



Carson and Walker River Flooding TTX





Agenda

- Introduction
- Carson River Basin
 - Heavy Rain Event – Lahontan not full
 - Heavy Rain Event – Lahontan full
- Walker River Basin
 - Heavy Rain Event – Reservoirs not full
 - Heavy Rain Event – Reservoirs full
 - Night in the Country
- Conclusion



Carson River Basin



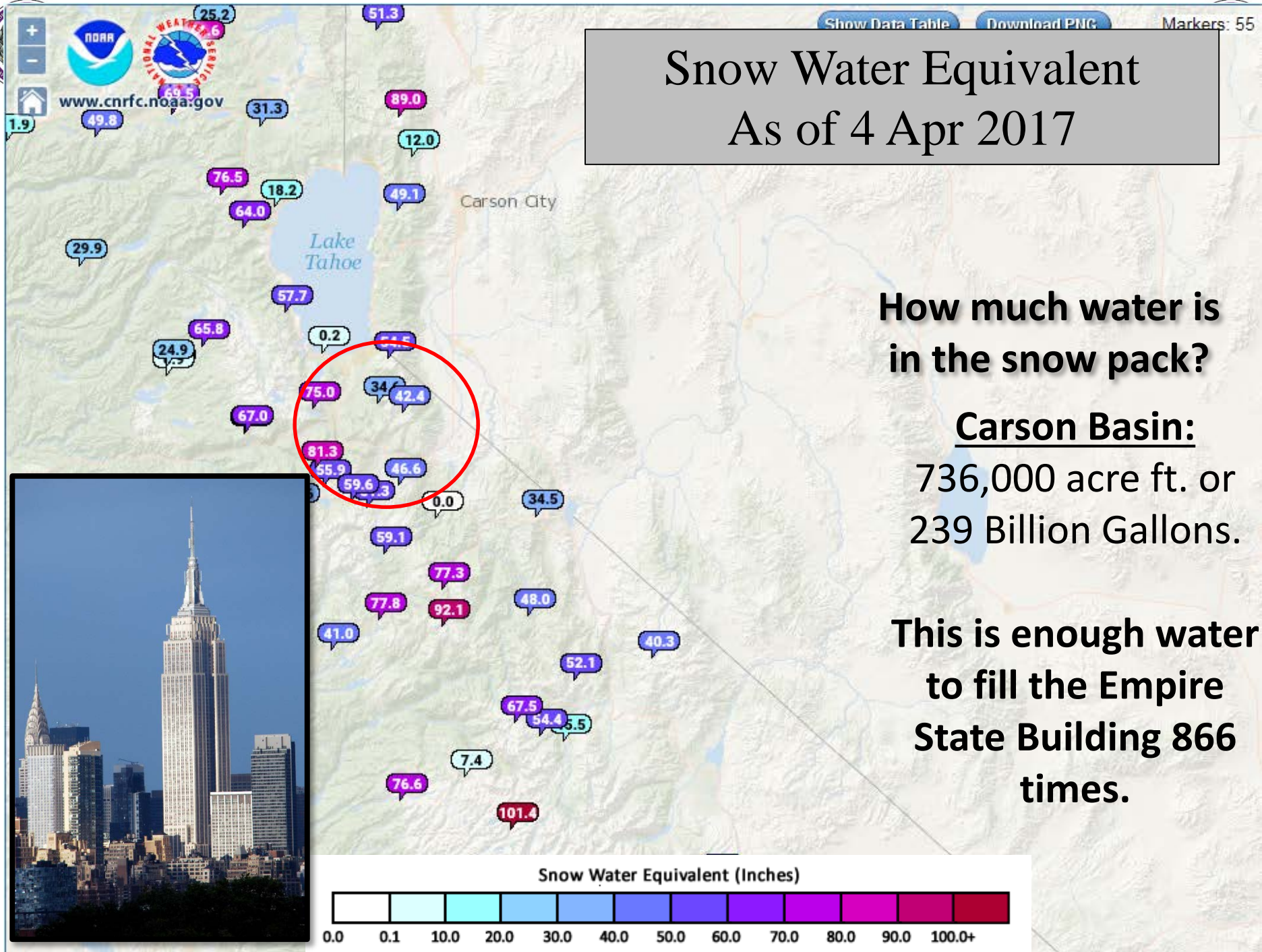
Snow Water Equivalent As of 4 Apr 2017

**How much water is
in the snow pack?**

Carson Basin:

736,000 acre ft. or
239 Billion Gallons.

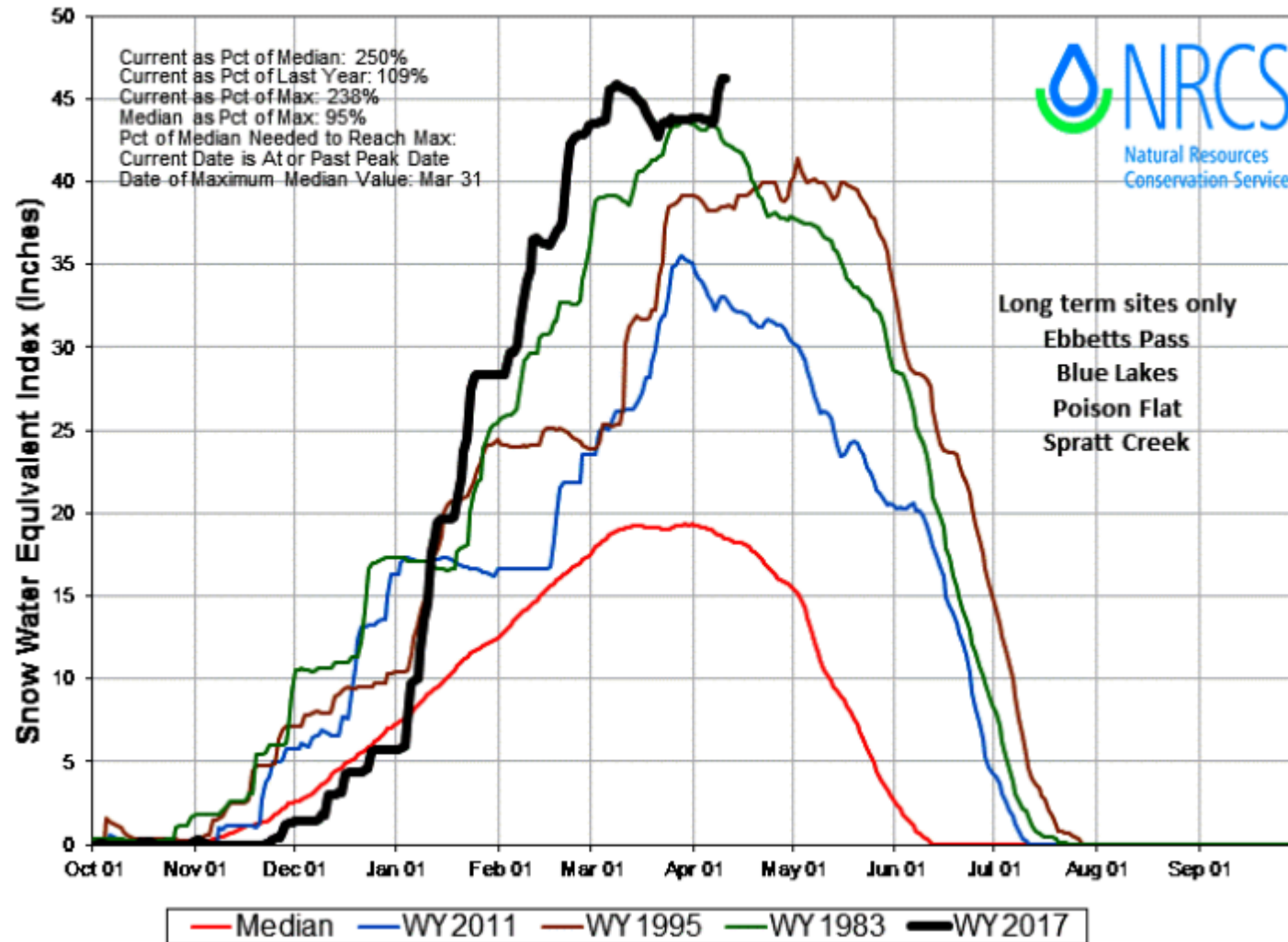
**This is enough water
to fill the Empire
State Building 866
times.**



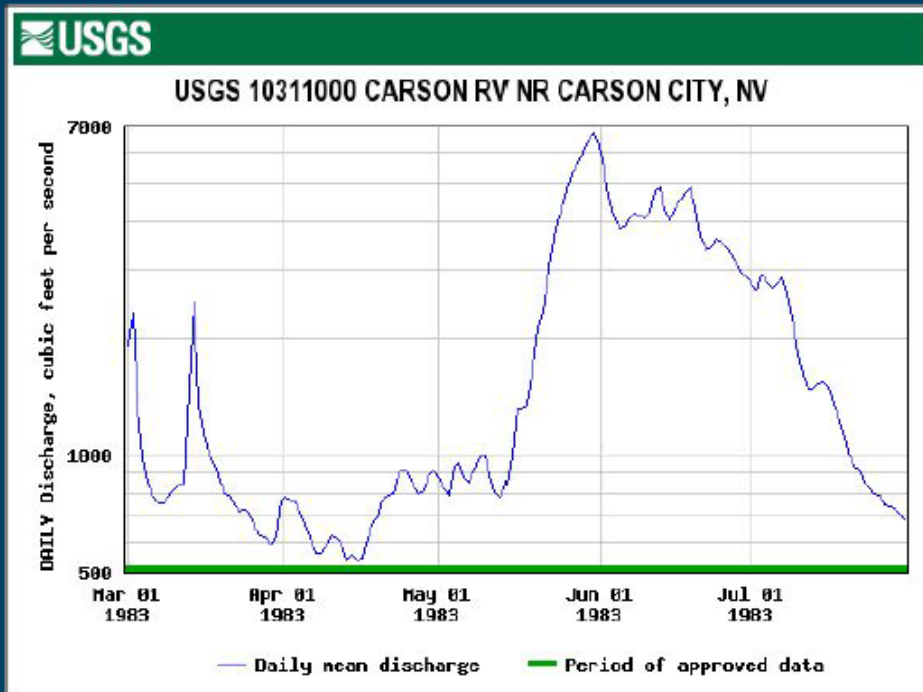


Carson Basin

CARSON RIVER BASIN Time Series Snowpack Summary **Based on Provisional SNOTEL data as of Apr 10, 2017**



What Does this Mean for the Carson River?



