



Patrick Hesp Flinders University

Wyomi Beach – Seawall Versus Retreat Adaptation Pathways

Brad Smith – Wavelength

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Background

- Wyomi Beach has a long history of erosion
- Loss of sand from longshore transport
 - Long term erosion trend ~ 1 m/yr
- Shoreline highly responsive to storms:
 - ~ 15 m of erosion from a series of storm events in 2016



Existing Coastal Management



Existing Coastal Management

- Trial nourishment placed to protect edges of seawall:
 - May 2020 ~13k m³ placed
 - April 2021 ~12k m³ placed
- Protected GSCs and assets, however placement required every year
- All nourishment lost in 2021 winter
- Nourishment volumes will continue to increase with Sea Level Rise

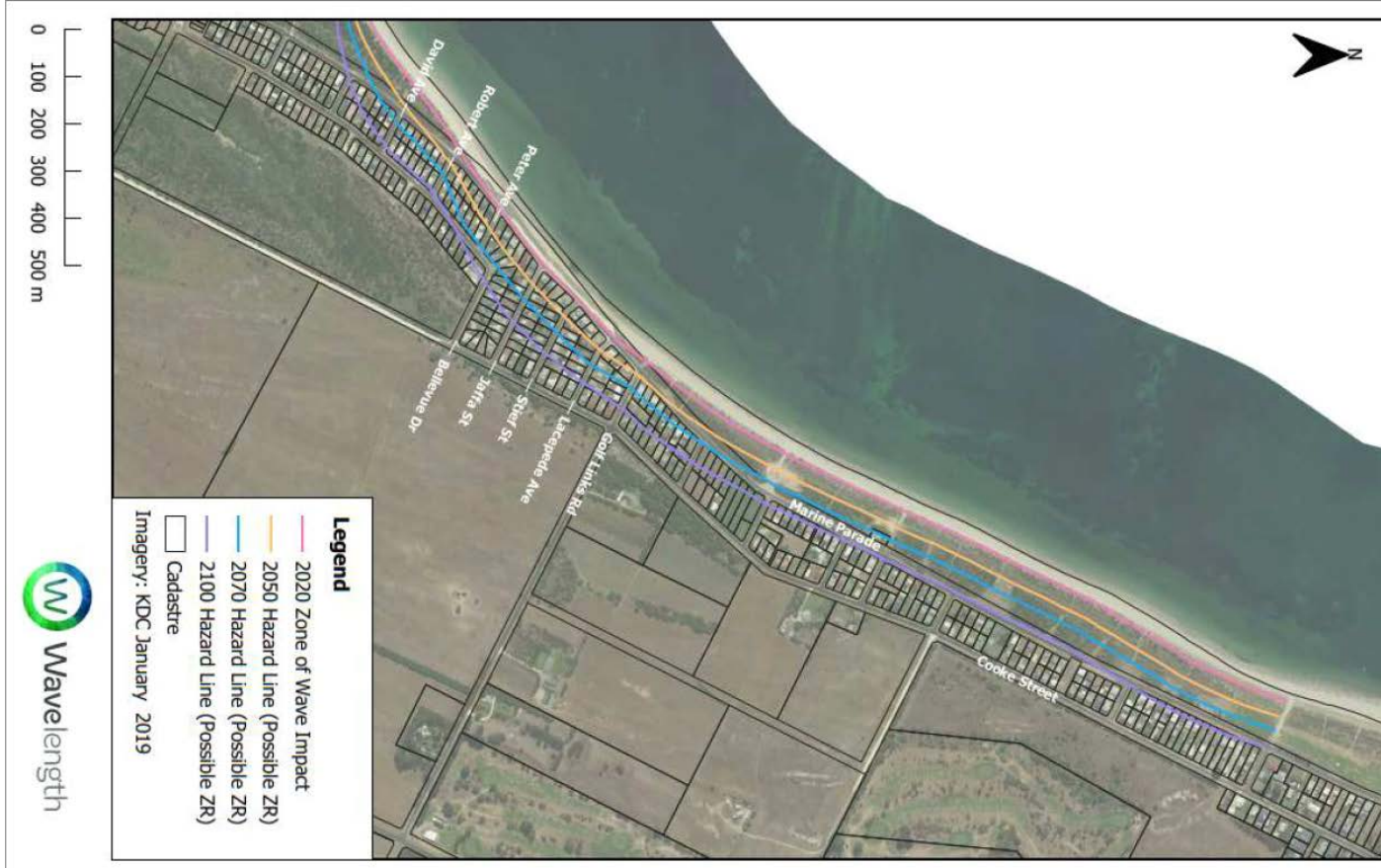


Coastal Adaptation Strategy – Erosion Risk

- Coastal Adaptation Strategy undertaken in 2020
- At Wyomi, erosion hazard maps showed several assets at risk of erosion under a Do Nothing approach:
 - Present Day:
 - Beach
 - Existing GSC seawalls
 - Telstra cable
 - Footpath
 - By 2050:
 - Marine Pde and access to properties



