

COMMUNITY DEVELOPMENT AGENCY
PLANNING DIVISION

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Brian C. Crawford
DIRECTOR

Thomas Lai
ASSISTANT DIRECTOR

Marin County Board of Supervisors
3501 Civic Center Drive
San Rafael, CA 94903

Marin County Civic Center
3501 Civic Center Drive
Suite 308
San Rafael, CA 94903
415 473 6269 T
415 473 7880 F
415 473 2255 TTY
www.marincounty.org/plan

SUBJECT: Informational presentation on the Community Development Agency's Collaboration: Sea-level Marin Action Response Team's Draft Marin Coast Sea Level Rise Vulnerability Assessment.

Dear Board Members:

RECOMMENDATION: Receive staff report.

BACKGROUND:

In June 2014, the Community Development Agency initiated the Collaboration: Sea Level Marin Adaptation Response Team (C-SMART) planning program to begin to prepare for the threats of sea level rise and increased storm surges in Marin County's coastal communities. The first phase of this process is the sea level rise Vulnerability Assessment (Assessment) which details where future threats may exist, the nature of the threats, and the consequences the threats may have on existing buildings, infrastructure, and natural resources, referred to as assets.

The Assessment is the first of two major program deliverables, and serves as the foundation for the second deliverable, the Adaptation Strategy Report. The Adaptation Strategy Report will include physical engineering strategies, community programs, and proposed updates to the Draft Local Coastal Program policies. Staff anticipates bringing a final Adaptation Strategy Report to your Board of Supervisors for action in April 2016.

The Assessment is based on the California Adaptation Guide (CalAdapt) model of assessing exposure and sensitivity to higher tides, ability to adapt to higher tides, and the timing and potential impacts for each built and natural asset. The Assessment integrates input and review by the Technical Advisory and Stakeholder Advisory Committees, local stakeholders, additional agency and technical experts, CDA management, and the professionals charged with managing the variety of vulnerable assets, referred to as asset managers. The Assessment uses the USGS CoSMoS Model, provided to the public through Point Blue's Our Coast Our Future website, and Marin Map to determine built and natural resource assets that could be exposed to sea level rise and heightened storm impacts. Managers for each asset were interviewed using a Vulnerability Assessment Tool gain information on previous flooding and erosion related impacts, anticipated sensitivity, adaptive capacity to future sea level rise and storms, and potential future adaptation opportunities and issues. Research from other coastal regions in the country and past and recent

experiences with severe storms and sea level rise also informed the Vulnerability Assessment. Finally, the Assessment sought additional analysis from the Greater Farallones National Marine Sanctuary on habitat and species vulnerability, and project consultants Environmental Science Associates on potential habitat shifts in marshes and beach and bluff erosion associated with increases in sea level.

SUMMARY:

The Assessment concludes that near the end of this century, Marin's coastal communities, including over 1,300 properties, could be dramatically impacted by higher sea levels and storms if adaptation strategies are not implemented. In the near-term, hundreds of seaside and bayside buildings could flood at typical high tides and suffer losses during storm events. Properties further from the shoreline could experience transportation, electrical, water, and septic systems disruption. Water delivery systems are vulnerable in the near-term in Stinson Beach and Bolinas, and in the medium- and long-terms in Inverness and Pt. Reyes. Saltwater intrusion could impact wells along the East Shore and in Dillon Beach in the medium- and long-terms.

In the long-term 10 to 20 miles of roads could flood and impact a greater number of residents, as whole communities of Bolinas, Inverness, and the East Shore of Tomales Bay could be cut off from their primary access roads. Extended road flooding is also a concern for West Marin's agricultural and aquaculture operations that depend on the transportation network's to receive supplies and get goods to market. When roads are flooded, emergency services could be impacted, leaving those in need especially vulnerable.

West Marin beaches could erode at accelerated rates and in most cases can be expected to disappear without sufficient additional sources of sand and room to migrate inland as early as 2030 along the narrow shores of Tomales Bay and Bolinas. Stinson beaches could disappear before the end of the century along the majority of the sand spit. Potential bluff collapse in Muir Beach, Bolinas, and Dillon Beach could destroy several roads and more than a hundred homes. Marsh areas in Bolinas and Tomales Bay are anticipated to become inundated and migrate upland where possible, turning existing marsh areas into mudflats. This could alter habitat functions for wildlife and impact the communities' aesthetics and recreational opportunities. If sea level rise and storms negatively impact the built and natural assets on Marin's Coast, property values could decline, flood insurance rates will rise, and residents may relocate causing a decline in the population needed to support the local economy. Visitors may also choose alternative options as these communities begin to decline, exacerbating the economic impacts further.

