

Coastal Flood Adaptation Strategy (CFAS) Implementation

CFAS Advisory Group Meeting

July 30, 2020

www.surrey.ca/CoastalTakingAction

Surrey **Coastal Flood
Adaptation
Strategy**
Taking Action

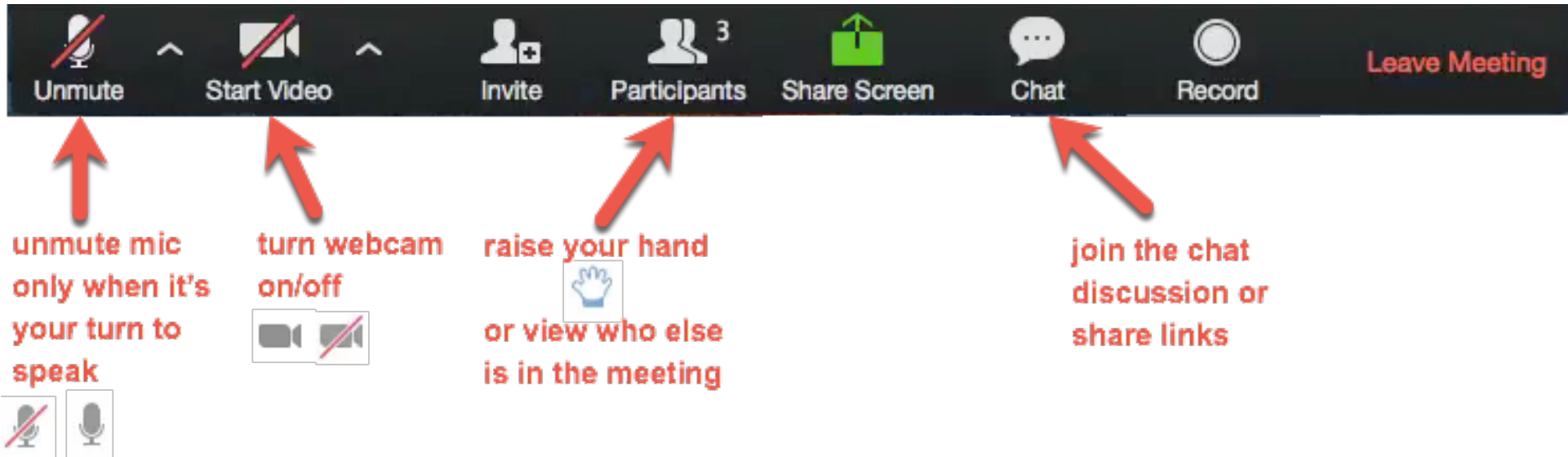


Zoom House Keeping

- Session will be recorded
- Please go on mute when not speaking
- Use the chat feature
- Follow-up for detailed or sidebar discussions



Zoom Functions



The image shows a Zoom meeting toolbar with several icons and labels. Red arrows point from text annotations below to specific icons in the toolbar. The annotations include: 'unmute mic only when it's your turn to speak' pointing to the Unmute icon; 'turn webcam on/off' pointing to the Start Video icon, with a small inset showing video icons; 'raise your hand or view who else is in the meeting' pointing to the Participants icon, with a small inset showing a hand icon; and 'join the chat discussion or share links' pointing to the Chat icon. The toolbar also includes icons for Invite, Share Screen, Record, and a 'Leave Meeting' button.

Unmute **Start Video** **Invite** **Participants** **Share Screen** **Chat** **Record** **Leave Meeting**

↑ unmute mic only when it's your turn to speak

↑ turn webcam on/off

↑ raise your hand or view who else is in the meeting

↑ join the chat discussion or share links

Agenda

- General project updates
 - Coastal Flood Adaptation Strategy
 - Disaster Mitigation and Adaptation Fund (DMAF) projects
 - Nature-based Coastal Climate Adaption Project – Mud Bay
 - Project design and engineering
 - Environmental Assessment exemption
- Next steps and engagement going forward

Key People

City of Surrey

- Matt Osler, Senior Project Engineer
- Tindi Sekhon, Project Supervisor
- Miriam Marshall, Environmental Coordinator
- Tjasa Demsar, Climate Adaptation Coordinator
- Namrit Uppal, Communications Coordinator

Consultant Team

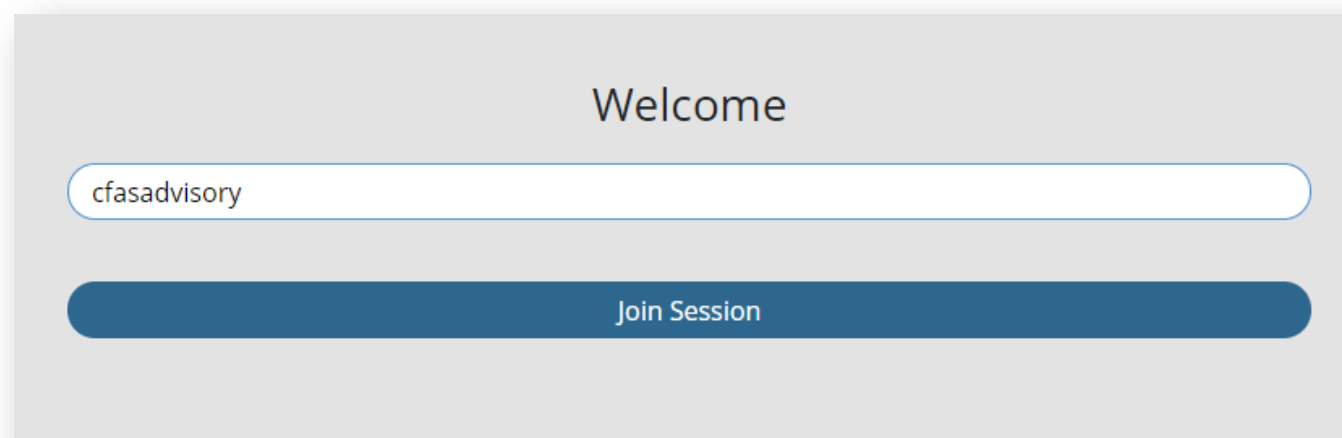
- Lyle Thompson, Hatfield Consultants
- John Ingram, EcoPlan

Purpose of Advisory Group

- Provide non-binding recommendations, strategic advice and input on CFAS
- Identify key issues, concerns and opportunities for the City and project consultant team
- Support collaboration and develop a deeper understanding of issues
- Support CFAS communications and outreach

Live Polling

- Go to: www.rwpoll.com on your smartphone or computer browser
- Enter: **cfasadvisory** as the session ID
- Click **Join Session**

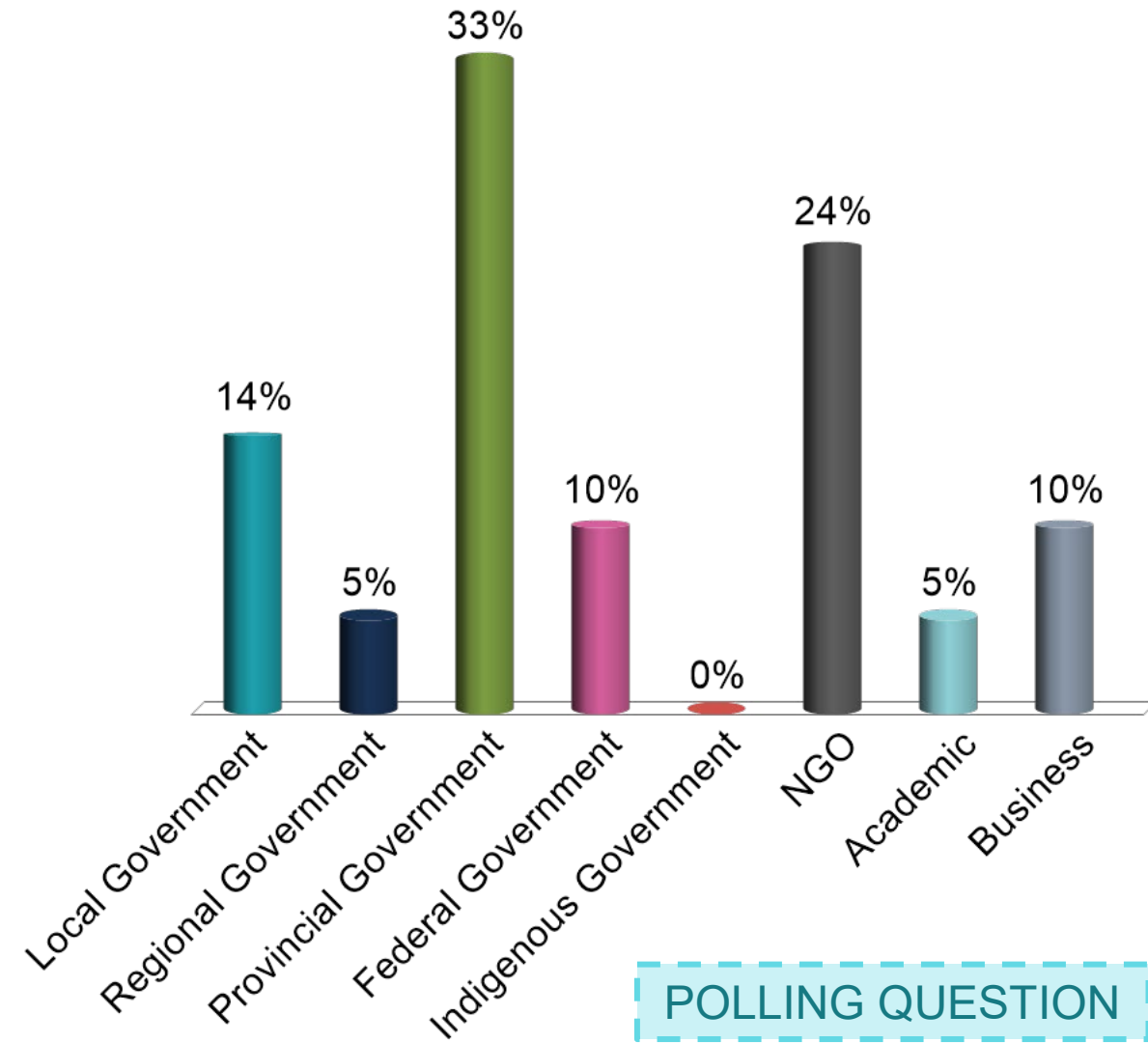


Welcome

[Join Session](#)

Who's in the room?

