Effects of El Nino on the West Fork Trinity

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Operations and Engineering Coordination
Tarrant Regional Water District

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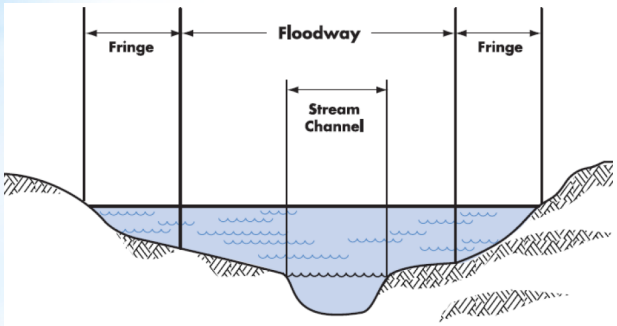
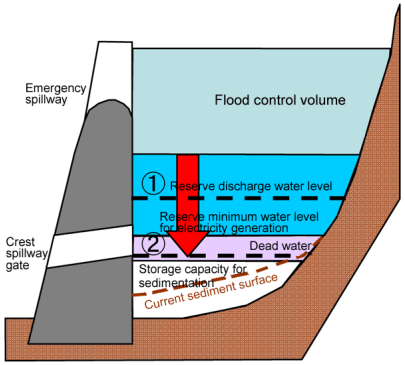
Anatomy of a flood

- Rainfall driven
  - Storm total volume
  - Peak flow
- Reservoirs rise and store water
- River rises and stores water (valley storage)
- The floodway system stores water in the sumps
- Stored water from the sumps and reservoirs is released after the peak





The 1922 flood In Fort Worth

LARGEST CIRCULATION IN TEXAS

FORT WORTH STAR-TELEGRAM

DOUBLE DAILY ASSOCIATED PRESS REPORT BY LEASED WIRE

HOME EDITION

VOLUME XLII. NUMBER 86. EIGHTEEN PAGES FORT WORTH, TEXAS, THURSDAY, APRIL 27, 1922. PRICE 5 CENTS

38 PERSONS YET MISSING

REFUGEES RETURNING TO THEIR HOMES THURSDAY IN THE FLOODED DISTRICT. WEST OF THE CITY. Left, this truck bears all the family possessions rescued from the waters. Center, drying out the clothes which spent several days under water. Right, refugees along the Camp Bowie Boulevard looking over the places where "home" used to be.

FLOOD CREST PASSES DALLAS; 1,500 HOMELESS NEAR CITY

SITUATION OVER NORTH TEXAS IMPROVES

Young Wife Sobs for Mother as She Huddles Her Own Baby Saved From Raging Torrent

3 ENTIRE FAMILIES BELIEVED DROWNED; KNOWN DEAD SEVEN

Boy Is Fatally Burned When Torch Explodes

'CATS' DONATE ROOM FOR Y. M. C. A.

Nacogdoches Gets Seven-Inch Rain; Rivers Overflow

SEED CRUSHER SCORES BILL ON TARIFF

Klan Issue Is Injected in Trial of Liquor Case

TEXAS & PACIFIC TRAIN STILL STRANDED

Weather or Not

GERMANY TO OFFICER SOVIETS, IS RUMOR

SANITARY PRECAUTIONS ARE URGED IN FLOODED AREA

Water Now in City Mains Has Been Filtered

MURDER VERDICT IN KANSAS IS UPHELD

REVISED LIST OF DEAD AND MISSING IN FLOOD

Y. M. C. A. Campaign for $375,000 Building Fund Extended Two Days

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CITY LAYING PLANS TO AVOID FUTURE FLOODS

On April 26 Mayor Cockrell said a special committee would consider a bond issue to rebuild damaged streets, parks, and bridges. He said a levee would be built to protect the Holly Street waterworks, situated next to the river.

