

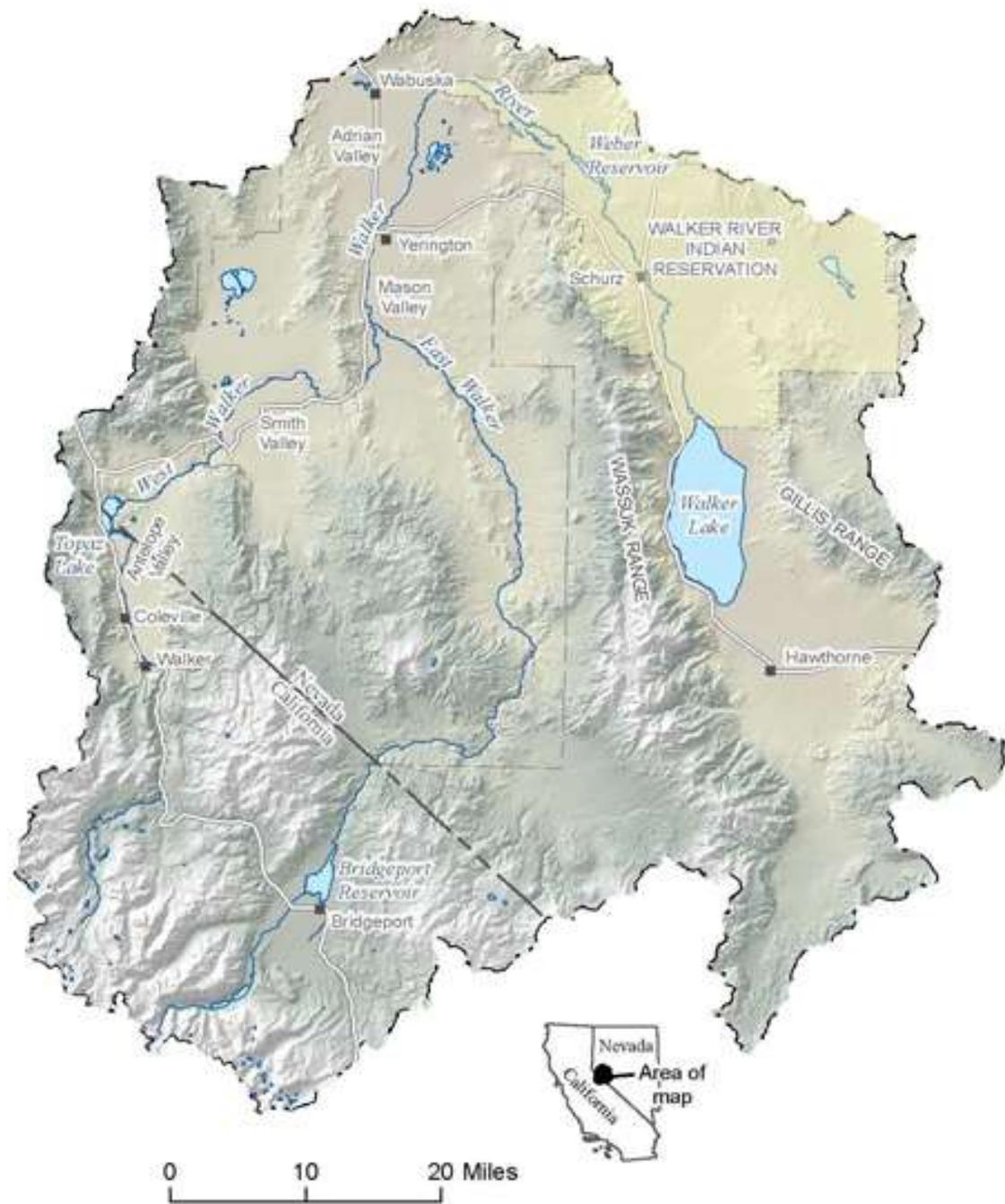


Division of
WATER RESOURCES

Walker River Workshops

Smith: August 27, 2015
and
Yerington: August 28,
2015

DEPARTMENT OF
**CONSERVATION &
NATURAL RESOURCES**



Agenda

- Review of the issues and actions
- Climate outlook for winter of 2015-2016
- Recent pumpage tabulations
- Review of Mason and Smith Valley pumpage tool
- Recent DRI modeling results – supplemental rights only
- NRCS streamflow forecast for surface water supply and curtailment
- Curtailment sliding scale
- Priority tables
- Schedule of actions and hearings
- Q & A

Recent Actions

- Public meetings held January 22, 2015
- Issued Order 1250 on February 3, 2015
 - Called for 50% curtailment of pumping of supplemental groundwater rights
 - Required properly installed and accurate meters
- Order appealed and Preliminary Injunction issued
- Court case is pending
- Workshops held July 15 & 16, 2015
 - Water levels continue decline
 - Drought worsening
 - New Curtailment Order required for 2016

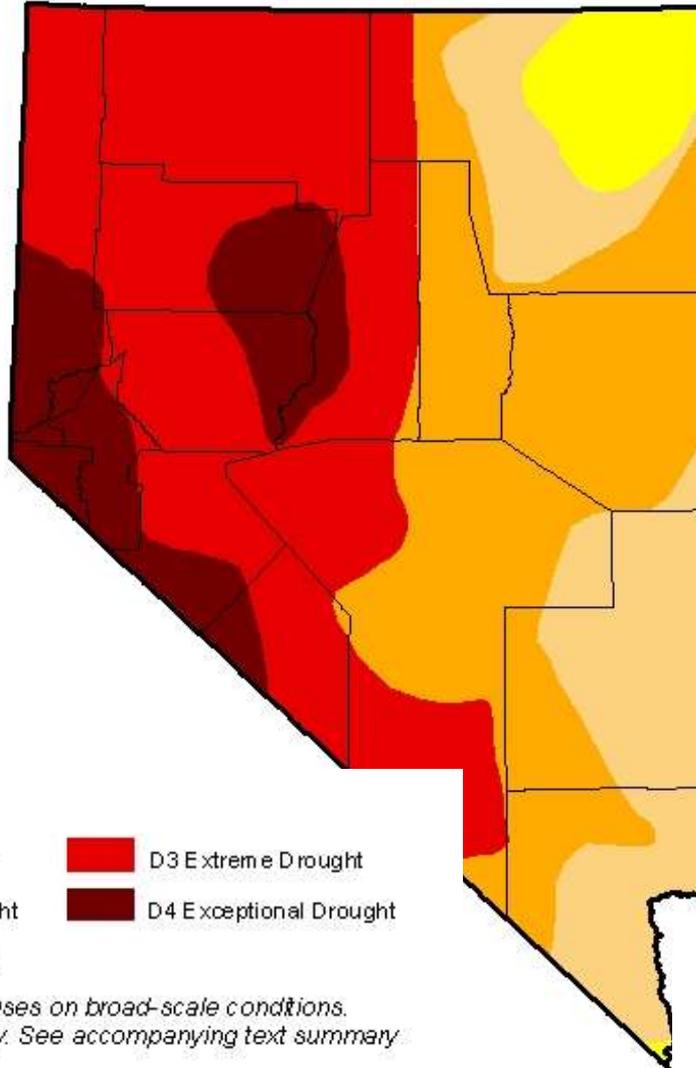
Hydrologic Conditions

&

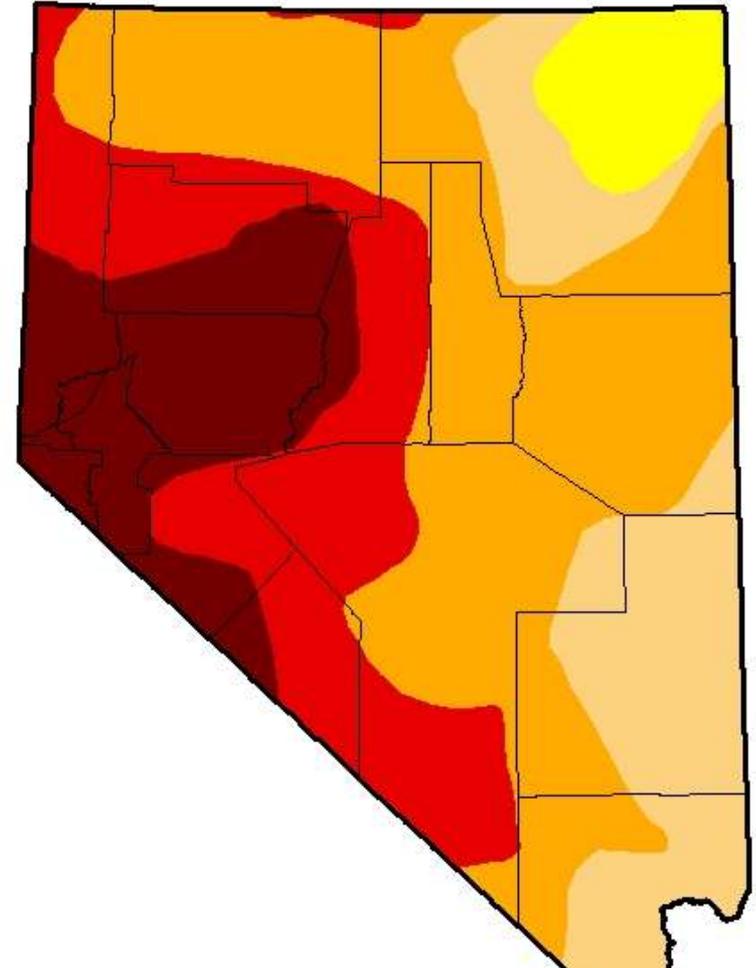
Climate Forecast

Current Drought Conditions

July 7, 2015



August 11, 2015



Intensity:

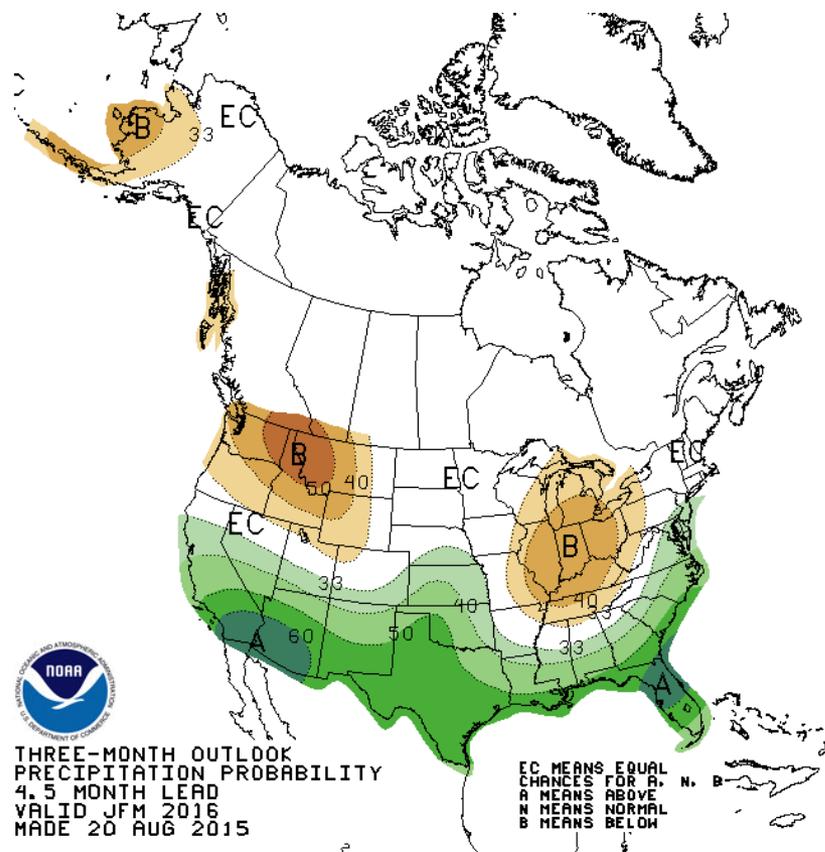
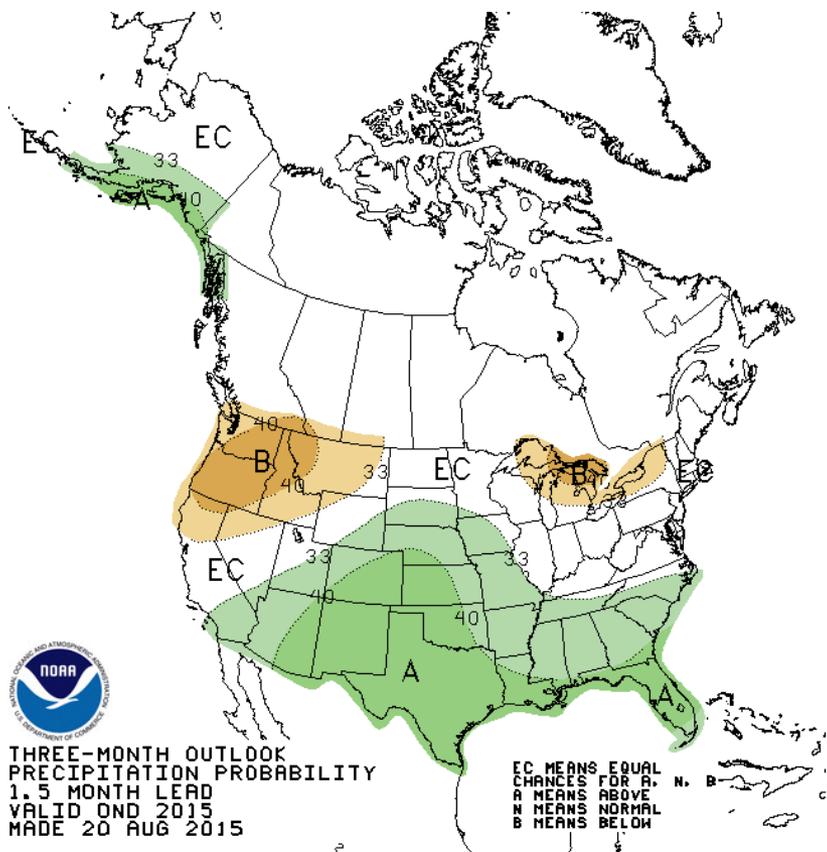
- | | |
|--|--|
|  D0 Abnormally Dry |  D3 Extreme Drought |
|  D1 Moderate Drought |  D4 Exceptional Drought |
|  D2 Severe Drought | |

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

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

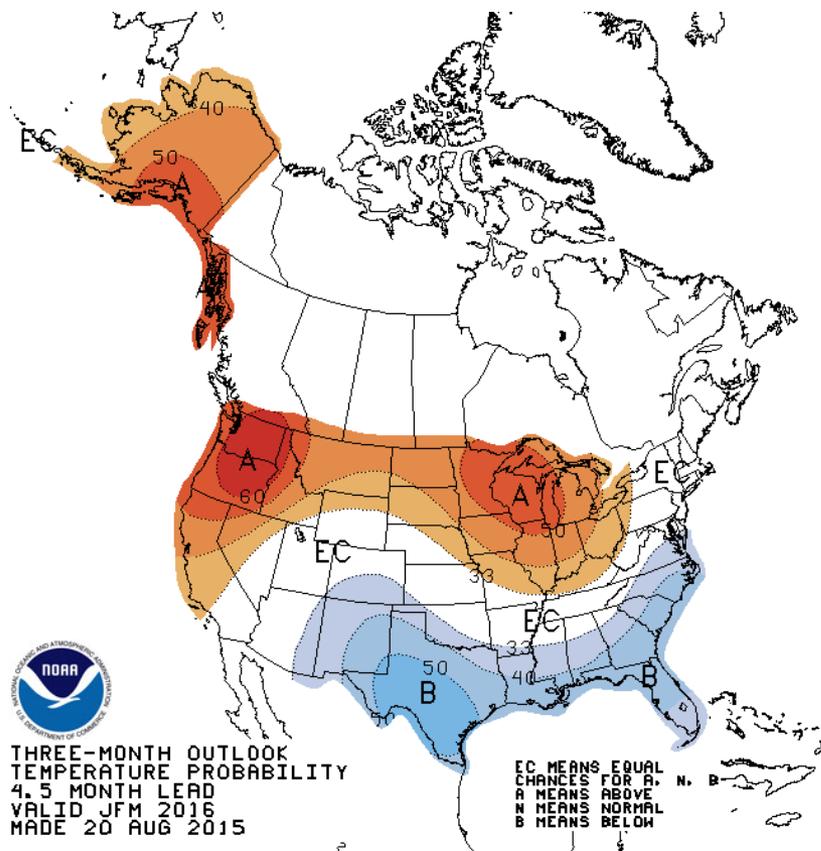
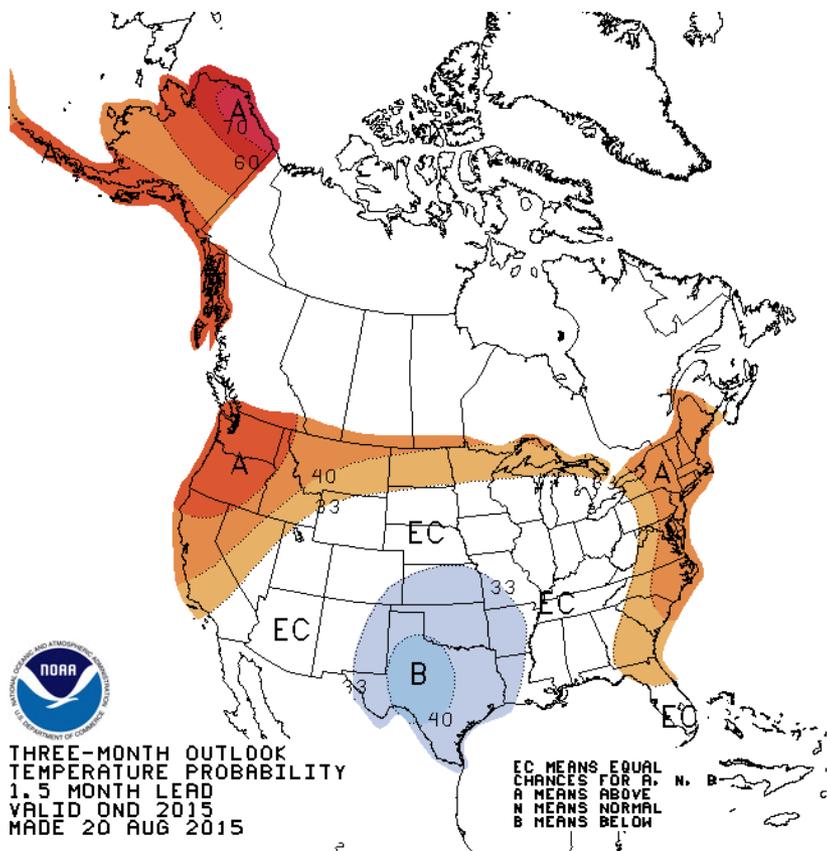
Weather/Climote Forecast

