



# Water Security and the Role of Residents and Community Organizations: A Case Study from Indian Bay, NL

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# Water Security

“Sustainable access, on a watershed basis, to adequate quantities of water, of acceptable quality, to ensure human and ecosystem health”.

Norman *et al.* (2011)



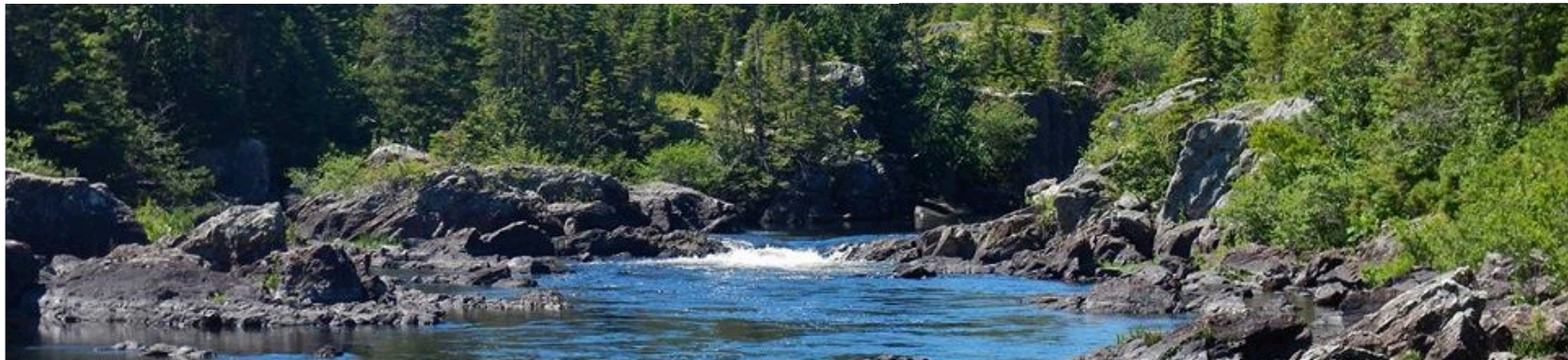
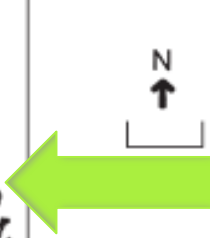
# Watersheds

drinking water,  
subsistence,  
commodities,  
recreation,  
cultural, emotional,  
spiritual  
attachments ...



## Index of pond (P.) names

- |                     |                         |
|---------------------|-------------------------|
| 1. Alley's P.       | 9. Indian Bay Big P.    |
| 2. Back-up P.       | 10. Little Bear Cave P. |
| 3. Big Bear Cave P. | 11. Little Wings P.     |
| 4. Big Wings P.     | 12. Moccasin P.         |
| 5. First P.         | 13. Skipper's P.        |
| 6. Forked P.        | 14. Southern P.         |
| 7. Four Mile P.     | 15. Third P.            |
| 8. Indian Bay P.    |                         |



# Background



- Boil water advisories (BWA)
  - Town of Indian Bay BWA since Sept. 2008
- Limited municipal capacity
- Indian Bay Ecosystem Corp.
  - Local stewardship since 1988
  - History of research partnerships

# Rationale



- Apparent lack of awareness amongst citizens about safe drinking water sources and the presence of BWAs (and DBPs)
- Questions about impacts of land use activities
- Water quality testing not regularly conducted due to BWA and limited in the watershed area



# Objectives

- ① Determine presence of microbiological and/or chemical contaminants of surface waters and roadside springs
- ② Determine population perspectives and practices with respect to water consumption and management of the watershed
- ③ Research water quality monitoring models for a community-based approach



