



**2012 Spill Season
Year-end Review
November 15, 2012**

TOTAL DISSOLVED GAS Monitoring

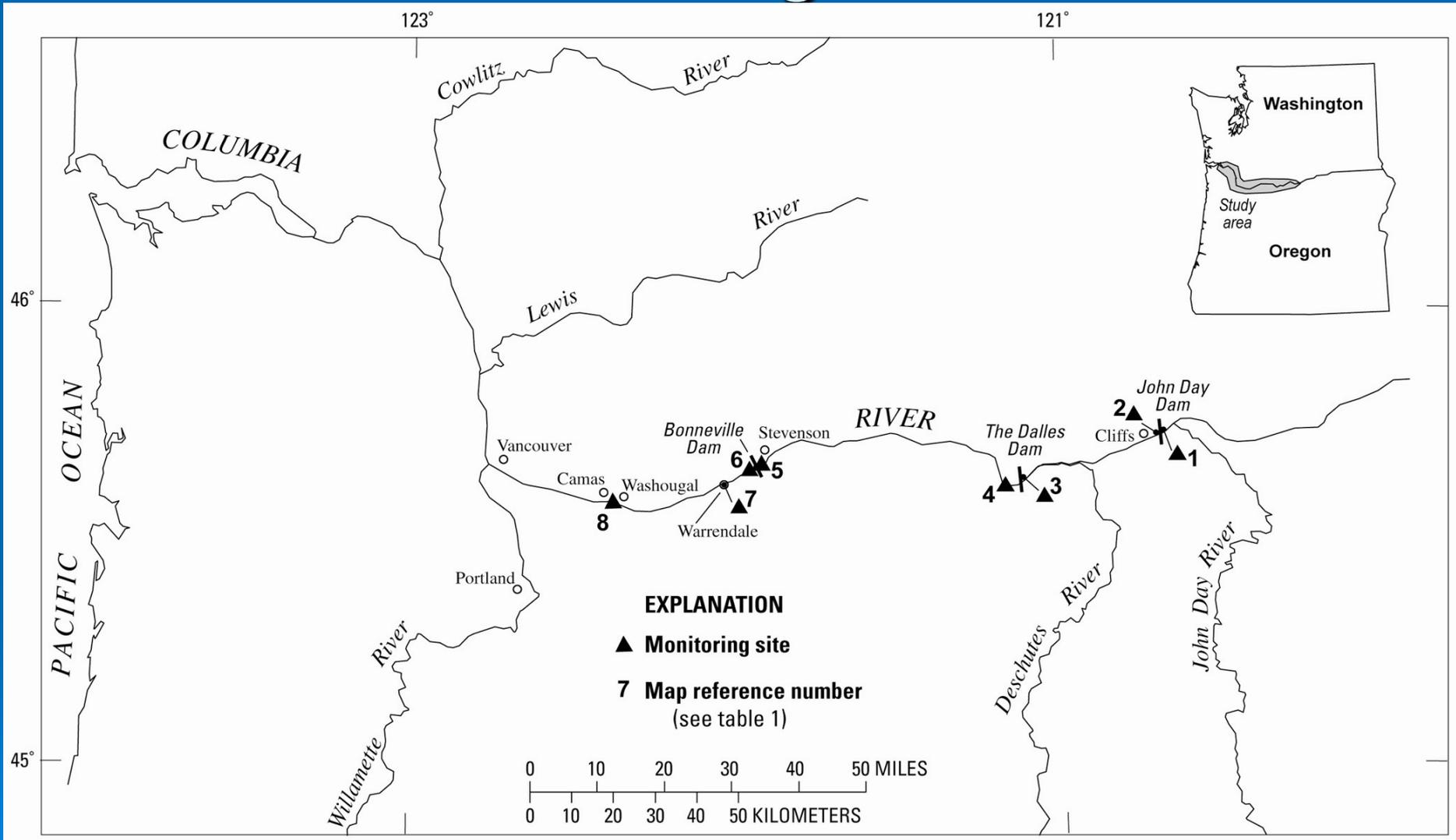
Lower Columbia River

U.S. Department of the Interior
U.S. Geological Survey

Overview

- 8 monitoring sites; 4 year-round and 4 only during spill season
- High flows, spills, and TDG – parts of April through July
- Cascade Island site (below Bonneville Dam) damaged by high water April 25; new pipes installed June 6
- John Day tailwater site was relocated to higher ground before spill season

Monitoring Sites



Field and lab equipment – no changes

- Hydrolab Minisondes
- Vaisala analog barometers at sites
- Sutron Satlink 2 high-data-rate DCPs (data collection platforms)
- Surveyor 4 and PDA for field display
- NovaLynx hand-held digital barometer
- For lab, Digimano pressure gage

