

Salinity: the ocean's memory

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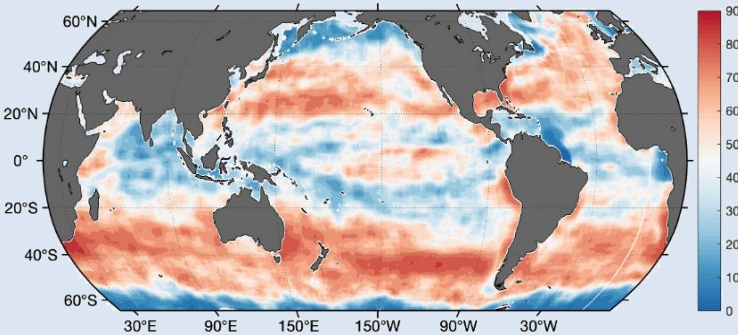
WHY IT PERSISTS — the surprise

density gradients:

- driven by temperature

- driven by salinity

Basin scale (>200km)



SST anomaly

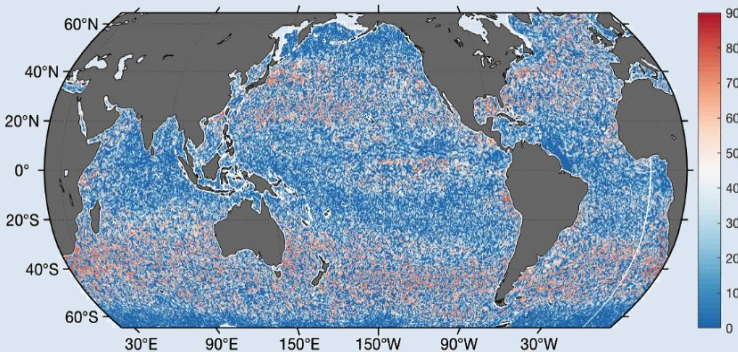
→ damped by air–sea
heat flux in days/weeks

SSS anomaly

→ no restoring flux
→ persists & sharpens
→ sets density below
~10 km

→ ΔS of 0.5 $\approx$ ΔT of 2 °C
for density

Mesoscale (25-200km)

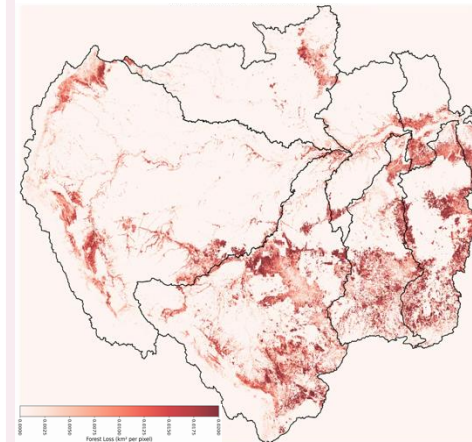


Yu, 2026

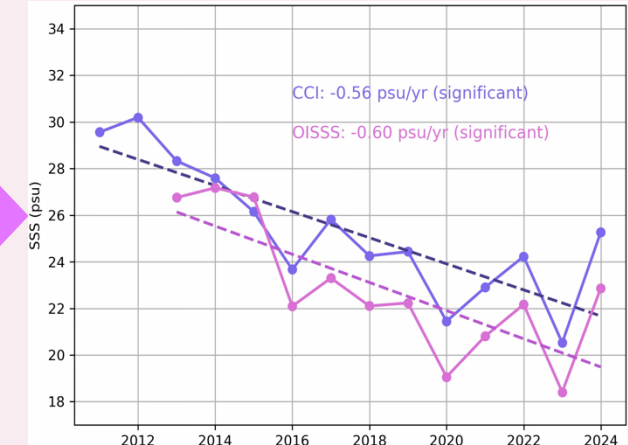
WHAT IT RECORDS — my research

Is deforestation freshening the tropical Atlantic?

2000-2023 Amazon deforestation



Coastal Atlantic freshening (~0.6 pss/yr)



- Coastal SSS is ~30× more variable than the open ocean: a fingerprint of the land water cycle.
- Early results suggest **deforestation-driven freshening of coastal waters**

Fournier et al., 2023 (GRL); Jarugula et al., 2026, in prep

Today's satellites resolve salinity at 50 km with a 100 km coastal gap. But this physics lives at smaller scales or at the coast.