Southeastern Wisconsin

Regional Planning Commission

Chloride Impact Study

TAC Meeting – Review of Technical Report No. 61
Field Monitoring and Data Collection for the Chloride Impact Study
June 28, 2023

Worldox Number 268839

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Meeting Agenda and Speakers

- Review of Summary Notes from TAC meeting on April 26, 2023
- Review of preliminary draft chapters for *SEWRPC Technical Report No. 61, Field Monitoring and Data Collection for the Chloride Impact Study*
- Next Steps

Today's Speakers:

- Laura Herrick, Chief Environmental Engineer
- Joe Boxhorn, Principal Planner
- Aaron Owens, Senior Planner
- Nick Neureuther, Specialist-Biologist

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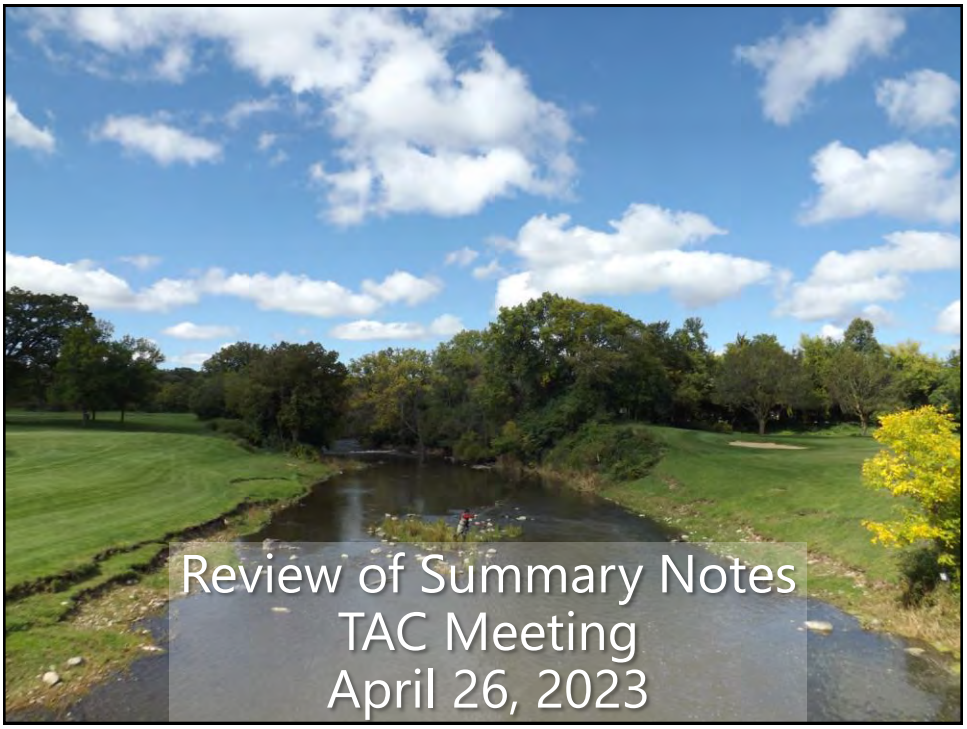
Review of Summary Notes
TAC Meeting
April 26, 2023

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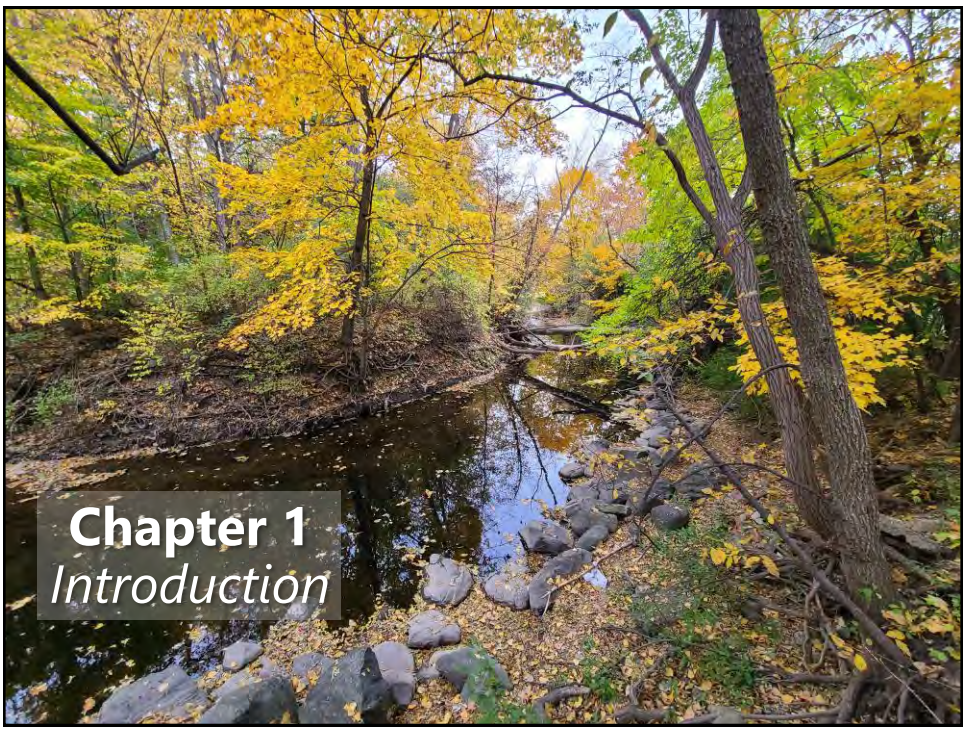
Chapter 1
Introduction

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Chapter 1 – Introduction

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1. Describes the purpose of the report and the subjects addressed
2. Places this Technical Report in the context of the objectives of the Chloride Impact Study
3. Presents the organization of the Report

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Chapter 1 – Introduction

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1.) Purpose of the Report

- Approach used to select stream and lake monitoring sites
- Characterization of areas draining to water quality monitoring sites
- Equipment used for continuous monitoring and installation process
- How continuous monitoring equipment was maintained
- Water quality parameters collected at continuous monitoring sites
- Equipment and methodology for collecting grab samples
- Water quality parameters measured from grab samples
- Methodology used for winter weather event sampling
- QA/QC procedures for water quality monitoring
- Data management, documentation, and post-processing procedures

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Chapter 1 – Introduction

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2.) Place TR-61 in Context of the Objectives of Chloride Impact Study

Chloride Impact Study Reports:

- *PR-57-A Chloride Impact Study for Southeastern Wisconsin*
- **TR-61-Field Monitoring and Data Collection for the Chloride Impact Study**
- *TR-62-Impacts of Chloride on the Natural and Built Environment*
- *TR-63-Chloride Conditions and Trends in Southeastern Wisconsin*
- *TR-64-Regression Analysis of Specific Conductance and Chloride Concentrations*
- *TR-65-Mass Balance Analysis for Chloride in Southeastern Wisconsin*
- *TR-66-State of the Art for Chloride Management*
- *TR-67-Legal and Policy Considerations for the Management of Chloride*

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Chapter 1 – Introduction

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3.) Organization of the Report

TR-61 Chapters

- Chapter 1 – Introduction
- Chapter 2 – Water Quality Monitoring Site Selection and Characterization
- Chapter 3 – Monitoring Site Installation, Field Equipment, and Data Collection Procedures
- Chapter 4 – Data Management and Documentation

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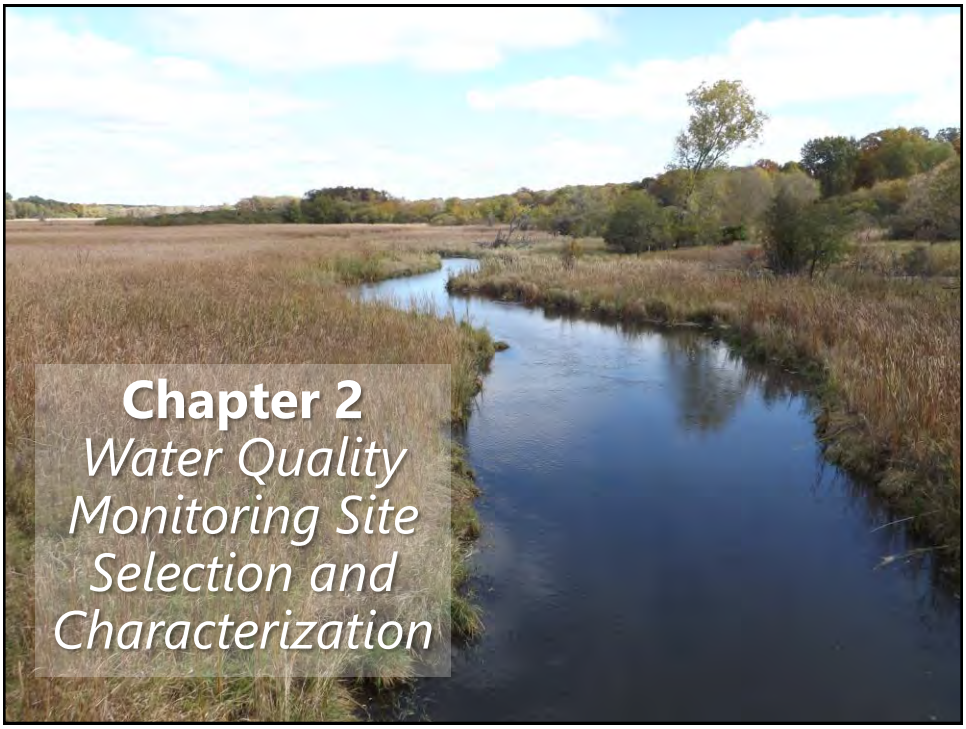

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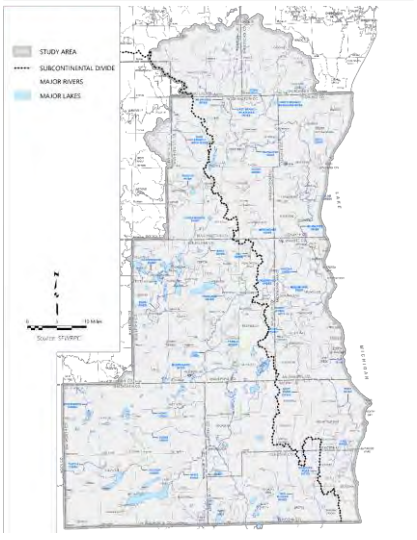
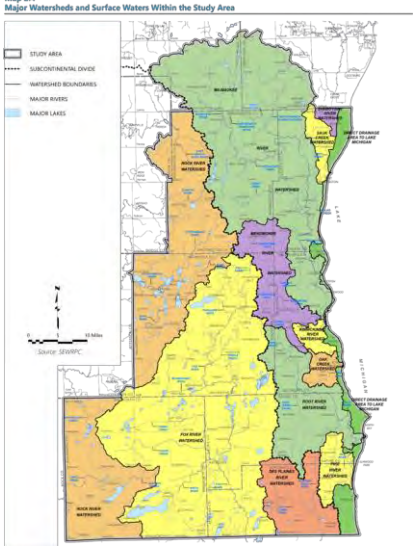
Defining the Study Area

Map 2.2
Study Area for the Regional Chloride Impact Study



Map 2.4
Major Watersheds and Surface Waters Within the Study Area



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Defining the Study Area

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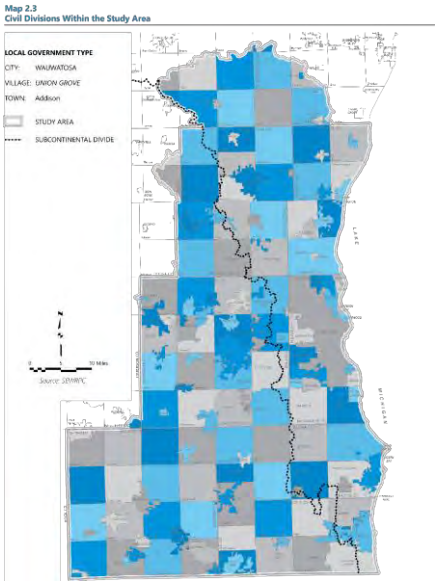

- Study Area includes:
  - 7 County SE WI Region plus areas that drain into the Region including all or portions of:
    - 11 Counties
    - 29 Cities
    - 75 Villages
    - 73 Townships

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Stream Monitoring Site Selection

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- Preliminary Site Selection Considerations
  - Geographic Distribution
  - Land Use
  - Public WWTPs and SSSAs
  - Stormwater Management Systems
  - USGS Stream Gage Stations
  - Stream Size
  - Availability of Historical WQ Data
  - Sources of Water Supply
- Site Specific Site Selection Considerations
  - Stream Access and Safety
  - In-stream and Riparian Characteristics

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Preliminary Site Selection Considerations

