2018 California
Sea Level Rise Regional Snapshots

Prepared for the
Ocean Protection Council
by the
Climate Readiness Institute

Updated May 2018
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Introduction

As part of the AB 2516 *Planning for Sea Level Rise Database* Project for the Ocean Protection Council (OPC), the Climate Readiness Institute (CRI) at UC Berkeley developed a series of “snapshots” to document and measure progress on sea level rise planning and implementation in six regions of California—San Diego, Los Angeles/Orange, Central Coast, San Francisco Bay Area, Sacramento/San Joaquin Delta, and the North Coast. The information contained in the snapshots will help to inform policies and programs to advance the work on this critical set of issues for California.

CRI used web searches, written surveys, and group and individual interviews with key sea level rise stakeholders to gather and analyze the information contained in the snapshots. A full list of participants is included in Appendix A.

This 2017-18 process was designed to provide a baseline picture of sea level rise planning in each region to inform OPC and its partners in the near-term, and to allow OPC to repeat the process in future years to measure local and regional progress at regular intervals going forward.

Key overall findings are presented on page 4 followed by the six regional snapshots.
Key Findings

The six Regional Snapshots on the following pages show that each region included in this study is making progress on planning for sea level rise and related climate change impacts. The extent of that progress varies widely based on resources available, public pressure for action, the presence of local champions, and other local factors. Activities range from vulnerability assessments, Local Coastal Program updates and other planning now underway in nearly all coastal, bayside and Delta counties, to large-scale regional efforts such as the $5 million Resilient by Design Bay Area Challenge, the $700,000 San Diego Resilient Coastlines Project, and the Regional AdaptLA project.

While the individual snapshots provide the clearest picture of each region’s work on addressing sea level rise, we offer the following overall, statewide observations from our interview and survey process:

1. **Planning** - Planning efforts to-date have primarily focused on (a) “voluntary” detailed vulnerability assessments (usually at the county level) and (b) sea level rise updates to Local Coastal Programs that govern permissible land uses and related policies under the California Coastal Act. Amendments to local hazard mitigation plans and general plans are less common but are getting more attention due to SB 379.

2. **Projects** - A small but growing number of on-the-ground, sea level rise-related pilot and demonstration projects are being developed in each of the six regions, including wetlands restoration, living shorelines, flood protection, etc.

3. **Public Engagement** - A range of public engagement activities have been attempted, such as workshops, citizen science projects, and outreach meetings. For the most part, however, these have not generated substantial public participation in sea level rise planning. (Notable exceptions: where coastal property owners can see a direct threat to their assets.)

4. **Environmental Justice** - A few communities have identified socially vulnerable communities for sea level rise impacts. While there is substantial interest among planners in working with individuals and organizations from vulnerable communities, these groups have mostly not been actively engaged to-date in city/county planning activities.

5. **Funding and Financing** - Grant funding, mostly from state agencies in competitive processes, is fueling the bulk of the planning efforts across the state. A few local governments have added their own resources to support sea level rise planning, but most are relying on stretching the work loads of existing staffing.

6. **Governance and Collaboration** - Collaborative activities, at the regional or county-level, have provided assistance to some cities and counties through pooling resources, sharing best practices, and mutual self-help. The multitude of permitting authorities is slowing
progress on planning and project implementation. Elected official champions for sea level rise planning have made a significant difference where they are active.

7. **Data and Science** – Cities and counties are using a number of different models, approaches and projections in local vulnerability assessments. Additionally, local stakeholders are finding it challenging to keep up with ever-changing scientific information. Currently, no region is collecting or tracking data to help identify critical triggers or threshold points.

Throughout the interview and survey process, sea level rise stakeholders from local governments and regional agencies expressed a strong desire to significantly expand and strengthen sea level rise planning and implementation in their areas. In our discussions, these stakeholders identified five top barriers that are holding back California’s progress and outlined solutions to move us forward.

1. **There are too many different and sometimes conflicting sea level rise/flooding directives from state and federal agencies.** A “cross-walk” is needed to fully align and coordinate separate legal processes for hazard mitigation plans, general plans, local coastal programs, and climate action plans. Alternatively, some stakeholders have suggested creating a single requirement for one unified plan. As part of this effort, the state should integrate and coordinate permitting processes from multiple agencies.

2. **The level of resources available for local and regional planning continues to lag far behind the need for action on sea level rise.** Identify the best roles for state, region and local entities, creating a streamlined, integrated statewide program that will maximize output from existing resources. Create a dedicated, major statewide funding program commensurate with the seriousness of the problem and the urgency of the situation. Develop new 21st century financing strategies, recognizing that public financing alone will not be sufficient. Provide new, low-cost planning assistance for cities from academic institutions, non-profits, etc. Fund more demo and pilot projects to create better understanding of the actual costs for different adaptation strategies.

3. **A number of local governments have not prioritized sea level rise planning and few have “mainstreamed” this planning function, primarily because it is still not seen as a required action.** Strengthen and clarify existing regulations or create new ones. Build public support for greater action at the local level. Provide substantial state resources to go with state mandates. Align and coordinate participation by utilities and other large actors that are currently not engaged in local planning.

4. **Changing science and guidance is a serious challenge for building understanding and strong support among elected officials and the general public and for creating legally defensible policies.** Bring together scientists, policy makers, legal experts, and local government staff to create a strong, state-region-local agreement on sea level rise science and action. Develop and implement a statewide educational program to increase scientific literacy on sea level rise among key public, private and non-profit
leaders. Create clear monitoring programs to collect consistent data, develop key indicators, and track triggers and thresholds for changing coastal and bayside conditions.

5. **Socially vulnerable communities and populations and tribal groups are often not engaged on sea level rise issues and are not “at the table” for planning and decision-making.** Provide resources to community-based organizations and local governments to facilitate engagement and participation. Share best practices and worst practices to produce better results.
San Diego Regional Sea Level Rise Snapshot
Developed for the Ocean Protection Council by Climate Readiness Institute
May 2018

Section 1: Background Information

Region Name: San Diego

Counties: 1
San Diego

Cities or Towns: 21

Tribal Areas: 17 (Federally recognized)

Population of Region: 3.1 million

Section 2: Planning

A. Comprehensive City or County Vulnerability Assessments

Completed: 3
- Carlsbad Sea Level Rise Vulnerability Assessment
- Del Mar Risk Assessment and Vulnerability Study
- Imperial Beach Sea Level Rise Assessment

In-Progress: 2
- City of San Diego
- Oceanside

B. Local Coastal Programs Updated for Sea Level Rise
(Source for below: Coastal Commission 12/31/2016)

Completed: 1
Chula Vista – in part

In-Progress: 6
- Carlsbad
- Del Mar
- Imperial Beach
- Oceanside
- San Diego County
- Solana Beach
C. General Plan Safety Elements Updated for Sea Level Rise

Completed: 0

In-Progress: 2
- Imperial Beach
- Oceanside

D. Hazard Mitigation Plans Updated to Include Sea Level Rise

Completed: 1
San Diego County HMP 2015 (covers all cities)

In-Progress: 1
Imperial Beach

E. Region-wide Plans for Sea Level Rise:

- Sea Level Rise Strategy for San Diego Bay (covers 5 cities)
- San Diego Resilient Coastlines Project (in progress with major NOAA grant)
- Southern California Wetlands Recovery Project (regional collaboration)

F. Other Substantial Plans or Reports Relevant to Sea Level Rise (not covered in A-E)

- Batiquitos Lagoon Resiliency Plan
- Chula Vista Climate Adaptation Strategies
- Climate Science Alliance Regional Research Needs
- Encinitas-Solana Beach Coastal Storm Damage Reduction Project
- Integrated Natural Resource Management Plan for San Diego Bay
- Legal Risk Analysis for Sea Level Rise Adaptation Strategies in San Diego
- Port of San Diego Climate Action Plan
- San Diego Airport Strategic Master Drainage Plan
- San Diego Airport Water Stewardship Plan
- San Diego 2050 is Calling, How Will We Answer
- San Diego Climate Education Partners
- San Diego Focus 2050 Impacts (2008)
- SANDAG Regional Sediment Master Plan
- Tijuana Estuary Tidal Restoration Program
- Water Stewardship Plan - San Diego International Airport - Protecting Our Water Resources
G. Cities and Counties that Require Sea Level Rise to be Addressed in New Developments or Capital Improvements

- Imperial Beach
- Cities with LCPs that have been updated for sea level rise — See Section 2B

Section 3: Physical projects

A. On-The-Ground, Community-Scale Physical Adaptation Projects

- Batiquitos Lagoon Resiliency Project
- Caltrans North Coast Corridor project
- Cardiff Beach Living Shoreline Project
- Chula Vista Bay Front Wetland Buffer
- Southern California Wetlands Recovery Project
- Coastal Storm Damage Reduction Project (CSDRP) – Encinitas/Solana Beach
- D Street Fill Restoration Project
- Dune restoration projects (various locations)
- Oceanside — multiple beach replenishment projects
- Rewild Mission Bay
- Tijuana Estuary Tidal Restoration Program
- San Elijo Lagoon Restoration Project
- San Diego Bay Native Oyster Living Shoreline
- Loma Alta Slough Wetlands Restoration
- Los Penasquitos Lagoon Enhancement Plan

B. Cities, Counties, State Agencies, Federal Agencies or Special Districts That Have Implemented Substantial Efforts/Activities to Address Sea Level Rise in The Operations and Maintenance of Their Facilities, Land, And Water

NOTE: Difficult to accurately determine through this survey/interview process. Stakeholders reported that operations and maintenance activities have been enhanced for sea level rise issues by certain actors, e.g. San Diego Airport, Navy, local streets and roads.

