


## ADAPTING TO CLIMATE CHANGE

### Presentation Outline

- Conservation Authorities Overview
- Summary of Climate Change Impacts
- Some examples of CA Responses
- Source Protection
- Integrated Watershed Management
- Sustainable Communities

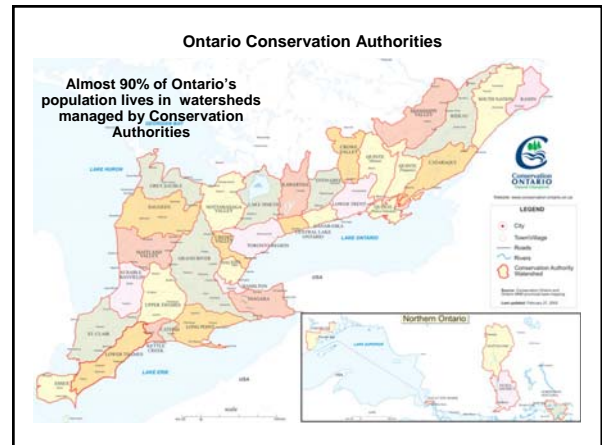
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## CONSERVATION AUTHORITIES

- 36 Conservation Authorities established under the Conservation Authorities Act
- Governed by municipally appointed Boards (67% municipally elected)
- Municipal (39%), Provincial (14%), Federal (2%) and self-generated (45%) revenues
- Combined expenditures of >\$260,000,000
- Serve 12 million people or 90% of Ontarians

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## CONSERVATION AUTHORITIES ARE UNIQUE

- Established and managed on a watershed basis
  - Globally recognized model of watershed stewardship
- Science based
  - Extensive technical expertise and established watershed monitoring programs
- Partnership driven and implementation oriented
  - We get things done working with others





## OUR PRIORITIES

- Protect, manage & restore Ontario's rivers, lakes, streams, woodlands, wetlands, and natural habitats
- Develop and maintain programs that protect life and property from natural hazards such as flooding and erosion
- Provide opportunities for the public to learn from, enjoy and respect our natural environment







## SUMMARY OF CLIMATE CHANGE IMPACTS

### Climate change affects our core business:

- more frequent severe weather events, such as higher intensity/duration rainfall
- longer ice free period on lakes, increased lake effect snow
- more rapid snow melts
- more frequent and prolonged droughts
- longer growing season (may increase demand for more irrigation)

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## SUMMARY OF CLIMATE CHANGE IMPACTS

### Climate change affects our core business:

- increased flooding and erosion
- reduced flow, levels in rivers, lakes, streams and groundwater
- diminished cold water fisheries, wetland and marsh habitats
- poorer water quality; greater costs required to treat water
- greater competition for water supplies

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## SUMMARY OF CLIMATE CHANGE IMPACTS

### Societal impacts that we will need to adapt to include:

- increased property damage, risk to life from flooding & erosion
- damage to public infrastructure as design parameters are exceeded
- pressure for irrigation, coupled with more frequent water restrictions

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## SUMMARY OF CLIMATE CHANGE IMPACTS

### Ecosystem impacts include:

- an overall loss of biodiversity, ecological health and productivity:
  - species most likely to tolerate climate change are habitat generalists and invasive species
  - The most sensitive, habitat specialist species and species with limited mobility will be most affected

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## RESPONSES TO CLIMATE CHANGE IMPACTS

- Prolonged drought in 1990s focused attention on water quantity
  - Provincial Groundwater Monitoring Network re-established (MOE) 1999
  - Low Water Response Framework (MNR) 1999
- May 2000 Walkerton tragedy focused on water quality, but relationship to extreme event was established
- MOE funded municipal groundwater studies over period 2002 to 2003 (quantity focus)
- Permit to take Water program revamped
- Low Water Response Framework reviewed in two pilot watersheds in 2008

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### Multi-Purpose Reservoirs Grand River Conservation Authority



### GRCA Reservoirs

seven water control structures

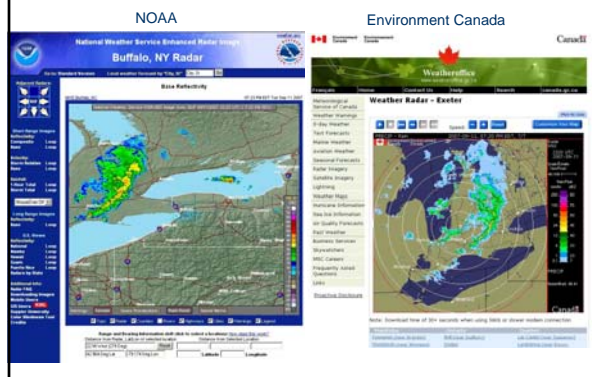
stores 175 million cubic meters (175 billion liters) of water