Three-Month Outlook - Precipitation



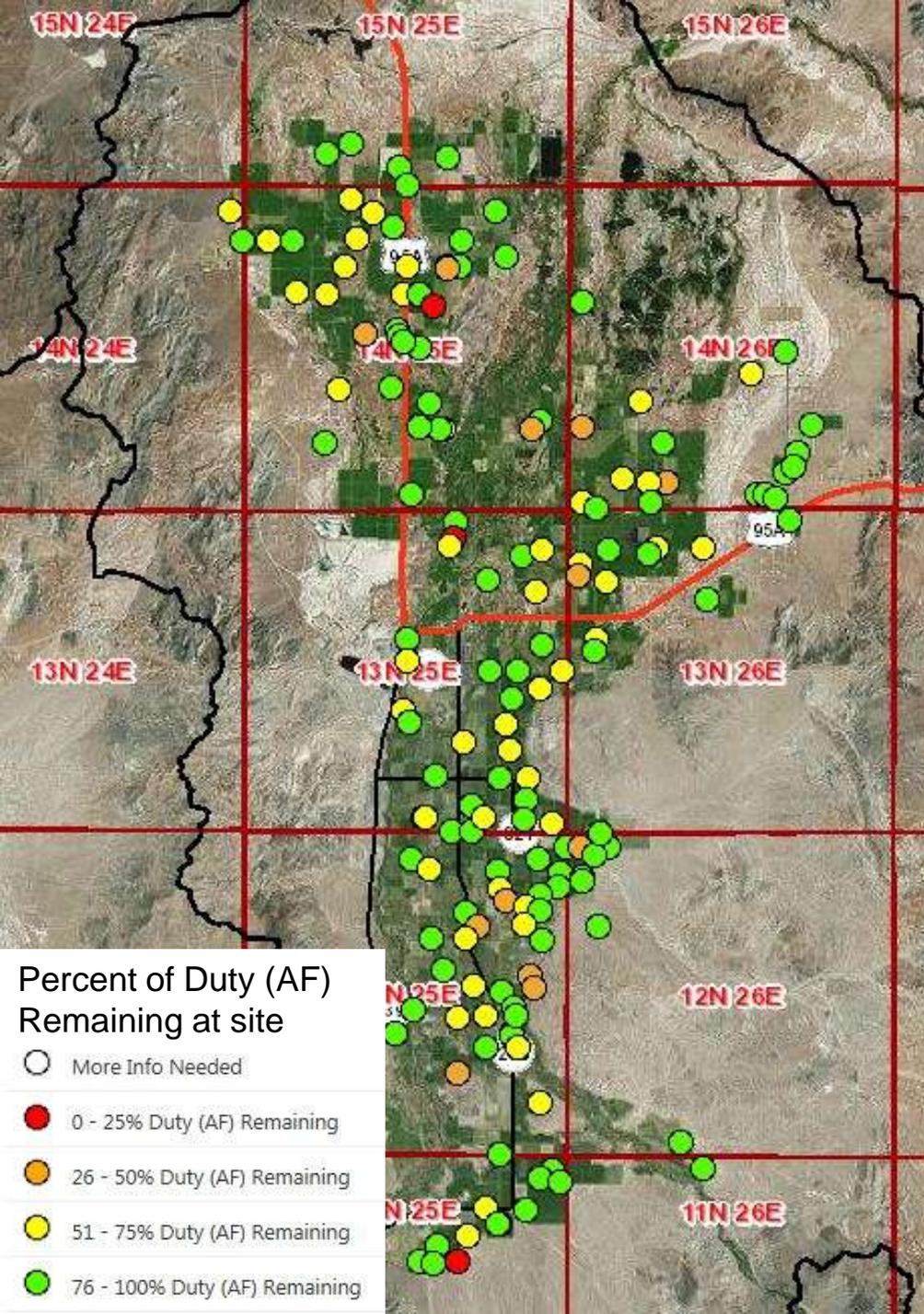
Weather/Climate Forecast

Three-Month Outlook - Temperature



2015 Pumping

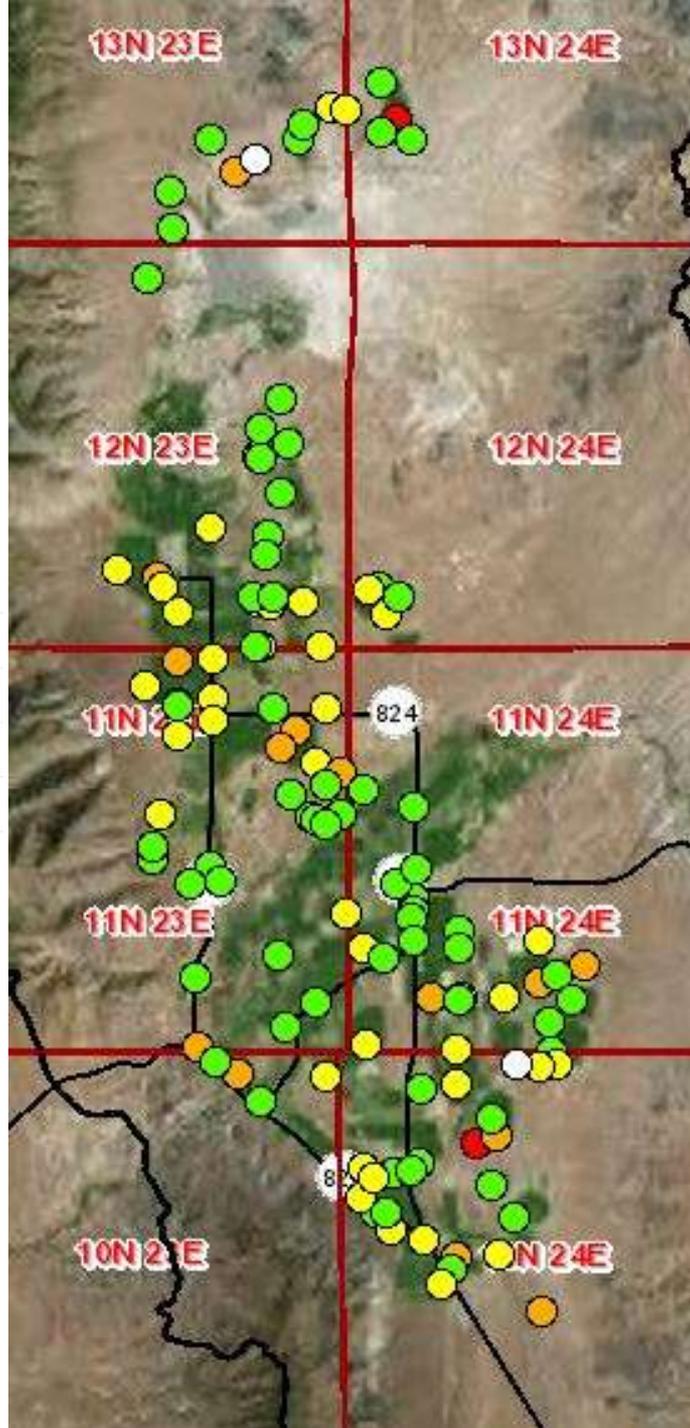
On-Line Pumping Resources



Mason Valley
Irrigation
Pumpage
estimate as of
August 1, 2015:
39,500
Acre-Feet
(2014 Ag pumping ~ 120,000 af)

Percent of Duty
(AF)
Remaining at
site

- More Info Needed
- 0 - 25% Duty (AF) Remaining
- 26 - 50% Duty (AF) Remaining
- 51 - 75% Duty (AF) Remaining
- 76 - 100% Duty (AF) Remaining



Smith Valley
Irrigation
Pumpage
estimate as of
August 1, 2015:
12,100
Acre-Feet
(2014 Ag pumping ~ 40,000 af)

Smith & Mason Online Resources

Using your web browser go to the following url: <http://water.nv.gov/>



The screenshot shows the homepage of the State of Nevada Division of Water Resources. At the top, there is a navigation bar with links for 'Links | Contact Us' and a menu with items: 'Home', 'Forms', 'Water Rights', 'Programs', 'Mapping & Data' (circled in red), 'Hearings', and 'FAQ'. Below the navigation bar, the main content area is divided into several sections:

- HOME**
- Our Mission**

The mission of the Nevada Division of Water Resources (NDWR) is to conserve, protect, manage and enhance the State's water resources for Nevada's citizens through the appropriation and reallocation of the public waters. In addition, the Division is responsible for quantifying existing water rights; monitoring water use; distributing water in accordance with court decrees; reviewing water availability for new subdivisions and condominiums; reviewing the construction and operation of dams; appropriating geothermal water; licensing and regulating well drillers and water rights surveyors; reviewing flood control projects; monitoring water resource data and records; and providing technical assistance to the public and governmental agencies.
- About Us**
 - Contact Information
 - Frequently Asked Questions
 - Organizational Chart (PDF)
 - Statutory Authority
 - Water Law
- Publications**
 - General Publications
- Top Viewed Pages**
 - Water Rights Home
 - Permit Search
 - Spring Valley Water Rights Hearing
 - Well Log Database Query Tool
 - Forms Home
- Calendar of Events**
 - Calendar icon
- Recent News**
 - Agenda for Workshop on Water Related Issues in Smith and Mason Valleys - August
 - Pony Canyon Preliminary Order of Determination
 - Walker River Meetings Presentation - July 15 & 16, 2015

Smith & Mason Online Resources

Links | Contact Us



State of Nevada Division of Water Resources

Home Forms Water Rights Programs **Mapping & Data** Hearings FAQ

MAPPING AND DATA HOME

Nevada Maps

- Basin Boundary Map – PDF 3.6 MB
- Water Resource Specialist Assignments
- Interactive Water Resource Maps**
- Hydrographic Regions
- GIS Data Downloads
- Range Maps
- Search Truckee River Maps
- Search Carson River Maps
- Static Water Levels of Nevada - 1974 – PDF 7.7 MB

Water Rights Data

- Permit Search
- Hydrographic Abstracts (Advanced Search)
- Monthly Report
- Titles Database
- Decrees / Adjudication Status
- Hydrographic Basin Summaries
- List of State Engineer's Orders
- Search State Engineer's Orders
- Search State Engineer's Rulings
- Licensed Water Right Surveyors

Top Viewed Pages

- Water Rights Home
- Permit Search
- Spring Valley Water Rights Hearing
- Well Log Database Query Tool
- Forms Home

Calendar of Events



Recent News

- Agenda for Workshop on Water Related Issues in Smith and Mason Valleys – August
- Pony Canyon Preliminary Order of Determination
- Walker River Meetings Presentation – July 15 & 16, 2015
- Agenda for Workshop on Water Related Issues in Smith and Mason Valleys – July

Smith & Mason Online Resources

Links | Contact Us



State of Nevada
Division of Water Resources

Home Forms Water Rights Programs Mapping & Data Hearings FAQ

MAPPING APPLICATION LINKS

Mapping Application Links
(Silverlight Required - Not supported in Chrome)

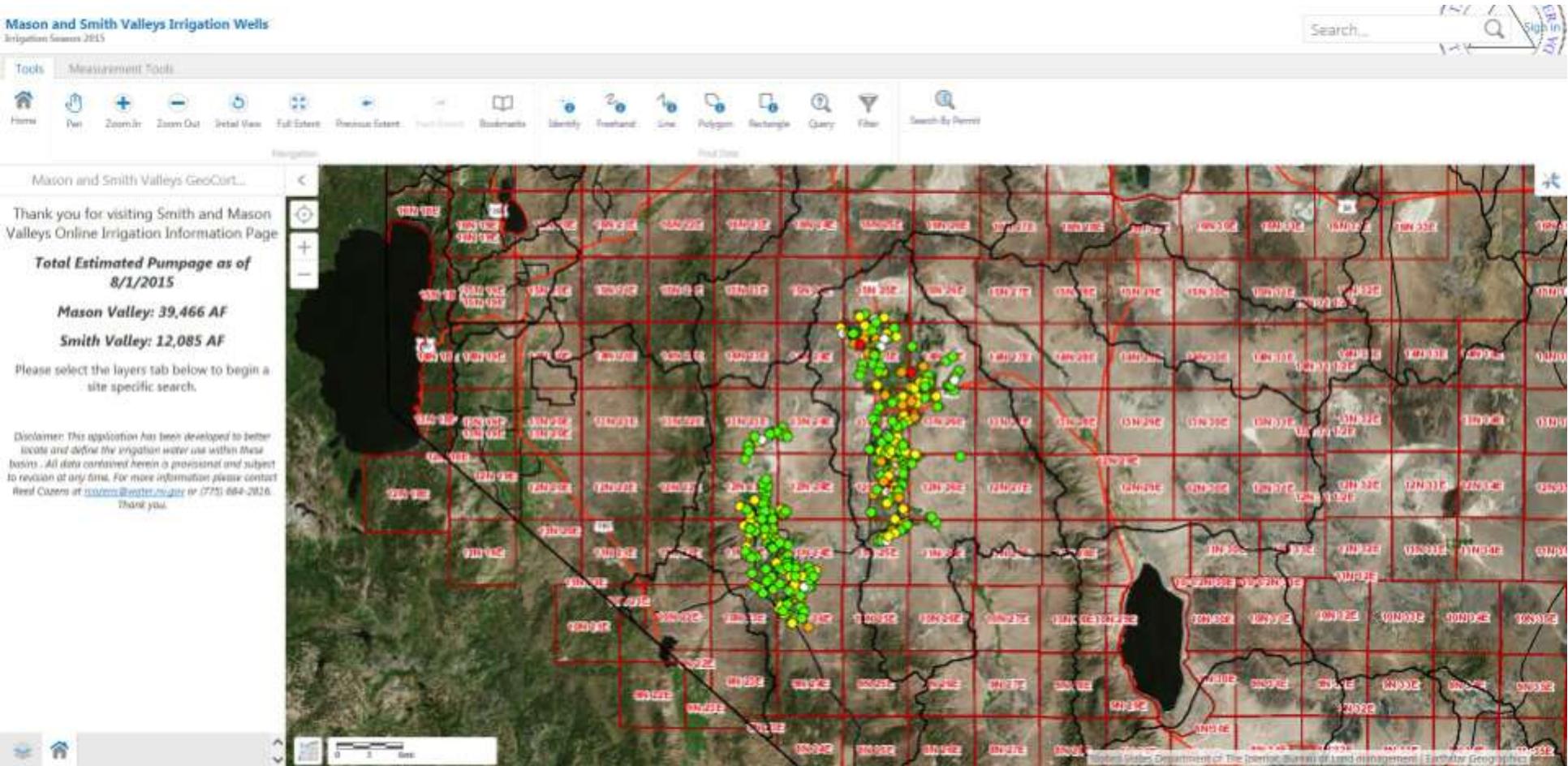
- [Water Rights](#)
- [Adjudications](#)
- [Nevada Hydrology Data](#)
- [Mason and Smith Valleys Irrigation Wells](#)

Mobile Device Links
(HTML5 Based ... Android/iDevices)

- [Water Rights Mapping Application](#)
- [Mason and Smith Valleys Irrigation Wells](#)

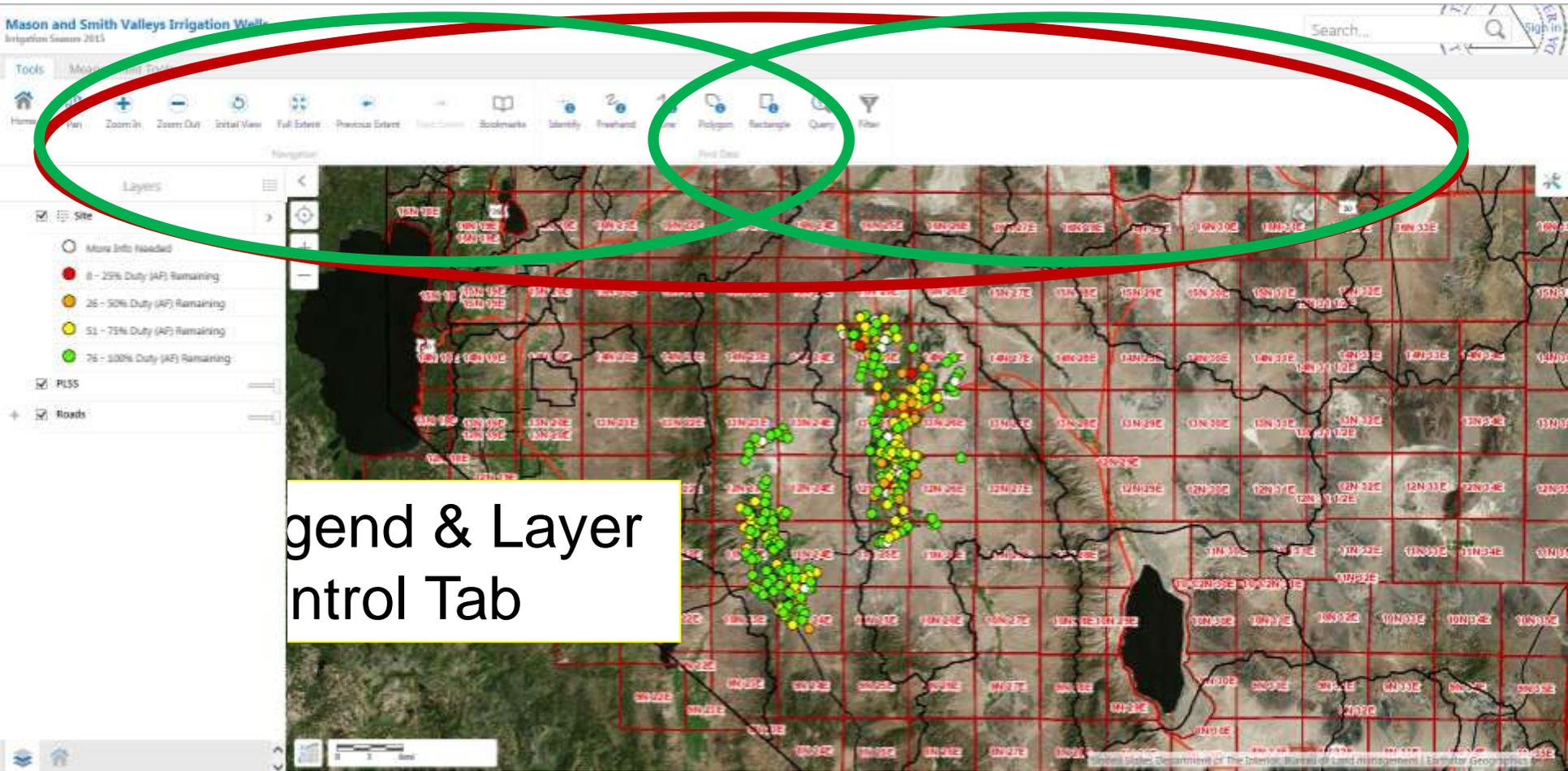
<http://water.nv.gov/home/contactlist.cfm>

Smith & Mason Online Resources

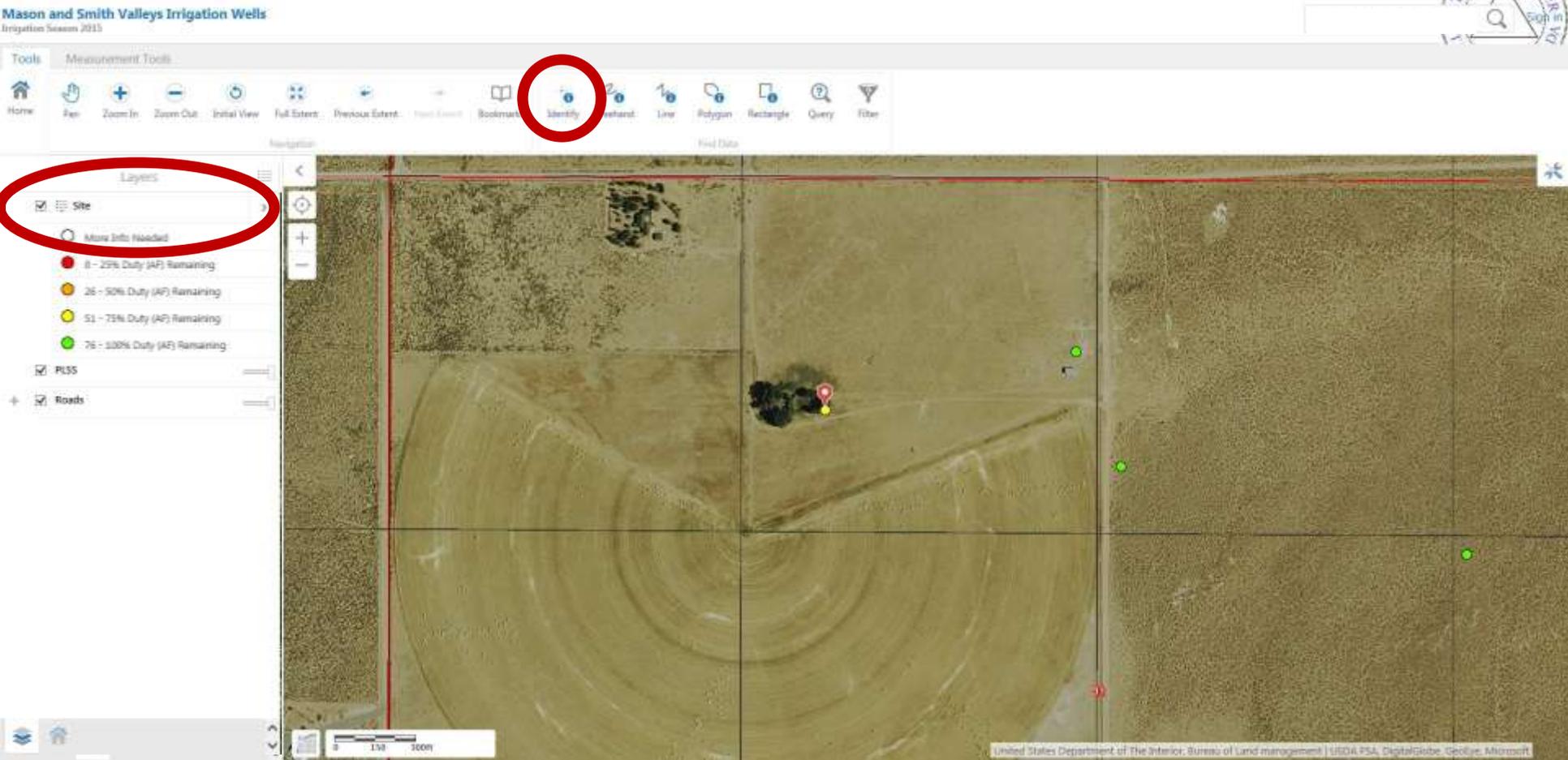


Disclaimer: This application has been developed to better locate and define the irrigation water use within these basins. All data contained herein is provisional and subject to revision at any time. For more information please contact Reed Cozens at rcozens@water.nv.gov or (775) 684-2816.