Coastal Adaptation Strategy – Erosion Risk



Coastal Adaptation Strategy – Erosion Risk

- CAS identified two feasible pathways for Wyoming:
 - Defend – Seawall
 - Managed Retreat
- Not enough information to progress for discussion with community
- Recommended a more detailed seawall vs retreat study:
 - Identify staging and timing of pathways
 - Identify any roadblocks or fatal flaws
 - Calculate financial costs of options



Seawall Vs Retreat- Beach Impact

- Beaches are highly valued by community who walk and drive along beaches at Kingston
- Ecological function of beach and dune also important
- Important to consider beach impacts when looking at options:
 - Seawall without nourishment will lead to loss of beach in front and north
 - Retreat returns system to natural processes

Shoreline without seawall



Shoreline with seawall



Gradual loss of beach



Seawall Vs Retreat- Implementation & funding

- Planning & Implementation:
 - Seawall planning and implementation well understood
 - Managed retreat requires careful consideration
- The funding mechanism isn't clear and needs to be decided
- Examples of how this has been handled in other locations:
 - Collaroy-Narabeen (NSW) - benefit distribution analysis assesses who benefits from seawall construction and nourishment
 - Bundaberg Council (QLD) - established a Steering Committee to assist with sourcing internal and external funding opportunities
 - Albany (WA) - Council intend to establish a Specified Area Rate applied to those properties who will directly benefit from management options



Staging - Seawall

- Loss of beach in front
- Continue extending seawall north and south
- By 2050:
 - ~800m total (north and south)
 - Upgrade rock size
- Costs ~\$3.9M NPV to 2050
\$3.9M seawall extensions, upgrades and repairs
- By 2070:
 - increase crest levels to +4.8 mAHD



Staging – Full Retreat

- Full retreat:
 - Remove seawall in centre
 - Retreat assets and properties
- Beach connectivity is maintained
- Difficult planning and implementation
- High costs due to purchase price of property
- ~\$13.2M NPV by 2050
- \$0.9M seawall removal, \$0.9M roads and assets, \$11.4M property (~\$18M current property value)



Staging - Hybrid Option

- Hybrid option also investigated:
 - Maintain seawall in centre
 - Retreat to north and south of seawall
- Considerations:
 - Loss of beach connectivity in centre
 - Requires retreat planning and implementation
- ~\$4.3M NPV by 2050
 - \$2.8M seawall, \$1.5M property (\$6.2M current property value)



Seawall with Nourishment

- Beach nourishment in conjunction with seawall
- Objectives:
 - Counter longshore transport and Sea Level Rise to maintain beach in front of seawall
- Based on nourishment trial results:
 - ~20k m³/yr at present
 - Volumes increase with SLR
- By 2050:
 - ~100k m³ /yr required each year, approx. \$1.8M per year
 - ~\$18M NPV by 2050



Summary

Option	Maintains Beach and Dune	Includes Retreat (relocation of assets)	NPV to 2050
Seawall	X	X	-\$3.9M
Full Retreat	✓	✓	-\$13.2M
Hybrid Seawall in centre with retreat north and south	X	✓	-\$4.3M
Seawall with Nourishment	✓	X	-\$17.7M



Key Findings

- Erosion risk at Wyomi is imminent:
 - Beach loss in front of seawall in coming few years
 - Loss of Marine Parade by 2050
- All options are feasible but have different benefits and impacts:
 - Seawall – cheapest option but results in loss of beach connectivity without expensive nourishment
 - Retreat – maintains beach connectivity but high cost and difficult planning and implementation process
 - Hybrid approach – is relatively cheap and has trade-offs of both options
- Need to balance pros and cons, with input from the community on what they ‘value most’



Next Steps

1. Engage with community:
 - Develop community engagement strategy
 - Engage with community and get feedback on pathways
2. Select option, using community engagement results:
 - Specific Multi-criteria Assessment (MCA)
3. Commence implementation:
 - Identify funding mechanism and opportunities
 - Planning
 - Implement option



Questions

- Any questions?