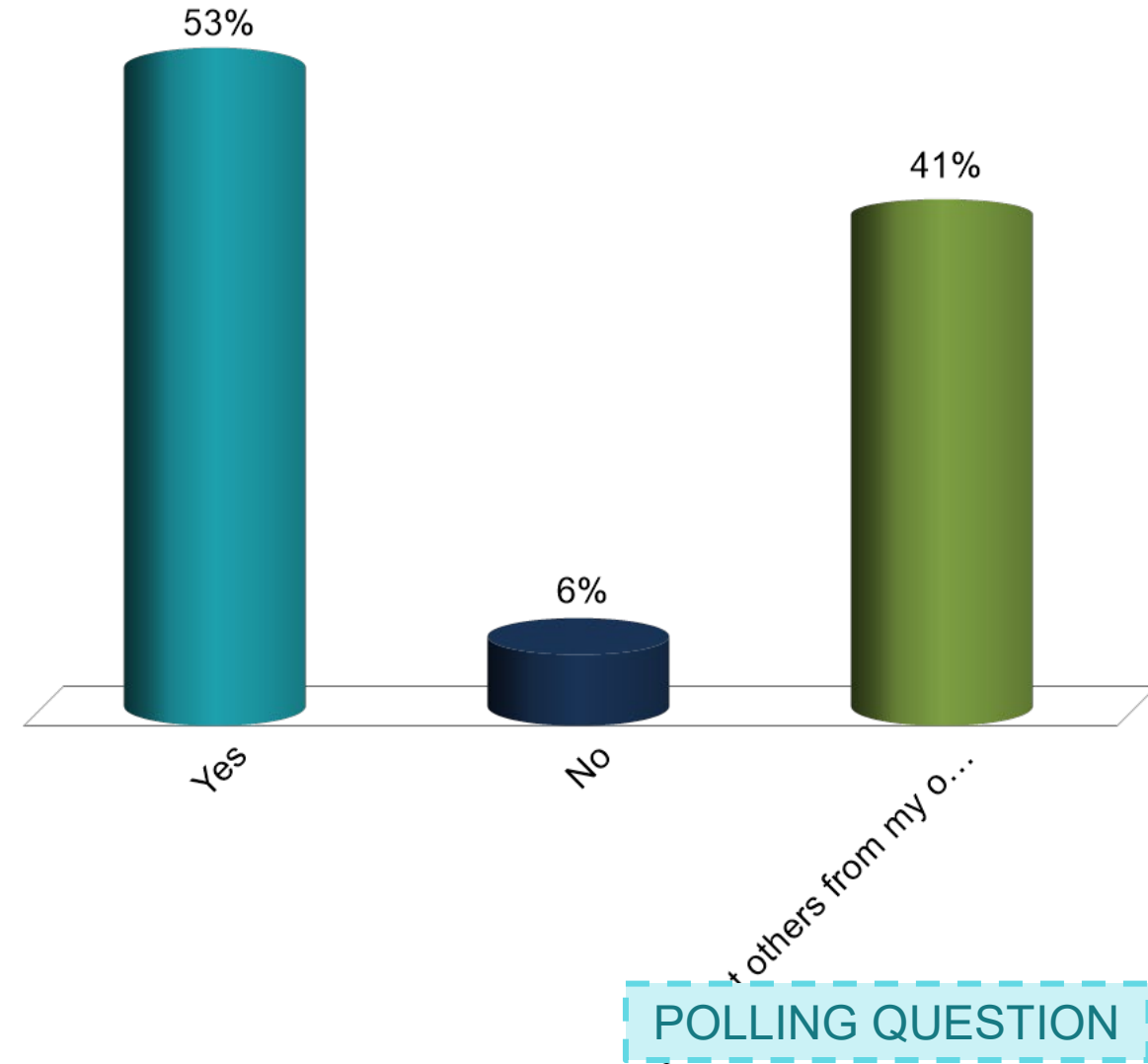
- A. Local Government
- B. Regional Government
- C. Provincial Government
- D. Federal Government
- E. Indigenous Government
- F. NGO
- G. Academic
- H. Business



POLLING QUESTION

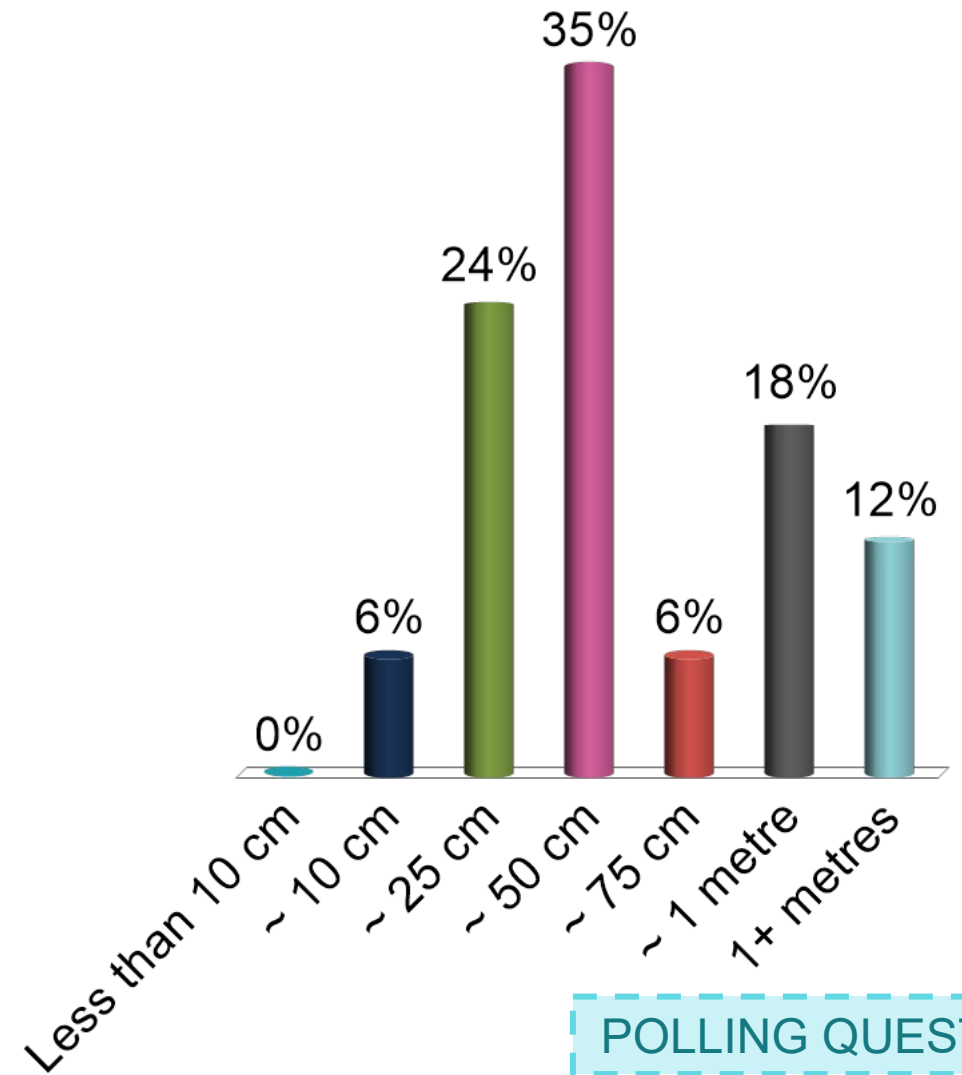
Have you participated in other CFAS Advisory Group meetings?

