



## **2014-2015 SANTA CLARA COUNTY CIVIL GRAND JURY REPORT**

### **A SLOW RISING EMERGENCY --- SEA LEVEL RISE**

#### **Summary**

The 2014-2015 Santa Clara County Civil Grand Jury (Grand Jury) received a complaint questioning three areas regarding expected Sea Level Rise (SLR) as a result of global warming. The three questions the Grand Jury was asked to investigate were:

- Is the current level of disaster planning sufficient to mitigate the expected effects, both immediate and long term, of global warming, specifically as it relates to SLR?
- What, if any, are the long range plans of Santa Clara County (County), cities, and some agencies within the county, for changing infrastructure elements and vacating lands that could be flooded by a one to two meter rise in sea level of San Francisco Bay (Bay)?
- What is being done to inform and educate private landowners whose land will be at risk of flooding from SLR?

The Grand Jury interviewed representatives from the cities in the County that abut the San Francisco Bay (“Bay”) and have addressed SLR (Palo Alto, Mountain View, Sunnyvale, and San Jose) as well as other government entities. One city, Milpitas, indicated that it had not addressed this issue and, as a result, they were not interviewed. The purpose of the interviews was to determine what, if any, actions were being planned to confront and prevent the negative consequences of SLR.

The Grand Jury reviewed a great deal of information and many studies addressing SLR and found:

- The current flood control systems are not adequate to prevent flooding with the expected SLR,
- There is inconsistency among the cities and county that abut the Bay with regard to addressing the issue of SLR, and
- There are plans, overseen by the U.S. Army Corps of Engineers (Corps of Engineers), the Santa Clara Valley Water District (Water District), and the California State Coastal Conservancy (Coastal Conservancy), to address this issue.

It does not appear that every government entity in the county that should be addressing SLR is doing so. Some local governments have studied and published reports on the effect of SLR but others have not. Consequently, we have a disjointed approach within the county to address the ramifications of SLR.

## **Background**

### **The Causes of Sea Level Rise**

According to the National Geographic Society, there are three main reasons for the rise in the ocean's level. These are:

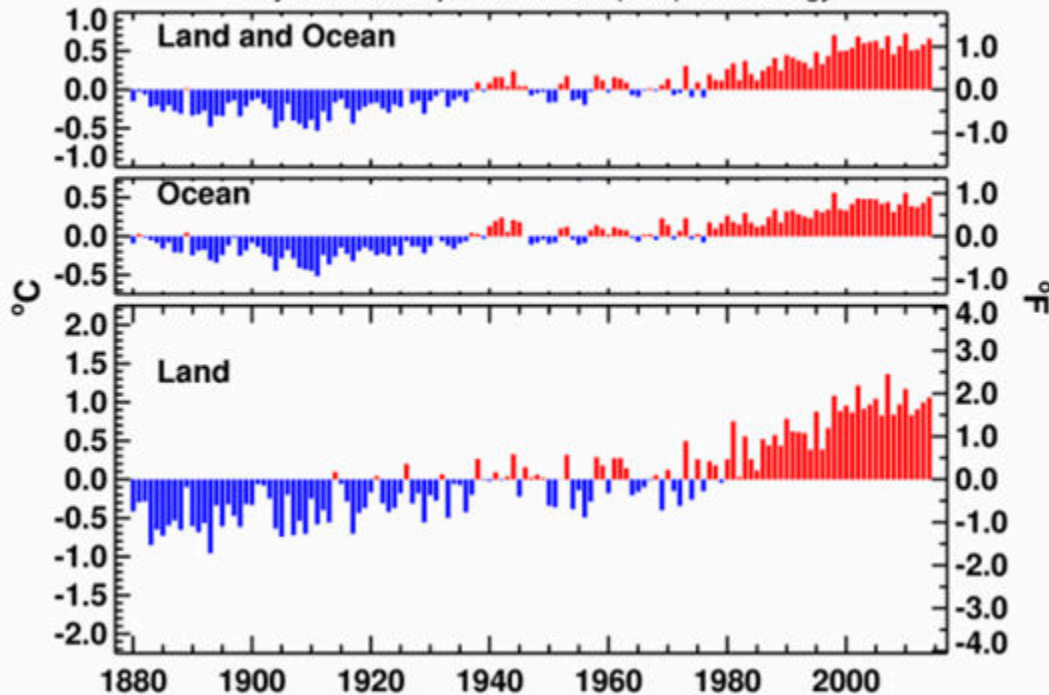
- **Oceanic Thermal Expansion.** When water heats, it expands, and when the oceans are constrained by land mass, the only direction the oceans can move is upward to inundate low lying regions of land,
- **Melting of Glaciers World-Wide and both Polar Ice Caps.** There is currently more ice melting in summer than is replaced by snowfall during winter, and
- **Ice Loss from Greenland and West Antarctica.** The winter snowfall on these land masses does not currently replenish the amount of ice that melts during summer.

The National Oceanic and Atmospheric Administration (NOAA) has tracked the rise in ocean temperature from 1880 to the present. As can be seen in the section titled "Ocean" in the following chart, it is evident that since 1880 the ocean's temperature is rising and has risen rapidly in the recent past.

## Jan-May Global Surface Mean Temp Anomalies

NCDC/NESDIS/NOAA

Analysis is based upon Smith et al. (2008) methodology.



### Studies of Sea Level Rise

Since 1987, there have been numerous studies conducted of the Bay and the effects of potential SLR. Some examples of these studies are:

- "Sea Level Rise: Predications and Implications for San Francisco Bay" [1987, Bay Conservation and Development Commission (BCDC)],
- "Assessing The Costs Of Adapting To Sea-Level Rise: A Case Study Of San Francisco Bay" (1990, Peter Gleick and Edwin Maurer, Pacific Institute),
- "Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on its Shoreline" (2011, BCDC),
- "Sea-Level Rise: a Slow-Moving Emergency" (2014, California State Assembly Select Committee; Sea Level Rise and the California Economy),
- "The Impacts of Sea Level Rise on the San Francisco Bay" (2012, California Energy Commission's California Climate Change Center),
- "Evaluating Tidal Marsh Sustainability in the Face of Sea-Level Rise: A Hybrid Modeling Approach Applied to San Francisco Bay" (2011, Plus One),
- "The Impacts of Sea-Level Rise on the California Coast" (2009, Pacific Institute),
- "Sea Level Rise Study; Feasibility Report and Capital Improvement Program" [2012, City of Mountain View/Environmental Science

