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Evolution of LID and Source Controls in B.C.'s Lower Mainland

March 23, 2016

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Outline

- Where did we start?
- Implementation and early lessons
- Reception and changing attitudes
- Where are we now?
- Next steps

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BC History

Pre 1970

- Little or no comprehensive urban drainage planning

1970-1988

- Flows and pipes approach to master drainage planning (MDP)

1989-1990s

- City of Burnaby is the first to apply an ‘environmental approach’ to MDP using an interdisciplinary team approach.

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BC History

1992

- Federal/Provincial *Land Development Guidelines* and Provincial *Urban Runoff Quality Control Guidelines* released.

2000-2010

- Integrated Stormwater Management Plans (ISMPs)provide comprehensive , ecosystem-based approach to stormwater planning. ISMP Template published

2010-now

- ISMP ‘course correction’, from stormwater to rainwater, and moving away from the ISMP template.

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Role of the Provincial Government

- The *Environmental Management Act (EMA)* allows municipalities and regional districts to develop Liquid Waste Management Plans (LWMP) for approval by the Minister of the Environment.
- EMA allows the minister to direct local governments to prepare or revise a waste management plan.

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Role of the Provincial Government

- The ministry requires LWMPs to address urban stormwater runoff though watershed based stormwater management planning.
- To assist with this expectation the Province has released several guidance documents.

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A GUIDEBOOK FOR BRITISH COLUMBIA

Stormwater Planning

Convening for Action in British Columbia

Beyond the Guidebook 2010:

Implementing a New Culture for Urban Watershed Protection and Restoration In British Columbia

June 2010

BRITISH COLUMBIA
The Best Place on Earth

real estate foundation
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Fisheries and Oceans Canada | Pêches et Océans Canada

