Between the ocean and hard place:

How to answer the most challenging questions about beaches, armoring, and retreat.

Carey Batha | Environmental Scientist
California Coastal Commission

Stinson Beach, Brittney Cozzolino

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Coastal Commission Basics

California Coastal Act

- Protection of coastal resources
  - Public access, recreation, habitat, wetlands, wildlife, agriculture, priority land uses, scenic views…
- Hazard minimization
  - Site and design development to be safe
  - Limits on use of shoreline armoring

Local Coastal Programs

- Implement Coastal Act at local level
- Land Use Plan and Implementation Plan/Zoning Ordinance
- Developed by local governments for certification by the Coastal Commission
- Local gov then assumes permitting authority

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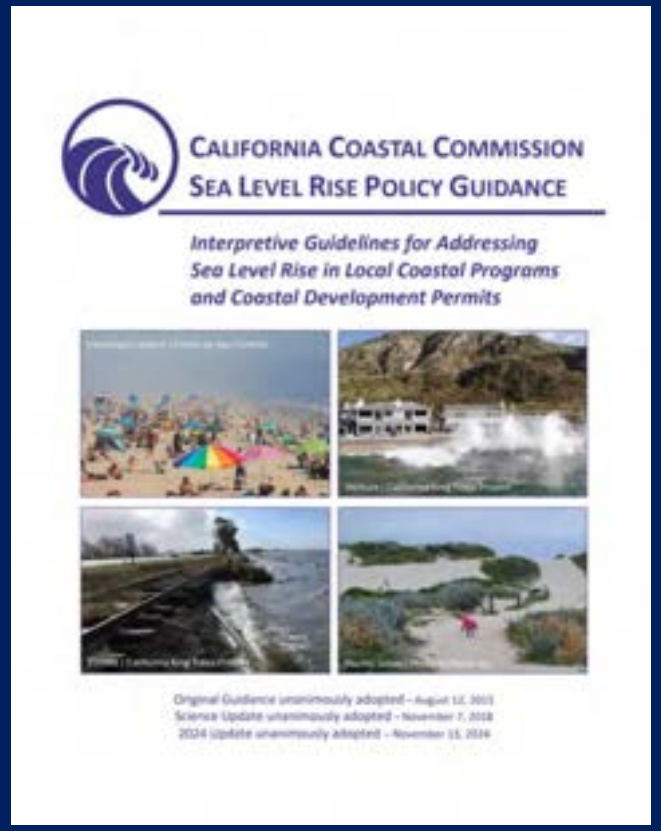
Sea Level Rise Adaptation Planning

Additional legislation

SB 272 requires LCP updates by 2034 including:

1. Best available science
2. Vulnerability assessment, including at-risk communities
3. SLR adaptation strategies and recommended projects
4. Identification of lead planning and implementation agencies
5. Economic impact analysis of costs to critical public infrastructure
6. Timeline for updates

Guidance



LCP Grants

Quick Stats:
- **$30M**
- **50 jurisdictions**
- **100 projects**

Progress to Date

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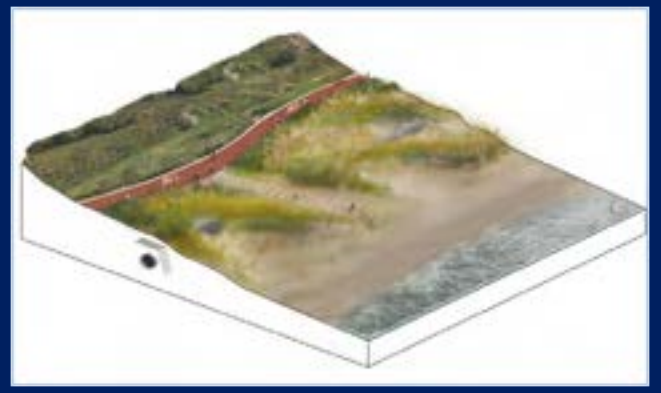
ADAPTATION OPTIONS