New Cascade Island site





Old John Day tailwater



New John Day tailwater





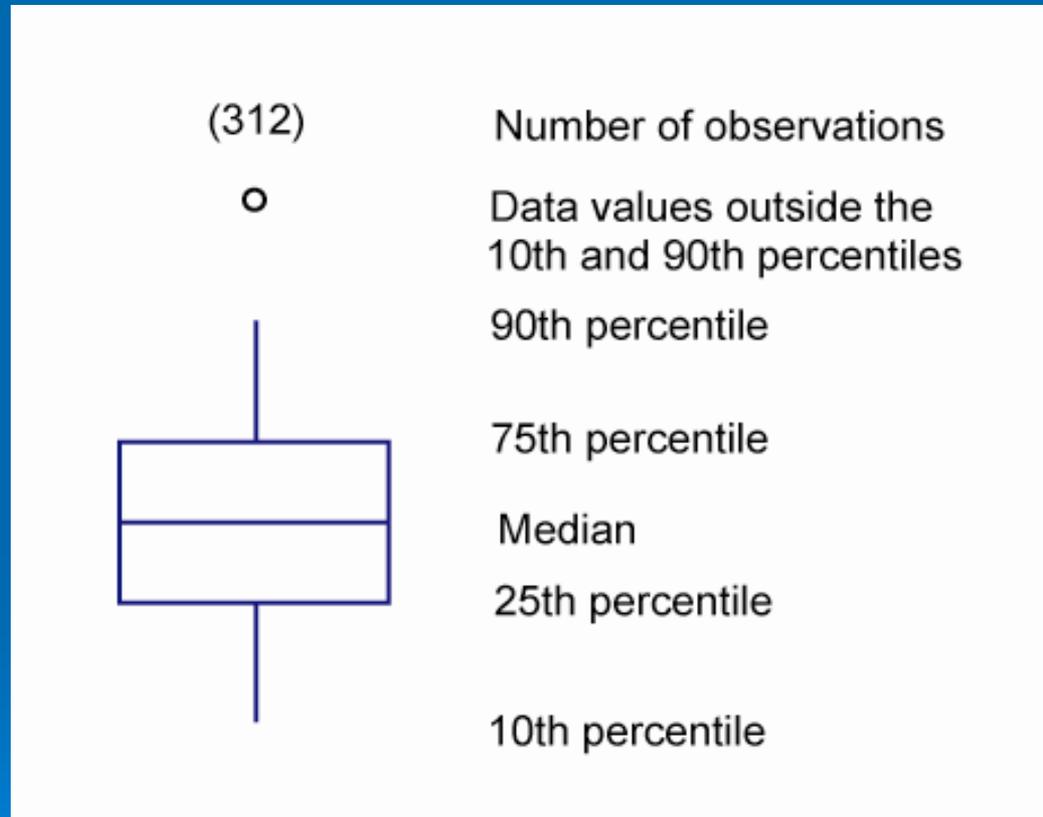
Season summary

- During the spill season, hourly values of TDG were **sometimes** larger than 115% saturation for the forebay sites and larger than 120% for the tailwater sites.
- All except one of the field checks of TDG sensors were within $\pm 1\%$ saturation after 3 to 4 weeks of deployment in the river.
- Field checks of barometric pressure were within ± 1 mm Hg, and water-temperature field checks were within $\pm 0.2^\circ\text{C}$.
- Of the 98 laboratory TDG checks that were performed on instruments after field deployment, all were within 0.7-percent saturation.
- For the eight monitoring sites, an average of 97.7% of the TDG data were received in real time and passed QA checks.