- A. Yes
- B. No
- C. No, but others from my organization have



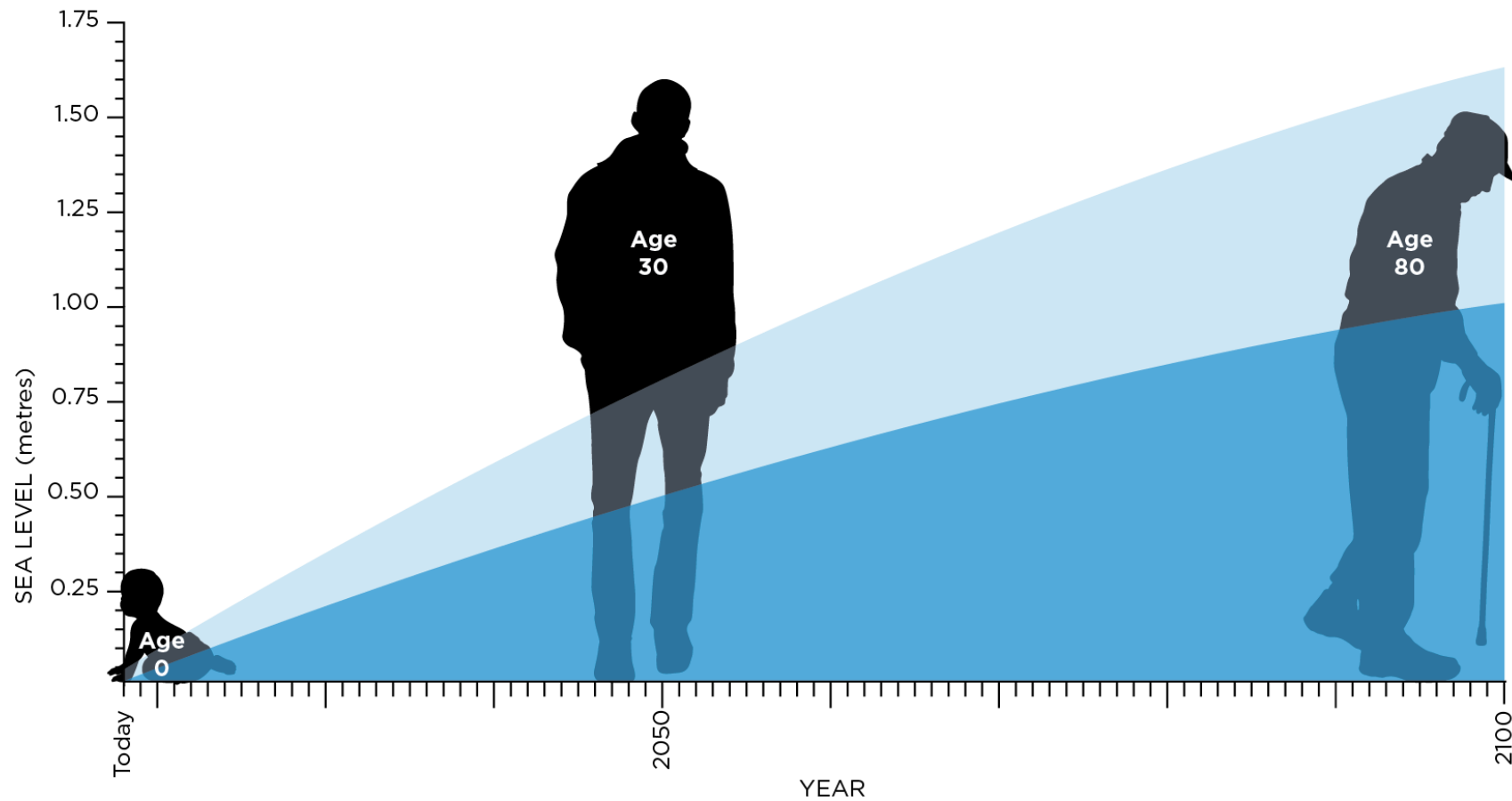
How much are sea levels in the Salish Sea expected to rise in the next 30 years?

- A. Less than 10 cm
- B. ~ 10 cm
- C. ~ 25 cm
- D. ~ 50 cm
- E. ~ 75 cm
- F. ~ 1 metre
- G. 1+ metres



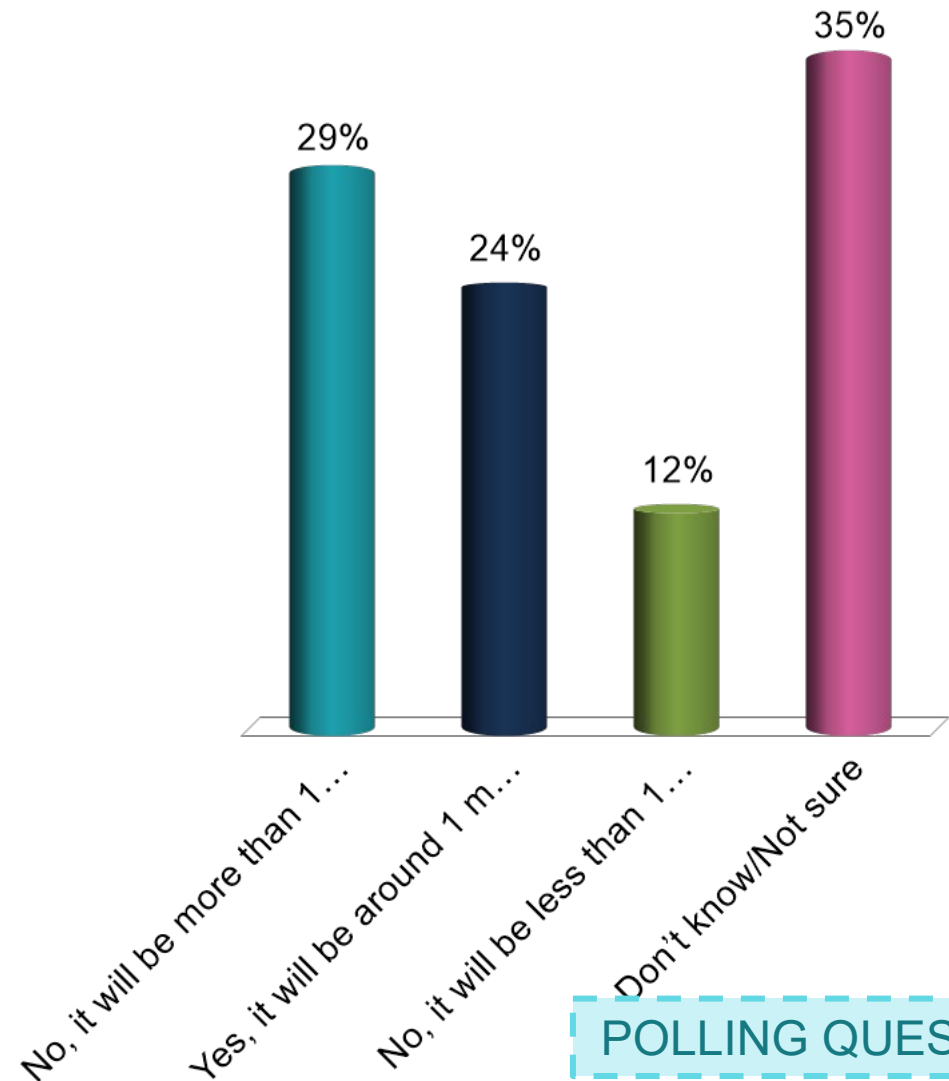
POLLING QUESTION

Salish Sea rising



Do you agree with the sea level rise forecast for the region?

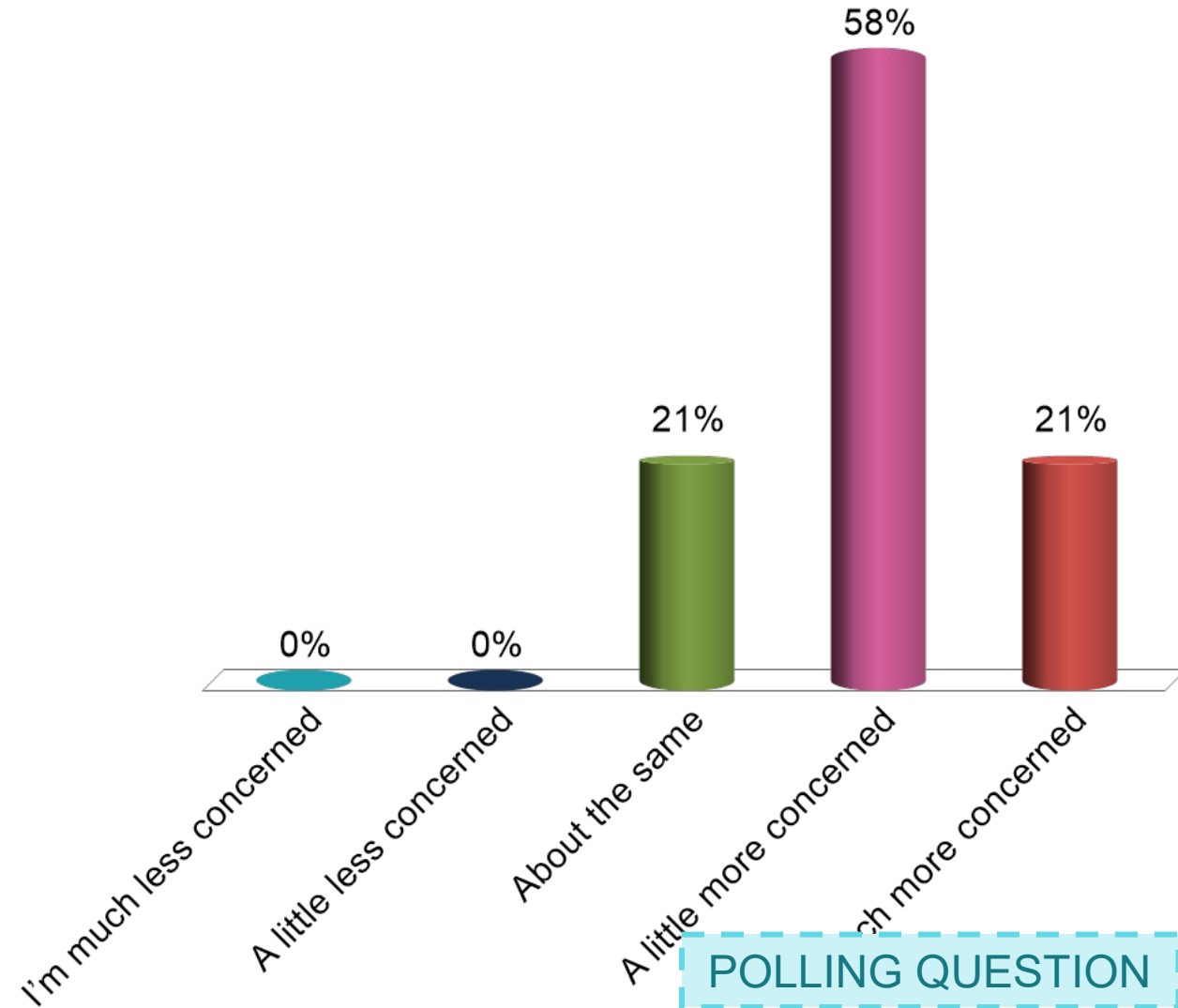
- A. No, it will be **more** than 1 metre by 2100
- B. Yes, it will be **around** 1 metre by 2100
- C. No, it will be **less** than 1 metre by 2100
- D. Don't know/Not sure



POLLING QUESTION

Has your level of concern about climate change and sea level rise changed since CFAS began in 2016?