California Coastal Records Project



COASTAL SQUEEZE

Graphic: Jeremy Smith, California Coastal Commission

More Challenges

Local Government Working Group identified:

- Sea level rise uncertainty
- Piecemeal adaptation
- Feasibility of adaptation beyond the parcel scale
- Takings risk
- Disagreements over definition “Existing structures,” which can qualify for armoring
- Armoring outcome paralysis
- Communication challenges
- Funding

More Challenges

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Stalled progress

Neighborhood-Scale Adaptation

Adaptation at the right geographic scale

A Coastal Act-consistent mix of different adaptation approaches when looked at together across a jurisdiction

Approaches could include the more difficult strategies, including retreat and armoring, when they are included in a mix of strategies are - on balance - most protective of coastal resources.

Policy Guidance

Development patterns

Recreation and public access

Habitat and sensitive species

Beach evolution

Community considerations

POLICY GUIDANCE

Development patterns

Recreation and public access

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Community considerations

Development patterns

- Density
- Development types
  - Existing
  - Coastal dependent
  - Priority land uses
- Permitting history

Policy Guidance

Development patterns

Recreation and public access

Habitat and sensitive species

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Community considerations

Recreation and public access:

- Visitation
- What kinds of activities are supported?
- Alternatives nearby?
- Cultural significance?

POLICY GUIDANCE

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Community considerations

Habitat and sensitive species

- Endangered species?
- ESHA?
- Sensitivity to possible adaptation responses

POLICY GUIDANCE

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Beach evolution

- Beach width
- Would sediment management maintain beaches?
- Would backshore erosion maintain beaches?

Policy Guidance

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Community considerations

Community considerations

- Significance to visitors from inland
- Environmental justice community needs
- Tribal resource and significance

The Hardest Questions

- What is a Coastal Act consistent mix of approaches?
- To what extent can Coastal Act support armoring outside of the narrow circumstances in which the law mandates approval?
- How can we handle the likely controversy when a neighborhood-scale approach includes retreat in one area but long-term armoring in another?
- How can we implement retreat at a neighborhood scale?
- Will retreat save the beach?

