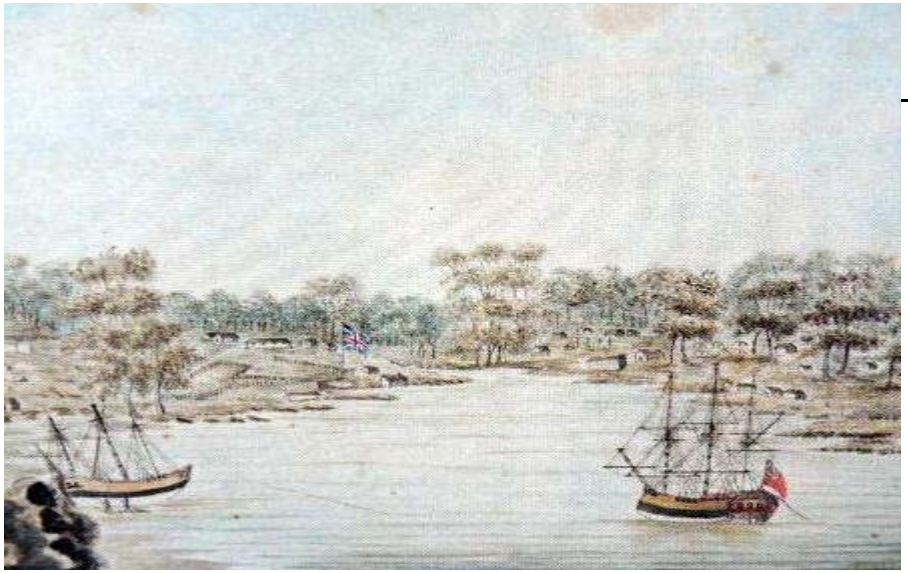
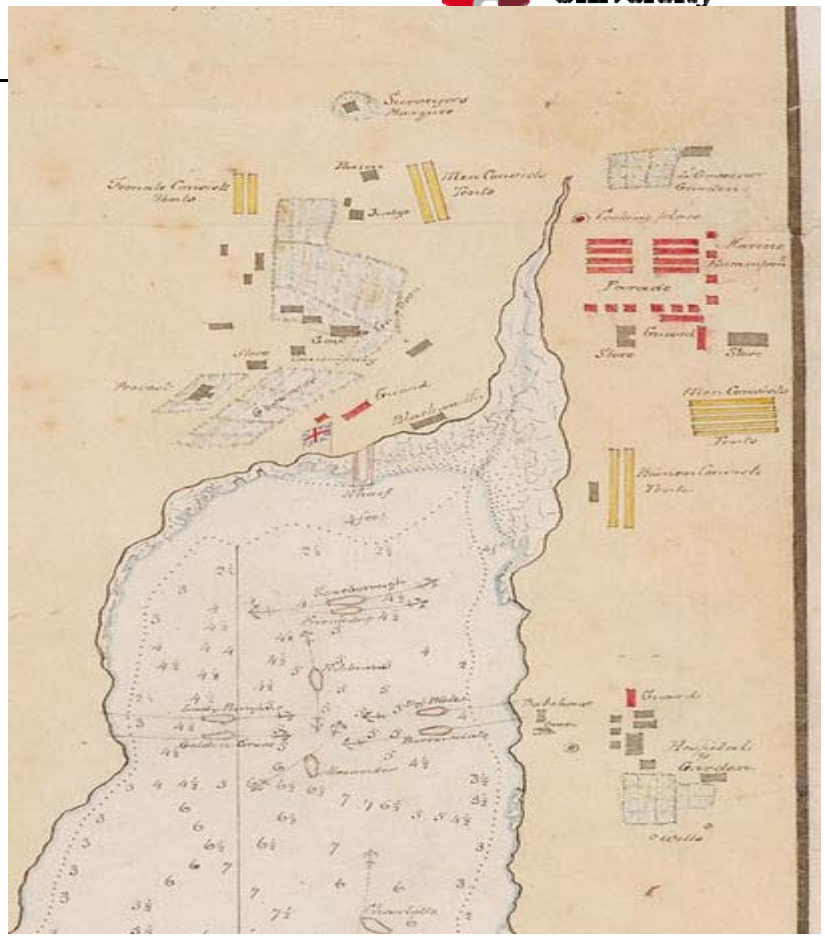
Trophic structure of mangrove ecosystems in eastern Australia and the input of Anthropogenic Nitrogen

