

Division of
WATER RESOURCES

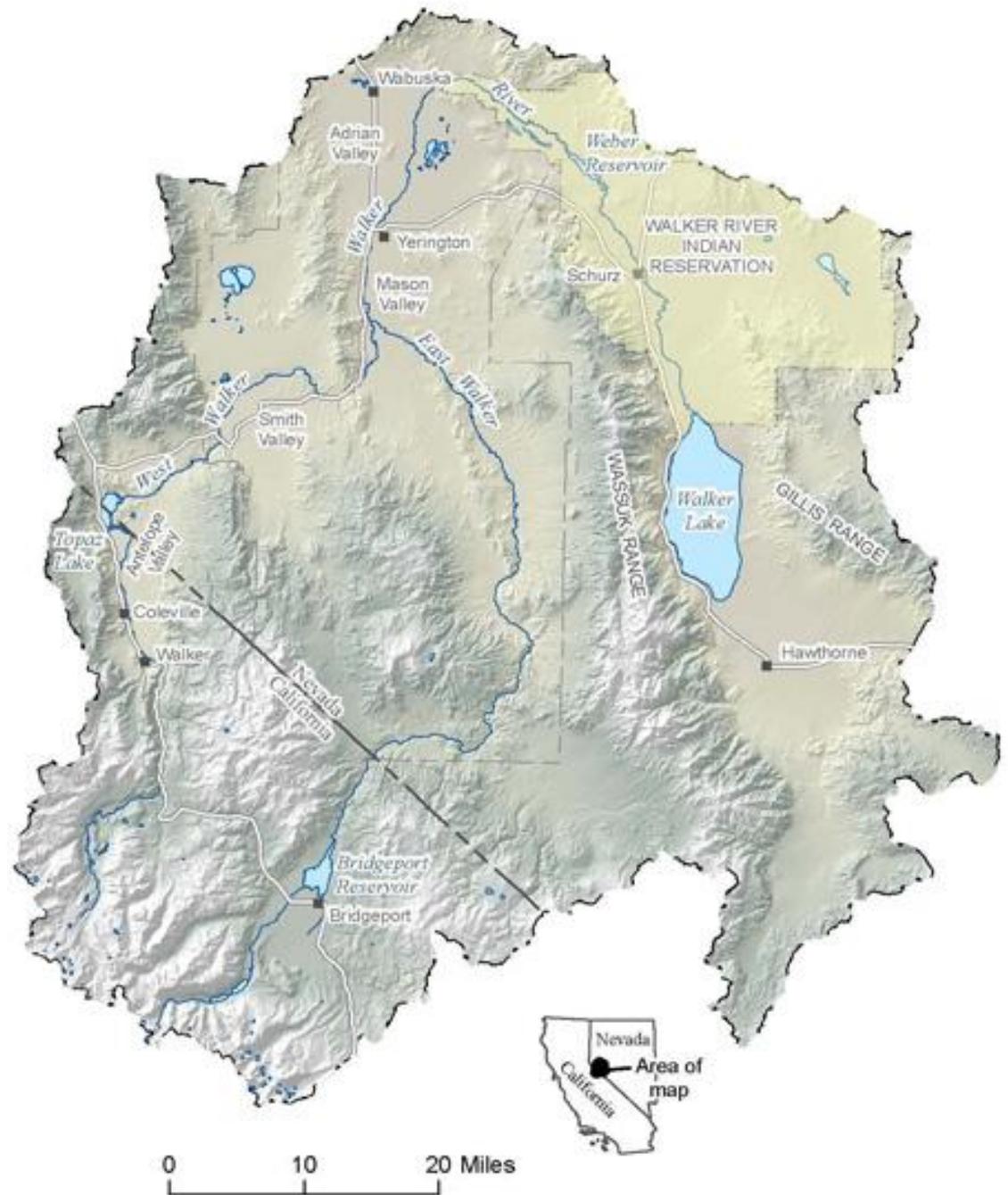
Surface Water/ Groundwater Issues in Nevada

AWSE
Salt Lake City
June 9, 2015

Rick Felling
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Deputy Administrators

