



Flood Mitigation Efforts Churchill County 2017

Update 5/8/17

Overview

- Lahontan Reservoir
- What is the current high water situation
- How local governments and agencies are responding to the situation
- The 100 year flood scenario and maps
- Flood insurance facts
- Links and references

Lahontan Dam



Flashboards installed in 2011

Lahontan Dam

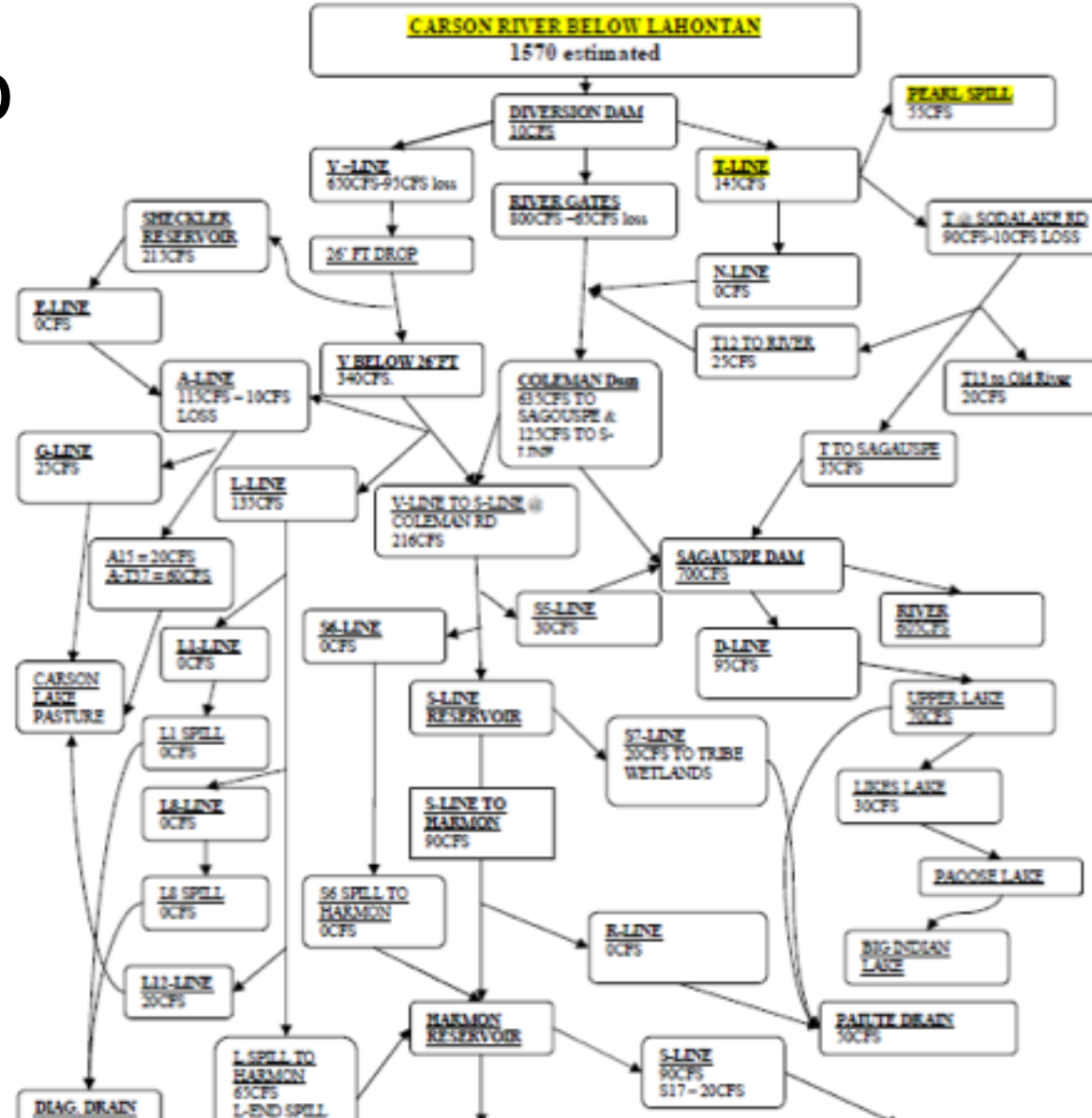
- Earth and gravel filled dam
- Constructed by the USBOR in 1915.
- Inspected, very safe





2/27/2017: Updated Flowchart to reflect T-line increase of 25cfs; water was taken from Diversion Dam due to high water. 2/28/2017; increase flows 30cfs to Diversion Pond.

And then... off into the TCID canal system.





05/08/17Update

8:30A.M.

Lahontan - 196,300

KAF

Fort Churchill 3970 CFS

Below Lahontan -

2970cfs

Total release to date -

314,814 KAF

The Situation

- Water content in the Carson River Watershed is approximately 250% of a normal water year.
 - Amount of water heading our way is about 2.5 times Lahontan Reservoir's capacity.
- Soil in snow run-off areas is already water saturated.
- Lahontan reservoir water content is currently at 196,300 Acre Feet (AF). (5/08/17)
 - Top of concrete rim of the dam is 295,100 AF *
 - Top of emergency wooden flashboards 312,984 AF **



* FEMA Flood Insurance Study (FIS)
2008

** BOR model





Behind the scenes good news.... Got ahead of the situation early.

