

SEP 2024

Appendix to the Delta Plan Five-Year Review 2024

Technical Details for the Delta Plan
Performance Measure Report Cards



**Delta
Stewardship
Council**

A CALIFORNIA STATE AGENCY

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Introduction

This technical appendix supporting the 2024 Five-Year Review report provides detailed findings from the performance measure evaluations and the basis for the progress ratings presented in the Delta Plan chapter report cards. The performance measures evaluate the ten-year period Delta Plan has been in effect (2013-2023). Additionally, performance measure evaluations include recommendations regarding improving performance measure tracking using recently available monitoring data, tools, and science. Developing additional performance metrics and analysis methods would expand understanding of the effectiveness of management actions and inform adaptive management of the Delta Plan. Not all performance measures include recommendations for further refinements. This report is supported by the Delta Stewardship Council's Performance Measures dashboard, updated annually, where more frequent performance measure evaluations and data products are available at viewperformance.deltacouncil.ca.gov.

The Five-Year Review used only those performance measures that observed a change over the ten years since the Delta Plan's adoption to 2023. Additionally, performance measures with a numeric target were also included in the progress evaluations because these assessments could not be quantified. Performance measures not considered in the progress reports are listed at the end of this appendix.

A More Reliable Water Supply for California

Improve Water Conservation and Expand Local and Regional Water Supplies

Urban Water Use (Performance Measure 3.1)

Water conservation and improved water use efficiency reduce demand for scarce water and help meet the State's goal of reducing reliance on Delta water supplies. Through water efficiency measures, suppliers can become more resilient and self-reliant. Urban water agencies serving more than 20,000 people achieve water efficiency goals by decreasing per capita water use in their supply area.

Rating Results

The overall performance measure score is rated "VERY GOOD" (76-100% of target met). The statewide average water use efficiency reported by urban water suppliers in 2010 was 183 gallons per capita per day (GPCD). In 2015, the average improved to 133 GPCD. It remained relatively flat in 2020 at 135 GPCD. This means that statewide, California reduced its per capita urban water use by more than 20% between 2010 and 2020, using 50 GPCD less when compared to a 2010 water use baseline.

Performance Measure 3.1 Recommendations

- Align Delta Plan water conservation and efficiency targets with current State strategies and the ongoing State Water Resource Control Board rulemaking process that sets new objectives for residential, urban, and industrial water use. The upcoming Making Conservation, a California Way of Life regulation, will include considerations of small and vulnerable communities.
- Track a metric for reduced Delta water reliance and improved regional self-reliance to evaluate the long-term trends in meeting the State goal of reduced reliance on the Delta.

Agricultural Water Planning (Performance Measure 3.6)

Agricultural water suppliers must comply with water planning and measurement laws and submit Agricultural Water Management Plans (AWMPs) to the California Department of Water Resources (DWR) every five years under the California Water Conservation Act of 2009 (SB X7-7) and the Water Management Planning Act of

2018 (AB 1668). Agricultural water suppliers report annually on aggregated water deliveries to farms.

Rating Results

The overall performance measure score is rated “VERY GOOD” (76-100% of target met). Of the 27 suppliers required to quantify water use efficiency (WUE) in 2021 AWMP submissions, 25 (93%) quantified WUE¹.

Performance Measure 3.6 Recommendations

- Encourage DWR and Reclamation to coordinate with the SWP and CVP contractors to track total or percentage usage of Delta agricultural water.
- Improve methods to track in-Delta water use, including in-Delta water rights statements of water use data and evapotranspiration rates of Delta crops, from sources such as Electronic Water Rights Information Management System (eWRIMS) and the OpenET (satellite-based evapotranspiration data).

Alternative Water Supply (Performance Measure 3.2)

A diverse portfolio of alternative sources of local water supply contributes to a more reliable water supply for California and supports reduced reliance on Delta water. Alternative water supply sources include recycled water, desalination, and stormwater runoff capture. Urban water suppliers must submit plans to the DWR every five years, showing their current sources of water supply, projections of future water supply sources, and implementation of alternative water sources. Performance Measure 3.2 tracks the percentage of urban water suppliers meeting at least 75% of their projected beneficial use of recycled water, stormwater, and desalinated groundwater or ocean water, as established in their previous Urban Water Management Plans (UWMPs).

Rating Results

The overall performance measure score is rated “GOOD” (51-75% of target met) based on the arithmetic mean of three performance metrics:

- **Recycled water projections:** 27% in 2015 and 26% in 2020
- **Storm water-use projections:** 100% in both years

¹ The scoring of this metric did not include United States Bureau of Reclamation (USBR) agricultural water suppliers because USBR conservation plans do not require quantification of WUE.

- **Desalination projections:** 60% in 2015 and 64% in 2020. Only urban water suppliers in the South Coast and Central Coast regions reported desalination data.

The combined average across all alternative sources was 62% in 2015 and 63% in 2020.

Performance Measure 3.2 Recommendations

- Consider adding a metric that tracks the amount of water developed for each type of alternative source and measures progress toward statewide targets to recycle and reuse at least 800,000 acre-feet of water per year by 2030 and expand groundwater desalination production by at least 28,000 acre-feet of water per year and increase stormwater capture water supply by at least 250,000 acre-feet of water per year (California Natural Resources Agency, 2022).
 - By 2040, 1.8 million acre-feet, 84,000 acre-feet in desalination, and 500,000 acre-feet in stormwater capture.
- Identify additional data sources for alternative water project implementation.
- Identify programs and funding opportunities for alternative projects in small and disadvantaged communities.
- Consider developing metrics to track alternative water supply projects that benefit small and disadvantaged communities.

Water Supply Reliability (Performance Measure 3.4)

A reliable water supply is necessary to meet California’s current and future needs. During drought, there will be increased demand for scarce Delta water if suppliers are not prepared to meet demand locally during dry years. Reliability can be achieved through increased use of alternative supplies, demand management, or both. Dry year reliability is based on the water supplies available during a supplier’s historically driest years. Urban Water Management Plans (UWMPs) must include an estimate of service changes during the historic driest three years and, if necessary, identify a mechanism to limit water demand during those three years (Wat. Code § 10632).

Rating Results

The overall performance measure score is rated “VERY GOOD” (76-100% of target met). Water suppliers sufficiently plan for dry-year reliability targets. Over 90% of urban water suppliers in the state are meeting their dry-year reliability targets.

This means that most agencies that depend on water from the Delta can reliably supply water with existing supplies and demand for one and multiple consecutive dry years. Results are based on the driest years on record for water agencies. However, certain regions projected decreased reliability in 2020 UWMPs:

- San Francisco Bay hydrologic region suppliers had a 28% decline in projected reliability for one-year reliability targets and an 11% decline for multi-year reliability. Some projections by these agencies anticipated implementation of the Bay-Delta Water Quality Control Plan, which adds a level of uncertainty for water suppliers that receive water from San Joaquin River tributaries, and
- The North Coast hydrologic region had 13% declines in single-year and multi-year projected reliability.

