

# SPILL AND TDG UPDATE TO TMT

Dan Turner  
USACE NWD  
June 6, 2018

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# CONTENTS

- Damaged gauges
- Factors that influence TDG besides spill
- Lessons learned so far
- Process and assumptions for Tuesday
- Expectations for June



# DAMAGED GAUGES

Bonneville Tailrace: CCIW

Video from May 16.

Statistical estimate using K Nearest Neighbor:

- Uses distance to determine the N nearest neighbors of known values (forebay TDG, spill)
- Averages these values to determine unknown value (downstream TDG)

| Date / Time    | BON FB TDG (% sat) | BON Spill (kcfs) | WRNO TDG (% sat) | CCIW (% sat) |
|----------------|--------------------|------------------|------------------|--------------|
| 6/5/2018 1:00  | 113.9              | 160              | 118.6            | 122.1        |
| 6/5/2018 2:00  | 113.9              | 148              | 118.8            | 122.5        |
| 6/5/2018 3:00  | 113.9              | 141              | 118.2            | 123.3        |
| 6/5/2018 4:00  | 113.9              | 140              | 117.7            | 122.9        |
| 6/5/2018 5:00  | 113.9              | 122              | 117.7            | 119.6        |
| 6/5/2018 6:00  | 113.8              | 121              | 117.1            | 119.6        |
| 6/5/2018 7:00  | 113.8              | 121              | 116.6            | 119.6        |
| 6/5/2018 8:00  | 113.9              | 134              | 116.8            | 121.5        |
| 6/5/2018 9:00  | 114.1              | 152              | 117.3            | 123.4        |
| 6/5/2018 10:00 | 114.2              | 153              | 118.0            | 122.5        |
| 6/5/2018 11:00 | 114.2              | 153              | 118.5            | 123.0        |
| 6/5/2018 12:00 | 114.3              | 144              | 118.5            | 123.4        |

The Dalles Tailrace: TDDO

Likely malfunction before 6/4

*It was repaired yesterday!!!*

McNary Tailrace: MCPW

11 hour offset between USGS and the Corps

Values OK



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## FACTORS THAT IMPACT TDG BESIDES SPILL

- Mixing with powerhouse flow and upstream TDG
  - Forecasted flows and powerhouse operations
- Water Temperature
  - Air temperature forecast but no water temperature
- Barometric Pressure
  - 5 days from NWS model, distributed by 3<sup>rd</sup> party.
- Dissipation to atmosphere -- wind
  - 7 day forecast from NWS
- Stratification and lateral variation
  - Assume the gauge represents the current river conditions

Represented by SYSTDG

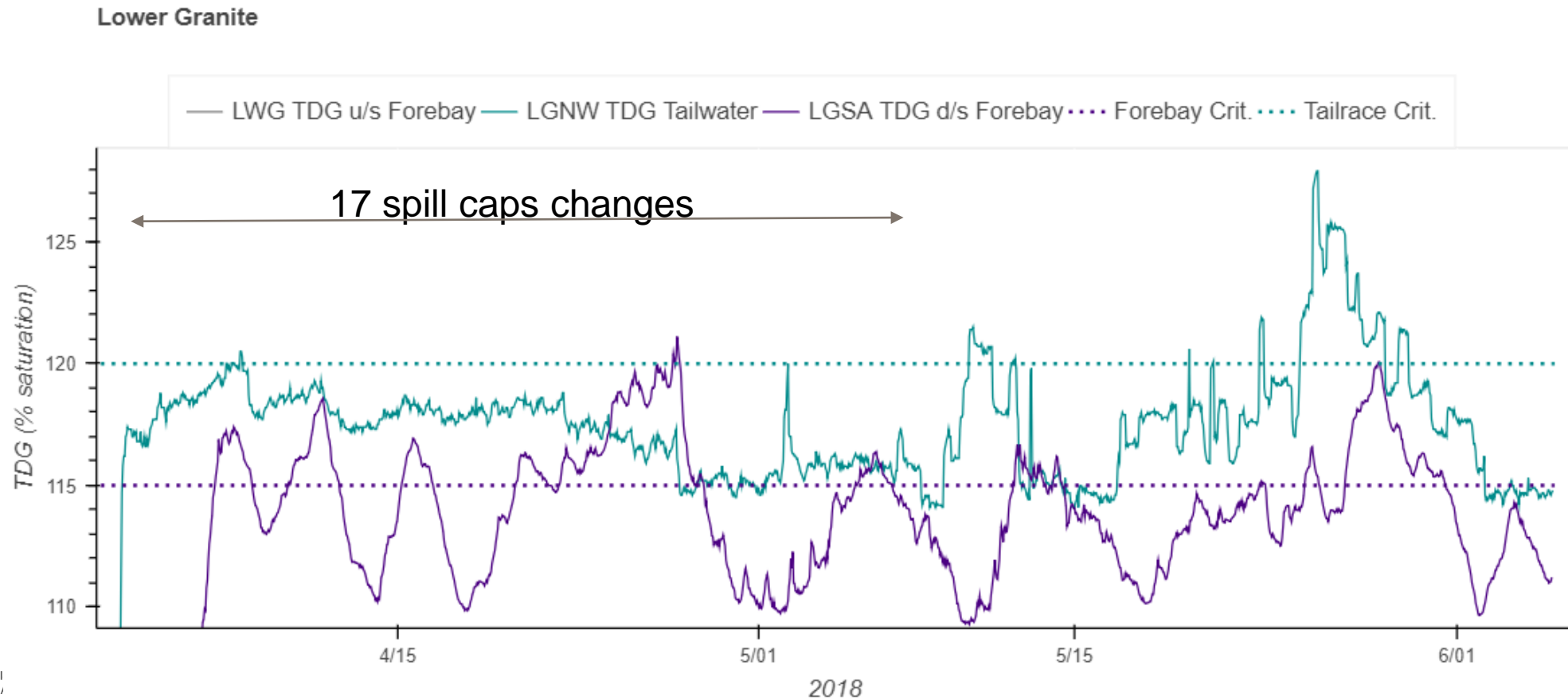


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## Lessons learned so far:

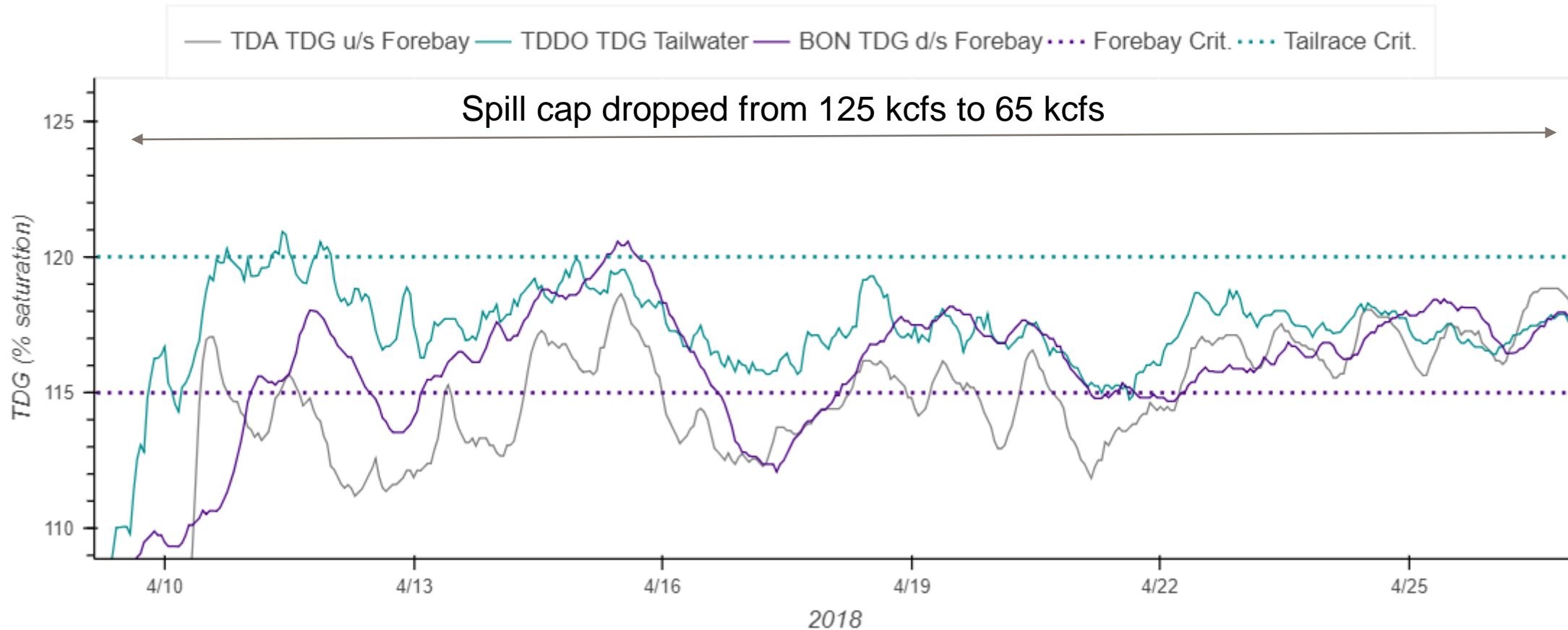
- Degassing rate from tailrace to downstream forebay is variable.
- The downstream forebay can be greater to or equal to the tailrace TDG.
- The downstream forebay gauge is usually the most restrictive gauge.
- The factors outside of our control have a major impact on the forebay TDG.
- Changing spill rates cannot effectively keep forebay TDG at 115%.



