

## Attachment 2. Climate Change Adaptation Measures

Project or Program	Linkage to Climate Change (Why)	Outcome (What)	Schedule (When)	Status
<p><b>FLOOD PROTECTION – Lead = Liang Xu</b></p> <p>Climate change is expected to generate more severe storms for Northern California, and the sea level will continue to rise as a result of global warming. More uncertainty in storm pattern and severity renders the need for flood forecast and emergency operations to reduce flood damage. Continuous sea level rise, with uncertainties in green house gas abatement effects, necessitates regional coordination and adaptive designs of flood protection facility. District’s work is developed to address these needs.</p>				
1. Develop Policy to Incorporating Sea Level Rise to Projects in Tidal Zone	Have a consistent approach to design facilities to protect against sea level rise	A regionally coordinated engineering procedure for planning and design	Draft memo is completed and final version of the guidance is expected to be completed in FY16.	Compiling information from other local, state and federal agencies
2. Augment Rain and Streamflow Gauge Systems	Need rain and streamflow gauges to monitor climate change effects, facilitate emergency flood-fighting actions and enable flood warning systems	Install streamflow and rain gauges at key locations to allow hydrologic and hydraulic modeling.	2010 – 2017 2010: planning 2011-17: installation. FY15: 4 planned FY16: 2 planned FY17: 2 planned	Installed 22 new streamflow & 8 rain gauges as of FY16.
3. Develop Fluvial Flood Maps	Present flood maps of various flood levels to communicate flood risks to residents and affected critical infrastructures	Map floodplain boundaries for 1% (100-yr), 0.5% (200-yr) & 0.2% (500-yr) floods for major creeks	FY15: Coyote FY16: Uvas, main stem Llagas & L. Silver tributaries FY17: Guadalupe, West Valley & Llagas tributaries FY18: Lower Peninsula	Completed San Tomas flood maps using FEMA grant in FY14. Completed Coyote Creek floodplain and Lower Silver watershed flood study is under way in FY16.
4. Develop Flood Warning Systems	Alert residents of imminent flooding to reduce flood damage. Prior Flood protection projects designed for 1% flood may not be sufficient for the future.	Develop flood warning systems to forecast flooding and allow residents time to prepare for and reduce flood damage.	Fall 2014: San Francisquito, West Little Llagas, Upper Guadalupe FY15: Uvas FY16: Coyote FY18: Stevens FY19: U.	The flood warning system was launched in Oct. 2014 and five creek flood warning systems were completed as FY16.

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			Penitencia FY21: San Tomas FY22: L. Penitencia	
5. Develop Coastal Flood Maps for FEMA	Identify risks of sea level rise and tidal flooding and collaborate with FEMA in developing flood maps	Coastal modeling results for FEMA review and incorporation into updated coastal flood maps	12/2014: modeling FY15: flood maps FY2016: SLR modeling	Preliminary costal flood mapping has been completed in FY15 and awaiting FEMA review.
6. Coordinate with San Francisco Bay Conservation and Development Commission (BCDC), Coastal Conservancy & other agencies	Coordinate among agencies to maintain consistent approach to adapt to the regional effect of sea level rise	Coordinate for continuous and consistent design of levees through neighboring counties.	Ongoing	Collaborating with USFWS on salt pond levee maintenance to maintain flood protection for Santa Clara County
7. Acquire global warming downscaled climate data	Needed to compare possible local changes to precipitation and temperature under global warming different scenarios	Downscaled temperature and precipitation projections for more than a dozen locations within Santa Clara County.	Dec 2015	On target
<p><b>WATER SUPPLY – Lead = Tracy Hemmeter</b>            Potential effects of climate change on the core service area of water supply include the potential for reduced imported and local surface water availability, increased water demand, changes in hydrology, and increased drought and heat waves. The Board approved 2012 Water Supply Master Plan strategy is to secure and optimize the use of existing supplies and infrastructure and meet future increases in demands with conservation and recycling. This strategy includes the following elements that adapt well to future climate changes:</p>				
8. Manage water use demands	No regrets response to increasing water demands and threats to water supply reliability.	Current and planned water conservation programs are projected to achieve about 99,000 AFY of water savings per year by 2030	Ongoing.	On target

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<b>9.</b> Provide drought-proof supplies	No regrets response to increasing water demands and threats to water supply reliability.	Non-potable recycled water use is projected to increase from about 22,000 AFY in 2014 to 30,000 AFY by 2035. Developing potable reuse, which could provide an additional 20,000 to 45,000 AFY of drought-proof supply for groundwater recharge	Ongoing. Evaluated annually and updated every 5 years in the Water Supply Master Plan	On target
<b>10.</b> Increase water supply system flexibility	Managing the increased frequency of extreme events that are anticipated in a changing climate existing water supplies, especially during high storm flows and wet years.	Maintaining and rehabilitating the system, including dam retrofits.	Almaden Dam Improvements – FY 21 Anderson Dam Seismic Retrofit – FY 20 Calero and Guadalupe Dams Seismic Retrofit – FY 20 Main and Madrone Pipelines Restoration – FY 18	On target
<b>11.</b> Increase water supply system flexibility	Managing the increased frequency of extreme events that are anticipated in a changing climate	Developing a new reservoir pipeline and additional groundwater recharge ponds	Scheduled for FY 19 start	

