

San Joaquin Area Simulation Model (SANJASM)

Purpose: SANJASM was developed to simulate the flow and storage conditions in the San Joaquin River basin by incorporating reservoir operations, flow standards, demands, and hydrology.

CALFED Potential: SANJASM can be used in CALFED alternatives analysis to evaluate impacts of alternative instream flow criteria, operating procedures, conjunctive-use groundwater schemes, power generation strategies, and new physical facilities between Millerton Lake and the Delta. The output can be flexible to reflect all of the permutations that can be developed among all of the variables available to the summary files.

Approach: SANJASM is an arithmetic accounting of flow and storage within the model boundaries. The model boundaries include the San Joaquin, Merced, Tolumne, Stanislaus, Fresno, Chowchilla, Mokelumne, and Calaveras Rivers. These primary rivers are subdivided for model calculations and analyzed in detail. The Cosumnes River, westside streams, and numerous small tributaries are included in the model at a lesser level of detail. The Friant Unit is included in the model.

Input Data: Input includes data on hydrologic conditions, water demands, regulatory criteria, and operational considerations. Hydrologic data include reservoir inflows, rainfall, evaporation, and river accretions and depletions. Regulatory criteria include instream flow standards and Vernalis water quality standards. Operational considerations include reservoir management criteria, flood control requirements, and canal or pump capacity. Data are application-specific and are provided to the model in separate files for each type. The user specifies the simulation period; current data sets extend 70 years. Groundwater is not simulated in the model.

Methods: SANJASM performs mass balance calculations at each model node to track flow, storage, and other model conditions. The model starts with the flow into a node, subtracts diversions and losses, and adds water gains to estimate the flow leaving the node.

Results: The model can be run two ways: based on historic storages, (resulting in historical releases), or based on inflows and downstream demands limited by flood control rules and minimum conservation pools. Two types of output reports are generated by two postprocessing programs: balance sheets for each of seven model sections, and summaries of a single variable for any consecutive set of years in a simulation.

Applications: SANJASM can be used to describe a multitude of operational and physical changes for the San Joaquin River system between Millerton Lake and the Delta.

Documentation: SANJASM Documentation, Version 2.82, U.S. Bureau of Reclamation, 1993.

Source: Free-access, PC FORTRAN 77 by the Lahey F77L-EM/32 FORTRAN compiler, or UNIX model compiled using Greenhills FORTRAN. Reclamation, (916)979-2276.