Performance Measure 3.4 Recommendations

- Consider defining and developing performance metrics and analysis methods for environmental water supply reliability.
- Consider, in close collaboration with DWR, enabling urban water suppliers to track public health, economic, and social benefits of water supply reliability.
- Research, identify data sources, and propose performance metrics to quantify water reliability and affordability in small and disadvantaged communities.
- Consider developing a recommendation that state and local agencies proposing water management projects in the Delta prepare analyses demonstrating that the project maintains or improves the affordability of water supplied, with a particular focus on affordability to water users in small and disadvantaged communities.

Water Exports Match Available Water (Performance Measure 3.9)

Many California water suppliers rely on water exported from the Delta through the Central Valley Project (CVP) and State Water Project (SWP). However, relying on the Delta for water supply places greater pressure on the Delta ecosystem. The amounts of water available for exports and the Delta ecosystem is driven by climate and hydrological variability and are vulnerable to climate change and catastrophic event impacts. Managing Delta exports based on the amount of water available in the system at any given time can benefit the ecosystem. Specifically, exports during critically dry years have a greater chance of degrading the aquatic ecosystem because, during these years, the Delta experiences lower inflows to support natural communities. During wet years, the Delta's inflow is higher,

and many aquatic species are less stressed. Water exported from the Delta should more closely match water supplies available to be exported, based on water year type and consistent with the coequal goal of protecting, restoring, and enhancing the Delta ecosystem. This is done by increasing water use during wet years and limiting water use during dry years (a concept sometimes referred to as “Big Gulp, Little Sip”).

Rating Results

The overall performance measure score is “VERY GOOD” (76-100% of target met) based on three performance metrics:

- **Critically Dry Year Export Decrease:** The critically dry year average annual exports between 2015 and 2023 were 1.92 million-acre feet (MAF). This is significantly lower than the yearly water baseline exports in critically dry years across 1975-2014 (3.9 MAF). Total annual exports in critically dry years 2015, 2021, and 2022 were 1.94 MAF, 1.65 MAF, and 2.18 MAF, respectively.
- **Wet Year Exports:** The wet year average annual exports between 2015 and 2023 were 5.7 MAF. This is higher than the baseline total exports in wet years across the period 1975-2014 (5.0 MAF). Total annual exports in wet years 2017, 2019, and 2023 were 6.46 MAF, 5.34 MAF, and 5.39 MAF, respectively.
- **Exports Across All Years:** Between 2015-2023, the average annual total Delta exports for all water year types were 4.87 MAF. This is lower than the baseline exports across 2000-2014 for all water year types (5.1 MAF). The fifteen-year average annual Delta export target to be achieved by 2030 is 4.85 MAF, representing a 5% decrease from historical exports².

Performance Measure 3.9 Recommendation

- Consider increasing the long-term reduction target in the overall water exports to 10% (of the baseline) to account for projections that a hotter and drier climate will reduce available water supply by 10% in the next 20 years (California Natural Resources Agency, 2022).

² The observed period is relatively short to calculate a fifteen-year average, and the data is sensitive to the fact that the period generally had lower than average precipitation.

Protect, Restore, and Enhance the Delta Ecosystem

Create More Natural Functional Flows

Flow is a major environmental input that shapes ecological processes, habitat, and biotic composition in river and estuary ecosystems, such as the Delta. Native species, by natural selection, are adapted to the seasonal, inter-annual, and spatial variability of the historical flow pattern and its functions. A cornerstone of restoring the Delta to a healthier estuary is managing for more natural functional flows, as evaluated by the following four performance measures.

Yolo Bypass Inundation (Performance Measure 4.2a)

The Yolo Bypass is a large floodplain habitat adjacent to the lower section of the Sacramento River that is frequently flooded and provides alternate routing of flows and young fish through the Delta. Floodplain inundation provides key ecological functions, and restoring more natural functional flow patterns in the Yolo Bypass delivers important ecological benefits such as stimulating food webs, enhancing phytoplankton growth, triggering aquatic invertebrate production, exporting food downstream, and providing habitat for native fish spawning and rearing.

Rating Results

The overall performance measure score is “FAIR” (26-50% of target met), based on two performance metrics:

- 14-day consecutive inundation at a frequency of two out of three years:** The target is Fremont Weir flows of at least 6,000 cubic feet per second (cfs) to provide sufficient inundation of the Yolo Bypass between November 1 and March 15³. In wet years 2017, 2019, and 2023, the Yolo Bypass was inundated for 30, 34, and 23 days, respectively. Between 2013 and 2023, the frequency of 14-day inundation was achieved in four out of eleven years (36% of the time).
- 21-day consecutive inundation at a frequency of one out of two years, between November 1 and March 15:** In wet years 2017, 2019, and 2023,

³ This target is a proxy for inundation area because current model estimates of Yolo Bypass inundation are only available up to water year 2012.

the Yolo Bypass was inundated for 30, 34, and 23 days, respectively. Between 2013-2023, five out of eleven years achieved the target (45% of the time).

Performance Measure 4.2a Recommendation

- Consider setting additional performance metrics using recently developed satellite data to more accurately quantify both the area and duration of Yolo Bypass floodplain inundation.

In-Delta Flow (Performance Measure 4.2d)

Flows through the interior of the Delta to the San Francisco Bay are an important measure of ecosystem health. The outflow ratio from the Delta to the inflow into the Delta is a key component of managing natural functional flows. Higher Delta outflows, expressed as an outflow to inflow (O/I) ratio, mean more water is flowing out of the Delta. The ratio of Delta outflows to inflows encompasses a vast array of flow and ecological complexity and is relevant to in-Delta flow patterns, including the overall quantity, timing, and variability of flow regimes. Variability of flows between years is very high in California, therefore, a ratio accounts for different water year types. Maintaining higher Delta outflows during dry and critically dry years is an important component of the natural functional flows approach.

Rating Results

The overall performance measure score is "GOOD" (51-75% of target met) based on two performance metrics:

- **Dry and critically dry year outflow to inflow ratio:** Between 2013-2023, the Delta outflow to inflow ratio was greater than 0.5 in every dry and critically dry water year (2013, 2014, 2015, 2020, 2021, 2022) (100% of the time). This means that at least half of the freshwater flow entering the Delta passed through the Delta into the San Francisco Bay during these dry years.
- **Change in average annual outflow to inflow ratio across all water year types:** This change is calculated as a ten-year trend (slope). The target is for the ten-year trend to be positive, meaning that Delta outflows increase proportionally to inflows. The Delta outflow-to-inflow ratio increased from 2013 to 2017 but decreased slightly from 2020 to 2022. This means there was a positive slope in five (2013-2017) out of the 10 years (50% of the time). In wetter years, 2017 and 2019, more than half of the freshwater inflow left the Delta (O/I=0.68). The average rate of change in the O/I ratio from 2013-2022 was positive (very slightly above zero (slope = 0.0035, p-value <0.001). Between 2013-2017, eight out of 10 years had an O/I ratio that was the same or greater than the previous year.

