North Santiam Total Dissolved Gas Data

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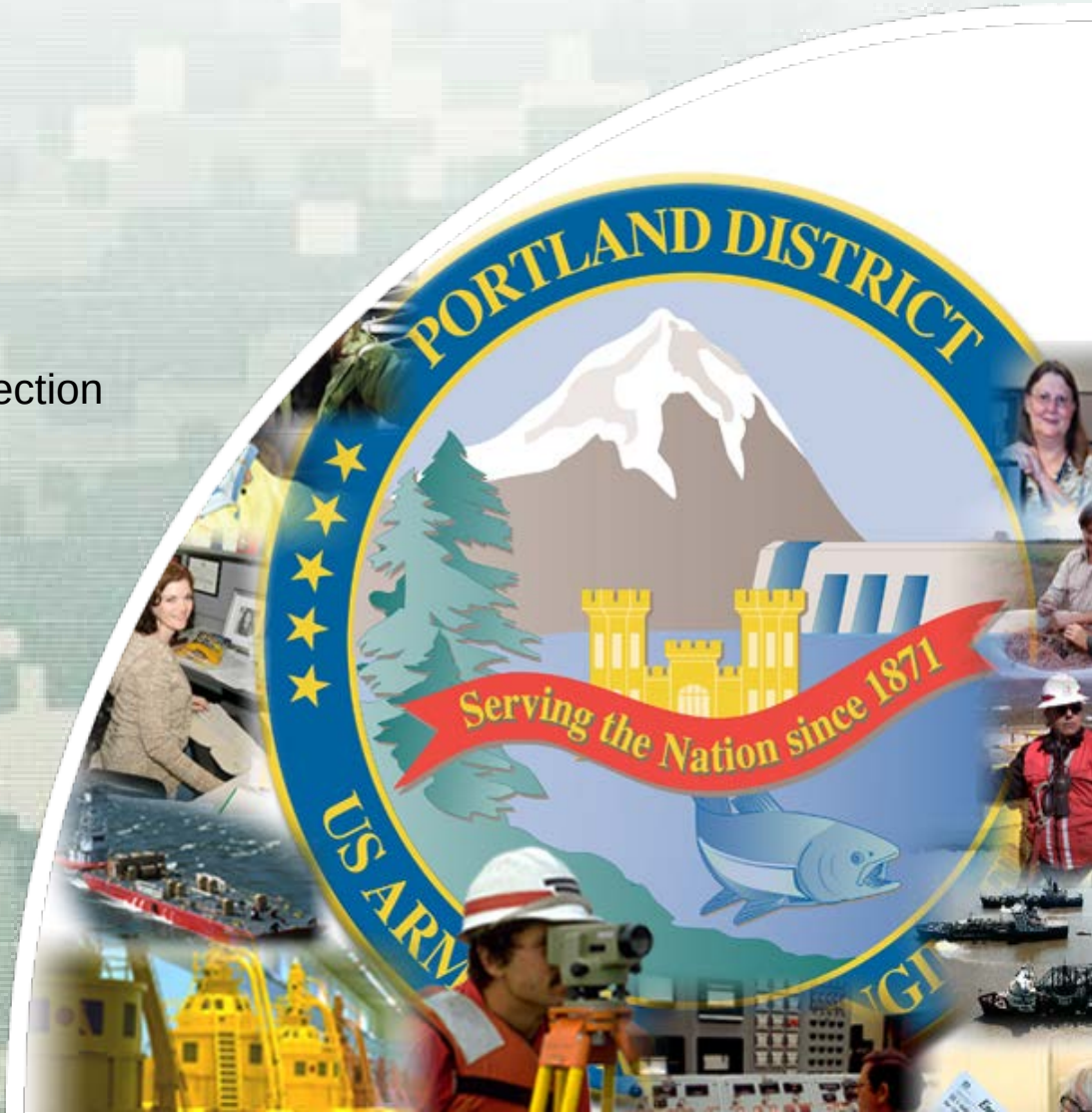

