




Photo: Rob Thompson

# Prioritising wetland remediation in coastal estuaries



How sea level rise will close the window of opportunity for drainage of estuarine floodplains



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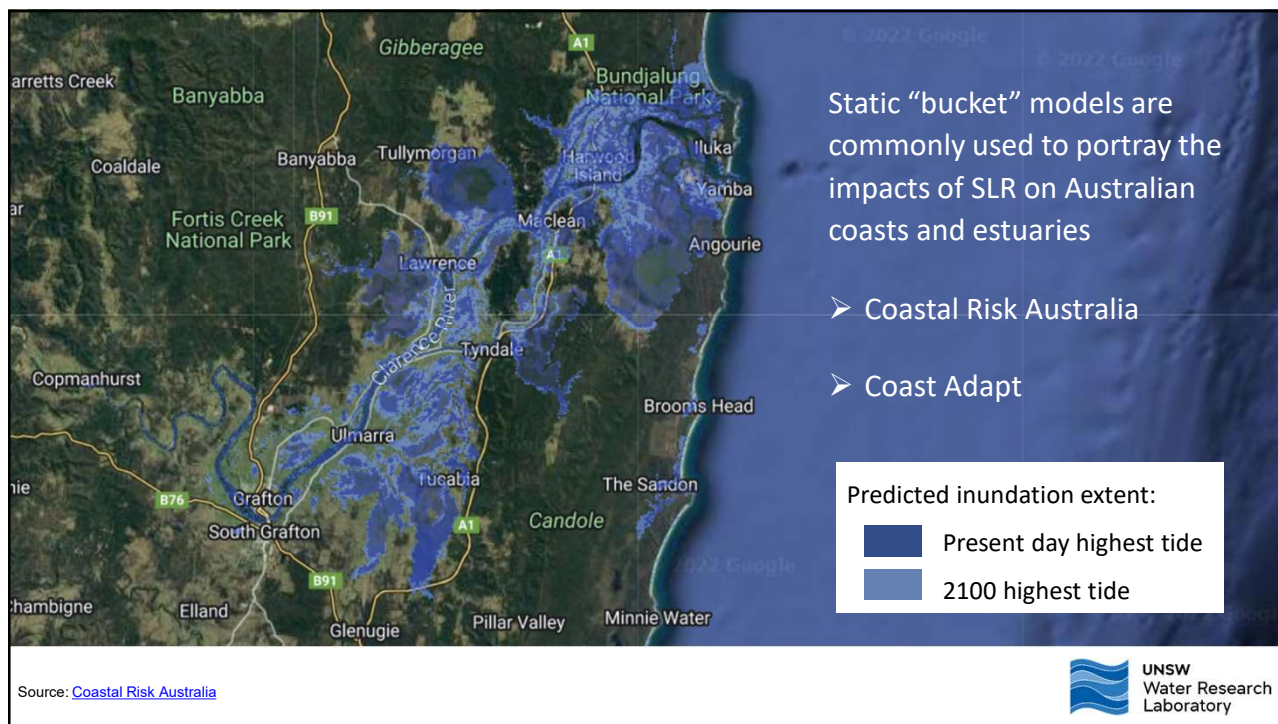


CAFE - RESTAURANT

Source: Craig, N. (2014, January 15). Wading diners enjoy king tide *Port Stephens Examiner*. Retrieved from [Wading diners enjoy king tide \(portstephensexaminer.com.au\)](http://www.portstephensexaminer.com.au)



