



Delta Stewardship Council
Climate Change Vulnerability Assessment & Adaptation Strategy
Stakeholder Work Group
October 2, 2019
Meeting Summary

Welcome, Introductions, and Agenda Review

Susan Tatayon, Chair of the Delta Stewardship Council (the Council), welcomed Stakeholder Work Group (SWG) members and provided opening remarks. She explained that the Council is tasked with developing a long-term comprehensive plan for land and water management in the Delta that works towards the Council's coequal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. As part of this broader process, the Council is developing a Climate Change Vulnerability Assessment and Adaptation Strategy (CCVA&AS). Tatayon noted that climate change is already altering the physical environment of the Delta, and over the long-term, it is expected to impact human health and safety, degrade water and environmental quality, and make it more difficult for government agencies to provide basic services. Climate change will also disproportionately impact disadvantaged communities. Tatayon explained that the role of the SWG is to work with and advise the Council throughout the CCVA&AS process.

SWG members and the project team introduced themselves (see Appendix A for a list of attendees). Joey Goldman, facilitator, reviewed the agenda.

Overview of Vulnerability Assessment & Adaptation Strategy

Harriet Lai Ross, Assistant Planning Director, provided an overview of the Council's CCVA&AS process. She explained the four expected outcomes of the process are: 1) to inform future Delta Plan amendments and implementation, 2) to help the State prioritize future actions and investments, 3) to provide a toolkit of information for local governments to use in their regulatory documents, and 4) to create a framework that can be expanded in the future. Ross also noted that the Council will use models and studies that are replicable and updatable to allow other entities to use the Council's models for their own analyses as conditions change.

Ross outlined the project approach, noting the CCVA&AS will address climate challenges through the year 2100 per the Delta Reform Act and Delta Plan. The project will also apply existing State guidance regarding how to address climate change, vulnerable communities, and other challenges. The project will also apply lessons learned from the San Francisco Bay Conservation and Development Commission (BCDC) Adapting to Rising Tides (ART) program. Finally, the project will integrate and build on the best available science.

Ross explained that the geographic scope of the CCVA&AS includes the legal Delta and Suisun Marsh (i.e., the same area the Council has authority over), though the water supply impact analysis will examine a broader area.

Next, Ross explained that the CCVA&AS would follow a seven-step process commonly used in vulnerability assessments and adaptation strategies:

1. Review the existing science
2. Inventory assets and resources
3. Assess vulnerability
4. Assess risk
5. Develop adaptation approaches
6. Prepare adaptation plan
7. Monitor and implement

The first step is complete. One of the goals of this meeting is to help the project team identify additional assets and resources as part of Step 2. Step 4 will be complete in the spring of 2020, with the release of the Vulnerability Assessment. Coordination with and input from the SWG will be critical for Steps 5 and 6.

Ross noted that the primary climate stressors in the Delta are sea-level rise, changes in air and water temperatures, and changes in precipitation and runoff. These factors will be quantified and examined in depth. Secondary climate stressors such as wildfire, wind, and fog will be considered qualitatively.

Ross described the asset sectors that the project team would consider in the CCVA&AS. These include utilities, flood management infrastructure, critical facilities (e.g., hospitals, police and fire stations), buildings and facilities, parks and recreational facilities, transportation, water quality, water supply, ecosystems, agriculture, cultural resources, and human populations (including vulnerable communities). Ross summarized the work completed to date, which includes scoping the project, developing draft resilience goals, synthesizing existing studies, and developing an analytical approach. The technical approach will focus on analyzing flooding, water supply, agriculture, and economics in the Delta.

Ross reviewed the role of the SWG, which will promote stakeholder interests and the exchange of information, provide input on how to maximize the utility of the Vulnerability Assessment as well as on assets and resources, and work with constituents to identify an adaptation approach that will be successful in their communities.

