MOECC Low Impact Development Stormwater Management Guidance Manual

Ontario

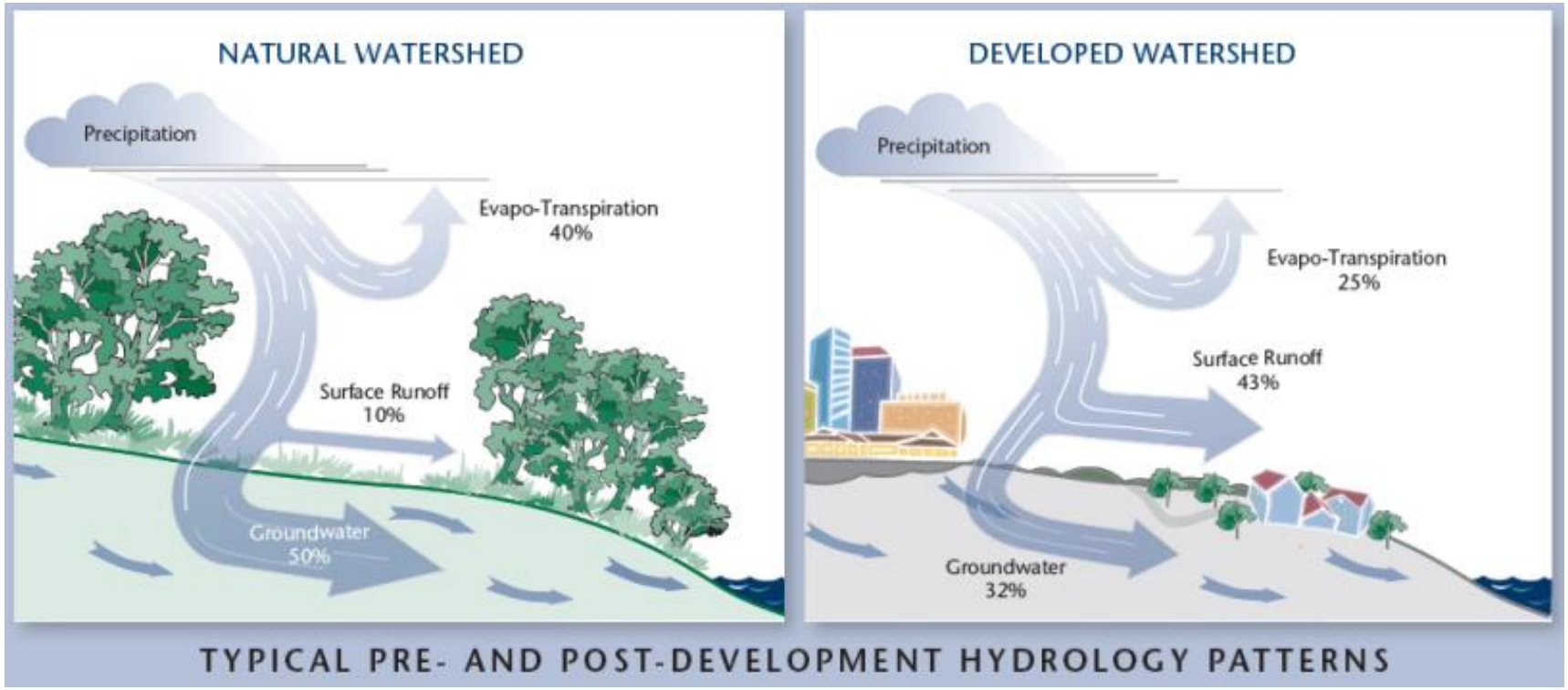
Purpose

The purpose of this presentation is to provide an update on work we are doing in preparation of a guidance document on low impact development stormwater management.

The supporting documents prepared by our consultants are draft. The material is what has been proposed. A final ministry position will be established after public consultation.