Table 2.1
Counties Within the Study Area

County[a]	Area (sq mi)	Percent of Region	Percent of Study Area
Waukesha	581	21.6	19.5
Walworth	576	21.4	19.3
Washington	436	16.2	14.6
Racine	341	12.7	11.4
Kenosha	278	10.3	9.3
Milwaukee	243	9.0	8.2
Ozaukee	235	8.8	7.9
Fond du Lac[b]	139	---	4.7
Sheboygan[b]	123	---	4.1
Dodge[b]	26	---	0.9
Jefferson[b]	4	---	0.1
Total	2,982	100.0	100.0

Table 2.2
Major Watersheds Within the Study Area

Watershed[a]	In-Region Area (square miles)	Out-of-Region Area (square miles)	Total Study Area (square miles)	Percent of Study Area
Fox River[b]	934	4	938	31.5
Rock River[b]	611	21	632	21.2
Milwaukee River	435	266	701	23.5
Root River	198	---	198	6.6
Menomonee River	136	---	136	4.6
Des Plaines River[b]	133	---	133	4.5
Direct Drainage to Lake Michigan	94	---	94	3.1
Pike River	51	---	51	1.7
Sauk Creek	34	1	35	1.2
Oak Creek	28	---	28	0.9
Kinnickinnic	25	---	25	0.8
Sheboygan[b]	11	---	11	0.4
Total	2,690	292	2,982	100.0

➢Geographic Distribution

- Balanced coverage throughout seven-county SE WI Region
- Balanced coverage among major watersheds within study area

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Preliminary Site Selection Considerations

Table 2.3
Land Use Groups for the Chloride Impact Study

Chloride Study Land Use Group	SEWRPC Land Use Code	SEWRPC Land Use Description
Lower-Density Residential	111R	Rural-Density Single-Family Residential
	111S	Suburban-Density Single-Family Residential
	111L	Low-Density Single-Family Residential
	199	Residential Land Under Development
Medium-Density Residential	111M	Medium-Density Single-Family Residential
	150	Mobile Homes
High-Density Residential	111X	High-Density Single-Family Residential
	120	Two-Family Residential
	141	Multi-Family Low Rise
	142	Multi-Family High Rise
Commercial	210	Retail Sales and Service--Intensive
	220	Retail Sales and Service--Nonintensive
	299	Retail Sales and Service Land Under Development
Industrial	310	Manufacturing
	340	Wholesaling and Storage
	399	Industrial Land Under Development
Government and Institutional	611	Administrative, Safety, and Assembly - Local
	612	Administrative, Safety, and Assembly - Regional
	641	Educational - Local
	642	Educational - Regional
	661	Group Quarters - Local
	662	Group Quarters - Regional
	681	G&I Local - Cemeteries
	682	G&I Regional - Cemeteries
	699	Government and Institutional Land Under Development
Roads and Parking Lots	411	Freeway
	414	Standard Arterial Street and Expressway
	418	Local and Collector Streets
	425	Bus Terminal
	426	Truck Terminal
	430	Off-Street Parking - Multiple Land Use-Related
	431	Off-Street Parking - Residential-Related
	432	Off-Street Parking - Retail Sales and Service-Related
	433	Off-Street Parking - Industrial-Related
	434	Off-Street Parking - Transportation-Related
	435	Off-Street Parking - Communication and Utilities-Related
	436	Off-Street Parking - Government and Institution-Related
	437	Off-Street Parking - Recreation-Related
	498	Transportation Land Under Development
Transportation, Communication, and Utilities	441	Railroad Track Right-of-Way
	443	Railroad Switching Yards
	445	Railroad Stations and Depots
	463	Air Fields
	465	Air Terminals and Hangars
	485	Ship Terminal
	510	Communication and Utilities
	599	Communication and Utility Land Under Development

Table continued on next page.

➢Land Use Characteristics

- SEWRPC's Regional Land Use Inventory (2015)
  - 103 unique classifications of land uses
  - Condensed into 16 land use groups for Chloride Study
- Out-of-Region Land Use (various years)
  - Inventory developed for previous studies
  - Reached out to Counties

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Preliminary Site Selection Considerations

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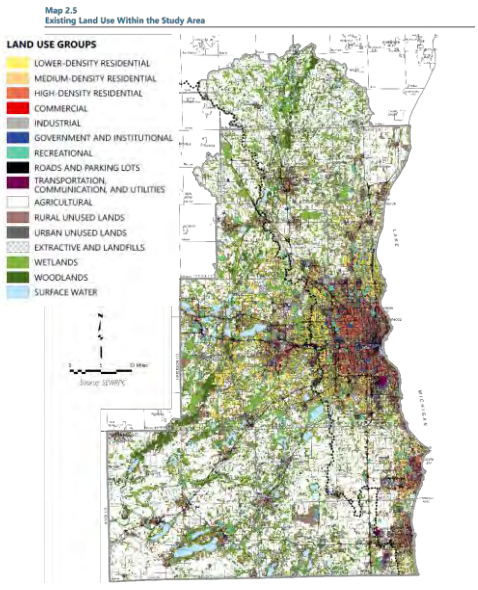

- Land Use Characteristics
  - Uniform land use inventory for entire study area

Preliminary Site Selection Considerations

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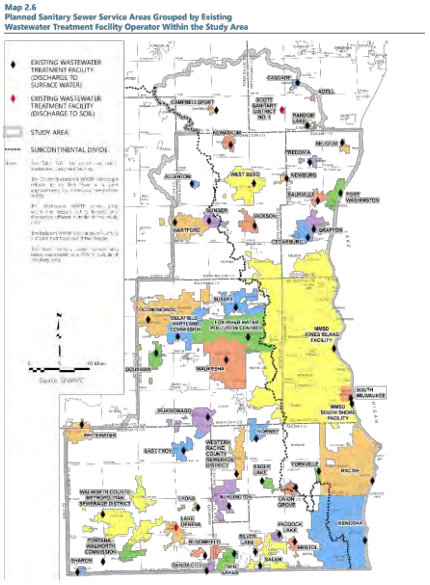

- Public Wastewater Treatment Facilities and Sanitary Sewer Service Areas
  - 49 Public WWTPs
  - 57 Sanitary Sewer Service Areas (planned areas)

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Preliminary Site Selection Considerations