Smith & Mason Online Resources



Smith & Mason Online Resources



Smith & Mason Online Resources

The screenshot displays the Smith & Mason online resource interface. At the top, there is a navigation bar with a search box and a "Sign In" button. Below this is a toolbar with various tools such as Home, Pan, Zoom In, Zoom Out, Initial View, Full Extent, Previous Extent, Next Extent, Bookmarks, Identify, Refresh, Line, Polygon, Rectangle, Query, and Filter. The main area shows an aerial map of a field with several green dots representing irrigation wells. A scale bar at the bottom left indicates 0, 150, and 300 feet. The site ID "Site , 107 N12 E24 318ACB1" is displayed below the map. At the bottom, there is a data table with columns for Description, Details, Permits, Metrics, and Readings.

Description	Details	Permits	Metric(s)	Reading(s)
Site ID			% AF Remaining (function of pro-rata duty)	74.7296
107 N12 E24 318ACB1			Estimated Usage (AF)	128
Longitude NAD83			Potential Max Duty (AF)	506.52
-119.342				
Latitude NAD83				
38.865				
Pro-Rata Duty (AF)				
506.52				

Modeling Results

&

Curtailment Details

2016 Curtailment

Supplemental Groundwater Only

NOT All Priority Rights

NOT Domestic Wells

DRI Models - Water Level Changes Caused by Pumpage

- DRI groundwater models for Mason and Smith Valleys
- To be used to quantify amount of curtailment needed to achieve targeted water-levels
- Use 2010 as proxy for average flow and diversions
- Uses March 2005 as baseline for water levels
- Simulating water-level changes for range of scenarios:
 - River flows of 20%, 40%, 60%, 80%, 100% of average
 - Pumpage curtailed by priority by 0%, 25%, 50%, and 75% of duty
 - Additional simulations where needed

Mason Valley

Water Level Decline from Mar 2014 to Mar 2015

32% of Median Flow

● Measured well

Water Level Decline Rates

 > 8 feet/year

 > 4 feet/year

Pumped 2014 AF/Y

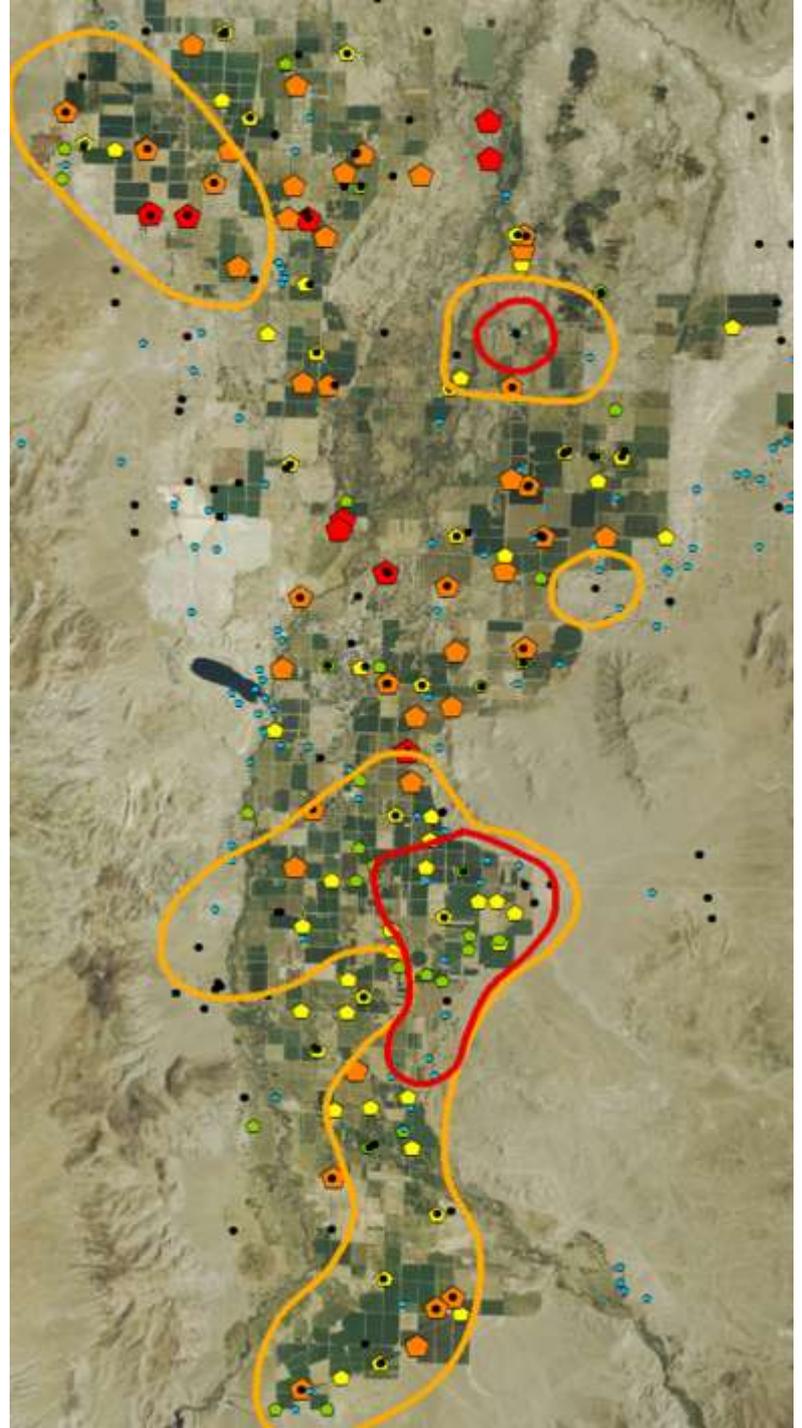
 2000 - 3270

 1000 - 2000

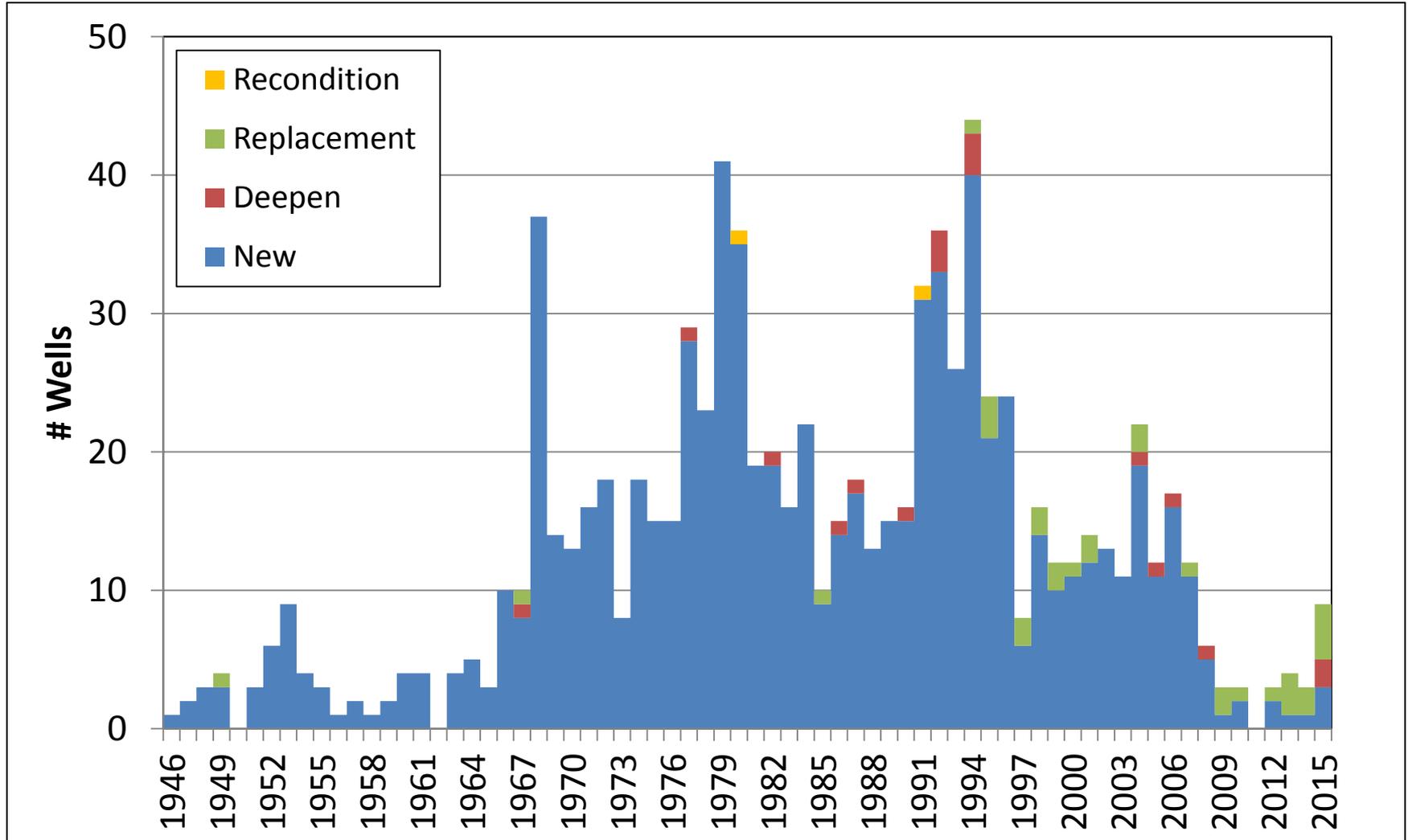
 500 - 1000

 200 - 500

 0 - 200



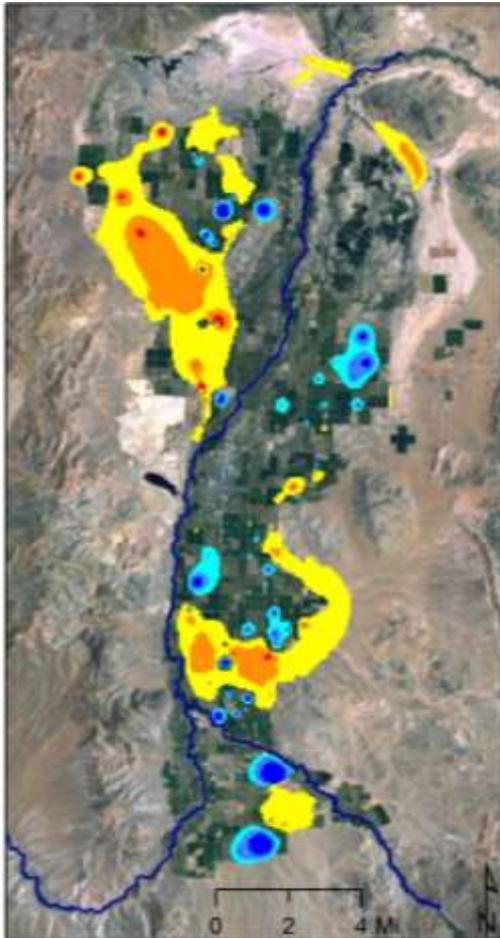
Mason Valley Domestic Wells



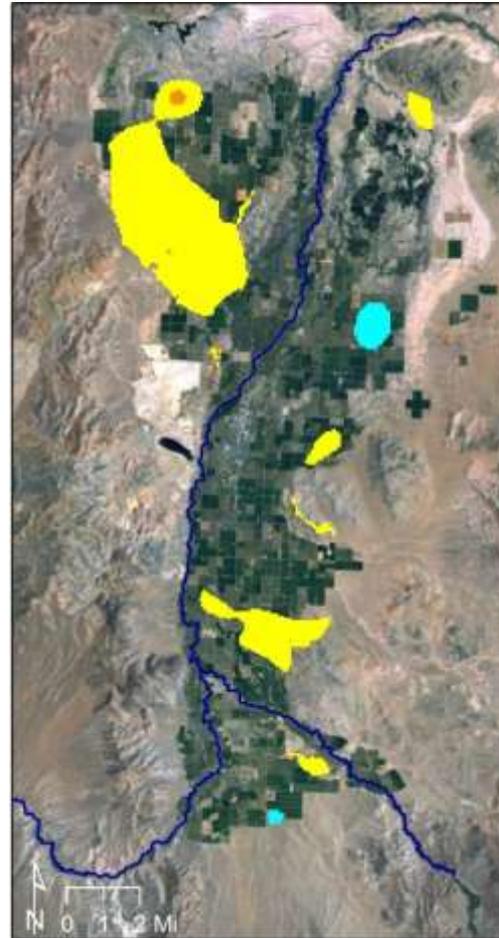
DRI Models - Water Level Changes

Streamflow = 60%; Curtailment = 25%

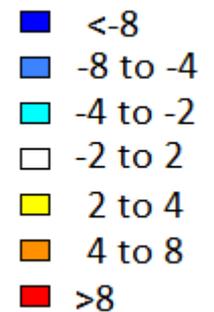
August to August



March to March



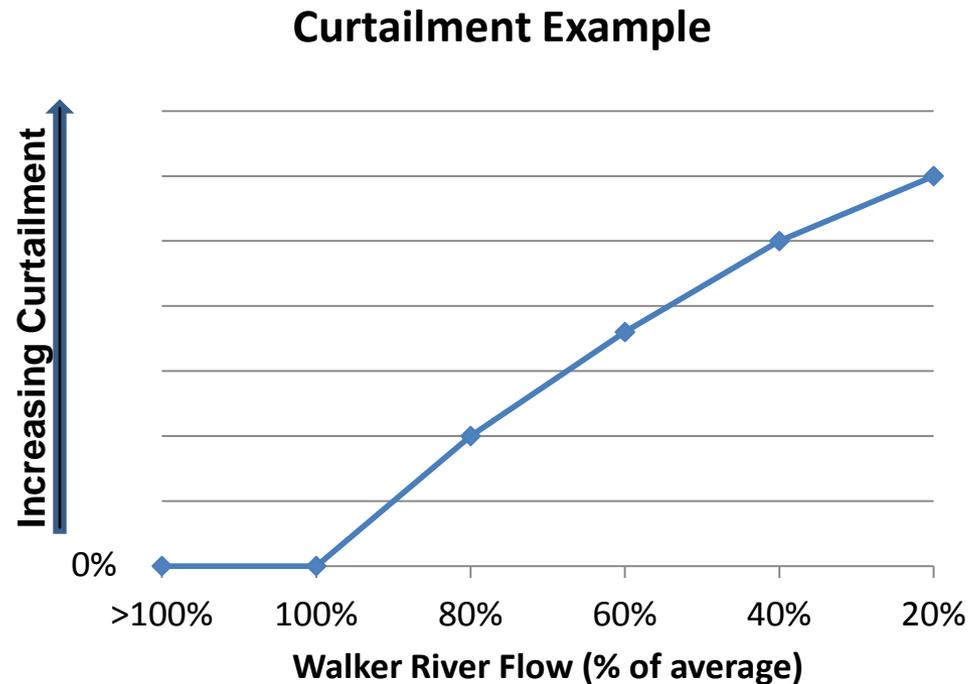
Drawdown (ft)



* negative drawdown indicates rising water levels

Discussion of Possible Curtailment in 2016

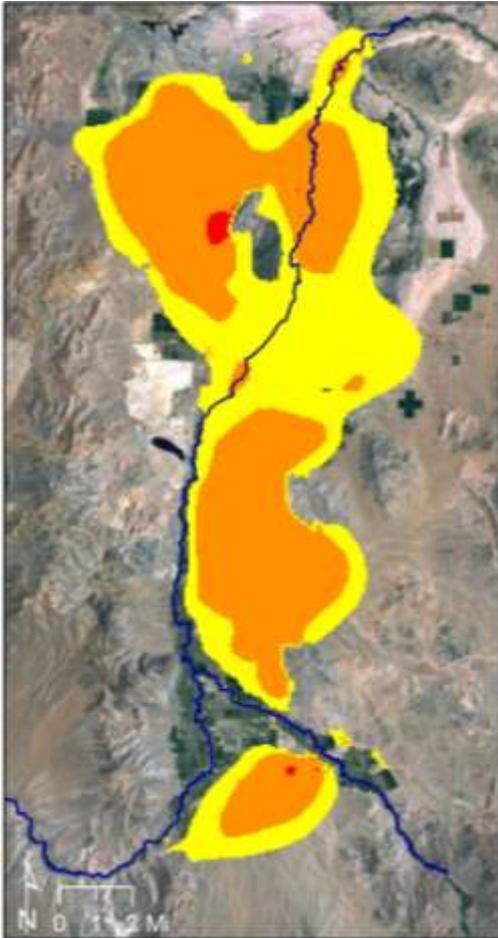
- Sliding scale
- Less curtailment if river flow is higher
- Priority dates determined for each curtailment



