

Implications of Rising Sea Levels and a Lower Mainland Flood Management Strategy

Environmental Managers Association of BC – Vancouver, BC



Presented by: Fraser Basin Council – November 16, 2017



Over
14,500

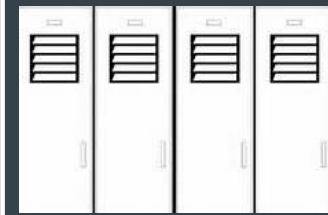
HOMES DAMAGED



The Alberta
Experience
2013
\$6 B in
losses



10
HEALTH
FACILITIES
DAMAGED



80
SCHOOLS
DAMAGED



100,000

PEOPLE EVACUATED



3,000

BUSINESS AFFECTED



30

COMMUNITIES IMPACTED



985
KM

ROADS CLOSED



Lower Mainland Flood Management Strategy

Aims to reduce flood vulnerabilities and increase flood resilience for communities and ecosystems along the Lower Fraser River and south coast:

- Hope to the Salish Sea
- Squamish to White Rock
- Fraser River freshet (spring flood)
- Coastal storm surge (winter flood)



Lower Mainland Flood Management Strategy: Roles

Fraser Basin Council

- Facilitator, coordinator, administrator

Partners

- Funding, data, advice and expertise
- Other key work in parallel



Who is collaborating? 44 Partners +

Government of Canada

Province of BC

Emergency Management BC
Min. of Forests, Lands and Natural
Resource Operations
Min. of Transportation and
Infrastructure
Min. of Environment

Other Regional Interests

Greater Vancouver Gateway
Council
BC Wharf Operators Association
Canadian National Railway
Canadian Pacific Railway
Insurance Bureau of Canada
Pacific Institute of Climate
Solutions
Port Metro Vancouver
Simon Fraser University (ACT)
TransLink
Trans Mountain
Vancouver International Airport
Authority
BC Agriculture Council

Who is collaborating? 44 Partners +

City of Abbotsford

Village of Belcarra

City of Burnaby

Bowen Island Municipality

City of Chilliwack

City of Coquitlam

Corporation of Delta

Fraser Valley Regional District

District of Hope

District of Kent

Township of Langley

Village of Lions Bay

District of Maple Ridge

District of Mission

City of New Westminster

City of North Vancouver

District of North Vancouver

City of Pitt Meadows

City of Port Coquitlam

City of Port Moody

City of Richmond

District of Squamish

City of Surrey

City of Vancouver

Metro Vancouver

District of West Vancouver

City of White Rock

Phase 1 of the Strategy (2014-2016)

Building a better understanding of:

- Flood hazards
- Flood vulnerabilities
- Flood protection infrastructure, policies and practices



Phase 2 and 3 of the Strategy (2016-2018)



Developing a regional action plan:

- National, provincial, regional, local priorities
- Recommended management options for diverse local circumstances
- Recommendations for secure, sustainable funding
- Through engagement, dialogue and consultation supported by science and technical analysis



