

RECLAMATION

Managing Water in the West

Workshop: Review of 2012 Drought – Hydrologic Conditions and Operations

Lahontan Basin Area

November 6, 2012



U.S. Department of the Interior
Bureau of Reclamation

Outline

- **Truckee-Carson Basins**
- **River Policy and Operations**
- **2012 Hydrologic Conditions**
- **2012 Review of Operations**
- **Truckee-Carson Modeling Tools**



RECLAMATION

River Policy and Operations

Truckee River

- Current Operations – 1935 Truckee River Agreement
 - 1944 Orr Ditch Decree
 - 1959 Tahoe Prosser Exchange Agreement
 - 1994 Interim Storage Agreement
 - 1997 OCAP
- Future Operations – Truckee River Operating Agreement (TROA)

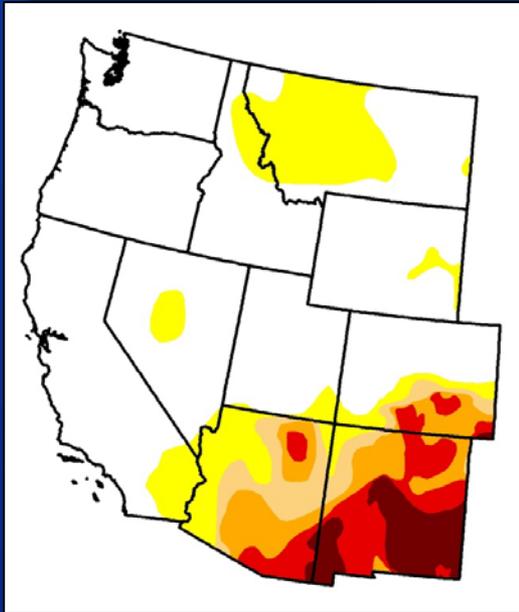
