

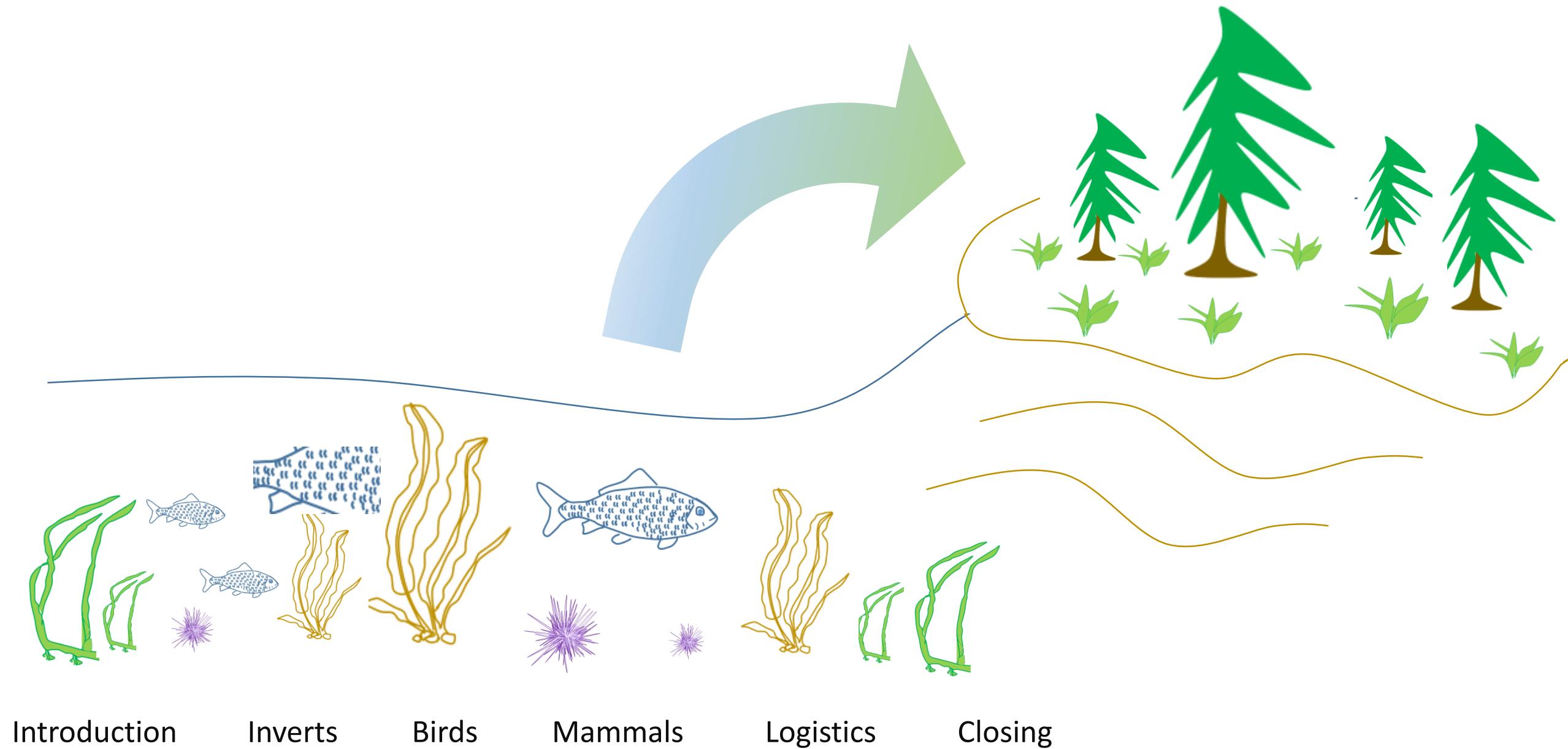
Kelp forests to rainforests: can nearshore marine subsidies shape island ecosystems?



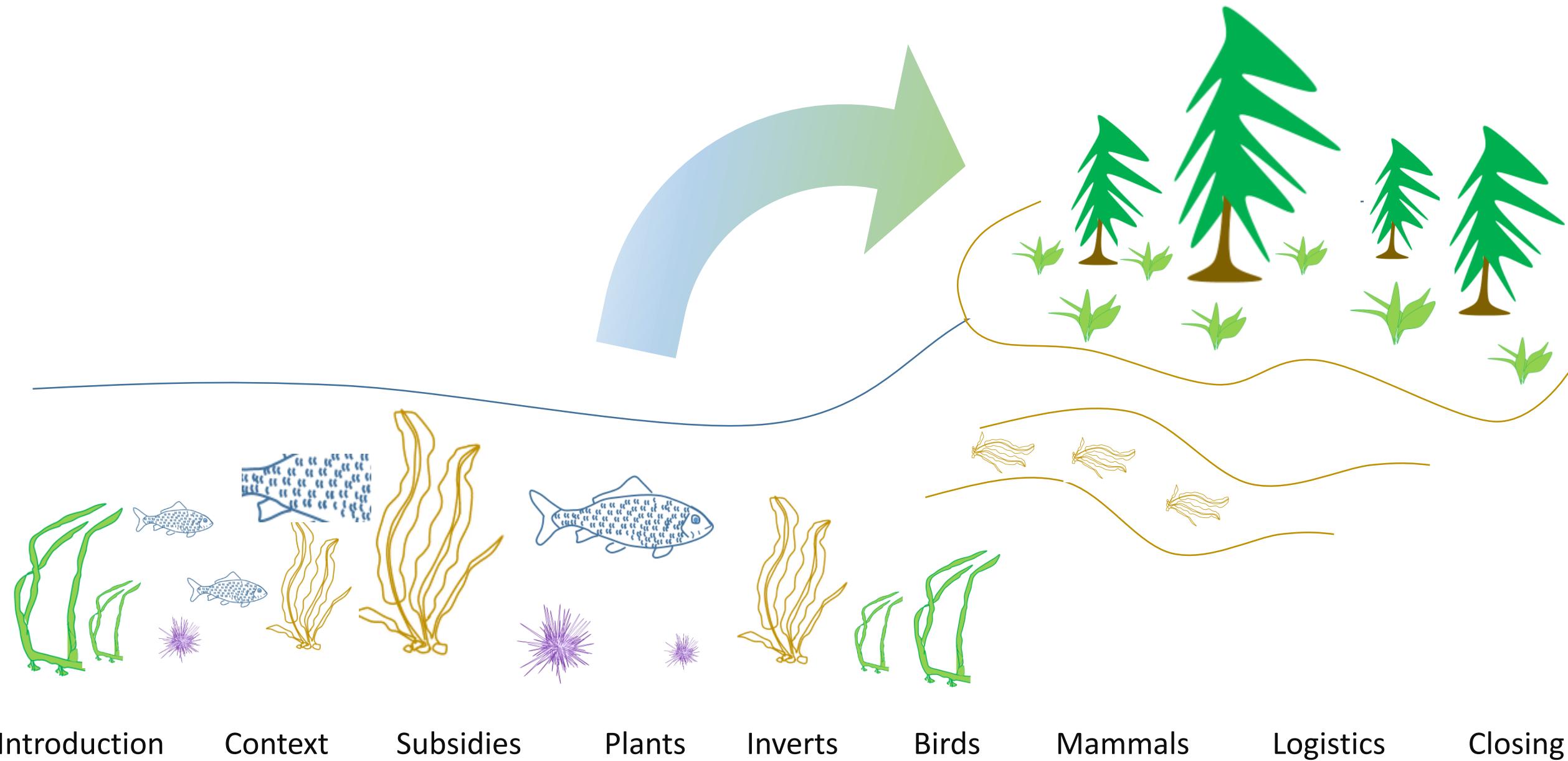
Norah Brown
University of Victoria
[@norahebrown](https://twitter.com/norahebrown)

Co-authors: Ben Millard-Martin, Margot Hessing-Lewis, Geneviève Reynolds,
Rebecca Miller, Sara Wickham, Owen Fitzpatrick, Katie Davidson, Deb Obrist, Pat
Hanly, Christopher Ernst, John Reynolds, Chris Darimont, Brian Starzomski

