



**Credit Valley
Conservation**
inspired by nature

The Evolution of Conservation Authorities: Science, Policy & Socio-Economic Drivers to Watershed Management

Latornell Conservation Symposium

November 19, 2019

By Bob Morris CVC



Outline

- CVC Watershed Plan Overview
- Management Program Histories
- Examples of Drivers of Change
 - Science / Technology
 - Population / Demographics
 - Newsworthy Events / Social Movements
 - Legislation, Policies & Politics
 - Economics / Budgets



CVC Watershed Plan and Historical Context

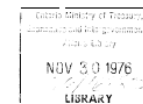
- 2015 CVC commits to learning from history to move forward.
- “Develop a comprehensive watershed plan and assessment of environmental health in the Credit River watershed reflecting 60 years of watershed management and planning for the future”.
- Last Watershed Plan mandated in 1984.
- Credit River Water Management Strategy 1990 / 1992 and Update 2006 directed water management programs primarily with focus urban SWM.
- Natural Heritage System completed in 2015 and with Water Management Strategy could represent an Integrated Watershed Management Plan with support and direction of all other programs.

DEPARTMENT OF PLANNING AND DEVELOPMENT

THE HONOURABLE W.M. NICKLE, Minister

A. E. Richardson, Chief Conservation Engineer

CREDIT VALLEY CONSERVATION REPORT 1956



TORONTO
1956

CVC Watershed Plan and Historical Context

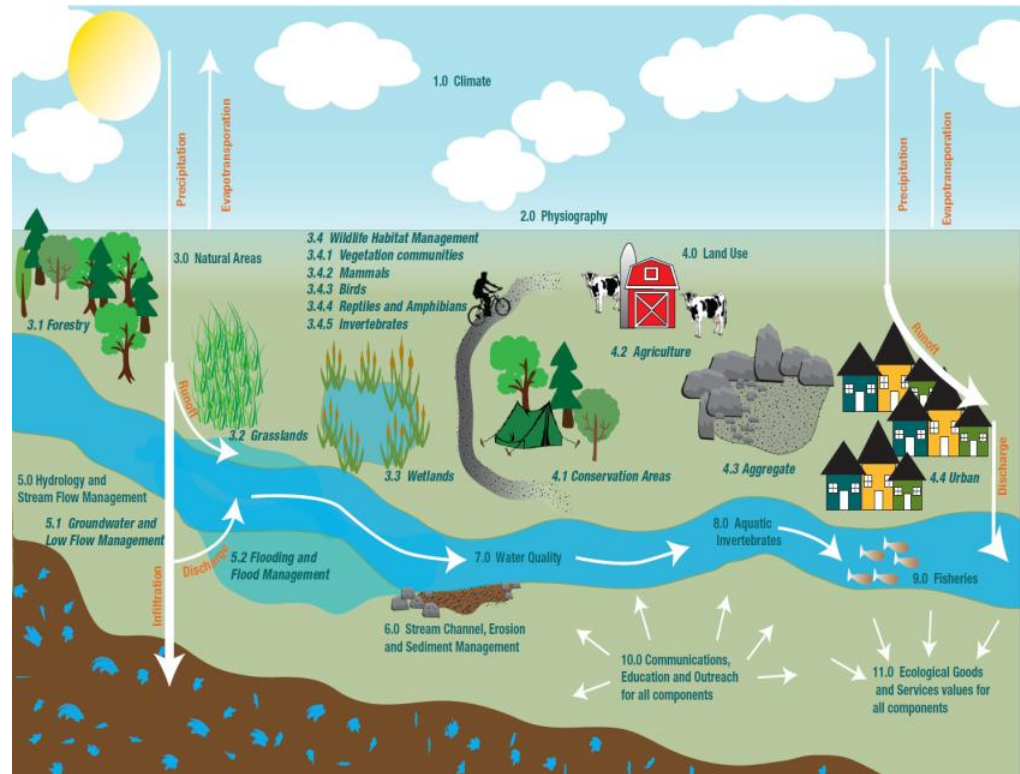
- **Past History** 1954 to 2000
 - Report Cards on recommendations made in 1956 and 1984 Watershed Plans
 - Summary of Board Minutes
 - CVC Program History Reports
- **Present**
 - Status and trends 1999 – 2018 from CVC Watershed Monitoring Program
 - Review and gap analysis of 45 key / 160 CVC Strategies, Plans and Guidelines
- **Future**
 - Future land use, climate change and management scenarios
 - Other future trends, target setting and recommendations



