

CALIFORNIA DEPARTMENT OF WATER RESOURCES

REPORT OF ACTIVITIES

OCTOBER 2018

THE PURPOSE OF THIS REPORT...

is to provide a brief update to Central Valley Flood Protection Board (CVFPB) members on California Department of Water Resources (DWR) activities that occurred in the previous month. This report is organized by the five DWR mega-programs:

- Flood Emergency Response
- Flood Management Planning
- Floodplain Risk Management
- Flood Risk Reduction Projects
- Flood System Operations and Maintenance

Only programs with updates for this month have been included in this report. Programs not listed in this month's report may be included in future reports if updates are provided.

A full list of programs and program descriptions are available upon request. Please email Mitra.Emami@water.ca.gov for questions or concerns.

FLOOD EMERGENCY RESPONSE (FER)

FER // REAL-TIME FLOOD CONDITIONS, STATUS, & WARNING

The Flood Project Inspection Section has begun work on the fall levee inspections. As of September 27, 2018, inspectors closed a total of 301 CVFPB permits.

- Staff continued to update the FERIX website to include the Emergency Operations Plans and Contingency Maps developed from the Flood Emergency Response Grant projects.
- Staff continued to make improvements to the Flood Emergency Management System (FEMS) which is used by the Flood Operations Center staff to manage incidents, track resources and requests, and develop status reports and action plans. The FEMS system will be further tested and exercised during the Flood Coordinated Operations (F-CO) exercise on October 9.

Chester Diversion Dam Inundation Maps and Emergency Action Plan (EAP)

- Staff gave a presentation on the project at the Flood Management Association (FMA) conference in Reno, Nevada.
- The final EAP will be submitted to Cal OES by the January 1, 2019 deadline.
- Staff are also assisting DSOD with their inundation mapping reviews for other high-hazard dams.

Delta Emergency Response Tool (Delta ERT)

- Staff is developing enhancements.
- The Delta ERT simulates the impacts of levee failures in the Sacramento-San Joaquin Delta. Impacts include the time and cost for repairing and dewatering islands, as well as the associated water quality impacts.
- Planned enhancements to the model include the ability to simulate new barrier locations, additional default recovery strategies, and other general interface improvements.

Real-Time Inundation Modeling (RTIM) Tool

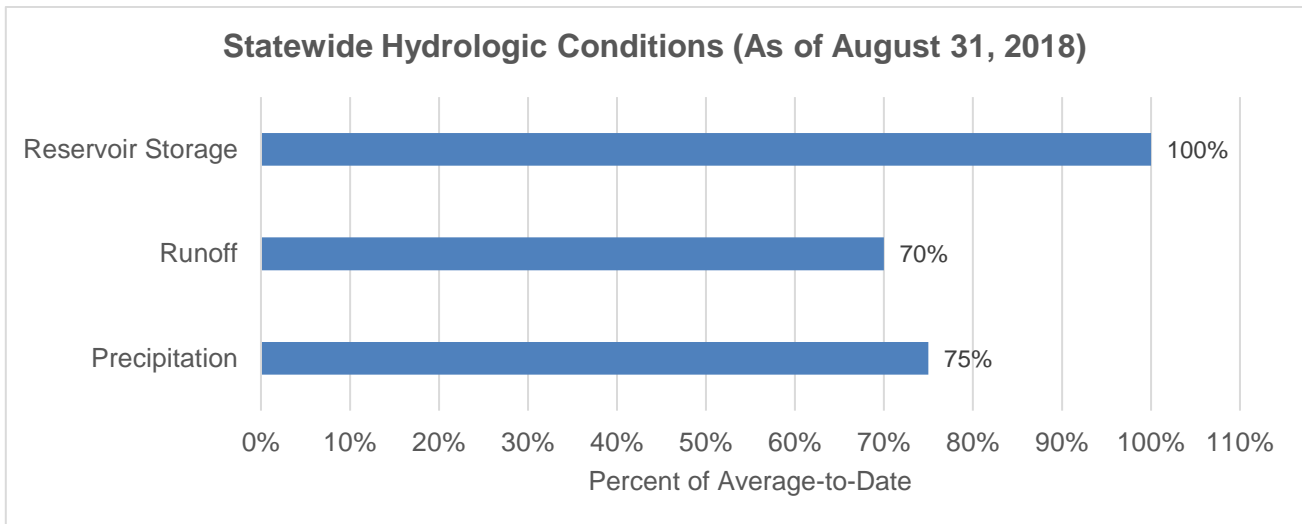
- Staff continued to test and refine the modeling tool.
- The tool has the capability to simulate the impacts of levee failures along the Sacramento River system, using forecasted hydrologic conditions. Simulated impacts include area of inundation, arrival time and depth of inundation, and duration of inundation.

