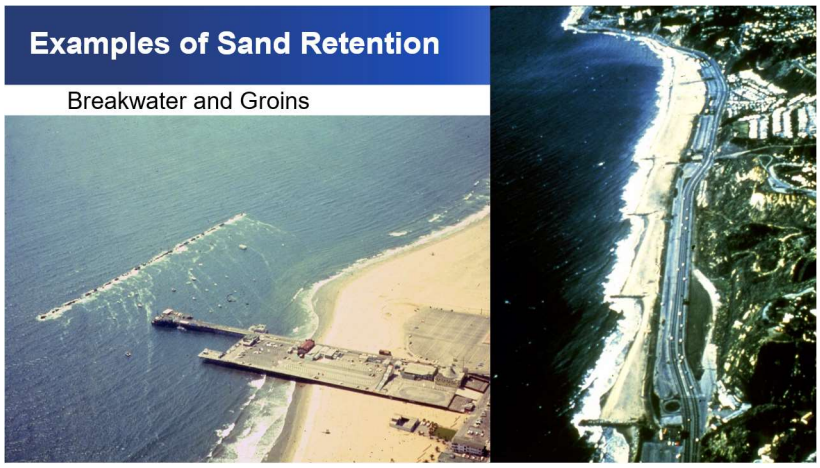


Figure 3 - Types of Sand Retention Strategies

    - South Carlsbad was identified to pilot an offshore breakwater to help create a back beach
- The RBSRS identified areas in Oceanside, Encinitas, and Solana Beach as the most suitable sites to implement a pilot retention project.
    - North Carlsbad was eliminated from consideration due to the sensitive biological habitat.
- Sand retention is marginally suitable for Imperial Beach.
- The need for retention is not as apparent for South Carlsbad, Del Mar, and Torrey Pines.
- SANDAG applied for state funding to update the economic analysis with the monitoring results from Regional Beach Sand Project I and other design/related studies.
- SANDAG's goal was to implement a pilot sand retention strategy at the same time as Regional Beach Sand Project II; however, the state rejected the proposal and SANDAG continued with implementing Regional Beach Sand Project II.

SAND COMPATIBILITY AND OPPORTUNISTIC USE PROGRAM – SCOUP (2006)

- This program was created to streamline the process of utilizing sand from construction projects that become available and is compatible for beach replenishment.
- It was certified in a CEQA/NEPA document
- In this document, the grain size envelope was defined for determination of compatibility of source sand with a receiver site.
- Challenge is that each coastal city needs to individually obtain a SCOUP permit and keep active to utilize opportunistic sand for nourishment and bear the costs, rather than a regional/programmatic approach.

SAN DIEGO COASTAL REGIONAL SEDIMENT MANAGEMENT PLAN (2009)

- The Coastal Regional Sediment Management Plan took all existing shoreline monitoring data at the time to consider sand nourishment and retention in the San Diego region.
- This plan identified sediment sources (Figure 4) in San Diego County and considered sand retention device installation/pilot projects.

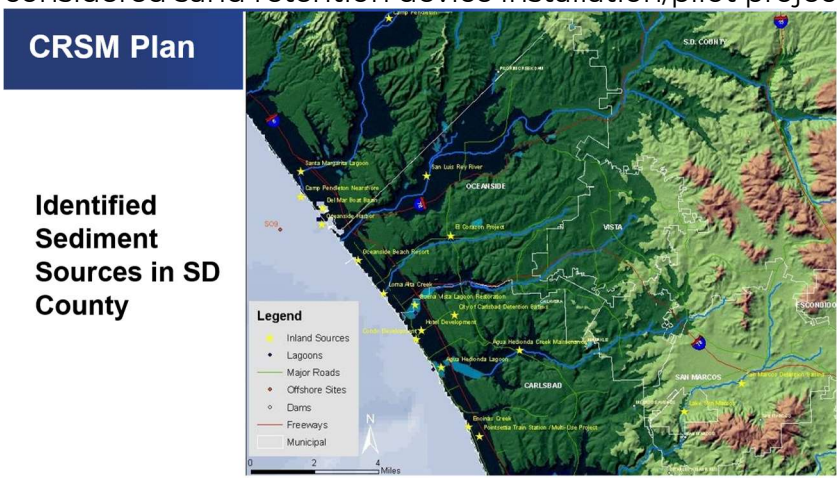


Figure 4 - Identified Sediment Sources in San Diego County

- It estimated sand budgets and provided projects.
- This plan estimated that the San Diego region needs at least 30 million cubic yards of sand to completely restore the region's beaches.
    - Totaling about 400,000 cubic yards of sand per year as maintenance.
    - Shoreline monitoring post Regional Beach Sand Project I showed that 400,000 cubic yards of sand was dispersed or lost.
- The Coastal Regional Sediment Management Plan estimated that the region would need 1 million cubic yards of sand per year to offset the 400,000 dispersion/loss rate and would supply 30 million cubic yards over the next 50 years.
    - 90% of the 1 million cubic yards of sand could come from opportunistic sand supply.
    - Retention measures could reduce the needed volume.

<u>Recommendations:</u>

- Implement SCOUPs as much as possible each year.
- Continue harbor and lagoon maintenance dredging operations.
- Implement larger projects periodically to offset any remaining dispersion/losses, and coordinate in time.
- Strongly consider sand retention throughout the region to minimize dispersion/losses and future fill amounts.

WHAT SHOULD OCCUR WITH THE FOUR SHORELINE POLICY PLANS?I

1. Implement the recommendations
    a. Conduct SCOUPs
    b. Conduct Regional Beach Sand Projects, United States Army Corps of Engineers (USACE) projects, and bypass the harbors
    c. Install and monitor at least one pilot sand retention project
2. Update and/or combine the plans
    a. Integrate all the plans under one document
    b. Update with current conditions and data
    c. Factor in sea level rise
3. Prepare new plans
    a. Revise goals (narrower beaches)
    b. Take a different direction
    c. Add new ideas (for example, a programmatic approach to regional beach sand projects rather than singular implementation)

POSSIBLE UPDATES TO THE PLANS

1. Effects of sea level rise increases the need for higher sand volumes
2. Factor in the USACE Sand Project at Solana Beach and Encinitas
    a. Reduced sand volumes needed due to the benefits from these projects
3. Consider a program of regional beach sand projects rather than singular events
4. Revise expectations for future beach width goals
5. Install and monitor at least one pilot sand retention project

SEDIMENT MANAGEMENT TECHNICAL TASKFORCE SUMMARY & DRAFT RECOMMENDATIONS *(Keith Greer, SANDAG)*

- **Formed**: The Sediment Management Technical Taskforce was formed in June of 2023 by the Shoreline Preservation Working Group
- **Purpose:** Understand how sediment flows within the littoral cell as it pertains to active/future beach nourishment efforts
- **Implementation Action:** Recommendation to form a technical group originated from the San Diego Coastal Regional Sediment Management Plan (2009).

