



# GIS as a Tool to Evaluate Breast Screening

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# Outline

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- **Objectives**

- Nova Scotia Breast Screening Program
- Geographic Information Systems (GIS)
- Results
- Challenges/Opportunities
- Next Steps

# Map of Canada

## Location of Nova Scotia within Canada



Sources: Statistics Canada, DMTI

April 5, 2006

# Nova Scotia Breast Screening Program

- Established in 1991: one fixed site - Halifax
  - Targets women aged 50 - 69 (~ 100,000 women in 2001 Census)
  - Modeled after the first Canadian program in BC (1988)
  - Unique features of the NSBSP:
    - Dedicated workup sites all with Stereotactic Needle core biopsy (1991)
    - Physician assisted referral for abnormalities (1991)
    - Central booking of all Mammo-screen and diagnostic (1999) - 80%
- 2005: 8 fixed sites + 3 mobile units (+last 2 fixed sites in 2006)

# NS BSP Fixed and Mobile Sites

## Nova Scotia Organised Breast Cancer Screening Fixed & Mobile Base Clinic Locations With Year They Came Online



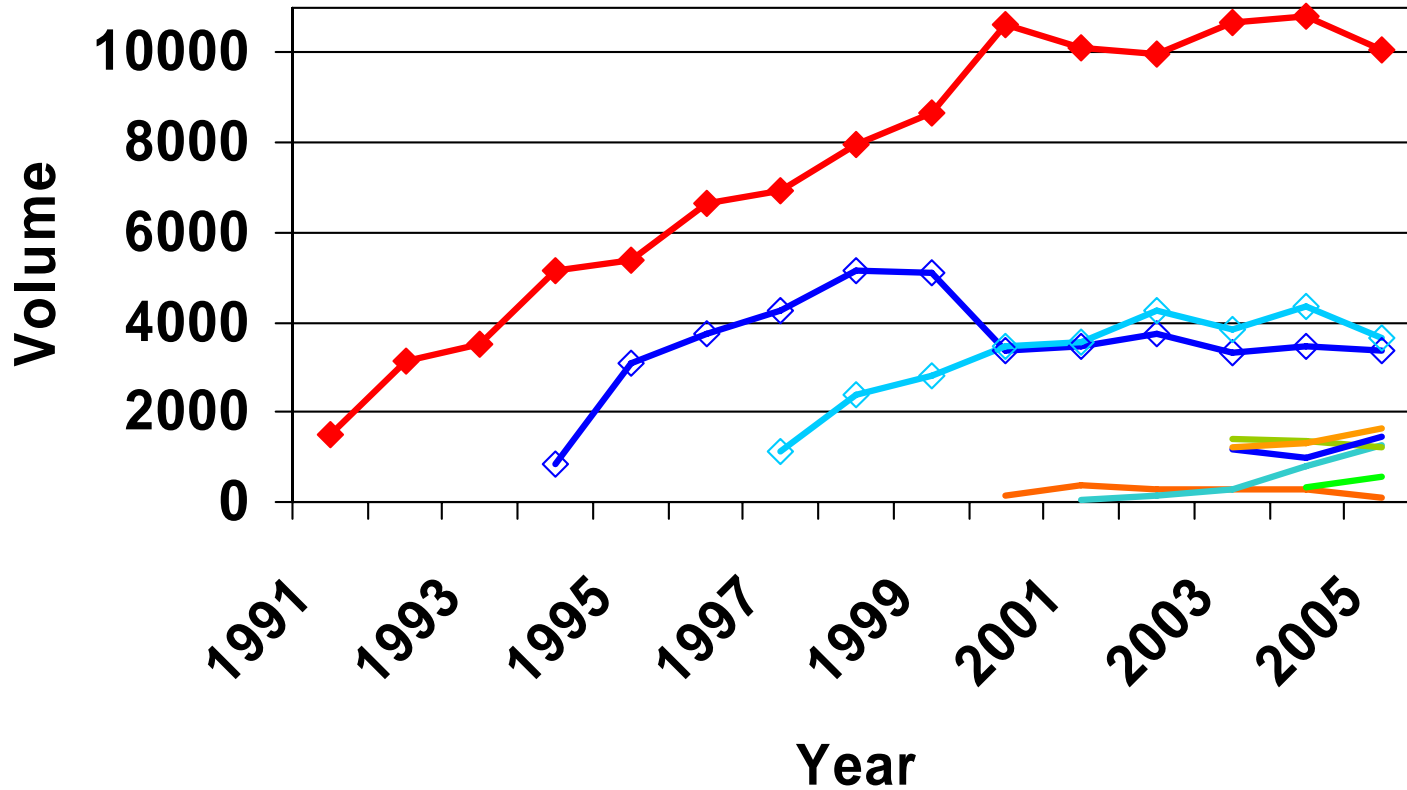
s Division  
ning Clinic Site

Sources: Statistics Canada, DMTI, NS Organised Breast Cancer Screening Program

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# Growth of Screening Volume (1991-2005)

