Observations and Biological Futures

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Observations and Biological Futures

Natural scientists by now need no reminding of the already documented effects of global warming on natural habitats and the species they support. Most biologists are also aware of the complications that land-use change will impose on attempts to understand this growing threat and protect the planet's biota. Many will not, however, have seen a fine-grained modeling study of the effects on biodiversity of land-use change and climate change considered together. The article that begins on page 231, by Lee Hannah and colleagues, is a notable example of this sort of work, which, regrettably, will be needed more often as our species' effects on the globe become more widespread.

Building on the pathbreaking Protea Atlas Project, and on the insights from a multispecies modeling effort conducted for 300 plant species in the Cape Floristic Region of South Africa, the article demonstrates a variety of sobering consequences that can be expected in coming decades. In a region where no less than 20 percent of the land is protected to some degree, the mean protected range of proteas is expected to decrease by 36 to 60 percent by 2050 as a result of climate change. Land-use change alone can be expected to increase the number of threatened proteas in 2020 by between 4 and 13, and when likely climate change is considered too, that number almost triples. The precise number depends on parameters that cannot be known exactly (although they can be estimated, and the sensitivity of the predictions to such parameters assessed).

Although the Cape Floristic Region is a remarkable part of the world, lessons arising from studies such as the Cape modeling project should be applicable in many areas. Making good use of such results depends, of course, on information about local climate and how it is changing over time. All the more distressing, then, that despite the oft-heard mantra that more observations of climate change are needed before committing to policies to combat it, the US Congress eliminated last December the $3 million 2005 budget for the National Oceanic and Atmospheric Administration's (NOAA) Climate Reference Network. This nationwide system of dozens of climate observation stations was intended to yield an authoritative, detailed, long-term US climate record—which will certainly be needed to counter the effects of warming. The network is now partly functional, but as a result of the congressional cut, much work aimed at expanding it has been put on hold or cancelled. It would seem that the people's representatives have little use for climate observations after all. Several NOAA atmospheric observatories are also threatened, and senior scientists fear that, incredibly, budget cuts might mean discontinuing the measurements of atmospheric carbon dioxide started in 1958 by Charles D. Keeling atop Mauna Loa in Hawaii. Those measurements have long been exhibit A in the case for taking global warming seriously.

This shortsightedness, at a time when the administration is pushing to implement a Global Earth Observing System of Systems aimed at improving coordination between networks, is alarming, to put it mildly. As Hannah and his colleagues argue in reference to global warming generally, biologists need to be engaged.

TIMOTHY M. BEARDSLEY
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