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12. Improve the reliability of imported water supplies	Sea level rise and reduced precipitation are threats to imported water reliability and the Delta ecosystem	Pursuing Delta solution(s) to achieve the coequal goals of providing a more reliable water supply and protecting and restoring the Delta ecosystem.	Ongoing	Presented preliminary cost and benefit analysis of the California WaterFix to the Board's BDCP Ad Hoc Committee on February 22, 2016
13. Rinconoda Water Treatment Plant Reliability Project	Climate change threatens source water quality affecting water treatment effectiveness	The RWTP Reliability Project will convert the primary disinfection process to ozone, which will allow the RWTP to be more flexible and adaptable to poor source water quality.	Project completion scheduled for FY 21.	On target.
14. Water Utility Infrastructure Reliability Assessment	Climate change and extreme storms have the potential to damage or disrupt infrastructure and related operations.	Completed a vulnerability assessment of the major water utility infrastructure classes for several extreme climate scenarios. The assessment will inform the Infrastructure Reliability Plan and Asset Management Program.	Complete 2015	Complete
<b>ENVIRONMENTAL STEWARDSHIP- Ecosystem Resilience– Lead = Lisa Porcella</b> <i>Monitor effect of climate change on vegetation and wildlife. Collaborate in water resources master plan to preserve environmental benefits under climate change and sea level rise.</i>				
15. Environmental database development	Changes in climate and weather can compromise weakened or unhealthy	Develop a habitat conditions database to monitor effects of climate change and	FY14-28: SCW D5 FY15: Uvas-Llagas FY16: L. Peninsula FY17: W. Valley	FY13: Completed California Rapid Assessment Method (CRAM) ecosystem health

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	ecosystems.	<p>develop adaptive measures.</p> <p>See habitat condition data on EcoAtlas – <a href="http://www.ecoatlas.org/regions/ecoregion/bay-delta">http://www.ecoatlas.org/regions/ecoregion/bay-delta</a></p> <p>Ecological Monitoring – Information Management System (EM-IMS) is a District environmental database</p>		<p>measures for the Coyote and Guadalupe watersheds</p> <p>FY14: Water quality (stream temperatures) module created for EM-IMS database</p> <p>FY16: Completed field work for the Uvas-Llagas (north Pajaro) watershed</p> <p>Began development of EM-IMS wildlife module</p>
<b>16.</b> Maintain and enhance ecosystem	Changes in climate and weather can compromise weakened or unhealthy ecosystems.	A healthier ecosystem	<p>Integrated Water Resource Master Plan</p> <p>FY14-28: SCW D3</p> <p>FY15-16: priority plan</p> <p>FY17-28: implementation</p> <p>Stream and Watershed Protection Program (SWPP) – completed FY16; long-term management in perpetuity</p>	<p>FY16: Completing the <i>Interim Countywide Overview Report</i>; part of a Countywide water resources master plan.</p> <p>Begin developing Stream Corridor Priority Plans</p> <p>SWPP: acquisition of final 1700 acre property completed FY2016. Through the course of the program, approx. 3600 acres of upper watershed lands have been preserved.</p>
<b>17.</b> Invasive species issues	Invasive species compete with native species' ability to	Removing invasive plants to allow native plants to	<p>FY14-28: SCW D2</p> <p>FY15-19: SMP</p>	<p>FY14: revitalized 10 acres of native riparian habitat</p>

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	adapt to a changing climate and may be more prevalent in a changed climate	survive, and maintaining riparian and fresh and tidal wetland habitat.		FY15: revitalized 4 acres of salt marsh FY16: developing partnerships with County and State agencies

<b>DISTRICT-WIDE PLANNING STRATEGY FOR ADAPTATION</b>				
<b>18.</b> Provide Climate Change Training to District staff	Ensure consistent understanding of climate change science	Develop consistent, up to date knowledge base to inform major planning efforts	Conducted two training sessions in FY 15 addressing climate change science and adaptation	Completed. Additional training will be developed as needed.
<b>19.</b> Actively Engage and Leverage Existing State, Regional, and Local Organizations Addressing Mitigation and Adaptation Policies and Strategies	Keep current on the state of science, collaborate on solutions, and inform District's work.	Improved partnerships, stakeholder relationships and climate change understanding.  Improved and coordinated regional responses	FY15: Implement strategies for engagement with organizations FY15: Participate in up to 10 (ten) forums on the state, regional, and local level.	On Going
<b>20.</b> Update long term planning documents with the most recent information from the monitoring and analysis of the science	As climate change understanding increases, our efforts to adapt to a changing climate and challenges will be reflected in our work and planning activities.	"Incorporate climate change mitigation and adaptation into District planning efforts." (Board Ends Polices BAO Interpretations: S 2.7; S 3.4; S 4.6.)	FY16: Provide climate change knowledge to: -UWMP December 2015 -Draft FAHCE EIR Oct 2015 -Tier 1 Water Resources Master Plan May 2016 -Water Supply Master Plan December 2016 - Local Hazard Mitigation Plan 2016	Ongoing
<b>21.</b> Develop Climate Change Action Plan	Climate change impacts and responses need to be assessed and managed holistically where possible	Districtwide Climate Action Plan	FY19	Not started