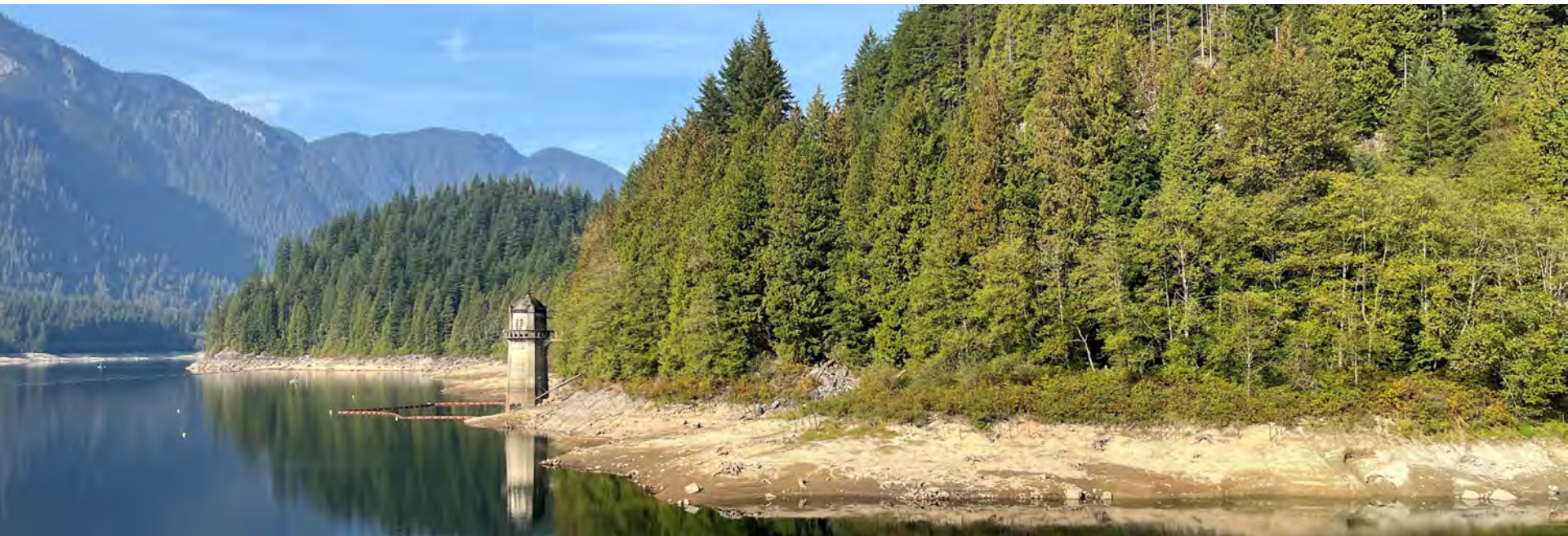


metrovancover

Welcome

Seymour Capilano Filtration Plant





Coquitlam Reservoir - October 2022

Adapting to Climate Change: Urban Forests and Watering Restrictions

Edward Nichol

Senior Planner, Regional Planning and Housing Services

BC Recreation and Parks Association – February 28, 2024

61982851

Megan Wood

Senior Project Engineer, Water Services, Policy, Planning and Analysis

metrovancouver

PURPOSE

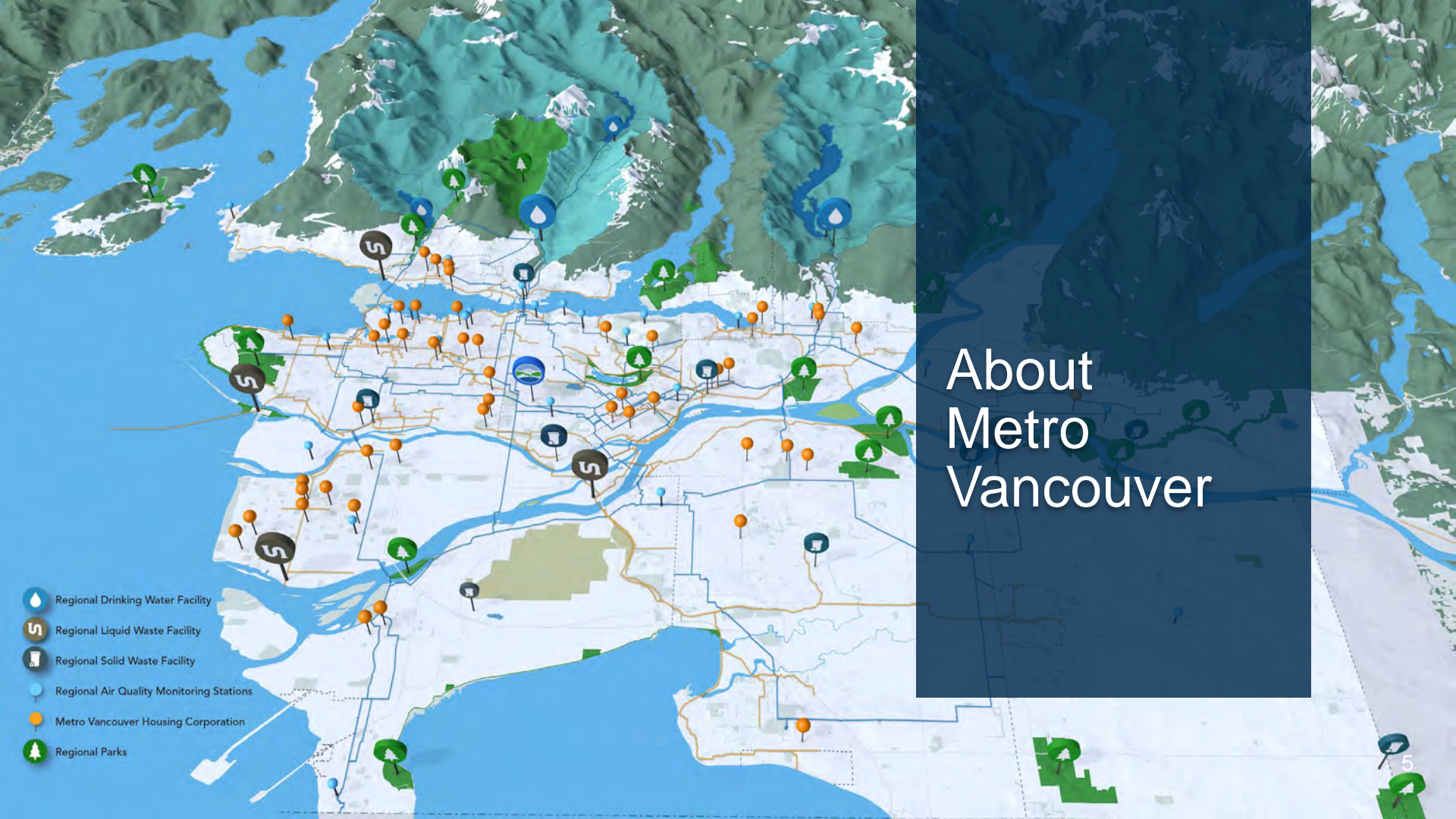
- Provide an overview of water supply planning and the role of the regional watering restrictions.
- Provide guidance to maintaining healthy and resilient urban forests across the region.



