



EXTREME WEATHER IMPACTS & DAMAGES

Safety, assessment and
recovery plan

Regular Board Meeting
Monday, January 24, 2022



- The purpose of the presentation is to provide an update to the Board on the effects and recovery process related to recent storm damage to our park network's coastal assets including:
 - Stanley Park Seawall
 - Piers and Docks
 - Trails and Beaches

- January 7, 2021 - What Happened
- Safety & Clean Up Actions
- Assessment & Repair
- The Path Forward



Storm Event

King Tides & Storm Surge



What happened on Jan 7th 2022

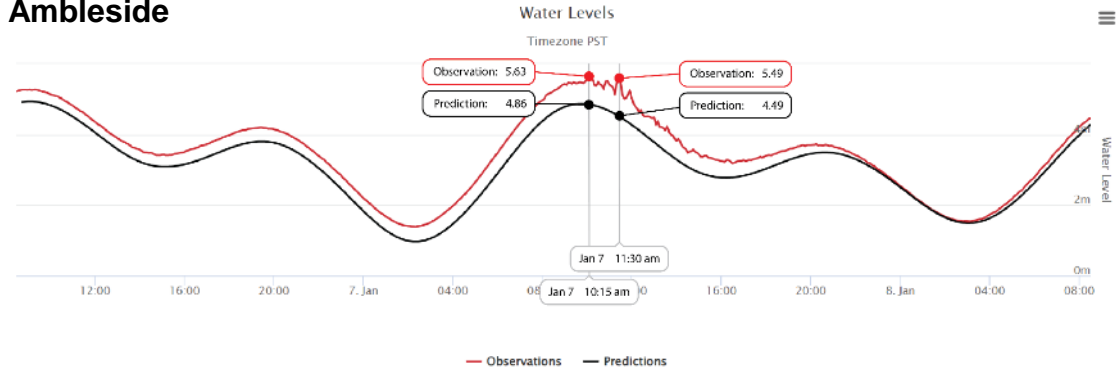
- King tide (high tide 10am)
- Intense low pressure system
- Storm surge
- Combined with sustained winds of 70km/hr for 6+ hours
- Fraser River debris/logs dislodged from Dec 2021 floods



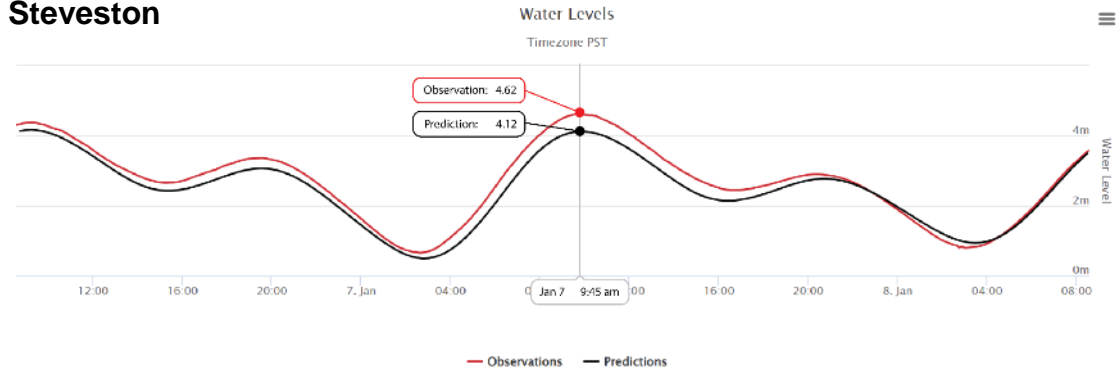
Storm Surge – Regional Context

- Measured peak water level at Ambleside was 5.63 m at 10:00 am, resulting in 0.8m storm surge at highest tide
- However, water levels remained consistently high throughout the morning with storm surge peaking at 1 m at 11:30 am
- The cyclical nature of the storm also increased the battering effect on the shoreline
- Storm impacted Vancouver & West Vancouver shorelines most severely in the lower mainland

Ambleside



Steveston



Storm Surge – Regional Context





Safety and Cleanup Efforts

- Closure of damaged sections
- Removing debris e.g. capstones, logs and secure sites
- Minimizing further damage and focusing on public safety
- More king tide events in the coming weeks – still vulnerable
- Stabilization of seawall for next King tide event Jan 31st, Feb 1st + 2nd
- Continue to be proactive in anticipating & preparing for future extreme weather events and enhance emergency planning
- Closing the seawall and other marine and other park amenities to the public will become more frequent (need to build in culture)

