Cedar River Council
February Flood Management and Impacts

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February 25, 2020

Seattle Public Utilities

City of Seattle

SPU Watershed Division Core Responsiblities

- Protect and Manage Forested Watersheds (Cedar & Tolt)
- Support High Quality Drinking Water
- Implement Cedar River Habitat Conservation Plan (HCP)
- Manage Education Center and Rattlesnake Lake Recreation Area

Rattlesnake Lake 2-16-2020

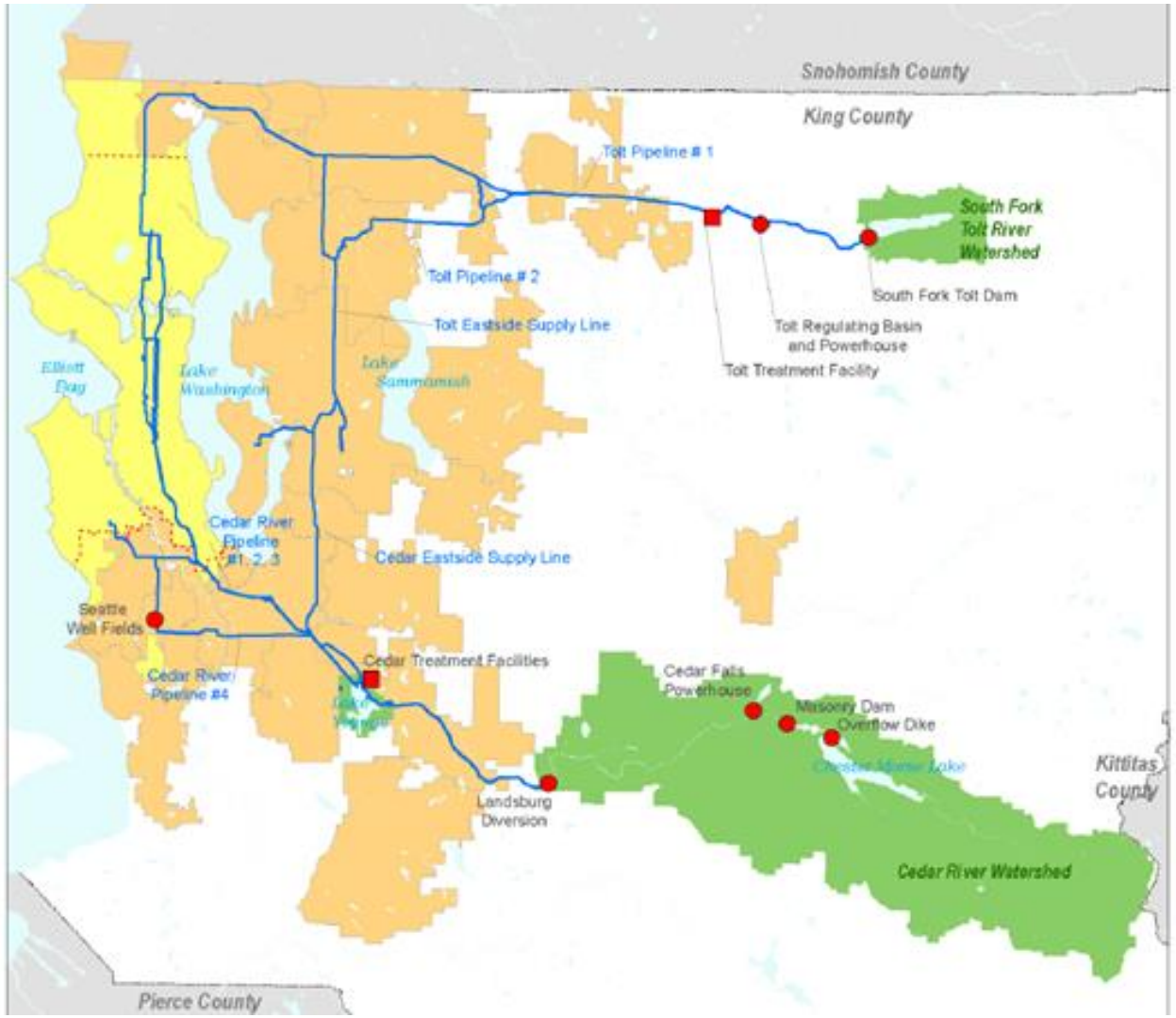
SPU Water Resources Core Responsiblities

- Manage Water Supply - Key Objectives:
  - Provide drinking water for 1.5 million people
  - Manage instream flows and goal to stay below salmon redd scour thresholds
  - Support flood management downstream
  - Coordinate with SCL on hydropower
  - Implement dam safety protocols
  - Coordinate plans with ACOE for Lake Washington water levels
- Oversee Dam Safety Capital Projects
- Manage Cedar River HCP
- Direct Aquatic Resources Programs (i.e., hatchery, fish passage, redd surveys)
- Manage Seattle's Water Rights

