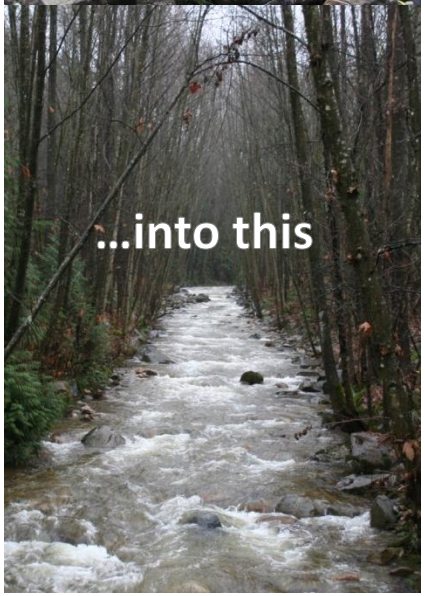
ISMP ADVISORY GROUP

District and City of North Vancouver



Integrated Stormwater Management Planning (ISMP) is an innovative approach that uses proactive land use planning tools to protect property and watershed habitat from the impacts of stormwater and urbanization, while at the same time sustaining economic growth.

Due to our shared watersheds and other natural resources the District and City of North Vancouver are working together to conserve and enhance the local environment while still meeting the needs and supporting the values of our communities.

Advisory Group's Purpose and Membership:

The ISMP Advisory Group will play a vital role in shaping the future of stormwater, environmental, and land use management in both the District and City of North Vancouver.

This is a new vision for our watersheds that touches on all aspects of life in North Vancouver and we need input and support from all members of the local community to make it succeed. The only qualification needed to join is interest. Whether you are an expert, non-expert, development professional, municipal committee member, active watershed steward, or first-time volunteer from either the District or City of North Vancouver, your input is needed.

Time Commitment:

The ISMP Advisory Group will meet 5 to 6 times per year through the end of 2016, with other opportunities for involvement and feedback throughout the year.

While there is no requirement to attend every meeting, or to remain with the group for a full two-years, the outcome will benefit substantially from extended participation.

NORTH VANCOUVER DISTRICT

city of north vancouver

ISMP ADVISORY GROUP
District and City of North Vancouver

ISMP PROCESS

- Community & Environmental Goals
- Gather Information
- Technical Analysis
- Develop the ISMPs
- Implementation
- Adaptive Management

Meeting Format and Topics:

Meetings will be a mix of presentations, study and document review, workshops, discussion, and excursions to share your knowledge and learn more about your watersheds.

The format and topics discussed at each meeting will be determined jointly by the Advisory Group and municipal staff to ensure all stakeholder values and concerns are addressed.

Sample Discussion Topics:

- Project Prioritization
- Fish Habitat Protection and Restoration
- Water Quality
- Low Impact Development Solutions (LIDs)
- Environmental Indicators and Monitoring

Example Meeting Excursions:

- Interpretive Creek Walks
- Burrard Inlet Foreshore Restoration
- Visits to Innovative Stormwater Projects (e.g. rain gardens, bioswales, habitat restoration, permeable paving)

Get Involved and More Information:

To find out more about the ISMP and to inquire about the Advisory Group please email or go online.

Email:
ISMP@dnv.org
ISMP@cnv.org

Go Online:
www.dnv.org/ISMP
www.cnv.org/ISMP



NORTH VANCOUVER DISTRICT

city of north vancouver

BACKGROUND

District and City of North Vancouver ISMP Advisory Group

Stormwater Runoff
The component of rainwater and snowmelt that flows over land or impervious surfaces rather than soaking into the ground

Motivation

Under Metro Vancouver's 2011 Integrated Liquid Waste and Resource Management Plan (ILWRMP) all municipalities are required to develop Integrated Stormwater Management Plans (ISMPs) for all watersheds within their boundaries.

Purpose

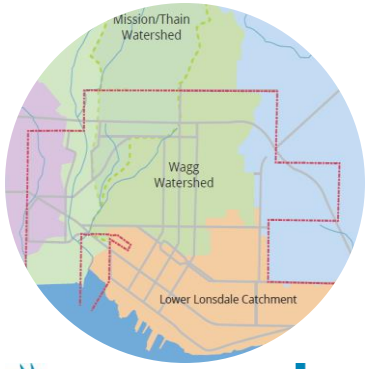
ISMPs are meant to provide a clear picture of how to be proactive in applying land use planning tools to protect property from flooding and to enhance environmental health and aquatic habitat. Other objectives include using stormwater as a resource, providing effective and affordable management, and facilitating urban development without compromising the environment or public safety.