insights from stable isotope analysis

Neil Saintilan, Debashish Mazumder





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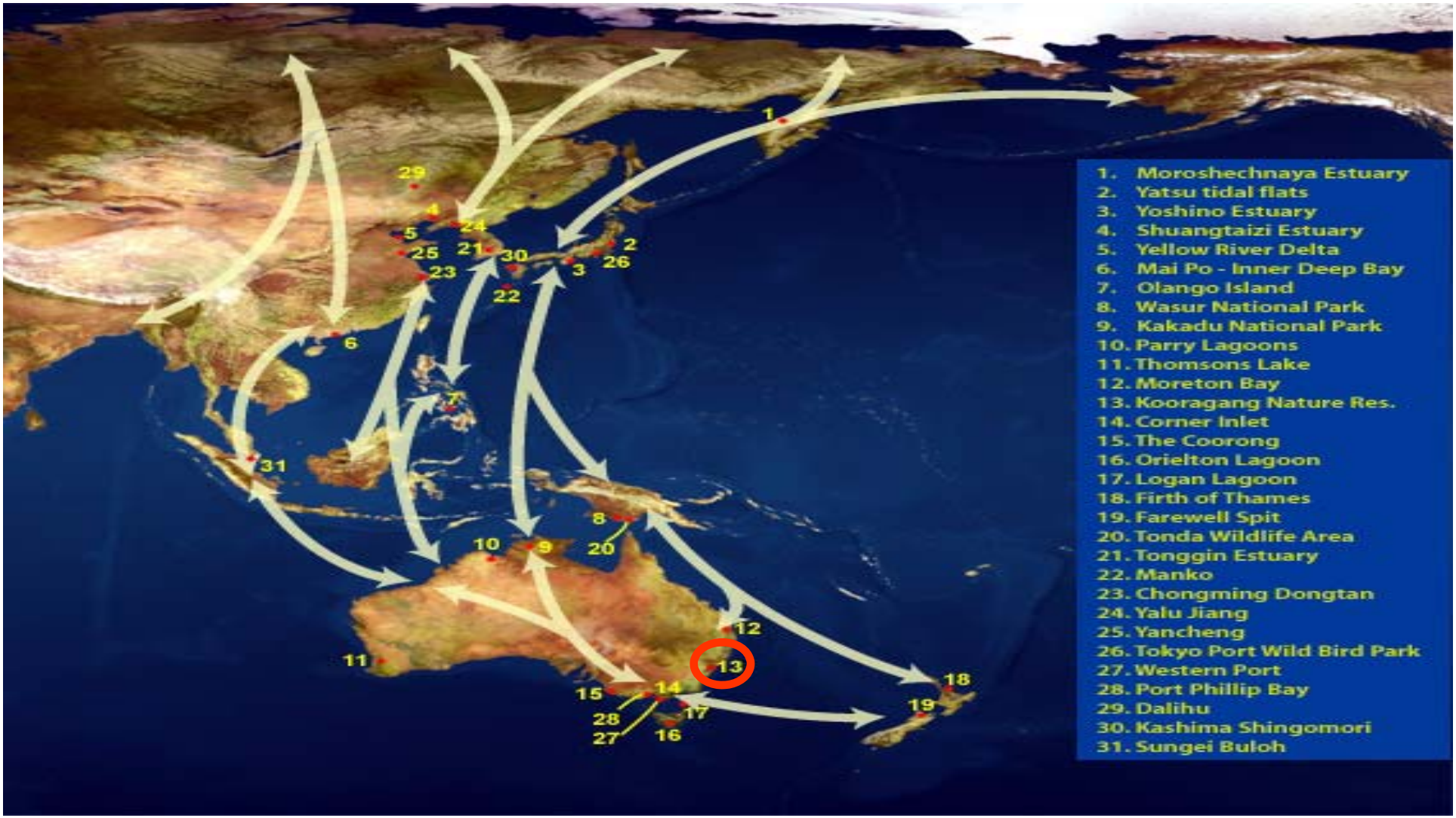
Saintilan, N., et al. (2014). Mangrove expansion and salt marsh decline at mangrove poleward limits. *Global change biology*, *20*(1), 147-157.


1. Moroshechnaya Estuary
2. Yatsu tidal flats
3. Yoshino Estuary
4. Shuangtaizi Estuary
5. Yellow River Delta
6. Mai Po - Inner Deep Bay
7. Olango Island
8. Wasur National Park
9. Kakadu National Park
10. Parry Lagoons
11. Thomsons Lake
12. Moreton Bay
13. Kooragang Nature Res.
14. Corner Inlet
15. The Coorong
16. Orielton Lagoon
17. Logan Lagoon
18. Firth of Thames
19. Farewell Spit
20. Tonda Wildlife Area
21. Tonggin Estuary
22. Manko
23. Chongming Dongtan
24. Yalu Jiang
25. Yancheng
26. Tokyo Port Wild Bird Park
27. Western Port
28. Port Phillip Bay
29. Dalihu
30. Kashima Shingomori
31. Sungei Buloh