Urbanization Changes the Hydrologic Cycle

- Stormwater runoff is naturally occurring
- Runoff increases with imperviousness



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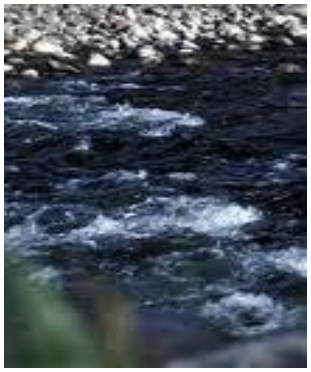
Impacts of Stormwater Runoff Changes on the Watershed

- Watershed hydrology
- Stream geometry
- Water quality
- Aquatic/riparian/terrestrial ecosystems
- Fisheries





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2003 MOE Stormwater Management Planning & Design Manual

Objectives:

- Groundwater and baseflow characteristics are preserved;
- Water quality will be protected;
- Watercourse will not undergo undesirable and costly geomorphic change;
- There will not be any increase in flood damage potential; and ultimately,
- That an appropriate diversity of aquatic life and opportunities for human uses will be maintained.

- Meeting the set of criteria addressing all water resource concerns typically requires a combination of stormwater management practices as part of a treatment train approach.
- Lot level and conveyance controls, specifically infiltration-based controls, are required to maintain the natural hydrologic cycle to the greatest extent possible.

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INTERPRETATION BULLETIN
ONTARIO MINISTRY OF ENVIRONMENT AND CLIMATE CHANGE
EXPECTATIONS RE: STORMWATER MANAGEMENT
February 2015

The natural hydrologic cycle should be maintained to the greatest extent possible. The ministry's existing acts, regulations, policies and guidelines emphasize the need for this approach to stormwater management.

Going forward, the Ministry expects that stormwater management plans will reflect the findings of watershed, sub-watershed, and environmental management plans, and will employ LID in order to maintain the natural hydrologic cycle to the greatest extent possible.

Too often, preservation of the natural hydrologic cycle is not sufficiently addressed in stormwater management plans submitted to the ministry for an ECA.

Low impact development stormwater management is relevant to all forms of development, including urban intensification and retrofit.

LID can be less costly than conventional stormwater management practices. A 2007 US EPA report summarizes 17 case studies of developments that include LID practices and concludes that applying LID techniques can reduce project costs and improve environmental performance (USEPA, 2007).

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Low Impact Development Stormwater Management Guidance Manual

- LID manual will complement 2003 manual
- Will not cover detailed design, siting, or sizing of specific LID facilities