- County gained permission to put heavy earth moving equipment in the Carson River, creating unprecedented efficiency in moving water down the river.
- Started precautionary releases several months ago.
- Immediate construction of an emergency weir (spillway) on the V line canal
 - Completed 10 March
 - Weir will add an additional 1000+ cfs to flood mitigation flow efforts

























Saturday's Heavy Rainfall Totals

Walker-Coleville, CA	1.63"
Minden, NV	1.47"
Carson City, NV	1.29"
South Lake Tahoe, CA	1.18"
Hawthorne, NV	0.95"
Yerington, NV	0.59"
Reno-Tahoe Airport	0.57"R

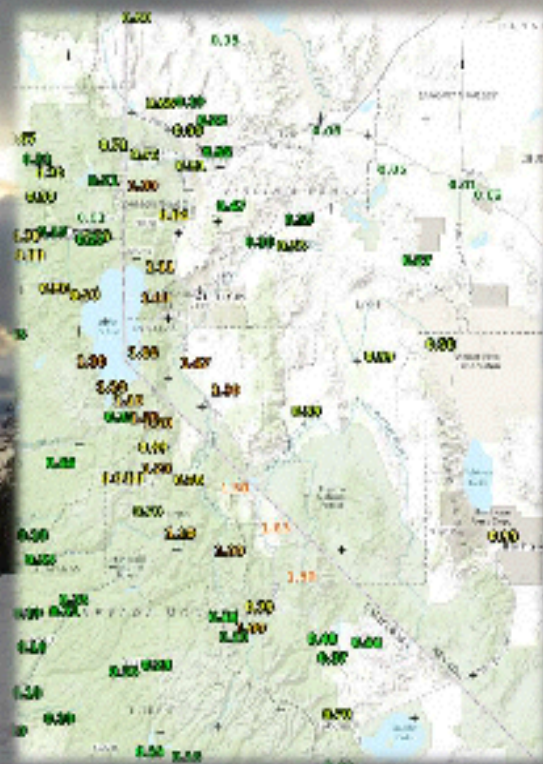


Photo: 



Reno National Weather Service

Forecasting for the Sierra and western Nevada since 1905



Did We Really Need More Rain!?

Hawthorne - nearly $\frac{1}{4}$
of annual average
rainfall. In one day!

Reno now 260% of
normal water-year to
date precip - 14.94".
Crushing 1982-83
previous record



Situational Awareness - When Should I Freakout?

Chris' 7-Day Regional Freakout Forecast for the Sierra and western Nevada

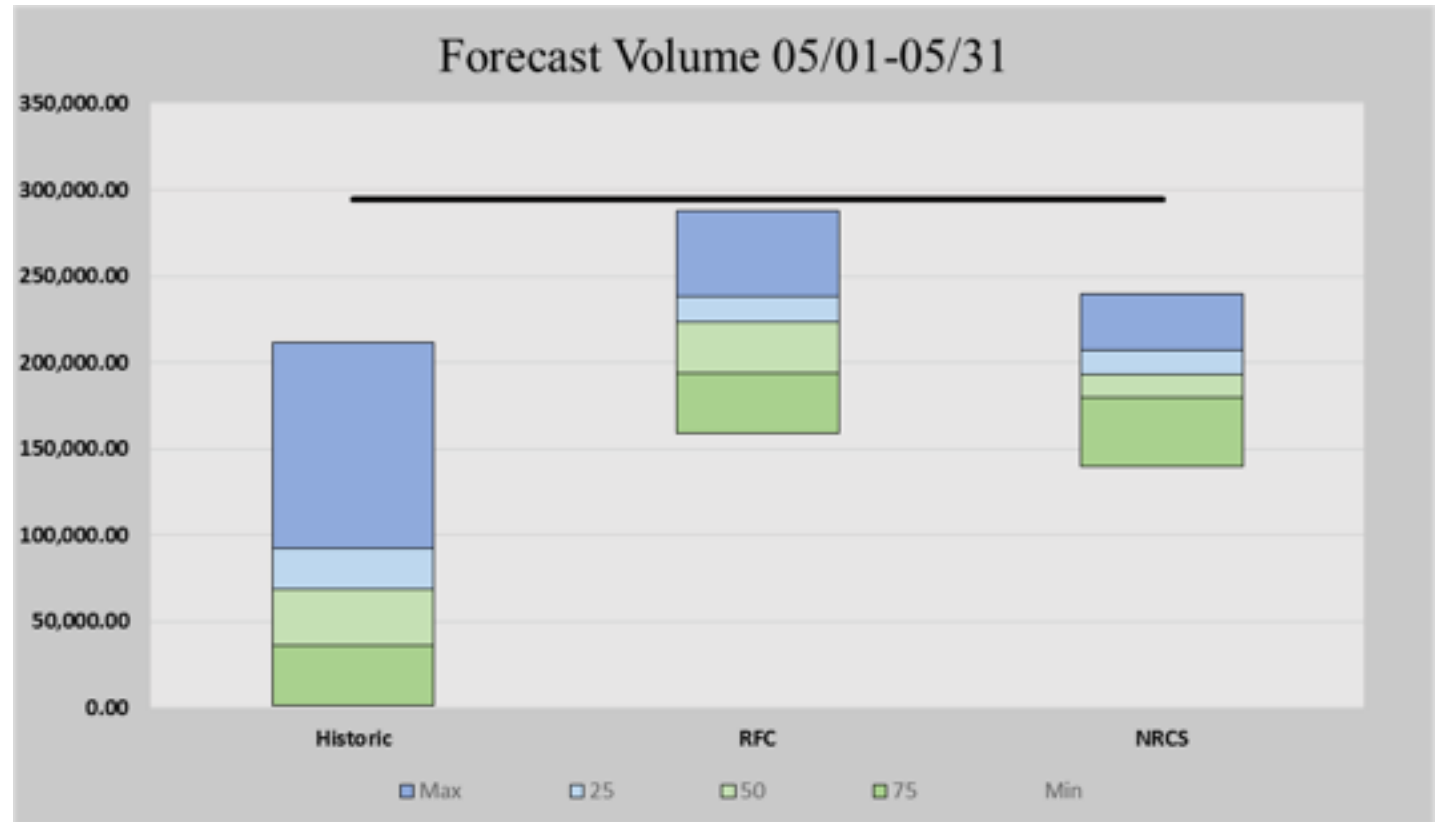
	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Next Week
Wind			increased SW winds, but nothing too unusual	gusty W winds but negligible impact			
Snow							mountain snow impacts possible
River & Snowmelt Flooding	continued high flows with localized minor flooding impacts; slightly higher flows Wed-Fri with warmer temps						less snowmelt flow with cooler temps
Flash Flooding (fast paced flooding of streams, poor drainage and steep terrain areas, rock slides, burn scar runoff)							possible if bands of heavy rain develop with cutoff low
Thunderstorms							possible
Unusual Cold or Heat							early season hard freezes possible
Fire Weather	conditions remain unfavorable for rapid fire spread except localized drying of carryover grasses						

