8.3 Climate Change Considerations


Projected of climate change and sea-level rise (SLR) in tidal areas suggests that a great proportion of the Pacific coast wetlands may not survive without means of adaptation (Thorne et al. 2018). The primary window of effects for our proposed infrastructure project is over the next 20-30 years which is included in the Suisun Marsh Plan EIR/EIS (2014). During this period, SLR is projected to be relatively small at 18-21 cm. However, managed wetlands are one of the few alternatives that may allow adaptation to the exponential rate of rise past the mid-century.

Managing protective levees and water control structures is one of the only ways that rising tides will not freely inundate low elevation wetland areas. For example, this has been the strategy used for decades in the Netherlands. However, much of the current Suisun Marsh management is dependent on gravity drains, but at some point after 2050, this will be rendered ineffective by SLR. Instead, pumping will likely increase as a management tool for drainage, so we included two subprojects where pump efficiency will be examined and included into our modeling and management tool.

Other effects of climate change may include increases in upestuary salinities (Cayan et al. 2005). One of the primary concerns for managers in Suisun Marsh is regulating the salt in marsh soils to allow vegetation development, and small increases in salinity may preclude plant growth for cover and food and result in development of saline flats. In addition, increased salinity may indirectly affect food resources for fish by reducing zooplankton production that has been shown to be produced in abundance on managed wetlands (Slaughter et al. 2018, Bay-Delta Conference).

We propose to augment the RMA managed wetland model to examine effects of SLR (National Research Council 2012, Thorne et al. 2018) including residence times and the optimal range exchanged with adjacent sloughs (Bedsworth et al. 2018, California’s Climate Change Fourth Assessment). Although current projections indicate that slow linear sea-level rise effects (see Thorne et al. 2018) on infrastructure likely will be minimal in the near-term through the mid-century, longer-term climate change vulnerability through the end of the century can be examined through the modeling.

Literature Cited