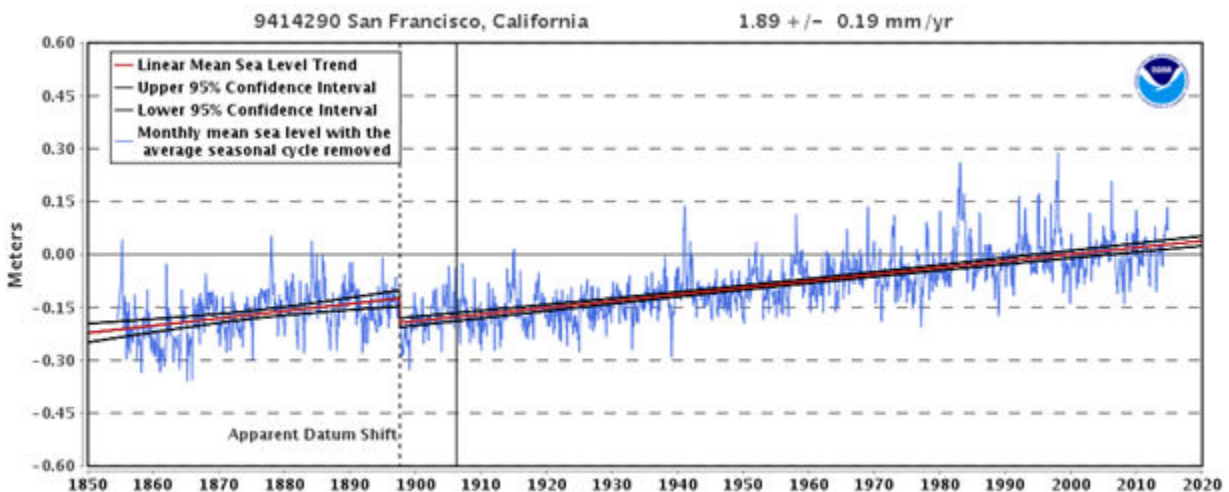
- Associates and Phillip Williams and Associates (ESA/PWA)], and “Adapting to Rising Tides” (2013, an ongoing study supported by the NOAA Coastal Services Center and the BCDC).

The studies consistently address a range of different projected rises in sea level through the end of the century. These ranges in SLR are estimated at 10 to 17 inches by 2050, 17 to 32 inches by 2070, and 32 to 69 inches by the turn of the century. The international scientific community now generally accepts these estimates of SLR.

### Measuring Sea Level Rise in the Bay

On June 30, 1854, the United States Coast Survey, now known as the National Geodetic Survey (NGS), installed a self-recording tide gauge in the Bay. This station has measured the rise and fall of tides continuously since then, making it the nation’s oldest continually operating tidal observation station. The average of the high and low tides measures the current sea level.

The following chart displays the readings from the San Francisco tide gauge house and documents that the Bay level is rising.



### Awareness of Sea Level Rise

The California State Assembly Select Committee on Sea Level Rise and the California Economy published a report in August of 2014 titled, “Sea-Level Rise: a Slow Moving Emergency.” In the introduction of this report it states:

The sea is rising. The Nation’s longest continuously operating gauge of sea level, at Fort Point in San Francisco Bay, recorded a seven-inch rise in the sea level over the 20th century. As a result of climate change and global warming, sea-level rise is projected to accelerate during the next century. Even if greenhouse gas emissions are reduced, residual warming of the ocean will cause seas to continue to rise. A 2012 report from the National Research Council found that the average sea-level rise projections for California are an additional 6 inches by 2030, 12 inches by

2050, and 36 inches (3 feet) by 2100. As a result of these projections, sea-level rise has been called a slow-moving emergency. **The Fact is that California is indeed facing an emergency.**

The International Intergovernmental Panel on Climate Change (IPCC), with 195 countries participating, is the leading authority on climate related SLR. Their mission is to study and monitor the effects of global climate change. Since 1990, the IPCC has released five “Assessment Reports.” On November 1, 2014, the fifth Assessment Report (AR5) was released by the IPCC, which divided the “Observed changes in the climate system” into four entities. They are Atmosphere, Ocean, Cryosphere<sup>1</sup>, and Sea Level.

AR5’s opening sentence when addressing the issue of sea level is:

Over the period 1901–2010, global mean sea level rose by 0.19m (7.5”) [0.17m to 0.21m] (6.7”-8.25”). The rate of sea-level rise since the mid-19th century has been larger than the mean rate during the previous two millennia.

The IPCC and the State of California (State) have indicated that a major consequence of climate change is Sea Level Rise.

### **Possible Sea Level Rise in Santa Clara County**

“The South San Francisco Bay Shoreline Study” (Bay Shoreline Study) is produced by a consortium consisting of the Corps of Engineers, the Water District, and the Coastal Conservancy. The purpose of this study is to identify and recommend flood risk management and ecosystem restoration projects along the Bay to justify federal funding.

According to the Bay Shoreline Study calculations, the figure in Appendix B shows the effects of a 16 inch sea level rise (pink) and a 55 inch sea level rise (red). The Silicon Valley Leadership Group that addresses environmental programs and policies has stated: “A total of 257 technology companies located in the flood zone are at significant risk.”

## **California and Local Governmental Responses to Sea Level Rise**

### **California**

Assembly Bill 32 titled “California Global Warming Solution Act” was passed and signed

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<sup>1</sup> The cryosphere is those portions of Earth's surface where water is in solid form, including sea ice, lake ice, river ice, snow cover, glaciers, ice caps, ice sheets, and frozen ground.

on September 27, 2006. This bill directs the State to reduce greenhouse gas emission levels to that of 1990 and to accomplish this by 2020. The focus for most county governments has been on climate action plans and the creation of organizations within county governments, such as the Santa Clara County Office of Sustainability, to meet AB 32's goals. Again, the primary purpose of AB 32 is greenhouse gases and their reduction.

Unfortunately, no comparable act has been passed by the State nor has a government organization been established in the county to address SLR. Therefore, each local government entity that abuts the Bay is addressing SLR as they deem appropriate. The following is a brief description of how each of these local governments is or is not addressing SLR.

### **Palo Alto**

The Grand Jury learned from interviews with the representatives of the City of Palo Alto (Palo Alto), and research, the following:

1. Palo Alto's focus is on sustainability, greenhouse gas reduction, and updating their Climate Action Plan. A little over a year ago, Palo Alto appointed a Chief Sustainability Officer to oversee the city's Climate Action Plan,
2. Palo Alto is unaware of actions being considered or taken to address SLR by the neighboring cities of Sunnyvale and Mountain View,
3. Palo Alto is a member of the San Francisquito Creek Joint Powers Authority, as is the Water District. Per their website, this authority leads projects along the creek and the Bay that reduce a proven flood threat (not a product of SLR) enhance ecosystems and recreational opportunities, and connect the communities. This joint powers authority recently began to look at different infrastructure alternatives to protect Menlo Park, East Palo Alto, and Palo Alto against extreme tides as a consequence of SLR, and working with other agencies to improve shoreline habitat, and
4. In August 2014, the City of Palo Alto released their "Threat and Hazard Identification and Risk Assessment." The report evaluates vulnerability and decides implementation measures based on the necessary capabilities to deal with the hazards and threats. SLR is not one of the hazards in this report, but flooding and severe winter storms are.<sup>2</sup>

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<sup>2</sup> Threat and Hazard Identification and Risk Assessment, p.4

### **Milpitas**

The City of Milpitas (Milpitas) has told the Grand Jury that it is not addressing SLR. It has a 100 page climate action plan, titled, "City of Milpitas: Resolution 8252: A Resolution of the City Council of the City of Milpitas adopting Negative Declarations and Climate Action Plan (5/7/2013)." The plan does not mention SLR, but only addresses greenhouse gas reductions.

