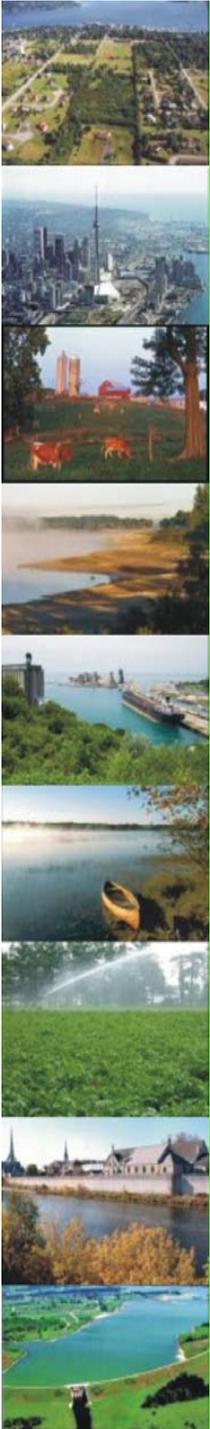


# Source Protection and Climate Change

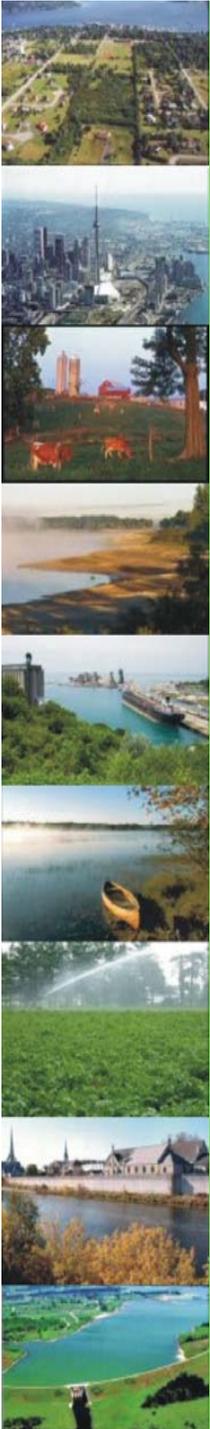
Rob de Loë  
Department of Geography  
University of Guelph

C-CIARN Ontario Workshop  
November 3, 2005



# The Project

- Pollution Probe and the Canadian Water Resources Association
- Where and how can climate change be incorporated into Drinking Water Source Protection Plans (DWSPP)?

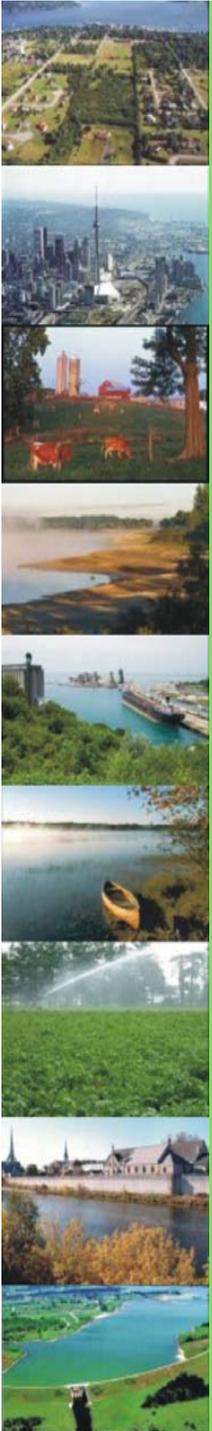


# Rationale

- DWSPP → an opportunity to *mainstream* climate change?
- Numerous opportunities exist in proposed DWSPP system

