SAN MATEO COUNTY:
CALIFORNIA'S GROUND ZERO FOR SEA LEVEL RISE

Issue | Summary | Glossary | Background | Discussion | Best Practices | Findings
Recommendations | Request for Responses | Methodology | Bibliography | Appendices | Responses

ISSUE

The San Mateo County Flood and Sea Level Rise Resiliency District ("OneShoreline") began operating in 2020. It was designed to coordinate countywide efforts to combat the harms of sea level rise caused by climate change. Is OneShoreline on course to adequately address the sea level rise challenge that has been assigned to it, and does it have the support it needs?

SUMMARY

San Mateo County has been declared the California County most at risk from sea level rise (SLR). ***Its Bayside communities have billions of dollars of residential and commercial property at risk.*** Its five wastewater facilities and three airports, including San Francisco International, are all at risk for flooding from the rising sea. Transportation systems, schools, medical facilities, homes, and parks are all at risk. The Pacific coast communities are also vulnerable to flooding and erosion from higher seas.[1]

Sea level rise is a complex problem with an uncertain timetable that demands ongoing long-term solutions. It requires people to think differently and to truly collaborate. While solutions are still being developed, they will require planning, funding, and collaboration between affected cities, the County, and private entities.

OneShoreline was created from the County Flood Control District, has countywide jurisdiction, and focuses on SLR in addition to flooding from creeks. The official name for OneShoreline is the "San Mateo County Flood and Sea Level Rise Resiliency District."

OneShoreline provides expertise in the complex process of designing and building SLR and flood mitigation projects, including guidance through the complex maze of federal and state funding for projects. Major SLR projects can take five to ten years to plan, engineer, permit, and construct. Each SLR project will require regulatory permitting by regional, state, and federal agencies. OneShoreline could also guide County officials and regional legislators as they lobby Congress and state and federal agencies for funding and regulatory reform to address this serious problem.

---

[1] Hillary Papendick, Jasneet Sharma, Carolyn Raider, Avana Andrade, Emi Hashizume, Montserrat Plascencia, Sally Prowitt, et al. 2018, March, "County of San Mateo, Sea Level Rise Vulnerability Assessment" Final Report, Redwood City: County of San Mateo, https://seachangesmc.org/wp-content/uploads/2018/03/2018-03-12_SLR_VA_Report_2.2018_WEB_FINAL.pdf

To effectively implement SLR projects, OneShoreline must earn the confidence of San Mateo County (SMC) residents. Some people may not see the need for the expensive SLR projects and will need convincing that the expense cannot be avoided. Others will prefer to simply delay projects, causing costs to increase dramatically. OneShoreline has an agreement with the San Mateo County Office of Sustainability, and others, to educate the public to ensure that the residents understand that SLR is a real threat and that waiting until flooding is imminent is not a viable choice. Powerfully effective public engagement campaigns about SLR will be necessary to meet such challenges.

Currently, OneShoreline's operational funding comes primarily from contributions by the County and its twenty cities and towns. It needs a stable source of funding, one that will not be vulnerable to competing concerns of the communities it serves. Obtaining funds for projects to reduce the damage caused by sea level rise is a major challenge. Such projects are very expensive and are often funded by a combination of federal, state, and local funds. Obtaining required funding can be a complicated, slow, and somewhat costly process.

This Grand Jury recommends that:

- the County and its cities and towns support steady, reliable funding for OneShoreline's basic operations;
- OneShoreline consider establishing and administering a low interest revolving loan fund to enable jurisdictions to prepare the initial engineering and planning necessary to obtain federal and state financial support for SLR projects; and
- the County, its cities, and OneShoreline, along with other Bay Area counties and cities, lobby the federal and state governments for regulatory changes to enable SLR projects to proceed more easily.

Additionally, this Grand Jury urges all residents of San Mateo County to keep themselves informed as to the risks of SLR, and the need to stay ahead of SLR in order to minimize the damage it could cause in San Mateo County. *The glaciers are melting, and the clock is ticking.*

GLOSSARY - TERMS

King Tide – a non-scientific term for exceptionally high tides.

MOU – Memorandum of Understanding; defines a relationship among the parties that outlines terms and details of an agreement, without the terms of a legally enforceable contract.

Reaches – stretches of land bordered by water, often used in flooding projects as a way to divide the project into segments defined by the nature of the land and water.

RFP – Request for Proposal; announces a project, describes it, and solicits bids from qualified contractors to complete it.

SLR – sea level rise.

Storm Surge – the temporary rise in sea level caused by a strong storm's wind and waves.

GLOSSARY – AGENCIES

Army Corps – United States Army Corps of Engineers – For SLR and flooding, the Army Corps is the primary agency for levees.

BCDC – San Francisco Bay Conservation and Development Commission was founded in the mid-1960s; and became a state agency in 2008 with the passage of AB 2094. It is the State agency responsible for leading the Bay Area's preparedness for, and resilience to, rising sea level, tides, and storm surge due to climate change.

FEMA – the Federal Emergency Management Agency. For SLR & flooding, FEMA administers the national flood insurance program and manages mitigation efforts involving berms, dikes, and other efforts.

LAO – the California Legislative Analyst's Office, the California Legislature's nonpartisan fiscal and policy advisor.

NFIP – National Flood Insurance Program, overseen by FEMA.

OneShoreline – the short name for the San Mateo County Flood & Sea Level Rise Resiliency District; it is the successor to the San Mateo County Flood Control District.

Office of Sustainability – a department of the County of San Mateo that "strives to improve the sustainability of the County's operations and the greater community."[2]

Resource Conservation District of San Mateo County – a special district that helps "meet the need for voluntary resource conservation."[3]

SFCJPA – San Francisquito Creek Joint Powers Authority – leads projects that mitigate the risk of flooding along San Francisquito Creek and the San Francisco Bay. The cities of East Palo Alto, Palo Alto, and Menlo Park, along with OneShoreline and the Santa Clara Valley Water District, are members of the JPA.

USFWS – United States Fish and Wildlife Service.

---

[2] Contact Us – SMC Office of Sustainability (smcsustainability.org), https://www.smcsustainability.org/contact-us/

[3] About the RCD | San Mateo RCD, http://www.sanmateorcd.org/about/

BACKGROUND – SEA LEVEL RISE AND THE THREAT TO SAN MATEO COUNTY

How Big Is the Problem?

> Global sea level has been rising over the past century, and the rate has increased in recent decades. In 2014, global sea level was 2.6 inches above the 1993 average – the highest annual average in the satellite record (1993-present). Sea level continues to rise at a rate of about one-eighth of an inch per year.
>
> Higher sea levels mean that deadly and destructive storm surges push farther inland than they once did, which means more frequent nuisance flooding. Disruptive and expensive, nuisance flooding is estimated to be from 300% to 900% more frequent within U.S. coastal communities than it was just fifty years ago.[4]

San Mateo County (SMC) covers 455 square miles with a 2019 population of 766,573. The County consists of twenty incorporated cities, twenty-three school districts, 78,000 acres of natural land (including 8,381 acres of wetlands), twenty County parks (over 17,000 acres), 190 miles of County and local trails, 12.9 miles of beaches, 21,528 businesses, and an employed workforce of 416,263.[5]

San Mateo County faces several complications from SLR. "Sea level rise has a clear and direct impact on any coastal or bayside community, any people or businesses within inundation zones, and any ecosystem subject to erosion and flooding. Sea level rise causes direct physical damage to property and habitats, and it can have huge economic repercussions for both individuals and communities."[6] In addition to flooding, "waves crashing further up the shore will erode … coastal cliff walls," and "higher ocean water levels could force up the water levels underneath the ground as well, leading to flooding, saltwater intrusion into fresh groundwater supplies, and toxic contamination by carrying hazardous materials to the surface."[7]

"Sea level rise (SLR) is one of the most serious consequences of climate change and it will have a significant effect on San Mateo County, which has more people and property value at risk from the rising sea than any other county in the state."[8] Future flooding and coastal erosion could pose considerable risks to life, safety, critical infrastructure, the economy, and the County's natural and recreational assets. Flood damage could exceed $1 billion and assessed values of parcels exposed to erosion and flooding in the long term totals roughly $39.1 billion. More than 30,000 residential parcels and 3,000 commercial parcels could be vulnerable in the long term.

---

[4] Is sea level rising? (noaa.gov), https://oceanservice.noaa.gov/facts/sealevel.html

[5] U.S. Census Bureau QuickFacts: San Mateo County, California (2019), https://www.census.gov/quickfacts/sanmateocountycalifornia

[6] Papendick, et al., *Vulnerability Assessment*, 2018

[7] Ehlers, Rachel. *What Threat Does Sea-Level Rise Pose to California,* 2020, LAO Publication, Sacramento: Legislative Analyst's Office, p. 4, https://lao.ca.gov/reports/2020/4261/sea-level-rise-081020.pdf

[8] C/CAG, Flood and Sea Level Rise Resiliency Agency Proposal, Dec. 21, 2018, https://ccag.ca.gov/wp-content/uploads/2019/01/6.3_A3-Water-Agency-Proposal_122118.pdf

Vulnerable infrastructure includes wastewater treatment plants, schools, and essential transportation: BART, Caltrain, Highway 101, and Highway 1.[9] Electrical distribution facilities, and facilities related to the San Francisco International Airport (SFO), located in SMC, are also at risk.

In addition to the monetary losses, SLR may impact "affordable" housing disproportionately. "Already half of East Palo Alto sits within a federally designated flood zone. According to projections, in 10 years or so up to two-thirds of the land within city limits may regularly experience flooding."[10] Redwood City, Pacifica, and unincorporated areas of the County also have areas of affordable housing subject to flooding.[11]

Flooding in a bayside mobile home park in south San Mateo County. (Photo from OneShoreline website)

Additionally, SMC residents who do not live near a shoreline may think SLR is not their problem. This is incorrect. All residents, including inland residents, need: access to highway 101,

---

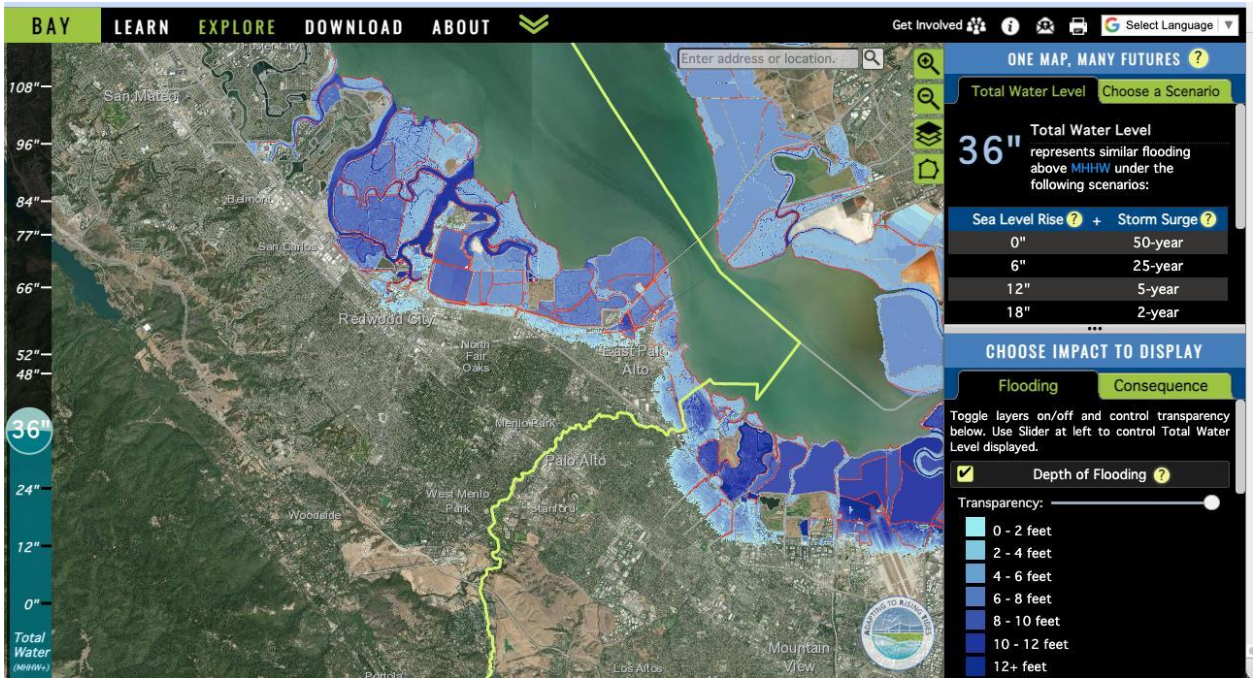
[9] Papendick, et al., *Vulnerability Assessment*, 2018.