DEPARTMENT OF
**CONSERVATION &
NATURAL RESOURCES**



Surface Water/Groundwater Issues

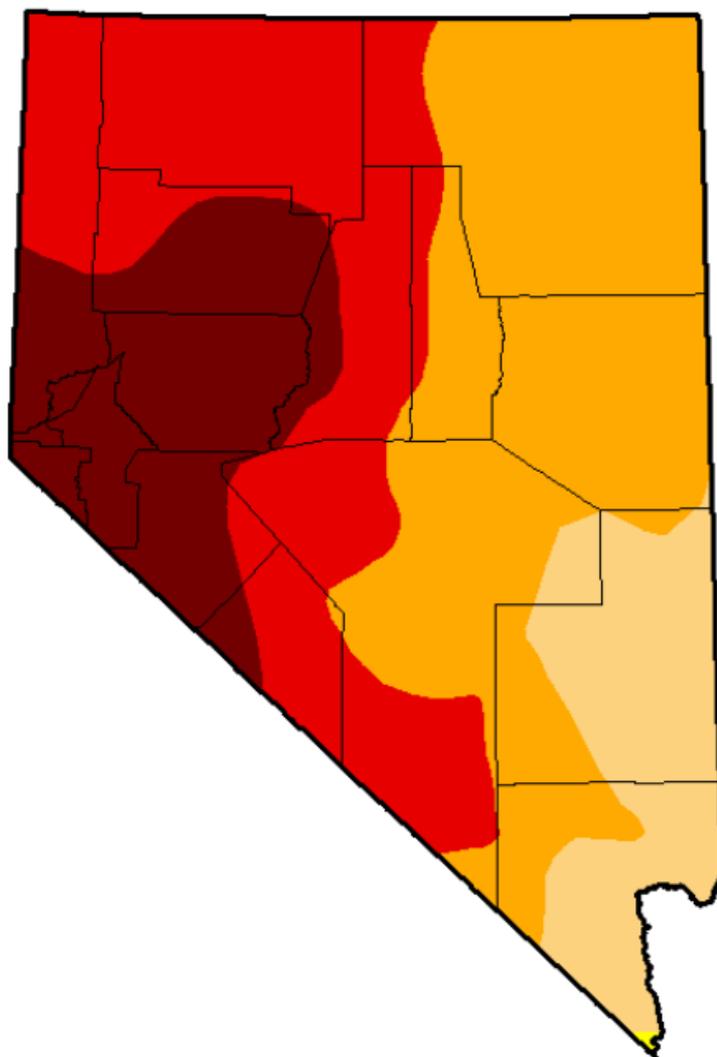
- Historically managed as separate sources
- Surface water (almost) always of senior priority
- Surface water (almost) always fully appropriated
- Groundwater resource (perennial yield) estimated by either recharge or ET discharge of native (pre-development) phreatophytes
- Conflict historically prevented by well seal rules
- Long-term effects now understood by users
- Increasing calls for action to stop/cure conflict
- Drought conditions significantly exasperating the problem

U.S. Drought Monitor Nevada

May 5, 2015

(Released Thursday, May. 7, 2015)

Valid 7 a.m. EST



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	99.93	87.00	49.21	18.38
Last Week 4/28/2015	0.00	100.00	99.93	87.00	49.21	18.38
3 Months Ago 2/3/2015	0.00	100.00	99.93	63.08	47.95	17.43
Start of Calendar Year 12/30/2014	0.00	100.00	96.98	68.25	48.38	11.89
Start of Water Year 9/30/2014	0.00	100.00	97.04	69.89	48.38	11.89
One Year Ago 5/6/2014	0.00	100.00	100.00	84.40	38.73	8.24

Intensity:



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

Author:

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National Drought Mitigation Center



<http://droughtmonitor.unl.edu/>

Walker Basin Overview

- Headwaters in Sierra, 4,000 sq. mi.
- Mean flow ~300,000 af
- Irrigates 80,000 acres in CA and NV
- Walker Lake is terminus
- NV perennial yield of 42,000
- 140,000 af of supplemental groundwater
- 2012-2014 pumping of 160,000 afa in Smith and Mason Valleys