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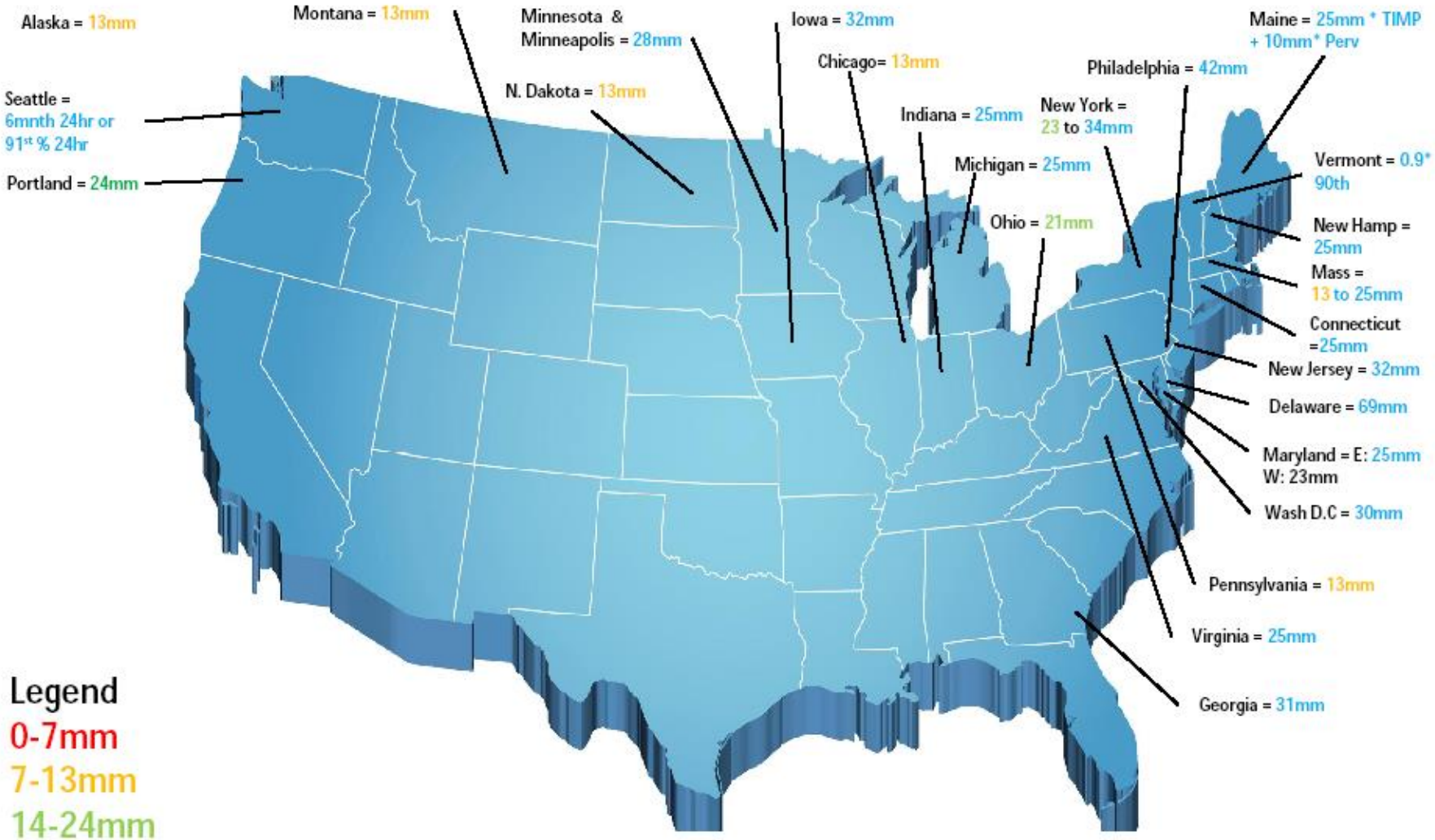

Figure 3.2 - Summary of U.S. Volume Targets

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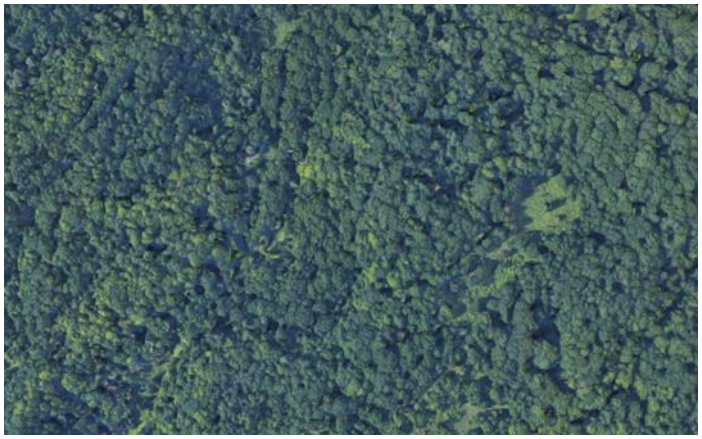
Stormwater Volume Control

Key Principles:

- Maintaining the pre-development water balance
- Return precipitation volume to the natural hydrologic pathways of infiltration, evapotranspiration, and runoff
- Application of a **consistently derived, geographically-specific volume control target** across the province
- Goal: Limit total runoff volume to 10% (or less) of total rainfall volume. 90% of rainfall volume should be controlled and returned to natural pathways



