



CONPLAN ATLANTIS



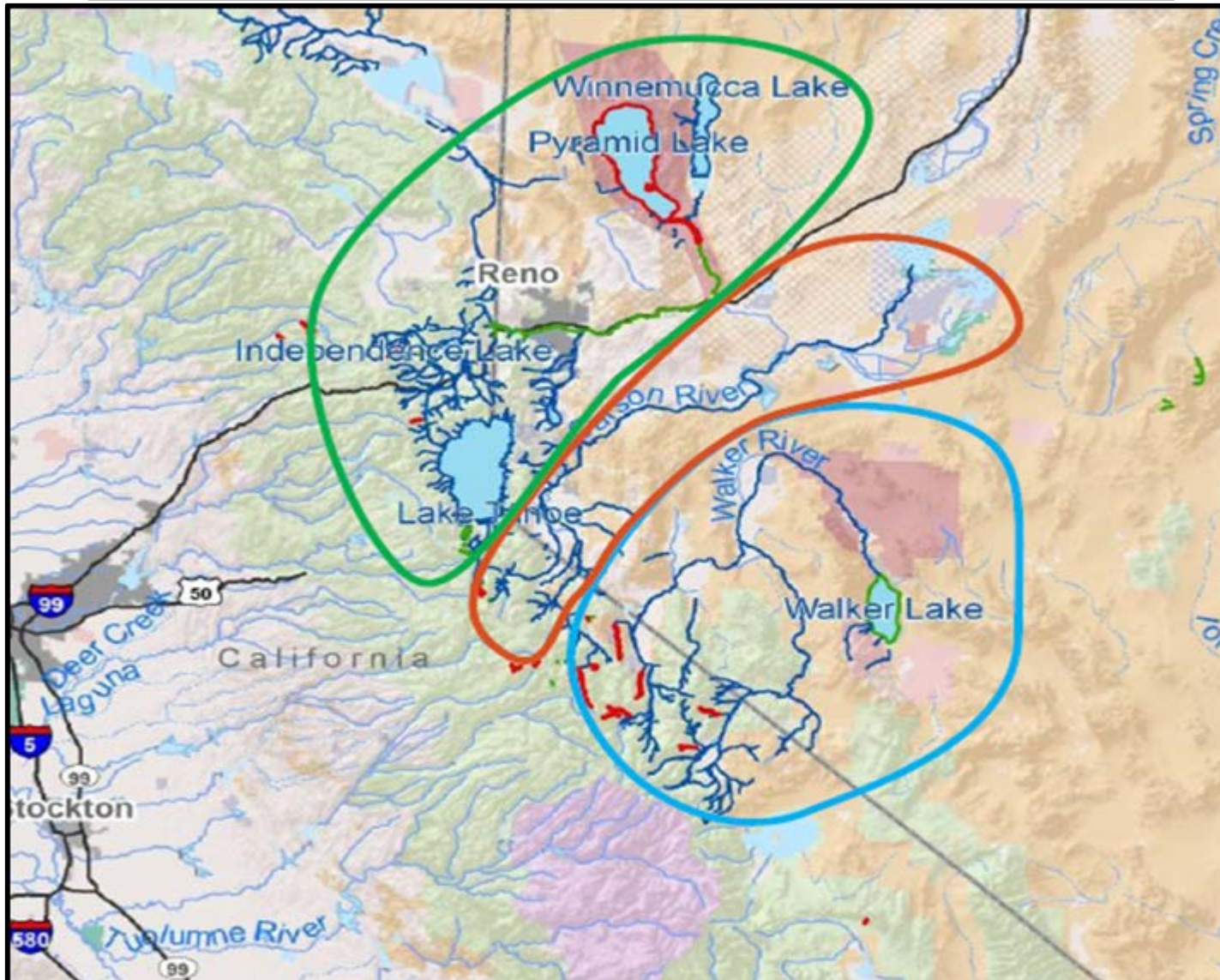


Agenda

- Operating Environment/Area of Interest
- Current Situation
 - Snow Pack / Water Totals
- Probable Scenarios/Impacts
 - Walker River Scenario
 - Carson River Scenario
 - Washoe Valley
- Decision Points
- Response
- Questions



Area of Operations





Spring Flood Outlook

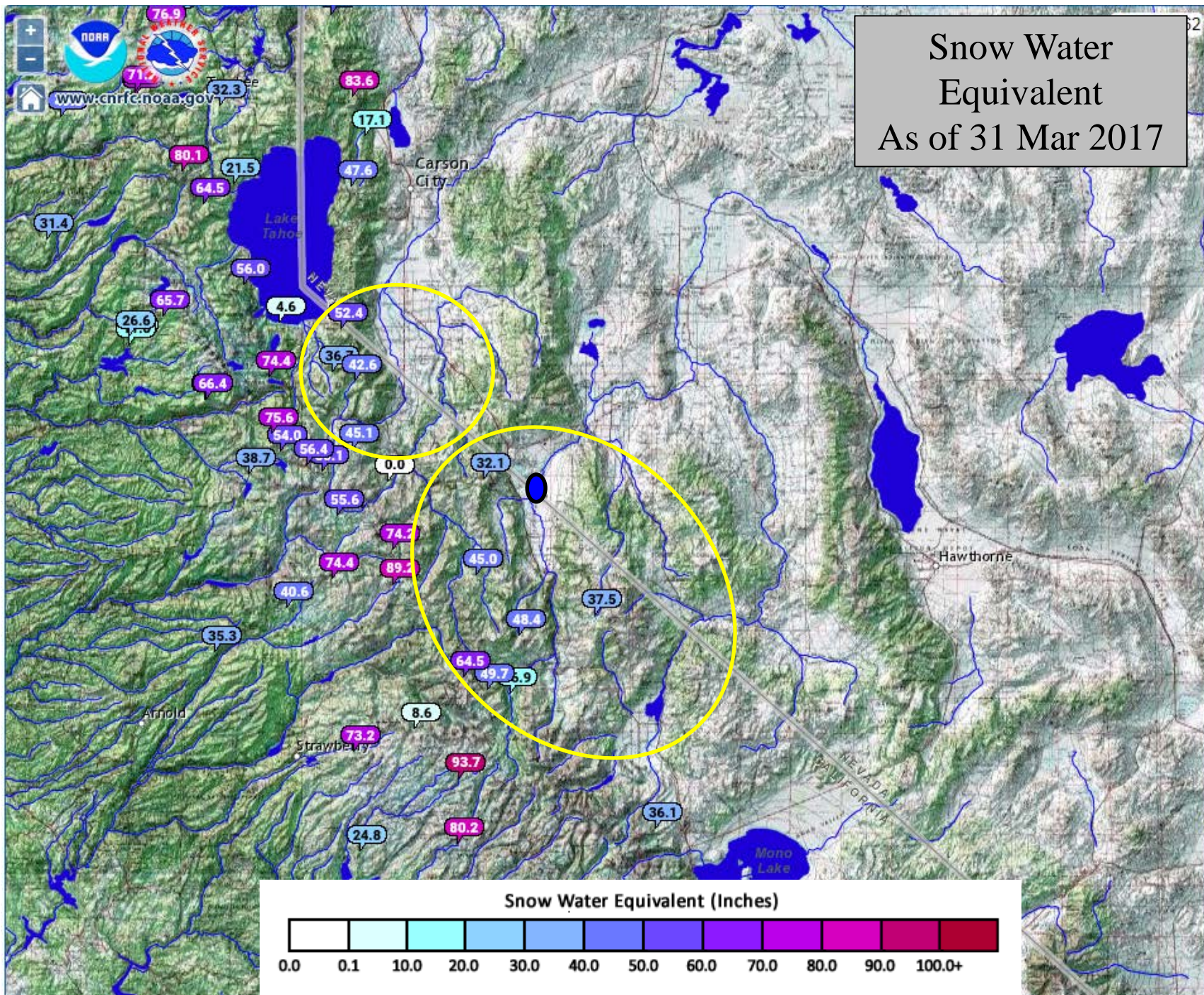


Key Points Up Front

- **Flooding is certain** from spring into summer along rivers and streams fed by snowmelt. **The question is how severe?**
- **Severity** affected by **spring storms and/or temperatures.**
- **Flash flooding** - remains **high risk**
- **Strong potential for flooding in communities**
 - Yerington, Schurz, Silver Springs, Fallon



Snow Water
Equivalent
As of 31 Mar 2017





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How much water is in the snow pack?



Walker Basin:

640,000 acre ft. or 208 Billion Gallons.

**This is enough water to fill the Empire State
Building 753 times.**

Carson Basin:

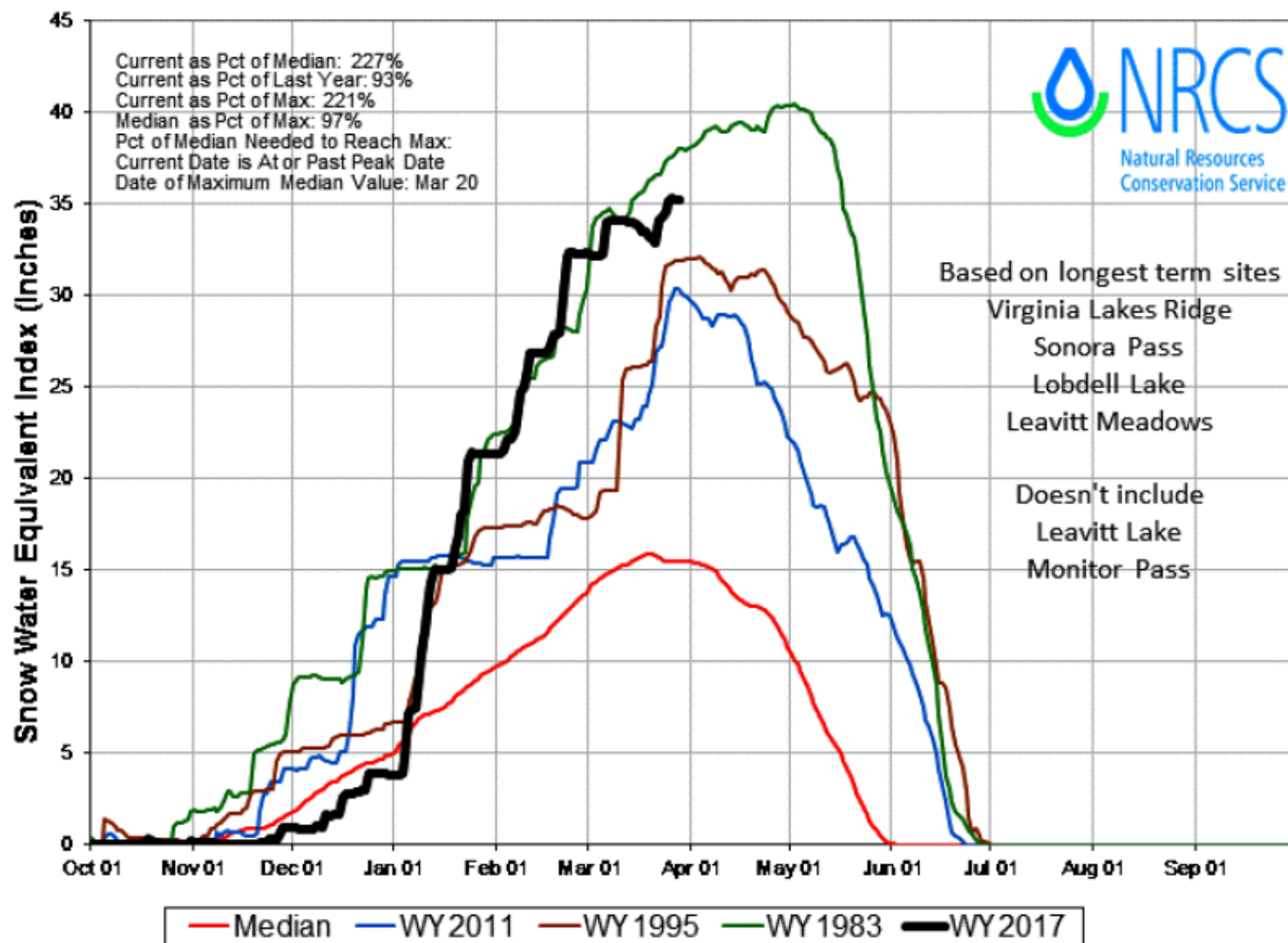
736,000 acre ft. or 239 Billion Gallons.

**This is enough water to fill the Empire State
Building 866 times.**



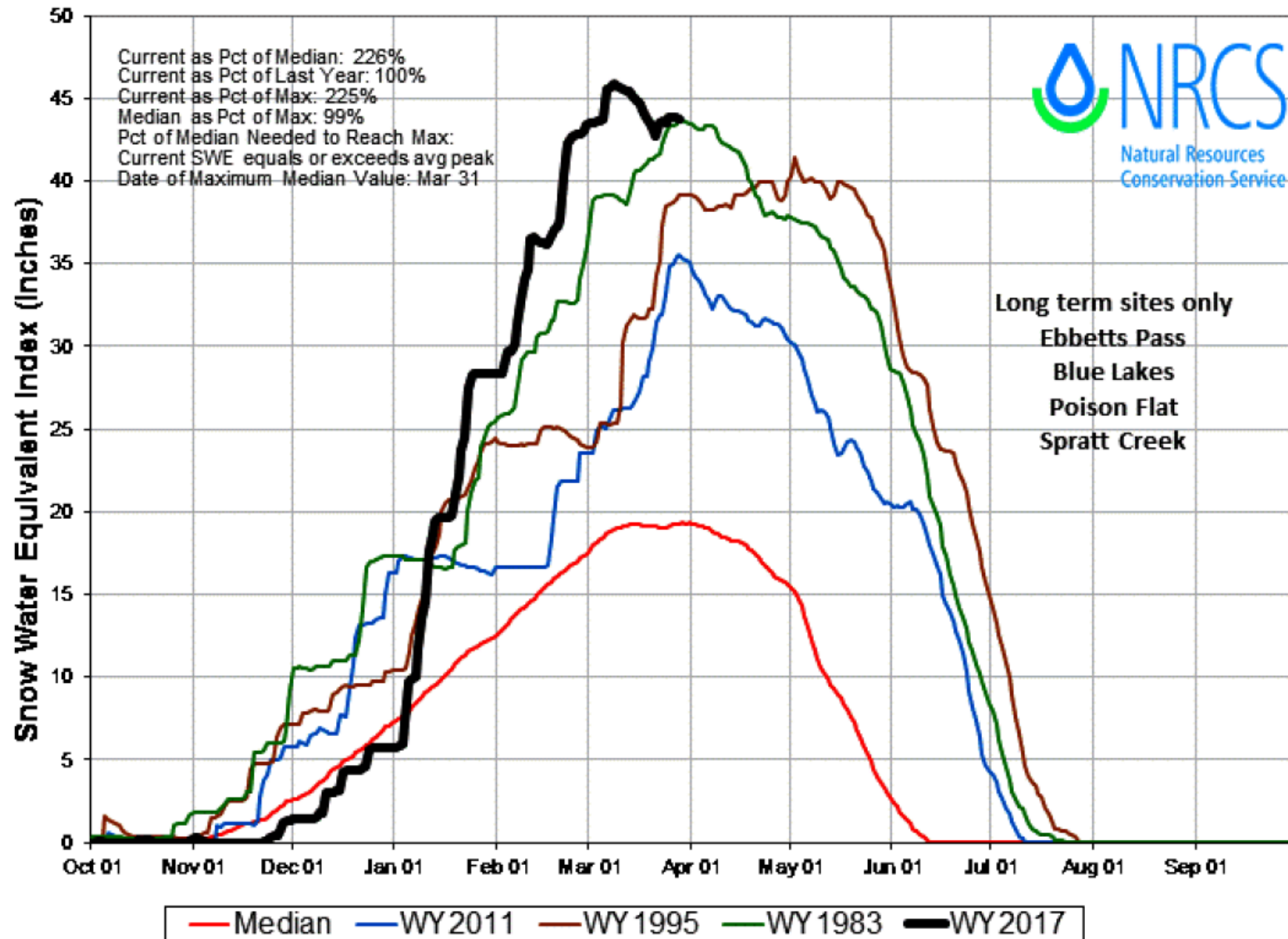
Have We Reached Peak Snowpack?

