

RDN Community Watershed Monitoring Network 2016 Data Summary



Ministry of
Environment



Thank You!

Stewardship Groups

- Nile Creek Enhancement Society (NCES)
- Qualicum Beach Streamkeepers (QBS)
- Friends of French Creek Conservation Society (FFCCS)
- Mid Vancouver Island Habitat Enhancement Society (MVIHES)
- Lantzville / Nanoose Streamkeepers (LNS)
- Island Waters Fly Fishers (IWFF)
- Departure Creek Streamkeepers (DCS)
- Vancouver Island University (VIU)
- Nanaimo and Area Land Trust (NALT)
- Gabriola Streamkeepers (GSk)
- Walley Creek Streamkeepers (WCS)
- Fanny Bay Salmonid Enhancement Society (FBSES)

Government

- Ministry of Environment
- Regional District of Nanaimo

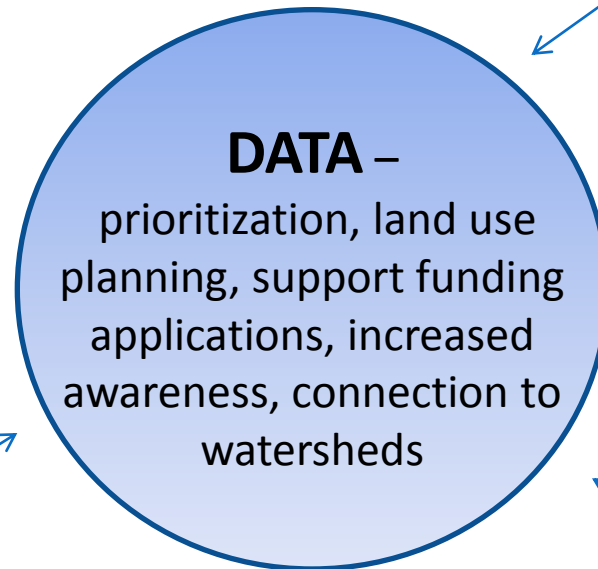
Stakeholders

- Island Timberlands

Partnership

RDN – equipment,
technical support,
training, outreach, data
entry

MoE – technical
support, training, data
entry, data review



**Stewardship
Groups** – sampling,
local knowledge

**Island
Timberlands** –
safety gear, land
access, QA/QC
sponsorship

Positives

- Expanded to include new groups, streams and sites.
- Consistent data collection.
- Excellent cooperation between all partners.
- Growing awareness in community.
- Good coverage: 54 sites, on 32 streams, in 23 different watersheds

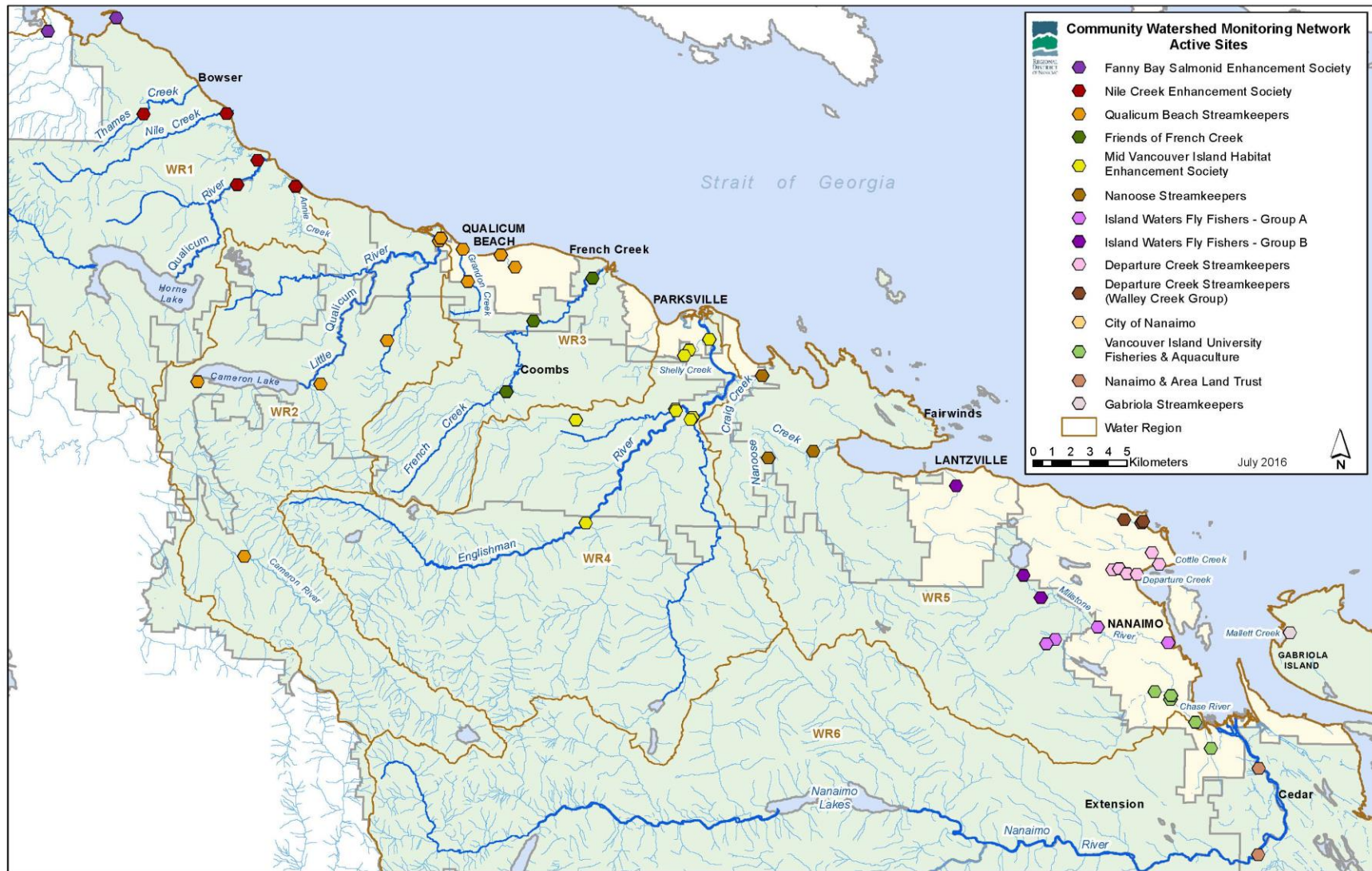
Reminder:

Take good field notes!!! Include weather, observations at the site.

6th year of the Program

Started:	2011	2012	2013	2014	2015	2016
Group	NCES	IWFF	LNS	CoN	GSk	FBSES
	QBS	VIU		NCES added sites		WCSk
	FFCCS	DCSk		MVIHES added sites		IWFF added a site
	MVIHES					
	NALT					
Trend Report:	Yes (Oct. 2014)	Yes. (June 2016)	Yes. (May 2017)	N/A	No.	No.

- Trends can start to be observed after a minimum of 3 years
- Use data to learn about watershed health; to determine where more effort is needed (i.e. upstream determination of sources)



New in 2016....

- **Sites added**

- Upper McGarrigle Ck. (IWFF)
- Knarston Ck. @ Superior Rd. (IWFF)
- Millstone River @ Jingle Pot Rd. (IWFF)
- Walley Ck. (3 separate sites) (WCS)
- Rosewell Creek @ Rosewell Creek Park (FBSES)
- Deep Bay Creek (FBSES)

- **Sites deactivated**

- Thames Creek u/s of Inland Island Hwy
- Little Qualicum River 20m u/s Hwy 19, d/s of intake

Related initiatives

- **Stream/ Riparian Assessments**
 - using the Provincial “Urban Salmon Habitat Program” methodology
 - took place last June with volunteers on Millstone River (IWFF) and Holden Creek (NALT).
 - This helped document the physical characteristics that may be influencing DO and Temperature and Turbidity.
 - In 2017, Annie Creek & Cat Stream are proposed for USHP assessment.



Related initiatives

DWWP program offers seed funding for stewardship / restoration projects (\$1000-\$3000)

- *Plum Creek Wetland (Cedar)*
- *Departure Creek*
- *Millstone River*

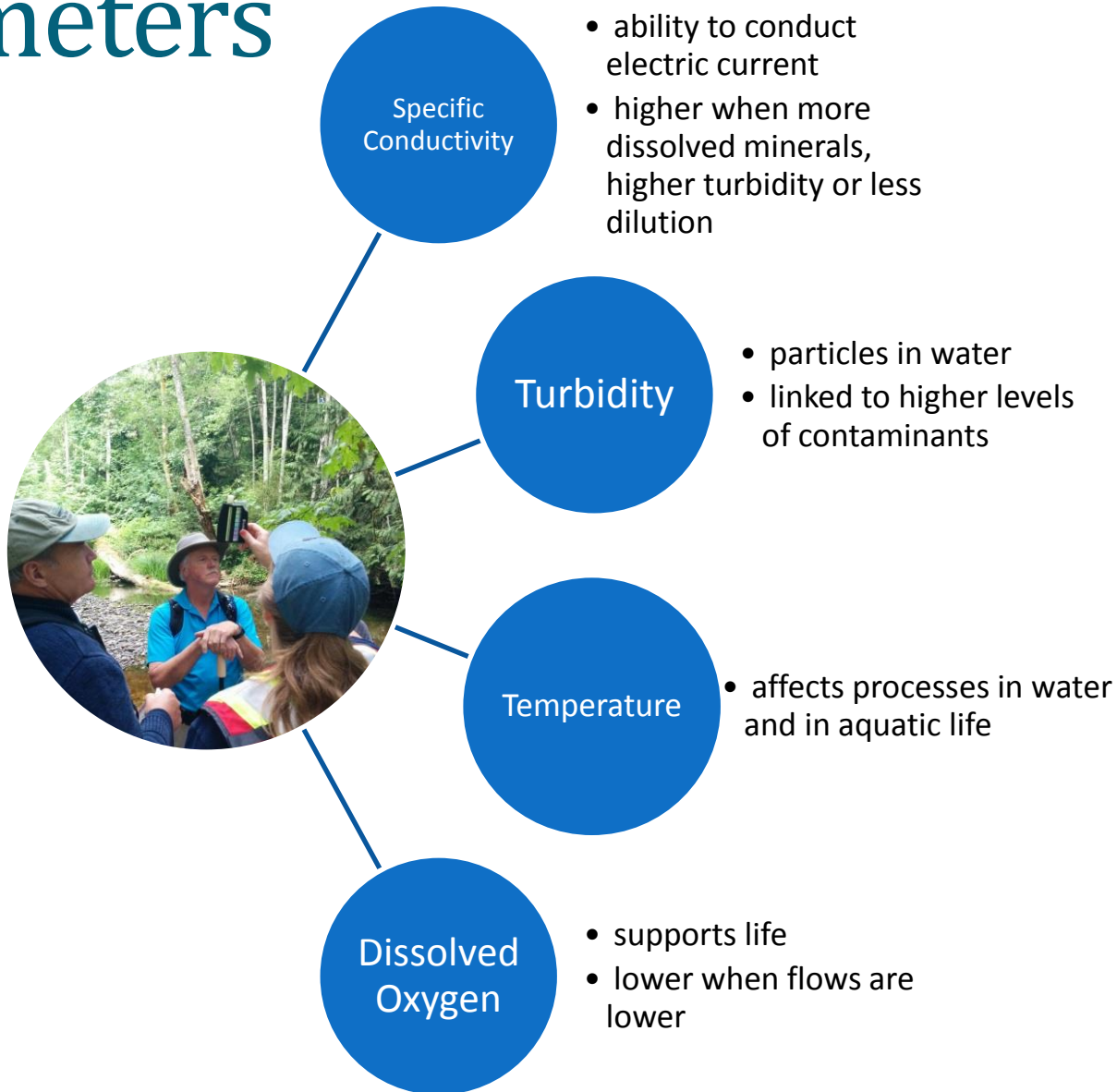


This is still room to support more projects in 2017 – apply now!

Application form available at www.rdn.bc.ca/cwmn

Contact waterprotection@rdn.bc.ca or call 250-390-6560 for more info

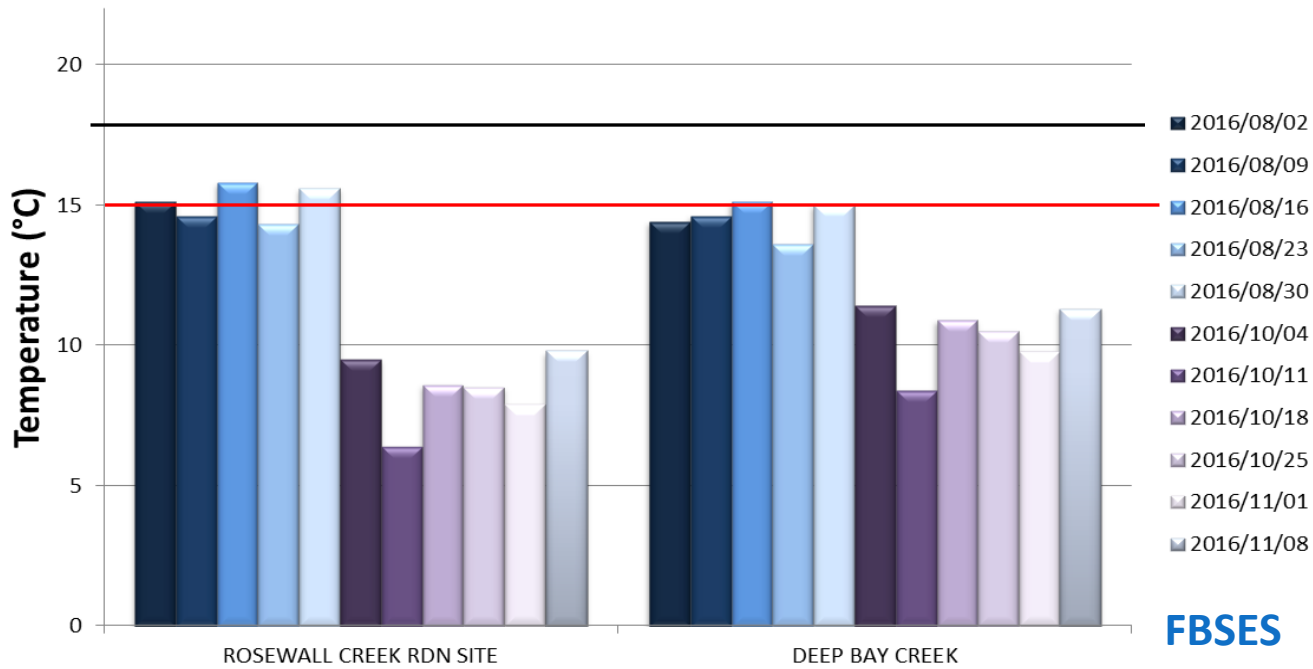
Water Quality Monitoring Parameters



Temperature

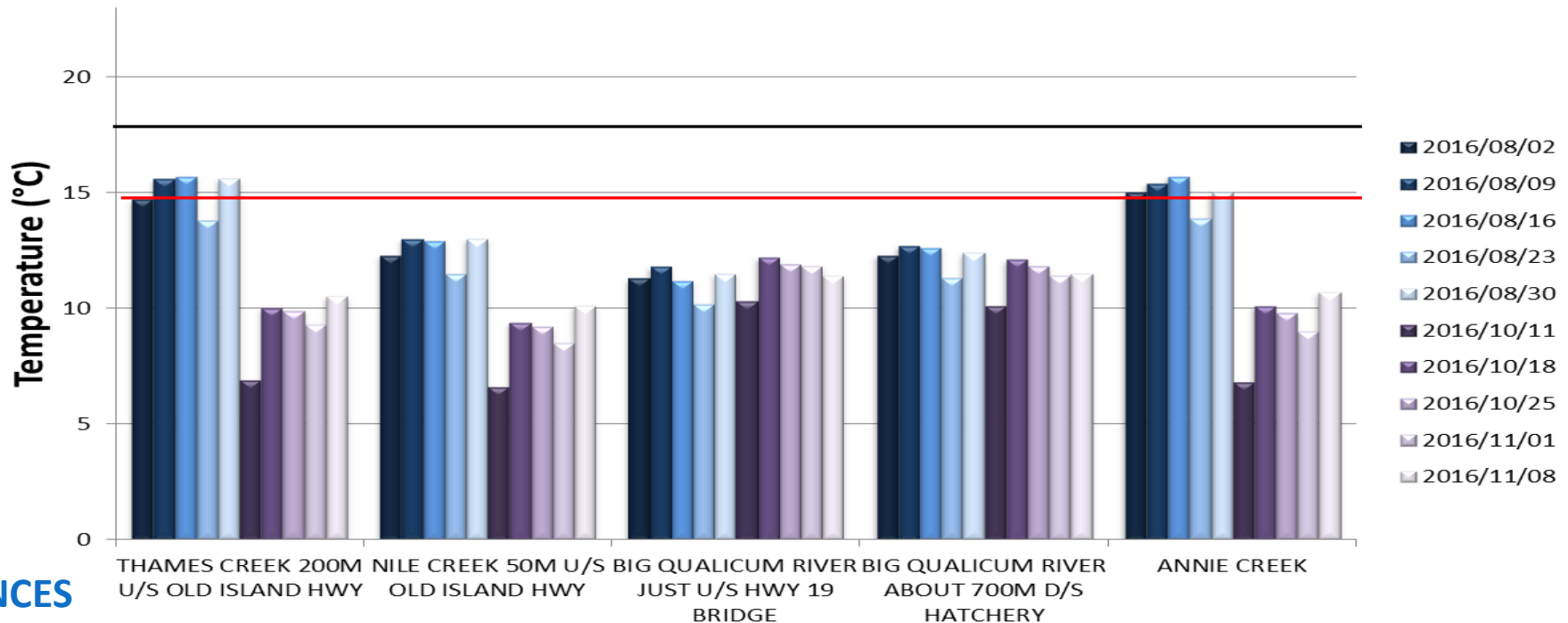


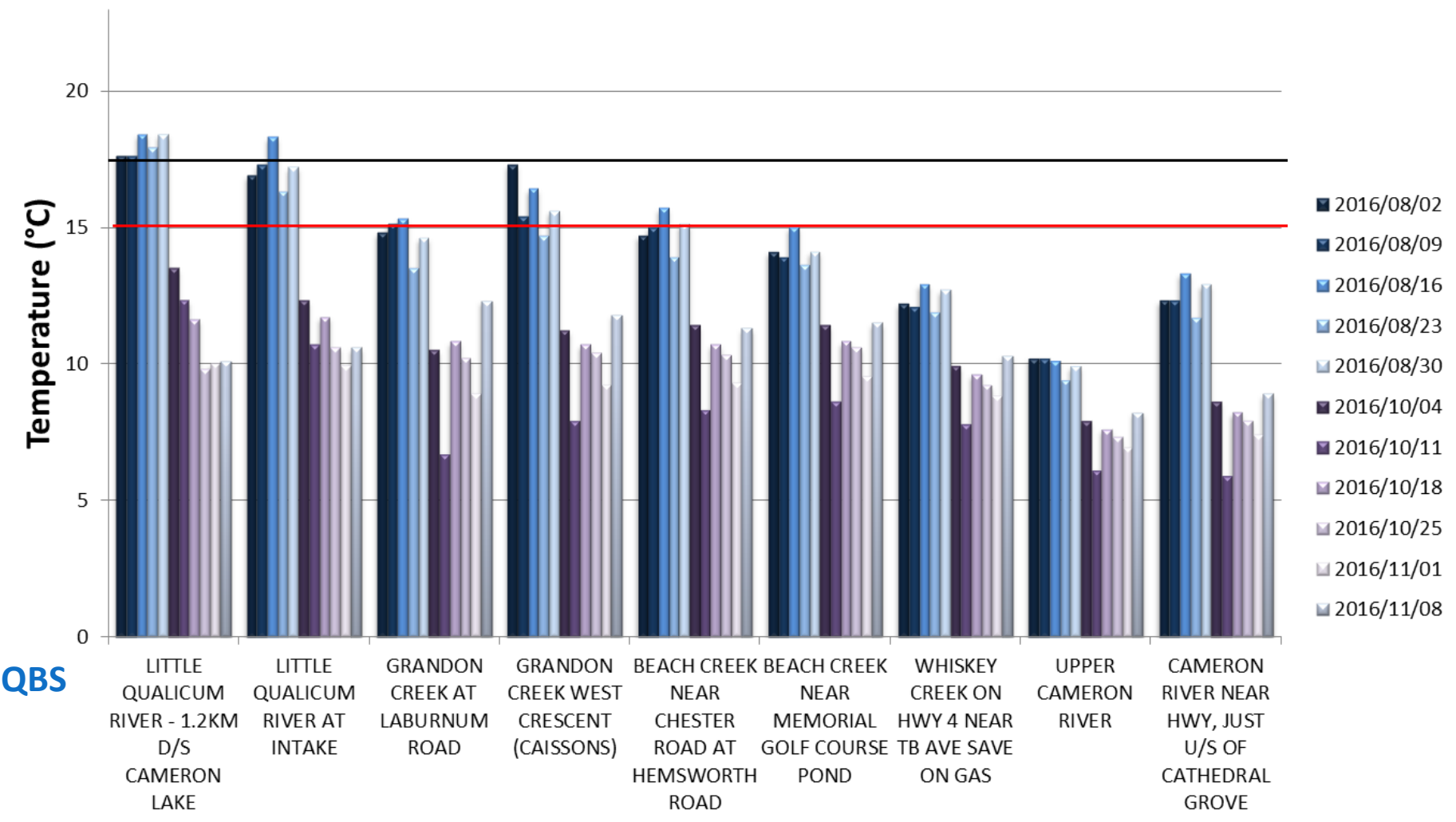
- Aesthetic drinking water objective (weekly average $\leq 15^{\circ}\text{C}$)
- Aquatic life guideline for Coho rearing (weekly average $\leq 17^{\circ}\text{C}$)



Aesthetic drinking water objective (15°C)

Aquatic life guideline for Coho rearing (17°C)