What Does This Mean? <small>Integrates impacts and confidence</small>	No worries	Low level of freakoutness	Moderate freakoutness	High freakoutness	End of this
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Carson River May Inflow Forecasts Ft Churchill Gage

- May inflow is going to be very high, possibly the highest in the 116 year record
- If the releases continue at the current level, and with the available space in the reservoir, there would have to be ~271,000 af of inflow in May to get to the top of the spill way
- There would have to be ~295,000 af of inflow to get to the top of the flashboards





Prepare Yourself!!!

- When spring hits, whether it's "official" or feels like spring, many of us are eager to get out of the office and into the fresh air. However, too much rain or thawing snow after a long winter from mountains can bring severe flooding. Floods are the most common and costly natural disaster in the United States. Here are some things to keep in mind as the spring flood season draws near.
- • Never drive or walk through flooded streets. It only takes six inches of moving water to sweep a person off their feet and 12 inches to move a car. Remember, if a street is flooded, Turn Around; Don't Drown.
- • Floods are expensive. A few inches of water in a 1,000-square foot home could cost more than \$10,000 in repairs and replacement of personal possessions. Visits FEMA's data visualization website to learn more about the costs and impacts of floods in your state
- • Most insurance does not cover flood damage. Only flood insurance will cover the damage from floods. Speak with your insurance agent to learn more and remember flood insurance takes 30 days to take effect, so purchase now to protect your family!
- • Talk with your family and make an emergency plan for you and your pets. No matter the disaster, it's always a good idea to have emergency supplies ready at home, at work, and in the car.
- You can learn more about the dangers of flooding and find information about flood insurance at Ready.gov/floods and Floodsmart.gov. We also have prepared a Flood Safety Social Media Toolkit so you can share tips with your friends and family prepare at www.ready.gov/flood-toolkit.

Flood Fact Sheet

Basic Safety Tips

- Turn Around, Don't Drown! ☹
- Avoid walking or driving through flood waters.
- Just 6 inches of moving water can knock you down, and 2 feet of water can sweep your vehicle away.
- If there is a chance of flash flooding, move immediately to higher ground. Flash floods are the #1 cause of weather-related deaths in the US.
- If floodwaters rise around your car but the water is not moving, abandon the car and move to higher ground. Do not leave the car and enter moving water.
- Avoid camping or parking along streams, rivers, and creeks during heavy rainfall. These areas can flood quickly and with little warning.

Flood Watch

Flood Watch = "Be Aware." Conditions are right for flooding to occur in your area.

Steps to Take

- Turn on your TV/radio. You will receive the latest weather updates and emergency instructions.
- Know where to go. You may need to reach higher ground quickly and on foot.
- Build or restock your emergency preparedness kit. Include a flashlight, batteries, cash, and first aid supplies.

Prepare Your Home

- Bring in outdoor furniture and move important indoor items to the highest possible floor. This will help protect them from flood damage.
- Disconnect electrical appliances and do not touch electrical equipment if you are wet or standing in water. You could be electrocuted.
- If instructed, turn off your gas and electricity at the main switch or valve. This helps prevent fires and explosions.

Flood warning

Flood Warning = "Take Action!" Flooding is either happening or will happen shortly.

Steps to Take:

- Move immediately to higher ground or stay on high ground.
- Evacuate if directed.
- Avoid walking or driving through flood waters. Turn Around, Don't Drown! Just 6 inches of moving water can knock you down and 2 feet of water can sweep your vehicle away.