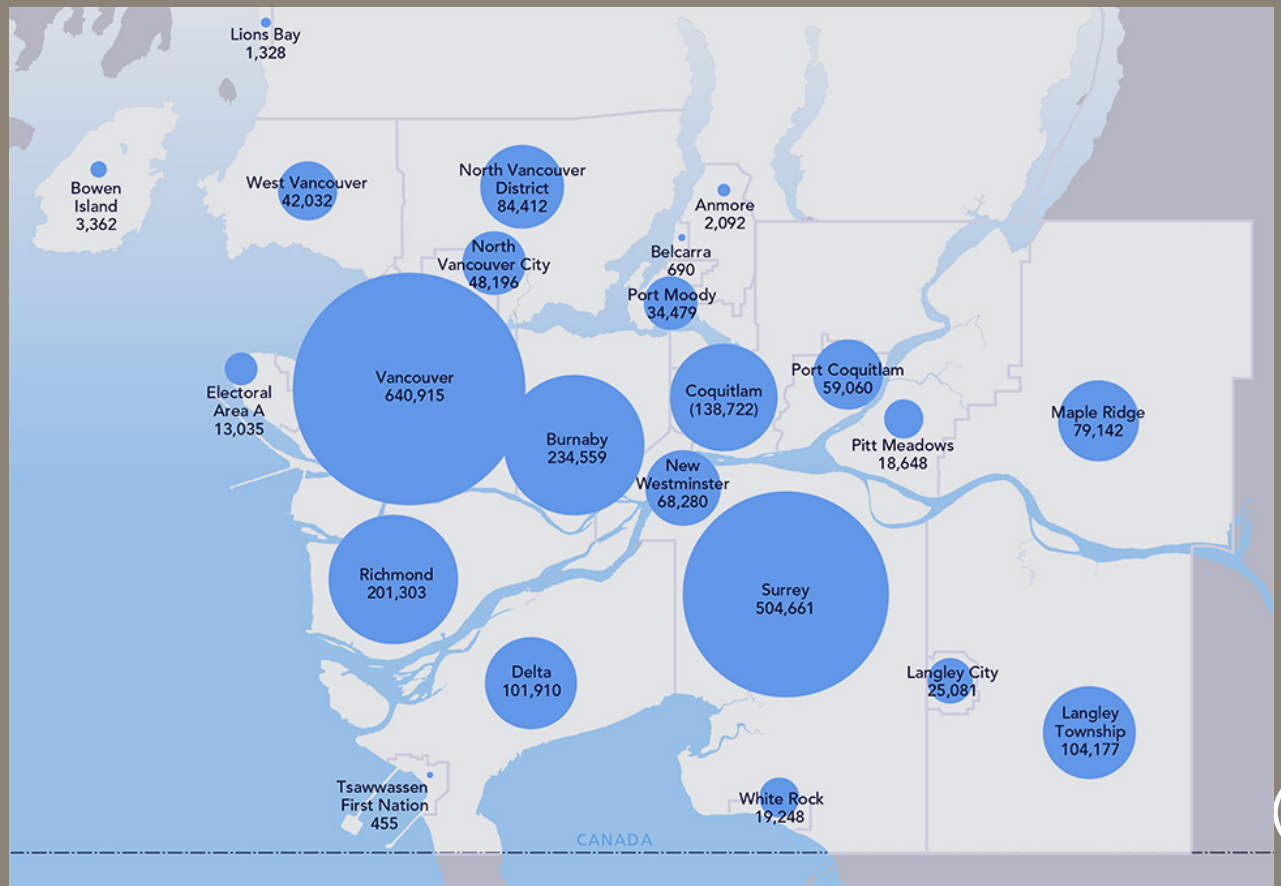
INTERIM GUIDELINES FOR PREPARING LIQUID WASTE MANAGEMENT PLANS

BRITISH COLUMBIA | Ministry of Environment

Revised Edition | July 2011

Role of Regional Government

- Metro Vancouver (formerly GVRD)- 21 municipalities, one Electoral Area and one Treaty First Nation that collaboratively plans for and delivers regional-scale services.



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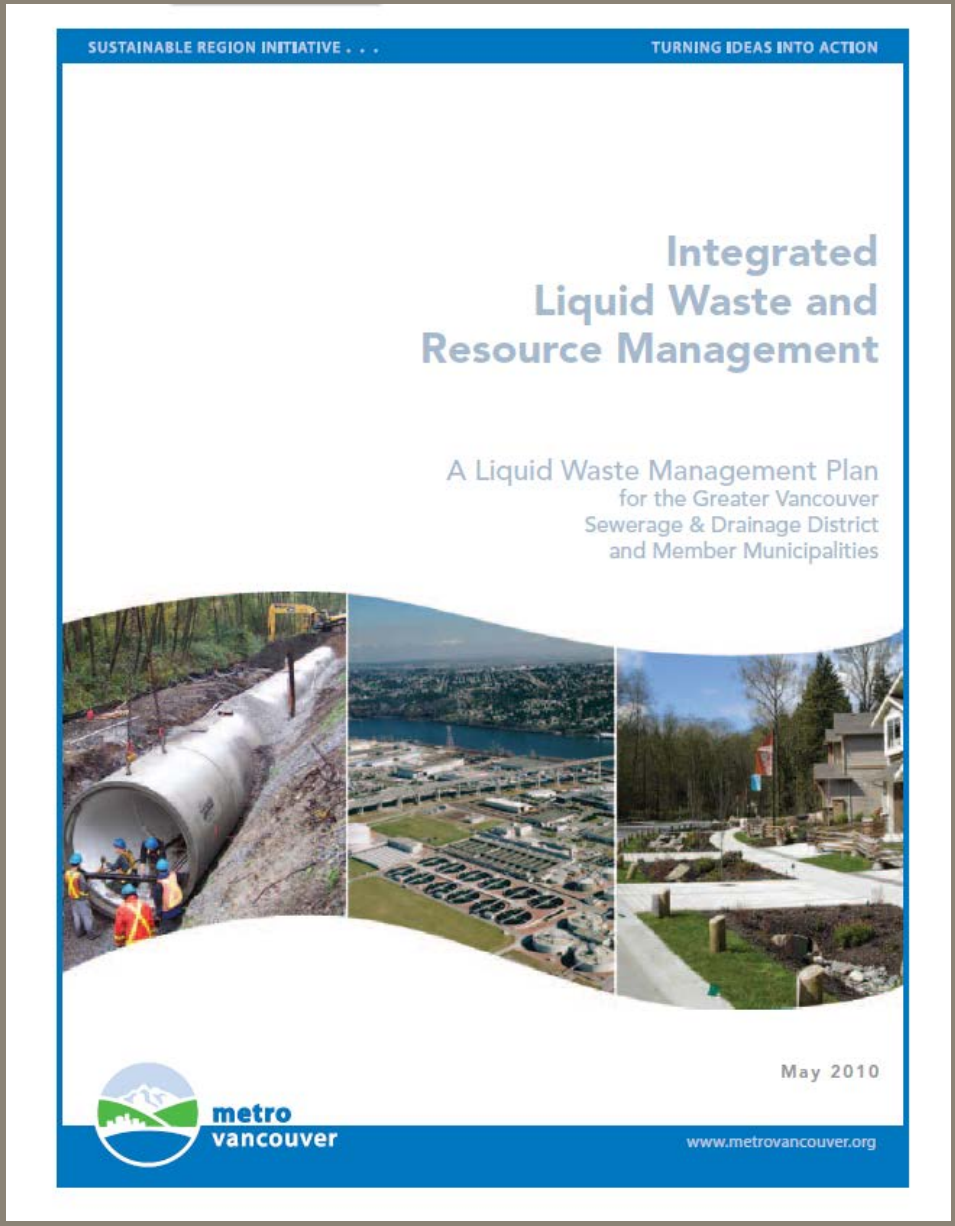
Role of Regional Government