[10] What Can the Bay Area Do About Rising Seas? East Palo Alto Has a Few Great Answers | KQED, https://www.kqed.org/science/1973805/climate-solutions-in-east-palo-alto; see also the 2015 Preliminary FEMA, NFIP map for East Palo Alto and portions of Menlo Park, https://www.cityofepa.org/sites/default/files/fileattachments/community_amp_economic_development/page/2531/fema_maps_2015_201509011239377956.pdf

[11] Grand Jury interview.

to take Caltrain, or to use SFO. All key wastewater treatment plants are located at the shoreline, and everyone needs "toilets that flush."[12]

An interactive map showing the effect of SLR and storm surges is available at https://explorer.adaptingtorisingtides.org/explorer. Below is an example showing the flooding from a 36-inch increase in water level along the Bay at the southern end of the County. As shown in the graphic below, a 36-inch increase can be experienced from no sea level rise and a "50-year" storm, six inches of sea level rise and a "25-year" storm, and other combinations.



Options for Responding to Sea Level Rise

There are only few options for dealing with the threat of SLR. They are:

- ***Protect*** the land and structures by berms, levees, sea walls, pumping stations and other structures, and raise mudflats and bay marshes to prevent erosion or flooding.
- ***Modify*** assets to withstand periodic flooding.
- ***Relocate*** the facilities to higher land.
- ***Abandon*** land and structures that will be flooded.[13]

[12] Grand Jury interviews.

[13] Grand Jury interviews.

Sea Level Rise is a Present Threat: Reports since 2016

In 2015 the San Mateo County Grand Jury issued a report titled: "Flooding Ahead: Planning for Sea Level Rise."[14] That report called for the creation of a countywide agency to address the problems brought on by SLR. Since then, numerous other reports examined SLR in California, the Bay Area, and San Mateo County. New significant reports from governmental and non-governmental agencies appear several times a year. Some of the recent and more significant reports include:

In March 2018, the County Office of Sustainability issued: *County of San Mateo Sea Level Rise Vulnerability Assessment*.[15] This report focused on understanding sea level rise risk, the level of risk is in each area, how people are affected, and our adaptive capacity.[16] **The report cited San Mateo County as the county with the highest risk of damage in the Bay Area, and one of the hot spots in the nation.** At least 32% of the population live in vulnerable areas. (See Appendix A - Selected Demographics). San Mateo County's three airports, San Francisco International, San Carlos, and Half Moon Bay, are all threatened by SLR. In addition, environmentally sensitive areas – closed landfills, former industrial sites, underground storage tanks and other contamination sites – may be damaged by SLR and contaminate the area. The County has 29 known sites classified as containing hazardous materials or cleanup sites that are vulnerable to flooding in the near term. Up to 665 sites are at risk in the long term.

Also in March 2018, Stanford Public Policy Program issued *Adaptation Planning for Sea Level Rise in San Mateo County - An Examination of 11 Bayside Cities*, a report prepared for the County Office of Sustainability.[17] It found that San Mateo County was "ground zero" for SLR vulnerability. That report noted that a mid-level projected sea level rise of 3.3 feet would impact 22,000 acres of land, 30,600 residential parcels, and five wastewater facilities. The Stanford study encouraged the cities and County to share up to date SLR information with the public.

In December 2019, the California Legislative Analyst Office (LAO) issued a report titled *Preparing for Rising Seas*,[18] which noted that SLR will impact California's coastlines in extensive and expensive ways. It posits that most of the responsibility for SLR preparation will lie with local governments and private property owners – none of whom have faced anything like this before – and observes that delaying preparations will only increase the cost dramatically. The LAO's report makes recommendations for the support of local adaptation efforts, and emphasizes the benefit of taking action early, as shown in the graphic below.

---

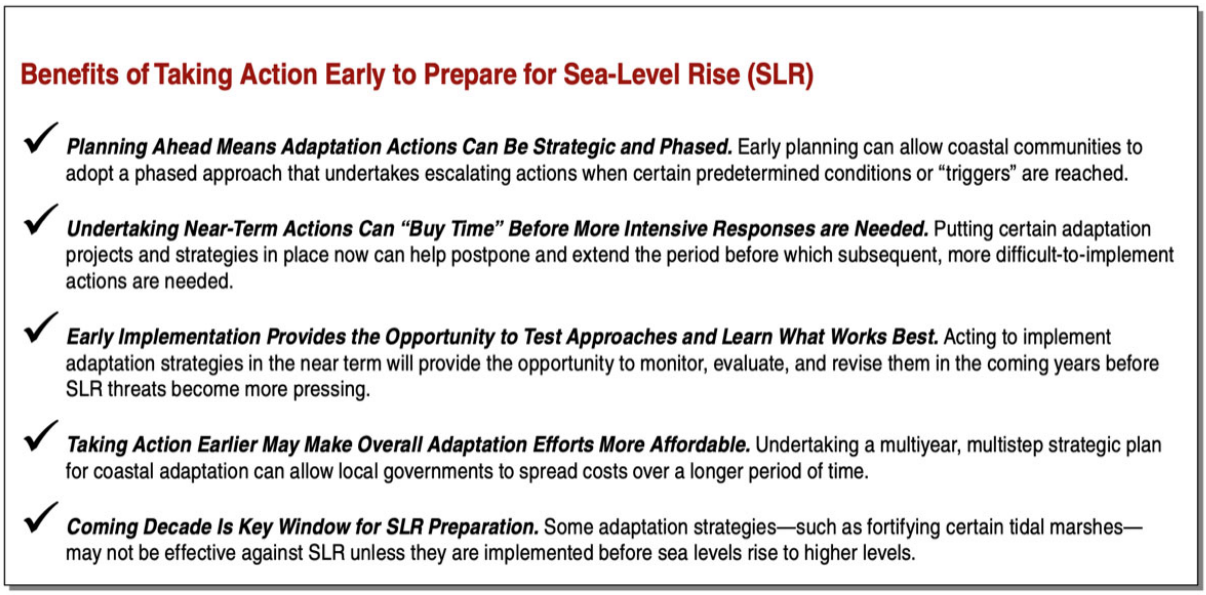
[14] Flooding Ahead: Planning for Sea Level Rise (sanmateocourt.org), http://www.sanmateocourt.org/documents/grand_jury/2014/sea_level_rise.pdf

[15] Papendick, et al., *Vulnerability Assessment.*

[16] Ibid.

[17] Enrique, Alex, Isabelle Foster, and Will La Dow, *Adaptation Planning for Sea Level Rise in San Mateo County - An Examination of 11 Bayside Cities,* March 2018, Consulting Stanford, California: Stanford Public Policy.

[18] Ehlers, Rachel, *Preparing for Rising Seas: How the State Can Help Support Local Coastal Adaptation Efforts,* December 2019, LAO Publication, Sacramento: Legislative Analyst's Office.



In March 2020, The San Francisco Bay Conservation and Development Commission (BCDC), and the Metropolitan Transportation Commission/Association of Bay Area Governments (MTC/ABAG), issued: *Adapting to Rising Tides Bay Area: Regional Sea Level Rise Vulnerability and Adaptation Study*.[19] The report, available both in a long form (205 pages) and in a summary form (36 pages), focuses on "consequences the Bay Area may face as sea levels rise in the absence of coordinated, prioritized adaptation."[20] The Adapting to Rising Tides "ART Portfolio" website contains tools and information tested and refined by BCDC. It offers key sector impact data, maps, sample projects, and guidance for cities seeking to develop adaptation strategies against sea level rise.[21]

In August 2020, the LAO issued another SLR report, titled: *What Threat Does SLR Pose to California?*[22] This report describes available research on how rising seas threaten California's coast in seven categories of impacts: public infrastructure, private property, vulnerable

---

[19] Adapting to Rising Tides 2020. Adapting to Rising Tides Bay Area: Regional Sea Level Rise Vulnerability and Adaptation Study. San Francisco Bay Conservation and Development Commission (BCDC) and Metropolitan Transportation Commission/Association of Bay Area Governments (MTC/ABAG), March 2020, San Francisco, CA., http://www.adaptingtorisingtides.org/wp-content/uploads/2020/03/ARTBayArea_Main_Report_Final_March2020_ADA.pdf

[20] Adapting to Rising Tides 2020. *Adapting to Rising Tides Bay Area: Short Report Summary of Regional Sea Level Rise Vulnerability and Adaptation Study.* San Francisco Bay Conservation and Development Commission (BCDC) and Metropolitan Transportation Commission/Association of Bay Area Governments (MTC/ABAG), March 2020, San Francisco CA. at p. 5., http://www.adaptingtorisingtides.org/wp-content/uploads/2020/07/ARTBayArea_Short_Report_Final_March2020_ADA.pdf

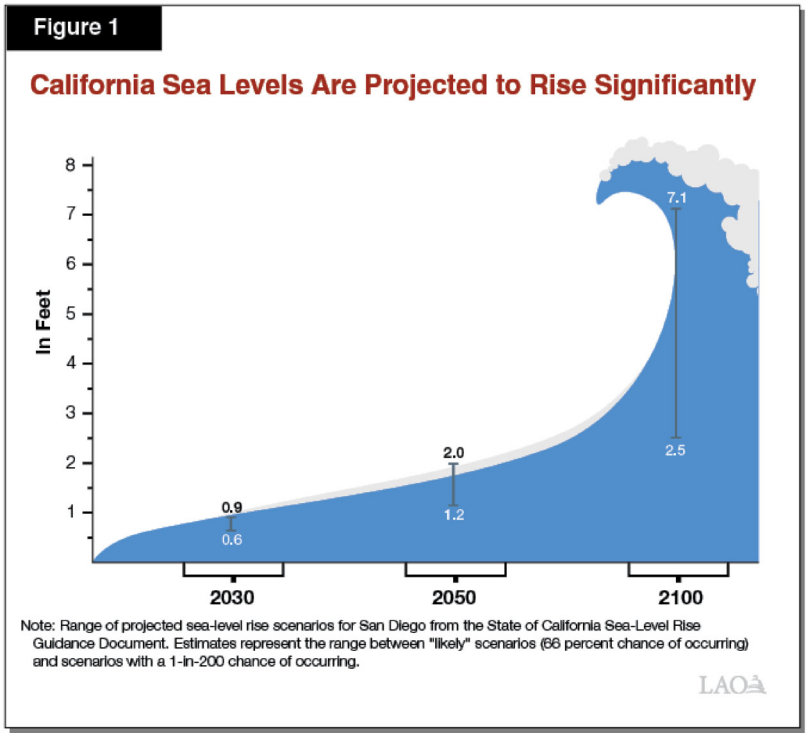
[21] Adapting to Rising Tides, https://www.adaptingtorisingtides.org

[22] Ehlers, Rachel. *What Threat Does Sea-Level Rise Pose, supra.*

communities, natural resources, drinking and agricultural water supplies, toxic contamination, and economic disruption.