After a Flood

- Return home only when authorities say it is safe.
- Be aware of areas where floodwaters have receded and watch out for debris. Floodwaters often erode roads and walkways.
- Do not attempt to drive through areas that are still flooded.
- Avoid standing water as it may be electrically charged from underground or downed power lines.
- Photograph damage to your property for insurance purposes.

When it is not flooding: Make a flood plan

- Know your flood risk.
- Make a flood emergency plan.
- Build or restock your emergency preparedness kit, including a flashlight, batteries, cash, and first aid supplies.
- Consider buying flood insurance.
- Familiarize yourself with local emergency plans. Know where to go and how to get there should you need to get to higher ground, the highest level of a building, or to evacuate.
- Stay tuned to your phone alerts, TV, or radio for weather updates, emergency instructions, or evacuation orders.





Additional Items to Consider Adding to an Emergency Supply Kit:

- Prescription medications and glasses
- Infant formula and diapers
- Pet food and extra water for your pet
- Important family documents such as copies of insurance policies, identification and bank account records in a waterproof, portable container
- Cash or traveler's checks and change
- Emergency reference material such as a first aid book or information from www.ready.gov
- Sleeping bag or warm blanket for each person. Consider additional bedding if you live in a cold-weather climate.
- Complete change of clothing including a long sleeved shirt, long pants and sturdy shoes. Consider additional clothing if you live in a cold-weather climate.
- Household chlorine bleach and medicine dropper – When diluted nine parts water to one part bleach, bleach can be used as a disinfectant. Or in an emergency, you can use it to treat water by using 16 drops of regular household liquid bleach per gallon of water. Do not use scented, color safe or bleaches with added cleaners.
- Fire Extinguisher
- Matches in a waterproof container
- Feminine supplies and personal hygiene items
- Mess kits, paper cups, plates and plastic utensils, paper towels
- Paper and pencil
- Books, games, puzzles or other activities for children


Ready
Prepare. Plan. Stay Informed.®



Emergency Supply List



FEMA

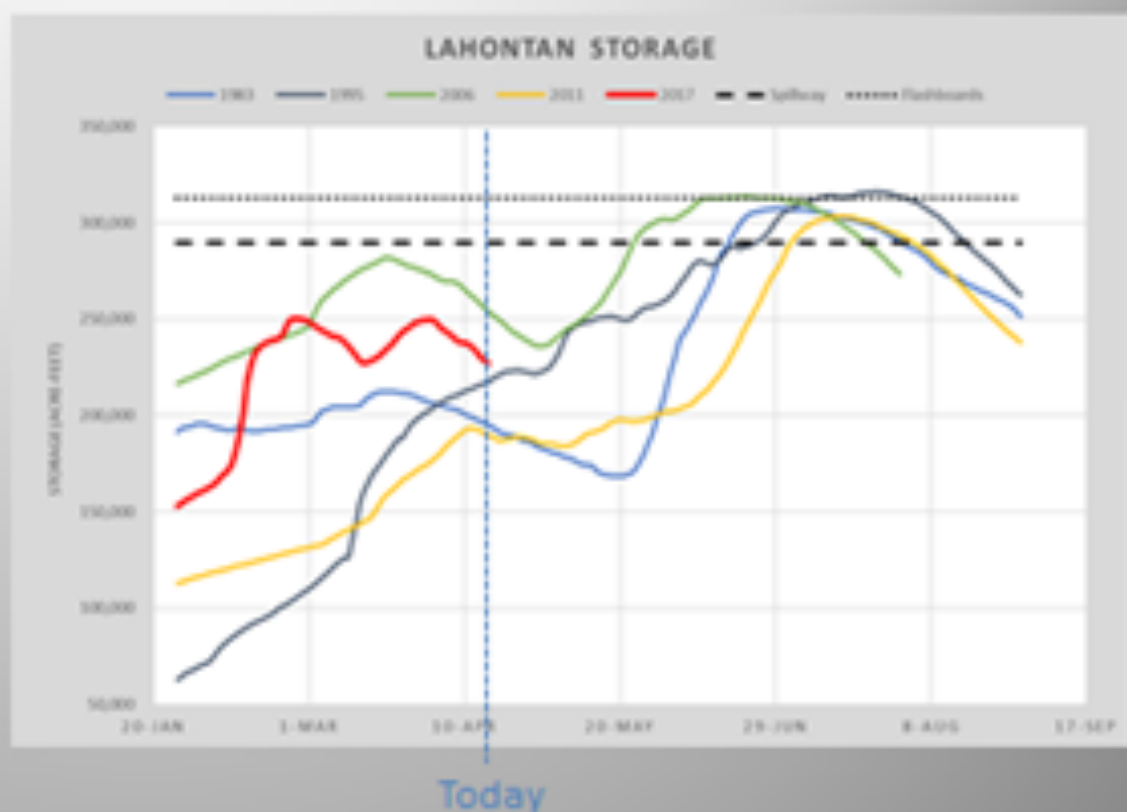
www.ready.gov

Historic "Big Year" Comparison Current Lahontan Storage

Year	April 18 th Storage (af)	March Volume (kaf)	AJ Volume (kaf)
1983	192,800	62.3	514
1995	220,000	102.9	450
2006	250,800	50.1	332
2011	188,000	53.9	386
2017	223,200	80	570/588*

