

CRESCENT CITY HARBOR DISTRICT



**CRESCENT CITY  
HARBOR DISTRICT  
HAZARD MITIGATION  
PLAN 2024 UPDATE  
9.30.24 DRAFT**

101 CITIZENS DOCK RD,  
CRESCENT CITY, CA 95531

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# 1. INTRODUCTION

## 1.1 Hazard Mitigation Plan Point of Contact

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## 1.2 The Planning Area - The Crescent City Harbor District

### 1.2.1 Physical Area

The Crescent City Harbor is on the northern California coast located in Del Norte County, the northernmost county in California. The Harbor District is located just south of the City of Crescent City. The County has a population of 27,552. The population of Crescent City, the county seat, is 6,400.

The Harbor is owned and managed by the Crescent City Harbor District (CCHD), a special district, which is a political subdivision of the State of California. The CCHD was formed in 1931 by the California legislature to “aid and promote the economic development of the harbor for the citizens of the county.”

On June 24, 1963, the District received a Land Grant from the State of California. These granted lands, were approved of “for the establishment, improvement, and conduct of a harbor, for the construction, maintenance and operation of wharves, docks, piers, slips, quays and other utilities, structures, facilities, and appliances necessary or convenient for commerce, navigation and fisheries, and for public recreation purposes.”

The Harbor District consists of approximately 4,052 acres of land and water area, with approximately 150 acres of that being land. The District's property line extends from the mouth of Nickel Creek in the National Park to the south, then north along the mean high tide line of the coast for approximately 4.6 miles, along U.S. Highway 101. From that point, the District's boundary extends to a point in the center of the harbor waterway and then due west to a point one mile out into the Pacific Ocean. From that point in the Pacific Ocean, the District's boundary line then extends south back to the original point of beginning at Nickel Creek. The District includes South Beach and North Beach in the Harbor. (See the Maps and Photos in Appendix B).

Beaches within the CCHD are used by residents and tourists for a variety of recreational activities, including beachcombing, walking, surfing, kite flying and picnicking.

The entirety of the Harbor's built infrastructure is located on approximately 35 acres within the Harbor's port area. The Harbor plays a vital role in the local and regional economy. It is the home to the two largest local economic sectors: Tourism and Commercial Fisheries. The commercial boat basin is home to more than 100 commercial fishing vessels which catch shrimp, tuna, cod, and crab in local waters. The commercial fishing industry infrastructure includes the commercial boat basin, multiple docks for unloading catch, seafood packing and transportation area, fish processors and fish sales areas. The boat basin also has slips for recreational watercraft.

The port area is also home to restaurants, shops, commercial buildings and RV parks, and a public boat launch. Several 100 people work in the harbor each day, with hundreds more visiting.

The ground transportation infrastructure in the harbor consists of three public roads, Citizens Dock Road, Starfish Way, and Anchor Way. The ingress and egress for Citizen's Dock and Anchor Way is U.S. Highway 101.

The port section of the District is protected by a 4,100-foot outer breakwater, a 12,000-foot inner breakwater, and a 2,400-foot sand barrier, which combine to create the only "harbor of refuge" between Humboldt and Coos Bay. A fourth break water, approximately 800 feet in length, is located on the southeast side of Whaler Island and helps protect the recreational boating parking lot and ramp.

CCHD is governed by a five-member elected Board of Commissioners. The Board of Commissioners serve four-year terms and appoint the Harbormaster who oversees the day-to-day operations and staff. Currently the District employs 11 full and part-time employees.

As part of its fiduciary duty, the CCHD is required to take reasonable steps to maintain the harbor to meet the needs of the people of the State and the provision of recreational and visitor-serving uses. Furthermore, the California Coastal Act emphasizes support for coastal-dependent uses (i.e., uses that must have a waterfront site in order to exist), and coastal related, visitor-serving, recreation, and commercial uses. Harbor District policies and programs that carry out

the administrative mandates of the State are encompassed in the Crescent City Harbor District Harbor Strategic Plan, the Del Norte County Local Coastal Program, and the Crescent City Local Coastal Plan for the Harbor Dependent and Harbor Related planning areas.

The existing roadway facilities, breakwaters, docks, and piers in the Harbor are facing increased closures, damage, and loss of service due to natural hazards.

Failures in sections of the breakwaters are endangering the safety of all harbor users and resulting sporadic closures of transportation corridors, causing employment disruption in the businesses and services which support the commercial fleet and tourism industry. Since their construction, the breakwaters have been subjected to the impacts of tsunamis, severe winter storms, and tidal surges. Total failure of any one of the breakwaters would irreparably damage the financial health of the Crescent City Harbor District, the City of Crescent City and Del Norte County.

There is historic precedent at the harbor for infrastructure failure. Over the past 80 years, thirty-nine tsunamis have been detected in the Harbor; four of which caused more than \$37 million in damage to the harbor. In 1964, the Alaskan earthquake triggered a tsunami that destroyed the Crescent City Harbor and killed 12 people. The breakwaters were built following that tsunami. In 2011, a tsunami caused by the Tohoku earthquake destroyed the commercial and recreational boat slips and docks in the Harbor. The physical and economic damage from those tsunamis was so severe they still impact the harbor area today.

In addition, nine disaster declarations have been declared from storm surges and flooding in the past 30 years, resulting in additional millions of dollars of damage. The harbor also suffers from regular coastal flooding often associated with the simultaneous occurrence of king tides, large waves, and storm surge, especially during the winter. These combined effects produce coastal flooding that causes additional inundation and associated damage due to the simultaneous nature of these events.

The Crescent City Harbor District (CCHD) is addressing their natural hazard vulnerabilities by 1) developing an armored and engineered harbor to improve the safety, efficiency, and reliability of the movement of goods into, out of, and within the port, and to 2) make operational improvements to improve port resilience.

This Hazard Mitigation Plan will assist the CCHD meet those goals.

### **1.2.2 Local Demographics**

The Harbor is located in Census Tract 1.02, a historically disadvantaged and low-income community in an area of persistent poverty. The census tract has a Social Vulnerability Index, rating of 0.95, indicating a very high level of vulnerability. According to the Council on

Environmental Quality (CEQ) Climate and Economic Justice Screening Tool (CEJST), the low-income percentile for this census tract is 74, meaning the percent of people living equal to or below twice the poverty level is higher than 74% of the census tracts in the USA. 19 percent of adults in the census tract are unemployed. The percentile for unemployment for this census tract is 97, meaning the percent of unemployed people is higher than 97% of the census tracts in the USA. The Poverty percentile for this census tract is 88, meaning the share of people in households where income is at or below 100% of the Federal poverty level is higher than 63% of the census tracts in the USA. The project area is in the HPI Score (3.0) Tract 1.02, and has a 16.3 percentile rating, meaning that this Tract has healthier community conditions than only 16.3% of other California Tracts,

The Harbor District is in Federal Opportunity Zone number 06015000102. The median household income in the zone is approximately \$36,856, which is 32% less than Del Norte county, 55% less than the state of California, and 46% less than the nation. The percentage of households below the poverty line is 30%, which is 18 points higher than the 12% rate for the state of California. This Opportunity Zone has a median home value of approximately \$190,000, which is 67% lower than the median home value for the state of California of \$570,000.

### **1.2.3 Purposes for Planning**

The Crescent City Harbor District Mission Statement is “The Crescent City Harbor District provides sustainable marine and shore-based commercial, economic, educational, and recreational opportunities for the benefit of the community.”

The CCHD core values are -

1. Be an economic driver for the community.
2. Be fiscally responsible with public assets.
3. Be a leader in the community.
4. Be a partner for the benefit of the community.

To help meet its mission statement and values, the CCHD has prepared an update to its hazard mitigation plan in compliance with the Code of Federal Regulations, which requires the plan to be updated every 5 years for a jurisdiction to be eligible to receive funding from FEMA.

The 2018 Del Norte County Operational Area Hazard Mitigation Plan was a countywide plan, which included separate chapters for each of the regions of the County, including the Harbor District. The 2018 plan, which was officially accepted by FEMA in 2019, has expired. The County of Del Norte is just beginning a multi-year county-wide hazard mitigation planning process, which the Crescent City Harbor District will participate in.

However, an update of the plan is needed immediately by the Crescent City Harbor District, especially for use of currently awarded FEMA funds.

### **1.3 Benefits of this Plan**

All citizens and businesses of the Crescent City Harbor District Del Norte County are the ultimate beneficiaries of this hazard mitigation plan. The plan reduces risk for those who live in, work in, and visit the planning area. It provides a viable planning framework for all foreseeable natural hazards. The plan's goals and recommendations can lay groundwork for the development and implementation of local mitigation activities and partnerships.

### **1.4 Mitigation Goals and Objectives**

The guiding principle used in selecting actions contained in this plan update: Reduce the vulnerability to natural hazards in order to protect the health, safety, welfare and economy of the Crescent City Harbor District. No development changes have affected the jurisdiction's overall vulnerability since the 2018 HMP.

#### Mitigation Goals

1. Save and protect lives from the impact of hazards.
2. Protect the environment.
3. Protect property from the impact of hazards.
4. Maintain economic viability after a disaster event.
5. Promote efficient use of public funds.
6. The effectiveness of a mitigation strategy is assessed by determining how well these goals are achieved.

#### Objectives

Each selected objective meets multiple goals, serving as a stand-alone measurement of the effectiveness of a mitigation action, rather than as a subset of a goal. The objectives also are used to help establish the mitigation priorities of this plan. The objectives have not changed since the 2018 HMP. The objectives are as follows:

1. Consider the impacts of hazards in all planning mechanisms that address current and future land uses within the Crescent City Harbor District.
2. Pursue implementation of all feasible measures that reduce the risk exposure and promote the adaptive capacity of public and private property within Del Norte County.
3. Seek mitigation projects that provide the highest degree of hazard protection in a cost-effective manner.
4. Address identified/known repetitive losses within the planning area.

5. Increase resilience and the continuity of operations of identified critical facilities within the Harbor District.
6. Consider codes that require new construction to consider the impacts of hazards.
7. Utilize the best available data, science, and technologies to improve understanding of the location and potential impacts of hazards, the vulnerability of building types, community development patterns, and the measures needed to protect life safety.
8. Enhance emergency management capability within the planning area.
9. Sustain reliable local emergency operations and facilities before, during and after a disaster.
10. Inform the public on the hazard risk exposure and ways to increase the public's capability and adaptive capacity to prepare for, respond to, recover from, and mitigate the impacts of natural-hazard events.



## 2. DOCUMENTATION OF PLANNING PROCESS

### 2.1 Public Comment and Involvement in Plan Development

The 2024 Crescent City Harbor Hazard Mitigation Plan is a public document. Preparation of the plan included the opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.

Crescent City Harbor District hired a consulting team to review the 2018 Hazard Mitigation Plan to identify elements of that plan to carry forward into the 2024 Crescent City Harbor Hazard Mitigation Plan. The 2018 Hazard Mitigation Plan had extensive public hearings that occurred for a year throughout the County and in the Harbor.

The planning team was made up of the following:

2024 Plan Update Team:

CEO/Harbor Master: Tim Petrick; Assistant Harbor Master: Mike Rademaker; HMP Project Manager: Michael Bahr (consultant, Community System Solutions); HMP Community Liaison: Aislene Delane (consultant, Community System Solutions); HMP Graphics Coordinator: Mika Mckenzie (consultant, Community System Solutions); HMP Administrative Lead: Trinket Glasgow (consultant, Community System Solutions).

Harbor Master Petrick and Assistant Harbor Master Rademaker hired the Community Systems Solutions team to work with them to prepare, draft, and finalize the plan. Michael Bahr led the team in researching, organizing, and writing the plan. Aislene Delane coordinated and led stakeholder meetings and integrated public and stakeholder comments into the writing of the plan. Mika Mckenzie created graphics and charts to input into the plan. Trinket Glasgow prepared and reviewed the final adopted plan. The entire team met regularly throughout the creation of the plan and reviewed and approved the final copy before it was adopted by the Board.

Crescent City Harbor District Board of Commissioners:

President: Harry Adams; Secretary: Rick Shepherd; Commissioners: Gerard Weber; Brian Stone; Wes White

The CCHD Board of Commissioners participated by attending community meetings, reviewing documents and adopting the final plan.

The 2024 Plan update team 1) reviewed the 2018 plan; 2) all Harbor and County plans which have been created since that time, 3) current state and federal plans that cover the Harbor District; 4) work presently going on in the harbor, 5) interviewed Harbor staff about planned and priority projects and 6) solicited public input.

CCHD is located in an underserved community. Efforts to include underserved communities and local vulnerable populations included hosting multiple community meetings; meeting one-on-one with local fisherman and other stakeholders, and conducting online and in person surveys.

A website was created for the draft plan, which was promoted through social media and multiple media releases. Invitations to community meetings were sent out via email to Harbor tenants and to the Harbor communications list, as well as advertised on social media, and the local radio. Harbor Board meetings included a Zoom component, allowing those not attending in person to comment on the plan.

For the 2024 update, the planning team held a series of public meetings from September 2023 to March 2024 collecting public input on future harbor infrastructure which could be designed to mitigate hazards. At those meetings elements from the 2018 Hazard Mitigation Plan were presented to get comments, on including:

- Sea-Level Rise Mitigation Plans and Structure Elevation program.
- Replacement of the seawall.
- Repair, retrofit or replacement Citizens' Dock.
- Repair, retrofit or replacement of the breakwaters.
- Repair, retrofit or replacement of the other piers in the harbor.

The draft plan had input from the CCHD management team and CCHD Board of Harbor Commissioners. Input gathered from community meetings, Board meetings, online surveys, and meetings with fisherman and other stakeholders were included in the HMP as it was received.

The planning team assembled a final document to meet federal hazard mitigation planning requirements.

### **2.1.1. Key Public Comment Dates and Activities**

August 24th, 2024: Planning team met to begin planning the HMP process.

September 5th, 2024: Planning team met to begin community meeting plan.

September 7th, 2023: Initial community meeting held to alert the community of the HMP process.

October 4th, 2023: Second community meeting held to continue discussion of HMP and related projects.

October 18th, 2024: Planning team met to update and review HMP draft.

November 7th, 2023: Planning team met to update and review HMP draft.

November 28th, 2023: Planning team met to update and review HMP draft.

December 4th, 2023: Planning team met to prepare for stakeholder meetings on December 12th.

December 12th, 2023: The planning team met with local fisherman and other stakeholders to review stakeholder needs and ideas.

January 4th, 2024: Planning team met to debrief stakeholder interviews and discussed how to incorporate feedback into HMP.

January 31st, 2024: Planning team met to update and review HMP draft.

February 8th, 2024: Planning team met with local fishermen and food council members to discuss HMP progression.

February 12th, 2024: Planning team met to update and review HMP draft.

March 19, 2024: Crescent City Board of Harbor Commissioners reviewed draft plan and opened the public hearing process.

March 19, 2024: Draft Plan placed online on the Harbor's website for community review. Start of social media campaign soliciting public input on the plan. Press releases sent to local media about the process.

March 19, 2024: Hold public meeting - topics of discussion included the need for hazard mitigation in the harbor, needed harbor infrastructure contained in the hazard mitigation plan and the elements of the Hazard Mitigation plan.

March 22nd, 2024: Planning team reviewed feedback from public meeting and discussed incorporation into HMP draft.

April 2nd, 2024: Crescent City Board of Harbor Commissioners held a second public hearing on the Hazard Mitigation Plan.

April 10th 2024: Planning team reviewed feedback from public hearing and incorporated feedback into HMP draft.

April 16th, 2024: Crescent City Board of Harbor Commissioners adopted HMP.

April 23rd, 2024: Final HMP sent to Cal OES for review and approval.

August 7th, 2024: Feedback from Cal OES reviewed and included into HMP.

September - October 2024 - Revised Plan with Cal OES recommended changes was placed on the Crescent City Harbor District website for public comment. Updated Plan with opportunity to comment on it announced at Crescent City Harbor District meetings. Public feedback incorporated into this document.

## **2.2 Staff and Local Stakeholder Involvement in Plan Development**

The Crescent City Harbor District Hazard Mitigation Plan was developed with input from staff and local stakeholders. The Crescent City Harbor District Board of Commissioners and the Harbor management team reviewed the 2018 Plan and shared events and situations that had arisen since the development of that plan. The 2024 draft plan was discussed at public meetings held at the Harbor District and input was given which is incorporated into the final plan.

An updated draft of the 2024 Hazard Mitigation plan was emailed to the following regional and local Stakeholders to review and comment on:

- California Office of Emergency Services
- FEMA Region IX, Lead Community Planner
- U.S. Geological Survey, Science Advisor
- California Department of Transportation, Director-District 1
- Bureau of Land Management, Tribal Relations
- California Department of Forestry and Fire Protection, Resource Management Division
- The Yurok Tribe
- Resighini Rancheria
- Smith River Rancheria
- The Elk Valley Rancheria
- The County of Del Norte, Office of Emergency Services
- The County of Del Norte
- The City of Crescent City
- Del Norte Local Agency Formation Commission
- Crescent Fire Protection District
- Commercial Fishermen's Association
- Crescent Land Title Company

- Pacific Choice Seafood
- CalPoly Humboldt
- Caito Fisheries
- Crede Project Management

All the agencies listed above were provided an opportunity to review and comment on this plan, primarily through the hazard mitigation plan website. All were sent an e-mail message informing them that draft portions of the plan were available for review. Upon completion of a public comment period, a complete draft plan was sent to the California Office of Emergency Services for a pre-adoption review to ensure program compliance.

Some of the above agencies were met with because of their regulatory or connection to the Harbor District. These included the following:

- The County of Del Norte, Office of Emergency Services — A local and regional agency involved in hazard mitigation activities. Their mission includes mitigate the impacts of future disasters by incorporating emergency management concepts and risk analysis into future planning efforts and infrastructure design.
- The County of Del Norte — A local and regional agency that has authority to regulate development.
- The Elk Valley Rancheria — A local Tribe which owns land adjacent to the Crescent City Harbor District and is involved in planning processes adjacent to the Harbor District.
- The City of Crescent City — A local neighboring government and an agency that has authority to regulate development adjacent to the Harbor District.
- Del Norte Local Agency Formation Commission — A local and regional agency involved in planning and regulating existing and future public services, including those in the Crescent City Harbor District

Local businesses in the Harbor were also given the draft plan and invited to the public meetings.

