Smart Coast California

Humboldt County
Sea Level Rise Summit

SMART COAST CALIFORNIA

Virtual Meeting
November 3, 2022
3:00pm

SCHMITZ & ASSOCIATES, INC

Smart Coast California

2022 Board of Directors

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San Mateo

Policy Summit
"One California, One Coast"

Policy Summit: Westin Hotel Long Beach

-Widespread Positive Feedback

-Participation from local elected officials and staff throughout the State, including Coastal Commission

-Coastal Commissioner Uranga encourages collaboration with Smart Coast California

Smart Coast
California

Program Outline

Joe Prian

- President, Smart Coast California, opening and closing statements

Mike Wilson

- Third District County Supervisor, California Coastal Commissioner

  (including Aldaron Laird, Senior Environmental Planner)

Michael Richardson

- Humboldt County Supervising Planner: Regional Feasibility Study

David Loya

- Arcata Director of Community Development: Coastal Plans on the Local Level

Don Schmitz

- Schmitz and Associates: Statewide SLR Planning Activity

Joe Prian

- Closing Statements and Introduction of Special Guests and Q&A

Humboldt County Summit

Smart Coast California

Mike Wilson – California Coastal Commissioner and 3rd District Humboldt County Supervisor

California Coastal Commissioners

Chair
Donne Brownsey

Vice Chair
Dr. Caryl Hart

North Coast
Mike Wilson

North Central Coast
Catherine Rice

Central Coast
Carole Groom

South Central Coast
Meagan Harmon

South Coast
Roberto Uranga

San Diego Coast
Steve Padilla

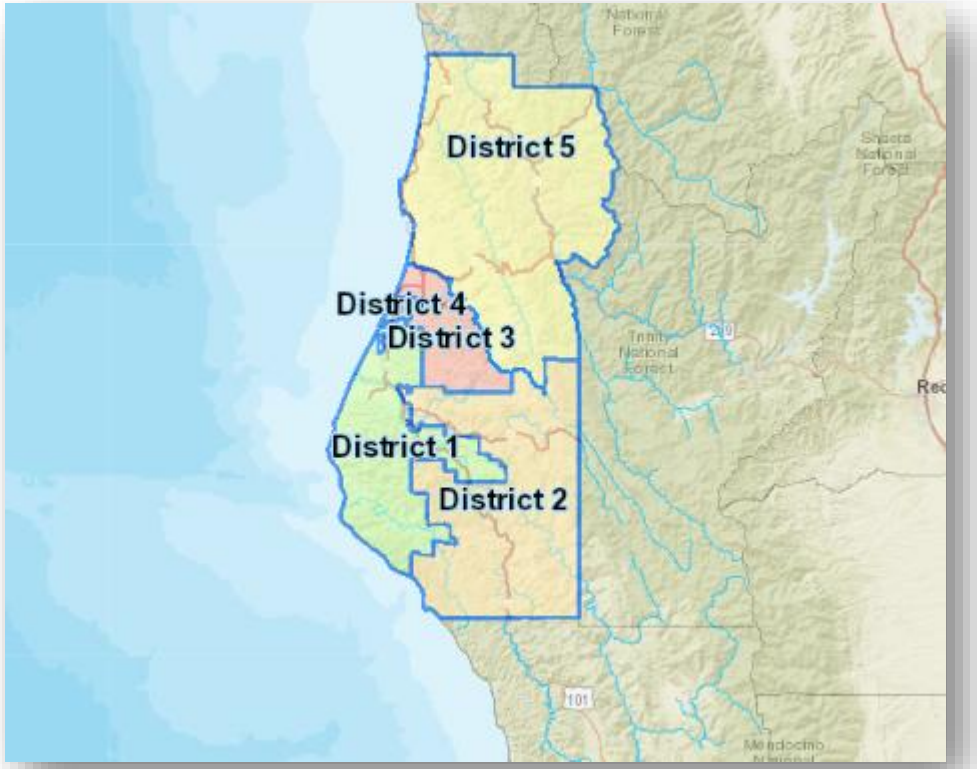
Commissioner
Dayna Bochco

Commissioner
Effie Turnbull-Sanders

Commissioner
Sara Aminzadeh

Commissioner
Linda Escalante

Humboldt County Board of Supervisors

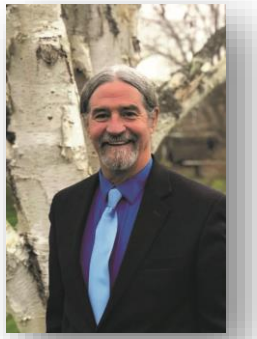


1st District–
Rex Bohn

2nd District–
Michelle Bushnell

3rd District–
Mike Wilson

4th District–
Virginia Bass



5th District–
Steve Madrone

SLR Local Government Working Group

Coastal Commission- **Carole Groom**

Coastal Commission- **Madeline Cavalieri**

Humboldt County– **Mike Wilson**

Coastal Commission- **Jack Ainsworth**

Coastal Commission- **Kelsey Ducklow**

San Luis Obispo- **Bruce Gibson**

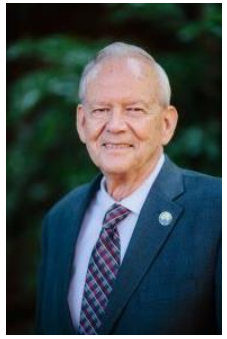
Sonoma County- **Lynda Hopkins**

CSAC- **Catherine Freeman**

Ventura County- **Robert O'Riley**

League of Cities- **Derek Dolfie**

City of Santa Barbara- **Eric Friedman**



Pismo Beach- **Ed Waage**

City of Santa Barbara– **Melissa Hetrick**

Imperial Beach- **Tyler Foltz**

Pismo Beach- **Matt Downing**

Local Government SLR Working Group

Mike Wilson, Humboldt County

Lynda Hopkins, Sonoma County

Bruce Gibson, San Luis Obispo County

Ed Waage, Pismo Beach

Matt Downing, Pismo Beach

Eric Friedman, City of Santa Barbara

Melissa Hetrick, City of Santa Barbara

Robert O'Riley, Ventura County

Tyler Foltz, Imperial Beach

Sea Level Rise Planning Process:

from assessing vulnerabilities to a Certified Local Coastal Plan

Source: California Coastal Commission https://www.coastal.ca.gov/

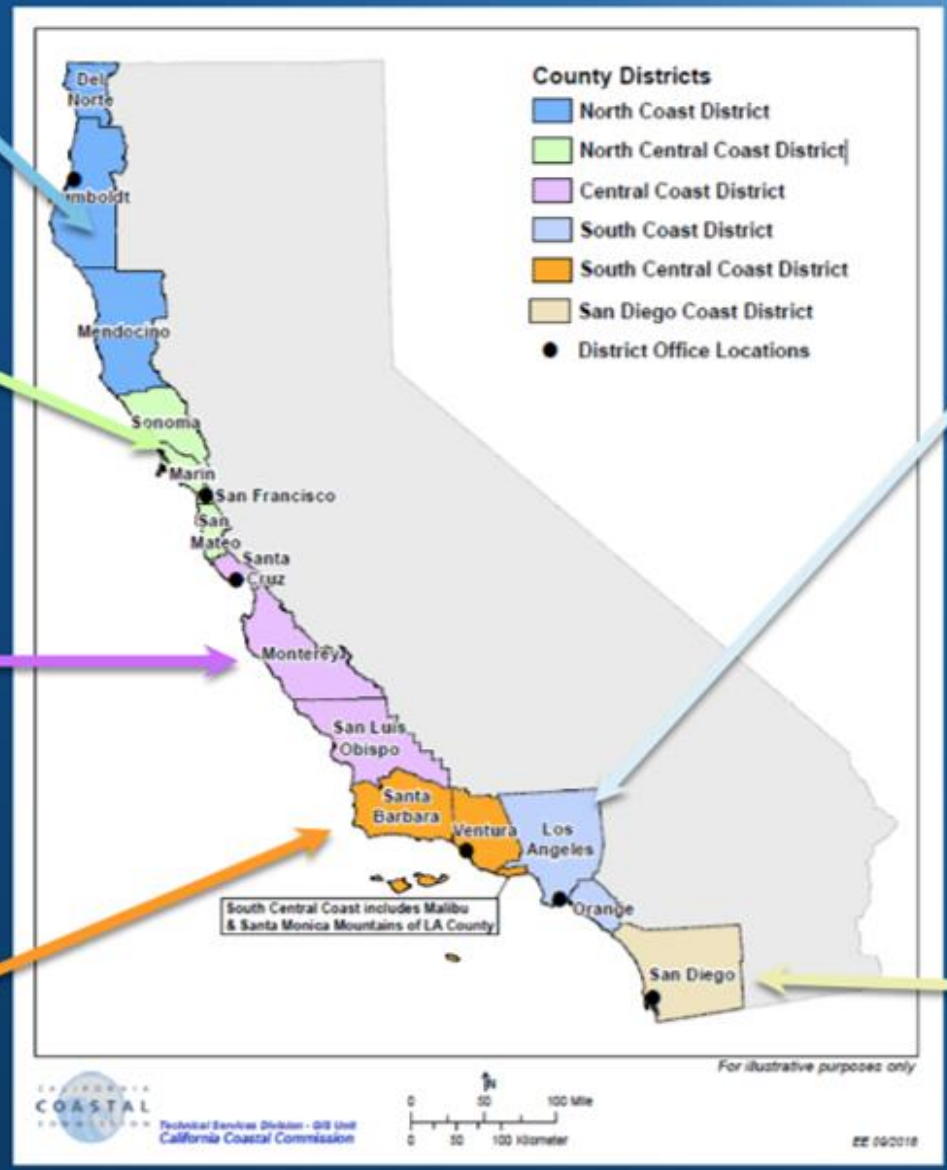
California Coastal Act

PUBLIC RESOURCES CODE
DIVISION 20
CALIFORNIA COASTAL ACT
(2022)

		Section	Page
Chapter 1	Findings and Declarations and General Provisions	30000	1
Chapter 2	Definitions	30100	8
Chapter 2.5	Revisions to the Coastal Zone Boundary	30150	17
Chapter 3	Coastal Resources Planning and Management Policies	30200	35
	Article 1. General		
	Article 2. Public Access		
	Article 3. Recreation		
	Article 4. Marine Environment		
	Article 5. Land Resources		
	Article 6. Development		
	Article 7. Industrial Development		
	Article 8. Sea Level Rise		

Coastal Commission Districts

County	Cities/Area
Del Norte County	City of Crescent City
Humboldt County	City of Trinidad
	City of Arcata
	City of Eureka
	City of Fortuna
Mendocino County	City of Fort Bragg
	City of Point Arena
Sonoma County	-
Marin County	-
San Francisco City/Co.	City of San Francisco
San Mateo County	City of Daly City
	City of Pacifica
	City of Half Moon Bay
Santa Cruz County	City of Santa Cruz
	City of Capitola
	City of Watsonville
Monterey County	City of Marina
	City of Sand City
	City of Seaside
	City of Monterey
	City of Pacific Grove
	City of Carmel
San Luis Obispo County	City of Morro Bay
	City of Pismo Beach
	City of Grover Beach
Santa Barbara County	City of Guadalupe
	City of Santa Barbara
	City of Goleta
	City of Carpinteria
Ventura County	City of San Buenaventura
	City of Oxnard
	City of Port Hueneme
Los Angeles County	Santa Monica Mountains Portion of Los Angeles County



Los Angeles County	City of Malibu
	City of Los Angeles
	City of Santa Monica
	City of El Segundo
	City of Manhattan Beach
	City of Hermosa Beach
	City of Redondo Beach
	City of Torrance
	City of Palos Verdes Estates
	City of Rancho Palos Verdes
	City of Long Beach
	City of Avalon
Orange County	City of Seal Beach
	City of Huntington Beach
	City of Costa Mesa
	City of Newport Beach
	City of Irvine
	City of Laguna Beach
	City of Laguna Niguel
	City of Aliso Viejo
	City of Dana Point
	City of San Clemente
San Diego County	City of Oceanside
	City of Carlsbad
	City of Encinitas
	City of Solana Beach
	City of Del Mar
	City of San Diego
	City of Coronado
	City of National City
	City of Chula Vista
	City of Imperial Beach

Commission Funding Programs

❖ ***Vulnerability Assessments*** ❖ ***Adaptation Plans*** ❖ ***LCPA's***

Humboldt Bay Regional Sea Level Rise Adaptation Strategy

- California Coastal Commission Grant for $1.4 million
- Start date: January 1, 2023
- End date: December 31, 2026

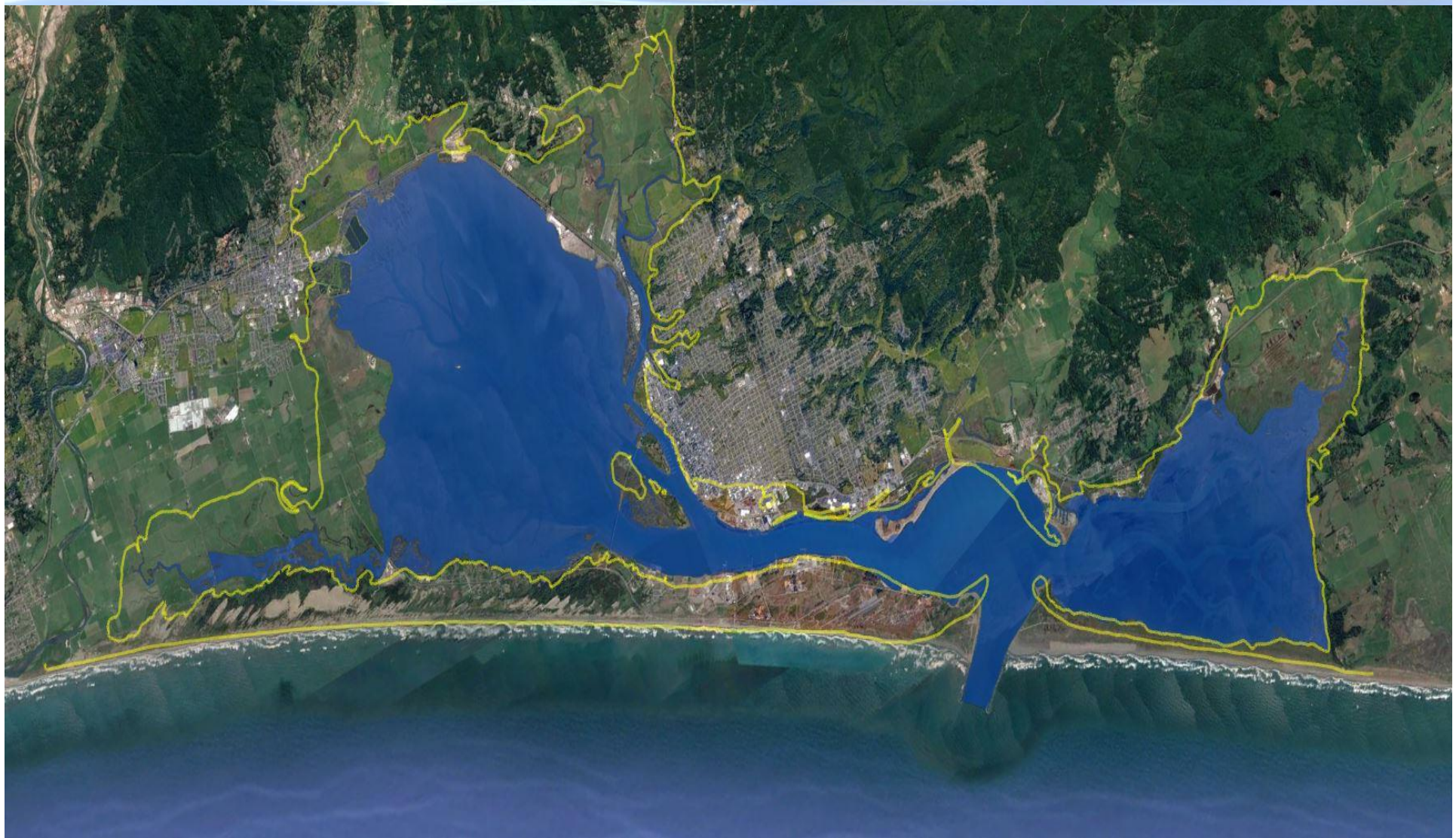
ACTIVITY	COMPLETION DATE
Implemented organizational framework for SLR Adaptation	12/31/2023
Shoreline Vulnerability/Resilience Analysis	6/1/2026
Biological/Ecosystem studies	9/1/2024
Economic and Cultural Impact Analysis	9/1/2024
Sea Level Rise Adaptation Strategy Implementation Guide	1/1/2025
Integration of Seal Level Rise Adaptation Strategy with Climate Action Plan	9/1/2026

Aldaron Laird

- SLR Planning in Humboldt County: coastal geomorphology
- Key Vulnerabilities in Humboldt County
- Humboldt Infrastructure at Risk