Historical Report Template

Each of 25 disciplines / management programs requested to conduct an historical analysis including:

- Introduction and selection of indicator(s) to track over time
- Historical Changes
- Cause / Effect Relationships
- CVC Management Roles
- **Broader Drivers of Change** including science, policy and other socio-economic factors.
- Conclusions (Lessons Learned)



Science, Engineering & Technology

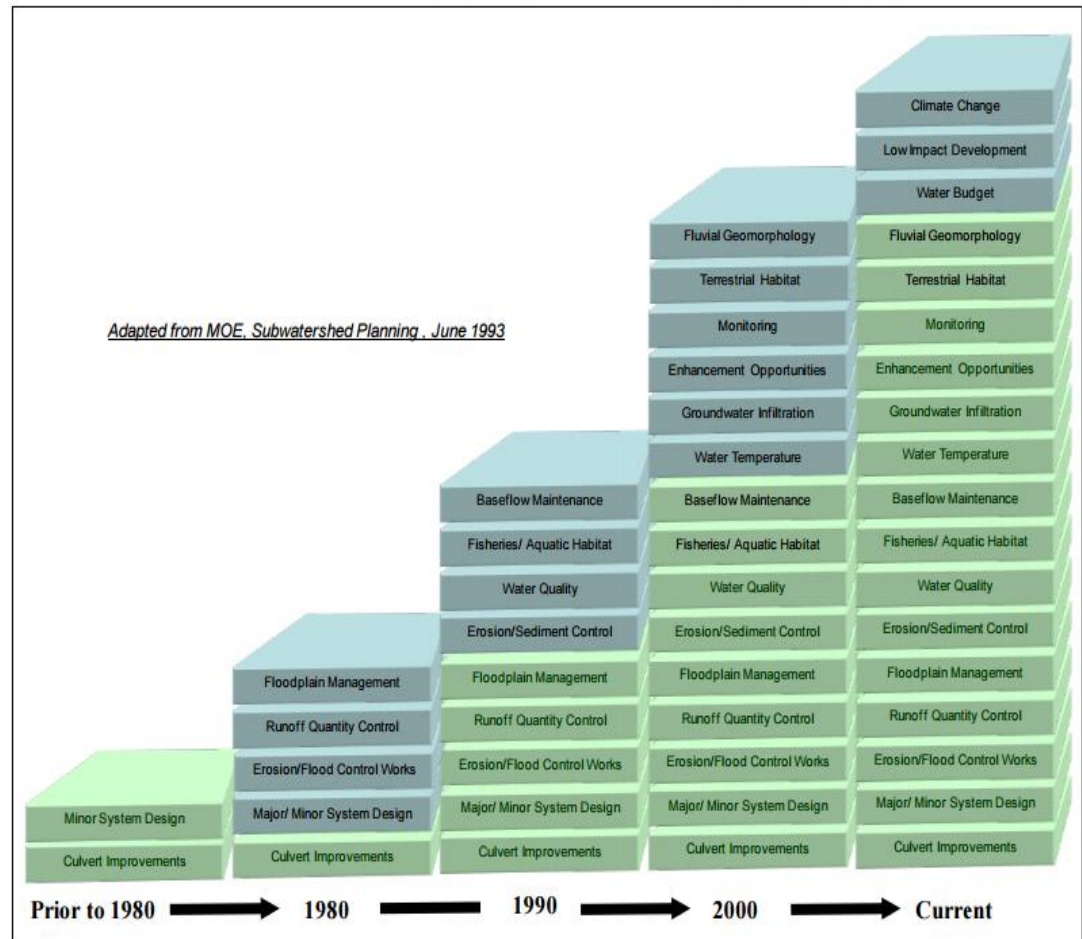
- New plastic pipes allows for increased drainage and irrigation
 - Flows at Cataract greater than Norval downstream
 - 1964/65 CVC asks OWRC to limit water taking in face of drought
 - 1966 CVC Board reads MacLeans March issue on water crisis with drought and U.S. demands
 - Grants for reservoirs / farm ponds to store water
 - Fisheries biologists and anglers informed us of impacts and soon after alter program not to fund on-line ponds
- Example that science can create single issues or integrated solutions and that other drivers such as policy, public input and economic incentives can interact