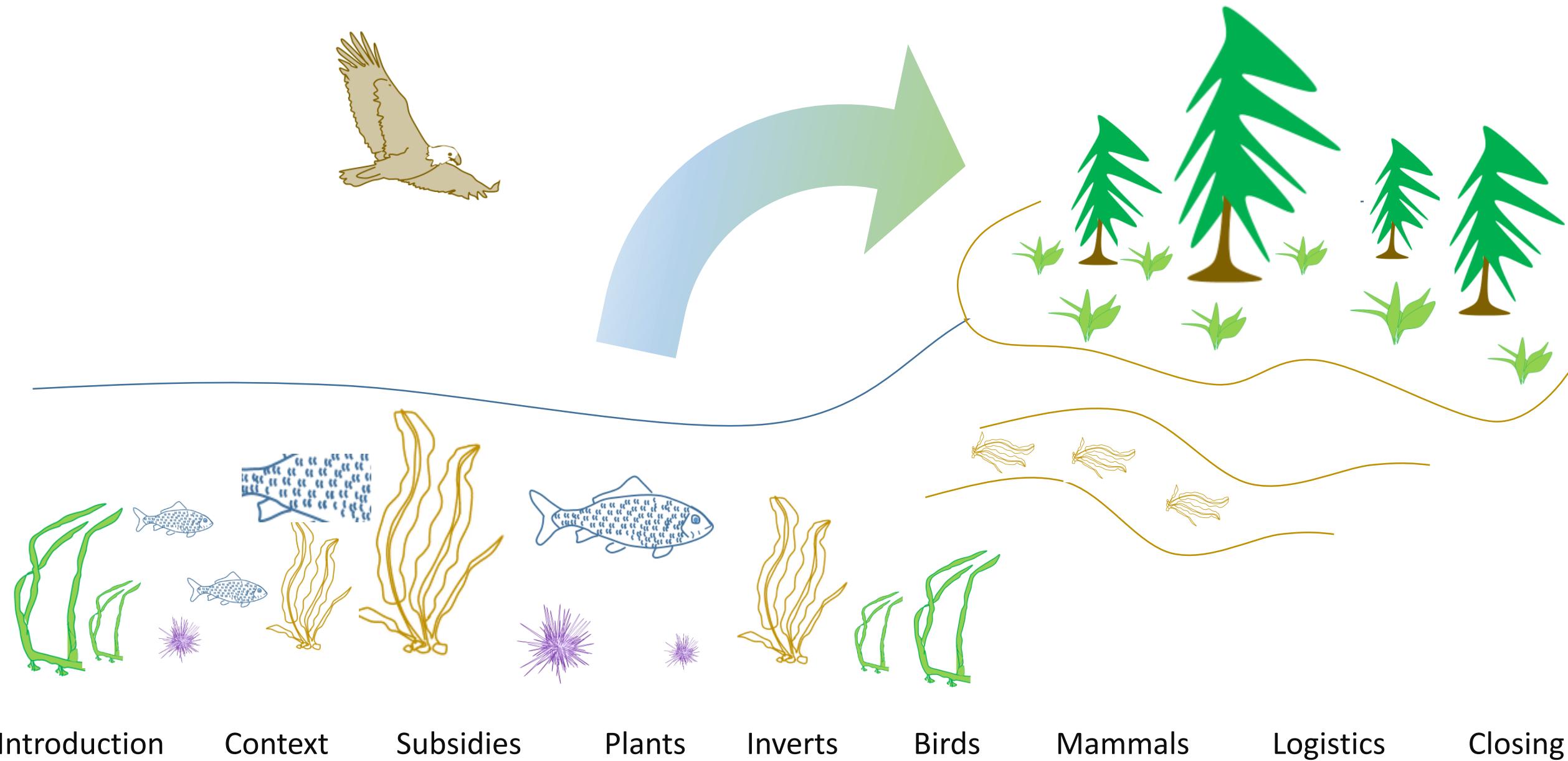
Marine subsidies to coastal ecosystems



Marine subsidies to coastal ecosystems

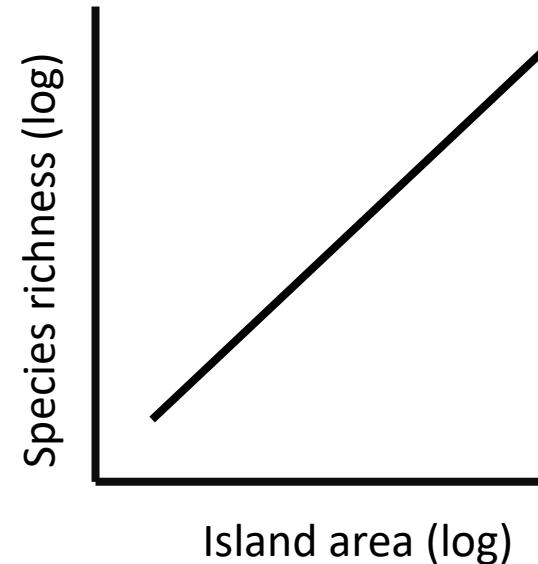


Marine subsidies to coastal ecosystems





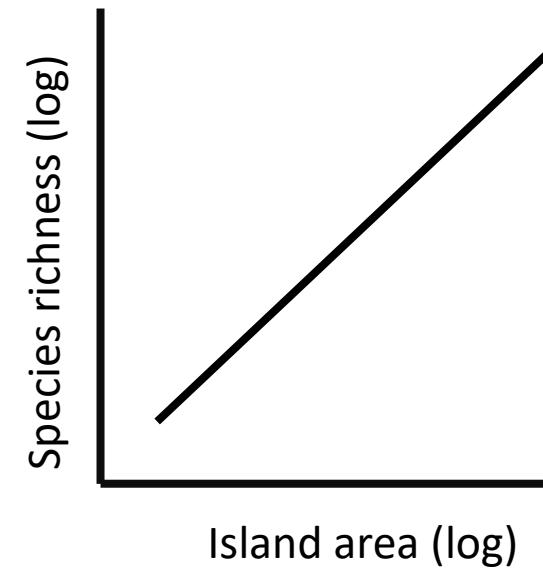
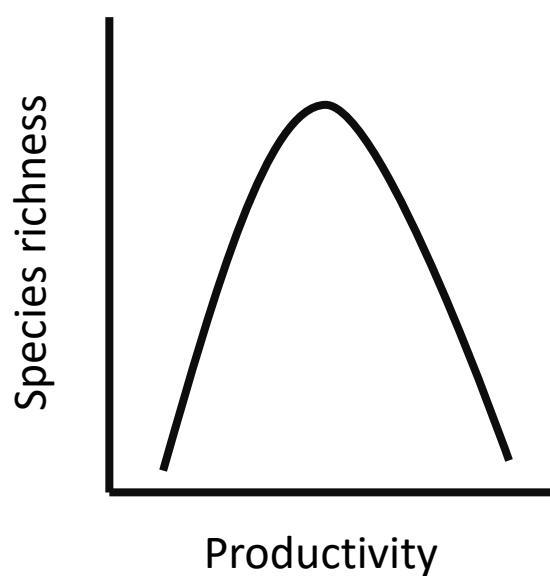
Island biogeography theory modified by marine subsidies



Anderson and Wait 2001
Polis and Hurd 1996



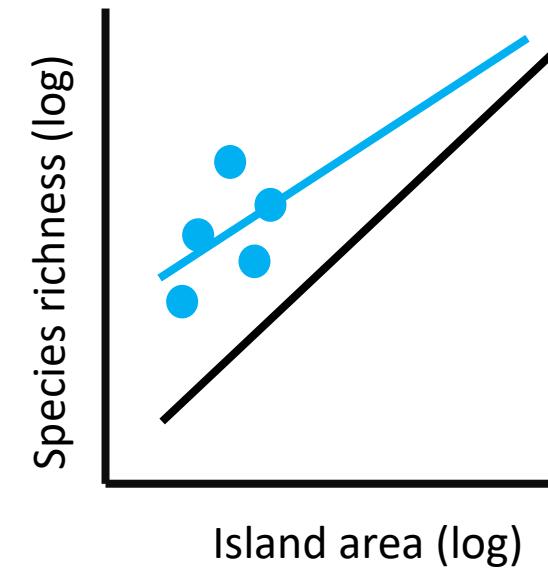
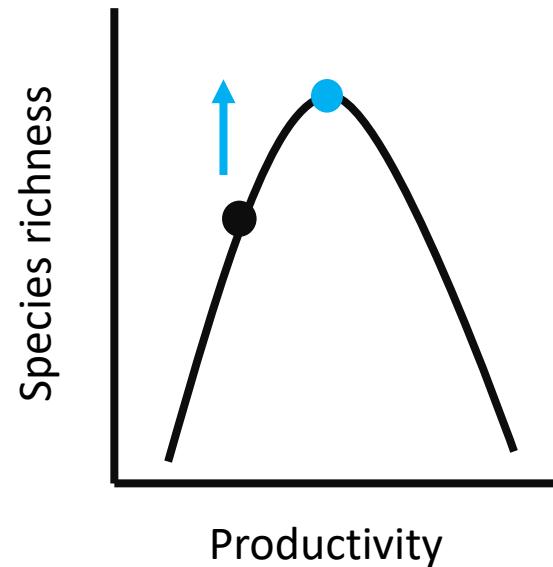
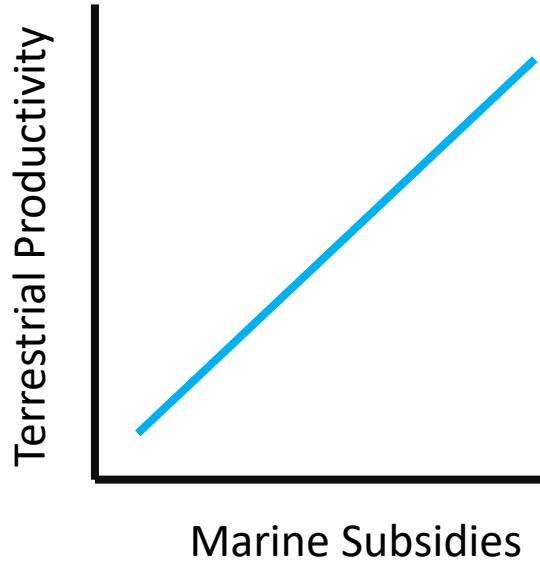
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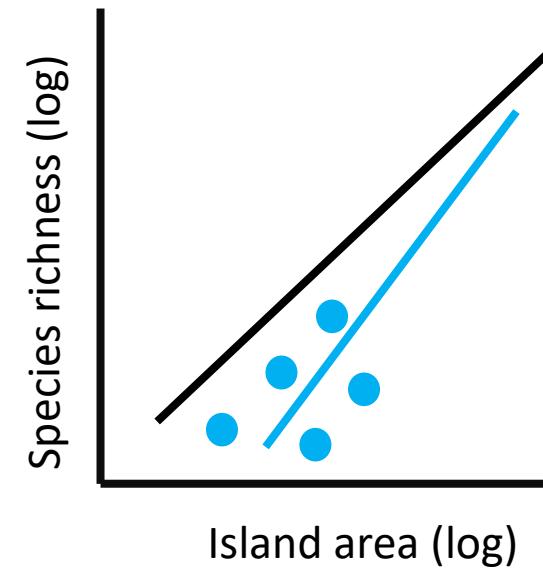
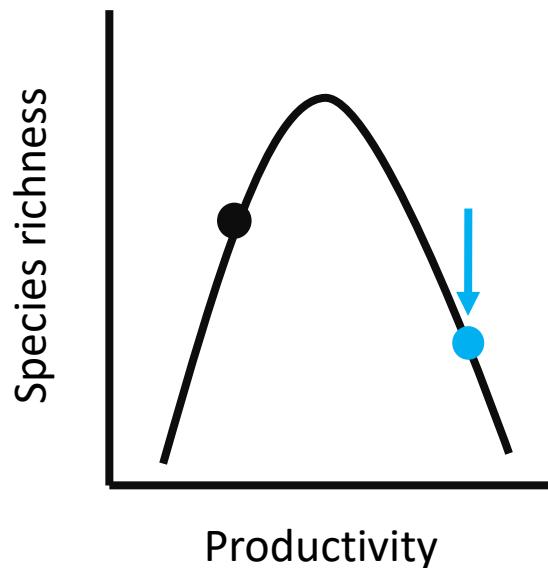
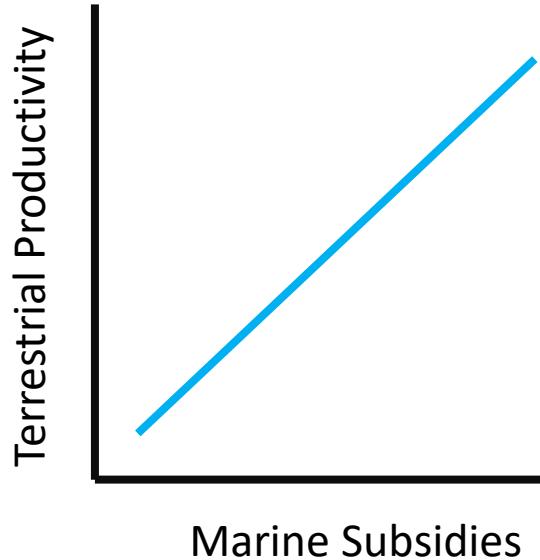
Island biogeography theory modified by marine subsidies



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Island biogeography theory modified by marine subsidies



Anderson and Wait 2001
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Central Coast of British Columbia



Introduction

Context

Subsidies

Plants

Inverts

Birds

Mammals

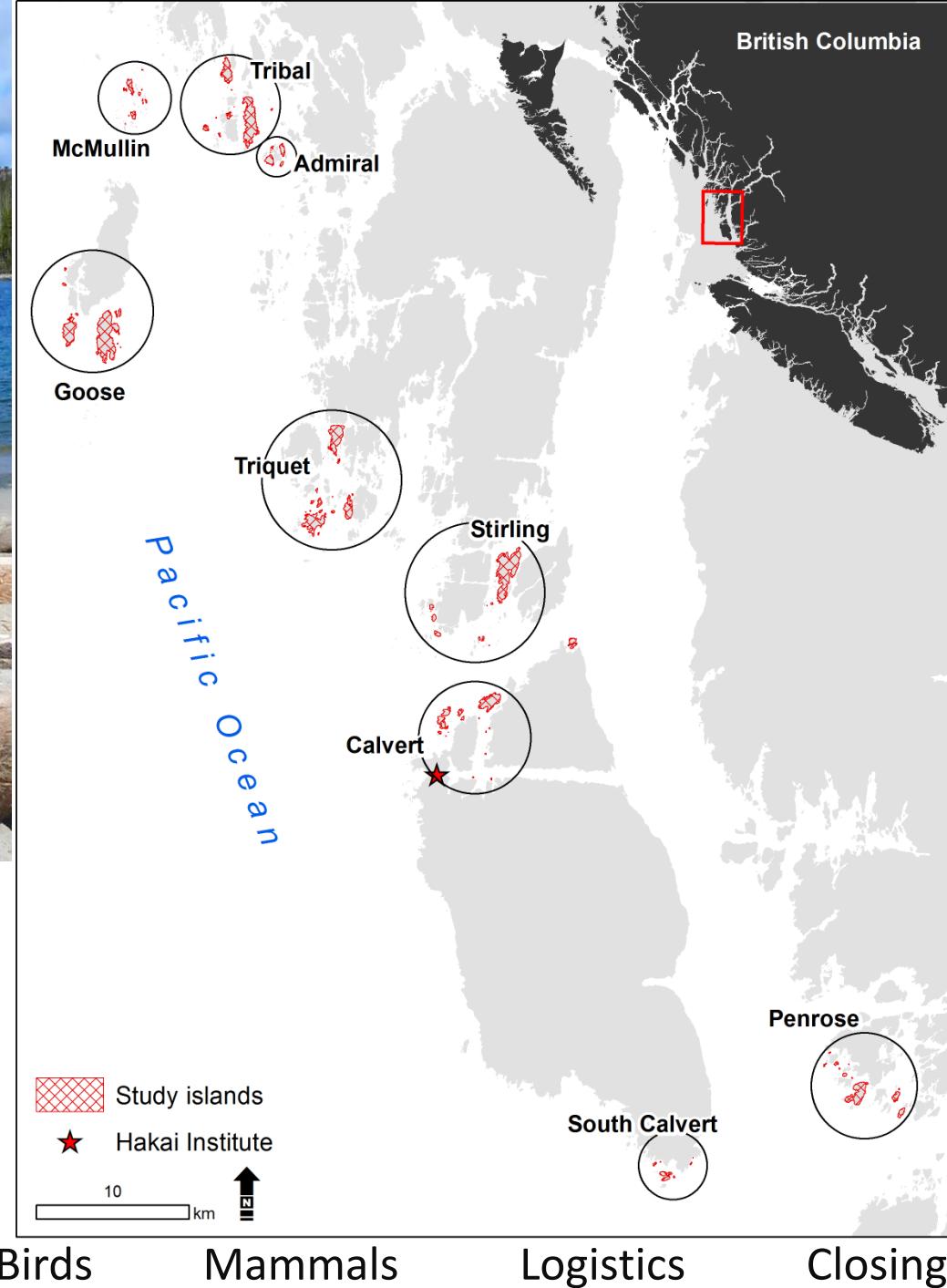
Logistics

Closing

100 Islands Project



- Biodiversity surveys for seaweeds, plants, invertebrates, songbirds and mammals
- Isotope analysis $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ on soil, leaves, invertebrates, bird feathers, mouse hair