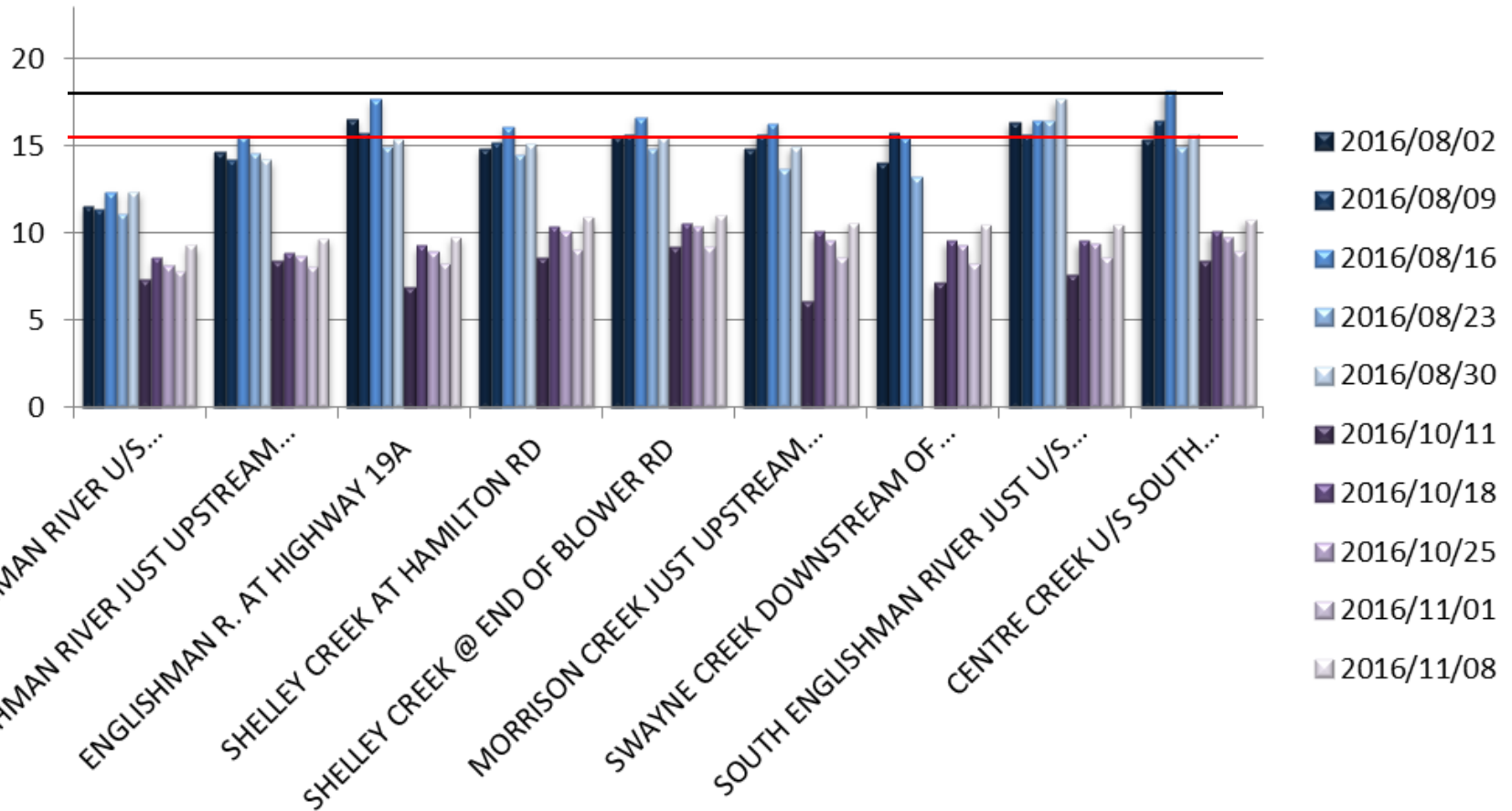




Aesthetic drinking water objective (15°C)

Aquatic life guideline for Coho rearing (17°C)

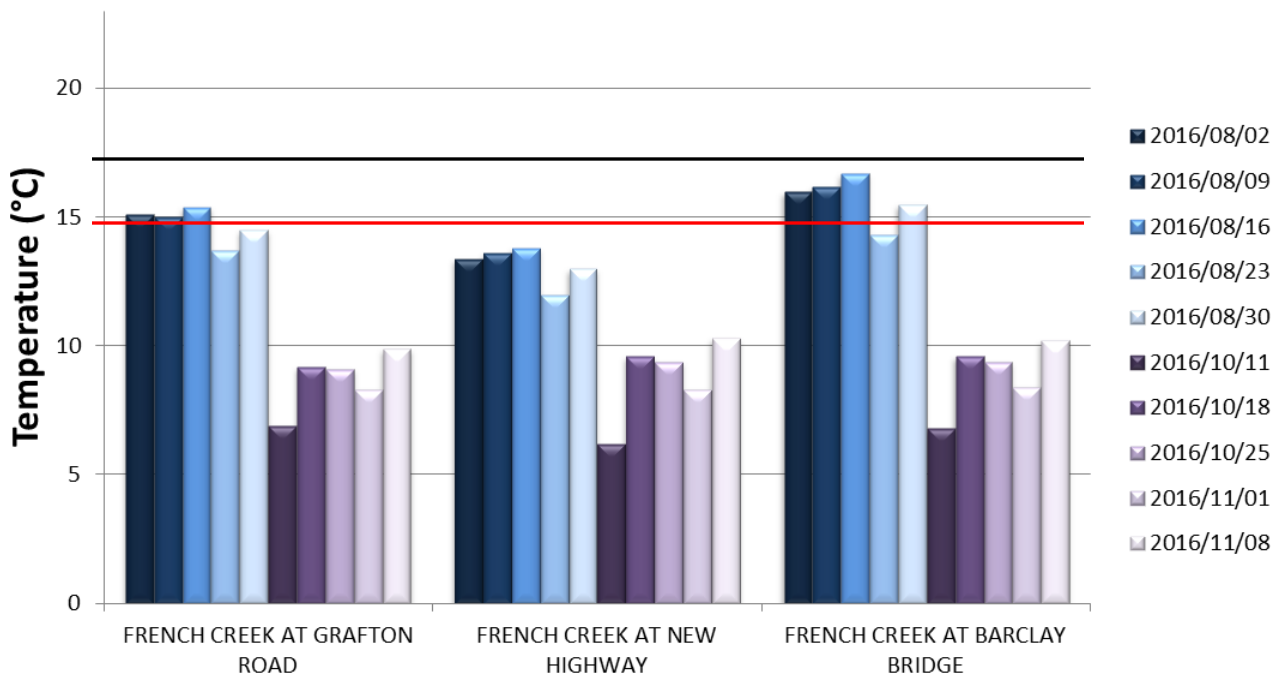
Temperature (°C)



MVIHES

Aesthetic drinking water objective (15°C)

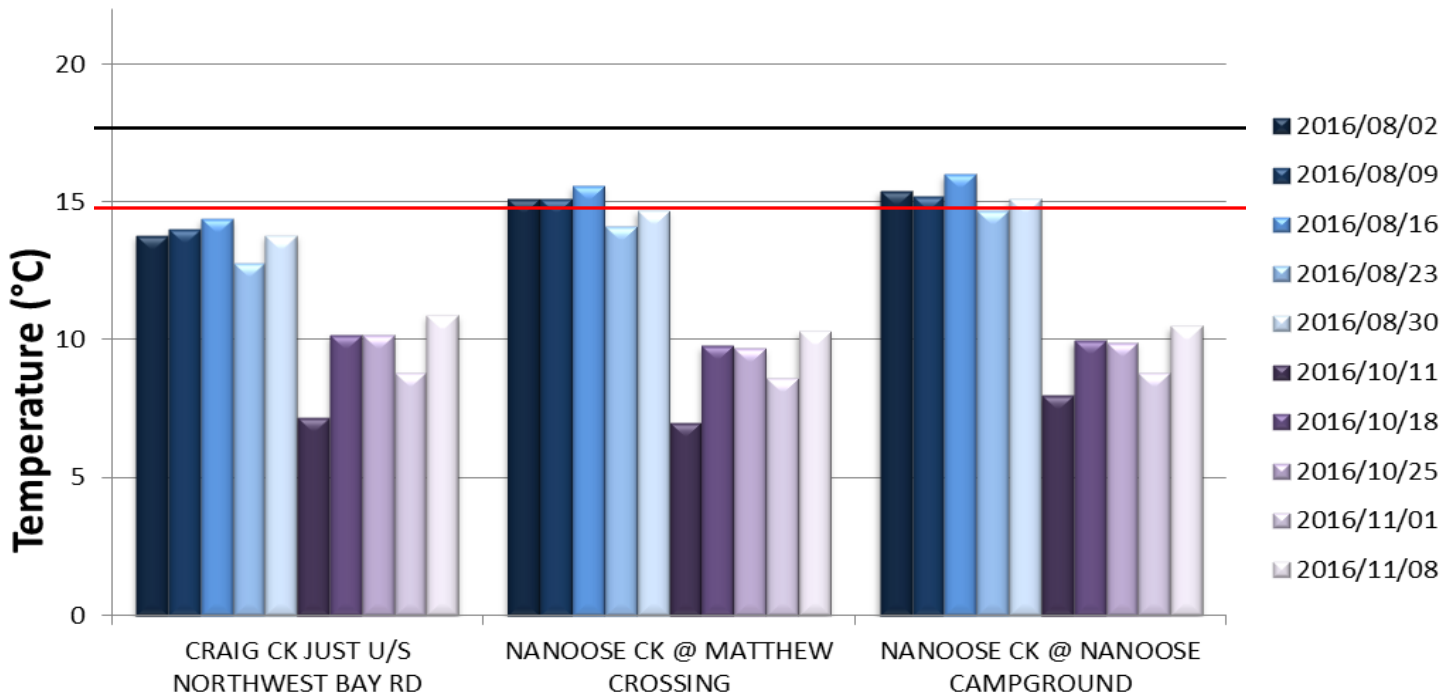
Aquatic life guideline for Coho rearing (17°C)



Aesthetic drinking water objective (15°C)

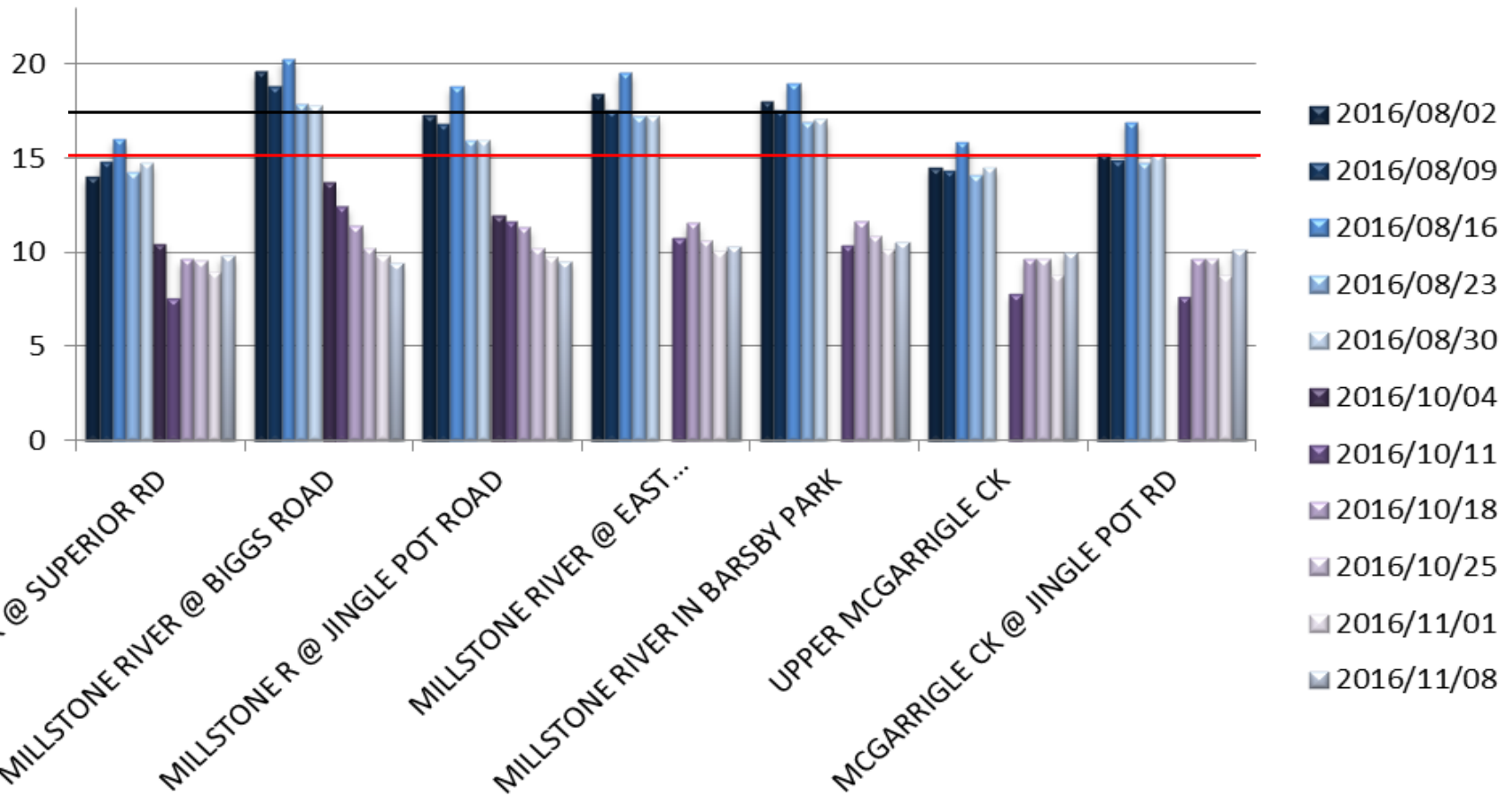
Aquatic life guideline for coho rearing (17°C)

FFCCS



LNS

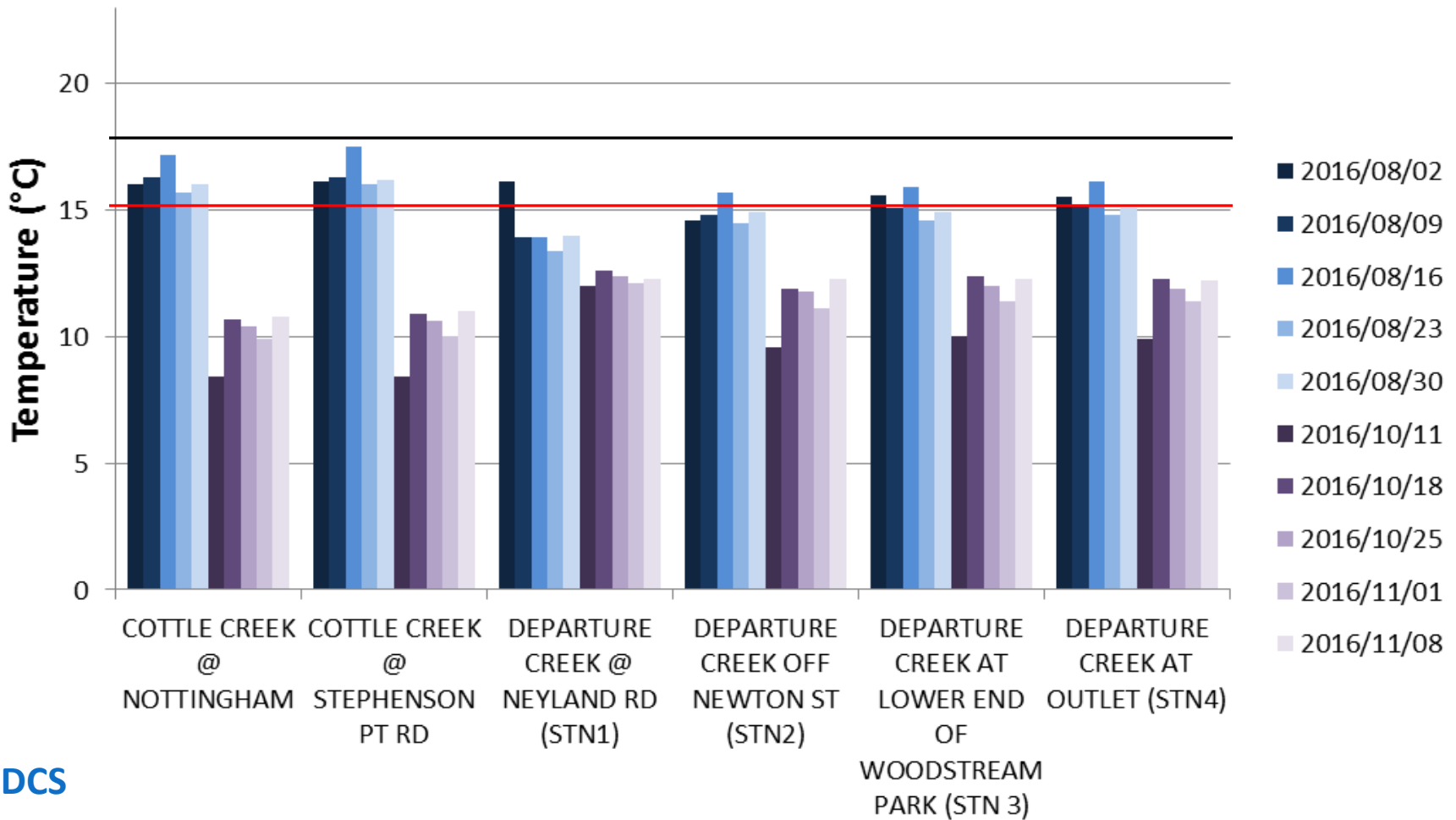
Temperature (°C)



IWFF

Aesthetic drinking water objective (15°C)

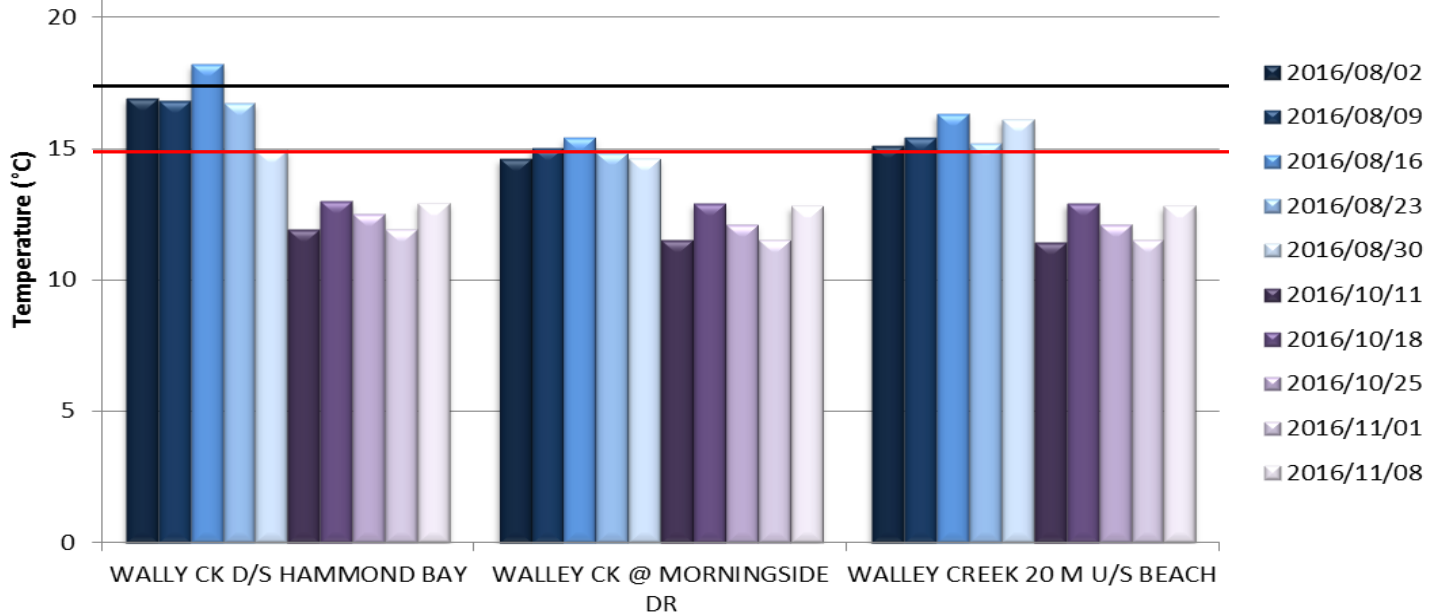
Aquatic life guideline for Coho rearing (17°C)



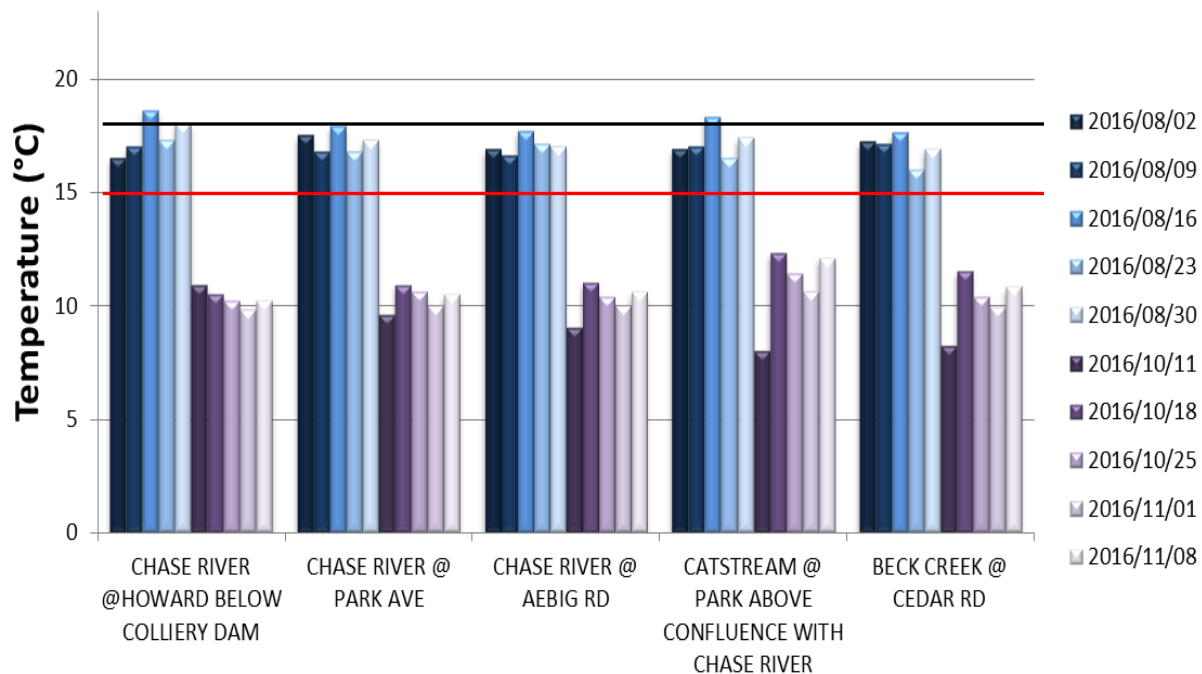
DCS

Aesthetic drinking water objective (15°C)

Aquatic life guideline for Coho rearing (17°C)



