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Dear Members of the Academy,

Many ecosystems – including lakes, deserts, coral reefs and boreal forests – are now recognized for their propensity to exhibit abrupt, "tipping-point" transitions between alternative community states. For kelp forests, which have long been considered emblematic of these ecosystems, the frequency of transitions from kelp- to urchin-dominated states appears to be increasing worldwide. Understanding when, where and how kelp forests (and other such ecosystems) will exhibit transitions is of paramount importance to their management and conservation, not least because the ecological functioning and services of urchin barrens pale to those of the "healthy" kelp-forest state.

My co-authors and I are therefore excited to submit our manuscript, entitled *Kelp-forest dynamics controlled by substrate complexity*. In it, we report on analyses of four decades of biannually-collected monitoring data from the furthest offshore of California's Channel Islands: San Nicolas Island. Our data – and therefore our analyses and inferences – differ in noteworthy ways from prior work, thereby providing several important lessons for the understanding of tipping-point ecosystems in general and for how kelp forests in particular may be managed.

Our primary finding is that substrate complexity (the rugosity of the bedrock surface) is a "master variable" of kelp-forest dynamics. More specifically, our analyses evidence substrate complexity to control both (*i*) the number of alternative stable states that the ecosystem can exhibit, as well as (*ii*) the velocity with which perturbation-induced shifts between and within alternative stable states occur. In addition to this, our analyses also provide novel empirical evidence for (*iii*) the existence of a multi-generational long-term transient kelp state (the correct identification of which was only possible due to the spatially-fixed and atypically long-term nature of our data), and (*iv*) new insights that can lead kelp-forest ecologists to refine the interpretations of prior studies which used urchin density as a primary independent predictor of kelp-forest collapse.

We are submitting our manuscript to *PNAS* in the belief that it not only addresses concepts of critical interest to theoretical and community ecologists in general, but also because our findings have direct ramifications for the management and restoration of a tremendously important ecosystem. In regard to these ramifications, our manuscript is not only important but also timely given the unprincipled manner in which urchin-removal and kelp-forest restoration efforts along the Californian coast are now being implemented. We hope you agree that *PNAS* is the most appropriate venue for our manuscript's dissemination.

On behalf of my co-authors, I thank you very much for your consideration.

Sincerely,

Zachary Randell, Ph.D. Candidate