*Geoscientific Model Development*

Supporting Information for

# SDMBCv2 (v1.0): correcting systematic biases in RCM inputs for future projection

Youngil Kim[1*], Jason P. Evans[1,2]

[1] Climate Change Research Centre and ARC Centre of Excellence for Climate Extremes, University of New South Wales, Sydney, New South Wales, Australia

[2] ARC Centre of Excellence for the Weather of the 21st Century, University of New South Wales, Sydney, New South Wales, Australia

## Contents of this file

Figures showing bias maps of climatological statistics across monthly and seasonal time scales.

## Introduction

The supplemental information includes climatological statistics that compare ERA5 with both uncorrected and bias-corrected GCM outputs for three atmospheric variables at the lowest model level, on monthly and seasonal time scales across the entire domain.

## 1. Monthly

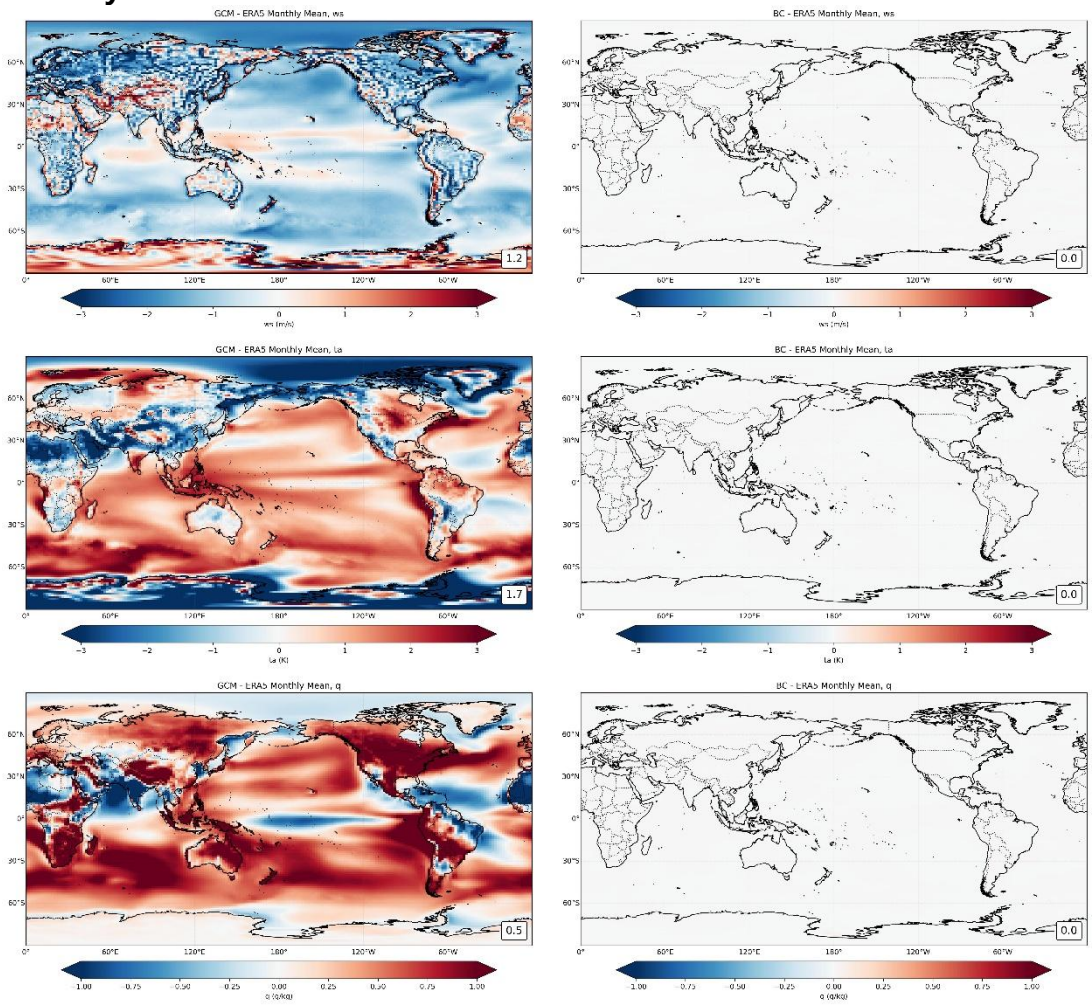


Figure 1-1 Climatological mean bias maps comparing ERA5 with GCM outputs before (left panels) and after (right panels) bias correction (BC), evaluated at the lowest model level on a monthly time scale for the calibration period (1959–1989). The panels show results for wind speed (ws), air temperature (ta), and specific humidity (q). The number at the bottom right shows the mean absolute error.