Historic Conditions Humboldt Bay

Present Day Humboldt Bay



King Tides

Shoreline Erosion - Breaching

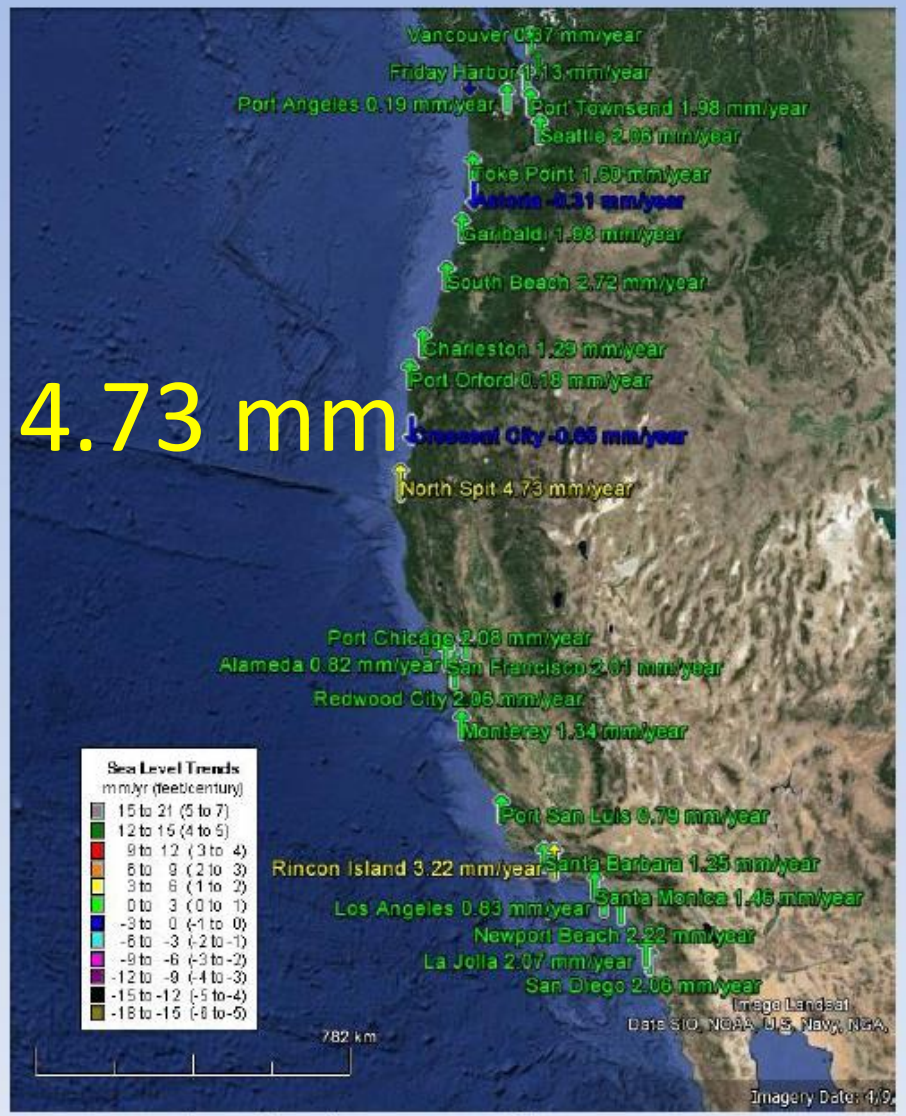
Tidal Inundated

Stormwater Runoff
Backwater Flooding

Emerging Groundwater

Areas Likely at Risk from Emerging Groundwater

Relative Sea-Level Rise



Source: Google Earth and NOAA coops-slt.kmz

Relative or Local Mean Sea-Level Rise (RSLR):

- Average sea-level rise measured at a tide gauge relative to a specific point on land (e.g. North Spit Tide Gauge)
- RSLR can be different than GSLR or ReSLR due to local factors such as
  - Local climate and ocean patterns (e.g. ENSO and PDO)
  - Vertical land motion
  - Tide gauge record length

RSLR rates:

- RSLR has been increasing over most of US West Coast consistent with GSLR and ReSLR trends, but at different rates
- Green values range from 0 to 3 mm/yr (all show increasing rates of SLR, constent with ReSLR)
- Yellow values range from 3 to 6 mm/yr (higher than ReSLR)
- Blue values indicate negative RSLR (lower than ReSLR)
- North Spit and Crescent City RSLR appear to be the two extremes

NHE 2013

January 11, 2021
Tim Hanan

New Years Eve 2005 - State of Disaster

Record Extreme Water Elevation, Humboldt Bay 9.6’

Humboldt Bay
Sea Level Rise

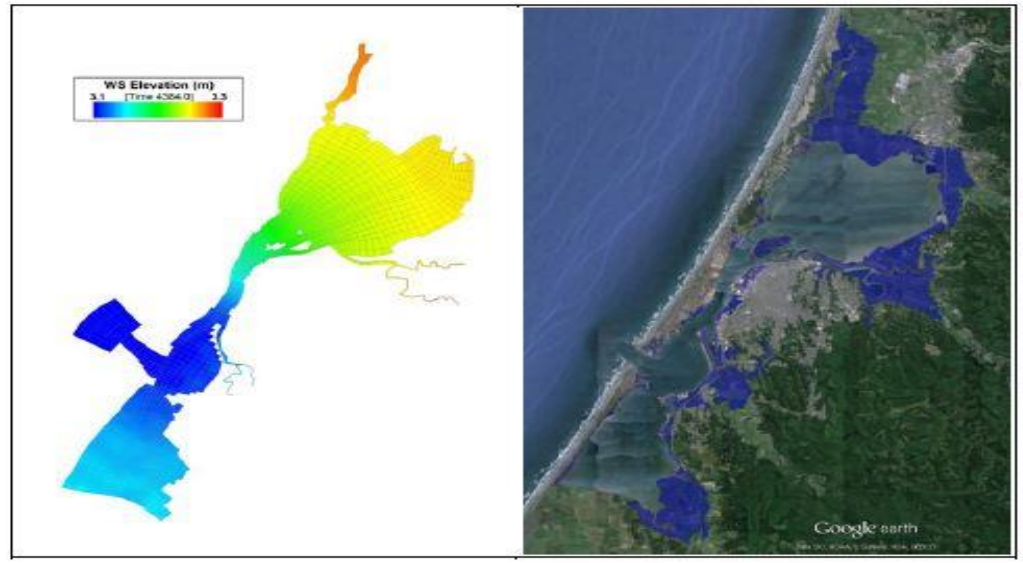
- 2005 — State of Disaster 9.6 ft
- 1 foot — MAMW 9.8 ft — MMMW 8.7 ft
  MHHW 7.5 ft
- 2 feet — MAMW 10.8 ft — MMMW 9.7 ft
  MHHW 8.5 ft
- 3 feet — MAMW 11.8 ft — MMMW 10.7 ft
  MHHW 9.5 ft

Humboldt Bay: Sea Level Rise, Hydrodynamic Modeling, and Inundation Vulnerability Mapping

Prepared for

State Coastal Conservancy, and

Coastal Ecosystems Institute of Northern California



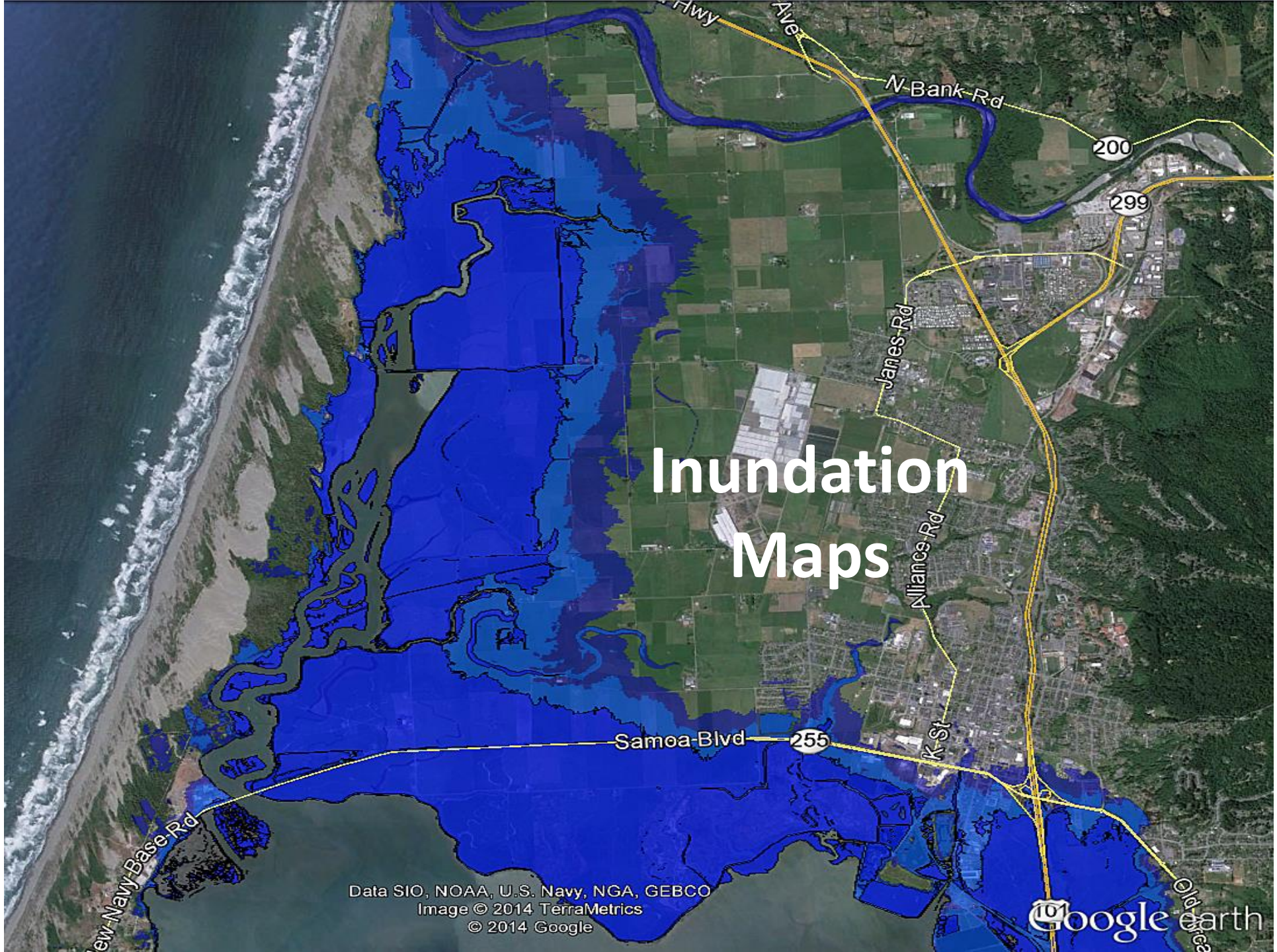
Final Report

April 2015

Prepared by

Northern Hydrology & Engineering

Northern Hydrology & Engineering

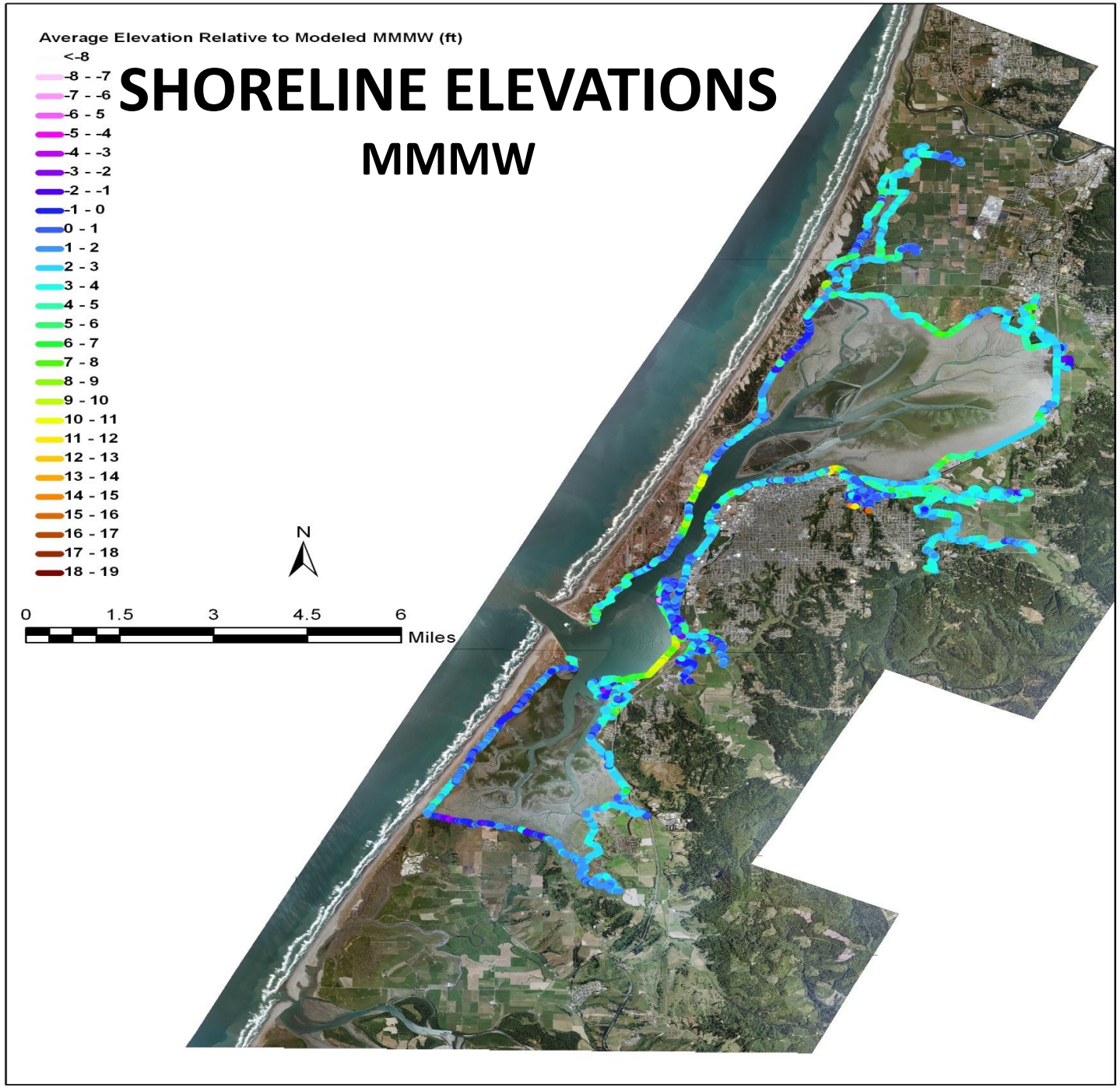

Inundation Maps
N Bank Rd
200
299
Janes Rd
Alliance Rd
K St
Samoa Blvd
255
Navy Base Rd
101
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2014 TerraMetrics
© 2014 Google
Google earth

Historical Legacy Diking-Off Salt Marsh

41 miles Diked Shoreline
7,000 acres Former Tidelands

SHORELINE ELEVATIONS

MMMW



Humboldt County
Humboldt Bay Area Plan
Diked Shoreline Sea Level Rise Adaptation Feasibility Study