**Keith provided a quick review of all previous Sediment Management Technical Taskforce meetings and the main takeaways*

OVERALL RECOMMENDATIONS FROM THE SEDIMENT MANAGEMENT TECHNICAL TASKFORCE

- Update & combine SANDAG shoreline policy documents into one plan
    - Reflect current science and identified data gaps
    - Use Regional Beach Sand Project III studies to update nourishment and sand retention strategy
    - Sand nourishment program not "one-off" projects
    - Form science and engineering taskforce to guide plan development
    - Include Southern California peer agencies as advisors
- Seek funding to perform a Sand tracer study to analyze exactly where sand moves within sub- littoral cells
    - Estimated to cost $400,000 for Scripps Institute of Oceanography and SANDAG to implement pilot project.
- Combine Scripps Institute of Oceanography and SANDAG shoreline data into an online open data portal
- Develop regional consensus to install and monitor at least one pilot sand retention project
- Develop and maintain regional SCOUP permit
- More best management practices and data should be collected on impacts to biological resources when applying sand nourishment projects and sand retention strategies.

Sediment Management Technical Taskforce Summary & Draft Recommendations

Oceanside Littoral Cell

Shoreline Preservation Working Group | Item 3
Keith Greer, Deputy Director of Regional Planning, SANDAG
December 5, 2024

1

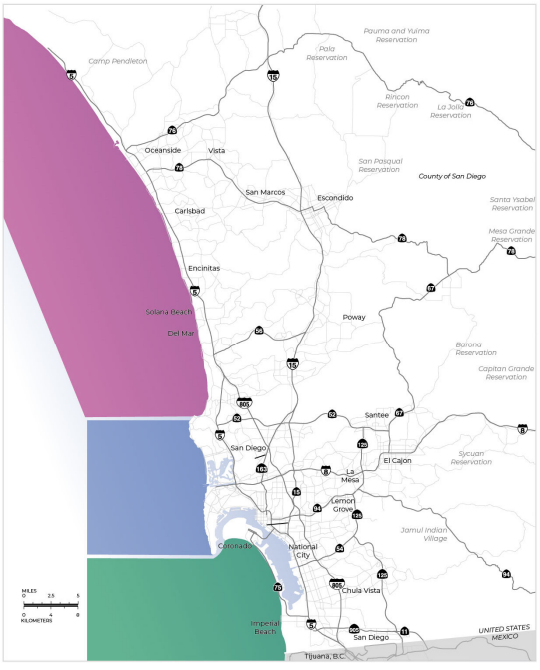
The San Diego Region has three littoral cells

A littoral cell is a natural area of the nearshore environment that contains a closed cycle of sedimentation including sources, transport paths, and sinks.

Oceanside Littoral Cell

Mission Bay Littoral Cell

Silver Strand Littoral Cell



SANDAG

2

Sediment Management Technical Taskforce - Oceanside Littoral Cell

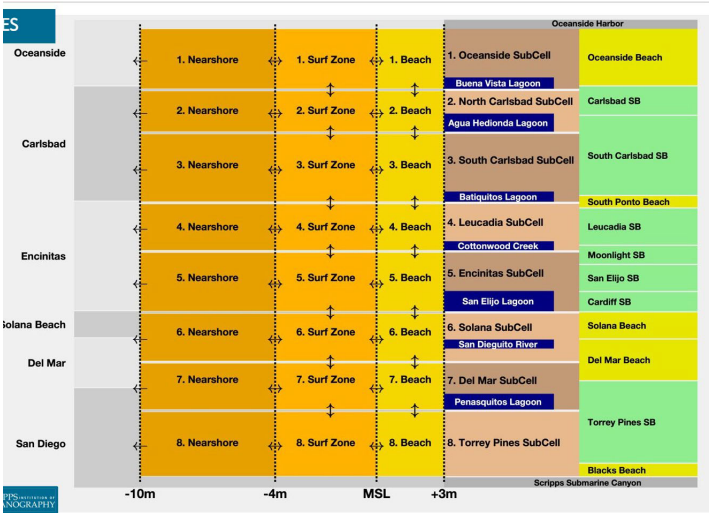
- **Formed:** June 2023 SPWG Meeting
- **Purpose:** Understand how sediment flows within the littoral cell as it pertains to active/future beach nourishment efforts
- **Implementation action** from the San Diego Coastal Regional Sediment Management Plan (CSMP).

3

Meeting #1 – September 28, 2023

Presentations by Nick Sadrpour, GHD & Dr. William O'Reilly, Scripps Institution of Oceanography

- Historical input of sand from rivers and coastal bluffs largely eliminated (> 50%)
- "River of Sand" is **oversimplistic**
- Evidence points to **sub-cell relationships** for sediment transport.
  - Oceanside Harbor -> Scripps Submarine Canyon = 8 sub-cells
  - El Niño winters and atmospheric rivers = offshore and southward ↓ sediment flow
  - Non-El Niño winters = northward ↑ sediment reversals
  - Swell period also dictates direction
  - Magnitude of sediment transport varies by subcell



4

Meeting #2 – January 18, 2024

Presentation by Greg Hearon, Coastal Frontiers Corporation

- Oceanside Harbor **greatly influences sediment flow**
- USACE study its effect on shoreline migration
  - Without Harbor = Oceanside has wide beach
  - With Harbor = shoreline retreats
- Shoreline monitoring over last 28 years were evaluated by 9 subcells

