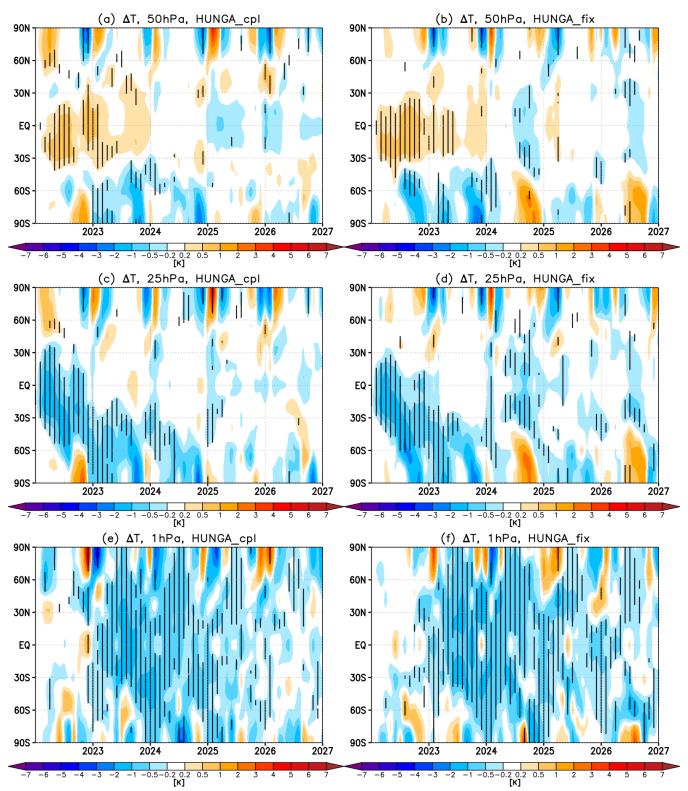
## Supplementary Material to:

## Indirect climate impacts of the Hunga eruption

Ewa M Bednarz<sup>1,2</sup>, Amy H. Butler<sup>2</sup>, Xinyue Wang<sup>3</sup>, Zhihong Zhuo<sup>4</sup>, Wandi Yu<sup>5</sup>, Georgiy Stenchikov<sup>6</sup>, Matthew Toohey<sup>7</sup>, Yunqian Zhu<sup>1,2</sup>

- 1. Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado Boulder, Boulder, CO, USA.
- 2. NOAA Chemical Sciences Laboratory (NOAA CSL), Boulder, CO, USA.
- 3. Department of Atmospheric and Oceanic Sciences, University of Colorado Boulder, Boulder, USA
- 4. Department of Earth and Atmospheric Sciences, University of Quebec in Montreal, Montreal (Quebec), Canada.
- 5. Lawrence Livermore National Laboratory, CA, USA
- 6. Physical Science and Engineering Division, King Abdullah University of Science and Technology, Jeddah, Saudi Arabia
- 7. Institute of Space and Atmospheric Studies, University of Saskatchewan, Saskatoon, Canada.



**Figure S1.** Timeseries of zonal mean temperature changes at (a-b) 50 hPa, (c-d) 25 hPa, and (e-f) 1 hPa between the forced simulation and the control for the coupled ocean (left) and atmosphere-only (right) simulations. Stippling denotes statistical significance (as in Fig. 1).

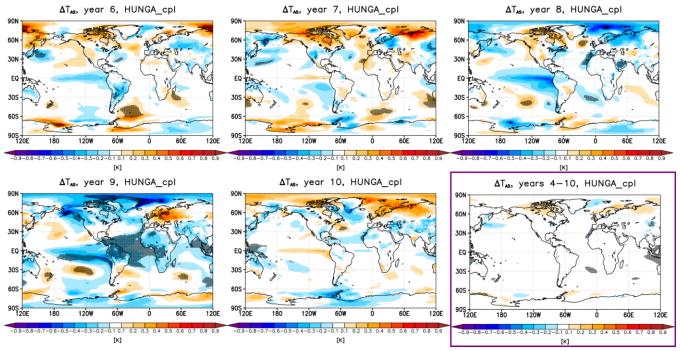


Figure S2. As in Fig. 2 of the main paper but for years 5-10.