Prepared by

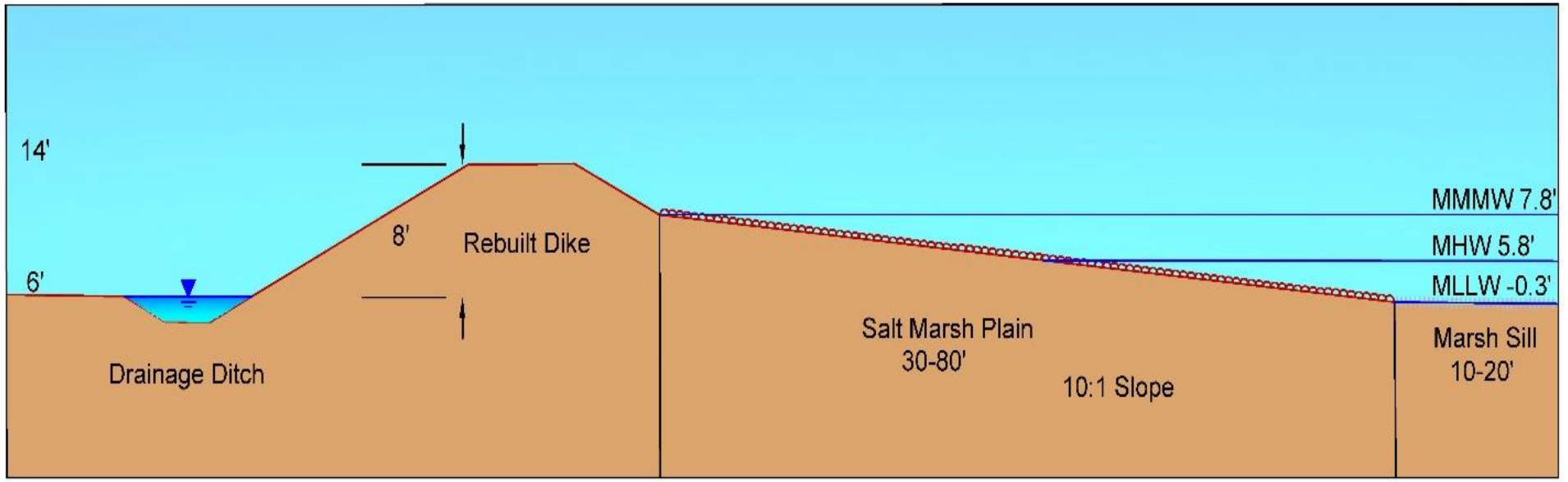
Aldaron Laird
Trinity Associates

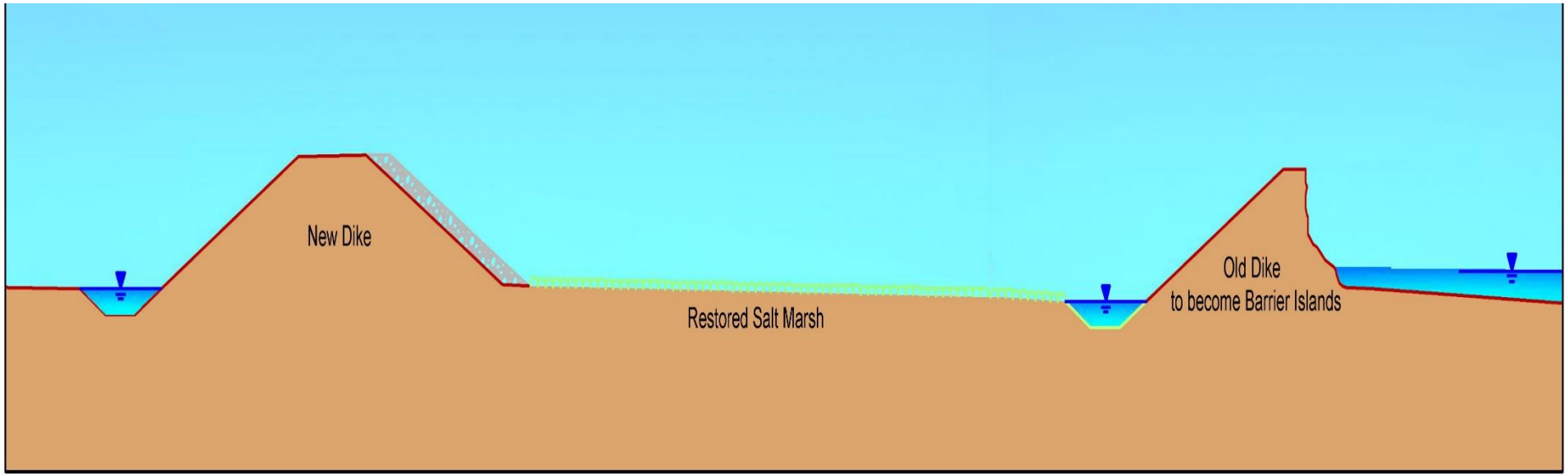
July 2018

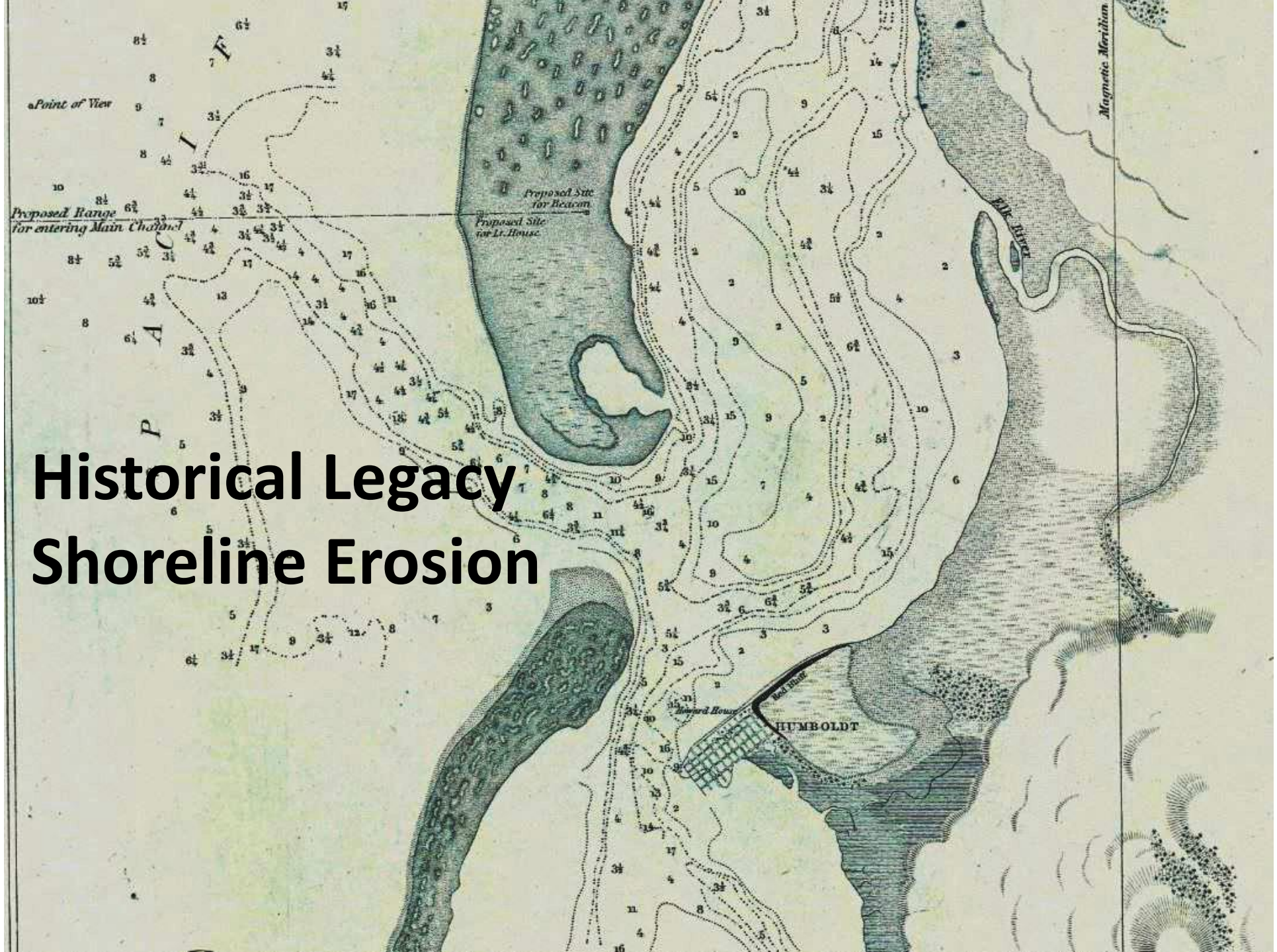
24 Diked Shoreline Units

Rebuilding In-Place – Relocate

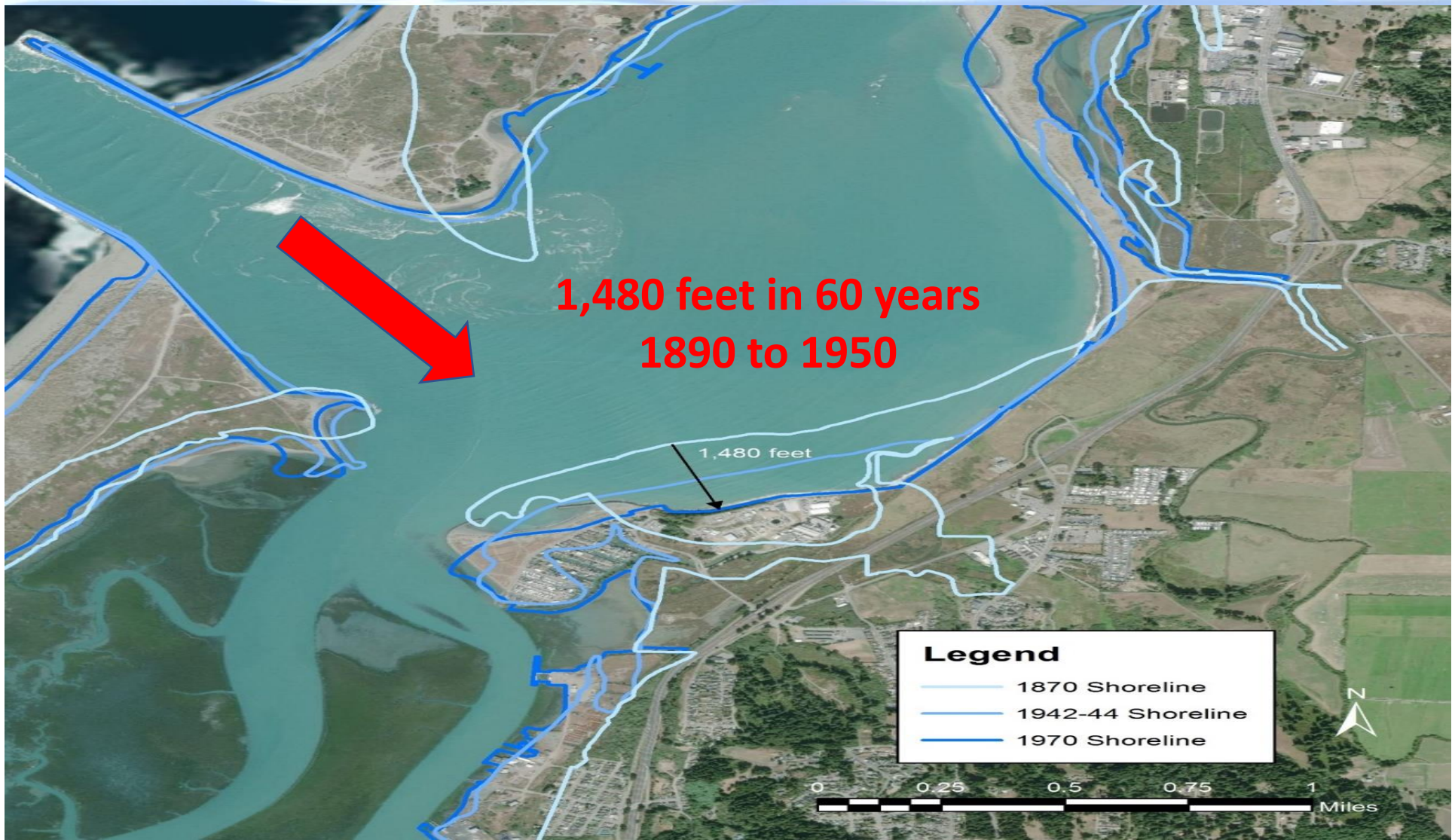
Living Shoreline – Barrier Islands






Point of View
Proposed Range for entering Main Channel
Proposed Site for Beacon
Proposed Site for Lt. House
Elk River
Magnetic Meridian
HUMBOLDT
Historical Legacy
Shoreline Erosion