2



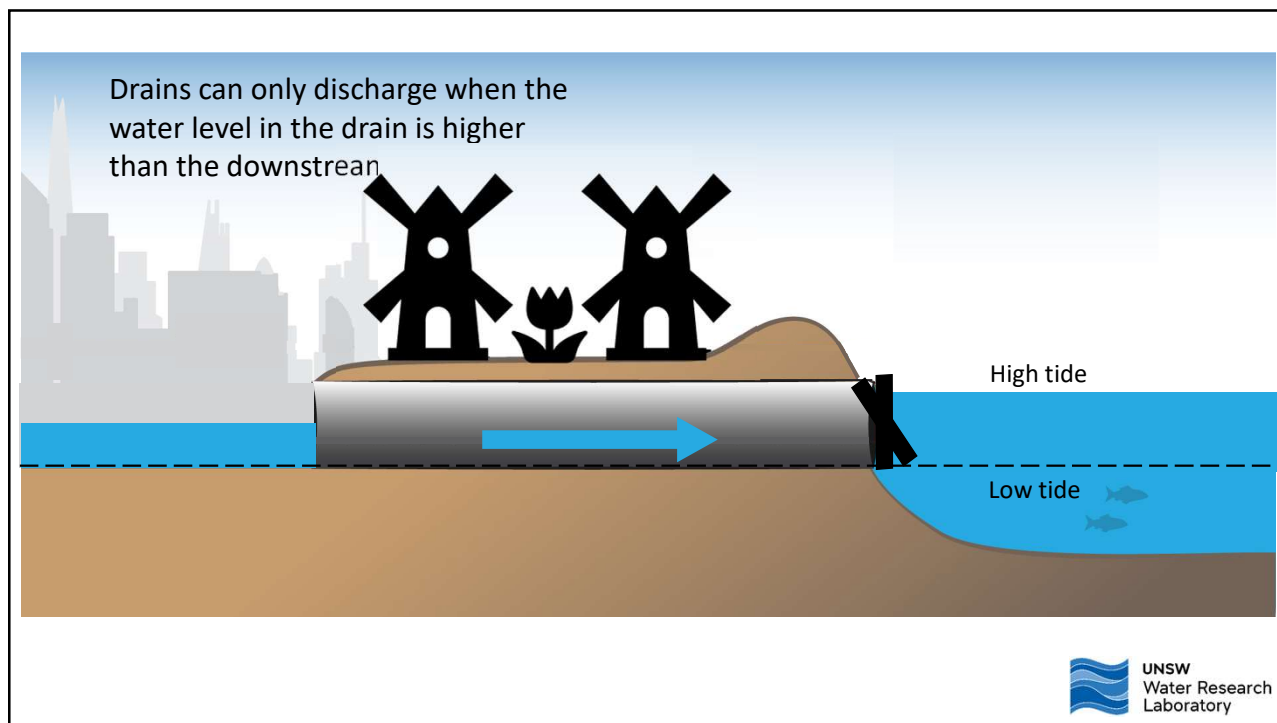
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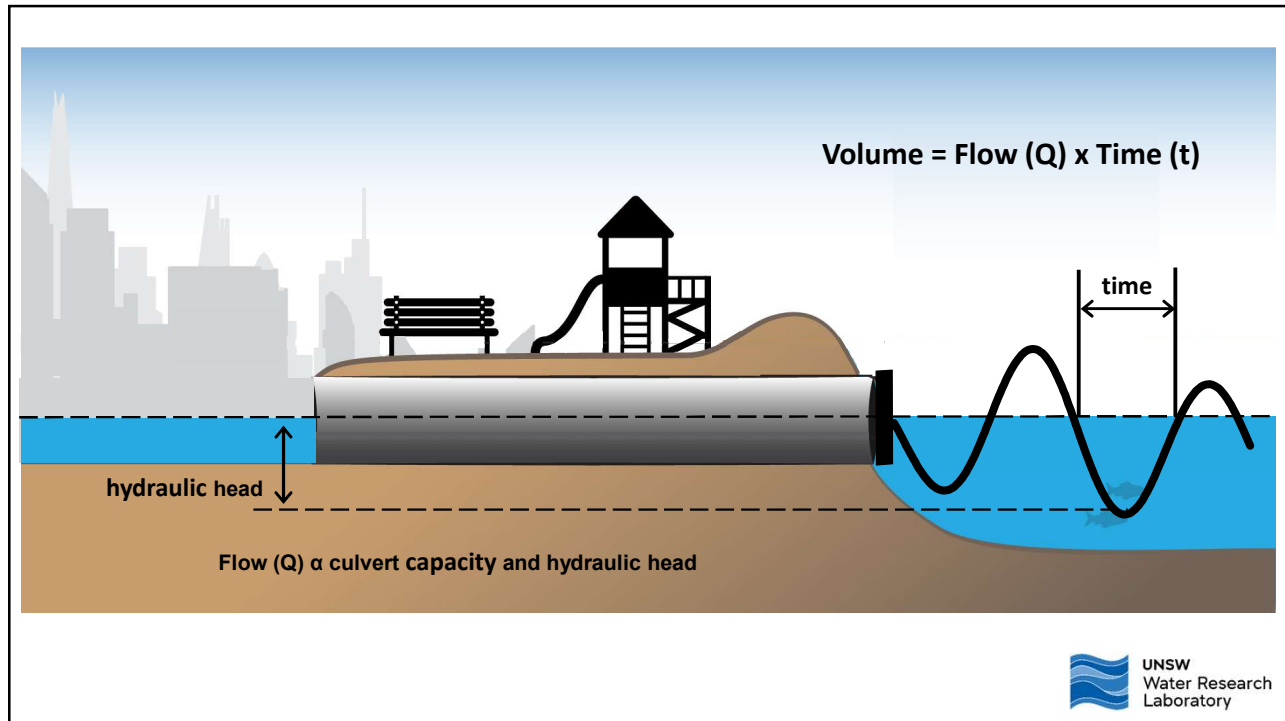
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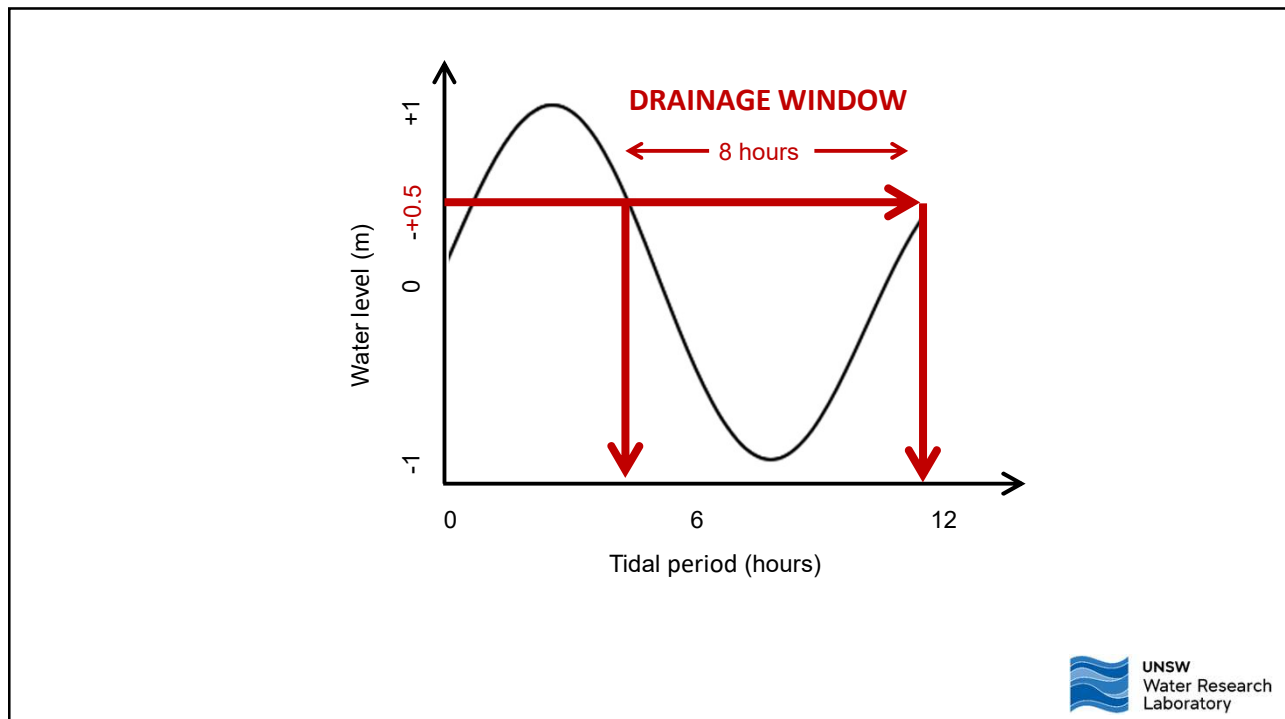
