

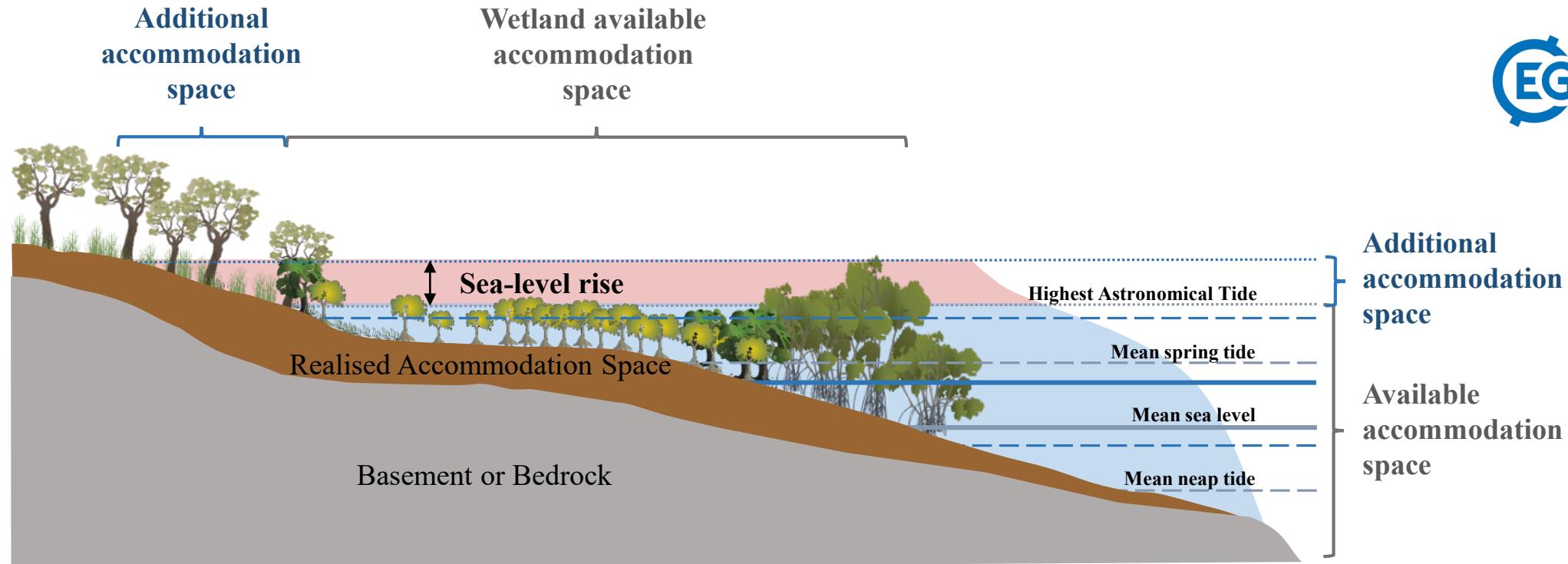


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Accommodation space and sea-level rise