### **2.3 Existing Reports, Plans, Regulatory Tools and Other Resources**

Hazard mitigation planning must include review and incorporation, if appropriate, of existing plans, studies, reports, and technical information

The plan team relied heavily on the information in the 2018 Hazard Mitigation Plan in preparing this plan. All the relevant federal and state agencies' programs and regulations identified in the 2018 plan were reviewed for relevance and the majority were incorporated into this plan. (see Appendix A for list).

Report, plans, and regulatory mechanisms that were published since the 2018 plan were also reviewed to provide information for this plan. These include:

- **Hazard Mitigation Plan Development Tool-kit** —The toolkit was used to support the development of this plan including past hazard events, noted vulnerabilities, risk ranking and action development.
- Ben C. Gerwick Engineering study and predictive modeling for tsunami flow in Inner Boat Basin of the Crescent City Harbor— Used to aid in the identification of mitigation actions regarding future tsunamis.
- Cal Poly Humboldt: Redwood Coast Tsunami Work Group: You live in Earthquake County — Used to aid in the identification of earthquakes as local Hazard.
- **CCHD Sea Level Rise Assessment (AB691)** — Used to aid in the identification of mitigation actions regarding future sea level rise.
- **California Ocean Protection Council: Sea Level Rise -Guidance-DRAFT-Jan-2024** — Used to aid in the identification of mitigation actions regarding future sea level rise.
- Climate Central: Sea Level Rise and Coastal Flood Risk (Summary for Del Norte County — Used to aid in the identification of mitigation actions regarding future flooding.
- **CCHD Municipal Service Review and Sphere of Influence Update** — Used to aid in the identification of mitigation actions to lessen impacts on infrastructure.
- **Crescent City Economic Development Strategic Action Plan** — Used to aid in the identification of mitigation actions on infrastructure and business.
- **Del Norte County Comprehensive Economic Development Strategic Plan** — Used to aid in the identification of mitigation actions on infrastructure and business.

The Harbor planning team also looked at other available data and hazard projections to enhance the update to the plan. The updated California Geological Service Inundation maps, the California Geological Service Tsunami Hazard Map Area and the FEMA National Flood Layer Maps were analyzed and discussed, and the findings were incorporated into this plan.

### 3. RISK ASSESSMENT

Risk assessment is the process of estimating the potential loss of life, personal injury, economic injury, and property damage resulting from identified hazards.

The Hazard Mitigation Plan requirements are a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

The risk assessment must include:

- Hazard identification—Use all available information to determine what types of hazards may affect a jurisdiction, how often they can occur, and their potential severity.
- Exposure identification—Estimate the total number of people and properties in the jurisdiction that are likely to experience a hazard event if it occurs.
- Vulnerability identification and loss estimation—Assess the impact of hazard events on the people, property, environment, economy, and lands of the region, including estimates of the cost of potential damage or cost that can be avoided by mitigation.

This section of the plan will look at all those items.

#### 3.1 Jurisdiction-Specific Natural Hazard Event History

Table 3.1 identifies some of the past occurrences of natural hazards for which specific damage was recorded in the Crescent City Harbor District in the past 60 years. Some of these hazard events caused damage throughout the entire Harbor District, some just damaged portions of the Harbor District. All resulted in economic loss to the Harbor District and impacts to users of the Harbor.

Type of Event	FEMA Disaster # (if applicable)	Date	Damage Assessment
Severe Storm	DR-4699	4/3/23	\$150,000
Flood	EM-3592	3/10/23	N/A
Flood	DR-4683	1/14/23	\$7,000,000
Fire	DR-4569	10/16/20	N/A
Other	DR-4482	3/22/2020	N/A
Other	EM-3428	3/13/2020	N/A

Severe Storm	DR-4434	5/17/19	\$200,000
Severe storm, flooding, wind	DR-4308	2/2017	\$95,000
Tsunami	DR-1968	3/11/2011	\$24,735,332
Severe winter storms	N/A	1/1/2008	\$150,000
Tsunami	N/A	11/15/2006	\$28,222,299
Severe storms, flooding	DR-1628	2/3/2006	\$3,000,000
Tropical Storm	EM-3248	9/13/2005	N/A
El Nino floods	DR-1203	2/9/1998	N/A
Severe Storm	DR-1155	1/4/1997	N/A
Severe Storm	DR-1044	1/10/1995	N/A
Fishing losses (El Nino effect)	FDR-1038	9/20/1994	N/A
Flood	DR-979	2/3/1993	N/A
Earthquake	DR-943	4/25/1992	N/A
Wildland fire (lightning)	GP-1987	9/10/1987	N/A
Flood	DR-758	2/21/1986	N/A
Tropical Storm*	DR-677	2/9/1983	N/A
Severe Storms, Flooding	DR-329	4/5/1972	N/A
Flood	DR-283	2/16/1970	N/A
Flood	DR-183	12/24/1964	N/A
Tsunami	DR-169	3/31/1964	N/A

### **3.1.1 Hazard Risk Ranking**

The 2018 ranking process involved an assessment of the likelihood of occurrence for each hazard, along with its potential impacts on people, property and the economy.

The 2024 planning team reviewed the current impact area tools from FEMA and other agencies to determine impacts of earthquakes, floods, tsunami and sea level rise on the project area. (Maps of those results are in Appendix B).

For this plan, the team considered the full range of natural hazards that could affect the planning area and then listed hazards that present the greatest concern.



Two types of events are not directly reflected on the natural event charts, but studies and data show that the probability is high they will occur, so they are included in the Hazard Risk Ranking: earthquakes and sea level rise.

To determine the impacts of sea level rise on the District, documents reviewed and included the following: CCHD Sea Level Rise Assessment (AB691); California Ocean Protection Council: Sea Level Rise -Guidance-DRAFT-Jan-2024 and Climate Central: Sea Level Rise and Coastal Flood Risk (Summary for Del Norte County). Each of the documents show that sea level rise will be an increasing hazard impacting the Crescent City Harbor District.

The planning team reranked the hazards based on the historical record of hazard damage in the Harbor. In addition, based on recent hazards, the team modified the ranking to include Wildland Fire.

The 2023 Smith River Complex Fire had a severe impact on the Harbor and the businesses in the Harbor. The fire caused a week of no power, and then several weeks of power provided by generators. The lack of power disrupted normal business operations in a variety of ways and led to a large decrease in revenue for the Harbor District and local businesses.

Table 3.2 presents a list of Risk Ranking for all hazards of concern for the Crescent City Harbor District.

Table 3.2. Hazard Risk Ranking			
Rank	Hazard Type	Risk Rating Score (Probability x Impact)	Category
1	Tsunami	(3x18) = 54	High
2	Severe Weather	(3x9) = 27	High
3	Flooding	(2x9) = 18	High
4	Wildland Fire	(2 x 0) = 0	Medium
5	Earthquake	(2 x 18) = 36	Medium
6	Sea Level Rise	(2 x 10) = 20	Medium
Tsunami - Rank based on past tsunami events and possible tsunami events. Assumptions for risk ranking i based on composite possible tsunami events			
Severe Weather - Rank based on past events and possible events. Assumptions for risk ranking include high probability, medium impact on people, low impact on assets and low impact on operations.			
Flooding - Rank based on past events and possible events. Assumptions for risk ranking based on 1 percent-annual-chance flood zone (otherwise known as the special flood hazard area)			
Wildland Fire - Rank based on past events and possible events. Assumptions for risk ranking based on Very High and High Fire Severity Zones.			
Earthquake - Rank based on past regional events and future scenarios. Assumptions for risk ranking based on the Big Lagoon Bald Mountain M7.9 scenario			

Sea Level Rise - Rank and assumptions for risk ranking based on 4 feet of sea level rise.

### 3.2 Jurisdiction Specific Vulnerabilities

This section provides information about the specific hazard vulnerabilities for the jurisdiction based on historical impacts and data which shows potential future impacts on the Harbor.

Facilities in the Harbor District can be divided into two categories: Critical facilities and infrastructure essential to the health and welfare of the population and noncritical facilities.

Critical facilities are typically defined to include police and fire stations, schools, and emergency operations centers. Critical infrastructure can include the roads and bridges that provide ingress and egress and allow emergency vehicles access to those in need and the utilities that provide water, electricity and communication services to the community.

Critical facilities in The Harbor District include the harbor office, the harbor maintenance buildings and the management team office. Critical infrastructure in the Harbor District includes the breakwaters and seawalls, which protect the harbor, but also U.S. Highway 101 as it fronts along the harbor district. It also includes the harbor roads and Citizen's Dock.

There are approximately 24 buildings in the harbor, which are a mix of retail, commercial and office use. More than a hundred people work in those buildings and hundreds more visit them each day. There are estimated to be between 45 and 200 RVs in the planning area, depending upon the time of year. All the RVs are residential use and may have multiple people staying in them. In addition, there are approximately 100 boats which moor in the harbor on a daily basis. Depending on the time of day, many of those boats may have 1-5 people on them.

The risk assessments in this plan describe the risks associated with each identified hazard of concern. The potential impacts from those have been identified based on a review of the results of the risk assessment, public involvement strategy, historical data, and data projections included in sea level rise studies.

To protect individual privacy and the security of critical facilities, information on properties assessed is presented in aggregate, without details about specific individual personal or public properties.

Figure 3.1 shows the plan's geographic boundaries within the planning area.

**Figure 3.1**



### **3.2.1 Tsunami**

#### **3.2.1.1 General Background**

Tsunamis can be induced by earthquakes, landslides and submarine volcanic explosions. At the shoreline, tsunamis may take the form of a fast-rising tide, a cresting wave, or a bore (a large, turbulent wall-like wave). The bore phenomenon resembles a step-like change in the water level that advances rapidly (from 10 to 60 miles per hour). The first wave is usually followed by several larger and more destructive waves. The configuration of the coastline, the shape of the ocean floor, and the characteristics of advancing waves play important roles in the destructiveness of the waves.

The Crescent City Harbor District is thought to be the most prone tsunami location in the United States.

#### **3.2.1.2 Hazard Profile - Past Events**

Previous tsunamis have caused significant damage to Harbor District facilities and operations, including:

- Destruction of the commercial boat basin
- Destruction of commercial fishing docks
- Destruction of boats in the harbor

- Destruction of the recreation docks
- Destruction of boat ramp
- Destruction of buildings
- Destruction of recreational vehicles
- Destruction of private cars and harbor vehicles
- Disruption of electricity and water service

In addition, visitors may not be aware of appropriate responses in the event of a tsunami warning, which could lead to injuries and loss of life.

### **3.2.1.3 Frequency**

The Global Historical Tsunami Database lists 40 tsunami events recorded in the planning area between 1938 and 2023.

The two most significant Tsunamis:

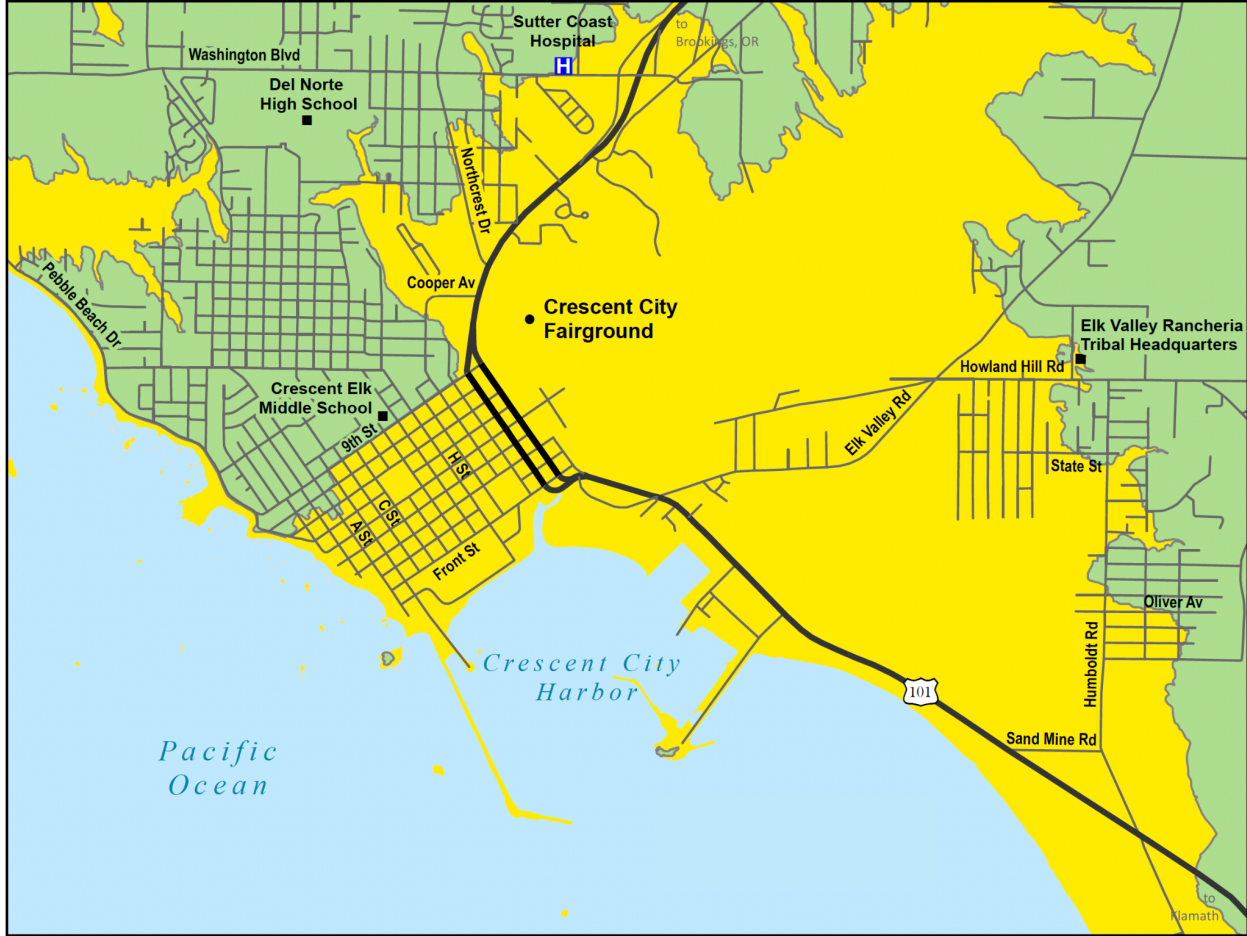
1964 Alaska Earthquake Tsunami—The 1964 tsunami event generated by the magnitude-9.2 Alaska earthquake resulted in the most fatalities. Tsunami waves reached Crescent City at heights of more than 20 feet and inundated 29 city blocks. Four waves were associated with this event. Much of the non-permanent infrastructure in the Harbor was destroyed.

2011 Japan Earthquake Tsunami—An 8-foot swell of water destroyed docks and boats in the harbor. The commercial boat basin was destroyed and had to be completely rebuilt. The recreational boat docks were destroyed and have not been replaced in the inner boat basin. The replacement value of infrastructure and property destroyed exceeded \$30 million.

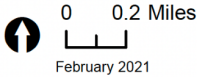
### **3.2.1.4 Exposure and Vulnerability**

Figure 3.2 shows the Tsunami Inundation Zone for the Crescent City Harbor and surrounding areas.

Figure 3.2 Tsunami Inundation Zone



**CRESCENT CITY**  
*Tsunami Hazard Map*



**3.2.1.5 Population**

The entire population of the planning area is potentially exposed to some degree to direct damage from tsunamis or indirect impacts such as business interruption, road closures, loss of function of utilities and damage of critical infrastructure which protects the harbor area. Short term and long-term residents staying in the harbor could be vulnerable to tsunami hazards and could suffer both short- and long-term effects. Those working in the harbor are also potentially exposed to some degree of hazard from tsunamis.

**3.2.1.6 Property**

All property in the Harbor District is considered vulnerable to tsunami hazards. Impacts based on past tsunamis include destruction of the commercial boat basin, business interruption, road closures, loss of function of utilities and damage of critical infrastructure which protects the harbor area. Past tsunami damages have been in the tens of millions of dollars.

There has been no development/land use in the Harbor in the past 5 years which affected the jurisdiction's vulnerability to this hazard.

### **3.2.1.7 Critical Facilities and Infrastructure**

Since the entire planning area has exposure to tsunamis, all critical facilities and infrastructure components are exposed.

The inner basin docks were replaced in 2012 with piles that account for a tsunami surge elevation of 7.5 feet. The Harbor is currently seeking funding to armor the rest of the harbor infrastructure to those standards.

### **3.2.1.8 Environment**

The entire Harbor District is exposed to tsunami hazards, including all natural resources, habitat and wildlife.

### **3.2.1.9 Future Development Trends**

The County general plans include policies regarding construction in tsunami hazard areas. The County requires construction in low-lying coastal areas or in the zone of possible tsunami runup to be designed in accordance with the requirements of the County Flood Hazard Ordinance (Del Norte County, 2003). The Crescent City Harbor District will follow the County general plan for new construction in the Harbor.

### **3.2.1.10 Scenario and Impacts**

The worst-case scenario for the planning area is a local tsunami event triggered by a seismic event along the Cascadia subduction zone. Historical records suggest that tsunami wave heights on the order of 15 to 60 feet could be generated by a Cascadia subduction event. A major tsunami event in the region would have devastating impacts on the people, property and economy of the Harbor District and the rest of Del Norte County. Changes in population patterns could include displacement of socially vulnerable populations currently using the RV park, and changes in land use and development to prevent future impacts.

### **3.2.1.11 Issues**

Important issues associated with a tsunami in the planning area include the following:

- A local tsunami presents the highest risk to the planning area, as evacuation times may be extremely limited.
- The loss of harbor and dock facilities after an earthquake would have significant impacts on the local economy.

