Local Governments
for Sustainability
Les gouvernements locaux
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CANADA

Coastal Adaptation in Practice: Lessons from Vancouver and Nanaimo

Slide decks presented by City of Vancouver and City of Nanaimo



Sea2City Design Challenge Project snapshot

June 2026









The City of Vancouver is on the unceded traditional territory of the Musqueam, Squamish and Tsleil-Waututh First Nations.

These lands are the foundation of thousands of years of living culture of the Musqueam, Squamish and Tsleil-Waututh peoples.

We acknowledge hən̓q̓əmiń əm̓ and Sḵwxwú7mesh as the original languages of these lands.

Today's Agenda

- **The Challenge**
- **False Creek**
- **Sea2City Design Challenge & values-based planning**
- **Outcomes and outputs**
- **Q+A**



What’s the Challenge?

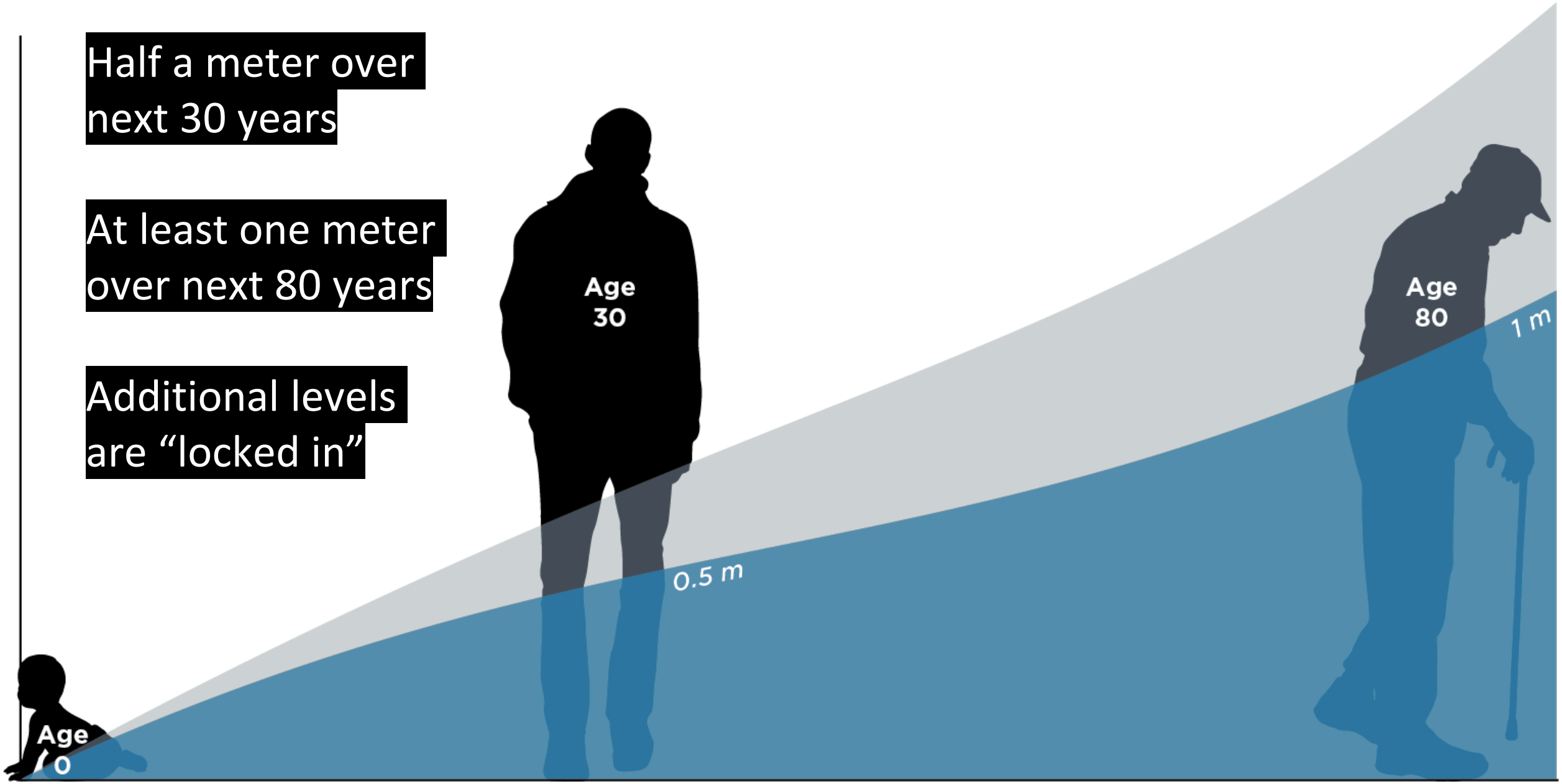
Sea level rise, coastal flooding and overland flooding



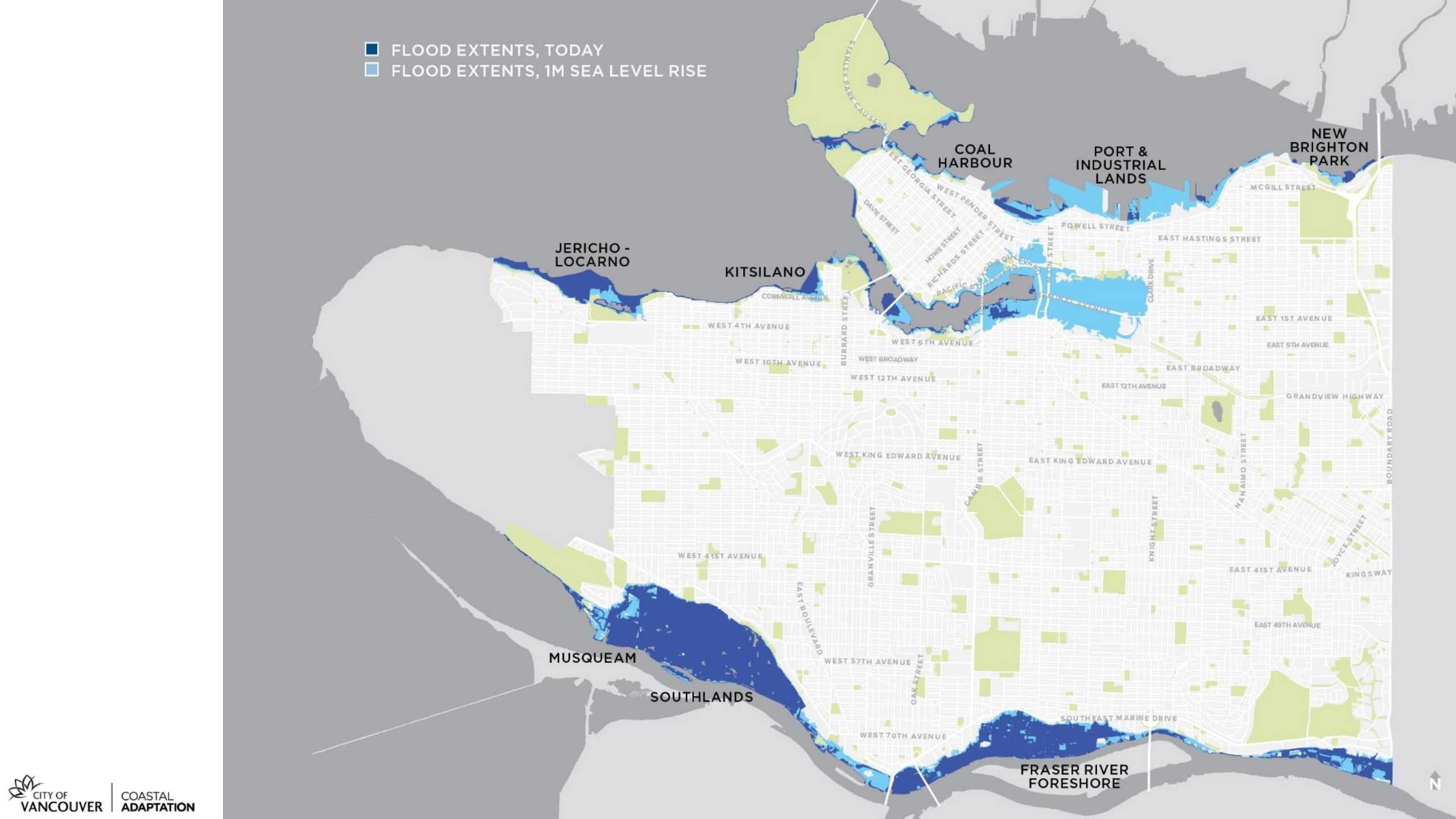
Half a meter over next 30 years

At least one meter over next 80 years

Additional levels are “locked in”



