

# South Orange County Regional Coastal Resilience Strategic Plan

Presented by:

David Cannon, PE

Principal Engineer, Anchor QEA

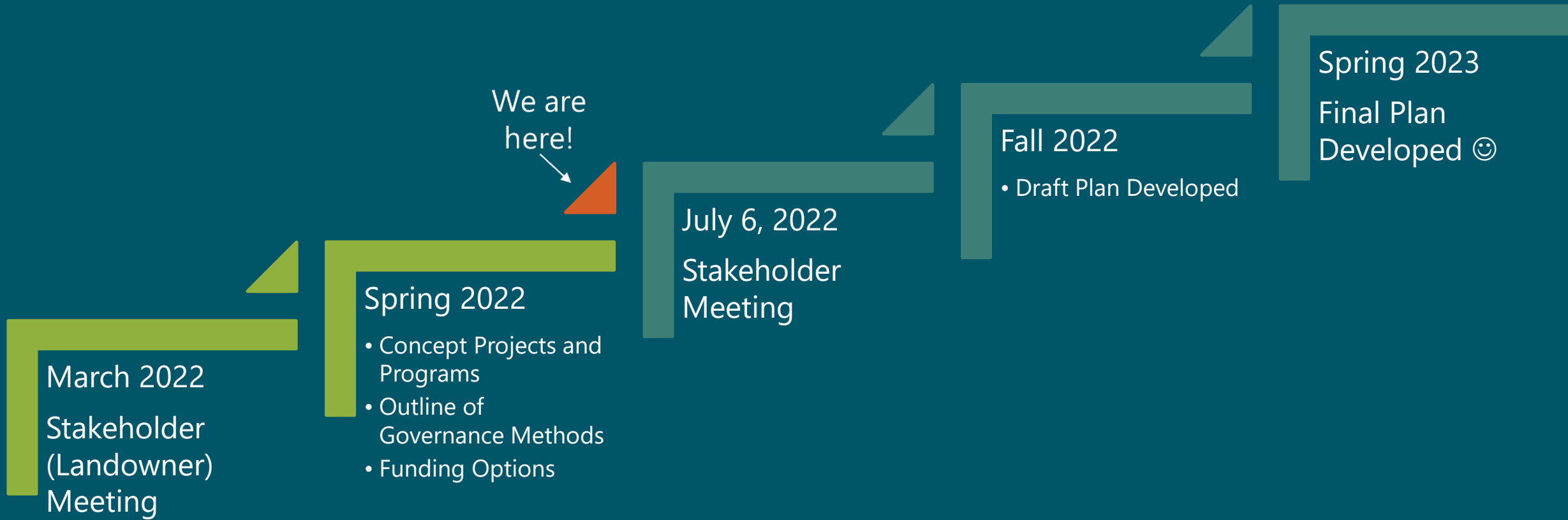
Adam Gale

Senior Manager, Anchor QEA

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# Schedule and Next Steps





# Meeting Objectives



- Comply with grant conditions
- Review stakeholder priorities
- Summarize coastal processes
- Obtain stakeholder input
  - Projects & Programs
  - Governance Methods
  - Funding Strategies

# Grant Overview

- **Executed:** May 4, 2021
- **Goal:** develop a regional, collaborative strategic plan to facilitate implementation of regional shoreline management activities to address chronically eroding shorelines in the southern portion of Orange County
- **Main Objective:** assess, prioritize, and advance resilience opportunities to reduce the risk to residents and increase the viability of south Orange County beaches



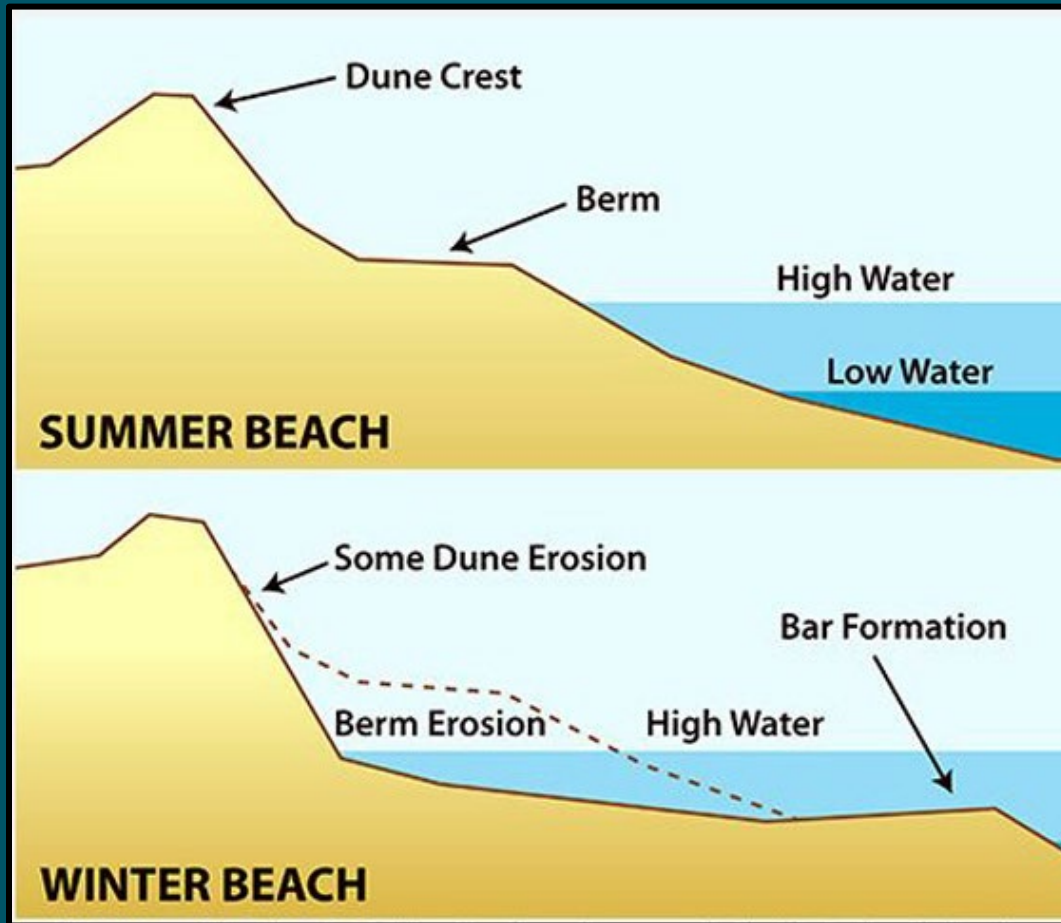




# Beach Morphology

- River flow changes impact sediment flow to beaches
- Wave climate changes impact sediment movement along beaches