# Audience

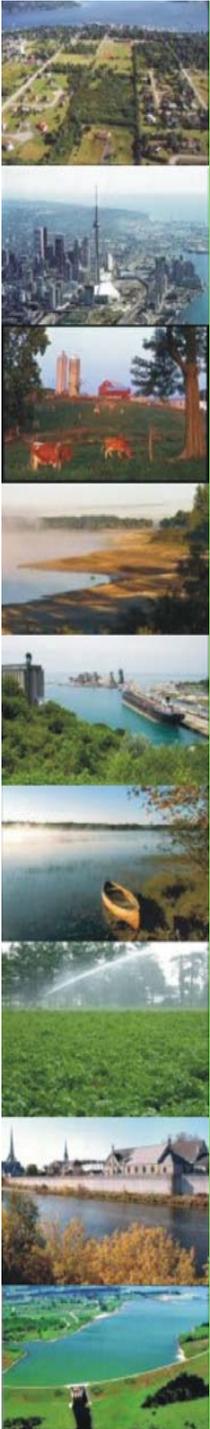
- People involved in DWSPP
- Varying technical backgrounds expected
- Varying understanding, awareness, acceptance of climate change





# Tasks for White Paper – Body

1. Climate change impacts in Ontario
2. Key climate drivers at watershed scale
3. Implications for ecosystems & human uses of surface and groundwater
4. Links to planning and management
5. Adaptive strategies
6. Cases and examples



# Tasks for Appendix

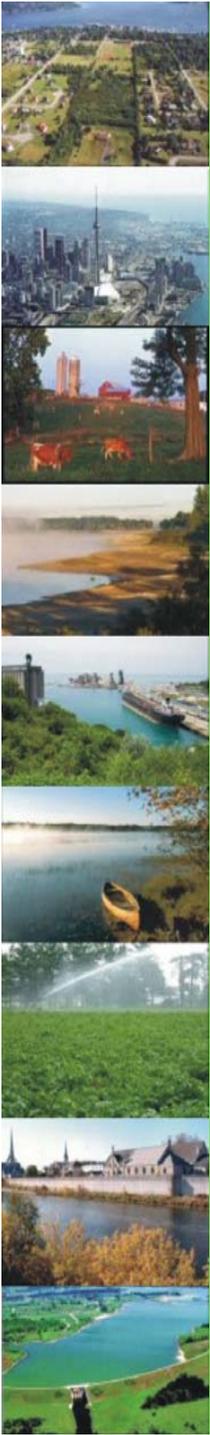
1. Describe current state of climate change modelling at global and regional scales; implications for watersheds
2. Advice for CAs and others involved in hydrological modelling for source protection planning



# Climate Change in Southern Ontario \*

- Increased air temperature
- Longer, more intense heat waves
- Increased evapotranspiration
- Slight increase in precipitation
- Changes in timing, intensity of precipitation expected

\* Less known about Northern Ontario.  
Predictions are scenario dependent!



# Selected Anticipated Hydrologic Impacts – GLSB \*

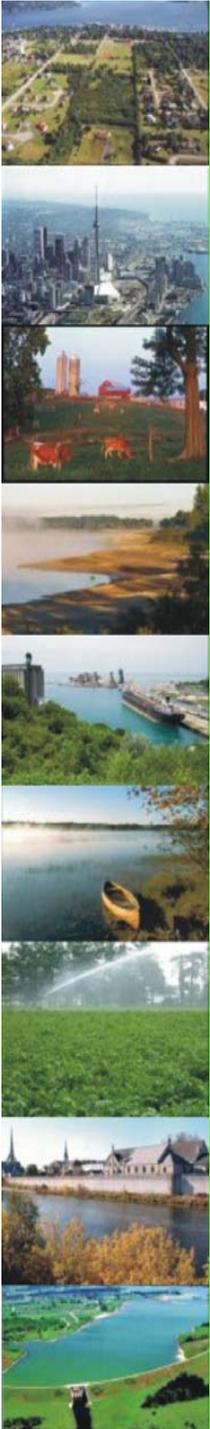
- Declining lake levels
- Reduced runoff
- Reduced groundwater levels and recharge
- Increased water temperature

\* Much uncertainty!