Chester Morse Reservoir 2-9-2020

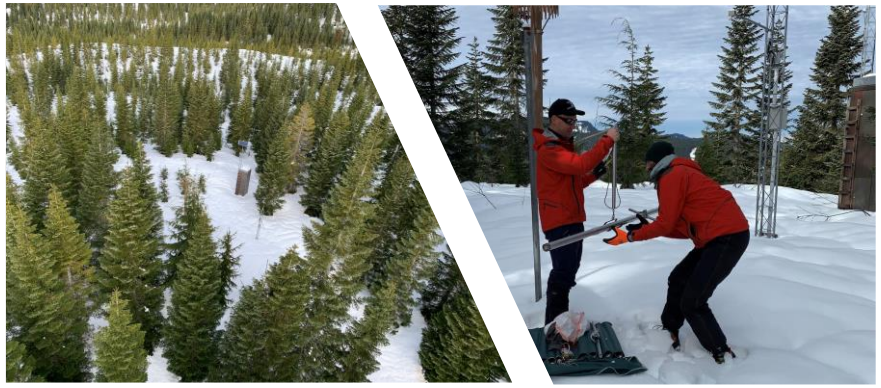
Facilities

Masonry Pool
Intake Tower
Intake Gate Shaft
Auxiliary Spillway
Original Auxiliary Spillway Notch
Service Spillway
Right Abutment
Gallery Adit
Low-Level Outlet
Spill Gates

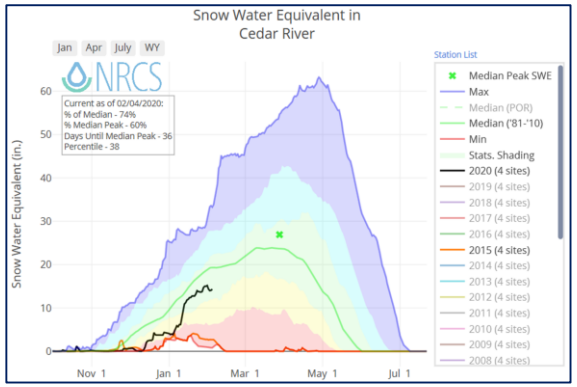

Snohomish County
King County
Tolt Pipeline # 1
South Fork Tolt River Watershed
Tolt Pipeline # 2
South Fork Tolt Dam
Tolt Eastside Supply Line
Tolt Regulating Basin and Powerhouse
Tolt Treatment Facility
Elliott Bay
Lake Washington
Lake Sammamish
Cedar River Pipeline #1, 2, 3
Cedar Eastside Supply Line
Seattle Well Fields
Cedar Treatment Facilities
Cedar Falls Powerhouse
Masonry Dam
Overflow Dike
Cedar River Pipeline #4
Kittitas County
Landsburg Diversion
Cedar River Watershed
Pierce County