# Cross-shore Transport

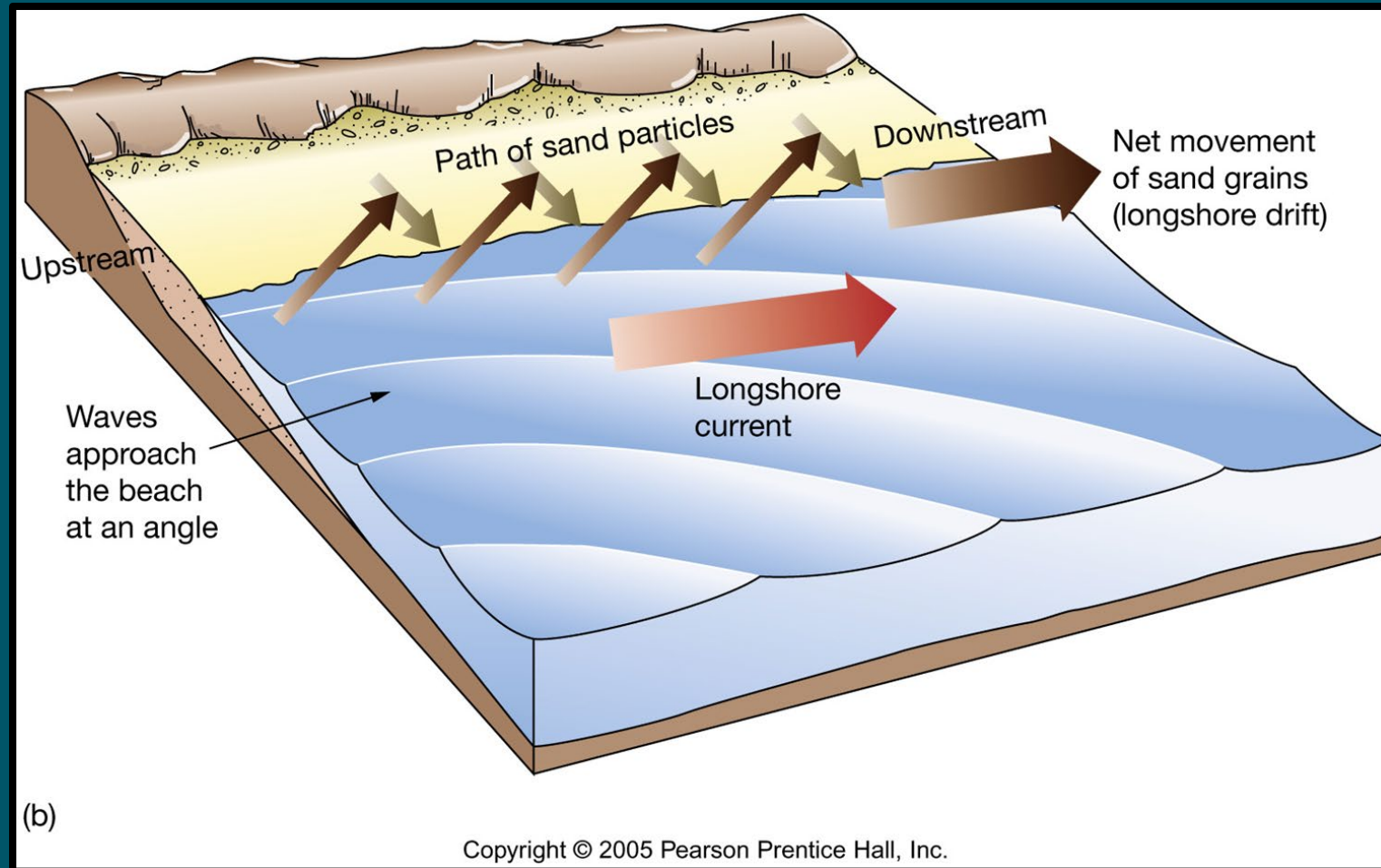


Larger winter waves move sediment offshore narrowing beaches

Sediment pushed offshore forms a sandbar, moving the breaker line farther offshore

The sandbar dissipates wave energy

# Longshore Transport





## ADAPTATION STRATEGIES



**AVOID**  
Restricting construction in at-risk areas



**ACCOMMODATION**  
Upgrading existing property

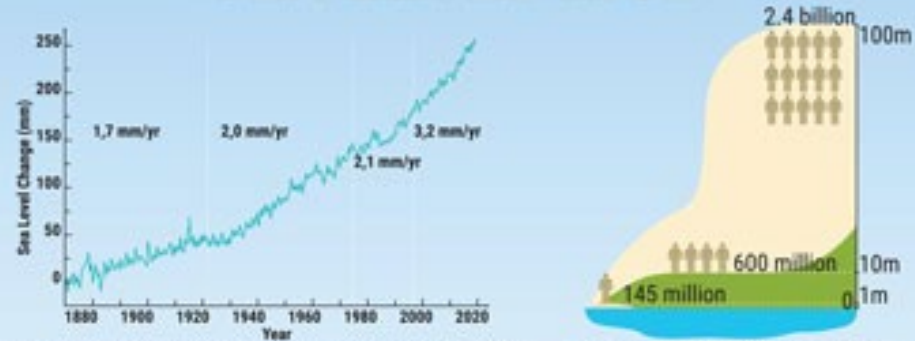


**PROTECTION**  
Improving flood defenses

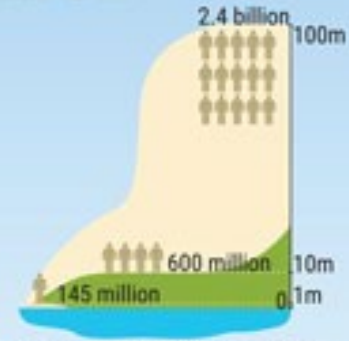


**RETREAT**  
Preparing for planned relocations

## SEA LEVEL RISE

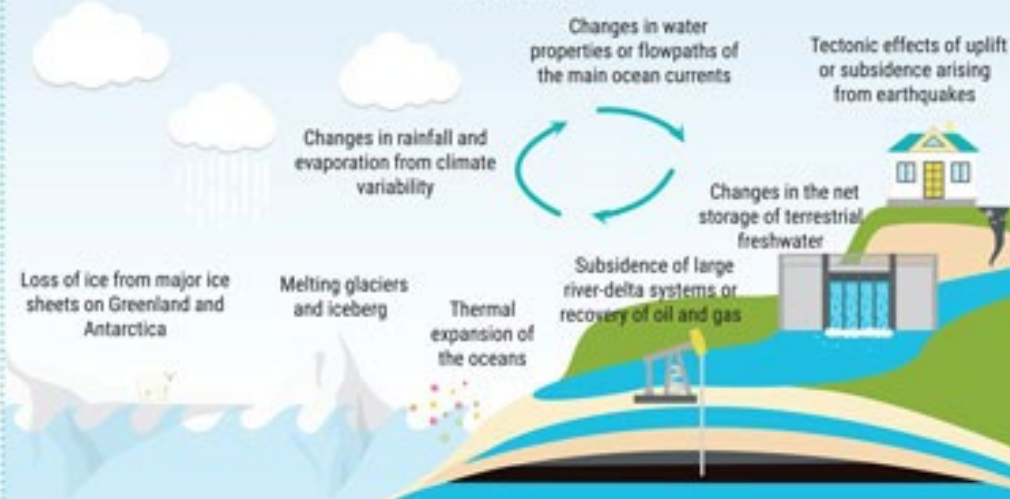


Globally averaged sea level has risen by about 25 cm since the 1800s. The annual rate increased to 3.3 millimeters per year