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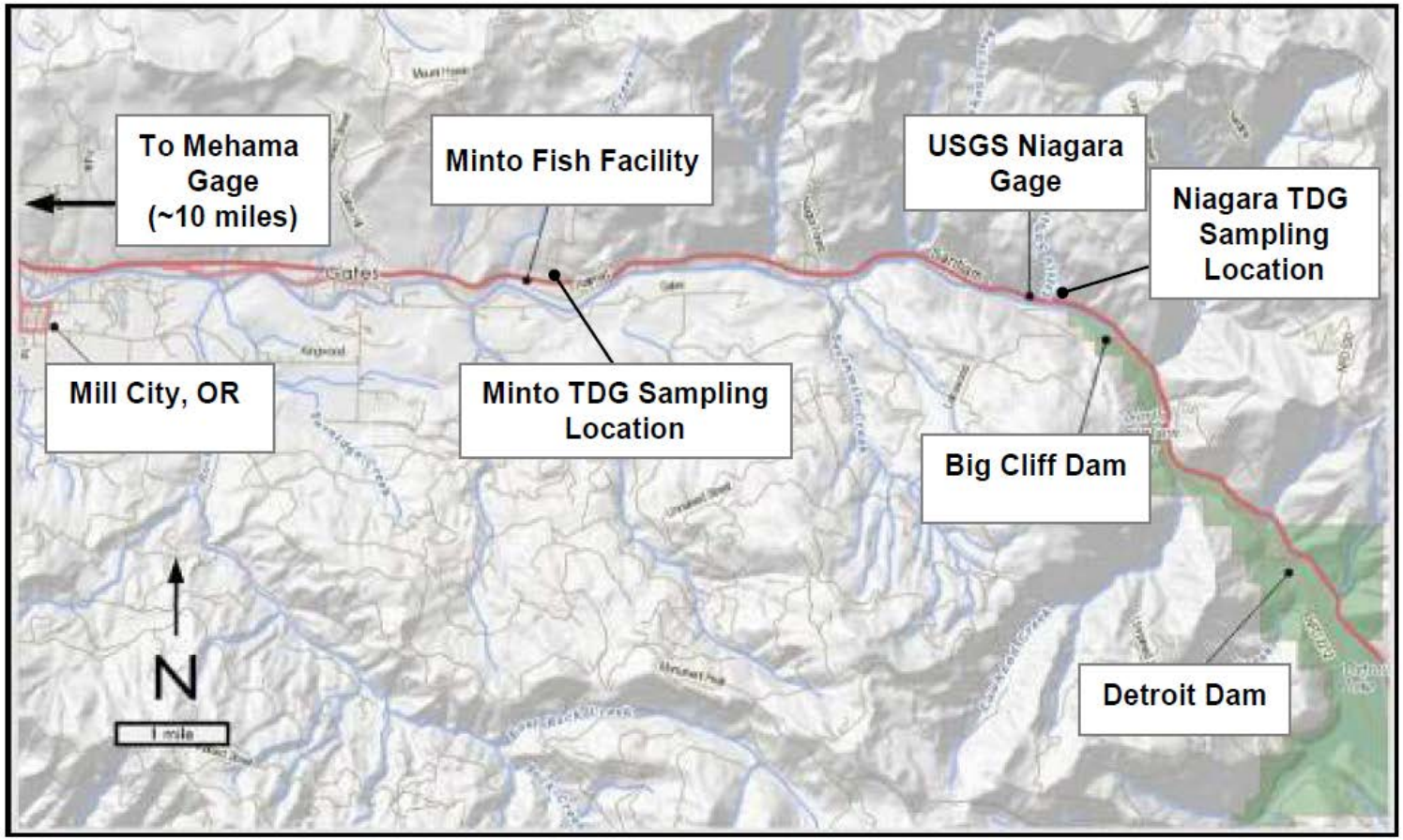
Table 1. The last 3 columns are based on WY 2016, a high water year, and are shown for reference to information provided by Willis (2008) which incorporated data from 2003 - 2008. The parenthesis are days in any given month used to calculate the TDG percent exceedances (NOAA, 2008 Willamette Biological Opinion citied from Willis, 2008).