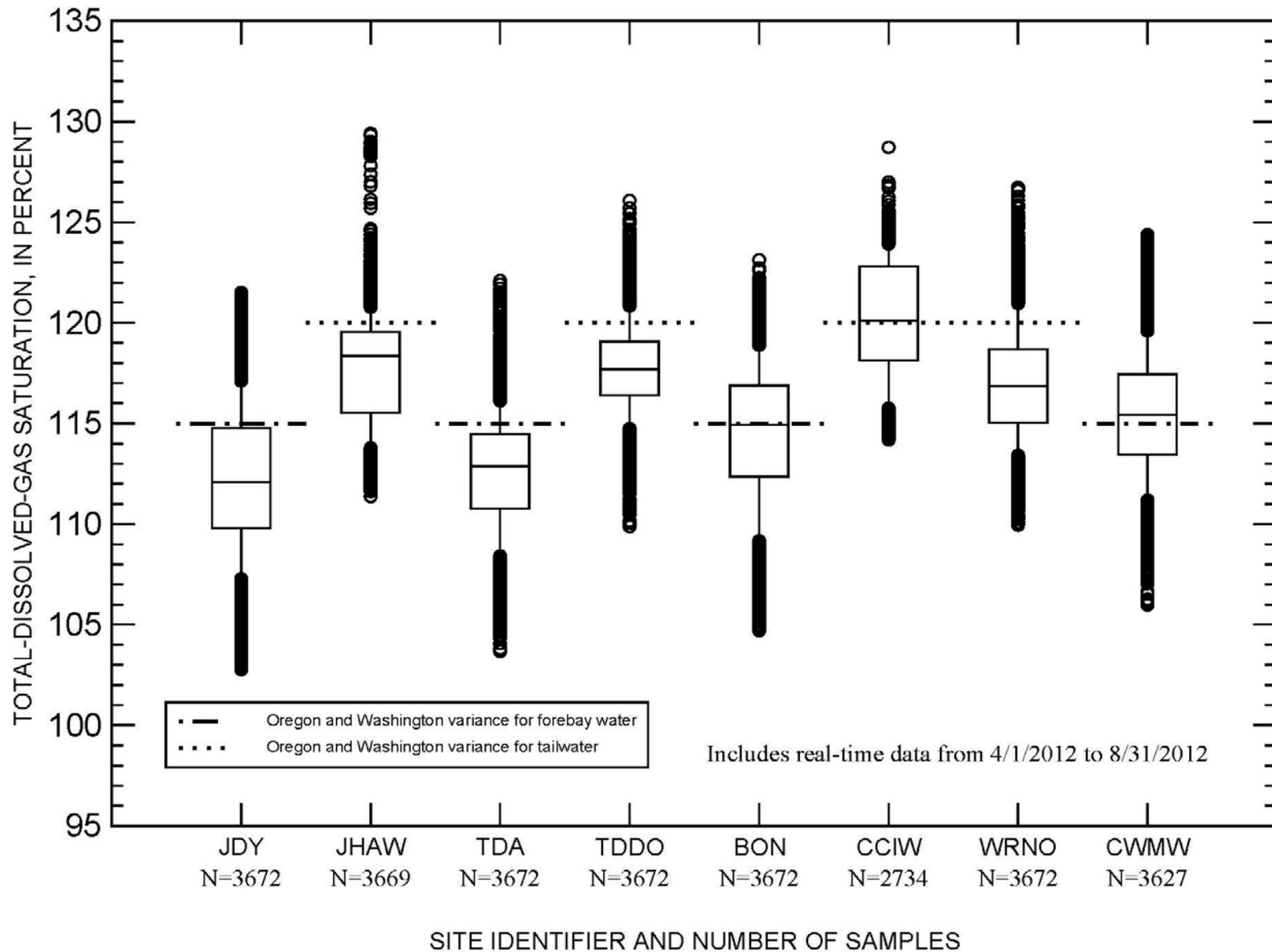
Data Completeness for 2012

Station name	Number of missing or deleted hourly values	Percentage of real-time data passing quality assurance
John Day navigation lock	19	99.6%
John Day tailwater	11	99.9