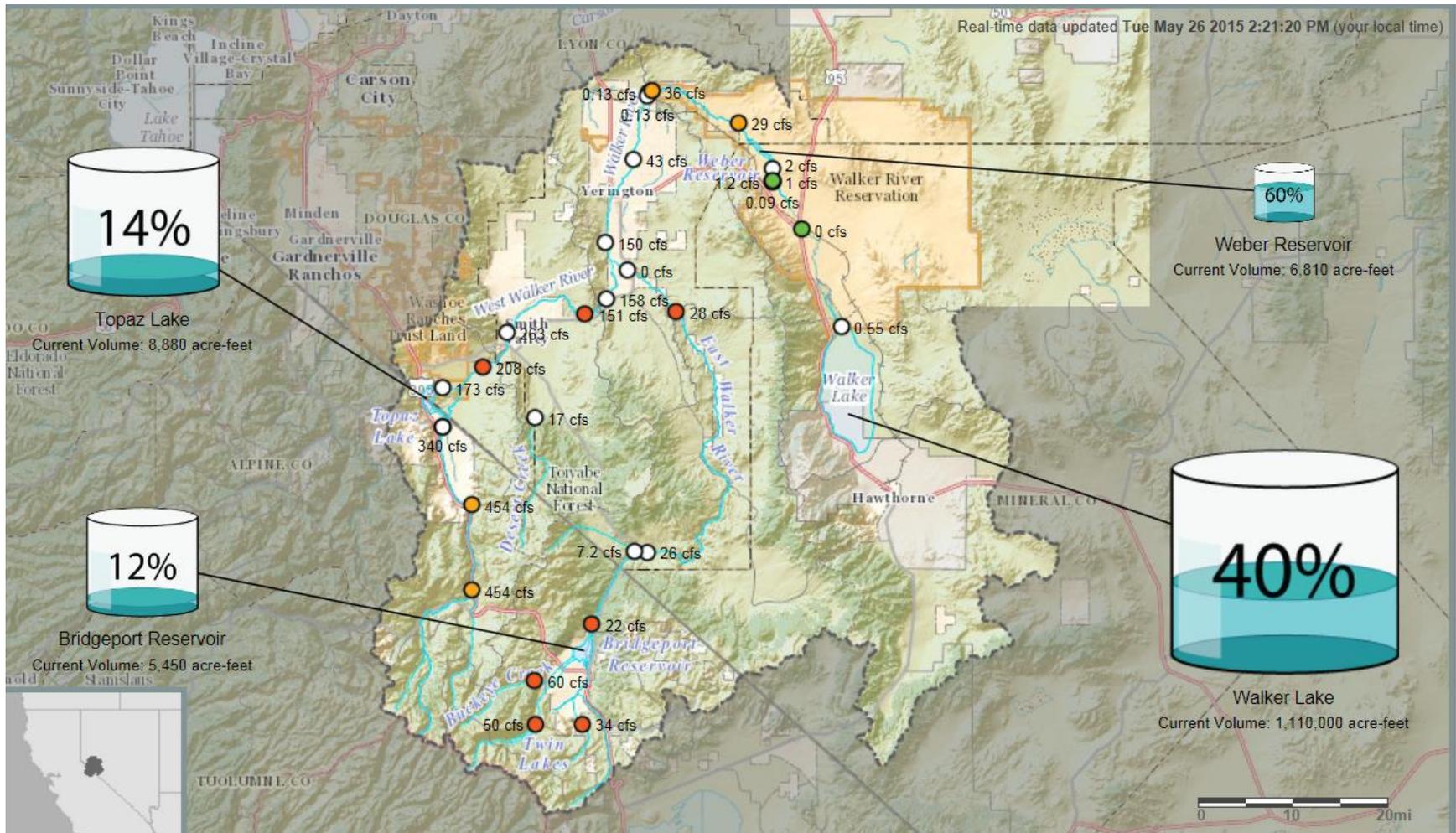
Walker Basin Issues

- System yield used to maximize water availability
- Flow to Walker Lake not considered
- Long dry periods results in excessive pumping
- 2015 driest of the last 4 years
- Groundwater aquifers becoming depleted
- Many shallow wells - 400 domestic wells
- High risk of well failures