# LESSONS LEARNED SO FAR:

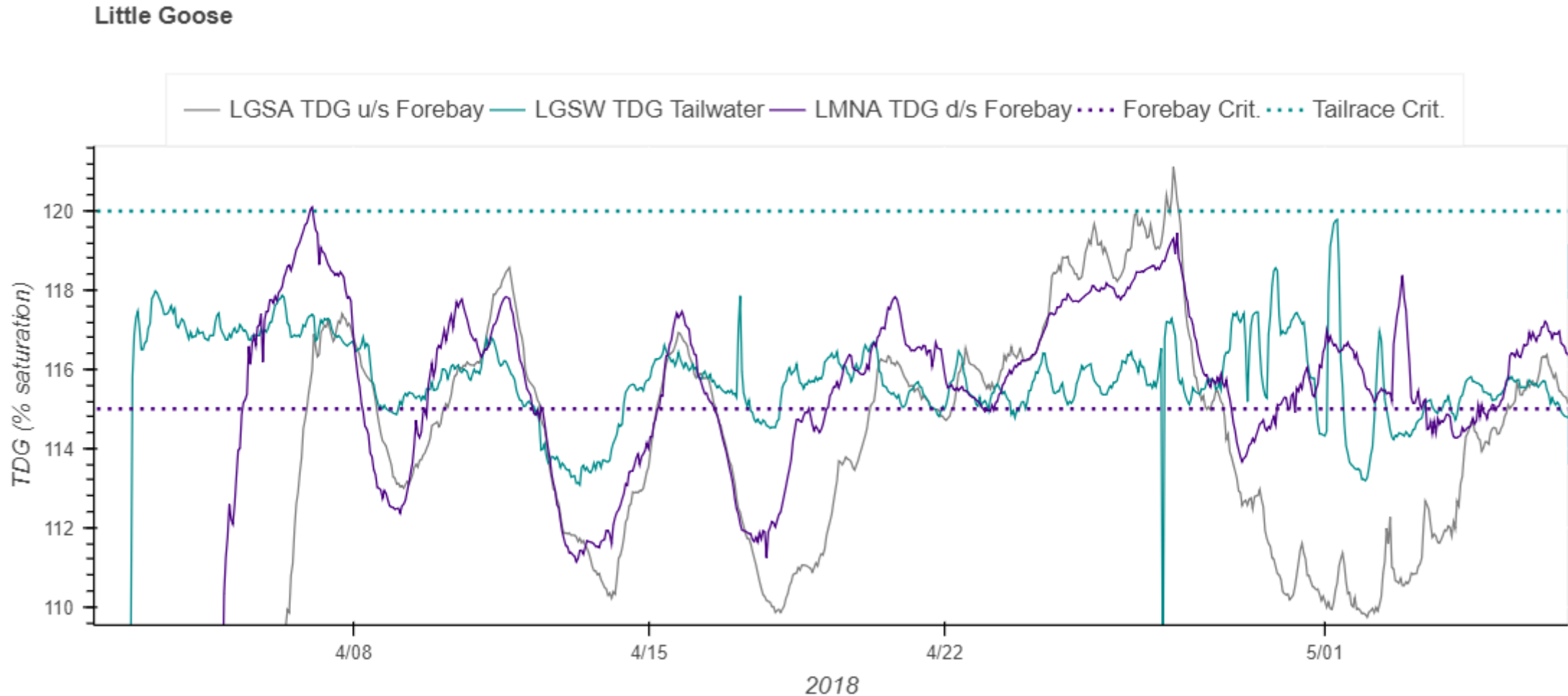
Upstream TDG influences downstream TDG

## The Dalles

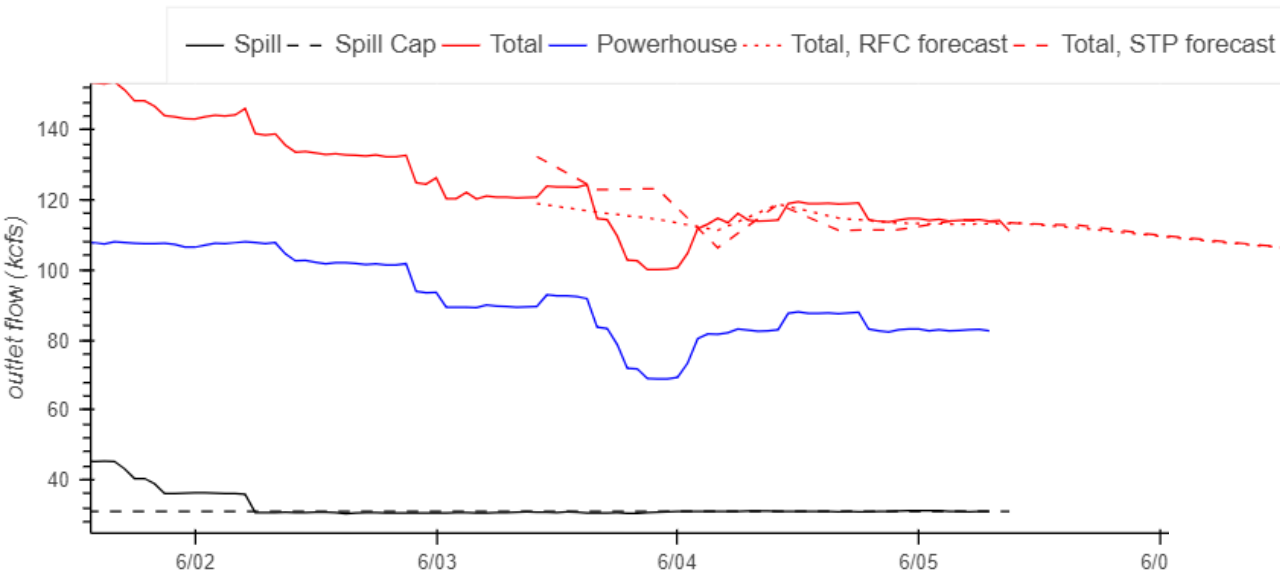


# LESSONS LEARNED SO FAR:

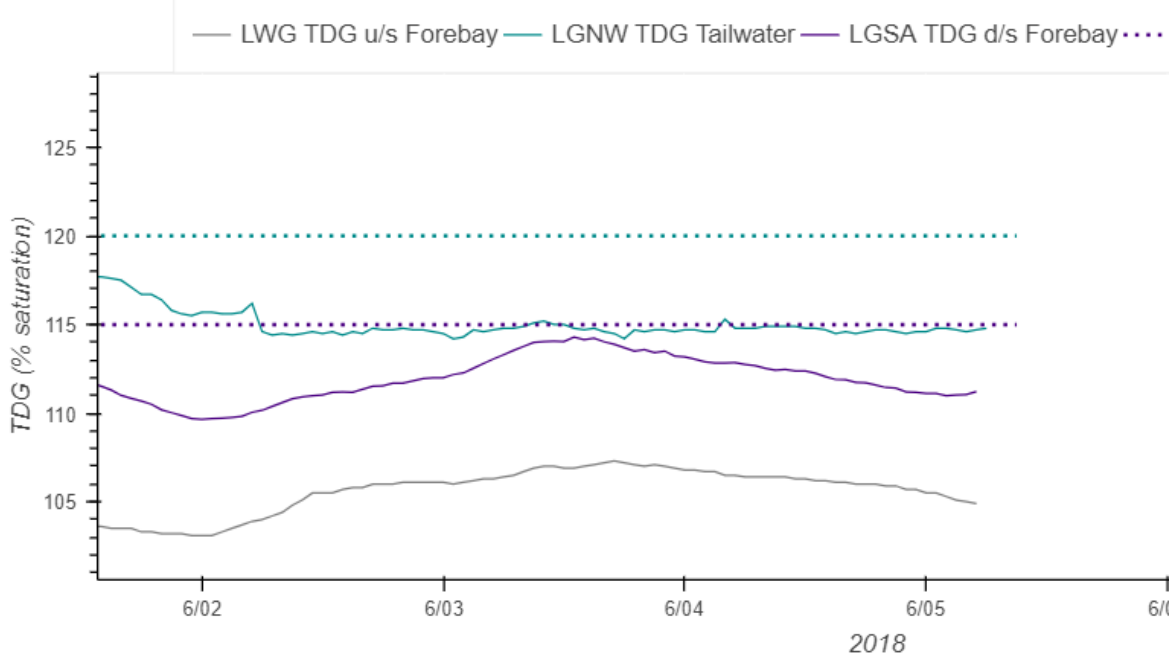
At Little Goose, the tailrace TDG will need to be <115% to achieve the 115% target in the downstream forebay.