ISMP Template

Metro Vancouver's ISMP template standardizes the ISMP process and lays out the key components in three disciplines – engineering, planning, and environment. Each municipality can then determine which components are applicable to each watershed and what level of effort is required depending on the properties of the watershed and the resources available.

Collaborative Approach

Watersheds do not stop at political boundaries, and neither can stormwater management. The District and City of North Vancouver share several watersheds and will collaborate on the development and implementation of these ISMPs, as well as sharing information and best practices to produce the best results across the region.



Other Resources

For further information on ISMPs and land use planning tools see www.waterbucket.ca

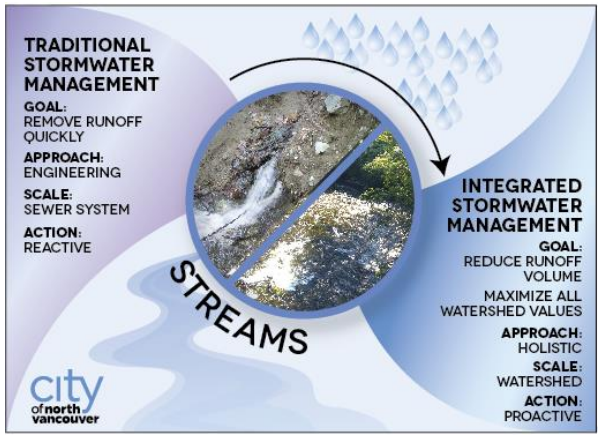
NORTH VANCOUVER DISTRICT

city of north vancouver

INTEGRATED VS TRADITIONAL STORMWATER MANAGEMENT

District and City of North Vancouver ISMP Advisory Group

	Traditional Stormwater Management	Integrated Stormwater Management
Primary Goal	**Remove** runoff from developed areas as quickly as possible	Maximize all watershed values and minimize impact to watercourses by **reducing** the volume of runoff from developed areas
Approach	Concrete and steel **engineered solutions**, such as pipes, culverts, ditches, and drains	Considers **all aspects of watershed use** and values, including land use, ecology, recreation, and cultural values
Scale	Only accounts for the stormwater **sewer system**	Works at the **watershed** scale, accounting for everything from the headwaters to the receiving waters, and all activities in the area
Time of Action	**Reactive** – Increase sewer capacity as runoff volumes increase due to urbanization	**Proactive** – Attempts to find the best overall solution by looking at all potential actions to reduce, slow down, infiltrate, and transport runoff
Decision Making	**Top-Down** – Stormwater planning performed by municipal engineers	**Participatory and Adaptive** – A holistic approach requires input from all stakeholders and regular monitoring and adaptation



NORTH VANCOUVER DISTRICT

city of north vancouver

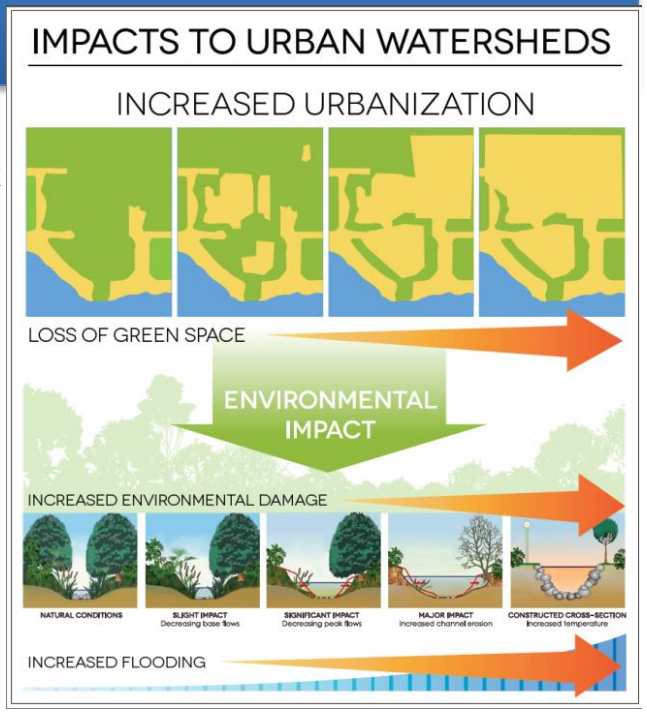
IMPACTS OF URBANIZATION

District and City of North Vancouver ISMP Advisory Group

Overview

In natural, permeable areas most rainwater soaks into the ground and moves slowly downhill through the rock and soil to the nearest creek or body of water.

However, when rain lands on impermeable surfaces, such as roads and buildings, the water flows over the surface – known as stormwater runoff.