### **Sunnyvale**

The City of Sunnyvale (Sunnyvale) is in the very early stages of the SLR issue. Through interviews, the Grand Jury has learned the following:

1. As of April 2014, it has a Climate Action Plan that mentions adapting to SLR and the effects on Sunnyvale,
2. There is a lack of urgency or immediacy of action due not only to the lack of funds, but also a belief that SLR is so far in the future,
3. Officials of Sunnyvale told the Grand Jury that they are unaware of SLR plans being taken by their neighboring communities, and
4. Officials of Sunnyvale stated that they would like an organization to take a leadership role to coordinate everyone's efforts.

### **Mountain View**

The City of Mountain View (Mountain View) has an extensive plan in place and is taking steps, mostly on its own, to address the threat of SLR. The Grand Jury has learned the following:

1. Mountain View appointed an Environmental Sustainability Coordinator who focuses almost exclusively on the potential impact of greenhouse gases,<sup>3</sup>
2. The threat of SLR is being addressed by the city through its Public Works Department. With the help of ESA/PWA, the department produced the "Shoreline Regional Park Community: Sea Level Rise Study: Feasibility Report and Capital Improvement Program," which addressed both the threat of SLR to the city as a whole and the threat posed in the salt ponds areas of the city. The latter, as proposed by the report, requires creating a gently sloped upland habitat transition area along the bay ward levee slope.<sup>4</sup> Responsibility for designing levees in Mountain View's Action Plan area is assumed by the department working in consultation with the Water District, which, in turn, is working with the US Army Corps of Engineers,
3. The Bay Shoreline Study indicated that Mountain View was not a priority area, thus the city moved on its own in the expectation that

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<sup>3</sup>"City of Mountain View: Climate Change: Environmental Sustainability Action Plans"

<sup>4</sup> "City of Mountain View: Climate Change: Environmental Sustainability Action Plans," 12/18/2012, p. 2

- a future study might revise that assessment, and
4. The current proposals the city is addressing include:
    - a. Charleston Slough and Palo Alto Flood Basin Levee Improvement,
    - b. Coast Casey North Levee Improvement,
    - c. Landfill Erosion Protection,
    - d. Lower Permanente Creek Levee and Floodwall Improvements,
    - e. Golf Course Facilities High Ground Augmentation,
    - f. Lower Stevens Creek Levee Improvements,
    - g. Coast Casey Pump Station Improvement,
    - h. Lower Permanente Creek Storm Drain Improvements,
    - i. Sailing Lake Access Improvement,
    - j. Sailing Lake Intake Pump Station Modification, and
    - k. Charleston Slough Tide Gates Improvement.<sup>5</sup>

**NOTE:** All of these areas are currently at risk due to the threat of flooding. That risk, however, increases when also threatened by SLR.<sup>6</sup> The total estimated cost to complete the Mountain View projects is \$43 to \$57 million up front with an annual operating budget of \$117,000 to \$130,000 (in 2012 dollars). The City will fund these expenditures on its own.<sup>7</sup>

5. The Grand Jury was told that Mountain View would like more county-wide coordination in addressing the SLR issue.

### **San Jose/Alviso**

Issues of SLR for the City of San José/Alviso are being coordinated by the Water District.

### **Santa Clara Valley Water District Response to Sea Level Rising**

From 1929, with the formation of the Santa Clara Valley Water Conservation District, to 1952, with the establishment of the Santa Clara Valley Flood Control and Water Conservation District, there were several water districts in the county that were responsible for building reservoirs and recharging the underground aquifers. In 1952, the Santa Clara County Board of Supervisors merged these districts into the Santa Clara Valley Water Conservation District. They gave the district the task of protecting

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<sup>5</sup> Id. at 6-7

<sup>6</sup> Id. at 9

<sup>7</sup> Id. at 8



most of the County from flooding and providing water to the County residents. In the 1970s, this District was renamed the Santa Clara Valley Water District and given responsibility for flood control and water supply for the County.

The Water District was created by an act of the California Legislature, and operates as a State of California Special District, with jurisdiction throughout Santa Clara County. This act is the “Santa Clara Valley Water District Act.”<sup>8</sup>

Per Section 4, the Santa Clara Valley Water District Act’s primary purpose is “to authorize the district to provide comprehensive water management for all beneficial uses and protection from flooding within Santa Clara County.” In doing so, the legislature made it clear that “it is the intent of the Legislature that the district work collaboratively with other appropriate entities in Santa Clara County in carrying out the purposes of this act.”

The aforementioned Bay Shoreline Study is the Water District’s response to SLR in the Santa Clara County. It is a countywide plan to address SLR along the entire coastline of Santa Clara County.

The Act gives the Water District “Powers” in order to carry out their purposes. Per §5.12., the Water Districts is given the power “To make contracts, and to employ labor, and to do all acts necessary for the full exercise of all powers vested in the district or any officers thereof, by this Act.”<sup>9</sup> The Water District has entered into at least four (4) joint committees and one joint powers authority.” The four committees are:

- Joint Recycled Water Advisory Committee with the City of Palo Alto,
- Joint Recycled Water Committee with the City of Sunnyvale,
- Joint Recycled Water Policy Advisory Committee with the City of San José and the City of Santa Clara, and
- San Felipe Division Reach One Committee with San Benito County Water District.

The members of the San Francisquito Creek Joint Powers Authority are the Santa Clara Valley Water District, together with Palo Alto, East Palo Alto, Menlo Park, and San Mateo County Flood Control District.

The Grand Jury has learned through interviews the following:

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<sup>8</sup> See Santa Clara Valley Water District Act §60-1 et. seq.

<sup>9</sup> Santa Clara Valley Water District Act §60-5(12).

1. The cities that abut the Bay have very little information about the Bay Shoreline Study,
2. Mountain View is addressing SLR independent of the Water District,
3. The Water District is part of a San Francisquito Creek Joint Powers Authority together with Palo Alto, East Palo Alto, Menlo Park, and San Mateo County Flood Control District, and
4. There is no joint power authority or any other agreement between the Water District and the cities of Milpitas, Sunnyvale, Mountain View or Palo Alto in regard to dealing with SLR in Santa Clara County.

### **The Cost of Not Addressing Rising Sea Level**

Additionally, the Grand Jury was told that if the flood hits the water treatment plants in Palo Alto, Sunnyvale, and San José, the total value at risk more than doubles and up to a foot of water will cover Highways 101 and 237.<sup>10</sup> There remain concerns of rising sea levels flooding additional lands near the Bay. Also, in the case of severe rainstorms, there is an additional concern, that because of a higher Bay level, there will be more flooding in the lower stream beds.