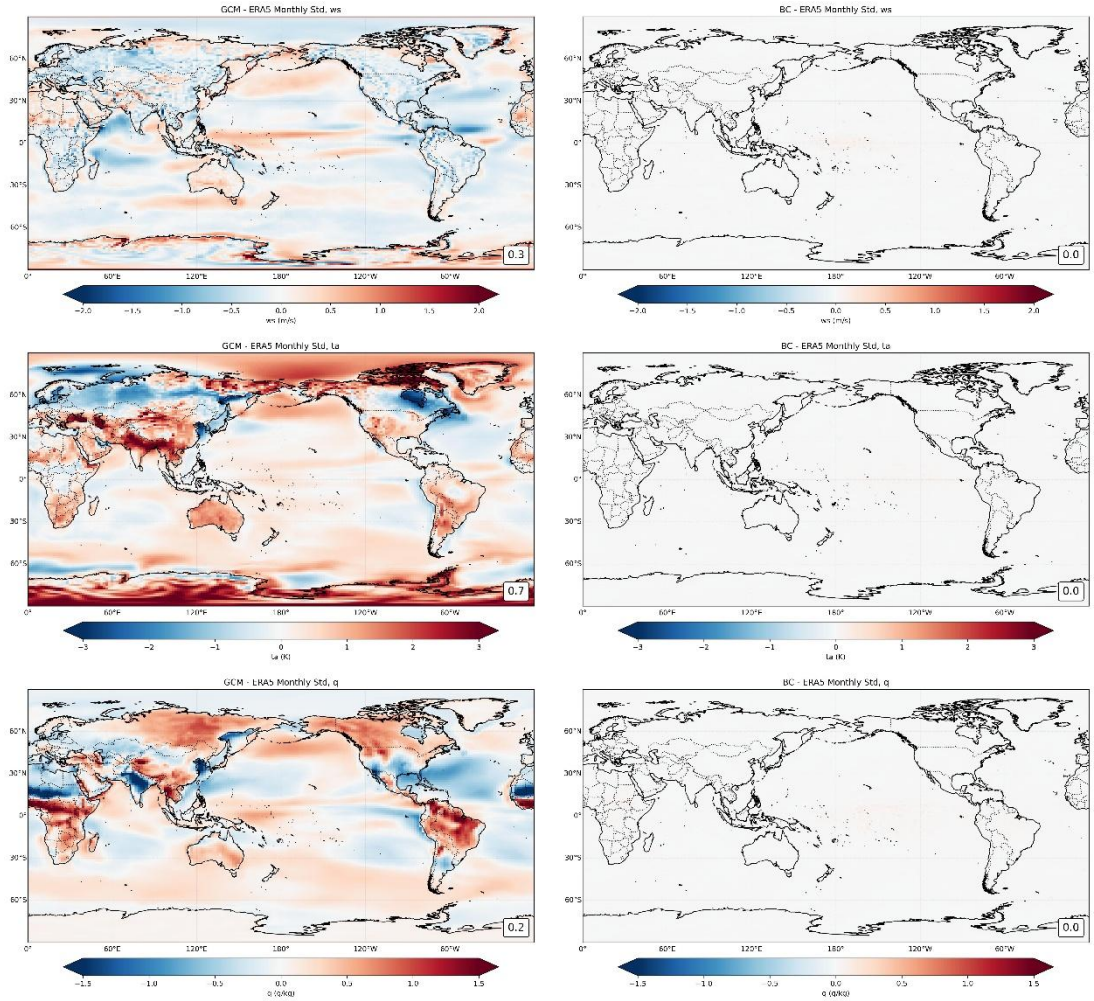


Figure 1-2 As in Figure 1-1, but for standard deviation

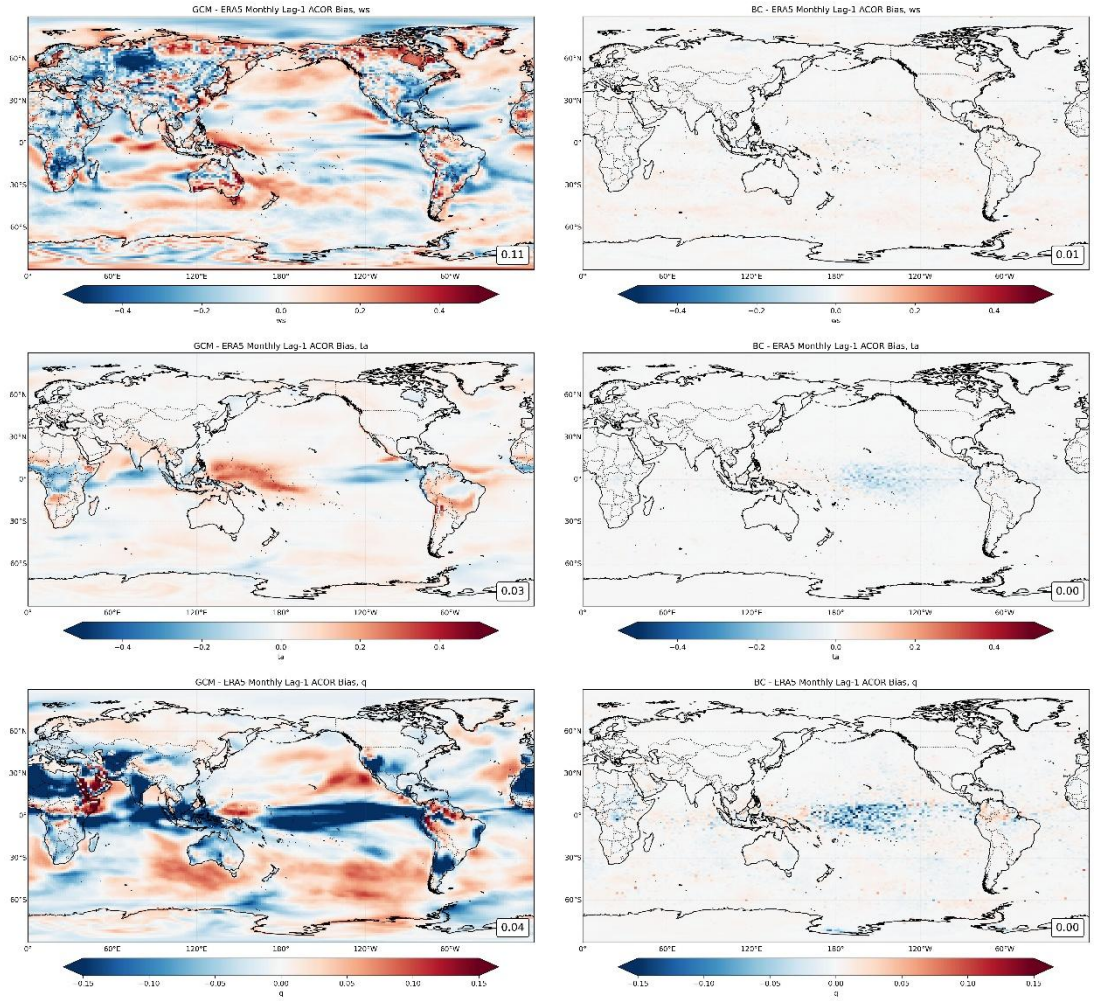


Figure 1-3 As in Figure 1-1, but for lag1 auto-correlation

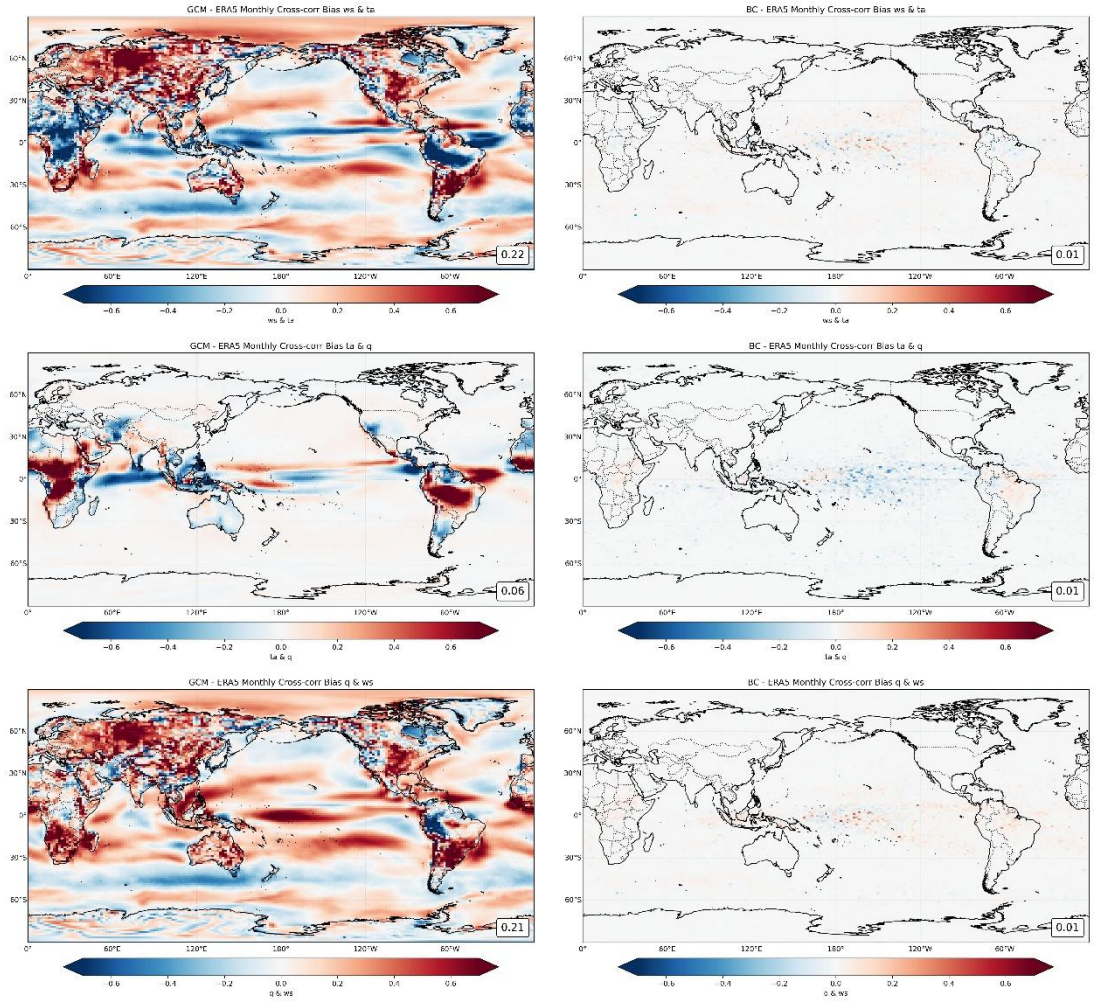