SPU's Real-Time Planning & Operations

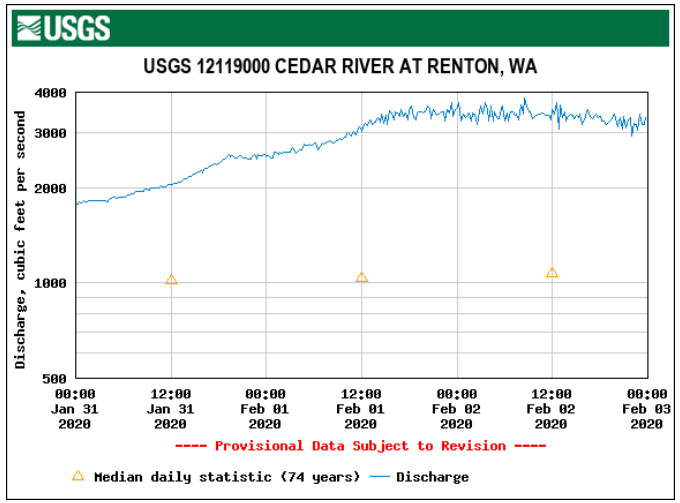
Field Evaluations



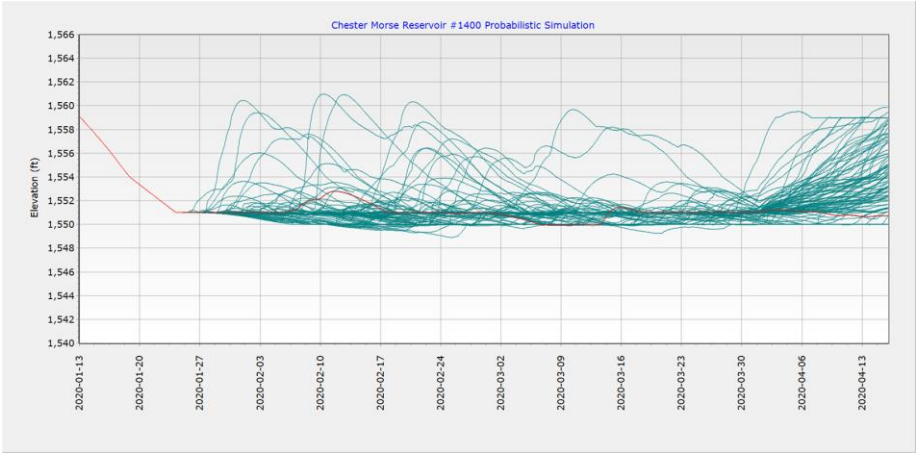
Remote Sensing



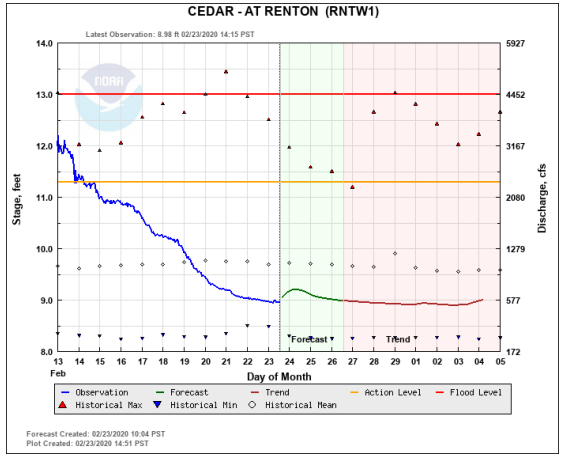
Discharge/Stage Gaging Stations



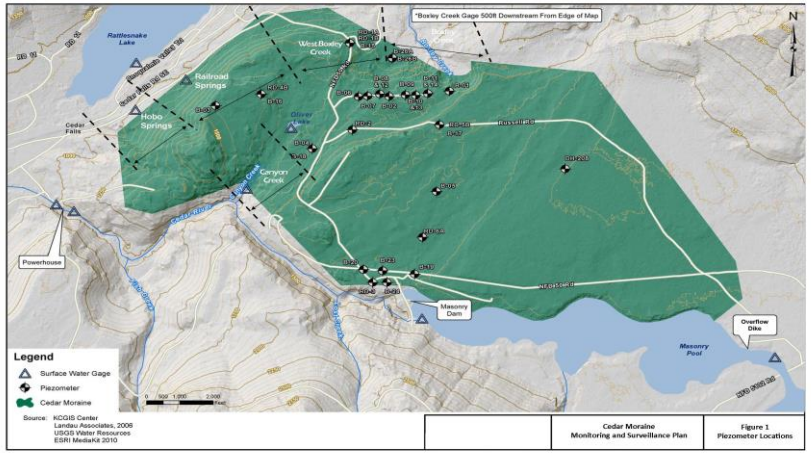
SPU Continuous Simulation Hydrologic Model