Lessons Learned

- **Grain Size** [coarser = lasts longer; finer = erodes faster]
- **Fill Size** [Larger project, longer sediment stays]
- **Frequency** [routine nourishment = lasting benefits]
- **Location** [some sites hold sand better than others]
- Recommended a **tracer study to help fill in gaps** on sediment movement

Sub-Reach Outcome Summary

Sub-Reach	Consecutive Years w/ MSL BW Gain Relative to Pre-Project			Ideal Re-nourishment Interval Based on Past Project Performance	Considerations
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Leucadia/Enc	*3*	*1*	-	*< 5-yrs*	*sand retention candidate; quantity matters*
Cardiff	11	4	3	*5-10 yrs*	*grain size matters*
Solana Beach	6	6+	6	*5-10 yrs*	*grain size less important*
Del Mar	1	-	-	*more info needed*	*use coarser sand*
Torrey Pines	*2*	-	-	*more info needed*	*use coarser sand*
La Jolla	-	-	-	*n/a*	*stable*

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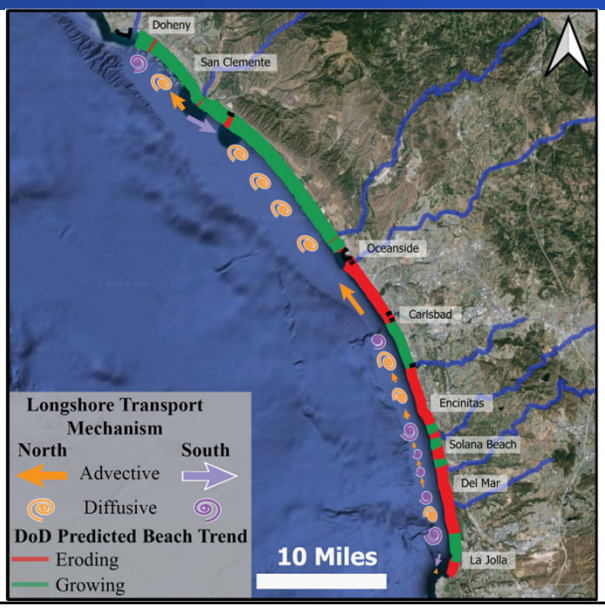
Meeting #3 – March 21, 2024

Presentation by Daniel Kahl, University of California, Irvine

- Factors that drive changes in beach width:
  - Seasonal cycles, El Niño's, sand supply, difference in longshore transport
- **Divergence of Drift (DOD)** – spatial differences in longshore transport
  - Capistrano Bight beaches would widen given adequate sediment
- DOD explains 73% of beach width changes south of Oceanside Harbor
- Transport: south in the winter, north in summer
- Erosion accelerates in recent decades despite routine nourishments
- The advection dominated environment motivates a sand retention strategy
- Actual transport needs to be investigated further south Oceanside cell due to high variability & varied beach composition



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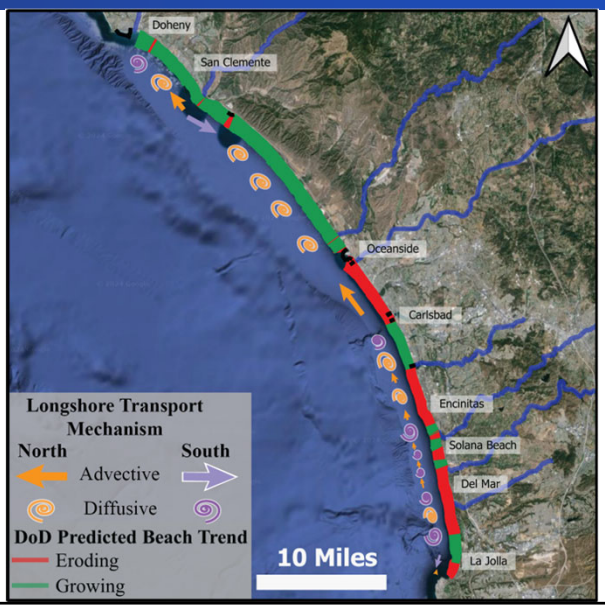
Meeting #3 – March 21, 2024

Presentation by Daniel Kahl, University of California, Irvine

- Factors that drive changes in beach width:
  - Seasonal cycles, El Nino's, sand supply, difference in longshore transport
  - **Erosion has accelerated in recent decades**
- Transport: more southerly in the winter, northerly in summer, areas can be advective or diffusive

- **Divergence of Drift (DOD)** – spatial differences in longshore transport drive beach change
  - DOD explains 73% of beach width changes south of Oceanside Harbor
  - Capistrano Bight beaches would widen given adequate sediment supply according to DoD
- **Advection** dominated environments point towards a **sand retention strategy**
- Field investigations needed and compared to models



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Meeting #4 – May 16, 2024

Presentations by Lagoon Managers from Batiquitos, San Elijo, and Los Peñasquitos Lagoon

- Inlet closure and tidal muting can have **negative effect**
  - dissolved O_2 ↓, vector born illnesses ↑, fish and bird species die off, and/or migration to other areas
- Increased sediment from sand nourishment can migrates into lagoon channels which then requires increased dredging
- Lagoon managers want to be involved in sand nourishment projects to discuss management and funding be allocated for increased inlet maintenance
- Lagoon managers request to have **streamlined process** for acquiring permits to open inlets
- More scientific studies are needed to show how quickly sediment migrates into lagoon inlets that cause emergency and regular annual dredge maintenance
- Improved monitoring (e.g., grain size analysis) to determine the effects and impacts of beach nourishment projects on coastal lagoons/estuaries.

