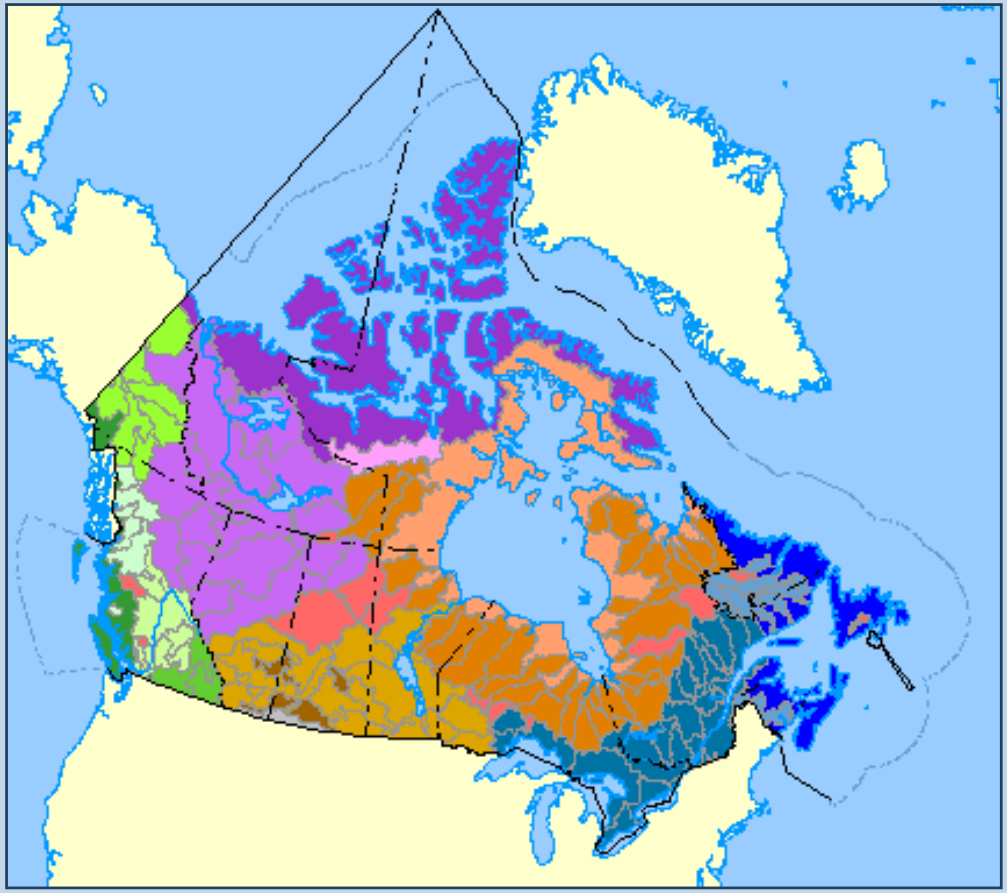
A Comparison of Watershed Approaches in Canada



Wading In: Watershed Management in Nova Scotia

March 26-27, 2009

Wolfville, NS

Barbara Veale

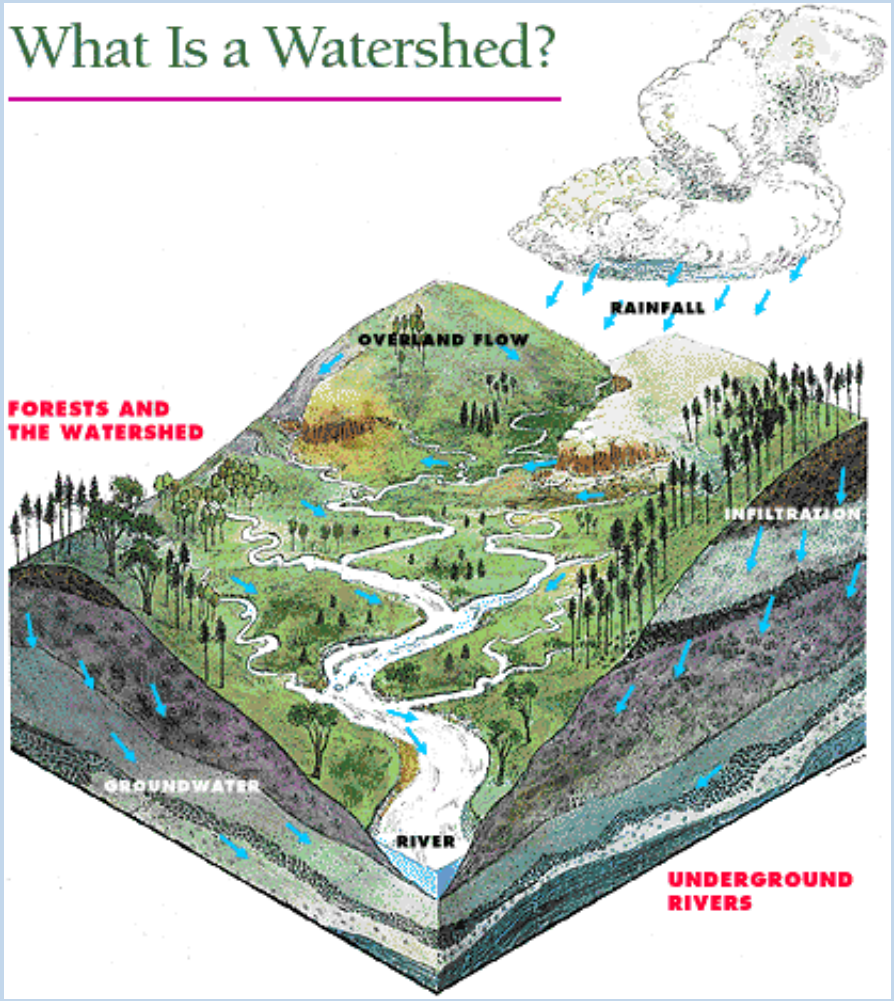
Grand River Conservation Authority

www.grandriver.ca

Presentation Topics

- Watershed Management Philosophy
- History of Watershed Governance in North America and Canada
- Current Watershed Initiatives
- The Process of Watershed Management
- Factors for Success