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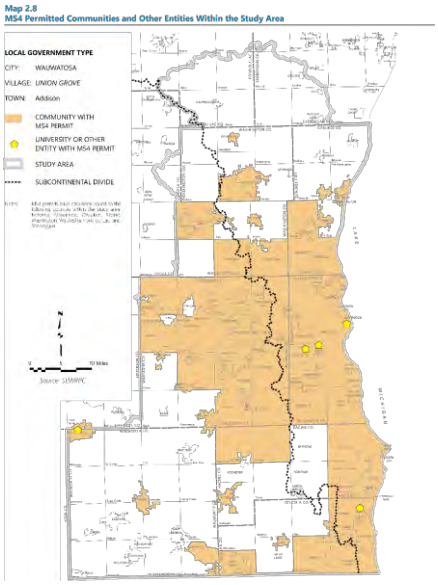

- Stormwater Management Systems
  - Municipal Separate Storm Sewer System (MS4) permits
    - 8 Counties
    - 95 Municipalities
    - 3 Universities
    - Wisconsin State Fair Park
    - SE WI Baseball Park District

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Preliminary Site Selection Considerations

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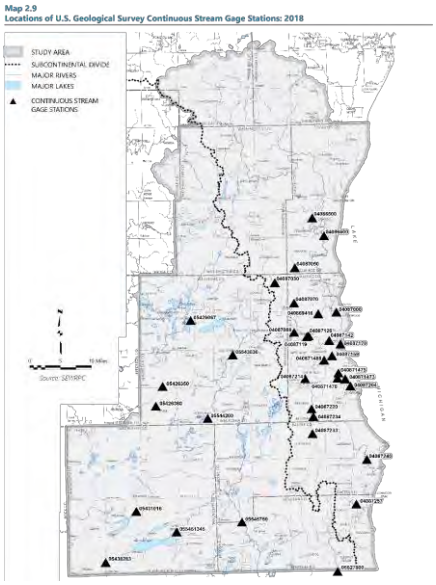

- Proximity to USGS Stream Gage Stations
  - 34 continuous recording streamflow gaging stations
  - Prioritized establishing monitoring sites near these gages

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Preliminary Site Selection Considerations

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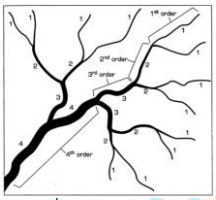

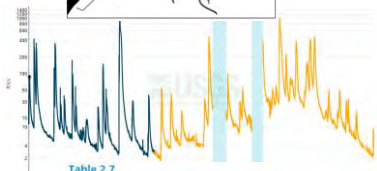

Table 2.7
Flow Criteria for Defining Natural Stream Community Type Based on the Wisconsin Stream Model

Natural Community	Annual 90 Percent Exceedance Flow (cfs)
Ephemeral	0.0
Macroinvertebrate	0.0-0.03
Cold Headwater	0.03 -1.0
Cold Mainstem	>1.0
Cool (Cold-Transition) Headwater	0.03-3.0
Cool (Cold-Transition) Mainstem	>3.0
Cool (Warm-Transition) Headwater	0.03-3.0
Cool (Warm-Transition) Mainstem	>3.0
Warm Headwater	0.03-3.0
Warm Mainstem	3.0-110.0
Warm River	>110.0

Note: For further information on stream natural community types, see the WDNR webpage explaining stream natural communities: dnr.wisconsin.gov/topic/Rivers/NaturalCommunities.html

Source: Wisconsin Department of Natural Resources

- Stream Size
  - Channel width
  - Stream order classification
  - Streamflow
    - USGS gage stations
    - Modeled streamflow (WDNR Natural Communities Model)

Preliminary Site Selection Considerations

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MMSD
PARTNERS FOR A CLEANER ENVIRONMENT

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WISCONSIN DEPT. OF NATURAL RESOURCES

Southeastern Wisconsin Regional Planning Commission
SEWRPC

USGS
science for a changing world

- Availability of Historical Surface Water Quality Monitoring
  - MMSD
  - WDNR SWIMS database
  - USGS NWIS database
  - U.S. EPA STORET database
  - Past SEWRPC studies
  - Relevant datasets from other entities

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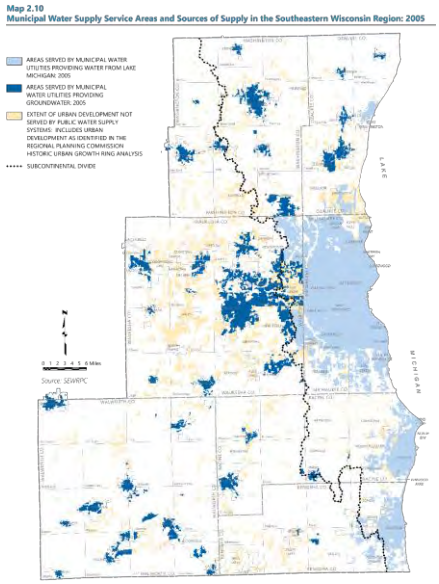
Preliminary Site Selection Considerations



➢Sources of Water Supply

- Light blue: Served by municipal utilities using Lake Michigan water
- Dark blue: Served by municipal utilities using groundwater
- Tan: Urban development that is not served by municipal water supply – likely private wells (groundwater)

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Preliminary Site Selection Considerations

➢Chloride Impaired Streams (2016)

- Kinnickinnic River
- Lily Creek
- Lincoln Creek
- Little Menomonee River
- Oak Creek
- Pike Creek
- Pike River
- Unnamed Tributary to North Branch Pike River
- Root River
- Ulao Creek

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Preliminary Site Selection Considerations

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- Other Peripheral Considerations
  - Salt storage locations
  - Large agricultural feed lots
  - Landfills
  - Certain food processing activities

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Preliminary List of Potential Streams

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- List of 55 potential stream monitoring locations assembled based on preliminary considerations
- Potential sites were broadly representative of varying characteristics across the Region
  - 19 sites in the Fox River watershed
  - 12 sites in the Rock River watershed
  - 10 sites in the Milwaukee River watershed
  - 4 sites in the Root River watershed
  - 2 sites each in the Menomonee and Des Plaines River watershed and the Lake Michigan Direct Drainage
  - 1 site each in the Pike River, Oak Creek, Kinnickinnic River, and Sauk Creek watersheds

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Site-Specific Considerations

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- Stream Access and Safety
  - Prioritized locations with publicly owned land
  - Private land access – formal letters sent to landowners (Appendix A)
  - Safe Access
    - Close to road crossings
    - Off-street parking or sufficient roadside shoulder
    - Save entry into streams

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Site-Specific Considerations