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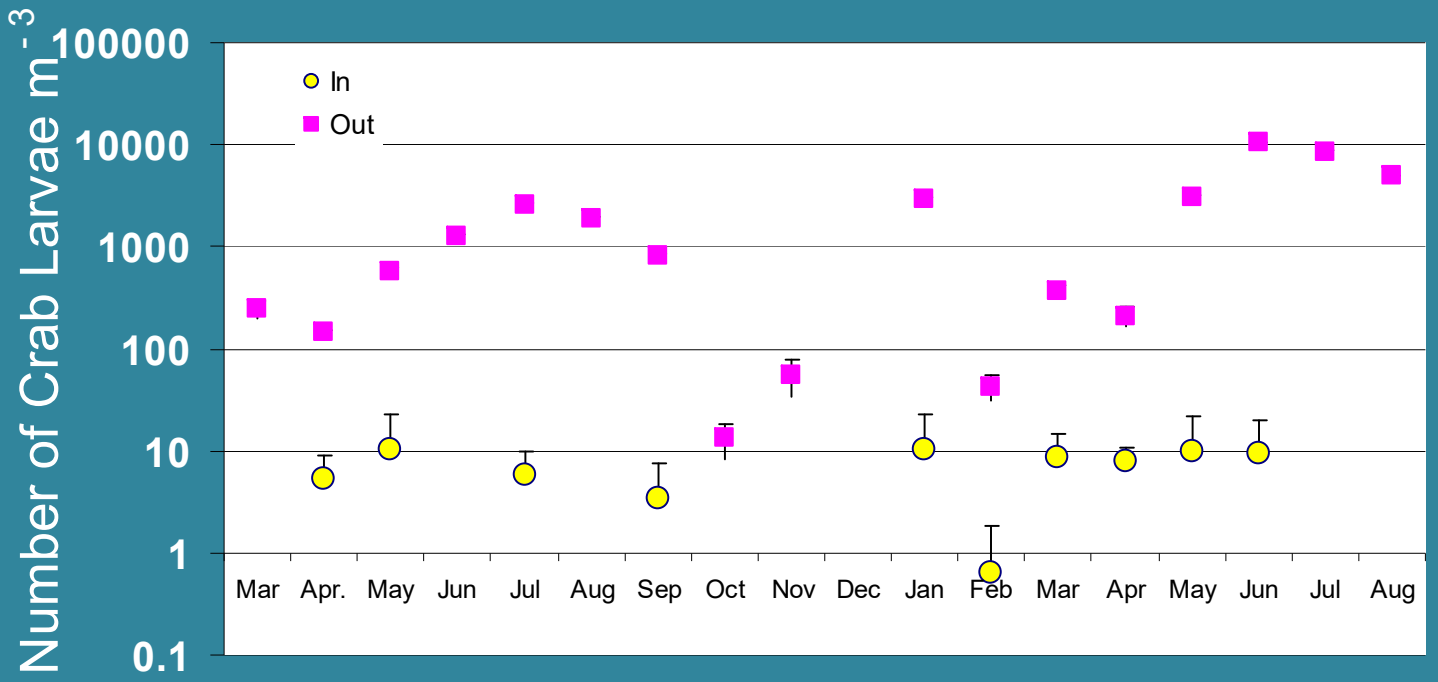
Crab larval export from saltmarsh



Mazumder D., et al. 2006. *Marine and Freshwater Research* 57, 193-199.