- As tsunami warning technologies evolve, the tsunami warning capability within the planning area will need to be enhanced to provide the highest degree of warning to planning partners with tsunami risk exposure.
- With the possibility of climate change, the issue of sea level rise may become an important consideration as probable tsunami inundation areas are identified through future studies.
- Special attention will need to be focused on the vulnerable communities and tourists in the tsunami zone and on hazard mitigation through public education and outreach.

### **3.2.2 Severe Weather**

#### **3.2.2.1 General Background**

Severe Weather, which includes a mix of heavy rain and wind, often combined with large waves, has had impacts on the Harbor and will continue to do so in the future.

#### **3.2.2.2 Hazard Profile - Past Events**

Previous Severe Weather events have caused significant damage to Harbor District facilities and operations, including:

- Damage to Harbor infrastructure, including breakwaters.
- Damage to buildings.
- Flooding.
- Closure of roads due to high water and debris.
- Power outages.

#### **3.2.2.3 Frequency**

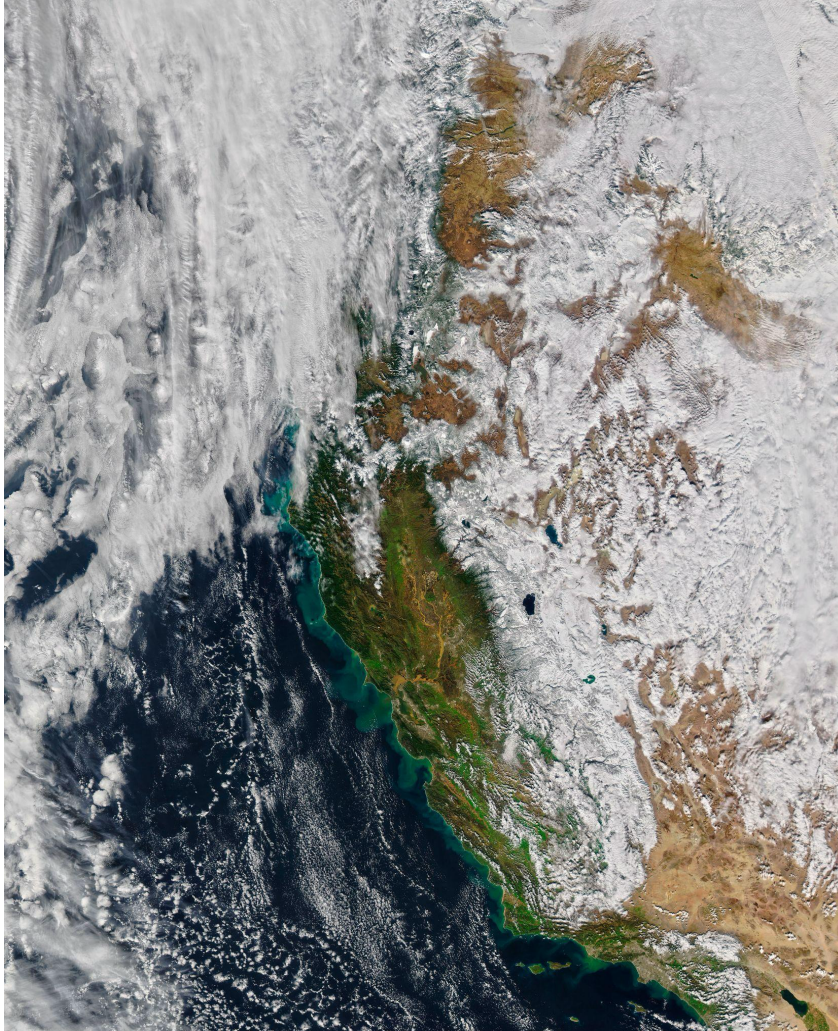
There have been 23 recorded severe weather events in the planning area since 1958. Severe winter storm events have occurred nine times, with an average recurrence rate of eight to nine years. Damaging winds events have occurred 16 times, with an average recurrence rate of every three to four years. In the planning area, there are an average of five thunderstorm days per year. The probability of a severe weather event impacting the planning area is high.

#### **3.2.2.4 Exposure and Vulnerability**

Figure 3.3 is of satellite imagery of the January 7, 2023, storm which brought heavy rains, winds, and some flooding to the Crescent City Harbor District. As can be seen, severe weather impacts both the planning area and the entire region simultaneously.

#### **Figure 3.3**





### **3.2.2.5 Population**

The entire population of the planning area is potentially exposed to some degree to direct damage from severe weather hazards. The most common problems associated with severe weather events are immobility, closure of roads, and loss of utilities. However, damage of critical infrastructure which protects the harbor, has and can also occur. Short term and long-term residents staying in the harbor could be vulnerable to severe weather hazards and could suffer both short- and long-term effects. Those working in the harbor are also potentially exposed to some degree of hazard from severe weather hazard.

### **3.2.2.6 Property**

All property in the Harbor District is vulnerable during severe weather events, but properties in poor condition or in particularly vulnerable locations may risk the most damage. This could include damage from wind, rain, or flooding. Impacts based on past storms include business



interruption, road closures, loss of function of utilities and damage of critical infrastructure which protects the harbor area. Past damages have been in the millions of dollars.

There has been no development/land use in the Harbor in the past 5 years which affected the jurisdiction's vulnerability to this hazard.

### **3.2.2.7 Critical Facilities and Infrastructure**

Since the entire planning area has exposure to severe weather, all critical facilities and infrastructure components are exposed to severe weather hazards, including power, water and phone service, roads, and breakwaters.

### **3.2.2.8 Environment**

The entire planning area is exposed to the severe weather, including all natural resources, habitat and wildlife.

### **3.2.2.9 Future Development Trends**

All future development will be affected by severe weather events. The ability to withstand impacts lies in sound land use practices and consistent enforcement of codes and regulations for new construction. The local planning partners have adopted the International Building Code in response to California mandates. This code is equipped to deal with the impacts of severe weather events. Land use policies identified in general plans within the planning area also address many of the secondary impacts (flood and landslide) of the severe weather hazard. With these tools, the planning partners are well equipped to deal with future growth and the associated impacts of severe weather.

### **3.2.2.10 Scenario and Impacts**

A worst-case severe-weather event would involve prolonged high winds during a winter storm with large amounts of precipitation after soils are already saturated. Such an event would have both short-term and long-term effects. Road in and adjacent to the Harbor could experience limited ingress and egress. Prolonged rain could produce flooding further obstructing roads and isolating the Harbor residents. Changes in population patterns could include displacement of socially vulnerable populations currently using the RV park, and changes in land use and development to prevent future severe weather impacts.

### **3.2.2.11 Issues**

Important issues associated with severe weather in the planning area include the following:

- Older building stock in the planning area could be highly vulnerable to severe weather events such as damaging winds.
- Power outages could cause significant communication disruption.
- Transportation routes in the planning area are limited. If severe weather results in road closures, there could be delays in response and recovery.

### **3.2.3 Flooding**

#### **3.2.3.1. General Background**

The Crescent City Harbor District is susceptible to both coastal flooding and riverine flooding from the several creeks that are adjacent or flow across Harbor District lands.

Flooding along the Harbor District is often associated with the simultaneous occurrence of very high tides, large waves, and storm swells during the winter. Storm centers from the southwest produce the type of storm pattern most commonly responsible for serious coastal flooding. The strong winds and high tides that create storm surges are also accompanied by heavy rains. In some instances, high tides block river flow, which causes flooding at the river mouths.

Flooding on Elk Creek and its recognized floodplain is caused by a combination of excess runoff and tidal action. Excess runoff is caused by heavy rainfall and tidal action is caused by wind, waves and tsunamis. Flooding history on Elk Creek indicates that tidal action has been the principal cause of flooding.

#### **3.2.3.2 Hazard Profile - Past Events**

Flooding has, and can have the following impacts on the Harbor:

- Flood debris flowing down Elk Creek can block Marina entrance and pollutants in flood waters can jeopardize the health of marine mammals and fish stock.
- Flooding of Anchor Way blocks critical infrastructure located on Whaler Island.
- Flooding debris must be cleared and disposed of before roads are reopened.

#### **3.2.3.3 Frequency**

Flooding has been extensively documented by gage records, high water marks, damage surveys and personal accounts. Flooding events occur almost annually in the Harbor District. Floods large enough to trigger either a national or state disaster declaration have occurred at the rate of at least once per decade since the 1960s.

#### **January 2006 Flood Event**

The year began with a New Years' weekend storm pummeling Del Norte County, damaging the Crescent City harbor, flooding Klamath, and closing Highways 101 and 169. Damage in the Harbor exceeded \$1 million. December 20

December 2016 Flood Event

A strong atmospheric river brought widespread rainfall to Northwest California in mid-December causing flooding and damage in the harbor.

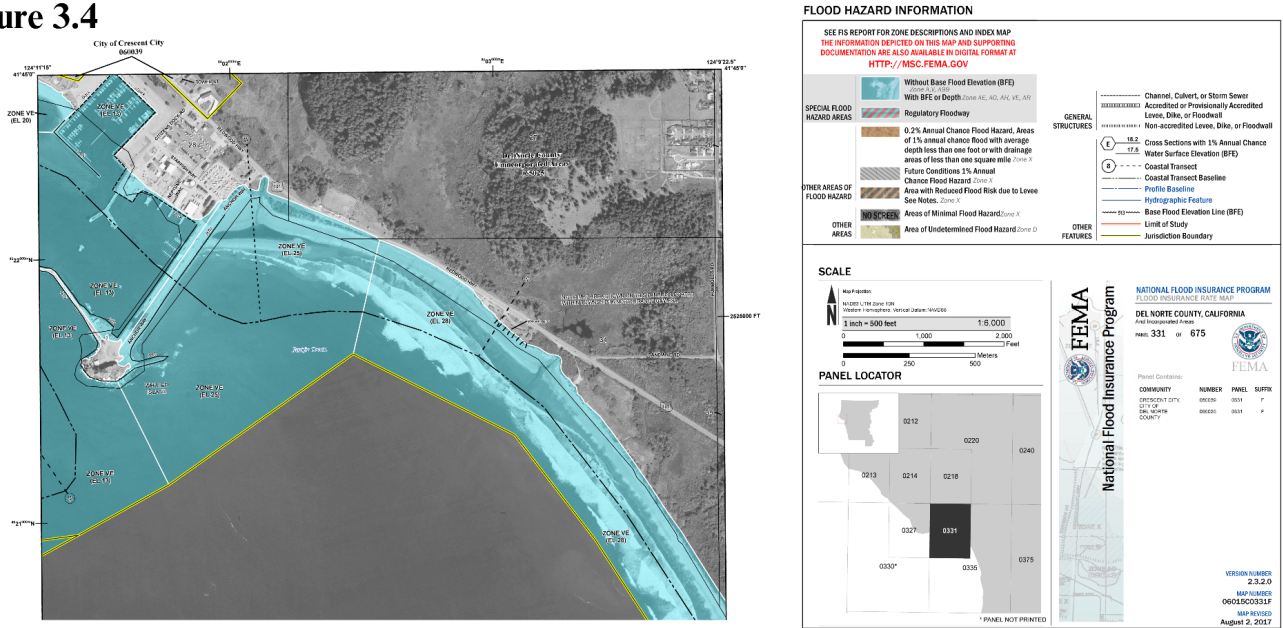
December 2022 -January 2023 Flood Event

The year ended and began with a weeklong storm along the entire California Coast, resulting in a national disaster declaration. The flooding accompanied by high seas damaged critical pieces of Harbor infrastructure: the Whaler Island groin, the Anchor Way Breakwater and Anchor Way road. CCHD has applied for disaster funds to fix those pieces of key infrastructure.

**3.2.3.4 Exposure and Vulnerability**

Figure 3.4 shows the FEMA flood map for Crescent City Harbor District.

**Figure 3.4**



**3.2.3.5 Population**

The entire population of the planning area is potentially exposed to some degree to direct damage from flooding or indirect impacts such as business interruption, road closures, loss of function of utilities and damage of critical infrastructure which projects the harbor area. Short term and long-term residents staying in the harbor could be vulnerable to flooding hazards and could suffer both short and long term effects. Those working in the harbor are also potentially exposed to some degree of hazard from flooding.

**3.2.3.6 Property**

All property in the Harbor District is vulnerable during flooding events, but properties in poor condition or in particularly vulnerable locations may risk the most damage. Impacts based on past flooding include business interruption, road closures, loss of function of utilities and damage of critical infrastructure which protects the harbor area. Past damages have been in the millions of dollars.

There has been no development/land use in the Harbor in the past 5 years which affected the jurisdiction’s vulnerability to this hazard.

The Harbor District contains no NFIP insured structures which have been repetitively damaged by floods.

Using floods from the past 40 years as guides for the potential dollar losses to vulnerable structures in the harbor results in the following estimates for mild, extreme and catastrophic flooding scenarios, table 3.3.

Flood Scenario Chart - Table 3.3			
Scenario	Low Cost	Mid Cost	High Cost
Mild Flooding	\$ -	\$ 500,000	\$ 1,000,000
Extreme Flooding	\$ 500,000	\$ 1,000,000	\$ 5,000,000
Catastrophic flooding	\$ 1,000,000	\$ 5,000,000	\$ 10,000,000
Mild Flooding - based on a flood that is not declared a disaster			
Extreme Flooding - based on the 2022/2023 flood scenario			
Catastrophic flooding - based on the 1964 flood scenario			

**3.2.3.7 Critical Facilities and Infrastructure**

Since the entire planning area has exposure to flooding hazards, all critical facilities and infrastructure components are exposed, especially roads.

**3.2.3.8 Environment**

The entire planning area is exposed to flooding hazard, including all natural resources, habitat and wildlife.

### **3.2.3.9 Future Development Trends**

Expected development trends in the Crescent City Harbor District will be undertaken with efforts to minimize damage from future flooding.

### **3.2.3.10 Scenario and Impacts**

The coastal area and the river systems flood at irregular intervals, but generally in response to a succession of intense winter rainstorms occurring between early November and late March. The worst-case scenario is a series of storms that flood numerous drainage basins in a short time. This would overwhelm Harbor and County response. Major roads would be blocked, preventing critical access for many residents and critical functions. High river flows could cause rivers to scour, possibly washing out roads and creating more isolation problems. In the case of multi-basin flooding, the County and Caltrans may not be able to make repairs quickly enough to restore critical facilities and infrastructure. Changes in population patterns could include displacement of socially vulnerable populations currently using the RV park, and changes in land use and development to prevent future flooding impacts.

### **3.2.3.11 Issues**

The following flood-related issues are relevant to the planning area:

- Many properties and facilities in the Harbor are susceptible to flooding hazards.
- The District needs to review the NFIP program.

## **3.2.4 Wildland Fire**

### **3.2.4.1 General Background**

A wildland fire is any uncontrolled fire on undeveloped land that requires fire suppression. Natural resource lands, primarily forestlands, surround many unincorporated communities in Del Norte County. 239 wildland fires burned in Del Norte County between 1909 and 2023.19 of those fires exceed 3,000 acres.

### **3.2.4.2 Hazard Profile - Past Events**

A wildland fire in Del Norte County would not cause direct damage to the Harbor. However, in the past wildland fires have had severe impacts on the harbor including:

- Loss of electrical power for several weeks.
- Closure of businesses.
- Disruption of harbor operations.
- Decreased revenue to Harbor District and Harbor businesses.

- Exposure to smoke, making it difficult to breathe.

### **3.2.4.3 Frequency**

The overall probability of some wildland fire event impacting Del Norte County is high. There is an average of 2 fires per year and the range is 0 to 17 fires per year.

#### Smith River Complex fire (2023)

This fire burned 95,107 acres and caused disruption in power to the Harbor for 5 days then intermittently for the next three weeks. The almost one month-long closure of Highway 199 disrupted freight travel to and from the harbor impacting the commercial fishing industry and restaurants in the harbor.

#### Biscuit Fire (2002)

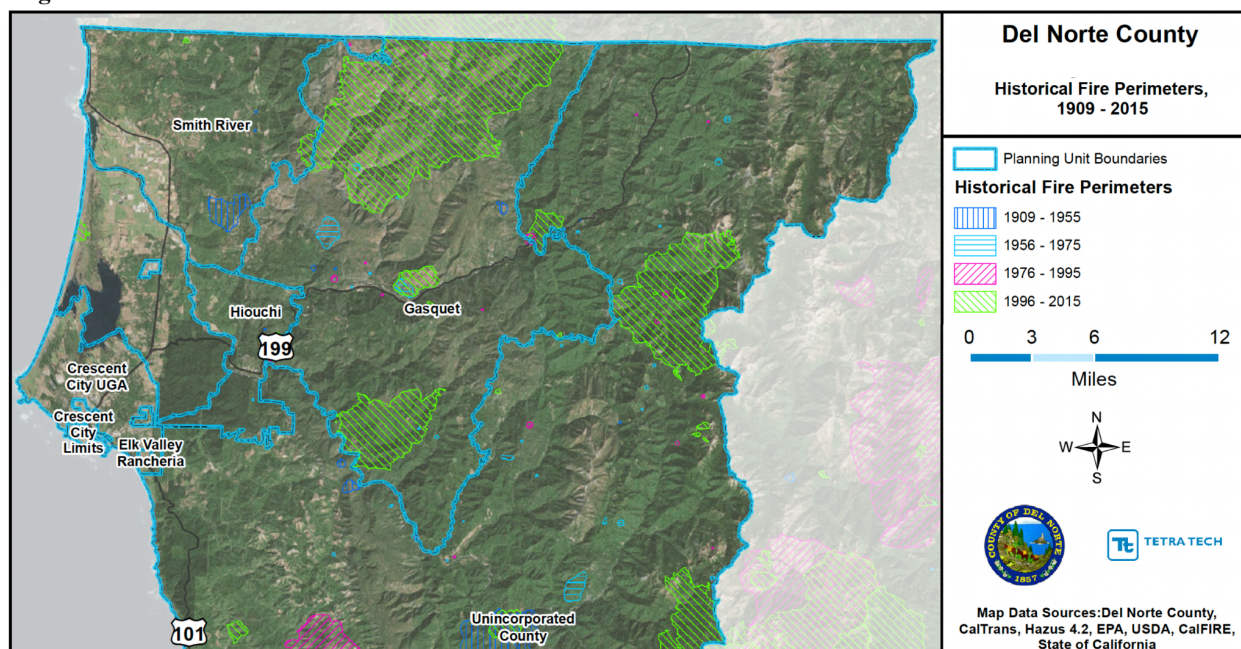
This fire burned over 500,000 acres and caused disruption in power to the Harbor for more than a week and then intermittently for almost a month. The on and off again closure of Highway 199 during a two month period disrupted freight travel to and from the harbor impacting the commercial fishing industry and restaurants in the harbor.