Figure 1-4 As in Figure 1-1, but for lag0 cross-correlation

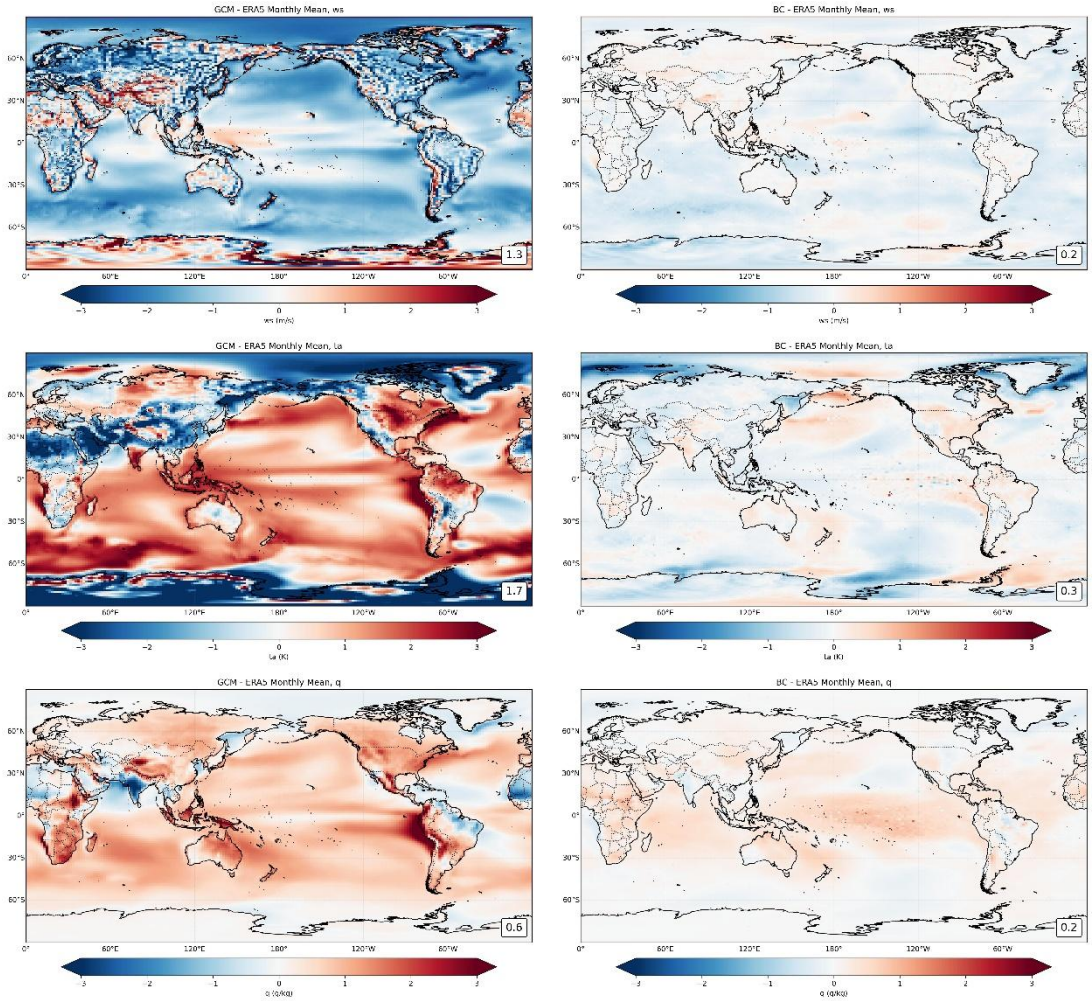


Figure 1-5 Climatological mean bias maps comparing ERA5 with GCM outputs before (left panels) and after (right panels) bias correction (BC), evaluated at the lowest model level on a monthly time scale for the validation period (1990–2020). The panels show results for wind speed (ws), air temperature (ta), and specific humidity (q). The number at the bottom right shows the mean absolute error.