Science, Engineering & Technology

- SWM evolved from single purpose flood control to water quality to erosion to fish habitat and water temperature to at source recharge and LID to climate change
- 1964 established 16 PWQMN sites that drive more studies and actions including SWM and WWTP upgrades
- 1992 CRWMS recommends natural heritage system restoration to offset flooding from urban growth...

Figure 1.2.1 Evolution of stormwater management practice in Ontario



Watershed Ecosystems Science

- 1990 Crombie Commission promotes **watershed ecosystems** approach in policy
- 1991 **Stream Corridors** integrates hydrology, geomorphology and natural systems within valley corridor
- 1993 provincial trilogy of **watershed planning guidelines**
- 1994 Riley and Mohr Natural Heritage of Southern Ontario Settled Landscapes further promotes **Natural Heritage Systems**.
- 1990s **CVC decade of studies** and policy development (urban hydrology, hydrogeology, fluvial geomorphology, fisheries, natural heritage, monitoring)
- 1990s to 2000s, 544 top science **papers in ecology peak** after an earlier peak of classics prior to 1980s (Courchamp et. al. 2017, 100 articles every ecologist should read)
- 1998 Linda Mortsch Env. Canada gives first **climate change** talk to CVC

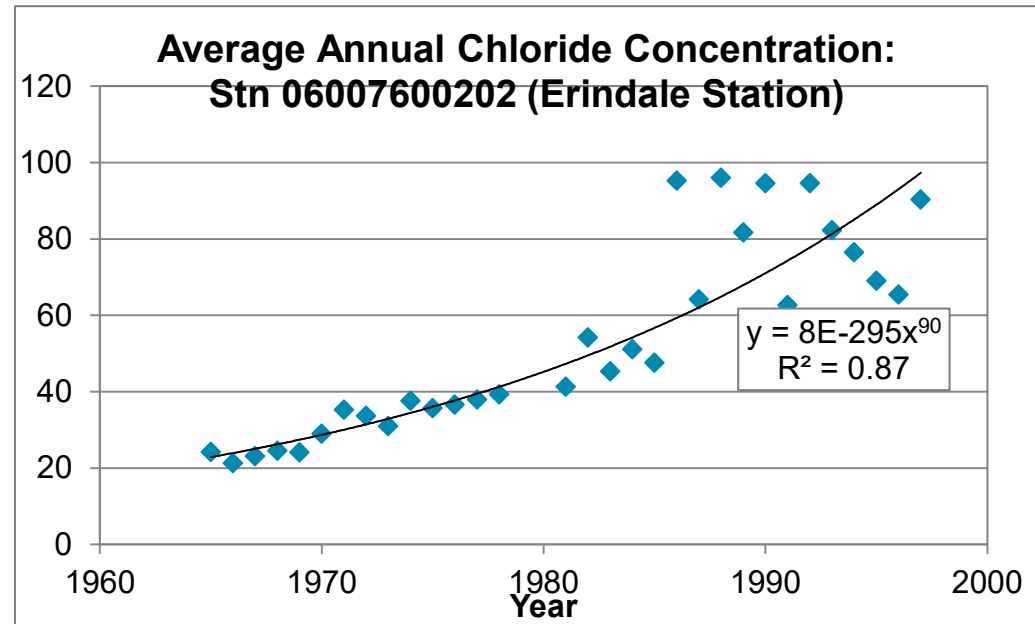
Information Technology

- 1987 desktop publishing documented as breakthrough in organizing brochures and reducing publication costs...websites soon after reduced need for print information
- 1991 GIS used to improve floodplain mapping and 1993 to map groundwater resources
- 2000 CVC website transforms 2 way communications and allows for more and current public input, data, surveys, promotions ... citizen science
- 2010s real time technology improves monitoring