Section 4: Public Awareness: Outreach and Education for SLR

A. Activities employed to engage the public on sea level rise

<table>
<thead>
<tr>
<th>Activity</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Meetings/Town Hall Meetings/Workshops</td>
<td>YES</td>
</tr>
<tr>
<td>Public hearings (before an elected board or council)</td>
<td>YES</td>
</tr>
<tr>
<td>Activity</td>
<td>Answer</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>Participatory events, e.g. festivals, tours of vulnerable/impacted sites,</td>
<td>YES</td>
</tr>
<tr>
<td>Webinars</td>
<td>YES</td>
</tr>
<tr>
<td>Social media (which platforms?)</td>
<td>YES</td>
</tr>
<tr>
<td>TV, radio and newspaper stories</td>
<td>YES</td>
</tr>
<tr>
<td>Other print materials</td>
<td>YES</td>
</tr>
<tr>
<td>Online information sites</td>
<td>YES</td>
</tr>
<tr>
<td>Surveys or polling</td>
<td>YES</td>
</tr>
<tr>
<td>Citizen science activities (monitoring, data collection, etc.)</td>
<td>YES</td>
</tr>
<tr>
<td>Restoration activities (plant collection, propagation, planting, etc.)</td>
<td>YES</td>
</tr>
</tbody>
</table>

**Examples:** Art shows, library exhibits, historic photo displays, engagement with local scientists

**B. Public Opinion Polling Used in The Region to Gauge Public Knowledge and Belief on Sea Level Rise and Related Climate Impacts**

Carlsbad uses mail and on-line polling of residents on projects

**Section 5: Environmental Justice and Equity**

**A. Communities Have Been Identified That Will Be More Socially-Vulnerable to Sea Level Rise and Extreme Storms**

- Some initial background work has been done on this topic
- CDPH’s county-level “Climate Change and Health Profile” reports provide some basic information on climate change and vulnerable populations

**NOTE:** This analysis should include military families, students and other low-income groups perhaps not typically thought of as socially vulnerable.
B. Vulnerability Assessments and Other Plans Listed in Section 2 That Specifically Address Socially-Vulnerable Residents

- City of San Diego
- Imperial Beach

C. Vulnerability Assessments That Have Identified Problematic Land Uses Like Landfills and Hazardous Waste Sites Near Socially-Vulnerable Communities

None at this time

D. Individuals or Groups Representing Socially-Vulnerable Populations Are “At the Table” for Planning and Decision-Making Around Sea Level Rise and Related Issues

Yes, in the Resilient Coastlines Project

NOTE: To-date, residents who do not live right on the coast generally do not consider sea level rise an issue they should prioritize. Residents who live on the coast are easier to engage because they see the direct threat. Coast residents are generally higher income.

E. Individuals from Socially-Vulnerable Communities Have Been Directly Involved in Citizen Science Research Activities

Not at this time (more attention on heat and drought than sea level rise)

Section 6: Funding for Regional/Local Sea Level Rise Activities

A. Substantial Grants and Other Funding That Have Been Secured from Outside Sources to Support Planning for Sea Level Rise

- Carlsbad – Coastal Commission Round 2 - $48,000
- Carlsbad – Ocean Protection Council Round 2 - $180,000
- City of San Diego - Coastal Commission/Conservancy Round 4 - $100,000
- City of San Diego - SB 1 Grant – Adaptation Strategies to Safeguard Transportation System - $439,000
- Del Mar - Coastal Commission Round 3 - $211,000
- Del Mar – Ocean Protection Council Round 2 - $100,000
- Encinitas/Cardiff Dunes Project – SCC, $1.2M & Ocean Protection Council, $2.0M
- Imperial Beach – Coastal Conservancy Climate Ready Round 1 - $300,000
- Imperial Beach — Coastal Commission Round 3 - $225,000
- Los Penasquitos Lagoon Foundation – Coastal Conservancy, $180,000
- Oceanside- Coastal Commission Round 3 - $200,000
- Oceanside/Loma Alta Slough – Coastal Conservancy, $400,000
• San Diego Association of Governments - SB 1 Grant – Regional Sea Level Rise Adaptation Guidance for Transportation Infrastructure - $180,000
• San Diego Audubon Society/ReWild Mission Bay- Coastal Conservancy, $485,000
• San Diego Climate Education Partners — National Science Foundation – N/A
• San Diego County – Coastal Commission Round 2 - $52,000
• San Diego Foundation - $70,000
• San Diego Resilient Coastlines Project — NOAA Regional Coastal Resilience Grant - $689,000; California State Coastal Conservancy $25,000
• Solana Beach – Coastal Commission Round 1 - $120,000

B. Local or Regional Government Entities That Have Added Staff to Specifically Address Sea Level Rise Planning and Implementation

Carlsbad

C. Local or Regional Entities That Have Formally Analyzed or Developed New Funding Sources (Bonds, Taxes, Etc.) For Sea Level Rise Planning or Implementation

• Imperial Beach SLR study identified Coastal Hazards Assessment District (CHAD) as a possible funding mechanism.
• SANDAG Measure A beach nourishment (failed)
• SANDAG TransNet ½ cent countywide sales tax for transportation

D. Local or Regional Entities That Have Developed Cost Estimates for Different Strategies to Address Sea Level Rise

• Del Mar Cost Benefit Analysis (216 pages)
• Imperial Beach SLR study - cost benefit analysis of five adaptation strategies.

Section 7: Governance

A. Collaborative Structure(s) in The Region That Bring Together a Range of Stakeholders for Sea Level Planning, Discussion, Information Sharing, Problem Solving, And Other Purposes

• San Diego Regional Climate Collaborative
• Climate Science Alliance – South Coast
• SANDAG Shoreline Preservation Working Group
• Southern California Wetlands Recovery Project

B. MOUs or Other Formal Partnership Agreements for Collaborative Sea Level Rise Planning Among Local Governments

• Batiquitos Lagoon
• Cardiff Dunes State Park & Encinitas
• Coronado Beach — Scripps & Navy
• Natural Resource Management Plan for San Diego Bay
• San Diego Bay

C. Structures in Place for Facilitating and Expediting Permitting Processes Among Multiple Federal, State, Regional and Local Agencies for Sea Level Rise-Related Projects?
   Carlsbad paid for 2 years of Coastal Commission staffing to address this issue. SANDAG/TransNet paid for permitting support from the Coastal Commission.

D. Identified Champions for Sea Level Rise Planning Among the Region’s Elected Officials
   Yes

Section 8: Science

A. Modeling and Mapping Tools Being Used in The Region in Vulnerability Assessments and Other Planning Efforts

<table>
<thead>
<tr>
<th>Tool</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCOF/ COSMOS</td>
<td>YES</td>
</tr>
<tr>
<td>TNC Coastal Resilience</td>
<td>NO</td>
</tr>
<tr>
<td>Pacific Institute</td>
<td>NO</td>
</tr>
<tr>
<td>NOAA Sea Level Rise Viewer</td>
<td>NO</td>
</tr>
<tr>
<td>Climate Smart Cities Los Angeles</td>
<td>NO</td>
</tr>
<tr>
<td>Surging Seas by Climate Central</td>
<td>NO</td>
</tr>
<tr>
<td>Cal-Adapt/Radke et al</td>
<td>NO</td>
</tr>
<tr>
<td>Other: Scripps localized modeling, SPAWAR (2014), consultants</td>
<td>YES</td>
</tr>
</tbody>
</table>

B. Vulnerability Assessments in The Region Analyze the Following:

<table>
<thead>
<tr>
<th>Issue</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bluff erosion</td>
<td>YES</td>
</tr>
<tr>
<td>Hydrodynamics – in the CoSMoS Model</td>
<td>YES</td>
</tr>
<tr>
<td>Riverine flooding</td>
<td>YES</td>
</tr>
<tr>
<td>Stormwater</td>
<td>YES</td>
</tr>
<tr>
<td>Ground water issues</td>
<td>yes</td>
</tr>
<tr>
<td>Changes in liquefaction risk (seismic)</td>
<td>NO</td>
</tr>
<tr>
<td>Dune erosion and/or beach loss</td>
<td>YES</td>
</tr>
<tr>
<td>Levees</td>
<td>NO</td>
</tr>
</tbody>
</table>

Not at this time
Los Angeles-Orange Regional Sea Level Rise Snapshot

“Santa Monica Beach Crowd” by Mats Haugen via Flickr
Section 1: Background Information

Region Name: Los Angeles—Orange

Counties: 2
Los Angeles, Orange

Cities or Towns: 122

Tribal Areas: 0 (Federally recognized)

Population: 13.4 million

Section 2: Planning

A. Comprehensive City or County Vulnerability Assessments

Completed: 4
- City of Los Angeles One Water LA – Climate Risk and Resilience Assessment for Infrastructure
- City of Los Angeles Sea Level Rise Vulnerability Study
- Hermosa Beach Vulnerability and Adaptation to Sea Level Rise Report
- Long Beach Climate Resiliency Assessment (conducted by the Aquarium of the Pacific)

In-Progress: 4
- Long Beach Vulnerability Assessment
- Manhattan Beach – starting in 2018
- Santa Monica (under LCP project)
- Venice – coastal zone

B. Local Coastal Programs Updated for Sea Level Rise (completed)
(Source for below: Coastal Commission 12/31/2016)

Completed: 5
- Laguna Beach – in part
- Los Angeles County – 2 segments in part
- Malibu – in part
• Newport Beach – in part
• Redondo Beach – in part

In-Progress: 7
• City of Los Angeles – 1 segment in progress
• Dana Point – in progress
• Hermosa Beach – in progress
• Huntington Beach – one segment in progress
• San Clemente – in progress
• Santa Monica – in progress
• Seal Beach – in progress

C. General Plan Safety Elements Updated for Sea Level Rise

Completed: 0

In-Progress: 3
• City of Los Angeles
• Hermosa Beach
• Long Beach

D. Hazard Mitigation Plans Updated to Include Sea Level Rise

Completed: 3+
• City of Los Angeles (currently in review by Cal OES and FEMA)
• Huntington Beach
• Newport Beach

NOTE: A number local hazard mitigation plans in Los Angeles County mention sea level rise

In-Progress: 2
• Long Beach
• Santa Monica

E. Region-wide Plan for Sea Level Rise

• Regional AdaptLA (USC Sea Grant)
• A Greater LA Climate Action Framework (LARC)