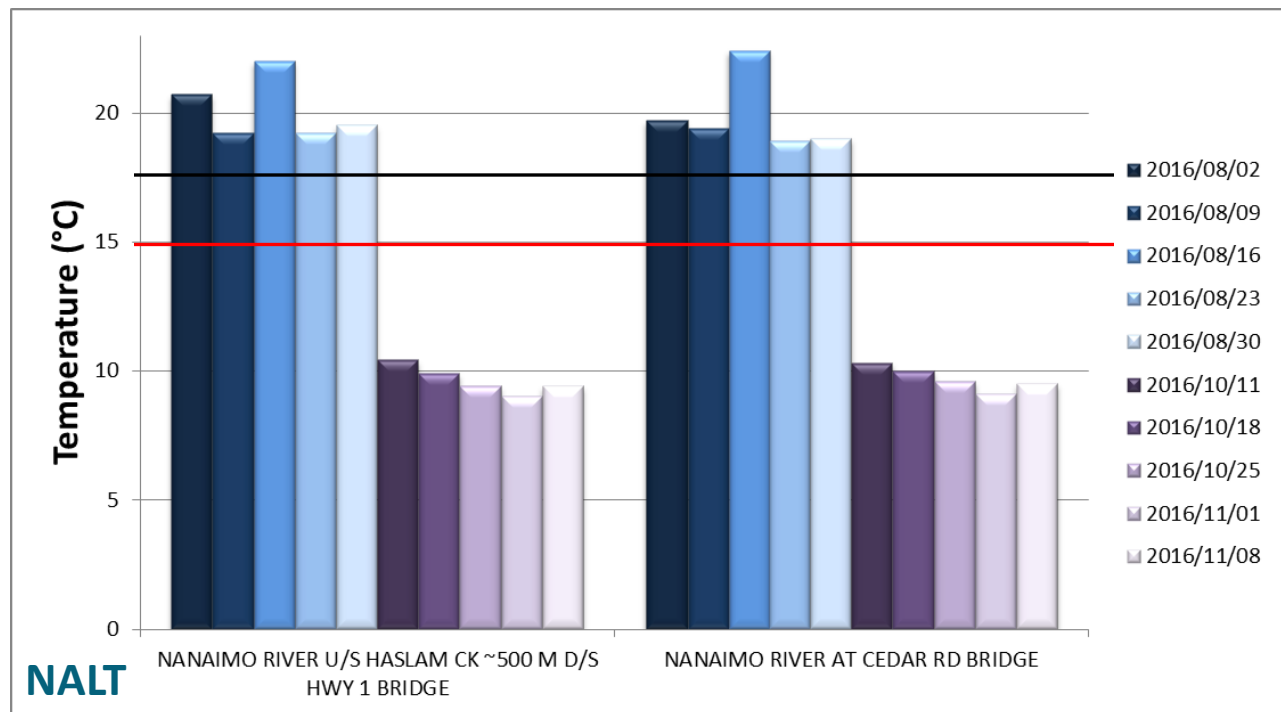
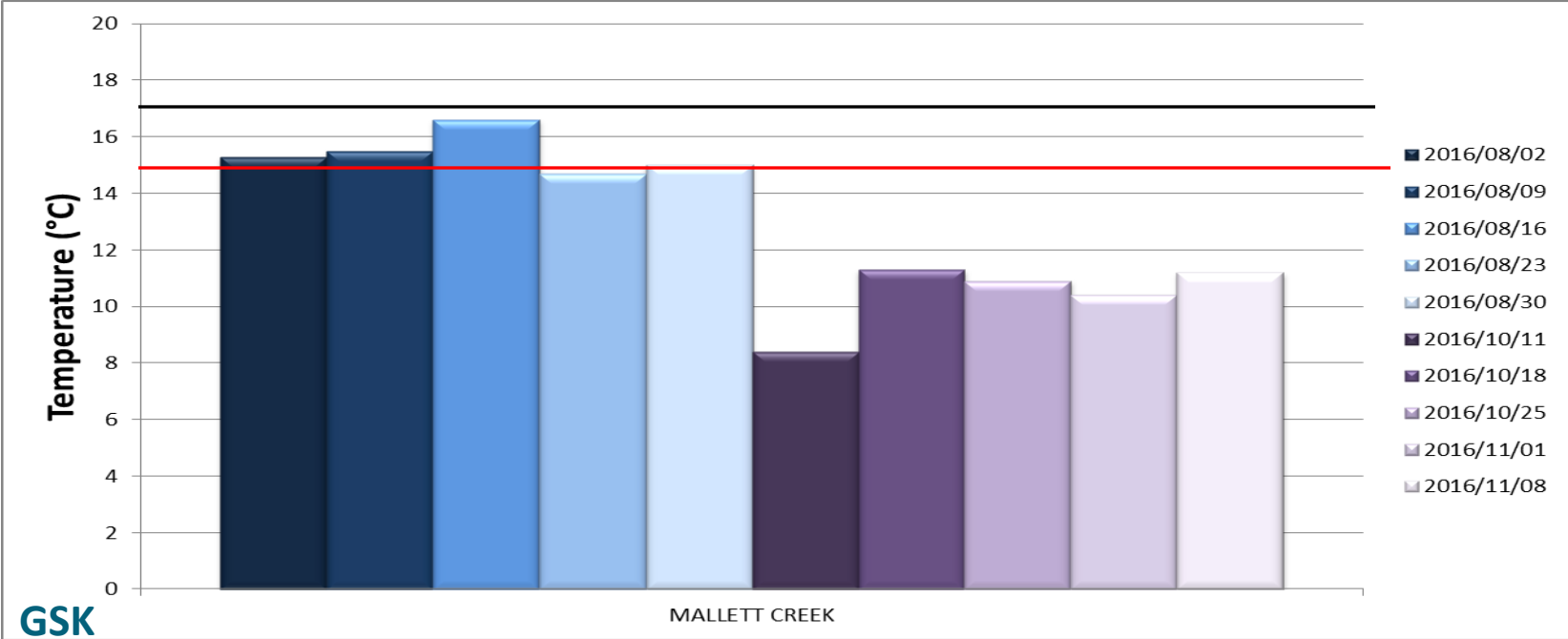
WCS



Aesthetic drinking water objective (15°C)

Aquatic life guideline for Coho rearing (17°C)

VIU



Aesthetic drinking water objective (15°C)

Aquatic life guideline for Coho rearing (17°C)

Aesthetic drinking water objective (weekly average $\leq 15^{\circ}\text{C}$)
Potential to exceed at:

most low elevation sites in summer

Aquatic life guideline for Coho rearing ($\leq 17^{\circ}\text{C}$)
Potential to exceed in:

Nanaimo River	Millstone River
Little Qualicum River	Centre Creek
South Englishman River	Chase River
Englishman River	Cat Stream
Grandon Creek	Walley Creek

- Typical of shallow wide portions of lower watersheds
- Okay if juvenile fish have lower temperature refuges (riparian, pools, etc.)
- There were roughly an equal number of sites in 2016 with high water temperature values as seen in 2015



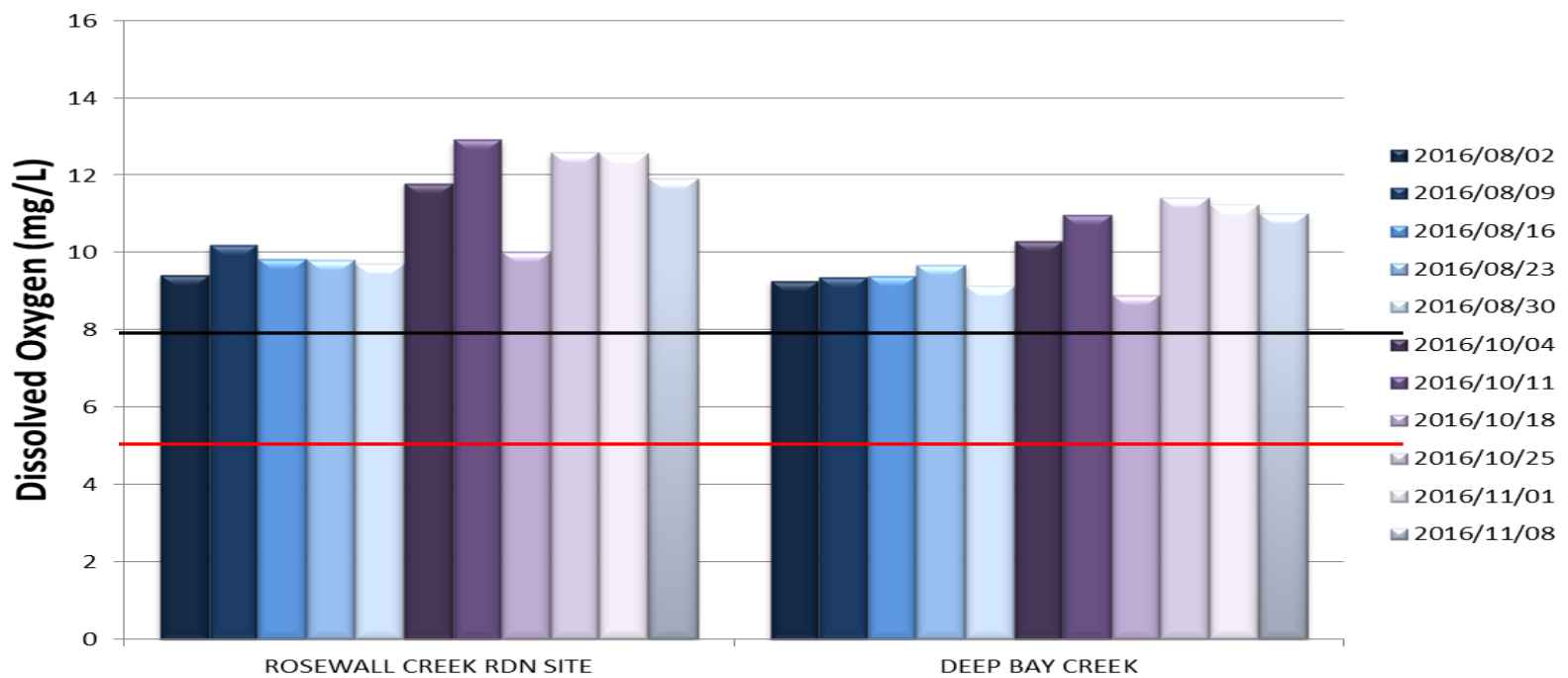
Temperature



Dissolved Oxygen



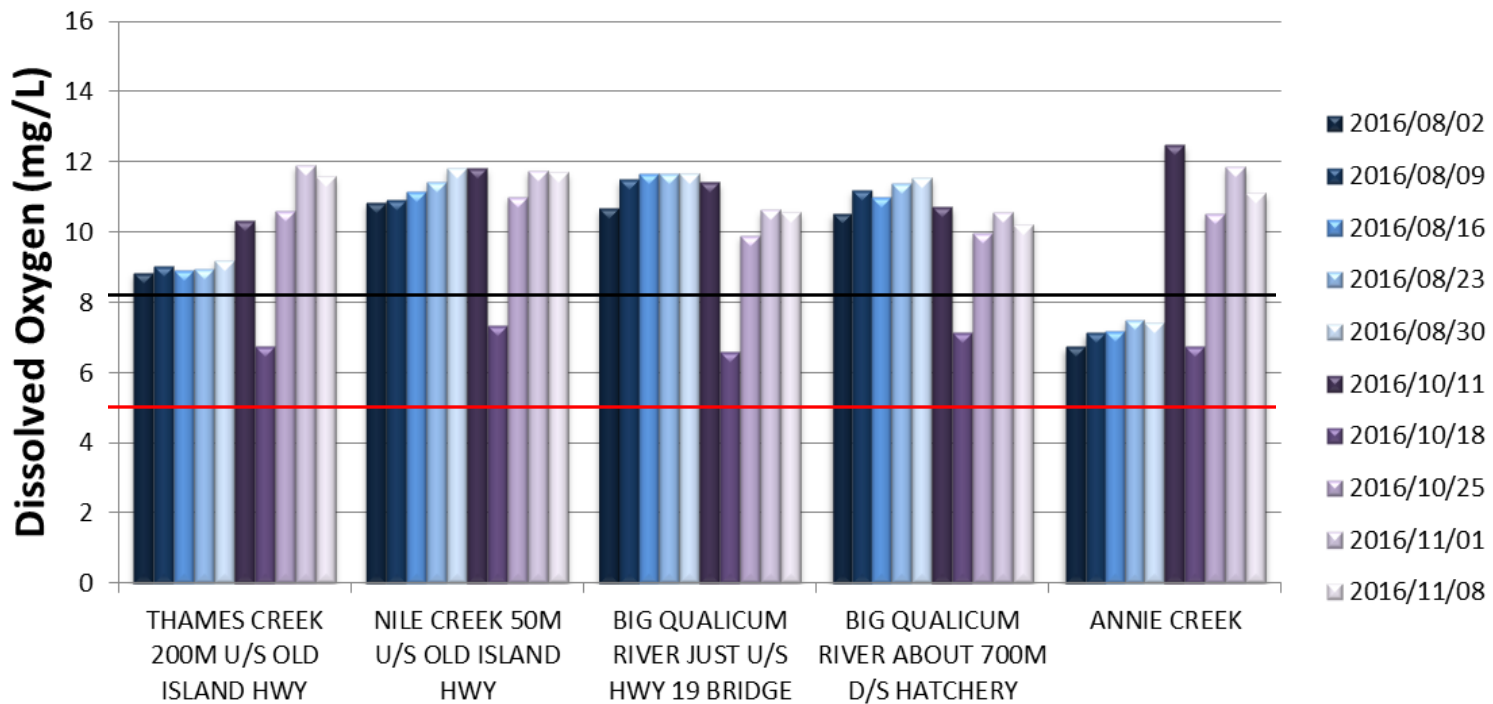
- 30 day average: 8 mg/L
- Instantaneous minimum: 5 mg/L



FBS&S

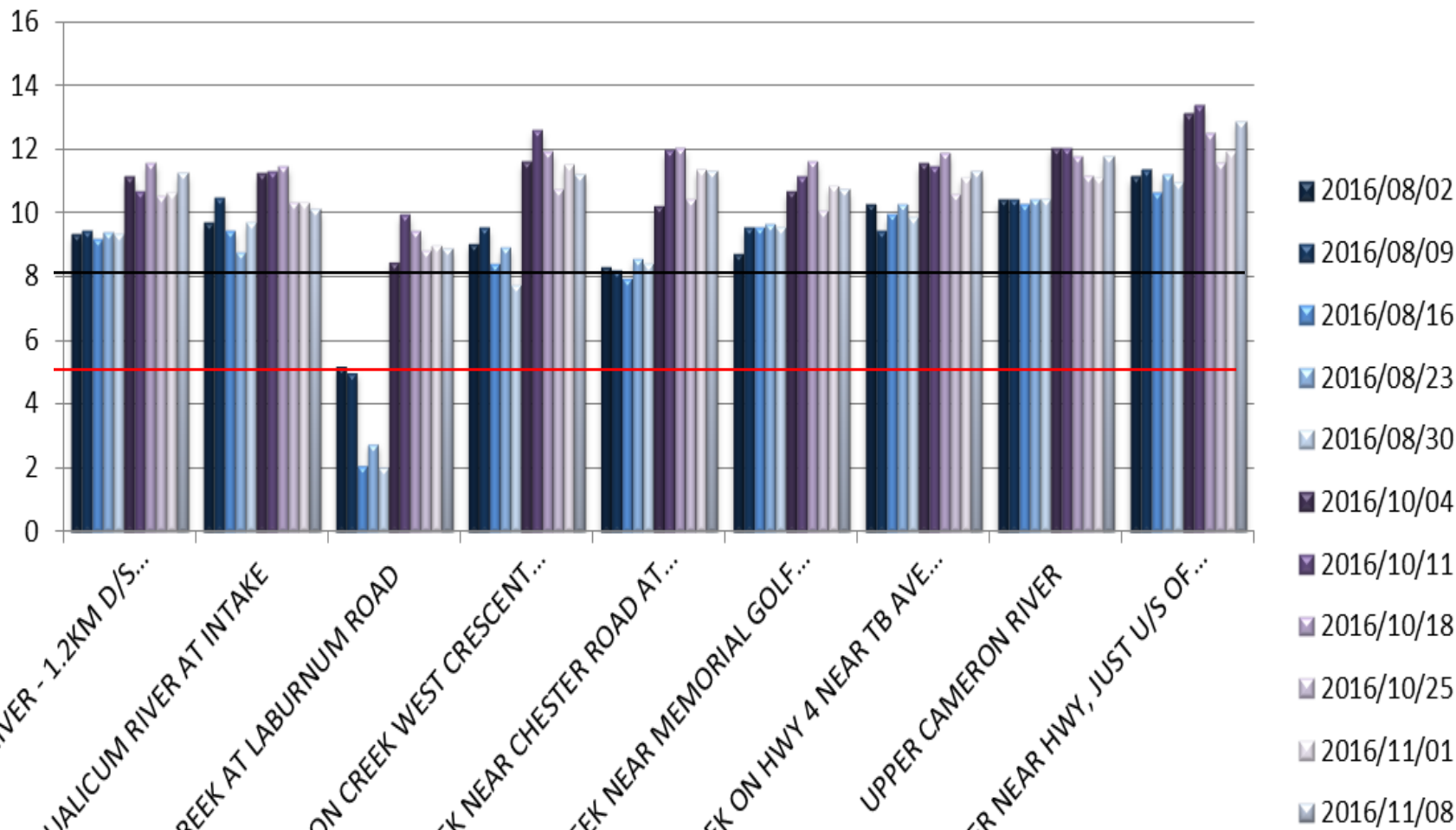
30 day average:
8 mg/L

Instantaneous
minimum:
5 mg/L



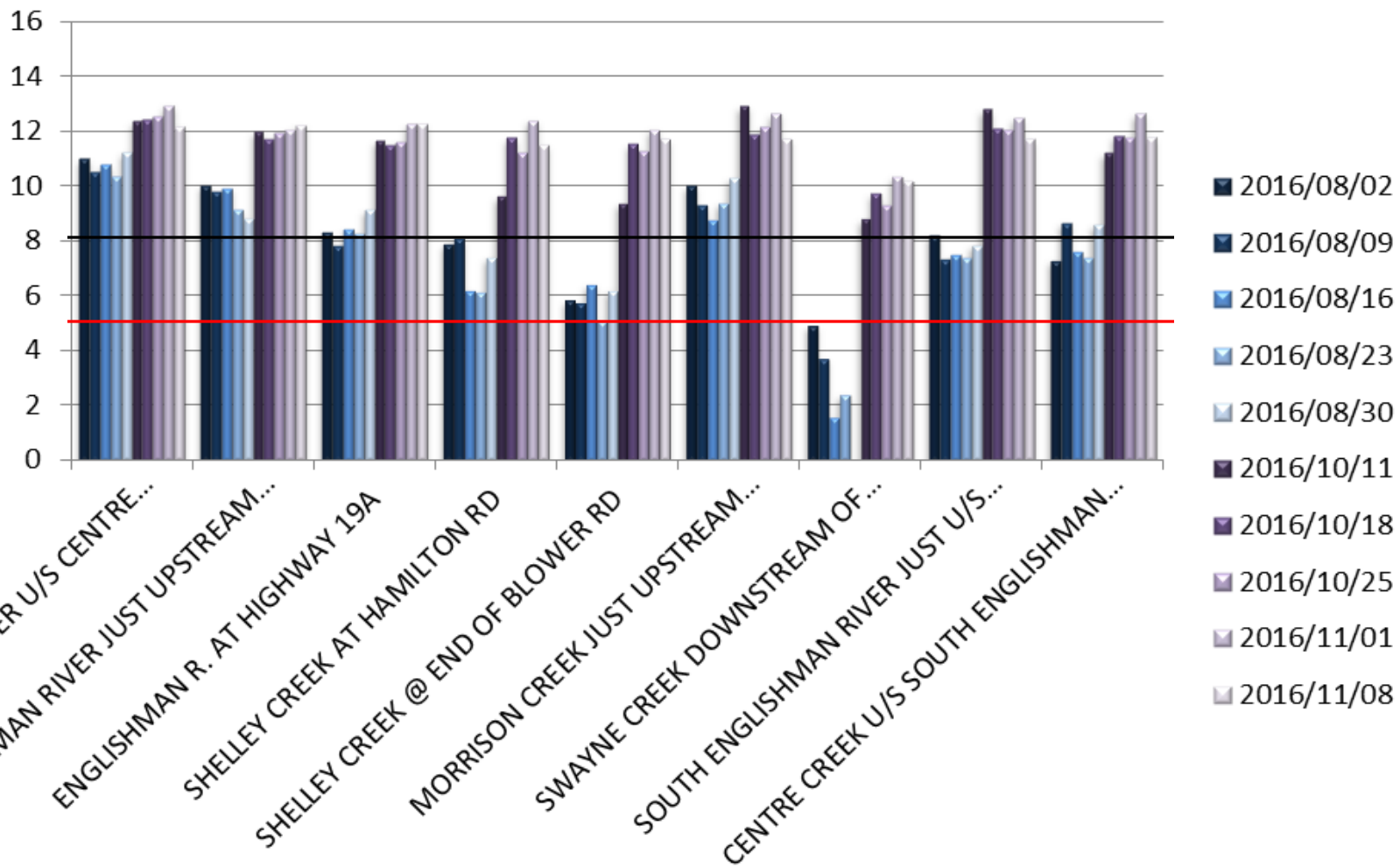
NCES

Dissolved Oxygen (mg/L)



30 day average:
8 mg/L

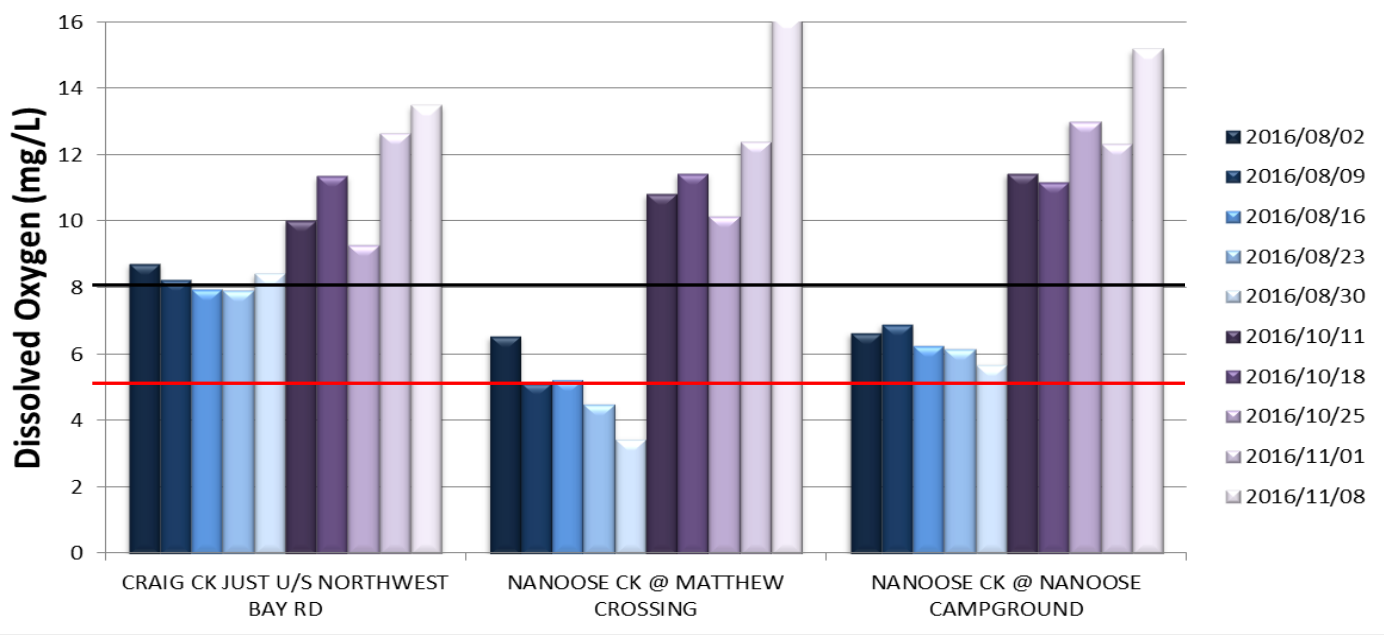
Dissolved Oxygen (mg/L)



