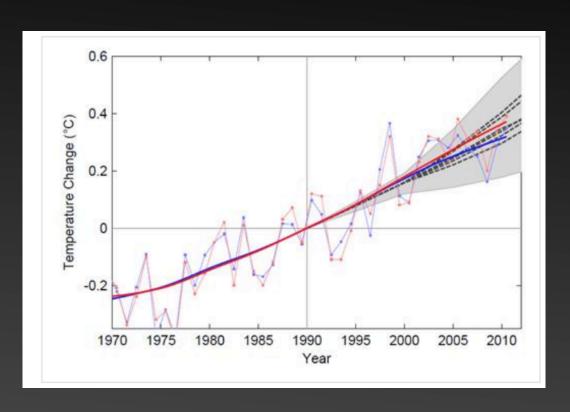
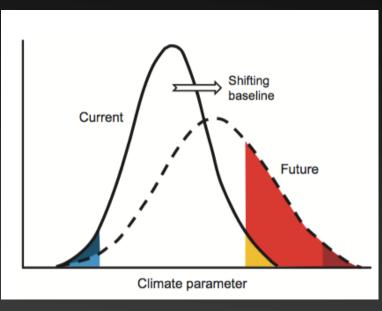


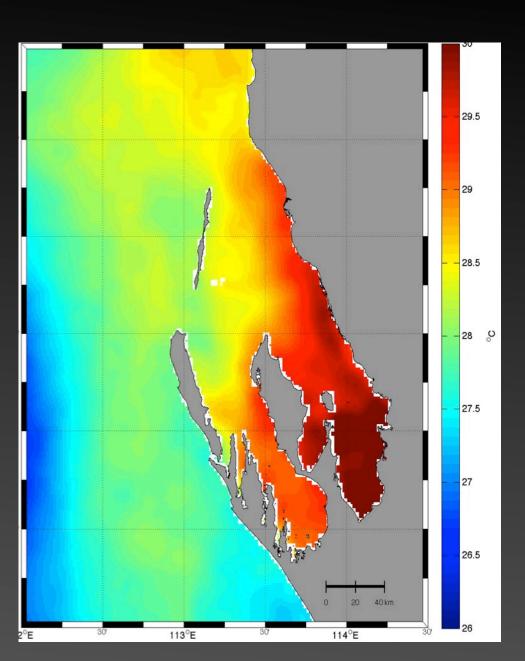
Extreme climatic events

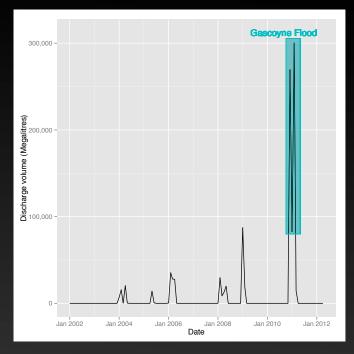




How important are the peaks in marine ecosystems?

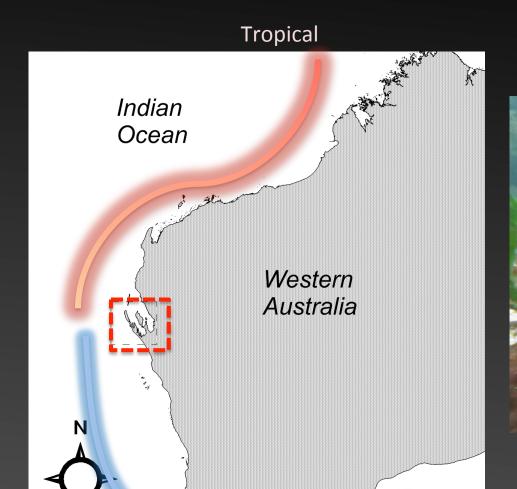
Summer 2010/11: An extreme time...