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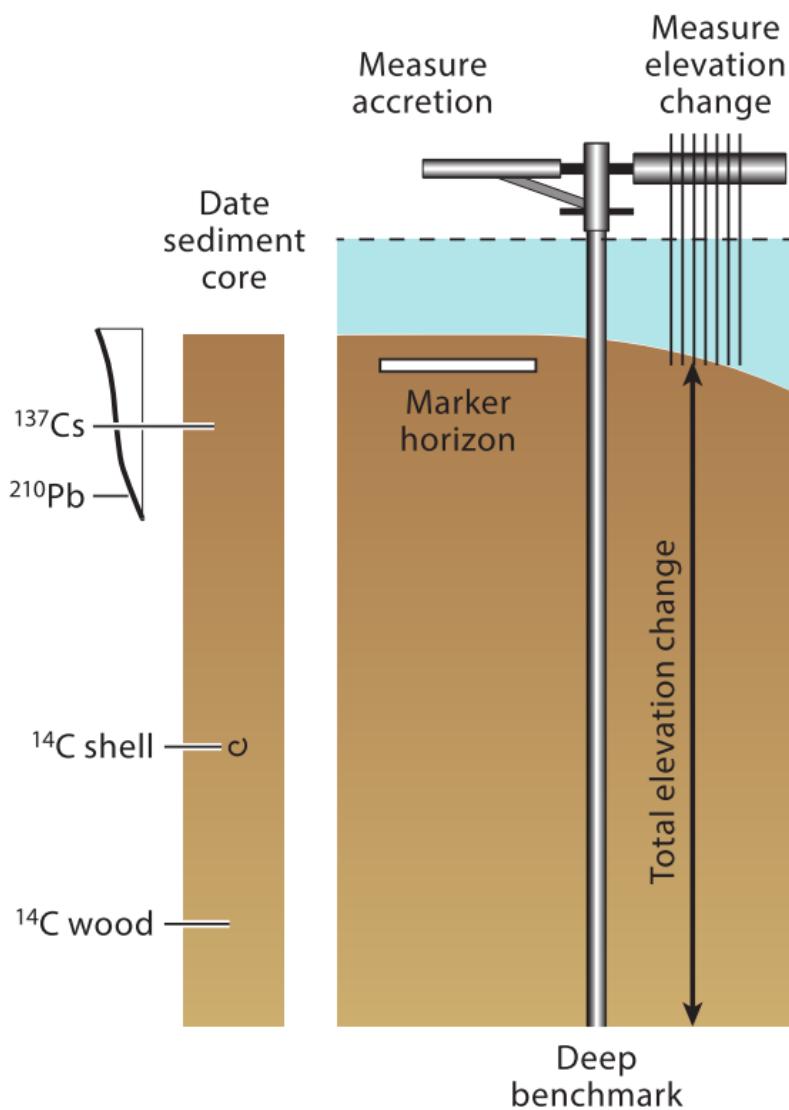
Increasing Realised Space

- Mineral sediment addition
- Root & organic matter addition
- Substrate swelling

Increasing Available Space

- Eustatic sea-level rise
 - Deep subsidence
 - Tectonism* (also decreasing AS)
 - Hydrological changes along estuaries
- Organic matter decomposition
 - Root zone collapse
 - Substrate compaction or consolidation

Monitoring response to sea-level rise



- Position:**
- RTK-GPS
 - Water levels
 - LiDAR
 - Tidal analysis



- Sediment:**
- Grain size
 - Bulk density
 - LOI
 - %C, %N
 - $\delta^{13}\text{C}$, $\delta^{15}\text{N}$
 - ITRAX
 - Forams



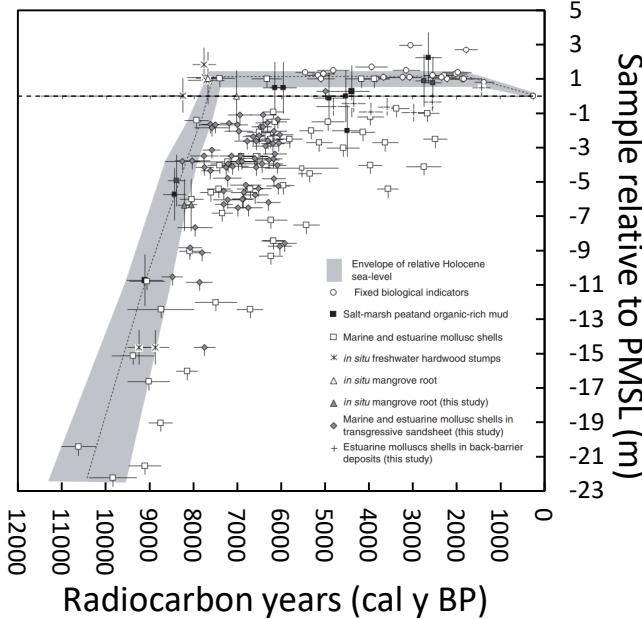
- Dating:**
- ^{210}Pb
 - ^{137}Cs
 - ^{14}C