# Research Methods

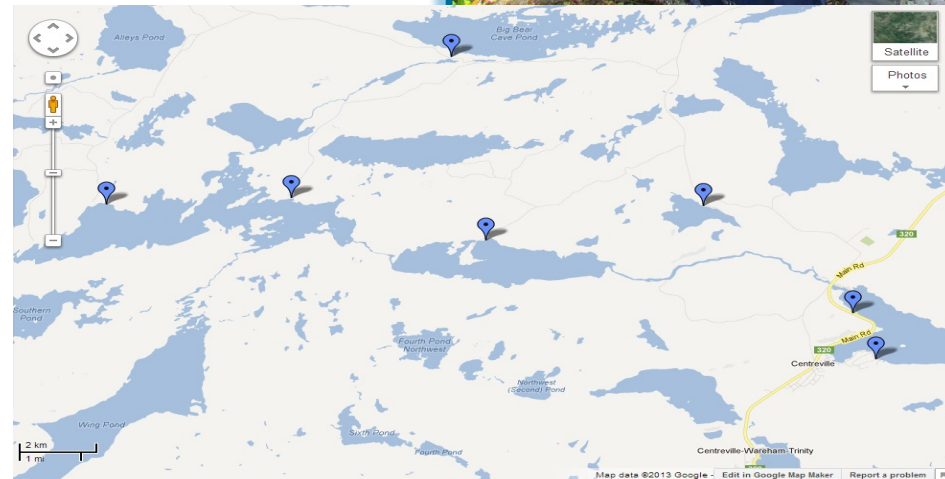
- Review of relevant literature/documents
- Water quality testing
- Household population survey
- Cabin inventory and site inspections
- Interviews, partnerships, and additional stakeholder engagement



# Water Quality Testing



- Chemical and microbiological testing on 7 sites
- Metals, nitrates, sulphates, E. coli, total and fecal coliforms
- 5 rounds; 1 round for hydrocarbons





# Water Quality Testing

Sample site	December, 2012		March, 2013		June, 2013		August, 2013	
	Total C	E Coli	Total C	E Coli	Total C	E Coli	Total C	E Coli
1. No. 2 Pond	√	√	√	X	√	x	√	x
2. No. 2 Pond (boat launch)	√	x	√	X	√	√	√	x
3. Jim's Steady	√	√	√	X	√	√	√	x
4. No. 1 Pond	√	√	√	X	√	√	√	x
5. Dirt Brook Pond	√	√	√	X	√	√	√	x
6. Rockcut Spring	√	x	√	X	√	x	√	x
7. Wareham Spring	√	x	√	X	√	x	√	√

WetPro field kit testing Sept. 2013 - coliforms in springs and tap water

# Water Quality Testing

Presence of E. coli in Wareham spring  
(August 2013): need for caution and  
monitoring of roadside springs

Sample site	December, 2012		March, 2013		June, 2013		August, 2013	
	Total C	E Coli	Total C	E Coli	Total C	E Coli	Total C	E Coli
1. No. 2 Pond	√	√	√	X	√	x	√	x
2. No. 2 Pond (boat launch)	√	x	√	X	√	√	√	x
3. Jim's Steady	√	√	√	X	√	√	√	x
4. No. 1 Pond	√	√	√	X	√	√	√	x
5. Dirt Brook Pond	√	√	√	X	√	√	√	x
6. Rockcut Spring	√	x	√	X	√	x	√	x
7. Wareham Spring	√	x	√	X	√	x	√	√