Temperate seagrass is the foundation of the Shark Bay ecosystem





Temperate

Healthy *Amphibolis antarctica* meadow



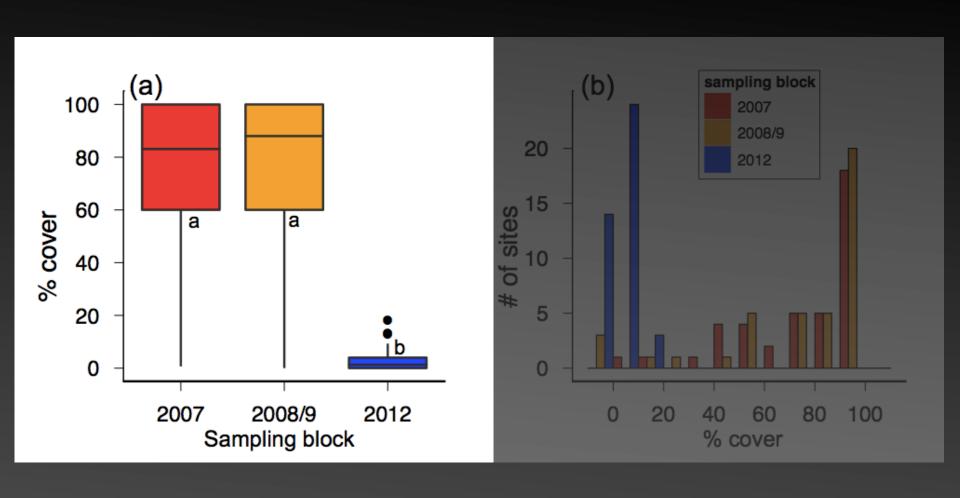


Defoliated *Amphibolis* antarctica meadow



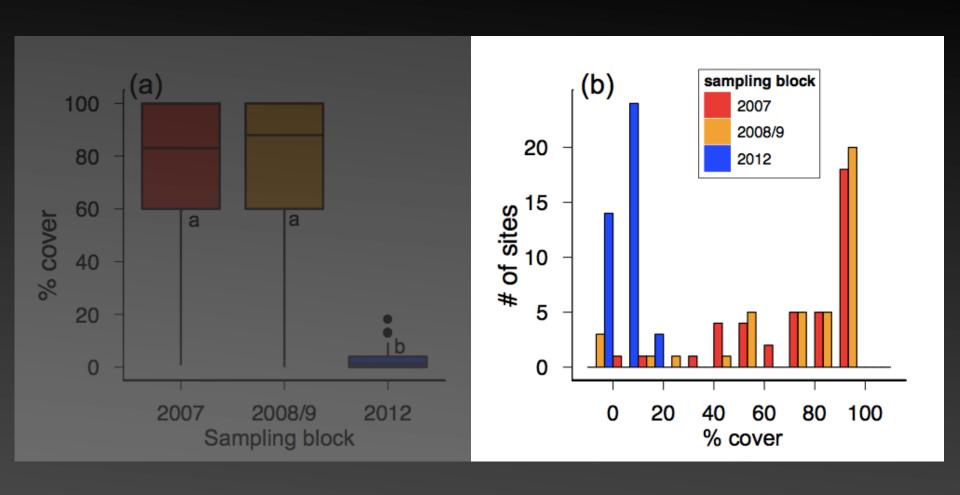


Over 90% dieback in some areas

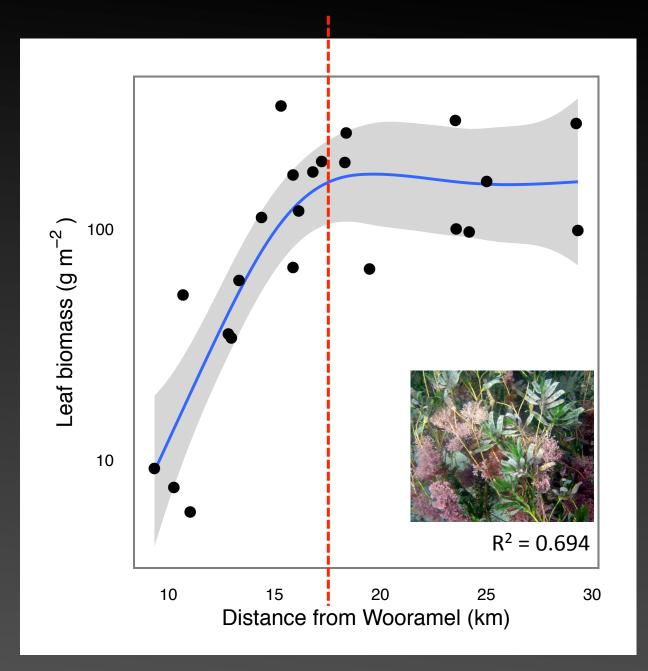


Massive reduction in wireweed cover across Shark Bay following the heatwave