Walker River Basin

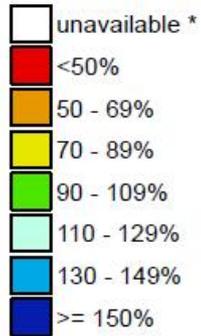
Walker Basin Reservoir Storage May 2015



Nevada/California SNOTEL Current Snow Water Equivalent (SWE) % of Normal

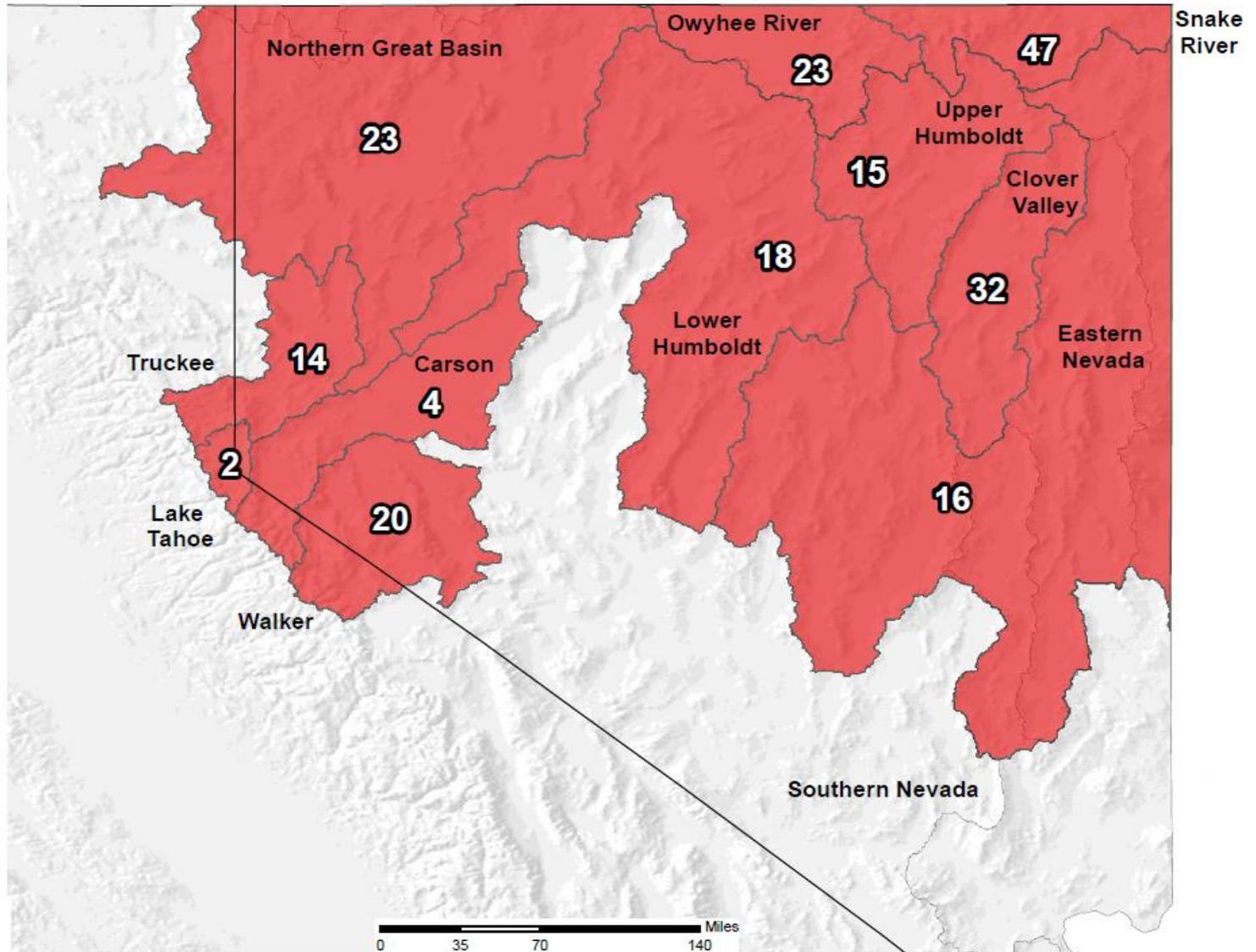
Apr 01, 2015

Current Snow Water Equivalent Basin-wide Percent of 1981-2010 Median



* Data unavailable at time of posting or measurement is not representative at this time of year

