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# CONTRIBUTIONS

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## Losing the Culture of Ecology

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The recent editorial in *Science* entitled “Celebrating the culture of science” (Durant and Ibrahim 2011) prompted reflection on the culture of our field, ecology. Ecology grew from deep roots in natural history, taxonomy, and empirical science based on how nature works and the relationships of organisms with each other and to their environment (Elton 1927, Likens 1992). Currently, many exciting new tools and approaches, such as genomics, stable isotopes, meta-analyses, drive ecological research. However, other cultural changes, both inside the field and in science per se, may impact ecology negatively in the future. These cultural changes include:

1) Long-term declines in fundamental fields like taxonomy and natural history (e.g., Noss 1996, Uniya 2011) and increasing emphasis on meta-analysis, data-mining, and modeling. Even though these latter approaches can be quite powerful, they tend to be cheaper and quicker to complete, and generate publications more rapidly than traditional field-based, empirical ecology. This situation makes it difficult for early-career field ecologists to compete, particularly when funding success is based primarily on metrics like publication numbers.

2) Increasing difficulty in publishing empirical and place-based studies compared with modeling, meta-analysis, and data mining in some areas of ecological research. For example, our recent review of Adaptive Management (Lindenmayer and Likens 2010, Westgate et al., *in review*) revealed that quantitative studies were significantly less common and less cited than qualitative thought and opinion pieces ( $\beta = -0.68 \pm 0.09$ ,  $P < 0.001$ ).

3) Increasing emphasis on articles with significant word and citation limits, which often conspires against field-based studies.

These trends have major implications for ecology, such as impeding progress in ecological modeling and theory testing. Meta-analyses and systematic reviews, which underpin evidence-based environmental policy and management (Collaboration for Environmental Evidence 2011), eventually will not be possible without the data from field-based studies (e.g., Whittaker 2010).

To balance these cultural changes and to advance ecology, we believe it is important to maintain outlets for empirical and often descriptive field-based ecology, develop new metrics which reward empirical ecologists for the use of their data by others (e.g., Likens and Lindenmayer 2011, Reichman et al. 2011), and re-craft funding schemes to emphasize collaborative partnerships among empirical, field-based ecologists, theoreticians, and modelers.

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