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Hakai Nearshore Program



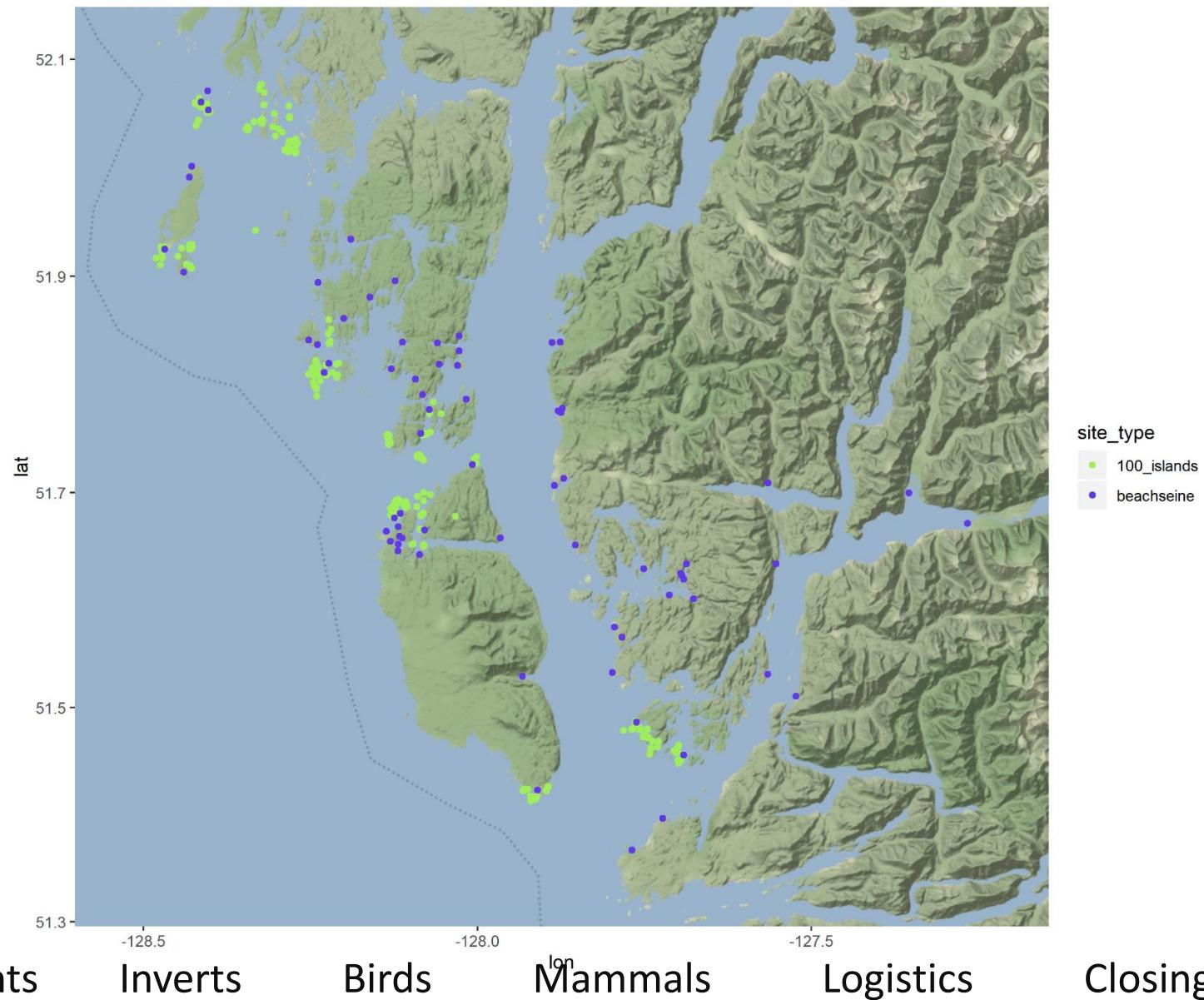
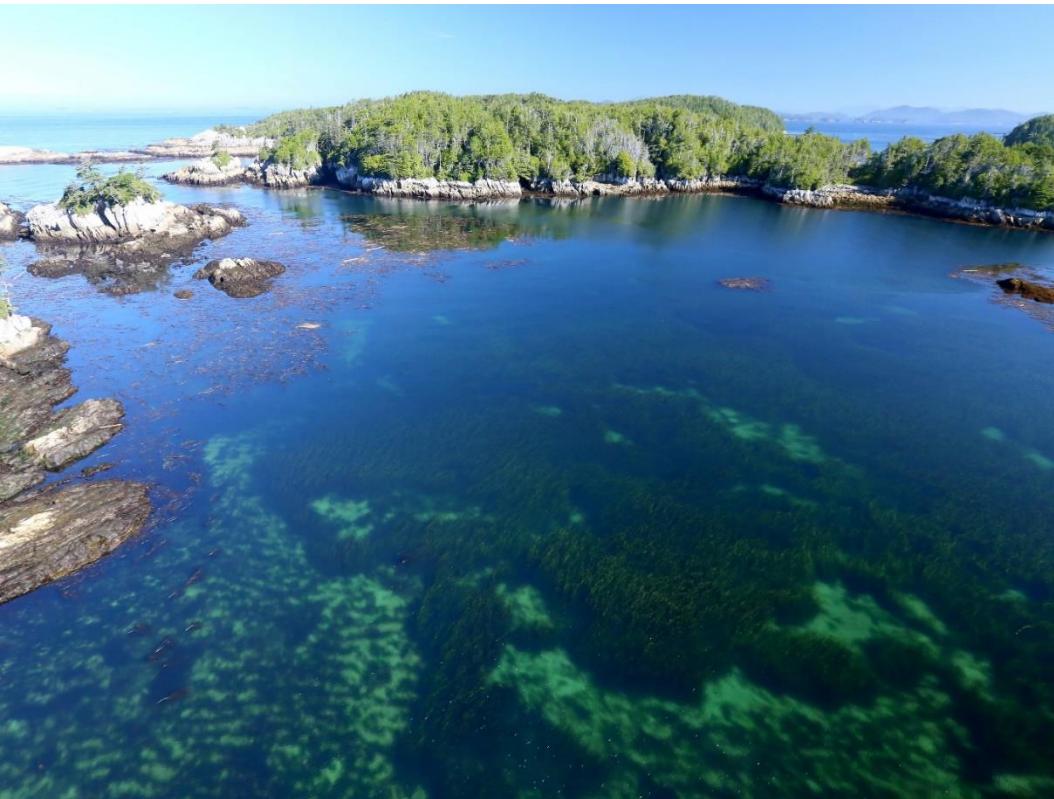
Margot Hessing-Lewis

Ben Millard-Martin

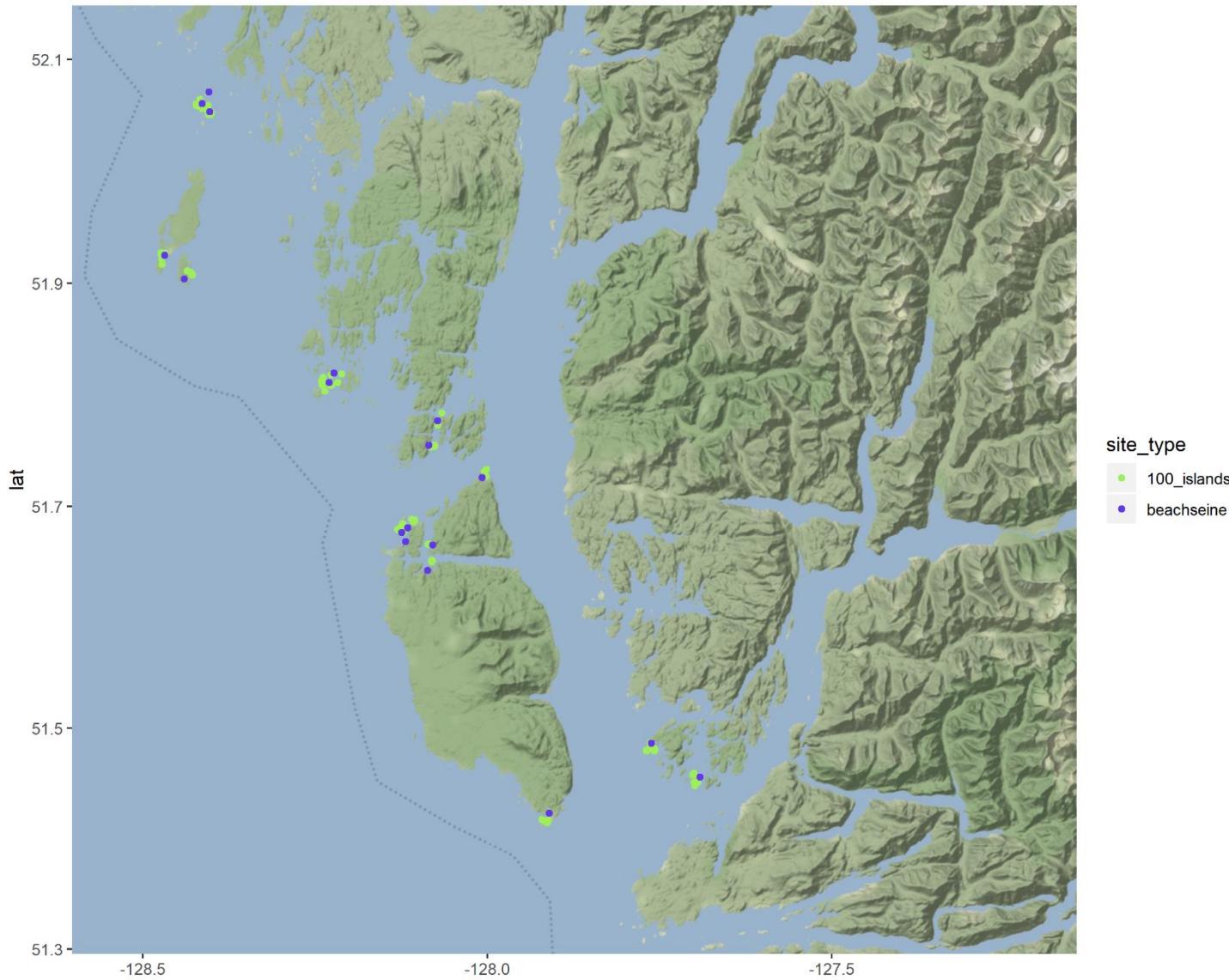
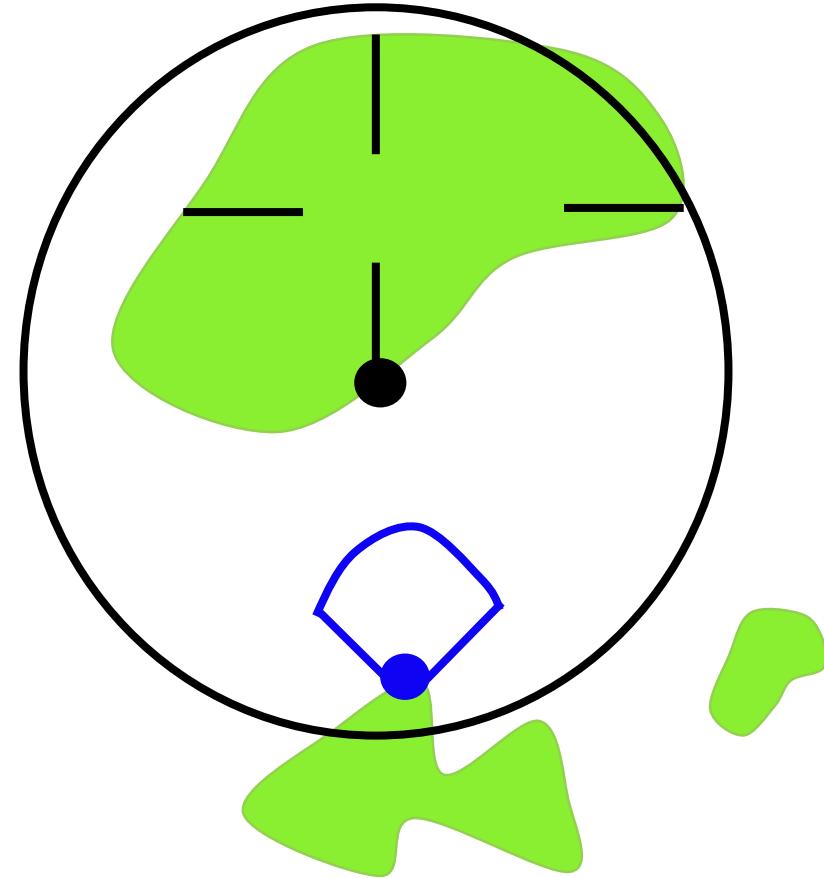