Study location: Westernport Bay, Victoria

Large tidal embayment; semidiurnal with ~ 3 m tide range, catchment ~ 3400 km 2 , mangroves near southern limit

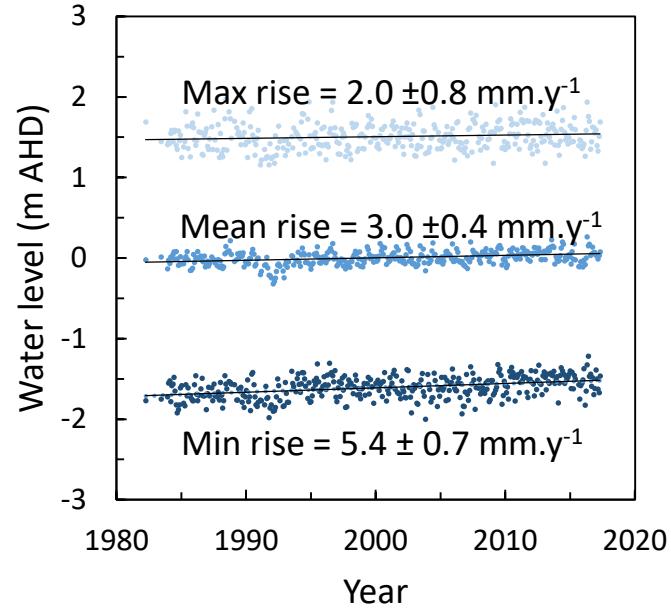
Holocene sea level:

Relative tectonic and GIA stability

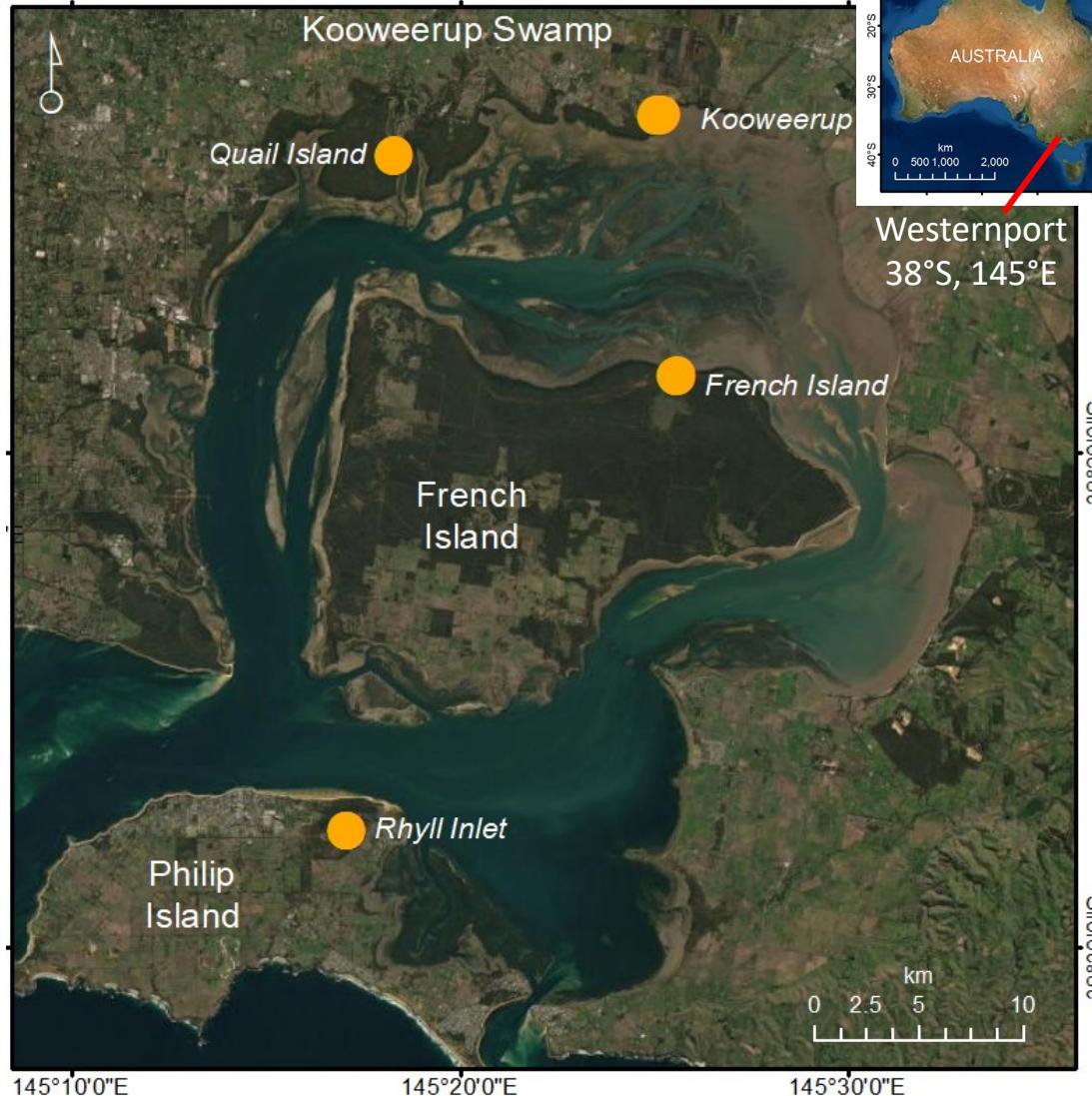


Sloss et al. (2007) *The Holocene* 17: 999-1014

