

**REPORT OF ACTIVITIES
OF THE
DEPARTMENT OF WATER RESOURCES**

By

**Keith E. Swanson, Chief,
Division of Flood Management
Department of Water Resources
California Natural Resources Agency
State of California***

*Prepared for the Central Valley Flood Protection Board for February 28, 2014 meeting.

FUNCTIONAL AREA 1 FLOOD EMERGENCY RESPONSE

This functional area includes work to better prepare for, respond to, and recover from flood emergencies. A program for flood emergency response is a necessary part of flood management because California will always face flood emergencies, even when system improvements reduce the frequency of flooding. Program activities include inspection and assessment of flood projects' integrity; reservoir operations and river forecasting; flood data collection, management, and dissemination; precipitation and runoff forecasting; Delta flood preparedness, response, and recovery; and statewide flood emergency response functions.

REAL-TIME FLOOD CONDITIONS, STATUS, & WARNING

The purpose of the Real Time Flood Conditions, Status, and Warning element is to provide information needed to manage floods as they are occurring. This element supports flood operations by 1) inspecting, documenting, and assessing the integrity of the Sacramento and San Joaquin Flood Control Project levees, 2) storing and managing information so that it is accessible to flood managers and the general public, 3) providing emergency flood information and warnings based upon existing and forecasted conditions and field reports, and 4) developing information management tools to support emergency operations.

INSPECTIONS

Section staff is working on Central Valley Flood Protection Board inspecting and coordinating encroachment permits. The Encroachment Permit and Levee Log databases continue to be updated and consolidated under task orders. Section staff continues to coordinate with DWR, USACE, CVFPB, and LMA staff in a number of venues and have been participating in meetings regarding rodent abatement, Regional Plans, and Unacceptable Vegetation.

FLOOD PROJECT INTEGRITY/VULNERABILITY ASSESSMENT ACTIVITIES

No new information this month.

LOCAL MAINTAINING AGENCY ANNUAL REPORTING PROGRAM (CWC 9140-9141)

2013 version of the *Inspection and Local Maintaining Agency Report of the Central Valley State-Federal Flood Protection System* was presented to the CVFPB at the January 10, 2014 Board meeting. Section staff mailed the CD version of the report to 48 libraries and to some local agencies/cities/counties. Staff will continue to mail the hard copy reports to the local agencies as they become available for distribution. Staff continues to work for findings in Non-Project Levee information. Staff also updated the Public_System_Documentation website with latest findings in As-Builts and O&Ms.

CLIMATE DATA COLLECTION & PRECIPITATION/RUNOFF FORECASTING

This Element supports Flood Emergency Response by providing information on current and forecasted water conditions, and by providing meteorological and climate information. Additionally, this Element includes evaluating and improving the data collection and exchange network and forecasting models, providing water supply and watershed runoff information and forecasting, and the development of a

new generation of forecasting and data collection tools to improve the quality, timeliness, and length of watershed and river forecasts. Real-time data, its timely availability, and quantities and quality are all critical to improving forecasting quality and timeliness.

WATER CONDITIONS

As of December 31, statewide hydrologic conditions were as follows: precipitation, 25 percent of average to date; runoff, 20 percent of average to date; snow water equivalent, 20 percent of average for the date (7 percent of the April 1 average); and reservoir storage, 70 percent of average for the date. Sacramento River Region unimpaired runoff, for Water Year 2014, observed through December 31, 2013 was about 1.0 million acre-feet (MAF), which is about 33 percent of average. In comparison to Water Year 2013, the observed Sacramento River Region unimpaired runoff through December 31, 2012 was about 4.8 MAF, or about 155 percent of average.

On December 31, the Northern Sierra 8-Station Precipitation Index Water Year total was 3.3 inches, which is about 19 percent of the seasonal average to date and 7 percent of an average water year (50.0 inches). During December, the total precipitation for the 8-Stations was 0.9 inches, or about 11 percent of average for the month. Last year on December 31, the Water Year 2013 seasonal total for the 8-Stations was 32.9 inches, or about 186 percent of average.

On December 31, the San Joaquin 5-Station Precipitation Index Water Year total was 3.0 inches, which is about 23 percent of the seasonal average to date and 7 percent of an average water year (40.8 inches). During December, the total precipitation for the 5-Stations was 1.1 inches, or about 18 percent of average for the month. Last year on December 31, the Water Year 2013 seasonal total for the 5-Stations was 19.1 inches, or about 147 percent of average.

Selected Cities Precipitation Accumulation as of 12/31/2013 (National Weather Service Water Year: July through June)					
City	July 1 to Date 2013 – 2013 (in inches)	% Average	July 1 to Date 2012 – 2012 (in inches)	% Average	% Avg "Water Year" July 1 to June 30 2013 - 2014
Eureka	5.12	30	20.83	122	13
Redding	3.50	25	19.16	139	10
Sacramento	1.90	29	11.29	171	10
San Francisco	2.08	23	13.10	144	9
Fresno	0.73	20	3.39	93	6
Bakersfield	1.07	51	0.79	38	17
Los Angeles	1.04	26	4.28	107	8
San Diego	2.24	68	3.17	96	22

Key Reservoir Storage (1,000 AF) as of 12/31/2013								
Reservoir	River	Storage	Average Storage	% Average	Capacity	% Capacity	Flood Control Encroachment	Total Space Available
Trinity Lake	Trinity	1,187	1,668	71	2,448	48	---	1,261
Shasta Lake	Sacramento	1,673	2,897	58	4,552	37	-1,698	2,879

Lake Oroville	Feather	1,286	2,226	58	3,538	36	-1,877	2,252
New Bullards Bar Res	Yuba	431	537	80	966	45	-365	535
Folsom Lake	American	187	479	39	977	19	-390	790
New Melones Res	Stanislaus	1,049	1,344	78	2,420	43	-921	1,371
Don Pedro Res	Tuolumne	1,034	1,329	78	2,030	51	-656	996
Lake McClure	Merced	232	454	51	1,025	23	-443	793
Millerton Lake	San Joaquin	225	278	81	520	43	-211	295
Pine Flat Res	Kings	173	418	41	1,000	17	-498	827
Isabella	Kern	60	154	39	568	10	-110	508
San Luis Res	(Offstream)	604	1,401	43	2,039	30	--	1,435

The latest National Weather Service Climate Prediction Center (CPC) long-range, 1-month precipitation outlook for January 2014, issued December 31, 2013, suggests below average rainfall for all of California.

SNOWMELT & SEASONAL VOLUME RUNOFF FORECASTING SNOW SURVEYS AND SNOW COURSE MAINTENANCE

As of February 12, 2014, the regional snow pack conditions as reported by the remote snow sensors are as follows:

- **Northern Sierra** – 4” of SWC for 13% of April 1 Avg.
- **Central Sierra** – 8” of SWC for 26% of April 1 Avg.
- **Southern Sierra** – 5” of SWC for 19% of April 1 Avg.
- **Statewide** – 6” of SWC for 20% of April 1 Avg.
- **Statewide** – Percent of normal to date = 27%

The February 1, 2014 Snow Survey Results from the courses near Echo Summit along Highway 50 indicate a gloom snow pack condition. The results were:

Location	Elevation	Snow Depth	Water Content	% of Average
Alpha	7600'	7.5”	1”	13
Phillips Station	6800'	12.4”	1.4”	7
Lyons Creek	6700'	13.5”	3.0”	22
Tamarack Flat	6500'	16.5”	3.0”	18

From the courses measured statewide around February 1, results show a snowpack at 6% of the April 1 average and 9% of the February 1 average. Much of the snowpack that fell during last weekend’s storm fell after measurements were made. The additional snow is captured in the daily snow sensor information above.

HYDROLOGIC DATA MANAGEMENT

The Snow Surveys section continues to collect, review, Quality Control, and enter Full Natural Flow (FNF), precipitation, snow, and reservoir storage data for thousands of locations statewide on a daily basis. With this data staff continues to issue daily, monthly, and seasonal water condition reports on CDEC. The extreme dry conditions during 201314 have brought a lot of media attention and a lot of

question from cooperating agencies. During the month Snow Surveys staff alone responded to over three dozen media requests.

BULLETIN 120 AND WATER SUPPLY INDEX FORECASTS

The low flows this winter are a true reflection of the lack of storm systems moving through California. Observed monthly flows from October through January have not exceeded 82 percent of normal for any forecasted river. During January, no major Sierra rivers flowed at a rate greater than 45 percent of normal and the statewide average was 8 percent. The January flows in the Sacramento River, San Joaquin River and Tulare Lake regions were 13, 6 and 7 percent of average, respectively.

The February 1, 2014 Water Supply Index (WSI) and Bulletin 120 (B120) forecasts were issued on February 10. The forecasts include observed conditions through the end of January.