The probability of wildland fire event impacting the Crescent City Harbor District is much lower, probably zero. There has not been a wildland fire event that has impacted the Harbor since construction of the Harbor. The only non-developed tree or bush covered property is the year round wetlands across the street from the Harbor. Climate change will likely have no effect on the likelihood of wildfire danger to the Harbor.

### **3.2.4.4 Exposure and Vulnerability**

Figure 3.5 shows historical wildland fire perimeters in Del Norte County. Though the fires themselves have not directly threatened structures in the Crescent City Harbor District, secondhand impacts from the fires have disrupted operations at the harbor.

**Figure 3.5 Fire Perimeters**



### 3.2.4.5 Population

The entire population of the planning area is potentially exposed to some degree of electrical infrastructure disruption from wildland fires that damage the electrical infrastructure in other parts of Del Norte County. This could include direct damage, like loss of refrigerated and frozen food and business closures, to indirect impacts such as business interruption. They are also exposed to smoke making it difficult to breathe.

### 3.2.4.6 Property

All properties in the harbor are exposed to impacts of wildland fires from the loss of electricity for weeks at a time.

No properties in the harbor are at direct risk from wildland fires. There have been no direct wildland fire events in the harbor.

There has been no development/land use in the Harbor in the past 5 years which affected the jurisdiction’s vulnerability to this hazard.

### 3.2.4.7 Critical Facilities and Infrastructure

The entire planning area has exposure to the secondary impacts of wildland fire hazards. The Harbors’ critical facilities and electricity and harbor operations can be impacted. However, most of the Harbor’s critical infrastructure does not rely on electricity to work, so exposure would be short term for each occurrence.

### **3.2.4.8 Environment**

There is minimal direct exposure to wildland fire hazard for the natural resources, habitat, and wildlife of the Harbor. There may be impacts from secondary impact exposure.

### **3.2.4.9 Future Development Trends**

Wildland fires will continue to be an issue in the wilderness areas of Del Norte County. Development in the Harbor will need to consider times of intermittent power and plan for those outages.

### **3.2.4.10 Scenario and Impacts**

Worst case scenario is a wildfire would destroy miles of the utility infrastructure along Highway 199, making power outages and interruptions occur for months. Changes in population patterns could include displacement of socially vulnerable populations currently using the RV park, and changes in land use and development to prevent future wildland fire impacts.

### **3.2.4.11 Issues**

Though the Crescent City Harbor District is not directly threatened by wildland fires, disruption in electricity and goods and services caused by wildfires, makes the Harbor vulnerable to the impacts of wildfire.

- Harbor District should explore its own power infrastructure opportunities.

## **3.2.5 Earthquake**

### **3.2.5.1 General Background**

All areas of Northern California have experienced earthquakes in the past and will do so again in the future. In the past 150 years, nearly 40 earthquakes of magnitude 6 or larger have affected Northern California. The Cascadia Subduction Zone stretches underneath the Humboldt-Del Norte county region, extending from Cape Mendocino all the way up through the Pacific Northwest. This fault zone is capable of generating a magnitude 9 (or larger) earthquake on average every 500 years. The last such event was in 1700.

Data show that partial ruptures on the southern half of the Cascadia Seismic Zone (which extends into Northern California) have historically generated earthquakes with magnitude 8 or greater. On December 20, 2022, a magnitude 6.4 quake struck a few miles off the coast of



Humboldt County, followed by at least a dozen smaller aftershocks. Very large earthquakes occurring close to the coast could cause damaging levels of ground shaking and tsunami waves.

### 3.2.5.2 Hazard Profile - Past Events

The CCHD has not experienced an earthquake event that has resulted in a federal disaster declaration. However, the 7.2 Cape Mendocino event, which struck on April 25, 1992, and the December 20, 2022, Humboldt quake, with a magnitude 6.4, were both felt in the harbor.

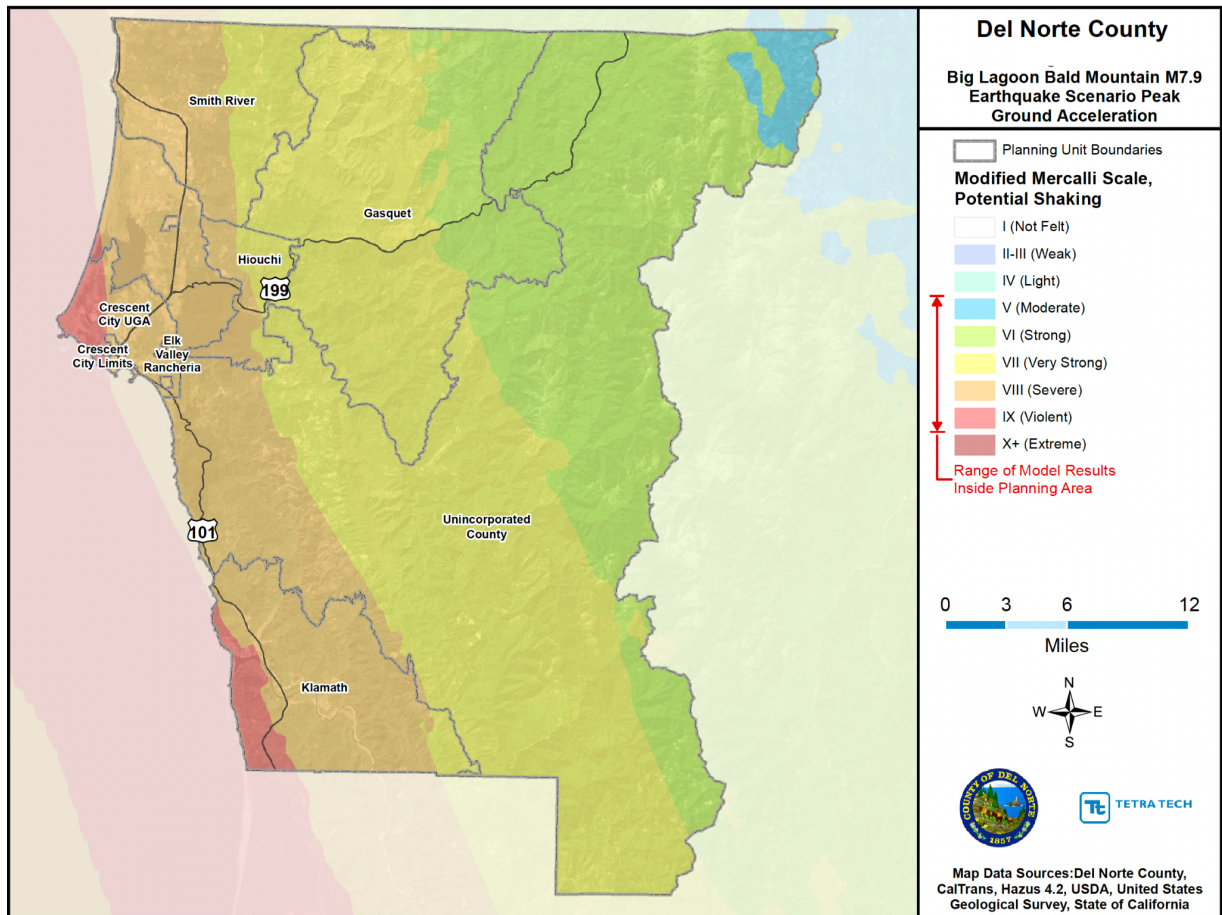
### 3.2.5.3 Frequency

Del Norte County is susceptible to regular earthquake activity, as evidenced by the five seismic events with a magnitude of 5.5 or higher experienced from 2000 through 2018 (see Table 9-3). Since 2000, the planning area has been impacted by a magnitude 5.5 or greater event every 3.6 years, on average.

### 3.2.5.4 Exposure and Vulnerability

Figure 3.6 is from the 2018 Hazard Mitigation Plan and shows impacts in Del Norte County, Crescent City and the Crescent City Harbor District from a 7.9 earthquake in Big Lagoon / Bald Mountain area of Humboldt County.

**Figure 3.6 Big Lagoon / Bald Mountain Earthquake Scenario**



### **3.2.5.5 Population**

The entire population of the planning area is potentially exposed to some degree to direct damage from earthquakes or indirect impacts such as business interruption, road closures, loss of function of utilities and damage to critical infrastructure which projects the harbor area. Short term and long-term residents staying in the harbor could be vulnerable to earthquakes and could suffer both short and long term effects. Those working in the harbor are also potentially exposed to some degree of hazard from earthquakes.

### **3.2.5.6 Property**

All property in the Harbor District is considered vulnerable to earthquake hazards.

There has been no development/land use in the Harbor in the past 5 years which affected the jurisdiction's vulnerability to this hazard.

### **3.2.5.7 Critical Facilities and Infrastructure**

Since the entire planning area has exposure to the earthquake hazard, all critical facilities and infrastructure components are exposed. This includes roads, utility infrastructures, breakwaters and docks.

### **3.2.5.8 Environment**

The entire planning area is exposed to earthquake hazard, including all natural resources, habitat and wildlife.

### **3.2.5.9 Future Development Trends**

Land use in the planning area will be directed by general plans adopted under California's General Planning Law. The safety elements of the general plans establish standards and plans for the protection of the community from hazards, including seismic hazards.

### **3.2.5.10 Scenario and Impacts**

Based on history and geology, the Del Norte County planning area will be frequently impacted by earthquakes. The worst-case scenario is a higher-magnitude event (7.5 or higher) with an epicenter within 50 miles of Del Norte County. Earthquakes of this magnitude or higher could lead to massive structural failure of property on soils prone to liquefaction. Building and road foundations would lose load-bearing strength. An earthquake event of this magnitude located off the coast could cause a significant local tsunami that would further damage structures and

jeopardize lives. Changes in population patterns could include displacement of socially vulnerable populations currently using the RV park, and changes in land use and development to mitigate future earthquake impacts.

Climate change is not expected to affect earthquake scenarios.

### **3.2.5.11 Issues**

Important issues associated with an earthquake include the following:

- A large percentage of the planning area is located on NEHRP D soils, which is prone to liquefaction. Structures on these soils may experience significant structural damage; however, this threat is unknown as liquefaction susceptibility maps have not been developed.
- Damage to road systems in the planning area after an earthquake has the potential to significantly disrupt response and recovery efforts and lead to isolation of populations.
- Earthquakes can cause conflagration of wooden homes and collapse of essential buildings such as fire stations.
- Landslides and tsunamis are major natural secondary hazards that could have a widespread effect on the county.
- Citizens are expected to be self-sufficient up to two weeks after a major earthquake without government response agencies, utilities, private-sector services, and infrastructure components. Education programs are currently in place to facilitate development of individual, family, neighborhood, and business earthquake preparedness. It takes individuals, families, and communities working in concert with one another to truly be prepared for disaster.
- After a major seismic event, Del Norte County is likely to experience disruptions in the flow of goods and services resulting from the destruction of major transportation infrastructure across the broader region.

## **3.2.6 Sea Level Rise**

### **3.2.6.1 General Background**

Sea levels have been rising over the past several decades and are expected to continue to rise. Sea level rise is mostly attributed to two factors: the expansion of water as it warms (thermal expansion) and the melting of ice sheets and glaciers. As average ocean temperatures continue to increase, thermal expansion will continue and can be projected with some degree of certainty. Less certain is how quickly ice sheets will melt, accounting for most of the uncertainty in projections.

### 3.2.6.2 Hazard Profile - Past Events

The physical impacts of sea level rise include inundation, flooding, increasing shoreline erosion, larger tidal prisms, wave heights and force, saltwater intrusion, and changes in sedimentation and littoral drift patterns.

According to the Climate Central: Sea Level Rise and Coastal Flood Risk (Summary for Del Norte County “Even small amounts of sea level rise make rare floods more common by adding to tides and storm surge. Climate Central has estimated risk by combining local sea level rise projections with historic flood statistics from the NOAA water level station at Charleston, OR, 112 miles from the center of Del Norte County. For reference, our extreme values analysis indicates that the "100-year" flood height, is 3.6 feet above local Mean Higher High Water (high tide line)<sup>1</sup>. The highest observed flood at this location, in records from 1970 to 2015, reached 3.56 feet MHHW in 1983. Taken all together, these values suggest that floods above 4 feet likely pose significant concerns.”

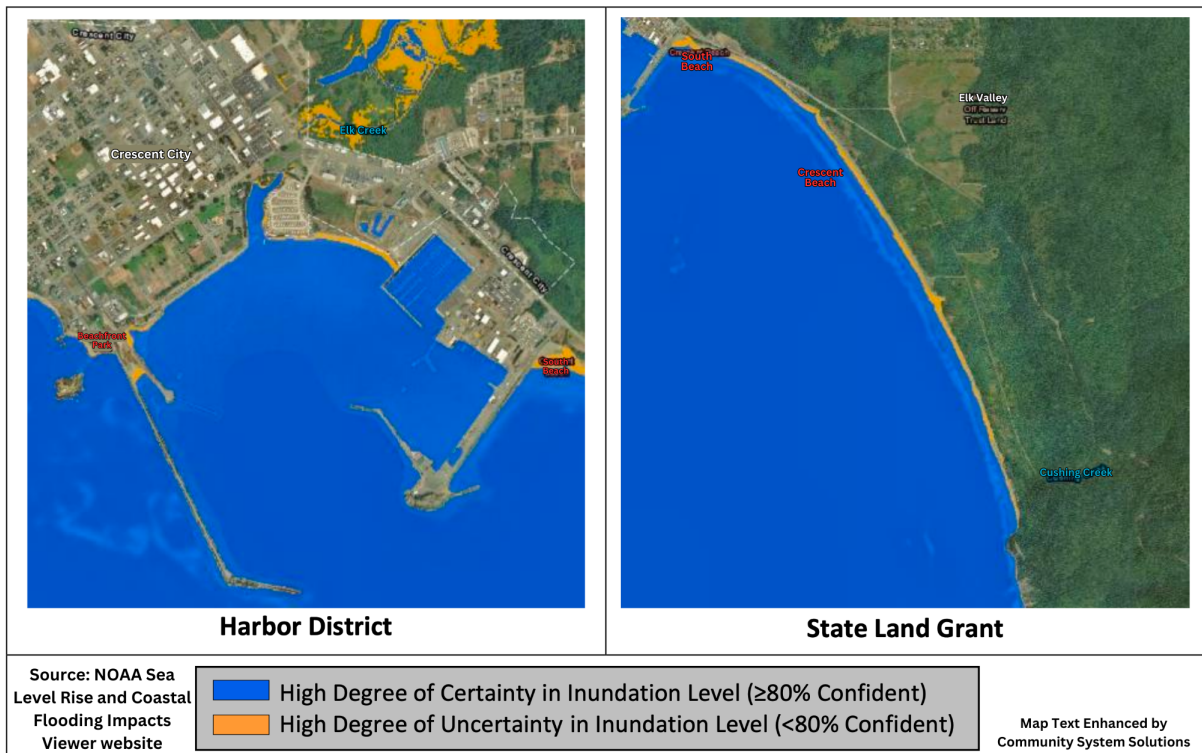
### 3.2.6.3 Frequency

Numerous studies have found that sea level is rising. For the California coast, sea level rise is estimated to be as follows: six inches by 2030; 1.5 ft by 2050; 6 feet by 2100.

### 3.2.6.4 Exposure and Vulnerability

Figure 3.7 shows the inundation levels at the Crescent City Harbor District of sea level rise of 2 feet, according to the Crescent City Harbor District AB691 Sea-Level Rise Assessment.

**Figure 3.7 Sea Level Rise**



### **3.2.6.5 Population**

The entire population of the planning area is potentially exposed to some degree to direct damage from sea level rise or indirect impacts such as business interruption, road closures, loss of function of utilities and damage of critical infrastructure which protects the harbor area. Short term and long-term residents staying in the harbor could be vulnerable to sea level rise and could suffer both short- and long-term effects. Those working in the harbor are also potentially exposed to some degree of hazard from sea level rise.

### **3.2.6.6 Property**

All property in the Harbor District is considered vulnerable to sea level rise hazards in the future. Without mitigation, the estimated costs of harbor resources and facilities that could be impacted by SLR could exceed \$100 million. Private owned resources in the harbor would also experience significant damage.

There has been no development/land use in the Harbor in the past 5 years which affected the jurisdiction's vulnerability to this hazard.

### **3.2.6.7 Critical Facilities and Infrastructure**

Since the entire planning area is exposed to sea level rise, all critical facilities and infrastructure components are exposed.

### **3.2.6.8 Environment**

The entire planning area is exposed to sea level rise including all natural resources, habitat, and wildlife.

### **3.2.6.9 Future Development Trends**

Future sea level rise could significantly impact operations if adaptation measures are not taken.

The CCHD participates in NOAA's National Buoy Data Center, which provides observations that help support the understanding and predicting of changes in weather, climate, oceans, and coastlines. The specificity this data provides is a valuable tool for the CCHD to correlate SLR and tidal information with impacts on the maritime assets. The CCHD will continue to monitor the long-term trends in SLR using the NOAA tidal gauge in the harbor and will continue to monitor changes to existing protective structures. The CCHD will also monitor existing non-protective resources and facilities to evaluate the design life of each and incorporate SLR adaptation strategies.

