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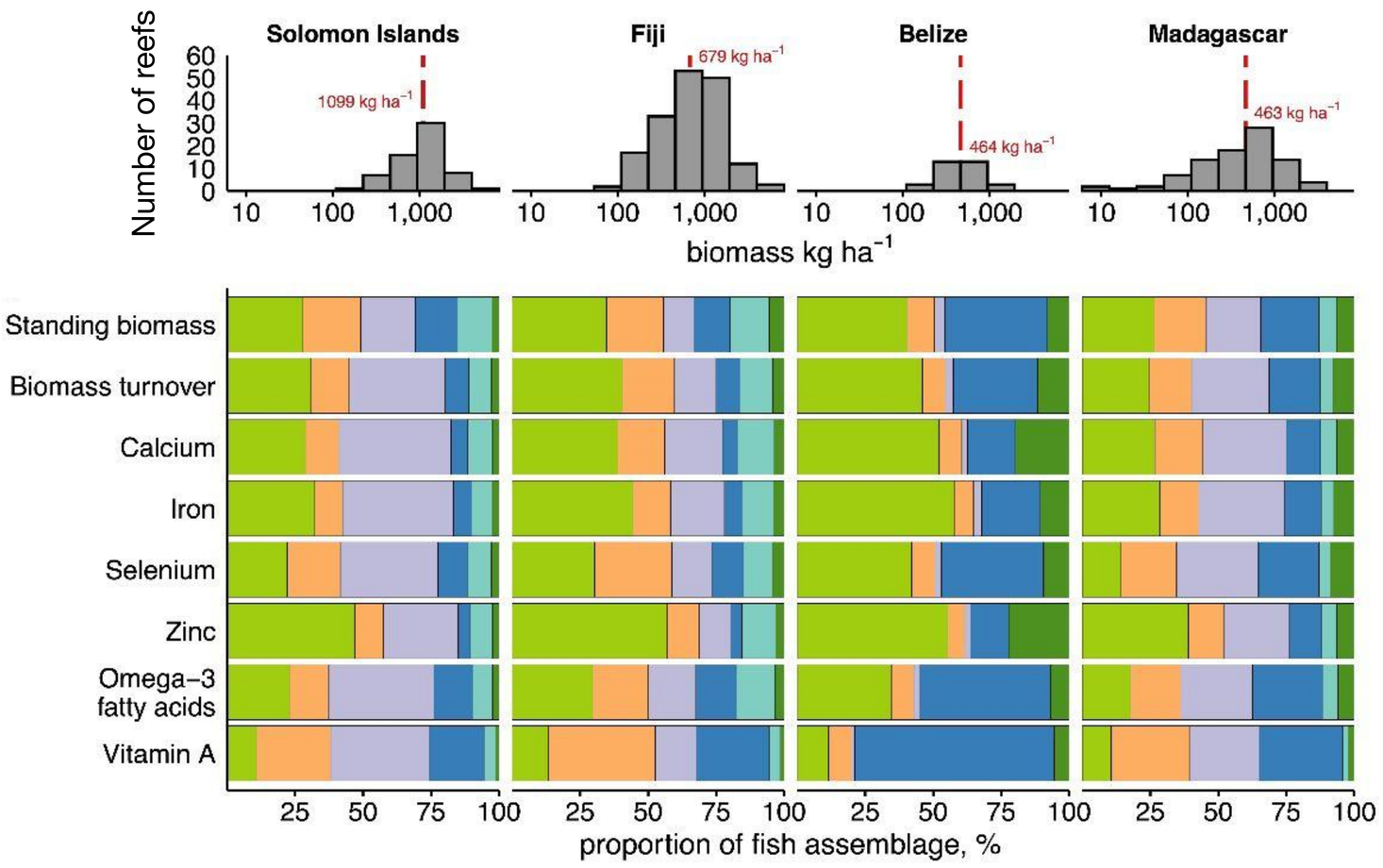
# Fisheries services from degraded coral reefs

## Context

Climate-driven disturbances such as heatwaves and extreme weather have caused declines in coral cover across the tropics, leading to dominance of turf algae, macroalgae, or rubble. It is unclear how critical coral reef fishery services such as biomass production and nutritious seafood will operate in these alternate habitat regimes.


## Methods

Underwater visual surveys at 333 reef sites spanning fishing and benthic gradients. We estimated standing biomass, biomass turnover[1], and nutrient concentrations[2] of each trophic group.




**Q** How are fisheries services distributed among trophic groups?

We estimated trophic group contributions to **fisheries services**:
fish biomass, biomass turnover & nutrient production

- Invertivore (mobile)
- Piscivore
- Herbivore (macroalgae)
- Herbivore (detritivore)
- Planktivore
- Omnivore
- Invertivore (sessile)

**Coral reef food webs are bottom-heavy: herbivores provide >50% of most fishery services,** particularly biomass turnover and production of essential micronutrients calcium, iron and zinc.

