



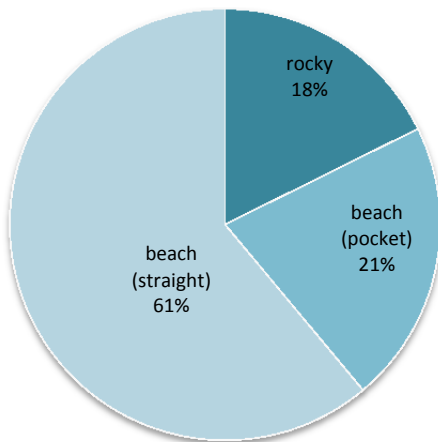
# Del Norte County

## Coastal Zone



Del Norte County has approximately 49 miles of shoreline extending from the Oregon border to the Humboldt County line. Much of the coastline is sandy beach while rocky shores and rugged beaches also provide significant habitat for coastal species. The county contains special rural communities and tribal lands of several Native American tribes (e.g. the Yurok tribe and the Tolowa Dee-ni Nation). The 39,680 acres (62 square miles) of terrestrial coastal zone also includes significant forest, agriculture and fisheries resources, state beaches and parks that protect coastal redwood habitat and provide access and recreation, and extensive coastal dunes. Key wetland areas are at Lakes Earl and Talawa and at the mouth of the Smith and Klamath Rivers. In addition, the Crescent City Harbor lies just south of the City of Crescent City, and provides significant moorage for commercial fishing and recreational vessels.

## Outer Coast Shoreline



### Coastal Zone Resources

Ports & Harbors: Crescent City, Klamath  
 Publicly Owned/Accessible: 15,300 acres  
 Public Access Coastal Areas: 47 locations  
 Coastal Zone Wetlands: 7,100 acres

## Ocean Economy

**2013 County Ocean Sectors GDP \$51.0 M**

### 2013 Major Ocean Economic Sectors

Tourism and Recreation GDP	\$28.2 M
Living Resources GDP	\$17.0 M

**0.1%**  
of State Ocean Sector GDP

Source: National Ocean Economics Program, 2016

Accounting for 0.1% of the state's total ocean sector Gross Domestic Product (GDP), Del Norte County's ocean economy is comprised mainly of tourism and recreation, and living resources sectors. Living Resources includes all fish hatcheries, aquaculture, fishing, seafood markets, and seafood processing. While tourism and recreation GDP is about 50% larger than that of the living resource sector, this industry employs ten times the number of people. Impacts from sea level rise can affect the tourism and recreation assets (harbors, beaches) and living resources (e.g. fisher closures due to ocean conditions or shifts in species locations).



# Del Norte County

## Hazards and Vulnerability

Del Norte County is the northernmost county in California and is less developed than most coastal counties in the state. While the county lacks a comprehensive assessment of sea level rise hazards and would benefit from a county specific vulnerability study, Commission staff identified areas of concern based on their professional experience and expertise. Sea level rise poses threats to development, agriculture, and habitat in Del Norte County, though tectonic uplift is a mitigating factor. A Cascadia earthquake, however, could result in a massive subsidence event that would expose large areas to higher sea levels [1]. Understanding the effects of extreme precipitation events on river flows combined with sea level rise and storms is a data gap in



Vulnerable Development near Elk Creek, Del Norte County

The Crescent City airport near Point St. George has possible erosion/bluff retreat issues, and vulnerable wetlands and sensitive habitats [1].

Crescent City harbor repeatedly experienced significant tsunami damage (most recently from 2006 and 2011 earthquakes off the coast of Japan) and despite reconstruction, it remains vulnerable to extreme events combined with rising sea level [1].

Del Norte County also has infrastructure that is vulnerable to sea level rise. The county's wastewater treatment plant has been identified as a vulnerable asset [1]. Some regions of Highway 101 (e.g. Last Chance

**Population at risk to 100yr Flood**  
 1,800 = current risk | 2,600 = future w/  
 1.4m SLR  
 Source: Heberger et al., 2009

**Potential Bluff Erosion Risk w/ 1.4m SLR**  
 700 properties | 620 people  
 Source: Heberger et al., 2009, County parcel data

the county and will also be especially important to understanding flooding risks at river mouths.

In the northernmost part of the county, the Smith River area has low lying dunes and vulnerable agricultural land [1]. Many of the agricultural lands are protected by older levees, which may be vulnerable to increased storms, flooding, and rising sea levels. South of the Smith River, a wide sandy beach extends to Lakes Talawa and Earl, where development already experiences flooding and where protection of sensitive habitat area is a concern [1].

Grade, Crescent Beach and Wilson Creek and Beach), bridges, and parking lots have experienced flooding, landslides, and have been noted as highly vulnerable to future sea level rise [1]. Mass wasting earthflows also currently threaten Highway 101 and planning to reroute those sections of the road has begun [1].

The county has many natural resources, several of which have been recognized as vulnerable to rising sea levels and increased storm surge. Wetlands, marshes, state and national parks, rivers, and beaches have all begun to experience negative impacts from rising sea levels [1]. The loss of these resources will also likely reduce or eliminate public access and recreation at these places.