Historical Shoreline Erosion



Overtopping Shoreline Fortifications

Independent Spent (Nuclear) Fuel Storage Installation

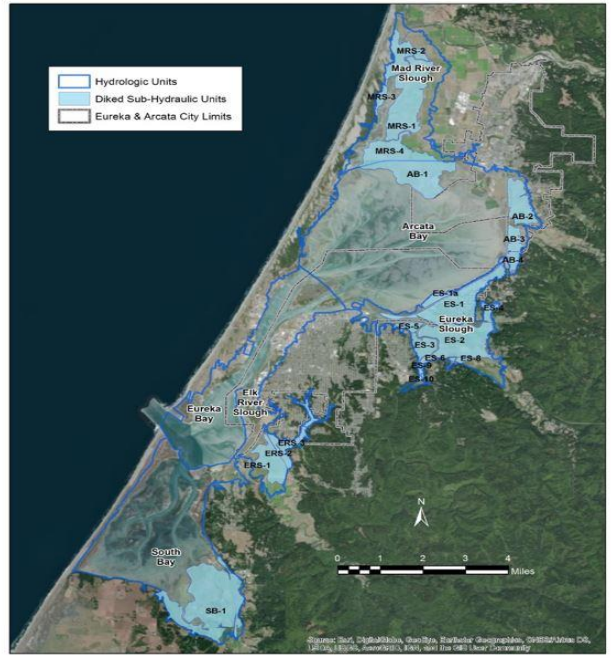
Humboldt County

Humboldt Bay Area Plan

Consolidation of Key Sea Level Rise information

by

Hydrologic Unit



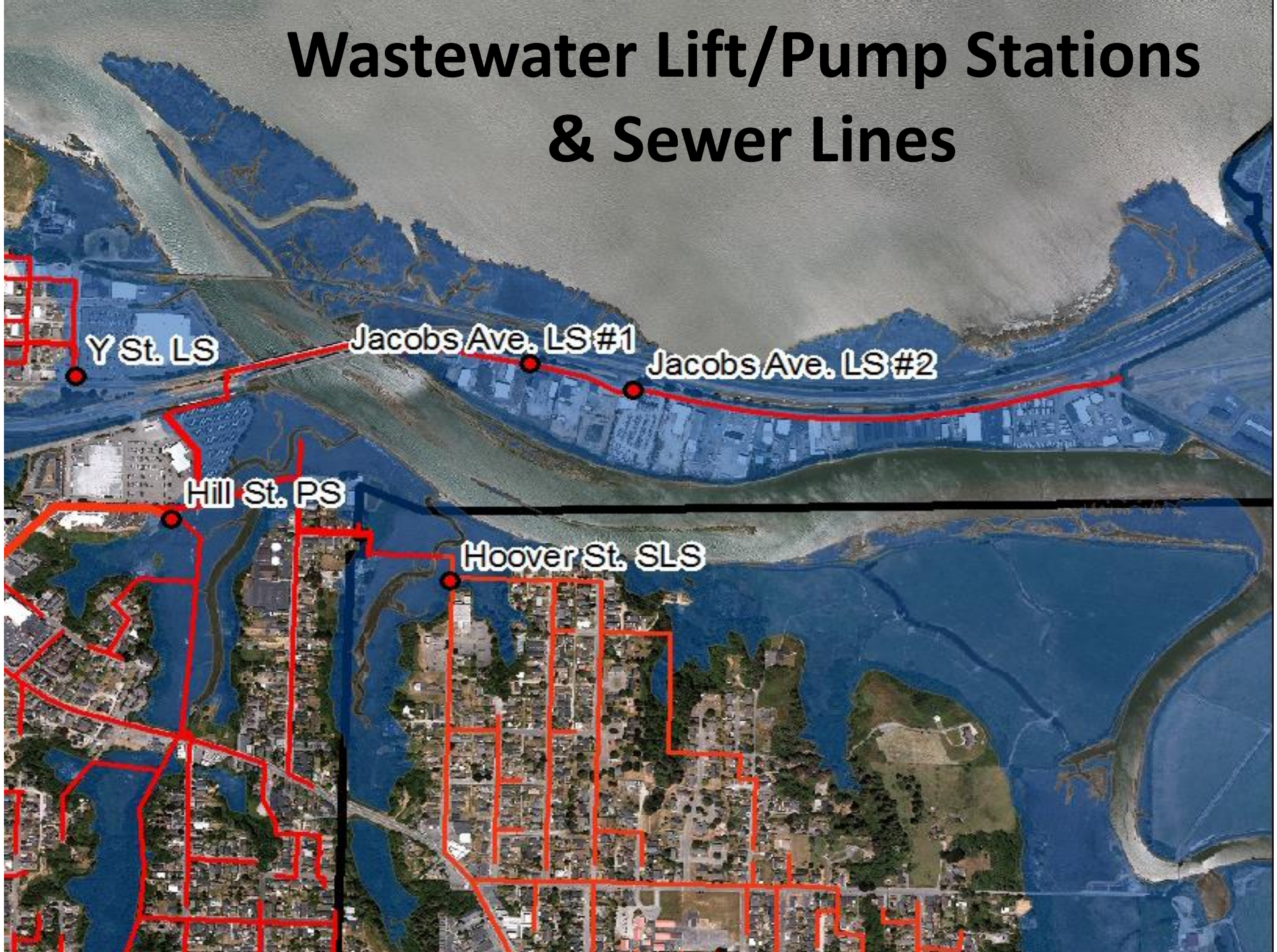
Prepared by

Aldaron Laird

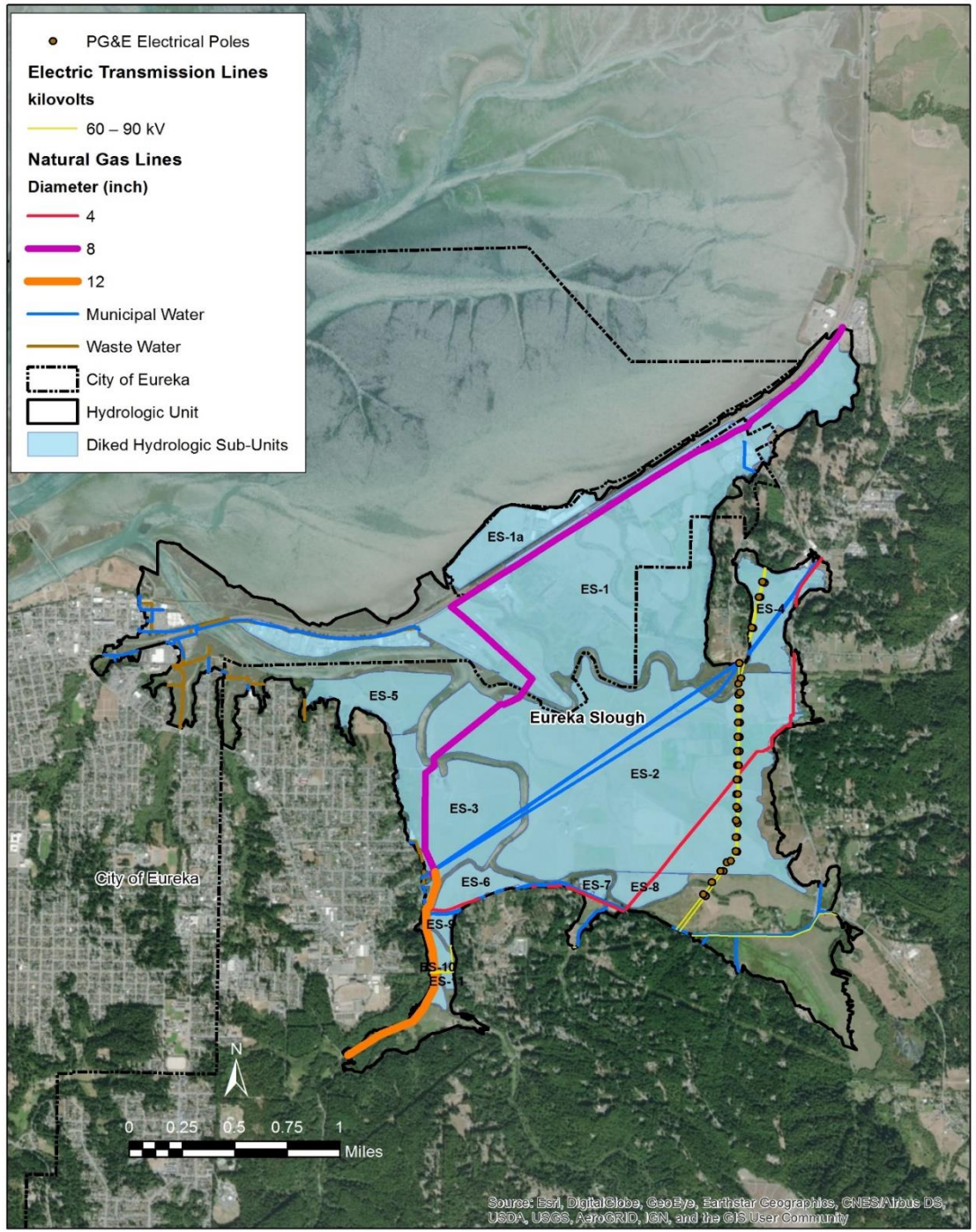
Trinity Associates

February 2020

Wastewater Lift/Pump Stations & Sewer Lines



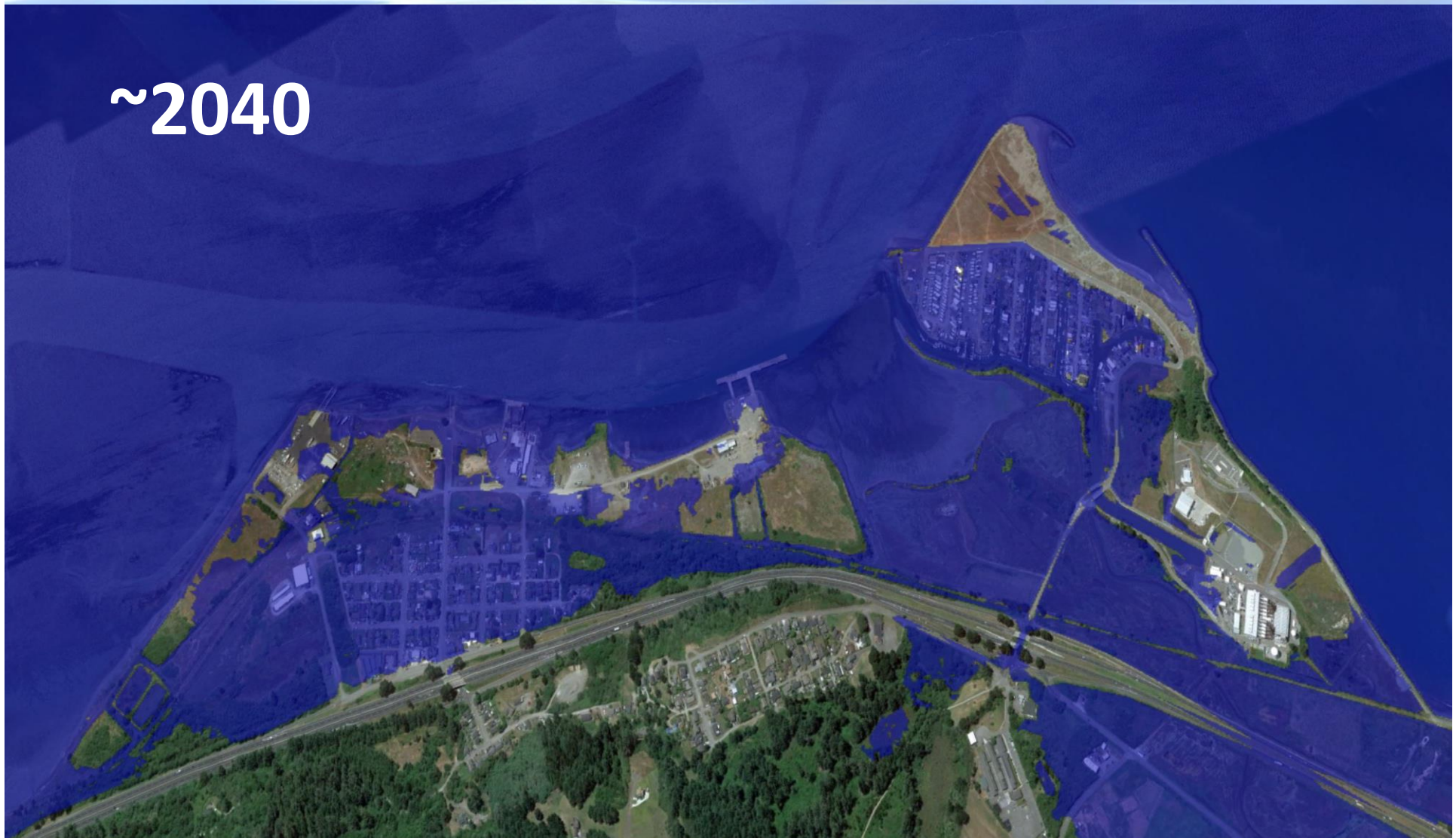
Mad River Pipeline


PG&E Electrical Poles
Electric Transmission Lines
kilovolts
60 – 90 kV
Natural Gas Lines
Diameter (inch)
4
8
12
Municipal Water
Waste Water
City of Eureka
Hydrologic Unit
Diked Hydrologic Sub-Units
ES-1a
ES-1
ES-4
ES-5
Eureka Slough
ES-2
ES-3
City of Eureka
ES-6
ES-7
ES-8
ES-9
ES-10
ES-11
N
0 0.25 0.5 0.75 1
Miles
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

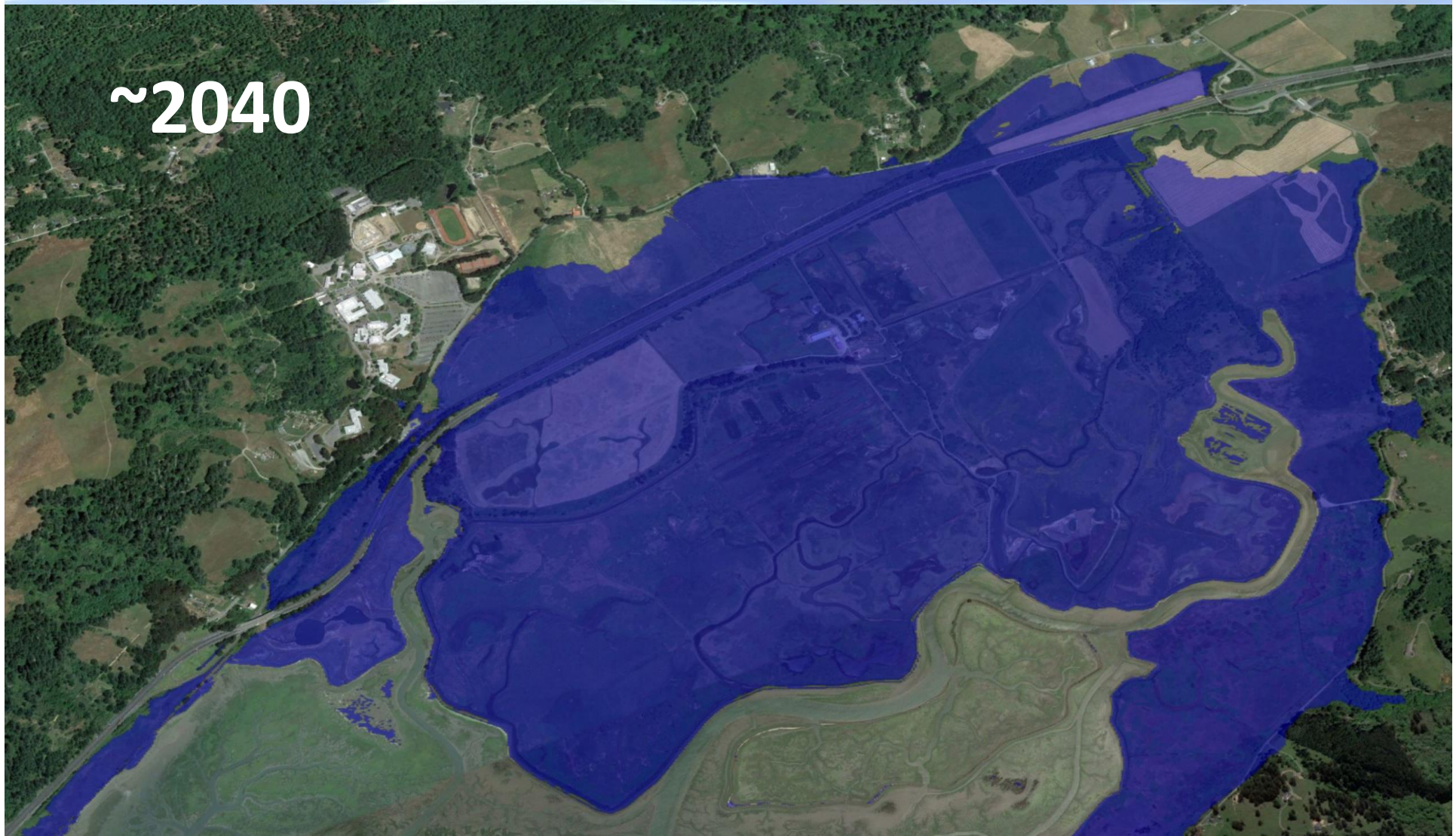
Local Roads

King Tide 8.94’, 2010

King Salmon & Fields Landing
1.6 feet Sea Level Rise - King Tide



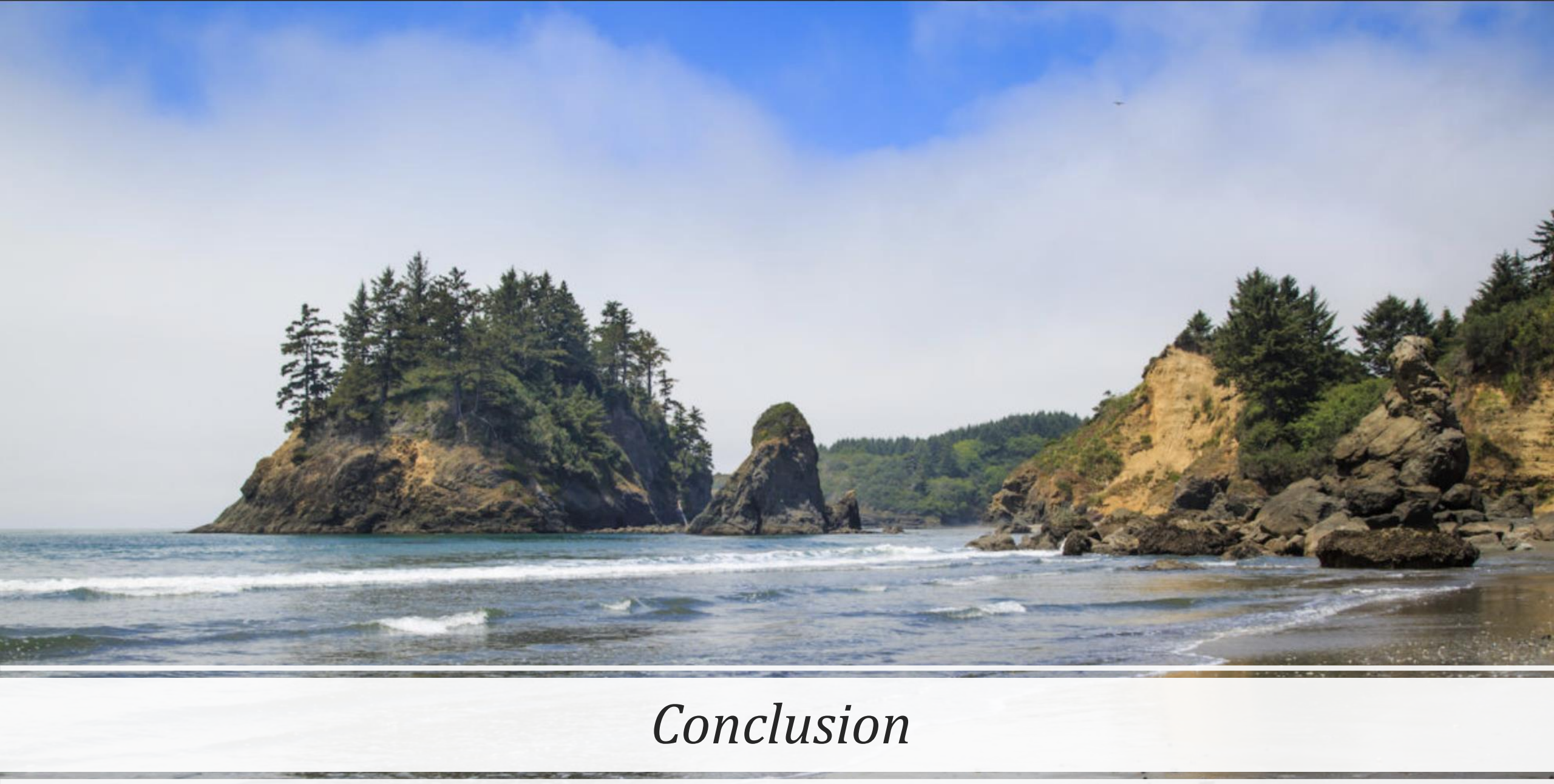
Highway 101 – South Bay
1.6 feet Sea Level Rise - King Tide



Humboldt Area Hazard Mitigation Plan 2019
Economic Impact of Sea Level Rise
Humboldt Bay Area