flood control

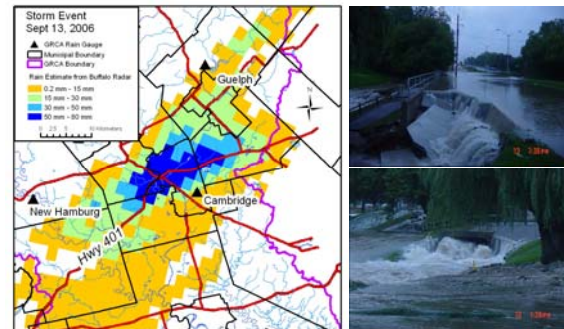
water supply

low flow augmentation

## Present Map View



## Why Use Radar?



## CREDIT VALLEY CONSERVATION RESPONSES TO CLIMATE CHANGE

### Flooding and erosion

- emergency preparedness
- real time monitoring and response for flood warning and forecasting
- spill response strategies
- plan input and review re stormwater and Low Impact Development (LID)
- erosion and sediment control workshops



## CREDIT VALLEY CONSERVATION RESPONSES TO CLIMATE CHANGE

### Water Quality and Quantity

- water quality and quantity studies (subwatershed studies, water budget, water quality strategy)
- control of stormwater at source (Low Impact development)
- point source and non-point source pollution retrofit of 14 creeks and Credit River
- Peel farm rural water quality retrofits
- Settlement and servicing masterplans for communities



## CREDIT VALLEY CONSERVATION RESPONSES TO CLIMATE CHANGE

### Ecosystem Enhancement

- mapping biodiversity and preservation plans
- species of conservation concern protection plan
- natural heritage system creation in Mississauga and Brampton and preservation in new development
- removing invasives
- goal of planting 500,000 trees per year
- restoration and creation of wetlands
- aquatic restoration
- manage 6,000 acres for conservation purposes
- land acquisition
- working with all landowners to environmentally retrofit
- Ontario shoreline retrofit
- Plan to protect Credit River cold water fishery



## CREDIT VALLEY CONSERVATION RESPONSES TO CLIMATE CHANGE

### Public Environmental Education and Outreach

- -conservation youth corps
- -sustainable futures workshops
- -working with watershed partners especially teachers and NGOs and decision makers
- -climate change workshops
- -LID workshops, etc



## CREDIT VALLEY CONSERVATION RESPONSES TO CLIMATE CHANGE

### Municipal Plan Input and Review

- -commenting agency under the Planning Act
- -administer Conservation Authorities Act



## CREDIT VALLEY CONSERVATION RESPONSES TO CLIMATE CHANGE

### Environmental Monitoring:

- monitoring of more than 150 terrestrial and aquatic sites for:
  - fisheries
  - benthics
  - terrestrial health
  - geomorphology
  - water quality
  - water quantity,
  - weather (climate change monitoring specifically), etc



## RESPONSES TO CLIMATE CHANGE IMPACTS

### Mississippi Valley CA

- water management responses - modeling and planning
- fish and fisheries - adapting to climate change
- economics, consequences and adaptation - survey

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## RESPONSES TO CLIMATE CHANGE IMPACTS

### Toronto & Region Conservation Authority

- Symposium on Climate Change and Watershed Management, 1999
  - Broaden awareness of adaptive management techniques

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## RESPONSES TO CLIMATE CHANGE IMPACTS

- Joint TRCA, Canadian Climate Change Impacts and Adaptation Research Network workshop, 2005
  - Integration of Climate Change Impacts and Adaptation into Municipal Policy and Programs
  - Adaptation Strategies for:
    - ✓ Health impacts of heat
    - ✓ Extreme weather events
      - Basement flooding
      - Well contamination
      - Ice storms
      - Essential services

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## RESPONSES TO CLIMATE CHANGE IMPACTS

### Toronto & Region Conservation Authority

- New Strategic Direction due to range of connected issues:
  - Climate change
  - Energy supply
  - Urban growth and infrastructure
  - Health care
  - Air and water quality
  - Quality of life
  - Biodiversity
- Requires coordinated and integrated effort from business, governments and the public at large

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## RESPONSES TO CLIMATE CHANGE IMPACTS

### Objectives

- Healthy rivers and shorelines
- Regional biodiversity
- Sustainable communities
- Business Excellence

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## RESPONSES TO CLIMATE CHANGE IMPACTS

### Examples

- Living City Campus at Kortright
  - Archetype sustainable house
  - World Green Building Council Secretariat
- Pearson Eco-Business Zone
  - 12,000 ha, alter the landscape to green and economically vibrant sector using a systems approach
  - Examines local and regional flows of materials, energy, synergies, byproducts

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## RESPONSES TO CLIMATE CHANGE IMPACTS

### Examples continued

- Innovation in stormwater management
- Weather monitoring
- Climate Change Action Plan
- Community Transformation Programs
- Education (175,000 students annually)
- Outreach Education and Stewardship

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## RESPONSES TO CLIMATE CHANGE IMPACTS

