



Is local biodiversity declining or not ... *and how can we tell?*

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Outline ...



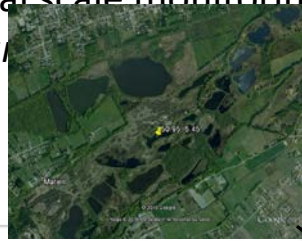
- Two recent syntheses
- A closer look
- Lessons & challenges

Global meta-analysis reveals no net change in local-scale plant biodiversity over time

Mark Vellend^{a,1}, Lander Baeten^{b,c}, Isla H. Myers-Smith^{a,d}, Sarah C. Elmendorf^e, Robin Beauséjour^a, Carissa D. Brown^a, Pieter De Frenne^b, Kris Verheyen^b, and Sonja Wipf^f

16,000 local scale monitoring plots for 5-261 years in “areas under profound human influence & more pristine areas.”

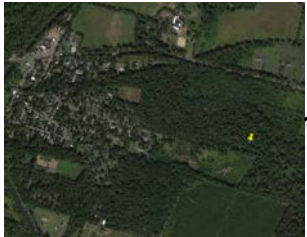
Post-disturbance succession
Mt St Helens, USA
+17 spp (18 yrs)



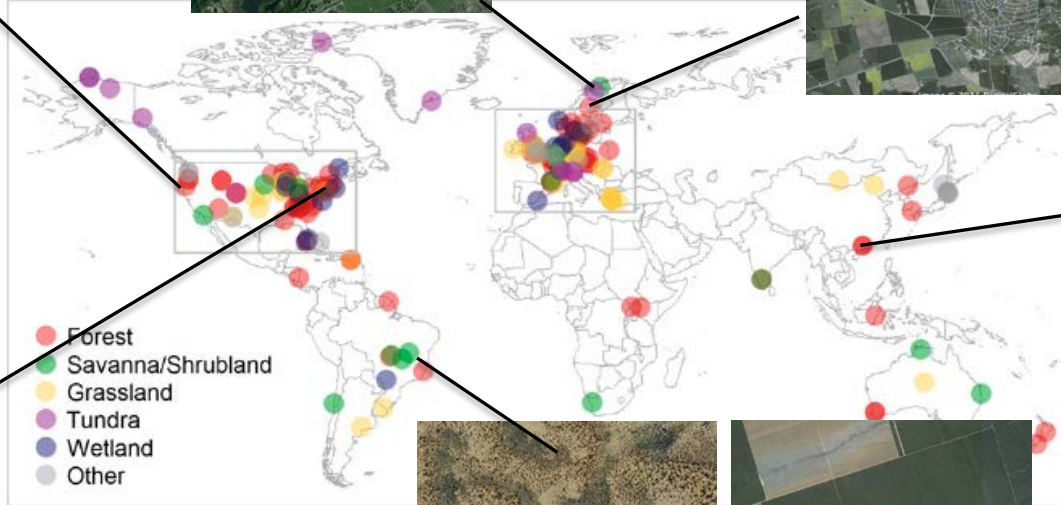
Response to grazing
Grassland, Belgium
-17 spp (25 yrs)
Recovery
+33 spp (58 yrs)



Fragmentation
Forest, Sweden
-3 spp (69 yrs)



Fragmentation
Forest, USA
-7 species (29 yrs)



Response to Climate Δ
Forest, China
-6 spp (43 yrs)