Species	Life Stage(s)	Month	Percent of days mean daily spill exceeds 1,400 cfs resulting in 115% TDG 1 mile below the base of BC dam	Percent of days in 2016 mean daily TDG exceeds 110% TDG .75 miles below the base of BC dam	Percent of days in 2016 mean daily TDG is equal to or exceeds 115% TDG .75 miles below the base of BC dam	Percent max TDG in 2016
UWR Steelhead	Adults	April	3	87 (26)	88 (26)	126
		May	0	55 (17)	52 (16)	123
	Juveniles	April	3	87 (26)	88 (26)	126
		May	0	55 (17)	52 (16)	123
		June	3	23 (7)	20 (6)	119
		July	0	27 (8)	0	114
		August	0	0	0	103
UWR Chinook Salmon	Juveniles	October	19	71 (22)	39 (12)	124
		November	42	37 (11)	37 (11)	123
		December	32	39 (12)	35 (11)	125
		January	39	45 (14)	26 (8)	122

TDG monitoring sites

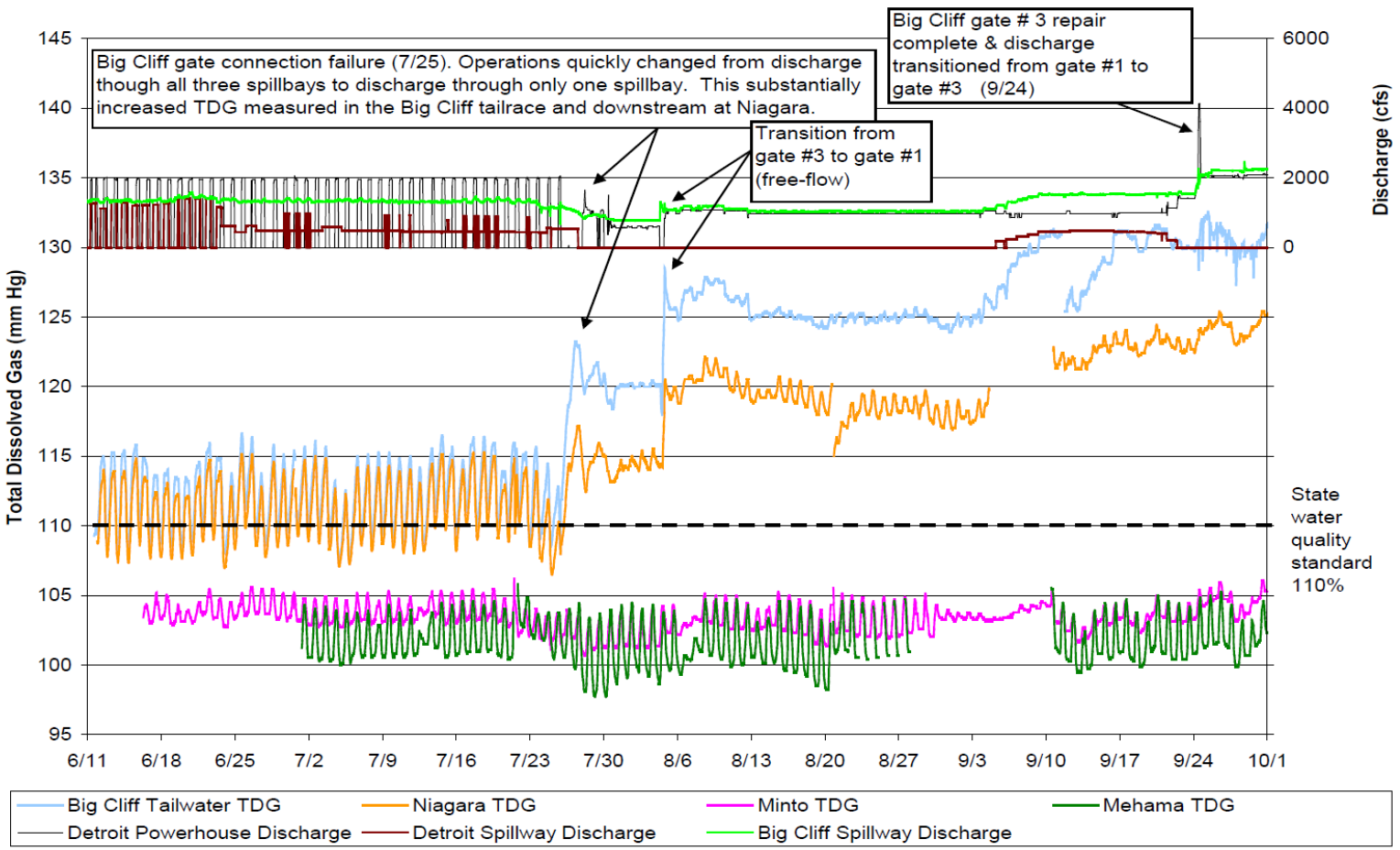
Figure 3.4. North Santiam River from Detroit Reservoir to the Minto Fish Facility