- Beachseines targeting fish, invertebrates as bycatch
- Fish richness, abundance, length. (Derived biomass estimate from literature)

Mapping both datasets



Matching seine sites within a 1km radius of transect



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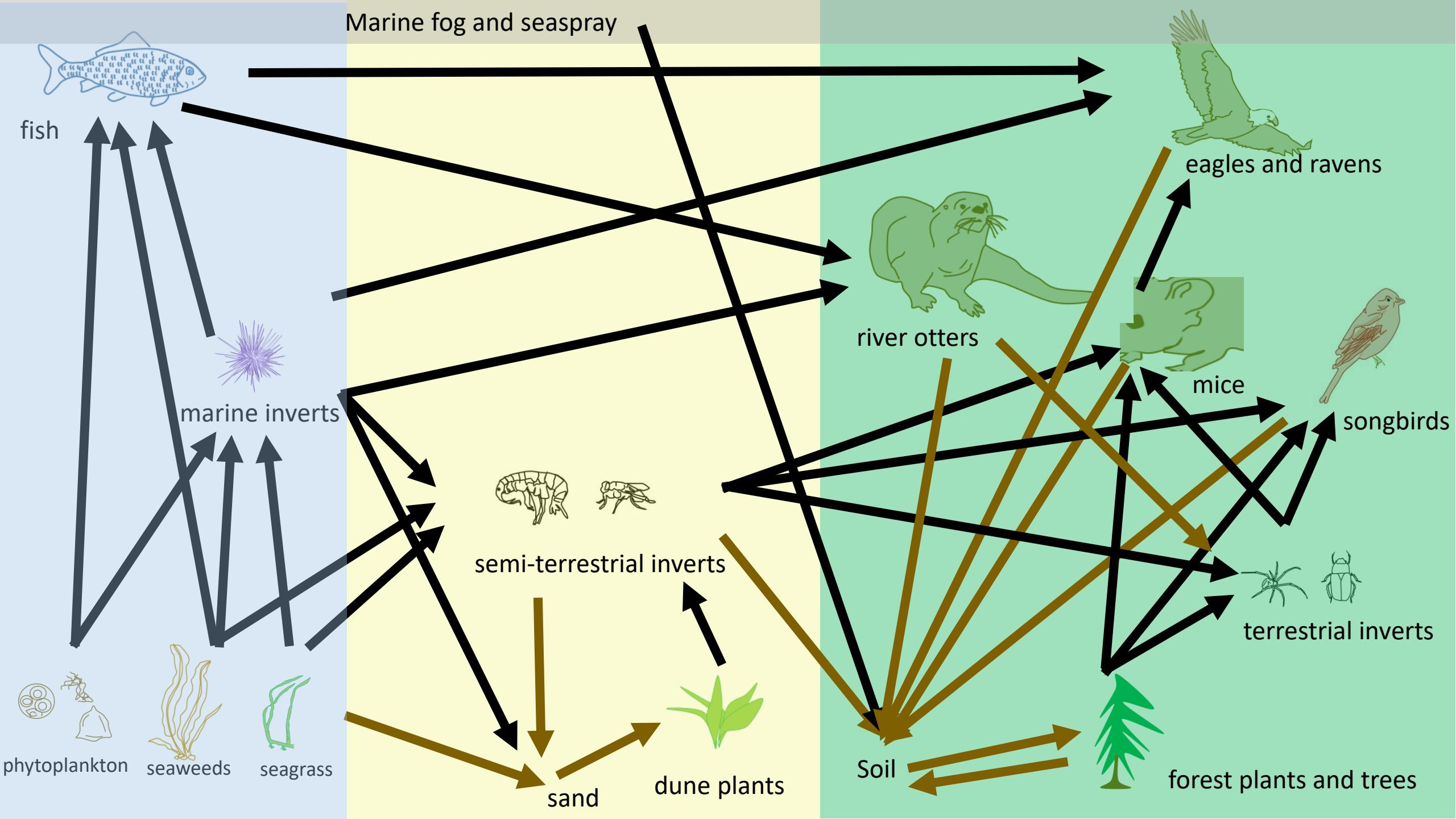
Birds