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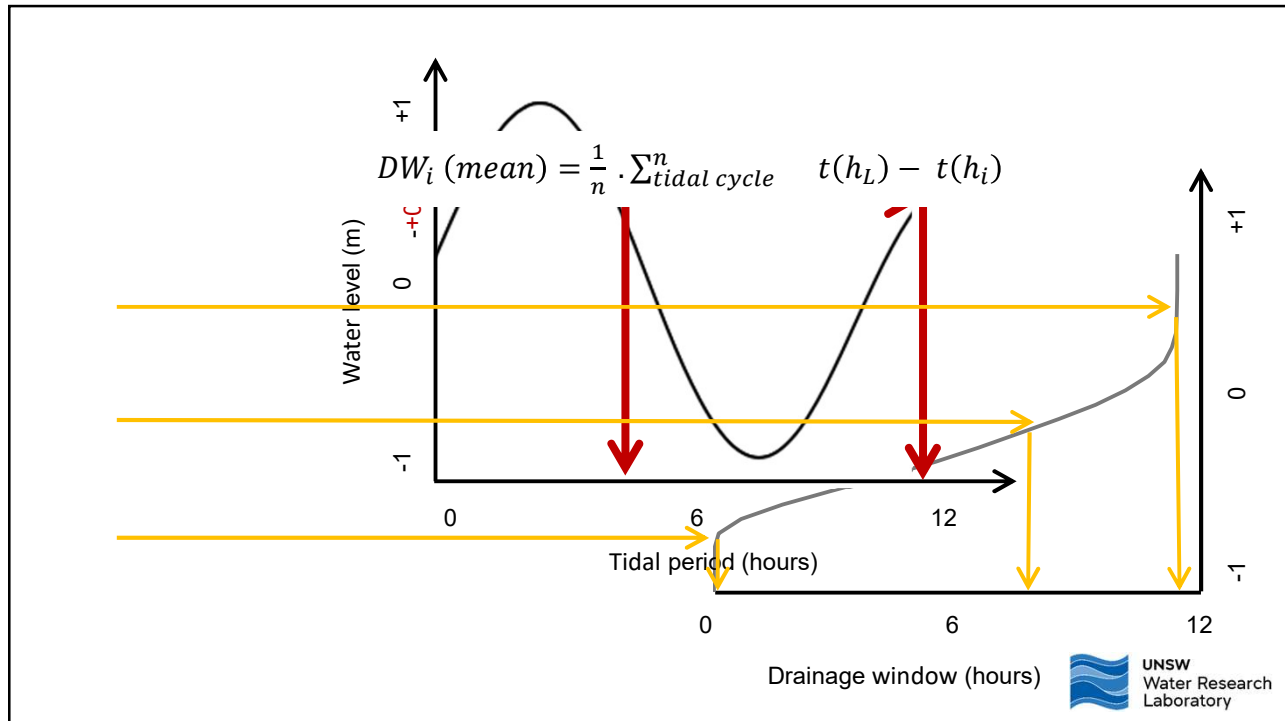
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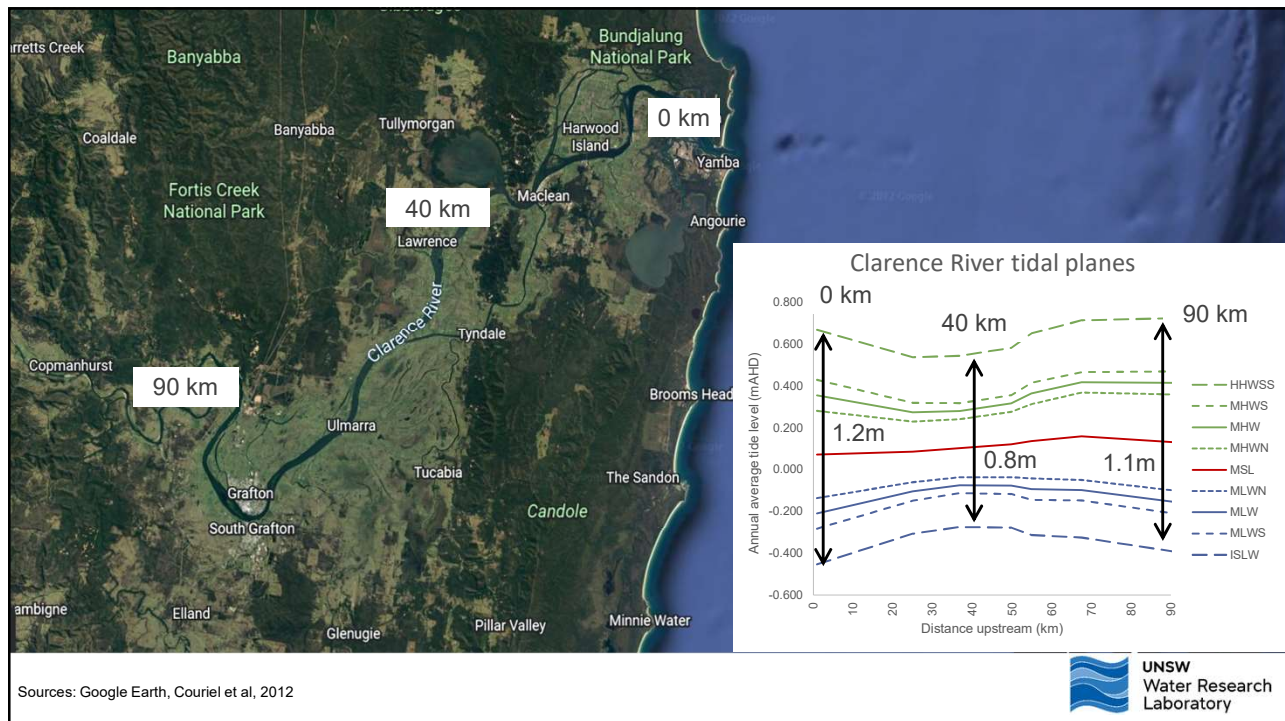
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