From USACE 2010

2009

Figure 3.9. Detroit and Big Cliff Project Operations and Total Dissolved Gas Saturations measured in the tailrace of Big Cliff Dam, near the Niagara USGS gage, near the Minto Fish Facility and near the Mehama USGS gage, June – September, 2009



2010

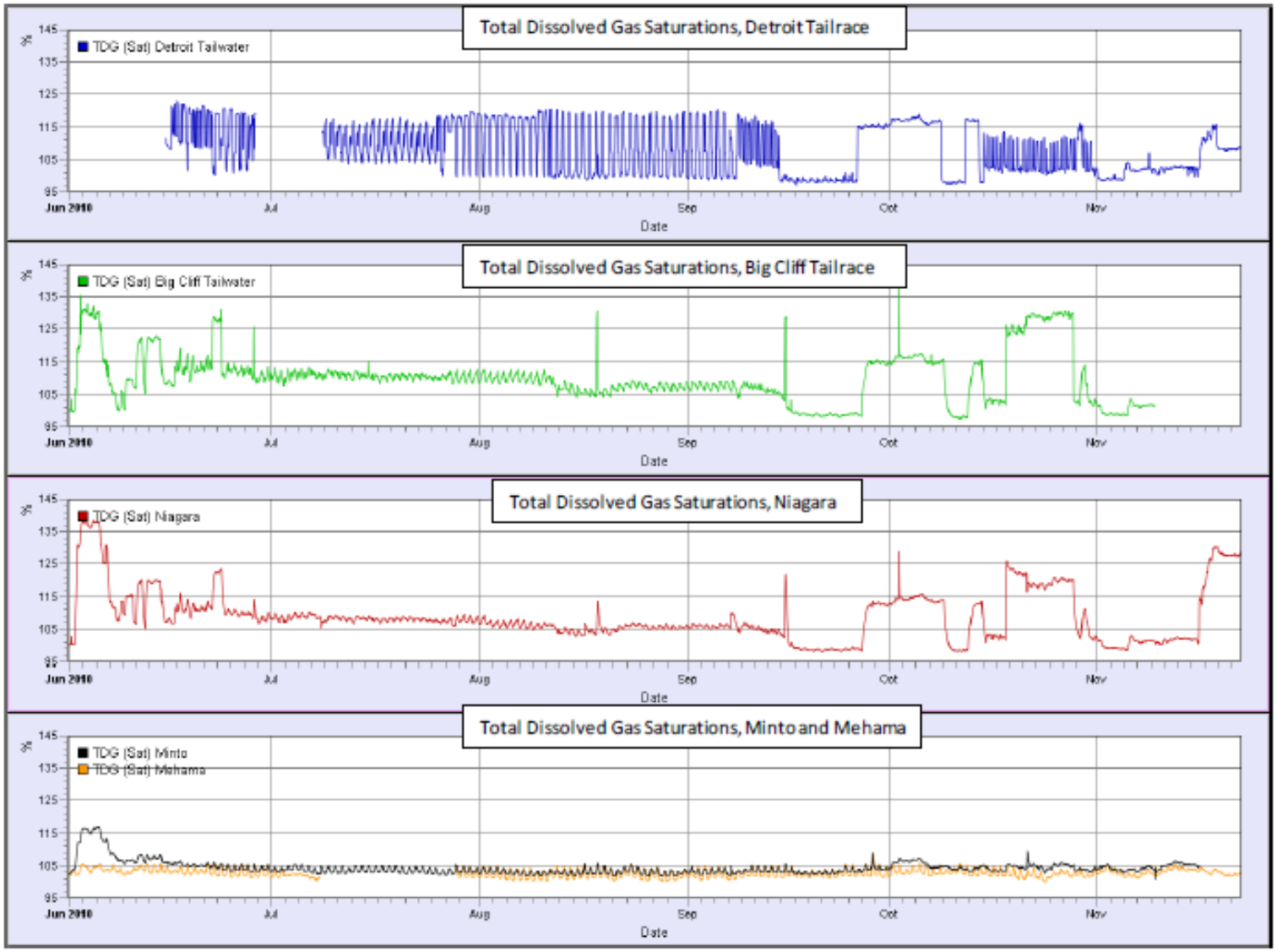


Figure 6-6. Total Dissolved Gas Saturation Measured in the Detroit and Big Cliff Tailraces and Near Niagara, Minto and Mehama on the North Santiam River, June through November, 2010. From the *Willamette Basin Annual Water Quality Report for Water Year 2010, pg. 25.*