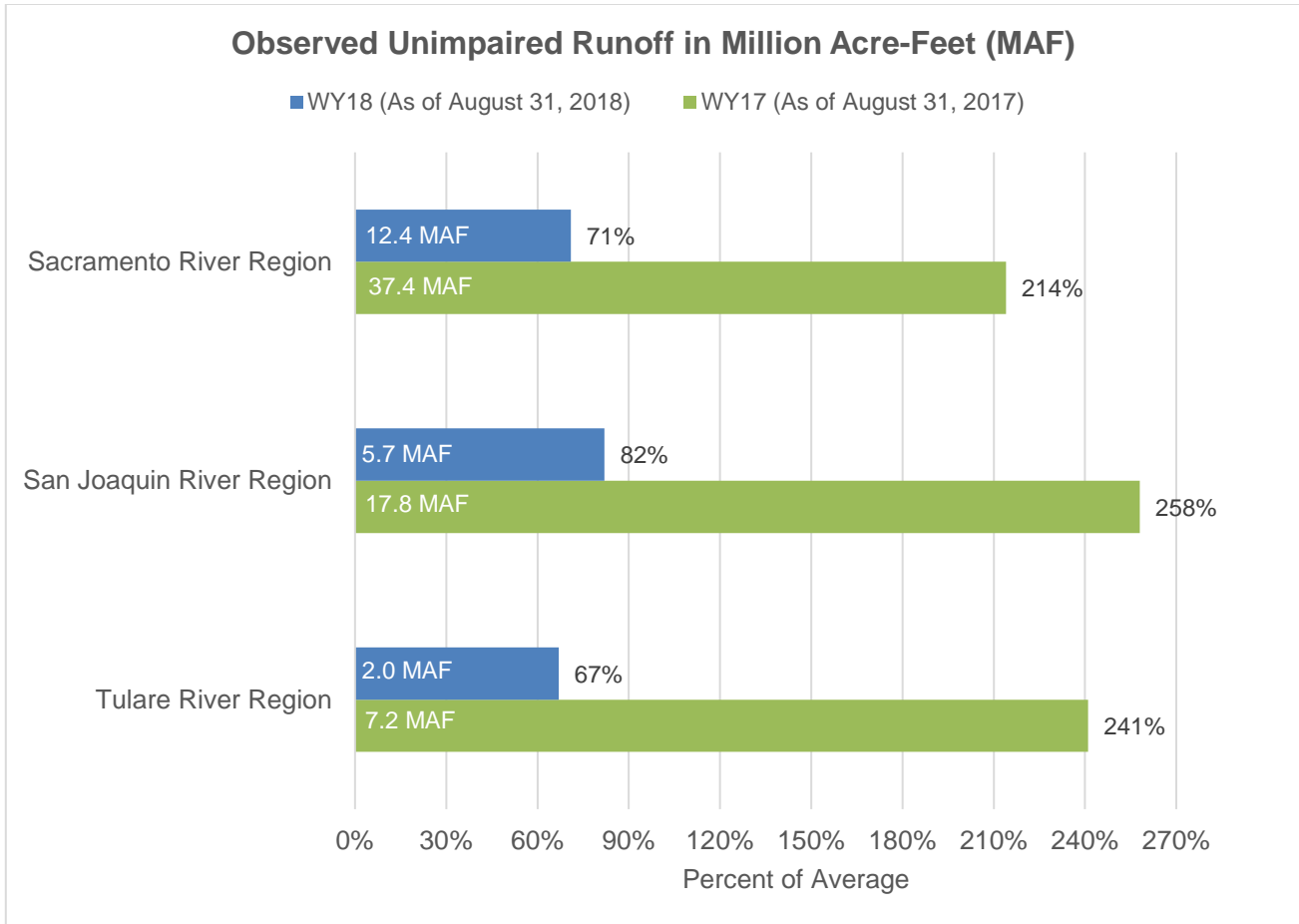
Statewide Flood Emergency Response Grants Round 1

