

# Exploring Solutions for Sustainable Rural Drinking Water Systems in Newfoundland and Labrador

## Sustainable Drinking Water Management- A Tall Order for Municipal Governments

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IMFE 2014



# Major Components of Research



- ◆ Source water quality and quantity
- ◆ Infrastructure and operations
- ◆ Policies and governance
- ◆ Public perception, awareness, and demand

(Annual Report, 2012)

# Research Team

## Principal Investigator

- Kelly Vodden, EPI, Grenfell Campus- MUN

## Co-Investigators

- Bing Chen, Faculty of Engineering, MUN
- Maura Hanrahan, EPI, Grenfell Campus- MUN
- Andreas Klinke, EPI, Grenfell Campus- MUN
- Mano Krishnapillai, Environmental Science, Grenfell Campus-MUN
- Atanu Sarkar, Faculty of Medicine, MUN
- Michael van Zyll De Jong, EPI, MUN





# Community Partners



- ◆ Derrick Bragg,  
President, Professional  
Municipal Administrators
- ◆ Robert Keenan, Community  
Cooperation Office,  
Municipalities  
Newfoundland and  
Labrador
- ◆ Craig Pollett, Municipalities  
of Newfoundland and  
Labrador



# Advisory Committee

- ◆ Faculty of Engineering and Applied Science, MUN
- ◆ Faculty of Medicine, MUN
- ◆ Municipalities Newfoundland and Labrador, Small Towns Director
- ◆ Eastern Regional Health Authority
- ◆ Municipal Operator/Town Manager
- ◆ Department of Environment and Conservation- Water Resources Branch
- ◆ Department of Natural Resources
- ◆ Department of Municipal Affairs
- ◆ Department of Health and Community Services
- ◆ Atlantic Canada Opportunities Agency
- ◆ Health Canada
- ◆ Newfoundland and Labrador Environmental Industry Association
- ◆ Atlantic Canada Water and Wastewater Association



# Industrial Partners

Corner Brook Pulp and Paper  
Limited, Corner Brook, NL

Ducks Unlimited, Corner  
Brook, NL

Compusult Limited, Mount  
Pearl, NL

Townsuite Municipal Software-  
PROCOM Data Services Inc.,  
Gander, NL

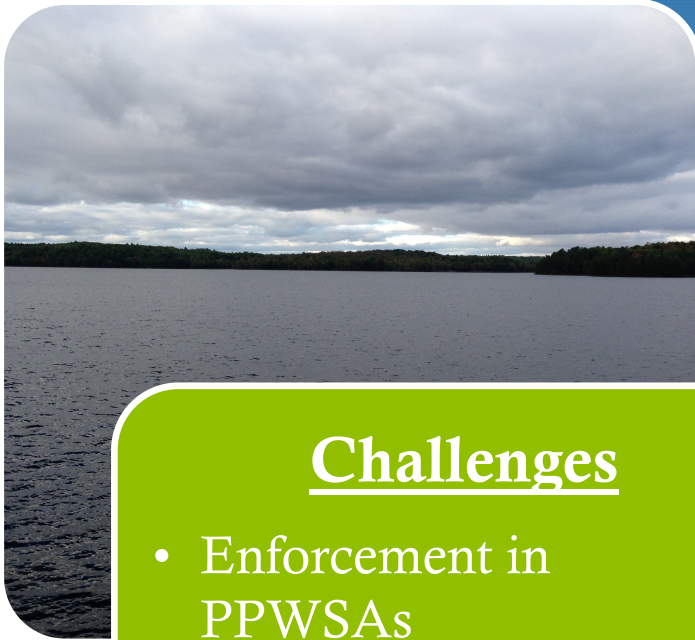
# Methods

- ◆ Literature Review
- ◆ Media Scan
- ◆ Legislation and Policy Review (DPSIR)
- ◆ Policy workshop
- ◆ Community Surveys and Consultations
- ◆ Case Studies





# Source Water Protection



## Challenges

- Enforcement in PPWSAs
- Inter- municipal cooperation
- Citizen buy in/ ownership