F. Other Substantial Plans or Reports Relevant to Sea Level Rise (not included in A-E)

• City of Los Angeles Resilience Plan (scheduled release in 2018)
• Climate Change Implications for the Ballona Wetlands Restoration
• Climate Change Vulnerability Assessment of the SMBNEP Bay Restoration Plan
• Combatting Sea Level Rise in Southern California – How Local Governments Can Seize Opportunities While Minimizing Risk
• Economic evaluation of adaptation pathways and their robustness to sea level rise in Los Angeles county (Ruig et al. in progress)
• Lands Commission SLR Vulnerability Assessments (SB 679 by lessees on state property)
• Los Angeles County Coastal Regional Sediment Management Plan
• Los Angeles County Public Beach Sea Level Rise Vulnerability Assessment
• Los Angeles Region Framework for Climate Change Adaptation and Mitigation — Los Angeles Regional Water Quality Control Board
• Orange County Coastal Regional Sediment Management Plan
• Port of Long Beach Climate Adaptation and Coastal Resiliency Plan
• Preparing for Climate Change Impacts in Los Angeles
• Sea Level Rise and Adaptation Pathways for Los Angeles (Aerts et al. in progress)
• Sediment Management Working Group (Corps of Engineers)
• Urban Coast: State of the Bay (SMBNEP 2015)

G. Cities and Counties that Require Sea Level Rise to be Addressed in New Developments or Capital Improvements

Cities with LCPs that have been updated for sea level rise — See Section 2B

Section 3: Physical projects

A. On-The-Ground, Community-Scale Physical Adaptation Projects

• Ballona wetlands restoration
• Bolsa Chica Wetland Restoration
• Dune Restoration at Zuma and Point Dune County Beaches in Malibu (Bay Foundation)
• Malibu Lagoon restorations
• Santa Monica Beach Restoration Pilot Project (Bay Foundation)
• Seal Beach National Wildlife Refuge Thin Layer Sediment Augmentation Project
• Southern California Wetlands Recovery Project (multiple locations)
• Upper Newport Bay Living Shorelines Project

B. Cities, Counties, State Agencies, Federal Agencies or Special Districts That Have Implemented Substantial Efforts/Activities to Address Sea Level Rise in The Operations and Maintenance of Their Facilities, Land, And Water

NOTE: Difficult to accurately determine through this survey/interview process. Stakeholders reported that operations and maintenance activities have been enhanced for sea level rise issues by certain actors, e.g. beach, pier and harbor operations.
Section 4: Public Awareness: Outreach and Education for SLR

A. Activities employed to engage the public on sea level rise

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<td>Public hearings (before an elected board or council)</td>
<td>YES</td>
</tr>
<tr>
<td>Participatory events, e.g. festivals, tours of vulnerable/impacted sites,</td>
<td>YES</td>
</tr>
<tr>
<td>Webinars</td>
<td>YES</td>
</tr>
<tr>
<td>Social media (which platforms?)</td>
<td>YES</td>
</tr>
<tr>
<td>TV, radio and newspaper stories</td>
<td>YES</td>
</tr>
<tr>
<td>Other print materials</td>
<td>YES</td>
</tr>
<tr>
<td>Online information sites</td>
<td>YES</td>
</tr>
<tr>
<td>Surveys or polling</td>
<td>YES</td>
</tr>
<tr>
<td>Citizen science activities (monitoring, data collection, etc.)</td>
<td>YES</td>
</tr>
<tr>
<td>Restoration activities (plant collection, propagation, planting, etc.)</td>
<td>YES</td>
</tr>
<tr>
<td><strong>Examples:</strong> King Tides, town halls, project kickoffs, Owl viewers, working with local radio like KPCC</td>
<td></td>
</tr>
</tbody>
</table>

B. Public Opinion Polling Used in The Region to Gauge Public Knowledge and Belief on Sea Level Rise and Related Climate Impacts

The FloodRISE project conducted household level surveys in Newport Beach.
Section 5: Environmental Justice and Equity

A. Communities Have Been Identified That Will Be More Socially-Vulnerable to Sea Level Rise and Extreme Storms

- Yes, some assessments but little actual planning to-date. Getting more attention now with SB 1000.
- CDPH county-level “Climate Change and Health Profile” reports provide some basic information on climate change and vulnerable populations

B. Vulnerability Assessments and Other Plans Listed in Section 2 That Specifically Address Socially-Vulnerable Residents

- City of Los Angeles Sea Level Rise Vulnerability Study
- Hermosa Beach SLR Vulnerability Study

C. Vulnerability Assessments That Have Identified Problematic Land Uses Like Landfills and Hazardous Waste Sites Near Socially-Vulnerable Communities

Not at this time

D. Individuals or Groups Representing Socially-Vulnerable Populations Are “At the Table” for Planning and Decision-Making Around Sea Level Rise and Related Issues

Not at this time. Some initial work is beginning statewide with the Coastal Commission and tribal groups.

E. Individuals from Socially-Vulnerable Communities Have Been Directly Involved in Citizen Science Research Activities?

Yes - USC Sea Grant community science and education initiatives (e.g. Urban Tides)

Section 6: Funding for Regional/Local Sea Level Rise Activities

A. Substantial Grants and Other Funding That Have Been Secured from Outside Sources to Support Planning for Sea Level Rise

- Avalon- Coastal Commission Round 4 - $75,000
- Bay Foundation – Coastal Conservancy Climate Ready Round 3 - $69,000
- City of Los Angeles - Rockefeller 100 Resilient Cities — N/A
- City of Los Angeles – Coastal Commission Round 1 - $100,000
- City of Los Angeles – Coastal Commission Round 2 - $250,000
- CoSMoS and Regional AdaptLA outreach - Coastal Conservancy — $65,000
• Dana Point - Coastal Commission Round 3 - $135,000
• Hermosa Beach – Coastal Commission Round 1 - $100,000
• Hermosa Beach - Coastal Commission Round 3 - $135,000
• Hermosa Beach - Coastal Conservancy Climate Ready Round 1 – $100,000
• LA County Beaches and Harbors - Coastal Conservancy Climate Ready Round 1 – $69,000
• LARC Framework and LA Metro – Strategic Growth Council - $1 million
• Newport Beach – Coastal Commission Round 2 - $67,000
• NOAA’s Ecological Effects of Sea Level Rise - $1.15 million
• Orange County Coastkeeper – Coastal Conservancy Climate Ready Round 3 - $250,000
• Regional AdaptLA (Santa Monica) Ocean Protection Council Round 1 - $235,000
• San Clemente – Coastal Commission Round 1 - $90,000
• San Clemente - Coastal Commission Round 3 - $135,000
• Santa Monica – Coastal Commission Round 2 - $225,000
• Santa Monica - Coastal Commission Round 3 - $100,000
• Seal Beach - Coastal Commission Round 3 - $200,000
• Seal Beach Coastal Sediment Augmentation – CA DFW - $1 million
• Southern California Association of Governments – SB 1 Transportation Grant Regional Climate Adaptation - $942,000
• Zuma and Pt Dume Projects - Coastal Conservancy Climate Ready - $250,000

B. Local or Regional Government Entities That Have Added Staff to Specifically Address Sea Level Rise Planning and Implementation

• Rockefeller 100 Resilient Cities grant for LA resiliency officer (all topics including SLR)
• City of Los Angeles added staff (a few transfers and 2-3 new hires)
• Santa Monica 16-person sustainability team – Office of Sustainability includes SLR

NOTE: In many local governments, SLR work is just added to existing jobs

C. Local or Regional Entities That Have Formally Analyzed or Developed New Funding Sources (Bonds, Taxes, Etc.) For Sea Level Rise Planning or Implementation

Not at this time

D. Local or Regional Entities That Have Developed Cost Estimates for Different Strategies to Address Sea Level Rise

Economic evaluation of adaptation pathways and their robustness to sea level rise in Los Angeles county (Ruig et al. in progress)
Section 7: Governance

A. Collaborative Structure(s) in The Region That Bring Together a Range of Stakeholders for Sea Level Planning, Discussion, Information Sharing, Problem Solving, And Other Purposes

- Regional ADAPT LA (USC Sea Grant)
- Los Angeles Regional Collaborative (LARC)
- OC Climate Exchange (UC Irvine hosts and moderates the listserv)

B. MOUs or Other Formal Partnership Agreements for Collaborative Sea Level Rise Planning Among Local Governments

Not at this time

C. Structures in Place for Facilitating and Expediting Permitting Processes Among Multiple Federal, State, Regional and Local Agencies for Sea Level Rise-Related Projects

Not at this time

D. Identified Champions for Sea Level Rise Planning Among the Region’s Elected Officials

Yes.

Section 8: Science

A. Modeling and Mapping Tools Being Used in The Region in Vulnerability Assessments and Other Planning Efforts

<table>
<thead>
<tr>
<th>Tool</th>
<th>Answer</th>
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<tbody>
<tr>
<td>OCOF/ COSMOS</td>
<td>Yes</td>
</tr>
<tr>
<td>TNC Coastal Resilience</td>
<td>Yes</td>
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<tr>
<td>Pacific Institute</td>
<td>Yes</td>
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<tr>
<td>NOAA Sea Level Rise Viewer</td>
<td>Yes</td>
</tr>
<tr>
<td>Climate Smart Cities Los Angeles</td>
<td>Yes</td>
</tr>
<tr>
<td>Surging Seas by Climate Central</td>
<td>No</td>
</tr>
<tr>
<td>Cal-Adapt/Radke et al</td>
<td>No</td>
</tr>
<tr>
<td>FloodRISE</td>
<td>Yes</td>
</tr>
<tr>
<td>Other:</td>
<td></td>
</tr>
</tbody>
</table>
B. Vulnerability Assessments in The Region Analyze the Following:

<table>
<thead>
<tr>
<th>Issue</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bluff erosion</td>
<td>Yes</td>
</tr>
<tr>
<td>Hydrodynamics – through CoSMoS model</td>
<td>Yes</td>
</tr>
<tr>
<td>Riverine flooding</td>
<td>Yes</td>
</tr>
<tr>
<td>Stormwater</td>
<td>Yes</td>
</tr>
<tr>
<td>Ground water issues</td>
<td>Yes</td>
</tr>
<tr>
<td>Changes in liquefaction risk (seismic)</td>
<td>No</td>
</tr>
<tr>
<td>Dune erosion and/or beach loss</td>
<td>Yes</td>
</tr>
<tr>
<td>Levees</td>
<td>No</td>
</tr>
</tbody>
</table>


