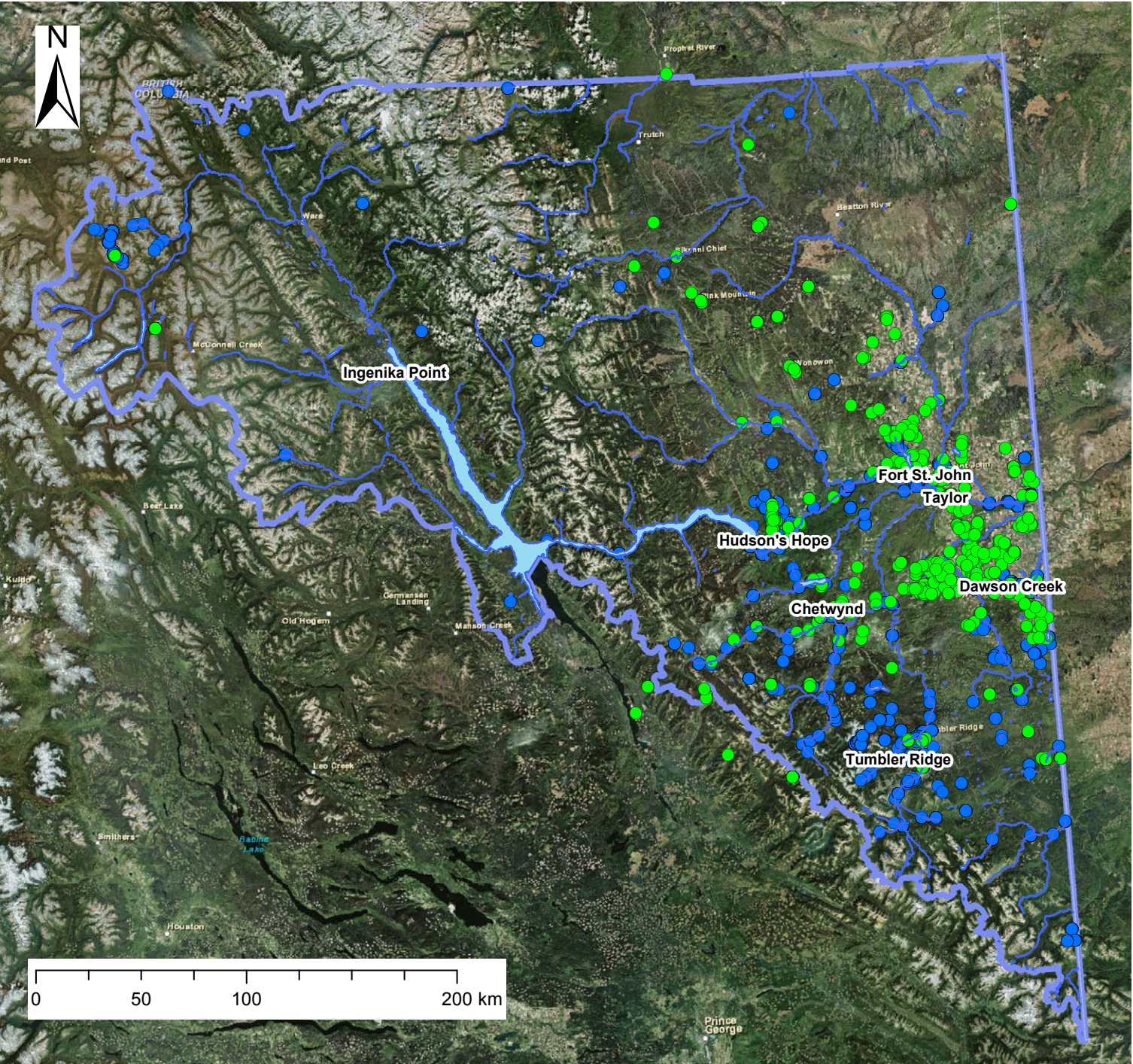


WATER CHEMISTRY

Surface Water and Groundwater Chemistry Data

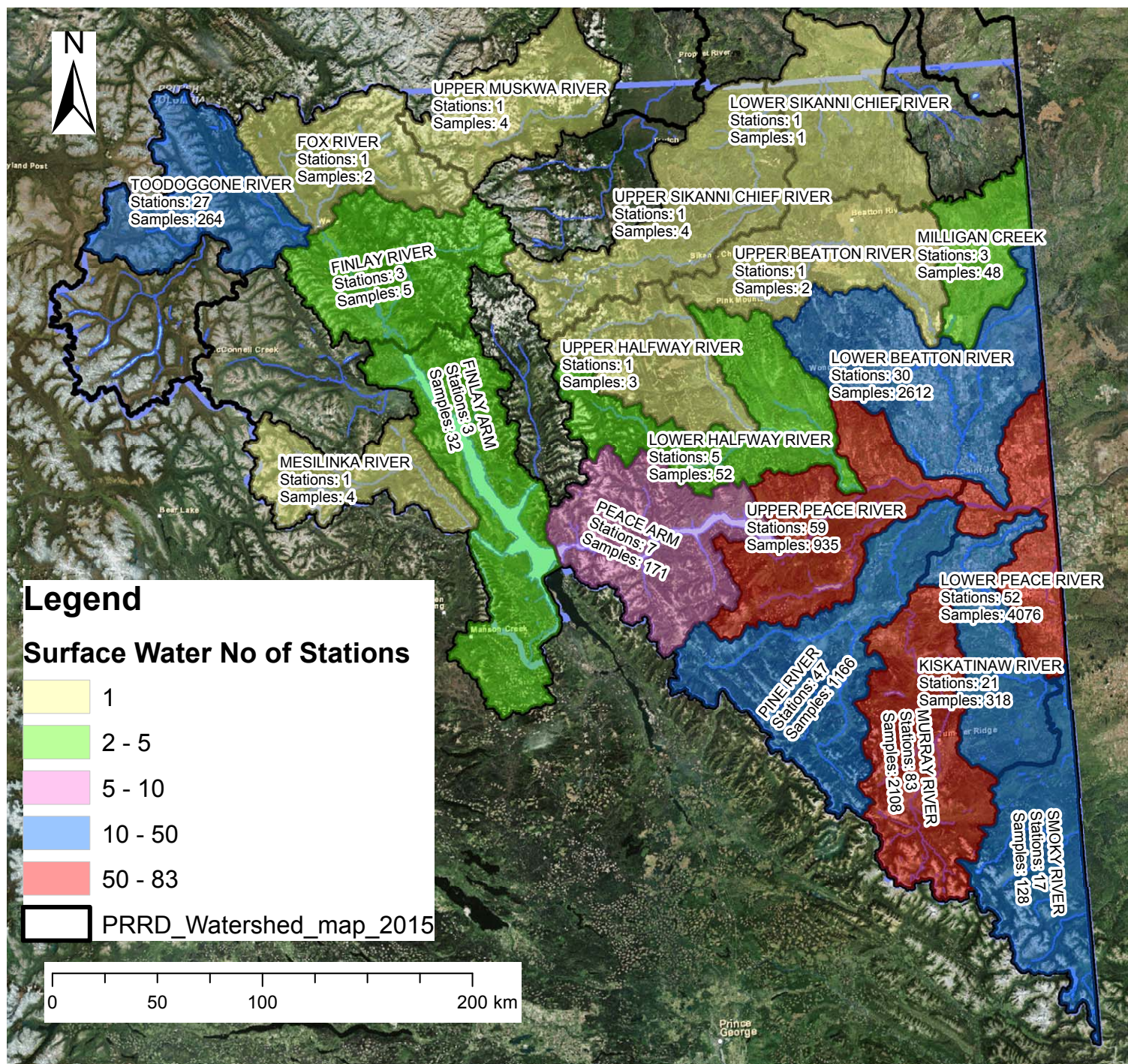


- Groundwater
- Surface water

PRRD Database

Total Samples	Monitoring sites	Water Source
935	468	Groundwater
11,935	364	Surface water
12,870	832	Total

Stations & Samples per Watershed



Watershed	Number of stations	Number of samples
FINLAY ARM	3	32
FINLAY RIVER	3	5
FOX RIVER	1	2
KISKATINAW RIVER	21	318
LOWER BEATTON RIVER	30	2612
LOWER HALFWAY RIVER	5	52
LOWER PEACE RIVER	52	4076
LOWER SIKANNI CHIEF RIVER	1	1
MESILINKA RIVER	1	4
MILLIGAN CREEK	3	48
MURRAY RIVER	83	2108
PEACE ARM	7	171
PINE RIVER	47	1166
SMOKY RIVER	17	128
TOODOGGONE RIVER	27	264
UPPER BEATTON RIVER	1	2
UPPER HALFWAY RIVER	1	3
UPPER MUSKWA RIVER	1	4
UPPER PEACE RIVER	59	935
UPPER SIKANNI CHIEF RIVER	1	4
Total	364	11935

