

***Mount Nansen
Water Balance and Water Quality Model
Report***

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1. Introduction

1. Introduction

The Mount Nansen (MN) Site (the Site) is an abandoned gold and silver mine, located approximately 60 km west of Carmacks, Yukon. The Site is within the Traditional Territory of the Little Salmon Carmacks First Nation. In 1999, the owner, BYG Natural Resources Inc., terminated operations. Following shutdown, BYG appointed a receiver to the Site, who later abandoned the property that same year. Through the Devolution Transfer Agreement, the Government of Yukon became responsible for the Site in 2003, along with associated remediation. The main components of the Site include an open pit and adjacent waste rock piles, a mill complex, a tailings storage facility (TSF), a tailings dam seepage collection pond, and a seepage collection pond dam. Discharge from the seepage collection pond is controlled and pumped over the seepage collection pond dam and into Dome Creek. Discharge from the seepage collection pond represents the point of discharge for the Site.

This document outlines methods used to develop a water balance and water quality model (the model) for the purposes of assessing the effects of the Site on the downstream receiving environment, including Dome and Victoria Creek. The model is used to evaluate current effects from the Site on Dome and Victoria Creeks, including inputs from upper Dome Creek and the mill area, inputs from the tailings management facility and discharge from the seepage collection pond, as well as the benefits of proposed water treatment of surface discharge from the tailings seepage collection pond. Ultimately, model results are used to support the overarching surface water quality effects assessment for the Site as well as inform the design and performance specifications of the water treatment facility. Details of the water treatment process, operation, and performance are provided in Appendix 7E of the Mount Nansen Care and Maintenance Project Proposal.

Water treatment is an interim mitigation measure for the care and maintenance period until the closure plan is implemented. The treatment process is designed to remove total suspended solids (TSS) and total iron (T-Fe) but is also expected to be beneficial for the removal of other total metals such as arsenic, cadmium, iron, and zinc. Total manganese (T-Mn) removal is not included in the treatment process because the conclusions from the surface water quality assessment suggest T-Mn treatment is not needed at this time. The water treatment process may provide some T-Mn removal, however the model assumes no removal. Further monitoring as per the aquatic effects monitoring plan (AEMP) will provide the basis for environmental effects monitoring of indicators of aquatic health and future decision-making regarding water quality objectives, discharge limits, and decision-making with respect to water treatment.

2. Model Structure and Setup

2. Model Structure and Setup

The Mount Nansen water balance and water quality model was developed to better understand current chemical loading and flows within the regional study area of the Site. The primary source for loading comes from seepage and pumped discharge from the tailings facility into Dome Creek. An upper-catchment diversion around the tailings pond has been well characterized for flow and geochemistry, allowing the downstream modelling of water quality in Dome Creek, and further along past the confluence of Dome and Victoria Creeks.

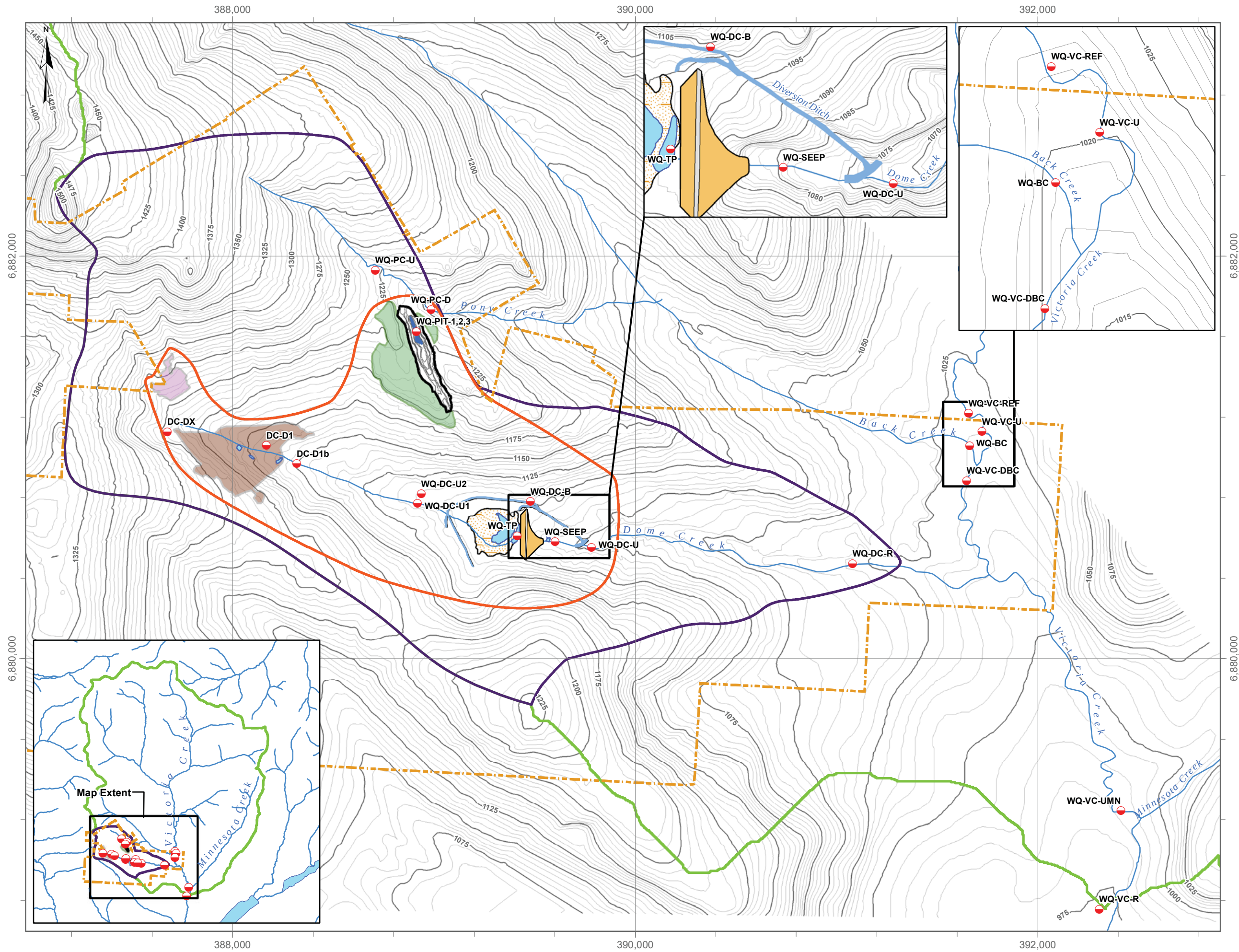
This section describes the general structure of the model, the flow and geochemical source term assumptions and the methodology applied to the water treatment sensitivity.

2.1 Water Balance Model Structure

The water balance and water quality model (WBQM) was written on the GoldSim numerical modelling platform. GoldSim was initially developed to track the flow and chemical fate of radionuclides in the surface and ground water aquifers near nuclear disposal sites. It has grown to become one of the premier modelling tools for surface flow and water quality modelling. GoldSim has an extensive toolbox of elements that can simulate water in advective and diffusive environments, track reservoir storage levels and the storage and release of water from ice generation.

Reconstructed streamflows were generated for the model at a daily time-step, which allows the WBQM to also run with a daily time-step. Geochemical source terms in the model are derived from monthly water quality observations.

The project study area with surface water quality monitoring locations is illustrated in Figure 2-1. A schematic of the Mt. Nansen model layout is shown in Figure 2-2. The primary flow inputs are the upstream inputs of Dome Creek and Victoria Creek (stations DC-B and VC-DBC), and the seepage rate from the tailings facility. Geochemical loading comes from the tailing seep water quality records, as well as the background characterizations of Dome and Victoria Creeks. Loadings from upstream sources are incorporated into the model for Dome and Victoria Creeks and are based on water quality monitoring from DC-B and VC-DBC water quality stations, respectively. Upstream contributions from the mill area report to Dome Creek monitoring station DC-B and are accounted for in the model. Likewise, upstream contributions from Pony and Back Creeks, including placer mining effects, report to Victoria Creek monitoring station VC-DBC and are incorporated into the model. Flow and water quality are monitored at the downstream station DC-R (Dome Creek) and VC-UMN (Victoria Creek).



LEGEND

- Water Quality Monitoring Station
- PSA
- LSA
- RSA
- Mount Nansen OIC Boundary
- Mill Area
- Mine Camp Area
- Tailings Dam
- Tailings
- Pond
- Pit Outline
- Waste Rock Area
- 25m Contour
- 5m Contour

Coordinate System: NAD 1983 UTM Zone 8N
 Projection: Transverse Mercator
 Datum: North American 1983
 Units: Meter

1:18,000

0 200 400 Meters

DATE SAVED: Mar 29, 2017

DRAWN BY: GM

REVIEWED: JM

VERSION: 1

CLIENT:

PROJECT:

Mount Nansen Care & Maintenance Project Proposal

TITLE:

Study Area and SWQ Monitoring Locations

PROJECT #: A422-1

FIGURE: 2-1

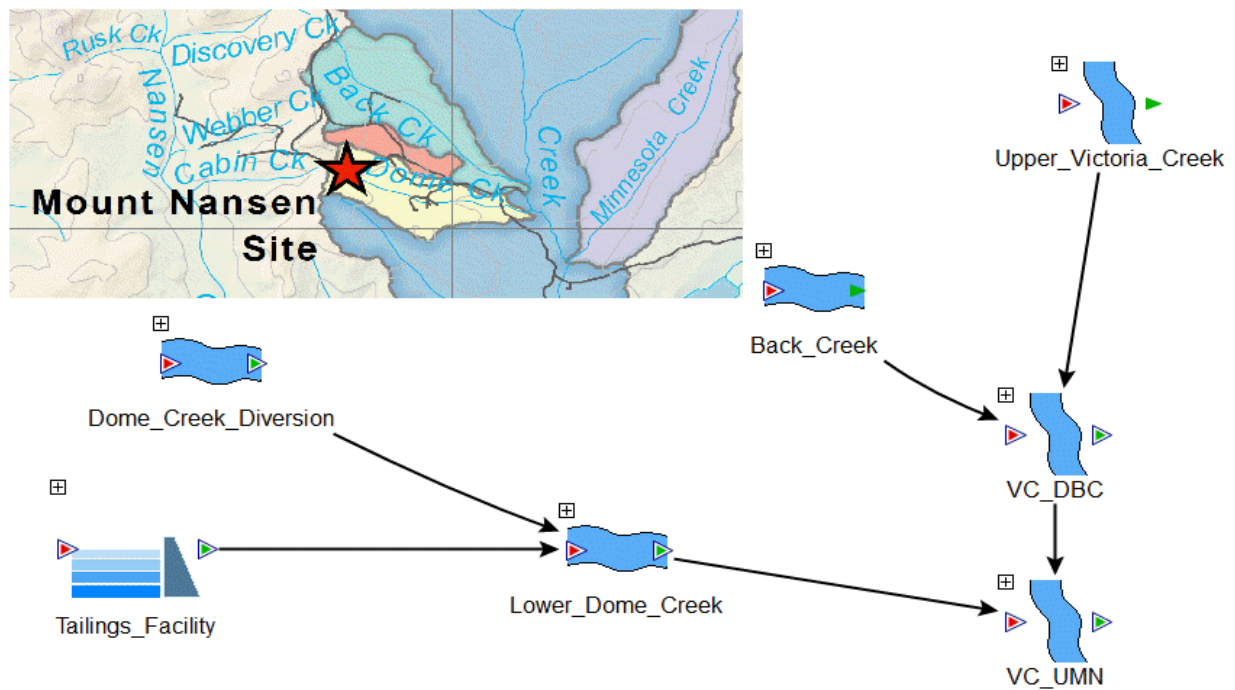


Figure 2-2: Water balance model layout

2.1.1 Dome Creek Flow

Flow from Dome Creek joins Victoria Creek just upstream of station VC-UMN. Total flow at the mouth of Dome Creek is assumed to be represented by the flow at station DC-R. Three flows aggregate at DC-R: Dome Creek diversion channel, seep from the tailings seepage pond and an incremental flow assumed to be equal to 20% of the synthetic streamflow derived at DC-U based on estimated incremental catchment area, and supported by sulfate observations at both stations (Table 2-1), which exhibit consistent dilution at an average of 22% of DC-R values relative to DC-U. While not a direct measure of groundwater contributions to Dome Creek, the observed decline in sulfate concentrations suggest that contributions to Dome Creek along this flowpath are not causing an increase in parameters of concern. Further, a comparison of model results to observations are well calibrated and suggest that other inputs contributing to Dome Creek water quality (*e.g.*, groundwater) are negligible in comparison to inputs from the seepage collection pond and upper Dome Creek (*e.g.*, DC-B).

Table 2-1:
Sulfate values at Dome Creek Stations DC-U and DC-R Used to Evaluate Incremental background catchment dilution in lower Dome Creek

Month	DC-U	DC-R	% reduction
January	713.6		
February	699.3		
March	688.8		
April	549.6	325.3	41%
May	301.0	245.1	19%
June	473.9	392.7	17%
July	523.8	397.8	24%
August	478.8	384.2	20%
September	432.2	353.0	18%
October	548.7	450.8	18%
November	625.8	494.7	21%
December	722.0		

The model schematic for Lower Dome Creek is shown in Figure 2-3.

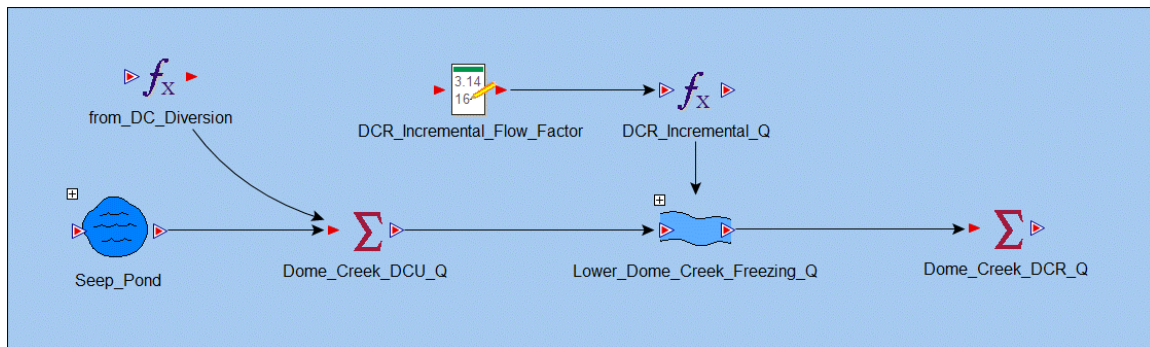


Figure 2-3: Lower Dome Creek model layout.

Flow enters lower Dome Creek at station DC-U, which is modelled as the combination of flows from the diversion channel that guides upper Dome Creek around the tailings facility and discharge from the seep pond (Figure 2-3). The seepage discharge is comparatively steady, and during winter low flow months comprise most or all of the flow at DC-U due to freeze up of the diversion channel.

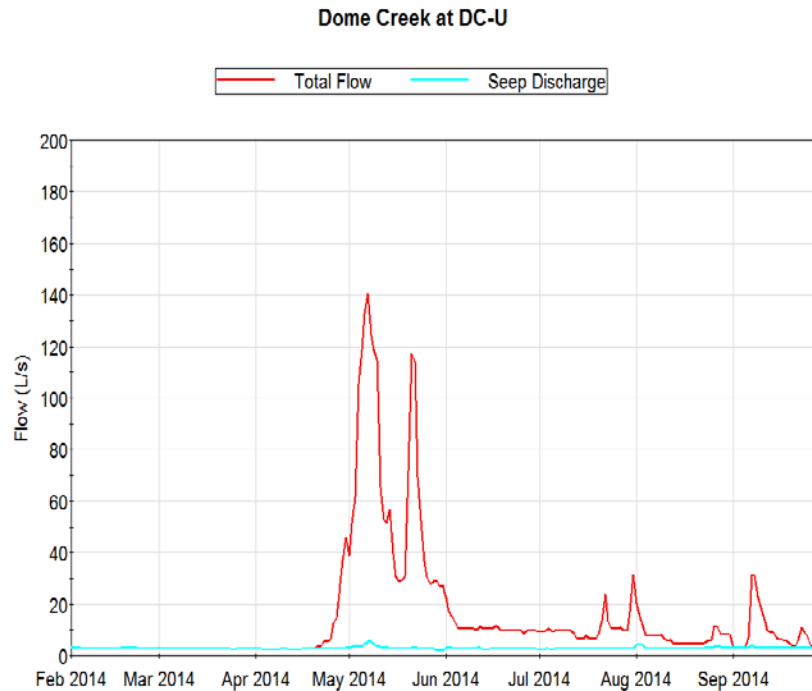


Figure 2-4: Dome Creek DC-U: contributions from Seepage Pond discharge and upper Dome Creek.

Lower Dome Creek (between DC-U and Victoria Creek) flow freezes almost completely in the winter, a process which is described further in Section 3.1.1.1. To take this into account, ice storage is implemented whereby a fraction of Dome Creek flow between stations DC-U and DC-R is frozen in the winter (Table 2-2) and released in spring. Freezing rates in Table 2-2 were derived through the analysis of average monthly temperature, also taking into consideration antecedent flow conditions in the creek. Freezing rates are applied only when site temperature is below 0°C; similarly, a temperature-dependent melting rate is applied when the temperature rises above 0°C. Figure 2-5 compares the flows from melting ice against the total flow at DC-R for the early open water season in 2014. Although the flow makes up only a small fraction of the total, contaminant load is also accumulated over winter and released during ice melt and can contribute to elevated concentrations during early freshet.

Table 2-2:
Flow fraction sent to ice in Dome Creek between stations DC-U and DC-R during the winter

Month	Fraction of Dome Creek converted to ice
January	80%
February	70%
March	60%
April	40%
May	0%
June	0%
July	0%
August	0%
September	0%
October	0%
November	50%
December	80%

Dome Creek at DC-R

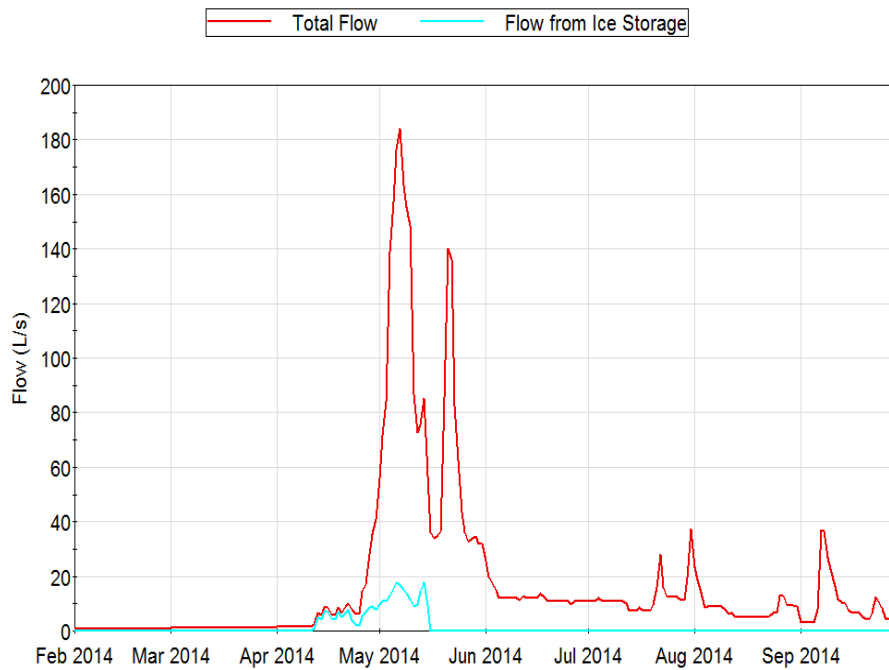


Figure 2-5: Total flow versus flow from melting ice at Dome Creek DC-R in 2014.

The sudden early-freshet release of contaminant load is observed in Victoria Creek downstream of the confluence of Dome Creek (station VC-UMN upstream of Minnesota Creek). A comparison of the daily model results from 2015 is shown in Figure 2-6 as an example of the observed elevated sulfate and calcium in the downstream portion of Victoria Creek during early freshet, and how the model parameterization of this process was validated at station VC-UMN. Model calibration results support the approach derived herein, as illustrated in Figure 2-5 and Figure 2-6 as well as field observations of aufeis (Figure 2-8 to Figure 2-12).

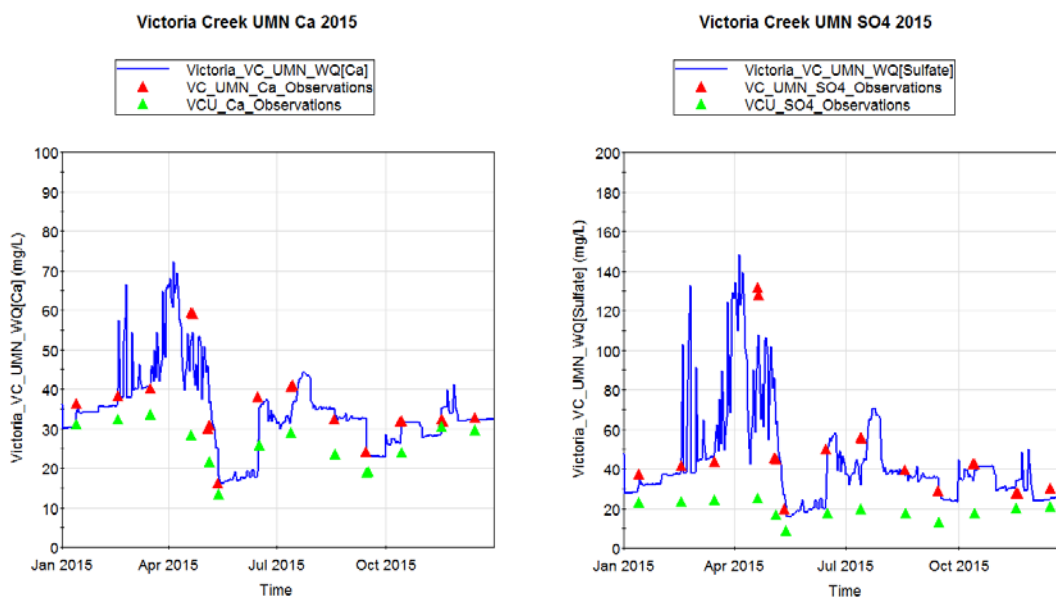


Figure 2-6: Observed Ca and SO4 in Victoria Creek upstream and downstream of the confluence with Dome Creek. Daily model concentrations are shown for comparison

2.1.1.1 Winter Ice Regime in Dome Creek

All available winter spot flow measurements from the 2011 to 2016 period were summarized to characterize streamflow conditions in Dome Creek. Spot streamflow measurements made in Dome Creek at DC-M (proximal to DC-U) indicate that unit yields can reach lows of 0.1 L/s/km² just prior to the initiation of freshet (mid-April), but are generally in the range of 1 to 5 L/s/ km² for the months of November through April. DC-B typically freezes to bed during the winter months, supported by observations made by the water resources consultant on monthly water quality sampling trips. Extensive icing is also encountered at DC-R, with one manual winter flow measurement taken in November 2013

indicating yields of $<1 \text{ L/s/km}^2$ (EDI, 2013). Zero flow conditions become widespread by January and are accompanied by extensive aufeis formation.

Aufeis (*i.e.*, frozen groundwater seepage that accumulates within- and adjacent to local watercourses) is pervasive in creeks and streams in the region and at the Site. Aufeis melts during the freshet, but may persist into the early summer (mid- to late-June). This ice growth, or aufeis, is the result of shallow groundwater discharge and/or baseflow in the stream channel freezing. The ice impedes subsequent flow, which is forced on top of the existing ice sheet, where it freezes (Figure 2-7). This process repeats continuously throughout the winter, and results in laminated ice sheets that have been measured close to 0.5 m in thickness within Dome Creek (Figure 2-8 to Figure 2-12). Liquid flow is thus either not present, or it can still occur between these laminae, and at the edges of the stream channel. It is these flows that the water quality samples are taken from during the winter. The aufeis process also acts as a storage reservoir for winter baseflows, and can store up to a third of the cumulative annual baseflow in sub-Arctic watersheds (Yoshikawa *et al.*, 2007).

Aufeis often far exceeds the natural stream channel width in the smaller tributaries, and as ice melts much more slowly than the snowpack, much of the freshet occurs while extensive aufeis is still present. This makes accurate measurement of streamflows (where they exist) challenging or impossible during the winter season at many of the Project hydrometric stations, and dangerous during the initiation of freshet. This process also influences the distribution of annual streamflow, as the baseflow stored in aufeis during the winter months is released during the freshet and early summer periods. This means that proportionately even more of the total annual runoff is expressed during the months of May through October.

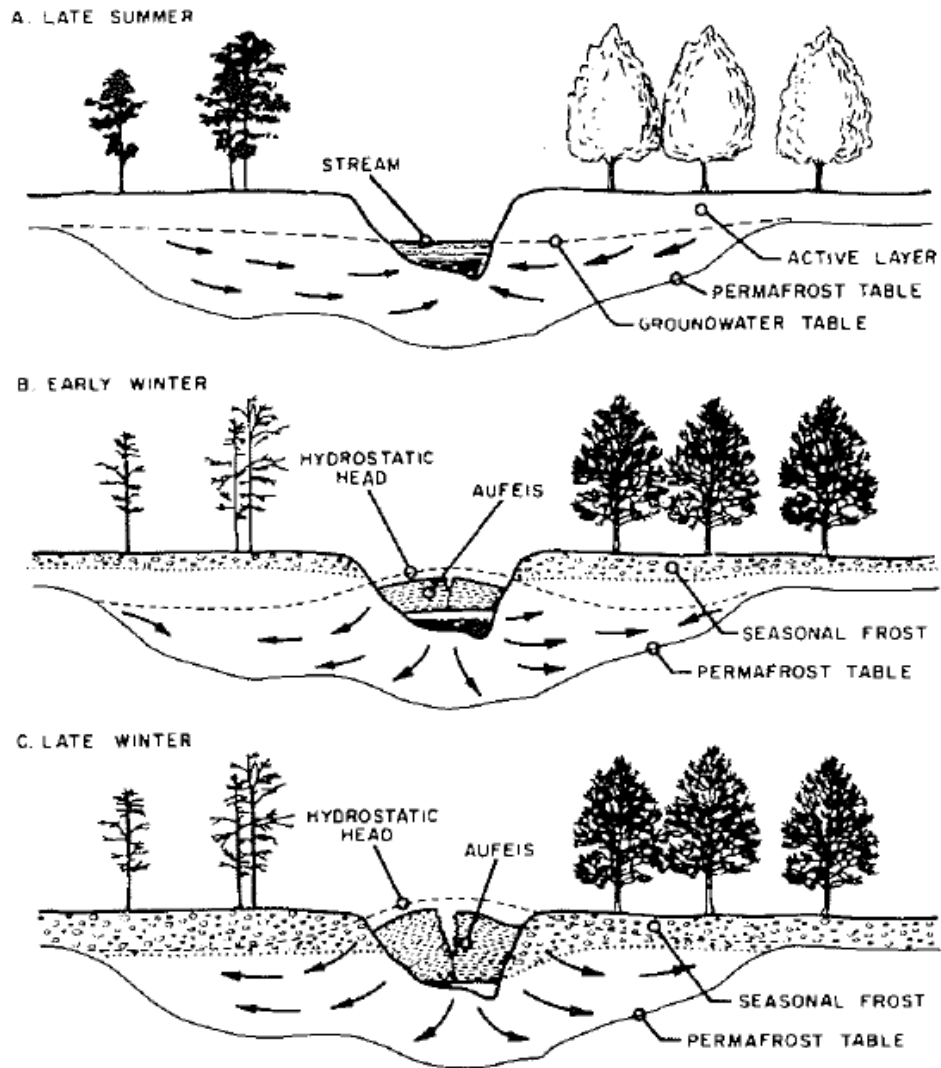


Figure 2-7: Groundwater flow patterns and aufeis formation (from Kane, 1981).



Figure 2-8: Overflow at DC-U, looking upstream (March 17, 2015). Source: EDI 2015.



Figure 2-9: DC-M, looking upstream (March 10, 2014). Source: EDI 2014.



Figure 2-10: DC-R, looking downstream (February, 2015). Source: EDI 2015



Figure 2-11: DC-B, looking downstream (March 17, 2015). Source: EDI 2015



Figure 2-12: DC-B, looking upstream (January 14, 2014). Source: EDI 2014.

2.1.2 Victoria Creek Flow

Baseline streamflow data for Back Creek and Upper Victoria exist, but the streamflow at VC-UMN (Victoria Creek upstream of Minnesota Creek) was found to be the most reliable. Synthetic streamflows were developed for VC-UMN and VC-DBC (Victoria Creek downstream of Back Creek) based on baseline data collected at the respective stations. As outlined in the hydrology section (Appendix A), the uncertainty in the VC-DBC synthetic record led to the use of a proportional (90%) flow based on the VC-UMN synthetic record for flow at VC-DBC. The synthetic flow record at VC-UMN, and the contributing flows from VC-DBC and Dome Creek at station DC-R (discussed in the next section) are shown in Figure 2-13.

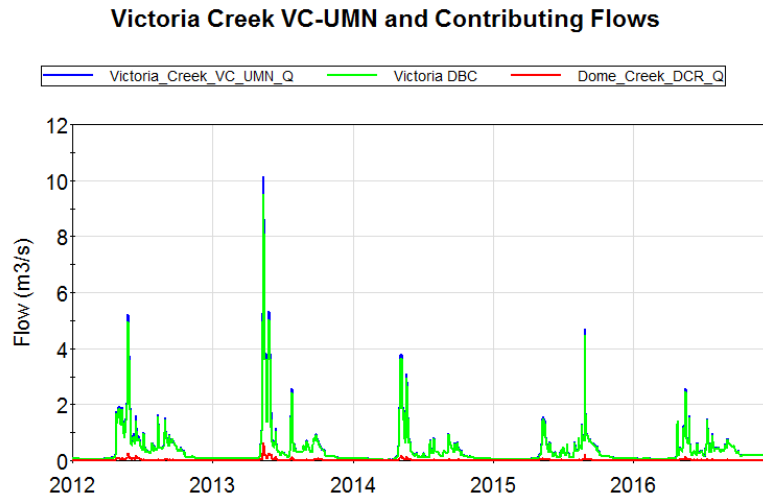


Figure 2-13: Synthetic flow at VC-DBC (90% VC-UMN) used in the Mt. Nansen GoldSim model as upstream boundary condition

No incremental flow is assumed to enter Victoria Creek between VC-DBC and VC-UMN from the Victoria Creek watershed, as the factor applied to the VC-UMN synthetic flow (90%) takes incremental flow between the stations into account. The modelled flow at VC-UMN is the sum of upstream flow from VC-DBC and the discharge from Dome Creek.

2.2 Water Quality Model Structure

The water quality model combines the flows tracked in the water balance component with the baseline/background water chemistry and the applied source terms for contact water. Water treatment is included as a sensitivity to the water quality model. The water quality model closely follows the water balance model in structure (Figure 2-14).

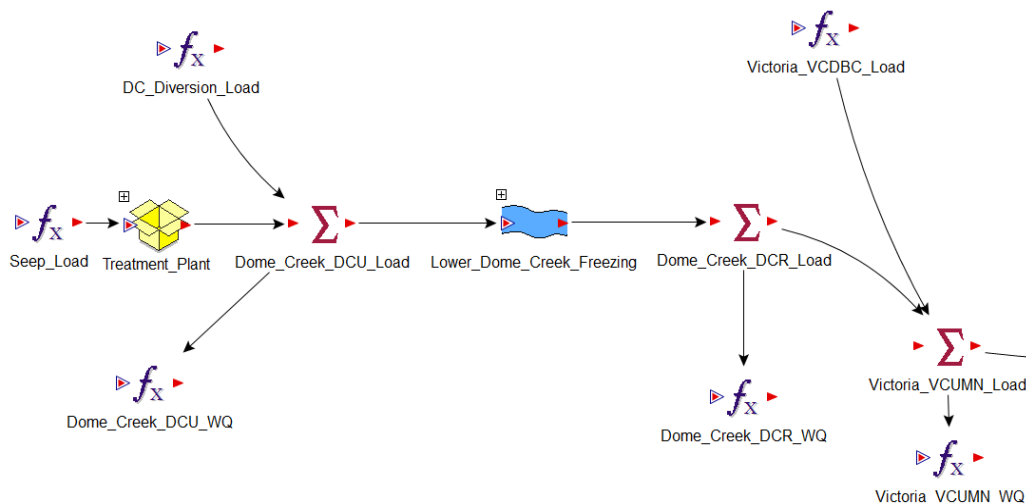


Figure 2-14: Mount Nansen water quality model layout

The water quality model tracks 30 chemical parameters (Table 2-3). Mixing at surface water nodes is performed assuming conservation of contaminant mass according to the flow-weighted average relationship:

$$C_{out} = \frac{\sum_i Q_i C_i}{\sum_i Q_i} \text{ [Equation 1]}$$

where C is concentration and Q represents flow for flows i=1,n.

Other processes such as saturation/precipitation or geochemical attenuation are not assumed to occur where water masses mix unless explicitly prescribed in the model inputs as described below. All nodes mix efficiently (within the same time-step), except for the frozen flow in Dome Creek where both flow and load are accumulated.

Table 2-3:
Water quality parameters tracked in the Mt. Nansen WBQM

Anions	Total Metals	Dissolved Metals
Sulfate	Al	Al
Ammonia	As	As
Nitrate	Ca	Ca
Nitrite	Cd	Cd
P	Cr	Cr
WADCN	Co	Co
	Cu	Cu
	Fe	Fe
	Mg	Mg
	Mn	Mn
	Na	Na
	Zn	Zn

2.2.1 Background Water Quality

Background source chemistry is applied to three flows: Victoria Creek VC-DBC, Dome Creek diversion channel and the incremental flow between stations DC-U and DC-R. The derivation and application of background water quality source terms to the model is summarized in Table 2-4 and are presented in Appendix B.

**Table 2-4:
Source terms for background catchments**

Station	Source Chemistry
Victoria Creek VC-DBC	Baseline observations from April 2012 to November 2016. Concentrations measured approx. monthly; held steady in the model between measurements.
Dome Creek diversion	Limited observations at station DC-B between 2014 and 2016; monthly averages were generated to supplement missing observations from 2012-2014.
Dome Creek DC-R Incremental	Baseline observations at station VC-U (2012 to 2016) were used as background for the incremental catchment in Dome Creek.

The water chemistry from the diversion channel goes through one alteration prior to mixing with the seep water at station DC-U. Measured dissolved iron (D-Fe) from DC-B is compared to the following table of monthly values and is set to the minimum of the DC-B observation or the value in Table 2-5. Maximum D-Fe values specified in Table 2-5 were refined as part of the model calibration process. Site observations indicate that D-Fe readily oxidizes in the oxygenated, neutral drainage as D-Fe does not persist in the downstream environment in lower Dome Creek. Winter comparison of water quality from seepage pond discharge and DC-U provide insight on the natural transformation of D-Fe and was used as a proxy for transformation along the flowpath from DC-B to DC-U. Indeed, this flowpath is more turbulent and longer than the flowpath from SEEP to DC-U and is therefore expected to be a conservative estimate of D-Fe reporting to DC-U.

**Table 2-5:
Maximum dissolved Fe applied to Dome Creek diversion channel outflow**

	Maximum D-Fe (mg/L)
Jan	0.67
Feb	0.67
Mar	0.67
Apr	0.54
May	0.21
Jun	0.04
Jul	0.08
Aug	0.11
Sep	0.17
Oct	0.62
Nov	0.68
Dec	0.67

2.2.2 Contact Water Source Terms

Contact water enters Dome Creek through discharge from the seep pond below the tailings storage facility. From 2012-2016 the flow and chemistry of the discharge were measured monthly, providing the source load for Dome Creek. Manganese, identified as a parameter of potential concern, is shown in the seep discharge against ambient concentrations at station DC-B (diversion channel) in Figure 2-15.

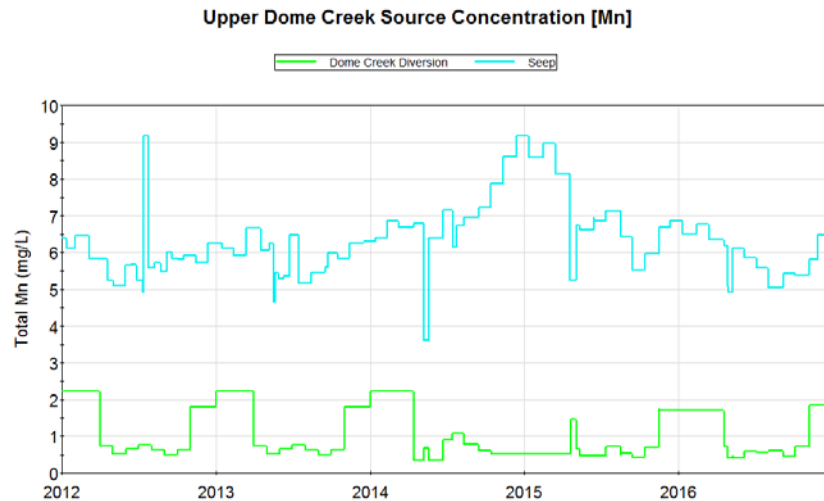


Figure 2-15: Manganese concentrations in seep water and upper Dome Creek

The relative loading from these two sources illustrates the potential impact of the seep discharge on manganese levels in Lower Dome Creek (Figure 2-16). During low flow periods in open-water season, and particularly in winter, the seep load can dominate the lower Dome Creek manganese levels.

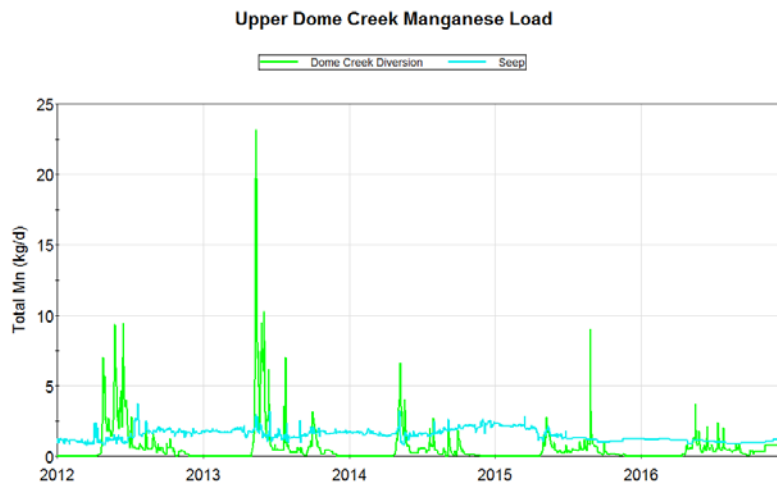


Figure 2-16: Manganese load from seep water and upper Dome Creek to lower Dome Creek

2.2.3 Water Treatment Source Terms

Treatment of contact water from the seep discharge is included in the WBQM to allow sensitivities to be run examining treatment effects on water quality in lower Dome Creek and Victoria Creek. The treatment method considers both the effect of removing particulates and TSS from the influent as well as the reduction of dissolved metals. The effect of particulate removal reduces the total metal levels to those of the dissolved portion. Effluent limit levels for treatment are applied in the model as per Table 2-6.

Table 2-6:
Water treatment maximum limit concentration levels.

Anion	Limit (mg/L)	Total and Dissolved Metal	Limit (mg/L)
Ammonia	6	Al	0.07
Nitrate	1.3	As	0.05
Nitrite	0.06	Ca	313
P	-	Cd	0.0004
WADCN	0.03	Cr	0.001
		Co	0.01
		Cu	0.003
		Fe	0.5
		Mg	68
		Mn	9.5
		Na	-
		Zn	0.06

3. Results

3. Results

Water balance and water quality model outputs are presented in the following chapter.

3.1 Water Balance Model

3.1.1 Basin Water Balances

An extensive update of the hydro-meteorological baseline characterization was undertaken for this exercise. This involved a characterization of the climate (mainly temperature and precipitation) and streamflow regimes at Site. Typically, a water balance model is driven by precipitation inputs that are then converted to runoff via runoff coefficients that are specific to each land cover class (*e.g.*, natural/non-contact, waste rock, pit walls). These runoff coefficients are then calibrated so that the modeled runoff matches the measured runoff. As the Hydro-meteorology report outlines, the measured Site discharge data were extended using statistical relationships with a regional hydrometric station. The resulting synthetic streamflow data was then used as the primary input to the water balance model. In order to support this decision, the climate and streamflow information summarized in the Hydro-meteorology Baseline Report was used to develop simple mean annual water balances for three of the Project area basins following the simple water balance equation (Equation 2).

$$R = P - AET - GW \quad \text{[Equation 2]}$$

Where:

R = runoff (mm/year)

P = precipitation (mm/year)

AET = actual evapotranspiration (mm/year)

GW = groundwater recharge (mm/year)

These water balances were assembled for the Dome Creek watershed (stations DC-B and DC-R) and the Victoria Creek watershed (VC-UMN). Each basin was discretized into 100 m elevation bands, and the area associated with each elevation band calculated using the ArcGIS software suite. The climate parameters listed as inputs to Equation 3 were benchmarked to the elevation of the Mount Nansen site climate station (1,255 m), and then scaled to the mid-point of each elevation band using the gradients presented in Table 3-1.

Table 3-1:
Mean annual climate parameter assumptions for Mount Nansen climate station
elevation (1,255 m asl)

Parameter	(mm)	Units
MAP	353	mm
Rainfall ¹	259	mm
SWE (@1,250 m) ²	94	mm
Summer rainfall gradient ³	5	%↑/100 m ↑
Winter snowfall gradient ³	10	%↑/100m ↑
Mean annual PET (Apr. to Oct.) ⁴	486	mm
Mean annual AET (40% of PET) ⁵	194	mm
Evaporation Gradient ⁶	10	%↓/350 m ↑
Mt. Nansen climate station elev.	1,255	m
Mt. Nansen snow survey elev.	1,250	m

Notes:

¹Mount Nansen Hydro-meteorology Baseline Report; Table 3-5

²Mount Nansen Hydro-meteorology Baseline Report; Table 3-3. Mount Nansen snow course (09CA-SC01) April 1st average SWE adjusted to climate station elevation of 1,255 m based on orographic gradient of 10% increase per 100 m increase in elevation.

³Based on regional gradients calculated from long-term climate datasets

⁴Mount Nansen Hydro-meteorology Baseline Report; Table 3-9.

⁵Mount Nansen Hydro-meteorology Baseline Report; Table 3-8. Based on average ratio of areal evapotranspiration to lake evapotranspiration measurements from regional climate stations.

⁶British Columbia Manual of Operational Hydrology (Coulson, 1991)

The mean annual estimates of precipitation (MAP), maximum snow water equivalent (SWE) and actual evapotranspiration (AET) are presented for each of the three basins in Table 3-2 through Table 3-4. Annual runoff was calculated using Equation 3 for each elevation band:

$$MAR = MAP - AET - GW \quad \text{[Equation 3]}$$

The MAR estimates for each elevation band were weighted by the relative proportion of total basin area represented by each band, and summed to provide an estimate of MAR for the basin as a whole.

The mean annual runoff estimates derived from the synthetic streamflow series (Q) described in Appendix A were then subtracted from the water balance estimates of runoff derived from Equation 2. The difference is assumed to represent recharge to the groundwater system via infiltration. The absolute values of estimated infiltration range from 47 mm (DC-B) to 83.7 mm (DC-R), and indicate that 12% to 22% of MAP could be lost to recharge in the Dome Creek drainage.

Table 3-2:|
Mean annual water balance by elevation band for DC-B

Elevation (m asl)	Diversion Channel at the Bridge (DC-B; 3.0 km ²)		Mean Annual Precipitation		Mean Annual SWE (potential snowmelt)		Mean Annual Evapotranspiration		Estimated Runoff ¹	
	m ²	% basin area	mm/yr	L/s	mm/yr	L/s	mm/yr	L/s	mm/yr	L/s
1100	0	0.0%	332.1	0.00	85.5	0.00	199.8	0.00	0.0	0.0
1200	1,328,718	44.5%	353.0	14.86	94.0	3.96	194.4	8.19	70.5	6.7
1300	1,111,254	37.2%	375.4	13.22	103.4	3.64	189.2	6.66	69.2	6.6
1400	437,222	14.6%	399.3	5.53	113.7	1.58	184.1	2.55	31.5	3.0
1500	109,339	3.7%	424.9	1.47	125.1	0.43	179.2	0.62	9.0	0.9
1600	2,404	0.1%	452.4	0.03	137.6	0.01	174.3	0.01	0.2	0.0
Total	2,988,937	100%	389.5	35.1	109.9	9.6	186.8	18.0	180.4	17.1
							Estimated MAR ²		133.0	
							Estimated Recharge		47.4	
							% MAP		12%	

Notes:

¹Runoff estimated following Equation 3

²MAR = Mean Annual Runoff

Table 3-3:
Mean annual water balance by elevation band for DC-R

Elevation (m asl)	Dome Creek at the Road (DC-R; 4.5 km ²)		Mean Annual Precipitation		Mean Annual SWE (potential snowmelt)		Mean Annual Evapotranspiration		Estimated Runoff ¹	
	(m ²)	% basin area	mm/yr	L/s	mm/yr	L/s	mm/yr	L/s	mm/yr	L/s
1000	0	0.0%	312.6	0.00	77.7	0.00	205.3	0.00	0.0	0.0
1100	793,347	17.7%	332.1	8.35	85.5	2.15	199.8	5.02	23.4	3.3
1200	2,008,354	44.7%	353.0	22.47	94.0	5.98	194.4	12.37	70.9	10.1
1300	1,142,179	25.4%	375.4	13.59	103.4	3.74	189.2	6.85	47.3	6.7
1400	437,222	9.7%	399.3	5.53	113.7	1.58	184.1	2.55	20.9	3.0
1500	109,339	2.4%	424.9	1.47	125.1	0.43	179.2	0.62	6.0	0.9
1600	2,404	0.1%	452.4	0.03	137.6	0.01	174.3	0.01	0.1	0.0
Total	4,492,844	100%	378.5	51.4	105.3	13.9	189.5	27.4	168.7	24.0
							Estimated MAR ²		85.0	
							Estimated Recharge		83.7	
							% MAP		22%	

Notes:

¹Runoff estimated following Equation 3

²MAR = Mean Annual Runoff

Table 3-4:
Mean annual water balance by elevation band for VC-UMN

Elevation (m asl)	Victoria Creek Upstream of Minnesota Creek (U-MN; 83.4 km ²)		Mean Annual Precipitation		Mean Annual SWE (potential snowmelt)		Mean Annual Evapotranspiration		Estimated Runoff ¹	
	(m ²)	% basin area	mm/yr	L/s	mm/yr	L/s	mm/yr	L/s	mm/yr	L/s
900	0	0.0%	294.4	0.0	70.6	0.0	210.9	0.0	0.0	0.0
1000	422,857	0.5%	312.6	4.2	77.7	1.0	205.3	2.8	0.5	1.4
1100	8,254,405	10.0%	332.1	86.9	85.5	22.4	199.8	52.3	13.2	34.6
1200	15,795,178	19.1%	353.0	176.7	94.0	47.0	194.4	97.3	30.2	79.4
1300	22,399,720	27.0%	375.4	266.4	103.4	73.4	189.2	134.3	50.3	132.1
1400	18,786,449	22.7%	399.3	237.7	113.7	67.7	184.1	109.6	48.8	128.1
1500	10,146,284	12.2%	424.9	136.6	125.1	40.2	179.2	57.6	30.1	79.0
1600	3,666,146	4.4%	452.4	52.6	137.6	16.0	174.3	20.3	12.3	32.3
1700	2,049,140	2.5%	481.9	31.3	151.4	9.8	169.7	11.0	7.7	20.3
1800	1,161,381	1.4%	513.6	18.9	166.5	6.1	165.1	6.1	4.9	12.8
1900	193,440	0.2%	547.6	3.4	183.2	1.1	160.7	1.0	0.9	2.4
Total	82,875,000	100%	407.9	1014.6	119.0	284.8	184.8	492.1	199.0	522.5
							Estimated MAR ²		141.0	
							Estimated Recharge		58.0	
							% MAP		14%	

Notes:

¹Runoff estimated following Equation 3

²MAR = Mean Annual Runoff

To benchmark these recharge estimates, measured streamflow data from the stations located in Dome Creek (DC-B, H-SEEP, DC-M and DC-R) were compared for the years of 2015 and 2016. The results are summarized in Table 3-5 below:

Table 3-5:
Discharge balances for Dome Creek. All values are in m³/s

Station	Year	May	Jun	Jul	Aug	Sep
DC-M – (DC-B+H-SEEP)	2015	0.014	-0.002	-0.004	0.001	0.000
DC-R – (DC-B+H-SEEP)	2015	0.002	-0.001	-0.001	-0.004	0.002
	2016	-0.006	-0.001	0.007	0.009	0.014
DC-R - DC-M	2015	-0.012	0.001	0.003	-0.004	0.002

Continuous open water season (May through September) discharge data are only available for the DC-M station in 2015, but data exist for the DC-B, H-SEEP and DC-R stations for 2015 and 2016. In general, discharge volumes increase moving downstream during the months of May and September, as would be expected with increasing watershed areas. However, flow reductions between upstream and downstream stations are common during the months of June, July and August, averaging 1 L/s in 2015 for Dome Creek as a whole, and 2 L/s in the upper portion (above DC-M) of the drainage. However, the available data for 2016 suggest flow increases of 5 L/s between the DC-M (calculated as DC-B + H-SEEP) and DC-R stations.

3.2 Water Quality Model Results

The water balance and water quality model was run on a monthly time step using data from 2012 to 2016. Model results are presented as average monthly values for this time period. Separate model routines were conducted for existing conditions (pre-treatment) and for a post-water treatment case. By operating the model in this manner, the water balance for both scenarios are identical and the average monthly water quality data for the two cases are directly comparable. This allows for direct comparison to evaluate the benefit of implementing water treatment of discharge from the seepage collection pond.

Model results for parameters of potential concern are screened against WQGs and WQOs (Table 3-6) and are presented for Dome Creek and Victoria Creek in Table 3-7 to Table 3-12 below. Water quality guidelines have been applied to Victoria Creek. In some cases, site-specific water quality objectives (WQOs) have been derived for Dome Creek (Appendix 7F of the MN CMPP).

**Table 3-6:
Surface water quality guidelines (WQG) and surface water quality objectives (WQO) for Dome Creek and Victoria Creek**

Parameter	Victoria Creek	Dome Creek
Sulphate	309	857
Dissolved Aluminium	0.05	
Total Arsenic	0.005	0.025
Total Iron	1	
Dissolved Iron	0.35	
Total Manganese	0.9 to 1.3	2.3 to 6.1
Total Zinc	0.03	

Note: Highlighted WQOs are equivalent to generic WQGs. WQOs that are not highlighted have been derived specifically for the Project and apply to Lower Dome Creek only. Further detail is provided in the text following this table.

The model was run on a monthly time step using data from 2012 to 2016 and model results are presented as monthly average concentrations. Estimates that screen above the WQG are highlighted and values above the WQO are shown in bold. Model results are presented in order of the following stations and model scenarios:

- Table 3-7: Dome Creek Station DC-B is located within the Dome Creek Diversion Channel (DCDC), upstream of TSF effects and represents inputs to Dome Creek above the WTP discharge. Model results are therefore the same for pre- and post-treatment scenarios.
- Table 3-8: Pre-treatment effects for Dome Creek Station DC-R represent net project effects on Dome Creek prior to treatment implementation.
- Table 3-9 Post-treatment effects for Dome Creek Station DC-R represent residual project effects on Dome Creek following treatment.
- Table 3-10: Victoria Creek Station VC-DBC is located downstream of Back Creek and associated placer effects and represents inputs to Victoria Creek above Dome Creek and the WTP discharge. Model results are therefore the same for pre- and post-treatment scenarios.
- Table 3-11: Pre-treatment effects for Victoria Creek Station VC-UMN represent net project effects on Victoria Creek.
- Table 3-1: Post-treatment effects for Victoria Creek Station VC-UMN represent residual project effects on Victoria Creek following water treatment.

Water quality model results for all parameters of interest are summarized in Appendix C.

In addition to the summary table below, monthly model results are presented as time series in Appendix C for the stations and model cases listed above. Model estimates are compared to background sources and water quality observations to provide an indication of conservatism and fit for pre-treatment scenarios and to provide an indication of improvement for post-treatment scenarios.

Overall, water quality model estimates for conservation (non-reactive) parameters such as sulphate align well with observations and provide confidence in the results. Further, model estimates for reactive parameters (*e.g.*, iron and arsenic) are typically higher than observations and provide a sense of conservatism in that actual observations are unlikely to exceed model estimates. In this regard, outputs from the WBQM are appropriate to support the surface water quality effects assessment, including the evaluation of water treatment plant performance.

Table 3-7:
Model results for parameters of interest for Upstream Dome Creek Station DC-B

Indicator	Objective	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SO4	429	975	975	975	574	249	440	600	535	467	576	901	963
T-As	0.025	0.003	0.003	0.003	0.012	0.019	0.028	0.011	0.015	0.018	0.011	0.006	0.005
D-Al	0.05	0.006	0.006	0.006	0.046	0.085	0.042	0.022	0.024	0.038	0.014	0.007	0.006
T-Fe	1	4.15	4.15	4.15	3.49	5.34	4.85	2.59	3.40	4.10	3.41	2.76	2.64
D-Fe	0.35	0.67	0.67	0.67	0.54	0.21	0.04	0.08	0.11	0.17	0.60	0.68	0.67
T-Mn	2.3 to 6.1	1.78	1.78	1.78	0.94	0.51	0.56	0.74	0.67	0.52	0.62	1.37	1.53
T-Zn	0.03	0.039	0.039	0.039	0.029	0.041	0.034	0.010	0.015	0.025	0.024	0.027	0.027

Notes: values in mg/L; values above ecological objective are highlighted; a range is provided for the T-Mn objective, which is a function of hardness; where T-Mn is highlighted, the associated objective is provided in parenthesis.

Table 3-8:
Pre-treatment Model results for parameters of interest for Dome Creek Station DC-R

Indicator	Objective	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SO4	857	No flow	No flow	No flow	670	260	420	550	510	490	550	750	No flow
T-As	0.025	No flow	No flow	No flow	0.048	0.021	0.029	0.018	0.022	0.026	0.021	0.033	No flow
D-Al	0.05	No flow	No flow	No flow	0.021	0.076	0.036	0.019	0.020	0.029	0.015	0.0088	No flow
T-Fe	1	No flow	No flow	No flow	12	5.8	5.5	3.9	4.4	5.3	5.4	8.3	No flow
D-Fe	0.35	No flow	No flow	No flow	9.4	1.4	1.2	1.7	1.5	1.9	2.8	5.6	No flow
T-Mn	2.3 to 4.8	No flow	No flow	No flow	5.5 (4.4)	1.1	1.3	1.8	1.8	2.2	2.3	4.3	No flow
T-Zn	0.03	No flow	No flow	No flow	0.032	0.034	0.027	0.0094	0.013	0.020	0.022	0.029	No flow

Notes: values in mg/L; values above ecological objective are highlighted; a range is provided for the T-Mn objective, which is a function of hardness; where T-Mn is highlighted, the associated objective is provided in parenthesis.

Table 3-9:
Post-treatment Model results for parameters of interest for Dome Creek Station DC-R

Indicator	Objective	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SO4	857	No flow	No flow	No flow	670	260	420	550	510	490	550	750	No flow
T-As	0.025	No flow	No flow	No flow	0.032	0.018	0.026	0.015	0.017	0.021	0.017	0.024	No flow
D-Al	0.05	No flow	No flow	No flow	0.021	0.076	0.036	0.019	0.020	0.029	0.015	0.0088	No flow
T-Fe	1	No flow	No flow	No flow	1.0	4.4	3.8	1.9	2.3	2.6	2.2	1.3	No flow
D-Fe	0.35	No flow	No flow	No flow	0.18	0.19	0.057	0.078	0.099	0.13	0.38	0.30	No flow
T-Mn	2.3 to 4.8	No flow	No flow	No flow	5.4 (4.4)	1.1	1.3	1.8	1.8	2.2	2.3	4.3	No flow
T-Zn	0.03	No flow	No flow	No flow	0.024	0.034	0.027	0.0090	0.012	0.020	0.021	0.024	No flow

Notes: values in mg/L; values above ecological objective are highlighted; a range is provided for the T-Mn objective, which is a function of hardness; where T-Mn is highlighted, the associated objective is provided in parenthesis.

Table 3-10:
Model results for parameters of interest for Upstream Victoria Creek Station VC-DBC

Indicator	Objective	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SO4	309	17	17	18	19	12	14	18	18	18	19	19	19
T-As	0.005	0.0003	0.0002	0.0003	0.0012	0.0074	0.0051	0.0020	0.0018	0.0025	0.0013	0.0006	0.0004
D-Al	0.05	0.006	0.006	0.005	0.015	0.072	0.052	0.017	0.019	0.026	0.021	0.011	0.007
T-Fe	1	0.03	0.03	0.02	0.78	3.5	2.5	0.52	0.38	1.2	0.37	0.15	0.06
D-Fe	0.35	0.009	0.009	0.009	0.025	0.15	0.11	0.040	0.052	0.071	0.067	0.034	0.016
T-Mn	0.9 to 1.1	0.05	0.07	0.10	0.12	0.20	0.51	0.08	0.07	0.08	0.07	0.06	0.05
T-Zn	0.03	0.0021	0.0020	0.0021	0.0055	0.020	0.012	0.0053	0.0051	0.0083	0.0044	0.0031	0.0027

Notes: values in mg/L; values above ecological objective are highlighted; a range is provided for the T-Mn objective, which is a function of hardness; where T-Mn is highlighted, the associated objective is provided in parenthesis.

Table 3-11:
Pre-treatment Model results for parameters of interest for Victoria Creek Station VC-UMN

Indicator	Objective	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SO4	309	24	31	47	70	25	43	46	33	27	44	35	26
T-As	0.005	0.00077	0.0013	0.0026	0.0048	0.0081	0.0067	0.0029	0.0025	0.0029	0.0022	0.0013	0.00078
D-Al	0.05	0.006	0.006	0.005	0.015	0.072	0.051	0.017	0.019	0.026	0.021	0.011	0.007
T-Fe	1	0.16	0.28	0.60	1.6	3.6	2.7	0.70	0.50	1.2	0.60	0.34	0.16
D-Fe	0.35	0.11	0.21	0.51	0.75	0.22	0.18	0.13	0.095	0.10	0.19	0.16	0.090
T-Mn	1.0 to 1.3	0.13	0.20	0.37	0.54	0.26	0.55	0.17	0.12	0.12	0.17	0.15	0.10
T-Zn	0.03	0.0024	0.0029	0.0039	0.0079	0.021	0.013	0.0055	0.0054	0.0085	0.0052	0.0037	0.0029

Notes: values in mg/L; values above ecological objective are highlighted; a range is provided for the T-Mn objective, which is a function of hardness; where T-Mn is highlighted, the associated objective is provided in parenthesis.

Table 3-12:
Post-treatment Model results for parameters of interest for Victoria Creek Station VC-UMN

Indicator	Objective	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SO4	309	24	31	47	70	25	43	46	33	27	44	35	26
T-As	0.005	0.00062	0.00093	0.0018	0.0036	0.0080	0.0065	0.0027	0.0023	0.0028	0.0021	0.0011	0.00064
D-Al	0.05	0.006	0.006	0.005	0.015	0.072	0.051	0.017	0.019	0.026	0.021	0.011	0.007
T-Fe	1	0.035	0.035	0.040	0.82	3.5	2.6	0.59	0.44	1.2	0.46	0.18	0.069
D-Fe	0.35	0.010	0.011	0.013	0.036	0.15	0.11	0.042	0.053	0.073	0.081	0.040	0.018
T-Mn	1.0 to 1.2	0.12	0.20	0.37	0.54	0.26	0.55	0.17	0.12	0.12	0.17	0.15	0.10
T-Zn	0.03	0.0023	0.0025	0.0032	0.0071	0.021	0.013	0.0055	0.0053	0.0085	0.0052	0.0036	0.0029

Notes: values in mg/L; values above ecological objective are highlighted; a range is provided for the T-Mn objective, which is a function of hardness; where T-Mn is highlighted, the associated objective is provided in parenthesis.

4. Closure

4. Closure

We trust that this report meets your expectations. Please contact the undersigned with any questions or comments.

Sincerely,

LORAX ENVIRONMENTAL SERVICES LTD.

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***Appendix A:
Mount Nansen Long-Term Synthetic
Streamflow Estimates***

1. Introduction

This memo presents the methodology used to develop long-term estimates of streamflow to be used as inputs to the site-wide water balance model (WBM). The calibration and time-series of monthly average flows are also presented.

1.1 Project Area Watersheds

The Mount Nansen Hydro-meteorology Baseline Report (Lorax 2017) presents the available streamflow data collected at the Mount Nansen site (the ‘site’) from 2011 to 2016. This dataset provides a comprehensive picture of the variation in runoff across the site, and in the receiving environment. The Mount Nansen site is drained by two small creeks (Dome Creek and Pony Creek), but Dome Creek drains the majority of the mine site infrastructure, flowing past the tailings storage facility (TSF) via a diversion channel to its confluence with Victoria Creek. Victoria Creek therefore forms the receiving environment for contact runoff from the site. The Victoria Creek drainage is a tributary of the Nisling River, which is located within the larger Donjek/White River basin.

1.2 Objectives

In order to generate water quality predictions for a representative range of flow conditions, the streamflow inputs to the WBM must represent the full range of potential variation both within (intra-annual) and between (inter-annual) years. While the continuous baseline records of streamflow are generally of good quality, they are representative of a relatively short period (2011-2016), and due to challenging monitoring conditions during the winter months, continuous records are incomplete. Therefore, the objective of this exercise was to leverage the relationship between site and regional streamflow data gathered at a Water Survey of Canada (WSC) hydrometric station to generate a robust, long-term estimate of streamflow variability for the key WBM nodes.

2. Methods

The WBM nodes that require streamflow time-series as inputs are listed in Table 2-1.

**Table 2-1:
Mount Nansen water balance model nodes requiring streamflow inputs**

Drainage	WBM node	Location	Drainage Area (km ²)
Dome Creek	DC-B	Diversion Channel at Bridge	3.0
	DC-R	Dome Creek at Road	4.5
Victoria Creek	VC-DBC	Victoria Creek Downstream of Back	75
	VC-UMN	Victoria Creek Upstream of Minnesota Creek	83.4

In summary, the synthetic streamflow series for the site stations are based on statistical relationships between the site hydrometric data for a given station, and the data collected at a regional hydrometric station with a much longer period of record.

Four regional stations from the Water Survey of Canada (WSC) network were assessed for use as the predictor dataset, all of which gauge watersheds located near to the site, and are under 10,000 km² in area, and thus are more likely to contain streamflow responses that are similar to the site watersheds:

- Big Creek near the Mouth (09AH003; 1,800 km²; 1974-2015)
- Nordenskiold River below Rowlinson Creek (09AH004; 6,410 km²; 1982-2015)
- Drury Creek at KM 469 Robert Campbell Highway (09AH005; 550 km²; 1995-2015)
- Nisling River below Onion Creek (09CA006; 7,910 km²; 1995-2015)

The comparison focused on whether the progression of streamflows was reflective of site conditions, and in particular, whether the magnitude and timing of freshet, periodic rainfall event drive peak flows, recession curve shape, and low flow regimes matched those measured at site. Following this comparative exercise, the hydrometric record from the Big Creek near the Mouth WSC gauge was used as the predictor basin for all synthetic hydrographs. A plot showing the unit yields for the site stations in Table 2-1 overlaid on the Big Creek yields is presented in Figure 2-1 for reference.

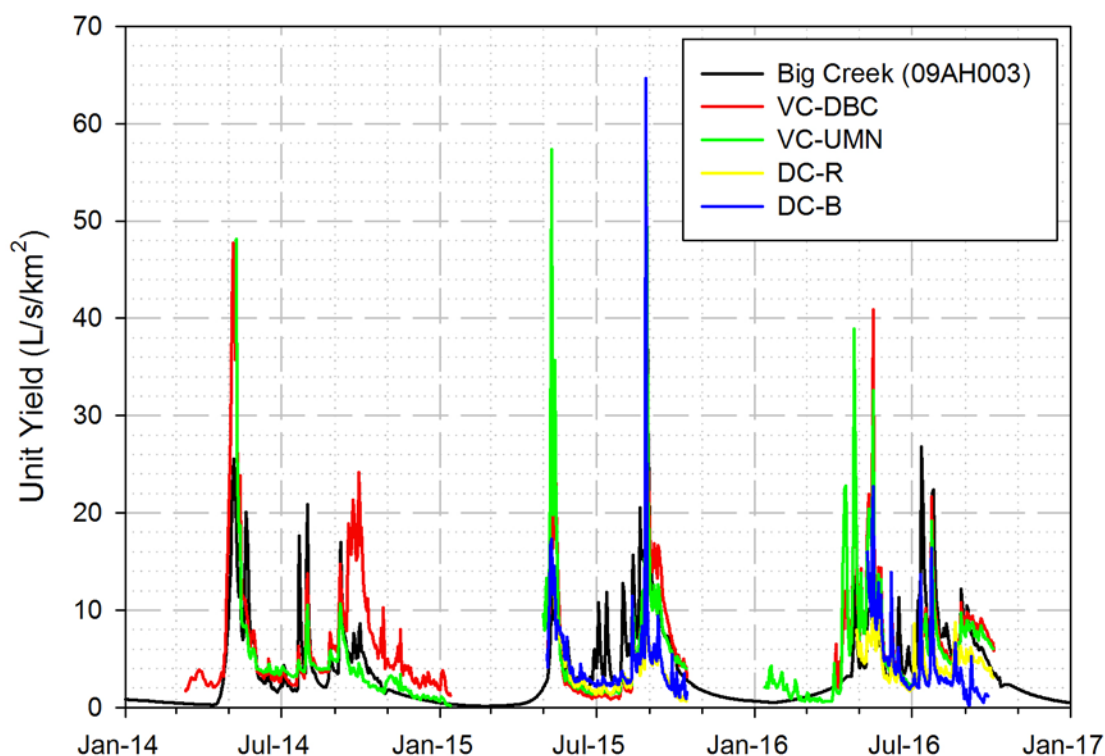


Figure 2-1: Site watershed and Big Creek (09AH003) unit yield time-series (2014-2016)

Following the Empirical Frequency Pairing (EFP) methodology described by Butt (2013), the overlapping periods of record were selected for the site station and the representative regional station. Data were discretized by month, and all available daily average flows for each month were ranked. For example, if there were data available for the month of April over three years, then the number of paired observations was 90. The paired and ranked observations were then plotted, with the regional station set as the predictor variable (x-axis). Due to the limited availability of continuous winter flow data, all data for the months of October through April were grouped to represent the winter low-flow regime. Additionally, all available spot flow measurements were included in the analysis to buttress the continuous low flow discharge data.

The methodology described in Butt (2013) was modified to improve the predictive power of the EFP method. A piece-wise linear regression approach was employed to estimate flow values that fall between each site-regional data pair. For cases where the minimum/maximum daily flow in the record fell outside of the site data record, the relationships were extrapolated using a linear relationship between at least 10 data pairs, and an understanding of the regional peak and low flow unit yields.

An example of the EFP relationship for the Dome Creek at the Road (DC-R) hydrometric station is provided in Figure 2-2.

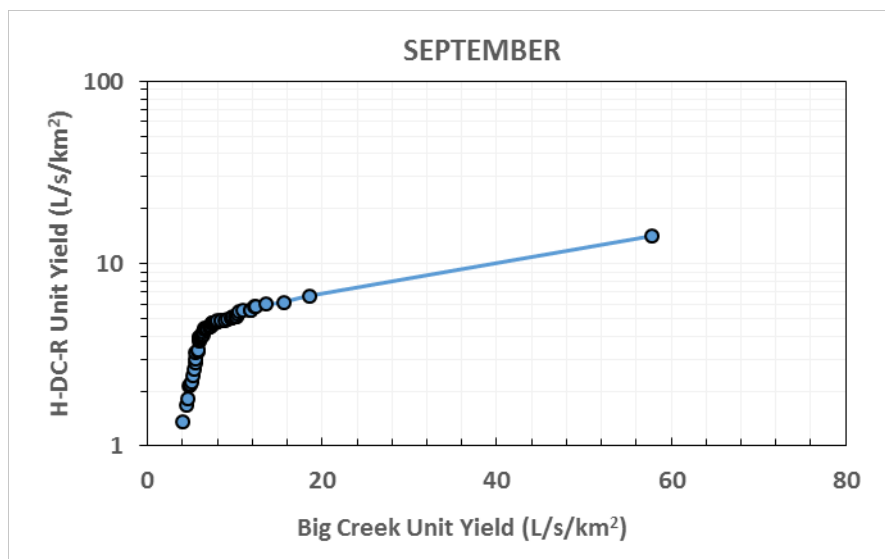


Figure 2-2: Empirical frequency pairing relationship for September at hydrometric station DC-R

The first attempt to construct a synthetic discharge series for the VC-DBC node resulted in higher discharges than those measured at the downstream VC-UMN station, which has a larger contributing area, and would therefore be expected to generate relative more runoff in the winter. No losing reaches are thought to exist between these monitoring points, and the water quality record is indicative of lower winter flows at the upstream (VC-DBC) station. Finally, an inspection of the available continuous water level data from the VC-DBC station during the winter months indicated that these measurements were likely artificially elevated due to channel icing alteration of the hydraulic relationship between flow and stage at the gauging station. Accordingly, the VC-UMN synthetic record was scaled by a simple drainage area ratio (0.9), for all months, due to issues with winter low flow data at VC-DBC. This record resulted in much improved model calibration to measured water quality during the winter.

The synthetic discharge records generated for the three site stations span the period of 1975 to 2016 (42 years), which allows the shorter-term site discharge records to be placed in a broader historical context.

The following figures and tables are provided in Appendix A.1 to A.3:

- Time-series of measured and synthetic streamflow data;
- Flow duration curves for the overlapping period of record (measured and synthetic time-series);

- Comparisons of synthetic and measured winter flows to manual streamflow measurements;
- Plots of all monthly and low flow EFP relationships for all Project hydrometric stations;
- Plots depicting the long-term variability in the synthetic annual runoff for the Project area as time-series, and expressed as standardized anomalies (departure of each annual value from the long-term mean).
- Tables of estimated average monthly discharge from the synthetic time-series for all nodes listed in Table 2-1.

An example standard anomaly plot is shown below for the Dome Creek at the Road (DC-R) station. An anomaly of zero means that the year's runoff value is equal to the long-term mean, a negative value indicates a lower than average runoff, and vice-versa.

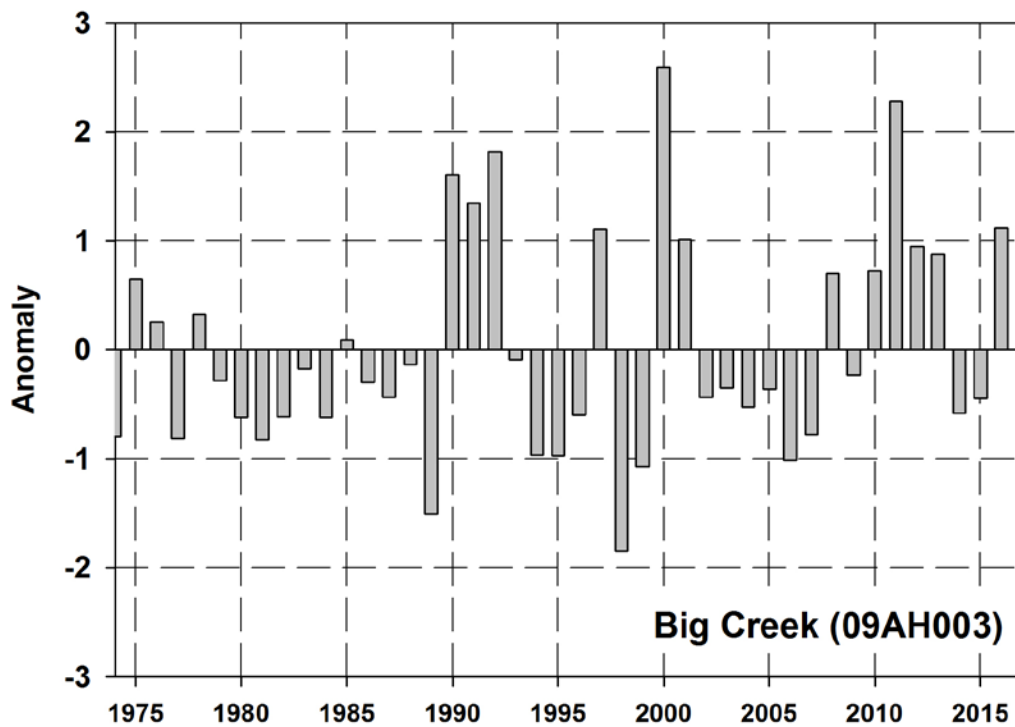


Figure 2-3: Standard anomaly plot of synthetic annual runoff series for the DC-R hydrometric station.

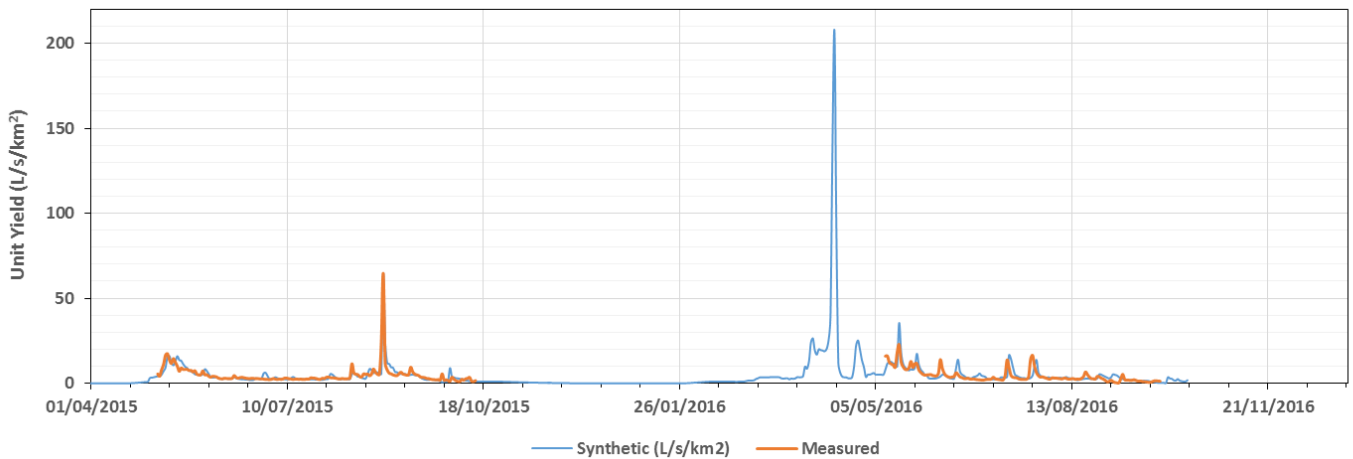
It is apparent from Figure 2-3 that the baseline record period (2011 to 2016) spans a wetter-than-average period within the longer regional record. The average runoff measured by the Big

Creek station is 140 mm over the 1975 to 2016 period, and 177 mm for the 2011-2015 period, with 2011 showing markedly higher than average runoff (264 mm), 2016 showing slightly higher than average runoff (200 mm). Based on the synthetic runoff data, the wettest year on record is 1979 (363 mm), and the driest year was 1998 (144 mm), which are approximately equal to a 1:50 wet-year and 1:200 dry year, respectively.

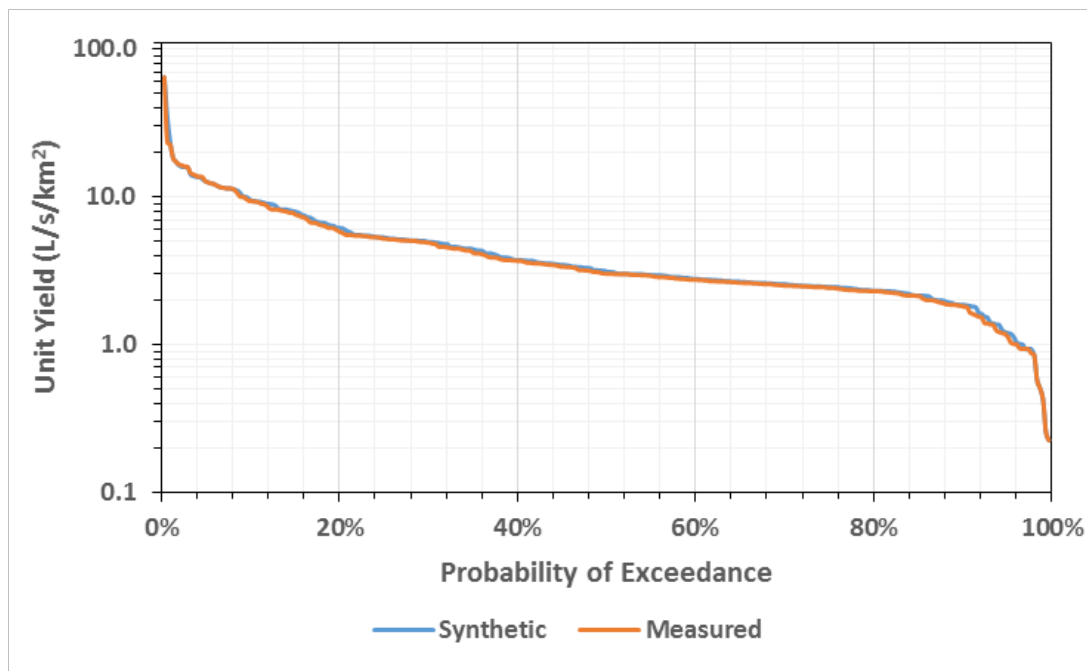
3. References

Butt, C.M.S. 2013. Evaluation of the performance of frequency and chronological pairing techniques in synthesising long-term streamflow. M.A.Sc. Thesis, University of British Columbia. 91 p.

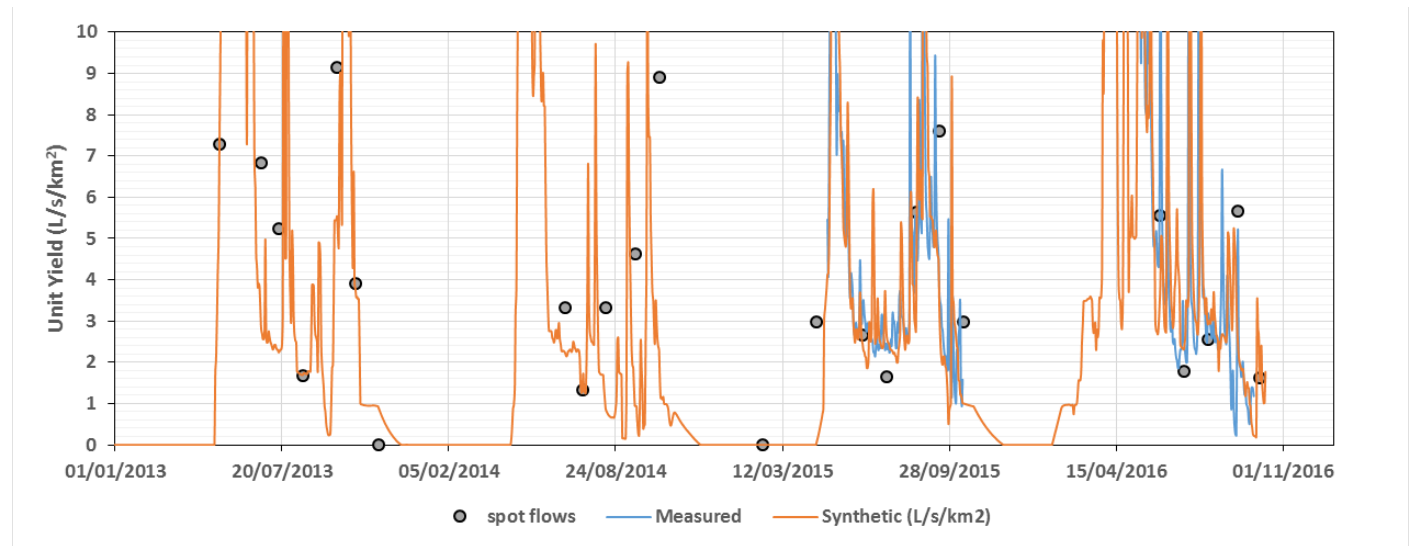
APPENDIX A.1:
SYNTHETIC DISCHARGE DATA
SUMMARY FOR DOME CREEK DC-B



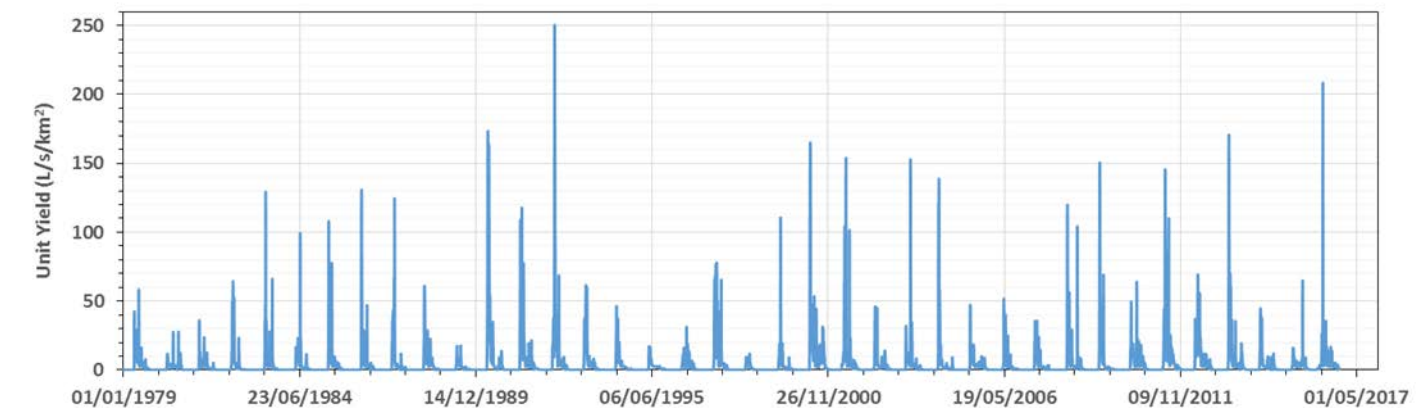
A.1-1: Time series of measured and synthetic discharge for DC-B (2015 to 2016).



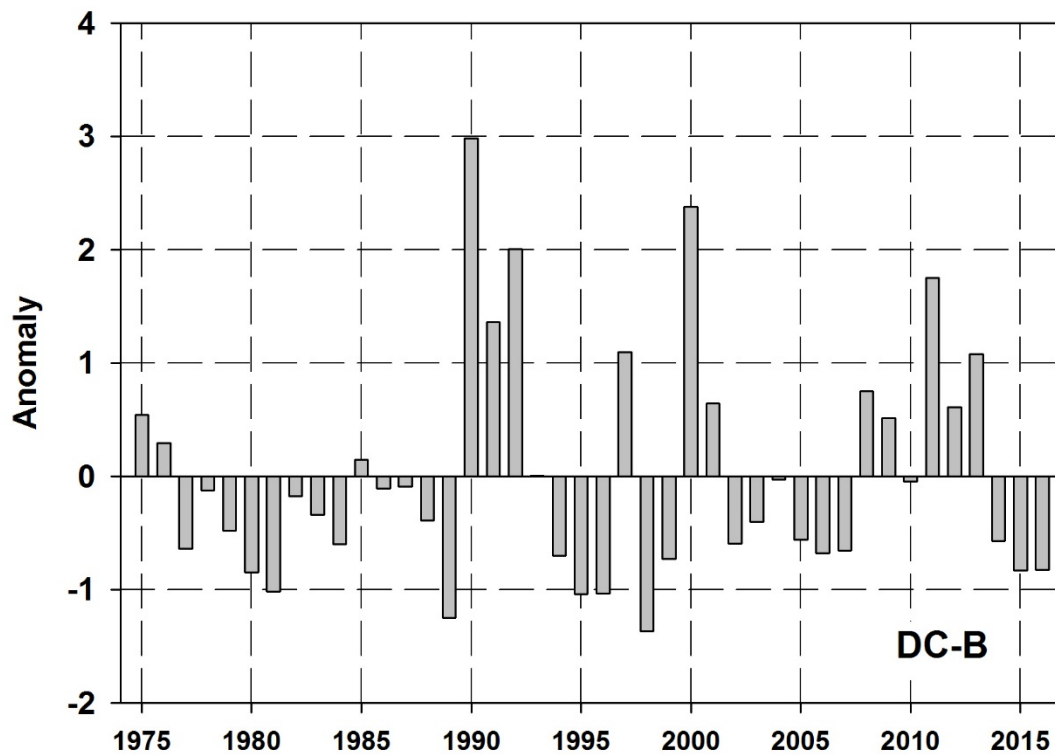
A.1-2: Flow duration curves of measured and synthetic discharge for DC-B (2015 to 2016).



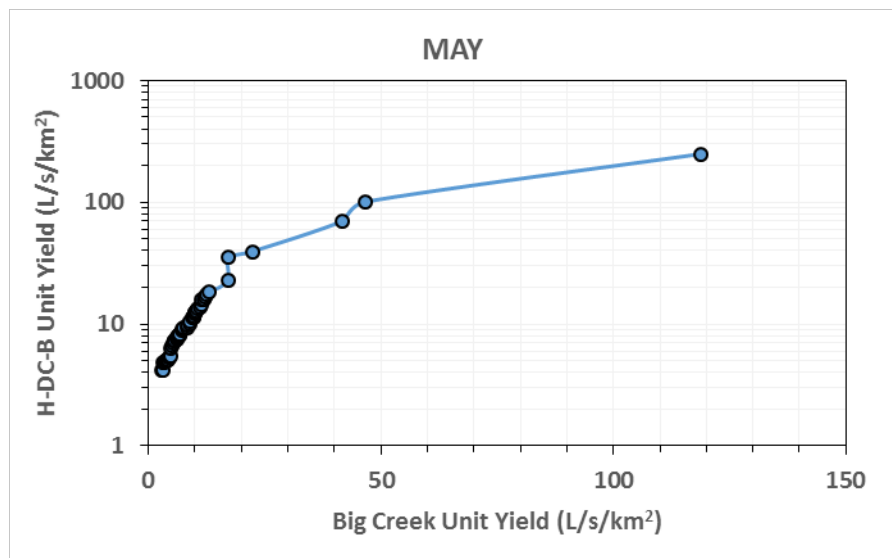
A.1-3: Time series of measured continuous discharge, spot discharge measurements and synthetic discharge for DC-B (2013 to 2016). Note that y-axis is scaled to low flows to highlight match between datasets.



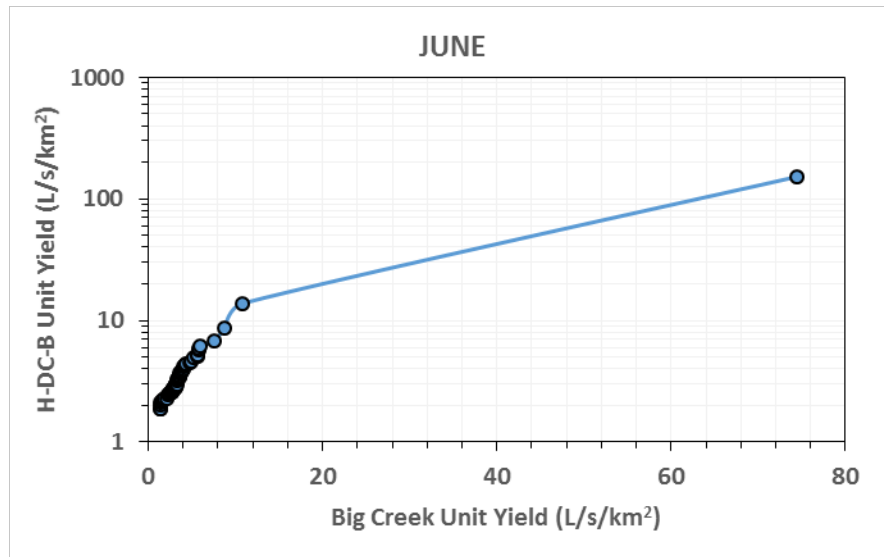
A.1-4: Time series of synthetic discharge for DC-B (1975 to 2015).



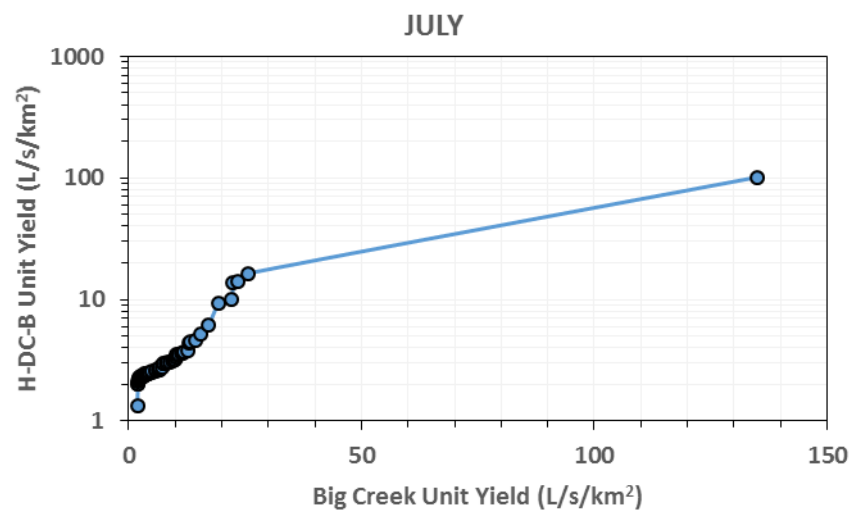
A.1-5: Annual runoff standard anomaly time-series for DC-B (1975 to 2015).