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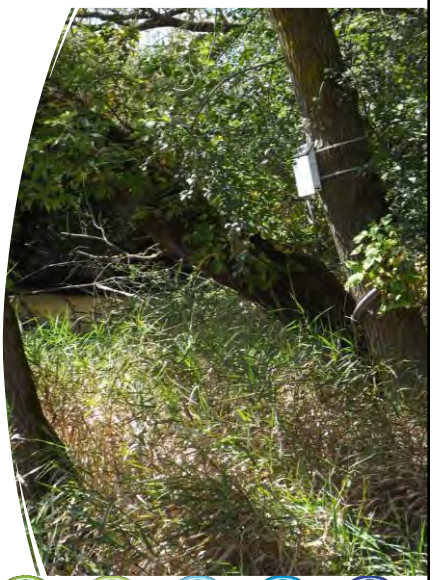
- In-Stream and Riparian Characteristics
  - Ideal water depths
  - Suitable flow conditions
  - Stable streambed substrates
  - Inconspicuous locations, out of public view
  - Suitable riparian conditions to install out-of-water equipment



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Stream Sites Selected for Monitoring

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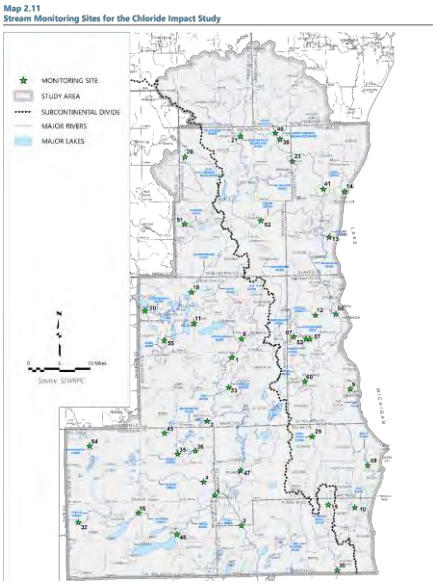

- Stream Monitoring Sites
  - 41 Stream locations selected for installation of monitoring equipment
  - Balanced Regional coverage representative of diverse characteristics
  - 17 Sites near USGS continuous streamflow gaging stations (Table 2.8)
  - 15 Sites with drainage areas containing other stream monitoring sites (Table 2.9)
  - 16 Sites on streams with streamflow carrying treated wastewater effluent from one or more public WWTPs (Table 2.10)

Lake Monitoring Site Selection

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- Provide a balanced geographic distribution across Region
- Include lakes representative of a variety of lake types
- Willing volunteers based on known contacts from previous Commission projects

Lake Sites Selected for Monitoring

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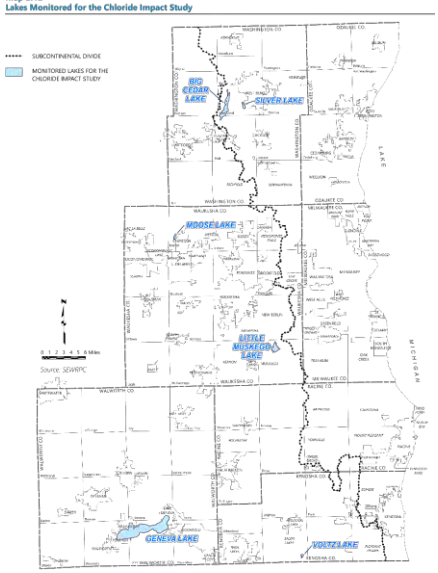
Map 2.12
Lakes Monitored for the Chloride Impact Study



- Big Cedar Lake
- Geneva Lake
- Little Muskego Lake
- Moose Lake
- Silver Lake (Washington County)
- Voltz Lake

Characterization of Monitoring Sites

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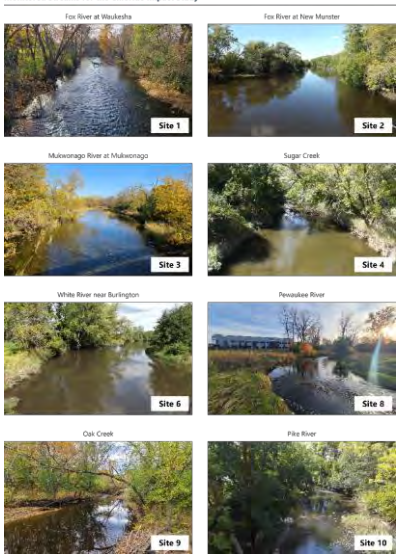
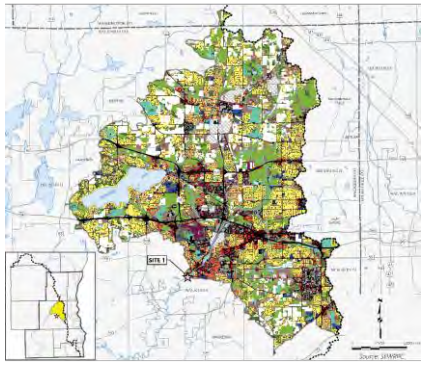
Figure 2.1
Monitored Streams for the Chloride Impact Study

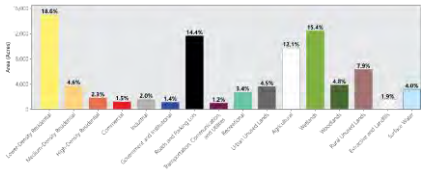


- Descriptions of each monitoring site and upstream drainage areas
  - General location
  - Nearby USGS stream gage
  - Stream size characterization and contributing drainage area size
  - Nested monitoring sites
  - Land Use statistics and characteristics
  - Planned Sanitary Sewer Service Areas
  - Public Wastewater Treatment Facilities

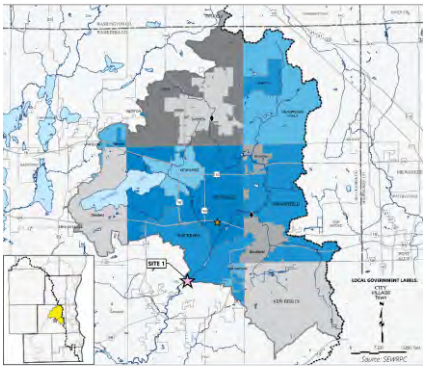
Stream Monitoring Site Drainage Areas – APPENDIX B