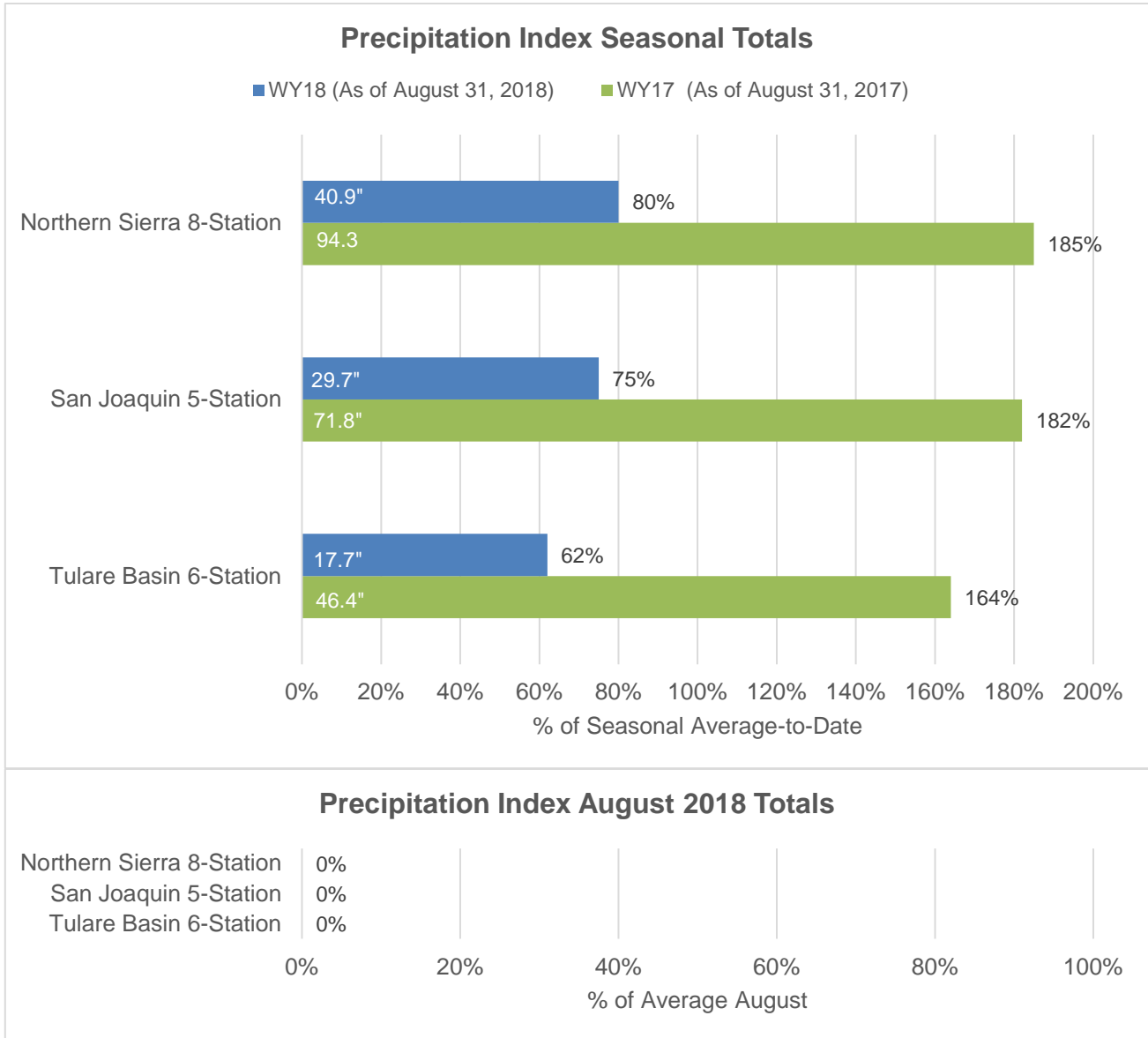
- Staff continued to manage one remaining grant contract (the final contract out of 14) with local agencies to improve their flood emergency response capabilities.
- The grantees are currently working on final invoices and closeout reports.

