

Plastics in coastal wetlands – *A double-edged sword*

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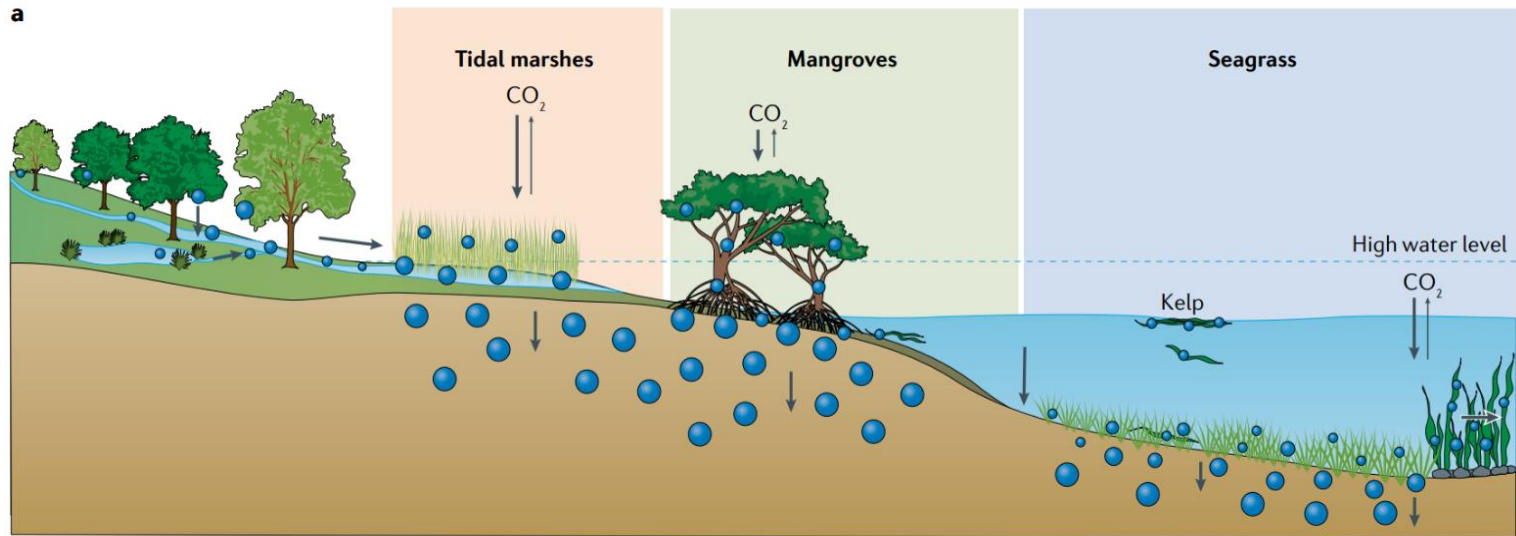
Ending Plastic Waste Symposium 2024
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What's next...