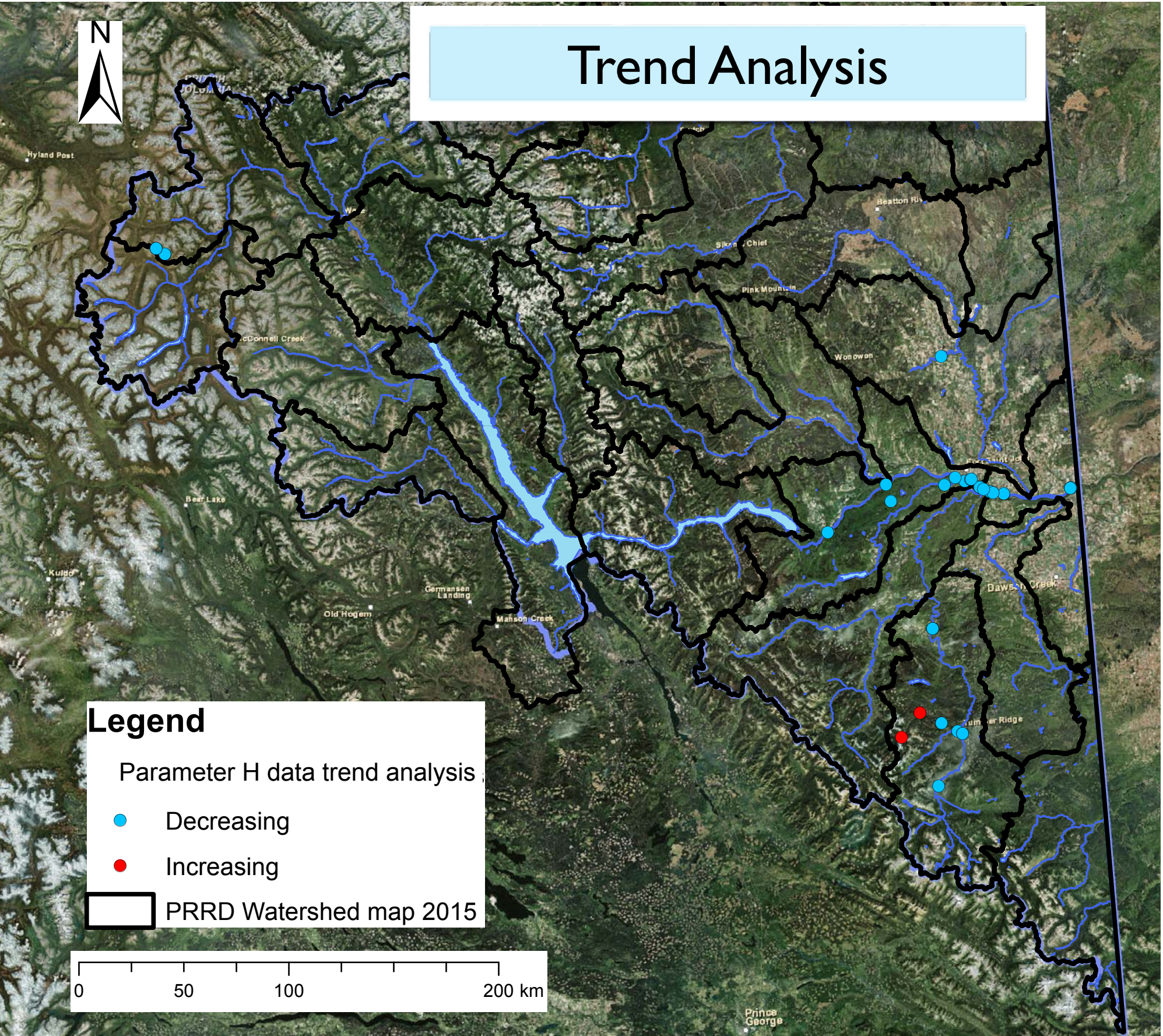
Query Function

Table Of Contents

- Thallium
 - 0.000001 - 0.000001
 - 0.00008 - 0.00008
- PRRD_Surface
 - Selenium
 - 0.00001 - 0.00001
 - 0.001 - 0.001
 - Mercury
 - 0.0 - 0.000
 - 0.000027 - 0.000027
 - Lead_Pb
 - 0.000005 - 0.000005
 - 0.001 - 0.001
 - Copper
 - 0.00002 - 0.00002
 - 0.002 - 0.002
 - Cadmium
 - 0.000001 - 0.000001
 - 0.00009 - 0.00009
 - ☒ PRRD_Surface
 - parameter A _mg_L_
 - 0.00001 - 0.00001
 - 0.1 - 214.0
 - PRRD_Surface_water_Aluminum
 - Aluminum_AI_Total_mg_L_
 - 0.0002 - 0.1
 - 0.1 - 214.0
 - PRRD_Surface_water_LEAD
 - PRRD_GW_Nitrates_N
 - Boron_Surface_water
 - PRRD_CHEMISTRY_DATABASE_JULY_25_2014
 - PRRD_Surface_water_Oct_2014_map
 - Northern_Health_Authority_10_2014

Context Menu:

- Copy
- Remove
- Copy Properties
- Paste Properties
- Open Attribute Table
- Joins and Relates
- Zoom To Layer
- Zoom To Make Visible
- Visible Scale Range
- Use Symbol Levels
- Selection
- Label Features
- Definition queries
 - Manage queries...
 - Turn selection to query
 - None
 - January-April_2011
 - May-July_2011
 - August-October_2011
 - Nov-Dec_2011
 - Jan-Apr_2004
 - May-Jul_2004
 - Aug-Oct_2004
 - Nov-Dec_2004
 - Jan-Apr_2013
 - May-Jul_2013
 - Aug-Oct_2013
 - Nov-Dec_2013
 - Jan-Apr_2012
 - May-Jul_2012
 - Aug-Oct_2012
 - Nov-Dec_2012
 - Above 1 mg/l
 - 1990
 - 2004
 - 2011
 - 2014
 - up to 2007
 - up tp 2014
- Edit Features
- Edit with MS Excel
- Import Edits from MS Excel
- Convert Labels to Annotation...
- Convert Features to Graphics...
- Convert Symbolology to Representation...
- Data
 - Save As Layer File...
 - Create Layer Package...
 - Find Associated Documents and Datasets...
- Properties...



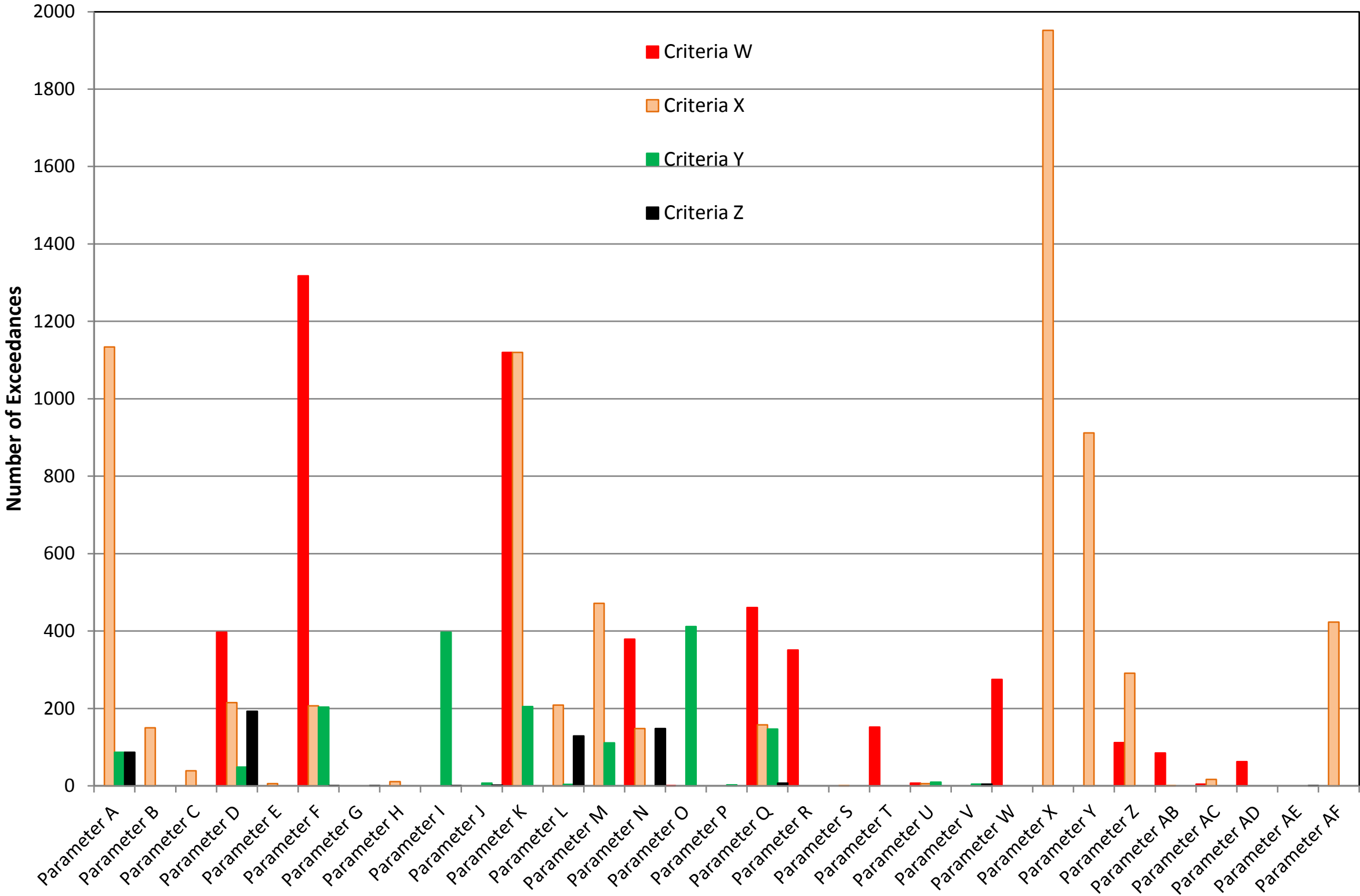
Mann Kendall Trend Analysis

Manage queries...