WALKER RIVER BASIN Time Series Snowpack Summary **Based on Provisional SNOTEL data as of Mar 28, 2017**

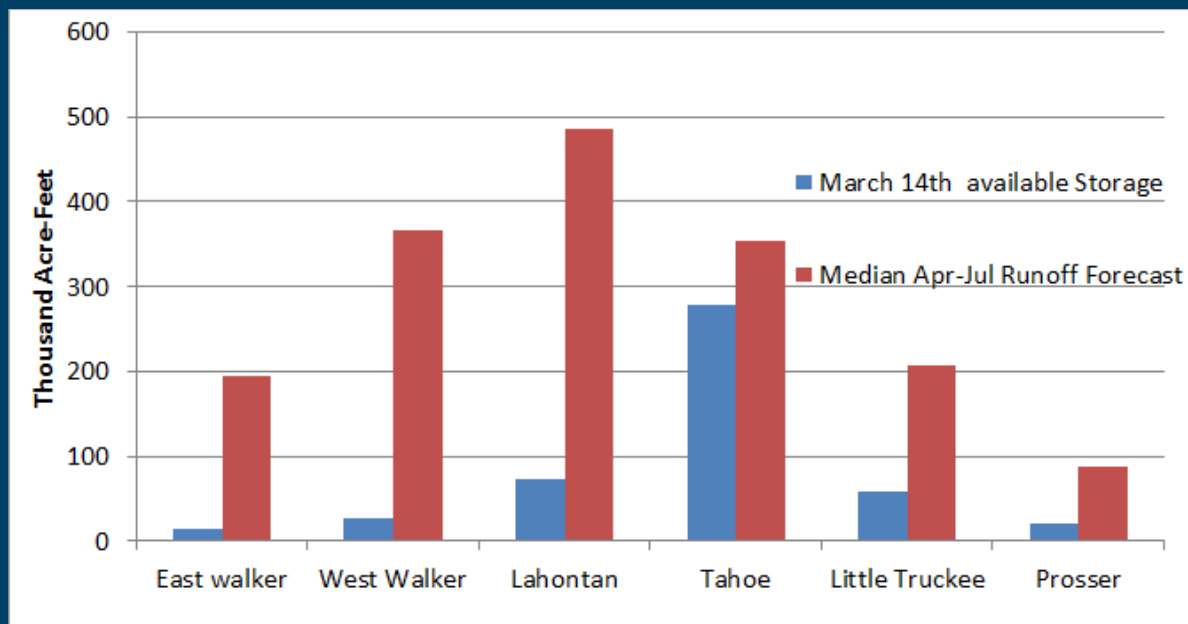


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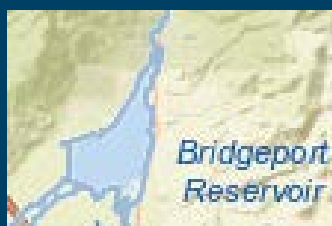
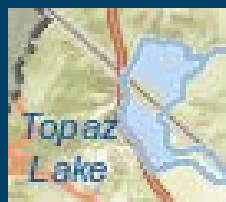


Reservoir Space vs What's Coming...



Reservoirs - will help reduce flooding downstream, but due to expected runoff volume and reservoir capacities, they will not eliminate downstream flood risk.

***Snowmelt equals 5x Topaz and Bridgeport or 47x the Weber Reservoir



Reno National Weather Service

Forecasting for the Sierra and western Nevada since 1905

Situational Awareness - When Should I Freakout?

Chris & Tim's Rough Sketch on Timing the Highest Risks of Snowmelt Flooding

	March	April	May	June	July	August
Walker River Basin						
Carson River Basin						
Truckee River Basin						
Tahoe Basin Creeks/Streams						
NE California Basins						
E Sierra Creeks/Streams						
Humboldt River Basin						
What Does This Mean?	No worries	Low level of freakoutness	Moderate freakoutness	High freakoutness	End of this	

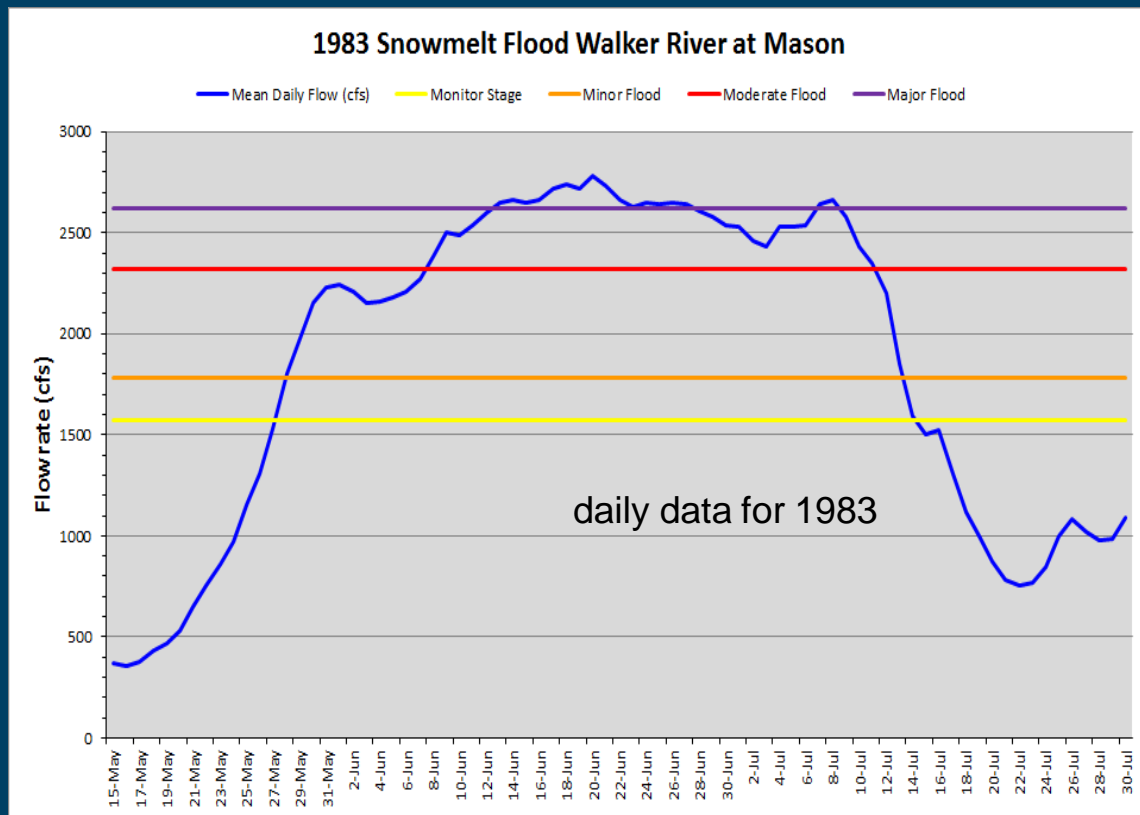
What Does this Mean for the Walker River?

Walker Basin is the most likely major basin to experience significant and prolonged snowmelt flooding.

Minor flooding likely in upper basin, but longer and more significant flooding likely in valley locations.

Intensity based on snowmelt rate, contributing area, and runoff efficiency

Flooding impacts could last well into July.





Flooding Emergency Declarations

Churchill County 3 March 2017

Steve Ranson
sranson@lahontanvalleynews.com

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March 3, 2017
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County, city declare state of emergency

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STEVE RANSON / LVN

The Churchill County Commission declared a state of emergency today in order to access state resources if flooding becomes an issue in the Lahontan Valley this spring. This bridge crosses the Carson River on U.S. Highway 95 North.

STAY INFORMED

Churchill County will post all updates at the top of their main page <http://www.churchillcounty.org>

City of Fallon will post updates at the top of their main page <http://www.fallonnevada.gov>

Churchill County Sheriff's Office will post all updates on Facebook at <https://www.facebook.com/ChurchillSO/>

Truckee Carson Irrigation District posts updates on Facebook at <https://www.facebook.com/Truckee-Carson-Irrigation-District-189654201053657/>

CFMA Flood Maps and National Flood Insurance

Churchill County and the city of Fallon declared a state of emergency today so local agencies will be able to maximize resources available from the state.

Both county and city officials emphasize there is no immediate threat to any area of the community. The combined government team is concerned a significant amount of water will flow on government land southeast of Sheckler Reservoir and eventually cross U.S. Highway 95 to Carson Lake.

A spokesman from the combined government team said efforts are being made by the Nevada Department of Transportation to reduce the impact to the highway. The Truckee-Carson Irrigation District has previously reported water in that area will remain for several months.

Rusty Jardine, TCID's executive director, said Thursday the precautionary drawdown of the Lahontan Reservoir is in progress with water being released in the Carson River. He said increased flows should be expected. For example, he said the river flow at Bafford Lane is 773 cubic feet per second.

"We have a true river once again," Jardine said of the Carson River's flow. "We encourage residents

Lyon County – 16 March 2017

Lyon County approves flood-related emergency declaration



Photo taken 2/7/2017

By Staff/Lyon County Release | Posted: Fri 12:18 PM, Mar 17, 2017 | Updated: Fri 2:29 PM, Mar 17, 2017



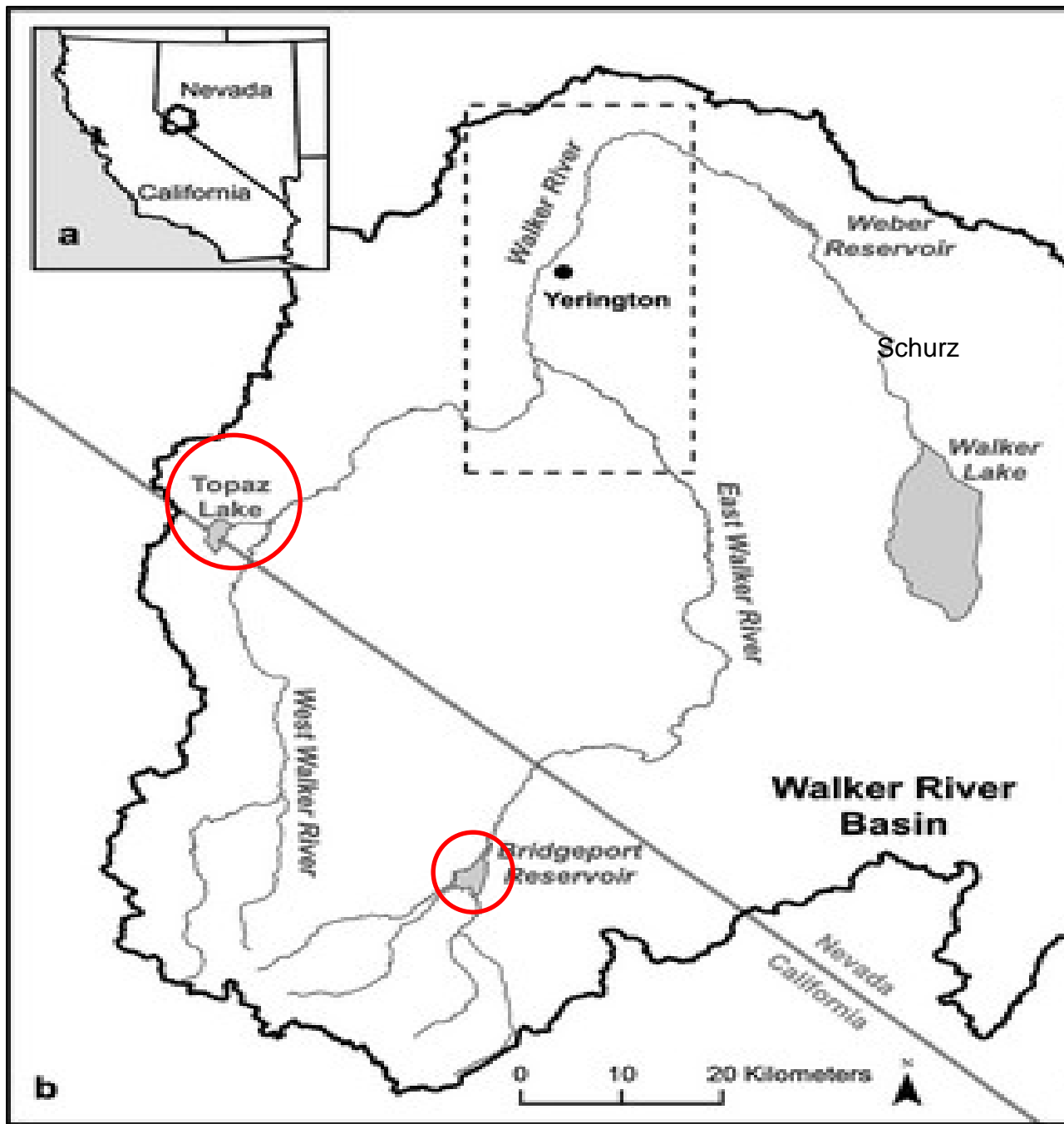
YERINGTON, Nev. (KOLO) - The Lyon County Board of Commissioners has approved a Declaration of Emergency for all of Lyon County in preparation for potential flooding from spring and summer snow melt runoff.