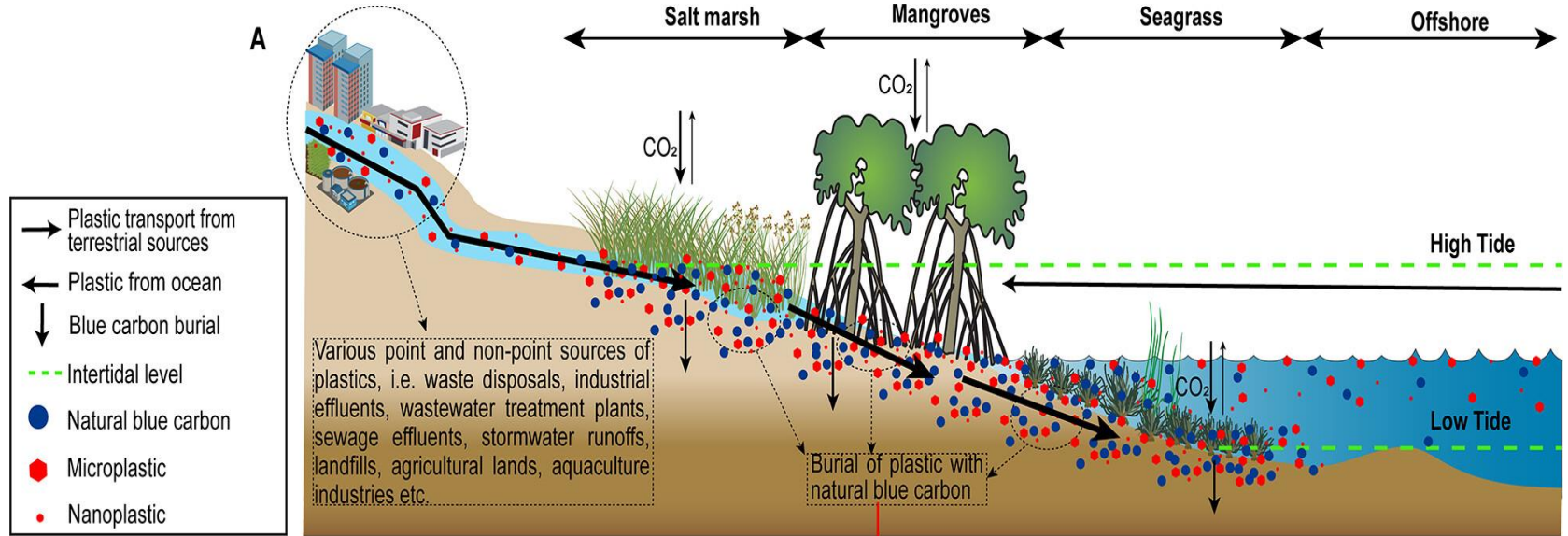
Coastal “Blue carbon ecosystems” (BCEs)



- Contribute >50% of total organic carbon buried in marine sediments
- Nature-based solutions for climate adaptation and mitigation
- Accumulate ~100 million metric tonnes of blue carbon annually