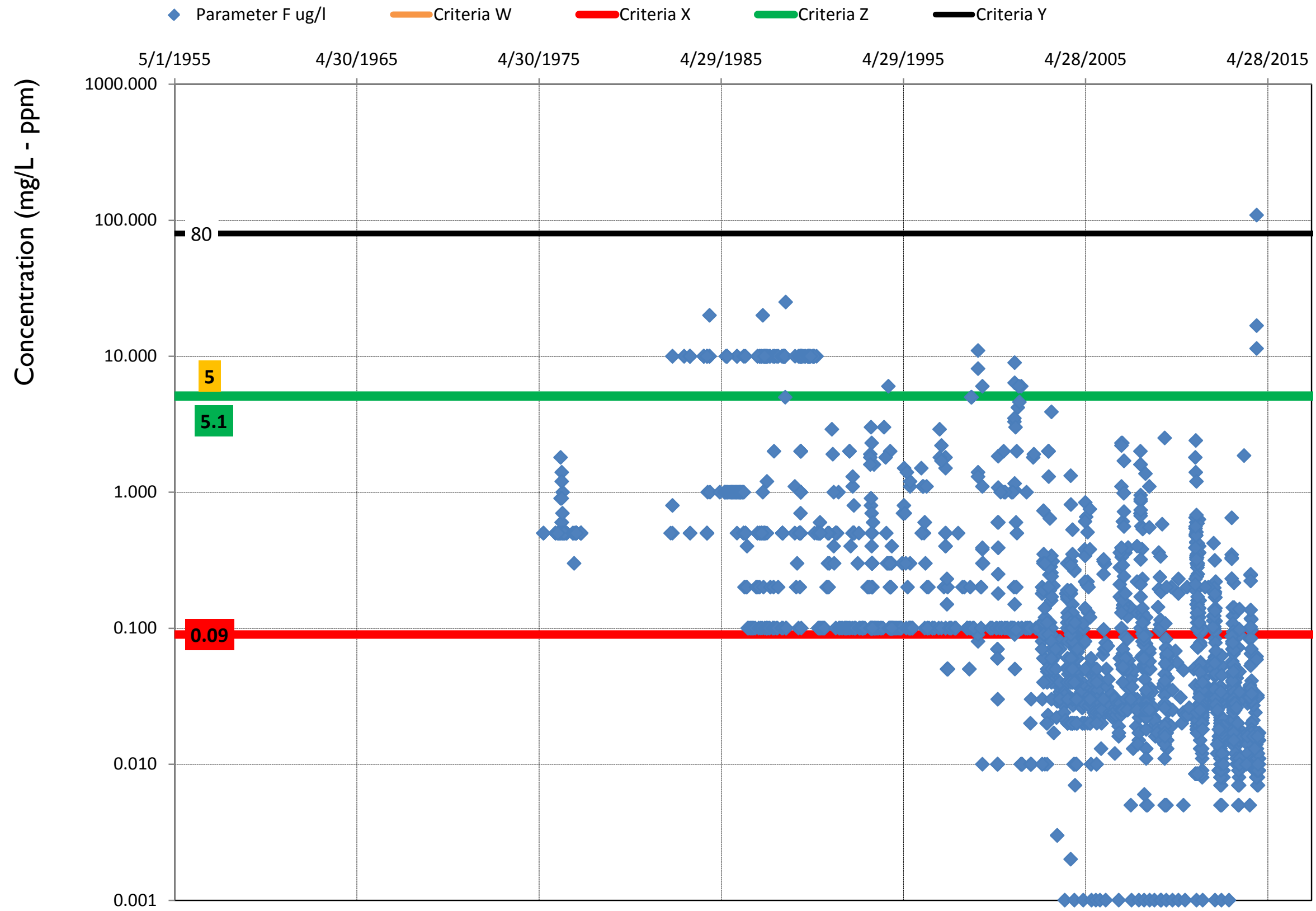
Turn selection to query

- Parameter A
- Parameter B
- Parameter C
- Parameter D
- Parameter E
- Parameter F
- Parameter G
- ☒ Parameter H
- Parameter I
- Parameter J
- Parameter K
- Parameter L
- Parameter M
- Parameter N
- Parameter O
- Parameter P
- Parameter Q
- Parameter R
- Parameter S
- Parameter T
- Parameter U
- Parameter V
- Parameter W
- Parameter X
- Parameter Y
- Parameter Z

