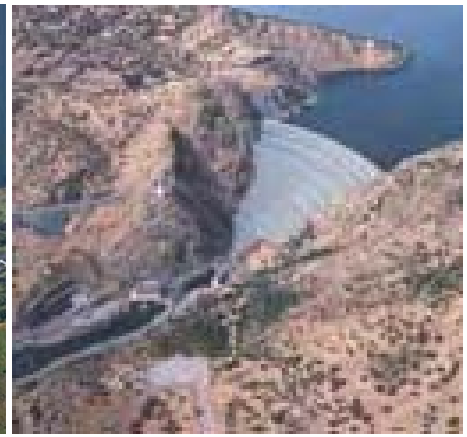
Stanislaus - Lower San Joaquin River Water Temperature Modeling and Analysis

Confluence

Goodwin

Tulloch



New Melones

Agenda

- Background
- Objective - CALFED
- Project Tasks
- Model Description
- Calibration Results
- Demonstration of Model Run
- Temperature Criteria Peer Review
- Operational Studies
- Future Work

Background

- **Stanislaus River Water Temperature Model (1999-2002)**
  - Cost-Share Partners (USBR, USFWS, CDFG, OID, SSJID, SEWD)
  - HEC-5Q (New Melones to Confluence)
  - Data Collection (Weather, Streams & Reservoirs Water Temperature)
  - Model Calibration (Limited Data)
  - Temperature Criteria (Fall-run Chinook, Steelhead)
  - Operational Studies (11 Cases)
- **Stanislaus – Lower San Joaquin River Water Temperature Modeling & Analysis (2003-2006)**
  - CALFED Grant (Tri-Dam)
  - Model Extension (Lower San Joaquin River)
  - Temperature Criteria (Peer Review Panel)
  - Model Calibration (New Data)
  - Operational Studies (Public Input)
  - Implementation Plan (Selected Alternatives)

Objective - CALFED

Ecological Processes

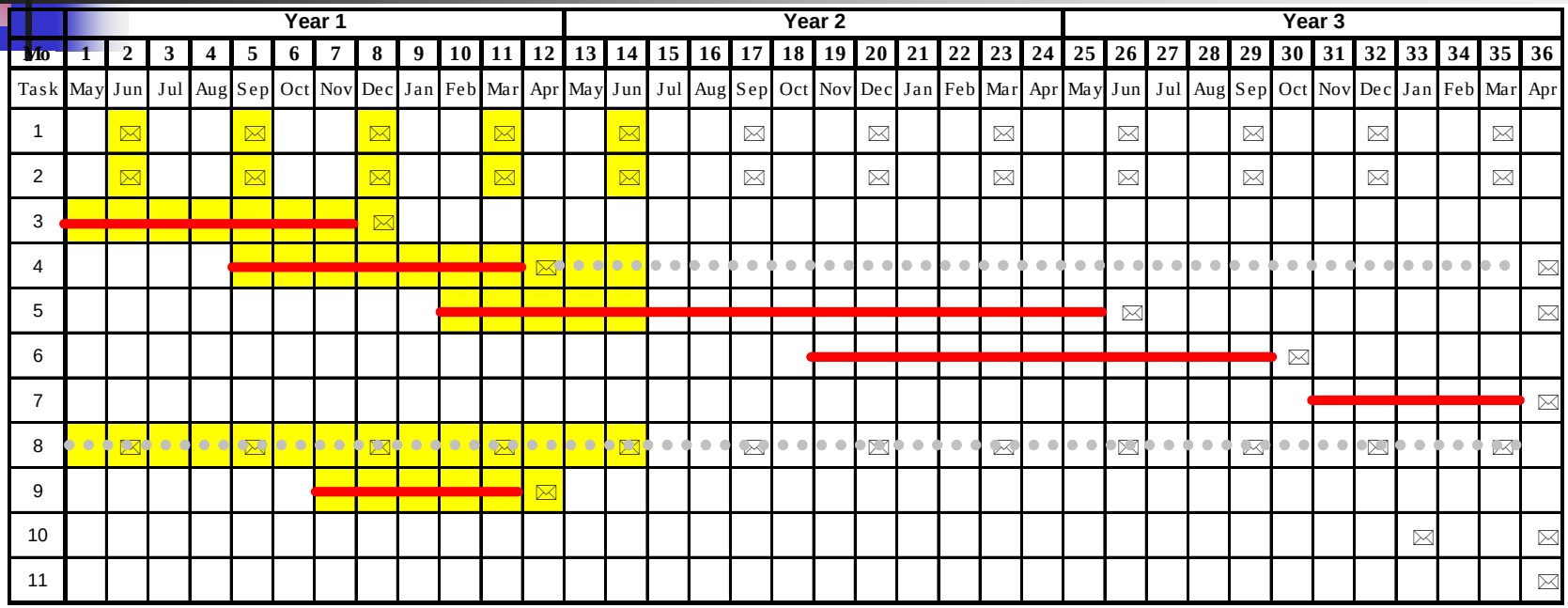
- **Milestone 84:**

  Develop and implement temperature management programs within major tributaries in the San Joaquin River Basin. The goal of the programs should be achievement of the ERP temperature targets for salmon and steelhead. The programs shall include provisions to: a) develop accurate and reliable water temperature prediction models; b) evaluate the use of minimum carryover storage levels and other operational tools; c) evaluate the use of new facilities such as temperature control devices; and d) recommend operational and/or physical facilities as a long-term solution.

- **Milestone 85:**

  Develop and implement a program to address the thermal impacts of irrigation return flows in the San Joaquin River Basin. The goal of the program should be achieve Basin Plan objectives for water temperature. The program should include provisions to: a) identify locations of irrigation return flows with thermal impacts; b) develop measures to avoid or eliminate thermal impacts from irrigation return flows; and c) prioritize problem sites based on impacts to Chinook salmon and steelhead. If feasible, proceed with implementation of some or all actions to address thermal impacts of irrigation return flows.

Project Tasks



Key:

- Duration of Task
- On-going Task
- Activities Completed
- Milestone Date, Progress Report, Deliverable

Task	Description
1	Project Management and Administration
2	Public Participation
3	Extend the existing model
4	Refine the S-SJR Model using current data
5	Perform operational studies
6	Perform pre-feasibility studies
7	Develop implementation plans
8	Collect, store and manage data
9	Peer review of water temperature criteria
10	Draft and Final Report
11	Project Closure Report

Selected Model

- **The HEC-5Q Model**
  - Designed to Analyze Thermal and Water Quality in Stream-Reservoirs System
  - Well Established Model Used on Numerous Water Systems
  - Public Domain Model that is Well Documented
  - Generalized FORTRAN Code and Compatible with Most Computer Systems
  - Powerful GUI for Displaying and Interpreting Model Results
  - Well Accepted Heat Budget and Water Quality Kinetic Relationships
  - Simulates Complex Reservoirs and Stream Sections Concurrently
  - Flexible Structure Allows Adding Features and Parameters in an Efficient Manner
  - Spatial Resolution of Stream from a few hundred Feet to Several Miles
  - Model Time Steps from 1-hour to 24-hour
  - Unlimited Simulation Period (e.g. 73-year analysis for Upper Sacramento)

Model Description

Schematic of the Stanislaus River