The projected median April-July runoff in the major Sierra river basins ranges from 14 percent on the Tule River to 55 percent on the Pit River. Forecasted median Water Year runoff ranges from 16 percent for the Tule River to 43 percent for the Total Inflow to Shasta Lake. These first 4 months of this water year have been persistently dry, but remember California climate has also been persistently variable too. The WSI forecast can be summarized as follows:

Sacramento River Unimpaired Runoff Water Year Forecast

- 6.2 MAF (50 percent exceedance) (34 percent of normal)

Sacramento Valley Index (SVI)

- 3.7 (50 percent exceedance) (Critical)

San Joaquin Valley Index (SJI)

- 1.1 (75 percent exceedance) (Critical)

A Bulletin 120 Update for conditions on February 11 will be available Thursday, February 13. The March 1, 2014 Bulletin 120 and Water Supply Index forecasts will be available on March 10, 2014.

HYDRO-CLIMATE ANALYSES

No new information this month.

REAL-TIME DATA COLLECTION NETWORK

No new information this month.

RESERVOIR OPERATIONS & RIVER FORECASTING

This element supports Flood Emergency Response through a coordinated effort with various agencies' operating reservoirs in the system to enhance reservoir operations. The goal of coordinated operation of the reservoirs will be to reduce peak flood flows downstream of the reservoirs. Additionally, this Element supports Flood Emergency Response through river forecasting activities conducted in coordination with the National Weather Service River Forecast Center located at the

Joint Operations Center in Sacramento. By conducting real-time and long-range hydrologic and watershed analyses, this Element provides accurate and timely runoff and river peak flow forecasts.

RESERVOIR COORDINATED OPERATIONS

No new information this month.

RIVER FORECASTING

No new information this month.

FLOOD OPERATIONS EMERGENCY RESPONSE

This element includes all preparation and planning to execute flood fights, deploy teams, provide training, and coordinate local response needs and federal assistance in the event of a flood. This includes maintaining the readiness of the Flood Operations Center and all the staff that may have to staff it in the event of an emergency and assuring local response efforts can be integrated into the State response system.

FLOOD OPERATIONS, TRAINING AND EXERCISES

Much of the Flood Ops staff are supporting Drought efforts. Coordination of a DWR internal Delta flood emergency exercise continues with HAFOO staff coordinating efforts across the Department.

OUTREACH

Additional products for Drought are being compiled by the Flood Ops Center (in addition to daily regular river bulletins)

LOCAL PREPAREDNESS

Staff continues to work with applicants to execute the Statewide Flood Emergency Response grants and the Delta Flood ER grants. The purchase of the north parcel for the Delta Flood ER facility in Stockton is proceeding.

EMERGENCY RESPONSE SUPPORT

This element includes various efforts that will further the Departments understanding of the flood system interactions with water supply systems and conjunctive use programs. It also includes the update of the Central Valley hydrology for use in risk assessment and project development. Another component includes developing a comprehensive plan to response to flood events in the Delta.

CENTRAL VALLEY HYDROLOGY STUDY (CVHS)

No new information this month.

HYDRAULIC ANALYSIS AND EVALUATION

In January 2014 the Hydraulic Analysis Section (HAS) continued to manage the remaining hydraulic model development work under the CVFED program. The combined riverine and overland flow hydraulic models for the Upper and Lower Sacramento River System are 99% and 99% completed, respectively; and for the

Upper and Lower San Joaquin River System 97% and 99%, respectively. In parallel HAS also been working on activities related to the development of applications and tools using CVFED models and data to support FloodSAFE programs. In addition HAS has initiated and been involved in planning, scoping, designing and developing tools and applications for CVFED data management including inventory, update, visualization and dissemination of CVFED program data and tools for FloodSAFE programs and projects.

Following the deliveries of the ULOP 200-year Informational Floodplain Maps (SB 1278 and AB 1965) for urban communities in July 2013, we continued to respond to communities and legislators regarding maps, model and data requests related to the 200-year informational maps during the month of January.

In this month HAS continued to populate the Library of models with CVFED Models as they are completed and approved. Approximately fifty percent of the comprehensive riverine and over land flow hydraulic models corresponding to the CVFED program are populated in LOM.

In the month of January, we processed 5 requests for data and transferred a total of 2,828 LIDAR tiles and 30,612 tiles of Aerial Imagery. Three of the requests were from within DWR and the other two were from outside public agencies. Approximately 685 GB of data were transferred covering a land area of approximately 6,860 square miles.

FUNCTIONAL AREA 2 OPERATION AND MAINTENANCE

Operation and maintenance is a functional area under FloodSAFE established to ensure project facilities are operated and maintained in good working condition. DFM's Flood Maintenance Office (FMO) has responsibility for operation and maintenance of the Sacramento River Flood Control Project as outlined in California Water Code sections 8361 and 12878. Routine operation and maintenance is performed by the Sacramento and Sutter Maintenance Yards (Yards). Outside contractors are sometimes given responsibility for non-routine operation and maintenance. Funding from FloodSAFE has expanded the program by providing additional funding for deferred maintenance and for new projects identified through a number of inspection programs. FMO also provides funds to share costs with the federal government and with local maintaining agencies for repair projects.

DWR is responsible for planning projects in a way that avoids or minimizes environmental impacts, and for obtaining State and federal environmental permits and clearances for projects within Functional Area 2. DWR works to conduct operation and maintenance in a manner that supports public safety while protecting, and where possible, enhancing the environment. As such, environmental stewardship is integrated into each of the other major elements rather than a stand-alone element. Also, with DWR's established open collaborative process, various local, State, and federal agencies examine issues together and develop integrated solutions to complex environmental compliance requirements and resource opportunities as flood control maintenance activities are undertaken.

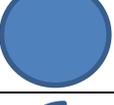
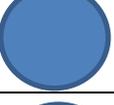
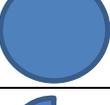
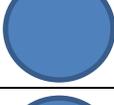
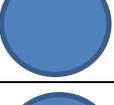
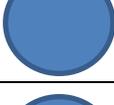
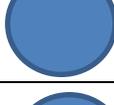
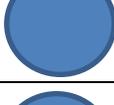
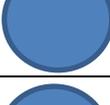
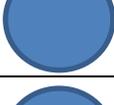
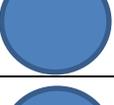
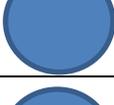
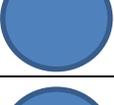
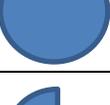
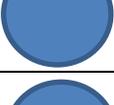
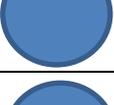
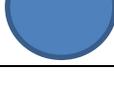
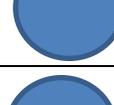
FLOOD SYSTEM PREPAREDNESS

Routine maintenance of project facilities is an essential component of Flood System Preparedness and is conducted by the Yards. Routine annual maintenance of project levees, channels, and flood control facilities begins in March and continues until the beginning of the flood season in October. The project's operation and maintenance manuals and the criteria for evaluating maintenance practices developed by the United States Army Corps of Engineers (USACE) serve as a guide for establishing maintenance practices. The Yards focus on completing all routine maintenance activities (including repair of damage caused by previous flood season's high water events) and having adequate flood fighting supplies on hand before the onset of the next flood season.

LEVEE MAINTENANCE

Maintenance of levees includes: mowing levees and managing vegetation to maintain visibility and accessibility for flood fighting, filling rodent holes, inspecting and repairing pipe penetrations, keeping levee crown roads in good condition, repairing damaged gates, and repairing slumping or eroded levee sections. Levees are inspected four times per year.

- The maintenance area formation on Cache Creek is underway with the completion of the flood benefit map prepared by Wood Rogers. DWR will meet with Yolo County and the City of Woodland to prepare for a public meeting that will likely occur in April 2014.
- The following figure shows the status of routine maintenance activities.

Maintenance Activities completed for Fiscal year 2013-2014						
	Veg control	Rodent grouting	Encroachment removal	Levee Restoration	Levee road	Minor Structures
MA 1						
MA 3						
MA 4		N/A				
MA 5		N/A				
MA 7		N/A		N/A	N/A	
MA 9					N/A	
MA 12			N/A			
MA 13						
MA 16					N/A	
MA 17		N/A				
WC 8361 State maintained				N/A		

N/A = not applicable

CHANNEL MAINTENANCE

Channels are maintained to convey the design flood flow by removing and thinning vegetation, and by removing accumulated debris and sediment as necessary. Hydraulic models are developed and applied to analyze channel flow capacity and identify critical areas within channels where vegetation or sediment needs to be removed to maintain channel capacity. As the models are completed, channel-specific management plans are developed to support on-going maintenance activities in the channel. Approximately 20 percent of the project channels will be modeled every year with priority given to channels with suspected deficiencies and every channel will be modeled no less than every 5 years.