River Policy and Operations

Carson River

- Alpine Decree
- Anderson-Bassman Decree
- Price Decree

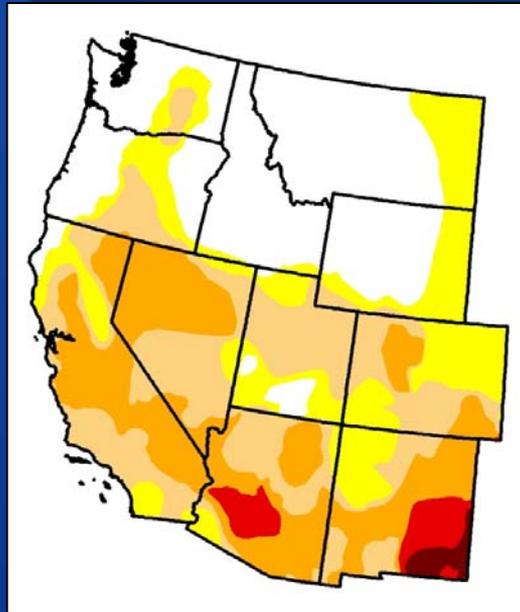
2012 Hydrologic Conditions

Truckee-Carson 2012 Drought Progression



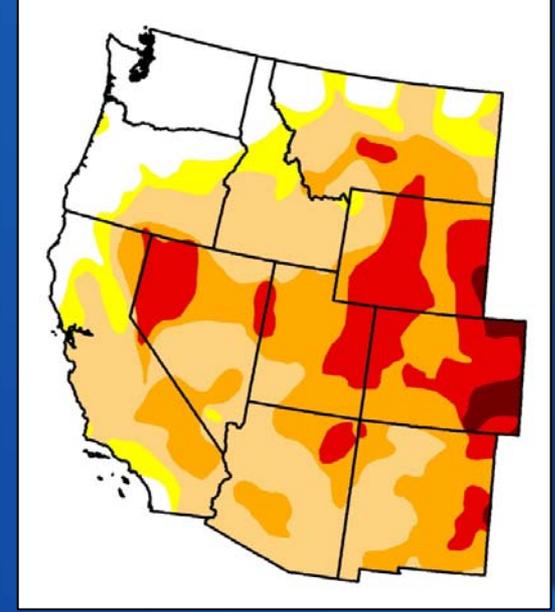
October 2011

Dry



April 2012

Severe



September 2012

Extreme



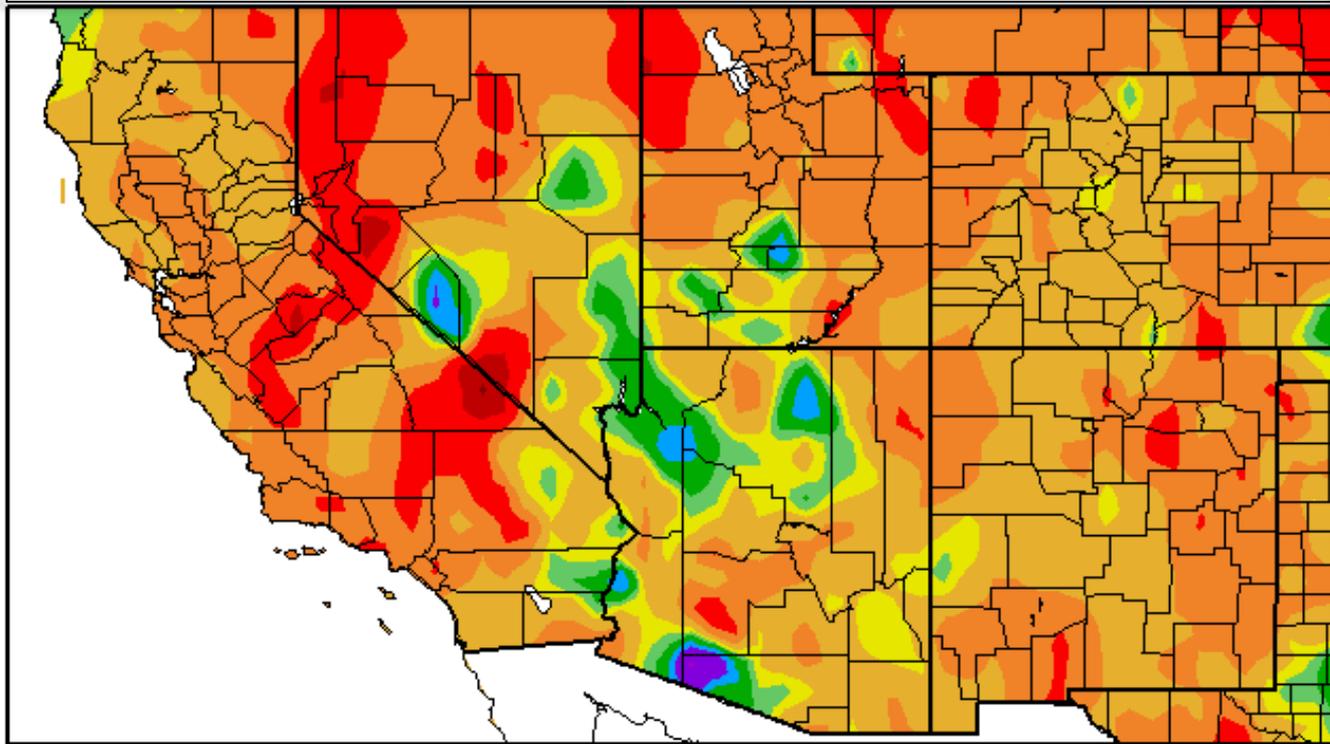
*Nevada/Eastern CA designated a natural disaster area by the USDA

RECLAMATION

2012 Water Year Cumulative Precipitation

Percent of Normal Precipitation (%)
10/1/2011 - 9/30/2012

Truckee Basin = 67% Avg. Carson Basin = 48% Avg.



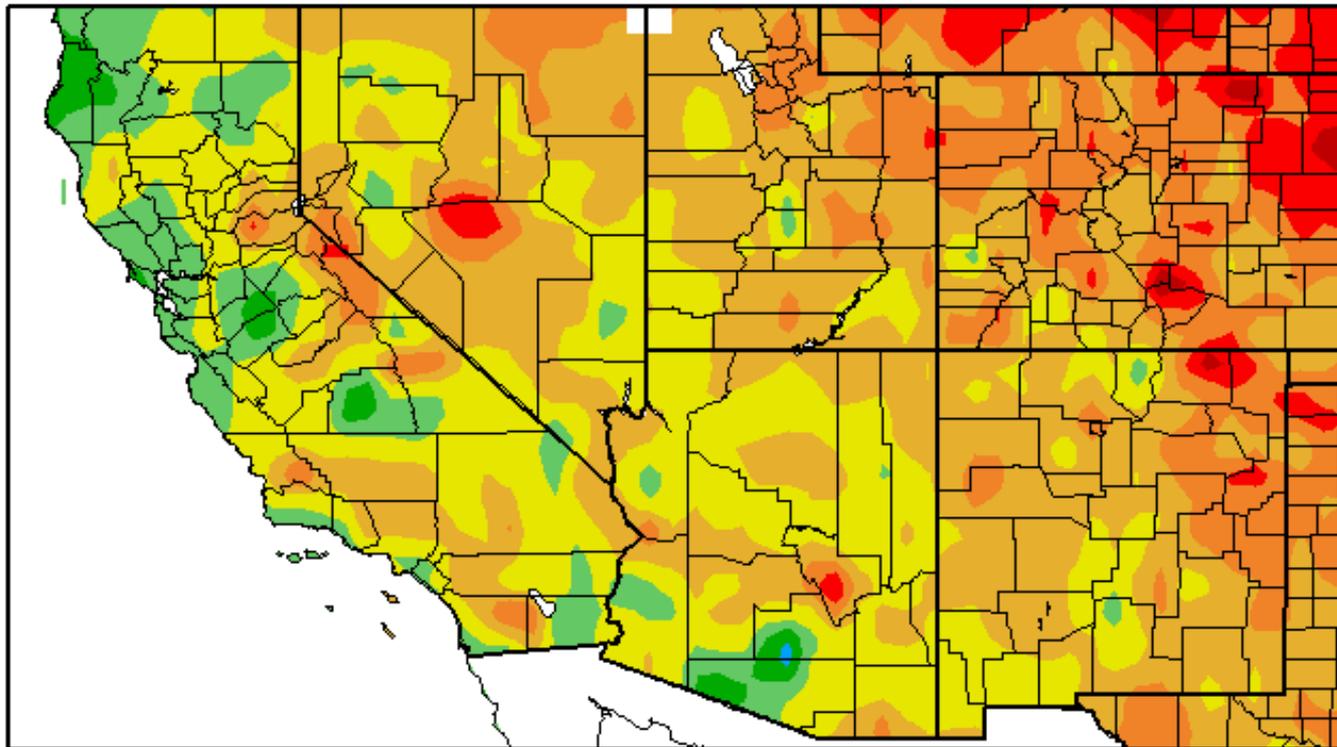
Generated 10/11/2012 at HPRCC using provisional data.