Douglas County – est. 6 Apr 2017

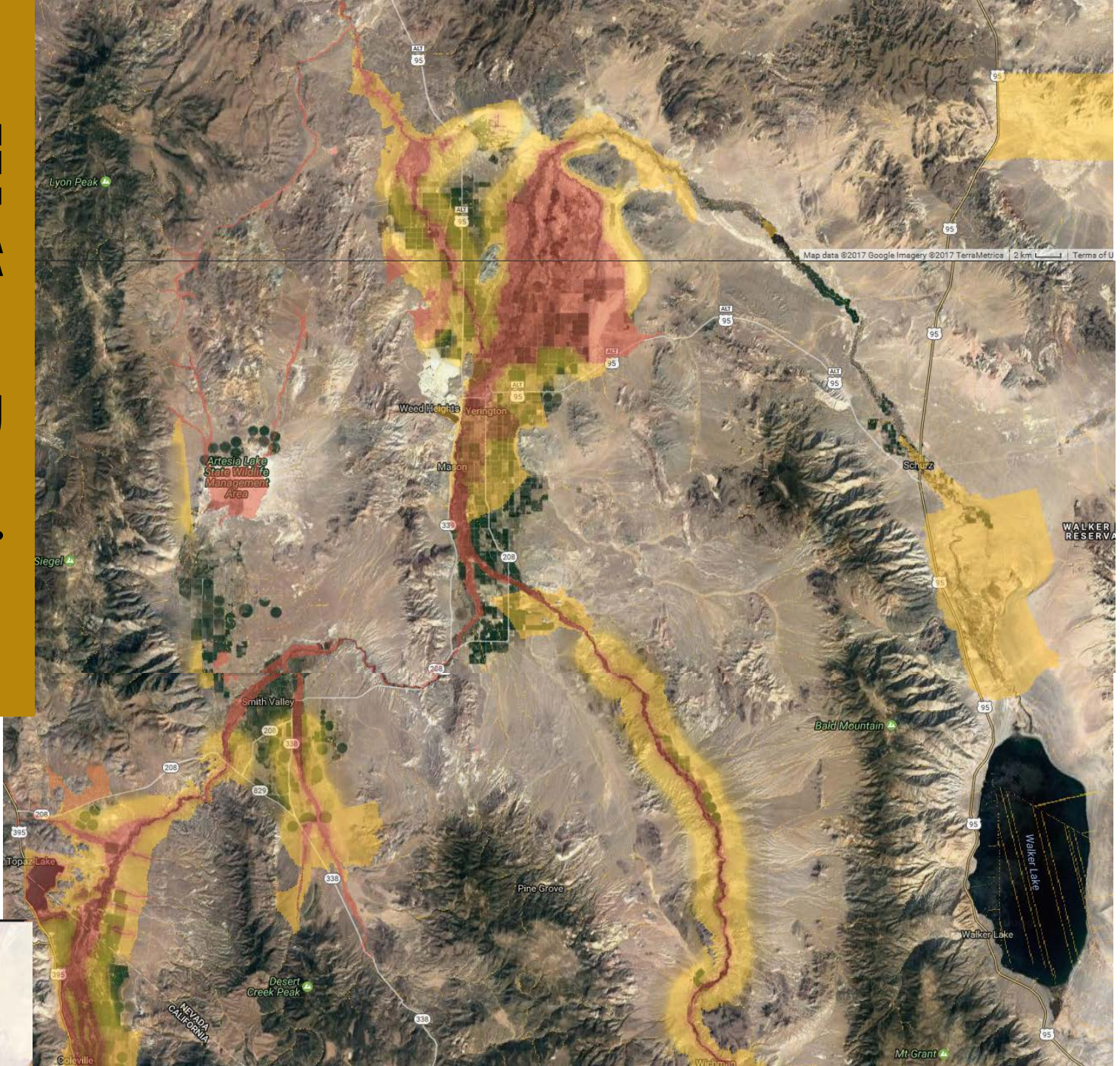
Schurz – est. 13 Apr 2017



Walker River Basin Scenario



Walker Basin



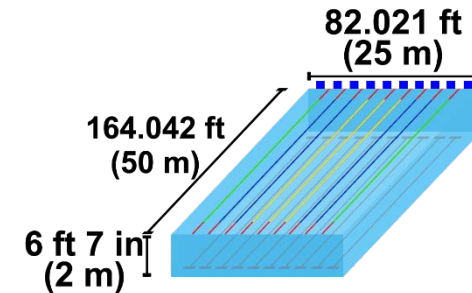


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What does 1,000 CFS look like?



Olympic Pool



Volume: 660,000 US gal

**25m x 50m x 2m = 2,500 m³
or 88,000 Cubic Feet**

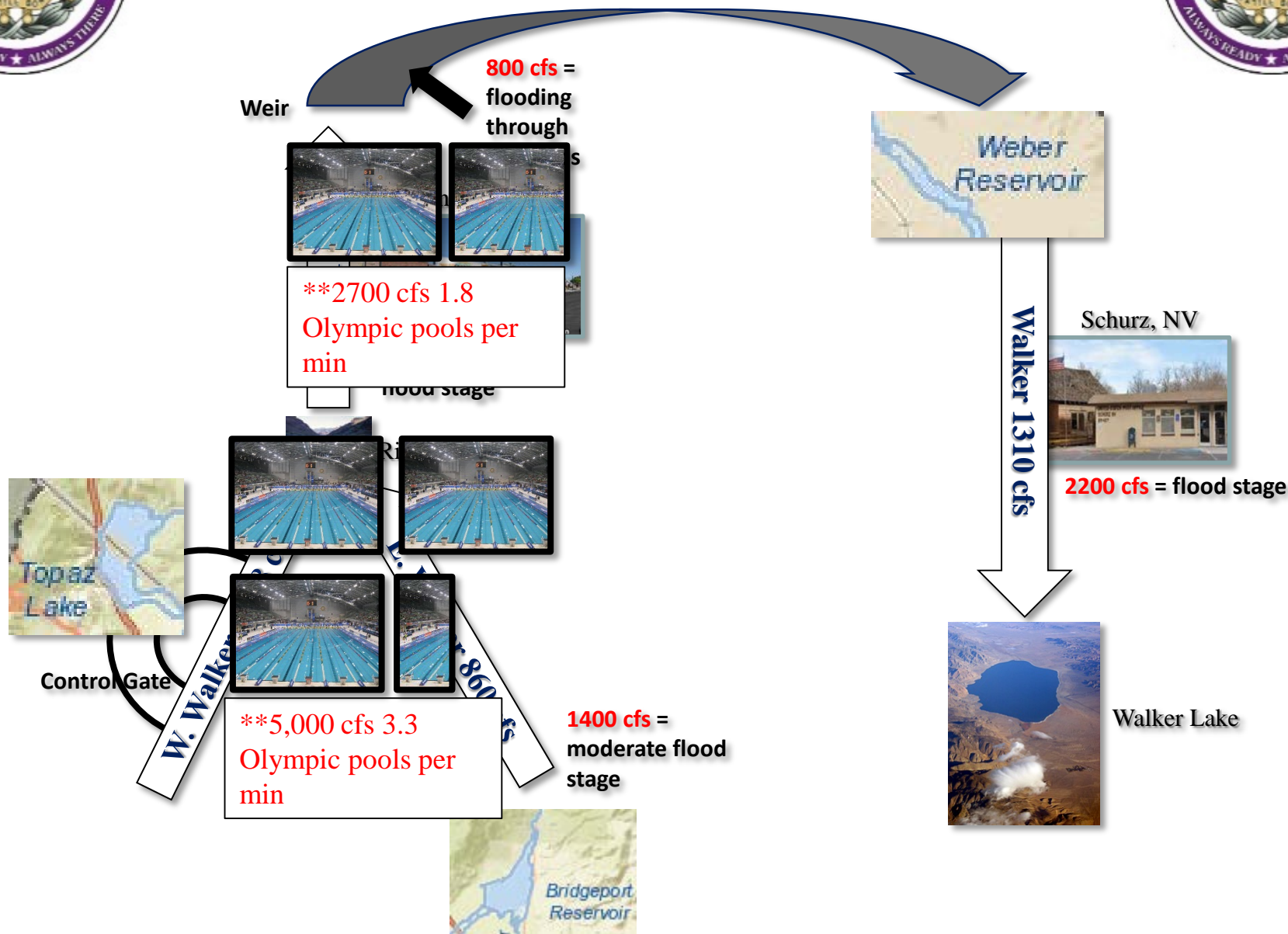
**At a rate of 1,000 CFS, an Olympic sized pool
would be filled in 1 minute 28 seconds.**

**Over the period of 24 hours a rate of 1,000 CFS
would fill 981 Olympic Pools**



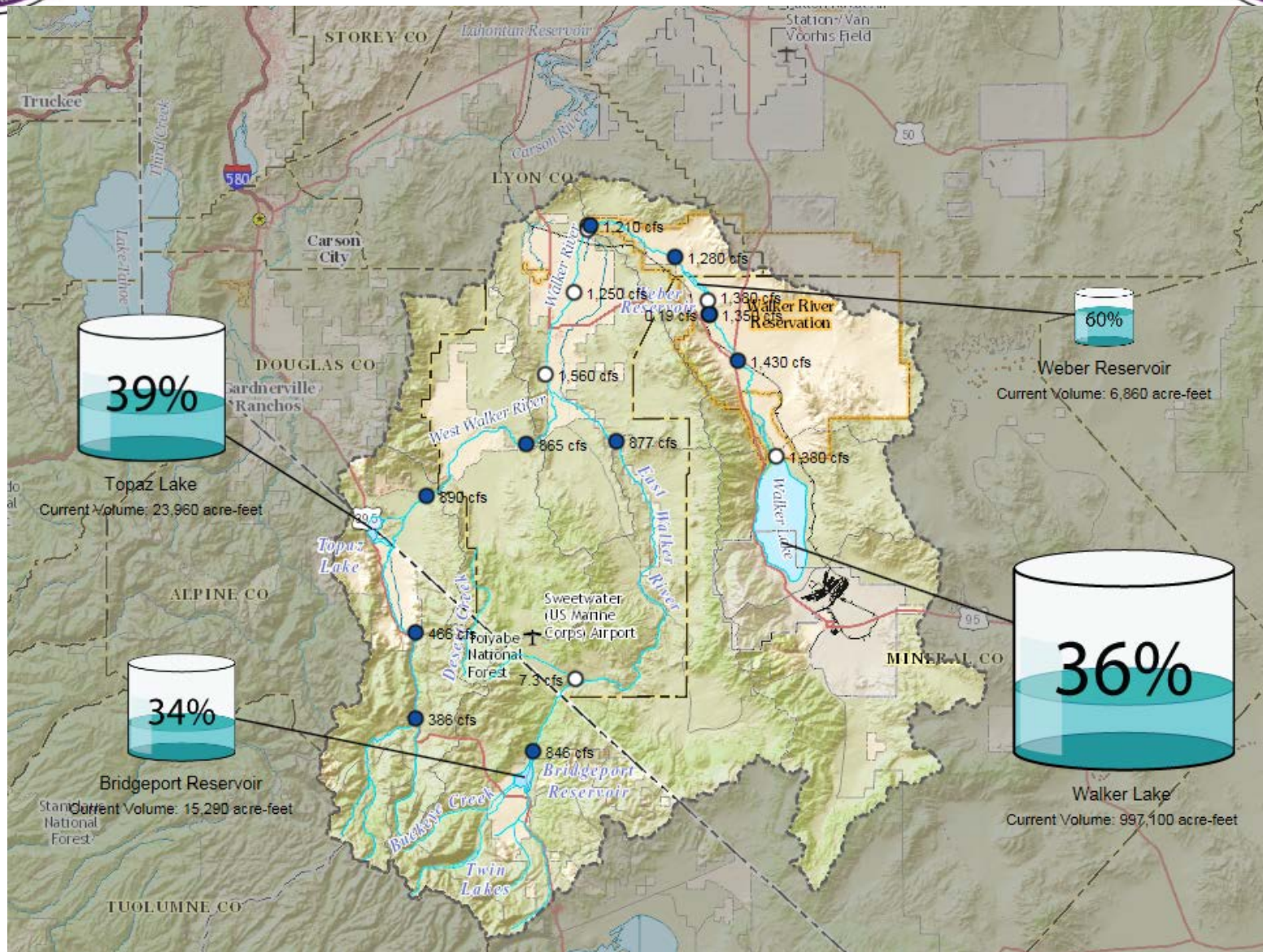
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Walker River Basin





Walker Basin – Hydromapper





When Could Topaz Be Full? What does Topaz Full Mean?

- Topaz could be full as soon as May 23-30th
 - Date varies by snow melt, rain events, draw down rate
- Topaz full = uncontrolled river flow into Smith & Mason Valleys
- Yerington Flooding
 - Major flood stage
 - May through July



Bridgeport Dam

Elev. **6461** ft
for Spillway

40' Drop

1880 cfs max
(controlled
release)

≈70ft drop off

Elev. **6473** ft

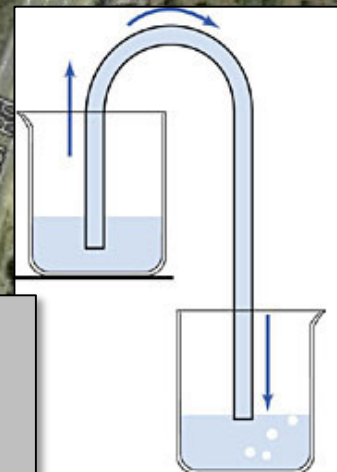
Elev 6470 ft

Bridgeport
Valley

Guard House Siphons
Elev. **6459.94** ft

Elev. 6475 ft

Bridgeport
Reservoir

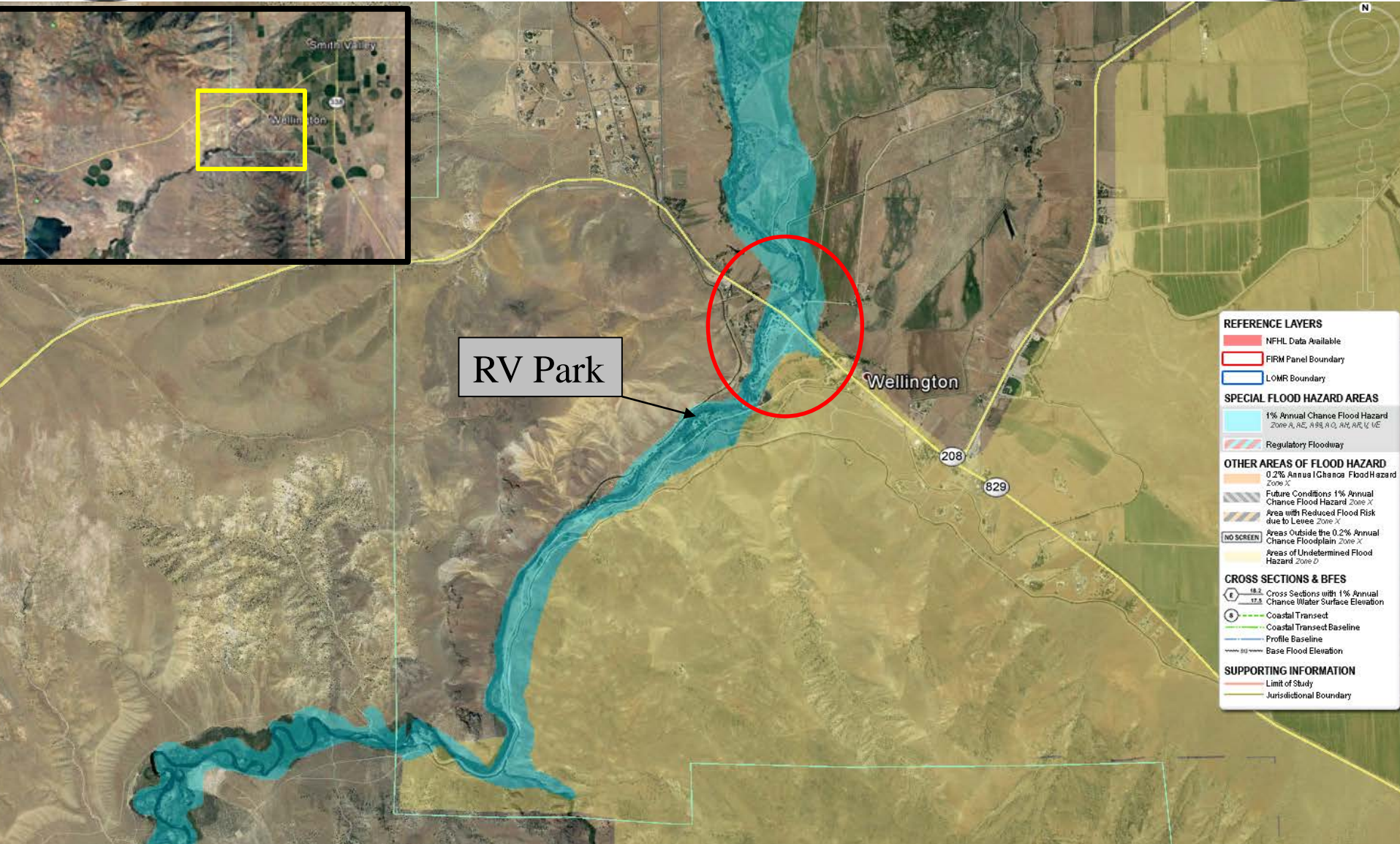


Considerations

1. Spillway elevation = 1 ft above Siphons
2. Siphon vibration affects on Dam??
3. US Army Corp of Engineers modify spillway elevation lower than siphons ASAP