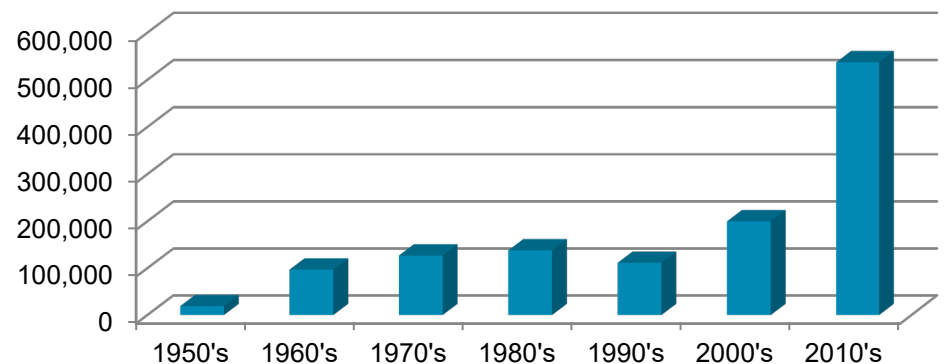


Population / Demographics

- 1957 to 1970 watershed population doubles ...has since doubled 2 more times...
- 1985 Mississauga / Brampton fastest growing cities in Canada
- Chlorides have tripled since in correlation with urban growth
- Park visitor numbers have jumped possibly with promotion or demographic changes



Historical Conservation Area Visitation



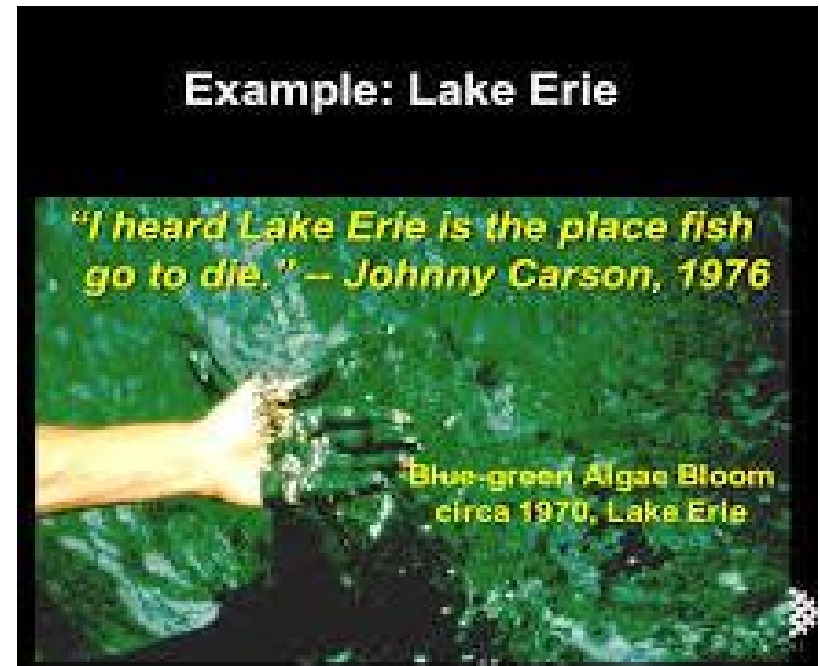
CVC Newsworthy Events / Social Movements

- 1956 over 80 no fishing/trespassing signs in Forks area prompted public acquisition of valleylands for recreation and floodplain functions...no publicly owned parks at this time
- 1957 myth that Hurricane Hazel led to creation of CAs...CVC created earlier to address poor agricultural practices, low flows for dilution the broader conservation movement including recreational access but still advanced flooding programs
- 1963 Silent Spring by Rachael Carlson inspires CVC resolution to reduce roadside spraying and meet with Dept. of Agriculture