NW Rivers Forecast



Cedar Moraine Monitoring



Weather Forecast and Conditions

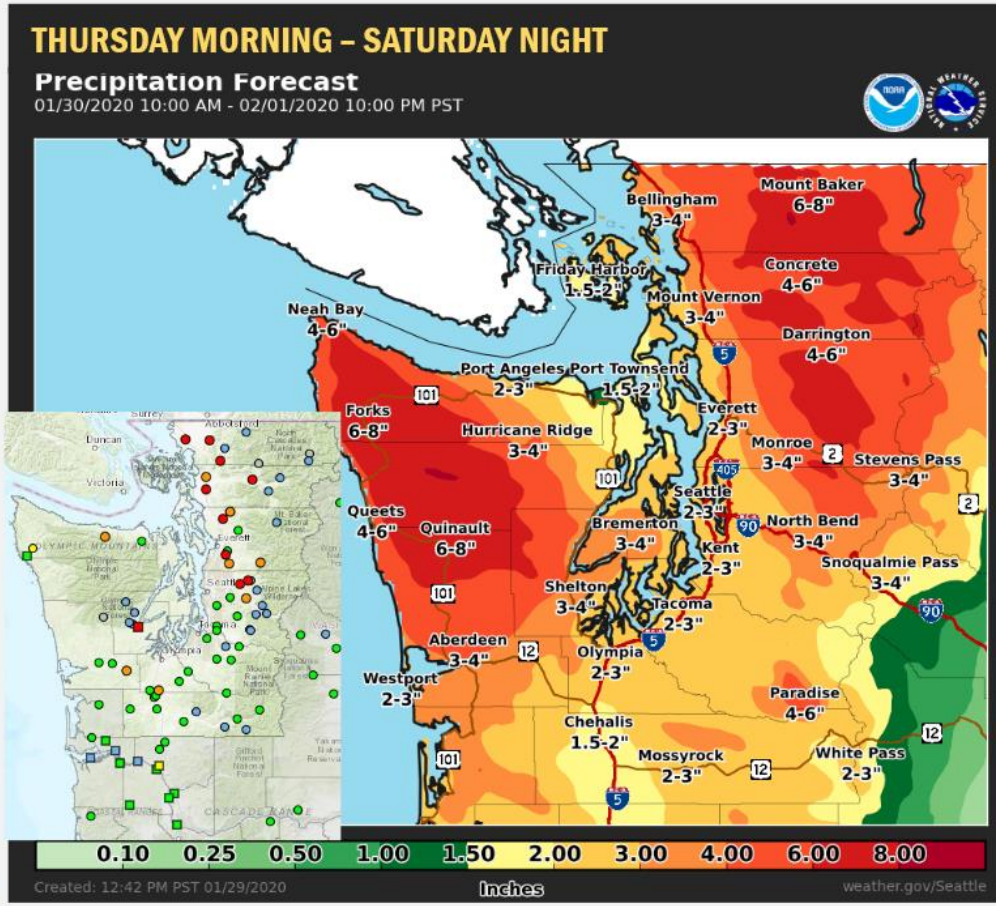
February 2, 2020

- NWS forecast moderate rainfall
- NW River Forecast Center forecast, Renton (USGS 12119000) will peak at 3,500 cfs
- Cedar River at Landsburg Flood Phase 2
- Cedar River at Renton, 2,860 cfs
- Chester Morse Reservoir 1560.60 ft. and rising

Rain Forecast

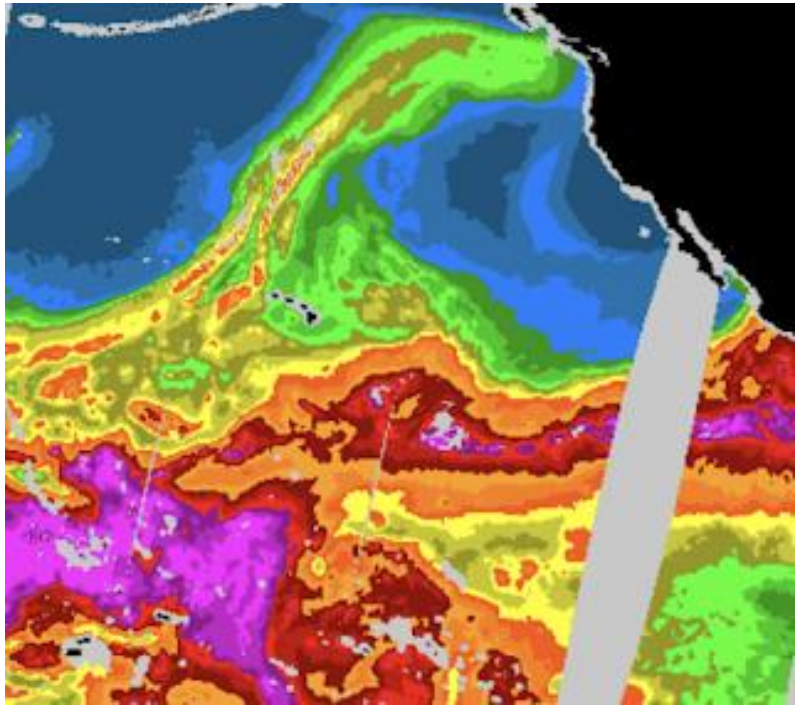
THU Morning – SAT Night

- CONFIDENCE: MODERATE
- Several rounds of moderate to heavy rain are expected through the weekend. This will yield rising rivers and may cause periods of minor urban flooding.
- Confidence is lower in *where* the heaviest rain will fall. This will affect the magnitude of river flooding.
- Reasonable worst case scenario will see rivers from northern King through Whatcom County reach major flood stage.
- The river forecasts **WILL** change. Find the latest river forecasts at https://water.weather.gov/ahps2/forecasts.php?wfo=SEW