# Del Norte County

## LCP and Sea Level Rise Planning

Local Coastal Programs (LCPs) are planning tools used by local governments to guide development in the coastal zone, in partnership with the Coastal Commission. LCPs specify the appropriate location, type, and scale of new or changed uses of land and water and include a land use plan and measures to implement the plan (such as zoning ordinances). The Coastal Commission has awarded three rounds of the Local Assistance Grant Program since January 2014 to support certification and updates of LCPs, with an emphasis on addressing the impacts of climate change. No local governments in Del Norte County have applied or been awarded grants from the Coastal Commission to address the impacts of sea level rise within their LCP jurisdictions. Table 1 below shows whether jurisdictions have studies or LCPs that address sea level rise. While staff reviewed a Caltrans vulnerability assessment focused on roads for a region that included Del Norte County, it is not listed as a vulnerability study because it does not go into the level of detail necessary to be useful at the LCP segment planning scale [3]. "In part" means an LCP segment has some explicit policy language addressing sea level rise.

**Table 1. LCP Planning in Del Norte County (as of Dec. 2016)**

Jurisdiction/Segment	Certified LCP?	Grant?	Vulnerability Assessments	Updated for SLR?	Shoreline by Jurisdiction
Del Norte County	No	No	No	No	50%
County Segment	Yes (1983)	No	No	No	
Harbor Segment	Yes (1987)	No	No	No	
Lopez Creek Segment	Yes (1987)	No	No	No	
Pt. St. George Segment	No	No	No	No	
City of Crescent City					3%
Crescent City Segment	Yes (1983)	No	No	In Part	
McNamara-Gillespie Segment	Yes (1984)	No	No	No	
Federal Lands and Ports					47%

### Coastal Act Management Priorities

Priority sea level rise adaptation issues in Del Norte County include coordinating with other agencies to protect natural habitat, to preserve agricultural land, and to evaluate and address vulnerabilities to important public infrastructure and development such as the Crescent City Harbor, U.S. Highway 101, and certain County roads. As this county is relatively undeveloped, more agriculture and sensitive natural resources are vulnerable to sea level rise impacts.

#### ***Coastal Habitats, ESHA, and Wetlands (Coastal Act Sections 30230, 30231, 30233, 30240)***

Inundation and increased erosion from sea level rise could convert habitats from one type to another and generally reduce the amount of nearshore habitat, such as sandy beaches and rocky intertidal areas. Where marsh, lagoon, and tidal estuarine habitat, near the mouths of major rivers habitat is vulnerable to sea level rise, opportunities for habitats to migrate inland should be evaluated as potential adaptation strategies (e.g., South of Crescent city near Highway 101). Some adaptation strategies might require advanced actions now in order to ensure those strategies are viable in the future (i.e. protecting lands adjacent to wetlands to ensure they have room to move).



## Del Norte County

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### ***Public Access and Recreation (Coastal Act Sections 30210, 30211, 30213, 30220, 30221)***

One of the highest priorities in the Coastal Act is the mandate to protect and maximize public access to the coast. Sea level rise in Del Norte County could lead to a loss of public access and recreational opportunities due to permanent inundation, episodic flooding or erosion of beaches, recreational areas, and trails. Collaboration with the state with tribal governments and the National Park Service will be important to plan for possible sea level rise impacts on public access, recreation, and cultural resources along the county coastline because of its substantial natural resources and park lands.

### ***Coastal Development and Hazards (Coastal Act Sections 30235, 30236, 30250, 30253)***

Many developed areas in Del Norte County already experience hazards related to bluff erosion and flooding (e.g., Crescent City, Klamath town site, and the bluffs north of the Smith River). While Crescent City has updated its LCP with some sea level rise policies, more work remains to be done on addressing growing risks to existing development. The potential for flooding of Highway 101 and habitat loss in Crescent City requires further study. The tide gate at Elk Creek currently provides flood protection to developed areas (that occasionally experience coastal flooding), but the gate's expected performance under sea level rise scenarios is unknown. The city has a Tsunami Ready program and efforts to promote tsunami-resilient development should also be examined for possible benefits in adaptation to rising sea level. Another important issue for improving understanding of hazards in the northern part of the county relates to the pace of regional uplift, and how long it might outpace sea level rise.

### ***Additional Consideration***

- More information is needed for planners to make informed decisions about future relative sea level rise, accounting for regional uplift, riverine flooding, and possible co-seismic subsidence.
- More information is needed county-wide, to describe flooding and erosion risks posed to agricultural resources, development, and infrastructure.
- Increased river flows and extreme storm conditions may be an issue in this county because there are no dams regulating river flows. The combination of river flows in high precipitation events with sea level rise and storm conditions will likely cause backwater flooding and erosion of river channels. As such, there is a need for hydraulic modeling of river flows, precipitation events, and ocean processes to better understand flood risks in these river mouth areas.
- Multi-agency coordination and collaboration among local governments, Caltrans, Crescent City Harbor District, and local utilities will be needed to include sea level rise adaptation in new infrastructure projects, regional transportation plans, and planning for Crescent City Harbor.

### **References**

- [1] California Coastal Commission North Coast District Staff Interview. July 18, 2016.
- [2] [Heberger M, H Cooley, P Herrera, PH Gleick, E Moore. 2009. The Impacts of Sea-Level Rise on the California Coast. Prepared by the Pacific Institute for the California Climate Change Center.](#)
- [3] [GHD, ESA PWA, Trinity Associates. 2014. "District 1 Climate Change Vulnerability Assessment and Pilot Studies FHWA Climate Resilience Pilot Final Report."](#)