Safety + Clean Up Efforts



Debris Impact



Washouts





Removing Debris



Seawall Repairs Update





Damage Assessment

Overview of Impacted Park Sites

SEAWALL, SHORELINE & MARINE INFRASTRUCTURE DAMAGE ASSESSMENT

LAST UPDATED: 2022 JAN 18

DAMAGE SEVERITY

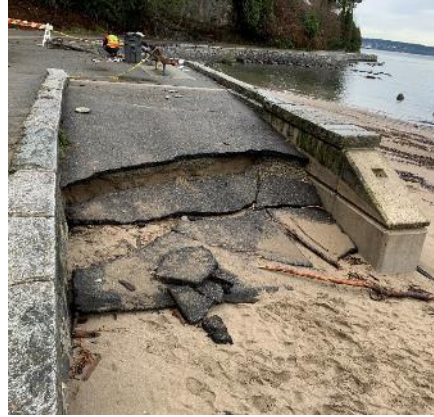
- LOW
- MODERATE
- HIGH



Stanley Park – Lions Gate Bridge to Siwash Rock



Stanley Park – Third Beach



Stanley Park – Second Beach to Third Beach



English Bay Beach Park



Sunset Beach Park



Vanier Dock



Vanier & Hadden Park



Kitsilano Beach - Kitsilano Beach Pool

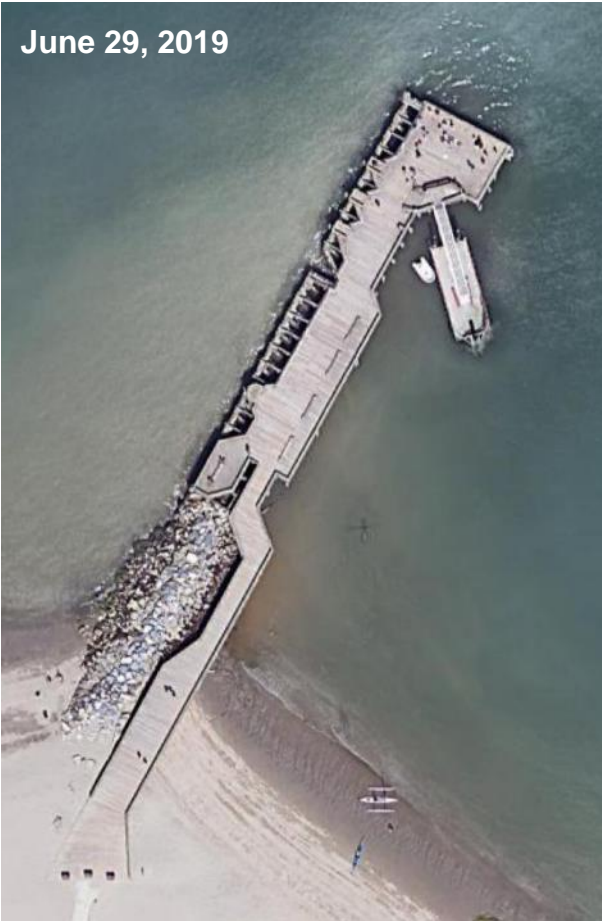