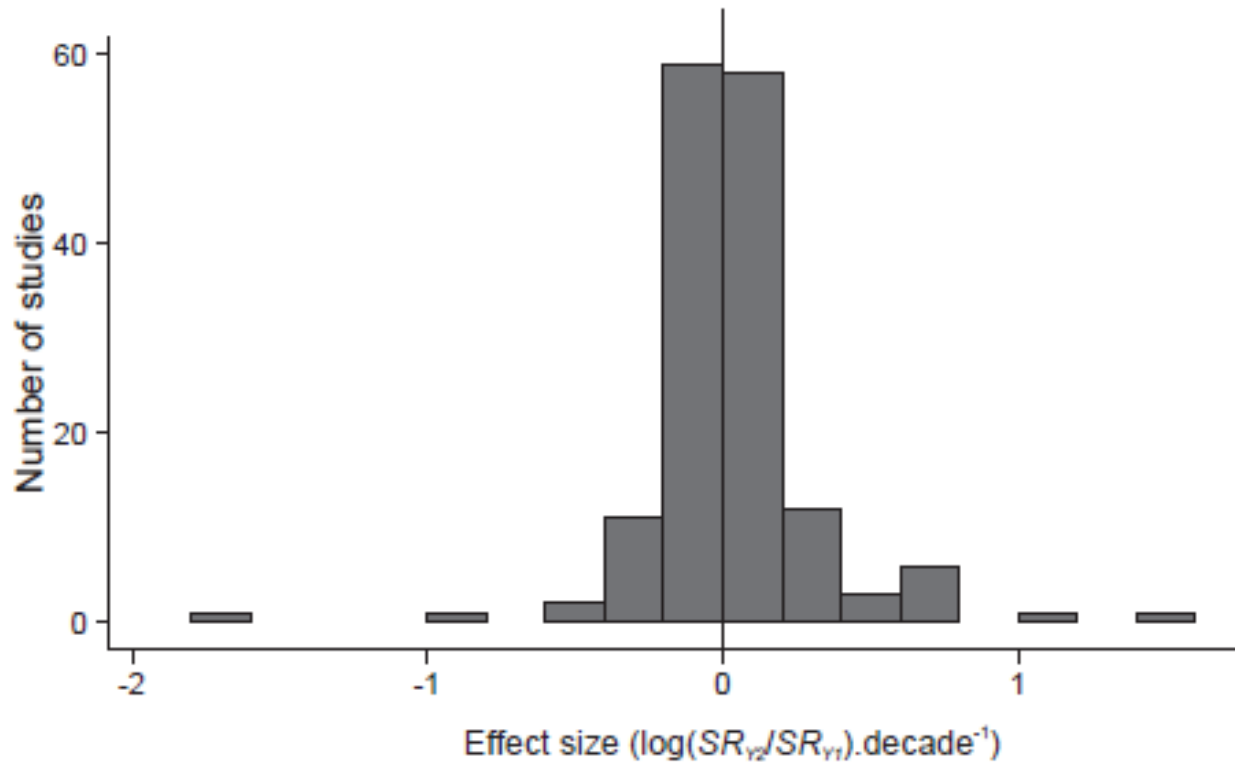


Response to ↑ fire
Shrubland, Brasil
-8 spp (53 yrs)



Recovery from fire
Shrubland, Brasil
+22 spp (53 yrs)

“mean temporal change in species diversity is not different from zero, with increases at least as likely as declines”