- 3 feet SLR = 620 People Exposed,
- 290 Structures, Value $396,101,566.00

- 8 Feet SLR = 2,589 People Exposed,
- 1,166 Structures, Value $2,338,461,359.00



Conclusion

Feasibility of a Regional Approach to Sea Level Rise Adaptation on Humboldt Bay

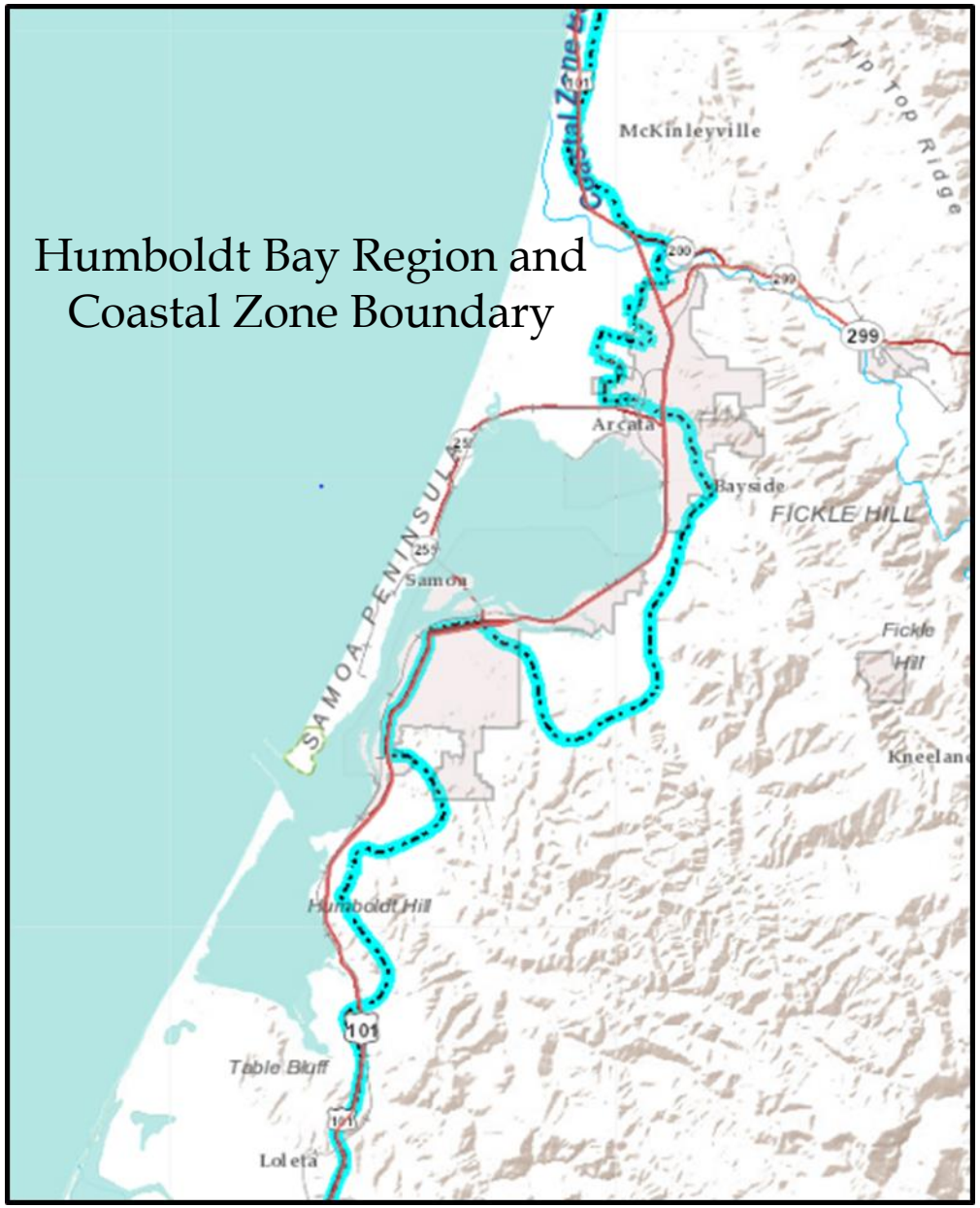
COUNTY OF HUMBOLDT

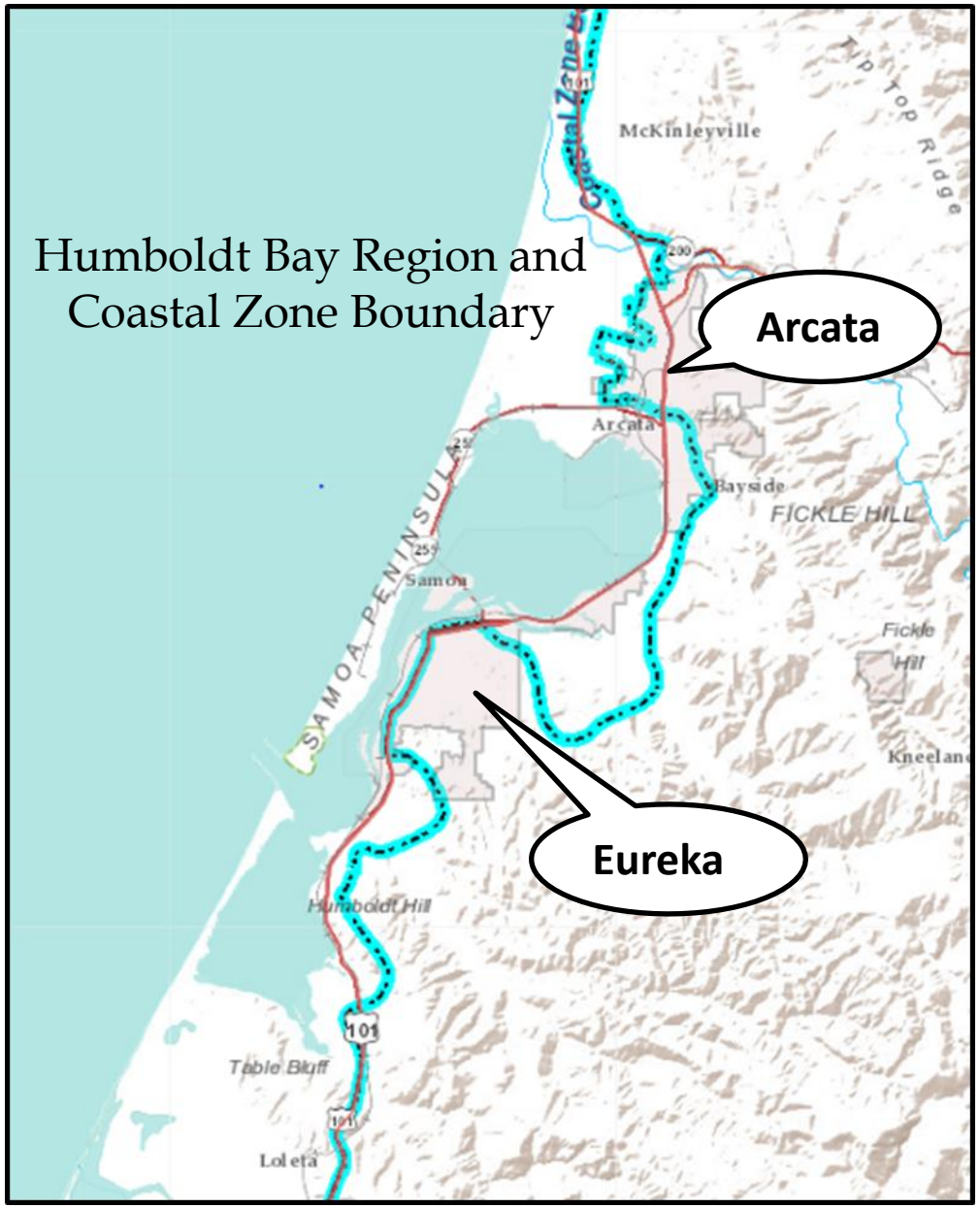
Planning and Building Department

November 3. 2022

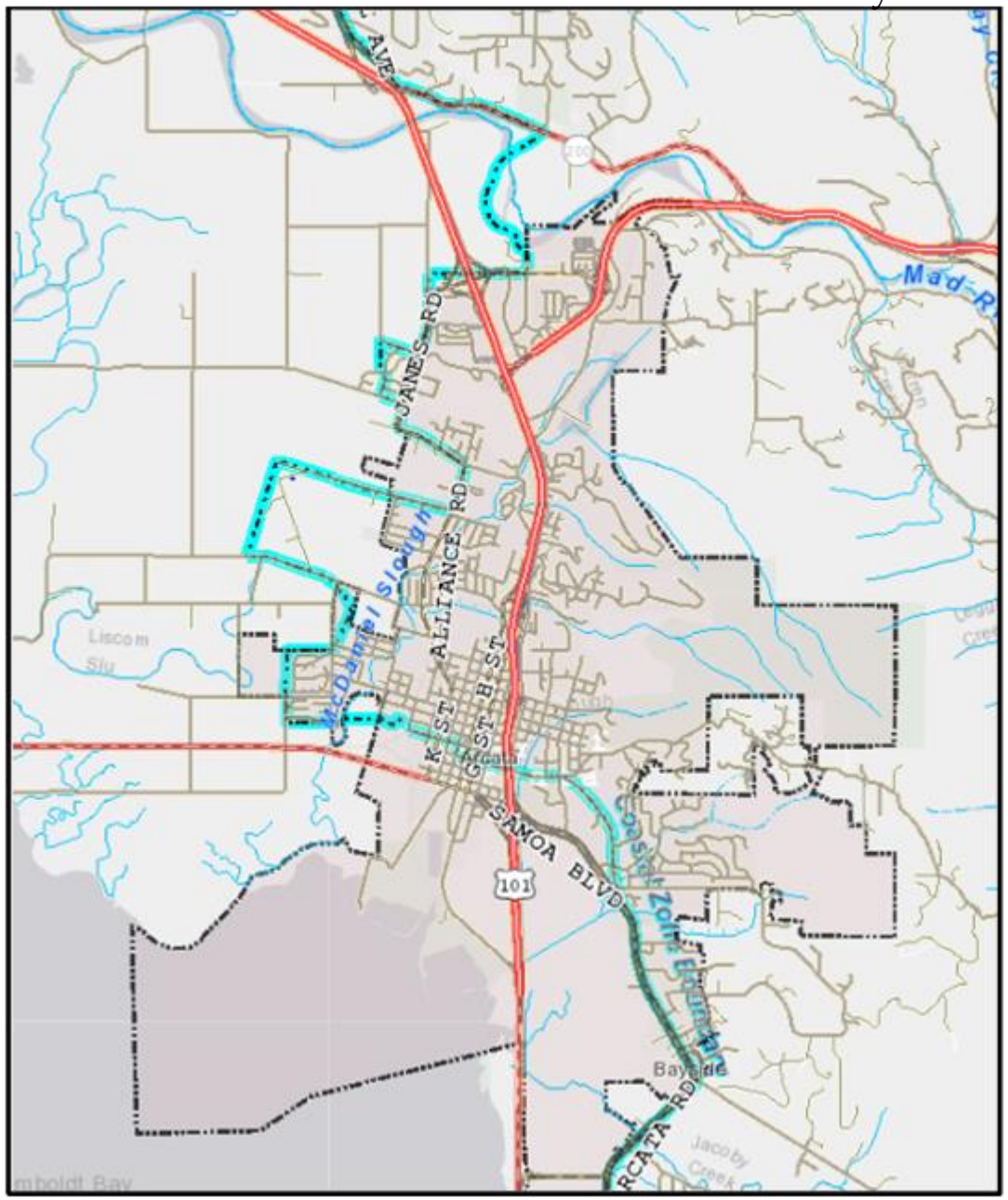
Presentation Overview

1. Maps showing the coastal zone boundary around Humboldt Bay.
2. 2019 Coastal Commission Grant exploring the feasibility of regional sea level rise planning.
3. 2022 grant application to facilitate regional sea level rise planning.

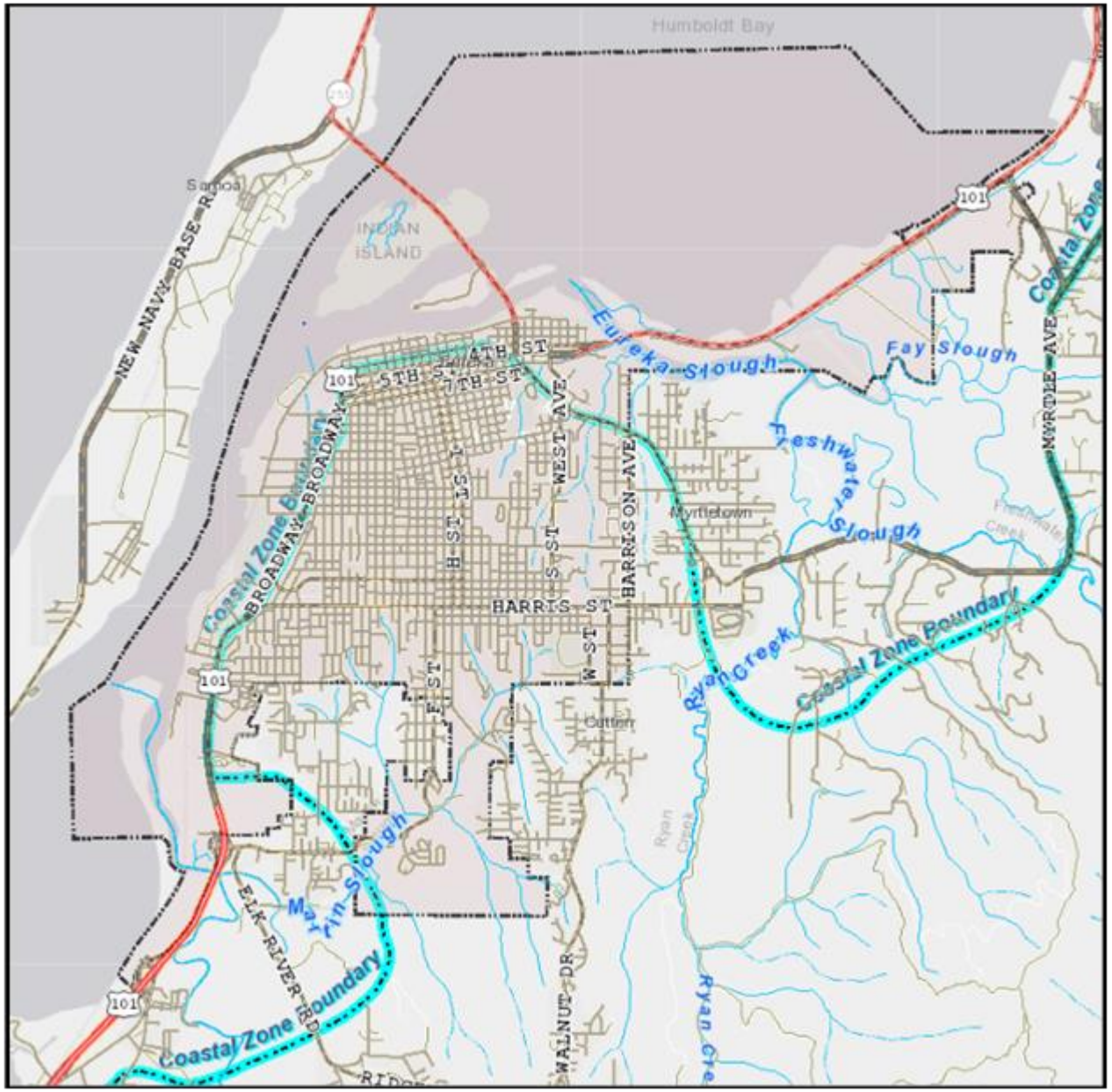

Humboldt Bay Region and
Coastal Zone Boundary
McKinleyville
Arcata
Bayside
FICKLE HILL
Samoa
SAMOA PENINSULA
Fickle Hill
Kneeland
Humboldt Hill
Table Bluff
Loleta
299
101


Humboldt Bay Region and
Coastal Zone Boundary
Arcata
Eureka
McKinleyville
Arcata
Bayside
FICKLE HILL
Samoa
SAMOA PENINSULA
Fickle Hill
Kneeland
Humboldt Hill
Table Bluff
Loleta
101
Top Ridge

Arcata and Coastal Zone Boundary



Eureka and Coastal Zone Boundary



2019 Coastal Commission Grant

- The 2019 grant explores whether it might make sense to address the risk of sea level rise through a **cooperative and coordinated** regional approach.
- This approach could be applied to:
  - Identification of sea level rise adaptation measures
  - Funding
  - Implementation

Regional SLR Planning Feasibility Study

- A regional approach is being used successfully for roads and trails and other local infrastructure projects
- We are also coordinating on a regional climate action plan (CAP) that synchronizes the measures we commit to for reducing our greenhouse gas emissions.
- This regional approach has already paid off leading to securing $275,000 for environmental review of the CAP that was otherwise unavailable.

Regional SLR Planning Feasibility Study

Chapter 1 - Stakeholder Catalogue

- Available on our website: https://humboldtgov.org/3261/Regional-Sea-Level-Rise-Planning
- Identifies asset owners, managers, and other parties that could be involved a regional SLR planning effort.
- Provides information regarding assets they own or manage, their authority or area of interest

Regional SLR Planning Feasibility Study

Stakeholder Catalogue: Six Topic Areas

1. Shoreline Management
   - Who is managing and maintaining the shoreline?
   - How is the shoreline currently managed and maintained?
   - What shoreline management changes may be needed to accommodate current and future uses while also addressing SLR?

Regional SLR Planning Feasibility Study

Stakeholder Catalogue: Six Topic Areas

2. Property Ownership and Adaptation Responsibility
   - Who owns the property and who is their neighbor?
   - How will adaptation measures on one property impact other properties?
   - Who is going to take the lead for implementation of SLR adaptation measures?

Regional SLR Planning Feasibility Study

Stakeholder Catalogue: Six Topic Areas

3. Regulatory Authorization and Compliance
   - Can permits/authorizations to implement SLR adaption measures be obtained?
   - Can the permits and requirements of various regulatory agencies be coordinated?

Regional SLR Planning Feasibility Study

Stakeholder Catalogue: Six Topic Areas

4. Feasible Adaptation Strategies
   - What do we do to address SLR impacts?
   - How do we decide?

Regional SLR Planning Feasibility Study

Stakeholder Catalogue: Six Topic Areas

5. Funding
   - How should SLR adaptation be funded?

Regional SLR Planning Feasibility Study

Stakeholder Catalogue: Six Topic Areas

6. Sea Level Rise Impacts:
   - Erosion
   - Tidal inundation
   - Backwater flooding
   - Emerging groundwater flooding
   - Saltwater intrusion

Regional SLR Planning Feasibility Study

Stakeholder Catalogue: Community Input

- Survey results
  - Property owners that could be impacted by one meter of sea level rise, as well as for the general public
  - Second survey targeting "Coastal Professionals" (individuals involved in California coastal resource management, conservation, and protection from coastal hazards)

Regional SLR Planning Feasibility Study

Chapter 2

- Research evaluating how different approaches/frameworks may support SLR protection, accommodation, and retreat strategies.

Regional SLR Planning Feasibility Study

Chapter 2 – Research of Regional SLR Planning

- Potential regulatory frameworks
- Cross-jurisdictional coordination
- Funding frameworks and opportunities
- Regulatory and feasibility pathways and barriers

2022 Coastal Commission Grant Application

Goal: Develop a regional sea level rise adaptation strategy for Humboldt Bay.