### Maitland Valley Conservation Authority

- Analyze ways in which institutional arrangements for water management facilitate or constrain adaptive capacity
- Agriculture and recreation most affected
- Challenge is alteration of existing attitudes and practices
- Need better understanding of social, economic and cultural barriers to water conservation

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## RESPONSES TO CLIMATE CHANGE IMPACTS

### Recommendations

- MVCA, Lower Maitland Stewardship group have local knowledge pertinent to municipal planning, source protection planning, promotion of bmp's
- Source protection presents opportunity for enhancing adaptation to variability by integrating water quantity and quality management; CA's should become advocates for inclusion of CC considerations in Source Protection Plans
- Senior governments should provide sustainable funding to facilitate relationship building and time needed to design and implement changes to systems

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## Source Protection

### CO Submission to Walkerton Inquiry

- promoted concept of **Multi-barrier approach – Source Water Protection**
  - Watershed based approach to managing water in the environment, rather than reliance on "in the pipe" treatment solutions
  - Integrating drinking water into broader water management considerations (consider the needs of aquatic ecosystem)
  - Managing quantity of water, not just quality
- Justice O'Connor incorporated watershed-based source protection into his Part II recommendations:
 

*"The first barrier to the contamination of drinking water involves protecting the sources of drinking water."*

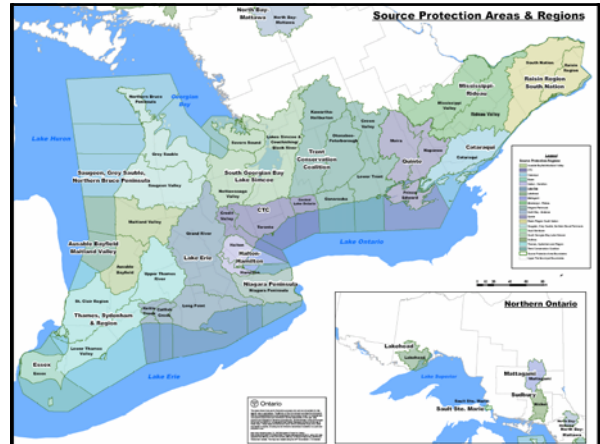
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## Source Protection Authority (Conservation Authority)

- CAs act as Source Protection Authorities
- Most Source Protection Authorities are grouped into Source Protection Regions
- SPA role includes:
  - Appoint Source Protection Cttee (SPC) members
  - Provide technical support to SPC
  - Administer provincial funding
  - Facilitate communication and consultation
  - Monitor and report on plan implementation

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## Source Protection Committee Role

- Direct the source protection planning process
- Assign responsibilities (municipal, CA, working groups, etc)
- Lead consultation process
- Prepare and submit:
  - Terms of Reference
  - Watershed Assessment Report
  - Source Protection Plan



## Municipal Role in Source Protection

Municipalities are key partners in Source Protection

- Select SPC representatives
- Designate drinking water systems for inclusion
- Undertake components of assessment report and plan
- Participate on working groups
- Review and comment on terms of reference, watershed assessment report and source protection plan

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## Source Protection Planning Steps

Terms of Reference (winter 2008/2009)

- Work plan, roles, timelines, etc.

Watershed Assessment Report (fall 2009)

- Identify vulnerable areas and threats
- Evaluate risks

Source Protection Plan (August 2012)

- Actions to mitigate risks
- Implementation plans (who, what, when)

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## INTEGRATED WATERSHED MANAGEMENT

- An integrated provincial water policy framework that recognizes all aspects of watershed management
- Clarified roles and responsibilities of all levels of government, conservation authorities and others
- Advancing watershed management through the preparation of watershed plans by local agencies

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## INTEGRATED WATERSHED MANAGEMENT

- Watershed action plans that describe what is needed to ensure a safe and secure water supply and healthy aquatic ecosystem
- Stakeholder driven with strong science and monitoring
- Adds value to Clean Water Act Source Water Protection Plans

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## INTEGRATED WATERSHED MANAGEMENT

- Research into water issues and development of decision support tools for local application
- Adequate monitoring programs to understand watershed systems and track watershed health



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## INTEGRATED WATERSHED MANAGEMENT

- Improvements to and maintenance of data management systems that are publicly accessible
- Effective implementation of watershed management and source protection through land use planning, regulation, stewardship, and land securement

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## INTEGRATED WATERSHED MANAGEMENT

- Identification and quantification of the roles of existing wetlands, forests and riparian areas as well as protection, enhancement and restoration of those that provide water quality and quantity benefits
- Mechanisms for adequate and stable source(s) of funding including cost recovery from water users (i.e. user pay principle), and from effluent dischargers (i.e. polluter pay principle) as well as funding from provincial and/or federal governments for broader public/environmental benefits (i.e. non-use benefits).

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## SUSTAINABLE COMMUNITIES



- Climate change and air quality addressed through energy efficiency and renewable energy focus
- Enhanced focus on urban water resources management
- Improved community engagement through direct participation, citizen monitoring and environmental education programming

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Questions?



Conservation Ontario  
February 19, 2009