- A. I'm much less concerned
- B. A little less concerned
- C. About the same
- D. A little more concerned
- E. Much more concerned



A coastal scene with a path leading to the ocean under a stormy sky. The path is on the left, bordered by a fence and trees. The ocean is on the right, with waves crashing. The sky is dark and cloudy. The overall tone is blue and moody.

Coastal Flood Adaptation Strategy

PROJECT UPDATE

Coastal Flood Adaptation Strategy (CFAS)



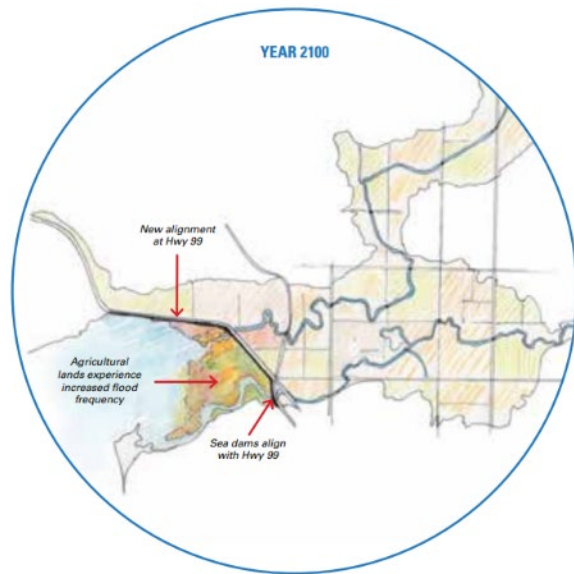
- Proactive process started in 2016 to reduce climate change-driven coastal flood risk now and into the future
- Range of strategic actions were developed to help the City's coastal communities become more resilient to the challenges
- Council endorsed final strategy on November 4, 2019 (Corporate Report No. R212)

CFAS Awards

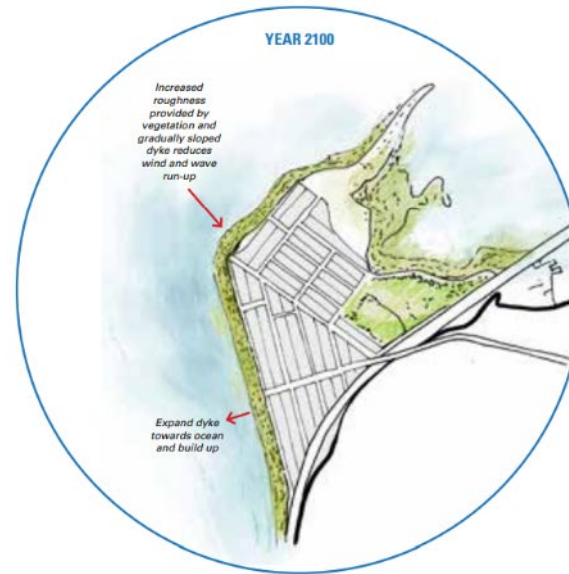
- 2019 Climate & Energy Action Award
 - Canadian Energy Association
- 2020 Award for Planning Excellence – Climate Change (Merit)
 - Canadian Institute of Planners
- 2020 Award for Excellence in Planning - City and Urban Areas (Nicomekl Riverfront Park)
 - Planning Institute of BC

3 Long-term Strategic Directions | Year 2100

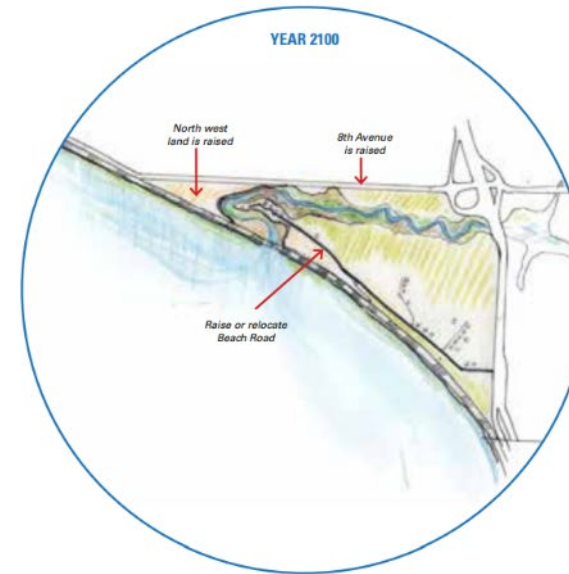
Mud Bay



Crescent Beach



Semiahmoo Bay



46 Near-term Actions

CFAS PROGRAM AND POLICY ACTIONS

	2020-30	2030-40	2040-50	2050-60	2060-70	2070-80	2080-90	2090-2100
Ongoing Education, Communications, and Advocacy Initiatives								
1	CFAS Steering Committee							
2	Internal Updates							
3	CFAS Advisory Group							
4	CFAS Website							
5	Advocacy Partners Workshop							
6	Communications and Media							
Detailed Planning, Studies, and Data Collection								
7	Update hazard bibliography							
8	Update coastal flood hazard assessment							
9	Detailed studies - Strategic Actions							
Regulatory Controls, Design Standards, and Guidelines								
10	Review Development Variance practices							
11	Support flood resilient design and construction							
12	Explore Sea Level Rise Planning Area							
13	Design Standards Guidebook							
Extreme Flood Management								
14	Hazard review							
15	Training and readiness							
16	Improve flood warning systems and communications							
17	Temporary protection measures assessment							
18	Build Back Better program							

CFAS PLANNING AREA-SPECIFIC ACTIONS

	2020-30	2030-40	2040-50	2050-60	2060-70	2070-80	2080-90	2090-2100
MUD BAY								
Mud Bay Foreshore								
19	Foreshore enhancements							
20	Sediment augmentation in foreshore area							
Inter River West (west of 152nd St)								
21	152 nd St upgrades and raising							
22	Serpentine and Nicomekl sea dams							
23	Upgrade Serpentine left bank and Nicomekl right bank dykes							
24	Install pumps at sea dams in phases							
25	Hwy 99 Works – New dyke west of Hwy 99							
26	Pullback to Hwy 99 Protection Works							
Inter River East (east of 152nd St)								
27	Upgrade Serpentine left bank and Nicomekl right bank dykes							
28	Drainage upgrades – Cloverdale neighbourhood							
29	Serpentine and Nicomekl floodplain storage							
Colebrook								
30	Coordinate with MOTI – Hwy 99/Colebrook dyke upgrades							
31	Upgrade Colebrook Dyke							
32	Replace Colebrook Drainage Pump Station							
33	'Good neighbour dyke' – Delta							
34	Shared drainage improvements – Delta							
35	Serpentine floodgates – BNSF							
Serpentine North								
36	Upgrade Serpentine right bank and left bank dykes							
Nicomekl South (east of 152nd St)								
37	Upper Nicomekl flood storage							
38	Upgrade Nicomekl left bank dyke							
39	Upgrade drainage system – Morgan Creek area							
Nico Wynd Area								
40	Upgrade Nico Wynd area flood management							
CRESCENT BEACH								
41	Maintenance of Crescent Beach Dyke							
42	Maintenance of Shoreline							
43	Drainage improvements							
44	Expanded edge							
SEMAHM00 BAY								
45	Little Campbell River emergency access							
46	Comprehensive flood improvements							

Notes: ✓ indicates that the project scope is included in Surrey DMAF program and has confirmed funding.
Planning Area-Specific Actions under \$5M capital cost are omitted for clarity

A coastal scene with a path leading to the ocean under a stormy sky. The path is on the left, leading towards the water on the right. The sky is dark and cloudy, suggesting an approaching storm. The water is choppy with white foam from waves. The overall tone is blue and teal.

DMAF Projects Update

Coastal Flood Adaptation Strategy – Taking Action

DMAF Projects

- \$76.6 M in federal funding awarded under the Disaster Mitigation and Adaptation Fund (DMAF)
- Federal completion deadline – March 31, 2028



#	Name	Asset Type	Hazard Mitigation	Community Co-benefits	Values Protected	Project Partners
1	Colebrook Dyke Upgrades	Coastal Dyke		Recreation, bird watching, food security		Province of BC
2	Colebrook Drainage Pump Station Replacement	Drainage Pump Station		Increased agricultural productivity and food security		
3	Sea Dam – Serpentine River	Sea Dam (drainage and irrigation)		Agriculture irrigation, fish passage, worker safety		
4	152 St Road Upgrades and Raising	Integrity of Transportation Network and Asset		Congestion relief, transportation safety, accommodate growth, cycling, pedestrian		Translink FortisBC Energy
5	Nicomekl Riverfront Park - Phase 1	Flood storage alternative to riverine dyking		Recreation (blue way), nature trails, wetlands, culture, open space		
6	King George Boulevard Bridge and Nicomekl River Sea Dam Replacement	Arterial Bridge (integrated with one sea dam) Integrity of Transportation Network and Asset		Congestion relief, transportation safety, accommodate growth, cycling, pedestrian, integrated to Nicomekl Park, fish passage, agriculture irrigation		Metro Vancouver Ministry of Transportation & Infrastructure
7	Crescent Beach Storm Sewer System Upgrades - Perforated Piping	Flood Protection increases transportation resilience		Street beautification/road improvements, transportation safety		
8	Dyking - Lower reaches of Nicomekl and Serpentine	Flood Protection (nuisance and extreme event)		Food security and transportation flood safety		
9	Serpentine SRY Rail Link Bridge Replacement and Dyking	Flood Protection (nuisance and extreme event)		Economy (freight and heritage railway), worker safety and goods movement		SRY LINK (Southern Railway of BC)
10	Burrows Drainage Pump Station Upgrade	Drainage Pump Station		Increased agricultural productivity and food security		
11	Stewart Farm Sanitary Pump Station Coastal Flood Proofing	Integrity of Sanitary Sewer Network		Sanitation, worker safety and water quality		
12	Campbell River Pedestrian and Emergency Access Bridge Replacement	Integrity of Transportation Network		Emergency access, Multi Use Path		Semiahmoo First Nation
13	Foreshore Enhancements	Structural and nature based flood control and environmental enhancements		Wetlands (birds, fish, clams) and food security		City of Delta