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Rainfall Analysis & RVCt

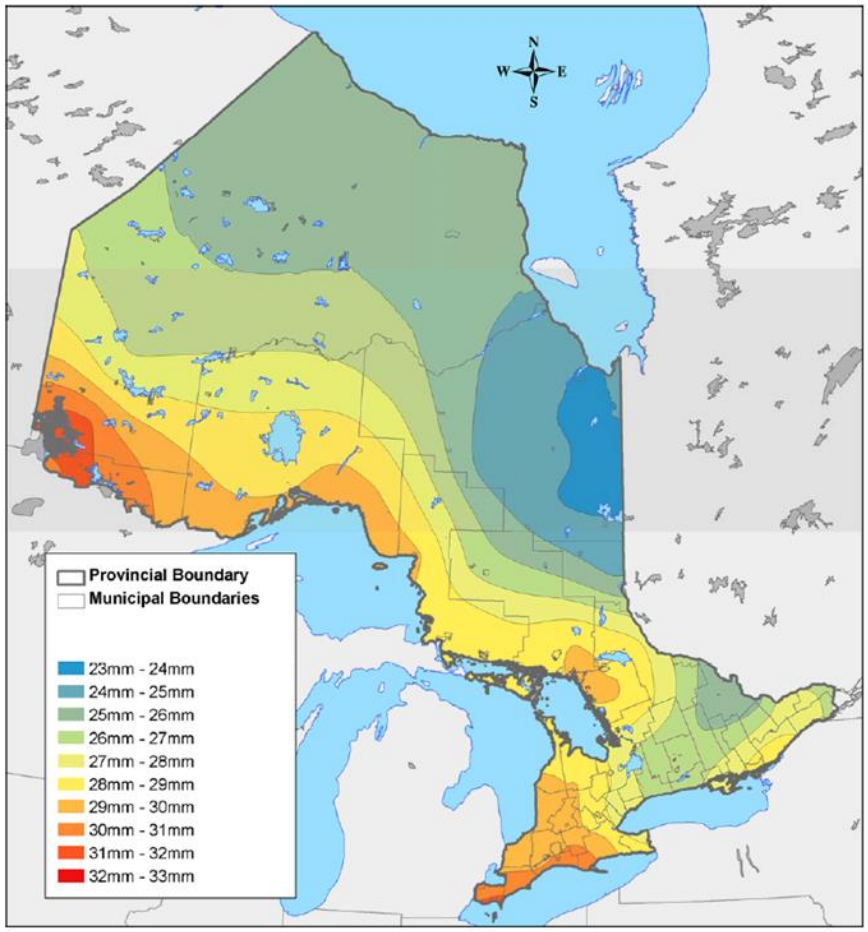
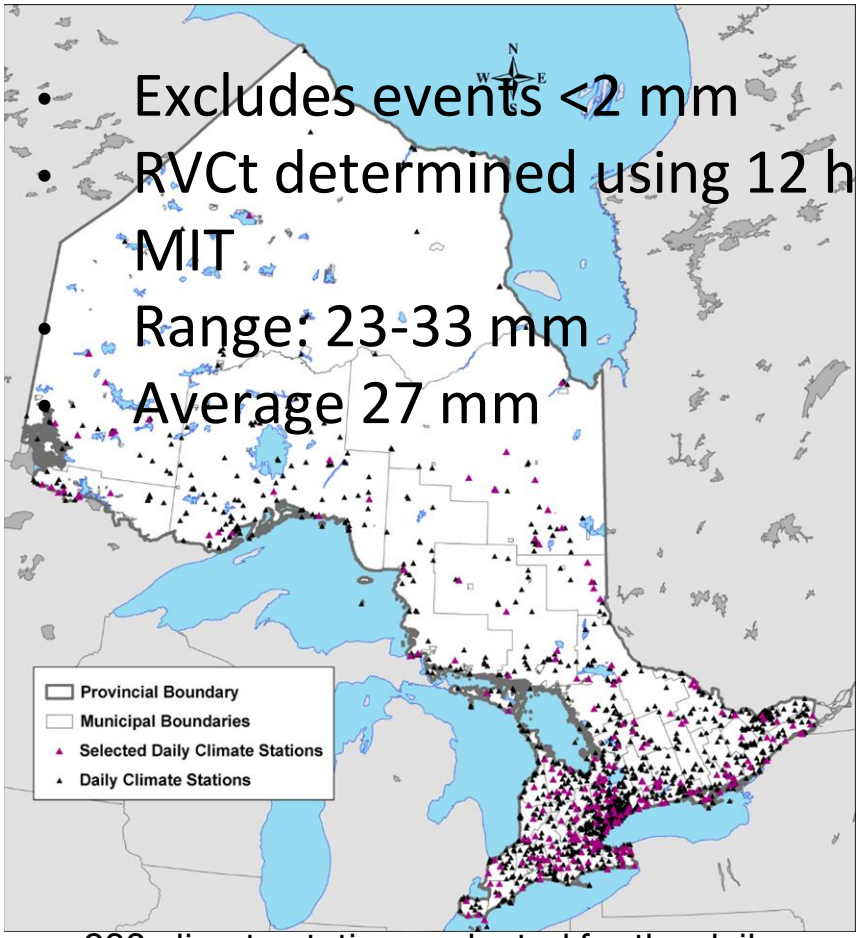