The Dalles forebay	0	100.0
The Dalles tailwater	12	99.9
Bonneville forebay	0	100.0
Cascade Island	1,042	77.8
Warrendale	3	100.0
Camas	46	98.9
Average		97.7%

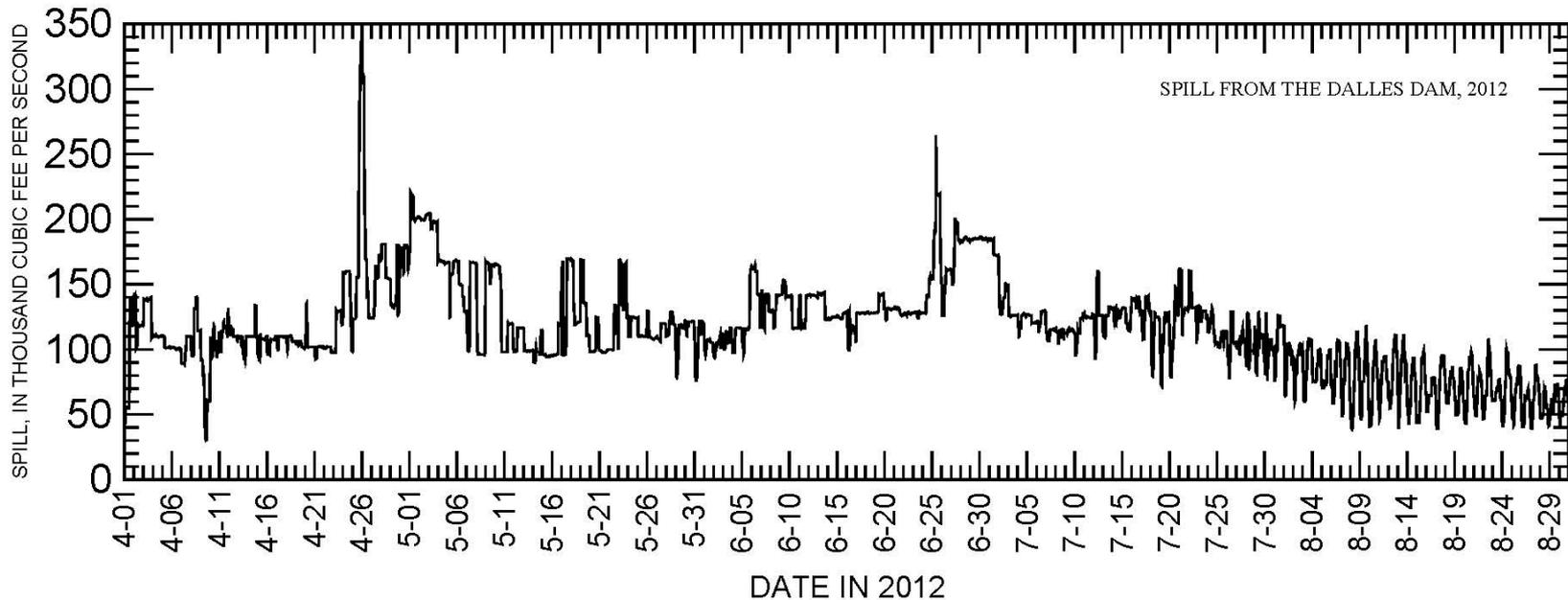
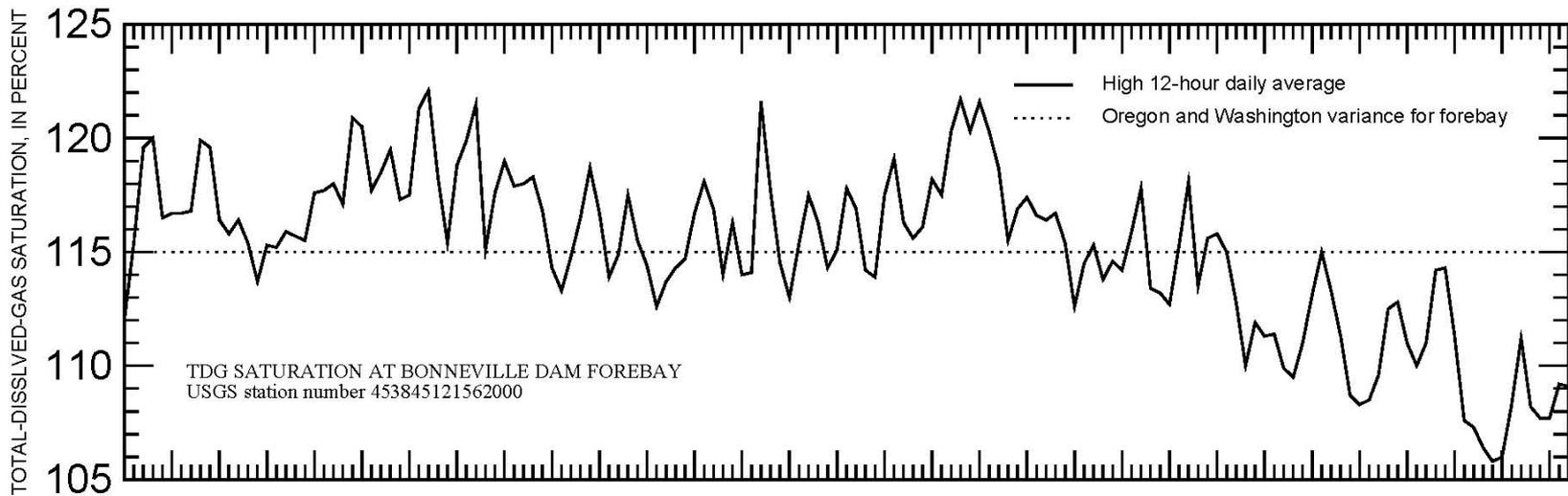
Explanation of a Boxplot