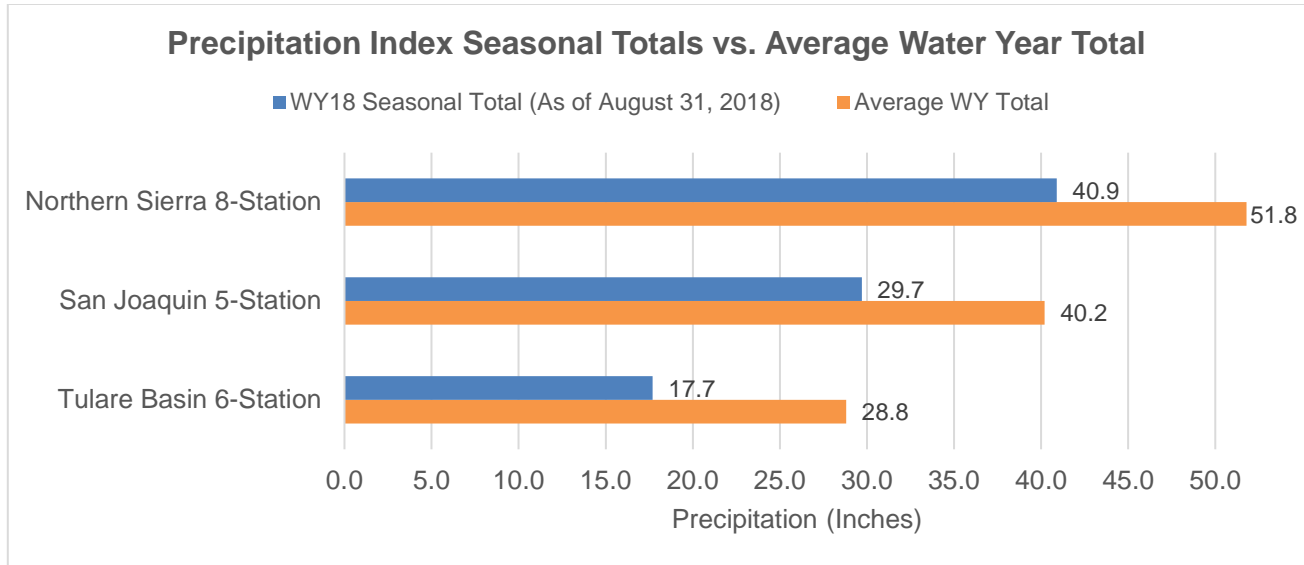
- The deliverables from the completed grant projects include emergency operations plans, flood contingency maps, decision support tools, communications equipment, flood fight supplies, and enhanced early warning systems.

FER // HYDRO-CLIMATE DATA COLLECTION & PRECIPITATION / RUNOFF FORECASTING









Daily Precipitation (Inches) for Selected Stations as of August 31, 2018

Station	WY18 to 08/31/2018	% of Avg	WY17 to 08/31/2017	% of Avg	WY18 % of Avg WY (Oct 1–Sep 30)
Mount Shasta	19.48	45	59.52	138	45
Eureka	35.95	90	51.51	130	89
Redding	19.68	58	45.64	134	57
South Lake Tahoe	20.84	106	47.70	242	102
Sacramento Executive Airport	15.06	83	32.97	181	81
Santa Rosa (Sonoma Co AP)	24.20	67	58.21	162	67
San Francisco	17.42	74	32.07	137	74
Stockton	9.22	67	21.63	157	66
Yosemite	27.35	73	74.45	199	72
Monterey	13.26	83	24.20	152	82
Paso Robles	9.35	74	14.19	113	73
Fresno	6.73	59	17.20	152	59
Bakersfield	3.95	62	7.80	122	61
Death Valley	0.67	31	1.41	66	28
Los Angeles	4.58	31	17.69	120	31
Riverside	3.76	31	12.00	99	30
Palm Springs	2.80	52	7.75	144	49
San Diego	3.34	33	12.27	120	32

National Weather Service Climate Prediction Center (CPC) long-range, 1-month precipitation outlook for October 2018 (issued September 30, 2018), suggests:

- Below-average precipitation for extreme Northern California.
- Above-average precipitation for Central and Southern California.
- Normal precipitation for the remainder of the state.

FER // RESERVOIR OPERATIONS & RIVER FORECASTING

Key Reservoir Storage (1,000 AF) as of August 31, 2018

Reservoir	River	Storage	Avg Storage	% Avg	Capacity	% Capacity	Flood Control Encroachment	Total Space Avail.
Trinity Lake	Trinity	1,570	1,803	87	2,448	64	---	878
Shasta Lake	Sacramento	2,691	2,878	94	4,552	59	-1,861	1,861
Lake Oroville	Feather	1,597	2,318	69	3,538	45	-1,941	1,941
New Bullards	Yuba	652	653	100	966	68	-314	314
Folsom Lake	American	506	611	83	977	52	-471	471
New Melones	Stanislaus	1,825	1,387	132	2,400	76	-595	595
Don Pedro Res	Tuolumne	1,590	1,436	111	2,030	78	-440	440
Lake McClure	Merced	696	564	124	1,025	68	-323	329
Millerton Lake	San Joaquin	279	236	118	520	54	-241	241
Pine Flat Res	Kings	276	378	73	1,000	28	-724	724
Isabella	Kern	94	216	44	568	17	-267	474
San Luis Res	(Offstream)	971	858	113	2,041	48	---	1,068

FLOOD RISK REDUCTION PROJECTS (FRRP)

FRRP // DELTA LEVEE SYSTEM INTEGRITY (DLSI)

Delta Levees Maintenance Subvention Program

The Delta Levees Maintenance Subventions Program is authorized by CA Water Code § 12980-12995. Recent changes to § 12986 of the CA Water Code affected the Subventions Program. These changes became effective July 1, 2018 and include definitions, application reporting requirements and a change to the per levee mile deductible.