Impacts of Urbanization

Without proactive management urbanization tends to result in less infiltration and more runoff, leading to many potential problems:

- Runoff moves downhill very quickly, increasing the risk of flooding, erosion, and sedimentation downstream
- Runoff picks up pollution as it travels, leading to environmental damage and lower water quality
- More runoff requires bigger and more expensive storm sewers
- Less infiltration decreases the water available for baseflow, the portion of streamflow that comes from subsurface flows and seepage from the ground, and what allows streams to continue flowing during dry periods
- In extreme cases baseflow can decrease below the minimum amount needed to maintain a healthy ecosystem, resulting in substantial environmental damage

'Flashiness'

The 'flashiness' of a stream refers to how quickly its flow increases during a storm and decreases after it ends. Measuring 'flashiness' is a good indicator of the effects of urbanization in the watershed – and also of our efforts to mitigate them.

NORTH VANCOUVER DISTRICT

city of north vancouver

LAND USE CHANGE IN NORTH VANCOUVER

District and City of North Vancouver ISMP Advisory Group

Current Land Use

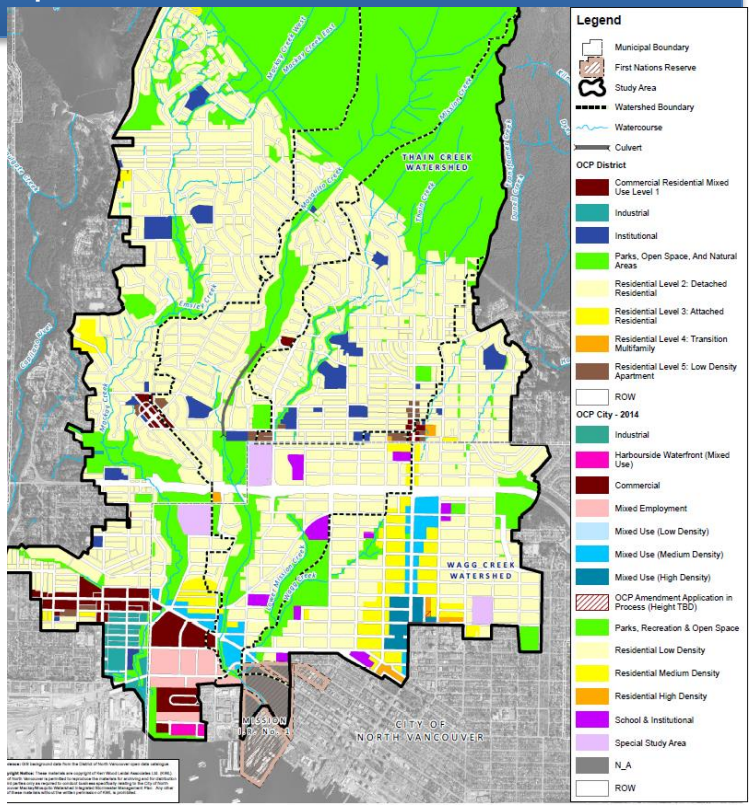
Land use in most North Vancouver watersheds follows a fairly typical pattern:

- Forested mountain headwaters
- Single-family residential homes in the middle reaches
- Higher density housing, commercial, and industrial uses as you approach Burrard Inlet, especially west of the Seymour River

Future Land Use

More than 1 millions additional people will live in Metro Vancouver by 2041 (Regional Growth Strategy), with all of the regional municipalities sharing a portion of this growth.

In North Vancouver the growth will be focused around existing Town Centres, such as Lonsdale, Lynn Valley, Edgemont, and Maplewood, as laid out in the municipal Official Community Plans (District OCP, City OCP).



The gradual redevelopment to larger single-family homes and mixed-use communities could have substantial stormwater and environmental effects if not properly managed. Luckily, the redevelopment of these properties offers a great opportunity to proactively mitigate any impacts.

Projected Increase to 2041 vs 2006

	District	City
Population	27,000 (31%)	20,500 (43%)
Dwelling Units	13,740 (44%)	7,840 (35%)
Jobs	13,000 (48%)	11,000 (38%)

NORTH VANCOUVER DISTRICT

city of north vancouver

LOW IMPACT DEVELOPMENT

District and City of North Vancouver ISMP Advisory Group

Overview

Lot level stormwater solutions are actions that can be taken on a property that benefit the entire stormwater system. This can be done by either delaying the release of runoff, promoting infiltration to reduce the amount of runoff, and/or filtering the runoff to improve water quality.