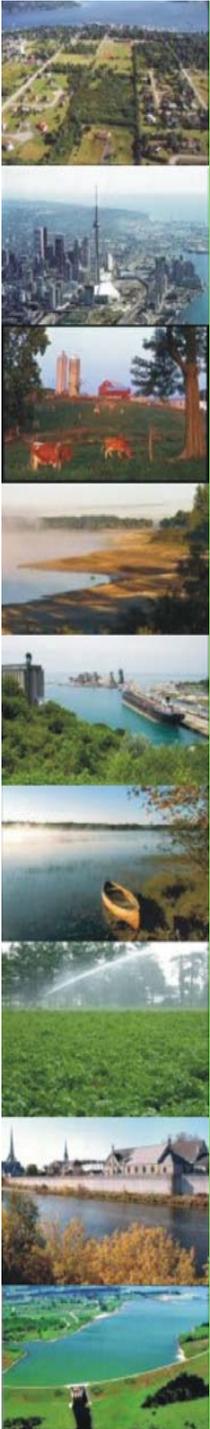
# Source Protection

- Watershed-based planning
- Source protection regions
- Collaborative and locally-driven
- Provincial plan approval
- Relationship to Municipal OPs, Provincial instruments – uncertain
- Major implementation challenges



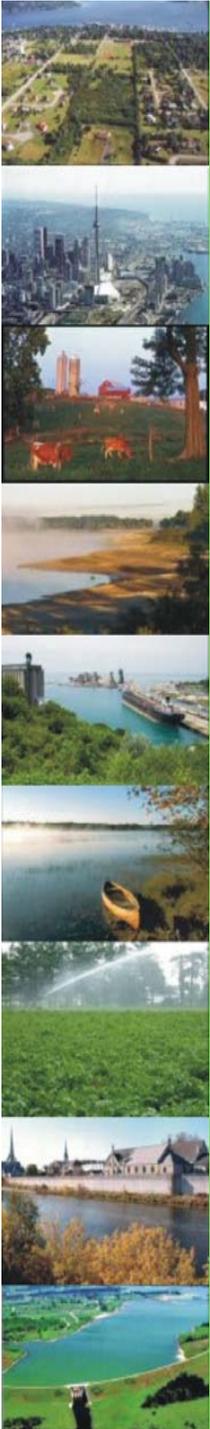
# Incorporating Climate Change...

- Water budgets
- Vulnerability analysis
- Threats and issues
- Responses



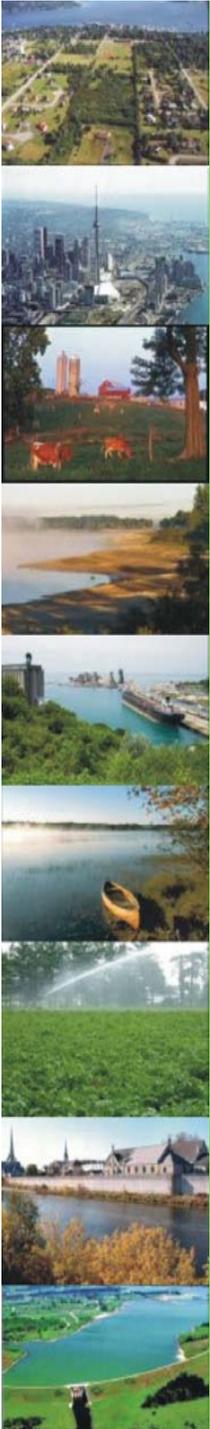
## ... In Water Budgets

- Model of “inputs” and “outputs” of water in a region
- Quantifiable information regarding:
  - Temporal/spatial water availability
  - Environmental needs
  - Human uses and needs (or wants)
  - Impacts of future land use changes
  - Sensitive areas