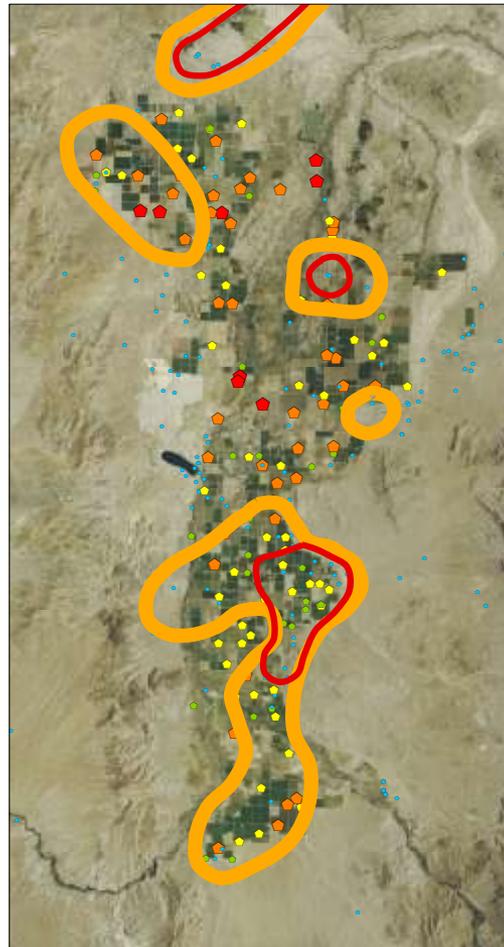
DRI Models - Water Level Changes

Mason Modeled Versus Observed

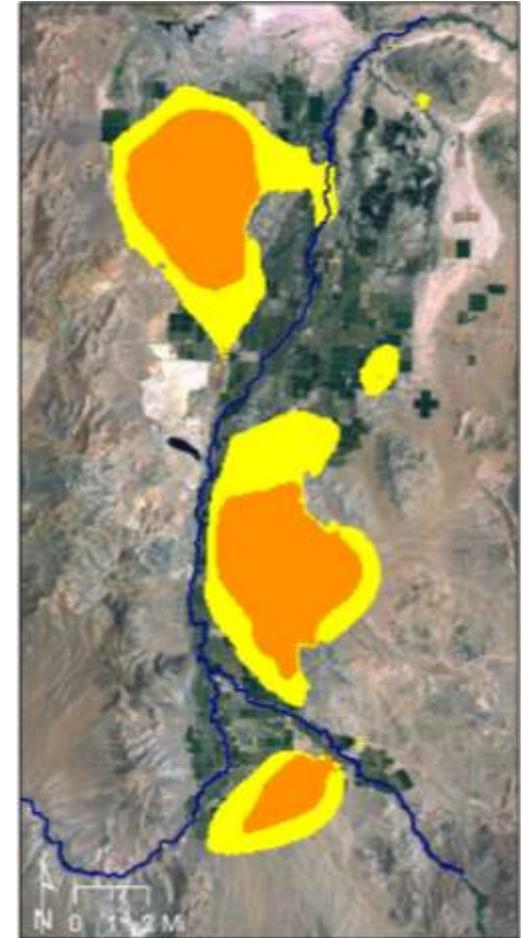
20% Streamflow



Measured Drawdown
32% streamflow



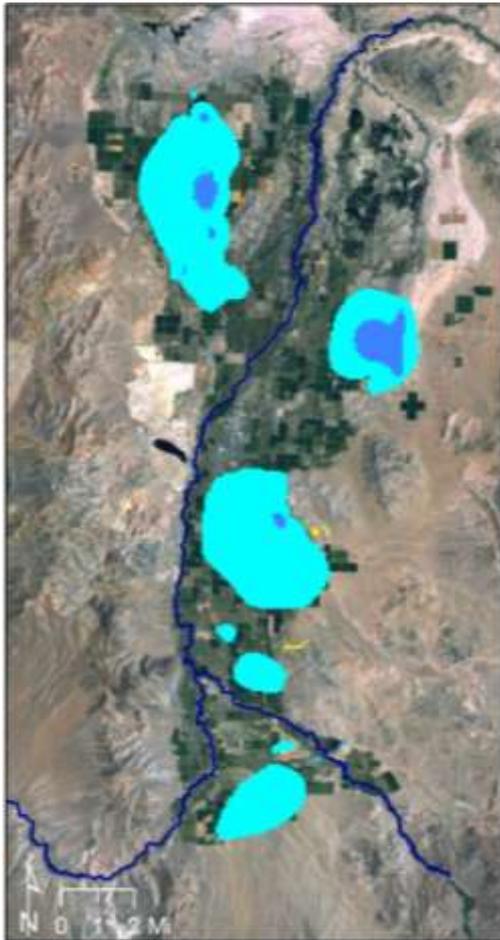
40% Streamflow



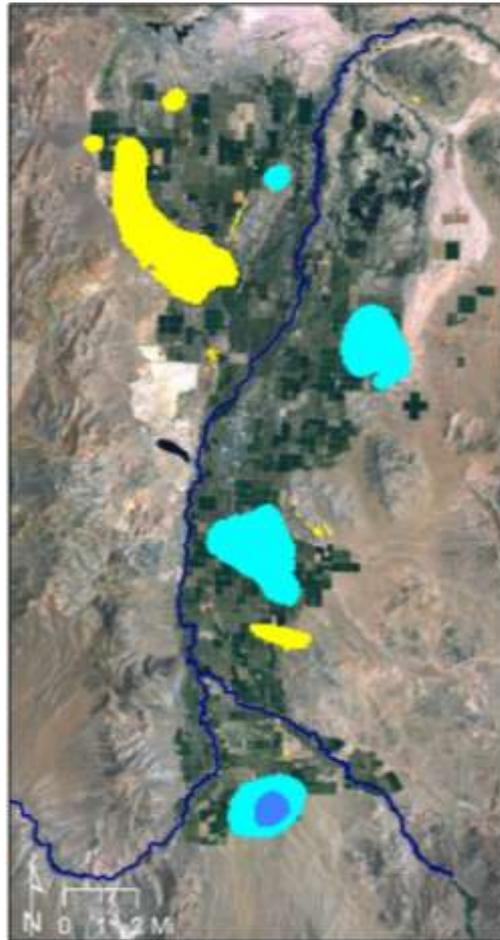
Mason - March to March Drawdown

Streamflow % as shown, No Curtailment

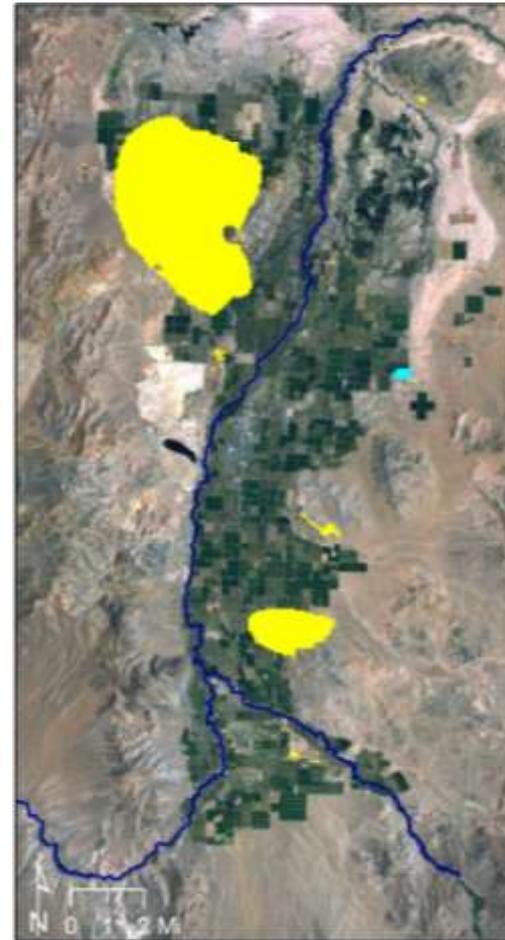
100%



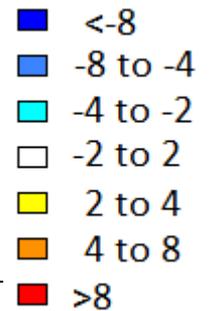
80%



70%



Drawdown



* negative drawdown indicates rising water levels

Mason - March to March Drawdown

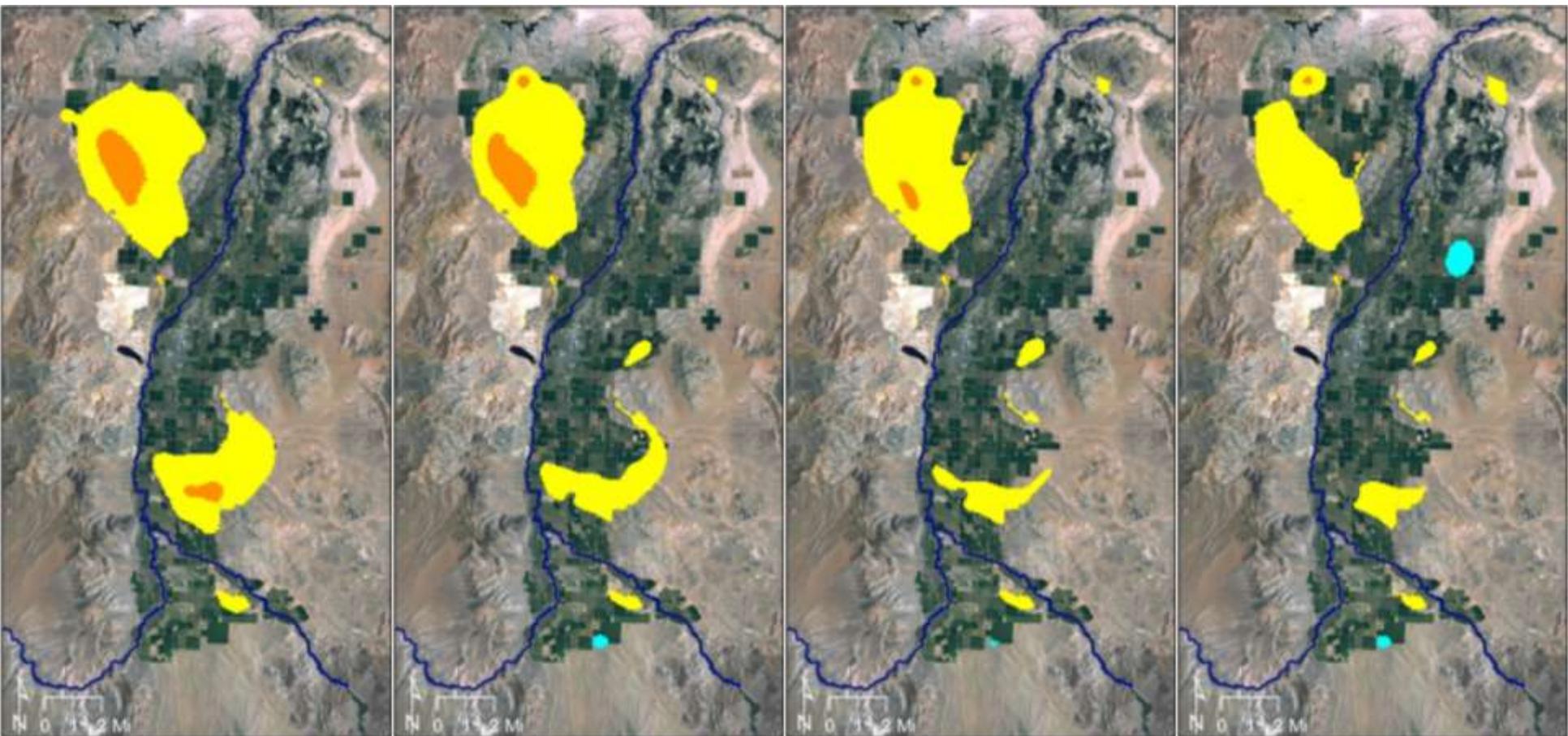
Streamflow = 60%

No Curtailment

20%

25%

30%



Mason - March to March Drawdown

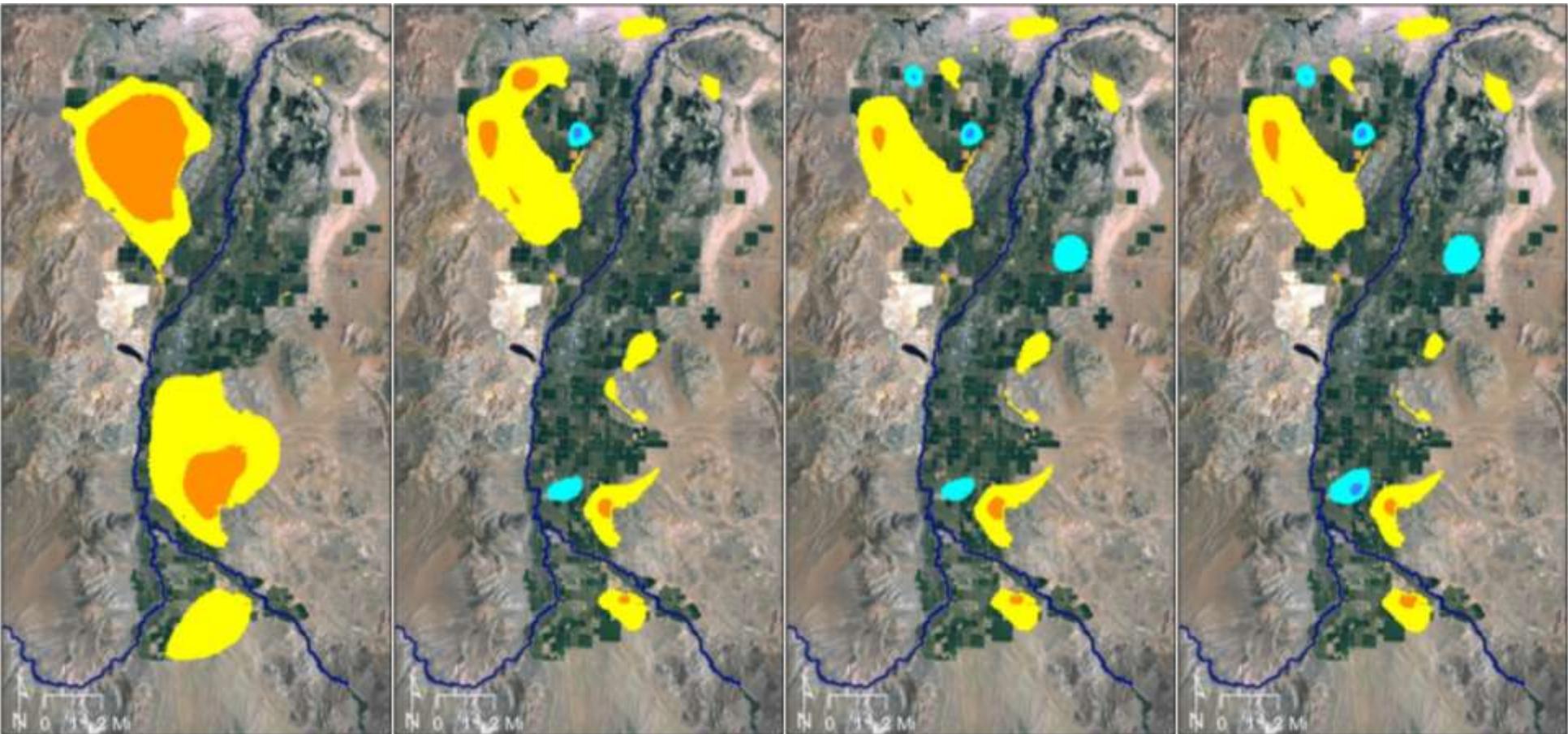
Streamflow = 50%

No Curtailment

45%

50%

55%



Mason - March to March Drawdown

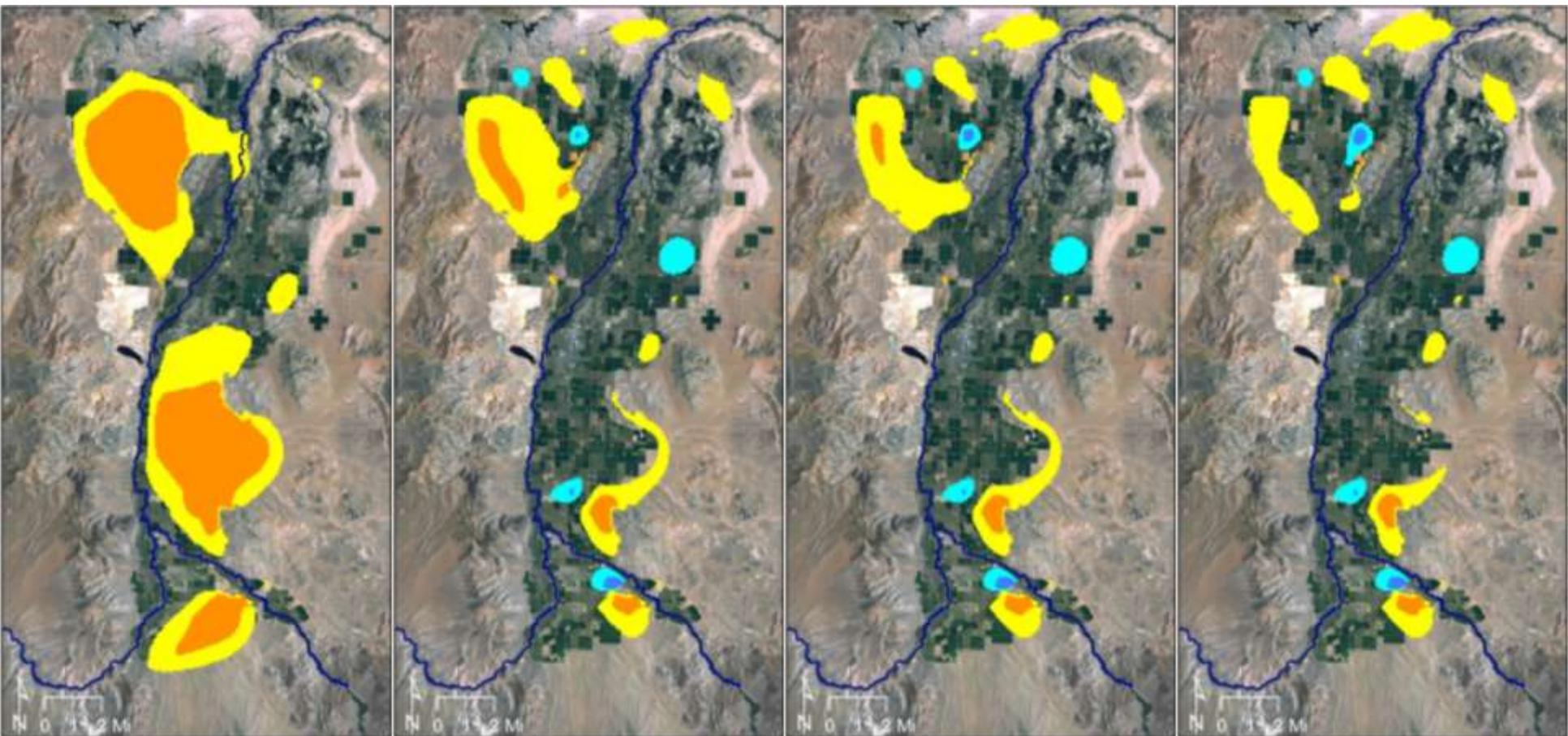
Streamflow = 40%

No Curtailment

60%

65%

70%



Mason - March to March Drawdown

