

Heinz et al. 2021

1. The authors stress that communication with stakeholders is a pathway to mitigate tipping points. How important do you think it is to establish this kind of relationship in the scientific community? What improvements need to be made to do so? They also mention the inclusion of indigenous knowledge, how does that play in identifying or responding to early signs of oceanic tipping points?
2. The title is “the quiet crossing of tipping points.” What is the author suggesting with this title? What mechanisms contribute to the ‘quiet’ nature of tipping point dynamics in this paper compared to what we typically read/see?
3. The author highlights research topics where Earth system scientists are contributing to the development and implementation of mitigation actions. What do you think about this section? Are there any that stuck out to you, or are there any that you believe holds more importance/urgency?

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1. Is the authors’ suggestion of having a domain with multiple points of transition beneficial? Does it make the idea of a tipping point more appealing or is this way of defining tipping points/ combining thresholds and tipping points make the theory more convoluted? (see fig. 1).
2. Look at Fig. 3. What do y'all think of the two different thresholds and the curve? Compare this with figure 4. Do these figures show evidence of a tipping point and a state shift?
3. Because changes/tips in forest soil system communities and long-term ocean processes are obscure, how do we address them? Is there a way to address these issues directly? Or are these tipping points yet another of many consequences of increased atmospheric CO<sub>2</sub> and N deposition?
4. This paper discusses evidence of tipping points within forest soil systems. In Montoya et al. 2018, they cautioned against using the boundaries and tipping points framework in conservation and management, however, this paper encourages understanding alternative stable states to improve restoration efforts. How does this paper change/ affect your stance on the usefulness of tipping points for conservation and management? Should we embrace this concept?