Batiquitos Lagoon

San Elijo Lagoon

Los Peñasquitos Lagoon

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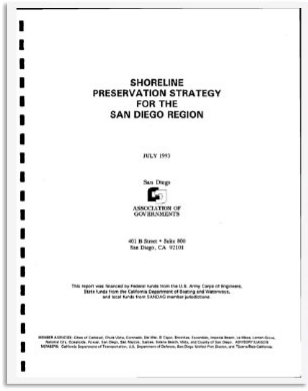
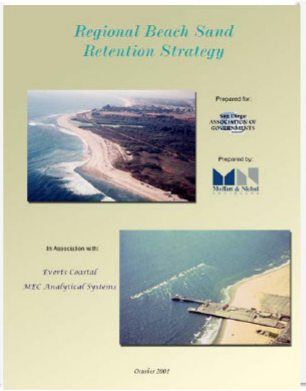
Meeting #5 FINAL – August 15, 2024

Presentations by Chris Webb, Moffatt & Nichol



July 1993



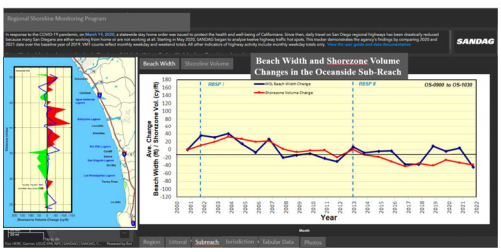
October 2001

March 2006

March 2009

Recommendations

- Update & combine SANDAG Shoreline Policy documents into one plan
  - Reflect current science and identified data gaps
  - Use RBSP III studies to update nourishment and sand retention strategy
  - Nourishment Program not "one-off" projects
  - Form science and engineering taskforce to guide plan development
  - Include S. California peer agencies as advisors
- Seek funding to perform a Sand Tracer Study to analyze exactly where sand moves within subcells
- Combine Scripps and SANDAG shoreline data into an online open data portal
- Develop regional consensus to install and monitor at least one pilot sand retention project
- Develop and maintain regional SCOUP permit



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Shoreline Preservation Working Group

Item: 4

December 5, 2024

State of California Sea Level Rise Guidance: 2024 Science and Policy Update

Action: **Information**

Ocean Protection Council staff will present an overview on the recent science and policy updates made to the State of California Sea Level Rise Guidance.

Fiscal Impact:

N/A

Schedule/Scope Impact:

N/A

Overview

Sea level rise and increased climate-driven flooding will continue to threaten public health and safety, critical infrastructure, coastal habitats, private property, and public access in California. To build resilience for coastal communities and ecosystems, thoughtful science-based planning and adaptation actions need to happen now. Ocean Protection Council's State of California Sea Level Rise Guidance: 2024 Science and Policy Update (Guidance) combined with Senate Bill 1 Sea Level Rise Adaptation Grant Program and $660 million maintained in the Governor's FY 2024/2025 Budget for critical coastal resilience programs and projects, will help prepare California for sea level rise. This Guidance replaces the 2018 State of California Sea-Level Rise Guidance. Staff from the Ocean Protection Council will provide an overview of the latest science and updates.

Key Guidance Takeaways

- There is greater certainty and a narrowing range of the amount of sea level rise through 2050, with a statewide average of 0.8 ft of rise projected in the next 30 years.
- By 2100, statewide sea levels are expected to rise between 1.6 ft and 3.1 ft (Intermediate-Low to Intermediate Scenarios), and even higher amounts cannot be ruled out.
- Beyond 2100, the range of sea level rise becomes increasingly large due to uncertainties associated with physical processes, such as earlier-than-expected ice sheet loss and resulting future sea-level rise. By 2150, statewide sea levels may rise from 2.6 ft to 11.9 ft (Intermediate-Low to High Scenarios), although even higher amounts are possible.
- Vertical land motion (uplift or subsidence) is the primary driver of local variations in sea level rise across the state. Vertical land motion is incorporated into the sea level scenarios for the 13 tide gauges along the coast and in San Francisco Bay, providing more locally specific information.
- Sea level rise, when combined with extreme storms and higher tides, will result in accelerated cliff and bluff erosion, coastal flooding and beach loss, and mobilization of subsurface contaminants.

Keith Greer, Deputy Director of Regional Planning

OPC Sea Level Rise Guidance: 2024 Science and Policy Update

Item 4 - December 5, 2024

Justine Kimball, Ph.D., Climate Change Program Lead
California Ocean Protection Council

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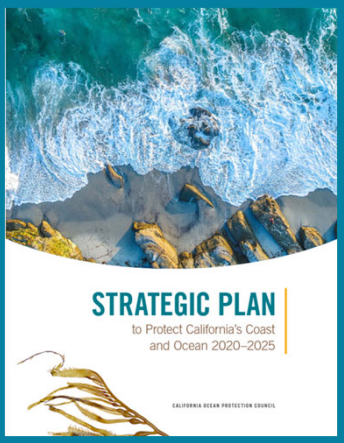
OPC's Mission and Priorities

Climate Change

Equity

Biodiversity

Sustainable Blue Economy



- Enacted in 2004 through the CA Ocean Protection Act
- OPC Executive Director serves as CNRA Deputy Secretary for Ocean and Coastal Policy
- The mission of OPC is to ensure that California maintains healthy, resilient, and productive ocean and coastal ecosystems for the benefit of current and future generations

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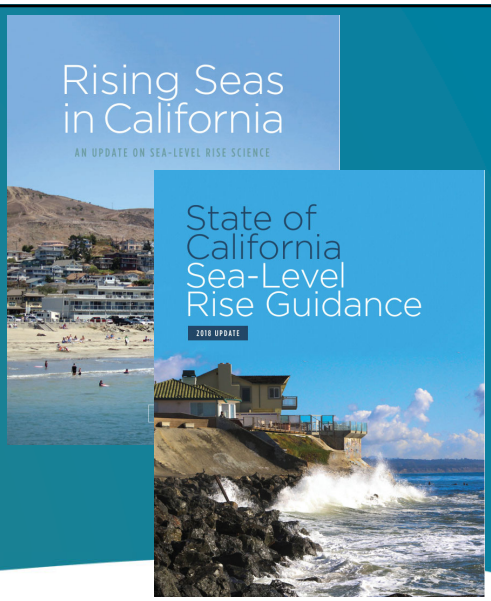
Update to the 2017/18 Science and Policy Guidance

- Separate science and policy reports
- SLR projections for 12 tide gauge locations
- Probabilistic projections for high and low emissions (2030 – 2150), and an extreme scenario (H++)
- Stepwise (5 steps) process on how to select SLR projections based on risk tolerance
- Recommendations for planning and adaption