Surface Water - Whole Region
Parameters Above Guidelines

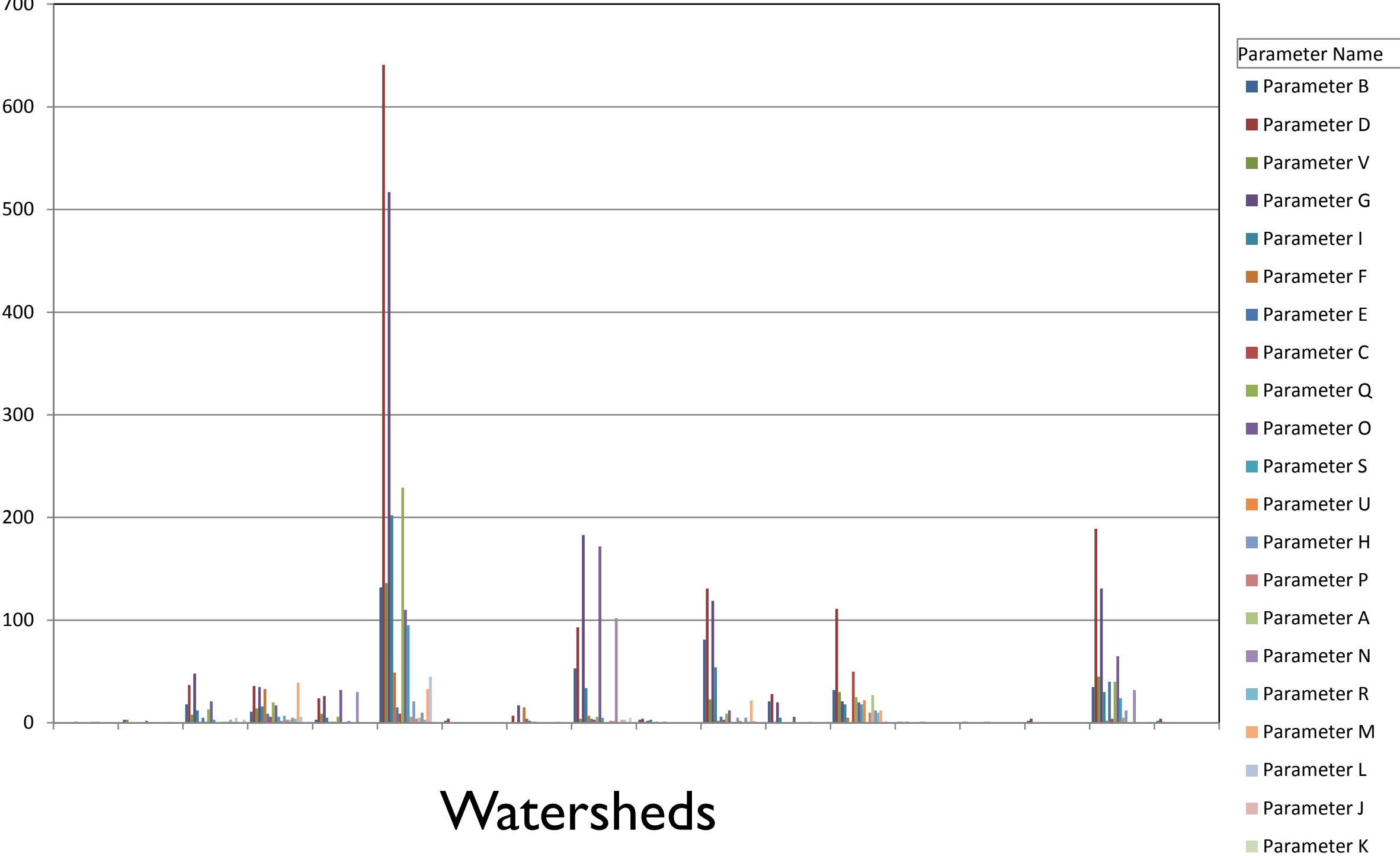


Parameter F - Whole Region

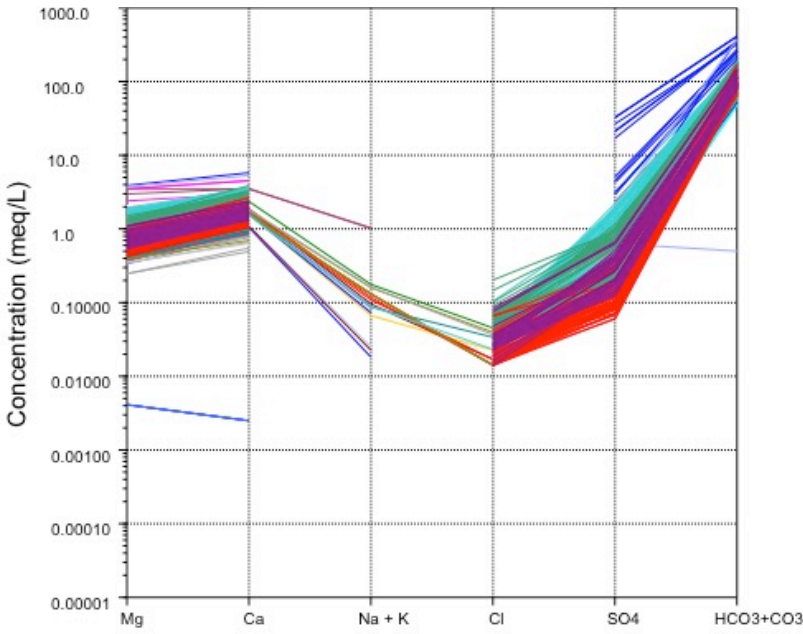
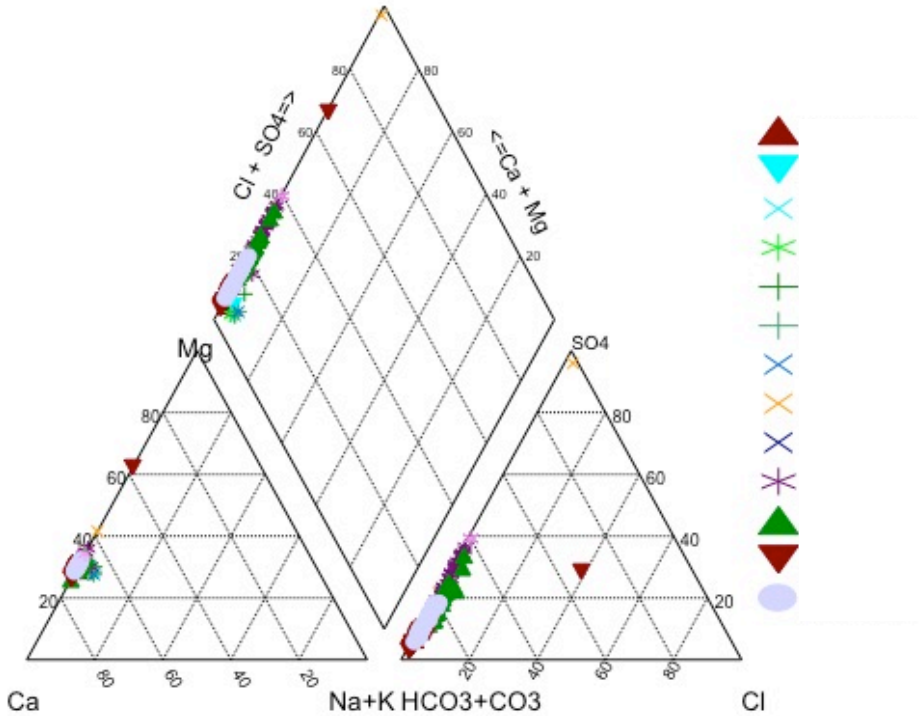
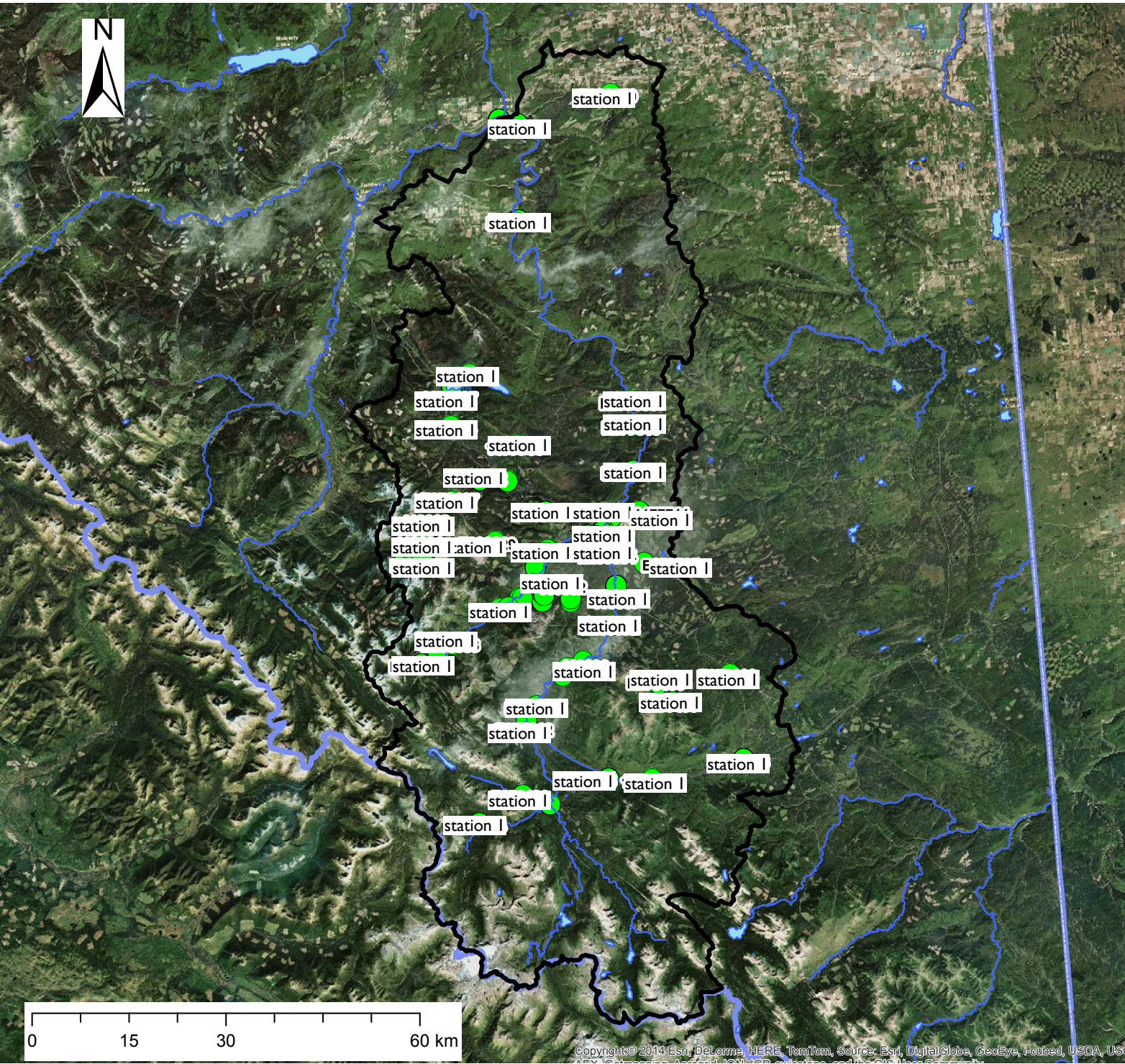


Surface Water Water Chemistry per Watershed (Criteria A)

