

# Innovation in the context of small and aboriginal water systems

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# Perspective

- NSERC / Halifax Water Industrial Research Chair
  - Work closely with five industrial research partners
  - New ideas / challenging thoughts

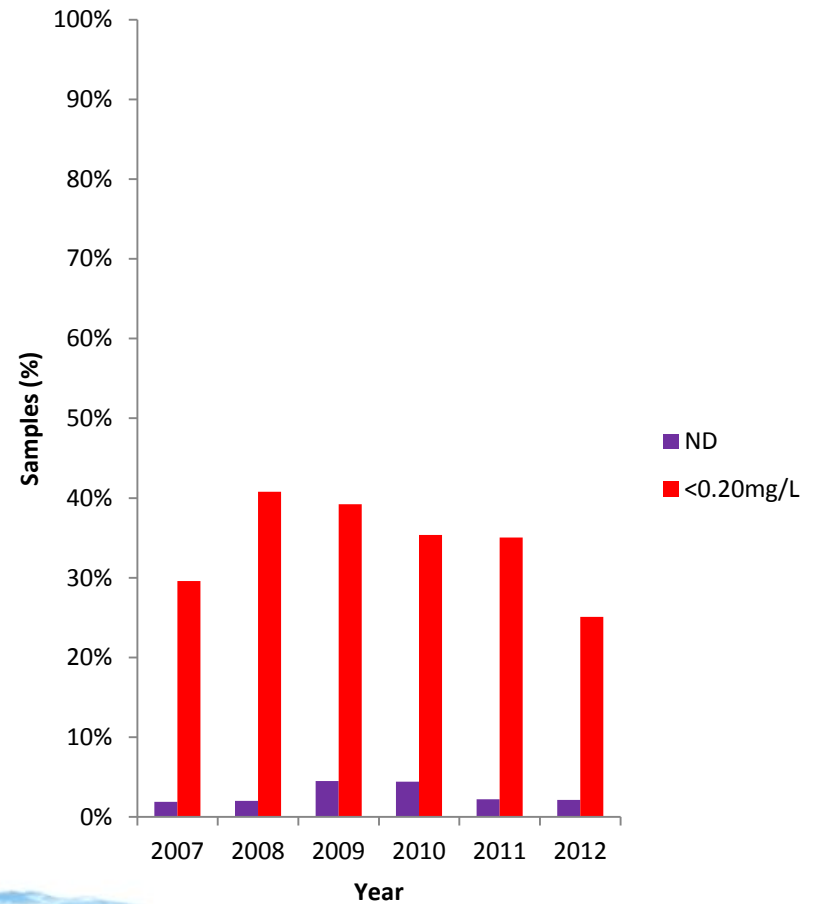
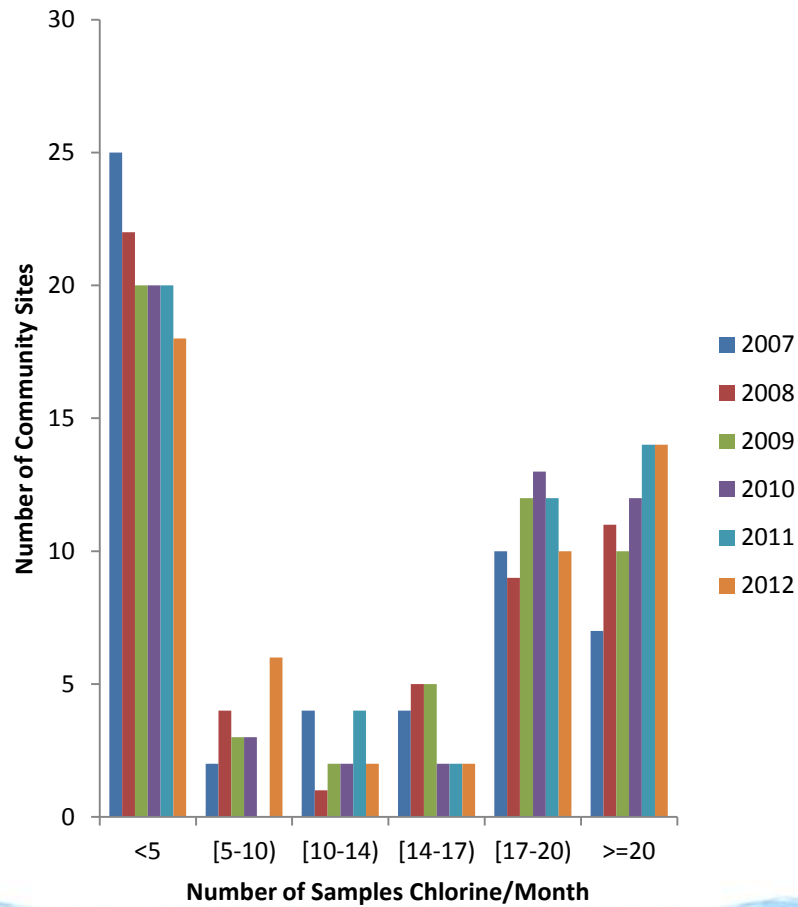
- Long-term partnership with the Atlantic Policy Congress of First Nation Chiefs
  - Looking at different solutions to address water challenges.

