

# Nitrogen pollution from Scalby Beck: its impact on Scarborough north and south bays

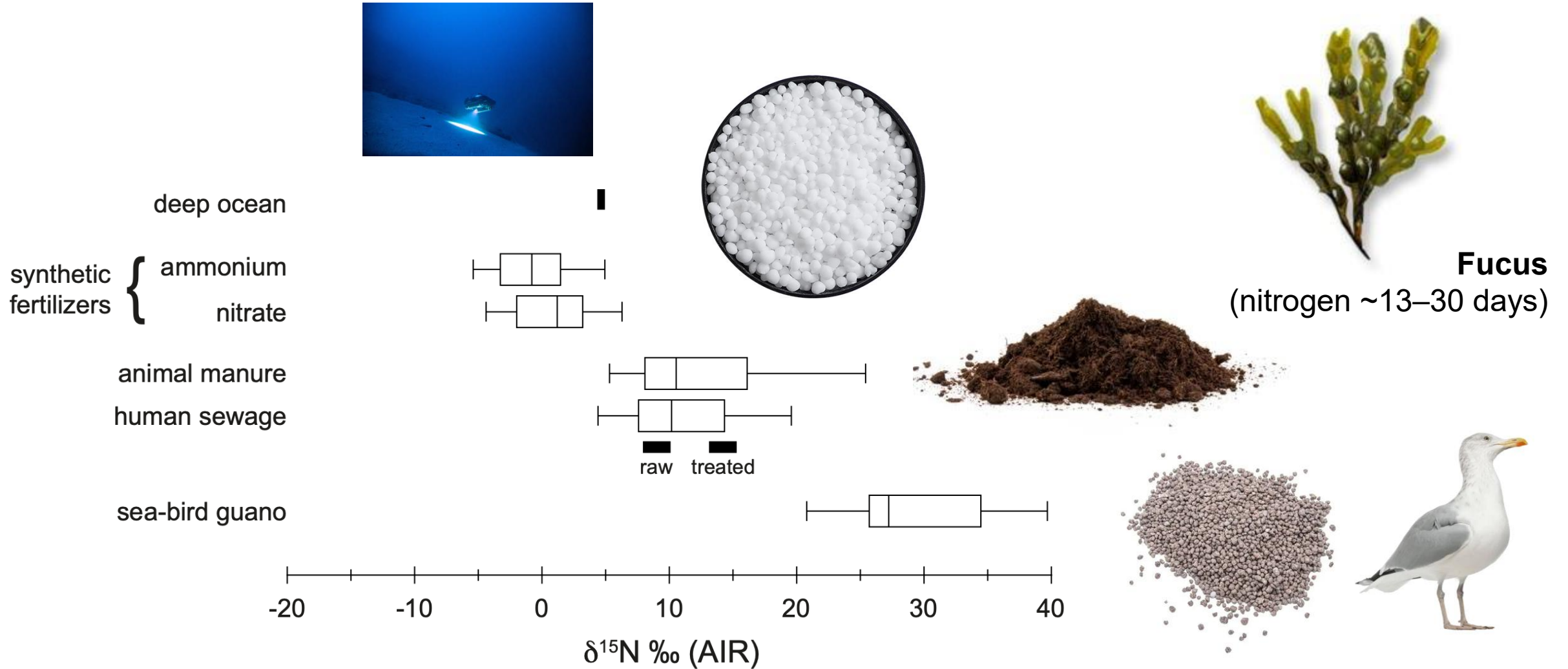
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# Nitrogen Isotopes as a Source of Pollution