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The 1949 flood

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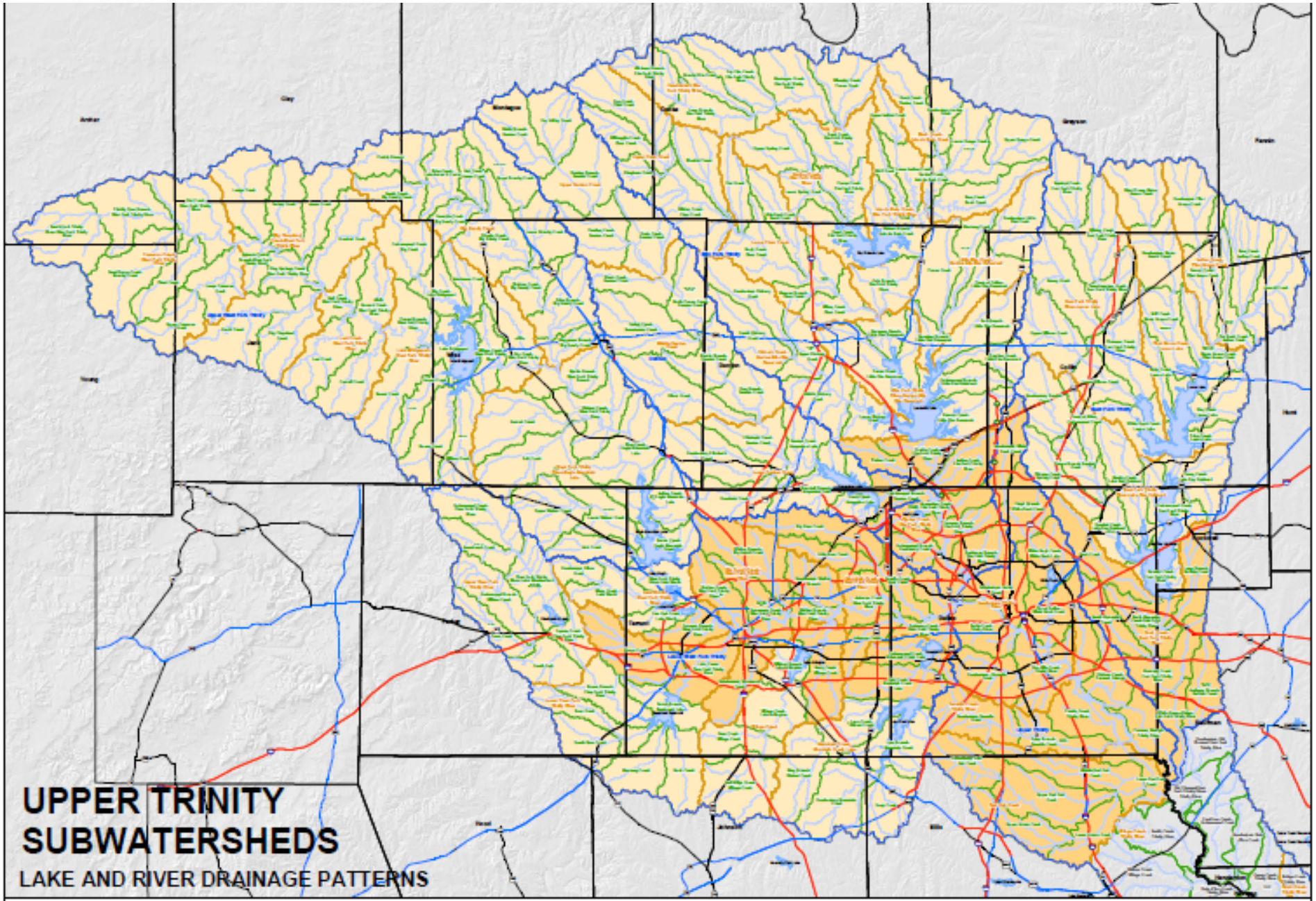
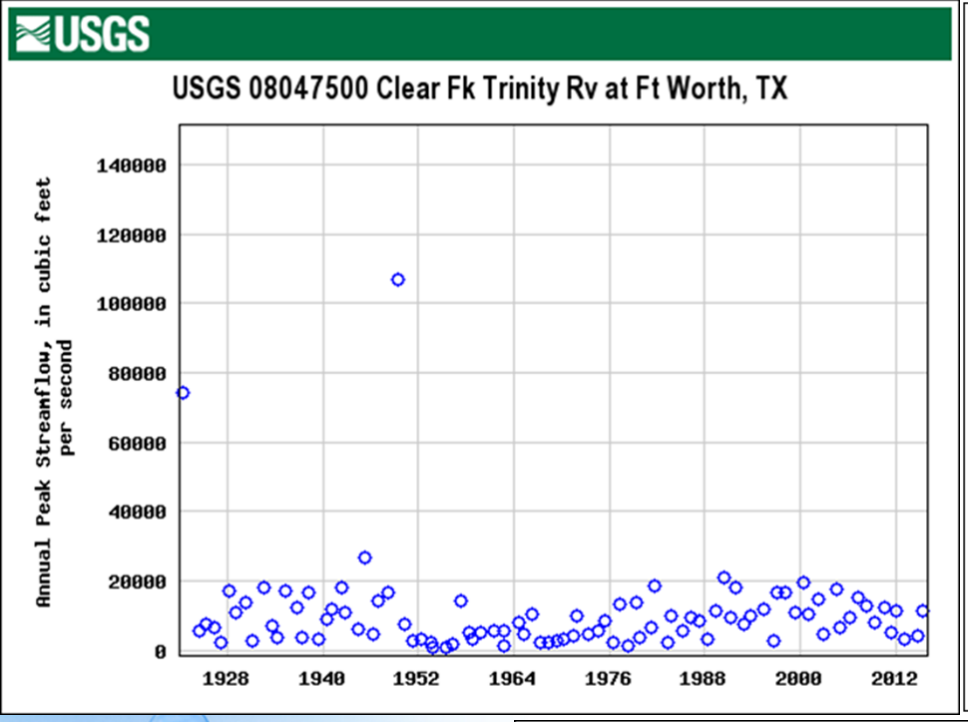
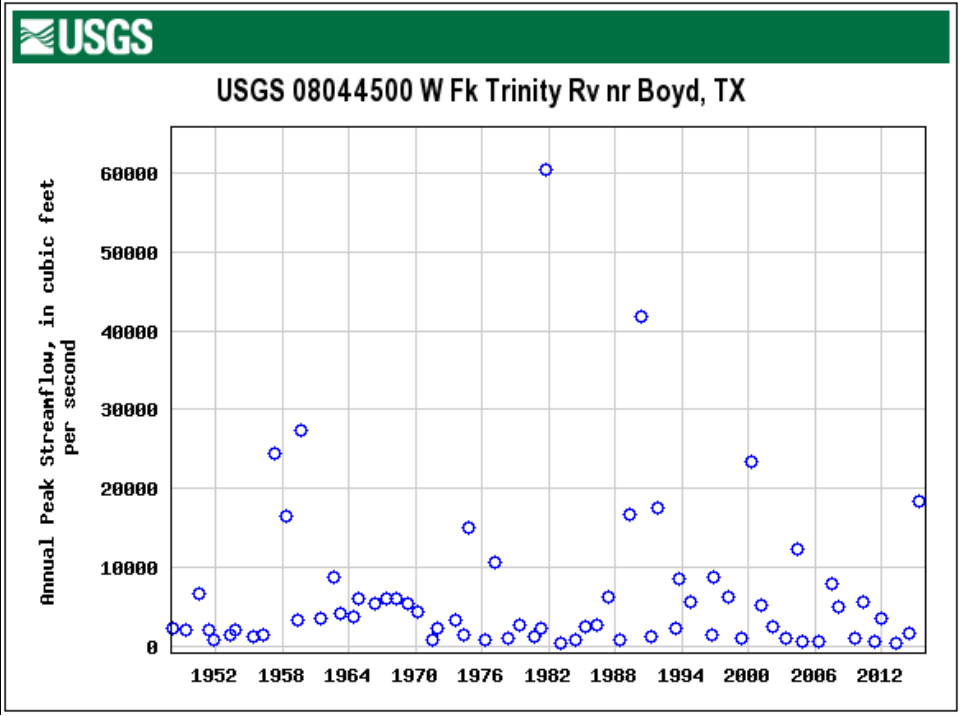
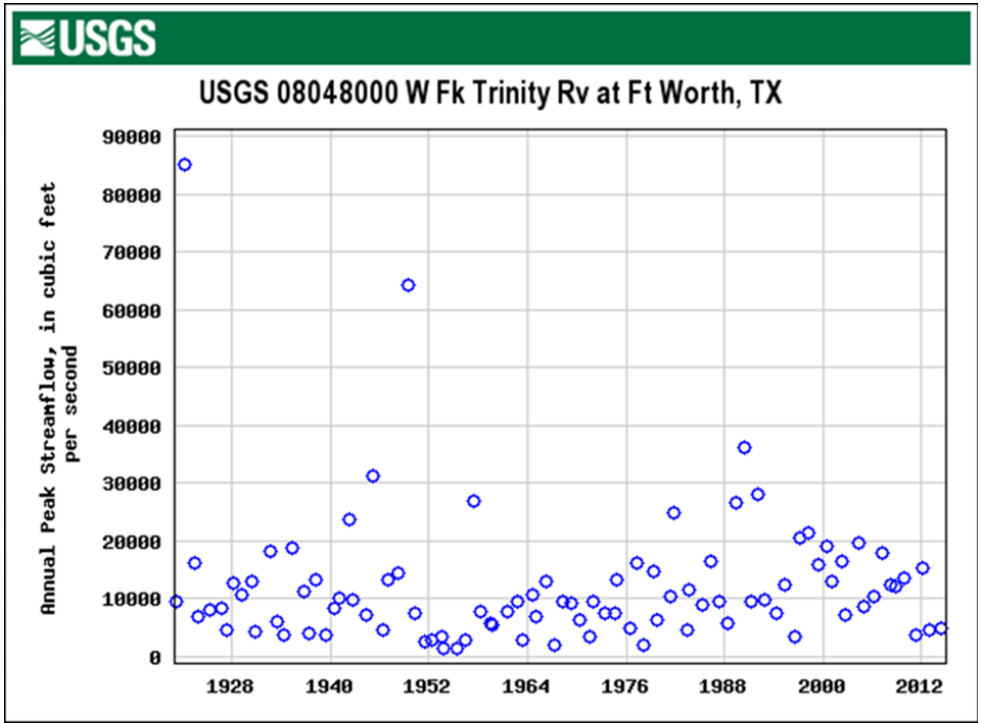

UPPER TRINITY
SUBWATERSHEDS
LAKE AND RIVER DRAINAGE PATTERNS
Legend
Upper Trinity Basin
Drains to Water Supply Reservoirs
Drains to Trinity River
Subbasins
Watersheds
Subwatersheds
Primary Highway
Secondary Highway
Access Ramp
Major Arterial
Trinity River
Lakes
Streams
Counties
North Central Texas
Council of Governments
Environment & Development
N
Miles
0 3 6 12 18
Data Source : Watershed Boundary Dataset (WBD) by
USDA - Natural Resources Conservation Service







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West Fork Trinity– 2,052 square mile drainage

Bridgeport and Eagle Mountain reservoirs spillways act like a bucket with a hole;
the higher the water the more is released
Volume is temporarily stored and the peaks reduced through valley storage

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Lake Worth's spillway acts like a bucket with a spout, storing very little floodwaters. As the level in the lake increases, the release increases