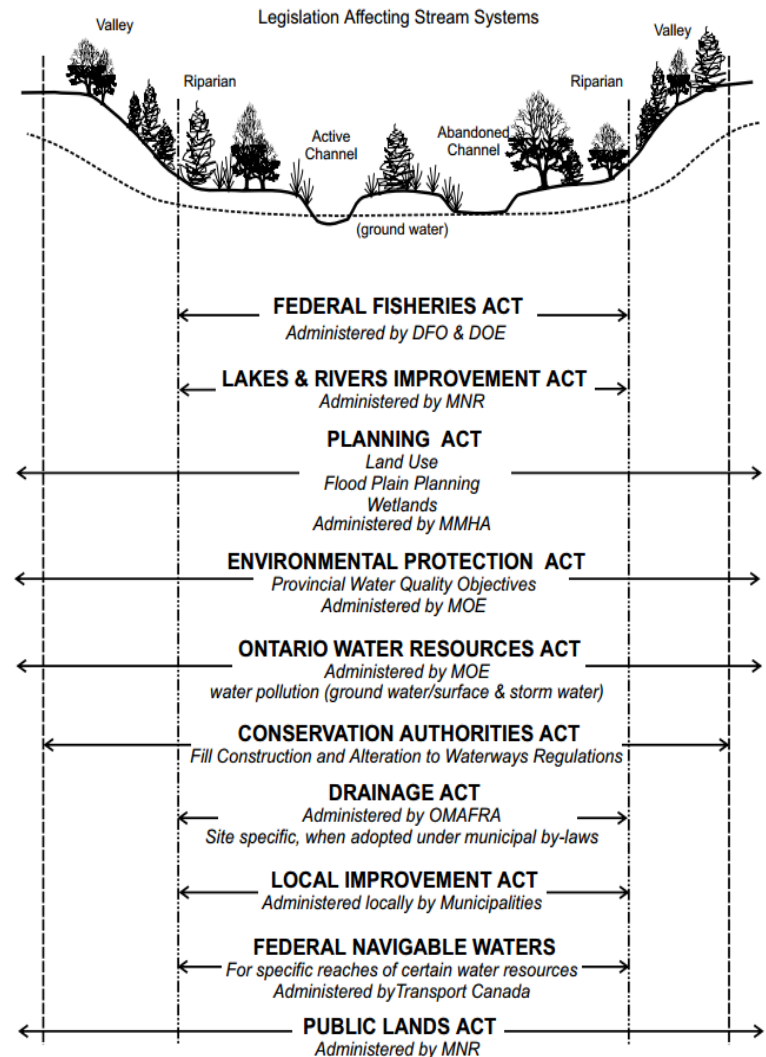
Newsworthy Events / Social Movements

- 1960s Lake Erie dead from phosphorous...spurs regulation
- 1971 bulldozer protest leads to purchase of Rattray Marsh and formation of NGO and again in 1986 opposition to Jack Darling waterfront development adjacent to marsh
- 1979 drownings at McCarthy dam used to speed up dam removals despite no MNR approval
- 2000 Walkerton E coli outbreak leads to Source Water Protection