CITY OF VANCOUVER | COASTAL ADAPTATION



CITY OF VANCOUVER | COASTAL ADAPTATION

False Creek

A much-loved urban waterway in the heart of the city



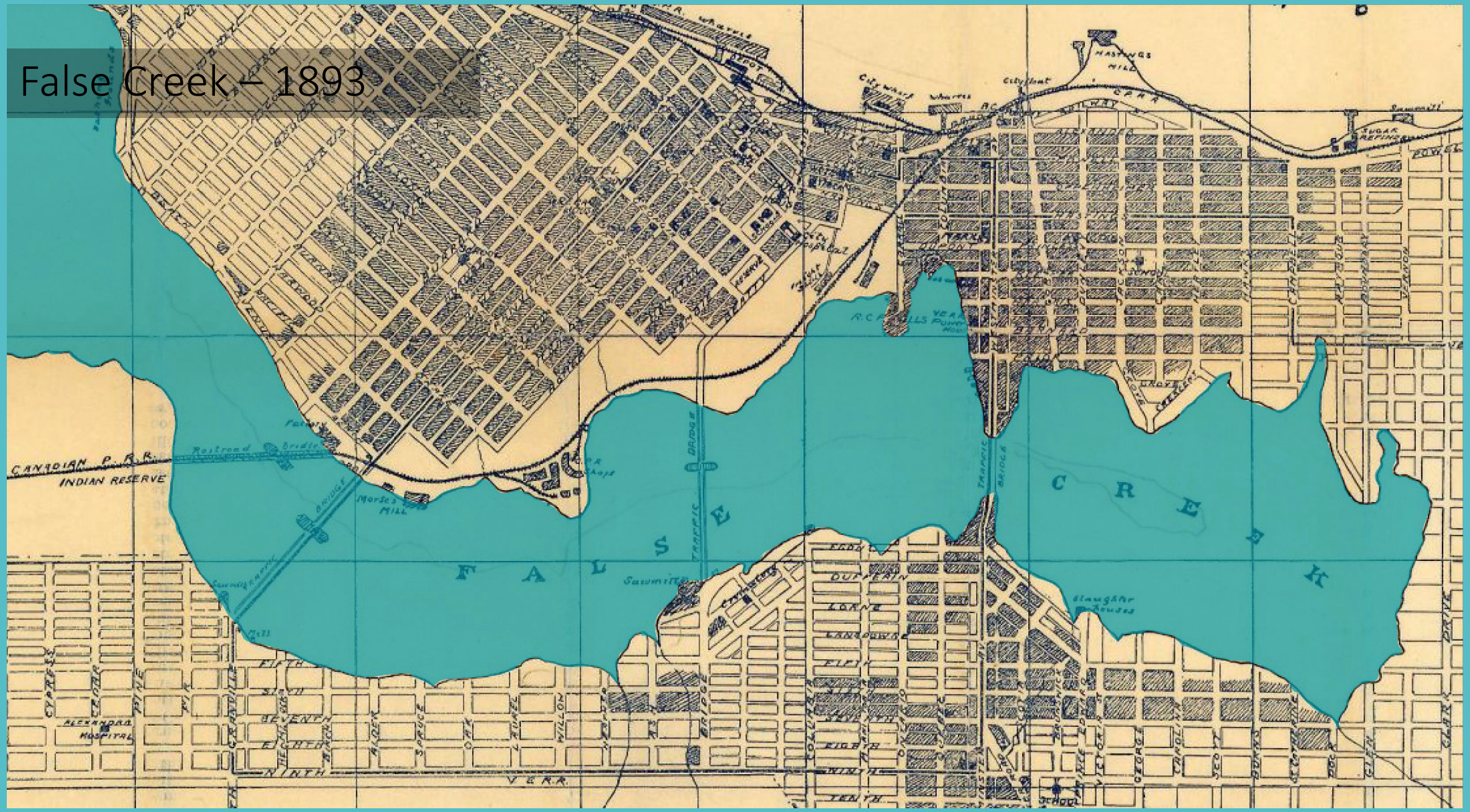








False Creek – 1893



False Creek – 1m SLR, 1:500 storm



Values based planning

Responding to climate change in a way that reflects what matters to community



A Decade of Coastal Adaptation Planning



2012+

Mapping and flood modeling



2018

Coastal Adaptation Plan – Fraser River Foreshore



2020

Coastal Adaptation Plan – False Creek



2021/2022

Sea2City DESIGN CHALLENGE



Sea2City DESIGN CHALLENGE

A collaborative design competition

- ✓ Increase public awareness of sea level rise and coastal flooding
- ✓ Explore and develop a coastal adaptation approach that centres reconciliation with Host Nations
- ✓ Examine options for sea level rise of at least two metres
- ✓ Inform next phase of Vancouver's Coastal Adaptation Plan

Community Values – False Creek



Communities, People, and Homes



Health and Safety



Infrastructure and Transportation



Environment



Local and Regional Economy



Arts, Culture, and Heritage



Recreation



Indigenous Knowledge Value

- Musqueam, Squamish, and Tsleil-Waututh have the right to maintain, control, protect and develop their cultural heritage, traditional knowledge, and cultural expressions as they see fit.
- Musqueam, Squamish, and Tsleil-Waututh history, presence, and culture in and around False Creek is highly valued but could be better shared and celebrated as the Nations see fit.
- Acknowledgement and conservation of archeological sites and objects as well as historic places and objects.
- Learning from Indigenous environmental efforts and projects that are leading the way in understanding and revitalizing local ecosystems and their processes. This work should guide current environmental efforts and projects.
- Support the environmental restoration and remediation of the shoreline and lands of False Creek. This may include daylighting historical creeks where appropriate.
- Support Indigenous use of the waterfront.
- Desire to see knowledge and design elements from Indigenous peoples incorporated into any future coastal flood adaptation work.

RFP Language

Team make up

In terms of other relevant specialists, the City strongly encourages but does not require inclusion of the following expertise and team composition:

- Indigenous perspectives rooted in the experience of Musqueam, Squamish and Tsleil-Waututh First Nations;

General language

The City strongly encourages Proponents:

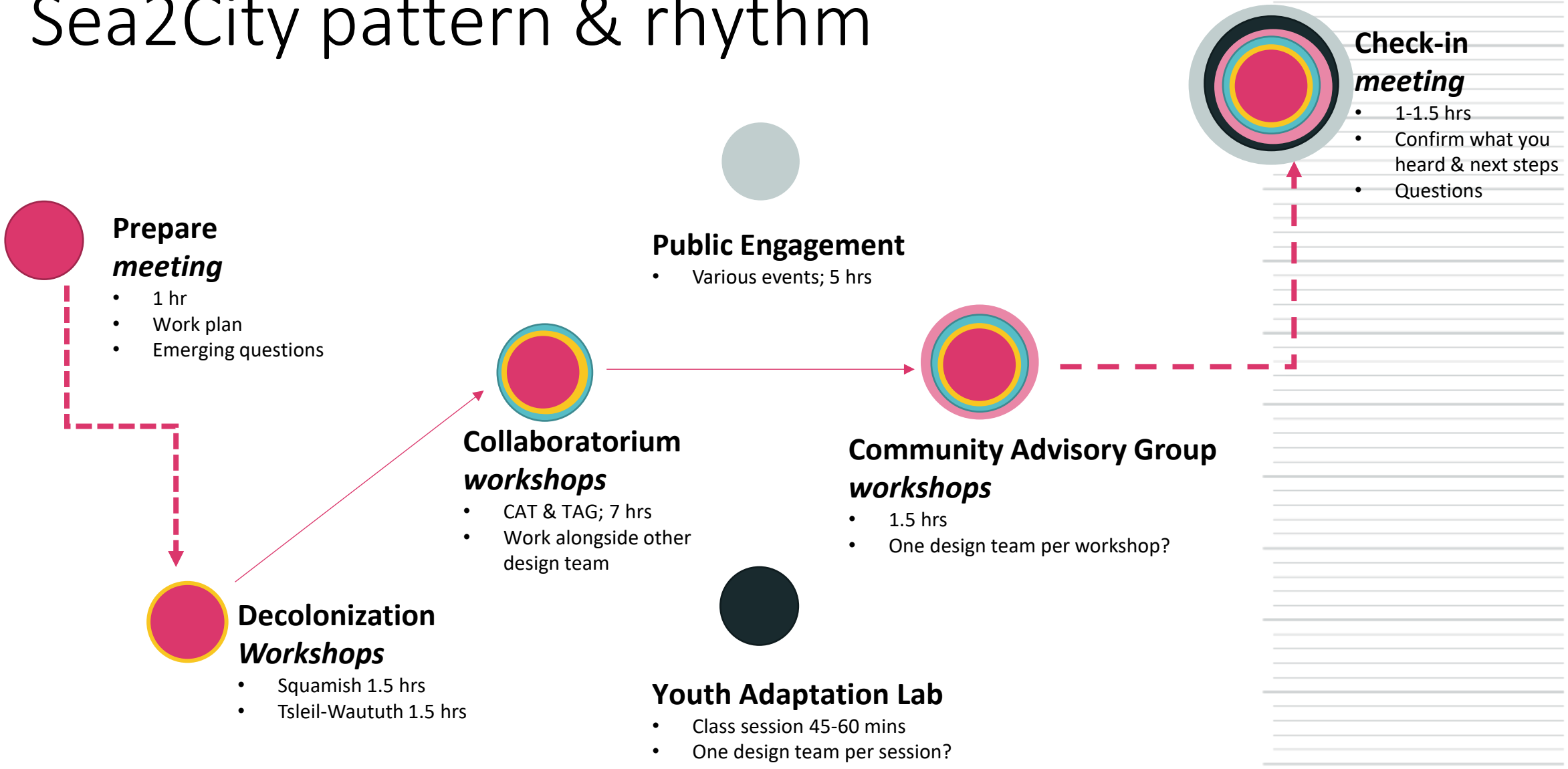
- to include different perspectives on their team. This may include Indigenous people, youth, people with disabilities, and people with working experience outside of Canada; and
- to provide opportunities for people from equity seeking communities on their team and to credit and compensate them appropriately.