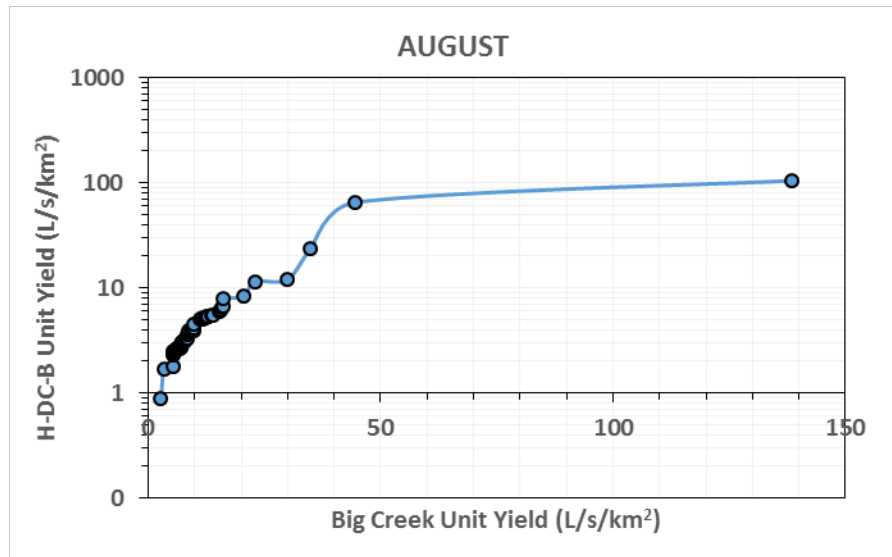
A.1-6: Piece-wise ranked regression plot for DC-B (May; 2015 to 2016)



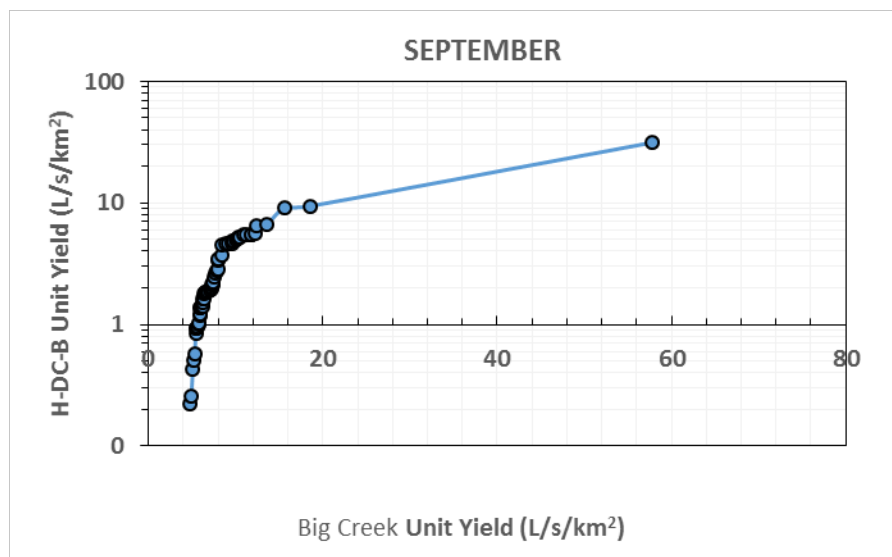
A.1-7: Piece-wise ranked regression plot for DC-B (June; 2015 to 2016)



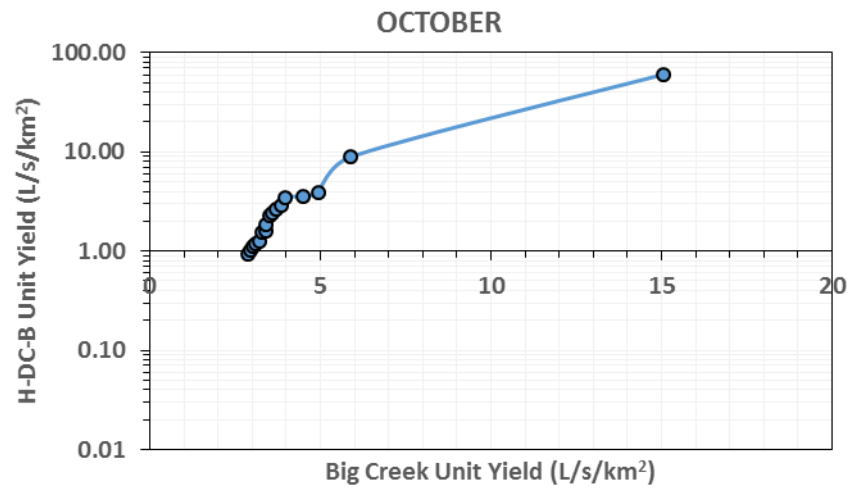
A.1-8: Piece-wise ranked regression plot for DC-B (July; 2015 to 2016)



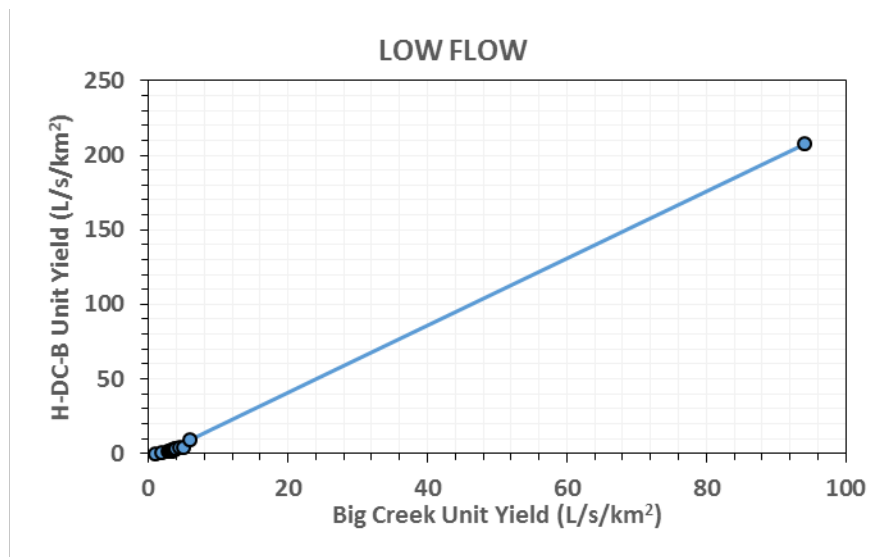
A.1-9: Piece-wise ranked regression plot for DC-B (August; 2015 to 2016)



A.1-10: Piece-wise ranked regression plot for DC-B (September; 2015 to 2016)



A.1-11: Piece-wise ranked regression plot for DC-B (October; 2015 to 2016)



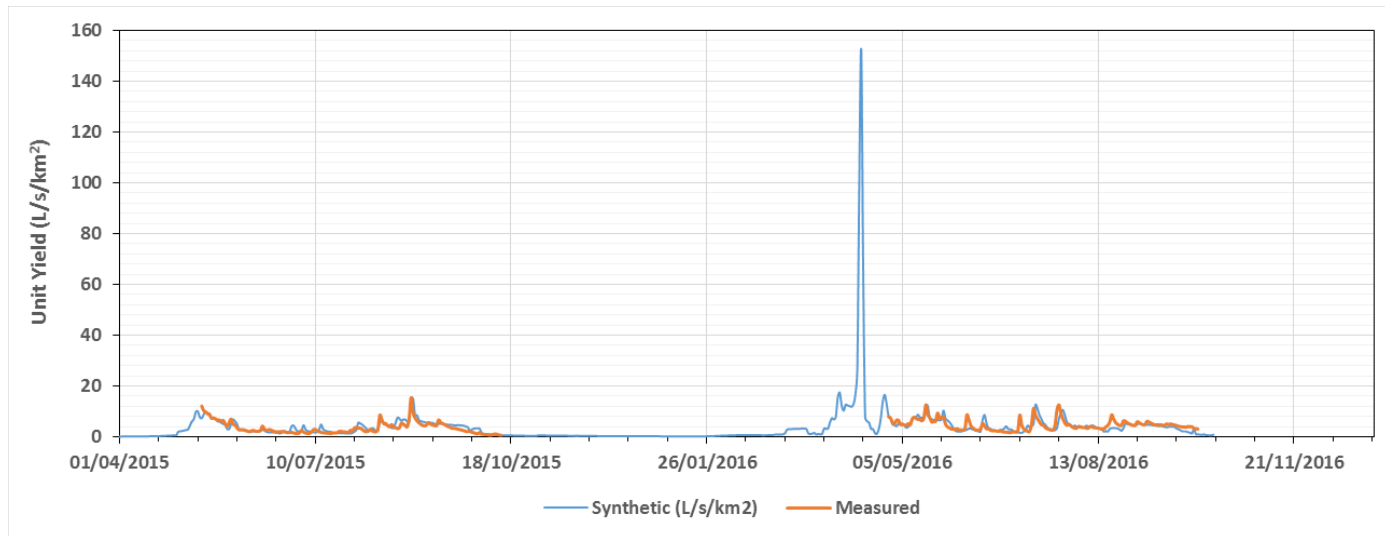
A.1-12: Piece-wise ranked regression plot for DC-B (Winter – October to April; 2015 to 2016)

A.1-13: Average monthly synthetic discharge (m³/s) for DC-B (1975-2016)

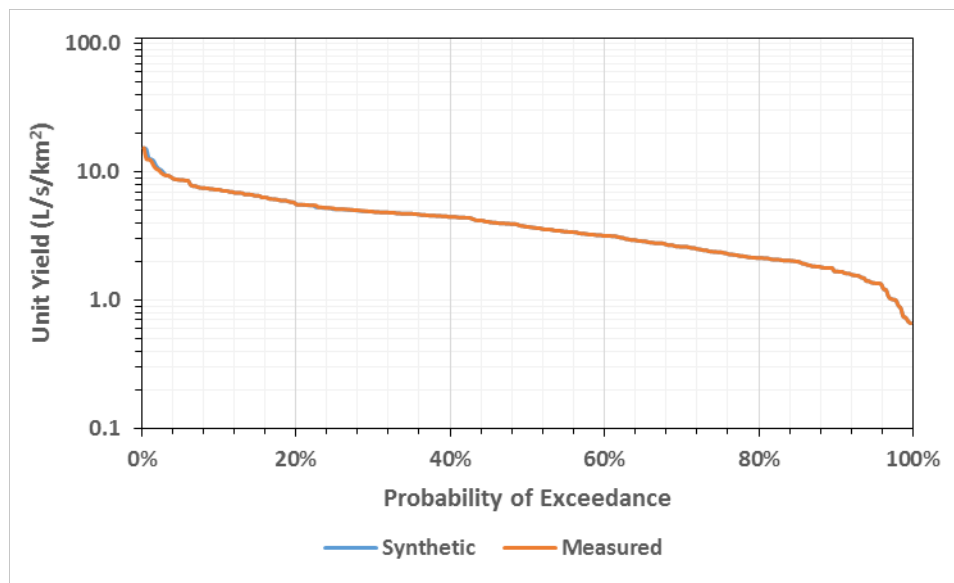
Average of synthetic DC-B discharge (m ³ /s)												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1975	0.000	0.000	0.000	0.000	0.115	0.031	0.021	0.017	0.008	0.004	0.000	0.000
1976	0.000	0.000	0.000	0.000	0.059	0.066	0.045	0.004	0.000	0.000	0.000	0.000
1977	0.000	0.000	0.000	0.000	0.041	0.041	0.012	0.002	0.000	0.001	0.000	0.000
1978	0.000	0.000	0.000	0.000	0.015	0.058	0.041	0.021	0.001	0.005	0.000	0.000
1979	0.000	0.000	0.000	0.000	0.042	0.040	0.014	0.008	0.004	0.002	0.000	0.000
1980	0.000	0.000	0.000	0.000	0.017	0.008	0.016	0.007	0.017	0.015	0.000	0.000
1981	0.000	0.000	0.000	0.000	0.030	0.009	0.013	0.010	0.000	0.004	0.000	0.000
1982	0.000	0.000	0.000	0.000	0.067	0.052	0.005	0.012	0.000	0.001	0.000	0.000
1983	0.000	0.000	0.000	0.000	0.022	0.056	0.016	0.024	0.002	0.002	0.000	0.000
1984	0.000	0.000	0.000	0.000	0.028	0.043	0.018	0.003	0.008	0.001	0.000	0.000
1985	0.000	0.000	0.000	0.000	0.077	0.058	0.013	0.008	0.005	0.002	0.000	0.000
1986	0.000	0.000	0.000	0.000	0.071	0.042	0.016	0.008	0.003	0.002	0.000	0.000
1987	0.000	0.000	0.000	0.000	0.076	0.050	0.006	0.008	0.001	0.002	0.000	0.000
1988	0.000	0.000	0.000	0.000	0.068	0.020	0.017	0.011	0.000	0.002	0.000	0.000
1989	0.000	0.000	0.000	0.000	0.023	0.014	0.006	0.003	0.000	0.001	0.000	0.000
1990	0.000	0.000	0.000	0.074	0.256	0.035	0.007	0.002	0.015	0.009	0.000	0.000
1991	0.000	0.000	0.000	0.006	0.153	0.056	0.011	0.013	0.016	0.006	0.003	0.001
1992	0.000	0.000	0.000	0.001	0.165	0.094	0.033	0.009	0.011	0.005	0.000	0.000
1993	0.000	0.000	0.000	0.013	0.101	0.017	0.009	0.009	0.001	0.001	0.000	0.000
1994	0.000	0.000	0.000	0.021	0.044	0.015	0.008	0.005	0.000	0.001	0.000	0.000
1995	0.000	0.000	0.000	0.001	0.034	0.009	0.008	0.006	0.003	0.003	0.000	0.000
1996	0.000	0.000	0.000	0.000	0.014	0.011	0.018	0.015	0.006	0.002	0.000	0.000
1997	0.000	0.000	0.000	0.000	0.079	0.112	0.021	0.022	0.004	0.003	0.000	0.000
1998	0.000	0.000	0.000	0.000	0.018	0.014	0.004	0.001	0.000	0.000	0.000	0.000
1999	0.000	0.000	0.000	0.000	0.021	0.056	0.007	0.002	0.003	0.002	0.000	0.000
2000	0.000	0.000	0.000	0.001	0.170	0.067	0.024	0.023	0.030	0.029	0.003	0.001
2001	0.000	0.000	0.000	0.001	0.037	0.103	0.032	0.014	0.010	0.006	0.001	0.000
2002	0.000	0.000	0.000	0.000	0.049	0.019	0.008	0.011	0.010	0.004	0.000	0.000
2003	0.000	0.000	0.000	0.010	0.026	0.048	0.019	0.008	0.001	0.005	0.000	0.000
2004	0.000	0.000	0.000	0.003	0.119	0.011	0.005	0.005	0.001	0.005	0.000	0.000
2005	0.000	0.000	0.000	0.020	0.031	0.016	0.008	0.009	0.012	0.008	0.001	0.000
2006	0.000	0.000	0.000	0.000	0.056	0.024	0.008	0.004	0.000	0.002	0.000	0.000
2007	0.000	0.000	0.000	0.006	0.055	0.016	0.010	0.005	0.001	0.003	0.000	0.000
2008	0.000	0.000	0.000	0.002	0.126	0.022	0.007	0.036	0.012	0.008	0.001	0.000
2009	0.000	0.000	0.000	0.001	0.137	0.046	0.005	0.002	0.000	0.002	0.000	0.000
2010	0.000	0.000	0.000	0.025	0.038	0.013	0.036	0.017	0.012	0.005	0.001	0.000
2011	0.000	0.000	0.000	0.003	0.133	0.087	0.033	0.027	0.006	0.006	0.002	0.000

2012	0.000	0.000	0.000	0.022	0.070	0.061	0.012	0.014	0.012	0.008	0.001	0.000
2013	0.000	0.000	0.000	0.000	0.141	0.044	0.017	0.007	0.010	0.019	0.002	0.000
2014	0.000	0.000	0.000	0.005	0.062	0.008	0.008	0.005	0.006	0.008	0.001	0.000
2015	0.000	0.000	0.000	0.000	0.024	0.009	0.008	0.023	0.011	0.005	0.001	0.000
2016	0.000	0.000	0.000	0.006	0.029	0.013	0.015	0.009	0.006	--	--	--
Average	0.000	0.000	0.000	0.005	0.070	0.038	0.015	0.011	0.006	0.005	0.000	0.000
σ	0.000	0.000	0.000	0.013	0.054	0.028	0.010	0.008	0.006	0.005	0.001	0.000
Runoff (mm)	0.0	0.0	0.0	4.5	62.5	33.2	13.7	9.6	5.0	4.2	0.4	0.0

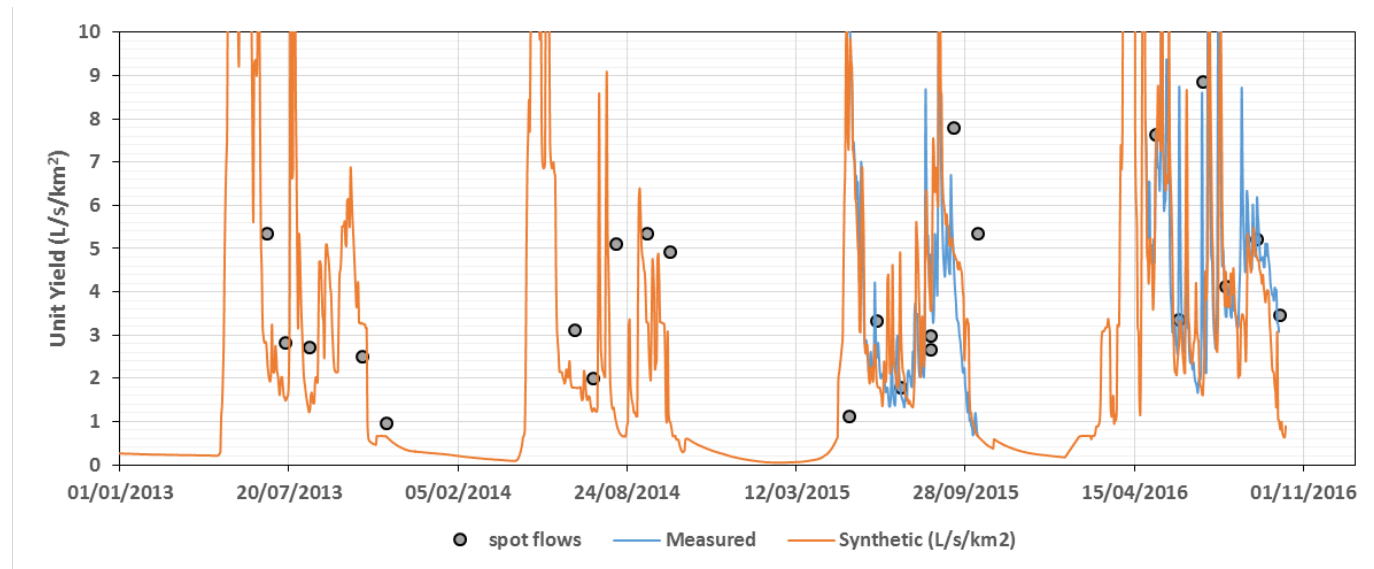
APPENDIX A.2:
SYNTHETIC DISCHARGE DATA
SUMMARY FOR DOME CREEK DC-R



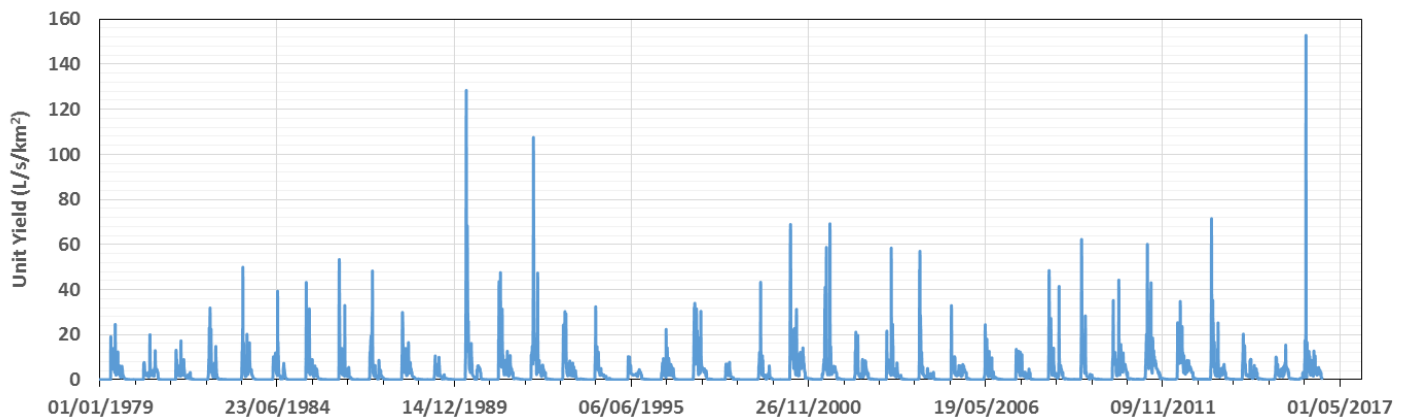
A.2-1: Time series of measured and synthetic discharge for DC-R (2015 to 2016).



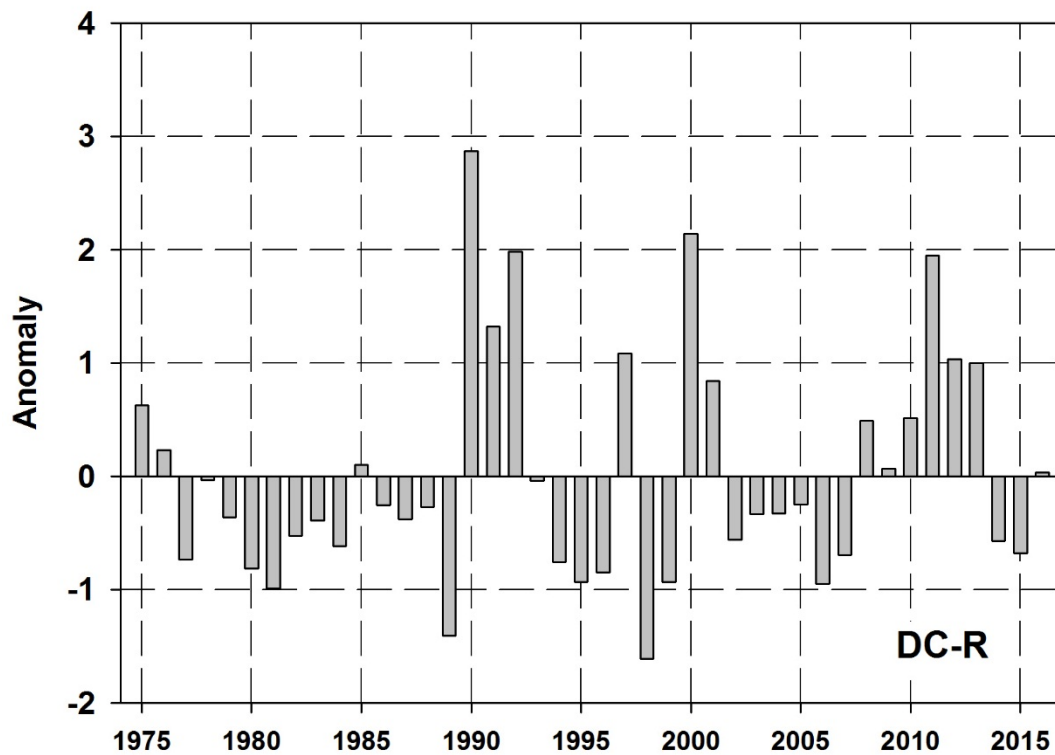
A.2-2: Flow duration curves of measured and synthetic discharge for DC-R (2015 to 2016).



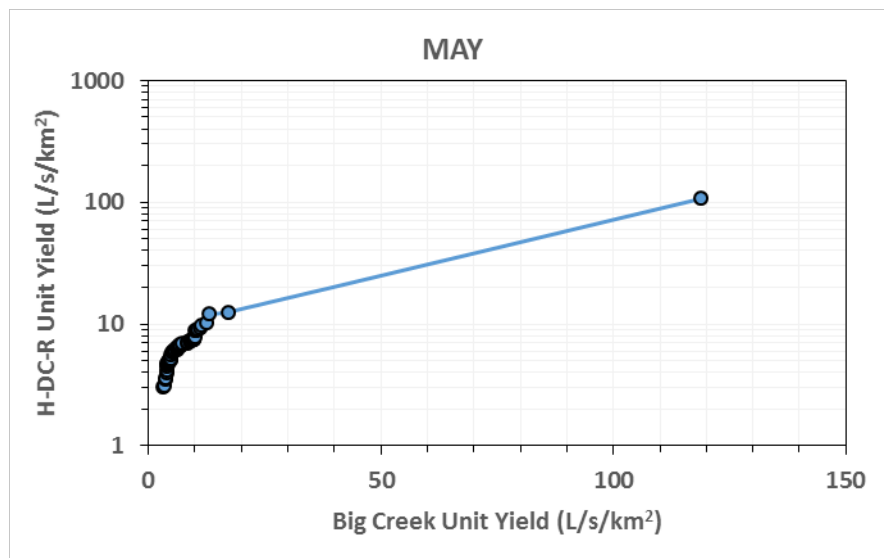
A.2-3: Time series of measured continuous discharge, spot discharge measurements and synthetic discharge for DC-R (2013 to 2016). Note that y-axis is scaled to low flows to highlight match between datasets.



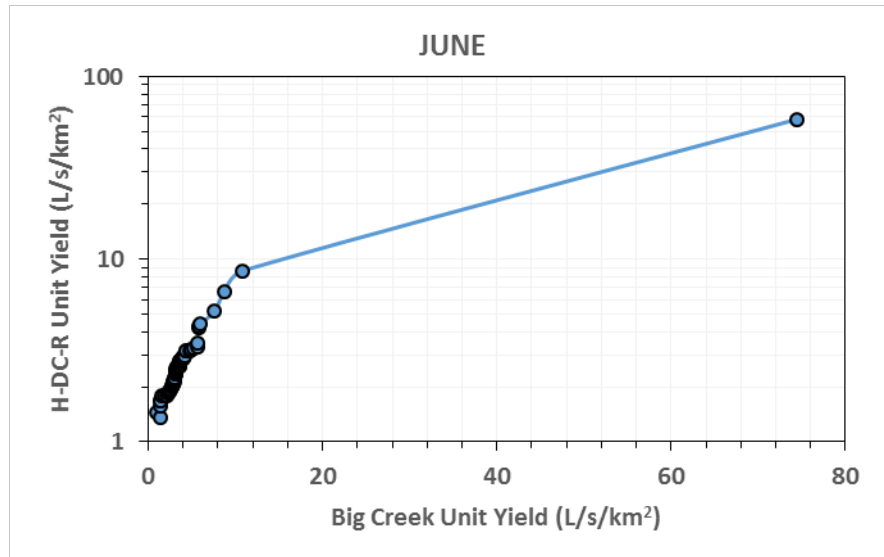
A.2-4: Time series of synthetic discharge for DC-R (1975 to 2015).



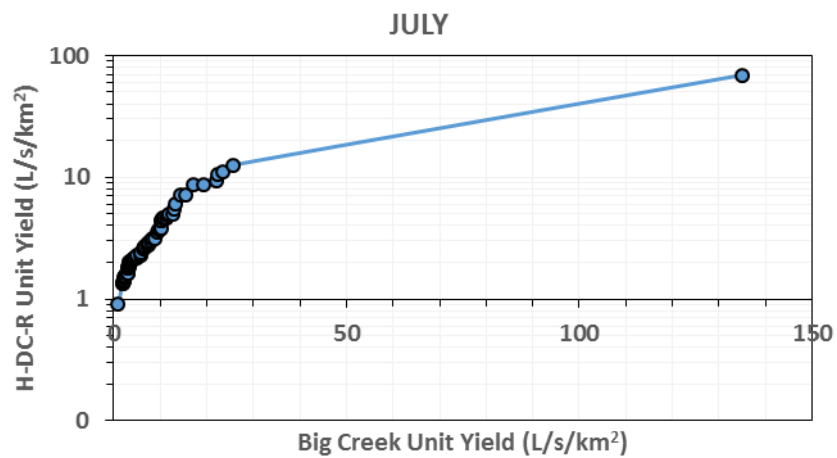
A.2-5: Annual runoff standard anomaly time-series for DC-R (1975 to 2015).



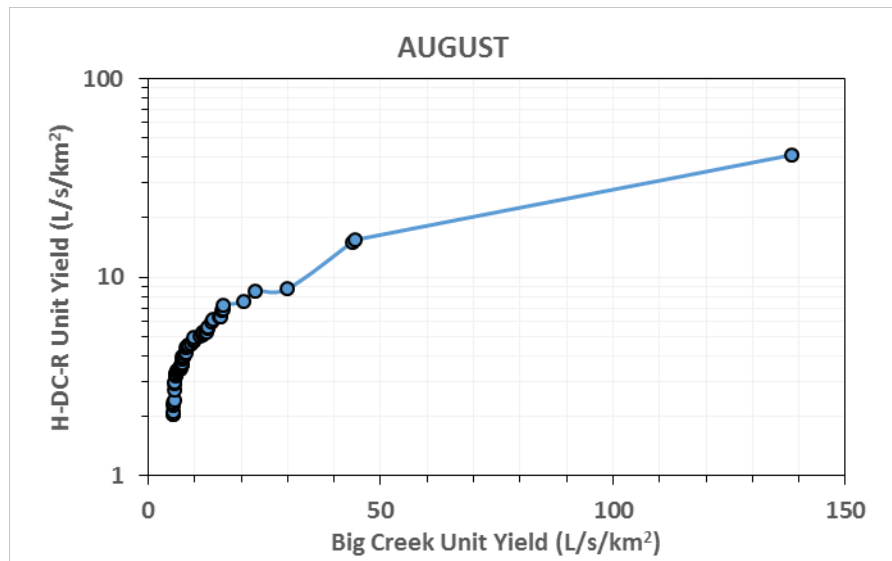
A.2-6: Piece-wise ranked regression plot for DC-R (May; 2015 to 2016)



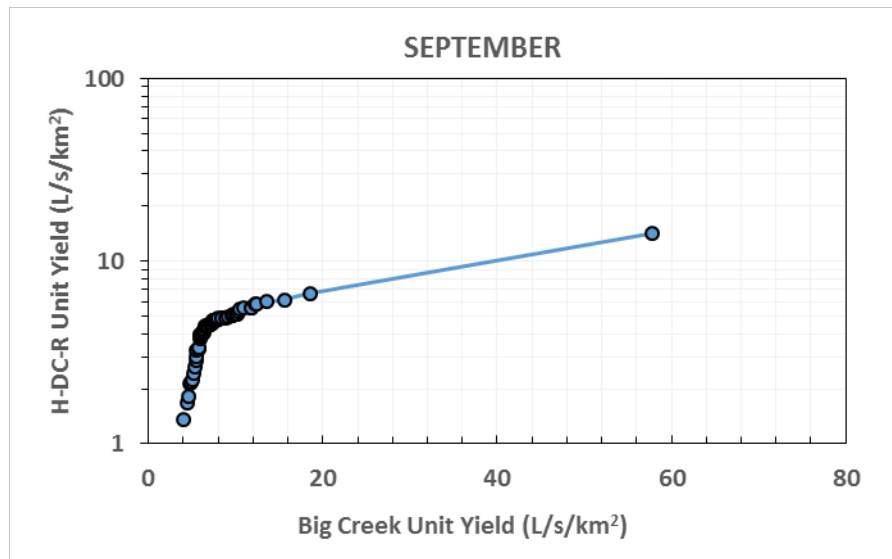
A.2-7: Piece-wise ranked regression plot for DC-R (June; 2015 to 2016)



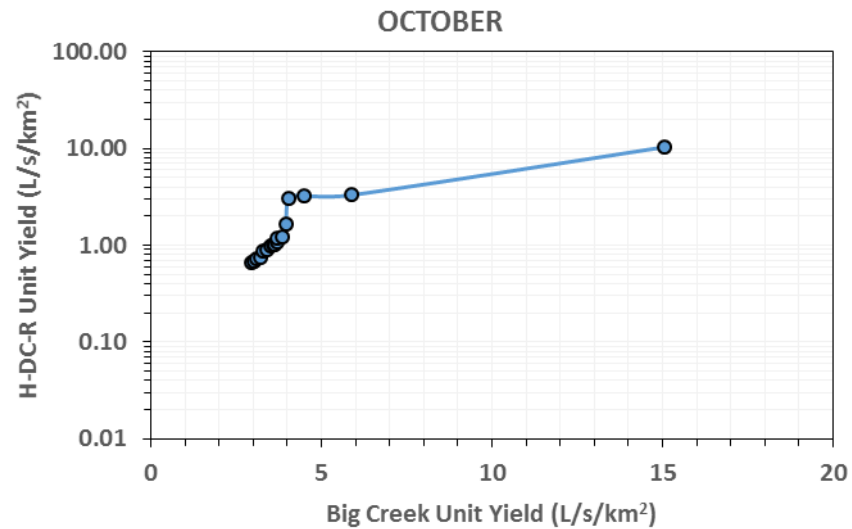
A.2-8: Piece-wise ranked regression plot for DC-R (July; 2015 to 2016)



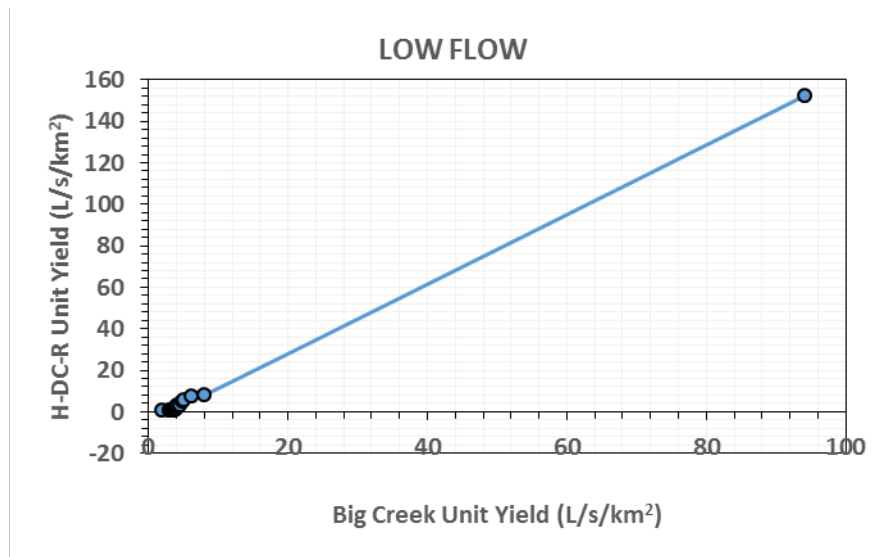
A.2-9: Piece-wise ranked regression plot for DC-R (August; 2015 to 2016)



A.2-10: Piece-wise ranked regression plot for DC-R (September; 2015 to 2016)



A.2-11: Piece-wise ranked regression plot for DC-R (October; 2015 to 2016)



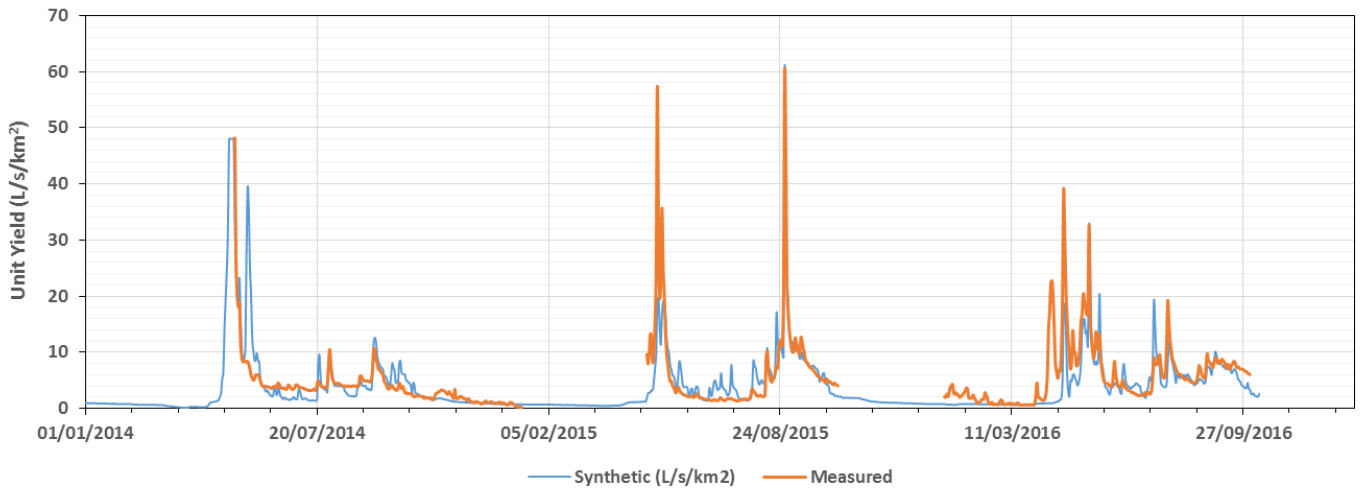
A.2-12: Piece-wise ranked regression plot for DC-R (Winter – October to April; 2015 to 2016)

A.2-13: Average monthly synthetic discharge (m³/s) for DC-R (1975-2016)

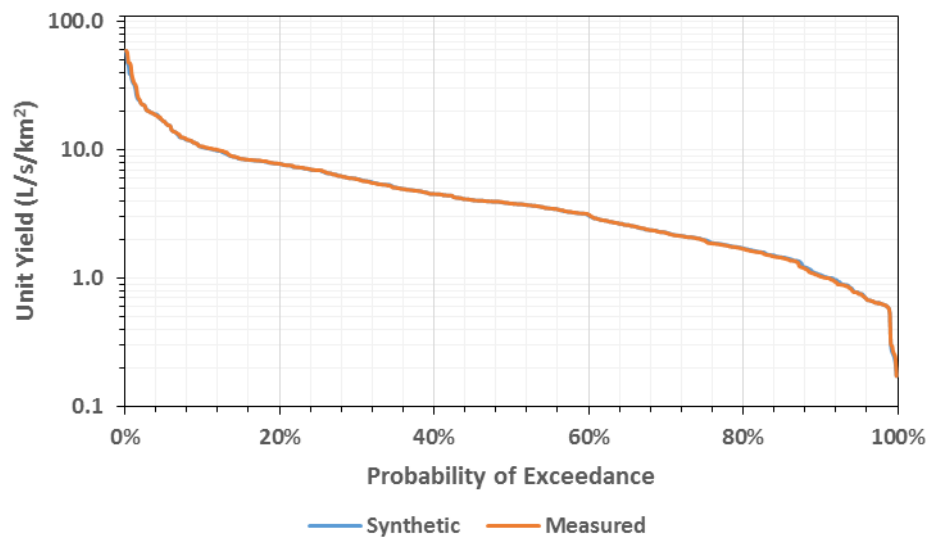
Average of synthetic DC-R discharge (m ³ /s)												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1975	0.000	0.000	0.000	0.000	0.079	0.028	0.027	0.025	0.019	0.004	0.000	0.000
1976	0.000	0.000	0.000	0.000	0.049	0.050	0.052	0.005	0.001	0.001	0.001	0.000
1977	0.000	0.000	0.000	0.000	0.038	0.035	0.018	0.003	0.003	0.001	0.001	0.000
1978	0.000	0.000	0.000	0.000	0.017	0.040	0.049	0.024	0.007	0.004	0.001	0.001
1979	0.000	0.000	0.000	0.000	0.038	0.035	0.021	0.013	0.012	0.002	0.001	0.000

1980	0.000	0.000	0.000	0.000	0.017	0.009	0.020	0.013	0.023	0.010	0.001	0.000
1981	0.000	0.000	0.000	0.000	0.028	0.010	0.021	0.014	0.005	0.004	0.001	0.000
1982	0.000	0.000	0.000	0.000	0.049	0.039	0.007	0.015	0.001	0.001	0.001	0.000
1983	0.000	0.000	0.000	0.000	0.018	0.041	0.021	0.028	0.011	0.002	0.000	0.000
1984	0.000	0.000	0.000	0.000	0.029	0.034	0.024	0.003	0.016	0.001	0.000	0.000
1985	0.000	0.000	0.000	0.000	0.053	0.045	0.022	0.014	0.015	0.002	0.001	0.001
1986	0.000	0.000	0.000	0.000	0.046	0.035	0.020	0.013	0.011	0.002	0.001	0.000
1987	0.000	0.000	0.000	0.001	0.053	0.036	0.009	0.012	0.008	0.002	0.001	0.000
1988	0.000	0.000	0.000	0.000	0.056	0.020	0.025	0.018	0.005	0.002	0.001	0.001
1989	0.000	0.000	0.000	0.000	0.026	0.015	0.008	0.004	0.002	0.001	0.001	0.000
1990	0.000	0.000	0.000	0.080	0.165	0.032	0.010	0.003	0.024	0.007	0.001	0.000
1991	0.000	0.000	0.000	0.006	0.102	0.044	0.020	0.019	0.024	0.007	0.003	0.002
1992	0.001	0.000	0.000	0.001	0.112	0.066	0.043	0.014	0.020	0.006	0.002	0.001
1993	0.000	0.000	0.000	0.013	0.071	0.018	0.013	0.015	0.007	0.001	0.002	0.001
1994	0.001	0.000	0.000	0.021	0.041	0.016	0.010	0.006	0.001	0.001	0.000	0.000
1995	0.000	0.000	0.000	0.001	0.036	0.011	0.010	0.011	0.015	0.002	0.001	0.001
1996	0.000	0.000	0.000	0.000	0.015	0.012	0.025	0.023	0.015	0.001	0.001	0.000
1997	0.000	0.000	0.000	0.000	0.059	0.076	0.030	0.026	0.016	0.003	0.001	0.001
1998	0.000	0.000	0.000	0.000	0.023	0.015	0.005	0.001	0.001	0.000	0.000	0.000
1999	0.000	0.000	0.000	0.000	0.021	0.042	0.009	0.003	0.009	0.002	0.000	0.000
2000	0.000	0.000	0.000	0.001	0.112	0.052	0.032	0.028	0.031	0.017	0.003	0.002
2001	0.001	0.001	0.000	0.001	0.034	0.069	0.040	0.022	0.020	0.006	0.002	0.001
2002	0.000	0.000	0.000	0.001	0.040	0.017	0.011	0.017	0.018	0.003	0.002	0.001
2003	0.000	0.000	0.000	0.010	0.030	0.035	0.024	0.012	0.006	0.003	0.001	0.001
2004	0.000	0.000	0.000	0.004	0.084	0.012	0.007	0.007	0.005	0.004	0.001	0.001
2005	0.000	0.000	0.000	0.021	0.033	0.016	0.013	0.014	0.022	0.008	0.002	0.000
2006	0.000	0.000	0.000	0.001	0.041	0.021	0.011	0.006	0.003	0.001	0.001	0.000
2007	0.000	0.000	0.000	0.007	0.048	0.016	0.013	0.007	0.008	0.003	0.001	0.000
2008	0.000	0.000	0.000	0.002	0.087	0.021	0.009	0.026	0.021	0.006	0.002	0.001
2009	0.001	0.001	0.000	0.002	0.093	0.036	0.006	0.004	0.003	0.001	0.001	0.001
2010	0.000	0.000	0.000	0.025	0.038	0.014	0.045	0.025	0.021	0.005	0.002	0.001
2011	0.001	0.001	0.001	0.005	0.091	0.062	0.045	0.034	0.017	0.005	0.002	0.001
2012	0.001	0.001	0.001	0.023	0.058	0.049	0.020	0.023	0.022	0.009	0.002	0.001
2013	0.001	0.001	0.001	0.001	0.098	0.035	0.022	0.012	0.019	0.013	0.003	0.001
2014	0.001	0.001	0.001	0.005	0.049	0.010	0.011	0.007	0.016	0.006	0.002	0.001
2015	0.000	0.000	0.000	0.001	0.027	0.010	0.010	0.026	0.022	0.004	0.002	0.001
2016	0.001	0.001	0.001	0.008	0.030	0.014	0.022	0.017	0.017	--	--	--
Average	0.000	0.000	0.000	0.006	0.053	0.031	0.020	0.015	0.013	0.004	0.001	0.001
σ	0.000	0.000	0.000	0.014	0.032	0.018	0.012	0.009	0.008	0.003	0.001	0.001
Runoff (mm)	0.2	0.1	0.1	3.4	31.7	17.8	12.2	8.7	7.3	2.3	0.7	0.4

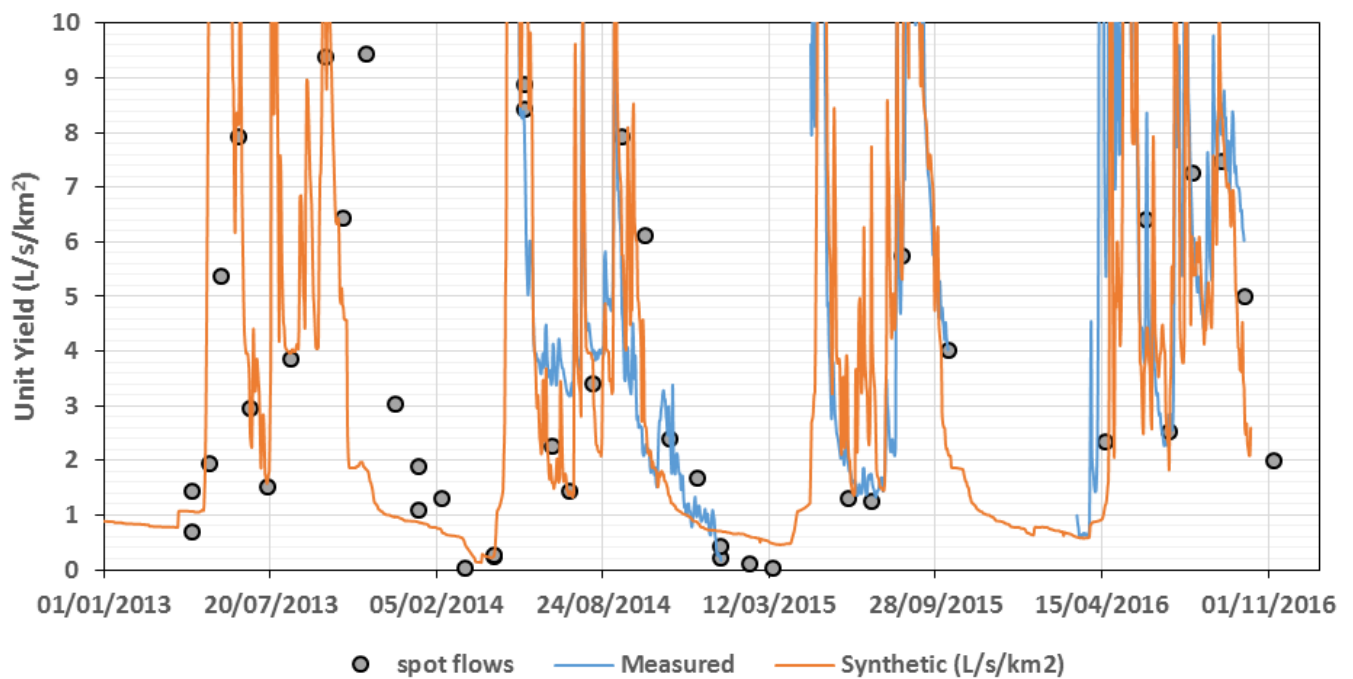
APPENDIX A.3:
SYNTHETIC DISCHARGE DATA
SUMMARY FOR VICTORIA CREEK VC-UMN



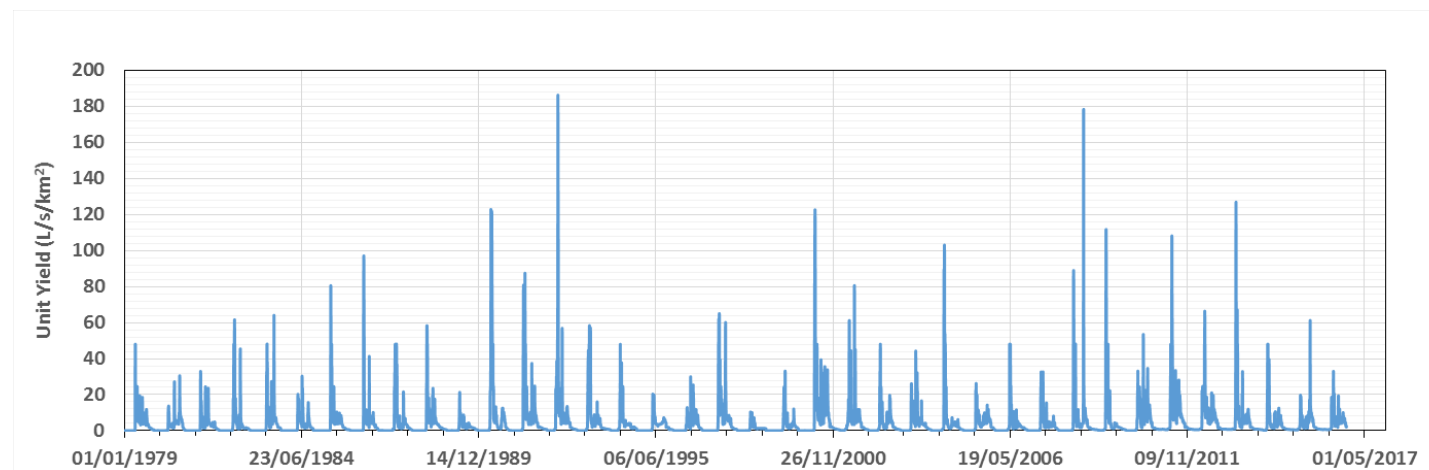
A.3-1: Time series of measured and synthetic discharge for VC-UMN (2014 to 2016).



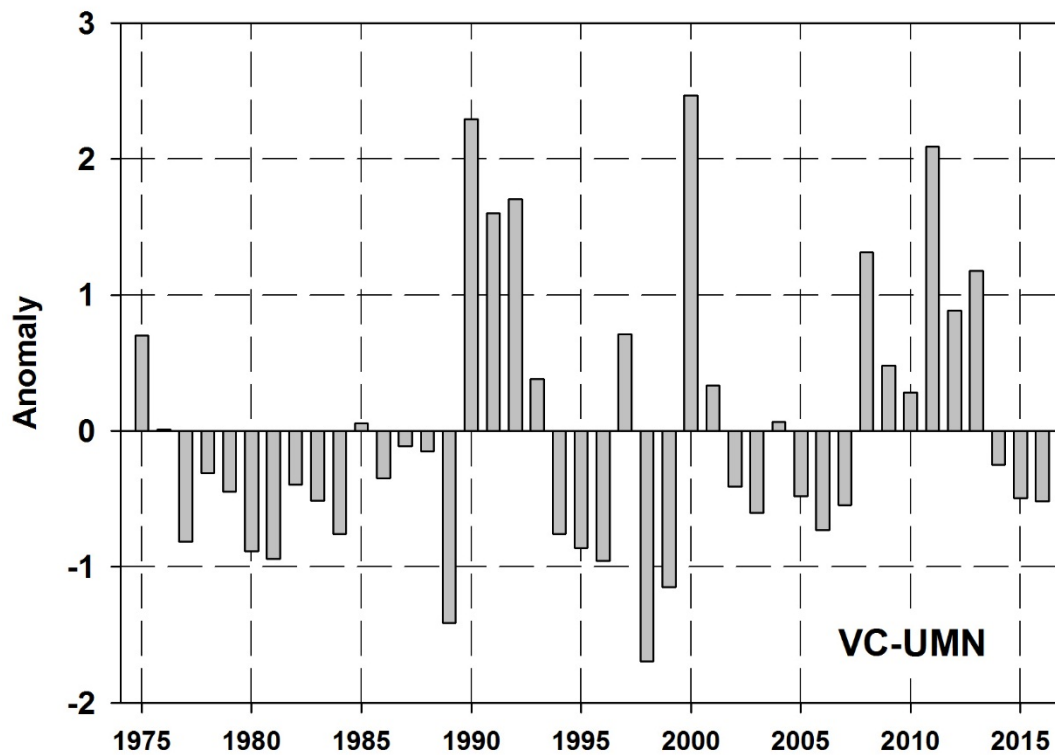
A.3-2: Flow duration curves of measured and synthetic discharge for VC-UMN (2014 to 2016).



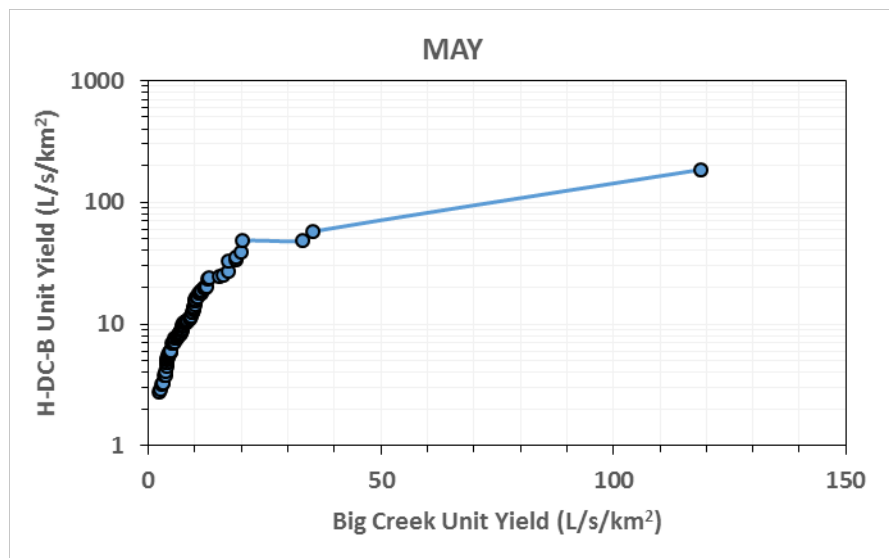
A.3-3: Time series of measured continuous discharge, spot discharge measurements and synthetic discharge for VC-UMN (2014 to 2016). Note that y-axis is scaled to low flows to highlight match between datasets.



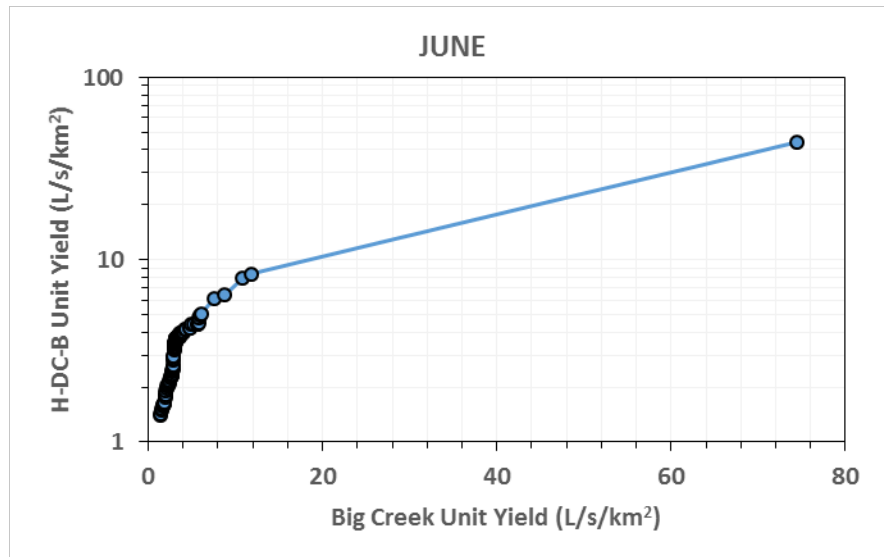
A.3-4: Time series of synthetic discharge for VC-UMN (1975 to 2015).



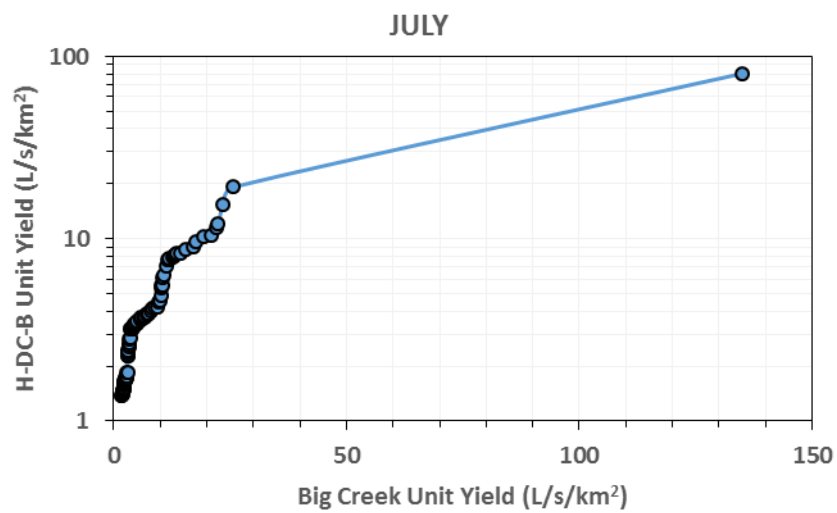
A.3-5: Annual runoff standard anomaly time-series for VC-UMN (1975 to 2015).



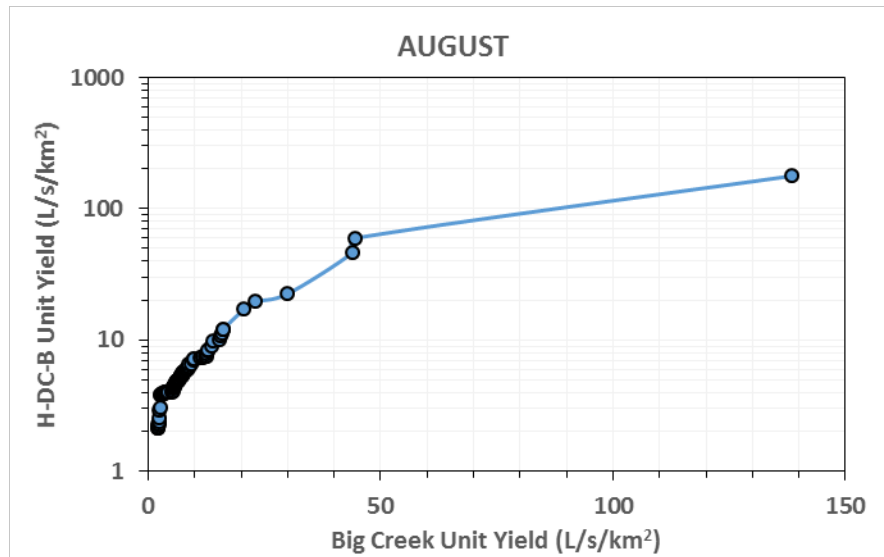
A.3-6: Piece-wise ranked regression plot for VC-UMN (May; 2014 to 2016)



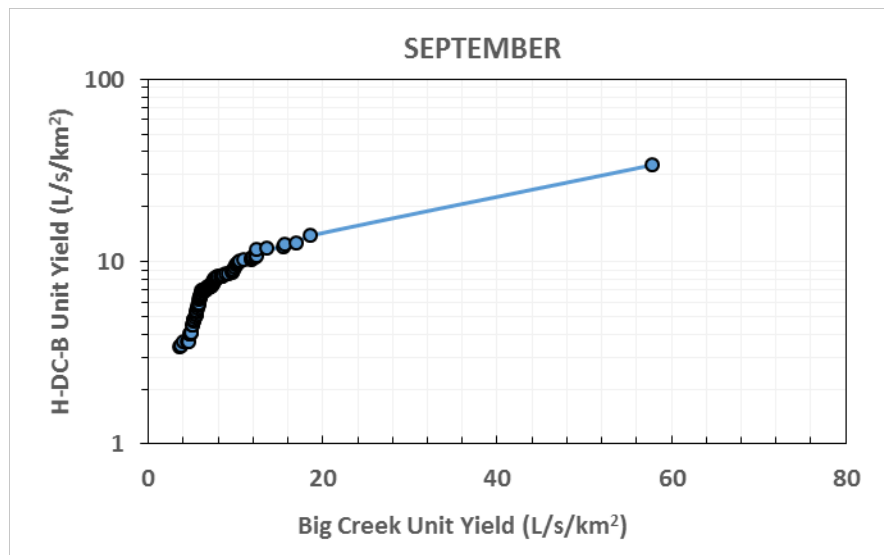
A.3-7: Piece-wise ranked regression plot for VC-UMN (June; 2014 to 2016)



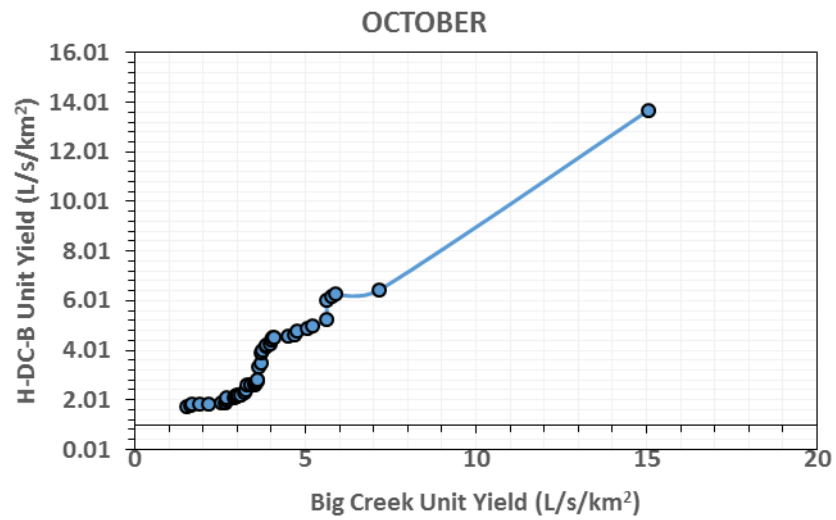
A.3-8: Piece-wise ranked regression plot for VC-UMN (July; 2014 to 2016)



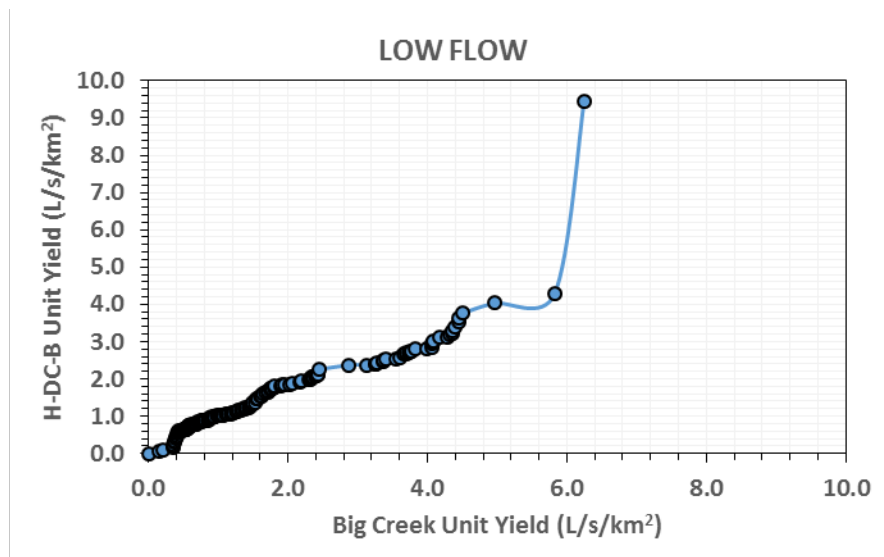
A.3-9: Piece-wise ranked regression plot for VC-UMN (August; 2014 to 2016)



A.3-10: Piece-wise ranked regression plot for VC-UMN (September; 2014 to 2016)



A.3-11: Piece-wise ranked regression plot for VC-UMN (October; 2014 to 2016)



A.3-12: Piece-wise ranked regression plot for VC-UMN (Winter – October to April; 2014 to 2016)

A.3-13: Average monthly synthetic discharge (m³/s) for VC-UMN (1975-2016)

Average of synthetic VC-UMN discharge (m ³ /s)												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1975	0.001	0.001	0.002	0.019	2.853	0.518	0.659	0.809	0.625	0.199	0.009	0.003
1976	0.002	0.001	0.001	0.017	1.797	0.813	1.215	0.299	0.126	0.116	0.035	0.004
1977	0.003	0.003	0.002	0.028	1.276	0.604	0.429	0.209	0.183	0.138	0.034	0.001
1978	0.001	0.000	0.000	0.001	0.424	0.662	1.176	0.934	0.317	0.211	0.083	0.025
1979	0.007	0.002	0.002	0.007	1.322	0.622	0.532	0.446	0.437	0.145	0.061	0.008
1980	0.002	0.002	0.003	0.012	0.449	0.202	0.490	0.397	0.841	0.346	0.036	0.003
1981	0.002	0.002	0.002	0.009	0.882	0.202	0.519	0.535	0.248	0.189	0.076	0.014
1982	0.002	0.002	0.002	0.008	1.884	0.658	0.164	0.673	0.118	0.121	0.042	0.006
1983	0.002	0.001	0.001	0.002	0.669	0.687	0.528	1.023	0.394	0.143	0.014	0.000
1984	0.000	0.000	0.000	0.005	0.903	0.602	0.582	0.213	0.567	0.133	0.009	0.001
1985	0.000	0.000	0.001	0.003	2.043	0.751	0.518	0.433	0.504	0.148	0.069	0.038
1986	0.010	0.005	0.002	0.002	1.599	0.621	0.519	0.405	0.414	0.151	0.027	0.012
1987	0.008	0.003	0.001	0.042	2.327	0.608	0.217	0.460	0.328	0.143	0.054	0.009
1988	0.003	0.002	0.003	0.023	1.987	0.420	0.625	0.551	0.259	0.144	0.079	0.038
1989	0.008	0.003	0.001	0.009	0.673	0.313	0.198	0.239	0.169	0.132	0.061	0.015
1990	0.004	0.002	0.001	0.635	5.841	0.582	0.258	0.173	0.802	0.262	0.048	0.006
1991	0.003	0.004	0.008	0.121	4.020	0.743	0.488	0.647	0.818	0.247	0.153	0.094
1992	0.057	0.009	0.010	0.051	3.867	1.029	1.015	0.439	0.680	0.231	0.089	0.060
1993	0.011	0.004	0.003	0.254	3.041	0.391	0.343	0.476	0.305	0.122	0.085	0.071
1994	0.029	0.005	0.002	0.353	1.402	0.367	0.289	0.300	0.130	0.126	0.014	0.005
1995	0.003	0.001	0.000	0.033	1.097	0.292	0.289	0.372	0.477	0.155	0.066	0.038
1996	0.003	0.000	0.000	0.000	0.365	0.247	0.619	0.722	0.525	0.137	0.033	0.002
1997	0.001	0.000	0.000	0.002	2.137	1.162	0.712	0.906	0.510	0.174	0.083	0.029
1998	0.003	0.002	0.001	0.011	0.513	0.333	0.105	0.112	0.103	0.110	0.004	0.000
1999	0.000	0.000	0.000	0.007	0.645	0.713	0.202	0.207	0.375	0.141	0.007	0.001
2000	0.000	0.000	0.000	0.023	4.168	0.838	0.773	1.178	1.184	0.497	0.169	0.102
2001	0.068	0.034	0.011	0.066	1.020	1.072	0.933	0.717	0.678	0.246	0.111	0.061
2002	0.013	0.005	0.003	0.039	1.490	0.342	0.256	0.541	0.643	0.183	0.086	0.057
2003	0.013	0.005	0.002	0.213	0.782	0.622	0.620	0.449	0.288	0.207	0.078	0.027
2004	0.008	0.008	0.009	0.086	3.087	0.272	0.162	0.344	0.259	0.203	0.066	0.021
2005	0.009	0.008	0.007	0.320	0.963	0.340	0.332	0.442	0.720	0.273	0.100	0.012
2006	0.003	0.002	0.002	0.035	1.657	0.379	0.286	0.285	0.210	0.136	0.063	0.006
2007	0.000	0.000	0.001	0.113	1.767	0.347	0.323	0.318	0.322	0.166	0.041	0.005
2008	0.002	0.002	0.002	0.037	3.314	0.430	0.226	1.666	0.712	0.245	0.107	0.071
2009	0.051	0.021	0.011	0.063	3.691	0.638	0.129	0.234	0.202	0.136	0.079	0.036
2010	0.008	0.004	0.004	0.382	1.222	0.308	1.097	0.820	0.702	0.207	0.104	0.071
2011	0.067	0.069	0.053	0.107	3.525	0.977	1.090	1.352	0.556	0.240	0.127	0.081
2012	0.061	0.052	0.057	0.460	2.213	0.795	0.480	0.717	0.717	0.288	0.115	0.076
2013	0.072	0.069	0.065	0.089	3.478	0.616	0.527	0.399	0.648	0.389	0.134	0.081

2014	0.071	0.057	0.031	0.088	1.932	0.216	0.261	0.308	0.542	0.264	0.110	0.071
2015	0.058	0.052	0.041	0.074	0.735	0.242	0.247	0.953	0.719	0.207	0.103	0.074
2016	0.061	0.061	0.051	0.248	0.849	0.340	0.546	0.456	0.553	--	--	--
Average	0.017	0.012	0.009	0.098	1.903	0.546	0.499	0.554	0.467	0.195	0.069	0.032
σ	0.025	0.021	0.017	0.144	1.272	0.252	0.298	0.331	0.246	0.080	0.041	0.032
Runoff (mm)	0.6	0.4	0.3	3.1	61.6	17.1	16.2	17.9	14.6	6.3	2.2	1.0

***Appendix B:
Source Term Application Updated
with Diss-Fe at DC-B***

Station	Source Chemistry
Victoria VC-DBC	Baseline observations from April 2012 to November 2016. Concentrations measured approx. monthly; held steady in the model between measurements.
Dome Creek diversion	Limited observations at station DC-B between 2014 and 2016; monthly averages were generated to supplement missing observations from 2012-2014.
Dome Creek DC-R Incremental	Baseline observations at station VC-U were used as background for the incremental catchment in Dome Creek.

Anions	Total Metals	Dissolved Metals
Sulfate	Al	Al
Ammonia	As	As
Nitrate	Ca	Ca
Nitrite	Cd	Cd
P	Cr	Cr
WADCN	Co	Co
	Cu	Cu
	Fe	Fe
	Mg	Mg
	Mn	Mn
	Na	Na
	Zn	Zn

Date	Anions						Total Metals												Dissolved Metals											
	Sulfate	Ammonia	Nitrate	Nitrite	P	WADCN	Al	As	Ca	Cd	Cr	Co	Cu	Fe	Mg	Mn	Na	Zn	Al	As	Ca	Cd	Cr	Co	Cu	Fe	Mg	Mn	Na	Zn
1/12/2012	20	0.01	0.17	0.001	0.01	0.001	0.01	0.0002	30.8	1.00E-05	0.0004	3.00E-05	0.001	0.025	10.2	0.041	2.62	0.002	0.005	0.0002	31	1.00E-05	0.0004	2.00E-05	0.001	0.011	10.3	0.043	2.7	0.001
2/02/2012	18	0.01	0.18	0.001	0.01	0.001	0.009	0.0002	29.9	1.00E-05	0.0004	5.00E-05	0.001	0.011	10.6	0.058	2.91	0.002	0.005	0.0002	27.4	1.00E-05	0.0007	4.00E-05	0.001	0.005	10.3	0.053	2.8	0.002
3/07/2012	20	0.04	0.18	0.001	0.01	0.001	0.01	0.0003	32.1	1.00E-05	0.0004	6.00E-05	0.002	0.022	10.7	0.067	3.06	0.002	0.005	0.0004	31.6	2.00E-05	0.0006	4.00E-05	0.001	0.009	10.3	0.069	2.6	0.004
4/18/2012	18	0.01	0.21	0.001	0.01	0.001	0.081	0.0006	29.2	4.00E-05	0.0005	0.00033	0.002	0.302	10.4	0.14	2.92	0.004	0.006	0.0003	28.8	1.00E-05	0.0004	0.00011	0.001	0.01	10.3	0.062	2.8	0.002
5/02/2012	8.2	0.01	0.1	0.001	0.024	0.001	0.101	0.0007	17.3	1.00E-05	0.0006	0.00011	0.003	0.23	5.64	0.034	1.64	0.005	0.09	0.0006	19.3	2.00E-05	0.0004	0.0001	0.002	0.173	5.7	0.022	1.6	0.016
5/16/2012	10	0.01	0.07	0.001	0.01	0.001	0.053	0.0004	19	1.00E-05	0.0004	8.00E-05	0.002	0.167	6.44	0.016	1.97	0.001	0.054	0.0004	19.2	1.00E-05	0.0007	6.00E-05	0.002	0.143	6.5	0.014	1.9	0.005
5/31/2012	6.8	0.01	0.1	0.001	0.108	0.001	0.198	0.0002	121	2.00E-05	0.0004	0.00019	0.004	7.95	42.1	1.39	8.66	0.003	0.101	0.0002	9.8	1.00E-05	0.0004	0.00021	0.004	0.098	3.1	0.004	1	0.003
6/12/2012	10	0.01	0.1	0.001	0.01	0.001	0.058	0.0002	16.5	1.00E-05	0.0004	8.00E-05	0.002	0.099	5.33	0.013	1.95	0.001	0.024	0.0003	17.2	1.00E-05	0.0004	0.00011	0.002	0.061	5.4	0.011	1.8	0.002
6/26/2012	9.4	0.05	0.07	0.001	0.093	0.001	0.048	0.0002	17.2	1.00E-05	0.0004	0.00011	0.002	0.103	5.22	0.014	1.96	0.001	0.03	0.0003	17	2.00E-05	0.0004	0.00041	0.002	0.061	5.2	0.011	1.8	0.001
7/10/2012	10	0.01	0.06	0.001	0.005	0.001	0.08	0.0004	17.9	3.00E-05	0.0005	0.0002	0.002	0.18	5.4	0.022	2.1	0.004	0.032	0.0003	18.3	2.00E-05	0.0005	0.0001	0.002	0.08	5.6	0.017	2	0.004
7/24/2012	9.1	0.04	0.05	0.001	0.012	0.001	0.112	0.0006	16.6	2.00E-05	0.0004	0.0002	0.004	0.222	4.84	0.022	2.1	0.003	0.049	0.0004	16.5	1.00E-05	0.0004	0.00013	0.003	0.098	4.8	0.013	1.7	0.004
8/07/2012	9.7	0.01	0.1	0.001	0.012	0.001	0.084	0.0005	18.4	1.00E-05	0.0004	0.00016	0.002	0.176	5.77	0.018	2.44	0.002	0.035	0.0003	18	1.00E-05	0.0005	0.00014	0.002	0.101	5.6	0.014	2	0.001
8/22/2012	10.2	0.01	0.37	0.001	0.012	0.001	0.054	0.0006	18.8	2.00E-05	0.0004	0.0002	0.002	0.142	5.75	0.0195	2.24	0.004	0.03	0.0003	17.7	1.00E-05	0.0004	0.00011	0.001	0.091	5.43	0.014	1.9	0.002
9/05/2012	10.7	0.05	0.1	0.001	0.012	0.001	5.51	0.0139	21.6	0.00037	0.0082	0.0036	0.0154	9	7.67	0.223	2.5	0.0423	0.036	0.0008	19	3.00E-05	0.0004	0.00032	0.002	0.084	5.6	0.055	1.9	0.001
9/18/2012	12.3	0.01	0.1	0.001	0.012	0.001	0.922	0.00257	20.6	7.00E-05	0.0014	0.0006	0.0044	1.38	6.5	0.0569	2.3	0.01	0.031	0.0006	20.2	2.00E-05	0.0009	6.00E-05	0.001	0.106	6.27	0.025	2	0.003
10/03/2012	15	0.03	0.1	0.001	0.012	0.001	0.393	0.00128	23.5	6.00E-05	0.0007	0.0003	0.0021	0.643	7.62	0.0504	2.7	0.0049	0.019	0.0005	25	1.00E-05	0.0009	0.00012	0.001	0.093	8.07	0.041	2.2	0.001
10/16/2012	14.4	0.05	0.14	0.001	0.012	0.001	0.064	0.00068	24.5	4.00E-05	0.0005	0.0001	0.0015	0.18	7.82	0.0366	2.5	0.0032	0.016	0.0003	24	2.00E-05	0.0009	0.00015	0.001	0.045	7.89	0.031	2.3	0.001
11/15/2012	17.6	0.01	0.15	0.001	0.012	0.001	0.063	0.00041	28.3	2.00E-05	0.0005	0.0001	0.0016	0.111	9.52	0.0351	2.8	0.003	0.008	0.0004	27.5	2.00E-05	0.0008	2.00E-05	0.001	0.011	9.53	0.03	2.7	0.004
12/12/2012	19.7	0.01	0.17	0.001	0.012	0.001	0.057	0.00042	30.5	4.00E-05	0.0005	0.0001	0.0012	0.095	10.1	0.0476	2.9	0.0016	0.007	0.0004	29.8	1.00E-05	0.0004	0.0008	0.001	0.016	10.1	0.04	2.8	0.001
1/15/2013	20.1	0.01	0.2	0.001	0.012	0.001	0.024	0.0003	30.6	2.00E-05	0.0005	0.0001	0.0011	0.043	10.6	0.0549	2.8	0.001	0.005	0.0003	34.4	3.00E-05	0.0009	2.00E-05	0.001	0.012	10.8	0.054	2.2	0.002
2/12/2013	19.2	0.01	0.21	0.001	0.012	0.001	0.017	0.00026	32.1	4.00E-05	0.0005	0.0001	0.001	0.033	10.8	0.0628	3.2	0.0011	0.016	0.0003	31.8	2.00E-05	0.0007	2.00E-05	0.001	0.009	10.9	0.06	2.5	0.001
3/12/2013	18.6	0.01	0.17	0.001	0.012	0.001	0.013	0.0003	30.4	2.00E-05	0.0005	0.0001	0.001	0.03	10.5	0.0796	3.3	0.0014	0.005	0.0002	30.5	2.00E-05	0.001	0.00074	0.001	0.015	11.4	0.071	3.2	0.001
4/17/2013	19.1	0.01	0.166	0.001	0.05	0.001	0.0143	0.00028	32.1	2.50E-05	0.00012	0.0001	0.00091	0.024	11.5	0.08	2.83	0.003	0.0053	0.00026	32.3	2.50E-05	0.0001	0.0001	0.00082	0.014	11.5	0.078	2.75	0.0046
5/07/2013	15.5	0.005	0.0786	0.001	0.05	0.001	0.0992	0.00051	25.7	7.50E-05	0.00022	0.00011	0.00126	0.175	9.86	0.0676	2.48	0.0034	0.0102	0.00038	25.6	3.50E-05	0.0001	0.0001	0.00097	0.043	9.82	0.0583	2.43	0.0032
5/16/2013	3.46	0.0094	0.0184	0.001	0.207	0.001	2.75	0.00577	11.9	0.000217	0.00373	0.00179	0.00928	3.97	4	0.133	1.17	0.025	0.156	0.00035	8.85	4.50E-05	0.00016	0.00016	0.00339	0.201	2.6	0.026	0.802	0.0039
5/22/2013	8.44	0.0064	0.0646	0.001	0.056	0.001	0.948	0.002	15.7	6.10E-05	0.00185	0.00061	0.00564	1.36	5.58	0.0608	1.57	0.0086	0.0643	0.00036	15.7	2.70E-05	0.00013	0.0001	0.00262	0.135	5.43	0.0209	1.49	0.0013
5/28/2013	3.04	0.0123	0.027	0.001	0.189	0.001	3.41	0.00814	8.03	0.00029	0.0047	0.0021	0.00988	5.18	3	0.128	0.869	0.0272	0.0953	0.00056	6.9	2.90E-05	0.00014	0.00015	0.00309	0.224	2.01	0.0218	0.675	0.0031
6/11/2013	9.96	0.005	0.0876	0.001	0.05	0.001	0.331	0.00121	16.6	4.10E-05	0.0006	0.00022	0.003	0.528	5.53	0.261E-05	1.73	0.0047	0.0412	0.00054	16.7	1.60E-05	0.00012	0.0001	0.00192	0.13	5.44	0.0193	1.78	0.001
6/25/2013	15.4	0.005	0.0734	0.001	0.05	0.001	1.45	0.00196	22.6	4.60E-05	0.00146	0.00067	0.0037	1.63	7.94	0.0638	2.35	0.0068	0.0203	0.00048	22.8	1.80E-05	0.0001	0.0001	0.00149	0.041	7.47	0.0306	2.29	0.001
7/16/2013	16.8	0.005	0.045	0.001	0.05	0.001	0.0533	0.00037	26	2.50E-05	0.00048	0.0001	0.00133	0.089	8.84	0.0411	2.48	0.003	0.0088	0.00035	26.2	1.60E-05	0.0001	0.0001	0.00109	0.026	8.84	0.0379	2.48	0.0011
8/14/2013	15.2	0.005	0.053	0.001	0.05	0.001	0.0471	0.00049	24.4	2.30E-05	0.00022	0.0001	0.00184	0.122	8.1	0.0351	2.37	0.003	0.0164	0.00041	24.1	1.50E-05	0.0001	0.0001	0.00127	0.066	7.92	0.032	2.3	0.0005
9/24/2013	12.1	0.005	0.0684	0.001	0.05	0.001	0.167	0.00062	19	2.80E-05	0.00047	0.00022	0.00196	0.359	6.3	0.0397	2.07	0.0036	0.0414	0.00039	19	1.70E-05	0.00018	0.00013	0.00142	0.126	6.32	0.0308	2.04	0.0014
10/17/2013	16.5	0.005	0.124	0.001	0.05	0.001	0.165	0.00058	24.9	2.50E-05	0.00029	0.00018	0.00163	0.33	8.33	0.0465	2.26	0.0034	0.0196	0.00029	24.1	1.60E-05	0.00012	0.0001	0.00111	0.076	8.15	0.0375	2.19	0.0014
11/13/2013	18.2	0.005	0.143	0.001	0.05	0.001	0.0374	0.00035	29.1	2.00E-05	0.00019	0.0001	0.00121	0.084	10	0.0411	2.71	0.003	0.0079	0.00025	26.9	2.00E-05	0.0001	0.0001	0.00092	0.019	9.31	0.0348	2.59	0.0014
12/17/2013	19.3	0.005	0.119	0.001	0.05	0.001	0.0205	0.00047	28	2.20E-05	0.00014	0.0001	0.00106	0.043	9.56	0.0436	2.69	0.003	0.0075	0.00029	28.9	2.10E-05	0.0001	0.0001	0.00104	0.016	9.73	0.0435	2.8	0.0015
1/14/2014	20.3	0.54	0.125	0.001	0.05	0.001	0.0359	0.00036	29.8	3.20E-05	0.00012	0.0001	0.0011	0.06	9.91	0.0529	2.62	0.003	0.0095	0.00025	30.3	2.00E-05	0.0001	0.0001	0.00089	0.013	10.1	0.0485	2.65	0.001
2/11/2014	20	0.005	0.165	0.001	0.05	0.001	0.0166	0.00025	27.8	2.80E-05	0.00011	0.0001	0.00198	0.031																

Date	Anions						Total Metals												Dissolved Metals											
	Sulfate	Ammonia	Nitrate	Nitrite	P	WADCN	Al	As	Ca	Cd	Cr	Co	Cu	Fe	Mg	Mn	Na	Zn	Al	As	Ca	Cd	Cr	Co	Cu	Fe	Mg	Mn	Na	Zn
4/18/2012	23	0.04	0.21	0.001	0.01	0.001	0.024	0.0005	3.01E+01	4.00E-05	3.90E-03	9.00E-05	0.001	0.028	10.4	0.084	2.96	0.002	0.026	0.0012	2.93E+01	0.00051	1.10E-03	0.00107	0.017	0.005	10.2	0.079	2.7	0.006
5/02/2012	11	0.02	0.1	0.001	0.062	0.001	0.805	0.0056	1.85E+01	0.00016	1.30E-03	0.00073	0.005	0.872	5.57	0.171	1.68	0.012	0.08	0.0011	1.78E+01	4.00E-05	4.00E-04	0.00018	0.003	0.169	5.3	0.073	1.6	0.007
5/16/2012	14	0.02	0.06	0.001	0.01	0.001	0.284	0.003	2.06E+01	9.00E-05	5.00E-04	0.00034	0.002	0.431	6.61	0.111	2.05	0.005	0.048	0.0008	2.03E+01	3.00E-05	7.00E-04	0.00013	0.002	0.14	6.5	0.087	1.9	0.006
5/31/2012	9.2	0.02	0.1	0.001	0.01	0.001	1.1	0.0079	2.07E+02	0.00016	0.0011	0.00073	0.006	13.5	32.2	5.63	43.1	0.013	0.098	0.0007	1.07E+01	2.00E-05	0.0004	0.00015	0.004	0.118	3.2	0.03	1	0.003
6/12/2012	13	0.01	0.1	0.001	0.01	0.001	0.085	0.0006	1.80E+01	3.00E-05	0.0004	0.00012	0.002	0.158	5.57	0.048	2.05	0.002	0.023	0.0005	1.87E+01	2.00E-05	0.0004	8.00E-05	0.002	0.06	5.7	0.044	1.8	0.002
6/27/2012	12	0.05	0.09	0.001	0.011	0.001	0.046	0.0002	1.90E+01	2.00E-05	4.00E-04	0.00015	0.002	0.116	5.7	0.047	2.14	0.001	0.024	0.0005	1.84E+01	2.00E-05	5.00E-04	0.00011	0.002	0.075	5.5	0.042	1.8	0.002
6/28/2012	12	0.05	0.1	0.001	0.09	0.001	0.052	0.0003	1.91E+01	3.00E-05	0.0004	0.00012	0.002	0.13	5.7	0.047	2.06	0.001	0.026	0.0004	1.88E+01	2.00E-05	0.0006	8.00E-05	0.002	0.07	5.6	0.042	1.9	0.002
7/10/2012	16	0.01	0.05	0.001	0.036	0.001	1.3	0.008	2.14E+01	0.00016	1.80E-03	0.0009	0.005	1.75	6.2	0.149	2.2	0.015	0.03	0.0008	2.15E+01	4.00E-05	0.0005	0.0001	0.002	0.11	6.2	0.089	2.3	0.002
7/24/2012	12	0.01	0.05	0.001	0.022	0.001	0.005	0.001	1.74E+01	6.00E-05	0.0004	0.00026	0.004	0.343	5.05	0.055	2.12	0.004	0.047	0.0005	1.75E+01	2.00E-05	0.0005	0.00013	0.003	0.094	5	0.041	1.8	0.005
8/07/2012	13	0.03	0.1	0.001	0.022	0.001	1.27	0.0083	2.06E+01	0.0002	0.0015	0.00092	0.004	1.79	6.4	0.158	2.72	0.016	0.035	0.0008	1.94E+01	3.00E-05	0.0006	0.00014	0.002	0.099	5.7	0.049	2	0.001
8/22/2012	13.1	0.01	0.63	0.001	0.022	0.001	0.126	0.0018	2.04E+01	6.00E-05	0.0004	0.00022	0.002	0.241	5.99	0.0703	2.41	0.005	0.028	0.0006	1.85E+01	2.00E-05	0.0004	0.00012	0.001	0.08	5.55	0.045	2	0.002
9/05/2012	13.6	0.04	0.1	0.001	0.022	0.001	5.47	0.0113	2.31E+01	0.00065	0.0077	0.0034	0.014	8.22	7.92	0.246	2.6	0.0382	0.038	0.0009	2.01E+01	1.00E-05	0.0004	0.00022	0.002	0.099	5.83	0.082	2	0.001
9/18/2012	15.9	0.01	0.1	0.001	0.022	0.001	0.743	0.00268	2.25E+01	9.00E-05	0.0012	0.0006	0.0044	1.22	6.78	0.0951	2.4	0.0102	0.029	0.0009	2.16E+01	4.00E-05	0.0009	0.00015	0.001	0.107	6.52	0.058	2.1	0.002
10/03/2012	16.9	0.06	0.1	0.001	0.022	0.001	0.196	0.00096	25	5.00E-05	0.0005	0.0002	0.0017	0.377	7.95	0.0732	2.8	0.0036	0.019	0.0006	2.62E+01	2.00E-05	0.0008	0.00016	0.001	0.096	8.31	0.075	2.4	0.001
10/16/2012	18.2	0.01	0.14	0.001	0.022	0.001	0.152	0.001	2.65E+01	7.00E-05	0.0005	0.0002	0.0019	0.322	8.33	0.079	2.6	0.003	0.017	0.0006	2.68E+01	4.00E-05	8.00E-04	0.00018	0.001	0.055	8.56	0.073	2.6	0.002
11/15/2012	17.7	0.01	0.15	0.001	0.022	0.001	0.133	0.00054	2.88E+01	3.00E-05	0.0005	0.0001	0.0013	0.203	9.7	0.0397	2.8	0.002	0.008	0.0007	2.89E+01	2.00E-05	0.0008	5.00E-05	0.001	0.03	9.8	0.03	2.7	0.005
12/12/2012	19.6	0.01	0.17	0.001	0.022	0.001	0.043	0.00036	3.04E+01	4.00E-05	0.0005	0.0001	0.0011	0.073	10.2	0.0467	3	0.0013	0.006	0.0003	3.01E+01	1.00E-05	0.0004	2.00E-05	0.001	0.011	10.4	0.042	3.1	0.001
1/15/2013	20	0.01	0.18	0.001	0.022	0.001	0.021	0.0003	3.08E+01	2.00E-05	0.0005	0.0001	0.001	0.038	10.6	0.0539	2.8	0.0008	0.018	0.0004	3.74E+01	2.00E-05	9.00E-04	2.00E-05	0.001	0.013	11.1	0.054	2.3	0.011
2/12/2013	19.4	0.01	0.21	0.001	0.022	0.001	0.019	0.00028	3.22E+01	2.00E-05	0.0005	0.0001	0.0011	0.04	10.9	0.0642	3.2	0.0009	0.008	0.0004	3.14E+01	2.00E-05	0.0006	2.00E-05	0.001	0.011	10.9	0.062	2.5	0.001
3/12/2013	18.5	0.01	0.17	0.001	0.022	0.001	0.013	0.00028	3.10E+01	2.00E-05	0.0006	0.0001	0.0011	0.029	10.8	0.0785	4.5	0.0017	0.005	0.0002	3.03E+01	2.00E-05	1.10E-03	0.0009	0.001	0.018	11.3	0.07	3.1	0.001
4/16/2013	19.4	0.005	0.166	0.001	0.05	0.001	0.0127	0.00027	3.37E+01	2.70E-05	0.00011	0.0001	0.0009	0.027	12	0.08	2.82	0.003	0.0049	0.00024	3.24E+01	2.50E-05	1.00E-04	0.0001	0.00076	0.012	11.6	0.079	2.69	0.001
5/07/2013	17.9	0.005	0.0827	0.001	0.05	0.001	0.105	0.00062	2.65E+01	5.70E-05	0.00022	0.00012	0.00127	0.174	9.75	0.0842	2.51	0.0033	0.0093	0.00043	2.60E+01	4.40E-05	0.0001	0.000103	0.001	0.094	9.56	0.0766	2.53	0.0024
5/16/2013	4.67	0.0153	0.0169	0.001	0.471	0.001	6.08	0.0299	1.37E+01	0.000673	0.00775	0.00388	0.0163	8.87	4.94	0.356	1.45	0.0646	0.156	0.00066	9.40E+00	6.60E-05	0.0001	0.00018	0.00357	0.215	2.67	0.0382	0.847	0.0038
5/22/2013	11.1	0.0113	0.0626	0.001	0.135	0.001	2.51	0.0105	1.71E+01	0.000256	0.00335	0.00149	0.00698	3.54	5.93	0.16	1.78	0.0236	0.0676	0.0006	1.67E+01	4.60E-05	0.00013	0.00011	0.0028	0.14	5.36	0.0444	1.5	0.0016
5/28/2013	4.06	0.0159	0.0244	0.001	0.205	0.001	3.76	0.0114	8.5	0.000325	0.00603	0.00221	0.0112	5.55	3.04	0.16	0.966	0.0308	0.0967	0.00077	7.43E+00	4.30E-05	0.00014	0.00015	0.00314	0.21	2.05	0.0256	0.851	0.0013
6/11/2013	13.3	0.005	0.0848	0.001	0.05	0.001	0.407	0.00182	1.84E+01	6.10E-05	0.0007	0.00026	0.0035	0.667	5.9	0.0675	1.83	0.0048	0.0356	0.00087	1.80E+01	2.00E-05	0.00012	0.0001	0.00189	0.14	5.64	0.0537	1.78	0.004
6/25/2013	19.9	0.005	0.0924	0.001	0.05	0.001	1.15	0.00204	24.7	4.70E-05	0.00127	0.0006	0.00327	1.44	8.21	0.104	2.44	0.0065	0.0194	0.00074	2.52E+01	2.50E-05	0.0001	0.0001	0.00141	0.046	7.86	0.0707	2.43	0.0021
7/16/2013	17.5	0.005	0.044	0.001	0.05	0.001	0.0788	0.00045	2.63E+01	2.80E-05	0.0002	0.0001	0.00124	0.101	8.84	0.0507	2.55	0.003	0.0089	0.00034	2.62E+01	1.80E-05	0.0001	0.0001	0.00108	0.024	8.65	0.0477	2.51	0.0005
8/14/2013	17.7	0.0075	0.051	0.001	0.05	0.001	0.0453	0.00059	2.48E+01	2.50E-05	0.00024	0.0001	0.0019	0.12	8.17	0.0612	2.42	0.003	0.0152	0.00049	2.47E+01	2.20E-05	0.0001	0.0001	0.00128	0.066	8.08	0.0575	2.43	0.0005
9/24/2013	17.1	0.005	0.0647	0.001	0.05	0.001	0.169	0.00091	2.09E+01	3.50E-05	0.00054	0.00021	0.00181	0.395	6.8	0.0694	2.13	0.0034	0.0403	0.00053	2.07E+01	2.60E-05	0.00019	0.00013	0.00144	0.133	6.69	0.0583	2.16	0.0015
10/16/2013	19.9	0.005	0.112	0.001	0.05	0.001	0.0491	0.00057	2.53E+01	3.20E-05	0.00018	0.00013	0.00132	0.154	8.25	0.0404	2.35	0.003	0.0188	0.00044	2.50E+01	2.50E-05	0.0001	0.00011	0.00114	0.078	8.15	0.0686	2.28	0.0024
11/13/2013	18.3	0.005	0.144	0.001	0.05	0.001	0.0825	0.00044	2.87E+01	2.10E-05	0.00022	0.0001	0.00116	0.142	9.82	0.0434	2.67	0.003	0.0083	0.00025	2.69E+01	2.30E-05	0.0001	0.0001	0.00094	0.02	9.29	0.0359	2.6	0.001
12/17/2013	19.2	0.005	0.119	0.001	0.05	0.001	0.0222	0.00049	2.84E+01	2.30E-05	0.00017	0.0001	0.00114	0.043	9.62	0.0447	2.78	0.003	0.0072	0.00029	3.00E+01	2.00E-05	0.0001	0.0001	0.00098	0.014	9.93	0.0449	2.91	0.0012
1/14/2014	20.1	0.99	0.156	0.001	0.05	0.001	0.0322	0.00033	3.12E+01	5.60E-05	0.00013	0.0001	0.00119	0.057	10.3	0.0522	2.56	0.003	0.008	0.00023	3.10E+01	4.80E-05	0.0001	0.0001	0.0009	0.013	10.3	0.049	2.57	0.001
2/11/2014	20.2	0.005	0.151	0.001	0.05	0.001	0.0179	0.00029	2.88E+01	2.80E-05	0.00012	0.0001	0.0014	0.035	9.95	0.0814	2.72	0.003	0.0082	0.00021	2.84E+01	2.80E-05	0.0001	0.0001	0.00114	0.013	9.85	0.0777	2.66	0.0011
3/11/2014	23	0.005	0.103	0.001	0.05	0.001	0.0097	0.00046	3.26E+01	5.30E-05	0.00012	0.0001	0.00132	0.014	10.1	0.145	2.9	0.003	0.007	0.0002										

The table below **does not have** the following functionality applied to it (that is done dynamically in the model):

For DC-B: Dissolved Fe is either set to the monthly value in revised (right) column below, or if there exists a lower measurement (2014-2016), go with that.