08/08/2013

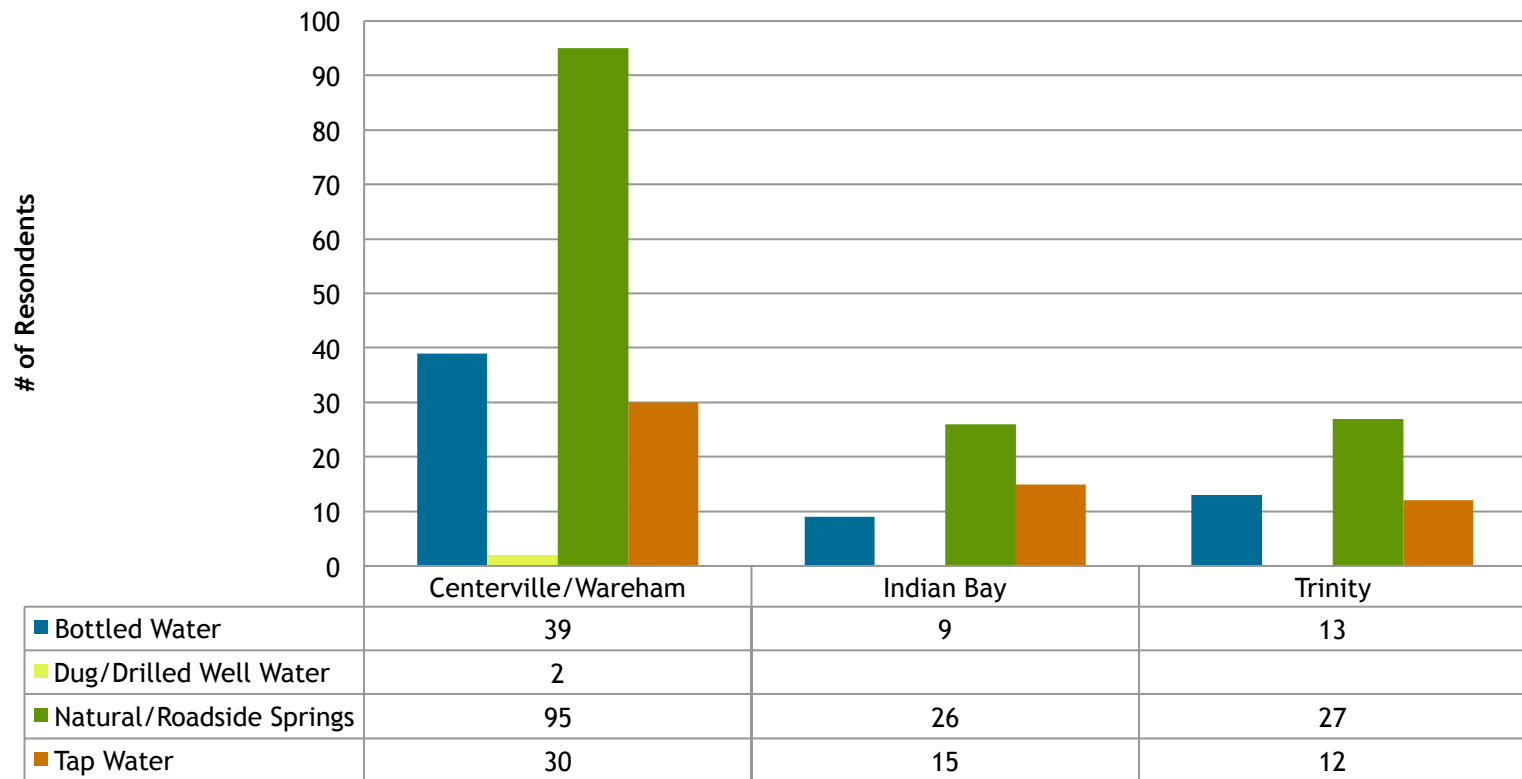


# Population Survey

- To better understand population perspectives and practices
- Designed with Advisory Committee, IBEC staff and board members
- 485 households, 268 completed (55%)
  - Indian Bay: 77%
  - Centreville-Wareham: 47%
  - Trinity: 40%