Questionnaire

Decolonization & Indigenous Perspectives

- What does decolonization mean to the team?
- Why does decolonization matter to the team?

Sea2City pattern & rhythm



SFU Centre for Dialogue – June 2022







Youth Adaptation Lab: adaptation & civic literacy





Engagement: interdisciplinary learning and collaboration

















straight EVENTS GUIDES

ARTS FILM & TV FOOD & DRINK MUSIC NEWS GOLDEN PLATES BEST OF VAN LIVING

LIVING »

Sea2City Design Challenge teams with Theatre Replacement to put an arts-focused emphasis on climate change





Sea2City Outputs

The project produced a range of planning and technical outputs



- Vision
- Commitments
- Adaptation approach language
- Site concepts
- Pilot projects

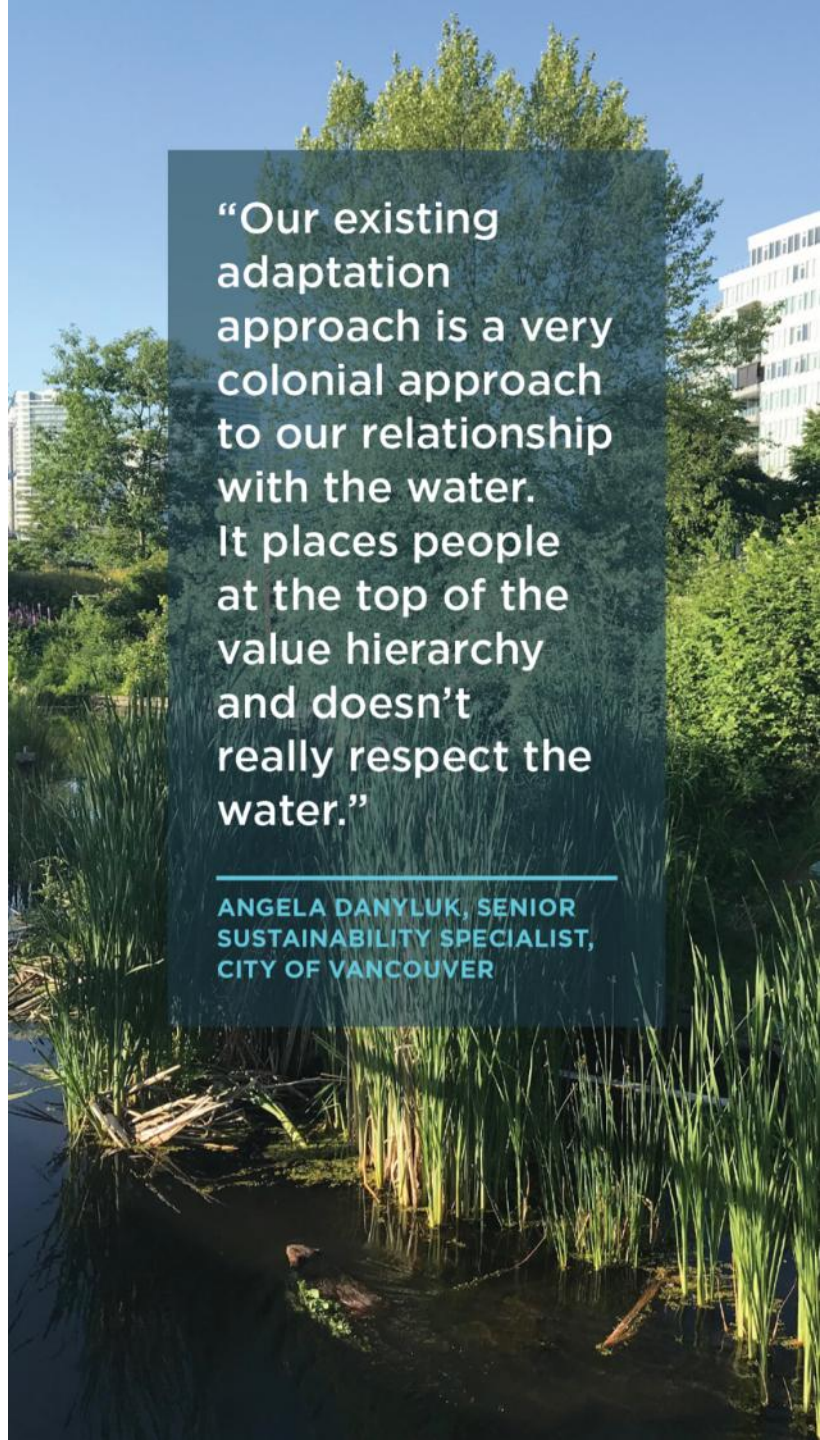


CONVENTIONAL APPROACH

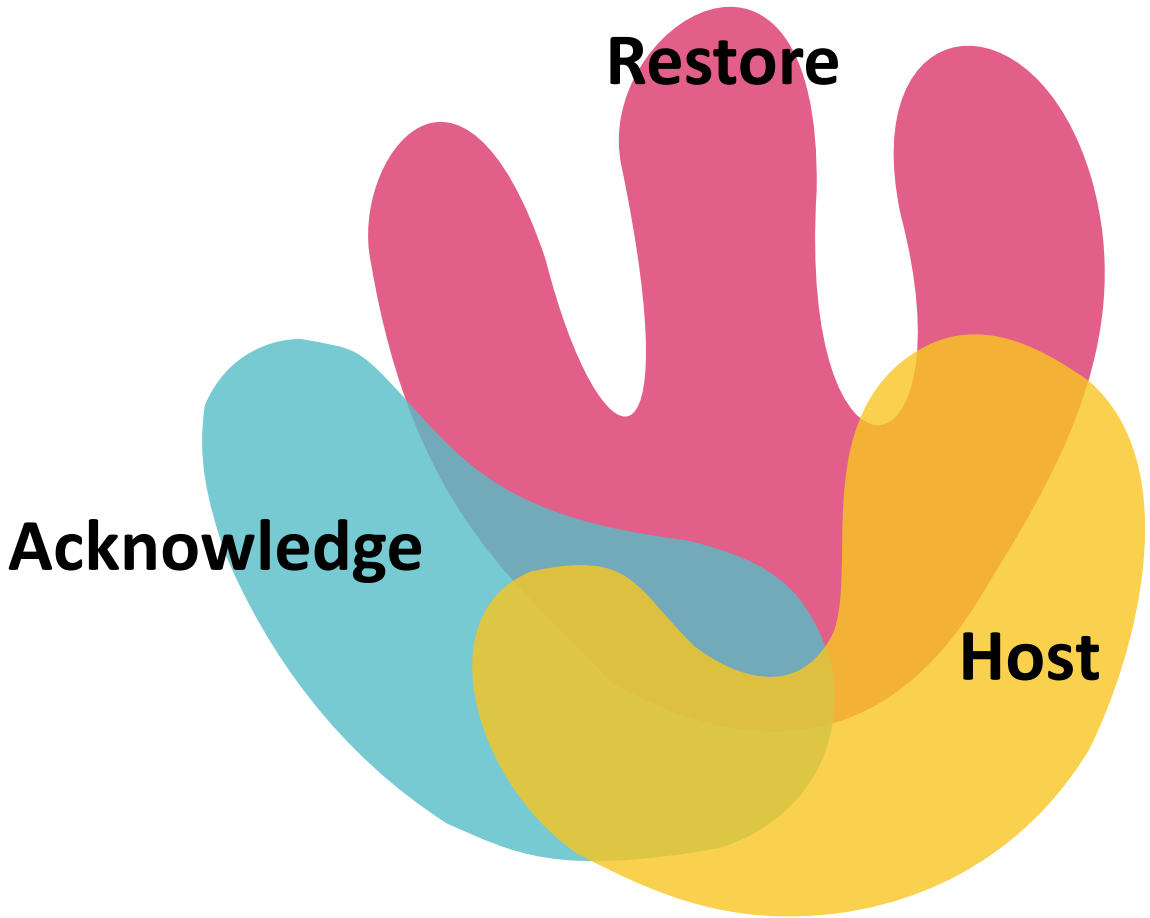
Resist

Accommodate

Move/Avoid



NEW APPROACH



ACKNOWLEDGE

Spaces are retrofitted or relocated over time to improve their resilience and better care for and steward natural systems.

HOST

A dynamic place where water, nature, and culture are welcomed and stewarded. Human uses are flexible, adaptable, and leave a light-touch. Infrastructure works with nature to enhance resilience.