### **Response to Anticipated Sea Level Rise**

At the time of the Grand Jury's investigation, the City of Mountain View and the Water District have been the most active in studying the possibility of SLR and are preparing to implement responsive projects to protect from such a possibility. Mountain View initiated a project that culminated in the publication on December 18, 2012, of "The Shoreline Regional Park Community (Shoreline Community) Sea Level Rise Study Feasibility Report and Capital Improvement Program (CIP)."

The Water District joined the Corps of Engineers and the Coastal Conservancy in creating a congressionally authorized study to develop projects to address the risks from flooding due to SLR and restoration of the wetlands. On December 18, 2014, the Corps of Engineers released their "Draft South San Francisco Bay Shoreline Phase I Study, Draft Integrated Interim Feasibility Study and Environmental Impact Statement/Report." On January 14, 2015, the Grand Jury attended a public meeting held by the Corps of Engineers, Water District, and Coastal Conservancy. The purpose of the meeting was to discuss the study and to receive input to the aforementioned draft report. Public comments were solicited.

The Grand Jury learned through the interview process that most cities wanted to maintain local control but believe that some county-level coordination would be helpful. As a result, the cities and other relevant agencies have a wide, often disjointed array of

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<sup>10</sup> <http://www.eenews.net/stories/1059974050>

responses to SLR demonstrating varying levels of commitment, efficiency, and staffing.

On September 17, 2014, the Grand Jury toured the Water District's San Jose/Santa Clara Regional Wastewater Facility in Alviso. During this tour, it was pointed out to the Grand Jury that some of the construction observed was being performed in order to relocate underground electrical facilities to above ground. This was being done to prepare for the anticipated effects of SLR, and indicated that there are currently active efforts within the County to prepare for the effects of climate related SLR.

## **Methodology**

In preparing this report, the Grand Jury:

- Toured the San Jose/Santa Clara Regional Waste Water Facility and the Silicon Valley Advanced Water Purification Center in San José,
- Toured the Don Edwards San Francisco Bay National Wildlife Refuge in Alviso,
- Submitted a questionnaire and received answers from the U.S. Army Corp of Engineers, South Pacific Division, San Francisco District,
- Reviewed portions of the "Draft Interim Feasibility Report and Environmental Impact Statement / Report South San Francisco Bay Shoreline Phase I Study Santa Clara County, CA," December 2014,
- Reviewed portions of the City of Mountain View's Shoreline Regional Park Community Sea Level Rise Study Feasibility Report and Capital Improvement Program, December 18, 2012,
- On January 14, 2015, members of the Grand Jury attended a meeting held in Alviso for the public discussion of the Draft Interim Feasibility Report and Environmental Impact Statement / Report South San Francisco Bay Shoreline Phase I Study Santa Clara County, CA (cited above),
- Interviewed representatives from the following:
  - Santa Clara Valley Water District,
  - San Jose/Santa Clara Regional Waste Water Facility,
  - Santa Clara County Office of Sustainability,
  - Consulting firm AECOM,
  - Bay Conservation and Development Commission (BCDC),
  - California State Coastal Conservancy (Coastal Conservancy),
  - City of San José, Environmental Compliance Office,
  - City of Mountain View, City Staff,
  - City of Mountain View, Public Works Department,
  - City of Sunnyvale, Environmental Services Department,
  - City of Palo Alto, Office of the City Manager,
- A questionnaire was completed and returned to the Grand Jury by the Corps of Engineers, and
  - Conducted web searches and read articles in newspapers and other publications.

## **Discussion**

To better comprehend Sea Level Rise and how it relates to Santa Clara County, an understanding of the relevant terms and concepts is necessary. The current chosen solutions to protect property within Santa Clara County is to construct dikes and levees along the Bay and to promote wetlands and marshes at the edges of the Bay.

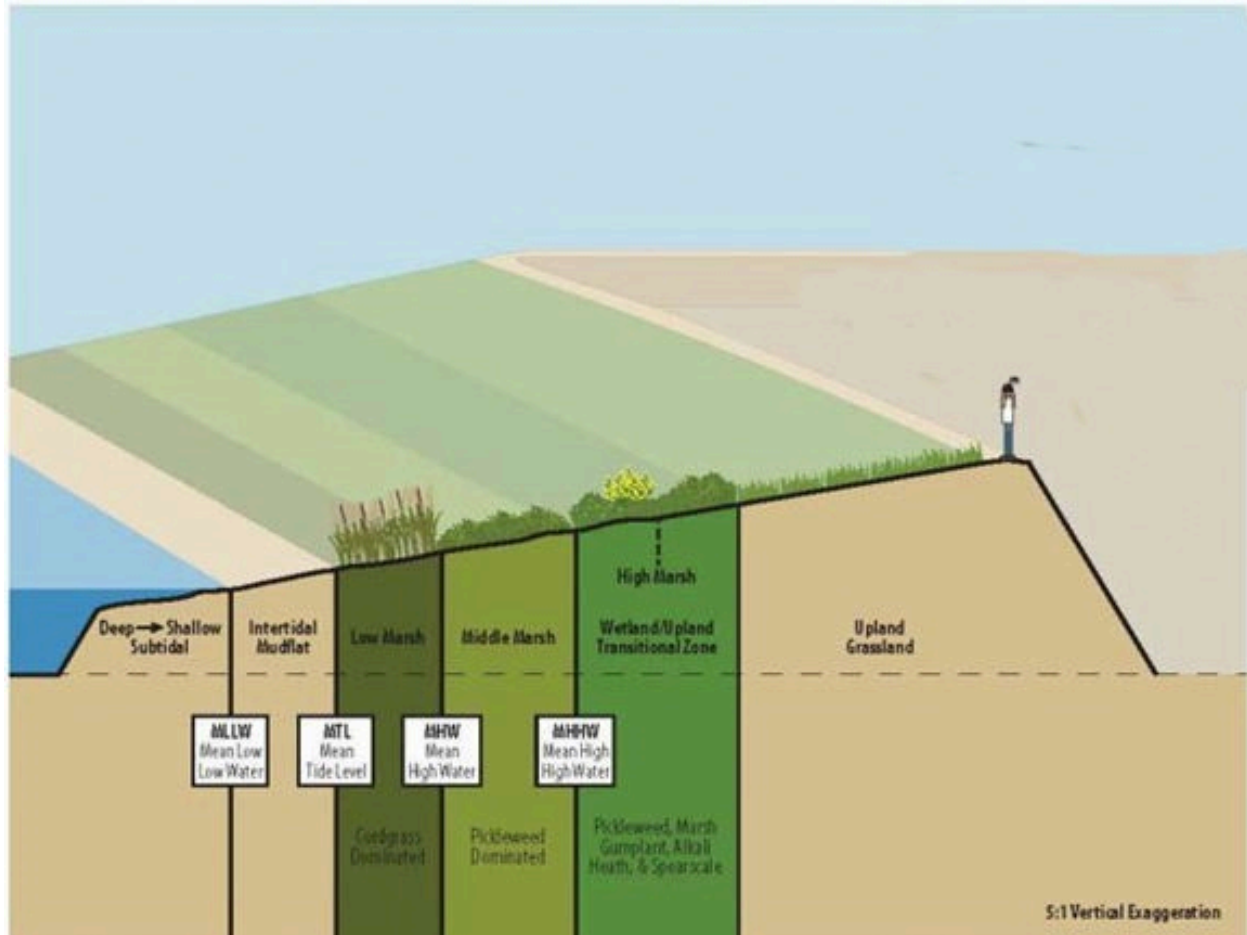
### **Dikes and Levees**

Dikes and levees are walls that are made of stone, clay, and other earth materials. They are designed to hold back water from dry land. Dikes usually protect land that would otherwise be under water. Levees protect land that is usually above water but may be flooded at times.