	D-Fe	D-Fe
Jan	2.23	0.67
Feb	2.23	0.67
Mar	2.23	0.67
Apr	1.785	0.54
May	0.6928	0.21
Jun	0.145667	0.04
Jul	0.276	0.08
Aug	0.382	0.11
Sep	0.563	0.17
Oct	2.066667	0.62
Nov	2.27	0.68
Dec	2.23	0.67

Date	Anions						Total Metals												Dissolved Metals											
	Sulfate	Ammonia	Nitrate	Nitrite	P	WADCN	Al	As	Ca	Cd	Cr	Co	Cu	Fe	Mg	Mn	Na	Zn	Al	As	Ca	Cd	Cr	Co	Cu	Fe	Mg	Mn	Na	Zn
1/15/2012	1120	0.472	0.061	0.001	0.05	0.001	0.008	0.00159	3.18E+02	0.00016	0.0002	0.00169	0.0011	5.16	142	2.22	16.8	0.0506	0.0025	0.00079	3.10E+02	0.00015	0.0002	0.00166	0.00055	0.67	138	2.15	16.7	0.0496
2/15/2012	1120	0.472	0.061	0.001	0.05	0.001	0.008	0.00159	3.18E+02	0.00016	0.0002	0.00169	0.0011	5.16	142	2.22	16.8	0.0506	0.0025	0.00079	3.10E+02	0.00015	0.0002	0.00166	0.00055	0.67	138	2.15	16.7	0.0496
3/15/2012	1120	0.472	0.061	0.001	0.05	0.001	0.008	0.00159	3.18E+02	0.00016	0.0002	0.00169	0.0011	5.16	142	2.22	16.8	0.0506	0.0025	0.00079	3.10E+02	0.00015	0.0002	0.00166	0.00055	0.67	138	2.15	16.7	0.0496
4/15/2012	430	0.057	0.019	0.001	0.05	0.001	0.786	0.01416	1.33E+02	0.00015	0.0015	0.00073	0.00372	3.27	52	0.73	5.2	0.028	0.0745	0.00688	1.65E+02	7.00E-05	0.00012	0.00052	0.00125	0.54	68	0.91	6.9	0.0192
5/15/2012	229	0.053	0.02	0.001	0.23	0.001	2.578	0.01987	9.10E+01	0.00028	0.00402	0.00189	0.00666	5.97	34	0.52	3.4	0.0454	0.0897	0.00481	8.50E+01	7.00E-05	0.00012	0.00041	0.0015	0.21	31	0.39	3	0.017
6/15/2012	543	0.099	0.139	0.001	0.1	0.001	1.595	0.02901	1.62E+02	0.00031	0.00326	0.00118	0.00613	4.69	72	0.65	7.7	0.0314	0.0111	0.00413	1.70E+02	2.00E-05	0.0001	0.0004	0.0006	0.04	76	0.59	7.6	0.0054
7/15/2012	612	0.125	0.073	0.001	0.05	0.001	0.309	0.00929	1.88E+02	0.0001	0.00062	0.00063	0.0016	2.38	86	0.77	9	0.0078	0.0224	0.00463	1.92E+02	2.00E-05	0.00011	0.00051	0.00063	0.08	87	0.78	9.2	0.0029
8/15/2012	494	0.137	0.057	0.001	0.05	0.001	0.851	0.01627	1.53E+02	0.00013	0.00176	0.00084	0.00389	3.64	68	0.62	7.2	0.0167	0.0303	0.00567	1.60E+02	2.00E-05	0.00013	0.00044	0.00079	0.11	72	0.61	7.3	0.0037
9/15/2012	460	0.119	0.093	0.001	0.08	0.001	1.347	0.0185	1.43E+02	0.00018	0.00258	0.00101	0.00521	4.08	62	0.49	6.5	0.0263	0.0381	0.00566	1.47E+02	2.00E-05	0.00015	0.00039	0.00099	0.17	66	0.46	6.5	0.0071
10/15/2012	599	0.164	0.172	0.001	0.05	0.001	0.138	0.00992	1.77E+02	7.00E-05	0.00043	0.00045	0.00102	3.33	81	0.63	8.3	0.0249	0.0098	0.00574	1.86E+02	3.00E-05	0.0001	0.00039	0.00048	0.62	84	0.63	8.4	0.0199
11/15/2012	1075	0.486	0.11	0.001	0.05	0.001	0.005	0.00463	325	7.00E-05	0.00017	0.00088	0.00075	2.73	152	1.79	17	0.0278	0.0029	0.00431	3.19E+02	8.00E-05	0.0002	0.00085	0.0004	0.68	144	1.73	16	0.0271
12/15/2012	1075	0.486	0.11	0.001	0.05	0.001	0.005	0.00463	3.25E+02	7.00E-05	0.00017	0.00088	0.00075	2.73	152	1.79	17	0.0278	0.0029	0.00431	3.19E+02	8.00E-05	0.0002	0.00085	0.0004	0.67	144	1.73	16	0.0271
1/15/2013	1120	0.472	0.061	0.001	0.05	0.001	0.008	0.00159	3.18E+02	0.00016	0.0002	0.00169	0.0011	5.16	142	2.22	16.8	0.0506	0.0025	0.00079	3.10E+02	0.00015	0.0002	0.00166	0.00055	0.67	138	2.15	16.7	0.0496
2/15/2013	1120	0.472	0.061	0.001	0.05	0.001	0.008	0.00159	3.18E+02	0.00016	0.0002	0.00169	0.0011	5.16	142	2.22	16.8	0.0506	0.0025	0.00079	3.10E+02	0.00015	0.0002	0.00166	0.00055	0.67	138	2.15	16.7	0.0496
3/15/2013	1120	0.472	0.061	0.001	0.05	0.001	0.008	0.00159	3.18E+02	0.00016	0.0002	0.00169	0.0011	5.16	142	2.22	16.8	0.0506	0.0025	0.00079	3.10E+02	0.00015	0.0002	0.00166	0.00055	0.67	138	2.15	16.7	0.0496
4/15/2013	430	0.057	0.019	0.001	0.05	0.001	0.786	0.01416	1.33E+02	0.00015	0.0015	0.00073	0.00372	3.27	52	0.73	5.2	0.028	0.0745	0.00688	1.65E+02	7.00E-05	0.00012	0.00052	0.00125	0.54	68	0.91	6.9	0.0192
5/15/2013	229	0.053	0.02	0.001	0.23	0.001	2.578	0.01987	9.10E+01	0.00028	0.00402	0.00189	0.00666	5.97	34	0.52	3.4	0.0454	0.0897	0.00481	8.50E+01	7.00E-05	0.00012	0.00041	0.0015	0.21	31	0.39	3	0.017
6/15/2013	543	0.099	0.139	0.001	0.1	0.001	1.595	0.02901	1.62E+02	0.00031	0.00326	0.00118	0.00613	4.69	72	0.65	7.7	0.0314	0.0111	0.00413	1.70E+02	2.00E-05	0.0001	0.0004	0.0006	0.04	76	0.59	7.6	0.0054
7/15/2013	612	0.125	0.073	0.001	0.05	0.001	0.309	0.00929	1.88E+02	0.0001	0.00062	0.00063	0.0016	2.38	86	0.77	9	0.0078	0.0224	0.00463	1.92E+02	2.00E-05	0.00011	0.00051	0.00063	0.08	87	0.78	9.2	0.0029
8/15/2013	494	0.137	0.057	0.001	0.05	0.001	0.851	0.01627	1.53E+02	0.00013	0.00176	0.00084	0.00389	3.64	68	0.62	7.2	0.0167	0.0303	0.00567	1.60E+02	2.00E-05	0.00013	0.00044	0.00079	0.11	72	0.61	7.3	0.0037
9/15/2013	460	0.119	0.093	0.001	0.08	0.001	1.347	0.0185	1.43E+02	0.00018	0.00258	0.00101	0.00521	4.08	62	0.49	6.5	0.0263	0.0381	0.00566	1.47E+02	2.00E-05	0.00015	0.00039	0.00099	0.17	66	0.46	6.5	0.0071
10/15/2013	599	0.164	0.172	0.001	0.05	0.001	0.138	0.00992	1.77E+02	7.00E-05	0.00043	0.00045	0.00102	3.33	81	0.63	8.3	0.0249	0.0098	0.00574	1.86E+02	3.00E-05	0.0001	0.00039	0.00048	0.62	84	0.63	8.4	0.0199
11/15/2013	1075	0.486	0.11	0.001	0.05	0.001	0.005	0.00463	325	7.00E-05	0.00017	0.00088	0.00075	2.73	152	1.79	17	0.0278	0.0029	0.00431	3.19E+02	8.00E-05	0.0002	0.00085	0.0004	0.68	144	1.73	16	0.0271
12/15/2013	1075	0.486	0.11	0.001	0.05	0.001	0.005	0.00463	3.25E+02	7.00E-05	0.00017	0.00088	0.00075	2.73	152	1.79	17	0.0278	0.0029	0.00431	3.19E+02	8.00E-05	0.0002	0.00085	0.0004	0.67	144	1.73	16	0.0271
1/15/2014	1120	0.472	0.061	0.001	0.05	0.001	0.008	0.00159	3.18E+02	0.00016	0.0002	0.00169	0.0011	5.16	142	2.22	16.8	0.0506	0.0025	0.00079	3.10E+02	0.00015	0.0002	0.00166	0.00055	0.67	138	2.15	16.7	0.0496
2/11/2014	1120	0.472	0.002	0.001	0.05	0.001	0.0082	0.00159	318.0	0.00016	2.00E-04	0.00169	0.0011	5.16	142	2.22	16.8	0.0506	0.0025	0.00079	310.0	0.000149	2.00E-04	0.00166	0.00055	0.67	138	2.15	16.7	0.0496
4/14/2014	332	0.0798	0.002	0.001	0.051	0.001	2.33	0.0243	93.3	0.000207	4.08E-03	0.00134	0.00625	6.2	19.4	0.345	2.45	0.0331	0.0031	0.00283	198.0	3.30E-05	1.00E-04	0.00073	0.00043	0.54	74.5	1.06	8.86	0.0053
5/09/2014	154	0.0739	0.002	0.001	0.622	0.001	6.05	0.0345	68.2	0.000485	8.49E-03	0.004	0.0109	11.7	23.3	0.674	2.42	0.0933	0.0474	0.00474	55.7	0.000105	1.00E-04	0.00036	0.00134	0.21	20.2	0.442	1.88	0.0283
5/21/2014	232	0.0581	0.002	0.001	0.142	0.001	2.56	0.0162	76.8	0.000162	0.00419	0.00175	0.00684	5.48	30.1	0.332	3.42	0.0292	0.112	0.00367	76.7	1.80E-05	0.00014	0.00048	0.00162	0.21	31.2	0.274	3.34	0.0058
6/24/2014	646	0.106	0.002	0.001	0.05	0.001	0.75	0.0109	186.0	0.000123	0.0016	0.0008	0.00335	2.55	85.5	0.888	9.21	0.0113	0.0092	0.00431	195.0	1.70E-05	0.0001	0.00049	0.00045	0.04	90.5	0.837	8.76	0.0027
7/15/2014	681	0.138	0.002	0.001	0.05	0.001	0.436	0.00987	216.0	0.000229	7.80E-04	0.00078	0.00179	2.44	98.6	1.07	10.2	0.0083	0.0116	0.00497	216.0	3.70E-05	1.00E-04	0.00059	0.00056	0.08	97.4	1.06	10.3	0.0024
8/12/2014	589	0.147	0.002	0.001	0.05	0.001	0.454	0.0141	173.0	8.90E-05	0.00098	0.00075	0.0021	3.46	77.6	0.776	8.22	0.0123	0.0093	0.0054	184.0	2.10E-05	0.0001	0.00051	0.00053	0.11	80.8	0.783	8.5	0.003
9/16/2014	454	0.15	0.002	0.001	0.05	0.001	0.652	0.0152	142.0	0.000108	1.47E-03	0.00074	0.00342	3.36	60.5	0.598	7.06	0.0163	0.0228	0.00601	151.0	1.50E-05	0.00014	0.00045	0.00092	0.17	64.8	0.581	7.22	0.0046
10/15/2014	535	0.143	0.002	0.001	0.05	0.001	0.076	0.00793	159.0	6.90E-05	0.00032	0.00039	0.00093	2.3	74.2	0.509	7.07	0.0231	0.0197	0.00576	168.0	2.30E-05	0.0001	0.00038	0.00061	0.62	78.7	0.522	7.33	0.0191
4/21/2015	769	0.0667	0.002	0.001	0.05	0.001	0.293	0.0169	227.0	0.000164	0.00071	0.00062	0.00145																	

Date	Anions						Total Metals													Dissolved Metals												
	Sulfate	Ammonia	Nitrate	Nitrite	P	WADCN	Al	As	Ca	Cd	Cr	Co	Cu	Fe	Mg	Mn	Na	Zn	Al	As	Ca	Cd	Cr	Co	Cu	Fe	Mg	Mn	Na	Zn		
1/12/2012	656	4.28	4.38	0.29	0.016	0.012	0.023	0.0342	2.63E+02	0.001	6.00E-04	0.0096	0.008	11.2	42.4	6.13	47.9	0.008	0.006	0.0217	2.74E+02	0.00091	1.60E-03	0.00958	0.004	8.58	35.3	6.38	49.7	0.007		
2/02/2012	605	4.72	4.04	0.15	0.011	0.012	0.034	0.051	2.36E+02	0.00079	1.10E-03	0.00977	0.008	15.2	45.2	6.46	49.2	0.008	0.007	0.032	2.41E+02	0.00059	2.10E-03	0.00892	0.002	11.4	35.3	6.46	48.2	0.007		
3/07/2012	570	4.56	4.05	0.32	0.021	0.012	0.015	0.0275	2.38E+02	0.00087	5.00E-04	0.009	0.008	9.26	40.6	5.84	47.4	0.015	0.006	0.0201	2.34E+02	0.00067	1.90E-03	0.00896	0.004	8.19	35.3	5.64	48.7	0.011		
4/18/2012	512	3.7	3.47	0.78	0.01	0.01	0.037	0.0474	2.18E+02	0.00059	0.0008	0.00934	0.006	12.7	37.8	5.25	45.1	0.009	0.008	0.0364	2.03E+02	0.00043	0.0005	0.00892	0.003	10	35.3	4.88	42.2	0.008		
5/02/2012	507	3.31	3.59	0.53	0.024	0.012	0.015	0.0407	2.18E+02	0.00055	0.0007	0.00829	0.006	11.2	37.1	5.1	42	0.008	0.005	0.0301	2.10E+02	0.00045	0.0012	0.00771	0.003	9.18	35.7	4.94	40.5	0.007		
5/16/2012	551	3.31	2.81	0.42	0.016	0.01	0.017	0.0487	2.04E+02	0.00053	8.00E-04	0.00827	0.006	11.9	35.9	5.1	39.7	0.005	0.011	0.0315	2.07E+02	0.00034	2.40E-03	0.00813	0.002	9.41	36.2	5.14	40.4	0.008		
5/31/2012	537	3.31	2.29	0.33	0.053	0.012	0.043	0.0403	2.14E+02	0.00048	0.0007	0.00881	0.007	12.5	36.2	5.66	42.3	0.008	0.007	0.0173	1.82E+02	0.00037	0.0009	0.00822	0.003	5.82	31	4.87	36.9	0.01		
6/13/2012	580	3.31	3.3	0.71	0.021	0.01	0.023	0.0368	2.32E+02	0.0006	7.00E-04	0.00946	0.006	11	41.3	5.68	46.2	0.007	0.005	0.0142	2.34E+02	0.00044	0.0013	0.00928	0.003	4.35	41	5.68	47	0.009		
6/27/2012	580	3.92	2.74	0.01	0.05	0.01	0.016	0.035	2.30E+02	0.00057	0.0011	0.00888	0.006	9.76	39.9	5.25	43.3	0.005	0.006	0.0226	2.34E+02	0.00045	0.0022	0.00883	0.003	6.14	40.1	5.24	42.5	0.008		
7/11/2012	592	4.48	2.5	0.021	0.031	0.01	0.05	0.0347	2.19E+02	0.00053	0.0008	0.01	0.008	9.57	36.6	4.88	43.1	0.009	0.011	0.0209	2.23E+02	0.00041	0.0007	0.009	0.005	5.25	37.4	5.03	43.7	0.009		
7/12/2012	947	7	10.9	0.13	0.029	0.01	0.04	0.0239	3.68E+02	0.00076	0.002	0.0205	0.022	14.6	35.1	9.16	87.7	0.01	0.02	0.0261	3.60E+02	0.00078	0.0013	0.0185	0.019	14.2	34.9	8.98	87.5	0.009		
7/25/2012	640	4.27	2.03	0.25	0.023	0.012	0.018	0.0366	2.65E+02	0.00056	0.0007	0.00836	0.006	9.04	45.2	5.59	45.3	0.005	0.005	0.0242	2.48E+02	0.00046	0.0016	0.00862	0.003	5.66	43.8	5.37	42.2	0.005		
8/08/2012	612	3.6	2.45	0.22	0.023	0.012	0.025	0.0364	2.47E+02	0.00062	0.0006	0.00977	0.008	8.46	44.3	5.71	46.6	0.008	0.006	0.0232	2.48E+02	0.00051	0.0032	0.00931	0.004	5.63	44.2	5.78	45.8	0.004		
8/23/2012	566	4.89	1.79	0.1	0.023	0.01	0.035	0.0325	234	0.00064	0.0012	0.00994	0.007	8.36	41.6	5.46	42.4	0.01	0.008	0.021	2.23E+02	0.00046	0.0026	0.00926	0.004	5.43	39.8	5.24	39	0.007		
9/06/2012	575	4.8	1.66	0.1	0.023	0.008	0.036	0.0336	2.48E+02	0.00059	0.0005	0.0083	0.0062	10.6	40.5	6.01	48.3	0.0078	0.006	0.0158	2.14E+02	0.00038	1.90E-03	0.0118	0.003	3.64	36.3	5.15	40.2	0.008		
9/19/2012	668	2.51	1.74	0.1	0.023	0.012	0.028	0.0287	2.47E+02	0.00062	0.0005	0.0074	0.0058	8.13	42.5	5.82	45.1	0.0054	0.008	0.0162	2.37E+02	0.00048	0.0049	0.00877	0.002	2.75	41.8	5.59	40.3	0.011		
10/04/2012	627	3.77	1.85	0.1	0.023	0.008	0.025	0.0317	2.49E+02	0.00063	0.0006	0.0089	0.0067	10.2	42	5.81	46.9	0.0091	0.011	0.024	2.64E+02	0.00047	0.0042	0.00961	0.003	6.9	46.8	6.13	47.3	0.008		
10/16/2012	613	4.01	2.13	0.1	0.023	0.008	0.019	0.0317	2.50E+02	0.00063	0.0005	0.0089	0.0058	10.7	43.2	5.93	45.1	0.0077	0.011	0.022	2.49E+02	0.00043	3.10E-03	0.00942	0.003	6.22	44.5	5.93	43.4	0.007		
11/15/2012	695	3.73	1.92	0.11	0.023	0.02	0.021	0.0434	2.50E+02	0.00056	0.0006	0.0086	0.0048	13.1	45.8	5.72	44.5	0.006	0.007	0.0216	2.45E+02	0.00028	0.0026	0.00846	0.001	4.78	47.3	5.62	44.1	0.005		
12/12/2012	684	3.73	2.03	0.1	0.023	0.012	0.034	0.0529	2.59E+02	0.00054	0.0007	0.0091	0.0047	15.3	46.4	6.26	45.3	0.0057	0.006	0.0291	2.46E+02	0.00031	1.80E-03	0.0084	0.002	7.8	45.4	5.9	42.9	0.005		
1/15/2013	670	3.73	2.38	0.18	0.023	0.014	0.019	0.0458	2.58E+02	0.00071	0.0007	0.0091	0.0047	13.1	46.8	6.13	44.3	0.0065	0.006	0.0285	2.62E+02	0.00043	3.10E-03	0.00831	0.002	8	48.7	5.92	39.9	0.006		
2/12/2013	715	3.73	2.05	0.1	0.023	0.01	0.018	0.0492	2.66E+02	0.00069	0.0005	0.0087	0.0049	14.2	47.6	5.92	47.4	0.0066	0.006	0.0273	2.55E+02	0.00046	0.0022	0.00837	0.002	8.05	47.8	5.86	42.1	0.008		
3/13/2013	733	3.73	1.72	0.15	0.023	0.016	0.017	0.0541	2.62E+02	0.00063	0.0005	0.0094	0.0057	15.4	47.8	6.65	47.2	0.008	0.007	0.0322	2.87E+02	0.00042	0.0044	0.00933	0.002	8.7	51.7	5.99	47.3	0.014		
4/17/2013	725	4.42	1.55	0.05	0.05	0.01	0.0163	0.0477	2.71E+02	0.000664	0.00047	0.00792	0.00477	13.2	54.4	6.05	44.6	0.01	0.0084	0.0353	2.71E+02	0.000359	0.00019	0.00777	0.00174	11.4	55.8	5.93	44.7	0.0086		
5/07/2013	716	4.63	1.47	0.048	0.05	0.0065	0.0343	0.0507	272	0.000655	0.00053	0.00871	0.00517	12.7	48.1	6.26	46.3	0.0086	0.0078	0.029	2.73E+02	0.00043	0.00031	0.00833	0.00169	10.4	48.9	6.06	44.4	0.0079		
5/17/2013	520	3.43	1.12	0.031	0.05	0.005	0.0822	0.0498	2.15E+02	0.000568	0.00055	0.00681	0.00893	11.6	41.6	4.67	32.8	0.0135	0.0335	0.0323	1.96E+02	0.000364	0.00036	0.00602	0.00455	8.82	38.1	4.14	29.5	0.0116		
5/22/2013	604	4.42	1.15	0.042	0.05	0.0065	0.0463	0.0505	222	0.000514	0.00152	0.00774	0.0075	12.8	42	5.45	38.3	0.0107	0.0127	0.0325	2.24E+02	0.000368	0.00036	0.00766	0.00254	9.43	42	5.35	37.7	0.0084		
5/29/2013	636	3.85	1.08	0.04	0.05	0.005	0.0672	0.0504	2.13E+02	0.000458	0.00175	0.00704	0.00632	13	40.8	5.29	36	0.0108	0.0105	0.0297	2.15E+02	0.000285	0.00028	0.00665	0.00196	7.61	41	5.05	34.7	0.0086		
6/11/2013	660	4.04	1.07	0.028	0.05	0.006	0.0416	0.0476	2.32E+02	0.000495	0.00058	0.00714	0.00736	10.4	46.6	5.35	36.4	0.0088	0.0084	0.028	2.38E+02	0.000351	0.00031	0.0072	0.00247	5.89	47	5.44	36.8	0.0067		
6/25/2013	772	6.03	1.07	0.046	0.05	0.0053	0.0249	0.0558	2.58E+02	0.000647	0.00059	0.00922	0.00438	13.2	46.5	6.49	46.4	0.0132	0.0116	0.0482	2.68E+02	0.000313	0.00041	0.00902	0.00172	11.2	50.3	6.62	46.1	0.0087		
7/16/2013	742	3.9	1.38	0.01	0.05	0.0114	0.0168	0.039	2.73E+02	0.000546	0.00047	0.00803	0.00558	8.56	50.1	5.16	40.3	0.009	0.0063	0.0225	2.84E+02	0.000396	0.00031	0.00798	0.00308	4.71	53.3	5.15	40.5	0.0059		
8/14/2013	753	4.07	1.19	0.035	0.05	0.0138	0.0185	0.0446	2.61E+02	0.00053	0.00052	0.00797	0.00532	8.68	52.7	5.44	39.9	0.0072	0.008	0.0241	2.62E+02	0.000387	0.00035	0.008	0.00293	4.65	53.6	5.5	39.7	0.0063		
9/17/2013	753	3.94	1.21	0.029	0.05	0.0088	0.022	0.0467	2.82E+02	0.000546	0.00052	0.00745	0.00479	8.74	59.2	5.61	38.3	0.0084	0.008	0.0241	2.62E+02	0.000387	0.00035	0.008	0.00293	4.65	53.6	5.5	39.7	0.0063		
9/18/2013	754	3.94	1.21	0.029	0.05	0.0088	0.0208	0.0487	2.76E+02	0.000544	0.00056	0.00738	0.00468	9.18	57	5.6	37.5	0.0084	0.008	0.0241	2.62E+02	0.000387	0.00035	0.008	0.00293	4.65	53.6	5.5	39.7	0.0063		
9/24/2013	744	4.57	1.64	0.028	0.05	0.0078	0.025	0.0443	2.60E+02	0.000514	0.00054	0.00846	0.00526	9.39	50.4	5.98	39.6	0.0082	0.0106	0.0341	2.71E+02	0.00036	0.00039	0.00825	0.00278	7.06	52.8	5.95	39	0.0066		
10/16/2013	815	4.4	1.7	0.029	0.05	0.0058	0.0227	0.0504	2.92E+02	0.00063	0.00056	0.00843	0.00535	11.8	67.7	5.83	39.5	0.0112	0.0106	0.0322	2.96E+02	0.000397	0.00031	0.00813	0.00273	6.99	65.8	5.68	38.7	0.0089		
11/13/2013	863	3.7	1.24	0.03	0.05	0.01	0.0158	0.0592	3.01E+02	0.000707	0.00051	0.0079	0.00428	11.9	7																	

***Appendix C:
Mount Nansen Water Balance and
Water Quality Model Results***

Appendix C:

C.1 Model results for parameters of interest for Upstream Dome Creek Station DC-B

C.2 Post-treatment Model results for parameters of interest for Dome Creek Station DC-U

C.3 Pre-treatment Model results for parameters of interest for Dome Creek Station DC-U

C.4 Post-treatment Model results for parameters of interest for Dome Creek Station DC-R

C.5 Pre-treatment Model results for parameters of interest for Dome Creek Station DC-R

C.6 Model results for parameters of interest for Upstream Victoria Creek Station VC-DBC

C.7 Post-treatment Model results for parameters of interest for Victoria Creek Station VC-UMN

C.8 Pre-treatment Model results for parameters of interest for Victoria Creek Station VC-UMN

C.9 Water Quality Model results for parameters of interest for DC-U station

C.10 Water Quality Model results for parameters of interest for DC-R station

C.11 Water Quality Model results for parameters of interest for DC-UMN station

C.1 Model results for parameters of interest for Upstream Dome Creek Station DC-B

	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Quality Guideline	SO ₄	429	429	429	429	429	429	429	429	429	429	429	429
	N-NO ₂	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	N-NO ₃	3	3	3	3	3	3	3	3	3	3	3	3
	N-NH ₃	2.08	2.08	2.08	2.07	2.02	1.89	1.81	1.83	1.84	2.08	2.08	2.08
	WADCN	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	T-As	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	D-Al	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	D-Cd	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046
	T-Co	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	T-Cr	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	T-Cu	0.049	0.049	0.049	0.034	0.015	0.024	0.033	0.030	0.026	0.031	0.047	0.050
	T-Fe	1	1	1	1	1	1	1	1	1	1	1	1
	D-Fe	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
	T-Mn	5.97	5.97	5.97	4.35	2.30	3.27	4.18	3.88	3.46	4.02	5.79	6.14
	T-Zn	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03

Water Quality Estimate	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	SO4	975	975	975	574	249	440	600	535	467	576	901	963
	N-NO2	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	N-NO3	0.037	0.030	0.026	0.009	0.009	0.057	0.030	0.024	0.038	0.070	0.045	0.045
	N-NH3	0.405	0.405	0.405	0.156	0.052	0.084	0.120	0.141	0.122	0.158	0.371	0.420
	WADCN	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	T-As	0.003	0.003	0.003	0.012	0.019	0.028	0.011	0.015	0.018	0.011	0.006	0.005
	D-Al	0.006	0.006	0.006	0.046	0.085	0.042	0.022	0.024	0.038	0.014	0.007	0.006
	D-Cd	0.00011	0.00011	0.00011	0.00007	0.00007	0.00003	0.00002	0.00002	0.00002	0.00003	0.00006	0.00007
	T-Co	0.0012	0.0012	0.0012	0.0008	0.0017	0.0013	0.0007	0.0008	0.0010	0.0005	0.0007	0.0008
	T-Cr	0.0002	0.0002	0.0002	0.0012	0.0035	0.0035	0.0009	0.0015	0.0025	0.0007	0.0002	0.0002
	T-Cu	0.0010	0.0010	0.0010	0.0029	0.0060	0.0065	0.0021	0.0034	0.0052	0.0015	0.0008	0.0008
	T-Fe	4.15	4.15	4.15	3.49	5.34	4.85	2.59	3.40	4.10	3.41	2.76	2.64
	D-Fe	0.67	0.67	0.67	0.54	0.21	0.04	0.08	0.11	0.17	0.60	0.68	0.67
	T-Mn	1.78	1.78	1.78	0.94	0.51	0.56	0.74	0.67	0.52	0.62	1.37	1.53
	T-Zn	0.039	0.039	0.039	0.029	0.041	0.034	0.010	0.015	0.025	0.024	0.027	0.027

Notes:

1. Highlight denotes above water quality guideline.
2. Bold denotes above proposed water quality objective (T-As = 0.025 mg/L).

C.2 Post-treatment Model results for parameters of interest for Dome Creek Station DC-U

	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Quality Guideline or Objective	SO ₄	429	429	429	429	429	429	429	429	429	429	429	429
	N-NO ₂	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	N-NO ₃	3	3	3	3	3	3	3	3	3	3	3	3
	N-NH ₃	2.08	2.08	2.08	2.04	2.01	1.91	1.80	1.83	1.87	2.07	2.08	2.08
	WADCN	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	T-As	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	D-Al	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	D-Cd	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046
	T-Co	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	T-Cr	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	T-Cu	0.036	0.036	0.036	0.035	0.017	0.026	0.033	0.031	0.029	0.032	0.041	0.040
	T-Fe	1	1	1	1	1	1	1	1	1	1	1	1
	D-Fe	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
	T-Mn	4.55	4.53	4.61	4.42	2.42	3.47	4.27	4.03	3.77	4.17	5.11	4.95
	T-Zn	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03

Water Quality Estimate	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	SO4	745	745	739	660	275	487	635	581	548	618	809	809
	N-NO2	0.042	0.042	0.039	0.027	0.003	0.004	0.007	0.008	0.011	0.013	0.020	0.031
	N-NO3	1.111	1.025	0.928	0.660	0.060	0.137	0.186	0.221	0.313	0.415	0.662	0.916
	N-NH3	4.238	4.391	4.406	3.321	0.344	0.743	1.172	1.204	1.457	1.585	2.710	3.620
	WADCN	0.011	0.012	0.014	0.011	0.002	0.003	0.004	0.004	0.004	0.004	0.008	0.012
	T-As	0.034	0.036	0.037	0.033	0.020	0.030	0.017	0.020	0.023	0.019	0.026	0.034
	D-Al	0.009	0.010	0.010	0.024	0.080	0.035	0.020	0.021	0.029	0.014	0.009	0.009
	D-Cd	0.00039	0.00039	0.00038	0.00029	0.00009	0.00007	0.00009	0.00011	0.00014	0.00015	0.00025	0.00032
	T-Co	0.0087	0.0086	0.0086	0.0065	0.0021	0.0023	0.0024	0.0026	0.0034	0.0034	0.0053	0.0072
	T-Cr	0.0006	0.0006	0.0006	0.0008	0.0033	0.0030	0.0008	0.0013	0.0018	0.0007	0.0004	0.0005
	T-Cu	0.0021	0.0019	0.0020	0.0023	0.0058	0.0058	0.0021	0.0032	0.0042	0.0020	0.0015	0.0016
	T-Fe	0.50	0.50	0.50	1.17	5.00	4.20	2.13	2.63	2.83	2.42	1.39	0.79
	D-Fe	0.10	0.10	0.10	0.20	0.20	0.05	0.08	0.11	0.14	0.42	0.32	0.18
	T-Mn	6.76	6.78	6.62	5.02	0.91	1.45	2.03	1.99	2.40	2.57	4.54	6.18
	T-Zn	0.025	0.028	0.029	0.026	0.039	0.031	0.010	0.013	0.022	0.023	0.026	0.025

Notes:

1. Highlight denotes above water quality guideline.
2. Bold denotes above proposed water quality objective (T-As = 0.025 mg/L).

C.3 Pre-treatment Model results for parameters of interest for Dome Creek Station DC-U

	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Quality Guideline or Objective	SO ₄	429	429	429	429	429	429	429	429	429	429	429	429
	N-NO ₂	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	N-NO ₃	3	3	3	3	3	3	3	3	3	3	3	3
	N-NH ₃	2.08	2.08	2.08	2.04	2.01	1.91	1.80	1.83	1.87	2.07	2.08	2.08
	WADCN	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	T-As	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	D-Al	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	D-Cd	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046
	T-Co	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	T-Cr	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	T-Cu	0.036	0.036	0.036	0.035	0.017	0.026	0.033	0.031	0.029	0.032	0.041	0.040
	T-Fe	1	1	1	1	1	1	1	1	1	1	1	1
	D-Fe	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
	T-Mn	4.55	4.53	4.61	4.42	2.42	3.47	4.28	4.03	3.77	4.17	5.12	4.97
	T-Zn	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03

	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Quality Estimate	SO4	745	745	739	660	275	487	635	581	548	618	809	809
	N-NO2	0.042	0.042	0.039	0.027	0.003	0.004	0.007	0.008	0.011	0.013	0.020	0.031
	N-NO3	1.111	1.025	0.928	0.660	0.060	0.137	0.186	0.221	0.313	0.415	0.662	0.916
	N-NH3	4.238	4.391	4.406	3.321	0.344	0.743	1.172	1.204	1.457	1.585	2.710	3.620
	WADCN	0.011	0.012	0.014	0.011	0.002	0.003	0.004	0.004	0.004	0.004	0.008	0.012
	T-As	0.048	0.055	0.062	0.056	0.022	0.034	0.021	0.025	0.029	0.023	0.035	0.051
	D-Al	0.009	0.010	0.010	0.024	0.080	0.035	0.020	0.021	0.029	0.014	0.009	0.009
	D-Cd	0.00056	0.00053	0.00050	0.00036	0.00009	0.00007	0.00010	0.00012	0.00015	0.00016	0.00026	0.00036
	T-Co	0.0090	0.0090	0.0088	0.0067	0.0021	0.0023	0.0027	0.0028	0.0033	0.0033	0.0054	0.0074
	T-Cr	0.0007	0.0006	0.0005	0.0010	0.0033	0.0030	0.0009	0.0013	0.0018	0.0007	0.0004	0.0005
	T-Cu	0.0051	0.0049	0.0050	0.0053	0.0061	0.0061	0.0030	0.0038	0.0059	0.0031	0.0030	0.0037
	T-Fe	12.30	14.07	14.89	12.69	6.04	6.08	4.48	4.97	5.81	6.03	8.84	12.07
	D-Fe	9.94	11.02	12.45	10.31	1.07	1.36	1.94	1.67	2.12	3.12	5.99	8.91
	T-Mn	6.84	6.91	6.83	5.20	0.93	1.49	2.05	2.08	2.42	2.58	4.60	6.25
	T-Zn	0.039	0.046	0.045	0.035	0.039	0.031	0.010	0.014	0.022	0.024	0.031	0.035

Notes:

1. Highlight denotes above water quality guideline.
2. Bold denotes above proposed water quality objective (T-As = 0.025 mg/L).

C.4 Post-treatment Model results for parameters of interest for Dome Creek Station DC-R

	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Quality Guideline or Objective	SO ₄	-	-	-	429	429	429	429	429	429	429	429	-
	N-NO ₂	-	-	-	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	-
	N-NO ₃	-	-	-	3	3	3	3	3	3	3	3	-
	N-NH ₃	-	-	-	2.08	2.07	1.89	1.89	1.89	1.93	2.06	2.08	-
	WADCN	-	-	-	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	-
	T-As	-	-	-	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	-
	D-Al	-	-	-	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	-
	D-Cd	-	-	-	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	-
	T-Co	-	-	-	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	-
	T-Cr	-	-	-	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
	T-Cu	-	-	-	0.030	0.015	0.023	0.029	0.028	0.026	0.029	0.040	-
	T-Fe	-	-	-	1	1	1	1	1	1	1	1	-
	D-Fe	-	-	-	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	-
	T-Mn	-	-	-	3.88	2.30	3.10	3.83	3.65	3.46	3.81	5.03	-
	T-Zn	-	-	-	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	-

	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Quality Estimate	SO4	-	-	-	557	260	418	552	510	490	550	782	-
	N-NO2	-	-	-	0.022	0.005	0.004	0.006	0.008	0.010	0.012	0.013	-
	N-NO3	-	-	-	0.598	0.112	0.129	0.169	0.204	0.292	0.388	0.567	-
	N-NH3	-	-	-	2.801	0.486	0.648	1.021	1.061	1.323	1.432	2.326	-
	WADCN	-	-	-	0.008	0.002	0.002	0.003	0.004	0.004	0.003	0.005	-
	T-As	-	-	-	0.026	0.018	0.026	0.015	0.017	0.021	0.017	0.024	-
	D-Al	-	-	-	0.039	0.076	0.036	0.019	0.020	0.029	0.015	0.007	-
	D-Cd	-	-	-	0.00025	0.00010	0.00006	0.00008	0.00010	0.00013	0.00014	0.00023	-
	T-Co	-	-	-	0.0056	0.0022	0.0021	0.0021	0.0023	0.0031	0.0031	0.0044	-
	T-Cr	-	-	-	0.0010	0.0030	0.0027	0.0008	0.0011	0.0017	0.0006	0.0003	-
	T-Cu	-	-	-	0.0028	0.0055	0.0054	0.0021	0.0030	0.0041	0.0019	0.0016	-
	T-Fe	-	-	-	1.36	4.39	3.83	1.87	2.30	2.61	2.15	1.48	-
	D-Fe	-	-	-	0.24	0.19	0.06	0.08	0.10	0.13	0.38	0.34	-
	T-Mn	-	-	-	4.10	1.09	1.28	1.77	1.76	2.18	2.32	3.71	-
	T-Zn	-	-	-	0.030	0.034	0.027	0.009	0.012	0.020	0.021	0.032	-

Notes:

1. Highlight denotes above water quality guideline.
2. Bold denotes above proposed water quality objective (T-As = 0.025 mg/L).

C.5 Pre-treatment Model results for parameters of interest for Dome Creek Station DC-R

	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Quality Guideline or Objective	SO4	-	-	-	429	429	429	429	429	429	429	429	-
	N-NO2	-	-	-	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	-
	N-NO3	-	-	-	3	3	3	3	3	3	3	3	-
	N-NH3	-	-	-	2.08	2.07	1.89	1.89	1.89	1.93	2.06	2.08	-
	WADCN	-	-	-	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	-
	T-As	-	-	-	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	-
	D-Al	-	-	-	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	-
	D-Cd	-	-	-	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	-
	T-Co	-	-	-	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	-
	T-Cr	-	-	-	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
	T-Cu	-	-	-	0.030	0.015	0.023	0.029	0.028	0.026	0.029	0.040	-
	T-Fe	-	-	-	1	1	1	1	1	1	1	1	-
	D-Fe	-	-	-	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	-
	T-Mn	-	-	-	3.88	2.30	3.10	3.84	3.65	3.46	3.81	5.04	-
	T-Zn	-	-	-	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	-

	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Quality Estimate	SO4	-	-	-	557	260	418	552	510	490	550	782	-
	N-NO2	-	-	-	0.022	0.005	0.004	0.006	0.008	0.010	0.012	0.013	-
	N-NO3	-	-	-	0.598	0.112	0.129	0.169	0.204	0.292	0.388	0.567	-
	N-NH3	-	-	-	2.801	0.486	0.648	1.021	1.061	1.323	1.432	2.326	-
	WADCN	-	-	-	0.008	0.002	0.002	0.003	0.004	0.004	0.003	0.005	-
	T-As	-	-	-	0.042	0.021	0.029	0.018	0.022	0.026	0.021	0.030	-
	D-Al	-	-	-	0.039	0.076	0.036	0.019	0.020	0.029	0.015	0.007	-
	D-Cd	-	-	-	0.00034	0.00010	0.00006	0.00009	0.00011	0.00014	0.00015	0.00025	-
	T-Co	-	-	-	0.0059	0.0023	0.0021	0.0024	0.0025	0.0031	0.0030	0.0045	-
	T-Cr	-	-	-	0.0010	0.0031	0.0027	0.0008	0.0011	0.0017	0.0006	0.0004	-
	T-Cu	-	-	-	0.0049	0.0059	0.0057	0.0028	0.0035	0.0056	0.0030	0.0026	-
	T-Fe	-	-	-	9.27	5.82	5.47	3.92	4.37	5.32	5.43	7.26	-
	D-Fe	-	-	-	7.70	1.35	1.20	1.70	1.48	1.93	2.82	5.14	-
	T-Mn	-	-	-	4.11	1.11	1.31	1.79	1.84	2.20	2.33	3.77	-
	T-Zn	-	-	-	0.046	0.034	0.027	0.009	0.013	0.020	0.022	0.039	-

Notes:

1. Highlight denotes above water quality guideline.
2. Bold denotes above proposed water quality objective (T-As = 0.025 mg/L).

C.6 Model results for parameters of interest for Upstream Victoria Creek Station VC-DBC

	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Quality Guideline or Objective	SO ₄	309	309	309	309	218	218	309	309	309	309	309	309
	N-NO ₂	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	N-NO ₃	3	3	3	3	3	3	3	3	3	3	3	3
	N-NH ₃	2.07	2.06	2.07	2.08	2.07	1.89	1.92	1.83	1.90	2.05	2.08	2.08
	WADCN	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	T-As	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	D-Al	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	D-Cd	0.00021	0.00021	0.00021	0.00022	0.00016	0.00016	0.00021	0.00020	0.00019	0.00020	0.00022	0.00023
	T-Co	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	T-Cr	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	T-Cu	0.004	0.004	0.004	0.004	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.004
	T-Fe	1	1	1	1	1	1	1	1	1	1	1	1
	D-Fe	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
	T-Mn	1.03	1.03	1.04	1.07	0.90	0.91	1.03	1.02	0.99	1.01	1.06	1.09
	T-Zn	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03

Water Quality Estimate	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	SO4	17	17	18	19	12	14	18	18	18	19	19	19
	N-NO2	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	N-NO3	0.122	0.126	0.118	0.107	0.054	0.072	0.062	0.094	0.105	0.120	0.141	0.155
	N-NH3	0.119	0.075	0.005	0.008	0.011	0.012	0.010	0.009	0.011	0.011	0.009	0.008
	WADCN	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	T-As	0.000	0.000	0.000	0.001	0.007	0.005	0.002	0.002	0.002	0.001	0.001	0.000
	D-Al	0.006	0.006	0.005	0.015	0.072	0.052	0.017	0.019	0.026	0.021	0.011	0.007
	D-Cd	0.00002	0.00003	0.00003	0.00008	0.00004	0.00003	0.00002	0.00002	0.00003	0.00003	0.00002	0.00002
	T-Co	0.0001	0.0001	0.0001	0.0004	0.0014	0.0007	0.0003	0.0002	0.0005	0.0002	0.0001	0.0001
	T-Cr	0.0002	0.0002	0.0002	0.0012	0.0032	0.0015	0.0006	0.0004	0.0015	0.0008	0.0003	0.0002
	T-Cu	0.0009	0.0010	0.0010	0.0020	0.0067	0.0044	0.0022	0.0020	0.0033	0.0018	0.0013	0.0011
	T-Fe	0.03	0.03	0.02	0.78	3.46	2.48	0.52	0.38	1.16	0.37	0.15	0.06
	D-Fe	0.01	0.01	0.01	0.03	0.15	0.11	0.04	0.05	0.07	0.07	0.03	0.02
	T-Mn	0.05	0.07	0.10	0.12	0.20	0.51	0.08	0.07	0.08	0.07	0.06	0.05
	T-Zn	0.002	0.002	0.002	0.006	0.020	0.012	0.005	0.005	0.008	0.004	0.003	0.003

Notes:

1. Highlight denotes above water quality guideline.
2. Bold denotes above proposed water quality objective (T-As = 0.025 mg/L).

C.7 Post-treatment Model results for parameters of interest for Victoria Creek Station VC-UMN

	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Quality Guideline or Objective	SO ₄	309	309	309	309	309	309	309	309	309	309	309	309
	N-NO ₂	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	N-NO ₃	3	3	3	3	3	3	3	3	3	3	3	3
	N-NH ₃	2.07	2.06	2.07	2.08	2.07	1.89	1.92	1.83	1.90	2.05	2.08	2.08
	WADCN	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	T-As	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	D-Al	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	D-Cd	0.00022	0.00023	0.00026	0.00030	0.00019	0.00022	0.00026	0.00023	0.00021	0.00024	0.00025	0.00024
	T-Co	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	T-Cr	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	T-Cu	0.004	0.004	0.005	0.007	0.003	0.004	0.005	0.005	0.004	0.005	0.005	0.005
	T-Fe	1	1	1	1	1	1	1	1	1	1	1	1
	D-Fe	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
	T-Mn	1.06	1.10	1.19	1.33	0.98	1.07	1.17	1.10	1.04	1.14	1.14	1.13
	T-Zn	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03

Water Quality Estimate	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	SO4	24	31	47	70	25	43	46	33	27	44	35	26
	N-NO2	0.001	0.002	0.002	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	N-NO3	0.132	0.142	0.148	0.158	0.058	0.076	0.067	0.097	0.108	0.131	0.152	0.162
	N-NH3	0.161	0.154	0.179	0.275	0.040	0.052	0.063	0.041	0.034	0.072	0.065	0.039
	WADCN	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	T-As	0.001	0.001	0.002	0.004	0.008	0.007	0.003	0.002	0.003	0.002	0.001	0.001
	D-Al	0.006	0.006	0.005	0.015	0.072	0.051	0.017	0.019	0.026	0.021	0.011	0.007
	D-Cd	0.00003	0.00003	0.00004	0.00010	0.00005	0.00003	0.00002	0.00002	0.00003	0.00003	0.00003	0.00002
	T-Co	0.0002	0.0002	0.0004	0.0009	0.0015	0.0008	0.0004	0.0003	0.0006	0.0003	0.0002	0.0002
	T-Cr	0.0002	0.0002	0.0002	0.0012	0.0032	0.0016	0.0006	0.0004	0.0016	0.0008	0.0003	0.0002
	T-Cu	0.0009	0.0010	0.0010	0.0020	0.0066	0.0045	0.0022	0.0020	0.0033	0.0018	0.0013	0.0011
	T-Fe	0.03	0.03	0.04	0.82	3.51	2.56	0.59	0.44	1.19	0.46	0.18	0.07
	D-Fe	0.01	0.01	0.01	0.04	0.15	0.11	0.04	0.05	0.07	0.08	0.04	0.02
	T-Mn	0.12	0.20	0.37	0.54	0.26	0.55	0.17	0.12	0.12	0.17	0.15	0.10
	T-Zn	0.002	0.003	0.003	0.007	0.021	0.013	0.005	0.005	0.009	0.005	0.004	0.003

Notes:

1. Highlight denotes above water quality guideline.
2. Bold denotes above proposed water quality objective (T-As = 0.025 mg/L).

C.8 Pre-treatment Model results for parameters of interest for Victoria Creek Station VC-UMN

	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Quality Guideline or Objective	SO ₄	309	309	309	309	309	309	309	309	309	309	309	309
	N-NO ₂	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	N-NO ₃	3	3	3	3	3	3	3	3	3	3	3	3
	N-NH ₃	2.07	2.06	2.07	2.08	2.07	1.89	1.92	1.83	1.90	2.05	2.08	2.08
	WADCN	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	T-As	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	D-Al	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	D-Cd	0.00022	0.00023	0.00026	0.00030	0.00019	0.00022	0.00026	0.00023	0.00021	0.00024	0.00025	0.00024
	T-Co	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	T-Cr	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	T-Cu	0.004	0.004	0.005	0.007	0.003	0.004	0.005	0.005	0.004	0.005	0.005	0.005
	T-Fe	1	1	1	1	1	1	1	1	1	1	1	1
	D-Fe	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
	T-Mn	1.06	1.10	1.19	1.33	0.98	1.07	1.17	1.10	1.04	1.14	1.15	1.13
	T-Zn	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03

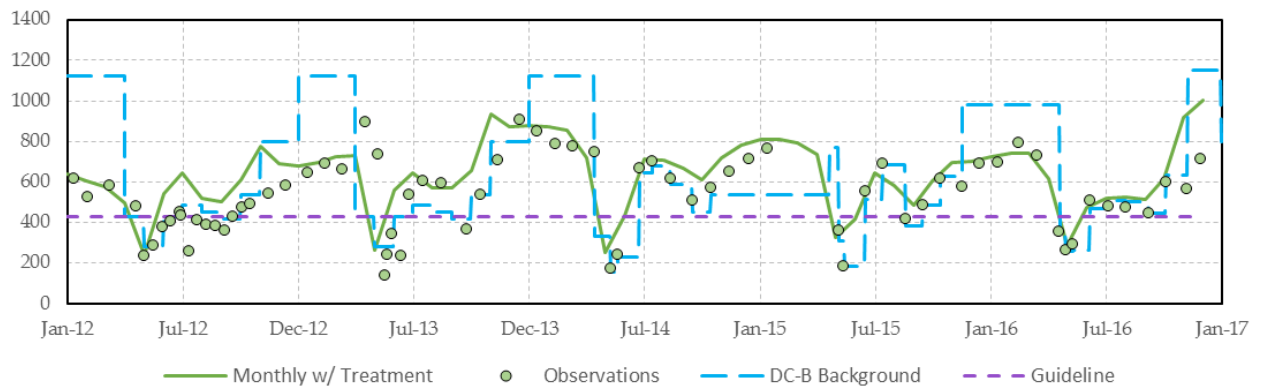
Water Quality Estimate	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	SO4	24	31	47	70	25	43	46	33	27	44	35	26
	N-NO2	0.001	0.002	0.002	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	N-NO3	0.132	0.142	0.148	0.158	0.058	0.076	0.067	0.097	0.108	0.131	0.152	0.162
	N-NH3	0.161	0.154	0.179	0.275	0.040	0.052	0.063	0.041	0.034	0.072	0.065	0.039
	WADCN	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	T-As	0.001	0.001	0.003	0.005	0.008	0.007	0.003	0.002	0.003	0.002	0.001	0.001
	D-Al	0.006	0.006	0.005	0.015	0.072	0.051	0.017	0.019	0.026	0.021	0.011	0.007
	D-Cd	0.00003	0.00004	0.00005	0.00010	0.00005	0.00003	0.00002	0.00002	0.00003	0.00003	0.00003	0.00002
	T-Co	0.0002	0.0002	0.0004	0.0009	0.0015	0.0008	0.0004	0.0003	0.0006	0.0003	0.0002	0.0002
	T-Cr	0.0002	0.0002	0.0002	0.0012	0.0032	0.0016	0.0006	0.0004	0.0016	0.0008	0.0003	0.0002
	T-Cu	0.0009	0.0010	0.0011	0.0022	0.0067	0.0045	0.0022	0.0020	0.0033	0.0019	0.0013	0.0011
	T-Fe	0.16	0.28	0.60	1.63	3.60	2.66	0.70	0.50	1.24	0.60	0.34	0.16
	D-Fe	0.11	0.21	0.51	0.75	0.22	0.18	0.13	0.09	0.10	0.19	0.16	0.09
	T-Mn	0.13	0.20	0.37	0.54	0.26	0.55	0.17	0.12	0.12	0.17	0.15	0.10
	T-Zn	0.002	0.003	0.004	0.008	0.021	0.013	0.005	0.005	0.009	0.005	0.004	0.003

Notes:

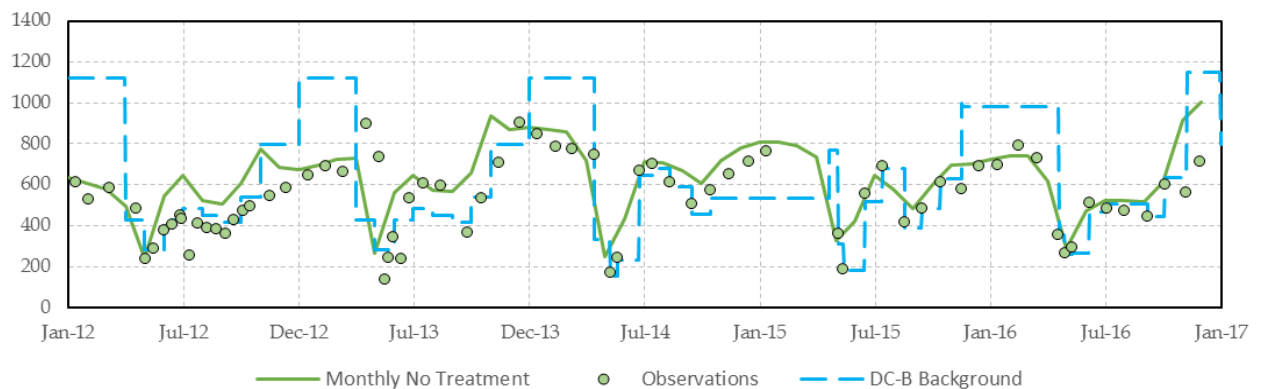
1. Highlight denotes above water quality guideline.
2. Bold denotes above proposed water quality objective (T-As = 0.025 mg/L).

C.9 Water Quality Model results for parameters of interest for DC-U station

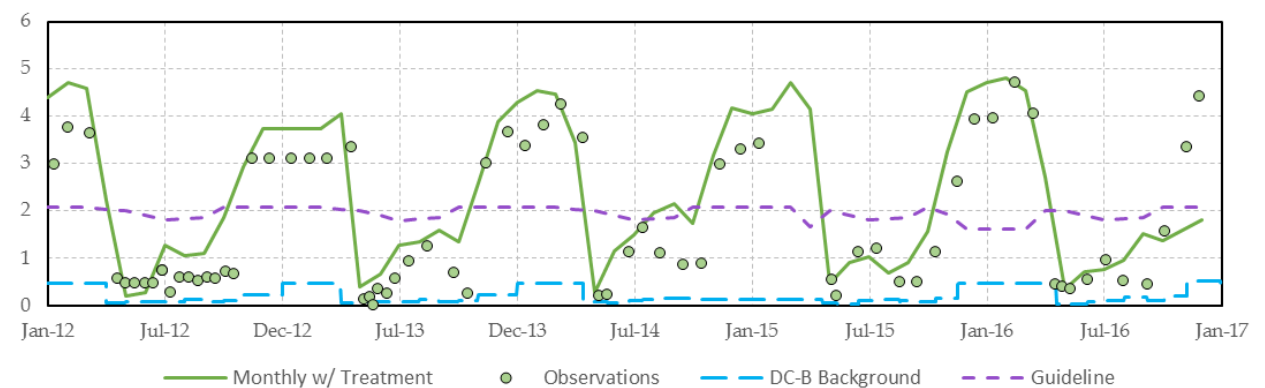
DC-U Sulfate



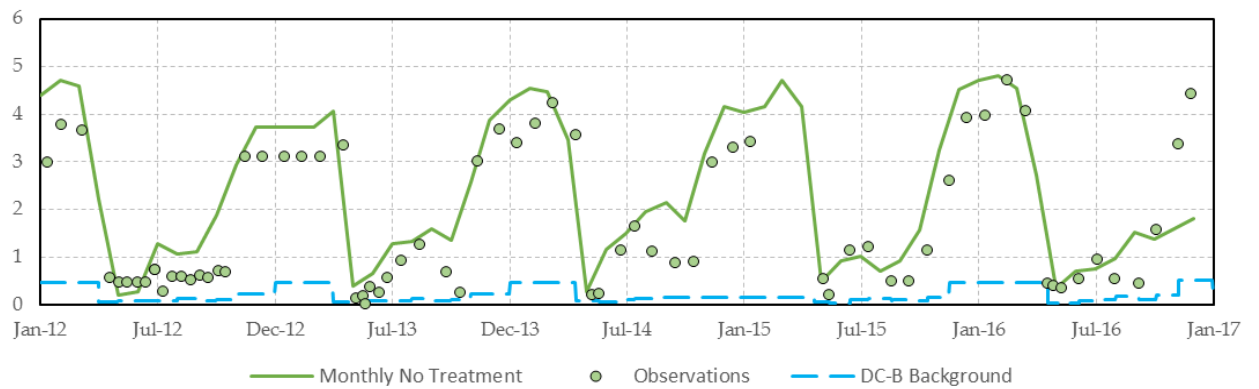
DC-U Sulfate



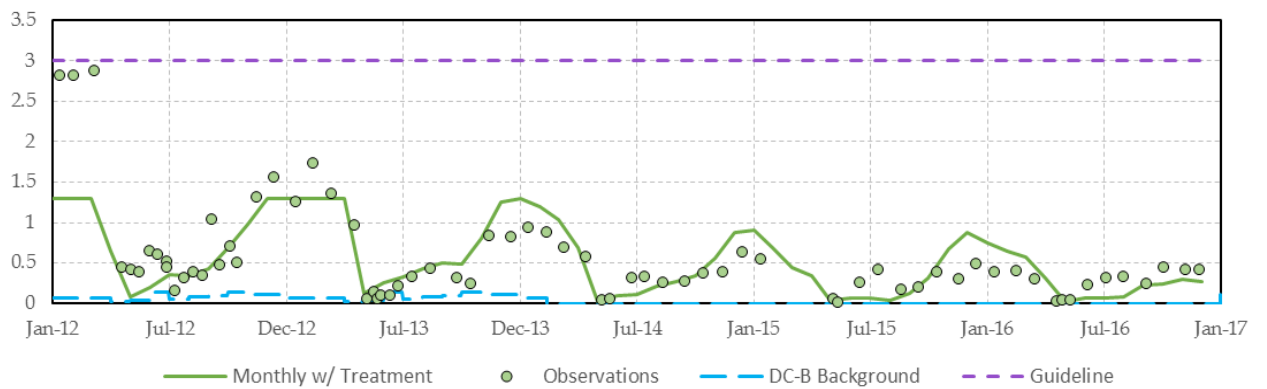
DC-U Ammonia



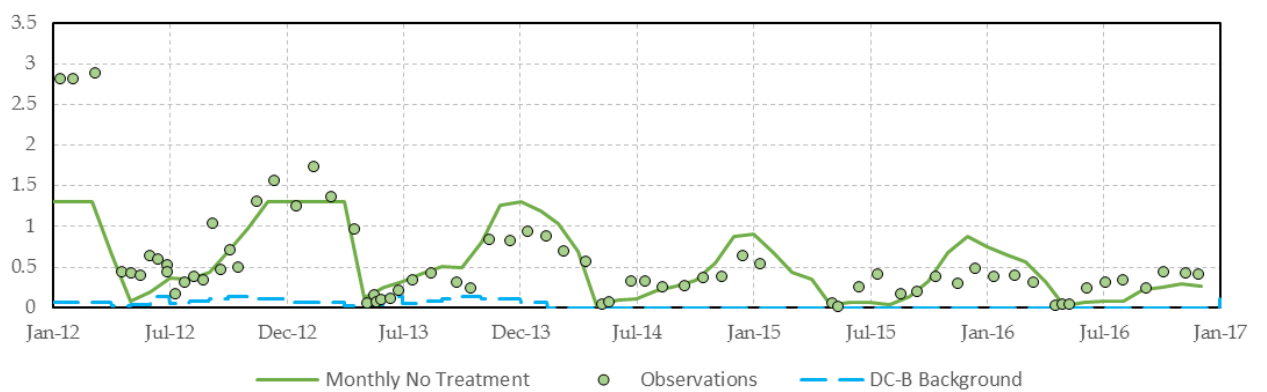
DC-U Ammonia



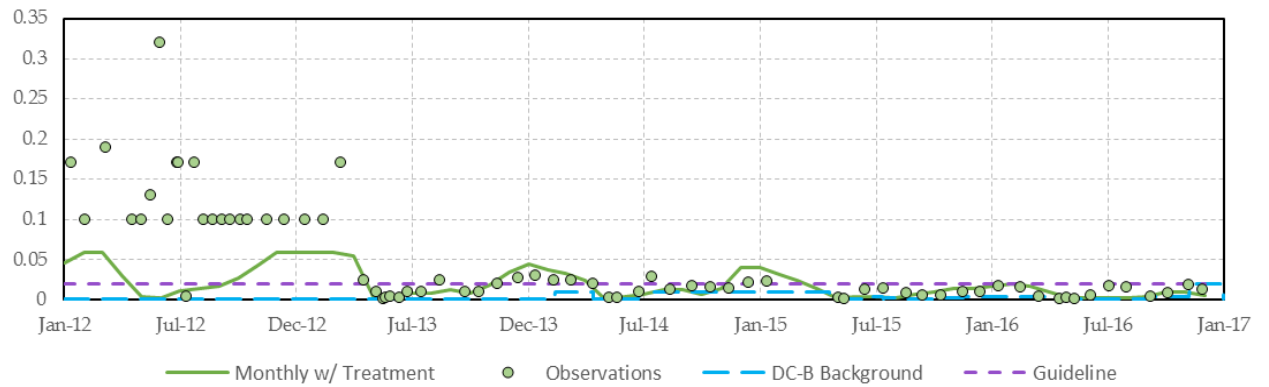
DC-U Nitrate



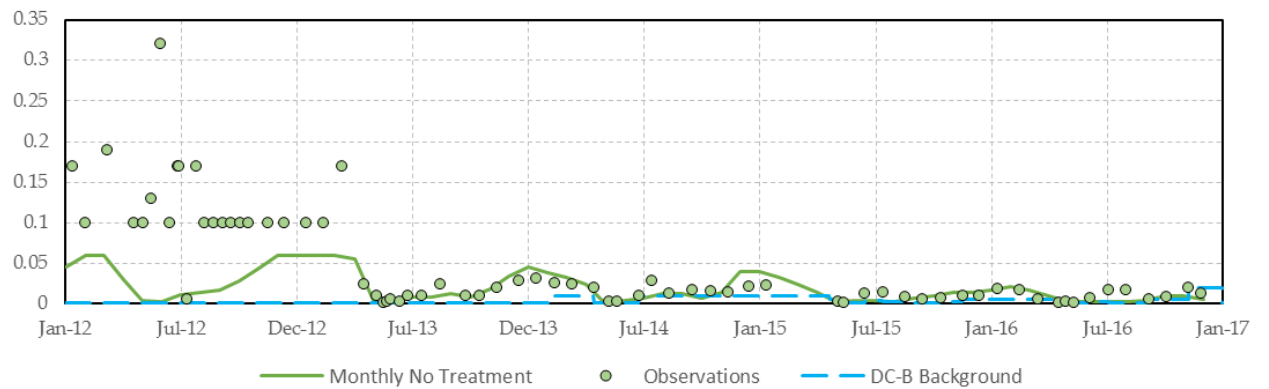
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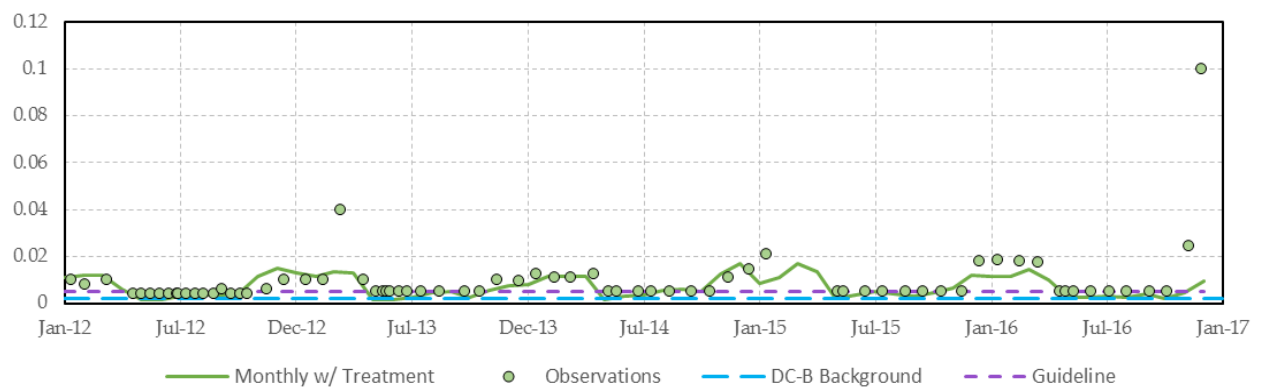
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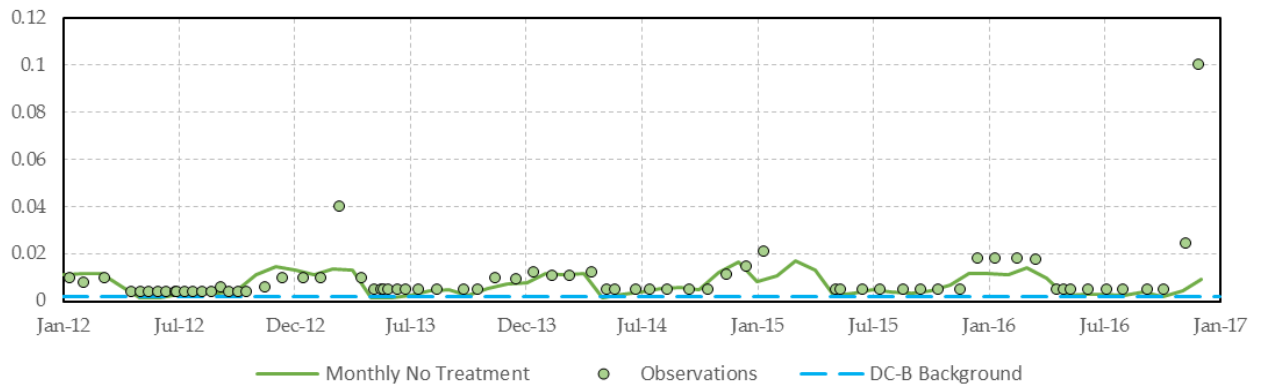
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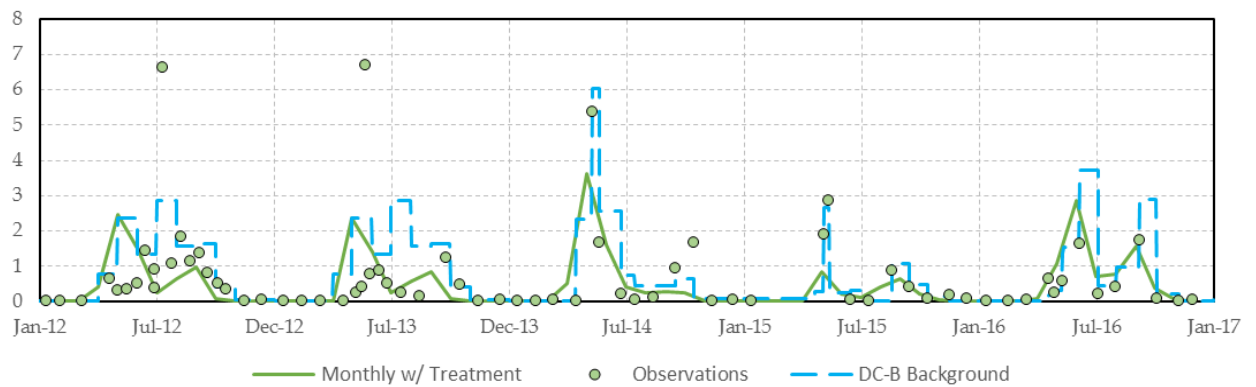
DC-U WADCN



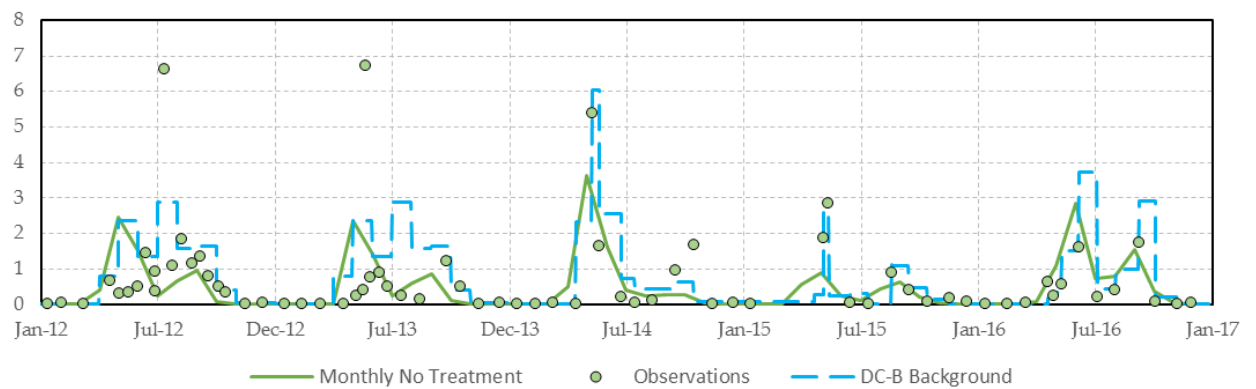
DC-U WADCN



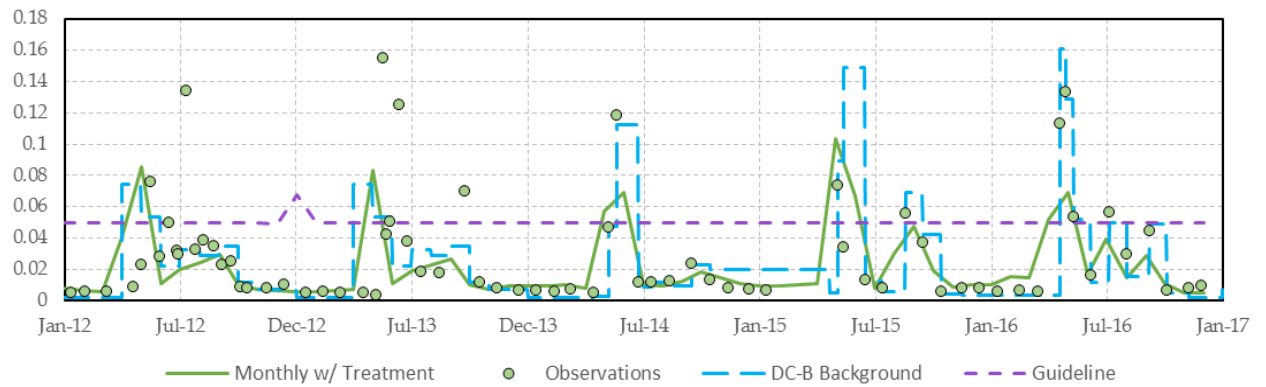
DC-U T-Al



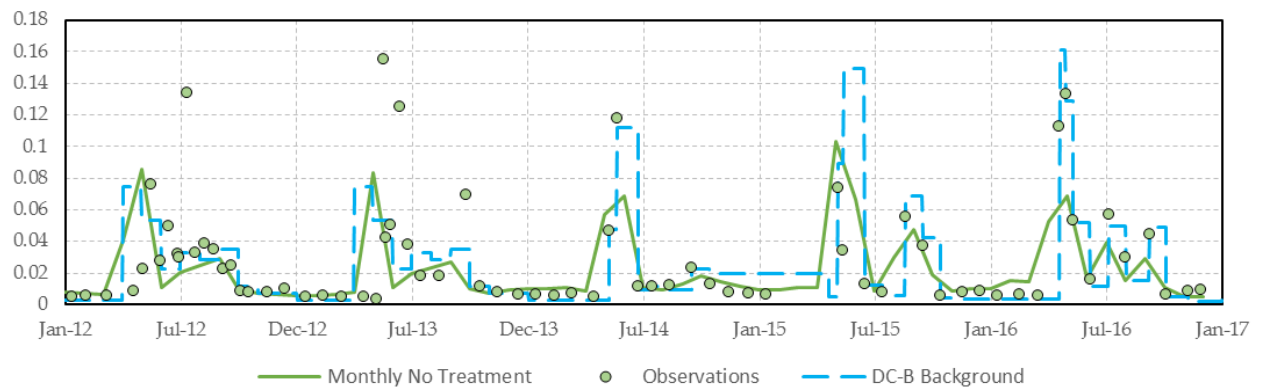
DC-U T-Al



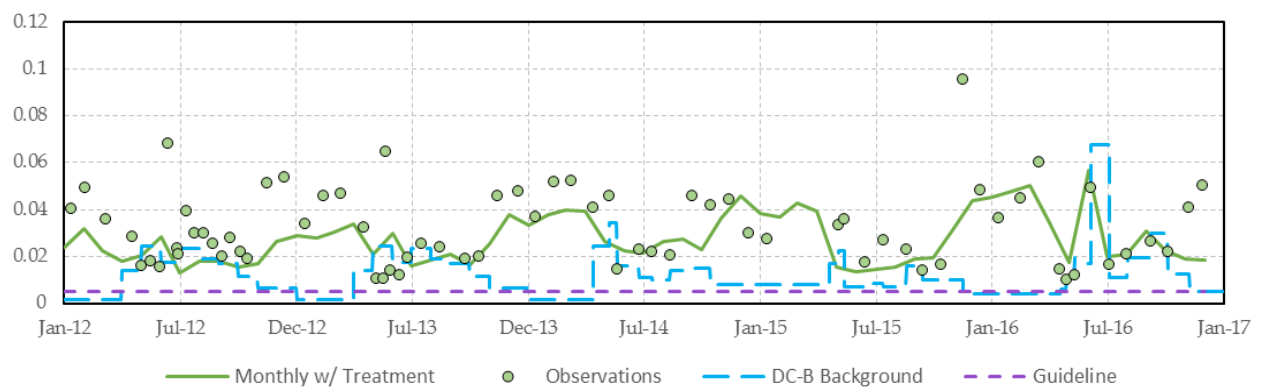
DC-U D-AI

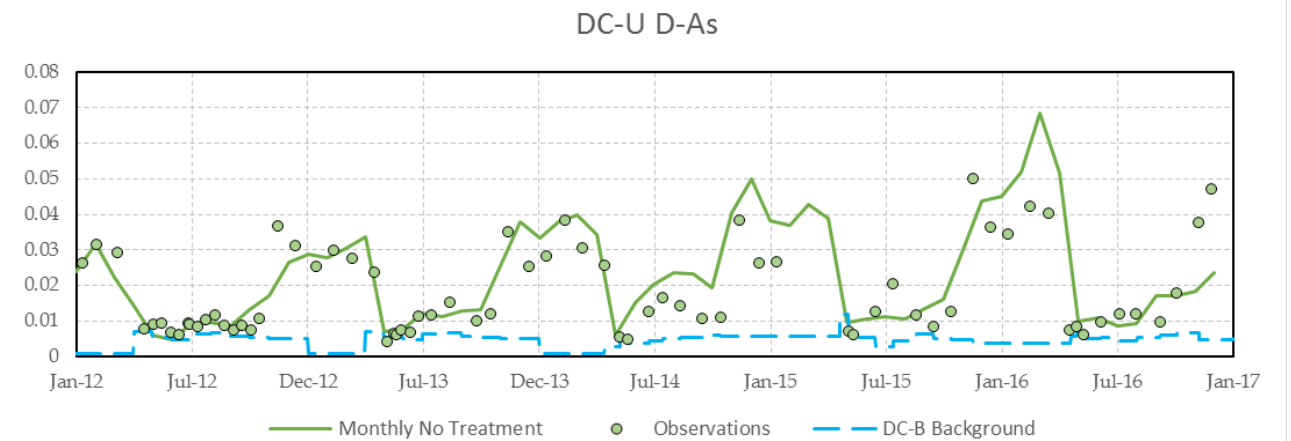
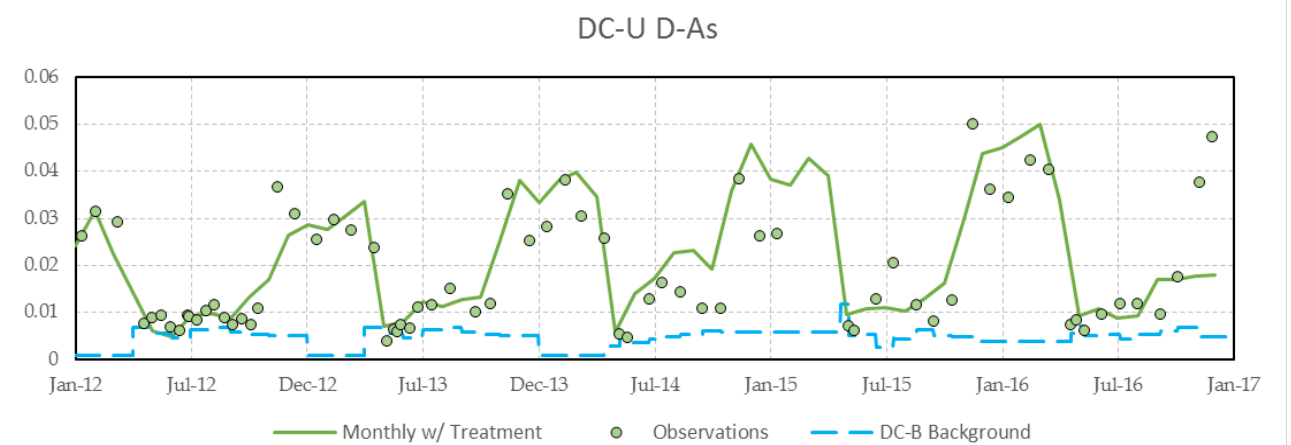
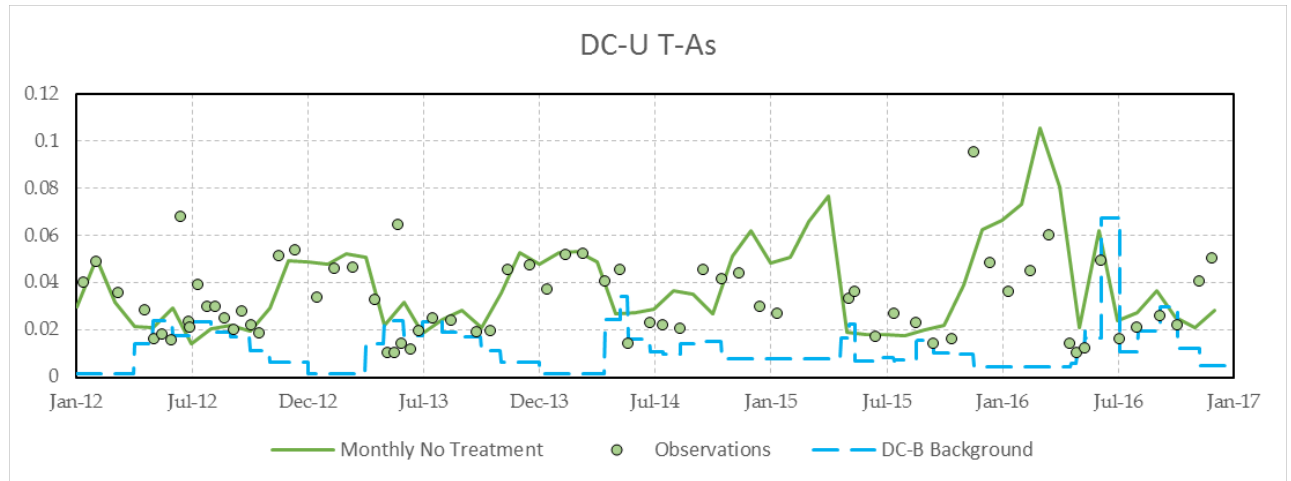


DC-U D-AI

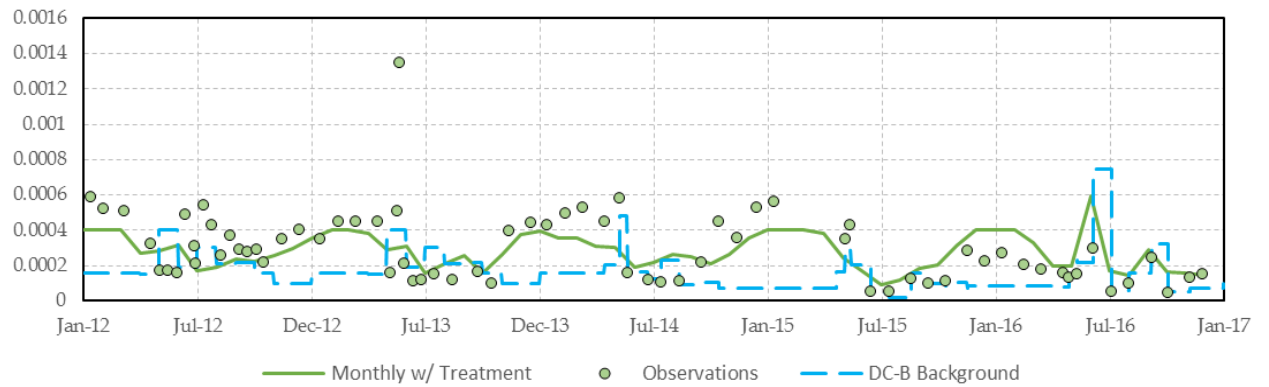


DC-U T-As

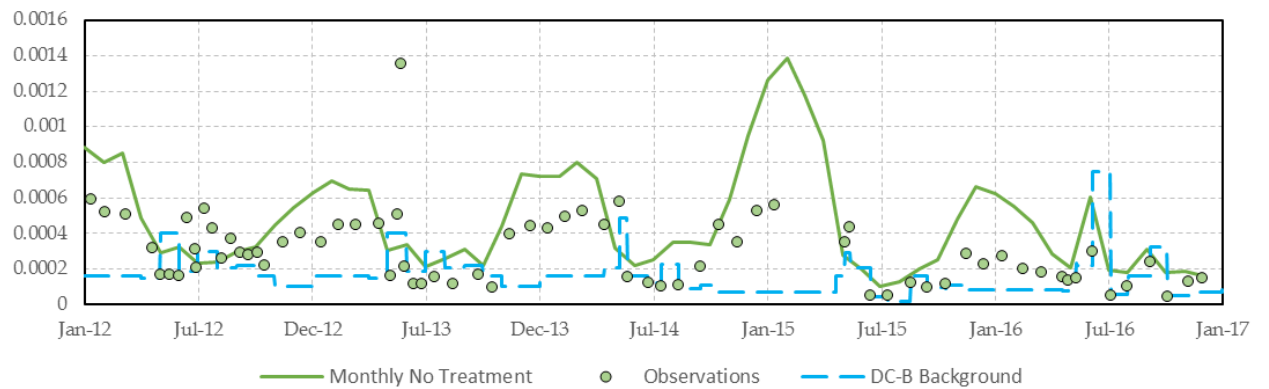




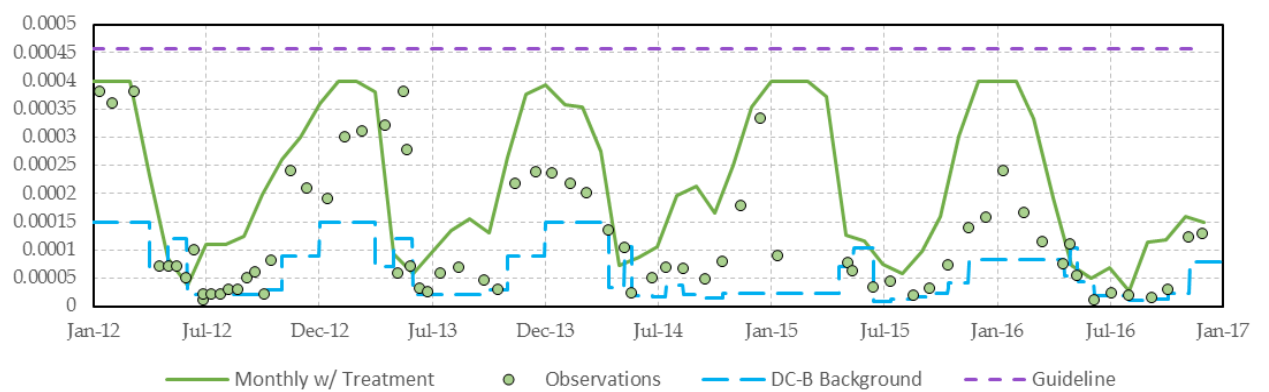
DC-U T-Cd



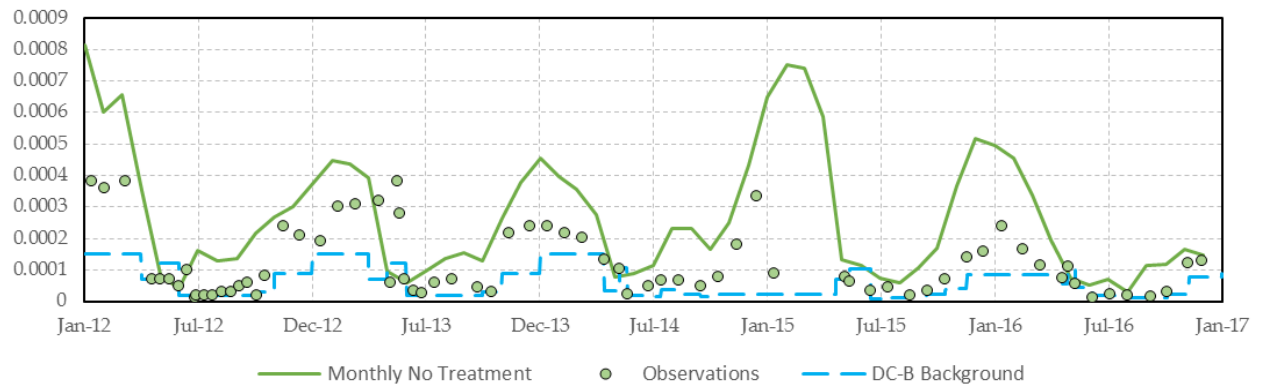
DC-U T-Cd



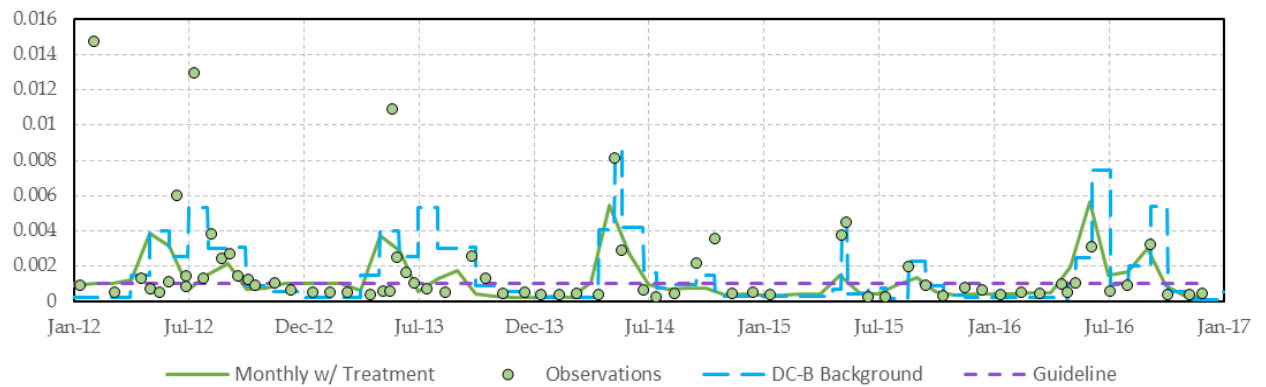
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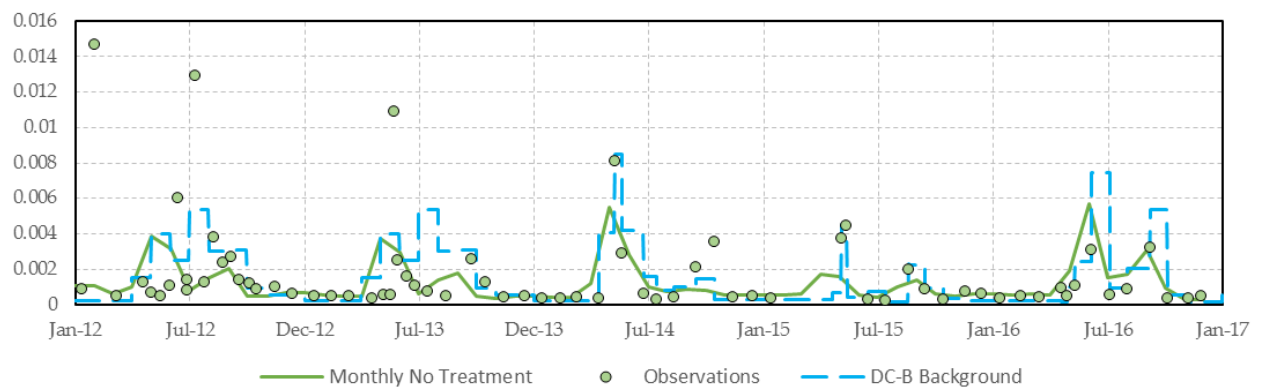
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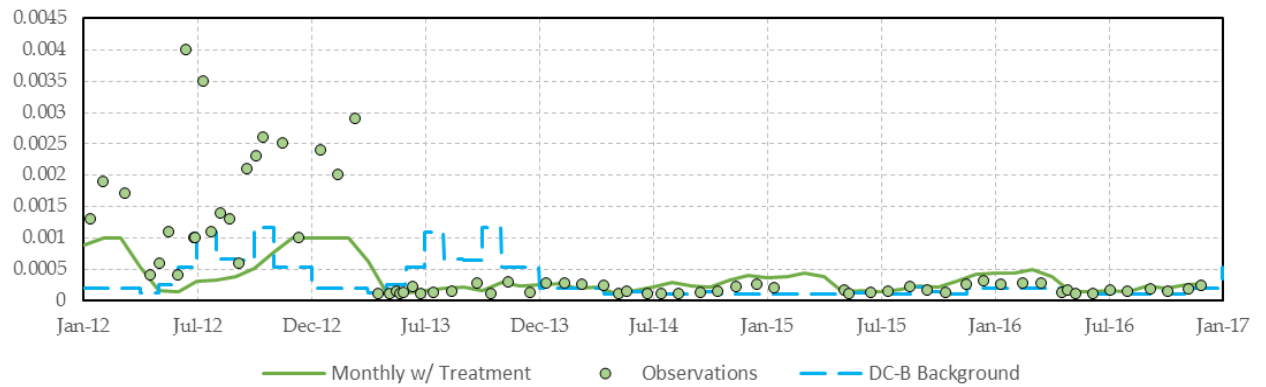
DC-U T-Cr



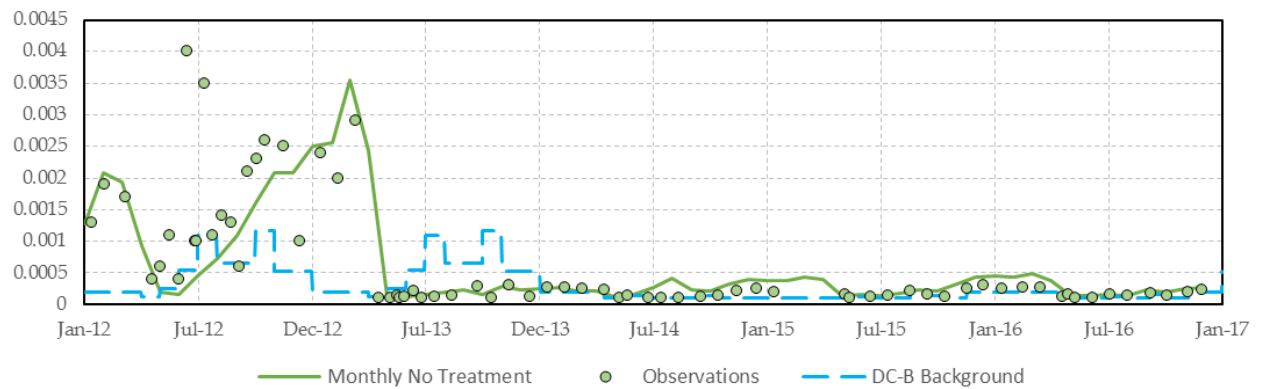
DC-U T-Cr



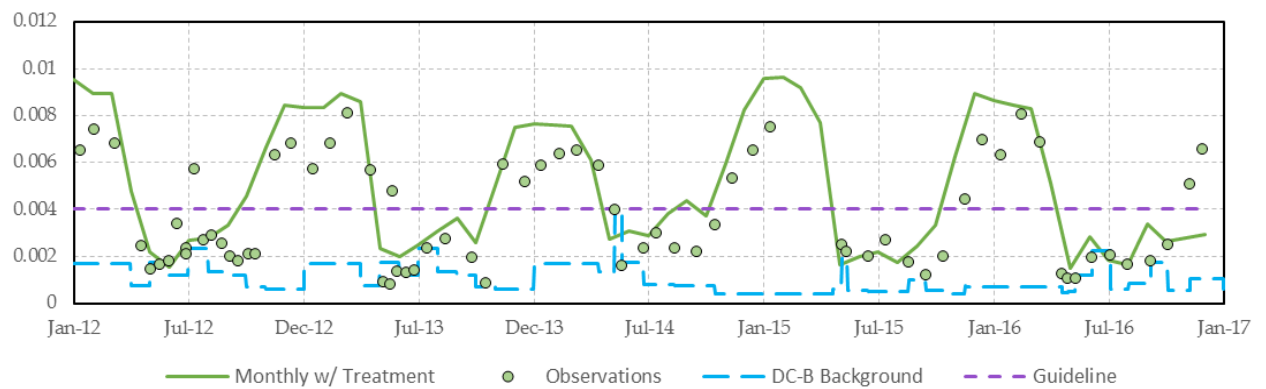
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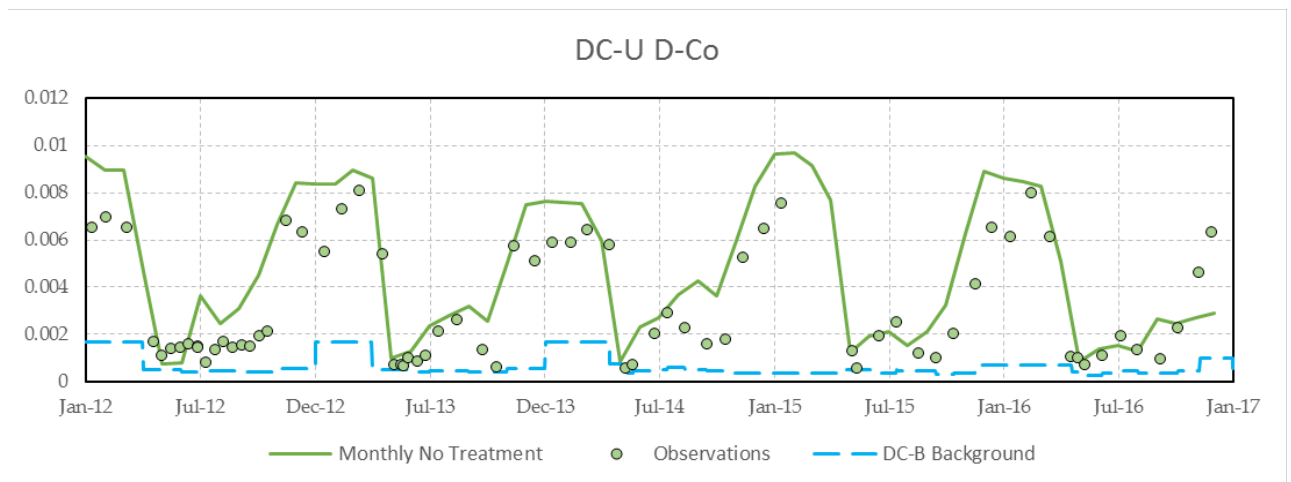
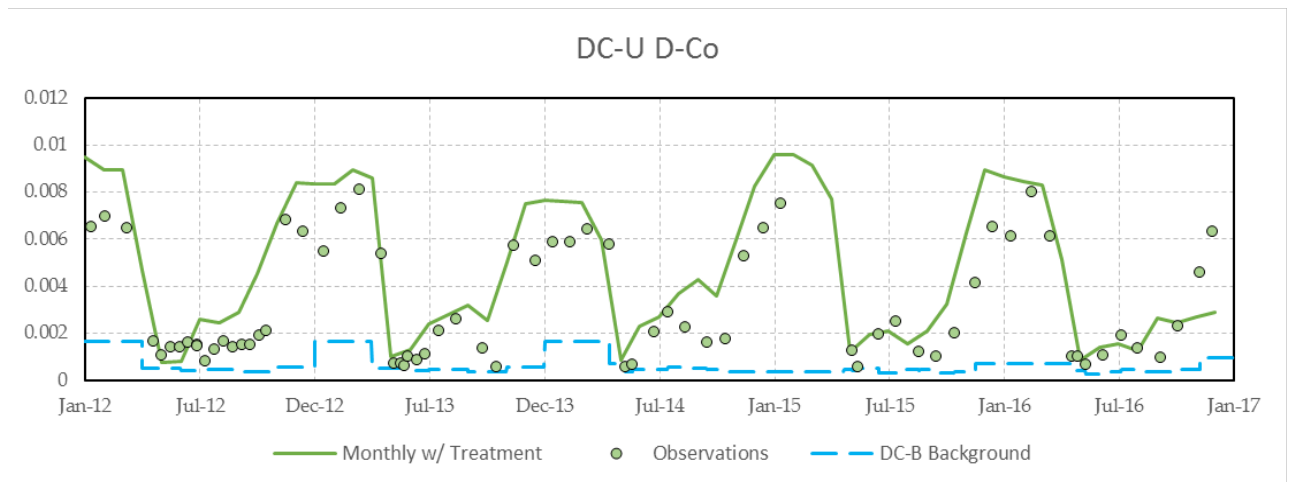
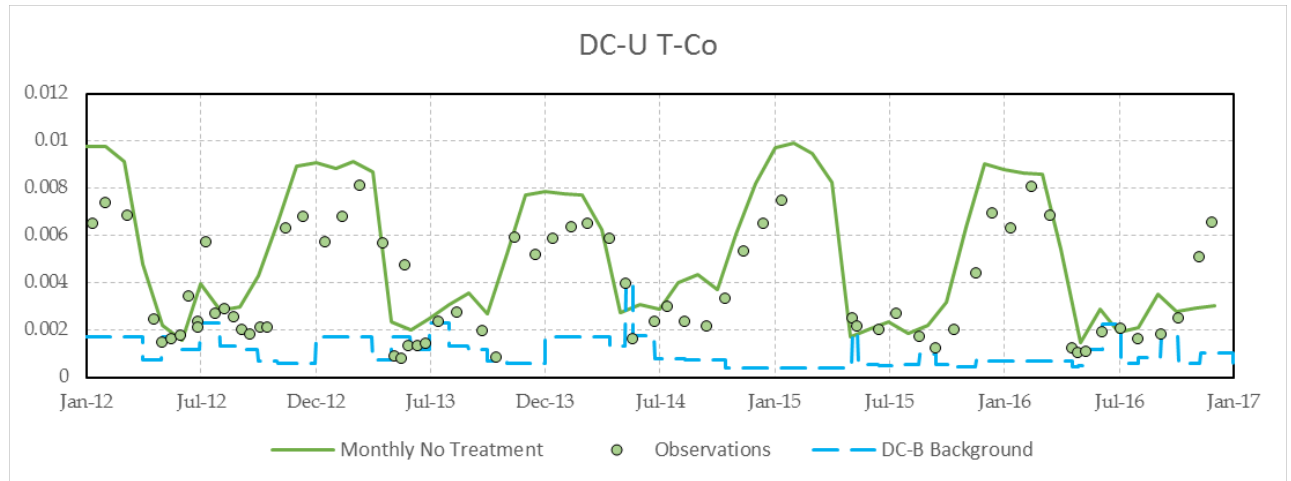