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The Hardest Questions

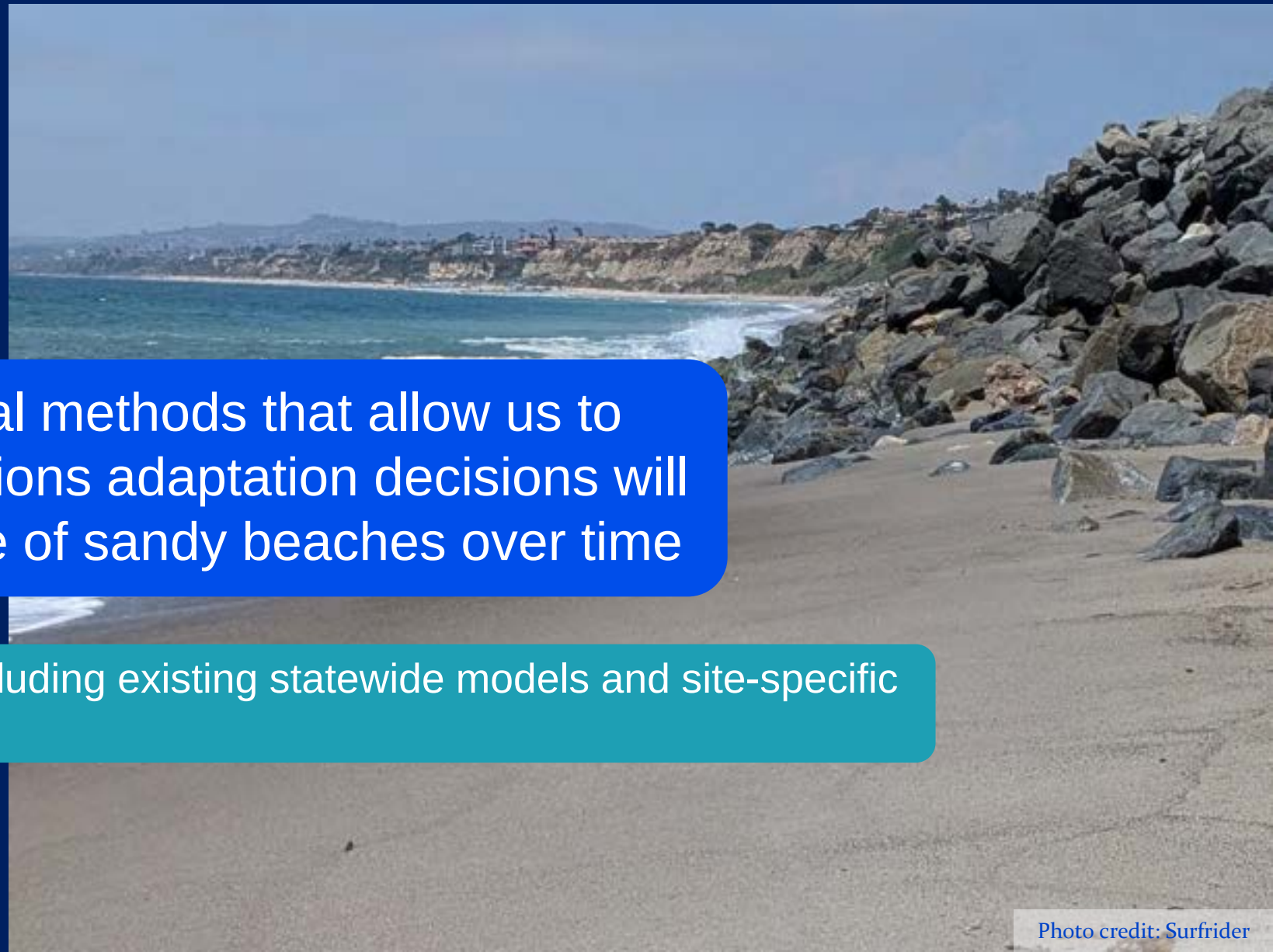
Will retreat save the beach?

TECHNICAL GUIDANCE

GOAL: Explore technical methods that allow us to understand the implications adaptation decisions will have on the persistence of sandy beaches over time