- Channel maintenance is about 90% complete with respect to mowing, vegetation removal, and spraying. The dry winter has allowed for more work to be completed than originally planned.
- American River Channel Management – Developing GIS data to compare areas on American River where DWR has historically performed channel/vegetation management with current conditions in those areas. Data will be used to determine how assumptions used in channel modeling efforts compare to current conditions and whether those models can be used to evaluate if DWR needs to perform maintenance in any of those areas.
- Butte Creek Hydraulic Model - No new information this month.
- Cherokee Canal Hydraulic Model - Continuing effort to combine recent CVFED hydraulic model and more detailed hydraulic models (closer cross-section spacing and more detailed channel roughness assumptions) previously developed by a consultant for the upper section of Cherokee Canal (Nelson Road to Highway 162) with the hydraulic model developed by FMO for the lower Cherokee Canal (Highway 162 to Butte Sink). Combined model will be used to evaluate channel management options for Cherokee Canal.
- Chico Area Streams Hydraulic Model – DWR’s Northern Region Office (NRO) has incorporated comments received from FMO and comments provided by Atkins (CVFED Consultant) on portions of model previously adapted by CVFED to the extent possible and is rerunning the model and revising the draft model report.
- Linda and Arcade Creek Hydraulic Model – No new information this month.
- Natomas Cross Channel (NCC) Hydraulic Model – No new information this month.
- East Side Canal (aka Coon Creek Interceptor) – Completed recalibration of East Side Canal roughness n-values in model. Conducted initial field visit to determine potential maintenance actions needed as identified by initial modeling results.
- Natomas East Main Drainage Canal (NEMDC) - No new information this month.
- Putah Creek Hydraulic Model – Incorporating new cross-section data and updating model channel roughness based on current conditions.
- Tisdale Bypass Hydraulic Model – Initial HEC-RAS Model completed. Preparing QA/QC package to send to DWR’s Northern Region Office (NRO).
- Wadsworth Canal Hydraulic Model – No new information this month.

FLOOD CONTROL FACILITIES MAINTENANCE

DWR operates and maintains flood control structures such as weirs, pumping plants, fish ladders, and bridges. Routine activities, such as maintaining electrical and

mechanical systems, removing debris from intakes, and inspecting facilities for deterioration, are performed so the facilities are ready for operation.

- Facility maintenance is complete for the calendar year.

MAINTENANCE YARD FLOOD SEASON PREPAREDNESS

The Yards serve as first responders for State-operated Maintenance Areas (MA) and those areas where the State Legislature has given DWR levee maintenance responsibilities. By October, the Yards prepare for the next flood season by: restocking flood fighting supplies, conducting flood fight training that is needed for new staff, preparing schedules for high water patrolling or staking that may be conducted during the forthcoming flood season, inspecting and repairing communication equipment, and coordinating flood fighting activities with DWR's Flood Operations Center.

Sacramento Maintenance Yard

No new information this month.

Emergency Response

The Yards, when requested, respond to flood events as first responders in areas where they have maintenance responsibilities. They also provide support to other locally maintained areas for flood fighting when requested.

No new information this month.

CENTRAL VALLEY FLOOD PROTECTION PLAN (CVFPP) – IMPLEMENTATION

In addition to the routine maintenance described above, FMO is using FloodSAFE bond funds to complete deferred non-routine maintenance projects (such as rehabilitation of pumping plants), and rehabilitation and repair of system facilities (such as removing accumulated channel sediment and repairing major levee and bank erosions sites). The CVFPP identified several near-term priority actions that are being implemented including: development of rural levee repair criteria, proactive erosion repair and stabilization, risk-prioritized repair of critical system problems, rehabilitation and maintenance of all-weather levee access roads, and participation in federal levee repair programs. Implementation of the rural levee projects will be consistent with the State System-wide Investment Approach (SSIA).

LEVEE REHABILITATION AND REPAIR

FMO is supporting the rehabilitation and repair of levees through a variety of cost-share programs with the federal government and local maintaining agencies. A key program for providing local cost-share assistance in rural/agricultural areas is the Flood System Repair Project (FSRP) that repairs critical damage to flood control facilities. The State, in collaboration with the Central Valley Flood Protection Board (CVFPB) and members of the flood control community, is also developing the Rural Levee Repair Guidelines (RLRG) to provide guidance for repairs of smaller-scale levee deficiencies in rural/agricultural areas. Once developed, these criteria may be applied to repairs conducted under the FSRP.

Small Erosion Repair Program (SERP)

DWR is in the final stages of the final Program Environmental Impact Report. The document was distributed to the commenting agencies on Tuesday, January 28, 2014 for a 10-day mandatory review period. FMO intends to sign the document by mid-February. Completion of CEQA allows other permits that rely on CEQA to progress to completion. For example, after approval of the program by DWR, the CVFPB has tentatively scheduled approval of its CEQA findings for the program during the March 2014 Board meeting.

Flood System Repair Project (FSRP)

Final construction inspection for the *Levee Erosion Repair San Joaquin River – River Mile 71.5R* was conducted on January 22, 2014. The repair consisted of approximately 2,000 feet of rock slope erosion protection with revegetation. The site work was completed in 2013, at which time the one-year plant establishment period began. This construction inspection verified the efficacy of the plant establishment period and started the two-year plant maintenance phase of the project.

Rural Levee Repair Guidelines (RLRG)

The final draft RLRG document has been reviewed by key stake holders: regional coordination groups, coordinating committee members, Central Valley Flood Control associations, and State and local Farm Bureaus. DWR presented this final draft document to the Central Valley Flood Protection Board on January 10, 2014 and to the Coordinating Committee on January 22, 2014. Key comments are being incorporated and the document will be finalized by March 2014.

Sacramento River Bank Protection Project

Final construction inspection for the *North Levee Setback, Cache Creek LM 3.9 and LM 4.2* was conducted on January 24, 2014. The project constructed two setback levees, approximately 1,300 feet and 900 feet long, relocated PG&E power poles and re-routed a portion of a county road. The levees were constructed to respond to channel erosion that was compromising the existing levee. With the completion of this project, the last of the 146 sites identified under the Governor's 2006 Emergency Declaration will have been repaired.

PL 84-99

No new information this month.

CHANNELS – CORRIDOR MANAGEMENT STRATEGY (CMS)

CMS is a concept for planning, designing, and implementing projects for flood control features that DWR has responsibility for maintaining and repairing. It incorporates DWR's environmental stewardship and sustainability policies, and involves developing a vision, strategy, and Corridor Management Plan (CMP) for managing corridors that integrate public safety, environmental stewardship, and economic stability over a long-term (greater than 30 years) planning horizon. CMPs are a foundation for securing programmatic regulatory agency approvals for on-going maintenance activities and habitat restoration. CMPs effectively support the objectives of the CVFPP and Conservation Framework in establishing an integrated management plan to reduce flood risk, improve ecosystem function, and create a

more sustainable flood management system that allows for on-going operation and maintenance of flood management facilities.

Lower Feather River Corridor Management Plan (LFRCMP)

Comments to the draft administrative LFRCMP and appendices were submitted by the DWR review team to AECOM (the primary support services contractor) in mid-January. The LFRCMP is currently being revised by AECOM. The revised LFRCMP should be ready to distribute to the DWR CMP management team by the end of February.

Willow Slough Bypass Channel Rehabilitation Project

No new information this month.

FLOOD CONTROL FACILITIES – REHABILITATION AND REPAIR

DWR repairs or replaces flood control structures that are part of DWR responsibilities within the Sacramento River Flood Control Project. These facilities include weirs, pumping plants, fish ladders, outfall gates, and bridges.

Butte Slough Outfall Gates (BSOG)

No new information this month.

Sutter Bypass East Borrow Canal – Weir No. 2

No new information this month.

Pumping Plants

Pumping Plant testing is on-going.

FUNCTIONAL AREA 3 FLOODPLAIN RISK MANAGEMENT

The primary purpose of Floodplain Risk Management is to empower local communities through floodplain management program support and technical assistance to make wise land use decisions in flood prone areas that result in reduced flood risk and preservation of the beneficial uses of floodplains. FPM projects and programs work towards development of a statewide integrated approach for flood risk reduction and long term floodplain sustainability that reduces loss of life and property damage and minimizes the economic impacts associated with flooding.

FLOODPLAIN MANAGEMENT ASSISTANCE

Floodplain Management Assistance provides statewide technical support to federal, state and local agencies, and the public for flood hazard maps, levee data, and the National Flood Insurance Program activities including the Community Rating System (CRS). As part of the NFIP Community Assistance Program (CAP) grant-partnership with the Federal Emergency Management Agency (FEMA), DWR conducts audits with communities participating in the NFIP, provides technical assistance to the public, and trains community officials.

In January 2014, the Floodplain Management Assistance Section and Regional Office staff conducted Community Assistance Visit (CAV) post-inspection meetings for Glenn, Contra Costa, Tehama, and Humboldt Counties.

Staff provided approximate 40-hours of technical assistance to the communities of Sacramento County, City of Los Angeles, and City of San Anselmo. Technical assistance inquiries were regarding Elevation Certificates, general NFIP insurance inquiries and regarding official notifications from FEMA headquarters.