DC-U D-Cr

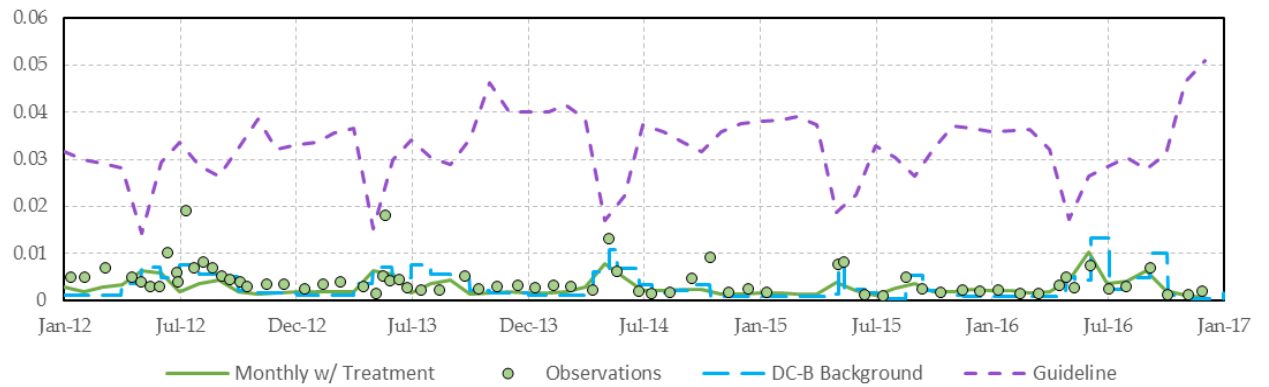


DC-U T-Co

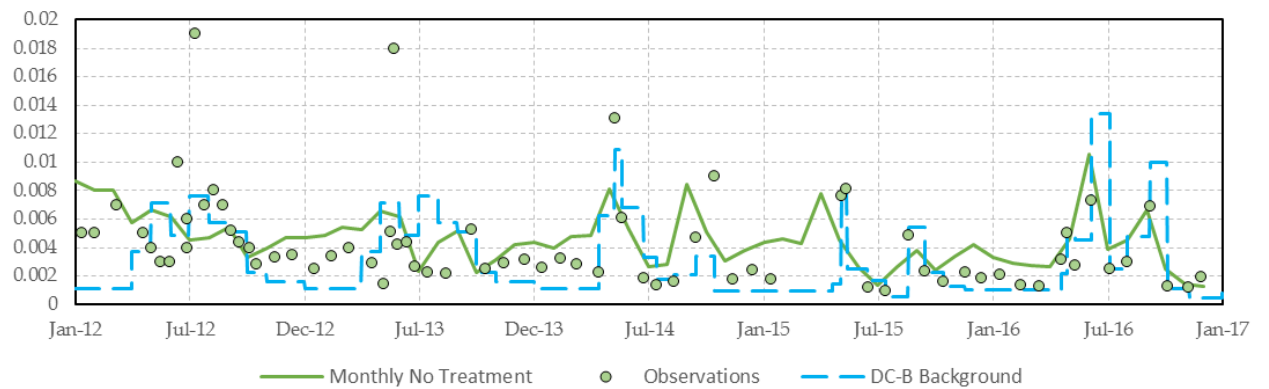




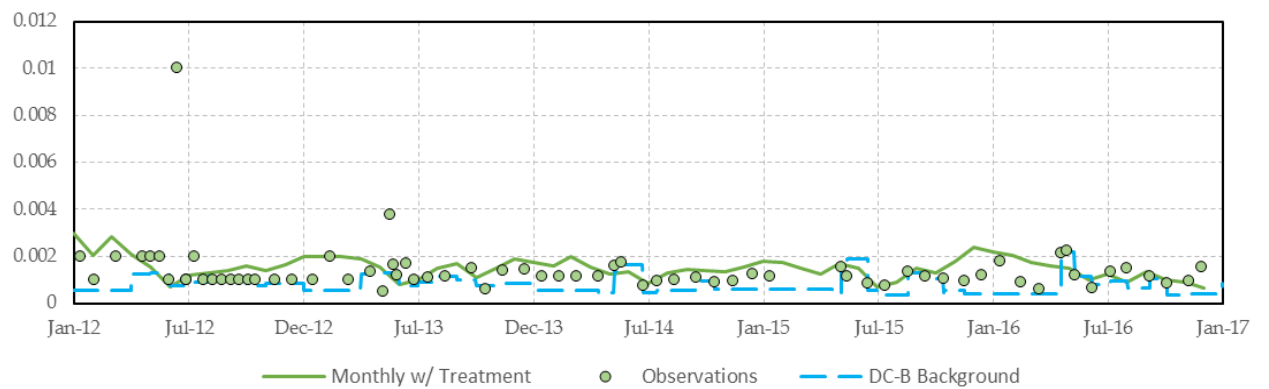
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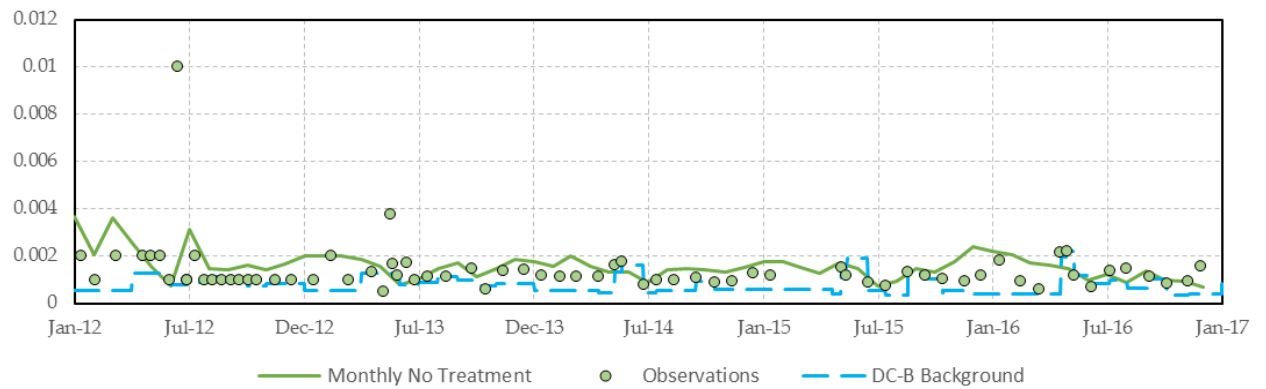
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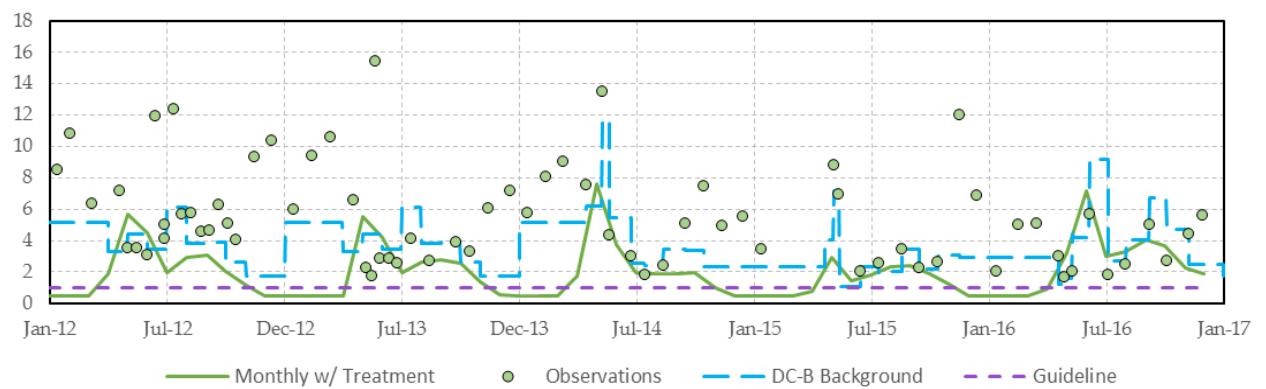
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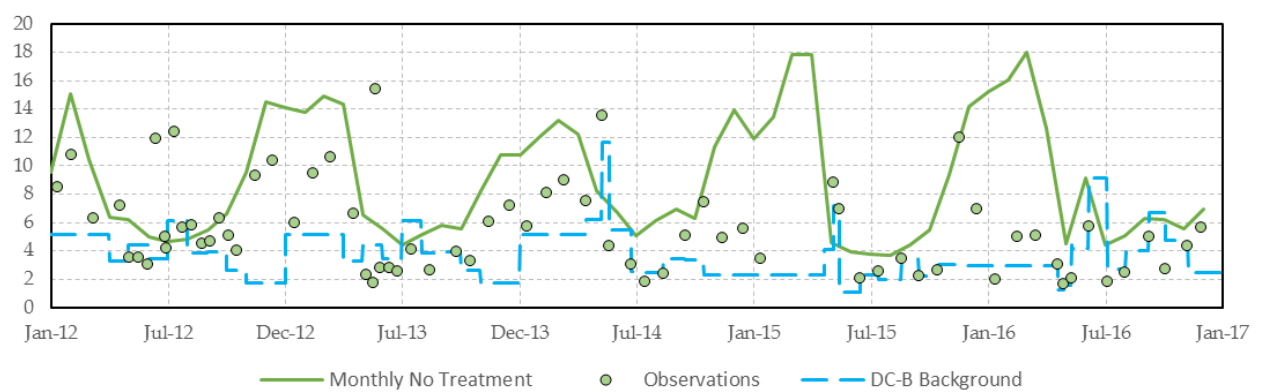
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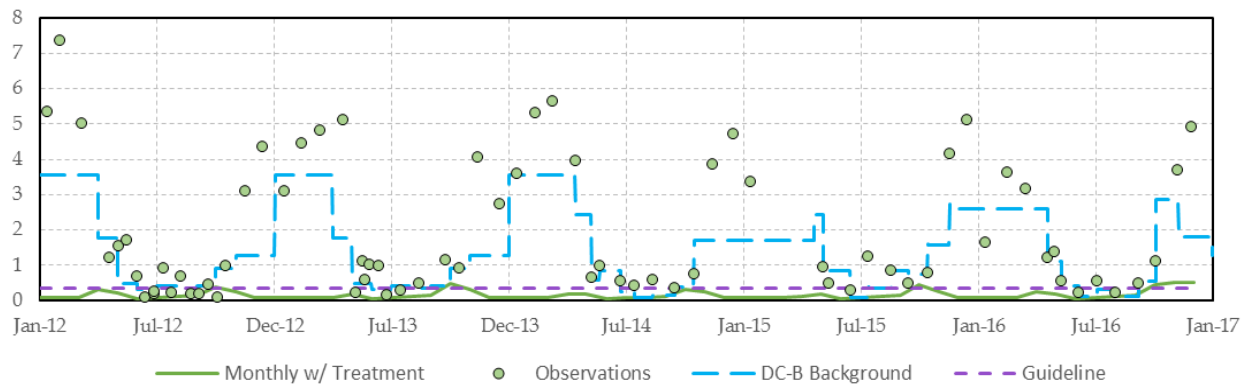
DC-U T-Fe



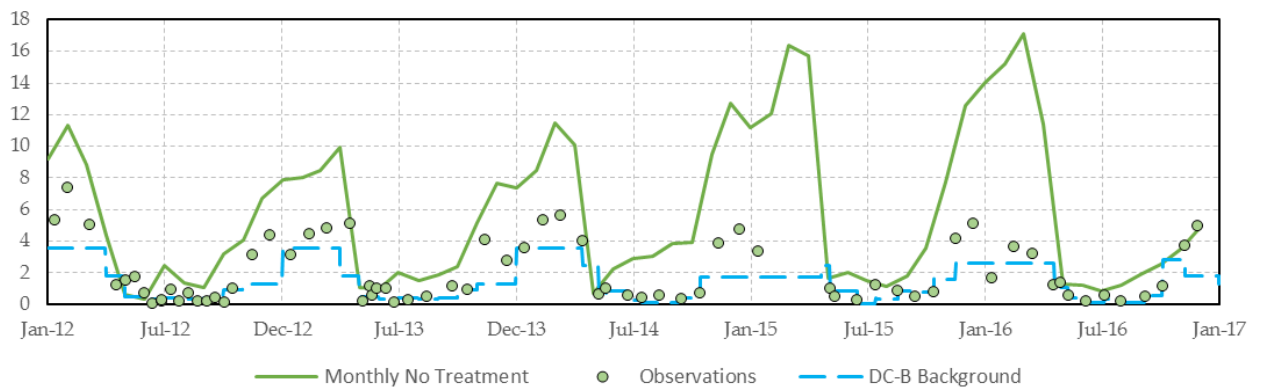
DC-U T-Fe



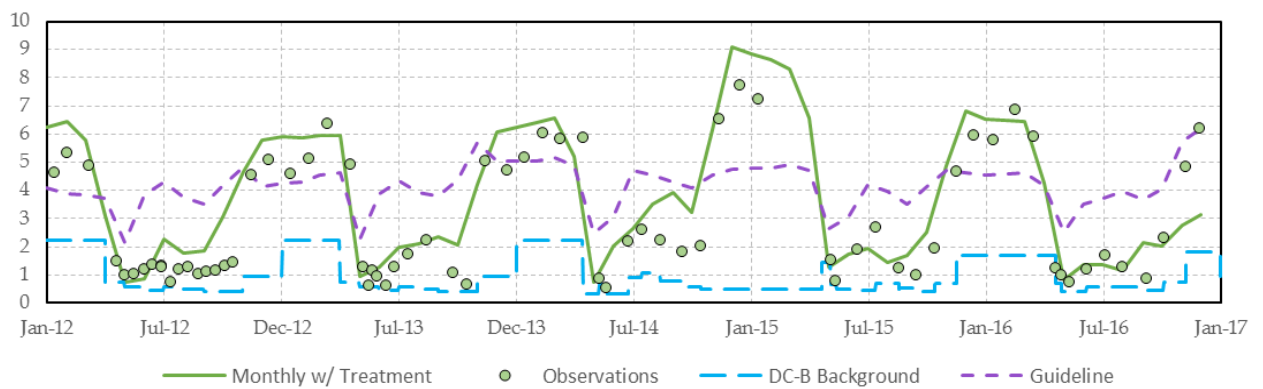
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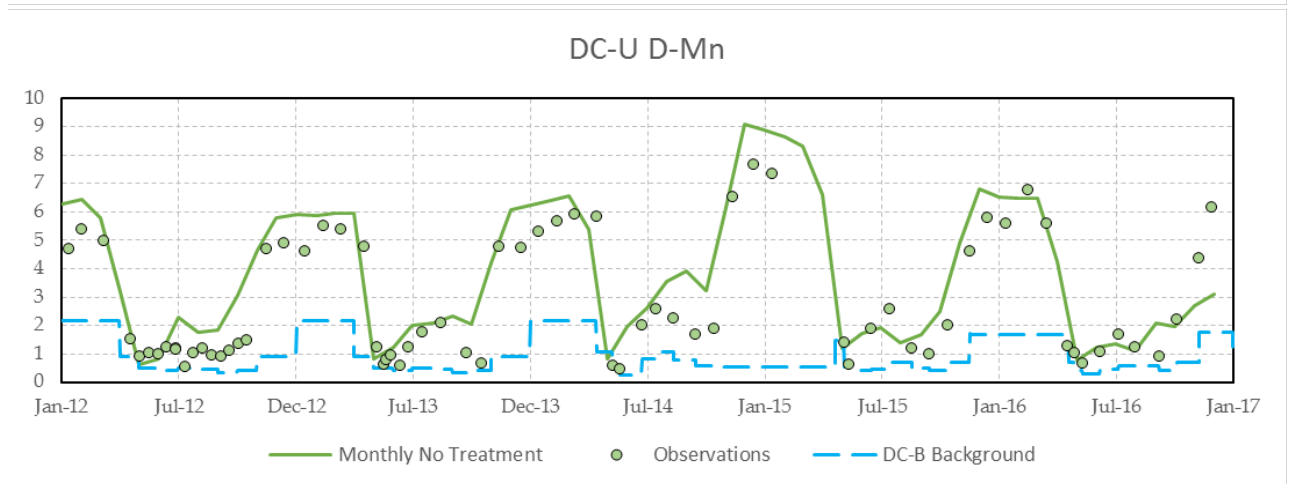
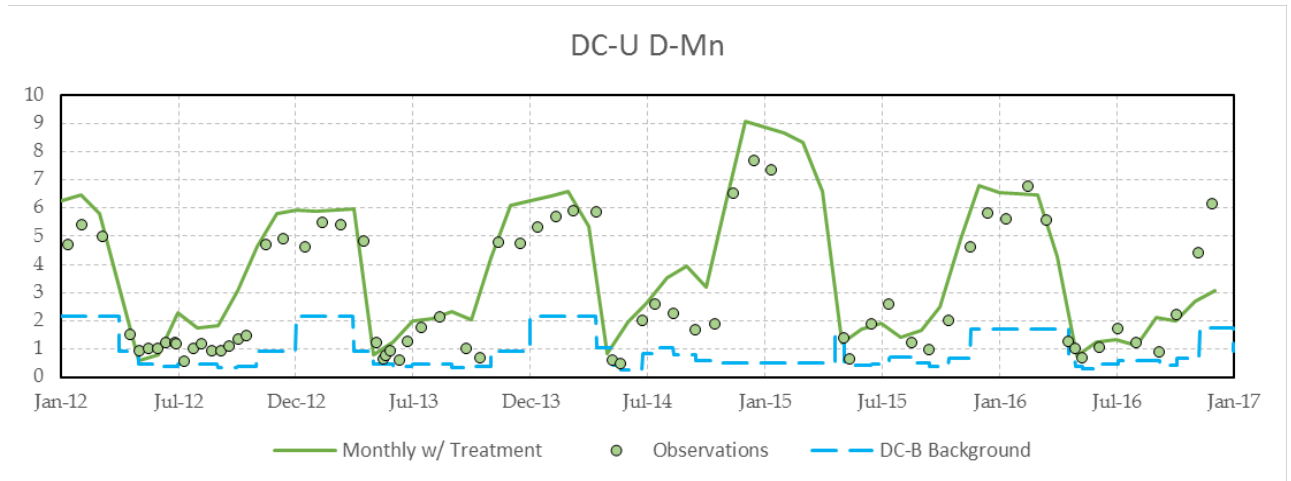
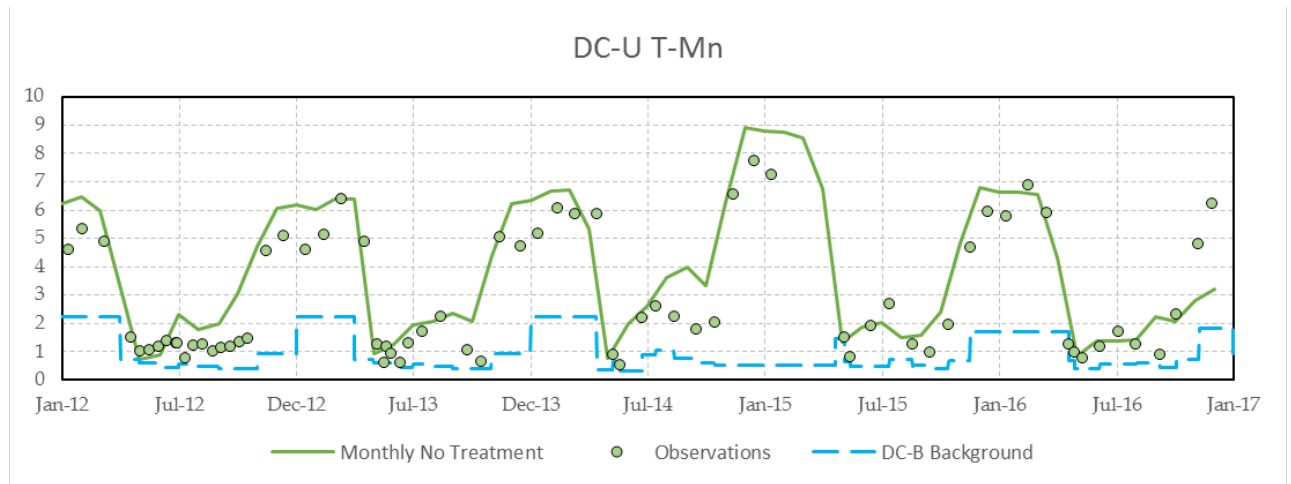


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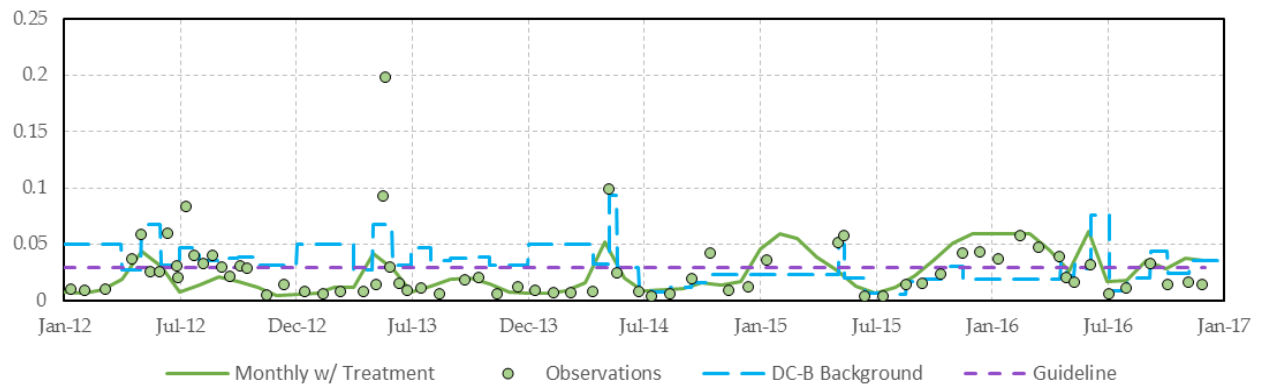


DC-U T-Mn

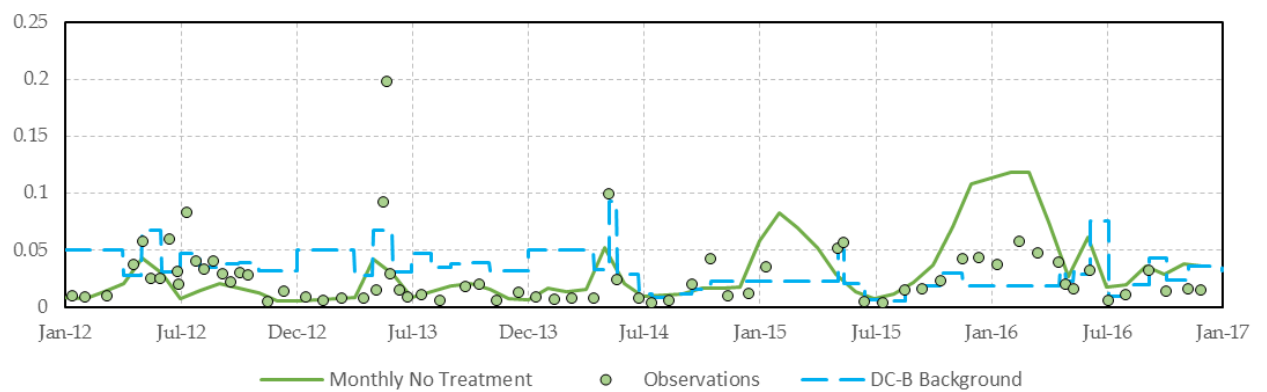




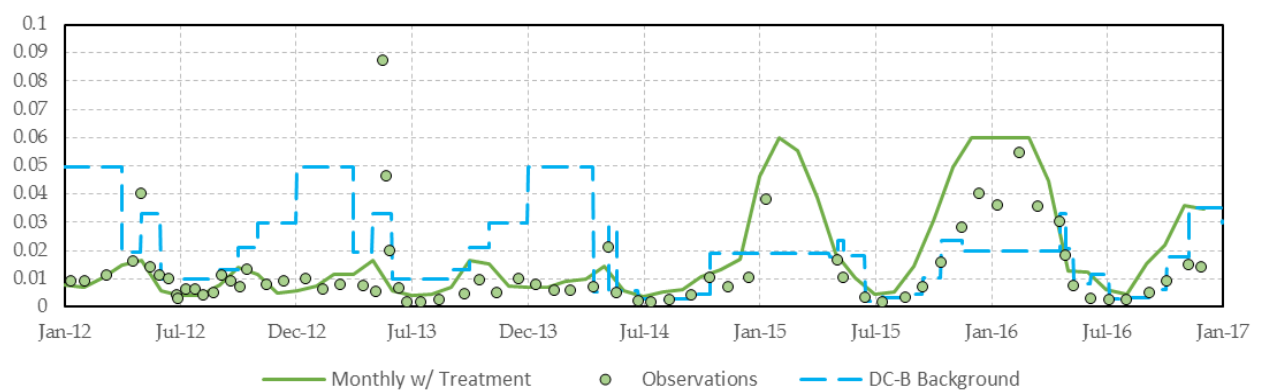
DC-U T-Zn

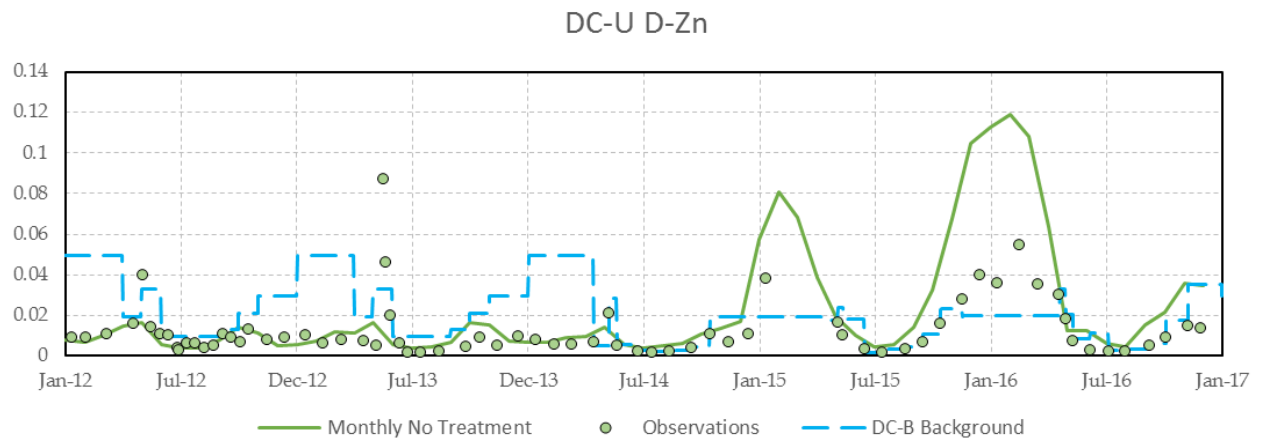


DC-U T-Zn

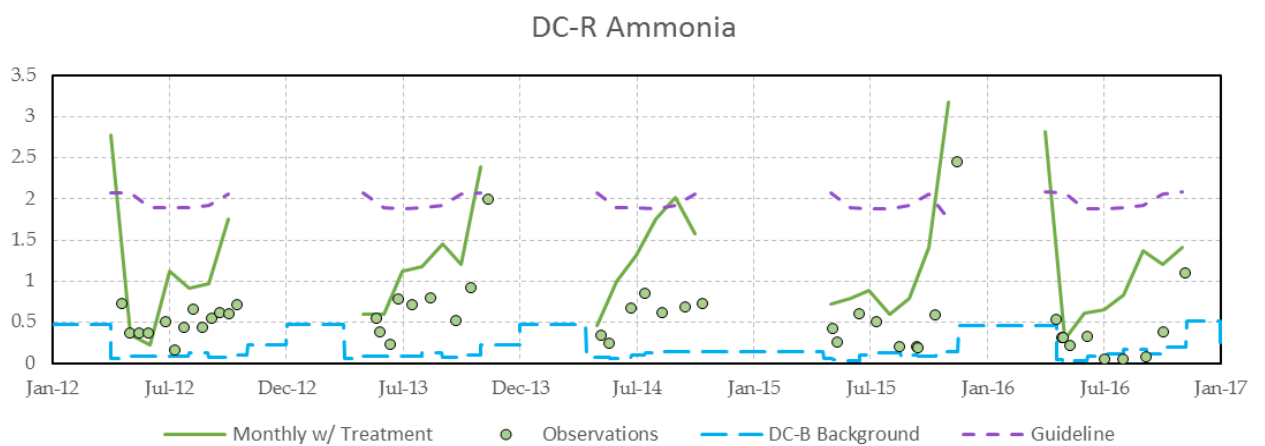
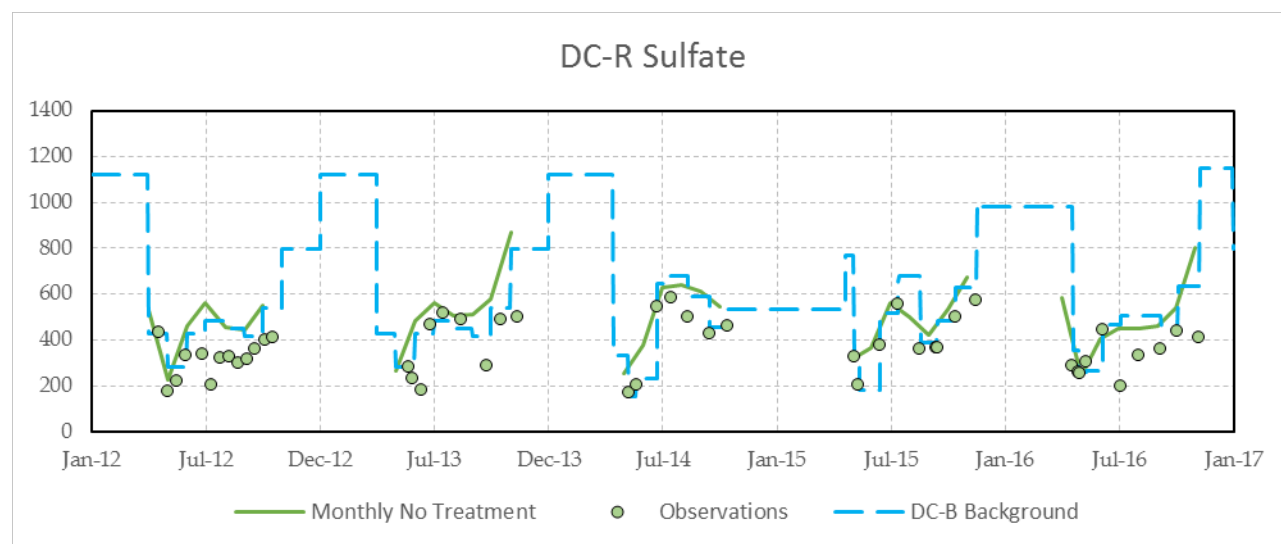
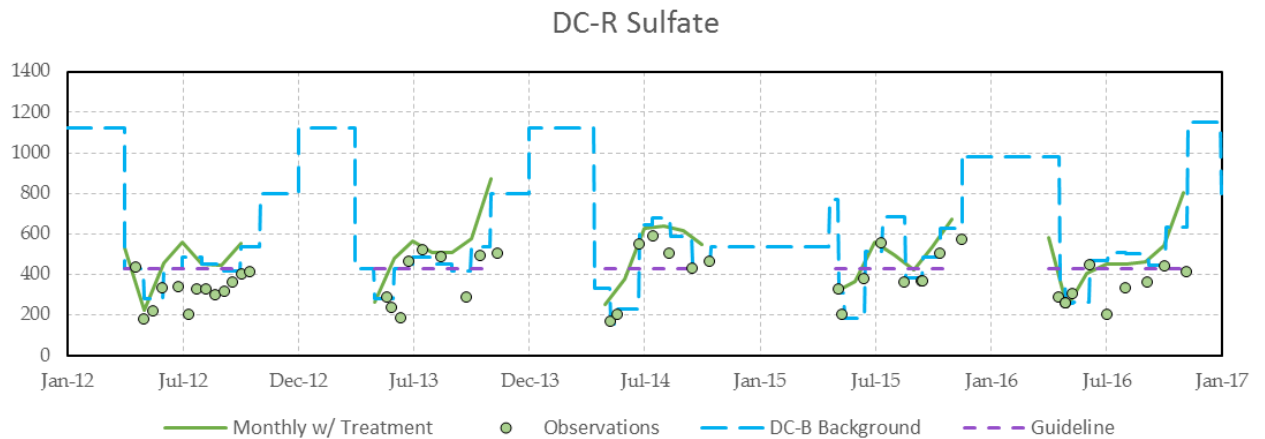


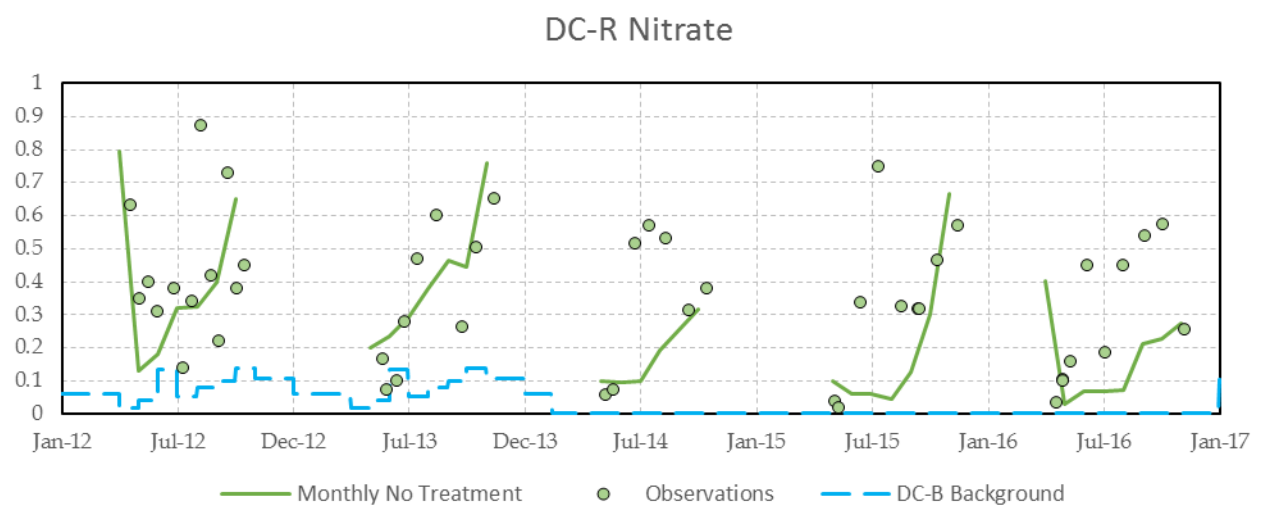
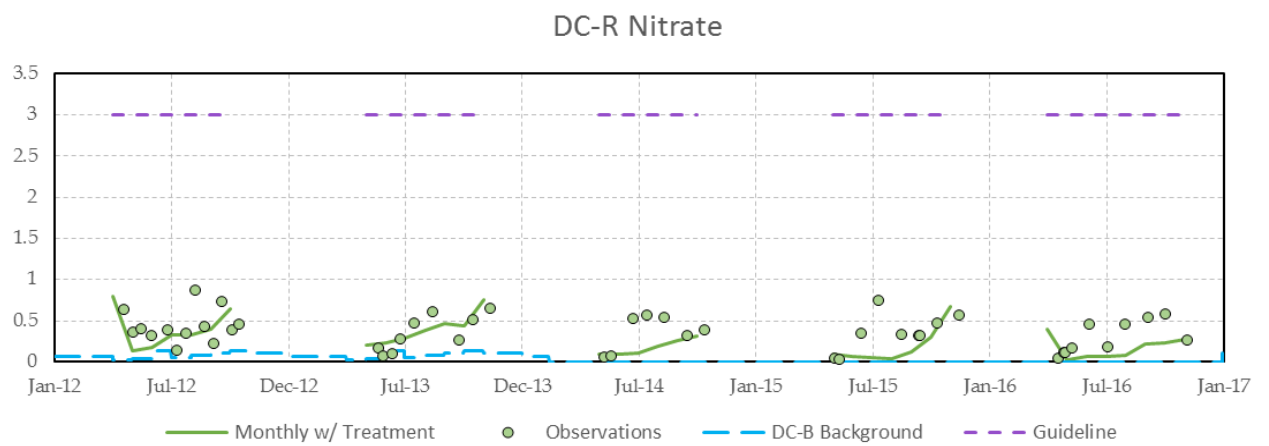
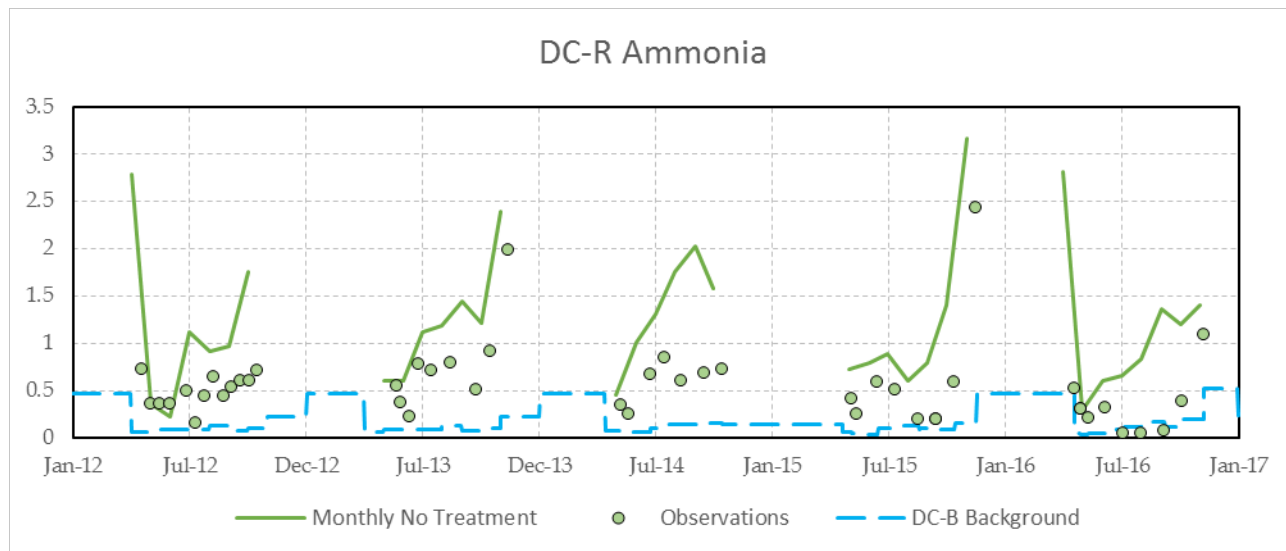
DC-U D-Zn



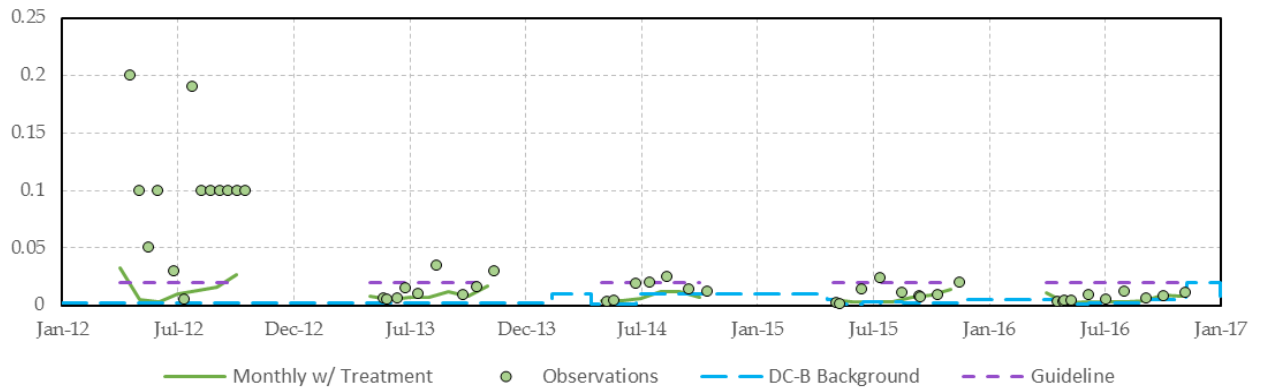


C.10 Water Quality Model results for parameters of interest for DC-R station

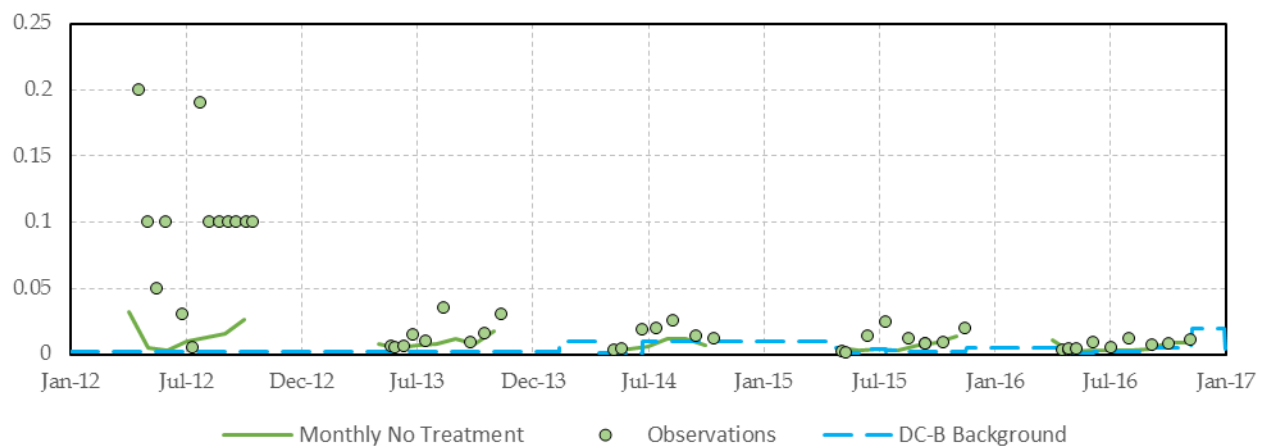




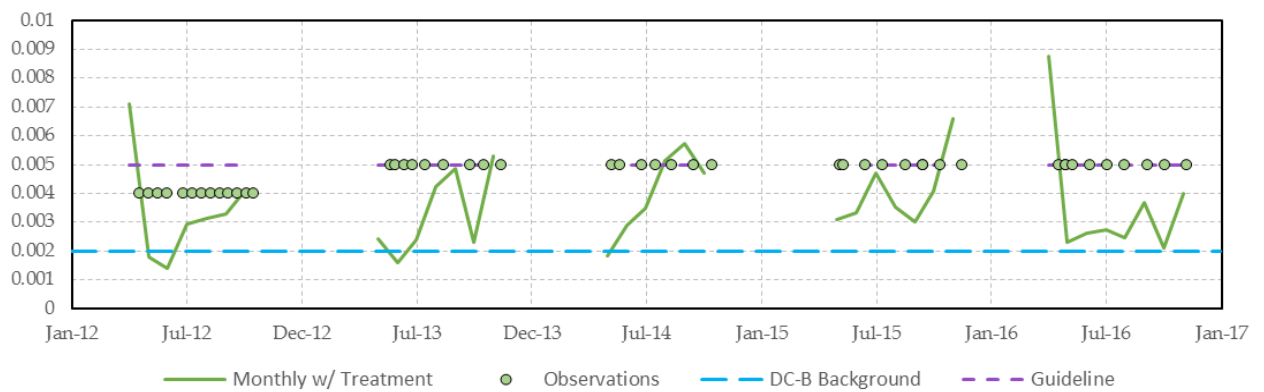
DC-R Nitrite

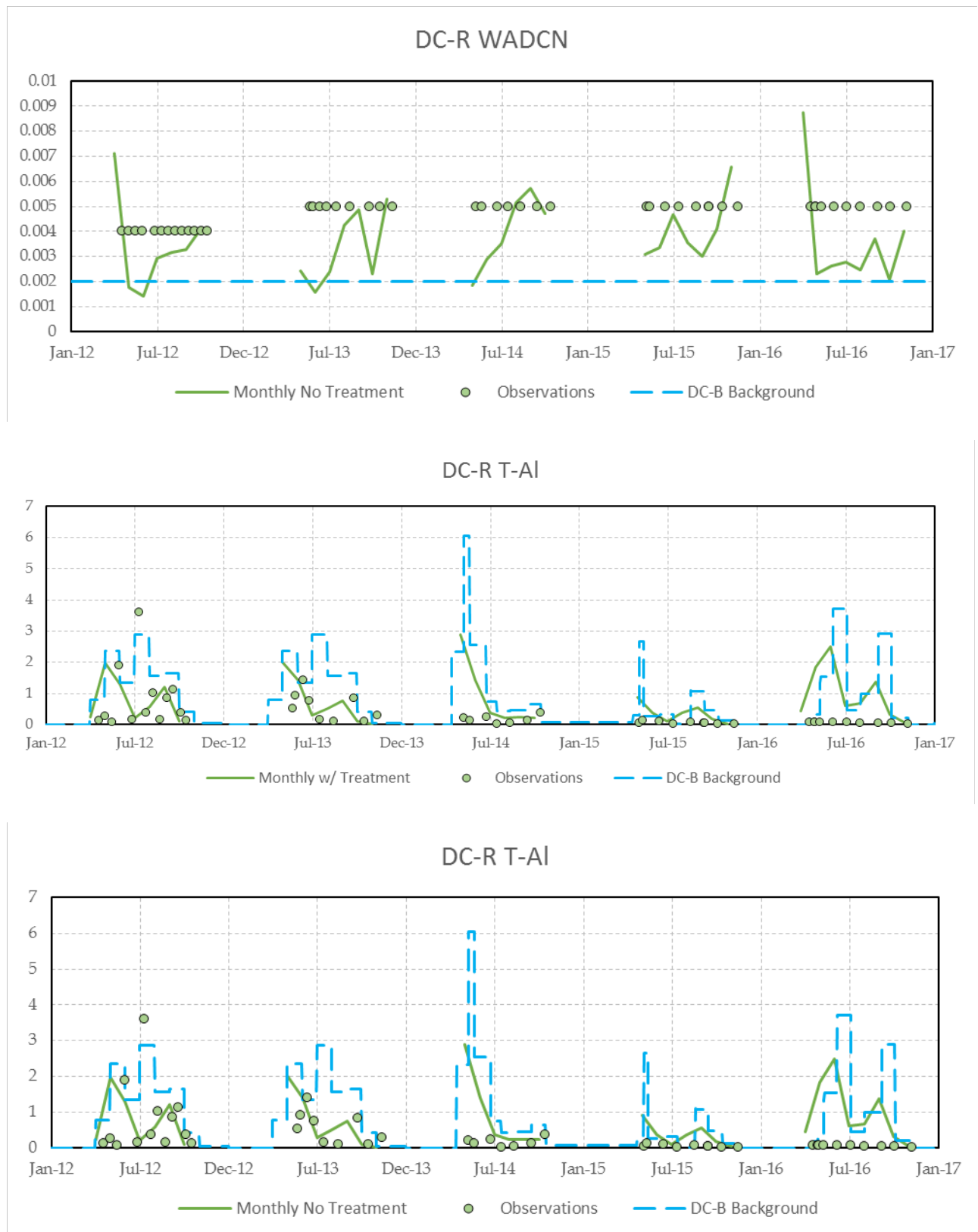


DC-R Nitrite

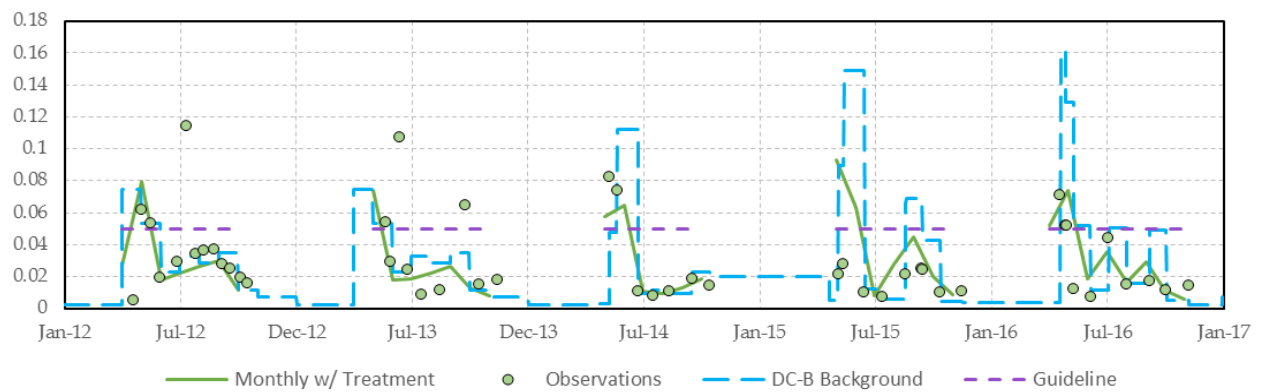


DC-R WADCN

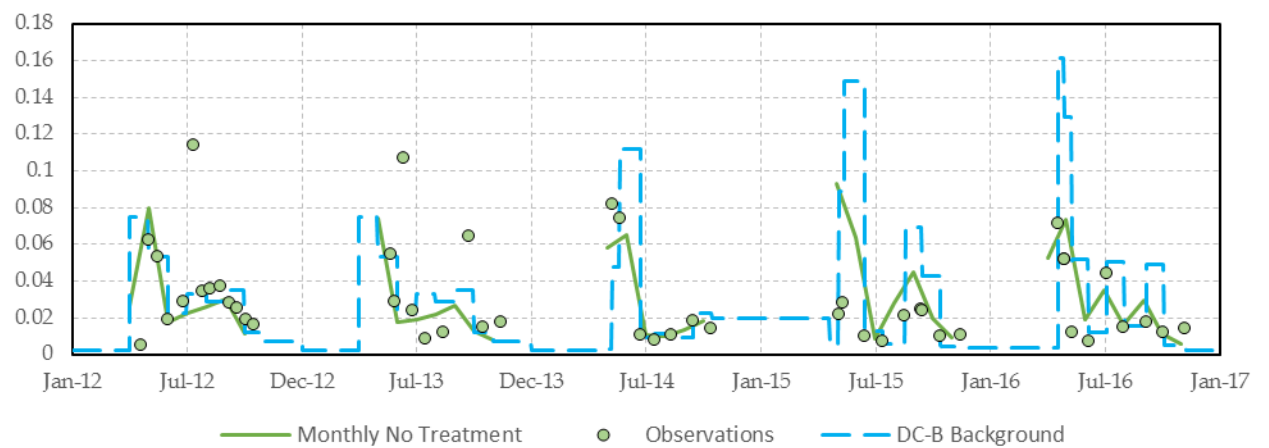




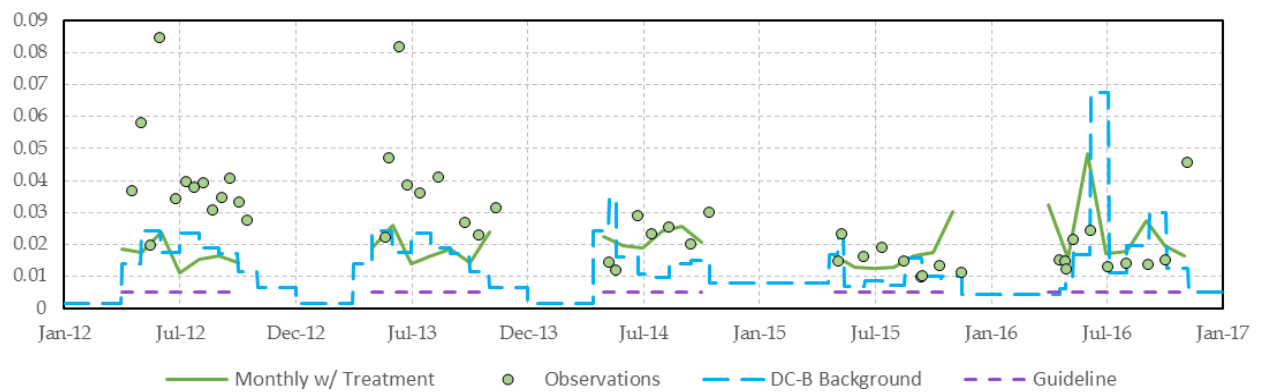
DC-R D-AI

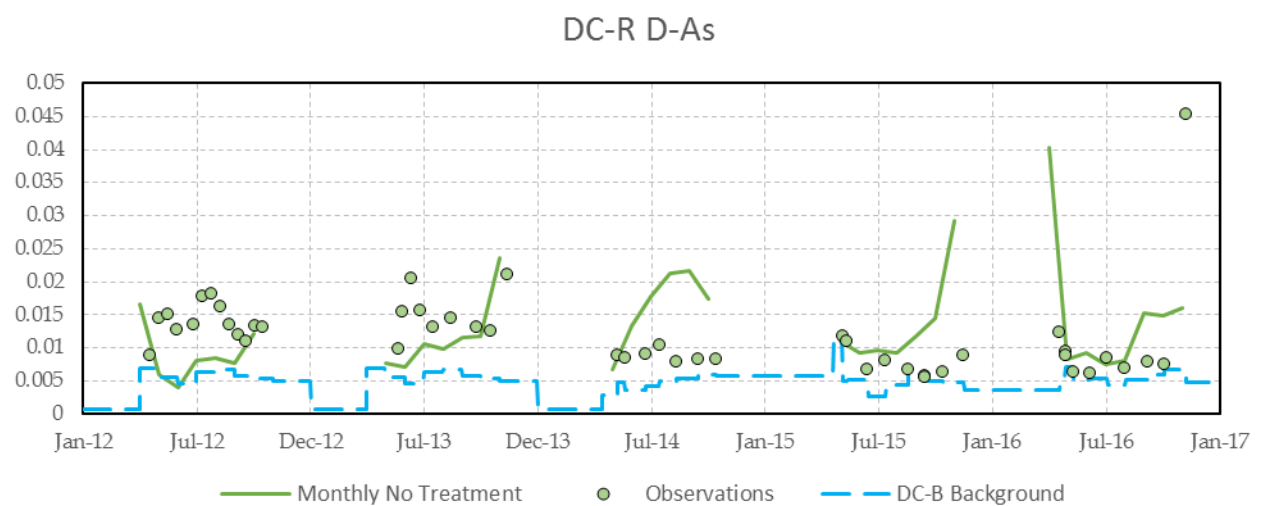
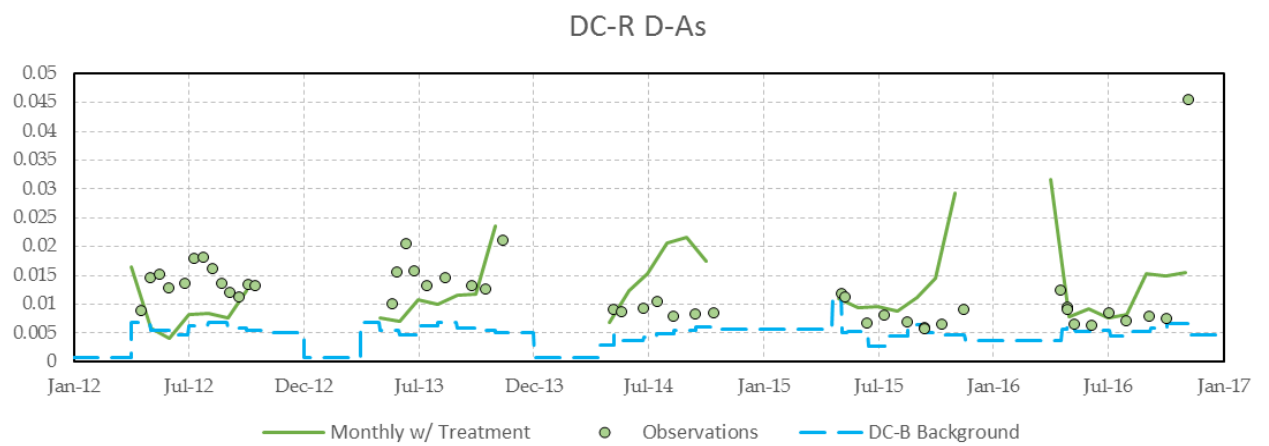
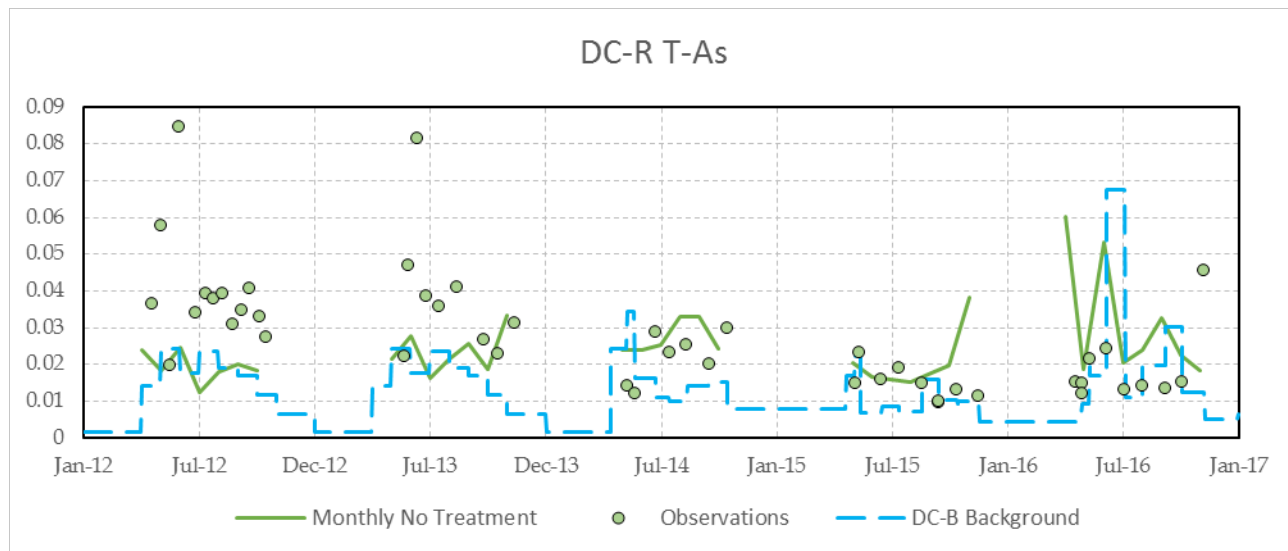


DC-R D-AI

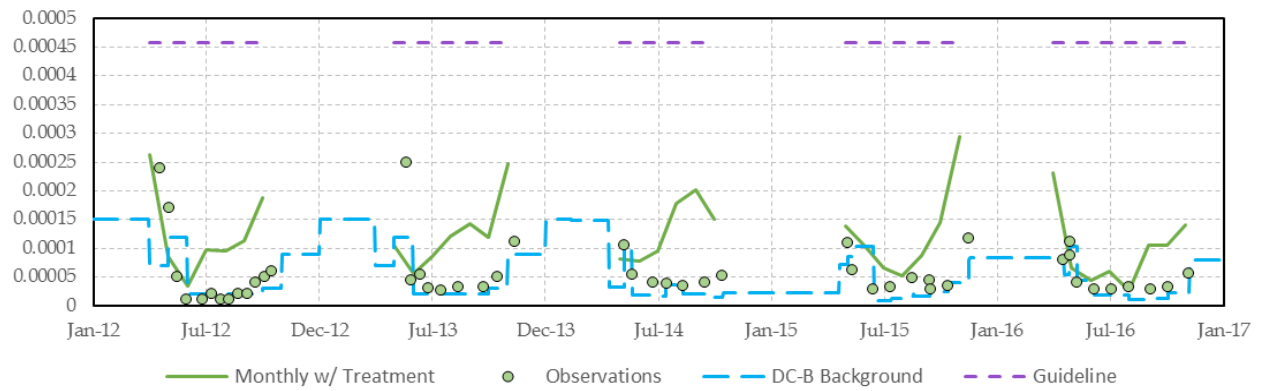


DC-R T-As

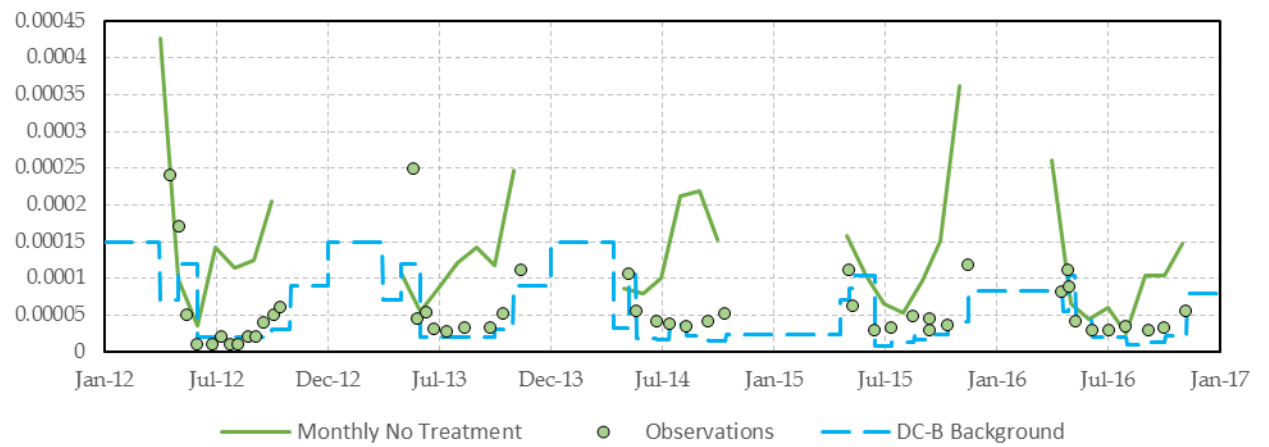




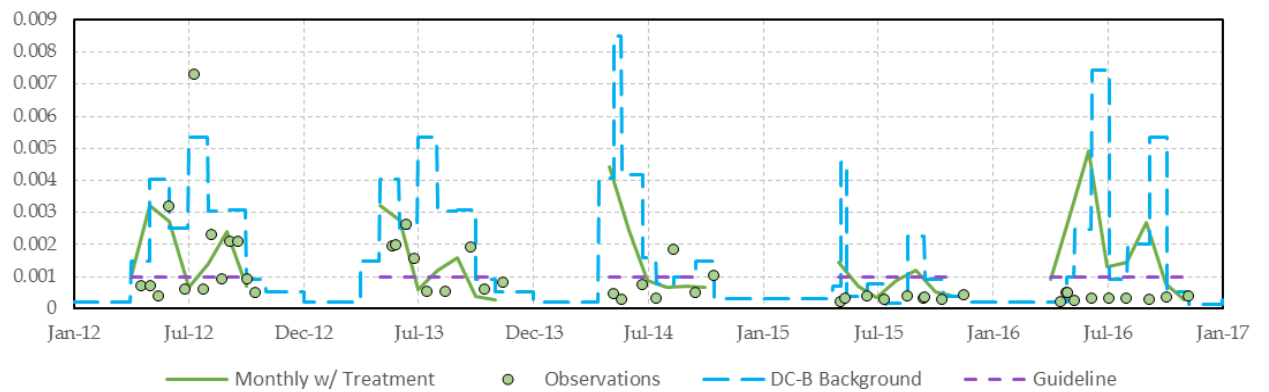
DC-R D-Cd

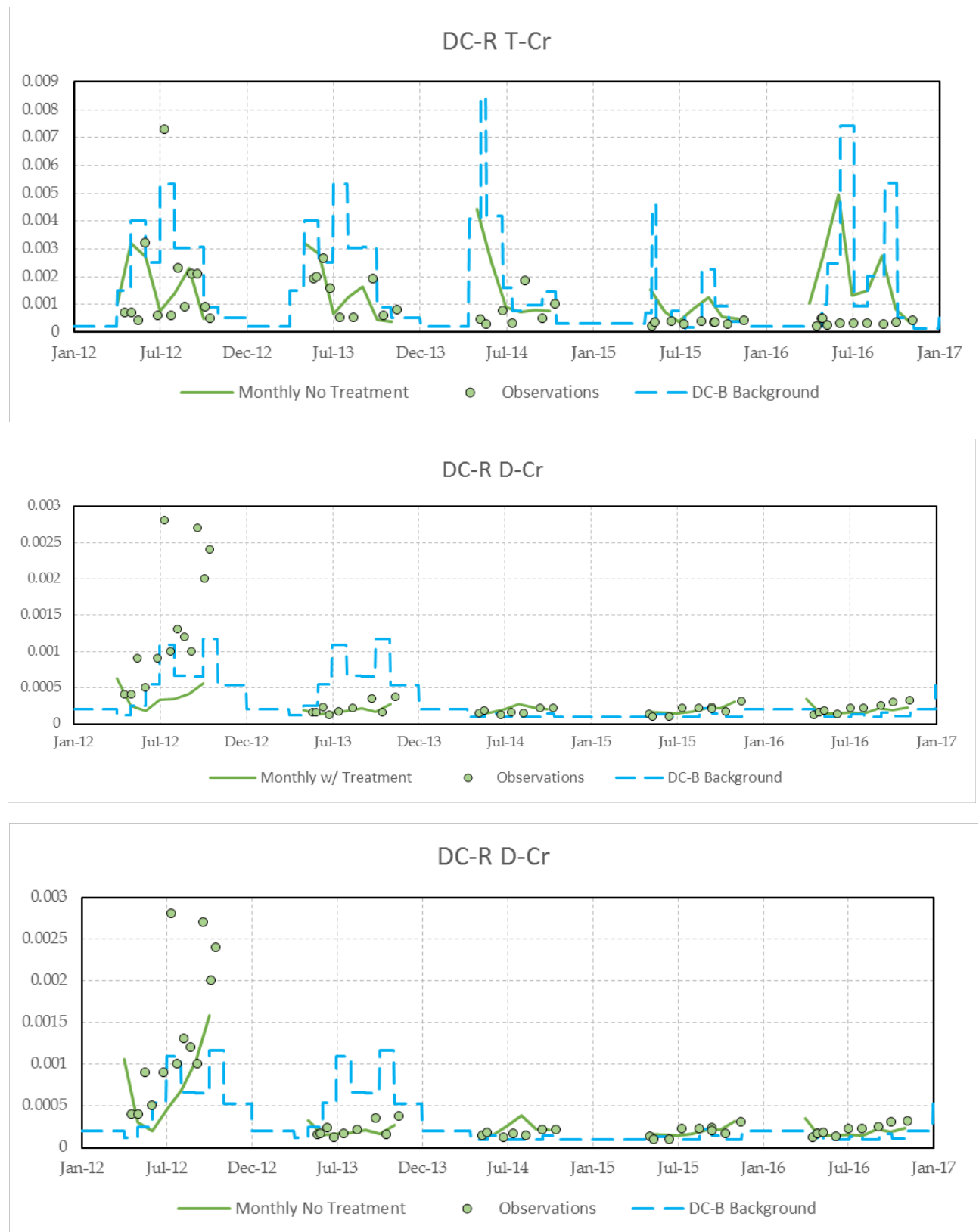


DC-R D-Cd

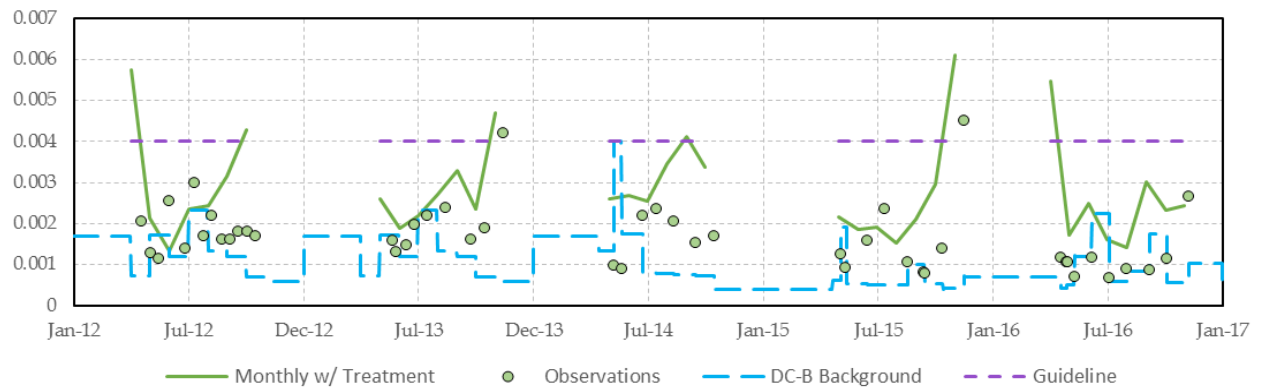


DC-R T-Cr

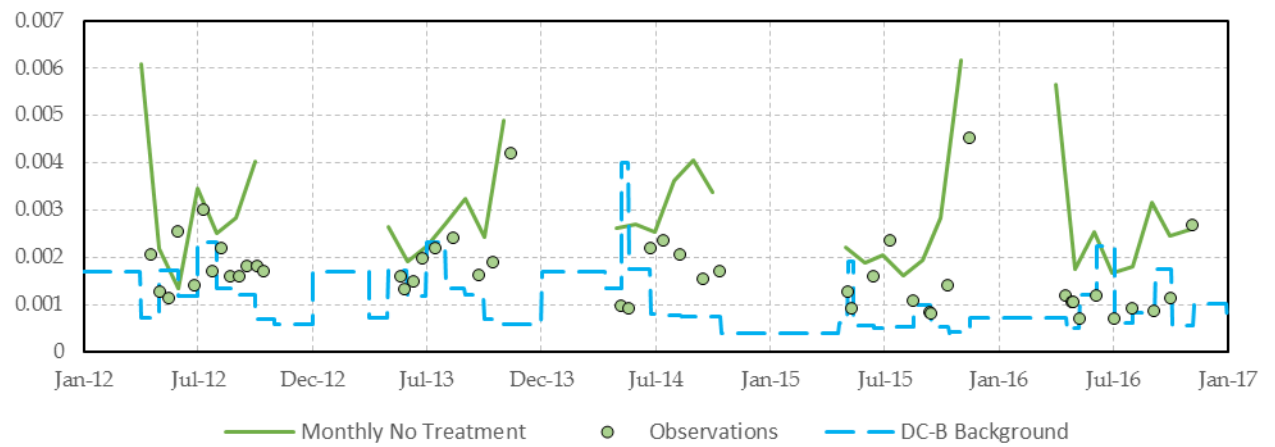




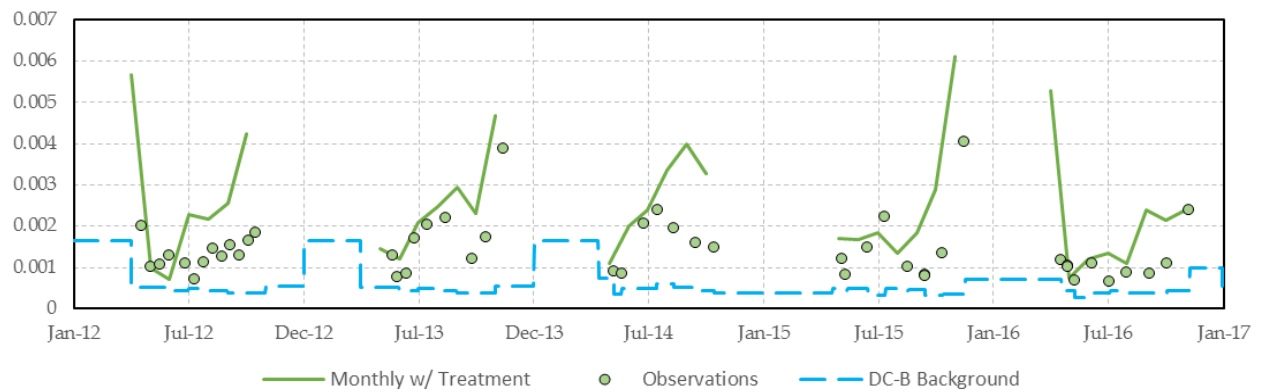
DC-R T-Co

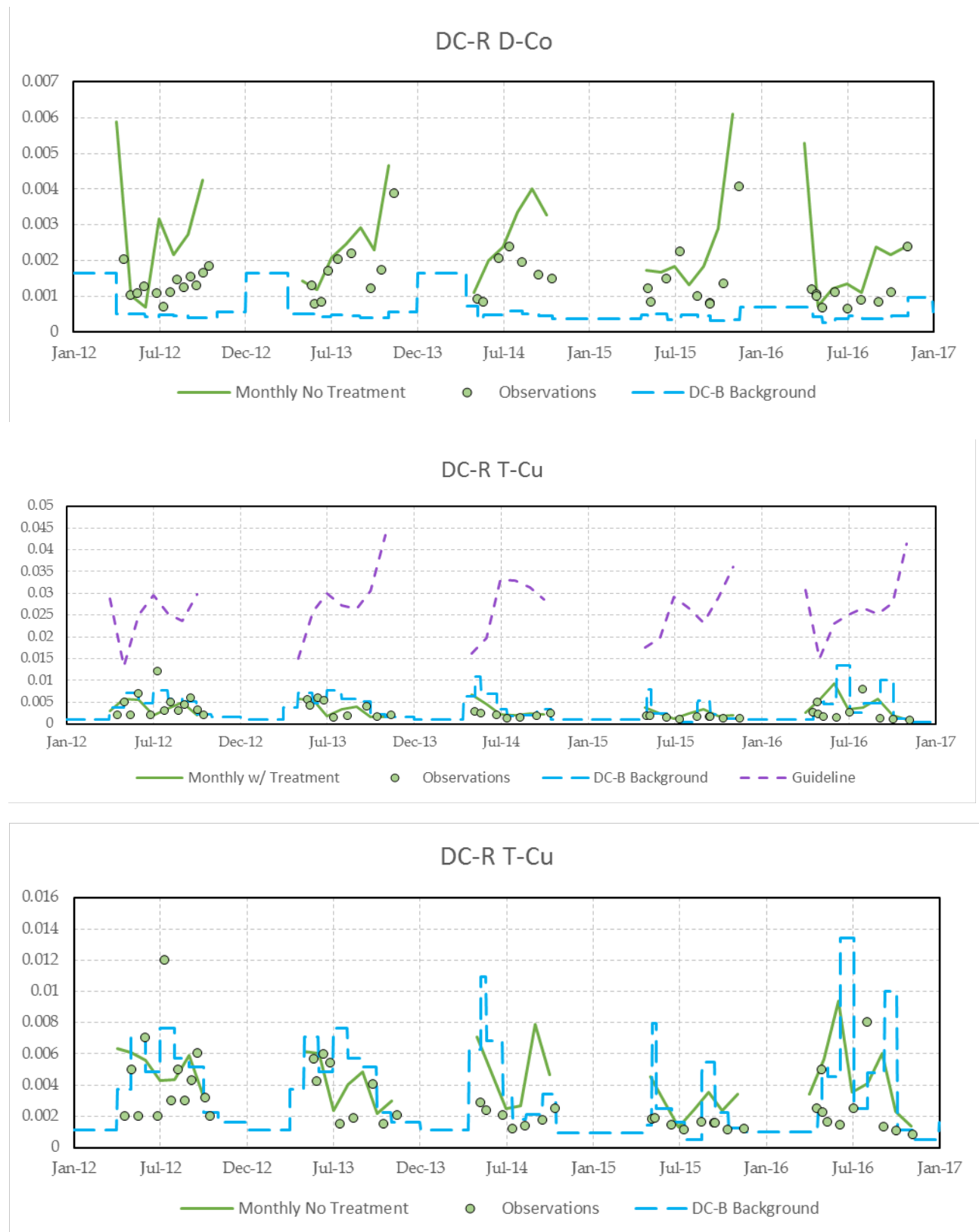


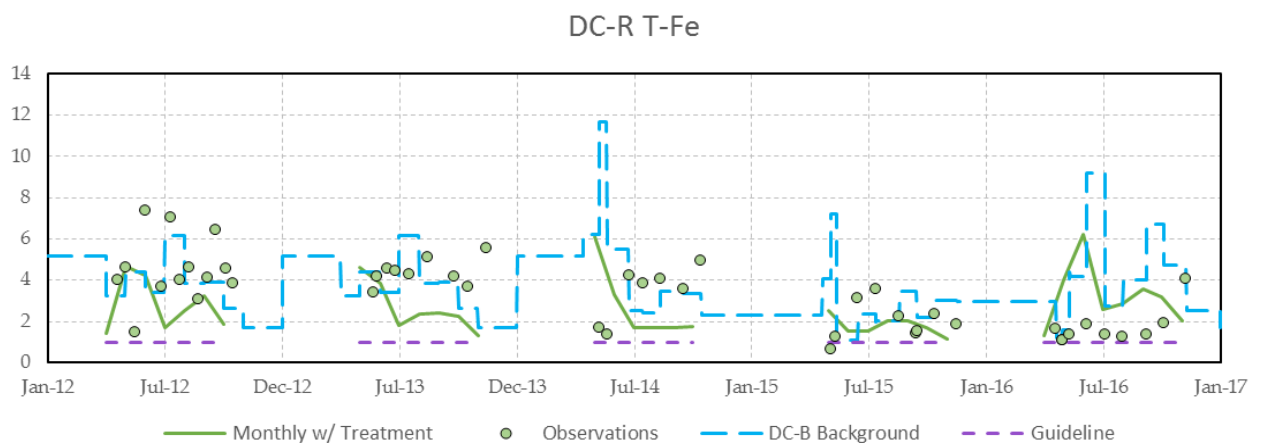
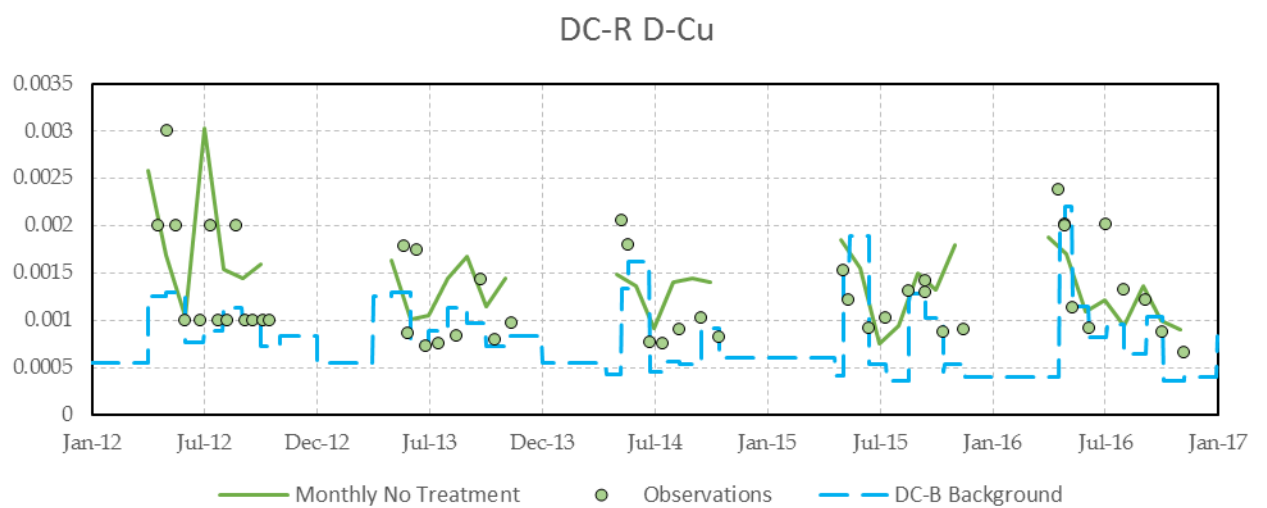
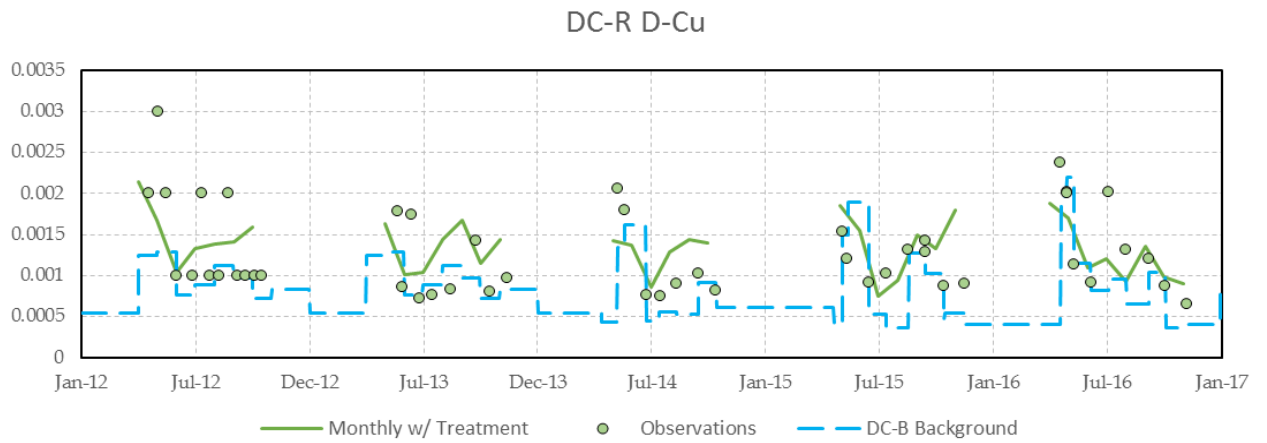
DC-R T-Co