Provisional data subject to revision

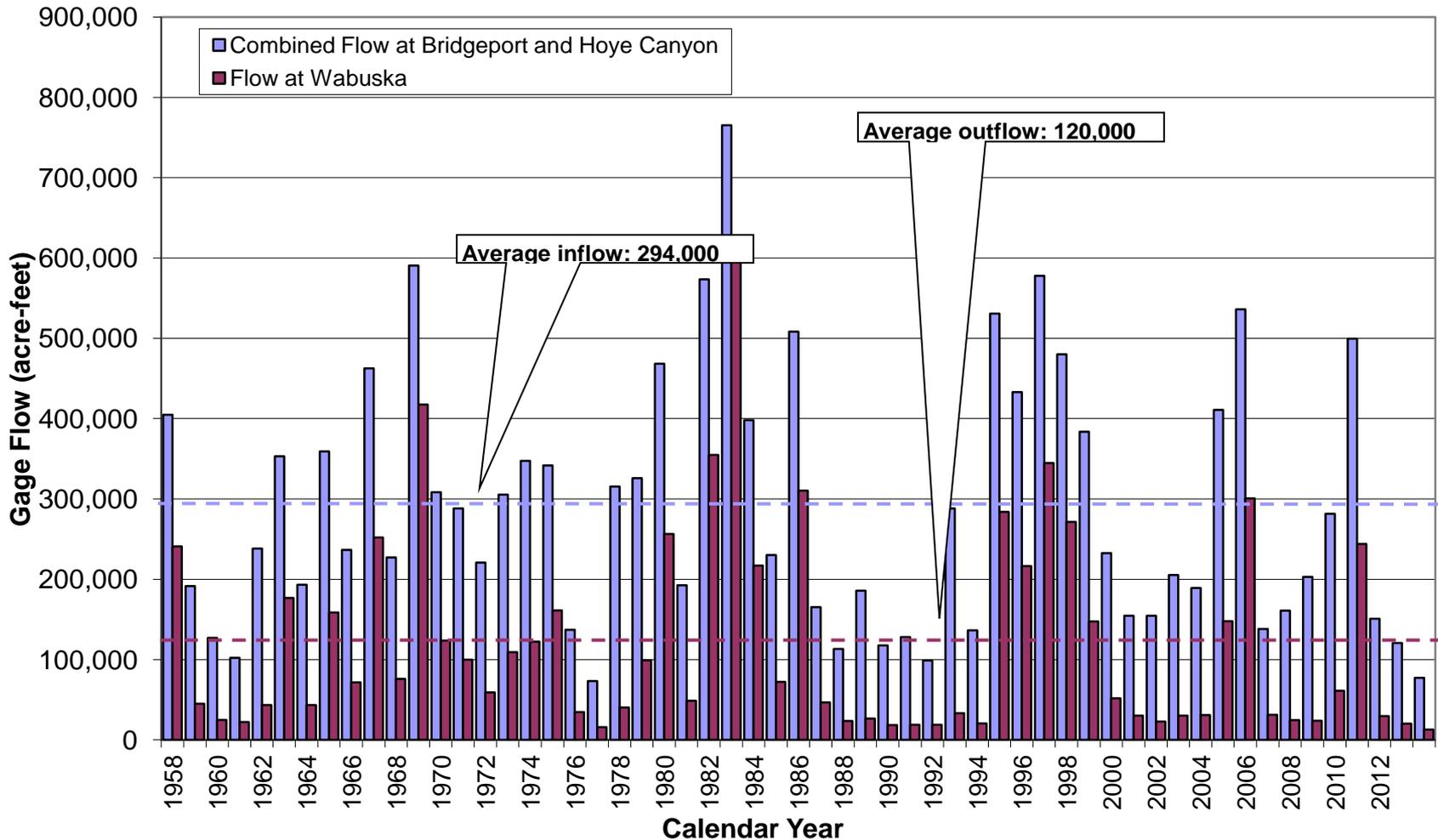


The current snow water equivalent percent of normal represents the snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

Prepared by:
USDA/NRCS National Water and Climate Center
Portland, Oregon
<http://www.wcc.nrcs.usda.gov>