TDG distribution at 8 sites-spill season



TDG and spill above Bonneville Dam

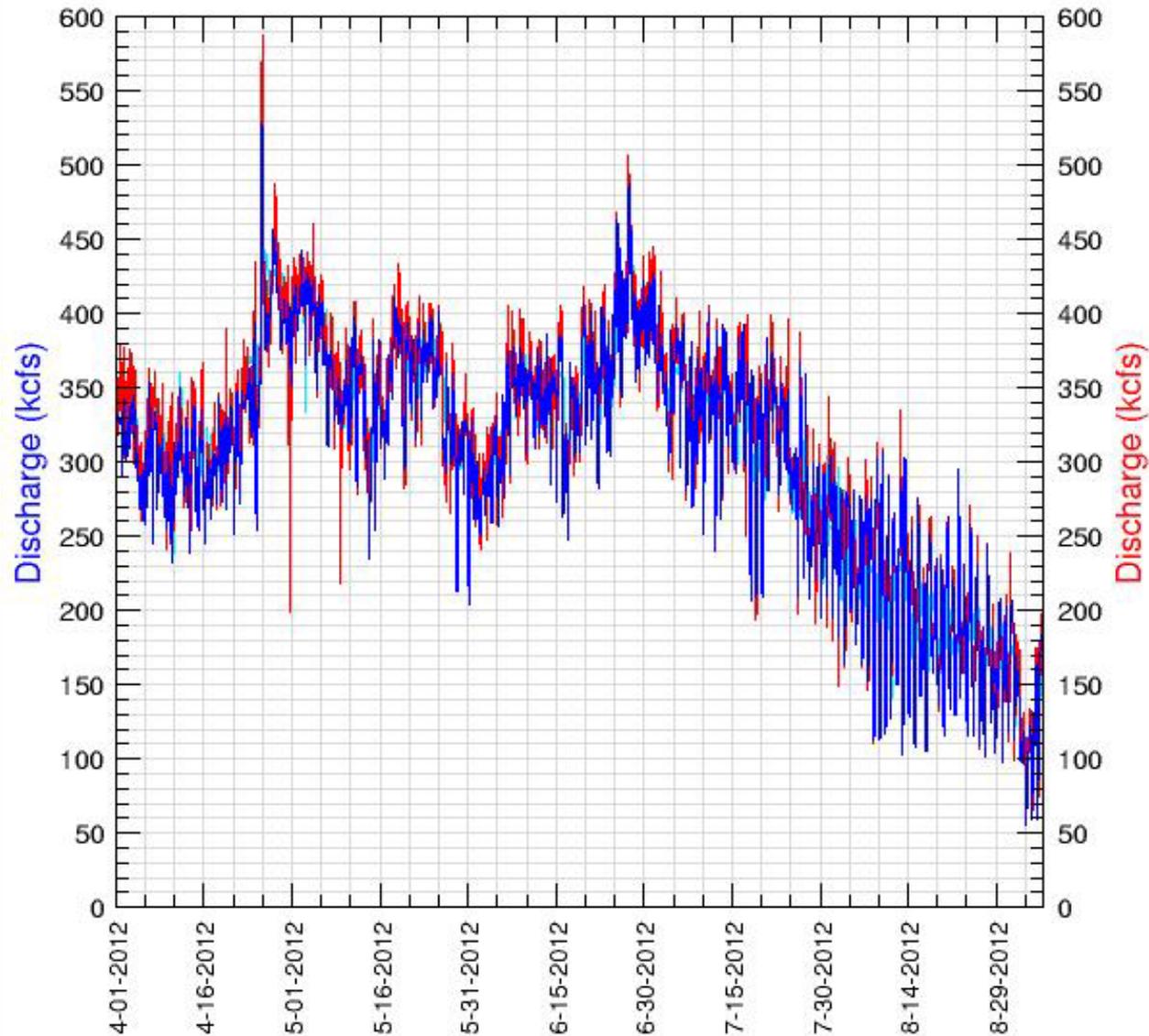


Columbia River, right bank, near Cliffs, WA (454249120423500)

Columbia River at The Dalles, OR (14105700)

Columbia River at Cascade Island, WA (453845121564001)