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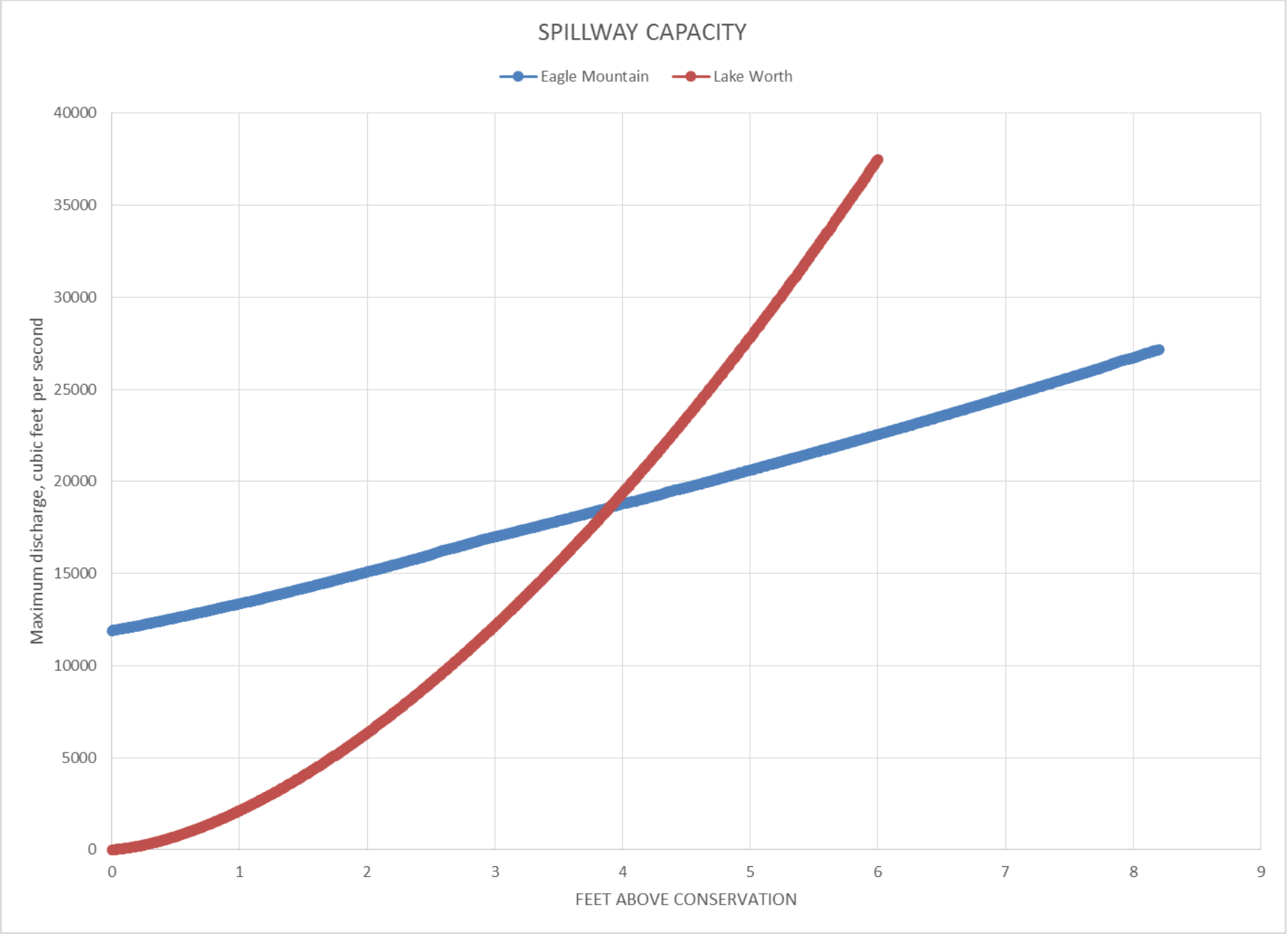

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West Fork Reservoirs

- Bridgeport – conservation level 836 ft msl, flood easement level 851, flood storage about 198,000 acre feet. Peak flood elevation recorded – 844.36 (8.36’)
- Eagle Mountain conservation level 649.1, flood easement 668, flood storage volume about 240,000 acre feet of flood storage. Peak flood elevation recorded – 659.9 (10.1’)
- Lake Worth Conservation level 594, flood easement to 600, flood storage 23,946 acre feet. Peak flood elevation - 598.70 (4.7’)

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LOWEST HOME ELEVATIONS

(above conservation)