Current flood stage - 8800 cfs
plots show daily average flow, not peak

- Minor to moderate flooding impacts likely in Carson Valley
- Minor flooding impacts possible but less likely in Carson City.
- Creating additional space and managing large projected flow into Lahontan will be key to mitigating (not eliminating) flood risks near Fallon.
- New v-line weir facilitating higher releases and faster draw-down of Lahontan.



Scenario 1 – Heavy Rain / Lahontan not full

- **Period of high heat in late May (7 days of 85 degrees)**
- **5 Day Rain Event Similar to February Flooding**
- **Lahontan at 250k AF**
- **Lahontan releasing 2800 cfs**

Douglas County

Carson City

Central Lyon

Churchill



Douglas County

- Carson Valley Country Club
- Genoa
- Aspen Mobile Home Park
- Westwood Subdivision



Looking east across the Carson Valley Golf Course in the floodplain of South Gardnerville, NV, January 1997 (Hwy 395 at top)

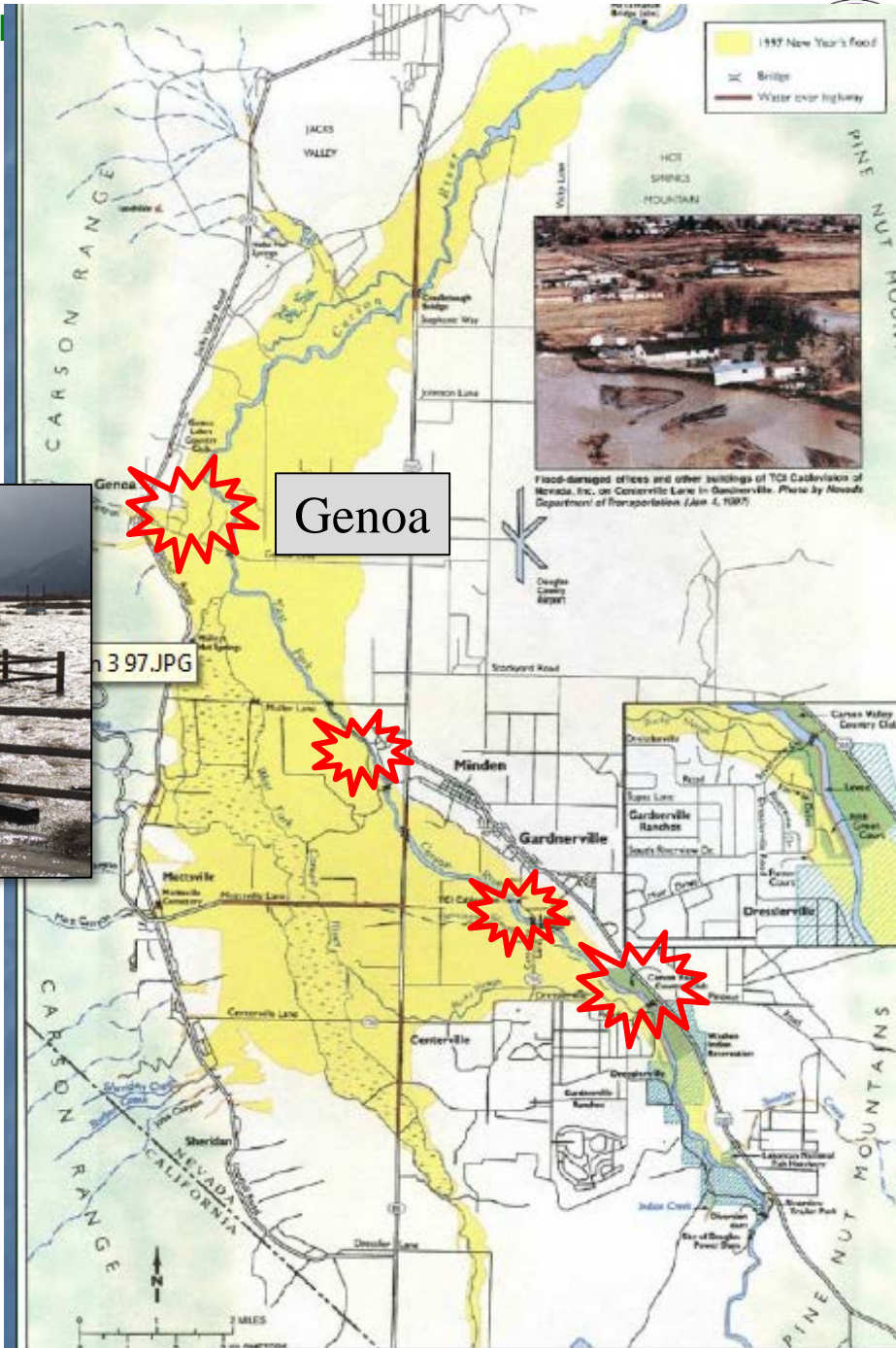


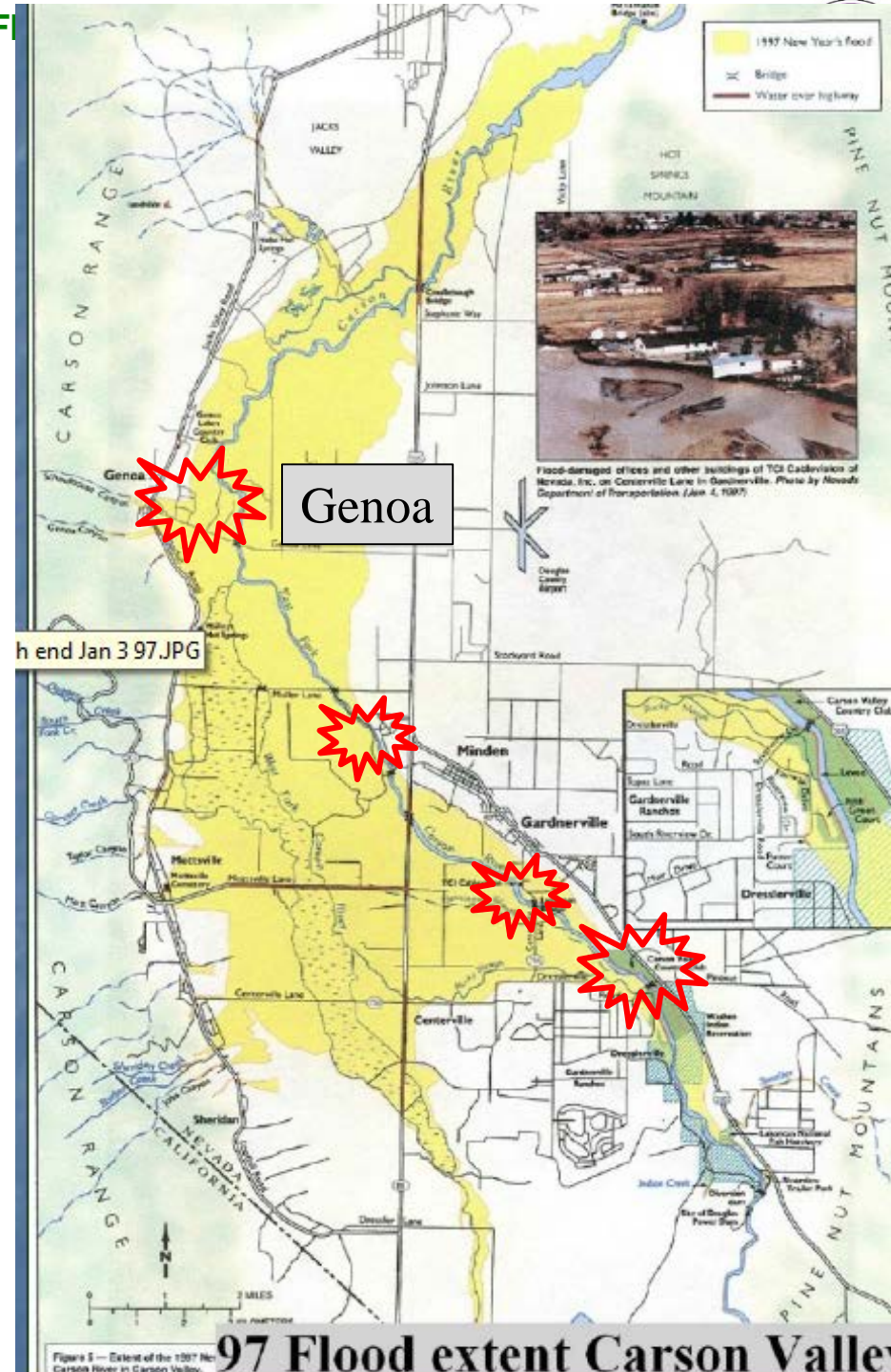
Figure 5 — Extent of the 1997 New Year's Flood in Carson Valley
97 Flood extent Carson Valley



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Douglas County

- Considerations
 - Medical or in home care?
 - Assisted living
 - Reroute traffic / detours
 - Marking flooded areas
 - Security of evacuated areas
 - Utilities sandbagged / secured?
 - Individual resident sandbags
 - Impacts on schools
 - Isolated communities (Genoa)
 - Sewer impacts
 - Propane tanks
 - Shelter plan
 - Bridge clearing (debris removal)
 - Pre-stage clearance equipment?
 - Vector control





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Douglas County



Cradlebaugh Bridge





Carson City

- Flash Flooding
- Sewer Treatment facility compromise
- Sandbags – remain in place
- Pre-stage clearance equipment?