Strategic Goal 1: Safeguard Coastal and Marine Ecosystems and Communities in the Face of Climate Change

3

Ocean Science Trust – Science Task Force

Executive Summary

Chapter 1: Introduction

Chapter 2: California Sea Level Scenarios *

Chapter 3: Combined Impacts of Sea Level Rise and Other Coastal Hazards *

Chapter 4: California Sea Level Rise Policy Guidance

Appendices

* Task Force authored

Dr. Susheel Adusumilli, University of California, San Diego
Dr. Patrick Barnard, United States Geological Survey (Co-Chair)
Dr. Daniel Cayan, University of California, San Diego
Laura Engeman, California Sea Grant & University of California, San Diego (Co-Chair)
Dr. Gary Griggs, University of California, Santa Cruz
Dr. Benjamin Hamlington, National Aeronautics and Space Administration (Co-Chair)
Dr. Kristina Hill, University of California, Berkeley
Dr. Felix Landerer, National Aeronautics and Space Administration
Dr. Phil Thompson, University of Hawaii at Manoa

+ Coordination with State Sea Level Rise Collaborative

Strategic Goal 1: Safeguard Coastal and Marine Ecosystems and Communities in the Face of Climate Change

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Chapter 2: New SLR Projections

- Intermediate (0.8 ft in 2050) should be considered most likely sea level rise in 2050.
- In 2100:
  - Low-to-Intermediate span range of possibilities without contributions from rapid ice sheet loss → 1.0-3.1 ft.
  - Intermediate-to-High span range of possibilities with contributions from uncertain rapid ice sheet loss → 3.1 to 6.6 ft.
- Beyond 2100:
  - The range of sea level rise becomes increasingly large due to uncertainties associated with physical processes.
  - Sea levels may rise from 2.6 ft to 11.9 ft (Int-Low to High Scenarios), although higher amounts are possible.
- Vertical land motion (uplift or subsidence) is the primary driver of local variations in sea level rise across the state.

YEAR	LOW	INT-LOW	INTERMEDIATE	INT-HIGH	HIGH
2020	0.2	0.2	0.2	0.2	0.3
2030	0.3	0.4	0.4	0.4	0.4
2040	0.4	0.5	0.6	0.7	0.8
2050	0.5	0.6	0.8	1.0	1.2
2060	0.6	0.8	1.1	1.5	2.0
2070	0.7	1.0	1.4	2.2	3.0
2080	0.8	1.2	1.8	3.0	4.1
2090	0.9	1.4	2.4	3.9	5.4
2100	1.0	1.6	3.1	4.9	6.6
2110	1.1	1.8	3.8	5.7	8.0
2120	1.1	2.0	4.5	6.4	9.1
2130	1.2	2.2	5.0	7.1	10.0
2140	1.3	2.4	5.6	7.7	11.0
2150	1.3	2.6	6.1	8.3	11.9

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Chapter 3: Combined Impacts of SLR and Other Coastal Hazards

- Sea level rise will increase the frequency of coastal flooding events
- Storm events will become more damaging and dangerous as climate change and sea level rise continue
- SLR will increase the rates of retreat of coastal cliffs and bluffs, the erosion of beaches, and the loss of coastal wetlands, tidal marshes and sand dunes
- The coastal groundwater table will rise with SLR

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Chapter 4: Policy Guidance

- A stepwise process is recommended for incorporating Sea Level Scenarios into planning and projects.
- The most precautionary approach is to **evaluate Intermediate, Intermediate-High, and High Scenarios (and 100-year storm conditions).**
- The process of selecting an implementation project or adaptation pathway that is adaptive to a certain amount of sea level rise will include consideration of many factors, including risk assessment.
- Selection will often include assessment of trade-offs, using trigger-based adaptation pathways to account for sea level rise over time.

>> STEP 1: *Identify the nearest tide gauge*

>> STEP 2: *Evaluate planning and/or project time horizon(s)*

>> STEP 3: *Choose multiple Sea Level Scenarios for vulnerability assessment*

>> STEP 4: *Conduct vulnerability assessment*

>> STEP 5: *Explore adaptation options and feasibility*

>> STEP 6: *Select phased adaptation approach and/or implement project*

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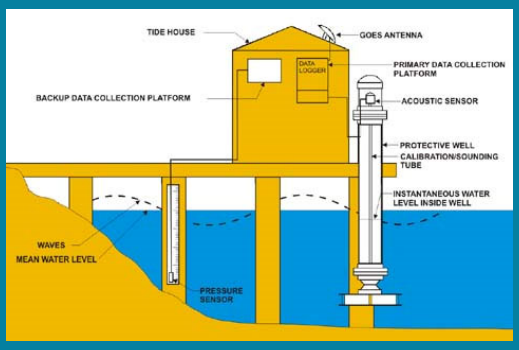
Steps 1 and 2

Step 1: Identify nearest tide gauge or use statewide table and local vertical land motion value.

Step 2: Many of the planning and projects utilizing this guidance will have time horizons beyond 2100, though some projects may be for shorter-term or temporary development, or planning efforts may consider both long-term goals and the shorter-term actions necessary to achieve them.

Alternatively, rather than using time to identify adaptation phases, it is equally valid to choose sea level rise values (step 3) to correspond to adaptation phases so long as those values roughly capture the time horizon in question.



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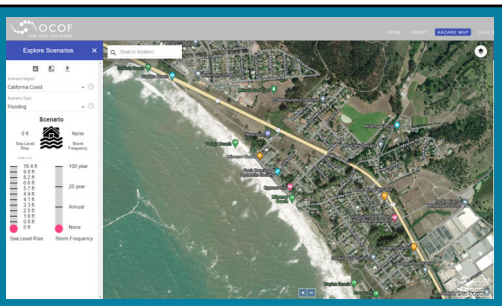
Steps 3 and 4

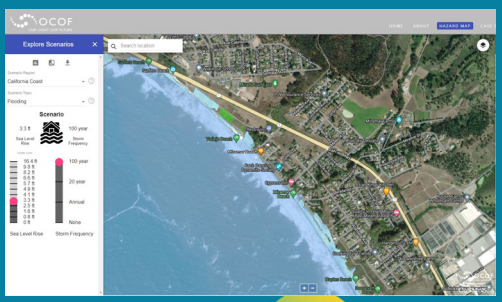
Step 3: For most planning and projects, it is recommended to evaluate **Intermediate, Intermediate-High, and High scenarios**. Consideration of storm conditions (for most applications 100-year storm) is also recommended to evaluate extreme water levels, as appropriate

Step 4: Exposure analysis can be performed using a SLR visualization tool or a tailor-made approach

For community planning, sensitivity analysis has recommended considerations. Adaptative capacity should be assessed through the existence of policies, structures, finances, and human resources

Existing vulnerability assessments can skip to Step 5, as appropriate





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Steps 5 and 6

Step 5: Explore adaptation options and feasibility – new Step!