Permeable Paving

Permeable paving includes a range of paving materials that allow water to move through them into the ground, and can include pervious concrete, porous asphalt, and permeable interlocking pavers, among others.

Rain Gardens

Rain gardens are planted depressions that allow runoff from nearby impervious surfaces to collect and be filtered and absorbed into the ground.

Green Roofs

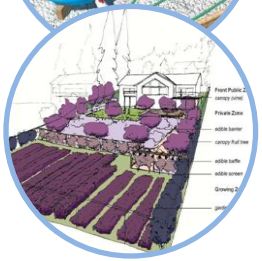
Green roofs are vegetated rooftop areas that collect and filter rainwater. Although direct infiltration is not possible green roofs improve water quality, increase evapotranspiration, and slow the release of runoff into the stormwater system.

Rain Barrels

Like green roofs, rain barrels collect rainwater that falls on the roof and slowly releases it into the stormwater system, or allows it to be stored and used for other purposes, such as watering the garden or lawn, instead of using potable water.

Urban Green Space

One of the easiest ways to mitigate increasing urbanization is simply to preserve and expand urban green space, including landscaping, gardens, and street trees.



BYLAWS AND DESIGN STANDARDS

District and City of North Vancouver ISMP Advisory Group

Overview

Both the City and District of North Vancouver have in place a number of bylaws and design standards related to stormwater management, watershed health, and mitigating the impacts of development. Modifying and strengthening these bylaws is one of the most powerful tools available to implement the ISMPs.

Development Permit Areas (DPAs)

DPAs control the shape and impact of development in areas of particular concern by requiring a development permit (DP) for all new construction. DPs can apply to a wide range of issues, including environmental, natural hazards, and particular land use or development types, such as coach houses.

DPAs for streamside protection and enhancement exist in both the City and District, which apply to all new construction, including paving and use of pavers, and the removal of soil, or vegetation. Other DPAs can apply to on-site rainwater detention, landscaping and drainage requirements, special considerations for steep slopes, and sediment control measures.

Zoning and Design Standards

Through zoning and development bylaws municipalities can also influence the form and character of development and re-development to benefit watershed health. Some examples could include requiring large setbacks from stream corridors, setting maximum levels of impervious area, requiring on-site stormwater controls, and making monetary community contributions toward other ISMP related projects.

Other Policies

Maintaining open streams and requiring fish-bearing or potential fish-bearing streams to be fish-passable.

Protection of drainage systems during construction to stop the release of prohibited substances

Erosion and sediment control bylaws requiring Sediment Control Plans, the use of Best Management Practices (BMPs), and monitoring during construction

CLIMATE CHANGE – Wetter and Warmer

District and City of North Vancouver ISMP Advisory Group

Overview

While the exact changes and timelines of climate change are somewhat uncertain – like any aspect of planning for the future – there are several trends that could have dramatic impacts on our watersheds

Precipitation

Overall, North Vancouver will receive only slightly more precipitation, but it is projected to fall in fewer, much more intense storms.

Extreme Events

Extreme heat days and rainfall events will occur much more frequently, with substantial impacts to human health, infrastructure, and the environment. The long lasting effects of infrastructure and land use decisions mean that we must plan for these much bigger and more frequent storms today.

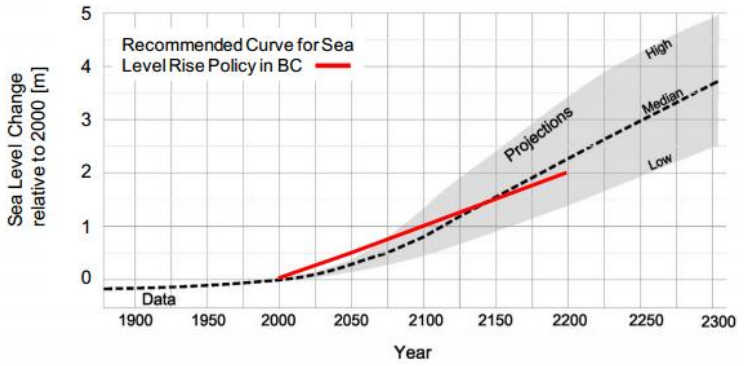
Seasons

Spring and summers will be hotter and drier – leading to more droughts and low streamflow conditions.

Fall and winter will be warmer and wetter, with less snow on the North Shore Mountains. What snow does fall will melt earlier and faster, further reducing stream levels in the spring and summer.

Sea Level Rise

Burrard Inlet is projected to rise by 1m by 2100, and will increase at an even faster rate into the 2100s. While higher sea levels won't effect our watersheds' upper reaches, it will exacerbate the impacts of large storms and flooding near the coast.