Nearly 145/600 million/2.4 billion people live within 1m/10m/100m of the coast

## CAUSES



## CONSEQUENCES



The disappearance of some low-lying islands



Submergence and increases flooding of coastal land



Increased erosion, and habitat destruction in coastal areas



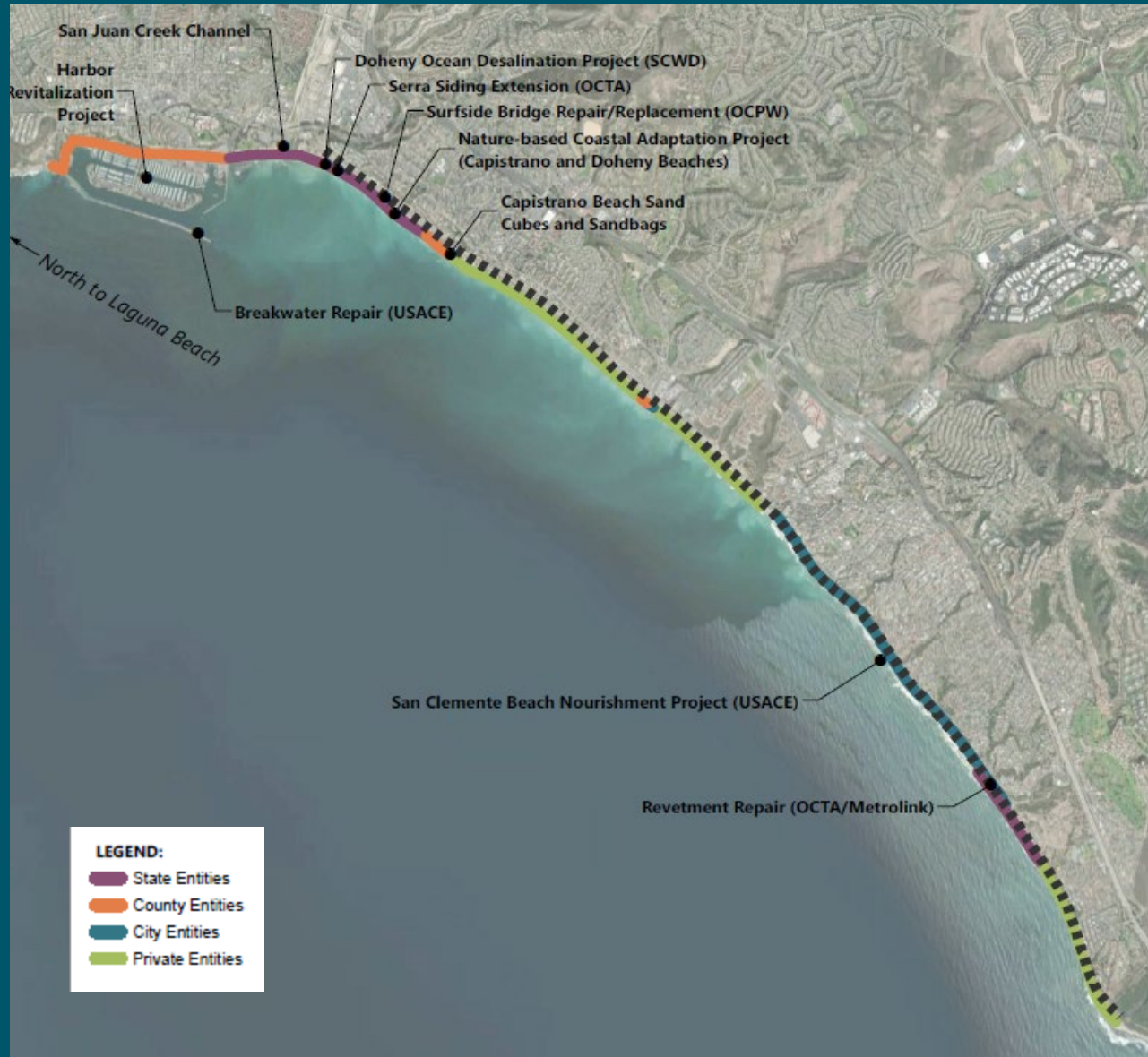
Saltwater intrusion of surface and subsurface waters





# Beach Erosion & Shoreline Retreat Problem Areas





# Related Existing and Planned Projects





# Projects & Programs



# Coastal Armoring

- Coastal armoring includes seawalls, rip-rap, and revetments
- Implementation not covered in Plan because:
  - Don't want to impact armoring efforts underway
  - The plan is regional and armoring is site specific
    - Will be owner's responsibility
  - Would delay implementation of regional efforts



