

# Pilot Surfer's Beach Sand Replenishment Project



**Brad Damitz**

**Beach Replenishment Committee Meeting, March 9, 2016**

# Aerial Photo of Pillar Point Harbor and Surfer's Beach



# Project Background/Need for the project

- Long history dating back to construction of the East Breakwater -- completed in 1961.
- Following construction coastal erosion rates and sedimentation inside Harbor dramatically increased.
- Severe erosion in the 1980s threatened Highway 1 and several structures, leading to the construction of revetments along Surfer's Beach.
- In 2007, community members including local surfers approached Harbor District demanding action be taken.
- 2007 Formal request by Harbor District to USACE to investigate erosion and determine if the Corps should participate in a shoreline restoration project.

# Project Background/Need for the project

- Upon the request from the District, the USACE conducted an Initial Appraisal, which was completed in July 2009, and concluded that:
  - “*a preponderance of evidence substantiates the claim that the construction of the outer breakwaters led to a dramatic increase in the erosion rate of the shoreline between the root of the East Breakwater and Arroyo de en Medio.*”
- September of 2010 USACE and the District sign cost-share agreement for CAP 111 feasibility study called *Northern Half Moon Bay Shoreline improvement Project*.
- As part of the CAP 111 project, several documents and studies have been prepared, including a Draft EA, a Section 404(b)(1) analysis, an Economic Assessment, and a detailed Engineering Appendix.

# Project Background/Need for the project

- The U.S. Army Corps evaluated several potential alternatives during various stages of this study.
- The CAP 111 Engineering Appendix contains a detailed analysis of the extent of the erosion and the potential mitigation measures.
- The USACE preferred alternative was a beach nourishment project of approximately 150,000 cy.

# Project Background/Need for the project

- The analysis in the USACE Engineering Appendix concluded that between 1993 and 2012 the bluffs between the East Breakwater and the Mirada Road revetment eroded at a rate of 1.64 feet per year (7x the background rate at a geologically similar stretch of coastline south of the Mirada revetment).
- The study also found that there is a significant accumulation of sand within Pillar Point Harbor. Since the construction of the East Breakwater, more than 250,000 CY has accumulated inside the Harbor, causing potential hazards to navigation.