Not at this time
Central Coast
Regional Sea Level Rise Snapshot

“Big Sur Coastline” by NOAA Photo Library via Flickr
Central Coast Regional Sea Level Rise Snapshot
Developed for the Ocean Protection Council by Climate Readiness Institute
May 2018

Section 1: Background Information

Region Name: Central Coast

Counties: 5
Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, Ventura

Cities or Towns: 41

Tribal Areas: 1 (Federally recognized)

Population: 2.25 million

Section 2: Planning

A. Comprehensive City or County Vulnerability Assessments

Completed: 11
• City of Capitola Coastal Climate Change Vulnerability Assessment
• City of Monterey Sea Level Rise & Vulnerability Analyzes – Existing Conditions/Issues
• City of Santa Barbara Sea Level Rise Vulnerability Study
• City of Santa Cruz Climate Change Vulnerability Assessment
• Goleta Coastal Hazards Vulnerability and Fiscal Impact Report
• Moss Landing Coastal Climate Change Vulnerability Assessment
• Oxnard - A Sea Level Rise Atlas for the City of Oxnard
• Pacific Grove Climate Change Vulnerability Assessment
• San Luis Obispo County – Integrated Climate Change Adaptation Planning in San Luis Obispo County
• Santa Barbara County – Sea Level Rise and Coastal Hazards Vulnerability Assessment
• Santa Cruz County Coastal Climate Change Vulnerability Report

In-Progress: 3
• Carpinteria
• Morro Bay
• Ventura County
B. Local Coastal Programs Updated for Sea Level Rise
(Source for below: Coastal Commission 12/31/2016)

Completed: 6
• Carmel (in part)
• City of Ventura (in part)
• Grover Beach (in part)
• Monterey County - Del Monte Forest segment (in part)
• San Luis Obispo County (in part)
• Seaside – (in part)

In-Progress: 12
• Carpinteria
• City of Monterey (5 segments)
• City of Santa Barbara
• City of Santa Cruz
• Goleta
• Monterey County (2 segments)
• Morro Bay
• Oxnard
• Pacific Grove
• Santa Barbara County
• Santa Cruz County
• Ventura County

C. General Plan Safety Elements Updated for Sea Level Rise

Completed: 0

In-Progress: 1
San Luis Obispo County (Safety Element update)

D. Hazard Mitigation Plans Updated to Include Sea Level Rise

Completed: 3
• Monterey County - Multi-Jurisdictional Hazard Mitigation Plan
• Santa Barbara County 2016 Multi-Jurisdictional Hazard Mitigation Plan
• Santa Cruz County – Local Hazard Mitigation Plan 2015 -2020

In-Progress: 1
City of Santa Cruz Local Hazard Mitigation Plan Five Year Update
E. Region-wide Plan for Sea Level Rise

There is no multi-county plan covering the region at this time

F. Other Substantial Plans or Reports Relevant to Sea Level Rise (not included in A-E)

Monterey

- Economic Impacts of Climate Adaptation Strategies for Southern Monterey Bay
- Evaluation of Erosion Mitigation Alternatives for Southern Monterey Bay
- Monterey Bay Sea Level Rise & Vulnerability Assessment - Technical Methods
- The Nature Conservancy Coastal Resilience Project – Monterey Bay

San Luis Obispo

- County of San Luis Obispo Energy Wise Plan - Chapter 7 - Adaptation
- Developing Adaptation Strategies for San Luis Obispo County: Preliminary Climate Change Vulnerability Assessment for Social Systems
- Morro Bay National Estuary Program Climate Vulnerability Assessment Report
- Projected Future Climatic and Ecological Conditions in San Luis Obispo County

Santa Barbara

- City of Santa Barbara Climate Action Plan
- 2015 Goleta Slough Sea Level Rise & Management Plan
- Santa Barbara Area Coastal Ecosystem Vulnerability Assessment (SBCEVA)
- Santa Barbara County Coastal Resilience Project
- The Nature Conservancy Coastal Resilience Project – Santa Barbara County

Santa Cruz

- City of Santa Cruz Climate Adaptation Plan
- Coastal Climate Change Vulnerability Assessment – Central Coastal Wetlands Gp.
- Santa Cruz County Climate Action Strategy

Ventura

- Coastal Resilience Ventura, Technical Report for Coastal Hazards Mapping, ESAPWA 2013 (found in Ventura CC snapshot)
- Coastal Resilience Ventura - Catalogue and Analysis of Local Sea Level Rise Planning Tools
- Economic Analysis of Nature-based Adaptation to Climate Change in Ventura County
- The Nature Conservancy Coastal Resilience Project – Ventura County

G. Cities and Counties that Require Sea Level Rise to be Addressed in New Developments or Capital Improvements

Cities with LCPs that have been updated for sea level rise — See Section 2B
Section 3: Physical projects

A. On-The-Ground, Community-Scale Physical Adaptation Projects

- Beach nourishment projects (various locations)
- Carpinteria Living Shorelines Project
- Devereux Slough Wetland Restoration
- Elkhorn Slough Tidal Marsh Restoration project – $5 million/60 acres
- Goleta Slough Wetland Restoration and Tidal Restoration
- Groundswell Coastal Ecology coastal restoration projects — Seabright Beach & Natural Bridges
- Moss Landing Wetlands Restoration
- Salinas River State Park Dune Restoration
- San Lorenzo River channel flood improvement projects
- Santa Barbara County Debris Basin Removal and Fish Passage Project
- Santa Cruz County flood-related projects
- Surfer’s Point (Ventura)

B. Cities, Counties, State Agencies, Federal Agencies or Special Districts That Have Implemented Substantial Efforts/Activities to Address Sea Level Rise in The Operations and Maintenance of Their Facilities, Land, And Water

NOTE: Difficult to accurately determine through this survey/interview process. Stakeholders reported that operations and maintenance activities have been enhanced for sea level rise issues by certain actors, e.g. streets and roads, beach nourishment, etc.

Section 4: Public Awareness: Outreach and Education for SLR

A. Activities employed to engage the public on sea level rise

<table>
<thead>
<tr>
<th>Activity</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Meetings/Town Hall Meetings/Workshops</td>
<td>YES</td>
</tr>
<tr>
<td>Public hearings (before an elected board or council)</td>
<td>YES</td>
</tr>
<tr>
<td>Participatory events, e.g. festivals, tours of vulnerable/impacted sites,</td>
<td>YES</td>
</tr>
<tr>
<td>Webinars</td>
<td>YES</td>
</tr>
<tr>
<td>Social media (which platforms?)</td>
<td>YES</td>
</tr>
<tr>
<td>Activity</td>
<td>Answer</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>TV, radio and newspaper stories</td>
<td>YES</td>
</tr>
<tr>
<td>Other print materials</td>
<td>YES</td>
</tr>
<tr>
<td>Online information sites</td>
<td>YES</td>
</tr>
<tr>
<td>Surveys or polling</td>
<td>YES</td>
</tr>
<tr>
<td>Citizen science activities (monitoring, data collection, etc.)</td>
<td>YES</td>
</tr>
<tr>
<td>Restoration activities (plant collection, propagation, planting, etc.)</td>
<td>YES</td>
</tr>
<tr>
<td>Examples:</td>
<td></td>
</tr>
<tr>
<td>20-event outreach campaign; Shoreline visuals in Santa Barbara; Guided awareness walks; BEACON infrastructure financing workshop; Caltrans virtual reality for West Cliff management plan</td>
<td></td>
</tr>
</tbody>
</table>

B. **Public Opinion Polling Used in The Region to Gauge Public Knowledge and Belief on Sea Level Rise and Related Climate Impacts**

On-line polling in Santa Cruz before LHMP and Adaptation Plan Updates – 700 respondents

**Section 5: Environmental Justice and Equity**

A. **Communities Have Been Identified That Will Be More Socially-Vulnerable to Sea Level Rise and Extreme Storms**

- Developing Adaptation Strategies for San Luis Obispo County: Preliminary Climate Change Vulnerability Assessment for Social Systems
- CDPH county-level “Climate Change and Health Profile” reports provide some basic information on climate change and vulnerable populations
- Santa Cruz Social Vulnerability to Climate Change Analysis

B. **Vulnerability Assessments and Other Plans Listed in Section 2 That Specifically Address Socially-Vulnerable Residents**

- City of Santa Cruz Climate Adaptation Plan Update (2017 – 2022)
C. Vulnerability Assessments That Have Identified Problematic Land Uses Like Landfills and Hazardous Waste Sites Near Socially-Vulnerable Communities

City of Santa Cruz Climate Adaptation Plan Update (2017 – 2022)

D. Individuals or Groups Representing Socially-Vulnerable Populations Are “At the Table” for Planning and Decision-Making Around Sea Level Rise and Related Issues

Not at this time

E. Individuals from Socially-Vulnerable Communities Have Been Directly Involved in Citizen Science Research Activities?

Not at this time

Section 6: Funding for Regional/Local Sea Level Rise Activities

A. Substantial Grants and Other Funding That Have Been Secured from Outside Sources to Support Planning for Sea Level Rise

