

GNWT Aquatic Quality Monitoring Network

Assessing and improving water quality monitoring in the NWT

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Water Stewardship Strategy Implementation Workshop
October 2026

Government of
Northwest Territories

AQUATIC QUALITY MONITORING NETWORK MATTERS

- **Comprehensive Long-Term Monitoring**

AQMN provides over 40 years of reliable data from more than 75 active sites across the Northwest Territories.

- **Integration of Indigenous Knowledge**

Aligning Western science with Indigenous and local knowledge enhances relevance and supports community priorities**.**

- **Addressing Emerging Challenges**

AQMN adapts to climate change, contaminants, and increasing demand for Indigenous leadership in monitoring.

- **Strategic Network Optimization**

Review identifies ways to align monitoring with risks and decision needs while protecting core data and partnerships.



KEY FINDINGS: STRENGTHS AND PRESSURE POINTS

- **Network Strengths**

Long-term, high-quality datasets and standardized methods ensure credible trend detection and data comparability across regions.

- **Spatial and Temporal Gaps**

Remote regions have monitoring gaps and winter water quality remains largely unmonitored, limiting full environmental understanding.

- **Operational Challenges**

High-maintenance instruments require frequent servicing and specialized expertise, increasing operational burden and costs.

- **Strategic Recommendations**

A shift to risk-based, adaptive, and strategic monitoring is needed to align resources with information value and risks.



OPTIMIZING THE NETWORK

- **Risk-Based Monitoring Optimization**

Align monitoring intensity with risk, data value, and stability to reduce costs and preserve core mission goals.

- **Cost Savings and Reinvestment**

Savings from optimization enable funding for emerging priorities like PFAS, microplastics, and ecosystem health monitoring.

- **Enhanced Network Flexibility**

Flexible network design allows rapid response to new issues and strengthens community participation and usability.

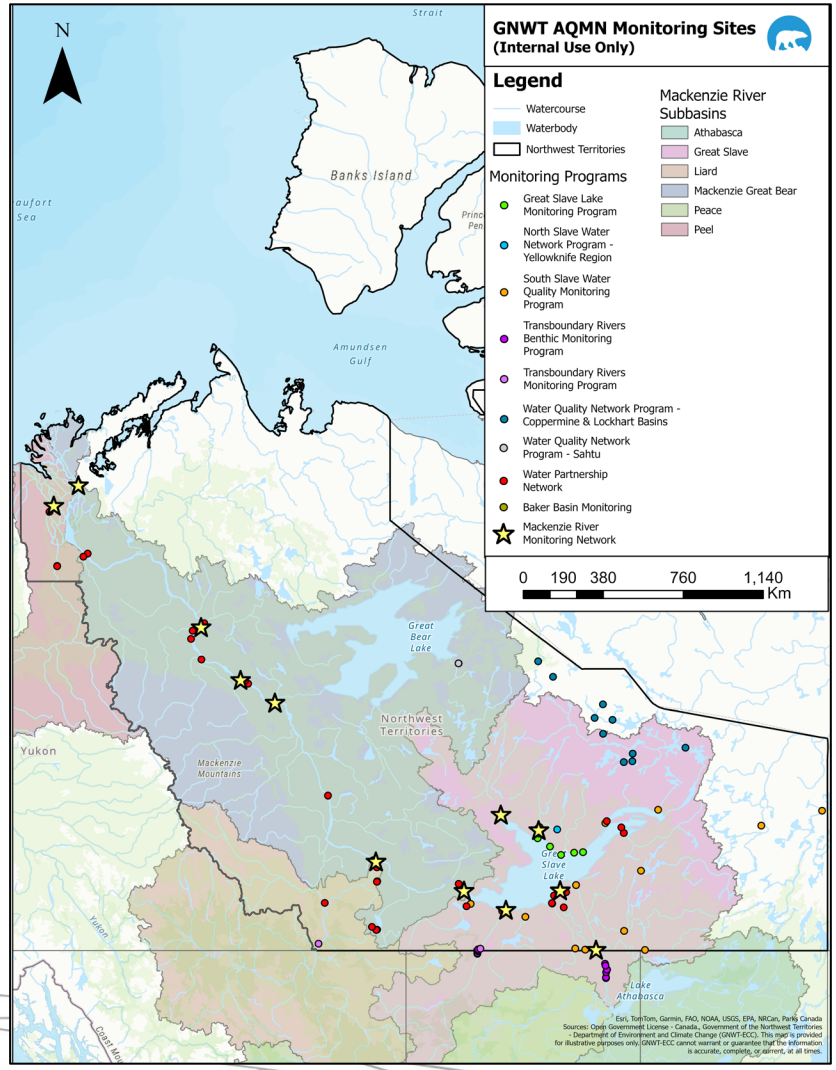
- **Accountability and Continuous Improvement**

Clear performance indicators and scheduled reviews ensure transparency and adapt to environmental changes.