2017

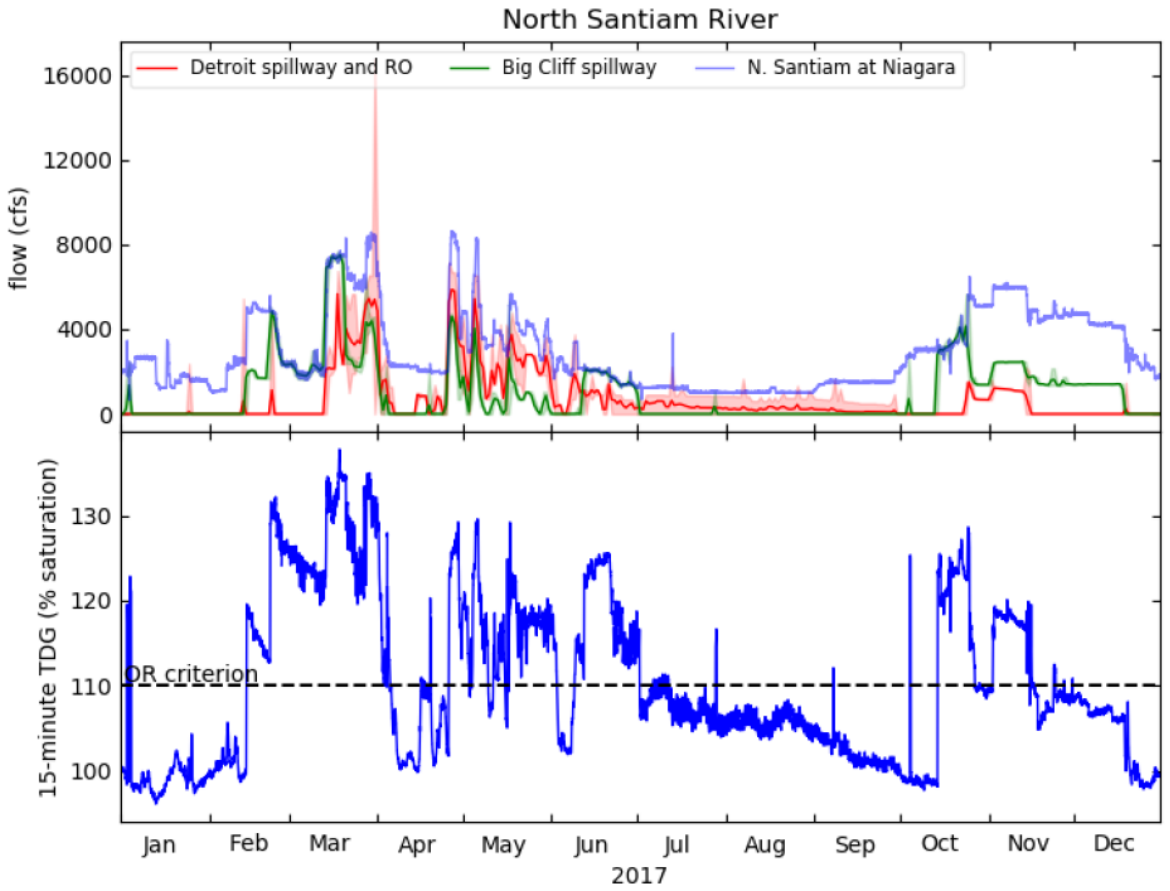


Figure 6-5. Detroit and Big Cliff Dam Operations and Subsequent Downstream Total Dissolved Gas Saturation (15-minute) Measured near Niagara, 2017. The shaded areas are minimum / maximum flow ranges.