The Delta Levees Subventions Maintenance Program 2016 Guidelines, Draft Addendum #1 has been prepared to reflect the recent changes to the CA Water Code § 12986 and will be presented to the Board in October.

- **Subventions Program FY 2016-17**
 - 67 final claims received.
 - 56 final claims for \$6.1 million are being processed for reimbursement.
- **Subventions Program FY 2017-18**
 - 72 applications were received and reviewed.

- CVFPB approved \$12 million for the FY 2017-18 Funding Plan on June 23, 2017.
- 72 work agreements have been executed.
- Final Claims are due November 1, 2018.
- **Subventions Program FY 2018-19**
 - 72 applications for \$54 million were received and reviewed.
 - The CVFPB approved \$12 million for the FY 2018-19 Funding Plan on May 18, 2018.
 - Urban Levees (10% or more of the land area considered residential land use) Bethel Island MID, Boggs Tract, Byron Tract, Lincoln Village West, Sargent-Barnhart Tract, Smith Tract, Weber Tract.

FRRP // USACE/CVFPB PROJECTS

American River Watershed Project – Natomas Basin

- At the September 25, 2018 CVFPB meeting, amendments to the Project Partnership Agreement and Local Project Partnership Agreement to include provisions for accelerated funds and Section 221 credits were approved by the Board.
- Congresswoman Doris Matsui has requested a Reach I groundbreaking ceremony for late October or early November.

American River Watershed Project – WRDA 2016

- A Non-Model Project Partnership Agreement (PPA) is being drafted by USACE HQ to incorporate supplemental funding language.

Folsom Dam Modifications Joint Federal Project (JFP)

- USACE has awarded a contract to complete many of the project punch-list items.

Folsom Dam Raise Project

- USACE Engineering Design (PED) of dikes #1-6 is underway.
- USACE Engineering Design (PED) of dikes #7 & 8, Left Wing Dam and Right Wing Dam, is underway.
- The Project Partnership Agreement (PPA) with USACE and local sponsor (SAFCA) is being revised by USACE HQ to include language incorporating the Supplemental funding.

Marysville Ring Levee Improvement Project

- Construction of Phase 2A-North is nearing completion. The slurry wall and levee rebuild are 100% complete.

Sutter Basin Project

- The Local Project Partnership Agreement (LPPA) was approved by the Central Valley Flood Protection Board on September 28, 2018. The agreement is being processed at Department of General Services to finalize the LPPA.

FRRP // USACE/CVFPB STUDIES

Lower San Joaquin River Feasibility Study (LSJRFS)

- The LSJRFS is included in the draft 2018 Water Resources Development Act (WRDA 2018) language. Approval of WRDA 2018 will authorize over \$1 Billion in improvements to the flood control facilities in the basin.

Woodland/Lower Cache Creek Feasibility Study

- USACE has re-initiated the Lower Cache Creek Feasibility Study and is in the process of assembling the Project Development Team. The preliminary schedule has the Tentatively Selected Plan (TSP) milestone being reached by December 2018, and completion of the Final Chief's Report scheduled for December 2019.

FLOOD SYSTEM OPERATIONS & MAINTENANCE (FSO&M)

Flood Maintenance Office (FMO) is responsible for two areas of SPFC facilities, State Maintained Areas (SMAs), which are authorized by CWC Section 8361, and ten Maintenance Areas (MAs), which are described in CWC Section 12878. SMAs are funded by State general fund, while MAs are on reimbursable accounts funded by property owners protected by the MA levees and facilities.

State Maintained Areas (SMAs)

- *Levees: ~145 miles*
- *Channels: ~1,200 miles*
- *Flood Structures: ~30 (11 weirs, 5 gate structures, 4 pumping plants, crossing bridges, etc.)*
- *Collecting Canals: ~60 miles*

Maintenance Areas (MAs)

Currently, FMO maintains ten MAs: MA01, 02, 04, 05, 07, 09, 12, 13, 16, & 17.

- *Levees: ~150 miles*
- *Structures: 1 pumping plant and 1 diversion weir*

OPERATIONS & MAINTENANCE (O&M)

Listed activities are mandated by O&M manuals for facilities in SMAs or MAs. This work is performed by two maintenance yards in Sacramento and Sutter with technical and environmental support from JOC.