Step 6: Selection guided by risk assessment (risk aversion):

- Low-risk averse projects => Intermediate Scenario
- Medium-high risk aversion => Intermediate-High Scenario
- Extreme risk aversion => High Scenario
- Storm conditions can be added to the Scenario value as appropriate

China Camp State Park
California King Tides Project

CALIFORNIA OCEAN PROTECTION COUNCIL

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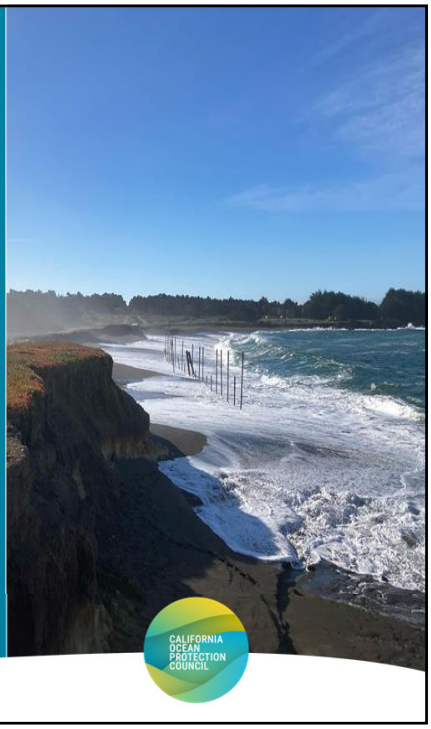
Funding Opportunity: SB 1 Grant Program (https://www.opc.ca.gov/sb-1-funding/)

- The FY 24-25 Budget maintained $77 million in funding for the SB 1 Grant Program. Plus new Prop 4 funding.
- $37.5M available now (not accounting for what has already been spent/committed to projects) and an additional $36.8M is expected in July 2026.
- SB 1: “making grants to local and regional governments to update local and regional land use plans to take into account sea level rise and for directly related investments to implement those plans”



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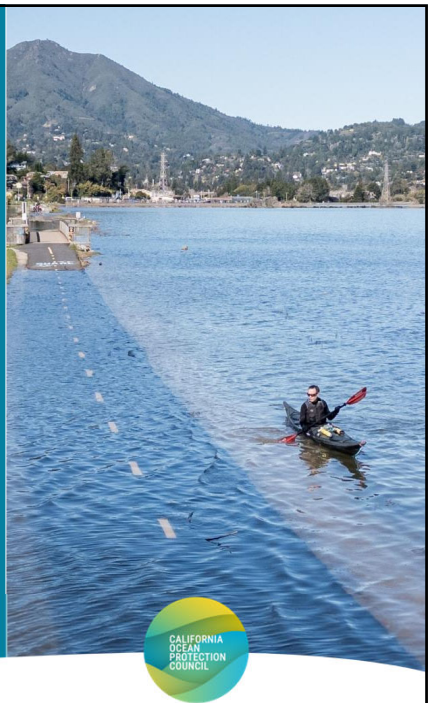
SB 1 Grant Program – Track 1 Open Now (+ urgent Track 2)

- Phase 1: Pre-planning (explore, define, assess)
  - Community visioning
  - Vulnerability Assessment
- Phase 2: Data Collection
  - Data/Information Gathering
- Phase 3: Planning Phases (defining adaptation frameworks and strategies)
  - Outer Coast SLR Adaptation Plan
  - Single Jurisdiction SF Bay Subregional SAP
  - Multi-jurisdictional SF Bay Subregional SAP
  - Sector-Specific Adaptation Plan



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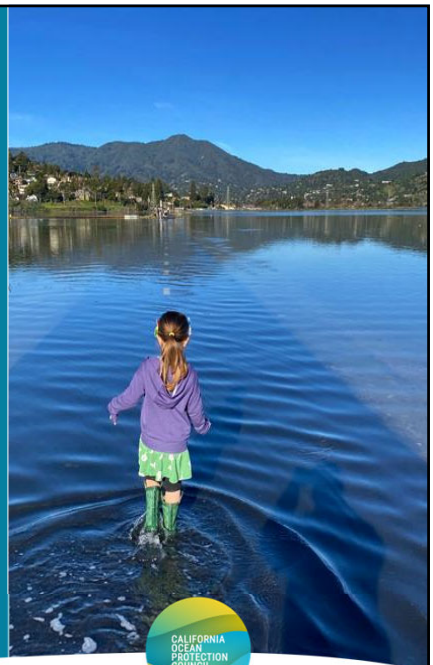
SB 1 Grant Program – Track 1 Open Now (+ urgent Track 2)

- Rolling Quarterly applications
- Must meet Eligibility requirements for Phase applying for (non-competitive)
- Eligible applicants:
  - Local governments
  - Regional governments
  - Federally recognized tribal governments
  - Organizations or consultants who apply on a government's behalf
- Urgent Track 2 proposals will also considered