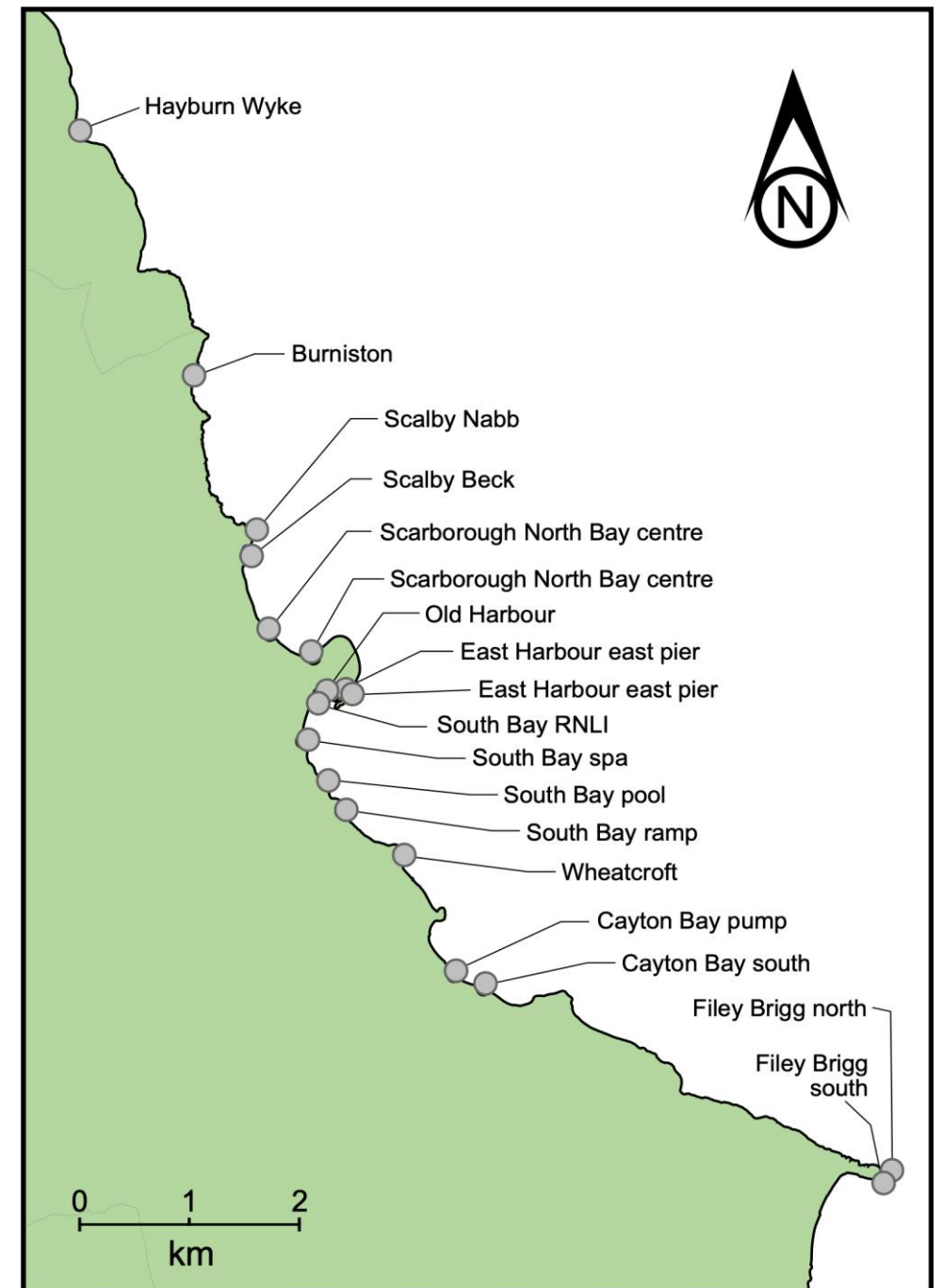


# Scarborough Sites

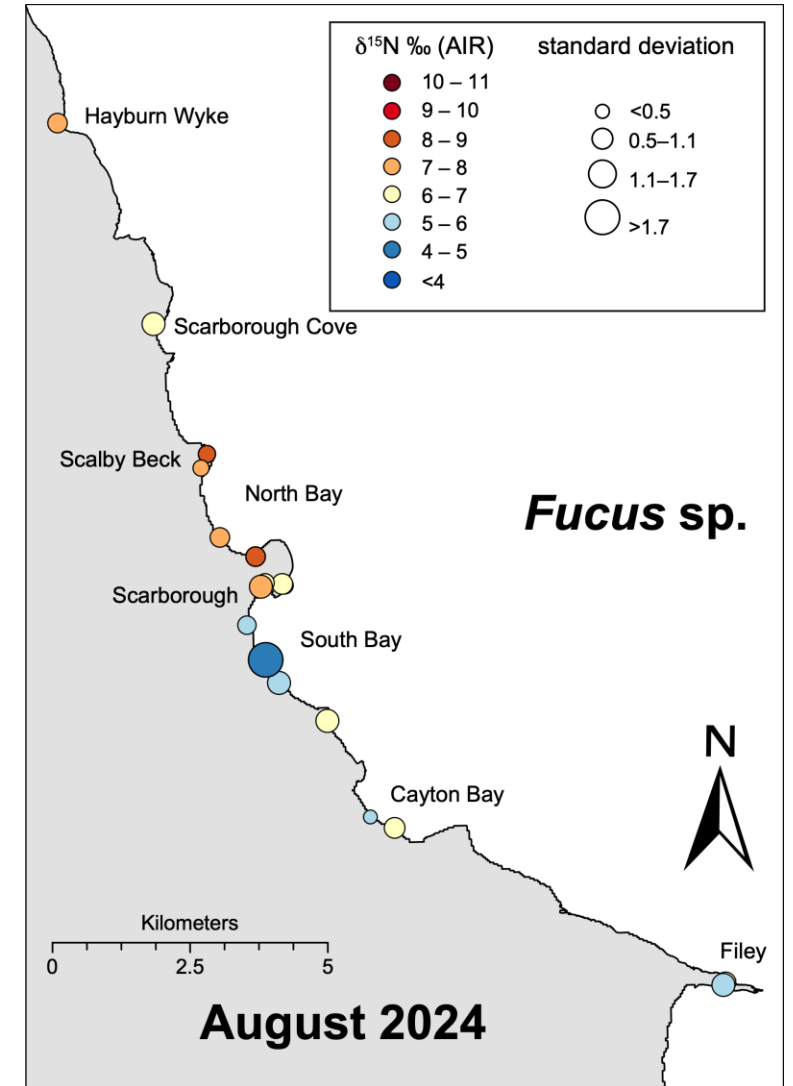
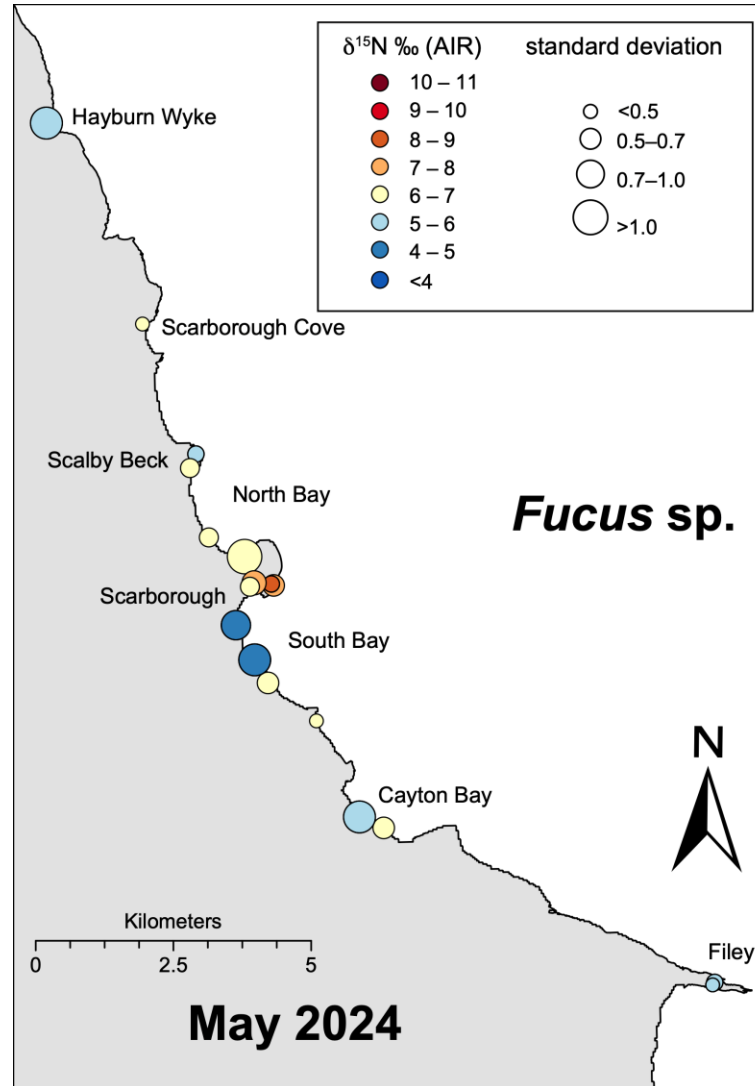
