



The WaterSHED Monitoring Program

SHED: Saskatchewan headwaters Edmonton downstream



2021 Update

Craig Emmerton (AEP)

craig.emmerton@gov.ab.ca

Stephanie Neufeld (EPCOR)

sneufeld@epcor.com

December 1st, 2021

Why a WaterSHED monitoring program?

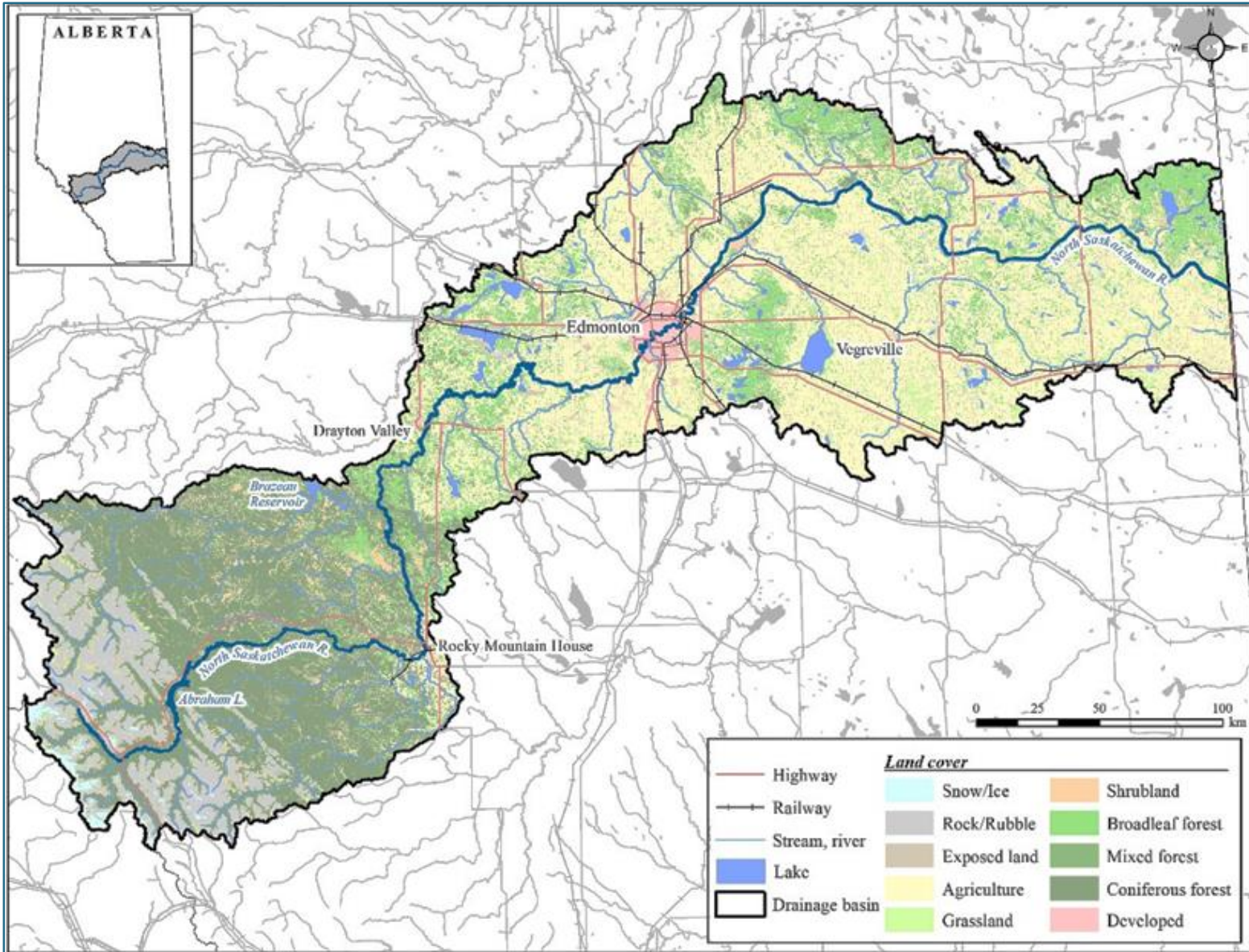
- Support identifying sources of point and non-point pollution
- Quantification of chemical delivery from tributaries
- Land use/land cover and climate change impacts across basins
- Evaluation of aquatic ecosystem health in major rivers and tributaries

WaterSHED Organization & Funding



- Initial rate-payer funding: 2018-2021; network implementation and monitoring
- Rate-payer funding extension: 2022-2026; ongoing network operation
- Steering committee; in-kind time
- Additional in-kind resources provided AEP-Resource Stewardship Division (Monitoring and Scientific support); NSWA/AEP/EPCOR (education and communication)