# Innovation: Regulations that Apply for Small Systems

- Water Safety Plans
- Combination of **risk assessment** and **risk management** approaches
- **Culture change:**
  - steer away from end-of-pipe monitoring (**reactive**) towards a “know your system” approach (**proactive**)

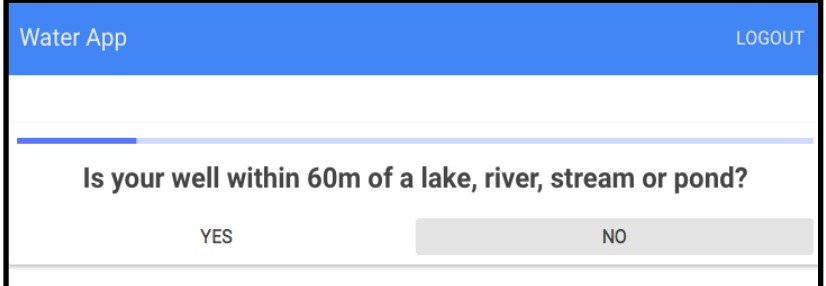


# Analysis of Chlorine Data..



# Would Water Safety Plan Correct the Situation?

- Accountability would shift
- Reporting / benchmarking would be needed
  - Communicate long-term progress
- Still very challenging at community level



The screenshot shows a mobile application interface. At the top, there is a blue header bar with the text "Water App" on the left and "LOGOUT" on the right. Below the header is a white area containing a question: "Is your well within 60m of a lake, river, stream or pond?". Underneath the question are two buttons: "YES" and "NO". The "NO" button is currently selected and highlighted in grey.

# First Nation Water Authority

- As advocated in 2006 Expert Panel
- A First Nation Water Authority could be another possible innovation for delivering safe water in communities
- **24 Band Council Resolutions in Atlantic in 2014**