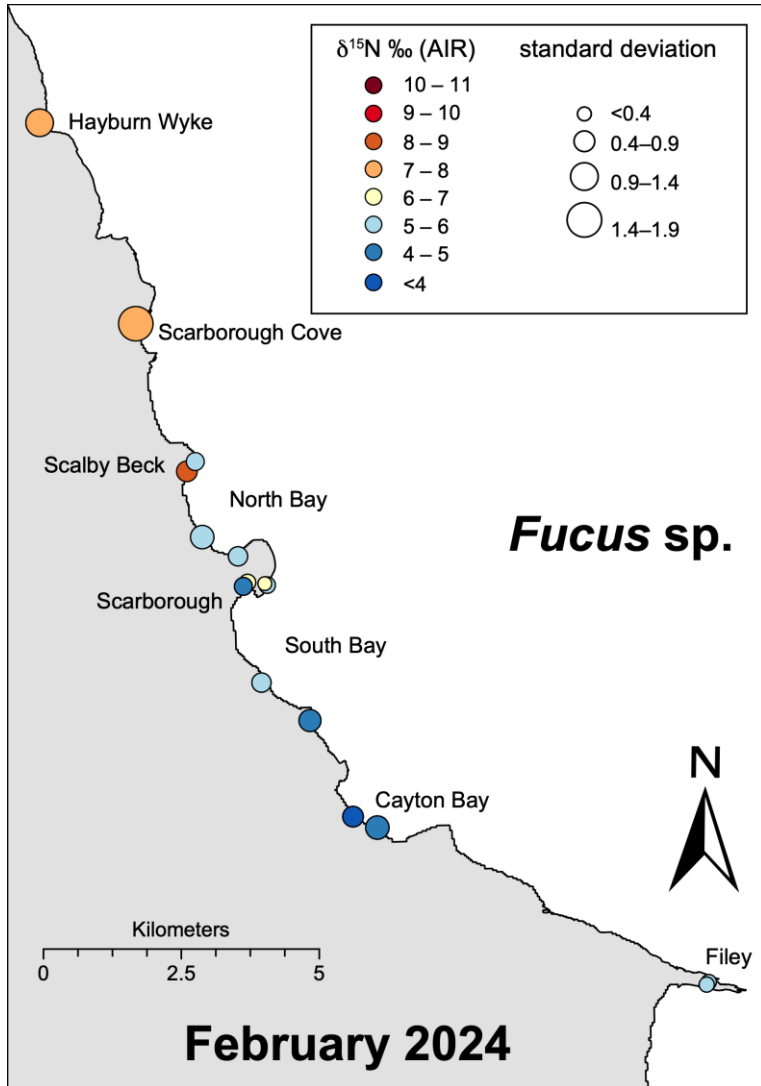
Over 3400 individual specimens of seaweed collected since September 2023 to October 2025