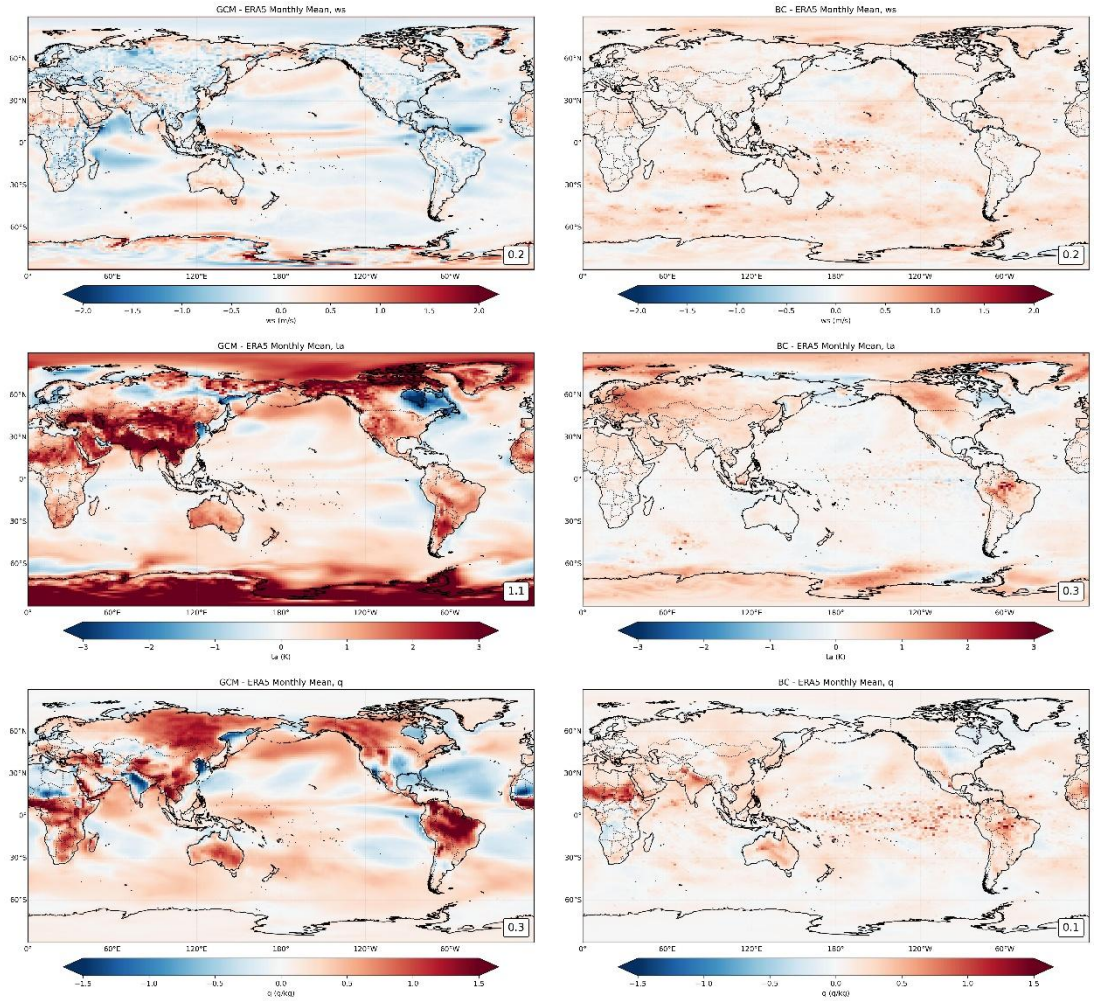


Figure 1-6 As in Figure 1-5, but for standard deviation

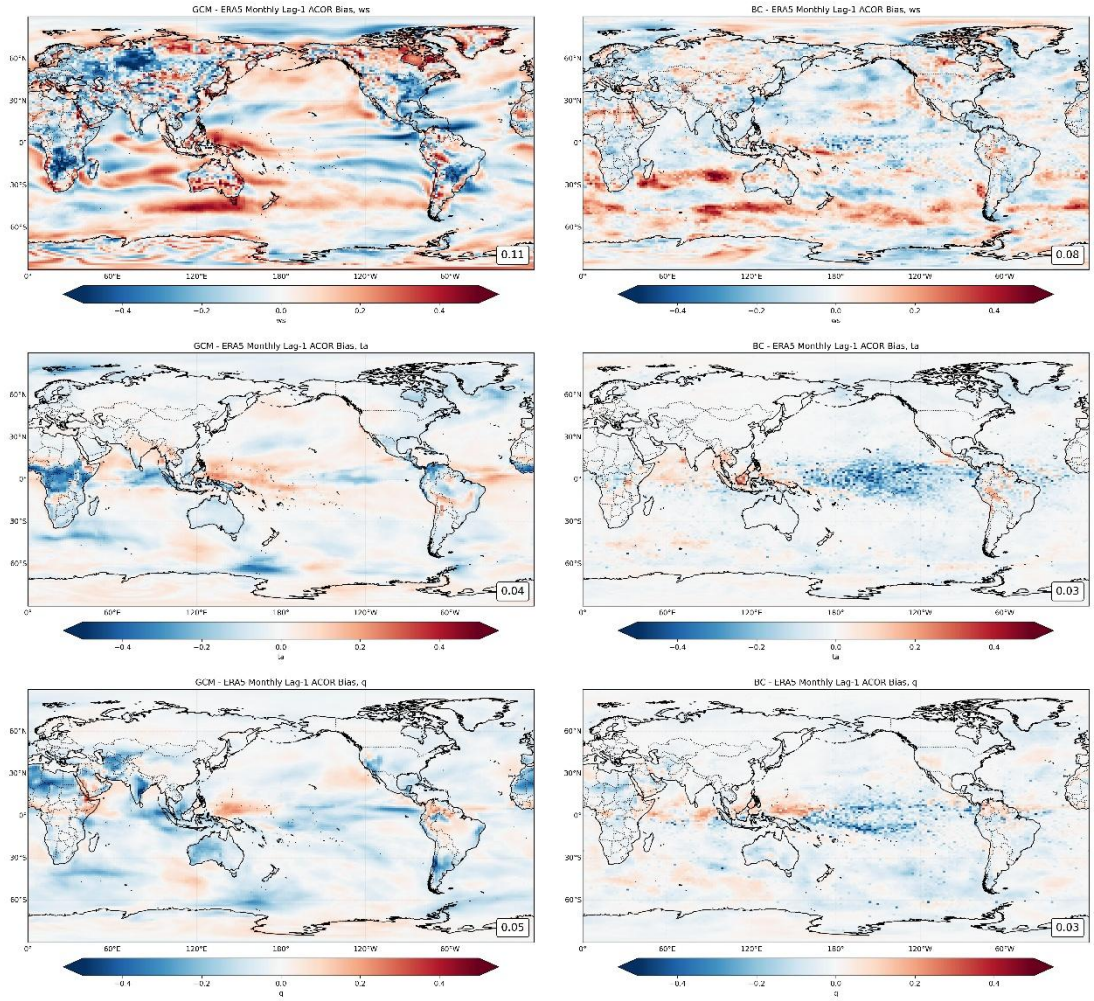


Figure 1-7 As in Figure 1-5, but for lag1 auto-correlation