Performance Measure 4.2d Recommendation

- Align the performance measure metric and target with the applicable outflow-inflow objectives in the forthcoming Bay-Delta Water Quality Control Plan update.

Peak Flow (Performance Measure 4.2b)

Large magnitude peak river flows in the spring (often referred to as “pulse” flows) help inundate floodplains, providing suitable habitat for many native migratory fish species. Spring peak flows are important for many native species in and along the Sacramento River and within the Sacramento-San Joaquin Delta. Periodic high flows also provide important channel-forming functions, including sediment transport and riverbank erosion and deposition. Dynamic river channels create varied channel and riparian habitats supporting diverse riparian communities.

Rating Results

The overall performance measure score is “POOR” (0-25% of target met). Between 2013 and 2023, the target of achieving at least one peak flow greater than 75,000 cfs and lasting at least 48 hours on the Sacramento River (at the Bend Bridge location) was met only in 2017. Every other year, there were insufficient days with high enough flows to reach the target.

Recession Flow (Performance Measure 4.2c)

California streams and rivers experience decreased flows in the spring at the end of the wet season. Gradual spring recession flow has wide-ranging effects on ecosystem health in California rivers and is an important component of functional flows. Gradually receding flows avoid stranding native fish and amphibians, improve the success of many invertebrates that are prey to native fish, and establish key riparian plant species. Recession flow is a proxy for a water level drawdown so that riparian tree species can access water and become established. Modeling indicates that a rapid drawdown of up to approximately a week may be sustainable if followed by stable flows. Specific recession flows do not necessarily need to occur yearly to support these important riparian tree species.

Rating Results

The overall performance measure score is “POOR” (0-25% of target met). Between 2013 and 2023, the target of a gradual daily flow decrease (less than 3.5% per day) during the spring flow recession period (March 15 – June 1) on the Sacramento River at the Bend Bridge location was met only once in 2015. In every other year during this period, gradual changes in daily flows exceeded the flow threshold.

Restore Ecosystem Functions

Acres of Natural Communities Restored (Performance Measure 4.16)

More than 90 percent of natural communities, including riparian, wetland, and tidal marsh, have been lost in the Delta over the past century. Reestablishing some of these natural communities will provide critical ecological functions such as primary production and energy transfer, as well as physical space, connectivity, and habitat structure, which are important for native species recovery. Restoring native vegetation will promote a more stable environment, providing a range of habitat options, leading to increased biodiversity and expanding species populations. Increasing acres of natural communities and restoring large areas contributes to a healthy Delta ecosystem resilient to a more variable climate. The Delta Plan sets targets for a net increase in acres of natural communities by 2050 and interim targets for 2030 and 2040.

Rating Results

The overall rating for this performance measure is “FAIR” (26-50% of target met) based on restoration of three ecosystem types: seasonal/non-tidal wetland, tidal wetland, and riparian habitat. Progress is measured as the net change in ecosystem acres between 2007 and 2016 and compared to the 2030 interim targets (Table 1).

Ecosystem Type	Baseline Acres (2007)	2016 Total Acres	2016 Acres (Net Change from 2007)	Delta Plan 2030 Interim Target Acres	Percent of 2030 Targets Achieved in 2016	2016 Progress Rating
Seasonal/ Non-tidal Wetland	5,100	11,217	6,117	6,300	97%	VERY GOOD
Tidal Wetland	19,900	14,582	-5,318	10,900	-49%	POOR
Riparian	14,200	15,219	1,019	5,400	19%	POOR

Table 4. Major Ecosystem Type Acreage Changes: 2007-2016 compared to Delta Plan 2030 Interim Targets.

Restoration Projects Completed (Supplemental Measure)

A supplemental performance measure was added to address the time lag between vegetation data and more recent restoration projects to evaluate progress between 2016 (the last available natural communities mapping data) and 2022. This additional metric was developed using data compiled in a 2023 Restoration Synthesis Report (Chapple et al., in press). Habitat acreages from individual restoration projects completed between 2016 and 2022 were added together and scored with respect to the 2030 acreage targets. Since 2016, these projects have added about 8,480 acres of additional habitat.

Rating Results

The overall score for this measure is “FAIR” (26-50% of target met) based on major habitat types in restoration projects between 2016 and 2022, compared to the 2030 interim targets for PM 4.16 (Table 2).

Ecosystem Type	2016-2022 Restoration Projects Completed Acres	Delta Plan 2030 Interim Target Acres	Percent of 2030 Target	Progress Rating
Seasonal/ Non-tidal Wetland	2,358	6,300	37%	FAIR
Tidal Wetlands	5,353	10,900	49%	FAIR
Riparian	768	5,400	14%	POOR

Table 5. Restoration Projects Completed 2016-2022 with Progress Rating Compared to Delta Plan 2030 Interim Targets.

Ecosystem acreages from vegetation mapping and restoration projects were calculated and scored independently because the data collection methods differ. Acres of natural communities are calculated from remote sensing imagery of on-the-ground conditions, while restoration project acres are obtained from project documentation and may not represent on-the-ground conditions accurately. Additionally, the evolution of natural communities after project completion takes time and is influenced by external factors and the presence of invasive species.

Performance Measure 4.16 Recommendation

- Consider using post-project monitoring data to establish a metric and analysis methods for evaluating natural communities at project locations.

Protect Native Species and Reduce the Impact of Non-native Invasive Species

Salmon Population Natural Production (Performance Measure 4.6)

Salmon are native anadromous fish and a strong indicator species of ecosystem health. In addition to ecological importance, salmon have sociocultural significance to many Native American communities. Central Valley Chinook Salmon, *Oncorhynchus tshawytscha*, is also an integral part of California's fishing industry. Chinook Salmon populations depend on various factors in the rivers, Delta, and ocean. The Delta is a migration corridor for Central Valley salmon runs and an important rearing habitat for young salmon migrating to the ocean. The natural production of Central Valley salmon runs (non-hatchery) should increase over the long term to double the 1967-1991 levels to reach the state and federal doubling goal.

Rating Results

The overall performance measure rating is "POOR" (0-25% of target), as the natural production of Central Valley salmon runs is declining. The current natural production is below the baseline. During the 2013-2022 period, the average annual production was 10% of the target (108,550 fish). Specifically, the salmon runs in the Sacramento River watershed were 12% of the doubling goal, and the salmon runs in the San Joaquin River watershed were 11% of the doubling goal.

Performance Measure 4.6 Recommendation

- Consider performance metrics from juvenile salmonid monitoring data to understand juvenile migration and survival through the Delta, as well as the use of restored habitat by juvenile salmon.

