

Appendix A

A1 Code

All the R code used in this study can be found at github.com/istfer/ENSOpaper

700 A2 Figures

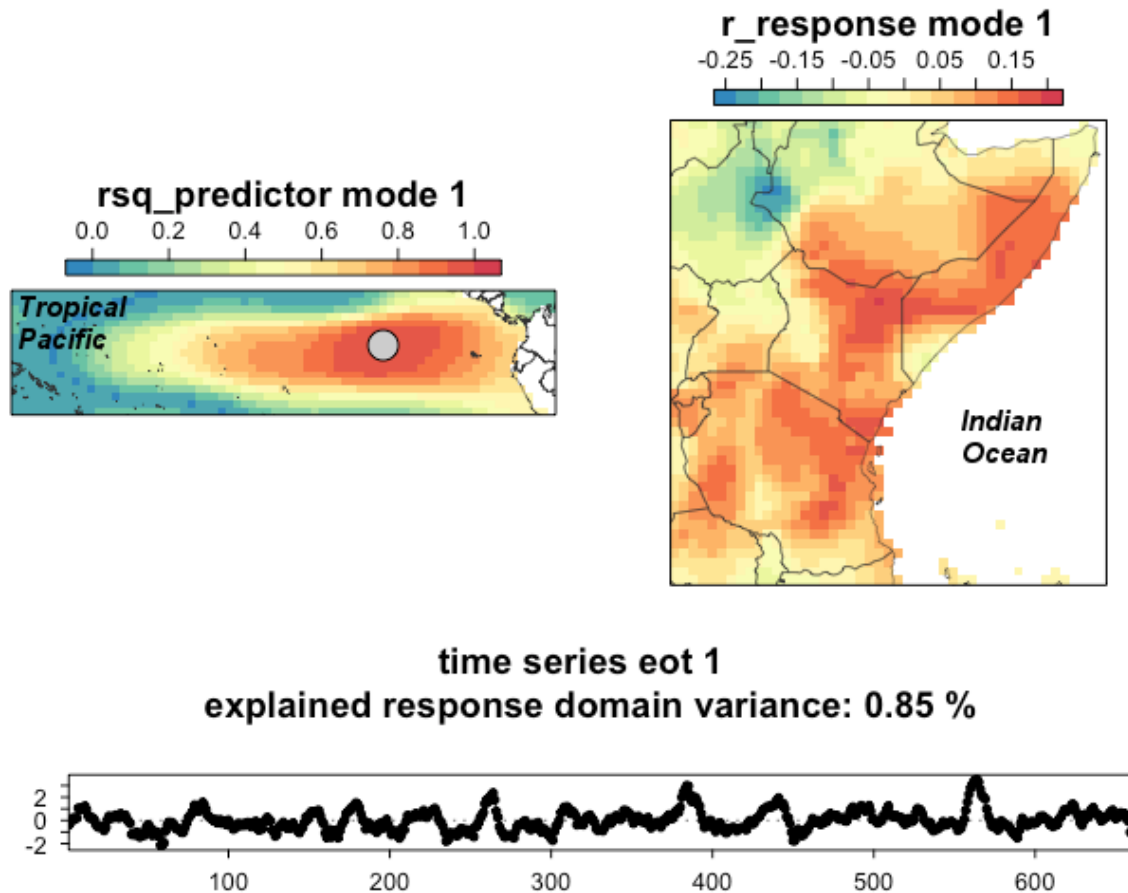


Figure A1. Coupled ocean-atmosphere teleconnection between Pacific Sea Surface Temperatures and East African Rainfall retrieved from historical observations. (Upper Left) The coefficients of determination for the predictor field highlights that the Niño-3.4 region explains the variance in the response domain the most. (Upper Right) Correlation coefficients of the each pixel of the East Africa (response) domain shows that spatially the coastal parts and a north-western area is being explained by the predictor field. (Bottom panel) Time series of Tropical Pacific SST anomalies at the base point (the gray circle in the upper left panel) of the first mode as ENSO signal.