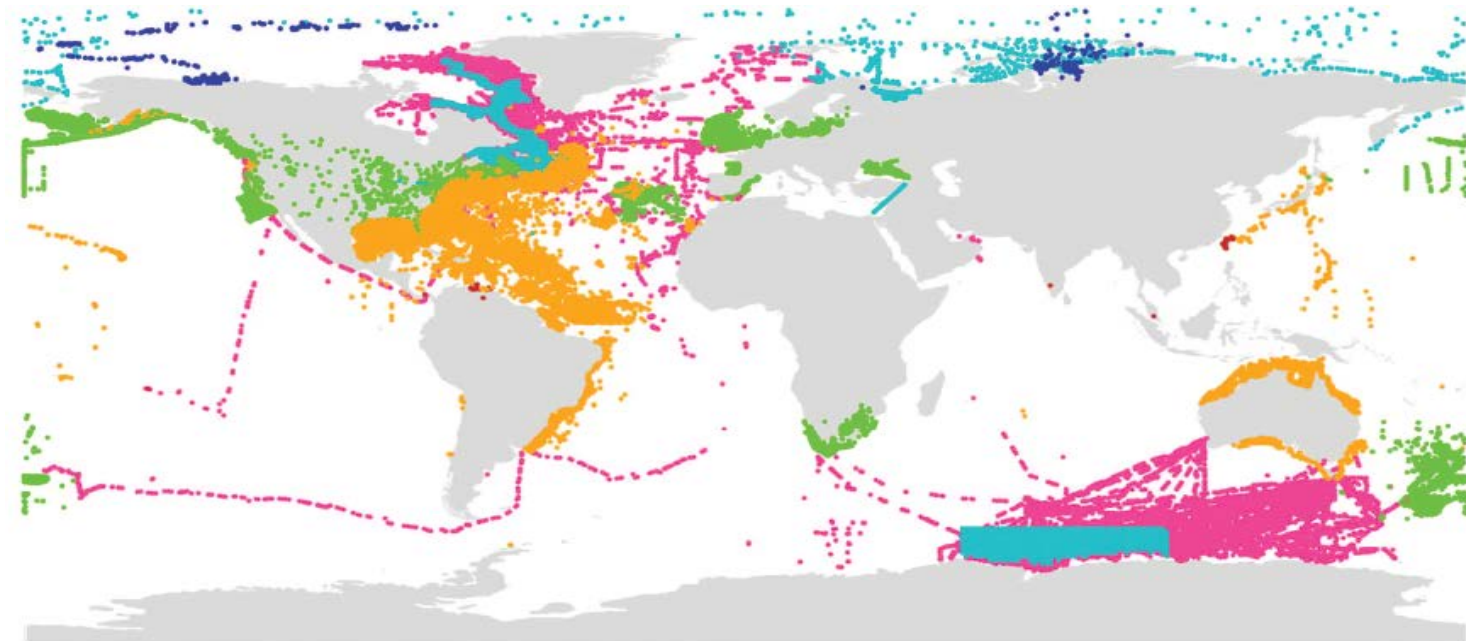


Assemblage Time Series Reveal Biodiversity Change but Not Systematic Loss

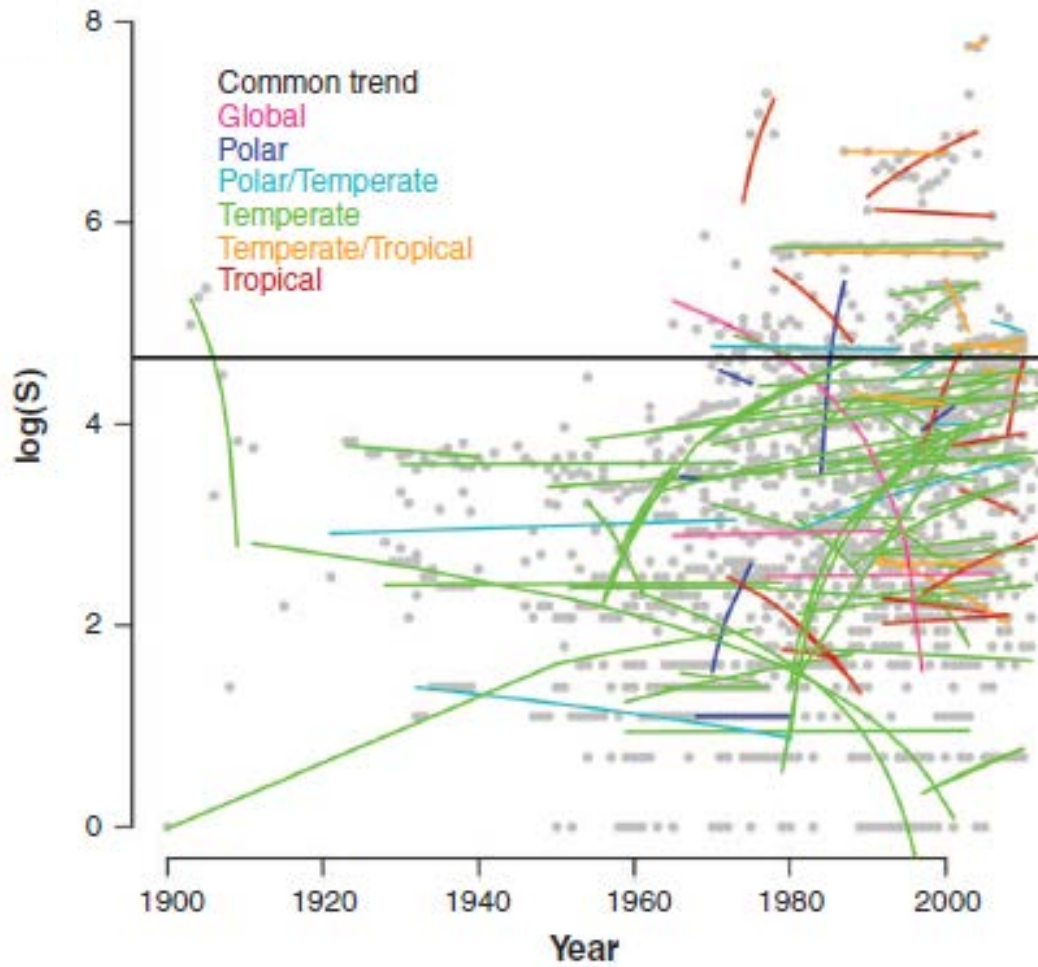
Maria Dornelas,^{1*} Nicholas J. Gotelli,² Brian McGill,³ Hideyasu Shimadzu,^{1,4} Faye Moyes,¹ Caya Sievers,¹ Anne E. Magurran¹

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100 time-series (3-141 years), 6.1 million records, 35,613 species



“Contrary to our expectations, we did not detect systematic loss of α diversity.”