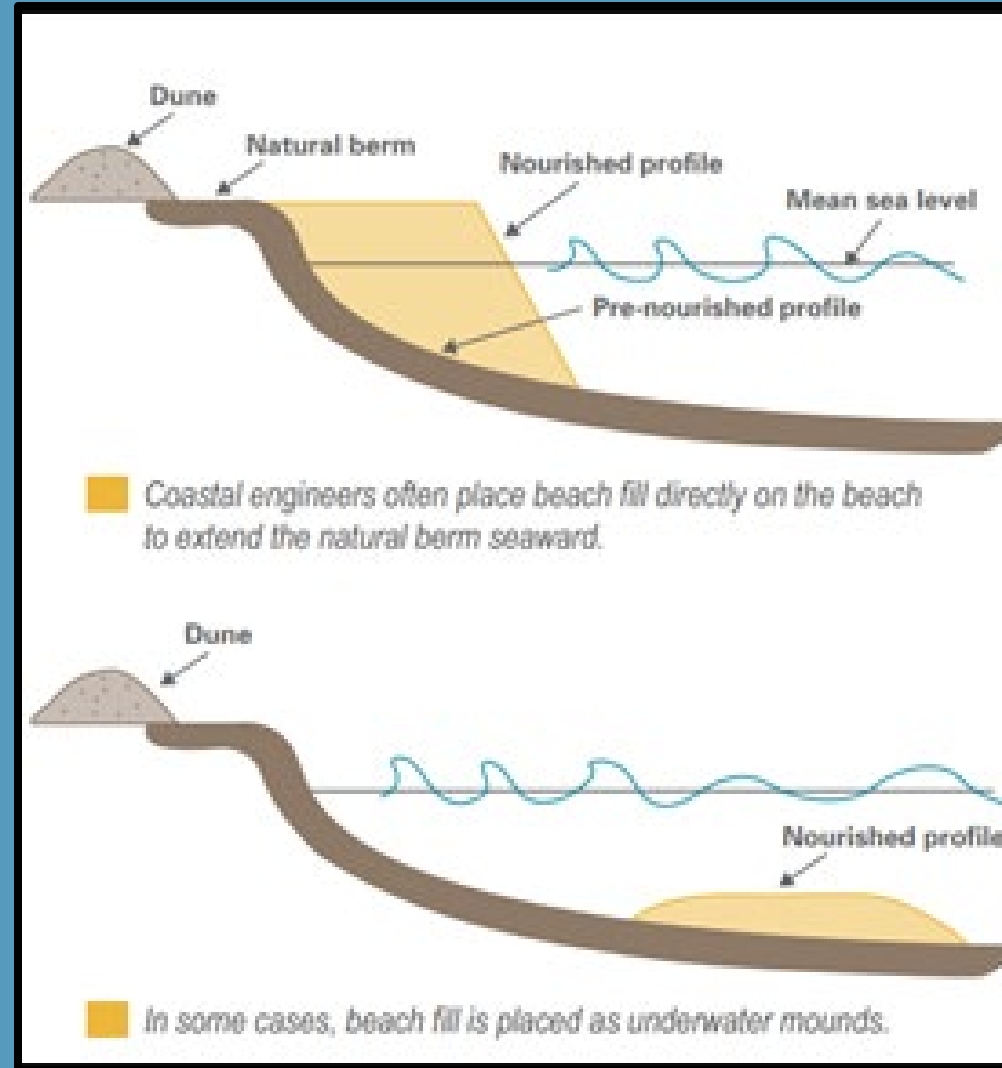
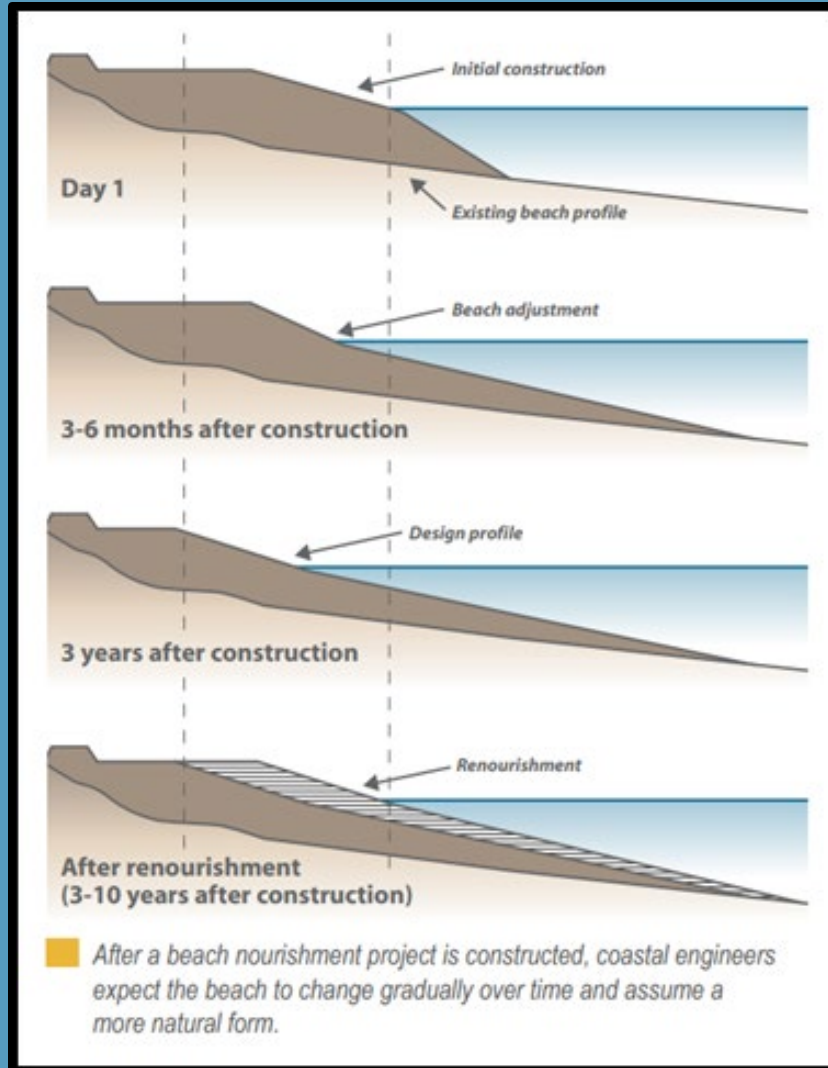


# Beach Nourishment

The placement of sandy sediment from outside the littoral cell onto beaches to mitigate erosion via beach width increases



# Beach Nourishment - A Primer





# Beach Nourishment

## Pros

- Beneficial reuse of sediment from rivers, bays, nearshore waters, & inland areas
- “Soft” solution
- Provides wildlife habitat (living shoreline)
- Allows recreational beach use

## Cons

- Difficult to find long-term sand source
- May require supplemental protective measures
- Expensive due to recurring costs
- Could impact nearshore habitats



# Beach Nourishment with Retention Structures

Beach nourishment coupled with structures that minimize the loss of beach sand

## Pros

- Improved protective performance
- Increased average beach width
- Decreased recurring costs

## Cons

- Increased capital costs due to structures
- New technology with unknown performance
- Difficult & time-consuming to permit
- Ideal location for retention structure may span multiple jurisdictions





# Retention Structures: Groins

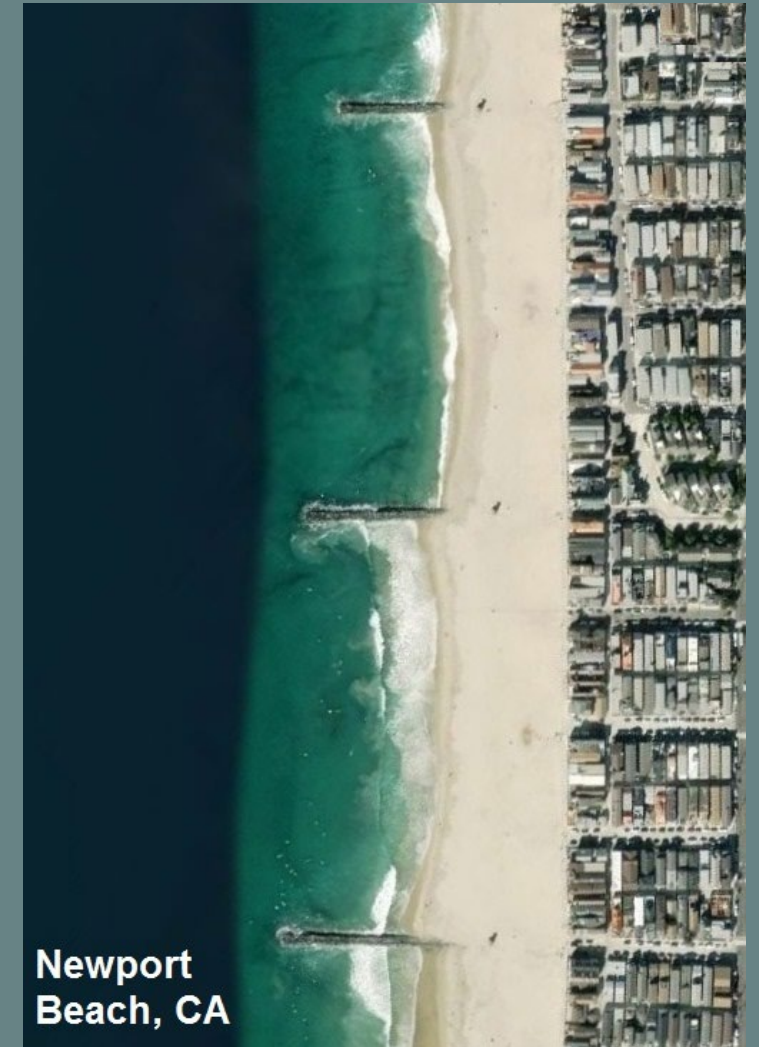
Shore-perpendicular structure that can be made of concrete, steel, boulders, or wood