Coquitlam Reservoir during the warm, dry fall 2022

AGENDA

- About Metro Vancouver and its Services
- Metro Vancouver Water Services Overview
- Climate Conditions and Water Supply
- Drinking Water Conservation Plan
- Planning for the Future
- Urban Forests in Regional Plans
- Urban Forests and Climate Change
- Urban Forest Climate Adaptation Initiative
- Other Initiatives



About Metro Vancouver

-  Regional Drinking Water Facility
-  Regional Liquid Waste Facility
-  Regional Solid Waste Facility
-  Regional Air Quality Monitoring Stations
-  Metro Vancouver Housing Corporation
-  Regional Parks

METRO VANCOUVER SERVICES

Metro Vancouver plans for and delivers regional public and utility services.

It is a regional federation of 21 municipalities, Tsawwassen First Nation, and Electoral Area A.



Water



Liquid Waste



Solid Waste



Regional
Planning



Air Quality



Regional
Parks



Housing



Invest
Vancouver

MISSION

A federation that collaboratively plans for and delivers regional-scale services



Deliver Core Services

Attain the highest possible levels of excellence in meeting our service delivery responsibilities.



Plan for the Future

Develop and use an integrated system of plans to manage all activities within Metro Vancouver's legislated scope of authority towards the achievement of a sustainable region.



Act as a Regional Forum

Build and facilitate collaborative processes, including those that engage citizens, to achieve a robust partnership that works together for a sustainable region.



metrovancover

23 Member Jurisdictions

2.8 Million Residents

53% of BC population



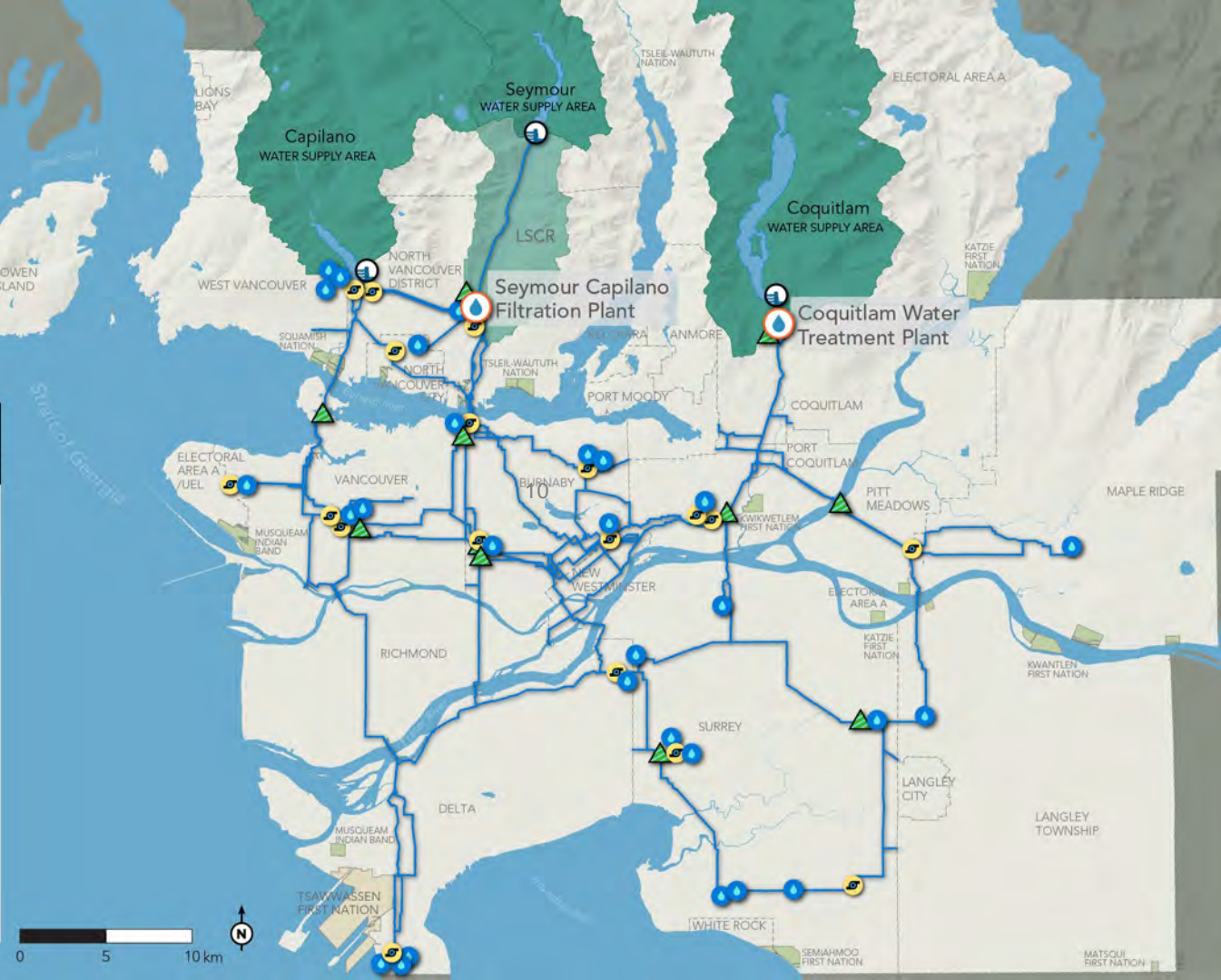
Metro Vancouver Water Services Overview

Jericho Reservoir - Langley



METRO VANCOUVER DRINKING WATER SYSTEM

- Water Supply Area
- Lower Seymour Conservation Reserve (LSCR)
- ⓘ Dam
- Water Main
- ⚙ Disinfection Facility
- 💧 Water Reservoir/Tank
- ⚡ Pump Station
- 🏠 Water Treatment Plant
- Municipal Boundary
- Treaty Lands
- First Nation Reserve