The Bay Shoreline Study recommends building levees in Economic Impact Areas. See Appendix C. These areas were arbitrarily selected to describe portions of the Bay shore at risk for SLR. The first Economic Impact Area (EIA) that the study recommended to be addressed is EIA 11. Economic Impact Area 11 includes Alviso. Its homes, commercial and industrial facilities are generally located below sea level, and protected by salt pond levees.

When the project is completed, the new levees will be approximately 15 feet high which is about 5 feet higher than the current non-engineered levees that were built for the salt ponds. They will have a slope of 30 to 1 on the Bay side. This means that for every foot in height, the levee will extend 30 feet into the Bay. The following is a cross section of the proposed 30:1 levee.

## Proposed Ecotone with 30:1 Side Slopes Cross-Section at Year 2017<sup>11</sup>



Note: Figure of a person on top of the levee is used to establish scale.

### Wetlands and Marshes

Wetlands are areas such as swamps, marshes, and bogs where water covers the soil, or is at or near the surface of the soil year round. They serve as giant filters removing toxic pollutants and nutrient runoff that could damage the ecosystem of the Bay. Some scientists feel that wetlands are as important as coral reefs and rain forests. A marsh is a type of wetland, which does not have trees or shrubs, but rather has grasses, rushes, sedges, and reeds. A marsh provides vital habitat to many plant and animal species as well as protecting neighboring areas of land from flooding, and in the case of saltwater marshes, preventing excessive salinization. In addition to filtering out pollutants and

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<sup>11</sup> An ecotone is a transition area between two biomes. It is where two communities meet and integrate. It may be narrow or wide, and it may be local (the zone between a field and forest) or regional (the transition between forest and grassland ecosystems).

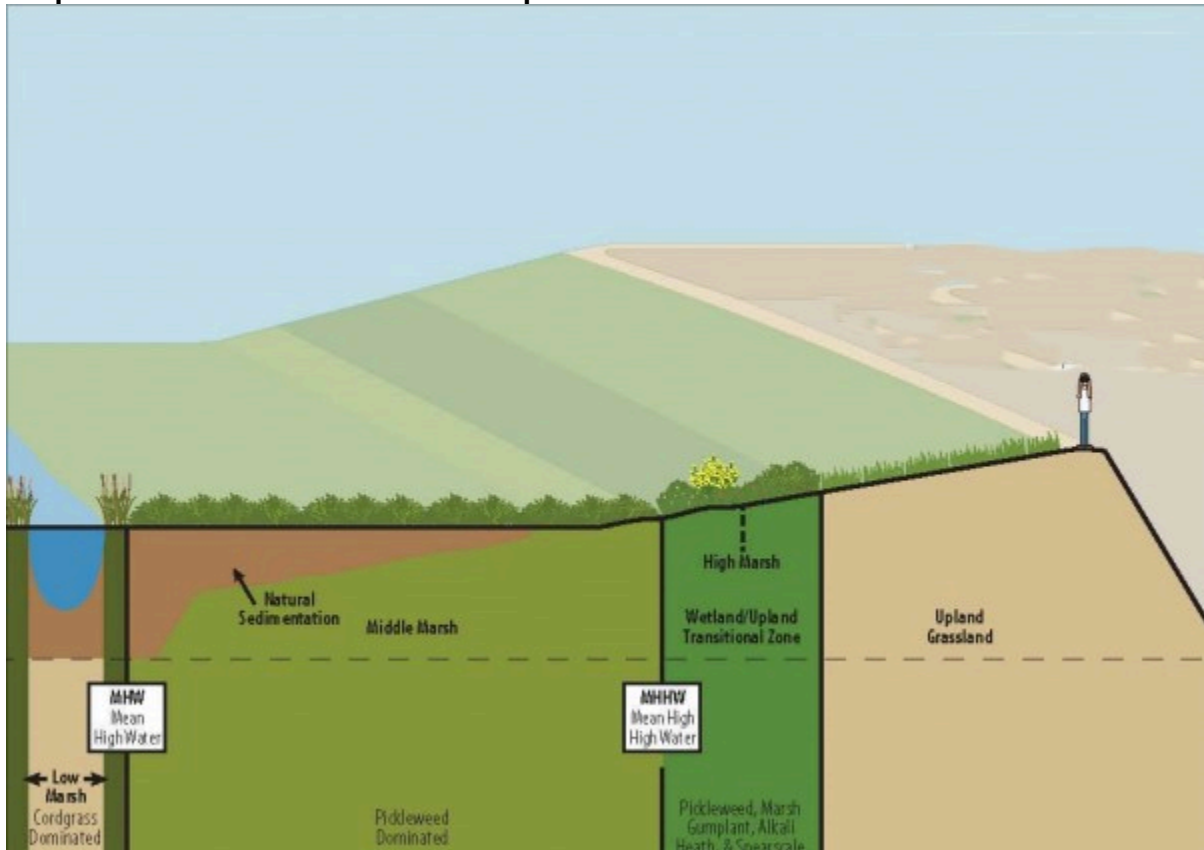
nutrient runoffs, wetlands have other advantages. They help by:

- capturing atmospheric carbon and storing it,
- serving as a natural sponge by absorbing large amounts of water due to tidal flooding or storm water releases, and
- providing a home to migratory and residential birds, fish and other marine life that use wetlands to forage, rest, and raise their young.

Wetlands also create a buffer against the consequences of SLR by:

- acting like a giant sponge, protecting the levees from damaging waves and tidal surges, and
- increasing levee height from the deposits of matter that rising sea level will bring into the wetlands thereby creating new and higher shorelines. The following figure shows what a 2017 levee might look like in 2067.

## Proposed Ecotone with 30:1 Side Slopes Cross-Section at Year 2067



Note: Figure of a person on top of the levee is used to establish scale.

### **Benefit of Combining a Levee Project with a Wetland Restoration Project**

In 2003, the 15,000 acre South Bay Salt Ponds were purchased from Cargill, Inc. by the federal government, the State of California, and the City of San José. These 15,000 acres are divided into three pond areas, the Ravenswood Ponds on the west shore of the Bay near Menlo Park, the Alviso Ponds that lie between the eastern edge of the Charleston Slough in Palo Alto to approximately 1 ¾ mile north of Coyote Creek in Milpitas, and the Eden Landing Ponds on the east shoreline of the bay near Hayward. The Federal stewardship of this property was placed in the hands of the U.S. Fish and Wildlife Service and the State stewardship of this property is in the hands of the California State Coastal Conservancy. The restoration of the south bay salt ponds is the largest tidal wetland restoration project on the West Coast and is aptly named the South Bay Salt Pond Restoration Project (Salt Pond Restoration Project).