- *Levee and channel vegetation management*
- *Access road and levee crown maintenance*
- *Debris and obstruction removal*
- *Rodent abatement*
- *Rodent Damage Repair*
- *Levee erosion repair*

- *Channel scour repair*
- *Small sediment removal*
- *Pumping plant, weir, outfall gates, and bridge operation, maintenance, and repair*
- *Pipe/Culvert repair*

FMO is in the process of developing a new program, Flood Maintenance Assistance Program (FMAP), with annual funding to increase the level of maintenance in SMAs and support Local Maintaining Agencies (LMAs), including MAs, to do the same.

SMA Activities

Sacramento Yard

- Cache Creek Settling Basin Channel: 80 acres of vegetation Mowing (completed).
- Cache Creek Levees: 23 miles of vegetation burning (in progress).
- Cache Creek Levees: 50 miles of road grading (completed).
- East Levee of Sacramento Bypass: 2 Miles of vegetation mowing (completed).
- Fremont Weir Channel: 160 acres of vegetation mowing (in progress).
- Knights Landing Ridge Cut: 80 acres of vegetation mowing (completed).
- Knights Landing Outfall Gates (KLOG): FMO operated the structure at a higher pool elevation in September. This was a request from DES to re-operate KLOG and work with local Reclamation Districts and local landowners to increase flows from the Colusa Basin into the Yolo Bypass in late August through mid to late September. The goal of the management action is to enhance both the quantity and quality of food for Delta Smelt in both the North Delta and lower Estuary. This will be achieved by achieving a target flow of 27,000 acre-ft. over a 4-week period. FMO will maintain a higher water surface elevation at KLOG while avoiding flooding landowners on the Colusa Basin Drain.
- Putah Creek: Vegetation spot spraying (in progress).
- Sacramento Weir: Structure maintenance (in progress).
- Sacramento Weir: 150 CY of debris removal (completed).
- Schriener's and Furlon Properties: 130 acres of vegetation mowing (completed).
- West Yolo Bypass Units 1-4: Vegetation burning (in progress).
- Willow Slough Bypass: Vegetation burning (in progress).

Sutter Yard

- Colusa Bypass Channel: 3 acres of vegetation spot spraying (completed).
- East Levee Sacramento River: 20.39 miles of vegetation burning (in progress).
- East Levee Sacramento River: 2 miles of vegetation spot spraying (completed).
- East Levee Sutter Bypass: Rodent depredating (in progress).
- East Levee Sutter Bypass: 20 miles of vegetation mowing (completed).
- East Levee Sutter Bypass: 11 miles of vegetation burning (in progress).
- East Levee Sutter Bypass: 8 miles of vegetation dragging (in progress).
- Elder Creek Channel: Vegetation spot spraying (in progress).
- Tisdale Bypass Channel: 50 acres vegetation mowing (in progress).
- Tisdale Bypass Levees: Vegetation spot spraying (in progress).
- Tisdale Bypass Levees: Rodent depredating (in progress).

- Wadsworth Canal: 3 miles of vegetation mowing (complete).
- Wadsworth Canal: Rodent depredating (in progress).
- SERP - Wadsworth Canal: SERP erosion repairs in progress. The final three sites received an extension to work beyond the giant garter snake (GGS) window and are anticipated to be complete by October 15, 2018.
- McClatchy Road Crossing: A deteriorated culvert was replaced with under an emergency permit. The box culvert used will provide better passage for GGS.

MA Activities

MA03

- 4 miles of vegetation spot spraying (in progress).
- 3.5 miles of vegetation burning (completed).
- Rodent depredating (in progress).

MA09

- 19.6 miles of vegetation cutting and limbing (in progress).
- 4.5 miles of road grading (in progress)
- Vegetation mowing (complete).
- SERP erosion repair (complete).

MA12

- 11.22 miles of vegetation dragging (in progress).
- 11 miles of vegetation burning (complete).
- 2 acres of rodent depredation (in progress).

MA13

- 41.97 miles of road grading (completed).
- Spot spraying (completed).

Technical Support to SMAs and Mas

- See Studies and Evaluations/Channel Evaluations.

Environmental Support to SMAs and MAs

- Biological monitoring of the small erosion repair program (SERP) sites was conducted on Wadsworth Canal. The monitoring has shifted to full time due to extending beyond the active season for the giant garter snake.
- See Environmental Initiatives Section for additional efforts and actions.

Flood Maintenance Assistance Program (FMAP)

FMO is working with CVFPB and LMAs to develop a program that will meet the intent of legislature and the needs of LMAs. At a minimum, the program will require execution of a new OMRR&R agreement with CVFPB and compliance with various flood reporting, such as AB 156.