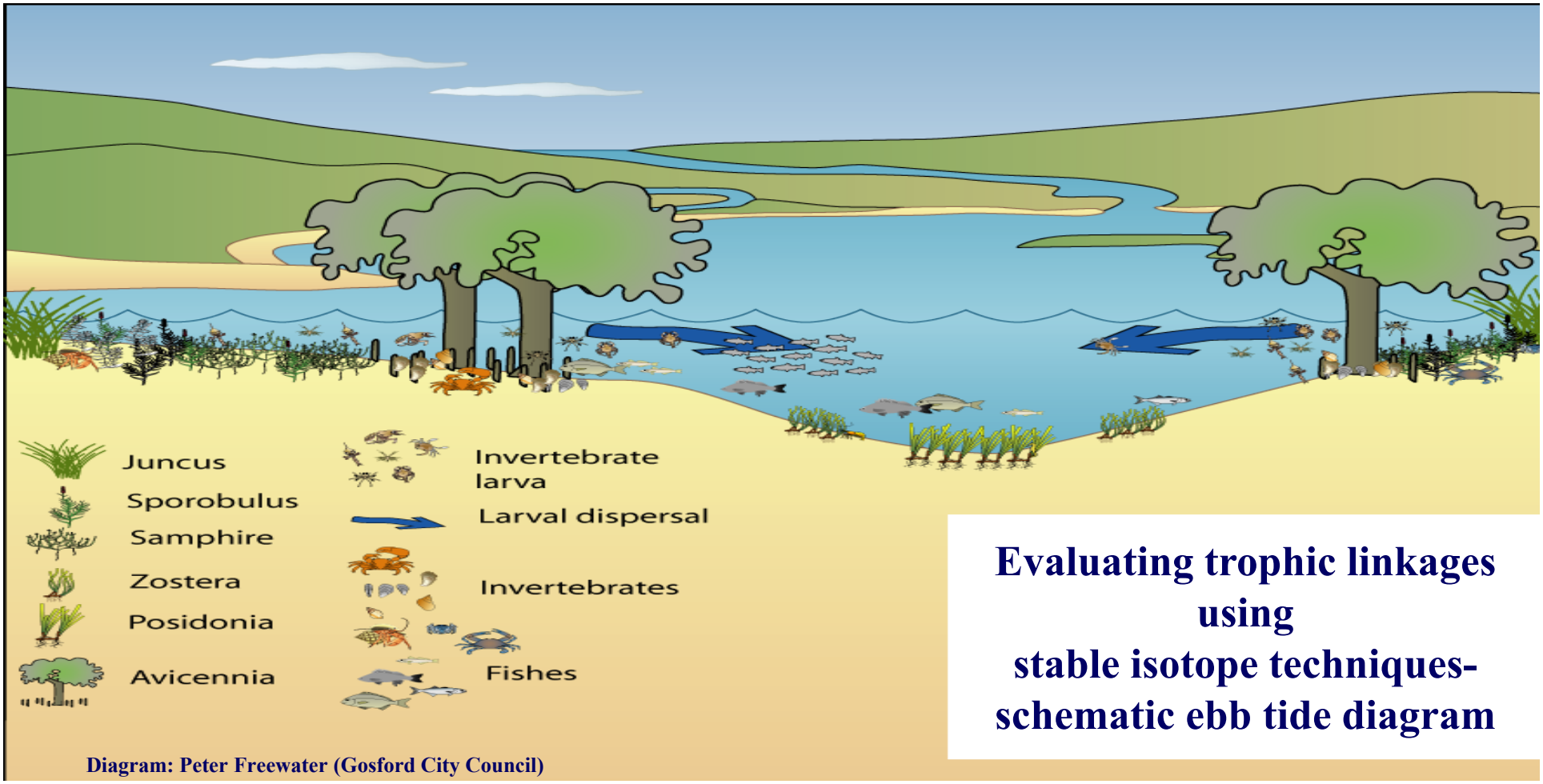
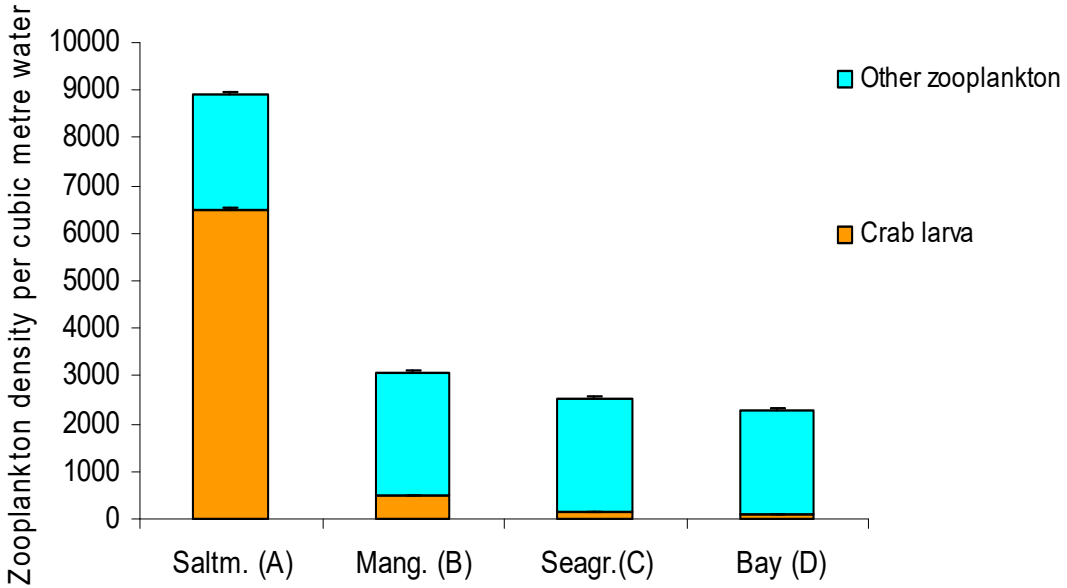