### 3.2.6.10 Scenario and Impacts

Climate change will impact the level of sea level rise in the Crescent City Harbor District. The following chart was prepared for the Crescent City Harbor District as part of its AB 691 Sea Level Assessment. Probabilistic SLR projections are based on the methodologies of Kopp et al., 2014 and Sweet et al., 2017 for the H++ scenario. This assessment has selected the Medium-High Risk Aversion<sup>1</sup> SLR projections, per the recommendations of the 2018 Ocean Protection Councils Risk Decision Framework and 2017 Harbor Improvement Report.<sup>2</sup> However, a range of projections are provided to demonstrate a spectrum of potential scenarios. While the likelihood that SLR will meet or exceed the Medium-High Risk Aversion Projection is low (0.5% probability), this precautionary approach is suitable for the less adaptive, more vulnerable, manmade CCHD resources that will experience medium to high consequences as a result of underestimating SLR.

Time Horizon (1991- 2009 baseline)	Emissions Scenario <sup>1</sup>	2018 Update Probabilistic SLR Projections (Feet)		
		Likely Range	1-In-200 Chance	H++ Scenario
		67% probability SLR is less than...	0.5% probability SLR meets or exceeds...	
		<i>Low Risk Aversion</i>	<i>Medium-High Risk Aversion<sup>2</sup></i>	<i>Extreme Risk Aversion</i>
2030	High (RCP 8.5)	0.3	0.5	1.2 <sup>3</sup>
2050	High (RCP 8.5)	0.7	1.5	3.1 <sup>3</sup>
2100	Low (RCP 2.6)	1.5	4.8	9.3
2100	High (RCP 8.5)	2.5	5.9	9.3

1 A Representative Concentration Pathway (RCP) is a greenhouse gas (GHG) concentration trajectory (IPCC, 2014). IPCC has established four RCPs that are consistent with possible future GHG emission scenarios. This report examines the two extreme scenarios of a low emissions trajectory (RCP 2.6) and a high emissions trajectory (RCP 8.5). RCP 2.6 assumes that GHG concentrations will peak between 2010 and 2020 then substantially decline. This trajectory aims to keep global warming within 2°C of pre-industrial temperatures. RCP 8.5 assumes that there will be no global efforts to constrain emissions and GHG concentrations will increase throughout the 21st century.

2 Medium-High Risk Aversion SLR Projections are outlined in blue as these will be considered throughout the report.

3 H++ scenario for North Spit, California which is the nearest projection (geographically) to the Crescent City Harbor District.

One impact of SLR are changes in population patterns which could include displacement of socially vulnerable populations currently using the RV park, and changes in land use and development to mitigate SLR impacts.

**3.2.6.11 Issues**

Important issues associated with sea level rise include the following:

- Without mitigation, the estimated costs of harbor resources and facilities that could be impacted by SLR could exceed \$100 million.
- Job losses could impact every business sector in the harbor.
- The tourism industry could be greatly decreased.
- Potential non-market losses due to SLR include recreational activities and marine habitat.

**3.3 Assets**

The majority of built infrastructure in the CCHD is located within the boundary of the harbor. The District has no built assets on the beaches.

Table 3.4 summarizes the critical assets of the district and their value.

<b>Table 3.4 Harbor District Assets</b>	
Asset	Value
<b>Property</b>	
150 Acres of land	\$0 (Not assessed, property exempt)
<b>Critical Facilities</b>	
Administrative Dock and Pump-Out Station	\$889,000
Anchor Way Boat Ramps	\$800,000
Anchor Way Breakwater	\$2,700,000
Beaches (3 total) <sup>1</sup>	-
CCHD Boat Ramps	\$5,200,000
Citizen’s Dock	\$20,900,000
Dredge Ponds	\$250,000
Inner Boat Basin Docks	\$30,000,000
Inner Breakwater	\$3,200,000
Lighthouse Way Breakwater <sup>1</sup>	\$9,730,000
Maintenance/Storage Buildings (5 total)	\$543,000
Marina Breakwater	\$3,160,000
Office/Retail Buildings (13 total)	\$1,630,000
Restroom Buildings (5 total)	\$889,000
Roads and Parking Areas	\$12,600,000



Seafood Processing Plants (2 total)	\$1,410,000
Shipyards Building	\$695,000
Solar Array1	\$1,650,000
South Beach Seawall	\$70,000
Syncrolift, Travelift, and Dock	\$2,500,000
Utilities (Power, Sewer, Water)	\$12,200,000
Whaler Island Groin	\$1,100,000
<b>Total</b>	<b>\$112,116,000</b>
<i>1Asset not owned by CCHD</i>	

### 3.4 Service area and trends

The CCHD 10-Year Strategic Plan 2018 - 2028, is intended to effectively plan for a higher level of Harbor activity, without exceeding the Harbor’s carrying capacity, or the amount of use the Harbor can sustain without adversely affecting the qualities of the area. The plan emphasizes the District’s intention to retain and improve existing harbor facilities in support of commercial fishing and recreational boating, while expanding coastal related visitor serving uses in the Harbor.

At the top of the list for improvements targeted in the plan is replacement of all currently failing infrastructure to create an armored and engineered environment which will incorporate future conditions and infrastructure resilience and significantly increase the level of protection at the harbor to mitigate against a 50-year tsunami event, 100-year storm surges and 1.5-foot sea level rise to protect critical harbor infrastructure.

Business projects include public facility improvements, restaurants and retail shops, and additional overnight accommodations. Such projects are intended to accommodate an increase in recreational, commercial, and visitor usage in a manner that provides for a variety of interests and activities without exceeding the Harbor’s carrying capacity.

Through recent grants and an increase in the Transient Lodging Tax the Harbor District has started replacement of aging infrastructure starting with the Citizens’ Dock seawall. Funding has been received for environmental review and permitting of a new Citizens’ Dock. Grants have been applied for replacement of the inner boat basin breakwaters and the repairs of the Anchor Way breakwater and road.

These hazard mitigation improvements and improvements to the business-related facilities have the potential of generating the revenue necessary to keep the CCHD economically viable,



sustaining its ability to meet its mandates under the State Tidelands Grant and the California Coastal Act.

## 4. MITIGATION STRATEGY

### 4.1 Mitigation Strategy Guiding Principle and Goals

The guiding principle for this hazard mitigation plan is to: Reduce the vulnerability to natural hazards in order to protect the health, safety, welfare and economy of the Crescent City Harbor District.

The following are the mitigation goals for this plan:

1. Save or protect lives from the impact of hazards.
2. Protect the environment.
3. Protect property from the impact of hazards.
4. Maintain economic viability after a disaster event.
5. Promote efficient use of public funds.

### 4.2 Status of Previous Plan Actions

Table 4.1 summarizes the actions that were recommended in the 2018 Hazard Mitigation Plan. Though elements of any given action item may have been started, no action items have been completed, so all of the action items are being carried over into this plan update.

<b>Table 4.1. Status of Previous Plan Actions</b>	
<b>Action Item</b>	<b>Carried Over to Plan Update Action #</b>
CCHD-1—Where appropriate, support retro-fitting, purchase or relocation of structures located in high hazard areas, prioritizing those structures that have experienced repetitive losses and/or are located in high or medium ranked hazard.	CCHD-1
CCHD-2—Actively participate in the plan maintenance protocols outlined in Volume 1 of 2019 hazard mitigation plan	CCHD-2
CCHD-3—Purchase generators for critical facilities and infrastructure that lack adequate back-up power including Harbor Maintenance Shop, Harbor Office, Harbor owned/operated Redwood RV Park.	CCHD-3
CCHD-4—Structural Retrofitting of Existing Buildings: Harbor District Office, 101 Citizens Dock Road; Harbor Maintenance buildings, Raker Road and Starfish Way; 201 Citizens Dock Road structure; Fashion Blacksmith building, 121 Starfish Way; Alber Seafood, 161 Starfish Way; Coast Redwood Art Gallery, 140 Marine Way; Crescent Seafood, 170 Marine Way; U.S. Coast Guard Auxiliary, 150 Marine Way; Crescent City Crab Shack, 160 Anchor Way; Kim’s Hair, 170 Anchor Way; MM Diving, 245 Anchor Way; North Coast Ocean Sports & Grill; 110 Anchor Way; Pacific Choice Ice Plant, end of Lumber wing, Citizens Dock; Pacific Choice Seafood, 151 Starfish Way; 730 Highway 101 South structures; Redwood Harbor Village facilities, Starfish and Anchor Ways; Del Norte County Sheriff facility, 250 Citizens Dock Road; Chart Room Retail building, 128 Anchor Way; Chart Room Restaurant, 130 Anchor Way; 105 Citizens Dock facility; 160 Marine Way facility.	CCHD-4
CCHD-5—Nonstructural retrofitting of Existing Buildings and Facilities; Crescent Harbor Art Gallery external stairway	CCHD-5

CCHD-6—Develop and implement a program to capture perishable data after significant events to support future mitigations efforts including the implementation and maintenance of the hazard mitigation plan	CCHD-6
CCHD-7—Replace damaged fender piles and support piles on Harbor District wharves: Citizens Dock; Alber Seafood Dock; Wild Planet Dock; Pacific Seafood Dock; Travelift Dock; Fashion Blacksmith dock; Public Hoist Dock.	CCHD-7
CCHD-8—Green Infrastructure, Solar and Wind Power Alternatives: Develop alternative sources of energy to get Harbor District functioning quickly after a disaster without having to wait for county-wide power grid to become operational after a natural disaster	CCHD-8
CCHD-9—Develop a post-disaster recovery plan and a debris management plan	CCHD-9
CCHD-10—Integrate the hazard mitigation plan into other plans, ordinances and programs within CCHD including the Master Plan	CCHD-10
CCHD-11—Develop Sea-Level Rise Mitigation Plans and Structure Elevation program	CCHD-11
CCHD-12—Repair areas of seawall where armor-stone has slipped into harbor compromising the integrity of the wall	CCHD-12
CCHD-13—Replace and elevate steel seawall that supports Citizens Dock, the Harbor District Office, the Public Hoist and the Seafood freezers	CCHD-13
CCHD-14—Post a link to the Hazard Mitigation Plan as well as other pertinent information all phases of emergency management on the District website.	CCHD-14
CCHD-15—Replace and elevate Travelift Dock	CCHD-15
CCHD-16—Repair, retrofit Concrete Seawall and Supports from Old Launch ramp to Crab Shack	CCHD-16
CCHD-17—Repair, retrofit elevate Sea wall structure from Crab Shack to USCG facility	CCHD-17
CCHD-18—Repair, retrofit elevate seawall along Ocean side of Anchor Way	CCHD-18
CCHD-19—Repair, elevate Whaler Island Groin Seawall	CCHD-19

### 4.3 Hazard Mitigation Action Plan and Evaluation of Recommended Actions

In the 2018 Hazard Mitigation Plan, and in this update of the plan, a comprehensive range of specific mitigation actions were identified and analyzed, with the goal to reduce the effects of the impacts of hazards on the Harbor District and its users.

Proactive solutions to maintain the CCHD’s resources for the next 100 years are likely to encompass a variety of adaptation strategies. Mitigation actions presented in this update are activities designed to reduce or eliminate losses resulting from natural hazards. The actions include a pragmatic, hybrid approach of protection and accommodation to hazard mitigation.

Full implementation of the recommendations of this plan will require time and resources. The measure of the plan’s success will be its ability to adapt to changing conditions. The Crescent city Harbor District will assume responsibility for adopting the recommendations of this plan and committing resources toward implementation.

Table 4.2, Hazard Action Plan Matrix, lists the actions that make up the Crescent City Harbor District hazard mitigation action plan.

There are 28 mitigation actions identified for implementation. All considered Mitigation Actions have been selected for implementation.

Each Mitigation Action is numbered with the same number as in the 2018 mitigation plan for easy reference. New Mitigation Actions are at the bottom of the chart. for easy reference.

The Objectives met column refers to how that Mitigation Action meets this plans Objectives as listed in the Mitigation Goals and Objectives section.

The Estimated Cost ratings are defined as follows:

- High—Existing funding will not cover the cost of the action; implementation would require new revenue.
- through an alternative source (for example, bonds, grants, and fee increases).
- Medium—The action could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the action would have to be spread over multiple years.
- Low—The action could be funded under the existing budget. The action is part of or can be part of an ongoing existing program.

Sources of Funding lists where the funding needs to come from outside sources or can be covered by the Harbor General Fund.

The Timeline indicated in the table is defined as follows:

- Short Term = to be completed in 1 to 5 years
- Long Term = to be completed in greater than 5 years
- Ongoing = currently being funded and implemented under existing programs.

Table 4.2. Hazard Mitigation Action Plan Matrix						
Applies to new or existing assets	Objectives Met	Lead Agency	Support Agency	Estimated Cost	Sources of Funding	Timeline
<b>CCHD-1—Where appropriate, support retro-fitting, purchase or relocation of structures located in high hazard areas, prioritizing those structures that have experienced repetitive losses and/or are located in high or medium ranked hazard areas.</b>						
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise</i>						
Existing	All	CCHD	N/A	High	BRIC, HMGP, FMA, DOT, CAOES	Short-term
<b>CCHD-2—Actively participate in the plan maintenance protocols</b>						

<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise, wildland fire</i>						
Existing	All	CCHD	N/A	High	General Funds	Short-term
<b>CCHD-3—Purchase generators for critical facilities and infrastructure that lack adequate back-up power including Harbor Maintenance Shop, Harbor Office, Harbor owned/operated Redwood RV Park.</b>						
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise</i>						
Existing	All	CCHD	N/A	High	BRIC, HMGP, FMA, DOT, CAOES	Short-term
<b>CCHD-4—Structural Retrofitting of Existing Buildings: Harbor District Office, 101 Citizens Dock Road; Harbor Maintenance buildings, Raker Road and Starfish Way; 201 Citizens Dock Road structure; Fashion Blacksmith building, 121 Starfish Way; Alber Seafood, 161 Starfish Way; Coast Redwood Art Gallery, 140 Marine Way; Crescent Seafood, 170 Marine Way; U.S. Coast Guard Auxiliary, 150 Marine Way; Crescent City Crab Shack, 160 Anchor Way; Kim’s Hair, 170 Anchor Way; MM Diving, 245 Anchor Way; North Coast Ocean Sports &amp; Grill; 110 Anchor Way; Pacific Choice Ice Plant, end of Lumber wing, Citizens Dock; Pacific Choice Seafood, 151 Starfish Way; 730 Highway 101 South structures; Redwood Harbor Village facilities, Starfish and Anchor Ways; Del Norte County Sheriff facility, 250 Citizens Dock Road; Chart Room Retail building, 128 Anchor Way; Chart Room Restaurant, 130 Anchor Way; 105 Citizens Dock facility; 160 Marine Way facility.</b>						
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise</i>						
Existing	All	CCHD	N/A	High	BRIC, HMGP, FMA, DOT, CAOES	Long-term
<b>CCHD-5—Nonstructural retrofitting of Existing Buildings and Facilities; Crescent Harbor Art Gallery external stairway</b>						
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise</i>						
Existing	All	CCHD	N/A	High	BRIC, HMGP, FMA, DOT, CAOES	Short-term
<b>CCHD-6—Develop and implement a program to capture perishable data after significant events to support future mitigation efforts including the implementation and maintenance of the hazard mitigation plan</b>						
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise, wildland fire</i>						
Existing	All	CCHD	N/A	High	CCHD General Funds	Short-term
<b>CCHD-7—Replace damaged fender piles and support piles on Harbor District wharves: Citizens Dock; Alber Seafood Dock; Wild Planet Dock; Pacific Seafood Dock; Travelift Dock; Fashion Blacksmith dock; Public Hoist Dock.</b>						
<i>Hazards Mitigated: Earthquake, flooding, severe weather, tsunami</i>						
Existing	All	CCHD	N/A	High	BRIC, HMGP, FMA, DOT, CAOES	Short-term
<b>CCHD-8—Green Infrastructure, Solar and Wind Power Alternatives: Develop alternative sources of energy to get Harbor District functioning quickly after a disaster without having to wait for county-wide power grid to become operational after a natural disaster</b>						
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise, wildland fire</i>						

Existing	All	CCHD	N/A	High	BRIC, HMGP, FMA, DOT, CAOES	Mid-term
<b>CCHD-9—Develop a post-disaster recovery plan and a debris management plan</b>						
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise, wildland fire</i>						
Existing	All	CCHD	N/A	High	BRIC, HMGP, FMA, DOT, CAOES	Short-term
<b>CCHD-10—Integrate the hazard mitigation plan into other plans, ordinances and programs within CCHD including the Master Plan</b>						
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise, wildland fire</i>						
Existing	All	CCHD	N/A	High	CCHD General Funds	Short-term
<b>CCHD-11—Develop Sea-Level Rise Mitigation Plans and Structure Elevation program</b>						
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise</i>						
Existing	All	CCHD	N/A	High	BRIC, HMGP, FMA, DOT, CAOES	Short-term
<b>CCHD-12—Repair areas of seawall where armor-stone has slipped into harbor compromising the integrity of the wall</b>						
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise</i>						
Existing	All	CCHD	N/A	High	BRIC, HMGP, FMA, DOT, CAOES	Mid-term
<b>CCHD-13—Replace and elevate steel seawall that supports Citizens Dock, the Harbor District Office, the Public Hoist and the Seafood freezers</b>						
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise</i>						
Existing	All	CCHD	N/A	High	BRIC, HMGP, FMA, DOT, CAOES	Short-term
<b>CCHD-14—Post a link to the Hazard Mitigation Plan as well as other pertinent information on all phases of emergency management on the District website</b>						
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise</i>						
Existing	All	CCHD	N/A	High	CCHD General Funds	Short-term
<b>CCHD-15—Replace and elevate Travelift Dock</b>						
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise</i>						
Existing	All	CCHD	N/A	High	BRIC, HMGP, FMA, DOT, CAOES	Long-term
<b>CCHD-16—Repair, retrofit Concrete Seawall and Supports from CD seawall to stubout</b>						
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise</i>						
Existing	All	CCHD	N/A	High	BRIC, HMGP, FMA, DOT, CAOES	Long-term