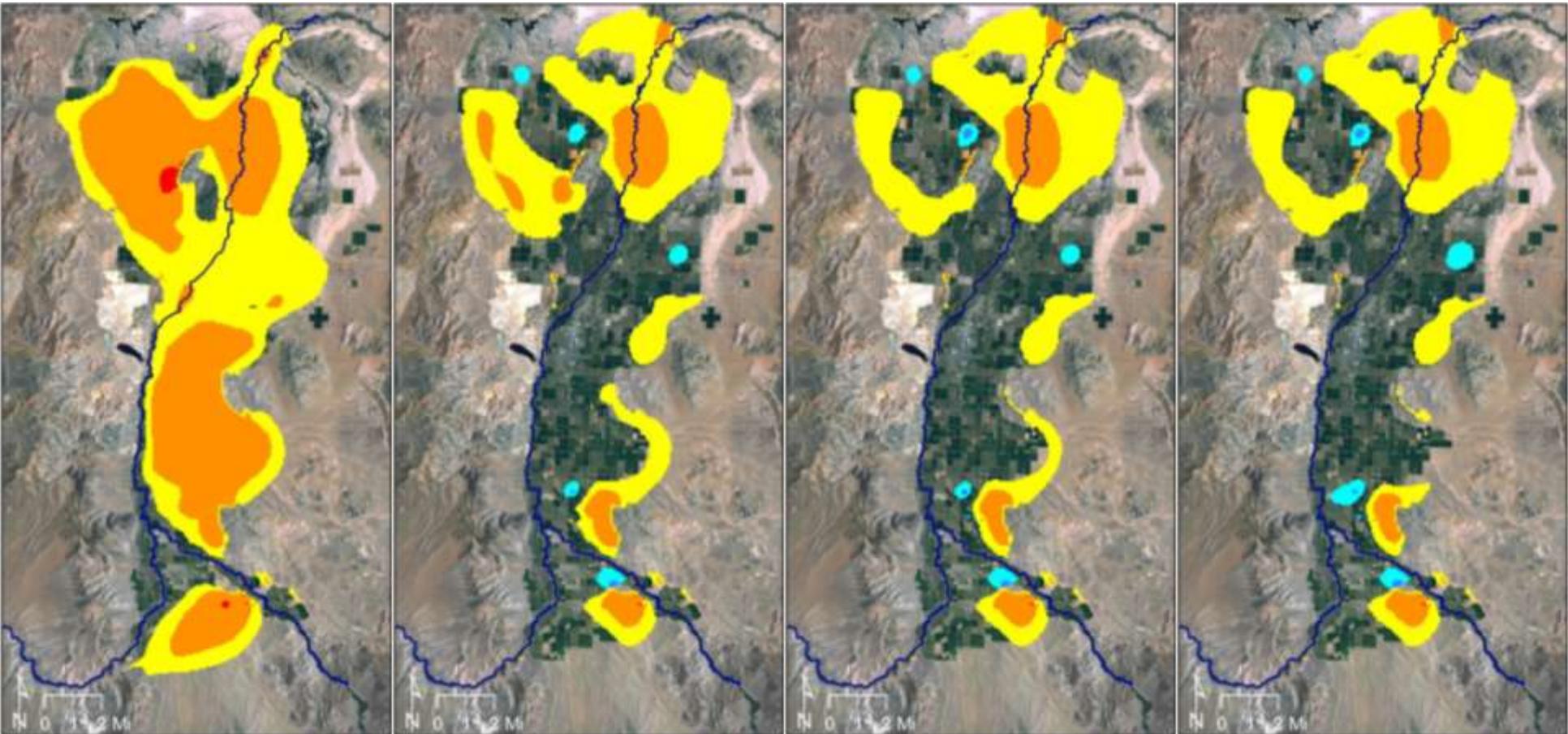
Streamflow = 20%

No Curtailment

65%

70%

75%



Smith Valley

Water Level Decline from Mar 2014 to Mar 2015 35% of Median Flow

Water Level Decline Rates

 > 8 feet/year

 > 4 feet/year

Pumped 2014 AF/Y

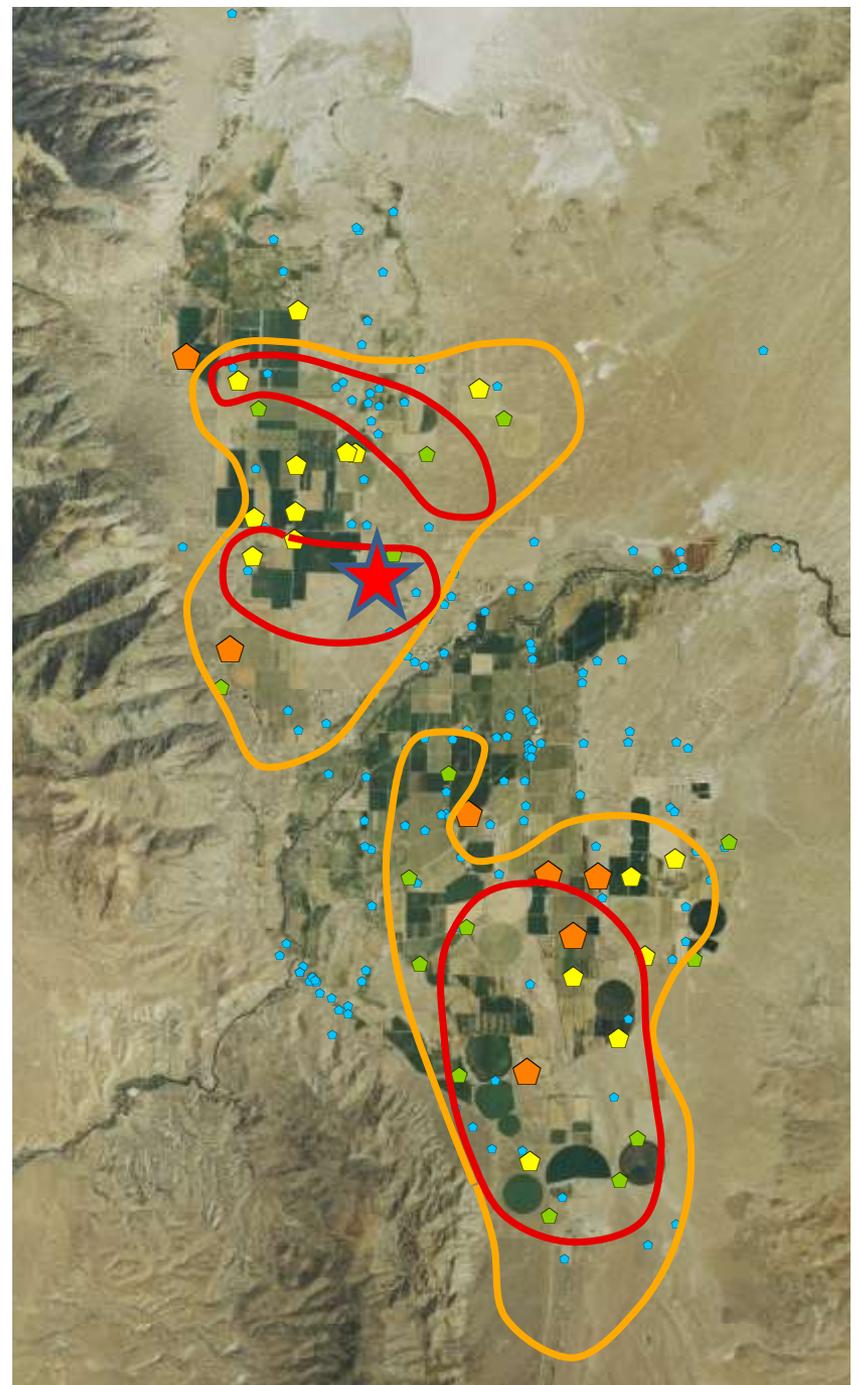
 2000 - 3270

 1000 - 2000

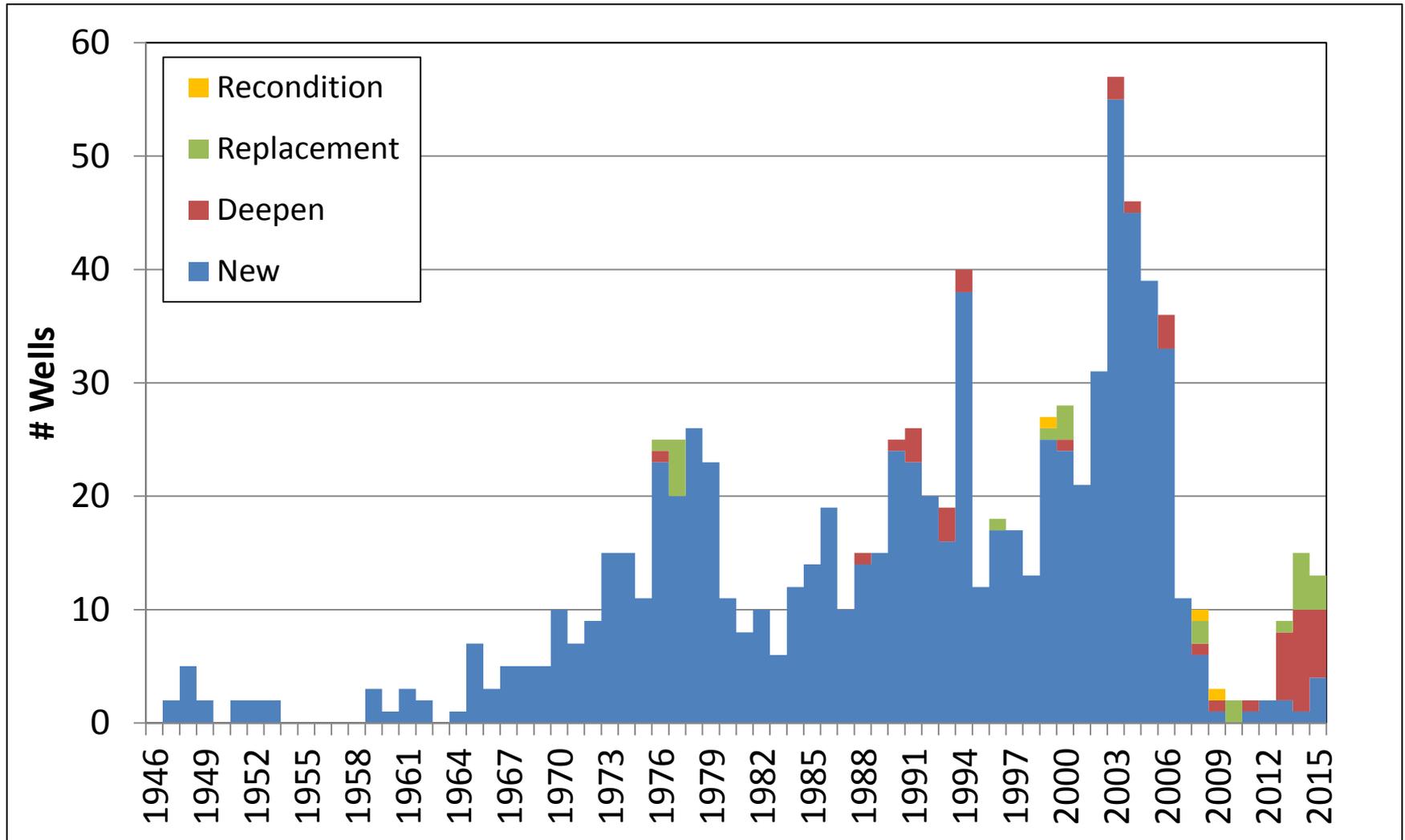
 500 - 1000

 200 - 500

 0 - 200



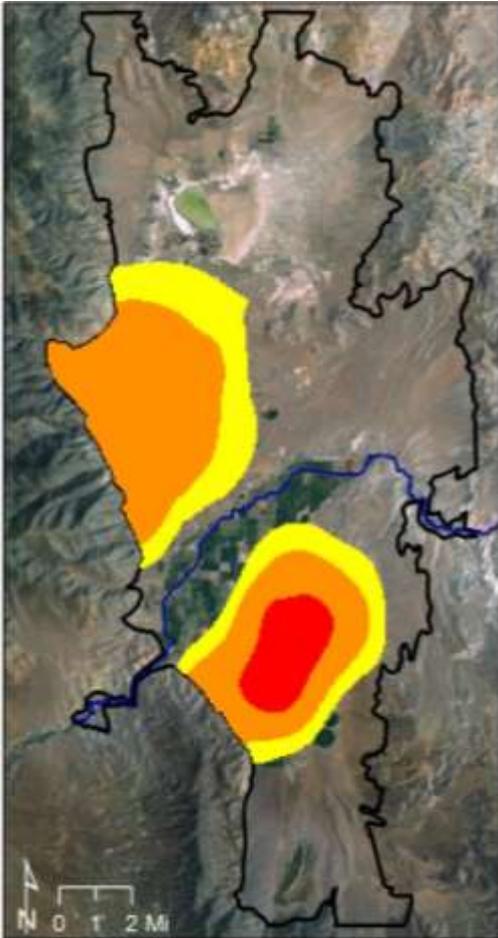
Smith Valley Domestic Wells



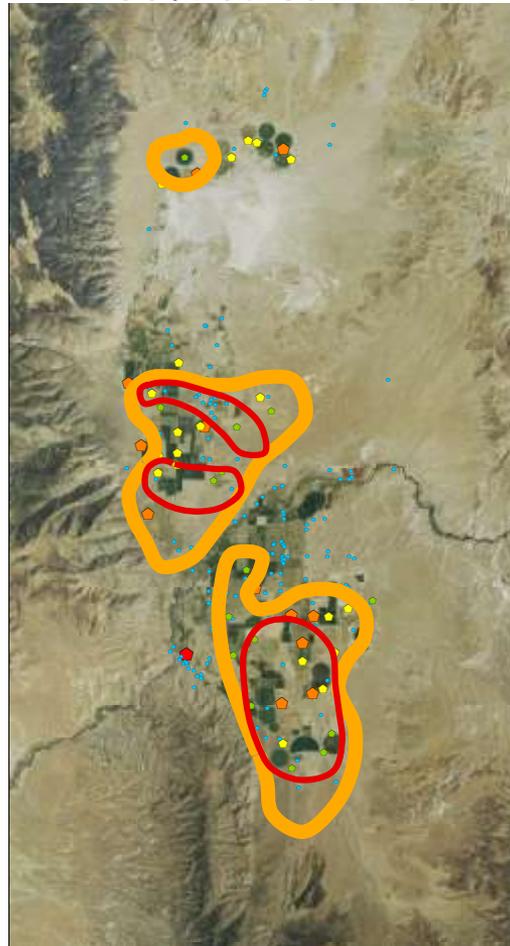
DRI Models - Water Level Changes

Smith Modeled Versus Observed

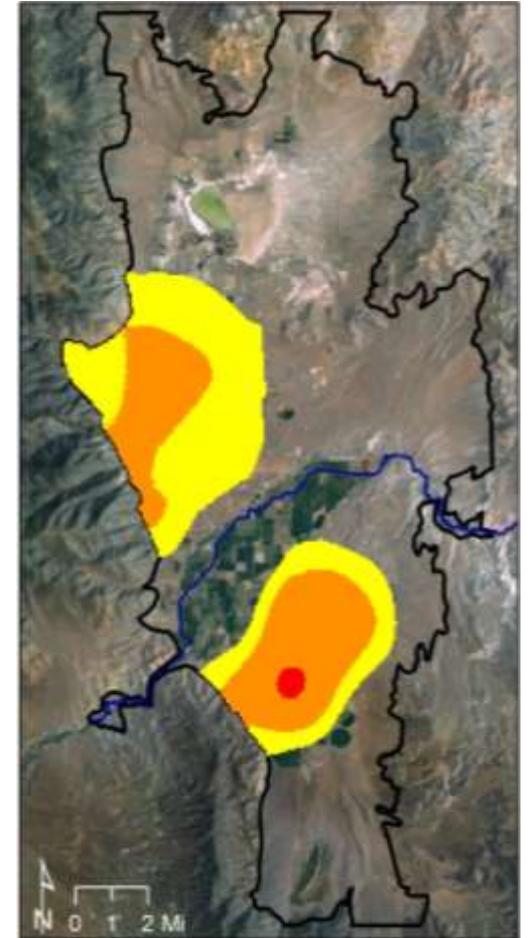
20% Streamflow



Measured Drawdown
35% streamflow

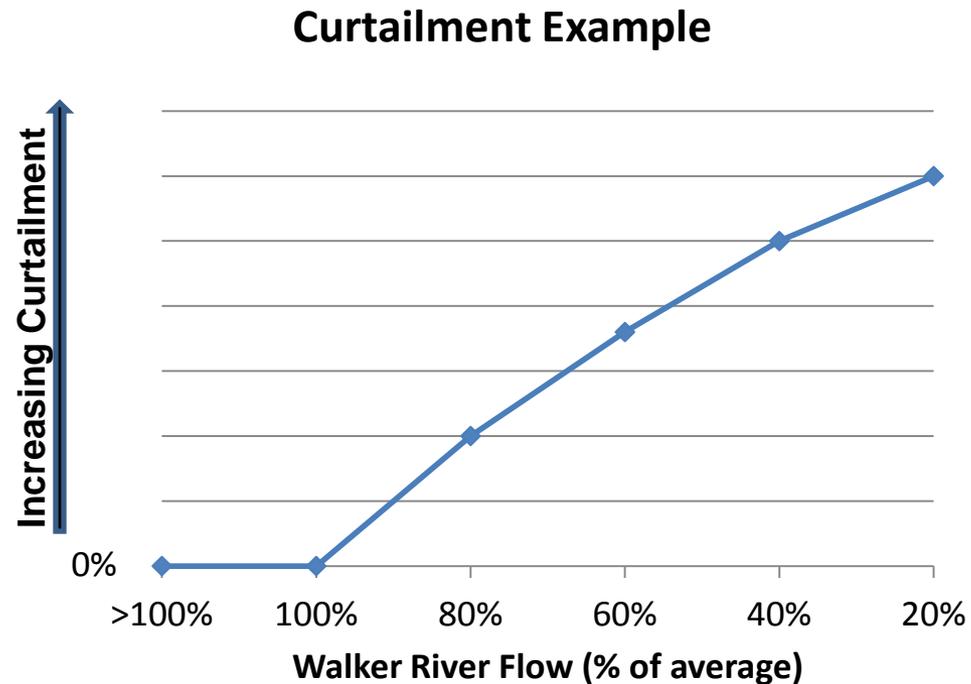


40% Streamflow



Discussion of Possible Curtailment in 2016

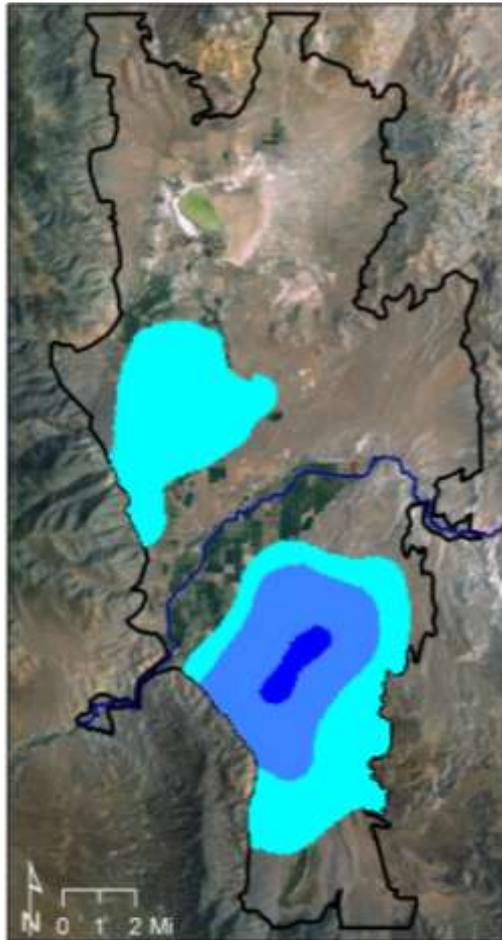
- Sliding scale
- Less curtailment if river flow is higher
- Priority dates determined for each curtailment