# Lower Granite

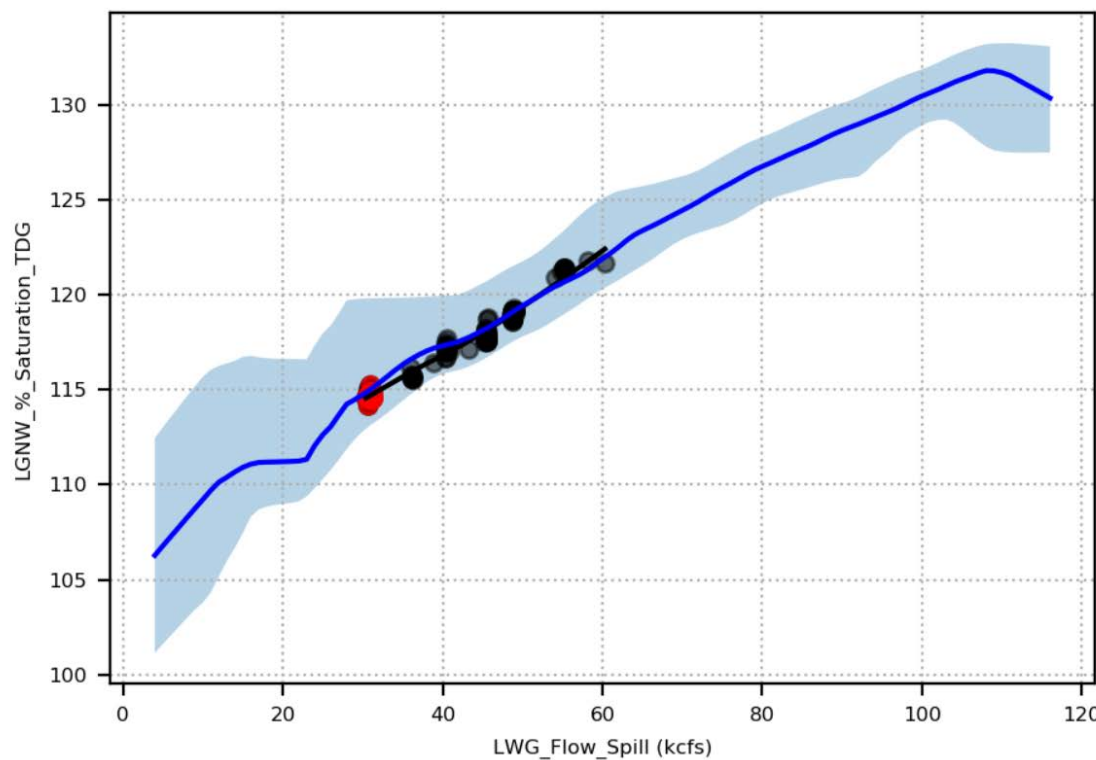


LWG 6/5/2018 0911



2018

# Process and assumptions from Tuesday

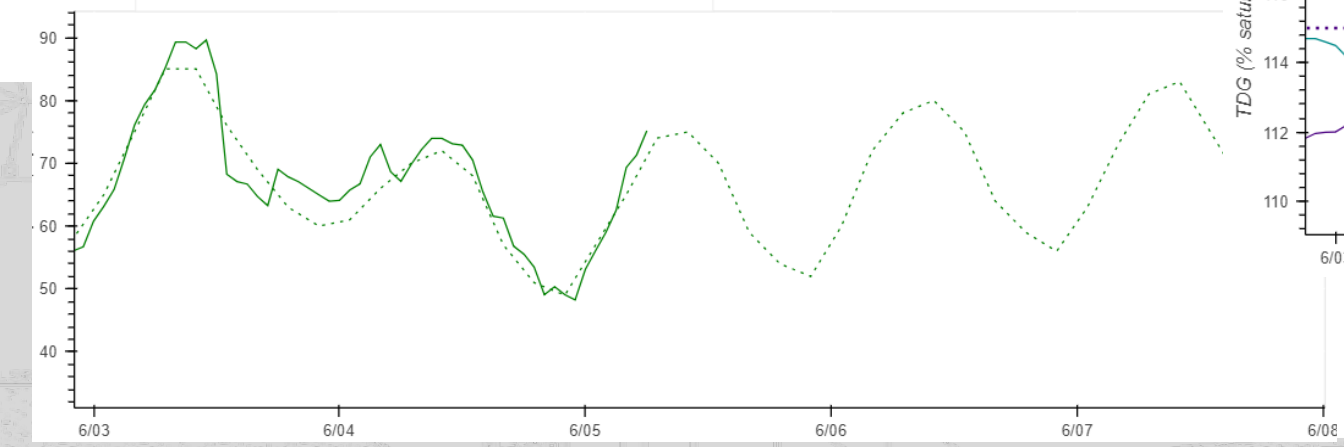