Map B.1
Site 1: Fox River at Waukesha Drainage Area – Existing Land Use





Map B.2
Site 1: Fox River at Waukesha Drainage Area – Characteristics



Facts at a Glance

- **Drainage Area Size:** 126 square miles
- **Major Watershed:** Fox River
- **Land Use:** Urban – 54.0%; Rural – 46.0%
- **Roads and Parking Lots (% of drainage area):** 14.4
- **Estimated Population (2010):** 120,800
- **Estimated Households (2010):** 49,480
- **Nearest USGS Streamgage:** Fox River at Waukesha (05543830)
- **Other Monitoring Sites Within this Drainage Area (★):** Site 8 (Pewaukee River)
- **Upstream Wastewater Treatment Facilities (♦):** Sussex and Fox River Water Pollution Control Center
- **Planned Sanitary Sewer Service Area (% of drainage area):** 73
- **Water Supply Source:** Groundwater (water supplied by the City of Waukesha is planned to be converted from groundwater to Lake Michigan supply in 2023)

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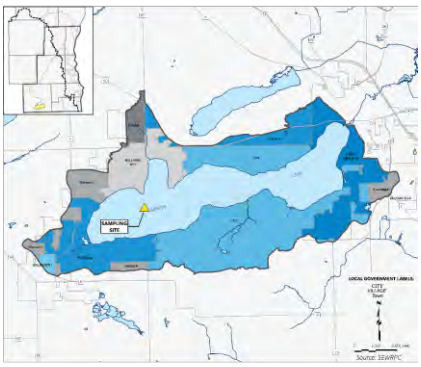
Lake Monitoring Site Drainage Areas – APPENDIX C

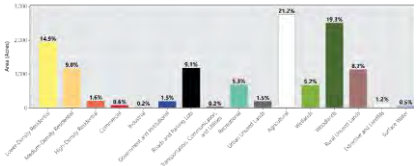
Map C.3
Geneva Lake Drainage Area – Characteristics



Facts at a Glance

- **Drainage Area Size:** 20 square miles
- **Major Watershed:** Fox River
- **Land Use:** Urban – 43.9%; Rural – 56.1%
- **Roads and Parking Lots (% of drainage area):** 9.1
- **Estimated Population (2010):** 9,910
- **Estimated Households (2010):** 4,278
- **Upstream Wastewater Treatment Facilities:** None
- **Planned Sanitary Sewer Service Area (% of drainage area):** 55
- **Water Supply Source:** Groundwater

Map C.4
Geneva Lake Drainage Area – Existing Land Use



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Stream Monitoring

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- Three methods were used to assess water quality
  - Streams continuously monitored using CTD-10 sensors
  - Monthly water quality sampling at each monitoring site
  - Winter weather event sampling to capture impacts of deicing practices

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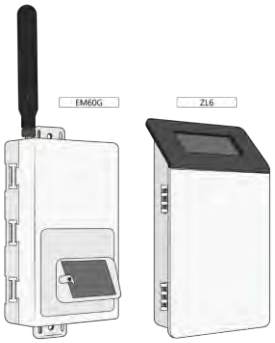
Continuous Stream Monitoring

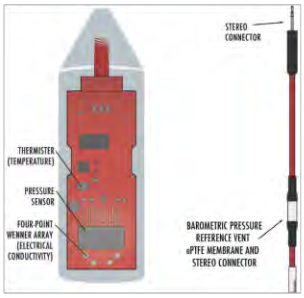
Equipment

Figure 3.2
Combined Data Logger and Telemetry Unit Devices



Source: METER Group Inc. and SEWRPC

Figure 3.1
CTD-10 Sensor Diagram



Source: METER Group Inc.

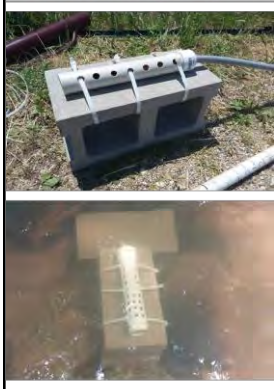
Figure 3.3
Aqua TROLL 500 Multiparameter Sonde and Wireless TROLL Com

Source: In-Situ Inc.

Continuous Stream Monitoring

Site Installation

Figure 3.4
CTD-10 Sensor and Housing Assembly



Source: SEWRPC

Figure 3.5
Illustration of Stream Monitoring Site Equipment Installation

Figure 3.6
Examples of Telemetry Unit Mounting Configurations at Stream Monitoring Sites

Source: SEWRPC

Source: SEWRPC

Continuous Stream Monitoring

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- Site continuous monitoring details
  - Data logged on telemetry units at 5-minute intervals
    - Specific conductance
    - Water temperature
    - Water level
  - Telemetry units uploaded data to the Zentra Cloud typically 6 times daily

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Continuous Stream Monitoring

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- Indication of Telemetry or Sensor Issues
  - Telemetry not transmitting to the ZENTRA Cloud
    - Fixed by resetting the unit using the onboard reset button
  - Telemetry reporting low battery level
    - Indicated a possible obstruction of the solar panels
  - Unusually high or low water levels
    - Pressure sensor malfunction
    - Moved due to waterborne debris or human intervention
  - Unexpectedly low specific conductivity
    - Indication of heavy sensor fouling, sedimentation
  - Gaps in the CTD-10 sensor data
    - Indicative of sensor damage or loose connection
- Staff would mobilize ASAP to further diagnose and make repairs

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Continuous Stream Monitoring

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Figure 3.8
CTD-10 Sensor Cleaning and Maintenance

Source: SEWRPC

- Routine equipment cleaning and maintenance
  - Spring and Fall
  - Temps above 45 degrees Fahrenheit (°F)
  - Unit was lifted out of the water
  - Sensor removed from the housing
  - Fouling removed from the CTD Sensor
  - Housing was cleaned
  - Reassembled and placed back in the water
  - Water level was recorded

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Continuous Stream Monitoring

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Figure 3.9
Examples of Fouling Observed on CTD-10 Sensors

Source: SEWRPC

- Examples of Sensor Fouling
  - Invertebrates
  - Filamentous Algae
  - Sedimentation

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Stream Water Quality Collection

Figure 3.10
Sample Bottles for Water Quality Sampling

Source: SEWRPC

- Monthly water sampling
  - Specific conductance is used to estimate aqueous chloride concentrations
  - To establish a reliable relationship, collection of an adequate number of paired water samples