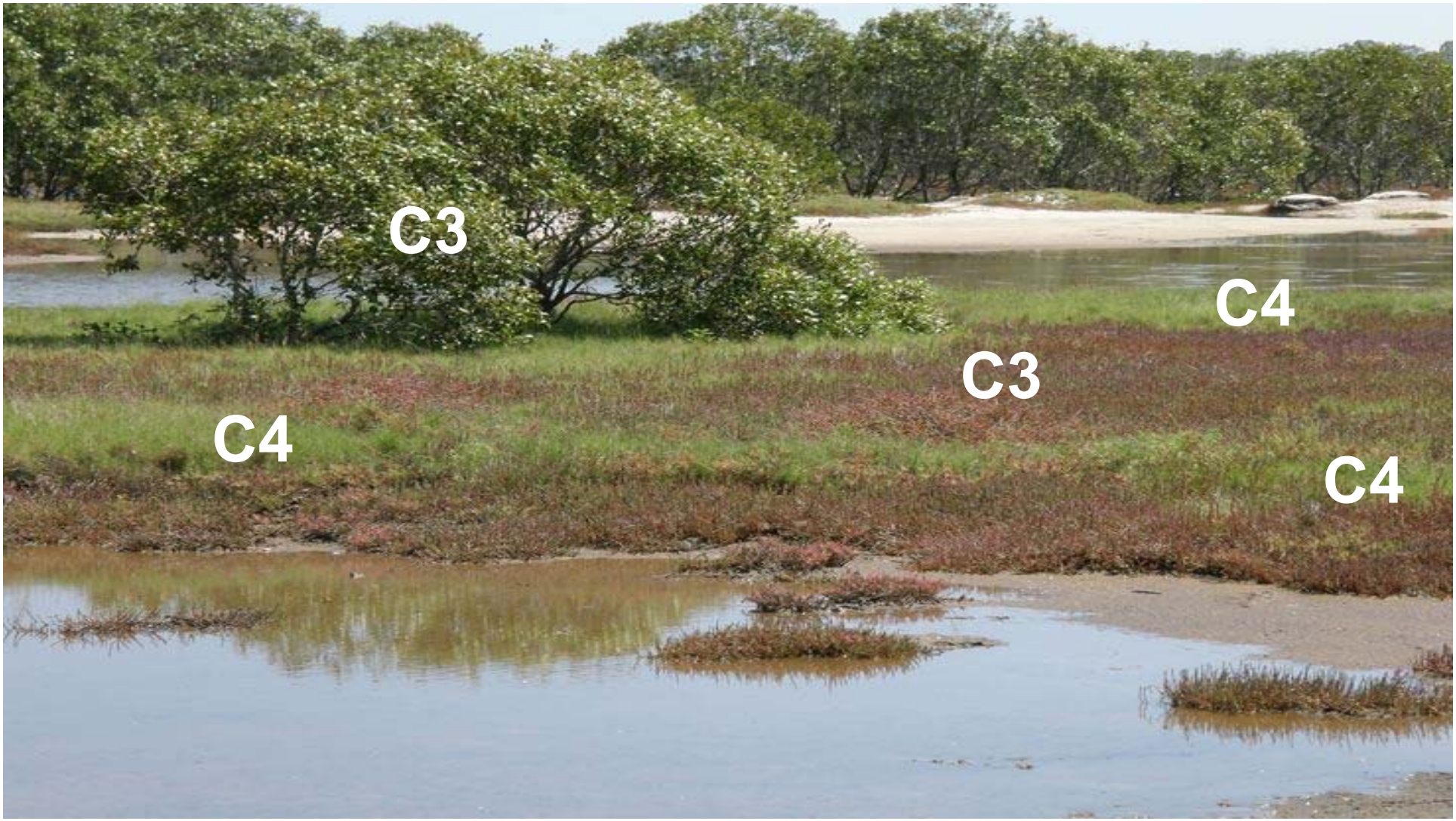
Diagram: Peter Freewater (Gosford City Council)

Evaluating trophic linkages using stable isotope techniques- schematic ebb tide diagram

Larval export through mangrove to estuary

Zooplankton abundance in different locations towards the Bay

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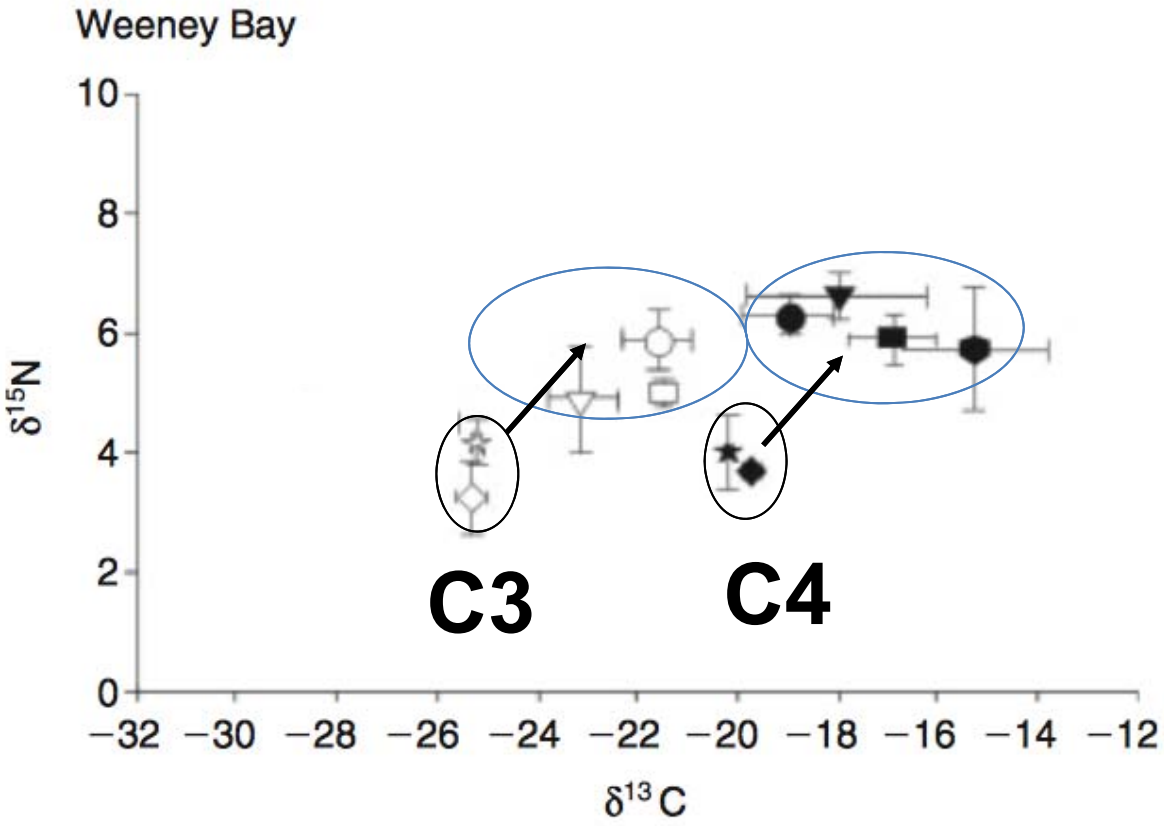