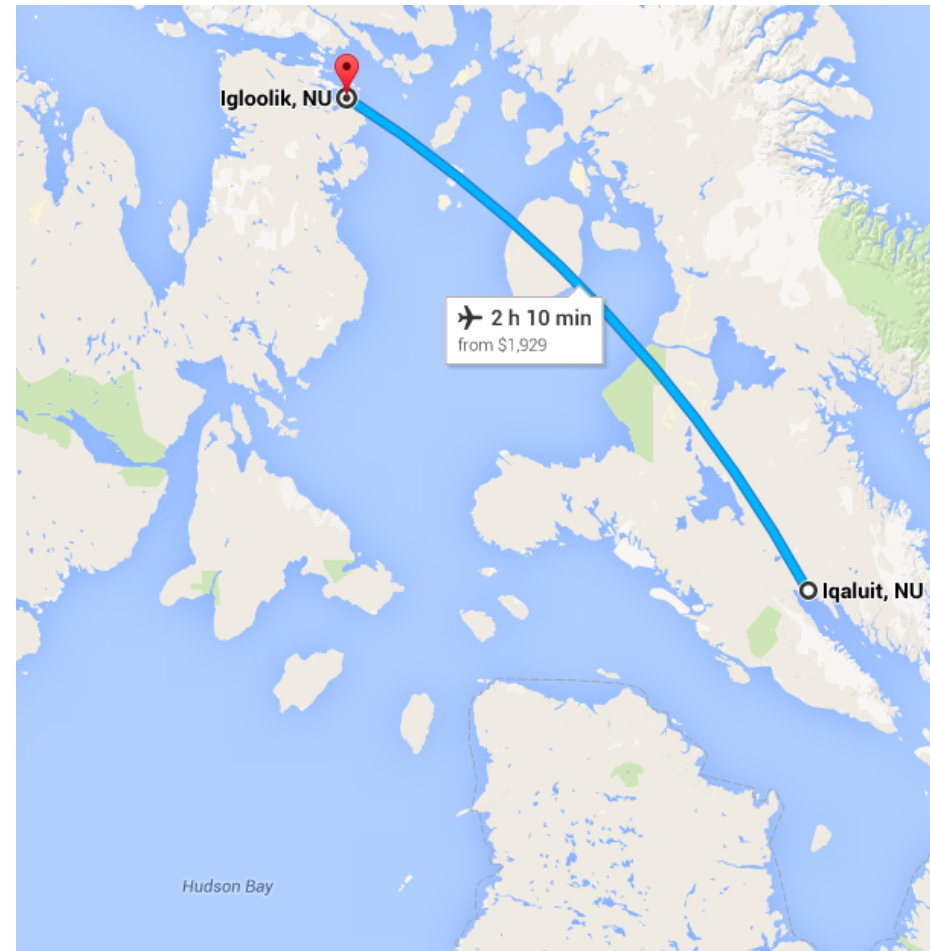


*First Nation*  
**CLEAN WATER  
INITIATIVE  
ATLANTIC**

[www.fncwi.ca](http://www.fncwi.ca)

# Innovation: Monitoring

- Igloolik, Nunavut
  - Occurrence of *E. coli* over Christmas 2014
  - Through a period of over 3-weeks deduced that drinking water was *not* cause
  - Long time to sort out over holidays

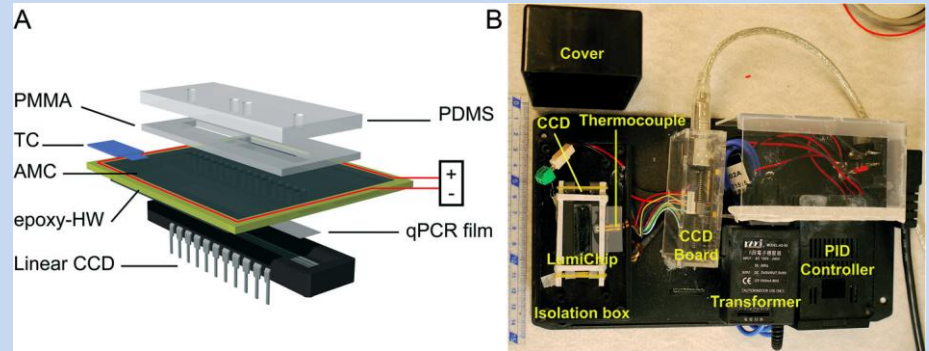


# Innovation in Monitoring

- Need for developing quick reproducible tests that do not require significant training



A) ATP Monitoring kit from LuminUltra



B) LumiChip – Tsai et al. 2015 *Lab Chip* 15:1472-1480





# Innovation: Treatment Technology

- Traditional Design requires fixed infrastructure
- New technologies are enabling distributed treatment scenarios
  - UV LED Example
    - No warm-up time (on/off cycling)
    - “Chip” design as a opposed to fixed lamps
      - Enables unique POU designs
    - 5-10 year development times (Ibrahim et al. 2014 *Environ Technol*)



# Acknowledgements

- NSERC / Halifax Water Industrial Research Chair
- Atlantic Policy Congress of First Nation Chiefs