Storm Event and Shifting Priorities

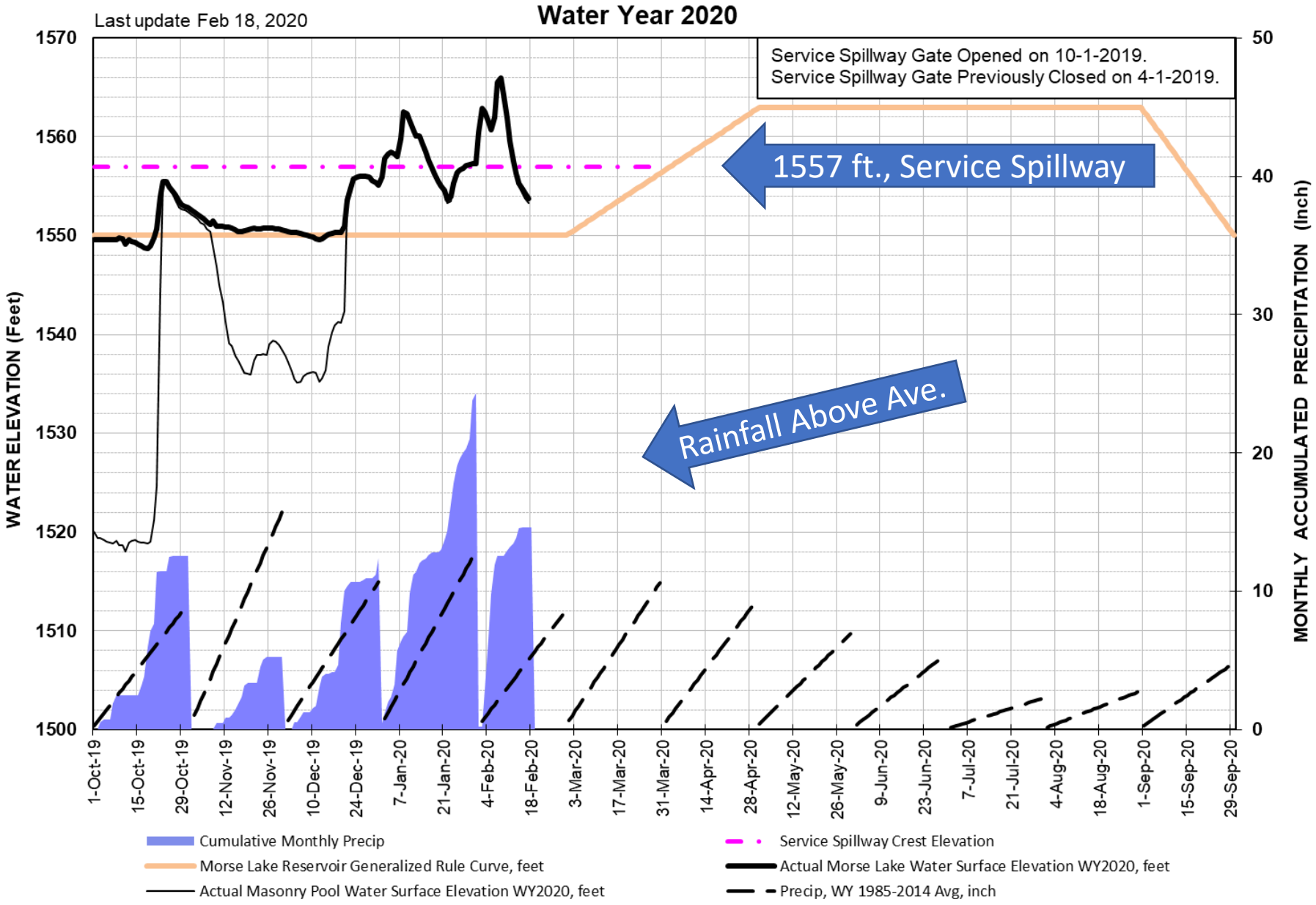
- Atmospheric River (Pineapple Express) stalled over watershed
- Approximately 10 inches of rain in <48 hours, roughly 10% of total annual precipitation
- Peak hourly flows of approximately 9,500 cfs on February 6
  Reservoir rate of rise peaked at 0.18 feet per/hr. on February 6
- Reservoir water elevation peaked at 1566.28 ft.
- Increased releases from Masonry Dam for dam safety
- Peak flow at Renton, 10,300 cfs, 2nd highest going back to 1901



NOAA satellite imagery of atmospheric river, 2-6-2020

Reservoir Management

- After each storm we follow standard protocols to appropriately release behind peak flows, with a goal of limiting additional impacts (i.e., redds, property, drinking water)
- Goal is to reach a flood pocket elevation of approximate 1550 ft. in a timely manner