Data from USGS and USACE

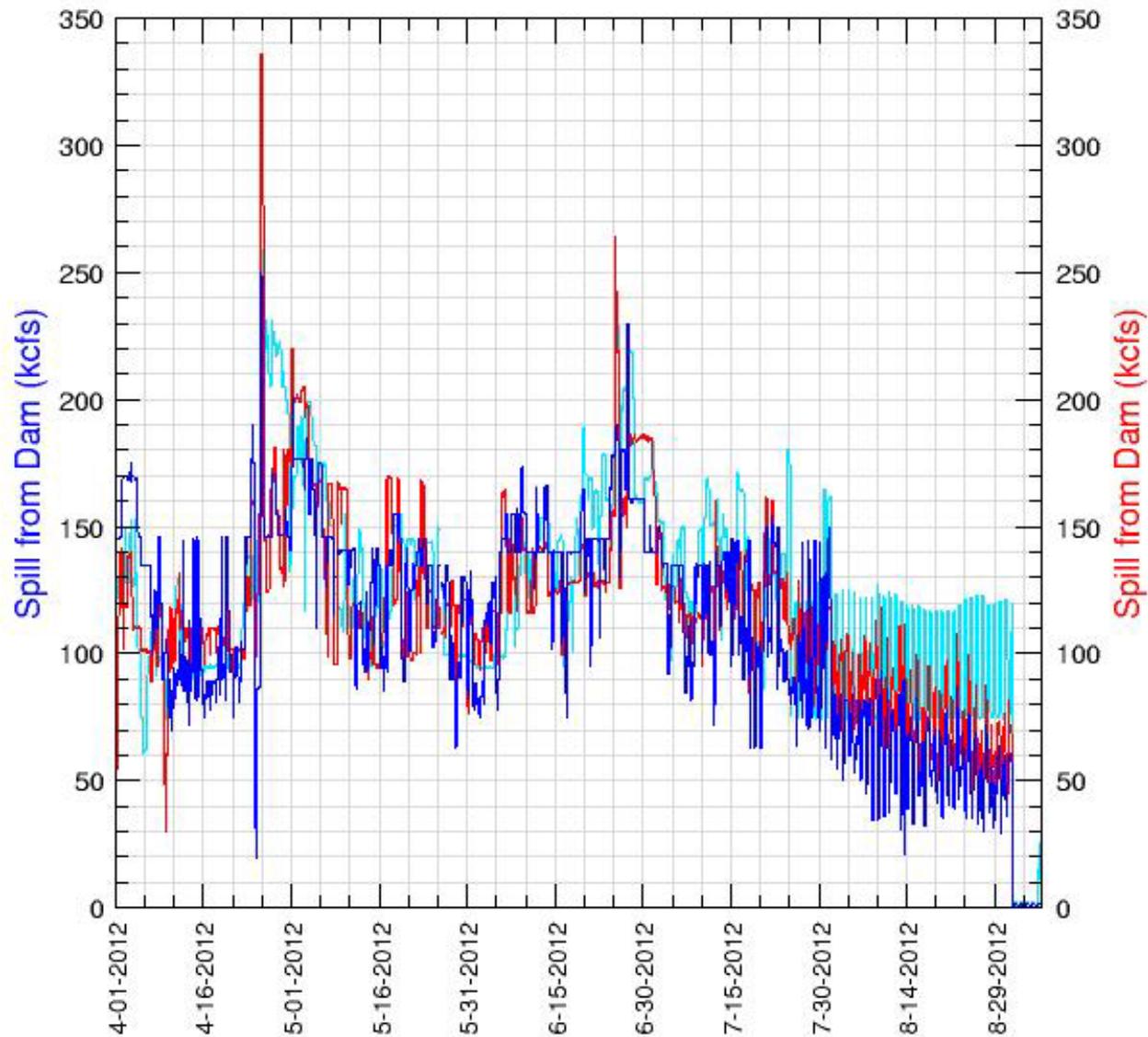


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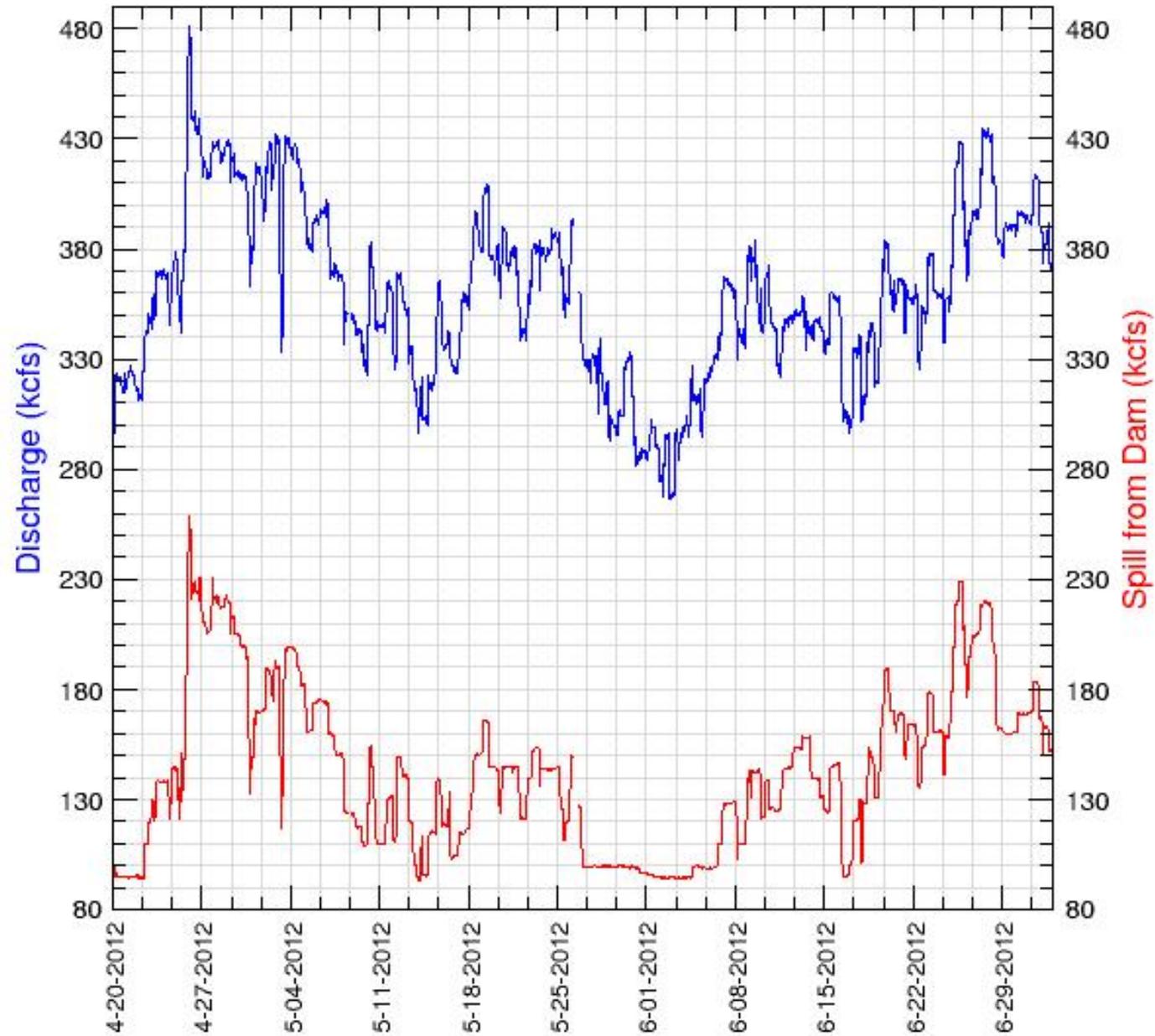
Columbia River at Cascade Island, WA (453845121564001)