Mammals

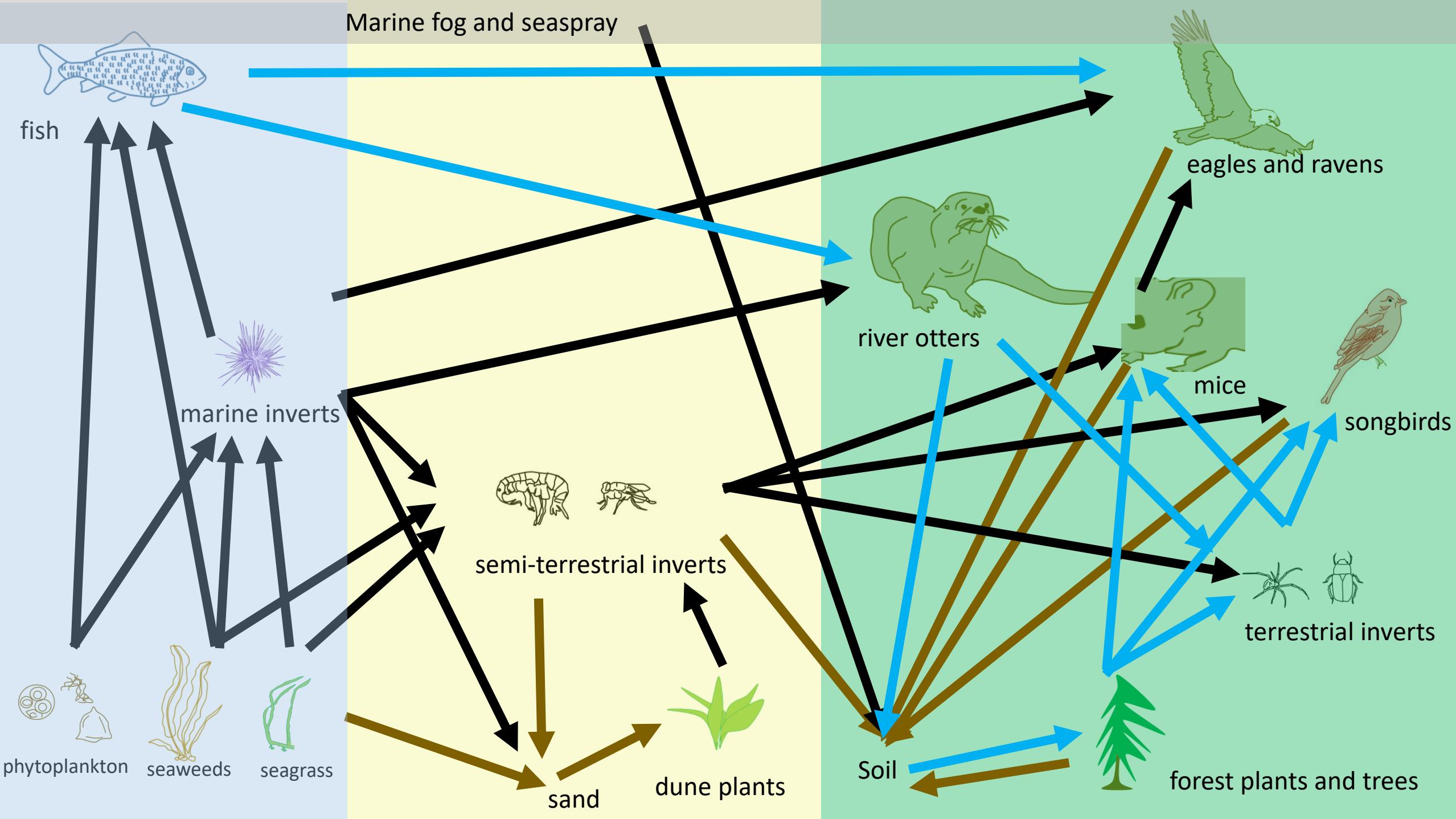
Logistics

Closing

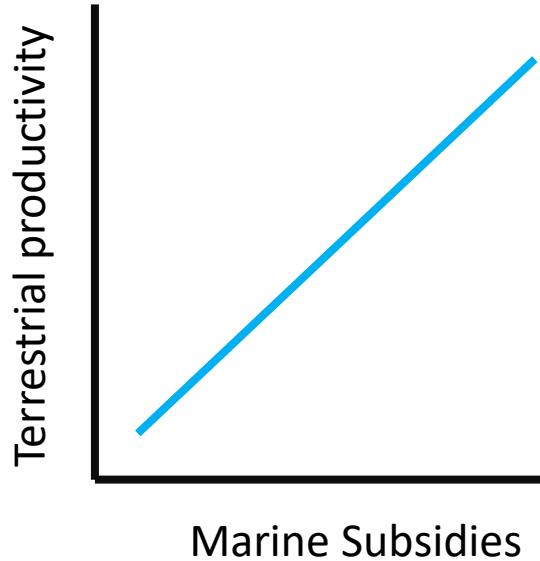
Marine fog and seaspray



Marine fog and seaspray



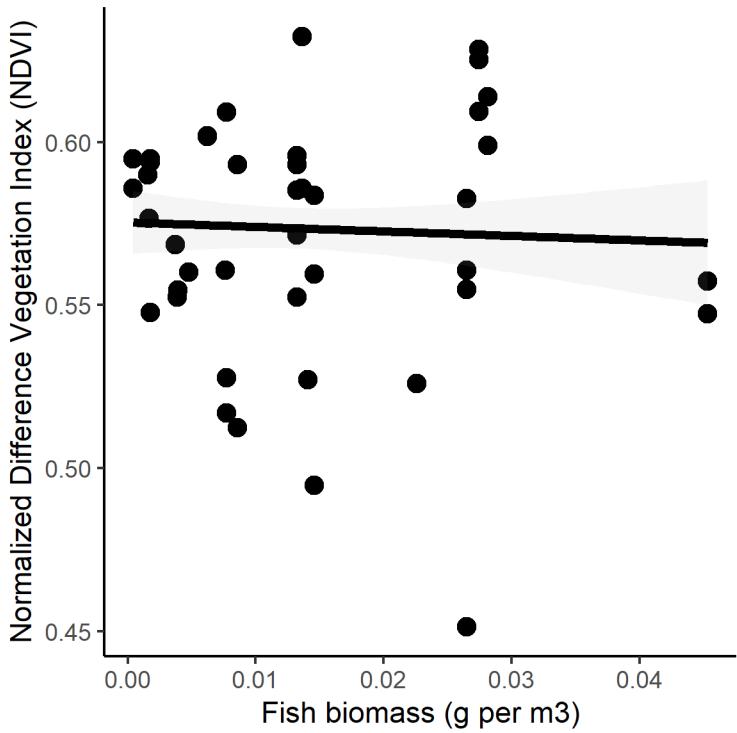
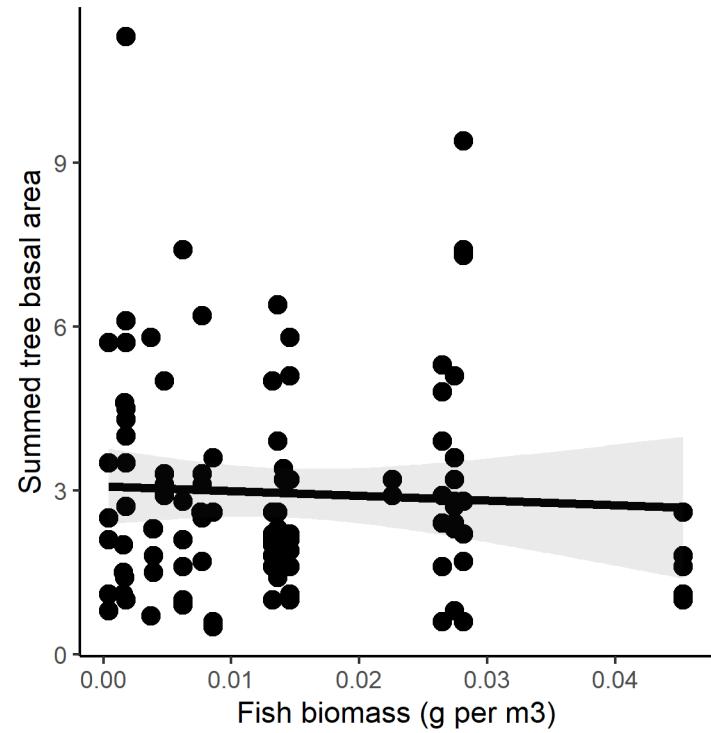
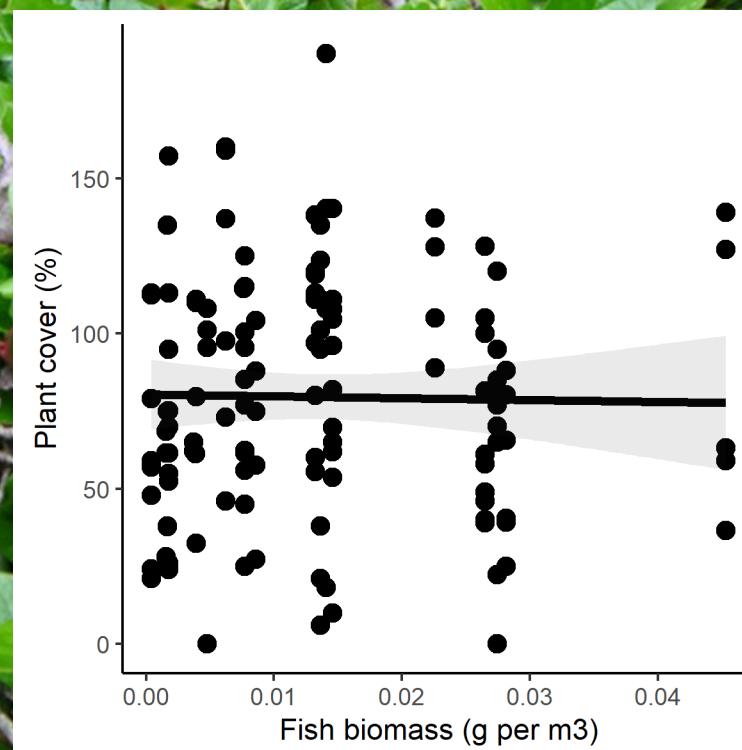
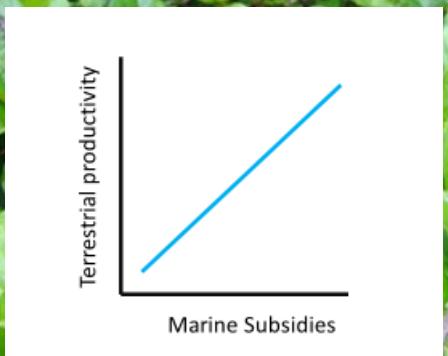
Do marine subsidies increase terrestrial productivity?



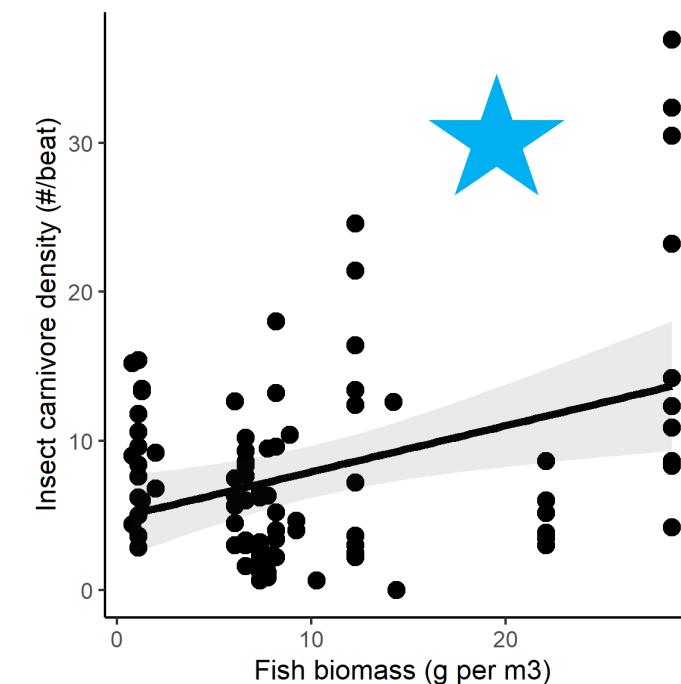
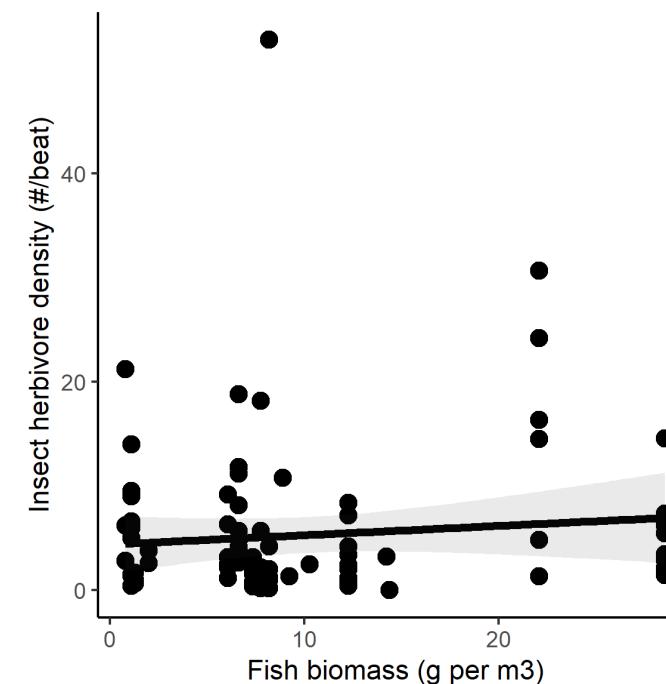
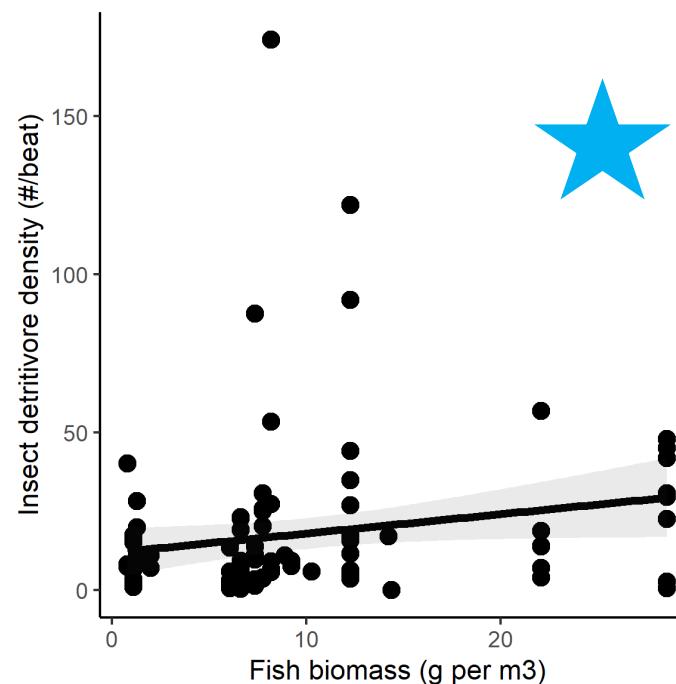
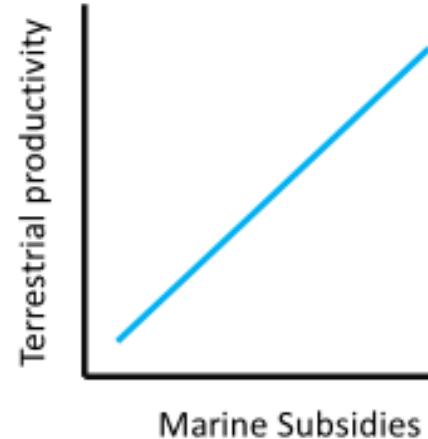
Marine subsidies ~ Nearby fish biomass