The WaterSHED network

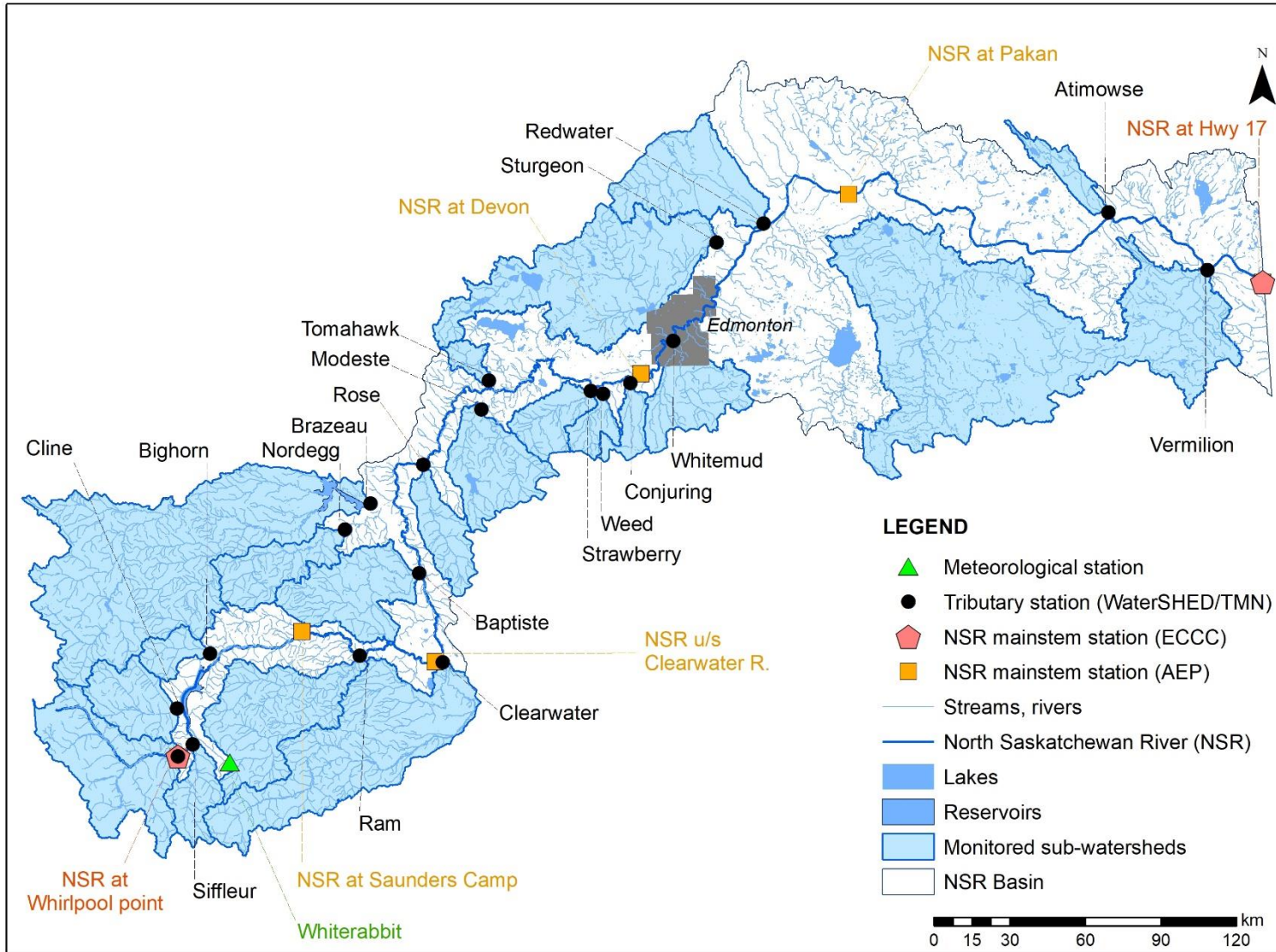


-Large and variable basin

-Systematic site selection

-Catchment conditions associated with water quantity and quality

The WaterSHED network



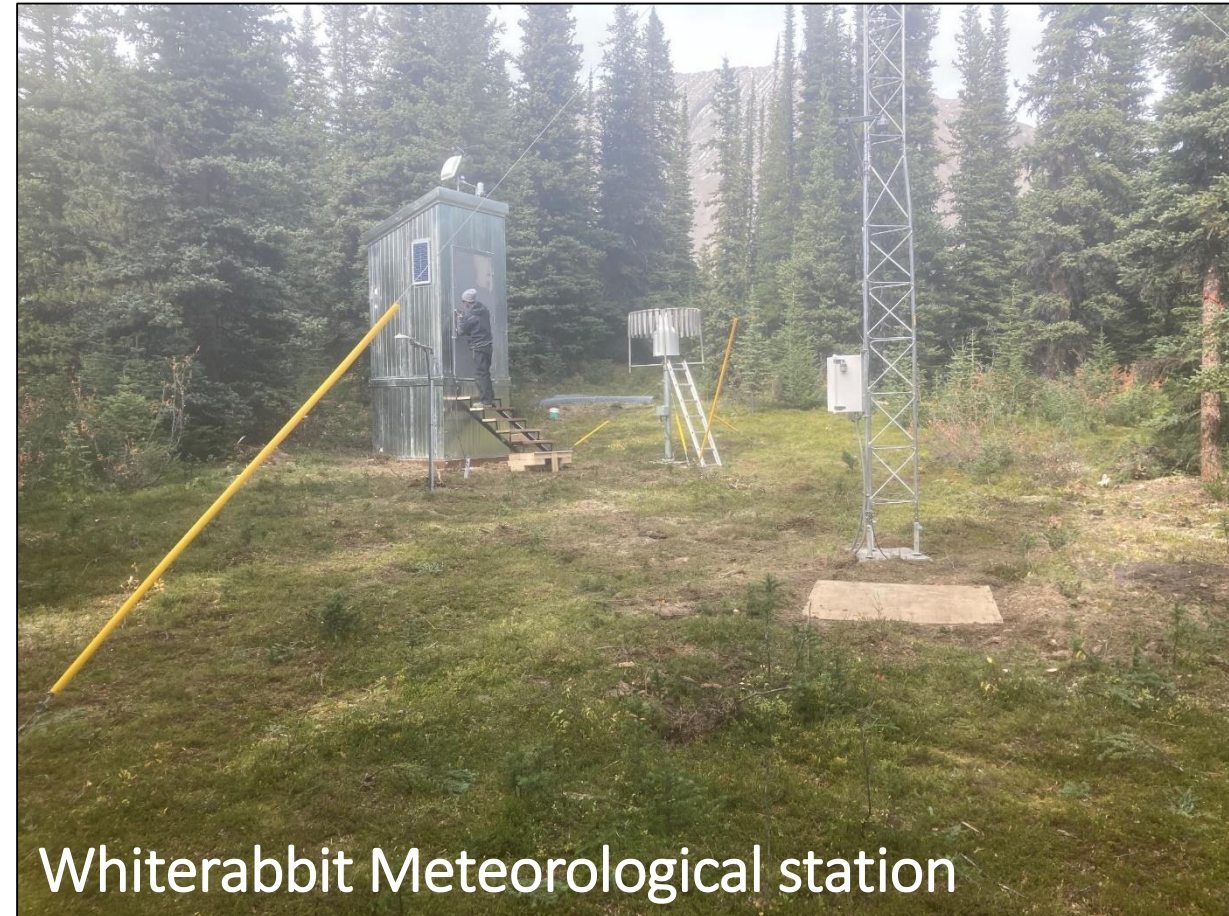
20 river sites:

- Continuous river flow
- Continuous water quality
- ~Monthly expanded water quality (ties into LTRN program)