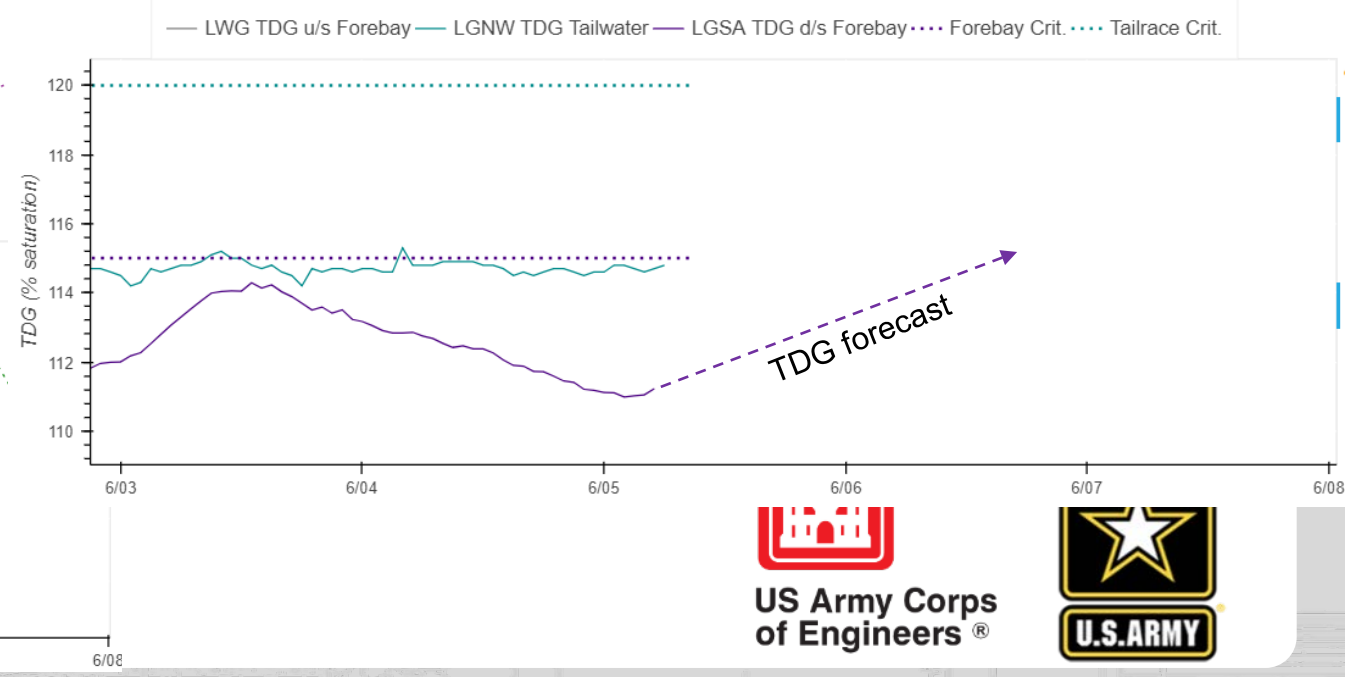
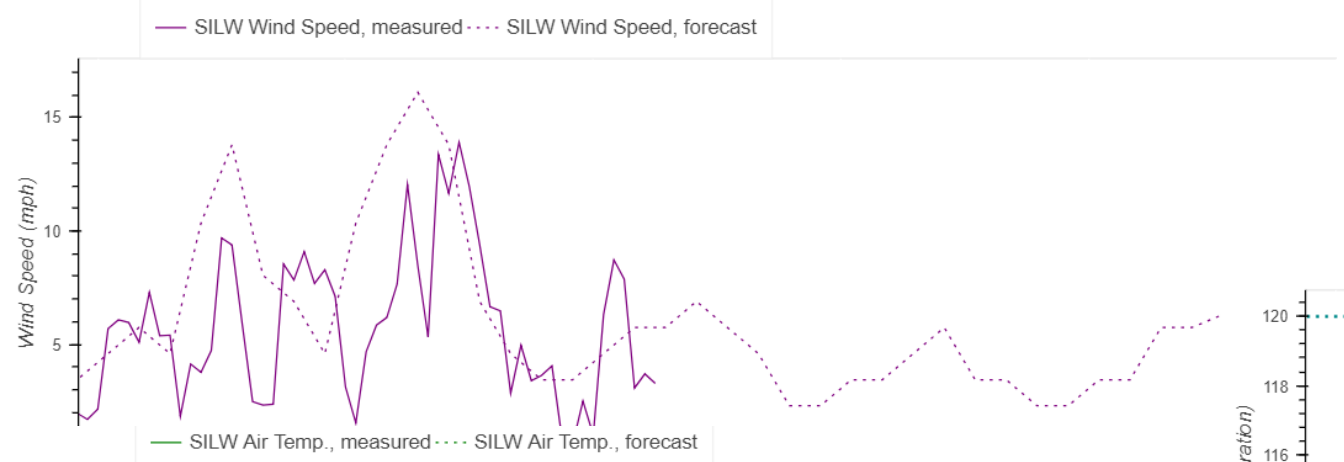
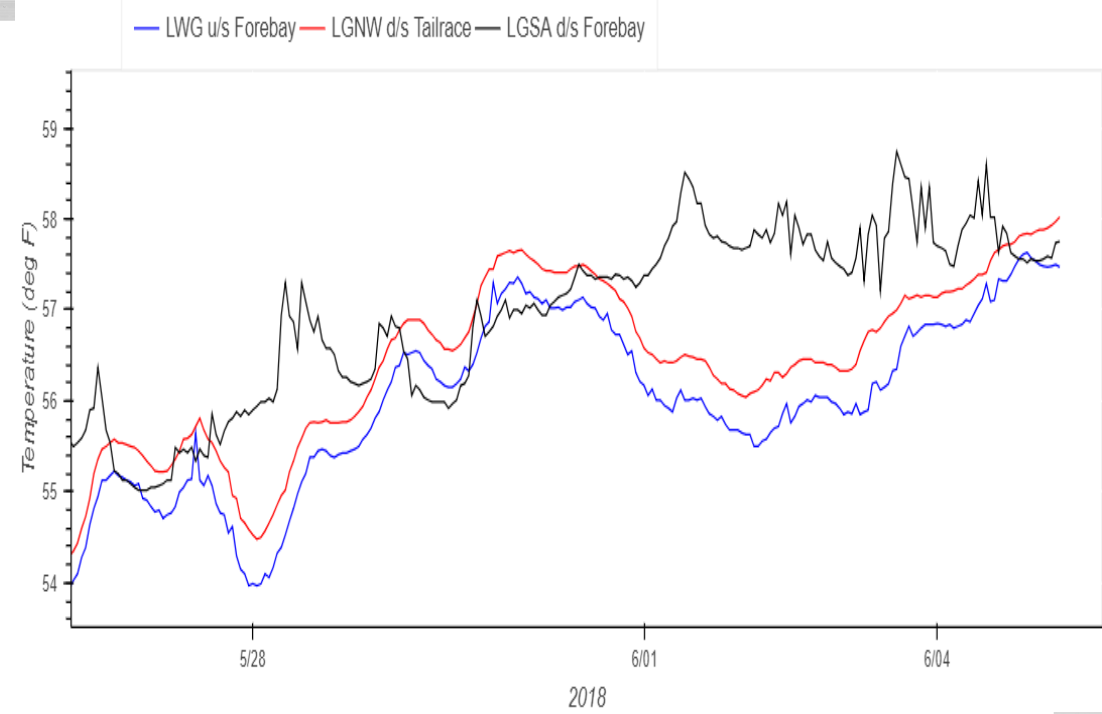
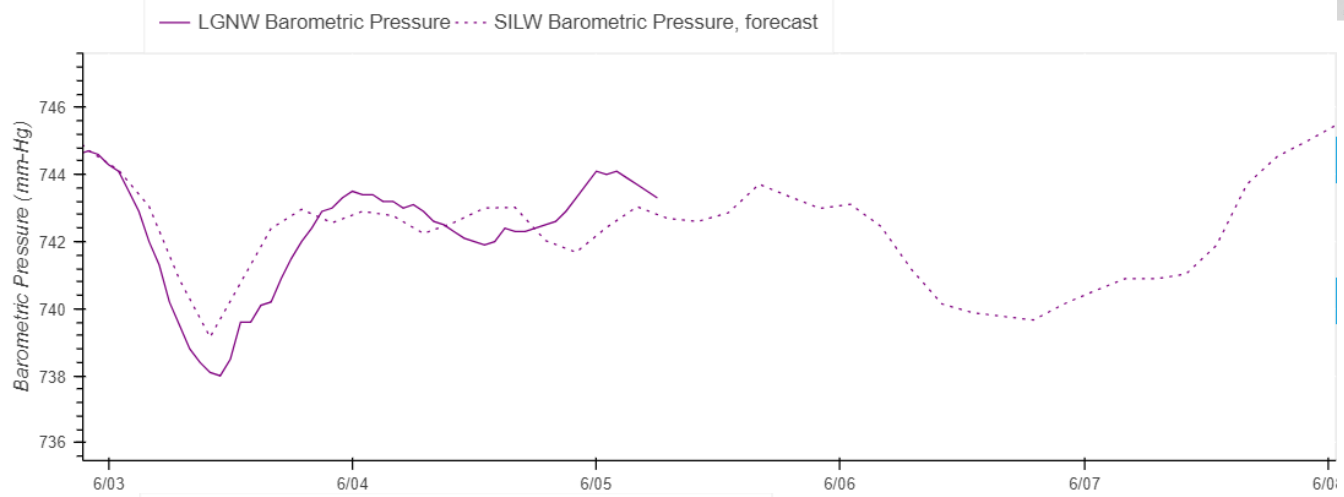