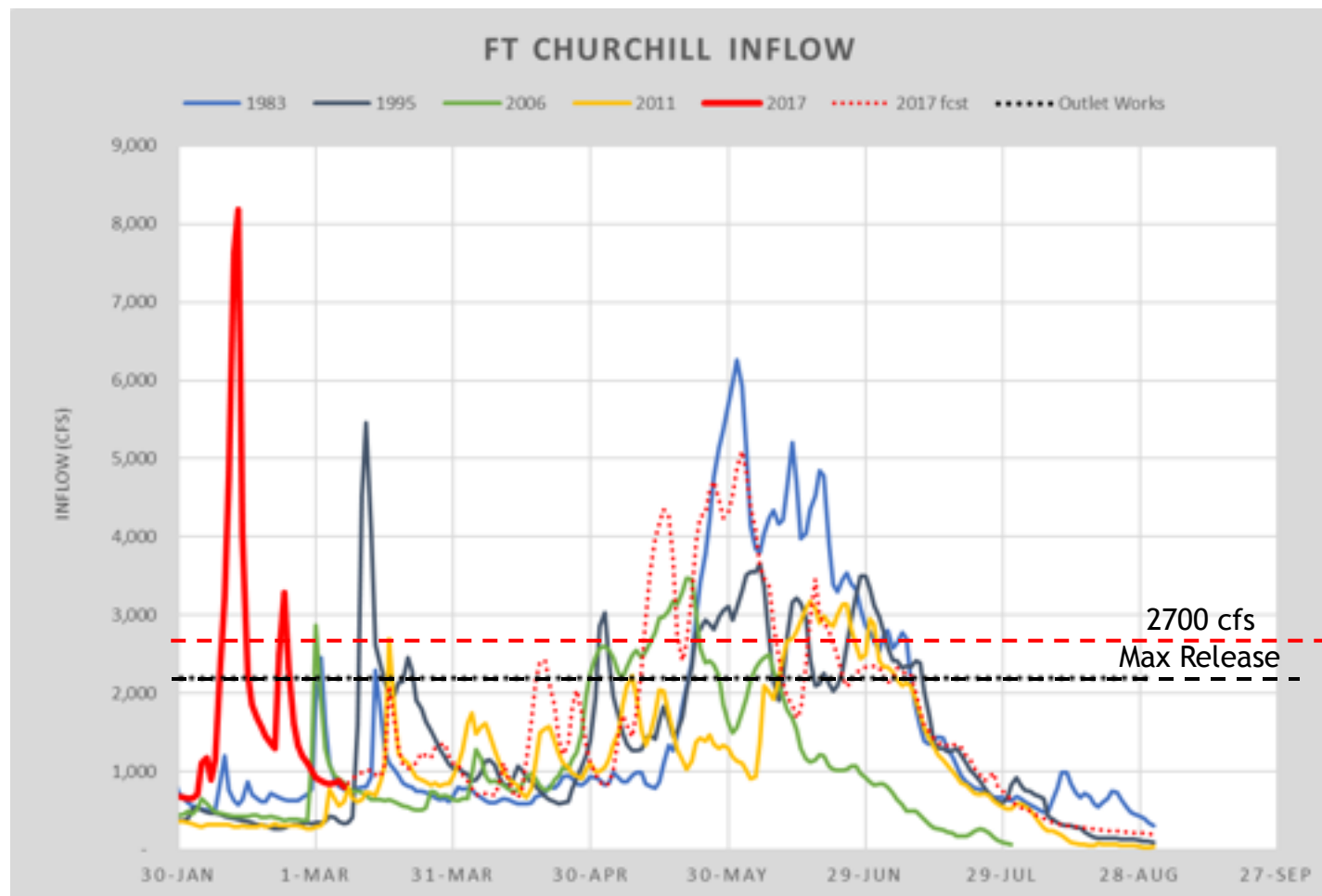
* NRCIS Apr 14th Forecast / RRC ESP Forecast Median 4/17/17

- Lahontan drawdown 13,500 af this past week
- Lahontan is expected to drawdown to ~218,000 af by next week