Additional sites:

- 1 high-elevation weather station
- 1 flow station NSR at Pakan

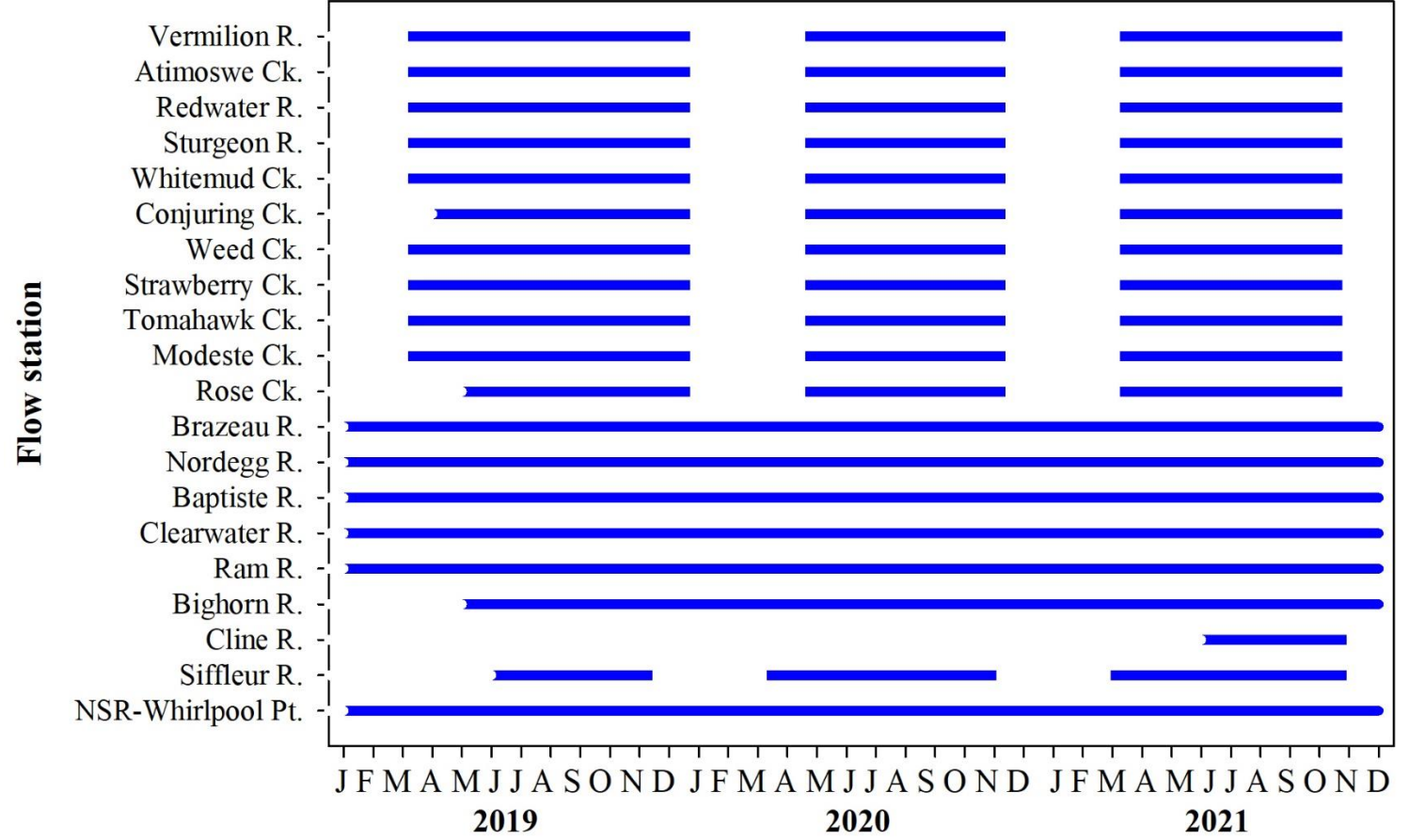
Network deployment finalization



Data: River flow (2019-21)



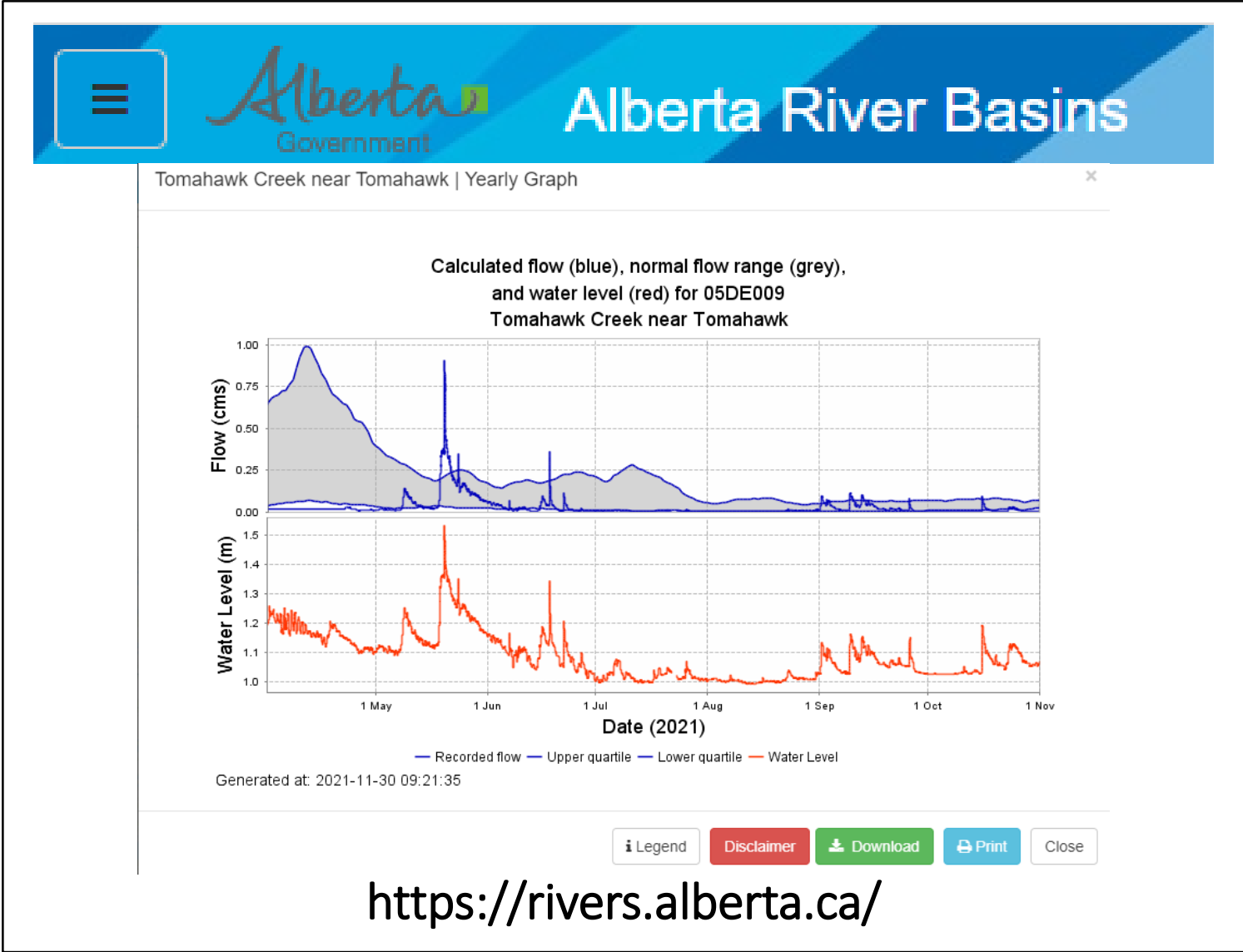
Water level
Discharge (calculated)