Photo credit: Surfrider

TECHNICAL GUIDANCE

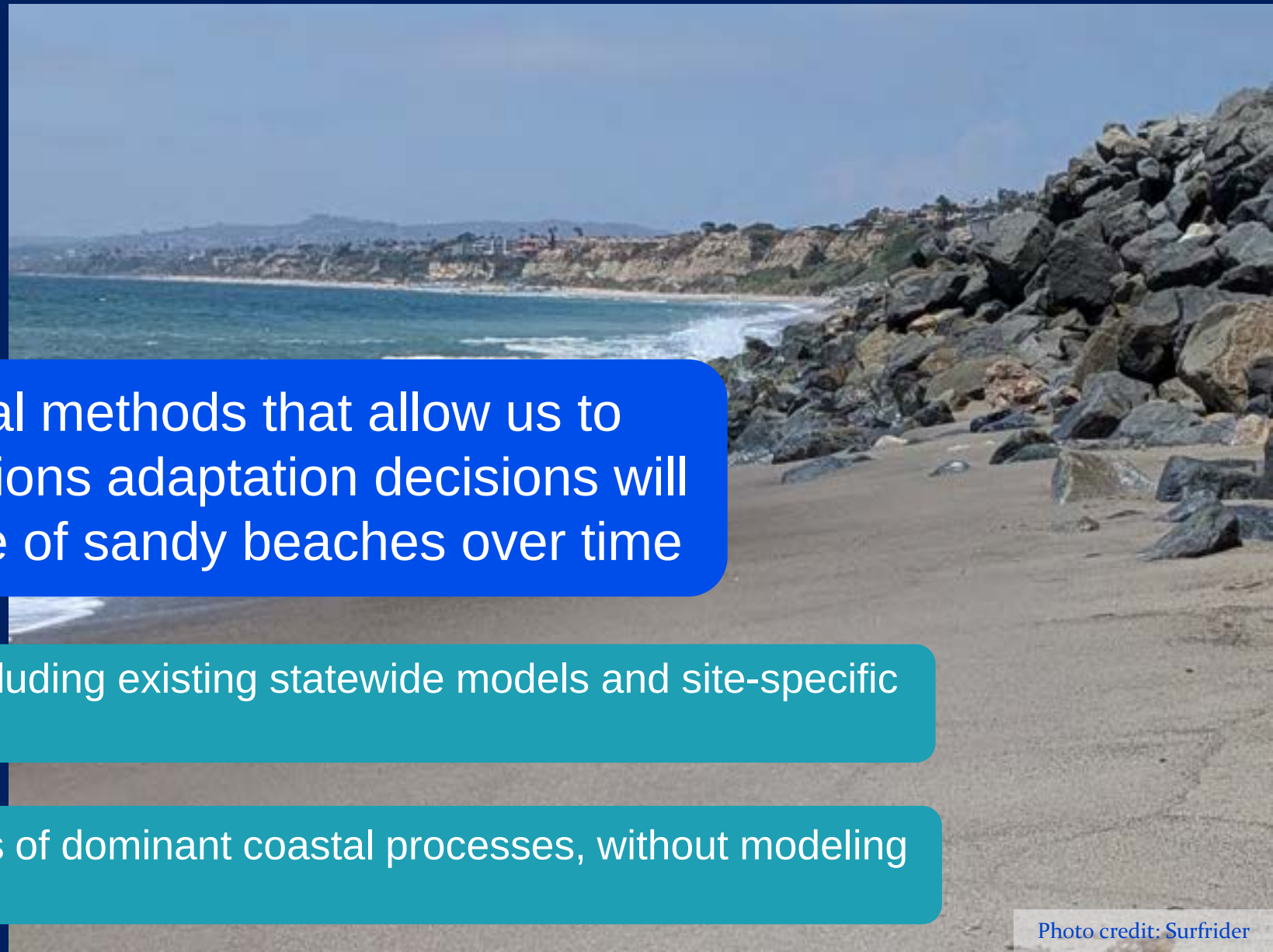


GOAL: Explore technical methods that allow us to understand the implications adaptation decisions will have on the persistence of sandy beaches over time

- Modeling, including existing statewide models and site-specific modeling

Photo credit: Surfrider

TECHNICAL GUIDANCE

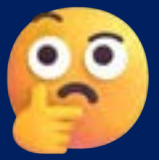


GOAL: Explore technical methods that allow us to understand the implications adaptation decisions will have on the persistence of sandy beaches over time

- Modeling, including existing statewide models and site-specific modeling
- Assessments of dominant coastal processes, without modeling

Photo credit: Surfrider

BROAD ASSESSMENTS

Space (backshore accommodation)	• Beach profile & composition • Geology underlying beach • Backshore morphology & composition • Anthropogenic influences (e.g., armoring)	+
Sand supply (sources & budgets)	• Historical sand budget • Position within littoral cell • Anthropogenic influences (e.g., dams, harbors)	-
Sand transport & retention	• Wave climate and shoreline orientation • Anthropogenic influences (e.g., groins, artificial headlands, offshore reefs,	+/- 

MODELING

For applicable models & methods, the guidance:

- Summarizes it
- Practical guide to its use
- Identifies the coastal settings where it is best suited.
- Lists opportunities to incorporate local conditions and data

Shoreline

- CoSMoS-COAST
  - Use published dataset
  - Rerun model
- Other: GenCade, Unibest, and LITPACK