ROLES AND RESPONSIBILITIES



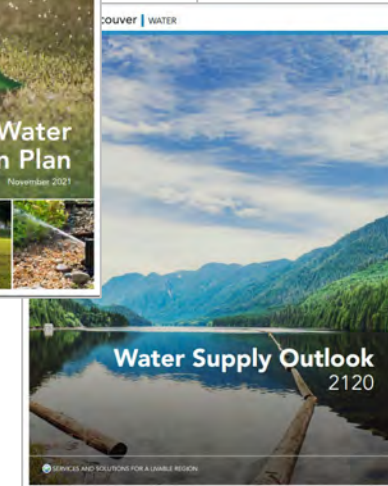
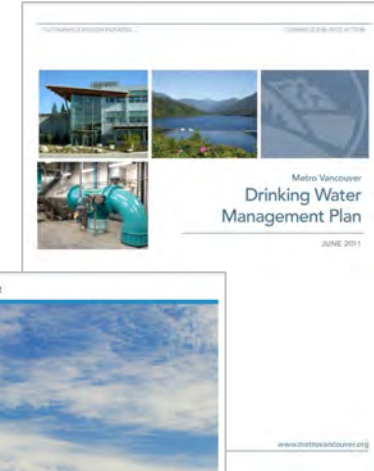
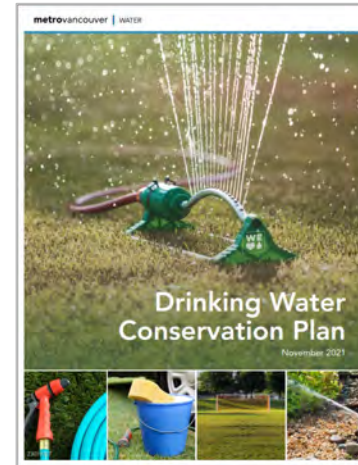
METRO VANCOUVER MANAGEMENT PLANS



GUIDING STRATEGIC PLANS AND INITIATIVES

Short, Medium, and Long-term Planning

- **Drinking Water Conservation Plan** – Implemented annually
- **Drinking Water Management Plan** – 10-year plan that guides the utility
- **Water Supply Outlook 2120** – 100 year look ahead at regional water supply and resiliency



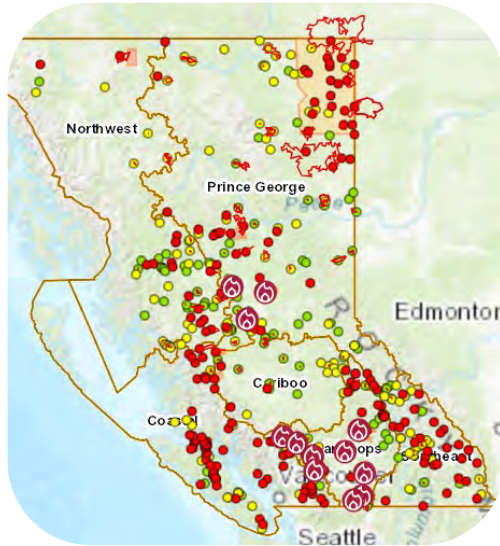
An aerial photograph showing a riverbed that has almost completely dried up. The remaining water is confined to a narrow, shallow channel. The surrounding area is a dense forest of evergreen trees. The ground is a mix of light-colored sand, gravel, and dark rocks, indicating a lack of water and significant erosion. The overall scene is one of severe drought.

Climate Conditions and Water Supply

Coquitlam Reservoir during fall 2022 drought

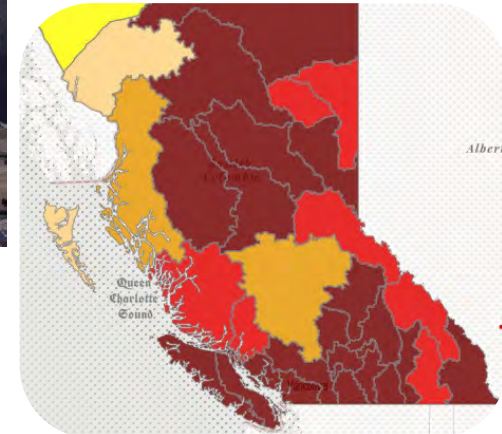
WATER SUPPLY AREA CLIMATE CONDITIONS

Active wildfire map – August 29, 2023
<https://wildfiresituation.nrs.gov.bc.ca/map>