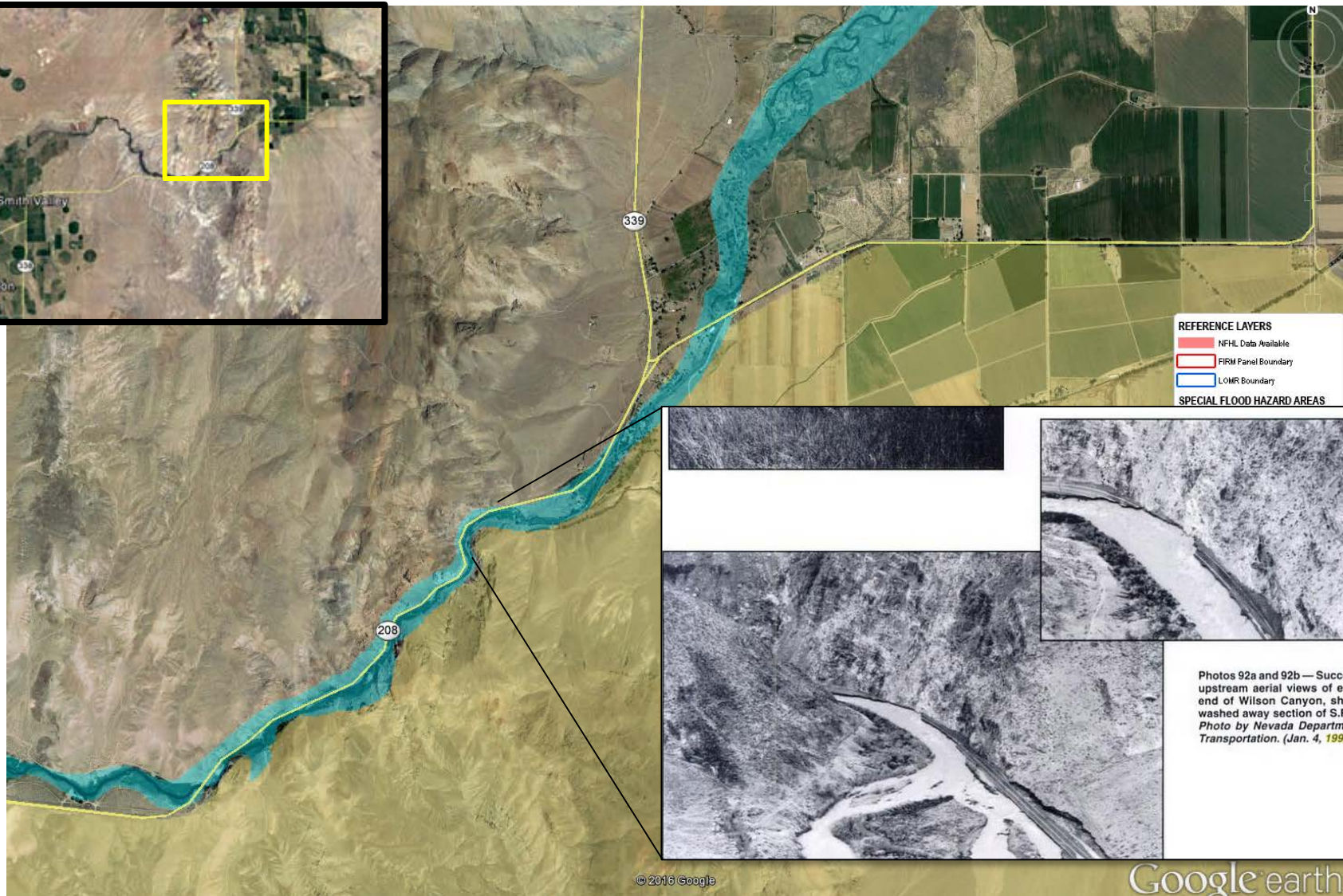
WEST WALKER RIVER

Wellington





WEST WALKER RIVER Wilson Canyon

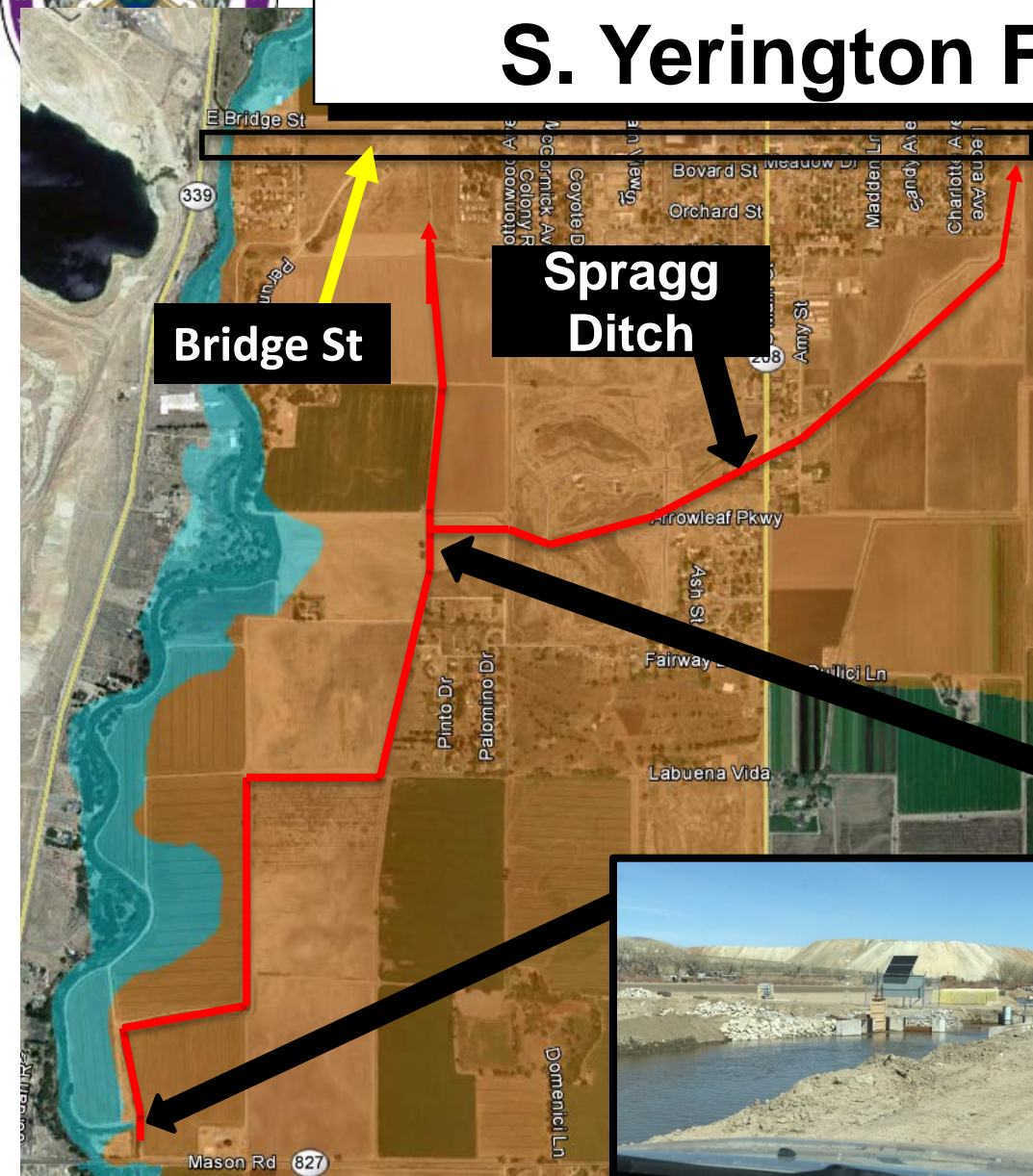


Photos 92a and 92b — Successive upstream aerial views of eastern end of Wilson Canyon, showing washed away section of S.R. 208. Photo by Nevada Department of Transportation. (Jan. 4, 1997)

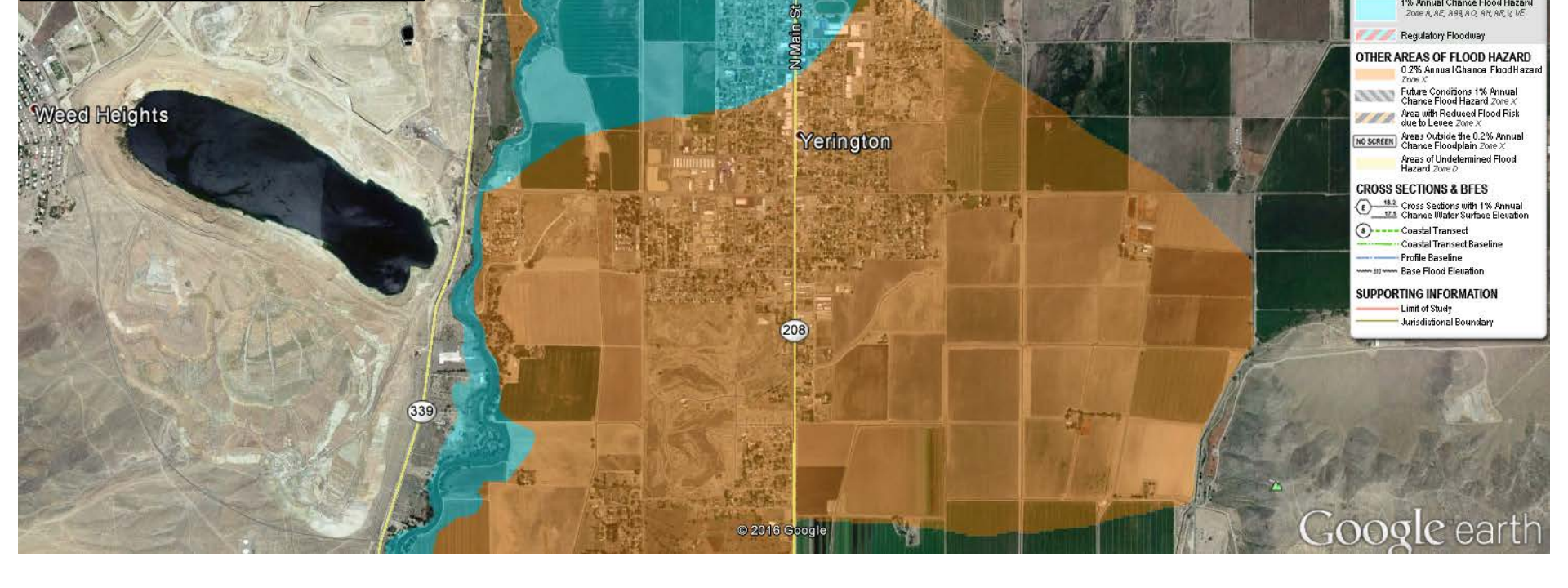


WALKER RIVER S. Yerington Flooding

- 1997 Mason Flooding
- Ditch running parallel to Walker River overflowed in vicinity of Mason Rd.
- Waters seeped North until contained by Bridge Street – Flooding S. Yerington
- **Recommended Mitigation:**
Shut down Spragg Ditch prior to prevent flooding