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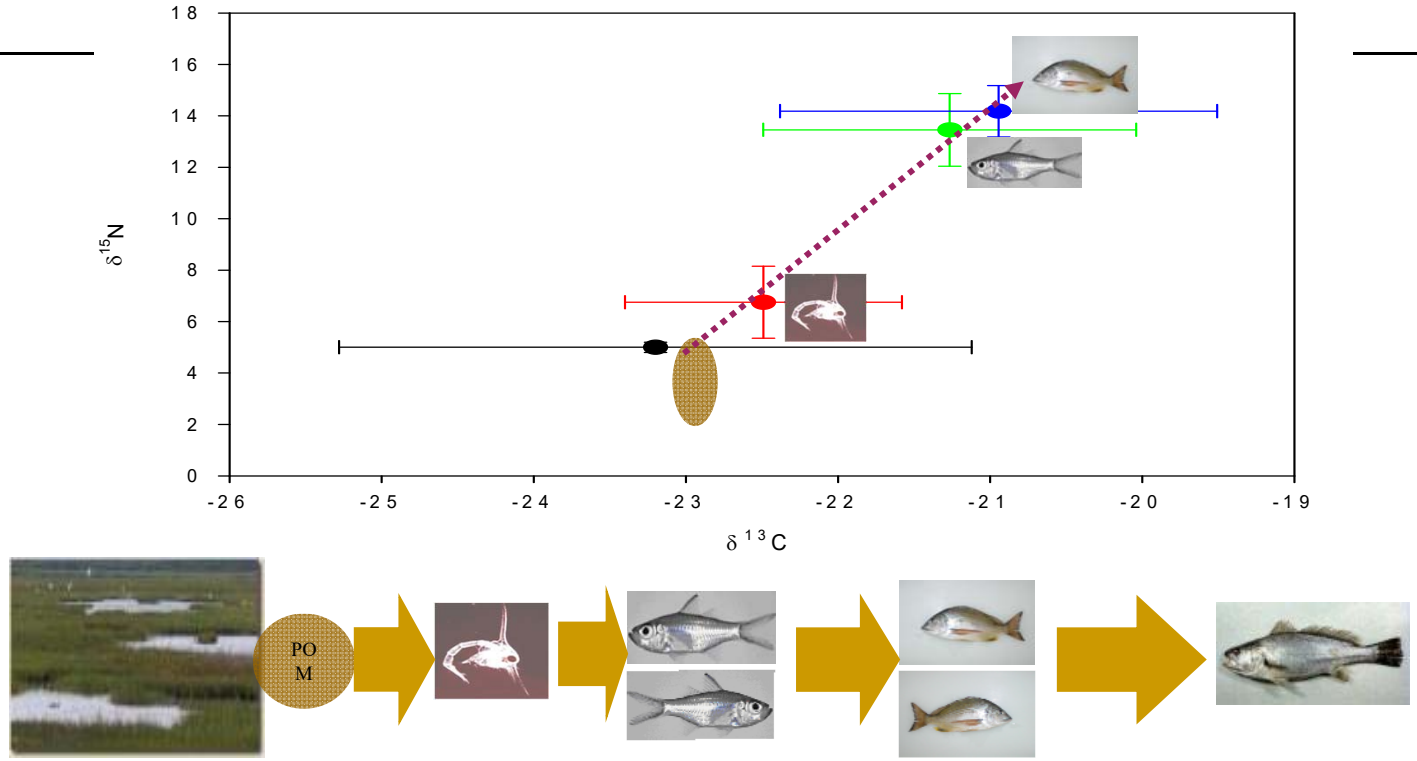

Movement of energy from habitats to deeper part of the estuary: Trophic Relay

Mazumder, D., et al. (2011). *Marine and Freshwater Research*, *62*(1), 11-19.