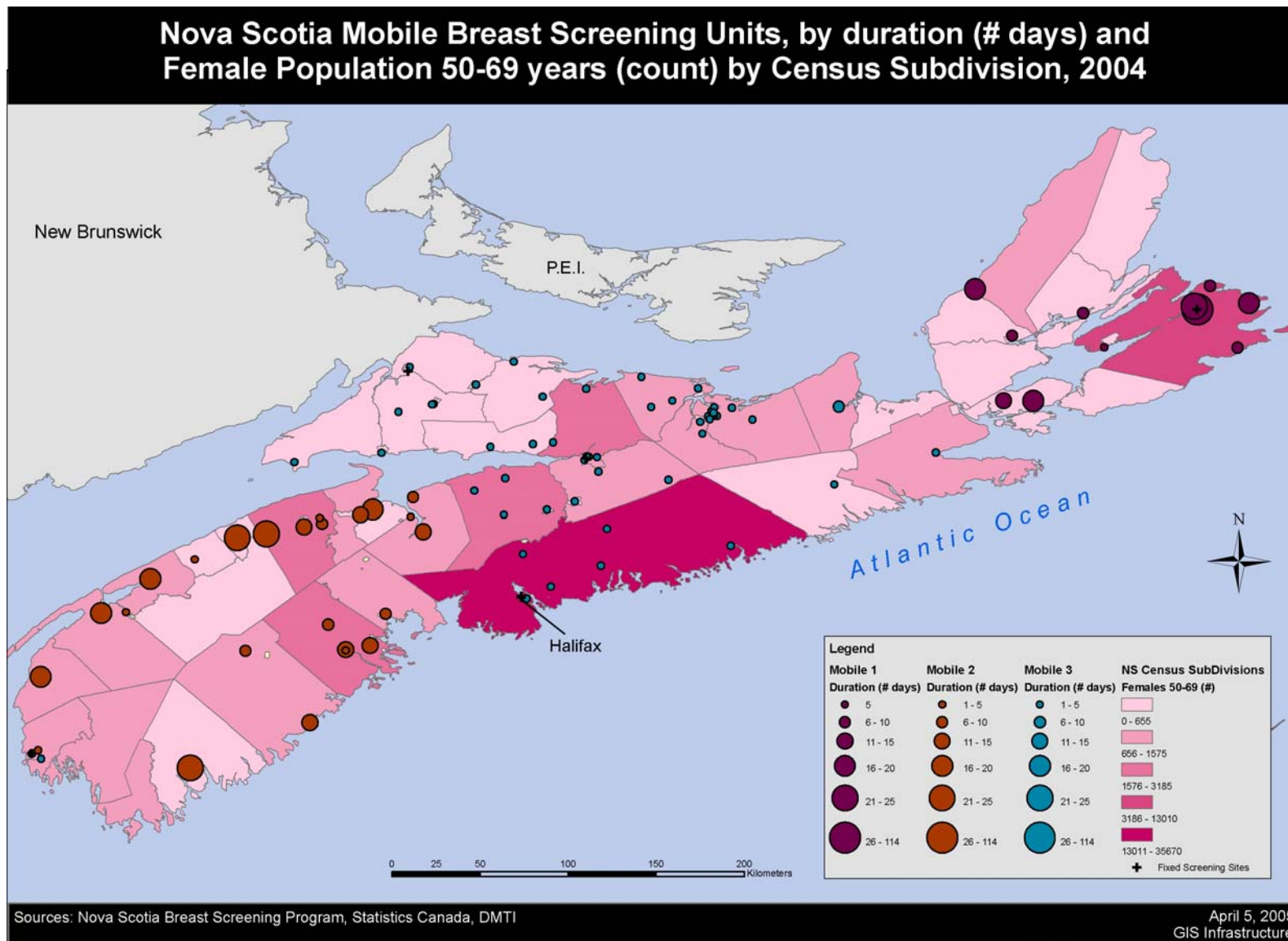


# Geographic Information Systems (GIS)

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- Is a computer technology that uses a geographic information system as a framework for understanding a problem
- Links information to location, then layers different types of information to understand how they may work together
- Has been applied to analyze variations in health services utilization
- First time used to evaluate a provincial screening program