<b>CCHD-17—Repair, retrofit elevate Sea wall structure from stubout to former USCG facility</b>							
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise</i>							
Existing	All	CCHD	N/A	High	BRIC, HMGP, FMA, DOT, CAOES	Long-term	
<b>CCHD-18—Repair, retrofit elevate seawall along Ocean side of Anchor Way</b>							
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise</i>							
Existing	All	CCHD	N/A	High	BRIC, HMGP, FMA, DOT, CAOES	Long-term	
<b>CCHD-19—Repair, elevate Whaler Island Groin Seawall</b>							
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise</i>							
Existing	All	CCHD	N/A	High	BRIC, HMGP, FMA, DOT, CAOES	Short-term	
<b>CCHD-20—Evaluate littoral drift and beach nourishment options to maintain beaches</b>							
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise</i>							
Existing	All	CCHD	N/A	High	BRIC, HMGP, FMA, DOT, CAOES	Long-term	
<b>CCHD-21—Limit or mitigate new development in mapped hazard area</b>							
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise</i>							
New	All	CCHD	N/A	High	CCHD General Funds	Short-term	
<b>CCHD-22—Repair, retrofit or replace Citizens' Dock</b>							
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise</i>							
Existing	All	CCHD	N/A	High	BRIC, HMGP, FMA, DOT, CAOES	Long-term	
<b>CCHD-23—Review and update sewer and water utilities</b>							
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise</i>							
New	All	CCHD	N/A	High	BRIC, HMGP, FMA, DOT, CAOES	Short-term	
<b>CCHD-24—Support repair, retrofit or replacement of U.S. Highway 101 fronting South Beach</b>							
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise</i>							
Existing	All	CCHD	N/A	High	BRIC, HMGP, FMA, DOT, CAOES	Long-term	
<b>CCHD-25—Identify South Beach mitigation measures</b>							
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise</i>							

New	All	CCHD	N/A	High	BRIC, HMGP, FMA, DOT, CAOES	Short-term
<b>CCHD-26 CCHD has adopted Floodplain Ordinances as part of the overall County of Del Norte Municipal Services Plan in their local regulations. CCHD will ensure continued participation in the NFIP, and compliance with NFIP requirements.</b>						
<i>Hazards Mitigated: Flooding</i>						
Existing	All	CCHD	N/A	High	CCHD General Funds	Long-term
<b>CCHD-27—To the extent possible based on available resources, provide coordination and technical assistance in the application for grant funding that includes assistance in cost vs. benefit analysis for grant eligible projects</b>						
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise</i>						
Existing	All	CCHD	N/A	High	CCHD General Funds	Long-term
<b>CCHD-28—Amend or enhance this hazard mitigation plan as needed to comply with state or federal mandates as compliance guidelines become available.</b>						
<i>Hazards Mitigated: Tsunami, severe weather, flooding, earthquake, sea level rise, wildland fire</i>						
New	All	CCHD	N/A	High	CCHD General Funds	Short-term

In addition, regarding CCHD-26, the Harbor has adopted the County of Del Norte Municipal Services Plan, which includes adoption of the latest effective Flood Insurance Rate Map (FIRM). The County of Del Norte implements and enforces local floodplain management regulations to regulate and permit development in SFHAs. The County of Del Norte Planning Division designates Maia Melo to implement the addressed commitments and requirements of the NFIP.

After a flood event, participants in floodplain management will implement designated procedures to address substantial improvement and substantial damage provisions as part of local regulations. These provisions are crucial for ensuring that properties within floodplains are rebuilt or repaired in ways that minimize future flood risks and enhance community resilience. A full description of how participants implement the substantial improvement/substantial damage provisions of the floodplain management regulations after an event is contained in the Appendix.

**4.4 Action Plan Prioritization**

Table 4-3, Mitigation Action Priority, identifies the benefits of each of the mitigation actions.

Prioritization of benefits includes 1) a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs; 2) the age of the current infrastructure in the harbor; and 3) the role it play in hazard mitigation.

Benefit ratings were defined as follows:



- High—Action will provide an immediate reduction of risk exposure for life and property.
- Medium—Action will have a long-term impact on the reduction of risk exposure for life and property, or action will provide an immediate reduction in the risk exposure for property.
- Low—Long-term benefits of the action are difficult to quantify in the short term.

The Implementation Priority ratings were defined as follows:

- High Priority—An action that meets multiple objectives, has benefits that exceed costs, and has a secured source of funding. Action can be completed in the short term (1 to 5 years).
- Medium Priority—An action that meets multiple objectives, has benefits that exceed costs, and is eligible for funding though no funding has yet been secured for it. Action can be completed in the short term (1 to 5 years), once funding is secured. Medium-priority actions become high-priority actions once funding is secured.
- Low Priority—An action that will mitigate the risk of a hazard, has benefits that do not exceed the costs or are difficult to quantify, has no secured source of funding, and is not eligible for any known grant funding. Action can be completed in the long term (1 to 10 years). Low-priority actions are generally “wish-list” actions. They may be eligible for grant funding from programs that have not yet been identified.

Grant Pursuit Priority ratings were defined as follows:

- High Priority—An action that meets identified grant eligibility requirements, has high benefits, and is listed as high or medium implementation priority; local funding options are unavailable or available local funds could be used instead for actions that are not eligible for grant funding.
- Medium Priority—An action that meets identified grant eligibility requirements, has medium or low benefits, and is listed as medium or low implementation priority; local funding options are unavailable.
- Low Priority—An action that has not been identified as meeting any grant eligibility requirements.

**Table 4.3. Mitigation Action Priority**

Action #	# of Objectives Met	Benefits	Costs	Do Benefits Equal or Exceed Costs?	Is Project Grant-Eligible?	Can Project be Funded under Existing Programs/Budgets	Implementation Priority	Grant Pursuit Priority
CCHD-1	All	High	High	Yes	Yes	No	Medium	High
CCHD-2	All	Low	Low	Yes	No	Yes	High	Low

CCHD-3	All	High	Medium	Yes	Yes	No	Medium	High
CCHD-4	All	High	High	Yes	Yes	No	Medium	Medium
CCHD-5	All	Medium	Medium	Yes	Yes	No	Medium	Medium
CCHD-6	All	High	Medium	Yes	No	Possibly	Medium	Low
CCHD-7	All	High	High	Yes	Yes	No	High	High
CCHD-8	All	High	High	Yes	Yes	No	Medium	Medium
CCHD-9	All	High	Medium	Yes	Yes	No	Medium	High
CCHD-10	All	Medium	Low	Yes	No	Yes	Medium	Low
CCHD-11	All	High	High	Yes	Yes	No	Medium	Medium
CCHD-12	All	High	High	Yes	Yes	No	High	High
CCHD-13	All	High	High	Yes	Yes	No	High	High
CCHD-14	All	Low	Low	Yes	No	Yes	High	Low
CCHD-15	All	High	High	Yes	Yes	No	Medium	High
CCHD-16	All	High	High	Yes	Yes	No	Medium	High
CCHD-17	All	High	High	Yes	Yes	No	Medium	High
CCHD-18	All	High	High	Yes	Yes	No	Medium	High
CCHD-19	All	High	High	Yes	Yes	No	Medium	High
CCHD-20	All	High	Medium	Yes	Yes	No	Medium	Medium
CCHD-21	All	High	Low	Yes	No	No	High	Low
CCHD-22	All	High	High	Yes	Yes	No	High	High
CCHD-23	All	High	High	Yes	Yes	No	Medium	Medium
CCHD-24	All	High	Low	Yes	Yes	No	High	High
CCHD-25	All	High	High	Yes	Yes	No	High	High
CCHD-26	All	Medium	Low	Yes	No	Yes	High	Low
CCHD-27	All	High	Medium	Yes	Yes	No	High	High
CCHD-28	All	High	Low	Yes	No	Yes	High	Low

## 4.5 Classification of Mitigation Actions

Table 4.4, Analysis of Mitigation Actions, summarizes the mitigation actions by hazard of concern and mitigation type.

Each recommended action was classified based on the hazard it addresses and the type of mitigation it involves.

Mitigation types used for this categorization are as follows:

- **Prevention**—Government, administrative or regulatory actions that influence the way land and buildings are developed to reduce hazard losses. Includes planning and zoning, floodplain laws, capital improvement programs, open space preservation, and stormwater management regulations.
- **Property Protection**—Modification of buildings or structures to protect them from a hazard or removal of structures from a hazard area. Includes acquisition, elevation, relocation, structural retrofit, storm shutters, and shatter-resistant glass.
- **Public Education and Awareness**—Actions to inform residents and elected officials about hazards and ways to mitigate them. Includes outreach projects, real estate disclosure, hazard information centers, and school-age and adult education.
- **Natural Resource Protection**—Actions that minimize hazard loss and preserve or restore the functions of natural systems. Includes sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, wetland restoration and preservation, and green infrastructure.
- **Emergency Services**—Actions that protect people and property during and immediately after a hazard event. Includes warning systems, emergency response services, and the protection of essential facilities.
- **Structural Projects**—Actions that involve the construction of structures to reduce the impact of a hazard. Includes dams, setback levees, floodwalls, retaining walls, and safe rooms.
- **Climate Resiliency**—Actions that incorporate methods to mitigate and/or adapt to the impacts of climate change. Includes aquifer storage and recovery activities, incorporating future conditions projections in project design or planning, or actions that specifically address jurisdiction-specific climate change risks, such as sea level rise or urban heat island effect.
- **Community Capacity Building**—Actions that increase or enhance local capabilities to adjust to potential damage, to take advantage of opportunities, or to respond to consequences. Includes staff training, memorandums of understanding, development of plans and studies, and monitoring programs.

**Table 4.4. Analysis of Mitigation Actions**

Action Addressing Hazard, by Mitigation Type								
Hazard Type	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
<b>Tsunami</b>	2, 10, 11, 21, 28	1, 4, 5, 7, 11, 15, 16, 17,	14	20, 25	3, 8, 24	4, 7, 12, 13, 15, 16, 17,	8	2, 6, 9, 10, 24

		18, 19, 22, 23, 27				18, 19, 22, 24		
<b>Earthquake</b>	2, 10, 11, 21, 28	1, 4, 5, 7, 11, 15, 16, 17, 18, 19, 22, 23, 27	14	20, 25	3, 8, 24	4, 7, 12, 13, 15, 16, 17, 18, 19, 22, 24	8	2, 6, 9, 10, 24
<b>Severe Weather</b>	2, 10, 11, 21, 28	1, 4, 5, 7, 11, 15, 16, 17, 18, 19, 22, 23, 27	14	20, 25	3, 8, 24	7, 4, 12, 13, 15, 16, 17, 18, 19, 22, 24	8	2, 6, 9, 10, 24
<b>Sea Level Rise</b>	2, 10, 11, 21, 28	1, 5, 4, 7, 11, 15, 16, 17, 18, 19, 22, 23, 27	14	20, 25	3, 8, 24	7, 4, 12, 13, 15, 16, 17, 18, 19, 22, 24	8, 11	2, 6, 9, 10, 24
<b>Flooding</b>	2, 10, 11, 21, 26, 28	1, 5, 4, 7, 11, 15, 16, 17, 18, 19, 22, 23, 27	14	20, 25	3, 8, 24	7, 4, 12, 13, 15, 16, 17, 18, 19, 22, 24	8	2, 6, 9, 10, 24
<b>Wildfire</b>	2, 10, 21, 28	---	14	20, 25	24	---	8	2, 6, 9, 10, 24

**4.6 Action Plan Implementation**

The Mitigation Actions have been prioritized in order for CCHD to begin to implement the highest-priority actions immediately. The effectiveness of the hazard mitigation plan depends on its effective implementation and incorporation of the outlined action items into all partners’ existing plans, policies, and programs. Some action items do not need to be implemented through regulation but can be implemented through the creation of new educational programs, continued interagency coordination, or improved public participation.

The Crescent City Harbor District will assume responsibility for facilitating hazard mitigation plan implementation.

**5. PLAN MAINTENANCE PROCESS**

**5.1. Plan Maintenance Strategy**

Plan maintenance is the formal process for achieving the following:

- Ensuring that the hazard mitigation plan remains an active and relevant document and that the planning partnership maintains its eligibility for applicable funding sources.
- Monitoring and evaluating the plan annually and producing an updated plan every five years Integrating public participation throughout the plan maintenance and implementation process.

- Incorporating the mitigation strategies outlined in this plan into existing planning mechanisms and programs, such as any relevant comprehensive land-use planning process, capital improvement planning process, and building code enforcement and implementation.

To achieve these ends, a hazard mitigation plan must present a plan maintenance process that includes the following (44 CFR Section 201.6(c)(4) and Section 201.7(c)(4)):

- A method and schedule for monitoring, evaluating, and updating the mitigation plan within a 5-year cycle.
- An approach for how the community will continue public participation in the plan maintenance process.
- A process by which local governments will incorporate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate.

### **5.1.1. Plan Monitoring**

CCHD will be the lead agency responsible for monitoring this plan update. CCHD will take the following approaches to maintaining the plan.

#### Integration into Other Planning Mechanisms

- Create a linkage between the hazard mitigation plan and individual jurisdictions' general plans or similar plans identified in the core capability assessments.
- Timeline: Continuous over the 5-year performance period of the plan.

#### Plan Monitoring

- CEO/Harbormaster will utilize the HMP as the Harbor continues to address implementation of elements found in this plan. The Harbor Board and Staff will track the implementation of actions over the performance period of the plan, as part of the ongoing monthly Harbormaster report.
- Timeline: Continuous over the 5-year performance period of the plan on a monthly basis.

#### Plan Evaluation

- Review the status of previous actions; assess changes in risk; evaluate success of integration.
- Timeline: Upon initiation of hazard mitigation plan update, comprehensive general plan update, or major disaster, and continuously over the 5-year performance period of the plan on a monthly basis.

### Grant Monitoring and Coordination

- As grant opportunities present themselves, the planning partners will consider options to pursue grants to fund actions identified in this plan.
- Timeline: As grants become available

### Plan Update

- The planning partnership will reconvene, at a minimum, every 5 years to guide a comprehensive update of the plan.
- Timeline: Every 5 years or upon comprehensive update to General Plan or major disaster; funding and organizing for plan update will begin in FY 2024/2025

### Continuing Public Participation

- CCHD will keep the website maintained. Mitigation Efforts will be discussed at CCHD planning meetings. The plan will be brought to the Harbor Commissioner meeting for review once a year.
- TimeLine: Continuous over the 5-year performance period of the plan.

### **5.1.2. Plan Evaluation**

The plan will be evaluated by how successfully the implementation of identified actions has helped to achieve the goals and objectives identified in this plan. This will be assessed by a review of the changes in risk that occur over the performance period and by the degree to which mitigation goals and objectives are incorporated into existing plans, policies and programs.

### **5.1.3. Plan Update**

Federal regulations require that local hazard mitigation plans be reviewed, revised if appropriate, and resubmitted for approval in order to remain eligible for benefits awarded under the Disaster Mitigation Act (44 CFR Section 201.6.d(3) and Section 201.7(d)(3)). The 2018 plan's format allows the planning partnership to review and update sections when new data become available. New data can be easily incorporated, resulting in a plan that will remain current and relevant. That is the methodology the Crescent City Harbor District took for this plan update.

The next update of the plan will be on a regional basis and start in August 2024. The Crescent City Harbor District will participate in the regional process, but will be the lead agency for the update of the Harbor specific section of the Regional Plan. During the regional planning process, which is expected to take at least two years, the Harbor will make any needed updates to the elements of the plan.

**5.1.4. Continuing Public Participation**

The CCHD will ensure the public will continue to be apprised of hazard mitigation activities through its website, public meetings and reports on successful hazard mitigation actions provided to the media. Once a year, the plan will be brought to a Board of Commissioners meeting for review.

**5.2. Capability Assessment**

Upon completion, the capability assessment was reviewed to identify opportunities to expand, initiate or integrate capabilities to further hazard mitigation goals and objectives. Where such opportunities were identified and determined to be feasible, they are included in the action plan and are identified as community-capacity-building mitigation actions in the analysis of mitigation actions table at the end of this plan.

The County of Del Norte has received funding to create a County-Wide Hazard Mitigation Plan. That plan will include all special districts in the County including the CCHD. The process to write that plan began in August 2024. Writing of the plan is expected to take at least 2 years. The Harbor District will participate in that process, but will be the lead agency for the Harbor section of that County-Wide plan, That plan is expected to be for the five year term of 2026-2031 and will supersede this plan once it is completed.

**5.2.1 Planning and Regulatory Capabilities**

Jurisdictions develop plans and programs and implement rules and regulations to protect and serve residents. When effectively prepared and administered, these plans, programs and regulations can support the implementation of mitigation actions. Table 5.1 summarizes existing codes, ordinances, policies, programs or plans that are applicable to this hazard mitigation plan.

<b>Table 5.1. Planning and Regulatory Capability</b>		
	<b>Date of Most Recent Update</b>	<b>Comment</b>
<b>Endangered Species Act</b>	2012	For permitting Harbor reconstruction and related dredging activities
<b>California Coastal Commission</b>	2012	For permitting fender piles
<b>California Environmental Quality Act</b>	2012	For permitting Harbor reconstruction and related dredging activities
<b>Municipal Service Review</b>	2015	For municipal services expansion and permitting in the Harbor District

<b>CCHD Information Technology Disaster Recovery Plan</b>	2015	Harbor District worked with Technical Service contracted provider to develop Recovery Plan
<b>CCHD Bomb Threat and Active Shooter Plan</b>	2016	Developed plan in concert with Del Norte County Emergency Management group
<b>Del Norte County Code</b>	2017	For that portion of the CCHD located in the unincorporated area of the County
<b>Crescent City Municipal Code</b>	2017	For that portion of the CCHD located within the City limits
<b>Del Norte Operational Area Emergency Operations Plan</b>	2018	Working on plan update for submittal
<b>CCHD Harbor Master Plan</b>	2018	Master Plan approved by Board of Commissioners in 2018
<b>Del Norte Operational Area Emergency Operations Plan</b>	2018	Working on plan update for submittal
<b>U.S. Army Corps of Engineers regulations</b>	2018	Working with Corps of Engineers on 10 Year Dredge Permit and Dredged Materials Management Plan
<b>CA State Lands Commission - Sea Level Rise Assessment</b>	2019	Sea Level Rise guidance approved by Board of Commissioners in 2019
<b>CCHD Financial Plan of Action and Milestones</b>	2022	For financial and reporting regulatory updates and improvements
<b>CCHD Dredged Material Management Plan</b>	2022	For permitting Harbor dredging activities

As these plans are updated, information from this plan may be incorporated into the Harbor specific elements of those plans. The Crescent City Harbor District is typically contacted as plans are being developed and will provide this plan and recommendations on how to incorporate the elements from this plan which are most relevant to those plans. The District may also participate in the community and will propose ways to integrate the ideas, information and strategy of the mitigation plan into other plans.