Storm Response and Impacts

Large wood impacting Landsburg Dam every five minutes

Storm Response and Impacts

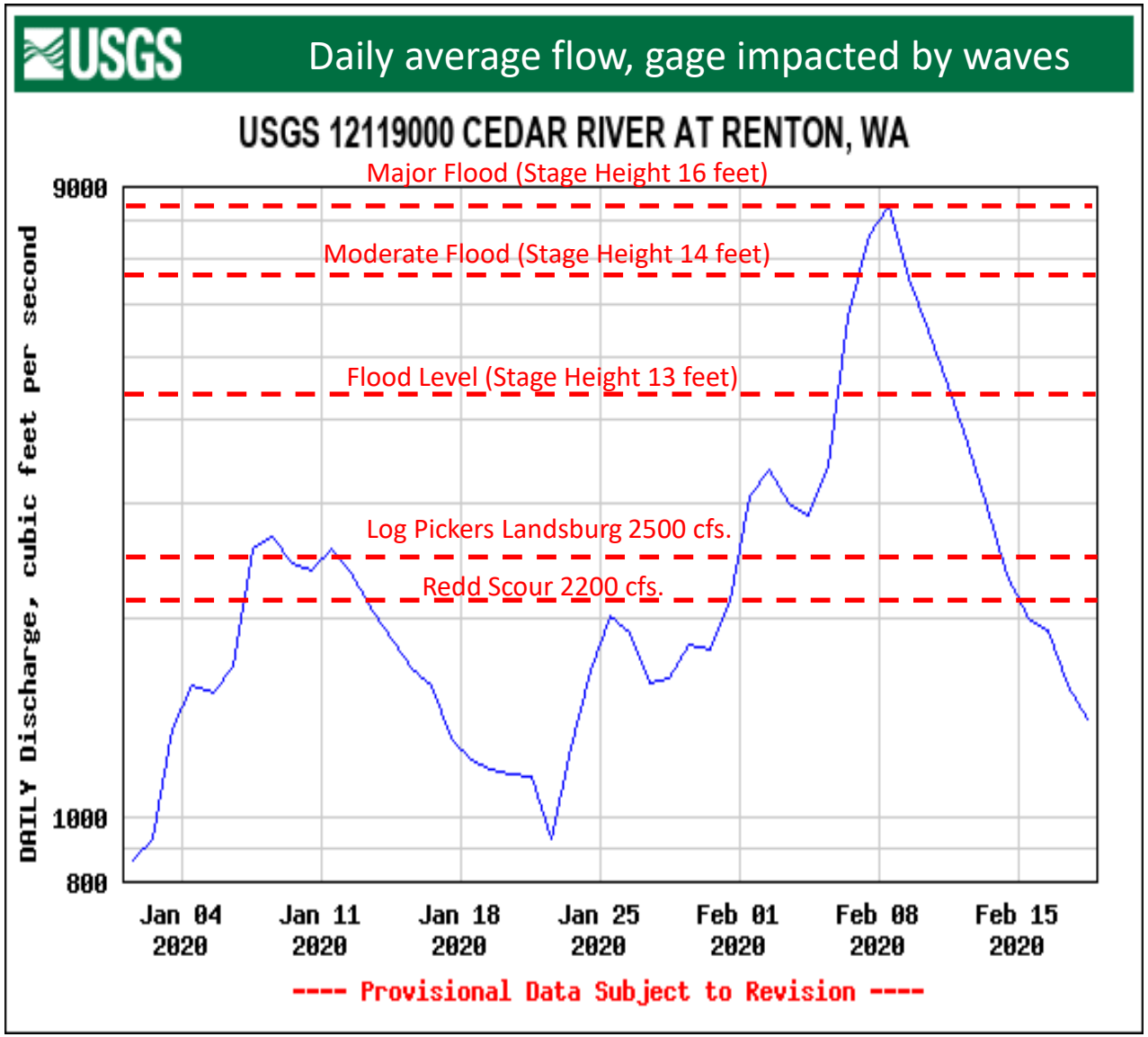
Tributaries with high flows and turbidity

