Nature-Based Coastal Resiliency Project Feasibility Study

San Clemente Beaches, Parks and Recreation Commission

February 14, 2023

Nature-Based Coastal Resiliency Project Feasibility Study

Purpose

Implement recommendations in City's 2021 Coastal Resiliency Plan + 2019 Sea Level Rise Vulnerability Assessment

Nature-Based Coastal Resiliency Project Feasibility Study

Goals

- Advance shoreline protection opportunities for City coastline
- Stakeholder driven process guided by science

Nature-Based Coastal Resiliency Project Feasibility Study

Funding

CCC LCP Planning Grant awarded to City in 2022

- Partially funds present study
- Also funds shoreline monitoring program re-established in 2022
- May and October beach profile / transect surveys each year Fall 2022 through 2025

Key Study Objectives

1. Identify feasible nature-based infrastructure projects to reduce coastal erosion
2. Complement upcoming USACE 50-year beach sand replenishment project
3. Maximize sand retention along shoreline to widen available sandy beach area
4. Provide multiple benefits: shoreline protection, public recreation, habitat
5. Coordinate & collaborate with ongoing OC Parks Resiliency Study

Public Outreach & Involvement Opportunities

- Four (4) public outreach meetings are currently planned per the grant
- Tonight is the first public meeting – 2/14/23 BP&R Commission
- Planned future public meetings:
  - #2 To review and solicit input on range of options included in Draft Study
  - #3 Following publication of Draft Study
  - #4 Following publication of Draft Final Study
- Additional meetings as needed

Schedule of Milestones	Dates
Consultant Selection + Project Kickoff	November – December 2022
Data Collection, field work, identify critical erosion areas	November 2022 – March 2023
Public Outreach & CCC Coordination	Ongoing for duration
Develop Conceptual Nature Based Resiliency Designs	December 2023
Identity Environmental Review & Permit Requirements	June 2024
Identify Data Needs/Technical Studies	June 2024
Submit Draft Feasibility Study Report	November 2024
Submit Final Feasibility Study Report	June 2025
Grant Completion Date	December 31, 2025

Join the Project Mailing List:

LCP@San-Clemente.org

Introduction to the Consultant Team

Nature-Based Coastal Resiliency Project Feasibility Study

City of San Clemente

By Moffatt & Nichol, Coastal Frontiers Corporation, Coastal Restoration Consultants, GHD, and Phil King, Ph.D.

February 14th, 2023

moffatt & nichol

Cotton's Point

- **Source: Dan Hancock (2020)**

North Beach

- Source: San Clemente Journal (2019)

Marine Safety Headquarters Building

- Source: Moffatt & Nichol (2022)

Regional Collaboration with Agency Partners

- County of Orange – Preservation of beach parks
- California State Parks – Preservation of State Beach Parks
- City of Dana Point – Restoration of City beaches and protection of coastal infrastructure
- OCTA/Metrolink/Amtrak Railroad – Protection of their track
- South Coast Water District – Desal plant and the beach
- Caltrans – Preservation of State highways

Approach – The List of Tasks

- Identify Critical Erosion Areas/Hot Spots
- Public Outreach
- CCC Staff Coordination
- Develop Nature-Based Resilient Concepts
- Identify Needed Permits, Data, and Available Funding
- Preliminary Design and Feasibility Report

Subdivide the Coast into Reaches

Create GIS Database of:

- Ecology
- Shoreline Positions
- Aerial and Ground Photos
- Sand Transport
- Erosion Rates
- Damage Records
- Wind and Waves
- Prior Reports

Identify Critical Erosion Areas/Hot Spots

- Existing data review (e.g., results of the 2019 SLR Vulnerability Assessment)
- Field reconnaissance
- Interviews with long-term residents/local experts
- Citizen science
- Consider variables such as:
  - Beach width & elevation trends, patterns, and timing
  - Vulnerable infrastructure
  - Ecology and habitat
  - Opportunities and constraints

Apply Nature-Based Solutions

- **Narrow beaches north of the pier**
  - Shorecliffs and Poche
  - North Beach
  - Dije Court through Mariposa Point
  - Linda Lane
- **Both narrow and wider beaches south of the pier**
  - T-Street and Calafia - wider
  - Riviera and State Beach - wider
  - Cypress Shores - narrow