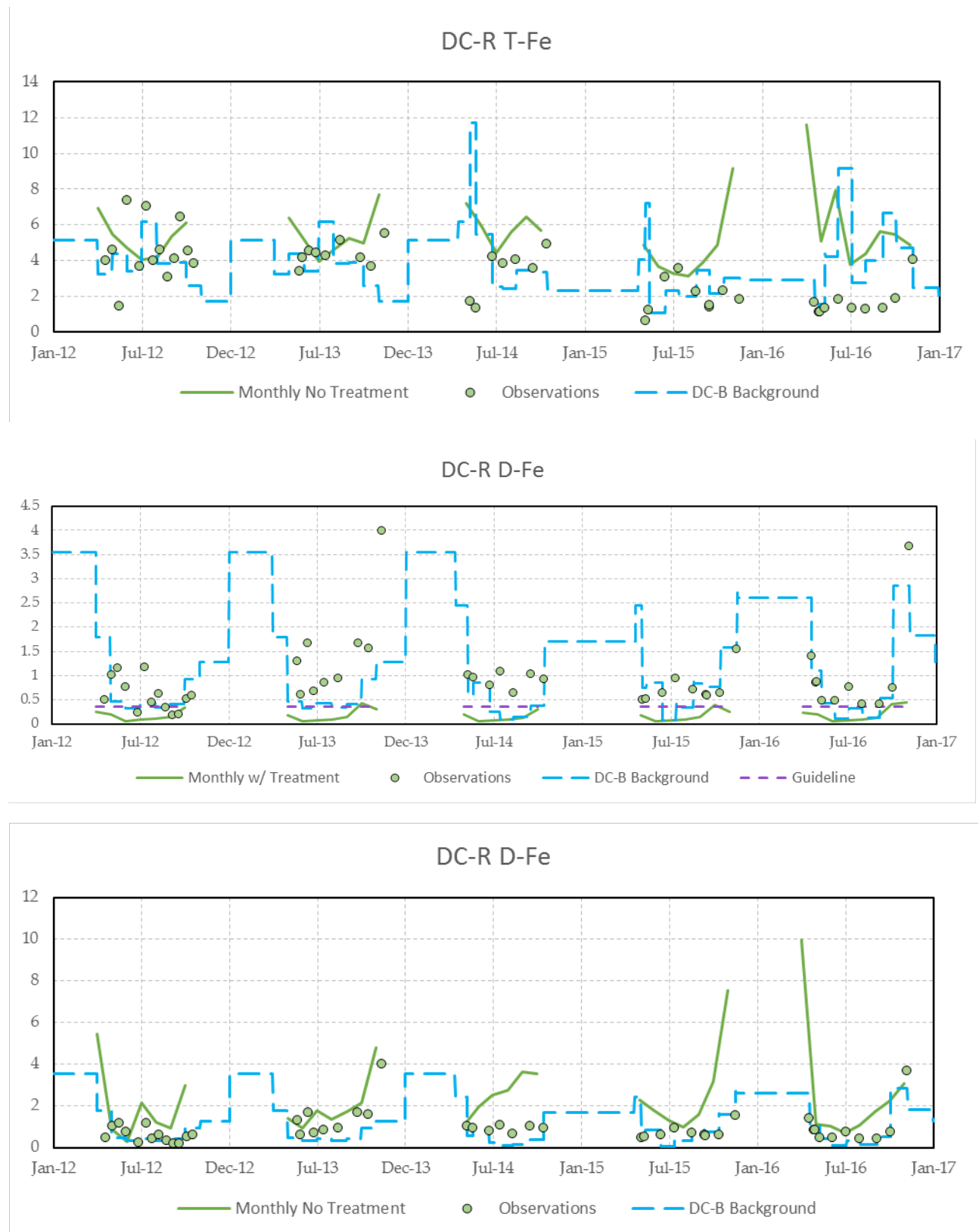


DC-R D-Co

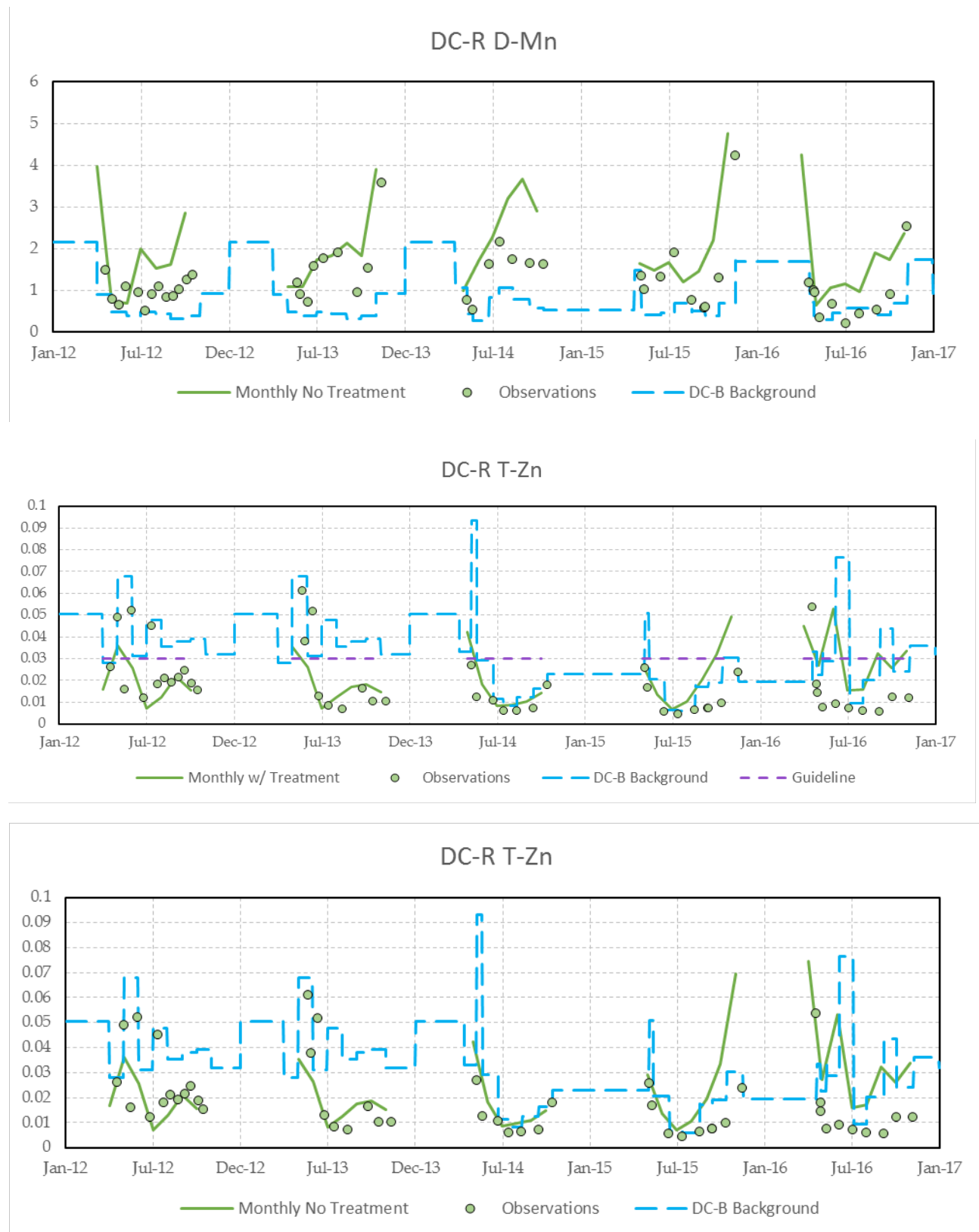


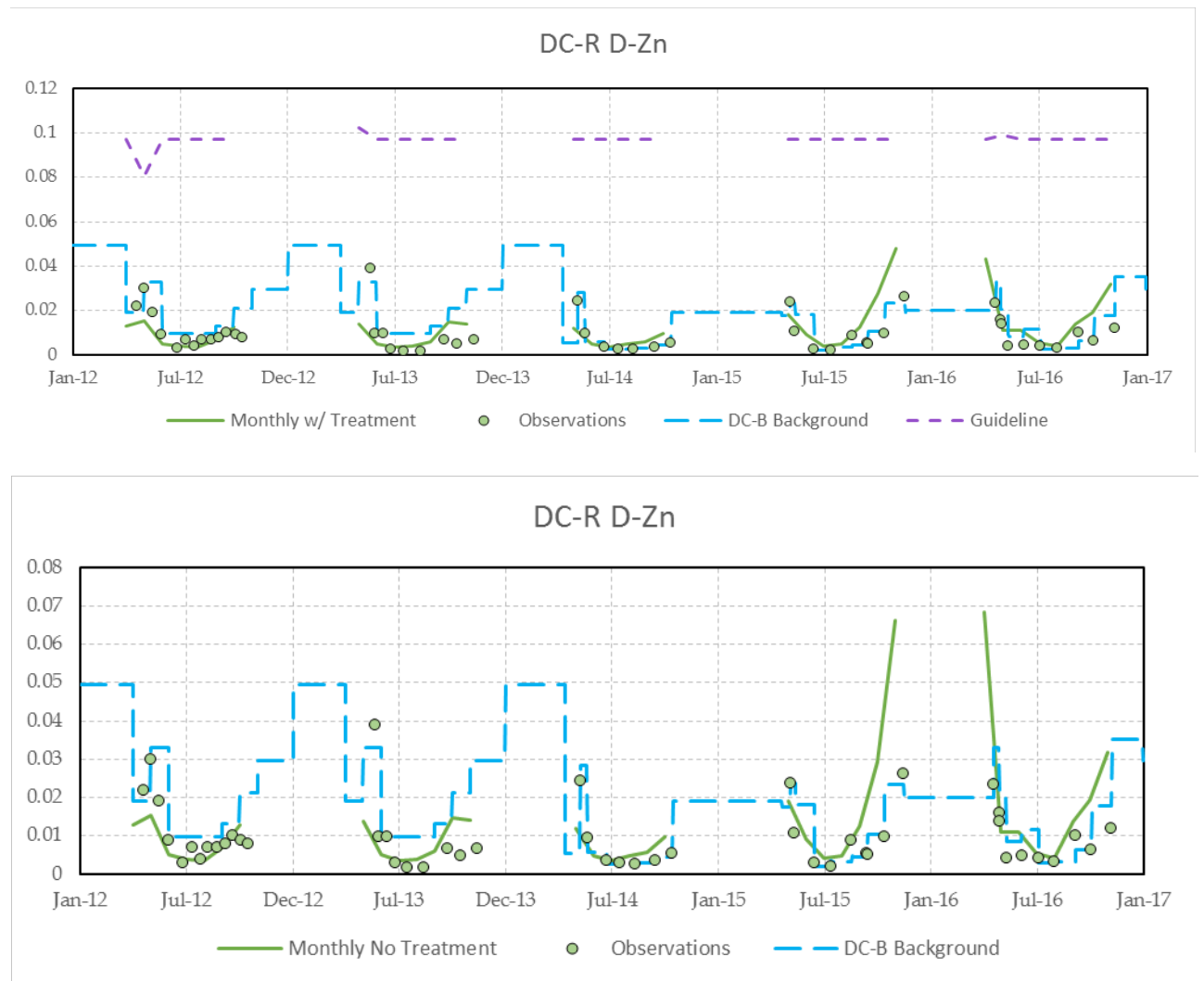






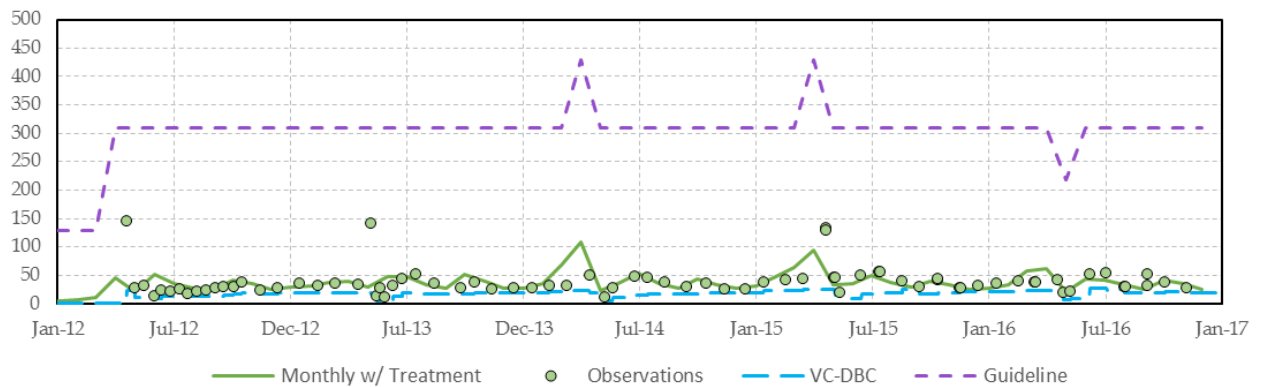




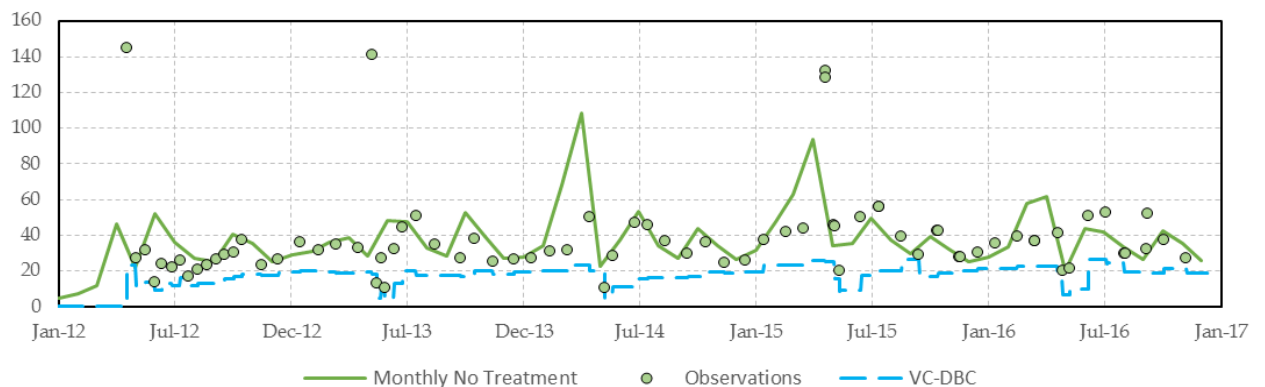


C.11 Water Quality Model results for parameters of interest for DC-UMN station

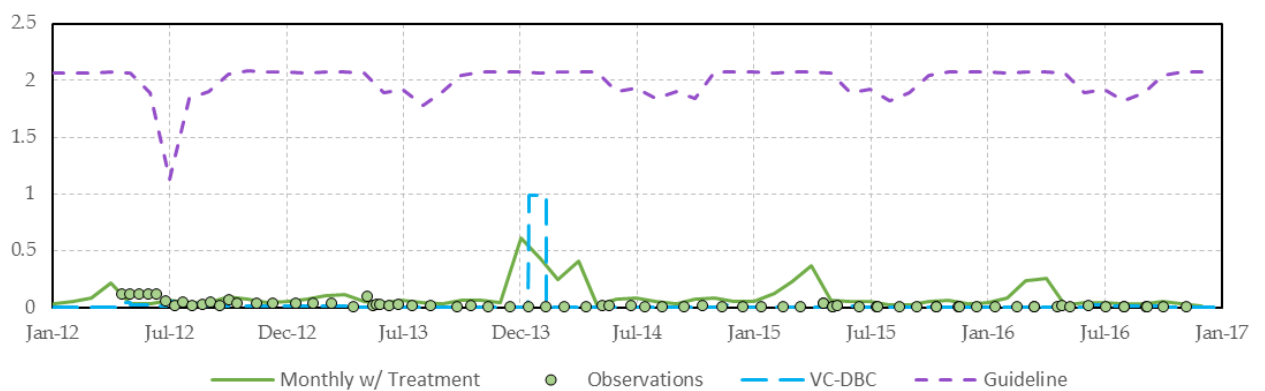
VC-UMN Sulfate



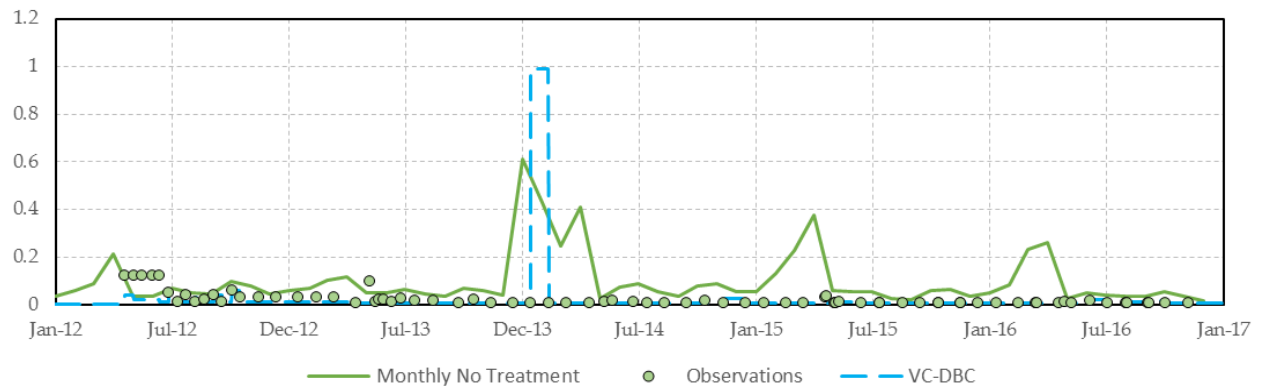
VC-UMN Sulfate



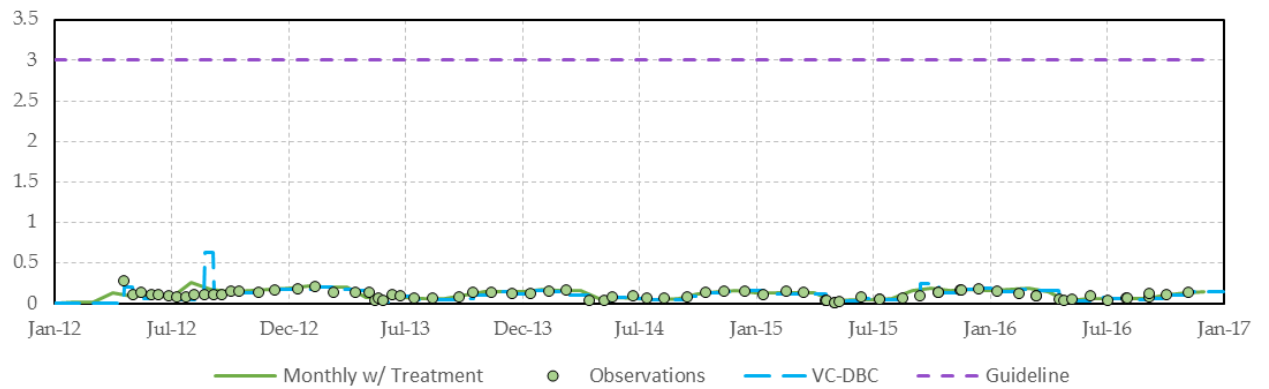
VC-UMN Ammonia



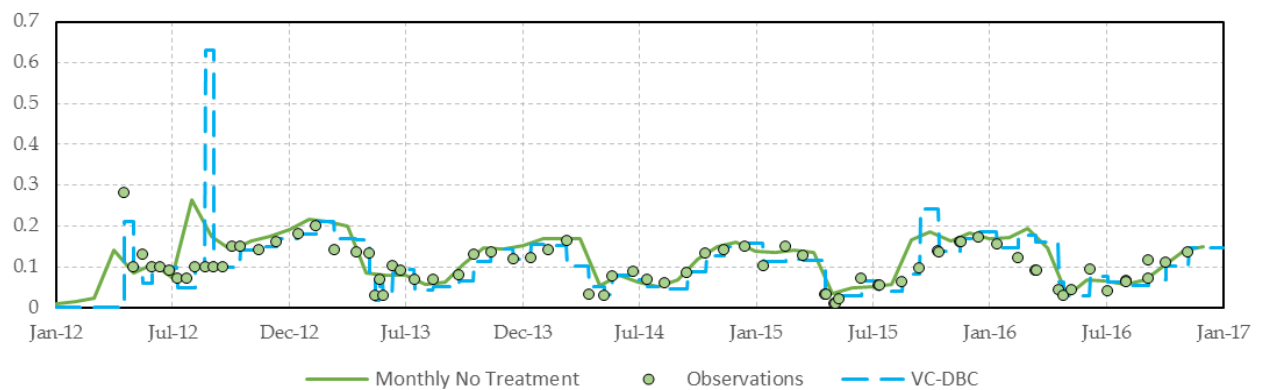
VC-UMN Ammonia



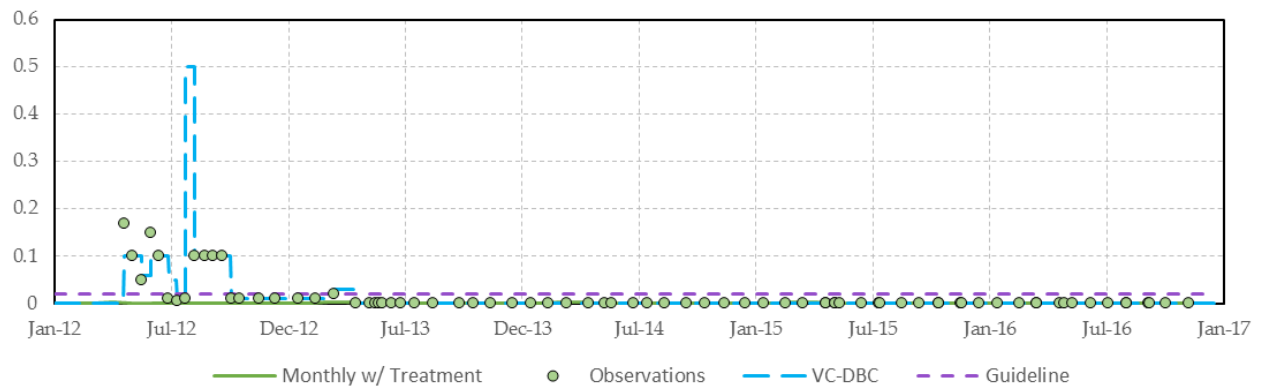
VC-UMN Nitrate



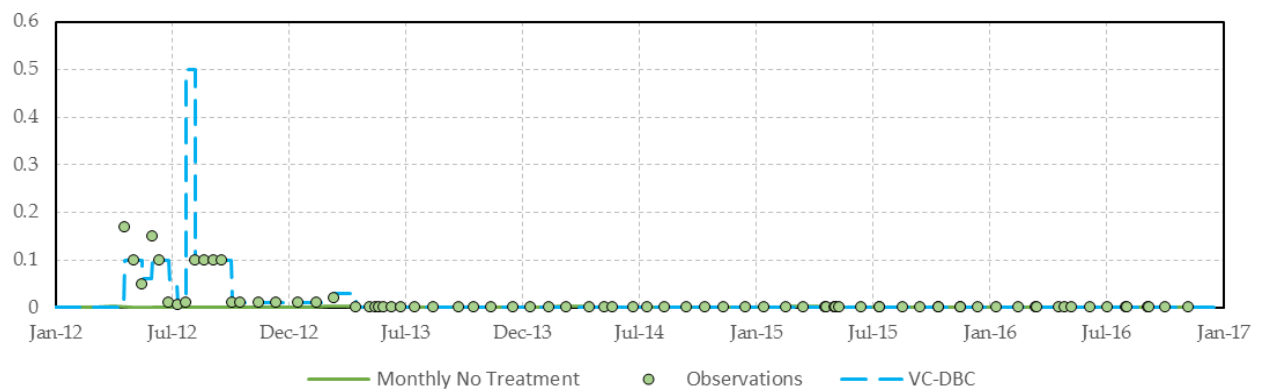
VC-UMN Nitrate



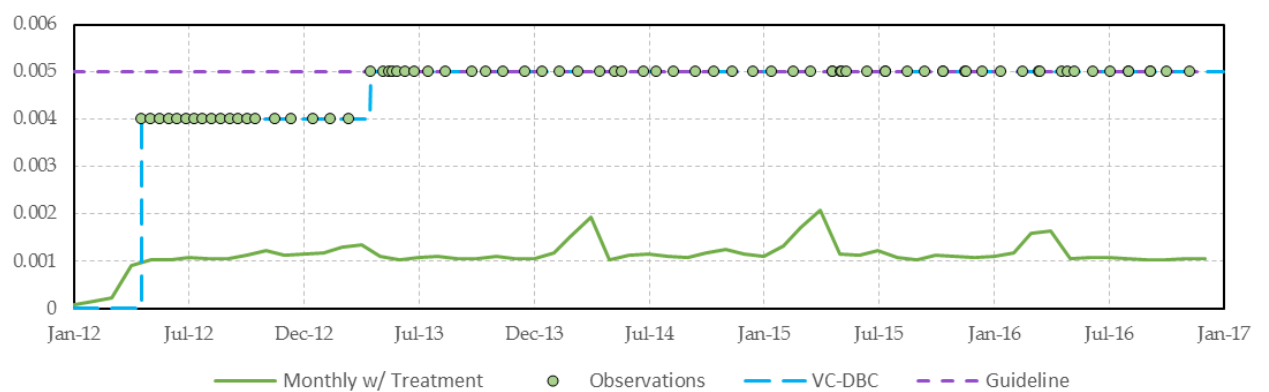
VC-UMN Nitrite

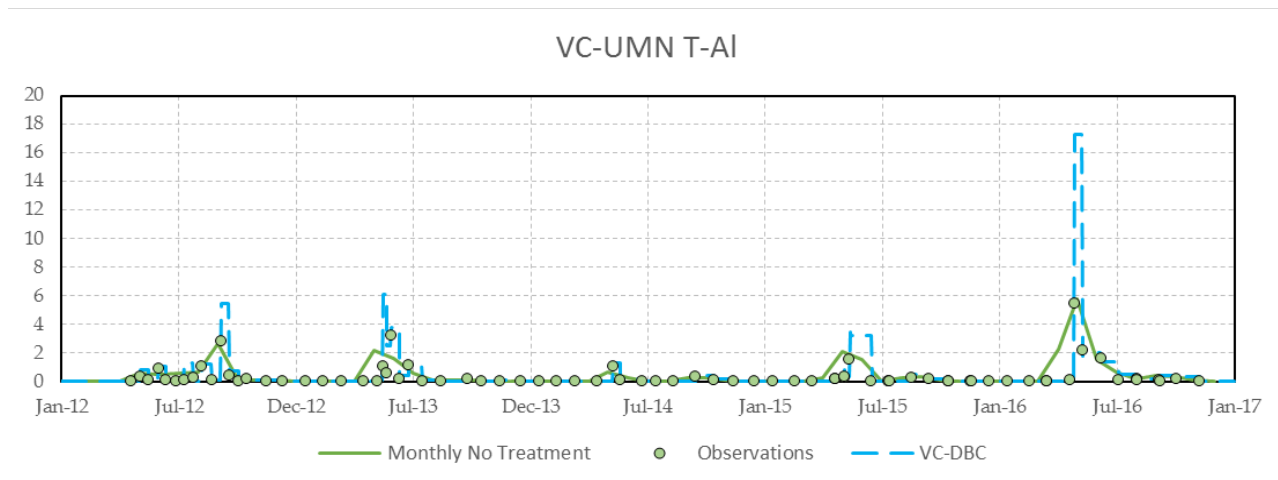
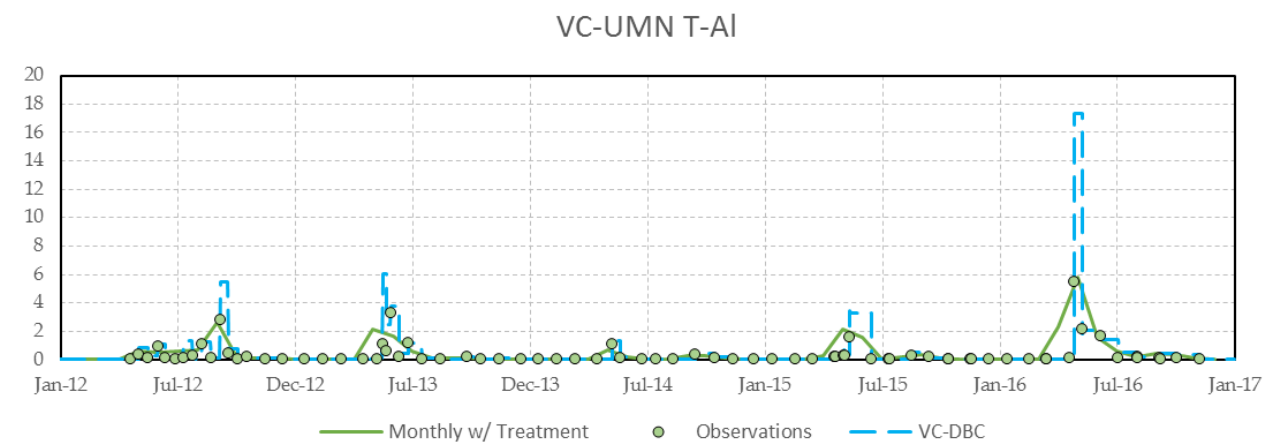
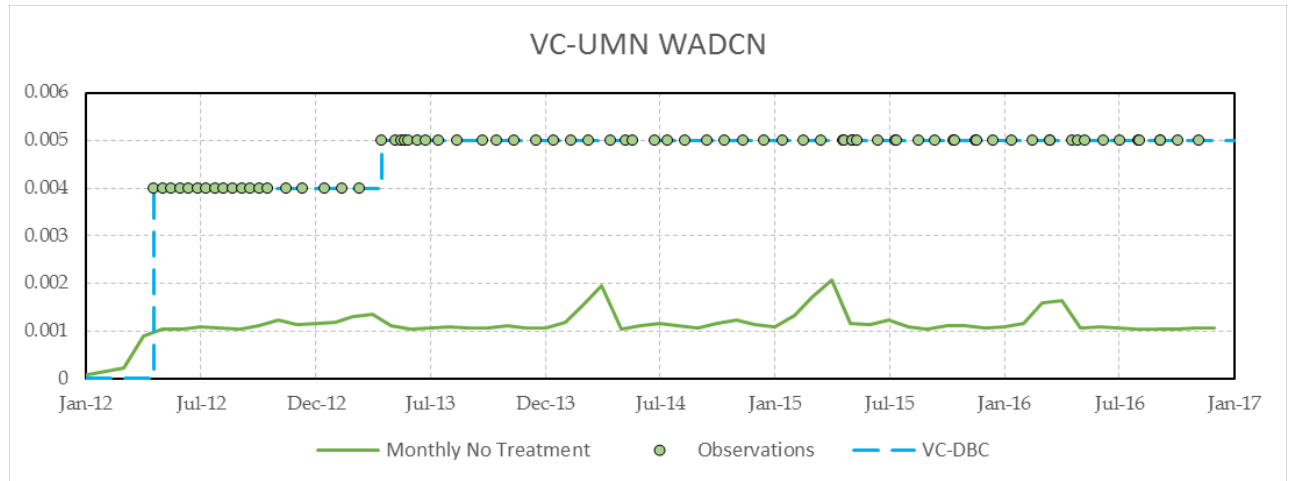


VC-UMN Nitrite

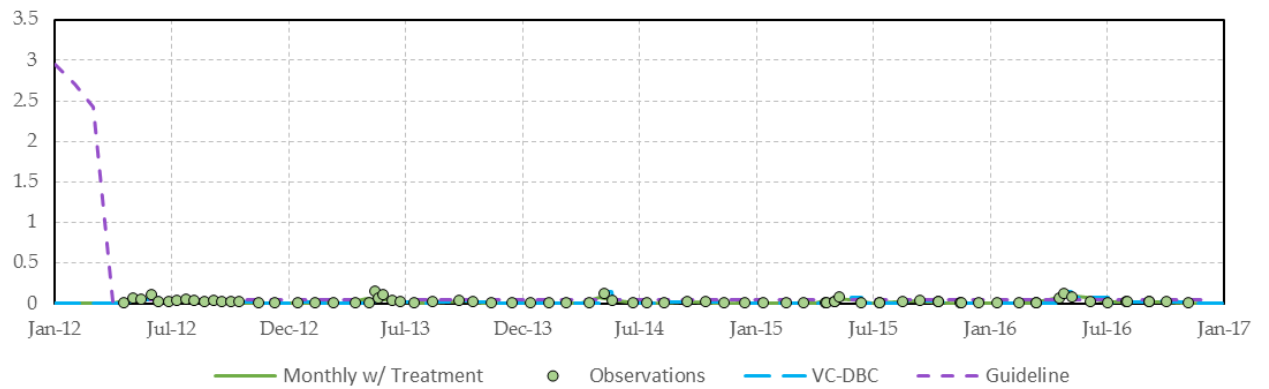


VC-UMN WADCN

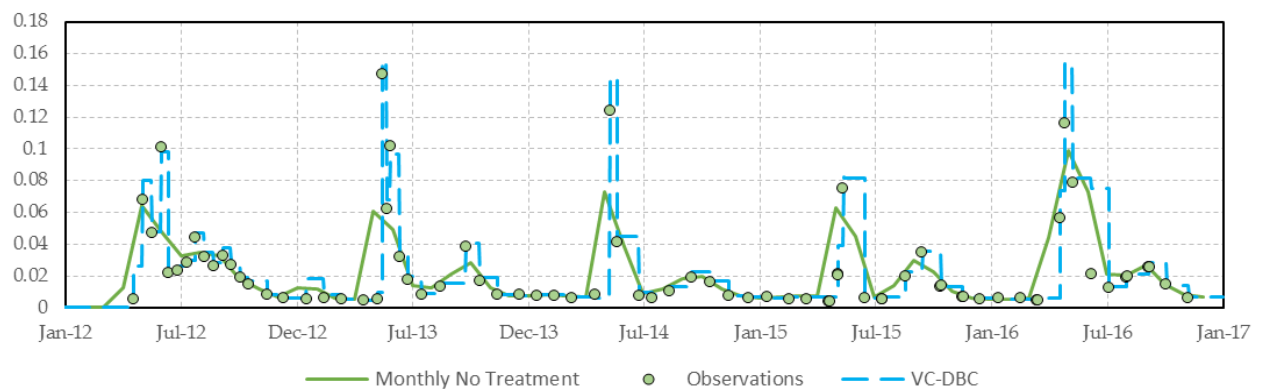




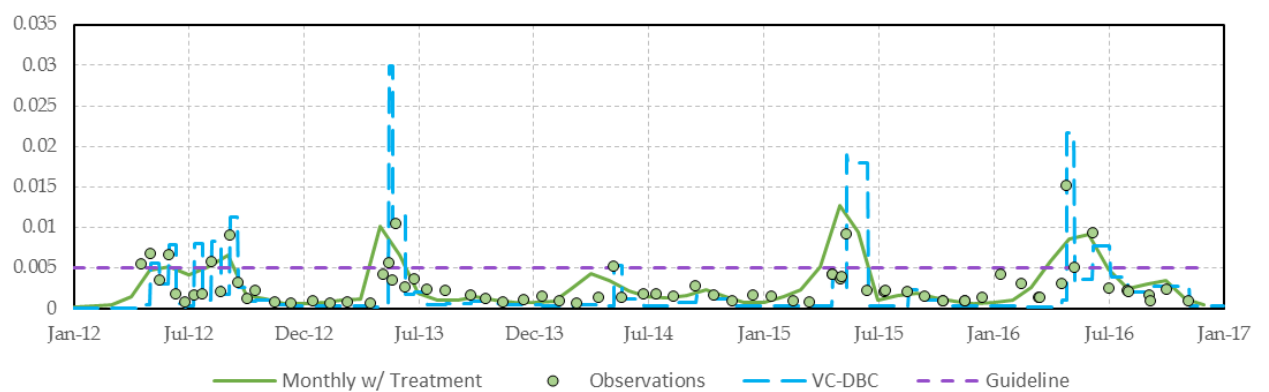
VC-UMN D-AI



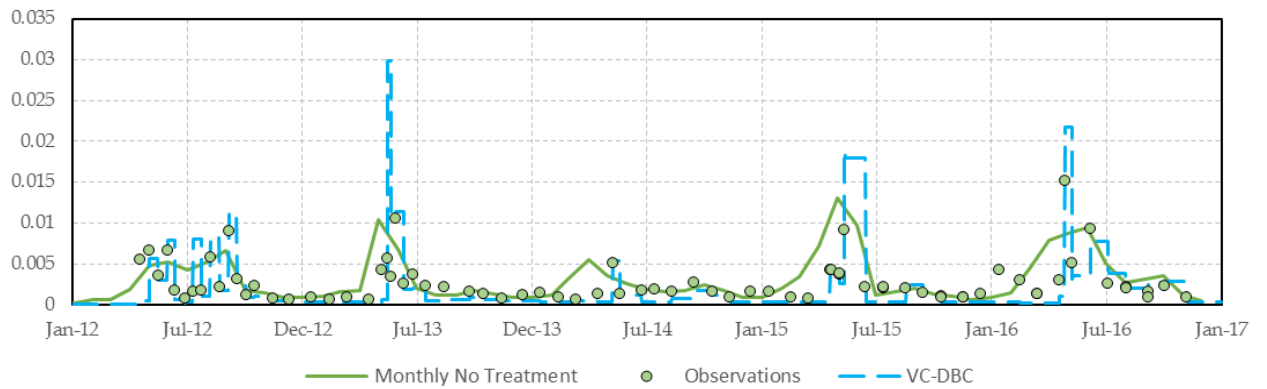
VC-UMN D-AI



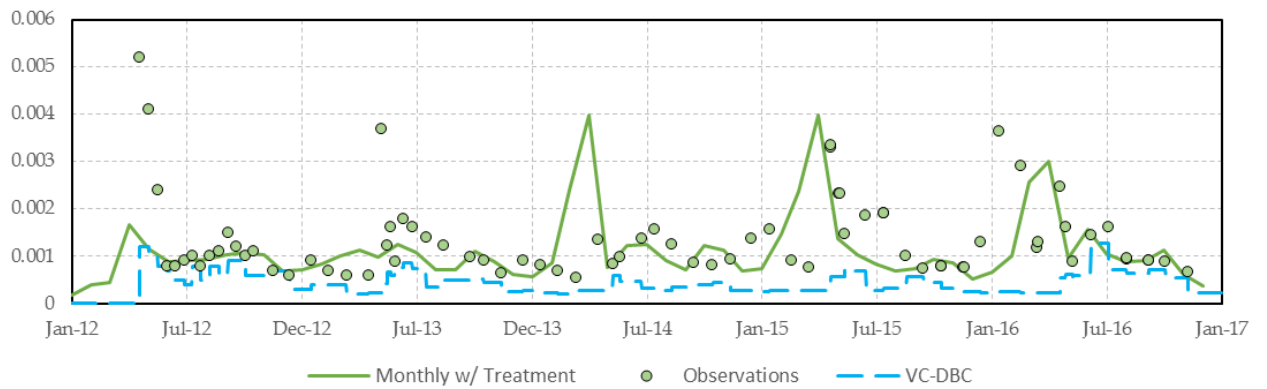
VC-UMN T-As



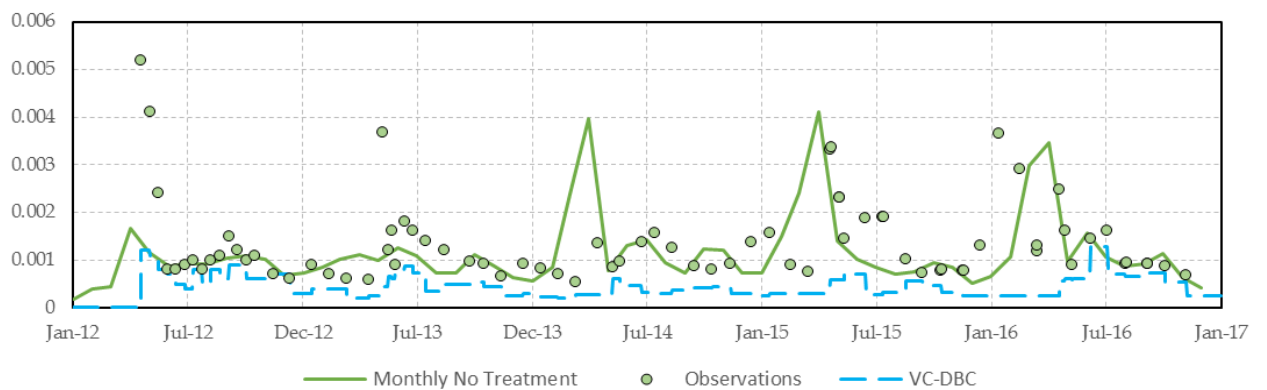
VC-UMN T-As



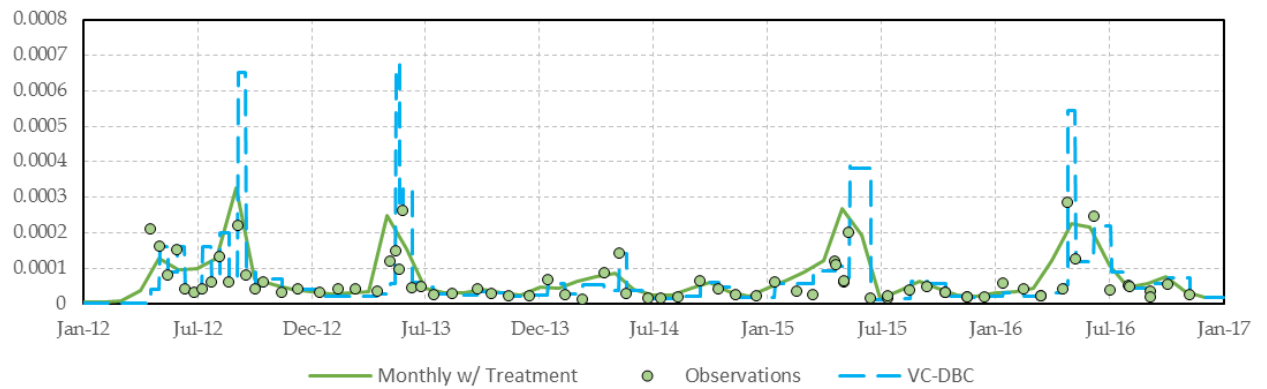
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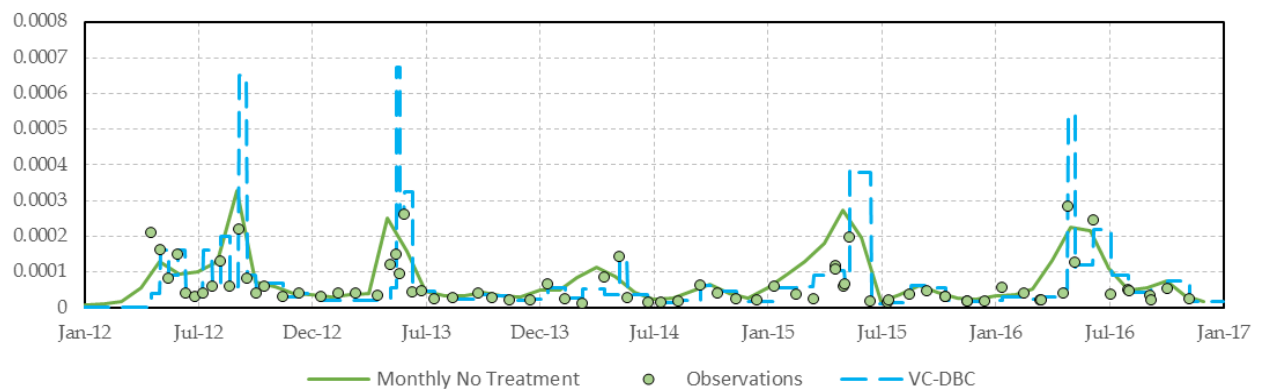
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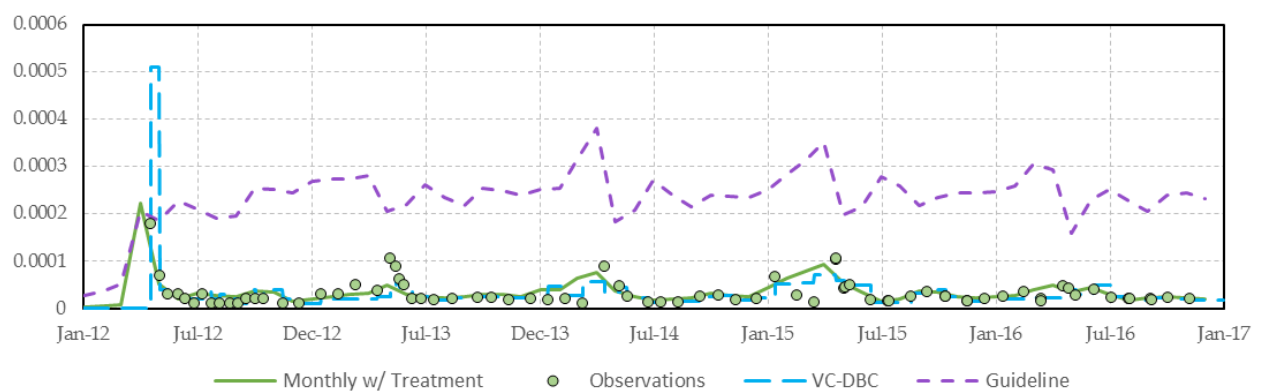
VC-UMN T-Cd

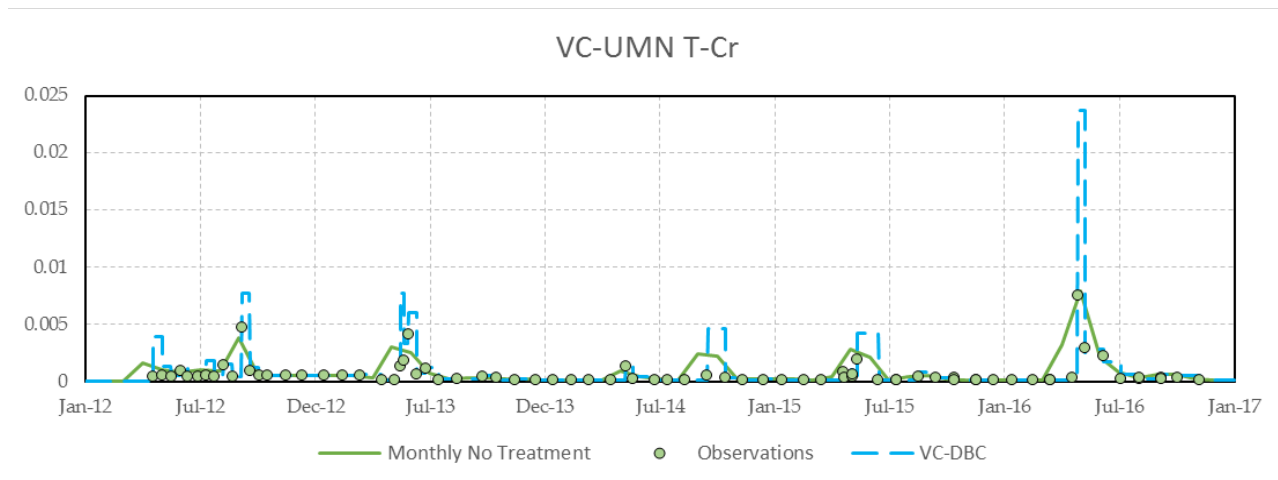
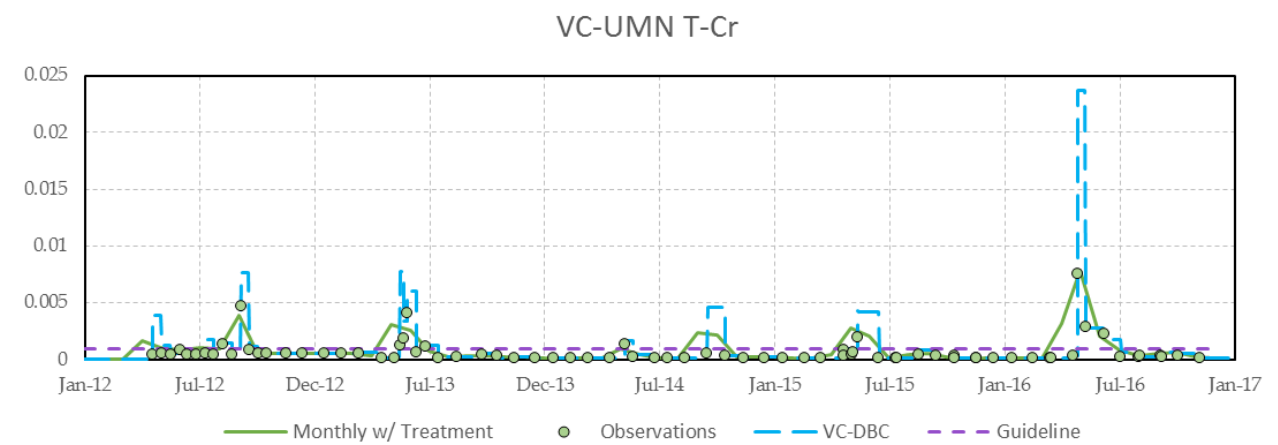
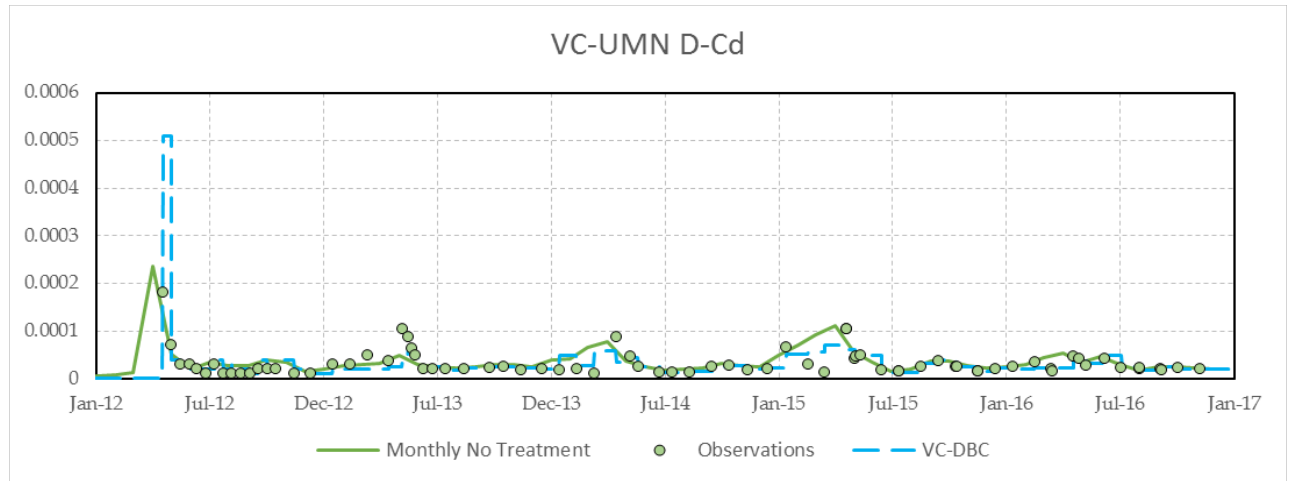


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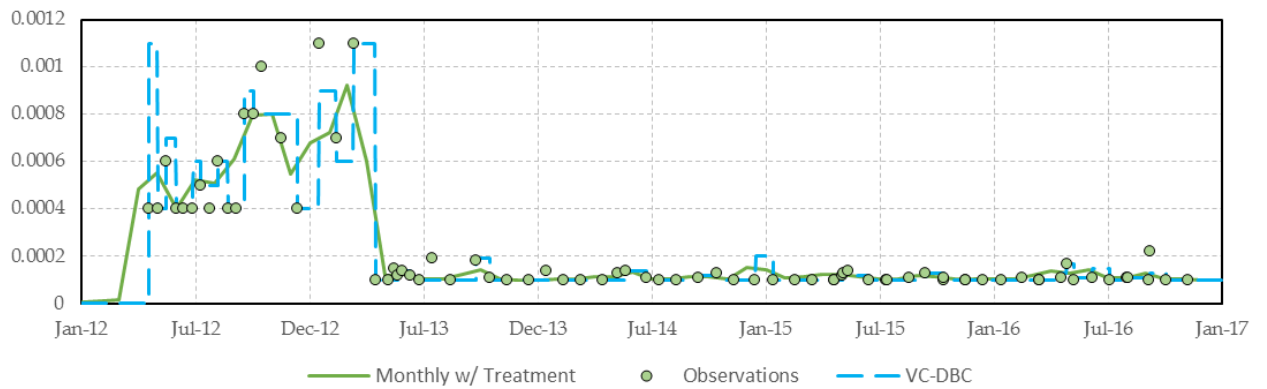


VC-UMN D-Cd

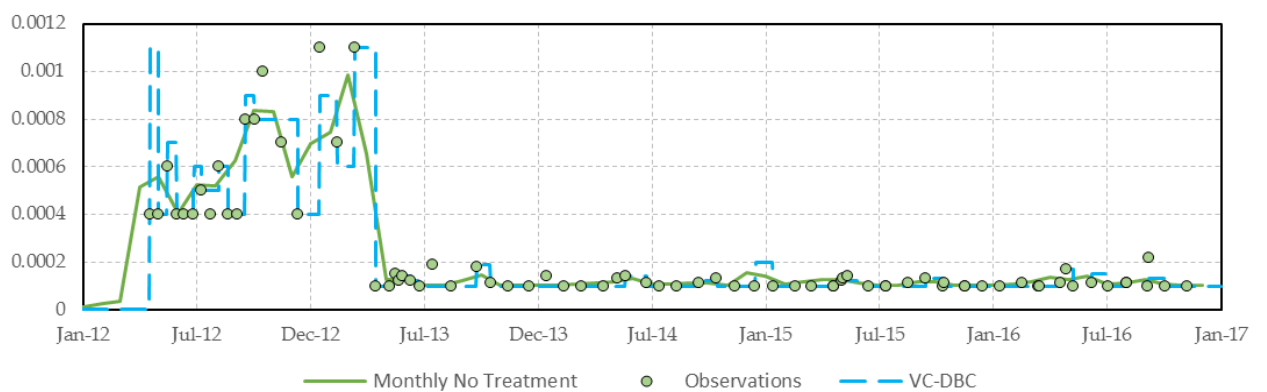




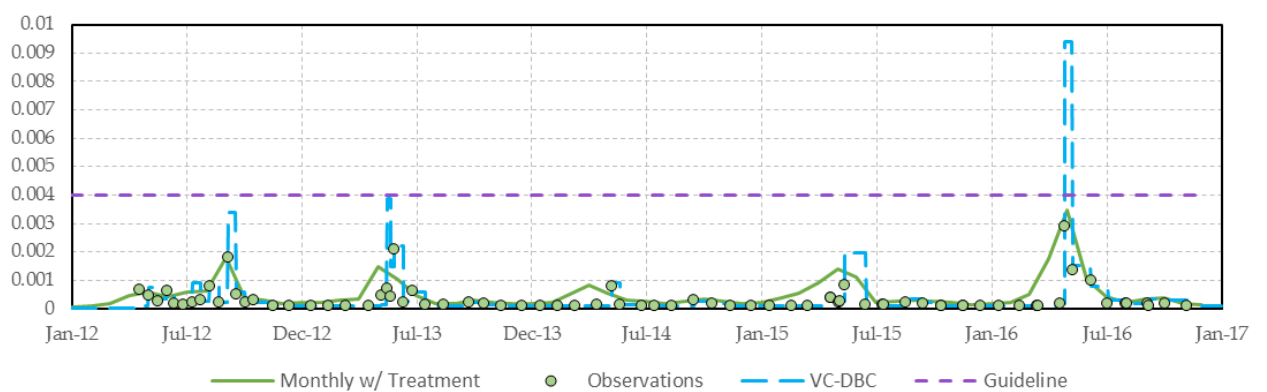
VC-UMN D-Cr



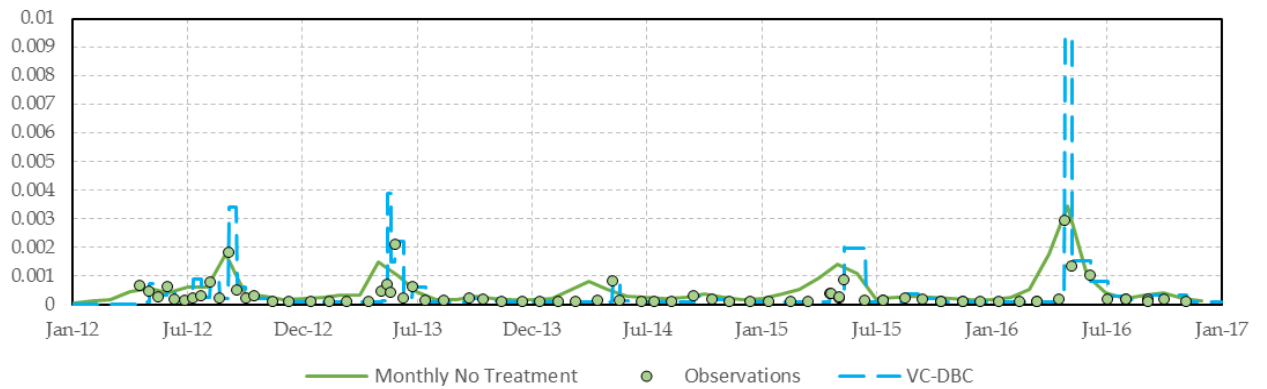
VC-UMN D-Cr



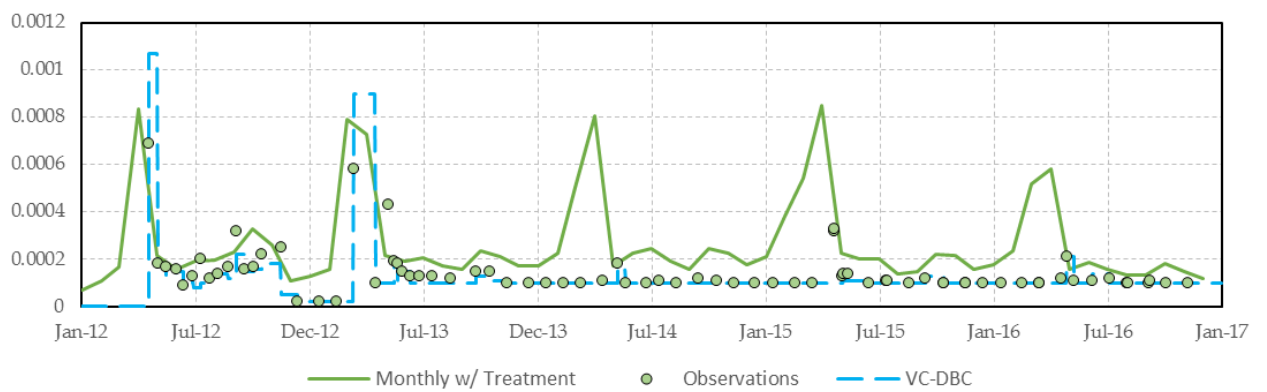
VC-UMN T-Co



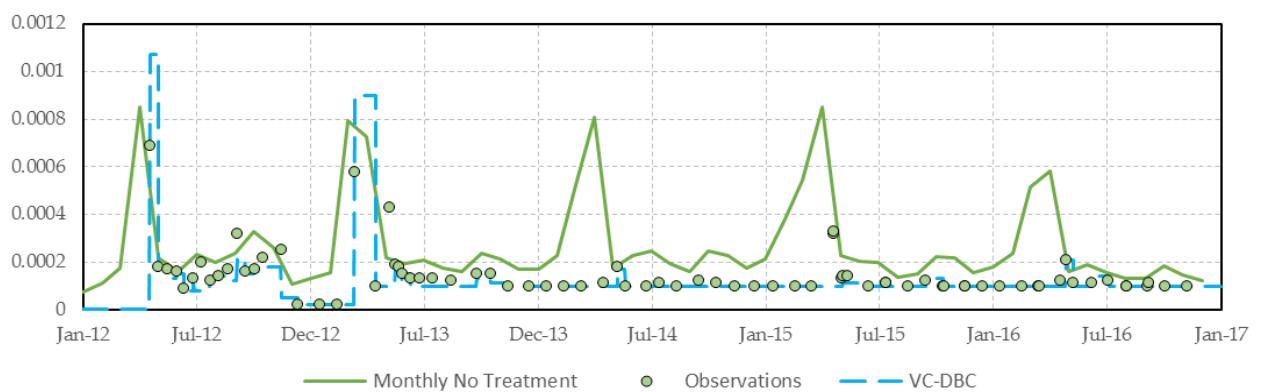
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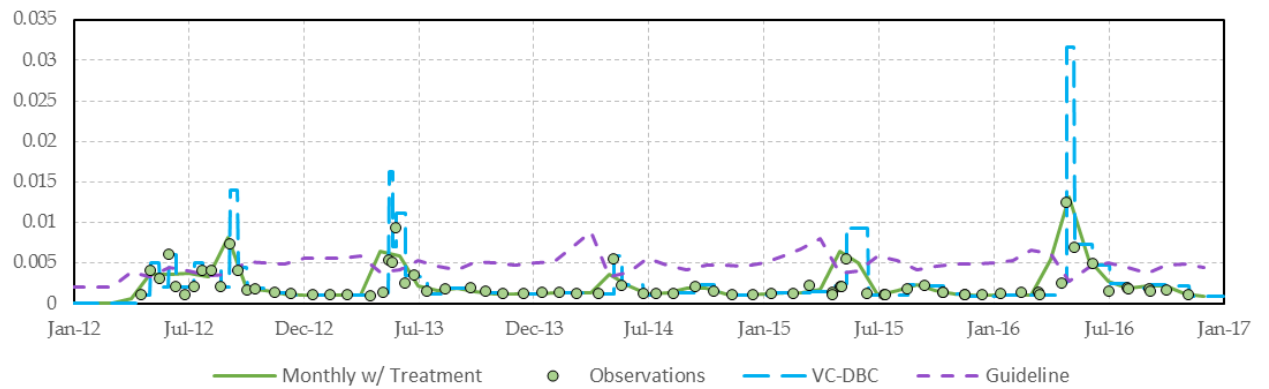
VC-UMN D-Co



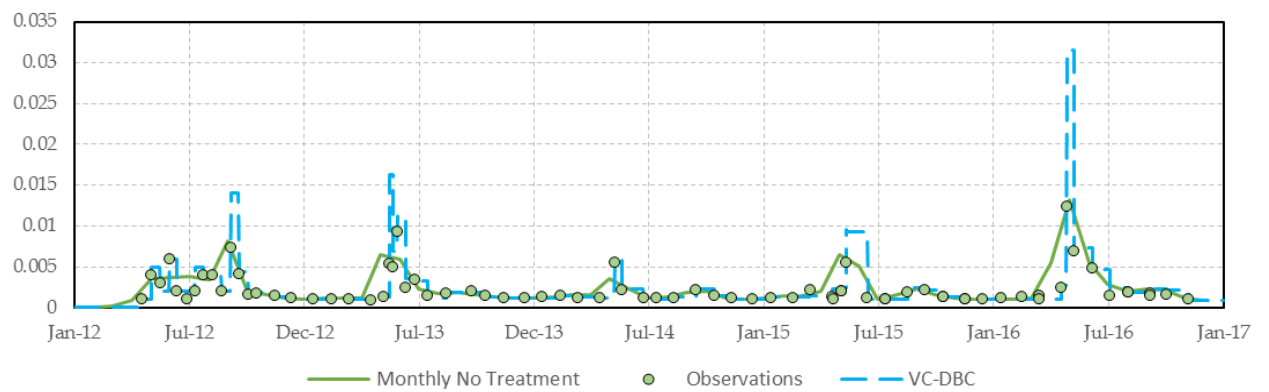
VC-UMN D-Co



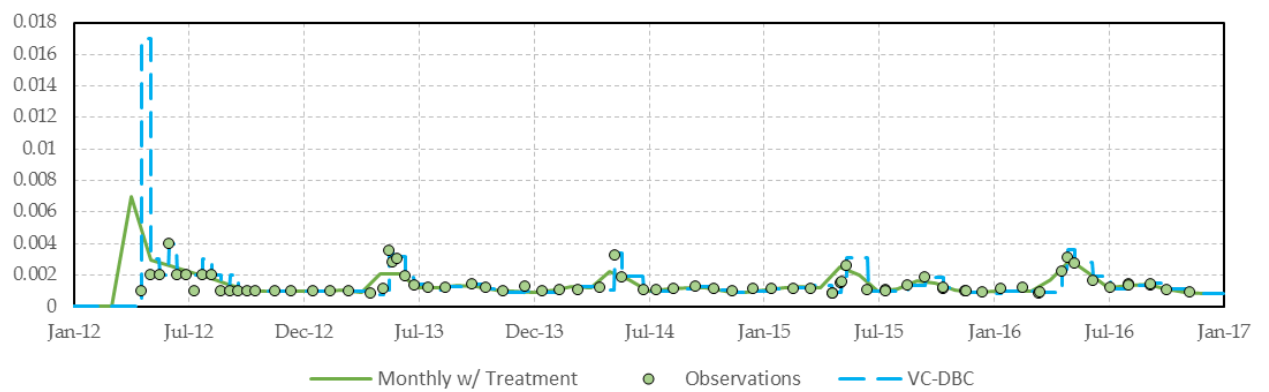
VC-UMN T-Cu

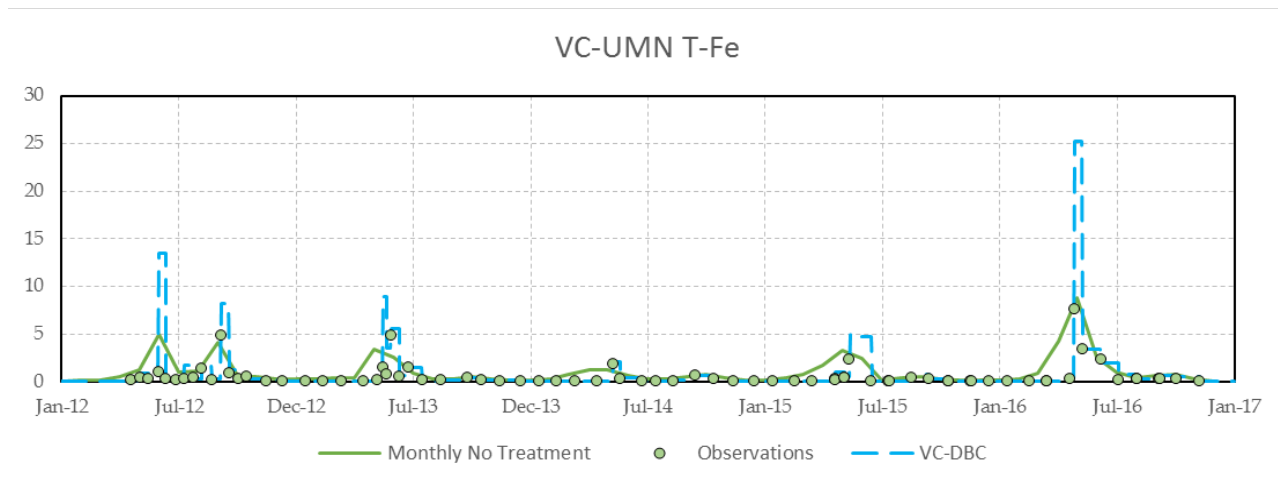
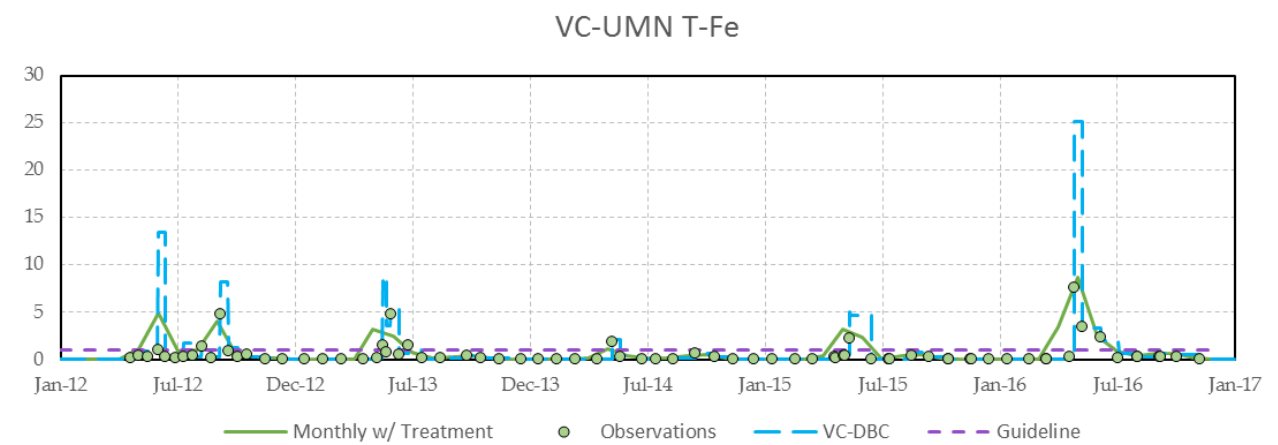
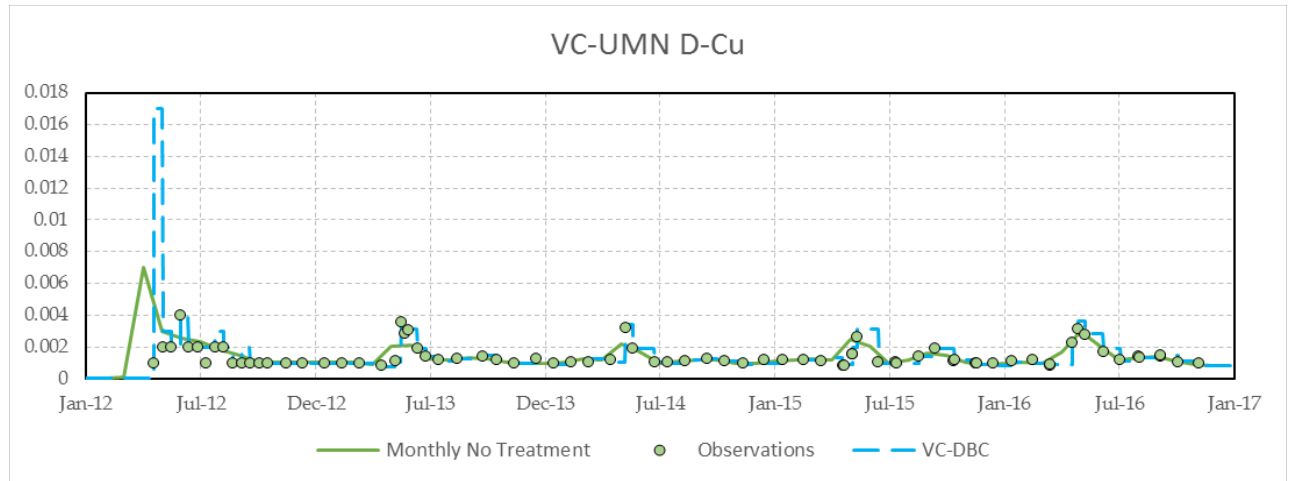


VC-UMN T-Cu

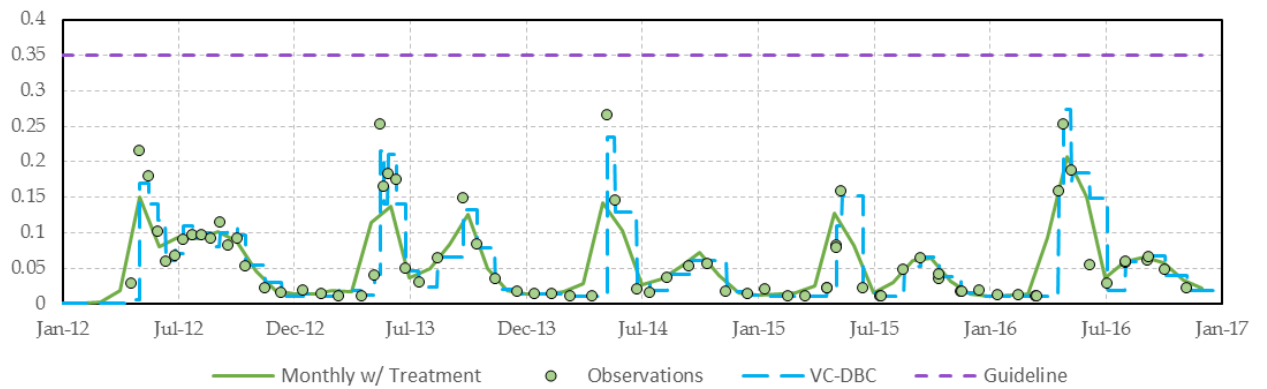


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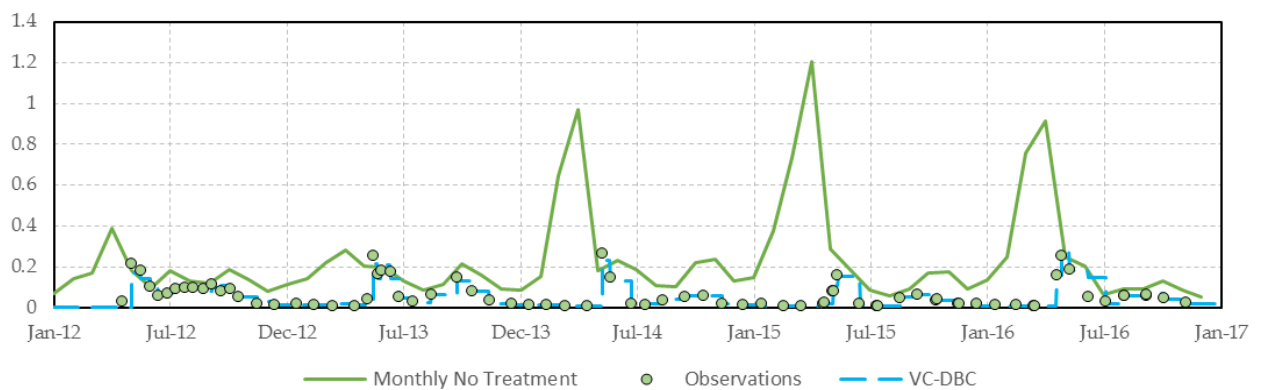




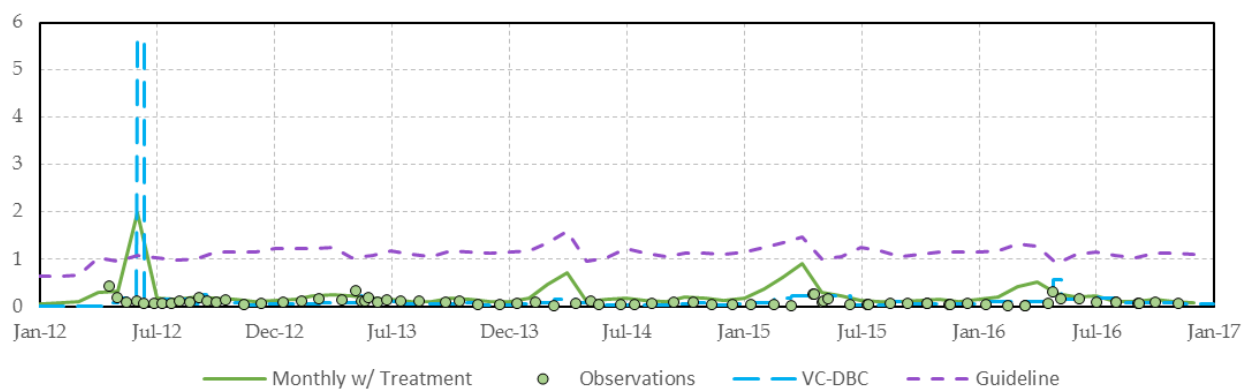
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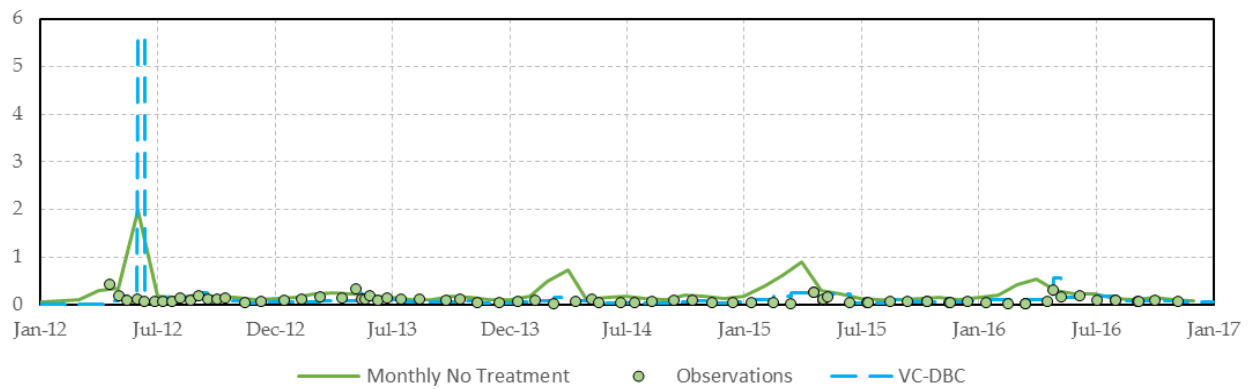
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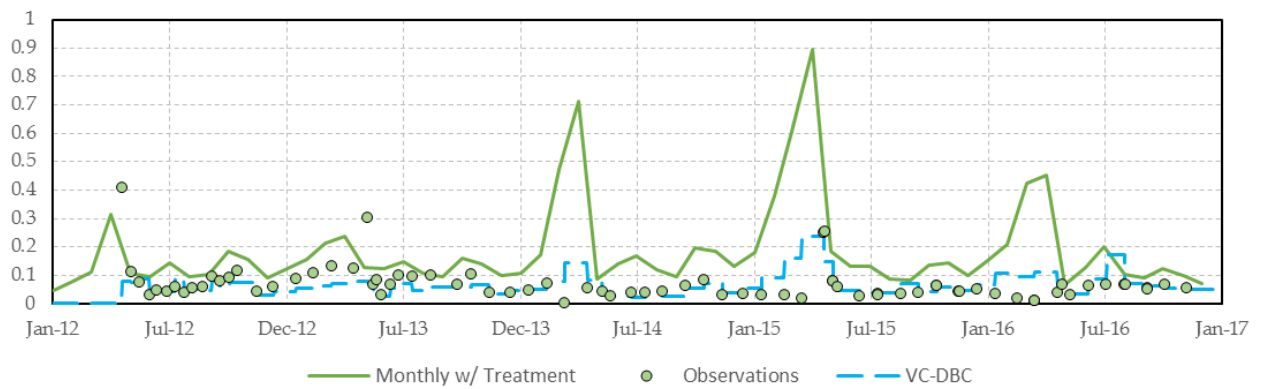
VC-UMN T-Mn



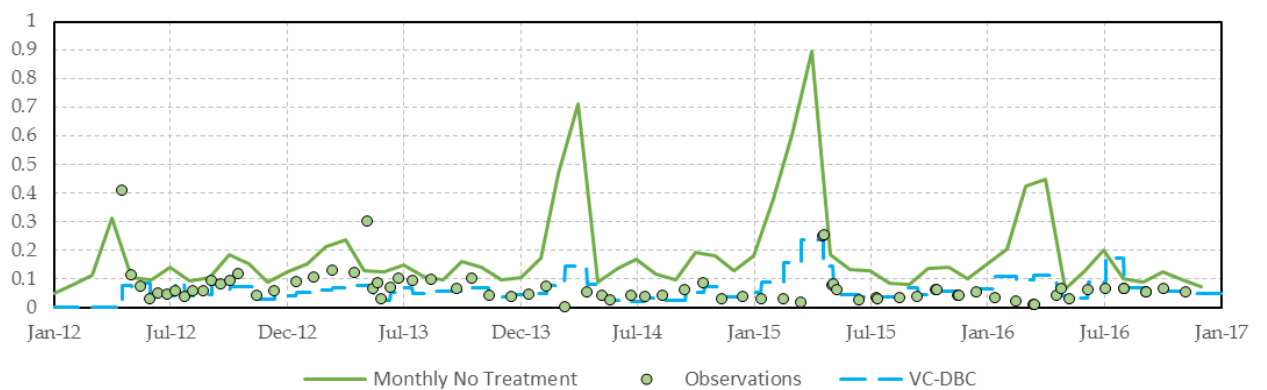
VC-UMN T-Mn



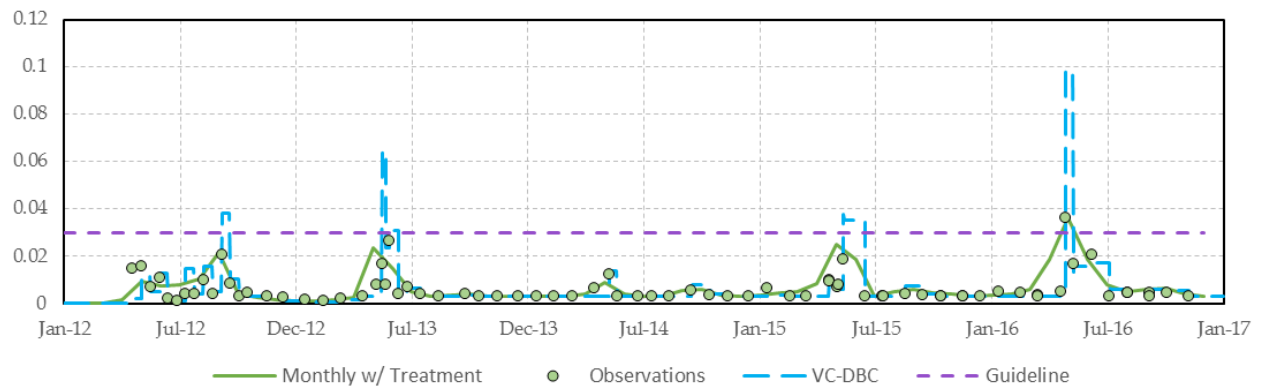
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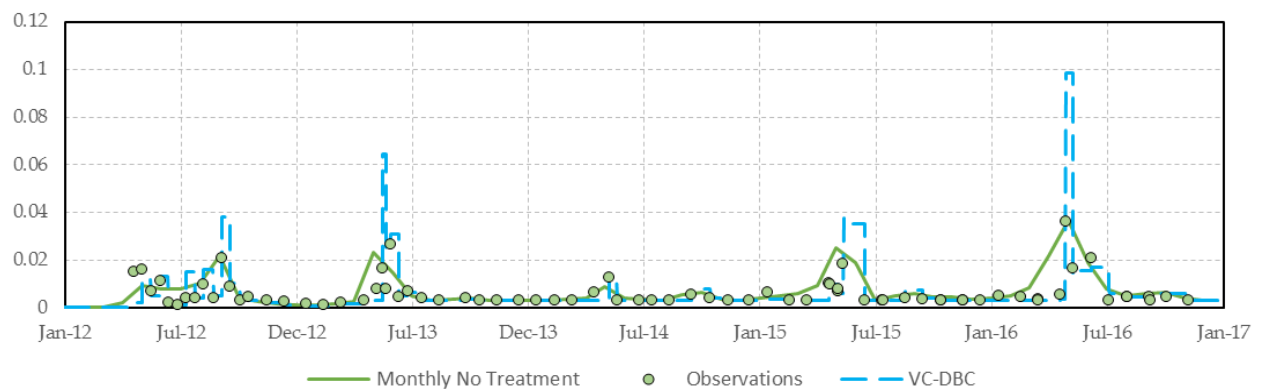
VC-UMN D-Mn



VC-UMN T-Zn



VC-UMN T-Zn



Summary (for report)

		Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Quality Guideline	SO4	SO4	429	429	429	429	429	429	429	429	429	429	429	429
		T-As	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
		D-Al	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
		T-Fe	1	1	1	1	1	1	1	1	1	1	1	1
		D-Fe	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
		T-Zn	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Water Quality Estimate	SO4	SO4	975	975	975	574	249	440	600	535	467	576	901	963
		T-As	0.003	0.003	0.003	0.012	0.019	0.028	0.011	0.015	0.018	0.011	0.006	0.005
		D-Al	0.006	0.006	0.006	0.046	0.085	0.042	0.022	0.024	0.038	0.014	0.007	0.006
		T-Fe	4.15	4.15	4.15	3.49	5.34	4.85	2.59	3.40	4.10	3.41	2.76	2.64
		D-Fe	0.67	0.67	0.67	0.54	0.21	0.04	0.08	0.11	0.17	0.60	0.68	0.67
		T-Zn	0.039	0.039	0.039	0.029	0.041	0.034	0.010	0.015	0.025	0.024	0.027	0.027

Complete (for appendix)

		Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Quality Guideline	SO4	SO4	429	429	429	429	429	429	429	429	429	429	429	429
		N-NO2	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
		N-NO3	3	3	3	3	3	3	3	3	3	3	3	3
		N-NH3	2.08	2.08	2.08	2.07	2.02	1.89	1.81	1.83	1.84	2.08	2.08	2.08
		WADCN	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
		T-As	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
		D-Al	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
		D-Cd	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046
		T-Co	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
		T-Cr	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
		T-Cu	0.049	0.049	0.049	0.034	0.015	0.024	0.033	0.030	0.026	0.031	0.047	0.050
		T-Fe	1	1	1	1	1	1	1	1	1	1	1	1
		D-Fe	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
		T-Mn	5.97	5.97	5.97	4.35	2.30	3.27	4.18	3.88	3.46	4.02	5.79	6.14
		T-Zn	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Water Quality Estimate	SO4	SO4	975	975	975	574	249	440	600	535	467	576	901	963
		N-NO2	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
		N-NO3	0.037	0.030	0.026	0.009	0.009	0.057	0.030	0.024	0.038	0.070	0.045	0.045
		N-NH3	0.405	0.405	0.405	0.156	0.052	0.084	0.120	0.141	0.122	0.158	0.371	0.420
		WADCN	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
		T-As	0.003	0.003	0.003	0.012	0.019	0.028	0.011	0.015	0.018	0.011	0.006	0.005
		D-Al	0.006	0.006	0.006	0.046	0.085	0.042	0.022	0.024	0.038	0.014	0.007	0.006
		D-Cd	0.00011	0.00011	0.00011	0.00007	0.00007	0.00003	0.00002	0.00002	0.00002	0.00003	0.00006	0.00007
		T-Co	0.0012	0.0012	0.0012	0.0008	0.0017	0.0013	0.0007	0.0008	0.0010	0.0005	0.0007	0.0008
		T-Cr	0.0002	0.0002	0.0002	0.0012	0.0035	0.0035	0.0009	0.0015	0.0025	0.0007	0.0002	0.0002
		T-Cu	0.0010	0.0010	0.0010	0.0029	0.0060	0.0065	0.0021	0.0034	0.0052	0.0015	0.0008	0.0008
		T-Fe	4.15	4.15	4.15	3.49	5.34	4.85	2.59	3.40	4.10	3.41	2.76	2.64
		D-Fe	0.67	0.67	0.67	0.54	0.21	0.04	0.08	0.11	0.17	0.60	0.68	0.67
		T-Mn	1.78	1.78	1.78	0.94	0.51	0.56	0.74	0.67	0.52	0.62	1.37	1.53
		T-Zn	0.039	0.039	0.039	0.029	0.041	0.034	0.010	0.015	0.025	0.024	0.027	0.027

Summary (for report)

	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		SO4	429	429	429	429	429	429	429	429	429	429	429
Water Quality Guideline	T-As	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	D-Al	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	T-Fe	1	1	1	1	1	1	1	1	1	1	1	1
	D-Fe	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
	T-Zn	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
	SO4	745	745	739	660	275	487	635	581	548	618	809	809
Water Quality Estimate	T-As	0.034	0.036	0.037	0.033	0.020	0.030	0.017	0.020	0.023	0.019	0.026	0.034
	D-Al	0.009	0.010	0.010	0.024	0.080	0.035	0.020	0.021	0.029	0.014	0.009	0.009
	T-Fe	0.50	0.50	0.50	1.17	5.00	4.20	2.13	2.63	2.83	2.42	1.39	0.79
	D-Fe	0.10	0.10	0.10	0.20	0.20	0.05	0.08	0.11	0.14	0.42	0.32	0.18
	T-Zn	0.025	0.028	0.029	0.026	0.039	0.031	0.010	0.013	0.022	0.023	0.026	0.025

Complete (for appendix)

	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		SO4	429	429	429	429	429	429	429	429	429	429	429
Water Quality Guideline or Objective	N-NO2	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	N-NO3	3	3	3	3	3	3	3	3	3	3	3	3
	N-NH3	2.08	2.08	2.08	2.04	2.01	1.91	1.80	1.83	1.87	2.07	2.08	2.08
	WADCN	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	T-As	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	D-Al	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	D-Cd	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046
	T-Co	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	T-Cr	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	T-Cu	0.036	0.036	0.036	0.035	0.017	0.026	0.033	0.031	0.029	0.032	0.041	0.040
	T-Fe	1	1	1	1	1	1	1	1	1	1	1	1
	D-Fe	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
	T-Mn	4.55	4.53	4.61	4.42	2.42	3.47	4.27	4.03	3.77	4.17	5.11	4.95
	T-Zn	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Water Quality Estimate	SO4	745	745	739	660	275	487	635	581	548	618	809	809
	N-NO2	0.042	0.042	0.039	0.027	0.003	0.004	0.007	0.008	0.011	0.013	0.020	0.031
	N-NO3	1.111	1.025	0.928	0.660	0.060	0.137	0.186	0.221	0.313	0.415	0.662	0.916
	N-NH3	4.238	4.391	4.406	3.321	0.344	0.743	1.172	1.204	1.457	1.585	2.710	3.620
	WADCN	0.011	0.012	0.014	0.011	0.002	0.003	0.004	0.004	0.004	0.004	0.008	0.012
	T-As	0.034	0.036	0.037	0.033	0.020	0.030	0.017	0.020	0.023	0.019	0.026	0.034
	D-Al	0.009	0.010	0.010	0.024	0.080	0.035	0.020	0.021	0.029	0.014	0.009	0.009
	D-Cd	0.00039	0.00039	0.00038	0.00029	0.00009	0.00007	0.00009	0.00011	0.00014	0.00015	0.00025	0.00032
	T-Co	0.0087	0.0086	0.0086	0.0065	0.0021	0.0023	0.0024	0.0026	0.0034	0.0034	0.0053	0.0072
	T-Cr	0.0006	0.0006	0.0006	0.0008	0.0033	0.0030	0.0008	0.0013	0.0018	0.0007	0.0004	0.0005
	T-Cu	0.0021	0.0019	0.0020	0.0023	0.0058	0.0058	0.0021	0.0032	0.0042	0.0020	0.0015	0.0016
	T-Fe	0.50	0.50	0.50	1.17	5.00	4.20	2.13	2.63	2.83	2.42	1.39	0.79
	D-Fe	0.10	0.10	0.10	0.20	0.20	0.05	0.08	0.11	0.14	0.42	0.32	0.18
	T-Mn	6.76	6.78	6.62	5.02	0.91	1.45	2.03	1.99	2.40	2.57	4.54	6.18
	T-Zn	0.025	0.028	0.029	0.026	0.039	0.031	0.010	0.013	0.022	0.023	0.026	0.025

Summary (for report)

		Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Quality Guideline	Water Quality Estimate	SO4	429	429	429	429	429	429	429	429	429	429	429	429
		T-As	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
		D-Al	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
		T-Fe	1	1	1	1	1	1	1	1	1	1	1	1
		D-Fe	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
		T-Zn	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Water Quality Guideline	Water Quality Estimate	SO4	745	745	739	660	275	487	635	581	548	618	809	809
		T-As	0.048	0.055	0.062	0.056	0.022	0.034	0.021	0.025	0.029	0.023	0.035	0.051
		D-Al	0.009	0.010	0.010	0.024	0.080	0.035	0.020	0.021	0.029	0.014	0.009	0.009
		T-Fe	12.30	14.07	14.89	12.69	6.04	6.08	4.48	4.97	5.81	6.03	8.84	12.07
		D-Fe	9.94	11.02	12.45	10.31	1.07	1.36	1.94	1.67	2.12	3.12	5.99	8.91
		T-Zn	0.039	0.046	0.045	0.035	0.039	0.031	0.010	0.014	0.022	0.024	0.031	0.035

Complete (for appendix)

		Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Quality Guideline or Objective	Water Quality Estimate	SO4	429	429	429	429	429	429	429	429	429	429	429	429
		N-NO2	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
		N-NO3	3	3	3	3	3	3	3	3	3	3	3	3
		N-NH3	2.08	2.08	2.08	2.04	2.01	1.91	1.80	1.83	1.87	2.07	2.08	2.08
		WADCN	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
		T-As	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
		D-Al	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
		D-Cd	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046
		T-Co	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
		T-Cr	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
		T-Cu	0.036	0.036	0.036	0.035	0.017	0.026	0.033	0.031	0.029	0.032	0.041	0.040
		T-Fe	1	1	1	1	1	1	1	1	1	1	1	1
		D-Fe	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
		T-Mn	4.55	4.53	4.61	4.42	2.42	3.47	4.28	4.03	3.77	4.17	5.12	4.97
		T-Zn	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
		SO4	745	745	739	660	275	487	635	581	548	618	809	809
		N-NO2	0.042	0.042	0.039	0.027	0.003	0.004	0.007	0.008	0.011	0.013	0.020	0.031
		N-NO3	1.111	1.025	0.928	0.660	0.060	0.137	0.186	0.221	0.313	0.415	0.662	0.916
Water Quality Estimate	Water Quality Estimate	N-NH3	4.238	4.391	4.406	3.321	0.344	0.743	1.172	1.204	1.457	1.585	2.710	3.620
		WADCN	0.011	0.012	0.014	0.011	0.002	0.003	0.004	0.004	0.004	0.004	0.008	0.012
		T-As	0.048	0.055	0.062	0.056	0.022	0.034	0.021	0.025	0.029	0.023	0.035	0.051
		D-Al	0.009	0.010	0.010	0.024	0.080	0.035	0.020	0.021	0.029	0.014	0.009	0.009
		D-Cd	0.00056	0.00053	0.00050	0.00036	0.00009	0.00007	0.00010	0.00012	0.00015	0.00016	0.00026	0.00036
		T-Co	0.0090	0.0090	0.0088	0.0067	0.0021	0.0023	0.0027	0.0028	0.0033	0.0033	0.0054	0.0074
		T-Cr	0.0007	0.0006	0.0005	0.0010	0.0033	0.0030	0.0009	0.0013	0.0018	0.0007	0.0004	0.0005
		T-Cu	0.0051	0.0049	0.0050	0.0053	0.0061	0.0061	0.0030	0.0038	0.0059	0.0031	0.0030	0.0037
		T-Fe	12.30	14.07	14.89	12.69	6.04	6.08	4.48	4.97	5.81	6.03	8.84	12.07
		D-Fe	9.94	11.02	12.45	10.31	1.07	1.36	1.94	1.67	2.12	3.12	5.99	8.91
		T-Mn	6.84	6.91	6.83	5.20	0.93	1.49	2.05	2.08	2.42	2.58	4.60	6.25
		T-Zn	0.039	0.046	0.045	0.035	0.039	0.031	0.010	0.014	0.022	0.024	0.031	0.035

Summary (for report)

	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Quality Guideline	SO4	-	-	-	429	429	429	429	429	429	429	429	-
	T-As	-	-	-	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	-
	D-Al	-	-	-	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	-
	T-Fe	-	-	-	1	1	1	1	1	1	1	1	-
	D-Fe	-	-	-	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	-
	T-Zn	-	-	-	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	-
Water Quality Estimate	SO4	-	-	-	557	260	418	552	510	490	550	782	-
	T-As	-	-	-	0.026	0.018	0.026	0.015	0.017	0.021	0.017	0.024	-
	D-Al	-	-	-	0.039	0.076	0.036	0.019	0.020	0.029	0.015	0.007	-
	T-Fe	-	-	-	1.36	4.39	3.83	1.87	2.30	2.61	2.15	1.48	-
	D-Fe	-	-	-	0.24	0.19	0.06	0.08	0.10	0.13	0.38	0.34	-
	T-Zn	-	-	-	0.030	0.034	0.027	0.009	0.012	0.020	0.021	0.032	-

Complete (for appendix)

	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Quality Guideline or Objective	SO4	-	-	-	429	429	429	429	429	429	429	429	-
	N-NO2	-	-	-	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	-
	N-NO3	-	-	-	3	3	3	3	3	3	3	3	-
	N-NH3	-	-	-	2.08	2.07	1.89	1.89	1.89	1.93	2.06	2.08	-
	WADCN	-	-	-	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	-
	T-As	-	-	-	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	-
	D-Al	-	-	-	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	-
	D-Cd	-	-	-	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	-
	T-Co	-	-	-	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	-
	T-Cr	-	-	-	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
	T-Cu	-	-	-	0.030	0.015	0.023	0.029	0.028	0.026	0.029	0.040	-
	T-Fe	-	-	-	1	1	1	1	1	1	1	1	-
	D-Fe	-	-	-	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	-
	T-Mn	-	-	-	3.88	2.30	3.10	3.83	3.65	3.46	3.81	5.03	-
	T-Zn	-	-	-	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	-
Water Quality Estimate	SO4	-	-	-	557	260	418	552	510	490	550	782	-
	N-NO2	-	-	-	0.022	0.005	0.004	0.006	0.008	0.010	0.012	0.013	-
	N-NO3	-	-	-	0.598	0.112	0.129	0.169	0.204	0.292	0.388	0.567	-
	N-NH3	-	-	-	2.801	0.486	0.648	1.021	1.061	1.323	1.432	2.326	-
	WADCN	-	-	-	0.008	0.002	0.002	0.003	0.004	0.004	0.003	0.005	-
	T-As	-	-	-	0.026	0.018	0.026	0.015	0.017	0.021	0.017	0.024	-
	D-Al	-	-	-	0.039	0.076	0.036	0.019	0.020	0.029	0.015	0.007	-
	D-Cd	-	-	-	0.00025	0.00010	0.00006	0.00008	0.00010	0.00013	0.00014	0.00023	-
	T-Co	-	-	-	0.0056	0.0022	0.0021	0.0021	0.0023	0.0031	0.0031	0.0044	-
	T-Cr	-	-	-	0.0010	0.0030	0.0027	0.0008	0.0011	0.0017	0.0006	0.0003	-
	T-Cu	-	-	-	0.0028	0.0055	0.0054	0.0021	0.0030	0.0041	0.0019	0.0016	-
	T-Fe	-	-	-	1.36	4.39	3.83	1.87	2.30	2.61	2.15	1.48	-
	D-Fe	-	-	-	0.24	0.19	0.06	0.08	0.10	0.13	0.38	0.34	-
	T-Mn	-	-	-	4.10	1.09	1.28	1.77	1.76	2.18	2.32	3.71	-
	T-Zn	-	-	-	0.030	0.034	0.027	0.009	0.012	0.020	0.021	0.032	-

Summary (for report)

		Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Quality Guideline	Water Quality Guideline	SO4	-	-	-	429	429	429	429	429	429	429	429	-
		T-As	-	-	-	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	-
		D-Al	-	-	-	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	-
		T-Fe	-	-	-	1	1	1	1	1	1	1	1	-
		D-Fe	-	-	-	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	-
		T-Zn	-	-	-	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	-
Water Quality Estimate	Water Quality Estimate	SO4	-	-	-	557	260	418	552	510	490	550	782	-
		T-As	-	-	-	0.042	0.021	0.029	0.018	0.022	0.026	0.021	0.030	-
		D-Al	-	-	-	0.039	0.076	0.036	0.019	0.020	0.029	0.015	0.007	-
		T-Fe	-	-	-	9.27	5.82	5.47	3.92	4.37	5.32	5.43	7.26	-
		D-Fe	-	-	-	7.70	1.35	1.20	1.70	1.48	1.93	2.82	5.14	-
		T-Zn	-	-	-	0.046	0.034	0.027	0.009	0.013	0.020	0.022	0.039	-

Complete (for appendix)

		Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Quality Guideline or Objective	Water Quality Guideline or Objective	SO4	-	-	-	429	429	429	429	429	429	429	429	-
		N-NO2	-	-	-	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	-
		N-NO3	-	-	-	3	3	3	3	3	3	3	3	-
		N-NH3	-	-	-	2.08	2.07	1.89	1.89	1.89	1.93	2.06	2.08	-
		WADCN	-	-	-	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	-
		T-As	-	-	-	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	-
		D-Al	-	-	-	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	-
		D-Cd	-	-	-	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	0.00046	-
		T-Co	-	-	-	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	-
		T-Cr	-	-	-	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
		T-Cu	-	-	-	0.030	0.015	0.023	0.029	0.028	0.026	0.029	0.040	-
		T-Fe	-	-	-	1	1	1	1	1	1	1	1	-
		D-Fe	-	-	-	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	-
		T-Mn	-	-	-	3.88	2.30	3.10	3.84	3.65	3.46	3.81	5.04	-
		T-Zn	-	-	-	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	-
Water Quality Estimate	Water Quality Estimate	SO4	-	-	-	557	260	418	552	510	490	550	782	-
		N-NO2	-	-	-	0.022	0.005	0.004	0.006	0.008	0.010	0.012	0.013	-
		N-NO3	-	-	-	0.598	0.112	0.129	0.169	0.204	0.292	0.388	0.567	-
		N-NH3	-	-	-	2.801	0.486	0.648	1.021	1.061	1.323	1.432	2.326	-
		WADCN	-	-	-	0.008	0.002	0.002	0.003	0.004	0.004	0.003	0.005	-
		T-As	-	-	-	0.042	0.021	0.029	0.018	0.022	0.026	0.021	0.030	-
		D-Al	-	-	-	0.039	0.076	0.036	0.019	0.020	0.029	0.015	0.007	-
		D-Cd	-	-	-	0.00034	0.00010	0.00006	0.00009	0.00011	0.00014	0.00015	0.00025	-
		T-Co	-	-	-	0.0059	0.0023	0.0021	0.0024	0.0025	0.0031	0.0030	0.0045	-
		T-Cr	-	-	-	0.0010	0.0031	0.0027	0.0008	0.0011	0.0017	0.0006	0.0004	-
		T-Cu	-	-	-	0.0049	0.0059	0.0057	0.0028	0.0035	0.0056	0.0030	0.0026	-
		T-Fe	-	-	-	9.27	5.82	5.47	3.92	4.37	5.32	5.43	7.26	-
		D-Fe	-	-	-	7.70	1.35	1.20	1.70	1.48	1.93	2.82	5.14	-
		T-Mn	-	-	-	4.11	1.11	1.31	1.79	1.84	2.20	2.33	3.77	-
		T-Zn	-	-	-	0.046	0.034	0.027	0.009	0.013	0.020	0.022	0.039	-

Summary (for report)

	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		SO4	309	309	309	309	218	218	309	309	309	309	309
Water Quality Guideline	T-As	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	D-Al	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	T-Fe	1	1	1	1	1	1	1	1	1	1	1	1
	D-Fe	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
	T-Zn	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Water Quality Estimate	SO4	17	17	18	19	12	14	18	18	18	19	19	19
	T-As	0.000	0.000	0.000	0.001	0.007	0.005	0.002	0.002	0.002	0.001	0.001	0.000
	D-Al	0.006	0.006	0.005	0.015	0.072	0.052	0.017	0.019	0.026	0.021	0.011	0.007
	T-Fe	0.03	0.03	0.02	0.78	3.46	2.48	0.52	0.38	1.16	0.37	0.15	0.06
	D-Fe	0.01	0.01	0.01	0.03	0.15	0.11	0.04	0.05	0.07	0.07	0.03	0.02
	T-Zn	0.002	0.002	0.002	0.006	0.020	0.012	0.005	0.005	0.008	0.004	0.003	0.003

Complete (for appendix)

	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		SO4	309	309	309	309	218	218	309	309	309	309	309
Water Quality Guideline or Objective	N-NO2	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	N-NO3	3	3	3	3	3	3	3	3	3	3	3	3
	N-NH3	2.07	2.06	2.07	2.08	2.07	1.89	1.92	1.83	1.90	2.05	2.08	2.08
	WADCN	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	T-As	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	D-Al	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	D-Cd	0.00021	0.00021	0.00021	0.00022	0.00016	0.00016	0.00021	0.00020	0.00019	0.00020	0.00022	0.00023
	T-Co	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	T-Cr	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	T-Cu	0.004	0.004	0.004	0.004	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.004
	T-Fe	1	1	1	1	1	1	1	1	1	1	1	1
	D-Fe	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
	T-Mn	1.03	1.03	1.04	1.07	0.90	0.91	1.03	1.02	0.99	1.01	1.06	1.09
Water Quality Estimate	T-Zn	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
	SO4	17	17	18	19	12	14	18	18	18	19	19	19
	N-NO2	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	N-NO3	0.122	0.126	0.118	0.107	0.054	0.072	0.062	0.094	0.105	0.120	0.141	0.155
	N-NH3	0.119	0.075	0.005	0.008	0.011	0.012	0.010	0.009	0.011	0.011	0.009	0.008
	WADCN	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	T-As	0.000	0.000	0.000	0.001	0.007	0.005	0.002	0.002	0.002	0.001	0.001	0.000
	D-Al	0.006	0.006	0.005	0.015	0.072	0.052	0.017	0.019	0.026	0.021	0.011	0.007
	D-Cd	0.00002	0.00003	0.00003	0.00008	0.00004	0.00003	0.00002	0.00002	0.00003	0.00003	0.00002	0.00002
	T-Co	0.0001	0.0001	0.0001	0.0004	0.0014	0.0007	0.0003	0.0002	0.0005	0.0002	0.0001	0.0001
	T-Cr	0.0002	0.0002	0.0002	0.0012	0.0032	0.0015	0.0006	0.0004	0.0015	0.0008	0.0003	0.0002
	T-Cu	0.0009	0.0010	0.0010	0.0020	0.0067	0.0044	0.0022	0.0020	0.0033	0.0018	0.0013	0.0011
	T-Fe	0.03	0.03	0.02	0.78	3.46	2.48	0.52	0.38	1.16	0.37	0.15	0.06
	D-Fe	0.01	0.01	0.01	0.03	0.15	0.11	0.04	0.05	0.07	0.07	0.03	0.02
	T-Mn	0.05	0.07	0.10	0.12	0.20	0.51	0.08	0.07	0.08	0.07	0.06	0.05
	T-Zn	0.002	0.002	0.002	0.006	0.020	0.012	0.005	0.005	0.008	0.004	0.003	0.003