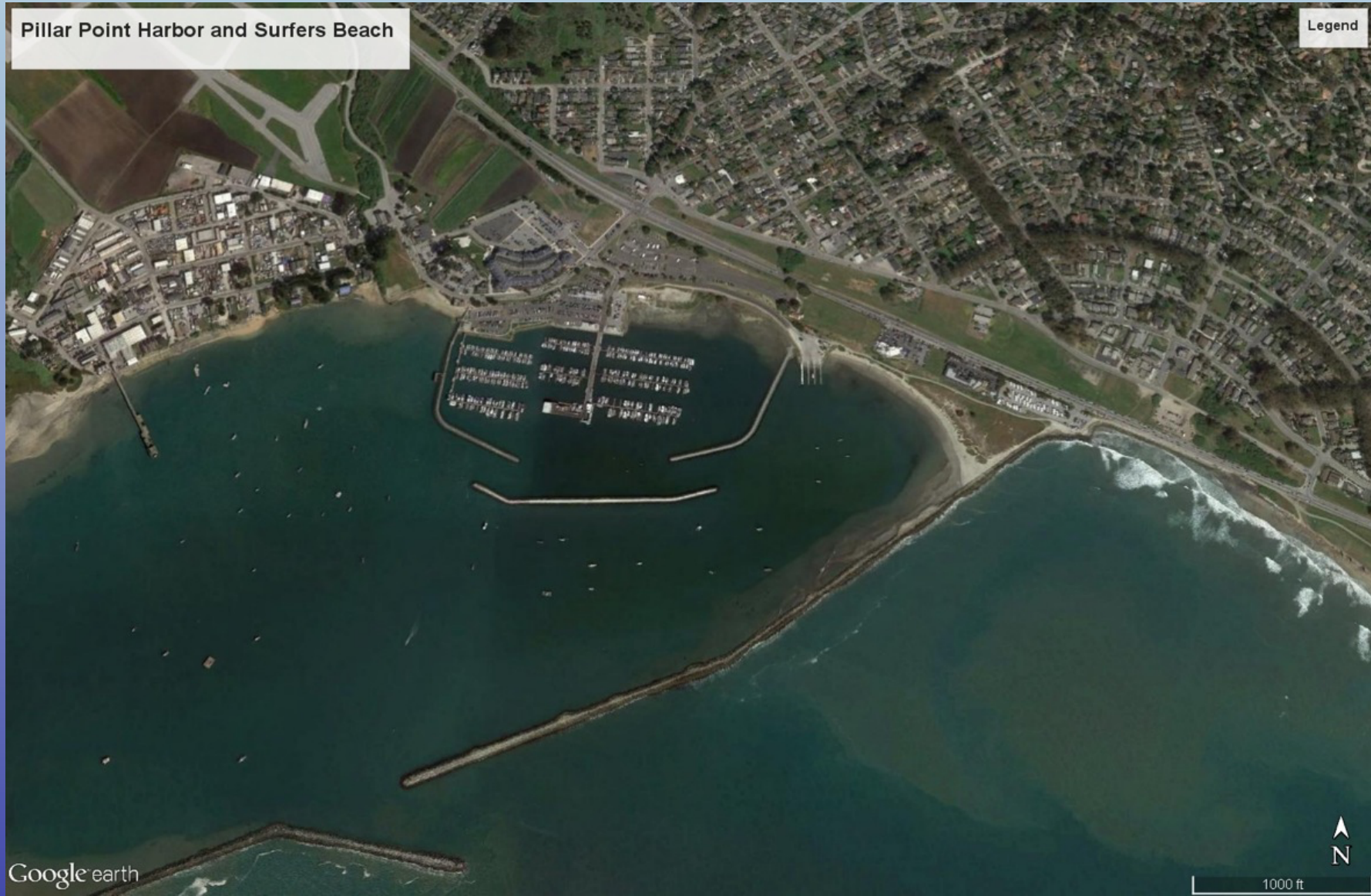


# Photo from Surfer's Beach looking at East Breakwater





# Aerial Photo of Pillar Point Harbor and Surfer's Beach



# Project Background/Need for the project

- USACE has determined (based on an economic analysis) that there is not a Federal interest in pursuing a beach nourishment project, though they have not released these results formally.
- Based on this news, the Harbor District Board of Commissioners decided in 2015 to pursue a pilot beach nourishment project that would address the serious erosion issues at Surfer's Beach.
- The currently proposed pilot project is a scaled-down version of the preferred alternative that was analyzed by USACE.
- In February 2016, the District submitted a grant application to Division of Boating and Waterways for \$800,000 to fund the Project implementation (construction and monitoring)

# Project Description

## Project Goal and Potential benefits:

- The overall goal for the proposed Project is to address the significantly accelerated coastal erosion rates that have occurred on the beaches adjacent to the Harbor as a result of the construction of the East Breakwater approximately 55 years ago.
- The two primary issues that the Project will address are impaired public access/recreational impacts and damages from coastal storms. The Project is necessary to reduce the threat of structural damage and recreation loss along the coastal stretch in the project area.
- Benefits include: preventing or mitigating beach erosion and sea cliff retreat; improving protection of Highway 1 and other structures; increasing quality and quantity of public access and recreation; reducing the need for hard structures (e.g. seawalls and revetments), and improving beach and wildlife habitat.

# Project Description

## Project Design Options and Details:

- “Pilot” project meant to study benefits and impacts.
- Proposed Project involves one-time placement of approximately 75,000 cubic yards of sand.
- Option 1: sand placement along 1,500 feet of shoreline (Surfer’s and Vallejo Beaches) to form 125-foot wide elevated berm.
- Option 2: Placement of sand exclusively above mean high water line to form narrower berm along 3,100 feet of shoreline (Surfer’s, Vallejo, and Miramar Beaches).

