

Work Plan for Fiscal Year 2005

I. Program Title: Ecological/Water Systems Operations Models, CVPIA Section 3406(g)

II. Responsible Entities

	Agency	Name	Role
Lead	USBR	Lloyd E. Peterson	Program Manager
Co-Lead	USFWS	Andrew Hamilton	Program Manager

III. Program Objective for FY 2005

The objective is to develop readily usable and broadly available models and supporting data to evaluate the ecologic and hydrologic effects of existing and alternative management strategies of public and private water facilities and systems in the Sacramento, San Joaquin, and Trinity watersheds. Specific to FY are:

- A. Calsim II and Calsim III Development CALSIM II is a reservoir system model jointly developed (Reclamation and DWR).
- B. CALSIM Review and Documentation Rigorous quality control and documentation are required to preserve credibility
- C. CALSIM Training This training is also necessary to efficiently train new agency and private sector staff.
- D. River and Reservoir Temperature Model Development
- E. Membership and Participation in Professional Organizations

IV. Status of the Program

The Ecological/Water Systems Operations Models, CVPIA Section 3406(g) program is a continuing program that started in 1994.

The program has supported the Ecosystem Modeling Consensus Project, review and update of the Central Valley Ground-Surface water model (CVGSM); development of a graphical user interface (GUI) and database for PROSIM and SANJASM (note: This GUI effort was abandoned because CALSIM replaced PROSIM and SANJASM, as well as DWRSIM); development of the 3-D temperature model for Whiskeytown Reservoir, development of CALSIM II, and hydrologic input for CALSIM.

Since 1998 this program has supported a steadily increasing level of support for CALSIM II development and application. The California Department of Water Resources and Reclamation have made a large investment in CALSIM and it is essential for Interior to participate in and guide its development and application. CALSIM II is now available for public use and is used in most, if not all, current water supply improvement studies.

This program supports new development of reservoir and river temperature models used by the Division of Planning and private contractors for modeling support for operations and planning.

This program supports training conducted by Reclamation and the California Department of Water Resources. The Mid-Pacific Region Division of Planning, the U.S. Fish and Wildlife Service, the California Department of Water Resources, and private contractors all have staff capable of applying these models trained under funding from this program.

This program provides a platform for staff to solicit and manage funds from other sources.

V. FY 2004 Accomplishments

- A. The staff of the River Systems Analysis Branch (MP-710), Reclamation's Technical Service Center, Derek Hiltz (USFWS), and private contractors developed code and data and reviewed CALSIM II, and conducted one three day training session.
- B. Comprehensive review of CALSIM II including detailed annotation of the code and documentation.
- C. Refined water quality (Electrical Conductivity) simulation in Calsim II for the San Joaquin Valley.
- D. Continued work on a comprehensive manual for input to Calsim II.
- E. Continuing development of an algorithm with CALSIM II to simulate the Environmental Water Account.
- F. Comments were received from a peer review of Calsim II and a work plan to respond to their comments was developed.
- G. Continued effort at building a GIS representation of the CALSIM II coverage in support of improved documentation was completed.
- H. Advancement in CALSIM II's simulation of the Stanislaus Basin

VI. Tasks, Costs, Schedules, and Deliverables

Narrative Explanation of Tasks (note these are in order of priority)

3406(g) Narrative Explanation of FY 05 Tasks		
Program Objective ID*	Task #	Narrative Explanation of Task
A-F	1	Program management – Managing this program and administration of contracts
C	2	Continuing review and documentation of CALSIM II code.
A	3	Continuing Reclamation development of CALSIM. Eighteen month plan for development of Calsim III is being initiated at the end of FY 04.
A	4	US Fish and Wildlife Service staff provided CALSIM oversight and review
B	5	Initiate development of a water temperature model of the American River from Folsom Lake to the confluence of the Sacramento River. The model will operate on a daily, or shorter (6-hour), time-step. Both Folsom Lake and Lake Natoma should be modeled explicitly. The model will be used for planning studies and real time operation.
C	6	Development and documentation of application of Calsim to Central Valley. This task refers to the quality control and review of input (such as agricultural demands).
F	7	Membership and Participation in Professional Organizations including membership in the California Water and Environmental Modeling Forum and conferences with organizations such as American Society of Civil Engineers and American Water Resources Association. This includes participation in CWEMF sponsored Calsim training.
Additional Program Needs		
E		Sacramento River chinook model Calibration and analysis. Calibration and analysis will include testing of existing model output and individual examination of two life stage modules, calibrating them against available data and then using the calibrated modules for pilot analyses of important management issues.
Key to Objective ID		
<ul style="list-style-type: none"> • A. CALSIM II Development • B. Process Based CALSIM Module Development • C. CALSIM Review and Documentation, • D. CALSIM Training • E. Fishery Model Development • F. Membership and Participation in Professional Organizations 		

B. 3406(g) Schedule and Deliverables

#	Task	Start	End	Deliverable
1	Program Management	10/1/04	9/30/05	Annual work plans; awarding and management of grants; supervision of staff on 3406(g) funded projects
2	CALSIM Review/Documentation	10/1/04	9/30/05	Refined and commented WRESL code in CALSIM
3	CALSIM Development (USBR)	10/1/04	9/30/05	Coding to improve elements of model such as EWA, (b)(2), and allocation simulation
4	USFWS CALSIM Oversight	10/1/04	9/30/05	Reviews of CALSIM, participation in development meetings
5	American River temperature model	10/1/04	9/30/05	American River shorter time step
6	Hydrology Documentation	10/1/04	9/30/05	Manual
7	Participation in Prof. Organizations	10/1/04	9/30/05	Shared technology

C. Summary of Program Costs and Funding Sources.

#	Task	Total Cost	W&RR	DWR	CALFED	Other Reclamation Funds
1	Program Management	\$75,000	\$75,000			
2	CALSIM Review/Documentation	\$100,000	\$50,000	\$50,000		
3	CALSIM Development	\$675,000	\$175,000	\$500,000		
4	USFWS CALSIM Oversight	\$50,000	\$50,000			
5	American River temperature model	\$104,000	\$104,000			
6	Hydrology Documentation	\$143,000	\$43,000	\$100,000		
7	Participation in Prof. Organizations	\$56,000	\$28,000	28,000		

D. CVPIA Program Budget.

#	Task	FTE	Direct Salary and Benefits Cost	Contract Costs	Misc. Costs	Admin Costs	Total
1	Program Management	0.50	\$37,500			37500	\$75,000
2	CALSIM Review/Documentation	0.31	\$46,000			4000	\$50,000
3	CALSIM Development (USBR)	1.00	\$150,000			25000	\$175,000
4	USFWS CALSIM Oversight	0.27	\$40,000			\$10,000	\$50,000
5	American River temperature model	0.50	\$75,000	\$25,000		\$4,000	\$104,000
6	Calsm application documentation	0.17	25000	\$15,500		\$2,500	\$43,000
7	Participation in Prof. Organizations	0.17	\$25,000		3000		\$28,000
	Total by Category		\$398,500	\$40,500	\$3,000	\$83,000	\$525,000

VII. Future Years Commitments/Actions

Certain CALSIM applications will require a smaller time step than a month. DWR has initiated development at a smaller time step (especially useful for the delta part of the model and assessment of flood operation). Reclamation will participate as time and funding permit. Ground water algorithms within Calsim must be improved to more reasonably simulate aquifer to surface water interaction. Agricultural demand simulation must be refined to respond closer to the way water contractors actually do in terms of fallowing and changing crops. Current CALSIM II treats deliveries on the Friant-Kern canal as a time series (based on historical demand). Future development will explicitly include the Friant service area.