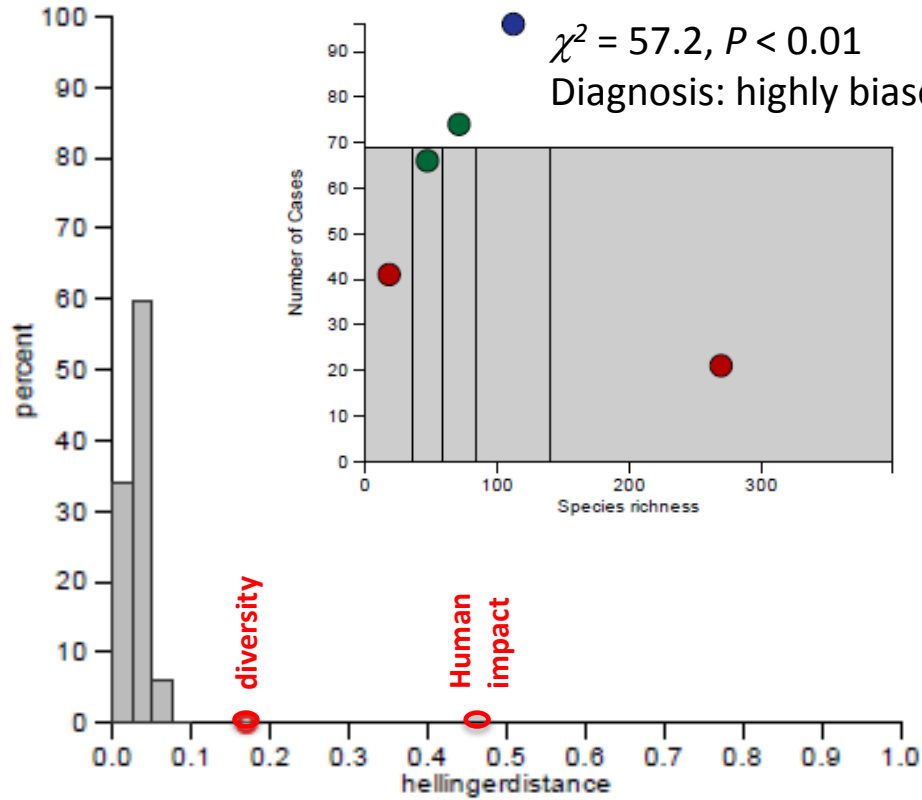


Outline ...

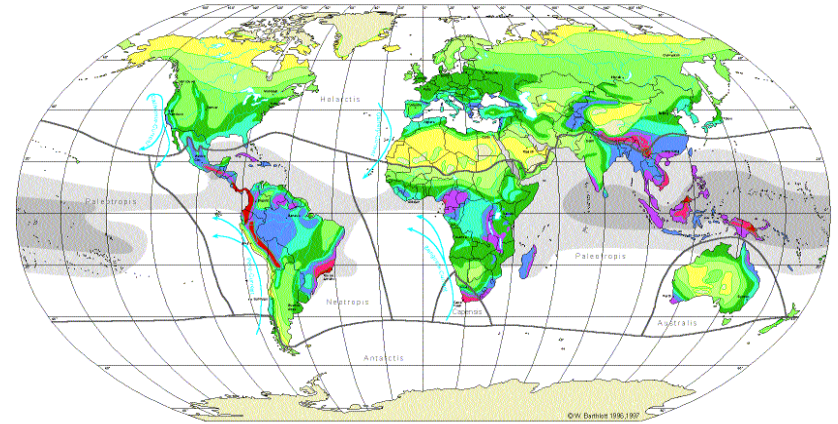


- Two recent syntheses
- **A closer look**
- Lessons & challenges

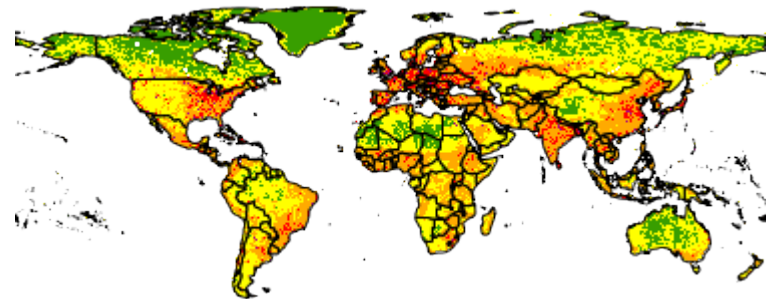
Representation ...