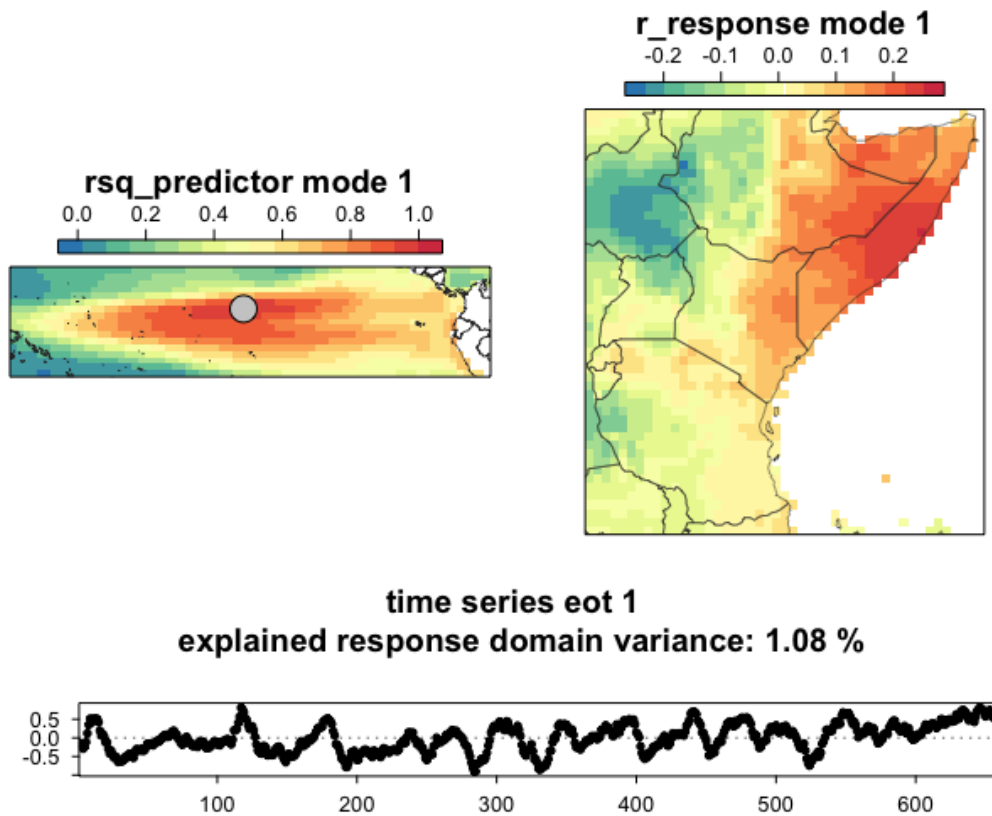
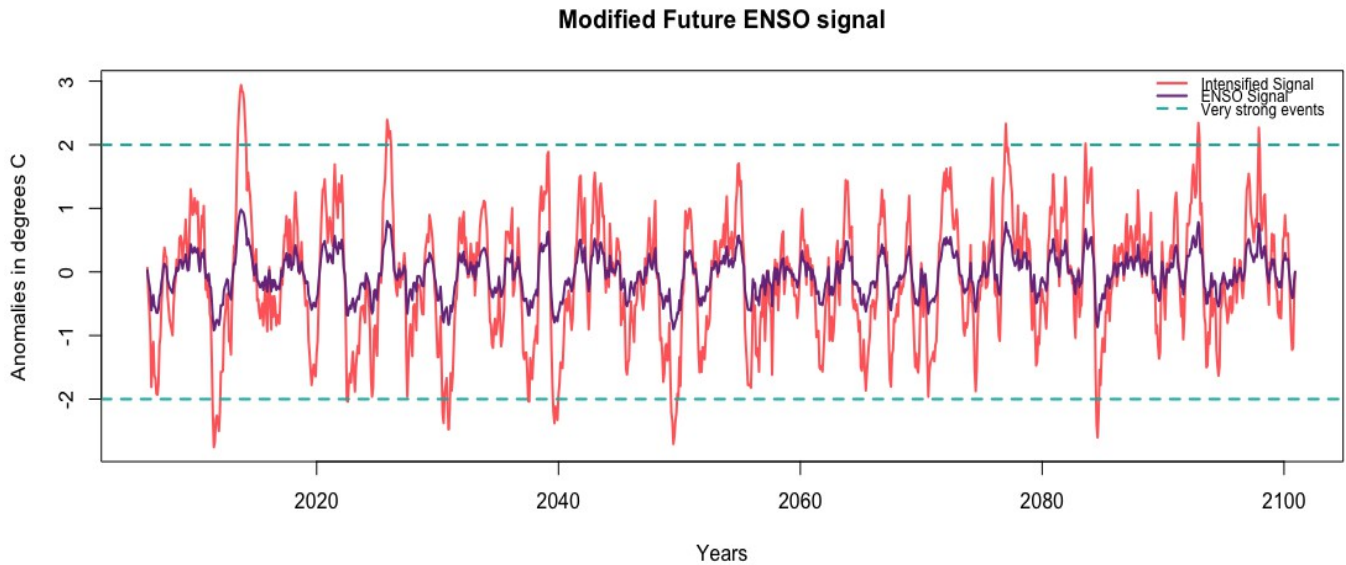


Figure A2. EOT Analysis for the historical period from the GCM simulations. Panels as explained in Figure A1: (Left) The coefficients of determination for the predictor field. (Right) Correlation coefficients of the each pixel of the East Africa (response) domain. (Bottom) Time series at the base point of the mode.



715 Figure A3. Intensified ENSO signal. Purple line: Future ENSO signal retrieved from GCM outputs for 2006-2100 period. Red Line: Intensified signal such that anomalies peak as strong as recorded amplitudes ($\pm 2.5^{\circ}$ C) .Dashed line marks the very strong ENSO event threshold..

A3 Full names of Global Circulation Models and their home Institutions

720 *CCCma-CanESM2*: Canadian Centre for Climate Modelling and Analysis - The second generation Canadian Earth System Model (Flato et al., 2000)

CERFACS CNRM-CM5: Centre Européen de Recherche et de Formation Avancée, Centre National de Recherches Météorologiques, Climate Model 5 (Voldoire et al., 2013)

725 *IPSL CM5A-MR*: Institut Pierre Simon Laplace Climate Model 5A Medium Resolution (Hourdin et al., 2013)

QCCCE CSIRO Mk3-6-0: Queensland Climate Change Centre of Excellence, Commonwealth Scientific and Industrial Research Organization, Mark 3.6 (Collier et al., 2013)

ICHEC EC-EARTH: Irish Centre for High End Computing, EC-Earth (Sterl et al., 2012)

MIROC5: Atmosphere and Ocean Research Institute (The University of Tokyo), National Institute for
730 Environmental Studies, and Japan Agency for Marine-Earth Science and Technology, Model for
Interdisciplinary Research on Climate (Watanabe et al., 2010)

MPI-M ESM-LR: Max Planck Institute for Meteorology, Earth System Model, Low Resolution
(Giorgetta et al., 2013)

NCC NorESM1-M: Norwegian Climate Centre, Norwegian Earth System Model (Bentsen et al., 2013)

735 *NOAA GFDL-ESM2M*: National Oceanic and Atmospheric Administration, Geophysical Fluid
Dynamics Laboratory (Dunne et al., 2012)

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