Ash Creek

Kings Canyon

Water Treatment Facility

Flood Hazard Zones

- 1% Annual Chance Flood Hazard
- Regulatory Floodway
- Special Floodway
- Area of Undetermined Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance Flood Hazard
- Area with Reduced Risk Due to Levee



Dayton

Debris due to flash flood, 50 impacted

Carson treatment plan

Bridge Closed due to flooding / Debris pile up

- Considerations
 - Medical or in home care?
 - Assisted living
 - Reroute traffic / detours
 - Bridge Repair
 - Marking flooded areas
 - Security of evacuated areas
 - Utilities sandbagged / secured?
 - Individual resident sandbags
 - Impacts on schools
 - Isolated communities (Genoa)
 - Sewer impacts
 - Propane tanks
 - Shelter plan
 - Bridge clearing (debris removal)
 - Pre-stage clearance equipment?
 - Vector control



Weeks

Bridge Closed due to flooding / Debris pile up
Isolates S. Lyon County
Contingency Routes
Repair Options

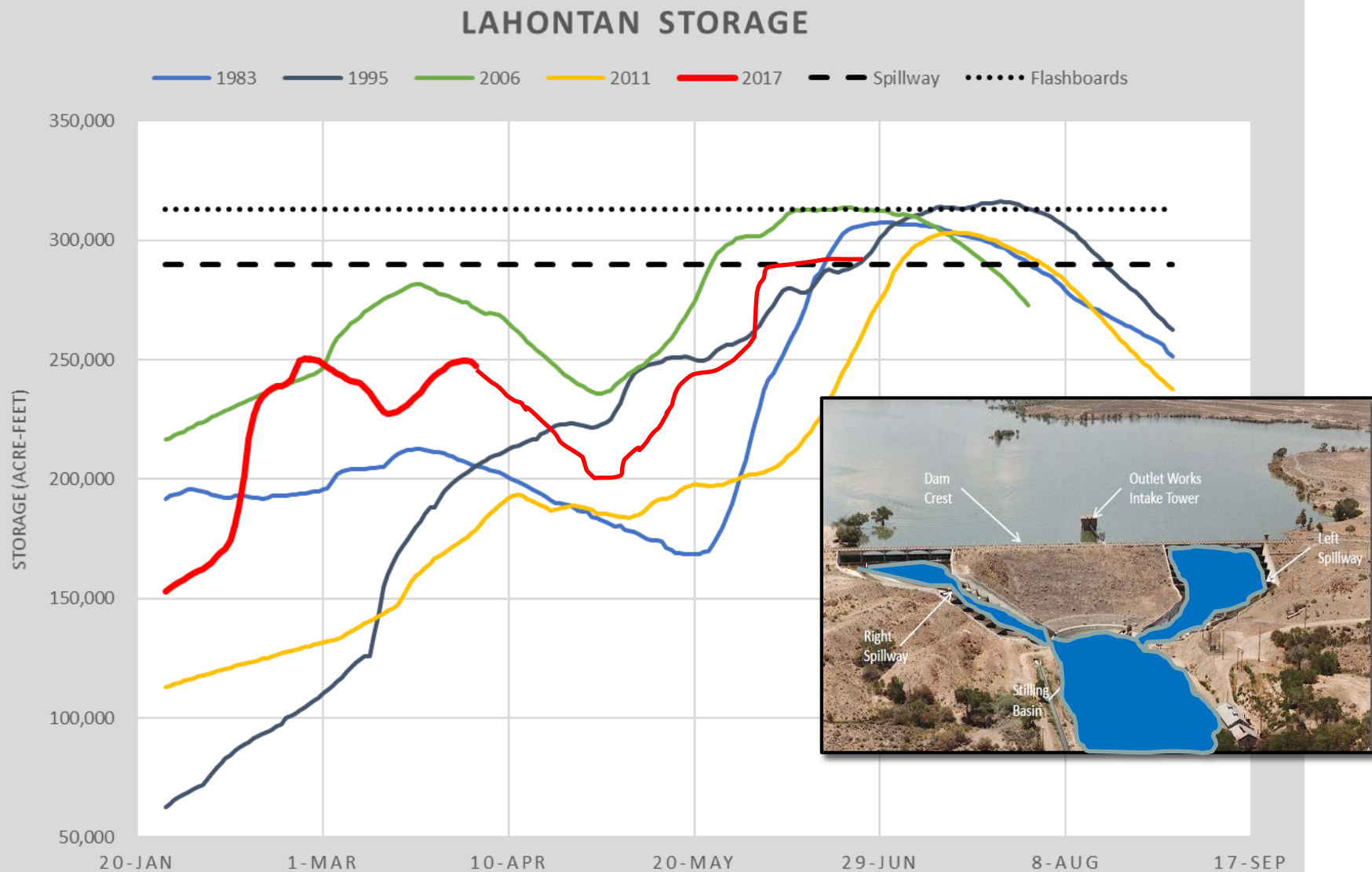




Discussion



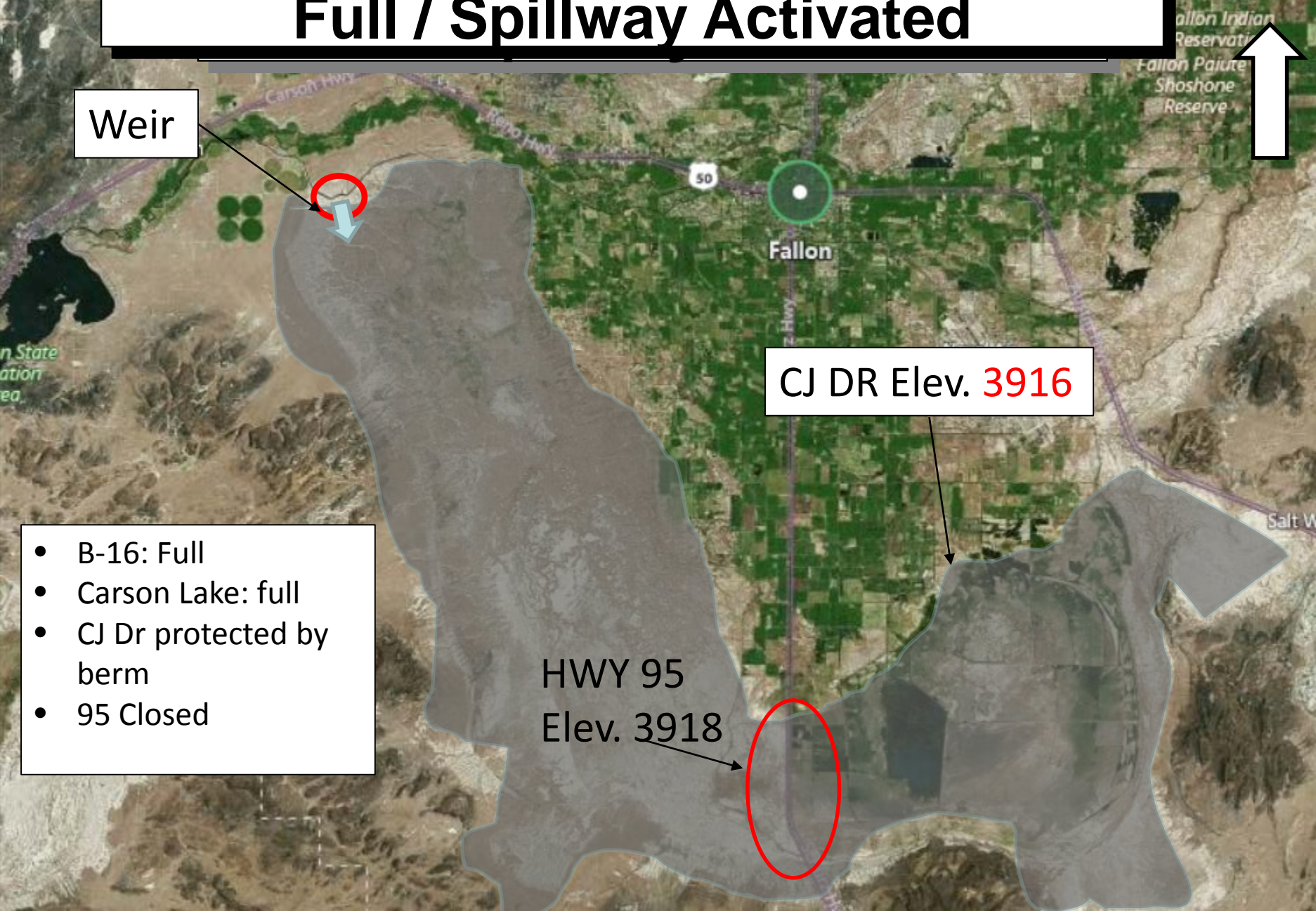
Scenario 2 – Heavy Rain / Lahontan Full / Spillway Activated





Scenario 2 – Heavy Rain / Lahontan Full / Spillway Activated

Weir



CJ DR Elev. 3916

HWY 95
Elev. 3918

- B-16: Full
- Carson Lake: full
- CJ Dr protected by berm
- 95 Closed



Scenario 2 – Heavy Rain / Lahontan Full / Spillway Activated

- Reservoir is full (295k AF)
- Spillway running at 2800 cfs
- Period of high heat in late June
- 5 Day Rain Event
- Carson running at 9500 cfs
 - Spillway will increase to 6100 cfs
 - Weir diverting 1500 cfs
 - ~**5k** cfs headed into Fallon
- Hwy 95 closed (water over top or culverts compromised)