Most recent: 6/5/2018 0700

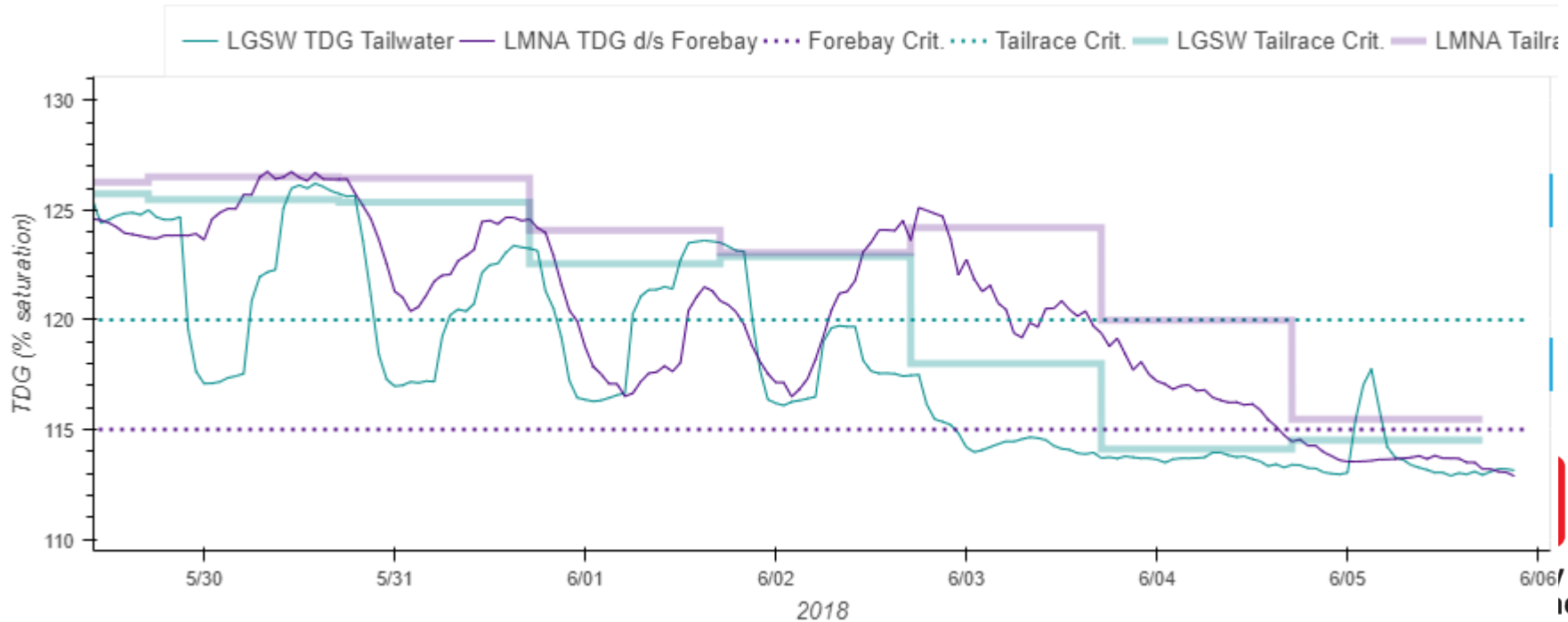
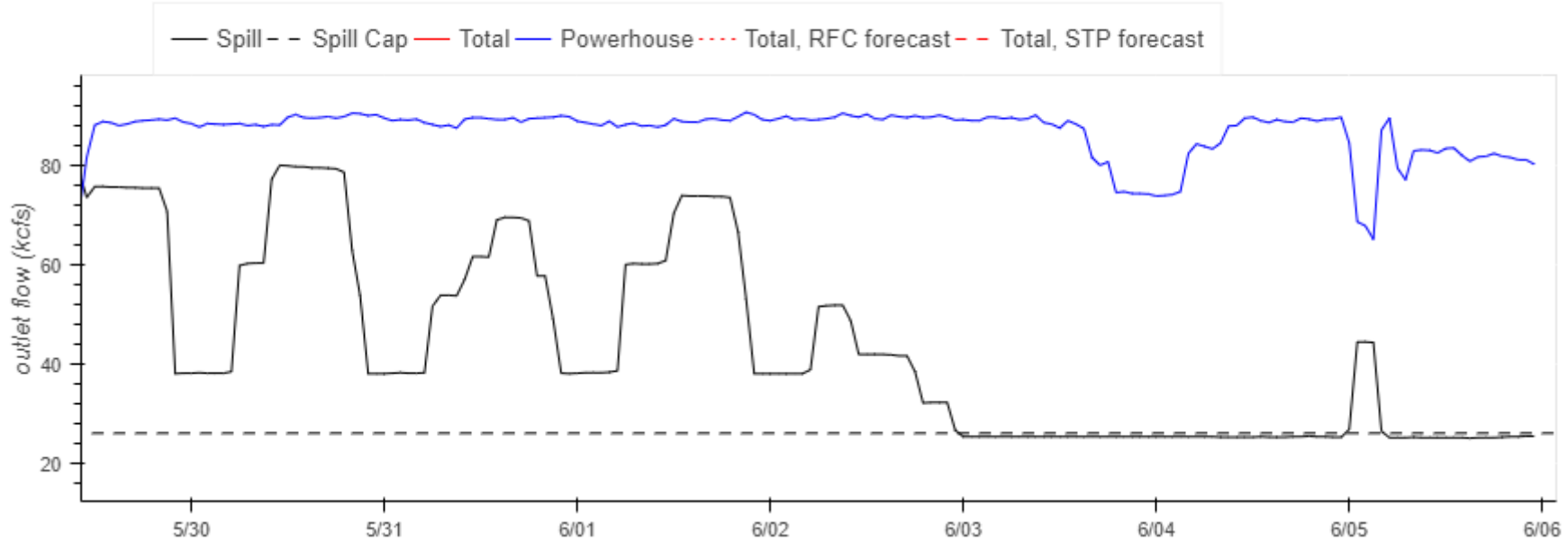
7day regress. TDG Spill (sat) (kcfs)

|      |     |
|------|-----|
| 110% | <30 |
| 115% | 31  |
| 116% | 36  |
| 117% | 41  |
| 118% | 45  |
| 119% | 49  |
| 120% | 54  |
| 121% | 55  |
| 122% | 58  |
| 123% | >60 |
| 124% | >60 |
| 125% | >60 |
| 126% | >60 |
| 127% | >60 |
| 128% | >60 |
| 129% | >60 |
| 130% | >60 |
| 131% | >60 |
| 132% | >60 |
| 133% | >60 |
| 134% | >60 |
| 135% | >60 |