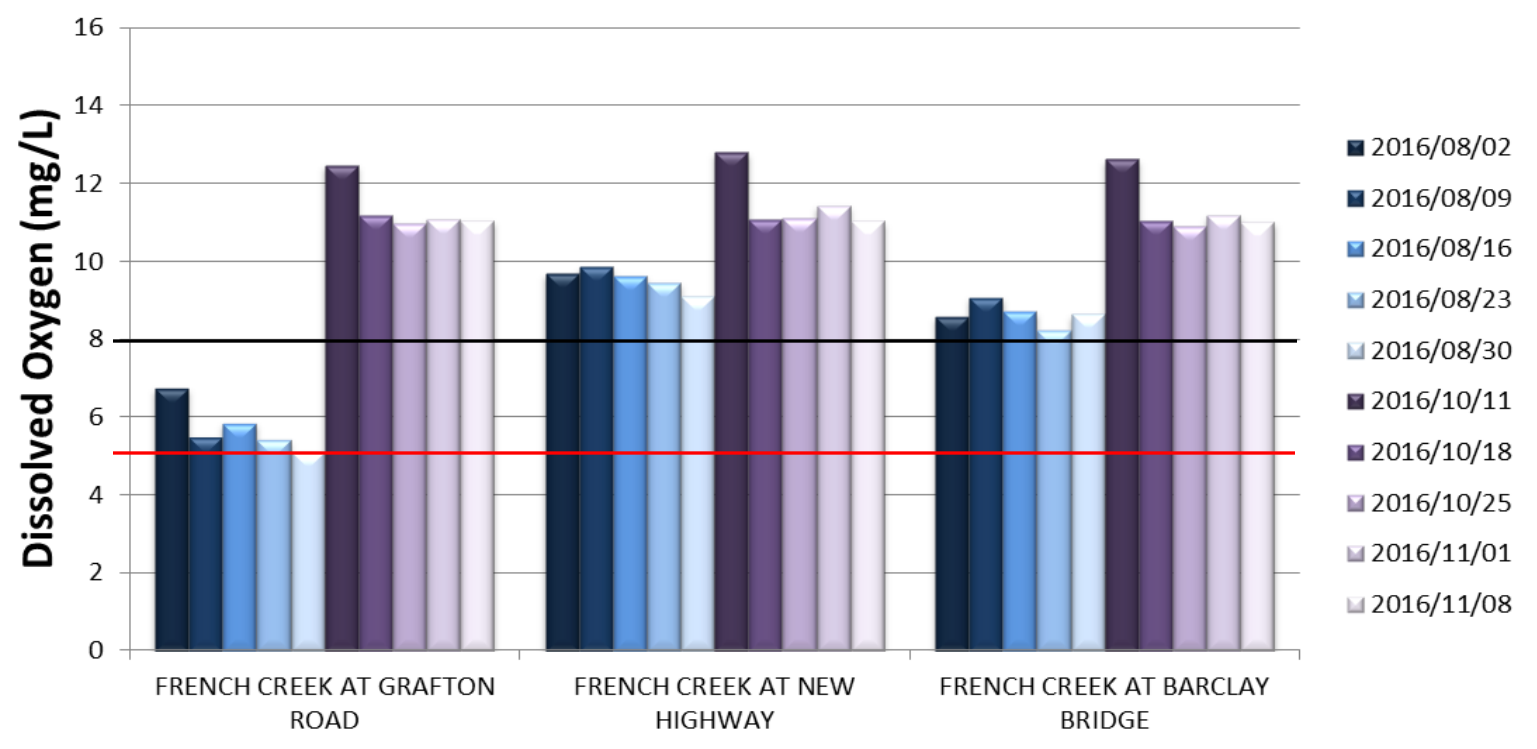
MVIHES

30 day average: 8 mg/L

Instantaneous
minimum: 5 mg/L

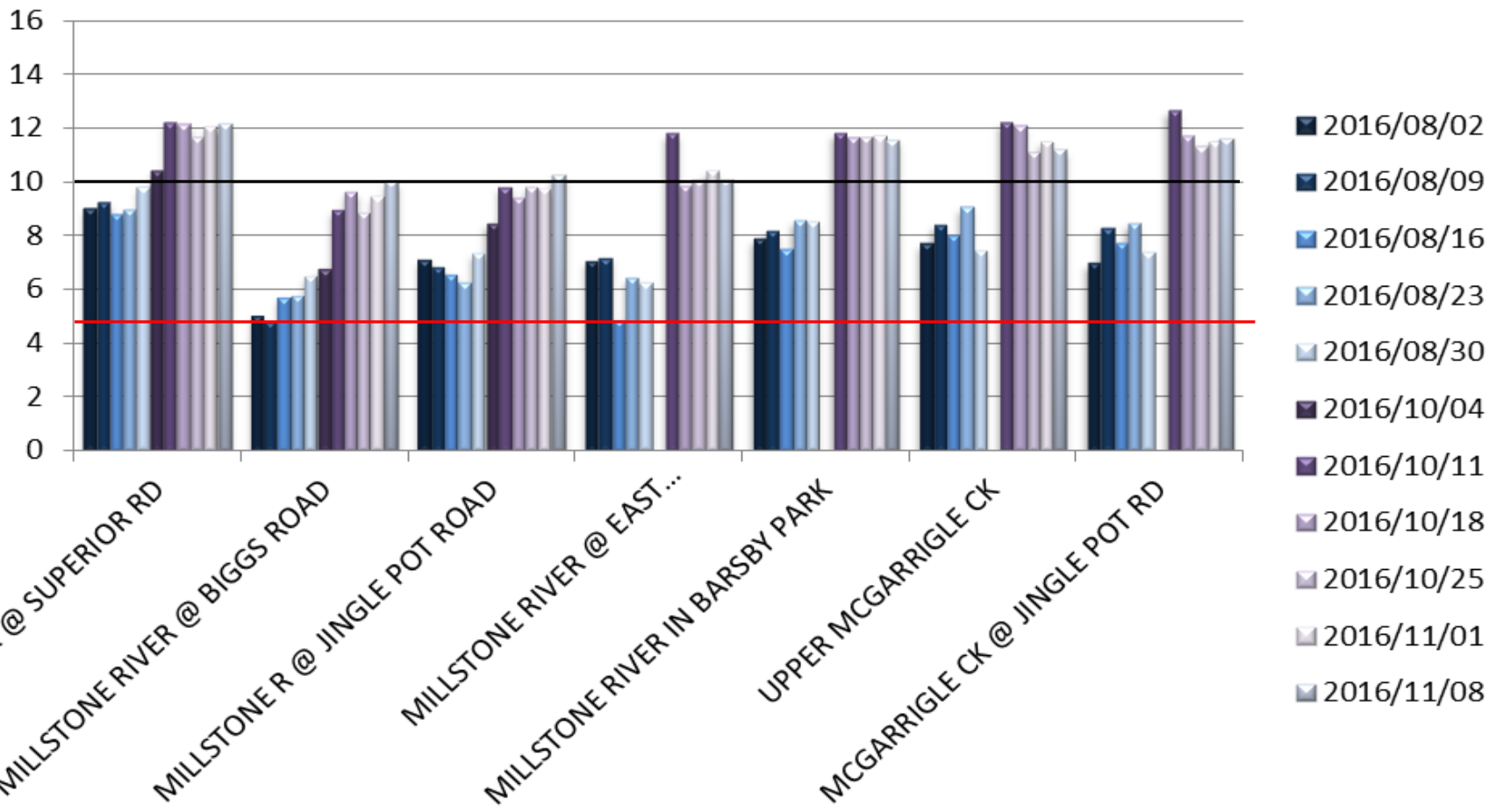


LNS



FFCCS

Dissolved Oxygen (mg/L)

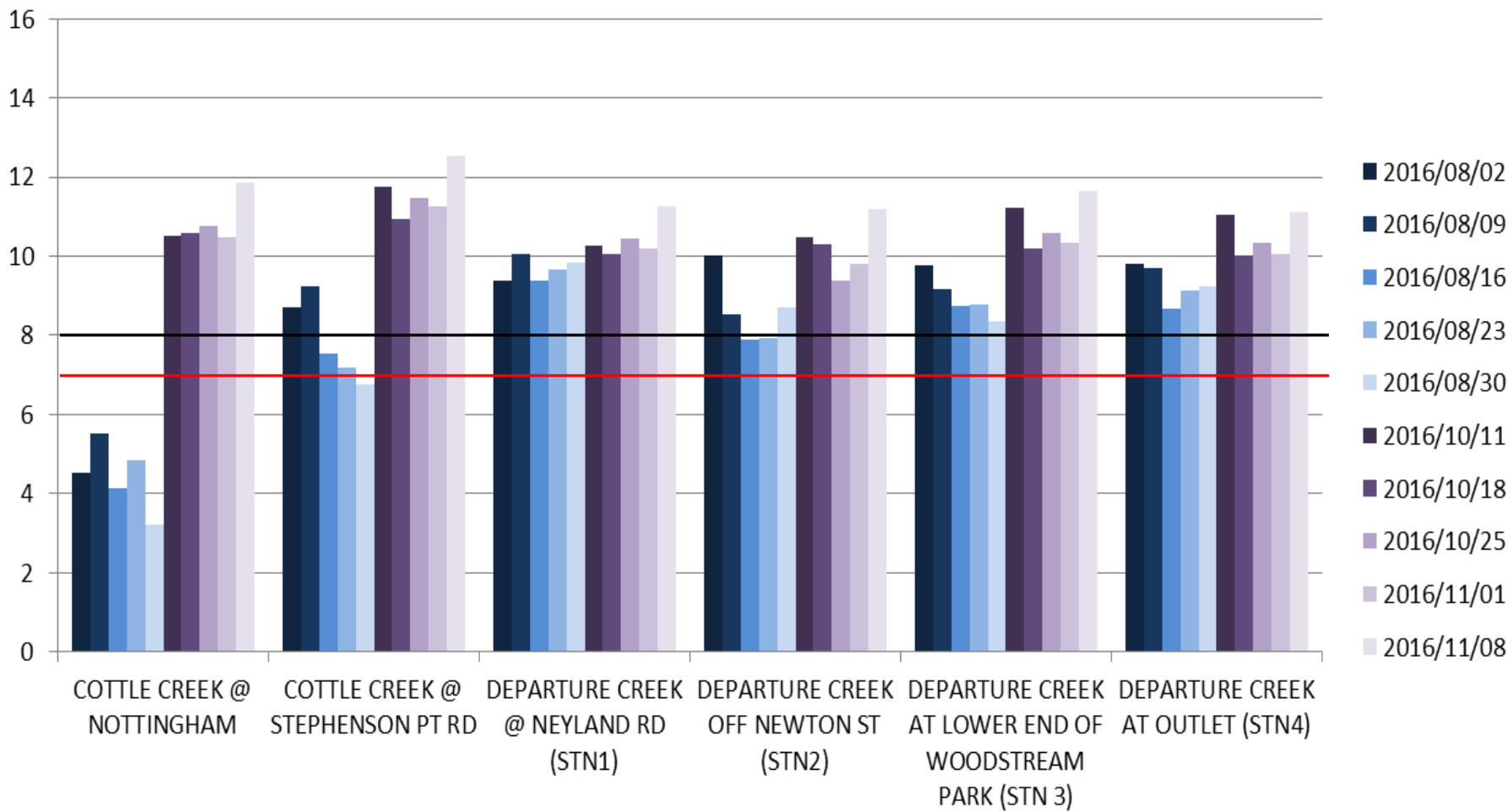


IWFF

30 day
average:
8 mg/L

Instantaneous
minimum:
5 mg/L

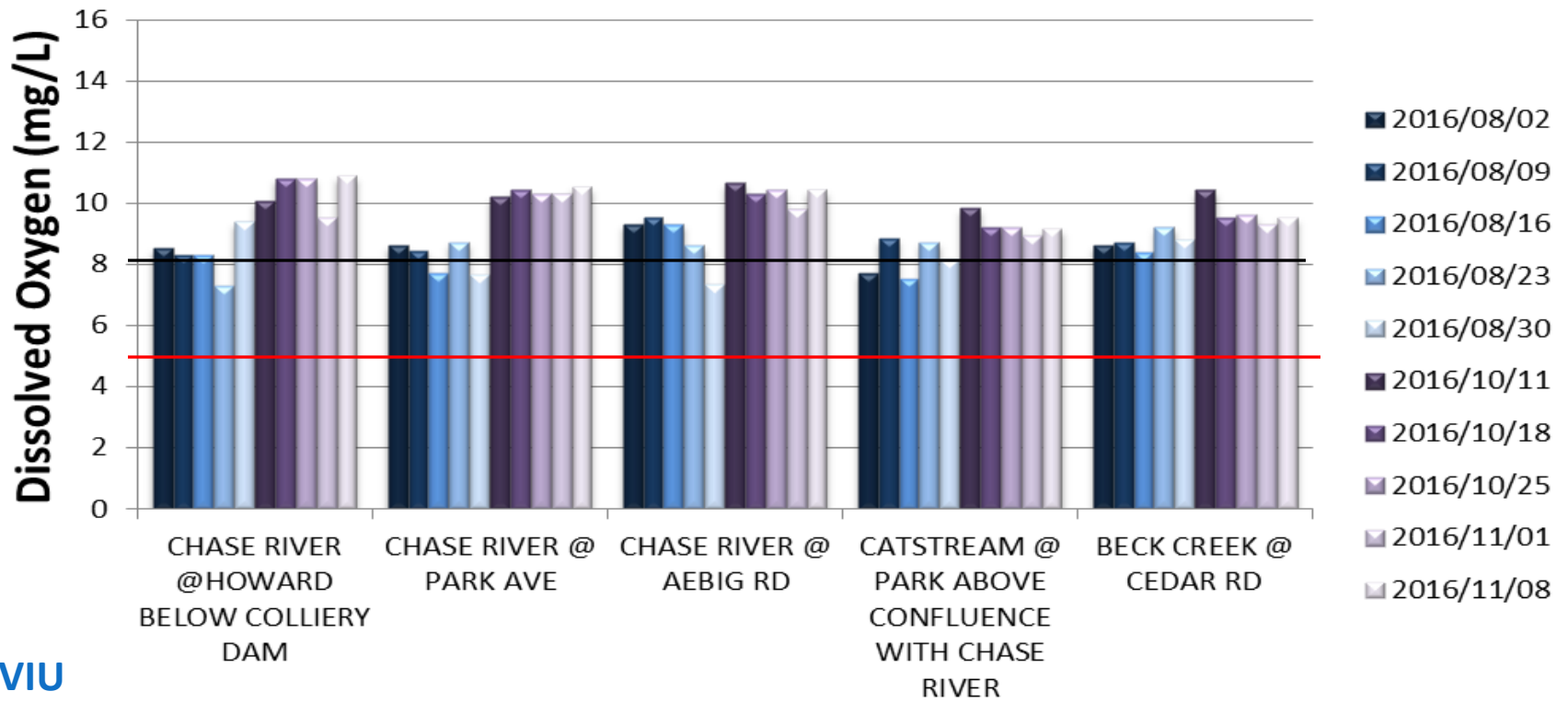
Dissolved Oxygen



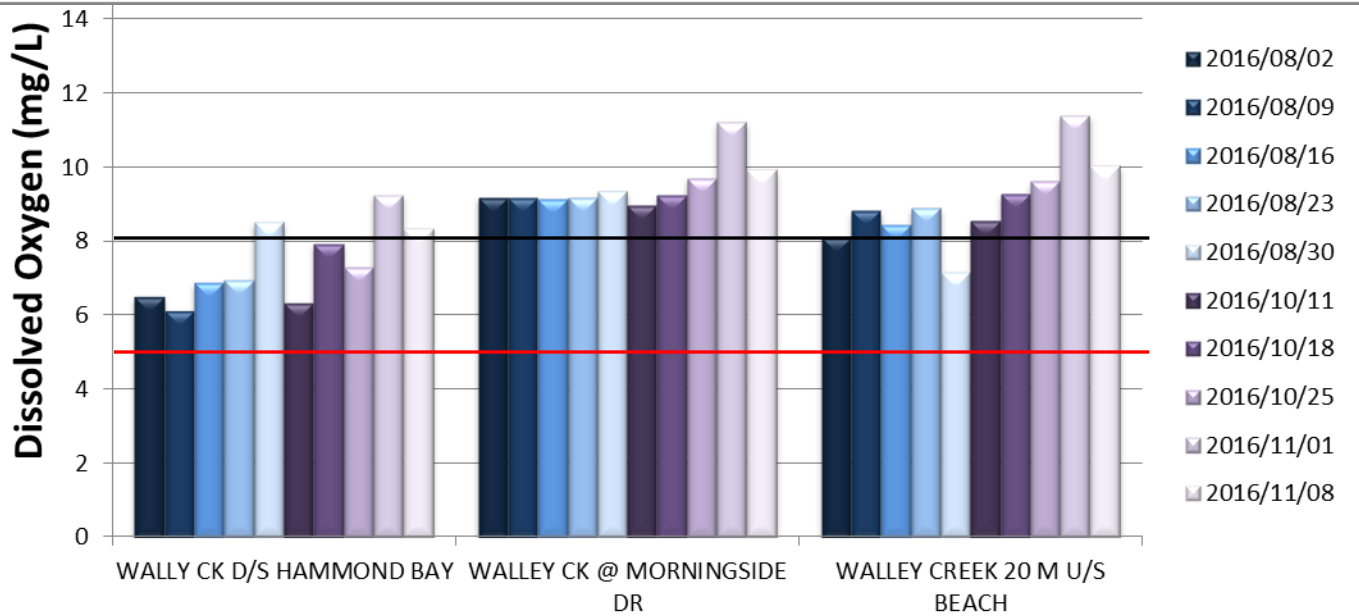
DCS

30 day average:
8 mg/L

Instantaneous minimum:
5 mg/L



VIU

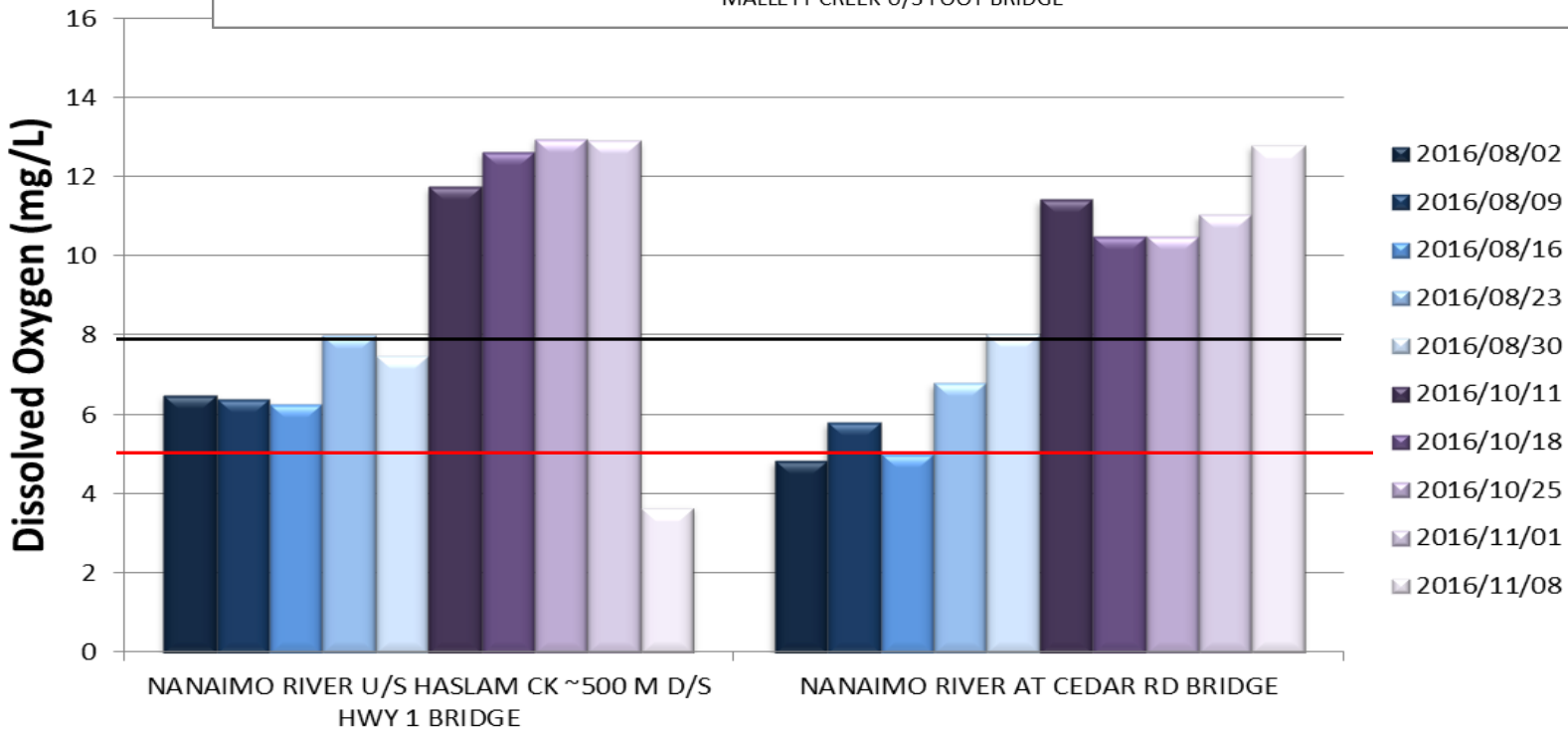
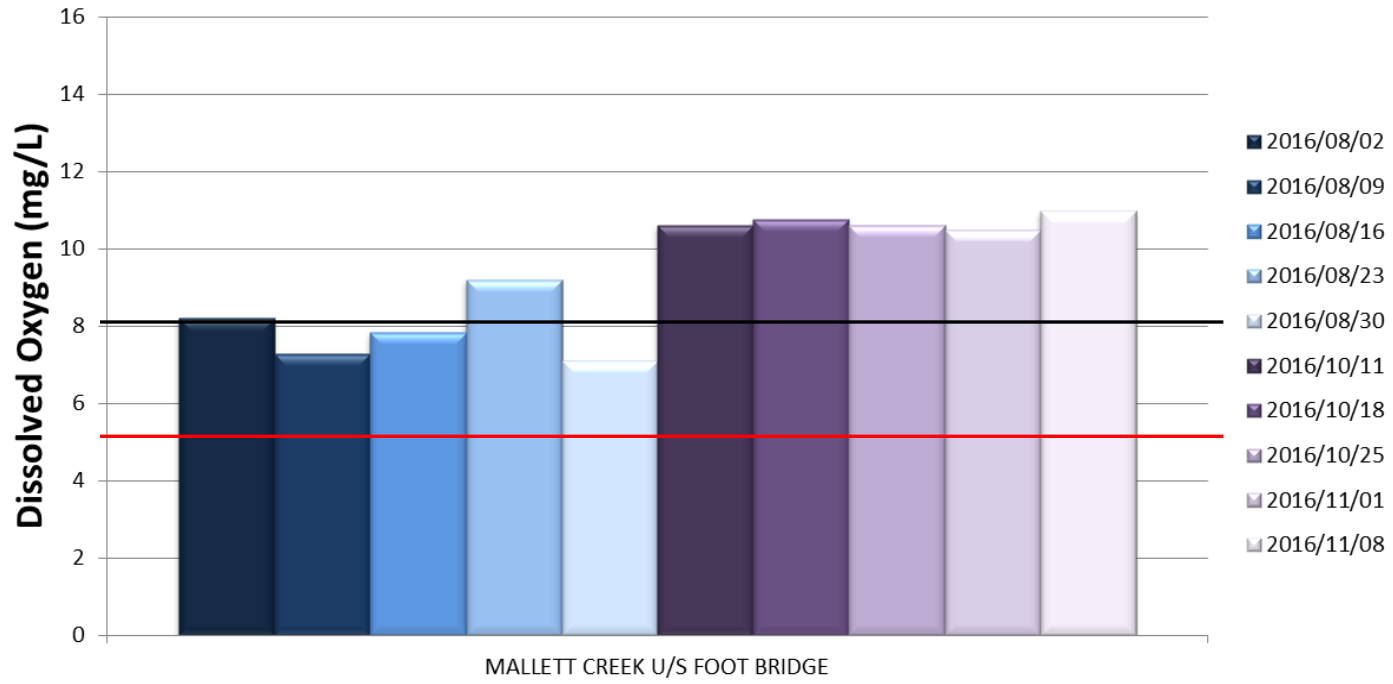


WCS

30 day average: 8 mg/L

Instantaneous minimum: 5 mg/L

GSK



NALT

Instantaneous guideline (5 mg / L) exceeded at:

Grandon at Laburnum	Cottle Creek all sites	Millstone at Biggs
Swayne Creek	Nanoose Creek	Nanaimo River

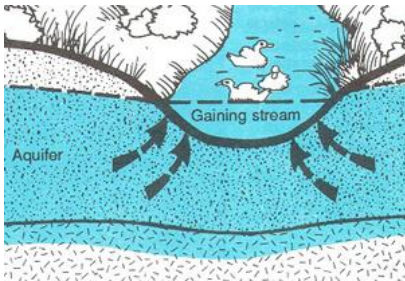
30 day average guideline (8 mg / L) not ever exceeded at:

Rosewell Creek	Deep Bay Creek	Little Qualicum River
Whiskey Creek	French Creek	Cameron River
Upper Englishman River	Morrison Creek	French Creek

- Exceedances occurred consistently at very low flow sites
- Swayne Creek on August 30th only system to have flow low enough to prevent monitoring

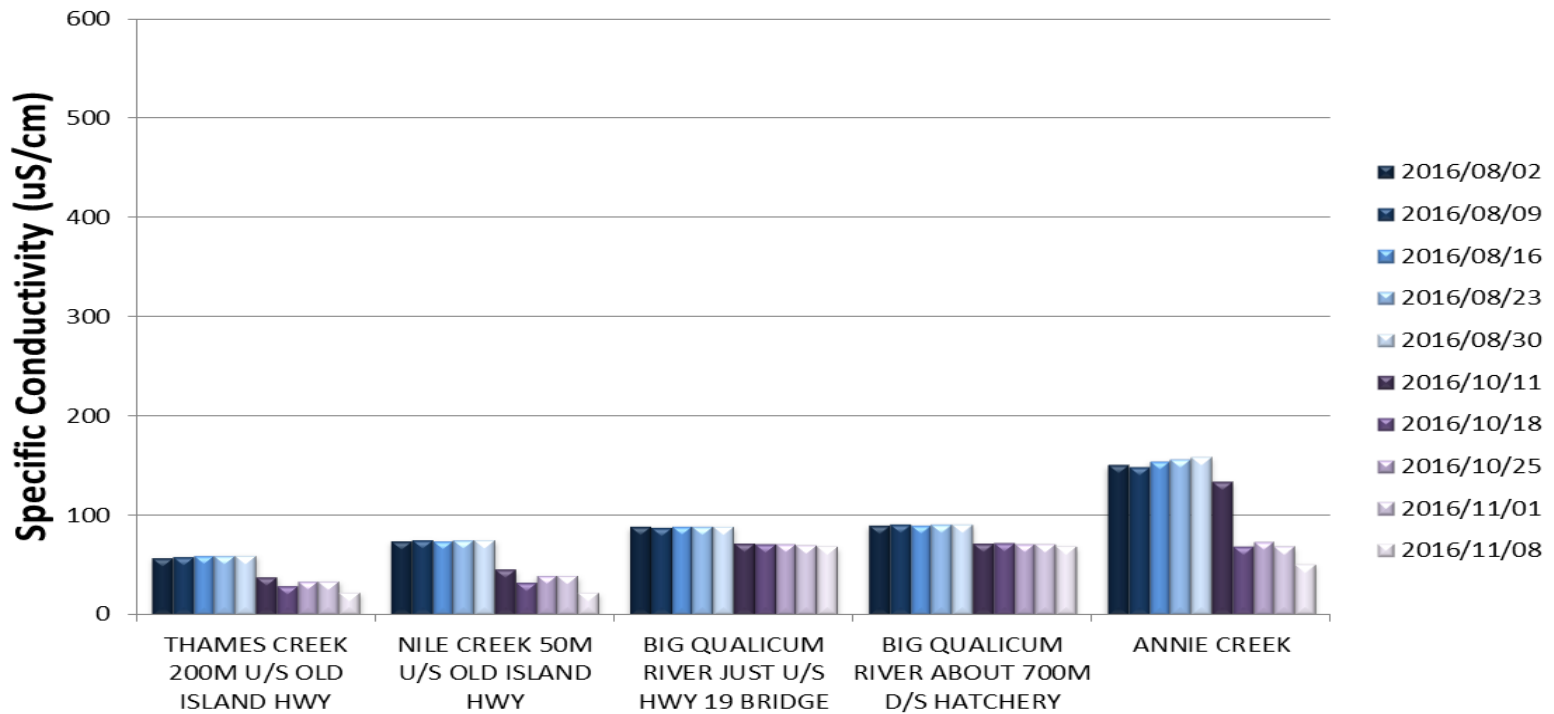
Dissolved Oxygen

Specific Conductivity



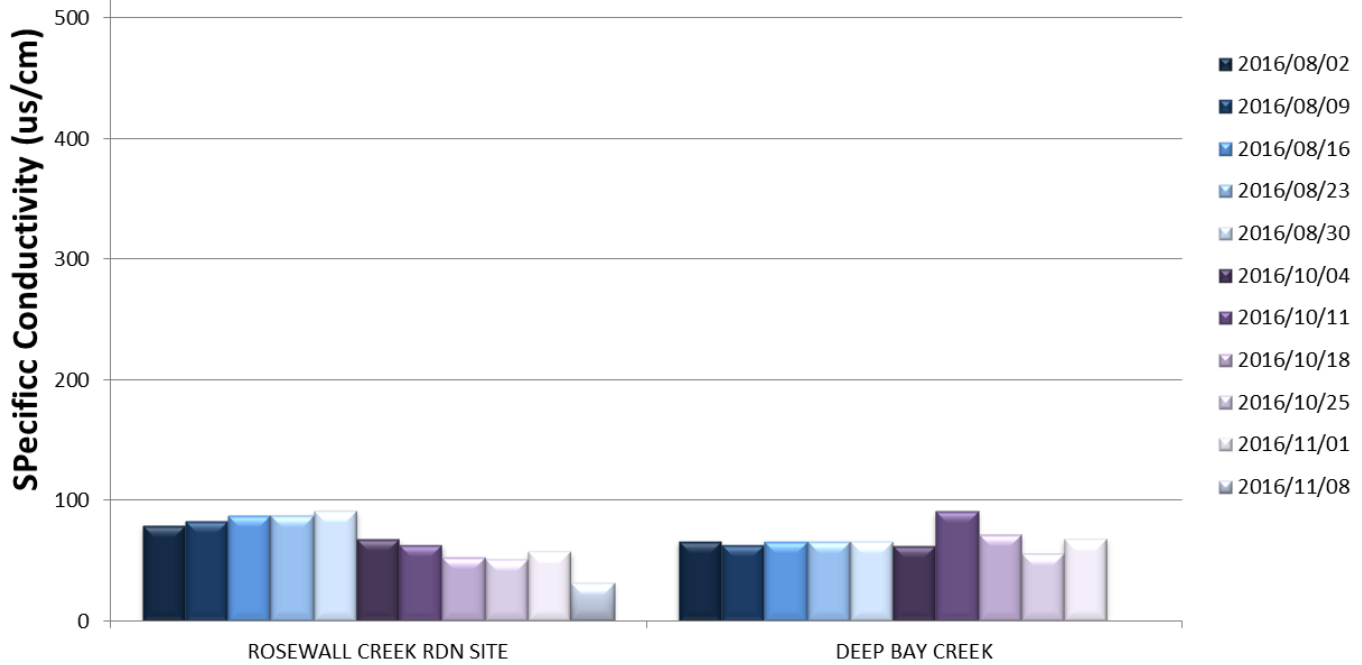
- Most coastal streams measure less than 80 $\mu\text{S}/\text{cm}$ but can be more if groundwater influences is present
- No guideline for this parameter

NCES

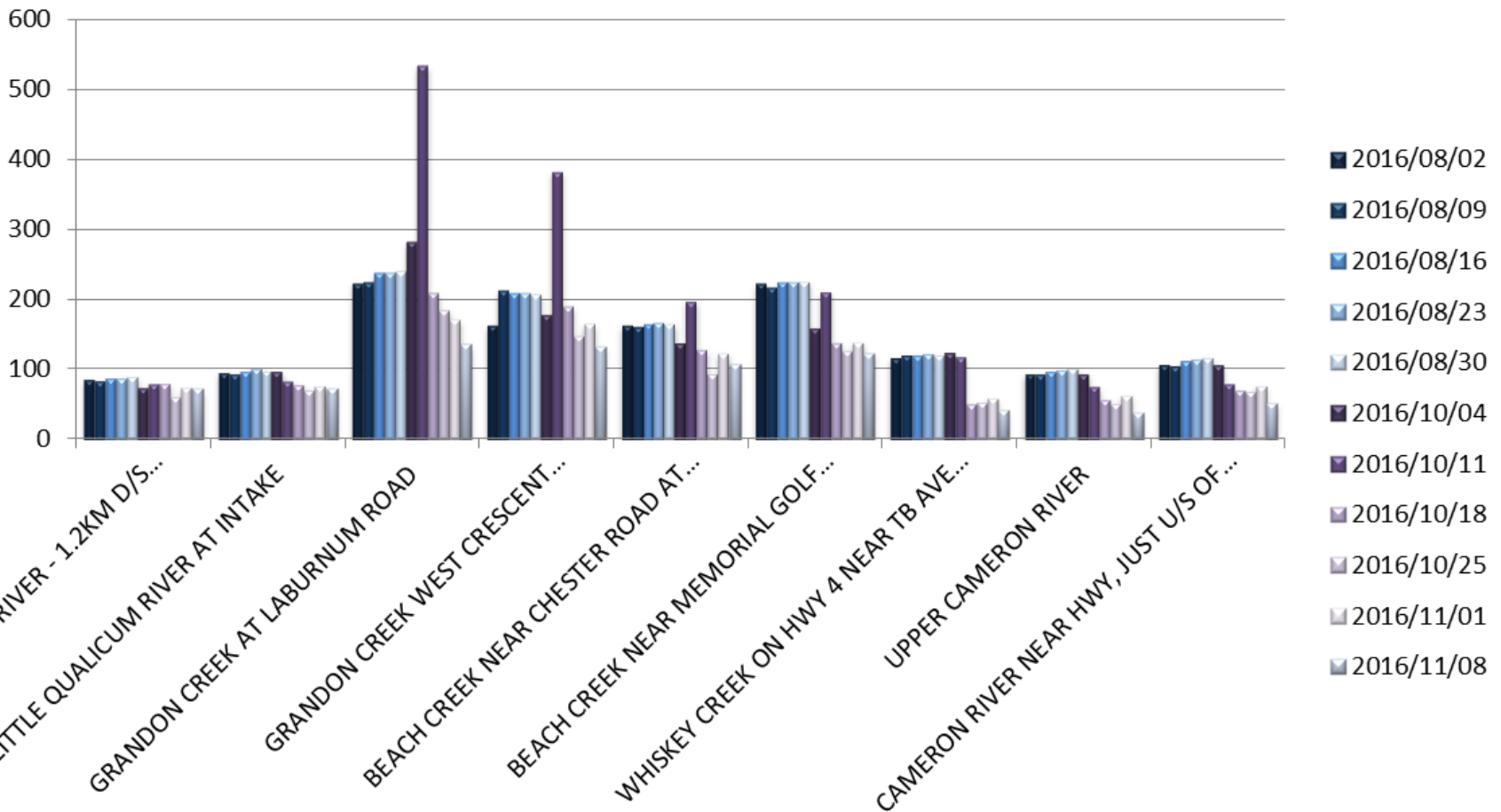


Most coastal streams less than 80 uS/cm but can be more if groundwater influences - No guideline

FBSES

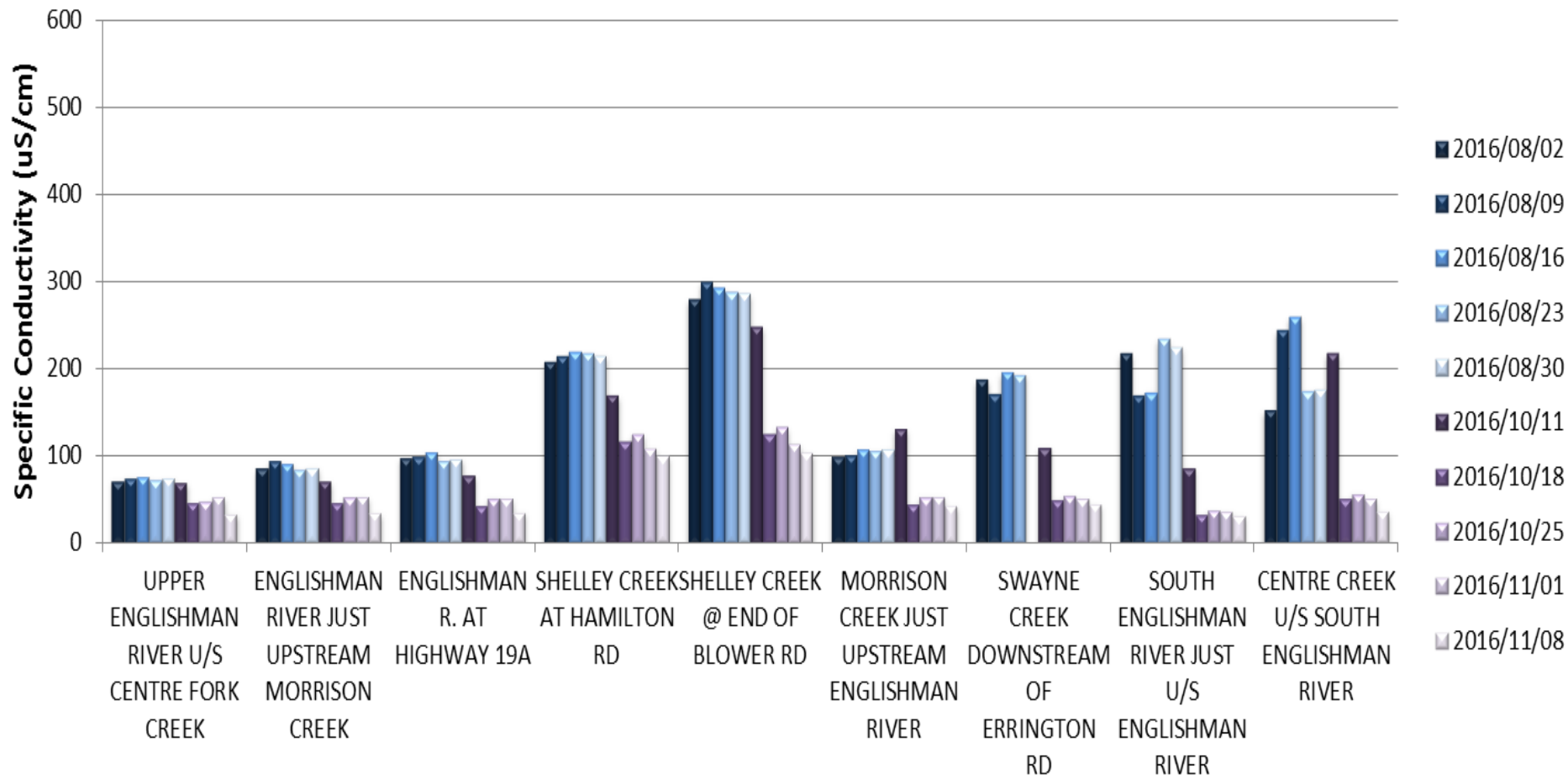


Specific Conductivity (uS/cm)



QBS

Most coastal streams less than 80 uS/cm but can be more if groundwater influences
- No guideline

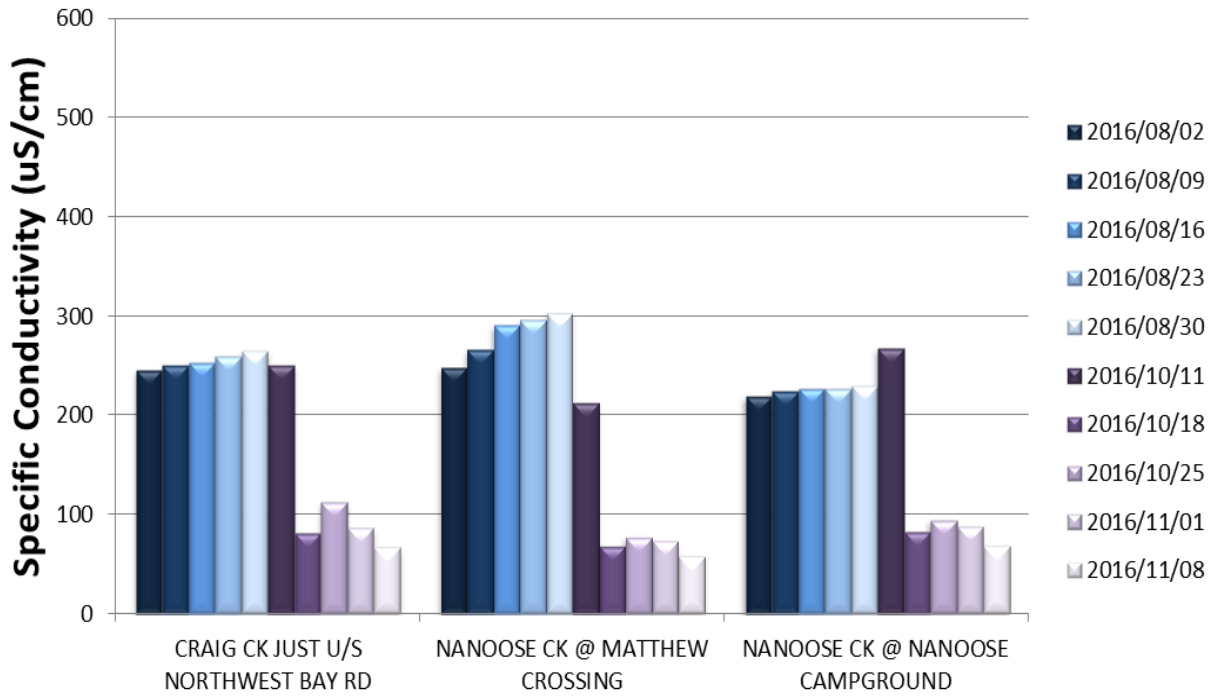


MVIHES

Most coastal streams less than 80 uS/cm but can be more if groundwater influences

- No guideline

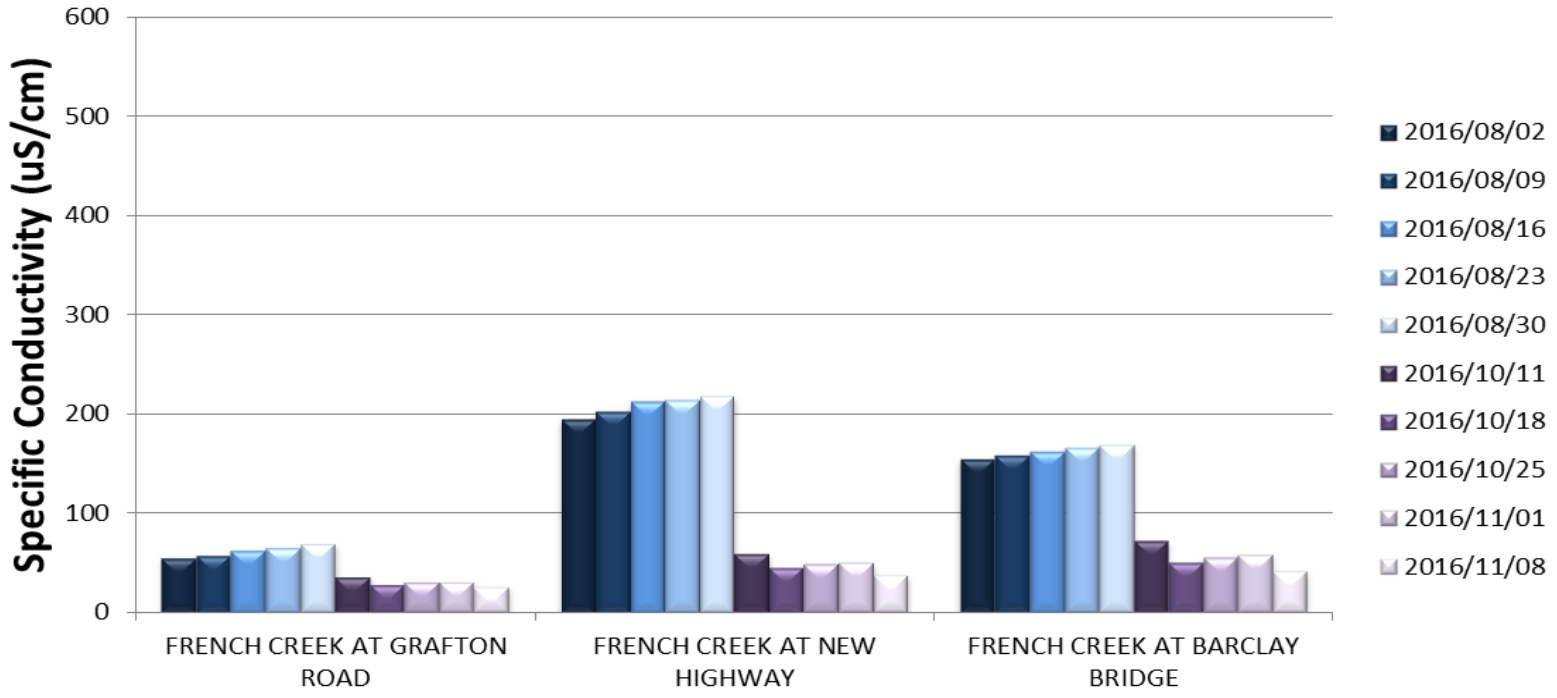
LNS

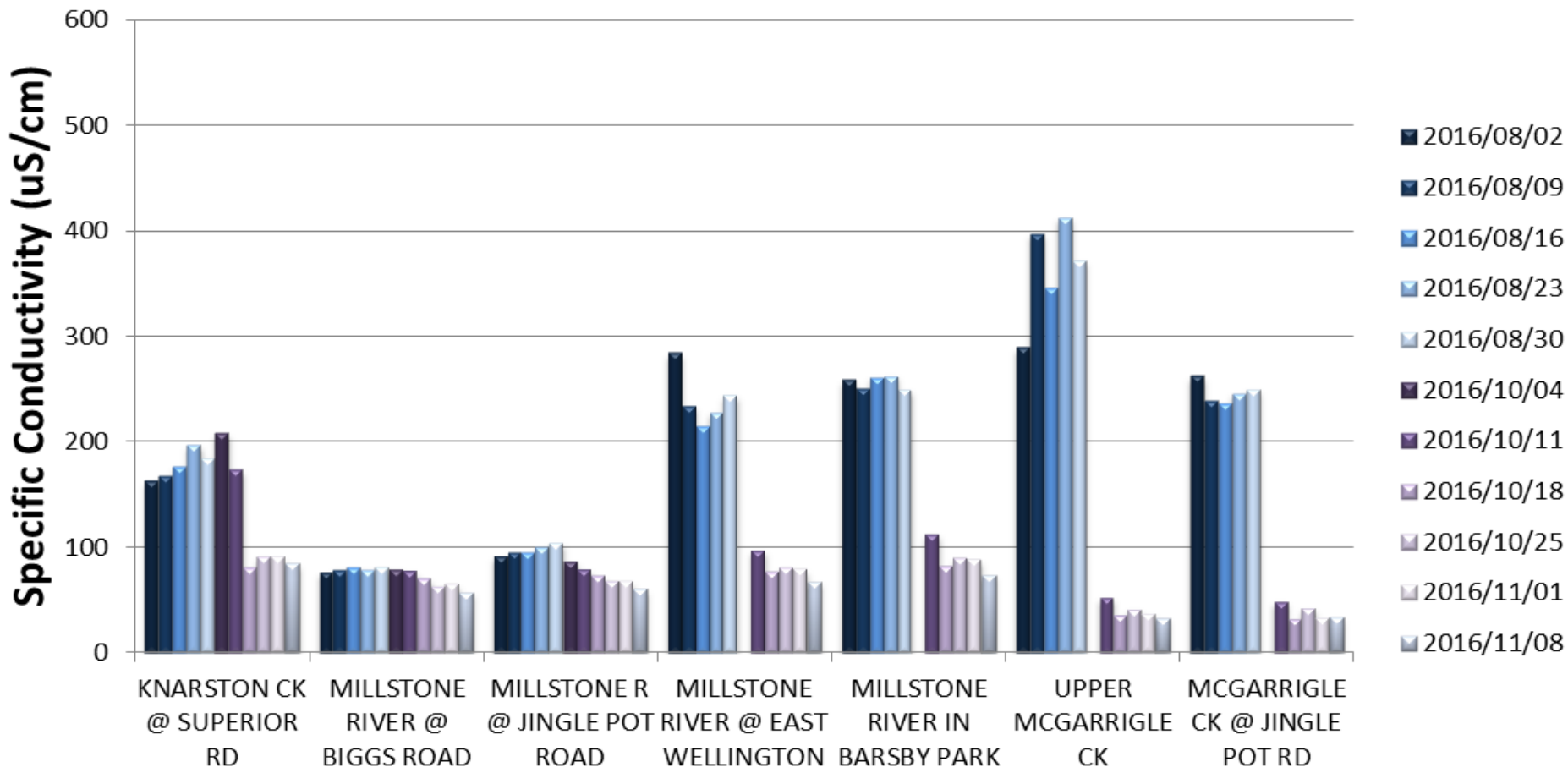


Most coastal streams less than 80 uS/cm but can be more if groundwater influences