Monthly Water Quality Sampling

- Sample Collection Equipment, Methods and Procedures
  - October 2018- October 2020
    - 954 monthly samples collected
- Methods
  - Collection took place mid-month
  - Water samples collected near CTD-Sensor
  - (2) 250ml bottles
  - Nitric acid preservative added to bottle analyzed for metals
  - WSLH lab sheet filled out
  - Samples were refrigerated at SEWRPC
  - Driven by staff to the lab weekly
- Quality Control
  - Field replicates
  - Field blanks

Winter Event Sample Collection

- Methods
  - Winter precipitation events
  - Snow melts
  - 111 event samples collected
- Procedures
  - Water samples collected in the same manner as monthly samples
  - Detailed notes taken
    - Location
    - Ice cover
    - Presence and extent of flooding
    - Ice dams
    - Deicing application observed near site

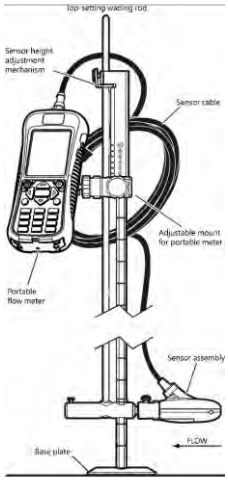
Water Sample Analysis

- All laboratory analysis completed at the Wisconsin State Laboratory of Hygiene
- Water Quality Constituents Analyzed:
  - Chloride
  - Sulfate
  - Metals
    - Calcium, Magnesium, Potassium, Sodium
  - Hardness

Wisconsin State Laboratory of Hygiene
UNIVERSITY OF WISCONSIN-MADISON

Streamflow Measurement

Figure 3.12
Flow Meter Component Diagram



Source: OTT Hydromet and SEWRPC

Figure 3.13
Streamflow Data Collection

Source: SEWRPC

- Measurements were performed at monitoring sites to better interpret CTD water level data where USGS gage station data was unavailable
- Equipment
  - OTT MF pro portable flow meter
- Computation of streamflow performed using mid-section method
- 66 surveys completed at 18 different monitoring sites

Lake Monitoring Methods and Procedures

Figure 3.14
Niskin-Style Vertical Water Sampler and Aqua TROLL 500 Multiparameter Sonde Assembly

Source: SEWRPC

- Water temperature and specific conductance profiles
  - Volunteers lent time and boats
  - Vertical profiles created at WDNR long term sampling station "deep hole"
    - Temperature
    - Specific conductance
  - Thermocline determined during summer stratification sampling

Lake Monitoring Methods and Procedures

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Figure 3.15
Lake Water Quality Sample Collection

Source: SEWRPC

- Collection of lake water samples
- Quarterly sampling
  - Typical sampling depths
    - Surface sample
    - Directly above thermocline
    - Directly below thermocline
    - Close to lake bottom
    - Samples added by discretion of field crew

Lake Monitoring in Winter

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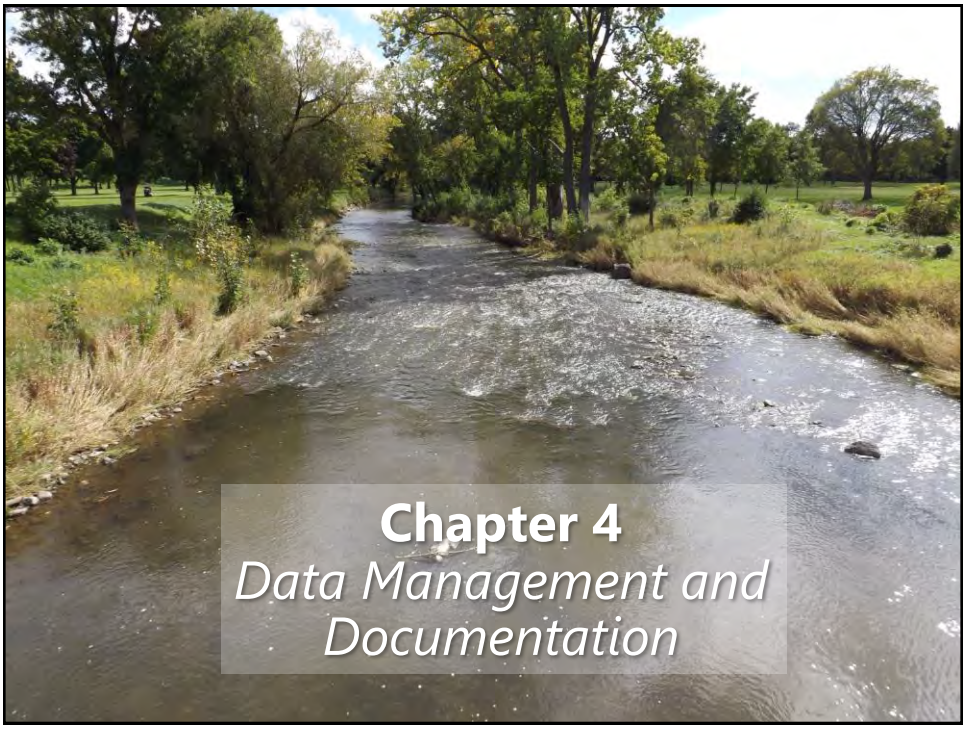
Figure 3.16
Equipment Used for Winter Lake Sampling

Source: SEWRPC

- Same procedures as warm weather lake monitoring
- Sampling was dependent on safe ice conditions
- Extra equipment involved
  - Sled to carry equipment
  - 10-inch diameter ice auger
  - Spud bar to probe ice



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Data Management

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- Scheduled workflows to organize and standardize management
- Continuous data sets
  - Downloaded monthly off Zentra Cloud and compiled incrementally
  - Raw data examined for gaps, repeats, chronological order
- Sonde Data
  - Raw files uploaded and filed daily after fieldwork
- Water sample analysis results
- Downloaded from SWIMS database

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Monthly Water Sample QC

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- Field blank samples
  - 2 field blanks were collected at random monitoring sites
  - Distilled water filled on site
  - Treated exactly like field samples
- Field replicate samples
  - 2 field replicates collected at random monitoring sites
  - Replicates were taken simultaneously in (2) 250ml bottles
  - Replicates compared to field sample passed QC with relative percent difference of 20 percent for one analyte
  - Only one replicate failed to meet that criteria