2016

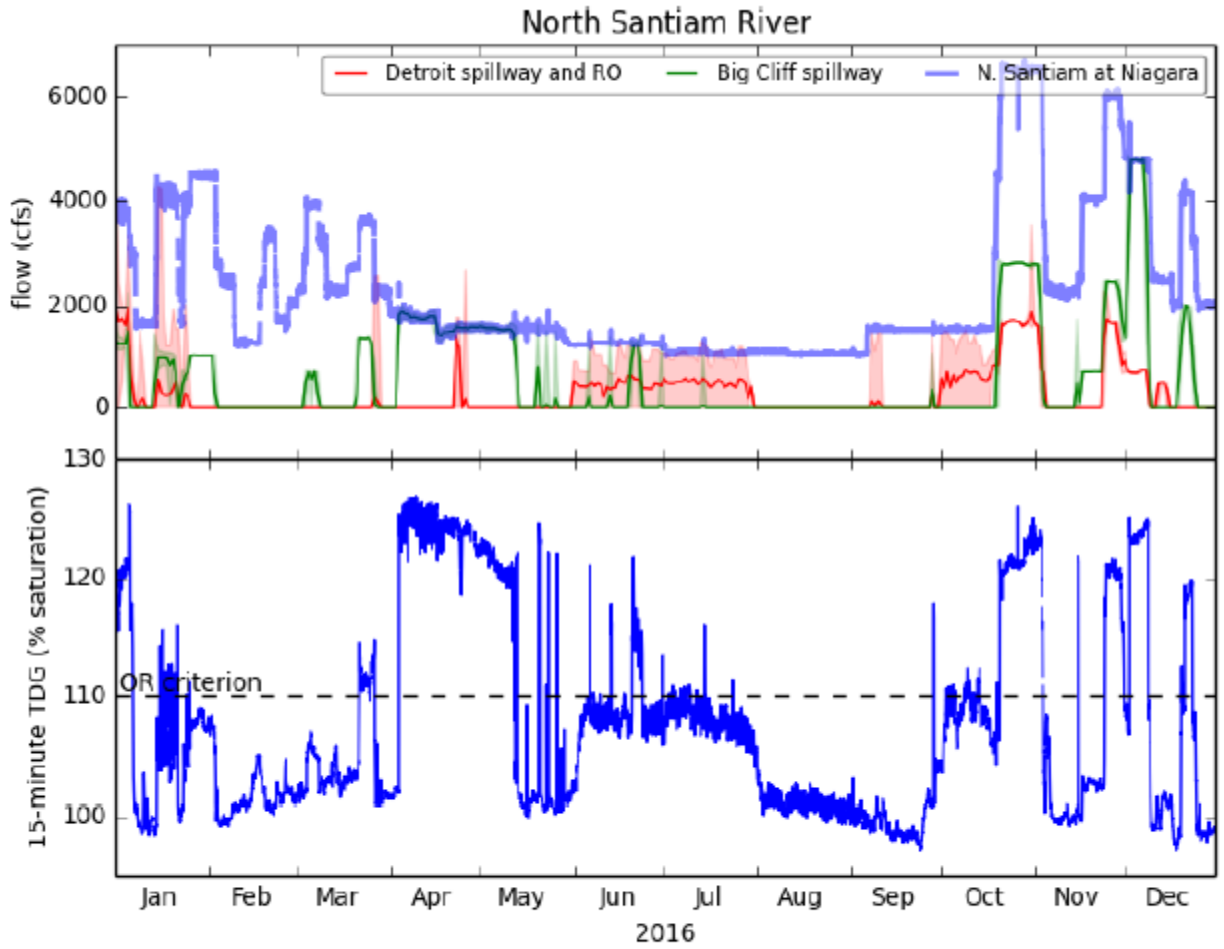