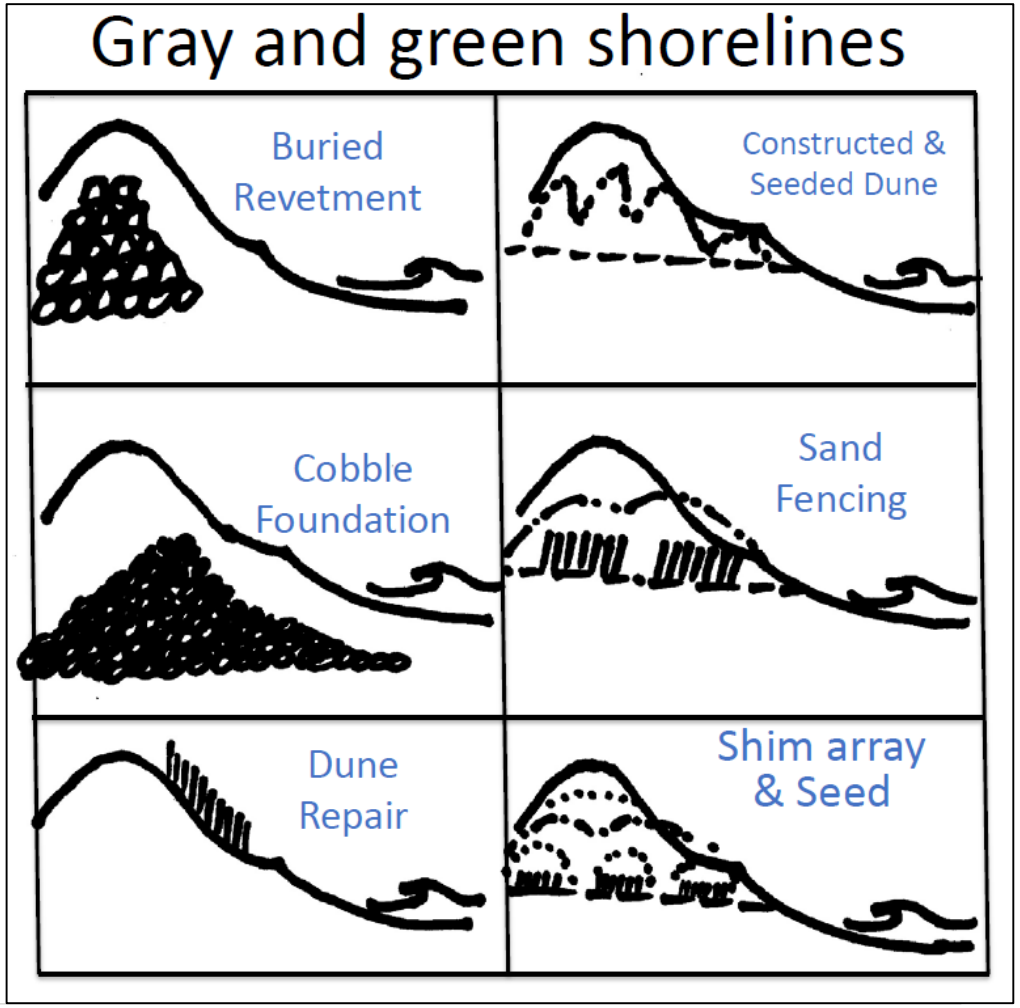
- City wants increased resilience wherever possible over time
- USACE Project can serve as a sand source for nature-based options

Develop Nature-Based Resiliency Concepts

Screening alternatives of the following:

- Living shorelines (e.g., vegetated dunes, etc.);
- Cobble berms;
- Beach nourishment;
- Sand retention with nourishment (add'l pier piles, nearshore reefs, etc.);
- Sand backpassing;
- Nearshore sand retention structures such as groin fields or reefs;
- Living breakwaters;
- Cobble delta structures (similar to Lower or Upper Trestles); and
- Hybrids of any or all the above.

- Trestles Beach may be a Reference Site.