Regional Climate Centers

RECLAMATION

2012 Water Year Temperature

Departure from Normal Temperature (F)
10/1/2011 – 9/30/2012

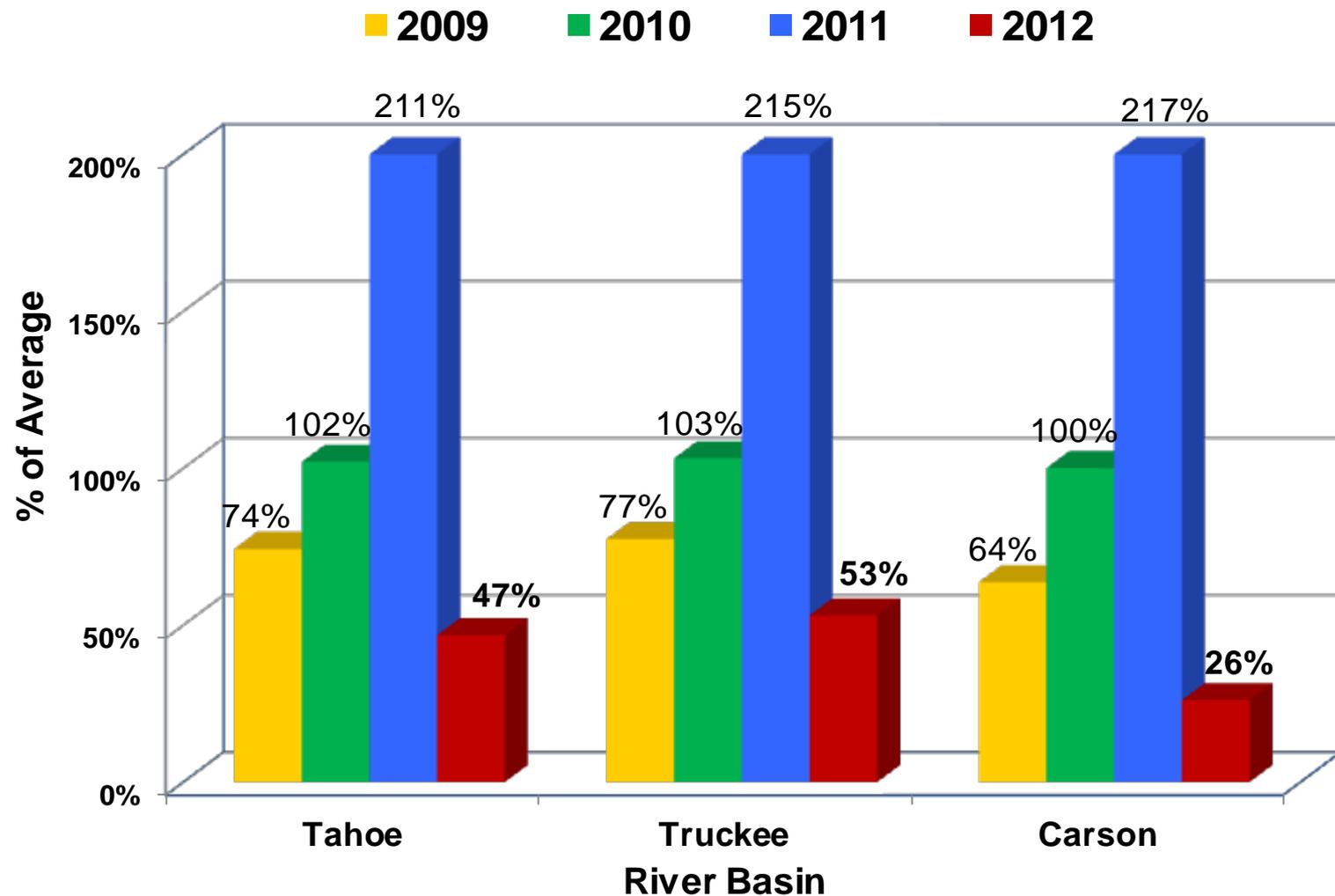


Generated 10/11/2012 at HPRDC using provisional data.