Hazard Mitigation
 = flood = seismic = drought

Values Protected
 = economy = infrastructure = environment = communities

Shovel-ready Projects

- City of Surrey
 - Colebrook Dyke Upgrades
 - Stewart Pump Station Upgrades
 - Burrows Pump Station Upgrades
 - SRY Rail Link Serpentine Bridge Replacement
- City of Delta
 - Boundary Bay Dyke Upgrades



High-priority Projects

- Nicomekl King George Blvd Bridge Replacement
- 152 St Raising and Widening
- Colebrook Pump Station Replacement
- Serpentine Sea Dam Replacement

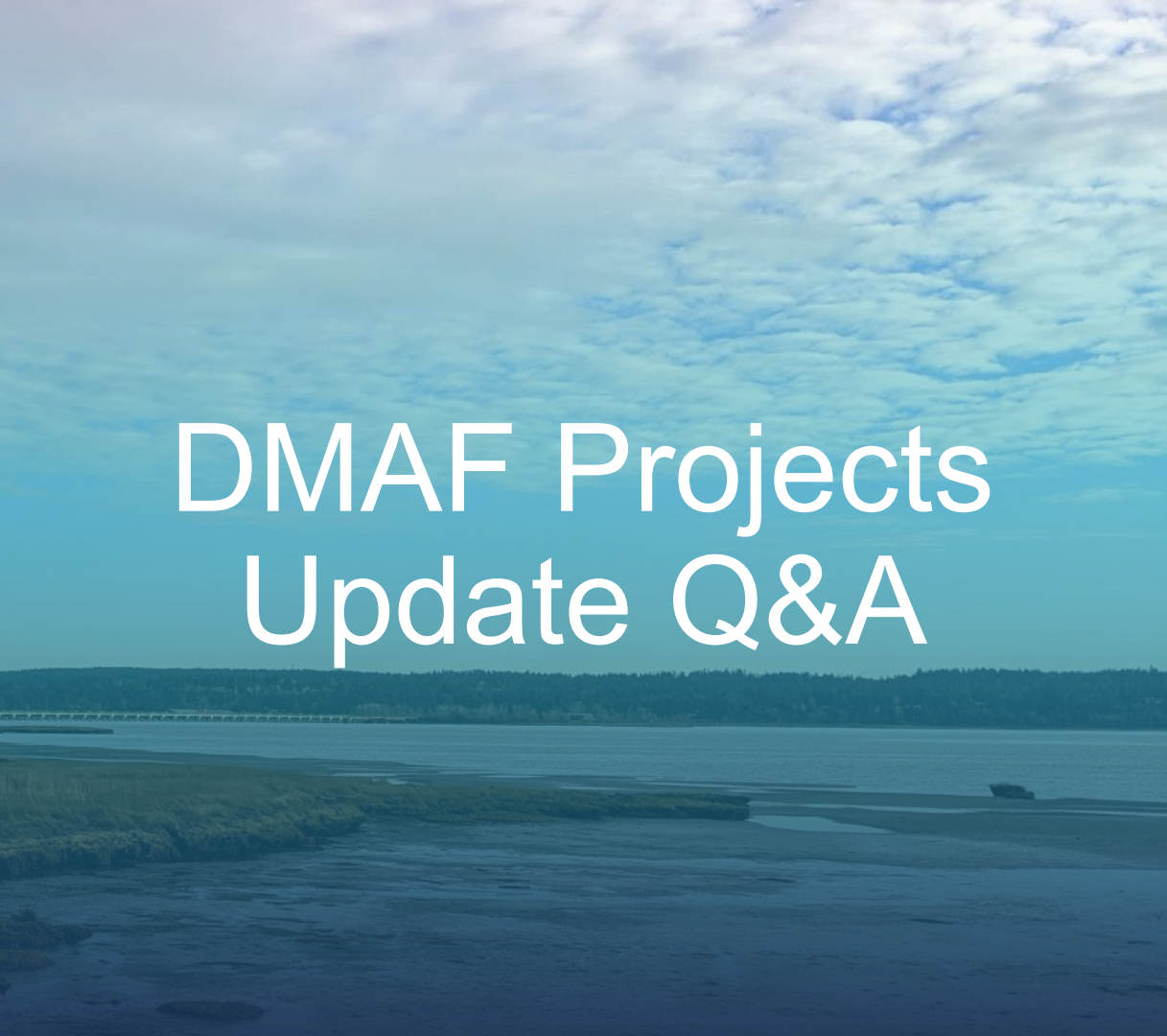


Innovative Nature-based Projects

- Foreshore Enhancements
- Nicomekl Riverfront Park



DMAF Projects	Status
1. Colebrook Dyke – Upgrade the earth dike along Mud Bay and the mouth of the Serpentine River, including drainage floodboxes	Design Complete
2. Colebrook Drainage Pump Station – Remove and replace the drainage pump station on the Colebrook Dyke	Design Underway
3. Sea Dam Serpentine River – Remove and replace the flood and irrigation control structure and instrumentation	Design Underway
4. 152 Street Road and Raising – Increase the vehicle and multi-modal capacity and resilience of this critical emergency access road and provide secondary flood defense	Design Underway
5. Nicomekl Riverfront Park – Develop a new park that provides increased flood storage, recreation and habitat	Design Request for Proposal
6. King George Boulevard Bridge and Nicomekl River Sea Dam – Remove and replace existing structures with an integrated structure	Design Request for Proposal
7. Crescent Beach Storm Sewer System – Expand the existing storm sewer network to reduce flooding	Design Underway
8. Dyking Lower Reaches of Nicomekl and Serpentine – Raise and widen the existing flood control works	Design Underway
9. Serpentine SRY Rail Link Bridge and Surrey Dyke Crossing – Upgrade crossing to improve flood resilience	Completed
10. Burrows Drainage Pump Station – Increase capacity of existing pump station and upgrade irrigation infrastructure and drainage floodboxes	Under Construction
11. Stewart Farm Sanitary Pump Station – Raise the existing pump station	Under Construction
12. Campbell River Pedestrian and Emergency Access Bridge – Remove and replace the existing bridge	Design Underway
13. i. Foreshore Enhancements and Dyke in Delta – Upgrade existing Boundary Bay Dyke and pilot Living Dyke ii. Foreshore Enhancements in Surrey – Construct foreshore enhancements in front of Colebrook Dyke and instrumentation	Design Request for Proposal



DMAF Projects Update Q&A

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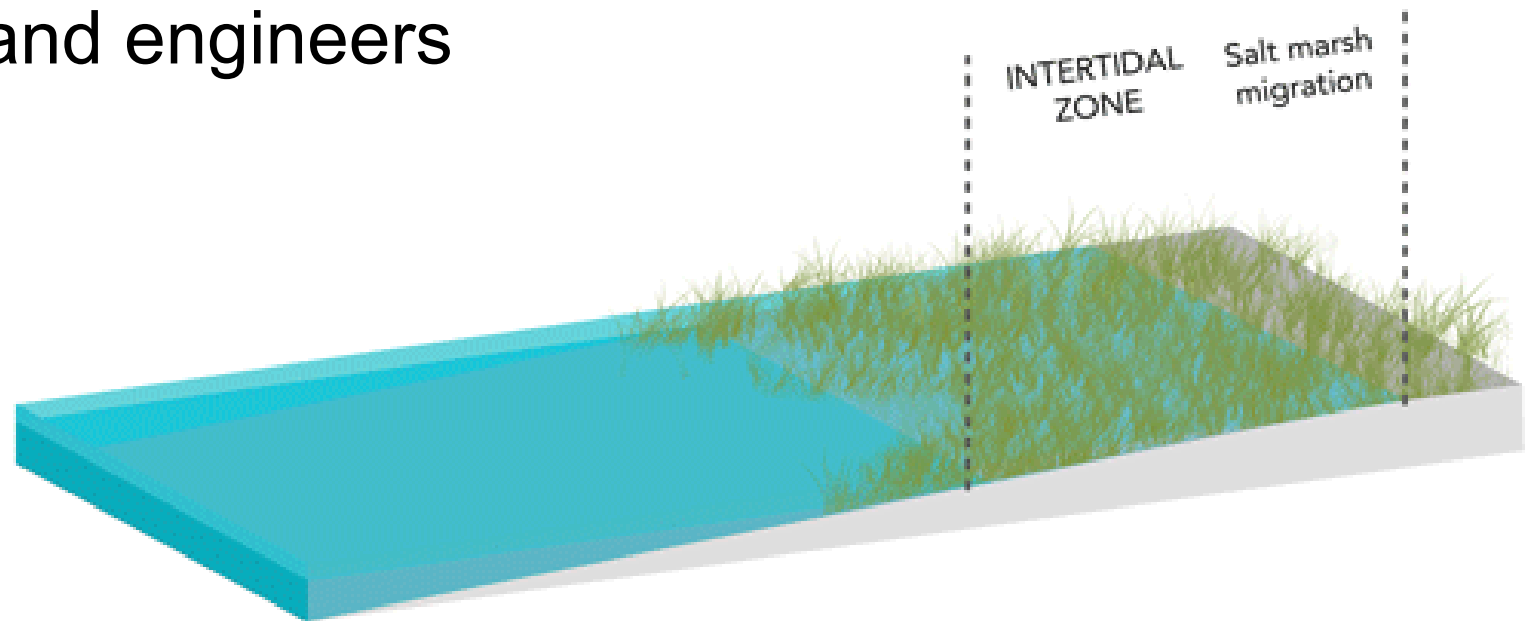


A coastal landscape featuring a dirt path that leads from a grassy area on the left towards the ocean on the right. The path is bordered by a wooden fence on the left and a concrete curb on the right. In the background, there are trees and a building. The ocean is visible on the right side of the path. The entire image is overlaid with a teal color filter. The text "Nature-based Coastal Climate Adaptation Project – Mud Bay" is written in white, sans-serif font across the middle of the image.