In addition to the SWG, the Council has convened a Technical Advisory Committee to assist with the CCVA&AS. Stakeholders can also attend Council Board Meetings, which are open to the public. The Council will partner with agencies and other groups to share information,

provide updates, and receive input, as well as hold small informal briefings. The Council will also conduct outreach in the Delta, particularly to connect with vulnerable communities. The project team will release a Draft Vulnerability Assessment in the spring of 2020 for public review and finalize the Vulnerability Assessment in the summer of 2020. The project will then move into the adaptation strategy phase, which is anticipated to be complete in the spring of 2021.

SWG members were given the opportunity to ask clarifying questions. These are identified below:

- Question (Q): Why does the Council assume 24 inches of sea-level rise in the water supply analysis?
 - Response (R): Although Ocean Protection Council (OPC) guidance recommends looking at a range of scenarios that go beyond 24 inches, currently available tools for evaluating water system performance can only simulate system operations up to 24 inches of sea-level rise. Council has raised this issue with the Department of Water Resources (DWR) and they are committed to explore additional tool development, but that is outside the scope of this project. The project team is planning on qualitatively extrapolating impacts beyond 24 inches of sea level rise in the Vulnerability Assessment. However, increases in sea level rise of more than 24 inches might necessitate changes in regulations or water operations, which would be analyses that would be considered as part of the Adaptation Strategy.
- Q: Will other aspects of the modeling effort (agriculture, flooding, etc.) look at a broader range of scenarios, i.e., not just up to 24 inches of sea level rise?
 - R: Yes, flood analysis will evaluate at least 6 feet of sea level rise and up to 10 feet if available modeling tools can adequately simulate such extreme changes.
- Q: What are the assumptions with regard to responding to rising sea levels and rising channel water levels? No additional improvements to levees? Some improvements to levees?
 - R: The Vulnerability Assessment looks at the existing system, but the Adaptation Strategy will examine various levels of investment to see what it would cost to maintain levees throughout the Delta.
- Q: Are you using the Central Valley Flood Protection Plan (CVFPP) scenarios for flooding?
 - R: The project team's approach will examine and stress test the Delta system against a range of large river inflows and sea level rise combinations. This will allow the project team to explore vulnerabilities and use projections of future

inflows to evaluate how likely occurrences of levee overtopping might be. This approach is flexible with respect to the future river inflow projections that will be considered. The CVFPP scenarios will be considered as a source of information about future likelihood of extreme flooding events. The project team noted that global climate models do a poor job of simulating highly local and/or short-term events like floods.

- Q: Are there plans to update the CalSim model?
 - R: The Council has expressed an interest in a modeling system that operates at higher levels of sea-level rise than currently available with CalSim, but updating CalSim is outside the scope of the CCVA&AS project.
- Q: Will salinity be modeled as part of this project?
 - R: Previous water supply modeling includes assessment of salinity. No new salinity modeling will be conducted as part of the CCVA. However, the model assumes existing regulations in the Delta apply, which includes salinity controls. As a result, the models do not show a lot of change in salinity levels because maintaining required salinity levels is prioritized in the models.

Implications to other parts of the system as a result of those regulatory assumptions will be evaluated as part of the CCVA.

Group Exercise: Utilization of Vulnerability Assessment Document

Goldman introduced the first group exercise. SWG members were asked to consider the following questions and share their thoughts:

1. How do you (or your organization) plan to utilize the Vulnerability Assessment?
2. How can DSC prepare the document to maximize its effectiveness?
3. What project or planning efforts are you working on that are related to the Vulnerability Assessment?

After writing their responses, participants placed them on the board, and project team members reviewed them and summarized them for the group. All responses can be found in Appendix B.

1. **How do you (or your organization) plan to utilize the Vulnerability Assessment?** There were a wide variety of responses to this first question, including informing investments, SB 379 compliance, informing local policy, informing plans and programs, and comparing to existing analyses. Many SWG members were looking beyond the Vulnerability Assessment to adaptation strategies when they responded to this question.
2. **How can DSC prepare the document to maximize its effectiveness?** In response to the second question, SWG members asked the Council to focus on and use

statewide issues and guidance, to share data and information in a graphical manner and make GIS data available, to account for the diversity of the Delta, to focus on local areas and assets, to be specific, feasible, and transparent, and to expand the water supply analysis to capture a larger range of impacts.