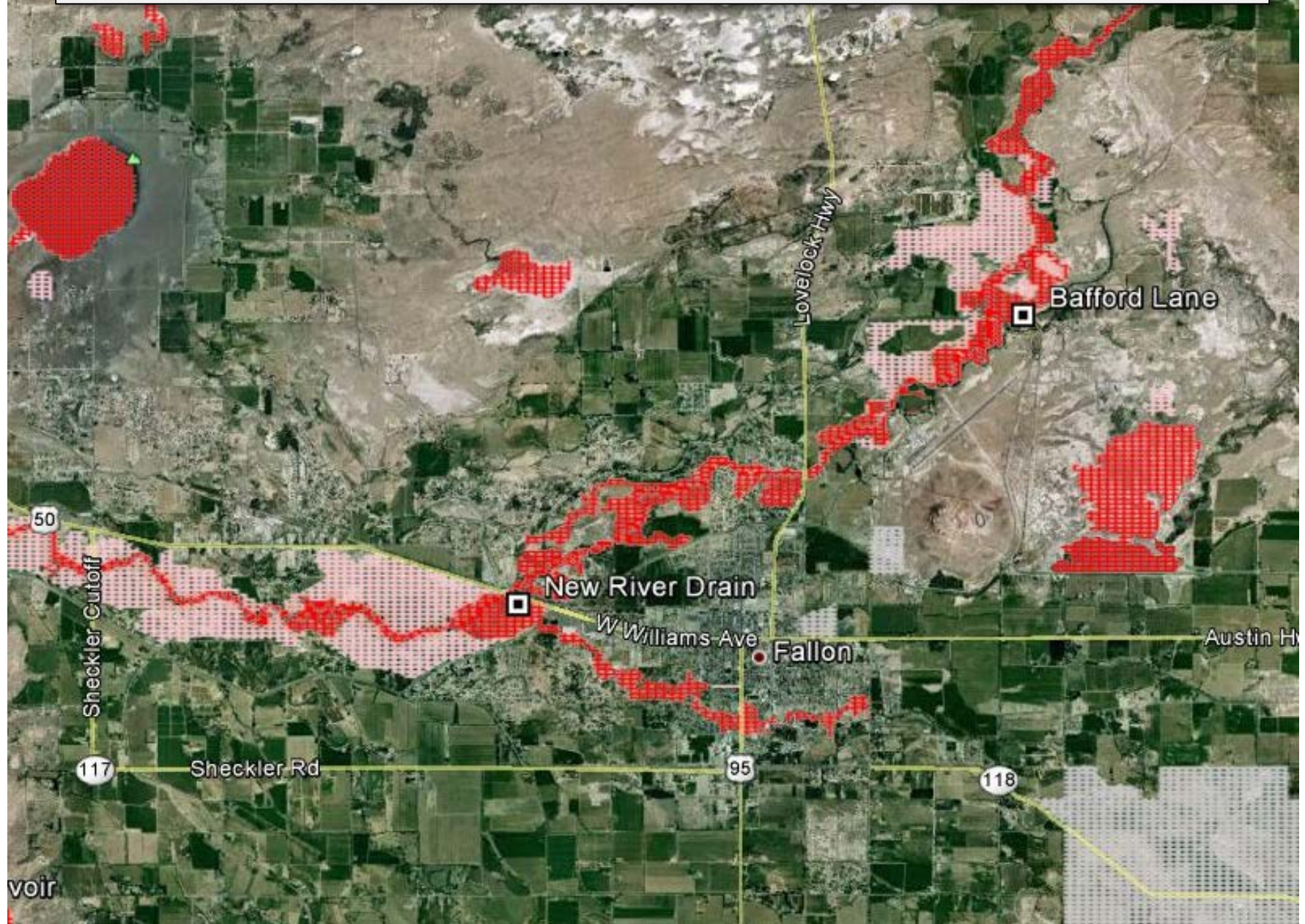


MAJOR DECISIONS

1. **Cut Reservoir release or continue**
2. **Decision to evacuate & when**
 - Routes
3. **95 / 95A traffic detour options**



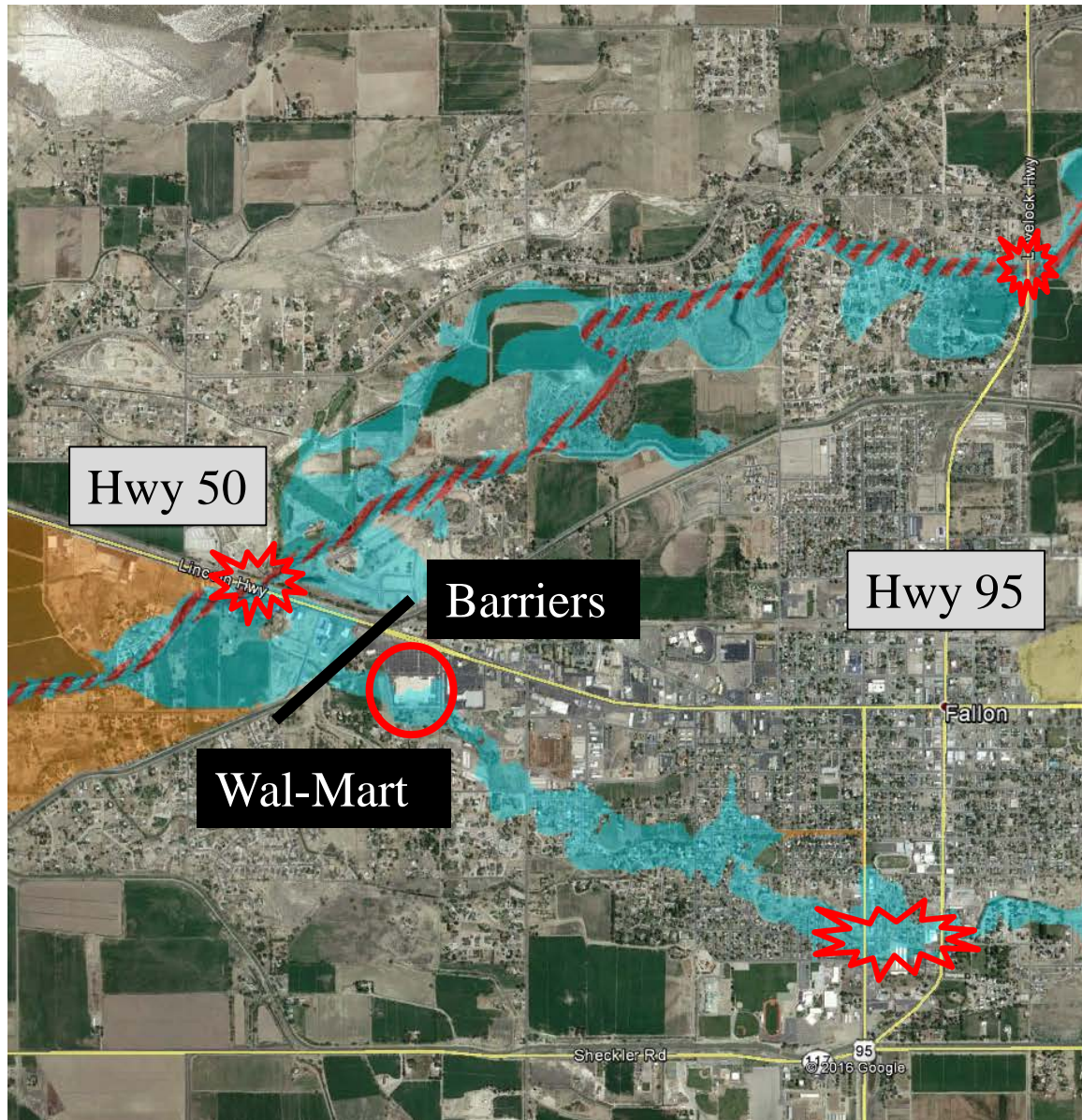
CARSON RIVER (Fallon)





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CARSON RIVER (Fallon)



- Considerations
 - Messaging/ Notification
 - Medical facilities
 - Assisted Living / Retirement home / In home care
 - Durable Medical Equip users
 - Detours / Hwy 50 & 95
 - Marking flooded areas
 - Security of evacuated areas
 - Utilities sandbagged / secured?
 - Individual resident sandbags
 - Impacts on schools
 - Isolated communities (CJ Dr)
 - Sewer impacts
 - Propane tanks
 - Shelter plan
 - Bridge clearing (debris removal)
 - Vector control



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CARSON RIVER (Fallon) HWY 50





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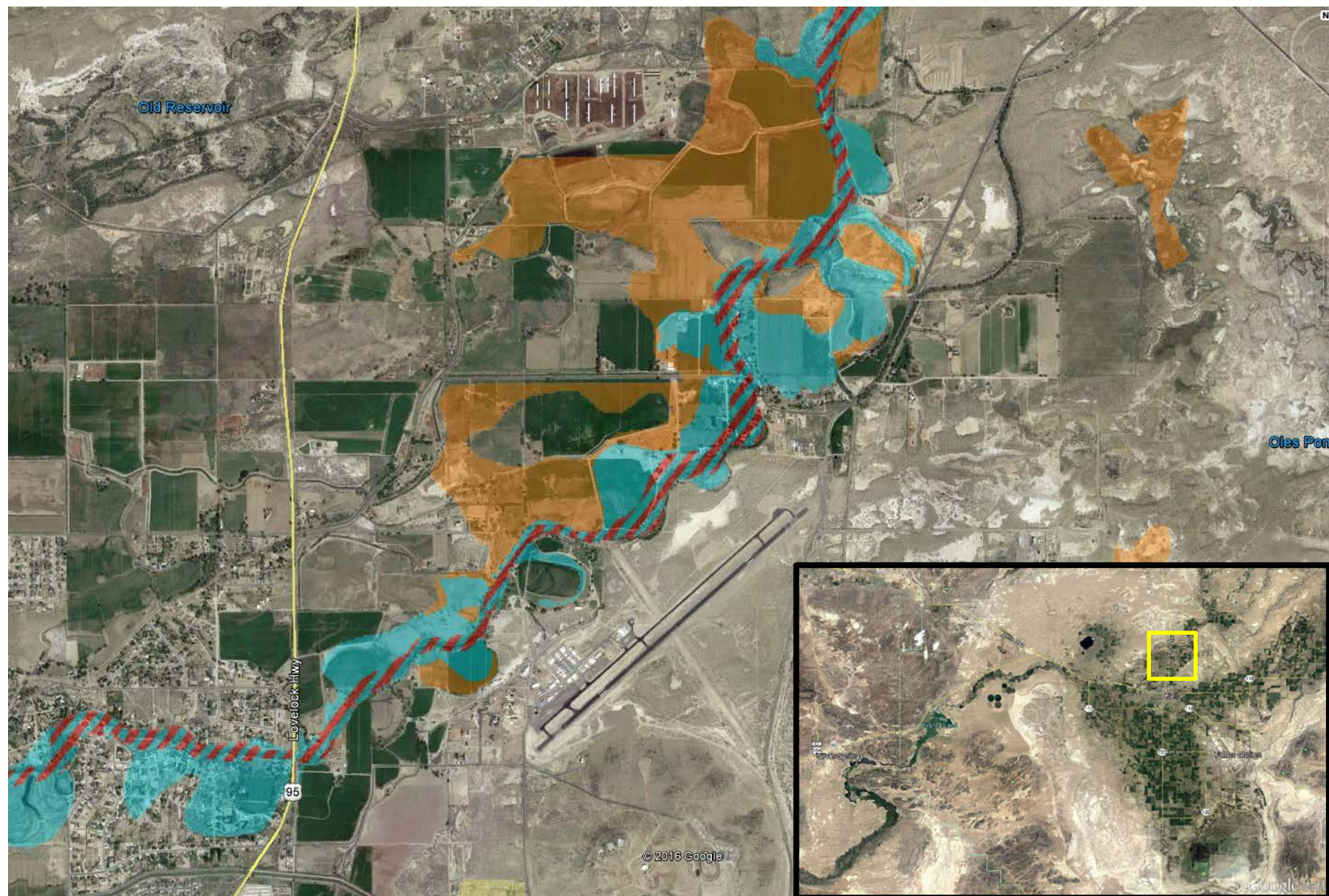
Walmart Area





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CARSON RIVER (Fallon)