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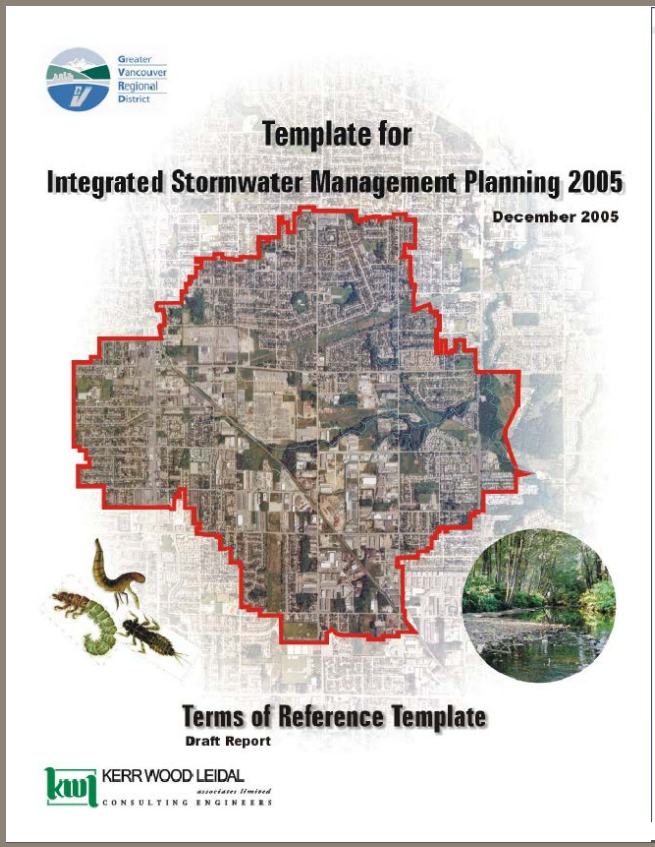
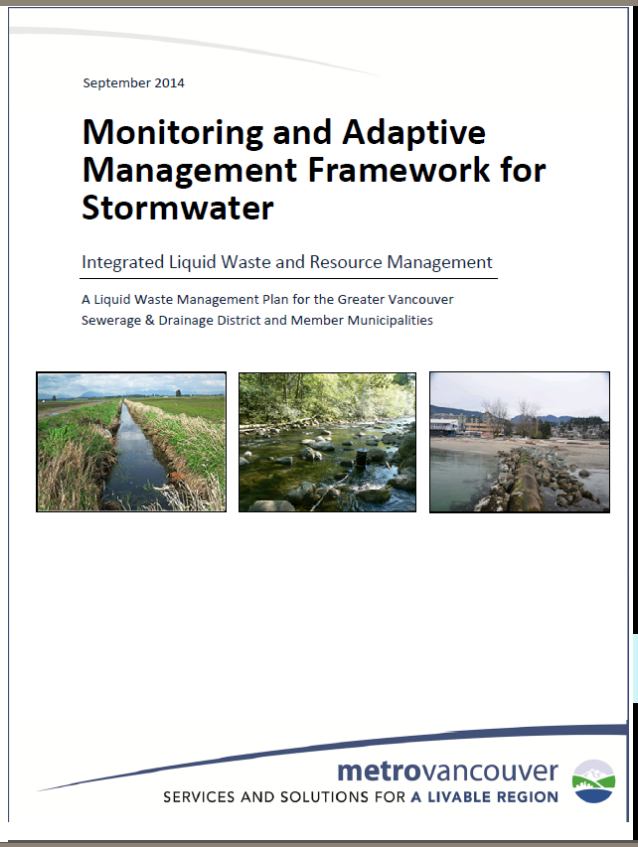
Liquid Waste and Resource Management Plan