Sum of Criteria W Exceedances

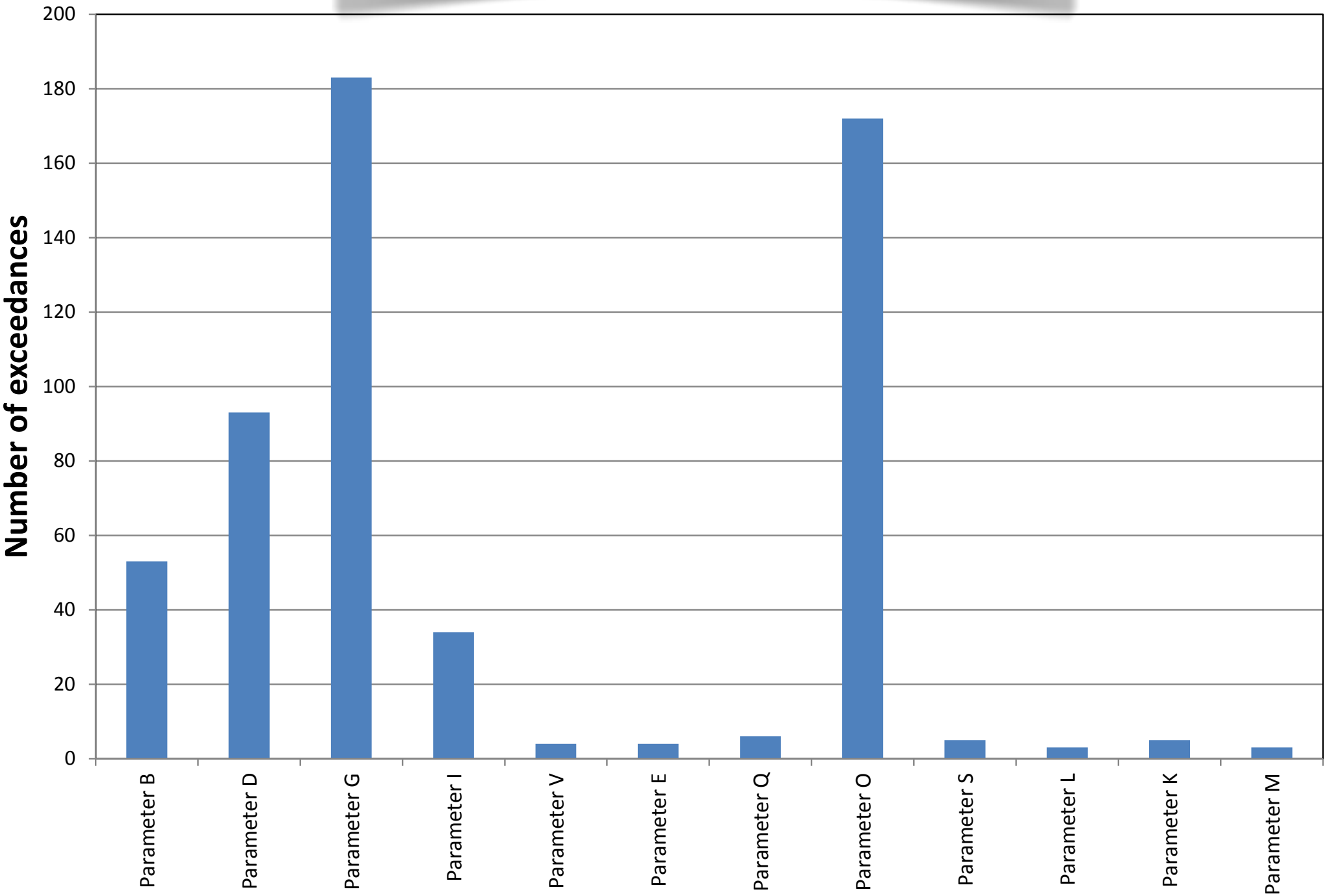


Surface Water Water Chemistry per Station in Watershed



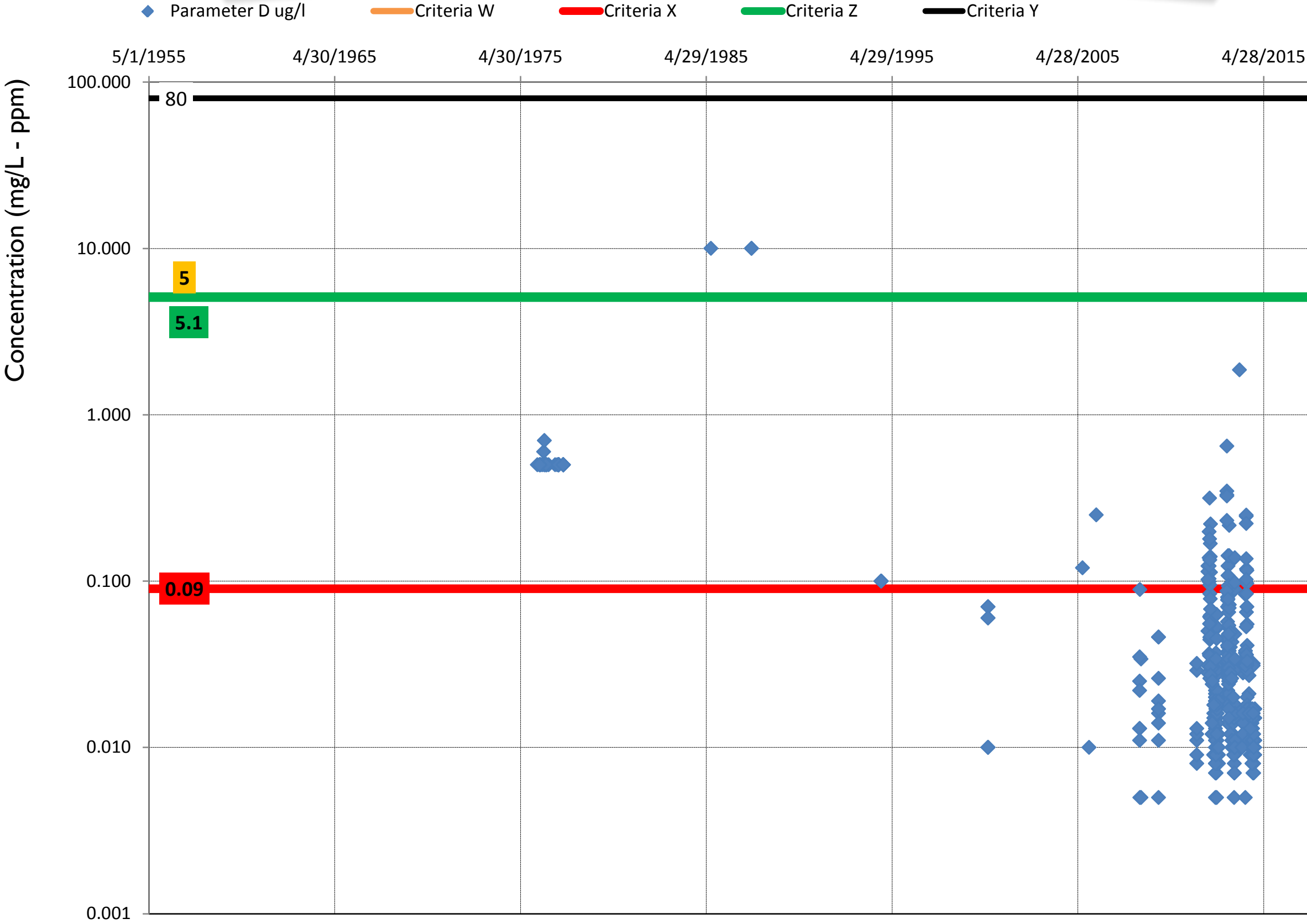
Sum of Criteria W Exceedances

Surface Water
Watershed A

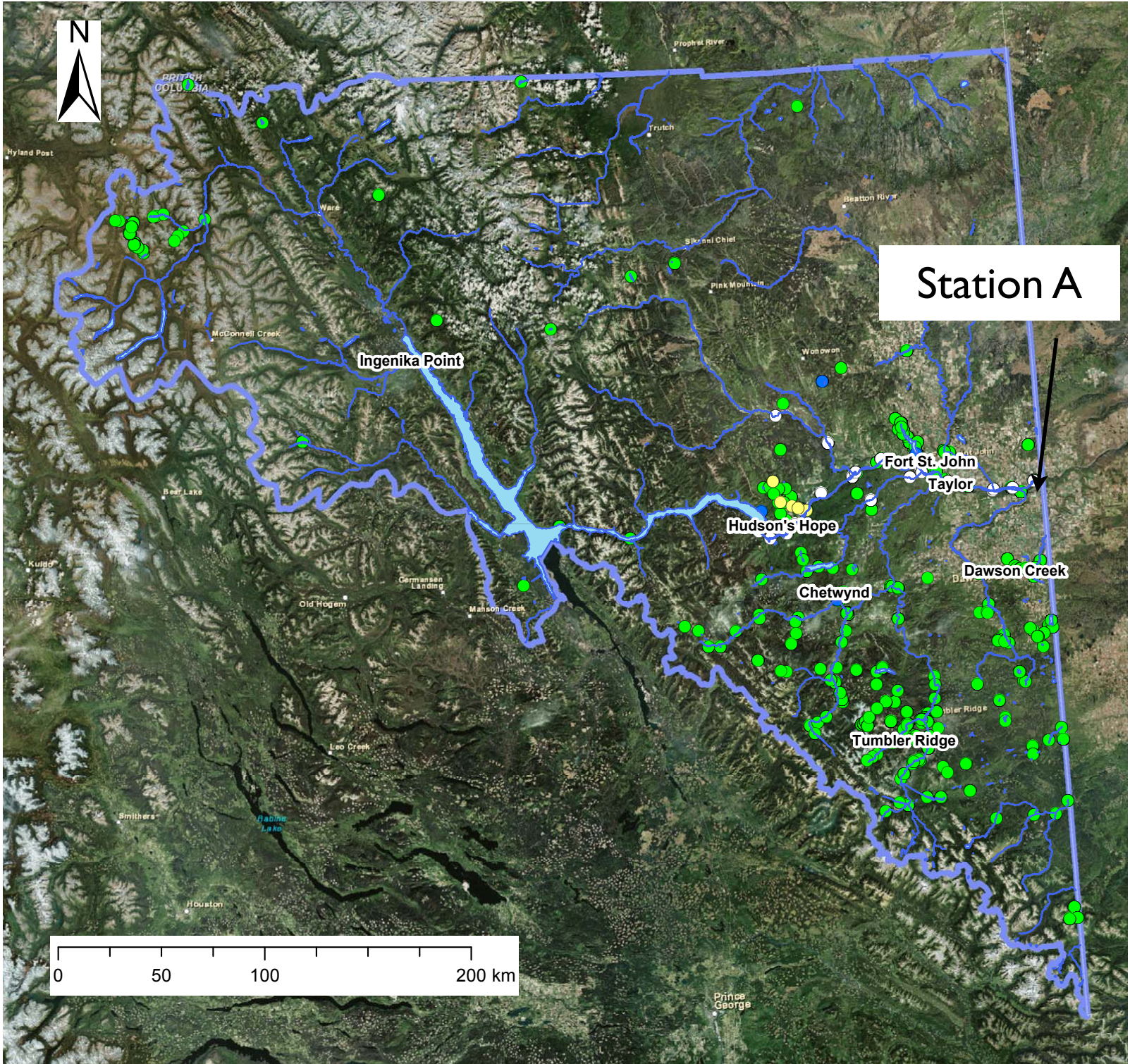