On January 8, staff assisted DWR FloodSAFE with a presentation providing an overview of the NFIP to the DWR Land Use Subcommittee. Staff is scheduled to make a second presentation covering the Biggert-Waters Flood Insurance Reform Act of 2012 at their March 5th meeting.

Staff is hosting a 4-day course and CFM Exam on March 10-13, 2014. This is the field deployed version of the FEMA Emergency Management Institute (EMI) E273 course. This course is designed to provide an organized training opportunity for local officials responsible for administering their local floodplain management ordinance.

STATEWIDE FLOODPLAIN EVALUATION AND DELINEATION

Floodplain Evaluation and Delineation works to estimate the frequency, depth, and limits of potential flooding throughout the state providing building blocks in terms of floodplain assessments, standards, methodologies, tools, and analyses supporting multiple applications including FloodSAFE programs and projects and FEMA's National Flood Insurance Program.

Coastal Floodplain Evaluation and Delineation (CFED)

The Coastal Data Merge Project is a collaboration with the Ocean Protection Council (OPC) with the purpose of merging coastal California's topographic/bathymetric data

into one formatted data set to provide a consistent application for the entire coast of California. Current status of the project:

No new information this month.

Alluvial Fan Floodplain Evaluation and Delineation (AFFED)

The AFFED project team reconvenes, when requested, to develop flood models and preliminary flood hazard delineation maps for California communities. Currently, there are no active AFFED projects.

No new information this month.

CENTRAL VALLEY FLOODPLAIN EVALUATION AND DELINEATION

Floodplain Evaluation and Delineation works to estimate the frequency, depth, and limits of potential flooding in the Central Valley by providing building blocks in terms of floodplain assessments, standards, methodologies, tools, and analyses supporting multiple applications including FloodSAFE programs and projects and FEMA's National Flood Insurance Program.

No new information this month.

FLOOD RISK NOTIFICATION

Flood Risk Notification focuses on communicating flood risk and risk mitigation strategies to the public and to local, state and federal agencies for areas protected by the facilities of the State Plan of Flood Control.

No new information this month.

FLOOD RISK PLANNING

Flood Risk Planning is focused on incorporating flood risk management into statewide and local land use decision-making to identify potential flood hazards and mitigation strategies to reduce flood risks through creation of integrated planning approaches and datasets that help agencies, communities, and individuals make well informed decisions.

No new information this month.

FUNCTIONAL AREA 4 FLOOD PROJECTS & GRANTS

Flood Protection Projects and Projects Grants has been a long-standing California Department of Water Resources (DWR) base program, and is expected to continue indefinitely, because of the ongoing need for system improvements and the long-lead time to implement federal flood control projects. The program is responsible for the majority of physical improvements to the flood management system and provides grant money in the Delta and Statewide. The State acknowledges the program need by continuing to be a significant partner in viable flood management projects in the Central Valley, Delta, and Statewide.

USACE/CVFPB PROJECTS AND STUDIES

USACE/CVFPB PROJECTS

The Central Valley Flood Protection Board (CVFPB/Board) continues to participate with the U.S. Army Corps of Engineers (USACE) on project non-federal cost-share funding to upgrade the Central Valley's State-federal flood management.

American River Common Features (ARCF) Project

The ARCF project is improving the levee system along the American and Sacramento rivers.

- Construction is complete for site L9A. The last two jet grout panels are being completed for site L9.
- USACE completed 100% design on sites R3A, L10, L7, and R7. The non-federal sponsors and USACE are currently negotiating the award for fiscal year (FY) 14 construction projects. The design is at 90% for the Natomas East Main Drainage Canal (NEMDC) North Extension site. NEMDC North contract has been awarded.

ARCF – Natomas Basin

The Natomas Basin Project is pending authorization in Congress in the Water Resources Development Act (WRDA) 2013 and includes significant improvements to the levees along the southern and eastern boundaries of the basin to improve flood protection to modern engineering standards.

- The Senate and House are in a conference committee to negotiate and work through the differences in the two WRDA bills; Senate (S) 601 passed by the Senate in April 2013, and House of Representatives (HR) 3080 passed by the House in October 2013.
- The Sacramento Area Flood Control Agency (SAFCA) and DWR continue to meet to discuss crediting and agreements with USACE, funding, and project management for this upcoming project.

Folsom Dam Raise

The Folsom Dam Raise Project will provide flood damage reduction by increasing the reservoir storage capacity by 3.5 feet and performing structural modifications to the existing tainter gates for operational safety. In addition, improvements to the temperature shutters and ecosystem restoration along the lower American River will provide environmental benefits.

- No new information to report this month.

Folsom Dam Modifications Joint Federal Project (JFP)

The purpose of the Folsom Dam Modifications Project is to construct an auxiliary spillway at the Folsom Dam that will work in conjunction with the existing spillways to help the Sacramento region achieve a 200-year flood protection level. The estimated completion for the JFP is October 2017.

- Construction and Design – The latest project status as of December 15, 2013 is as follows:

Phases	Planning & Design	Construction
Pre-construction Engineering and Design	100%	N/A
Phase III – Control Structure	100%	69%
Phase IV – Approach Channel, Chute, and Stilling Basin	100%	10%
Phase V – Site Restoration	19%	0%
Project Overall	90%	36%

- The first gate components for the control structure are scheduled to arrive the first week of February 2014 from the manufacturer located in Oregon. USACE plans to hold a media event for the gate arrival in late February or early March. CVFPB will be invited to attend the media event.

Lake Kaweah Enlargement Project (Terminus Dam, Kaweah River Project)

The Lake Kaweah Enlargement Project was completed in 2006. The final financial and turnover work is planned to be complete by September 2014.

- No new information to report this month.

Marysville Ring Levee Improvement Project

The Marysville Ring Levee Project will provide a 200-year or greater flood protection level to the city of Marysville by constructing cut-off walls, levee strengthening, and reshaping of the existing levee systems surrounding Marysville.

- Phase 1 cutoff wall construction was completed in 2012.
- Phase 2A design is 60% complete with construction award planned for fall of 2014.
- Phase 2B design will begin in 2015.
- Phase 2C design will begin spring of 2014.
- Phase 3 design will begin summer of 2014.
- Phase 4A construction is planned to begin spring of 2014.

Mid-Valley Area Levee Reconstruction Project

The Sacramento River Flood Control System Evaluation – The Phase III Contract Area 3 Project is located near Knights Landing in east Yolo County, approximately 26 miles northwest of Sacramento. Contract area 3 includes levee reconstruction at sites 9, 10, and 11 planned along the Sacramento River. Sites 12, 12A, and 13 are planned along the Knights Landing ridge cut drainage canal.

- No new information to report this month.

South Sacramento Streams Project

The South Sacramento County Streams Project will increase the flood protection level for south Sacramento County's urbanized area and an area to the south and east of the city of Sacramento.

- Improvements to Florin Creek are at the 90% design stage. DWR is planning for real estate acquisition, utility relocation, and California Environmental Quality Act coverage for the planned construction in 2015.

West Sacramento Area Project, Slip Repair

The West Sacramento Slip Repair Project was completed in 2011 and is awaiting close-out by USACE. On September 4, 2013, Flood Projects Office staff made a request to the USACE's Project Leadership Board to provide the State with a schedule to complete the project closeout and final accounting.

- No new information to report this month.

USACE/CVFPB STUDIES SECTION

The State, represented by CVFPB, participates and provides cost-share for feasibility studies with USACE and local partners. Several studies are underway.

ARCF General Reevaluation Report (GRR) This study will provide a 200-year level of flood protection for the Lower American River, downstream of the Folsom Dam, the Sacramento River (downstream of the Natomas Cross Canal), and the Natomas Cross Canal.

- No new information this month

Lower San Joaquin River Feasibility Study

This study is a coordinated effort by the State, USACE, and the San Joaquin Area Flood Control Agency to investigate feasible 200-year level flood protection and risk reduction alternatives and opportunities for floodplain restoration, recreational enhancements, and ecosystem restoration and enhancement for the city of Stockton and surrounding areas.

- No new information this month

Merced County Streams Project-Bear Creek GRR

This project will evaluate options to increase the Merced urban area level of flood protection from a 50-year to 200-year event.

- No new information this month

Rock Creek/Keefer Slough Feasibility Study

This study will generate an environmental impact statement/environmental impact report (EIS/EIR) and feasibility study to evaluate federal, State, and local interests in planning, designing, mitigating, and improving Rock Creek and Keefer Slough levee systems in Butte County.

- No new information this month

Sutter Basin Feasibility Study

This multipurpose study will address levee improvement measures for existing levee systems protecting Yuba City and the surrounding communities in the Butte/Sutter basin, as well as environmental restoration and recreation opportunities.

- No new information this month.