Over 90% dieback in some areas

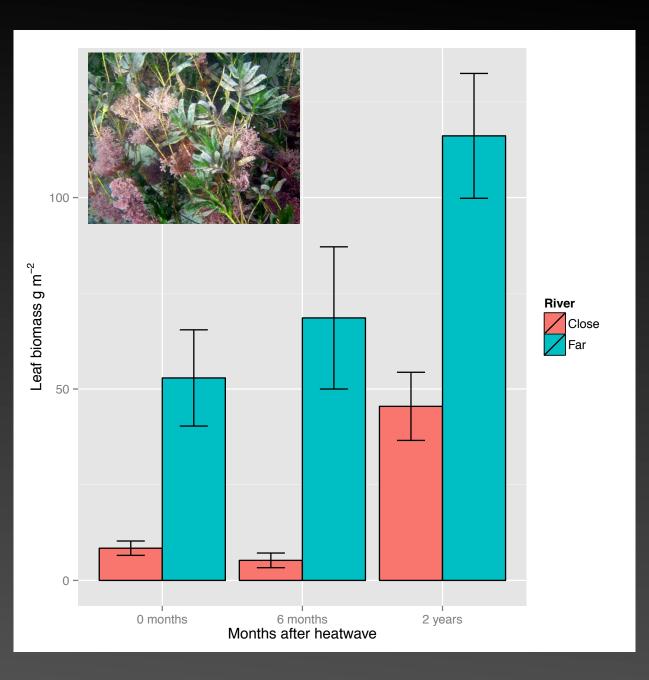


Massive reduction in wireweed cover across Few site left with pristine wireweed meadows



Defoliation was greatest near the mouth of the Wooramel River

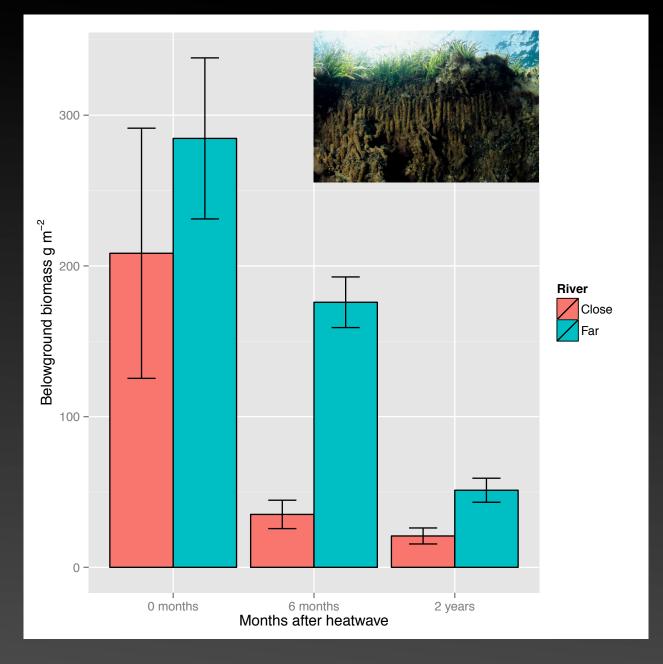
Fraser *et al.* 2014 Journal of Ecology



Leaf biomass showed some recovery 2 years post disturbance...