- No guideline

FFCCS

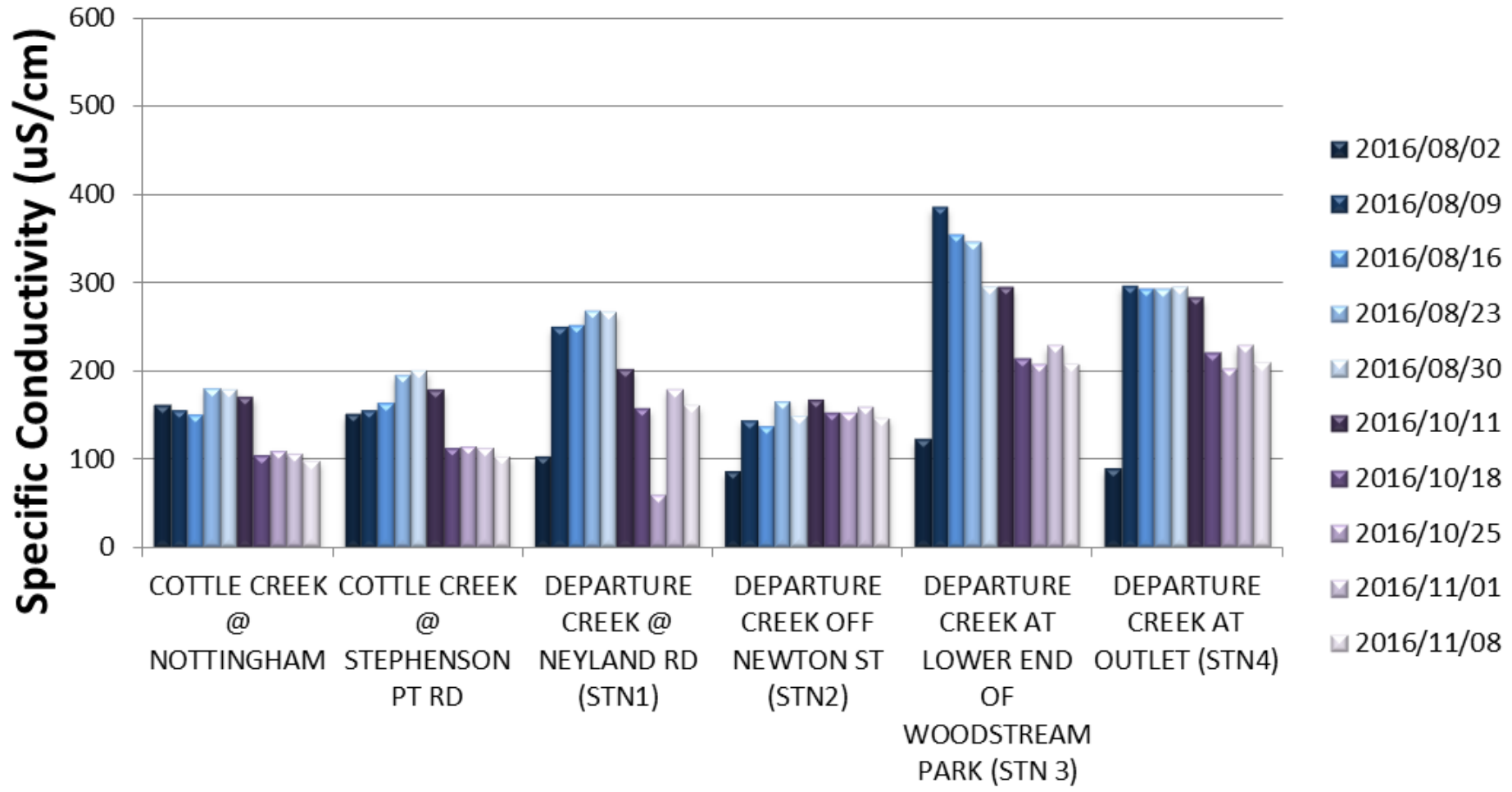




IWFF

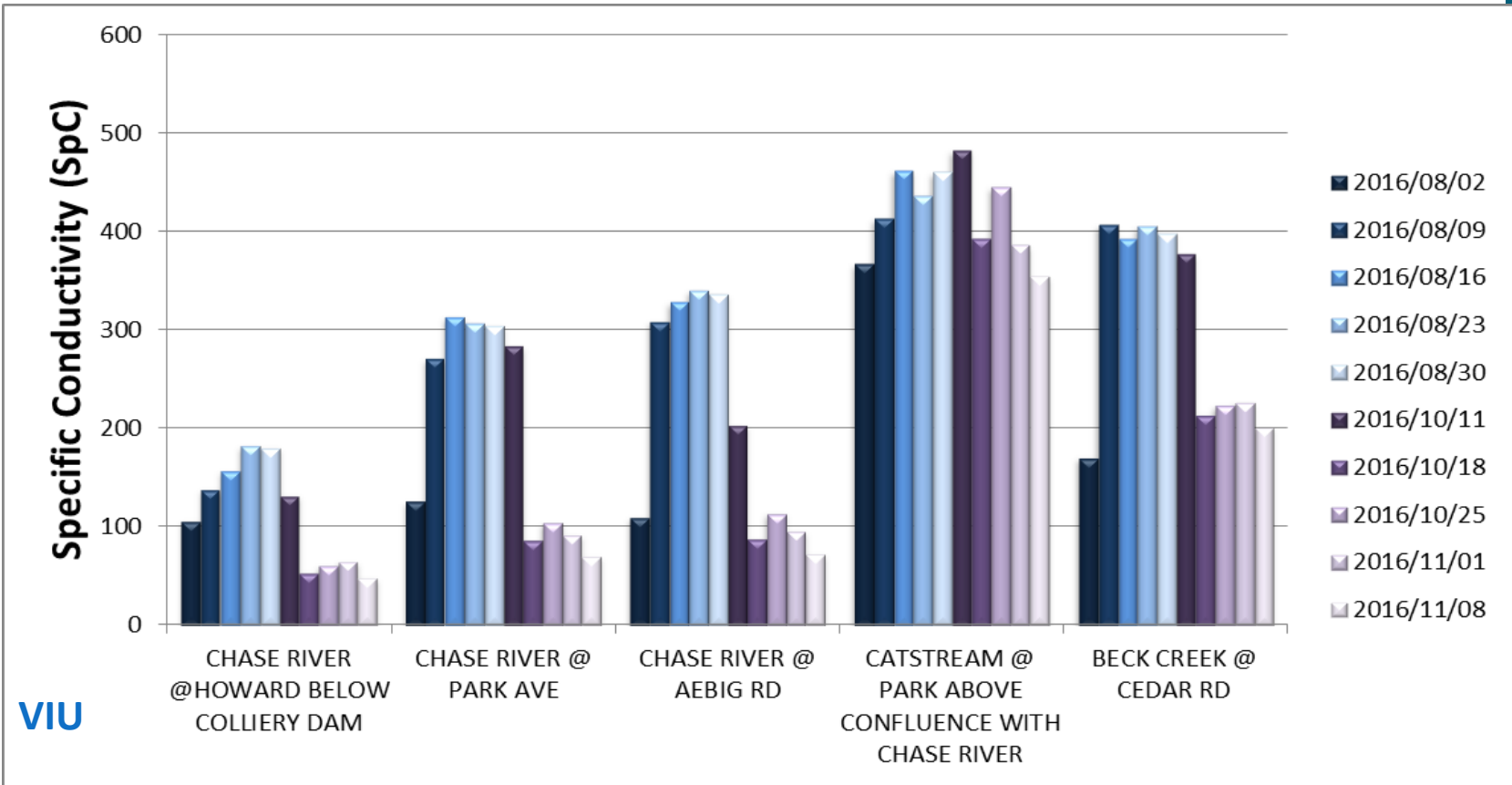
Most coastal streams less than 80 uS/cm but can be more if groundwater influences

- No guideline



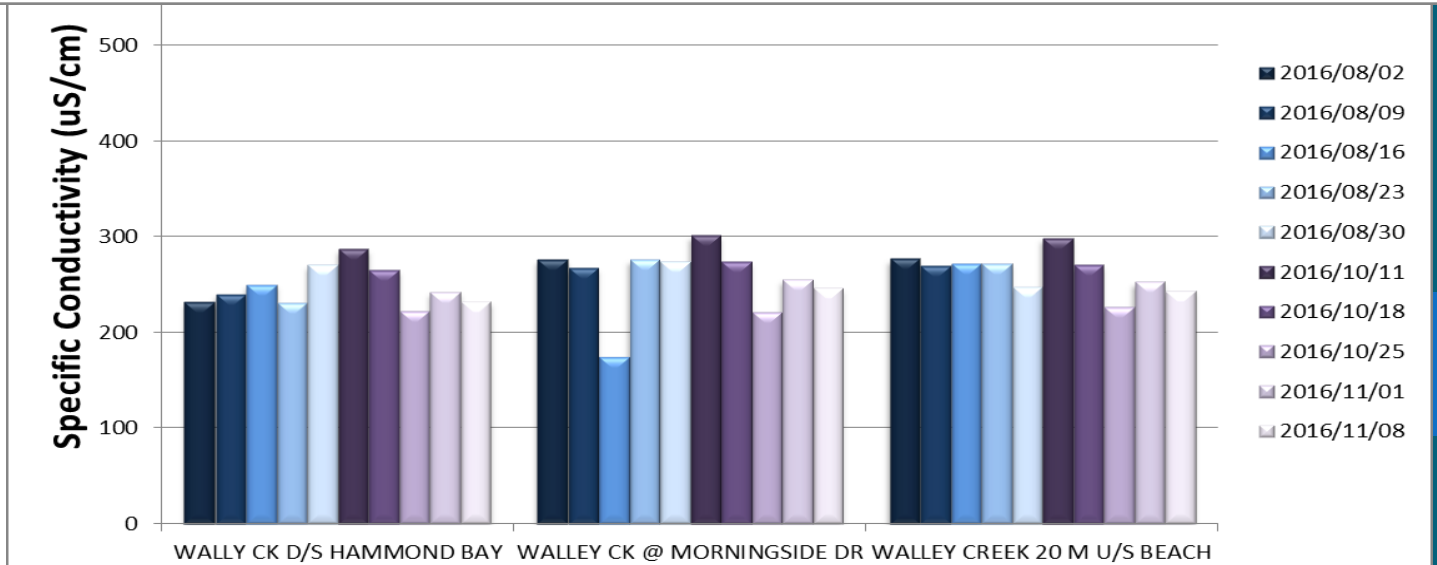
DCS

Most coastal streams less than 80 uS/cm but can be more if groundwater influences
 - No guideline

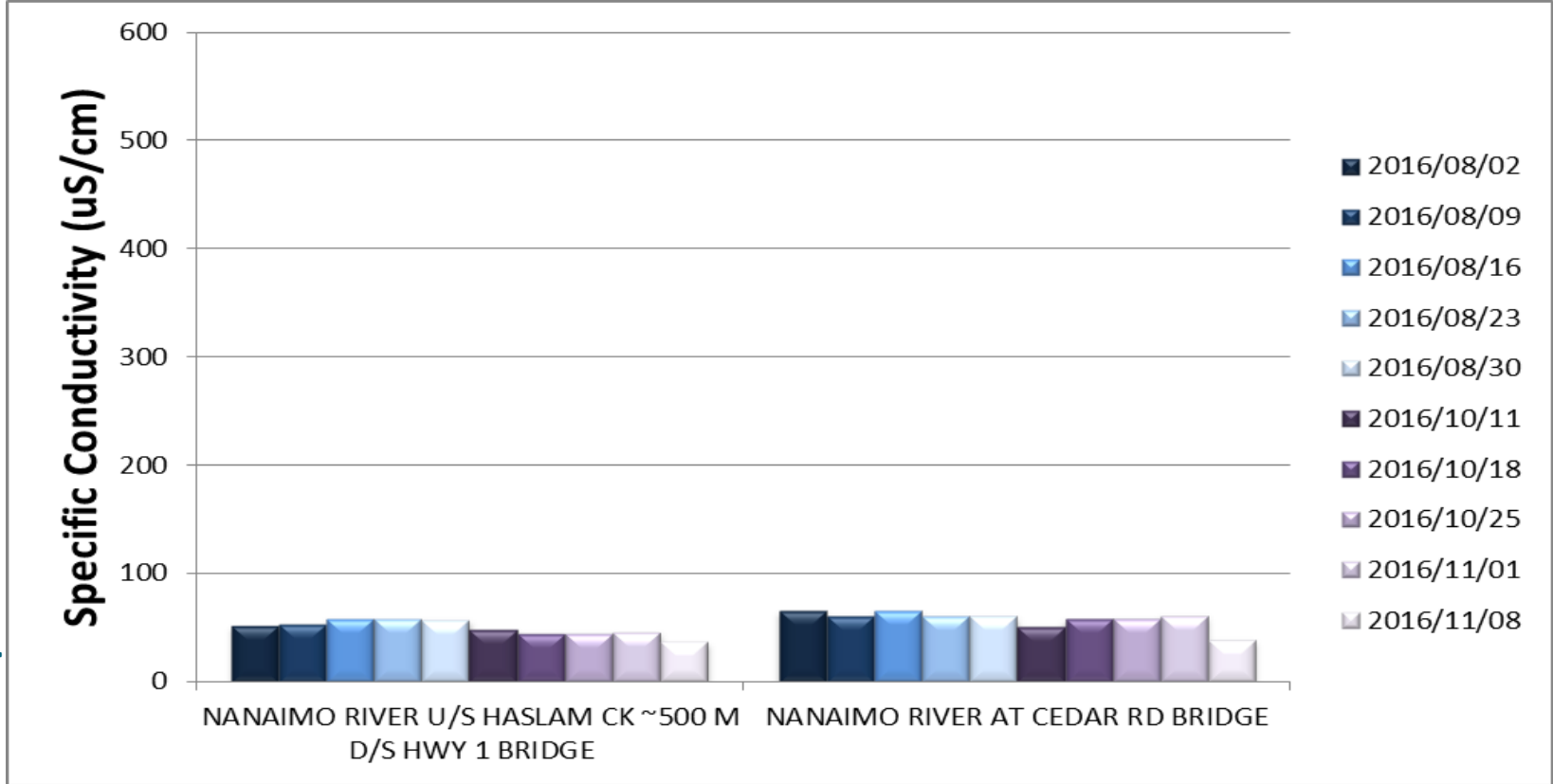


Most coastal streams less than 80 $\mu\text{S}/\text{cm}$ but can be more if groundwater influences
- No guideline

WCS



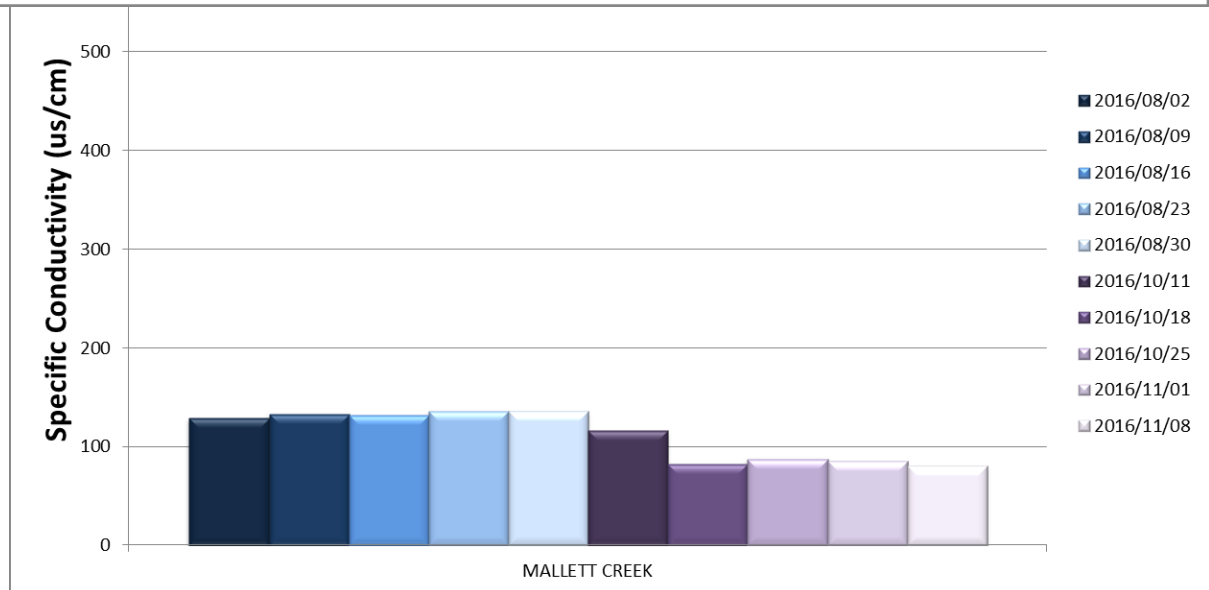
NALT



Most coastal streams less than 80 uS/cm but can be more if groundwater influences

- No guideline

GSK



Higher than typical specific conductivity could be attributed to:

Possible groundwater influence:			
South Englishman	Annie Creek	Nanoose Creek	Walley Creek
French Creek sites	Grandon Creek	Mallet Creek	Shelley Creek
Swayne Creek	Centre Creek	Craig Creek	Departure Bay Cr.

Possible human contaminant influence:		
Millstone River	McGarrigle Creek	Chase River
Cat Stream	Beck Creek	

Notes:

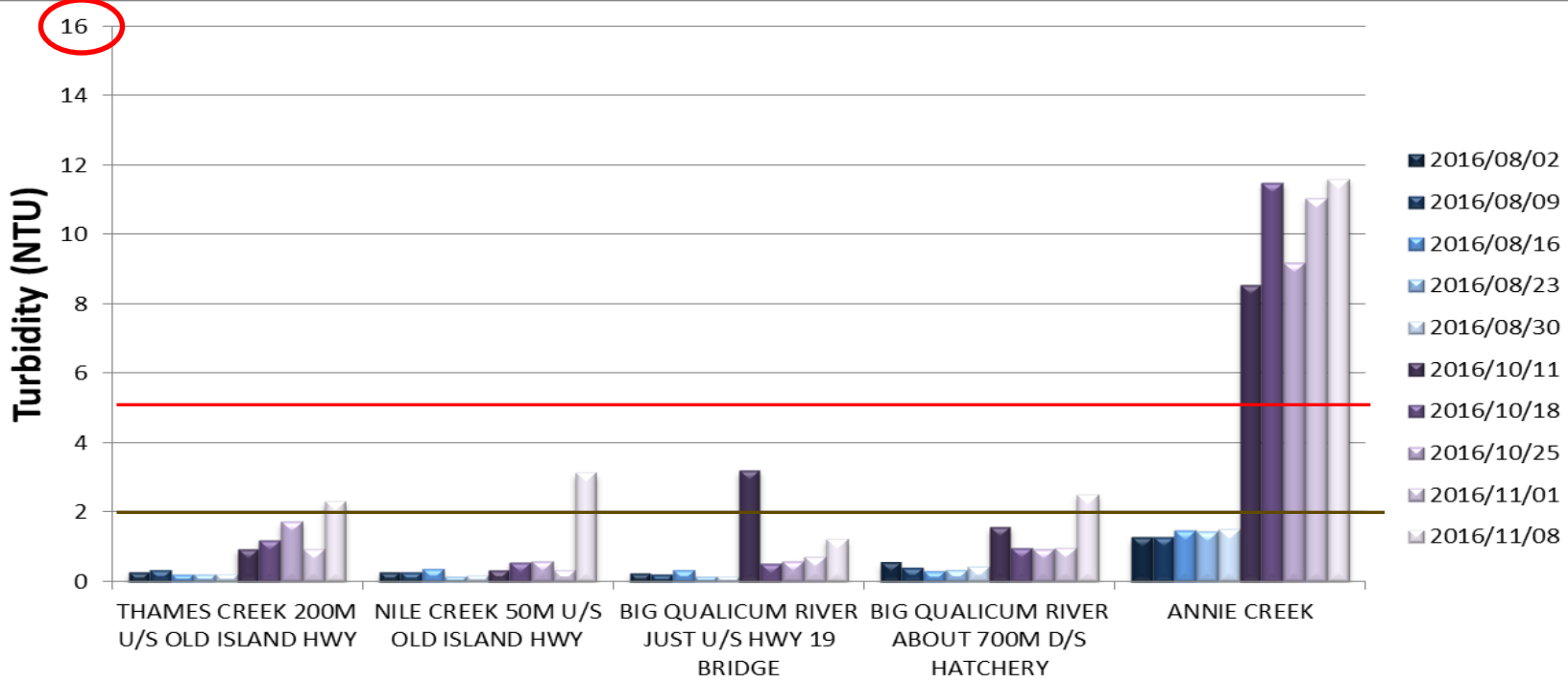
- Due to consistent rain events in the fall, turbidity increases are often seen in this period. Therefore the observations listed on this page are mostly attributed to summer season values.
- MoE knowledge of land-use contributes to consideration of human influence

Specific Conductivity (SpC)

Turbidity



- January to September (summer period) maximum: 2 NTU
- October to December (winter period) maximum: 5 NTU