RESTORE

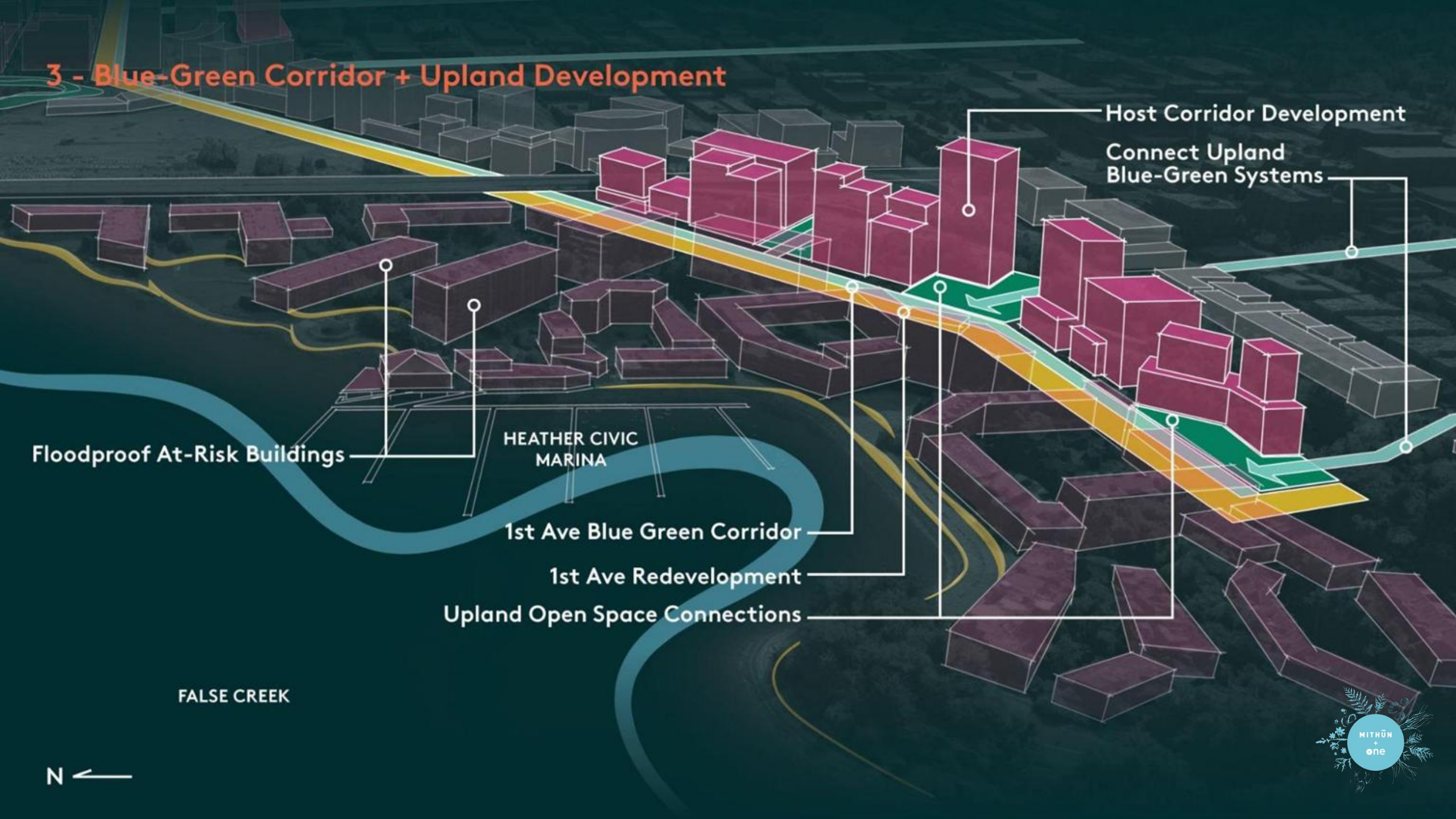
A revitalized and rehabilitated shoreline that restores natural functions, features, and ecosystems and includes improved flood protection for upland communities.

A FUTURE VISION

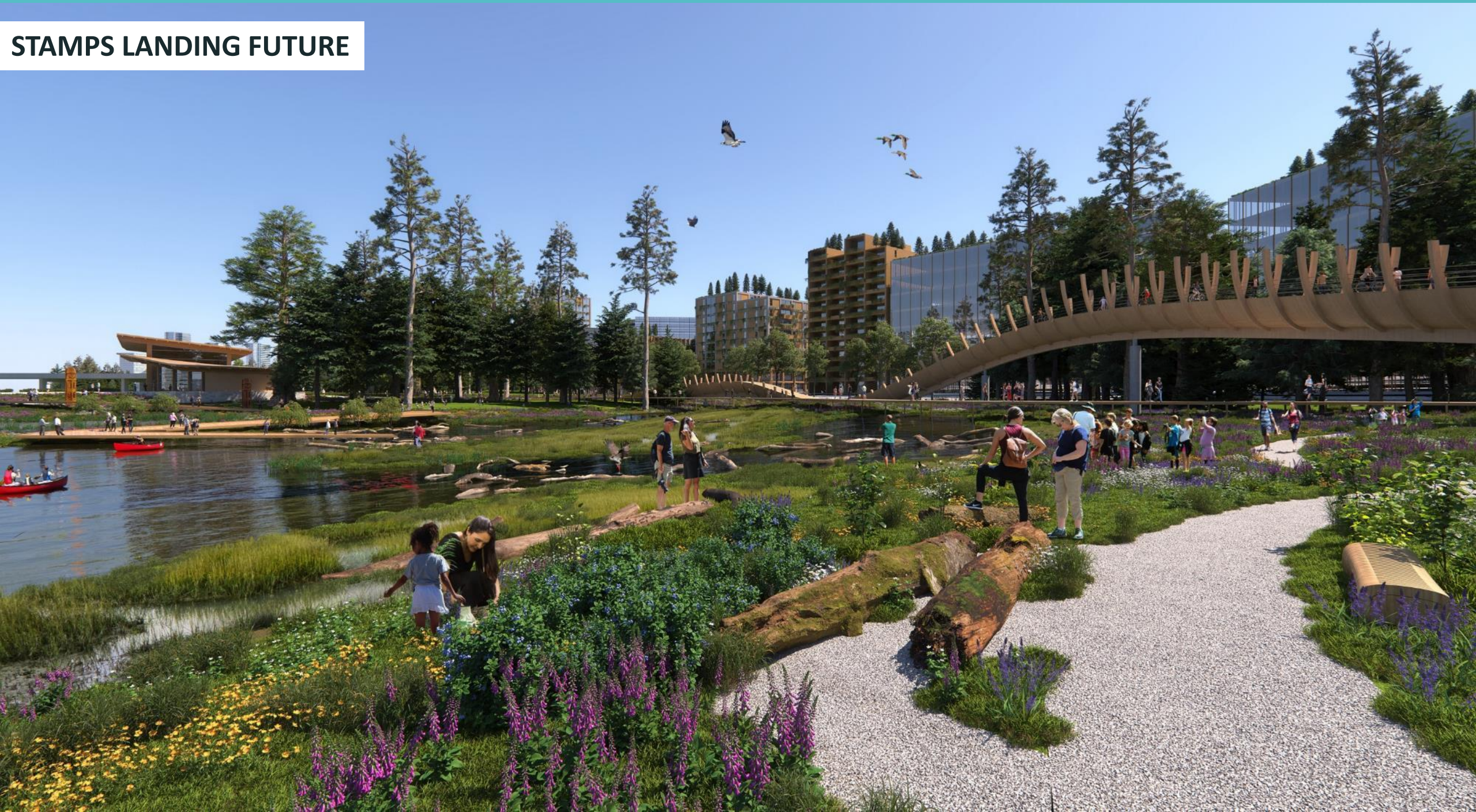
The Salish Sea has risen, and False Creek has transformed. The area remains a vibrant and much-loved place. The naturalized shoreline is a healthy and safe place for people to connect with the water.




EXISTING GRADE
Flood Construction Level (4.6m)
2100 1M+500yr (3.94m)
2100 King Tide 2.9m
2100 High Tide 2.3m
King Tide (1.9m)
High Tide (1.3m)
2100 Mean Water Level 0.9m
Mean Water Level (-0.1m)


3 - Blue-Green Corridor + Upland Development
Host Corridor Development
Connect Upland
Blue-Green Systems
Floodproof At-Risk Buildings
HEATHER CIVIC
MARINA
1st Ave Blue Green Corridor
1st Ave Redevelopment
Upland Open Space Connections
FALSE CREEK
N