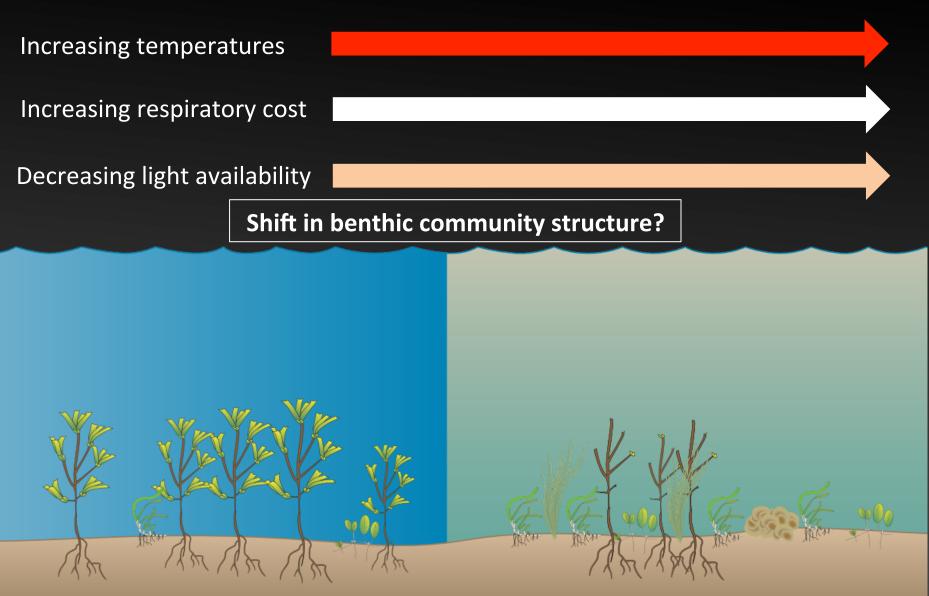
1987 average = 600 g m⁻²

... but belowground biomass decreased

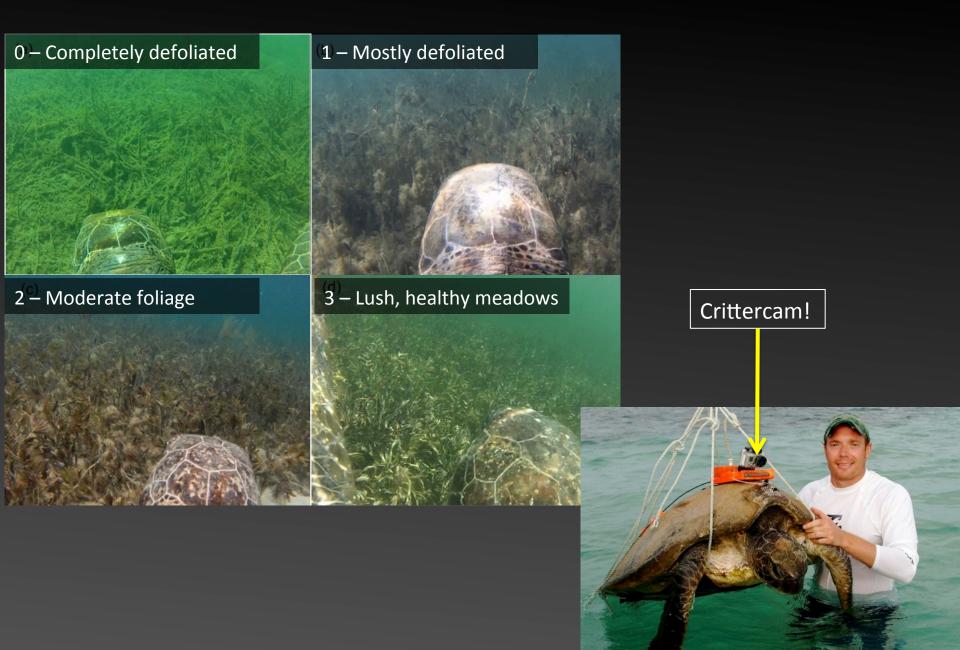


Reallocation of biomass...resilience???