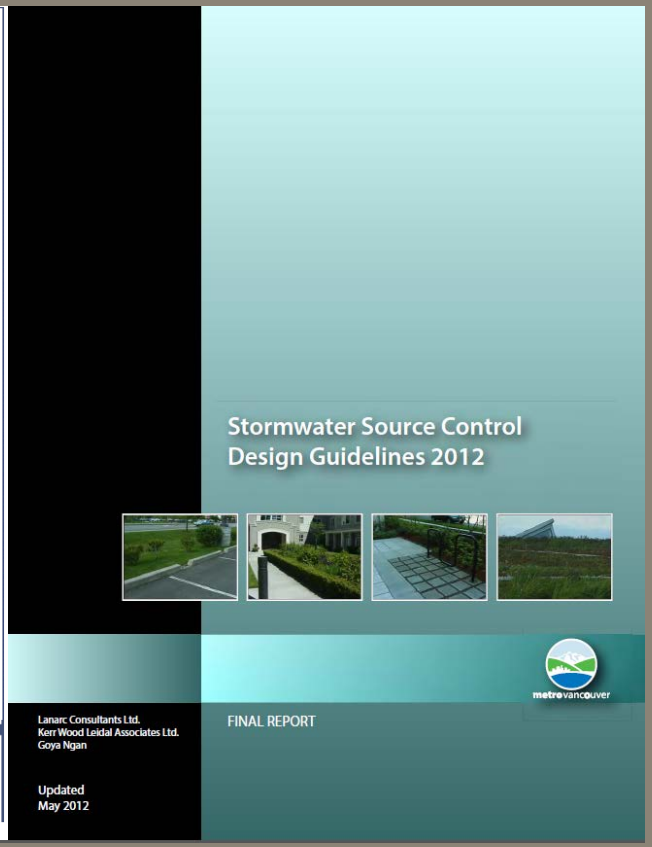
Develop and implement ISMPs	• Integrated Stormwater Management Plans for every urban watershed
Mange rainwater on-site	• Publish Stormwater Source Control Guidelines
Adaptive Management Framework	• Monitor stormwater and assess and report the effectiveness of ISMPs
Region Wide Baseline	• Establish baseline criteria for on-site rainfall management (minimum standard)

Regional Guidance

- Metro Vancouver took the lead and produced several document to assist member municipalities







ISMP Process

- The ISMP approach integrates:
  - watershed catchment
  - master drainage plans
  - stormwater plans
  - municipal planning such as Official Community or Neighbourhood Concept Plans, Recreation, Parks Master Plans and Strategic Transportation Plans into one document to address stormwater management impacts on community values.