STAMPS LANDING FUTURE



Coopers Tidal Terrace

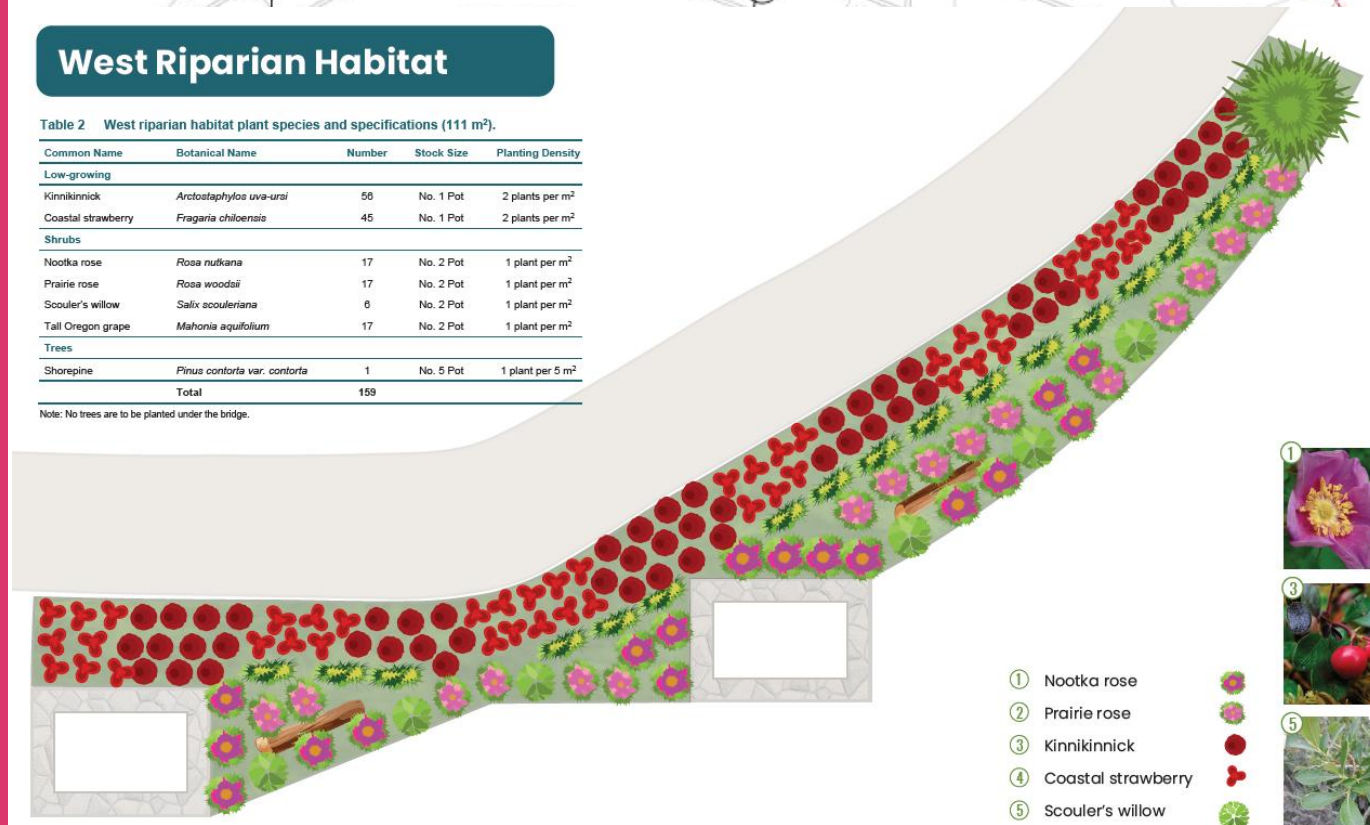
- Converting 150 m of seawall to a terraced design
- Pollinator garden
- Riparian area
- Access to the water
- Construction: 2026-2027

West Riparian Habitat

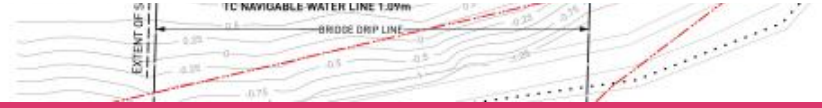
Table 2 West riparian habitat plant species and specifications (111 m²).

Common Name	Botanical Name	Number	Stock Size	Planting Density
Low-growing				
Kinnikinnick	*Arctostaphylos uva-ursi*	56	No. 1 Pot	2 plants per m²
Coastal strawberry	*Fragaria chiloensis*	45	No. 1 Pot	2 plants per m²
Shrubs				
Nootka rose	*Rosa nutkana*	17	No. 2 Pot	1 plant per m²
Prairie rose	*Rosa woodsii*	17	No. 2 Pot	1 plant per m²
Scouler's willow	*Salix scouleriana*	6	No. 2 Pot	1 plant per m²
Tall Oregon grape	*Mahonia aquifolium*	17	No. 2 Pot	1 plant per m²
Trees				
Shorepine	*Pinus contorta var. contorta*	1	No. 5 Pot	1 plant per 5 m²
	Total	**159**		

Note: No trees are to be planted under the bridge.



Hatfield



Lessons learned



- Amplify and center Indigenous peoples and perspectives
- Creating relationships takes time, plan to maintain them
- Plan for reciprocity: amplify other people's work, convene and build skills, pay for people's time
- Pay consultants to do new things like participate in reflection dialogues
- When engaging youth incorporate opportunities to build their professional skills and be coached by your consultants
- Work with creatives, designers, biologists and planners in addition to engineers

THANK YOU!



CITY OF NANAIMO
THE HARBOUR CITY

OUR COASTAL CITY

SEA LEVEL RISE MANAGEMENT PLAN

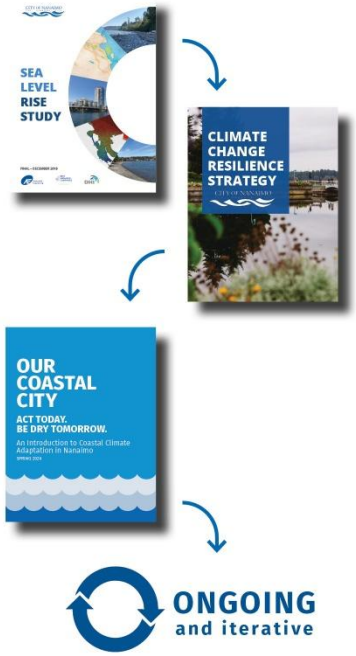
Dave Stewart – Environmental Planner

MAY 28, 2026



BUILDING OUR RESILIENCE

Highlights of Work Led by the City



Sea Level Rise Study (2018)

The Sea Level Rise Study was conducted to better understand potential coastal flooding vulnerabilities along the City's shorelines. It identified several low-lying areas along the coastline which are likely to be impacted by sea level rise.

Climate Change Resilience Strategy (2020)

The Climate Change Resilience Strategy built on the Sea Level Rise Study to identify a wider range of climate related vulnerabilities within the City and suggest best practice actions to address or avoid climate related risks.

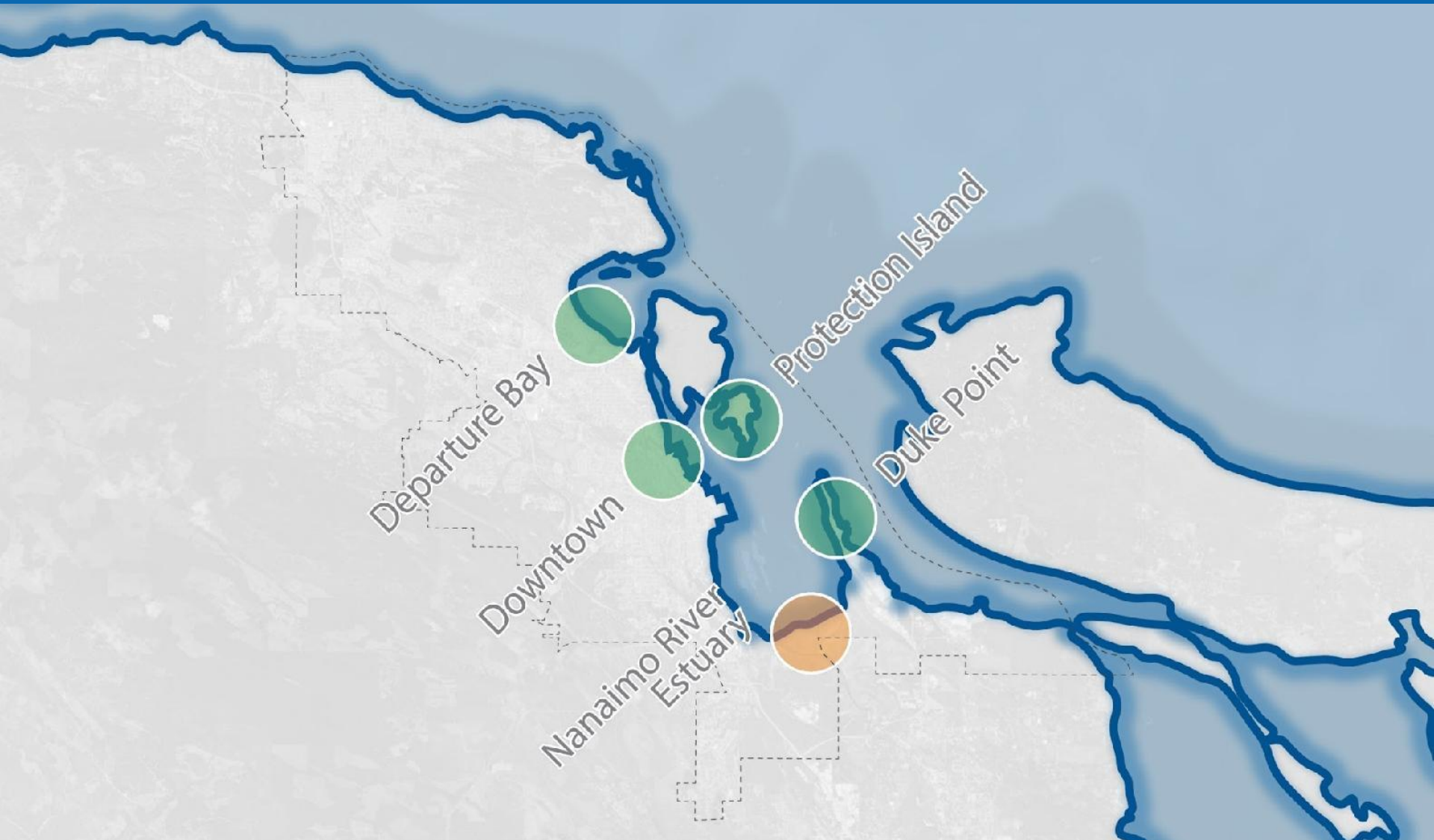
Our Coastal City (CURRENT)

We are exploring practical short- and long-term actions to reduce risk in key areas. The team is also conducting further modeling to refine likely impacts of sea level rise, as well as conduct an economic risk assessment of its impact in the City.

