

Discussion Questions for Nov 14th

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Oro et al. 2023

1. Figure 1A. Overall thoughts? Does it capture the role of thresholds and feedbacks in tipping point dynamics? Fig 1 has a threshold. Fig 2 has a tipping point. Are they the same? Threshold is related to patch quality and tipping point is related to social behavior. Why do you think the authors chose to use these words in their respective areas?
2. In what ways does the inclusion of social copying behavior in the dispersal model differ from traditional population models that use density-independent or positive density-dependent dispersal?
3. The authors argue that social copying behavior creates a feedback loop, leading to a tipping point for population collapse. Would this phenomenon hold up in other social species and could it work differently in non-social species? In their model, is the driver predation or social copying? Both? Can the trigger be separate from the driver?
4. How might social copying or other social behavior phenomena amplify or mitigate the effects of environmental stressors? How should land managers work this into their management strategies? Could social population behaviors be monitored as potential indicators of tipping points?
5. Many of the papers we've discussed this semester regarding ecological tipping points have focused on environmental stress thresholds, while this study emphasized the importance of social feedback mechanisms in tipping points. How do these types of tipping points interact? Can they be disentangled in ecological modeling? (should they be?)

Tao et al. 2023

1. The authors begin the paper by refuting Boulton's (and Lenton's) conclusion that $\frac{3}{4}$ of the Amazon is losing resiliency with dire consequences at a global scale. Is their concern justified and is the evidence the authors presented convincing?
2. What is AR(1) and is it a good indicator of resilience?
3. Authors re-examined resiliency loss using a radar dataset with similar specs (25km resolution, microwaves), but with active sensors instead of passive sensors. Additionally, radar dataset was shown to be "robust to rainfall, flood and soil

moisture change, and it was validated against ground data to be sensitive to biomass change¹⁰” (Tao et al., 2023, p. 2). Is this solid methodology that addresses the authors’ concerns with Boulton et al.? Are there other data sources or methods that might further enhance our understanding of Amazonian resilience?

4. “Decreasing trend in resilience was weak, mainly driven by drought events, and has been partly reversed in recent years.” (Tao et al., 2023, p. 3). They also say that it’s unclear if the Amazon is approaching a tipping point. Do we agree with their conclusion?
5. Given the Amazon’s importance on a global ecological scale, how might this study’s findings impact our understanding of global ecological processes such as carbon sequestration? Does this change how we consider the Amazon in climate models?