

10 May 2023

Dear Tony,

I am delighted to provide this letter to nominate Jillian Dunic for a Canadian Council of University Biology Chairs Graduate Student Research Prize. Jillian defended her PhD in February 2023 and passed with no corrections. Her thesis has yielded three publications, on which she is first author, and Jillian contributed to eight other high-profile papers (e.g., in *PNAS*, *Nature*, *Current Biology*, *Global Change Biology*, *Conservation Letters*) that stemmed from side projects during her time at SFU.

It is difficult to choose one paper among Jillian's many outstanding publications, but I believe that the paper she published in *Conservation Letters* (IF = 10.07) in January 2023 is the most original and impactful. This paper, entitled 'Management thresholds shift under the influence of multiple stressors: Eelgrass meadows as a case study', asks whether the presence of one stressful environmental pressure (such as increasing temperatures, for example) acting on an ecosystem can change how the ecosystem responds to a second pressure (such as diminishing light owing to pollution). More specifically, since ecosystems tend to respond to pressures in a stepwise manner – that is, resisting until the pressure is too strong and then degrading rapidly into an alternative state – the pressure strength associated with this 'tipping point' is an important target for managers. Healthy ecosystem states can be preserved if a pressure is maintained below the level that makes the ecosystem tip. But what happens when two pressures co-occur? Does the tipping point change? Do managers need to be more cautious and keep the first pressure at a lower level when a second one is also acting? Jillian provided the first answers to these important questions.

Using a meta-analysis of published studies that examined eelgrass growth under different experimental conditions, she showed that the tipping points in the responses of eelgrass performance to increasing magnitudes of one pressure (temperature) do indeed shift when an additional pressure (light limitation) co-occurs. This finding has massive implications for the management of seagrass ecosystems. It means that fixed targets for either pressure might be unsuitable for managing eelgrass meadows under multiple pressures. Her model is such that it can be developed to include additional pressures, applied to other species, and turned into an interactive management tool. This paper is a profound advance for our understanding of how to manage ecosystems stressed by multiple human pressures.

Jillian is extraordinary. She combines deep ecological knowledge, creativity, unrivalled analytical and coding skills, ability for theory development, field experience, and outstanding communication skills. A PhD student with this combination of abilities at such a high level comes around once in a blue moon. I am so lucky that she chose SFU and my lab.

Yours sincerely,