Mutual gains approach

- All agencies involved realize benefits
- Impacts are dispersed equitably and understood by all stakeholders

2022 Coastal Commission Grant Application

Three major components to help build resiliency and pragmatic adaptation:

1. Building the Organizational and Regulatory Framework
   - Phased approach with thresholds that trigger future policy, planning reviews, Local Coastal Plan updates and projects
   - Three year timeframe

2022 Coastal Commission Grant Application

Three major components:

2. Technical Studies supporting a phased approach:
   - Proceed concurrently with Part 1
   - Economic, engineering, biological, and cultural resource analyses

2022 Coastal Commission Grant Application

Three components:

3. Incorporating Regional Climate Action Plan measures into the LCPs

Arcata Local Coastal Program Update

October 2022

David Loya
Community Development Director

dloya@cityofarcata.org
707-825-2045

LCP Update

Ch 1.

The LCP Journey – a Twenty Year Tale in Twenty Seconds

Ch. 2

Sea Level Rise – the Antagonist and Central Character

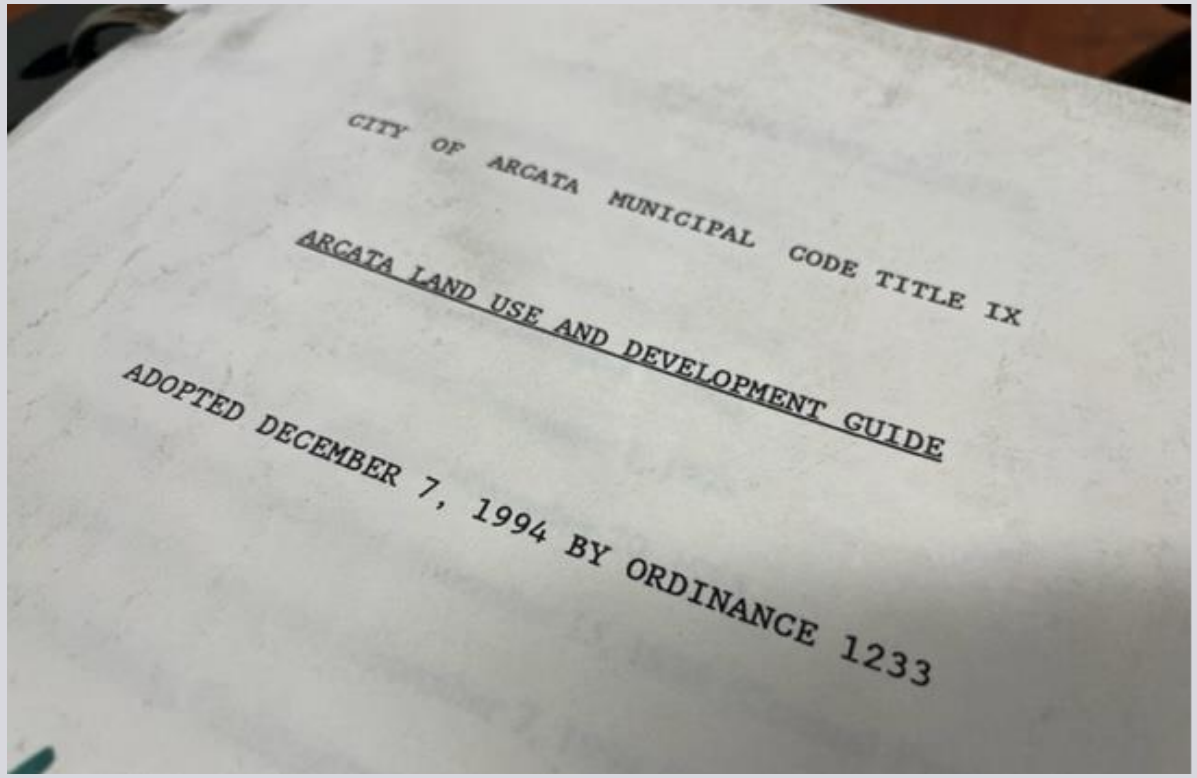
Ch. 3

Zoning and Adaptation Planning – the Protagonist Wins the Day in Three Parts

Ch. 1 – The Journey

Why update the LCP?

- Element - 1989
- Zoning - 1994



Why haven't we already done so?

- 2000 – General Plan Update
- 2008 – Land Use Code
- 2012 – Coastal Certification
- 2014 – Update restarted
- 2015 – LCP Grant from CCC
- 2016-2018 – Background docs/SLR Study
- 2018 – LCP Grant from CCC
- 2018-2022 – Closely worked with CCC Staff
- 2022 – Applied for rolling CCC Grant

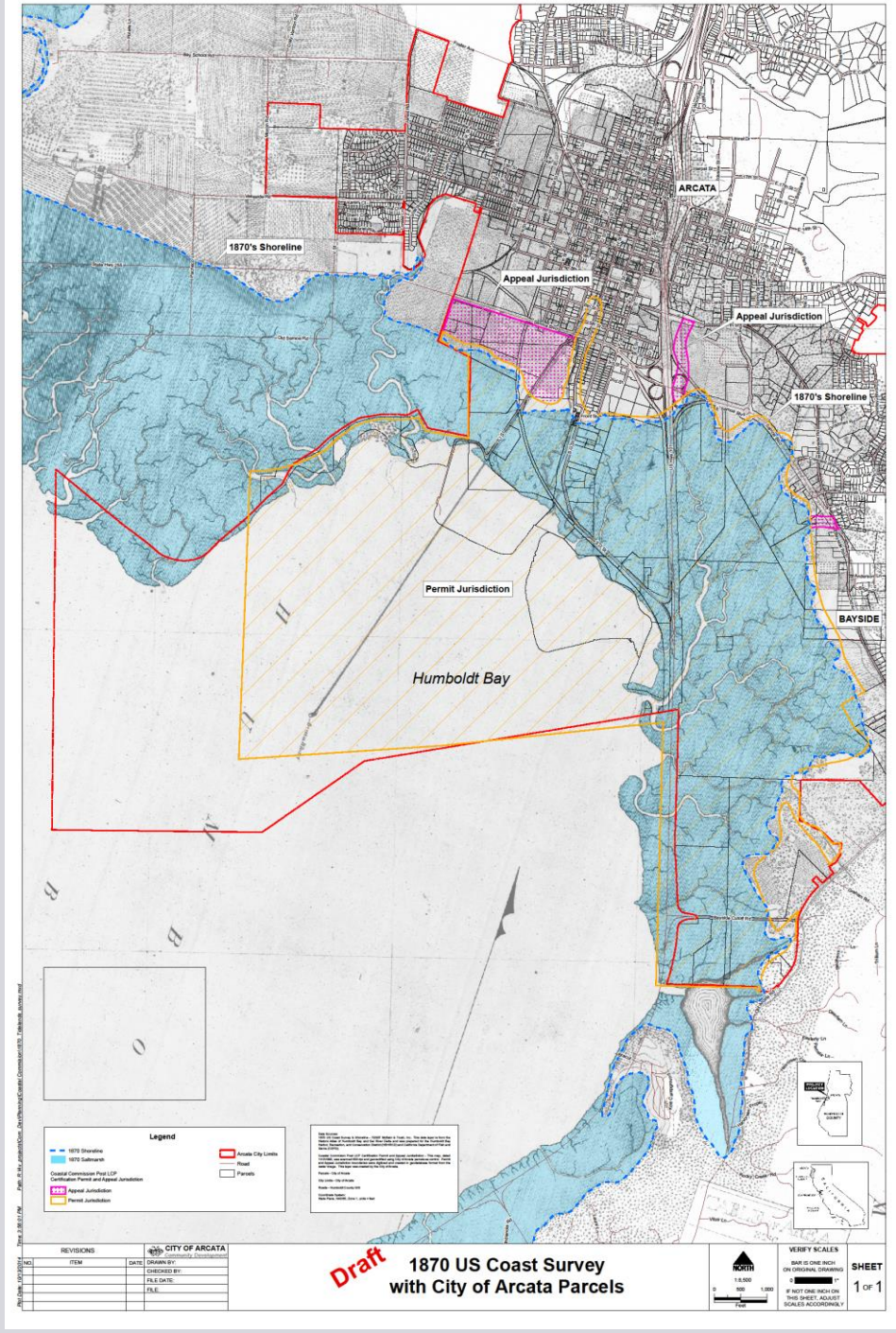
Has the public seen this before?

- 2016-2021 – 16 public meetings on SLR
- 2017 – Tabling multiple events
- 2014-2018 – Annual PC/CC Study Session
- 2021-2022 – Six PC Meetings
- King Tide events
- 3 panel events
- eNotification for LCP

What is the process moving forward?

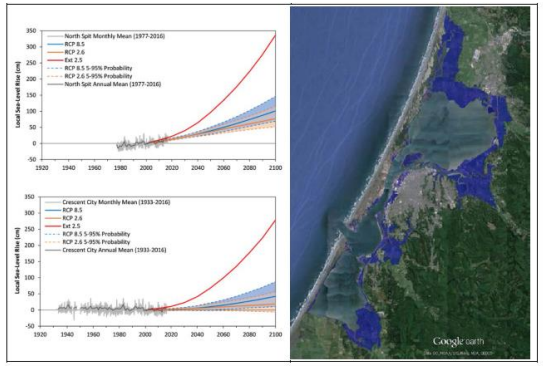
- 2022-2023 early – Additional Public Input
- 2023 mid – PC and CC adoption
- 2023 late – CCC certification hearings
- 2024 – Approved and effective

Ch. 2 - Sea Level Rise



1870 Shoreline

Sea-Level Rise in the Humboldt Bay Region



Prepared for

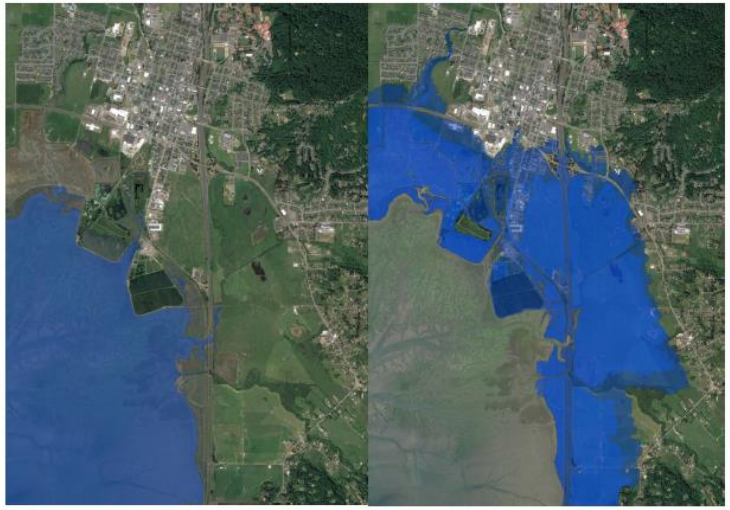
City of Arcata
736 F Street
Arcata, CA 95521

Prepared by

Jeffrey K. Anderson
Northern Hydrology & Engineering
P.O. Box 2515
McKinleyville, CA 95519

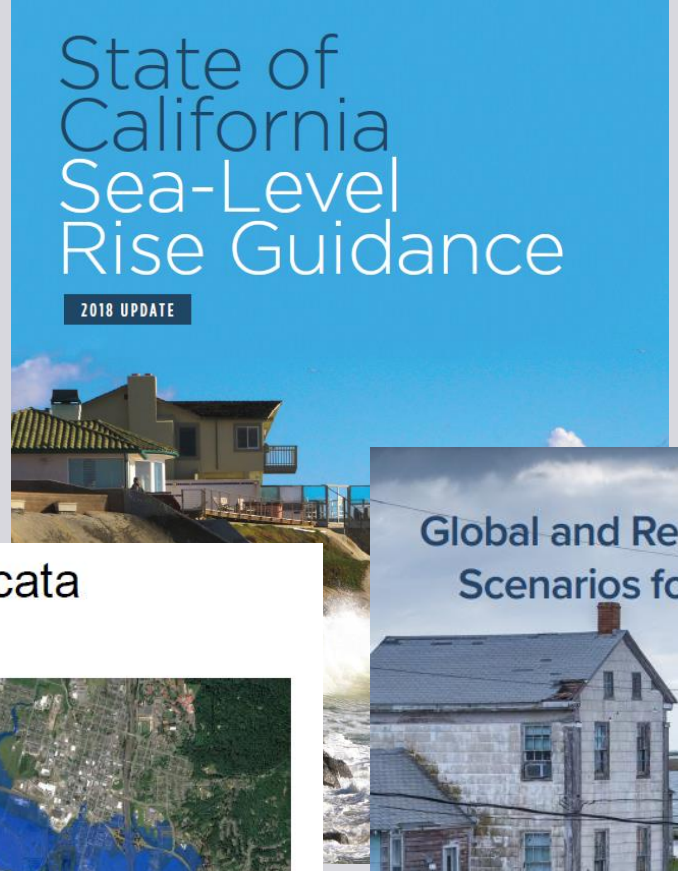
Northern Hydrology & Engineering

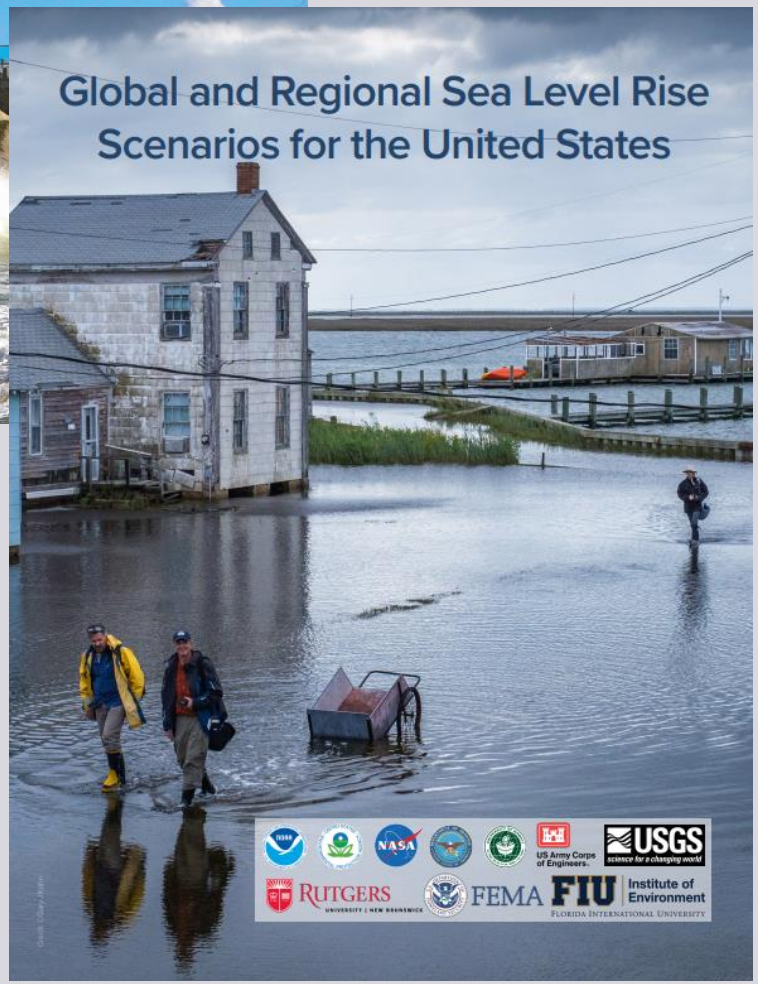
City of Arcata



Current Tidal Inundation Areas versus Potential Tidal Inundation Areas (Stillwater) with 4.6 feet (1.5 meters) of Sea Level Rise

Sea Level Rise Vulnerability Assessment





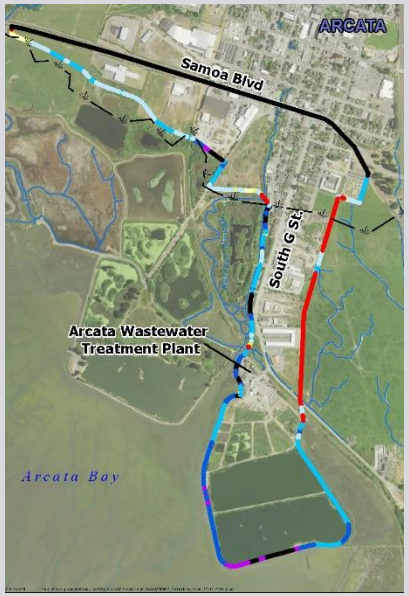
6’ SLR

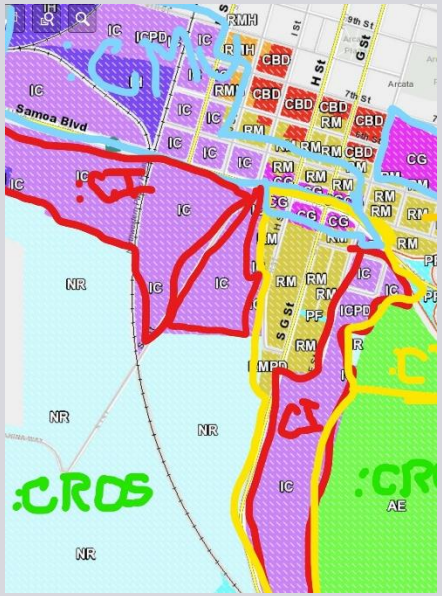
Gannon Slough
Redwood Par
Arcata Plaza
Arcata Ball Park
Arcata
Arcata Community Park
Arcata
Arcata Marsh and Wildlife Sanctuary
Sunny Br
Humboldt Bay
Oxidation Pond