Data: River flow (2019-21)



Water level
Discharge (calculated)



Data: Qualitative imagery (2019-21)

Sites equipped with cameras (daily images); <https://rivers.alberta.ca/>



WaterSHED

For more
information, visit
nswa.ab.ca

EPCOR

Alberta

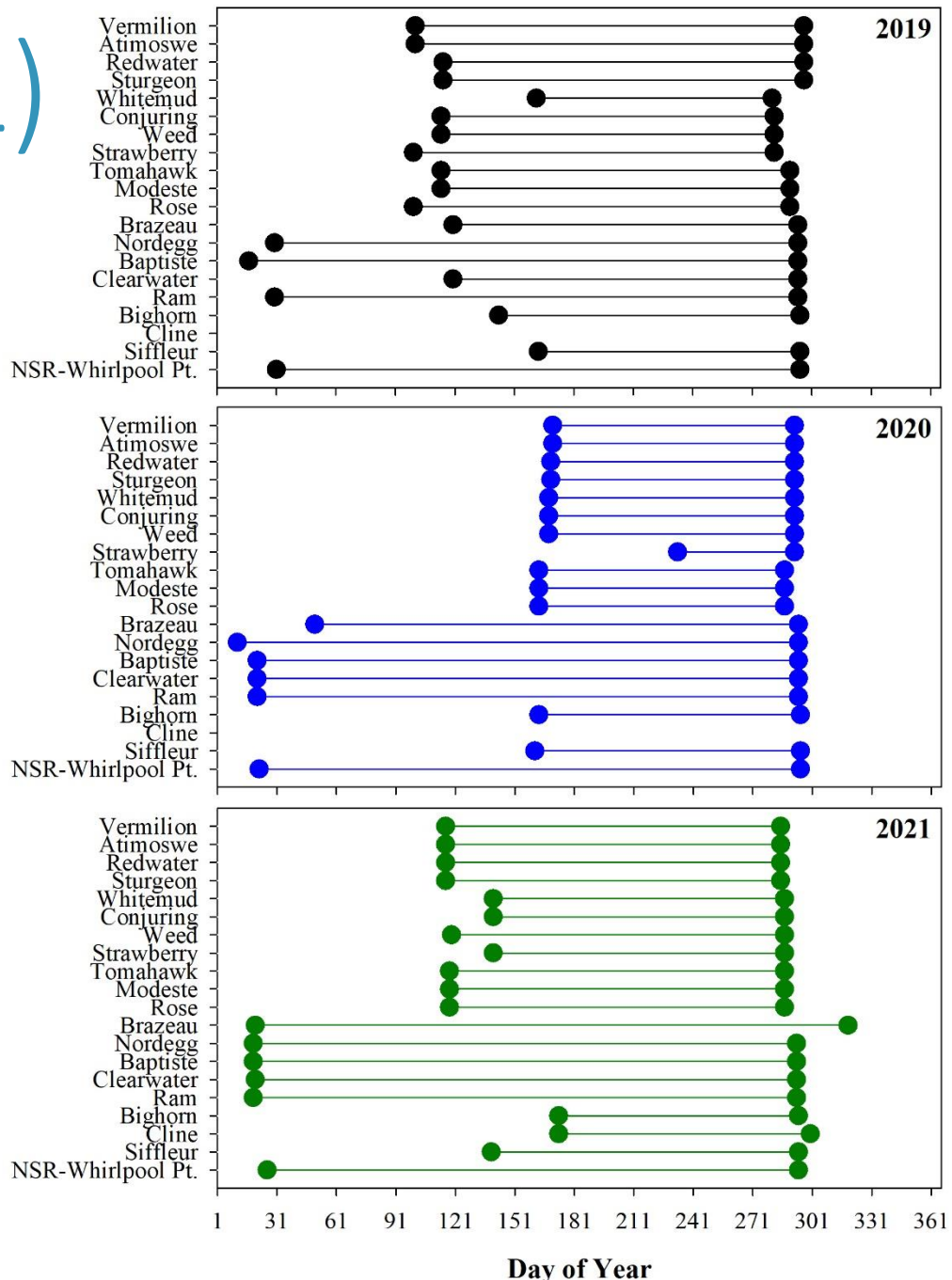
Edmonton



Data: Sondes (2019-21)