CONSERVATION ELEVATIONS

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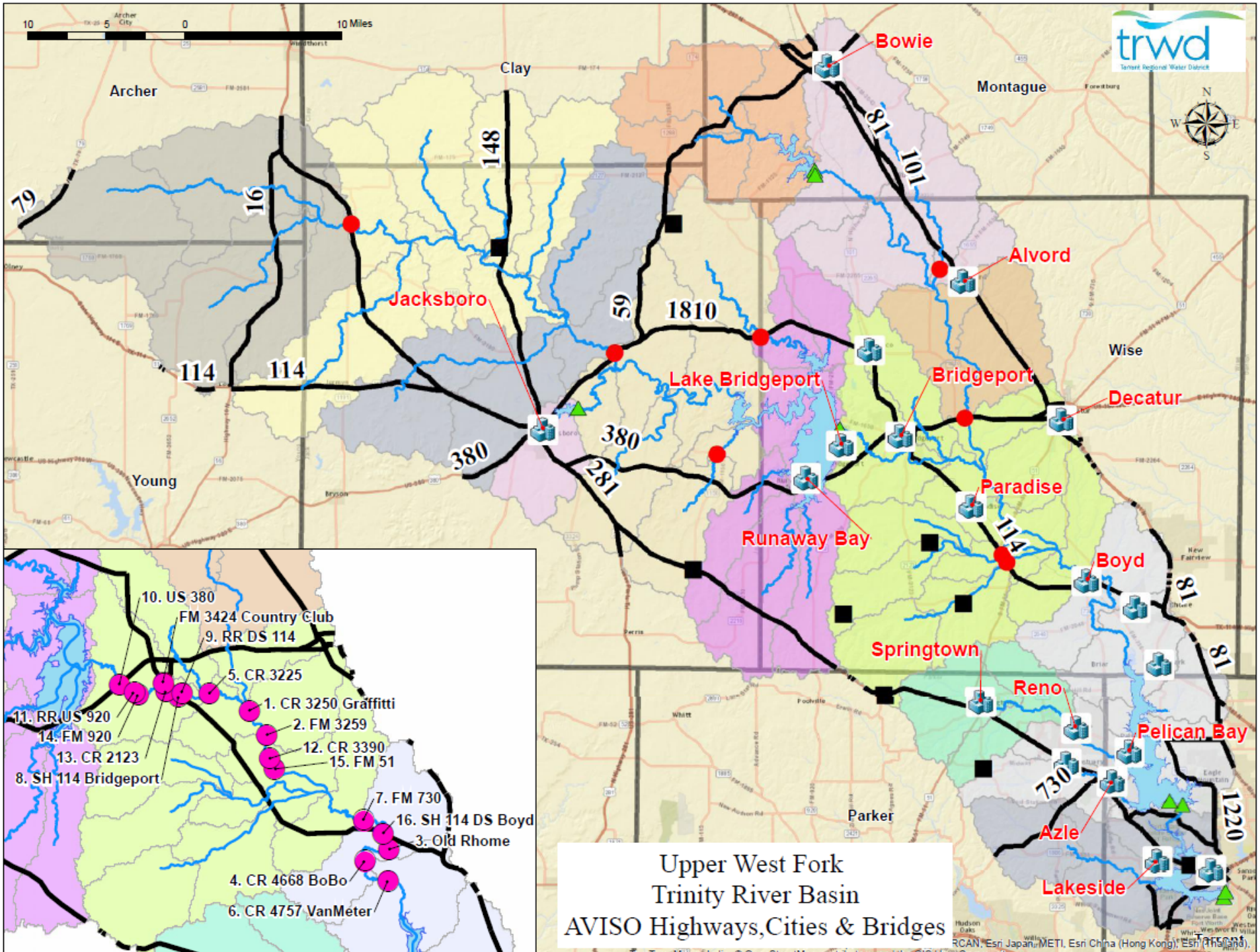
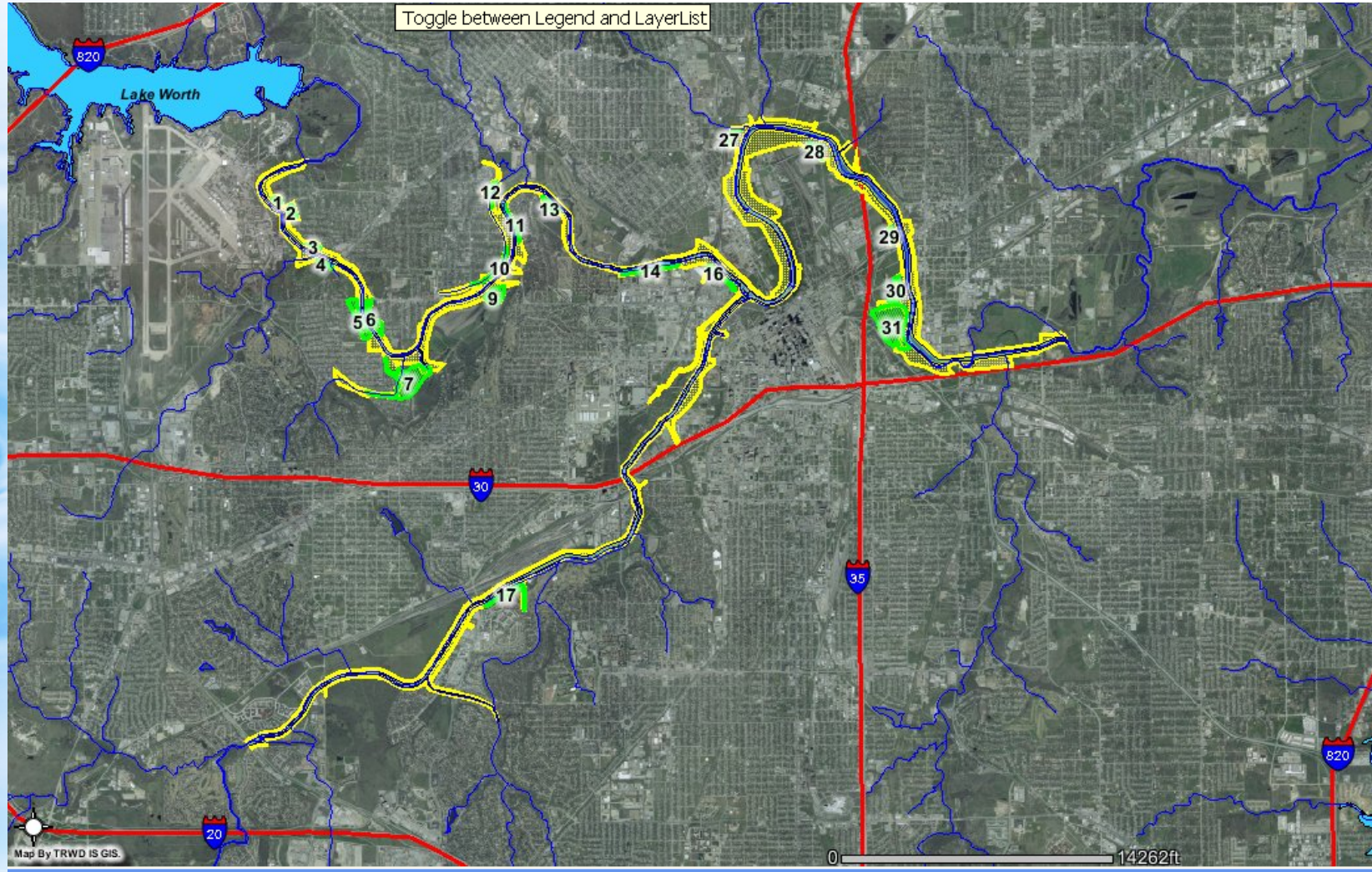
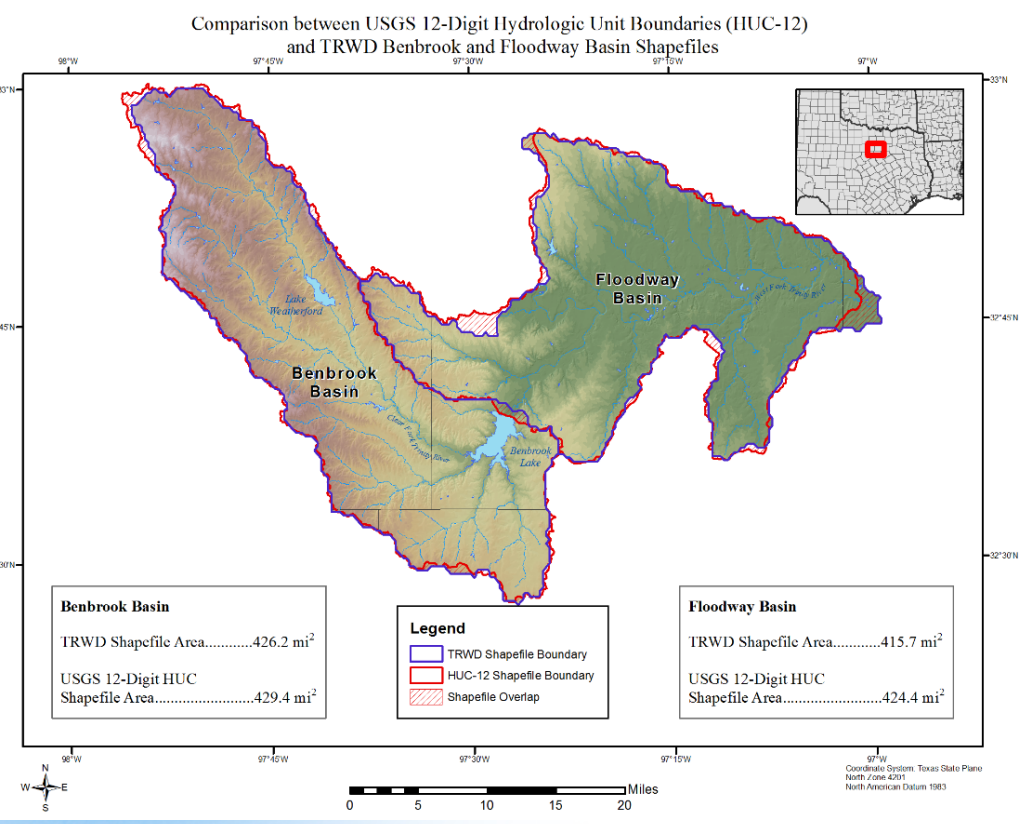

10 5 0 10 Miles
trwd
Tarrant Regional Water District
Archer
Clay
Montague
Wise
Young
Parker
Bowie
Alvord
Jacksboro
Lake Bridgeport
Bridgeport
Decatur
Paradise
Runaway Bay
Boyd
Springtown
Reno
Pelican Bay
Azle
Lakeside
79
16
148
81
101
59
1810
114
380
281
730
1220
10. US 380
FM 3424 Country Club
9. RR DS 114
5. CR 3225
1. CR 3250 Graffitti
2. FM 3259
12. CR 3390
15. FM 51
11. RR US 920
14. FM 920
13. CR 2123
8. SH 114 Bridgeport
7. FM 730
16. SH 114 DS Boyd
3. Old Rhome
4. CR 4668 BoBo
6. CR 4757 VanMeter
Upper West Fork
Trinity River Basin
AVISO Highways,Cities & Bridges