What is a Watershed?



http://www.gp.com/educationalinnature/water/watershed.html

- **An area of land that drains into a common water body, such as a river or lake.**

All polluted water, whether polluted by households, industry or agriculture, returns back, one way or another, to the environment and may cause damage to human health or the environment.

Managing Watersheds for Conservation

Watershed management is not so much about managing natural resources, but about managing human activity as it affects those resources –

Conservation Ontario

Strengths & Weaknesses of a Watershed Approach

Strengths	Weakness
☑ Water links other biophysical processes in land, air & water	☒ Watershed boundaries are sometimes difficult to define
☑ Nested hierarchy of landscape units that can be managed at different scales	☒ Management is problematic at larger scales
☑ Water systems demonstrate cumulative impacts – link activities to impacts	☒ Groundwater regimes & terrestrial ecosystems straddle watershed boundaries
☑ Watershed focus bridges barriers – a common planning unit for agencies	☒ Environmental stressors present management challenges beyond a watershed scope
☑ Logical, tangible unit for engaging public	☒ Socio-economic and political factors influence decision making

Watershed Governance in North America

- **Ohio Conservancy Districts – 1917**
- **Grand River Conservation Commission – 1932**
- **Tennessee Valley Authority – 1933**
- **Ontario Conservation Authorities – 1946**
- **Manitoba Conservation Districts – 1972**
- **Atlantic Coastal Action Program - 1991**

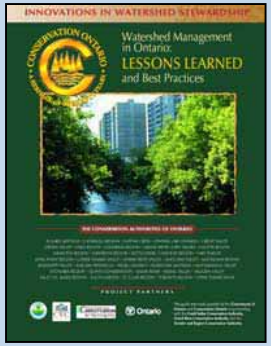
Ontario's Conservation Authorities

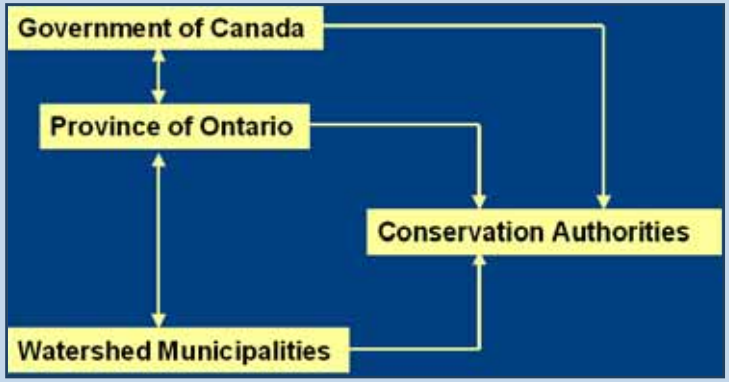
The Conservation Authorities Act allowed municipalities in a watershed to form a conservation authority to conserve and manage natural resources.

Three concepts were embodied in the Act:

- **Local (municipal) initiative**
- **Watershed approach**
- **Shared funding**

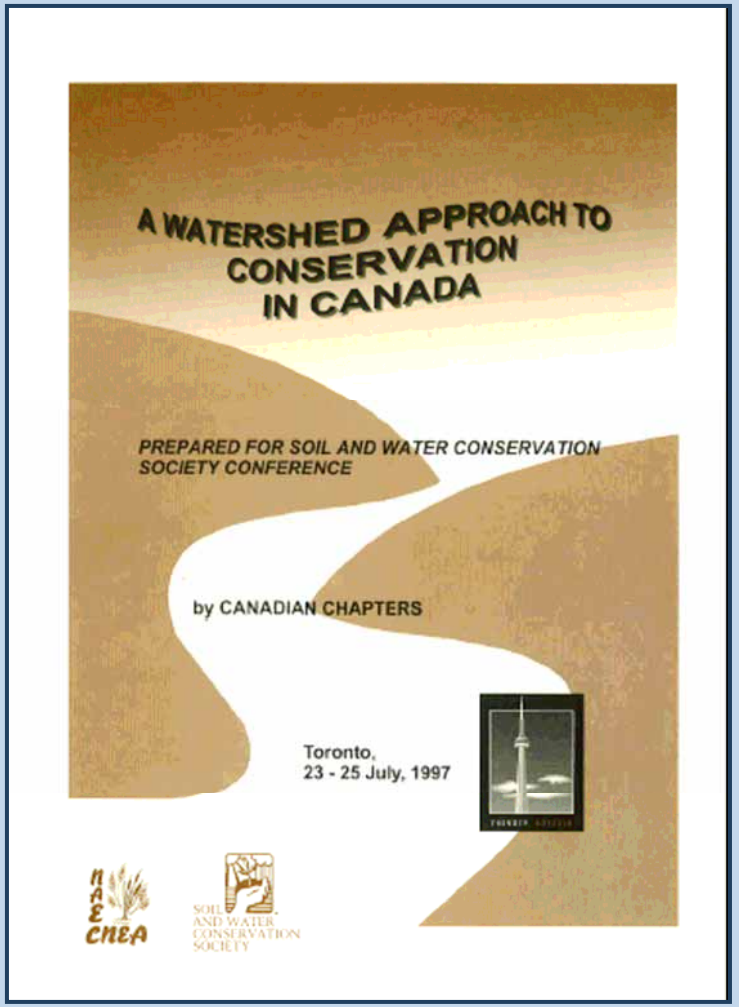
www.conservation-ontario.on.ca





Watershed Management in Canada

- 1997 Review for Annual SWCS Conference – Interactions: Management Ecosystems on a Watershed Basis
- Prepared mainly by SWCS Chapters in Canada
  - *Objectives, Methods*
  - *Successes, Shortfalls*



Key Observations from 1997

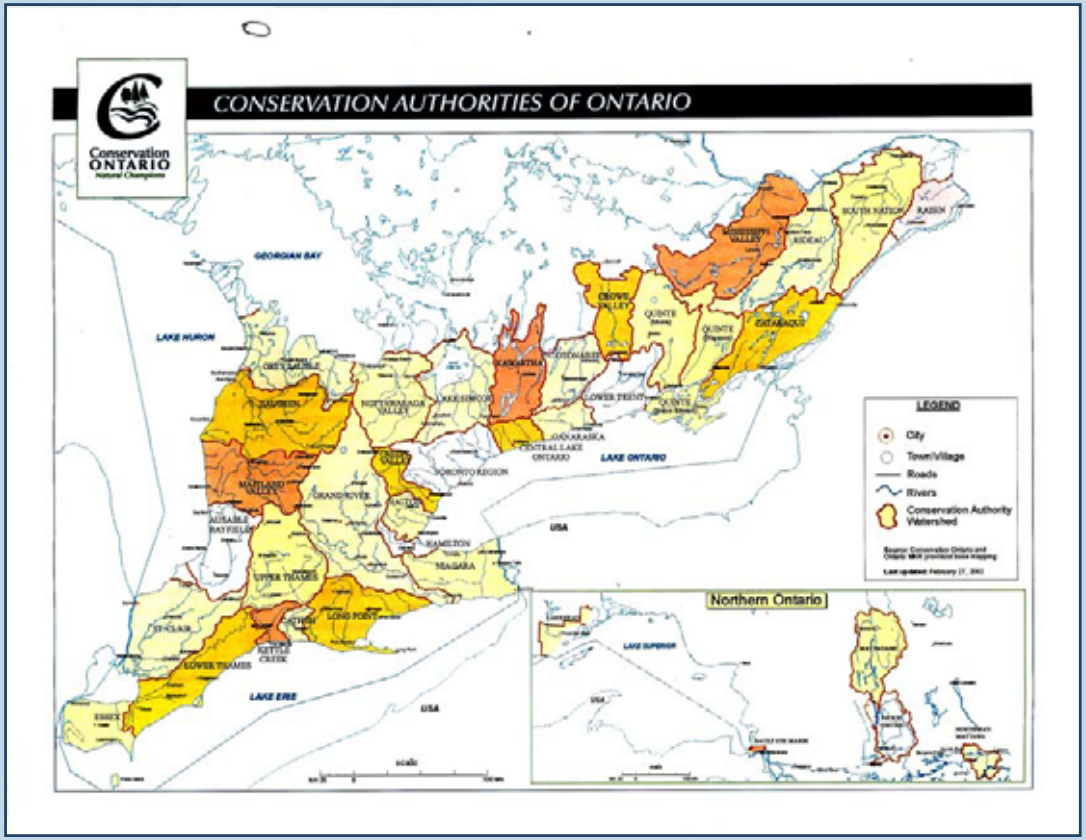
- **Watershed management acknowledged but not widely practiced**
- **Emphasis was on sectoral interests not integration** *(forestry, agriculture, fisheries)*
- **Ontario & Manitoba leading the way** *(Conservation Authorities in Ontario/Conservation Districts in Manitoba)*
- **Some large-scale watershed based research initiatives – Federal/Provincial** *(St. John River, Qu'Appelle River, Souris River, South Sask. River)*
- **Interest waxed & waned based on availability of funding resources**
- **Some grassroots interest in pursuing management on a watershed basis** *(Bow River Basin, Clean Annapolis River Project)*
- **Community approaches work best on small local watersheds; larger watersheds need a more formal governance structure**

Some Challenges

- **Lack of local capacity**
- **Gaps in science, data & scope of investigation** *(links between surface & groundwater; instream flows)*
- **Volunteer burn-out/loss of interest** *(sustaining public interest)*
- **Potential conflicts re: water allocation**
- **Weak linkages between water management and land use policies**
- **Lack of adequate funding for implementation; monitoring and evaluation**
- **Institutional inertia** *(need to change not only the planning process but the policies, legislation and institutional arrangements)*
- **Propensity towards structural solutions and entrenched economic strategies**

Conservation Authorities

- Withdrawal of province as key funding partner
- Now a partnership of local municipalities with limited capacity
- Source water protection – overshadow other conservation needs?
- No strong provincial strategy or leadership for watershed conservation



What has changed?