Historic “Big Year” Comparison Carson River Inflow

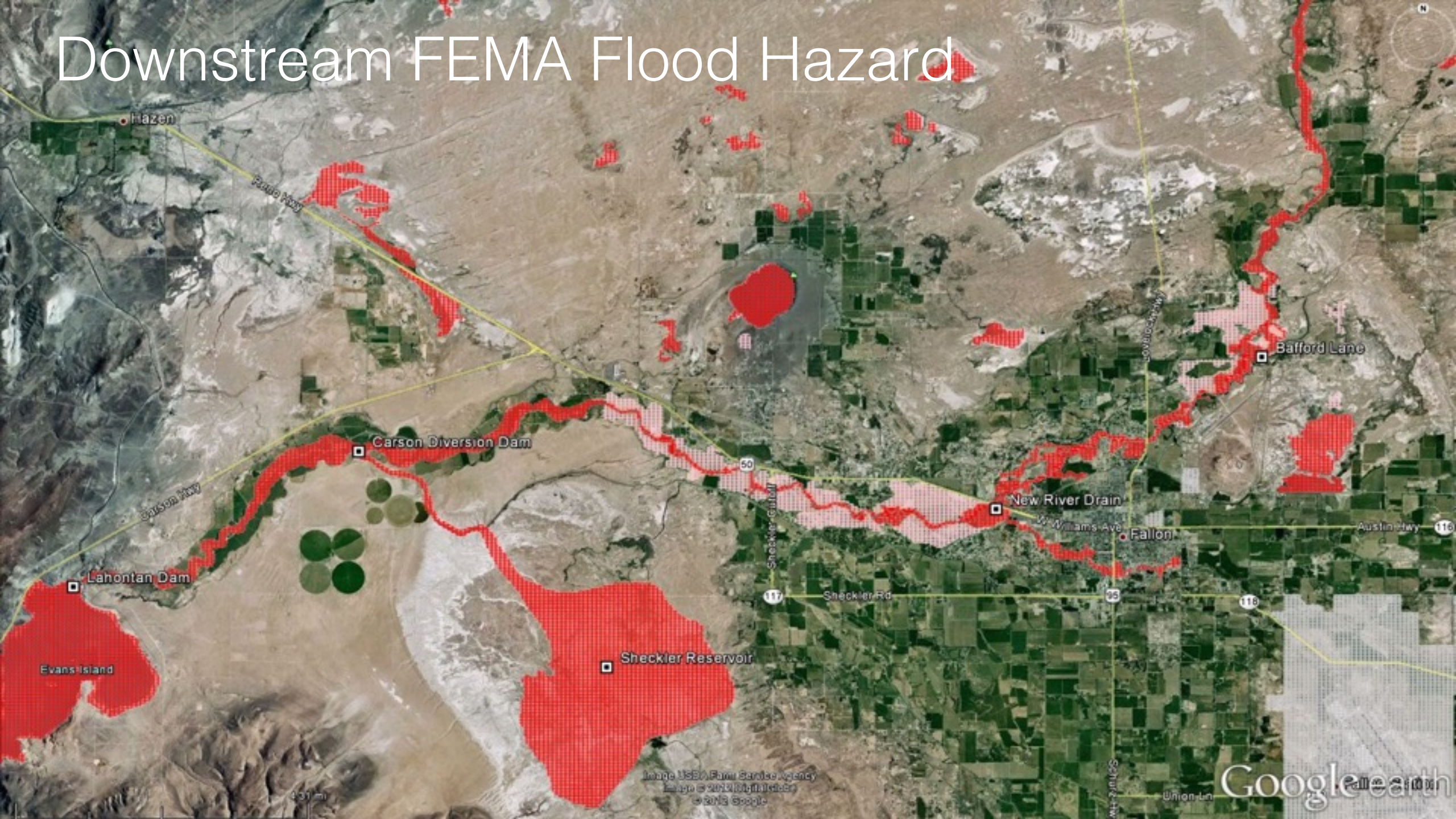
- Historic big years all have inflows that go over maximum release capacity of the reservoir for extended periods of time
- Managing spills over the spillway at ~3000 cfs helps, but doesn't solve the problem
- Reservoir must have sufficient space available before inflows exceed release capacity of the reservoir
- If the reservoir fills to the top and the inflows are still high, then reservoir fills and spills necessarily. Acts like a detention basin. Limited control over total outflow from reservoir
- At ~13” over the top of flashboards, the spill flows exceed 3000 cfs





The FEMA 100 Year Flood Insurance Rate Map (FIRM) Scenario

Downstream FEMA Flood Hazard





Flood Insurance

- If you have a mortgage on your home and you live in a high-risk flood zone, in most cases, your lender requires you to buy flood insurance.
- However, if you live in a moderate to low-risk zone, and your community belongs to the National Flood Insurance Program (which the City and County do), then you have the option of buying it on the open market.
- Most insurers will let you tailor your coverage (ex \$ 30K, \$ 50K, etc.)
- Most insurers place a 30 day moratorium on coverage from purchase and to first authorized flood claim event.



Nationally the Average Flood Claim is \$40,000

Finished floor, wood, carpeting	\$15,870
Doors, base trim, windows	\$2,150
Electrical, plumbing	\$320
Cleaning	\$2000
Kitchen and bath cabinets	\$4,500
Appliances	\$180
Washer, dryer	\$150
Repairs to furnace/AC	\$270
Bedroom furniture	\$1,800
Kitchenware and food	\$330
Living room furniture	\$2,700
Computer accessories	\$1,100
Media equipment	\$150
Accent furniture and accessories	\$450
Personal items	\$650