- 3. What project or planning efforts are you working on that are related to the Vulnerability Assessment?** For the final question, SWG members pointed to their own vulnerability assessments, climate action plans, and general plan updates, as well as other ongoing planning and modeling efforts.

Group Exercise: Discussion of Delta Assets

Goldman invited SWG members to circulate among four stations: 1) natural resources, 2) water supply & flooding, 3) communities, and 4) utilities & facilities. SWG members were encouraged to ask staff questions and share what assets and data sources the project team might be missing within each of these categories.

Justin Vandever, AECOM, explained that the project team has been working to collect GIS and asset data from completed studies, and each station had a list of those existing information sources, many of which are regional in scale. He requested that SWG members share any more specific or local datasets that had not already been incorporated into regional or statewide datasets, as this is what the project team is particularly interested in.

At the end of the exercise, project team members reported what they heard and discussed at each station.

1. Natural Resources

- Plans to reference:
 - Antioch Dunes National Wildlife Refuge – Lange’s Metalmark Butterfly (part of the Don Edward’s National Wildlife system)
 - Yolo Habitat Conservancy HCP/NCCP – plan adapted in 2019 (countywide)
 - East Bay Regional Park District Shoreline Parks/Open Space Data for CCC
 - Point Blue did recreational value of ecosystem services for BCDC for ART and natural capital stormwater infiltration-retention (note: dataset ends at Suisun Marsh)
- Questions about salinity with regard to changes to the ecosystem (fish, habitat, vegetation)
- Discussion about methods and parameters

2. Water Supply and Flooding

- Wells and groundwater throughout the Delta: DCA may have some information due to exploration for potential tunnel construction

- Differentiate levees for protection versus agricultural
- Convene meeting of megaregion of metropolitan planning organizations (MPOs) to talk about Vulnerability Assessment or Adaptation Strategy
- Questions about deep water ship channel, siltation, and approach to handling rainfall and riverine flooding

3. Communities

- Approaches to consider
 - Consider piers, septic systems, commercial and industrial areas, religious centers, and community gathering places
 - Don't limit to CalEnviroScreen (too focused on air quality)
 - Use local general plans
 - Council of governments low income-high minority analysis was valuable
 - Office of Planning and Research and CalEnviroScreen for identifying environmental justice and vulnerable communities
 - Agricultural vulnerability data?
 - Create new index based on flooding vulnerability
 - Adapting to Rising Tides project has a vulnerable communities dataset
 - Need to look at individual indicators, not just aggregates, to understand different types of vulnerability associated with different impacts (flooding, heat, etc.)
- Vulnerable populations include English as a second language, no car, no air conditioning, living along rural roads, no broadband
- Lots of vulnerable farmworker housing
- Map Comments
 - Remove Urban Interface Zone – doesn't represent all areas
 - Say "disadvantaged" not vulnerable

4. Utilities and Facilities

- Discussion of specific infrastructure pieces – were they included? As well as other types, such as landfills.
- How will powerplants that rely on river water (i.e., freshwater) for cooling be impacted if water becomes more saline?
- Desalination plant at Antioch
- Emergency operations centers

- Renewable energy facilities
- Bus routes, yards, and maintenance facilities

Goldman invited SWG members to share any additional ideas on assets or datasets via email to jgoldman@kearnswest.com.

Review Action Items and Next Steps

Goldman reviewed the project's next steps, noting the project team would move forward with the Vulnerability Assessment, then move to the Adaptation Strategy phase in 2020. The next SWG meeting is anticipated to take place in Spring 2020, though the project team may follow up with SWG members individually and share updates via webinar between now and then. The team will keep in touch with SWG members via email in the meantime.

An SWG member asked if the group would undertake a similar exercise structured around asset categories to help explore adaptation strategies, and if they were looking for SWG members to "groundtruth" the vulnerabilities reported in the Vulnerability Assessment. The project team responded that they anticipate much more back-and-forth with the SWG during the adaptation phase, and they will want input from and discussion with SWG members on the vulnerability data, but the exact format is still to be determined.