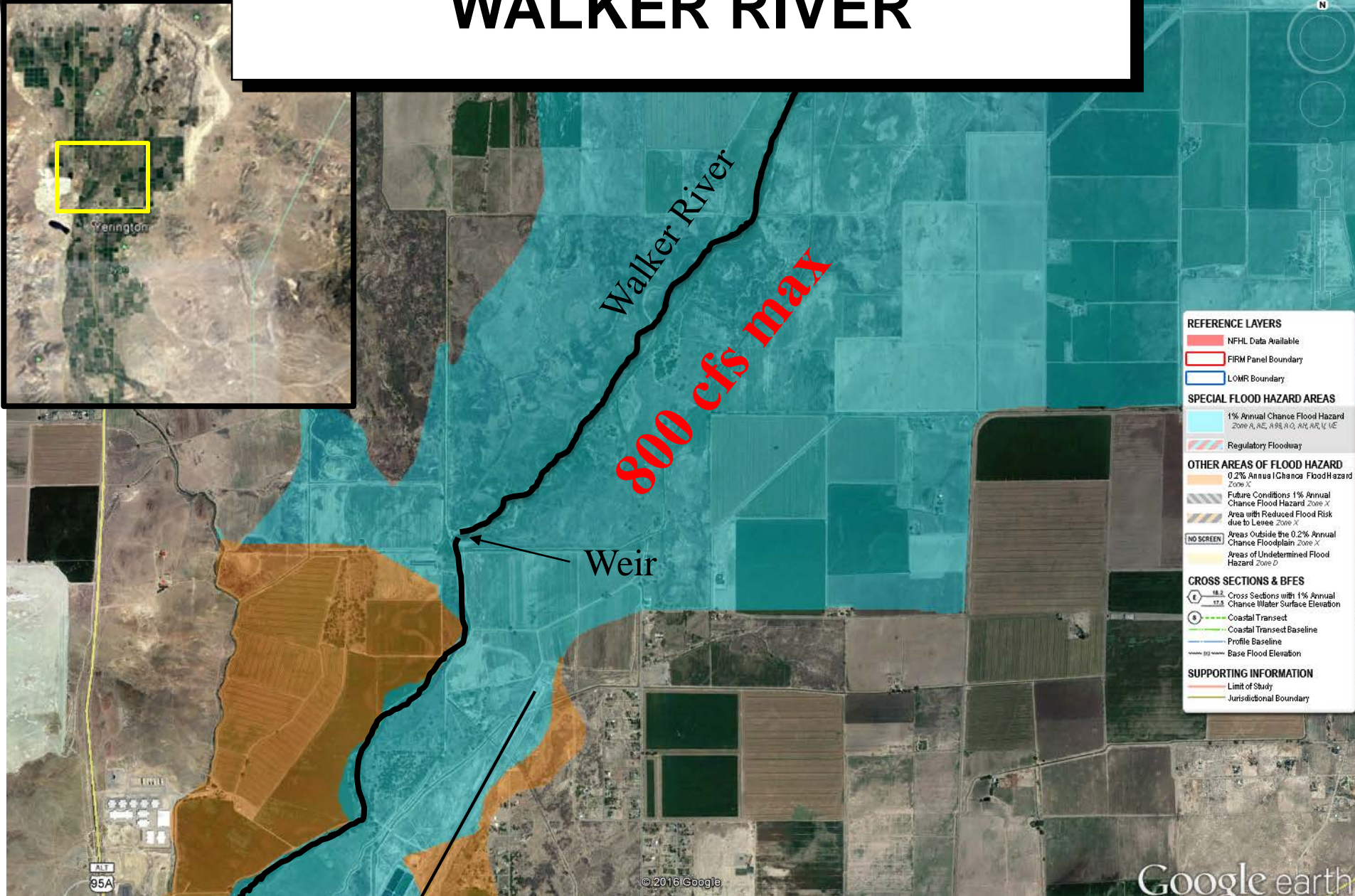


WALKER RIVER



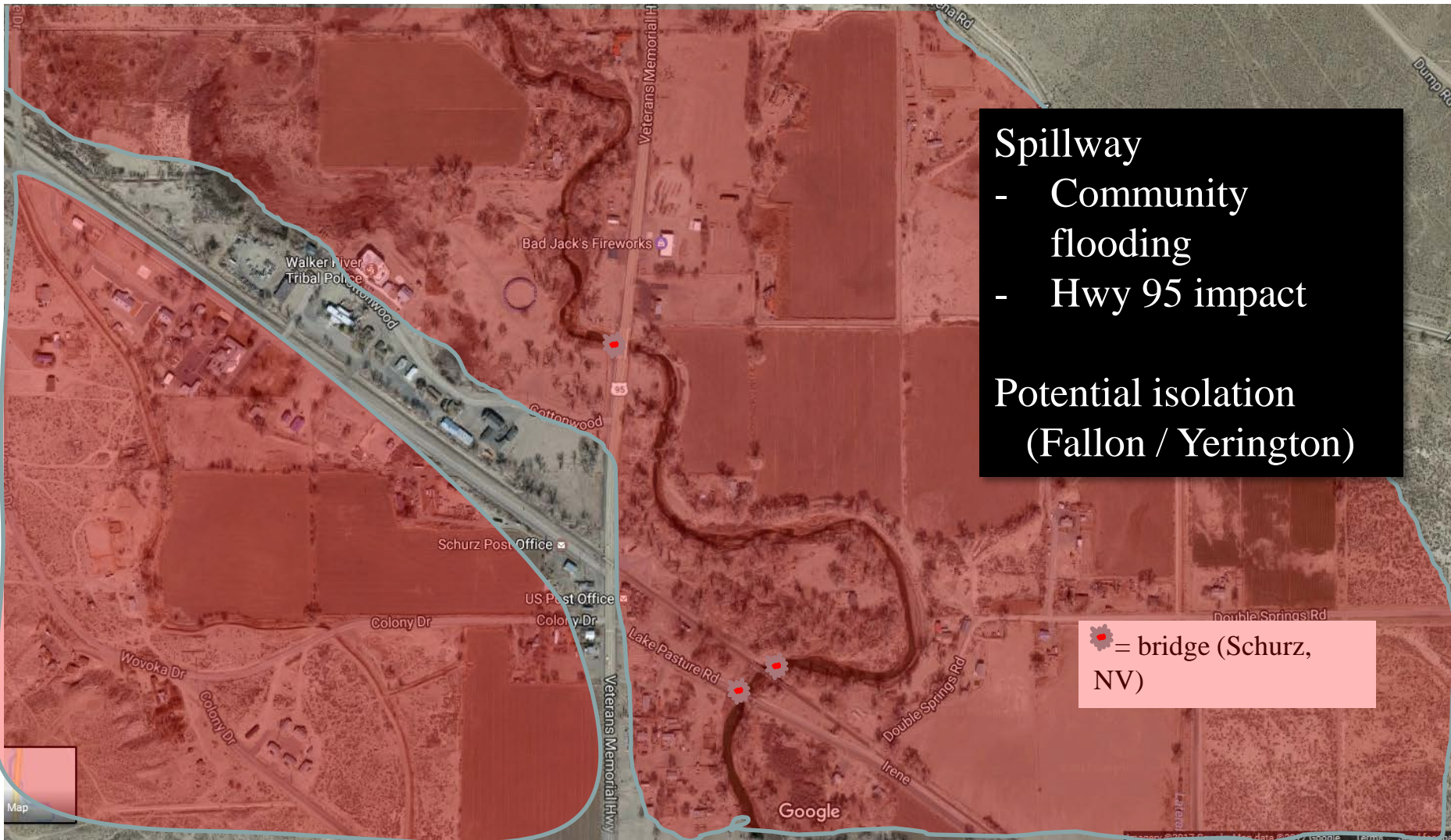


WALKER RIVER





Potential River Impacts Schurz



Spillway

- Community flooding
- Hwy 95 impact

Potential isolation
(Fallon / Yerington)

⚙ = bridge (Schurz,
NV)



Walker River Basin Mitigation Efforts



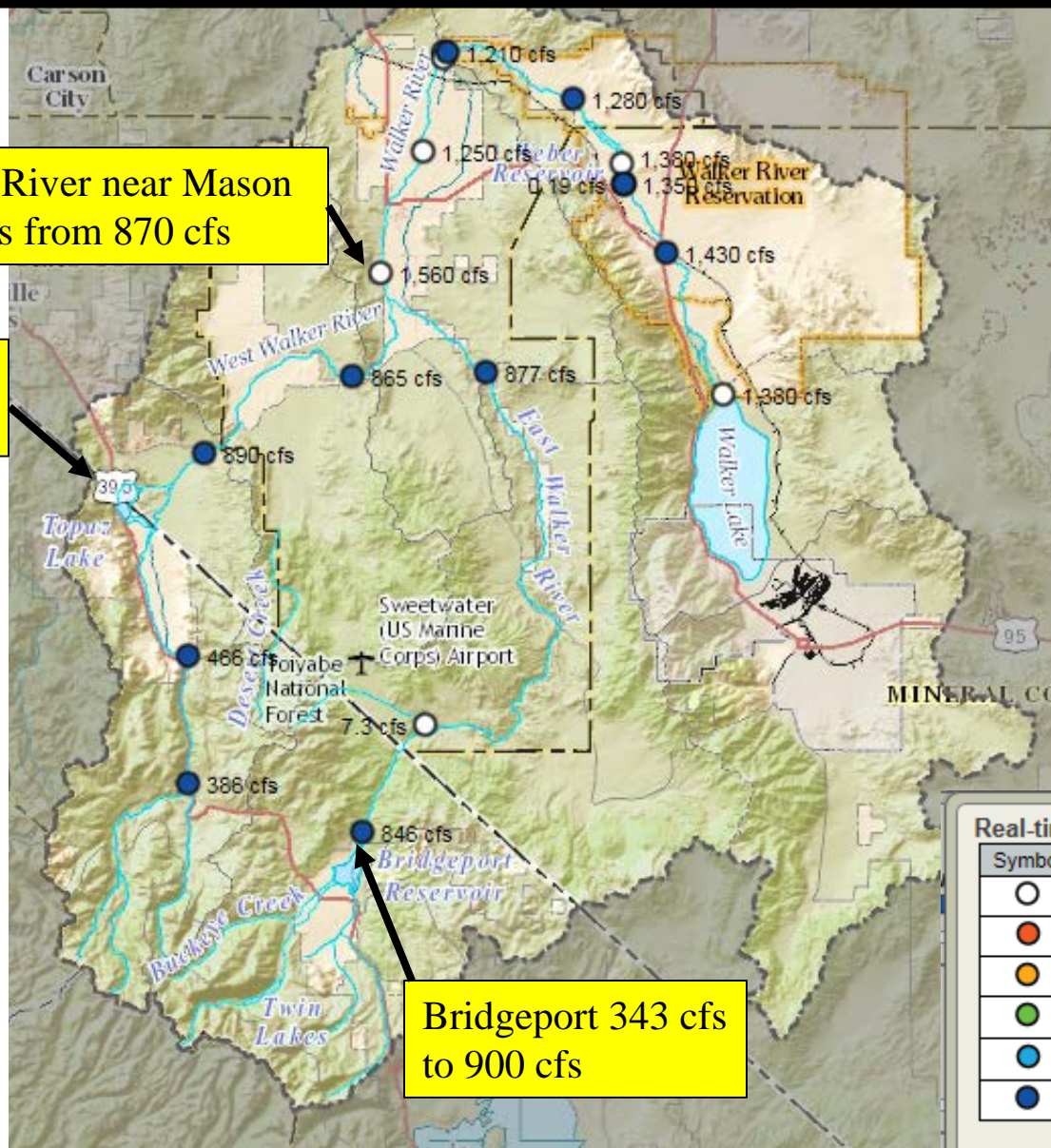
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Walker Release Mar 20, 2017

Walker River near Mason
1500 cfs from 870 cfs

Topaz 437 cfs to
diversion of 600 cfs



Real-time Streamflow

Symbol	Percentile	Description
○		Not ranked
●	< 10	Much below normal
●	10 – 24	Below normal
●	25 – 75	Normal
●	76 – 90	Above normal
●	> 90	Much above normal

Mason, NV March 28, 2017



Walker River in
Mason, NV



House on Walker
River in Mason,
NV



Bridge over
Walker River in
Mason, NV

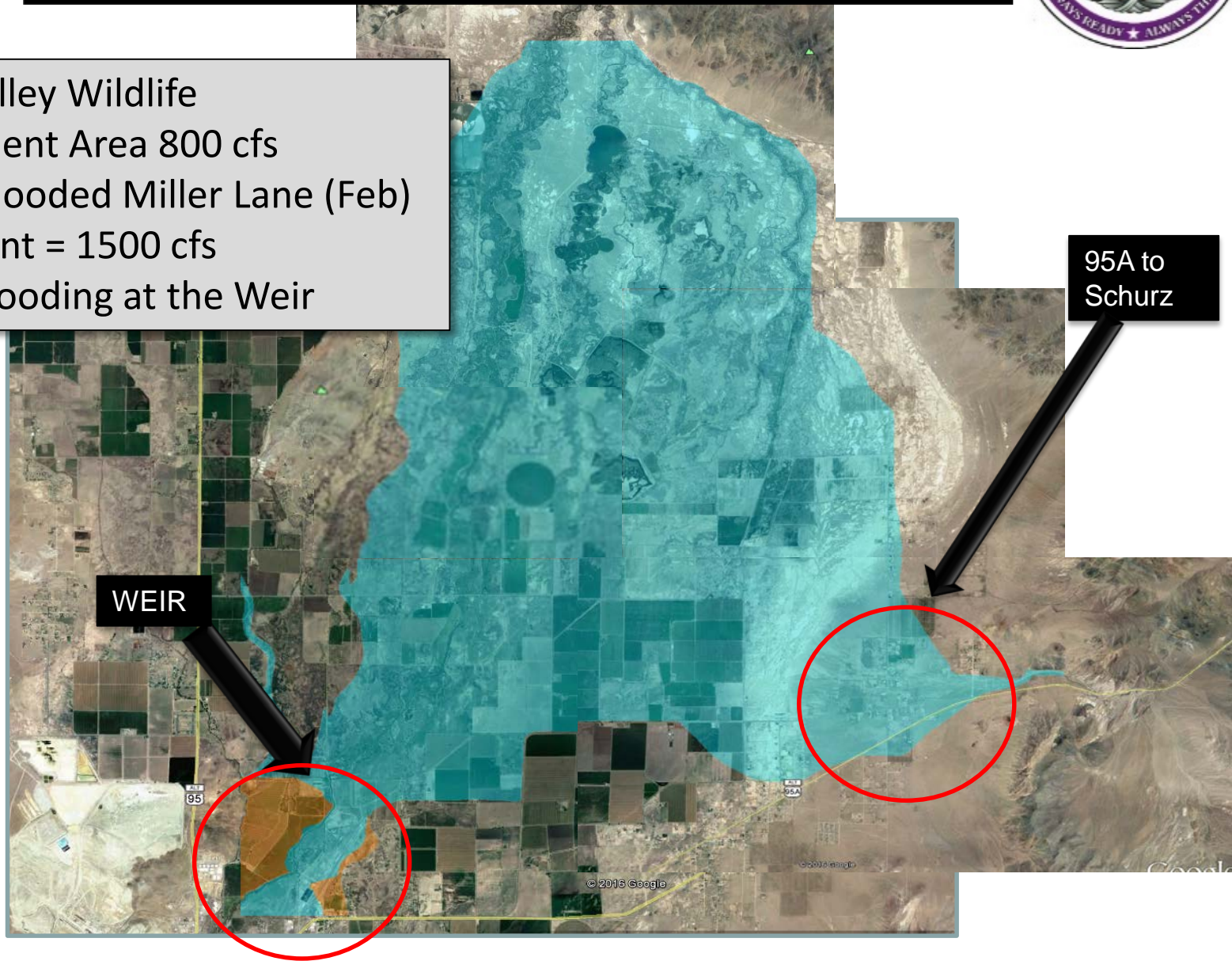


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N. Mason Valley

- Mason Valley Wildlife Management Area 800 cfs
- 1000 cfs flooded Miller Lane (Feb)
 - Current = 1500 cfs
- Back up flooding at the Weir