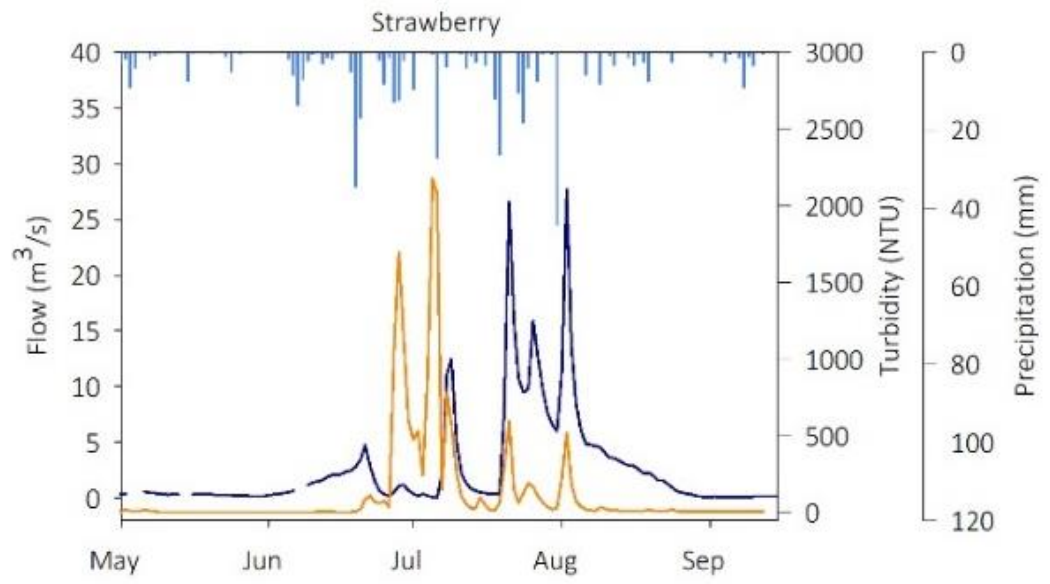
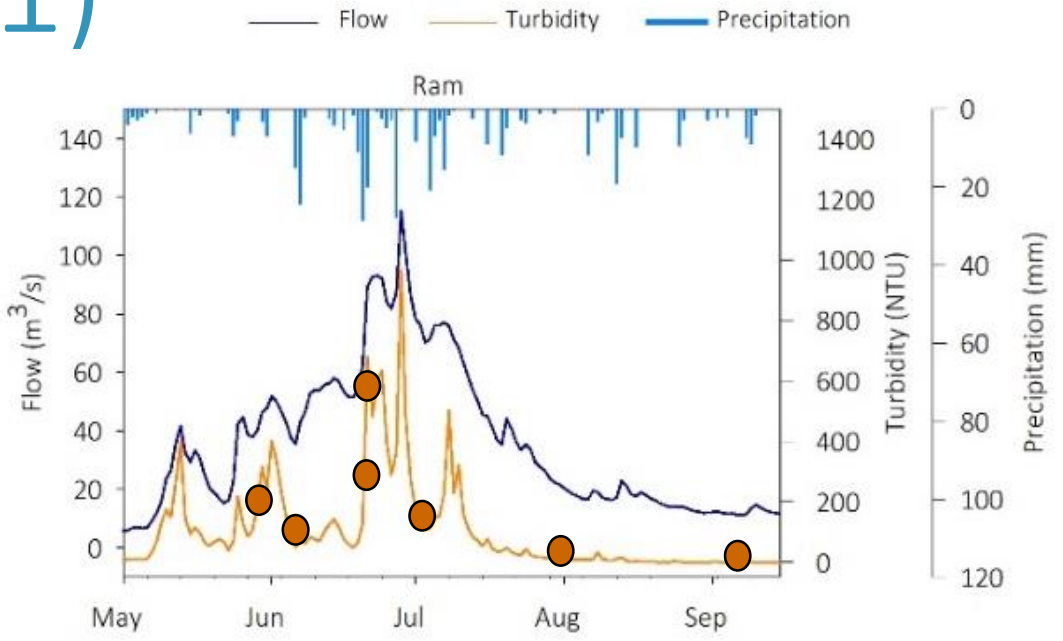
- Turbidity
- Water temperature
- Dissolved oxygen
- Specific conductivity
- pH
- Oxidation-reduction potential



Data: Sondes (2019-21)