Global Change Biology

Global Change Biology (2012) **18**, 891–901, doi: 10.1111/j.1365-2486.2011.02582.x

Paleoreconstruction of estuarine sediments reveal human-induced weakening of coastal carbon sinks

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Abstract

Human activities in coastal areas frequently cause loss of benthic macrophytes (e.g. seagrasses) and concomitant increases in microalgal production through eutrophication. Whether such changes translate into shifts in the composition of sediment detritus is largely unknown, yet such changes could impact the role these ecosystems play in sequestrating CO_2. We reconstructed the sedimentary records of cores taken from two sites within Botany Bay, Sydney – the site of European settlement of Australia – to look for human-induced changes in dominant sources of detritus in this

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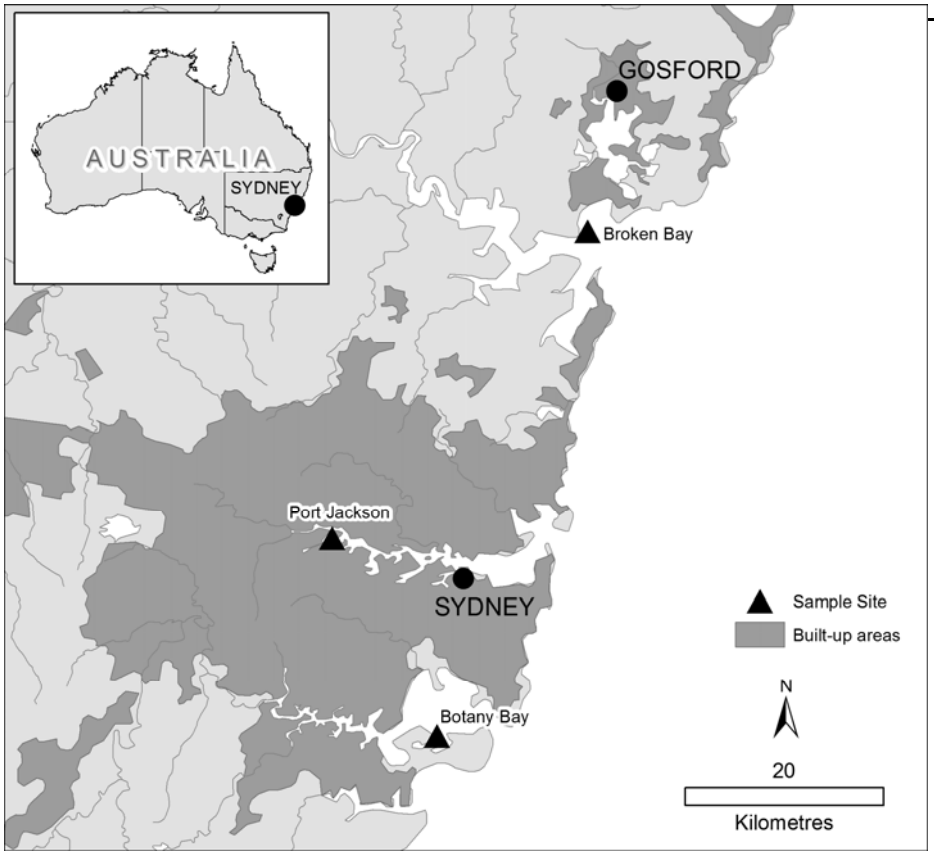
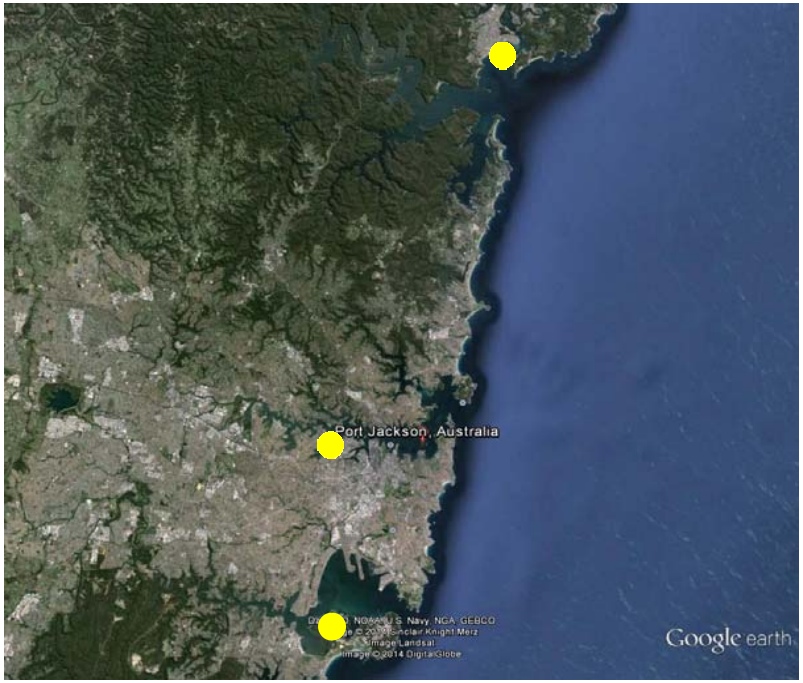
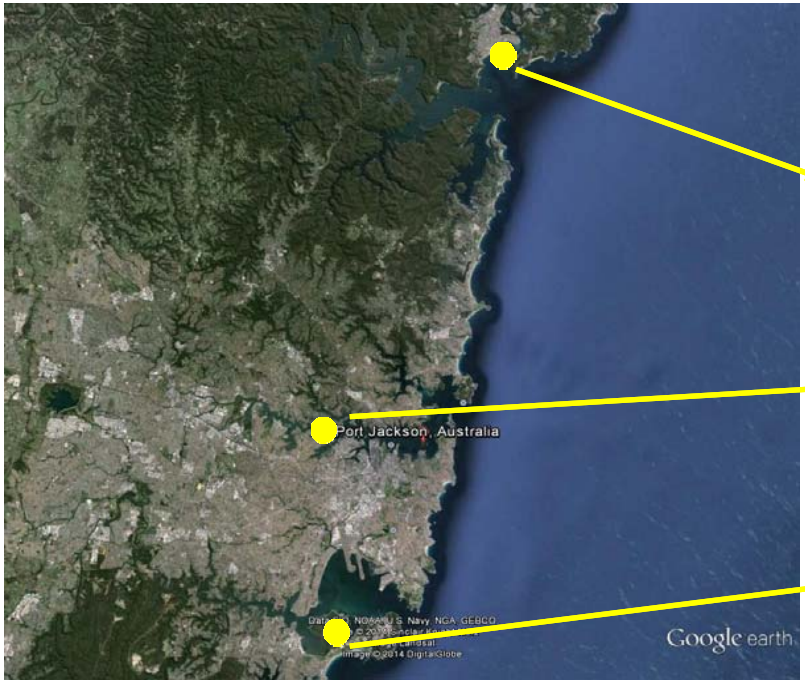
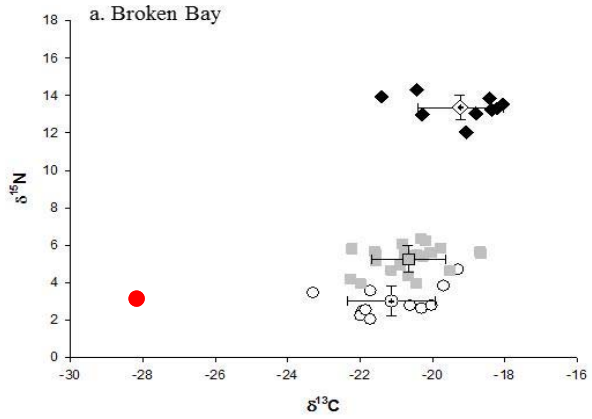
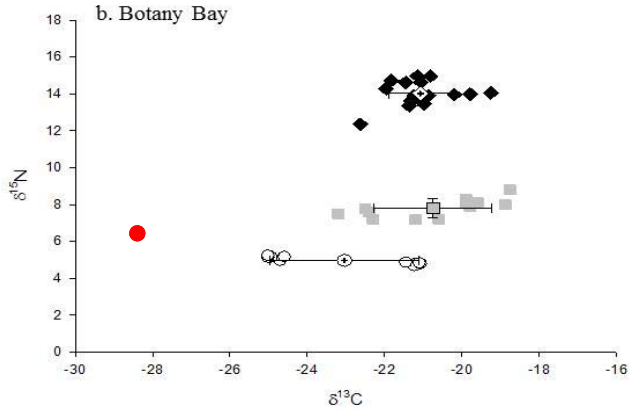