Fort Worth Floodway



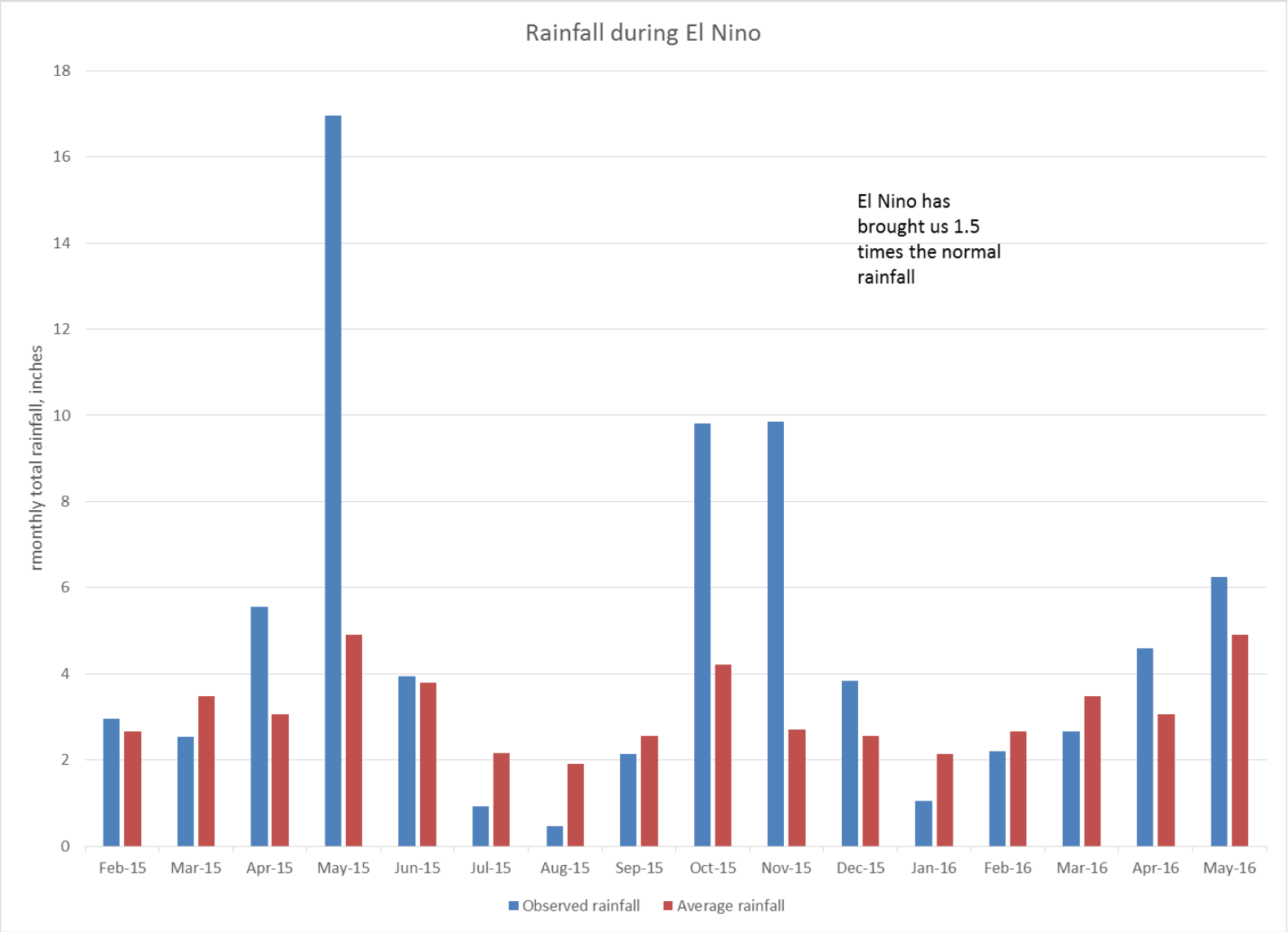
Lake Benbrook – 429 square mile drainage



© Can Stock Photo - csp0014755

Benbrook acts like a bucket with a spout, it fills until it spills. Volume is stored and high flows mitigated through valley storage

El Nino - Rainfall



Flood Discharges

	Bridgeport	Eagle Mountain	Lake Worth
	flood releases	flood releases	flood releases
	acre feet	acre feet	acre feet
2015	374,370	780,587	788,583
2016 through 5/30	286,490	450,430	512,021
total	660,860	1,231,017	1,300,604
% Lake Volume	183%	684%	3883%

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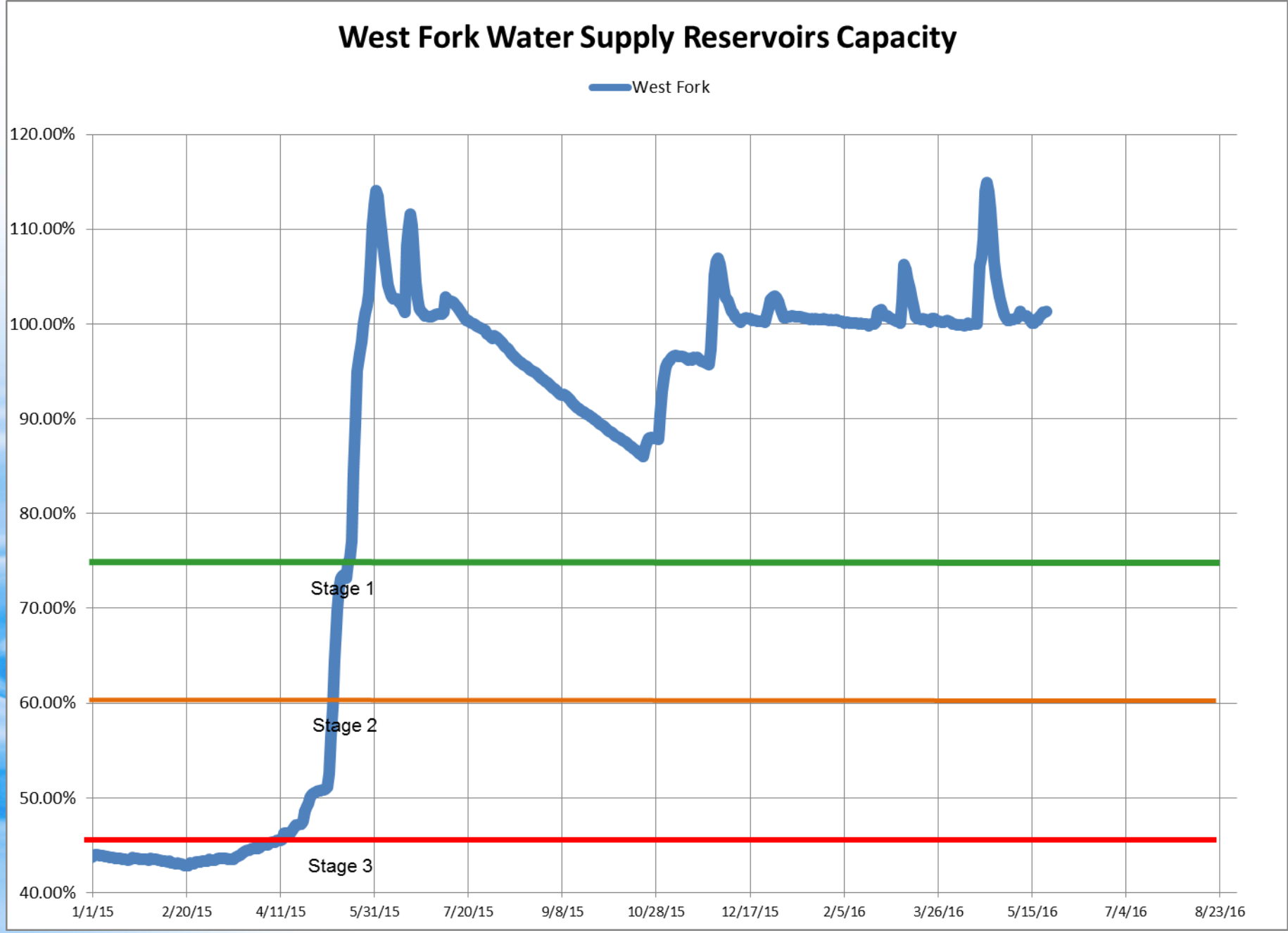