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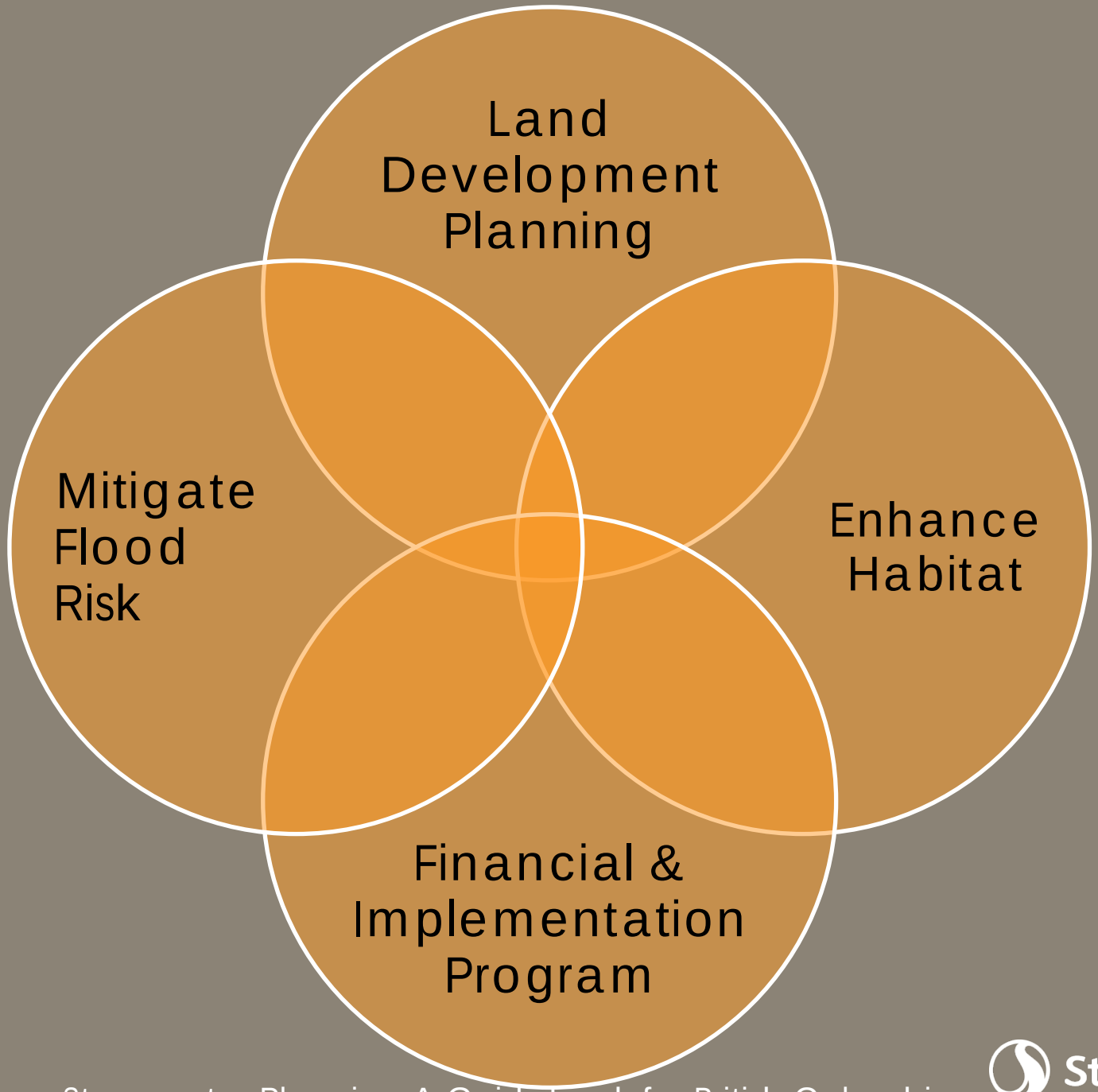