The most vulnerable assets (in order of timing and flood depth) of coastal Marin are:

- Near-term (Scenarios 1 and 2)
 - Beaches, underground on-site wastewater treatment systems (OWTS), buildings, and streets in Stinson Beach west of Shoreline Highway.
 - Shoreline Highway between Stinson Beach and Bolinas, at Green Bridge in Point Reyes Station, the Walker Creek crossing in Marshall, and bridges on Middle Road and Valley Ford Lincoln School Road in the near-term.
 - Beaches, beach front and downtown buildings and streets in Bolinas.

- Septic systems, beaches, marshes, and buildings along the eastern and western shores of Tomales bay on the East Shore and in Inverness.
- Water distribution pipe extending underneath Shoreline Highway and Sir Francis Drake serving Inverness residents.
- Intertidal rocky lands in Muir Beach and Agate Beach (Duxbury Reef).
- Fire service facilities and tsunami routes in Stinson Beach.
- Recreational facilities at Dillon Beach Resort and Lawson's Landing.
- Bluff top buildings in Muir Beach, Bolinas, and Dillon Beach may be vulnerable to accelerated erosion.
- Medium-term (Scenario 3)
 - Olema-Bolinas Road, the only access road to Bolinas.
 - Further north into downtown Bolinas, including the historic district.
 - Bolinas Public Utilities District lift station.
 - Shoreline Highway in Pt. Reyes Station Sir Francis Drake Blvd. in Inverness.
- Long-term (Scenarios 4 and 5)
 - Shoreline Highway along the East Shore in the medium and long-terms.
 - Buildings in Inverness west of Sir Francis Drake Blvd.
 - Downtown Bolinas up to Bridgton Road along Olema-Bolinas Road, including the market, library, community center, gas station, museum, and several other valued places.

The Draft Assessment was presented to the Planning Commission on November 9, 2015, in advance of the official public review period beginning on November 14, 2015 with a 30-day comment period. The Assessment findings and other activities will be presented at a Community Public Workshop and Open House on November 14, 2015 from 10 a.m. until after lunch at the Stinson Beach Community Center, 32 Belvedere Avenue. The Community Workshop in Stinson Beach on Nov. 14 will continue community dialogue on how to best address near, medium, and long-term vulnerabilities along the coast.

As summarized above, the Assessment points to a multitude of threats from rising tides along Marin's coast, and acknowledges that sea level rise is already occurring and is expected to continue into the future. And while the County and others work to implement policies and programs to reduce the amount of greenhouse gas emissions that contribute to sea level rise, the time has come to prepare for change by developing adaptation responses addressing the vulnerabilities of our coastal communities and natural resources. The next phase of the C-SMART program will focus on developing consensus based strategies for improving the resilience of Marin's coastal assets going forward. The ideas discussed and opinions received at the previous and upcoming workshops will help inform these strategies as part of the forthcoming Adaptation Strategy Report scheduled to be presented to the Board of Supervisors in April 2016.

The Vulnerability Assessment Report, available at <http://www.marincounty.org/depts/cd/divisions/planning/sea-level-rise/draft-vulnerability-assessment>. A wealth of other information on the C-SMART project, and the opportunity to sign up to keep informed are available at www.marinslr.org.

FISCAL/STAFFING IMPACT:

The program is funded in part by the Ocean Protection Council and California Coastal Commission. No fiscal or staffing impact as a result of the recommendation is expected since the work to complete the C-SMART program, including submittal of amendments to the Local Coastal Program, is budgeted and included in the Department's Performance Plan for the current fiscal year.

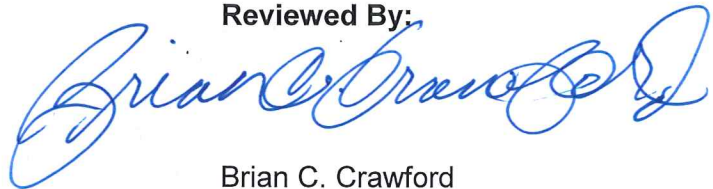
REVIEWED BY: (These boxes must be checked)

- Department of Finance N/A
- County Counsel N/A
- Human Resources N/A

SIGNATURE:


 Bridgit Van Belleghem
 Planner

Reviewed By:


 Brian C. Crawford
 Director

Attachments:

1. Draft Coastal Marin Sea Level Rise Vulnerability Assessment

In the interest of conserving resources, Attachments 1 through 4 are included only in the Board of Supervisor's packet. Copies of the Appendices are available online at: <http://www.marincounty.org/depts/cd/divisions/planning/sea-level-rise/draft-vulnerability-assessment>. To request hard copies of this material, please contact the Marin County Community Development Agency.