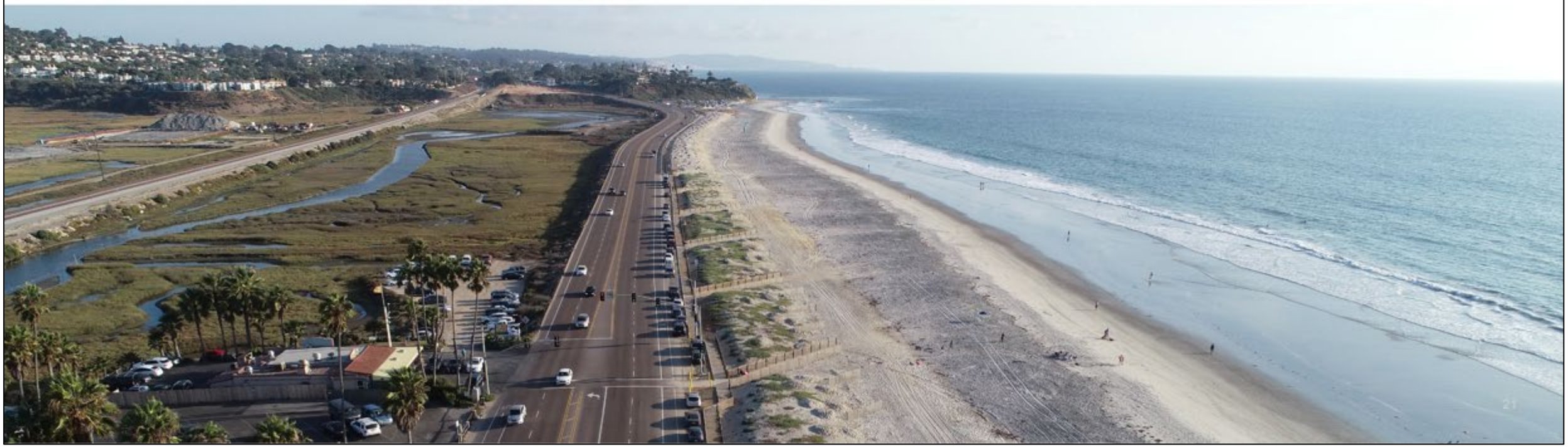
Reference Site: Trestles Beach

Living Shoreline Approaches

- We have lots of tools in the toolbox
- Dune restoration/creation
  - Naturally erode and re-build
  - Sand storage, higher topography, ecological resources
- Naturally functioning dunes require space
- Must be compatible with access, recreation, etc.

