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symposium summary

Climate change biogeography

A contributed session at the 5th International Biogeography Society Conference – Heraklion, Greece, 7–11 January 2011

Anthropogenic climate change and its realized and potential impacts on biodiversity represent the kind of large-scale complex phenomena for which the integrative broad-scale view of biogeography is especially useful. This was well exemplified at the 5th IBS conference's contributed papers session on "climate change biogeography". Earth's climate has exhibited marked changes and fluctuations in the past, and several studies (B. Sandel et al., Aarhus University; G. Rodriguez-Castañeda et al., Umeå University) provided deep-time perspectives on climate-change impacts on biodiversity, showing that the location and extent of long-term climatically stable areas have left strong imprints in current large-scale species diversity patterns. An important implication of these studies is that much species diversity may depend on climatic stability. Linked to this several studies addressed the complexity of ecological responses to current and expected climate change, showing that tree-lines may recede despite a warming climate, due to the interacting effects of fire and dispersal limitation (C.D. Brown and J.F. Johnstone, University of Saskatchewan), and that different ecological groups of closely related species may exhibit deviating responses to climate change, e.g. due to differential dispersal abilities and contingent differential lags in their responses

to climate change (C. Hof et al., University of Copenhagen). Finally, several studies highlighted the potentially critical losses due to 21st century climate change of not just species diversity, but also of unique evolutionary lineages within species (E. Vázquez-Domínguez et al., Universidad Autónoma de México). Even more worrying is the risk of wholesale loss of biodiversity from Amazonia, one of Earth's most biodiverse regions (K.J. Feeley et al., Florida International University). Together the studies presented not only illustrate how progress in our understanding of climate-change impacts on biodiversity is being provided by biogeographical research, but also illustrate how the field is rapidly advancing by creative development and application of sophisticated modeling approaches that integrate ecology, physical geography, and genetics.

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