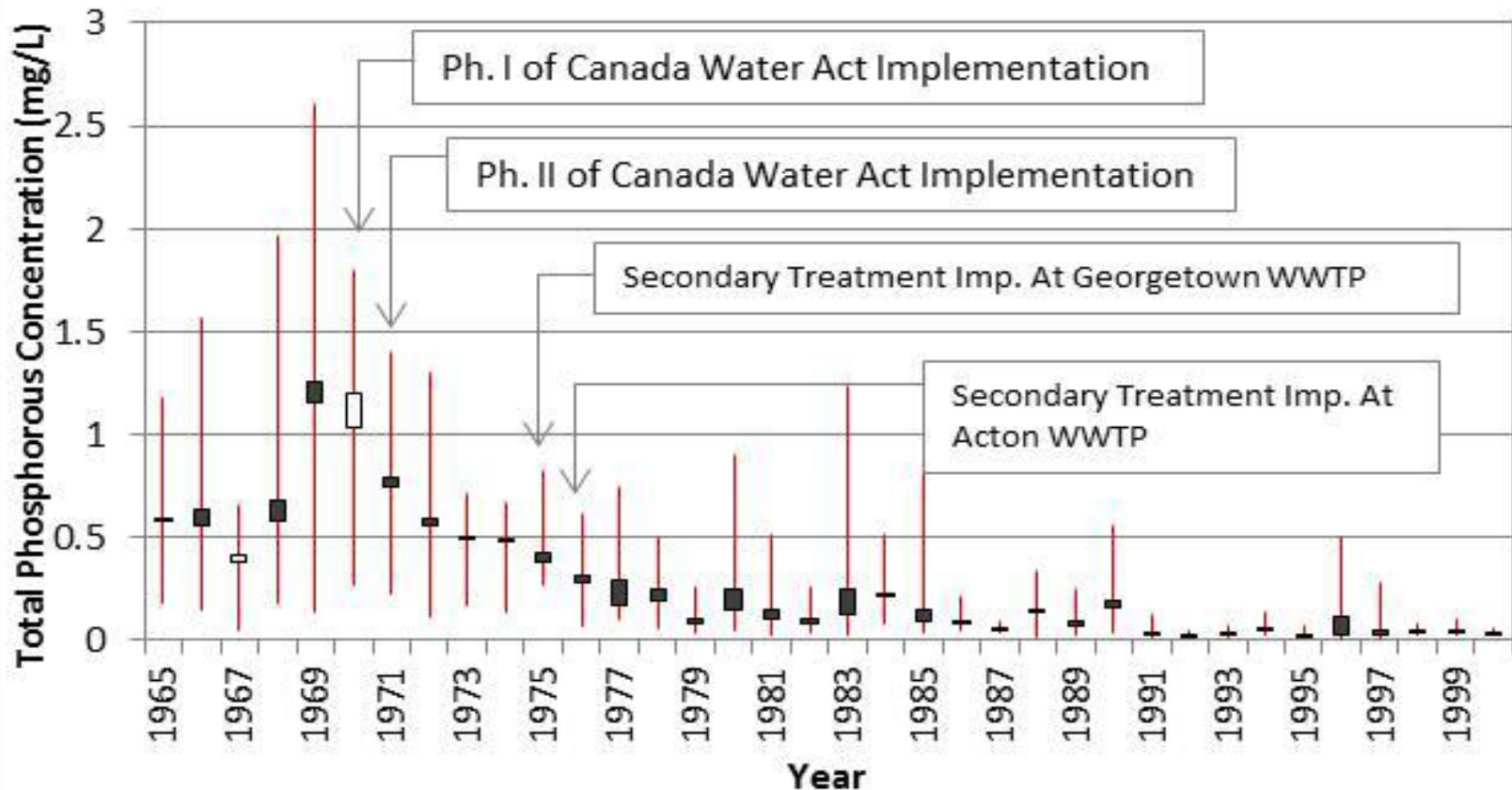
Legislation, Policies & Politics

- 1946 Conservation Authorities Act supports creation of CVC in 1954
- 1956 Water Resources Act to prohibit pollution and regulate water takings
- **1970 Canada Water Act supported Great Lakes phosphorous control**
- 1973 Niagara Escarpment Planning and Development Act



Legislation, Policies & Politics

Annualized [TP] at Station 501110001 - Silver Creek (U/S Norval)



