Human impacts on rates of phenotypic change in wild animal populations. ¹Department of Biology, McGill University, Canada; ²Department of Biological Sciences, University of Maine, USA.

Human activities can expose populations to dramatic environmental perturbations, which may then cause phenotypic changes owing to genetic or plastic responses. But are human-induced phenotypic changes qualitatively greater than changes caused by natural environmental variation acting on similar time scales? We address this question by analyzing a database of more than 3000 rates of phenotypic change in 63 “systems” (a particular species in a particular geographical area). We find that humans unequivocally increase rates of phenotypic change above natural background levels. Phenotypic plasticity is an important part of this response because the difference between human-induced and natural phenotypic changes was greater when estimated using individuals collected from the wild than when using common-garden or quantitative-genetic methods. We also find that phenotypic changes in wild animal populations are remarkably abrupt, again supporting an important role for plasticity. Humans are indeed an extreme agent of contemporary phenotypic change, particularly in regard to their influence on phenotypic plasticity. Here is another general way in which humans impact biological diversity.