

# Invitation to Earth Stewardship

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Earth is now in a state without precedent, defined by human dominance of fundamental processes, including the water, carbon, and nitrogen cycles; species extinctions; sedimentation; and ocean acidification. The world is also increasingly interdependent: people and places are linked by carbon and nitrogen as well as by globalization and the internet. We are in territory unknown to past generations, and can no longer assume that future events can be understood by reference to those of the past. This realization has profound and urgent consequences for the ways that people study, design, manage, represent, interpret, and govern human and natural systems.

The 20th century witnessed a proliferation of scientific subdisciplines and also of philosophies about society and the environment. With few exceptions, these rely on the division of landscapes into discrete units with specific purposes, such as to produce food or minerals; to provide water, timber, forage or wildlife habitat; and to support human settlements. For each of these purposes, one or more disciplines propelled greater efficiencies in resource exploitation and production as associated knowledge and technology developed.

In 1997, recognizing the connection between environmental health, national security, and social justice, ecologist Jane Lubchenco called for a “new social contract for science” to address the challenges of a human-dominated planet. Yet, over 15 years later, theories and research in conservation and ecology continue to focus on managing particular types of land for one or a few products or services. Such approaches may yield short-term efficiencies but often reduce longer term resilience and increase the risks of catastrophic failure. Even the venerable concept of stewardship, which emphasized the profound interconnectedness of people and their environments, has generally been applied under the assumption of dividing landscapes for separate purposes.

Changing the role of science in society is necessary but not sufficient to meet the challenges before us – the practices of science must also change. We offer the following seven recommendations to researchers as starting points for discussion: (1) Expand the concept of stewardship to encompass all lands and waters: urban as well as rural; the open oceans as well as lakes, rivers, and coasts; and areas actively managed as well as those set aside from direct human exploitation. (2) Work alongside various stakeholders – policy makers, professionals, employers and employees, educators, artists, clergy and laypeople, young and old – to envision and realize a future that is more secure, sustainable, and just. (3) Include people not only as variables affecting ecosystems but also as participants in those ecosystems and in the practice of science itself. (4) Acknowledge that social justice and environmental health are not separate or separable concerns, but are interconnected. (5) Understand processes and practices at multiple scales, interacting in complex and often non-linear ways. (6) Value a diversity of “ways of knowing”, including local and indigenous knowledge, about landscapes and natural resources. (7) Embrace stewardship as an ethical guide to the practice of science.

Researchers must recognize that the interdependence of the systems they study necessitates the use of analytical techniques from, and collaboration with, multiple disciplines. We invite scholars to build partnerships with communities and professionals, reaching out beyond “the academy” to those who inhabit, design, use, and manage ecosystems, because those peoples’ knowledge, skills, values, and ambitions are needed to solve problems in humane, just, and intelligent ways. A cultural shift in academia is needed to support and reward the work that Earth Stewardship requires, including research, teaching, and public engagement that is unconventional, non-traditional, or viewed as “high risk” by status quo standards of scholarly knowledge production. Finally, we urge policy makers to make decisions informed by the best available research, unconstrained by narrow or short-term interests.

In our opinion, scientists must acknowledge and embrace the social and ethical dimensions of scientific practice. We cannot simply generate information and assume that someone, somewhere, will apply it to mitigate or solve “real” problems. Our questions, methodologies, and outreach must be sensitive to the diverse and interconnected communities whose members are interested in and affected by what we study.