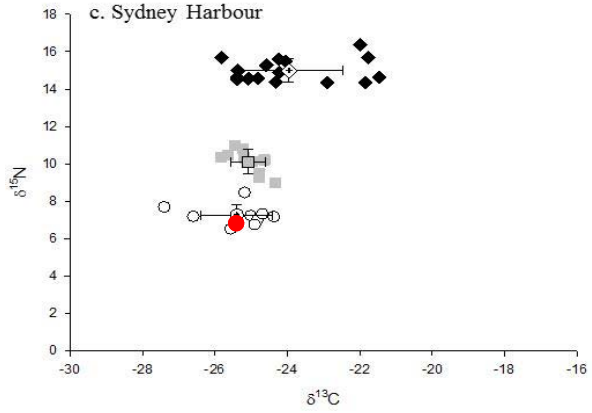




	Population (000)	Population Density	Total TN input (000 T/yr)	Increase in TN input (%)
Brisbane Water	101	644	39	188
Parramatta River	652	2460	68	397
Georges River/ Botany Bay	962	1010	470	824







● ***Avicennia marina (leaf)***

SOM individual value
Crab individual value
Glassfish individual value
SOM mean
Crab mean
Glassfish mean

Mazumder, D., et al. (2015) *Marine Pollution Bulletin* 100, 217-223.

Findings

Trophic linkages (SOM-Herbivore-Zooplanktivore) are consistent between estuaries

Benthic organic matter is the consistent basal carbon source

Food chain length higher in less disturbed estuary

Conclusions

No evidence that elevated N has altered basal carbon source

Less impacted estuary has a more complex trophic structure


Questions?