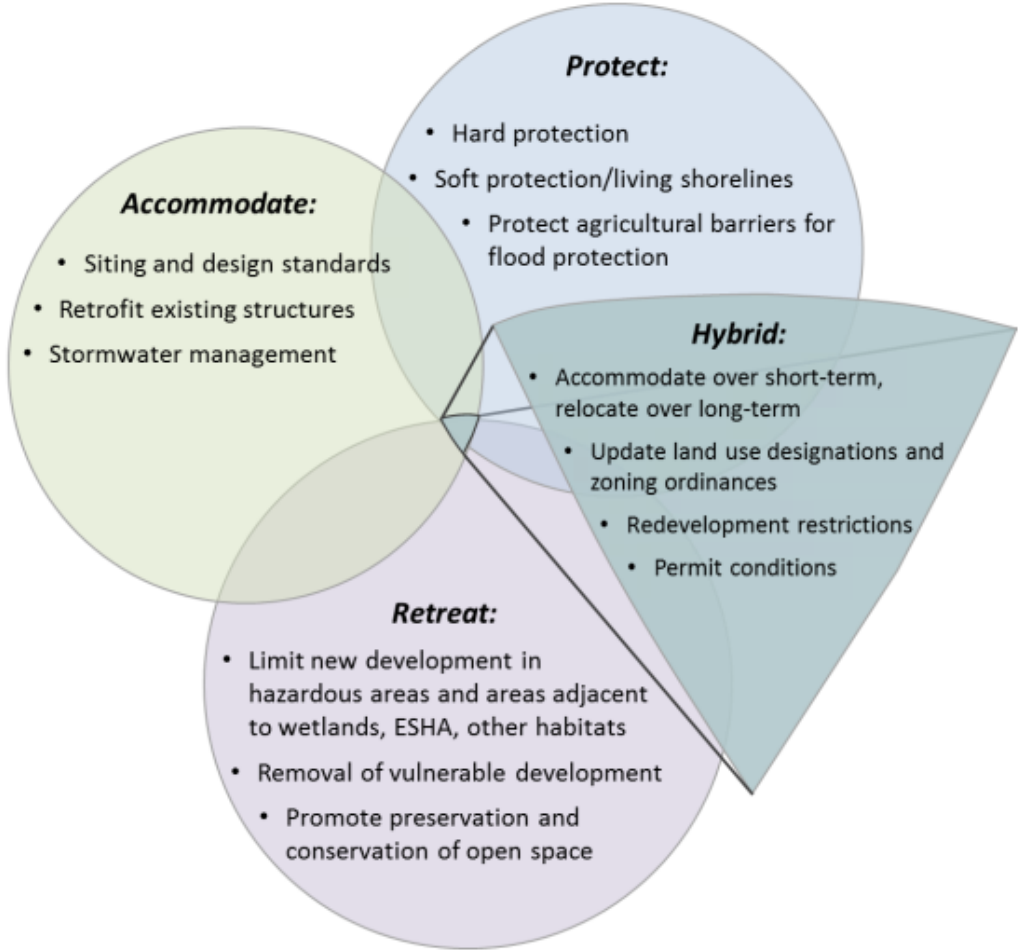
Cardiff Living Shoreline, Encinitas, CA

Buried revetment backstop as the last line of defense
- Cobble core and toe
- Vegetated sand dunes



Permitting Requirements

- CCC Coastal Development Permit (CDP)
  - Compliance with adaptation guidelines
  - Long-term plan with triggers for implementing actions
  - Public access
  - Sensitive habitat
- USACE Section 404/10 Permit and State Lands Commission lease jurisdictions
- Regional Water Quality Control Board 401 Certification
- Resource Agencies – NMFS, USFWS, CDFW
- CEQA/NEPA
- Potential compensatory mitigation for habitat impact, beach footprint, fill of WOUS



Economics: Benefit-Cost Analysis

- Net benefits of a project Include:
  - Increase (or loss in) beach recreation
    - Carrying capacity method used
    - Value from improved beaches
    - Reduction in storm/flood damages to structures
    - Cost of removal/replacement
- Economic Impact Analysis examines spending and taxes:
  - Loss in Transient Occupancy Tax (TOT) revenues
  - Local loss in sales tax revenues
  - Potential loss in property taxes

- **T-Street Beach (2020)**
  Source: KLTA

Funding Opportunities

- Provide a basic analysis of funding opportunities:
- **Local**
  - Transient Occupancy Taxes (only 10% in San Clemente)
  - Sales taxes
  - Special tax districts
- **State**
  - Dept of Parks and Recreation (Former Dept of Boating and Waterways)
  - Ocean Protection Council (OPC)
  - Coastal Conservancy
  - Coastal Commission
  - Dept of Fish & Wildlife
- **Federal**
  - NOAA
  - U.S. Fish & Wildlife Service (USFWS)
  - U.S. Army Corps of Engineers (USACE)

Preliminary Design and Feasibility Report

- To address at least one Pilot Project that the City can pursue (hopefully more!)