## Pros

- Stabilizes beach location
- Represents “soft” shoreline protection solution
- Provides wide beach for human and/or wildlife use

## Cons

- Difficult to permit due to potential impacts to adjacent beaches
- Can produce hazardous rip currents
- Can divert beach sand to offshore sand bars



# Retention Structures: Nearshore Breakwaters

Shore-parallel rock and/or concrete structures that provide shore protection by blocking incoming waves resulting in sand accumulation behind the structure

## Pros

- Reduces wave heights behind the structure
- Accumulates sand behind the structure resulting in wider beach
- Can reduce hazardous rip currents

## Cons

- Increases beach nourishment maintenance costs
- Difficult to permit due to potential impacts to adjacent beaches
- Could impact sensitive nearshore habitats and recreation (e.g., surfing)



# Retention Structures: Multipurpose Reef

Offshore, underwater structure designed to provide shore protection, marine habitat, and recreation

## Pros

- Reduces wave energy behind structure
- Accumulates sediment behind structure
- Provides habitat for marine wildlife
- Provides recreational benefits (e.g., surfing, diving, fishing)

## Cons

- Unproven technology with higher uncertainty of benefits
- Potentially high unquantified mitigation costs
- Difficult to permit due to potential impacts





# Dunes (Living Shoreline)

Raised sand depositional feature along back of beaches that provides habitat for wildlife and protects areas behind the feature from wave action

## Pros

- Natural, “soft” solution to beach erosion
- Relatively easy to permit
- Provides habitat and recreation as well as protection

## Cons

- Can have high maintenance costs
- May require supplemental protective measures
- Difficult to find long-term sand source
- Could impact nearshore habitats



# Cobble Beach

A beach constructed from cobbles instead of sand

## Pros

- “Soft” solution so easier to permit
- Minimal impacts to nearshore habitats
- Requires less material to provide similar protection
- Provides wildlife habitat (living shoreline)

## Cons

- Limited research on design and performance
- Could support nonnative wildlife
- Public acceptance could be low for recreation
- May require supplemental protective measures



# Hybrid Options: Sand & Cobble Beach

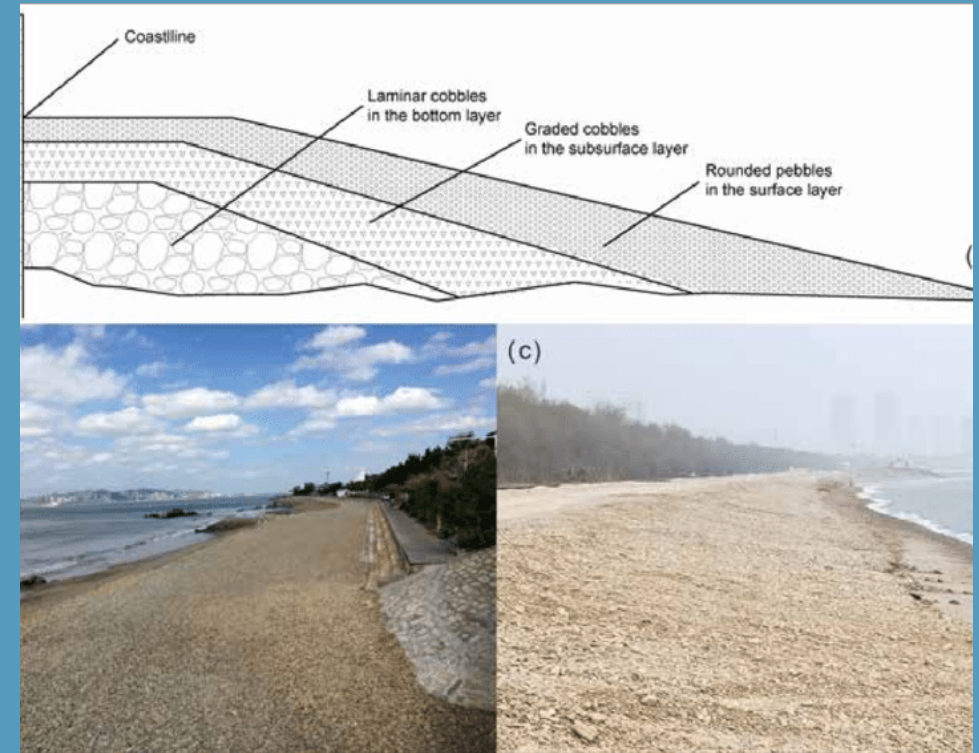
A cobble beach base with sand placement on top

## Pros

- Cobble could decrease recurring costs by reducing maintenance sand volumes
- Sand cover would facilitate recreation
- Sand cover would support “appropriate” wildlife

## Cons

- Limited research on design and performance
- Cobbles could support nonnative wildlife
- Public acceptance could be low for recreation
- May require supplemental protective measures





# Projects & Programs Activity



Open Forum



Preferred Projects  
& Programs

# Governance Methods



# Joint Powers Authority (JPA)

- Entity permitted under California State Code Section 6500
- There are two kinds of JPA arrangements
  1. Two or more public agencies contract to jointly exercise powers common to all members.
  2. Two or more public agencies to form a separate legal entity. This new entity has independent legal rights, including the ability to enter contracts, and hold property. Forming a separate entity can be beneficial because the debts, liabilities and obligations of the JPA belong to that entity and not the member agencies.