- Association of Monterey Bay Area Governments – SB 1 Transportation Grant – $360,000
- Carpinteria – Coastal Commission Round 3 – $150,000
- Carpinteria SLR Transportation Policy & Infrastructure – SB 1 Planning Grant – $221,000
- Central Coast Climate Collaborative – EPA / FEMA technical assistance grants
- Central Coast Wetlands Group – Coastal Conservancy multiple funds – $330,405
- City of Monterey - Ocean Protection Council Round 2 – $200,000
- City of Monterey – Coastal Commission Round 2 - $35,000
- City of Santa Barbara – Coastal Commission Rounds 1 & 2 – $409,000 (2 grants)
- Goleta – Coastal Commission Round 1 – $125,000
- Goleta Slough Vulnerability Assessment – Coastal Conservancy Climate Ready – $50,000
- Marina – Coastal Commission Round 4 – $86,000
- Monterey County – Ocean Protection Council Round 1 - $150,000
- Morro Bay – Coastal Commission Rounds 2 & 3 – $347,000 (2 grants)
- Morro Bay – Ocean Protection Council Round 1 - $250,000
- Oxnard - Ocean Protection Council Round 2 – $110,000
- Oxnard – Coastal Commission Round 2 - $40,000
- Pacific Grove – Coastal Commission Round 1 – $130,000
- Pismo Beach – Coastal Commission Round 4 – $86,000
- Santa Barbara County – Coastal Commission Round 2 - $8,000
- Santa Barbara County – Coastal Conservancy Climate Ready Round 1 – $200,000
- Santa Barbara County – Ocean Protection Council Round 2 – $175,000
- Santa Barbara County Transportation Resiliency Assessment – SB 1 Planning Grant – $100,000
• Santa Ynez Band of Chumash Indians – SB 1 Transportation Planning Grant – $185,000
• Southern California Association of Governments (includes Ventura County) – SB 1 Transportation Planning Grant – $941,700
• The Nature Conservancy Monterey Bay – Coastal Conservancy Climate Ready Round 1 – $150,000
• Ventura County – Coastal Commission Round 3 – $225,000

B. Local or Regional Government Entities That Have Added Staff to Specifically Address Sea Level Rise Planning and Implementation

Not at this time

C. Local or Regional Entities That Have Formally Analyzed or Developed New Funding Sources (Bonds, Taxes, Etc.) For Sea Level Rise Planning or Implementation

Not at this time

D. Local or Regional Entities That Have Developed Cost Estimates for Different Strategies to Address Sea Level Rise

• Economic Impacts of Climate Adaptation Strategies for Southern Monterey Bay
• Ventura County cost estimates

Section 7: Governance

A. Collaborative Structure(s) in The Region That Bring Together a Range of Stakeholders for Sea Level Planning, Discussion, Information Sharing, Problem Solving, And Other Purposes

• BEACON – Beach Erosion Authority for Clean Oceans and Nourishment - 2 counties and multiple cities
• 6-county Central Coast Climate Collaborative (just formed) as part of ARCCA statewide alliance
• Monterey Bay Region Climate Action Compact

B. MOUs or Other Formal Partnership Agreements for Collaborative Sea Level Rise Planning Among Local Governments

BEACON
C. Structures in Place for Facilitating and Expediting Permitting Processes Among Multiple Federal, State, Regional and Local Agencies for Sea Level Rise-Related Projects?

Not at this time

D. Identified Champions for Sea Level Rise Planning Among the Region’s Elected Officials

Yes

Section 8: Science

A. Modeling and Mapping Tools Being Used in The Region in Vulnerability Assessments and Other Planning Efforts

<table>
<thead>
<tr>
<th>Tool</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCOF/ COSMOS</td>
<td>YES</td>
</tr>
<tr>
<td>TNC Coastal Resilience</td>
<td>YES</td>
</tr>
<tr>
<td>Pacific Institute</td>
<td>NO</td>
</tr>
<tr>
<td>NOAA Sea Level Rise Viewer</td>
<td>YES</td>
</tr>
<tr>
<td>Climate Smart Cities Los Angeles</td>
<td>NO</td>
</tr>
<tr>
<td>Surging Seas by Climate Central</td>
<td>NO</td>
</tr>
<tr>
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<td>YES</td>
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<tr>
<td>Other:</td>
<td></td>
</tr>
</tbody>
</table>

B. Vulnerability Assessments in The Region Analyze the Following:

<table>
<thead>
<tr>
<th>Issue</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bluff erosion</td>
<td>YES</td>
</tr>
<tr>
<td>Hydrodynamics</td>
<td>YES</td>
</tr>
<tr>
<td>Riverine flooding</td>
<td>YES</td>
</tr>
<tr>
<td>Stormwater</td>
<td>YES</td>
</tr>
<tr>
<td>Ground water issues</td>
<td>YES</td>
</tr>
<tr>
<td>Changes in liquefaction risk (seismic)</td>
<td>NO</td>
</tr>
<tr>
<td>Dune erosion and/or beach loss</td>
<td>YES</td>
</tr>
<tr>
<td>Levees</td>
<td>NO</td>
</tr>
</tbody>
</table>


Not at this time
SF Bay Area
Regional Sea Level Rise Snapshot

“Hayward Shoreline - San Francisco Bay” by Ingrid Taylar via Flickr
SF Bay Area Regional Sea Level Rise Snapshot
Developed for the Ocean Protection Council by Climate Readiness Institute
May 2018

Section 1: Background Information

Region Name: SF Bay Area

Counties: 9
Marin, Sonoma, Napa, Solano, Contra Costa, Alameda, Santa Clara, San Mateo, San Francisco

NOTE: All 9 have bay shorelines. Four also have outer coast shorelines—Sonoma, Marin, San Francisco and San Mateo.

Cities or Towns: 101

Tribal Areas: 6 (Federally recognized)

Population: 7.1 million

Section 2: Planning

A. Comprehensive City or County Sea Level Rise Vulnerability Assessments

Completed: 7
• Alameda County
• Benicia
• Contra Costa County (to Pittsburg boundary)
• Hayward
• Marin County
• Richmond
• San Mateo County

In-Progress: 3
• Mountain View
• San Francisco Sea Level Rise Action Plan
• San Rafael

B. Local Coastal Programs Updated for Sea Level Rise
(Source: Coastal Commission 2016 snapshots)

Completed: 0
In-Progress: 5
- City and County of San Francisco
- Half Moon Bay
- Marin County
- Pacifica
- Sonoma County

C. General Plan Safety Elements Updated for Sea Level Rise

Completed: 3
- East Palo Alto
- Menlo Park
- Redwood City

In-Progress: 9
- Burlingame
- Contra Costa County
- Half Moon Bay
- Larkspur
- Millbrae
- Novato
- Pacifica
- San Rafael
- Sausalito

D. Hazard Mitigation Plans Updated to Include Sea Level Rise

Completed: 10
- Berkeley
- Foster City
- Mill Valley
- Ross
- San Anselmo
- San Francisco
- City of San Mateo
- San Mateo County (all cities except Foster City and San Mateo)
- San Rafael
- Sonoma County

In-Progress: 2
- Marin County
- Contra Costa County
E. Region-wide Plan for Sea Level Rise:

There is a proposed Regional Resilience Plan for sea level rise and flooding (BARC).

Eight policy recommendations for regional sea level rise planning were approved by BCDC’s Commissioners in October 2016. Currently, BARC and the Bay Conservation and Development Commission are leading a regional adaptation planning process - Adapting to Rising Tides Bay Area - that could provide a framework for further regional planning.

There are sub-regional plans like SAFER — Strategy to Advance Flood Protection, Ecosystems and Recreation Along San Francisco Bay that covers 2 counties and 5 cities under the San Francisquito Creek JPA.

There also projects like the South Bay Salt Ponds Project that bring together multiple counties.

F. Other Substantial Plans or Reports Relevant to Sea Level Rise

- A Framework for Prioritizing Adaptation Strategies (Marin County)
- A Slow Rising Emergency – Sea Level Rise: Santa Clara County Civil Grand Jury
- Adapting to Rising Tides — ART Portfolio
- Bay Area Sea Level Rise Analysis and Mapping (ART Project)
- Baylands and Climate Change Report
- BCDC Rising Sea Level Policy Recommendations (2016)
- Clean Safe Creeks (SCVWD)
- Crissy Field SLR Vulnerability Assessment
- Guidance for Incorporating Sea Level Rise Into Capital Planning in San Francisco
- Hayward Shoreline Resilience Study
- Marin County Demonstration Projects on the Eastern Shoreline
- Marin Ocean Coast Sea Level Rise Adaptation Report
- MTC BCDC FHWA Transportation Vulnerability Assessment
- Oakland Sea Level Rise Road Map
- Oakland/Alameda Resilience Study
- Ocean Beach Master Plan for Sea Level Rise
- Operational Landscape Units for San Francisco Bay (SFEI)
- Our Coast Our Future (website)
- Preliminary Study of the Effect of Sea Level Rise on Resources of the Hayward Shoreline
- Raising the Bar on Regional Resilience
- Resilience Atlas
- SAFER Bay Feasibility Study
- San Francisco Bay Plan Climate Change Amendment (2011) (BCDC)
- San Francisco Bay Subtidal Habitat Goals Report
- SF Mission Creek Sea Level Rise Adaptation Study
• SFO, San Bruno and Colma Creek Resilience Study Final Report
• Silicon Valley 2.0 Climate Adaptation Guidebook
• Sonoma County Climate Vulnerability Assessment
• South San Francisco Bay Shoreline Study
• State of the Estuary 2015 Report
• State Route 37 Stewardship Study
• Strong Housing, Safer Communities Project
• Surviving the Storm - Bay Area Council
• Tidal Marsh Recovery Plan" (USFWS)
• Wetlands Ecosystem Services Assessment in San Mateo County

G. Cities and Counties that Require Sea Level Rise to be Addressed in New Developments or Capital Improvements:

• Menlo Park
• San Francisco
• Cities with LCPs that have been updated for sea level rise — See Section 2B

Section 3: Physical projects

A. On-The-Ground, Community-Scale Physical Adaptation Projects:

• Aramburu Island Constructed Beach Demonstration Project
• Bair Island Restoration Project
• Bothin Marsh Project
• Case Studies of Natural Shoreline Infrastructure in Coastal California
• Community-based research for Living Shorelines Design
• Coyote Point Eastern Promenade Rejuvenation Project
• Deer Island Basin Phase I Tidal Wetlands Restoration Project
• Eastern Contra Costa County Habitat Conservancy Project
• Encinal Dune Restoration and Public Access
• Flood Control 2.0
• Foster City Sea Level Rise/Levee Planning Project
• Hamilton/Bel Marin Keys Wetlands Restoration Project
• Innovative Wetland Adaptation Tech. in Lower Corte Madera Creek Watershed
• Marin County Demonstration Projects on the Eastern Shoreline
• McGinnis Marsh Restoration Project
• Montezuma Tidal and Season Wetlands Restoration
• Napa River/Napa Creek Flood Protection Project
• New Life for Eroding Shorelines
• Novato Creek Dredged Sediment Beneficial Reuse Project
• Oro Loma Ecotone Project
• Restoration Strategy for Lower Sonoma Creek
• SAFER Bay Project
• San Leandro Treatment Wetland for Pollution Reduction, Habitat Enhancement, & Shoreline Resiliency
• SF Bay Living Shorelines Project
• SF Creek to Bay Project
• South Bay Salt Pond Restoration Project
• South San Francisco Bay Shoreline Project
• Suisun Marsh Restoration Project
• Tiscornia Marsh Habitat Restoration and Sea Level Rise Adaptation Project

B. Cities, Counties, State Agencies, Federal Agencies or Special Districts That Have Implemented Substantial Efforts/Activities to Address Sea Level Rise in The Operations and Maintenance of Their Facilities, Land, And Water

NOTE: Difficult to accurately determine through this survey/interview process. Stakeholders reported that operations and maintenance activities have been enhanced for sea level rise issues by certain actors, e.g. wastewater treatment plants, streets and roads, etc.