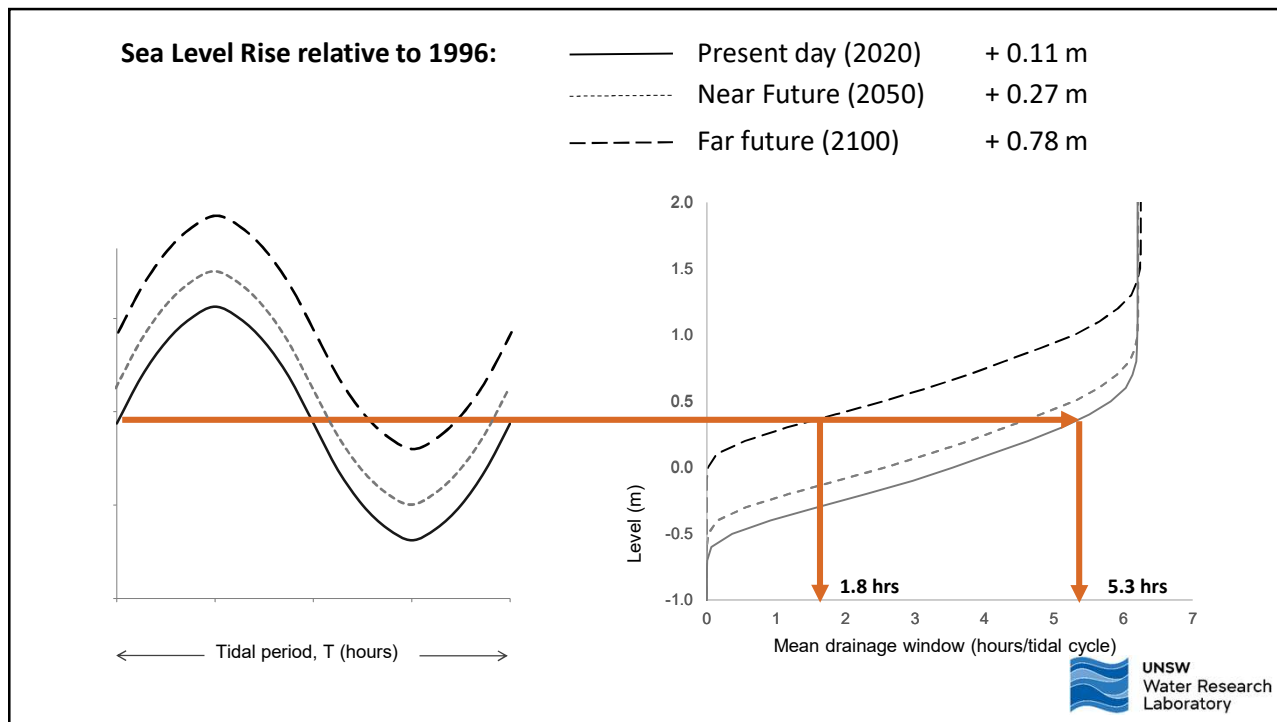
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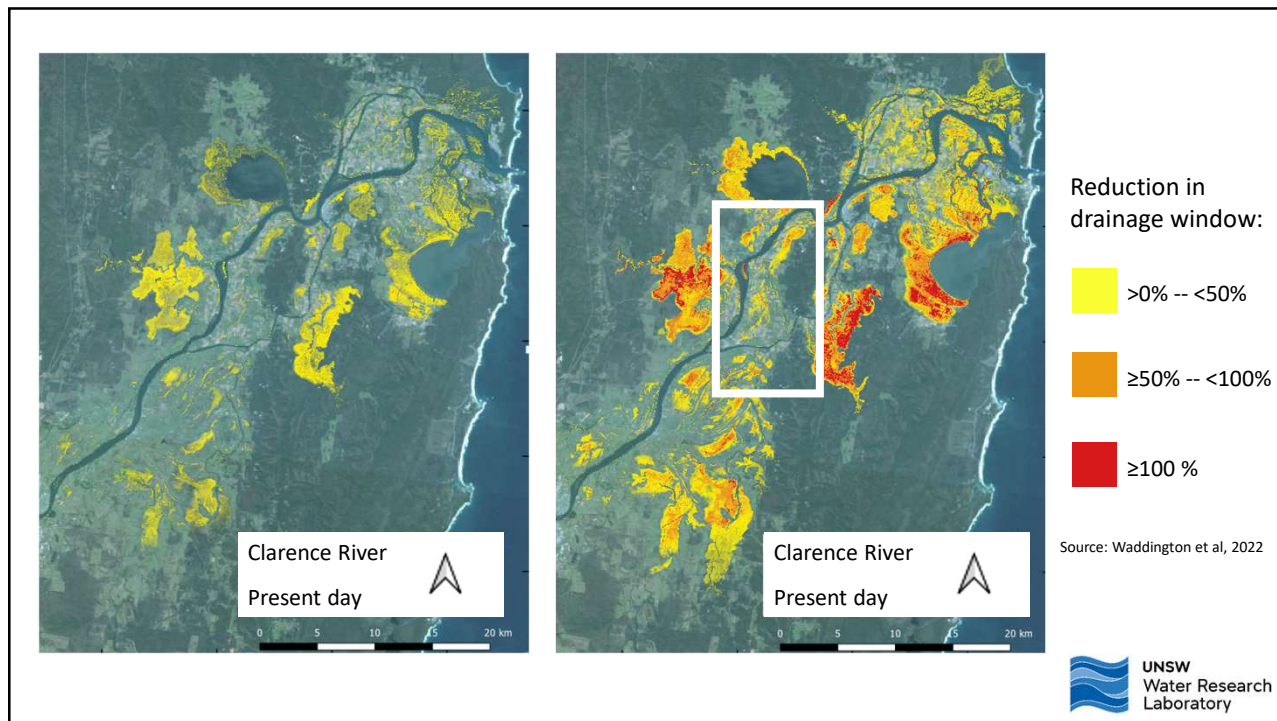
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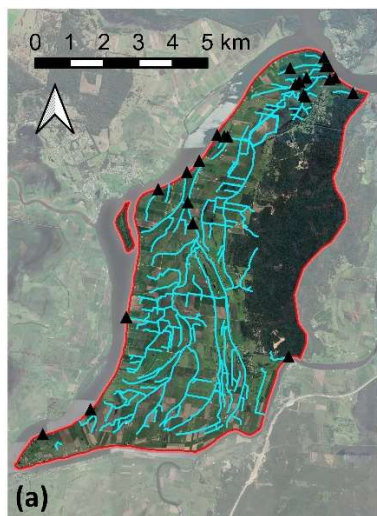