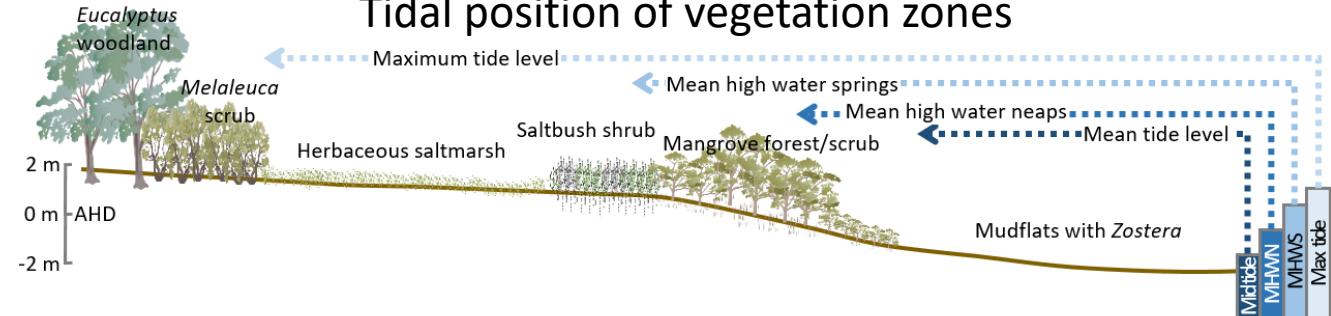
Contemporary sea level



Source: Stony Point tide gauge

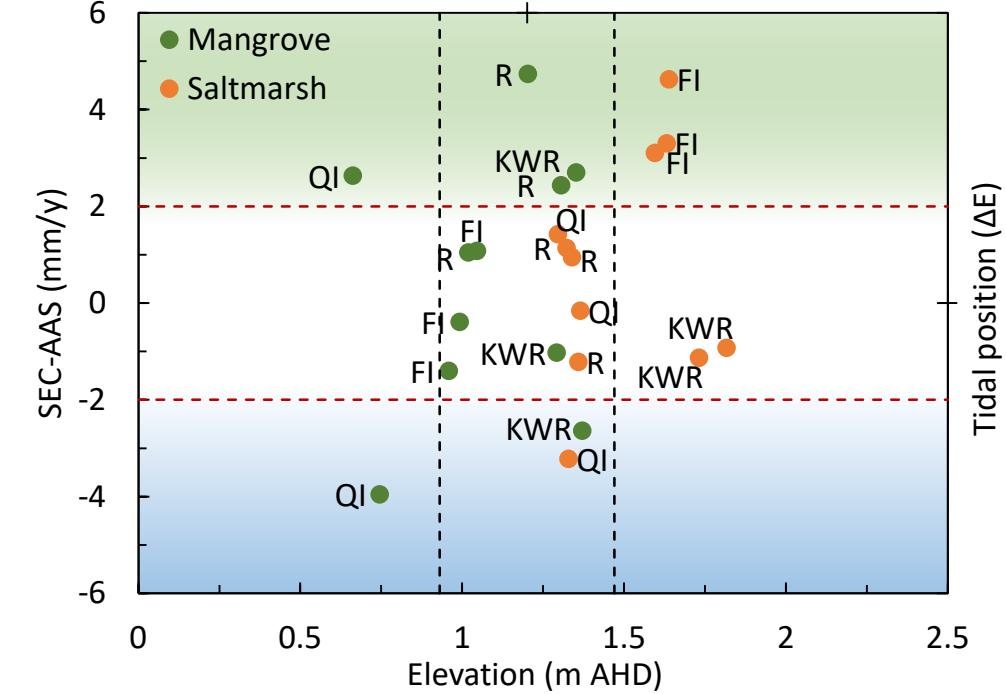
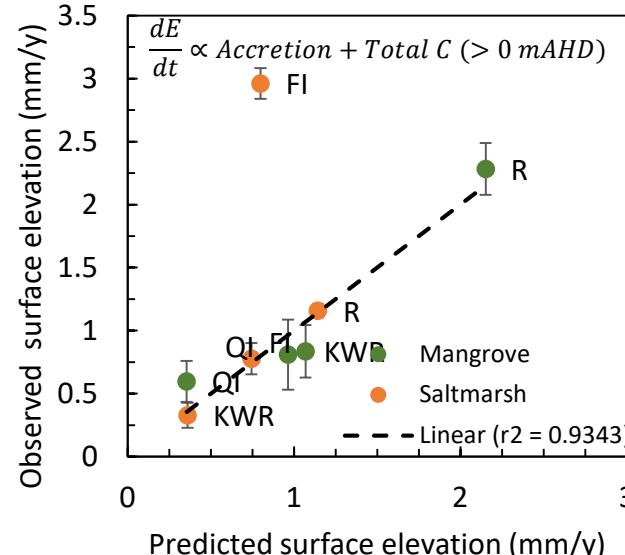