Terrestrial productivity ~ Vegetation cover

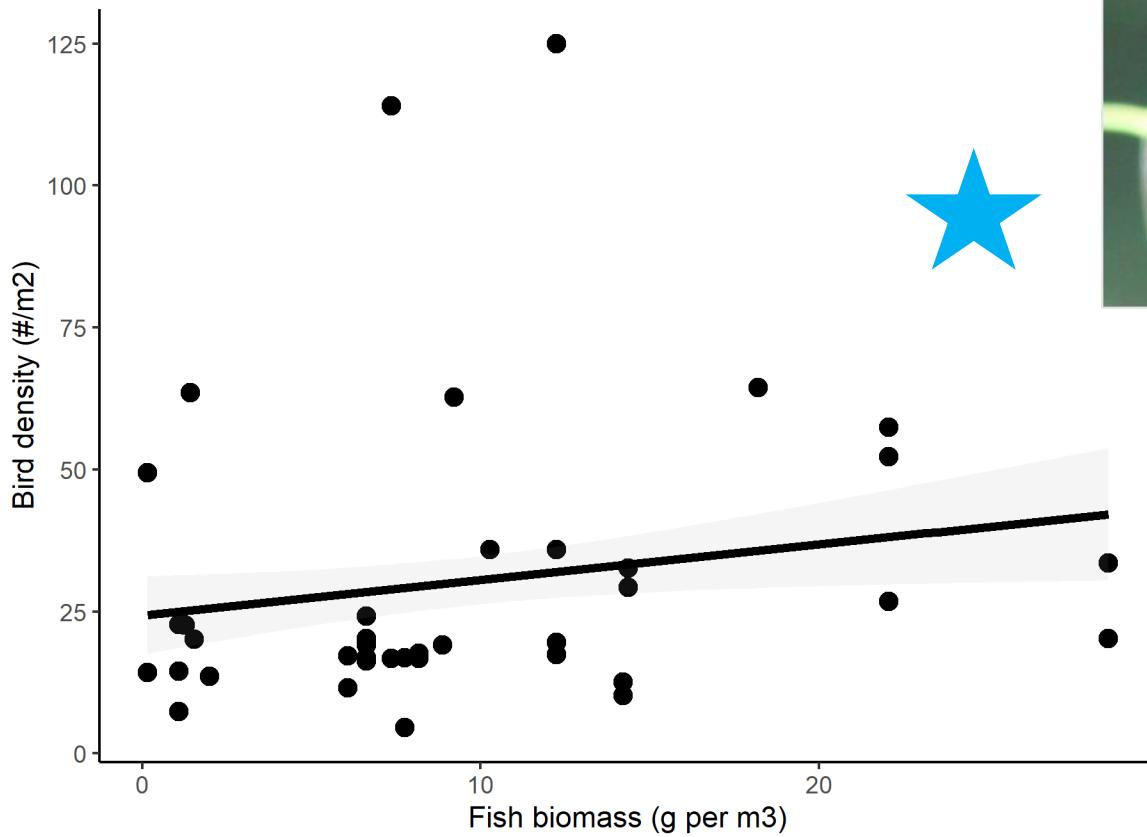
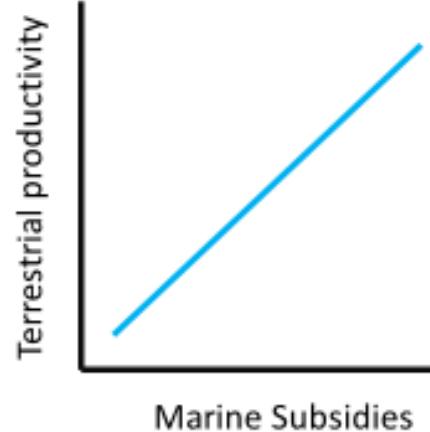
Do marine subsidies increase terrestrial productivity?



Do marine subsidies increase terrestrial productivity?

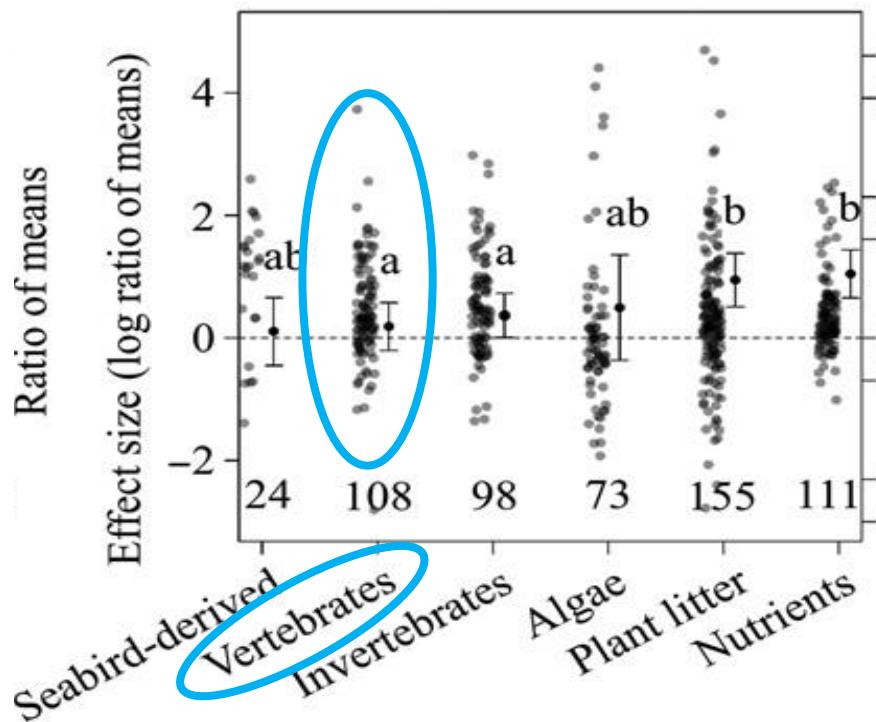


Do marine subsidies increase terrestrial productivity?



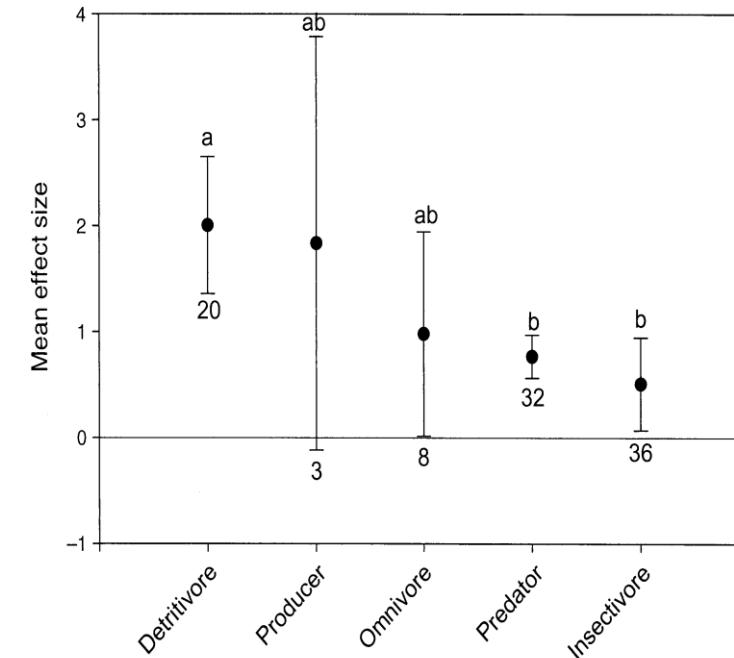
Biomass response to subsidies depends on properties of the donor and recipient

Subsidy type



Montagno et al. 2019

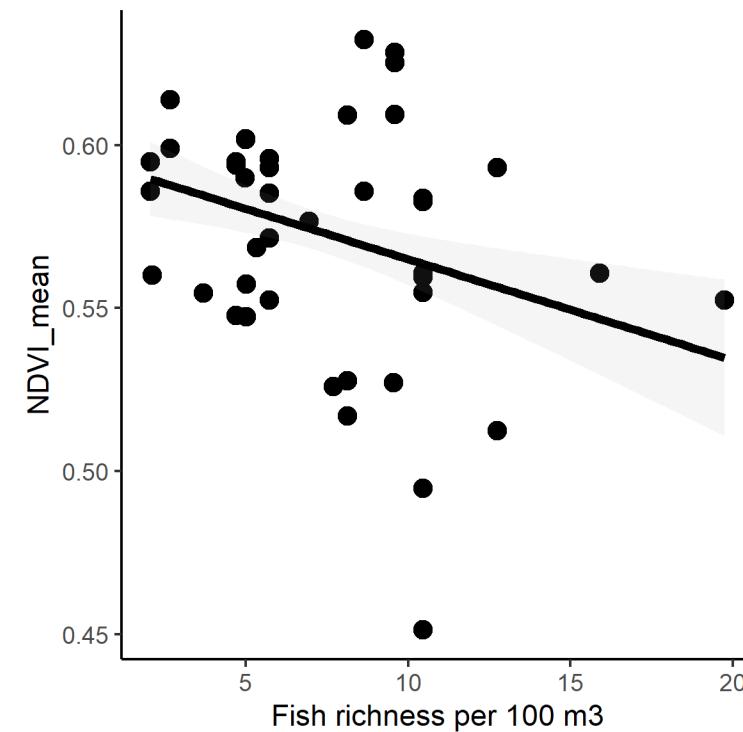
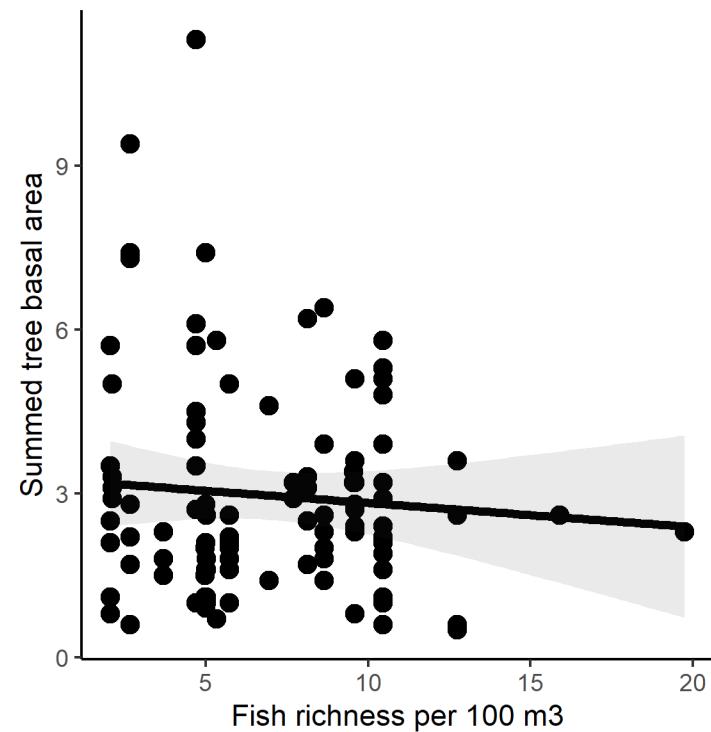
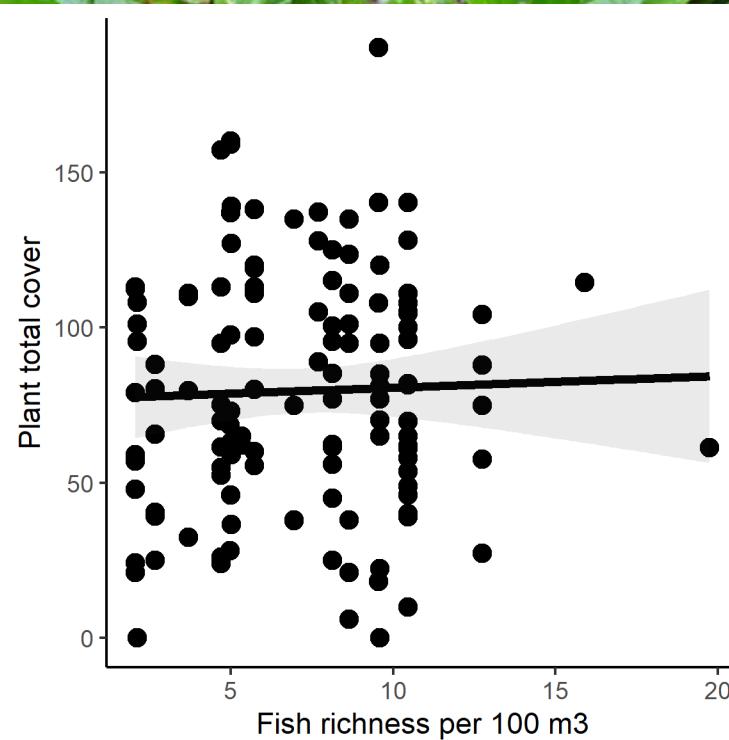
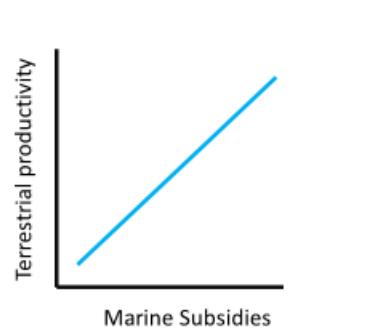
Recipient trophic level