West Sacramento GRR

The GRR is being conducted to study future work necessary to provide a minimum 200-year level of flood protection for the city of West Sacramento.

- No new information this month.

West Stanislaus County - Orestimba Creek Feasibility Study

This study will evaluate feasible flood protection alternatives for the city of Newman and the surrounding agricultural areas to achieve a 200-year level of flood protection.

- No new information this month

White River/Deer Creek Feasibility Study

This study will generate an EIS/EIR and feasibility study to evaluate federal, State, and local interests in planning, designing, mitigating, and improving existing levee system of White River and Deer Creek in Tulare County.

- No new information this month

Woodland/Lower Cache Creek Feasibility Study

This study is a State, USACE, and the city of Woodland coordinated effort to investigate the feasible 200-year level flood protection and risk reduction alternatives and opportunities for floodplain restoration, recreational enhancements, and ecosystem restoration for the city of Woodland and surrounding areas. The study will continue efforts, suspended in 2004, after significant local resistance to the USACE-selected flood barrier option alternative halted the study.

- No new information this month

Cache Creek Settling Basin

This settling basin was initially constructed in 1937 and modifications were completed in 1993. As a part of the federal authorization for the most recent improvements completed in 1993, the project authorization specified additional improvements to be considered at year 25 or when the sediment trapping efficiency fell below 30 percent.

- No new information this month.

Yuba River Basin Project GRR

The Yuba River Basin Project GRR consists of increasing the Yuba River Basin flood protection level in Marysville, Linda, Olivehurst, and Arboga.

- No new information this month.

CENTRAL VALLEY FLOOD PROJECTS

This element is responsible for flood projects review and federal feasibility studies cost-sharing. It contains three components: Feasibility Studies, Early Implementation Program (EIP) Projects, and Flood Control Projects.

EIP PROJECTS

EIP includes projects ready to proceed in advance of the Central Valley Flood Protection Plan. An approval element for these projects ensures they do not eliminate opportunities or prejudice the flood risk reduction alternatives that would provide regional or system-wide benefits.

Knights Landing Levee Repair Project

This project will repair 3.4 miles of levee along the left (east) bank of the Knights Landing Ridge Cut back to the USACE 1957 Design Profile.

- No new information this month.

Levee District 1 (LD-1) – Setback Levee at Starbend Feather River

LD-1 constructed a 3,400-foot-long setback levee at Star Bend near river mile (RM) 18.0 on the right bank of the Feather River to provide increased flood protection for Yuba City.

- No new information this month.

Reclamation District 17 (RD-17) – 100-Year Seepage Area Project

RD-17 levees have unacceptably low safety factors due to under-seepage and through-seepage. These issues are being addressed by constructing seepage berms, slurry walls, and a setback levee to increase the flood protection level for south Stockton, Lathrop, and Manteca.

- No new information this month.

Three Rivers Levee Improvement Authority (TRLIA) – Feather River

This project will result in a 200-year flood protection level for Highway 65 and 70, and will also improve flood protection for Olivehurst, Linda, Plumas Lake, Marysville, and Yuba City. This project includes one of the largest setback levees west of the Mississippi River, and creates 1600 acres for on-site mitigation, agricultural use, and habitat.

- No new information this month.

TRLIA – Upper Yuba River

This project will result in a 200-year level of flood protection for Highway 65 and 70, and will also improve flood protection for Olivehurst, Linda, Plumas Lake, Marysville, and Yuba City. This project includes a portion of the Yuba River's south levee.

- No new information this month.

SAFCA – Natomas Cross Canal

This Natomas Levee Improvement Program project will install cutoff walls to prevent seepage, under-seepage, and raise the levee to improve the Natomas Basin's flood protection and create a 200-year minimum flood protection level.

- No new information this month.

SAFCA – Sacramento River East Levee

This Natomas Levee Improvement Program project will install cutoff walls to prevent seepage, under-seepage, and raise the levee to improve the Natomas Basin's flood protection and create a 200-year minimum flood protection level. SAFCA plans to

complete components to element 12A (RM 67) along the Sacramento River and have the USACE complete the remaining work.

- No new information this month.

San Joaquin Area Flood Control Agency (SJAFC) – Smith Canal Closure Structure

The Smith Canal Closure Structure Project will construct an Obermeyer gate at the mouth of the Smith Canal on the San Joaquin River/Stockton Deep Water Ship Channel. The cost to design the structure is \$2,412,500.

- No new information this month.

West Sacramento Area Flood Control Agency (WSAFC) – North and Southport Improvement

- North Area Plan

The California Highway Patrol Academy, Rivers, and I-Street Bridge projects are part of the North Area Plan. All construction is complete for these sites. These projects correct through-seepage and foundation under-seepage that have excessive hydraulic gradients, embankment instability, and erosion problems. All three projects are designed to provide a 200-year flood protection level for about 47,000 residents.

No new information this month.

- Southport Area

The Southport area project is being designed and may include a large setback levee.

No new information this month.

Sutter Butte Flood Control Agency (SBFCA) – Feather River West Levee Project (FRWLP)

FRWLP is designed to repair approximately 35 miles of levee along the west bank of the Feather River from the Thermalito Afterbay to the north end of Star Bend. The design will include slurry walls and seepage berms to protect Gridley, Biggs, Live Oak, Yuba City, and parts of Sutter and Butte counties. FRWLP's highest priority segment was identified as Project Area C. DWR has decided to pursue this project area as the first construction contract.

- Discussions continue to address SBFCA's inquiries regarding availability of additional funding to complete their project.
- Construction of 1-mile of levee is complete.

STATEWIDE FLOOD PROGRAMS

The Statewide Flood Programs provide local entities financial support for State-wide flood and ecosystem restoration related projects. These programs include the Flood Control Subventions Program (FCSP), the Flood Corridor Program (FCP), the Local Levee Assistance Program (LLAP), and the Yuba-Feather Flood Protection Program (YFFPP).

Yuba-Feather Flood Protection Program (YFFPP)

YFFPP provides Proposition 13 financial assistance to local entities that can demonstrate non-structural flood management projects that show a peak flood flow reduction, flood stage, and flood risk in the Yuba and Feather River (including wildlife habitat enhancement and/or agricultural land preservation).

- No new information this month.

Flood Corridor Program (FCP)

FCP provides local assistance grants to local governments, special districts, and non-profit organizations for flood risk reduction projects using non-structural methods. Each project must also include an ecosystem restoration or agricultural land conservation component.

- Hamilton City Flood Damage Reduction and Ecosystem Restoration Project – Escrow closed on the 512-acre acquisition of the Miles et al. property on January 28, 2014.

DELTA FLOOD PROJECTS

This is a grants program that works with more than 60 reclamation districts in the Delta and Suisun Marsh to maintain and improve the flood control system and provide protection to public and private investments in the Delta, including water supply, habitat, and wildlife. The program, through its two major components; Delta Levees Maintenance Subventions Program and Delta Levees Special Flood Control Projects, works with the local agencies to maintain, plan, and complete levee rehabilitation projects. One of the requirements to qualify for available funds is for the project to result in no Delta habitat net loss. Additional Bay-Delta Levees Branch responsibilities are to support the levee system and habitat development; improve Delta flood fight capability through planning, cooperative efforts, encouraging the emergency response plan development for each Delta island; and conducting necessary program studies and contract efforts.

DELTA LEVEES MAINTENANCE SUBVENTION PROGRAM

DWR staff, on behalf of CVFPB, initiates and manages work agreements to fund levee maintenance and rehabilitation. To date, the status of work agreements is as follows:

Work Agreements for FY 2012-2013.

- The CVFPB's executive officer executed 65 work agreements.
- Staff received 60 final claims by the November 1, 2013, deadline totaling approximately \$12 million worth of work.
- DWR staff has conducted 37 joint levee inspections with the California Department of Fish and Wildlife and the local agencies.
- Claims are currently being reviewed for eligibility and completeness. Once fully reviewed, the eligible amounts will be reimbursed to the local agencies.

Work Agreements for FY 2013-2014.

- On September 13, 2013, the Board approved the FY 2013-14 funding plan for \$12 million dollars. Work Agreements have been mailed to the 67 local agencies for signature by the local agencies.

- To date, we have received 7 signed copies of the Work Agreements from the local agencies and will be routed to the CVFPB's executive officer for execution.

DELTA LEVEES SPECIAL FLOOD CONTROL PROJECTS

DWR initiates and manages project funding agreements in support of local agency levee rehabilitation, habitat, or other projects. DWR executes agreements authorizing the work proposed under Project Solicitation Packages.

Current information can be found at:

<http://www.water.ca.gov/floodmgmt/dsmo/bdlb/spp/>

FUNCTIONAL AREA 5 EVALUATION & ENGINEERING

Evaluation & Engineering is a FloodSAFE Functional Area established to address assessments of existing flood management facilities to identify deficiencies and needed improvements. This is a new Functional Area that is expected to continue after the FloodSAFE foundational objectives are met. Functional Area activities are performed in partnership with the USACE, which prior to FloodSAFE, conducted most evaluations and engineering for existing facilities. This Functional Area is based on the acknowledgement that changing conditions, new knowledge about system performance, and eventual facility deterioration will demand continued evaluation and engineering services.