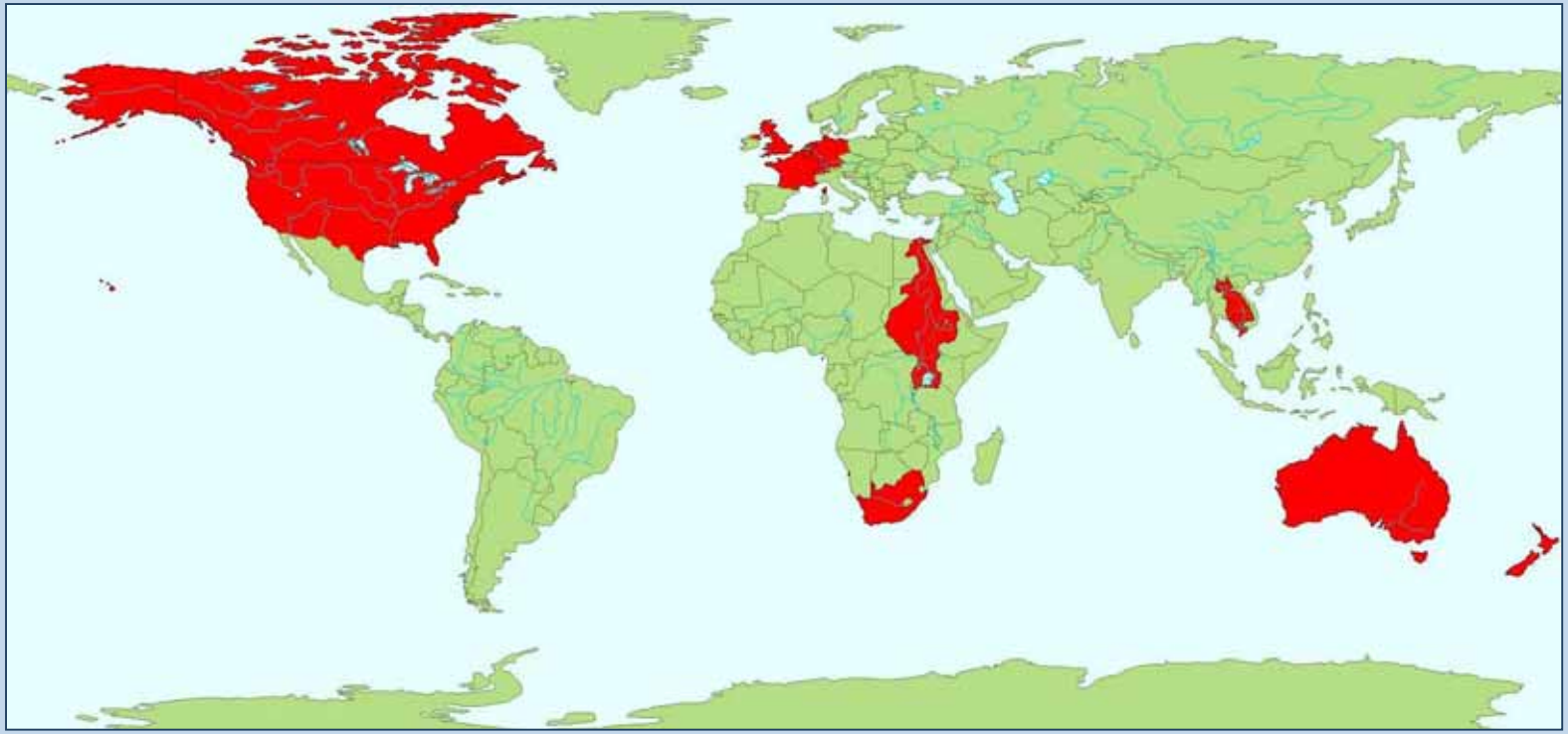
- **Escalating water & land management issues**
- **Walkerton, ON and North Battleford, SK**
- **More public interest and participation in local conservation issues**
- **More active leadership from provinces – less active leadership from the Federal government**
- **Evolving institutional arrangements & governance models relating to resource management**
- **International recognition of the importance of integrated water management on a watershed basis.**

International Support

"... ***a process which promotes the coordinated development and management of water, land and related resources*, in order *to maximize the resultant economic and social welfare* in an equitable manner without compromising the *sustainability of vital ecosystems."*** *– Global Water Partnership 2000*

"Water is not a commercial product like any other but, rather, a heritage which must be protected, defended and treated as such" *(EU News, March 21, 2003)*

International Examples



International Approaches

Watershed Agencies:

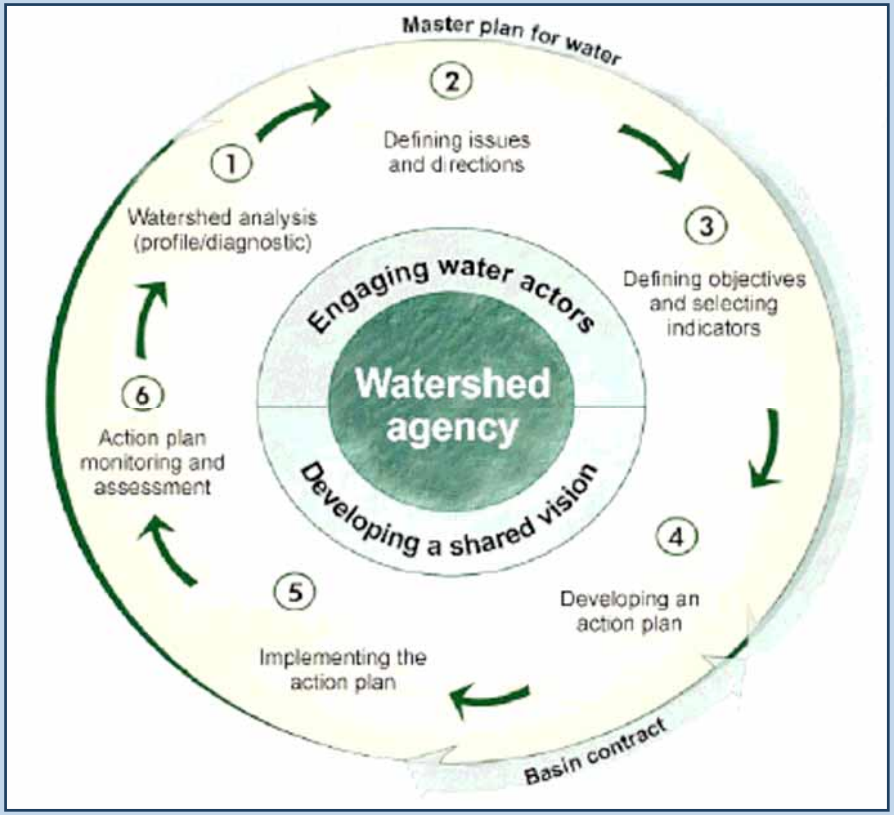
- **United Kingdom – Environment Agency/Planning Areas**
- **France – Water Agencies**
- **Australia – Integrated Catchment Management**
- **Africa – Catchment Management Agencies**
- **New Zealand – Regional Councils**
- **Rhine River – International Commission for the Protection of the Rhine**
- **Nile River – The Nile Basin Initiative**
- **Mekong River – Mekong River Basin Commission**

Common Principles

- Watershed accepted as a logical management unit
- Mix of top-down, bottom up governance models, building on a participatory approach
- Centralized to de-centralized decision making
- Shared vision & approach across provincial agencies
- Shared funding for projects; shared implementation
- Emphasis on integration, conservation, adaptive management; ecosystem health and sustainability
- General acceptance of the Adaptive Management Cycle

Provincial Strategies Promoting a Watershed Approach across Agencies

- **British Columbia** – *Living Water Smart, 2008*
- **Alberta** – *Water for Life, 2003*
- **Saskatchewan** – *Saskatchewan Watershed Authority, 2003*
- **Manitoba** – *Manitoba Water Strategy, 2007*
- **Québec** – *Québec Water Policy, 2002*



Getting to Action

Planning without action is just daydreaming!

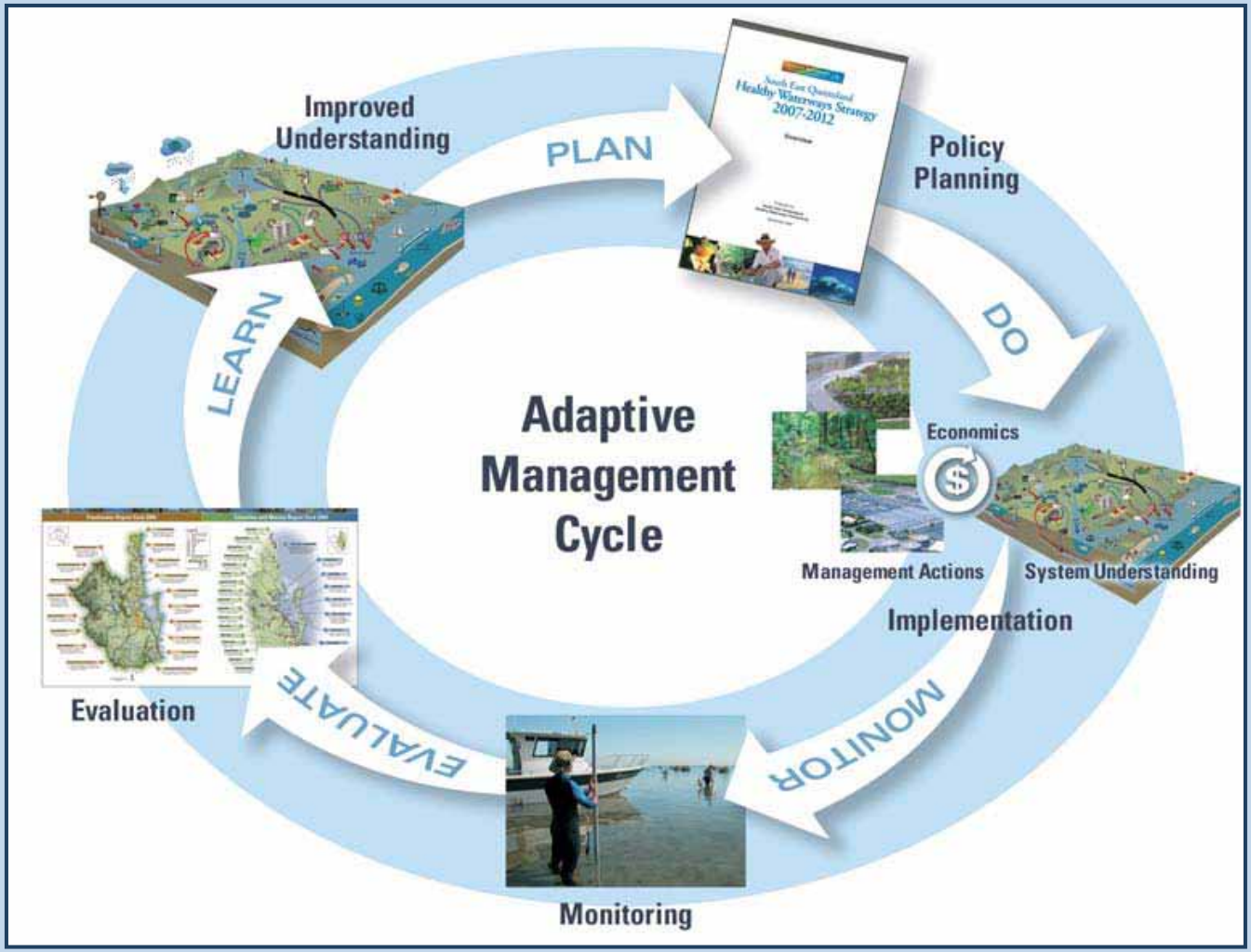
Action without planning can be a waste of time and money!