Section 4: Public Awareness: Outreach and Education for SLR

A. Activities employed to engage the public on sea level rise

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<td>Public hearings (before an elected board or council)</td>
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<tr>
<td>Participatory events, e.g. festivals, tours of vulnerable/impacted sites,</td>
<td>YES</td>
</tr>
<tr>
<td>Webinars</td>
<td>YES</td>
</tr>
<tr>
<td>Social media (which platforms?)</td>
<td>YES</td>
</tr>
<tr>
<td>TV, radio and newspaper stories</td>
<td>YES</td>
</tr>
<tr>
<td>Other print materials</td>
<td>YES</td>
</tr>
<tr>
<td>Online information sites</td>
<td>YES</td>
</tr>
<tr>
<td>Surveys or polling</td>
<td>YES</td>
</tr>
<tr>
<td>Citizen science activities (monitoring, data collection, etc.)</td>
<td>YES</td>
</tr>
</tbody>
</table>
Restoration activities (plant collection, propagation, planting, etc.) | YES

Examples: Game of Floods, Owlized (virtual reality at bayside), Shrinking Shores, Barter-Town (game) King Tides (citizen science), Resilient By Design: SF Bay Challenge (major public campaign), YESS Project (school curriculum)

B. Public Opinion Polling Used in The Region to Gauge Public Knowledge and Belief on Sea Level Rise and Related Climate Impacts

- Measure AA telephone polling (for bay restoration including sea level rise)
- RISER SF Bay project (UC Berkeley/UC Davis) on-line polling

Section 5: Environmental Justice and Equity

A. Communities Have Been Identified That Will Be More Socially-Vulnerable to Sea Level Rise and Extreme Storms

- Many were identified through the BCDC-ABAG ART process. (See ART web site)
- BCDC sea level rise maps (2018)
- CDPH county-level “Climate Change and Health Profile” reports provide some basic information on climate change and vulnerable populations

B. Vulnerability Assessments and Other Plans Listed in Section 2 That Specifically Address Socially-Vulnerable Residents

- Marin, San Mateo County, Contra Costa, Alameda County, SAFER Project, Benicia

C. Vulnerability Assessments That Have Identified Problematic Land Uses Like Landfills and Hazardous Waste Sites Near Socially-Vulnerable Communities

- Alameda County, Contra Costa, San Mateo County, Marin, SAFER Project, San Francisco

D. Individuals or Groups Representing Socially-Vulnerable Populations Are “At the Table” for Planning and Decision-Making Around Sea Level Rise and Related Issues

- Oakland Resiliency Plan, Contra Costa ART Project, ART Bay Area, Resilient by Design: Bay Area Challenge, San Mateo County Vulnerability Assessment
E. Individuals from Socially-Vulnerable Communities Have Been Directly Involved in Citizen Science Research Activities

Marin, West Oakland, Alviso, King Tides (all counties), Owl Project (Marin, SF, San Mateo), YESS Project

Section 6: Funding for Regional/Local Sea Level Rise Activities

A. Substantial Grants and Other Funding That Have Been Secured from Outside Sources to Support Planning for Sea Level Rise

- Alameda County Technical Assistance – Coastal Conservancy Climate Ready TA
- BART - SB 1 Adaptation Planning Grant - $500,000
- Benicia Vulnerability Study — Coastal Conservancy Climate Ready Round 1 - $150,000
- Capitol Corridor JPA - SB 1 Adaptation Planning Grant Alviso Wetlands - $250,000
- City of Alameda - SB 1 Adaptation Planning Grant - $236,000
- East Bay Dischargers Authority - Coastal Conservancy Climate Ready Round 1 - $200,000
- Golden Gate National Parks Conservancy Crissy Field - Coastal Conservancy Climate Ready Round 3 - $135,000
- Half Moon Bay – Coastal Commission Round 1 - $75,000
- Half Moon Bay – Ocean Protection Council Round 1 - $70,000
- Half Moon Bay — Coastal Commission Round 3 - $85,000
- Highway 37 & San Pablo Baylands Group – Coastal Conservancy Climate Ready TA
- Marin County - Highway 37 Study - SB 1 Adaptation Planning Grant - $130,000
- Marin County – Coastal Commission Round 1 - $54,000
- Marin County – Ocean Protection Council Round 1 - $200,000
- Marin County Vul. Assessment – Coastal Conservancy Climate Ready Round 3 – $250,000
- Marin County – MCF/ SCC — Stinson Beach Nature-Based Adaptation -- $200,000
- Marin County – MCF/SCC – Richardson Bay Beach Restoration Pilot Projects – $200,000
- Metropolitan Transportation Commission - Dumbarton Bridge/East Palo Alto SB 1 Adaptation Planning Grant - $200,000
- Metropolitan Transportation Commission – Local/Regional Resilience - SB 1 Adaptation Planning Grant - $307,000
- MTC/BCDC – Caltrans grant - $1.2 million
- National Audubon Society Sonoma County - Coastal Conservancy Climate Ready Round 2 - $200,000
- Oro Lomo Ecotone Project — Bay Area IRWMP (CA DWR) - $2.1 million
- Pacifica - Coastal Commission Round 3 - $188,000
- Resilient By Design Bay Area Challenge — Rockefeller Foundation - $5 million
- San Francisco – Coastal Commission Round 2 - $13,000
- San Francisco – Ocean Protection Council Round 2 - $160,000
- San Francisco International Airport - Coastal Conservancy Climate Ready Round 1 - $200,000
• San Francisquito Creek JPA — Coastal Conservancy Climate Ready Round 1 - $200,000
• San Mateo County - SB 1 Adaptation Planning Grant - $649,000
• Sea Change San Mateo County – Coastal Conservancy – $524,000
• Save the Bay - Coastal Conservancy Climate Ready Round 2 - $125,000
• Sonoma County – Ocean Protection Council Round 1 - $150,000
• South Bay Salt Ponds Project (multiple grants)
• San Francisco Bay Restoration Authority – Granting $25 million/year for 20 years

B. Local or Regional Government Entities That Have Added Staff to Specifically Address Sea Level Rise Planning and Implementation

• Bay Conservation and Development Commission
• Marin County
• San Mateo County
• Civic Spark and Climate Corps have provided temporary staff

C. Local or Regional Entities That Have Formally Analyzed or Developed New Funding Sources (Bonds, Taxes, Etc.) For Sea Level Rise Planning or Implementation

• BCDC’s Financing the Future Working Group
• Resilient by Design: Bay Area Challenge Financing Guide (53 pages)
• San Francisquito Creek JPA
• SF Bay Restoration Authority Measure AA regional ballot measure (2016) provides $25 million/year over 20 years through a regional parcel tax.

D. Local or Regional Entities That Have Developed Cost Estimates for Different Strategies to Address Sea Level Rise

Nothing comprehensive at this time. Cost estimates for selected specific projects have been developed.

Section 7: Governance

A. Collaborative Structure(s) in The Region That Bring Together a Range of Stakeholders for Sea Level Planning, Discussion, Information Sharing, Problem Solving, And Other Purposes

ART Working Group
CHARG – Coastal Hazards Adaptation Resiliency Group
Coastal Conservancy network with local sea level rise stakeholders
NOAA Sentinel Site Cooperative
B. MOUs or Other Formal Partnership Agreements for Collaborative Sea Level Rise Planning Among Local Governments

There are a number of project-specific MOUs. San Francisquito Creek JPA formed 20 years ago and is now addressing sea level rise. South Bay Salt Ponds Project has a management team MOU among the partners. San Mateo County has developed MOUs with the cities of Menlo Park, Redwood City and Atherton, and with South San Francisco and San Bruno to address flooding.