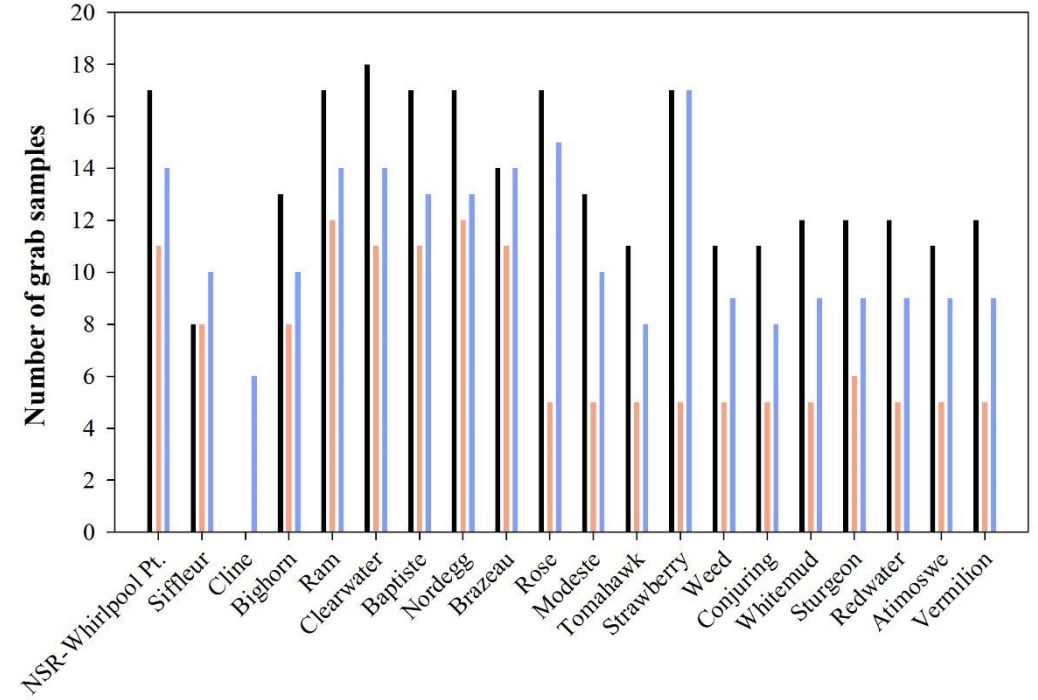
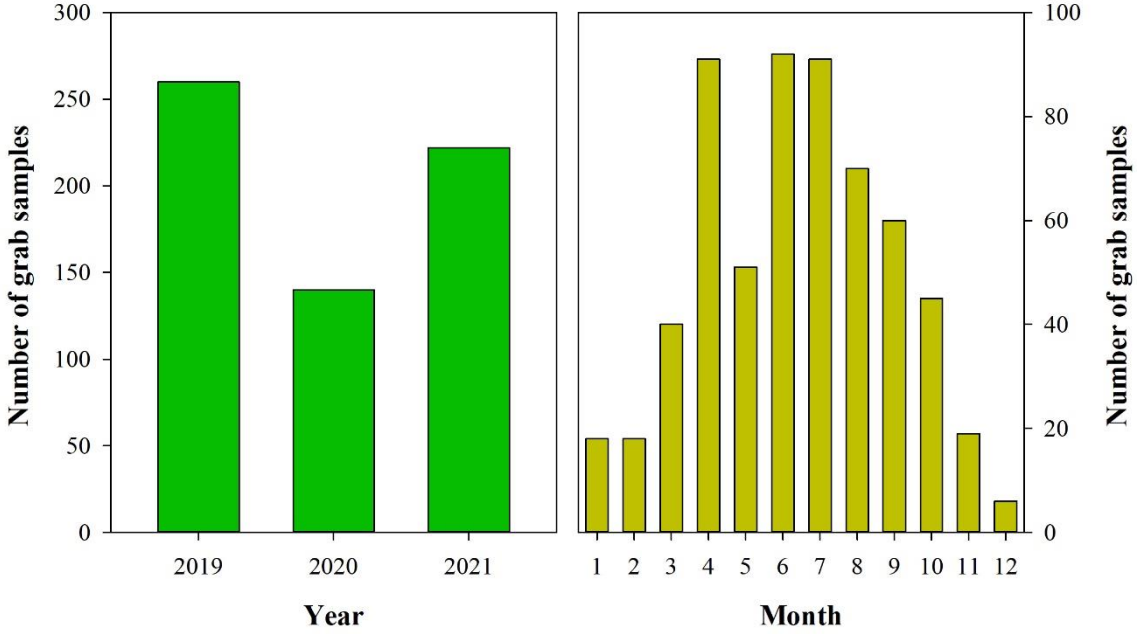
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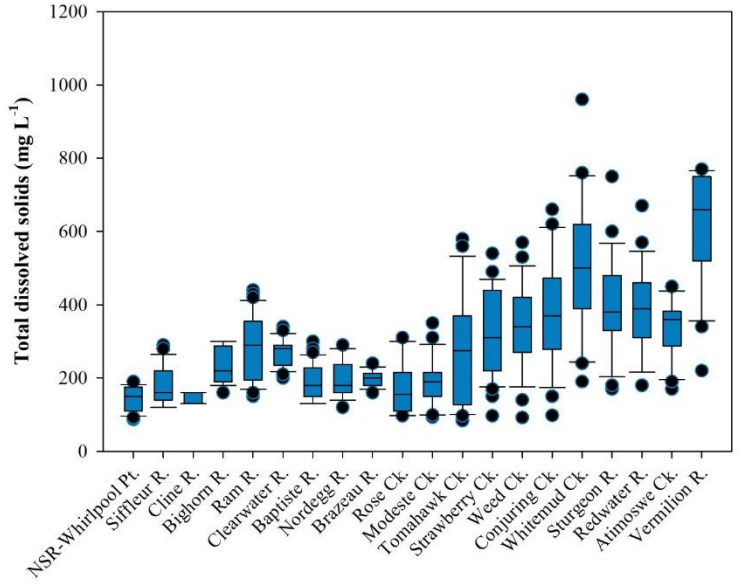
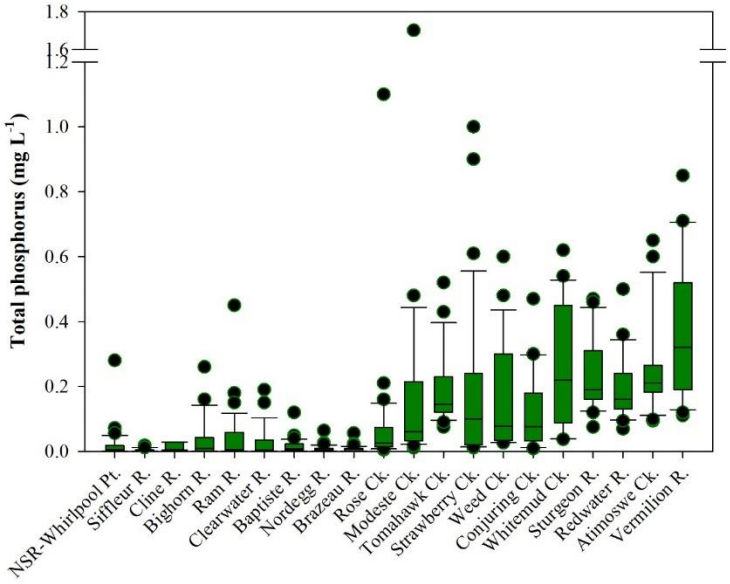
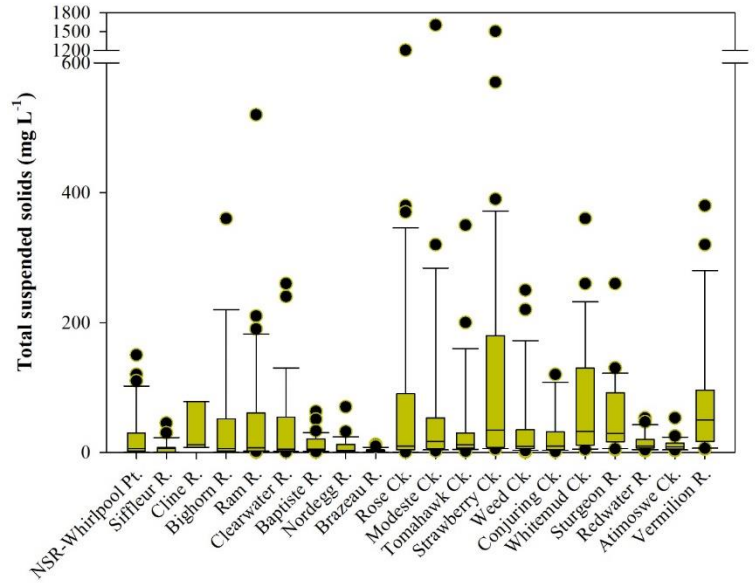
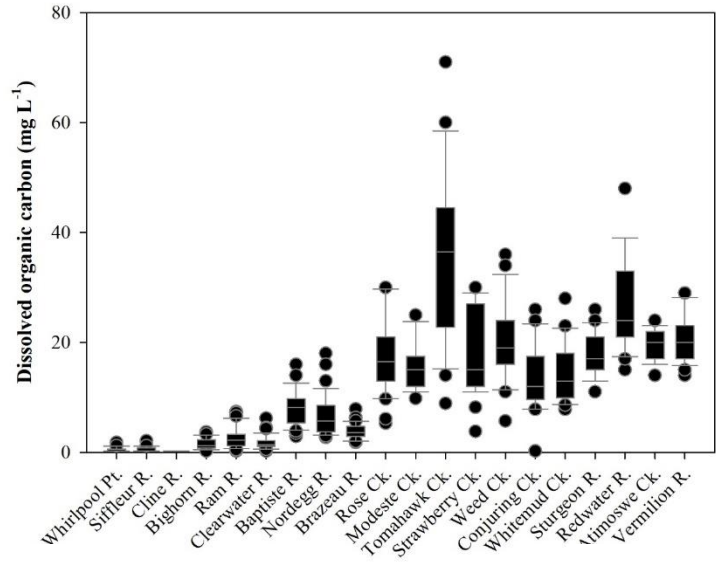
Data: Grabs (2019-21)