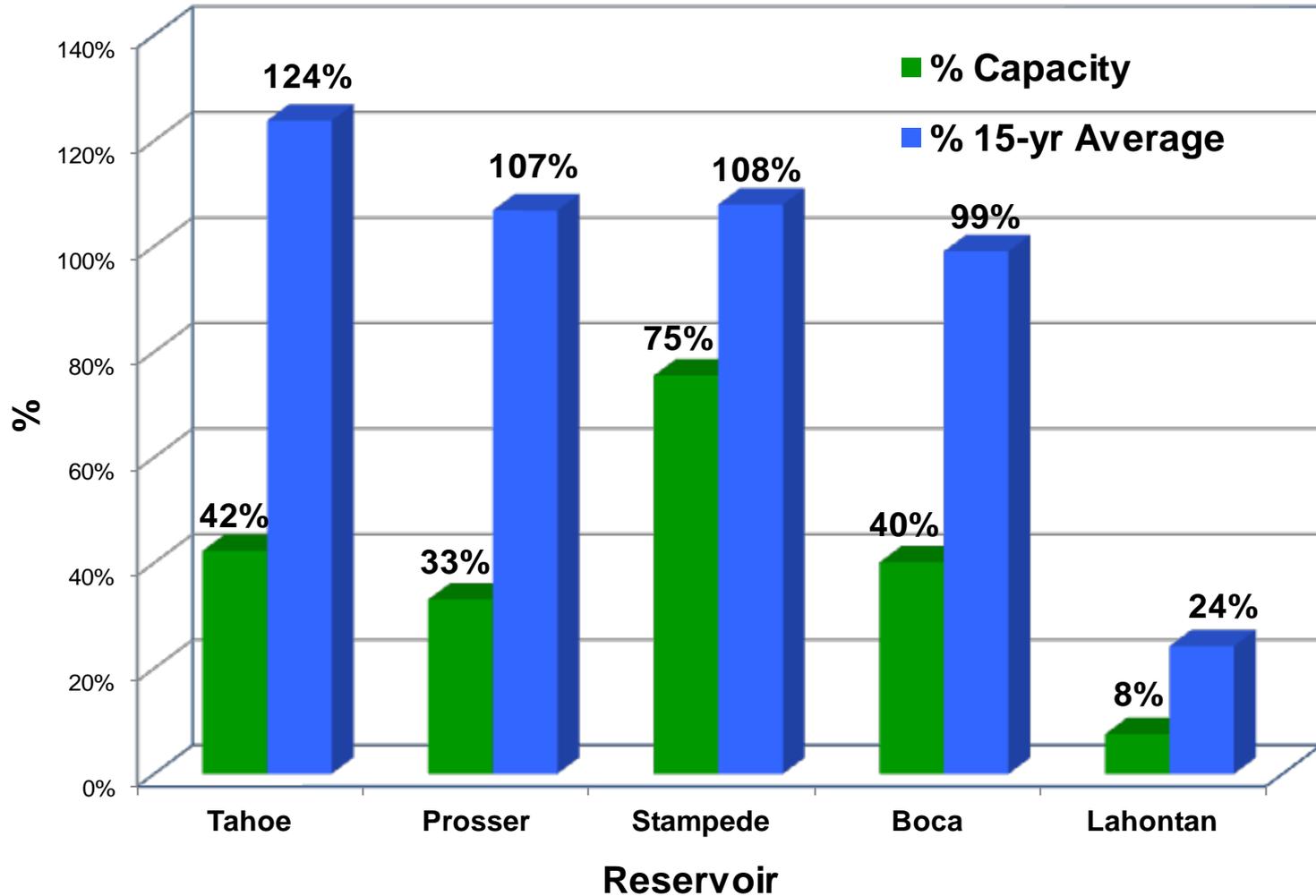
Regional Climate Centers

RECLAMATION