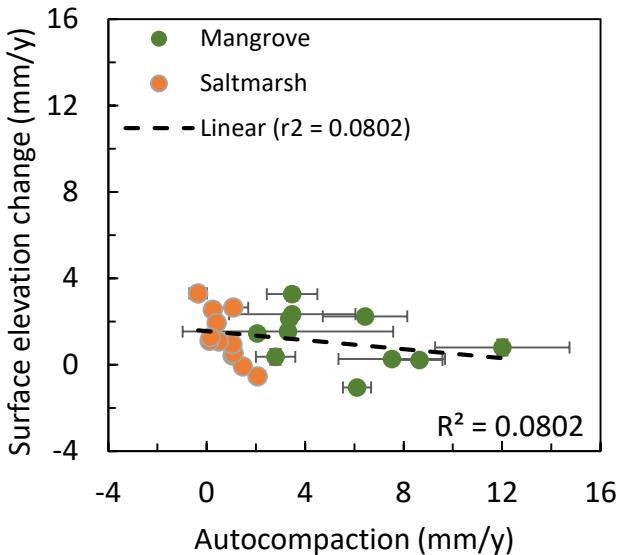
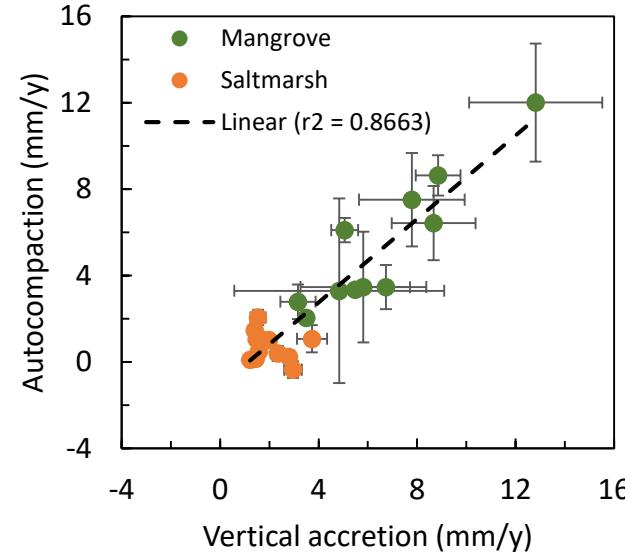
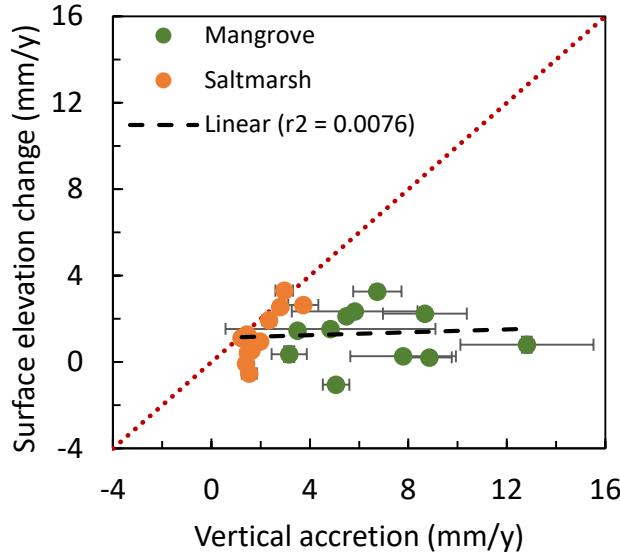