Adapted from: Stormwater Planning A Guidebook for British Columbia

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ISM

The objective of the ISMP is to strive to maintain existing watershed health and achieve no-net-loss on a watershed basis

Table 1-2: Summary of Stormwater Criteria

Application	Criteria/Methodology
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	gn event[1] oodplain HGL[1]
	off volume our storm storm)[2] ti-family, al, industrial nm of vious areas to pervious uses.[3]
	nual runoff BMPs[2]
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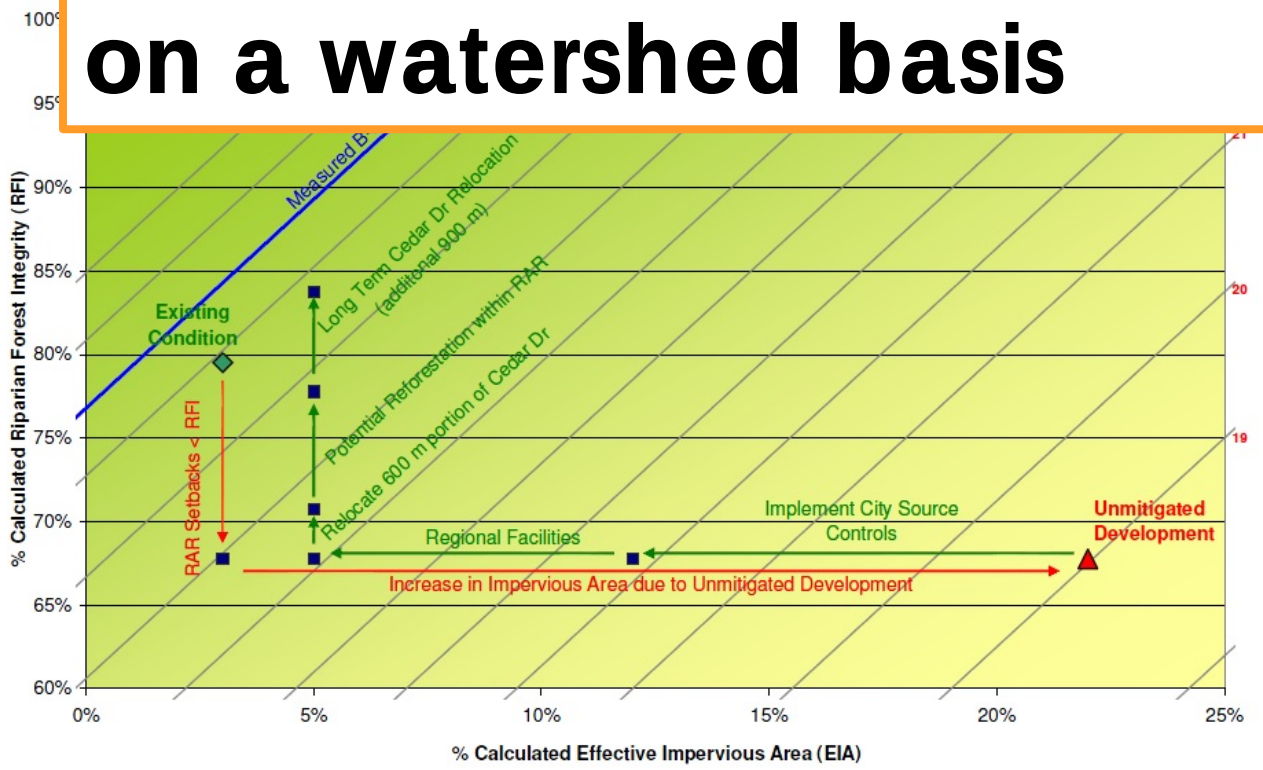