URBAN LEVEE EVALUATION (ULE)

DWR is required to evaluate the current level of performance of the State-Federal flood protection system in the Central Valley. Urban levees are levees that provide protection to developed areas with a population of at least 10,000 people. The evaluation of current urban levee performance is to include an estimate of the risk of levee failure, a discussion of the inspection and reviews performed, and recommendations regarding the levees and future work activities. The geotechnical engineering being performed will help flood managers understand the overall flood risks to populated areas in the Central Valley and consider alternative changes to the flood management system to better manage the risks.

ULE is evaluating 470 miles of urban levees that include State-Federal project levees, as well as appurtenant non-project levees that provide protection to urban areas receiving some protection from the State-Federal flood system. Urban levees are being evaluated to determine whether they meet defined geotechnical criteria for landside and waterside slope stability, under- and through-seepage, erosion, freeboard, seismic and, where needed, to identify remedial measures and cost estimates to achieve the defined geotechnical criteria. The information developed to date has been used in support of the Central Valley Flood Management Planning Program to inform development of two required 2012 documents: the Flood Control System Status Report and the Central Valley Flood Protection Plan. Information currently shown in the table below is in process or pending, and will be used to support the 2017 updates to these documents.

The final analyses and Geotechnical Evaluation Report (GER) is the end result of a five-step process that includes the following steps: historical data collection, initial field investigation, preliminary analysis, supplemental field investigation, and final analyses and reporting. Each of these five steps results in the below listed deliverables.

The overall status of the ULE program intermediate and final deliverables for the 27 urban levee study areas are shown in the table below.

No.	Urban Study Area	Historic Data Collection (TRM)	Initial Field Investigations (P1GDR)	Preliminary Analyses	Supplemental Field Investigations (SGDR)	Final Analyses & Report (GER)
1	Chico	Done	Done	Done	Done	In Progress
2	Marysville	Done	Done	Done	Done	Draft Volume 1 in

No.	Urban Study Area	Historic Data Collection (TRM)	Initial Field Investigations (P1GDR)	Preliminary Analyses	Supplemental Field Investigations (SGDR)	Final Analyses & Report (GER)
						preparation
3	RD 784	Done	Done	Done	Done	Final Volume 1 in preparation
4	Feather River West Levee	Done	Done	Done	Done	Draft Volume 1 in preparation
5	Sutter Bypass Wadsworth	Done	Done	Done	Done	Draft Volume 1 in preparation
6	American River	Done	Done	Done	Done	Draft Volume 1 and 2 in preparation
7	Sacramento River	Done	Done	Done	Done	Draft 2 Volume 1 in preparation
8	Davis	Done	Done	Done	Done	Draft Volume 1 in preparation
9	Woodland	Done	Done	Done	Done	Draft Volume 1 in preparation
10	NEMDC East	Done	Done	Done	Done	Draft Volume 1 in preparation
11	NEMDC West	Done	Done	Done	Done	Draft Volume 1 in preparation
12	Natomas North	Done	Done	Done	Done	Draft Volume 1 and 2 in preparation
13	Natomas South	Done	Done	Done	Done	Draft Volume 1 in preparation
14	West Sacramento	Done	Done	Done	Done	Done
15	DWSC	Done	N/A	N/A	Done	In Progress
16	South Sac Streams	Done	N/A	Done	Preparing Final	In Progress
17	RD 404	Done	Done	Done	Done	Draft 2 volume 1 submitted
18	RD 17	Done	Done	Done	Done	In Progress
19	Bear Creek	Done	Done	Done	Done	Draft Volume 1 in preparation
20	Calaveras River	Done	Done	Done	Done	In Progress
21	Lincoln Village	Done	N/A	N/A	Done	In Progress
22	Brookside	Done	N/A	N/A	Done	In Progress
23	Rough and Ready	Done	N/A	N/A	In Progress	In Progress

No.	Urban Study Area	Historic Data Collection (TRM)	Initial Field Investigations (P1GDR)	Preliminary Analyses	Supplemental Field Investigations (SGDR)	Final Analyses & Report (GER)
24	Boggs Tract	Done	N/A	N/A	In Progress	In Progress
25	Shima Tract	Done	N/A	N/A	In Progress	In Progress
26	SJAFCA upland levees	Done	N/A	N/A	In Progress	In Progress
27	Smith Canal	Done	N/A	N/A	In Progress	In Progress

Notes:

- 1) In areas where detailed recent studies were performed in advance of the GER five-step process, initial field investigations and preliminary analyses were not performed and the Technical Review Memorandum (TRM) incorporated these recent studies instead.
- 2) In Progress means that the work has been initiated and is in various stages of completion. The remaining In Progress SGDR work is nearing completion.

ULE SUMMARY

- Overall, ULE is 88% complete.
- Over 2000 interview records and historic reports have been obtained and reviewed. These records/reports have not currently been entered into the database but will be after completion of the ULE program.
- 400 miles of urban levees were surveyed using low altitude, high accuracy (+/- 6 cm) LiDAR survey techniques to generate topographic survey data.
- A bathymetric survey, to generate underwater topographic survey data, was performed for over 100 miles of river systems and integrated with the LiDAR survey to provide levee cross-section profiles that have both landside and waterside topography.
- 300 miles of levees were subject to Helicopter-based Electro-Magnetic Geophysical Survey (HEM). The HEM was performed to assist in assessing the subsurface stratigraphy between borings and determine the need for additional explorations.
- To supplement the HEM in no fly zones, over 100,000 feet of land based geophysical surveys were performed.
- For each of the 27 urban areas, detailed geomorphic studies and associated mapping were conducted to support the field explorations and subsequent analyses.
- Over 5,300 explorations along with approximately 15,000 laboratory tests have been performed as part of this effort for the 27 urban levee study areas.
- The West Sacramento GER was finalized in May 2012. Final RD 784 GER volume 1 under preparation.
- RD 404 Draft 2 GER Volume 1 completed.
- The current date for completion of all GERs is planned for the end of 2014.
- Completed responses to comments regarding the special ICB and Seismic Review Panel meeting to review project seismic vulnerability analysis protocols held on December 13, 2013.

NON-URBAN LEVEE EVALUATION (NULE)

DWR is required to evaluate the current level of performance of the State-Federal flood protection system in the Central Valley. Non-urban levees are levees that provide protection to agricultural areas and developed areas with a population of fewer than 10,000 people. The evaluation of current system performance includes an estimate of the risk of levee failure, a discussion of the inspection and reviews performed, and recommendations regarding the levees and future work activities. The geotechnical engineering being performed will help flood managers understand the overall flood risks to populated areas in the Central Valley and consider alternative changes to the flood management system to better manage the risks.

NULE is evaluating approximately 1,500 miles of non-urban levees that include State-Federal project levees and appurtenant non-project levees that also provide protection to non-urban areas receiving some protection from the State-Federal flood protection system. Non-urban levees are being evaluated to determine whether they meet defined geotechnical design criteria at the 55/57 design water surface for slope stability, under- and through-seepage, erosion, and, where needed, identify remedial measures and cost estimates to achieve the defined geotechnical design criteria. The information being developed will be used in support of the Central Valley Flood Management Planning Program to inform development of the six regional plans.

The overall status of the NULE program intermediate and final deliverables for the 21 non-urban levee study areas are shown in the table below.