Nature-based Coastal Climate Adaptation Project – Mud Bay

Nature-based Coastal Climate Adaptation Project

- Nature-based solution for “coastal squeeze” and coastal flooding
- Approach developed with support from broad group of rightsholders, stakeholders, regulators, scientists and engineers



Nature-based Coastal Climate Adaptation Project

- Foreshore enhancement along 1km west of Mud Bay Park
- Establishes salt marsh habitat
- Enables adaptation to sea level rise
- Preserves the natural look of the shoreline

Boundary Bay Living Dike Roundtable

- Chaired by West Coast Environmental Law and First Nations Emergency Planning Secretariat
- Representation from Indigenous, local, provincial and federal government staff, scientists, engineers, NGOs
- Conceptualized the “Living Dike” approach (WCEL concept report: https://www.wcel.org/sites/default/files/2019-01-livingdikeconceptbriefwcel1_final.pdf)

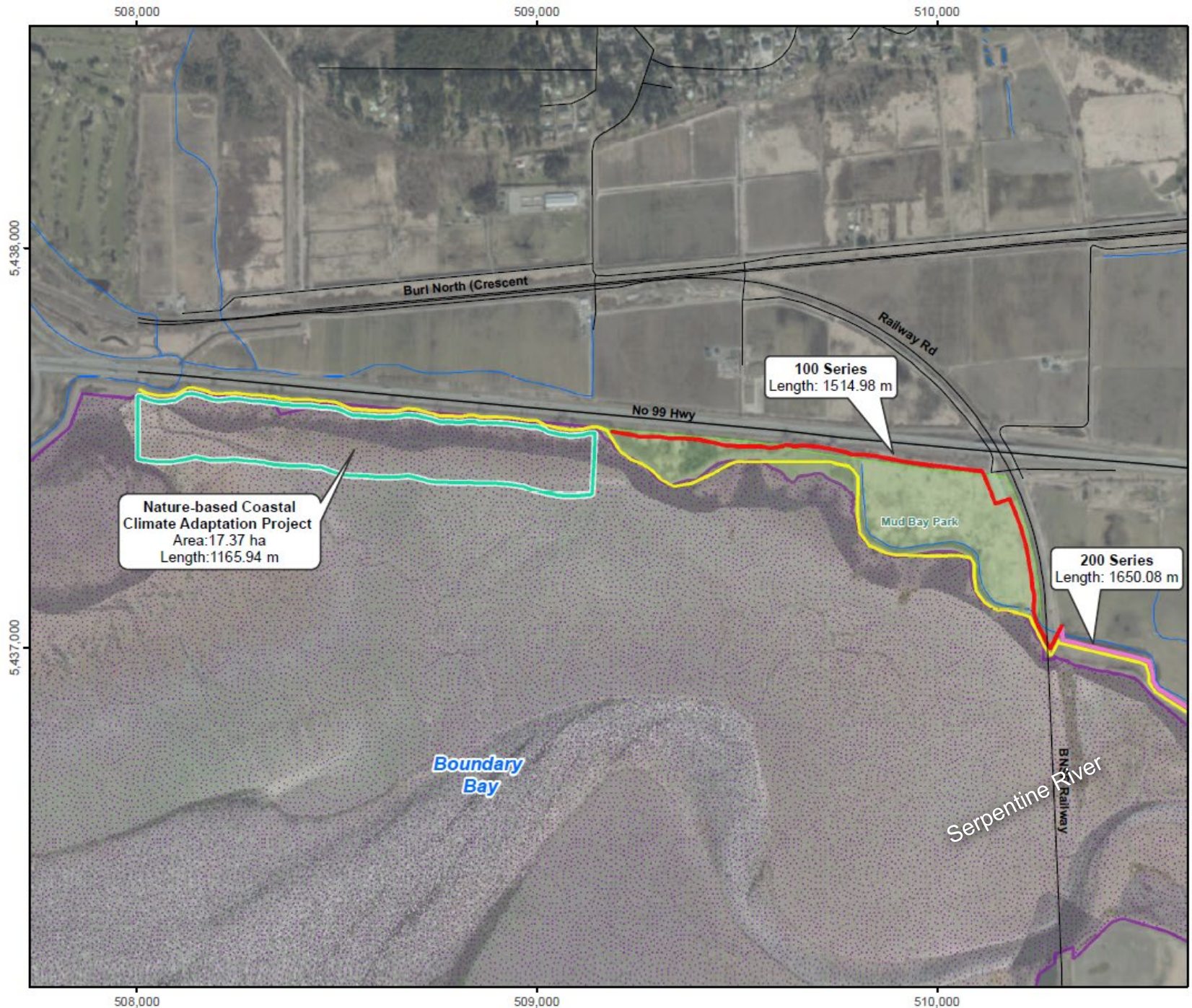


Broader Applicability











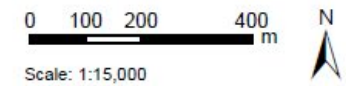
A coastal scene with a path leading to the ocean, overlaid with a teal filter and white text. The path is on the left, leading towards the water on the right. The sky is overcast and grey. The text is centered in the middle of the image.

Project Design and Engineering Status



Legend

-  Nature-based Coastal Climate Adaptation Project
 -  Boundary Bay Wildlife Management Area
 -  Existing Colebrook Dyke
- Colebrook Dyke Upgrade Project**
-  100 Series
 -  200 Series
- Base Features**
-  Watercourse
 -  Road
 -  Parks



Scale: 1:15,000

Projection: NAD 1983 UTM Zone 10N

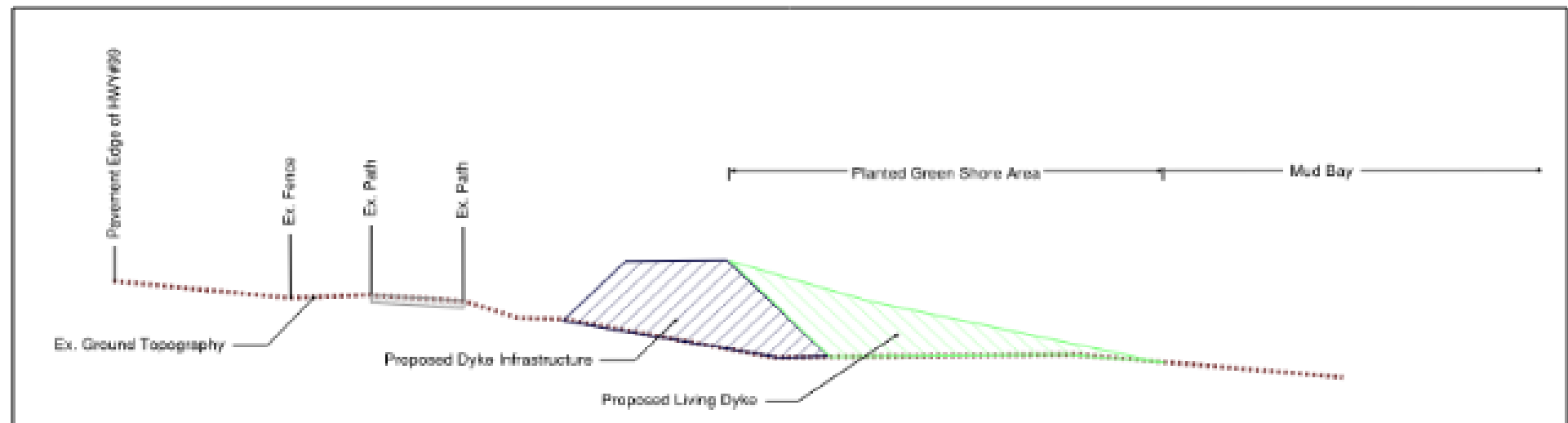
Data Sources:

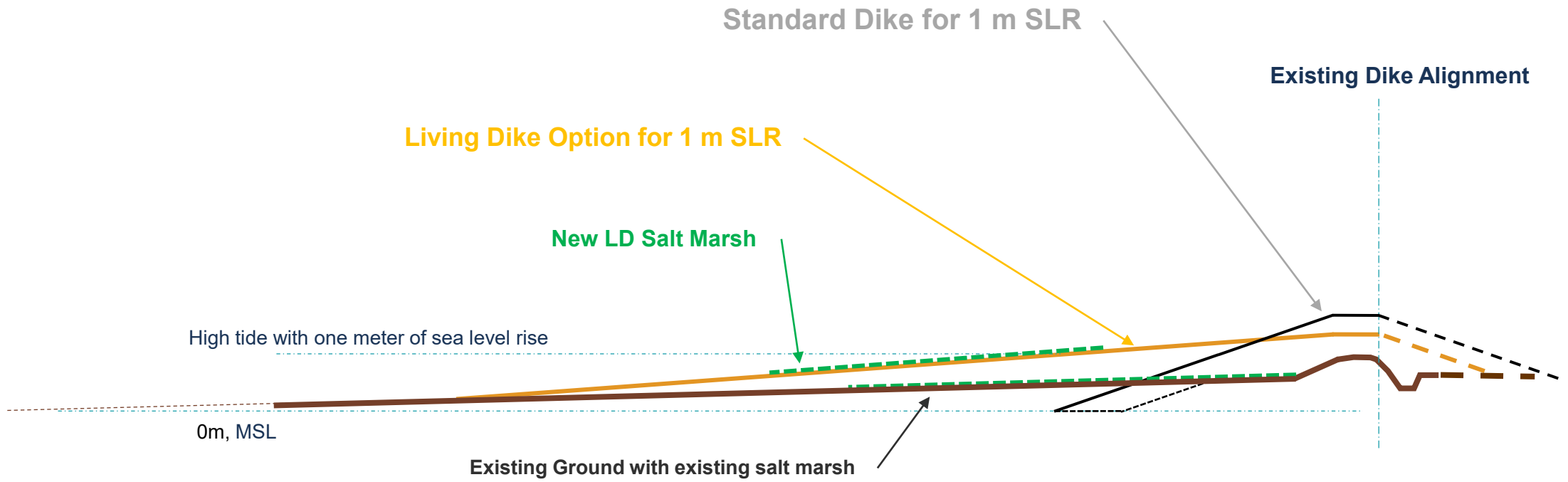
- a) Conceptual project area captured by digitizing using a georeferenced PDF map, City of Surrey 2020.
- b) Hydrography, Fresh Water Atlas 2011.
- c) Roads and park, City of Surrey 2020.
- d) Wildlife Management Area, FLNRO 2020.
- d) Aerial Imagery 10cm, 15 January, 2017, Esri Online Service.