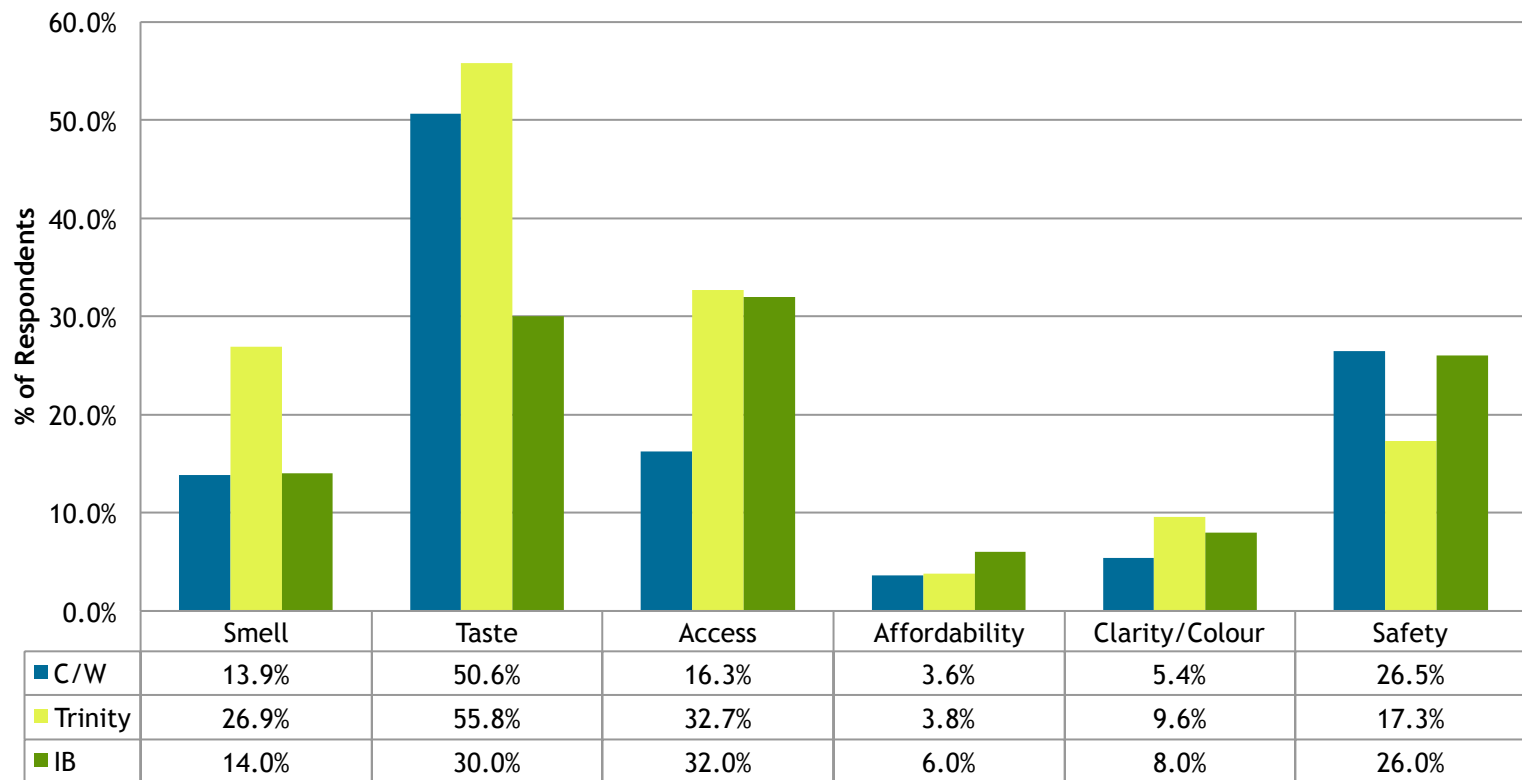
# Population Survey

Primary Water Source by Community