Figure 3.67 – Recommended Regional 90% Percentile Volume Targets for Ontario
(represented by the 95th percentile daily rainfall contours April - October, where daily volume exceeds 2mm).



- Excludes events <2 mm
- RVCt determined using 12 hr MIT
- Range: 23-33 mm
- Average 27 mm

233 climate stations selected for the daily rainfall event analysis in Ontario.

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RVC_T Targets

- New Development; Redevelopment, Reurbanization and Intensification, Linear Development: **RVC_T = 90th Percentile**
- For road resurfacing & minor roadway developments that may not significantly alter existing stormwater management the MOECC encourages **Maximum Extent Possible (MEP) or "best efforts" improvements**
- Stormwater Retrofits = **MEP**
  - Maintenance of rural cross-section = Retrofit

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RVC_T Flexibility

- Treatment Options for Sites with Constraints
- Allow for reduced RVC_T: 75% of RVC_T or MEP where:
  - Physical constraints (High GW, Bedrock, Contaminated Soils, etc.)
  - Risks to Groundwater & Drinking Water
  - Risks to human health, private property and infrastructure (flooding, I/I)
  - Surface water dominant features (Wetlands, etc.)
- Minimum volume targets, can be superseded by volume targets as developed through watershed, subwatershed, master drainage plans, Environmental Impact Statement (EIS) and/or other area specific studies. **They can be lower than the RVCt.**

Linear Development Feasibility and Prioritization Studies

- Encourages the comprehensive and holistic assessment of SWM and LID for the ROW to improve cost effectiveness, environmental performance and overall benefit to the receiver and the community.
- Align planned or forecasted capital or maintenance works following a Class EA or Class EA type (Social, Environmental, Financial & Technical)
- Municipalities - assess their infrastructure and prioritize upgrades in a prudent and economically feasible manner.

Control Hierarchy

Better Site Design (reduced land clearing, preserve natural systems etc) **& Pollution Prevention**

Approach 1 (Retention) Infiltration, evapo-transpiration and or re-use. The volume does not become runoff.

Approach 2 (LID Volume Capture and Release) – utilize filtration to filter runoff. The controlled volume is filtered and released to the municipal sewer networks or surface waters at a reduced rate and volume (a portion may be infiltrated or evapotranspirated).

Approach 3 (Other Volume Detention and Release) – Other technologies which utilize filtration, hydrodynamic separation and or sedimentation (to detain and treat runoff. The controlled volume is treated and released to the municipal sewer networks or surface waters at a reduced rate.

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Consultation

- Finalizing MOECC draft
- There will be additional consultation regarding implementation
- Manual will be posted to EBR for review and comment by all interested parties

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QUESTIONS

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