In April 2021, the San Francisco Estuary Institute issued: *Sediment for Survival: A Strategy for the Resilience of Bay Wetlands in the Lower San Francisco Estuary*,[23] which proposes using sediment that is dredged from the Bay's shipping channels (and currently barged out to sea or to deep parts of the bay) to restore wetlands and mudflats in such a way that they could help in adapting to sea level rise. It estimates this approach could offer cost savings, in some locations, over building seawalls to protect homes, businesses, highways and airports. These reports offer a wealth of information on sea level rise in California, and the Bay Area in particular.

Figure 1, below, showing the variability in SLR projections, is from the August 2020, LAO report, *What Threat Does SLR Pose to California,* mentioned above.



San Mateo County – Office of Sustainability

"Formed in July 2014, as a part of the County Manager's Office, the Office of Sustainability strives to improve the sustainability of the County's operations and the greater community through work in areas of renewable energy and energy efficiency; resource conservation;

[23] Dusterhoff, Scott, Katie McKnight, Letitia Grenier, and Nate Kauffman, *Sediment for Survival: A Strategy for the Resilience of Bay Wetlands in the Lower San Francisco Estuary,* April 2021, https://www.sfei.org/sites/default/files/biblio_files/Sediment%20for%20Survival%20042121%20med%20res.pdf

alternative transportation; and greenhouse gas emission reductions."[24] An important part of its work is climate change, including SLR. In 2015, the Office of Sustainability launched a program called "Sea Change San Mateo County" which led to the San Mateo County Sea Level Rise Vulnerability Assessment, discussed above.

It also functions as a "communications department" for public engagement on sea level rise in the County. The Office of Sustainability provides curricula for schools on sea level change as well as managing a Youth Climate Ambassadors Leadership Program for 9th to 11th grade students from across the County. This program empowers youth to take climate action into their own hands by having them develop projects designed to drive change within the County.[25]

The Office of Sustainability's description of SLR states: "San Mateo County is actively preparing for sea level rise. While the changing climate and rising sea pose many risks to the people and places in San Mateo County, together we can plan ahead to protect our people and manage our valuable resources responsibly."[26]

Origin of OneShoreline

In 2015, the San Mateo County Civil Grand Jury issued a report titled "Flooding Ahead: Planning for Sea Level Rise." As a result of that report and efforts by members of the Board of Supervisors, State and Federal legislators, and others, San Mateo County and its twenty cities and towns agreed to convert the County's Flood Control District to a new District called the "San Mateo County Flood and Sea Level Rise Resiliency District," also known as "OneShoreline." OneShoreline is perhaps the only countywide agency dedicated solely to sea level rise and flooding west of the Mississippi. A table comparing the basics of the old district to the new, is in Appendix D.

DISCUSSION

San Mateo County Flood and Sea Level Rise Resiliency District – OneShoreline

In 2019, state legislation created OneShoreline, which began operation on January 1, 2020. Its geographic boundaries and spheres of influence include addressing SLR in the entire County, not just flooding in the three creek flood zones.[27] Its seven-member board is made up of five city council members from different regions in the County, and two members of the County Board of

---

[24] May 19, 2020 - New Director of Sustainability: San Mateo County on "Front Lines" of Regional Challenges | County Manager's Office (smcgov.org), https://cmo.smcgov.org/press-release/may-19-2020-new-director-sustainability-san-mateo-county-%E2%80%9Cfront-lines%E2%80%9D-regional

[25] Youth Climate Ambassador – SMC Office of Sustainability (smcsustainability.org), https://www.smcsustainability.org/climate-change/youth-climate-ambassador/

[26] Office of Sustainability, Sea Change San Mateo County, https://seachangesmc.org/

[27] Our History – OneShoreline, https://oneshoreline.org/our-history/ , see also Assembly Bill 825 (2019, Mullin) https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201920200AB825

Supervisors.[28] The board hired the former director of the San Francisquito Creek Joint Powers Authority (SFCJPA) as the CEO of OneShoreline. Initial funding came from the County and the 20 cities, with contribution amounts varying by city population.

OneShoreline's mission is to address SLR, flooding, coastal erosion and large-scale storm water infrastructure improvements through integrated regional planning, design, permitting, project implementation and long-term operations and maintenance.[29]

OneShoreline was created to look at the SLR problem holistically, emphasizing collaboration among all affected by a SLR project. SLR is a complex issue that requires cities to work together. The old approach of designing a project with just enough protection to escape a requirement that property owners obtain flood insurance is inadequate. A rising sea level means that flood insurance maps will be revised more frequently, requiring expensive flood insurance or a new project to provide protection.[30]

OneShoreline monitors proposed development on the shoreline to urge cities to consider SLR in the planning, design, and engineering of projects built in vulnerable areas. Cities must be aware of the long-term risks posed by development projects that are inadequately designed and planned. SLR should not be ignored no matter the short-term benefits that a development project promises to the developer or the locality in the short term.[31] If development projects, whether commercial and residential neighborhoods, roadways, or infrastructure, are rushed through without fully contemplating the long-term effects of SLR, the inevitable result will be future problems that are much harder to fix.

OneShoreline's current operational funding is $1.5 million per year for its first three years, plus portions of flood zone taxes when those areas have active projects. As more projects get underway, the OneShoreline staff of four will likely need to expand. Long-term, stable funding is critical to the success of this organization but does not currently exist. Many avenues of secure revenue streams for funding OneShoreline operations have been considered; currently OneShoreline is evaluating the support for a countywide parcel tax that would support both SLR and wildfire mitigation efforts[32]

Outreach and public engagement are essential for OneShoreline's success. To effectively implement SLR projects, OneShoreline must ensure public support from County residents. Some may not see the need for the expensive SLR projects and will require convincing that the expense cannot be avoided. OneShoreline will need to work with the County Office of Sustainability, and

---

[28] AB 825, (2019, Mullin) San Mateo County Flood and Sea Level Rise Resiliency District, (2019), Section 4.5(a) prescribes the Board of Directors membership.

[29] OneShoreline, *FY2021 Audited Financial Statements,* https://oneshoreline.org/wp-content/uploads/2020/12/FSLRRD-FY20_Financial_Statement.pdf

[30] Grand Jury interviews.

[31] Grand Jury interviews and Papendick, et al., *Vulnerability Assessment.*

[32] Grand Jury interviews.

others, to ensure that residents understand that SLR is real, and that waiting until flooding is imminent is not a reasonable choice. It is partnering with the League of Women Voters and other officials to provide six public forums on SLR in 2021.[33] OneShoreline representatives are also meeting with city and town managers, and councils. Educating city elected officials and staff about the hazards of SLR and mitigation strategies is essential, since turnover of city council members is high, and SLR projects can take many years to plan and build.

OneShoreline was envisioned as the hub connecting multiple interested parties in combating SLR as seen in this diagram.[34]

[33] The last two forums are on September 2 and October 14, 2021. South San Mateo County | MyLO (lwv.org)South San Mateo County | MyLO (lwv.org), https://my.lwv.org/california/south-san-mateo-county

[34] Graphic from https://resilientsanmateo.org/wp-content/uploads/2019/04/Brochure_ExecutiveSummaryProposal_122118_PRINT-11x17-1.pdf, on April 29, 2021, (website not accessible on June 7, 2021). Similar diagram in C/CAG, *Flood and Sea Level Rise Resiliency Agency Proposal*, Dec. 21, 2018, at p. 11.

OneShoreline's First Year (2020)

In its first year of operations, OneShoreline set up its board of directors and commenced operations. The board is composed of elected representatives from different regions of the County. An executive director supervises a staff of four with expertise in flood prevention in San Mateo County. It maintains an informative website containing up-to-date documents on its projects, financing, and outreach efforts. By publishing a digital newsletter, OneShoreline has reached out to the city and town councils in the County. Importantly, the OneShoreline management and board are aware that its most pressing need is to secure a reliable source of funding for its operations.[35]

OneShoreline currently operates through a master services agreement with the County, under which it coordinates with the Office of Sustainability on outreach to keep the residents informed of SLR needs.

OneShoreline's current activities include:[36]

- obtaining long-term support, along with its constituent cities, to address funding of projects identified as necessary to mitigate hazards caused or exacerbated by sea level rise;
- addressing projects inherited from the San Mateo County Flood Control District;
- overseeing the Bayfront Canal project, with construction starting in 2021;
- offering to assist communities with other SLR and flooding projects;
- consulting with cities and towns about new projects; and
- managing multi-jurisdictional projects.

OneShoreline is most interested in working on projects: where meaningful objectives are achievable and enjoy local support; where OneShoreline can add value (such as projects involving multiple jurisdictions); and where the project makes fiscal sense.

In its interviews, the Grand Jury identified the following potential roles for OneShoreline:[37]

- *Work with the County and neighboring counties* to lobby state and federal governments for regulatory change for SLR projects;
- *Share expertise* for SLR and flooding projects;
- *Set standards* for determining the amount of SLR that cities and towns, the County, and private property owners must plan for;
- *Set guidelines* for the kinds of projects OneShoreline will prioritize;

[35] Grand Jury interviews and OneShoreline website.

[36] Grand Jury interviews and OneShoreline website.

[37] Grand Jury interviews.

- *Assist in obtaining federal and state funding* for SLR and flooding projects, by providing a unified voice when communicating with governmental agencies;
- *Work with congressional representatives* for authorizations and appropriations for initial project studies; and
- *Reach out to the San Francisco District of the Army Corps* to identify problems and discuss possible projects for the County.[38]
- *Facilitate and coordinate between interested parties* and the various state and federal regulators for projects;
- *Assist the cities* in obtaining permits for projects;
- *Keep local governments and the County informed* – regarding its operation and SLR risks; and
- *Coordinate with the County Office of Sustainability* on SLR and flooding outreach programs for the schools and community organizations.

OneShoreline Projects

OneShoreline's website contains a current list of its projects at https://onshoreline.org/projects; brief descriptions of some of those projects are available in Appendix C. One project currently under construction is the Bayfront Canal & Atherton Channel Flood Protection and Ecosystem Restoration Project[39] which, among its several goals, will protect mobile home parks near the bayfront from flooding.

Funding OneShoreline Operations

OneShoreline is working to build a strong reputation before its initial operational funding runs out in 2023. Many interviewees informed the Grand Jury that OneShoreline required secure funding commitments in order perform its functions beyond the initial three-year funding period.

Recently, the Strategic Planning Committee for OneShoreline's Board of Directors examined various potential sources of long-term stable funds for OneShoreline operations, as well as project support. The only funding option identified that would provide long-term, stable yet flexible funding for projects and for operations was a countywide parcel tax. "Polling is

[38] Grand Jury interviews.

[39] Bayfront Canal & Atherton Channel Flood Protection and Ecosystem Restoration Project – OneShoreline – at https://oneshoreline.org/projects/bayfront-atherton-flood-protection/

beginning … to test a few of these scenarios and public perceptions of this issue so that we may solidify potential ballot language."[40]

If such a tax is not feasible, OneShoreline may have to continue relying on contributions from cities and the County, renewed in multi-year commitments. OneShoreline has successfully obtained grants from the state for specific work (California Department of Water Resources $1 million grant from the Urban Streams Restoration Program, and funds for the flood warning system). While private funding is an alternative source that OneShoreline has considered, interviewees expressed their concern that such funding sources are unlikely to be reliable as long-term funding.