Seymour Reservoir looking south – August 2023

BC Drought Levels – August 29, 2023
British Columbia Drought Information Portal



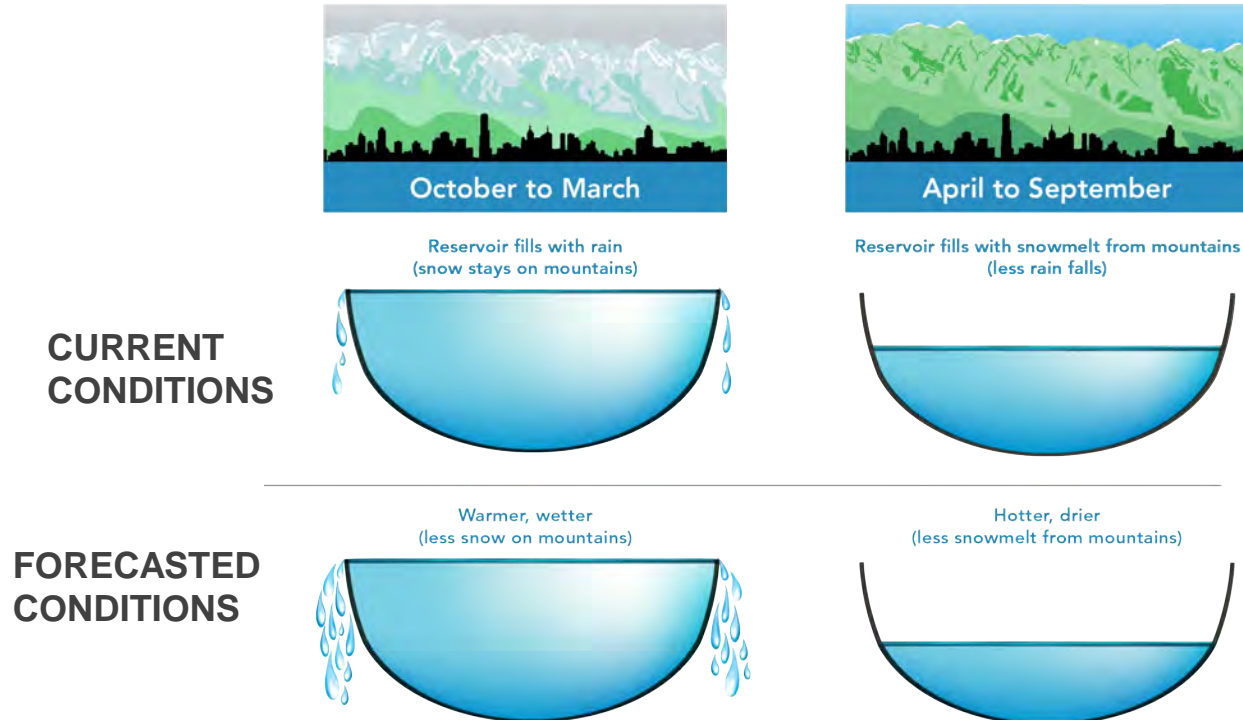
8/29/2023, 4:43:17 PM

British Columbia Drought Levels

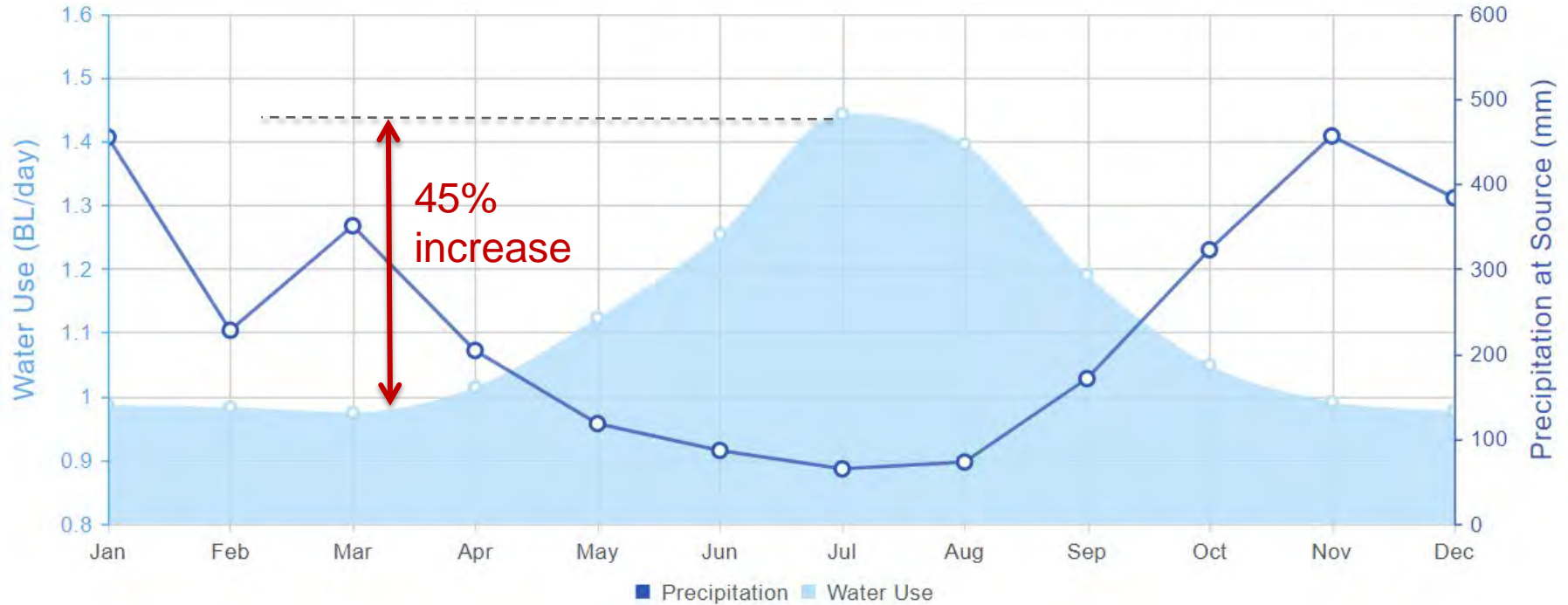
- Drought Level 1 - Adverse Impacts Rare
- Drought Level 2 - Adverse Impacts Unlikely
- Drought Level 3 - Adverse Impacts Possible
- Drought Level 4 - Adverse Impacts Likely
- Drought Level 5 - Adverse Impacts Almost Certain


WATER SUPPLY FORECASTING

Anticipated Climate Change Impacts to Water Supply



WATER SUPPLY AND DEMAND OVERVIEW





Drinking Water Conservation Plan

Coquitlam Water Supply Area

OVERVIEW OF THE DRINKING WATER CONSERVATION PLAN

- **Purpose:** to reduce consumption of water during periods of high demand or during water shortages
- Developed in 1993
- Updated in 2004, 2011, 2016 (minor amendments), 2017 (major update), and 2021



STAGE 1 RESTRICTIONS

Purpose: to reduce demand in summer months

Activation: annually from May 1 to October 15

metrovancover

RESIDENTIAL LAWN WATERING

ONE DAY PER WEEK

STAGE 1
LAWN WATERING REGULATIONS

MAY 1 TO OCTOBER 15

EVEN ADDRESSES Saturday
ODD ADDRESSES Sunday

LAWN AND GARDEN WATERING REGULATIONS MAY 1 TO OCTOBER 15

	RESIDENTIAL LAWNS	TREES SHRUBS, FLOWERS	VEGETABLE GARDENS
STAGE 1 May 1 – Oct 15	EVEN ADDRESS Saturday ODD ADDRESS Sunday AUTOMATIC WATERING: 5am – 7am MANUAL WATERING: 6am – 9am	HAND WATERING SOAKER HOSE or DRIP IRRIGATION Anytime	SPRINKLERS Any day 5am – 9am Anytime
STAGE 2	LAWN WATERING PROHIBITED	HAND WATERING SOAKER HOSE or DRIP IRRIGATION Anytime	SPRINKLERS Any day 5am – 9am Anytime
STAGE 3	LAWN WATERING PROHIBITED	SPRINKLERS AND SOAKER HOSES PROHIBITED HAND WATERING or DRIP IRRIGATION Anytime	Anytime

All activities prohibited in emergency Stage 4.