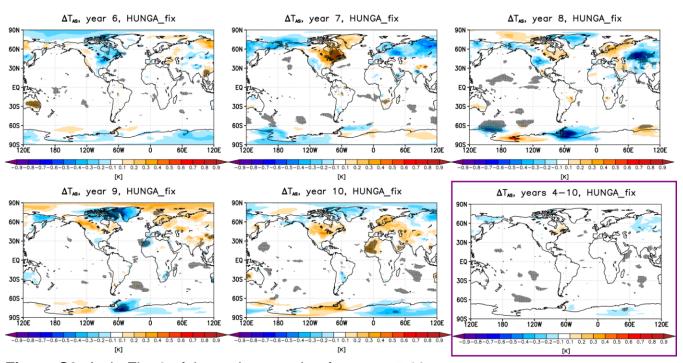


Figure S3. As in Fig. 3 of the main paper but for years 5-10.

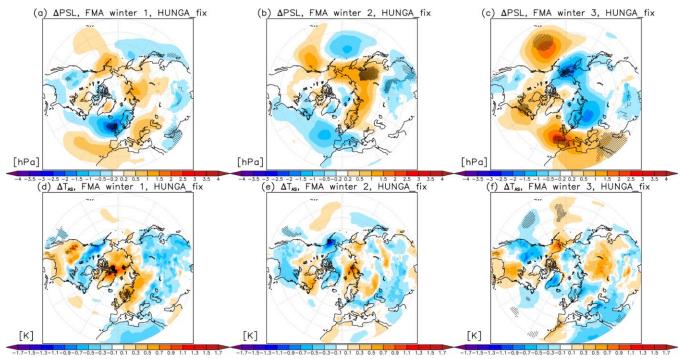


Figure S4. As in Fig. 7 of the main paper but for the changes in the atmosphere-only simulations.

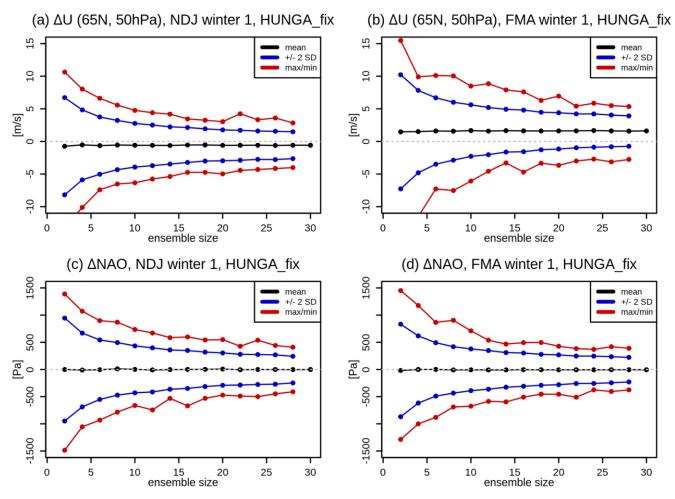


Figure S5. As in Fig. 9 of the main paper but for the changes in the atmosphere-only simulations.

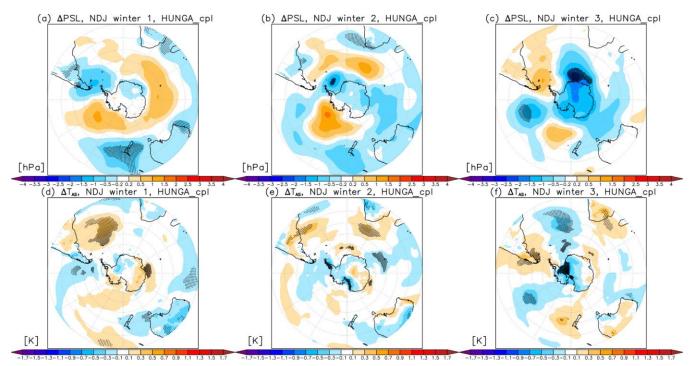


Figure S6. As in Fig. 12 of the main paper but for the changes in the coupled ocean simulations.