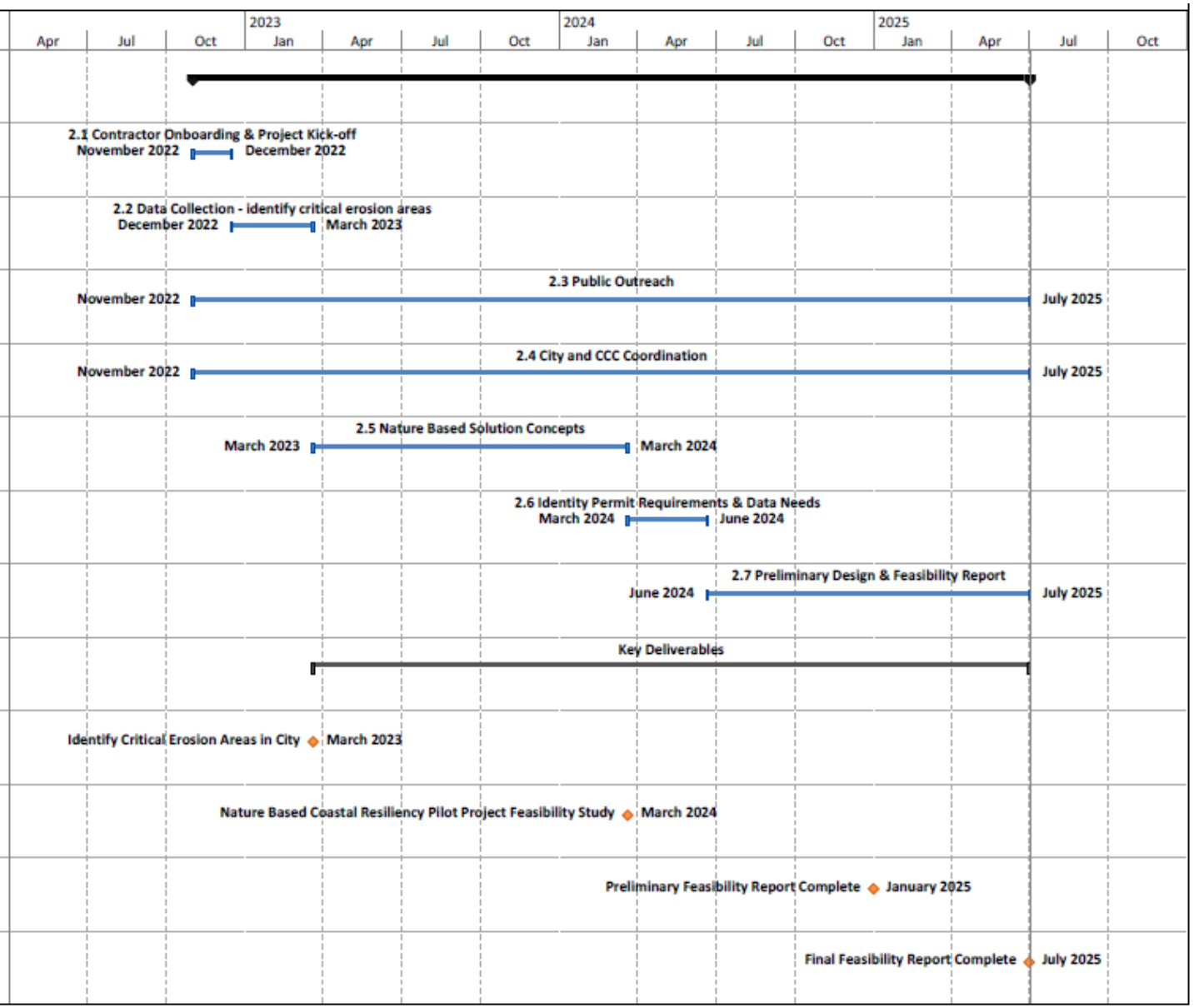
- Draft Report for City review
- Revised Draft for public review
- Final Report and all working files

Q&A

moffatt & nichol

Approach and Schedule

ID	Task Name	Duration	Start
1		**696 days**	**Tue 11/1/22**
2	2.1 Contractor Onboarding & Project Kick-off	33 days	Tue 11/1/22
3	2.2 Data Collection - identify critical erosion areas	67 days	Fri 12/16/22
4	2.3 Public Outreach	696 days	Tue 11/1/22
5	2.4 City and CCC Coordination	696 days	Tue 11/1/22
6	2.5 Nature Based Solution Concepts	262 days	Tue 3/21/23
7	2.6 Identity Permit Requirements & Data Needs	66 days	Thu 3/21/24
8	2.7 Preliminary Design & Feasibility Report	268 days	Fri 6/21/24
9	**Key Deliverables**	**595 days**	**Tue 3/21/23**
10	Identify Critical Erosion Areas in City	0 days	Tue 3/21/23
11	Nature Based Coastal Resiliency Pilot Project Feasibility Study	0 days	Thu 3/21/24
12	Preliminary Feasibility Report Complete	0 days	Wed 1/1/25
13	Final Feasibility Report Complete	0 days	Tue 7/1/25



Shoreline Modeling/Analyses Tools

- COAST Analyses
  - Developed model of simulated wave conditions and shoreline from Doheny to San Onofre
  - Calibrated with historic data
    - Shoreline mapping from aerials
    - UNSW CoastSat
    - NOAA LiDAR
  - Evaluated shoreline positions
    - Over time with SLR
    - Range of wave conditions

FIGURE 5-3. MODEL RUN 1 (370,000 CY NOURISHMENT) SHORELINE EVOLUTION, WITH 3.3 FT OF SLR BY 2100

Sustainable Solutions on Narrow Coastlines

- Nourishment and sand retention
- Dune restoration, symbolic fencing, maintain public access and towel space

Meet Our Team

Chris Webb
Project Manager

Russ Boudreau
Constructability

Phil King
Beach Economics

Justin Peglow
Deputy Project Manager

Kim Garvey
Permitting Lead

Aaron Holloway
Preliminary Design

Greg Hearon
Vulnerabilities

Matt James
Nature-Based Resiliency