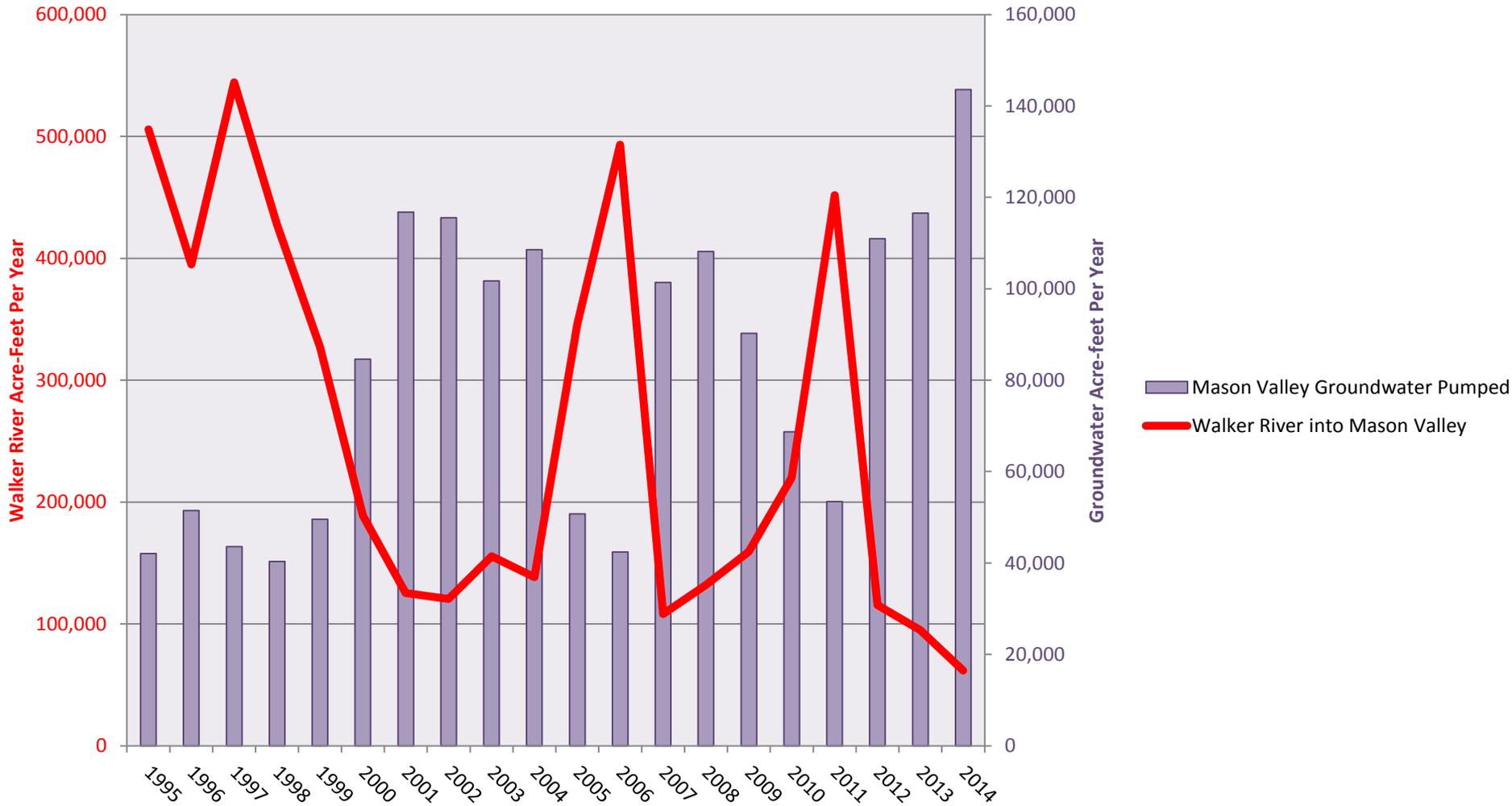


Walker River Flows in Smith, Mason and East Walker Basins



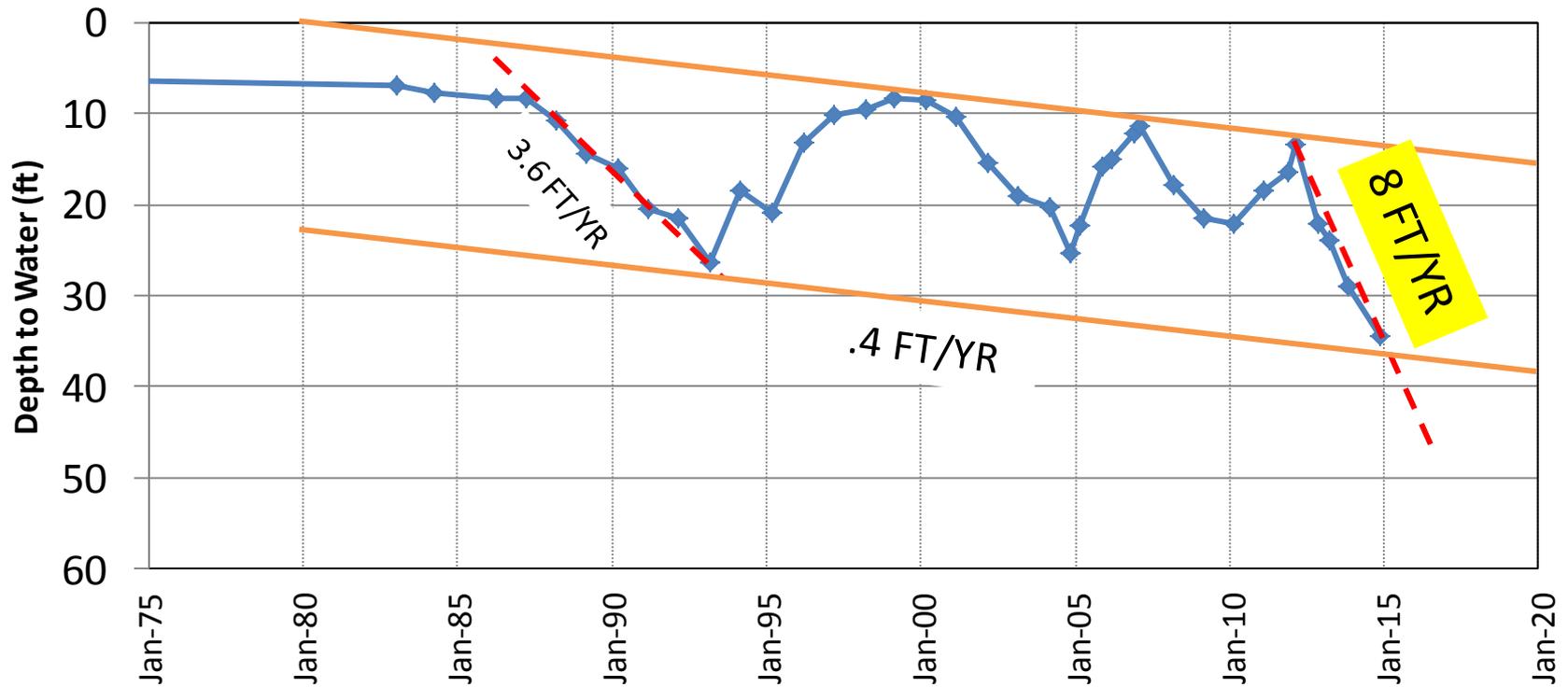
Mason Valley Groundwater & Surface Water History