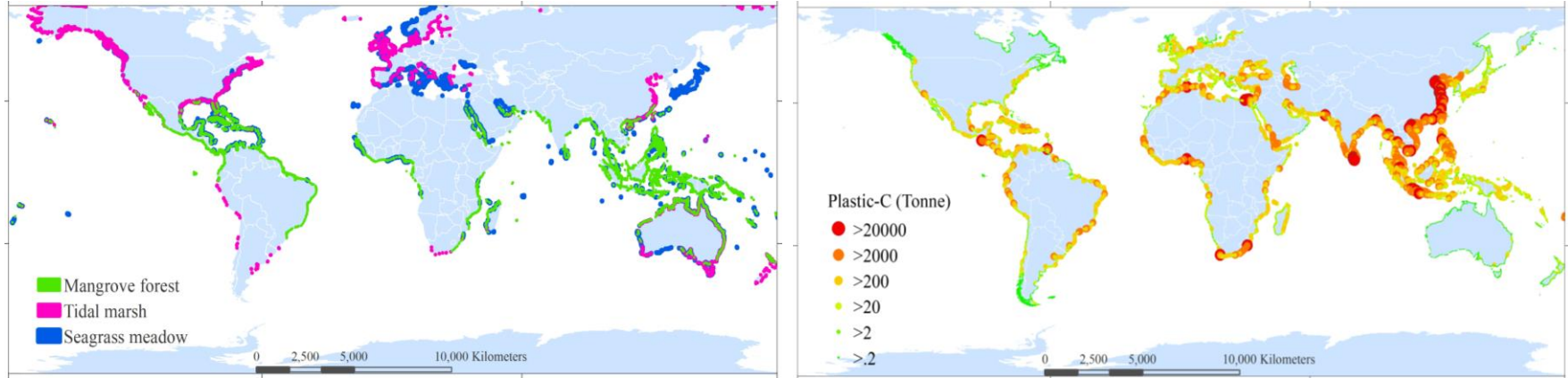


BCEs as plastics/microplastics sinks



BCEs are significant plastic and microplastics sinks

BCEs as plastics/microplastics sinks

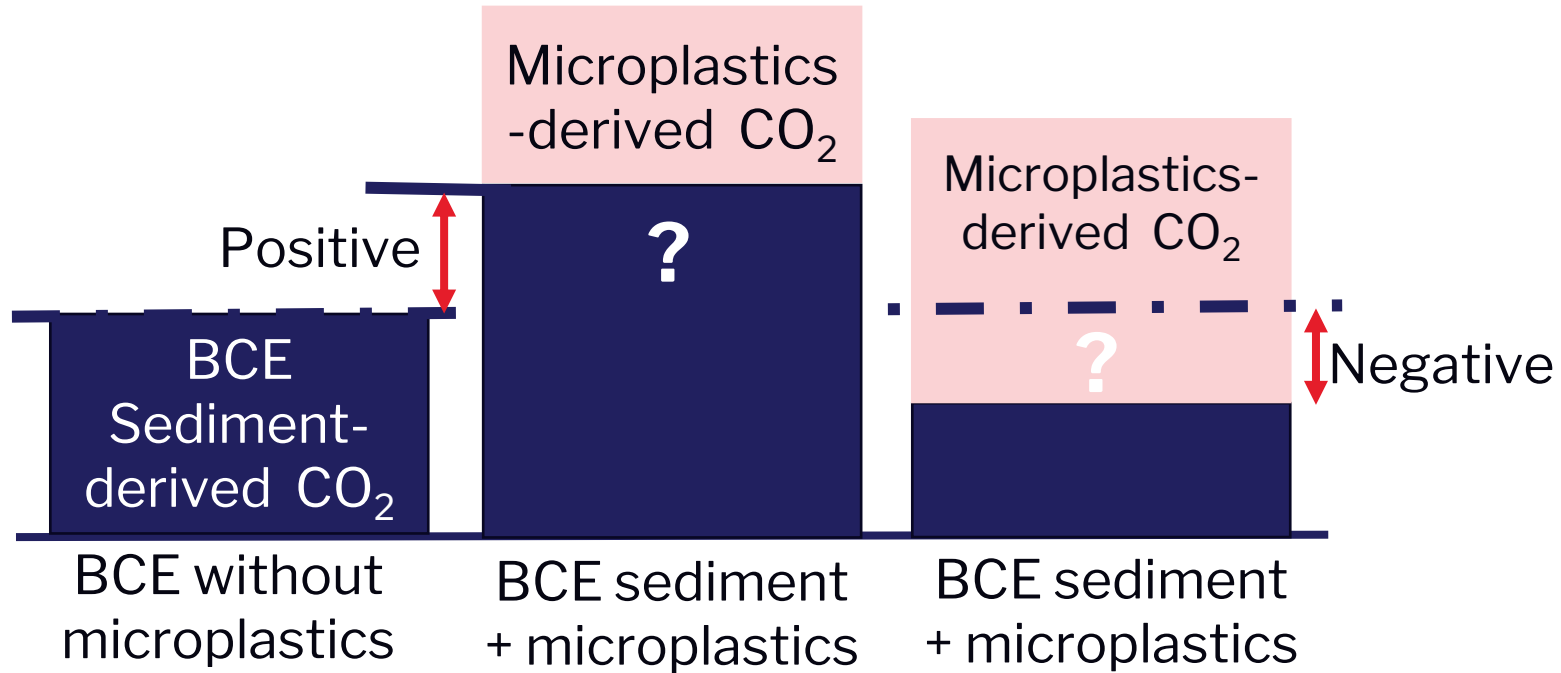


- 8300 million metric tonnes of virgin plastics equivalent to 6900 million metric tonnes of plastic-carbon (C)
- Plastic-C in BCEs are ~10 million metric tonnes