# Joint Powers Authority (JPA)

## Pros

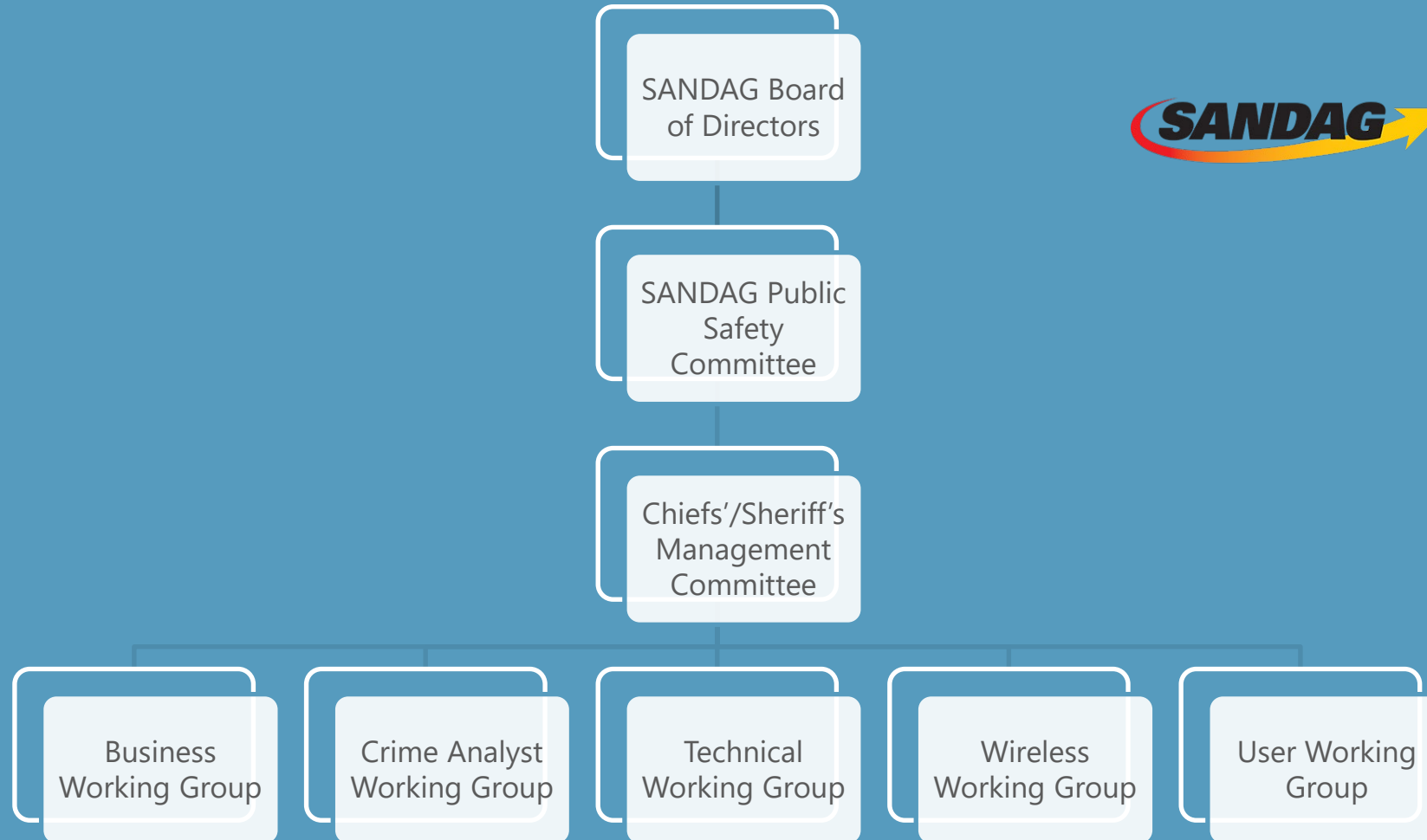
- Facilitates regional approaches
- Can be tailored to specific issues
- Can enter contracts
- Can hire dedicated staff
- Can be renewed continuously

## Cons

- All members must approve formation
- Can be difficult to fund
- Capabilities limited to union of member agencies
- Typically requires majority vote



# Example JPA Structure (SANDAG)



# Council of Governments

- Voluntary association of local governments
- Can be situated in either a metropolitan or rural area
- Designed to promote discussion and intergovernmental cooperation among its members concerning common and regional problems, and to engage in planning on a multijurisdictional basis





# Council of Governments

## Pros

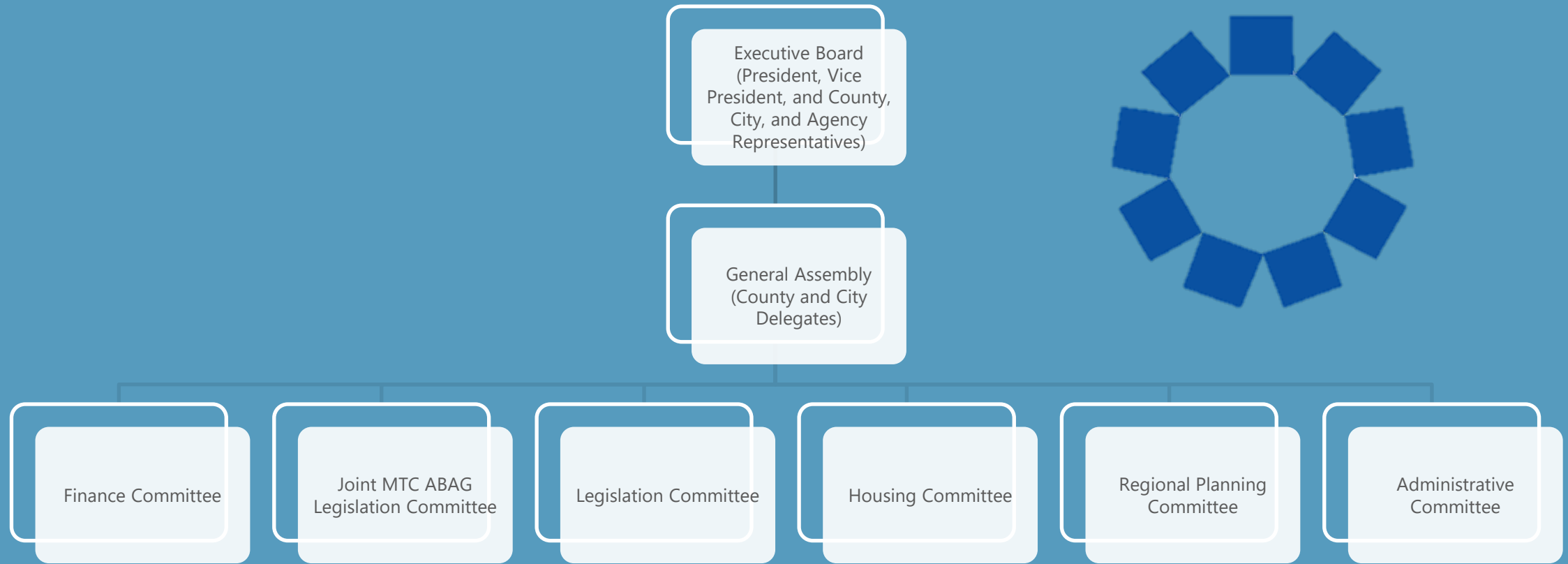
- Provides an arena where elected officials can meet and discuss regional issues
- Facilitates horizontal cooperation on regional issues
- Facilitates vertical cooperation with local, state, and federal government

## Cons

- Organizational need to operate on membership consensus can be difficult to reach decisions
- Low level of community reach results in low engagement across groups with differing interests



# Example Council of Governments Structure (Association of Bay Area Governments)



# Memorandum of Understanding/Agreement

- Voluntary cooperative arrangements
- Applicable to multiple government agencies of different levels
- Can be used by government agencies & private entities





# MOUs and MOAs

## Pros

- Long term history of use
- Relatively easy to implement
- Can be done administratively
- Can be duration limited

## Cons

- Contracts run by MOU/MOA parties
- Funding via MOU/MOA parties
- Staffed by MOU/MOA parties
- Flexibility limited by MOU/MOA



# Example MOU/MOA (Bolsa Chica Lowlands Restoration Project)



# Geologic Hazards Abatement Districts (GHAD)

- Enables property owners to collectively mitigate geological hazards which pose a threat to their properties (California Public Resources Code 26500-26601)
- Designed to handle long-term abatement and maintenance of real property potentially threatened by earth movement



# Geologic Hazards Abatement Districts (GHAD)

## Pros

- Facilitates local approaches
- Can be tailored to specific issues
- Can enter contracts
- Can issue bonds
- May obtain funding
- Can levy & collect assessments
- May condemn/acquire property
- Can construct improvements
- Can maintain improvements