Funding SLR Projects

Levees, sea walls, raising marshes and mudflats, and similar capital projects are *expensive*. For example, Levee Improvement Bond Measure P passed by Foster City voters in 2018,[41] authorized Foster City to issue $90 million in general obligation bonds to fund critical levee improvements. The property tax levy to repay this borrowing will continue for 30 years. The first-year rate was approximately $36 per $100,000 of assessed property value. Subsequently, the rate will be an estimated $33 annually, with continuing decreases assuming assessed property valuations continue to rise.[42]

Foster City Levee upgrade, March 26, 2021 (Grand Jury photo)

[40] OneShoreline Board of Directors presentation April 26, 2021. Available at: https://oneshoreline.org/wp-content/uploads/2021/04/FSLRRD-Board-mtg.-4.26.2021-presentation.pdf

[41] Measure P | Foster City California, https://www.fostercity.org/cityclerk/page/measure-p

[42] Frequently Asked Questions | Foster City Levee Project, https://fostercitylevee.org/faqs/

OneShoreline inherited funding that is limited for earmarked use in the flood areas in the County for established projects. Projects directly connected with one of the three creek flood zones (Colma, San Bruno, San Francisquito) may be funded from dedicated property taxes for the specific flood zone.[43]

State funding may be available if a proposed Bond Act is passed by the voters. This measure would raise approximately $7 billion to fund climate change and sea level rise projects statewide.[44]

The Army Corps of Engineers and FEMA also provide funding for some SLR projects, but each agency has a complex set of requirements for such funding. For example, federal funding requires that a preliminary engineering and design study must be prepared prior to application for the funds. OneShoreline will serve as a valuable resource to guide projects through the study, engineering, and funding application phases. To receive federal funds, the community must contribute funds for the project. As a result of such complexities communities and agencies similar to OneShoreline typically hire consultants to guide a proposal through the federal process.[45]

OneShoreline could operate a revolving loan fund, or a portion of a regional loan fund, "capitalized by a federal investment, like the Clean Water State Revolving Fund, and offer below-market rates. Savings on insurance premiums from improved ratings under FEMA Community Rating Systems, among other sources, could repay the funds."[46] The loan fund could be used to pay for the preliminary engineering and design studies required to apply for federal funding.

Delays in adapting to SLR can result in flood remediation costs of up to six times greater than the cost of planned adaptations. A "FEMA-sponsored study by the National Institute of Building Sciences found that for every $1 the federal government invested in various types of pre-disaster mitigation activities in recent years, it avoided public and private losses totaling $6."[47]

---

[43] FSLRRD-FY2020-21-Operations-and-Flood-Zones-Budgets-Approved-June-8-2020.pdf (oneshoreline.org), https://oneshoreline.org/wp-content/uploads/2020/06/FSLRRD-FY2020-21-Operations-and-Flood-Zones-Budgets-Approved-June-8-2020.pdf

[44] Bill Text - AB-1500 Safe Drinking Water, Wildfire Prevention, Drought Preparation, Flood Protection, Extreme Heat Mitigation, and Workforce Development Bond Act of 2022. (ca.gov), https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB1500

[45] Grand Jury interview.

[46] Grand Jury interview and Four Key Actions to Solve for Coastal Flooding and Sea Level Rise in the Bay Area: a Governance Proposal | SPUR, https://www.spur.org/news/2020-02-20/four-key-actions-solve-coastal-flooding-and-sea-level-rise-bay-area-governance; https://www.epa.gov/cwsrf . See also: Fact Sheet | How Can Revolving Loan Funds Make Our Coasts More Resilient? | White Papers | EESI at https://www.eesi.org/papers/view/fact-sheet-how-can-revolving-loan-funds-make-our-coasts-more-resilient

[47] Ehlers, Rachel, LAO 2019, *Preparing for Rising Seas*, *supra*, at p.7.

Will Regulatory Complexities Delay SLR Projects?

In addition to financial hurdles, sea level rise projects face serious regulatory delays. The "lengthy process for attaining approvals from state and federal agencies to implement adaptation projects is a significant barrier to getting more projects underway."[48] It has been suggested that regulatory reform at both the federal and state level is needed to allow SLR projects to be proposed, designed, and constructed with less delay and cost. It would be beneficial if OneShoreline, along with the Board of Supervisors, the cities and towns, and neighboring counties, worked together to lobby state and federal governments for appropriate reform.[49]

Multiple regulatory agencies must evaluate, and issue permits for a single project. Large SLR projects (i.e., via the Army Corps of Engineers) can require a decade to design, approve, and build. Whether it is the San Francisco Bay Conservation and Development Commission or the California Coastal Commission, regulatory systems were not designed for the threat of SLR.

Regulatory complexity may be reduced by lobbying the federal and state governments for reform, or by forming interagency teams to streamline the permit application process under existing law and regulations. One example of the later approach is the SF Bay Restoration Regulatory Integration Team (BRITT),[50] which expedites and simplifies the permitting process across nine Bay Area counties for Measure AA projects ("multi-benefit wetland restoration projects and associated flood management and public access infrastructure" projects).[51] BRITT coordinates permit reviews across all the applicable state and federal agencies for those projects.

The complexity of even a relatively simple current project is illustrated below, where the project required five funding sources, land easements among multiple parties, and permits from six agencies.[52]

---

[48] https://lao.ca.gov/reports/2019/4121/coastal-adaptation-121019.pdf **at** p. 26.

[49] Grand Jury Interviews; see also W. Chabot and others. April 28, 2021, during "Conversation With Kevin : Collaborating to Address Climate Change" hosted by Speaker Pro Tempore Kevin Mullin, video available at Conversation With Kevin Collaborating to Address Climate Change (facebook.com) https://www.facebook.com/102284836614761/videos/789035602040576/?__so__=channel_tab&__rv__=all_videos_card.

[50] California State Coastal Conservancy, San Francisco Bay Restoration Authority, "San Francisco Bay Restoration Regulatory Integration Team (BRRIT)", https://www.sfbayrestore.org/san-francisco-bay-restoration-regulatory-integration-team-brrit

[51] Combined Permitting overview, agreements, performance measures May 11 2018 (00409201-5).DOCX (sfbayrestore.org)' https://www.sfbayrestore.org/sites/default/files/2021-03/Permitting_agreements_and_performance_measures.pdf

[52] 4.26.2021 presentation (oneshoreline.org); https://oneshoreline.org/wp-content/uploads/2021/04/FSLRRD-Board-mtg.-4.26.2021-presentation.pdf

The US Army Corps of Engineers – Expertise, Funding, and Regulation of SLR Projects

The US Army Corps of Engineers (Army Corps) has decades of experience in protecting against flooding, especially with the use of levees. It serves a regulatory function in issuing permits, can be a source of funds, and can provide engineering expertise. Involving the Army Corps for federal funding is complex, involves Congressional action, and can take many years.[53]

An Army Corps project requires a local sponsor to provide initial funding for the design of the SLR protection. During planning and development, the local sponsor provides approximately 70% of the money and Army Corps provides the balance. During construction this reverses – the local sponsor provides approximately 30% and Army Corps provides the balance.

The Army Corps works best for big projects. Few communities can afford capital costs in the tens or hundreds of millions of dollars, or more. An article published by the Yale School of the Environment discussing the costs nationwide noted that, "In San Francisco, voters approved a $425 million bond to pay a quarter of the costs of fortifying a sea wall."[54] A simplified outline of the Army Corps process, as the Grand Jury understands it, is included in Appendix F.

---

[53]To get an idea of the complexity of applying for a permit see: San Francisco District > Missions > Regulatory > How to Apply for a Permit (army.mil), https://www.spn.usace.army.mil/Missions/Regulatory/How-to-Apply-for-a-Permit

[54] Who Will Pay for the Huge Costs of Holding Back Rising Seas? - Yale E360 https://e360.yale.edu/features/who-will-pay-for-the-huge-costs-of-holding-back-rising-seas. See also SF's Embarcadero seawall measure wins easily

The Water Resources Development Act (WRDA) of 2020 changed how the Army Corps evaluates projects. New regulations are expected later in 2021 and will require the evaluation to be based on "best available, peer-reviewed science and data."[55] The WRDA also requires an evaluation of the projected benefits of a project for a *50-year period* after the expected completion date.

The Army Corps evaluates socio-economic and environmental justice effects of a proposed plan during the study phase, and solicits public involvement, to understand the views and values of the community. The Army Corps is required to consider low-cost alternatives. One non-structural measure that might be considered is a managed retreat (relocation). The Army Corps considers the fair market value of vulnerable low-cost housing. If the cost to protect the housing is more expensive than replacing the housing elsewhere, then the Army Corps may prefer the relocation alternative. If a local sponsor wants to protect areas that the Army Corps does not consider economical, the cost difference will be borne by the local sponsor.[56]

FEMA – Flood Zone Maps, Mitigation, and Prevention

The Federal Emergency Management Agency (FEMA), in addition to providing aid after a disaster, also provides flood hazard and risk data to help guide mitigation actions. Flood mapping is an important part of the National Flood Insurance Program (NFIP). Flood maps are the basis for the NFIP regulations and flood insurance[57] requirements. FEMA's flood mapping program is called Risk Mapping, Assessment, and Planning, or Risk MAP.[58] FEMA maintains and updates data through flood maps and risk assessments.[59] FEMA redraws its maps as new SLR data is collected, so that NFIP requirements will increase over time.

Designating an area as a flood zone can impact property owners financially, because the consequence is that properties in the flood zone are required to carry flood insurance, which is expensive. In the Foster City example discussed above, residents chose to raise their property taxes to fund levee improvements, because doing so protected mortgage-holding residents from having their property designated as within a flood zone, and therefore requiring that they pay high flood insurance premiums.

(sfchronicle.com); https://www.sfchronicle.com/politics/article/SF-s-Embarcadero-seawall-measure-on-track-to-13369575.php

[55] Section 113, Water Resources Development Act (WRDA) of 2020. Water Resources Development Act of 2020 (congress.gov), https://crsreports.congress.gov/product/pdf/IF/IF11700

[56] Grand Jury interviews.

[57] Flood Insurance | FEMA.gov, https://www.fema.gov/flood-insurance

[58] Risk Mapping, Assessment and Planning (Risk MAP) | FEMA.gov, https://www.fema.gov/flood-maps/tools-resources/risk-map#

[59] Flood Maps | FEMA.gov, https://www.fema.gov/flood-maps

States, communities, and private levee owners are responsible for maintaining and operating the levees they own according to specific design criteria.[60] While FEMA maps flood hazards impacted by levee systems, it does not build, own, or certify levees. Instead, other parties (such as the Army Corps) build, inspect, and maintain the levees they own.

FEMA can provide funds for flood mitigation projects (such as SLR projects) through a competitive application process. FEMA will become deeply involved with permitting for any project occurring in a floodplain.