Parameter Name

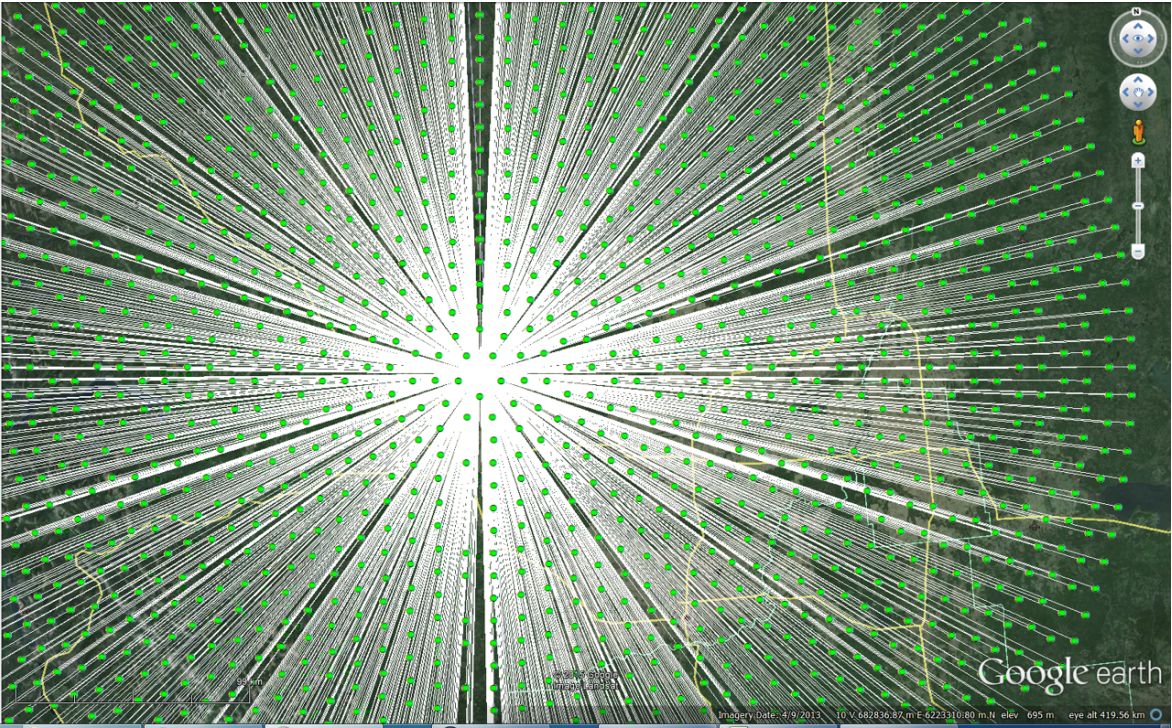
Parameter D - Watershed A



Surface Water
Water Chemistry per Station



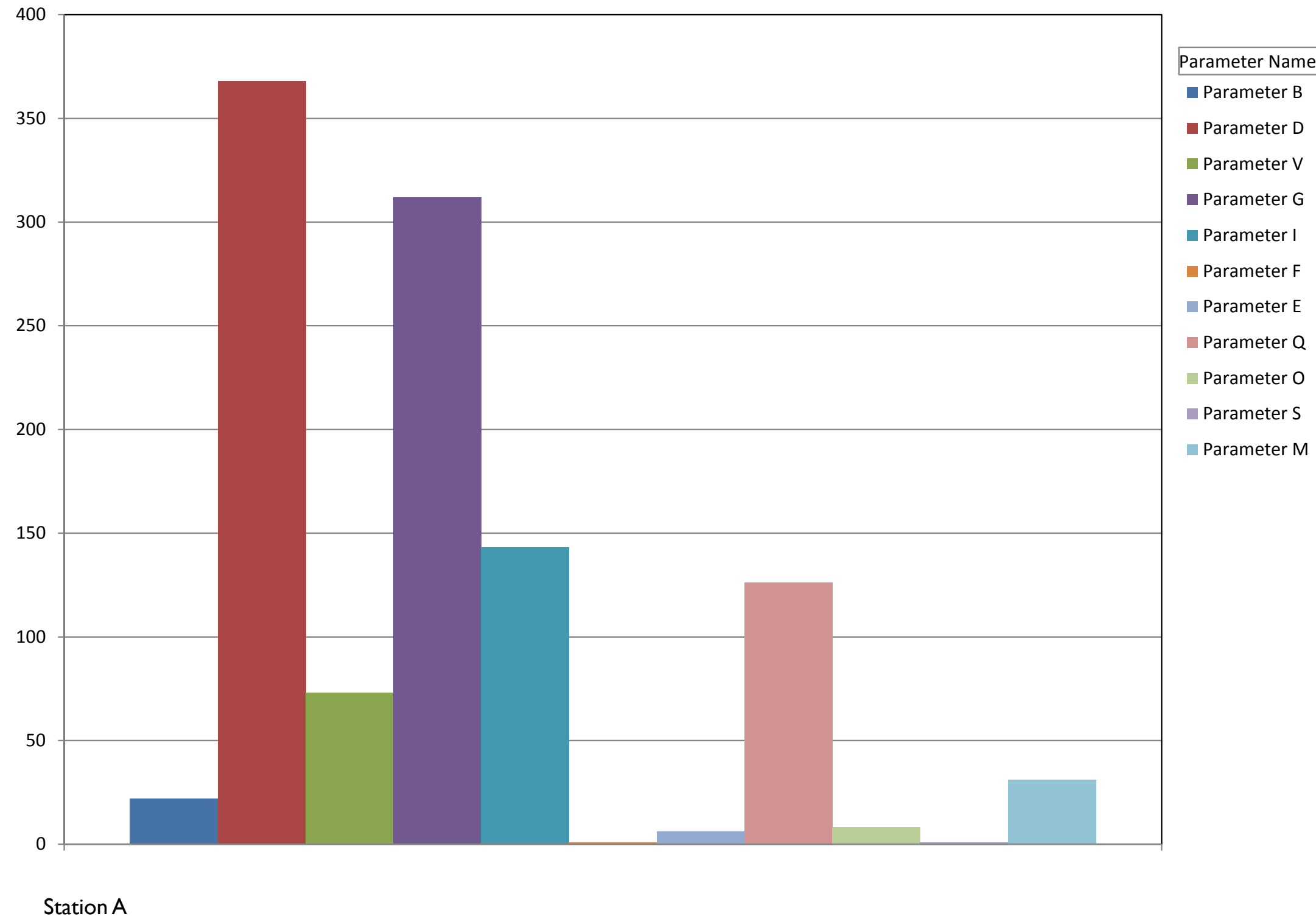
Station A	Number of Samples	Sampled From	Sampled To
	2071	1984	2013