The meeting concluded at 4:00 pm.

Appendix A: October 2, 2019 Meeting Attendance

SWG Members

- Tom Burke, South Delta Water Agency
- Joel Campos, San Joaquin Council of Governments (SJCOG)
- Samantha Cohen, San Francisco Bay Conservation and Development Commission
- Deirdre Des Jardins, California Water Research
- Shannon Fiala, San Francisco Bay Conservation and Development Commission
- Julie Haas-Wajdowicz, City of Antioch
- Campbell Ingram, Sacramento-San Joaquin Delta Conservancy
- Justine Kimball, Ocean Protection Council
- John Lundgren, Sacramento County
- Will Nelson, Contra Costa County
- Jennifer Nevills, Metropolitan Water District of Southern California
- Lynnea Ormiston, Sacramento Area Council of Governments (SACOG)
- Hector Rojas, City of Pittsburg
- Heather Rock, PG&E
- Sam Safi, Regional San
- Jose Setka, East Bay MUD
- Lorenzo Siemann, CivicSpark Fellow, City of Antioch
- Greta Soos, City of Sacramento
- David Tilley, City of West Sacramento
- Erik Vink, Delta Protection Commission
- Matt Walsh, Solano County
- Rachel Wigginton, San Francisco Bay Conservation and Development Commission

Project Team

- Kaylee Griffith, Delta Stewardship Council
- Jeff Henderson, Delta Stewardship Council
- Avery Livengood, Delta Stewardship Council
- Ron Melcer, Delta Stewardship Council

- Annie Merritt, Delta Stewardship Council
- Jessica Pearson, Delta Stewardship Council
- Harriet Ross, Delta Stewardship Council
- Andrew Schwartz, Delta Stewardship Council
- Susan Tatayon, Delta Stewardship Council
- Kristin Tremain Davis, AECOM
- Petra Unger, AECOM
- Justin Vandever, AECOM
- Joey Goldman, Kearns & West
- Mary Beth Day, Kearns & West

Appendix B: Notes from Group Exercise on Utilization of the Vulnerability Assessment Document

Question 1: How do you (or your organization) plan to utilize the Vulnerability Assessment?

- We plan to compare the results from this study to our existing data, and also use these results when developing our 2022 Regional Transportation Plan/Sustainable Communities Strategy. This study will help us focus on where we should invest in for the future. –SJCOG
- Will use plan as tool to support our planning efforts moving forward.
- We would use the VA for any future SLR work done in the ART Program, such as adaptation solutions for the region and our Regional Adaptation Strategy launching in 2020. –BCDC
- Statewide VA would be helpful in informing statewide policy and planning. Maximum effectiveness – specific vulnerability to wetlands (acres/geography) and specific resilience goals/adaptation planning. Same for WQ/sediments: the more specific, the better. –OPC
- Potentially use plan in future CA RPs and CDBG (housing) programs in 3-5 years.
- In our future General Plan Updates/CAPs, LHMP updates, local policy development, implementation and political backing.
- We will use the VA within our jurisdiction in Suisun Marsh. Our ART team will use lessons learned from this VA. –BCDC
- Looking at adaptation in a range of interests: Delta legacy communities, aquatic and terrestrial ecosystems, water supply, local Delta water supply, exports. Also, as example of managed retreat (may be first in the state). –California Water Research
- Compare findings and incorporate data sets and analytical outputs into our adaptation planning efforts. –SACOG
- SB 379 compliance
 - Compare against existing land uses and potential land uses (GP), evaluate land use for prone to flooding. –Solano County
- We will use the VA if it goes beyond or discovers new vulnerabilities not in our 2017 VA. We expect the DSC VA to focus more on state-wide issues and state facilities first before duplicating any pre-existing local efforts (for example: address vulnerabilities of state bridges – lack of repair parts. –Sacramento County
- We will use it in our work in Suisun Marsh including an upcoming amendment to

the Suisun Marsh Protection Plan. –BCDC

- To inform future operational and planning scenarios for Delta Water supplies and potential future in- Delta infrastructure/conveyance. –MWDSC
- We hope to use the VA to inform our investments of public funds for eco-restoration and economic development. –Delta Conservancy
- VA will be helpful for understanding the impacts of SLR (and climate change) on Delta as Place values. –
Erik Vink, Delta Protection Commission
- Will hope to align this Vulnerability Assessment with ongoing assessments of PG&E assets/infrastructure at risk from climate change. –Heather Rock, PG&E
- Inform policy development in our upcoming Climate Action Plan and General Plan Update. –City of Pittsburg