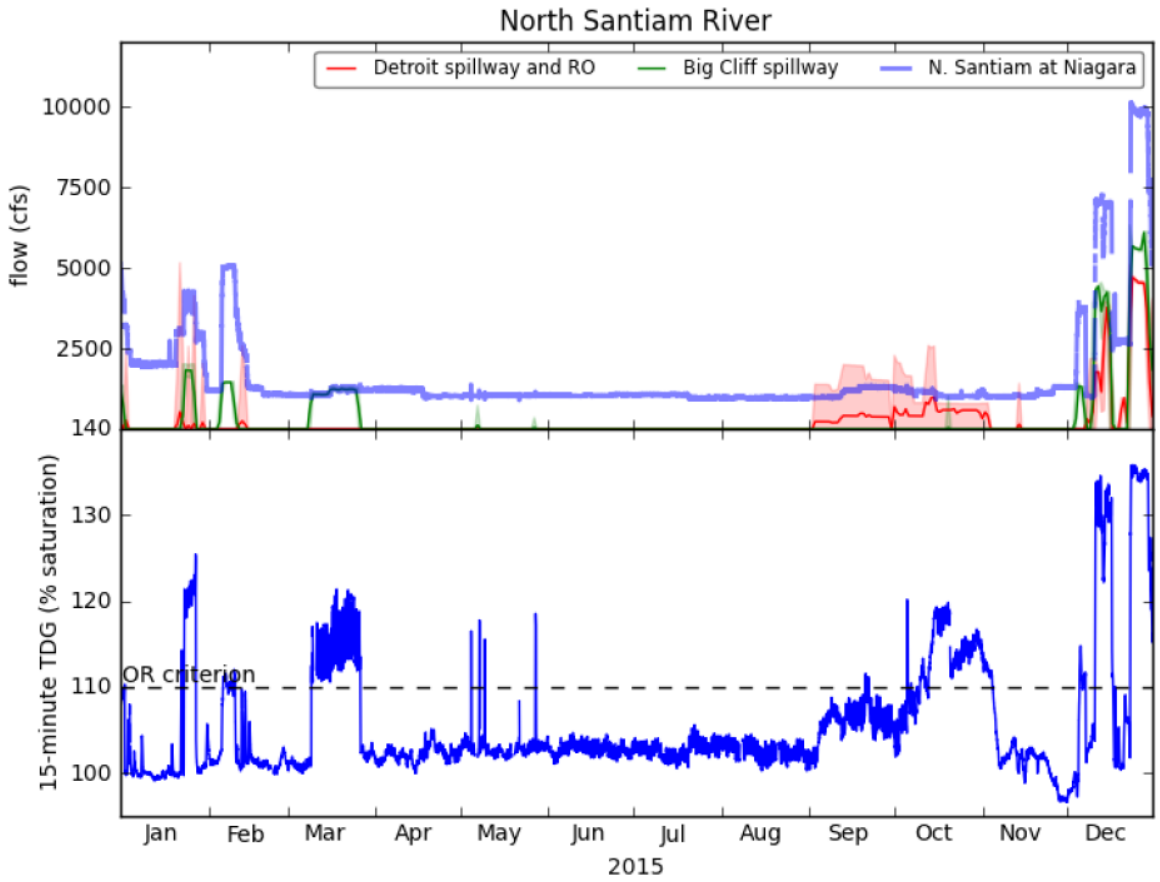