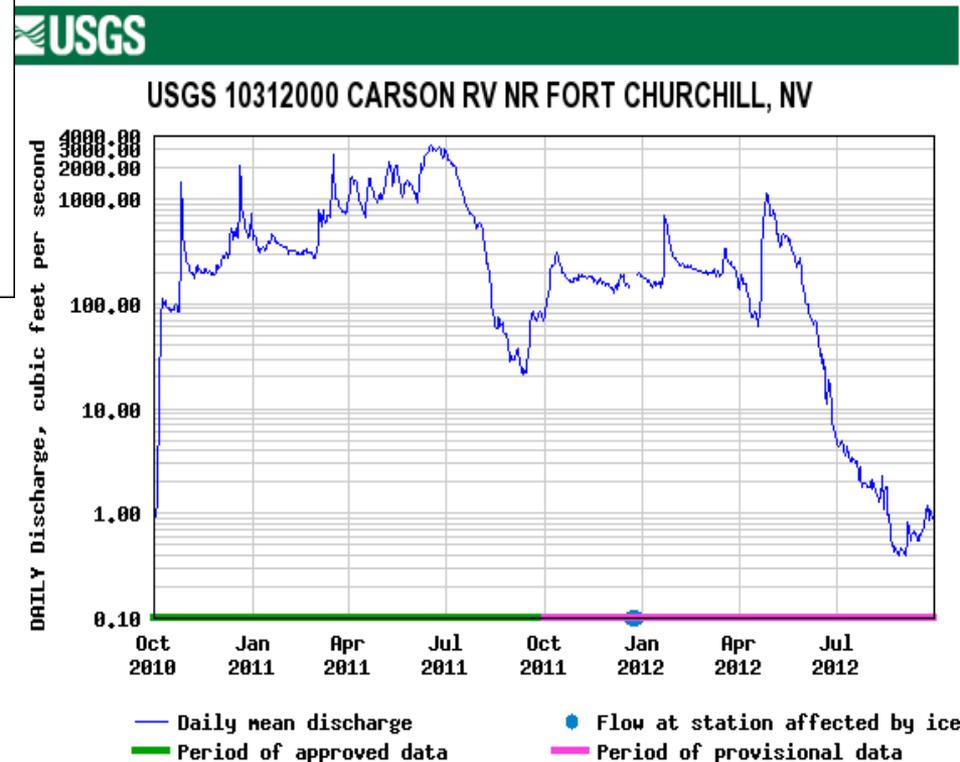
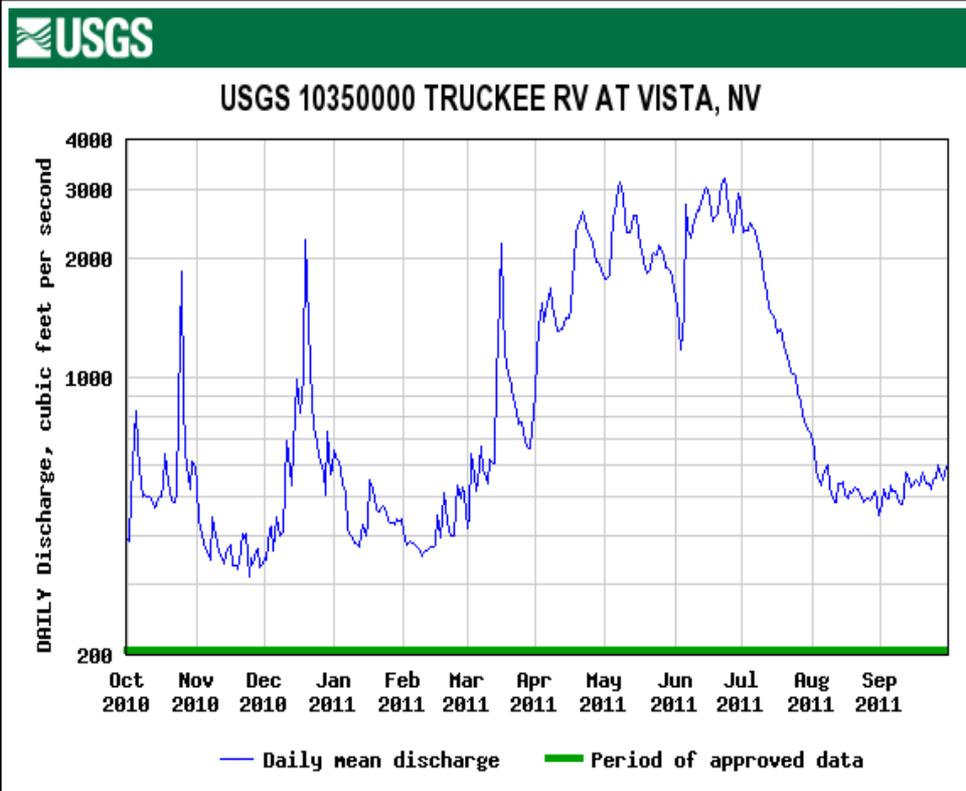
2012 April-July Runoff (% Average)