**5.2.2 Fiscal, Administrative and Technical Capabilities**

Fiscal capability is an indicator of a jurisdiction’s ability to fulfill the financial needs associated with hazard mitigation projects. An assessment of fiscal capabilities is presented in Table 5.2. Administrative and technical capabilities represent a jurisdiction’s staffing resources for carrying out the mitigation strategy. An assessment of administrative and technical capabilities is presented in Table 5.3.

The Crescent City Harbor District has the ability to expand and improve their capabilities to address mitigation issues. The current goal is to increase fiscal and project capabilities through grant and 3rd party funding sources. The following charts describe the resource capabilities of the District.



<b>Table 5.2. Fiscal Capability</b>	
<b>Financial Resource</b>	<b>Accessible or Eligible to Use?</b>
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	No
User Fees for Water, Sewer, Gas or Electric Service	No
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	Yes
Incur Debt through Private Activity Bonds	Yes
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	No
Federal Grant Programs	Yes
Other	Yes, grants from private, corporate, and state foundations

<b>Table 5.3. Administrative and Technical Capability</b>		
<b>Staff/Personnel Resource</b>	<b>Available?</b>	<b>Department/Agency/Position</b>
Planners or engineers with knowledge of land development and land management practices	Yes	CCHD contracts with various engineering firms for these services
Engineers or professionals trained in building or infrastructure construction practices	Yes	CCHD contracts with various engineering firms for these services
Planners or engineers with an understanding of natural hazards	Yes	CCHD contracts with various engineering firms for these services
Staff with training in benefit/cost analysis	Yes	CCHD contracts with a CPA firm for these analyses
Surveyors	Yes	CCHD contracts with various engineering firms for these services
Personnel skilled or trained in GIS applications	Yes	CCHD contracts with various engineering firms for these services
Scientist familiar with natural hazards in local area	No	CCHD would work with consultants or Humboldt State University for these services
Emergency manager	Yes	The Harbormaster and Deputy Harbormaster share these duties
Grant writers	Yes	CCHD contracts with private organizations for these services
Other	No	N/A

### 5.3. Adaptive Capacity for Climate Change

Given the uncertainties associated with how hazard risk may change with a changing climate, a jurisdiction’s ability to track such changes and adapt as needed is an important component of the mitigation strategy. Table 5.4 summarizes the District’s adaptive capacity for climate change.

Table 5.4. Adaptive Capacity for Climate Change	
Criterion	Jurisdiction Rating*
<b>Technical Capacity</b>	
Jurisdiction-level understanding of potential climate change impacts	High
Comment: None	
Jurisdiction-level monitoring of climate change impacts	Medium
Comment: None	
Technical resources to assess proposed strategies for feasibility and externalities	Low
Comment: None	
Jurisdiction-level capacity for development of greenhouse gas emissions inventory	Low
Comment: None	
Capital planning and land use decisions informed by potential climate impacts	Medium
Comment: None	
Participation in regional groups addressing climate risks	Medium
Comment: Members of the Redwood Coast Tsunami Work Group and Earthquake County Alliance	
<b>Implementation Capacity</b>	
Clear authority/mandate to consider climate change impacts during public decision-making processes	High
Comment: None	
Identified strategies for greenhouse gas mitigation efforts	Medium
Comment: None	
Identified strategies for adaptation to impacts	Medium
Comment: None	
Champions for climate action in local government departments	Low
Comment: None	
Political support for implementing climate change adaptation strategies	Medium
Comment: None	
Financial resources devoted to climate change adaptation	Medium

<b>Comment:</b> CCHD has several grants devoted to this	
<b>Local authority over sectors likely to be negative impacted</b>	High
<b>Comment:</b> None	
<b>Public Capacity</b>	
<b>Local residents knowledge of and understanding of climate risk</b>	Low
<b>Comment:</b> None	
<b>Local residents support of adaptation efforts</b>	Low
<b>Comment:</b> None	
<b>Local residents' capacity to adapt to climate impacts</b>	Medium
<b>Comment:</b> None	
<b>Local economy current capacity to adapt to climate impacts</b>	Low
<b>Comment:</b> None	
<b>Local ecosystems capacity to adapt to climate impacts</b>	Medium
<b>Comment:</b> None	
* High = Capacity exists and is in use; Medium = Capacity may exist, but is not used or could use some improvement; Low = Capacity does not exist or could use substantial improvement; Unsure= Not enough information is known to assign a rating.	

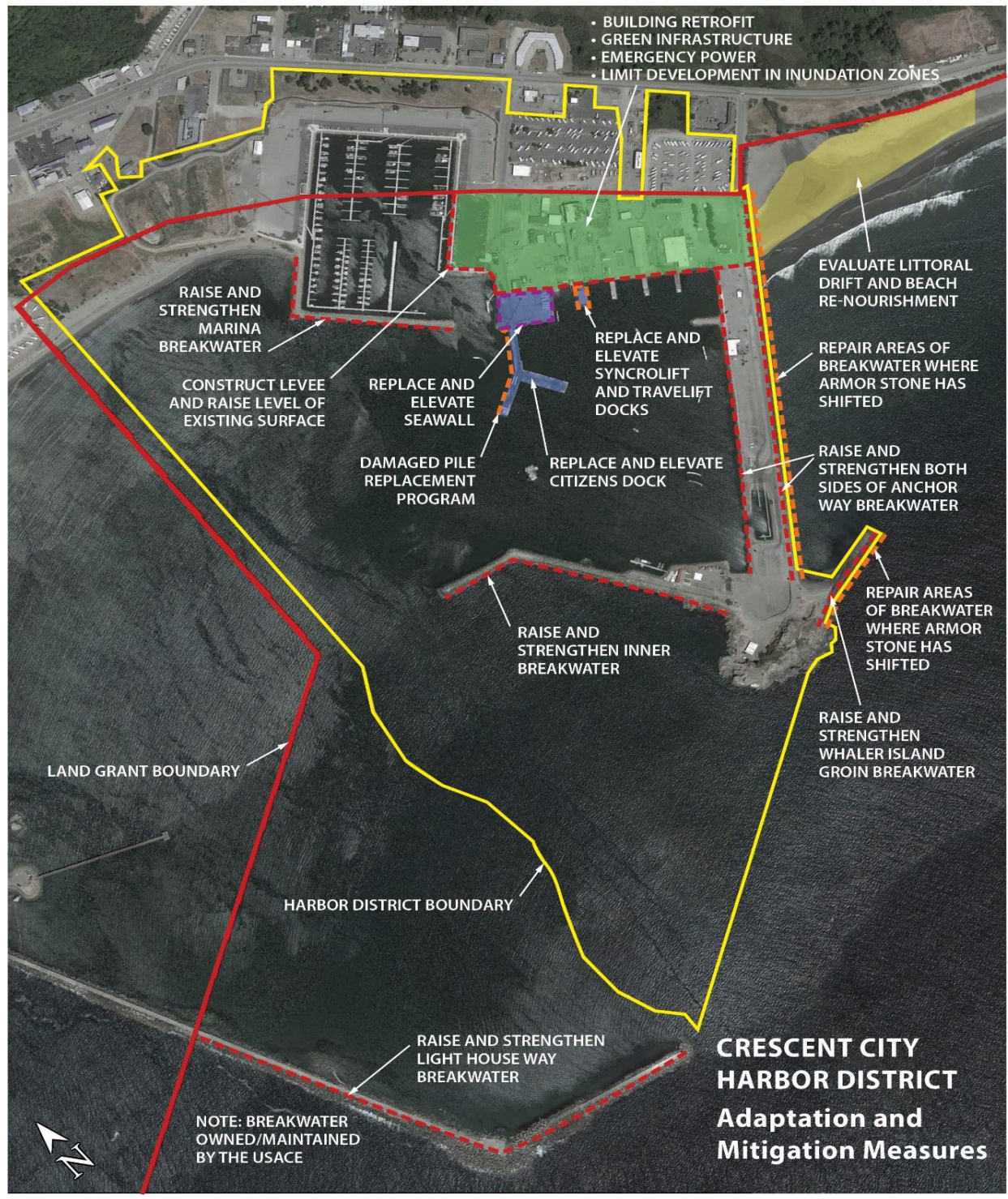
The Crescent City Harbor District has prioritized mitigation measures to hazards which are exacerbated by climate change including flooding, storm surges, tsunamis and sea level rise.

The District has already undertaken replacement of the Citizens Dock Seawall and has undertaken climate resiliency planning for the harbor area.

The Harbor District has identified Protection Mitigation/Adaption Measures as shown on the following map, Figure 5.1.

**Figure 5.1 Mitigation Map**





## 5.4 Integration with Other Planning Initiatives

The information on hazards, risk, vulnerability and mitigation contained in this hazard mitigation plan is based on the best available data. Plan integration is the incorporation of this information into other relevant planning mechanisms, such as general planning and capital facilities planning. It includes the integration of natural hazard information and mitigation policies, principles and actions into local planning mechanisms and vice versa. Additionally, plan integration is achieved through the involvement of key staff and community officials in collaboratively planning for hazard mitigation.

Integrating relevant information from this hazard mitigation plan into other plans and programs where opportunities arise will be the ongoing responsibility of the Crescent City Harbor District. All of the local municipal planning partners committed to creating a linkage between the 2018 hazard mitigation plan and their individual general plans or similar plans identified in the core capability assessment. The District has been working with other local governing bodies to ensure the relevant information from the 2018 hazard mitigation plan was incorporated into other plans and programs.

The CCHD will continue those efforts with the items in this updated plan.

### 5.4.1 Existing Integration

In the performance period since adoption of the 2018 Hazard Mitigation Plan, the Crescent City Harbor District has made progress on integrating hazard mitigation goals, objectives and actions into other planning initiatives. The following plans and programs currently integrate components of the hazard mitigation strategy:

- **CCHD Personnel Evacuation Plan**—This plan incorporates the most recent information about safe areas where staff can gather to ensure their personal safety. The evacuation plan was made in cooperation with Del Norte County Emergency Management personnel.
- **CCHD Critical Equipment Evacuation Plan**—The plan was made in consultation with local emergency personnel and CCHD staff to determine where heavy equipment can be placed safely in case of an earthquake, tsunami or flooding situation and in consideration of personnel safety. The plan was developed in response to the highest-ranking hazard, tsunami, facing the Crescent City Harbor District.
- **Crescent City Economic Development Strategic Action Plan, 202**—The plan was made in consultation with CCHD staff and incorporated the HMP recommendation to replace the seawall and rip rap throughout the harbor.



- **Del Norte County Comprehensive Economic Development Strategy, 2020**—The plan was made in consultation with CCHD staff and incorporated making the Harbor resilient to climate change to support economic development in the Harbor.
- **California Rural Infrastructure Finance Guidebook, 2019 - Case study**—The Guidebook incorporated the HMP recommendation to replace the seawall and Citizens’ Dock to make the Harbor more resilient to hazards.

**5.4.2 Opportunities for Future Integration**

As this hazard mitigation plan is implemented, the Crescent City Harbor District will use information from this plan and identify codes, plans and programs that provide opportunities for integration. The CCHD will continue to give progress reports to the public on ongoing, planned and future mitigation projects. CCHD will continue to hold public hearings through the planning and implementation process. These hearings allow for the community to continue public participation in the plan maintenance process. CCHD will continue to hold public meetings and keep the community updated on projects related to the HMP via social media, websites, surveys, press releases, and radio outreach. Plan elements will also be included for adoption in future plans, for example, the Harbor Strategic Development Plan.

**5.5 Education and Outreach Capabilities**

Outreach and education capability identifies the connection between government and community members, which opens a dialogue needed for a more resilient community. An assessment of education and outreach capabilities is presented in Table 5.5.

<b>Table 5.5. Education and Outreach</b>	
<b>Criterion</b>	<b>Response</b>
<b>Do you have a Public Information Officer or Communications Office?</b>	No, the Harbormaster and Assistant Harbormaster are assigned PIO duties
<b>Do you have personnel skilled or trained in website development?</b>	Yes
<b>Do you have hazard mitigation information available on your website?</b>	Yes
<b>Do you utilize social media for hazard mitigation education and outreach?</b>	Yes. In case of emergency CCHD would share evacuation information and links to the Prepare Del Norte website
<b>Do you have any citizen boards or commissions that address issues related to hazard mitigation?</b>	Yes; the elected CCHD Harbor Commissioners address hazard mitigation issues at their regularly scheduled public meetings
<b>Do you have any other programs already in place that could be used to communicate hazard-related information?</b>	Yes, we are have public meeting process on hazard mitigation projects being studied in the harbor
<b>Do you have any established warning systems for hazard events?</b>	Yes; CCHD participates in Del Norte County's Everbridge community warning system



## **6. FORMAL ADOPTION**

A hazard mitigation plan must document that it has been formally adopted by the governing bodies of the jurisdictions requesting federal approval of the plan (44 CFR Section 201.6(c)(5) and Section 201.7(c)(5)).

The Crescent City Harbor District Adopting Resolution this plan can be found in Appendix D.

This Resolution will be added once it is adopted and signed.



## Appendix A

### Relevant Federal and State Agencies, Programs and Regulations

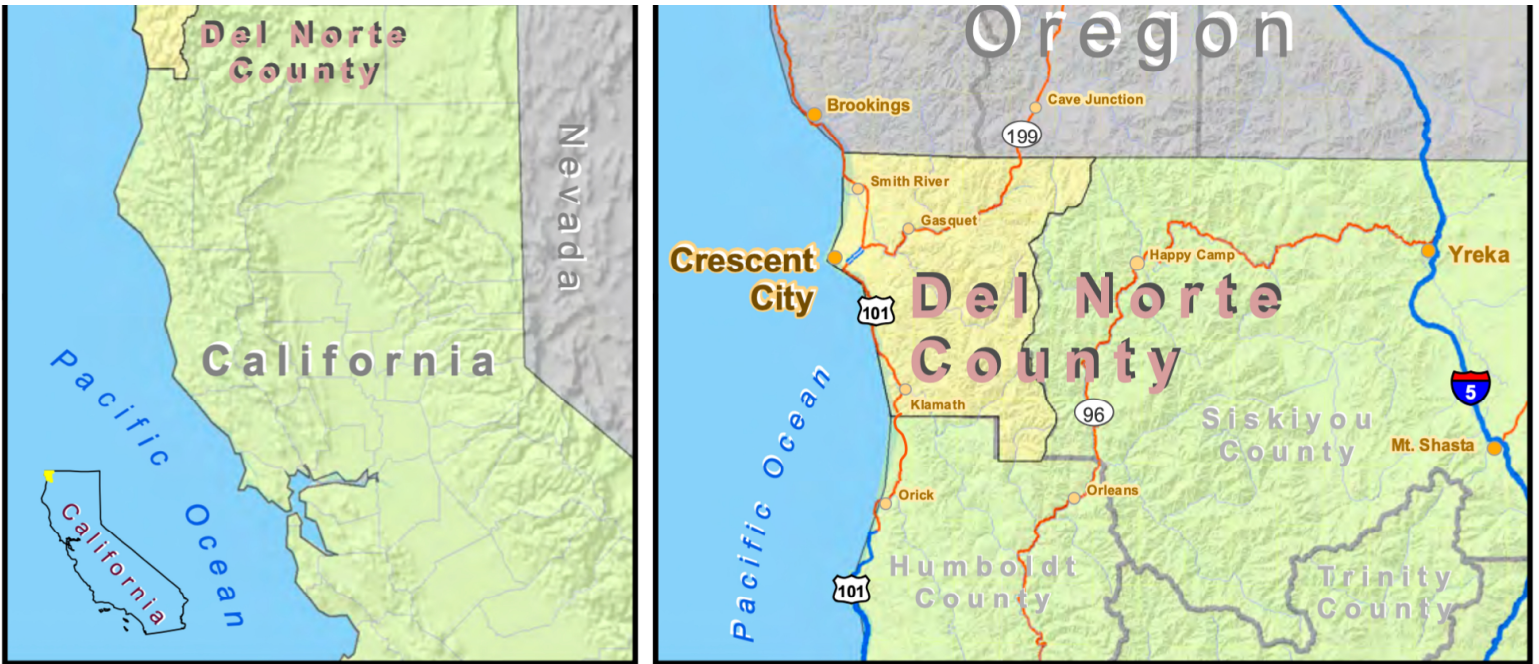
Summary of Relevant Federal Agencies, Programs and Regulations		
Agency, Program or Regulation	Hazard Mitigation Area Affected	Relevance
<b>A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment</b>	Wildfire Hazard	This strategy implementation plan prepared by federal and Western state agencies outlines measures to restore fire-adapted ecosystems and reduce hazardous fuels.
<b>Americans with Disabilities Act</b>	Action Plan Implementation	FEMA hazard mitigation project grant applications require full compliance with applicable federal acts.
<b>Bureau of Indian Affairs</b>	Wildland Fire Hazard	The Bureau's Fire and Aviation Management National Interagency Fire Center provides wildfire protection, fire use and hazardous fuels management, and emergency rehabilitation on Indian forest and rangelands.
<b>Bureau of Land Management</b>	Wildland Fire Hazard	The Bureau funds and coordinates wildfire management programs and structural fire management and prevention on BLM lands.
<b>Civil Rights Act of 1964</b>	Action Plan Implementation	FEMA hazard mitigation project grant applications require full compliance with applicable federal acts.
<b>Clean Water Act</b>	Action Plan Implementation	FEMA hazard mitigation project grant applications require full compliance with applicable federal acts.
<b>Community Development Block Grant Disaster Resilience Program</b>	Action Plan Funding	This is a potential alternative source of funding for actions identified in this plan.
<b>Community Rating System</b>	Flood Hazard	This voluntary program encourages floodplain management activities that exceed the minimum National Flood Insurance Program requirements.