18 sampling locations for seaweed and water

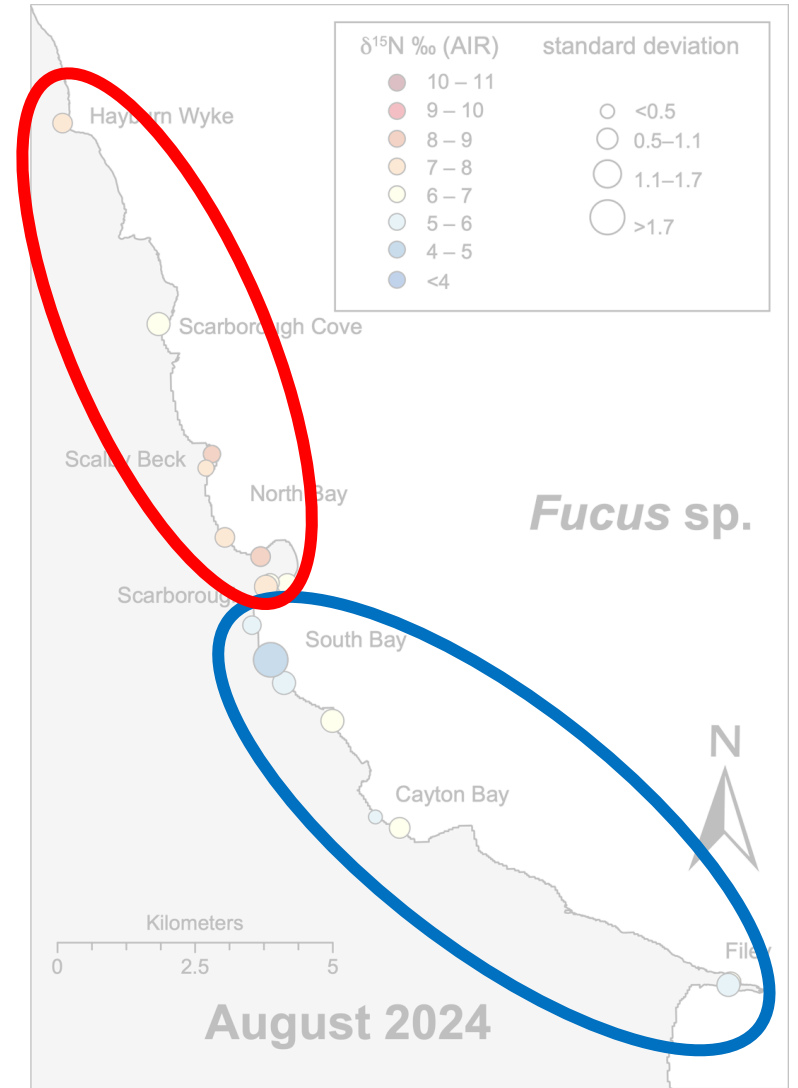
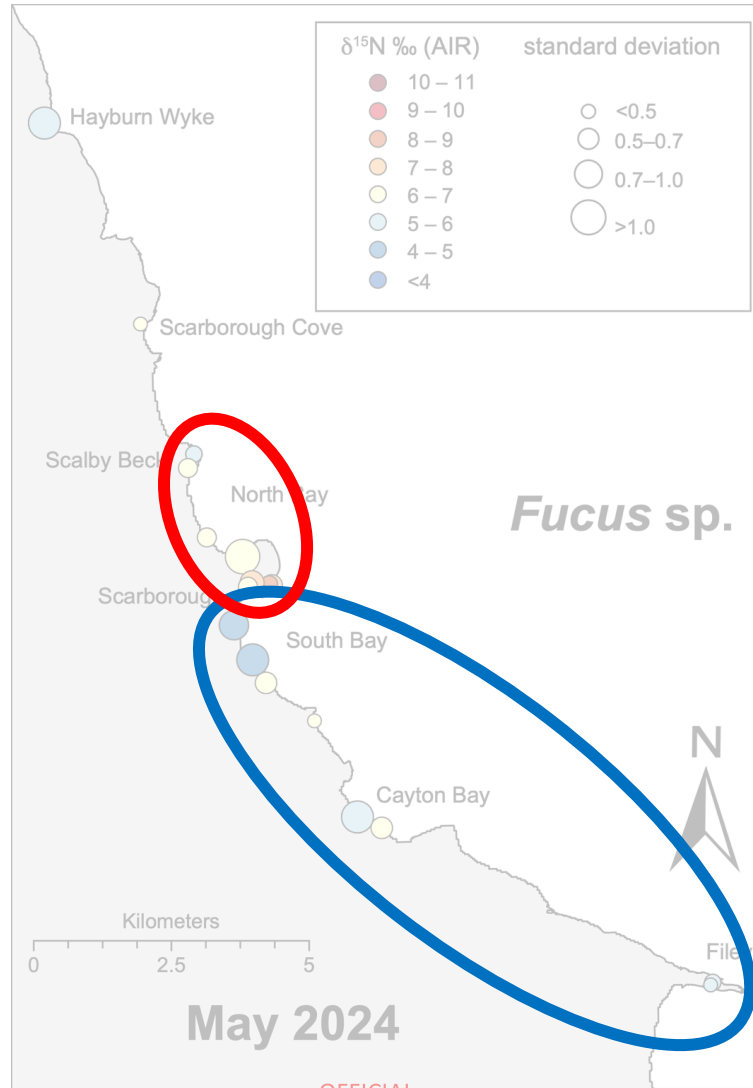
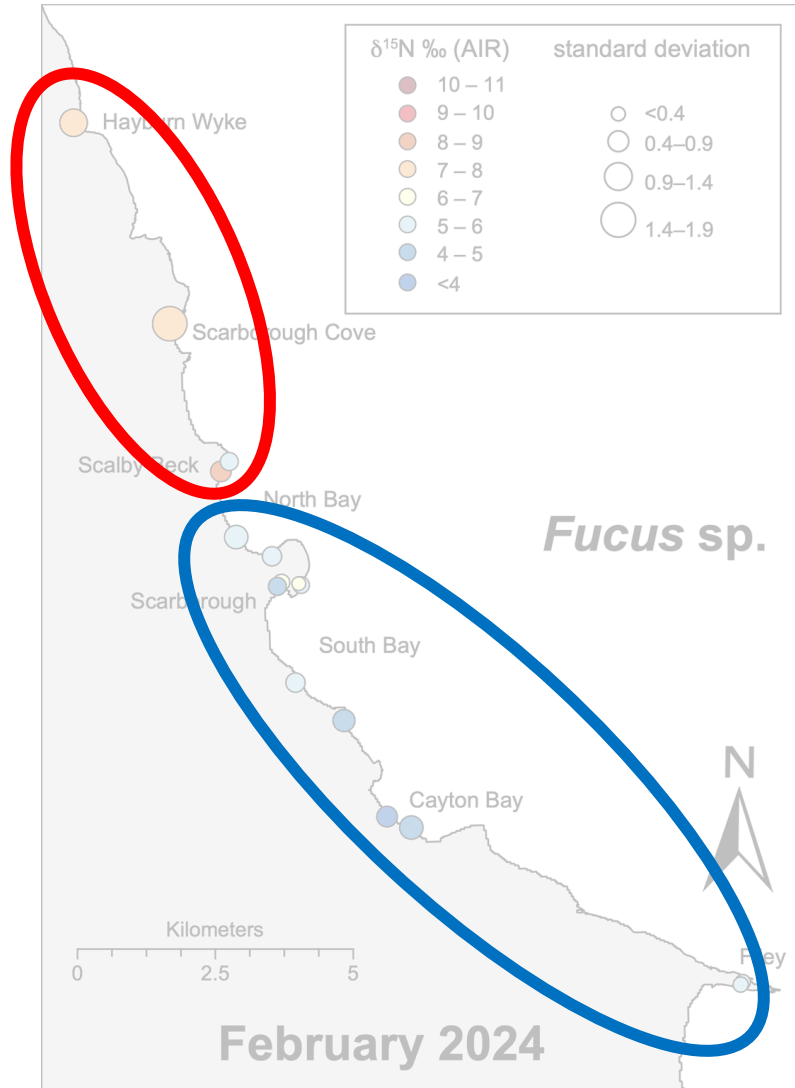
Seaweed consisted of *Fucus* sp. and *Ulva* sp.