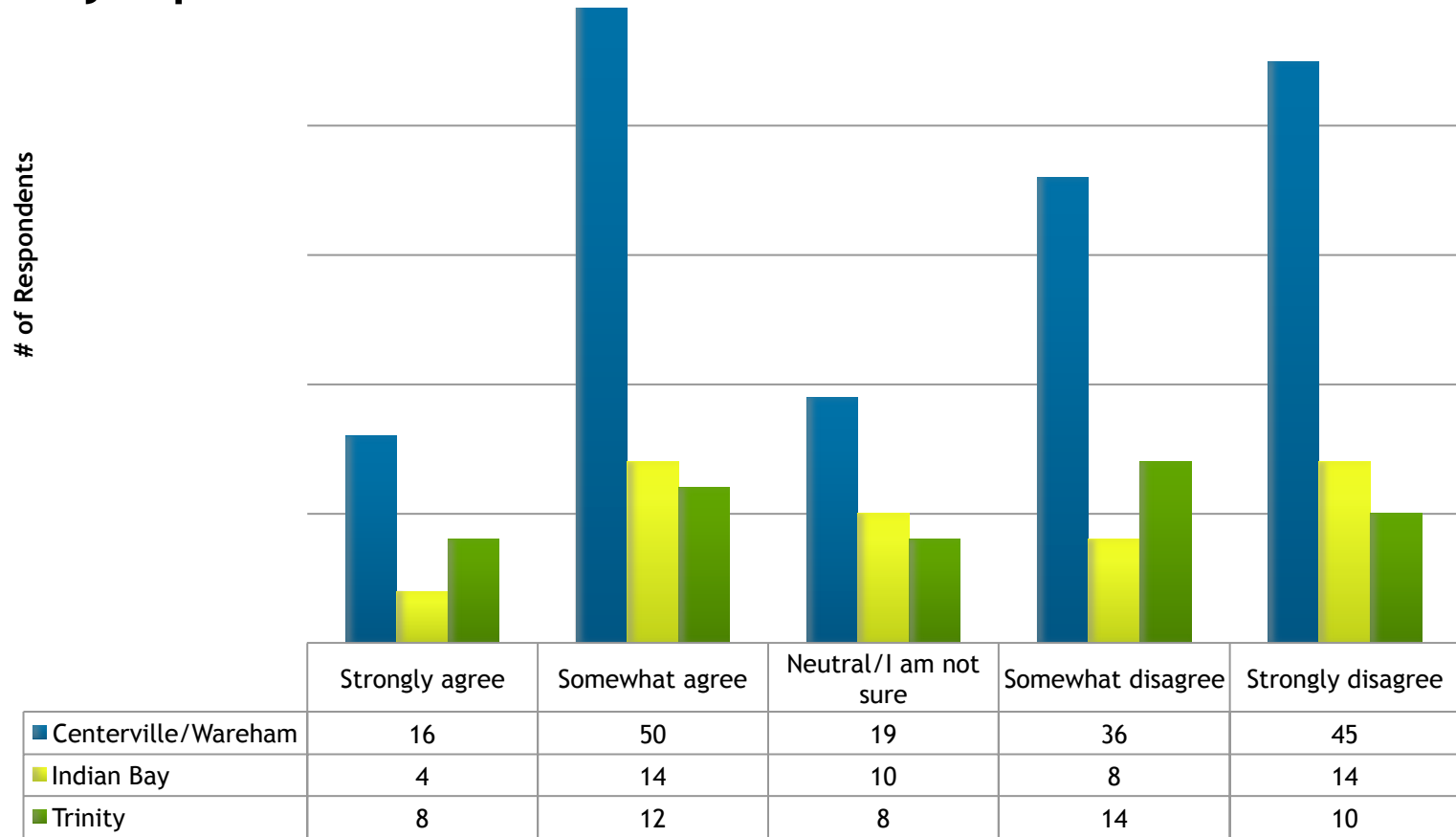


# Population Survey

Why is this the main source of your drinking water?

