LETTERS

Australia's long-term ecological research projects are at risk.

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Edited by **Jennifer Sills**

Save Australia's ecological research

Australia will lose its integrated long-term ecological research (LTER) network at the end of 2017 (*1*). The network comprises more than 1100 long-term field plots within temperate forests, rainforests, alpine grasslands, heathlands, deserts, and savannas, with an unparalleled temporal depth in biodiversity data. Its many achievements include Australia's first published trend data for key ecosystems (*2*) and a suite of IUCN ecosystem risk assessments (*3*).

Long-term ecological data are critical for quantifying environmental and biodiversity change and identifying its causes. LTER is especially important in Australia because many of the country's ecosystems are subject to frequent climatic extremes. Continuity of long-term research and monitoring, and broader use of existing time series data by science and policy communities, are crucial for measuring impacts of current unprecedented global environmental change and reliably predicting future impacts.

Long-term research and monitoring is also essential to understanding relationships between the economy, ecosystems, and risks to human well-being (*4*). The loss of Australia's LTER network will substantially diminish resource managers' ability to judge the effectiveness of management interventions on which billions of dollars are spent annually (such as vegetation restoration and invasive species control). Ending the network will also jeopardize sustainability assessments of resource-based industries such as agriculture and forestry. Moreover, Australia's capacity to participate effectively in global initiatives such as the International LTER will be impaired. The LTER network is part of the Terrestrial Ecosystem Research Network (TERN), funded by Australia's government (*5*). TERN's inclusion of existing LTER capability provided a template that others in Europe, China, and South Africa have followed. Discontinuing the LTER network within TERN will therefore undermine global cohesion in environmental research and monitoring.

At a time when the United States is increasing funding for its LTERs by US$5.6M annually (*6*), and other nations are rapidly building substantial LTER capacity, terminating Australia's LTER network is totally out of step with international trends and national imperatives. To prevent the collapse of the LTER network and prevent the resulting irreversible impacts of breaking current time-series, urgent and direct investment by the Australian government is crucial.

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SUPPLEMENTARY MATERIALS

www.sciencemag.org/content/357/6351/557/suppl/DC1
Full author list

10.1126/science.aao4228

Academics can help shape Wikipedia

Public understanding of science is increasingly important. Wikipedia is widely used by students, educators, researchers, doctors, journalists, and policy-makers. The online, crowd-sourced encyclopedia site is perceived as increasingly trustworthy, making it a key public engagement platform with immediate impacts on scientific literacy (*1*).

Now is an important time in the evolution of the encyclopedia. Its parent organization, the Wikimedia Foundation, is working to shape its strategic focus through to 2030. This represents an unprecedented opportunity for the global scientific community to advise on its future. Wikipedia has discussion pages for users to provide feedback on some of the upcoming challenges (*2*).

The scientific community can improve Wikipedia on a more granular level by learning to edit the encyclopedia in areas that need improvement. Poorly written articles can mislead readers and give a false impression of a research field. The recent introduction of a new editing interface has made the encyclopedia as easy to edit as a Word document, and a short 2014 article outlines some editing advice for scientists (*3*).

Wikipedia is increasingly engaging expert communities to improve accuracy and coverage. Interested parties can contribute to several existing collaborative initiatives or propose new ones. For example, some academic journals (such as *PLOS Computational Biology*, *Gene*, and *WikiJournal of Medicine*) have agreed to dual-publish articles as both a citable publication and Wikipedia page (*4*). The Cochrane library, a collection of health care databases, has a similar quality-improvement

partnership to help integrate optimal scientific references into the encyclopedia (*5*).

Finally, the new Wikidata system stores machine-readable, structured data, complementary to the prose format of the encyclopedia. Integrating Wikidata with scientific databases provides new opportunities to discover, curate, and use scientific knowledge within and across domains (*6*).

