

Chapter 4, part F. STORAGE AND CONVEYANCE

CALFED GOALS AND OBJECTIVES

Unlike the other programs discussed here, storage and conveyance is not a common program of CALFED. Whereas the common programs are included in all CALFED solution alternatives, storage may or may not be included in alternatives. The following types of new storage are being evaluated by CALFED: upstream surface storage, in-Delta surface storage, south of Delta off-aqueduct storage, and groundwater storage. Storage of water in surface reservoirs or groundwater basins can provide opportunities to improve the timing and availability of water for all uses. The benefits and impacts of storage will vary depending on the location, size, and operational policies of the storage project.

Conveyance describes the various ways that water can be moved from storage to the point of use. There are many possible configurations for conveyance.

MONITORING ELEMENTS, RESEARCH QUESTIONS, AND LINKAGES

This section will discuss projects that address storage and conveyance issues and their resulting monitoring elements and research questions. Linkages between these projects and CALFED common programs are also identified.

Delta channels bathymetry

New topographic and bathymetric maps of the Delta are needed because land surface is subsiding, levee construction and maintenance continues to alter profiles and elevations of levees, and channels continue to adjust geomorphically to altered hydrology and sediment inputs. These maps are needed to implement the Delta Levees Program, plan through-Delta channel modifications and Delta wetland restorations, and to improve Delta water

quality simulation models. A hydrodynamic model being developed for the proposed State Water Project/Central Valley Project (SWP/CVP) intake structure and fish-screening facility at Clifton Court Forebay will also need data on channel cross-sections. A U.S. Army Corps of Engineers (USACE) comprehensive study of flood protection on the mainstem Sacramento and San Joaquin Rivers and in the Delta will need land surveys and channel geometry measurements to update a Delta hydrodynamic model.

This work will provide useful input to the CALFED Ecosystem Restoration, Long-Term Delta Levee System Integrity, Water Transfers and Water Use Efficiency, and Water Quality Common Programs.

Streamflow measurement network

The network of continuous streamflow gages in the Bay-Delta watershed has declined over the past decade due to shrinking budgets. An adequate network of gaging stations is necessary to evaluate water availability, water quality, water transfers, water use efficiency, and other aspects of the CALFED program. An inventory of existing gages is being assembled for CMARP to help evaluate where gaps may exist in the network. The USACE comprehensive flood protection study will also require historic streamflow and stage data at various key locations in the south and central Delta regions, as well as flood hydrographs and flood frequency analyses. The hydrodynamic model being developed for the proposed SWP/CVP intake structure and fish screening facility at Clifton Court Forebay will need data on velocities and surface water elevations.

This streamflow-measurement network will provide useful input to all of the CALFED common programs, especially the Water Transfers and Water Use Efficiency programs.

Climatic effects on Central Valley hydrology

The range of streamflows that result from climate-driven natural-runoff in the Sierra Nevada has a lot to do with what management plans can and cannot guarantee for ecological health and water quality in the Bay-Delta system. Extreme high and low streamflows can cause effects in the system, which cannot be managed. The frequency and severity of these events need to be determined and incorporated into CALFED planning. Recent modeling efforts have demonstrated that streamflow variations—and potentially, water-management variations—can be forecast with useful levels of skill at lead times ranging from days to seasons. These improvements in snowmelt and rainfall-runoff models are possible through improvements in weather and climate predictions.

This work will also provide useful input to all of the CALFED common programs.

Wetlands water use

One approach being considered by CALFED for improving ecosystem quality in the Delta is the conversion of some agricultural lands to wetlands. However, an initial evaluation by CALFED staff found that wetlands would increase net water use on the converted lands. This needs to be studied further. Informational needs include

1. evapotranspiration rates of specific vegetative species,
2. operational procedures for proposed wetlands, and
3. development of standardized, pond-specific vegetative compositions.

Seasonal wetlands will not use as much water as permanent wetlands. Pond maintenance practices such as dewatering and discing activities will impact infiltration and evaporation losses. The vegetative mix in the wetlands will affect the applied water requirements, vegetative consumptive use, and irrigation efficiencies.

This work will provide useful input to the Ecosystem Restoration and Water Transfers and Water Use Efficiency common programs.