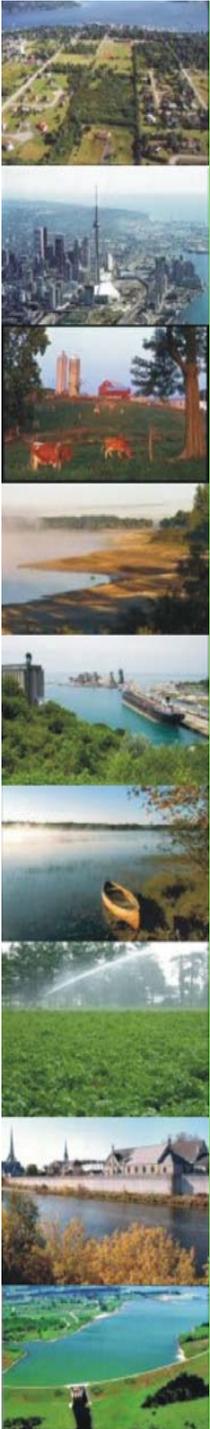
## ... In Vulnerability Analyses

- Identify and delineate vulnerable areas needing protection
  - Wellhead Protection Areas
  - Intake Protection Zones
  - Highly Vulnerable Areas
  - Areas of Significant Recharge



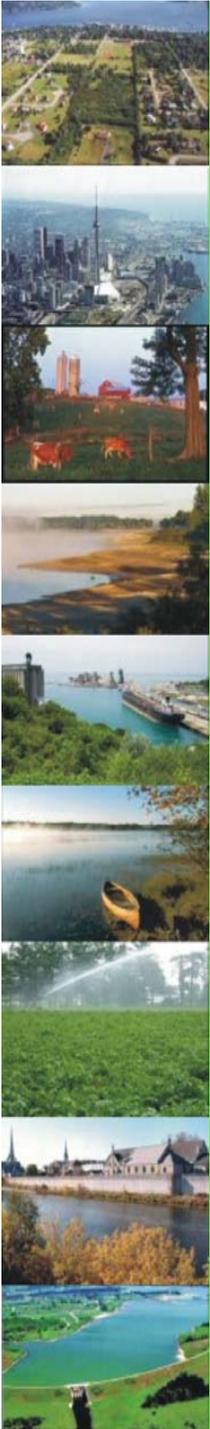
# ...In Assessment of Threats and Issues

- Assess current and potential threats to drinking water
- Identify issues that affect drinking water quality and quantity



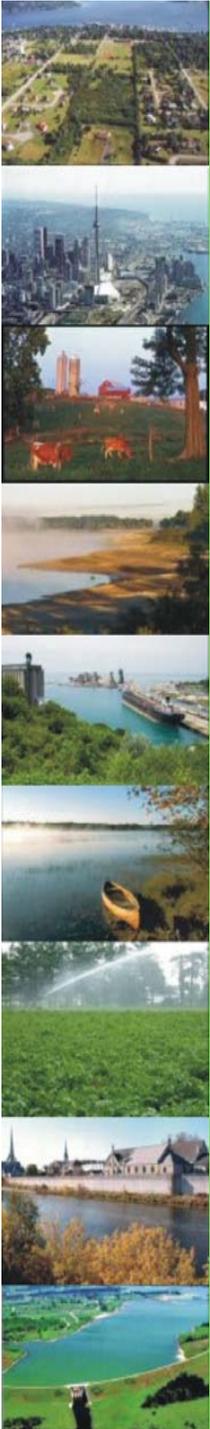
## ... In Responses and Actions

- Mainstream climate change in planning, decision making
  - Land use plans
  - Water supply and wastewater master planning
  - Permit to Take Water decisions



# Conclusion

- Drinking Water Source Protection  
Planning our best shot to  
mainstream climate change
- Political and social challenges  
exceed technical challenges
- Guidance needed



# Feedback

- Feedback on the draft Probe/ CWRA White Paper will be welcome!
  - Written comments
  - Participation in focus groups
- Please contact Rob de Loë
  - [rdeloe@uoguelph.ca](mailto:rdeloe@uoguelph.ca)