Implementation, Monitoring & Further Work (FUTURE)

Climate change impacts cannot be solved in a single plan or project. The City's work will be ongoing and adaptive, requiring collaboration across communities, governments, and interest holders. By building a strong knowledge base and decision-making structures now, we lay the foundation for long-term success in addressing sea level rise and coastal change.

AREAS OF FOCUS





WHAT IS AT RISK?

The **2018 Sea Level Rise Study** conducted a high-level investigation of potential flooding in the City

247 buildings
including homes, businesses, institutions, and offices

4 **high risk areas**
including Departure Bay, Duke Point, Protection Island, and areas of downtown

drainage systems
12,065 meters of pipe
121 manholes
147 outlets
2 reducers

sanitary systems
20,257 meters of pipe **160** manholes **8** pump stations

757
Number of lots affected

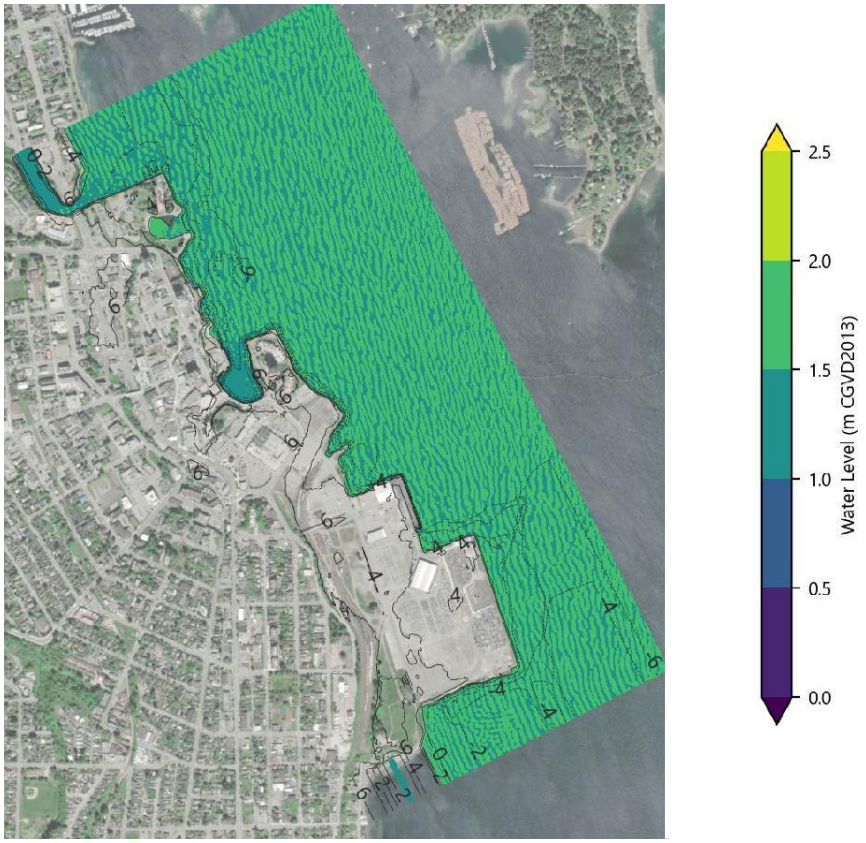
other potential utilities
like roads, telecom facilities, cables, and equipment

+ more (our future adaptation planning will include talking about what is most important)

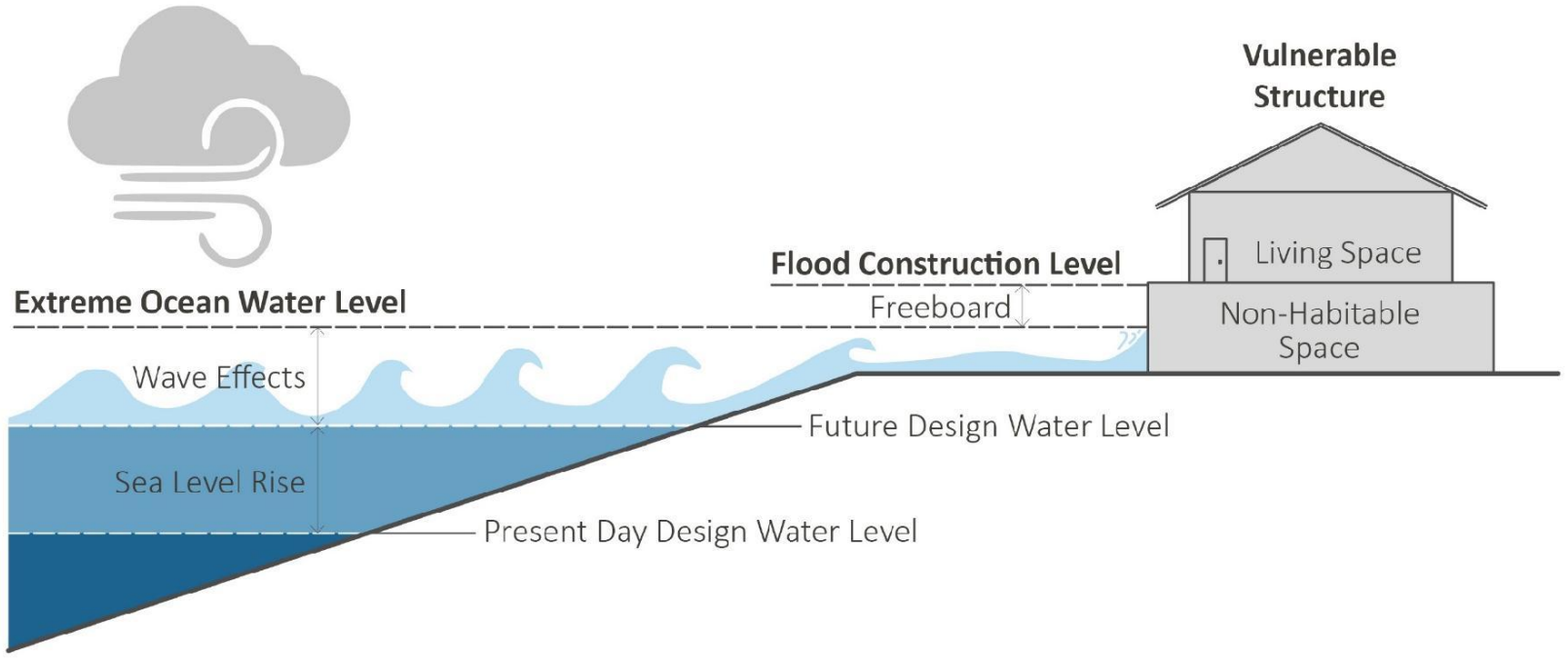
* Impacts from flooding that could occur by 2050 based on the City of Nanaimo Sea Level Rise Study, 2018. Sea Level Rise relative to the year 2000 was used, with +0.06m noted in 2018, +0.38m anticipated for year 2050, and +0.88m for year 2100.