# Population Size & Location/Duration of Mobile Unit Visits

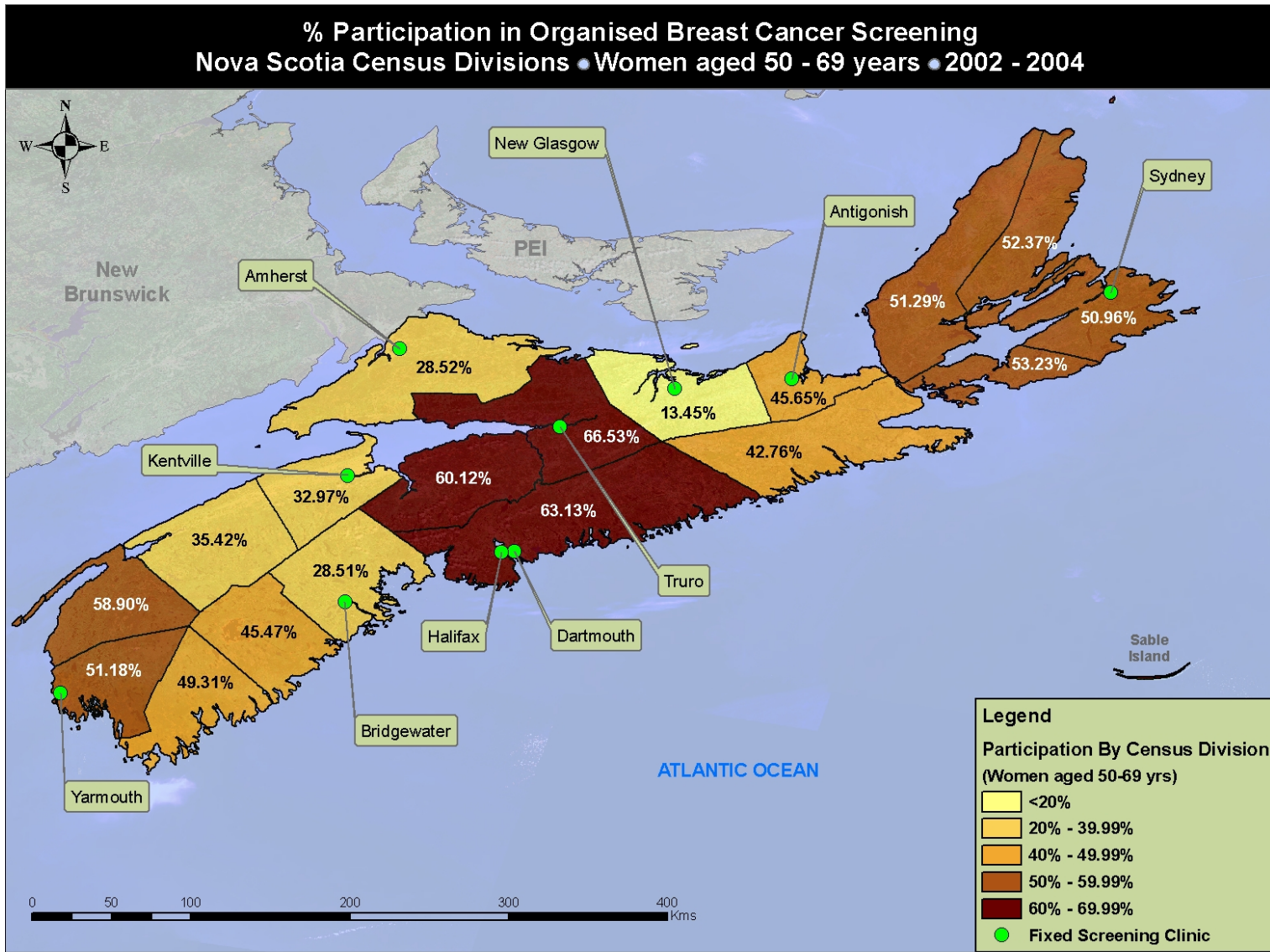


Sources: Nova Scotia Breast Screening Program, Statistics Canada, DMTI

April 5, 2005  
GIS Infrastructure

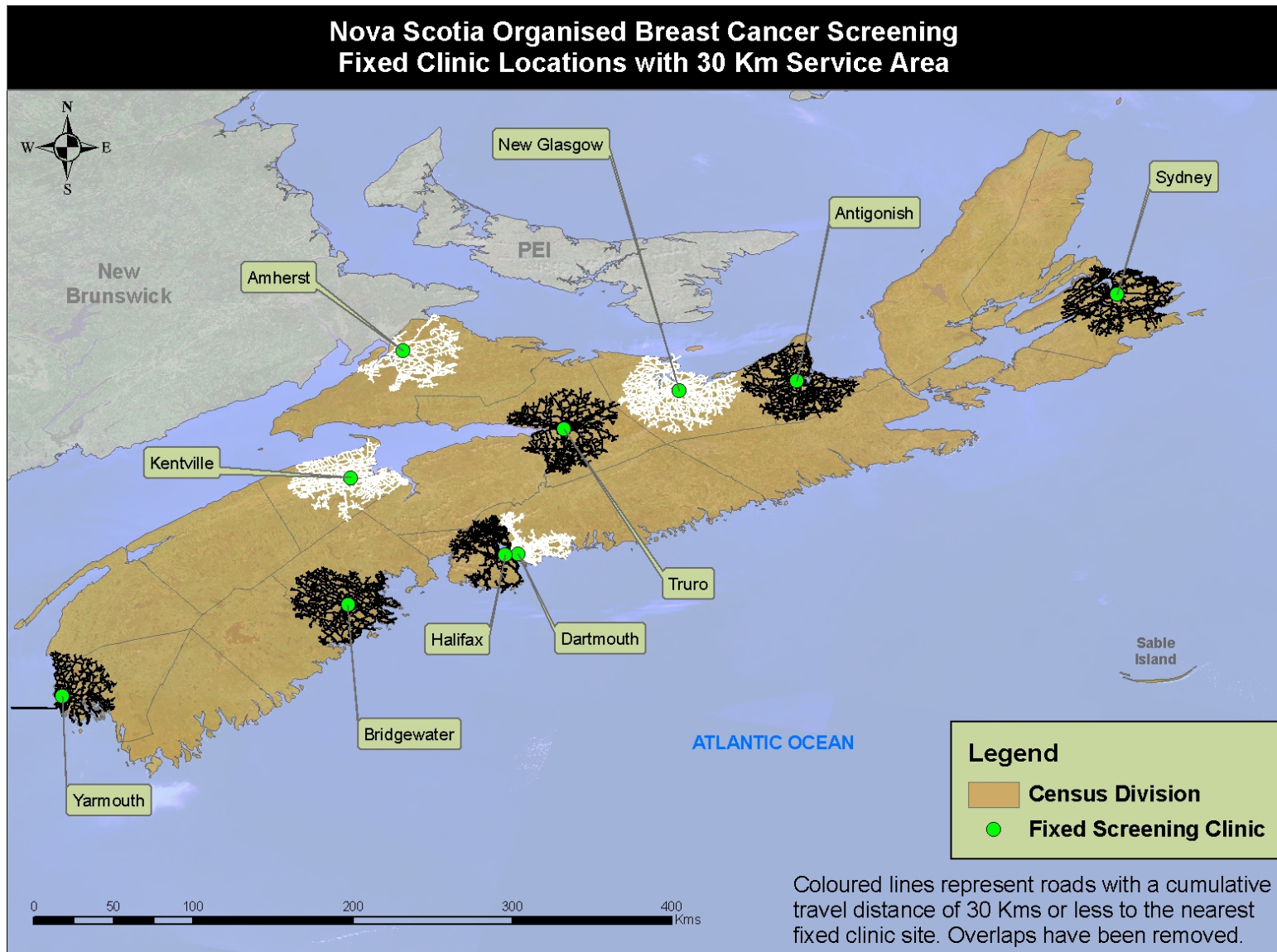


# Screening Participation Rates



Sources: Statistics Canada, DMTI, NS Organised Breast Cancer Screening Program

