

Biodiversity Change in the Anthropocene

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ABSTRACT

Humans have modified the planet so profoundly scientists are arguing for a new geological era classification: the Anthropocene. In this time period, humans have become a major driving force of the planet's processes including prominent change in land cover, climate and biogeochemical cycles, and an unfolding mass extinction. However, the extent to which biodiversity change in local assemblages contributes to global biodiversity loss is poorly understood. We analyzed 100 time series from biomes across Earth to ask how diversity within assemblages is changing through time. We quantified patterns of temporal diversity, measured as change in local diversity, and temporal β diversity, measured as change in community composition. Contrary to our expectations, we did not detect systematic loss of alpha diversity. However, community composition changed systematically through time, in excess of predictions from null models. Heterogeneous rates of environmental change, species range shifts associated with climate change and biotic homogenization may explain the different patterns of temporal alpha and beta diversity. Monitoring and understanding change in species composition should be a priority for the conservation and management of biodiversity.



BIOGRAPHY

Maria Dornelas is macroecologist, and uses a combination of field work, synthesis of public data and modeling to try to explain changing patterns of biodiversity. Maria Dornelas is currently Professor (Lecturer) at the University of St Andrews. Made her Post-Doctoral at the University of Aveiro, the University of St Andrews (Scotland) and the Centre of Excellence for Coral Reef Studies (Australia). Has PhD in Marine Biology from James Cook University, and graduated also in Marine Biology from the University Lisbon.

RELEVANT PUBLICATIONS

Dornelas M., Gotelli N.J., McGill B., Shimadzu H., Moyes F., Sievers C. & Magurran A.E. (2014). Assemblage Time Series Reveal Biodiversity Change but Not Systematic Loss. *Science*, 344, 296-299.

Dornelas M., Magurran A.E., Buckland S.T., Chao A., Chazdon R.L., Colwell R.K., Curtis T., Gaston K.J., Gotelli N.J., Kosnik M.A., McGill B., McCune J.L., Morlon H., Mumby P.J., Ovreas L., Stoeny A. & Vellend M. (2013). Quantifying temporal change in biodiversity: challenges and opportunities. *Proceedings of the Royal Society B-Biological Sciences*, 280, 1-10.

Dornelas M. (2010). Disturbance and change in biodiversity. *Philosophical Transactions of the Royal Society B-Biological Sciences*, 365, 3719-3727.

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