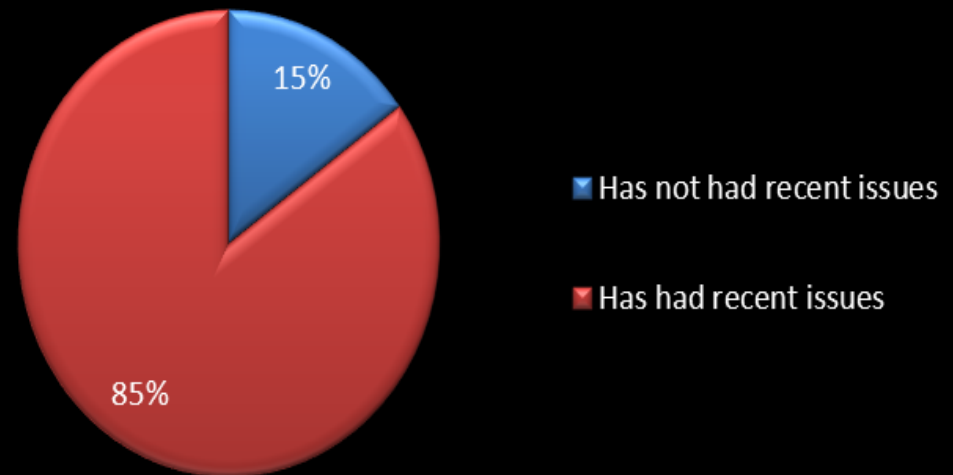
## Recommendations

- Mandatory watershed based source water protection
- Community based monitoring programs
- Proactive land use planning

# Administrator's Level Awareness

- **27/40** communities that said they had “no concerns with their drinking water system” had no current DWQI ranking in Winter 2014
- **59%** of respondents who indicated that they had not had any issues with THMs/HAAAs in the last 4 years had exceeded the recommended limit at least once in that timeframe

**Communities Reporting "No Concerns"  
Regarding Drinking Water System**



# Degrading Infrastructure



Source: Paula Dawe

- 2012-13 fiscal year, MIGA approved **\$30,245,000** of funding for water infrastructure projects
- **81% of LSDs** and **65% of MOTOLs** administrators said:
  - Drinking water infrastructure required repairs or upgrades
- Water Operators- **73% of LSDs** and **65% MOTOLs**
  - Age of system biggest problem other than financial constraints



# Asset Management

- **33% of LSD and 29% of MOTOLs** water operators
  - Lack of maps, as-builts, and digitized mapping of community infrastructure was the biggest issue in their community
- **52% of LSD and 16% MOTOL** community administrators
  - Had no maps or blueprints of drinking water infrastructure
- **17% of operators from LSDs and 8% from MOTOLs** said they had an organized leak detection program.
  - Yet 20% of LSDs and 27% of MOTOLs had 5+ leaks in 2012 that required repairs.