Bridges impacted by large wood debris

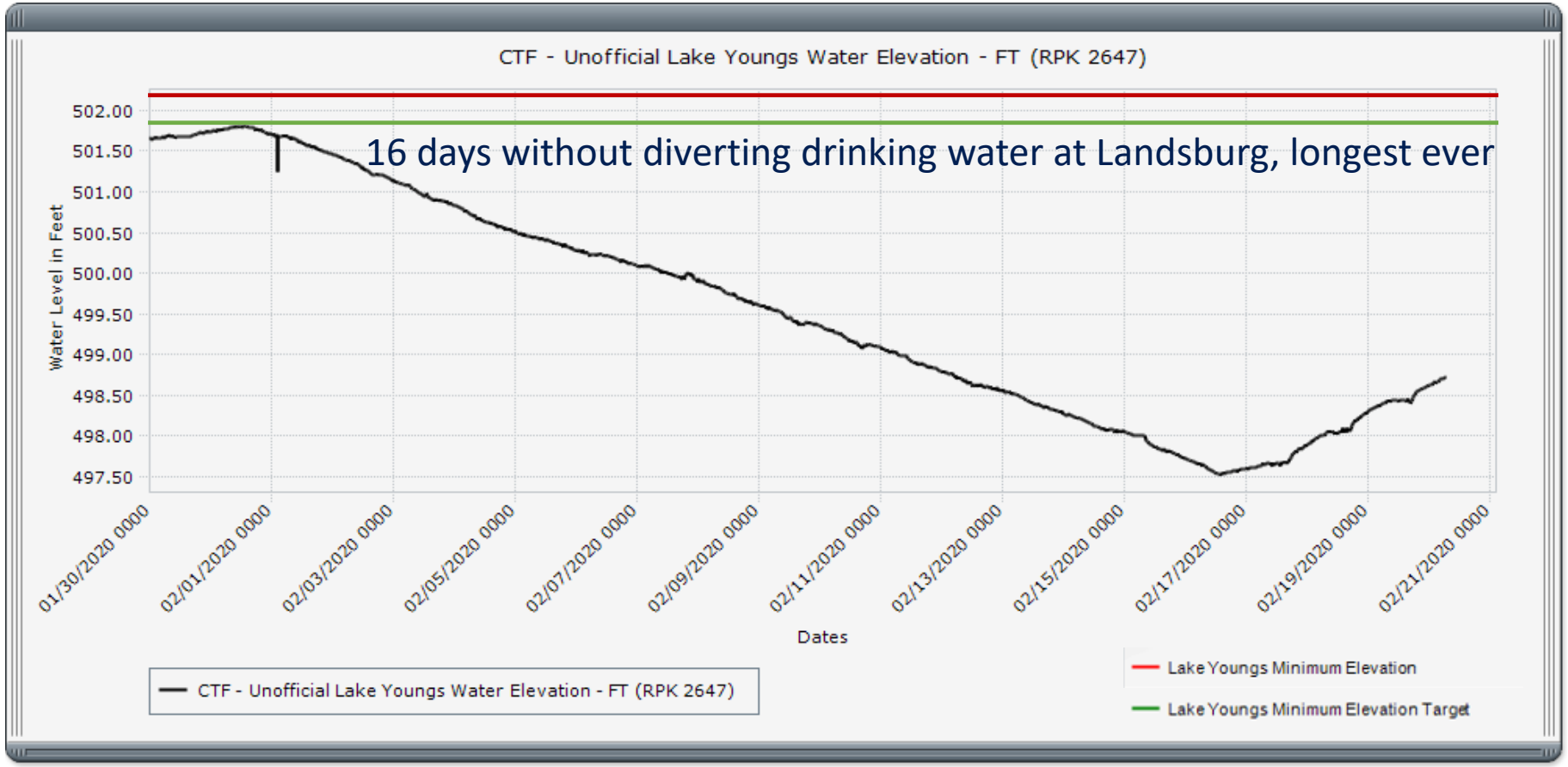
Many landslides

Storm Impacts

Seattle Office of Emergency Management
As of 2-21-2020, accumulated about **$26 million** in storm-related expenses throughout the region/county. The total for the state is estimated around **$38 million**. Also, collected information from about 70 individuals with ~ **$2.8 million** in uninsured losses, and 7 businesses with impacts.



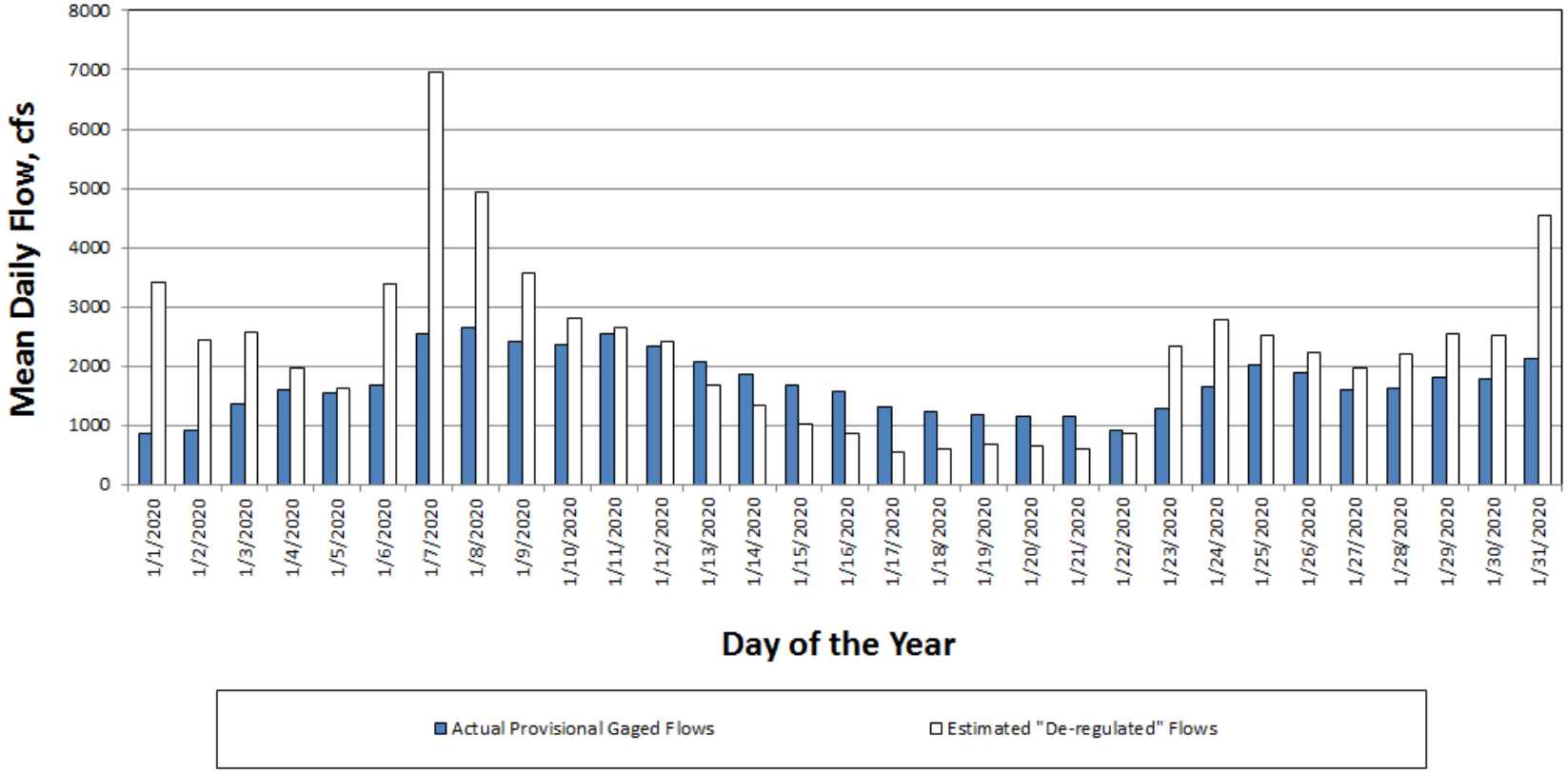
Storm Response and Impacts



Cedar River at Renton

All Data is Provisional and Subject to Revision

A simple rough estimation method was used to calculate the estimated De-regulated flow values. This graph is prepared for discussion purposes only. Do not use for decision-making.