Visit metrovancover.org/lawns for the complete regulations.

STAGE 2 & 3 RESTRICTIONS

Purpose: activated during unusually hot and dry conditions to control demand

Activation: when needed, activated three times since 1993



STAGE 4 RESTRICTIONS

Purpose: activated during an emergency to immediately limit water use to essential needs only

Activation: never activated to date



DWCP RESTRICTIONS FOR URBAN FORESTS

	RESIDENTIAL LAWNS	TREES SHRUBS, FLOWERS	VEGETABLE GARDENS	
STAGE 1 May 1 – Oct 15	EVEN ADDRESS Saturday ODD ADDRESS Sunday <hr/> AUTOMATIC WATERING 5am – 7am MANUAL WATERING 6am – 9am	 HAND WATERING SOAKER HOSE or DRIP IRRIGATION Anytime	 SPRINKLERS Any day 5am – 9am	Anytime
STAGE 2	 LAWN WATERING PROHIBITED	 HAND WATERING SOAKER HOSE or DRIP IRRIGATION Anytime	 SPRINKLERS Any day 5am – 9am	Anytime
STAGE 3	 LAWN WATERING PROHIBITED	 SPRINKLERS AND SOAKER HOSES PROHIBITED	 HAND WATERING or DRIP IRRIGATION Anytime	Anytime

RECENT EXPERIENCES

- Summer 2015 drought
- Summer 2021 heat dome
- Extended dry and warm fall 2022
- Summer 2023 drought



Brown lawn during summer 2015 drought



Capilano Reservoir during fall 2022 drought

SUMMER 2015 DROUGHT

Resulted in a 2017 Major Update of the DWCP

Supported by:

- In-depth technical review
- Two phases of public and industry-focused engagement



Metro Vancouver 2016 public engagement on DWCP update

SUMMER 2021 HEAT DOME

Sustained High Demand

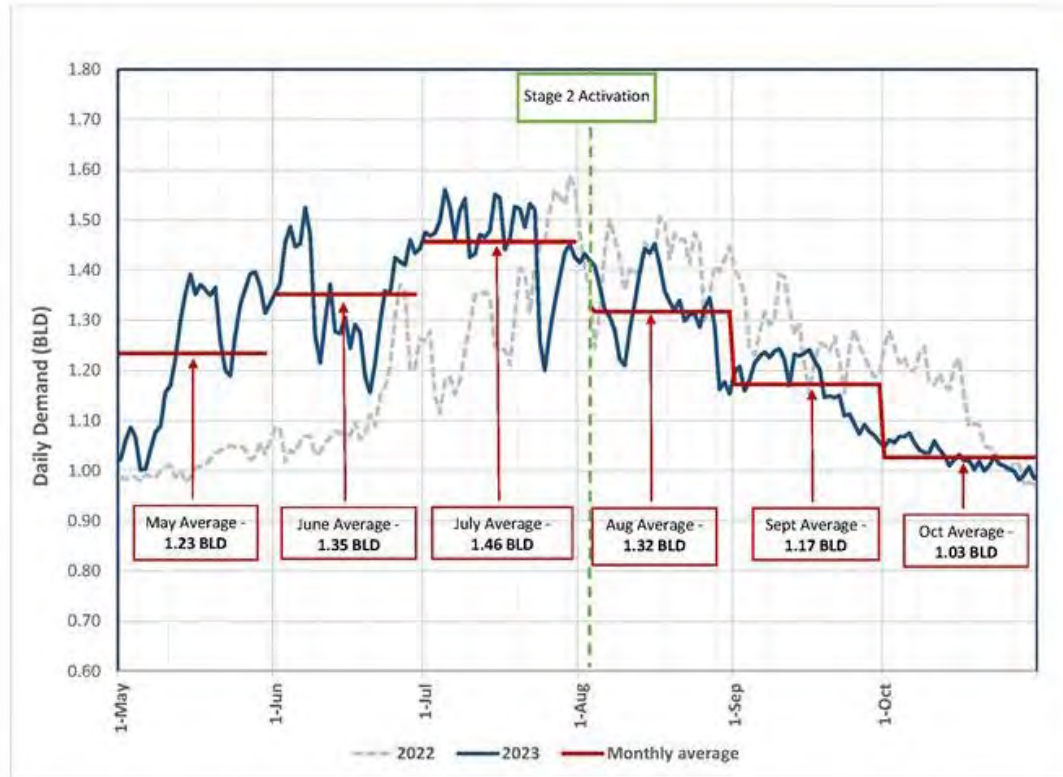
Average Weekly System Consumption Comparison



- Record-breaking heat wave in June followed by weeks of warm and dry weather
- Daily water demand spiked to a high of 1.8 BL/d
- Unprecedented, sustained water demand of over 1.5 BL/d for over 40 days