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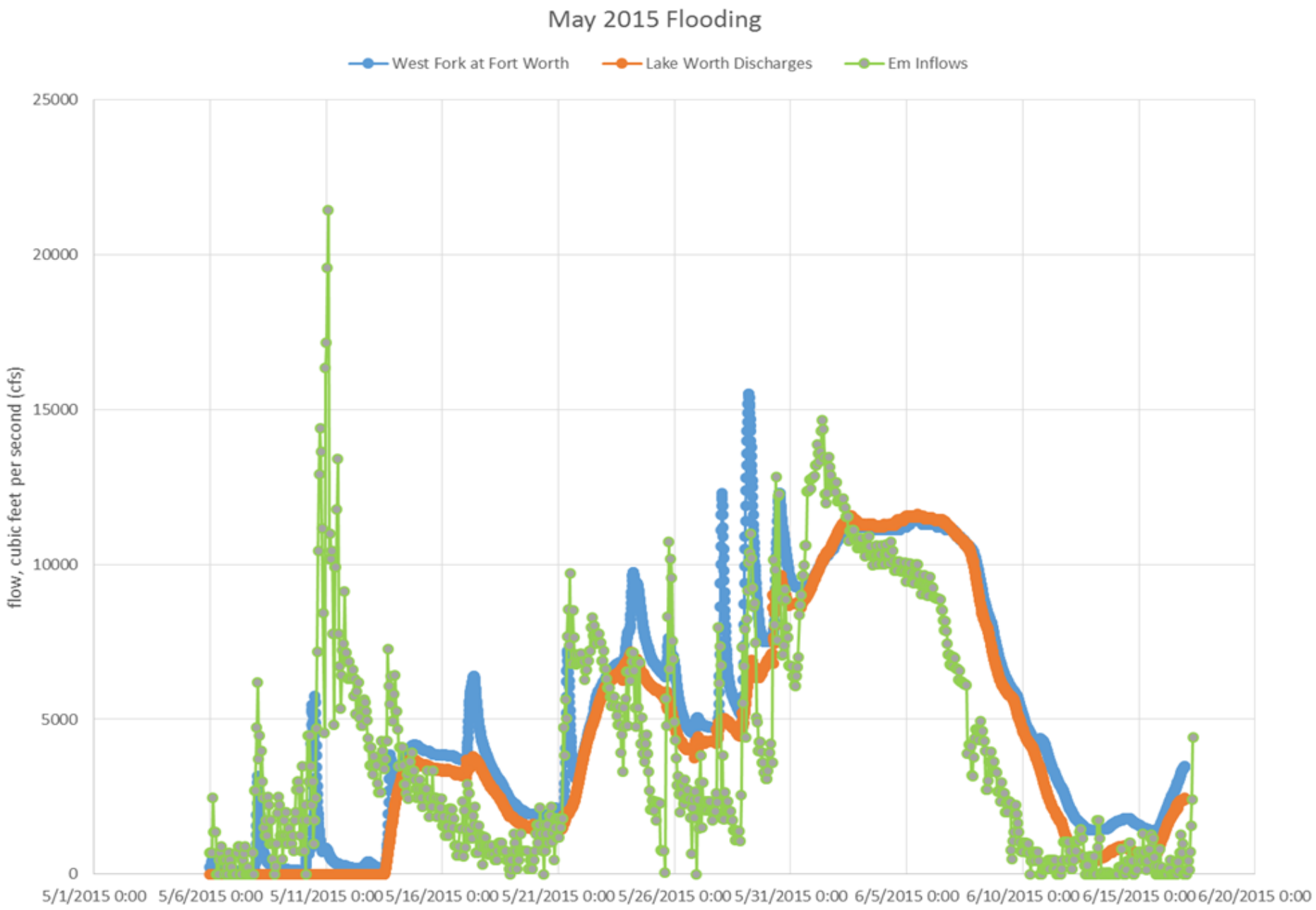

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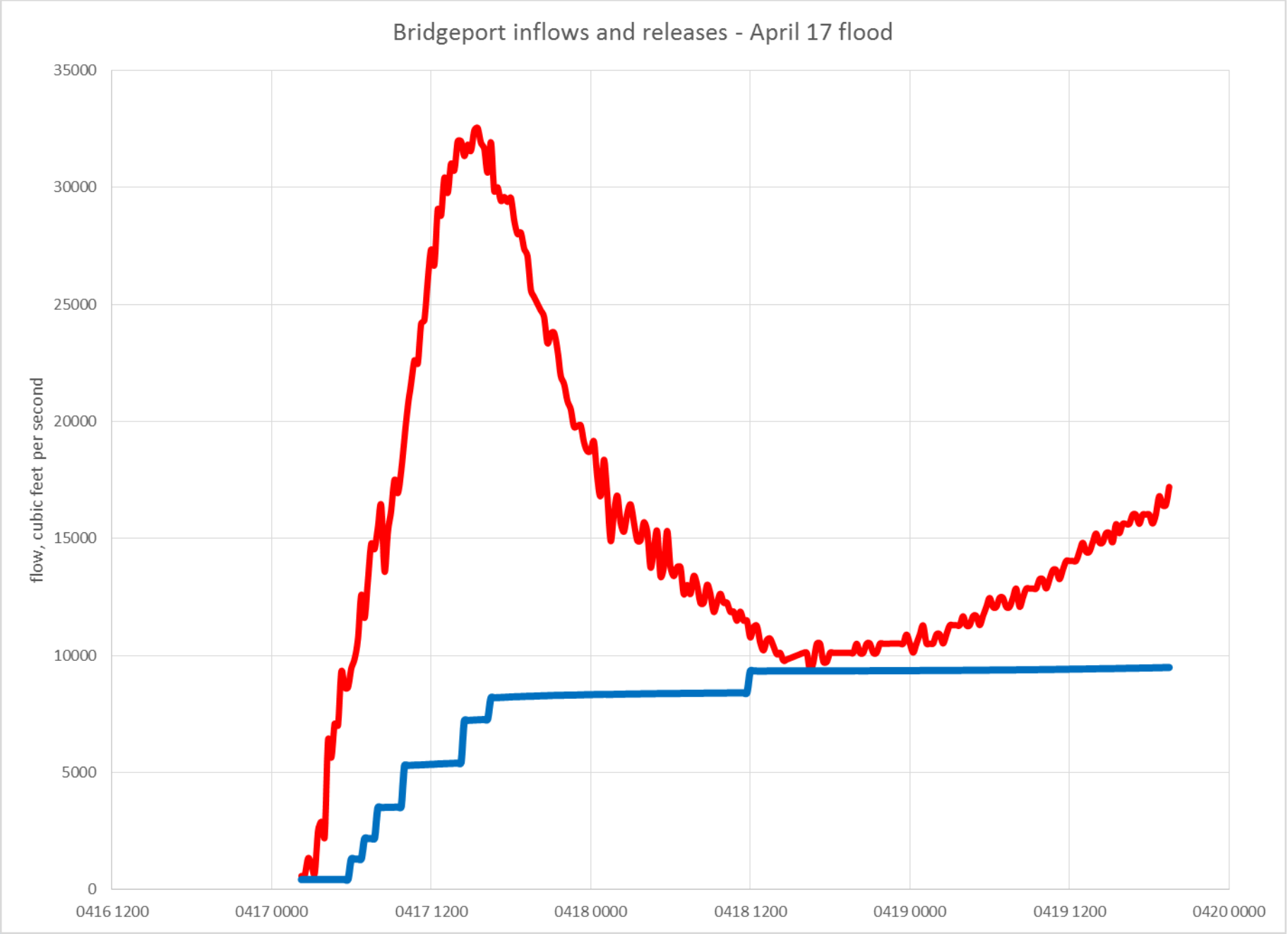