Discussion



Walker River Basin

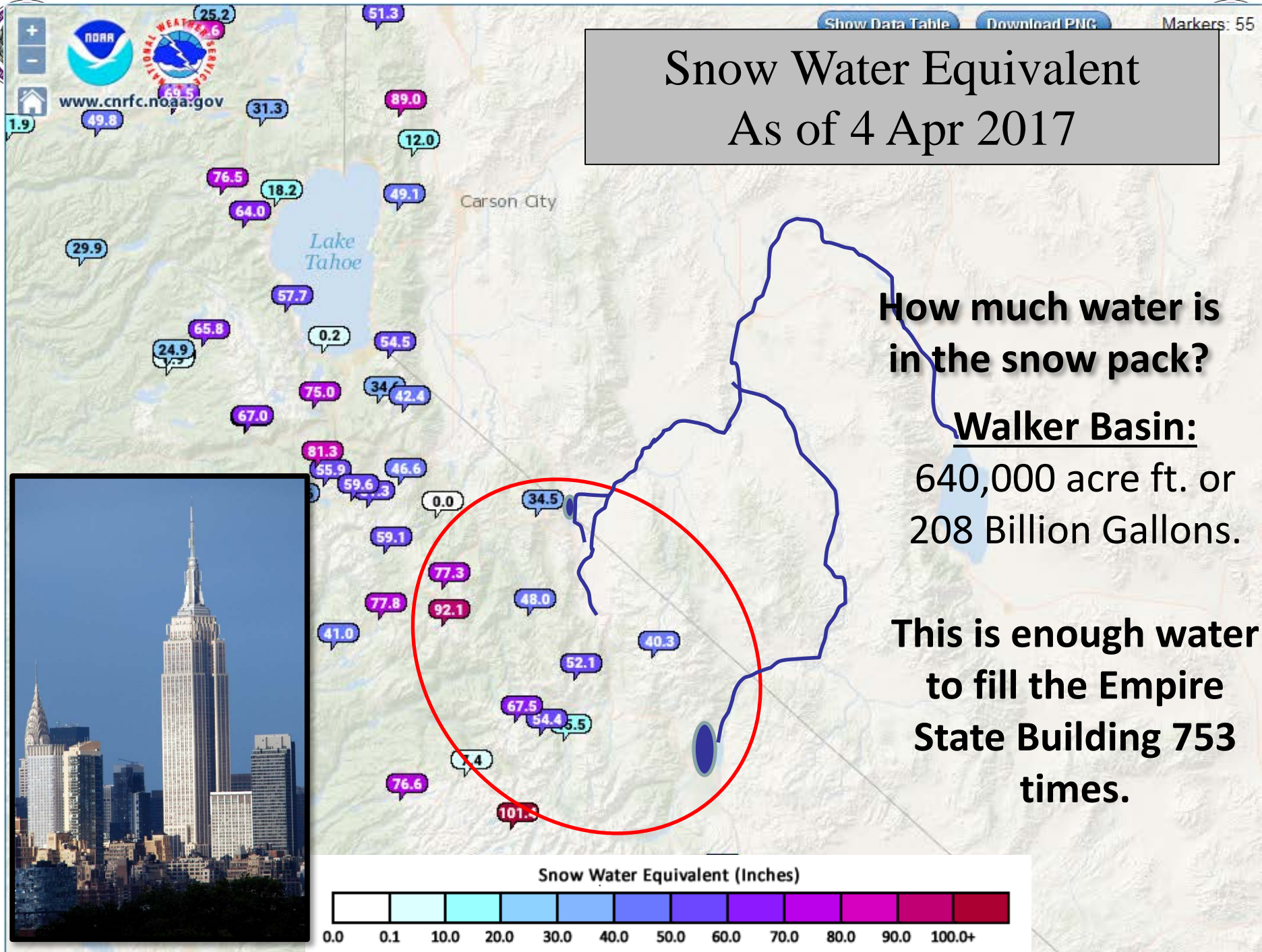
Snow Water Equivalent As of 4 Apr 2017

**How much water is
in the snow pack?**

Walker Basin:

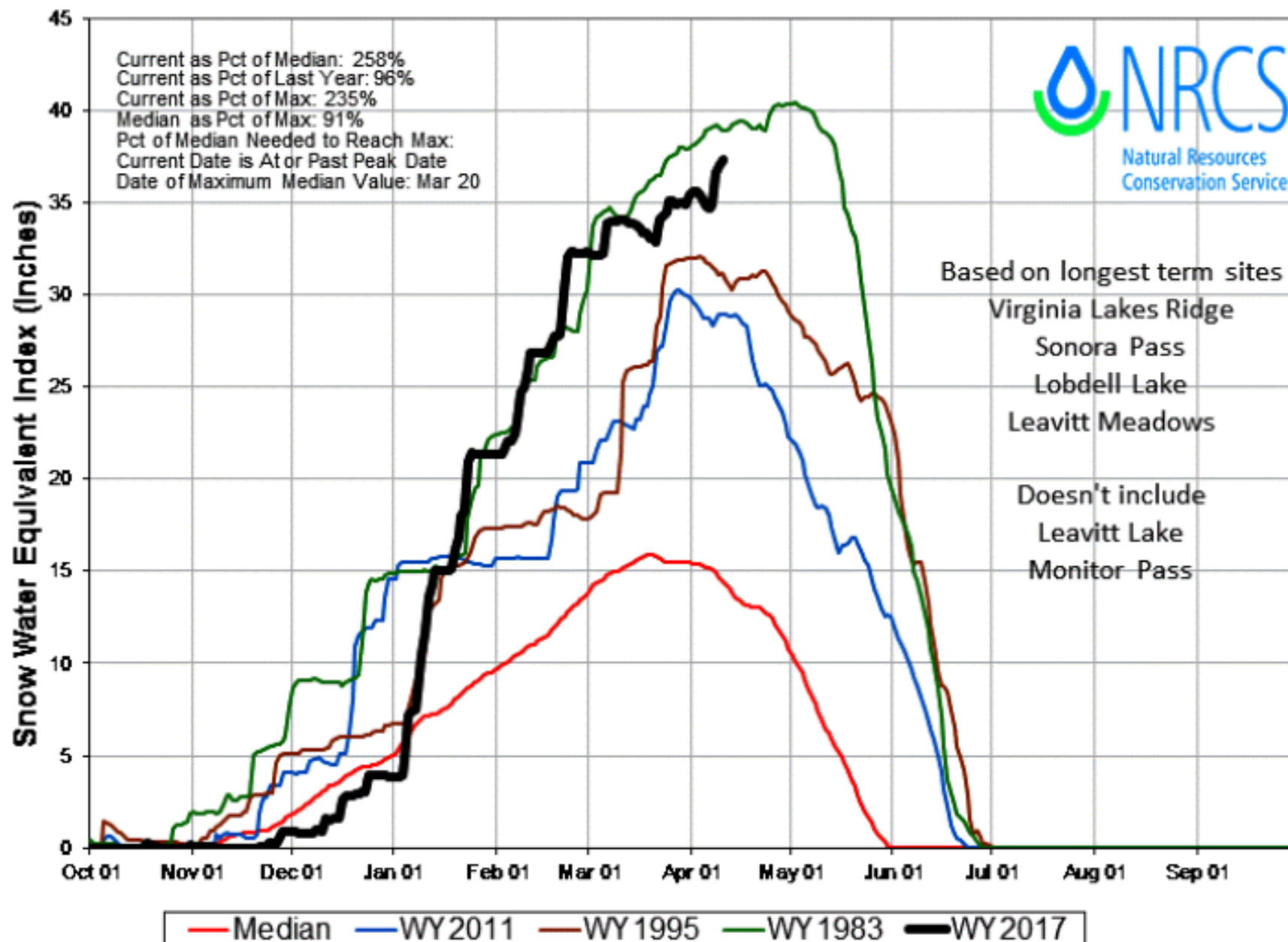
640,000 acre ft. or
208 Billion Gallons.

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



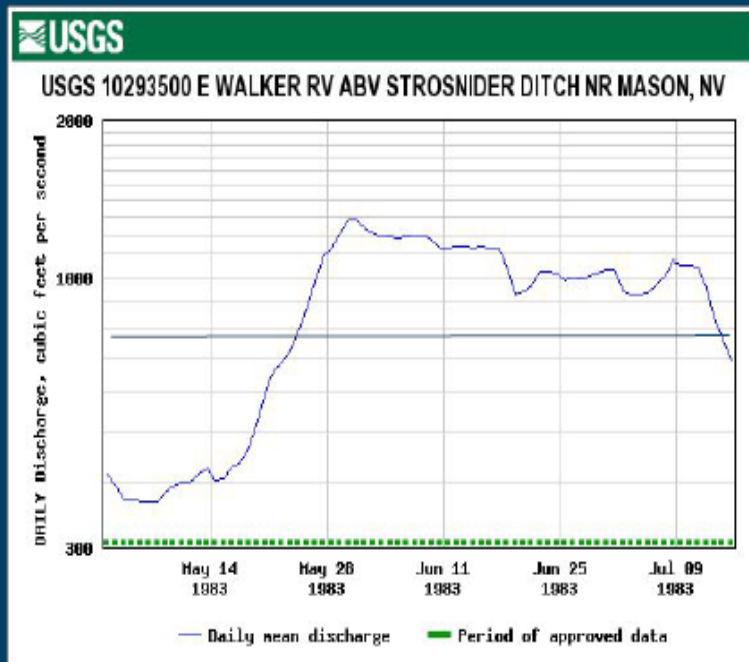


WALKER RIVER BASIN Time Series Snowpack Summary **Based on Provisional SNOTEL data as of Apr 10, 2017**



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
- Flooding impacts will start later and could last well into July.



East Walker high elevation snow contributing to possible record spring runoff volume.