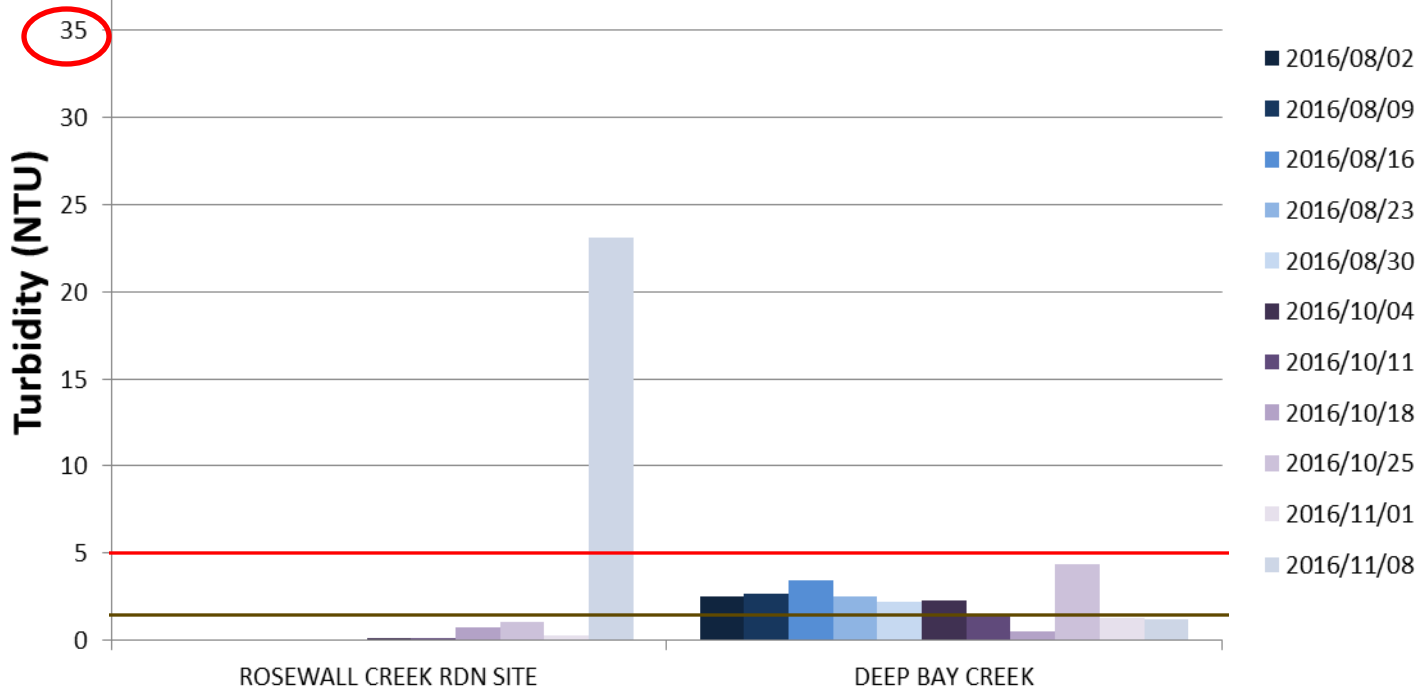


NCES

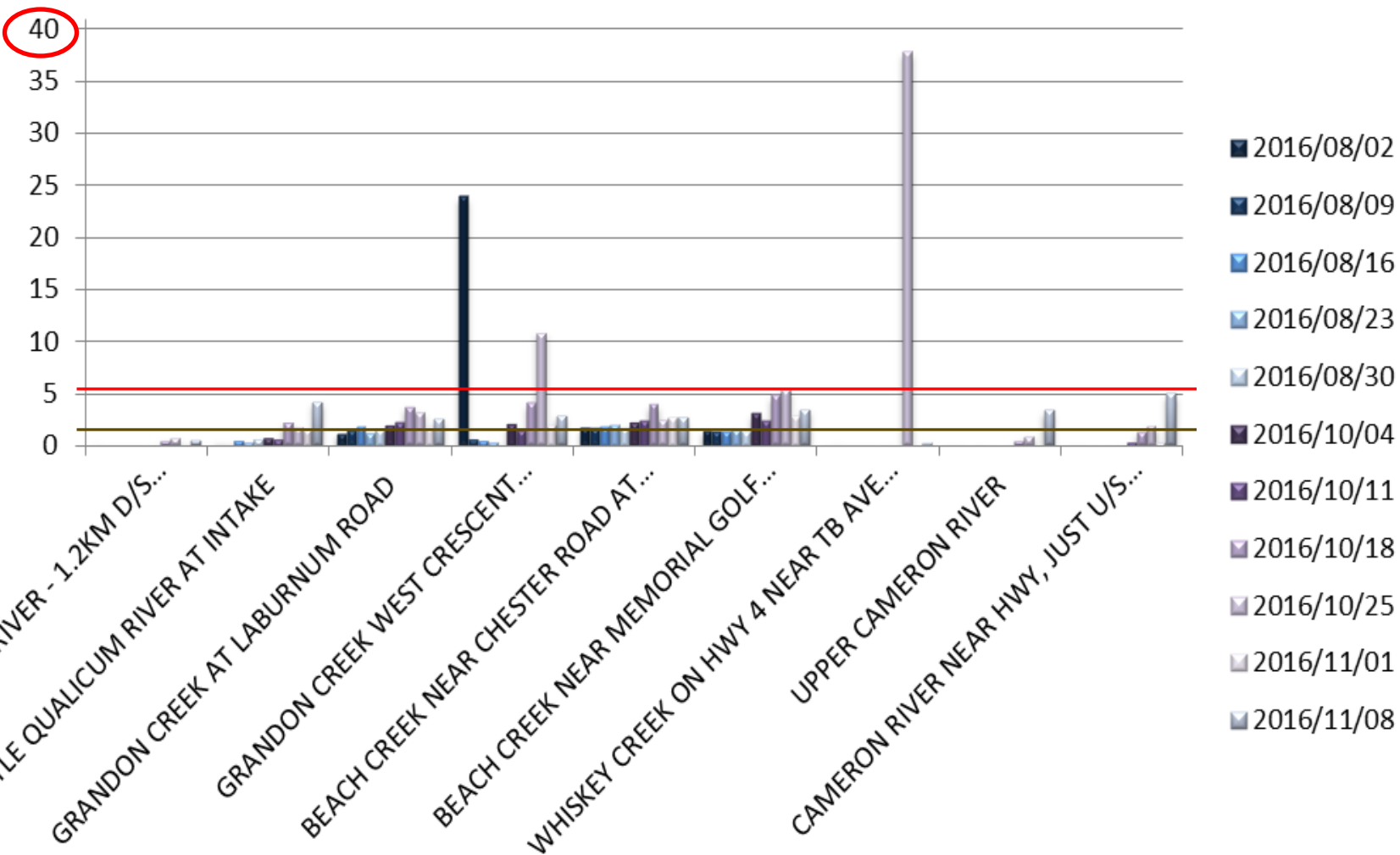
Oct-Dec max 5 NTU
(winter period)

Jan-Sept max 2 NTU
(summer period)

FBSES



Turbidity (NTU)

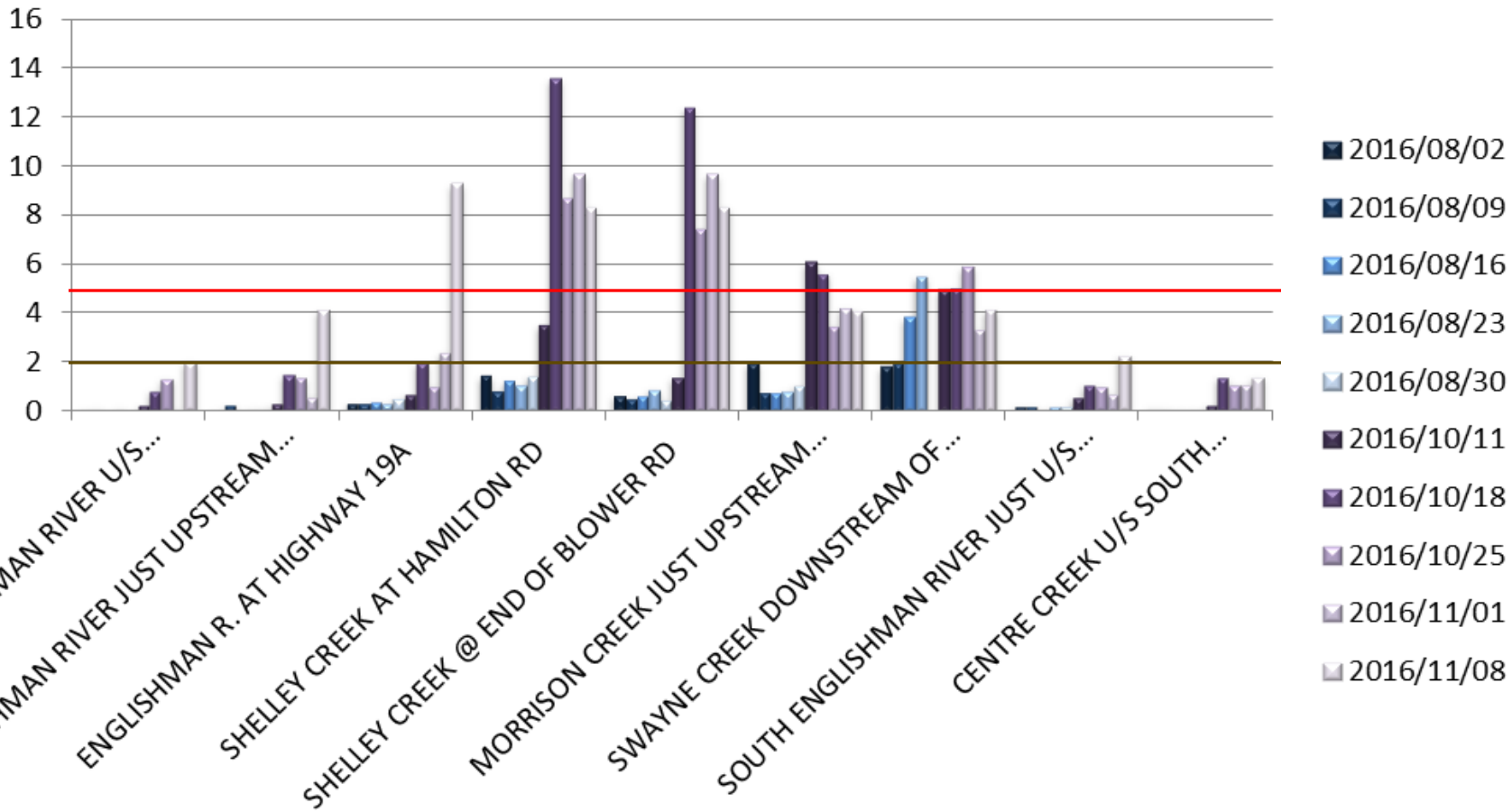


QBS

Oct-Dec max 5 NTU
(winter period)

Jan-Sept max 2 NTU
(summer period)

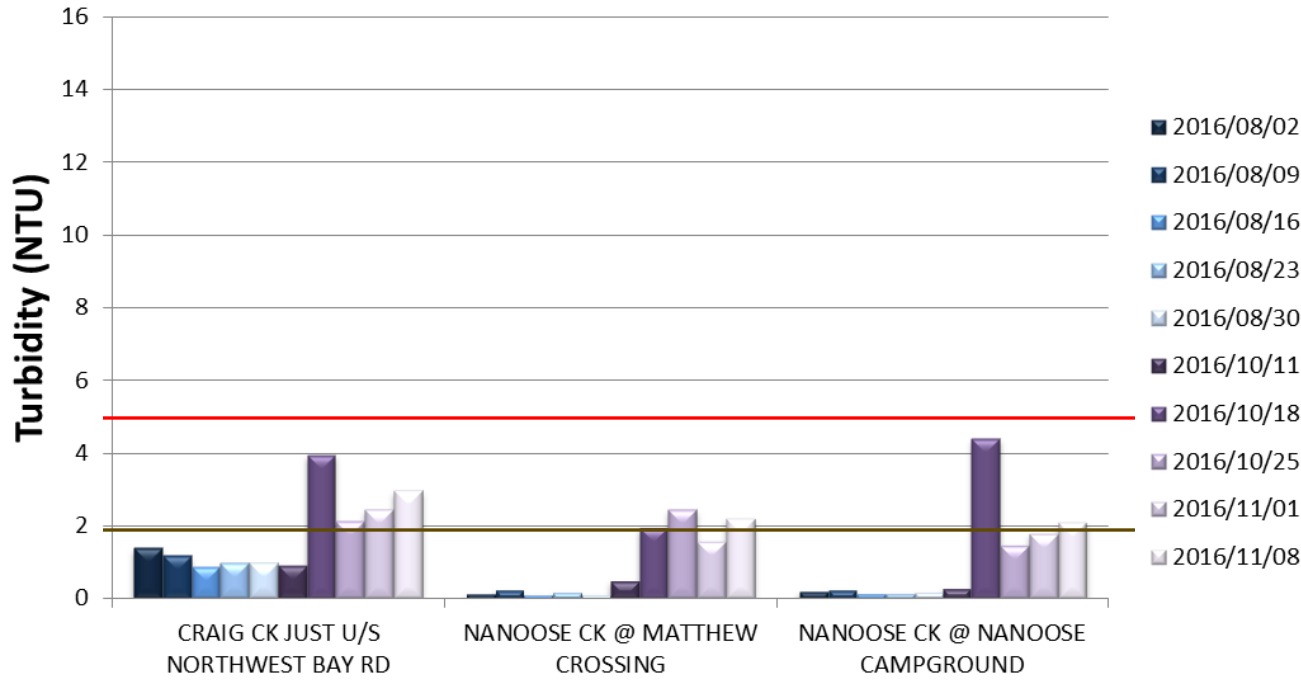
Turbidity (NTU)



MVIHES

Oct-Dec max 5 NTU
(winter period)

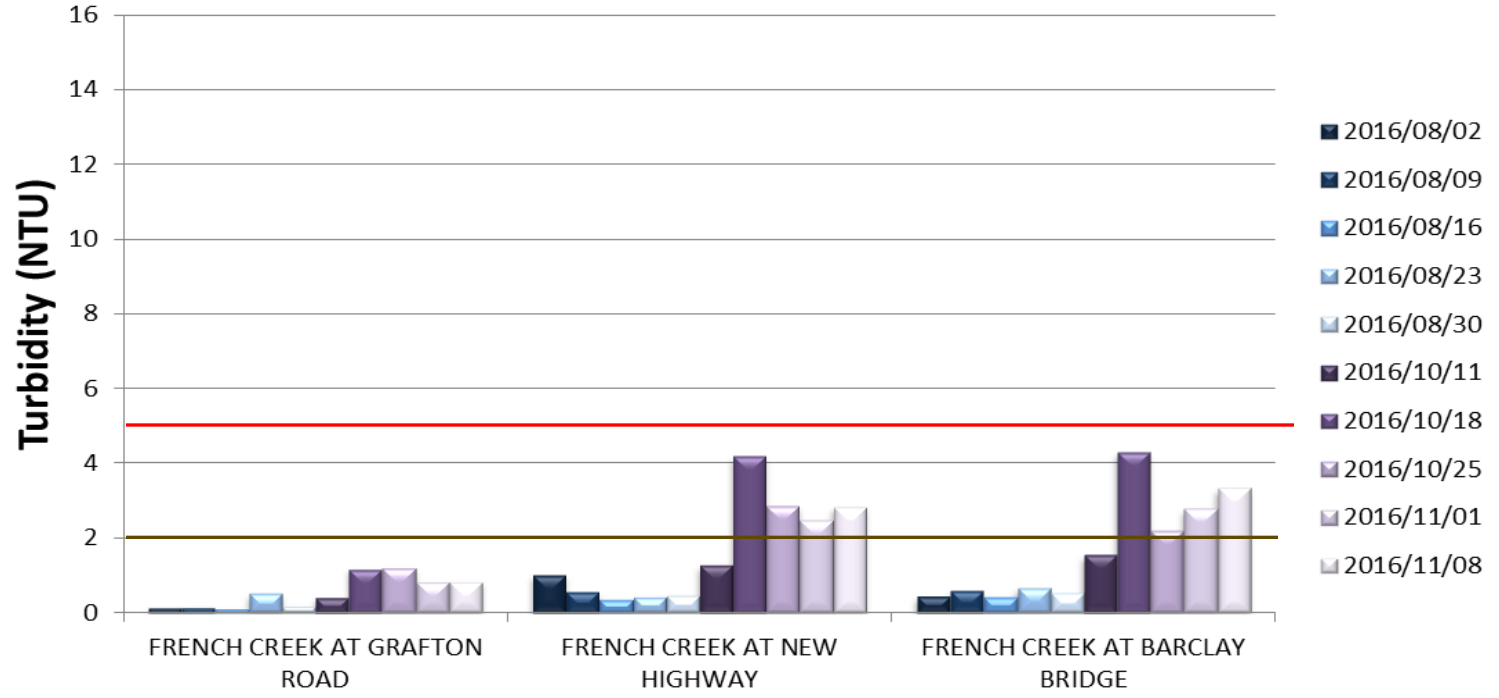
Jan-Sept max 2 NTU
(summer period)



Oct-Dec max 5 NTU
(winter period)

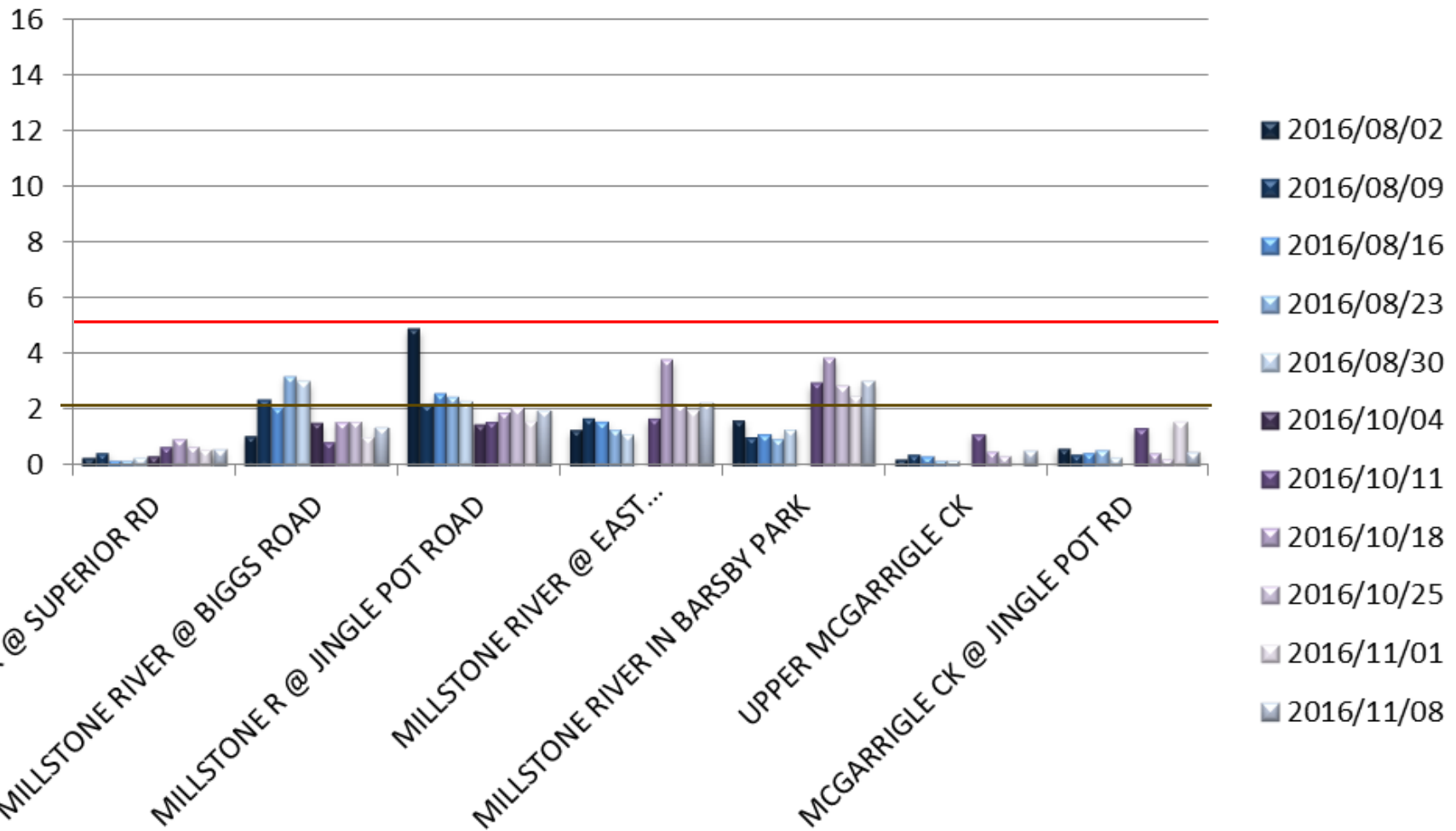
Jan-Sept max 2 NTU
(summer period)

LNS



FFCCS

Turbidity (NTU)



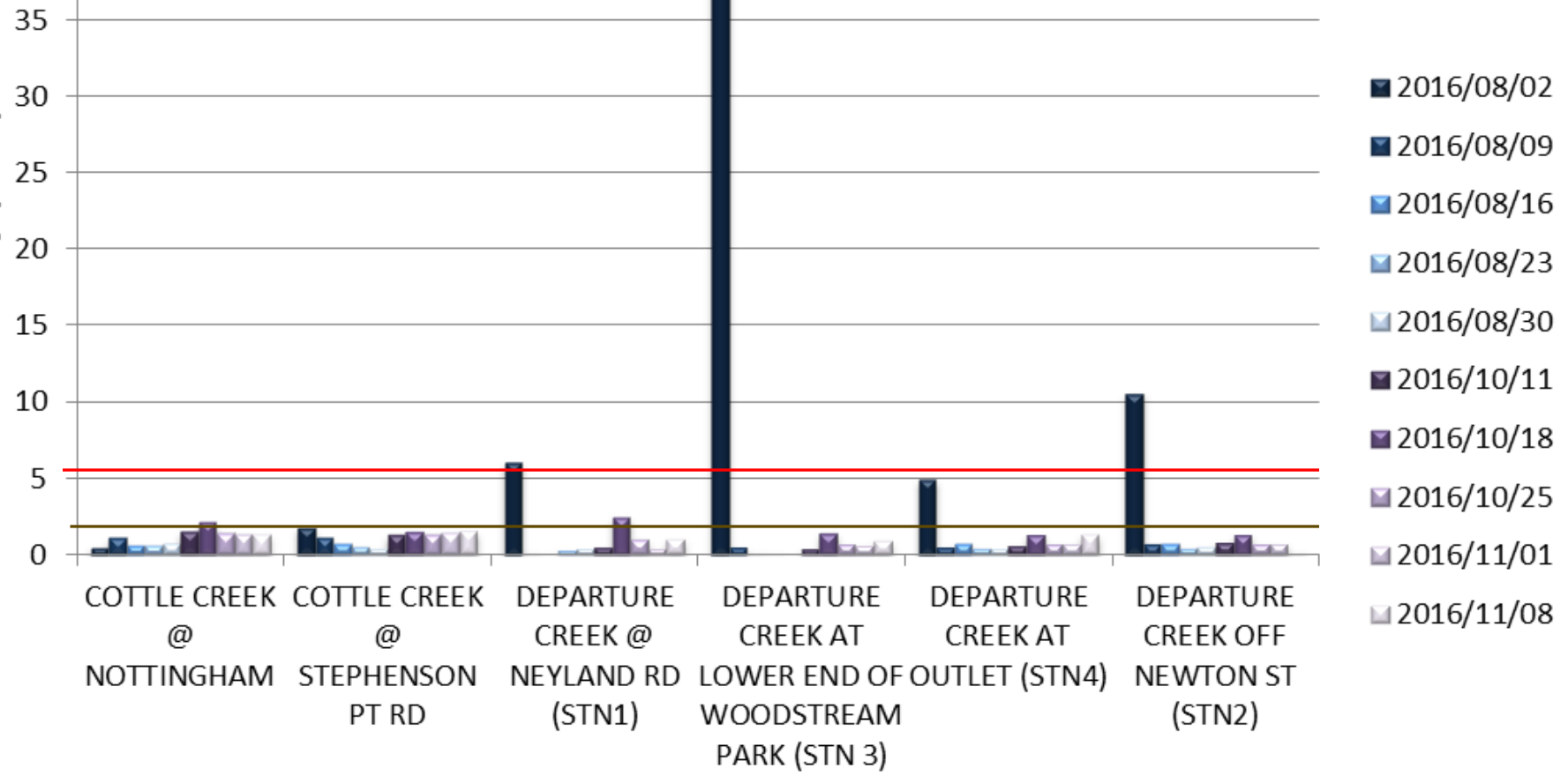
IWFF

Oct-Dec max 5 NTU
(winter period)