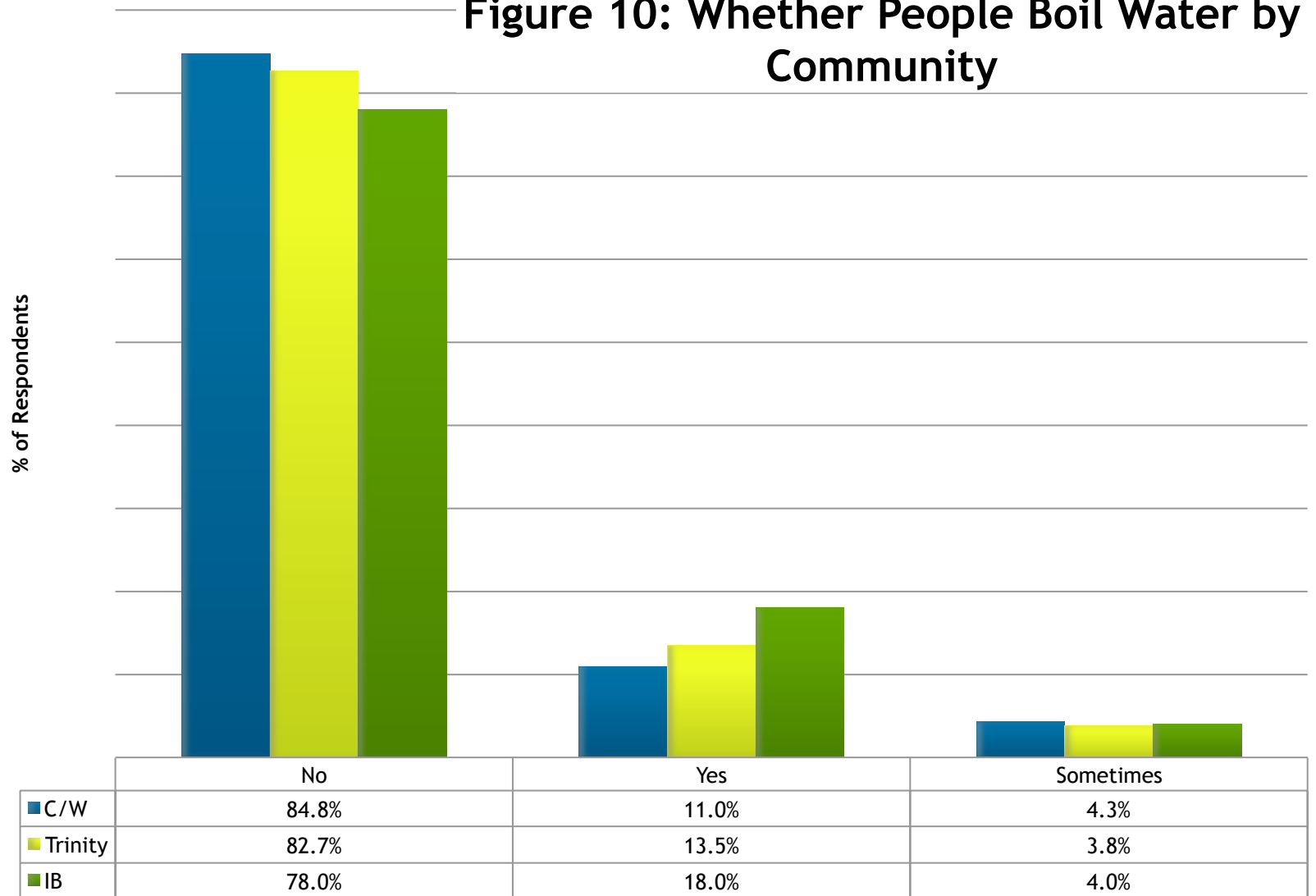


**Figure 9: Responses to  
"My tap water is safe to drink"**





**Figure 10: Whether People Boil Water by Community**



# Population Survey - Watershed Users



- 29% spend time in the watershed
- Majority for recreational motor vehicle use, followed by fishing and hunting
- Residents aware that the watershed is a *Protected Water Supply Area*
- 75% willing to alter their behavior were it deemed to be environmentally risky



# Cabin Survey



- Take stock of shorefront development
- 8 “ponds” chosen for density of development and water testing locations
- Shoreline clearing can be a significant hazard to water quality, e.g. erosion
  - 16 cabin properties completely cleared shoreline
- No significant instances of excessive waste and/or environmental damage on properties

# Role of watershed groups in water security

Scan of watershed groups in Canada reveals roles in:

- habitat restoration,
- water testing/monitoring,
- planning, and
- public education

# Partnerships



- Partnership with St. Mary's University to help establish a community-based water monitoring program
- *WET-PRO Field Kit* for portable water quality monitoring
- Participation in Atlantic-wide network

# Conclusions, Future Directions



- Distaste for municipal drinking water
- Safety concerns real and perceived - perceptions matter
- “Unofficial” water sources important for human health
- Ongoing community-based monitoring necessary to improve safety of consumption + ecosystem health
- Multi-use watersheds pose significant challenges for the management of public drinking water supplies
- Important role for citizen/NGO-government collaborations and community-based research partnerships



# Acknowledgements

- Co-PI Dr. Atanu Sarkar
- RAs David Speed, Stephen Parmiter, Salil Saxena
- Funders - Harris Centre RBC Water Research and Outreach Fund and the Institute for Biodiversity, Ecosystem Science, and Sustainability (IBES)
- Community partners - IBEC, Towns of Indian Bay and Centreville-Wareham-Trinity - and advisors

# Thank you for your time!!

Please feel free to ask questions or provide comments, your feedback is important to us.



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