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ISMP and Source Controls

- ISMP includes comparison and evaluation of land use strategies, LID measures, source controls, and regional BMPs





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Early Lessons/Issues

- LID maintenance problematic for municipalities, especially if on private property
- Implementation of ISMPs and source controls left largely to developers and property owners
- General Public not aware of the ‘why’ of source controls, education needed

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Early Lessons/Issues

- Questions on the feasibility of source controls in poor soils on steep slopes
- ISMP tended to be too engineering centric and resulted in large capital plans, as municipalities tried to combine the ISMP with the old MDP process.

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Reception and Changing Attitudes

- Developers had concerns about source controls:
  - competition for lot space (source control size)
  - concerns over failures and maintenance
  - municipal bylaws and standards not accepting source controls
  - conflict with the building code
  - lack of knowledge in general
  - Cost

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Reception and Changing Attitudes

- Municipalities encountered internal barriers such as:
  - Conflicts between various city departments
  - Strong desire to resist new methods and continue with tried and true traditional servicing
  - Internal processes not in place for approving and inspection of source controls
  - Maintenance responsibility and cost
  - Lack of faith that LID will work as designed
  - Liability concerns

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Reception and Changing Attitudes

- Municipalities were aware of the stumbling blocks and bridged the gap by developing new internal process and updated standards
- Pilot projects and performance monitoring was undertaken by the municipalities to prove source controls could be used in poor soils on steep slopes
- Pilot projects included improving awareness of stormwater LID purpose and function in the public, private and municipal realms
- Workshops for developers, engineers and architects were staged to educate these groups

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Current Landscape

- Many municipalities have completed the ISMP process and are starting to implement the watershed plans
- Municipalities and Universities are leading by example in installing source controls to meet watershed goals

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Current Landscape

- Neighbourhood plans must meet the no-net-loss goals within the ISMP
- Bylaws and guidance document have been amended and updated to reflect the need for source controls

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Current Landscape

- Watershed source controls are mandatory for new development or redevelopment including infill residential
- Public volunteer groups such as streamkeeper groups have been early adopters, and have installed many rain gardens on school and private properties.

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NOW WHAT?

- LID and source controls are currently the best available method in BC for mitigating the impacts of development
- Despite pilot projects, performance monitoring, and education efforts over the last 10 years, source controls are still somewhat rare, as implementation has lagged behind the ISMP planning process
- Design manuals and standards are being produced to further implementation efforts

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NOW WHAT?

- Bylaws (development, stormwater and land use) are being amended to include ISMPs and source controls
- Source controls are being considered as a tool to assist with climate change adaptation
- Many municipalities are starting to recognize that source controls could help build a more resilient storm water system

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Full Implementation of ISMPs

- The next step for municipalities is to fully implement the ISMPs for each watershed
- Operation and maintenance and homeowner modification of source controls remains a concern

Adaptive Management and On-Going Monitoring

- As part of the LWMP commitment, municipalities are required to re-visit the ISMP every 12-years
- An Adaptive management strategy is required for all ISMPs
- Metro Vancouver has recently released a framework for adaptive management that includes what parameters should be monitored and the acceptable levels