Scenario 1 – Heavy Rain / Moderate Flooding

- **Period of high heat in late May (7 days of 85 degrees)**
- **5 Day Rain Event Similar to February Flooding**
- **Topaz and Bridgeport at approx. 2/3rds capacity**
- **Bridgeport releasing 900 cfs**
- **Topaz releasing 600 cfs**
- **Mason Gauge Reading 2300 cfs**
- **Mason Flood Stage (Moderate – 2320 cfs)**



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WEST WALKER RIVER (Wellington)

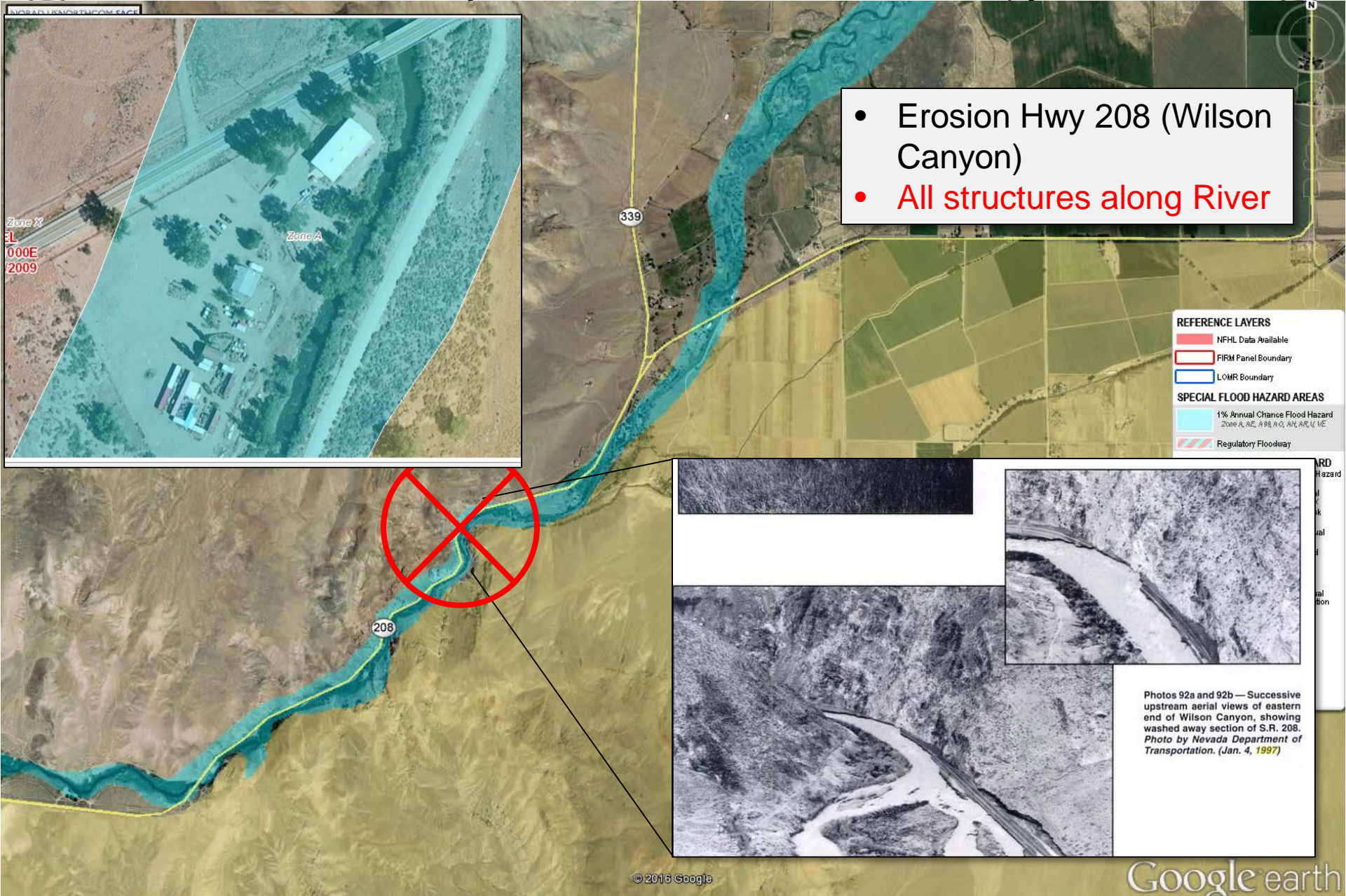


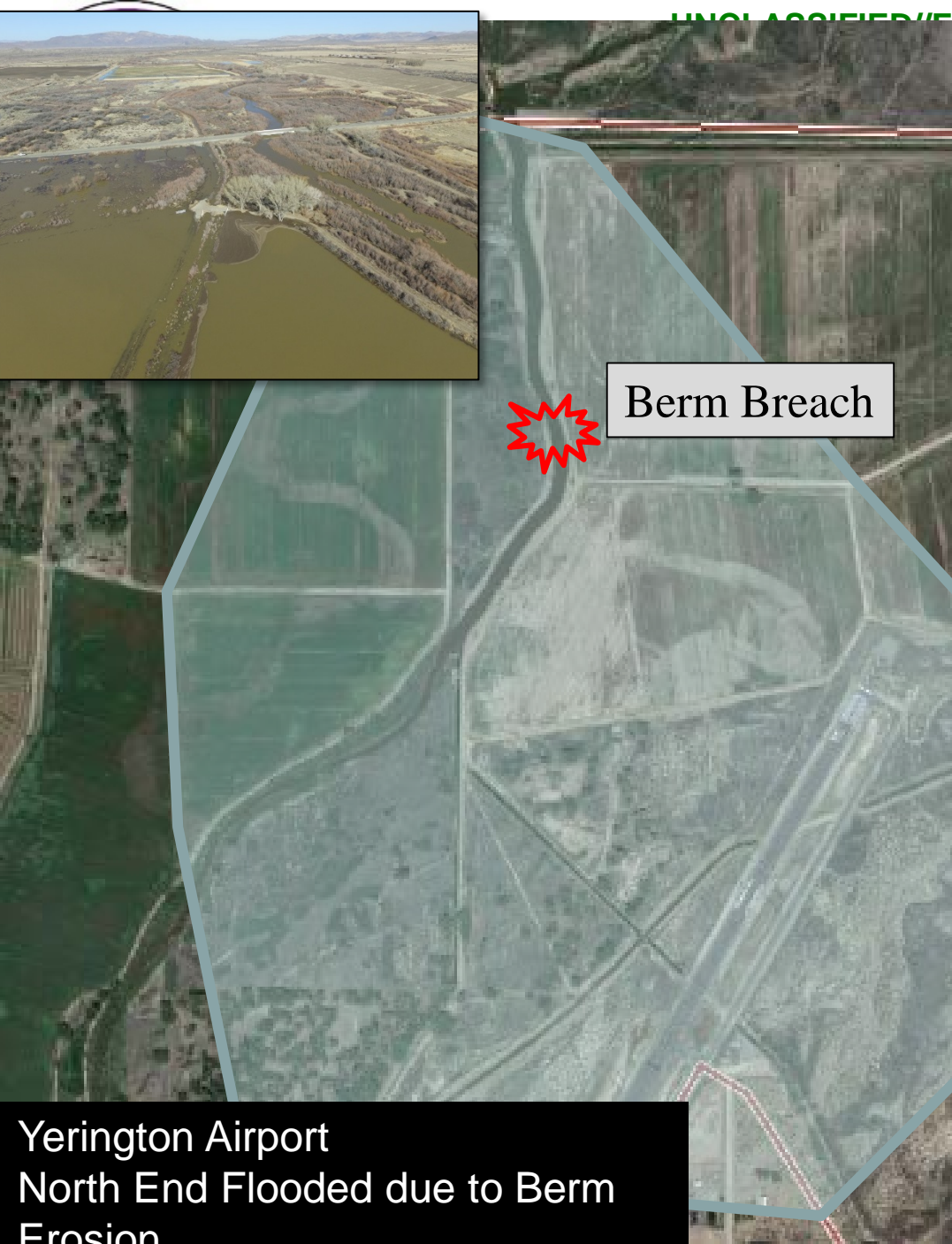


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Wilson Canyon / Structures along River





Berm Breach

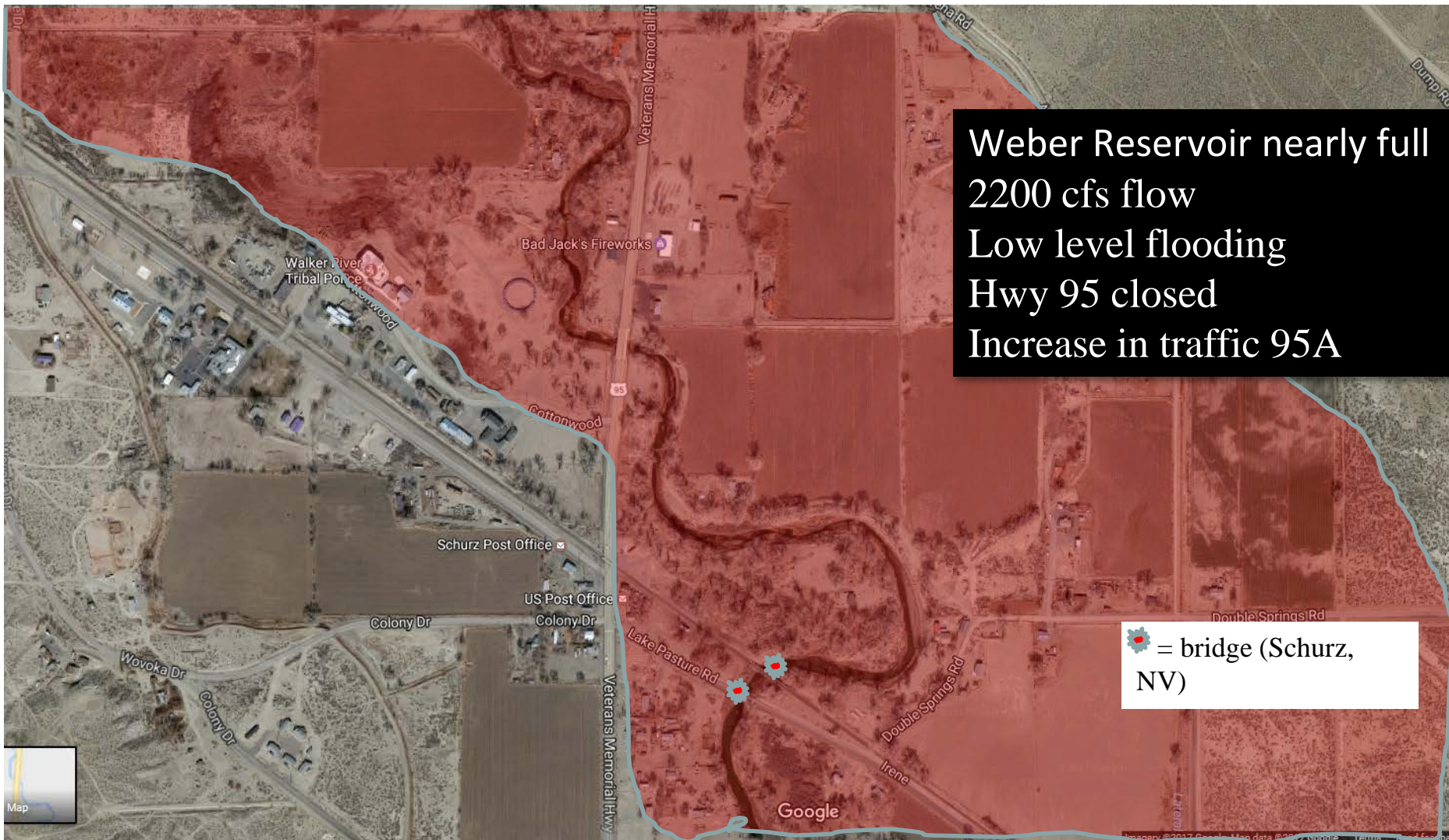
Yerington Airport
North End Flooded due to Berm
Erosion