Other Regulatory Agencies

The **U.S. Fish and Wildlife Service** (USFWS) regulates projects that affect fish and wildlife.[61] A new USFWS online planning tool is available to streamline the USFWS environmental review.[62]

National Oceanic and Atmospheric Administration – National Marine Fisheries Service (NOAA Fisheries) is involved on the ocean-side of SMC. Under the Marine Mammal Protection Act and the Endangered Species Act, NOAA Fisheries, through its scientific support and permitting, protects ocean species while a construction project is ongoing.[63]

The **San Francisco Regional Water Quality Control Board** (Water Board) regulates discharges into the waters and requires cleanups of unplanned or illegal discharges. Regulating discharges is done through a variety of permits, including those that control erosion and storm water runoff during construction, as well as National Pollution Discharge Elimination System permits, and stream and vegetation permits. Under the federal Clean Water Act, either dredging or wetland fill activities require permits from the Army Corps. The Water Board must certify that those federal permits meet State water quality standards and that the projects minimize impacts on water quality. Most permits are adopted by the Water Board in public hearings after opportunities for public comment, which can increase delays.[64]

The **California Department of Fish & Wildlife** (CDFW) provides environmental review and permits in two key programs: the California Environmental Quality Act (CEQA) Review[65] and

---

[60] FEMA, Cooperating Technical Partners and Engineers, accessed May 2021, https://www.fema.gov/flood-maps/living-levees/technical-partners-engineers

[61] U.S. Fish and Wildlife Service: An Overview - EveryCRSReport.com, https://www.everycrsreport.com/reports/R45265.html#_Toc519853442

[62] The tool is called IPac – Information for Planning and Consultation. IPaC: Home (fws.gov), https://ecos.fws.gov/ipac/

[63] Welcome to NOAA | NOAA Fisheries, https://www.fisheries.noaa.gov

[64] Permits We Issue | San Francisco Bay Regional Water Quality Control Board (ca.gov), https://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/permits.html

[65] California Environmental Quality Act (CEQA) Review, https://wildlife.ca.gov/Conservation/Environmental-Review/CEQA

the Lake and Streambed Alteration (LSA) Program.[66] Both programs have separate regulations and permits.

The **California Coastal Commission** (CCC) "is an independent, quasi-judicial state agency." "In partnership with coastal cities and counties, [it] plans and regulates the use of land and water in the coastal zone. Development activities, which are broadly defined by the Coastal Act to include (among others) construction of buildings, divisions of land, and activities that change the intensity of use of land or public access to coastal waters, generally require a coastal permit from either the Coastal Commission or the local government."[67] The CCC has a dedicated section on its website on Sea Level Rise Planning and Permitting.[68] A chart illustrating the CCC regulatory process is shown in Appendix E. The CCC does not regulate the land and water in San Francisco Bay. That area is under the jurisdiction of the BCDC.

Since 2008, the **San Francisco Bay Conservation and Development Commission (BCDC)** "has been the State agency responsible for leading the Bay Area's preparedness for rising sea level, tides, and storm surge due to climate change."[69] BCDC oversees the adaptation strategy to be used by the Bay Area's regional agencies. All levels of government will need to collaborate with public and private property owners who are affected by rising sea level.[70] BCDC issues permits for work in the Bay or within 100 feet of the shoreline, including filling, dredging, dredged sediment disposal, shoreline development and other work. "A public hearing is mandatory for a major permit application[71] and the application may be reviewed by the Commission's Design Review Board and/or the Engineering Criteria Review Board." BCDC's permitting process also includes an emphasis on environmental justice.

City Awareness of Sea Level Rise

The 2014-15 Grand Jury SLR report "*Flooding Ahead: Planning for Sea Level Rise*",[72] made recommendations that contributed to the formation of OneShoreline. That report also made recommendations that SMC cities and towns include the threat of SLR in their General Plans.[73] The current Grand Jury looked at the General Plans of South San Francisco, Pacifica, Redwood City, Woodside, Menlo Park, and East Palo Alto, and found that all, except South San Francisco, had SLR in their General Plans. Not all of the General Plans covered SLR protection of transportation and utility infrastructure, schools, public safety facilities and hazardous material

---

[66] Lake and Streambed Alteration Program (ca.gov), https://wildlife.ca.gov/Conservation/Environmental-Review/LSA

[67] California Coastal Commission, https://www.coastal.ca.gov/whoweare.html

[68] Planning & Permitting (ca.gov), https://www.coastal.ca.gov/climate/slr/planning-permitting/

[69] BCDC - about us (ca.gov), https://www.bcdc.ca.gov/aboutus/

[70] Ibid.

[71] BCDC PERMIT APPLICATION FORM, https://www.bcdc.ca.gov/forms/appform.pdf

[72] Flooding Ahead: Planning for Sea Level Rise (sanmateocourt.org), http://www.sanmateocourt.org/documents/grand_jury/2014/sea_level_rise.pdf

[73] Recommendation 6 of *Flooding Ahea*d, at pg. 18

sites. South San Francisco, which has active SLR projects, is in the process of amending its General Plan to include SLR.[74] For more information on the cities, see Appendix B.

This investigation also sought to determine whether city and town councils were aware of the nature of the SLR problem – its long-term impact and significant costs. Interviews with city employees revealed that, in general, the city and town councils, staff, and residents seem more aware of the impact of SLR now than they did six years ago. City representatives interviewed by this Grand Jury acknowledged the need to regularly update new council members on the SLR projects due to the prolonged time it takes for a SLR project to be designed, approved, funded, and built.[75]

OneShoreline – SMC's Future for Responding to Sea Level Rise

San Mateo County remains at risk from sea level rise and will continue to be for many generations. OneShoreline is the County's special district with the mission to protect the County from SLR and flooding, and to work with cities, towns, and the County. Although it is just a year old, OneShoreline appears to be heading in the right direction. OneShoreline must be sustainably funded in order to do the work needed to protect San Mateo County from the unavoidable problems caused by sea level rise.

BEST PRACTICES

- Cities and towns can respond to SLR by looking beyond the immediate FEMA-based flood insurance criteria and require project designs for new developments take into account long-term SLR. A project should not be viewed in isolation; consideration must be given to how it might affect nearby structures.[76]

- To build critical public support for sea level rise mitigation projects, public officials should demonstrate current and future sea level rise impacts to the community, emphasize the financial benefits of timely projects, and solicit community input in the choice of solutions to address the sea level rise problem.[77]

FINDINGS

F1. Sea level rise will seriously damage critical San Mateo County infrastructure and assets unless the County and its cities and towns prepare now.

F2. Sea level rise infrastructure projects can take more than a decade to plan, fund and build.

---

[74] South San Francisco, Request for Proposals, General Plan 2040, January 11, 2019, p. 4, https://www.ssf.net/Home/ShowDocument?id=14571

[75] Grand Jury interviews.

[76] Grand Jury interviews.

[77] Vulnerability Study, *supra*, at p. 201

F3. Complex federal and state regulations and procedures delay and increase the costs of already expensive sea level rise mitigation projects. They need to be revised.

F4. Delaying sea level rise projects will increase costs.

F5. To remain effective, OneShoreline needs steady, long-term, operational funding.

F6. Coordination between neighboring jurisdictions is important to reduce costs and improve the effectiveness of a SLR project.

F7. Competing budget priorities among the entities in a sea level rise project make the projects difficult to fund and manage, leading to risk of delays and missed deadlines.

F8. Numerous hazardous material sites in the County must be protected from sea level rise flooding.

F9. Storm surge and sea level rise threaten the County's wastewater treatment plants affecting everyone in the County – even inland County residents.

F10. OneShoreline is uniquely positioned to augment San Mateo County's ability to combat sea level rise by its planning, funding, permitting expertise, and guidance.

F11. Destruction of low-cost housing on the Bay and coast by flooding and erosion due to sea level rise will further increase inequities in communities such as Belle Haven (Menlo Park), East Palo Alto, Redwood City, and Pacifica.

F12. OneShoreline effectively collaborates with the Office of Sustainability and others on public engagement campaigns to educate individuals on how sea level rise will affect San Mateo County.

F13. A loan program to provide cities and towns funds for the required preliminary engineering necessary to obtain partial state or federal funding for SLR projects would be beneficial.

RECOMMENDATIONS

The Grand Jury recommends:

R1. At a public meeting, each city and town council, or board of supervisors should take at least one concrete action toward establishing a continuing funding source for OneShoreline, identify that action in response to this report, and potentially adopt a resolution expressing support for a parcel tax or property tax by June 30, 2022.

R2. A coordinated lobbying strategy with participation by the County, by San Mateo County cities and towns, by OneShoreline, and by other interested Bay Area cities and counties for federal and state regulatory simplification by January 31, 2022.

R3. OneShoreline consider establishing and administering a low interest revolving loan fund to enable jurisdictions to prepare the initial engineering and planning necessary to obtain federal and state funding for SLR projects, establishing such program by December 31, 2021.

R4. The County Board of Supervisors and each city and town council, should ensure that their general plans regarding SLR protection include transportation and utility infrastructure, schools, public safety facilities, and hazardous material sites by March 31, 2022.

REQUEST FOR RESPONSES

Pursuant to Penal Code Section 933.05, the Grand Jury requests responses as follows from the indicated government entities.

Responses to the Findings:

OneShoreline's board of directors should respond to Findings:

F1 through F13.

The County Board of Supervisors should respond to Findings:

F1 through F13.

The City and Town Councils (or Governing Bodies) should respond to Findings:

F1 through F13.

Per Government Code Section 933.05(a), "as to each grand jury **finding**, the responding person or entity shall indicate one of the following:

1) The respondent agrees with the finding.
2) The respondent disagrees wholly or partially with the finding, in which case the response shall specify the portion of the finding that is disputed and shall include an explanation of the reasons therfor."

Responses to the Recommendations

OneShoreline's board of directors should respond to Recommendations:

R2 and R3.

The County Board of Supervisors should respond to Recommendations:

R1, R2 and R4.

The City and Town Councils should respond to Recommendations:

R1, R2 and R4.

Per Government Code Section 933.05(b), "as to each grand jury **recommendation**, the responding person or entity shall report one of the following actions:

1) The recommendation has been implemented, **with a summary regarding the implemented action.**
2) The recommendation has not yet been implemented, but will be implemented in the future, **with a timeframe for implementation.**
3) The recommendation requires further analysis, **with an explanation and the scope and parameters of an analysis or study, and a timeframe** for the matter to be prepared for discussion by the officer or head of the agency or department being investigated or reviewed, including the governing body of the public agency when applicable. **This timeframe shall not exceed six months from the date of publication of the grand jury report.**
4) The recommendation will not be implemented because it is not warranted or is not reasonable, **with an explanation therefor."**

The governing bodies indicated above should be aware that the comment or response of the governing body must be conducted subject to the notice, agenda, and open meeting requirements of the Brown Act.

METHODOLOGY

Documents

Numerous reports, news articles, and webpages were consulted in preparation of this report, from the cities and towns, the County, OneShoreline, as well as the California Legislative Analyst's Office and other organizations. For a complete list see the Bibliography below.

Interviews

Reports issued by the Civil Grand Jury do not identify individuals interviewed. Penal Code Section 929 requires that reports of the Grand Jury not contain the name of any person or facts leading to the identity of any person who provides information to the Civil Grand Jury.

All interviews were conducted via videoconference using Zoom or Google Meets, or via written questions. For this report the Grand Jury interviewed:

- City or Town managers or members of city or town councils.
- At least one County Supervisor.
- At least one member of the Board of the San Mateo County Flood and Sea Level Rise Resiliency District, aka OneShoreline.
- At least one member of the staff of OneShoreline.
- At least one officer of an Environmental Organization.
- At least one consultant with knowledge of FEMA and the Army Corps.

- Elected Legislators at the State and Federal Level or their designated staff.
- A representative of the Army Corps of Engineers.