Summary (for report)

	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	SO4	309	309	309	309	309	309	309	309	309	309	309	309
Water Quality Guideline	T-As	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	D-Al	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	T-Fe	1	1	1	1	1	1	1	1	1	1	1	1
	D-Fe	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
	T-Zn	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
	SO4	24	31	47	70	25	43	46	33	27	44	35	26
Water Quality Estimate	T-As	0.001	0.001	0.002	0.004	0.008	0.007	0.003	0.002	0.003	0.002	0.001	0.001
	D-Al	0.006	0.006	0.005	0.015	0.072	0.051	0.017	0.019	0.026	0.021	0.011	0.007
	T-Fe	0.03	0.03	0.04	0.82	3.51	2.56	0.59	0.44	1.19	0.46	0.18	0.07
	D-Fe	0.01	0.01	0.01	0.04	0.15	0.11	0.04	0.05	0.07	0.08	0.04	0.02
	T-Zn	0.002	0.003	0.003	0.007	0.021	0.013	0.005	0.005	0.009	0.005	0.004	0.003
	SO4	24	31	47	70	25	43	46	33	27	44	35	26

Complete (for appendix)

	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	SO4	309	309	309	309	309	309	309	309	309	309	309	309
Water Quality Guideline or Objective	N-NO2	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	N-NO3	3	3	3	3	3	3	3	3	3	3	3	3
	N-NH3	2.07	2.06	2.07	2.08	2.07	1.89	1.92	1.83	1.90	2.05	2.08	2.08
	WADCN	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	T-As	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	D-Al	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	D-Cd	0.00022	0.00023	0.00026	0.00030	0.00019	0.00022	0.00026	0.00023	0.00021	0.00024	0.00025	0.00024
	T-Co	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	T-Cr	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	T-Cu	0.004	0.004	0.005	0.007	0.003	0.004	0.005	0.005	0.004	0.005	0.005	0.005
	T-Fe	1	1	1	1	1	1	1	1	1	1	1	1
	D-Fe	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
	T-Mn	1.06	1.10	1.19	1.33	0.98	1.07	1.17	1.10	1.04	1.14	1.14	1.13
	T-Zn	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Water Quality Estimate	SO4	24	31	47	70	25	43	46	33	27	44	35	26
	N-NO2	0.001	0.002	0.002	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	N-NO3	0.132	0.142	0.148	0.158	0.058	0.076	0.067	0.097	0.108	0.131	0.152	0.162
	N-NH3	0.161	0.154	0.179	0.275	0.040	0.052	0.063	0.041	0.034	0.072	0.065	0.039
	WADCN	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	T-As	0.001	0.001	0.002	0.004	0.008	0.007	0.003	0.002	0.003	0.002	0.001	0.001
	D-Al	0.006	0.006	0.005	0.015	0.072	0.051	0.017	0.019	0.026	0.021	0.011	0.007
	D-Cd	0.00003	0.00003	0.00004	0.00010	0.00005	0.00003	0.00002	0.00002	0.00003	0.00003	0.00003	0.00002
	T-Co	0.0002	0.0002	0.0004	0.0009	0.0015	0.0008	0.0004	0.0003	0.0006	0.0003	0.0002	0.0002
	T-Cr	0.0002	0.0002	0.0002	0.0012	0.0032	0.0016	0.0006	0.0004	0.0016	0.0008	0.0003	0.0002
	T-Cu	0.0009	0.0010	0.0010	0.0020	0.0066	0.0045	0.0022	0.0020	0.0033	0.0018	0.0013	0.0011
	T-Fe	0.03	0.03	0.04	0.82	3.51	2.56	0.59	0.44	1.19	0.46	0.18	0.07
	D-Fe	0.01	0.01	0.01	0.04	0.15	0.11	0.04	0.05	0.07	0.08	0.04	0.02
	T-Mn	0.12	0.20	0.37	0.54	0.26	0.55	0.17	0.12	0.12	0.17	0.15	0.10
	T-Zn	0.002	0.003	0.003	0.007	0.021	0.013	0.005	0.005	0.009	0.005	0.004	0.003

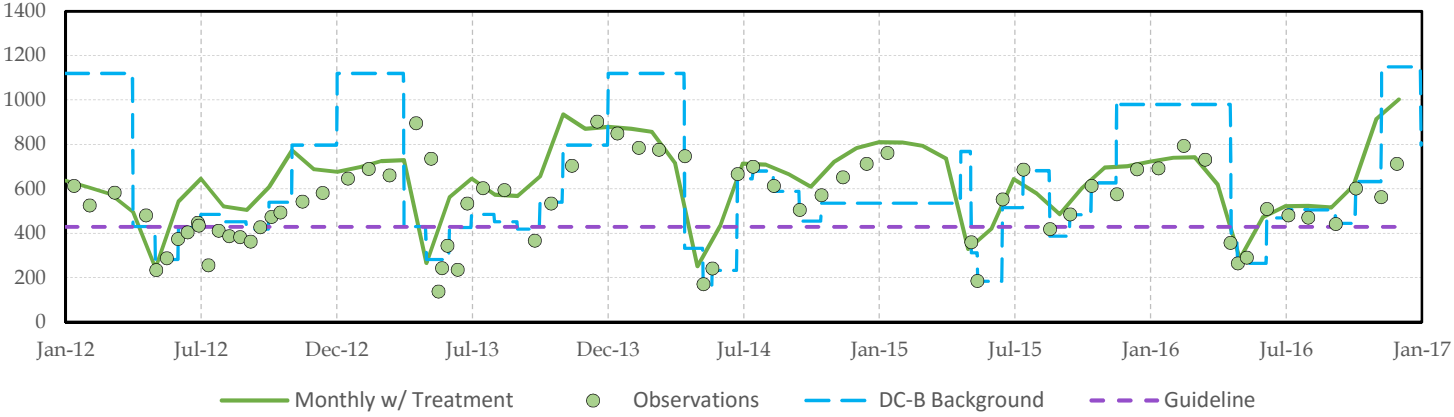
Summary (for report)

	Month												
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Quality Guideline	SO4	309	309	309	309	309	309	309	309	309	309	309	309
	T-As	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	D-Al	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	T-Fe	1	1	1	1	1	1	1	1	1	1	1	1
	D-Fe	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Water Quality Estimate	T-Zn	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
	SO4	24	31	47	70	25	43	46	33	27	44	35	26
	T-As	0.001	0.001	0.003	0.005	0.008	0.007	0.003	0.002	0.003	0.002	0.001	0.001
	D-Al	0.006	0.006	0.005	0.015	0.072	0.051	0.017	0.019	0.026	0.021	0.011	0.007
	T-Fe	0.16	0.28	0.60	1.63	3.60	2.66	0.70	0.50	1.24	0.60	0.34	0.16
	D-Fe	0.11	0.21	0.51	0.75	0.22	0.18	0.13	0.09	0.10	0.19	0.16	0.09
	T-Zn	0.002	0.003	0.004	0.008	0.021	0.013	0.005	0.005	0.009	0.005	0.004	0.003

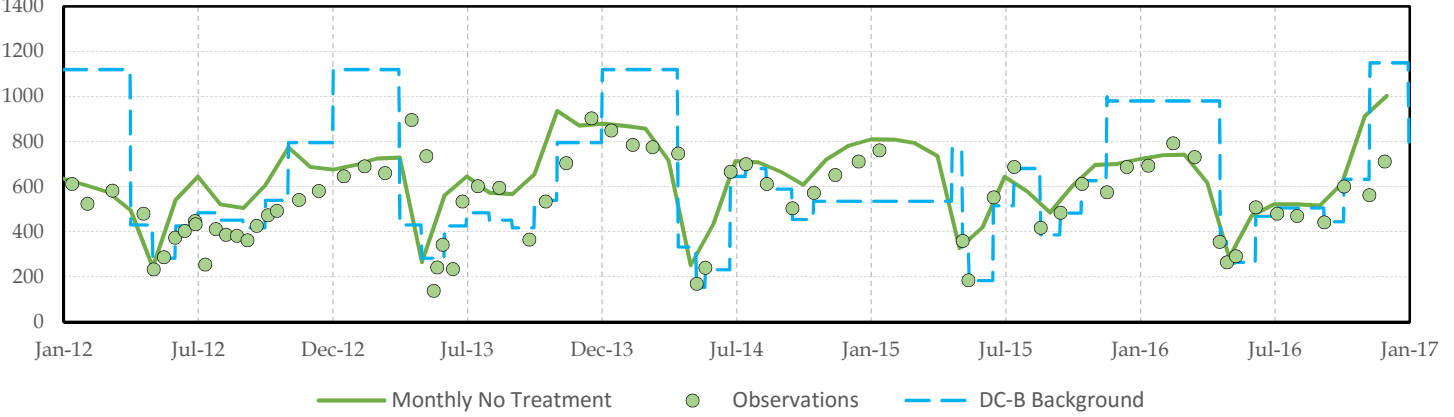
Complete (for appendix)

	Month												
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Quality Guideline or Objective	SO4	309	309	309	309	309	309	309	309	309	309	309	309
	N-NO2	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	N-NO3	3	3	3	3	3	3	3	3	3	3	3	3
	N-NH3	2.07	2.06	2.07	2.08	2.07	1.89	1.92	1.83	1.90	2.05	2.08	2.08
	WADCN	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	T-As	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	D-Al	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	D-Cd	0.00022	0.00023	0.00026	0.00030	0.00019	0.00022	0.00026	0.00023	0.00021	0.00024	0.00025	0.00024
	T-Co	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	T-Cr	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	T-Cu	0.004	0.004	0.005	0.007	0.003	0.004	0.005	0.005	0.004	0.005	0.005	0.005
	T-Fe	1	1	1	1	1	1	1	1	1	1	1	1
	D-Fe	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
	T-Mn	1.06	1.10	1.19	1.33	0.98	1.07	1.17	1.10	1.04	1.14	1.15	1.13
Water Quality Estimate	T-Zn	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
	SO4	24	31	47	70	25	43	46	33	27	44	35	26
	N-NO2	0.001	0.002	0.002	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	N-NO3	0.132	0.142	0.148	0.158	0.058	0.076	0.067	0.097	0.108	0.131	0.152	0.162
	N-NH3	0.161	0.154	0.179	0.275	0.040	0.052	0.063	0.041	0.034	0.072	0.065	0.039
	WADCN	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	T-As	0.001	0.001	0.003	0.005	0.008	0.007	0.003	0.002	0.003	0.002	0.001	0.001
	D-Al	0.006	0.006	0.005	0.015	0.072	0.051	0.017	0.019	0.026	0.021	0.011	0.007
	D-Cd	0.00003	0.00004	0.00005	0.00010	0.00005	0.00003	0.00002	0.00002	0.00003	0.00003	0.00003	0.00002
	T-Co	0.0002	0.0002	0.0004	0.0009	0.0015	0.0008	0.0004	0.0003	0.0006	0.0003	0.0002	0.0002
	T-Cr	0.0002	0.0002	0.0002	0.0012	0.0032	0.0016	0.0006	0.0004	0.0016	0.0008	0.0003	0.0002
	T-Cu	0.0009	0.0010	0.0011	0.0022	0.0067	0.0045	0.0022	0.0020	0.0033	0.0019	0.0013	0.0011
	T-Fe	0.16	0.28	0.60	1.63	3.60	2.66	0.70	0.50	1.24	0.60	0.34	0.16
	D-Fe	0.11	0.21	0.51	0.75	0.22	0.18	0.13	0.09	0.10	0.19	0.16	0.09
	T-Mn	0.13	0.20	0.37	0.54	0.26	0.55	0.17	0.12	0.12	0.17	0.15	0.10
	T-Zn	0.002	0.003	0.004	0.008	0.021	0.013	0.005	0.005	0.009	0.005	0.004	0.003

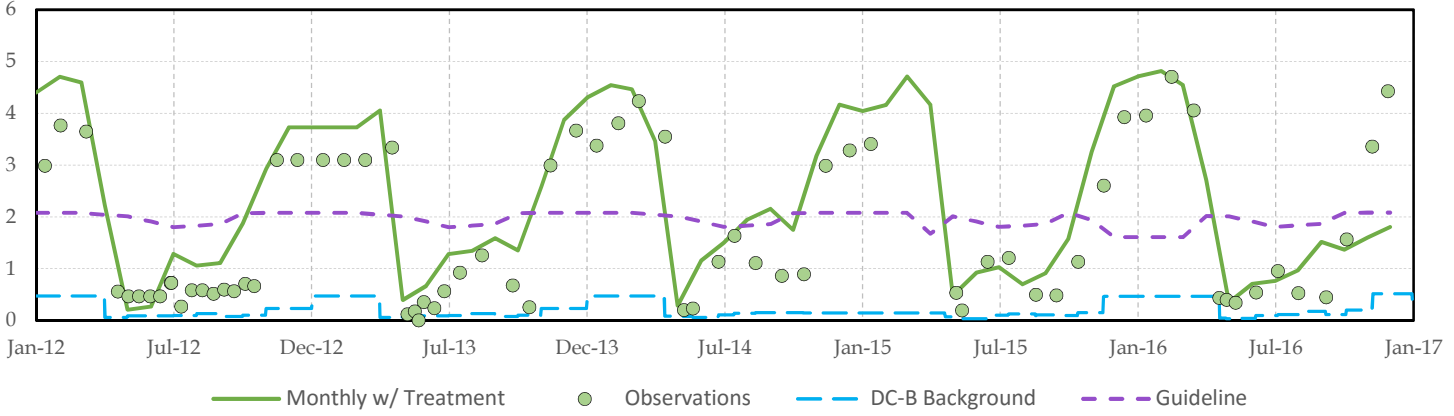
DC-U Sulfate



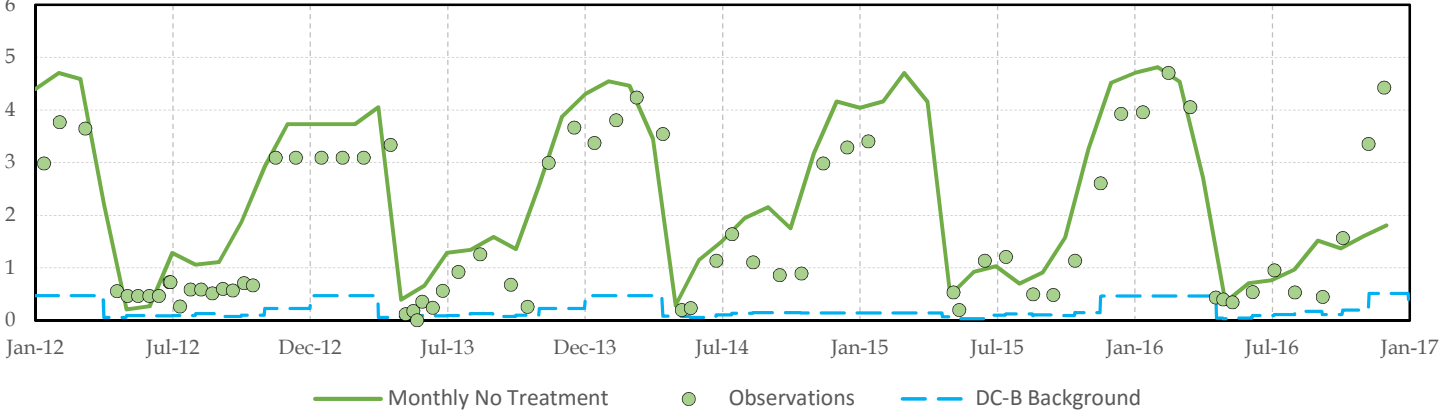
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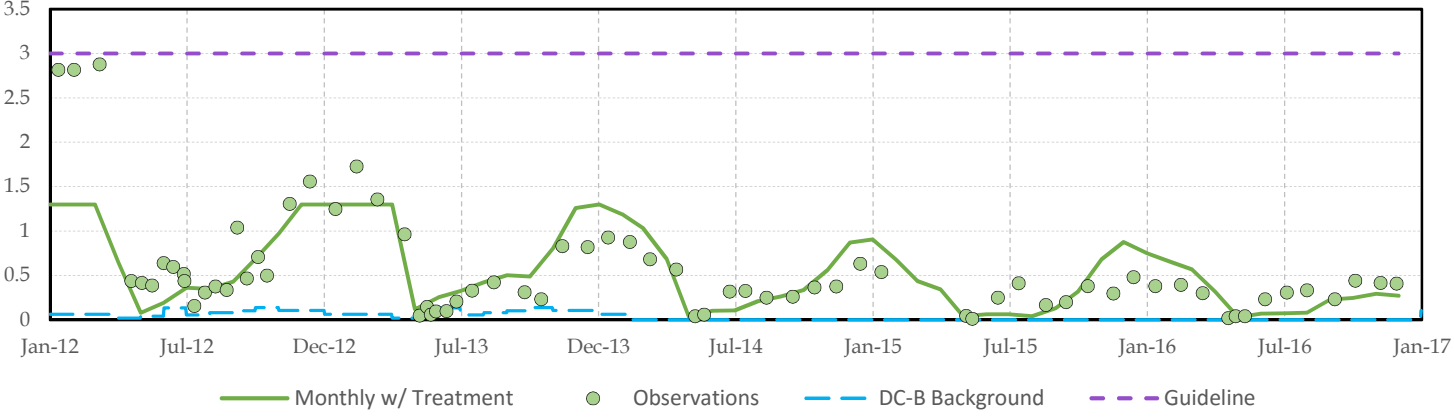
DC-U Ammonia



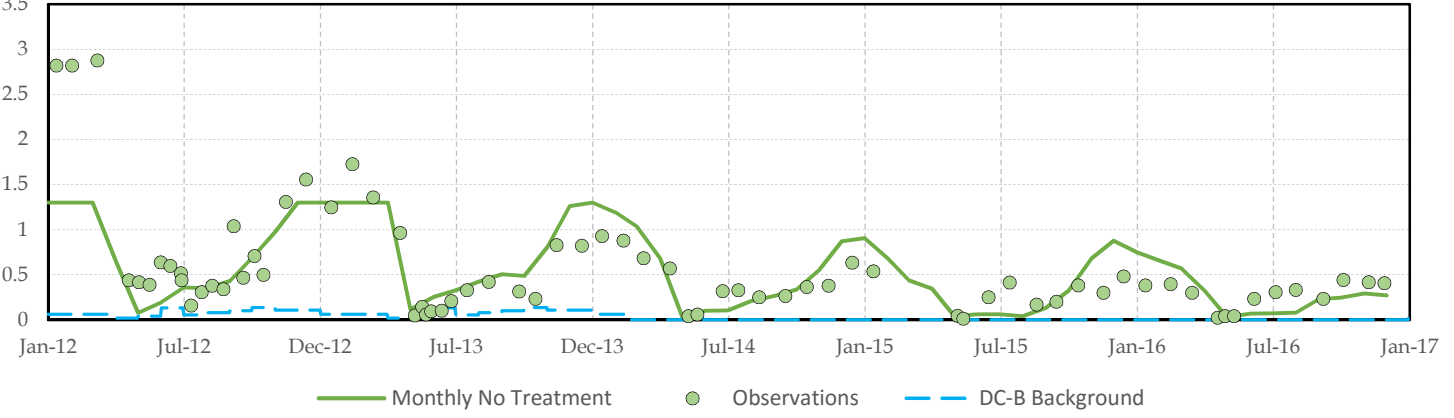
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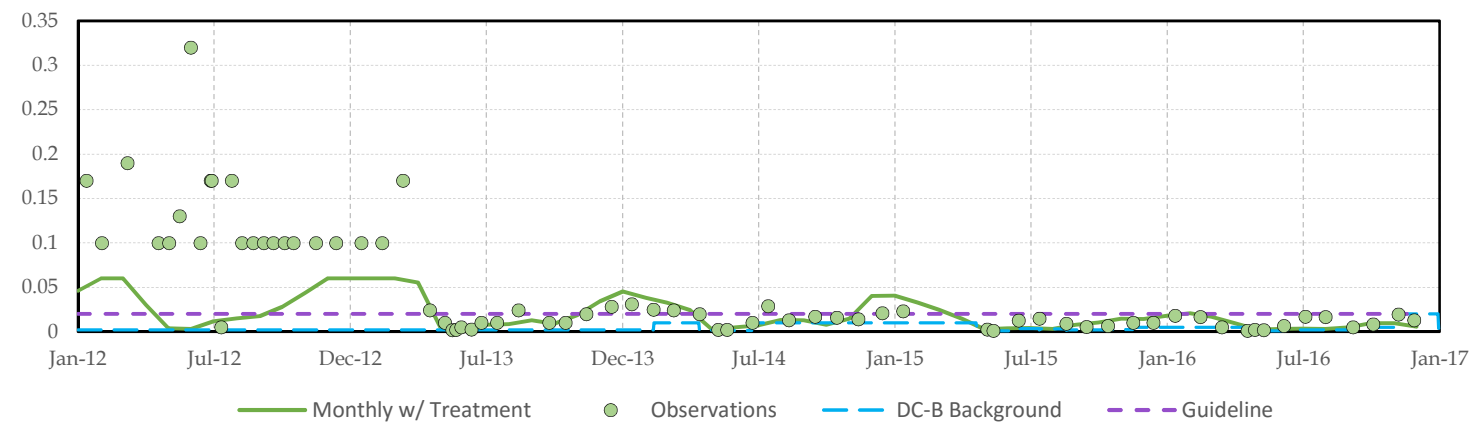
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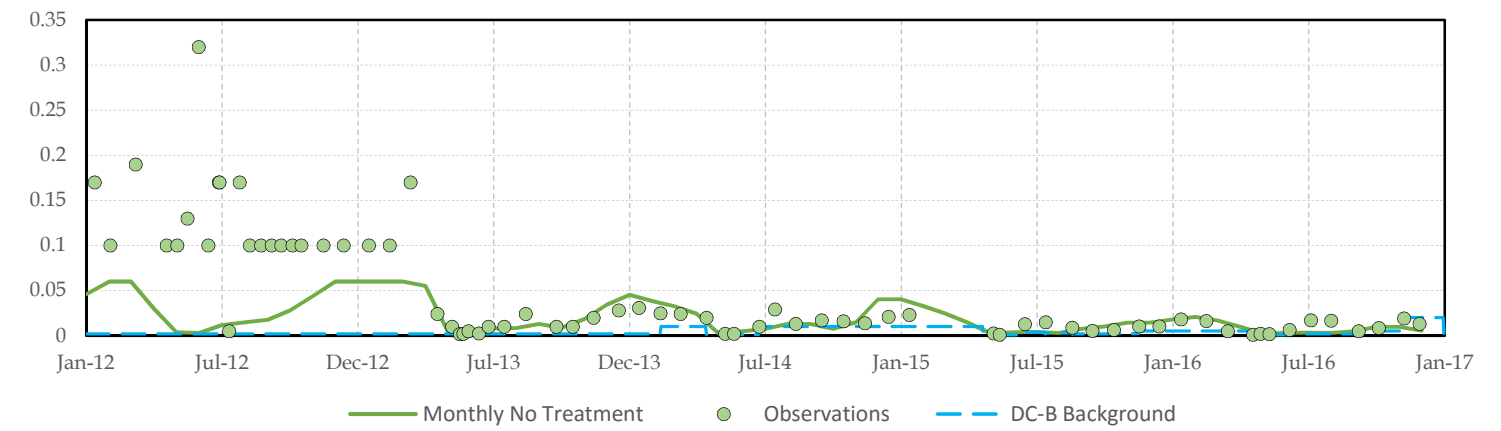
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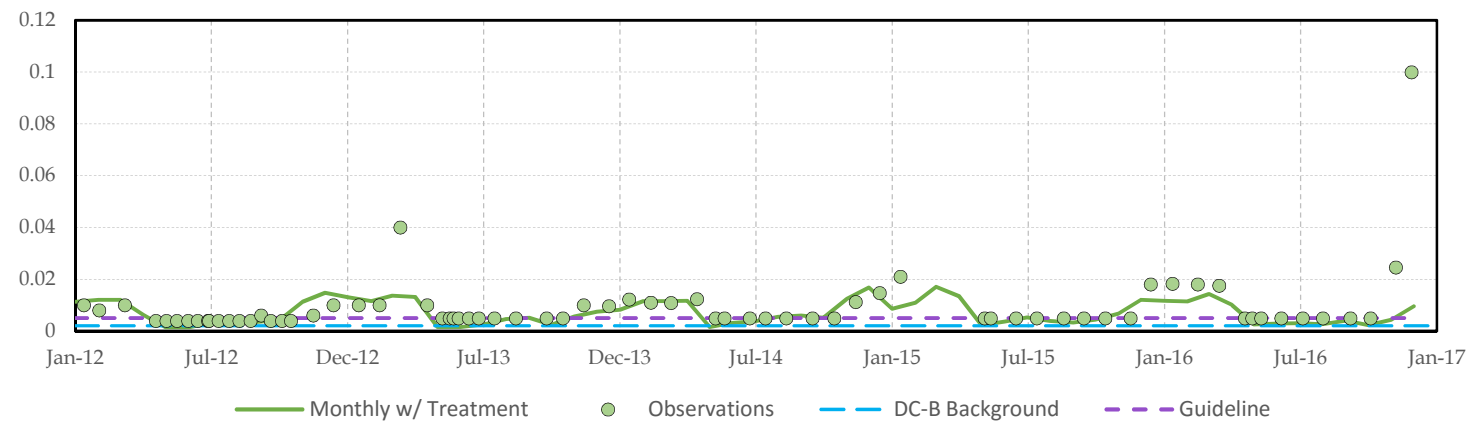
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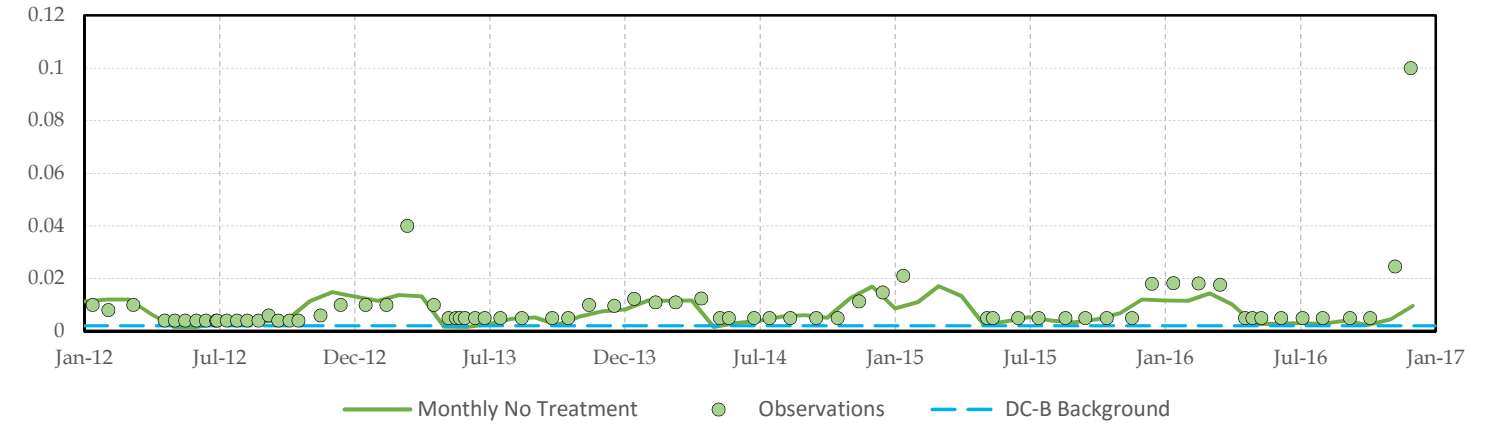
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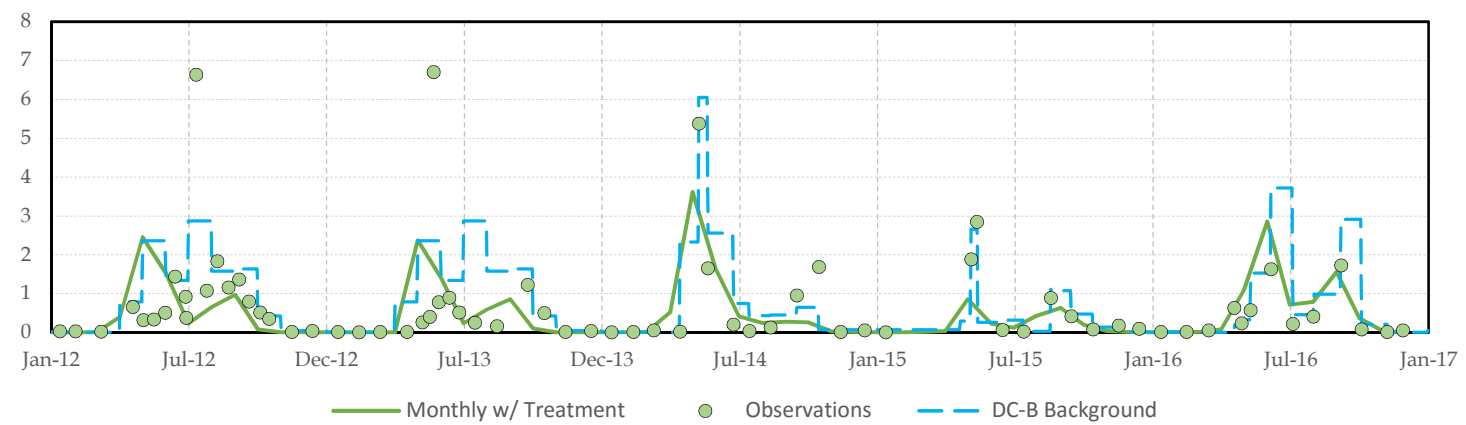
DC-U WADCN



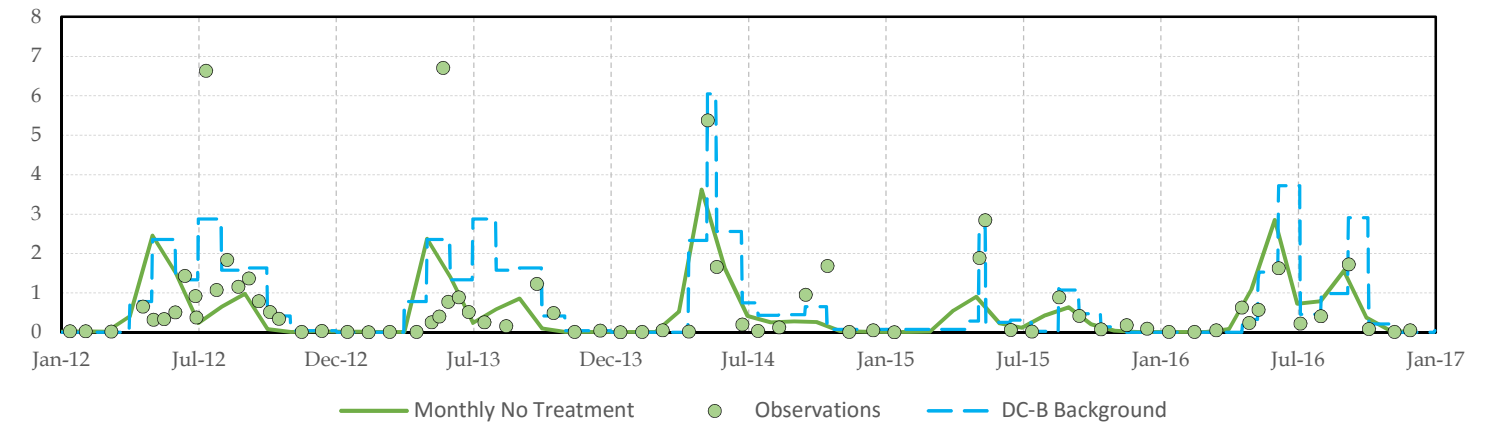
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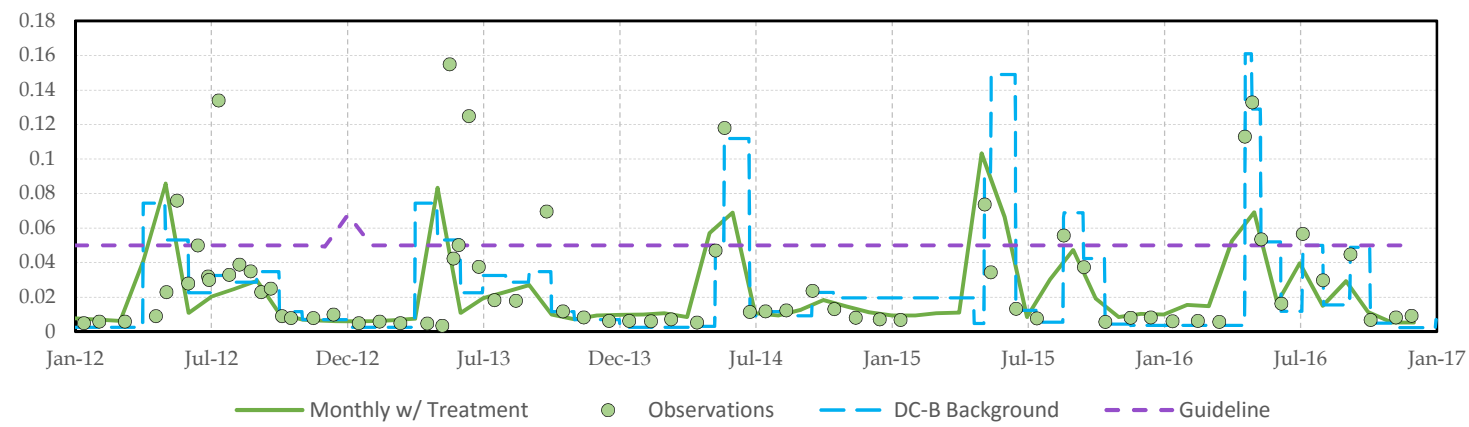
DC-U T-AI



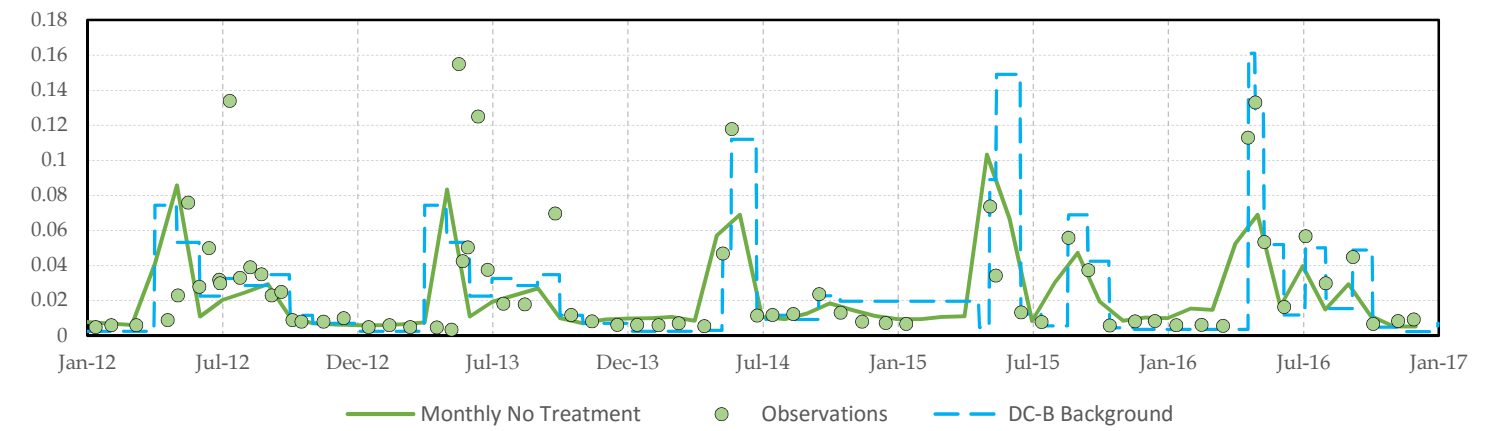
DC-U T-AI



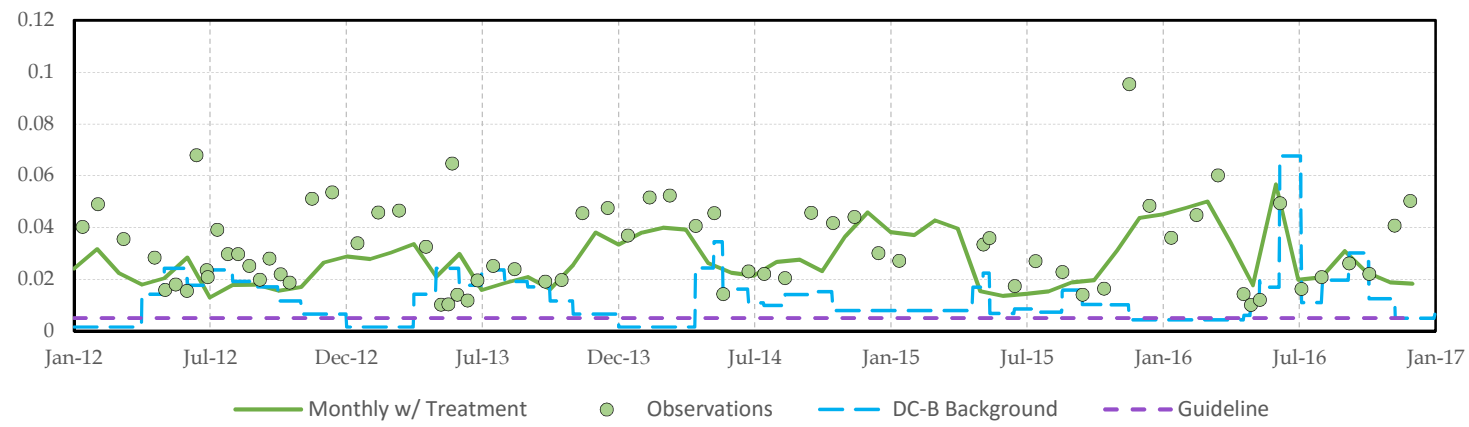
DC-U D-AI



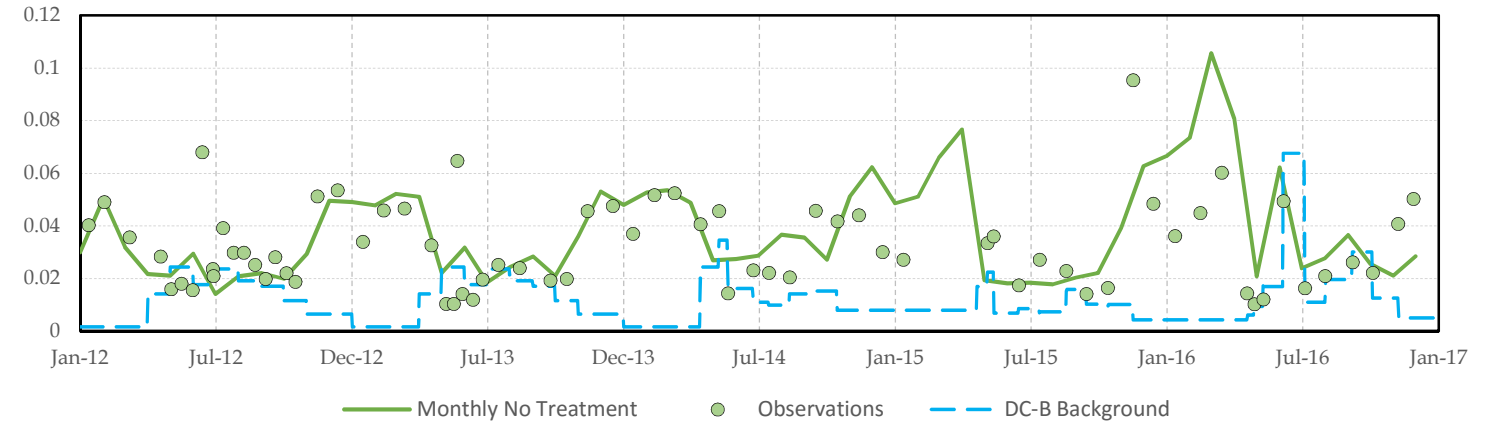
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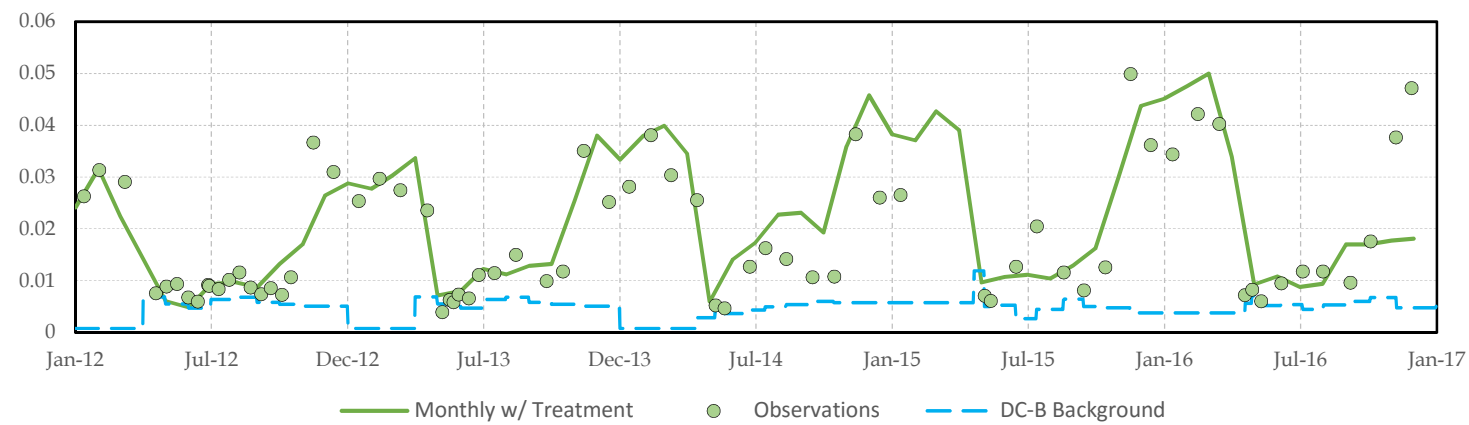
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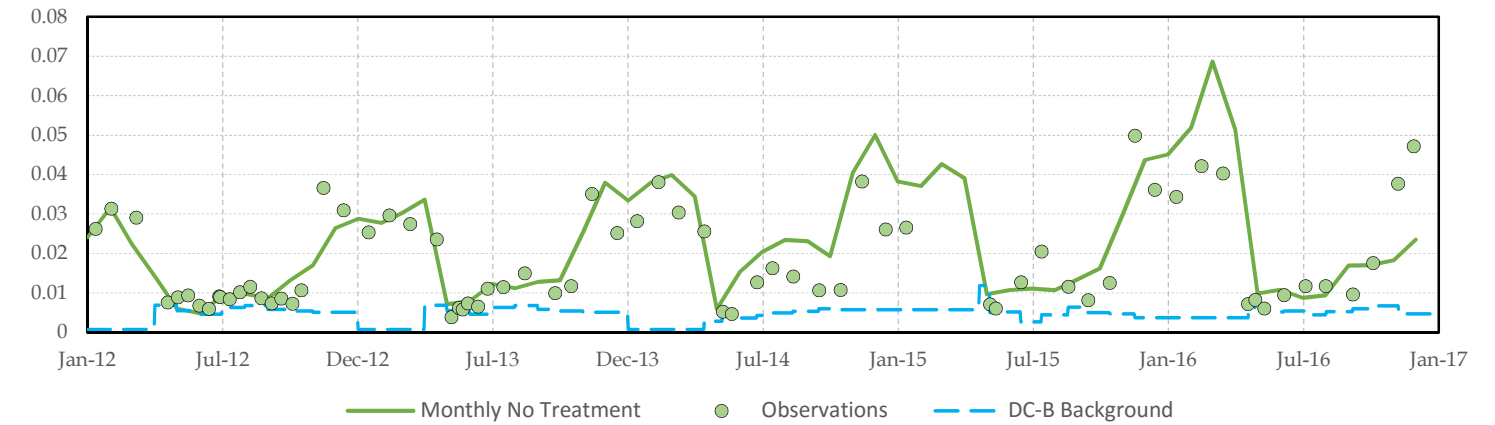
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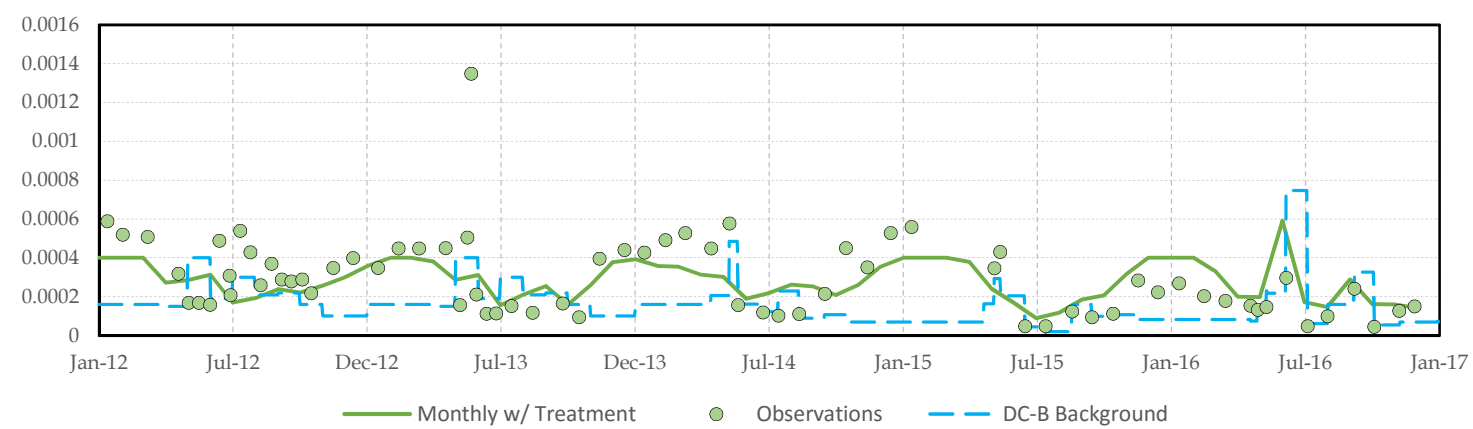
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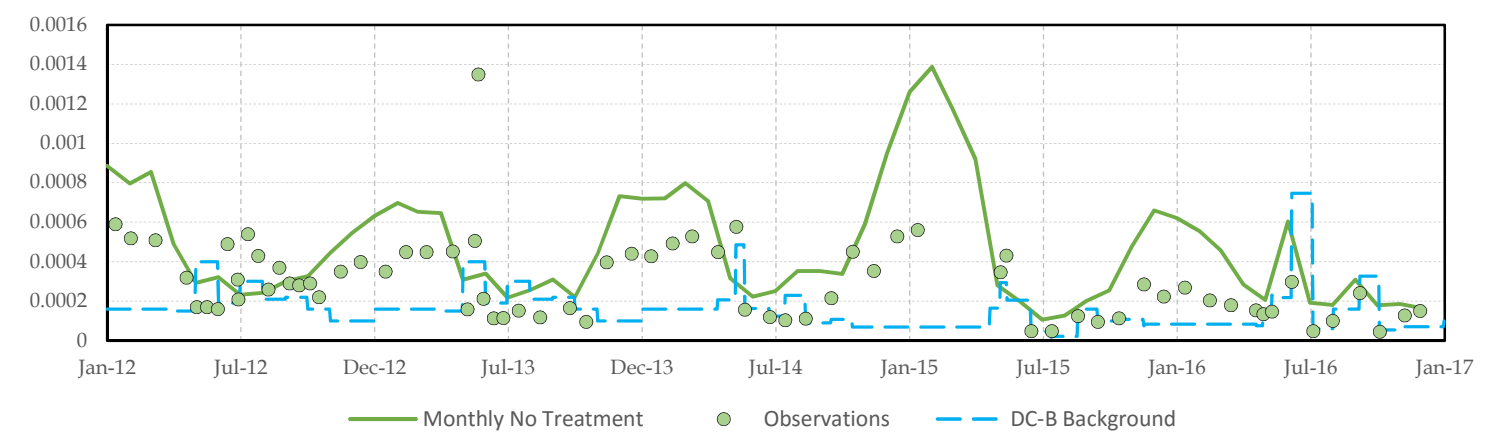
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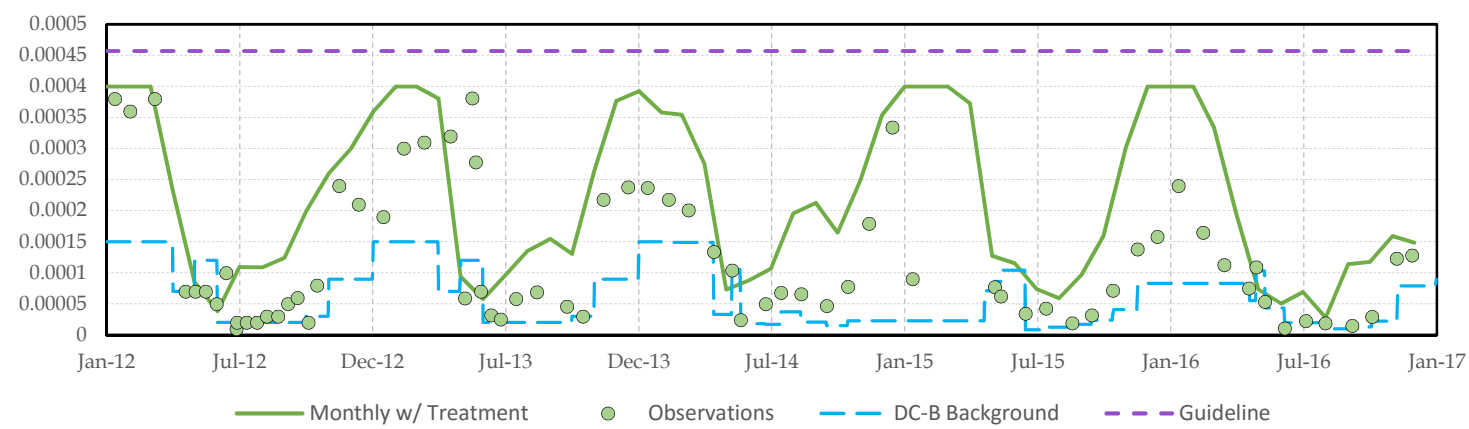
DC-U T-Cd



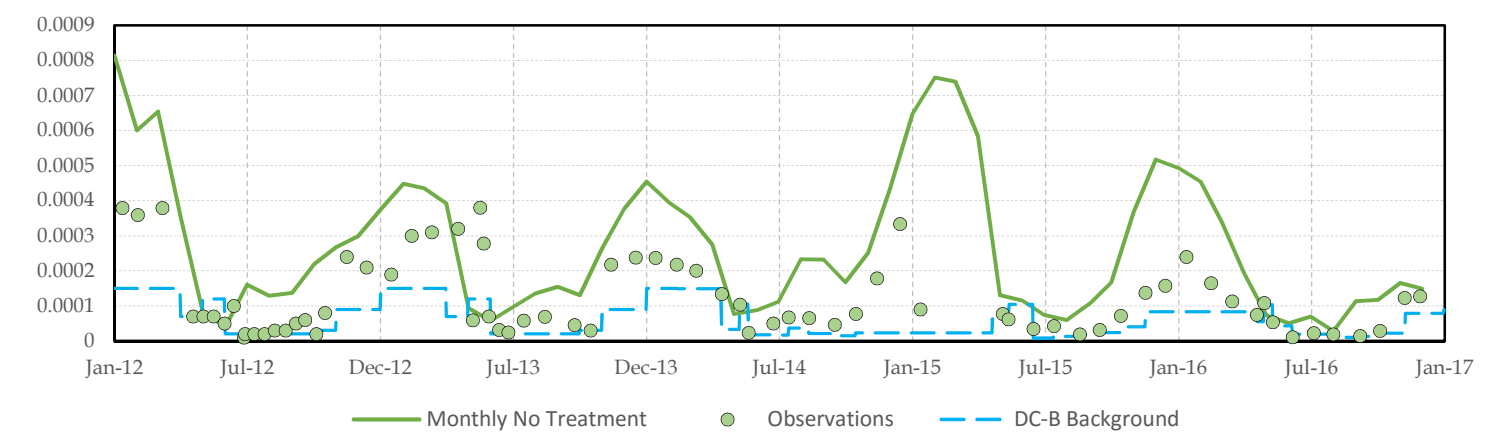
DC-U T-Cd



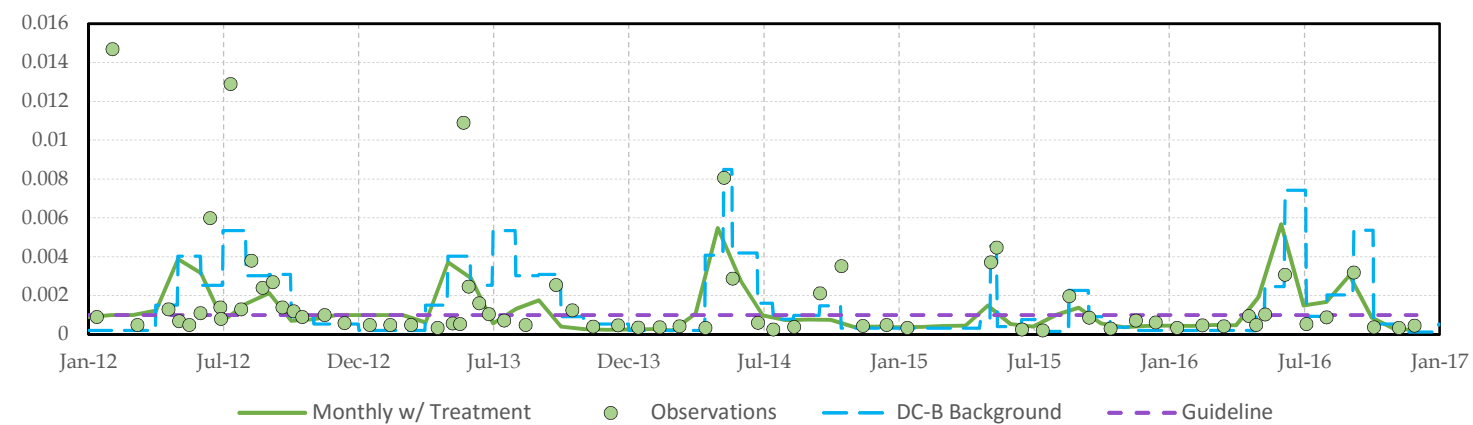
DC-U D-Cd



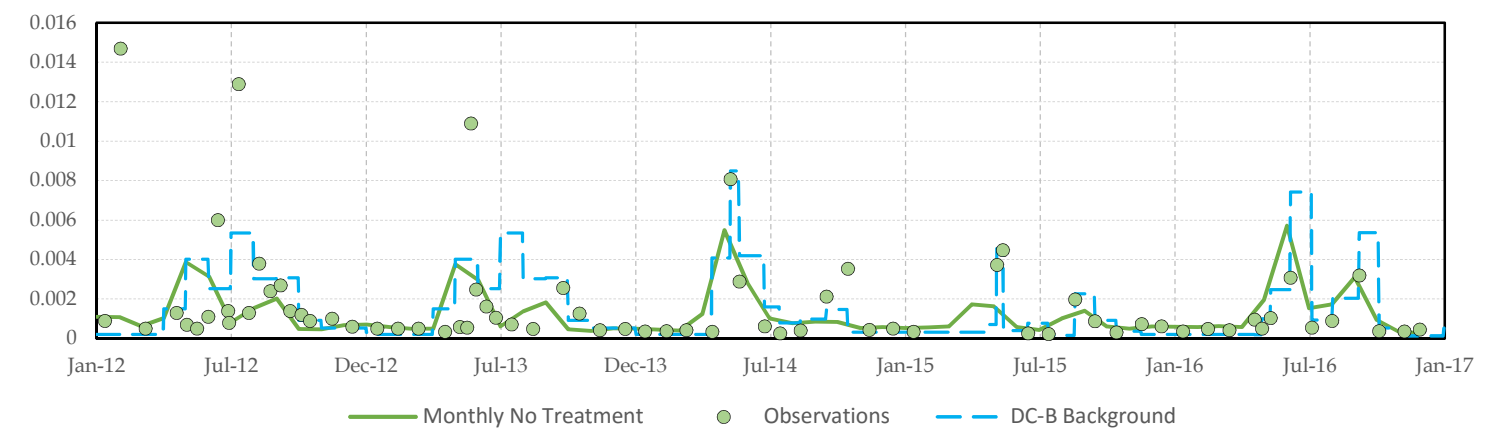
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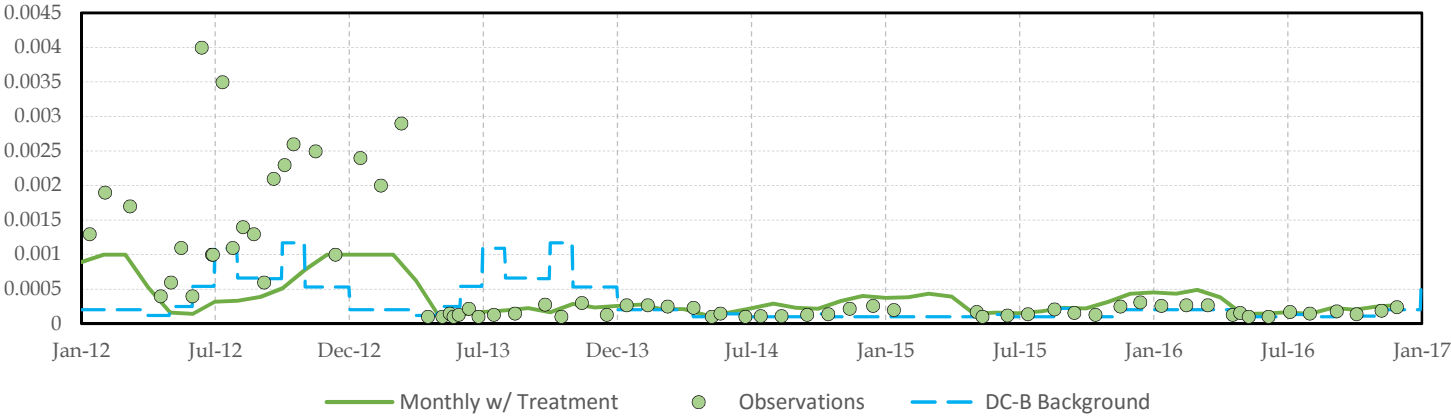
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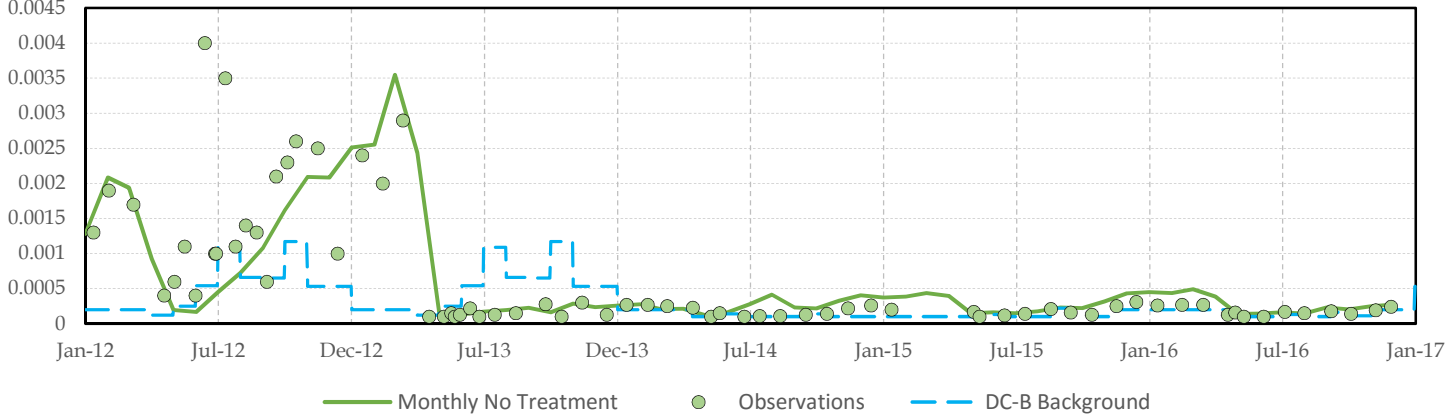
DC-U T-Cr



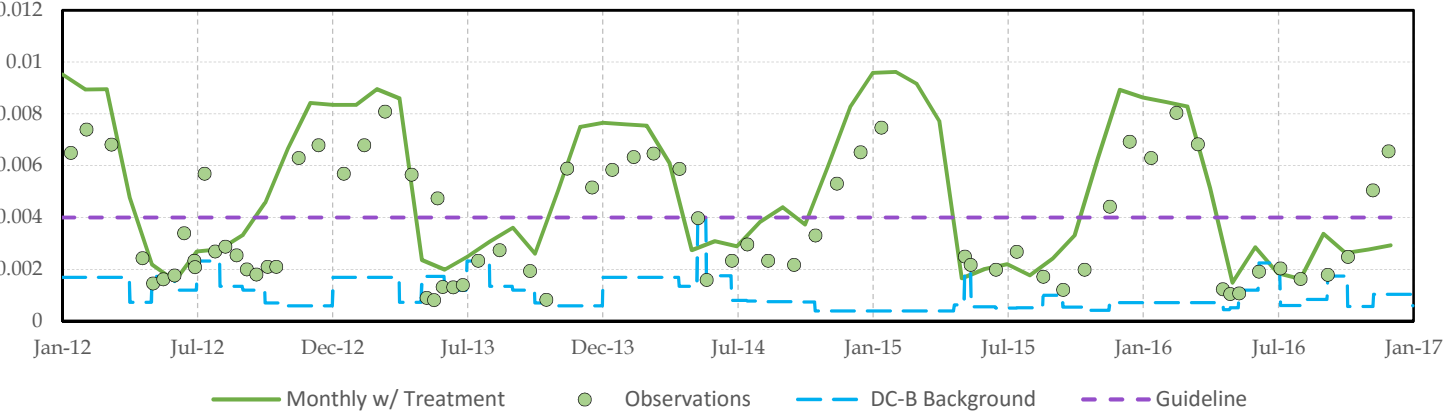
DC-U D-Cr



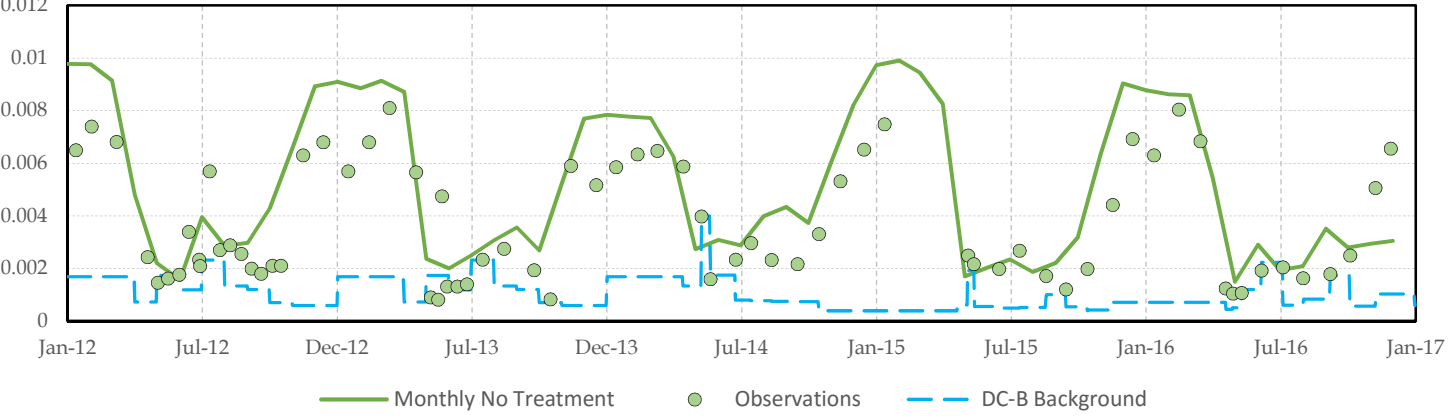
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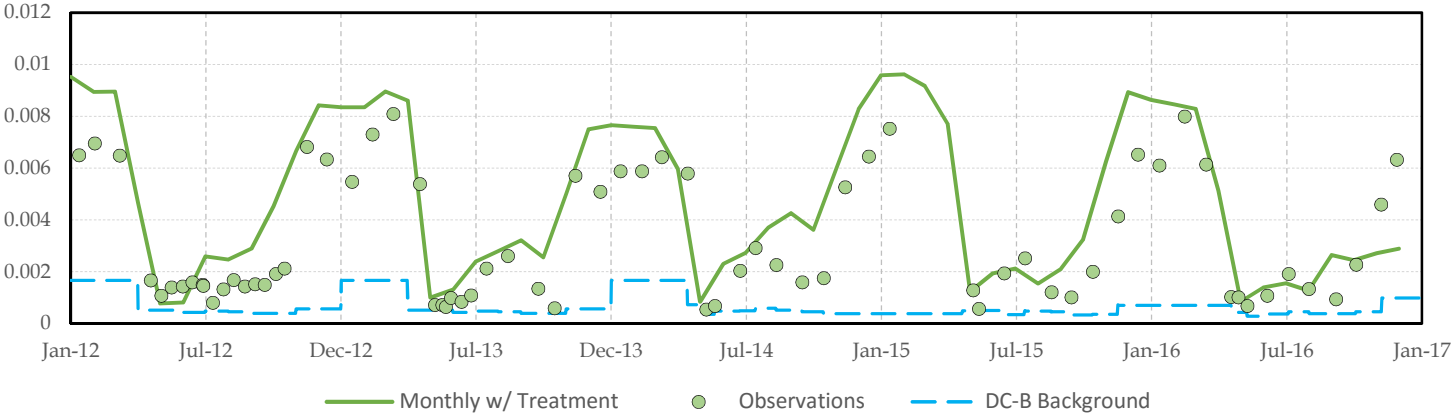
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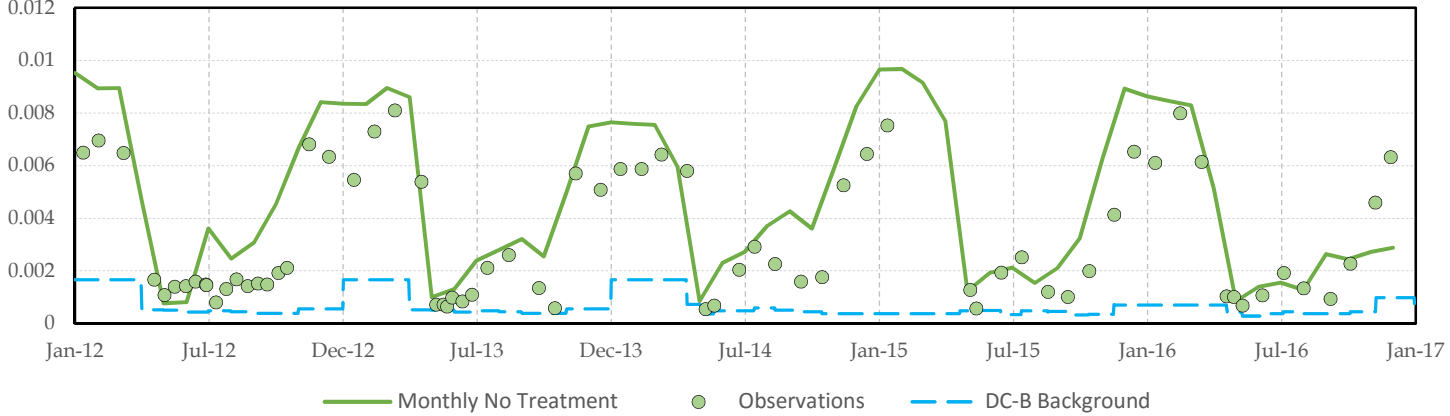
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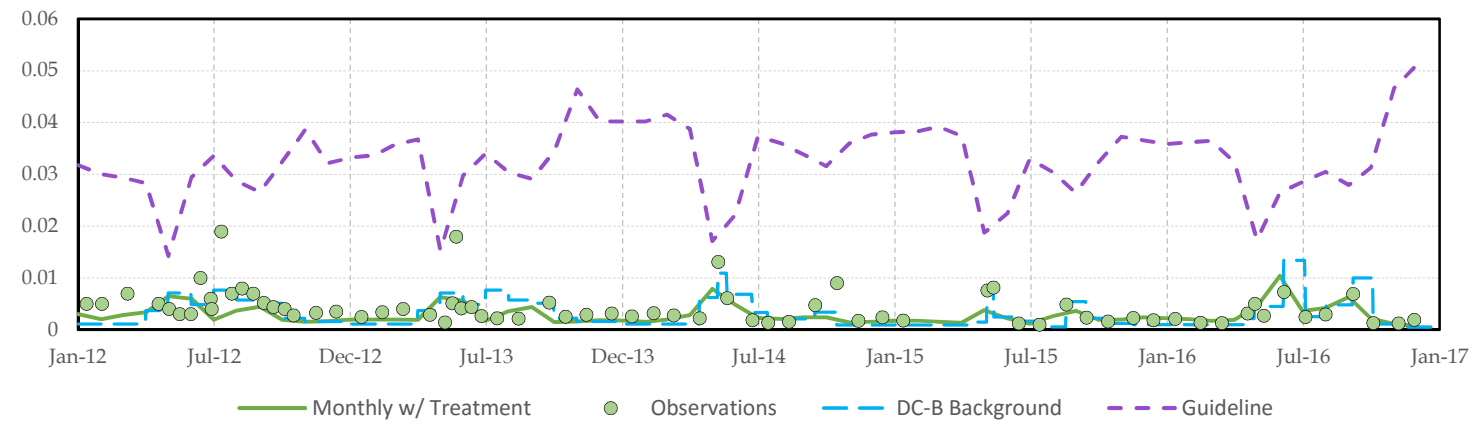
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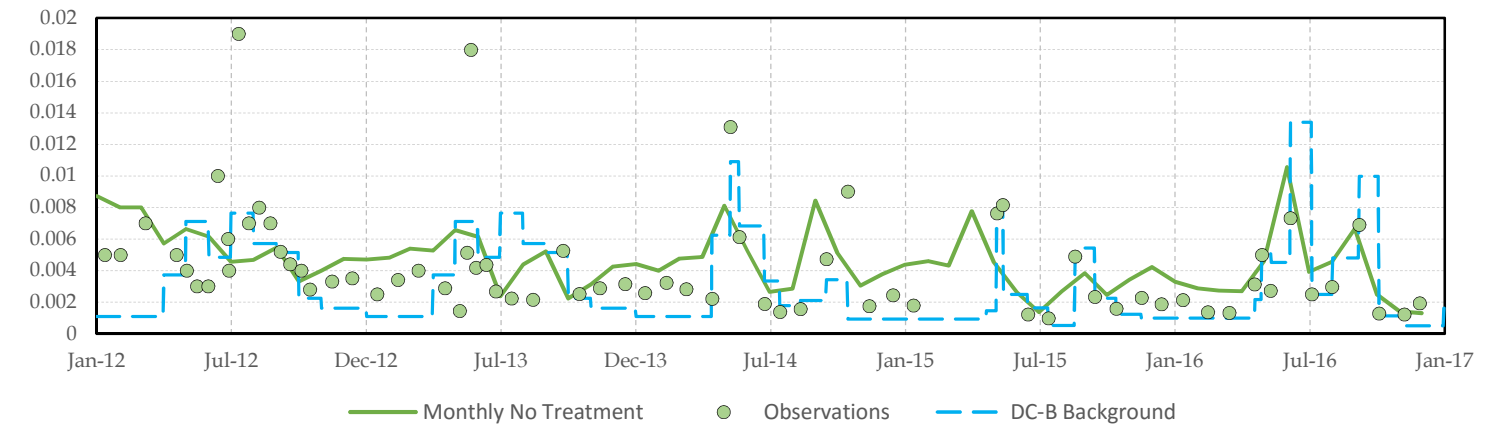
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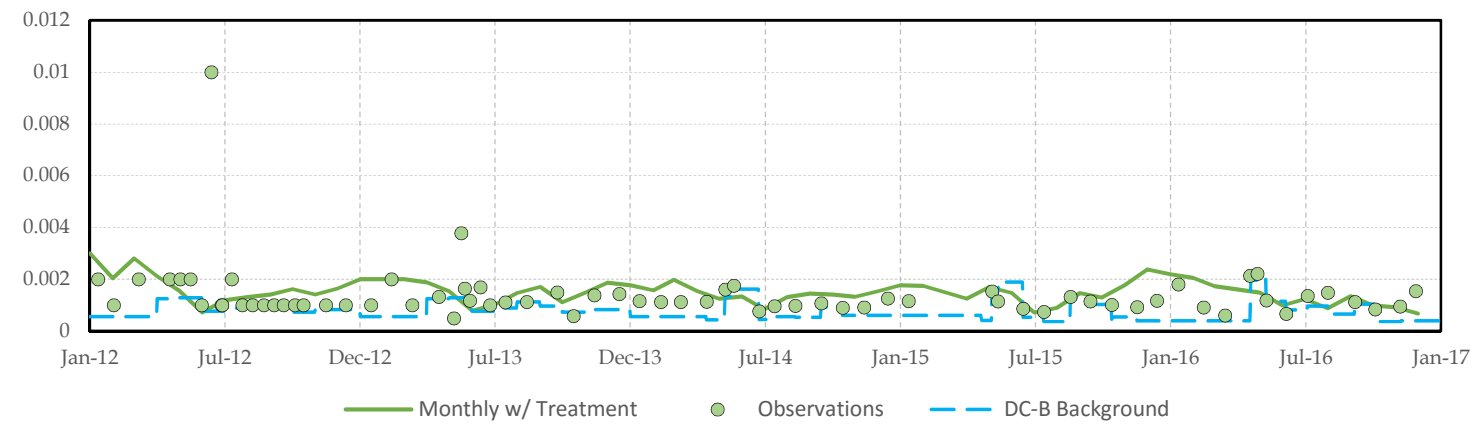
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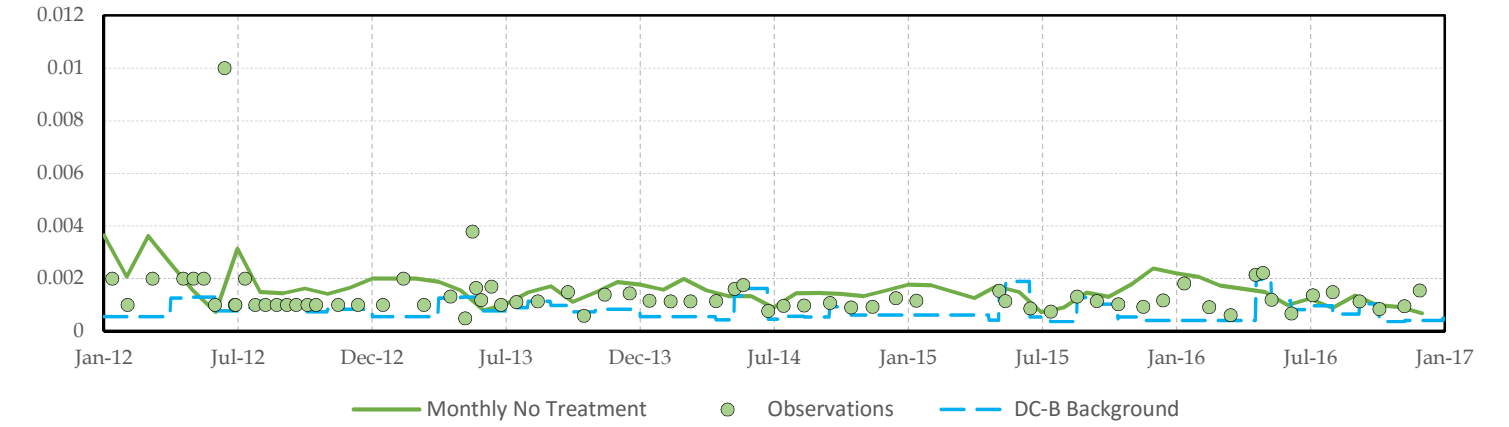
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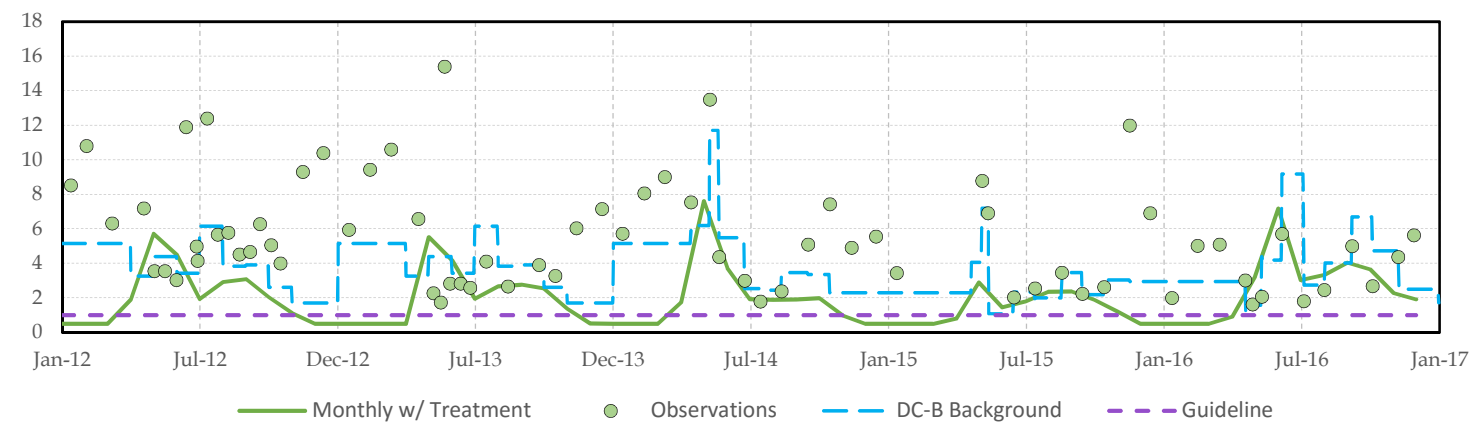
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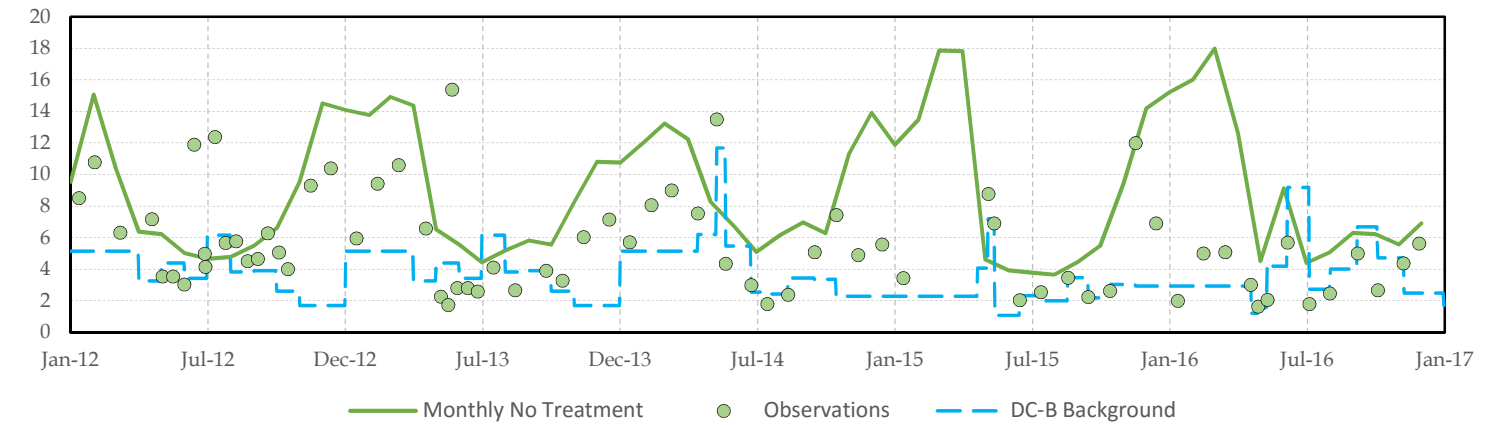
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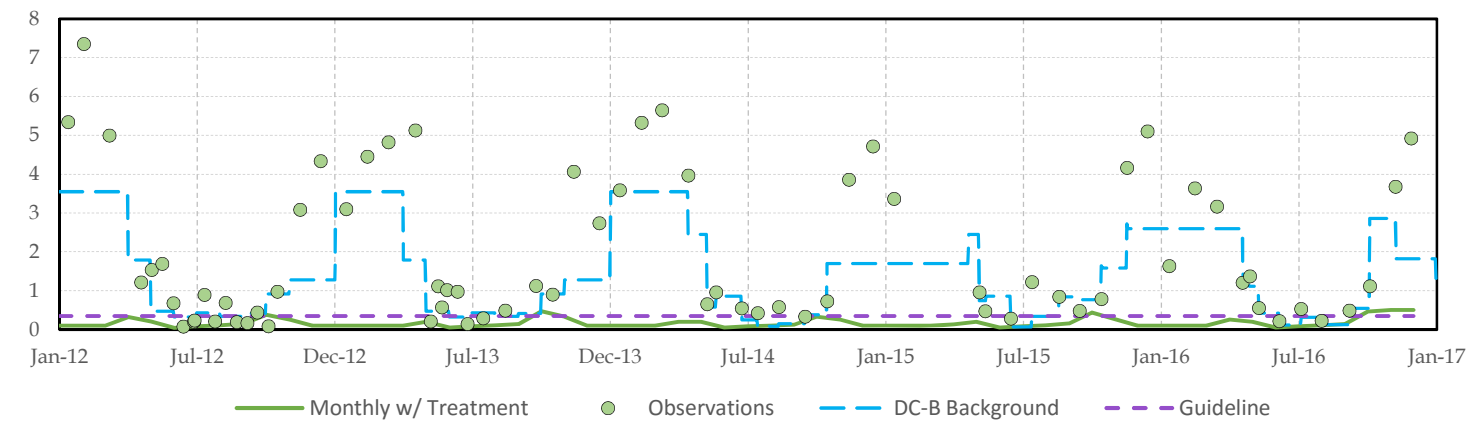
DC-U T-Fe



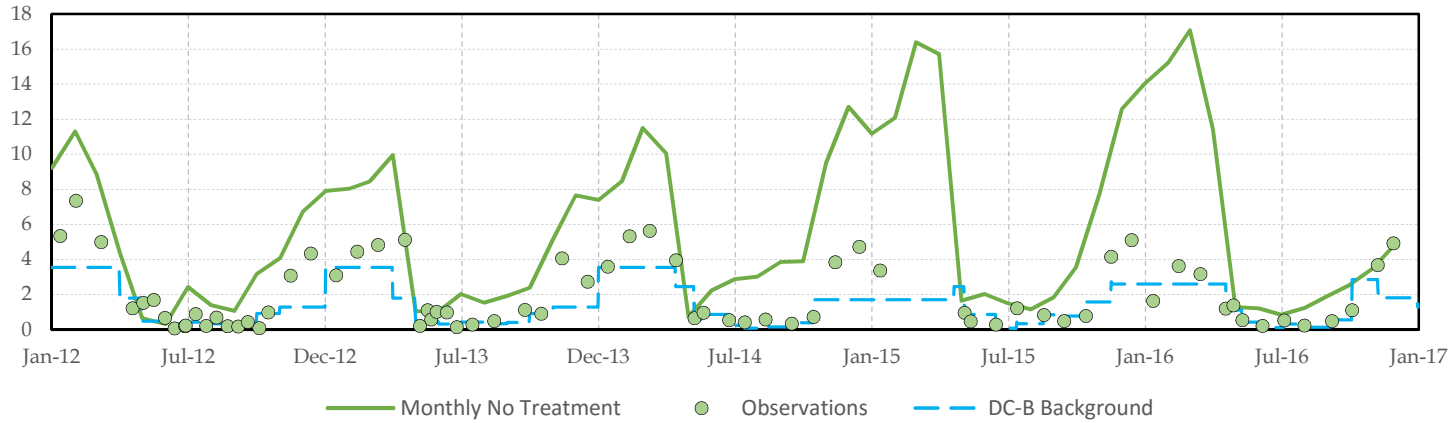
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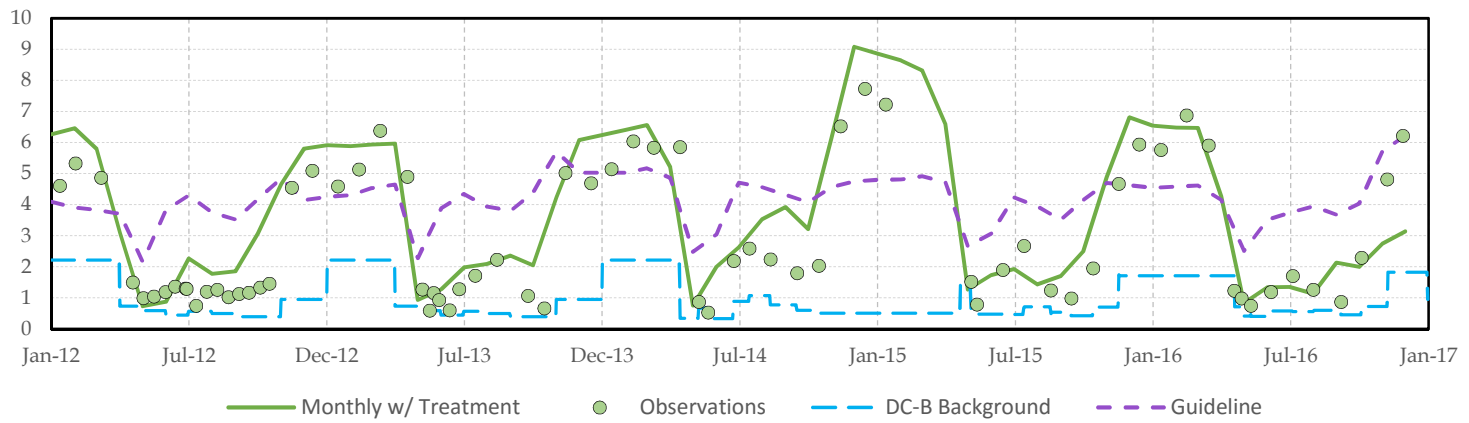
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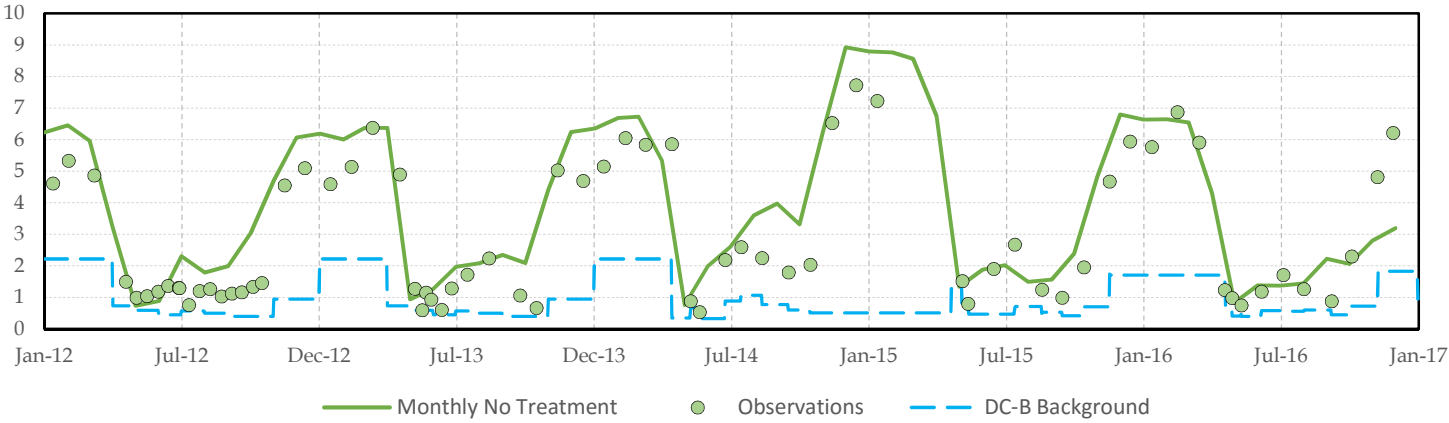
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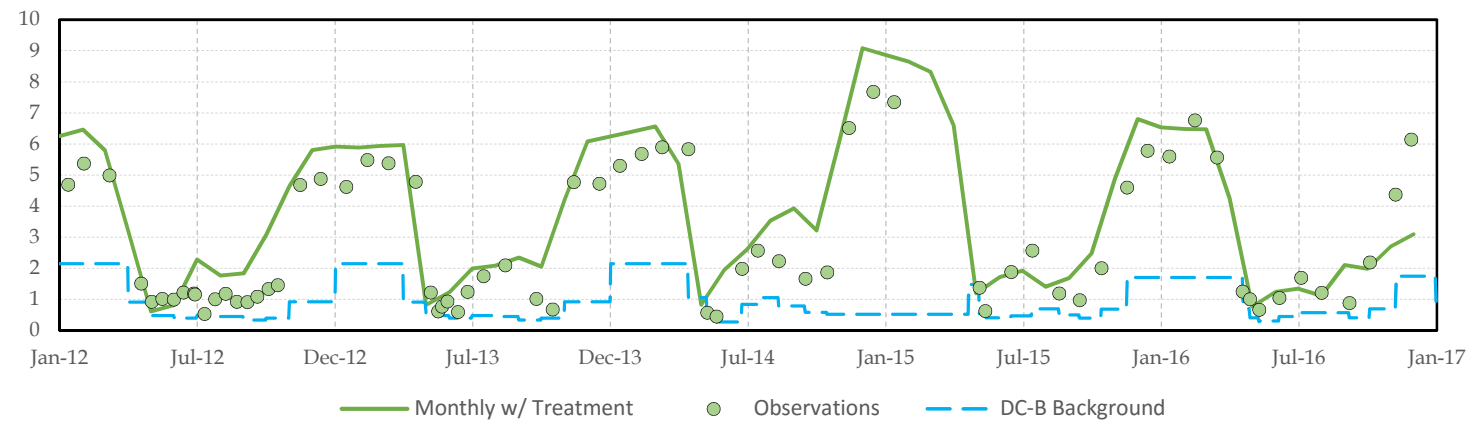
DC-U T-Mn