Reservoir Storage – 11/2/12



2012 Operations



2012 Operations

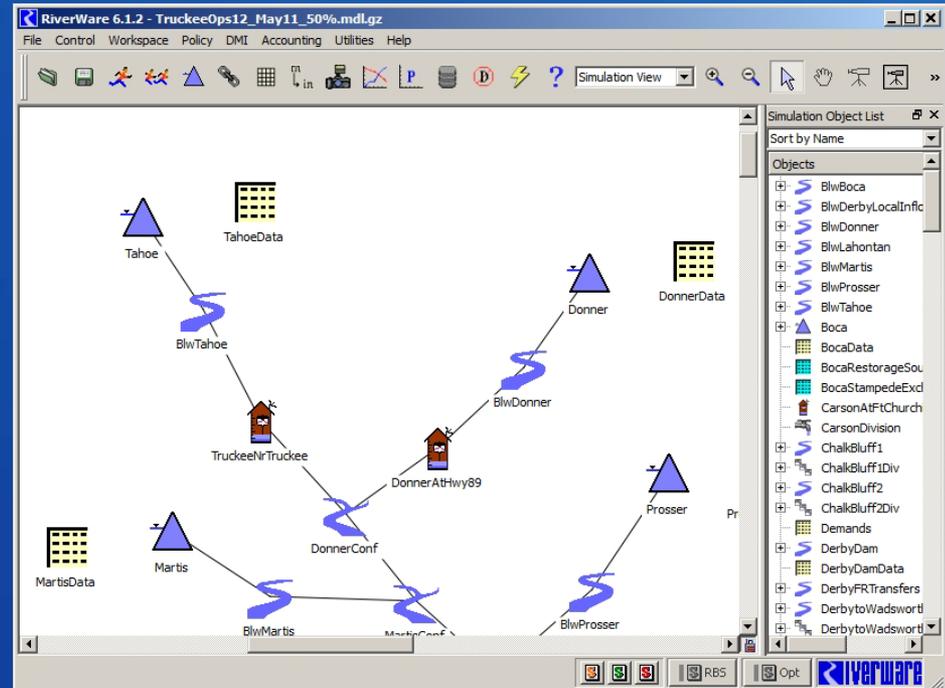
- Due to sizable carry-over storage from 2011:
 - Irrigation demands were substantially met (Newlands Project may only reach 95% allocation due to operational issues)
 - M & I demands were completely satisfied.
 - Reduced fish flow targets were met (however, only minor spawning of listed species occurred).

Truckee-Carson Modeling Tools

Model	Platform	Type	Time-Step	Forecast Range	Forecast Input	Notes
Current Policy Operations Model	RiverWare	Water Supply	Daily	15 Months	RFC ESP Inflow Traces or NRCS Volume Forecast	Operational 2004
Future TROA Policy Operations Model	RiverWare	Water Supply	Daily	15 Months	RFC ESP Inflow Traces or NRCS Volume Forecast	Testing 2013
Current Policy Planning Model	RiverWare	Water Supply	Daily	100 Years	Historical or Stochastic Inflow Data	Operational 2012
Future TROA Policy Planning Model	RiverWare	Water Supply	Daily	100 Years	Historical or Stochastic Inflow Data	Under Development 2014
Real-Time Forecast Model	Excel	Flood Forecast Routing Model	Hourly	5 Days	RFC Streamflow Forecast	Operational
Monte Carlo Controller	Excel	Water Supply	Daily	15 Months	NRCS Volume Forecast	Operational - Used to Control Operations Model

RiverWare Operations Model

- Development began in 2000.
- Node & object -based hydrologic model.
- Simulation is rule-based. River policy is coded in the rule set.
- Daily time-step with a 15-month outlook.
- Used for day-to-day forecasting of river flows and reservoir operations.