Microplastics on C cycling

...double-edged sword



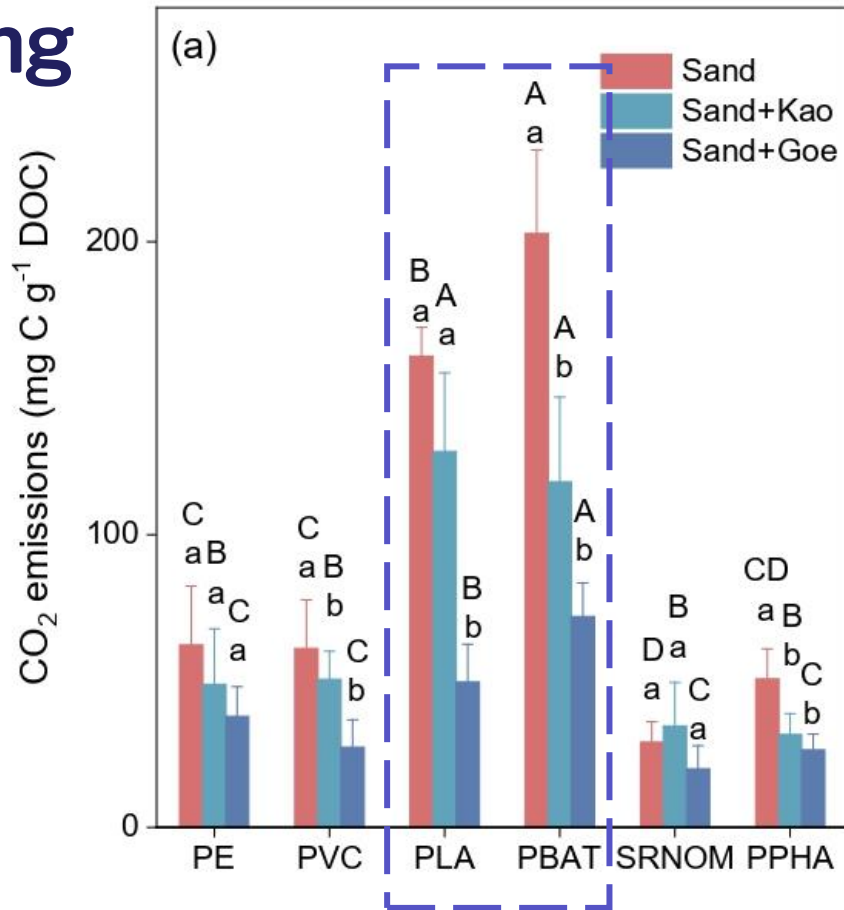
Microplastics on C cycling ...*double-edged sword*

MP-DOM:

- contain fewer DOM formulas
- are less recalcitrant
- show more labile-like compounds

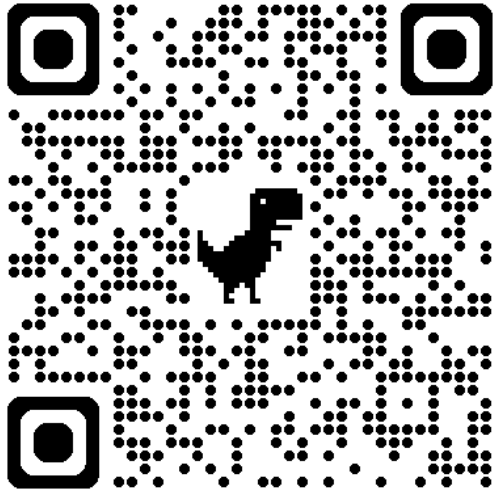
- MP-DOM emits more CO₂ and stores less carbon than NOM

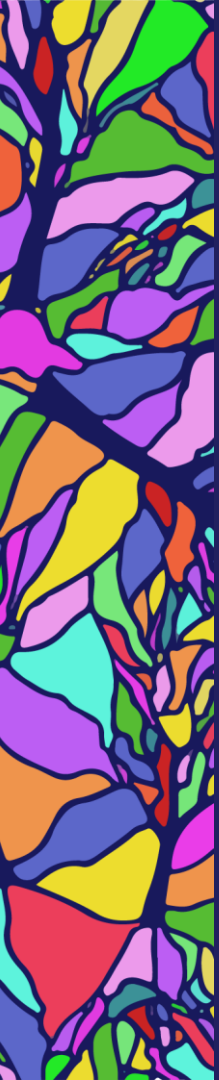
- biodegradable plastic emits more CO₂ emissions



Take home message

- Global coastal wetlands are becoming plastics/microplastics cesspit
- Plastic-derived organic matter can mineralise blue carbon in coastal wetlands
- Trade off among plastics, blue carbon sequestration and greenhouse gas emissions needs assessment in scale





Thank you!