# Project Description

## Funding Needs for Proposed Project:

- To date over \$700K has been dedicated to the project already, not including a significant amount of in-kind contributions.
- Funding Needed for Project Implementation (construction and monitoring):
  - Harbor District applied for a CDBW Grant for \$800K
  - This includes approximately \$400-600K for construction and \$200-400K for monitoring
- Funding Needed for Planning Phase
  - Currently funding is not available, but is necessary for the project to move forward.
  - Estimated funding needed for planning phase: \$150-200K.
  - Potential sources include contributions from affected stakeholders and other small grants.

# Pilot Project Timeline

## Planning Phase:

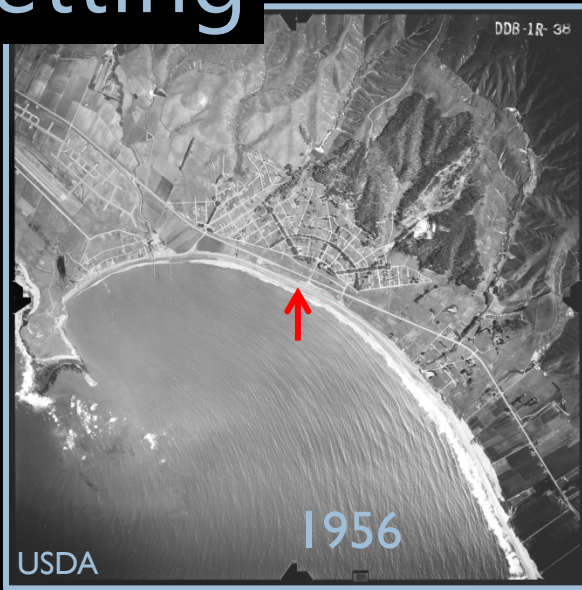
- Some initial aspects of the Planning Phase have begun already.
- Planning Phase includes the following components:
  - Stakeholder collaboration and public outreach process
  - Project design and engineering
  - Environmental review
  - Permitting and agency consultation
  - Biological and physical monitoring design/planning
- Planning Phase components are iterative and will occur concurrently, beginning ASAP once interim funding is available.
- Planning Phase will continue right up until project implementation.

# Pilot Project Timeline

## Implementation Phase:

- Implementation Phase includes Project Construction and Biological and Physical Monitoring
- Construction anticipated to begin in Spring or Summer 2017 and take 4-6 weeks to complete.
- Project Monitoring to begin several months prior to construction and continue for up to 2-years thereafter.
- A more detailed timeline and SOW will be developed during the Planning Phase over the next 1.5 years.