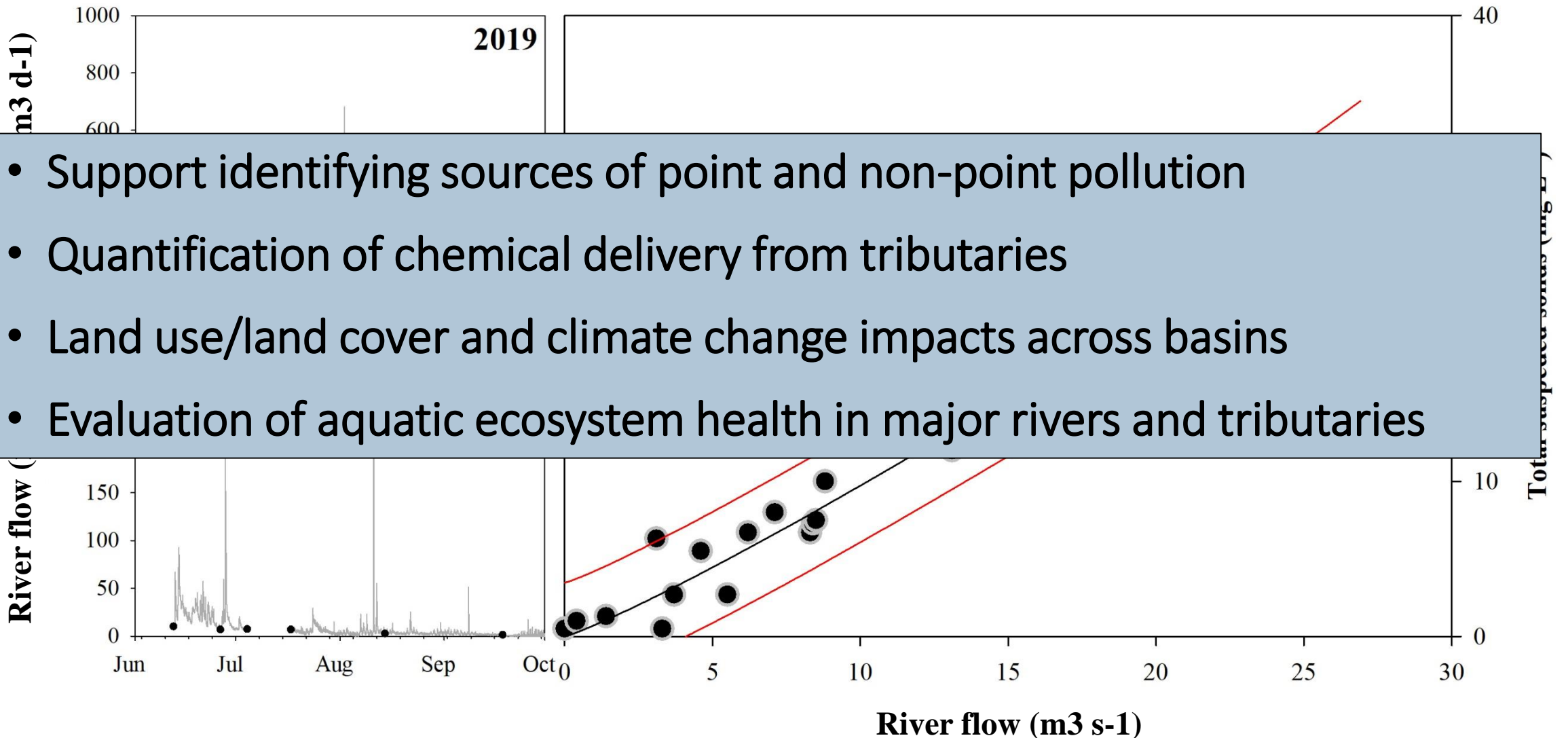
Physical chemistry
 Nutrients
 Metals (diss/total)
 Trace mercury (diss/total)
 Biologicals (pigments/bacti.)