Dune

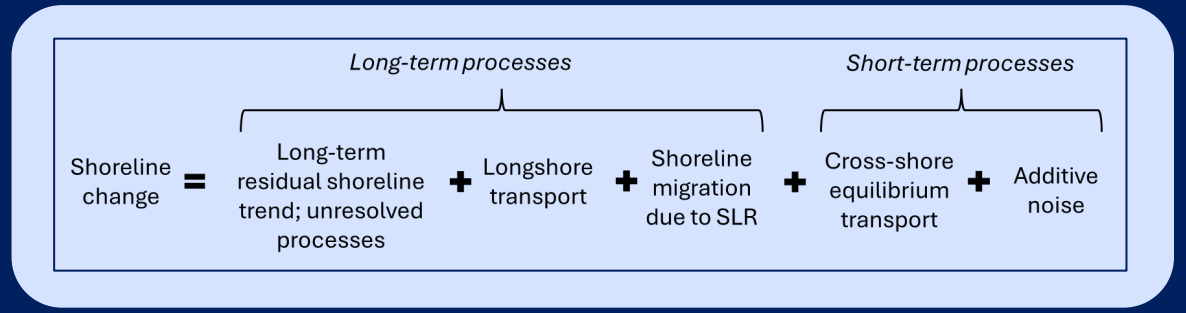
- Basic models
- Complex models
- Simplified models

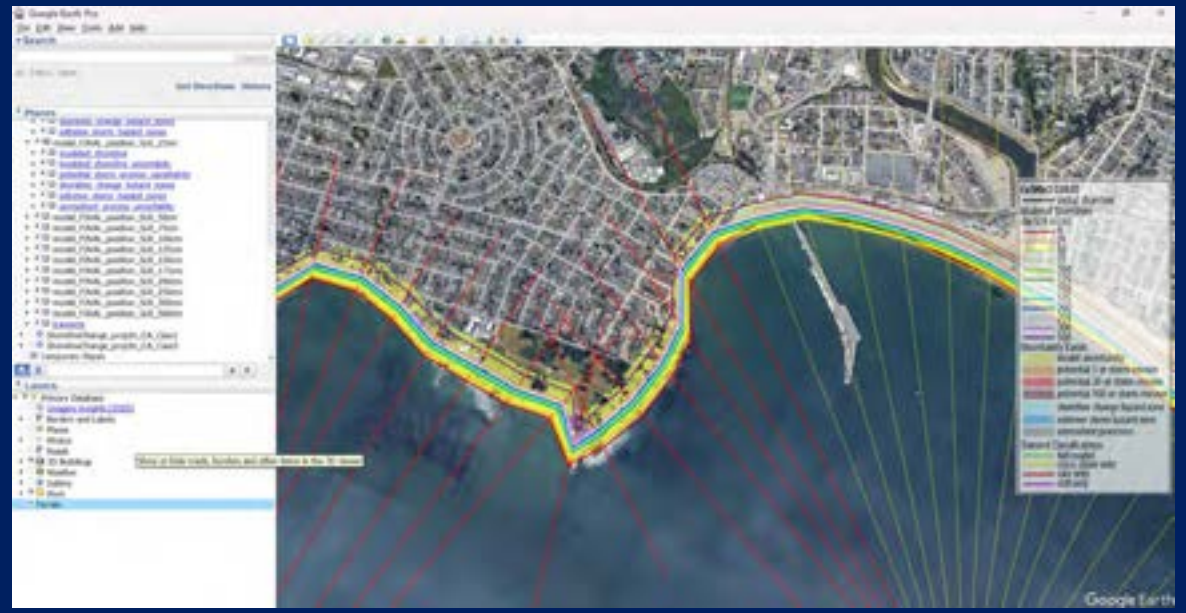
Cliff

- Bruun
- Sand balance
- SCAPE
- Total Water Level
- Hackney
- Trenhaile-Lite & Energy Flux
- Ensembles of the above