Aquatic and Terrestrial Invasive Species (Performance Measure 4.10)

Non-native invasive species are a major stressor to the Delta ecosystem because they affect the survival, health, and distribution of native Delta wildlife and plants. Non-native invasive species can take over habitat space, compete for food, alter food webs, modify the physical habitat structure, and prey upon native species.

Because the non-native species are widespread, the management goal is to reduce the key invasive species and prevent new invasive species from becoming established. Managing new invasive species in a timely manner is key to reducing the chance of establishment.

Rating Results

The overall performance measure rating is “POOR” (0-25% of target) based on three performance metrics:

- **Reduced invasive aquatic vegetation (POOR):** Peak coverages of both submersed aquatic vegetation (SAV) and floating aquatic vegetation (FAV) have increased since 2015. SAV increased from around 7,500 acres under a 2004-2016 baseline to 12,000 acres between 2019-2020 (a 64% increase), with minimal differences by water year type. Floating aquatic vegetation (FAV) peak coverage increased to ~2,200 acres (a 12% increase) for both 2019 and 2020 compared to a similar baseline (~2,000 acres).
- **Native fish population (POOR):** The performance metric is expressed as a percentage of native fish population to non-native fish population from the overall fish biomass and abundance. The target for native fish biomass relative to non-native fish biomass was met in only one year (2023) between 2013-2023. Likewise, the target for native fish abundance relative to non-native fish abundance was met in only one year (2023) between 2013-2023. Native fish biomass (size of fish) is highly dependent on water years and typically only increases in wet years.
- **Prevent new invasive species (POOR):** The performance metric is expressed as a number of key non-native invasive species of fish, plants, and invertebrates established in the Delta. Between 2018 and 2023, at least three non-native invasive species were introduced in the Delta. These species are well-documented and likely to degrade the Delta ecosystem, waterways, recreation, and/or agriculture (i.e., Alligatorweed (*Alternanthera philoxeroides*), Ribbon Weed (*Vallisneria australis*), Nutria (*Myocastor coypus*)). Other non-native species were prevented from establishing in the Delta due to rigorous surveillance, prevention, and education, including Quagga/Zebra Mussels (*Dreissena rostriformis bugensis*/*Dreissena polymorpha*), Water snakes (*Nerodia sipedon*), and Mute swans (*Cygnus olor*).

Performance Measure 4.10 Recommendations

- Consider revising the target for newly established invasive populations based on the best available science and best practices for invasive species

management and prevention. The current “zero new introductions” performance target is not achievable, given that the Delta is a highly invaded ecosystem and new invasive species will continue to emerge.

- Consider expanding the non-native fish biomass and abundance metric to incorporate newer fish monitoring data collection techniques, such as open-water trawl data and other fish sampling sources that also track open water/pelagic fish communities.

Enhance the Unique Cultural, Recreational, Natural Resource, and Agricultural Values of the Delta as an Evolving Place

Maintain Delta Agriculture

Preserve Farmland (Performance Measure 5.3)

Agriculture is the largest and most vital industry in the Delta. Conversion of Delta farmland will impact businesses, jobs, and communities because cultivated farmland is the foundation of the Delta's significant agricultural economy. Preserving farmland promotes community and small family farms and retains the Delta's rural heritage. Under current local government general plans, about 28,000 acres of farmland are potentially designated to change to urban development. Additional conversion of farmland to urban development beyond that already designated in general plans should not occur.

Rating Results

The performance measure rating is "VERY GOOD" (76%-100% of target met). The performance metric tracks acres of farmland lost to urban development. Since 2014, there has been an overall farmland loss of 2,150 acres to urban development. The change in farmland to urban land use occurred in locations planned for urban development, as described in local government general plans at the time of Delta Plan adoption (2013). Delta Plan policy **DP P1** states that new residential, commercial, and industrial development must be limited to areas already designated for urban development (Delta Plan Appendix 6 and 7) or must be consistent with the land uses designated in county general plans as of May 16, 2013.

Sustain a Vital Delta Economy

Delta Economic Vitality (Performance Measure 5.9)

A vital Delta economy supports a mix of agriculture, tourism, recreation, commercial, and other industries and vital components of state and regional infrastructure.

Rating Results

The performance measure rating is “FAIR” (26-50% of target met) based on an arithmetic mean of eight metrics derived from a recent Socioeconomic Indicators report prepared by the Delta Protection Commission. The Socioeconomic Indicators report compared two five-year periods: 2011-2015 and 2016-2021. These eight indicators were selected as alternative metrics to replace the no longer maintained Regional Opportunity Index (ROI) –the designated metric for this performance measure in the Delta Plan. Ratings in these socioeconomic metrics were evaluated based on: a) 5% change over the five-year period (the performance target for the ROI in the Delta Plan is 5% increase by 2025); b) compared to the statewide average; or c) adjusted for inflation and compared to statewide values for monetary-based indicators:

- **Education Level (GOOD):** The rate of residents who have completed high school indicates increased labor market participation and job competitiveness, which often correlates to high-skill jobs and high wages. From 2017-2021, 88.7% of Delta residents aged 25 and older had at least a high school education, compared to 83.8% from 2011-2015.
- **School District Poverty (GOOD):** The school district poverty rate tracks children ages 5 to 17 who live in families with income below the poverty line. School district poverty rates indicate educational access and socioeconomic opportunities for young people in the region. In 2015, the school district poverty rate for the Delta was 20.5%, which was similar to the statewide level rate at 19.9%. In 2021, the rate for the Delta was 14.3%, compared to 15.4% statewide.
- **Median Household Income (VERY GOOD):** Median household income represents the middle number of all household incomes in an area and indicates a region’s standard of living and prosperity. Median household income from 2011-2015 is slightly lower in the Delta compared to the state (\$59,844 vs. \$61,818). Between 2016 and 2021, the median household income in the Delta was \$86,322, exceeding the state median of \$84,097.
- **Unemployment Rate (GOOD):** The unemployment rate indicates the number of employed individuals and the size of the labor force and reflects the region's economic health. Low unemployment rates indicate less competition for existing jobs and often correlate with higher household incomes. The Delta’s unemployment rate for 2016-2021 was 7.3%, compared to 6.5% statewide. In 2011-2015, the Delta rate was 12.4%, compared to 9.9% statewide. Thus, there was an improvement in the unemployment rate from

2011-2015 (Delta was 2.5% higher than statewide) to 2016-2021 (Delta was 0.8% higher than statewide).