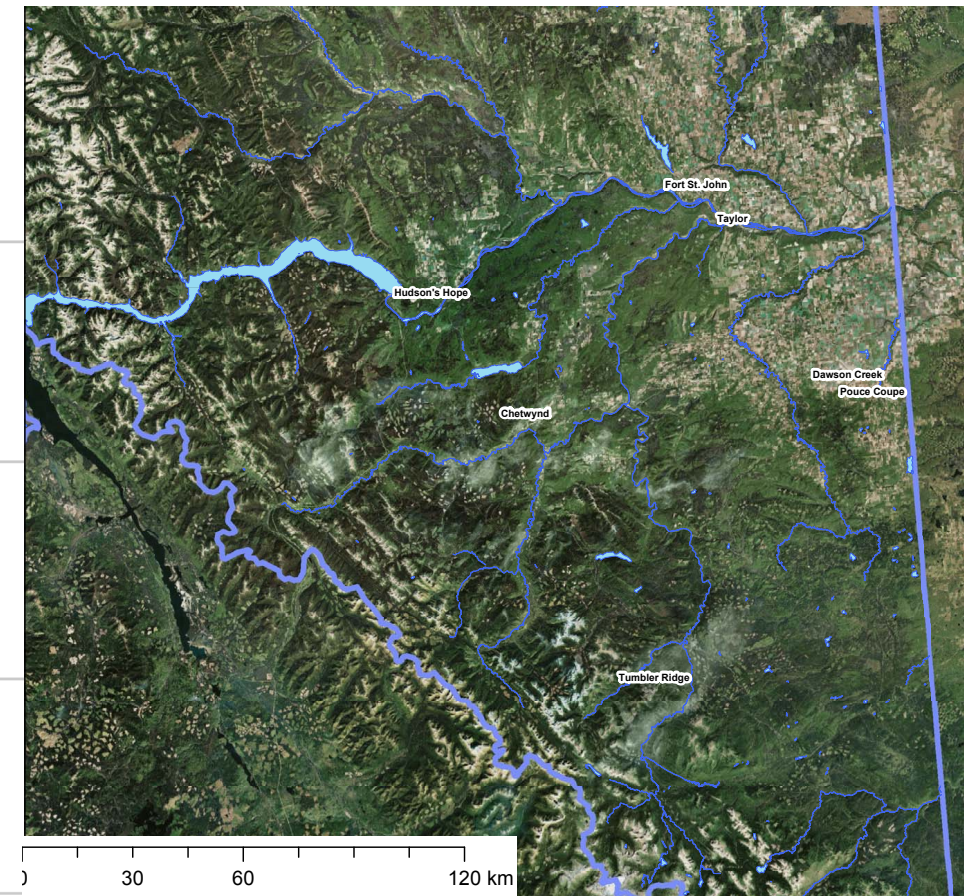
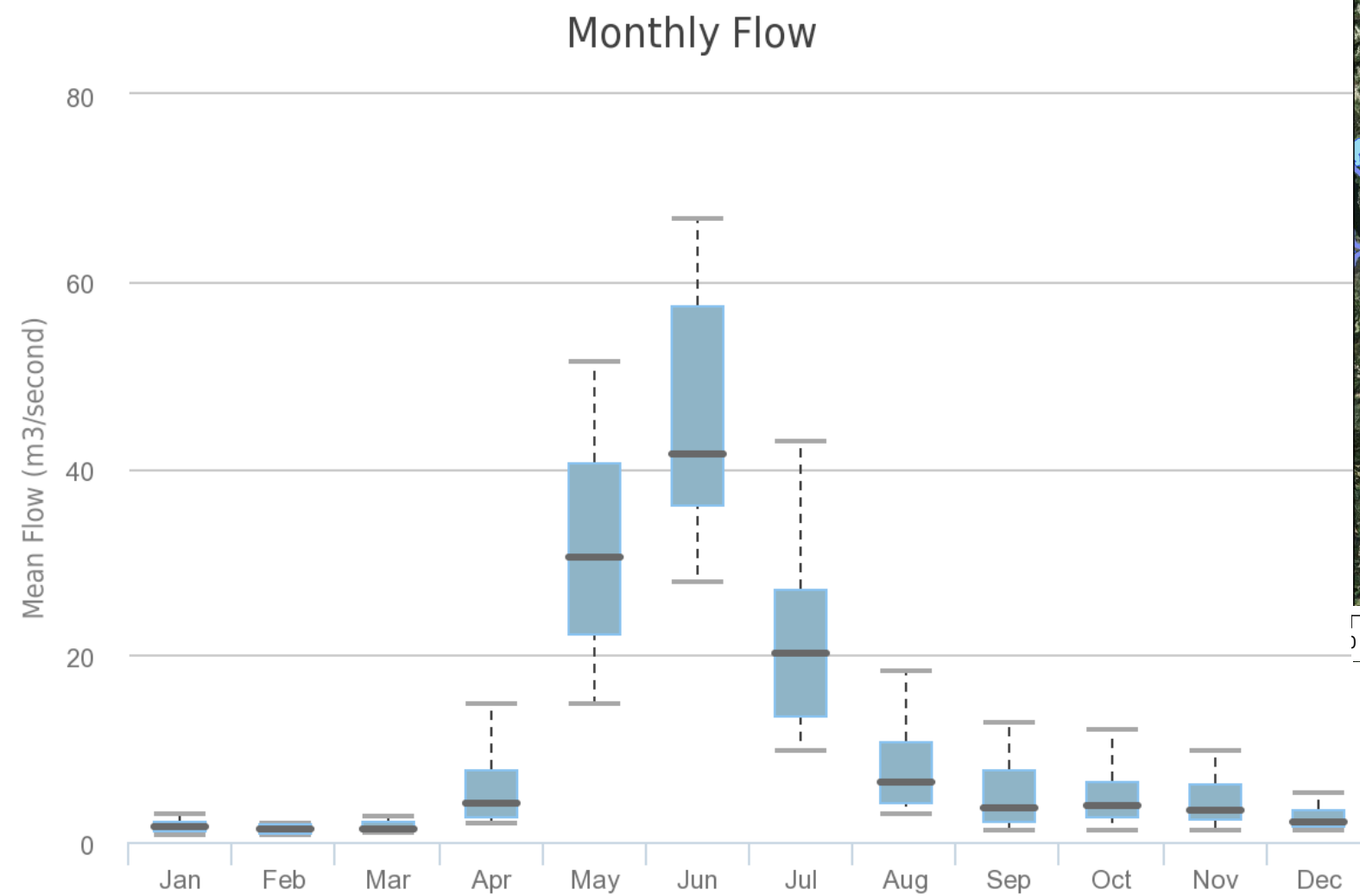
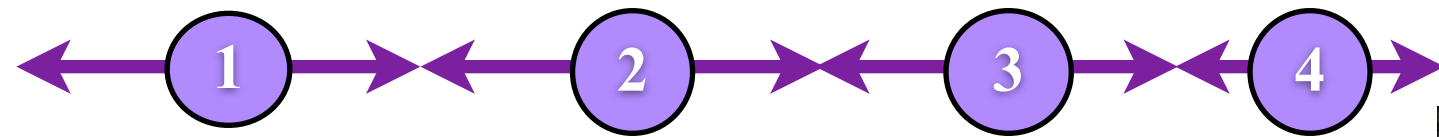
Surface Water