Data from Corps of Engineers

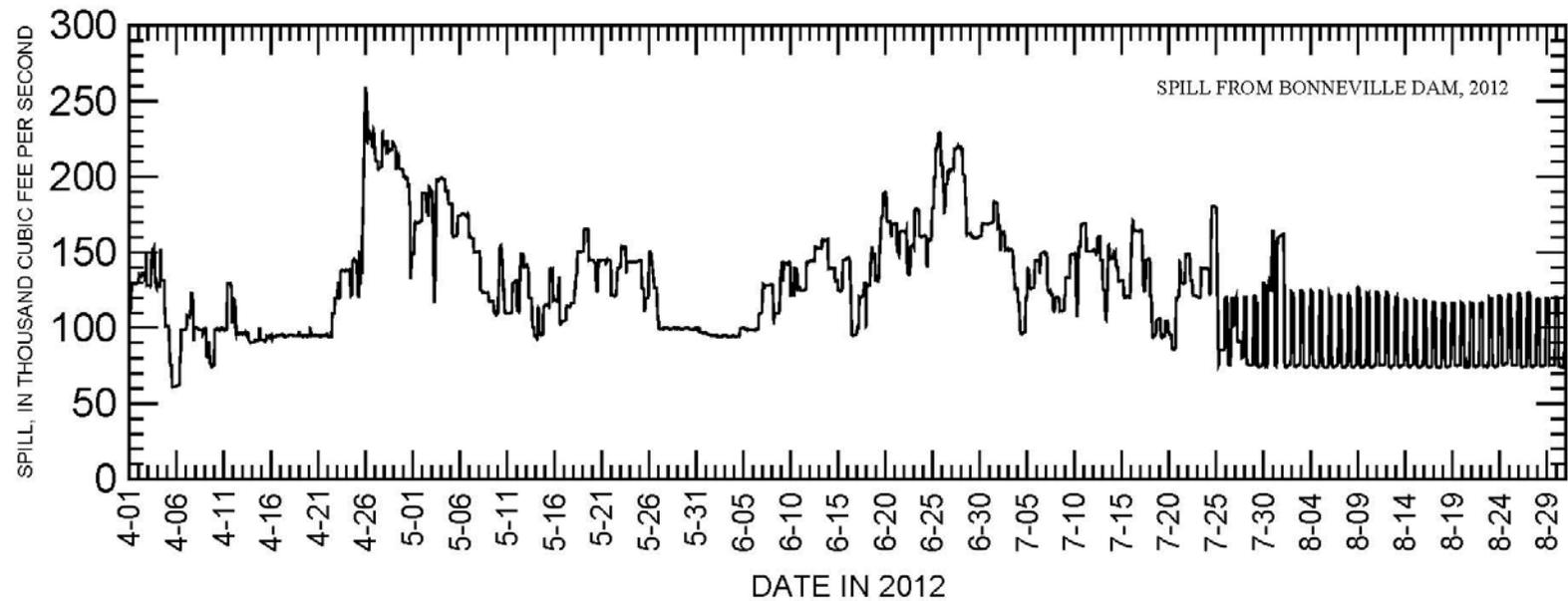
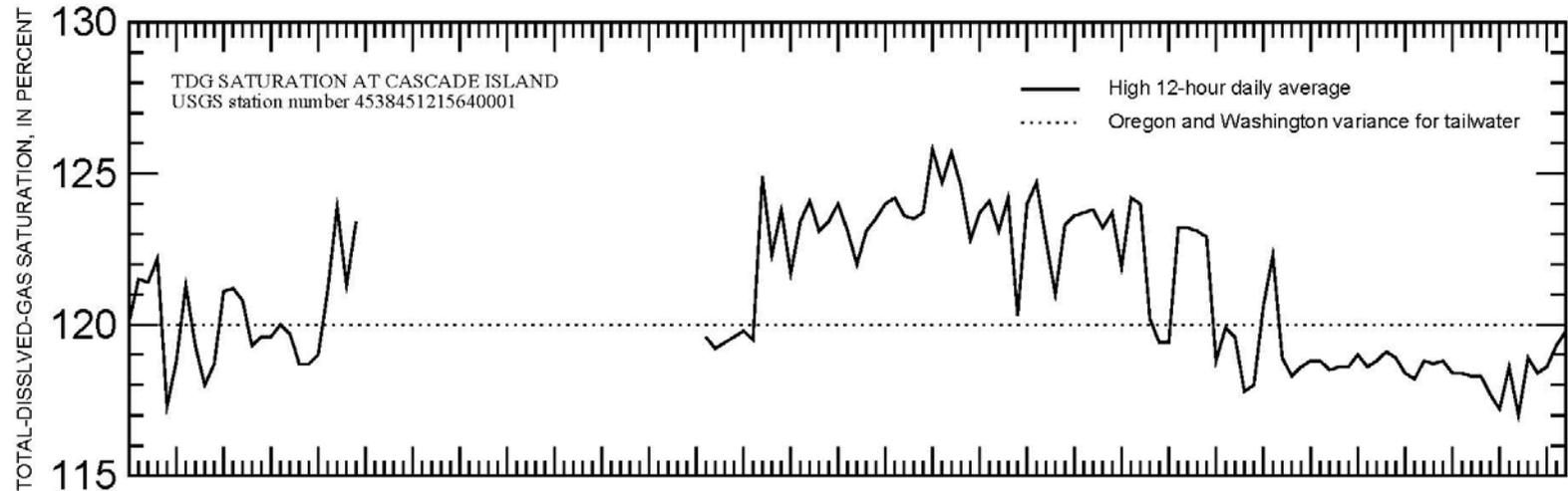


Columbia River at Cascade Island, WA (453845121564001)