- **Education Revenue per Student** (POOR): The cost-adjusted revenue per student is the revenue schools receive per student from the state and indicates available school district funding. It allows for understanding how much a school district can spend on necessary resources. The most recent data in 2018-2019 indicated that the Delta was no longer spending more per student than the rest of the state, as in 2013-2014. In 2013-2014, the average cost-adjusted revenue per pupil for districts within the Delta was \$8,160 compared to \$6,781 statewide. In 2018-2019, the average cost-adjusted revenue per pupil in the Delta was \$9,151 compared to \$10,813 state-wide.
- **Home Value** (POOR): Median home value indicates affordability of houses in the region. Delta median home values have increased from 64% of the statewide average in 2011-2015 to 78% of the statewide average in 2016-2021. This suggests Delta homes are becoming less affordable than those in the rest of the state.
- **Homeownership** (GOOD): The ratio of home ownership to home rental indicates the housing market's stability and the population's financial capability. High homeownership rates indicate a population that is financially stable and invested in its community. From 2016 to 2021, 61.7% of homes in the Delta were owner-occupied, which was higher than the statewide average (55.5%). From 2011-2015, the Delta homeownership rate was 59.5%, compared to 54.0% statewide.
- **Road Conditions** (POOR): Road pavement conditions indicate the quality of the interstates, freeways, and highways in the Delta and represent a measure of the Delta's transportation infrastructure. According to CalTrans data, the proportion of Delta lane miles that require major rehabilitation, replacement, or capital preventative maintenance has slightly increased from 21.4% in 2016 to 23.4% in 2021.

Performance Measure 5.9 Recommendations

- Consider compiling additional socioeconomic indicators from multiple agencies (local, state, federal) to provide a suite of metrics relevant to Delta's economy. Display the information on the Council's Performance Measures Dashboard and allow users to overlay multiple indicators on a map to identify the overlap of indicators among communities.

- Establish targets in relation to statewide values to allow regional evaluation of Delta communities with respect to the statewide conditions of each indicator.

Encourage Recreation and Tourism

Delta Tourism (Performance Measure 5.8)

The Delta is a world-class tourism destination, and investment in Delta communities will bring changes that enrich agriculture, support services, recreation quality, and the Delta economy. Many recreation and tourism opportunities are already present, and many additional ones have not been fully developed due to inadequate visitor information, aging/inadequate facilities, and restricted access to public lands.

Rating Results

The performance measure rating is “FAIR” (26-50% of target met) based on two metrics:

- **Increase publicly accessible land (FAIR):** The Delta includes over 58,000 acres of public land accessible for recreation and tourism. There has been no increase in publicly accessible land in the Delta since 2020, but there were steady increases between 2013 and 2019. About 10% of the Delta and Suisun Marsh is publicly accessible to visitors.
- **Fishing licenses sold (GOOD):** Interest in Delta fishing is steadily increasing. Fishing license sales rose 4.3% in 2022 compared to 2018. Sales peaked in 2020, possibly due to the pandemic. Sales slightly decreased in 2021 and 2022 but are overall higher than in 2018 across all six Delta counties.

Performance Measure 5.8 Recommendations

- Consider refining the performance target to include a fixed number of acres accessible for recreation or licenses instead of relying on the previous year so that tourism builds yearly.
- Consider developing a data source and methods to track changes in accessible shorelines.
- Consider conducting recurring recreation and tourism surveys to gather information on new visitors, off-season visits, and other pertinent data to improve tourism opportunities.

Protect Delta Lands and Communities

Subsidence Reversal (Performance Measure 5.2)

Much of the Delta is sinking due to subsidence caused by the drainage of Delta wetlands and the subsequent oxidation of peat soil. This results in elevation loss and the release of carbon dioxide. In some areas of the Delta, the land surface has subsided to 25 feet below sea level. Subsidence has made Delta levees less stable, increased flood risk, caused soil loss, and released vast quantities of carbon dioxide from oxidation. Continued land subsidence harms Delta agriculture because cultivation requires expensive drainage systems and levee maintenance. Subsidence can be reversed by slowly accumulating new sediment from mixed wetland-rice farms. Subsidence reversal projects can also sequester carbon allowing them to take advantage of carbon credit markets while helping California meet its greenhouse gas targets.

Rating Results

The performance measure score is "POOR" (0-25% of target met) based on acreage with subsidence reversal and/or carbon sequestration activities. Between 2018 and 2023, projects implemented in the Delta for subsidence reversal and carbon sequestration activities covered a total area of about 3,300 acres (10% of the target). Most subsidence reversal and carbon sequestration projects are smaller pilot-scale projects. Additional projects are proposed and are in the planning phases.

Performance Measure 5.2 Recommendations

- Consider expanding the performance measure target to add an additional 30,000 acres of carbon sequestration projects by 2045 (to a total of 60,000 acres) in alignment with the California Air Resources Board 2022 Scoping Plan for Achieving Carbon Neutrality.
- Consider expanding performance metrics and setting more aggressive targets for land accretion and carbon emission sequestration rates.
- Develop metrics and analysis methods for land management practices contributing to subsidence-causing activities on state-owned lands and associated subsidence rates. Develop information about opportunities to direct public land lease revenues toward subsidence halting or reversal activities within the Delta.

Delta Legacy Communities (Performance Measure 5.5)

The Delta has many communities with unique character and histories. The legacy communities have rich and unique natural, agricultural, and cultural heritages. Delta legacy communities develop community action plans to preserve their unique character and achieve a balance of positive social, economic, and environmental outcomes for residents. Improving community vitality increases the likelihood of enduring economic downturns, natural disasters, social difficulties, and unforeseen stressors.

Rating Results

The performance measure score is "FAIR" (26-50% of target met). Out of 11 Legacy Towns, 5 have adopted a Community Action Plan.

Performance Measure 5.5 Recommendation

- Consider developing performance measures for the Delta National Heritage Area Management Plan and specific targets for key aspects of community vitality (e.g., broadband infrastructure, community design, and public safety).

Improve Water Quality to Protect Human Health and the Environment

Improve Environmental Water Quality

Harmful Algal Blooms (HABs) (Performance Measure 6.10)

Algae are natural components of marine and freshwater ecosystems and form the foundation of most aquatic food chains. Blue-green algae, also known as Cyanobacteria, can potentially be harmful to humans and wildlife (hence the name Harmful Algal Blooms, or HABs). HAB events occur naturally due to environmental factors such as nutrient levels, water flow and chemistry, algal species composition, temperature, and sunlight but may be exacerbated due to human activities such as increased nutrient pollution, invasive species, and reduced water flows.

Rating Results

The performance measure score is “POOR” (0-25% of target met). The metric uses a proxy based on the total number of days that a specific Delta waterbody exceeds the threshold of 100,000 cells/ml cyanobacteria. A concentration of 100,000 cells/ml of cyanobacteria or 15.8 CI is considered to have a “High” relative probability of acute health effects. The metric is derived from a satellite-based tool that detects cyanobacterial levels; it does not detect the presence of harmful toxins. See the Council’s Performance Measures Dashboard for details on method limitations. During 2018-2023, major Delta waterbodies detected by the satellite tool exceeded the **CI** threshold several times (Table 3). This period included water year 2018 (following the 2017 wet year) and wet water year 2019, followed by the 2020-2022 drought. The wet water year 2023 showed decreases in the overall number of days that exceeded the CI threshold in most locations. Generally, HABs increased during drought years and decreased during wet years. However, different Delta waterbodies may exhibit different levels of HABs.