Water Chemistry per Station - Samples/Parameters Above Criteria W Guidelines

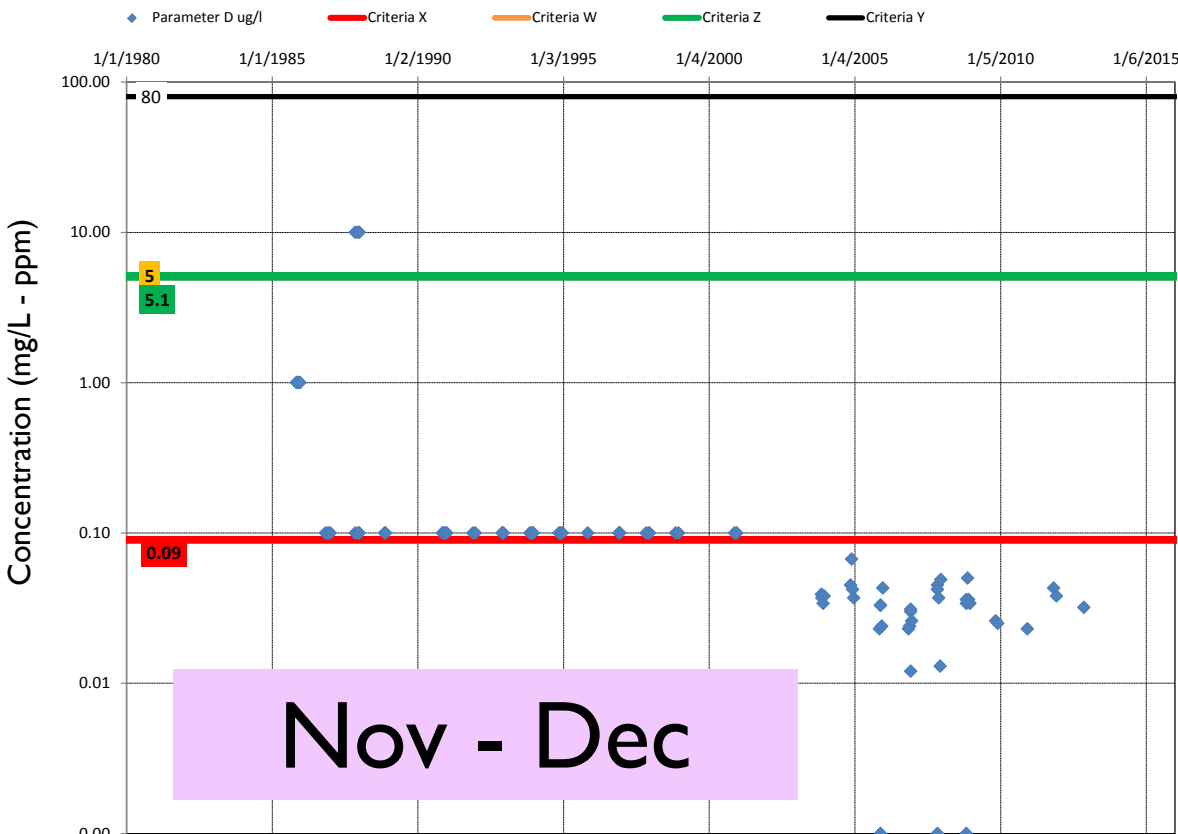
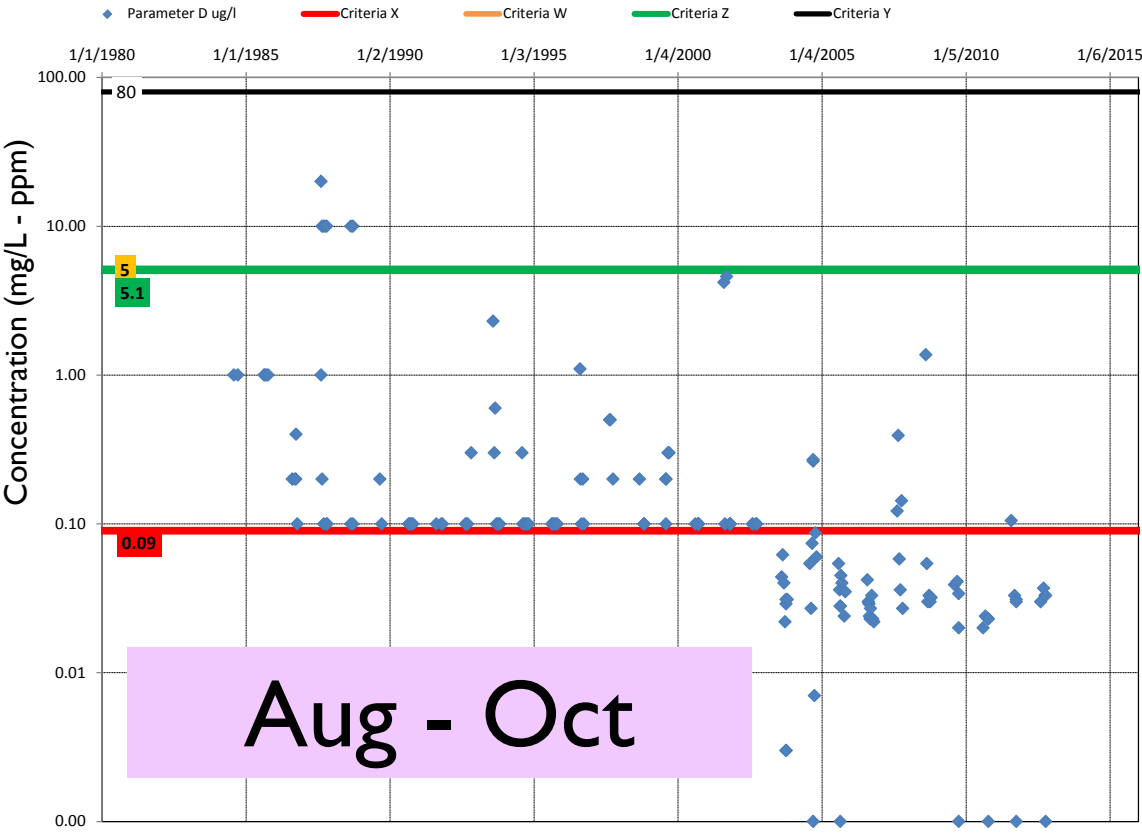
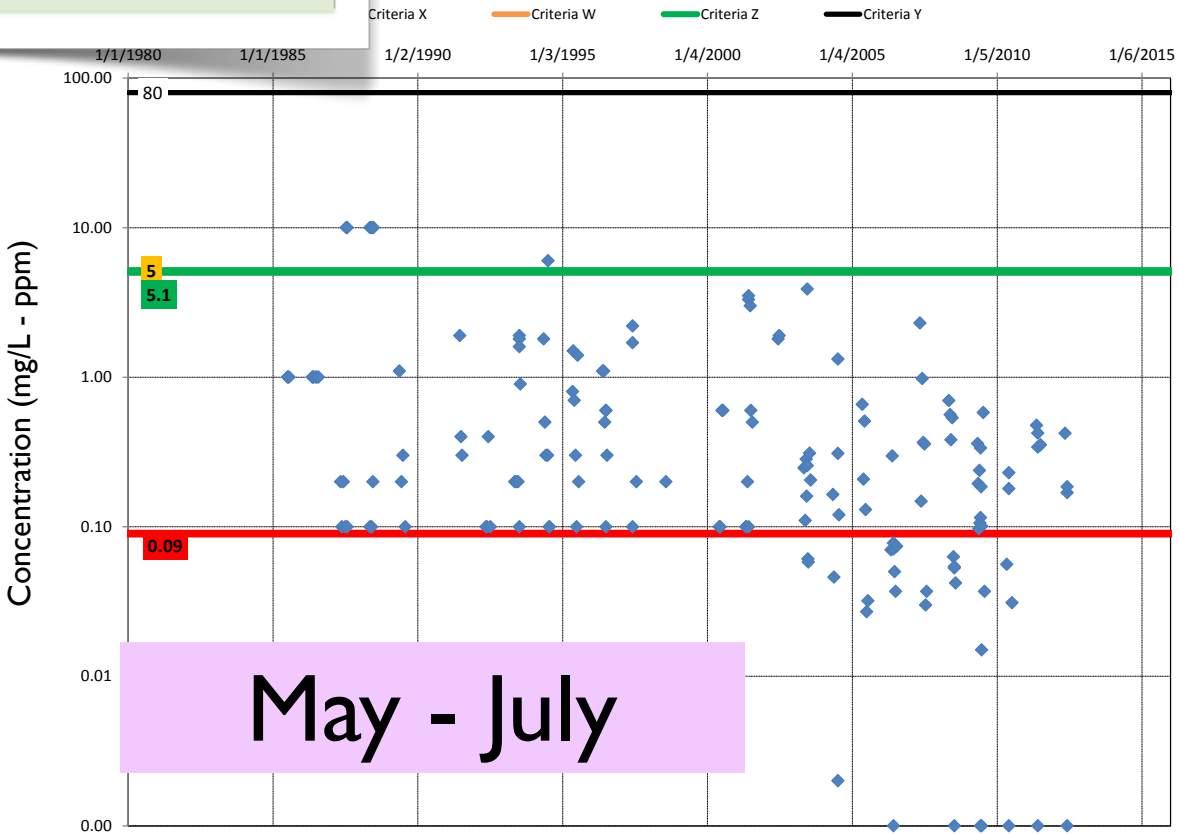
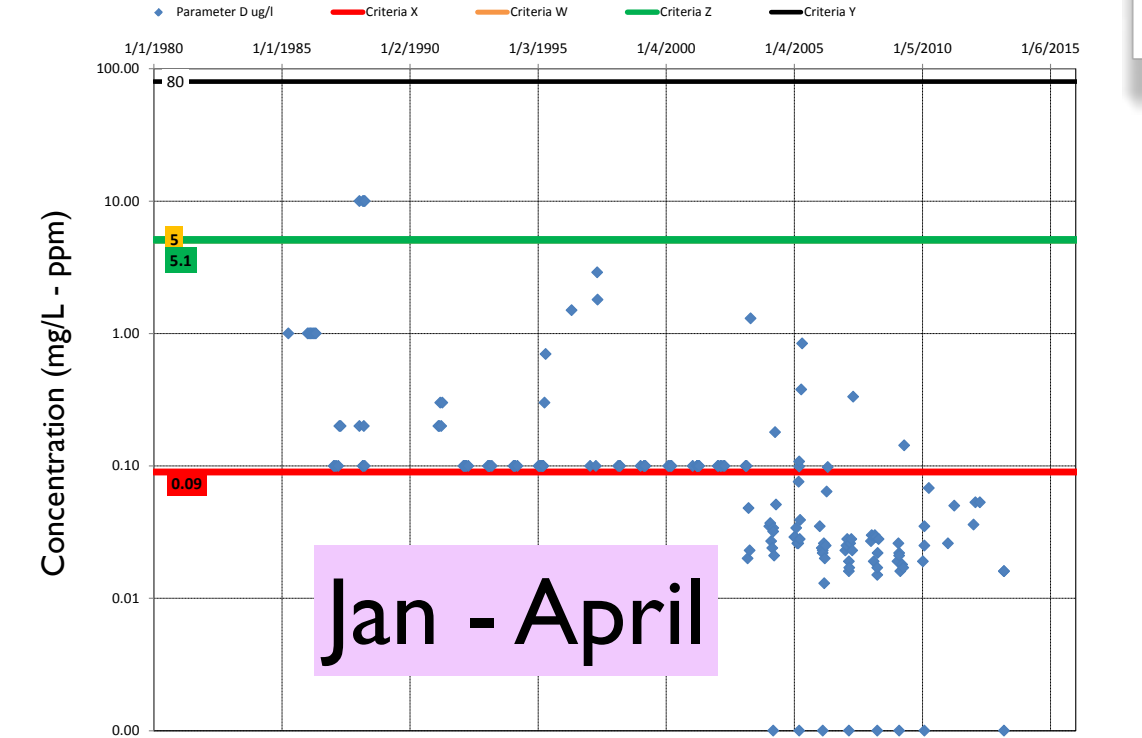
Sum of Criteria W Exceedances



Seasonal Fluctuation of River Flows



Parameter D vs Seasons
Station A



Data Interpretation Context

- Background values
- Changing detection limits
- Seasonal effects

Next Steps

- Data interpretation, graphing, mapping (peer reviewed)
- Potential application
 - Water for irrigation
 - Seasonal effects

Limitations

- Lack of data/stations in some watersheds
- Accuracy of older data
- Availability/change of guidelines/criteria
- Time/budget



(photograph: Dr. Gilles Wendling)

THANK YOU

Dr Gilles Wendling & PRRD Team