SHORELINE MODELING

- Assess whether CoSMoS-COAST published data captures local conditions
- Rerun CoSMoS-COAST model to, for example:
  - Test sensitivity
  - Account for sand bypassing
  - Model strategies
  - Add transects
  - Couple with backshore model





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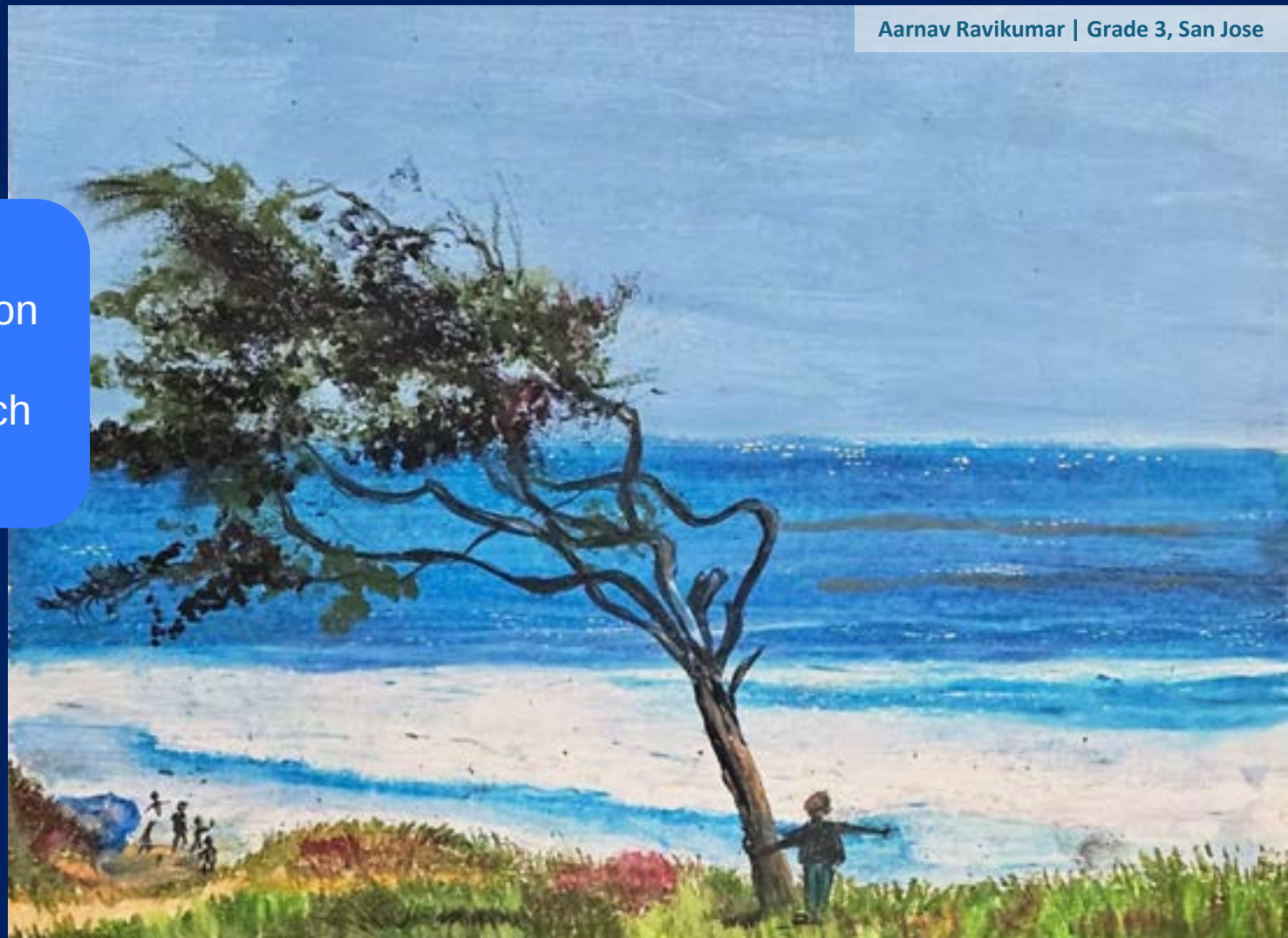
OTHER TOPICS