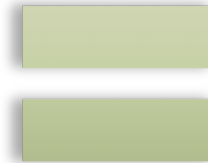


# Asset Management – A solution?

Poor  
Maintenance



Not  
Charging  
Enough for  
Service



**More  
frequent  
repairs  
and no  
money**

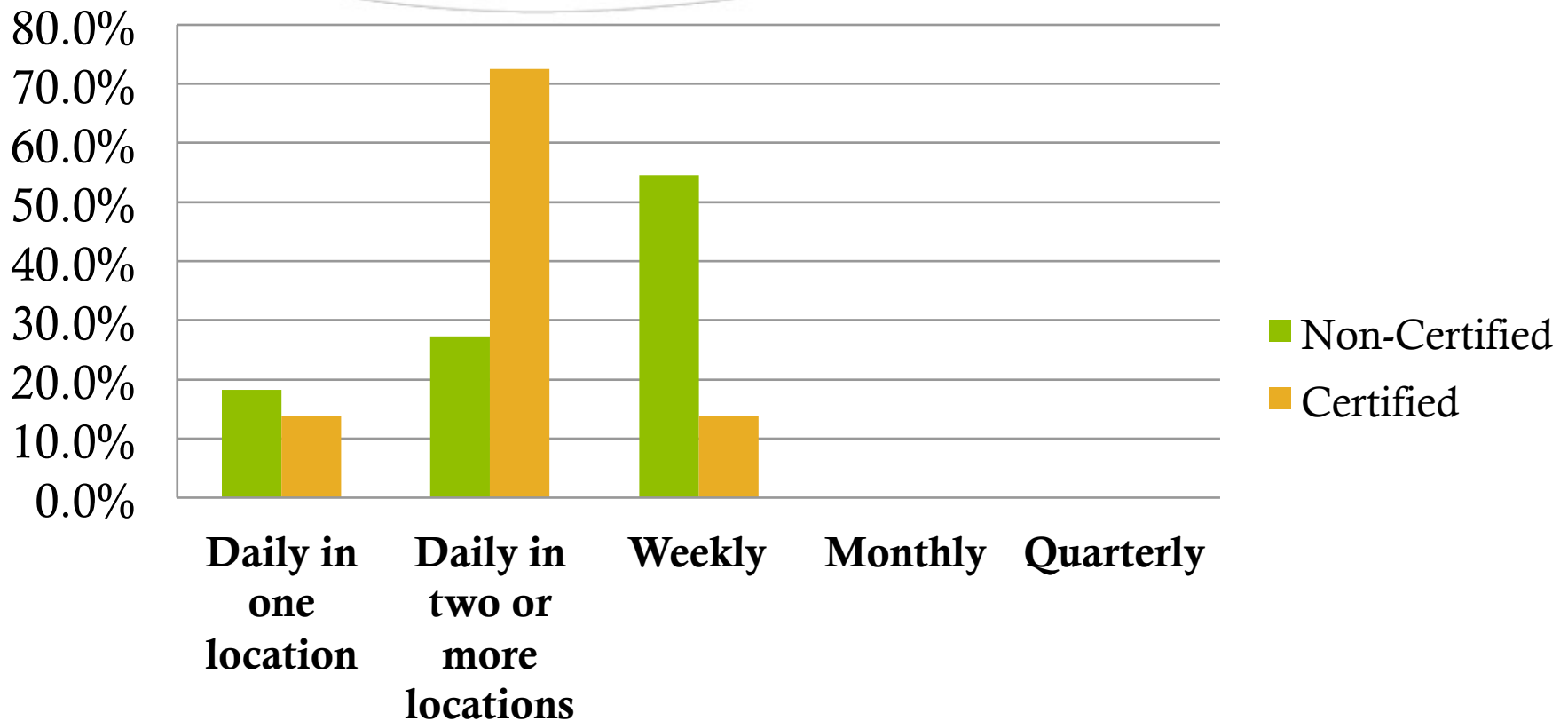


# Operations and Training

- Community administrator survey
  - 35% of **LSD** operators and 21% of **MOTOLs** have water operators with **no certification**
  - 35% of administrators in **LSDs**/33% in **MOTOLs** did not know what if/what level of certification their water operator held
- According to water operators survey: Certified water operators
  - More likely to have complete maps of piped infrastructure
  - More likely to report having a specific office or filing area for drinking water system information
  - More likely to have a maintenance plan for the water treatment system/plant operations



# Operations and Training



# Regional Approaches

- ◆ Need due to lack of financial and human resources
- ◆ Mixed success across province
- ◆ Recognized need for more regional approaches by Provincial actors
- ◆ Need more institutional support



# Conclusions: Capacity Building Needed

- Mandatory certification for water operators
- Self reporting
- Education for administrators and decision makers
- Public outreach

Technical

- Sustained funding for regional approaches
- Multi-level governance
  - Inter-community agreements