# Scenario 1: Distance Traveled to Fixed Sites = 30km

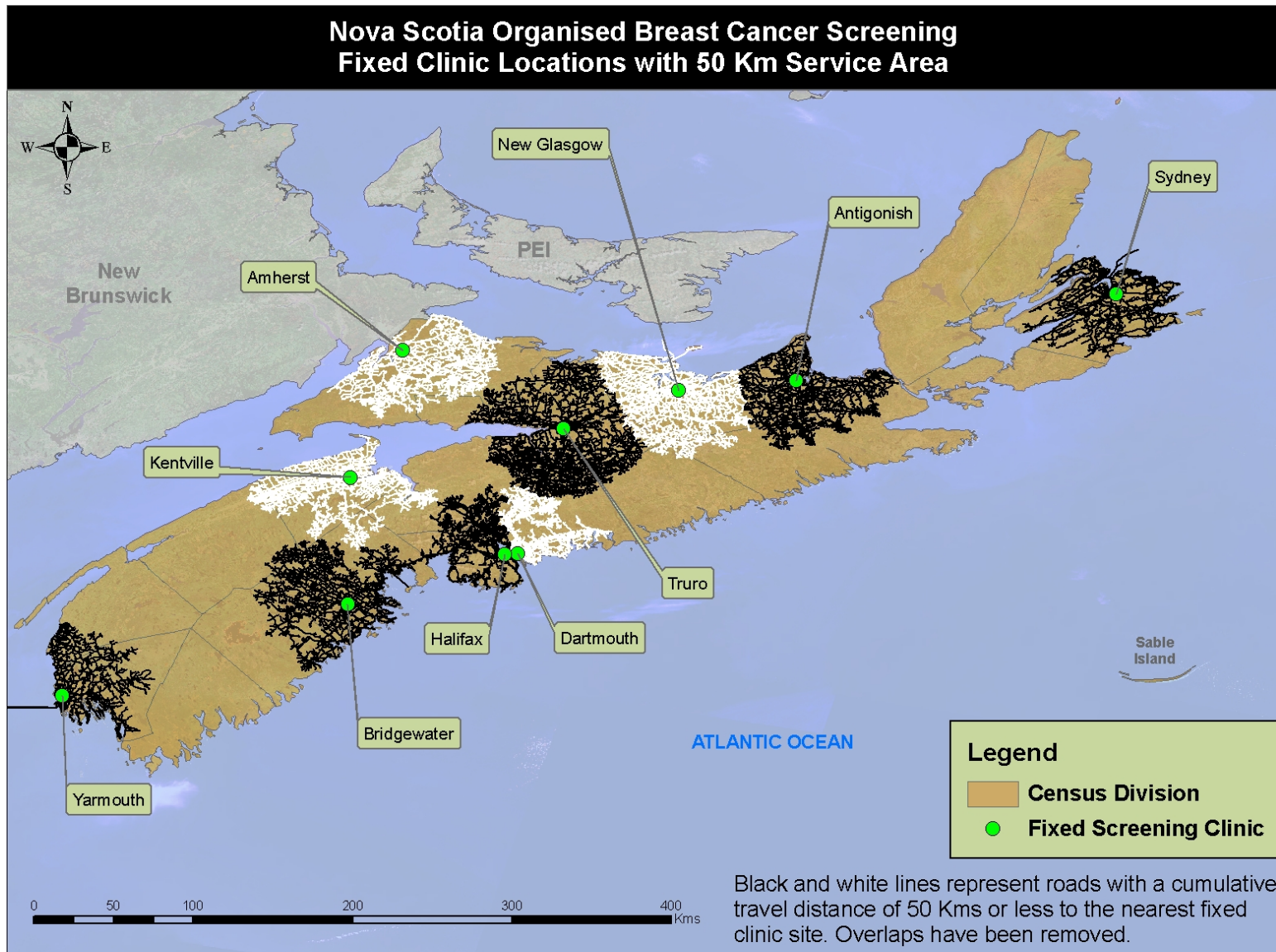


Sources: Statistics Canada, DMTI, NS Organised Breast Cancer Screening Program

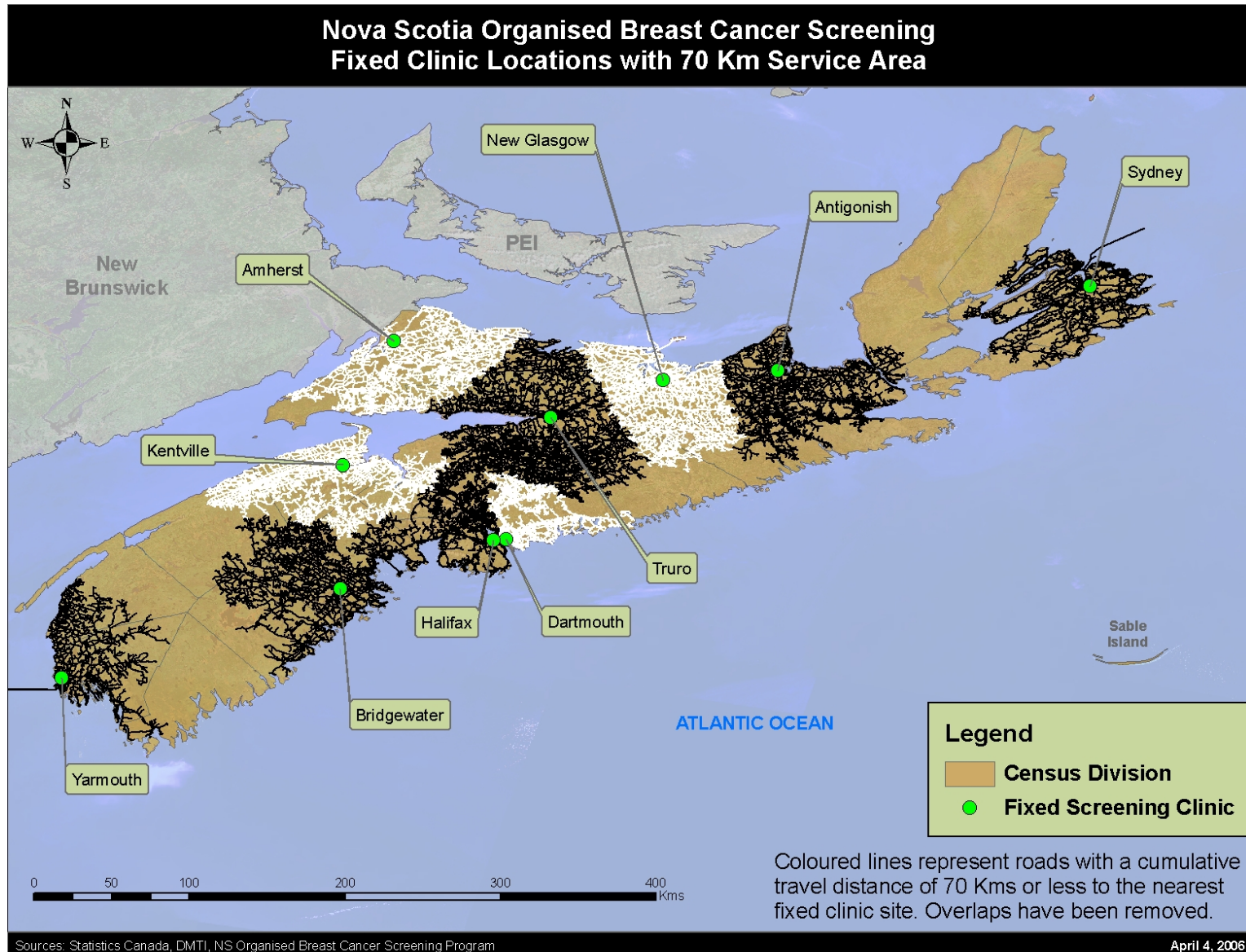
April 4, 2006



# Scenario 2: Distance Traveled to Fixed Sites = 50km



# Scenario 3: Distance Traveled to Fixed Sites = 70km



# Challenges and Opportunities

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- Dynamic provision of breast screening services:
    - 2 more fixed sites joining program in 2006
      - At that time, all screening & diagnostic mammography in the province will be part of the NSBSP-central booking will be 100%
    - Introduction of full-field digital mammography in 2006 will increase capacity.
- ❖ **priorities: participation vs retention vs wait times**







# Challenges and Opportunities

## ❖ priorities: participation vs retention vs wait times

- Increasing service capacity:
  - What are current inequalities in participation/retention?
  - What are current inequalities in wait times for both screening and diagnostic work-up?
  - How to allocate capacity to address inequalities
    - Region-specific interventions?
  - How to schedule mobile units to continually complement fixed sites?