Uncertainty
- Methodological
- Data
- Sea level rise trajectories

Model RFP
- Model project description and tasks for a project that would assess beach persistence

Next steps & research needs. E.g.,
- Erodibility measures
- Monitoring
- State or regionwide efforts



Aarnav Ravikumar | Grade 3, San Jose

Photos from the California Coastal Records Project

GOALS, AGAIN

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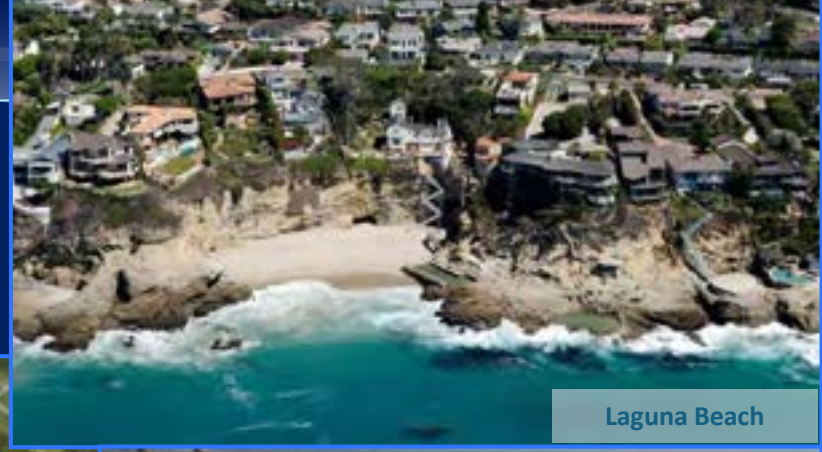
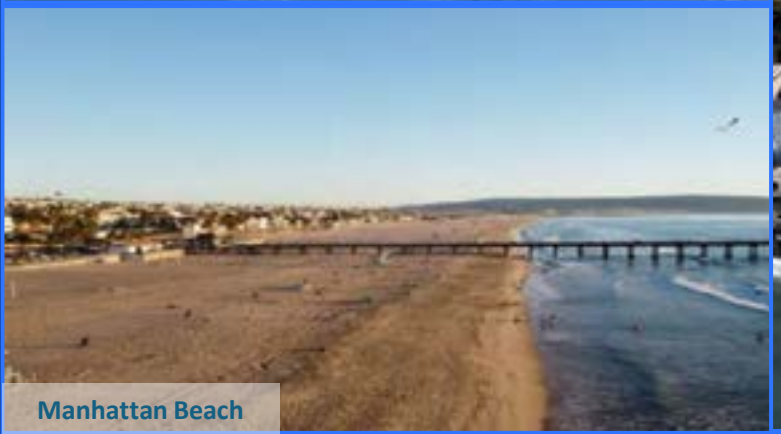

Laguna Beach

Solana Beach

Pismo Beach

Moss Landing


Manhattan Beach

Pacifica

San Clemente | Credit: LA Times, 2/1/2024

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OPPORTUNITY FOR FEEDBACK SOON!

We are anticipating asking for public review in the fall and will present the drafts at a CCC hearing.

Child's Play | Seaside, Cardiff State Beach | Nicholas Paoni
CA Ocean & Coastal Amateur Photography Contest, 2024

Thank you!

Thank you to our Local Government Working Group: Commissioner Ray Jackson, Commissioner Mike Wilson, Bruce Gibson, Matt LaVere, Jordan Wells, Sue Beckmeyer, Eric Friedman, Ed Waage, Scot Graham, Melissa Hetrick, Tyler Foltz, Melissa Sparks-Kranz

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