Kitsilano Beach - East

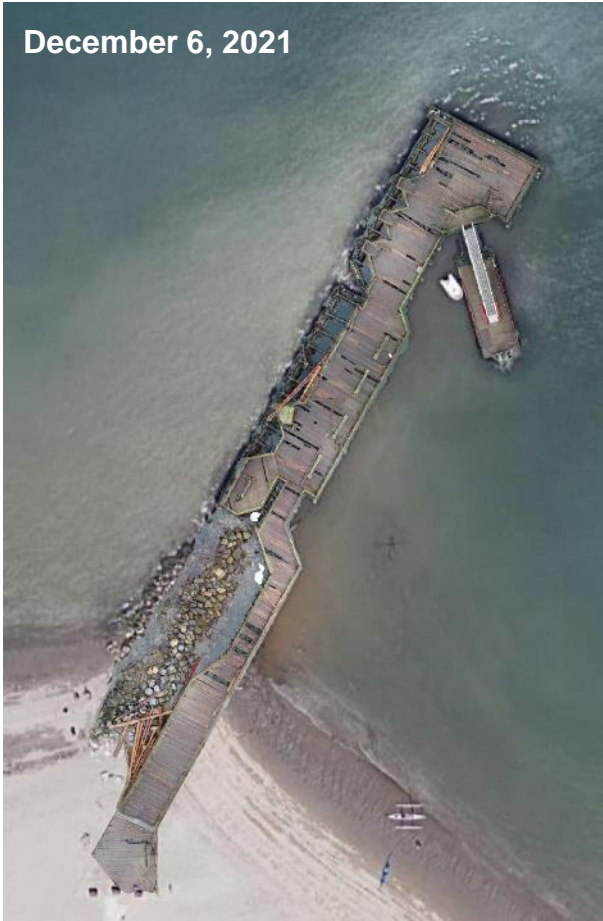


Jericho Pier

June 29, 2019



December 6, 2021



January 9, 2022



Jericho Pier



Spanish Banks – Salmon Stream



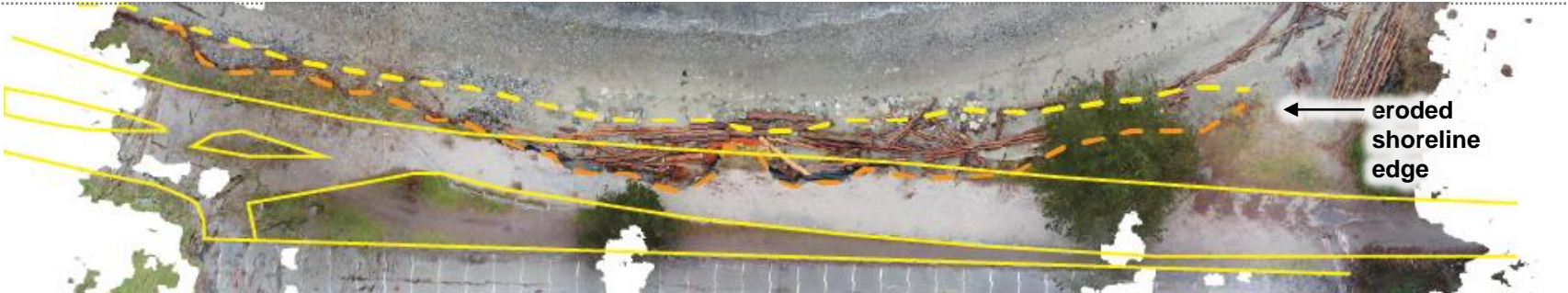
Spanish Banks – Salmon Stream

June 2019



original shoreline edge

Dec. 6, 2021



eroded shoreline edge

Jan. 9, 2022



eroded shoreline edge

Spanish Banks – Dog Park

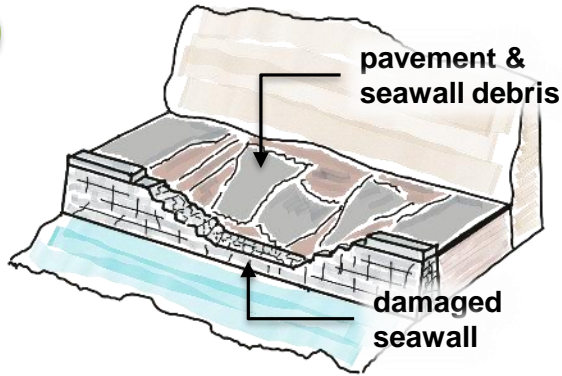




Repairs Update & Next Steps



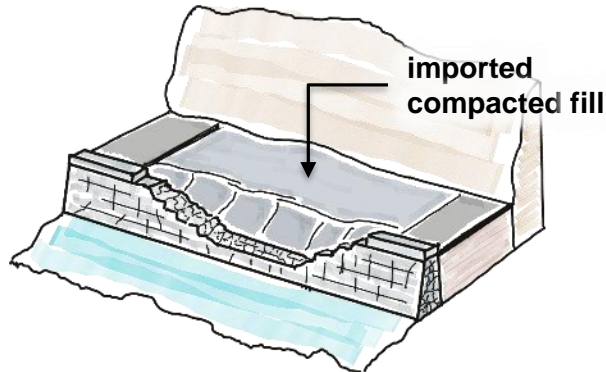
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✓ Remove Debris & Assess