STUDIES & EVALUATIONS

Activities related to evaluating all SPFC facilities to identify any deficiencies, and prioritizing (emergency, critical, serious, monitor) them for repair, rehabilitation, or replacement. These evaluations include:

- *Levee stability*
- *Levee penetrations, such as pipes and culverts*
- *Channel capacity*
- *Structure functionality*
- *Levee Tree Assessment*
- *Encroachments*
- *O&M right-of-way (ROW)*

Channel Evaluation

Cherokee Canal Evaluation

- Finished tabulating as-built cross-sections details and start earth volume (cut/fill) calculations for current conditions. Also developed a HEC-RAS model with as-built cross-sections to estimate the as-built condition water surface elevation.

Sacramento Area Streams Survey

- Added Cherokee Canal in the previous partnering agreement with DOE's Geodetic Branch to perform aerial LiDAR surveys this fall. The agreement now has nine channels: Cherokee Canal, Willow Slough Bypass, Cache Creek, Knights Landing Ridge Cut, Natomas Cross Canal, East Side Canal, Linda Creek, Arcade Creek, and NEMDC.

Levee Evaluation

Pipe/Culvert Evaluation

- Phase 1 video inspections:
 - 147 of 321 pipes passing through SMA levees have been video inspected by FMO.
 - 32 DWR directed funding agreements have been executed. The LMAs are in the process of implementing the DMP Phase-1 pipe evaluations work.
- Hydro vacuum/flushing followed by video inspection scheduled to continue in MA05, MA07, and MA16 through October 2018.
- AECOM is continuing with electro-magnetic studies for missing pipes. The pipes are in both the participating and non-participating LMAs.

Levee Tree Assessment

- MA04: Completed Pilot Assessment: 646 trees were surveyed, 172 trees flagged for monitoring, 25 trees will be more closely reviewed, and management actions will be developed and prioritized.
- MA09: Assessment has begun and will continue through 2018.

Encroachments

- FMO continues to coordinate with HAFOO, CDEC, FPO, and CVFPB to prepare a comprehensive list of encroachments in SMAs and MAs. Information and data from cooperating partners listed above are used and compared to the most recent USACE Periodic Inspection report for accuracy, completeness, and redundancy. This month the second draft list for MA13, has been completed, and is under review and field confirmation.

Structural Evaluation

Tisdale Weir

- September 26, 2018, FMO received a permitting timeline for delivering permits for this project. The timeline is under review.
- The design team met on September 25, 2018. The design concepts for the rehabilitation of this weir are continuing to evolve.

DEFERRED MAINTENANCE

Maintenance that has not been completed to keep the facilities in an acceptable and operable condition will result in deferred maintenance. If the work is not completed as part of O&M activities, it will lead to a larger maintenance issue and cost significantly more.

2017 Emergency Rehab

- Construction began on August 1, 2018 on the final nine critical repair sites identified for state rehabilitation. These repairs are anticipated to be completed by November 2018.
- Construction is anticipated for Fall 2019 on previously identified serious sites, 38 of which are in design and permitting stages.

Levee Rehab

Flood System Repair Program (FSRP)

- DWR is completing conducting LMA outreach and field reconnaissance to prioritize eligible repairs and continue to enter into project agreements with the remaining program funding. Reclamation Districts are asked to report their high priority sites as part of this reconnaissance.

Pipe Rehab

- Cured-In-Place Pipe (CIPP) contract for pipe rehabilitation has been awarded to Michels Pipeline Construction, Inc.
- FMO is currently working on the logistics to schedule the CIPP rehabilitation work in Putah Creek and Willow Slough in the Davis areas. These are system pipes that have Automatic Board Orders (ABOs). ABOs were “permits” issued by the Central Valley Flood Protection Board, where the Board assigned “responsibility” for features to the adjacent land owner, without the landowner taking any action. FMO believes these pipes/culverts are SPFC facilities, owned by the state, not encroachments.

The following table provides an overall status update of the pipe inspection/rehabilitation work:

DMP-Pipes Program		<i>Status Update:</i>	
		<i>9/20/2018</i>	
	MAs/SMAs	Non-Participating LMAs	Participating LMAs¹
Phase 1			
Total pipes for C&I (Cleaning & Inspection):	266	164	333
Total pipes completed:	147	134	TBD
Irrigation Impacted Pipes:	50	9	TBD
Continuous water Pipes:	28	11	TBD
Vault access required:	23	--	TBD
Geophysical Evaluation*			
"Not-Found" Pipe Location:			
Total Pipes for Geophysics (GP)	135	174	207
Total Pipes GP Complete	135	172	127
Phase 2 - R/R/R			
CIPP Slip-Lining Rehabilitation**	40	TBD	TBD
Removal and Replacement***	TBD	TBD	1
Removal	TBD	TBD	TBD
Abandonment in Place	TBD	TBD	TBD

* DWR Contractor completing geophysical evaluation in MAs/STs, Non-Participating LMAs, and where requested by Participating LMAs

** DWR has a contract for CIPP Slip-Lining Rehabilitation; 40 pipes are ready for rehab, pending scheduling and logistics

*** RD784 has 1 pipe in Phase 2 agreement with DWR for removal/replacement; Design/permitting work in progress

1 - Many Participating LMAs are reporting difficulty in contracting geophysics, pipe cleaning, and video inspection work.