METHODOLOGIES FOR SITE EVALUATION CRITERIA

- Reviewed >100 historical and active monitoring sites
- Assessed monitoring location, sampling frequency, parameters, equipment, years of record, and operational status
- **Each site was assessed against:**
  - Long-term data continuity
  - Alignment with monitoring objectives
  - Community and Indigenous priorities
  - Spatial coverage
  - Redundancy with nearby ECCC sites
  - Safety and accessibility
  - Operational effort versus information value



METHODOLOGIES FOR SITE EVALUATION CRITERIA (CONT'D)



Supporting Information

- Internal network assessment
- Community feedback
- 2014 Summit Environmental Consultants Network Evaluation
- Current operational experience

Outcome

- Identified monitoring gaps
- Identified redundant monitoring
- Evaluated cost-effectiveness
- Prioritized opportunities to strengthen long-term monitoring

PERFORMANCE INDICATORS

Performance Indicators	Targets
Sampling Frequency Adherence	≥90% of planned site visits completed
Equipment Uptime	≥85% operational during deployment
Data Timeliness	≥80% of validated results published within 90 days
QA/QC Compliance	≥95% required QA/QC samples completed
Spatial Representation	Monitoring network meets design targets
Community Participation	Stable or increasing number of trained community monitors
Cost Efficiency	Reduce monitoring duplication and rotational sampling schedule

STRATEGIC RECOMMENDATIONS

1. Optimize the Monitoring Network

- Maintain priority long-term sites
- Remove redundant monitoring locations
- Adopt rotational monitoring
- Apply risk-based sampling frequencies

2. Strengthen Partnerships

- Create a two-component monitoring framework
- Support-community-led monitoring
- Increase collaboration with ECCC
- Support Indigenous leadership and capacity building

STRATEGIC RECOMMENDATIONS (CONT.D)

3. Improve Efficiency

- Reduce routine low-value contaminant analyses
- Rotate YSI sondes and PMDs
- Reinvest savings into gaps and emerging priorities

4. Prepare for the Future

- Expand ecosystem health indicators
- Monitor emerging contaminants (e.g. cyanobacteria/algal blooms, microplastics)
- Continue adaptive management through five-year network reviews

TWO COMPLEMENTARY NETWORKS



- **Mackenzie River Monitoring Network**

MRMN is the core long-term program that uses standardized methods to detect trends and climate impacts at selected Mackenzie Basin sites.

- **Water Partnerships Network**

WPN supports Indigenous and community-led monitoring through flexible funding, training, and locally relevant data collection.

- **Dual-Network Benefits**

The two-network approach protects long-term data, reduces redundancy, lowers burdens, and strengthens Indigenous leadership.

- **Phased Implementation**

Implementation will occur in phases including site confirmation, partner engagement, pilot projects, and adaptive evaluation.

WHAT DOES THIS LOOK LIKE IN ACTION?

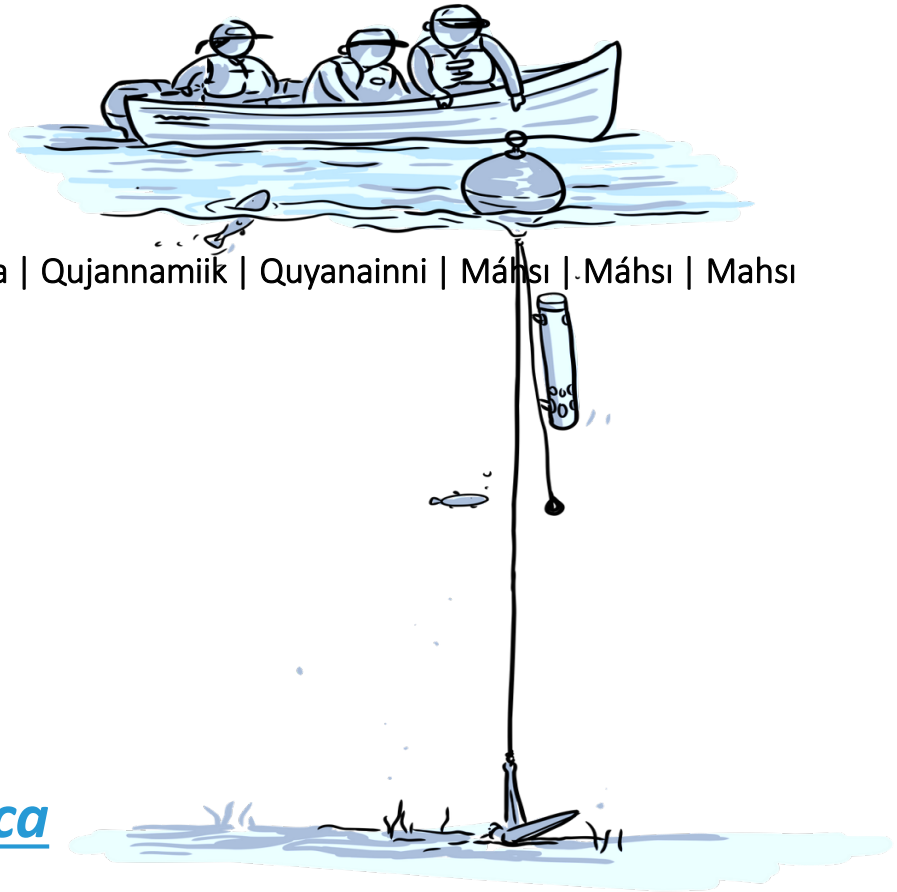
Recent examples:

- Increased sample locations in partnership with Gwich'in Renewable Resource Board (17 new sites in the mountains – remote access).
- ~60 samples for dissolved organic matter (DOM) analyzed in partnership with the University of Alberta and Florida State University
- Innovative technologies co-developed with communities and National Research Council
- 21 community organization partnerships enhancing capacity
- Tsu Lake partnership with Aurora College
- Algal bloom response kits for communities
- Iron bacteria sampling program
- Education outreach with youth
- Internal capacity distribution of roles

AQMN REVIEW SUMMARY

- Opportunities exist to improve efficiency through risk-based and rotational monitoring, reduce redundancies, and targeted resource allocation.
- Reinvestment priorities include emerging contaminants, ecosystem health indicators, filling data gaps, and community-led monitoring.
- Future success depends on adaptive management, strong partnerships, consistent data quality, and integration of Indigenous knowledge with western science.
- Five-year program reviews will ensure AQMN remains responsive, resilient, and effective.





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