Legislation, Policies & Politics

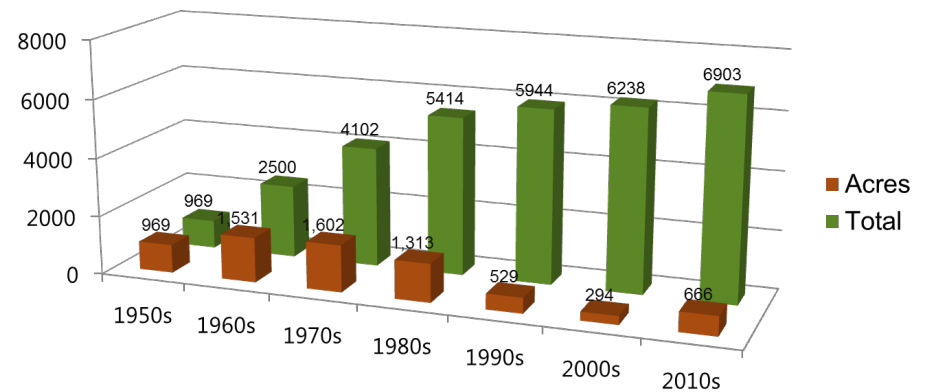
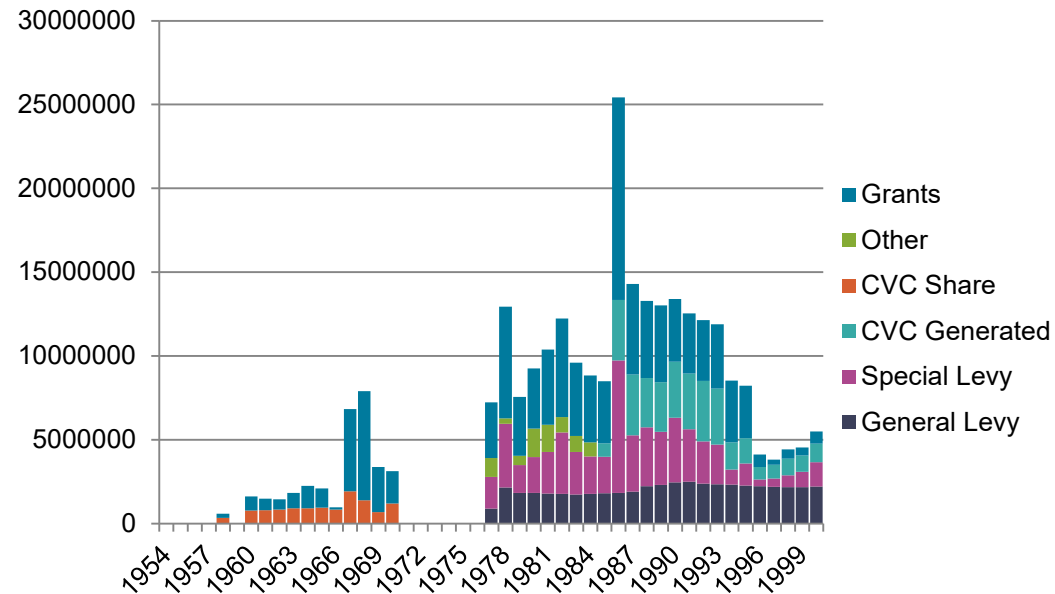
- **1991** Sewell Commission on Planning and Development Reform with proposed PPS
- **1991** MNR SWM Guidelines
- **1992** Waterfront Planning Policies
 - **1991** OMNR Natural Heritage Framework
 - **1992** Provincial Wetland Policy
 - **1994** Crown Forest Sustainability Act
 - **1996** Provincial Policy Statements (Natural Heritage)
 - **1999** Natural Heritage Reference Manual 1999

Legislation, Policies & Politics

- 1950s Progressive Conservatives
- 1960s Progressive Conservatives
- 1970s Progressive Conservatives (minority 1975-77)
- 1980 – 1985 Progressive Conservatives
- 1985 – 1990 Liberal (minority 1985 – 1987)
- 1990 -1995 NDP
- 1995 – 2003 Progressive Conservative
- **Surprized? Direct or indirect cause & effect??**

Economics / Budgets

- 1960 – early 70s reservoir construction with grants but later too expensive and did not address source of problems
- 1970s funding constraints transfer Monora Park to municipal management, sold pioneer demo farm and transferred cultural history to other agencies
- 1985 Niagara Escarpment acquisition fund
- 1980s building boom and waterfront development