Major Delta waterbodies with a cumulative number of days when the CI threshold was exceeded, measured by the Satellite-based Harmful Algal Blooms Analysis Tool, are:

Year	Sacramento River	San Joaquin River	Big Break	Franks Tract	Cache Slough Complex	Sherman Lake	Clifton Forebay	Total Days with CI Exceedance
2018	6	9	9	1	17	10	17	69
2019	19	1	18	0	66	9	19	132
2020	0	0	0	0	17	6	71	94
2021	0	6	0	67	0	0	59	132
2022	10	0	36	89	155	55	81	416
2023	0	0	51	10	36	0	2	99

Table 6. Annual Cyanobacteria Threshold Exceedances in Major Delta Waterbodies.

Performance Measure 6.10 Recommendations

- Consider new developments in remote sensing to support or alter the tracking of this performance measure.
- Use the forthcoming Delta HABs monitoring program and HABs numerical objectives developed by the State Water Resources Control Board to develop updated performance metrics, baselines, and targets.

Measurable Toxicity (Performance Measure 6.9)

Toxicity in Delta water bodies is a growing concern because it adversely affects all organisms and people who rely on water bodies—impacting water quality, ecosystem health, and the reproduction and viability of organisms in contact with the water. Even at low concentrations, these chemicals can have negative effects over longer periods of exposure for larger organisms. Toxicity in Delta water is especially a concern for threatened and endangered species, as certain chemicals harm reproduction and offspring viability. Toxicity is caused by various pollutants, such as pesticides and contaminants of emerging concern (e.g., neonicotinoids, pyrethroids, and phenylpyrazoles). Toxicity is measured by using organisms sensitive to the contaminants present that are representative of the environment being sampled. This performance measure uses sediment toxicity to represent the overall toxicity.

Rating Results

The performance measure score is “POOR” (0-25% of target met) based on performance metrics for sediment toxicity. The metric is based on sediment toxicity sampled using invertebrates following standard methods approved by the USEPA and measured by the State Water Resources Control Board. Sediment toxicity increased from 39% to 50% of sites with at least one toxic sample during

2013-2022 compared to 2003-12, respectively. Consistent monitoring of sites between the periods was limited; more samples were taken in the 2003-12 period (46) than in the 2013-22 period (26). A site was considered “Toxic” if at least one toxic sample was detected, regardless of the toxicity severity. Information regarding severity of toxicity is available on other platforms (e.g., EcoAtlas Water Quality and Sediment Toxicity visualizations, CEDEN database).

Performance Measure 6.9 Recommendations

- Revise the metrics, baseline, and target to align with the State Water Resource Control Board's recent adoption of “Toxicity Provisions,” including statewide numeric water quality objectives for acute and chronic toxicity.
- Collaborate with the Delta Regional Monitoring Programs and use their toxicity data to evaluate the overall toxicity of the Delta system.

Dissolved Oxygen (Performance Measure 6.5)

Dissolved oxygen water quality objectives ensure aquatic organisms receive minimum dissolved oxygen requirements for optimal growth and life support. Meeting dissolved oxygen water quality standards will help prevent negative effects on wildlife. Dissolved oxygen standards are specified in the Sacramento River and San Joaquin River Basins and San Francisco Bay Water Quality Control Plans.

Rating Results

The performance measure score is “VERY GOOD” (76-100% of target met). The performance metric is based on continuous, real-time Dissolved Oxygen (DO) measurements (mg/L) measured at multiple locations throughout the Delta/Suisun Marsh. In the Delta, most of the stations that monitor DO consistently met their daily DO objective ($\geq 76\%$) during the 2018-23 period. DO objectives for Suisun Marsh were established in 2019. The standards differ from those for Delta DO, including chronic (30-day running average) and acute site-specific objectives (daily averages). In Suisun Marsh, stations that monitor DO also consistently met their DO objectives ($\geq 76\%$) during the 2019-23 period.

Improve Drinking Water Quality

Protect Groundwater (Performance Measure 6.4)

Groundwater wells used for domestic and municipal water supply that exceed arsenic and/or nitrate drinking water limits in the Delta are water quality issues and possible indicators of other more serious contaminants. This is especially true

for small water systems and disadvantaged communities that are highly dependent on groundwater sources that may not meet certain drinking water quality standards. Sources of nitrate and arsenic contamination can come from both natural and man-made sources. Consumption of high levels of nitrate and arsenic has various long- and short-term health effects.

Rating Results

The performance measure score is “FAIR” (26-50% of target met) based on an arithmetic mean of two performance metrics:

- **Drinking water standards for nitrate (VERY GOOD):** The percentage of drinking water wells exceeding the nitrate limits in the Delta has decreased. The 2018-2022 period shows an increase to 11% (32 out of 303 wells sampled exceeding nitrate limits) from 8% (24 out of 308 wells) in the previous 2013-17 period. However, overall, there is about a 30% reduction compared to the baseline (2001-2013), with 15% (61 out of 402) of wells sampled exceeding nitrate limits.
- **Drinking water standards for arsenic (POOR):** The total percentage of wells exceeding arsenic limits remains consistent. The 2018-2022 period shows an increase to 32% (59 out of 185) of wells sampled exceeding arsenic limits, from 26% (52 out of 199) of wells in the 2013-2017 period. Compared to the baseline (2001-2013), which had 33% (89 out of 279) wells sampled, this shows minimal change.

Performance Measure 6.4 Recommendations

- Consider expanding the performance measure metric to track drinking water wells with arsenic and/or nitrate exceedances in small water systems and disadvantaged communities.
- Consider adding other metrics to track groundwater drinking water source status (e.g., total violations, length of violations, remediated wells, etc.).

Protect Beneficial Uses by Managing Salinity

Salinity Management (Performance Measure 6.2)

Salinity in the Delta is an important water quality characteristic affecting municipal, industrial, agricultural, and fish and wildlife water uses. When salinity exceeds compliance conditions or changes too rapidly, it can negatively impact many beneficial water uses. Both natural and human-caused actions affect salinity in the Delta and Suisun Marsh. Salinity management is governed by the DWR and the U.S.

Bureau of Reclamation (USBR) due to their roles in managing reservoirs in the watershed and water exports in the Delta and must comply with State Water Board Decision 1641 requirements for salinity objectives. Additionally, under the federal and State Endangered Species Acts, USFWS Biological Opinion and CDFW Incidental Take Permit set requirements for salinity expressed as Fall X2.

