# Global tipping point not backed by science, study finds

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(Phys.org)—A group of international ecological scientists led by the University of Adelaide have rejected a doomsday-like scenario of sudden, irreversible change to the Earth's ecology.

In a paper published today in the journal *Trends in* Ecology and Evolution, the scientists from Australia, US and UK argue that global-scale ecological tipping points are unlikely and that ecological change over large areas seem to follow a more gradual, smooth pattern.

This opposes recent efforts to define 'planetary tipping points' - critical levels of biodiversity loss or land-use change that would have global effect - with important implications for science and policy-makers.

"This is good news because it says that we might avoid the doom-and-gloom scenario of abrupt, irreversible change," says Professor Barry Brook, lead author of the paper and Director of Climate Science at the University of Adelaide. "A focus on planetary tipping points may both distract from the vast ecological transformations that have already occurred, and lead to unjustified fatalism about the catastrophic effects of tipping points.

"An emphasis on a point of no return is not particularly helpful for bringing about the conservation action we need. We must continue to seek to reduce our impacts on the global ecology without undue attention on trying to avoid arbitrary thresholds."

A tipping point occurs when an ecosystem attribute such as species abundance or carbon sequestration responds rapidly and possibly irreversibly to a human pressure like land-use change or climate change.

Many local and regional-level ecosystems, such as lakes and grasslands, are known to behave this way. A planetary tipping point, the authors suggest, could theoretically occur if ecosystems across Earth respond in similar ways to the same human pressures, or if there are strong connections between continents that allow for rapid diffusion of impacts across the planet.

"These criteria, however, are very unlikely to be met in the real world," says Professor Brook. "First, ecosystems on different continents are not strongly connected. Second, the responses of ecosystems to human pressures like climate change or land-use change depend on local circumstances and will therefore differ between localities."

The scientists examined four principal drivers of terrestrial ecosystem change - climate change, land-use change, habitat fragmentation and biodiversity loss - and found they were unlikely to induce global tipping points.

**More information:** www.sciencedirect.com/science/ … ii/S0169534713000335

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