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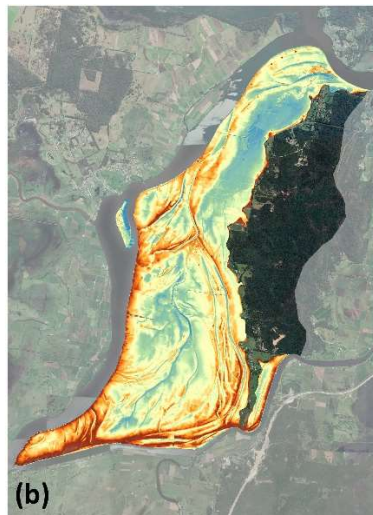
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Woodford Island is protected from inundation and backwater flooding by  
(a) floodgates and (b) levees



Legend:

- Catchment boundary
  - Waterways and drains
  - ▲ Floodgates
- Elevation (m AHD)
- 0.0
  - 0.5
  - 1.0
  - 1.5
  - 2.0
  - 2.5
  - 3.0
  - 3.5
  - 4.0

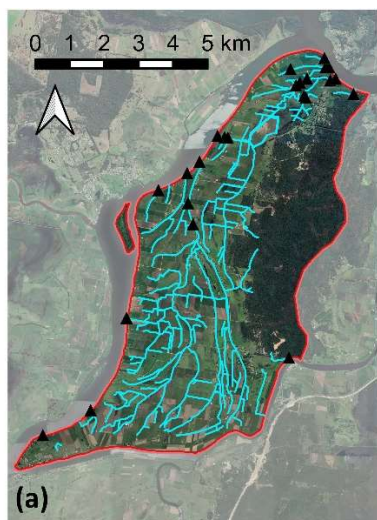


Source: Waddington et al, 2022



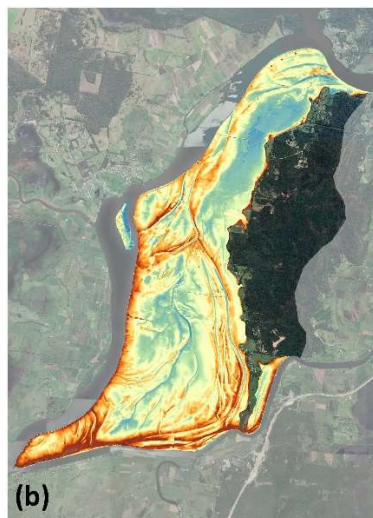
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But drainage will be restricted by future sea level rise



Legend:

- Catchment boundary
- Waterways and drains
- ▲ Floodgates

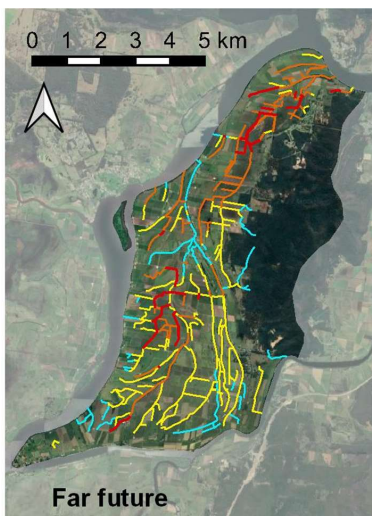


Source: Waddington et al, 2022



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But drainage will be restricted by future sea level rise



Legend:

- Catchment boundary
- Waterways and drains
- ▲ Floodgates

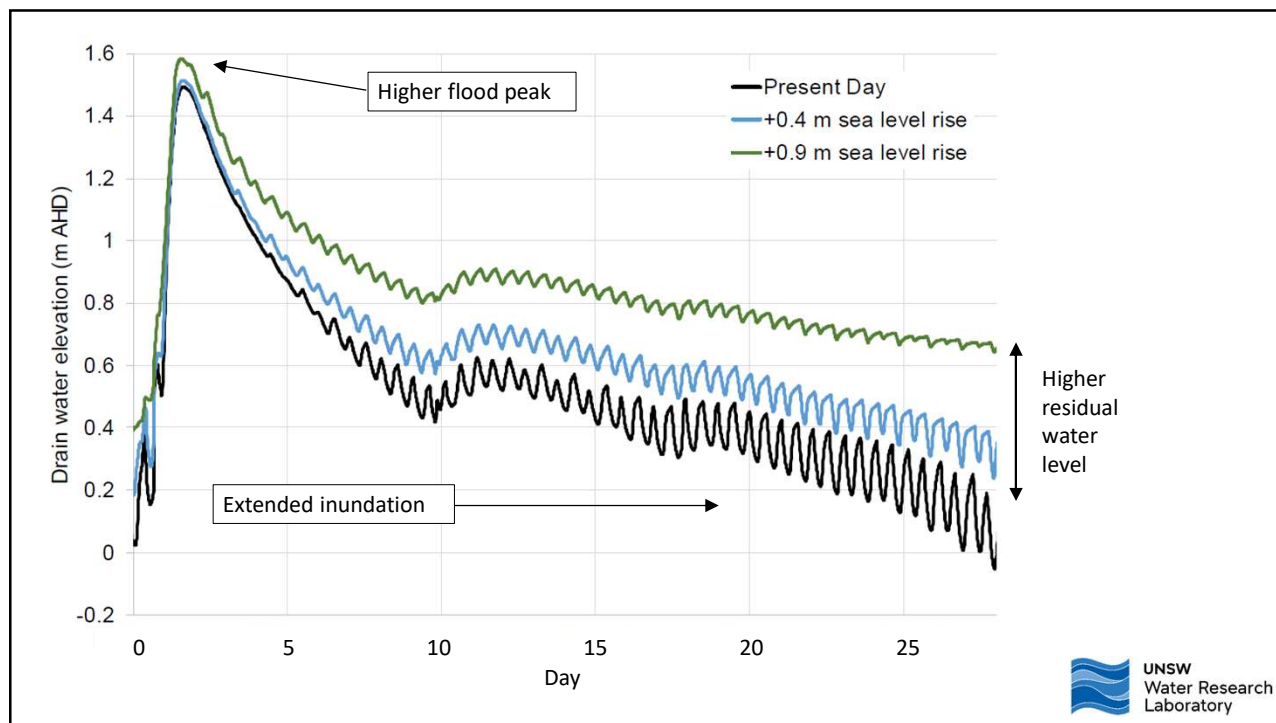
Reduction in drainage window:

- 0%
- >=0% - 50%
- 50% - 100%
- >= 100%

Source: Waddington et al, 2022

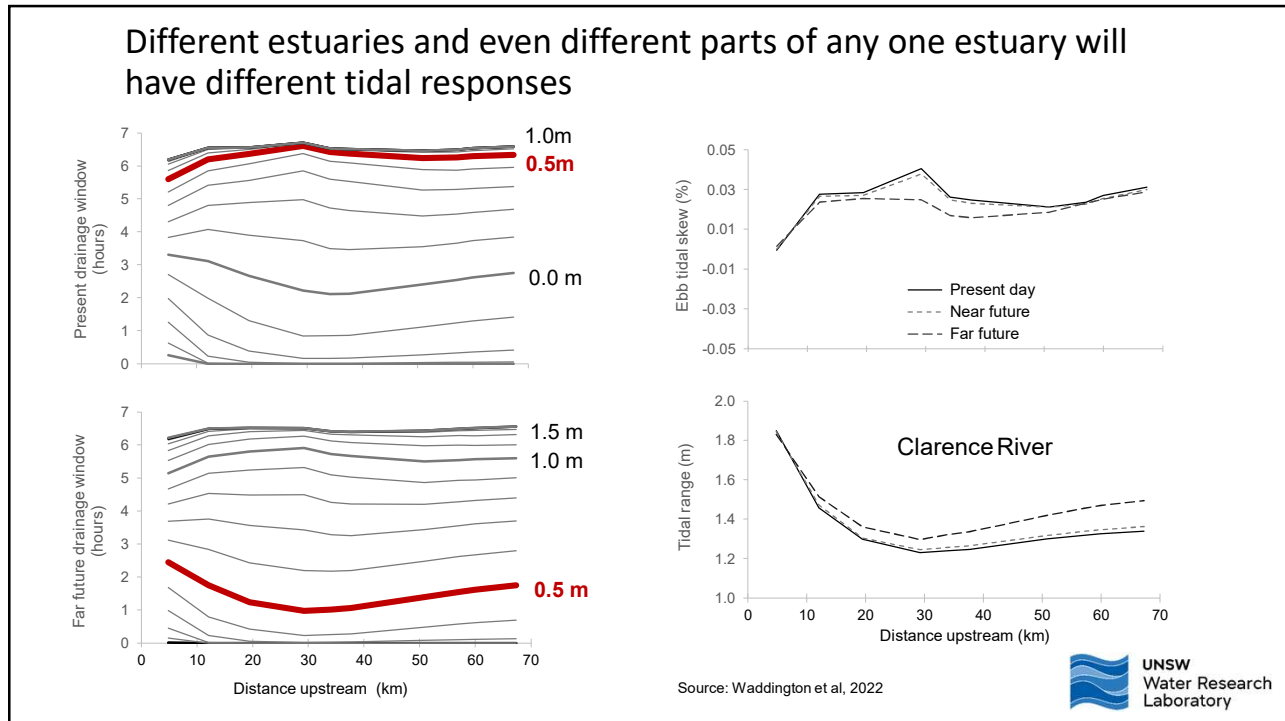


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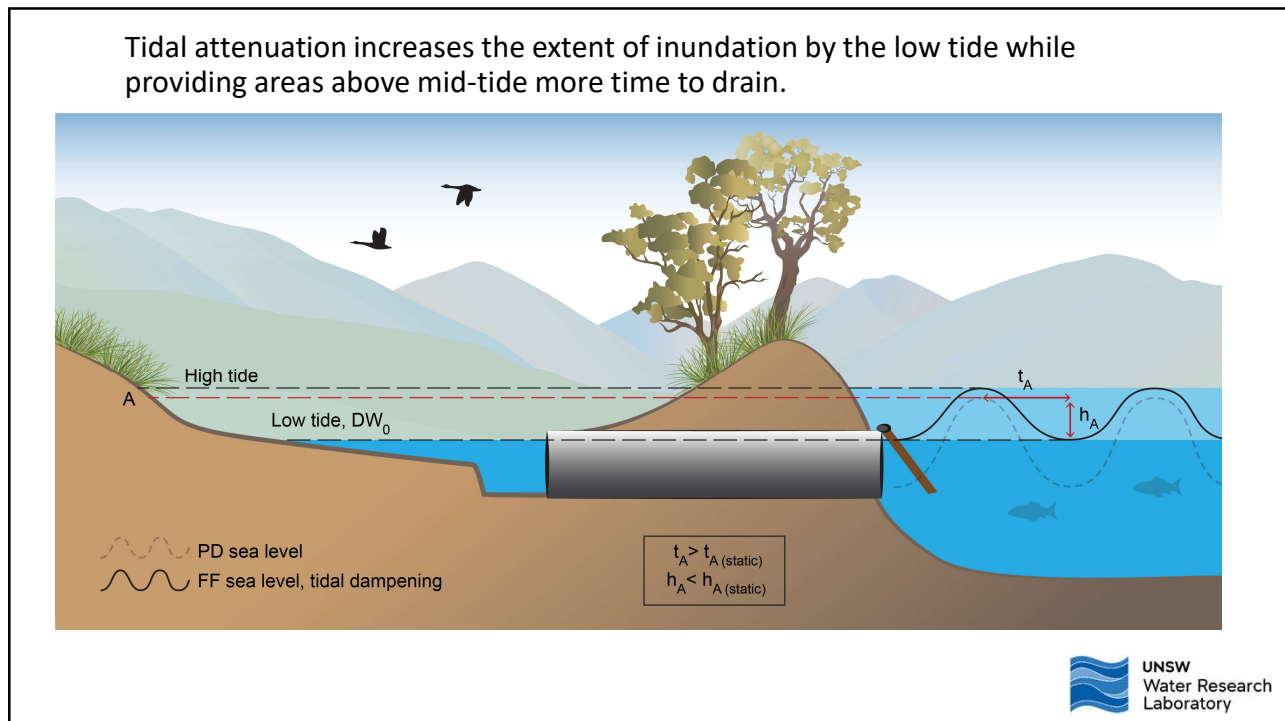


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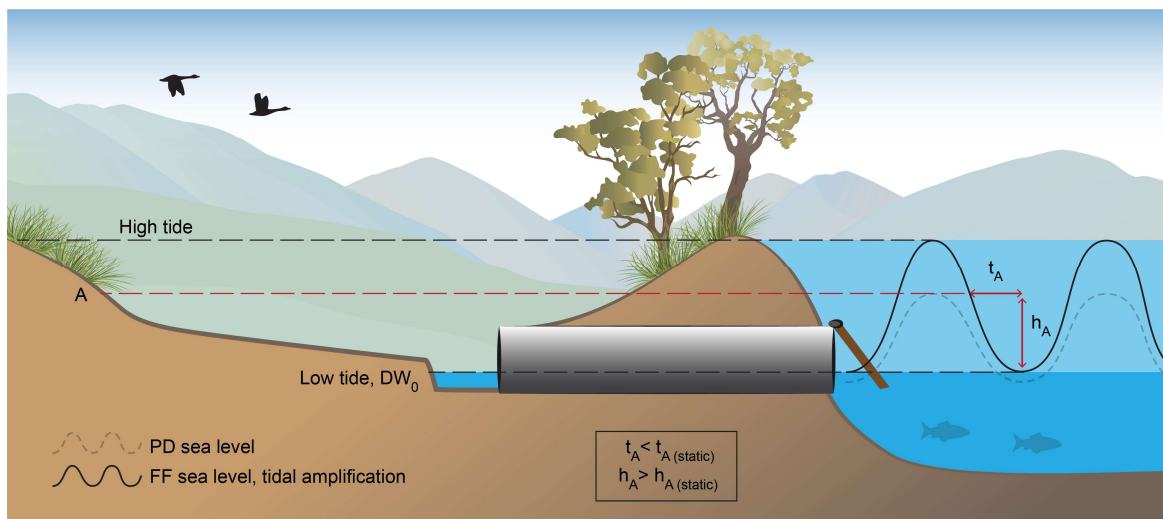