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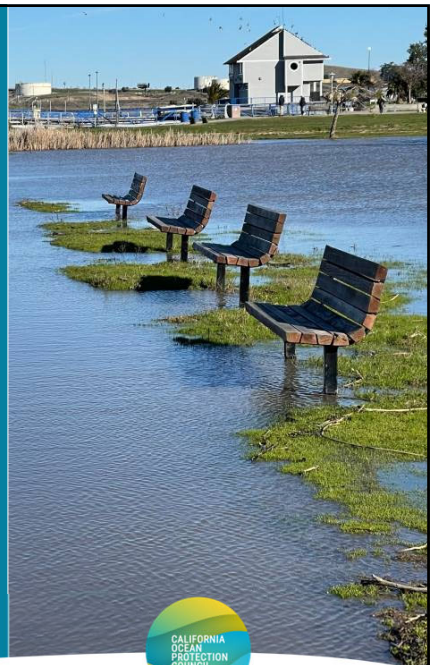
SB 1 Grant Program – Track 2 expected to launch early/mid 2025

- Guidelines in development
- Competitive application process
- Likely 1-2 RFPs in 2025
- Phase 4: Project Implementation (implement, innovate, assess, adjust)
  - Nature-based and Green-Gray Hybrid Adaptation Projects/Feasibility Study/Design Plans



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SB 1 Grant Program – Technical Assistance (TA)

- A complementary SB 1 TA Program provides application assistance to eligible SB 1 applicants
- TA is tailored based on the applicants' needs, including but not limited to capacity building and grant writing support
- Prioritize applicants based on:
  - EJ Communities
  - Federally Recognized Tribes
  - Small and Rural Communities
  - Other

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Thank you!

Justine Kimball, Justine.Kimball@resources.ca.gov

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SANDAG

Shoreline Preservation Working Group

Item: **5**

December 5, 2024

City of San Clemente Beach Nourishment Project Updates & Half-Cent Sales Tax Funding Measure

Overview

The City of San Clemente will present an update on its beach nourishment projects, including the United States Army Corps of Engineers' Sand Replenishment Project (2023) and the North Beach Sand Replenishment Project (2024). Additionally, the City will present an update on the results of the half-cent sales tax measure that was voted on this past November 2024 to help fund future beach nourishment projects.

Action: **Information**

City of San Clemente staff will present an update on the City's sand nourishment projects and recent half-cent sales tax.

Fiscal Impact:

N/A

Schedule/Scope Impact:

N/A

Key Considerations

- The City of San Clemente (City), in collaboration with the United States Army Corps of Engineers and California State Parks, is restoring the City's main public beach. The North Beach Sand Replenishment Project also uses 37,000 cubic yards of beach-quality sand sourced from the Santa Ana River (Costa Mesa/Fountain Valley). Both projects aim to protect local property and infrastructure from coastal hazards and improve recreation opportunities for beach users. More information is available on the City of San Clemente's Sand Replenishment project page.

- Measure BB to fund sand nourishment, maintaining beach access for residents, reducing beach erosion; protecting ocean water quality, surfing/ocean swimming locations; restoring/maintaining beach trail, pier and lifeguard lifesaving equipment, helping protect San Clemente's local beach economy, by establishing a dedicated 1/2¢ sales tax providing approximately $6,750,000 annually.

Keith Greer, Deputy Director of Regional Planning

City of San Clemente Updates

Presented to:
SANDAG
Shoreline Preservation Working Group

Leslea Meyerhoff, AICP
December 5, 2024

PROJECT UPDATES

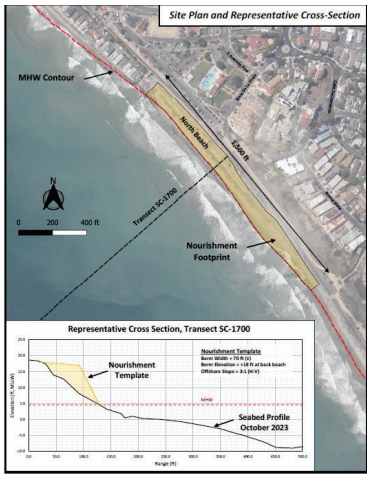
- North Beach Emergency SCOUP Project
- USACE 50-Year Project: Initial Event
- Measure BB (1/2 cent for Better Beaches)

NORTH BEACH EMERGENCY SCOUP PROJECT

- Project needed to address emergency need for sand in City
- Lifeguards unable to access North Beach at high tide
- Critical public infrastructure being undermined from wave exposure
- Project developed in cooperation with County of Orange
  - Sand removal is part of flood control maintenance efforts
  - County PW cleaning, sorting and stockpiling sand for use by City

PROJECT DESCRIPTION

- Approval to place up to 50,000 cubic yards of sand
- The City used permitted SCOUP project footprint = ~1,500 feet long
- Southern 1/3 (~530 feet) of the project footprint also located within OCTA's Reinforcement Areas 1 & 2
- Sand placed by City directly benefits railroad that traverses the City
  - Designated U.S. Department of Defense (DOD) Strategic Defense Rail Corridor



PROJECT CONSTRUCTION

- ~ 37,000 CY of sand delivered July 22 – October 1, 2024 via "Super 10" trucks (~10 CY capacity) accessed through Capistrano Shores community
- Sand placement Monday through Thursday only (per CCC) from 7am to 7pm
- Public Safety Closure Monday – Thursday with beach reopened Friday through Sunday
- Placed all available compatible sediment from SAR on the beach

PROJECT MONITORING

Project monitoring included the following:

- Baseline UAV photos of project site
- Water quality monitoring for turbidity during project
- Surf monitoring
- Avian and grunion monitoring
  - No grunion habitat determination at start of project
  - Some grunion arrived late August for the final grunion run
- Maximized use of City staff for monitoring to reduce project costs
- Total project cost ~ $2M (= $54.00 / CY)

BEFORE AFTER

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USACE 50-YEAR PROJECT: INITIAL EVENT

- City has partnered with State Parks and USACE to develop a 50-year (2024-2074) sand project with renourishment every 5-6 years
- Volume of sand on beach= 200,000 CY per nourishment
- Project footprint is 3,214 linear feet designed to widen beach by 50’