Project Design Ideas

- mimic natural marsh by adding sediment and vegetation
- use imported or dredged sediment material
- use pods to contain sediment until the marsh establishes
- successive layers to build up gradually over the years
- integrate dyke design (build south of current dyke, raise to 3.9m)






Engineering Status and Timeline

- Design consultants' submissions currently under review
- Aiming for seasonal construction 2021-2027
 - Construction anticipated to begin in June 2021
 - Adaptive monitoring and management 2021-2023
 - Substantial completion by end of 2027





Nature-based Coastal Climate Adaptation Project Q&A

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A coastal scene with a path leading to the ocean under a cloudy sky. The path is on the left, bordered by a fence and some buildings. The ocean is on the right, with waves breaking. The sky is overcast and grey. The overall tone is somber and atmospheric.

Environmental Assessment

Environmental Assessment



- Major projects in BC must meet provisions of the *Environmental Assessment Act*
- Process managed through BC Environmental Assessment Office (EAO)
- First time City of Surrey has triggered an environmental assessment process

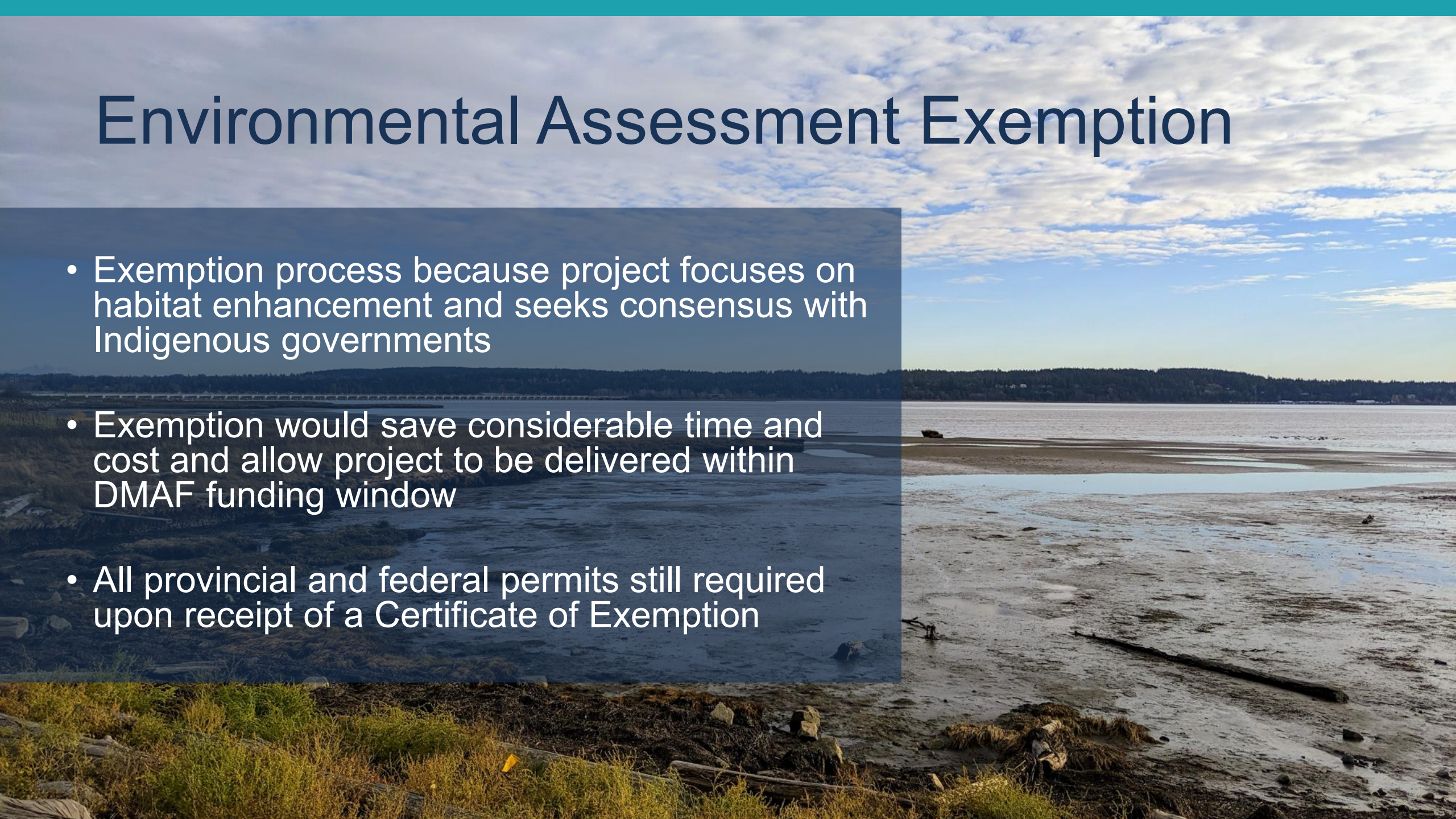
Environmental Assessment



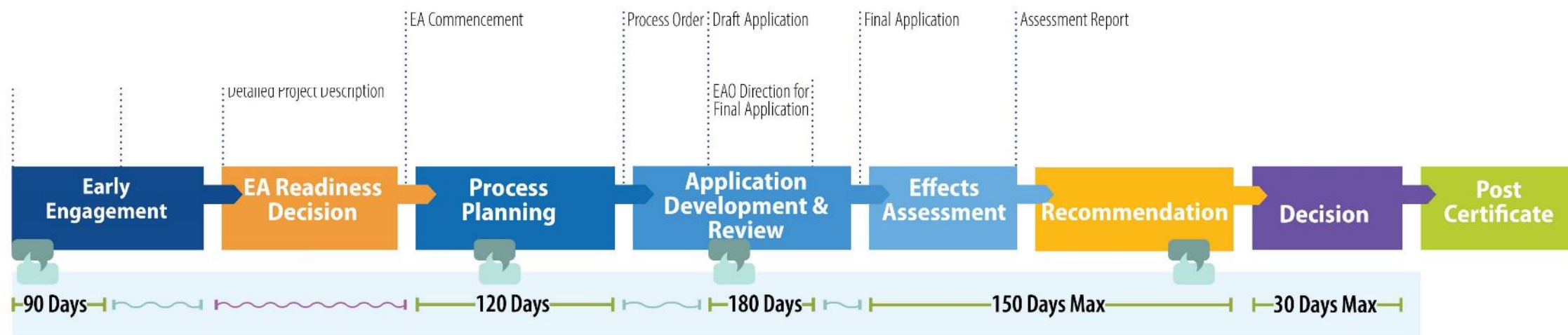
- Experts retained to design the work to mitigate environmental impact and provide environmental enhancement
- Environmental studies and public consultation
- Archeological protocols with Indigenous Nations in development as part of permitting process

Environmental Assessment Exemption

- Exemption process because project focuses on habitat enhancement and seeks consensus with Indigenous governments
- Exemption would save considerable time and cost and allow project to be delivered within DMAF funding window
- All provincial and federal permits still required upon receipt of a Certificate of Exemption



Environmental Assessment Process



Seeking exemption from several steps to expedite by 1 year

- ✓ Engage early and often
- ✓ Seek consensus with participating Indigenous Nations
- ✓ Build on prior engagement and relationships

Keys to Exemption Success

- Seek to achieve consensus with participating Indigenous governments
- Demonstrate that the project(s) will not have significant adverse environmental, economic, social, cultural or health effects, or, serious effects on an Indigenous nation or their rights
- Demonstrate the promotion of sustainability by protecting the environment and fostering a sound economy and the well-being of British Columbians and their communities
- Support reconciliation with Indigenous groups (UNDRIP)
- Stakeholder endorsement



Provincial staff
decision for
referral to the
Minister



Minister's
decision

EA Exemption Timeline



Schedule is subject to change

Environmental studies status:

- Migratory bird and biofilm studies have recently been completed
- Much of the baseline work completed
- Fisheries assessments ongoing (July 30-31)



Environmental Assessment and Exemption Q&A

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A coastal scene with a path leading to the ocean under a stormy sky. The path is on the left, bordered by a fence and trees. The ocean is on the right, with waves crashing. The sky is dark and cloudy. The overall tone is blue and moody.