Development of Floodplain Maps

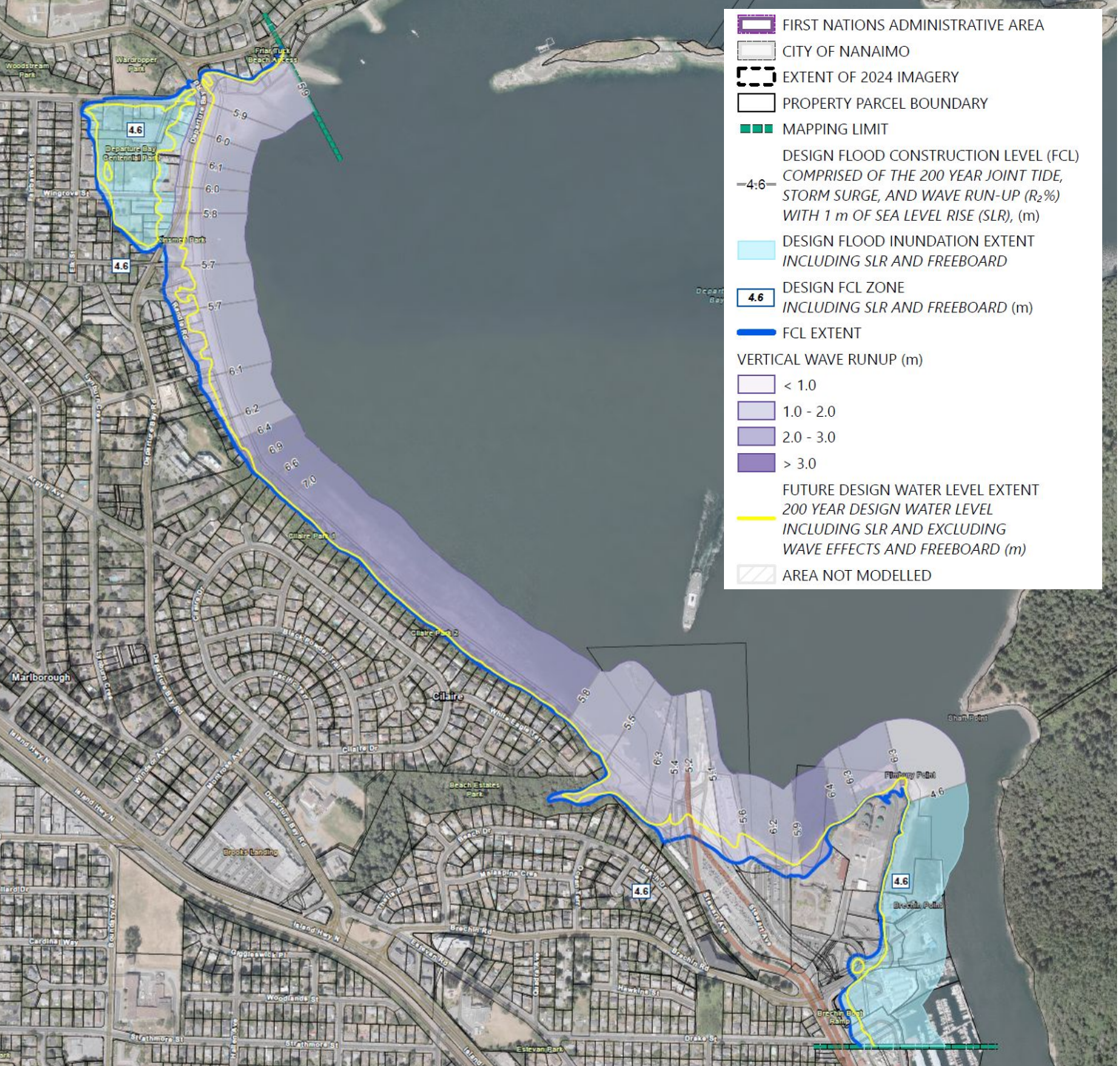
1. Joint Probability Analysis – to determine water level and waves
2. Regional Modelling
3. Nearshore Detailed Modelling
4. Floodplain Maps



Flood Construction Levels (FCLs)



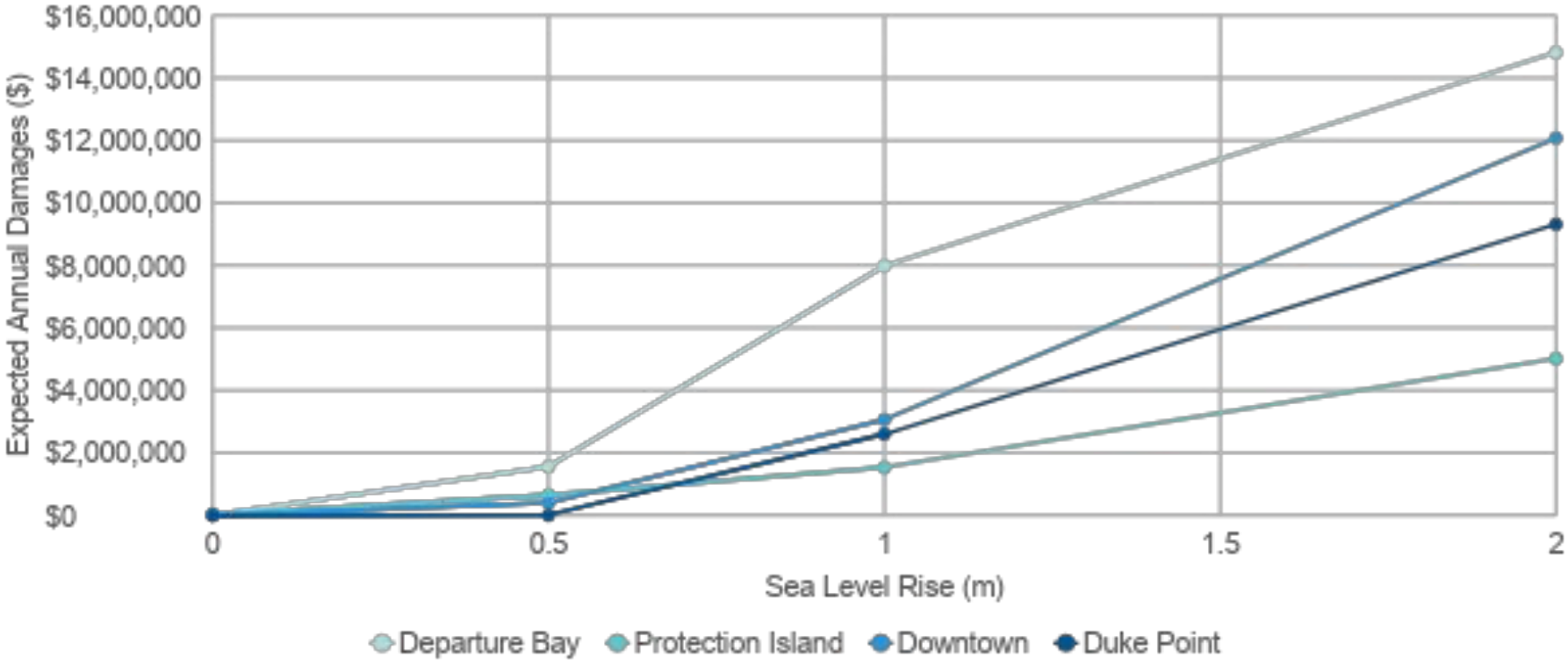
Departure Bay Floodplain Map



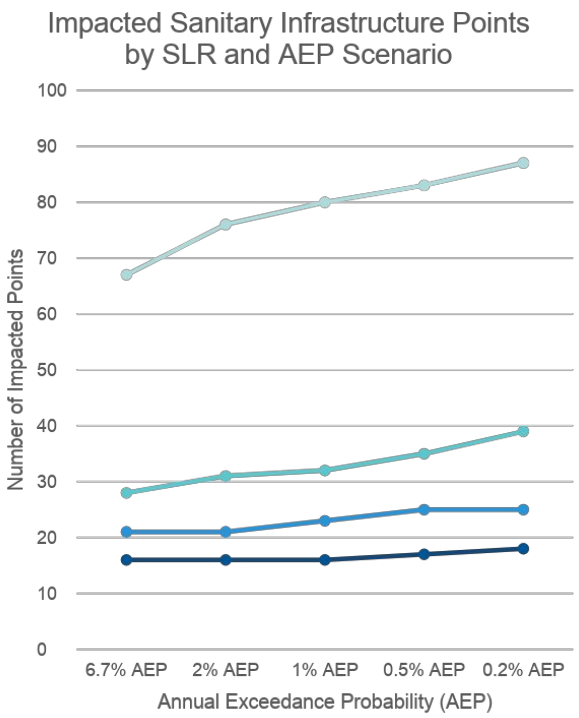
Downtown Floodplain Map

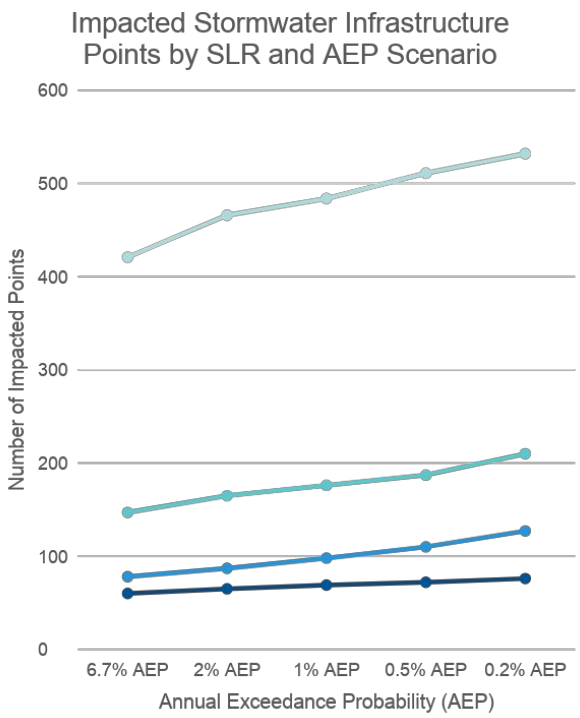


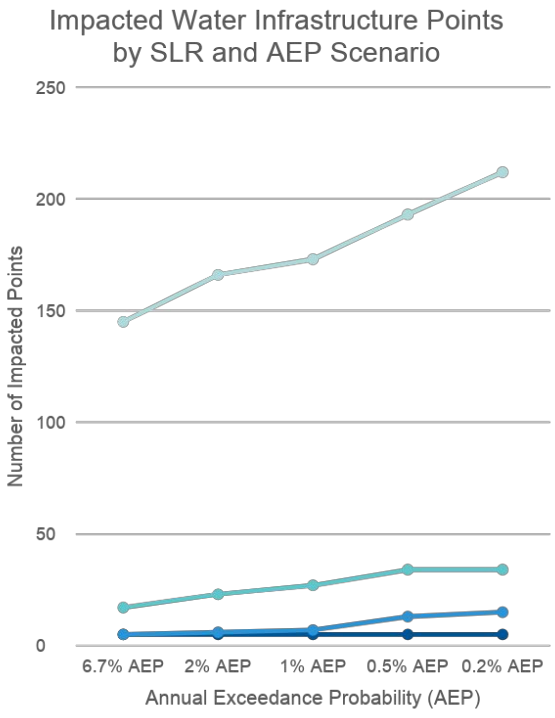
Risk Analysis – Preliminary Results (Buildings)



Risk Analysis – Preliminary Results (Infrastructure)











APPROACHES TO ADAPTATION



What actions are possible?