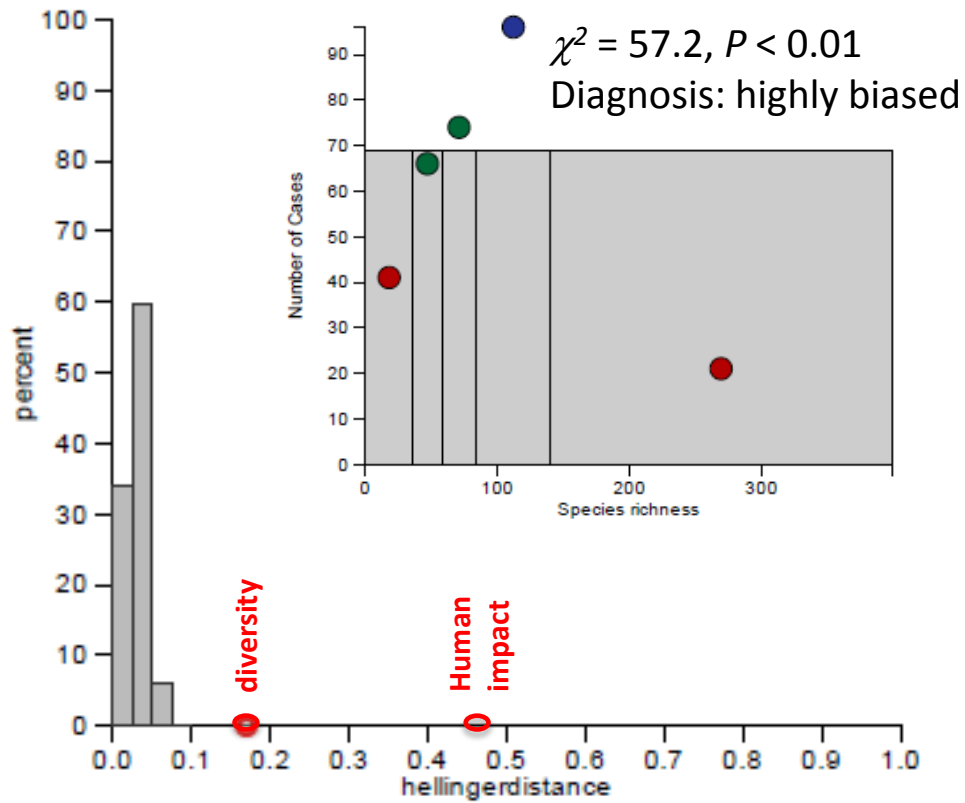


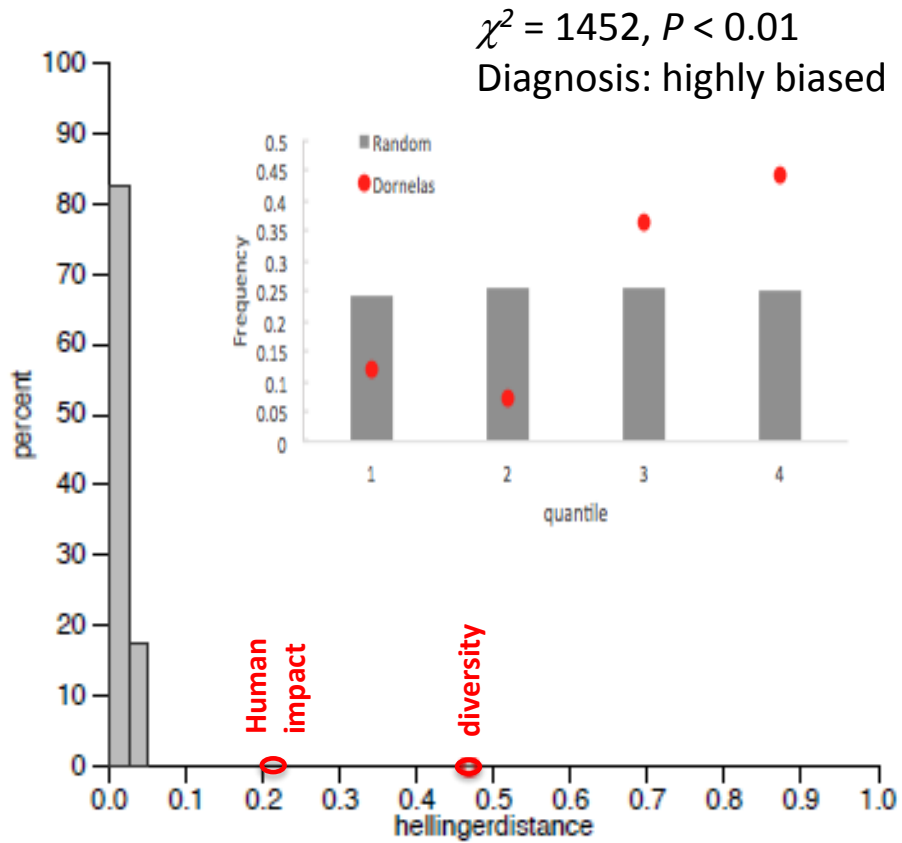
Barthlott et al. (1999) Acta Bot. Fennica



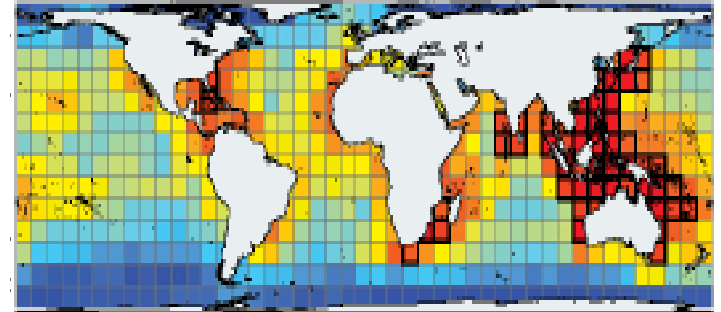
Global human influence index, NASA (SEDAC)



