November 14, 2019

Dear Dr. Findlay:

Please consider our paper, entitled "Winter temperatures dominate spring phenological responses to warming" for publication as a "Letter" in *Nature Climate Change*. This manuscript is a revised version of an earlier submission (NCLIM-19081773). We include a point-by-point response to reviewer comments.

As you may recall, our manuscript utilizes a new global database to address a research topic of critical relevance to a broad reach of *Nature Climate Change* readers: the timing of spring phenology (e.g., budburst, leafout) in woody plants. Spring phenology impacts plant fitness, shapes plant and animal communities, and affects wide-ranging ecosystem services from crop productivity to carbon sequestration and unites the fields of biometeorology, ecology, cellular and molecular biology. Our work is groundbreaking in its synthesis of four decades of research across 72 experiments to quantify the relative importance of three environmental cues critical to phenology. We estimate overall chilling, forcing and photoperiod responses for 203 species from around the globe.

The three reviewers recognized the potential of our work to influence future research. They also highlighted some concerns. Reviewer 1 suggested that additional details and clarification of methods would be beneficial for a fuller evaluation of the study. Reviewer 2 felt unconvinced that the experimental methods synthesized in our meta-analysis could be reliably applied to natural systems. Reviewer 3 had reservations about the validity of the results given the data and modeling approaches used.

We have substantially modified the manuscript to address the concerns expressed by reviewers and the issues mentioned by the Editor after the initial submission. Specifically, we have added new text and analyses to the main manuscript, including two new models testing for effects of continent and life stage and as well as applying a recently published modelling approach for estimating temperature sensitivity (sliding windows), as suggested by the reviewer. We have also created a new figure, and modified previous figures in the main text to address reviewer concerns. We have also added substantially to the online 'Methods' section, which adheres to the new guidelines of *Nature Climate Change*.

Upon acceptance for publication, the database will be freely available at KNB (currently meta-data are there: $\mathrm{ADD}_K NB_l ink?); the full database is available to reviewers and editors upon request. This work is a meta-analysis, so data have been previously published; however, the synthesis of these data and the tables, figures, models, and mat$

Sincerely,

Ailene Ettinger
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