# Setting



2013



US Army Corps of Engineers  
San Francisco District



# Conditions on April 28, 2011



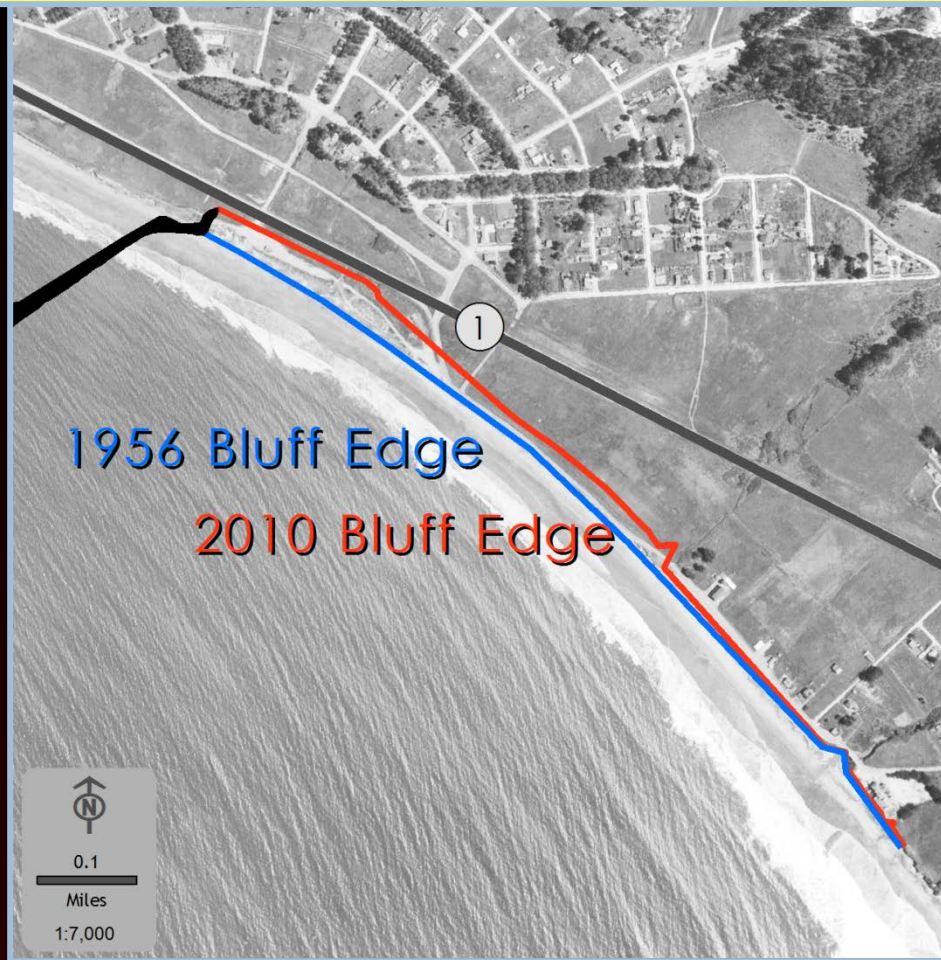
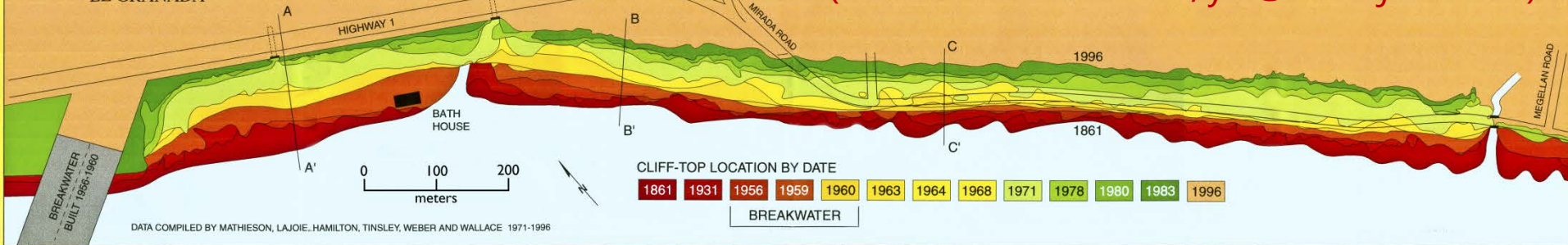
US Army Corps of Engineers  
San Francisco District