# Next Steps

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- Use GIS in on-going surveillance of need for/use of screening
  - help target under-serviced populations
  - participation versus retention
- Goal: use road-mapping approach to develop various scenarios for scheduling of mobile units
- Grant submission to Canadian Breast Cancer Foundation Atlantic Chapter (Dec 2005) for full-scale project

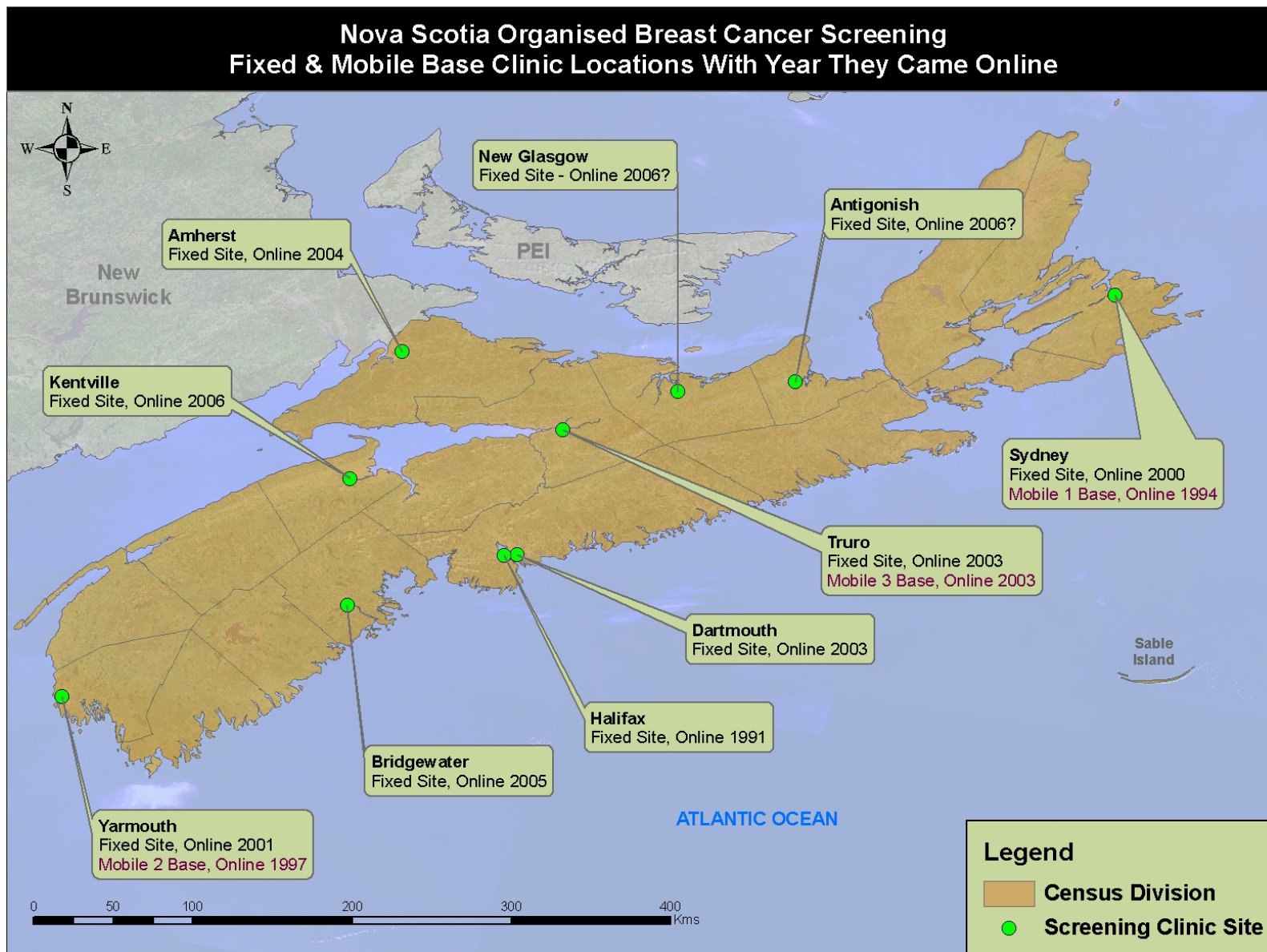
# Acknowledgements

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- Nova Scotia Department of Health
- Canadian Breast Cancer Foundation Atlantic Chapter
- Public Health Agency of Canada
- Department of Diagnostic Imaging, Queen Elizabeth II Health Sciences Centre



# NS BSP Fixed and Mobile Sites



Sources: Statistics Canada, DMTI, NS Organised Breast Cancer Screening Program

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