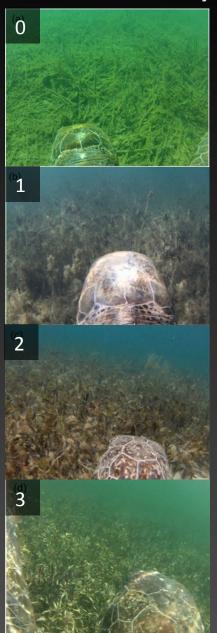
Synergistic stressors: climate and sediment inputs

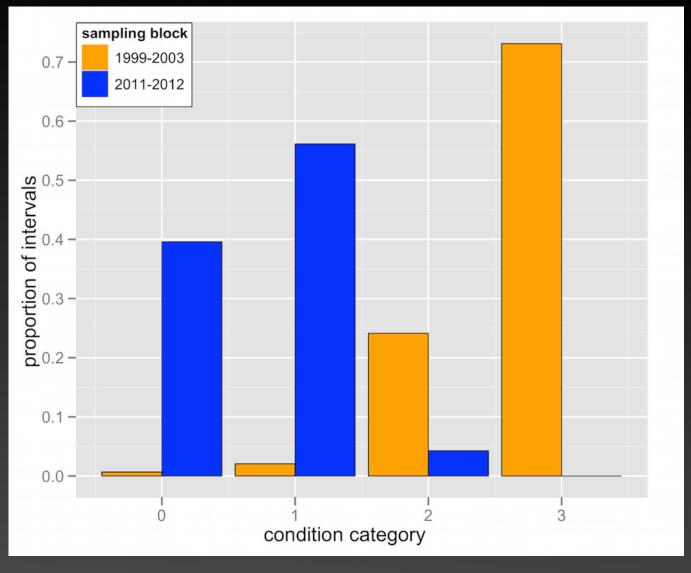


Ecosystem impacts: poor foraging habitat



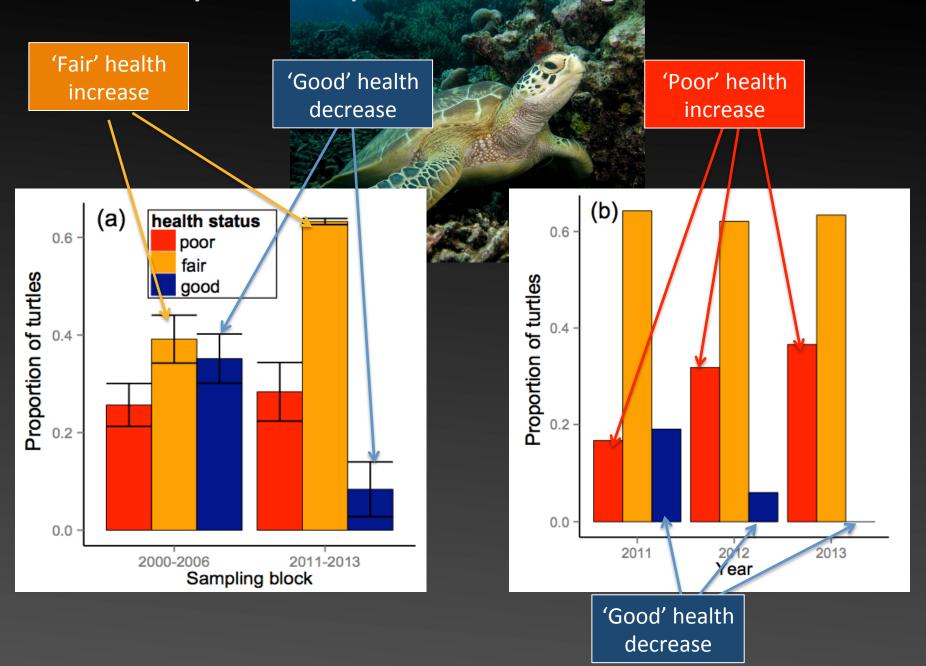
Ecosystem impacts: poor foraging habitat





Thomson *et al.* 2014 Global Change Biology

Ecosystem impacts: declining turtle health



How will Shark Bay respond to changing climates?

- Seagrass loss would affect the entire ecosystem and World Heritage Status
- Research needs to take multiple, synergistic stressors into account
- What about the impacts on biogeochemistry?
- Bottom-up impacts on habitats important for fisheries