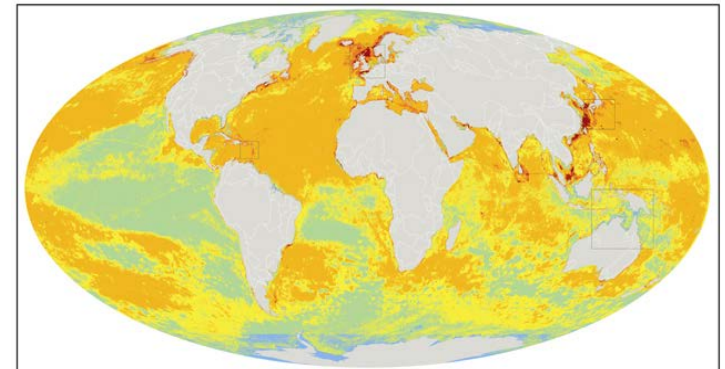


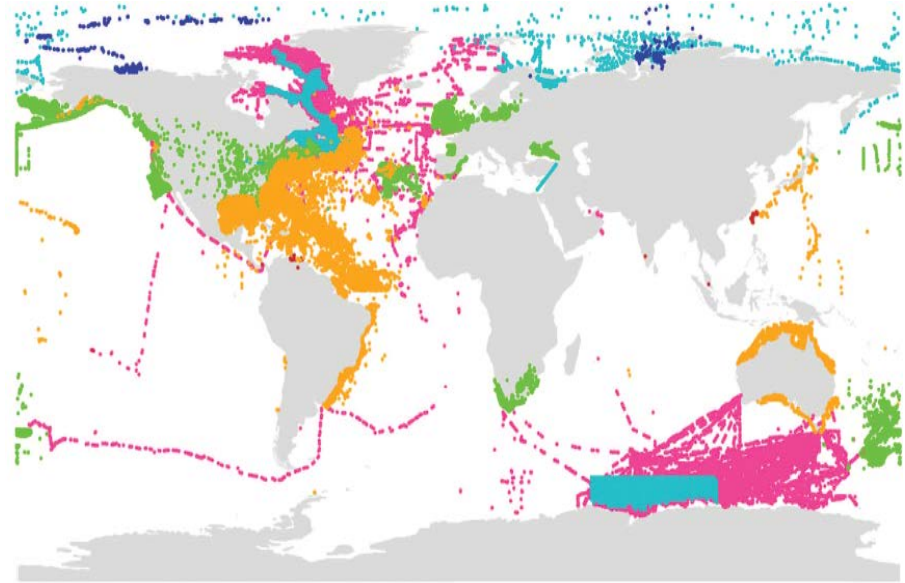
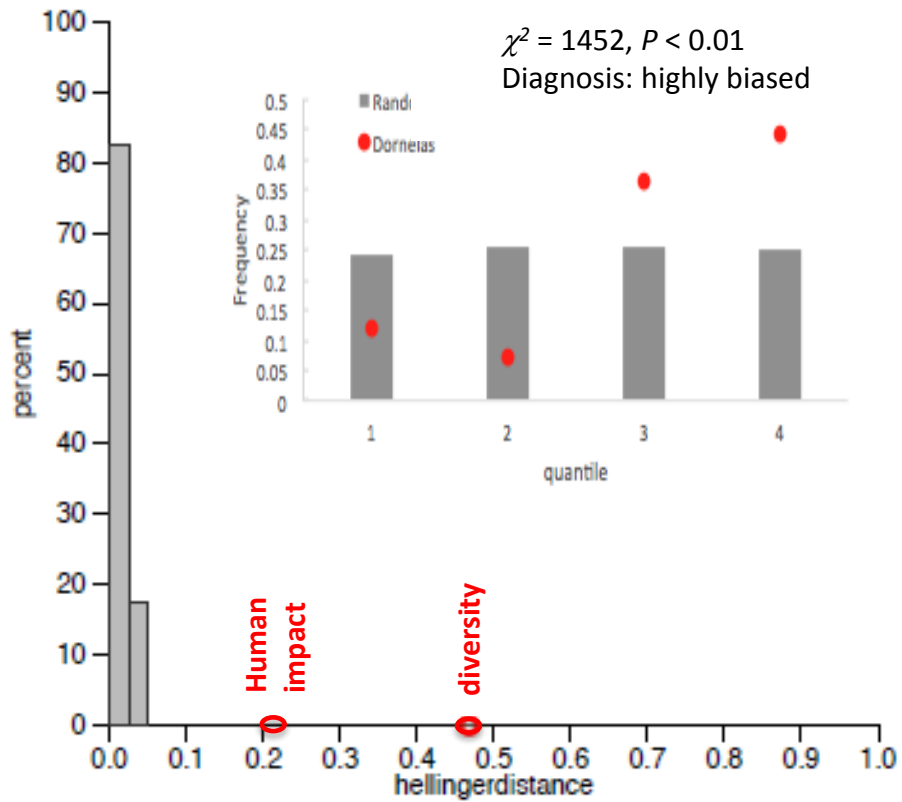


Tittensor et al., Nature (2010)



Halpern et al., Science (2008)

