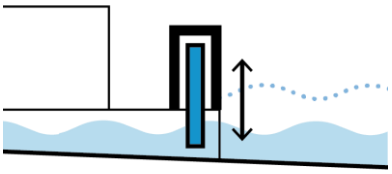
Measure Profile

Locks

Flood Adaptation Measure

PHYSICAL INFRASTRUCTURE



SHORELINE LOCATION:

In Water

Launch exiting tidal lock, Cullen Bay Marina, Darwin, Northern Territory, Australia ©David Wall/Alamy Stock Photo

DESIGN LIFE	ADAPTABILITY	IMPACT ON THE WATERFRONT	CONSTRUCTION COST
50+ years	Varies	Major Intervention	TBD

COASTAL FLOOD HAZARDS MITIGATED:

Sea Level Rise | Storm Surge | Groundwater | Waves | Erosion

MEASURES COMPATIBILITY:

Flood	Seismic
Levee, Seawall, Floodwalls	N/A

ECOSYSTEM SERVICES: Measure may affect these shoreline values

Aquatic Habitat	Terrestrial Habitat	Water Quality	Carbon Storage
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DESCRIPTION:

Locks are essentially a combination of gates, barriers and pumps which allow for vessels to navigate from high-to-low or low-to-high water levels. This solution is an extreme example of previously presented gates & barriers, but intended for use were sea levels to regularly exceed the vulnerable upland elevation.

CONSIDERATIONS:

- Large construction that is only applicable at creek mouths.
- Would need to be paired with adjacent shoreline protection to prevent outflanking.

ADVANTAGES:

- Maintains navigation during high water events.

DISADVANTAGES:

- High capital and operational cost.
- High environmental impact.
- Potential upland stormwater discharge impacts.
- Operational impact to navigation by increasing transit time.

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CONSTRUCTION IMPACTS TO THE PUBLIC:	SEA LEVEL RISE ADAPTATION OPPORTUNITIES:	CASE STUDIES:
• Dependent on location and siting. • Impacts could be significant if located near shore, or less if in offshore location.	• Limited adaptability. • Could be paired with deployables and shoreline floodwalls as additional protective elements.	• None cited

DESIGN OPPORTUNITIES:

Ecological Enhancements	Urban Design	Form
• TBD	• TBD	• TBD

DESIGN CONSIDERATIONS:

- Requires tie into cut-off wall that will disrupt the water column and allow for full closure in the event of a storm surge or king tide.
- High seismic region will provide a challenge to maintain operability of the gates in the event of moderate to high seismic event.
- Need to ensure circulation of natural channels is not lost, which may require supplemental pumping to move water and sediment.
- Extensive permitting process and high level of environmental study.

SITE-SPECIFIC CONSIDERATIONS:

- This measure would apply only at the Creeks.

INSTALLATION AND CONSTRUCTABILITY CONSIDERATIONS:

- Costly installation with long lead time and overall construction duration.

ARCHITECTURAL CONSIDERATIONS:

- Significant visual impact on current shoreline.
- Certain types of locks could be made publicly accessible which could provide opportunity for creek crossing.

OPERATION AND MAINTENACE CONSIDERATIONS:

- Extensive maintenance and monitoring costs require active operation to ensure they are utilized when needed to protect infrastructure upland.