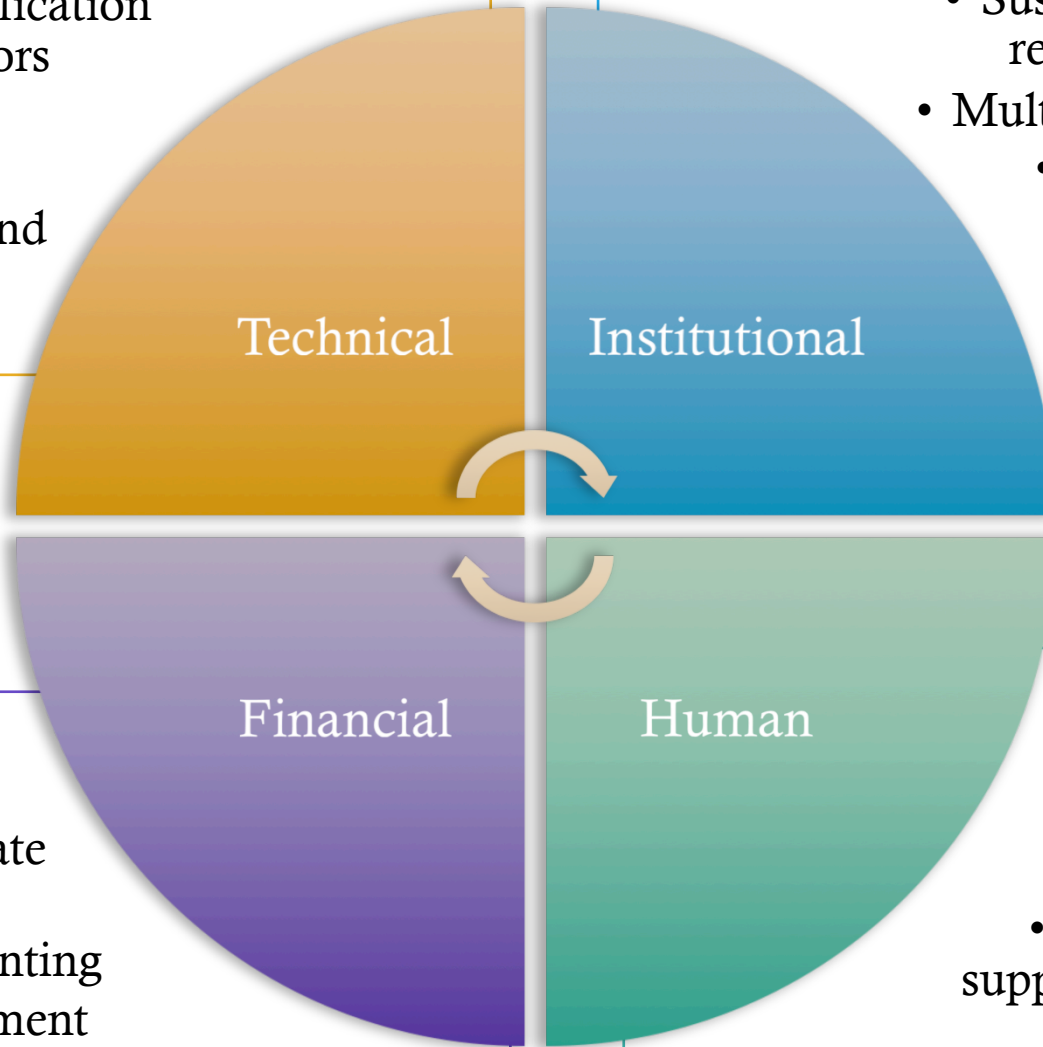
Institutional

Financial

- Place appropriate infrastructure
- Full cost accounting
- Asset management activities

Human

- Regional water operators
- Greater regional support by Provincial level





# Thank you!

And stay in touch!

- Visit our website: <http://nlwater.ruralresilience.ca>
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GRENFELL  
CAMPUS



Funding support  
from the Harris  
Centre – RBC  
Water Research  
and Outreach  
Fund is gratefully  
acknowledged

# Closing Discussion

- ◆ Any questions?  
Comments? Concerns?
- ◆ Do any of you do  
research in rural  
communities?
  - ◆ What kinds of drinking  
water challenges have you  
encountered?
  - ◆ Solutions?

# Areas for Future Research

## Public Perception, Awareness & Demand

- Public perceptions and use of water
- Appropriate outreach activities for water education and conservation efforts
- Studies on long term health impacts of DBPs in NL

## Source Water Quality & Quantity

- Baseline studies on all drinking water supplies
- New governance options for enforceable source water protection in rural areas

# Areas for Future Research

## Policy & Governance

- Research into how to improve the DWQI
- Managing BWAs, assessing risk with population studies on gastrointestinal illnesses in rural NL
- More dialogue with rural local government about needed policy changes

## Infrastructure & Operations

- Cost benefit analysis of water metering and other alternatives
- Research into remote technologies
- PWDU specific studies
- Technologies to reduce DBPs