BIBLIOGRAPHY

- California Assembly, 2019, Mullin, "AB 825 AB-825 San Mateo County Flood and Sea Level Rise Resiliency District." https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201920200AB825
- California Assembly, 2021, Garcia & Mullin, et al. "AB 1500 - Safe Drinking Water, Wildfire Prevention, Drought Preparation, Flood Protection, Extreme Heat Mitigation, and Workforce Development Bond Act of 2022." https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB1500
- Bay Conservation and Development Commission (BCDC). Undated. "About us" https://www.bcdc.ca.gov/aboutus/ accessed April 2021.
- Bay Conservation and Development Commission (BCDC). Adapting to Rising Tides website. https://www.adaptingtorisingtides.org/ accessed May 1, 2021.
- Bay Conservation and Development Commission (BCDC). Undated. "BCDC Application Form" https://www.bcdc.ca.gov/forms/appform.pdf
- Bay Conservation and Development Commission (BCDC). ART Bay Shoreline Flood Explorer (adaptingtorisingtides.org). https://explorer.adaptingtorisingtides.org/explorer , Accessed May 15, 2021.
- Bay Conservation and Development Commission (BCDC) and Metropolitan Transportation Commission/Association of Bay Area Governments (MTC/ABAG). 2020, March. "Adapting to Rising Tides Bay Area: Regional Sea Level Rise Vulnerability and Adaptation Study." San Francisco CA. http://www.adaptingtorisingtides.org/wp-content/uploads/2020/03/ARTBayArea_Main_Report_Final_March2020_ADA.pdf
- California Coastal Commission. Undated. "Our Mission: Protecting & Enhancing California's Coast" https://www.coastal.ca.gov/whoweare.html accessed April 2021.
- California Coastal Commission. 2018. *California Coastal Commission - Sea Level Rise Policy Guidance - Interpretive Guidelines for Addressing Sea Level Rise in Local Coastal Programs and Coastal Development Permits.* Agency Policy Guidance, San Francisco: State of California – Natural Resources Agency. California Coastal Commission Sea Level Rise Policy Guidance
- California Coastal Commission. Undated. "Sea Level Rise: Planning & Permitting." https://www.coastal.ca.gov/climate/slr/planning-permitting
- California Department of Fish and Wildlife. Undated. "California Environmental Quality Act (CEQA) Review" https://wildlife.ca.gov/Conservation/Environmental-Review/CEQA

- California Department of Fish and Wildlife. Undated. “Lake and Streambed Alteration Program” https://wildlife.ca.gov/Conservation/Environmental-Review/LSA accessed May 2021.
- California State Coastal Conservancy, San Francisco Bay Restoration Authority, “San Francisco Bay Restoration Regulatory Integration Team (BRRIT)” https://www.sfbayrestore.org/san-francisco-bay-restoration-regulatory-integration-team-brrithttps://www.sfbayrestore.org/san-francisco-bay-restoration-regulatory-integration-team-brrit
- C/CAG, *Flood and Sea Level Rise Resiliency Agency Proposal*, Dec. 21, 2018, 6.3_A3-Water-Agency-Proposal_122118.pdf (ca.gov) https://ccag.ca.gov/wp/content/uploads/2019/01/6.3_A3-Water-Agency-Proposal_122118.pdf
- City Clerk, Foster City. n.d. *Measure P | Foster City California.* Accessed May 14, 2021. https://www.fostercity.org/cityclerk/page/measure-p
- City of South San Francisco. January 11, 2019. “Request for Proposals, General Plan 2040 Comprehensive Zoning Code Update Environmental Impact Report” https://www.ssf.net/Home/ShowDocument?id=14571
- City of Pacifica, Planning Department. “General Plan Update Documents” https://www.cityofpacifica.org/depts/planning/general_plan_update/default.asp, accessed April 2021.
- Congressional Research Service. July 20, 2018. “U.S. Fish and Wildlife Service: An Overview” https://www.everycrsreport.com/reports/R45265.html#_Toc519853442 , accessed May 2021.
- County Manager’s Office, County of San Mateo. Press Release: “May 19, 2020 - New Director of Sustainability: San Mateo County on “Front Lines” of Regional Challenges” https://cmo.smcgov.org/press-release/may-19-2020-new-director-sustainability-san-mateo-county-%E2%80%9Cfront-lines%E2%80%9D-regional
- Dusterhoff, Scott, Katie McKnight, Letitia Grenier, and Nate Kauffman. 2021. “Sediment for Survival: A Strategy for the Resilience of Bay Wetlands in the Lower San Francisco Estuary.” April. Accessed April 15, 2021. https://www.sfei.org/documents/sediment-for-survival
- Economic Development Research Group, Inc., 2019. “2019 Economic Impact Study of San Francisco International Airport.” https://www.flysfo.com/sites/default/files/SFO_Economic_Impact_Report_2019.pdf
- Ehlers, Rachel. 2019, December. *Preparing for Rising Seas: How the State Can Help Support Local Coastal Adaptation Efforts.* LAO Publication, Sacramento: Legislative Analyst's Office. https://lao.ca.gov/reports/2019/4121/coastal-adaptation-121019.pdf

- Ehlers, Rachel. 2020. *What Threat Does Sea-Level Rise Pose to California.* LAO Publication , Sacramento: Legislative Analyst's Office. https://lao.ca.gov/reports/2020/4261/sea-level-rise-081020.pdf
- Enrique, Alex, Isabelle Foster, and Will La Dow. 2018, March. *Adaptation Planning for Sea Level Rise in San Mateo County - An Examination of 11 Bayside Cities.* Consulting, Stanford, California: Stanford Public Policy, prepared for the San Mateo County Office of Sustainability.
- FEMA. 2019, November. "Guidance for Flood Risk Analysis and Mapping - Levees." FEMA Guidance Document. https://www.fema.gov/sites/default/files/2020-02/Levee_Guidance_Nov_2019_v2.pdf
- FEMA. Undated. "Cooperating Technical Partners and Engineers" https://www.fema.gov/flood-maps/living-levees/technical-partners-engineers accessed May 2021.
- FEMA. Undated. "Flood Insurance" https://www.fema.gov/flood-insurance, accessed April 2021.
- FEMA. Undated. "Flood Maps" https://www.fema.gov/flood-maps , accessed March 2021
- FEMA. Undated. "Risk Mapping, Assessment and Planning (Risk MAP)." https://www.fema.gov/flood-maps/tools-resources/risk-map accessed March 2021
- Foster City, City Clerk, Measure P, Ordinance 613, https://www.fostercity.org/cityclerk/page/measure-p
- Foster City, Community Development. "General Plan" https://www.fostercity.org/commdev/page/general-plan , accessed April 2021
- Foster City, Levee Improvements Project, Frequently Asked Questions, https://fostercitylevee.org/faqs/
- League of Women Voters of South San Mateo County. "2021 Climate Resilience Forums" https://my.lwv.org/california/south-san-mateo-county accessed May 5, 2021.
- Morrison, James. August 5, 2019. "Who Will Pay for the Huge Costs of Holding Back Rising Seas?" , Yale School of the Environment. https://e360.yale.edu/features/who-will-pay-for-the-huge-costs-of-holding-back-rising-seas, accessed May 2021.
- National Ocean Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce. "Is sea level rising?" https://oceanservice.noaa.gov/facts/sealevel.html
- NOAA Fisheries, National Oceanic and Atmospheric Administration, U.S. Department of Commerce. "About Us" https://www.fisheries.noaa.gov/about-us , accessed May 2021.
- OneShoreline. (undated). "*Bayfront Canal & Atherton Channel Flood Protection and Ecosystem Restoration Project*" https://oneshoreline.org/projects/bayfront-atherton-flood-protection/ , accessed May 15, 2021.

- OneShoreline. April 26, 2021. Board of Directors Meeting presentation. https://oneshoreline.org/wp-content/uploads/2021/04/FSLRRD-Board-mtg.-4.26.2021-presentation.pdf
- OneShoreline. Dec. 10, 2020. *FY2021 Audited Financial Statements,* https://oneshoreline.org/wp-content/uploads/2020/12/FSLRRD-FY20_Financial_Statement.pdf
- OneShoreline. 2020. "Our History – OneShoreline" , accessed January 2021. https://oneshoreline.org/our-history/
- OneShoreline. 2021. "Current Project List." https://oneshoreline.org/projects/ accessed May 2021.
- OneShoreline. June 2020." San Mateo County Flood & Sea Level Rise Resiliency District Fiscal Year 2020-21 Operating Budget - Approved June 8, 2020" https://oneshoreline.org/wp-content/uploads/2020/06/FSLRRD-FY2020-21-Operations-and-Flood-Zones-Budgets-Approved-June-8-2020.pdf
- Orange County Register. January 23, 2016. "Pacifica declares local emergency after damage to sea wall" https://www.ocregister.com/2016/01/23/pacifica-declares-local-emergency-after-damage-to-sea-wall
- Papendick, Hilary, Jasneet Sharma, Carolyn Raider, Avana Andrade, Emi Hashizume, Montserrat Plascencia, Sally Prowitt, et al. 2018, March. *County of San Mateo, Sea Level Rise Vulnerability Assessment.* Final Report, Redwood City: County of San Mateo. https://seachangesmc.org/wp-content/uploads/2018/03/2018-03-12_SLR_VA_Report_2.2018_WEB_FINAL.pdf
- Redwood City, Planning Services. "General Plan" https://www.redwoodcity.org/departments/community-development-department/planning-housing/planning-services/general-plan-precise-plans/general-plan
- Resource Conservation District of San Mateo County, About page, http://www.sanmateorcd.org/about/
- San Francisco Region, California Water Boards. Undated. "Permits we issue." https://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/permits.html
- San Mateo County Grand Jury, 2015, "Flooding Ahead: Planning for Sea Level Rise", http://www.sanmateocourt.org/documents/grand_jury/2014/sea_level_rise.pdf
- San Mateo County, Office of Sustainability. (undated). "*Contact Us – SMC Office of Sustainability (smcsustainability.org)".* Accessed May 19, 2021. https://www.smcsustainability.org/contact-us/
- San Mateo County, Office of Sustainability. (undated) "Sea Change San Mateo County" https://seachangesmc.org/ accessed April 2021.

- San Mateo County, Office of Sustainability. (undated) "Youth Climate Amabassadors Leadership Program." https://www.smcsustainability.org/climate-change/youth-climate-ambassador/ accessed April 2021.
- Tam, Laura and Julie Beagle. Feb. 20, 2020. "Four Key Actions to Solve for Coastal Flooding and Sea Level Rise in the Bay Area: a Governance Proposal." https://www.spur.org/news/2020-02-20/four-key-actions-solve-coastal-flooding-and-sea-level-rise-bay-area-governance
- Stark, Kevin, Ezra David Romero. "What Can the Bay Area Do About Rising Seas? East Palo Alto Has a Few Great Answers." April 22, 2021. KQED. https://www.kqed.org/science/1973805/climate-solutions-in-east-palo-alto
- United States Army Corps of Engineers, "Regulatory Permits" San Francisco District > Missions > Regulatory > How to Apply for a Permit (army.mil) https://www.spn.usace.army.mil/Missions/Regulatory/How-to-Apply-for-a-Permit/ accessed May 2021
- United States Census Bureau, U.S. Department of Commerce. "U.S. Census Bureau QuickFacts: San Mateo County, California" 2019. https://www.census.gov/quickfacts/sanmateocountycalifornia
- United States Congress. 2020. Water Resources Development Act of 2020, https://crsreports.congress.gov/product/pdf/IF/IF11700
- University of Copenhagen. 2021. "New Research Shows Sea Level Will Rise Faster Than Previously Thought." *scitechdaily.com*, February 2, 2021. https://scitechdaily.com/new-research-shows-sea-level-will-rise-faster-than-previously-thought/
- Woodside, Town of, Planning Dept. "General Plan 2012" https://www.woodsidetown.org/planning/general-plan-2012-0 accessed March 2021.