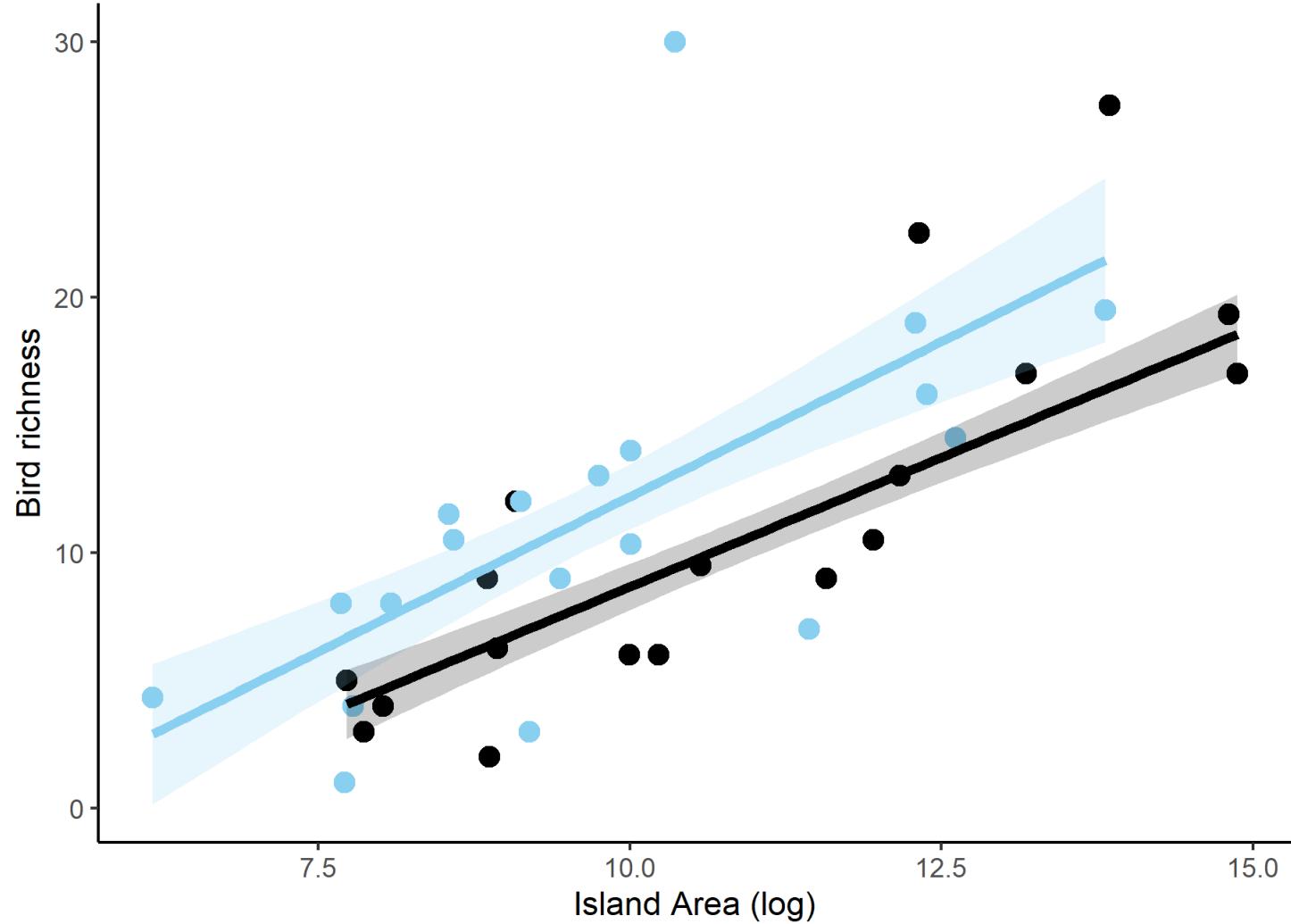
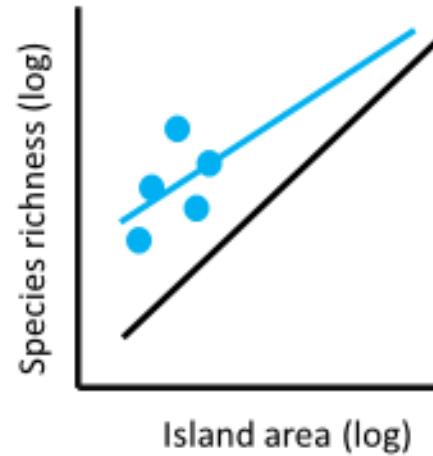
Marzak et al. 2007

IS fish biomass the best indicator of marine subsidy?

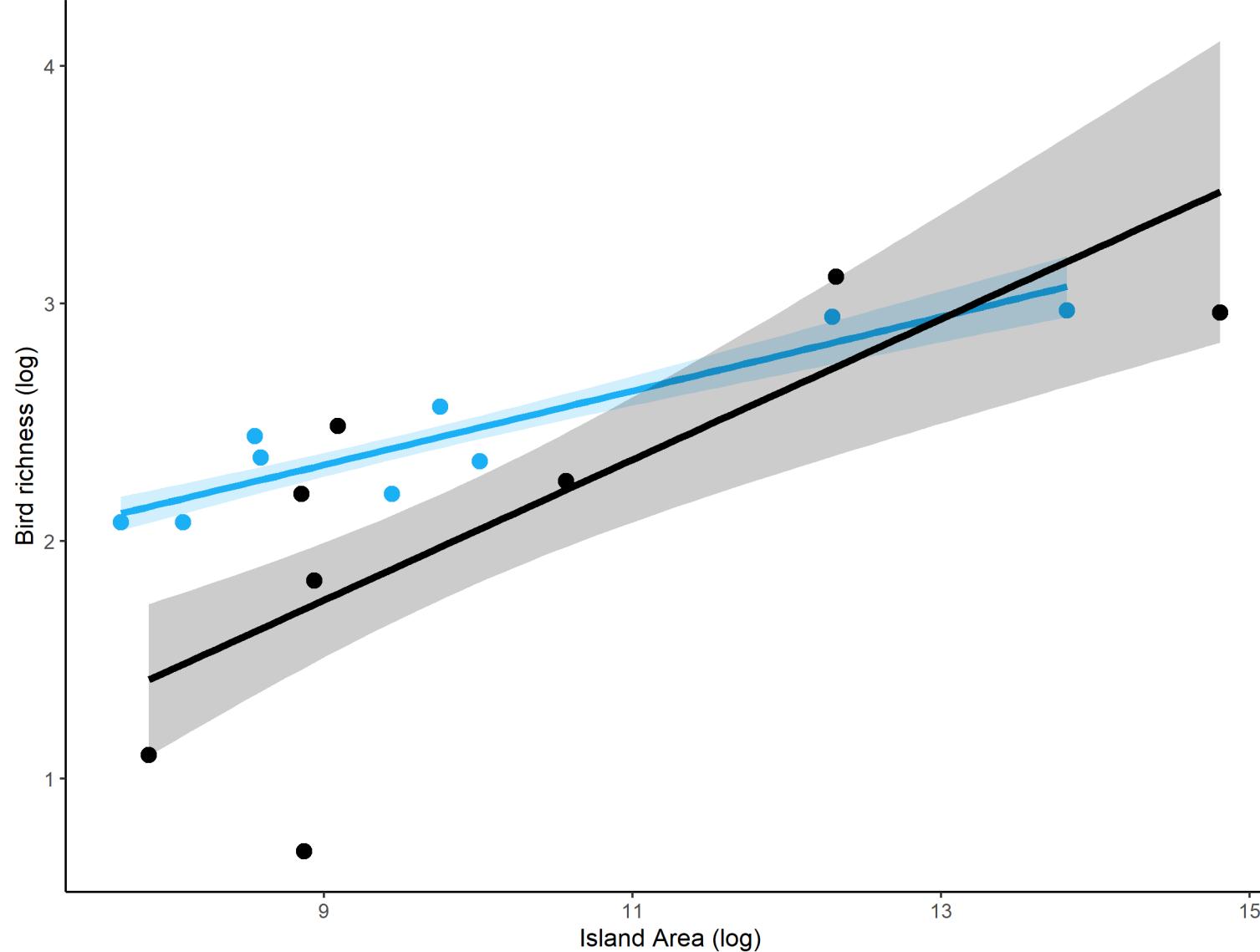
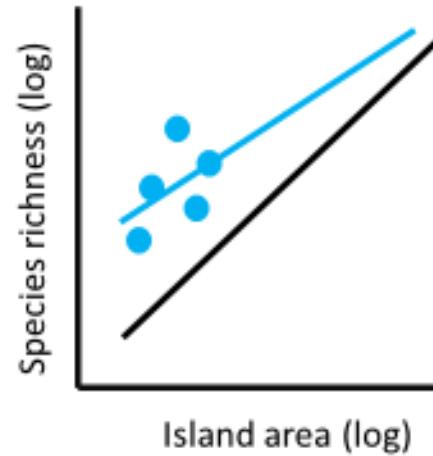
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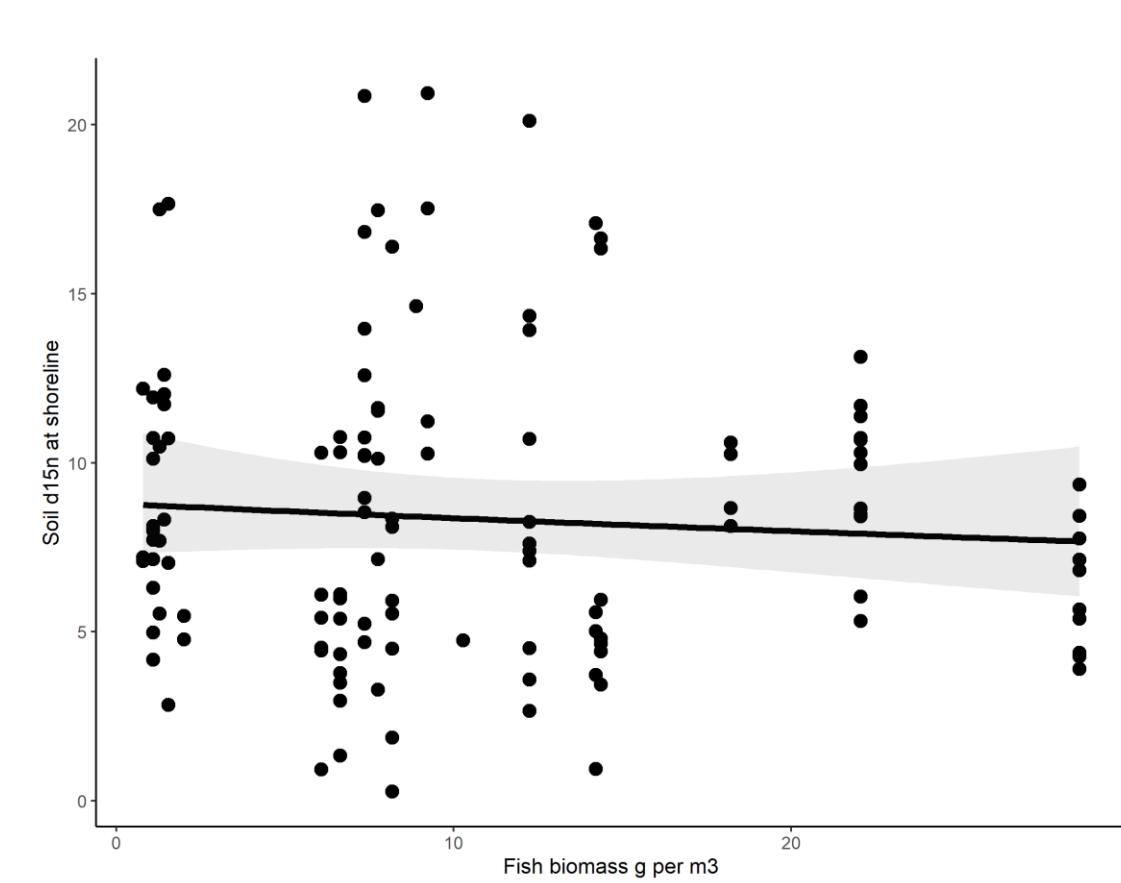