Notes: All calculations are based on realtime provisional mean daily flow readings calculated for the dates shown.
No flow adjustments are made to account for any gaging errors.
Rating tables used are approximate.
No flow adjustments are made for river time of travel.
Values calculated for estimated total local inflow may differ from actual values.
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CNatural Daily Graph for January 2020 lma/afc

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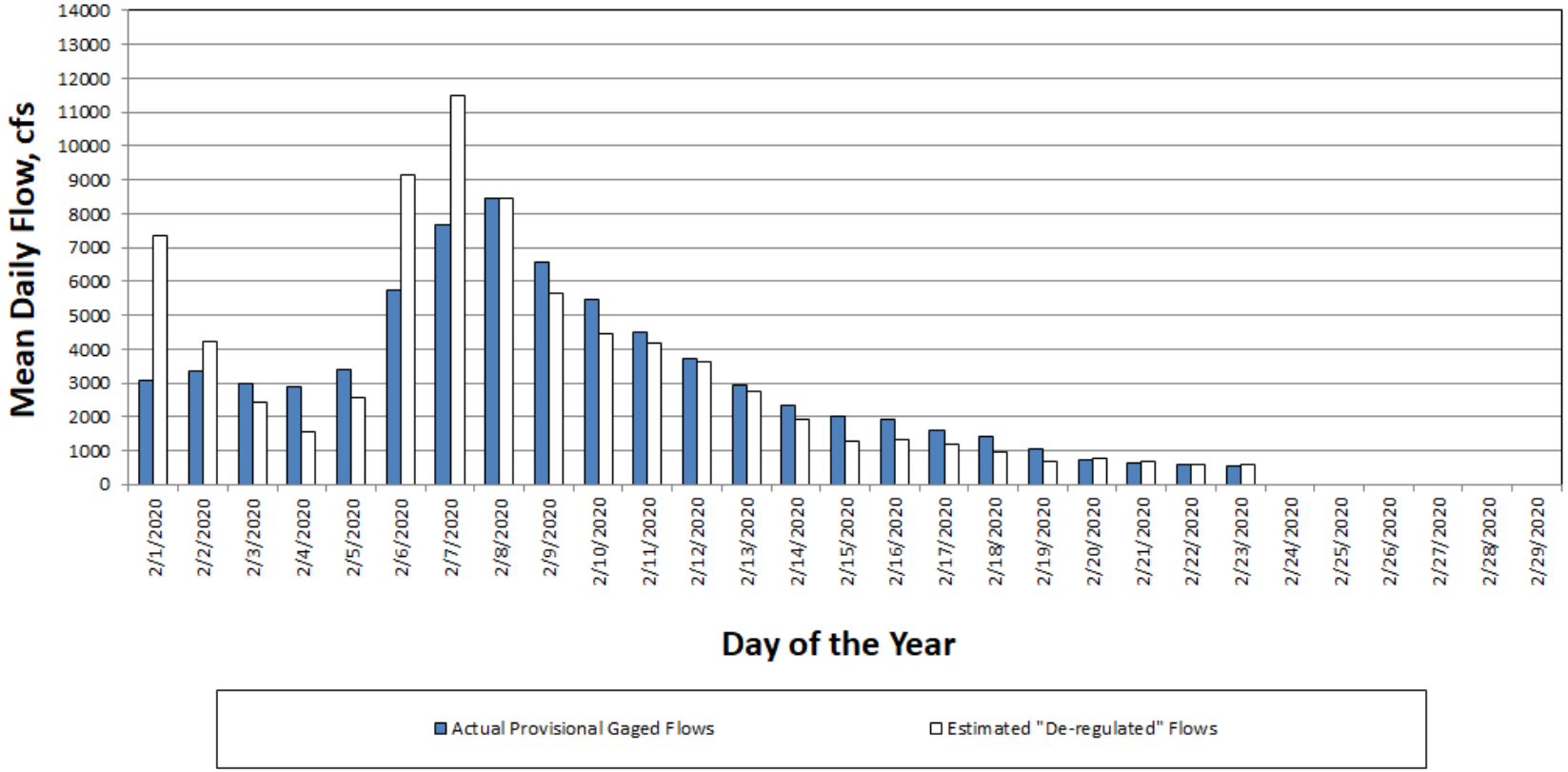

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CNatural Daily Graph for February 2020 lma/afc

Questions?