Less Surface Water Available = More Groundwater Pumped

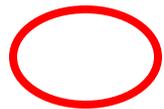


Representative Mason Valley Hydrograph

108 N13 E25 23DDDC1: SEYDEN



Mason Valley Water Level Decline from Nov 2011 to Nov 2014

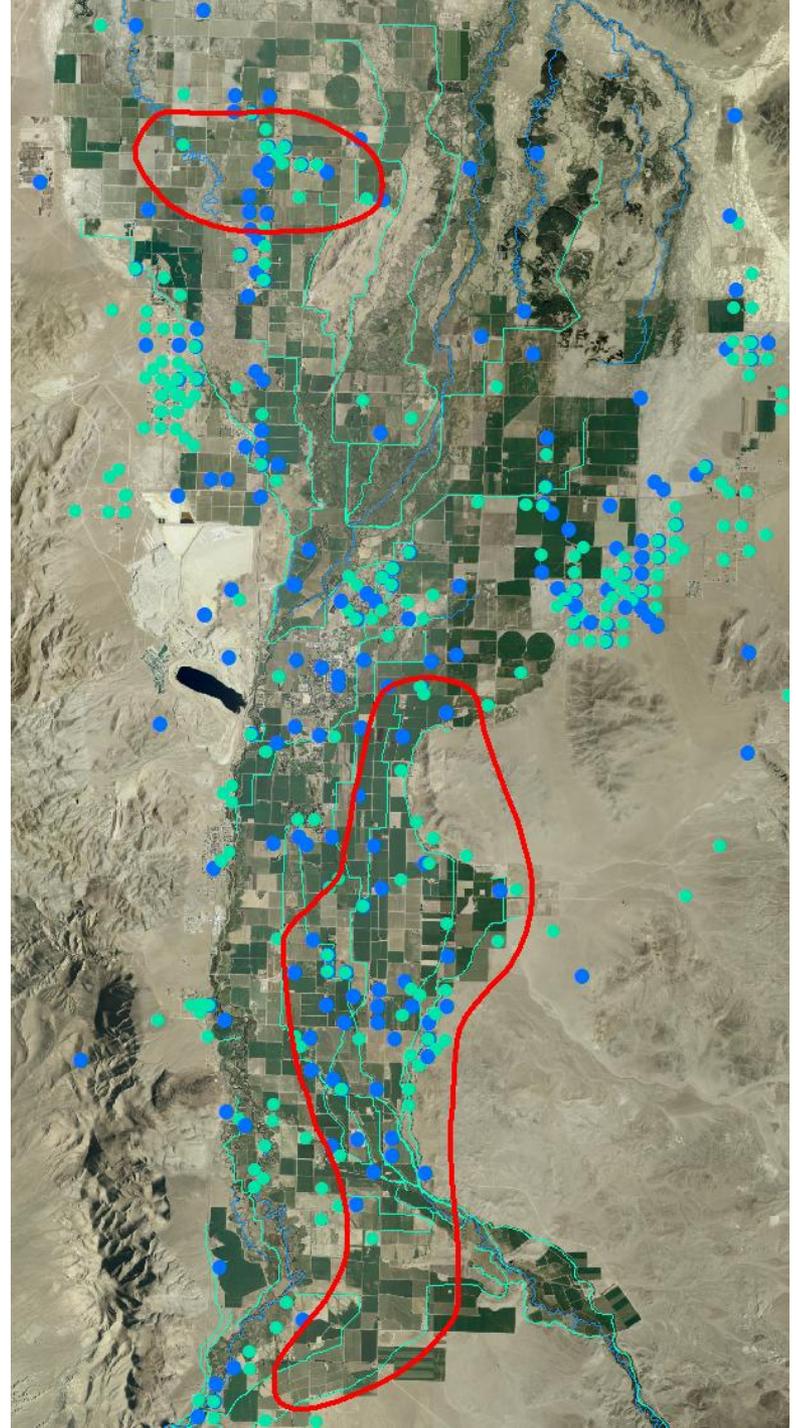
 20 - 30 ft

Well Depth

 ≤ 100 ft

 100 – 150 ft

In Mason Valley there are 279 wells that are less than or equal to 100 feet of these 139 are domestic



Recap

- Since 2000, only three above-average surface water years.
- Now in the fourth consecutive exceptionally dry year.
- Unprecedented water level declines basin-wide.
- Hundreds of shallow wells already experiencing significant water level declines in just the last three years – some failures already reported.
- Strong likelihood for basin-wide failure of domestic and other shallow wells without any action.

Actions Taken

- Ordered a 50% curtailment of supplemental irrigation wells
- Would have reduced water-level decline to a few feet for 2015
- Order appealed and eventually stayed
 - SE did not curtail by priority
 - Curtailment was a “taking” and would cause irreparable harm
- Considering new order for 2016



Humboldt River
Basin

Humboldt Basin Overview

- Entirely within Nevada, 16,800 sq. mi.
- Precipitation ~12.5 in/yr
- Mean flow ~290,000 af
- Irrigates 600,000 acres decree lands
- Large gold mines – dewatering
- Moderate agricultural groundwater demand
- Annual pumpage 380,000 af

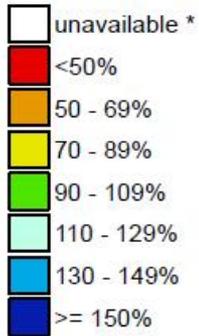
Humboldt Basin Issues

- Largest irrigated area at end of river – Lovelock
- No delivery over last 3 years
 - Drought
 - Groundwater pumping
- Most pumping distant from river
- Depletion slow to occur/slow to mitigate
- Calls for action by downstream users
 - Curtailment/regulation to perennial yield
 - No legal action yet taken