MONITORING AND ADAPTIVE MANAGEMENT

District and City of North Vancouver ISMP Advisory Group

Overview

A key component of a successful ISMP is a monitoring and adaptive management framework (MAMF) which assesses both watershed health and the ISMP's implementation and effectiveness in achieving its goals. Long-term monitoring is essential for evaluating whether the ISMP is working and for deciding what changes are needed to adapt to new conditions or improve results.

Guidelines and Baseline Levels

For monitoring to be meaningful it must be compared to both guidelines (e.g. water quality standards) and baseline levels (e.g. creek baseflow). We have to decide what we want to monitor today and start immediately (or preferably many years ago) so that we have baseline values for comparison. It is also useful to monitor above and below developed areas of the watershed to observe the impacts of urbanization and our efforts to mitigate them.

Water Quality

Typical measures of water quality include: dissolved oxygen, pH, temperature, conductivity, turbidity, various nutrients, E. Coli, fecal coliforms, and metal concentrations, such as iron, cadmium, copper, lead, zinc. These values are typically compared to standard guidelines to assess the local water quality.

Ecological Health

One of the main measures of stream health is the Benthic Index of Biological Integrity (B-IBI), which is a rating from 10 (very poor) to 50 (very healthy) of the composition and richness of benthic (streambed) invertebrates. B-IBI is useful because it reflects both the impacts of urbanization and the ability of larger species (e.g. salmon) to survive.

Other ecological indicators include the presence or absence of various fish species and riparian forest integrity.

Hydrometrics and Weather

Continuous measurements of rainfall, creek flow, and flow through the storm sewer – and how they relate to each other – is necessary to evaluate the impact of development and the success of our efforts to increase infiltration and reduce runoff. North Vancouver has the added challenge of receiving more rain at higher elevations, requiring multiple weather stations.

NORTH VANCOUVER DISTRICT

city of north vancouver

SOCIAL AND CULTURAL VALUES

District and City of North Vancouver ISMP Advisory Group

Overview

As in any decision making process, all forms of costs and benefits must be considered to reach the most beneficial outcome. Focusing only on drainage, land use, and ecology ignores a major component of watershed value – recreation and culture. While these values tended to be ignored in traditional stormwater management, they make up an integral part of ISMPs.

Recreation and Culture

North Vancouver's watercourses and headwaters offer some of the finest and most accessible natural areas and trails in the region, all of which both rely on and impact watershed health. The cultural and recreational value of these areas is one of the region's greatest assets and should not be ignored.

Stewardship

It is easy to forget that everything you do happens in and effects your watershed. The development and implementation of an ISMP is an incredible opportunity to increase watershed awareness and to encourage stewardship for our local waters. Including stewardship activities in the ISMP can have multiple benefits by educating and building support within the community, which then feeds back into more support for further action.

Related Benefits

The opportunity to engage the public on stormwater issues can also be used to as a catalyst for related causes, such as water conservation, grey water reuse, nature appreciation, outdoor activity, and other community building events.

NORTH VANCOUVER DISTRICT

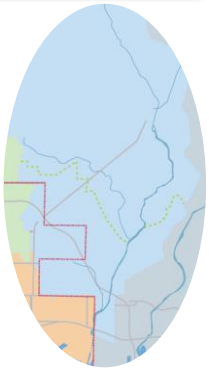
city of north vancouver

GLOSSARY

District and City of North Vancouver ISMP Advisory Group

Watershed

An area of land where all water drains to the same place, such as a creek or ocean. For example, the Lynn Creek Watershed includes all land where a raindrop falling there will travel overland or through the soil to Lynn Creek and eventually to Burrard Inlet.



Infiltration

The process by which water enters the ground, whether soil or rock. Similar to seeping or draining. How much and how fast water infiltrates into the ground is controlled by many factors such as vegetation, land cover, soil type and level of saturation, geology, and slope.

Stormwater Runoff

The component of rainwater and snowmelt that flows over land or impervious surfaces rather than infiltrating into the ground.

Pervious vs Impervious Surfaces

Impervious surfaces, such as roads and rooftops, do not allow any water to pass through them, which results in all precipitation becoming runoff, rather than infiltrating into the ground. In contrast, pervious materials allow water to pass through them and reach the ground. This concept may also be referred to as permeable and impermeable.

Green (soft) vs Grey (hard) Infrastructure

Grey infrastructure refers to the conventional approach to stormwater management based on piped drainage and engineering solutions, whereas green infrastructure uses solutions that mimic nature such as bioswales, ponds, wetlands, green roofs, and rain gardens.

NORTH VANCOUVER DISTRICT

city of north vancouver