The screenshot displays the Ruleset Editor software interface. The window title is "Ruleset Editor - 'TruckeeOps08.12.04.rls.gz'". The interface shows a list of rules with columns for Priority, On, Name, and Type. The rules are:

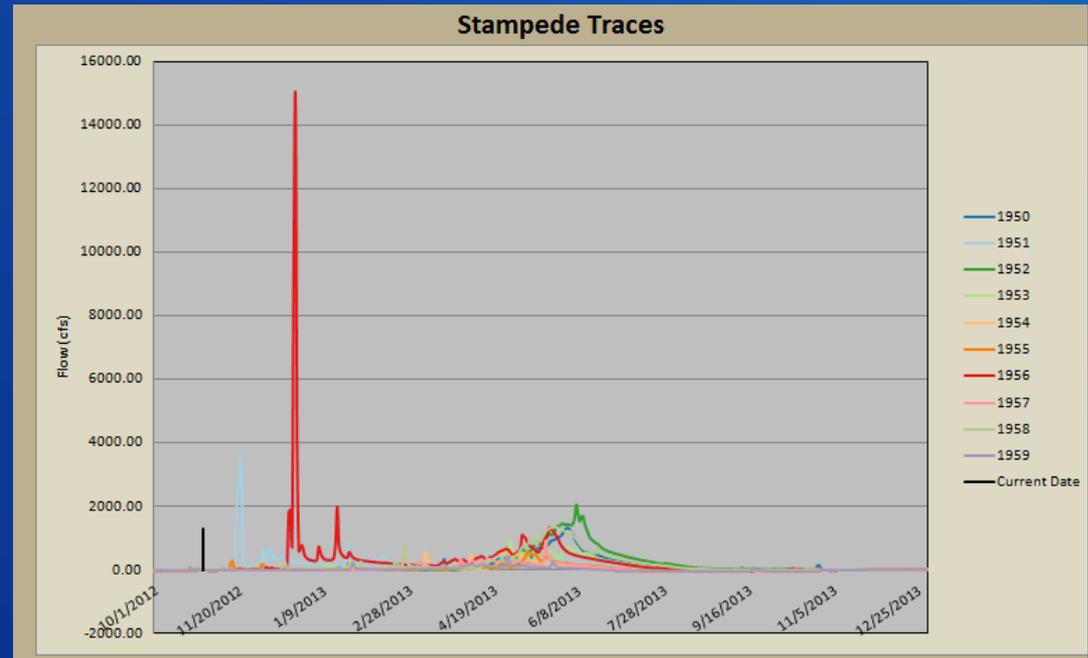
Priority	On	Name	Type
57	✓	Compute Theoretical I Canal Entitlen	Rule
58	✓	Net Gains Farad To Derby	Rule
59	✓	Max Capacity OCAP	Rule
60	✓	Meet TMWA Demand	Rule
61	✓	Meet TCID Demand	Rule
62	✓	Meet FR Demand	Rule