# Little Goose

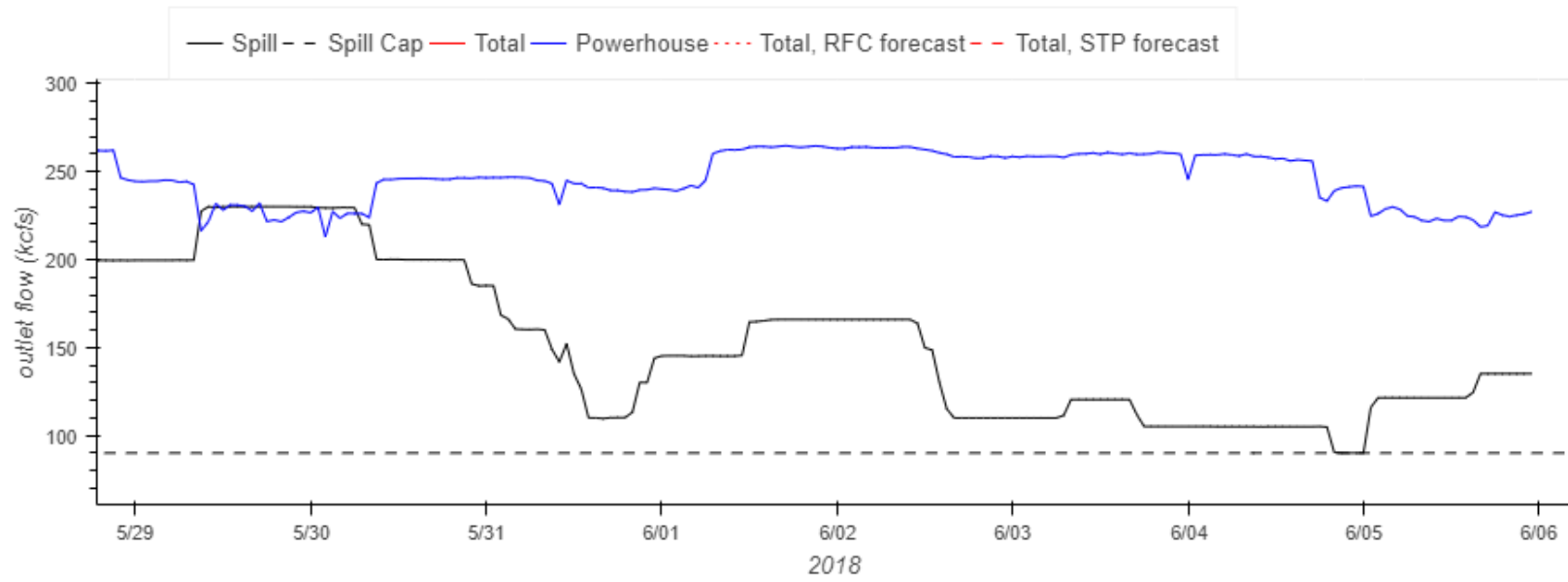


2018

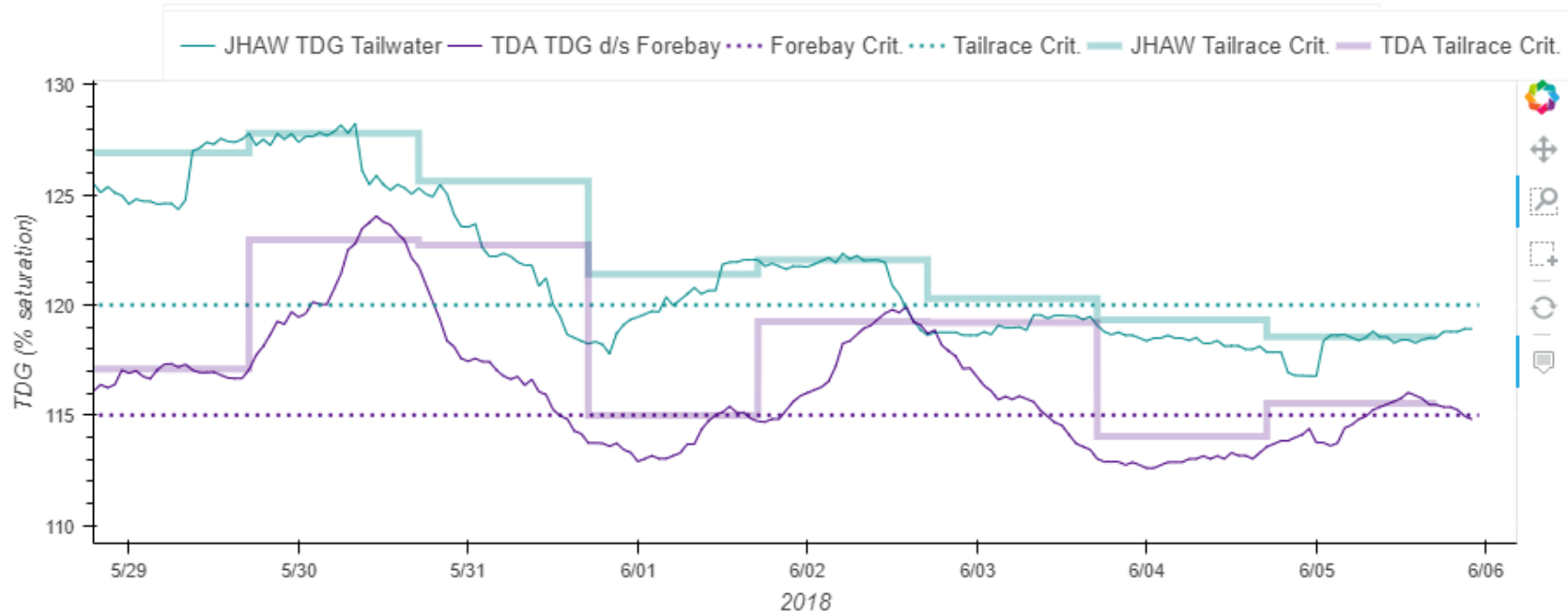
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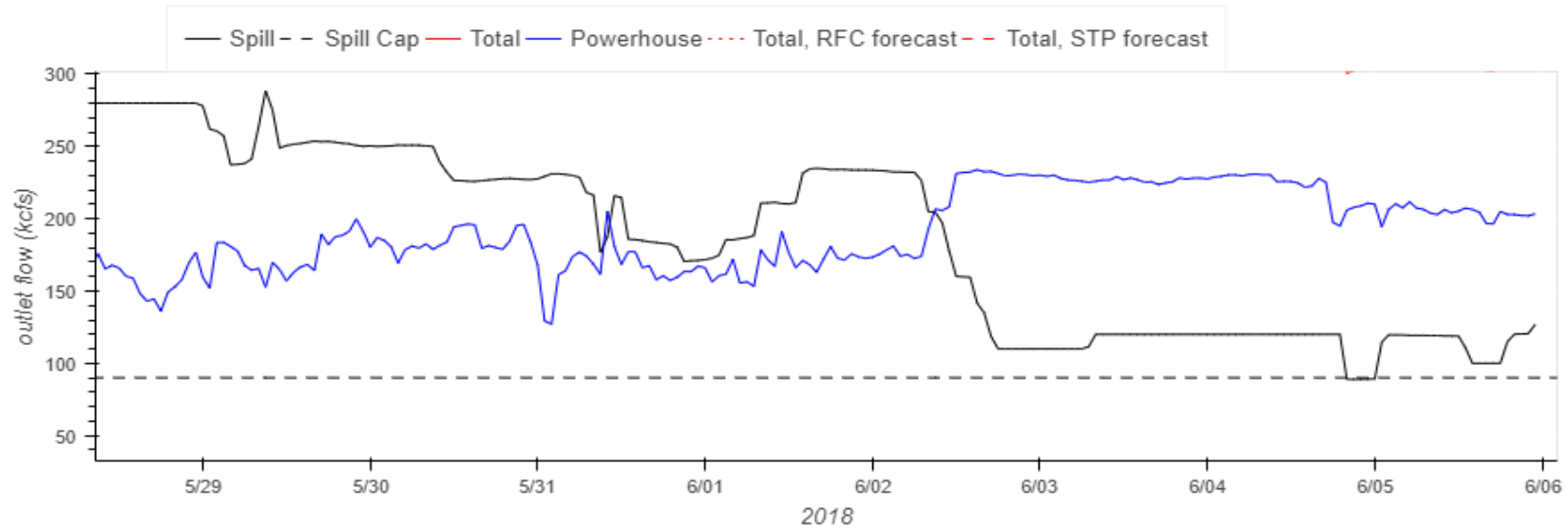
### John Day



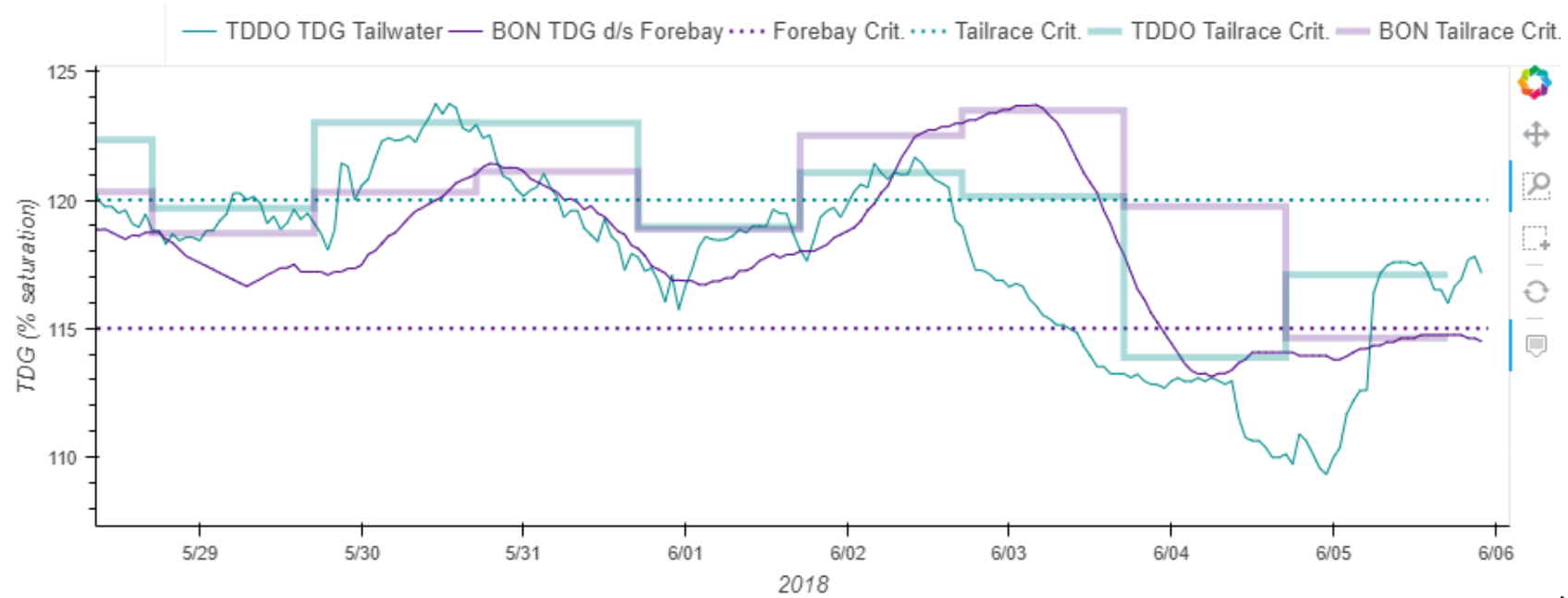
### John Day



The Dalles



The Dalles



## EXPECTATIONS FOR JUNE

- Continued daily spill cap evaluation:
  - spill to the maximum level that meets, but does not exceed, the TDG criteria.
- Less reactionary to short term TDG variability in the forebays.
- Setting spill caps that recognizes the factors that the Corps does not control.
- If the spill cap at LGS remains at 26 kcfs, then spill % is forecast to be <30% until June 14.
- If the spill caps at TDA and JDA remain at 90 kcfs, the spill % is forecast to be <30% until June 15.