USACE 50-YEAR PROJECT: INITIAL EVENT PROJECT TIMELINE

November 2023: Construction started

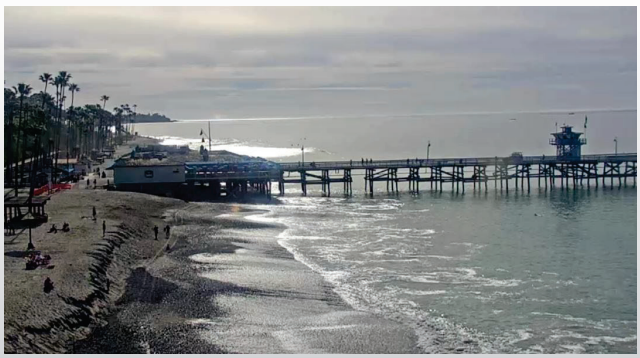
January 2024: Project halted due to sediment quality

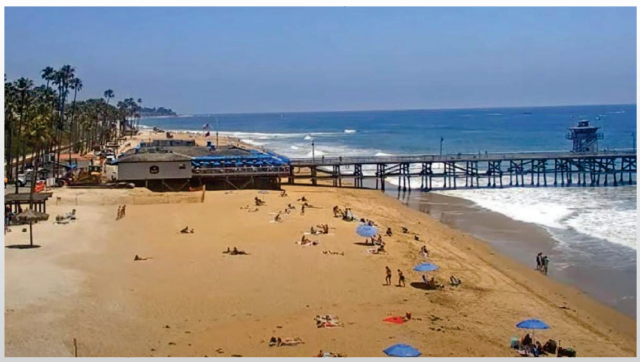
New borrow site identified and permitted

April 24, 2024: Project restarted

May 21, 2024: ~114,000 cubic yard placement completed

November 6, 2024: Returned to add 86,000 cubic yards to complete initial event





San Clemente Measure BB – Received Favorable Vote of 64.61%, but was a Special Tax Requiring 66.67%

Proposed Targeted Tax

- ½ of 1 % Sales Tax increase.
- 7.75% to 8.25%
- 100% of revenue stays in San Clemente
- 0.50 cents for every $100 spent
- Spreads the responsibility fairly by including visitors to the City

Sales Tax Comparison:

• Santa Ana	9.25%
• Seal Beach	8.75%
• Fountain Valley	8.75%
• Los Alamitos	9.25 %

Many other Cities are above 7.75%

San Clemente
A Beach Community Lacking the Tax Structure to Preserve Its Beaches

- San Clemente is the **Village** by the Sea
- **No** 5 – Star Resorts by the Sea
- San Clemente designed & built as residential community
- Tax base is like a small inland city
- 70% of General Fund: Public Safety and Maintenance.
- Cutting the budget = cuts to essential services.

Beach Protection, Restoration, and Clean Ocean Fund (Measure BB)

Legally Restricted to:

- Beach Sand Replenishment
- Beach Sand Retention
- Coastal erosion projects
- Coastal Trails and bridges
- Pier and Lifeguard facilities

Why is Additional Revenue Important?

Sand supply to the beaches is approaching zero

Cottons Point, San Clemente in 2008 vs. 2021.

How Much Sand is Needed?

~ 5 - 7 million cubic yards over time

How Much Sand has been added?

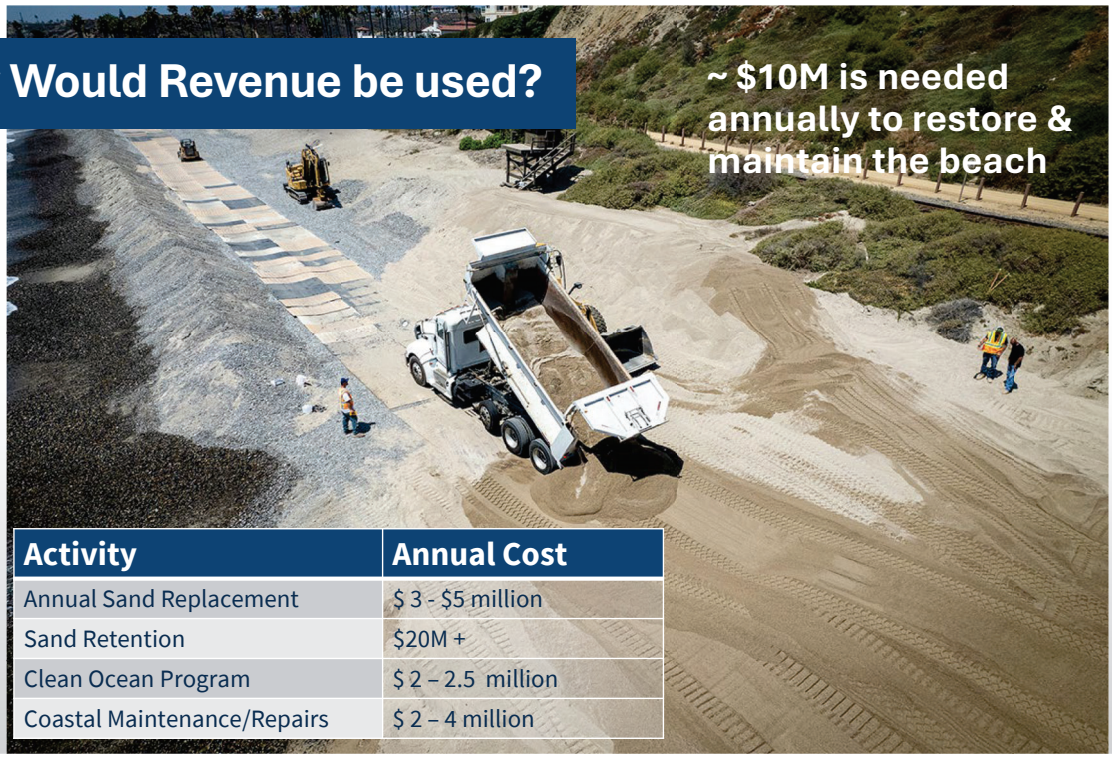
- ✓ USACE Project: 200,000 cubic yards (2024)
- ✓ North Beach SCOUP: 37,000 cubic yards (2024)

Beach Project Costs?

USACE $120 million for ~2 million CY over 50 years

$10 million (approx.) annually to restore the beach

How Would Revenue be used?



Activity	Annual Cost
Annual Sand Replacement	$ 3 - $5 million
Sand Retention	$20M +
Clean Ocean Program	$ 2 – 2.5 million
Coastal Maintenance/Repairs	$ 2 – 4 million