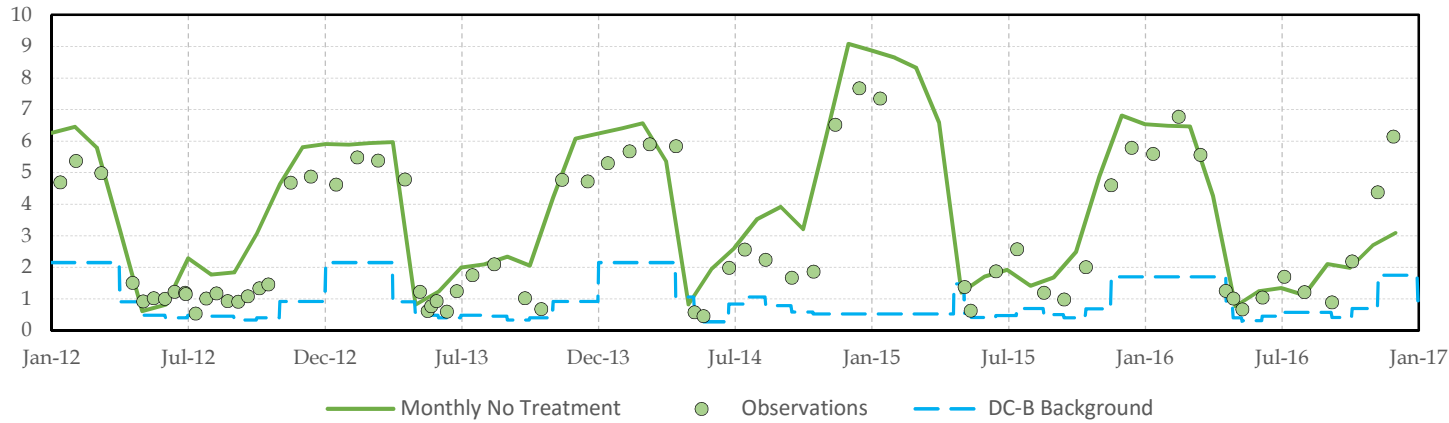
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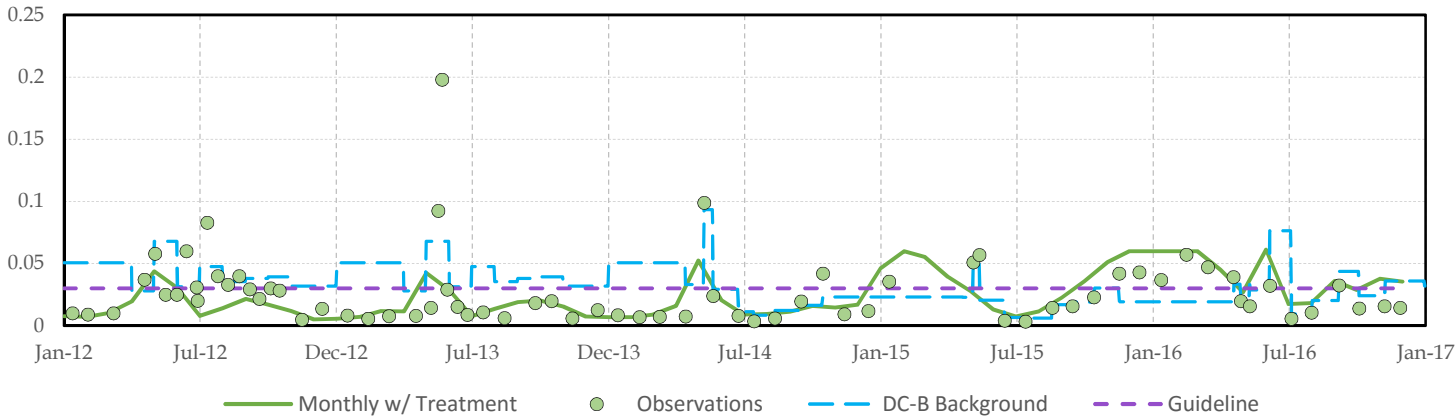
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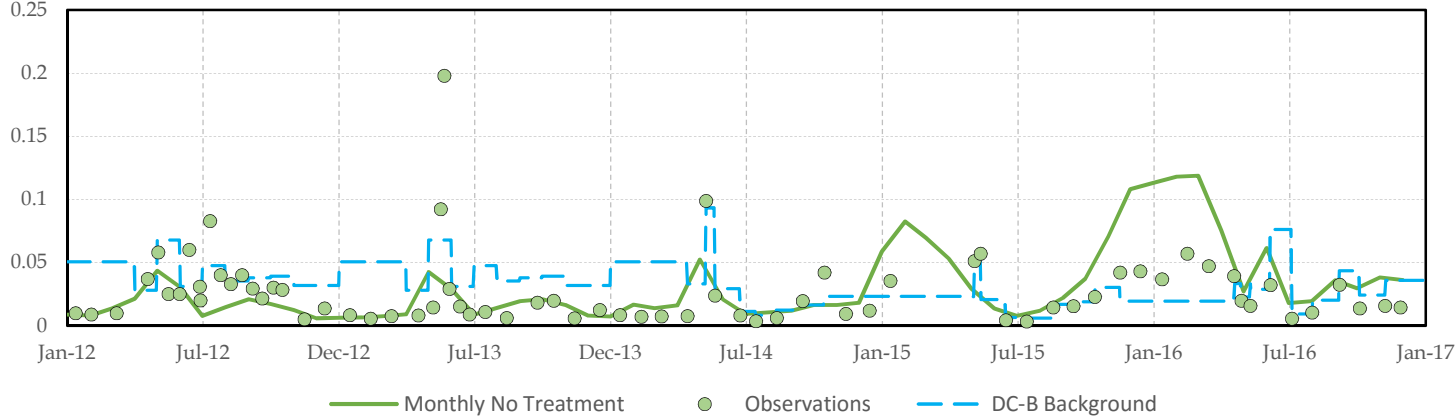
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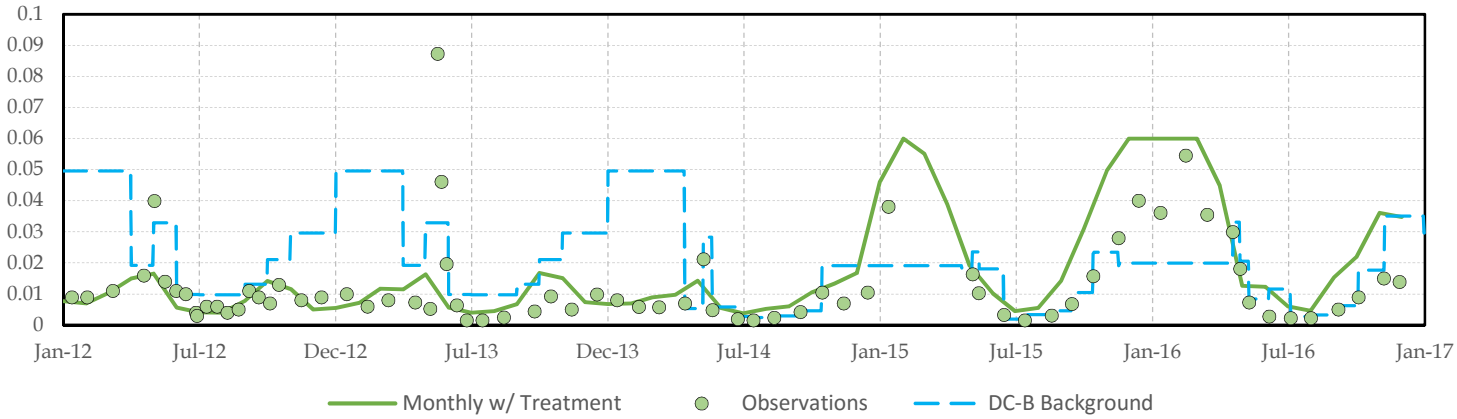
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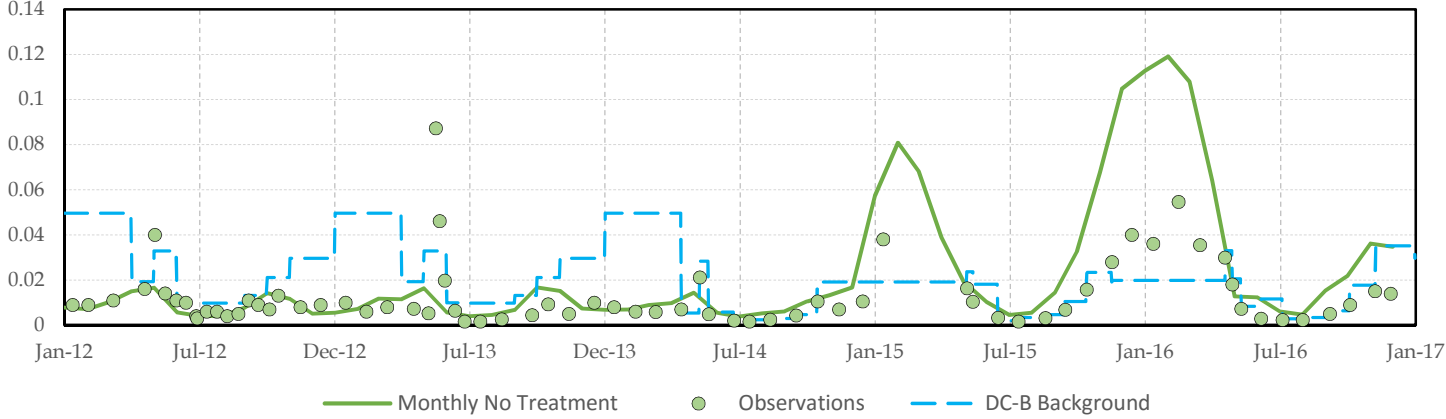
DC-U T-Zn



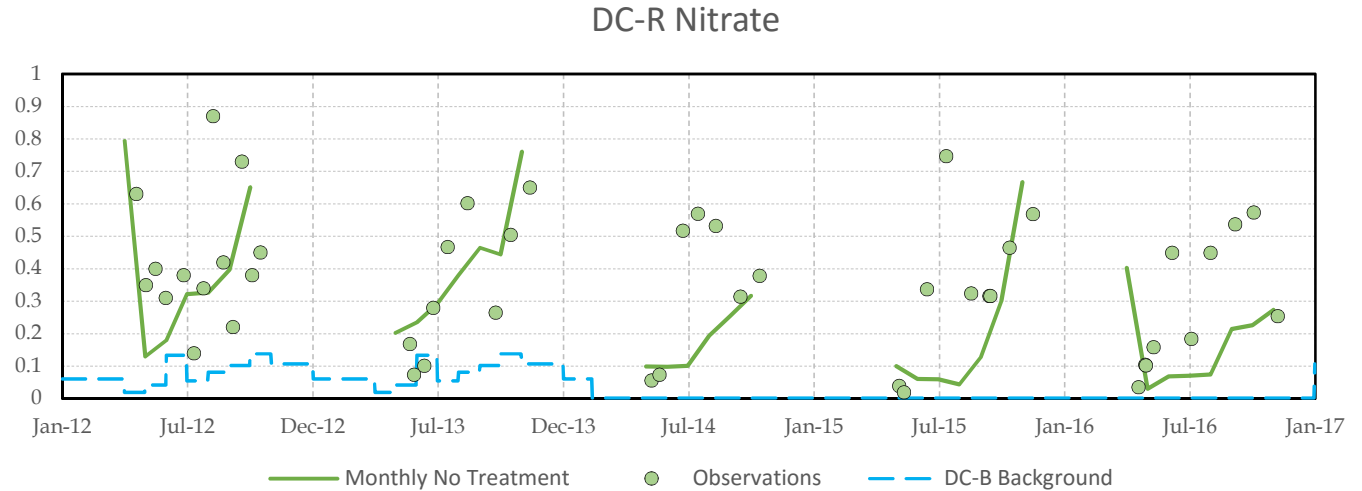
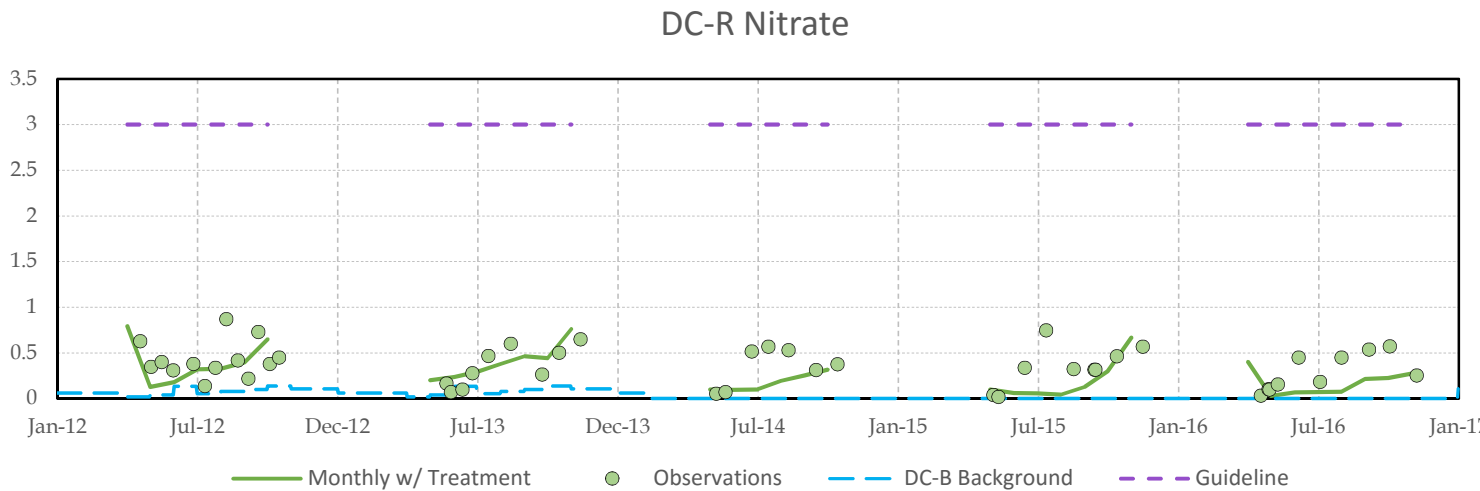
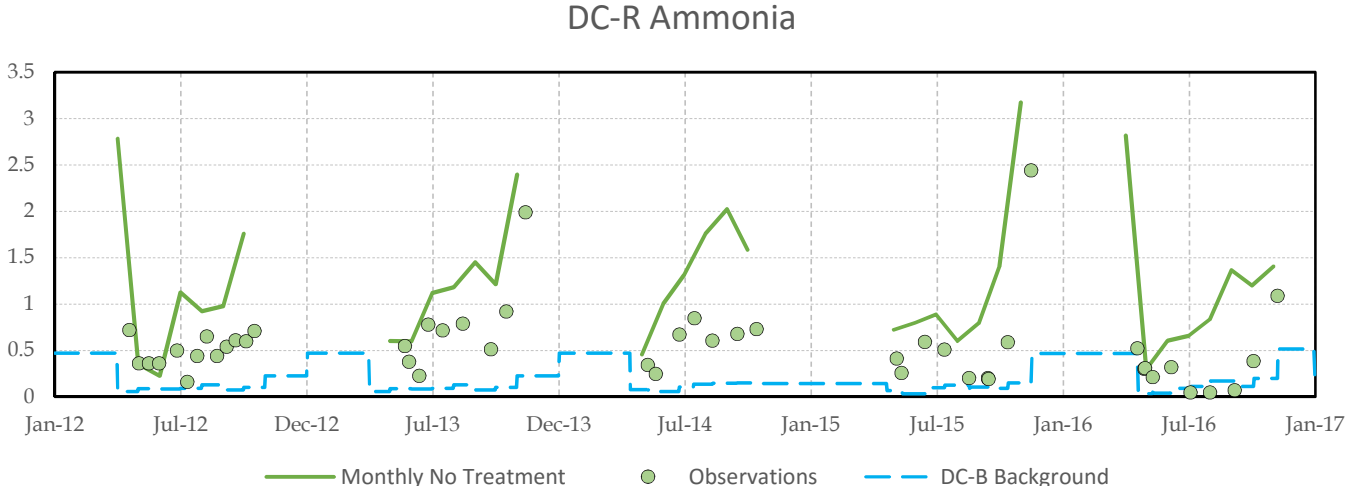
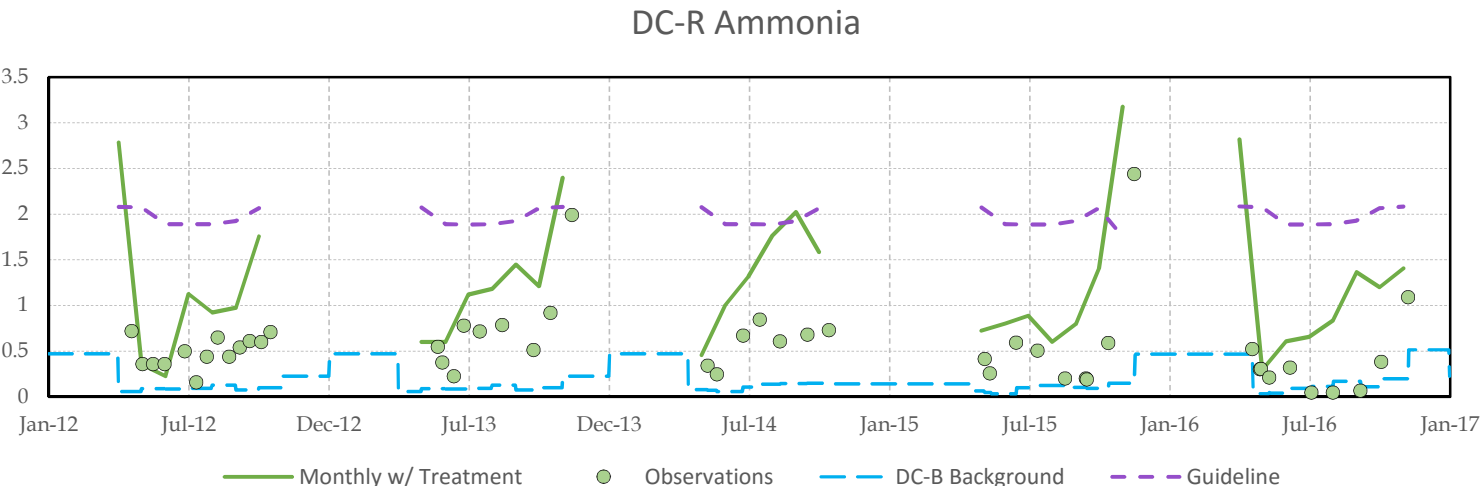
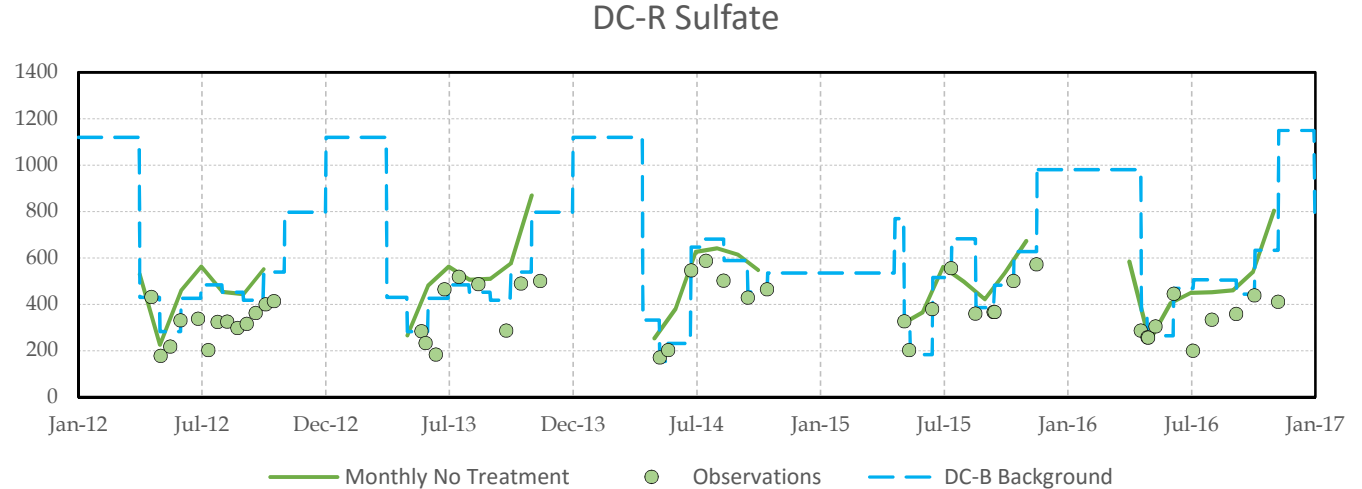
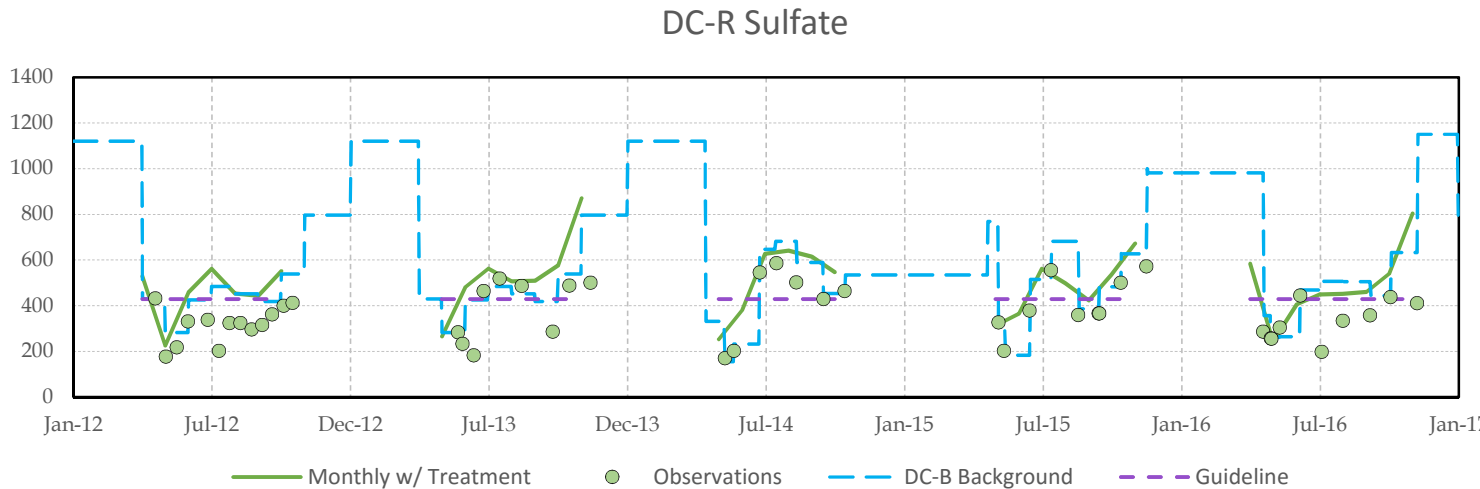
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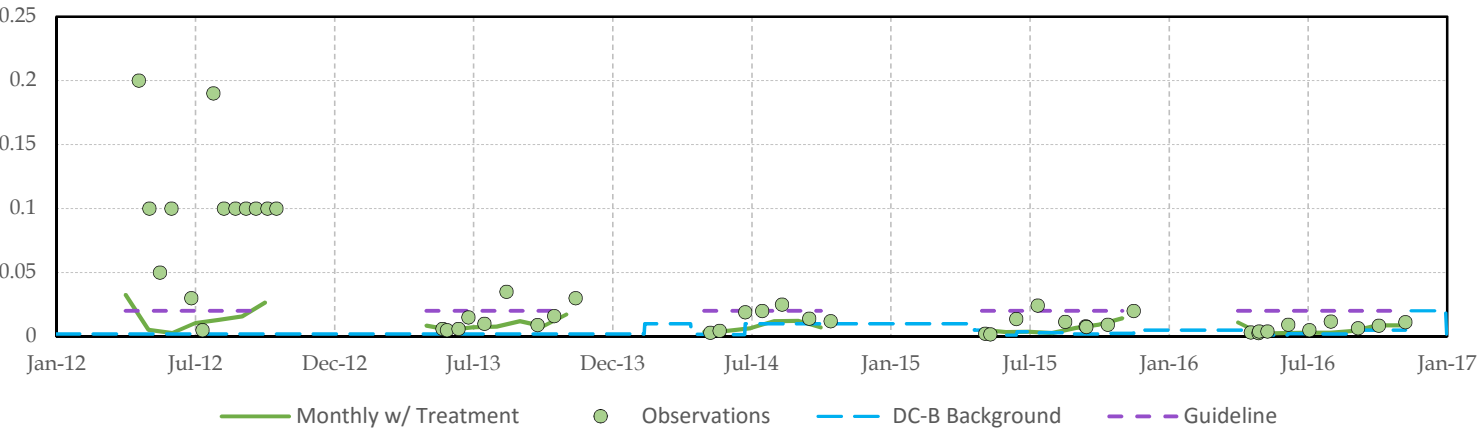
DC-U D-Zn



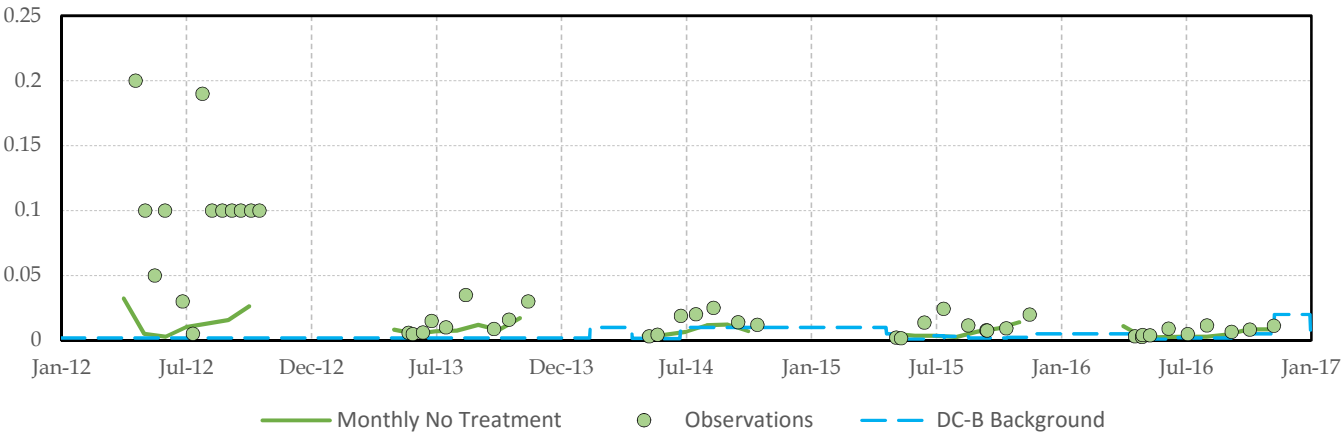
DC-R



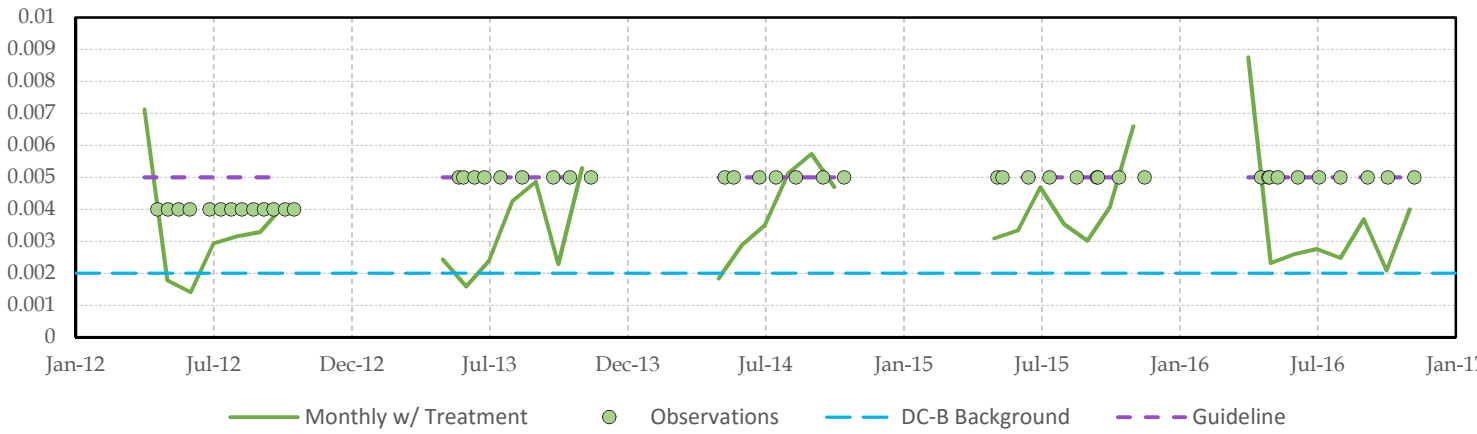
DC-R Nitrite



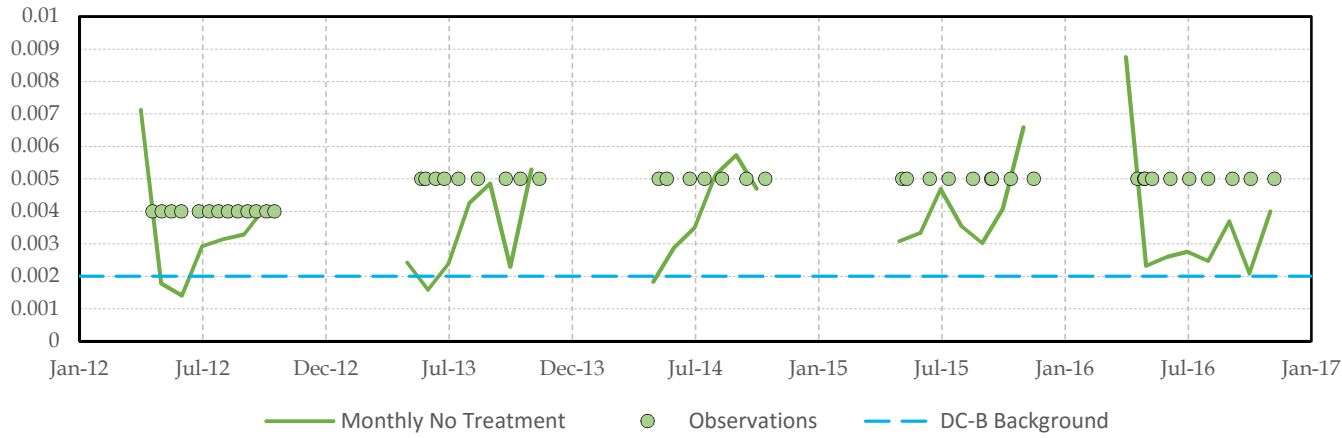
DC-R Nitrite



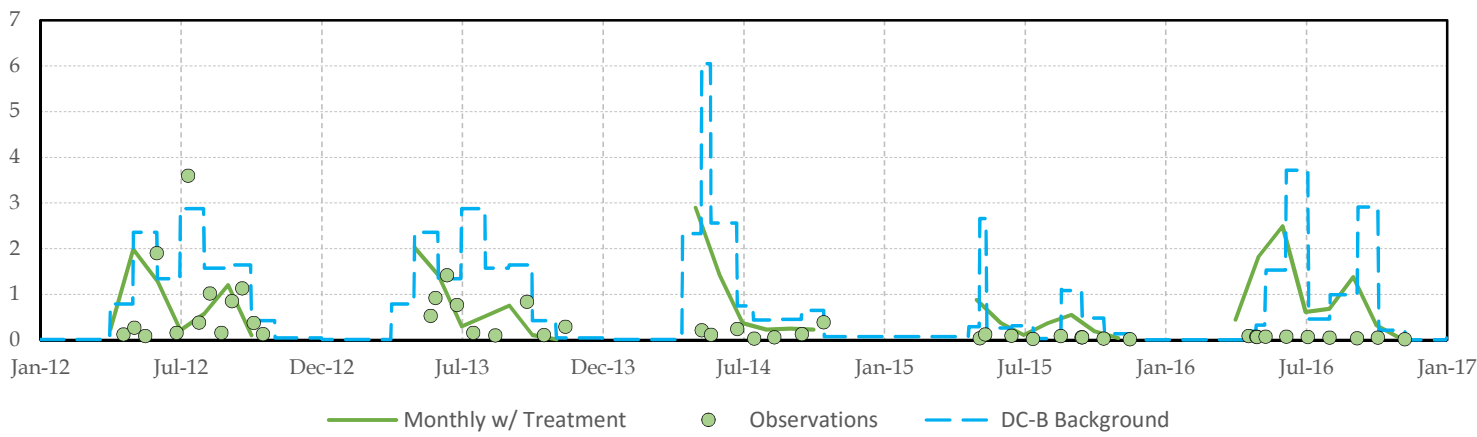
DC-R WADCN



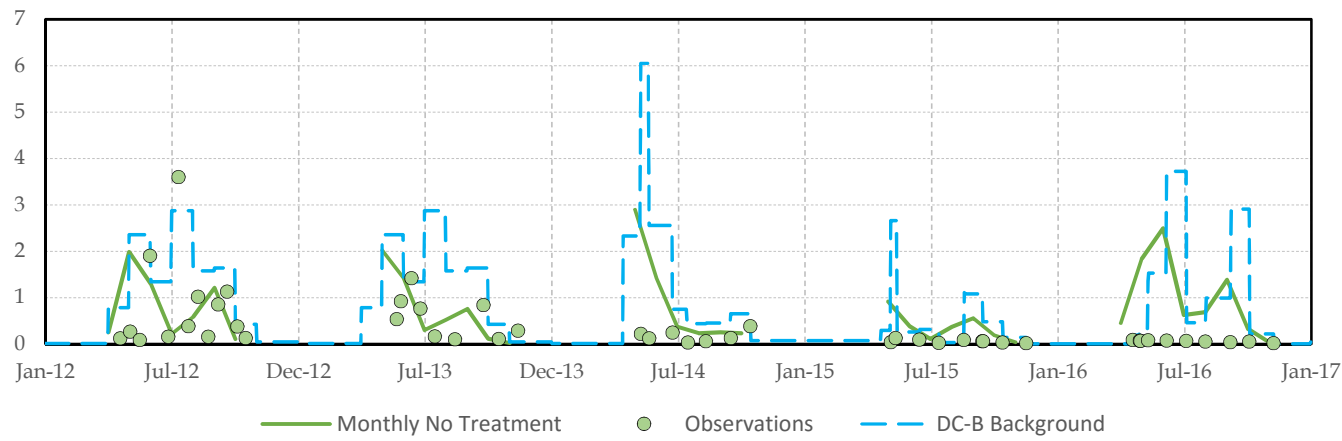
DC-R WADCN



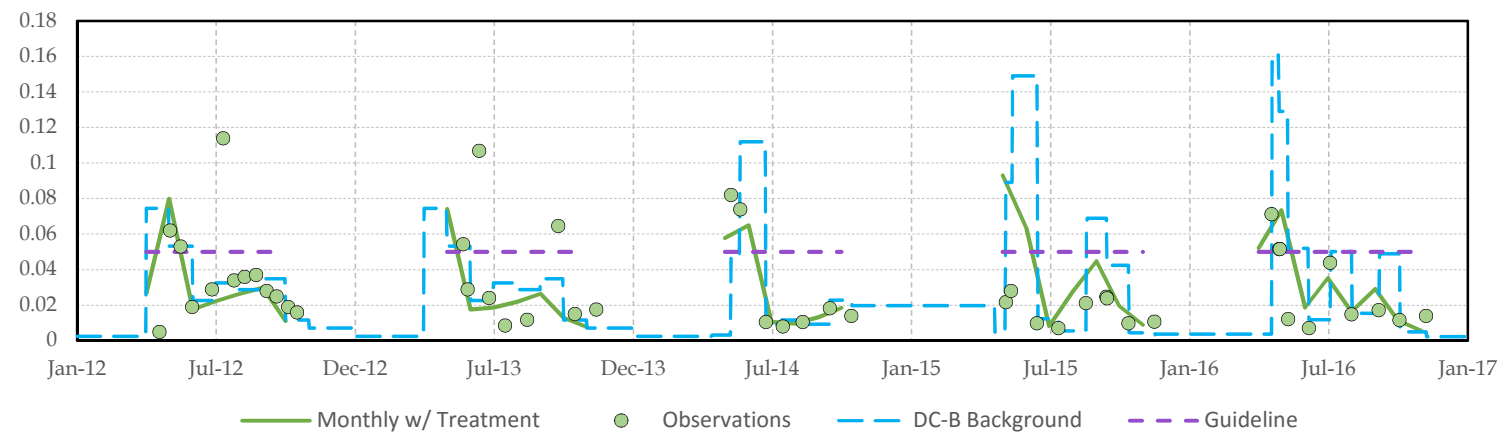
DC-R T-AI



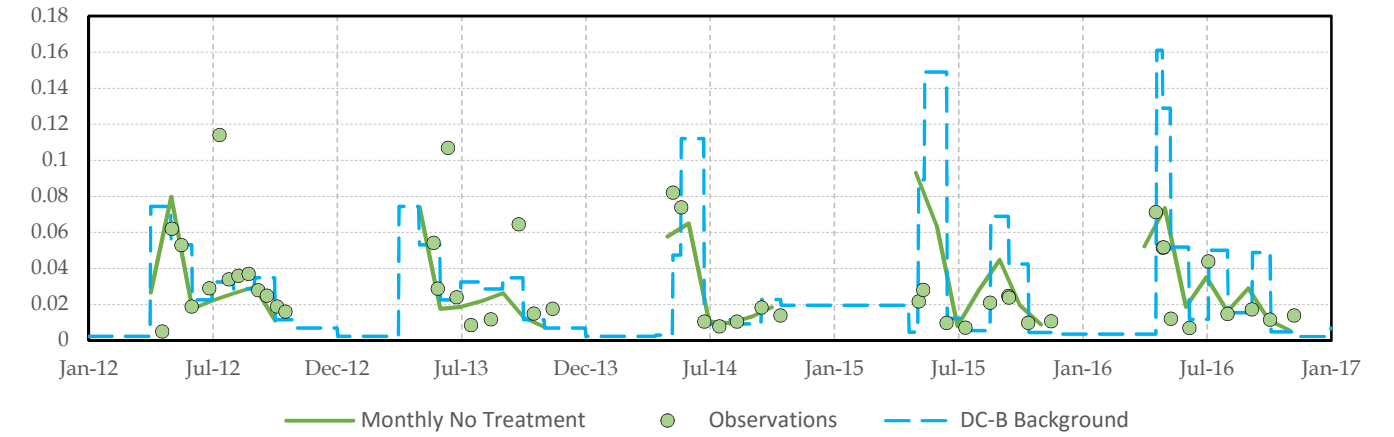
DC-R T-AI



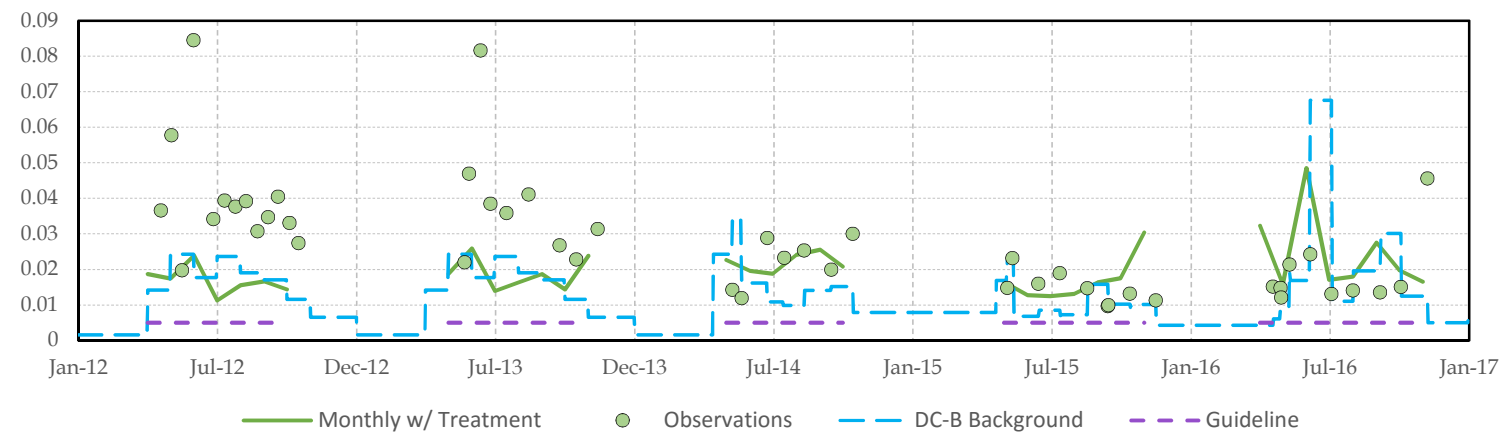
DC-R D-AI



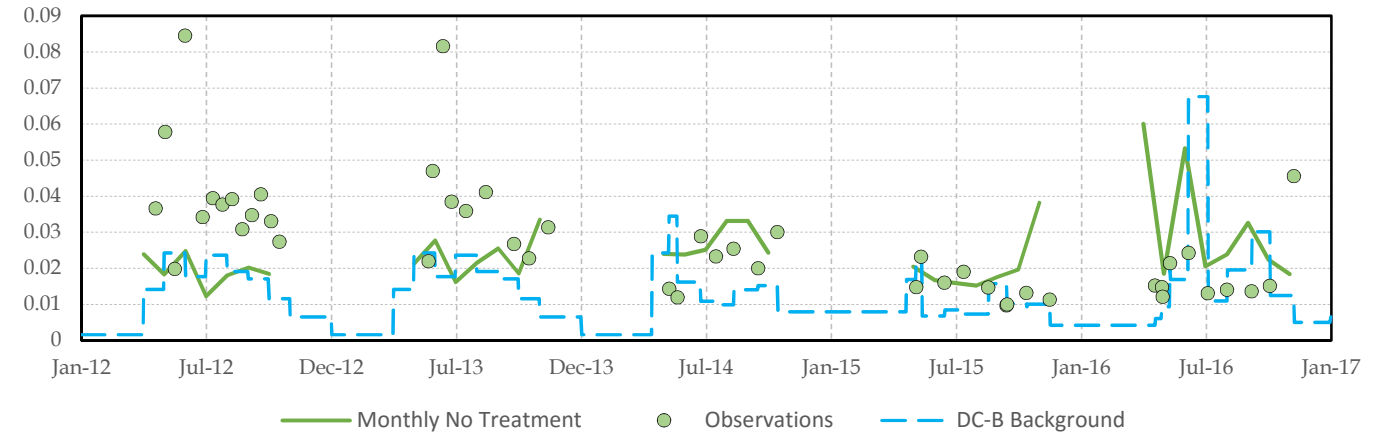
DC-R D-AI



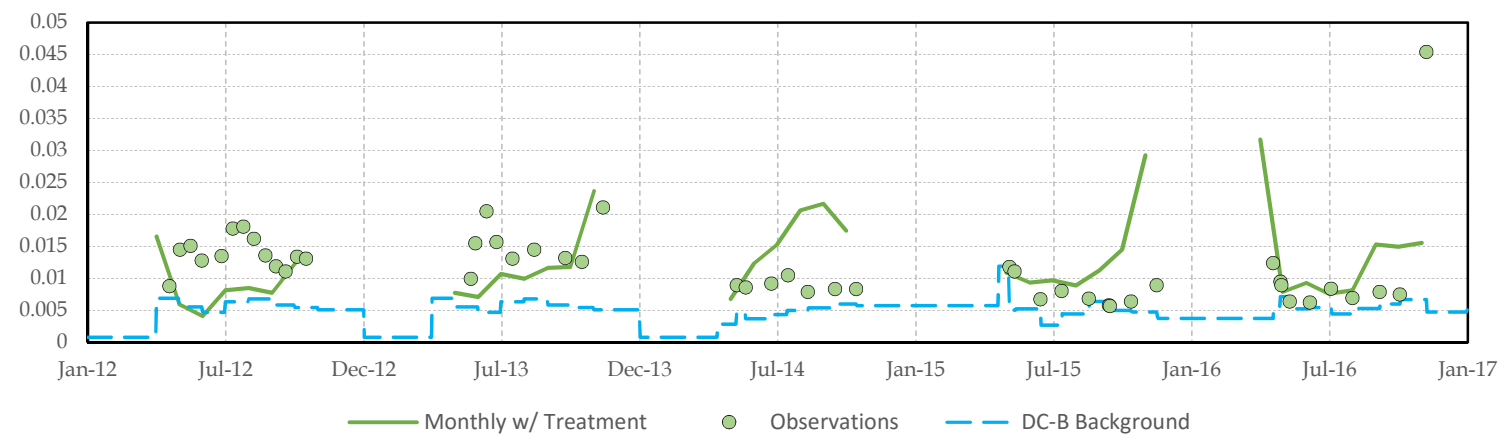
DC-R T-As



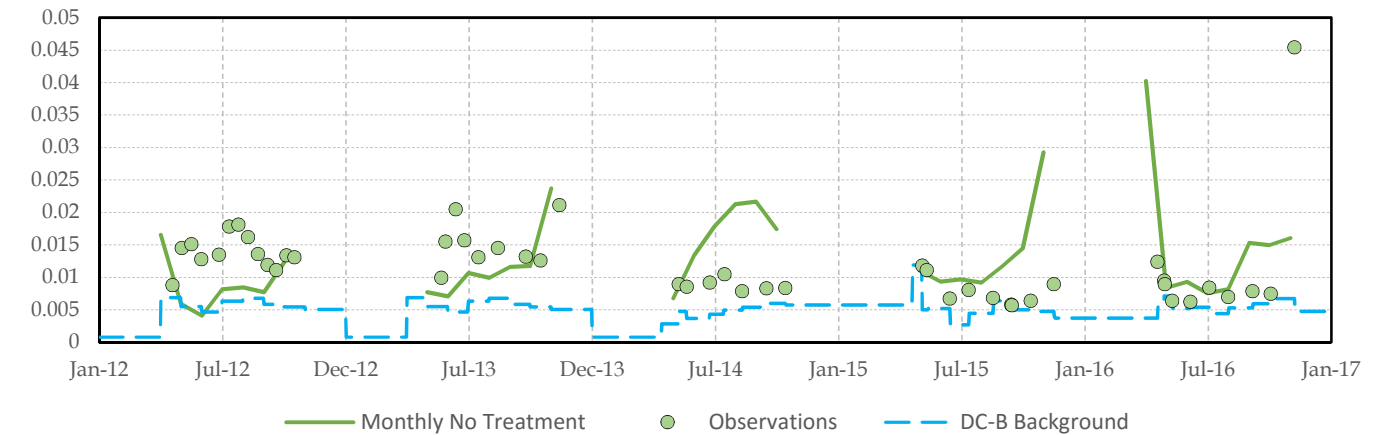
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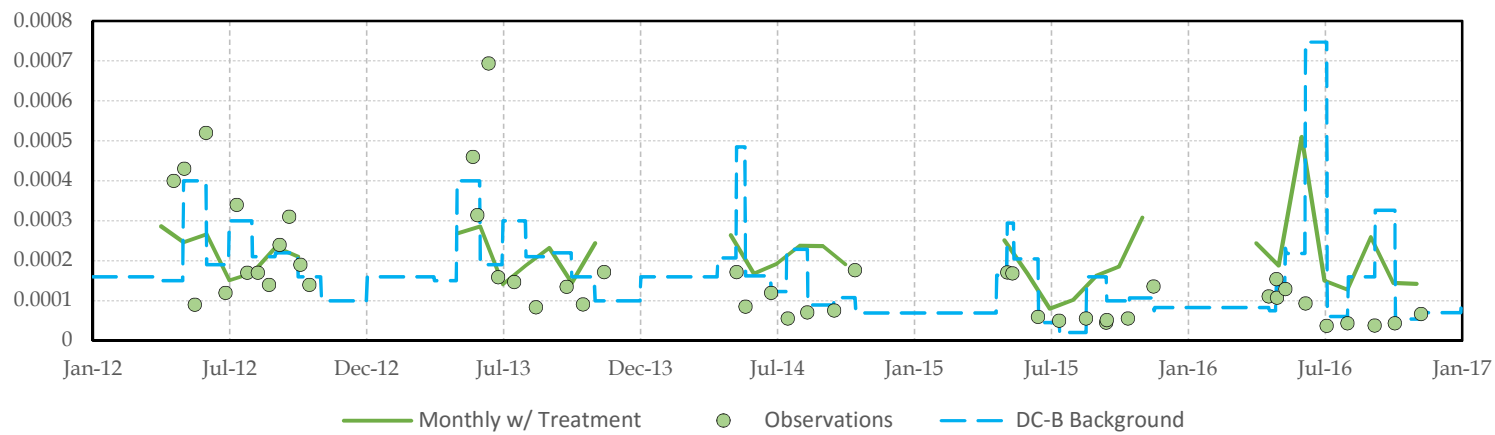
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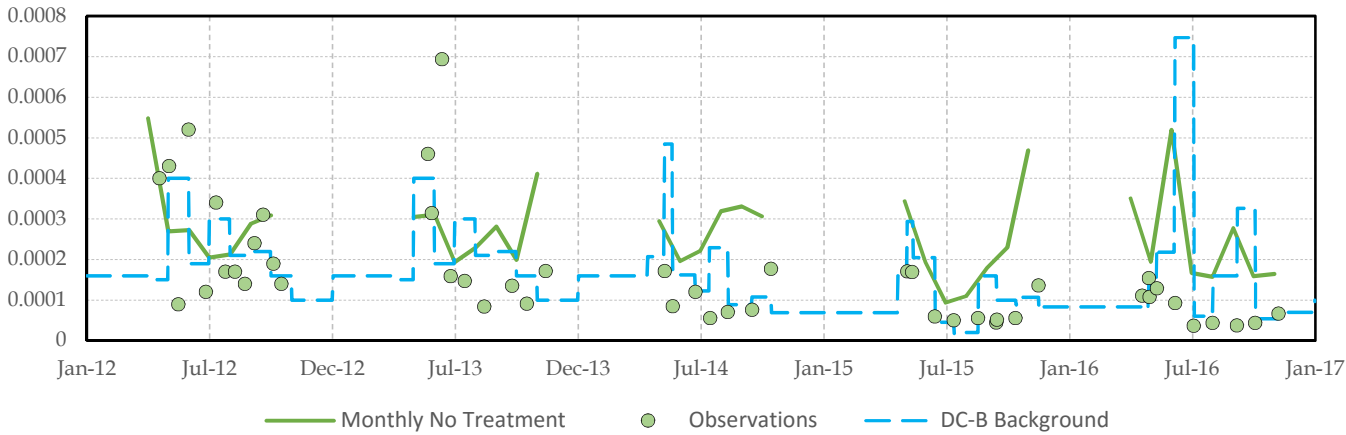
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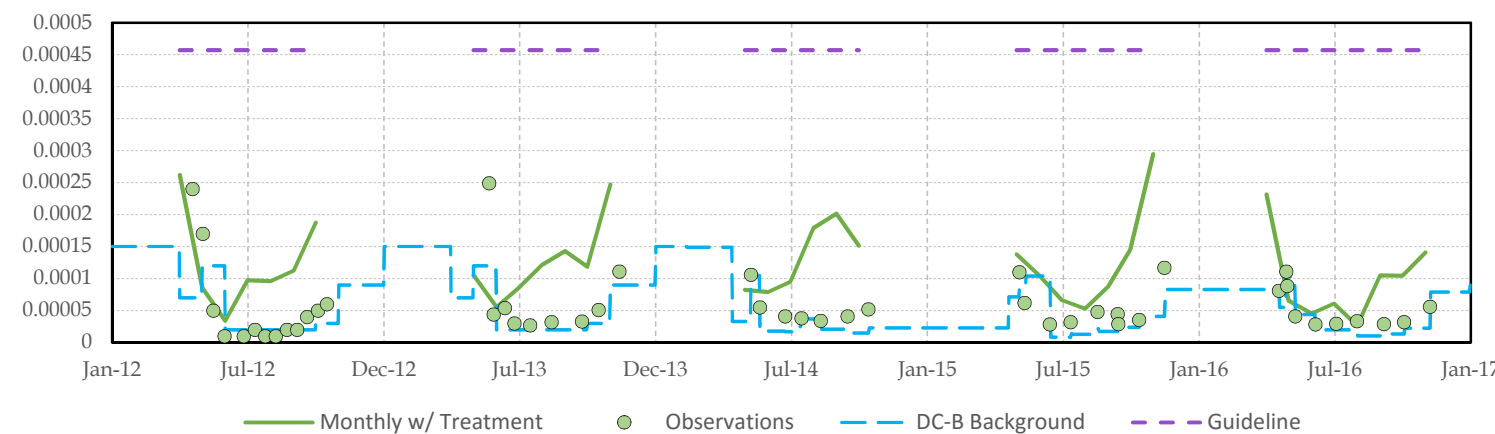
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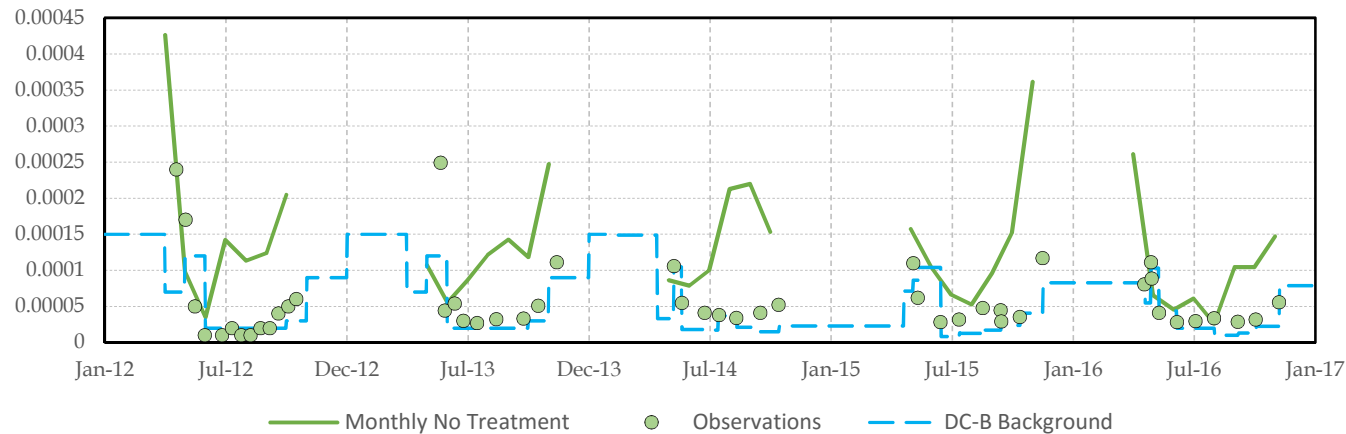
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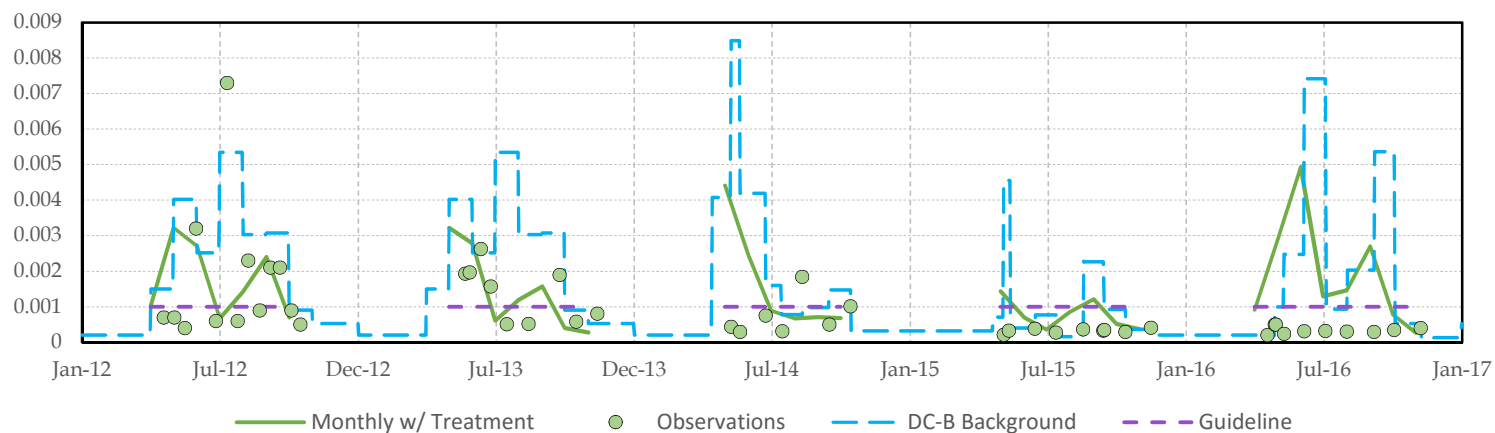
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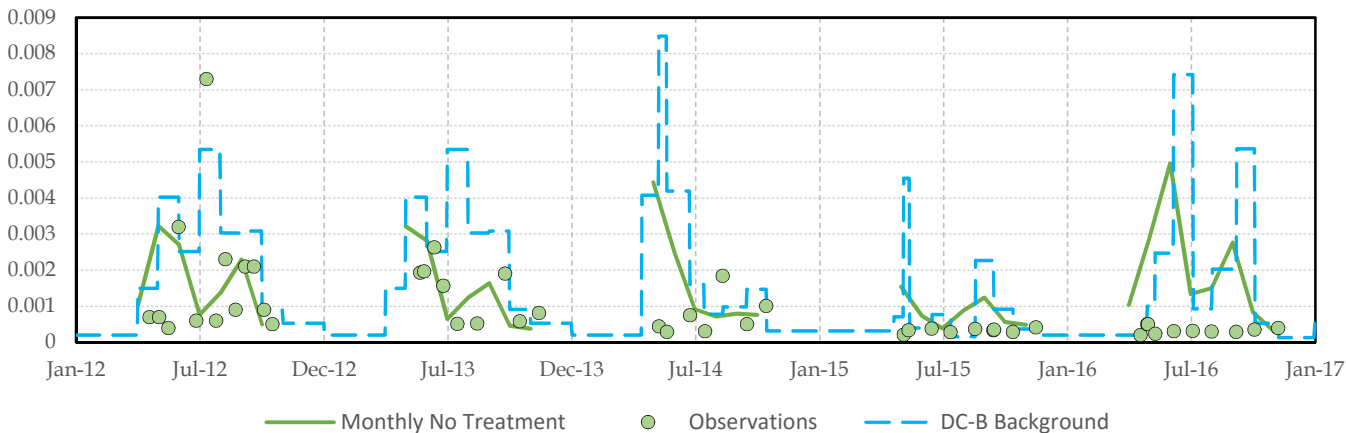
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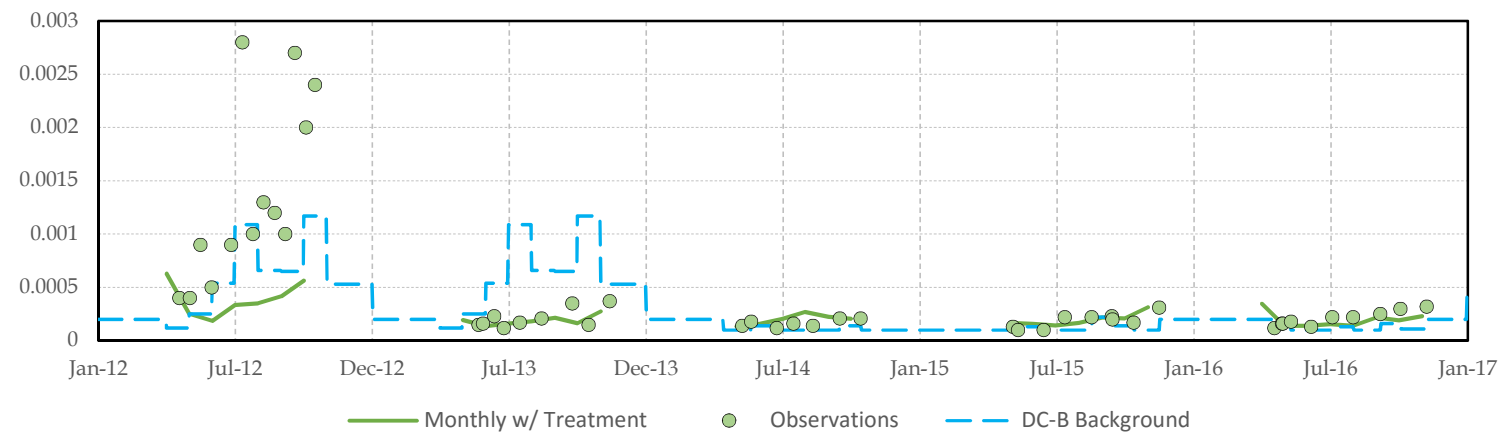
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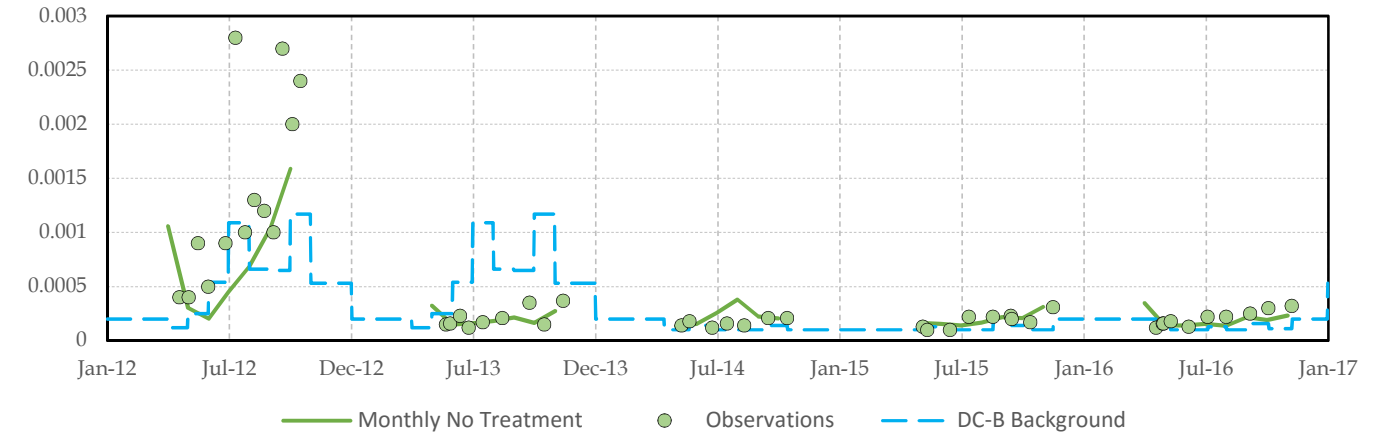
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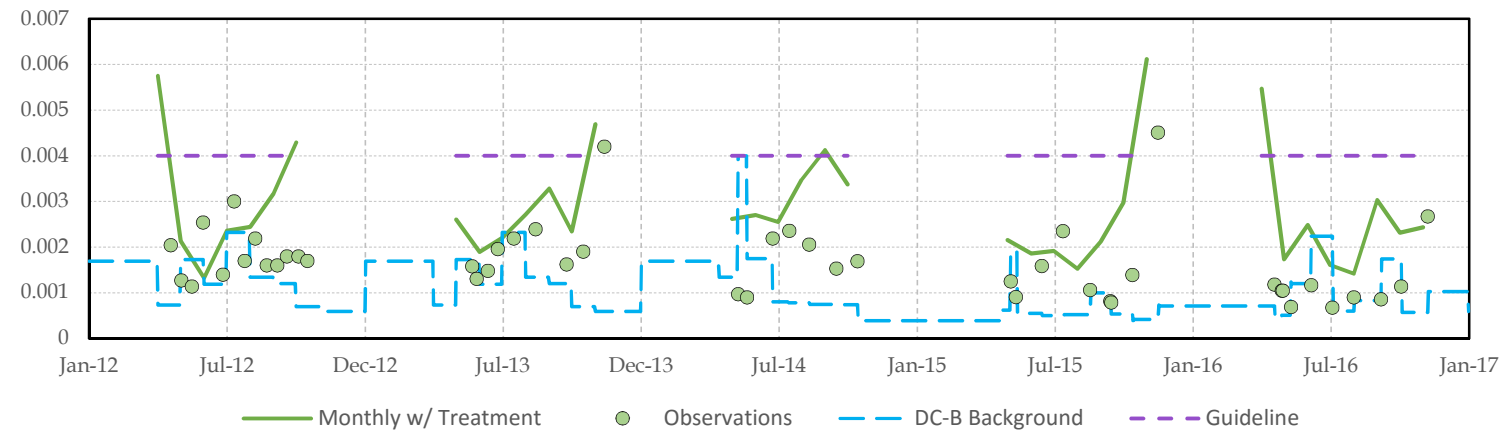
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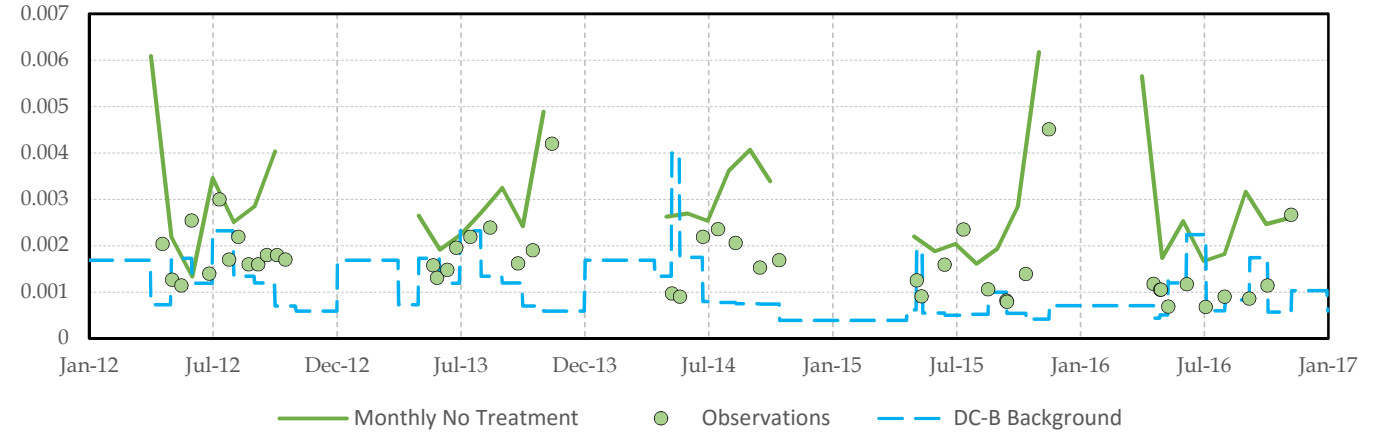
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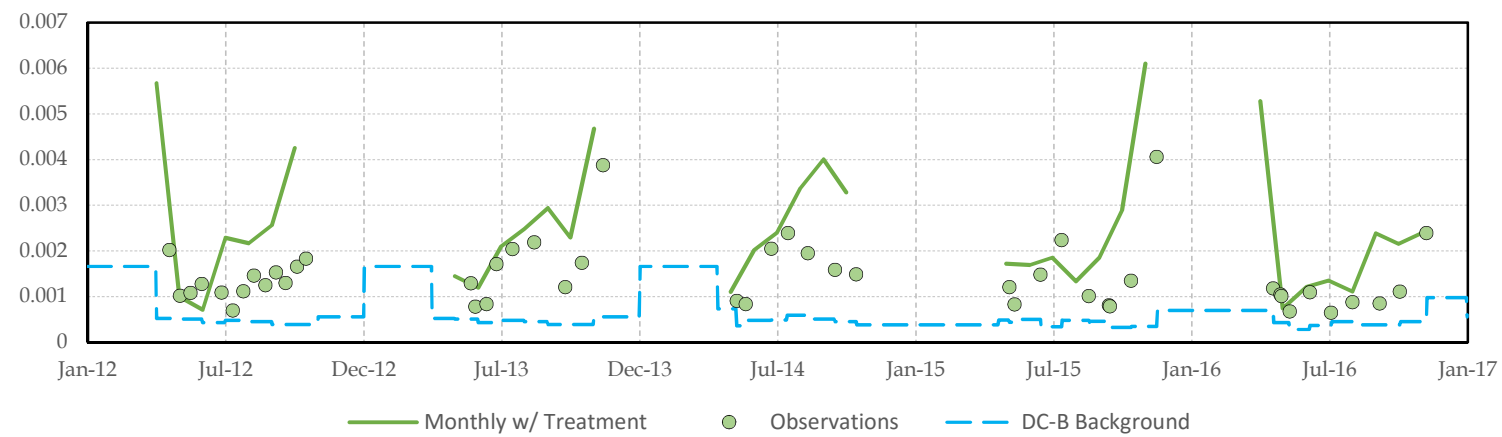
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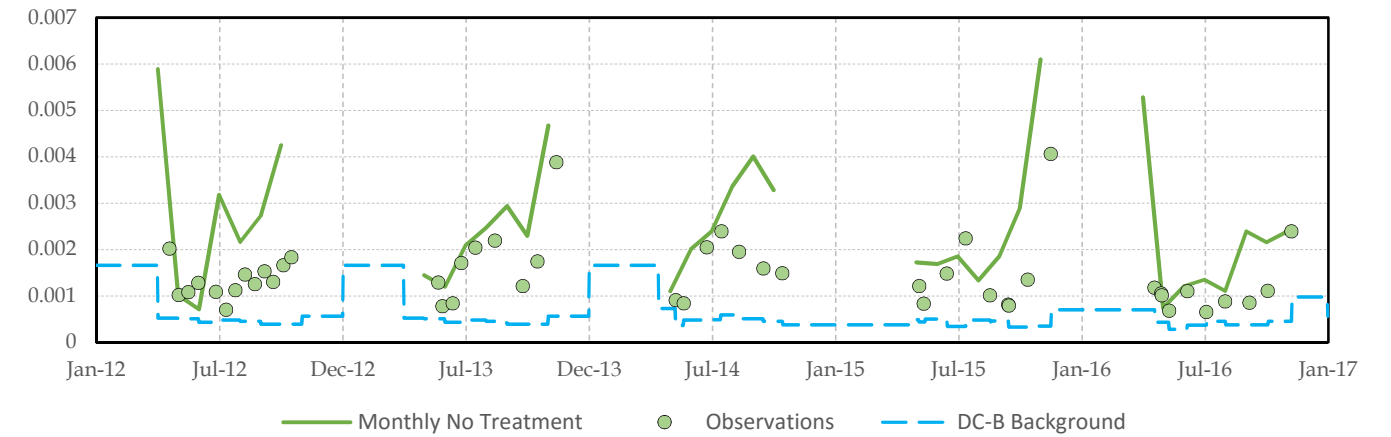
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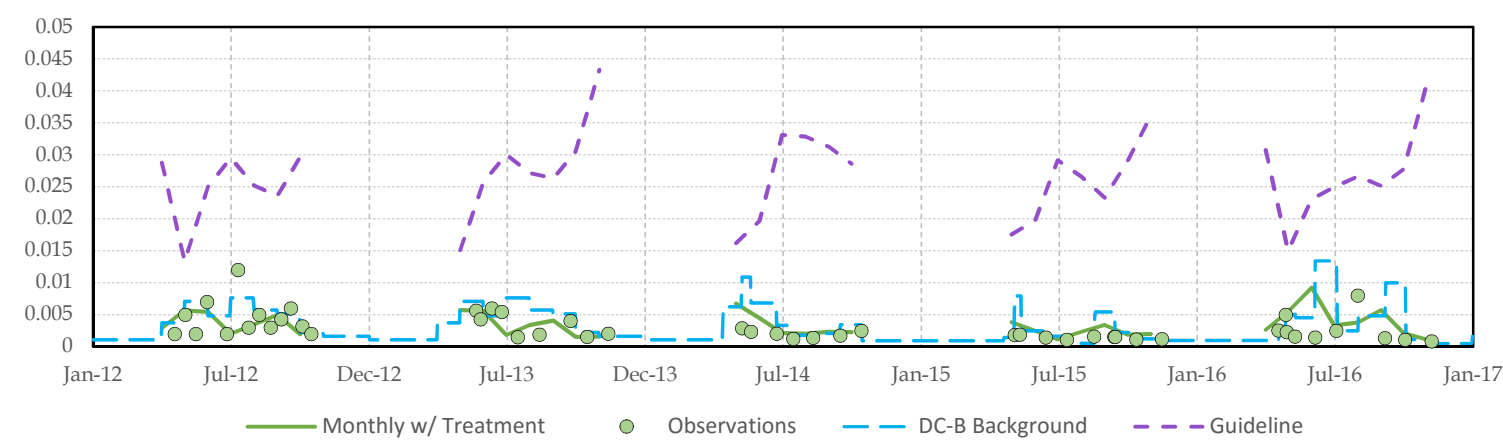
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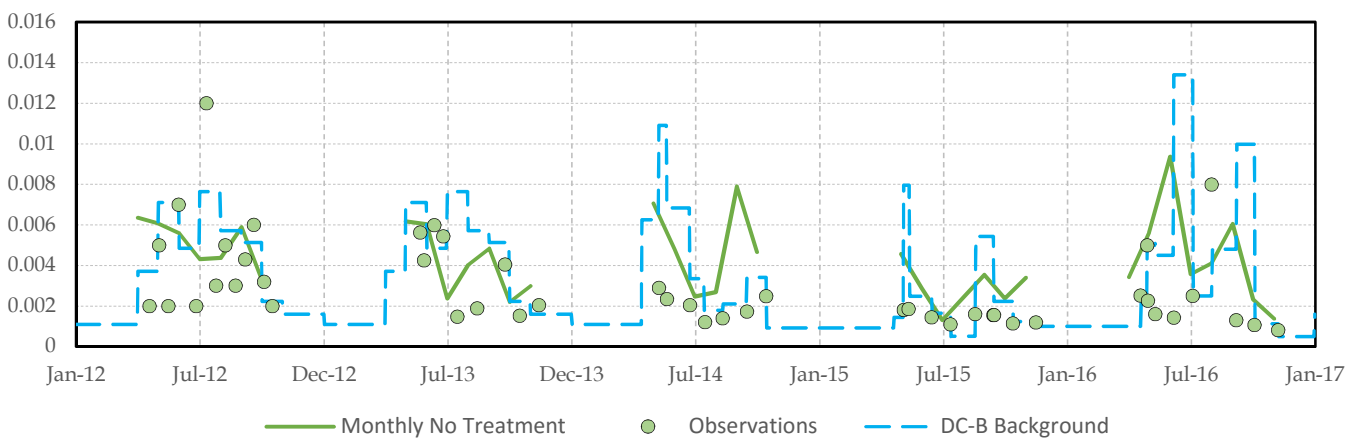
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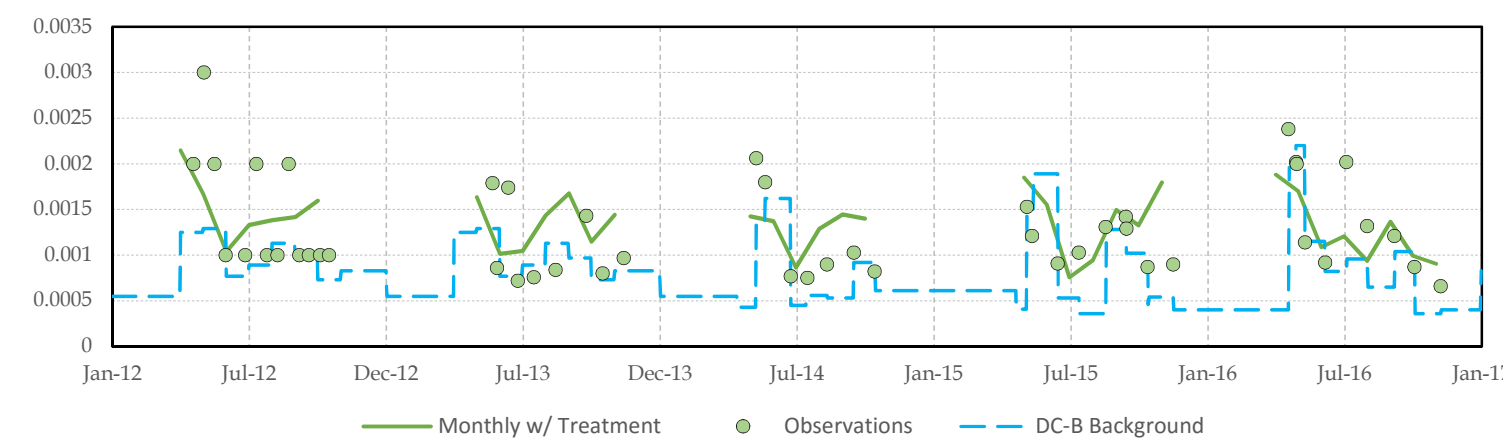
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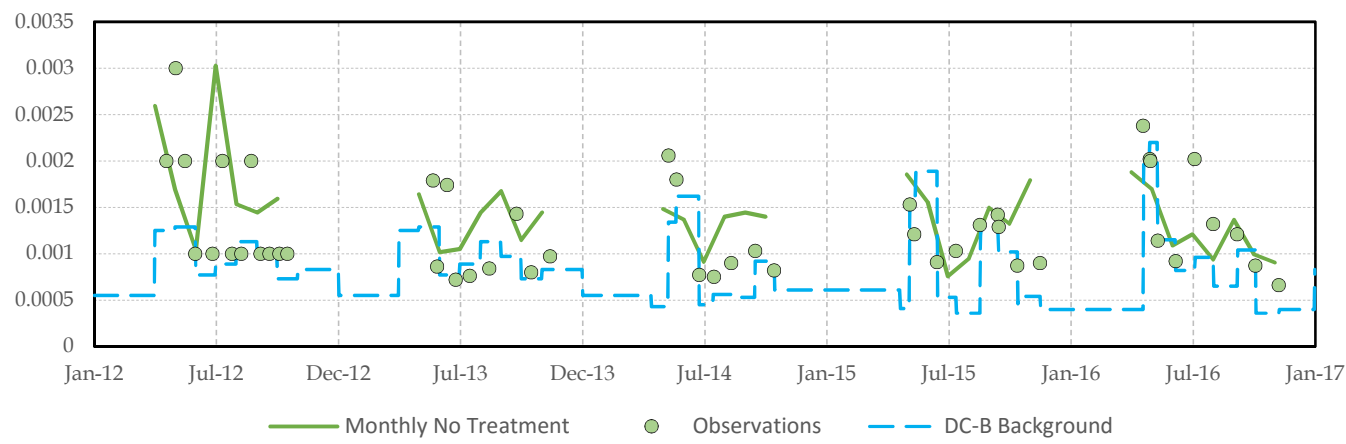
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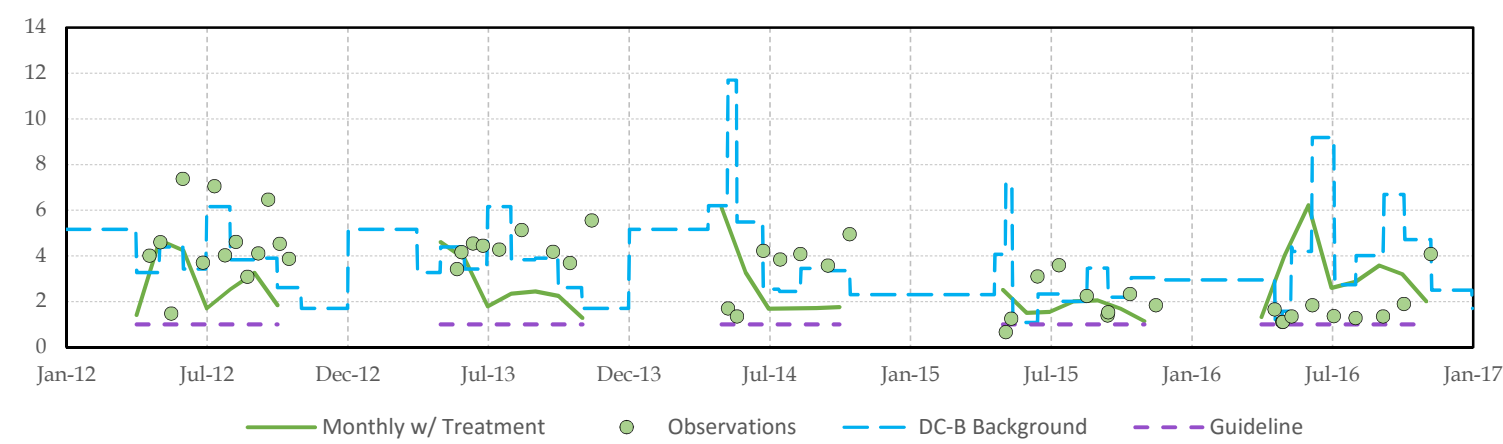
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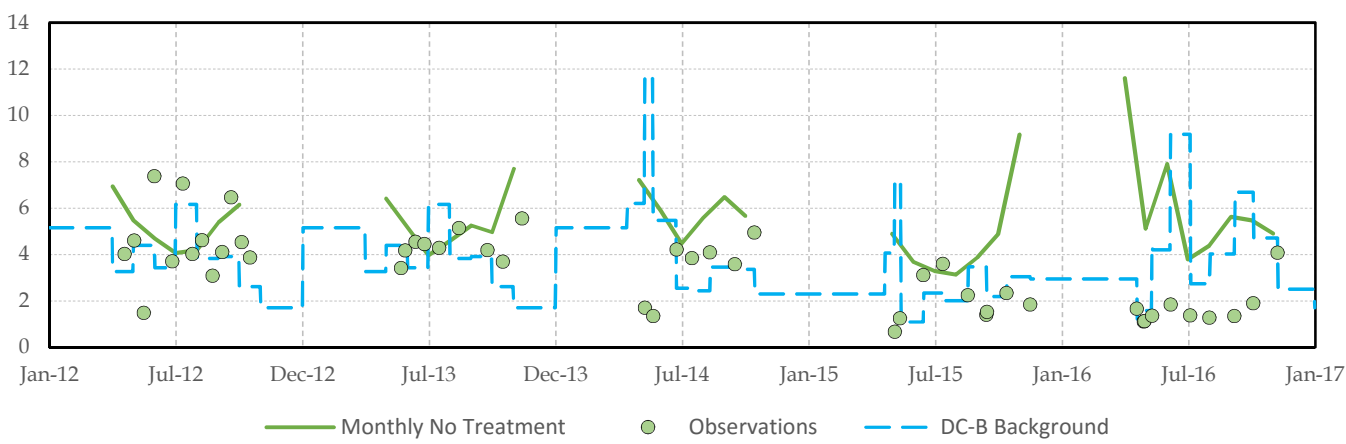
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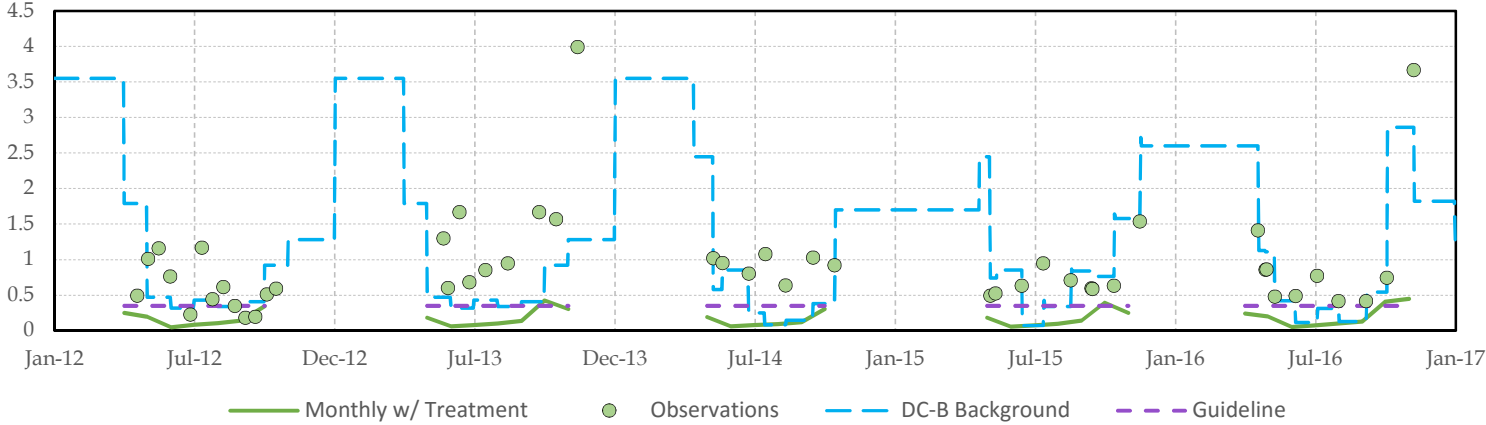
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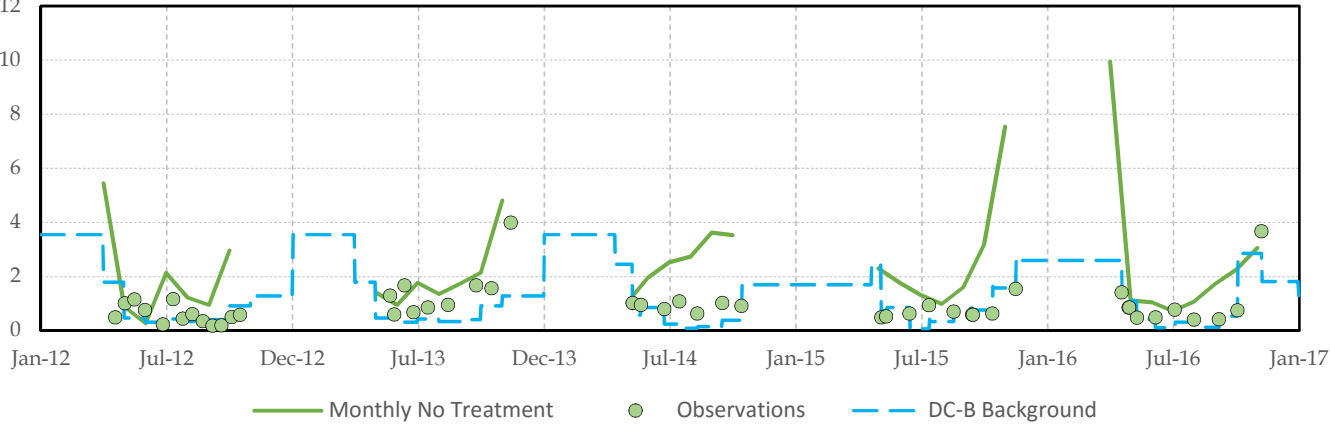
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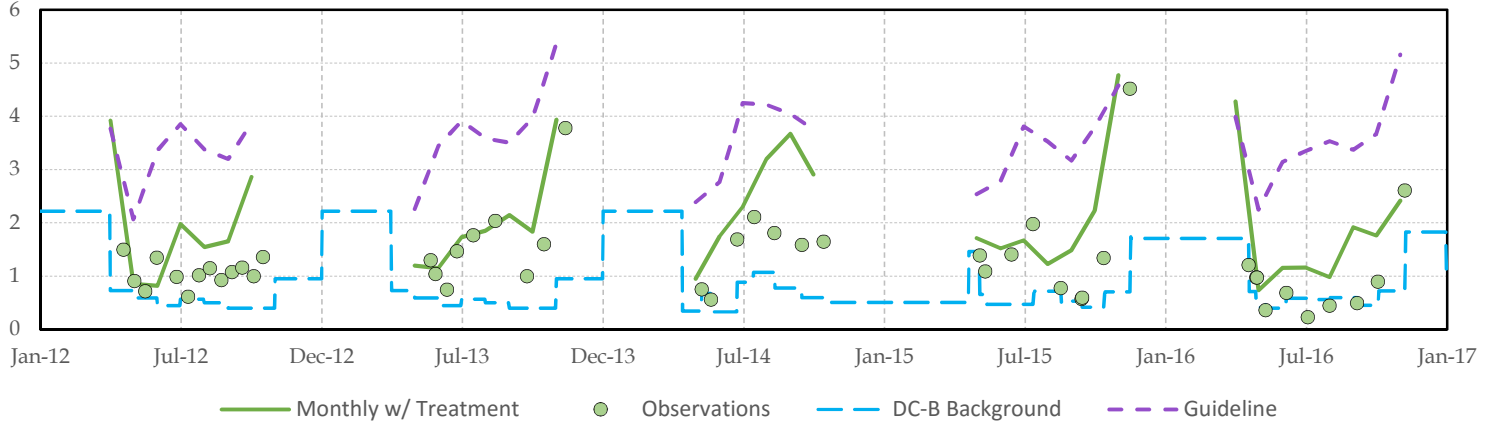
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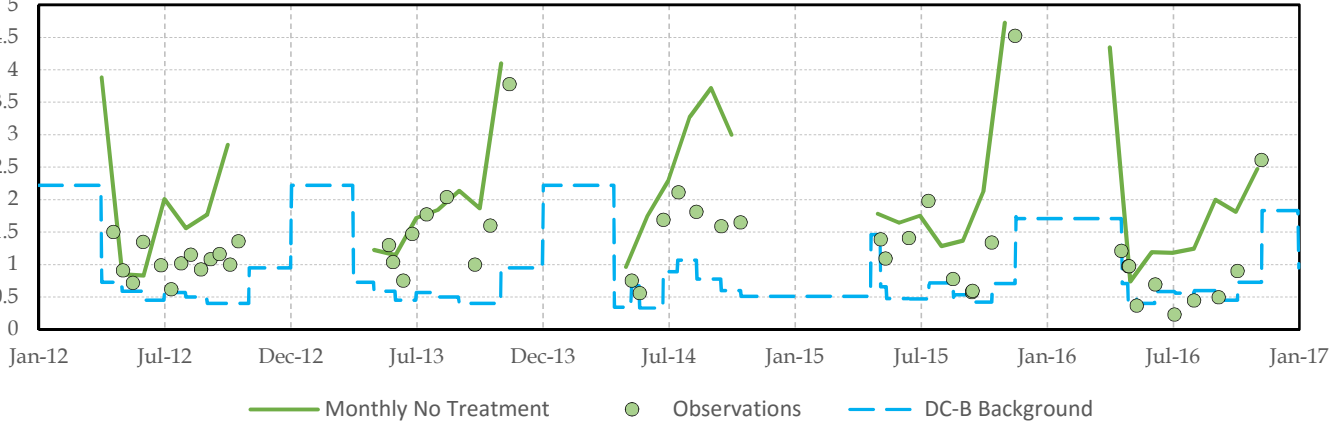
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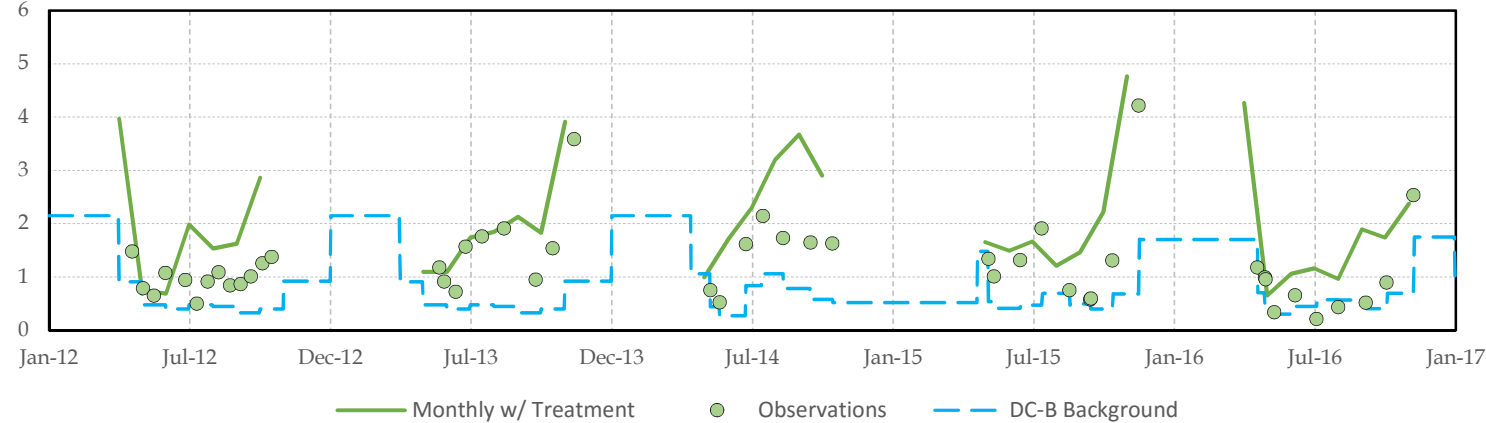
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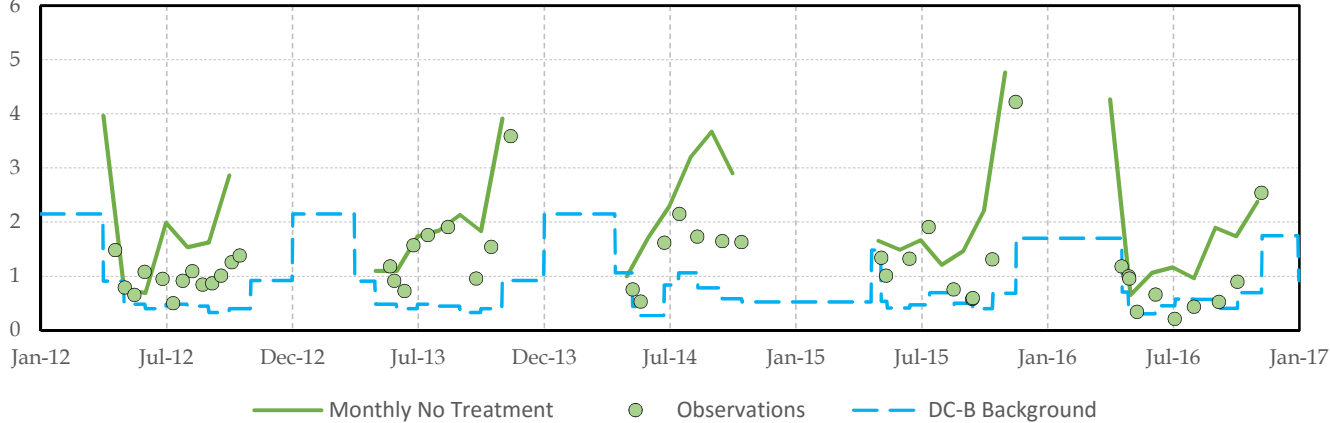
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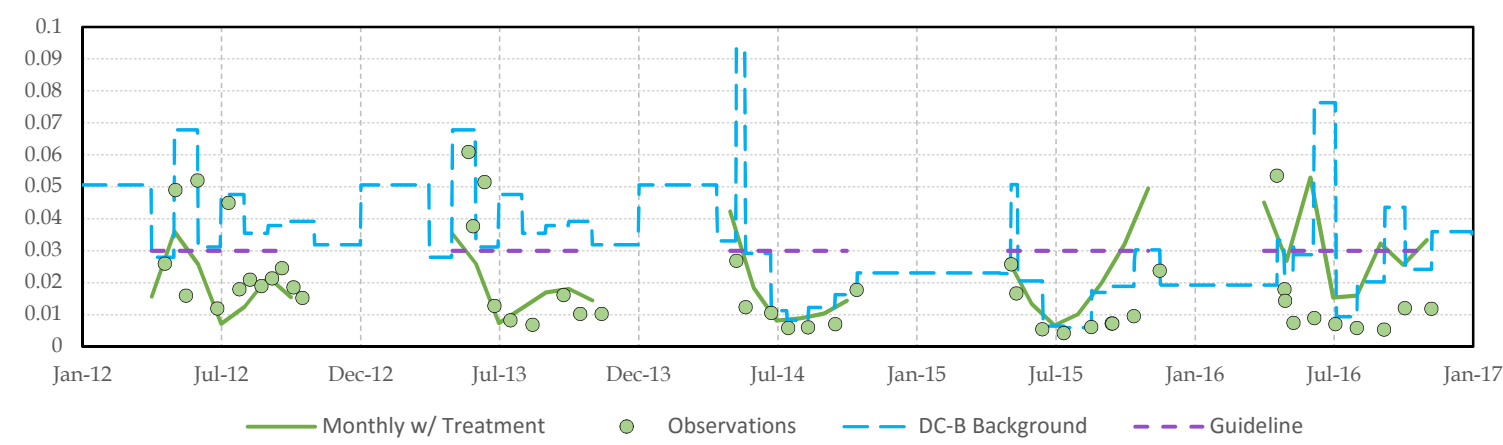
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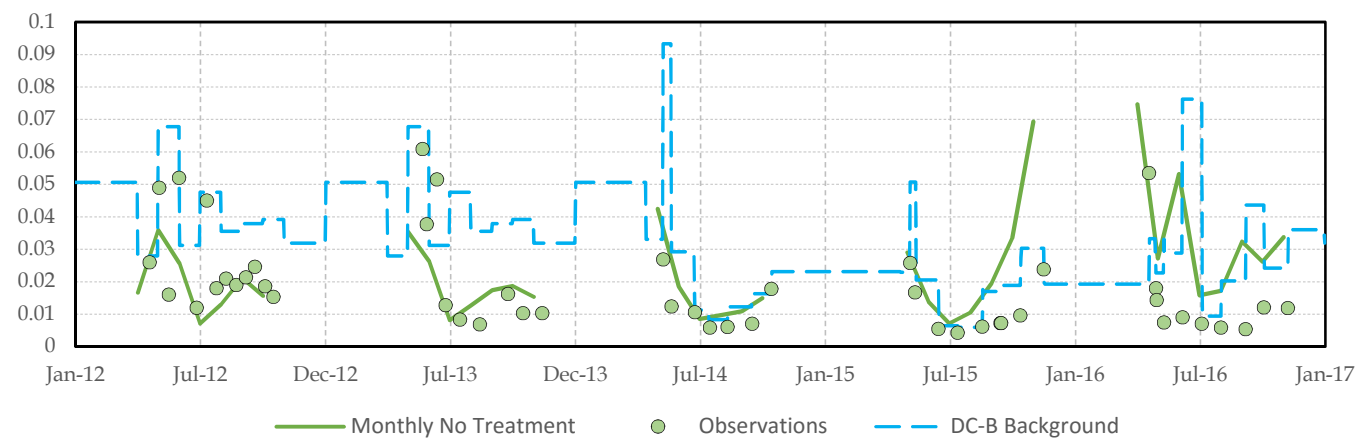
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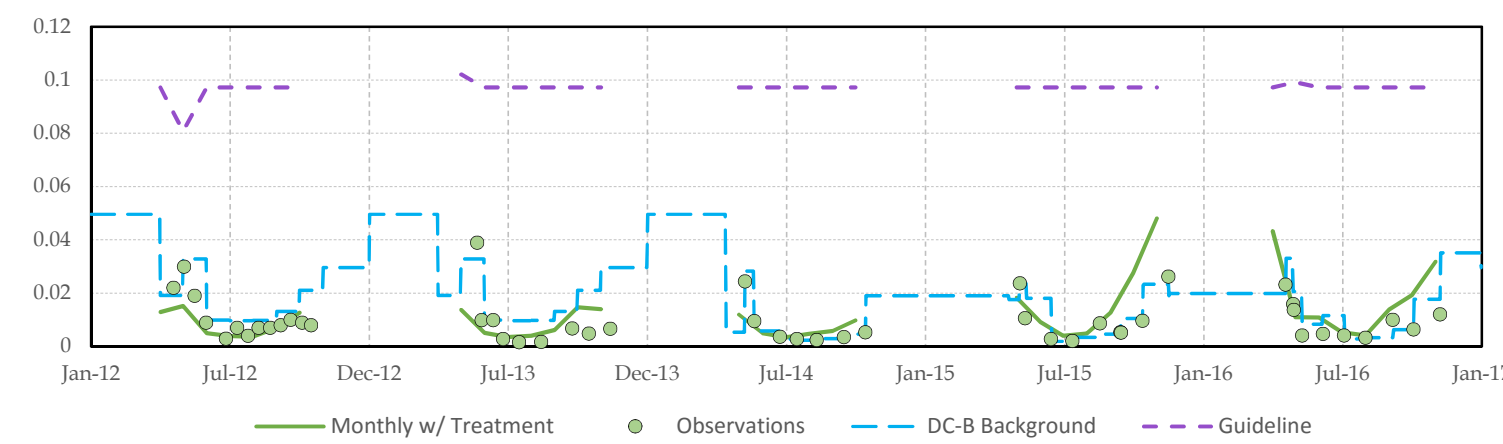
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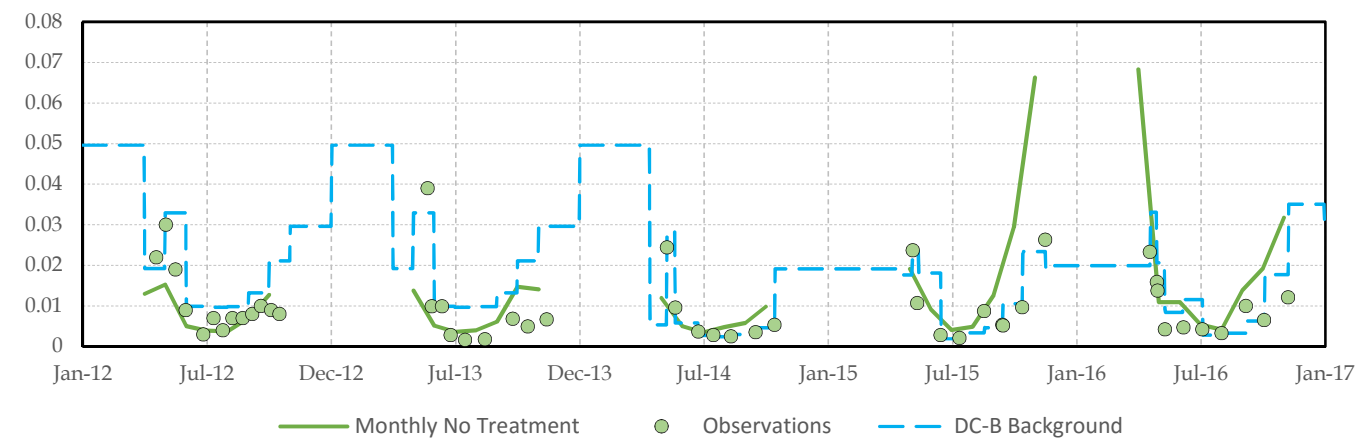
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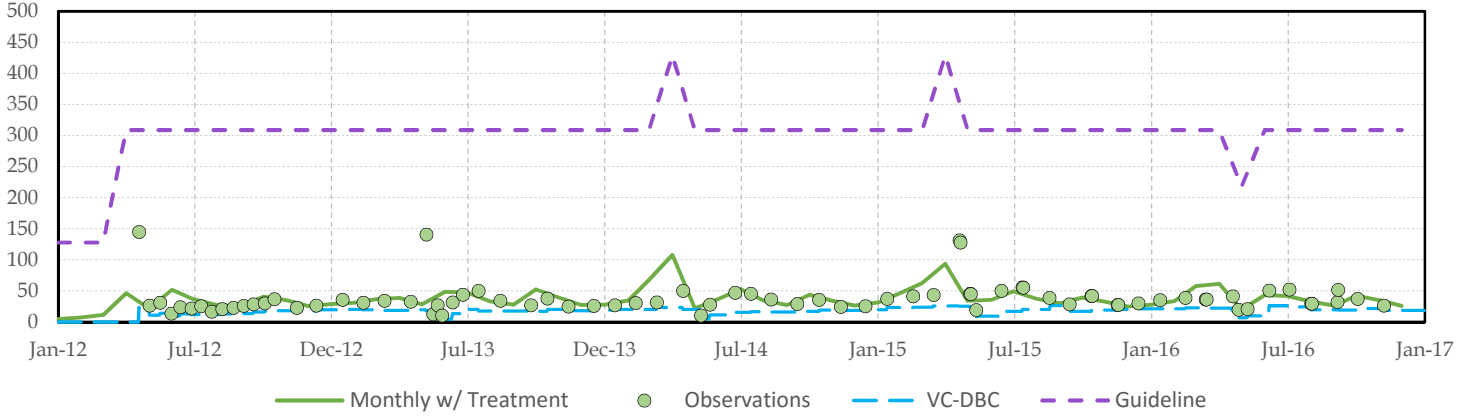
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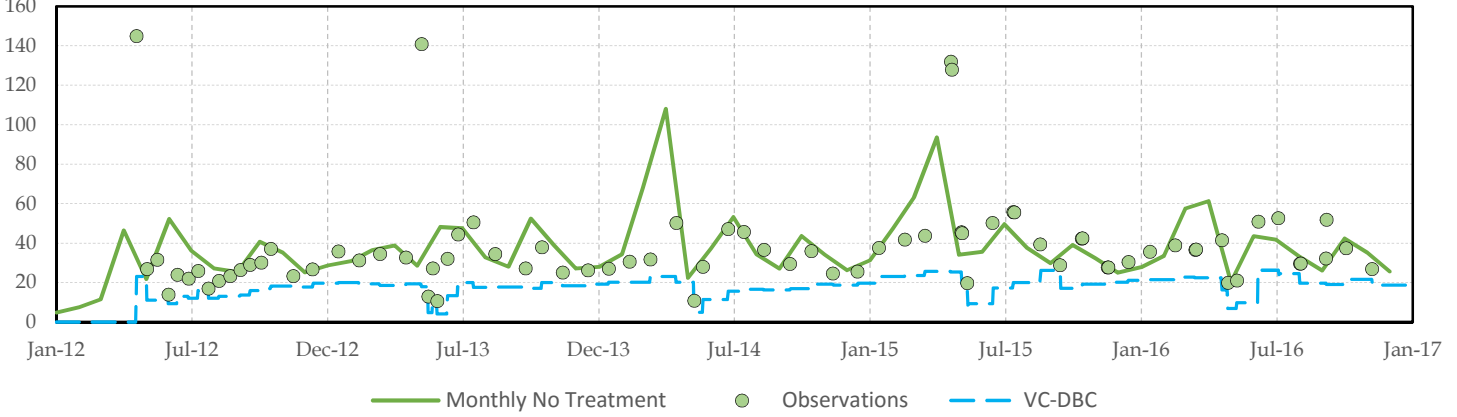
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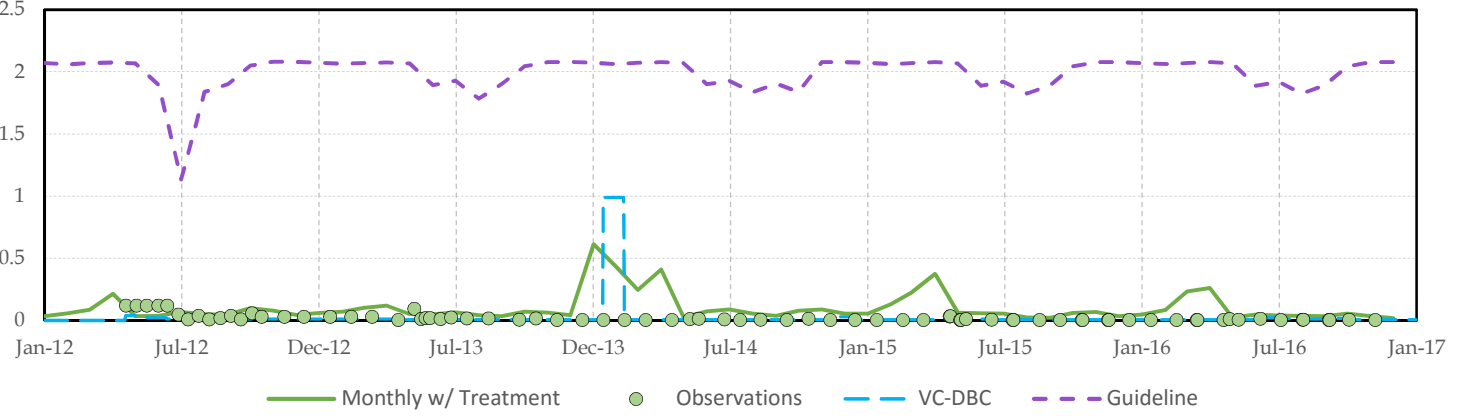
VC-UMN Sulfate