C. Structures in Place for Facilitating and Expediting Permitting Processes Among Multiple Federal, State, Regional and Local Agencies for Sea Level Rise-Related Projects

• On a project-by-project basis—SAFER SF Bay Project, South Bay Salt Ponds, etc.
• U.S. Fish and Wildlife Service expedited permitting for restoration projects
• City/County of San Francisco enhanced permitting process
• Resources Legacy Fund is working with Bay Area business groups and others to address permitting related to Measure AA implementation

D. Identified Champions for Sea Level Rise Planning Among the Region’s Elected Officials

Yes

Section 8: Science

A. Modeling and Mapping Tools Being Used in The Region in Vulnerability Assessments and Other Planning Efforts

<table>
<thead>
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<th>Tool</th>
<th>ANSWER</th>
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<tbody>
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<td>Climate Smart Cities Los Angeles</td>
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<tr>
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<td>NO</td>
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<tr>
<td>Cal-Adapt/Radke et al</td>
<td>NO</td>
</tr>
<tr>
<td>ART/BATA Regional Sea Level Rise Mapping and Analysis</td>
<td>YES</td>
</tr>
<tr>
<td>Other: Point Blue Marsh Sustainability Tool</td>
<td>YES</td>
</tr>
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B. Vulnerability Assessments in The Region Analyze the Following:

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<tr>
<td>Levees</td>
<td>YES</td>
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</table>


Not at this time
Sacramento-San Joaquin Delta
Regional Sea Level Rise Snapshot
Sacramento-San Joaquin Delta Regional Sea Level Rise Snapshot
Developed for the Ocean Protection Council by Climate Readiness Institute
May 2018

Section 1: Background Information

Region Name: Sacramento/San Joaquin Delta

Counties: 5
Contra Costa County, Sacramento County, San Joaquin County, Solano County, and Yolo County

Cities or Towns: 38

Tribal Areas: 3 (Federally recognized)

Population: 2.4 million

Section 2: Planning

A. Comprehensive City or County Vulnerability Assessments

Completed: 3
- Benicia Climate Change Vulnerability Report Summary
- Contra Costa – ART project – eastern project boundary is between Bay Point and Pittsburg
- Sacramento County - Climate Change Vulnerability Assessment for the Sacramento County Climate Action Plan

In-Progress: 1

NOTE: In April 2018, the Delta Stewardship Council issued an RFQ for the Climate Change Vulnerability Assessment and Adaptation Strategy for the Sacramento-San Joaquin Delta and Suisun Marsh

B. Local Coastal Programs Updated for Sea Level Rise (completed)

Completed: N/A

In-Progress: N/A

C. General Plan Safety Elements Updated for Sea Level Rise

Completed: 0
A number of general plans mention climate change and sea level rise but SLR is not yet a substantial issue in these plans.

- Contra Costa County General Plan
- Sacramento County General Plan
- San Joaquin County General Plan
- Solano County General Plan
- Yolo County General Plan

In-Progress: 0

D. Hazard Mitigation Plans Updated to Include Sea Level Rise

Completed: 0

In-Progress: 0

E. Region-wide Plan for Sea Level Rise:

Not at this time

F. Other Substantial Plans or Reports Relevant to Sea Level Rise

- Bay Delta Conservation Plan/California WaterFix Final EIR/EIS -- California Department of Water Resources:
- County of Solano Sea Level Rise Strategic Program
- Delta Conservancy Climate Change Policy
- Delta Levees Investment Strategy: Sea Level Rise Methodology
- Delta Plan: Ensuring A Reliable Water Supply for California, A Healthy Delta Ecosystem, And A Place of Enduring Value - Delta Stewardship Council
- Other plans for the Delta region discuss flooding but SLR is not yet a substantial issue in these efforts. Examples include Central Valley Flood Protection Plan, groundwater sustainability plans, habitat plans, Caltrans’ project reports, etc.

G. Cities and Counties that Require Sea Level Rise to be Addressed in New Developments or Capital Improvements:

None at this time
Section 3: Physical projects

A. On-The-Ground, Community-Scale Physical Adaptation Projects

NOTE: Many of the projects listed below are being designed for extreme flooding coming from multiple sources, but not specific to sea level rise

- North Delta Flood Control and Ecosystem Restoration Project
- Suisun Marsh Management Plan and restoration
- Levee repair and restoration (many locations)
- Dutch Slough tidal habitat restoration
- Home elevation projects underway in Sacramento County flood areas
- Yolo Bypass Salmonid Habitat Restoration and Fish Passage

B. Cities, Counties, State Agencies, Federal Agencies or Special Districts That Have Implemented Substantial Efforts/Activities to Address Sea Level Rise in The Operations and Maintenance of Their Facilities, Land, And Water

NOTE: Difficult to accurately determine through this survey/interview process. Stakeholders reported that operations and maintenance activities have likely been enhanced for sea level rise issues by certain actors as part of their flood protection efforts.

Section 4: Public Awareness: Outreach and Education for SLR

A. Activities employed to engage the public on sea level rise

NOTE: Activities noted here are about Delta flooding issues that may include SLR.

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<td>Webinars</td>
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<td>Social media (which platforms?)</td>
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<td>TV, radio and newspaper stories</td>
<td>YES</td>
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<td>Other print materials</td>
<td>NO</td>
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<td>Activity</td>
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<td>Online information sites</td>
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<td>Restoration activities (plant collection, propagation, planting, etc.)</td>
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B. Public Opinion Polling Used in The Region to Gauge Public Knowledge and Belief on Sea Level Rise and Related Climate Impacts

Not at this time

Section 5: Environmental Justice and Equity

A. Communities Have Been Identified That Will Be More Socially-Vulnerable to Sea Level Rise and Extreme Storms

- “Levee Failures and Social Vulnerability in the Sacramento-San Joaquin Delta Area” (Burton and Cutter)
- CDPH county-level “Climate Change and Health Profile” reports provide some basic information on climate change and vulnerable populations

B. Vulnerability Assessments and Other Plans Listed in Section 2 That Specifically Address Socially-Vulnerable Residents

Sacramento County Vulnerability Assessment for the Climate Action Plan

C. Vulnerability Assessments That Have Identified Problematic Land Uses Like Landfills and Hazardous Waste Sites Near Socially-Vulnerable Communities

Not at this time

D. Individuals or Groups Representing Socially-Vulnerable Populations Are “At the Table” for Planning and Decision-Making Around Sea Level Rise and Related Issues

Socially-vulnerable populations have been “at the table” for flooding issues; however, they have not been engaged for sea level rise specifically
E. Individuals from Socially-Vulnerable Communities Have Been Directly Involved in Citizen Science Research Activities?

Not at this time

Section 6: Funding for Regional/Local Sea Level Rise Activities

A. Substantial Grants and Other Funding That Have Been Secured from Outside Sources to Support Planning for Sea Level Rise

- City of Benicia – California Coastal Conservancy Climate Ready Round 1 — $150,000
- Other flood-related grants but not specific to sea level rise

B. Local or Regional Government Entities That Have Added Staff to Specifically Address Sea Level Rise Planning and Implementation

- Sacramento County added a 3rd planner. Not a SLR planner by name but allows them to do more with this issue.
- In general, while there has been an increase in tasks / work load there has not been an increase in funding or staffing.

C. Local or Regional Entities That Have Formally Analyzed or Developed New Funding Sources (Bonds, Taxes, Etc.) For Sea Level Rise Planning or Implementation

Delta Conservancy is looking at market based mechanisms – how to monetize actions taken. For example, obtaining funds through the American Carbon Registry Protocol

D. Local or Regional Entities That Have Developed Cost Estimates for Different Strategies to Address Sea Level Rise

No specific cost estimates for sea level rise strategies.

Section 7: Governance

A. Collaborative Structure(s) in The Region That Bring Together a Range of Stakeholders for Sea Level Planning, Discussion, Information Sharing, Problem Solving, And Other Purposes

There is currently no specific collaborative structure for sea level rise planning. However, there are three substantial regional organizations that currently bring stakeholders together for broader Delta issues.

- Delta Stewardship Council
- Delta Conservancy
- Delta Protection Council
B. MOUs or Other Formal Partnership Agreements for Collaborative Sea Level Rise Planning Among Local Governments

Delta Stewardship Council MOU with BCDC

C. Structures in Place for Facilitating and Expediting Permitting Processes Among Multiple Federal, State, Regional and Local Agencies for Sea Level Rise-Related Projects?

Permitting is a major issue in Delta. Central Valley Sustainable Conservation has done some work to streamline permitting.

D. Identified Champions for Sea Level Rise Planning Among the Region’s Elected Officials

Champions are for flood protection and Delta issues, but not specifically for sea level rise.

Section 8: Science

A. Modeling and Mapping Tools Being Used in The Region in Vulnerability Assessments and Other Planning Efforts

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<td>NO</td>
</tr>
<tr>
<td>Other: Cloern (USGS) project on Delta – Cascade project</td>
<td>YES</td>
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NOTE: Generally, the region is using the OPC 2012 guidance

B. Vulnerability Assessments in The Region Analyze the Following:

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<td>Levees</td>
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</table>

C. **Official Records in The Region That Track Key Impacts of Sea Level Rise—Loss of Wetlands, Loss of Beach Access, Loss of Coastal Access, Etc.**

Not at this time for sea level rise specifically.
North Coast
Regional Sea Level Rise Snapshot

“North Humboldt Bay” by Pacific Southwest Region USFWS via Flickr
Section 1: Background Information

Region Name: North Coast

Counties: 3 — Del Norte, Humboldt and Mendocino

Cities or Towns: 12

Tribal Areas: 20 (Federally recognized)

Population: 252,000

Section 2: Planning

A. Comprehensive City or County Vulnerability Assessments

Completed: 1
   Eureka Sea Level Rise Vulnerability and Risk Assessment

In-Progress: 2
   • Arcata Vulnerability Assessment
   • Humboldt County – Humboldt Bay Area Plan segment only

B. Local Coastal Programs Updated for Sea Level Rise
(Source for below: Coastal Commission 12/31/2016)

Completed: 3
   • Crescent City (in part)
   • Ft. Bragg (in part)
   • Pt. Arena (in part)

In-Progress: 5
   • Arcata
   • Crescent City Harbor Plan (Del Norte County/Crescent City Harbor Commission)
   • Eureka
   • Humboldt County (one segment)
   • Trinidad
C. General Plan Safety Elements Updated for Sea Level Rise

Completed: 0

In-Progress: 1
  Eureka

D. Hazard Mitigation Plans Updated to Include Sea Level Rise

Completed: 3
  • Crescent City
  • Del Norte County
  • Humboldt County (multi-jurisdiction plan)

In-Progress: 0

E. Region-wide Plan for Sea Level Rise:

No overall regional plan at this time; however, there are some collaborations:
  • On-going collaboration between the cities of Eureka and Arcata and Humboldt County
  • Bureau of Land Management is doing an adaptation plan covering lands in multiple counties (with Eco Adapt).