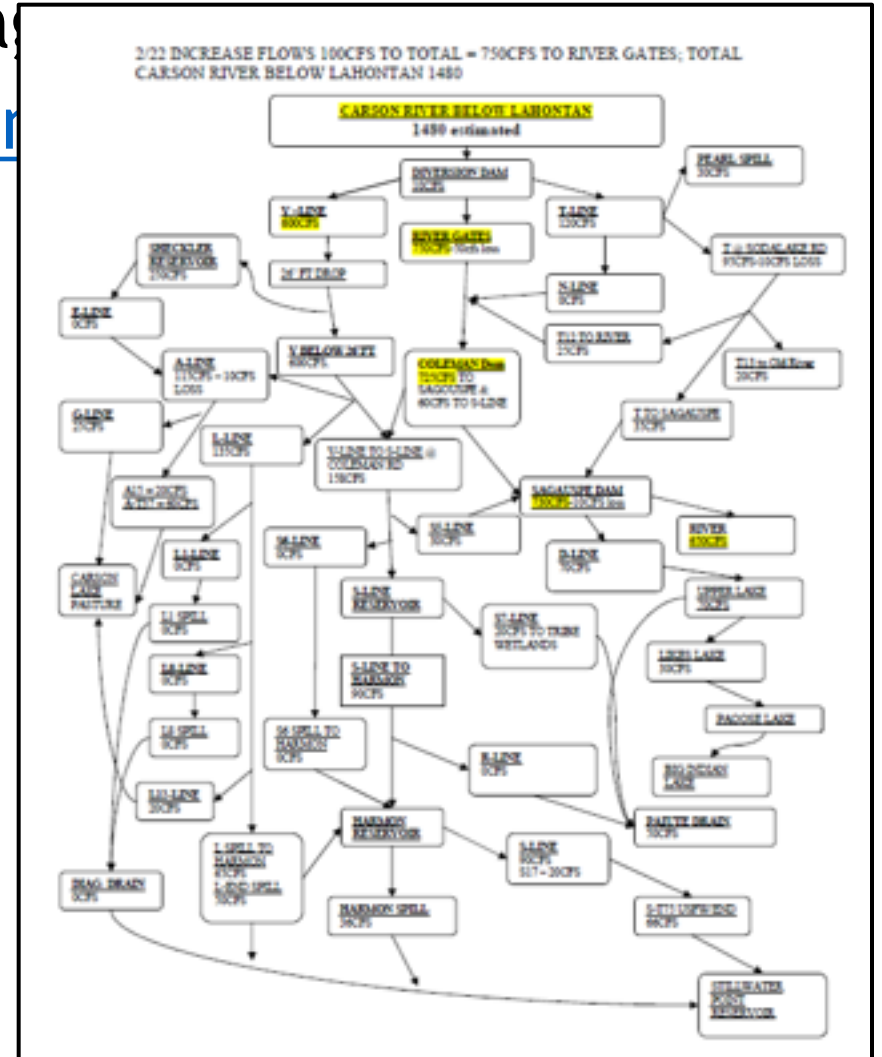
Total **\$39,150**

1,000 sq. ft. home is \$20,150



Useful Links and References

- Churchill County Sheriff's Facebook Page
- <http://nv-churchillcounty.civicplus.com>
- <https://www.floodsmart.gov>
- <https://www.ready.gov/>
- <http://www.tcid.org/>
- <http://www.churchillcounty.org/>
- fallonnevada.gov





Potential Consequences – Increased River Flows Below Diversion Dam

- 1000-1200cfs - normal operation
- 1200-1500cfs - local flooding in low lying areas, possible septic and well water issues.
- 1500-2000cfs - moderate flooding of river corridor with potential street flooding and access/egress compromise.
- 2000+ cfs - major flooding potential evacuation measures may be implemented



