Water Budgets in Ontario: Building Upon the Clean Water Act

Unified Approach to Sustainable Groundwater Use in Southern Ontario

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Scott Bates - MNRF

Ontario
Presentation Overview

• Why Water Budgets?
• CWA Water Budgets... the Foundation
  1) Ecologically Significant Groundwater Recharge Areas
  2) Drought Management Planning
  3) Environmental Flow Regime Design

• Groundwater Insights
Why Water Budgets?

A Water Budget assesses and accounts for the movement of water through the hydrologic cycle.

Water Budgeting is a framework that allows us to clearly understand the relationship between water supply and water demand including the examination of human and climate induced change.

“Water Budgets lead us on the path to secure and sustainable source waters”
CWA Water Budgets... the Foundation

- Implementation of Justice O’Connor’s Recommendations
- Technical Assessments initiated in 2005
- ~ 200 Full Time Staff across Province
- ~ $250 Million Invested to Date (~ $40M for Water Budgets)
- Identify Vulnerable Areas for Water Quality & Quantity
- Identify Threats to Municipal Drinking Water Sources
- Develop and Approve Source Protection Plans
- Municipalities Implement Source Protection Plans
CWA Water Budgets... the Foundation

**Tier 3**
Water Quantity Risk Assessment
Numerical Modelling of Surface Water and Groundwater
Evaluation of Water Flows & Levels versus Safe Thresholds

**Tier 2**
Water Quantity Stress Assessment
Numerical Modelling of Surface Water and Groundwater
Cumulative Evaluation of Water Demand versus Water Supply

**Tier 1**
Water Quantity Stress Assessment
GIS & Spreadsheet Analysis of Surface Water and Groundwater
Cumulative Evaluation of Water Demand versus Water Supply

**Conceptual**
Characterization and Visualization
Documenting Information and Knowledge within a Watershed

Increase Certainty
Increase Knowledge
Refine Spatial Scale

Local Features
Subwatershed
Subwatershed
Watershed
**ESGRAs**

- Lake Simcoe Protection Act & Plan Development 2008-2009
- LSPP Chapter 5 “Water Quantity”
  - Policy 5.2-SA – “Thou shalt prepare Tier 2 Water Budgets”
- LSPP Chapter 6 “Shorelines & Natural Heritage”
  - Policy 6.36-DP – “Thou shalt delineate ESGRAs”
- MNR Transfer Payment Grants 2010-2014 - $618k
- MOE Transfer Payment Grants 2012-2015 - $322k
- ESGRA Guidance development 2012
- Tier 2 Numerical Modelling & Water Budgets complete 2015
- ESGRA Delineation complete 2015
- LSRCA working to incorporate mapping in Municipal OPs 2015+
Drought Management Planning

Objectives

Explore, design and create a pro-active, locally-driven, planning framework for the development of drought management plans in Ontario.

The successful development of a drought management plan for the Innisfil Creek subwatershed within the Nottawasaga Valley Conservation Authority.

Water security within the Innisfil Creek subwatershed for increased economic productivity and sustainable aquatic ecosystems.
Drought Management Planning

Phase 1
1. Community Engagement & Communication
2. Integrated Water Budget Model Development
3. Drought Management Strategy Assessment
4. Technical Assessment Report

Phase 2
1. Detailed Environmental Flow Regime Assessment
2. Detailed Economic Analysis of Water
3. Climate Change Impact Assessment
4. Drought Management Plan Preparation
5. Communications & Technical Transfer
Drought Management Planning

Geologic Characterization
Environmental Flow Regime Design

Objectives

Development of a **guide** for designing, implementing and managing an environmental flow regime on a watershed basis.

Explaining the **science/technical** aspects of environmental flow regime design and specifying a **decision making framework** in the context of Ontario’s regulatory and planning environments.
Environmental Flow Regime Design

Focus

- Southern Ontario
- Watershed-Based
- Small Stream Systems
- Headwaters & Uplands
- Wetlands
- Groundwater
- Urban Land Use
- Agricultural Land Use
- Water Takings
- Supply Variation (Flood, Drought, Climate Change)
Environmental Flow Regime Design

- Project led by MNRF in support of Drought Planning & OLWR with a Project Timeline 2013-2015

- Consulting Services Contract led by Matrix Solutions in partnership with Parish Geomorphic, University of Guelph, Jennifer Lawrence & Associates.

- Advisory Team members including MNRF, OMAFRA, MOECC, MMAH, GRCA, TRCA, CVC, LSRCA

- Formal Peer Review by Canadian Rivers Institute (University of New Brunswick), Trout Unlimited Canada, University of Guelph, Katopodis Ecohydraulics
Groundwater Insights

- The OGS & GSC have been instrumental to the success of our work

- Geologic & Hydrogeologic characterization is critical to all types of Water Budget assessment

- Connections between groundwater and surface water systems appear to be stronger than previously thought (involve our SW colleagues!)

- Water Budget Tools and Approaches can be used as a unifying theme for all types of Water Quantity and Water Quality assessment
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Scott Bates

Ontario Ministry of Natural Resources and Forestry

(705) 755-1523
scott.bates@ontario.ca