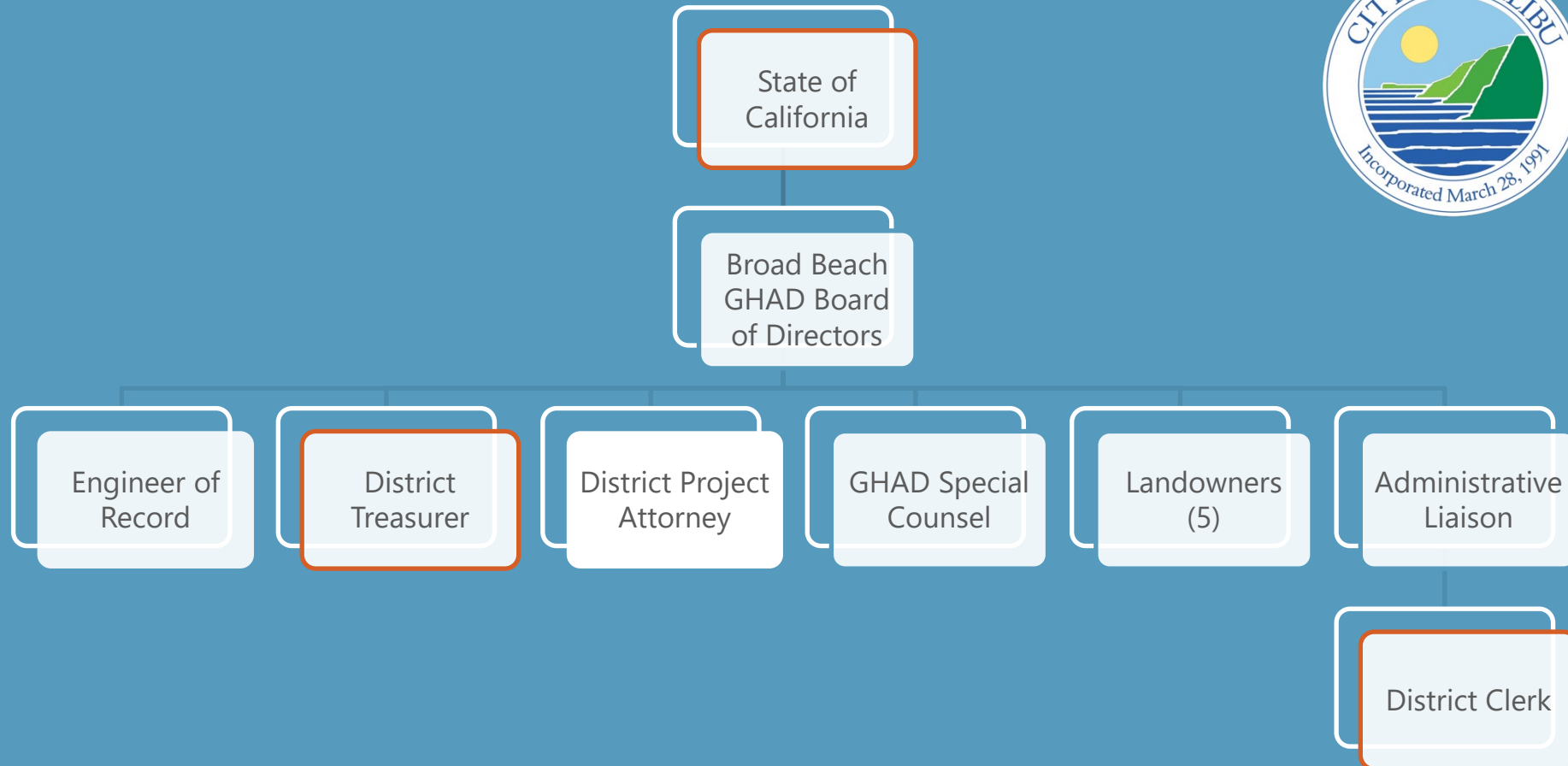
## Cons

- Not easy to dissolve
- Only need majority vote to expand
- Financed via supplemental tax assessments
- Can levy & collect assessments
- May condemn/acquire property





# Example GHAD Structure (Broad Beach GHAD)



 Required by law



# Ad Hoc Committee

- Temporary committee established by a board of directors to address a specific issue



# Ad Hoc Committee

## Pros

- Facilitates focused approach
- Easy to organize
- Can facilitate standing committee formation
- Carteret County, NC used it to organize four towns to secure federal, state, & county funding

## Cons

- Temporary so not suited for addressing recurring issues
- Single committee focus
- Limited by committee mission, funding, & staff



# Governance Methods Activity



Open Forum



Preferred Governance  
Methods



# Funding Strategies



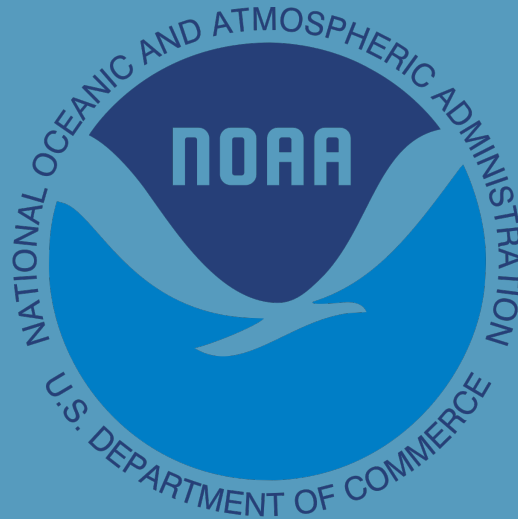
# Existing Funding Sources



# Federal Sources



**US Army Corps  
of Engineers**



**FEMA**



# U.S. Army Corps of Engineers (USACE)

Hurricane Storm Reduction Damage-Section 103 allows protection of public infrastructure against erosion and damages caused by natural storm driven waves and currents.

## Pros

- If there is federal interest, USACE will fund majority of project costs.
- Feasibility study is funded by USACE up to \$100,000.
- USACE funds 65% of design and construction.
- Easier to permit projects using federal-led process instead of state-led process.

## Cons

- High study, planning, and design costs due to USACE requirements.
- Local sponsor responsible for operational and maintenance costs once project completed.
- Entire process can take years to decades.
- Most projects do not obtain federal authorization.
- Implementation funding tied to appropriations so difficult to obtain and inconsistent.



**US Army Corps  
of Engineers**





# Infrastructure Investment and Jobs Act (IIJA)

Bipartisan legislation that provides \$1.2 trillion in infrastructure enhancement with \$492+ billion dedicated to supporting coastal resilience

## Pros

- Provides funding for coastal resiliency
- Existing source of funding
- Reestablishes One Federal Decision, decreasing permitting

## Cons

- Coastal resiliency not a top funding priority
- Funding is dispersed annually so might take a long time to get project funding
- Funds allocated through formula apportionments or competitive grants



# National Oceanic and Atmospheric Administration (NOAA) & National Fish and Wildlife Foundation (NFWF)

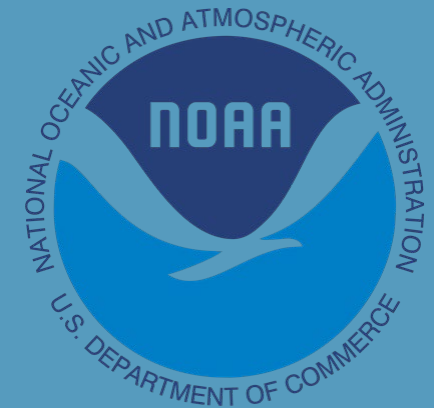
National Coastal Resilience Fund (NCRF) increases and strengthens natural infrastructure to protect coastal communities while also enhancing habitats for fish and wildlife.