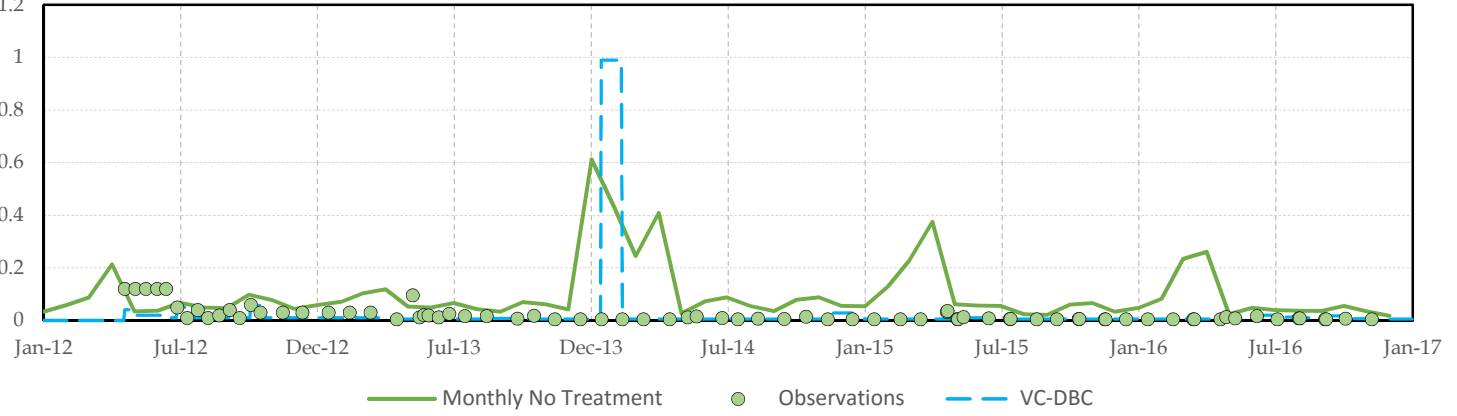
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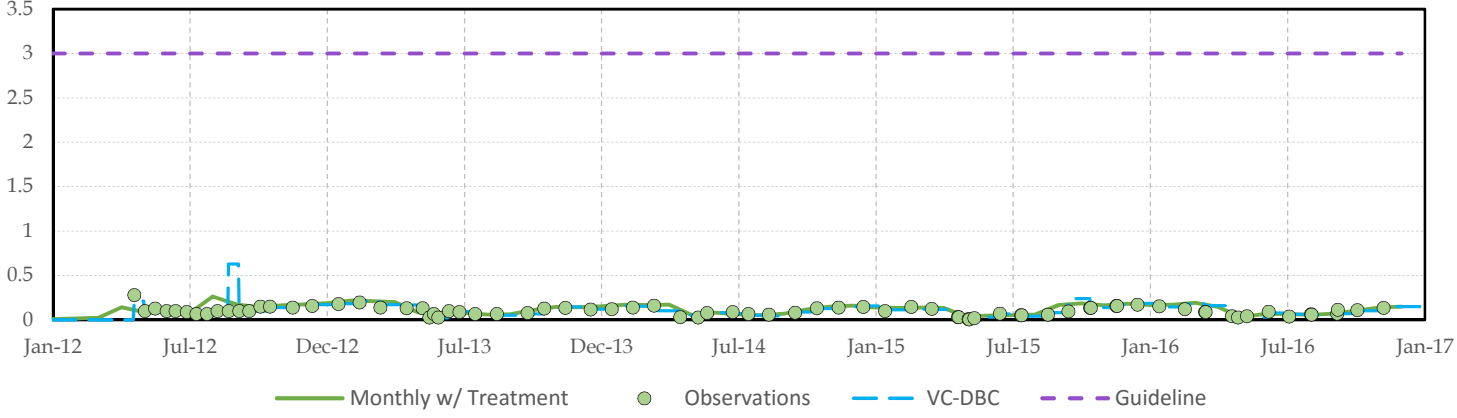
VC-UMN Ammonia



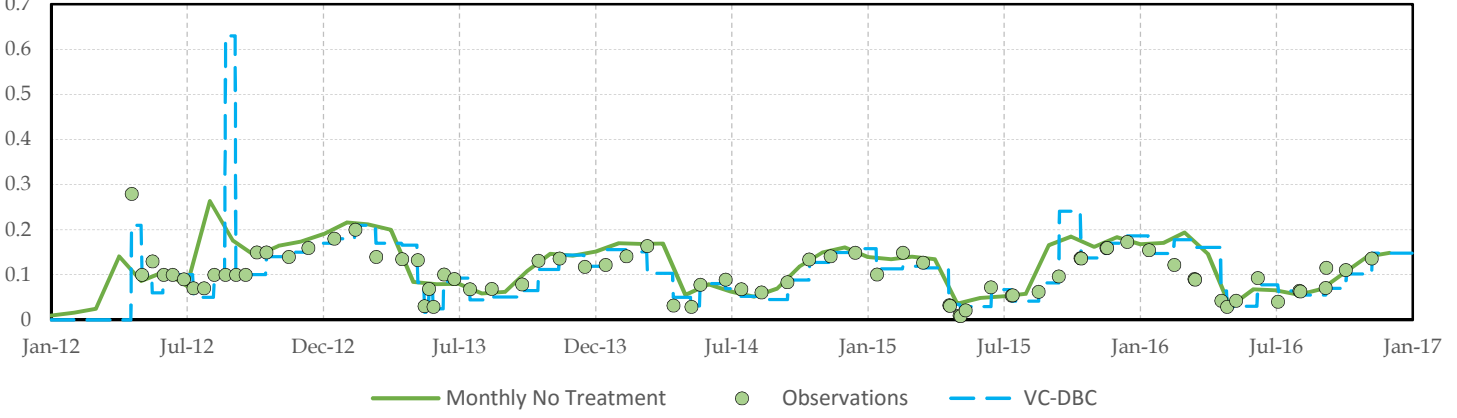
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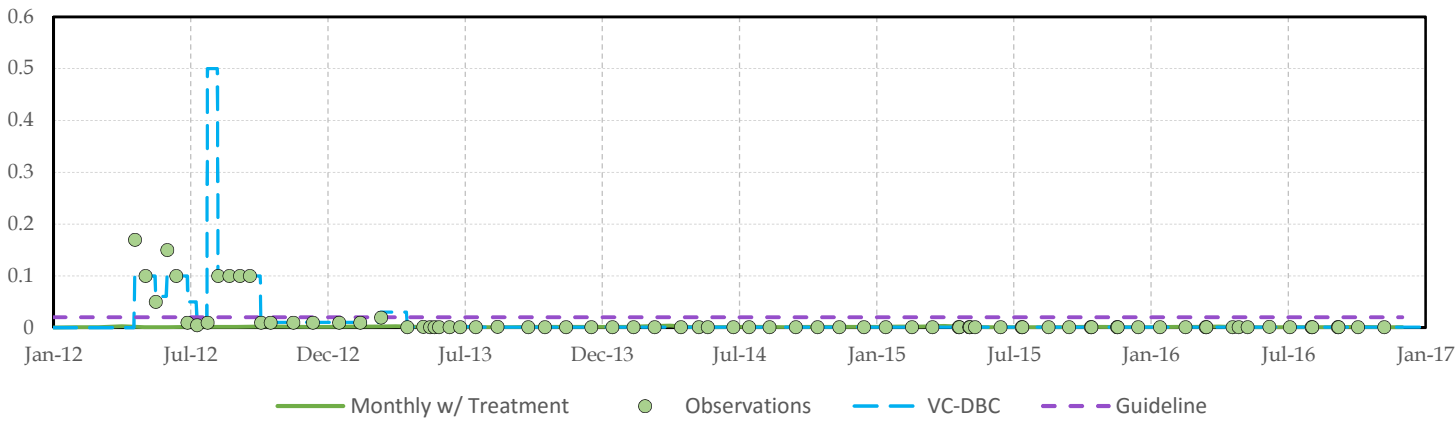
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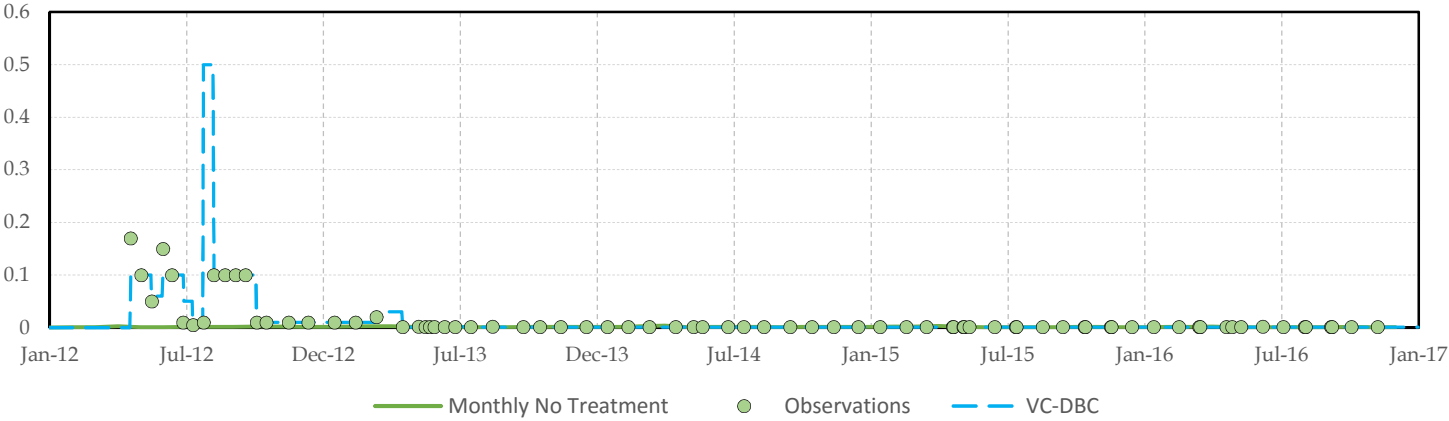
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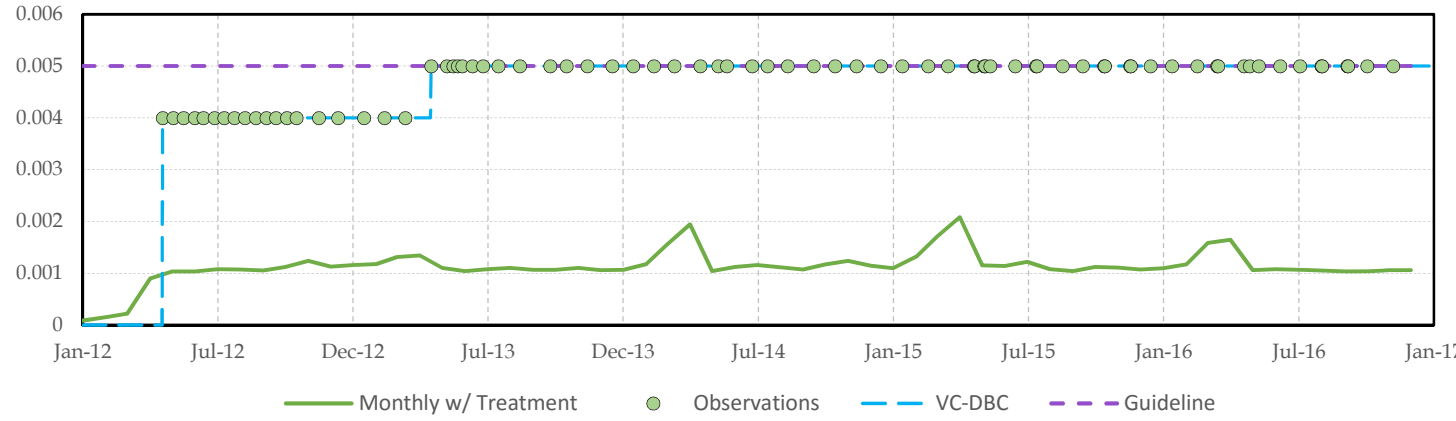
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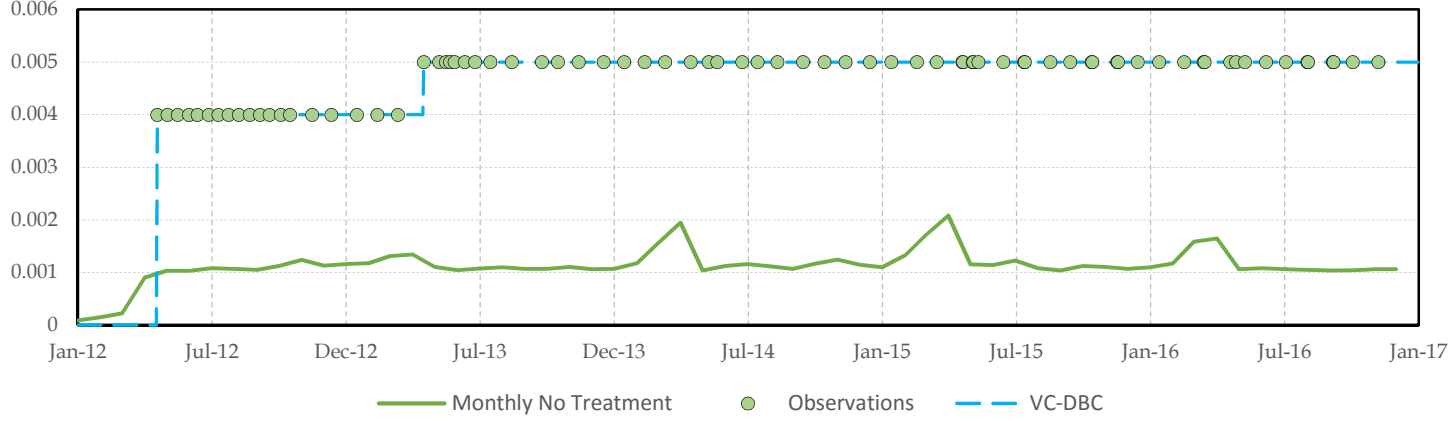
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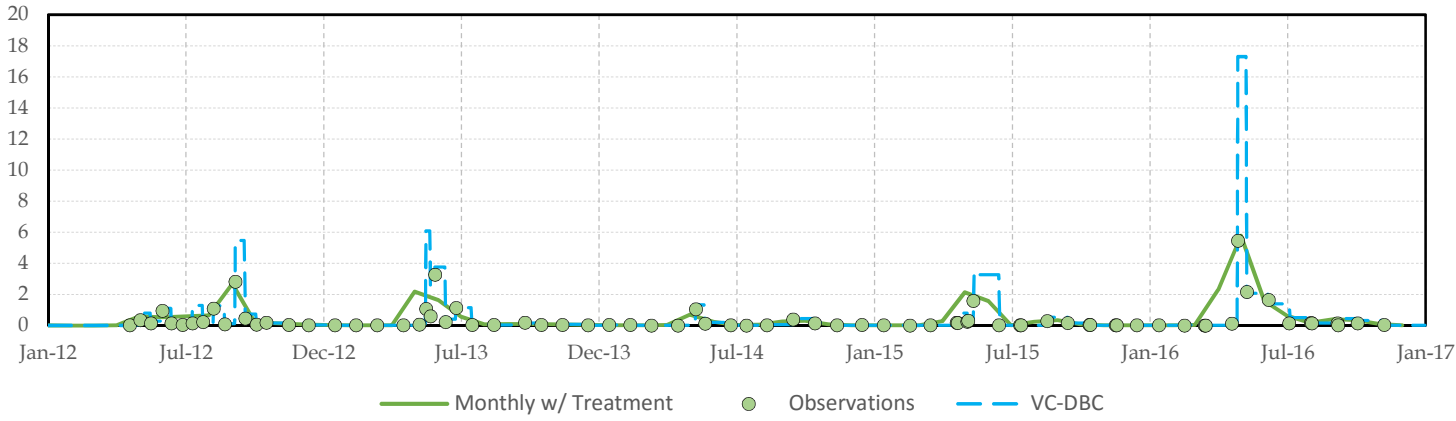
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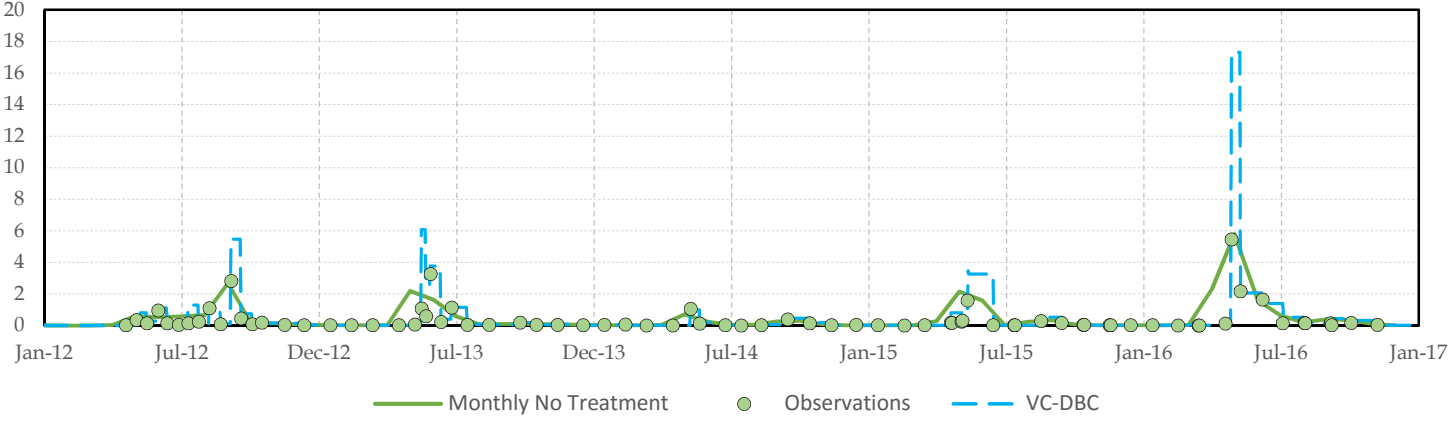
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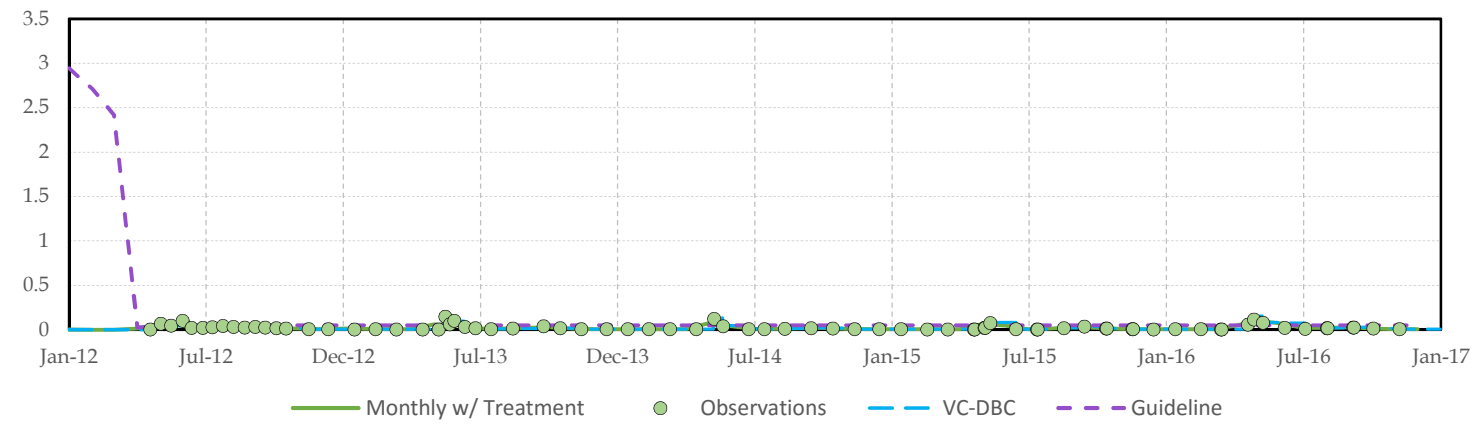
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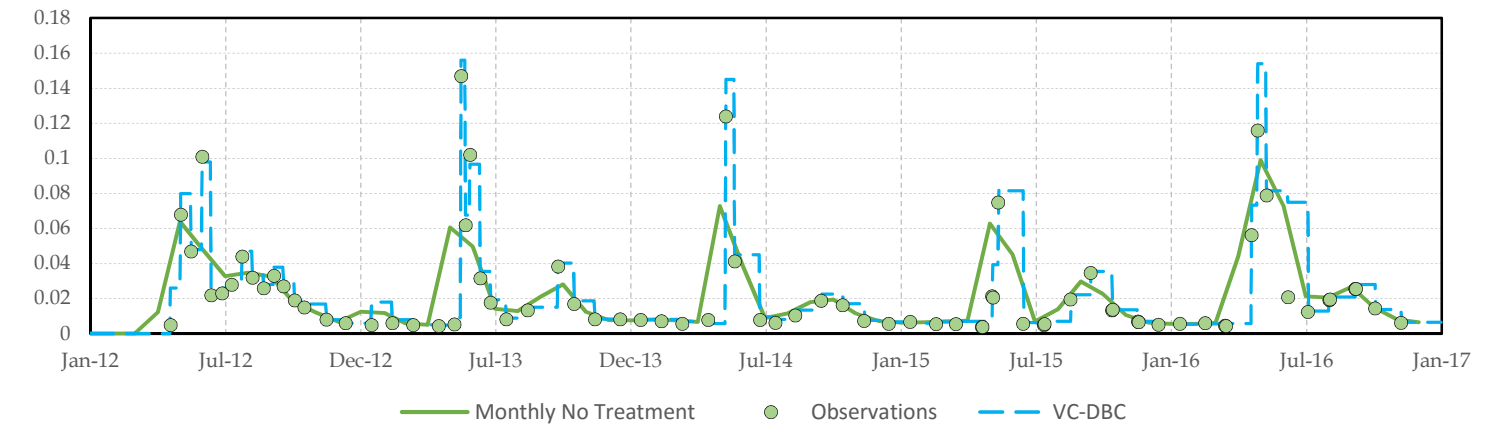
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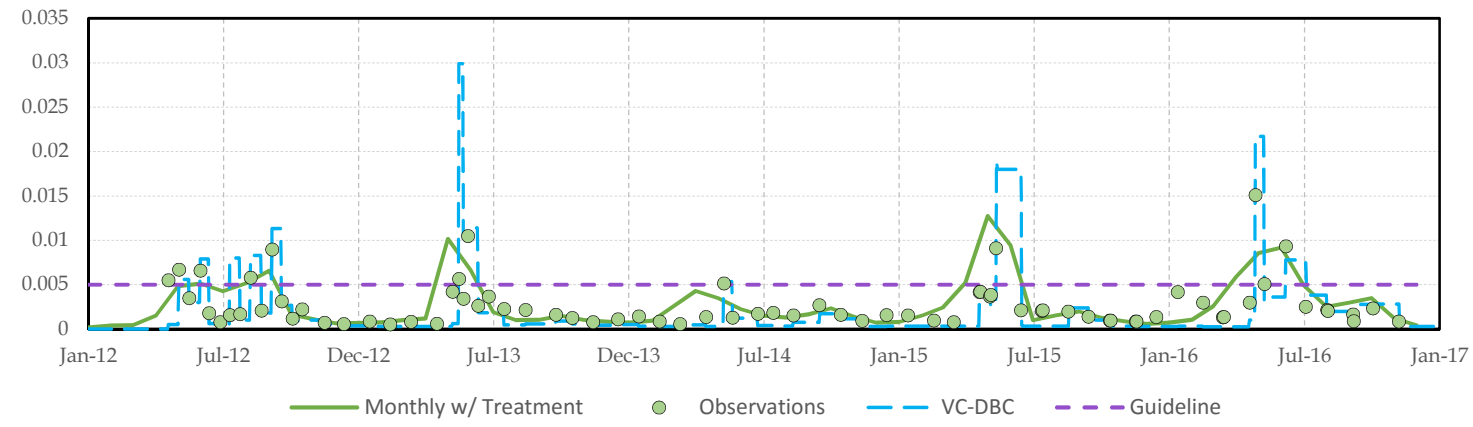
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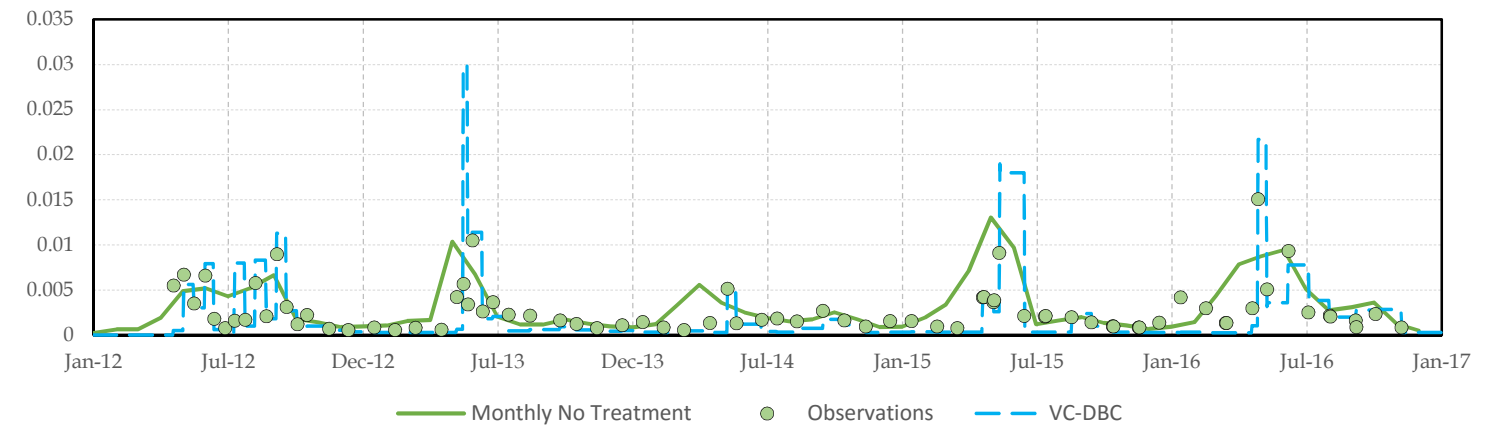
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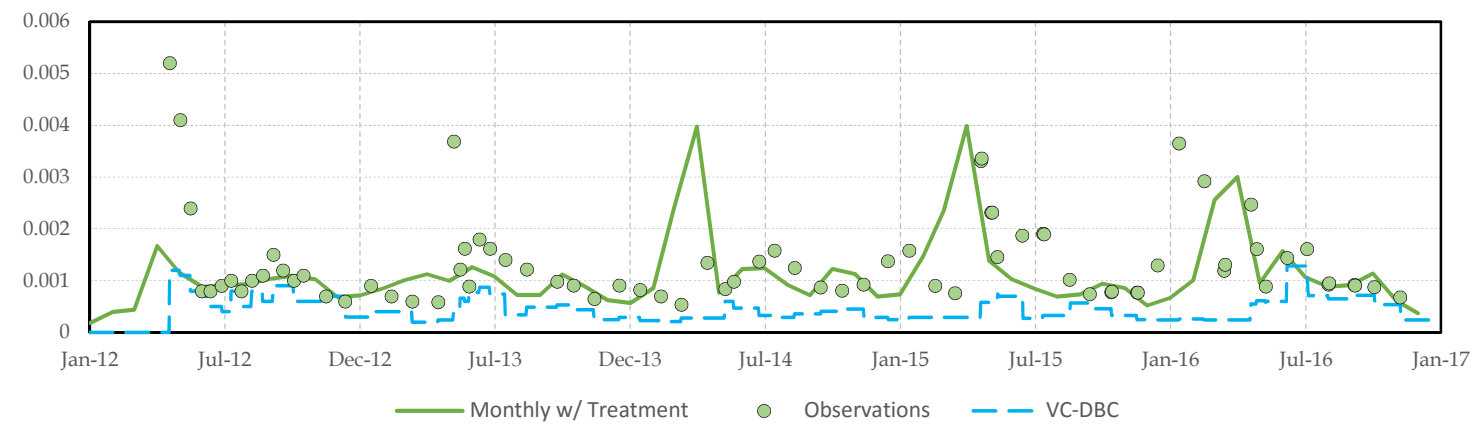
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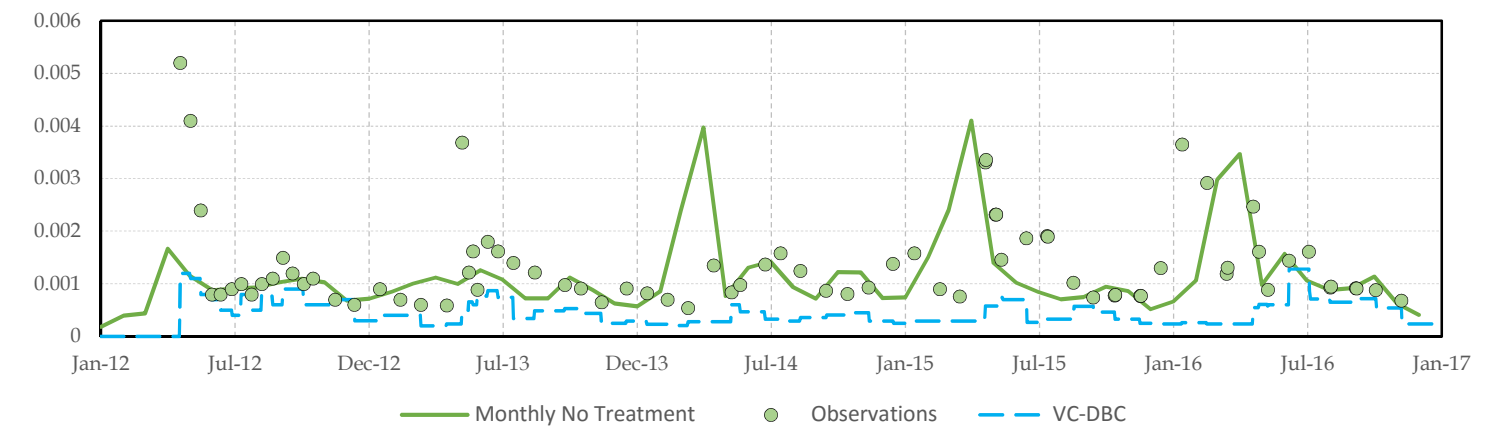
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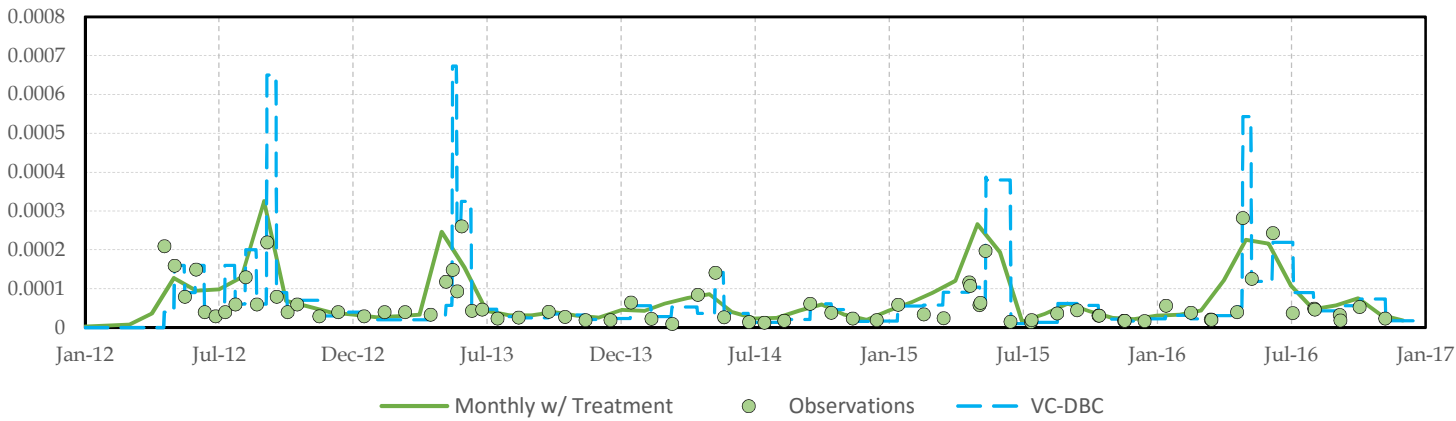
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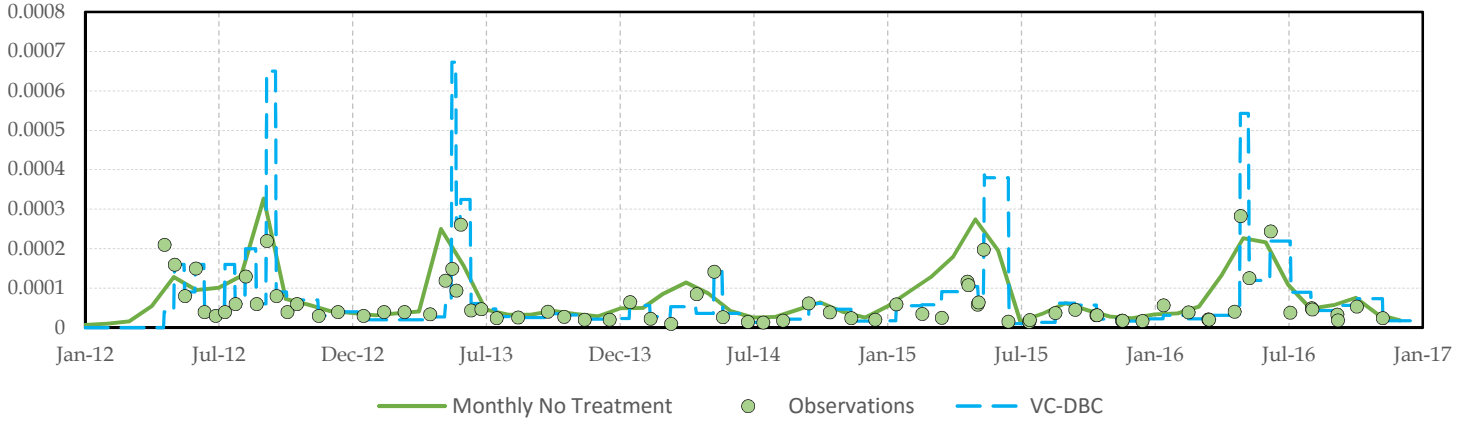
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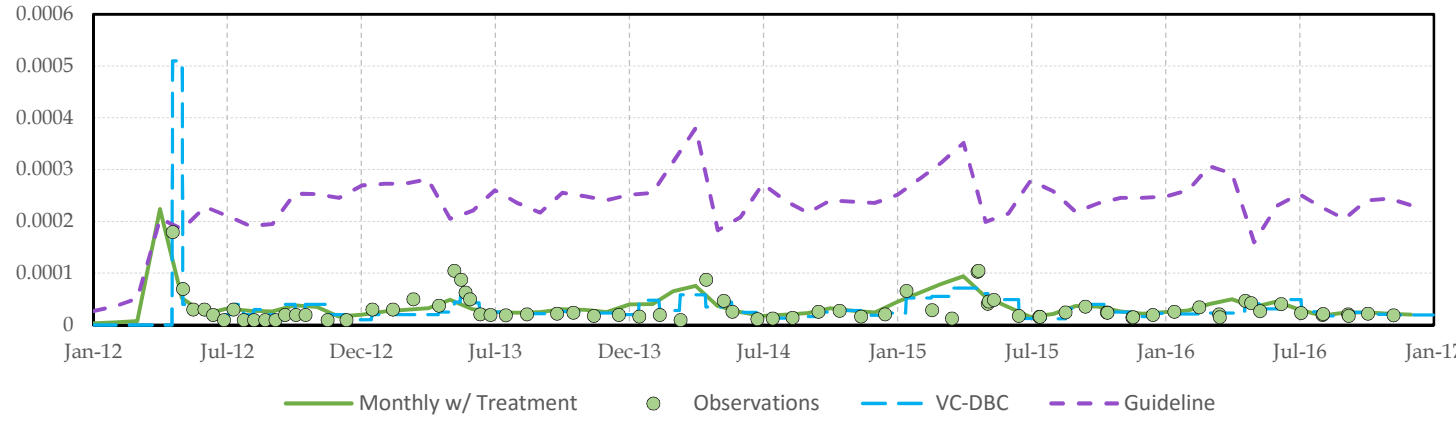
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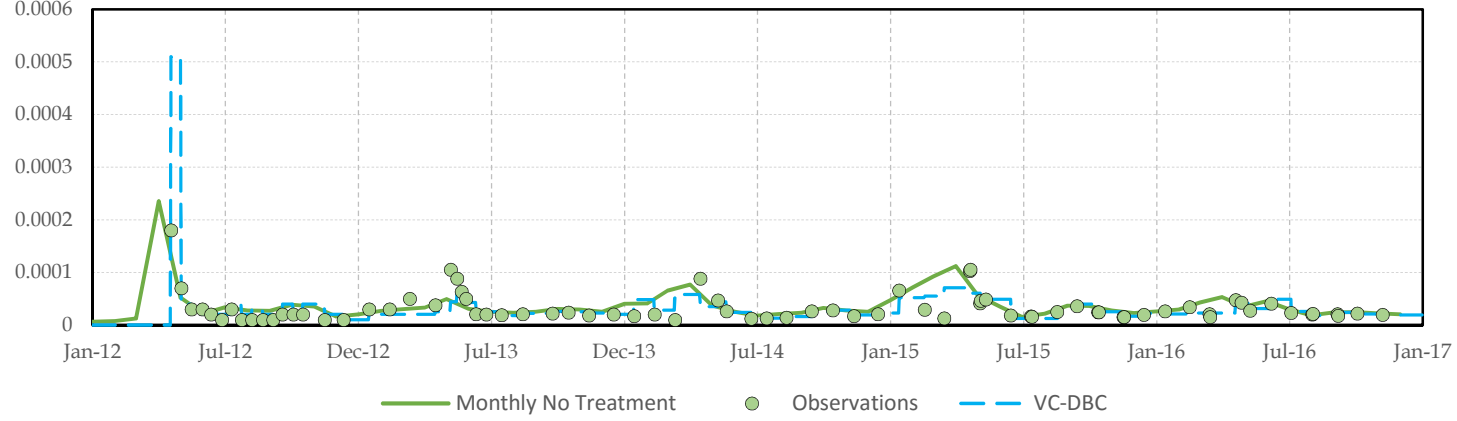
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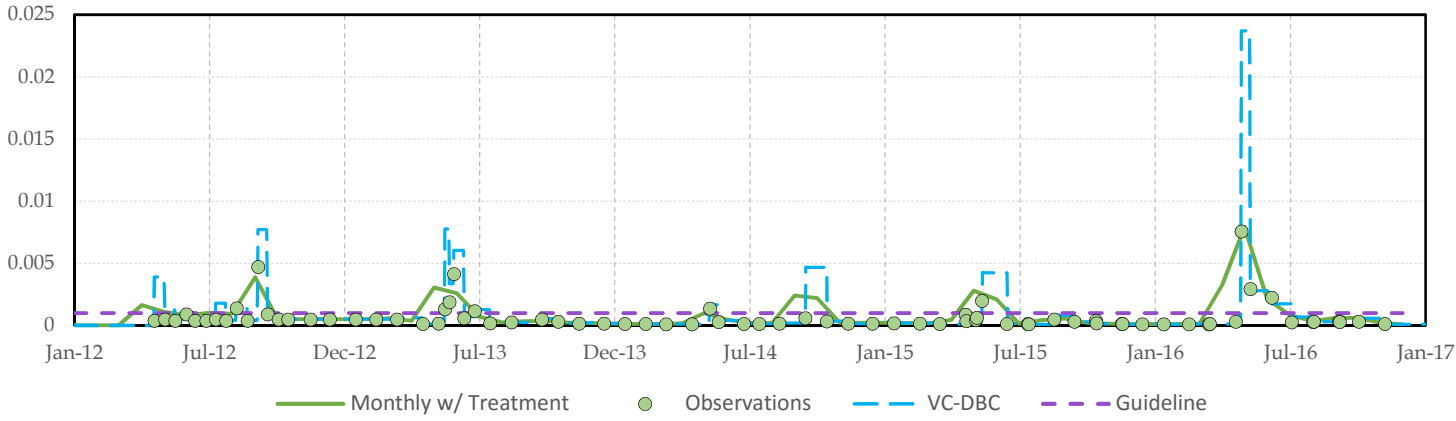
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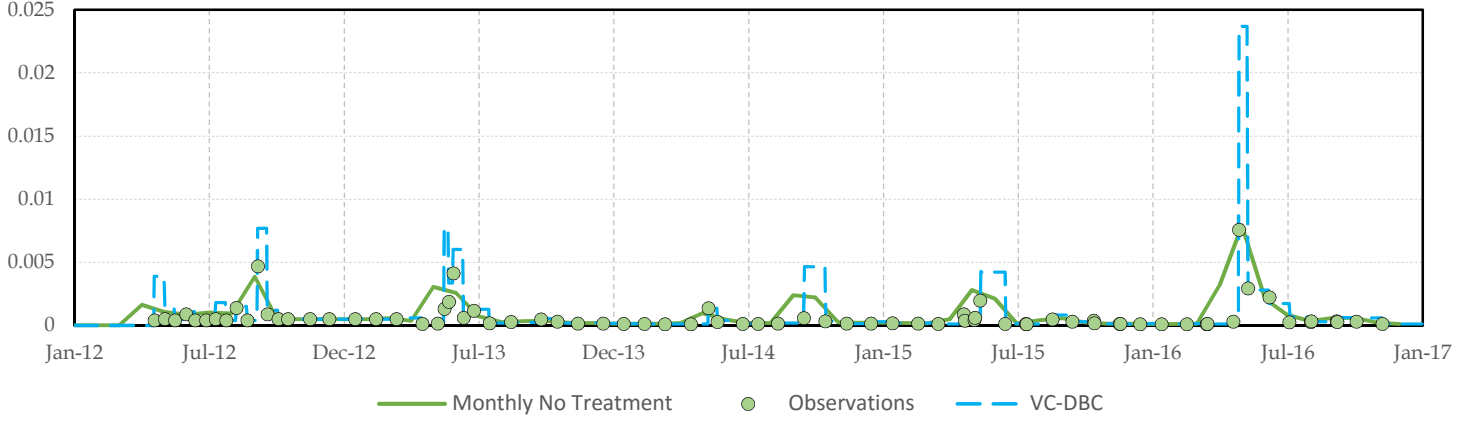
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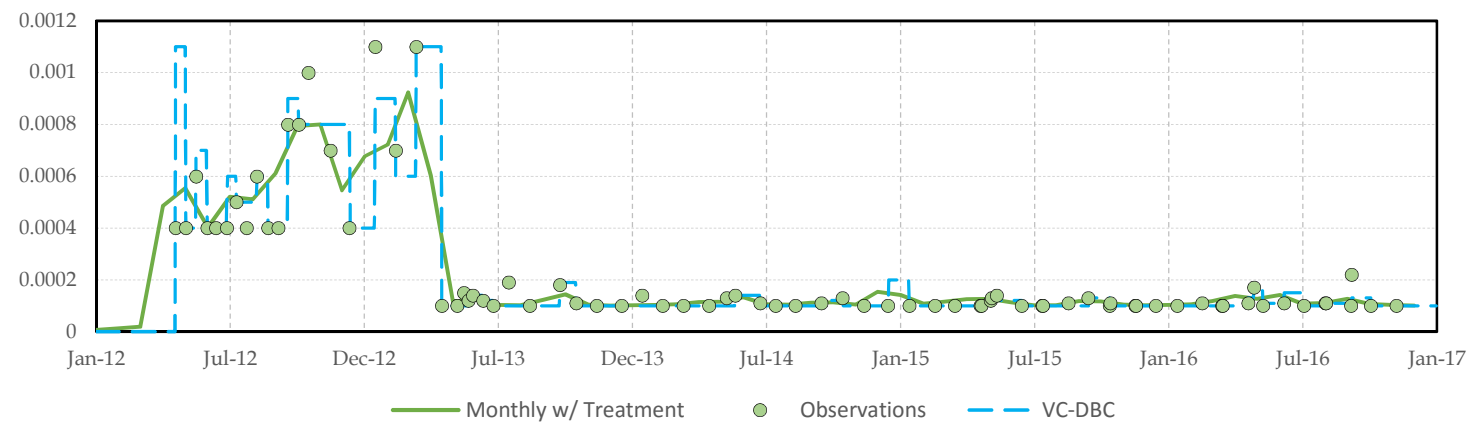
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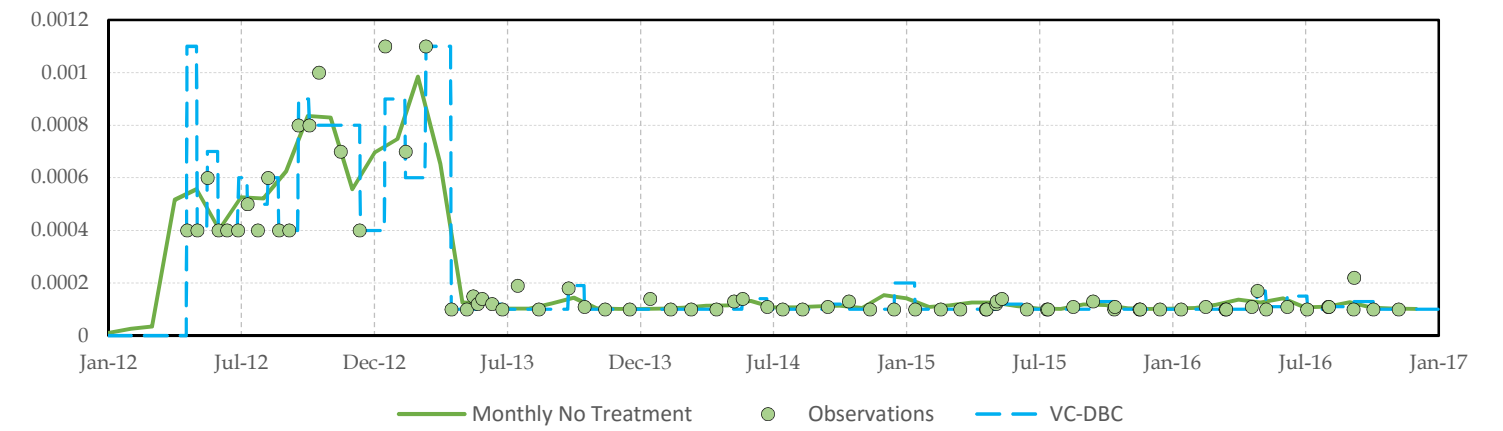
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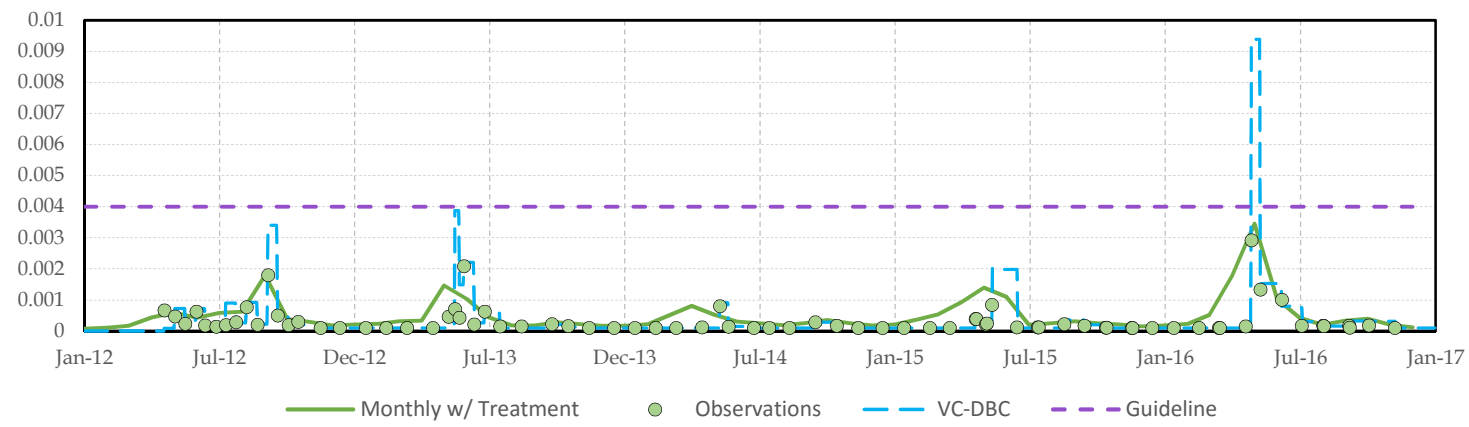
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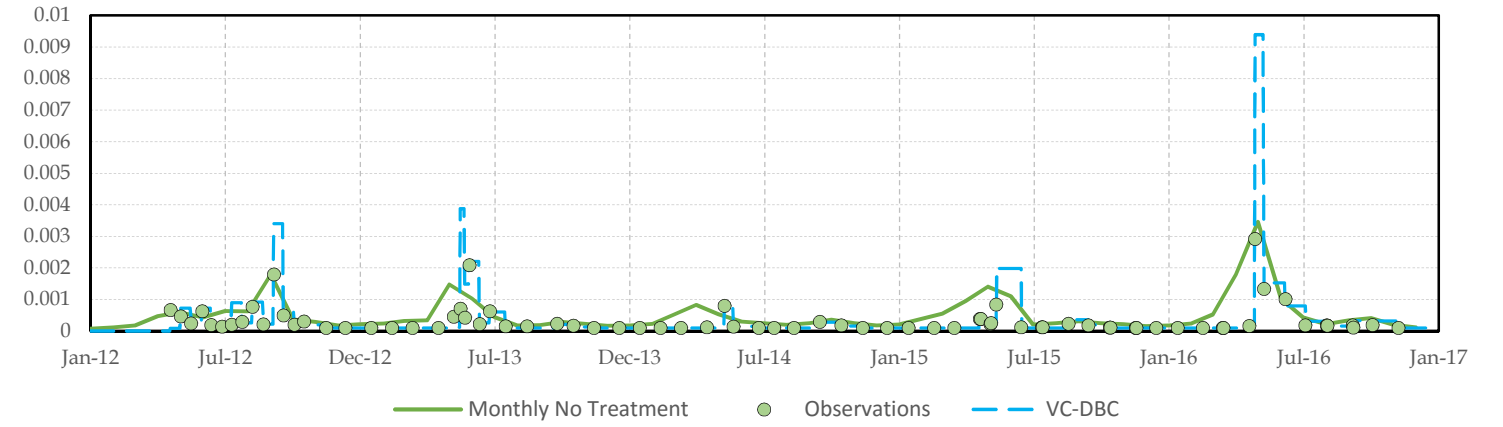
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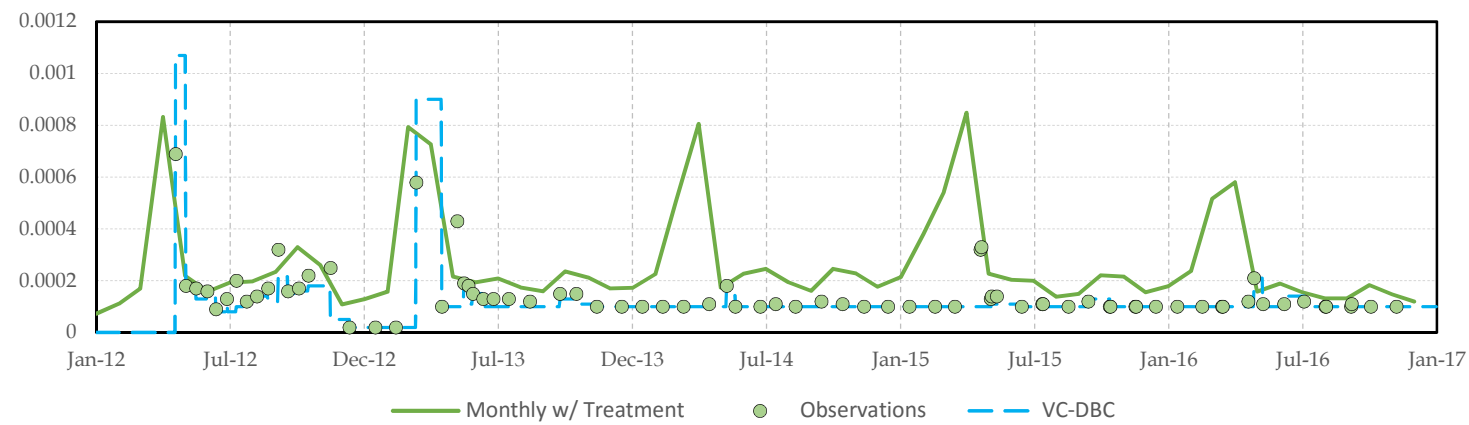
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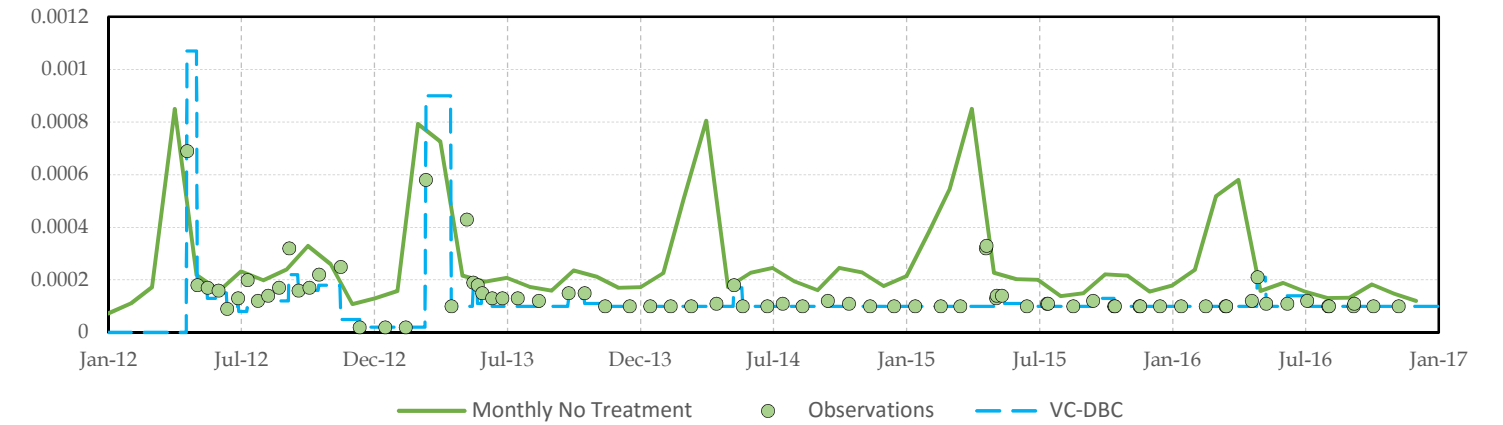
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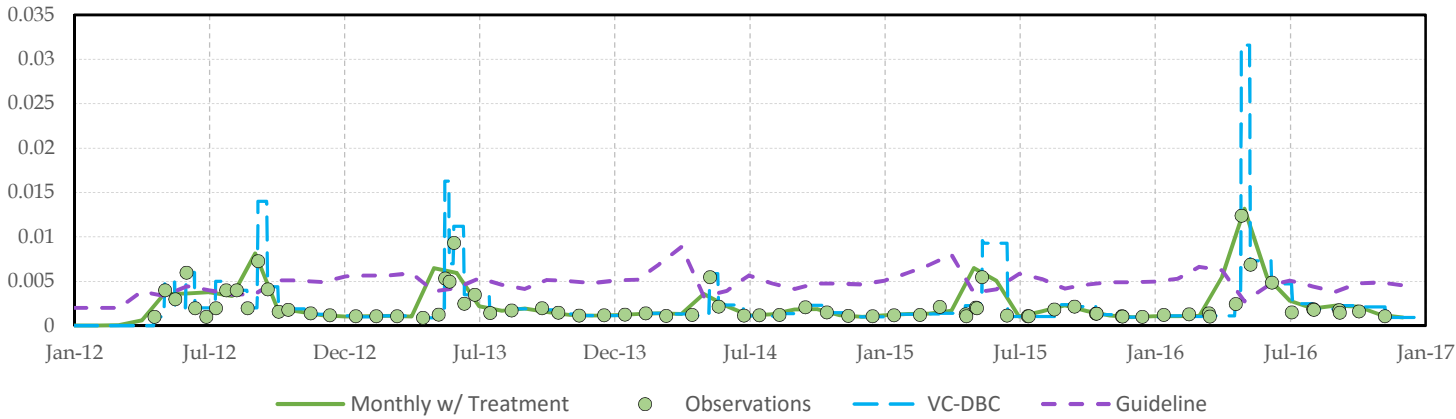
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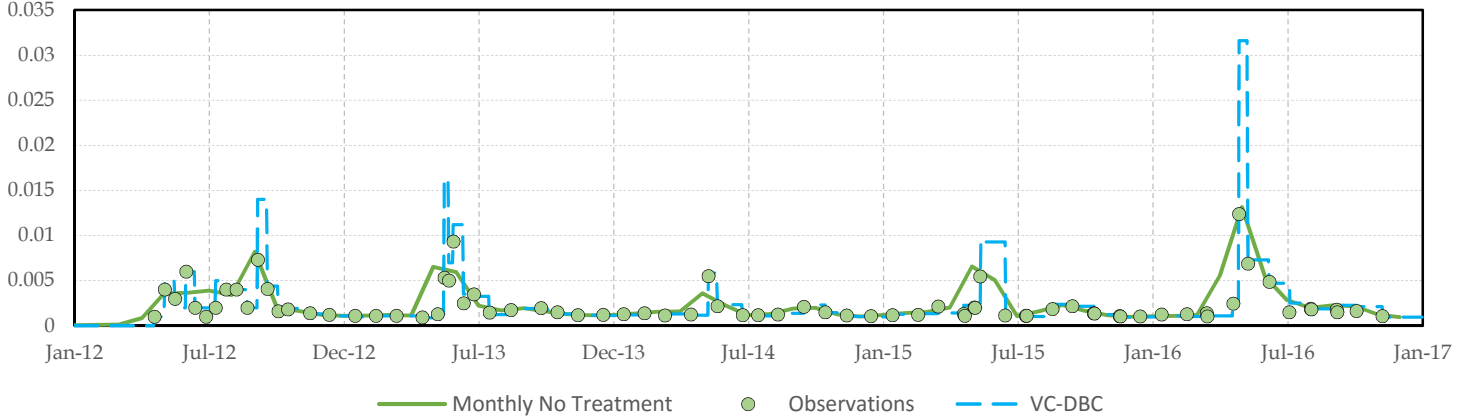
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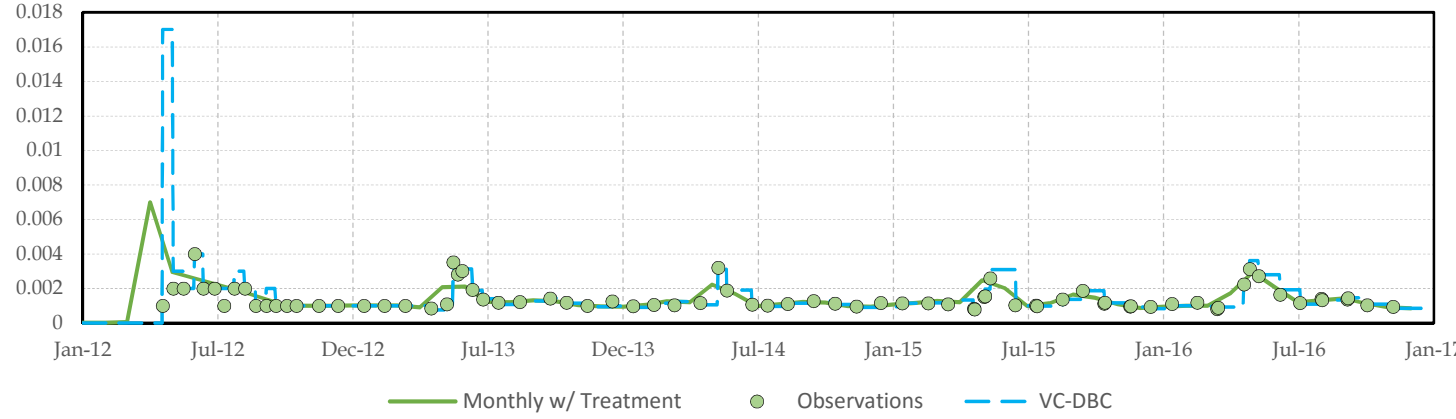
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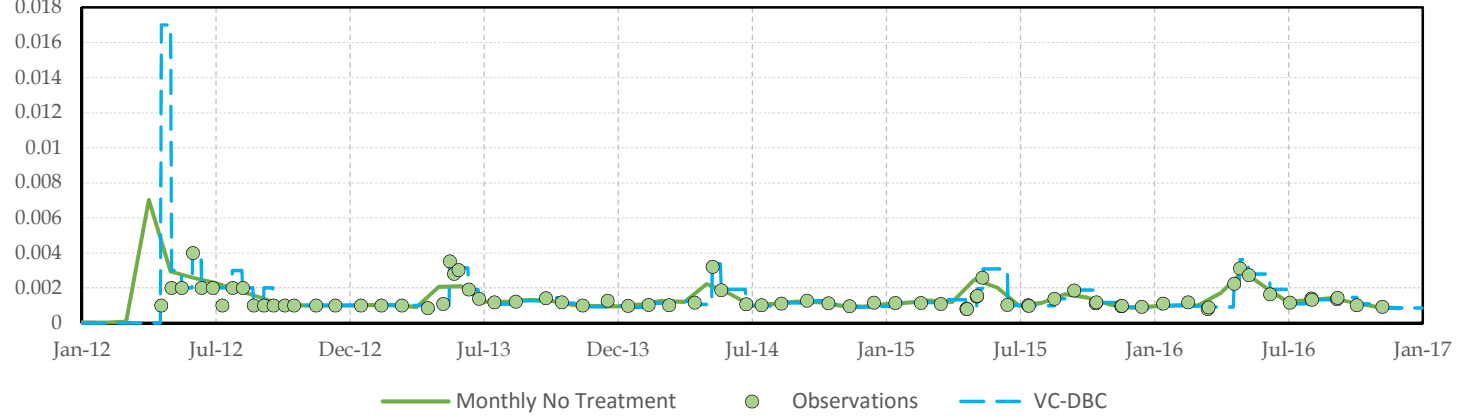
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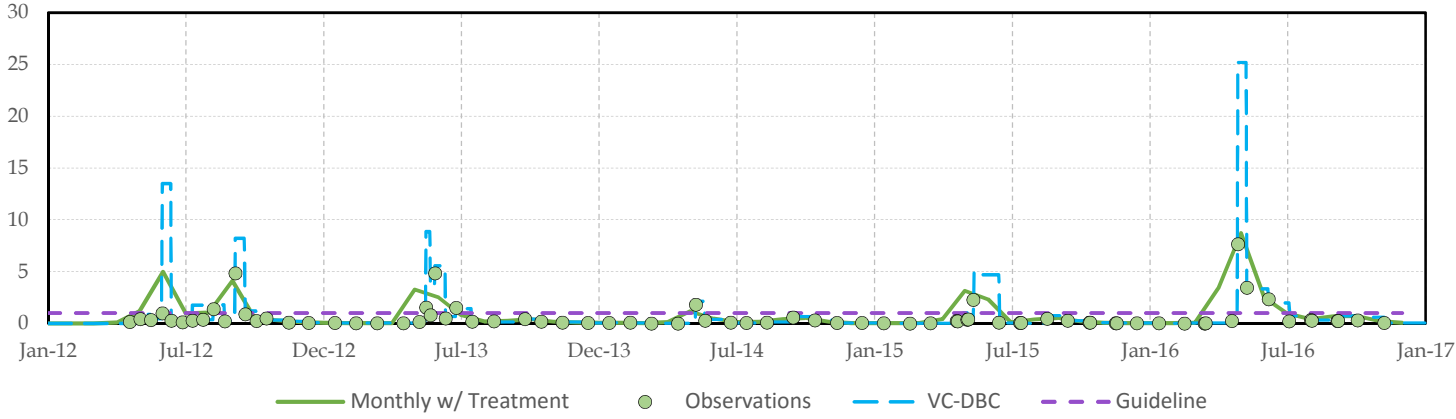
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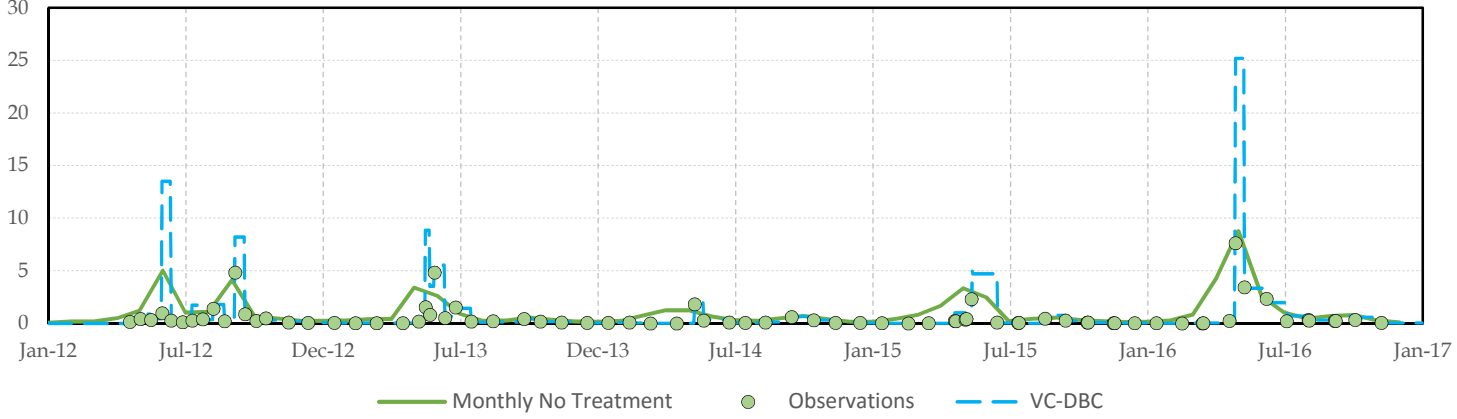
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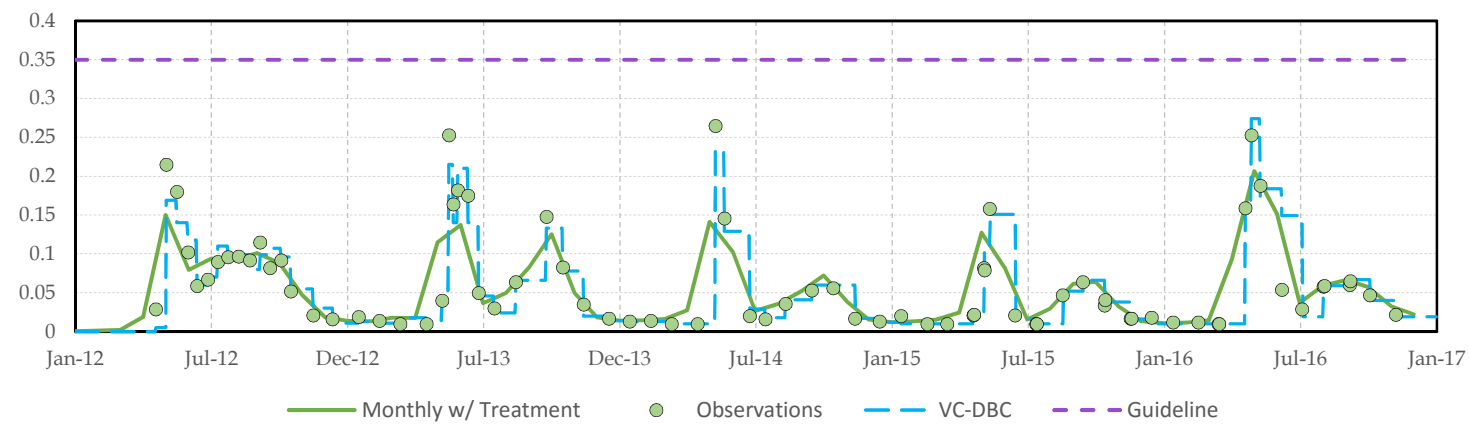
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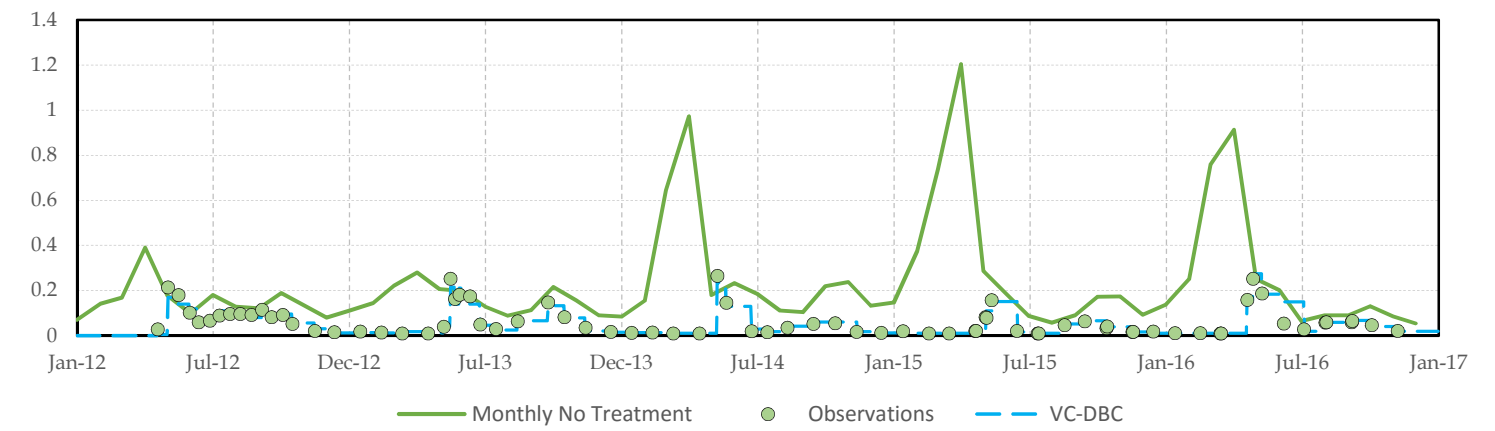
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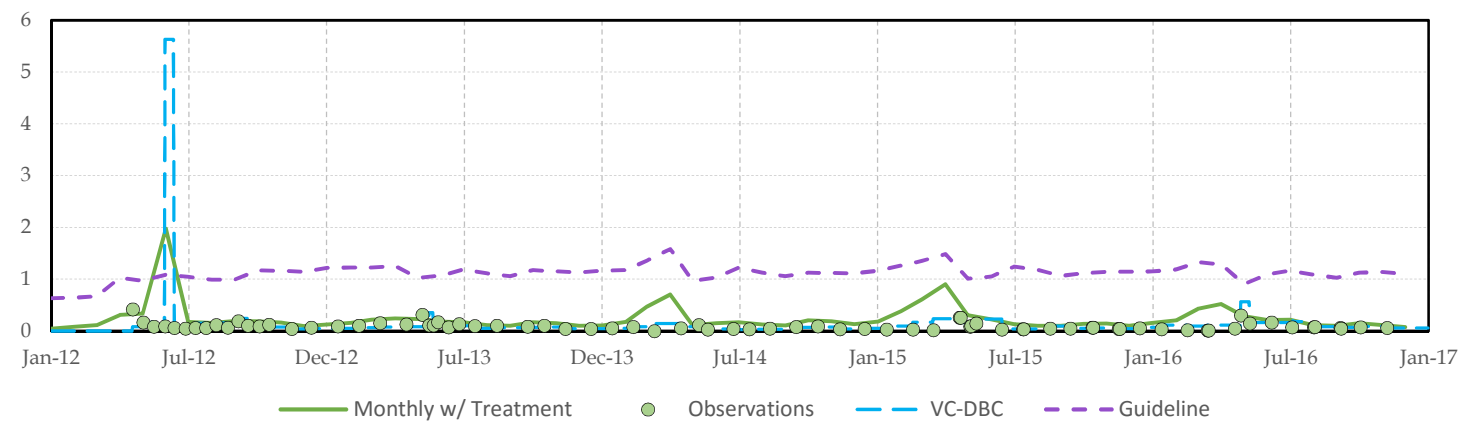
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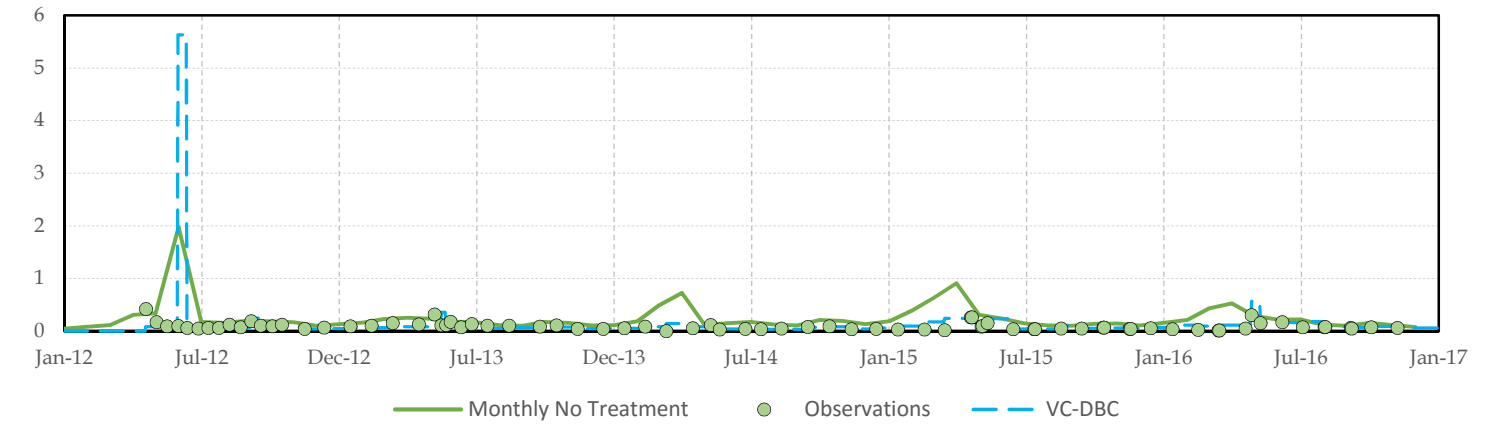
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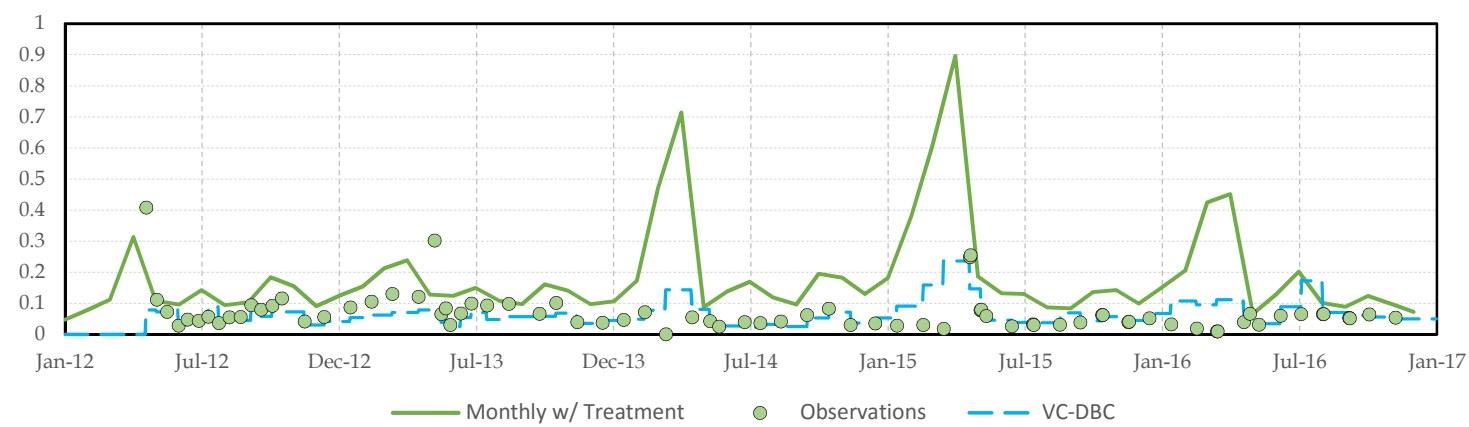
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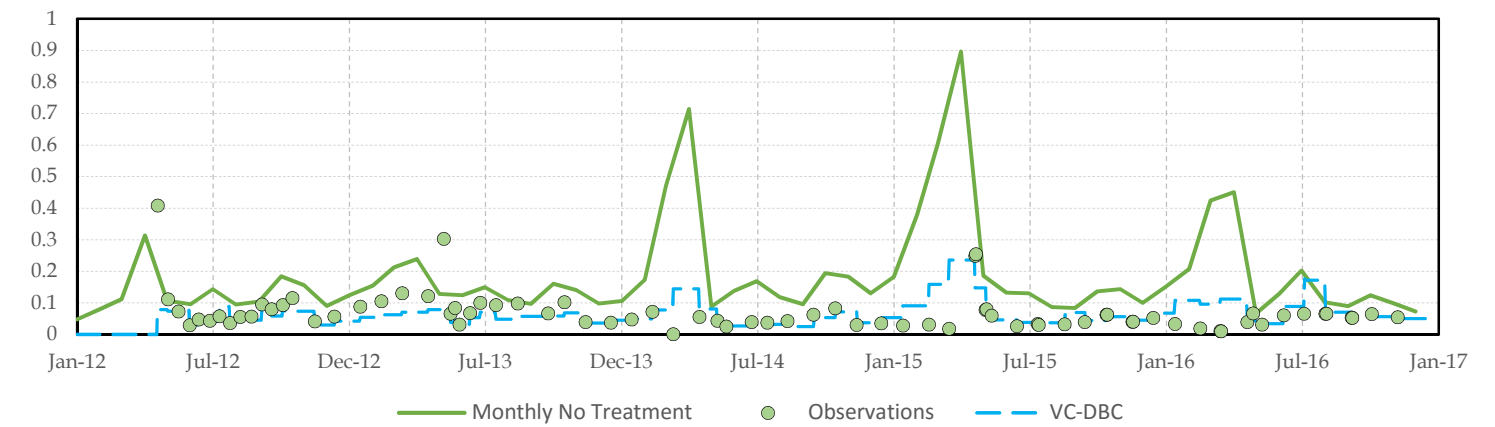
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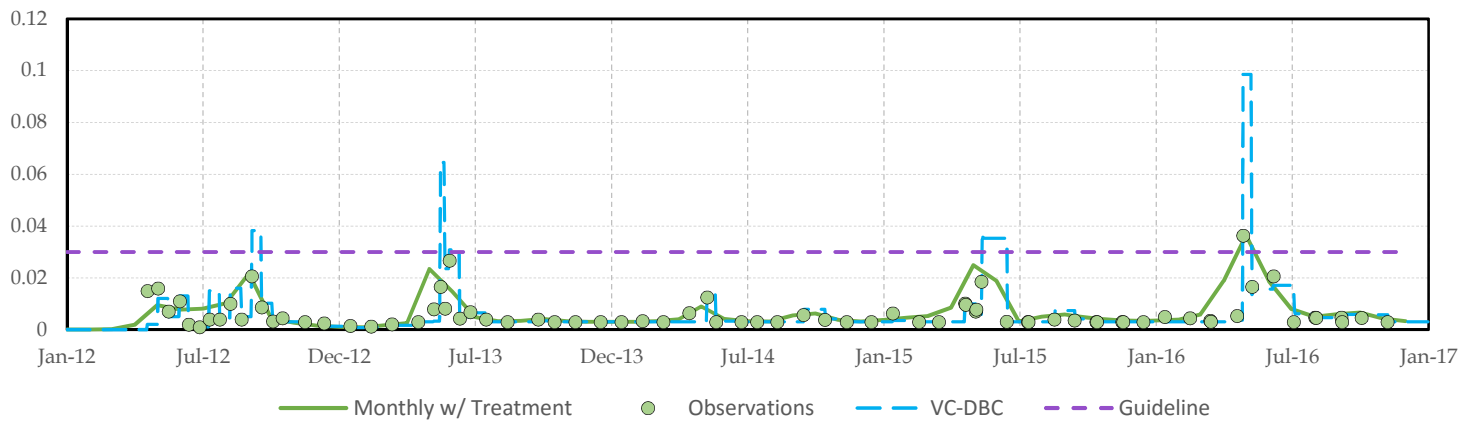
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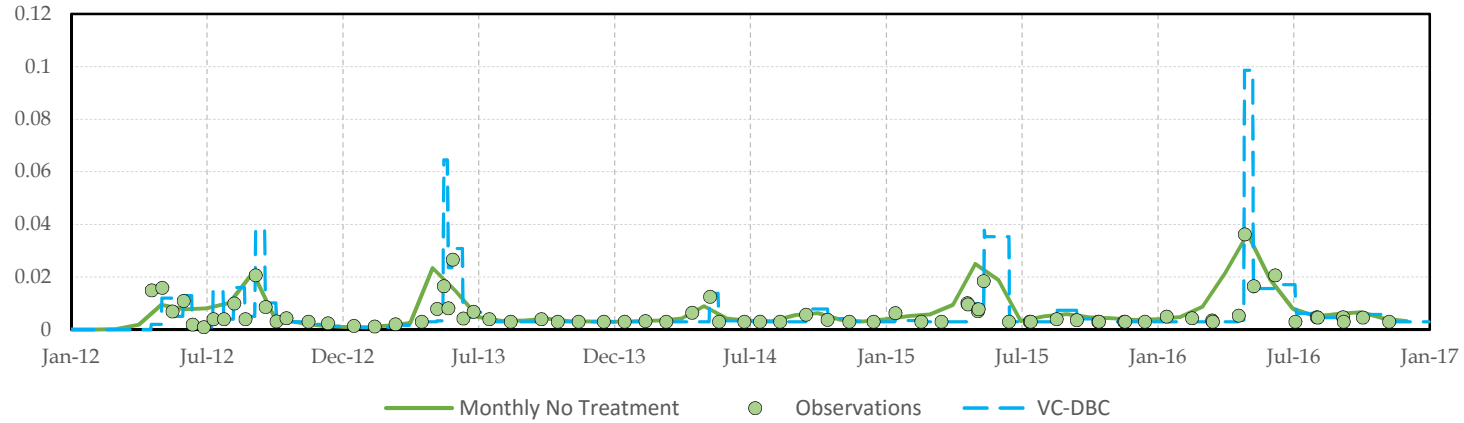
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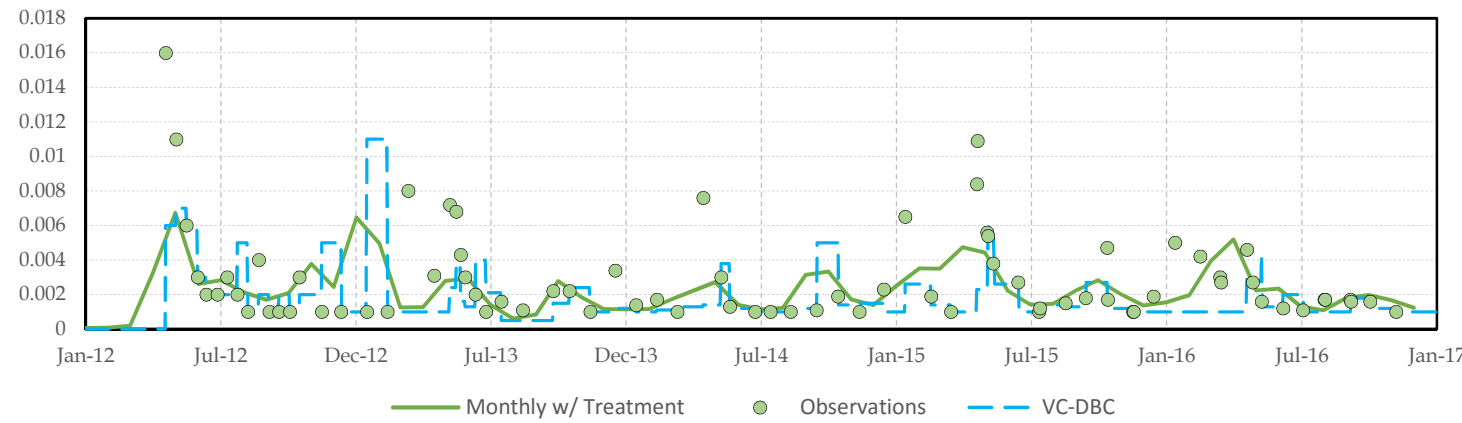
VC-UMN T-Zn



VC-UMN T-Zn



VC-UMN D-Zn



VC-UMN D-Zn