Question 2: How can DSC prepare the document to maximize its effectiveness?

- Expand water supply analysis to capture a larger range of impacts. –MWDSC
- Summarize by asset and by local region/county/jurisdiction.
- Please include all freeway, rail and shipping assets. Also, offer maps and GIS available online for other agencies to utilize for their own studies. –SJCOG
- Avoid one size fits all. Each jurisdiction is different. –Solano County
- Identify risks in certain areas (maps that are clear and easy to use), draft policies for local consideration.
- Include area/location/asset specific assessment like ART.
- Account for diversity of the Delta (i.e., urbanizing areas, etc.)
- Carefully consider the context and language used when presenting vulnerability and adaptation to Delta community.
- Streamline/put detailed info into appendix, include graphics and a high-level summary at the start of each chapter. –Rachel Wigginton, BCDC
- Make GIS datasets available online for download.
- Document should provide feasible suggestions or actions.
- The document must include enough specificity to be useful to the broad range of stakeholders.
- Focus on state-wide issues first before attempting to address any local vulnerabilities. Ideally our efforts will meet in the middle of a top-down bottom up approach. –Sacramento County

- By being transparent about the assumptions (and modeling) that go into the VA. –Erik Vink, Delta Protection Commission
- Include local data and findings; recommended set of actions for cities/counties; take into account connectivity and growth objectives. – City of Pittsburg
- Use state-approved data: Cal Adapt, RCP 8.5 scenario (per CPUC guidance). – Heather (PG&E)

Question 3: What project or planning efforts are you working on that are related to the Vulnerability Assessment?

- Future of Delta Legacy Communities, Delta tunnel, levee raise feasibility, infrastructure future.
- Water quality analysis of the rivers in the South Delta. –SDWA
- Long-term water supply reliability planning, future Delta conveyance/existing conveyance operations and regulations. –MWDSC
- Landscape scale effort to stop ongoing subsidence and resulting CO2 emissions from deeply subsided areas of the Delta. –Delta Conservancy
- Contra Costa County is updating its General Plan, Zoning Code, and Climate Action Plan. The Vulnerability Assessment might inform that effort depending on the timing.
- CAP, GPU. –City of West Sacramento
- Cache Slough General Plan Amendment, Development Permit. –Solano County
- We are working on our recycled water project for groundwater recharge and habitat improvement known as South County Agriculture Program. Climate change vulnerability assessment based on state guideline are part of this project, and we have received \$280M prop funding for it. –Regional San (Sam Safi)
- See existing VA Phase I CAP and Phase II CAP in process. Also, see environmental justice element and SB 160 requiring cultural competency in emergency planning. –Sacramento County
- General Plan Update (every 5 years), climate action plan (includes adaptation). – City of Sacramento
- ART East Contra Costa, ART Bay Area, Suisun Marsh Protection Plan and local Protection Plan Program. –
- Rachel Wigginton, BCDC
- City of Antioch is currently working on a Climate Action and Resiliency Plan. –

CARP

- We are currently conducting a criticality and vulnerability assessment of our current and planned transportation (including transit, etc.) system. –SACOG
- Conducting PG&E Climate Vulnerability Assessment, will overlap where PG&E assets are located in/near Delta. – Heather Rock, PG&E
- Everything the Commission does has the potential to be impacted by climate change. Delta/recreation/culture/heritage/natural resources. –Erik Vink, Delta Protection Commission
- Climate Action Plan; GHG Inventory; Northern Waterfront Initiative; General Plan Update. –City of Pittsburg