In 2005, Congress authorized the Bay Shoreline Study. It was designed to coordinate the ecosystem restoration of the salt ponds (Salt Pond Restoration Project) with a flood risk management project in light of the SLR in the Bay. Therefore, completion of the project proposed by the Bay Shoreline Study could complete a significant portion of the Salt Pond Restoration Project in the Alviso area.

### **Consequences of the Bay Shoreline Study**

The Santa Clara County “coastline” along the San Francisco Bay is approximately 15 miles long. The April 2013 “California’s Flood Future” report from the California State Department of Water Resources and the Corps of Engineers, finds that the County ranks second in the State in potential flood losses and third in the number of people exposed to flood danger. The Grand Jury was told by the Corps of Engineers that the Bay shoreline and the watersheds of Guadalupe and Coyote creeks pose much of the danger.

The purpose of the Bay Shoreline Study is to identify flood risk management and ecosystem restoration projects. The partners in the Bay Shoreline Study are the Corps of Engineers, the Water District, and the Coastal Conservancy. The Bay Shoreline Study divided the south Bay into fourteen (14) EIAs, only eleven (11) of these are in the County. The Bay Shoreline Study developed equivalent annual flood damage estimates for EIAs generally located between each creek system along the shoreline.

Some EIAs experience higher equivalent annual flood damages than others. EIA 11 in the Alviso area was among the highest and well known for its flooding issues. EIA 11 extends from the Guadalupe River (in the west) to Coyote creek (in the east). It extends in the south to include both the community of Alviso and the San Jose/Santa Clara Water Pollution Control Plant.

### **Studies Evaluating Sea Level Rise and Flooding in the Bay**

In November 2013, the California Department of Water Resources and the US Army Corp of Engineers issued a joint report, titled, “California’s Flood Future.” Its purpose was to assess the level of flood exposure statewide, identify flood management issues, and develop recommendations to help address California’s flood risk. This report states that:

... continuation or acceleration of this sea level rise, in combination with changes in precipitation and runoff patterns, likely would result in an increase in flood events...

and

... projected increase in flood inundation in the San Francisco Bay under one scenario of sea level rise... could be significant, especially in the south Bay Area where there are high levels of urbanization.<sup>12</sup>

The draft produced by the Bay Shoreline Study consortium concurs with the California

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<sup>12</sup> California’s Flood Future at 1-9 and the second quote is from pages 3-17.



Flood Future report. They both agree that there is currently a significant threat of major tidal flooding throughout the Alviso community, and this threat is projected to increase significantly over time because of SLR.<sup>13</sup> Therefore, when the above mentioned partners in the Bay Shoreline Study were contemplating where to begin the project it was natural to select EIA 11.

In addition, the selection of EIA 11 means that the flood control project could be tied in with the Salt Pond Restoration Project. This project's goal is the restoration of approximately 15,000 acres of former industrial salt ponds into tidal wetlands for animal and fish habitat, recreational use, and flood protection. If the Bay Shoreline Study receives federal funding, then this would allow these federal funds to be leveraged with state and local funds to accomplish some, if not the entire Salt Pond Restoration Project.

The Bay Shoreline Study advocates the creation of a two pronged project in which flood protection (levee) is built while concurrently restoring tidal wetlands in the south Bay. The proposed levee will be approximately 3.7 miles long which is approximately 25 percent of the Santa Clara County coastline. The levee will run from Guadalupe River to Coyote Creek. It is planned to be at a height of 15.2 feet and have a slope of 30 to 1. The estimated cost of this first phase of flood protection for EIA 11 is \$162,630,000. This would be divided as follows; U.S. Fish and Wildlife \$39,712,000, Corps of Engineers \$52,371,000, and non-Federal \$70,547,000. The Water District and California State Coastal Conservancy (CSCC) are the non-Federal sponsors.<sup>14</sup> After completing this phase, the partners would then turn their attention toward EIA 1 – EIA 10. It is estimated that to complete EIA 1 through EIA 10, the cost will be approximately \$400-\$500 million.

## **Conclusions**

There has been a great deal of time and effort devoted to studying the effects of Sea Level Rise (SLR) in the San Francisco Bay. These studies continue today, as those in various scientific specialties learn more about the fact that the sea is rising.

The Corps of Engineers, the Coastal Conservancy, and the Water District are currently addressing SLR as partners in the consortium, the "South San Francisco Bay Shoreline Study." The consortium produced a document that addresses some critical issues for Santa Clara County. It addresses not only SLR, but also the restoration of the salt ponds and the preservation of native habitats.

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<sup>13</sup> Draft South San Francisco Bay Shoreline Phase I Study, Draft Integrated Interim Feasibility Study and Environmental Impact/Report, Phase I study report at S.10

<sup>14</sup> Id. at S.4

If and when the South San Francisco Bay Shoreline Study recommended project for EIA 11, which includes Alviso, is completed, the county will have in place a levee and marshland, but these measures will only address the effects of SLR for the next few decades.

The Grand Jury reached the following conclusions:

- The cities of Palo Alto, Mountain View, and Sunnyvale want to retain control of SLR related efforts within their jurisdictions, but would like to have an organization assume responsibility for coordinating the plans and activities involved in addressing SLR.
- Within Santa Clara County, Milpitas has no plan to address SLR.
- The Water District, which is, by law, tasked with the responsibility for flood control in Santa Clara County, should take a sufficiently proactive leadership role in Santa Clara County's efforts to address SLR. They are participating in the South San Francisco Bay Shoreline Study, have active projects underway, and are best prepared and qualified for the role of coordinating efforts to coordinate SLR for Santa Clara County,
- Since the effects of SLR are not imminent, there is a lack of urgency in addressing this pending emergency. The scientific community, however, is giving long range future projections, indicating possibly devastating consequences in Santa Clara County. Nevertheless, the Grand Jury was told those consequences are seen by some jurisdictions as so far off in the future, that they have not seen a need to address its effects on the infrastructure and economy of Santa Clara County. The cities of Palo Alto, Mountain View, Sunnyvale, and Milpitas, as well as the Santa Clara Valley Water District should prioritize SLR at a higher level,
- As a consortium, the Corps of Engineers, the Coastal Conservancy, and the Water District are currently addressing SLR. The "South San Francisco Bay Shoreline Study" addresses not only SLR but also the restoration of the salt ponds and the preservation of native habitat. If the EIA 11 Alviso project is completed, the county would have in place a levee and marshland that would address the effects of SLR for the next few decades, and
- There has been very little dissemination of information about how the four cities within the County and the Santa Clara Valley Water District are addressing the effects of SLR. The Grand Jury was told this has led to a sense of complacency.