Pinpoint Map

Roads Closed in Lyon County

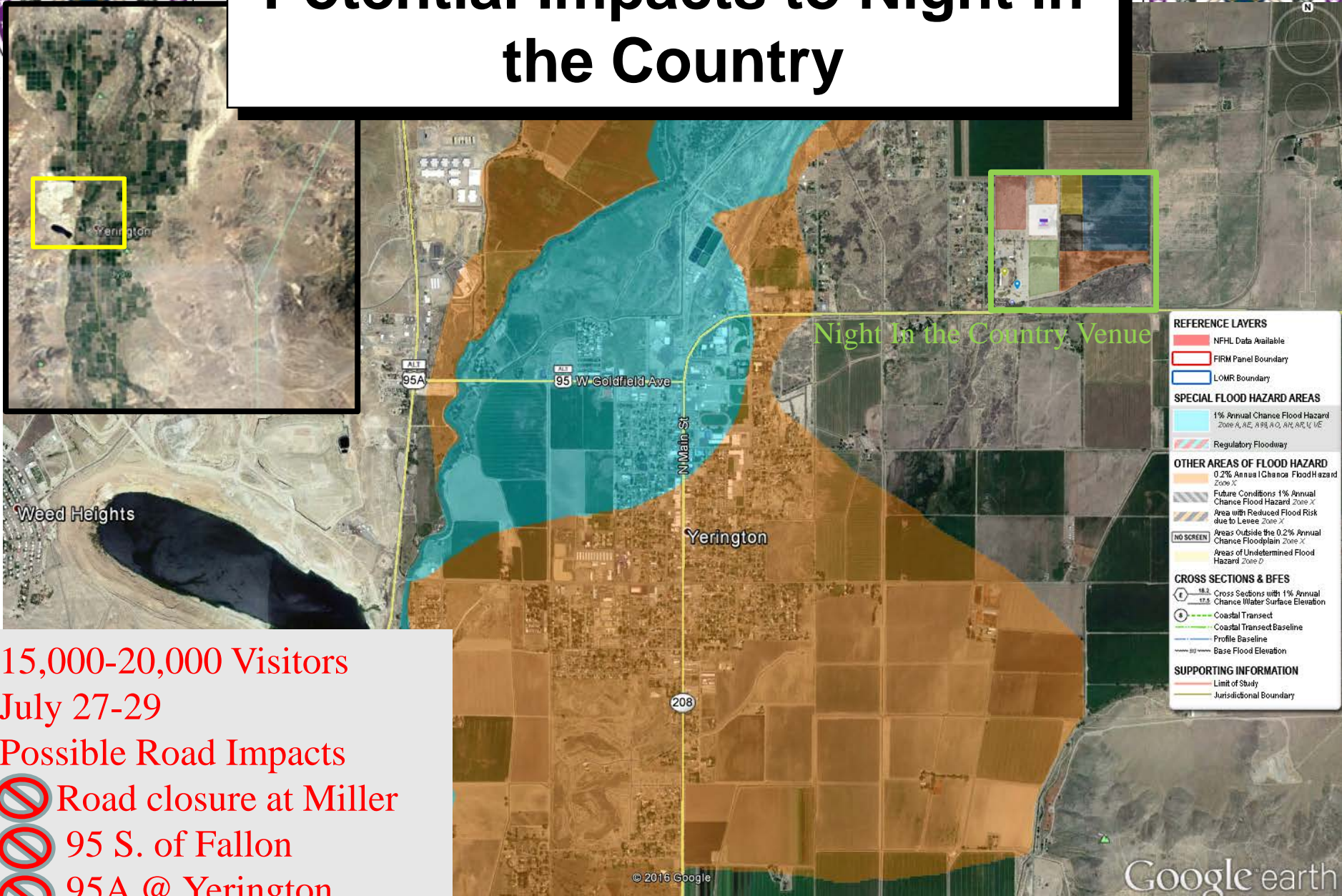


Miller Lane February 20, 2017



Miller Lane March 28, 2017

Potential Impacts to Night in the Country



15,000-20,000 Visitors

July 27-29

Possible Road Impacts

⊘ Road closure at Miller

⊘ 95 S. of Fallon

⊘ 95A @ Yerington



Carson River Basin



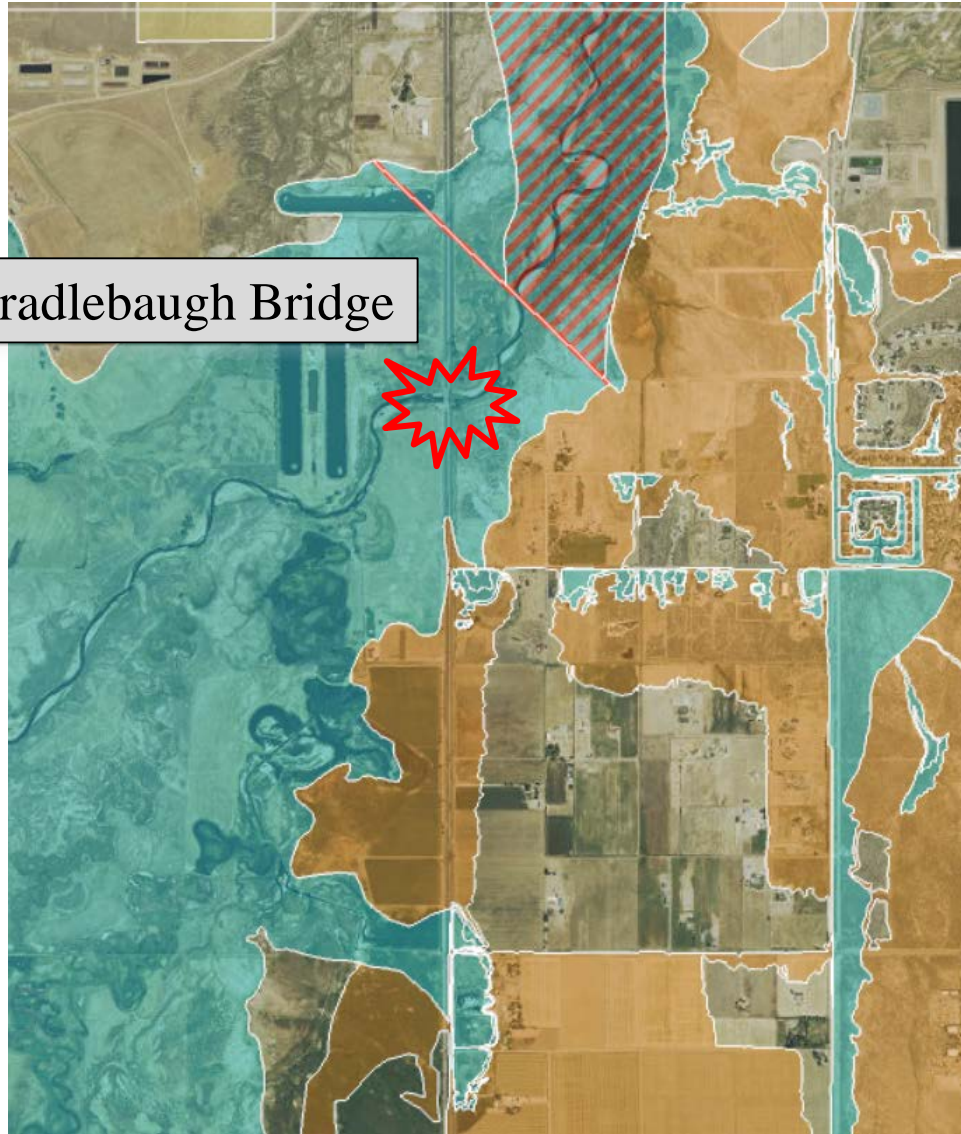
Carson Basin





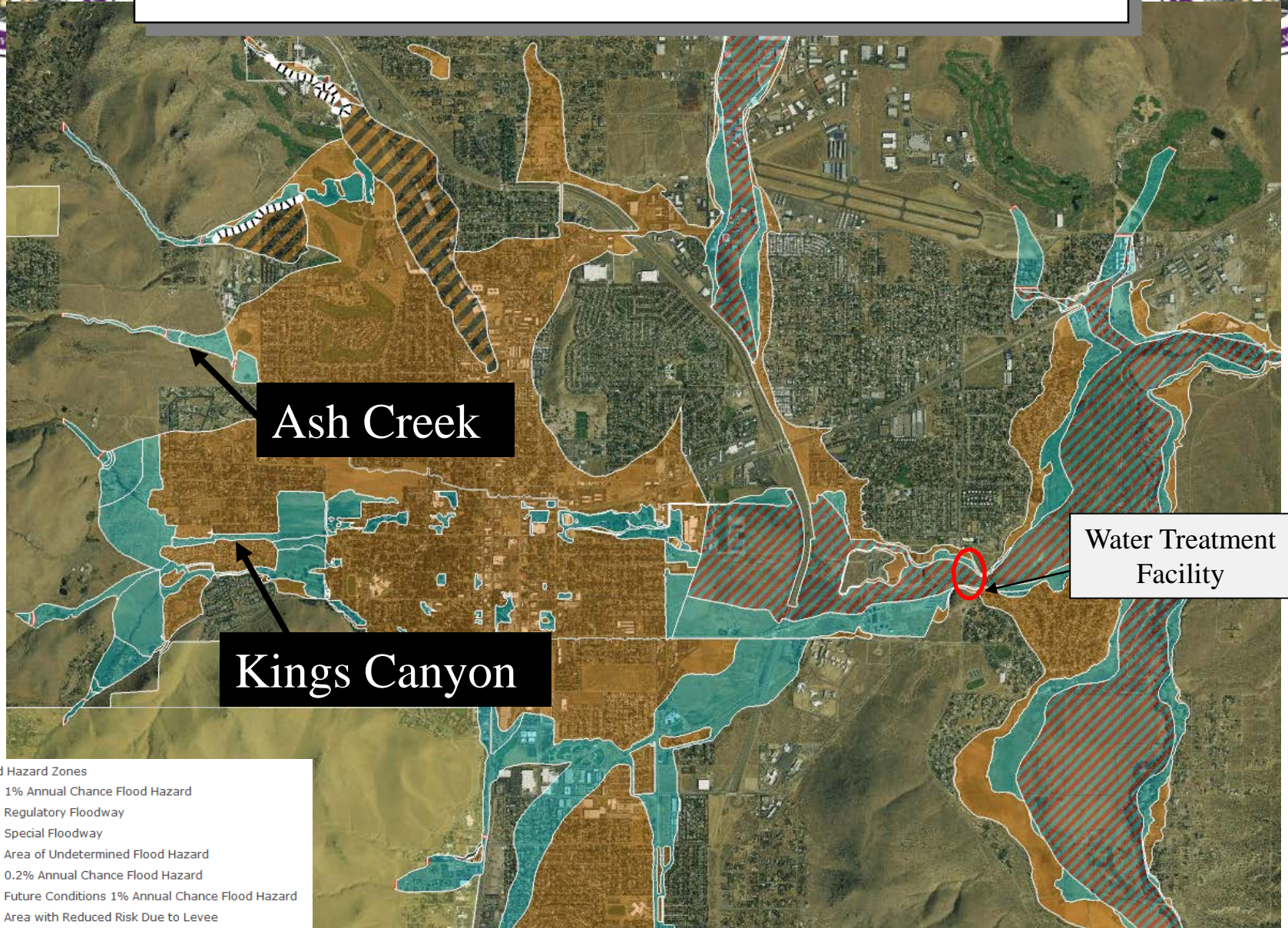
Douglas County

Cradlebaugh Bridge



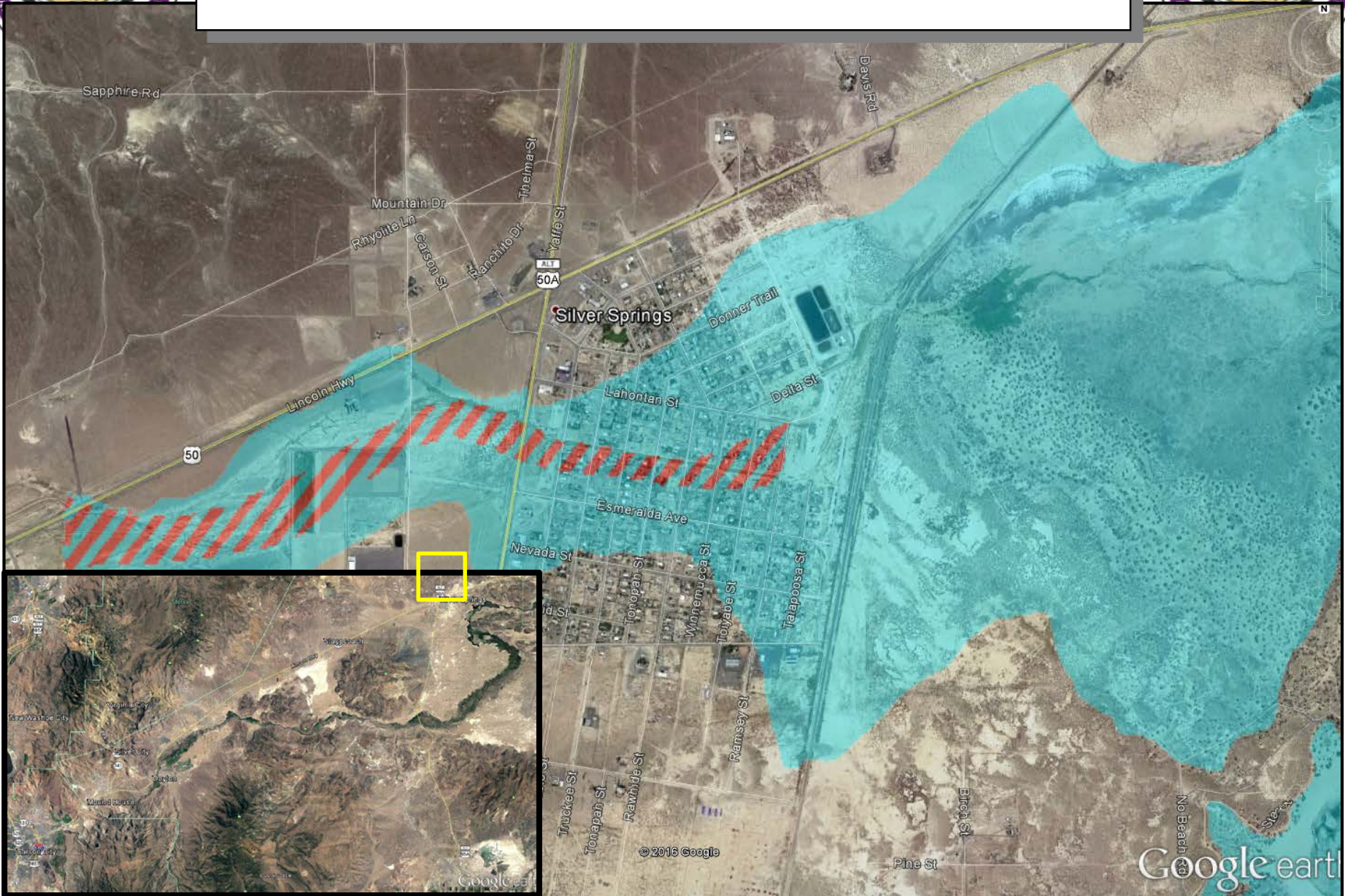


Carson City





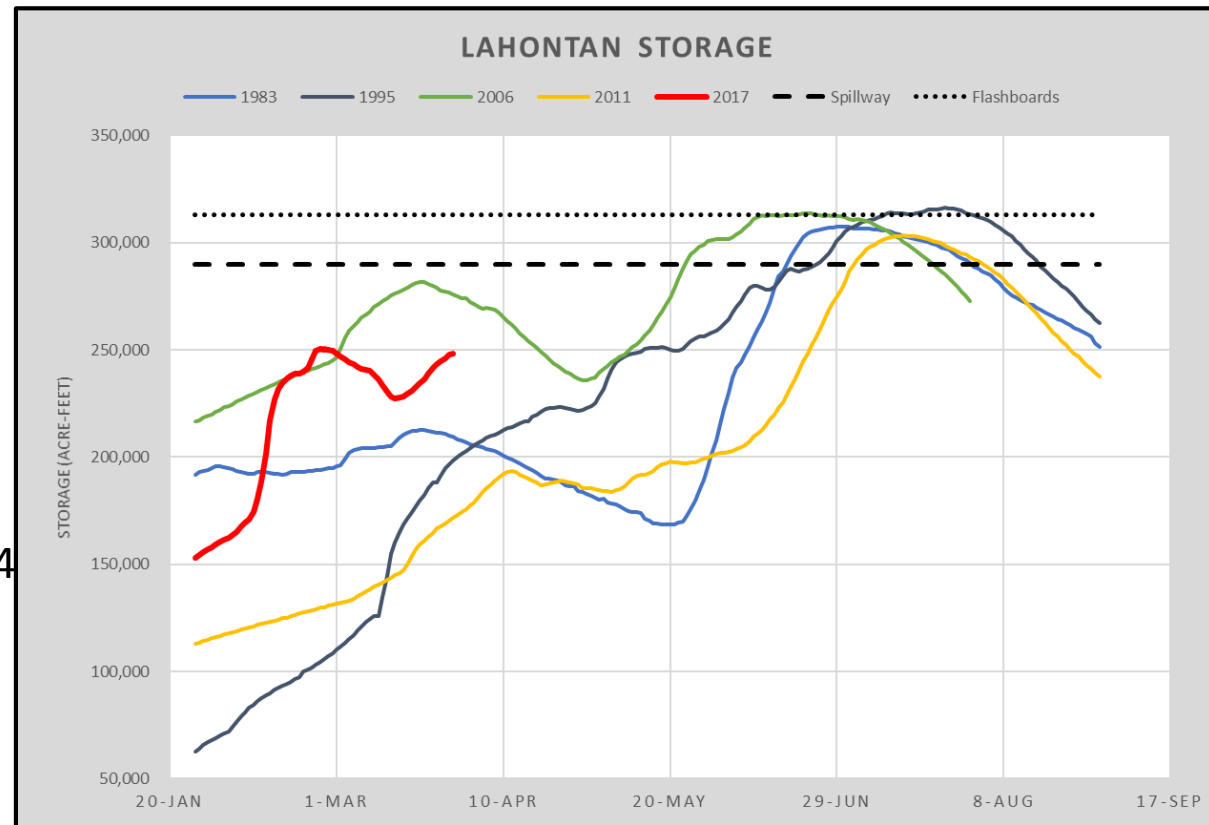
Silver Springs





Lahontan Dam Situation

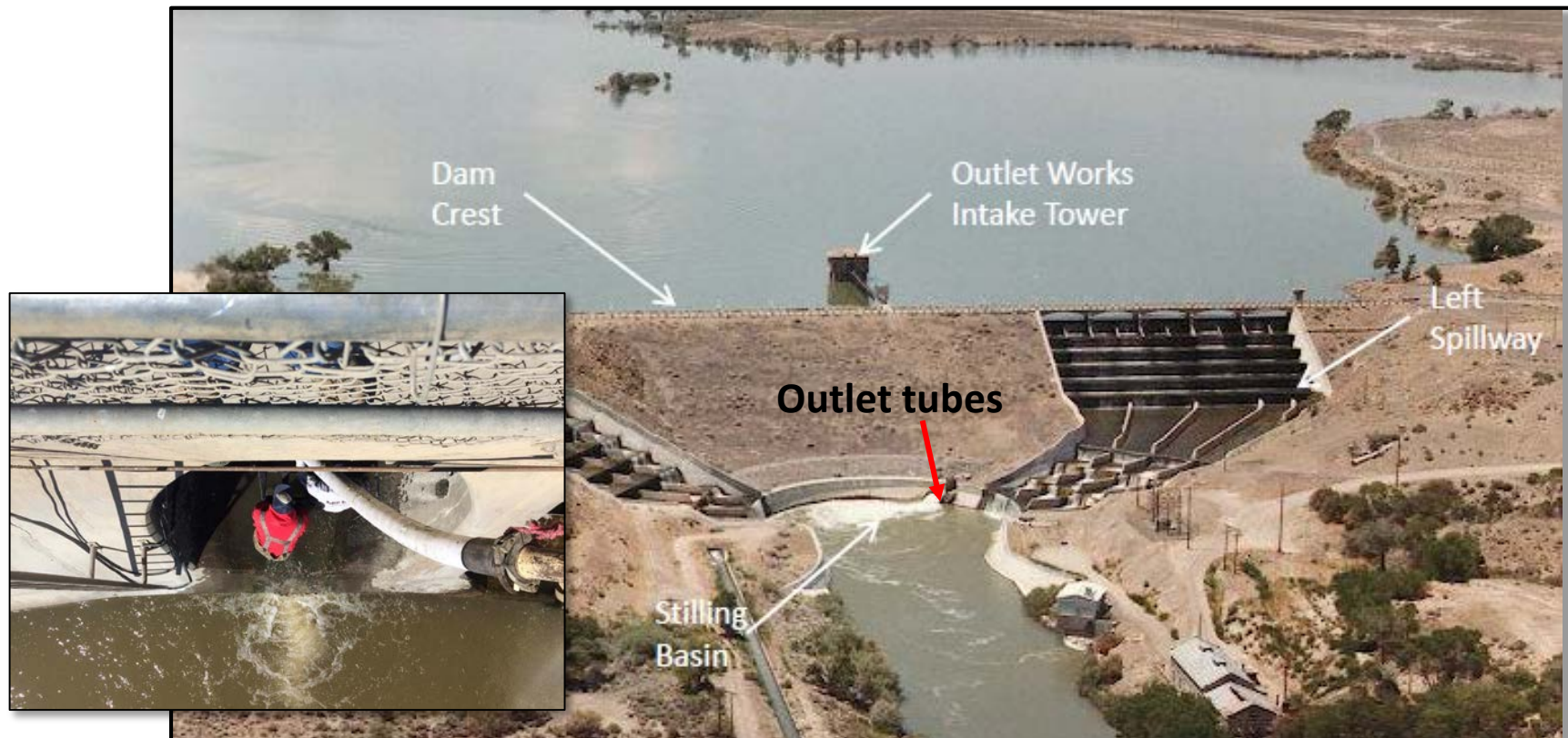
- Water content in the Carson River Watershed is $\approx 230\%$ normal
