



Reservoir Operations, Surface Water, Watershed Monitoring, and Drought Cactus and Pine GCSA

August 27, 2018 Stephen Flora, Hydrologist









Arizona's Climate Is...

Unpredictable Extreme Variable

Greatest Threats...

Drought Flood Wildfire

Response...

Plan for Future Prepare for Operations Protect for Resilience







Salt River Valley Water Users <u>Association</u>

- Established 1903
- A Federal reclamation project
- A private corporation
- Delivers 800,000 acre-feet per year

SRP Agricultural Improvement and <u>Power District</u>

- Established 1937 as a political subdivision of the state of Arizona
- 1 million customers in and around the Phoenix metro area





Salt River Project





Watershed and SRP Service Area

SRP Reservoirs and Water Delivery System



Surface Water Resources (SWR)

Maintenance/Operation Coordination

- Summer Salt System
- Winter Verde System

Monitoring and Forecasting for Reservoirs/Streamflow/Weather

Water Supply Planning and Emergency Reservoir Operations





- **Plan for Drought Prepare for Flood** 2.
- 3. **Protect the Watershed**



Salt/Verde River System Operations

Mostly, It's About Managing For Times of Scarcity.

U.S. Drought Monitor Arizona



August 21, 2018 (Released Thursday, Aug. 23, 2018) Valid 8 a.m. EDT

Drought Conditions (Percent Area)

1	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	91.01	48.23	8.62
Last Week 08-14-2018	0.00	100.00	100.00	91.01	48.23	8.62
3 Month s Ago 05-22-2018	0.00	100.00	100.00	97.05	73.20	15.71
Start of Calend ar Year 01-02-2018	0.00	100.00	100.00	28.66	0.00	0.00
Start of Water Year 09-26-2017	45.38	54.62	10.69	0.00	0.00	0.00
One Year Ago 08-22-2017	75.16	24.84	10.69	0.00	0.00	0.00

Intensity:

D0 Abnormally Dry D3 Extreme Drought D1 Moderate Drought D4 Exceptional Drought

D2 Severe Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

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http://droughtmonitor.unl.edu/

Droughts Happen, and Are Nothing New to Arizona







Salt and Verde River Inflows

Year	Jan-May Inflow (AF)	May 1 Storage (AF)	May 1 Percent Full	
2010	1,419,000	2,311,000	100	
2011	223,000	2,006,000	87	
2012	196,000	1,512,000	66	
2013	449,000	1,453,000	63	
2014	148,000	1,300,000	56	
2015	328,000	1,314,000	57	
2016	338,181	1,307,000	57	
2017	970,440	1,731,000	76	
2018	100,013*	1,337,000	58	

*2018 Lowest Jan-May Inflow 2002 Inflow – 106,000 AF

2011-2018 Lowest Inflow - consecutive 8-year period 1996 -2018 Lowest Inflow - consecutive 23-year period





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Reservoir Planning and Operations





SWANN Project Meeting







SnowVIEW: near real-time information to improve seasonal/storm streamflow forecasting.

SINGLE MAP | SWIPE VIEW | DUAL PANEL



Choose a value... * X Median SWANN SWE X 1983 SWANN SWE







Chart Data is for White River Watershed (11000-11500 ft). Download UA/SWANN Data for this Watershed



Provides Critical Snowpack Information for Stormflow Prediction

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Refill Reservoirs and Replenish Groundwater Floods Happen...

Be Prepared





2

- SWR coordinates WEROC
- WEROC Activation Criteria
 - >20,000 cfs below Granite Reef Dam



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 WEROC assumes operational responsibility, monitoring, documentation, and communication

Water Emergency Reservoir Operations Center (WEROC)

- PROP Committee, Agency Briefings
 & Communication
- Operational Priority
 - Safety of Dams
 Population/Public at Risk
- Reservoir Release









WEROC and Reservoir Release

WEROC Functional Exercise 2018

- SRP's last Water Emergency Reservoir Operations Center (WEROC) event occurred in January 2010.
- As such, SRP Surface Water Resources is planning to conduct a simulated WEROC event (functional exercise) in November 2018 to satisfy USBR requirement.
- Functional exercise must conducted be in real time, complete communication protocols, and use resources that are available during an activation. No mobilization or action in the field will occur.

2018									
FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
Planning/Data/Scenario Preps				Development		Readiness Testing		3-Day WEROC Certification	
 Preparation Activities: Communications Data Identification and Preparation Exercise Process Flows Storm Template Determination Resource Planning 			 Development A Control Cel Set Up AQ Data Loads XLS Storm 	 Development Activities: Control Cell Input UI Set Up AQ Environment Data Loads XLS Storm Template Readiness Activities Technical Bug Fixes Process Changes Readiness Rehearsals 		vities ug Fixes anges Rehearsals	Mid Nov 2018		







Watershed Monitoring – Large, Mid, and Small Scale







Middle Sycamore MS-1 Restoration Observation Area: Response to One-Hour Monsoon Storm event!

Middle Sycamore MS-1 Restoration Observation Area: Response to One-Hour Monsoon Storm event 2 days later with ¼ of precipitation from previous event!





3 Other SRP Efforts to Protect the Resilience of the Watershed









Water Resource Impacts

- Accelerating treatments and protecting watersheds
- Restoration Increases Resiliency Against Future Drought/Climate Change
- Monitoring Key to Identifying Change and Adaptive Management





Watershed Solutions



NOAA Makes El Niño Prediction For Winter 2018-2019





Strong consensus among various ENSO models of at least a weak to moderate El Niño...









Best to plan for continuation of drought conditions



- More groundwater pumping to conserve surface water – we are initiating more pumping this year
- Coordinated heightened conservation messaging with Valley Cities/ADWR/CAWCD
- Reduce water allocation to customers
- Mutual aid agreements
- Seek other innovative water sharing agreements
- www.droughtfacts.com



If The Drought Worsens Yet Further... (In Order Taken)





Thank You

- 1. Plan for Drought
- 2. Prepare for Flood
- 3. **Protect the Watershed**