Churchill County Flood Zones

<http://nv-churchillcounty.civicplus.com>



Details

Legend

NFHL

LOMRs

 Effective

LOMAs




FIRM Panels




Flood Hazard Boundaries

 Limit Lines

 SFHA / Flood Zone Boundary

 Other Boundaries


Flood Hazard Zones


 1% Annual Chance Flood Hazard

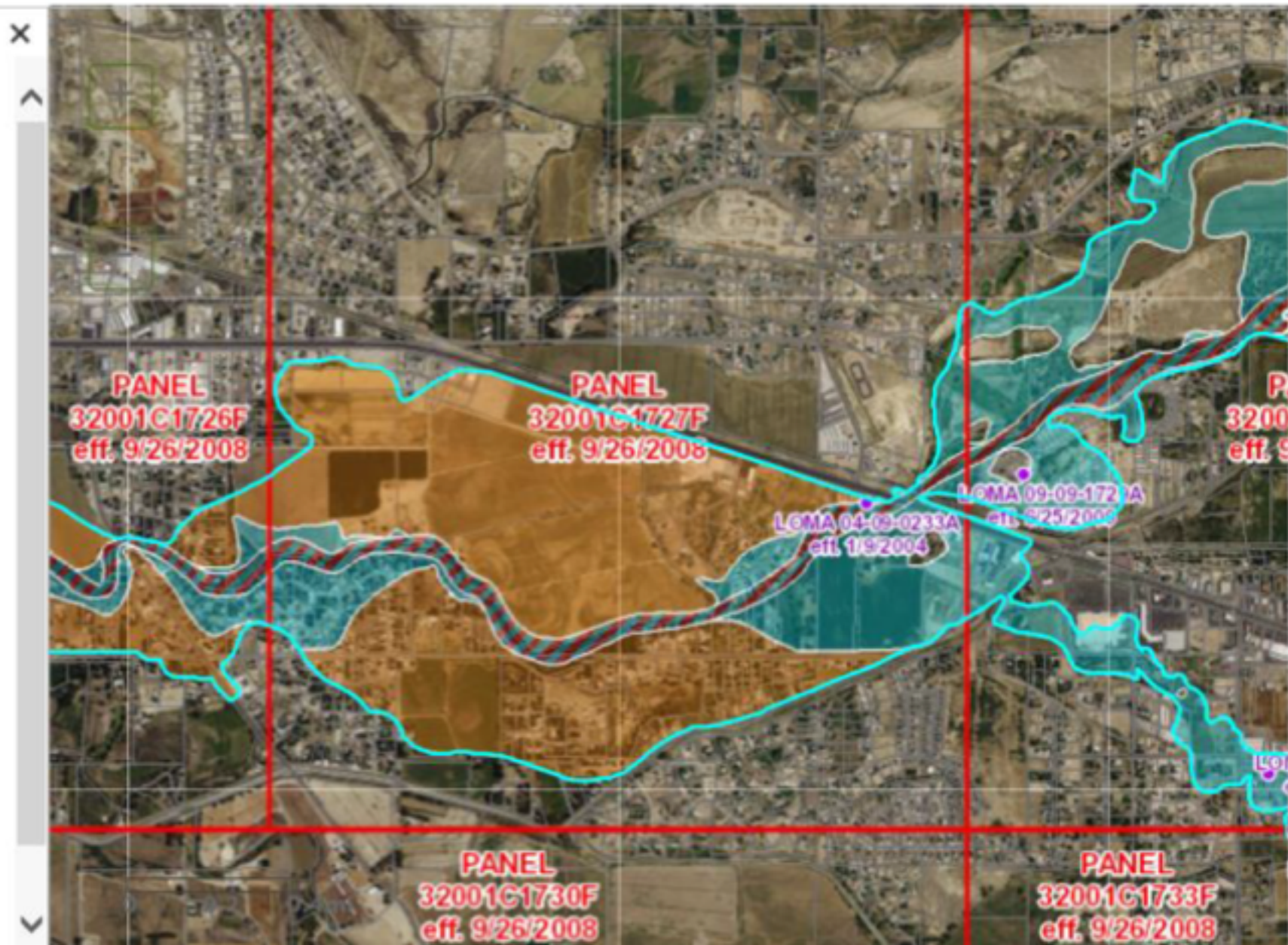
 Regulatory Floodway

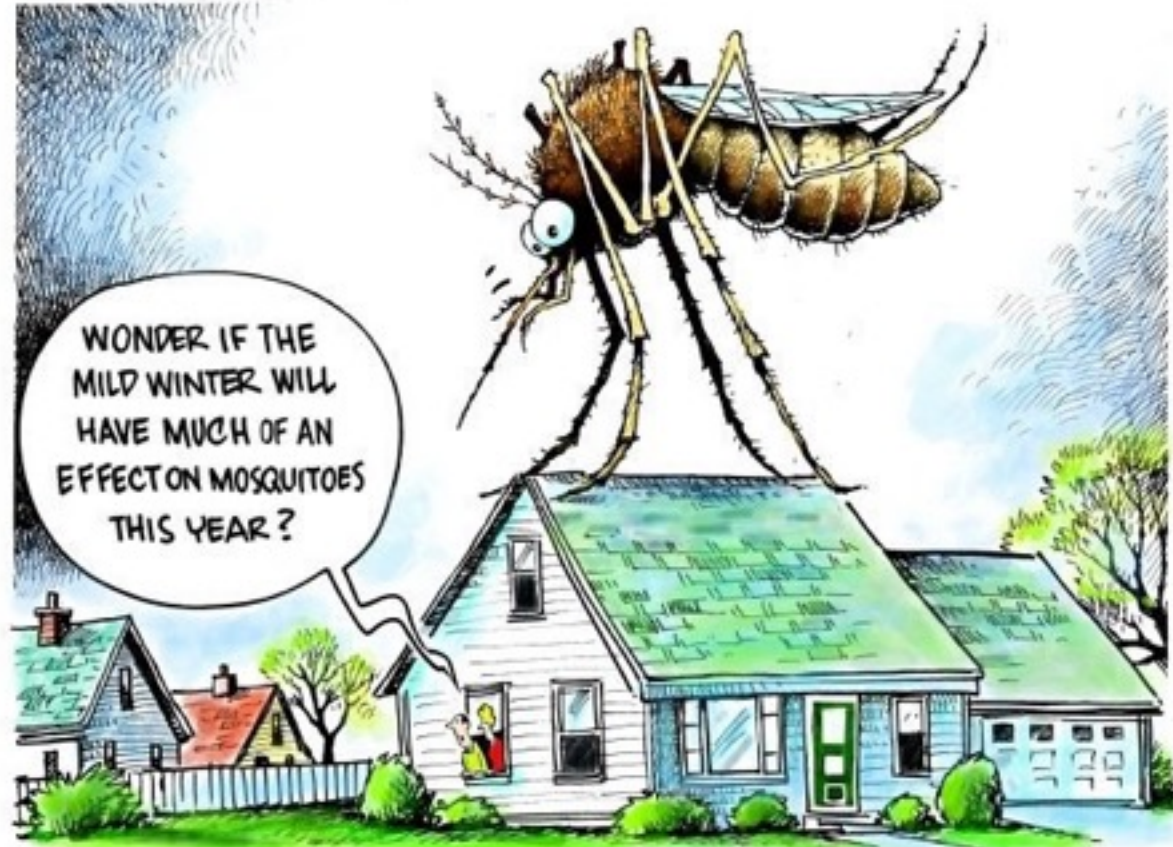
 Special Floodway

 Area of Undetermined Flood Hazard

 0.2% Annual Chance Flood Hazard

 Future Conditions 1% Annual Chance Flood Hazard





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