Next Steps

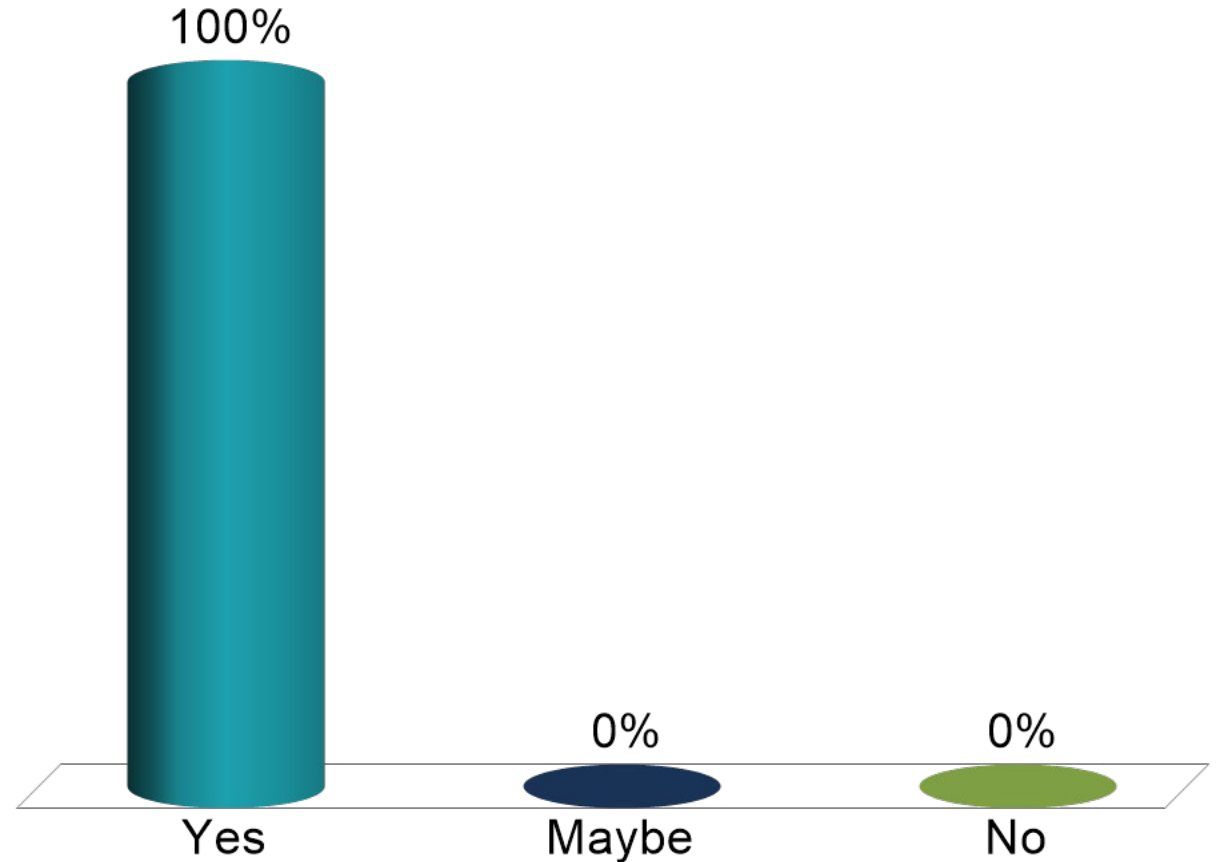
Coastal Flood Adaptation Strategy – Taking Action

Next Steps

- Initiate detailed design of Foreshore Enhancement
- Ongoing consultation and stakeholder engagement
 - Welcoming your input at coastal@surrey.ca
- Obtain letters of support and project endorsements
- Obtain permits and approvals
- Initiate construction in phases
- Updates to Council on overall CFAS implementation

Would you or your organization like to remain involved in the Advisory Group moving forward?

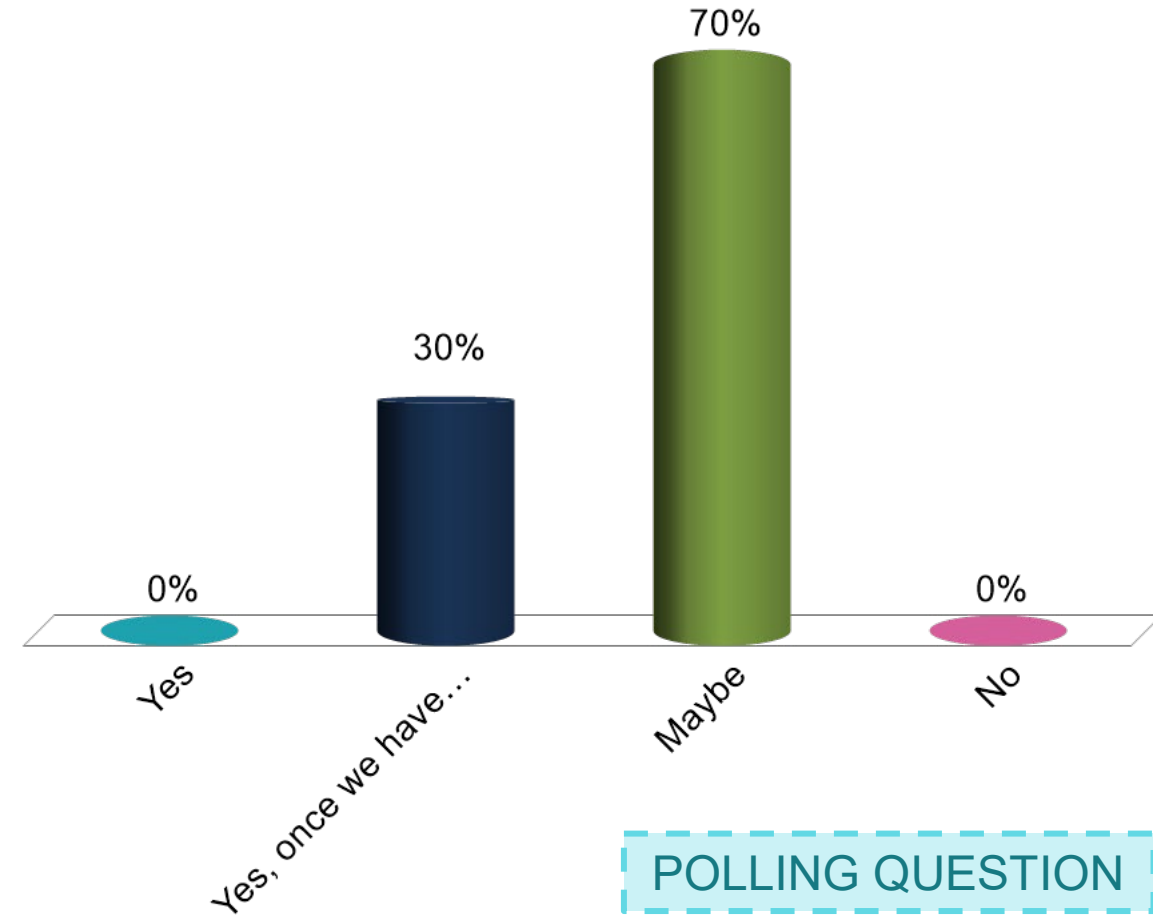
- A. Yes
- B. Maybe
- C. No



POLLING QUESTION

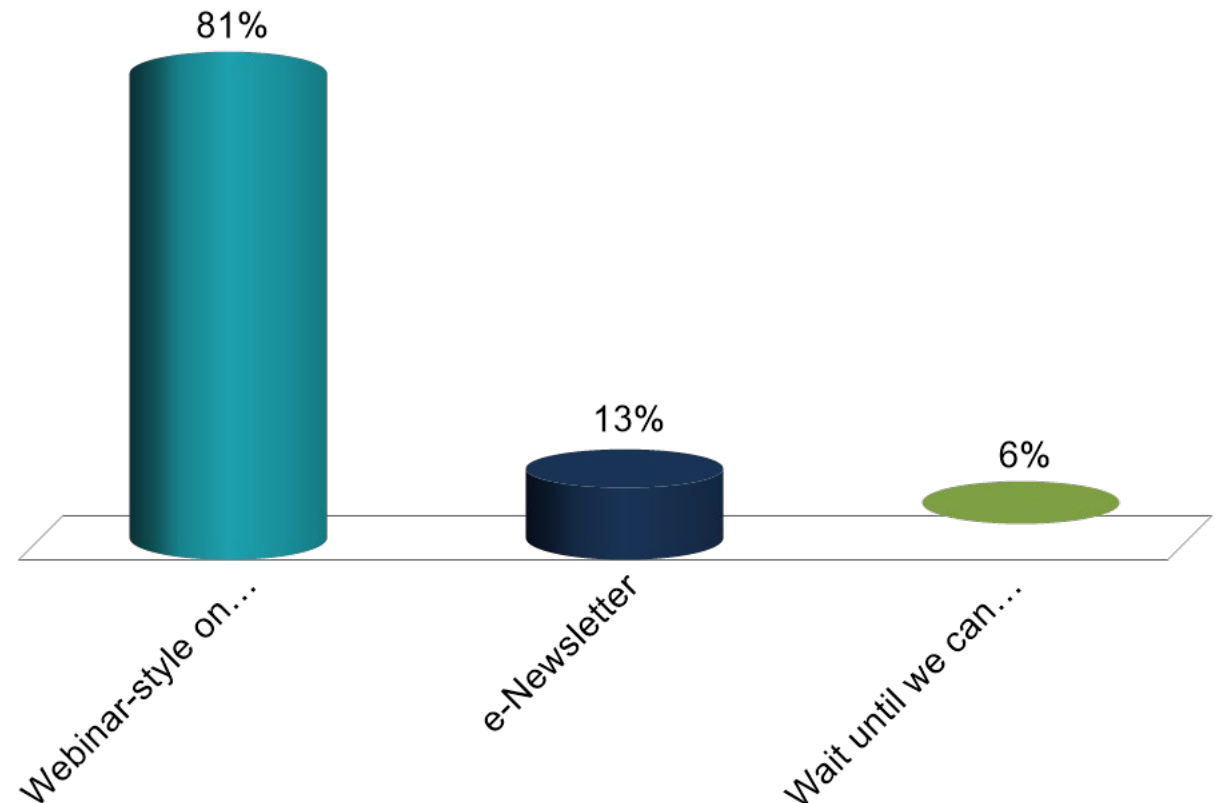
Would you or your organization provide a letter of support for the Mud Bay EA exemption?

- A. Yes
- B. Yes, once we have more information
- C. Maybe
- D. No



Considering the current COVID-19 situation, which format would work best for you for future involvement in the Advisory Group?

- A. Webinar-style online meeting
- B. e-Newsletter
- C. Wait until we can meet for an in-person workshop



POLLING QUESTION

A coastal scene with a path leading to the ocean under a stormy sky. The path is on the left, bordered by a fence and trees. The ocean is on the right, with waves crashing. The sky is dark and cloudy. The overall tone is blue and moody.

Thank you

Coastal Flood Adaptation Strategy – Taking Action

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