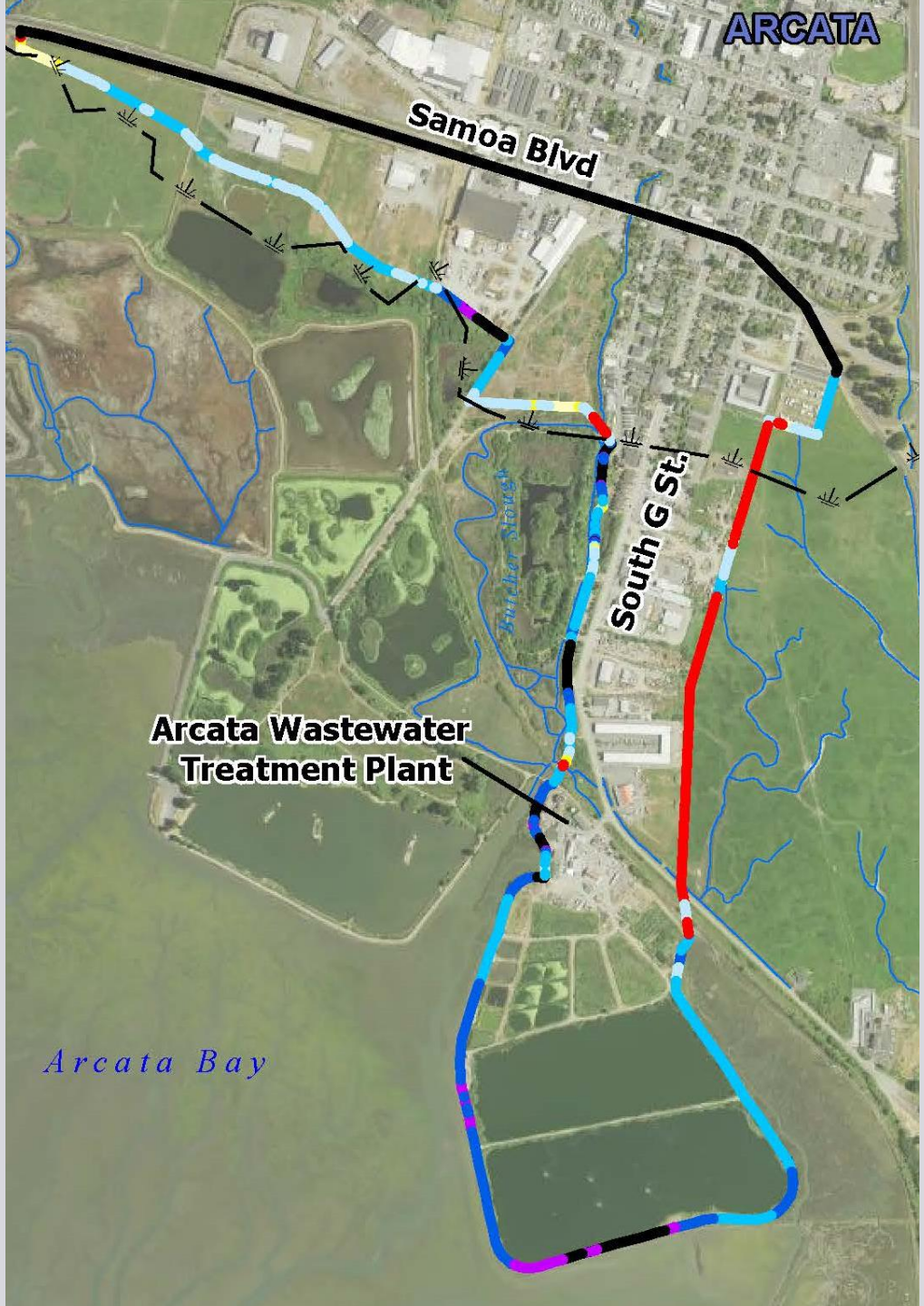
Ch. 3, Part 1 - Adaptation

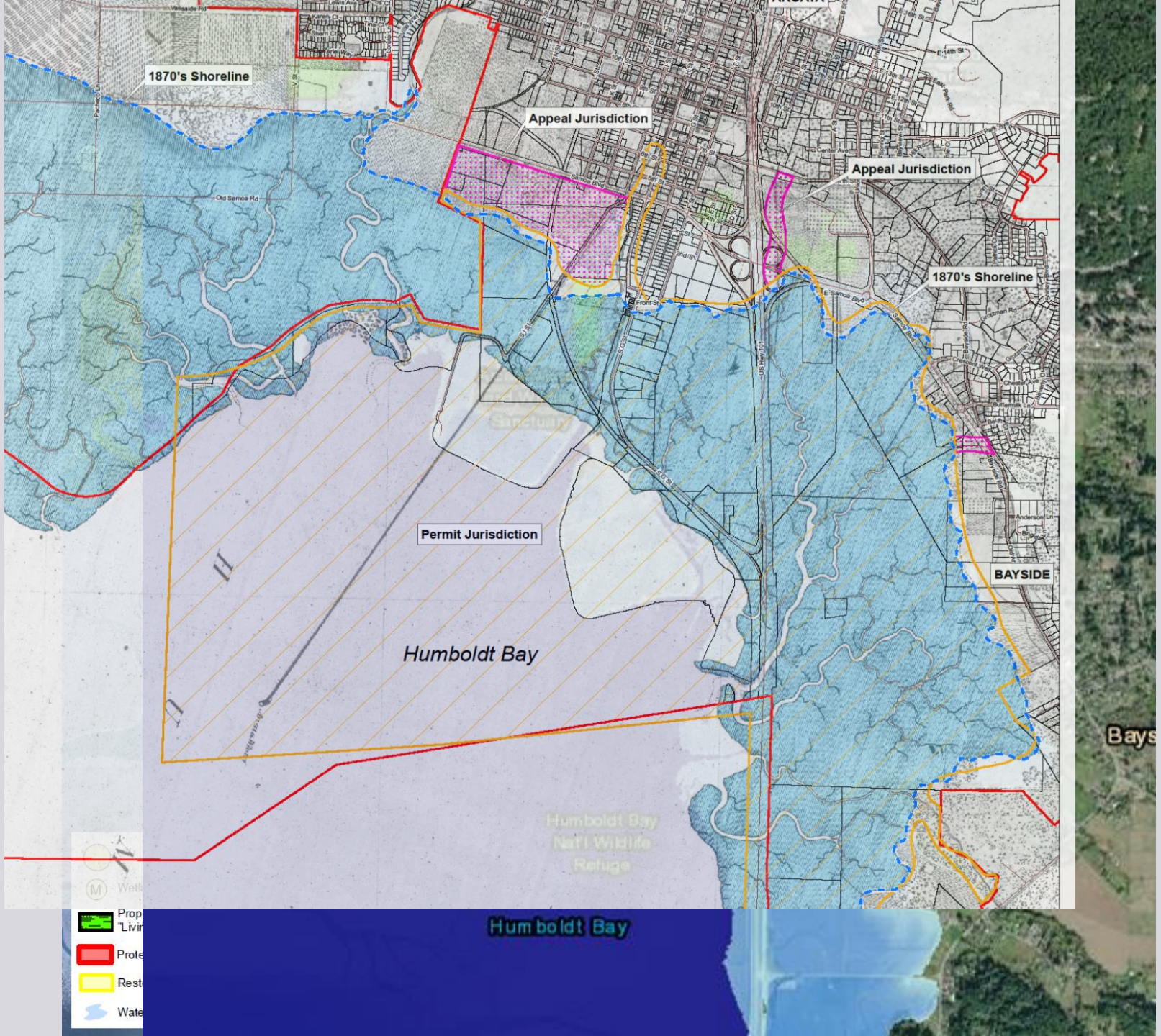
So What is the Strategy?

- Accommodate where planned and infeasible to defend
- Adapt uses and assets that are infeasible to defend
- Defend where feasible
- Retreat where and when no longer feasible to defend or adapt
- Use zoning to help with retreat/adaptation

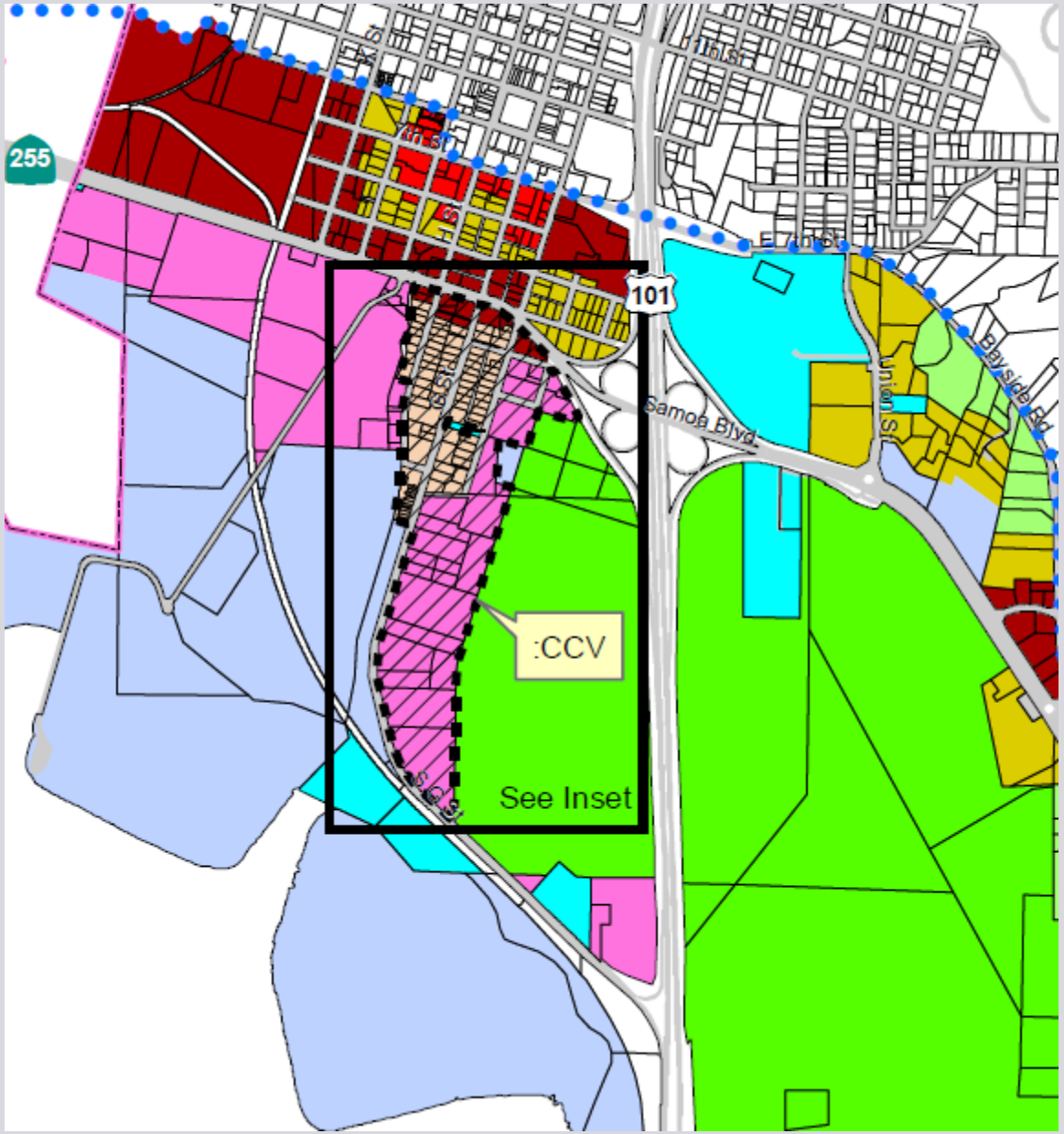





ARCATA
Samoa Blvd
South G St.
Arcata Wastewater
Treatment Plant
Arcata Bay


1870's Shoreline
Appeal Jurisdiction
Appeal Jurisdiction
1870's Shoreline
Permit Jurisdiction
BAYSIDE
Humboldt Bay
Humboldt Bay
Nat'l Wildlife
Refuge
Humboldt Bay

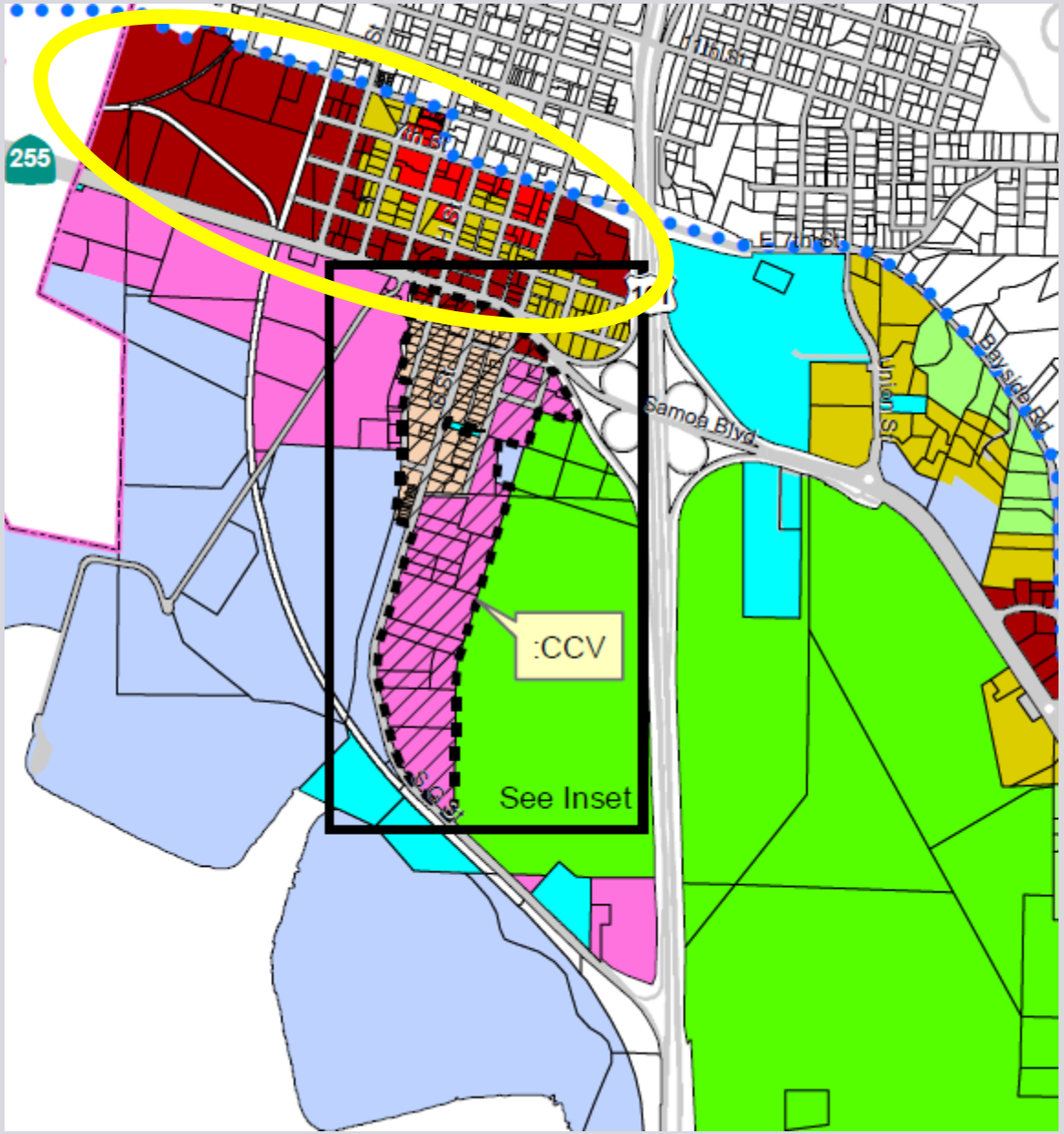
Ch. 3, Part 2 - Zoning



Coastal Zoning

Lower intensity
Higher return on investment
Dedicate access to perimeter
Communicate risk via deed

Ch. 3, Part 3 - Gateway Area Plan (also zoning)