Appendix A: Selected Demographics for the County and Certain Cities[78]

Appendix A: Selected Demographics for the County and certain Cities							
CITY	**POPULATION** (2019 est.)	**DENSITY** (per square mile)	**ELEVATION** (in feet)	**Housing Units**	**Owner-occupied housing (%)**	**Housing Density** (per square mile)	**Median Household Income ($)**
East Palo Alto	29,593	11,596	20	7,819	42.8	2,993	44,006
Foster City	33,997	8,138	7	12,458	57.9	3,317	135,470
Menlo Park	34,138	3,271	72	13,085	56.1	1,337	82,609
Pacifica	38,984	2,941	82	14,523	68.3	1,147	31,737
Redwood City	85,784	3,956	20	29,167	50.6	1,502	69,679
South SF	67,408	6,624	16	21,814	60.2	2,386	60,764
Woodside	5,542	451	387	2,157	87.1	184	212,917
SM County	767,423	2,753	n/a	284,471	Not available	789	69,306

[78] US Census Bureau, 2019, https://www.census.gov/quickfacts/sanmateocountycalifornia and other sources.

Appendix B – Examination of Selected Cities & SFO

This Grand Jury looked at certain cities and towns selected to represent the risks faced by the County as a whole. The cities are: South San Francisco, Pacifica, Redwood City, Woodside, Menlo Park, and East Palo Alto. This report added Foster City and the San Francisco International Airport, given their unique relevance to SLR today.

South San Francisco has levees, floodwalls, two wastewater treatment plants, a sealed hazardous waste area, parks and trails, a quarter of all outpatient health care facilities, acres of wetlands, Caltrain tracks and Highway 101, and a large biotech industrial district right on the SF Bay. All are at risk of SLR or flooding. Colma Creek frequently floods and has an established flood zone with a connected property tax.

SSF's General Plan, amended in 2018, does not mention SLR. In a recent presentation by OneShoreline, it was mentioned that OneShoreline was working with SSF to update its general plan regrading SLR and flooding.[79]

South San Francisco takes several approaches to sea level rise:

- Development planning and zoning for the future, utilizing SLR predictive models.
- Community awareness of the problems and recognizing the likelihood of needing resident's financial support for sea level rise mitigation projects in the future.
- Using consultants to work with federal agencies (e.g., the Army Corps of Engineers) in order to receive funding and expertise for project planning, design, and construction.
- Remediation of bay water seepage into existing landfills as the result of sea level rise.

Many parts of South San Francisco are in FEMA flood zones. South San Francisco has been proactive in seeking solutions to its own sea level rise challenges and hired consultants to work with the Army Corps of Engineers on a project to protect a $1billion water treatment plant located on the shoreline which cannot be moved. The funding, when working with the Army Corps, breaks down as follows: for design and development – SSF pays 70% and Army Corps 30%; for construction – SSF pays 30% and Army Corps 70%.

South San Francisco expects to collaborate with OneShoreline on projects such as the reconstruction of Colma Creek, which is funded via an existing property tax. SSF is also planning a water reclamation project and will look to OneShoreline for both funding and construction assistance.[80]

Pacifica is susceptible to significant impacts due to SLR. High tides and severe storms result in shoreline erosion, especially in northern Pacifica. The high cliffs are particularly susceptible to erosion and required the city to condemn and remove apartment houses and infrastructure (e.g.,

[79] Presentation by the League of Women Voters, OneShoreline, and others, April 8, 2021.

[80] Grand Jury interviews & city documents.

wastewater, telecom). Permanent fixes are complicated and expensive. Pacifica must also be prepared for tsunamis.

Properties along Esplanade Ave can be seen perched on the edge of an eroding cliff Dec. 23, 2015, in Pacifica, Calif. The center property is vacant.
(Leah Millis/San Francisco Chronicle)

Pacifica adopted a Sea Level Rise Adaptation Plan because of the 2018 Sea Level Vulnerability Assessment. The city of Pacifica is looking to implement coastal resiliency strategies and policies that are consistent with Pacifica General Plan and Local Coastal Programs.

Pacifica's General Plan recognizes the importance of global climate change and its impact on SLR. The plan describes how SLR affects coastal neighborhoods and habitats and acknowledges that "coastline-altering structures [may] be needed in the future to protect new development." It recommends periodically conducting studies of the expected rate of coastal flooding and erosion.[81] Pacifica has popular beaches, canyons, creeks and "mini-watersheds" that contribute to

[81] City of Pacifica, CA - -- General Plan Documents, https://www.cityofpacifica.org/depts/planning/general_plan_update/default.asp

flooding from the inland areas. It constructed an Equalization Basin to handle wastewater overflow to prevent sewage from entering the ocean.

Pacifica must work closely with the California Coastal Commission, which regulates any development near the coast, causing delays when evaluating new projects. It has a Local Coastal Land Use Plan which specifies the land uses and an Implementation Program containing zoning and other elements.

Storm surges frequently cover the Pacifica Pier, a present-day reality of SLR, as shown in the photograph below.

Huge waves batter the coast on Beach Boulevard in Pacifica Jan. 23, 2016. The city of Pacifica has declared a local emergency due to El Nino storm damage.[82]

Foster City, built entirely on bay fill, is protected by levees and is currently raising those levees to avoid being mapped as a flood zone requiring flood insurance. The $85 million project is being funded by a 2018 voter passed property tax.

[82] Pacifica declares local emergency after damage to sea wall – Orange County Register (ocregister.com), https://www.ocregister.com/2016/01/23/pacifica-declares-local-emergency-after-damage-to-sea-wall/

Foster City's General Plan discusses SLR and describes other contributors to coastal flooding: tides, storm surge, wind-driven waves, El Nino events, and fresh-water flooding. The Plan recognizes secondary environmental conditions (rainfall, soil conditions, etc.); the impact of human mitigation measures (levees, control channels, and other flood-control features); and addresses specific hazards, studies, past mitigation efforts, as well as an "evaluation of future sea level rise."[83]

Woodside is not at *direct* risk from SLR and has minimal flooding risk. Woodside's General Plan does not consider SLR to be much of a threat to the town, local infrastructure, or residents.[84] However, the plan acknowledges it has a vested interest in SLR mitigation given that its sole wastewater treatment facility is the Silicon Valley Clean Water Regional Wastewater Treatment Plant located in Redwood City, a facility extremely vulnerable to SLR. "Everyone needs to flush their toilets."[85]

Woodside would also be impacted by flooding of Highway/U.S. 101, other transportation resources, the loss of County industry and employers, and other infrastructure such as local airports, hospitals, and County government facilities.

Redwood City is currently working on several SLR projects namely, the Bayfront Canal and Atherton Channel Flood Improvement project with Menlo Park, Atherton, the County and OneShoreline. Improvements to the levees around Redwood Shores are being planned, with $500,000 initially budgeted for preliminary design. Also in progress is a salt pond restoration project next to Redwood Shores which will help reduce flooding during storms and high tides and protect the mouth of Redwood Creek. The City is working with property owners in the Seaport Centre and Seaport Plaza areas to raise those levees to 14 feet (at the highest point), to meet FEMA standards. Property owners are covering design and construction costs of approximately $13.5 million, while the City will be responsible for operation and maintenance.

The Redwood City General Plan cites specific SLR hazards posed to the Port of Redwood City, and the extensive development of residential, industrial, critical infrastructure, and coastal ecosystems on both sides of U.S. 101. The plan discusses:

- discouragement of development on land where SLR cannot be adequately addressed;
- consideration and mitigation of SLR in the planning process;
- supporting research and preparing adaptation plans for the effects of climate change;
- intent to consult with public agencies responsible for flood control; and
- preparing public awareness campaigns about climate change and how residents might become actively involved in solutions.

Redwood City plans to institute several SLR programs:

- Sea Level Rise Response Strategy;

---

[83] General Plan | Foster City California, https://www.fostercity.org/commdev/page/general-plan

[84] General Plan 2012 | Town of Woodside California (woodsidetown.org), https://www.woodsidetown.org/planning/general-plan-2012-0

[85] Grand Jury interview.

- Climate Change Consultation and Flooding Consultation;
- Upgrade levees to FEMA standards; and
- Improvements in the city's abilities to contain and process stormwater.[86]

Redwood City looks to OneShoreline to help on regional efforts and projects that span multiple jurisdictions and require the coordination of various agencies (FEMA, Army Corps, CA Environmental Protection Agency, Bay Conservation and Development Commission, etc.), as well as establishing uniform sea level rise standards throughout the County. Of special importance is the need for Redwood City to update the Redwood Shores levee, which, if not accomplished within a certain timeframe, will result in a large residential area being re-mapped by FEMA into a special flood hazard area, requiring homeowners carry expensive flood insurance.

Menlo Park understands that it must work cooperatively with its neighbors to solve the shared threat of SLR. "Water is fungible – it moves around."[87]

It is working with OneShoreline and the San Francisquito Joint Powers Authority (SFJPA) to address SLR and flooding. OneShoreline is currently leading project development pursuant to Memorandum of Understanding (MOU) for Bayfront Canal with Redwood City, Atherton, Menlo Park and the County. Menlo Park is also involved with OneShoreline and the San Francisquito Creek Joint Powers Authority to address concerns over flooding from the creek and the Bay in Menlo Park.

Menlo Park's General Plan recognizes the need to "prepare the community for potential adverse impacts related to climate change, such as sea level rise…," and includes a discussion of funding options. It acknowledges concerns of mortgage holders in the FEMA 100-year floodplain over the cost of mandatory flood insurance. Long-term planning for construction in SLR-vulnerable areas must be regulated to consider how development may be affected by SLR.

The Belle Haven area, located between the Bay and Highway 101, is particularly vulnerable to flooding from sea level rise. Menlo Park is working with OneShoreline, Redwood City, East Palo Alto, Atherton, PG&E and Facebook, to secure grants and other funding needed for levees to protect bayfront areas, including a PG&E substation – toward which PG&E has offered to contribute $10 million.

East Palo Alto is laser-focused on finding solutions to its flooding threats. "The City of East Palo Alto has 335 acres of land at risk in the baseline scenario, 714 acres in the mid-level scenario, and 992 acres in the high-end scenario. A significant portion of East Palo Alto's population (nearly 60%) is vulnerable to sea level rise in the mid-level scenario."[88] It is directly

---

[86] Redwood City General Plan.

[87] Grand Jury interview.

[88] Papendick, Hilary, Jasneet Sharma, Carolyn Raider, Avana Andrade, Emi Hashizume, Montserrat Plascencia, Sally Prowitt, et al. 2018, March. *County of San Mateo, Sea Level Rise Vulnerability Assessment.* Final Report, Redwood City: County of San Mateo, at p. 130.

impacted both by SLR and freshwater flooding from the San Francisquito Creek. It has a history of involvement, with the SFCJPA, to address creek flooding and has SLR projects in the early stages of development.

East Palo Alto's General Plan discusses educating its residents to take personal steps to combat climate change as a basic approach to mitigating SLR. The plan addresses the history of flooding and future hazards posed by the proximity of several neighborhoods to San Francisquito Creek. East Palo Alto considers the inevitability of SLR in its general assessment and mitigation planning for all flooding.

East Palo Alto has already been hit hard by flooding, especially around "the Village." Many of its neighborhoods are in FEMA flood zones, obliging homeowners to purchase costly flood insurance. As the city seeks to approve new development, it requires builders to "build higher" to ensure that new construction is not compromised by flooding threats.

East Palo Alto has recently been awarded a grant for sea wall construction. The City, with the assistance of OneShoreline, is working on a project with three "reaches":

Reach 1: Protect the Garden area of East Palo Alto – this project is complete.
Reach 2: Replace bridges, including the Pope / Chaucer Bridge. OneShoreline is providing design assistance along with the Army Corps of Engineers. This reach is currently looking for funding.
Reach 3: Exploring options about the ongoing upstream protection of Stanford University.