Tidal position of vegetation zones



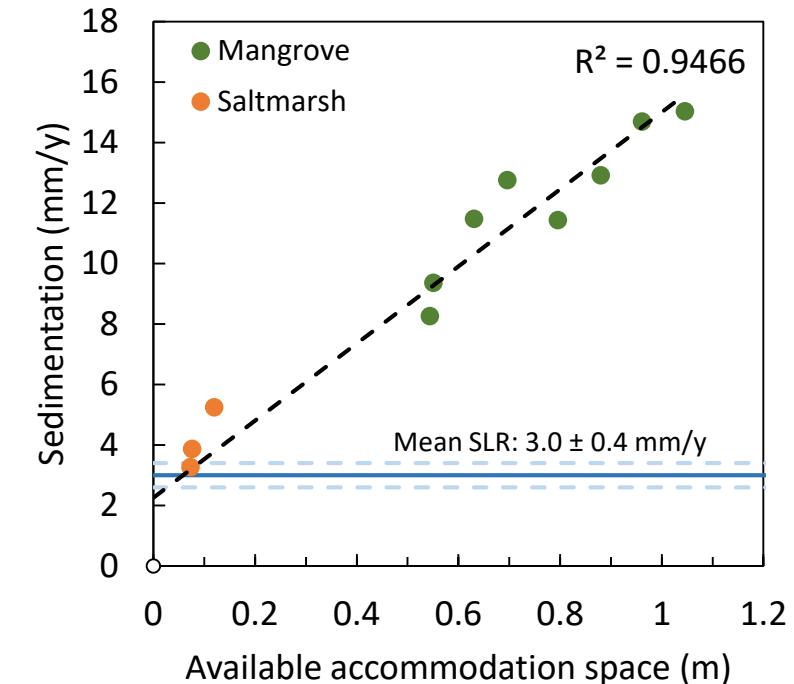
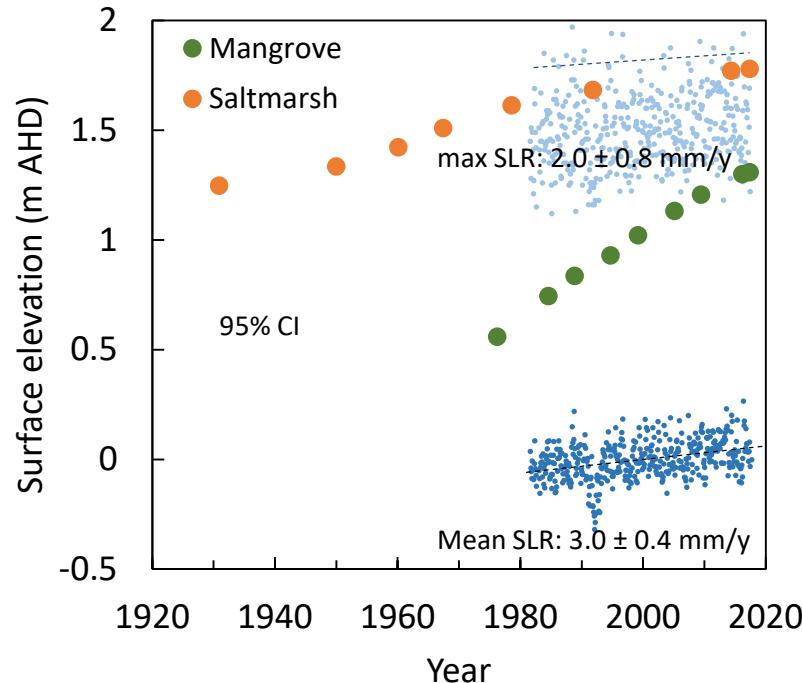
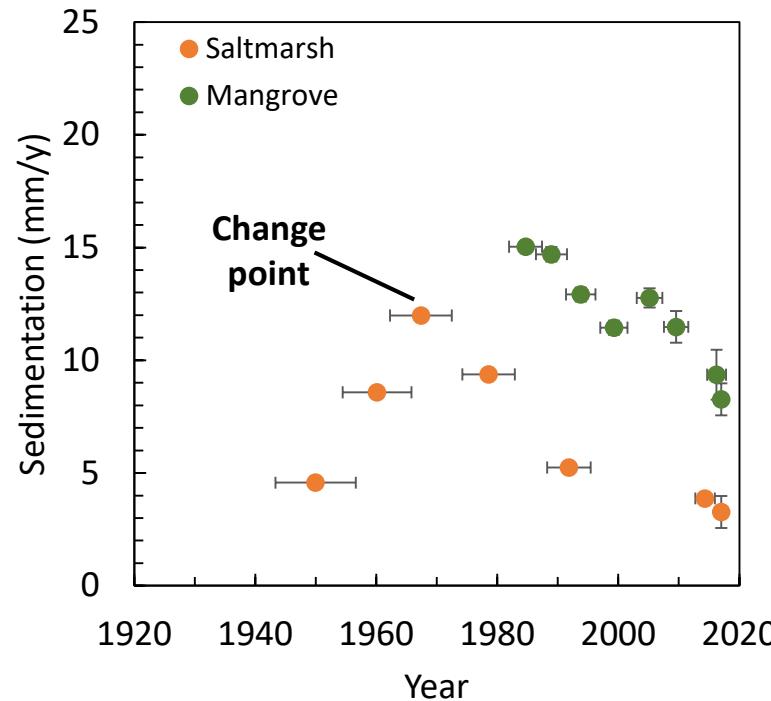
Processes influencing accommodation space

Surface elevation change, vertical accretion, substrate organic matter, autocompaction and tidal position



Sedimentation & accommodation space dynamically related

^{210}Pb dating results from Kooweeup; similar patterns at each study site



Sedimentation \propto Accommodation space

- Sedimentation rates higher than SLR, indicating ongoing infilling & progradation
- Acceleration when low in tidal frame & high accommodation space
- Deceleration when high in tidal frame & low accommodation space
- Slope of relationship dependent upon sediment supply

Acknowledgements

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- Key research partners: ANSTO, NSW Govt, USGS