## Pros

- National program with a regional focus that addresses region specific coastal resilience needs
- Can usually be leveraged to obtain additional funding (but not with compensatory mitigation funds)

## Cons

- 2021 grant slate did not include any beach nourishment projects
- Inconsistent funding source
- Might not cover complete project costs



# Federal Emergency Management Authority

Building Resilient Infrastructure and Communities (BRIC) and Hazard Mitigation Grant Program (HMGP) are pre-disaster mitigation programs that will support states, local communities, tribes and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards.



# FEMA

## Pros

- Existing and established source of funding
- Has supported projects that protect against sea level rise-related risks
- Cost-share for the program is 75% federal and 25% non-federal

## Cons

- Has not funded any beach nourishment projects in 2020 or 2021
- Homeowners and businesses cannot apply
- Focus on flood control and relocation may not be applicable to the goals of these stakeholders



# State Sources





# State Coastal Conservancy



## Ongoing funding opportunities

- Requires cooperation with regional manager

## Coastal Stories Program

### Pros

- Normally funds projects in concert with restoration efforts
  - Habitat, recreational, and economic benefits included in any project that they fund
- Can usually be leveraged to obtain additional funding (but not with compensatory mitigation funds)

### Cons

- Not general fund money
- Not a consistent or reliable source of money - depends on money they have access to distribute



# Ocean Protection Council

Coastal Resilience Solicitation's funding possible by Prop 68, Ch 10

- Goal to build resilience on the coast to assist coastal communities in preparing for and adapting to the impacts of sea-level rise



## Pros

- Priority issue is currently coastal resiliency and nature-based adaptation strategies to sea-level rise impacts, aligns with stakeholder goals
- Has partially funded BEACON's SLR Adaptation Pilot Program which included beach nourishment

## Cons

- Not a dedicated or guaranteed source of money
- OPC provides funds on a reimbursement basis, and withholds 10% of the funds, to be disbursed upon project completion.



# Division of Boating and Waterways

## Shoreline Erosion Control Program & Beach Restoration Program



### Pros

- Existing and established source of funding
- Acknowledges the benefits of beach nourishment as a source of erosion control
  - Partially funded San Clemente's beach restoration project

### Cons

- Boaters are protective of the fund and want the money allocated to boating
- Limits on funding related to land ownership
- Cannot fund beach projects aimed at protecting private property



# New Funding Sources



# Fees

Funds raised by charging fees for services, permits, or in-lieu fees (e.g., mitigation for impacts to sand flow).

## Pros

- An established process for funding other activities
- Provides a consistent funding source
- Funds can be dedicated to the intended purpose

## Cons

- Requires administrative network to manage
- Funds can be highly variable because some actions (e.g., development) are cyclical or one-time in nature
- Can be difficult to obtain public support





# Public-Private Partnership

A cooperation between public-sector agencies and private-sector entities that allow government and private entities to work together to provide a community benefit.

## Pros

- Reduces government costs.
- Provides dedicated funding source
- Improves “buy-in” between owners and public agencies

## Cons

- Can result in a loss of public control
- Requires strong leadership and good relationships



# Financing Opportunities



# Loans

Money borrowed from bank or government (state or federal) for a specific purpose



## Pros

- Effective way to bridge funding sources & needs
- Can provide advance funds to “lead” revenue sources
- Can be leveraged to accelerate implementation

## Cons

- Requires full repayment with interest
- Typically, provides a one-time source of funds
- Federal loan programs require authorization from Congress
- State loan programs require authorization from Legislature

# State Revolving Funds

Federal funds allocated annually to state governments to be granted as loans

## Pros

- Often dedicated to specific issues, such as water and infrastructure programs
- Can be used by private parties if connected to an eligible public project

## Cons

- Application process can be difficult & time consuming
- Longevity is contingent upon repayment of loans



# Municipal Bonds

Issued by local governments to finance capital projects in the form of either revenue bonds secured by future project revenue or general obligation bonds secured by future tax revenue

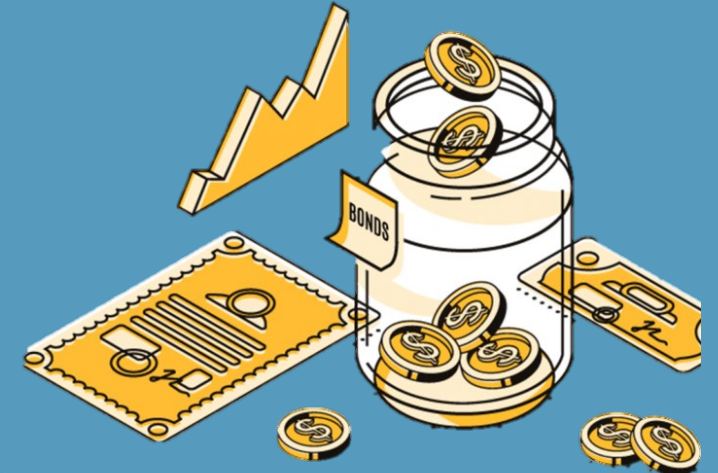
- Some special purpose entities (e.g., ports, utilities) can issue bonds so possible application for a special purpose entity covering beach erosion

## Pros

- Relatively low-cost mechanism to borrow money for capital projects
- Issuer can be either municipal or private entity (e.g., private-public partnerships)
- Relatively low interest rate for payoff

## Cons

- Might require a majority or super majority for approval
- Bonds for beach erosion purposes not likely to generate revenue so tax revenue payoff required
- Maintenance “nature” of beach nourishment might limit applicability





# Environmental Impact Bonds

Innovative tool that uses a pay-for-success method where investors are paid back at rates that depend upon satisfactory achievement of a specified environmental outcome, such as a predetermined amount of avoided land (beach) erosion



## Pros

- Attractive to investors interested in social and environmental benefits of projects
- Provides a concrete way to measure outcomes
- Spreads financial risk across both public and private sectors

## Cons

- Can require a lot of time and effort to find an investment group with aligned interests
- Need to identify a repayment revenue source that could be difficult for beach erosion work
- Innovative nature means little prior experience to build from

# Resilience Bonds

Bond designed to expand financial protections in the event of a disaster by linking insurance coverage with capital investments in resilient projects that will decrease risk



## Pros

- Can link insurance premiums and resilience projects to monetize avoided loss
- Avoided loss can provide funding for projects that reduce risk
- Expands financial protections to vulnerable communities

## Cons

- Extensive coordination with local and state government, insurers, and transportation/utility operators
- Designed for catastrophic events, not chronic stress like water scarcity or beach erosion
- There have been no municipal-level resilience bonds issued yet (e.g., new and innovative)
- Requires strong link of beach nourishment to protection instead of recreation and habitat

# Funding Activity



Open Forum



Preferred Funding  
Methods

# Schedule and Next Steps