Management and Documentation

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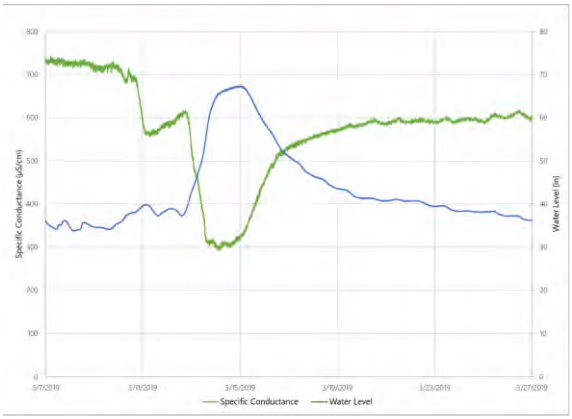
- Additional documentation
  - Field logbooks
  - Weather logs
  - Equipment logs
  - River sample master table

Continuous Data Post-Processing

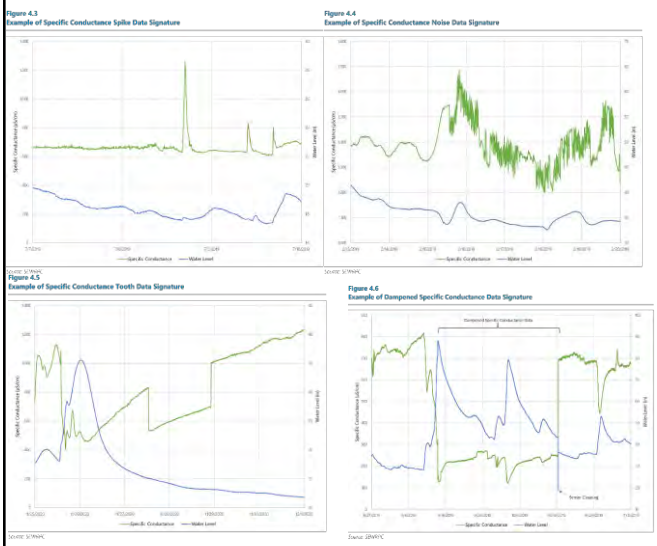
Figure 4.2
Stream Water Level and Specific Conductance During a Precipitation Event



Source: SEWRPC

- Examination of continuous datasets
  - Visualizations of each record plotted with simultaneous water and specific conductivity
  - Interactive plot using the dygraph package in R

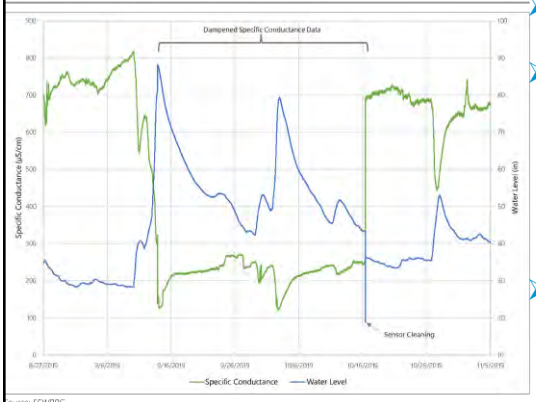
Continuous Data Post-Processing



- Identification of Data Signatures
  - Each record visually inspected
  - Most common signatures
    - Spikes
    - Noise
    - Teeth
      - No adjustments
    - Dampened data
      - Investigated further

Continuous Data Post-Processing

Figure 4.6
Example of Dampened Specific Conductance Data Signature



Source: SEWRPC

- Identification of sensor fouling due to dampened data
- Fouled sensor defined
  - Large increase in specific conductance at cleaning periods
  - Failure of specific conductance to recover after a hydrologic event
  - Handheld sonde readings were substantially higher
- Fouled data further verified
  - Field notes
  - Meteorological data
  - Streamflow data

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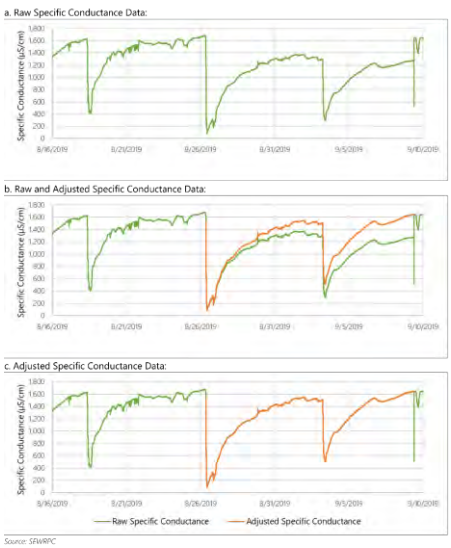
Continuous Data Post-Processing

Figure 4.8
Specific Conductance Data Adjustment Example



Source: SEWRPC

- Data adjustment procedures
  - Modifications only made after rigorous review
  - driftR package
    - Two Assumptions
      - Fouling is linear over time
      - CTD-10 sensor values post-cleaning are accurate in lieu of calibration
  - Post-cleaning value used to calculate a one-point adjustment
- Final review
  - Examined adjusted data to see if it followed similar patterns of unaffected data
  - Table 4.1 summarizes the adjustments that were made

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Commission Staff Contributions

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- Laura Herrick Chief Env Engineer
  - Mike Hahn – retired
  - Joe Boxhorn
  - Ron Printz – retired
  - Karin Hollister
  - Aaron Owens
  - Nick Neureuther
  - Alexis McAdams
  - Zijia Li
  - James Mahoney
  - Megan Shedivy
  - Julia Orlowski
  - Kathy Sobottke
  - Kim Walsh – intern
  - Santos Quispe – intern
- Tom Slawski – Chief Biologist
  - Justin Poinsatte
  - Dale Buser
  - Zofia Noe
- GIS Staff
  - Rob Merry
  - Mike Gosetti
  - Tim Gorsegner
  - Patti Bouchard
- Graphic Design
  - Megan Deau
  - Alexa Carzoli

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Chloride Impact Project – Next Steps

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- Comments on TR-61 Draft Chapters 1 through 4 are due by July 31, 2023 to Aaron (aowens@sewrpc.org)
- Anticipate next TAC meeting in late 2023 to include review of the two remaining draft chapter from TR-62 (Impacts of Chloride) or potentially draft TR-67 (Legal and Policy Considerations)
- Meeting agendas, presentations, and summary notes along with draft text are posted on project website

  www.sewrpc.org/chloridestudy

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Project Funding Provided By

U.S. Department of Transportation
Federal Highway Administration

MMSD
PARTNERS FOR A CLEANER ENVIRONMENT

Southeastern Wisconsin Regional Planning Commission
SEWRPC

Fund for Lake Michigan

WISCONSIN DEPT. OF NATURAL RESOURCES

Thank You

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