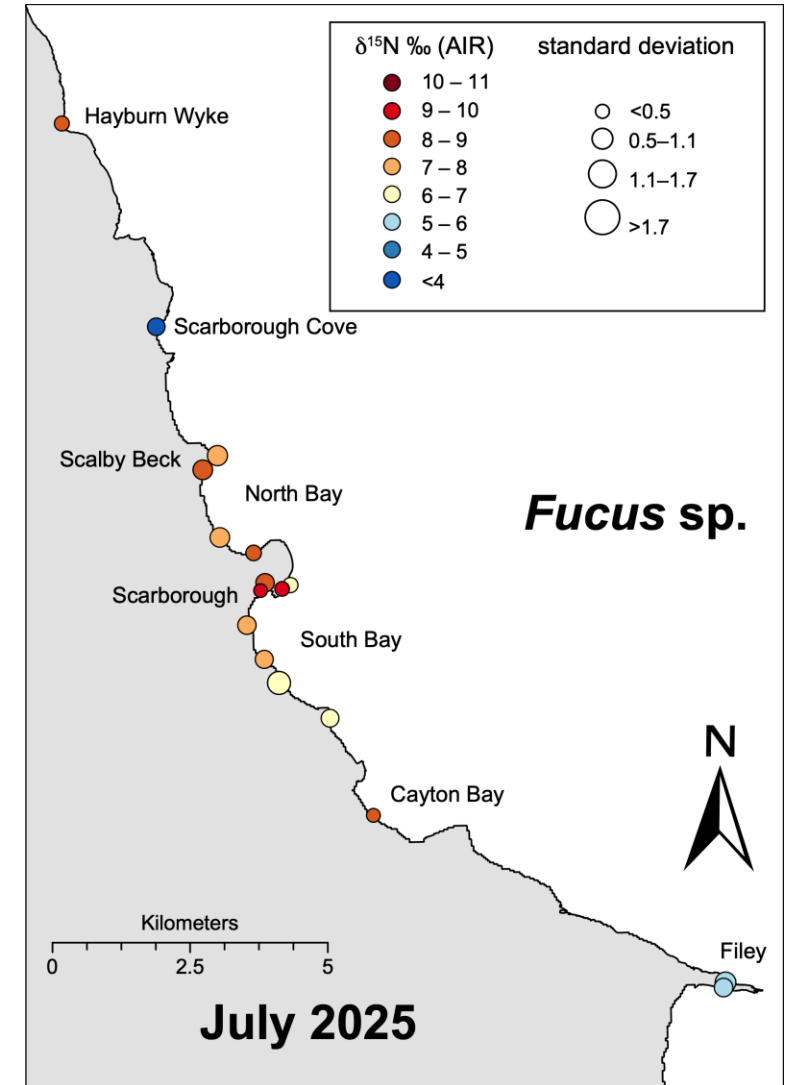
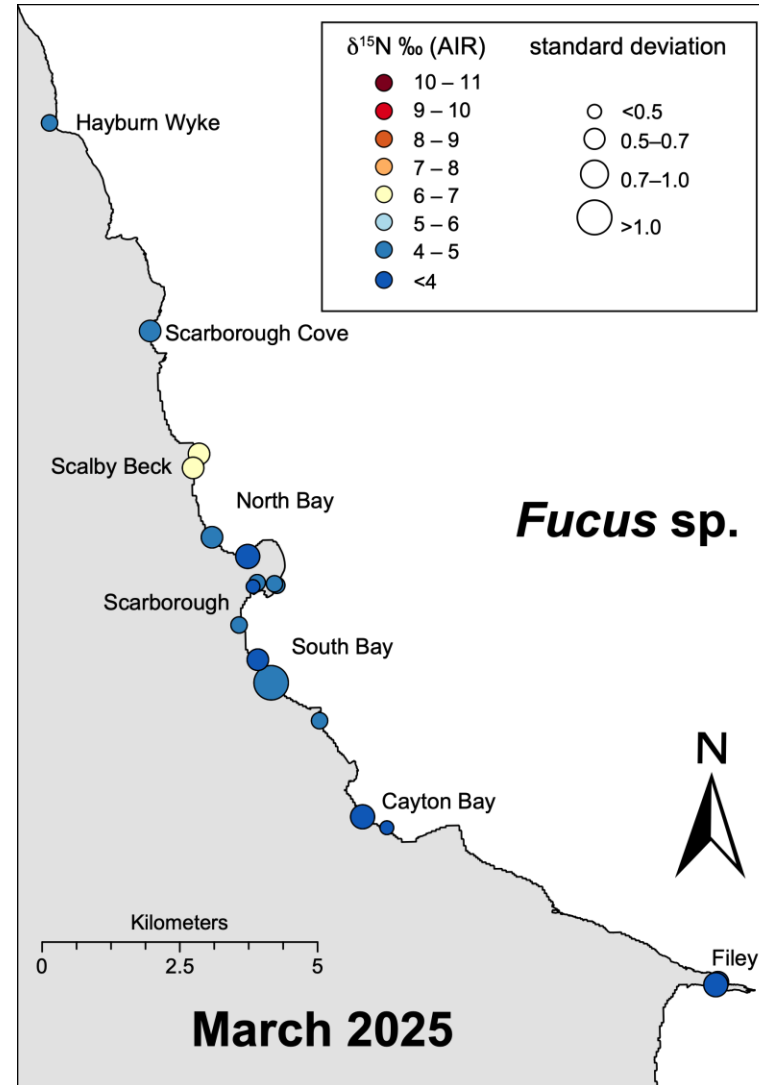
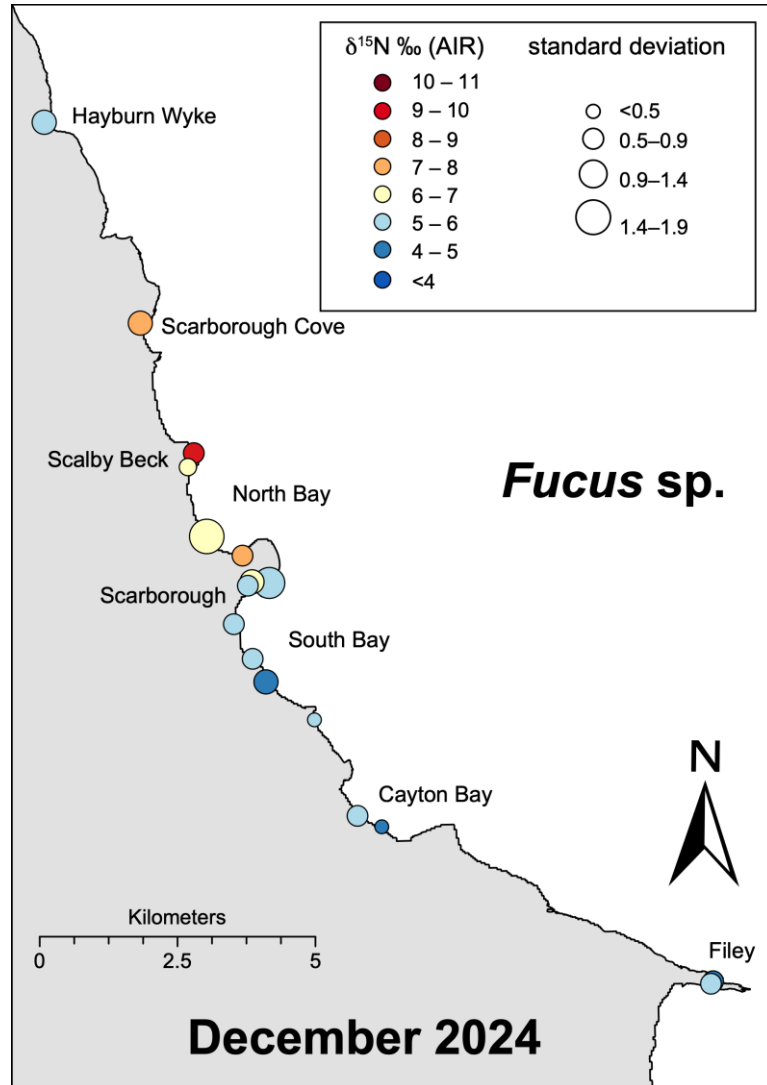
# Scarborough Annual Study