Coastal Zoning

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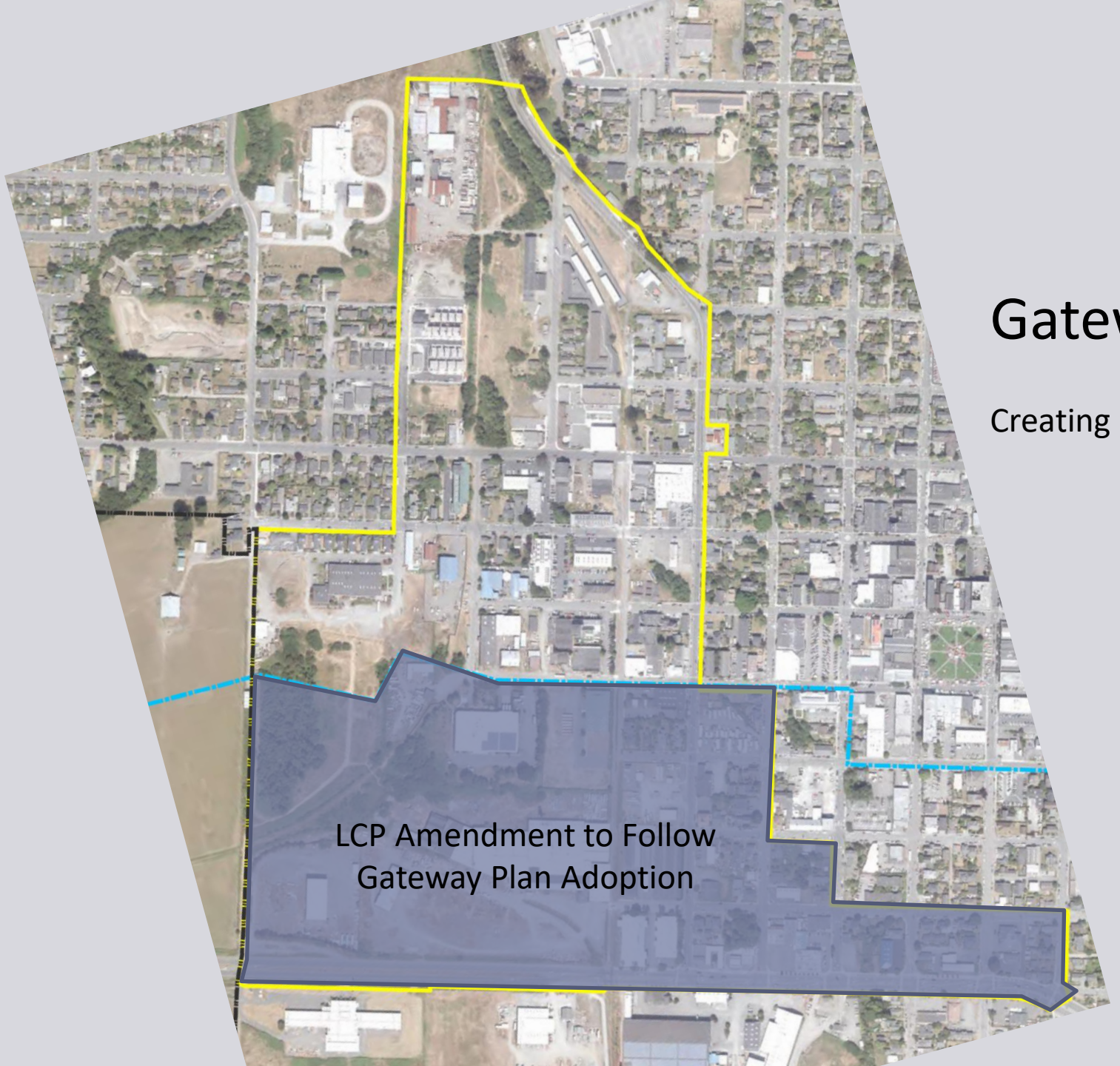


Gateway Area Plan

Creating a landbank for retreat

cityofarcata.org

David Loya
Community Development Director

dloya@cityofarcata.org
707-825-2045

Statewide Sea Level Rise Planning Overview

SMART COAST CALIFORNIA

Don Schmitz, AICP

Lead Consultant to Smart Coast California

President, Schmitz & Associates

SCHMITZ & ASSOCIATES, INC

Providers of Land Use Planning for a Better Community

Local Coastal Program Amendments Addressing SLR
Statewide Overview

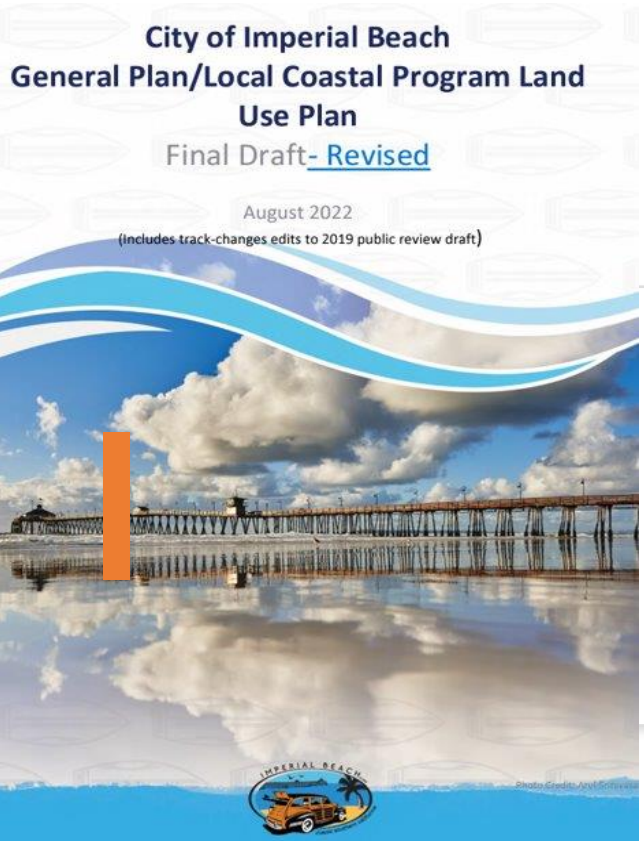
Certified	Morro Bay (2021) Half Moon Bay (2021)	San Diego County (2021) Pacific Grove (2020)	Santa Monica (2020) San Francisco (2018)
Submitted	Carlsbad (2021)	Pacifica (2022)	
Published	Santa Cruz (2021) **Arcata (2022)**	Imperial Beach (2022) Sonoma County (2022)	Manhattan Beach (2022)
Withdrawn	San Clemente (2020)	Del Mar (2021)	Santa Barbara County (2021)
Denied	Santa Cruz County (2022)		

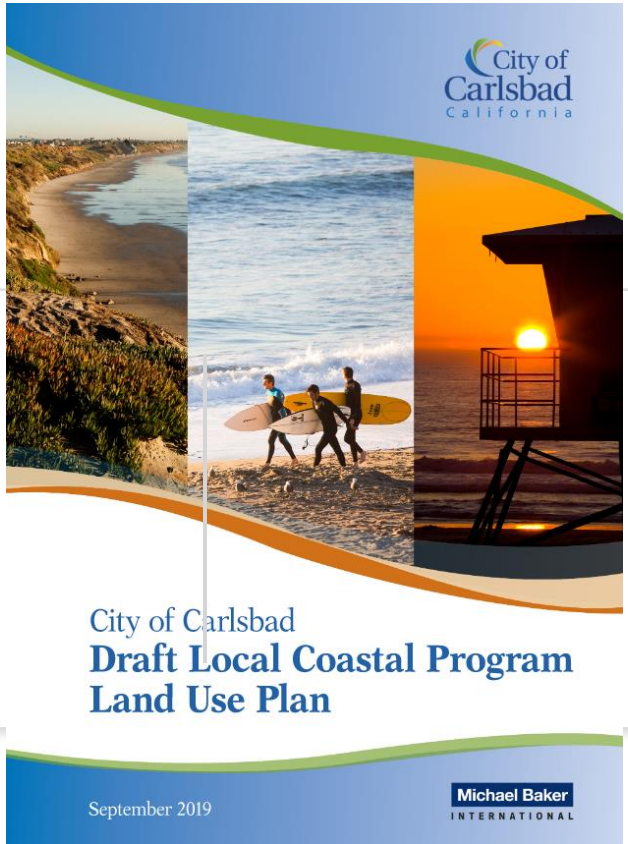
Representative Adaptation Studies/Draft LCPAs in Process				
Avalon	Carpinteria	Coronado	**Eureka**	**Humboldt County**
Marina and Monterey	Marin County	Oceanside	Pismo Beach	Santa Barbara Ventura (City+County)

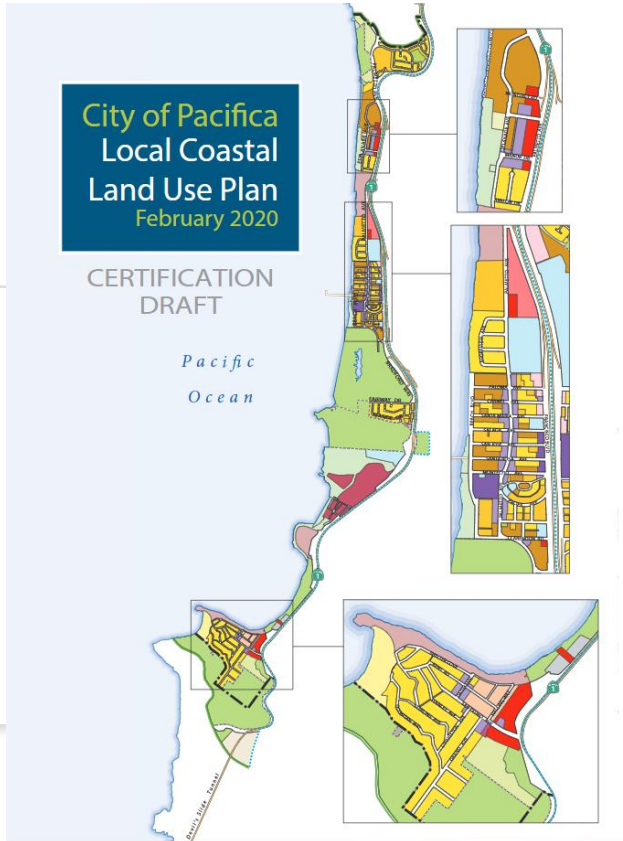
Submitted and Published Local Coastal Plans

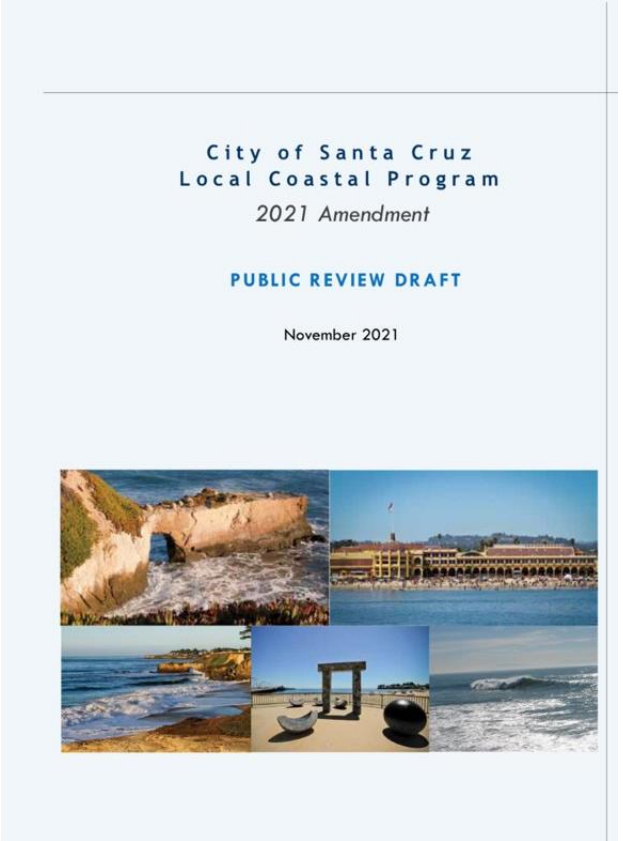
Proposed policies include:

- Tiered Response strategy for monitoring and triggers
- Define "existing" as of the date of LCPA certification
- Beach nourishment
- Living shorelines
- Dune restoration
- Sand retention groins









Withdrawn
Local Coastal Plans

Del Mar

Accepting Managed Retreat would condemn approximately 43% of existing residential properties

- per Councilmember Terry Gaasterland

Santa Barbara County

"...the County believes that the [Coastal Commission] suggested modifications impose unnecessary restrictions on coastal landowners, both public and private".

SOURCE: County of Santa Barbara Notice of Withdrawal, September 3, 2021

San Clemente

Resubmitted LCPA strikes 1977 date for tracking cumulative changes. New date: August 10, 2018

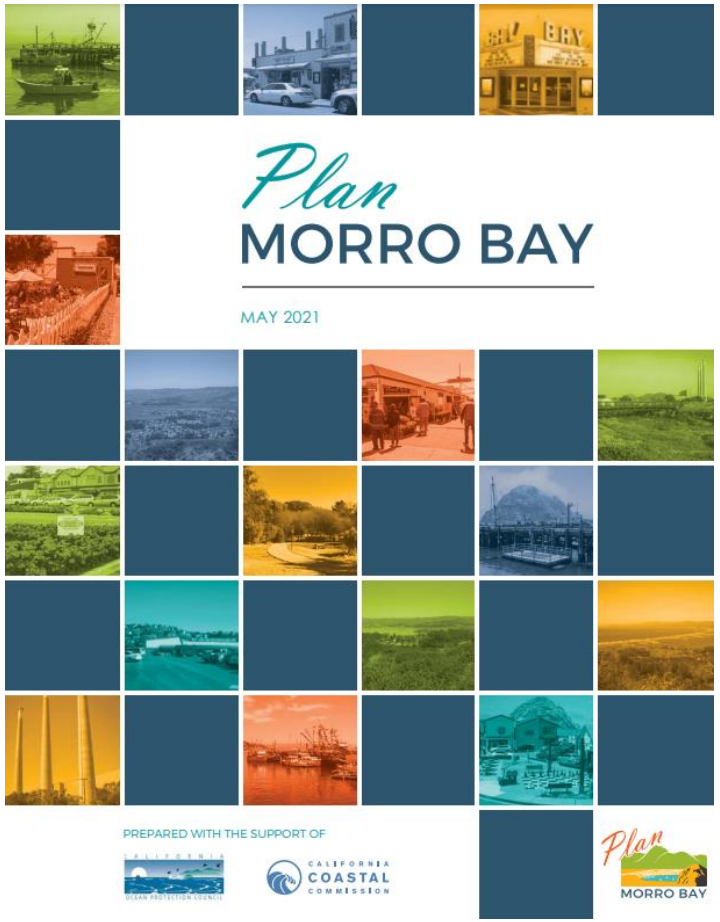
Legal Challenge
Defining "Existing Structures"

- *Casa Mira HOA v. California Coastal Commission*
- Initial oral arguments occurred October 12, 2022, trial continues
- Decision will rule on the definition of "existing structures"
- Statewide implications

Casa Mira Half Moon Bay

Certified

Local Coastal Plan



- Certified in 2021
- Includes managed retreat where feasible and protection where necessary

PHOTO 11. SHORELINE PROTECTION AT THE EMBARCADERO WATERFRONT

Conclusion

- No one size fits all
- Stay focused on the needs of your local community
- Stay informed
- Support your local planning agency

How to Get Involved in the Future of Your Community

Sunset at Hendry's Beach by Alex Braud, 2018

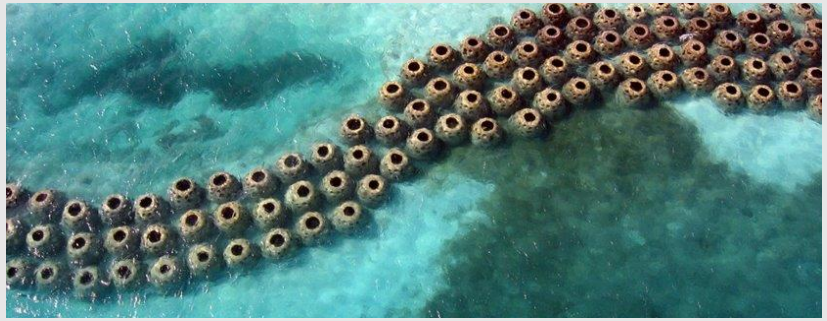
There is no one-size-fits-all approach when it comes to dealing with sea level rise and many of the solutions will have to be local. Not every strategy is going to work everywhere. For example, what works on the sandy beaches of San Diego is not going to work on the cliffs outside Crescent City.

Source: California Coastal Commission https://www.coastal.ca.gov/

- **Engage** coastal community members
- **Collaborate** with state and local government leaders
- Facilitate **community-wide** sea level rise adaptation
- Encourage the **implementation** of cutting-edge strategies
- Collaborate on short- and long-term **solutions**

Start with nature-based solutions

Dune restoration, Living shorelines, and coastal marsh enhancement



Kelp forestation, beach/sand nourishment, artificial reefs

Revetments, perched beaches, breakwaters, groins, harbor channels, seawalls

SOURCES: (left to right, top to bottom) RIOS; The Bay Foundation; USFWS; The San Diego Union Tribune; UCSB; Reef Ball Foundation; The San Diego Union Tribune; UCSB; Del Mar Times

Smart Coast California Policy reference in "Resilient Imperial Beach"

Smart Coast California: According to Smart Coast California https://www.smartcoastca.org/ a phased approach to an LCP update is an appropriate tiered response to SLR. A tiered response is a planning principle that institutes certain defined policies if/when there are specific thresholds of sea level rise that are observed, measured/quantified and documented as opposed to relying only projections only. Their website has a list of each City/County LCP and SLR efforts and the current status.

There are multiple options that can be incorporated into a phased or tiered coastal resiliency response LCP policy including, but not limited to, beach nourishment, kelp forests, offshore reefs, groins, submerged breakwaters, community seawalls to protect critical public infrastructure and nature-based solutions such as living shorelines.

Connect with Us!

Website

www.smartcoastca.org

Sign Up

www.smartcoastca.org/sign-up.html

Email: info@smartcoastca.org

Thank You

Question / Answer

Special Guests also available for questions:

- Melissa Kraemer – Coastal Commission North Coast District Manager
- Cristin Kenyon – City of Eureka Principal Planner
- Aldaron Laird – Senior Environmental Planner, Greenway Partners

Smart Coast California