RECLAMATION

RFC FORECAST

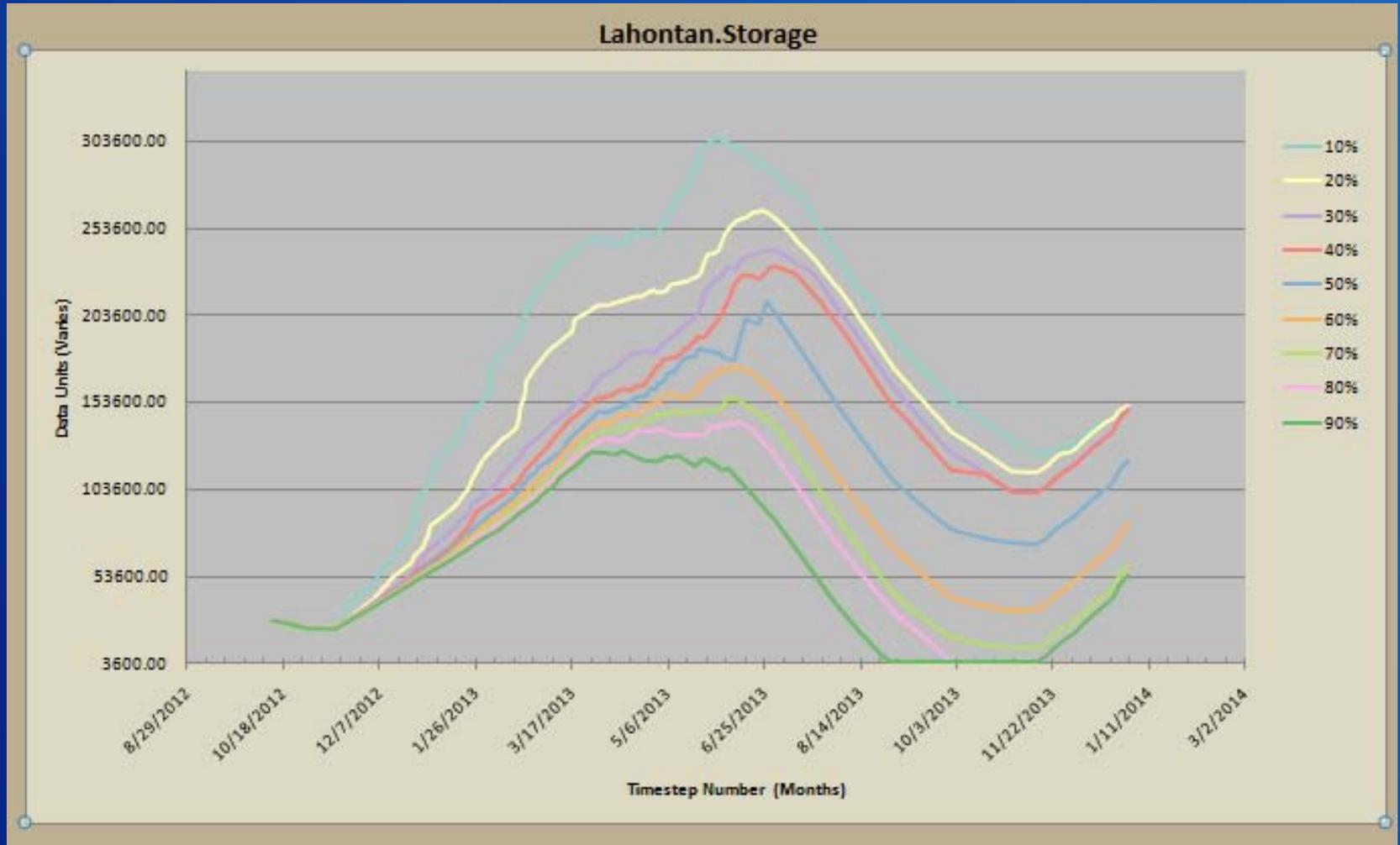


	A	B	C	D	E	F
1	Stampede Natural Flow Traces		Stampede	Current Date		10/30/2012
2	Date	Stampede_1950	Stampede_1951	Stampede_1952	Stampede_1953	Stampede_1954
34	11/1/2012	6.90	6.50	6.80	6.80	7.10
35	11/2/2012	3.80	5.10	4.60	3.00	4.80
36	11/3/2012	1.40	3.10	2.40	1.40	12.40
37	11/4/2012	1.10	2.60	2.00	1.30	2.80
38	11/5/2012	1.20	2.10	1.70	1.40	2.90
39	11/6/2012	1.40	2.50	1.40	1.40	3.00
40	11/7/2012	1.90	2.90	1.80	1.90	3.40
41	11/8/2012	2.30	3.00	2.30	2.30	3.50
42	11/9/2012	4.20	3.40	2.80	2.80	3.70
43	11/10/2012	6.90	3.80	2.90	2.90	4.20



RECLAMATION

Exceedence



RECLAMATION

Stakeholder Interaction

- **TROF – Truckee River Operations Forum**
- **TCID – Truckee-Carson Irrigation District**

Truckee-Carson Modeling Tools

Model	Platform	Type	Time-Step	Forecast Range	Forecast Input	Notes
Current Policy Operations Model	RiverWare	Water Supply	Daily	15 Months	RFC ESP Inflow Traces or NRCS Volume Forecast	Operational 2004
Future TROA Policy Operations Model	RiverWare	Water Supply	Daily	15 Months	RFC ESP Inflow Traces or NRCS Volume Forecast	Testing 2013
Current Policy Planning Model	RiverWare	Water Supply	Daily	100 Years	Historical or Stochastic Inflow Data	Operational 2012
Future TROA Policy Planning Model	RiverWare	Water Supply	Daily	100 Years	Historical or Stochastic Inflow Data	Under Development 2014
Real-Time Forecast Model	Excel	Flood Forecast Routing Model	Hourly	5 Days	RFC Streamflow Forecast	Operational
Monte Carlo Controller	Excel	Water Supply	Daily	15 Months	NRCS Volume Forecast	Operational - Used to Control Operations Model

Truckee-Carson Modeling Tools

Model	Platform	Type	Time-Step	Forecast Range	Forecast Input	Notes
Current Policy Operations Model	RiverWare	Water Supply	Daily	15 Months	RFC ESP Inflow Traces or NRCS Volume Forecast	Operational 2004
Future TROA Policy Operations Model	RiverWare	Water Supply	Daily	15 Months	RFC ESP Inflow Traces or NRCS Volume Forecast	Testing 2013
Current Policy Planning Model	RiverWare	Water Supply	Daily	100 Years	Historical or Stochastic Inflow Data	Operational 2012
Future TROA Policy Planning Model	RiverWare	Water Supply	Daily	100 Years	Historical or Stochastic Inflow Data	Under Development 2014
Real-Time Forecast Model	Excel	Flood Forecast Routing Model	Hourly	5 Days	RFC Streamflow Forecast	Operational
Monte Carlo Controller	Excel	Water Supply	Daily	15 Months	NRCS Volume Forecast	Operational - Used to Control Operations Model

QUESTIONS??



RECLAMATION