Rating Results

The performance measure score is 'VERY GOOD' (76-100% of target met) and is based on two performance metrics:

- **Salinity compliance** (VERY GOOD): Salinity compliance with objectives for agricultural and ecosystem purposes has been met at least 99 percent of the time at compliance points. Except for one station, most stations consistently met the D-1641 objectives during the 2018-23 period. In the critically dry year 2021, 25 percent of stations did not meet salinity objectives (JER, EMM, OLD, and VOL). In 2021, a Temporary Urgency Change Petition (TUCP) was enacted, loosening salinity standards, and an Emergency Drought Barrier was constructed on the West False River in the Fall of 2021, providing control on salinity intrusion into the central Delta. In 2022, a critical water year, a TUCP and a salinity barrier were also in effect.
- **Maintain Fall X2 After Wet Years** (GOOD): Fall X2 was required in 2019 and 2023 due to the wet year designations. In 2019, X2 requirements for September and October were met. In 2023, the X2 requirement was met in September (~78km), but X2 was not met in October, surpassing the 80km (80.56km).
 - In 2019, USFWS released an updated Biological Opinion for the CVP and SWP that modified X2 from the previously ≤ 74 km from the Golden Gate Bridge in wet years and ≤ 81 km in above normal years to now ≤ 80 km for both years. The 2019 Biological Opinions also implemented other measures, such as the Suisun Marsh Salinity Control Gates operation.
- In 2020, the California Department of Fish and Wildlife (CDFW) issued the DWR a [California Endangered Species Act incidental take permit](#) (ITP) for the long-term operation of the SWP in the Delta for the protection of Delta Smelt, longfin smelt, spring, and winter-run Chinook Salmon. This ITP will expire on March 31, 2030, unless renewed by CDFW.

Performance Measure 6.2 Recommendation

- Consider adding a metric that accounts for sensitive fish species' response to Fall X2 years.

Require Delta-Specific Water Quality Protection

Delta Water Quality (Performance Measure 6.1)

High amounts of pollutants or other water quality issues can impair the ability of water to support beneficial uses, such as recreational use, agricultural water supply, municipal water supply, and healthy habitat for native vegetation and wildlife. Reducing the number of impaired water bodies on the Clean Water Act 303(d) list is important for protecting beneficial uses in the Delta. The list contains the waterbody name and the type of contaminant present in the water. A waterbody can contain several combinations of contaminants. The performance measure tracks the number of waterbody-contaminant combinations on the State Water Resource Control Board 303(d) list.

Rating Results

The performance measure score is "POOR" (0-25% of target met) based on the following performance metric:

- **Delta impaired waterbodies:** In the 2020-22 303(d) list, Delta waterbody-contaminant combinations increased by 43% (net increase) from 2010 (baseline) and increased by 30% since the previous 2014-16 list. Pollutants included pesticides (36% of new listings), total dissolved solids (16%), nutrients (16%), other (14%), and metals (8%).

Performance Measure 6.1 Recommendations

- Consider refining the performance measure metric and target to track specific year-listed (e.g., 2010, 2016) 303(d) waterbody contaminants and any new impairments listed in subsequent 303(d) list updates to better track historical contaminants/pollutants and account for the progress of de-listings.
- Consider adjusting the target date from the current 2034 to a later year (e.g., 2050 or later) to reflect a more realistic timeline needed for improvements.

Reduce Risk to People, Property, and State Interests in the Delta

Multi-Hazard Coordination Task Force (Performance Measure 7.1)

The Sacramento-San Joaquin Delta Multi-Hazard Coordination Task Force (Task Force) created recommendations to improve emergency preparedness and response in the Delta. The Task Force identified recommendations for local, State, and federal agencies responsible for emergency response to reduce risk to people, property, and State interests in the Delta. Responsible agencies coordinate activities to improve emergency preparedness and response to any hazard in the Delta.

Rating Results

The overall performance measure score is rated 'VERY GOOD' (76-100% of target achieved). All (11) emergency preparedness and response recommendations from the 2012 Delta Multi-Hazard Task Force Report have been implemented.

Performance Measure 7.1 Recommendation

- Consider developing new performance metrics to evaluate the implementation of coordinated emergency agency response activities and emergency preparedness for different types of emergencies caused by levee failures, power and communication outages, etc.

Projected Flood Casualties and Damages (Performance Measure 7.2)

Reducing flood risks to people, property, and State interests is critical to achieving the coequal goals and protecting the Delta as a place. Evaluating risks to people, assets, water supply reliability, the Delta ecosystem, and the Delta as a place requires considering both the probability and the consequences of flooding. The Council developed the Delta Levees Investment Strategy (DLIS) to address the need to evaluate risk in the Delta. It includes probabilistic estimates of expected annual fatalities (EAF) and expected yearly damages (EAD). The EAF is a risk-based calculation of the average annual number of flood-related fatalities anticipated in the region for the full range of potential flooding conditions evaluated. The EAD is an average annual monetary value of current and future losses due to flooding Delta infrastructure and other assets; it includes flood damage to homes and commercial buildings, vehicles, transportation and energy infrastructure, agricultural infrastructure, and lost crops. The Delta Plan promotes several strategies for reducing flood risks in the Delta, including continued emergency

preparedness, investment in levees, managing land use, and protecting and expanding floodways, floodplains, and bypasses.

Rating Results

The overall performance measure score is rated 'VERY GOOD' (76-100% of target achieved). Flood risk decreased significantly between 2007 and 2017 due to a combination of levee improvements, new elevation data, and updated calculations concerning the probability of flooding. The updated risk projections in 2021 resulted in a greater than 50% reduction in both Estimated Annual Damages (EAD) and Estimated Annual Fatalities (EAF).

Delta Levees at Design Standards (Performance Measure 7.3)

The Delta is inherently flood-prone. Levees within the legal Delta protect approximately 740,000 acres of land and play a major role in flood-related risk reduction. State and federal guidelines and standards establish minimum levee design and maintenance criteria. Levees are maintained and improved over time to reduce the flood-related risk to people, property, and state interests in the Delta.

Rating Results

The overall performance measure score is rated 'FAIR' (26-50% of target achieved) based on two metrics:

- Urban levees (POOR):** Urban islands were assessed for the Delta Urban Levee Design Criteria (ULDC) analysis available in the 2022 Flood System Status Report Update. All levees that were located on Delta islands were evaluated for criteria compliance using the determination in the Overall Rating column. The performance criteria for categories used in these assessments are based on the USACE Engineer Manual (EM) 1110-2-1913, Design and Construction of Levees (U.S. Army Corps of Engineers 2000) and DWR's ULDC and were, therefore, deemed to be an accessible source of ULDC compliance data. Levee segments in the overall rating column were labeled as one of the following: Meets Criteria, Does Not Meet Criteria, and Not Assessed. These segments were weighed by total miles and then summed to obtain the total miles compliant with ULDC and the overall percentage of island levees compliant with ULDC on a per-island basis. There were 0 urban island levee systems out of 6, or 0% that was reported to have 100% ULDC compliance.