Phase 3 – Implementation

Lower Mainland Flood Management Strategy

Coastal Flood Scenarios Map

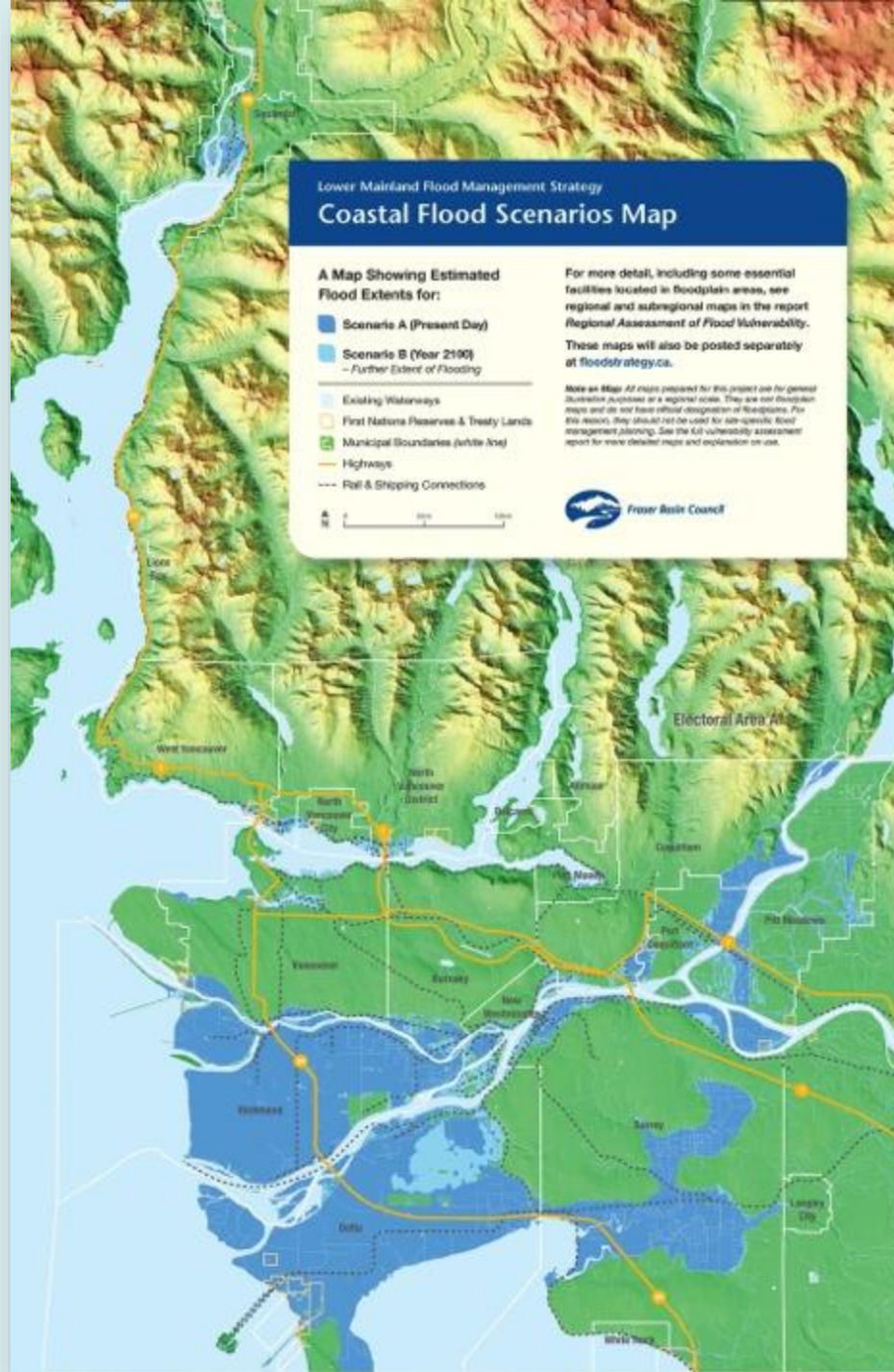
A Map Showing Estimated Flood Extents for:

-  Scenario A (Present Day)
-  Scenario B (Year 2100)
- Further Extent of Flooding
-  Existing Waterways
-  First Nations Reserves & Treaty Lands
-  Municipal Boundaries (white line)
-  Highways
-  Rail & Shipping Connections



For more detail, including some essential facilities located in floodplain areas, see regional and subregional maps in the report *Regional Assessment of Flood Vulnerability*. These maps will also be posted separately at floodstrategy.ca.

Note: All maps prepared for this project are for general illustrative purposes at a regional scale. They are not floodplain maps and do not have official designation of floodplains. For this reason, they should not be used for site-specific flood management planning. See the full vulnerability assessment report for more detailed maps and explanation on use.




Lower Mainland Flood Management Strategy

Fraser River Flood Scenarios Map


A Map Showing Estimated
Flood Extents for:


 Scenario C (Present Day)

 Scenario D (Year 2100)
– Further Extent of Flooding

 Existing Waterways

 First Nations Reserves & Treaty Lands

 Municipal Boundaries (white line)