## **Findings and Recommendations**

### **Finding 1**

The cities of Palo Alto, Mountain View, and Sunnyvale want to retain control of Sea Level Rise related efforts within their jurisdictions, but would like to have an organization assume responsibility for coordinating the plans and activities involved in addressing Sea Level Rise.

### **Recommendation 1**

The Santa Clara Valley Water District should take a more proactive role in coordinating with cities that will be affected by Sea Level Rise, unifying, integrating and directing efforts in Santa Clara County.

### **Finding 2**

The City of Milpitas does not have a Climate Action Plan which addresses Sea Level Rise.

### **Recommendation 2**

The City of Milpitas needs to develop a Climate Action Plan which addresses Sea Level Rise.

### **Finding 3**

The City of Palo Alto's 2014 "Threat and Hazard Identification and Risk Assessment" did not identify the effects of Sea Level Rise as one of the hazards.

### **Recommendation 3**

The City of Palo Alto needs to identify Sea Level Rise as a hazard in its "Threat and Hazard Identification Risk Assessment."

### **Finding 4**

The Santa Clara Valley Water District, which is by law tasked with the responsibility for flood control in Santa Clara County, has not coordinated Santa Clara County's efforts to address Sea Level Rise and all of the cities in Santa Clara County that abut the Bay.

### **Recommendation 4**

The Santa Clara Valley Water District should coordinate Santa Clara County's effort to address Sea Level Rise for all of the cities in Santa Clara County that abut the Bay.

**Finding 5**

According to the Santa Clara Valley Water District's website, since July 2012, it has held only one public meeting to share information about Sea Level Rise.

**Recommendation 5**

The Santa Clara Valley Water District should provide more information for the residents of Santa Clara County about Sea Level Rise.

## **Appendix A Documents Reviewed**

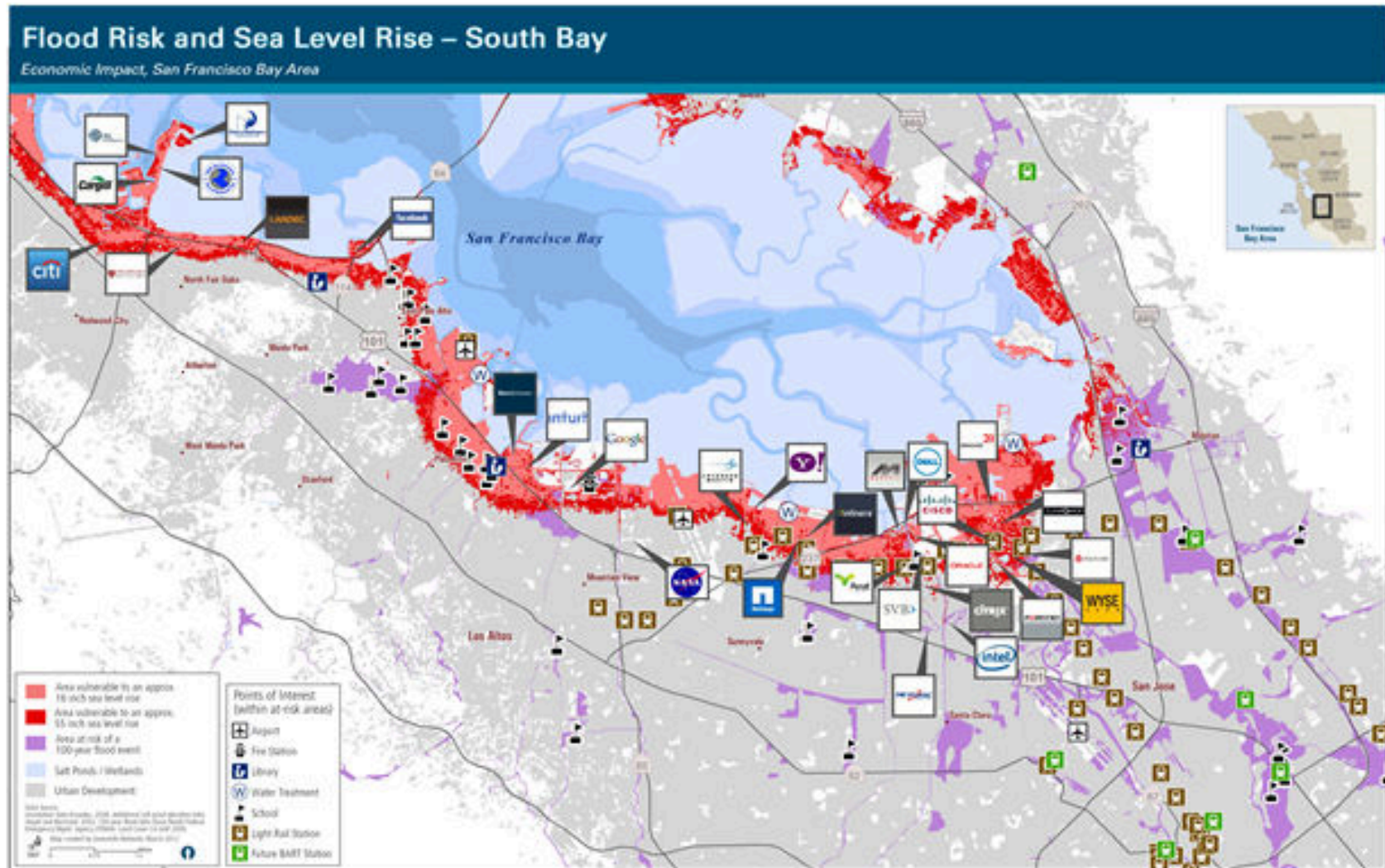
### **Documents/Articles/Maps**

- Adapting to Rising Tides (BCDC, NOAA Coastal Service Center)
- Aviso to Artesian—Alignment 1 (Map)
- Artesian to Coyote—Alignment 1 (Map)
- As the Seas Rise, A Slow Motion Disaster gnaws at America's Shores (McNeill, Nelson, Wilson) (09/04/2014)
- Bay Area Plan: Regional Indicators (12/2011)
- California Adaptation Forum: Resilient Communities: Bringing Change to Life (08/19/2014)
- CAP Work Plan 2020 Implementation Matrix (12/04/2014)
- City of Milpitas: Resolution 8252: A Resolution of the City Council of the City of Milpitas Adopting Negative Declaration and Climate Action Plan (05/07/2013)
- City of Mountain View: Environmental Sustainability Action Plan (ESAP) (October 2008) and ESAP-2 (April 2012)
- City of Palo Alto: Threat and Hazard Identification and Risk Assessment (Prepared by Office of Emergency Services) (04/2014)
- City of Sunnyvale: Climate Action Plan (Prepared by PMC) (04/2014)
- City of Sunnyvale: Sunnyvale CAP Initial Study/Negative Declaration (Prepared by PMC for the City of Sunnyvale) (03/2014)
- Climate Change 2014: Synthesis Report (11/01/2014)
- Comparison of SLC Projections: San Francisco, CA NOAA Tide Gauge
- County of Santa Clara Office of the County Executive: Office of Sustainability (01/10/2012)
- Draft South San Francisco Bay Shoreline Phase I Study, Draft Integrated Interim Feasibility Study and Environmental Impact/Report