Channel Rehab

Elder Creek Channel Rehab

- Year 2 of project activities began in August 2018.

Structural Rehab

Butte Slough Outfall Gate (BSOG) Rehab

- DWR/CDFW/NMFS management, environmental, engineering, and Sutter Yard staff met regarding CDFW and NMFS’s recommendations for design changes to BSOG.

- The regulatory agencies would like to see modifications to operations and maintenance as well as fish passage. DWR is running hydraulic analyses and the group will be reconvening soon.

Tisdale Weir

- After the conceptual design is complete, design activities will be initiated. The conceptual design is being completed with both technical and environmental input from FMO, Sutter Yard, and all resource agencies.

Collecting Canal Bridge CC-2 and CC-4

- Geotechnical soil results to support design of the new CC-4 bridge have been received. Staff are designing the abutments for supporting a new single span concrete bridge.

Knights Landing Outfall Gates (KLOG) Fish Barrier

- Previous fish exclusion barrier became inoperable and was removed in fall 2016.
- FMO is moving forward to identify the appropriate design and operational needs for replacing the fish exclusion barrier

Zamora Extensometer

- Sacramento Maintenance Yard is rebuilding an extensometer hut in Zamora for the Groundwater Supply and Special Studies Sections. This is extra work outside of FMO responsibility.

Yard Rehab

Sacramento Yard Improvements

- As of September 30, 2018, the contractor has completed the storm drain system, completed 50 percent of the sewer, completed 25 percent of the water, and 50 percent of the electrical conduits duct banks. The contractor is scheduled to complete the rehabilitation work at the end of November 2018. The roof replacement is complete; however, there are low areas that collect water that are being disputed.

ENVIRONMENTAL INITIATIVES

Environment coordination, advance mitigation, and other holistic measures to expedite our project delivery. FMO is looking to find long-term solutions that will allow more effective and efficient O&M by identifying and implementing environmental measures as part of the system.

Environmental Permitting for Operations and Maintenance Project (EPOM)

EPOM EIR was completed in January 2018. FMO is working on the implementation of the mitigation monitoring and reporting program. FMO is also considering other permits needed to keep state operations and maintenance activities in environmental compliance (e.g., California Endangered Species Act, Endangered Species Act, Clean Water Act, Porter-Cologne Act, etc.)

Routine Maintenance Agreement (RMA) under FCG 1600

The RMA with California Department of Fish and Wildlife Region 2 was executed on September 27, 2018. This agreement is for 12 years and broadens the ability of DWR's maintenance yards ability to impact sensitive environmental resources while performing maintenance activities on the Sacramento River Flood Control Project.

O&M Habitat Conservation Plan (HCP)

FMO has begun development of an HCP for state O&M activities covering the giant garter snake and valley elderberry longhorn beetle. FMO will coordinate with U.S. Fish and Wildlife Service and CDFW.

Advance Mitigation

Environmental Uplift Projects – An October 5, 2018, initial meeting with USFWS, NMFS, CDFW, and CVFPB will focus on environmental uplift projects and opportunities in the flood system that FMO and the agencies can work on together.

Small Erosion Repair Program (SERP)

FMO is investigating how much effort is needed to reauthorize the SERP permits. FMO is also investigating the interest of the permitting agencies to reauthorize the SERP permits.

FEDERAL PROGRAM

FMO's interaction with federal agencies, mainly USACE, in rehabilitation of deferred maintenance projects.

Federal Public Law 84-99 Emergency Repair Project (PL 84-99)

- USACE has begun construction on 12 PL 84-99 Emergency Rehabilitation sites identified from the 2017 flood events. Up to 16 additional sites are targeted for repair in 2019. USACE completed repairs to 15 damaged sites in 2017. DWR and the CVFPB are working closely with USACE to manage the state's interest in these projects.

Sacramento River Bank Protection (Sac Bank)

- On September 25, 2018, DWR submitted a federal credit request for approximately \$200 million for work performed under the 2006 emergency critical repair program performed under the Sac Bank authority. This crediting request is being reviewed by USACE.