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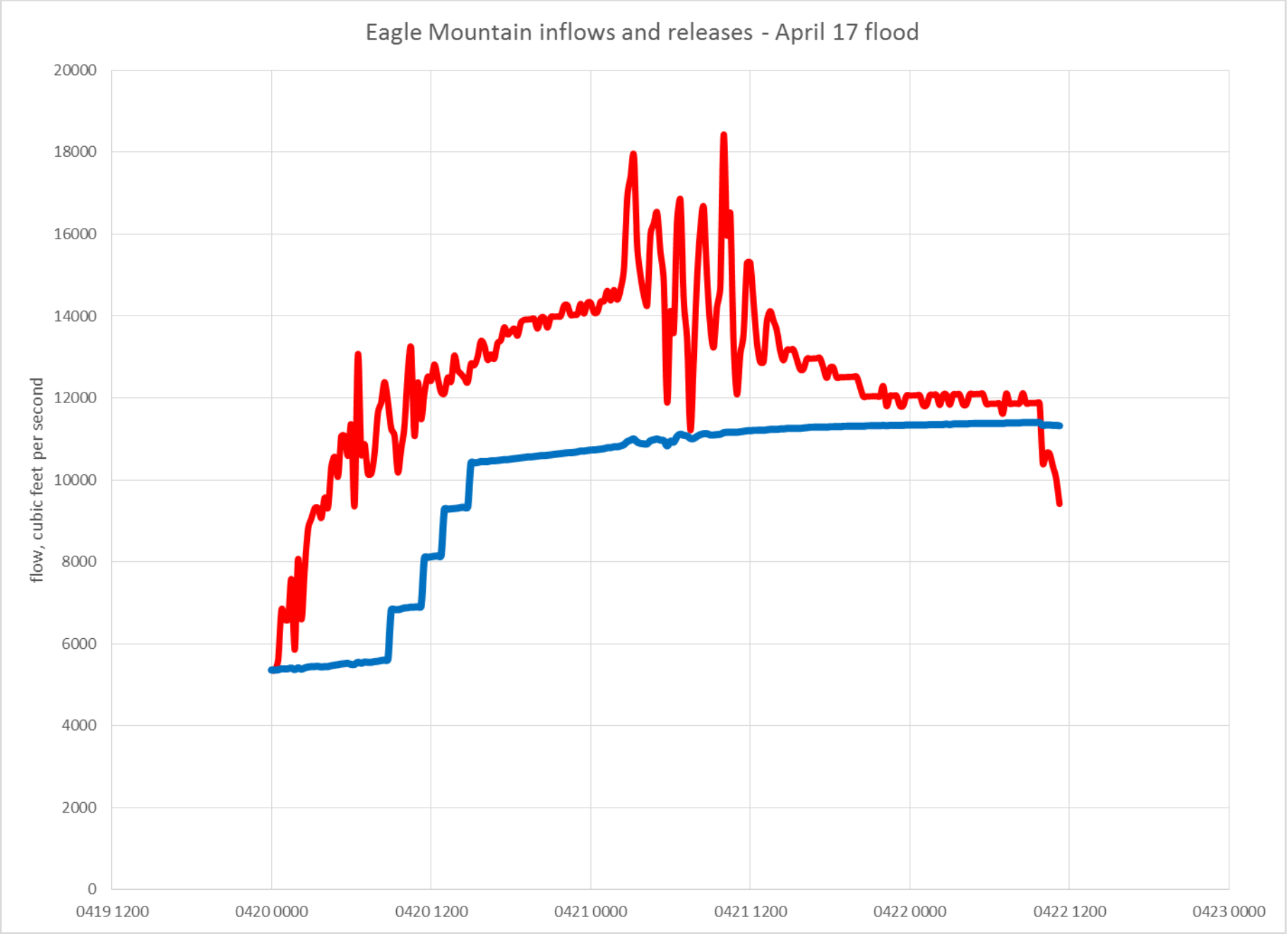

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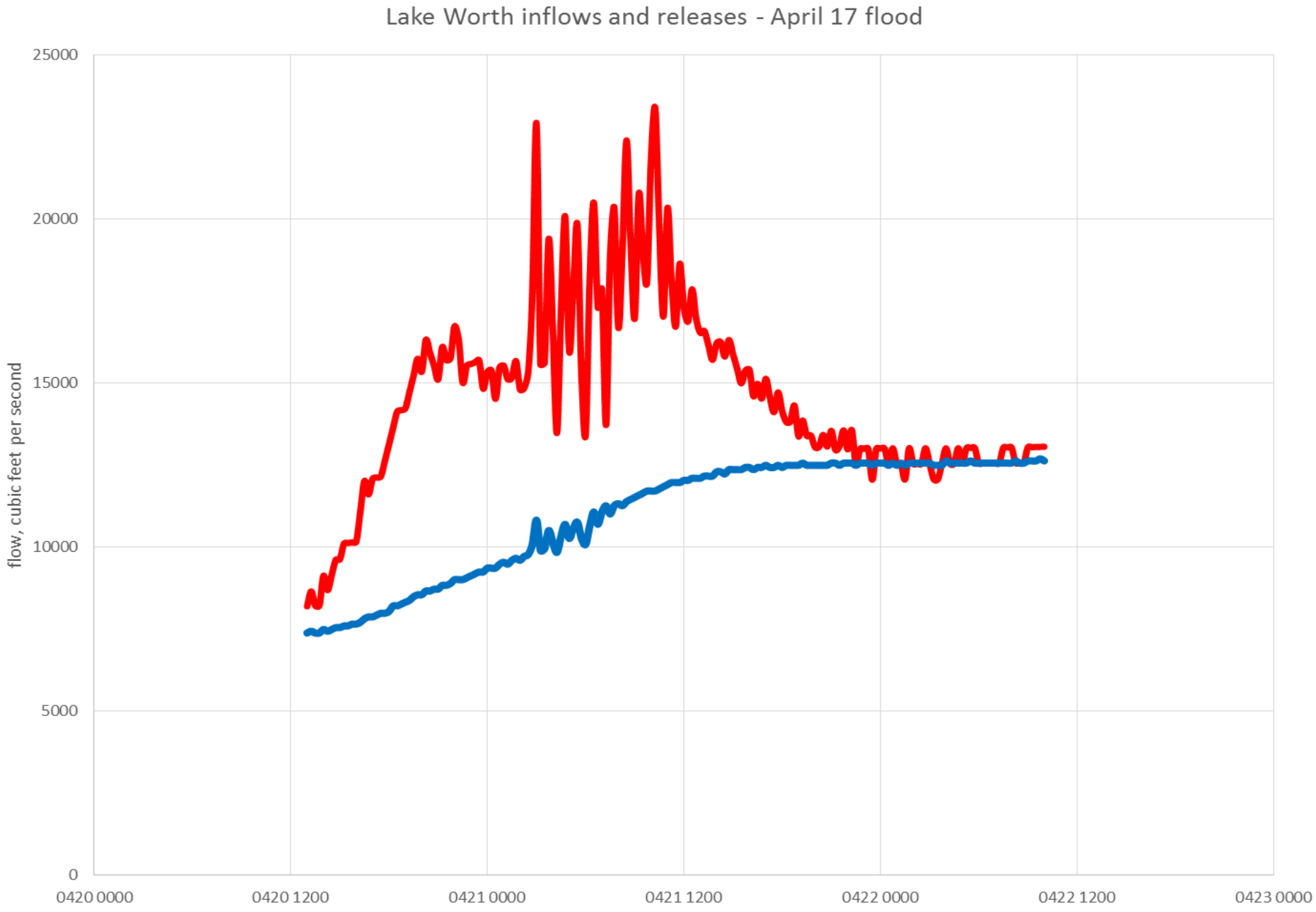