No.	Non-Urban Study Area	Geotechnical Assessment Report (GAR)	Remedial Alternatives and Cost Estimate Report (RACER)	Geotechnical Data Report (GDR)	Geotechnical Overview Report (GOR)
1	Chico/North/South	Done	Done	Done	In Progress
2	Clarksburg	Done	Done	Done	Final volume 1 in Progress, Final volume 2 in Progress
3	Colusa Drain	Done	Done	Done	Draft volume 1 Submitted to DWR for review
4	Colusa North	Done	Done	Done	In Progress
5	Colusa South	Done	Done	Done	Draft volume 1 Submitted to DWR
6	Gerber	Done	Done	Done	Volume 1 Done, Draft volume 2 in Progress
7	Knights Landing	Done	Done	Done	Draft volume 1 complete – conversion to template underway
8	Sutter	Done	Done	Done	Final volume 1 in Progress, Draft volume 2 in Progress
9	Wheatland	Done	Done	Done	In Progress

No.	Non-Urban Study Area	Geotechnical Assessment Report (GAR)	Remedial Alternatives and Cost Estimate Report (RACER)	Geotechnical Data Report (GDR)	Geotechnical Overview Report (GOR)
10	Woodland South	Done	Done	Done	Volume 1 Done, Draft volume 2 in Progress
11	Ash Slough	Done	Done	Done	In Progress
12	Berenda Slough	Done	Done	Done	In Progress
13	Black Rascal/Fairfield	Done	Done	Done	In Progress
14	Diverting Canal/Mormon	Done	Done	Done	In Progress
15	ESB/Chowchilla	Done	Done	Done	In Progress
16	Fresno River	Done	Done	Done	In Progress
17	Gravelly Ford	Done	Done	Done	Revised GOR Volume 1 under review by DWR
18	RD 2064	Done	Done	Done	In Progress
19	RD 2075	Done	Done	Done	In Progress
20	RD 2095	Done	Done	Done	In Progress
21	SJRRP/CCID	Done	Done	Done	In Progress
22	SJAFCA orphan levees (upper Bear Creek)	In process	NA	NA	NA

NULE SUMMARY

- Overall, Non-Urban Levee Evaluations are 89% complete.
- Over 8,000 records have been obtained and incorporated into a searchable Microsoft Access database.
- Over 7,000 points of interest have been recorded and incorporated in GIS-based maps that also link to the project records database.
- For the 21 non-urban areas, surficial geomorphic studies and associated mapping efforts were conducted. More detailed efforts were performed in selected areas. The surficial mapping was performed to aid the GAR, while the more detailed efforts were performed to aid field exploration efforts.
- Over 3,000 explorations along with approximately 6,000 associated laboratory tests were performed as part of this effort for the 21 leveed areas protecting populations greater than 1,000.
- Drilling is complete.
- Laboratory testing is complete.
- Preparation of GDRs for NULE study areas is complete.
- Preparation of GORs is continuing, with the current delivery dates scheduled for mid-late 2014. Woodland South final GOR volume 1 and Gerber final GOR volume have been completed.
- Preparation of GORs continued for each of the study areas. The results presented in the GORs will support FMO, regional plans, and SJRRP studies.
- A geotechnical assessment of non-urban levees in upper Bear Creek is underway. The draft Geotechnical Assessment Report is being prepared, to be completed in the spring of 2014.
- An effort is currently underway to transfer ULE/NULE data to the California Data Exchange Center. The goal of this effort is to make ULE/NULE data available to other potential users at DWR (e.g., maintenance and inspections personnel). Data exchange requirements are being developed. This effort will be completed in parallel with the completion of the ULE/NULE projects.

SUPPORT OF OTHER DWR AND USACE PROGRAMS

CVFPP

In support of Central Valley Flood Planning Program (CVFPP), ULE and NULE data and preliminary analyses were used to define levee reaches requiring remediation to bring them up to appropriate design standards; develop corresponding conceptual cost estimates; and prepare levee reliability curves and maps showing limits of deficiencies by failure mode (e.g., seepage, stability, erosion).

CVFED

To support Central Valley Flood Evaluation and Delineation Program, ULE and NULE data and preliminary analyses were used to establish the height at which a levee no longer meets criteria for stability and seepage for 2100 miles of levees. Revisions to the previously submitted data set using updated (circa February 2013) ULE/NULE analyses have been submitted to CVFED. An addendum to the previously submitted technical memorandum was prepared.

FSRP

In support of the FSRP, NULE and ULE information is being used to perform detailed assessment of potential repair sites in 74 Leveed Areas in the Central Valley. The 8000 records and 7000 points of interest collected for NULE were used as a basis for FSRP. Information and processes developed under NULE and ULE have been used to screen, assess and estimate the initial remediation costs of specific repair sites. In addition, FSRP repair sites undergoing further feasibility and design studies will use field investigation and analyses data being performed under the NULE project. Field reconnaissance for the FSRP project was completed by eight teams comprised of a combination of DWR and contractor staff. The Field Reconnaissance Summary Reports for the Sacramento River Basin and the San Joaquin River Basin have been finalized. The Pre-feasibility Cost Estimate Reports for north and south leveed areas have been finalized. Support of outreach to LMAs continues.

In addition to supporting the FSRP, NULE project information is being used to support development of the Rural Levee Repair Guidelines (RLRG) including preparation of templates for typical repairs. Development of the RLRG involves a collaborative effort with input from the U.S. Army Corps of Engineers, the Central Valley Flood Protection Board, DWR, local maintaining agencies, subject matter experts, and interested parties. The final draft RLRG document is currently under review by key stakeholders.

SAN JOAQUIN RIVER RESTORATION PROGRAM

The LEP team is supporting the San Joaquin River Restoration Project's efforts to meet the requirement of the settlement to increase the flow in the upper San Joaquin River. This support consists of providing to the Bureau of Reclamation and local maintaining agencies analyses of the geotechnical conditions of levees so that they can manage increases in flow with an understanding of the potential increased risk of flood. Standard geotechnical criteria (factor of safety, exit gradient) are being used. Task Order SJ105 is being implemented during the reporting period and draft geomorphology mapping is complete. The first phase of field explorations has been completed. Laboratory testing is complete for soil samples from these

explorations. Analyses for areas with significant channel fill have been completed and a summary technical memorandum was prepared. A geophysical resistivity study is underway, scheduled to be completed late February-early March, to identify potential anomalous levee conditions between existing exploration locations. The geophysical data will aid in the planning for other Phase 2 field activities. Phase 2 field work is to be completed during the summer of 2014.

USACE LOWER SAN JOAQUIN GENERAL REEVALUATION REPORT (LSJGRR)

Remediation cost estimating support – protocol developed for ULE/NULE levee repair cost estimating was provided to USACE to assist their GRR program for the lower San Joaquin system.

PROSPECT ISLAND TIDAL HABITAT RESTORATION PROJECT

Geomorphic mapping from the ULE/NULE program was augmented to support the Prospect Island Tidal Habitat Restoration Project being conducted by DWR's Geology and Groundwater Investigations Section North Central Region. Final mapping and accompanying Technical Memorandum were submitted October 18, 2013.

TECHNICAL REVIEW

Geotechnical analyses are being conducting on behalf of the CVFPB on an “as-needed” basis and to support proposed and ongoing capital improvement projects. Collaboration with the USACE is occurring with on-going geotechnical studies, including review of associated documents that may impact the CVFPP.

- Technical reviews are currently being performed for the Sutter Butte Area Flood Control Agency, the (LSJFS) Lower San Joaquin Feasibility Study, and RD 17.
- ULE/NULE continues providing additional supporting data to USACE for the LSJFS.
- ULE continues to review/provide construction support the SBFCA Feather River West design project.

TECHNICAL POLICY SUPPORT

A statewide seismic policy was developed for levee performance, emergency levee remediation, and long-term levee remediation. Urban Levee Design Criteria (ULDC) were developed to guide local urban levee improvement projects. Research is being conducted to resolve gaps in knowledge associated with the effects that woody vegetation growing on or near levees and animal burrowing activities have on levee integrity; and to provide technical support for the development of management policies as part of the CVFPP.

- For vegetation issues, joint research with Sacramento Area Flood Control Agency (SAFCA) continues with ULE/NULE logistical and technical support. The following studies have been or are nearly completed:
 - Tree Root Architecture – How and where do tree roots grow on and near levees?
 - Levee Slurry Wall Investigations – Do tree roots penetrate slurry walls? What are their effects?

- How Trees affect Seepage and Stability of Levees – Do tree roots become preferential seepage pathways through a levee and do trees contribute to levee slope instability?
- Tree Windthrow – What are the forces necessary to topple trees on California Levees?
- Burrowing Mammal Habitat Associations – How is burrowing mammal abundance related to the presence or absence of trees on levees?
- Levee Mammal Burrow Characterization and Grouting Efficacy – What are the seepage and stability implications of burrowing mammal activity on levees? Do standard grouting methods seal burrows in a levee? A conceptual study of the impacts is underway.
- Forensics – Has woody vegetation affected historic levee performance?
- In addition to the static evaluation process, two seismic studies are being performed for the ULE project. The objective of the first study is to develop conceptual seismic remediation alternatives and associated costs for areas of urban levees that have been identified as being potentially compromised by earthquake loading in the GER. The second seismic study focuses on West Sacramento as a prototype to perform economic analyses and to develop a cost/benefit assessment for seismic remediation. As part of this effort, a draft Seismic Remediation Alternative Report and a prototype seismic remediation cost/benefit study reports for the West Sacramento study area were prepared.
- Participated in various FloodSAFE FAXCTs (Functional Area Cross Coordination Teams).

FUNCTIONAL AREA 6 FLOOD MANAGEMENT PLANNING AND CONSERVATION STRATEGY

The Flood Management Planning and Conservation Strategy Functional Area refer to the planning and analysis necessary to evaluate flood systems as complete systems consistent with the intent of the FloodSAFE Implementation Plan rather than a set of individual, isolated projects. This functional area consists of three elements: Central Valley Flood Management Planning (CVFMP) Program, Statewide Integrated Flood Management Planning, and Conservation Strategies.