 - About 2 times capacity.
- Soil already water saturated.
- Reservoir water content is currently at 247k ac-ft
 - Top of concrete rim of the dam is 295,100 ac-ft
 - Top of flashboards 312,984 ac-ft





Lahontan Dam Situation

- Current inflow \approx 1400-1700 cfs
- Before problem discharging was \approx 2460 cfs
- 1 damaged, reduced outflow to \approx 1000 cfs
- Gaining 2,000 ac-ft per day
- **Tube fixed:** new goal 2800 cfs tomorrow



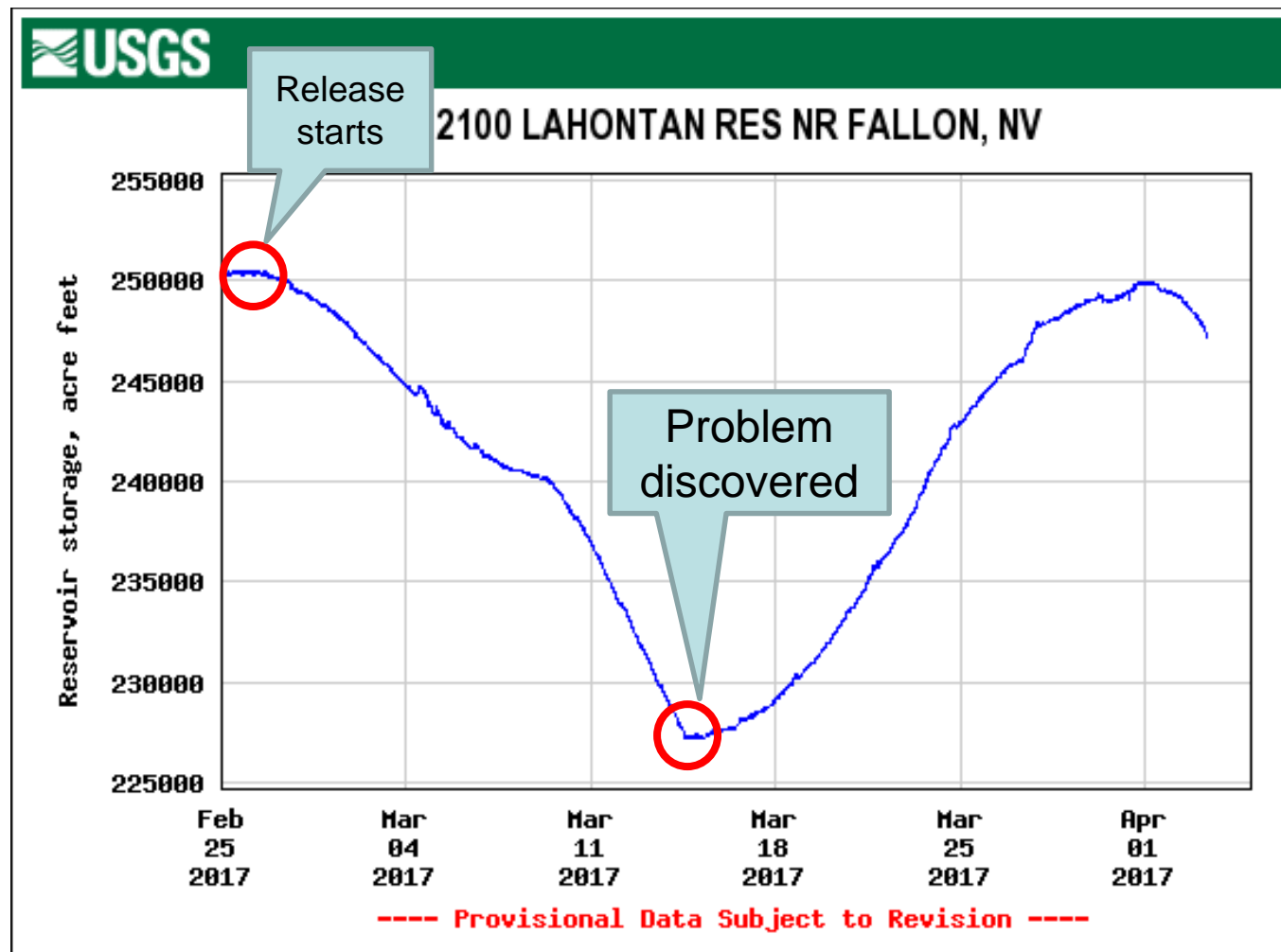


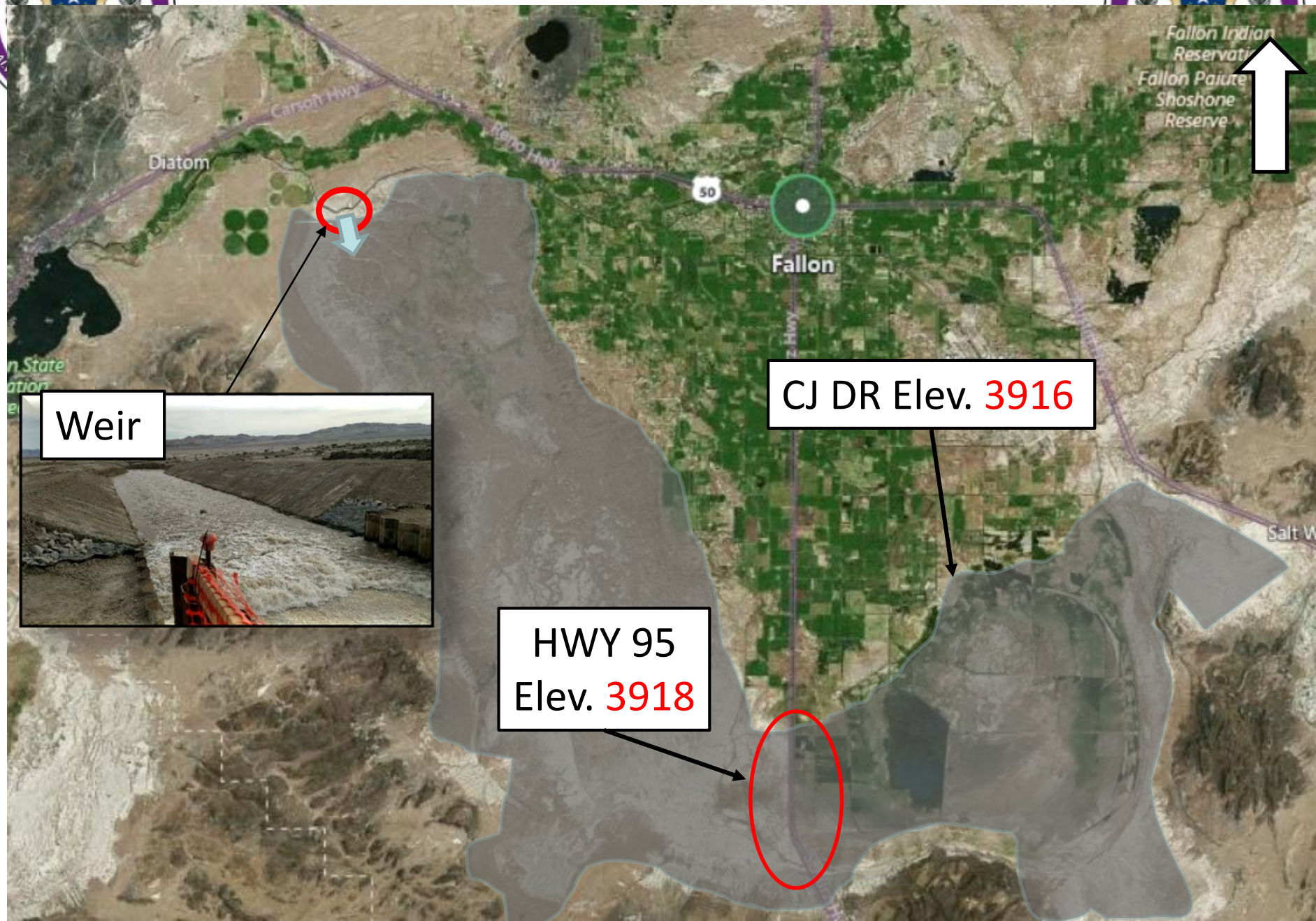
Lahontan Dam Situation

- Crest spillway
 - ≈ 2800 cfs
 - Max spill 6100 cfs
 - Plus 2500 cfs from outlet tubes
- $\approx 4,000$ cfs floods Fallon