F. Other Substantial Plans or Reports Relevant to Sea Level Rise

• Caltrans District 1 Climate Change Vulnerability Assessment and Pilot Studies FHWA Climate Resilience Pilot Final Report (CalTrans)
• Coastal Erosion Hazard Management Plan – City of Trinidad
• Conceptual Groundwater Model of Sea Level Rise in the Humboldt Bay Eureka-Arcata Coastal Plain
• Flood and Stormwater Management Report of the North Coast Hydrologic Region
• Humboldt Bay National Wildlife Refuge dune studies
• Humboldt Bay National Wildlife Refuge Sea-Level Rise Adaptation Demonstration Project - Final Environmental Assessment:
• Humboldt Bay Sea Level Rise Adaptation Planning Project Phase II Report
• Humboldt Bay Shoreline Inventory, Mapping, and Sea Level Rise Vulnerability Assessment
• Humboldt Bay: Sea Level Rise, Hydrodynamic Modeling, and Inundation Vulnerability Mapping
• North Coast Climate Mitigation, Adaptation, and Energy Independence Report
• Potential Effects of Projected Sea Level Rise at Tolowa Dunes State Park, CA
• Sea Level Rise -- Planning to Outpace Rising Waters: Building Resilient Infrastructure
• Sea Level Rise Vulnerability Assessment for Fay Slough, Mad River Slough, and Elk River Slough Wildlife Areas (CDFW 2013)
G. Cities and Counties that Require Sea Level Rise to be Addressed in New Developments or Capital Improvements

Cities with LCPs that have been updated for sea level rise — See Section 2B

Section 3: Physical projects

A. On-The-Ground, Community-Scale Physical Adaptation Projects

- Arcata: Baylands acquisition and restoration projects, Klopp Lake (levees and berms repair and maintenance), McDaniel Slough tidal restoration, wastewater treatment plant living shorelines project (planning stage)
- Eel River Estuary & Centerville Slough Enhancement project – The Wildlands Conservancy (permitting stage)
- Eureka Tidal Marsh Restoration Project - Elk River (permitting stage)
- Humboldt Bay National Wildlife Refuge White Slough Tidal Marsh Restoration
- Humboldt Bay Harbor Dredging Project – sediment reuse for resilience and waterfront (planning stage)
- South Jacoby Creek Restoration – City of Arcata + Fish and Wildlife Service
- NOTE: Many coastal restoration projects have sea level rise co-benefits

B. Cities, Counties, State Agencies, Federal Agencies or Special Districts That Have Implemented Substantial Efforts/Activities to Address Sea Level Rise in The Operations and Maintenance of Their Facilities, Land, And Water

NOTE: Difficult to accurately determine through this survey/interview process. Stakeholders reported that operations and maintenance activities have been enhanced for sea level rise issues by certain actors, e.g. wastewater treatment plants, sewer lines, relocation evaluation for key infrastructure, etc.

Section 4: Public Awareness: Outreach and Education for SLR

A. Activities employed to engage the public on sea level rise

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<td>Social media (which platforms?)</td>
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**Examples:** Humboldt Bay symposium for 150 people; Ag lands workshops for land owners; 100+ presentations to community groups ON THEIR OWN TURF (only way to get good attendance/engagement); SLR poster displays and poles to visually present SLR; 2-year planning effort meeting every other month that involved 25 stakeholders; walking tours of the marshes to show SLR

**B. Public Opinion Polling Used in The Region to Gauge Public Knowledge and Belief on Sea Level Rise and Related Climate Impacts**

Not at this time

**Section 5: Environmental Justice and Equity**

**A. Communities Have Been Identified That Will Be More Socially-Vulnerable to Sea Level Rise and Extreme Storms**

- Not at this time — Humboldt Bay plan update will do this
- CDPH county-level “Climate Change and Health Profile” reports provide some basic information on climate change and vulnerable populations
B. Vulnerability Assessments and Other Plans Listed in Section 2 That Specifically Address Socially-Vulnerable Residents

The Humboldt Bay Area Plan update specifically addresses the disadvantaged communities of King Salmon, Fields Landing, and Fairhaven/Finntown.

C. Vulnerability Assessments That Have Identified Problematic Land Uses Like Landfills and Hazardous Waste Sites Near Socially-Vulnerable Communities

Not at this time; however, Humboldt Baykeeper has mapped hazardous waste sites around the Bay. They plan to overlay this with SLR Inundation Maps to prioritize cleanups of vulnerable sites.

D. Individuals or Groups Representing Socially-Vulnerable Populations Are “At the Table” for Planning and Decision-Making Around Sea Level Rise and Related Issues

Not at this time

E. Individuals from Socially-Vulnerable Communities Have Been Directly Involved in Citizen Science Research Activities?

Not at this time

Section 6: Funding for Regional/Local Sea Level Rise Activities

A. Substantial Grants and Other Funding That Have Been Secured from Outside Sources to Support Planning for Sea Level Rise

- Arcata – Coastal Commission Round 1 – $54,000
- Arcata Living Shoreline – California Coastal Conservancy Climate Ready Round 1 — $86,000
- Eureka – Ocean Protection Council Round 1 – $250,000
- Fort Bragg – Coastal Commission Round 3 – $100,000
- Friends of the Dunes in Humboldt County – California Coastal Conservancy Climate Ready Round 3 — $250,000
- Humboldt Bay salt marsh accretion / erosion rates – EPA grant – $260,000
- Humboldt County – Coastal Commission Rounds 1, 2 and 3 – $114,000 (3 separate grants)
- Humboldt County – Ocean Protection Council Round 2 – $90,000
- Trinidad – Coastal Commission Rounds 2 & 3 – $131,000 (2 separate grants)
B. Local or Regional Government Entities That Have Added Staff to Specifically Address Sea Level Rise Planning and Implementation

No staff added at the local level

C. Local or Regional Entities That Have Formally Analyzed or Developed New Funding Sources (Bonds, Taxes, Etc.) For Sea Level Rise Planning or Implementation

Not at this time

D. Local or Regional Entities That Have Developed Cost Estimates for Different Strategies to Address Sea Level Rise

Caltrans District 1 vulnerability assessment looked at various strategies and costs

Section 7: Governance

A. Collaborative Structure(s) in The Region That Bring Together a Range of Stakeholders for Sea Level Planning, Discussion, Information Sharing, Problem Solving, And Other Purposes

No comprehensive structure yet but a series of efforts to bring stakeholders together:

- Coastal Ecosystems Institute (CEI) of Northern California – an incorporated non-profit focused on sea level rise planning. CEI is linked to a less formal working group made up of representatives from agencies and non-profits called the Humboldt Bay Initiative
- Humboldt Bay regional working group was funded for two years by the Conservancy
- Humboldt Bay SLR Institute is forming at Humboldt State University

B. MOUs or Other Formal Partnership Agreements for Collaborative Sea Level Rise Planning Among Local Governments

Not at this time

C. Structures in Place for Facilitating and Expediting Permitting Processes Among Multiple Federal, State, Regional and Local Agencies for Sea Level Rise-Related Projects

Not at this time

D. Identified Champions for Sea Level Rise Planning Among the Region’s Elected Officials

Not at this time
Section 8: Science

A. Modeling and Mapping Tools Being Used in The Region in Vulnerability Assessments and Other Planning Efforts

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<tr>
<td>Cal-Adapt/Radke et al</td>
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The following efforts have established baselines; however, it is unclear if there is funding or resources for ongoing tracking of specific indicators:

1. U.S. FWS baseline mapping for marshes
2. Coastal conservancy shoreline inventory baselines
Appendix A:
Stakeholder Participants

Adrienne Greve, Cal Poly, San Luis Obispo
Aldaron Laird, Trinity Associates
Allison Brooks, Bay Area Regional Collaborative
Alyssa Mann, USC Sea Grant
Amanda Lee, Del Mar
Amber Paris, South Coast Climate Science Alliance
Andy Gunther, Bay Area Ecosystems Climate Change Consortium
Brian Brennan, Beach Erosion Authority for Clean Oceans and Nourishment (BEACON)
Brian Leslie, Moffatt and Nichols
Campbell Ingram, Delta Conservancy
Carl Stiehl, Carlsbad
Cesar Espinosa, Los Angeles County
Chris Choo, Marin County
Chris Read, City of San Luis Obispo
Dana Murray, Manhattan Beach
Danielle Boudreau, Tijuana River National Estuarine Research Reserve
David Loya, Arcata
Don Thomas, Sacramento County
Elizabeth Schatz, Arcata
Fern Neuno, Long Beach
Guangyu Wang, Santa Monica Bay Restoration Commission
Hagu Solomon-Cary, City of Los Angeles
Jasneet Sharma, San Mateo County
Jim Nakagawa, Imperial Beach
Jody London, Contra Costa County
Joel Gerwein, Coastal Conservancy
John Andrew, Department of Water Resources
John Bourgeois, South Bay Salt Ponds Project
John Ford, Humboldt County
John Lundgren, Sacramento County
Judith Meister, Santa Monica
Juliette Hart, USGS
Kate Adams, Scripps
Kelly Leo, Coastal Resilience Network
Kristen Goetz, Eureka
Kristen Goodrich, Tijuana River NERR
Laura Engeman, San Diego Climate Collaborative
Laura MacPherson, City of Los Angeles
Len Matterman, San Francisquito Creek JPA
Lindsey Sheehan, ESA
Lindy Lowe, Bay Conservation and Development Commission
Lisa Shikany, Humboldt County
Marc Beyeler, University of California, Santa Cruz
Mark Lubell, UC Davis
Melinda Dorin, Delta Protection Commission
Melissa Kraemer, Coastal Commission
Michael Barber, Supervisor Dave Pine, San Mateo County
Michael Richardson, Humboldt County
Mike Eaton, Landowner/Farmer
Mindy Fogg, Santa Barbara County
Mo Lahsaiezadeh, Oceanside
Monica der Gevorgian, Long Beach
Phyllis Grifman, USC Sea Grant
Rachel Couch, Coastal Conservancy
Ron Melcer, Delta Stewardship Council
Ryan Stanbra, Delta Stewardship Council
Sarah Pierce, SANDAG
Selena Evilsizor, Santa Barbara County
Shannon Parry, Santa Monica
Susan Brodeur, Orange County
Tiffany Wise-West, City of Santa Cruz
Vanessa De La Rosa, Caltrans
Warner Chabot, San Francisco Estuary Institute