Data: Grabs (2019-21)

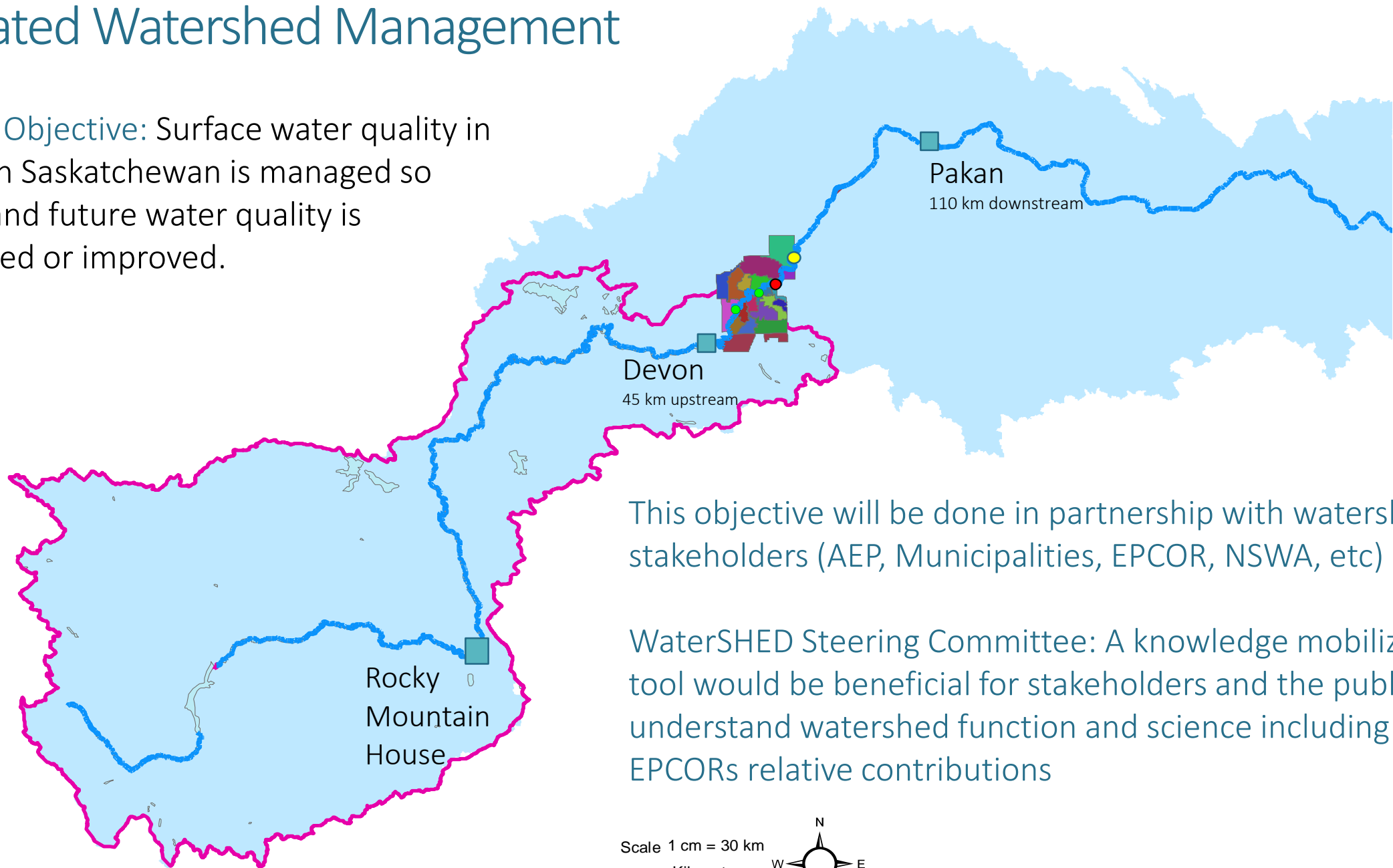


Analysis: Next steps



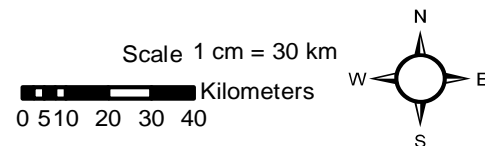
Integrated Watershed Management

Regional Objective: Surface water quality in the North Saskatchewan is managed so current and future water quality is maintained or improved.



This objective will be done in partnership with watershed stakeholders (AEP, Municipalities, EPCOR, NSWA, etc)

WaterSHED Steering Committee: A knowledge mobilization tool would be beneficial for stakeholders and the public to understand watershed function and science including EPCORs relative contributions



Integrated Watershed Plan: Knowledge Mobilization



Moving from organizational monitoring, research, modelling, and communication **in silos** to collaborative planning at all scales

Strategic Planning at Watershed Scale: Innovation Steering Committee

Monitoring Strategy: WaterSHED Program

Modelling Strategy: basin scale and within EPCOR

Research Strategy: basin scale and within EPCOR

Communication Strategy: Open and transparent data



How do we move forward?

A web-based platform that houses land use data, water quality data, water quantity data, modelling and research outputs, as science and communication tool

250 k for 2021

The Healthy River Ecosystem Assessment Tool THREATS

- **A web-based system designed to provide access, analysis and visualization of environmental datasets.**
- **Comprised of a suite of modules that address a variety of theme areas including hydrology and flow analysis; water quality; air quality; pipeline incidents and sensitive ecosystems; and land use and change metrics.**
- **The THREATS Project** has been developed to be a decision support tool and communication tool. It's currently funded under the WaterSHED monitoring program.

PHASE 1: 2021

Water Quality

- AEP and CreekWatch
- EPCOR Intake (4) and Creek Data (2000 on)

DataStream: Water Quality Database

Water Quantity

- Hydat with API to THREATS
- River Basins with API to THREATS

Land Cover/Use

- Direct input from Open Sources
- Agriculture, Oil and Gas, Forestry, Coal Mining, Current Land Cover, Linear disturbance, Impervious surface

Tools

- Spill Time of travel tool
- Load estimations for tributaries
- Graphs of flow distribution at Edmonton

Model Outputs

- None

THREATS
Geospatial web-based tool to visualize data and increase understanding of watershed science for EPCOR, stakeholders, and the public

Communication Tool:
Synthesis Points
2022

Acknowledgements



WaterSHED steering committee
Hydrometric and water quality field staff at AEP; science staff in AEP
Staff at the NSWA, Epcor, City of Edmonton
Network construction consultants
Technical staff at AEP flow forecasting
Monitoring equipment providers
Analytical laboratory staff