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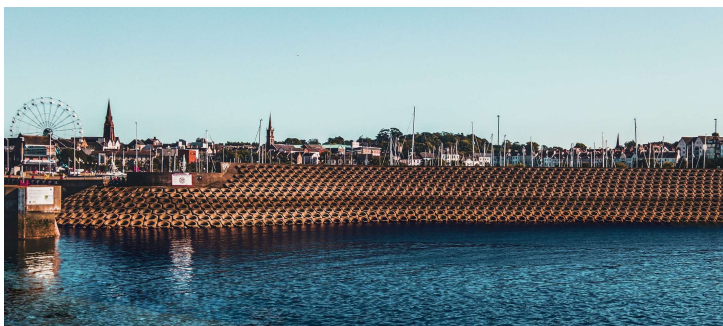


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### Tidal amplification assists drainage at low levels but reduces drainage at high levels



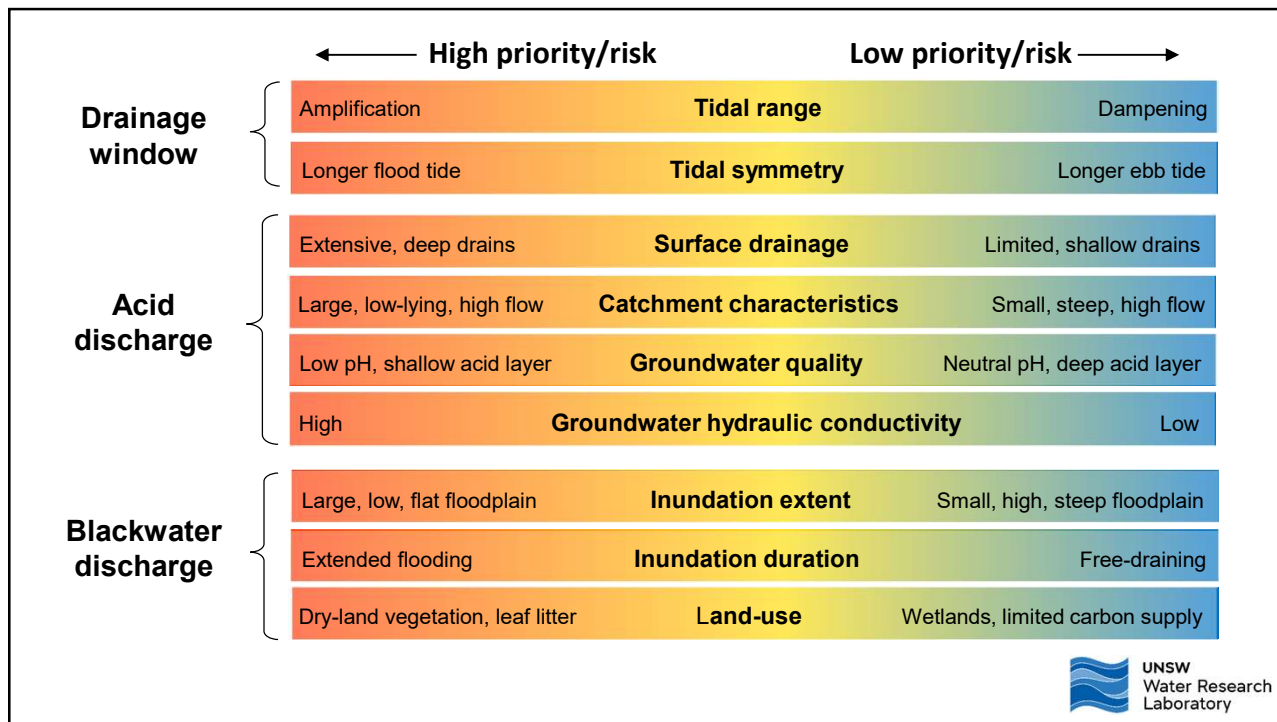
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Photos: K. Mitch Hodge and Jos Zwann on Unsplash

Shoreline hardening and construction of new levees may increase water levels and amplify the tidal range as flows are restricted to well-defined channels.

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Restoring wetlands to the areas most affected by reduced drainage provides opportunities for co-benefits including improved water quality and carbon offsetting.

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**References:**

Khojasteh, D., Hottinger, S., Felder, S., De Cesare, G., Heimhuber, V., Hanslow, D. J., & Glamore, W. (2020). *Estuarine tidal response to sea level rise: The significance of entrance restriction.*

Waddington, K., Marshall, L. A., Khojasteh, D., Rayner, D., & Glamore, W. (2022). *Quantifying the Effects of Sea Level Rise on Estuarine Drainage Systems.*

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