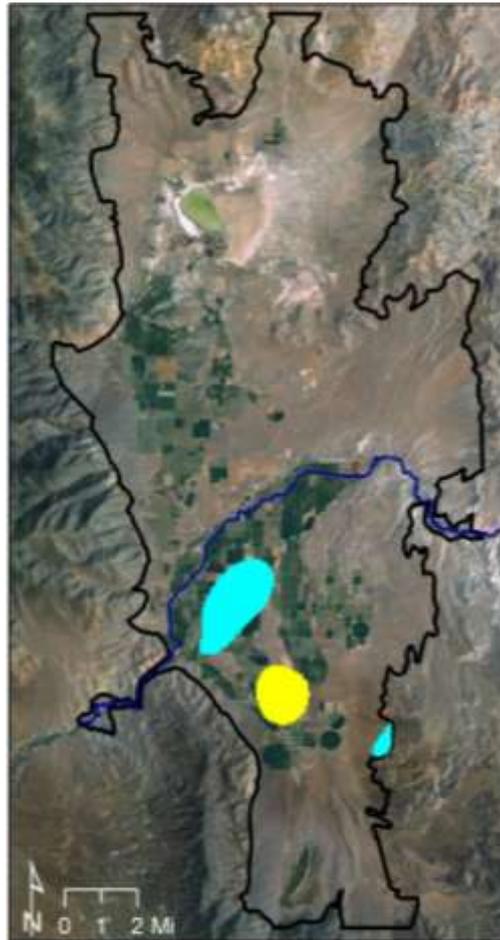
Smith - March to March Drawdown

Streamflow shown, No curtailment

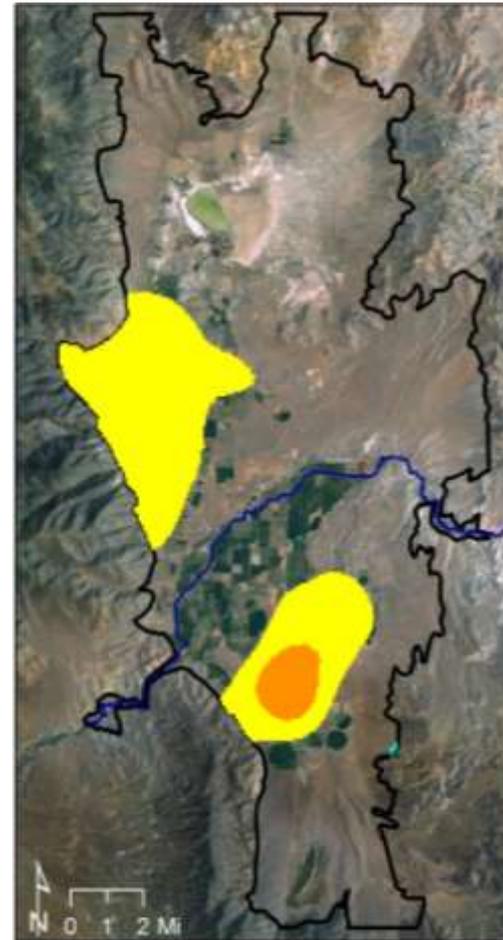
100%



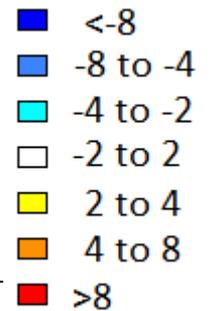
80%



60%



Drawdown

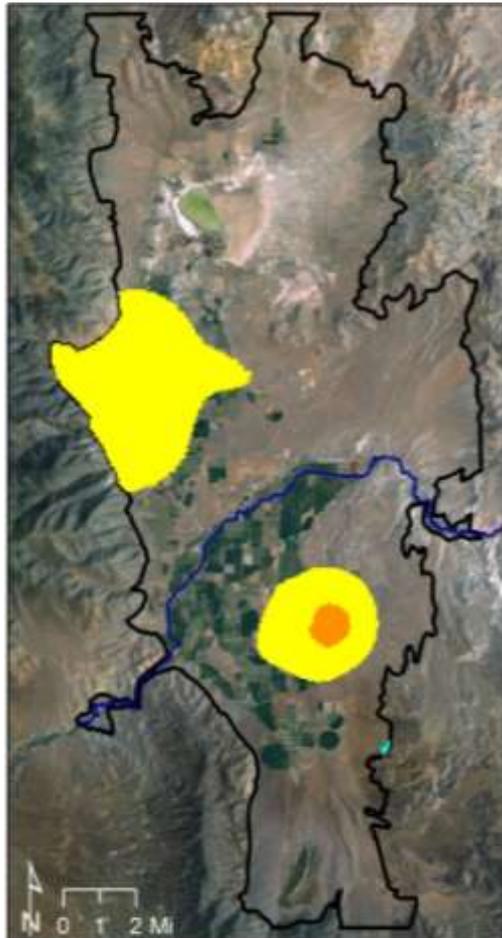


* negative drawdown indicates rising water levels

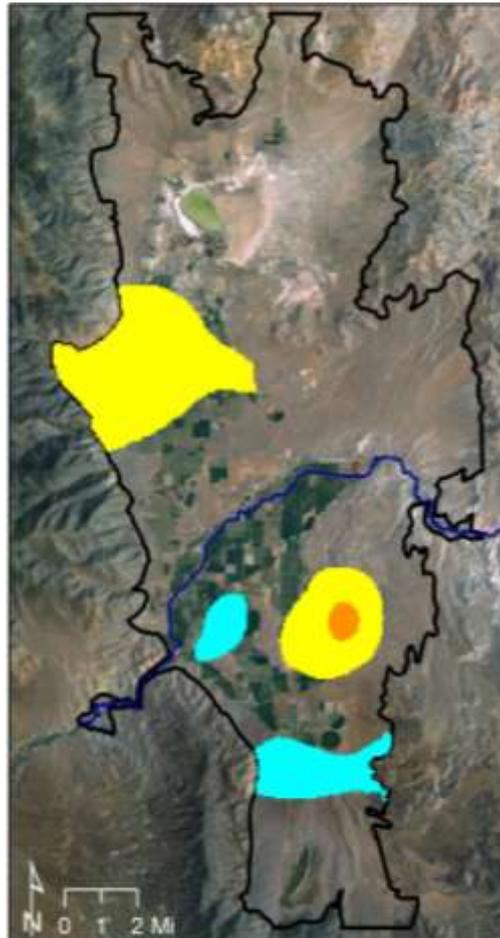
Smith - March to March Drawdown

Streamflow = 60%

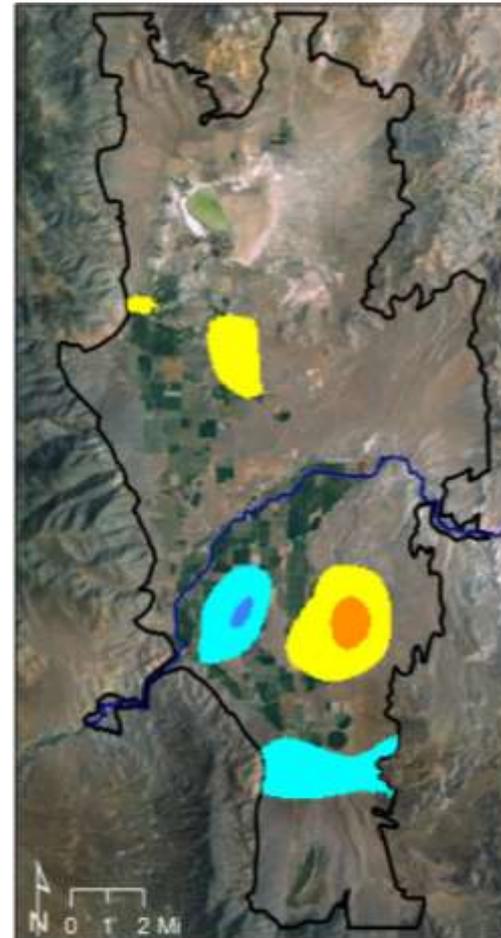
25%



50%



75%



Drawdown

- <-8
- -8 to -4
- -4 to -2
- -2 to 2
- 2 to 4
- 4 to 8
- >8

* negative drawdown indicates rising water levels

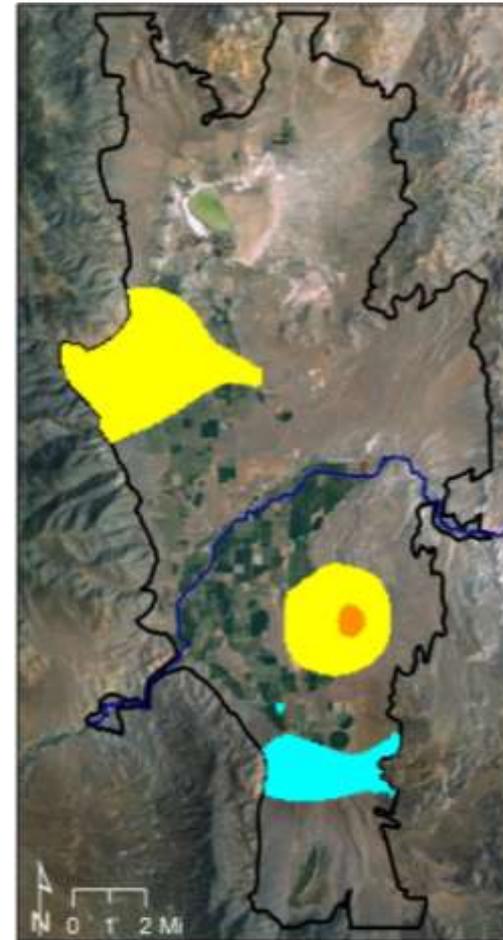
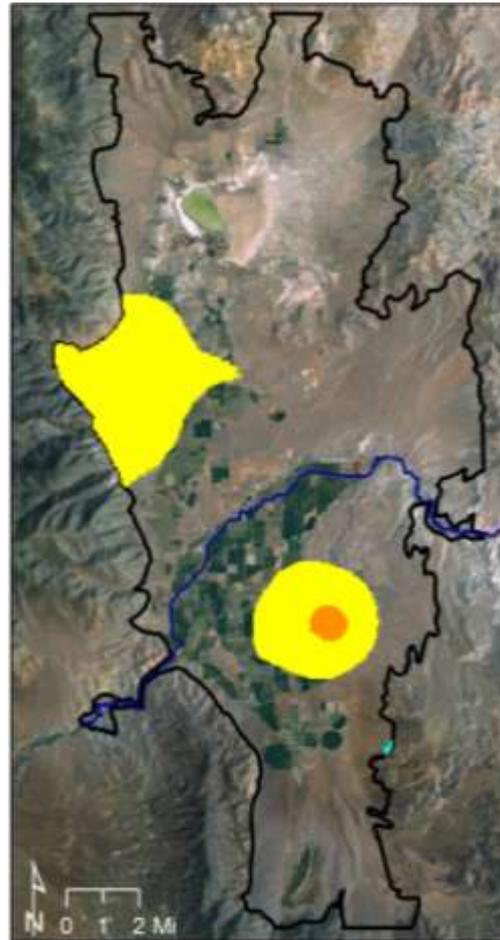
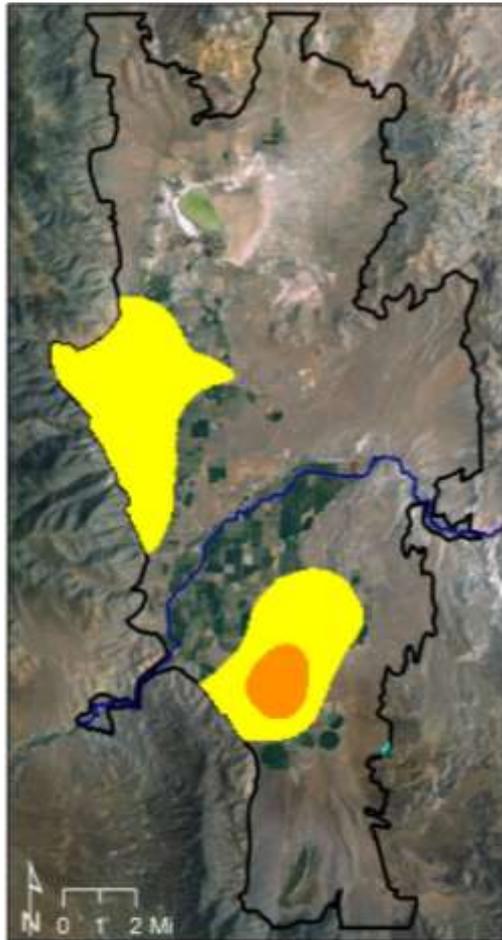
Smith - March to March Drawdown

Streamflow = 50%

No Curtailment

25%

50%



Drawdown

- <-8
- -8 to -4
- -4 to -2
- -2 to 2
- 2 to 4
- 4 to 8
- >8

* negative drawdown indicates rising water levels

Smith - March to March Drawdown

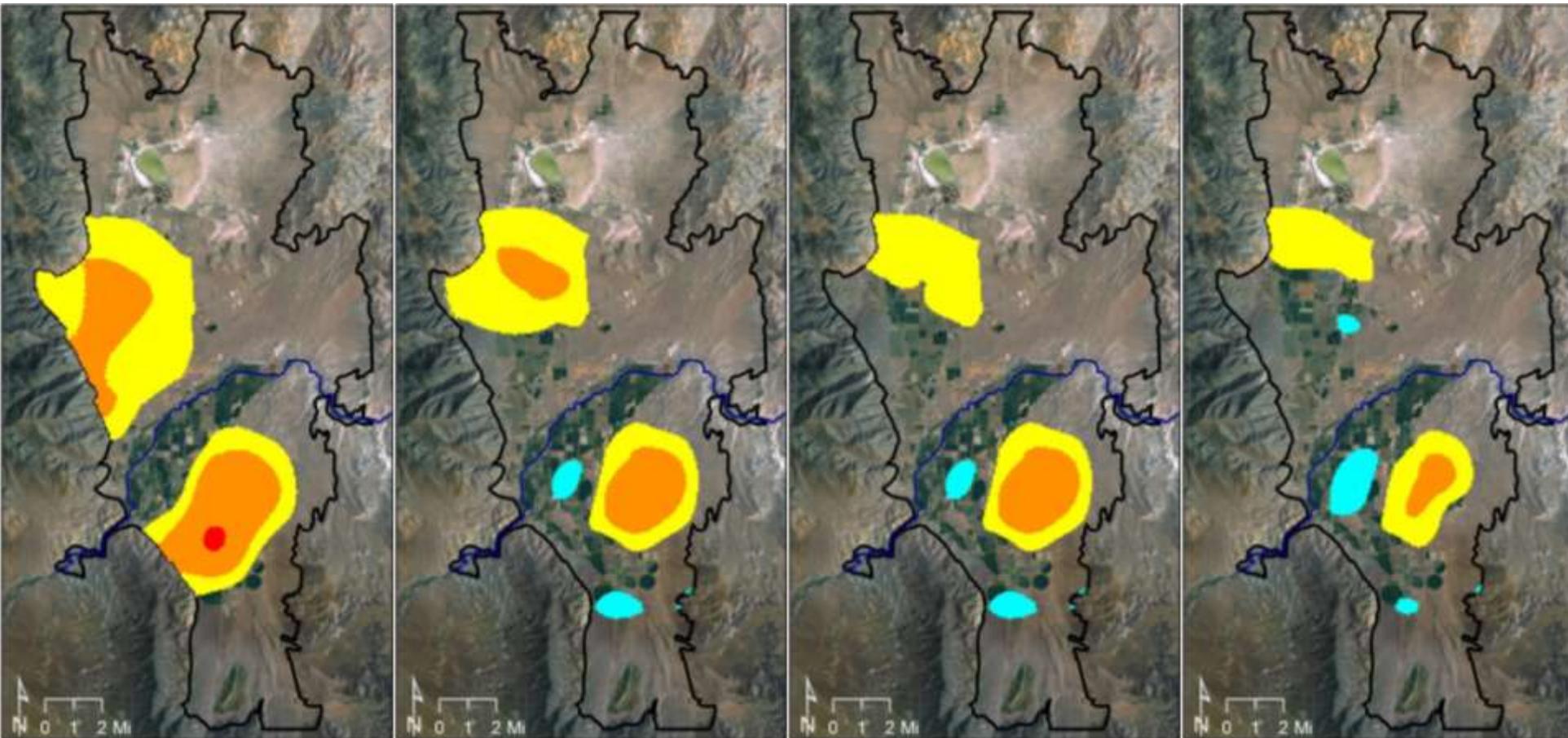
Streamflow = 40%

No Curtailment

70%

75%

100%



Smith - March to March Drawdown

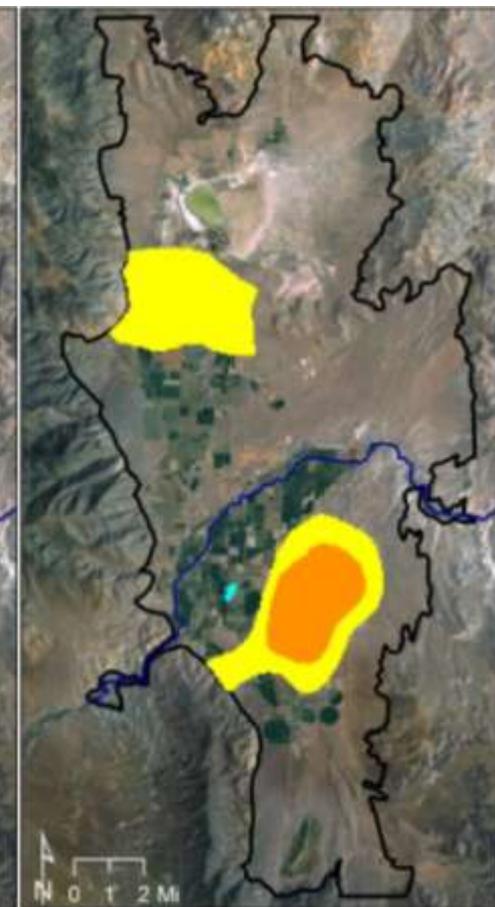
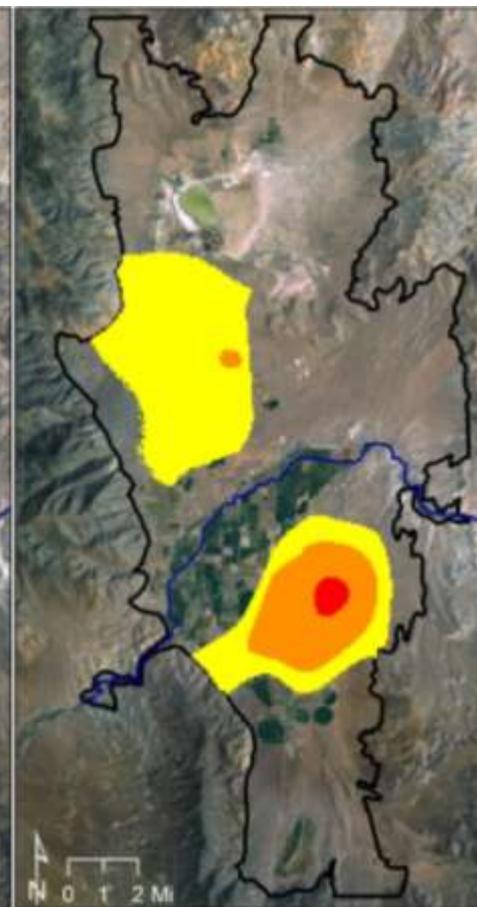
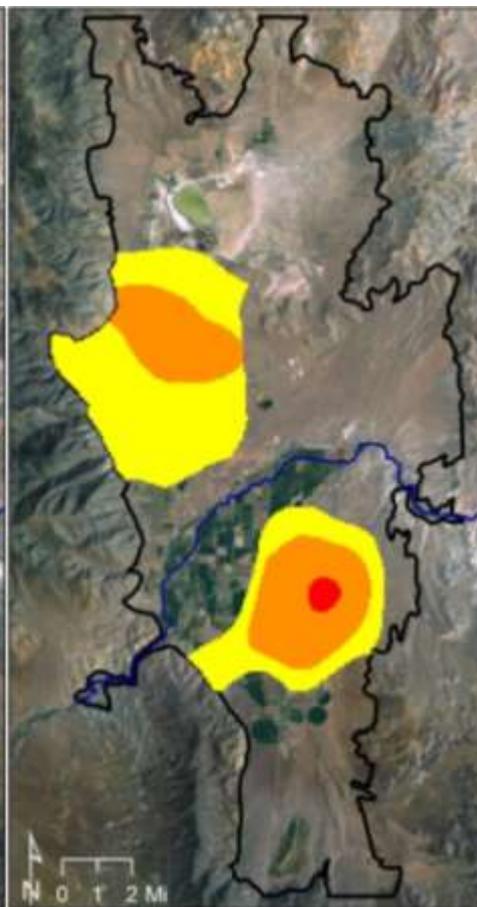
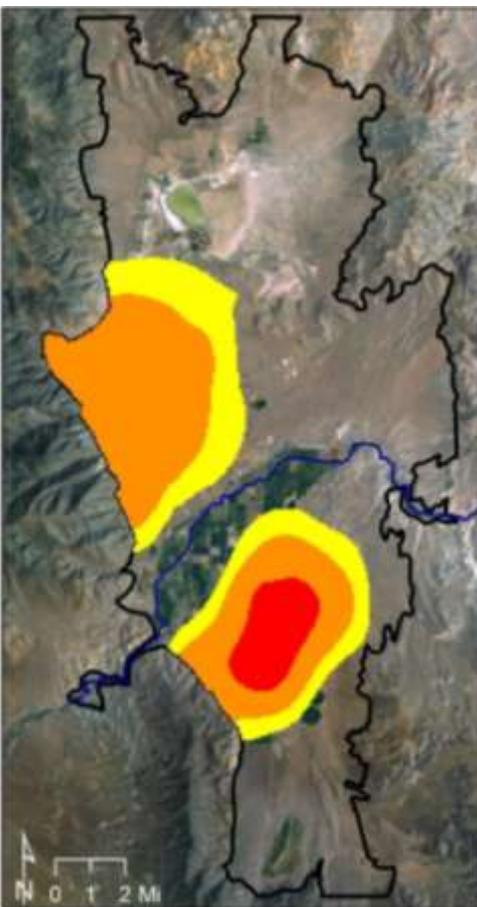
Streamflow = 20%