- **Rural levees (FAIR):** Rural Delta islands are rated based on the percent of levees meeting the Bulletin 192-82/PL 84-99 standards. For overall total (i.e., 100%) compliance rates, only rural islands with 100% compliance were considered in the 2023 and baseline datasets. There were 21 rural island levees out of 69, or ~30%, reported to have 100% Bulletin 192-82 compliance.

Performance Measure 7.3 Recommendations

- Consider research to identify data sources and performance metrics to quantify construction capacity (contractor/material availability) and the associated costs for sufficient and timely levee improvements. Such metrics inform the understanding of levee improvement needs at anticipated scales.
- Consider research and performance metrics to quantify the economic value of reliable water supplies and transportation services protected by the Delta's levees.

National Flood Insurance Community Rating (Performance Measure 7.7)

The state is liable for flood-related damages caused by levee failures. The DWR in 2005 prepared a Flood Management White Paper outlining integrated approaches to reduce flood risks and included a recommendation to require houses and businesses to have flood insurance. The National Flood Insurance Program (NFIP) provides affordable insurance to property owners, renters, and businesses to reduce the impacts of flooding on private and public structures. The NFIP includes a voluntary Community Rating System (CRS) incentive program to encourage activities that exceed the minimum NFIP requirements. CRS allows communities to decrease the cost of flood insurance for their residents by taking actions to reduce flood risk. Lowering premiums encourages greater flood insurance coverage throughout the community, which decreases both state and local liability. Every year, an eligible community certifies that it continues implementing the flood loss reduction activities required by the NFIP. Specific flood-proofing activities will provide credit for a community's classification, leading to a community discount on NFIP flood insurance. 19 CRS credit activities are used to determine the discount each community receives on its flood insurance premium. The California state profile and points for 19 CRS credit activities were summed for each Delta community from the October 2023 dataset and compared to baseline data from 2013.

Rating Results

The overall performance measure score is rated 'VERY GOOD' (75-100% of target achieved). Between 2013 and 2023, Delta communities participating in the NFIP increased their CRS scores by 4.3%. The 4.3% growth rate for eligible Delta communities in 10 years exceeded the 1% target set to be reached by 2025.

Performance Measure 7.7 Recommendation

- Consider research and performance metrics for Delta legacy and other small communities' participation in the NFIP to understand better smaller communities' limitations and opportunities in obtaining CRS benefits. These limitations may include administrative barriers associated with enrollment and reporting requirements.

Performance Measures Not Considered within the Report Cards

In the Five-Year Review report, only the performance measures that observed changes over the ten-year period and have a defined numeric target were considered. The Delta Plan includes additional quantitative performance measures that were not included due to the following limitations:

1. Performance measures were not considered because conditions did not change:
 - i. **Delivery Interruption** (Performance Measure 7.5) records the amount of water not delivered due to disruptions caused by floods or earthquakes in the Delta.

Status: There has been no significant delivery interruption in the last ten years caused by a flood or earthquake. In 2017, heavy rainfall damaged Oroville Dam, a component of the State Water Project. No water delivery interruptions were reported, but damage to the Oroville Dam and emergency spillways caused evacuations of over 100,000 people living downstream.
 - ii. **Sea Level Rise Planning** (Performance Measure 7.7) evaluates the number of covered action certifications requiring consistency with Delta Plan policy **RR P2** that ensures flood protection for residential development in rural areas.

Status: During 2013-2023, 51 covered actions certified consistency with the Delta Plan. None implicated **RR P2**. The Delta Plan prohibits new residential development within the rural areas of the Delta.
2. Redundant narrative data is included in another performance measure.
 - i. **Critical Pesticides:** (Performance Measure 6.7) evaluates the reduction in the number of key pesticides present in the waters and sediments of the Delta and Suisun Marsh. The data source is the State Water Resources Control Board 303(d) list of unimpaired waterbodies and is the same as *Delta Water Quality* (Performance Measure 6.1), included in the water quality report card.

Status: During 2016-2022, the total amount of waterbody-pesticide combinations on the 303(d) list increased from 83 to 94, respectively.

3. Performance metric or target is not defined in a measurable format that enables rating progress as a percentage of the target.

- i. **Sustainable Groundwater** (Performance Measure 3.8) tracks responsible agencies that carry out their responsibilities under the Sustainable Groundwater Management Act (SGMA).

Status: SGMA addresses chronic groundwater overdrafts throughout California. Groundwater overdraft occurs in regions that also rely upon water from the Delta watershed. Actions to ensure the long-term sustainability of the groundwater are essential to local self-reliance and improved regional water supply reliability. SGMA requires local Groundwater Sustainability Agencies in the identified priority basins to develop and implement groundwater sustainability plans (GSPs). GSPs provide a plan for how groundwater basins will reach long-term sustainability.

- ii. **Recreation Opportunities** (Performance Measure 5.6) tracks the implementation of recommendations and outcomes identified in the California State Parks Recreation Proposal for the Delta and Suisun Marsh. With the completion of the Great California Delta Trail and the National Heritage Area Management and Implementation Plans, more recreation opportunities are expected.

Status: Most State Parks Recreation Proposal recommendations were completed by 2020. California State Parks released a strategic plan, Path Forward, in February 2024 to set its updated goals and objectives and to align with the Outdoor for All and 30x30 initiatives.

- iii. **Inorganic Nutrients** (Performance Measure 6.8) tracks concentrations of bio-stimulatory substances (inorganic nutrients such as ammonium, nitrate, and phosphate) in Delta waters. Numeric water quality objectives for nutrients have not yet been determined.

Status: Inorganic nutrients such as ammonium, nitrate, and phosphate are essential parts of the ecosystem.

Human activities contribute to excess nutrients in the ecosystem. One major source of nutrients is wastewater effluent. The EchoWater Facility (formerly known as the Sacramento Regional Wastewater Treatment Plant) upgrade, completed in 2023, removes about 99 percent of ammonia and 89 percent of nitrogen from its discharged tertiary effluent.

- iv. **The North Bay Aqueduct Alternate Intake** Project (Performance Measure 6.3) tracks the project's environmental permitting and construction. It is currently on hold.

Status: The North Bay Aqueduct Alternate Intake Project has been on hold for the past five years. In 2022, the Solano County Water Agency (SCWA) board announced a water and infrastructure project that will protect the water supply for half a million Napa and Solano residents. The project is being called "Water +" and anticipates moving the North Bay Aqueduct intake to the Sacramento River, improving drinking water quality and water supply reliability while fortifying the project against climate change impacts.

- 4. **Ecosystem performance measures adopted in 2022.** Some ecosystem performance measure baselines were established recently, and not enough time has passed to be able to evaluate progress. These include:
 - i. Subsidence Reversal for Tidal Inundation (Performance Measure 4.12)
 - ii. Fish Passage (Performance Measure 4.13)
 - iii. Funding for Restoration Projects with Priority Attributes (Performance Measure 4.14)
 - iv. Seasonal Inundation and Connectivity (Performance Measure 4.15)