Nevada/California SNOTEL Current Snow Water Equivalent (SWE) % of Normal

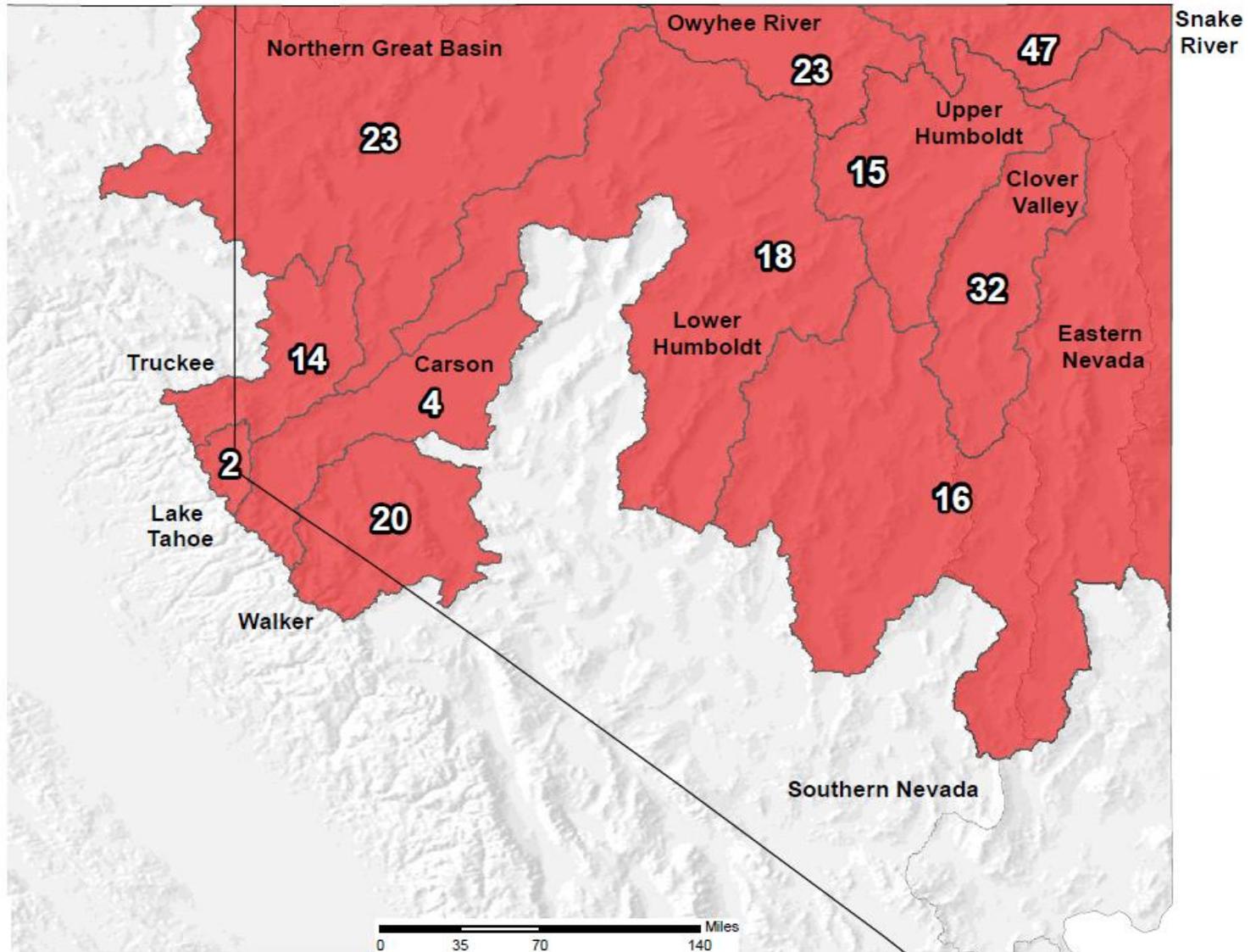
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Stream Flow Forecasts for March - July

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/nv/snow/waterproducts/forecasts>

Humboldt River near Imlay

Year	January 1 Forecast (KAF)	% of Average	March 1 Forecast (KAF)	Actual Flow (KAF)	Actual flow as a % of 30-yr average (222)
2011	355	160%	240	234	105%
2012	56	25%	40	24	11%
2013	160	72%	75	7	3%
2014	20	9%	24	5	2%
2015	140	63%	38	<2	1%

Humboldt Basin Actions Taken

- Evaluated effect of curtailment of groundwater pumping near the river w/ Glover analysis
- Ordered meters on all wells >5 af except stock
- Designated all basins
- Closed 2 basins to new appropriations
- Contracted for “capture” groundwater flow models
- Discussing conjunctive management/path forward with water users
- Augmentation/mitigation problems & solutions

Questions