But acting on well thought out plans can change both attitude and the landscape.

Triggers for Action

- **Water Allocation**
- **Drought**
- **Erosion**
- **Degraded Water Quality**
- **Contaminated Drinking Water (Source Protection)**
- **Flooding**

Process of Watershed Management

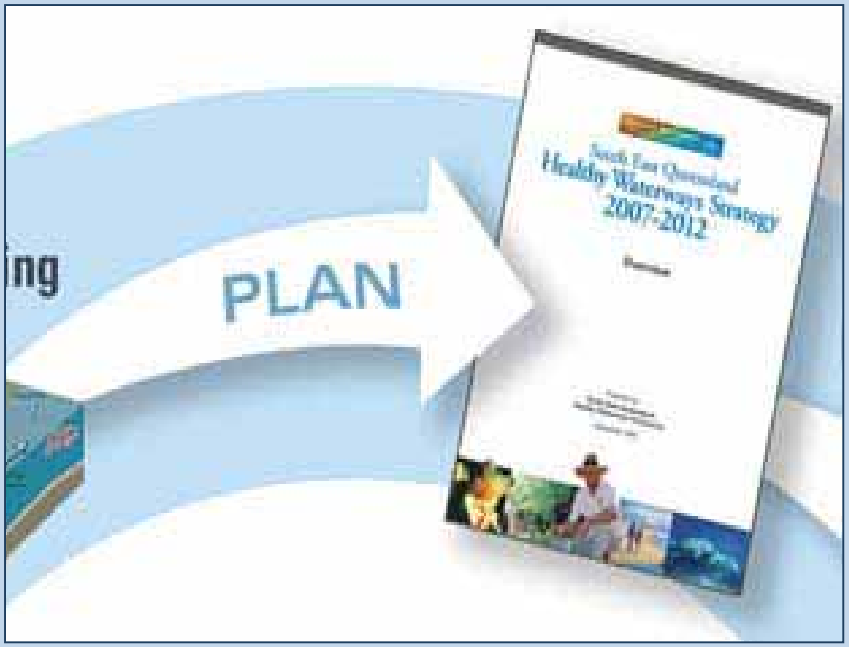


Documentation & Analysis

Understanding the River System

- What key actions/activities have been undertaken to address river health, water quality, fluctuating river flows & water supply?
- What do we know about the state of the health & functions of the river and the cause/effect relationships that influence them?
- What are the key technical/scientific issues & research/knowledge gaps?
- What technical, managerial and institutional options are available to address the issues and the impacts and implications of their implementation?

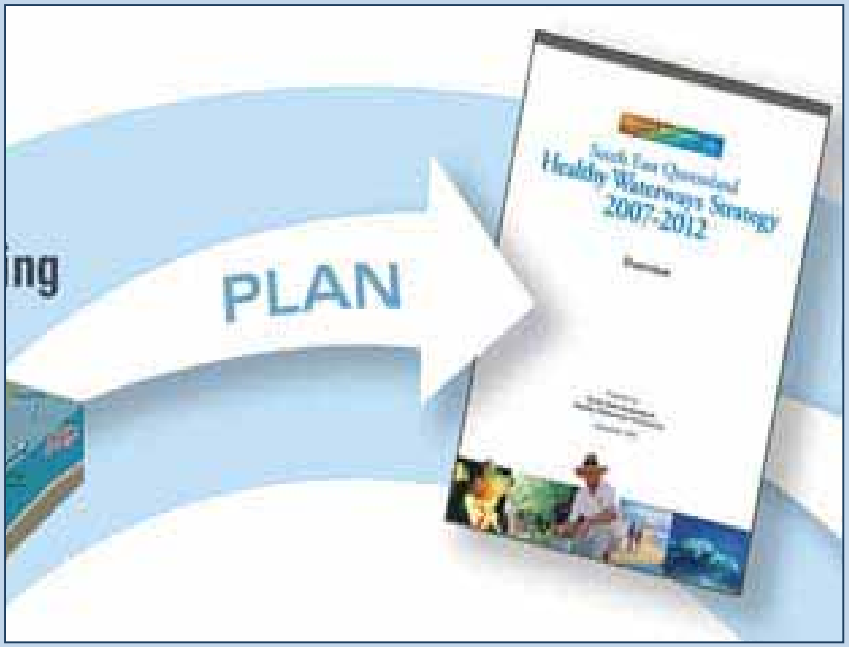
Vision & Values



(Conceptual Model) – Scoping the Plan

- What are the public views regarding watershed issues?
- What does the watershed community value?
- What future does the watershed community desire?
- What are the priority issues?
- Which technical, managerial and institutional options are acceptable to the public and technically appropriate to address the issues and at what level of implementation will actions be undertaken?