No Curtailment

75%

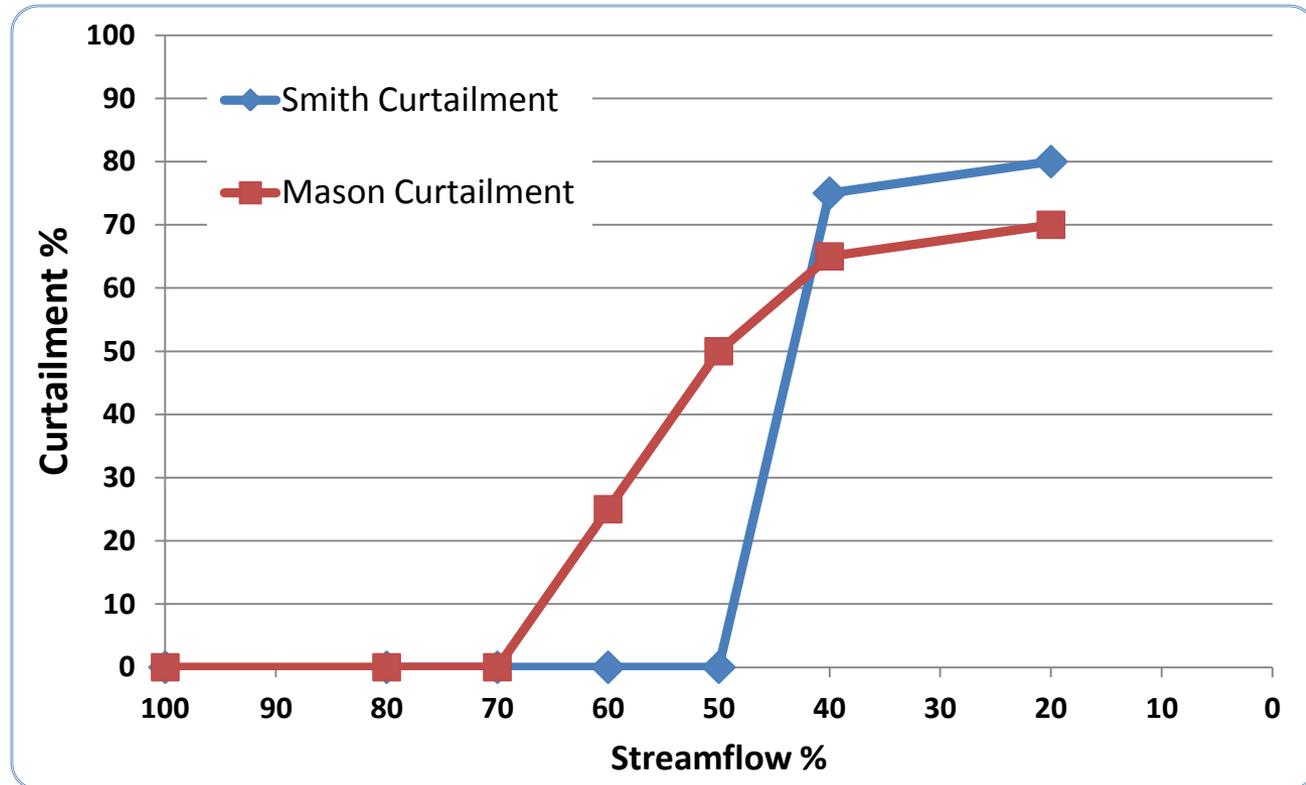
80%

100%



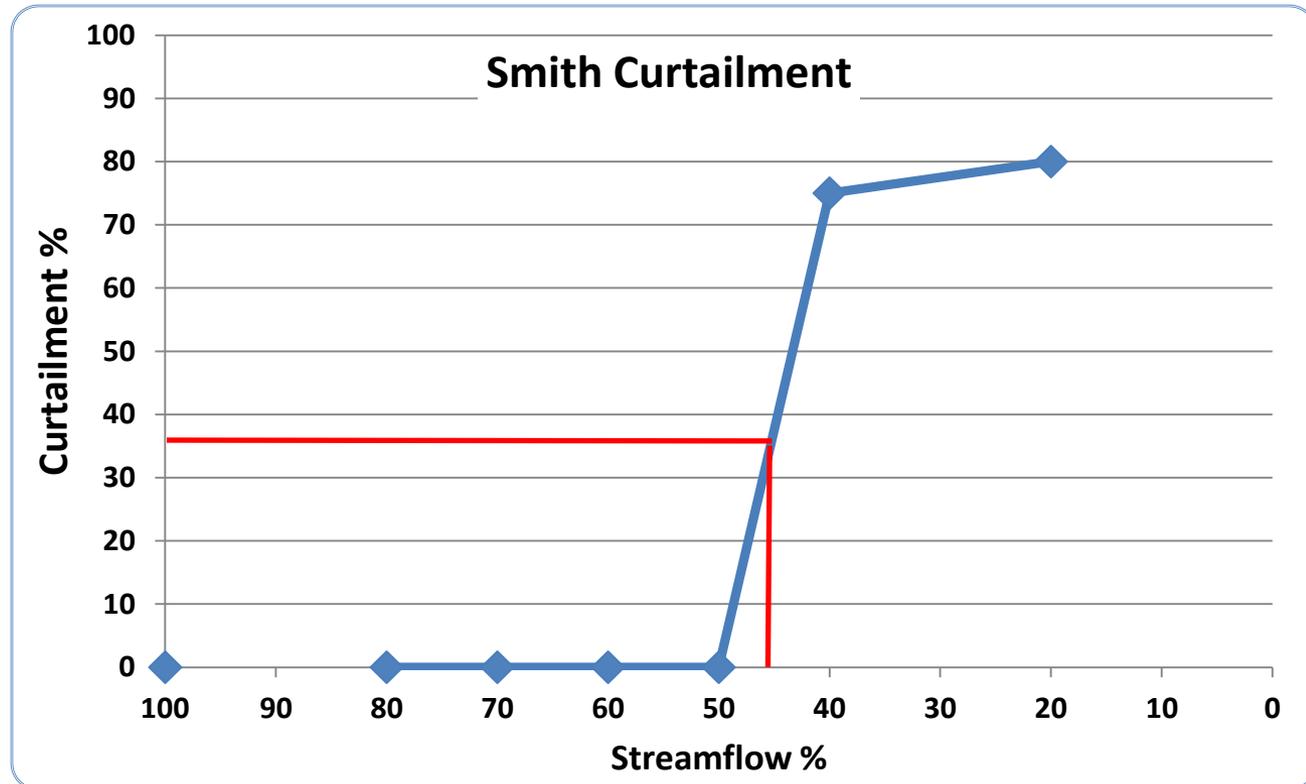
Curtailment Sliding Scale

- Sliding scale
- Less curtailment if river flow is higher
- Priority dates determined for each curtailment
- No curtailment at near normal or greater river flows



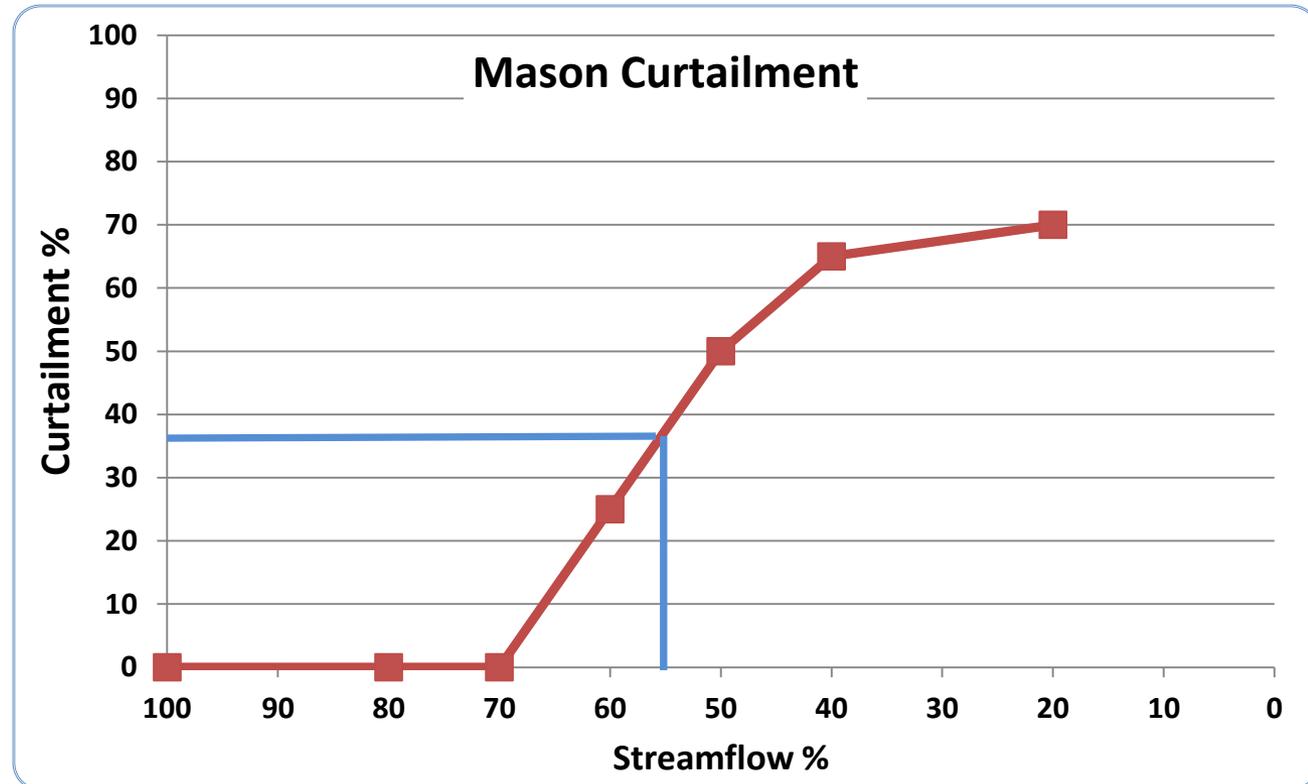
Curtailment Sliding Scale Example

- April 1 forecast is 45%
- Read curtailment for 45% streamflow
- Curtailment is 37.5%

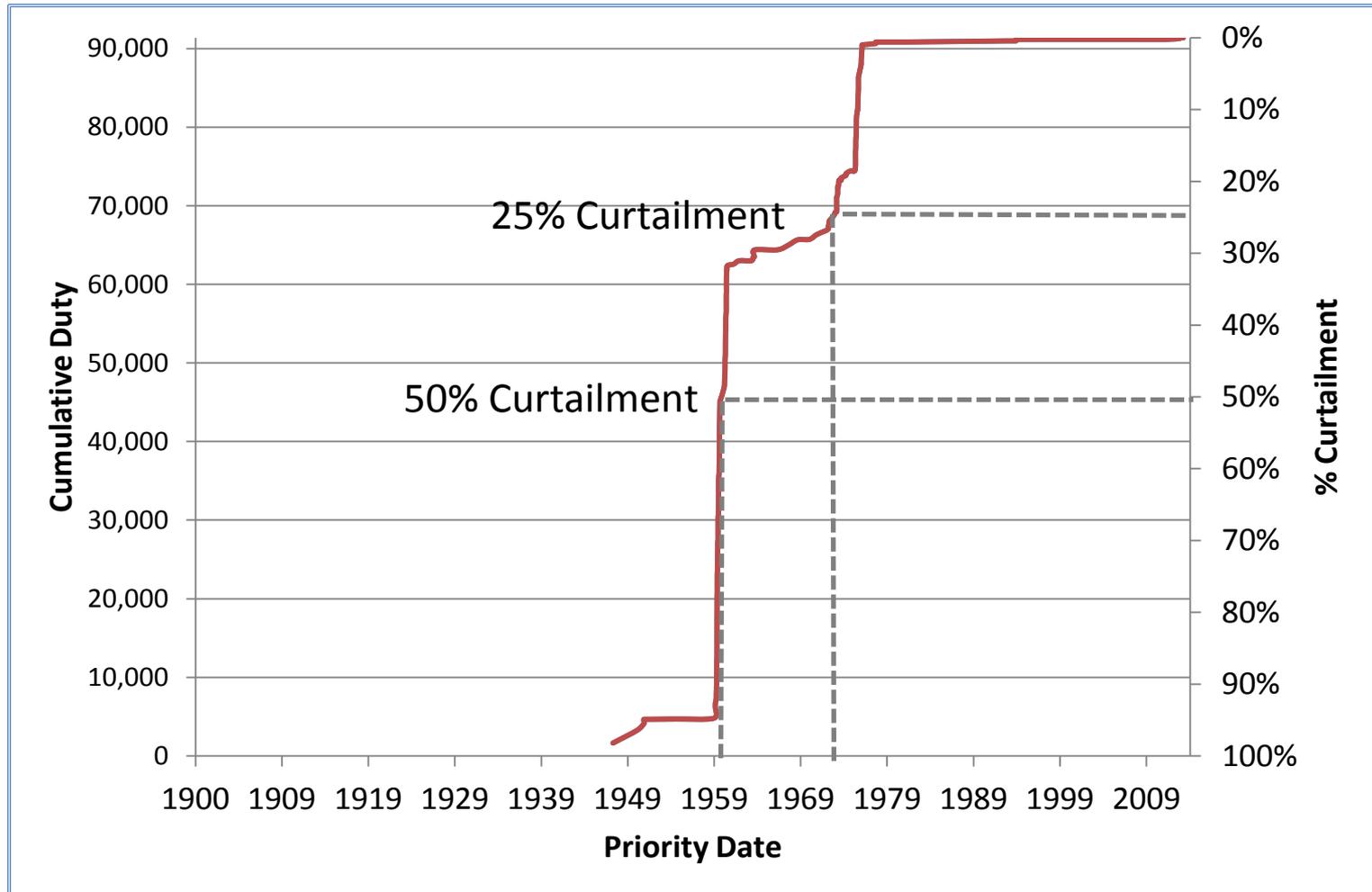


Curtailment Sliding Scale Example

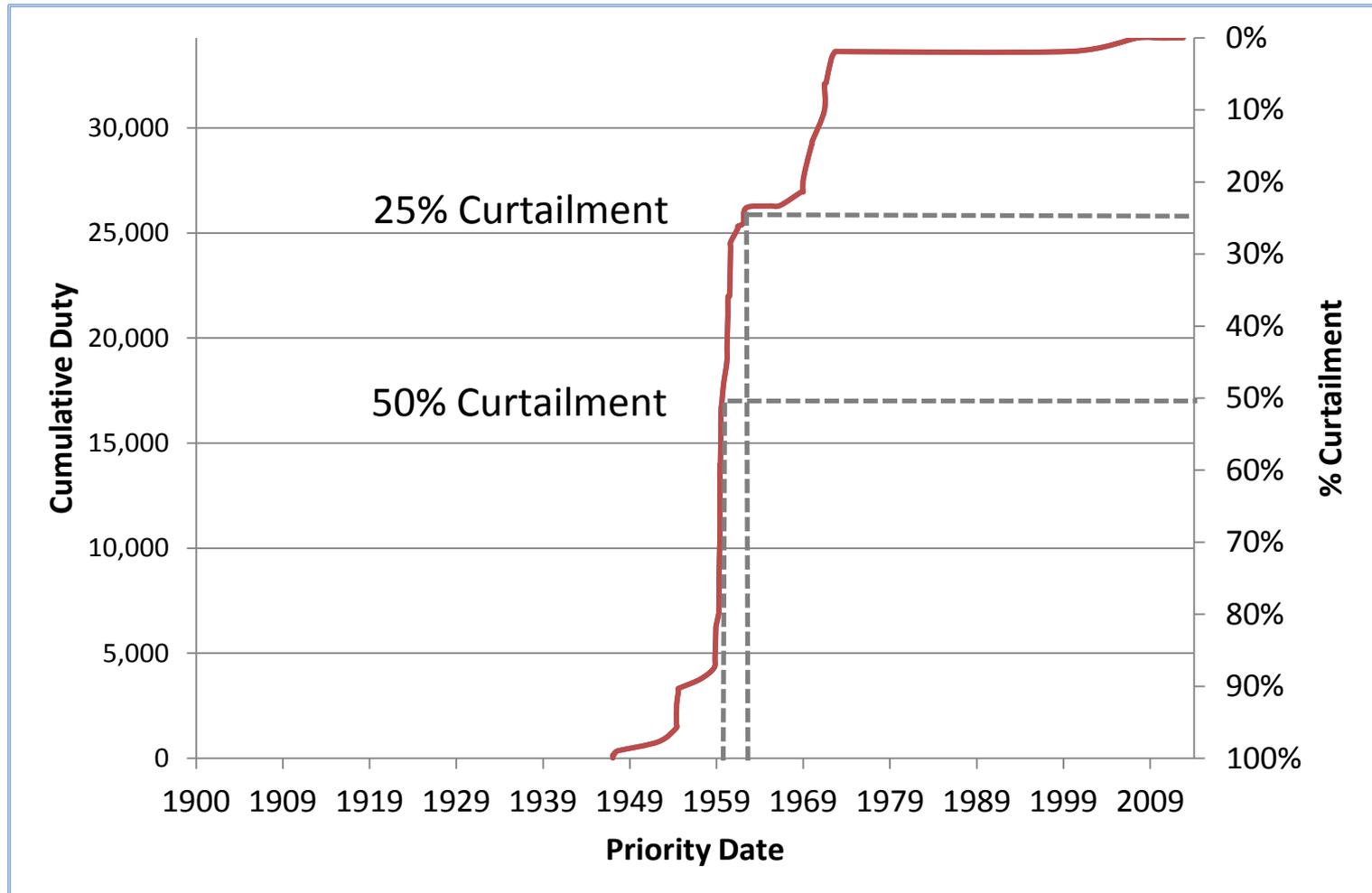
- April 1 forecast
55% of average
- Read
curtailment for
55% streamflow
- Curtailment is
37.5%