- remove debris and unstable sections of pathway and seawall
- assess the condition of the seawall and pathway structure and determine short-term and permanent repair methodology

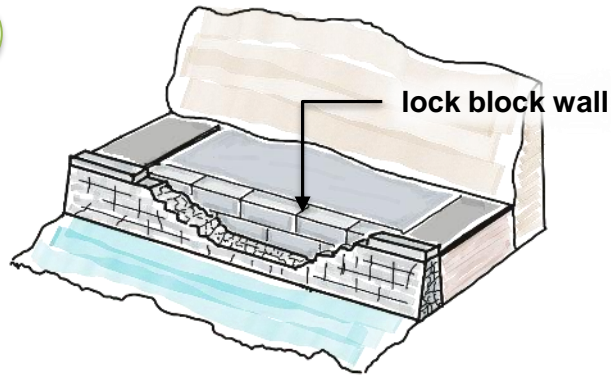
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✓ Construct Temporary Path

- import gravel to fill collapsed and eroded section of the seawall
- compact the imported fill to allow construction equipment and personnel to access other areas to start the repairs
- these sections are not safe for public use

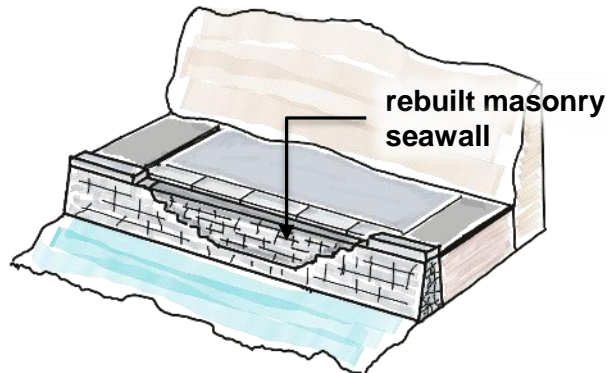
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□ Build Temporary Retaining Wall

- build a temporary lock-block retaining wall to prevent further damage and erosion of seawall during next king tides
- continue coping stone repairs in other areas

4



□ Rebuild Seawall & Pathway

- assess the seawall and temporary structures and adjust permanent wall detail
- rebuild the exterior masonry seawall
- rebuild the seawall path structure and repave




- We have been taking active steps in communicating with the public to ensure they are informed about the conditions, including:
 - regular posts through social media
 - preparing a public information video to warn the public about unstable conditions
 - providing regularly updated maps that show as sections of the seawall and shoreline re-open.

Current Status of Seawall & Pathways

VANCOUVER'S SEASIDE GREENWAY

Status of seawall and seaside pathways following January 7, 2022 storm

Last Updated: 2022 Jan 19

-  Closed - Do Not Enter
-  Open - Use Caution
-  Open





The Path Forward



The Path Forward: Coastal Adaptation Planning Process

Medium term

- 1) Current State & Hazard mapping
 - Describe current coastal conditions e.g. form, sediment transport, coastal squeeze
- 2) Vulnerability assessment
 - What is at risk?
- 3) Design Principles and Approaches
 - What do we care about? What do we want to see in future?



Vulnerability Questions:

- What assets, habitat and services are at risk?
- What is the vulnerability of these assets?
- What is the risk tolerance for different assets? For whom?
- What is our timeline? What is the adaptive capacity?

Long term

- 4) Refine
 - What options will work for us?
- 5) Solution seeking
 - How can we implement?

- 5 broad adaptation & mitigation approaches commonly considered:
- Under development with WEWF and plan to apply to all coastal areas under PB jurisdiction
- On-going work needing collaboration, engagement and Board interface



AVOID

Avoid development in hazardous areas.



ACCOMMODATE

Continue to use hazardous areas, but accommodate changes through alternative design practice or land-uses.



RETREAT

Relocate or abandon assets in hazardous areas. Allow natural systems to migrate inland.



PROTECT

Protect existing land-uses from hazards using 'hard' or 'soft' techniques.



ADVANCE

Extend land-use into hazardous areas. Frequently combined with 'protect' approaches.

- On-going clean up, damage assessment underway
- Understanding order of magnitude costs, plans & timelines for repair are still to be developed
- On-going communications with public and stakeholders
- Concurrently staff are undertaking coastal adaptation planning work
- MST collaboration
- Public engagement
- Staff will continue to interface with the Board e.g. updates, reports etc.