Flashboards Installed





Weir



CJ DR Elev. 3916

HWY 95
Elev. 3918

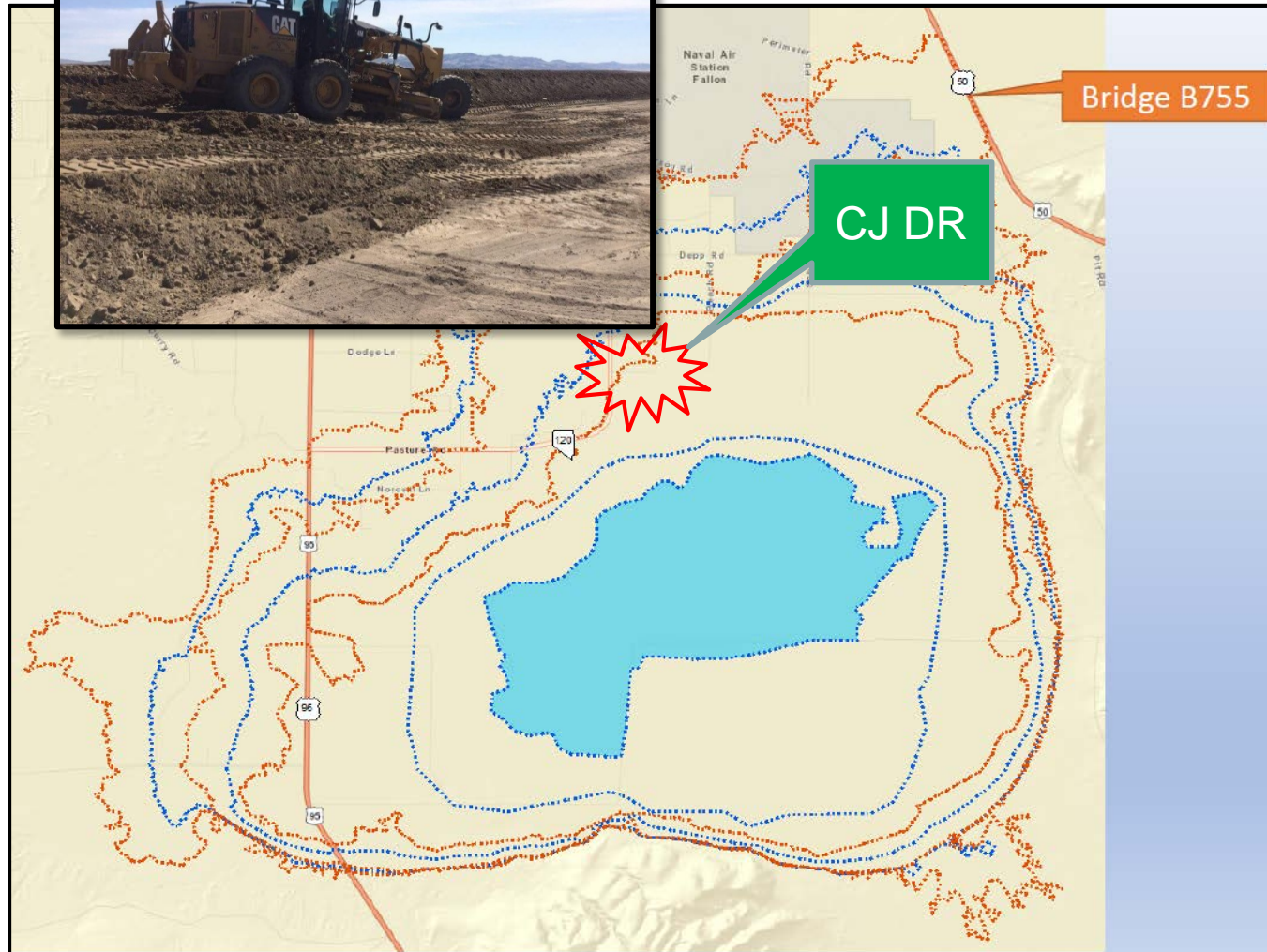


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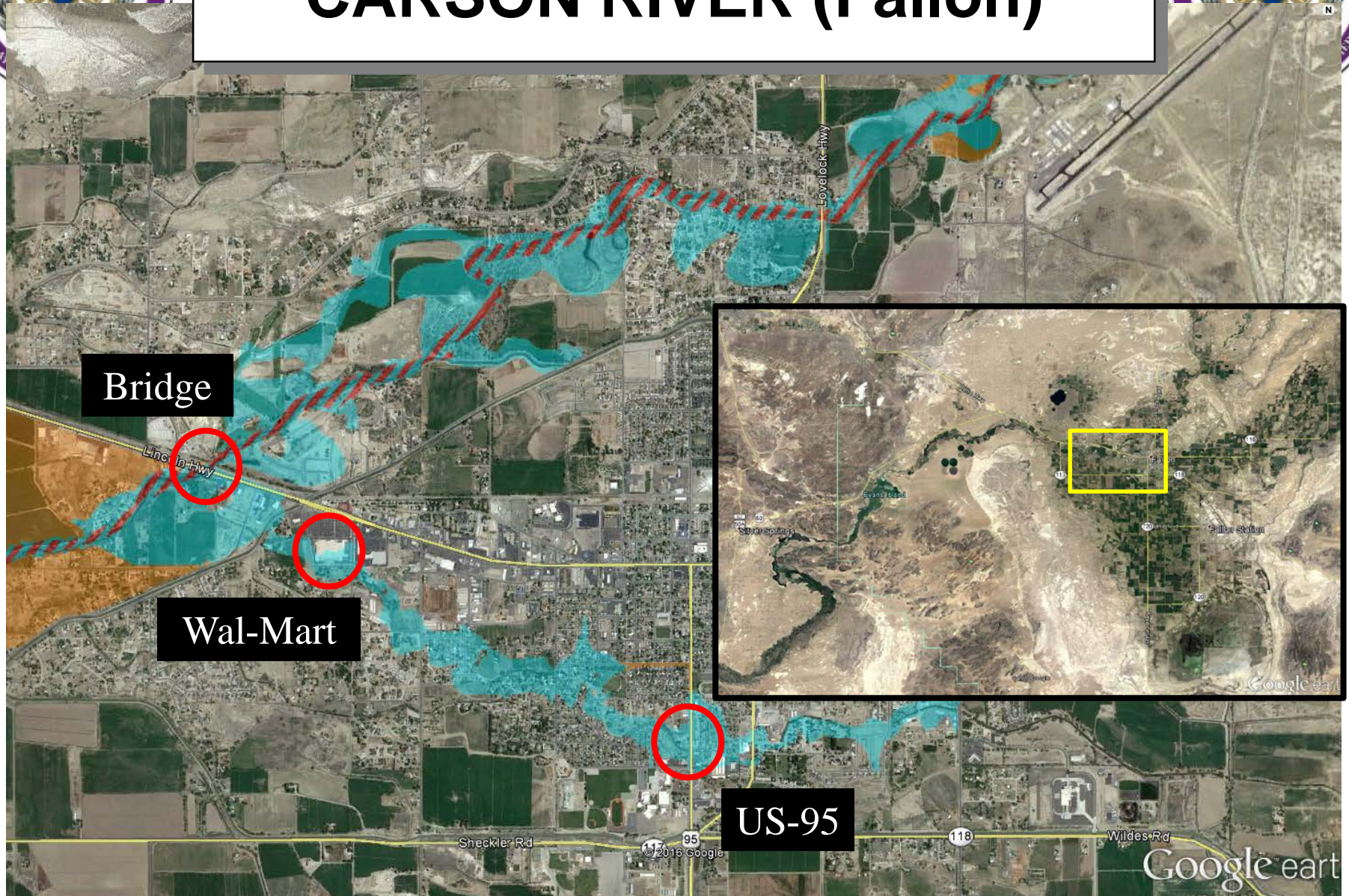


Carson Lake

- West of US 95 will not hold as much as expected: ~10,000 ac-ft
- Carson Lake
 - 70-100,000 ac-ft
- Lake level
 - 3916 (Goal): homes at risk CJ DR: berm built
 - 3918: Top US 95
 - 3920: 40 plus homes
- Digging additional ditch and culverts for US 50 (Bridge 755)



CARSON RIVER (Fallon)

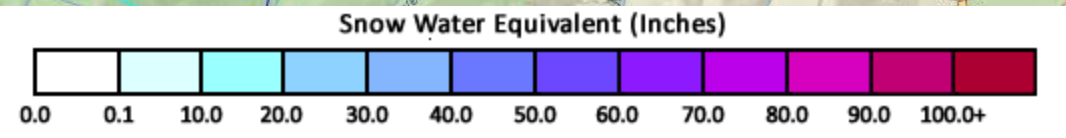
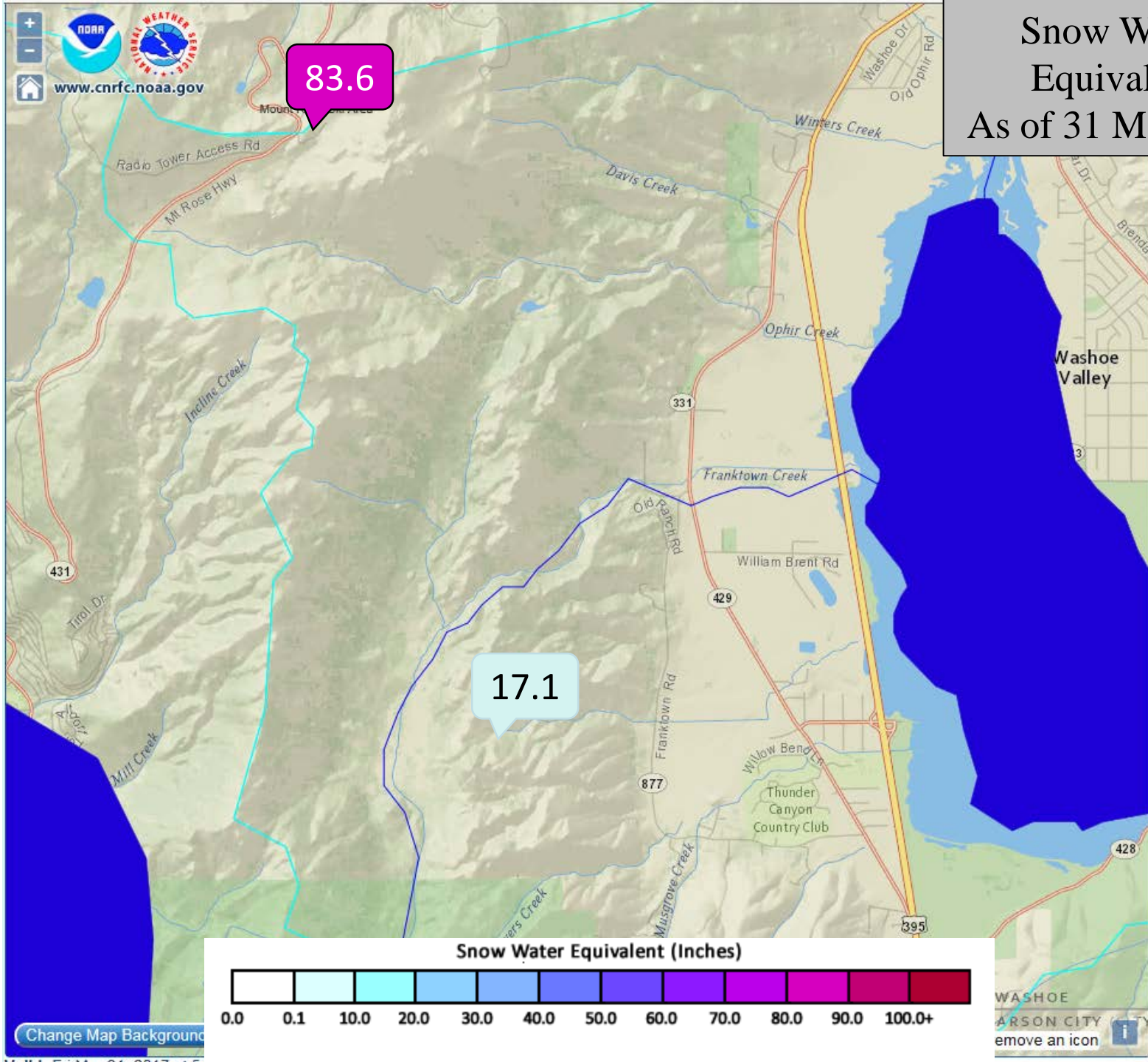




Washoe Valley Situation

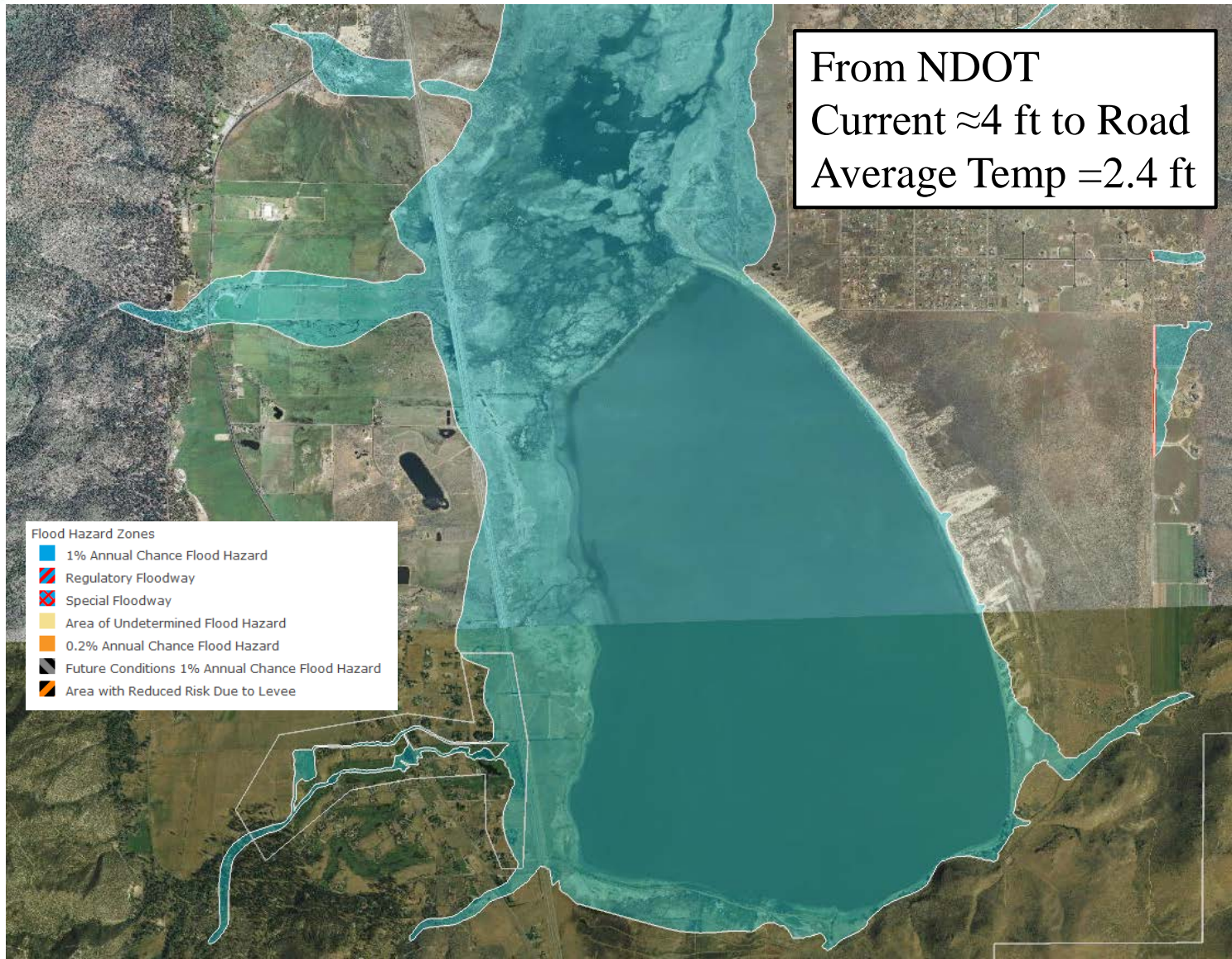
83.6

Snow Water
Equivalent
As of 31 Mar 2017





Washoe Valley (I-580)





Mitigation & NG Support



Mitigation

- **Precautionary draw-down**
- **Sandbags, K-Rails (jersey barriers), HESCO**
- Allowing proper flow of river (e.g. Clearing out ditches, creeks, environmental conservation areas, irrigation canals)
- Identifying possible flood areas
- Identifying critical infrastructure
- Elevate and waterproof structures
- Plan for alternate routes
- **Decon/HAZMAT Plan**
- **Evacuation Plans** (in particular for special needs, detention facilities)
- Plan for fuel shortage
- Secure above ground fuel tanks



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Messaging

- **Flood Insurance: Get it yesterday!**
- Flood Resources
 - Sandbag Locations
 - Emergency Contact information
 - Resource Contact information
- Be prepared - 2 weeks worth of supplies (food; medications; toiletries etc.)
- **Grab and Go Emergency Preparedness kit** with medications, important documents, and non-replacable keepsakes
- Pet plan
- Shelter locations
- Flood Forecast – know when to react
- River level
- It is going to flood and what it looks like



Decision Support Matrix

Decision Point	Decision	Triggers	Options
1	Recommended Evacuation	<ul style="list-style-type: none"> Mason guage predicted (72 hrs) <ul style="list-style-type: none"> 100 year zone Moderate 500 year zone Major Spillway water flow Dam failure Major Routes predicted to isolate community 	<ul style="list-style-type: none"> Notify Public (Radio, TV, social media, reverse 911, emergency alert system) Activate shelters Transportation Turn off utilities
2	Traffic Control	<ul style="list-style-type: none"> Road closure due to flood 	<ul style="list-style-type: none"> Barriers Temp traffic lights Detours Security Augmentation
3	Access Control	<ul style="list-style-type: none"> Total or portion of town evacuation 	<ul style="list-style-type: none"> Access control points Patrols (rescue and security)
4	Major event e.g. Night in the Country	<ul style="list-style-type: none"> Evacuation of City Major/location closure Major Routes predicted to isolate community 	<ul style="list-style-type: none"> Move to alt location Cancel
5	Emergency barriers	<ul style="list-style-type: none"> Flood forecast 	<ul style="list-style-type: none"> Hesco, sandbag, K-rail critical infrastructure Residential
6	Recommended re-entry	<ul style="list-style-type: none"> Water below flood stage Health Department 	<ul style="list-style-type: none"> Transportation Limited access
7	Flood Preparation and Awareness Campaign	<ul style="list-style-type: none"> Flood forecast 	<ul style="list-style-type: none"> Sandbag locations Townhall Pamphlets Social Media
8	EOC Activation	<ul style="list-style-type: none"> Gages reach action stage 	<ul style="list-style-type: none"> Location Limited ESFs



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Potential Guard Support

- Assistance in filling sandbags
- Evacuation (high water vehicles)
- Security (critical infrastructure; evacuated communities; LE Augmentation)
- Traffic Control Points
- Logistical Movement (ground or air)
- Aerial Assessment (IAA)
- Aerial Hoist Rescue
- Movement of personnel by bus
- Health and Welfare checks



Bottom Line...

- Flooding will happen
 - Severity is variable
- Could last into July
- Preparedness / Messaging - NOW
- Develop contingency response plans
- Worst case scenarios
 - Atmospheric river
 - Hot weather
 - Reservoirs reach spillways
 - Effects on major traffic routes (95, 95A, 395, 580).
 - Simultaneous events





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Questions



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