Jan-Sept max 2 NTU
(summer period)

Turbidity (NTU)

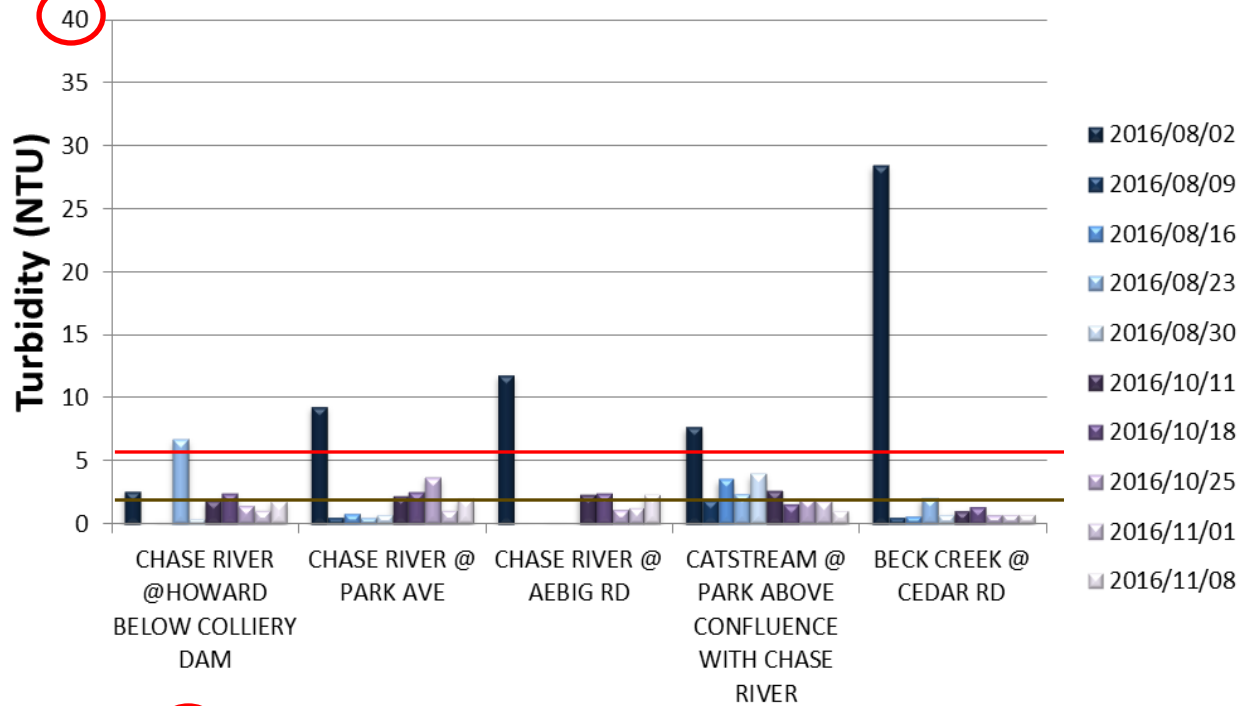
40



DCS

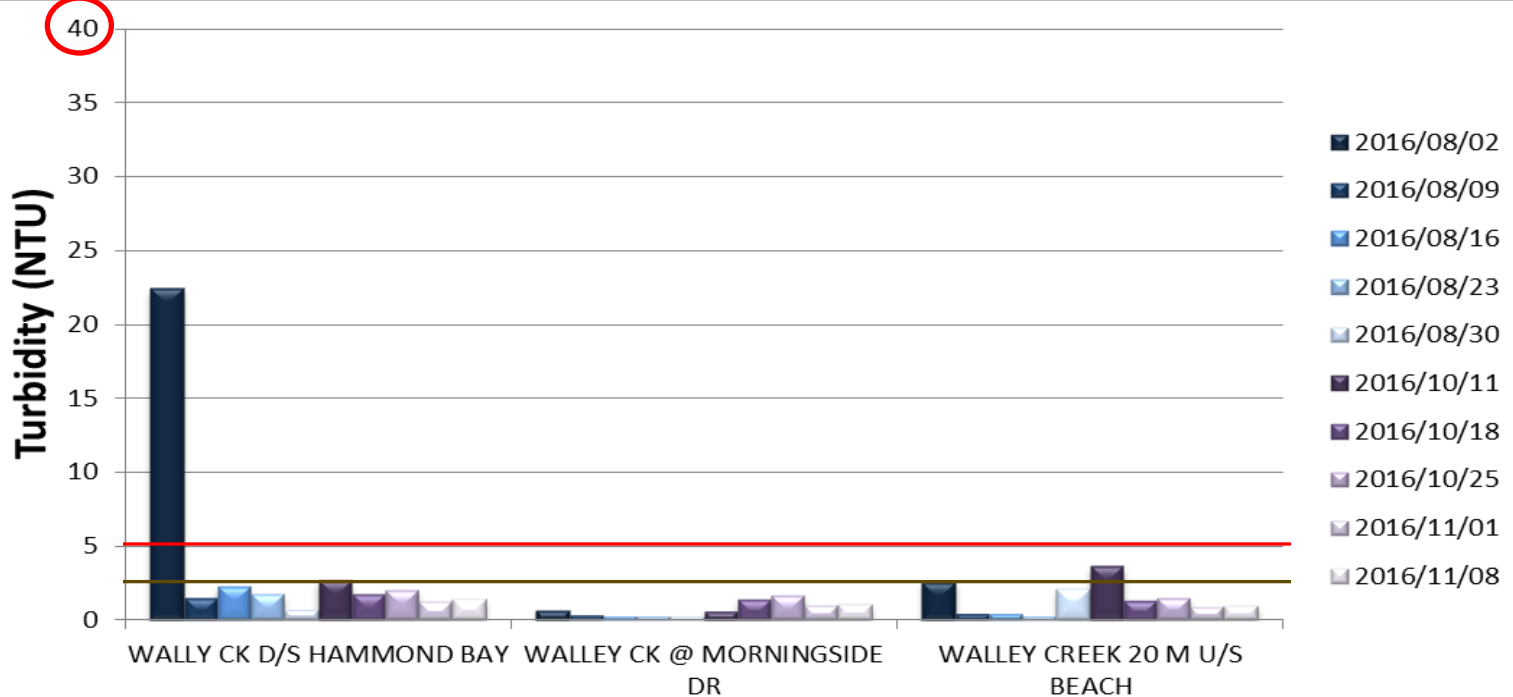
Oct-Dec max 5 NTU
(winter period)

Jan-Sept max 2 NTU
(summer period)

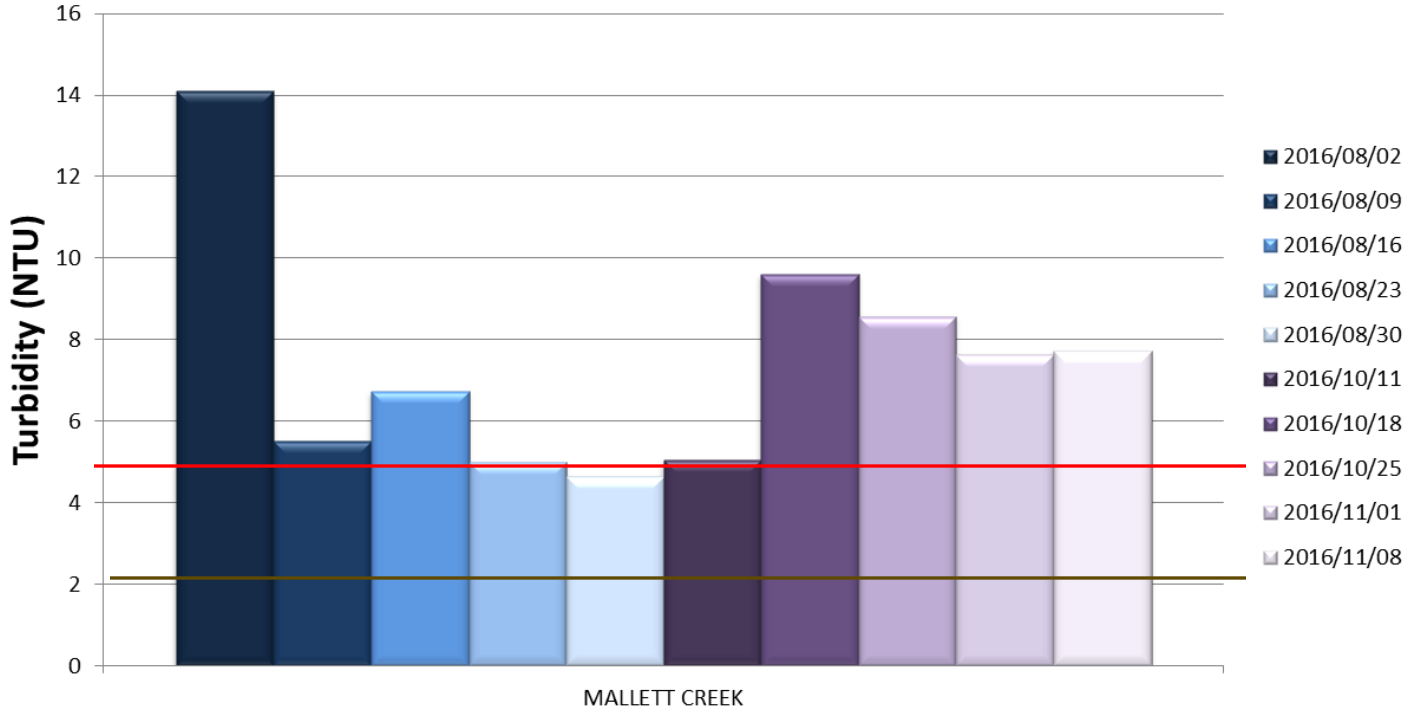


Oct-Dec max 5 NTU
(winter period)

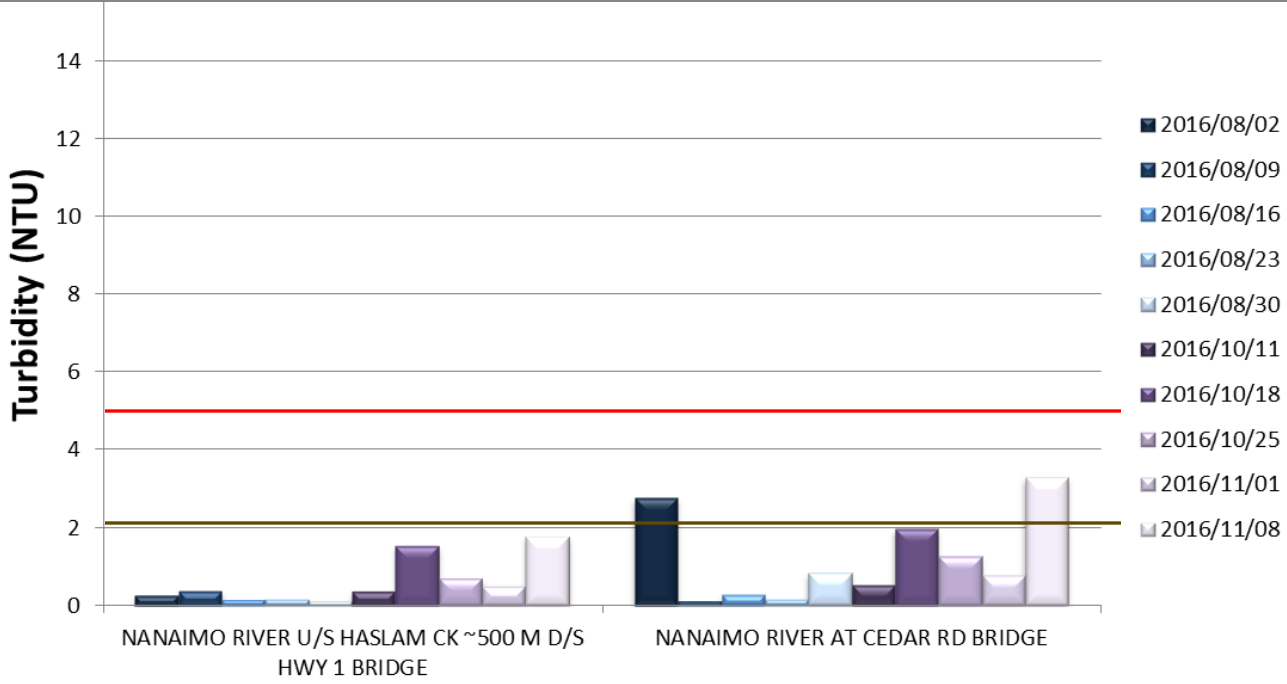
Jan-Sept max 2 NTU
(summer period)



GSK



NALT



Oct-Dec
max 5 NTU
(winter
period)

Jan-Sept
max 2 NTU
(summer
period)

Jan-Sept (summer) guideline exceeded occasionally at:

Beach Creek	Deep Bay Creek	Swayne Creek
Grandon Creek	Chase River	Cat Stream
Walley Creek	Millstone River	Beck Creek
Mallett Creek	Departure Creek	Nanaimo River

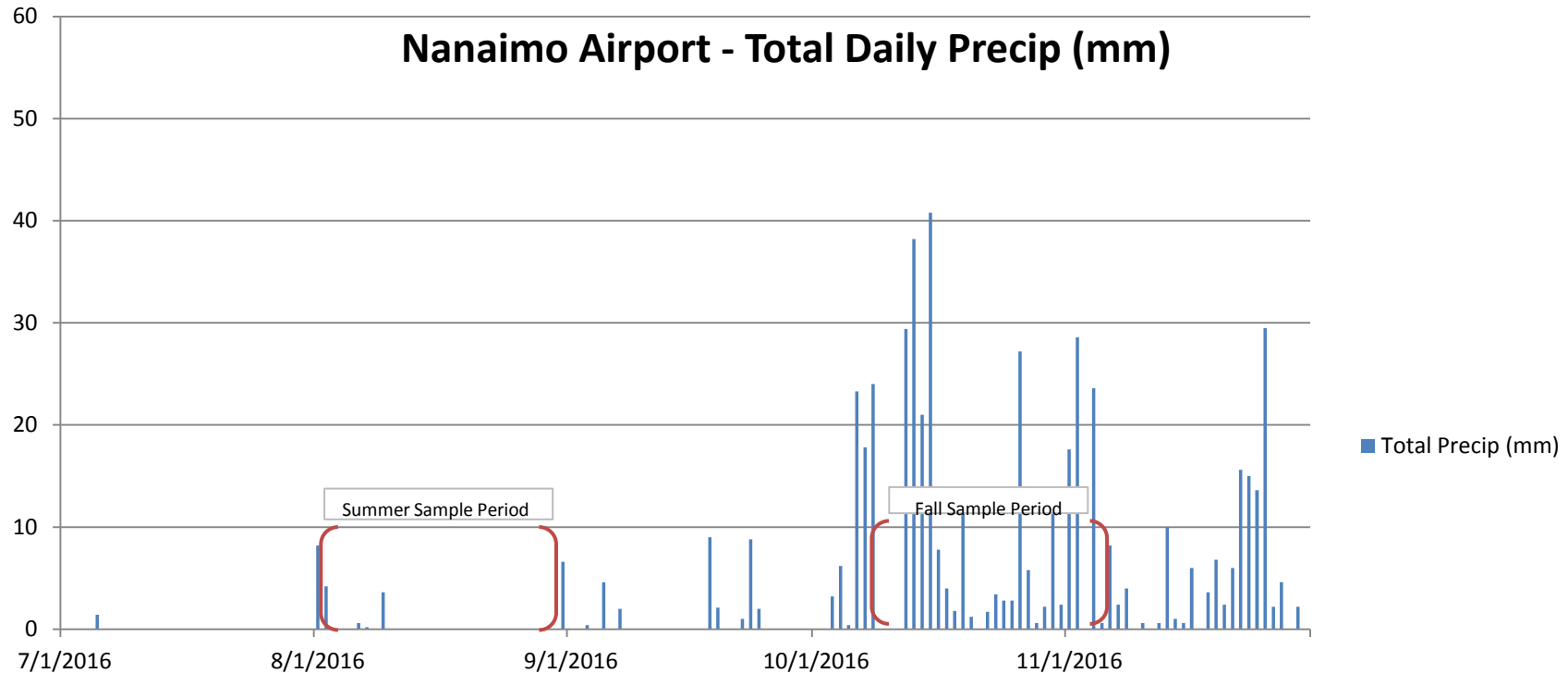
Oct-Dec (fall) guideline exceeded occasionally at:

Annie Creek	Rosewell Creek	Morrison Creek	Mallet Creek
Grandon Creek	Whiskey Creek	Englishman River	Shelley Creek

- Proximity of creeks to developed areas suggests human inputs; some high values are explained by field observations on a given day
- Increased summer values were associated with rainfall / storm events and salmon activity which was noted by several groups
- Urban streams much more difficult to interpret
- In 2016 there were more fall exceedences compared to 2015 (*Little Qualicum River, Annie Creek, Morrison Creek, Cottle Creek, Mallett Creek in '15*)
- In 2016 fall turbidity exceedences not seen in Little Qualicum River, and Cottle Creek

Turbidity

Precipitation Data - South



2014 rainfall:

- **22.6 mm** Summer (Aug 1 – Sept 10)
- **282.2 mm** Fall (Oct 1 – Nov 12)

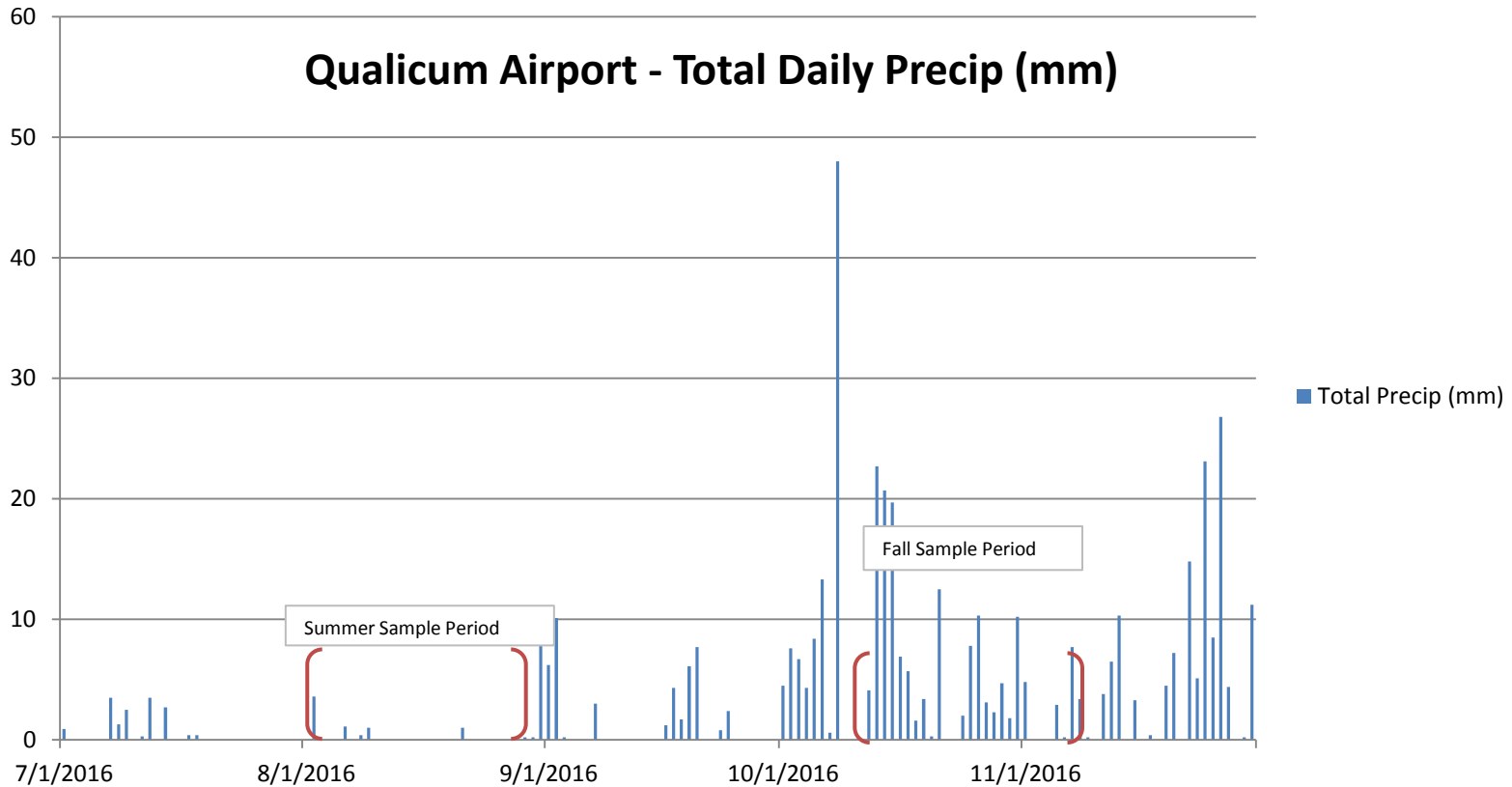
2015 rainfall:

- **22.1 mm** Summer (Aug 1 – Sept 1)
- **116.7 mm** Fall (Oct 1 – Nov 11)

2016 rainfall:

- **23.4 mm** Summer (Aug 1 – Aug 31)
- **379.2 mm** Fall (Oct 1 – Nov 8)

Precipitation Data – North



2014 rainfall:

- **29.4 mm Summer**
(Aug 1 – Sept 10)
- **187.5 mm Fall**
(Oct 1 – Nov 12)

2015 rainfall:

- **24.0 mm Summer**
(Aug 1 – Sept 1)
- **82.3 mm Fall**
(Oct 1 – Nov 11)

2016 rainfall:

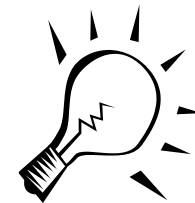
- **15.7 mm Summer**
(Aug 1 – Aug 31)
- **252.2 mm Fall**
(Oct 1 – Nov 8)

Data collected is a starting point to guide :

- Lab analysis
- Flow monitoring / Stream discharge
- Stream / riparian assessment
- Development of Water Quality Objectives



Data trend analysis can help target & inform:



Restoration projects
Outreach campaigns
Planning Review / Decisions



Now what?

Outlook for 2017...



- Continued data collection.
- Propose new sites, sites to deactivate.
- Stream assessments – Annie Creek & Cat Stream.
- Stewardship seed funding still available!

BASED ON Ministry of Environment STAFF AVAILABILITY:

- Select sites for lab analysis for 2017.....
- Analyze trends for 6 year mark for groups that started in 2011.
- Analyze trends for 3 year mark for the sites that were added in 2014.

Great work everyone!



Your communities and streams
thank you!