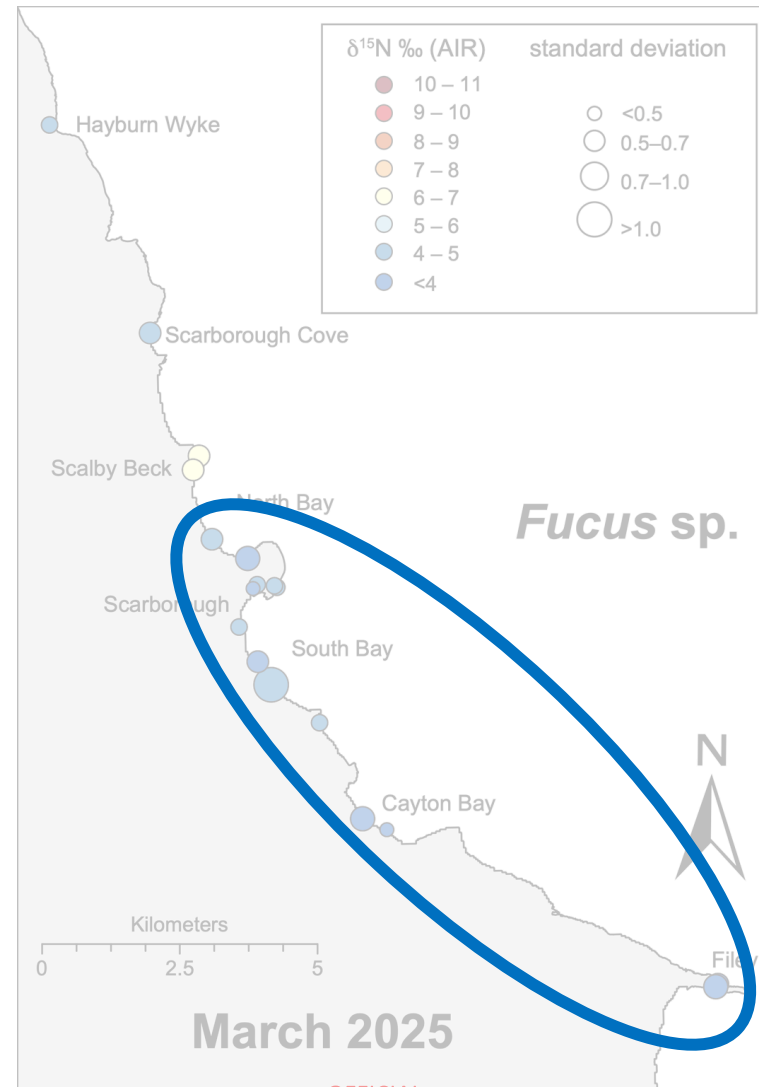
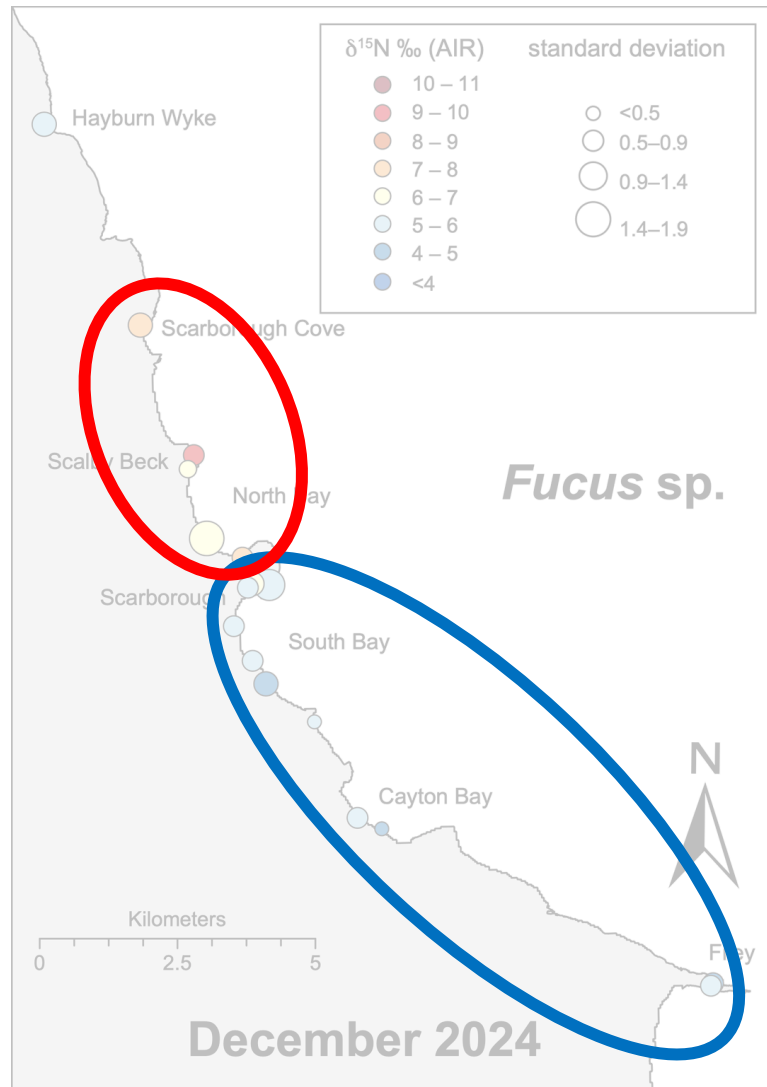
# Scarborough Annual Study