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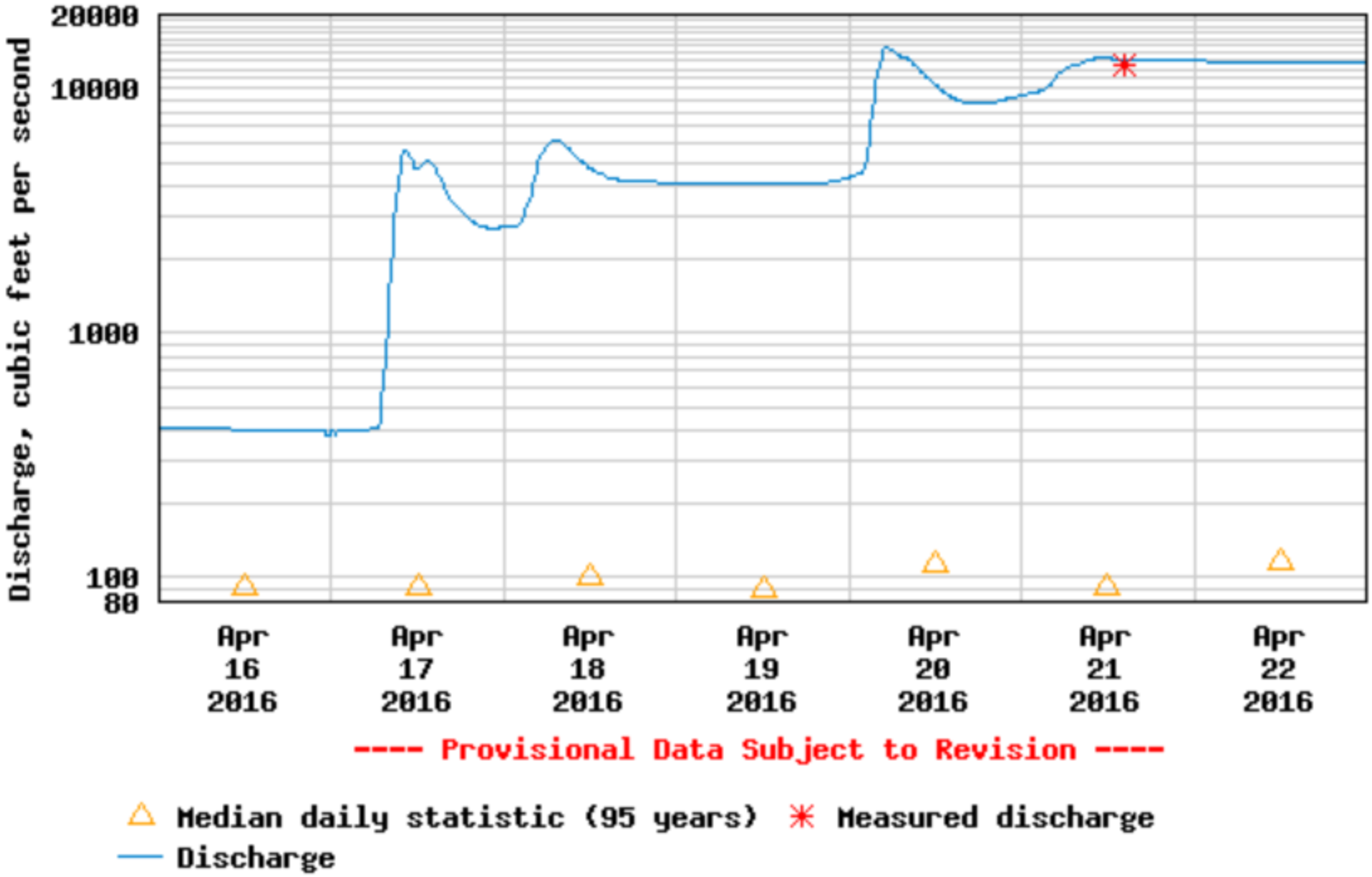
USGS

USGS 08048000 W Fk Trinity Rv at Ft Worth, TX



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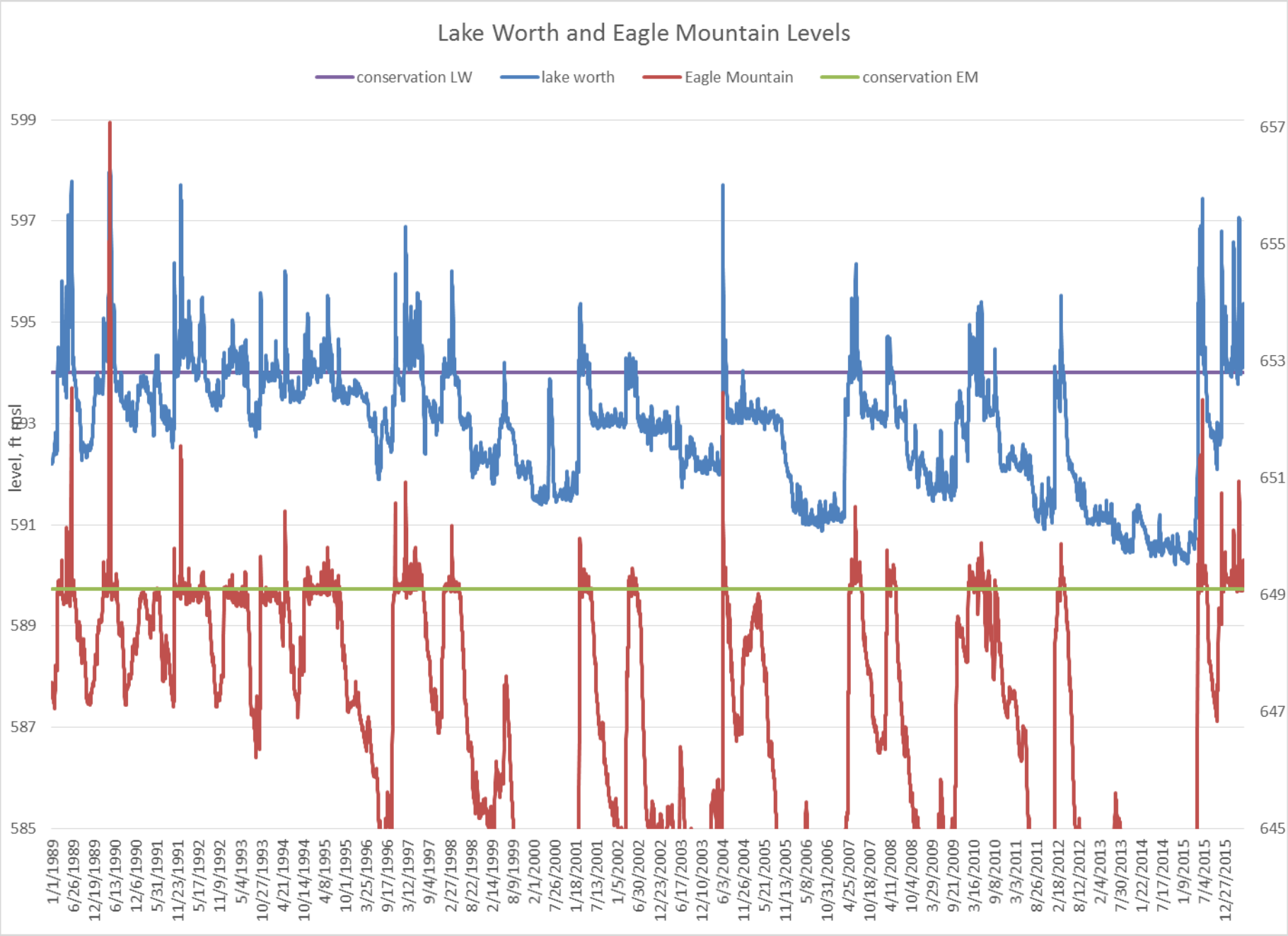

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Effects of El Nino

- 50% more rainfall than average
- Very large volumes of runoff
- Reservoir levels at conservation or above constantly since November
- Floods on all reservoirs, with homes damaged on Bridgeport and Eagle Mountain
- A great water supply for the upcoming La Nina period

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