Developing an Action Plan



(Conceptual Model) – Scoping the Plan

- What are the targets and goals of the plan?
- What is the preferred approach to address the priority issues?
- What are the mechanisms for implementation (e.g. regulatory, capital works, stewardship, formal agreements, etc.)?
- Who does what and who pays for what?
- What is the time line for action?
- What are the measures of success vs the goals (input, effort, process, performance, results on the ground)?

Implement the Plan

- Who undertakes actions/activities identified in the plan?
- Who coordinates and monitors actions/activities to ensure implementation and to keep track of undertakings?
- Who troubleshoots barriers to implementation?
- How is the process motivated? $
- How are activities/actions celebrated?
- Who coordinates and monitors actions/activities to ensure implementation and to keep track of undertakings?

Monitor the Plan

- What information/data is being collected and by whom?
- Is the current monitoring program sufficient to measure all parameters identified in the plan?
- Who collates/consolidates the information?

Evaluate the Plan

- Is the information being collected sufficient to determine whether or not the goals and targets are being met?
- Are additional indicators, information or analytical/modelling tools needed to assess effectiveness?
- How will the results be reported?
- How often will the results be reported?

Factors for Success

- **Political Endorsement**

  - gives political support for a watershed approach through policy statements, agreements, guidelines, and shared funding for research, decision-support tools and capital works/infrastructure

Factors for Success

- **Enabling Legislation**

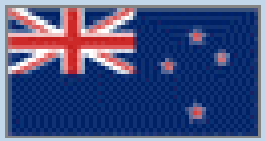
  - provides the framework for administrative procedures, partnership building and legitimacy of actions.

Ontario

- *Conservation Authorities Act*

South Africa

- *National Water Act*



New Zealand

- *Resource Management Act*

Factors for Success

- **Co-ordination and a Co-ordinating Body at the Watershed /Subwatershed Level**

  - builds trust and goodwill, continuity, a knowledge of context and local conditions, reduces the problems of power-sharing and duplication, matches the scale of the problem, and provides opportunities for sharing or pooling limited resources.

  - Watershed Planning and Advisory Councils – Alberta
  - Watershed Advisory Committees – Saskatchewan
  - Conservation Districts – Manitoba
  - Conservation Authorities - Ontario
  - Watershed Agencies - Quebec

Factors for Success

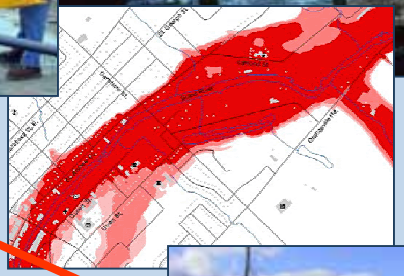
- **Clearly defined visions, goals and action items**

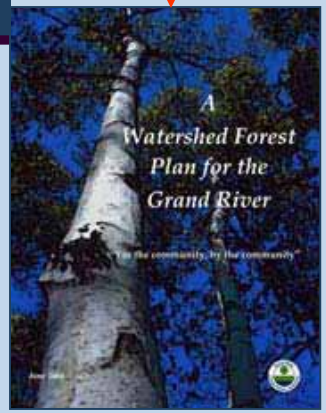
  - provides the scope and focus for defining issues and problems and finding solutions

Factors for Success

- **Sustainable Funding**

  - provides continuity, long-term commitment, competency, capacity, and implementation of projects.





Factors for Success

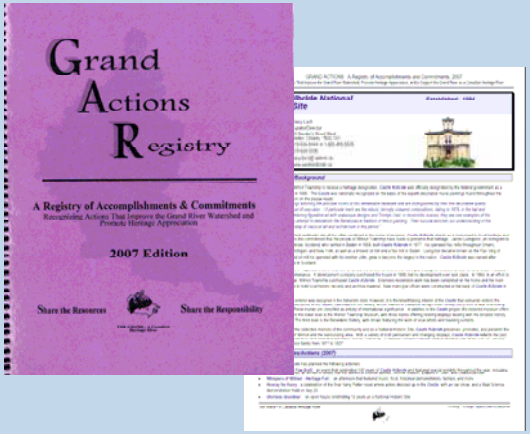
- **Public Involvement and Partner Collaboration**

  - builds trust, consensus; leverages effort and stretches capacity; and ensures implementation and change will occur at the local level. The implementers need to actively involved.

Factors for Success

- **Shared Action Plan & Incentives to Undertake Action**

  - includes information & education, communication & outreach, opportunities to participate in “hands-on” action, cost-sharing incentives, public-private partnerships, surcharges, regulation and enforcement.



Factors for Success

- **An Integrated Inter-Disciplinary Approach**

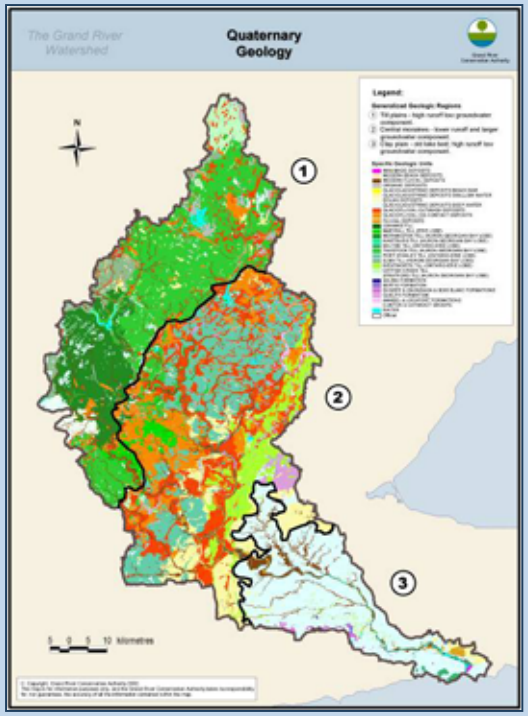
  - identifies resource functions/processes, cause-effect relations and linkages among natural functions and human activities.