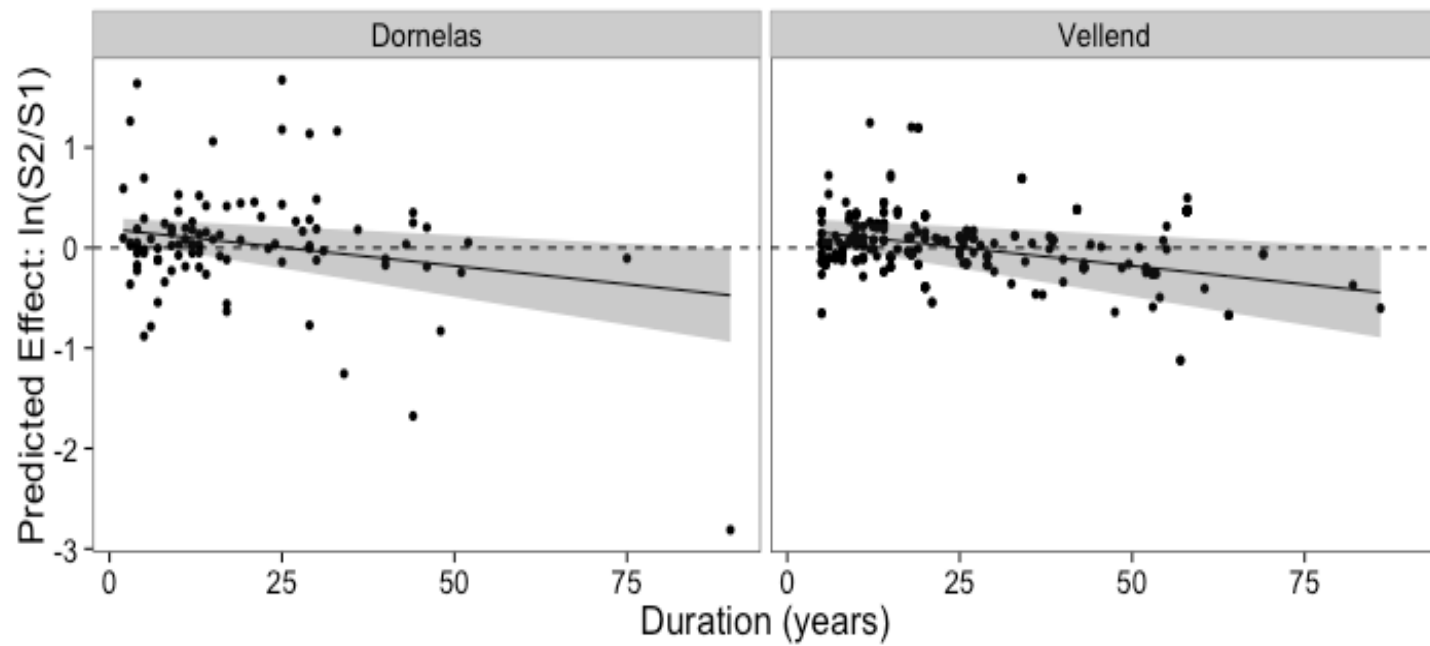




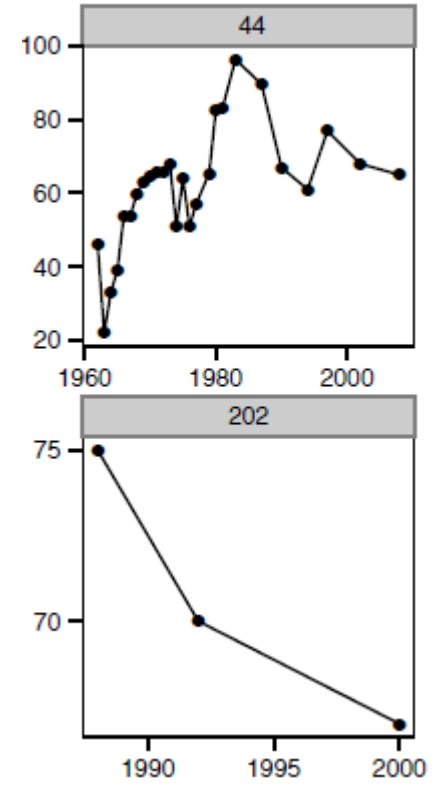
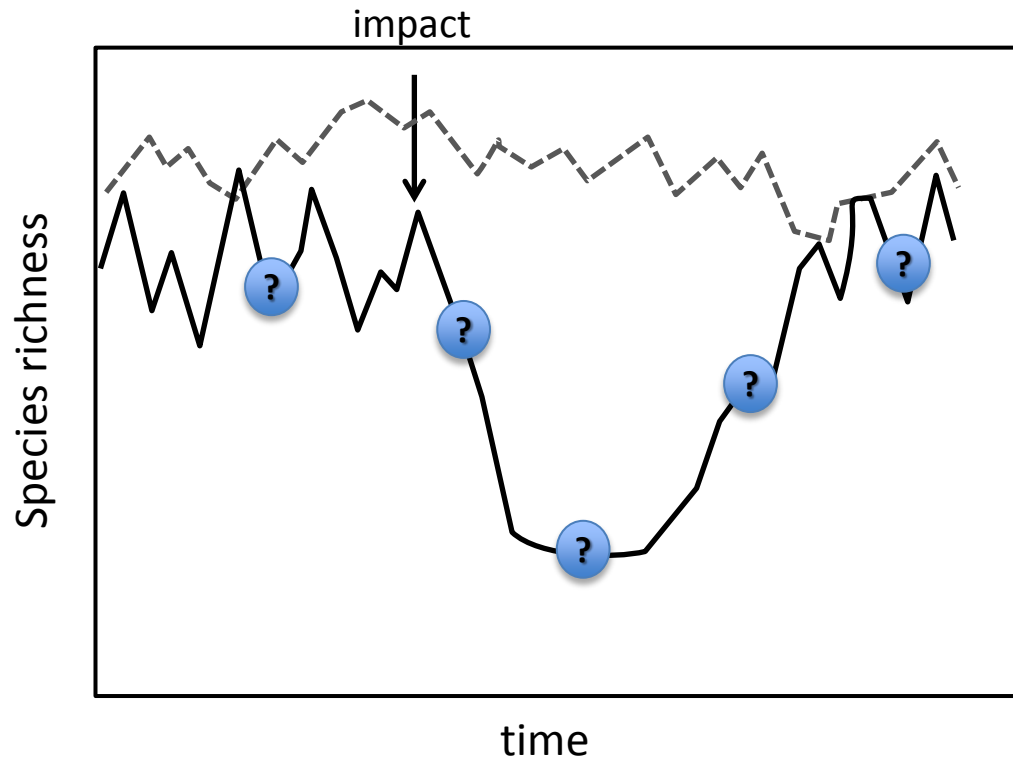
Scale ...