- Earthquake and Hazards Program (ABAG) (08/01/2014)
- Emergency Preparedness and Response: 10 Ways You Can be Disaster Prepared (02/13/2013)
- Glacial Melting In Antarctica Makes Continent The 'Ground Zero of Global Climate Change' (Henao and Borenstein) (02/27/2015)
- New Research May Solve Puzzle in Sea Level's Rise (01/14/2015)
- Obama Moves to Protect Against Flooding From Rising Sea Levels (01/30/2015)
- Office of the Press Secretary: The White House: Executive Order: Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input (01/30/2015)
- Preparing for California Climate Change: Climatologist Looks Back and Peers Forward (USGS)(03/24/2014)
- San Diego Union Tribune: Del Mar Council Agrees to Address Sea Level Rise, (03/11/2015)
- San Francisco Bay Conservation and Development Commission (BCDC)
- San Jose Mercury News: Beach Bummer; Climate Change Could Bring Bad News for Surfers as Days of Big-wave Riding May be a Thing of the Past, (02/24/2015), p. A1
- San Jose Mercury News: Judge Nullifies Project Report (1,000 Home Proposal (12/24/2014), p.B5
- Santa Clara County: Home Improvement and Performance Program: Final Report (prepared by ICF International)
- Shoreline Regional Park Community: Sea Level Rise Study: Feasibility Report and Capital Improvement Program (ESA, PWA with AMEC, HDR, SCI, and HT Harvey) (for the City of Mountain View (12/18/2012)
- County of Santa Clara Office of Sustainability - Silicon Valley 2.0 Project, January 2013 and is expected to be completed by June 2015
  - Silicon Valley 2.0 Project Schedule
  - Silicon Valley 2.0: A Regional Climate Change Adaptation and Climate Protection Initiative: Memorandum (08/22/2014)
  - Silicon Valley 2.0: A Regional Effort to Minimize the Impacts of Climate Change

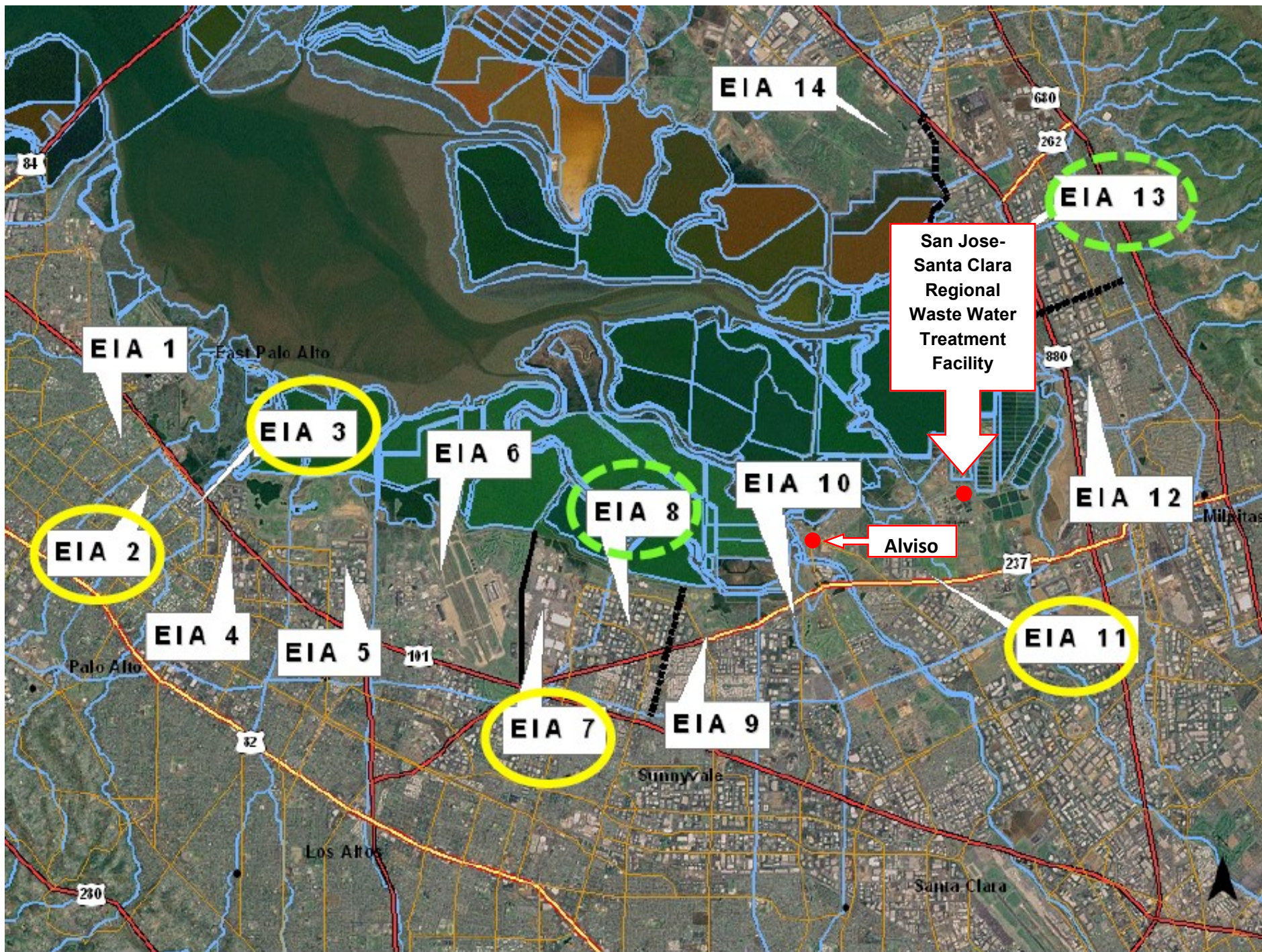
- South Bay Salt Pond Restoration Project: Restoring the Wild Heart of the Silicon Valley
- The South San Francisco Bay Shoreline Study: Alviso Ponds and Santa Clara County Interim Feasibility Study (US Army Corps of Engineers, Coastal Conservancy, Santa Clara Valley Water District)
- Why Americans Are Flocking to Their Sinking Shores Even as the Risks Mount (Nelson, McNeill, Wilson) (09/17/2014)

## Appendix B





Appendix C





This report was PASSED and ADOPTED with a concurrence of at least 12 grand jurors on this 11th day of June, 2015.

Elaine K. Larson

Elaine K. Larson  
Foreperson

Wilma Faye Underwood

Wilma Faye Underwood  
Foreperson pro tem

Joe A. Lopez

Joe A. Lopez  
Secretary

James L. Cunningham, Jr.

James L. Cunningham, Jr.  
Secretary pro tem