Depending on the scale of the solution, coastal adaptation can take many forms. At the highest level, adaptation strategies can be broadly categorized into five approaches. In practice, a combination of adaptation measures will be required.

Do Nothing



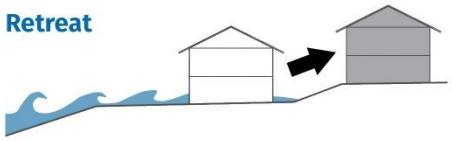
This means not planning, preparing or developing any strategies to deal with the impacts of sea level rise. **Doing nothing will most likely result in a delayed and much a more costly response** to sea level rise in the future.

Avoid



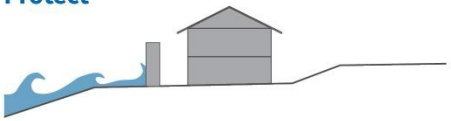
In areas that presently have little or no development, **avoiding future development through "no-build" areas is often the most effective approach to mitigating coastal hazards.** In areas with extensive existing human development, this approach may be more difficult.

Retreat



Retreat involves strategic, and often phased, **relocation of people and assets outside of high hazard areas.** It may also benefit the natural environment by providing space to adapt to the effects of climate change and sea level rise. Retreat can be implemented with assistance over long timescales to avoid negative outcomes.

Protect



Protecting involves constructing barriers against flood waters. This can include **"hard" measures like dykes and seawalls or "soft" measures like green shores**. "Hard" measures often have negative impacts on ecosystems.



"Soft" measures work with natural systems to find ways to protect against flooding while expanding the ecological integrity of a shoreline. These often involved the creation of new habitat and ecosystems.

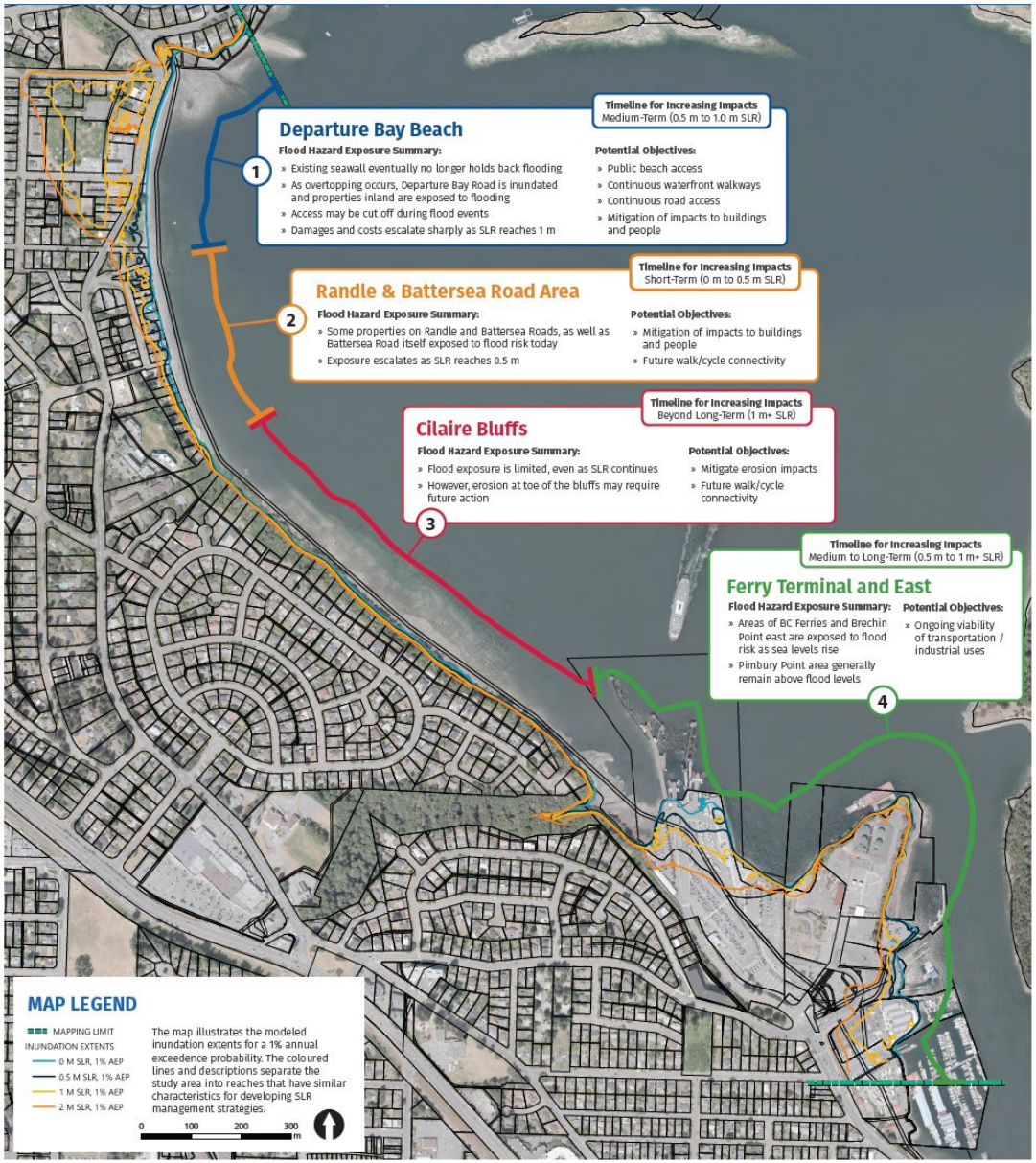
Accommodate



Accommodation involves adapting existing land uses through measures like elevating living areas and improving building design to help a structure withstand flooding.

OUR COASTAL CITY
DEPARTURE BAY

MAP 2:
SUMMARY OF FLOOD HAZARD EXPOSURE & STRATEGIES



DISCUSSION: OVERVIEW OF POTENTIAL STRATEGIES

1 Departure Bay Beach

	STRENGTHS	CHALLENGES	COMMENTS, QUESTIONS, ALTERNATE OPTIONS?
Strategy A: Raise Seawall Seawall, Departure Bay Road, and infrastructure raised, new builds to meet FCLs	» Protects existing buildings, cultural sites, people » Works in limited space	» View impacts » High costs » Wave effects impacts » Limits future adaptations	
Strategy B: Phased Retreat Long-term process of retreating existing buildings and relocating Departure Bay Road	» Removes people/infrastructure from flood zone » Potential for recreation » Long-term road connections outside flood zone	» Very high costs » Removal of existing economic benefits » Potential cultural site impacts » Public acceptance challenges	

2 Randle & Battersea Area

	STRENGTHS	CHALLENGES	COMMENTS, QUESTIONS, ALTERNATE OPTIONS?
Strategy A: Raise Buildings & Roads New builds to meet FCLs, roads raised: Battersea, Randle, Loat, Seaview	» Retains existing residential properties » Cost of on-parcel improvements by property owners	» Raised roads will require erosion protection from frequent inundation » Areas not raised will be subject to periodic flooding	
Strategy B: Phased Retreat Long-term process of retreating existing buildings and infrastructure	» Removes people/infrastructure from flood zone » Ecosystem benefits » Potential recreation opportunities » Major road outside flood zone	» Very high costs » Removal of existing economic benefits » Potential cultural site impacts » Public acceptance challenges	
Strategy C: Seawall Extension Seawall extended to protect roads/properties, expand public access	» Supports recreational access » Protects roads, cultural sites, infrastructure	» High costs » Life span limited » May require beach nourishment or offshore energy dissipation » Requires land acquisition	

3 Cilaire Bluffs

	STRENGTHS	CHALLENGES	COMMENTS, QUESTIONS, ALTERNATE OPTIONS?
Strategy A: Status Quo, Monitor Erosion No change in short term, monitor/mitigate potential future erosion of bluffs	» Not currently vulnerable to floods » No costs » Erosion supplies sediment to beach	» Bluffs vulnerable to erosion which could worsen with coastal flooding and SLR	
Strategy B: Seawall Extension Seawall extended to help protect Cilaire bluffs, expand public access	» Supports recreational access » Could protect bluffs from ongoing erosion	» High costs » Life span limited » May require beach nourishment or offshore energy dissipation » Loss of beach as SLR continues	

4 Ferry Terminal and East

	STRENGTHS	CHALLENGES	COMMENTS, QUESTIONS, ALTERNATE OPTIONS?
Strategy A: Raise Buildings & Roads New builds in low areas raised to meet FCLs, roads and infrastructure raised over time	» Low additional cost, each building raised as required when rebuilt » Can be phased slowly » Supports future flexibility	» None, unless not actively planning for future conditions » Some facilities may require future relocation as SLR continues	

OPTIONS COLOUR LEGEND

= primarily public lands adaptations = primarily private property adaptations = mix of private and public adaptations



CONCLUDING REMARKS

- Go to: getinvolvednanaimo.ca/sea-level-rise and complete the Survey
- Final report in July. Council presentation in September.
- Contact me: david.stewart@nanaimo.ca