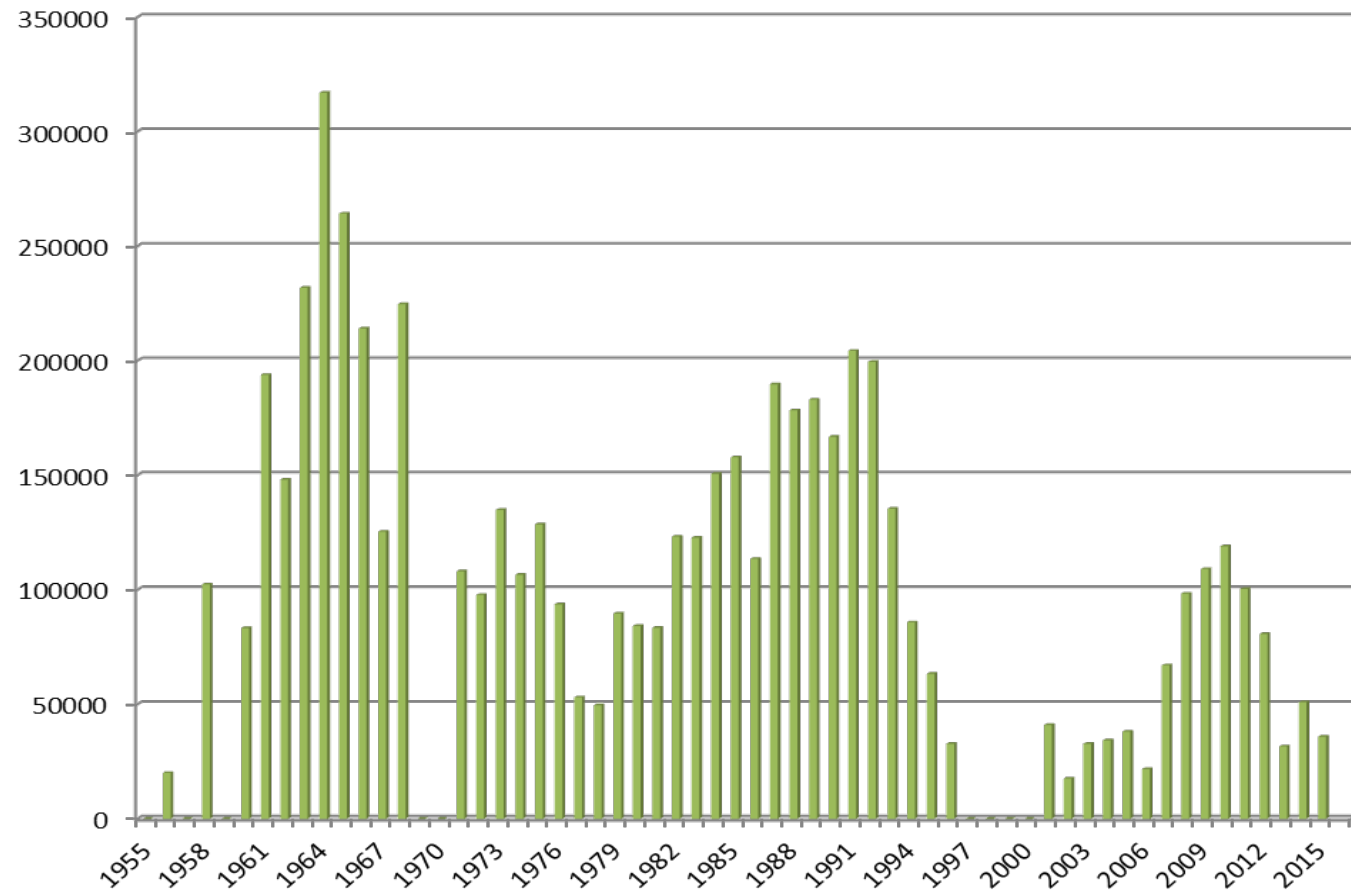


Conservation Area Land Acquisition

Forestry Economics / Budgets

- Mid-1980s less forest management for wood products and plantations not profitable leaving issues today
- Late 90s provincial cuts decimates CVC reforestation program

CVC Reforestation 1955-2015



1990s Economic Challenges

- 1995/96 CVC staff cut by almost half with 38% reduction in provincial funds.
- Economic challenges spawned “Blueprint for Success” by ACAO and CVC and MNR “Framework for Resource Management Partnerships” ... minor planning applications dropped and streamline planning approvals with municipal and provincial MOUs
- Terra Cotta pool and camping closed and naturalized
- Regional cutbacks for “commercial” recreation reflective of past cycles of nature vs recreation and recently raised again
- 1999 provide science to decision makers as priority and formalize more integrated and expansive monitoring program with endorsement of Adaptive Environmental Management



Conclusions

- Predictable drivers but do not always know which one may dominate or how it may interact with others
- Cycles or pendulum like movements in conservation but an overall evolution based in science and public awareness
- History can guide future with an Adaptive Management approach that
 - Passively predicts and teaches some lessons with past successes and failures
 - Documentation important and value science and monitoring of the past
 - Actively learn more by doing and changing management approaches
 - Embraces future management as experiments in an unpredictable world but set measurable targets and triggers using SMART objectives

questions?