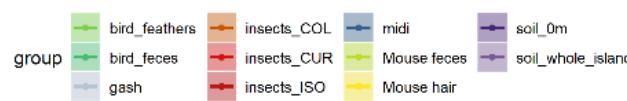
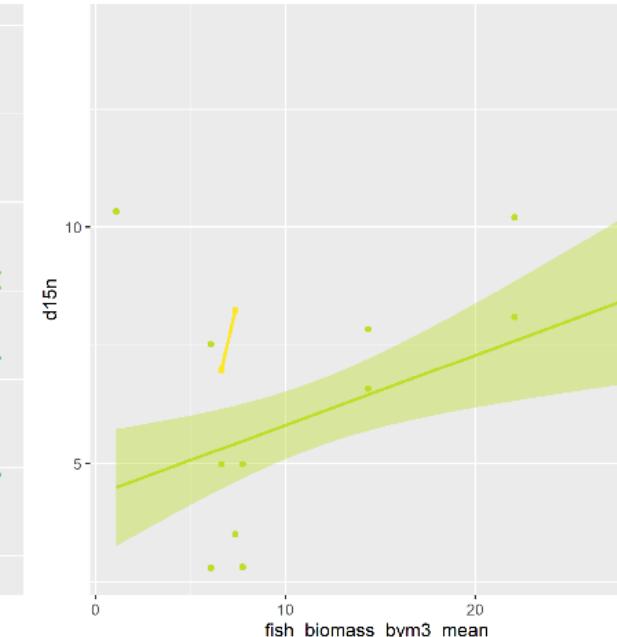
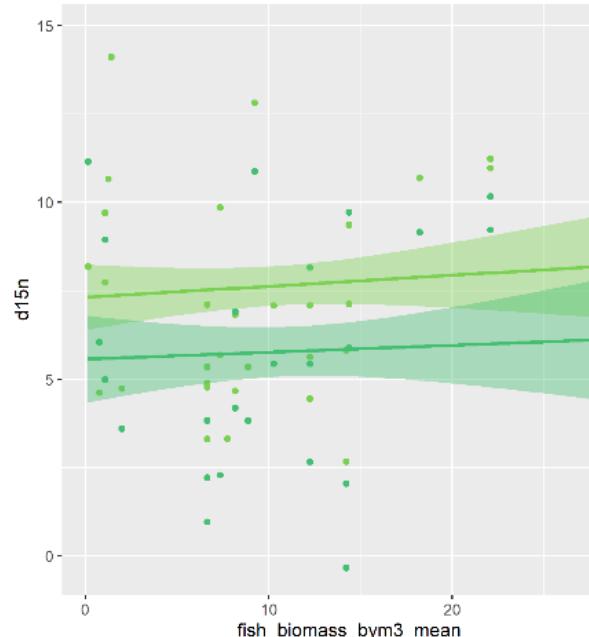
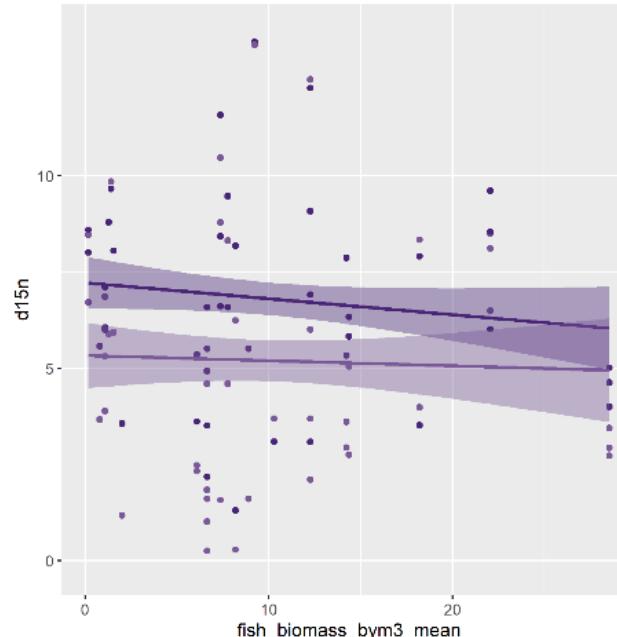
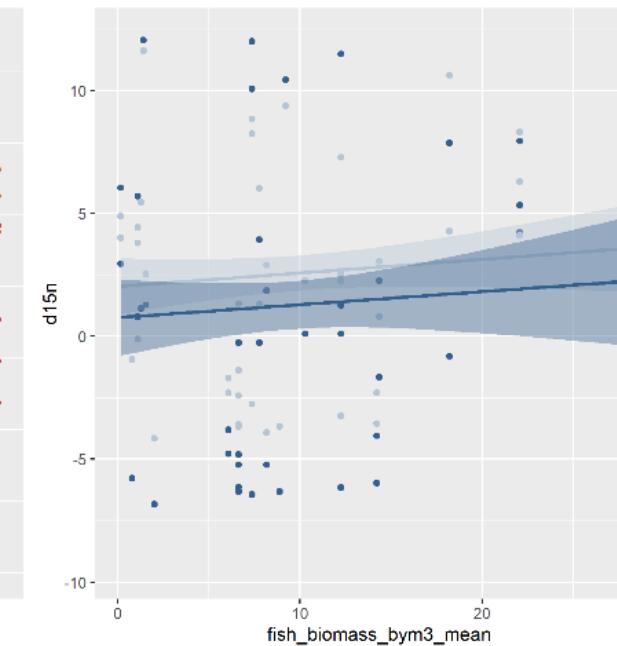
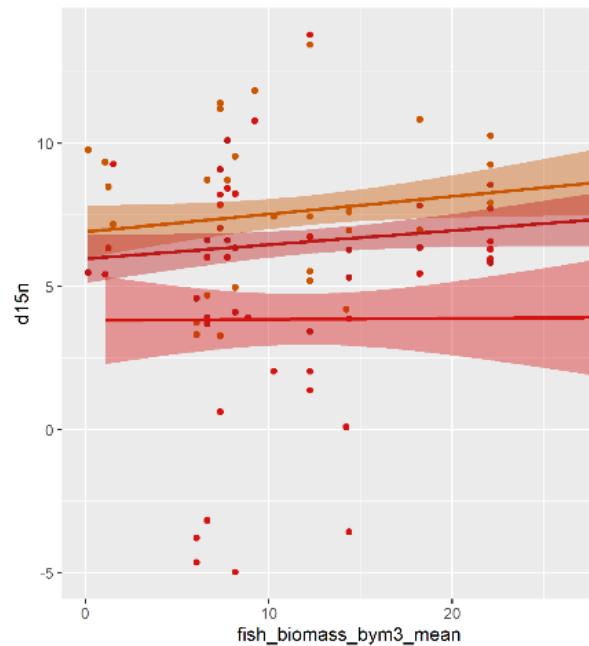
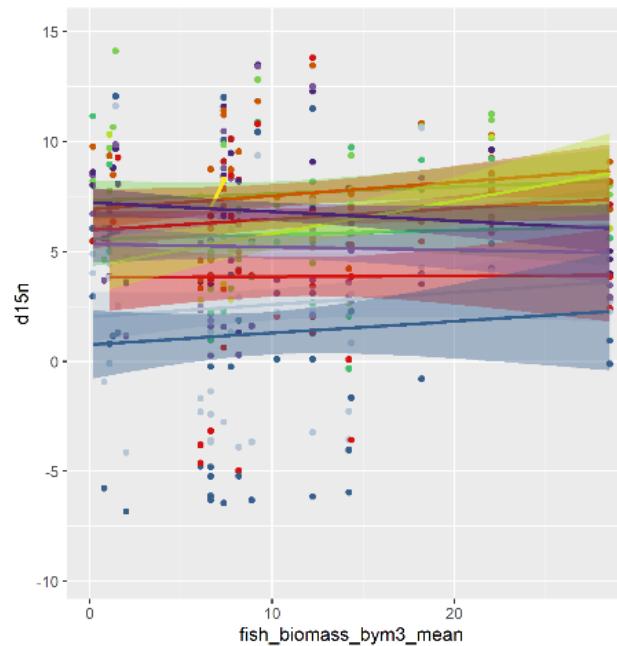
Do marine subsidies increase terrestrial diversity?



Do marine subsidies increase terrestrial diversity?

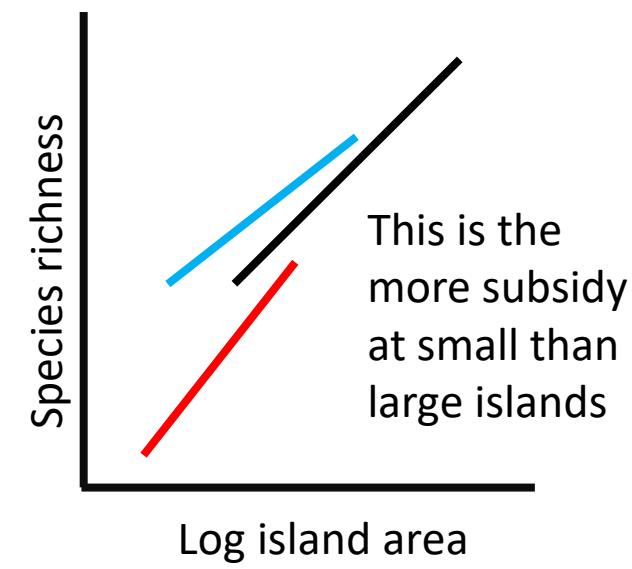
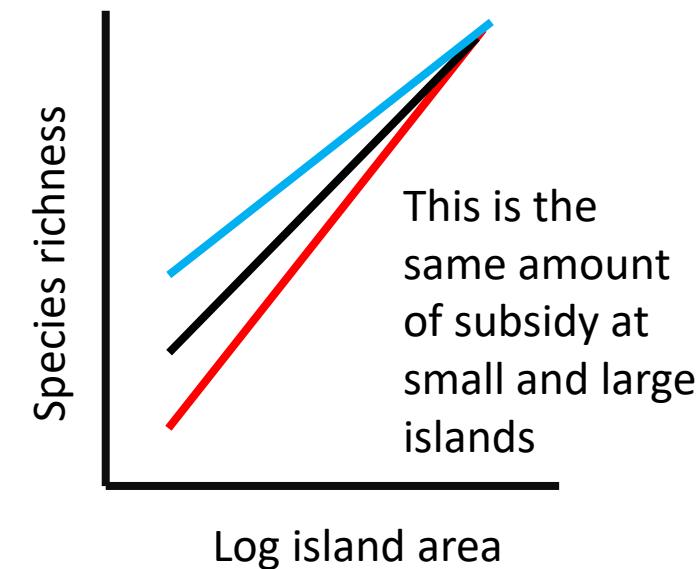
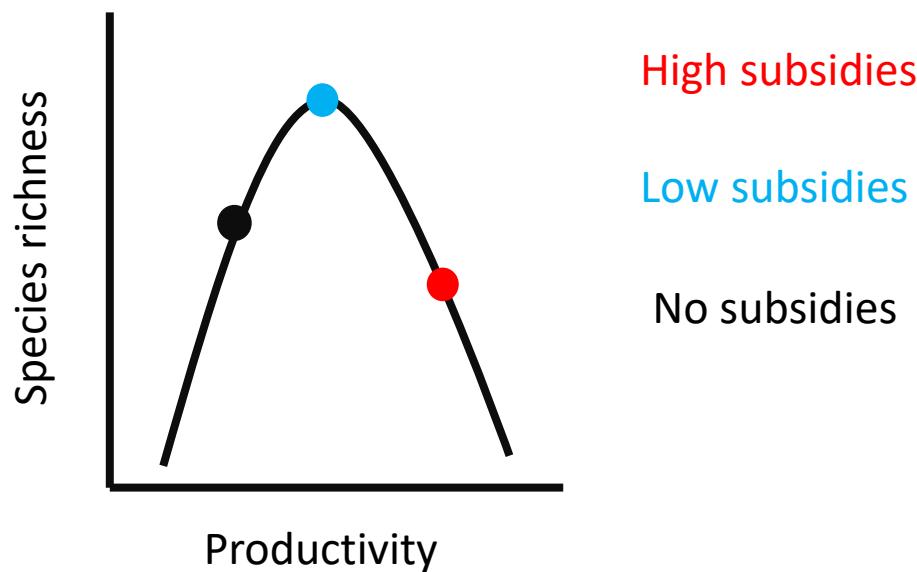






Isotope explanation slide

Island biogeography theory modified by marine subsidies



Anderson and Wait 2001
Polis and Hurd 1996