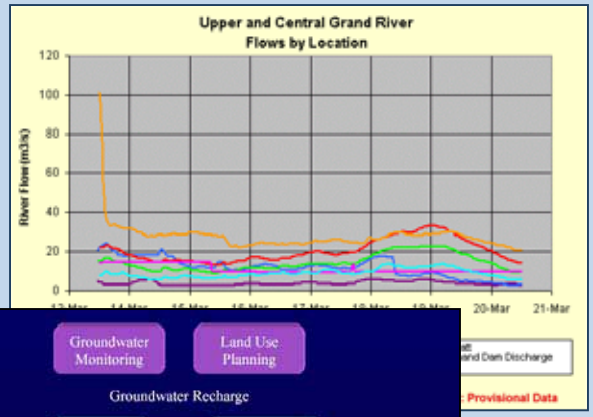
- Planners
- Engineers
- Biologists/Ecologists
- Communications Experts
- Foresters
- GIS Specialists

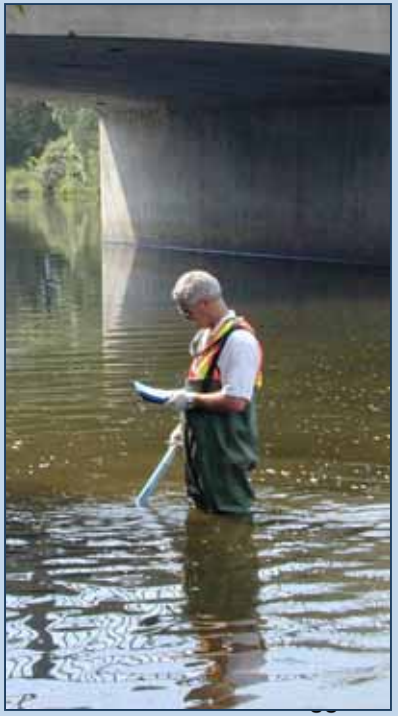
Factors for Success

- **Good Data, Appropriate Technical and Analytical Skills, and Useful Decision-Support Tools**

  - provides a strong base from which inform decision making; encourages useful science moving away from analysis towards synthesis.







Factors for Success

- **A Common Language for Decision-Making/Measures of Health**

  - helps stakeholders make decisions regarding trade-offs between environmental, social and economic objectives.

HUMBER RIVER WATERSHED 2003 PROGRESS REPORT

2000 INDICATOR*	2005 TARGETS	2000 - 2002: WHAT HAS BEEN DONE	PROGRESS			THREATS TO ACHIEVING TARGETS	FUTURE ACTIONS TO ACHIEVE TARGETS
			GOOD	SOME	NONE		
Conventional Pollutants (Suspended solids, phosphorus, nitrogen, ammonia and chlorides) 	• In the upper reaches of the watershed where development is taking place, levels of conventional pollutants have not increased beyond 1990-1995 levels	• No significant change in concentrations of conventional pollutants during dry weather at six stations (1995-2001) • Phosphorus exceeds Provincial Water Quality Objectives in seven of the 12 monthly dry/wet composite samples from June 2000 to June 2001 • The federal government has designated road salt as a toxic substance under the Canadian Environmental Protection Act • Analysis of benthic communities at 38 sites in 2001 showed generally good water quality and habitat diversity, except for one station on the Black Creek where significant impairment exists • The Nutrient Management Act was passed by the Ontario government to help ensure farming Best Management Practices		✓		• Inability to properly assess water quality due to insufficient data on pollutant concentrations during wet weather • Climate change is influencing atmospheric, terrestrial and aquatic processes leading to direct and indirect changes in water quality • Expected construction and discharge from new Nobleton Sewage Treatment Plant may increase phosphorus loading	• Implement recommendations of the Toronto WWFMMP such as separating combined sewers, enforcing the sewer use by-law, maintaining storm sewers, improving conveyance systems and employing lot level and end of pipe solutions • Municipalities to develop salt management plans • Identify areas of vulnerability to spills and develop remedial measures • Complete watershed based SPP • Add wet weather sites to the RMN to assess pollutant concentrations • Province to establish regulations and guidelines for Nutrient Management Act • Mitigate impacts of the proposed Nobleton Treatment Plant by implementing Best Management Practices upstream of the facility

Factors for Success

- **Celebrate Successes**
  - includes applause, recognition & celebration

Factors for Success

- **A Continuum of Proactive Planning, Monitoring, and Updating**

  - ensures flexibility and adaptability in dealing with changing environmental, social and economic issues.

Factors for Success

- **Dynamic Leadership**

  - helps motivate action, and lend legitimacy and credibility to the process. Good leaders are committed and empower others.

  Find the Champions!

Other Considerations

- **Renewed emphasis on monitoring & evaluation needed – Watershed Report Cards**
- **Partnership approach needs federal & provincial commitment to a watershed approach – leadership, $, research, data & technology**
- **Incorporate local peoples' knowledge to understand processes and conditions**
- **Need broad understanding that 'green infrastructure' is necessary for continued economic & social health and well-being of Canadians**