Supplemental Water Rights in Mason Valley



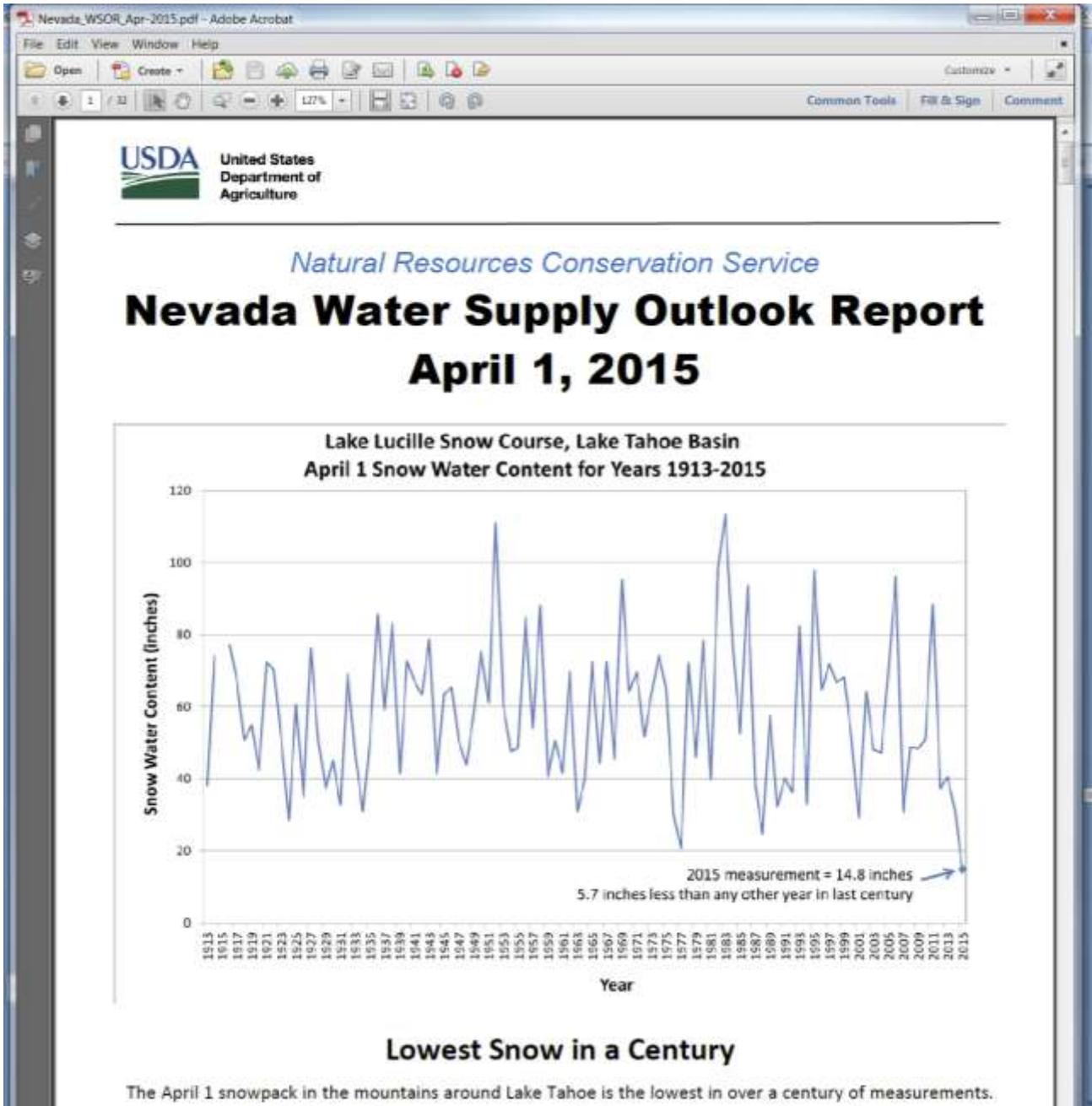
Supplemental Water Rights in Smith Valley



Streamflow Forecasts

NRCS April 1 Forecast for Water Supply

- Gages: West Walker nr Coleville and East Walker nr Bridgeport
- Best available forecast of water supply for Smith and Mason Valleys
- Data considered:
 - SNOTEL
 - Snow course
 - Total precipitation
 - Soil moisture
- Forecast updated monthly beginning January 1.
- <http://www.nrcs.usda.gov/wps/portal/nrcs/main/nv/snow/>



Walker River Streamflow Forecasts - April 1, 2015

 Forecast Exceedance Probabilities for Risk Assessment
 Chance that actual volume will exceed forecast

Walker River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
E Walker R nr Bridgeport	APR-AUG	0.67	2	8	12%	24	46	67
	MAY-AUG	0.59	1.77	6	10%	18.4	37	59
W Walker R bl L Walker nr Coalville	APR-JUL	0	7.5	24	15%	40	65	162
	MAY-JUL	0	5.1	21	15%	38	62	142
W Walker R nr Coalville	APR-JUL	15.7	21	24	15%	27	32	163
	MAY-JUL	0	2.9	21	15%	59	114	143
Walker Lake Elevation Change ¹	LOW-HIGH	-5.9	-3.5	-2.4	-170%	-1.26	1.17	1.41

1) 90% and 10% exceedance probabilities are actually 95% and 5%

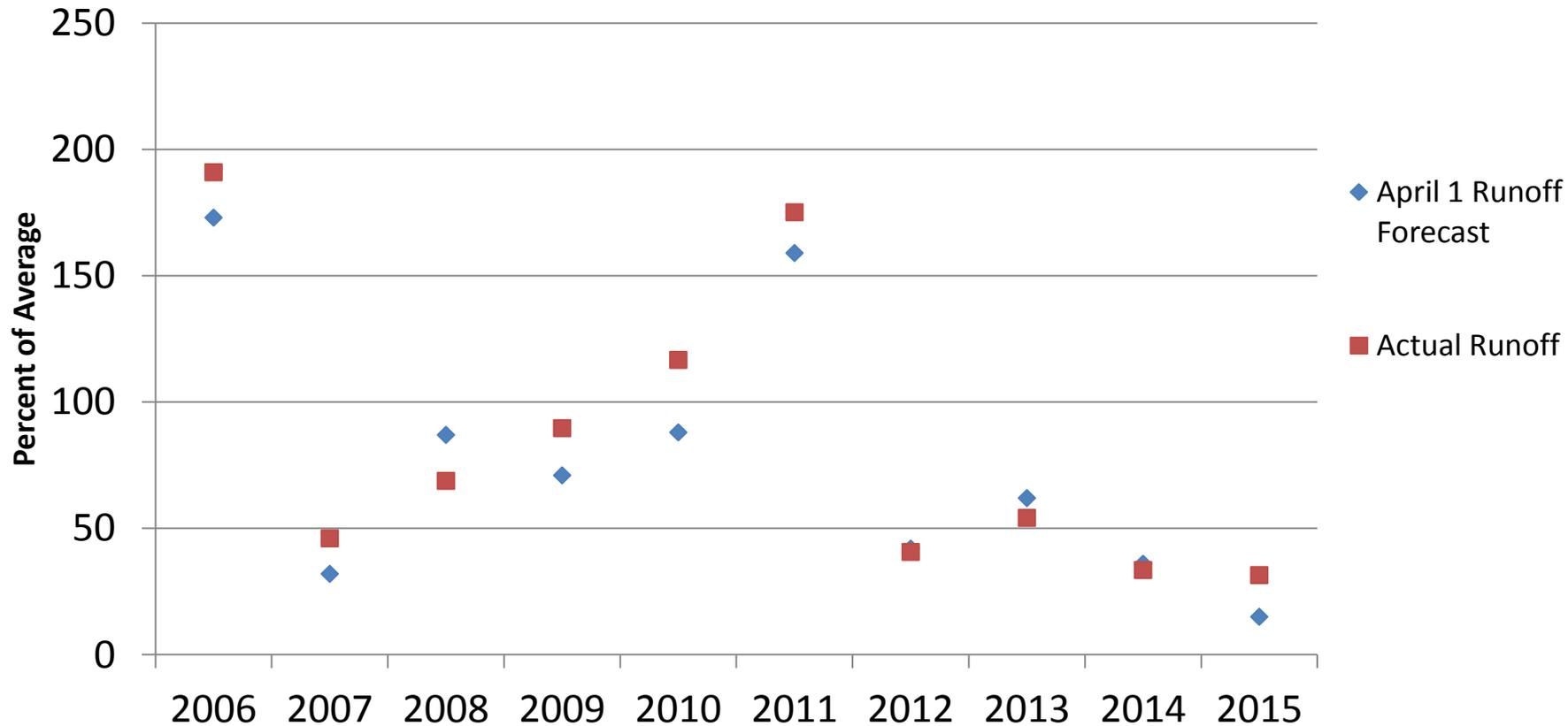
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

3) Median value used in place of average

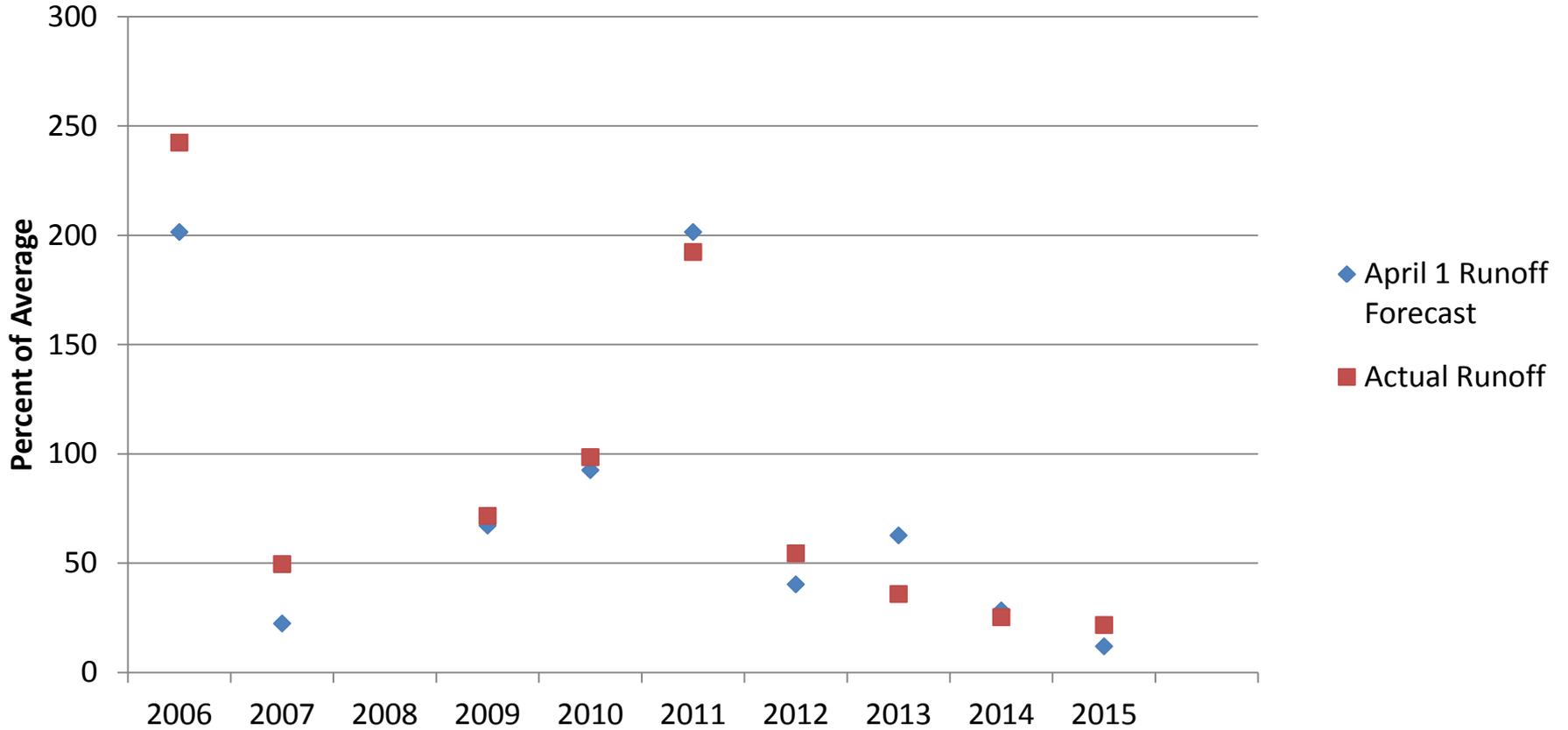
Reservoir Storage End of March, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Bridgeport Reservoir	6.5	10.2	27.2	42.5
Topaz Lake	9.6	7.9	32.1	59.4
Basin-wide Total	16.1	18.0	59.3	101.9
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis April 1, 2015	# of Sites	% Median	Last Year % Median
Walker River Basin	8	18%	44%
E. Walker Rv. Nr Bridgeport	4	4%	37%
W. Walker Rv. Nr Coleville	5	22%	48%

West Walker River near Coleville



East Walker River near Bridgeport



Curtailment Examples

Curtailment Example

One water right and one Place of Use :

If the curtailment priority cut-off date is 4/1/1974.



Irrigated Acreage: 100 acres



Water Right :
100 Acres
400 Acre-Feet
Priority 10/9/1972

Total Limit: 400 Acre-Feet for the irrigation of 100 Acres

Curtailment Example

One water right and one Place of Use:

If the curtailment priority cut-off date is 3/1/1970



Irrigated Acreage: 100 acres



Water Right :
400 Acre-Feet
Priority 10/9/1972

Total Limit: 0 Acre-Feet for the irrigation of 0 acres

Curtailment Example

Multiple water rights, one Place of Use , AND THE WATER RIGHTS ARE ADDITIVE:

If the curtailment priority cut-off date is 4/1/1974



Water Right No.1 :
100 Acre-Feet
Priority Date 10/9/1972



Water Right No.2 :
300 Acre-Feet
Priority Date 7/27/1977

Total Limit : 100 Acre-Feet

Curtailment Example

Multiple water rights, one Place of Use , AND THE WATER RIGHTS ARE NOT ADDITIVE:

Without a curtailment in place



Water Right No.1 :
75 Acres
Maximum: 300 Acre-Feet
Pro-Rata: 200 Acre-Feet



Water Right No.2 :
75 Acres
Maximum: 300 Acre-Feet
Pro-Rata: 200 Acre-Feet

Total Limit: 400 Acre-Feet for the irrigation of 100 Acres

Curtailment Example

Multiple water rights, one Place of Use , AND THE WATER RIGHTS ARE NOT ADDITIVE:

If the curtailment priority cut-off date is 4/1/1974



Water Right No.1 :
Maximum: 300 Acre-Feet
Priority Date 10/9/1972



Water Right No.2 :
Maximum: 300 Acre-Feet
Priority Date 7/27/1977

Total Limit: 300 Acre-Feet for the irrigation of 75 Acres

Why Only Supplemental Rights are Curtailed

Basis for Curtailment of Supplemental Groundwater Rights

- Perennial Yield is the amount of groundwater that can be pumped every year without depleting the resource
- System Yield has been defined as the amount of surface and groundwater that can be used each year for an indefinite period of time.
- EXCEPT in the case of severe and prolonged drought, the continued reliance on groundwater as the primary water supply can result in unreasonable lowering of the water levels and depletion of the aquifer.

Water Budgets – Water Supply

- Mason Valley
 - Perennial yield of 25,000 af
 - Recharge from precipitation ~2,000 afa
 - All other recharge derived from Walker River and irrigation
 - Perennial yield assumes additional capture of ET by conversion of new acreage to cropland
 - System yield of 100,000 af (consumptive)
 - Includes surface water and groundwater (1948-1965)
 - Appropriation of supplemental groundwater allows for full system yield use in all years
 - Groundwater appropriations = 148,000 af
 - 91,000 af supplemental to surface water rights

Water Budgets – Water Supply

– Smith Valley

- Perennial yield of 17,000 af

 - Recharge from precipitation = 17,000 afa

- System yield of 62,000 af (consumptive)

 - Includes surface water and groundwater (1958-1972)

 - 17,000 afa recharge

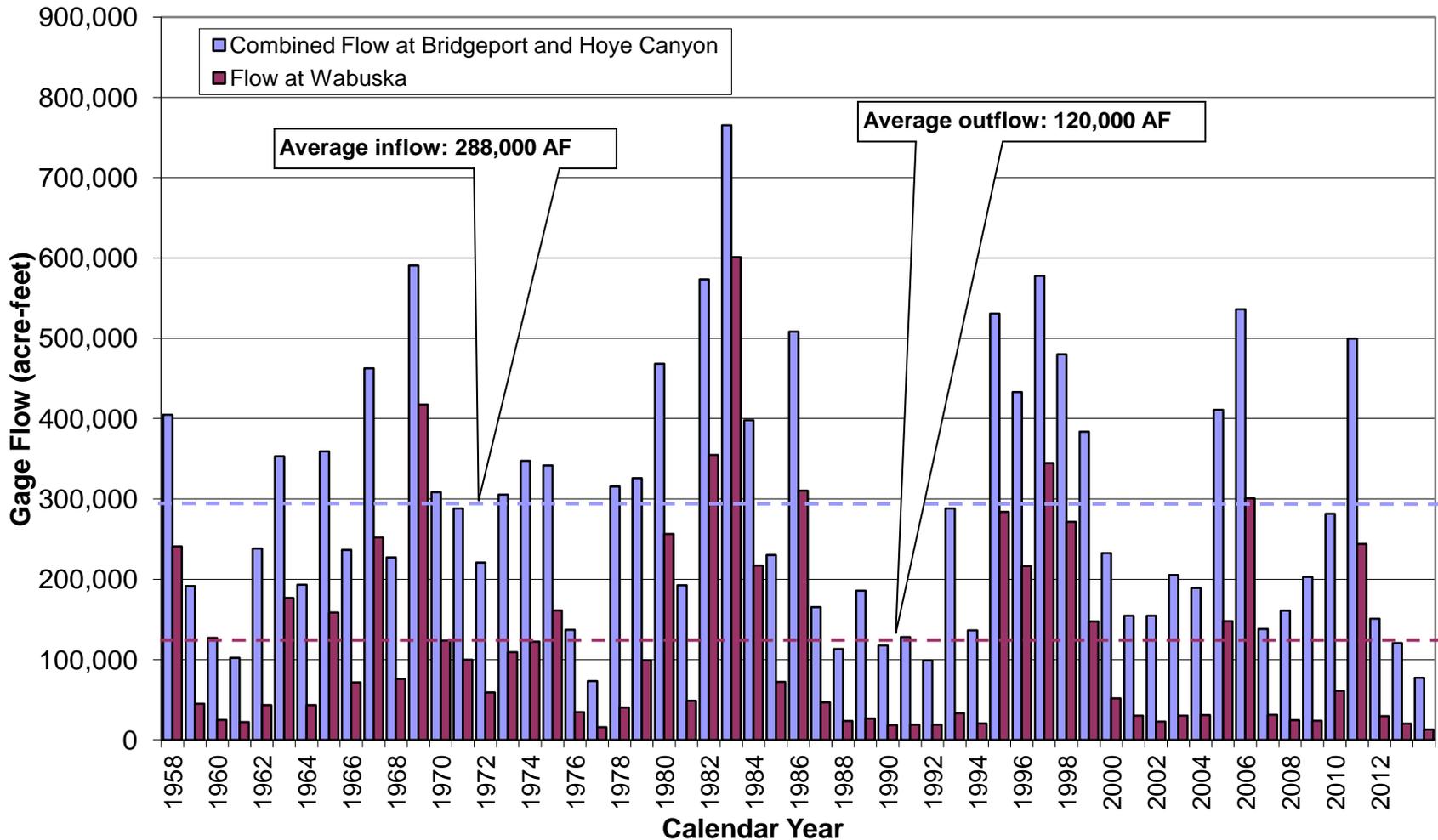
 - 75,000 afa diversions

 - (-)30,000 afa return flow

- Groundwater appropriations = 55,000 af

 - 34,000 af supplemental to surface water rights

Walker River Flows in Smith, Mason and East Walker Basins



Curtailment Order Review

- Targeted water level change of 4 feet or less
- Use existing groundwater flow models to simulate river flows and curtailment
- Curtailing supplemental irrigation only
- Sliding scale approach
 - Increasing curtailment when flows are lower
 - Priority tables available on our website (Water.nv.gov)
- Use April 1 NRCS forecast for determination of water supply
- Actual curtailment amount for 2016 to be determined in first week of April
- Curtailment may be adjusted (downward only) based on April and May precipitation, use NRCS May 1 and June 1 forecast

State Engineer Actions for 2016

- Draft Curtailment Orders in early September 2015
- Hearings in early October 2015
- Curtailment Orders issued in early October 2015
- Curtailment of supplemental groundwater only
- Use April 1, 2016 NRCS runoff estimates as basis
- Farmers have access to the same information as State Engineer in determining need for curtailment
- Continued high level of presence in both basins

A satellite map of a desert region, likely in Nevada, showing a central valley with green overlays. The overlays consist of several rectangular and irregular shapes, possibly representing agricultural fields or specific land parcels. The terrain is arid and hilly. Labels for 'Yerington', 'Schurz', 'Smith Valley', and 'Wellington' are visible. Highway markers for 395, 208, and 393 are also present. The text 'Questions?' is overlaid in large yellow font.

Questions ?

Yerington

Schurz

Smith Valley

Wellington

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