San Francisco International Airport (SFO)

San Francisco International Airport, while owned by the City and County of San Francisco, is in San Mateo County. This is the single most valuable asset in all the County. "In FY 2018, SFO directly accounted for almost $11 billion in business revenues, which supported more than 46,000 jobs at the Airport. Off-Airport businesses that depend directly on air service at SFO … raise the direct Airport contribution to the Bay Area economy to $42.5 billion in business sales, with more than 188,000 jobs."[89]

SFO borders two cites and the County. The Airport is in the planning stage of a $500 million project to increase the height of its levees. SFO has its own source of funding for SLR protection via airline ticket fees and other fees. SFO plans to work with OneShoreline to coordinate its SLR protection with its neighbors.

[89] SFO_Economic_Impact_Report_2019.pdf (flysfo.com), at p. 1, https://www.flysfo.com/sites/default/files/SFO_Economic_Impact_Report_2019.pdf

Appendix C – Some of OneShoreline's Current Projects

OneShoreline is involved in several flooding and sea level rise projects, many already in progress in various stages when the district was formed. Some of the currently active projects are summarized below. (For more details on any of these projects, check the OneShoreline website.[90]

Bay Shoreline Project: Burlingame, Millbrae, and San Francisco International Airport

The long-term objective is to raise shoreline and creek bank elevations along 1.6 miles of Bay shoreline and 1.5 miles of creeks. The project will remove properties from the current FEMA 100-year floodplain and protect them from an additional roughly six feet of sea level rise – a water level approximately 10 feet above current daily high tide. SFO has a revenue stream and will protect the airport. OneShoreline's role is, in part, to coordinate with SFO and the neighboring cities, as well as to help the cities design and finance their projects.

Bay Shoreline Project: Redwood Shores and San Carlos

Redwood Shores, built upon marshes of San Francisco Bay, is protected by a system of levees. In 2010, Redwood City raised the height of over three miles of levee surrounding Redwood Shores. In April 2020, FEMA notified Redwood City that the levees had to be raised again, or a certain residential area would be designated as a Special Flood Hazard Area requiring approximately 4,700 households to purchase flood insurance.

Bayfront Canal & Atherton Channel Flood Protection and Ecosystem Restoration Project

The Atherton Channel converges with the Bayfront Canal at the border of Redwood City and Menlo Park and empties into San Francisco Bay through a tide control structure. High tides keep the Canal and Channel from draining to the Bay. Even minor rainfall resulted in flooding of nearby mobile home parks and businesses 40 times over the past 70 years, most recently in 2017.

In 2017, Redwood City, Menlo Park, Atherton, and the County signed an MOU to establish funding for the design, environmental documentation, and land access agreements. This project consists of an underground culvert to divert excess flow from the Atherton Channel and the Bayfront Canal into managed ponds within the Ravenswood Complex of the South Bay Salt Ponds Restoration Project (SBSPRP). In 2020, OneShoreline assumed the lead role to complete the project working with the cites and the County.

Colma Creek, San Bruno Creek, Navigable Slough, and nearby areas of the shoreline

Colma Creek, San Bruno Creek, and Navigable Slough are connected waterways within the cities of South San Francisco and San Bruno that are prone to flooding, especially during high tide levels in the San Francisco Bay. Colma Creek and San Bruno Creek comprise two of the three long-standing active flood zones that OneShoreline inherited from the former flood control

[90] https://oneshoreline.org/projects/

district. OneShoreline has conducted a survey of these studies and potential projects to establish potential priorities for upcoming projects.

Countywide Flood Early Warning System and Flood Emergency Action Plans

OneShoreline is managing a coordinated, countywide flood emergency preparedness and response program in collaboration with the Sheriff's Office and the County Office of Emergency Services. The program upgrades and expands the region's flood warning system (measurement and alarms) for emergency responders and the general public. The program includes extensive public outreach and emergency response personnel training, and the creation of a publicly accessible flood monitoring webpage.

OneShoreline is also leading the creation of site-specific Flood Emergency Action Plans (EAPs) to better define and coordinate emergency responsibilities before, during, and after flood events that cross jurisdictional boundaries for the following areas: Bayfront Canal and Atherton Channel; Belmont Creek; and Navigable Slough, Colma Creek, and San Bruno Creek.

Appendix D – Comparing the Old District to OneShoreline

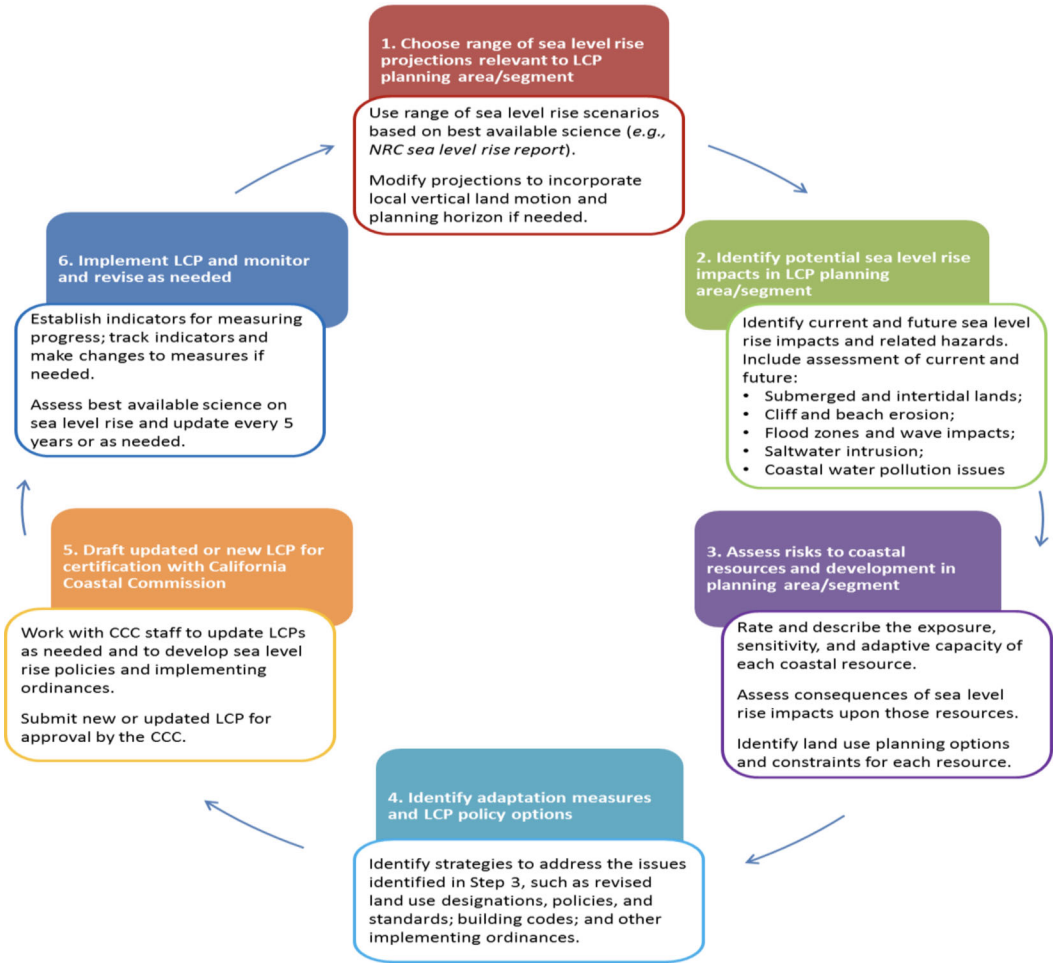
Comparing the Old Flood Control District to OneShoreline		
	Flood Control District	OneShoreline
Formal name	San Mateo County Flood Control District	San Mateo County Flood and Sea Level Rise Resiliency District
Year Established	1959	2019
Governance	Board of Supervisors of the County	Independent seven-member Board of Directors appointed from elected County and City officials[91]
Staffing	None; borrowed from County and consultants	As of May 2021, full time staff of four professionals, and consultants
Area of operation	3 Areas near creeks[92]	Entire County
Focus	Flooding – 3 creeks	SLR and Flooding
Operating budget	No "operating" budget	$1.5 million per year (2020-2022)
Funding	Property taxes from 3 flood zones by creeks	Operational: County & cities for approximately 3 years (with 2-year optional extension) Property taxes from three creek-side neighborhoods
Project Budgets	Flood zone property taxes, with some grants and matching	Flood zone property taxes, with some grants and matching, other agreements, and other assessments approved by voters

[91] Section 4.5(a) of the San Mateo County Flood Control Act, as amended.

[92] The three creeks are Colma, San Bruno, and San Francisquito.

Appendix E – California Coastal Commission Regulatory Diagrams

As an illustration of the complexity of the regulatory process, a chart from the "CALIFORNIA COASTAL COMMISSION SEA LEVEL RISE POLICY GUIDANCE - Interpretive Guidelines for Addressing Sea Level Rise in Local Coastal Programs and Coastal Development Permits"[93] is shown below.[94] While this only deals specifically with the Coastal Commission, a similarly complex iterative regulatory process will also be encountered with the BCDC, the Army Corps, and other agencies.



.

[93] California Coastal Commission, ""CALIFORNIA COASTAL COMMISSION SEA LEVEL RISE POLICY GUIDANCE - Interpretive Guidelines for Addressing Sea Level Rise in Local Coastal Programs and Coastal Development Permits," updated Nov. 7, 2018. Available at https://documents.coastal.ca.gov/assets/slr/guidance/2018/0_Full_2018AdoptedSLRGuidanceUpdate.pdf

[94] Ibid, p. 95.

APPENDIX F – The Army Corps of Engineers Procedures – "Simplified"[95]

The sequential steps that are involved in an Army Corps flood control project include:

1. Non-federal sponsor identifies problem and requests feasibility study. The non-federal sponsor, typically a city, county, or state, has the legal and financial capability to provide its share of the project cost.
2. Congressional authorization to study required, and local sponsor submits letter of intent.
3. Funds appropriated and study authorized - funds can be requested by Army Corps from President's budget, or Congress can appropriate funds.
4. Study process involves identifying problems, opportunities, objectives, and constraints, potential alternative plans, and identifies the:
    a. National Economic Development (NED) based on maximizing net benefits relative to costs. Benefits are primarily avoiding economic damages from flooding. The costs are those of constructing and maintaining the project.
    b. National Ecosystem Restoration (NER) alternative.
    c. Local sponsors may identify plans beyond the NED or NER and can include those at their own cost; a levee built higher than what the NED plan included, for example
5. Draft integrated feasibility report which includes a draft environmental compliance plan.
6. Review of the draft by:
    a. the public;
    b. resource agencies;
    c. stakeholders; and
    d. Army Corps internal legal, policy and technical.
7. Recommended Plan includes greater level of design, economic, engineering, environmental, and other technical details.
8. Final Feasibility Study Report, including environmental.
    a. Recommends project authorization.
9. Congressional Authorization and construction funding required.

The Army Corps in addition to looking primarily to avoid economic damages from flooding also evaluates based on:

- National Economic Benefit;
- Environmental Quality;
- Regional Economic Development;
- Other Social Effects;
- Views of the public;
- Federal regulatory agencies;
- State regulatory agencies; and
- Stakeholders.

[95] Grand Jury interview.

Civil works studies and projects compete nationally for congressional appropriations. The Army Corps also has a set of nine existing authorities under the Continuing Authority Program (CAP) to plan, design, and construct water resources projects of limited scope and complexity. CAP studies and projects do not require project-specific authorization from Congress. Potentially applicable CAP authorities applicable to coastal and fluvial water resources problems include Section 103 (Beach erosion and storm risk reduction); Section 204 (Beneficial Reuse of Dredge Material); Section 205 (Flood risk management); and possibly others.