SUMMER 2023 DROUGHT AND ACTIVATION OF STAGE 2

Drinking Water Demands



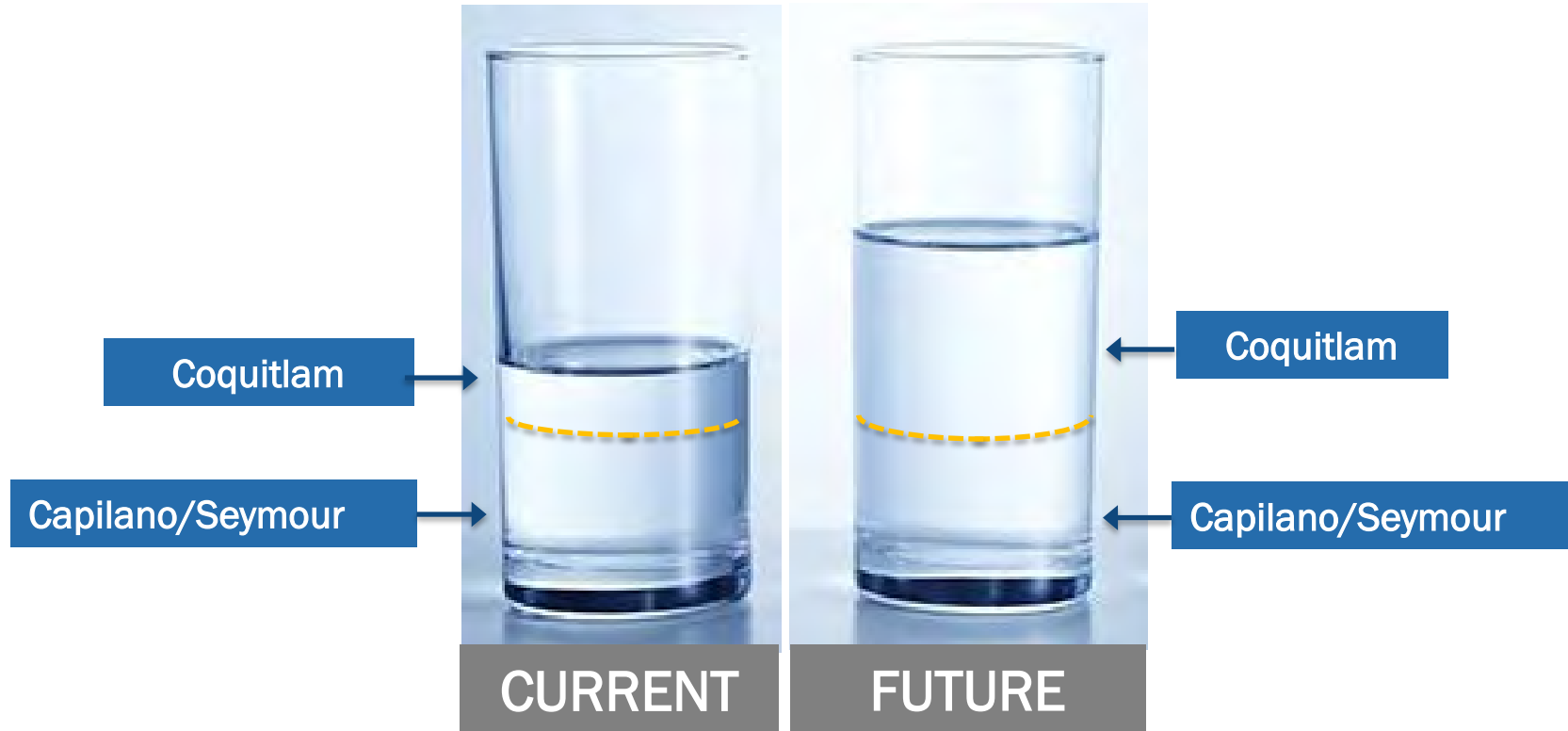
Planning for the Future

Seymour Capilano Filtration Plant – UV Disinfection



PLANNING FOR THE FUTURE

Coquitlam Lake Water Supply Project



MANAGING DEMAND THROUGH CONSERVATION

- Drinking Water Management Plan Update
- Regional Water Conservation Campaign
- Drinking Water Conservation Plan and Enforcement Guide
- Regional Assessment of Residential Water Metering
- Resources for Building-Scale Non-Potable Water Systems in Region
- Assessment of Drinking Water Conservation Potential



Low Water Levels, Seymour Reservoir, Fall 2022



Seymour Capilano Filtration Plant



Questions?

metrovancouver

An aerial photograph of a city, likely Vancouver, showing a dense urban forest covering a hillside. A prominent road, possibly a highway or main thoroughfare, runs up the center of the hill. The foreground shows residential houses with dark roofs, interspersed with green trees. In the background, several high-rise buildings are visible against a cloudy sky. A dark blue semi-transparent overlay covers the left side of the image, containing the title text.

Urban Forests and Climate Change

METRO 2050

- Shared vision for growth
- Develop resilient, healthy, and complete communities
- Protect, enhance, restore and connect ecosystems
 - 40% tree canopy cover target within UCB



CLIMATE 2050

Nature and Ecosystems Roadmap

- Carbon neutral and resilient region by 2050
- Ecosystem protection/restoration
- Support a resilient, robust, and healthy urban forest
 - Achieve 40% canopy cover
 - Provide data and resources
 - Improve regulations
 - Convene partners
 - Consider equity and health