CENTRAL VALLEY FLOOD MANAGEMENT PLANNING (CVFMP)

The CVFMP Program is one of several programs being managed within FloodSAFE California. The CVFMP Program addresses most of the flood-related planning activities that were authorized by the Legislature during the 2007/2008 session within much of the Central Valley. The CVFMP Program consists of two primary projects - State Plan of Flood Control (SPFC) and the Central Valley Flood Protection Plan (CVFPP).

STATE PLAN OF FLOOD CONTROL (SPFC)

The SPFC primarily includes: (1) SPFC Descriptive Document and (2) Flood Control Systems Status Report (FCSSR), which were completed and provided to Central Valley Flood Protection Board (Board) in November 2010 and December 2011, respectively. The SPFC Descriptive Document is to be updated as the SPFC is modified. The FCSSR is to be updated in 2016, and in subsequent years ending in 1 and 6.

CENTRAL VALLEY FLOOD PROTECTION PLAN (CVFPP)

The CVFPP reflects a system-wide approach to protecting lands currently protected from flooding by the SPFC. The Board adopted the 2012 CVFPP on June 29, 2012. The CVFPP is to be updated in 2017, and in subsequent years ending in 2 and 7. The 2012 CVFPP presents a State Systemwide Investment Approach (SSIA) for making improvements to the SPFC over time through five flood management programs: (1) Flood Emergency Response Program, (2) Flood System Operations and Maintenance Program, (3) Floodplain Risk Management Program, (4) Flood System Assessment, Engineering, Feasibility, and Permitting Program, and (5) Flood Risk Reduction Program. Two important components in further refining flood system improvements include developing Regional Flood Management Plans (RFMP) and two State-led Basin-wide Feasibility Studies (BWFS).

Regional Flood Management Planning (RFMP)

RFMP is a DWR sponsored and locally led planning process to develop a long-term vision of flood management in six regions in the Central Valley. Initial elements of the RFMPs include a Regional Flood Atlas, information on Regional Flood Management Priorities, and a Regional Financial Plan. RFMPs are being coordinated with the two BWFS led by DWR. DWR staff continues to support RFMP efforts. DWR staff and SPFC Coordinators have participated in locally led workgroups and meetings to help with identifying regional problems, financial planning, flood emergency response, and small community protection strategies. Monthly progress reports and RFMP activities are provided directly to the Board by Kim Floyd.

Basin-Wide Feasibility Studies (BWFS)

The two BWFS (Sacramento River Basin and San Joaquin River Basin) are being conducted to describe the State's flood management objectives in each river basin, refine the scale and location of system elements in connection with regional improvements in the SSIA, inform development of the CVFPP financing plan, and integrate a system-wide environmental conservation strategy. To support development efforts of the BWFS, major work efforts are divided into Plan Formulation, Technical Evaluations, and Communication & Engagement & Coordination.

- **Plan Formulation**

CVFPO staff is conducting necessary analysis and developing documentation for completion of Milestone 2. With an anticipated completion date of April 2014, Milestone 2 will document the plan formulation approach for a range of SSIA consistent system configurations. The identified system configurations will undergo robust technical analysis including a trade-off analysis after the completion of Milestone 2.

- **Technical Evaluations**

The Central Valley Flood Planning Office (CVFPO) continues to work on a number of tasks to support the Sacramento River and San Joaquin River Basin-wide Feasibility Studies. Some of these tasks include assessing potential bypass system modifications to the State Plan of Flood Control (SPFC) to improve flood conveyance, and developing economic analysis procedures for flood management studies. The technical evaluation being undertaken for the feasibility studies utilizes the following tools:

- The Central Valley Hydrology Study (CVHS) Products and Tools that include unregulated volume-frequency curves, HEC-HMS Rainfall-Runoff Models, and HEC-ResSim Reservoir Simulation Models will be used for the hydrologic analysis. Their output serving as input to the CVHS HEC-RAS 1-D model for in-channel hydraulic analysis.
- A 2-D hydrodynamic RMA2 model to propagate the sea-level rise projections in the delta to the downstream boundary of the HEC-RAS models. RMA2 will also be used to evaluate the complex hydraulics of the lower Sacramento Bypass system.
- The recently completed and more refined Central Valley Floodplain Evaluation and Delineation (CVFED) HEC-RAS 1-D model will replace the CVHS HEC-RAS model for hydraulic analysis. The CVFED FLO-2D models will be used for the floodplain modeling.

- **Communication, Engagement, and Coordination**

CVFPO presented the status of the Sacramento Basin-wide Feasibility Study at the Mid and Upper Sacramento River Regional Flood Management Plan System Improvements Focus Area Work Group in Colusa.

STATEWIDE INTEGRATED FLOOD MANAGEMENT PLANNING

The Statewide Integrated Flood Management Planning Program (SFMP) is intended to address flood risk to life and property statewide, and develop recommendations to guide the state's flood risk management strategic policies and investment decisions. The program inventoried existing and future flood management needs in the state's regions, identified opportunities for integrated flood management, and formulated potential integrated flood management solutions. The program published the report titled "Report on Flood Future: Recommendations for Managing California's Flood Risk" (Flood Future Report). In addition, SFMP includes integration of flood management into the California Water Plan.

FLOOD FUTURE REPORT

- No new information to report this month.

INTEGRATED FLOOD MANAGEMENT IN THE CALIFORNIA WATER PLAN

- No new information to report this month.

CONSERVATION STRATEGIES

The Conservation Strategies Element is designed to provide support and integrate environmental stewardship into the CVFMP Program. Therefore, major progress, such as the status of key documents, progress on major milestones, and upcoming events, is described under the Central Valley Flood Management Planning section above.

CONSERVATION STRATEGY DOCUMENT

Staff has consolidated a variety of improvements into an initial rough draft of the 2014 Conservation Strategy. These improvements include new and revised sections, based on comments received in briefings during the past few months. Staff are now working to ensure that it is internally consistent and relatively complete, and that it incorporates comments received to date. During the next few months, as the document improves, staff will be conducting focused briefings with key stakeholders to ensure that the planned July public draft meets a variety of general expectations.

BASIN-WIDE FEASIBILITY STUDIES ALIGNMENT AND INTEGRATION

Staff continues to work closely with CVFPO to integrate ecosystem elements with flood system improvement options as CVFPO moves forward in 2014 with modeling potential configurations for the Sacramento BWFS and San Joaquin BWFS elements on a more detailed level.

DEFINING MULTI-BENEFIT PROJECTS

Staff is working with DFM to clarify the definition of multi-benefit projects. This will help to standardize use of the term in BWFS planning and in DFM funding guidelines, and to guide RFMP groups in developing projects.

INTEGRATED FLOOD AND RESTORATION PROJECTS

Staff is working with local and agency partners to move forward with contracts to fund four advance mitigation projects, including projects for salmonid fish and riparian habitat on the Feather River and Sacramento River.

REGIONAL PERMITTING - FEATHER RIVER HCP/2081

DWR is pursuing an ESA Section 6 (Cooperative Endangered Species Conservation Fund) federal grant to support development of the Feather River HCP/2081 permit.

REGIONAL FLOOD MANAGEMENT PLAN (RFMP) ENVIRONMENTAL SUPPORT

Staff continues to attend RFMP meetings to provide information about the Conservation Strategy, environmental problems in the flood system, and available environmental data that could be used for RFMP planning. They have provided all regions with important environmental data and other information useful for their planning.

PERMITTING OF ADVANCE MITIGATION IN THE FLOODWAY

Staff has been working with DFM and CVFPB staff over the past few months to solve concerns about long-term requirements of mitigation projects located in the floodway, in the context of CVFPB encroachment permit authorities. This team has also been working with natural resource agencies to craft a workable solution. CVFPB staff will present an “Informational Item” on this topic at the March 28 or April 25 CVFPB meeting.

REFINEMENT OF LEVEE VEGETATION MANAGEMENT APPROACH

As requested by the CVFPB when adopting the 2012 CVFPP, staff has been working to refine the system-wide approach to managing levee vegetation. Based on a robust synthesis of research and in consultation with key interests, staff has developed an improved approach that focuses on inspection visibility and accessibility, as well as targeting potentially hazardous trees. Staff will be presenting this approach to the February 26 RFMP Coordinating Committee to get additional input.

FUNCTIONAL AREA 7 LEGISLATION, BUDGETS, AND COMMUNICATION

The primary goal of the Legislation, Budget, and Communication functional area is to facilitate legislation, budget, and communication matters to aid the efficient work of all functional areas in improving flood safety. This functional area will work to secure sustainable funding to implement the FloodSAFE initiative and to secure legislative support for all other functional areas that must continue indefinitely into the future. It is also responsible for coordination and public outreach consistency.

COMMUNICATION AND BRIEFING MATERIALS

- No new information to report this month.

FUNDING ADVOCACY & AGENCIES' ALIGNMENT

- No new information to report this month.