Dalby Söderskog National Park (Sweden)
0.36 km²
8.58 to 5.16 spp (69 yrs)





Baselines ...

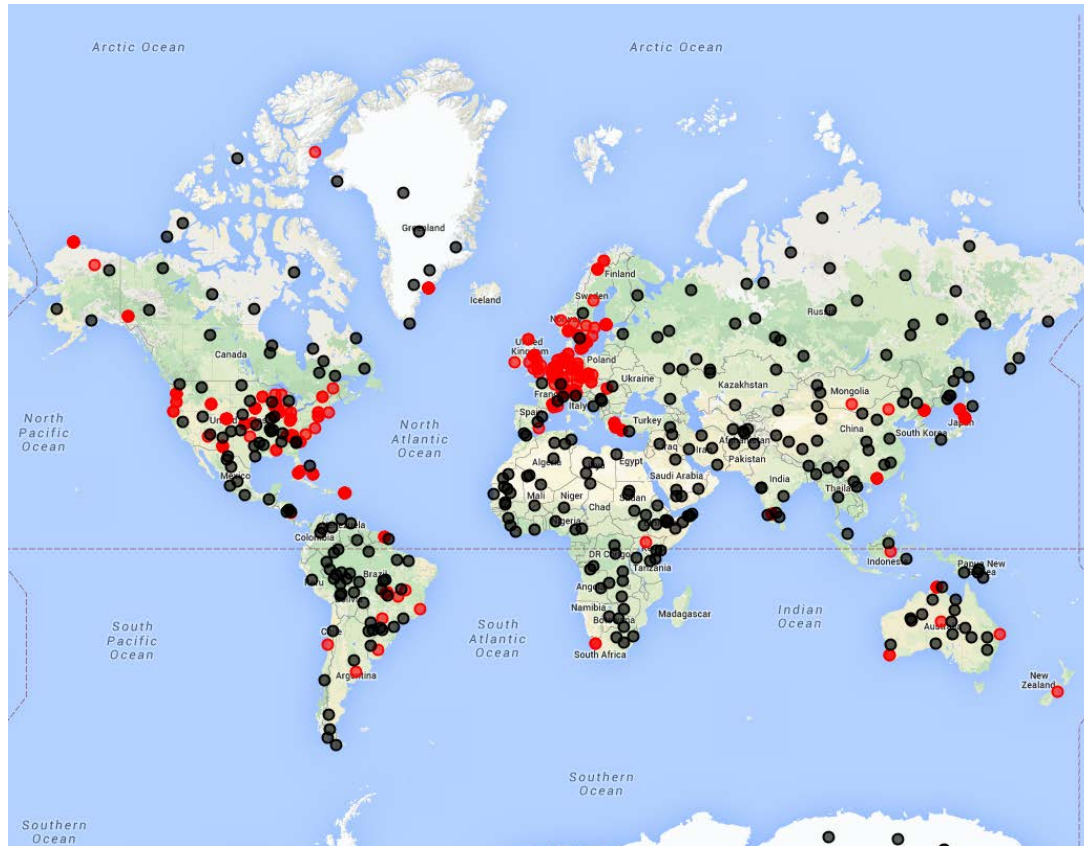


Outline ...



- Two recent syntheses
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- **Lessons & challenges**

1. Existing time-series of biodiversity change are numerous, but inadequate

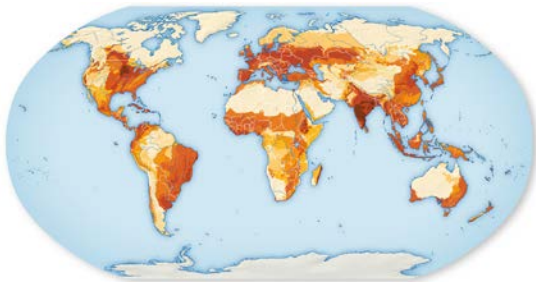


1. Existing time-series of biodiversity change are numerous, but inadequate
2. Need better stratification, scale, and baselines



miles 1
km 2

1. Existing time-series of biodiversity change are numerous, but inadequate
2. Need better stratification, scale, and baselines
3. Need to be clear about the questions and hypotheses



Species diversity



Threatened status



Human impacts