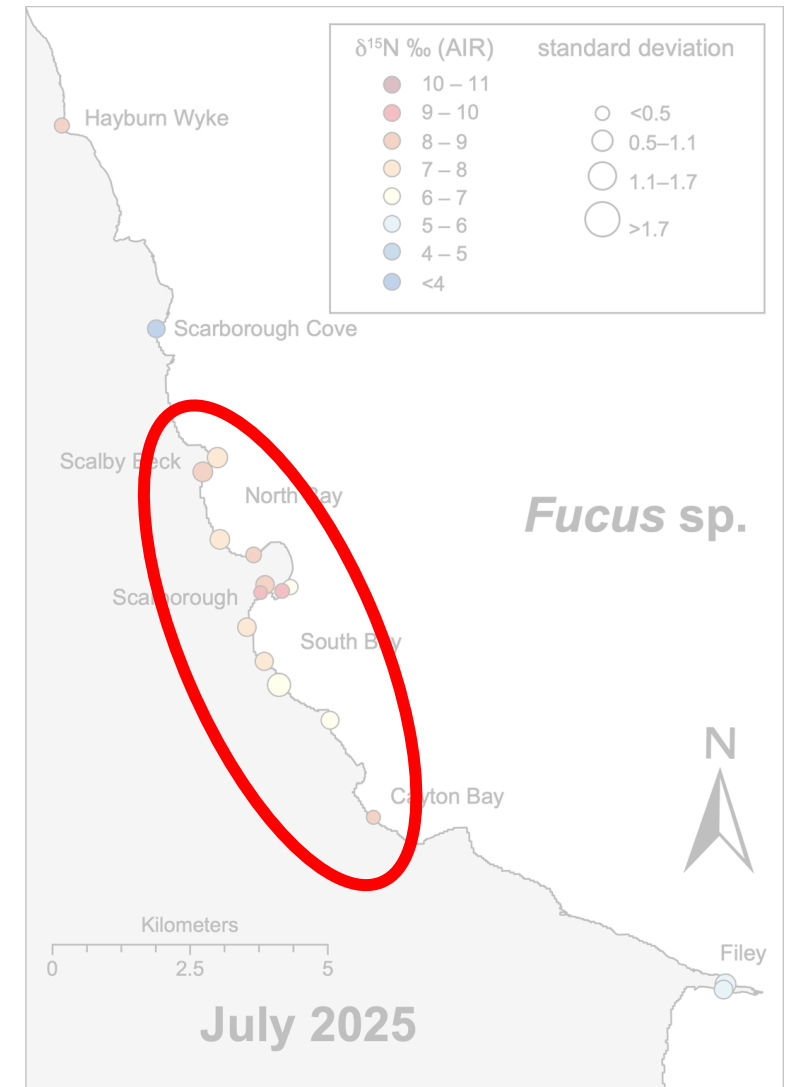
# Scarborough Annual Study



# Scarborough Annual Study



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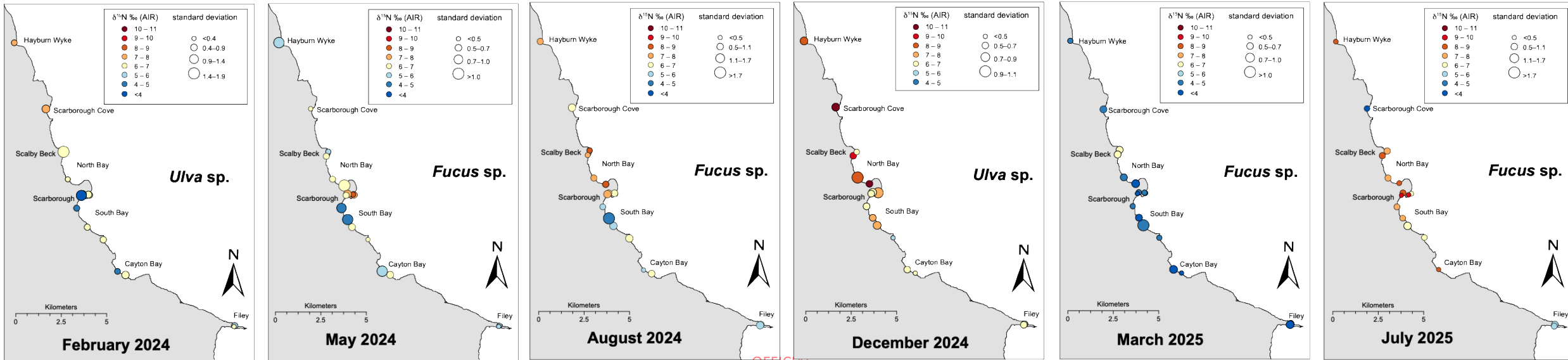
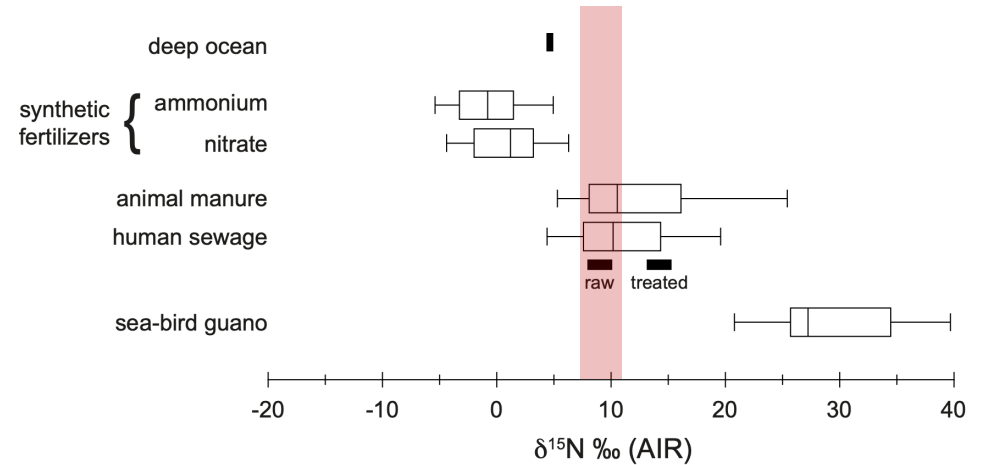