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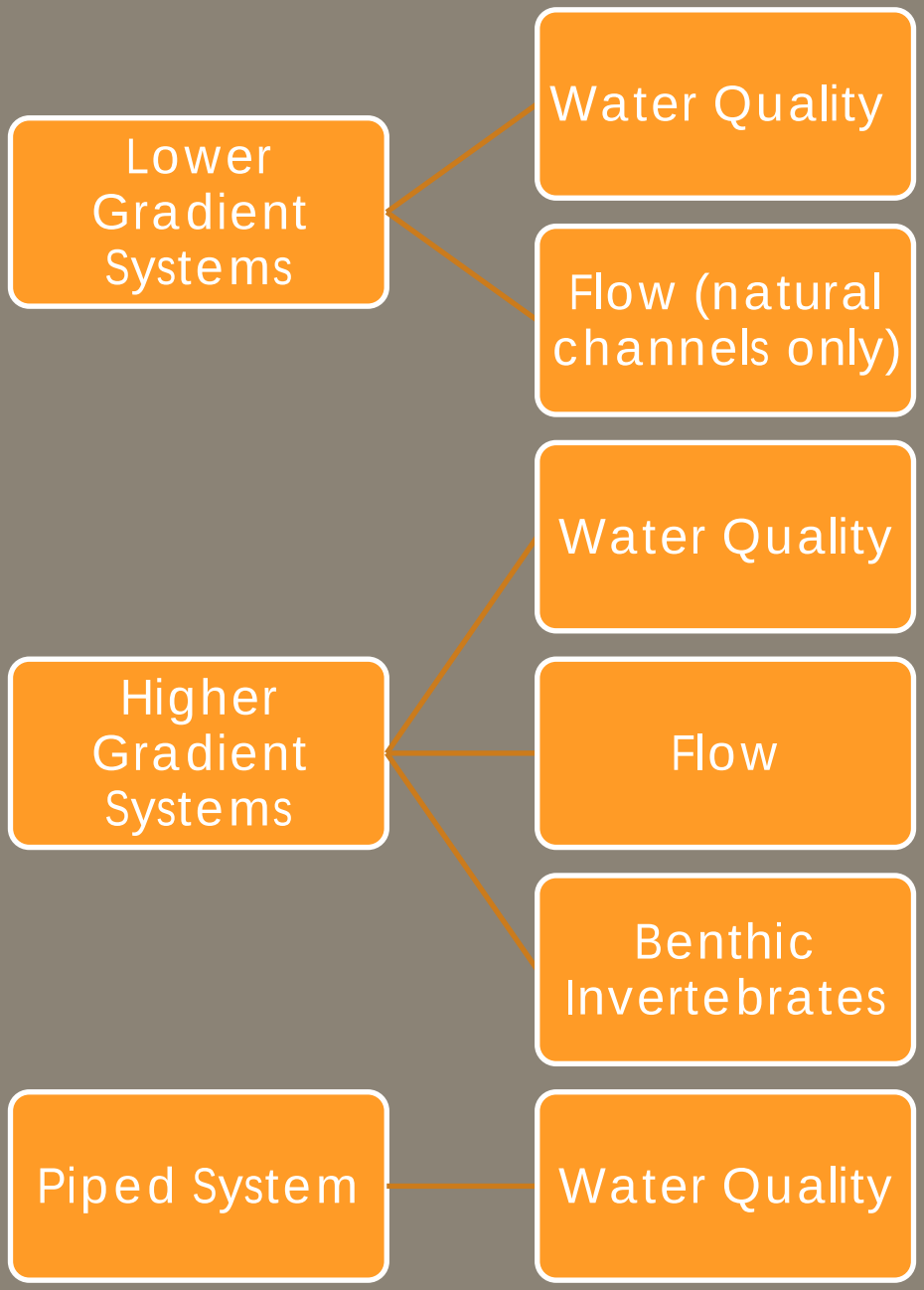
Recommended Monitoring Programs



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Fully Meeting the LWMP

- As part of the LWMP Metro Vancouver is required to provide a region-wide minimum standard for on-site management
- This will apply to areas without an ISMP (rural / agricultural areas)
- A minimum volume reduction target
- Municipalities must update their bylaws to implement this requirement

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Fully Meeting the LWMP

- Baseline would:
  - only apply to single family, duplex or triplex residential lots
  - Intended for Infill or one off developments/ redevelopment
  - Not for subdivision or non-residential development
  - For areas with no ISMP or management criteria

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Questions?

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