 Highways

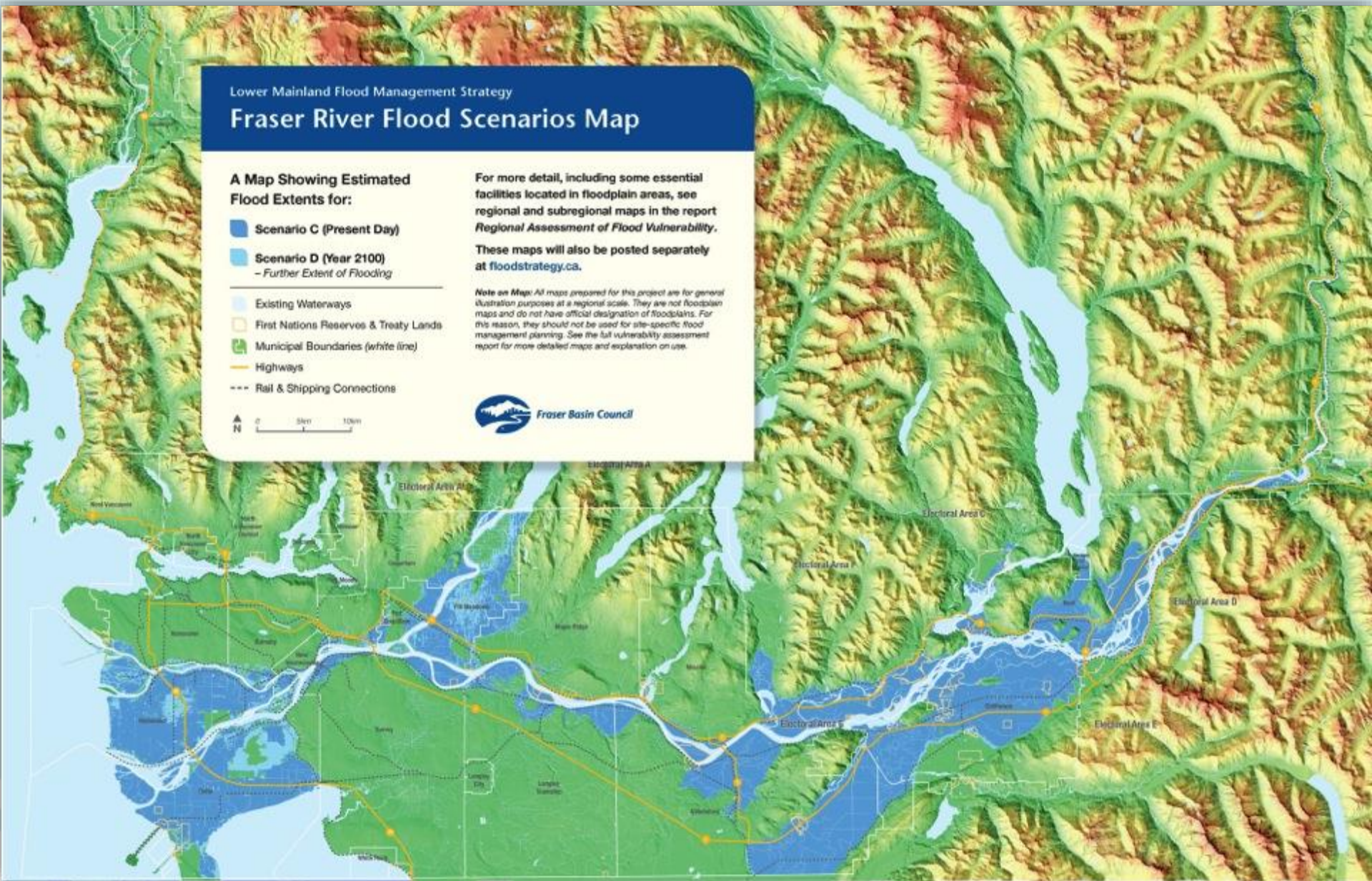
 Rail & Shipping Connections

 N
 0 5km 10km

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Regional Assessment of Flood Vulnerabilities



4 major flood scenarios assessed:

- 2 coastal & 2 Fraser River – Present Day & 2100

Flood-related direct losses & indirect economic losses related to:

- People and communities
- Residential, commercial and public/institutional buildings
- Select infrastructure
- Agriculture
- Cargo shipping delays

Regional Assessment of Flood Vulnerabilities

Present Day flood scenarios expected losses

- \$19.3 B (coastal flood)
- \$22.9 B (Fraser River flood)

Year 2100 flood scenarios estimated higher, totaling:

- \$24 B (coastal flood)
- \$ 32.7 B (Fraser River flood)
- Year 2100 scenarios are most costly because of deeper floodwaters and wider flood extent



Regional Assessment of Flood Vulnerabilities

Inter-dependencies – Infrastructure damage and disruption (e.g. hydro) impacts other infrastructure, services, people and businesses (e.g. supply chains)

Regional significance – infrastructure vulnerability makes flood risk a regional issue

Everyone in the region will likely be impacted one way or another



What about the Environment?

Environmental impacts of a large flood:

- Floods are natural processes
- Many habitats have formed and many species have evolved with these natural processes

However . . .

- Mobilization of numerous contaminants located on the floodplain (hazardous materials, fuels, agricultural chemicals, manure, livestock mortality, etc.)
- Degraded quality of water and land (incl. groundwater)
- Scouring of habitats
- Coastal habitat squeeze with sea level rise

What about the Environment?

Environmental impacts of flood mitigation practices:

- Riverbank dikes and erosion protection can degrade the quality & biodiversity of the foreshore & riparian areas
- Diking systems, pumps, & flood gates disrupt connectivity and fish passage between the Fraser River / Salish Sea and streams, sloughs, and side channels – with impacts on water quality and the mix of native vs. invasive species
- Pumps can cause direct fish mortality
- Dredging can impact fish and fish habitat
- Historic impacts such as the draining of Sumas Lake and the diversion of the Chilliwack River to the Vedder Canal

What about the Environment?

Integrating the environment within the Flood Strategy:

- Environmental Advisory Committee
- Collating best available data on environmental values, features and functions
- Research on environmentally sensitive approaches to flood mitigation
- Work to clarify understanding on environmental regulatory review and approval processes
- Learning events such as workshops, webinars and field tours

Thank You! For more information:
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