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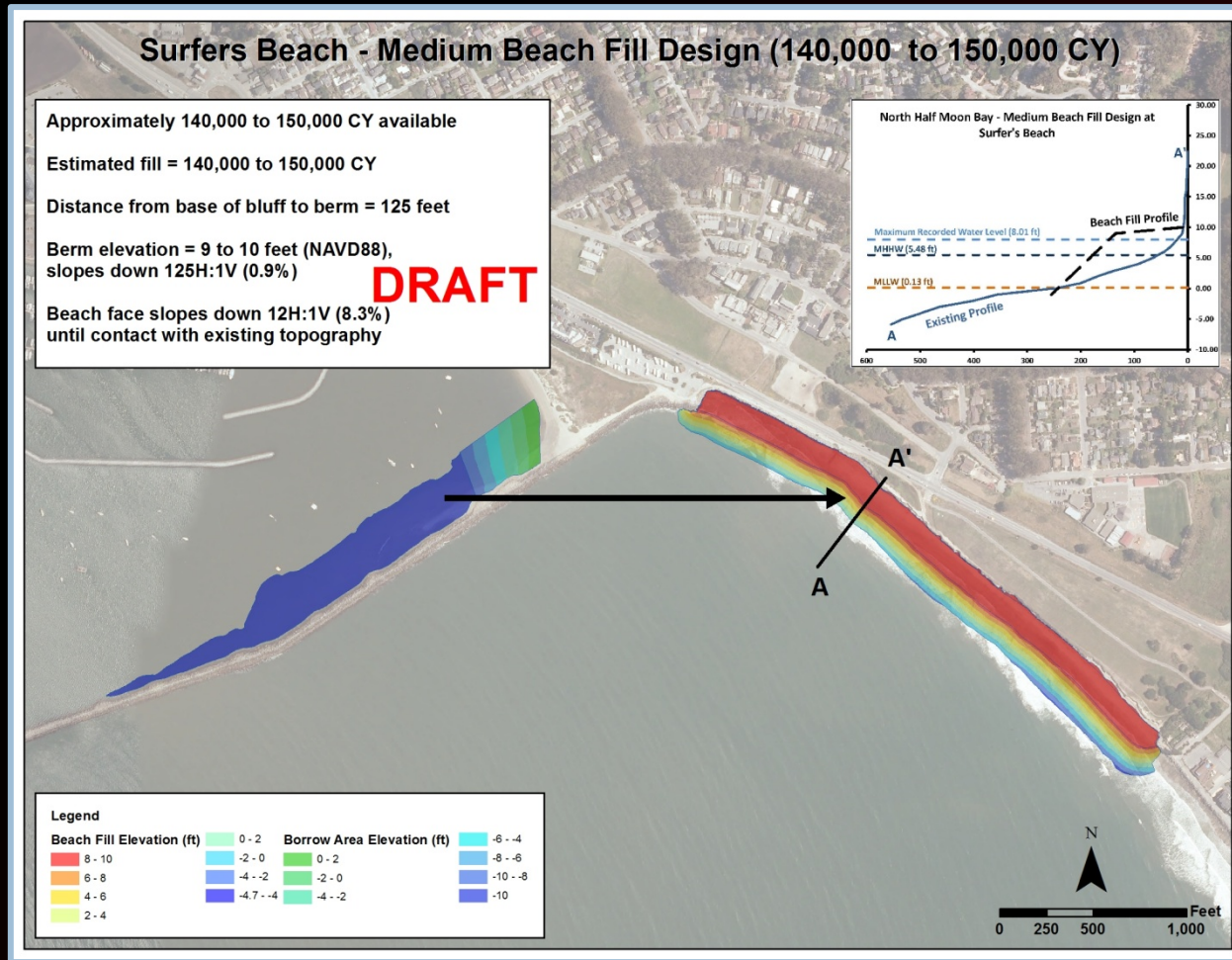
# Bluff Retreat

EL GRANADA

(1993 – 2012: ~0.5 m/yr @ Vallejo Beach)



# Engineering Model Results: Medium Beach Fill Scenario



# Model Estimate of Beach-Fill Life:

## Medium Beach Fill Scenario (140,000–150,000 yd<sup>3</sup>)

- Typical year (e.g., June 2009 – May 2010)
  - Approximately 24,000 yd<sup>3</sup> of sand will erode from the constructed beach. Assuming several consecutive typical years, the all of the placed sand will be gone in approximately 6 years.
  - However, 80 to 90% of the eroded sand will move into the adjacent surf zone in depths of 3 to 10 feet. As a result, approximately 4,000 yd<sup>3</sup> per year will leave the project area, giving a total residence time of approximately 36 years.
- Although not yet modeled, a similar analysis for Ocean Beach (San Francisco) shows that including an El Niño winter will notably shorten the beach-fill lifespan.

# Contact Information:

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