Agency, Program or Regulation	Hazard Mitigation Area Affected	Relevance
Disaster Mitigation Act	Hazard Mitigation Planning	This is the current federal legislation addressing hazard mitigation planning.
Emergency Relief for Federally Owned Roads Program	Action Plan Funding	This is a possible funding source for actions identified in this plan.
Emergency Watershed Program	Action Plan Funding	This is a possible funding source for actions identified in this plan.
Endangered Species Act	Action Plan Implementation	FEMA hazard mitigation project grant applications require full compliance with applicable federal acts.
Federal Energy Regulatory Commission Dam Safety Program	Dam Failure Hazard	This program cooperates with a large number of federal and state agencies to ensure and promote dam safety.
National Environmental Policy Act	Action Plan Implementation	FEMA hazard mitigation project grant applications require full compliance with applicable federal acts.
Federal Wildfire Management Policy and Healthy Forests Restoration Act	Wildland Fire Hazard	These documents mandate community-based collaboration to reduce risks from wildfire.
National Dam Safety Act	Dam Failure Hazard	This act requires a periodic engineering analysis of most dams in the country
National Fire Plan (2001)	Wildland Fire Hazard	This plan calls for joint risk reduction planning and implementation by federal, state and local agencies.
National Flood Insurance Program	Flood Hazard	This program makes federally backed flood insurance available to homeowners, renters, and business owners in exchange for communities enacting floodplain regulations
National Incident Management System	Action Plan Development	Adoption of this system for government, nongovernmental organizations, and the private sector to work together to manage incidents involving hazards is a prerequisite for federal preparedness grants and awards
National Park Service, Redwood National Park	Wildland Fire Hazard	Park staff provide wildland and structure fire protection and conduct wildfire management within the park.
Presidential Executive Order 11988 (Floodplain Management)	Flood Hazard	This order requires federal agencies to avoid long and short-term adverse impacts associated with modification of floodplains
Presidential Executive Order 11990 (Protection of Wetlands)	Action Plan Implementation	FEMA hazard mitigation project grant applications require full compliance with applicable presidential executive orders.
U.S. Army Corps of Engineers Dam Safety Program	Dam Failure Hazard	This program is responsible for safety inspections of dams that meet size and storage limitations specified in the National Dam Safety Act.
U.S. Army Corps of Engineers Flood Hazard Management	Flood Hazard, Action Plan Implementation, Action Plan Funding	The Corps of Engineers offers multiple funding and technical assistance programs available for flood hazard mitigation actions
U.S. Fire Administration	Wildland Fire Hazard	This agency provides leadership, advocacy, coordination, and support for fire agencies and organizations.
U.S. Fish and Wildlife Service	Wildland Fire Hazard	This service's fire management strategy employs prescribed fire throughout the National Wildlife Refuge System to maintain ecological communities.
U.S. Forest Service Six Rivers National Forest	Wildland Fire Hazard	Staff provide wildfire management primarily on National Forest lands.

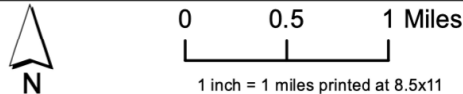
Summary of Relevant State Agencies, Programs and Regulations		
Agency, Program or Regulation	Hazard Mitigation Area Affected	Relevance
AB 32: The California Global Warming Solutions Act	Action Plan Development	This act establishes a state goal of reducing greenhouse gas emissions to 1990 levels by 2020
AB 70: Flood Liability	Flood Hazard	A city or county may be required to partially compensate for property damage caused by a flood if it unreasonably approves new development in areas protected by a state flood control project
AB 162: Flood Planning	Flood Hazard	Cities and counties must address flood-related matters in the land use, conservation, and safety and housing elements of their general plans.
AB 2140: General Plans—Safety Element	Hazard Mitigation Planning	This bill enables state and federal disaster assistance and mitigation funding to communities with compliant hazard mitigation plans.
AB 2800: Climate Change—Infrastructure Planning	Action Plan Development	This act requires state agencies to take into account the impacts of climate change when developing state infrastructure.
Alquist-Priolo Earthquake Fault Zoning Act	Earthquake Hazard	This act restricts construction of buildings used for human occupancy on the surface trace of active faults.
California Coastal Management Program	Flood, Landslide, Tsunami and Wildland Fire Hazards	This program requires coastal communities to prepare coastal plans and requires that new development minimize risks to life and property in areas of high geologic, flood, and fire hazard.
California Department of Forestry and Fire Protection (CAL FIRE)	Wildland Fire Hazard	CAL FIRE has responsibility for wildfires in areas that are not under the jurisdiction of the Forest Service or a local fire organization.
California Department of Parks and Recreation	Wildland Fire Hazard	State Parks Resources Management Division has wildfire protection resources available to suppress fires on State Park lands.
California Department Water Resources	Flood Hazard	This state department is the state coordinating agency for floodplain management.
California Division of Safety of Dams	Dam Failure Hazard	This division monitors the dam safety program at the state level and maintains a working list of dams in the state.
California Environmental Quality Act	Action Plan Implementation	This act establishes a protocol of analysis and public disclosure of the potential environmental impacts of development projects. Any project action identified in this plan will seek full California Environmental Quality Act compliance upon implementation.
California Fire Alliance	Wildland Fire Hazard	The alliance works with communities at risk from wildfires to facilitate the development of community fire loss mitigation plans.
California Fire Plan	Wildland Fire Hazard	This plan's goal is to reduce costs and losses from wildfire through pre-fire management and through successful initial response.
California Fire Safe Council	Wildland Fire Hazard	This council facilitates the distribution of National Fire Plan grants for wildfire risk reduction and education.
California Fire Service and Rescue Emergency Mutual Aid Plan	Wildland Fire Hazard	This plan provides guidance and procedures for agencies developing emergency operations plans, as well as training and technical support.
California General Planning Law	Hazard Mitigation Planning	This law requires every county and city to adopt a comprehensive long-range plan for community development, and related laws call



# Appendix B



-  Project Location
-  U.S Highway
-  Major Roads



Sources: NOAA Fisheries: Aerial 2009 0.5 meter resolution;  
StreetMap USA - TeleAtlas

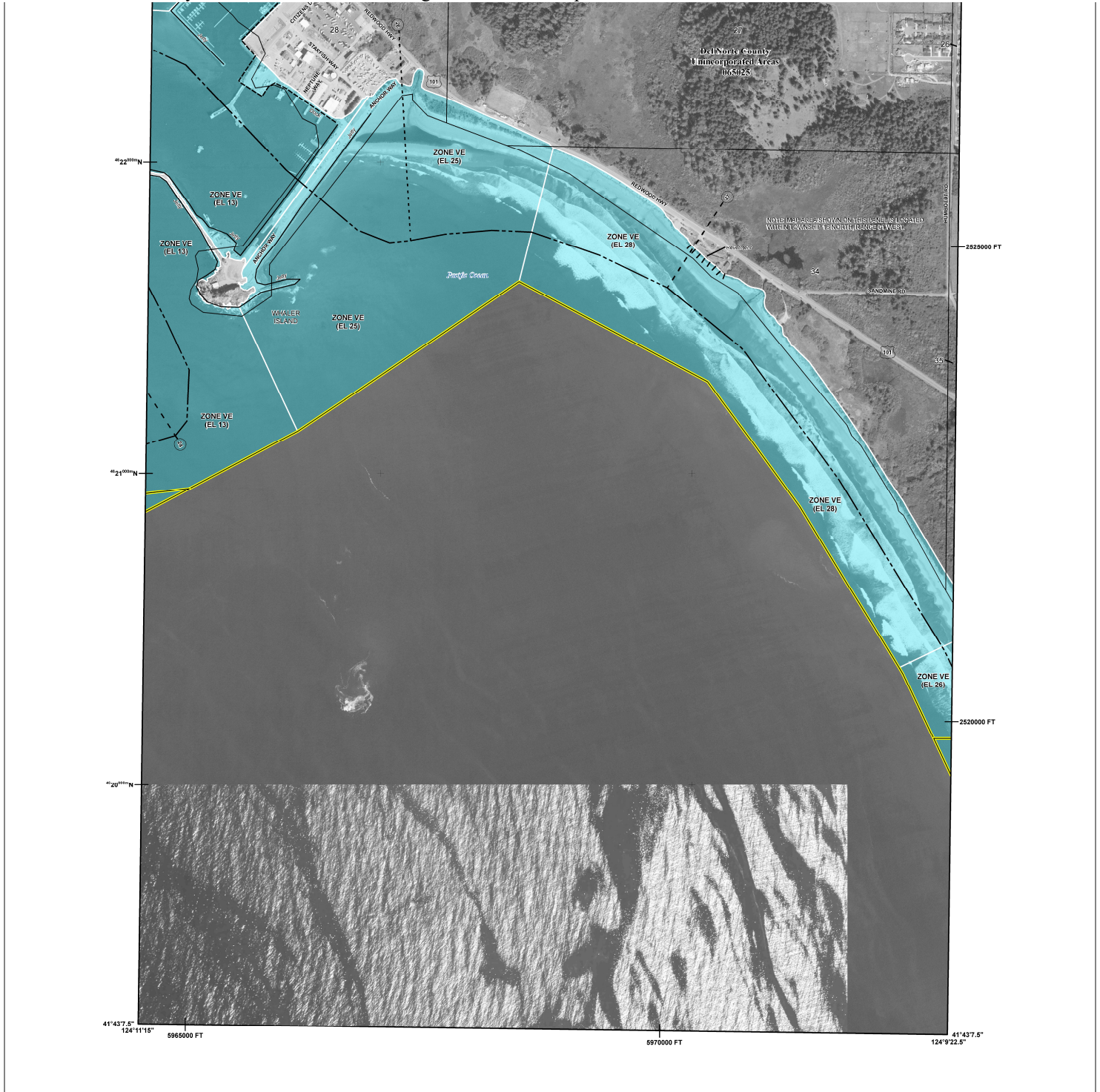
**Figure 1**  
**Vicinity Map**







# Crescent City Harbor District Hazard Mitigation Plan 2024 Update



## FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP  
**THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT [HTTP://MSC.FEMA.GOV](http://MSC.FEMA.GOV)**

	Without Base Flood Elevation (BFE) <i>Zone AE, AH, AO, AH, VE, AR</i>
	Regulatory Floodway
	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile <i>Zone X</i>
	Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i>
	Area with Reduced Flood Risk due to Levee See Notes, <i>Zone X</i>
	NO SCREEN Areas of Minimal Flood Hazard <i>Zone X</i>
	Area of Undetermined Flood Hazard <i>Zone D</i>
	Channel, Culvert, or Storm Sewer Accredited or Provisionally Accredited Levee, Dike, or Floodwall
	Non-accredited Levee, Dike, or Floodwall

## NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information Exchange at 1-877-FEMA-MAP (1-877-326-2627) or visit the FEMA Map Service Center website at <http://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Product, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information Exchange.

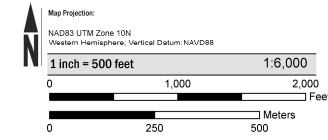
Communities annexed to adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates, refer to Table 15 and Notice to Flood Insurance Users in this FIS report.

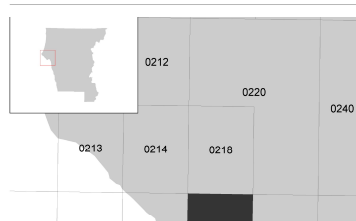
To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-338-6650.

Base Map information shown on this FIRM was derived from multiple sources: Coastal California LIDAR and Digital Imagery dated 2011 was compiled from the Coastal Services Center where available, and it was supplemented with 2012 USDA National Agriculture Imagery Program (2012 NAIP) Imagery.

## SCALE



## PANEL LOCATOR



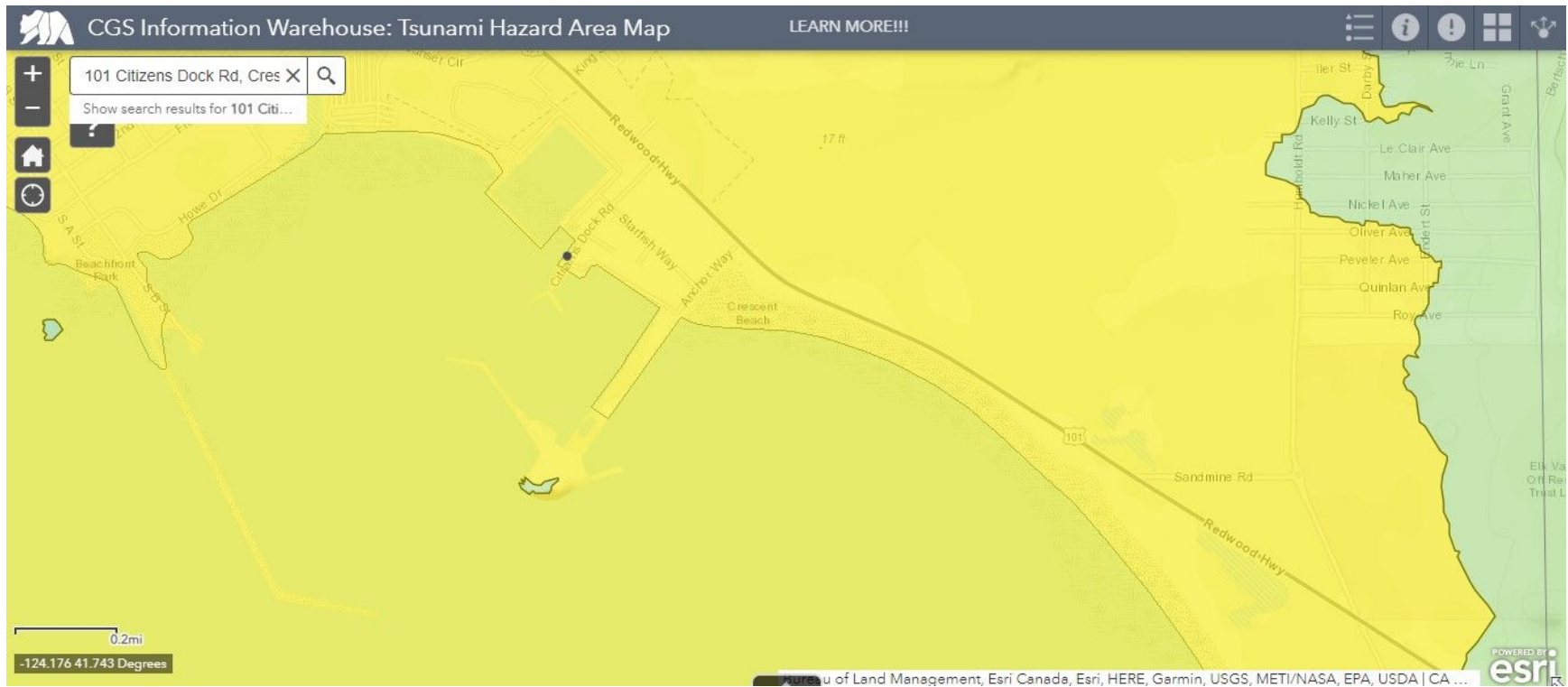
## NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP

DEL NORTE COUNTY, CALIFORNIA  
 And Incorporated Areas

PANEL 331 OF 675



COMMUNITY	NUMBER	PANEL	SUFFIX
CRESCENT CITY	060039	0331	F
CITY OF DEL NORTE COUNTY	065025	0331	F



## Appendix C

### Vol 1 and 2 of the 2018 Del Norte Hazard Mitigation Plan

The entirety of the 2018 Del Norte Hazard Mitigation Plan can be found at the following links.

#### **Volume 1**

chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.crescentcity.org/media/Community-Development/Development%20Permit%20Applications%20and%20Instructions/DelNorteCountyHMP\_Vol1\_Final.pdf

#### **Volume 2**

chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.crescentcity.org/media/Community-Development/Development%20Permit%20Applications%20and%20Instructions/DelNorteCountyHMP\_Vol2\_Final.pdf



## Appendix D

### Adopted Resolution

#### RESOLUTION NO. 2024-01

#### A RESOLUTION OF THE BOARD OF HARBOR COMMISSIONERS OF THE CRESCENT CITY HARBOR DISTRICT ADOPTING A REVISED HAZARD MITIGATION PLAN

**WHEREAS**, the Crescent City Harbor District (“the District”) is dedicated to reducing the risk of loss of life and property damage resulting from natural hazards through the implementation of a comprehensive hazard mitigation strategy; and

**WHEREAS**, the Federal Emergency Management Agency (FEMA) mandates that local jurisdictions develop and adopt hazard mitigation plans to qualify for certain federal funding for disaster relief, prevention, and recovery; and

**WHEREAS**, the Crescent City Harbor District has developed the Crescent City Harbor District Hazard Mitigation Plan 2024 Update, following extensive public engagement, including meetings held in September 2023 to discuss elements of the plan related to replacement of harbor infrastructure, further public hearings to review updated draft versions of the plan conducted in March and April of 2024, and an extensive public review process through the District's website; and

**WHEREAS**, this Plan outlines a series of mitigation goals, objectives, and actions designed to reduce impacts on the health, safety, welfare, and economy of the harbor and its users, and has been prepared in accordance with FEMA's requirements;

**NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF HARBOR COMMISSIONERS OF THE CRESCENT CITY HARBOR DISTRICT THAT:**

**Section 1.** The Recitals set forth above are true and correct and are incorporated into this Resolution by this reference.

**Section 2.** The Crescent City Harbor District Hazard Mitigation Plan 2024 Update, as presented and reviewed in public meetings held from September 2023 through April 2024, is hereby adopted as the official Hazard Mitigation Plan of the District.

**Section 3.** The Crescent City Harbor District commits to the ongoing implementation of the strategies and actions identified in the Plan and will actively seek funding and resources to support these efforts.