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Fishing responsibly and sustainably

In their Policy Forum "Committing to socially responsible seafood" (2 June, p. 912), J. N. Kittinger *et al.* do an admirable job of highlighting the need for marine scientists to catch up with other stakeholders in the growing discipline of socially responsible food. However, efforts to provide and research socially responsible seafood should not replace the work to ensure that seafood is sustainably managed.

Unfortunately, fishing operations can use their efforts to combat the socioeconomic problems associated with industrialized fishing as an excuse to let slip their commitments to sustainable fishing. As Kittinger *et al.* rightly point out, bad actors engaging in social malpractice depress the cost of seafood and simultaneously allow for overexploitation over the long term. However, efforts to solve social issues—such as increased wages, improved living conditions, and access to better food and health care—should not be used as incentives to catch and sell more fish in the short term in order to offset the true cost of labor. In a recent study of the impacts of each marine

Socially responsible fishing practices could lead to overfishing to recoup labor costs.

sustainable development target on the others, researchers concluded that ending overfishing is the most common prerequisite for the success of other targets on the United Nations' sustainable development plan (*1*). Overfishing cannot be used to pay for fundamental human rights.

At the UN Oceans Conference, several companies, along with environmental organizations and some national governments, endorsed the Tuna 2020 Traceability Declaration (*2*). The Declaration commits not only to catching or sourcing socially responsible tuna but also to combatting illegal fishing, implementing sustainable fishing practices, recovering overfished stocks, and moving fisheries management toward the development and use of previously agreed-upon harvest control rules when making management decisions. Through the language of the Declaration, the endorsers demonstrated their joint commitment to social and environmental responsibility. This can be a model for other seafood products around the world.

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TECHNICAL COMMENT ABSTRACTS

Comment on "Permanent human occupation of the central Tibetan Plateau in the early Holocene"

Dongju Zhang, Naimeng Zhang, Jian Wang, Bibu Ha, Guanghui Dong, Fahu Chen

Meyer *et al*. (Reports, 6 January 2017, p. 64) claim that permanent human occupation of the central Tibetan Plateau started in the early Holocene without the support of an agropastoral economy. By careful examination, we find that neither the archaeological evidence nor the travel cost modeling provided by Meyer *et al.* could support the permanent human occupation assertion.

Full text: dx.doi.org/10.1126/science.aam8273

Response to Comment on "Permanent human occupation of the central Tibetan Plateau in the early Holocene"

W. R. Haas, M. S. Aldenderfer, M. C. Meyer

Zhang *et al.* contest that Chusang was part of an annual mobility round that "more likely" included seasonal use of high-elevation environments than permanent use. We show that their probabilistic statement hinges on indefensible claims about hunter-gatherer mobility. In the context of quantitative data from hunter-gatherer ethnography, our travel model shows that seasonal-use models are highly unlikely to explain Chusang.

Full text: dx.doi.org/10.1126/science.aam9444

Comment on "Permanent human occupation of the central Tibetan Plateau in the early Holocene"

David D. Zhang and Sheng-Hua Li

Meyer *et al.* (Reports, 6 January 2017, p. 64) suggest a new chronology for permanent human occupation of Tibet based on their dating of the travertine and colluvium deposits that contain or are deposited near fossil human handprints and footprints. However, misinterpretations in both stratigraphic reconstruction and dating data may have caused the newly proposed age of these human imprints to have been seriously underestimated.

Full text: dx.doi.org/10.1126/science.aam9231

Response to Comment on "Permanent human occupation of the central Tibetan Plateau in the early Holocene"

M. C. Meyer, D. L. Hoffmann, M. S. Aldenderfer, W. R. Haas, J. A. Dahl, Z. Wang, D. Degering, F. Schlütz

We show that Zhang and Li's sedimentological model for the Chusang travertine neglects the three-dimensional information from multiple outcrops and that their optically stimulated luminescence (OSL) age of about 20,000 years for the human imprints is untenable. We highlight the robustness of our chronology and explore reasons why Zhang and Li's OSL age is a gross overestimation of the real depositional age of the imprinted travertine.

Full text: dx.doi.org/10.1126/science.aan8575

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