- Minor Flooding
 - Smith Valley, Mason Valley, Yerington,
 - Damage to farm and pasture lands
 - Flooding affecting structures adjacent to river
 - Miller Lane area submerged
 - Rapid reservoir increase
 - Flash Flooding from rain
 - MVWMA Flooding
 - Decision points regarding berm breaches
 - Berm erosion monitoring/repairs
 - Airport closure
 - Vector control
 - Increased traffic from 95 closure
 - Increased vehicle accident rate




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River Impacts Schurz



Weber Reservoir nearly full
2200 cfs flow
Low level flooding
Hwy 95 closed
Increase in traffic 95A

 = bridge (Schurz, NV)



Discussion



Scenario 2 – Heavy Rain / Topaz Full / Bridgeport Spillway Activated

- **Topaz Reservoir full – River bypassing with no controls**
- **Bridgeport within 2 foot of siphons**
- **Wellington Bridge Flooded**
- **East Walker Road cut**
- **Yerington 100 year flood & Sprague Ditch 97 repeat flood**
- **95A (Goldfield) submerged**
- **Miller Lane closed**
- **Mason 4k cfs**

- **Weber Spillway activated**
- **Hwy 95 bridge debris obstruction results in water backing up**
- **Hwy 95 (S. Fallon) closed**

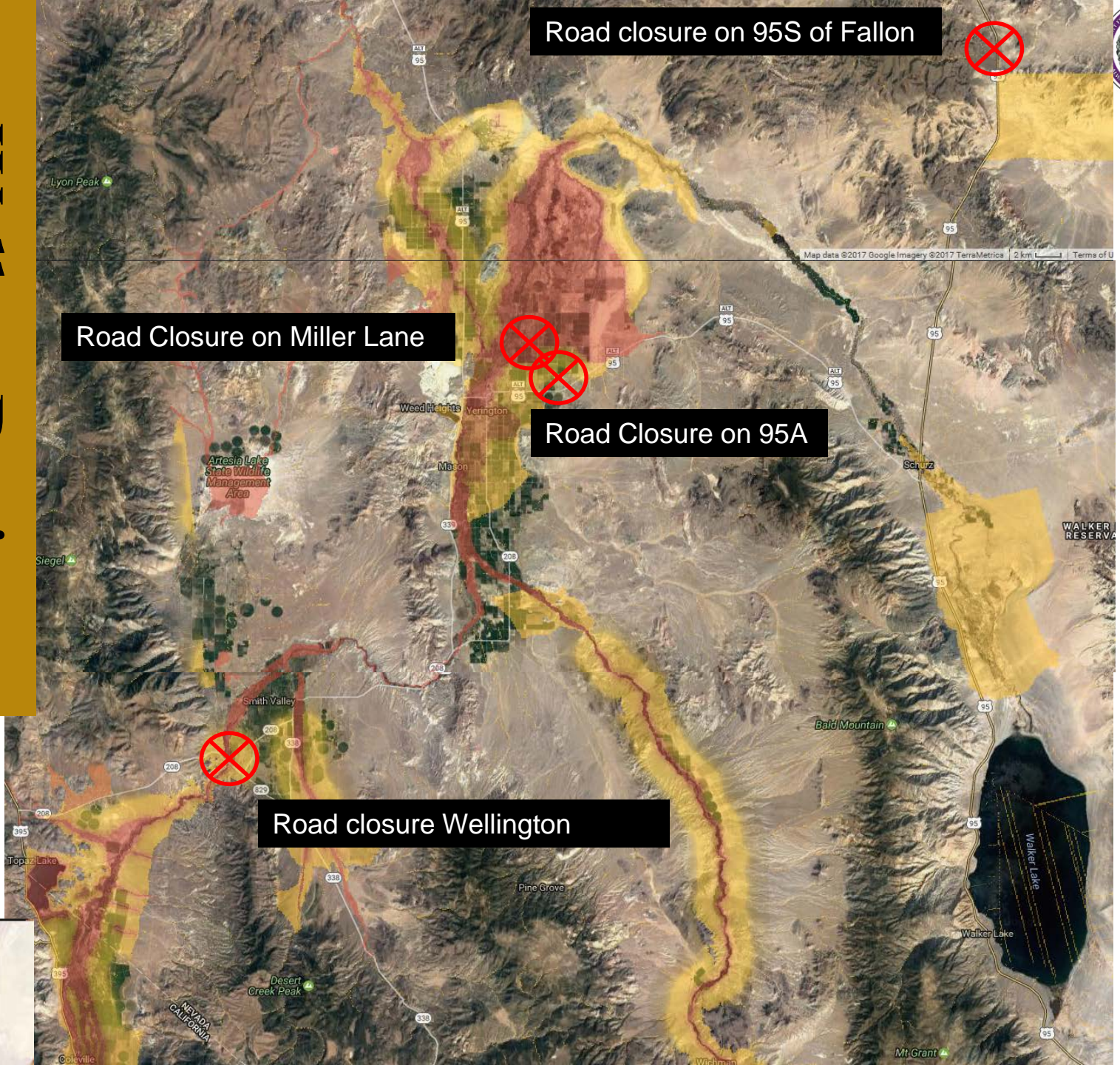


MAJOR DECISIONS

1. Reduce reservoir release or continue (Bridgeport)
2. Decision to close Sprague Ditch & when
3. Decision to evacuate & when
4. 95/95A traffic detour options
5. Bridgeport dam integrity monitoring
6. Life support to WRPT (isolated community)
7. Mineral County commodities from S. NV



Road closure Wellington





Back up flooding
from weir

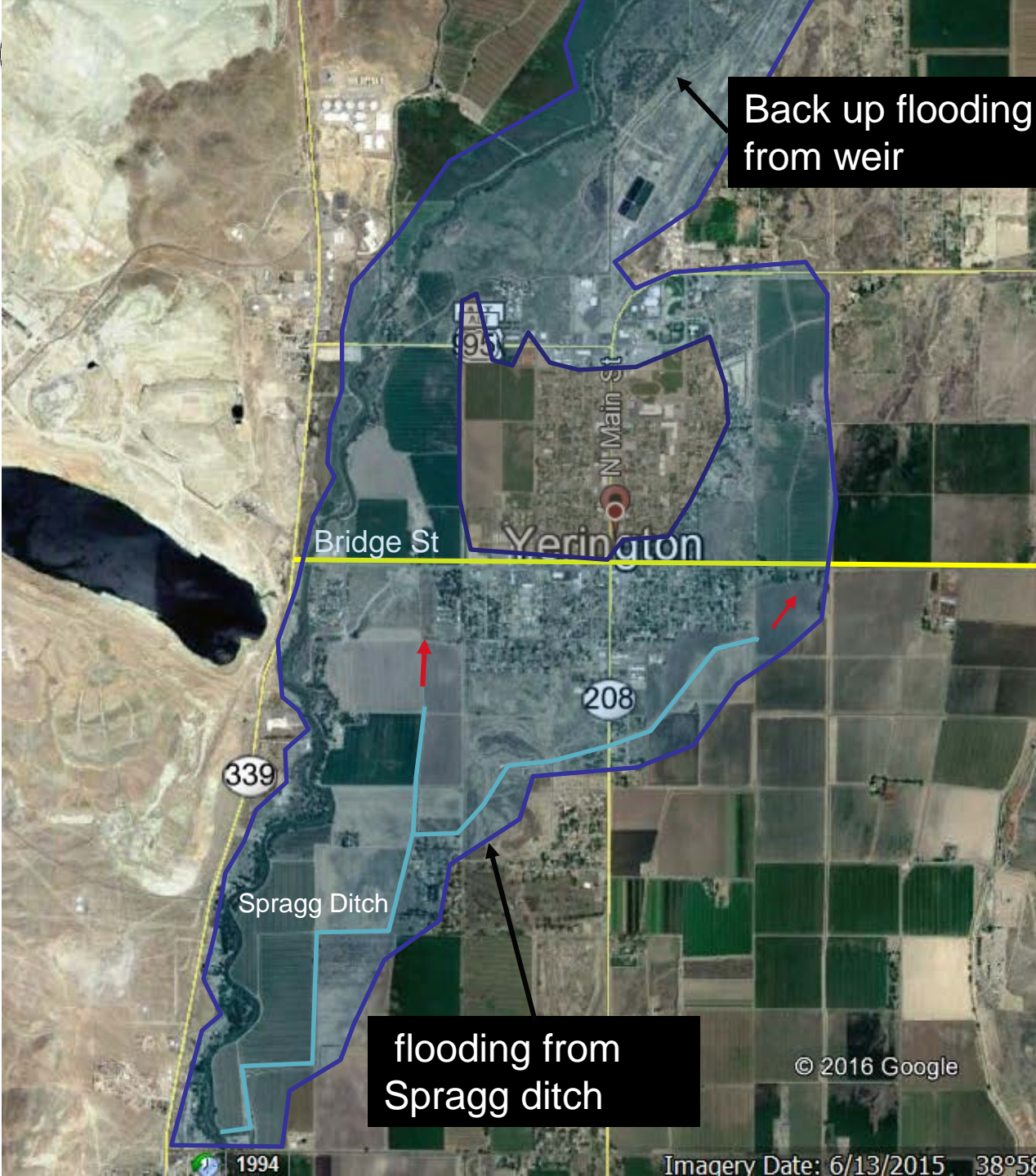
Bridge St

Structures in the flood zone:

- Scolari's
- Maverick
- Chevron
- Multiple Communities
- Lyon County Jail
- Mason Valley Residence
- Home Health Services of NV
- South Lyon Med Center
- DMV

flooding from
Spragg ditch

© 2016 Google



Back up flooding
from weir

Bridge St

Yerington

208

339

Spragg Ditch

flooded from
Spragg ditch

© 2016 Google

1994


Imagery Date: 6/13/2015 38°58'55.07" N 119°08'46.86" W elev 4392 ft

- Considerations
 - Messaging/ Notification
 - Dispatch center COOP
 - Jail Evacuation Plan
 - Evacuation Decision
 - Medical facilities
 - Assisted Living / Retirement home / In home care
 - Durable Medical Equip users
 - Alternate Gas Plan
 - Alternate food plan (Scolaris closed)
 - Detours / Hwy 95A & 95
 - Marking flooded areas
 - Security of evacuated areas
 - Utilities sandbagged / secured?
 - Individual resident sandbags
 - Sewer impacts
 - Propane tanks
 - Shelter plan
 - Bridge clearing (debris removal)
 - Vector control
 - Animals/Pets
 - Health & Welfare checks



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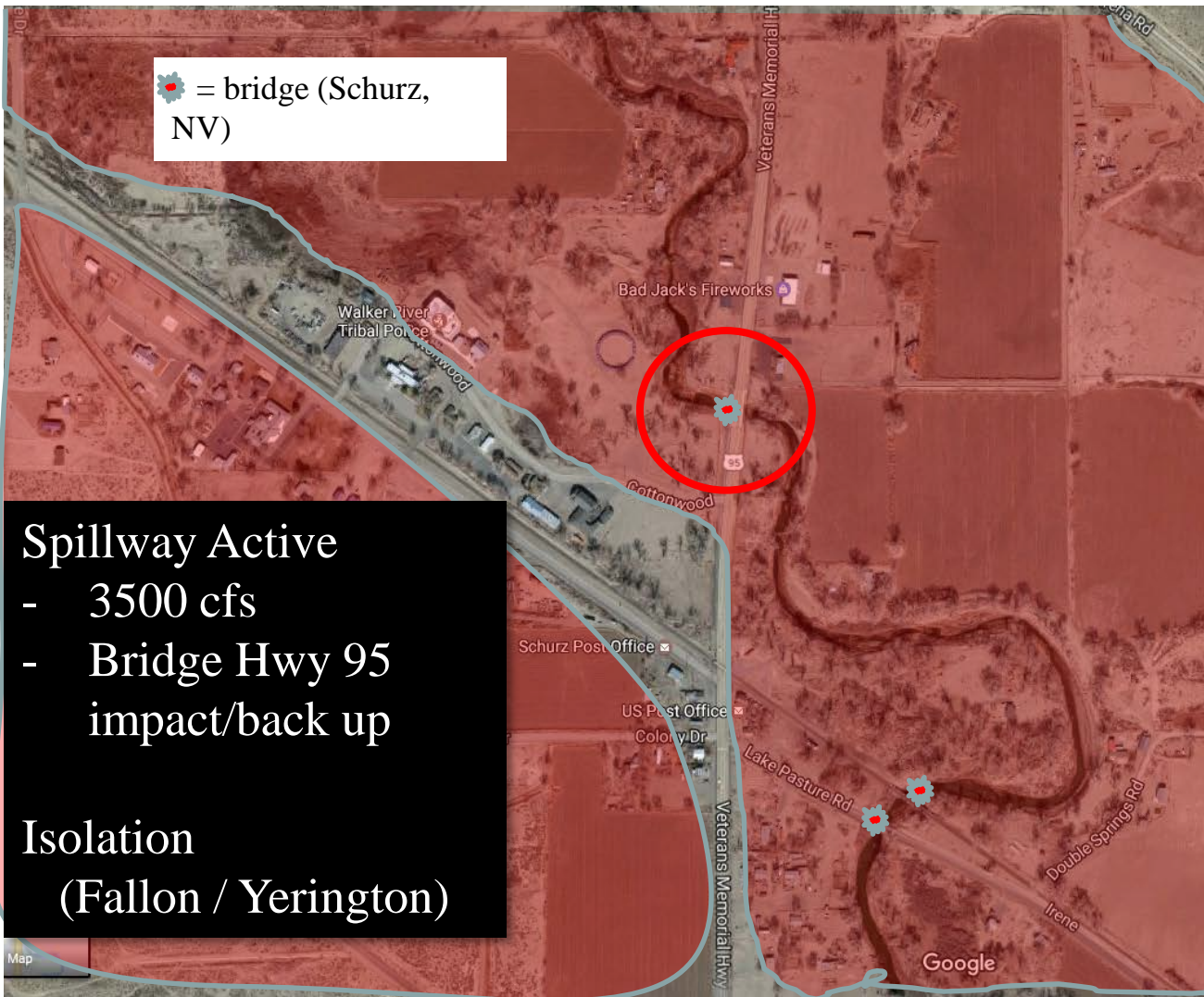
Schurz

 = bridge (Schurz, NV)

Spillway Active

- 3500 cfs
- Bridge Hwy 95 impact/back up

Isolation
(Fallon / Yerington)



- Considerations
 - Messaging/ Notification
 - Police Station COOP
 - Evacuation Decision
 - Assisted Living / Retirement home / In home care
 - Durable Medical Equip users
 - Isolated (North side) residents
 - Alternate Gas Plan
 - Alternate food plan
 - Alternate Medical Care / Hospital Access
 - Detours / Hwy 95A & 95
 - Marking flooded areas
 - Security of evacuated areas
 - Utilities sandbagged / secured?
 - Individual resident sandbags
 - Sewer impacts
 - Propane tanks
 - Shelter plan
 - Bridge clearing (debris removal)
 - Animals/Pets



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Messages

- Flood Resources
 - Sandbag Locations
 - Emergency Contact information
 - Resource Contact information
- Be prepared - two weeks worth of supplies to include food and medications (especially if dwelling is along the river)
- **Travel bag** to include medications, important documents, and non-replacable keepsakes
- Pet plan
- Shelter locations
- Flood Forecast – **know when to react**
- Flood Insurance
- It is going to flood and what it may look like



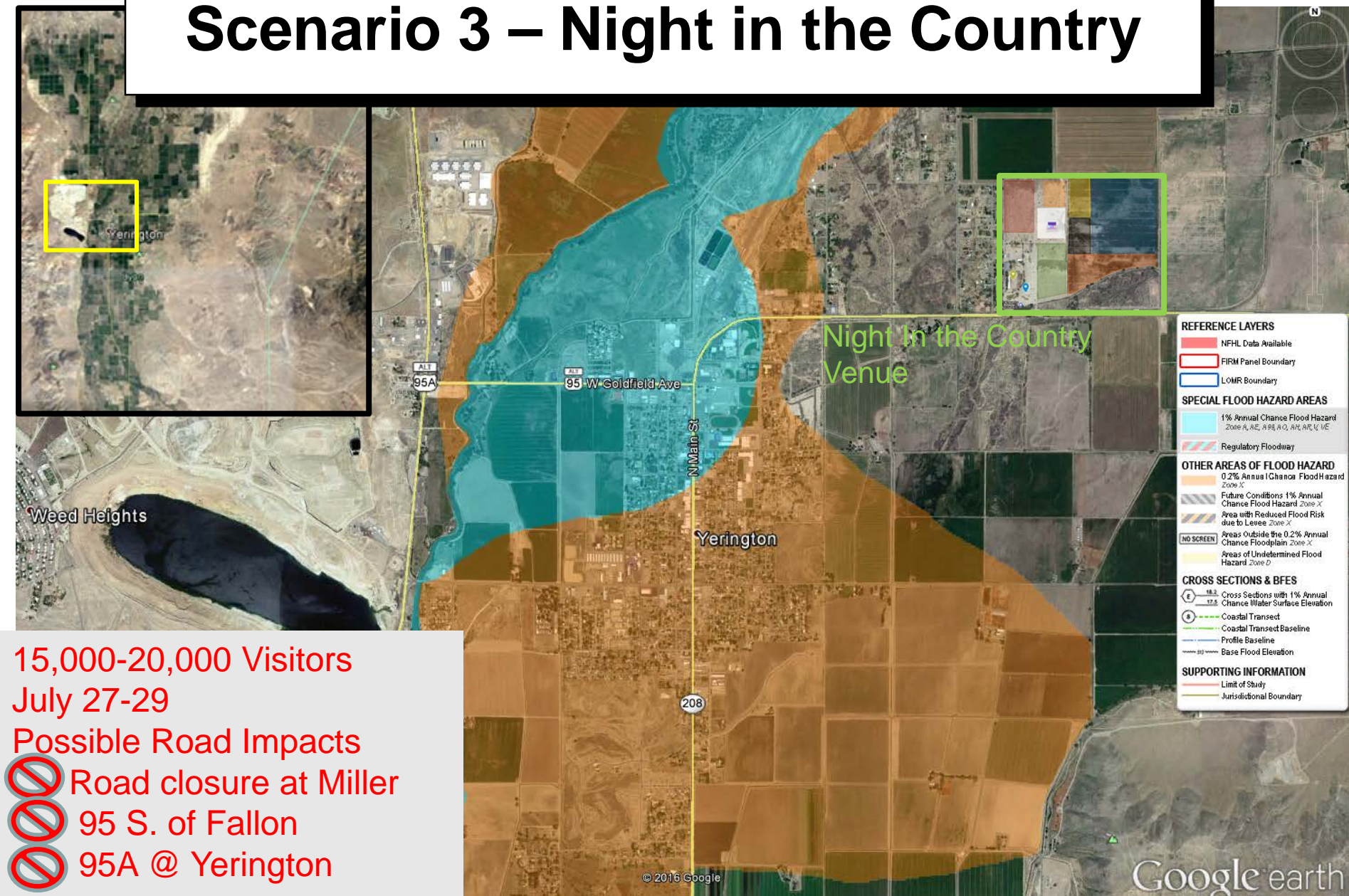
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Discussion



Scenario 3 – Night in the Country





Possible Scenarios / Decisions

- 1. Miller Lane Closed**
 - Traffic impacts in Yerington
 - Traffic impacts with 95 (S. Fallon) closed
- 2. June/Early July Major Flood in Yerington (Recovery Mode)**
- 2. Threat of heavy rain / flooding just prior to event (preventative cancellation)**
- 3. Threat of heavy rain / flooding during event (MAJOR evacuation)**



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Summer is Coming