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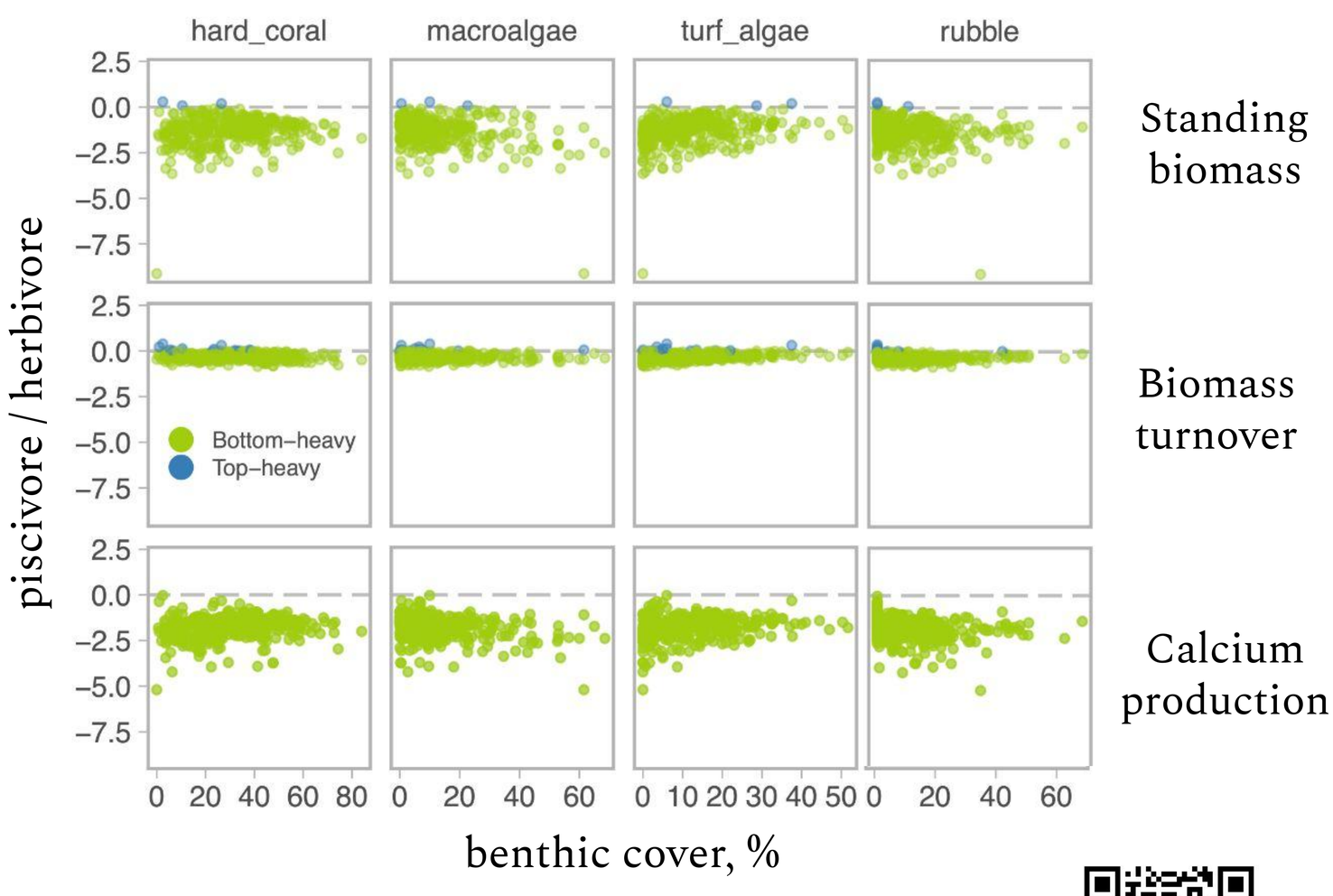
**Q** How does habitat change impact trophic structure of reef fishes?

We measured the contribution of herbivores (bottom) relative to piscivores (top) for three fishery services.

Bottom-heavy trophic structures were common in alternate habitat regimes.

Coral reef fisheries may persist despite coral loss.

Sustainable exploitation of herbivore populations will help maintain fishing and food provisioning along tropical coastlines.




1. Morais & Bellwood 2020 Principles for estimating fish productivity on coral reefs *Coral Reefs* **39** 1221–31.
2. Robinson et al. 2022 Climate-driven increases in micronutrient availability from small-scale tropical fisheries. *One Earth*.