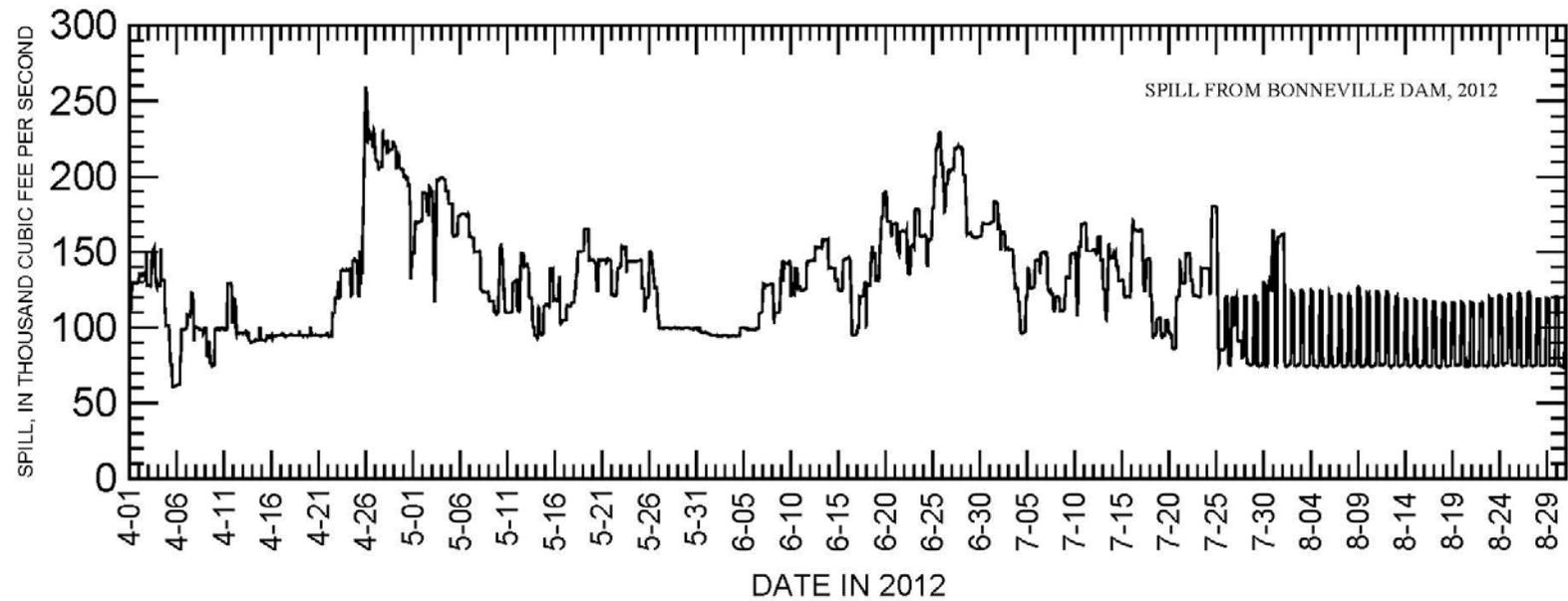
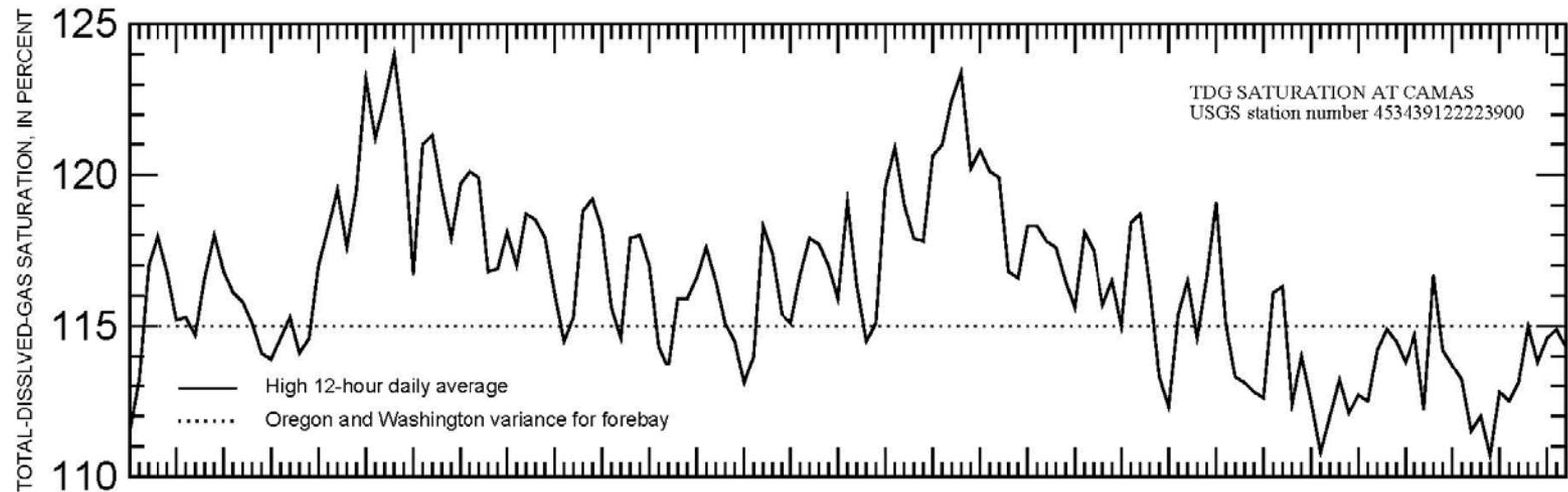
Data from Corps of Engineers



TDG and spill below Bonneville Dam – Cascade Island



TDG and spill below Bonneville Dam - Camas



Future Plans

- Winter monitoring continues below John Day, The Dalles, and Bonneville Dams (Warrendale site); calibration at 4 week intervals.
- USGS will publish an on-line report covering the material in this talk.