CLIMATE 2050 Roadmap

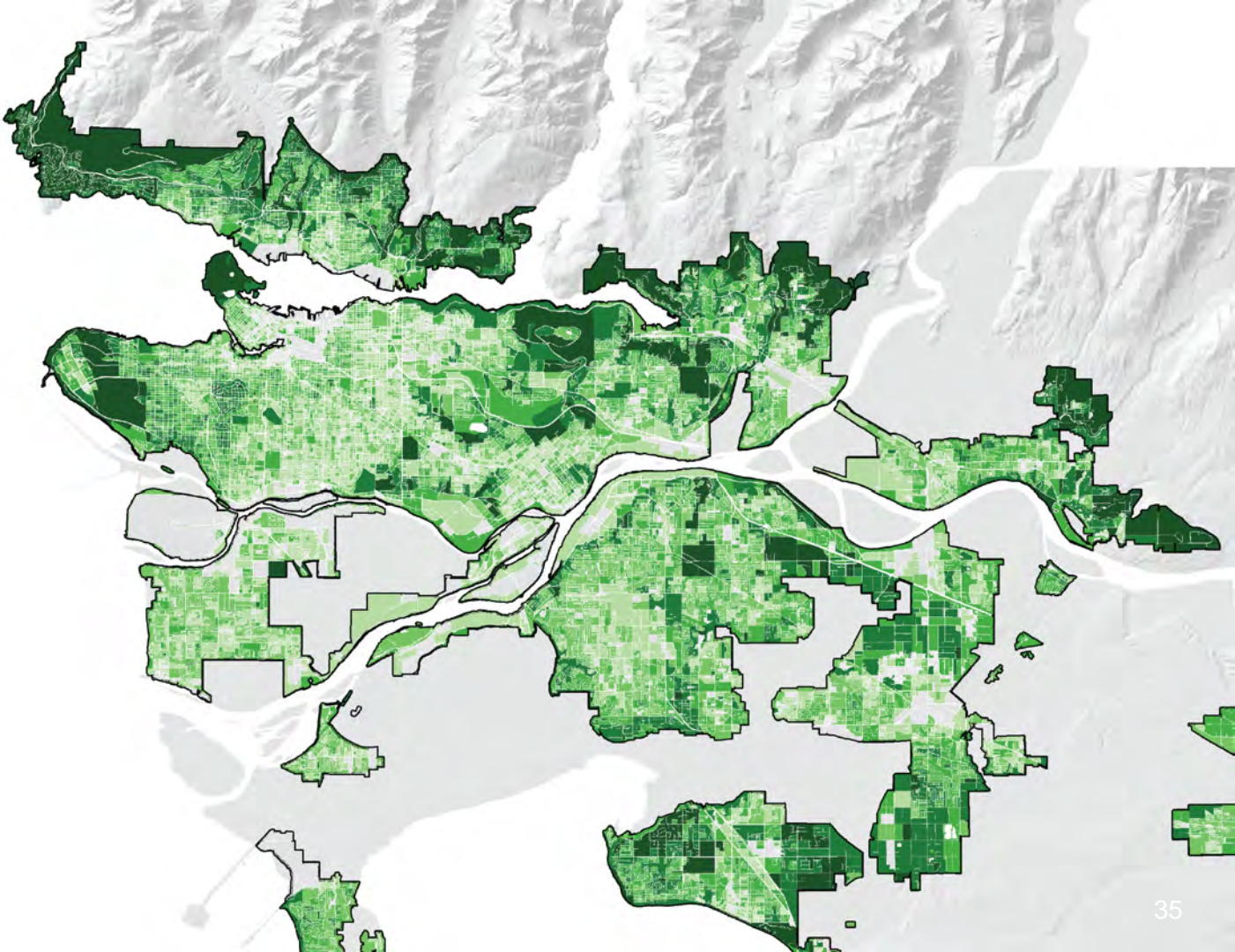
Nature & Ecosystems

A pathway to storing carbon and building a resilient future

with Nature and Ecosystems in Metro Vancouver

April 2023

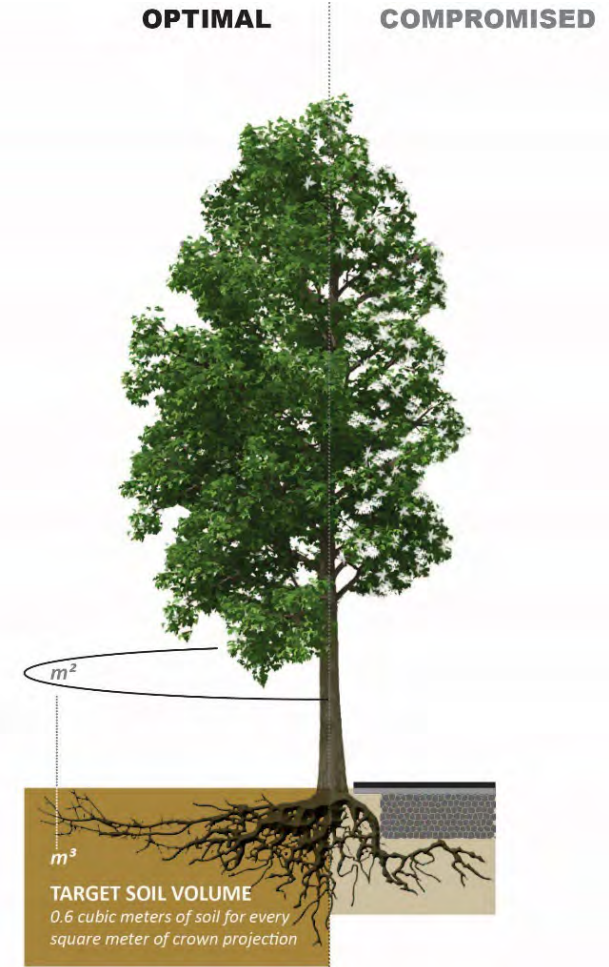
Tree canopy cover within the Urban Containment Boundary



A SYSTEM UNDER STRESS

Sources of Continuous Stress

- Below ground
 - Soil volume, soil quality, utilities
- At ground
 - Permeability
- Above ground
 - Utilities, structures



REGIONAL CLIMATE CHANGE IMPACTS

- Climate projections
 - Hotter, drier, extended summers
 - Warmer winters, reduced snowpack
 - More extreme rainfall events
- Impacts to ecosystems
 - Natural and urban forests



IMPACTS ON FORESTS

- Heat and drought can stress plants and trees
- Wildfire
- Soils affected by storms and increased precipitation
- Pests and diseases



Ecosystem Services Provided by Trees





URBAN FORESTS IN A CHANGING CLIMATE

- Provide ecosystem services, including climate adaptation **BUT**
- Must be healthy and resilient to provide these services
- Guidance was needed

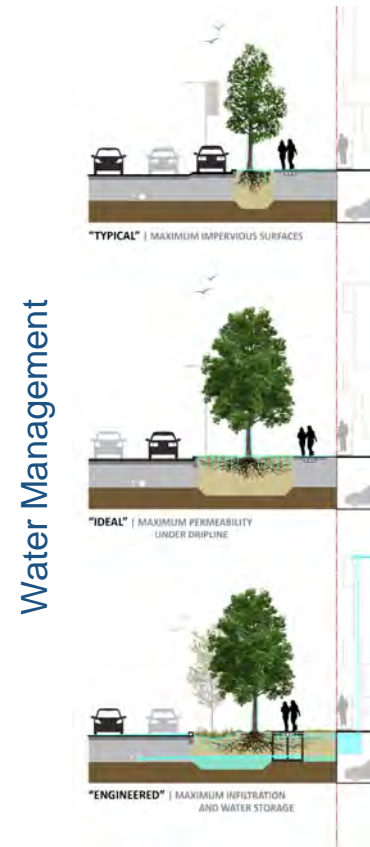
URBAN FOREST CLIMATE ADAPTATION INITIATIVE

- Goal: urban forest planning and management considers climate change
- Useful to a range of practitioners
- 4 outputs
 1. Framework
 2. Species selection database
 3. Design guidebook
 4. Urban tree list



1. URBAN FOREST CLIMATE ADAPTATION FRAMEWORK

- Purpose:
 - Assess current vulnerabilities, identify future risks
 - Develop tools to build resilience
- Management guidelines: Reduce vulnerability
- 3 key steps to help with species selection