# Nitrogen sources = manure & sewage

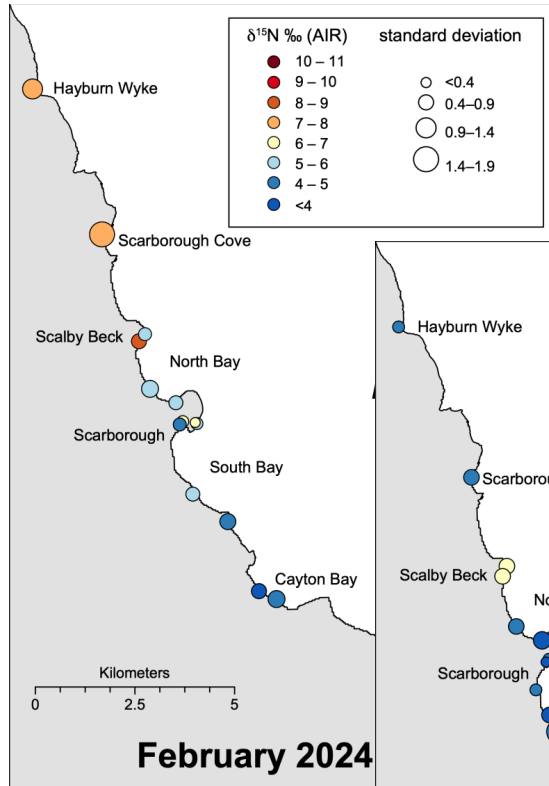
Seaweed  $\delta^{15}\text{N}$  values are consistent with animal manure and sewage (raw and treated)

Elevated  $\delta^{15}\text{N}$  values are dominantly recorded at Scalby Beck and travels southward due to ocean currents

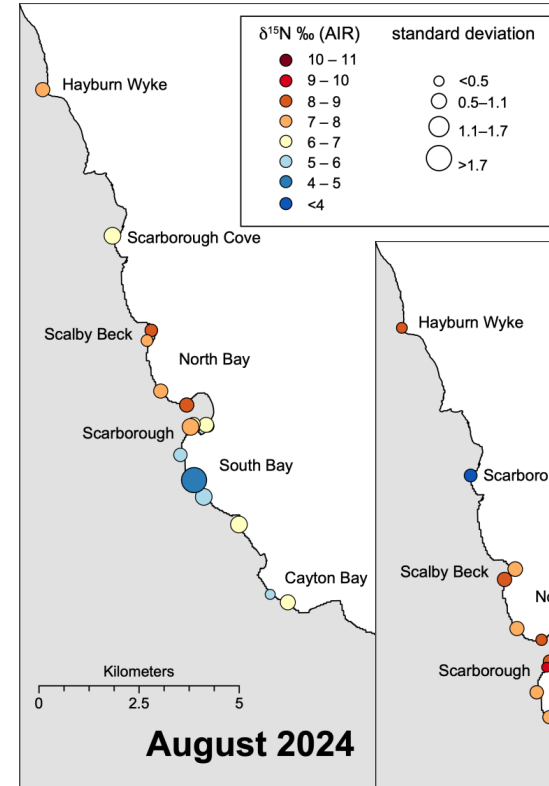
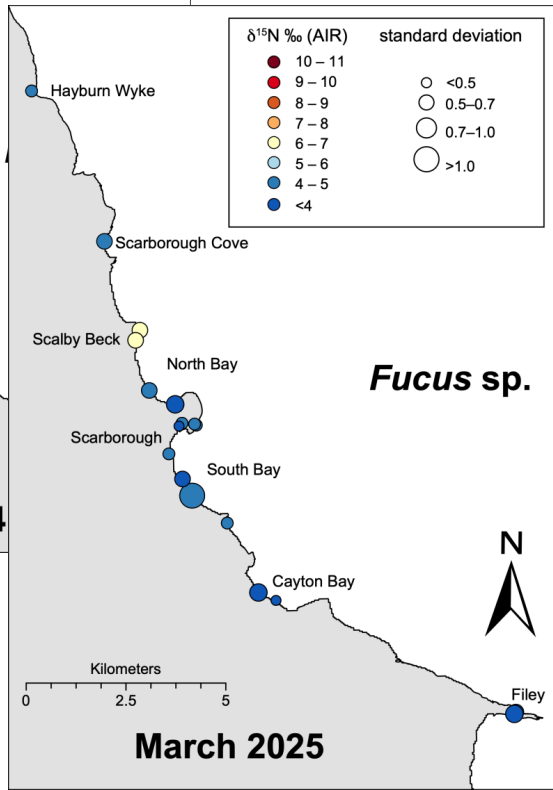
dominant range of  $\delta^{15}\text{N}$  values



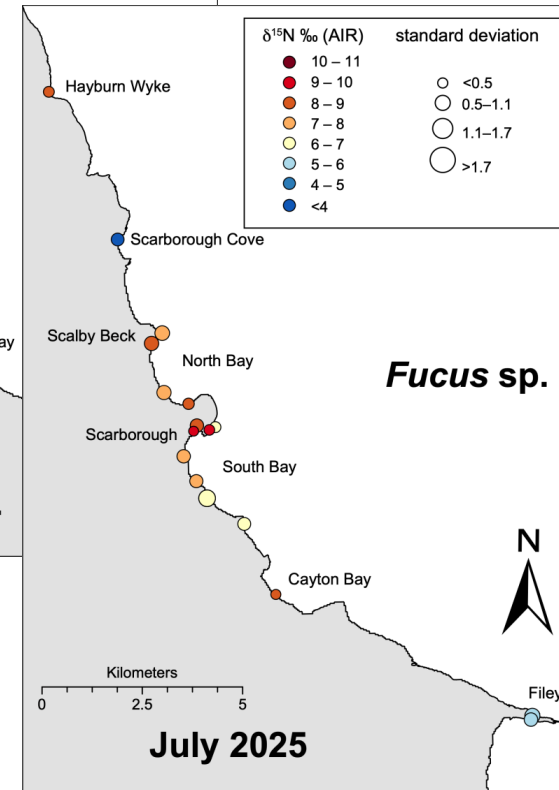
# Scarborough Annual Comparisons



Winter comparisons similar although Scalby Beck elevated in comparison



Summer comparisons shows Scalby Beck source and sewage pollution much worse in July 2025



# Scarborough Conclusions...

The data generated over the 2-year study indicate the following:

- $\delta^{15}\text{N}$  values are indicative of animal manure and human sewage
- Data from this study area indicates that Scalby Beck is the source of this pollution
- Ocean currents transport nitrogen pollution from the north to south bay
- $\delta^{15}\text{N}$  indicate no influence from bird guano
- Scalby Beck requires investment to reduce nutrient pollution entering the north bay
- Fertilizer pollution event in June/July 2025 at Scarborough Cove (down to 0–3‰  $\delta^{15}\text{N}$ )