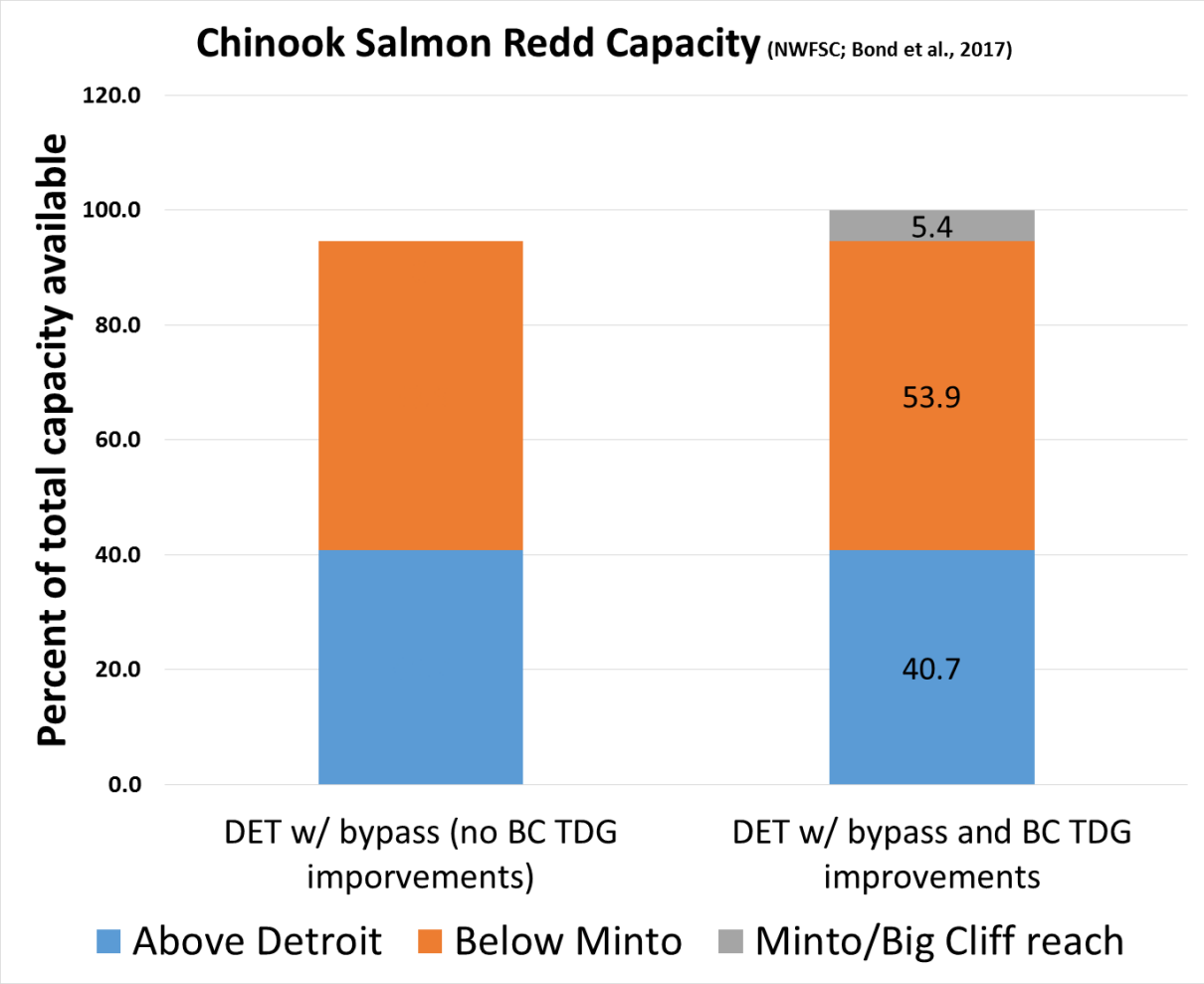
Figure 6-5. Detroit and Big Cliff Dam Operations and Subsequent Downstream Total Dissolved Gas Saturation (15-minute) Measured near Niagara, 2016. The shaded areas are minimum / maximum flow ranges.

2015

Figure 6-5. Detroit and Big Cliff Dam Operations and Subsequent Downstream Total Dissolved Gas Saturation (15-minute) Measured Near Niagara, 2015. The shaded areas are minimum / maximum flow ranges.



Structural actions to reduce TDG below BC Dam could increase production up to 5.4% in the North Santiam/Brietenbush rivers, based on estimated spawning Chinook salmon total redd capacity.



Bond et al., 2017

References

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