2. DESIGN GUIDEBOOK

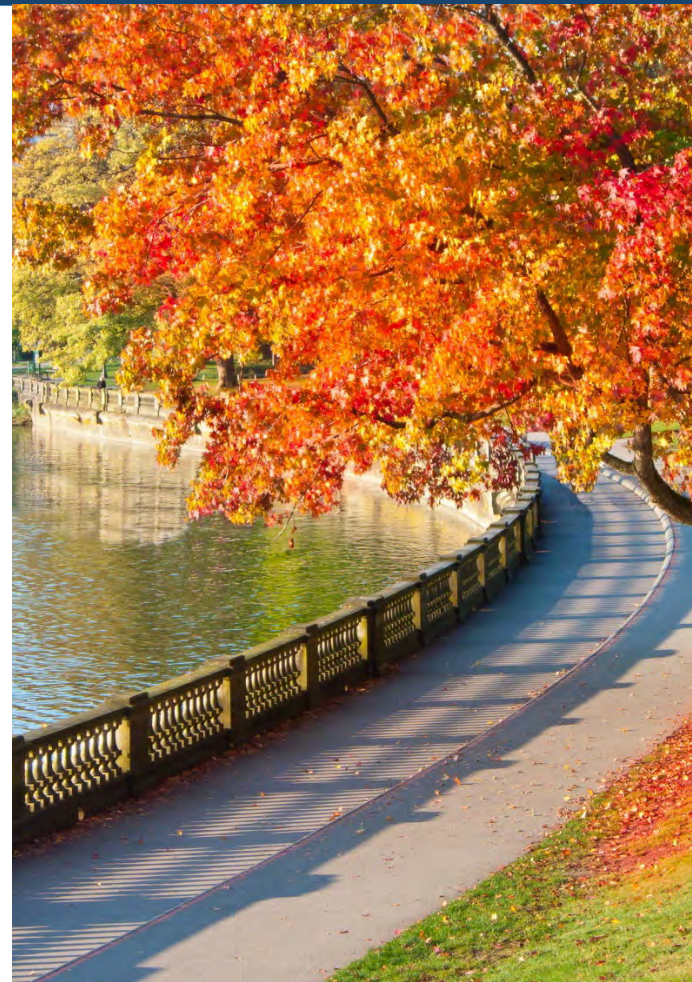


10 Parks + Playgrounds

Trees in recreational open space, school playing fields and play areas

3. SPECIES SELECTION DATABASE

- Expanded to 300 species
- Climate suitability
- Drought tolerance
- Practitioner comments



4. URBAN TREE LIST

Urban Tree List for Metro Vancouver in a Changing Climate

The list of over 300 tree species below are from the Metro Vancouver Urban Forest Climate Adaptation Initiative's tree species selection database. These species have been assessed for their suitability to the current and projected future climate in the Metro Vancouver region.

This list is intended to be used as a guide to inform decision-making by local practitioners rather than a prescriptive planting list.

All project materials are available publicly on the Metro Vancouver website. Please visit metrovancover.org and search 'Urban Forest'.

VERY SUITABLE = species anticipated to tolerate a broad range of sites under future climate

Arbutus menziesii	Cupressus arizonica *•	Koelreuteria bipinnata *•	Pinus nigra	Quercus garryana
Albizia julibrissin *	Cupressus macrocarpa *	Koelreuteria paniculata *	Pinus pinea *•	Quercus ilex •
Arbutus unedo	Cupressus sempervirens	Lagerstroemia x 'tuscaraora'•	Pinus ponderosa	Quercus imbricaria •
Calocedrus decurrens *	Cupressus x leylandii	Maackia amurensis •	Pinus sylvestris *	Quercus macrocarpa
Catalpa speciosa *	Eucommia ulmoides	Maclura pomifera *•	Pinus thunbergii *	Quercus shumardii
Cedrus deodara *	Ficus carica *	Notholithocarpus densiflorus	Pistacia chinensis	Quercus suber •
Celtis occidentalis *	Fraxinus ornus	Nyssa sinensis	Prunus dulcis •	Quercus virginiana •
Celtis sinensis •	Ginkgo biloba	Olea europaea *•	Pyrus calleryana *	Rhus typhina
Cercis canadensis	Gleditsia triacanthos	Phellodendron amurense *	Pyrus pyrifolia •	Sorbus aria
Cotinus coggygria	Gymnocladus dioicus	Pinus banksiana	Quercus acutissima *	Ulmus propinqua •
Crataegus crus-galli	Juglans major •	Pinus contorta	Quercus agrifolia •	
Crataegus x lavalleei	Juniperus chinensis	Pinus flexilis	Quercus alba	
Crataegus x mordenensis	Juniperus virginiana *	Pinus mugo	Quercus coccinea	

RELATED WORK

- Tree Canopy Cover and Impervious Surfaces Report
- Metro Vancouver Tree Regulations Toolkit



Regional Tree Canopy Cover and Impervious Surfaces

Analysis of Tree Canopy Cover and Impervious Surfaces in Metro Vancouver




GROW GREEN GUIDE

growgreen

Pick a Plant Designs of All Sizes Lush Lawns Resources About


A Guide to Eco-Friendly Lawns and Gardens in Metro Vancouver

Grow Green is your guide to creating and maintaining a sustainable garden or lawn space.

Search... 


Find the Right Plant

Browse our collection of plants to find the best choices for your lawn or garden

 Find Plants

Design Your Space

Find personalized design ideas that meet your gardening goals and fit your space

 Pick Designs

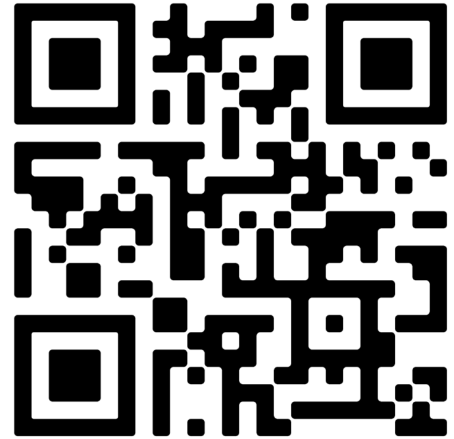
RESOURCES

www.metrovancouver.org

Search “**urban forest**”

- Tree Regulations Toolkit
- Urban Forest Climate Adaptation Framework
- Design Guidebook
- Tree Species Selection Database
- Urban Tree List
- Workshop Summary
- Tree Canopy Cover Report

www.growgreenguide.ca





Questions?

metrovancouver
Together we make our region strong