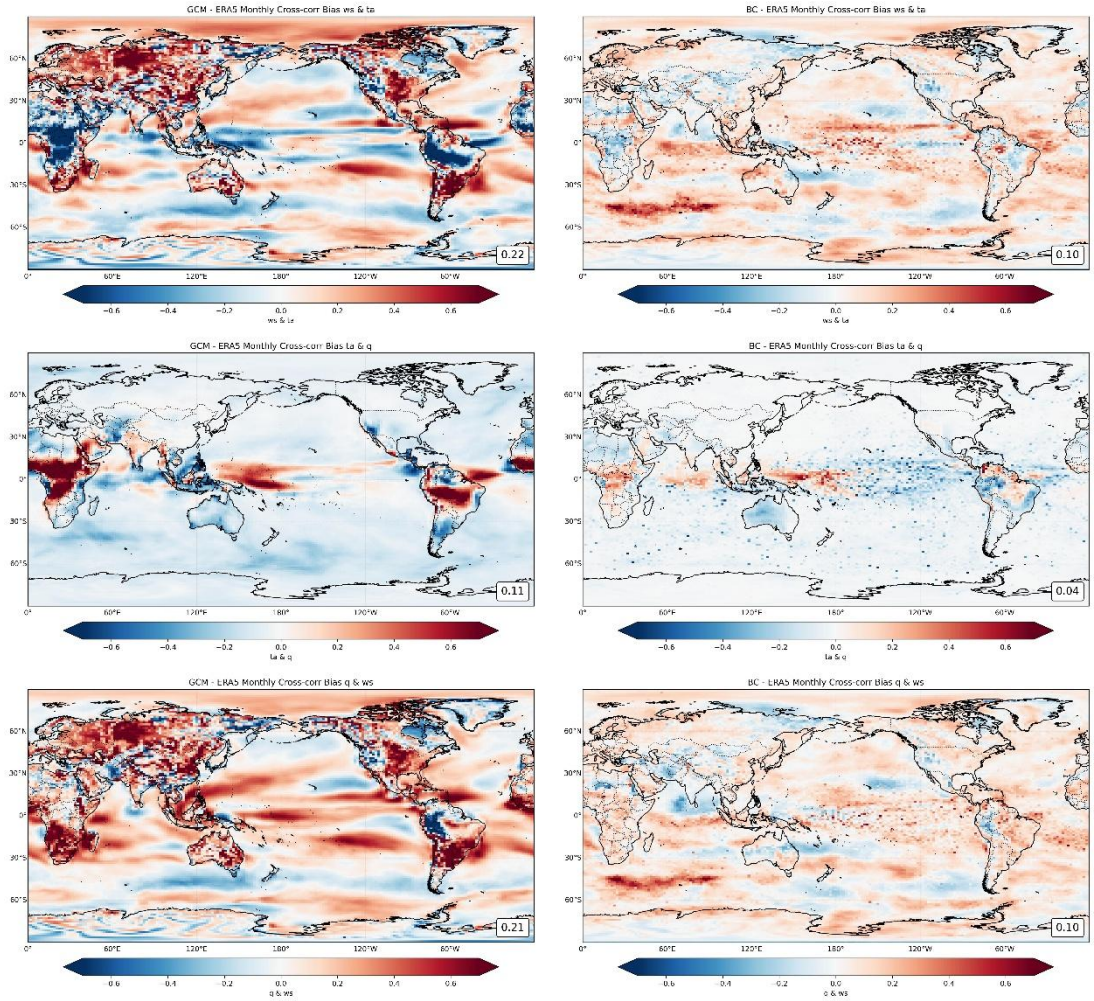


Figure 1-8 As in Figure 1-5, but for lag0 cross-correlation

## 2. Seasonal

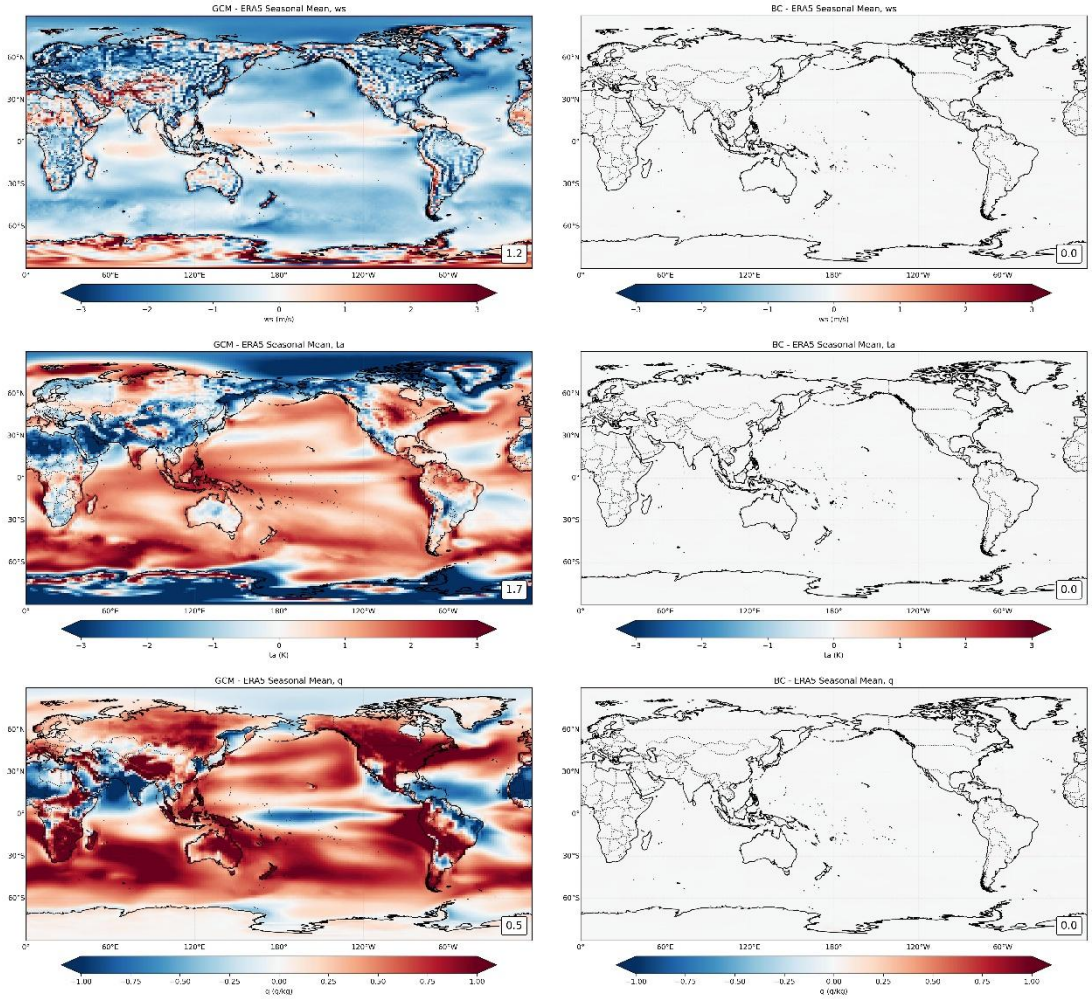


Figure 2-1 Climatological mean bias maps comparing ERA5 with GCM outputs before (left panels) and after (right panels) bias correction (BC), evaluated at the lowest model level on a seasonal time scale for the calibration period (1959–1989). The panels show results for wind speed (ws), air temperature (ta), and specific humidity (q). The number at the bottom right shows the mean absolute error.

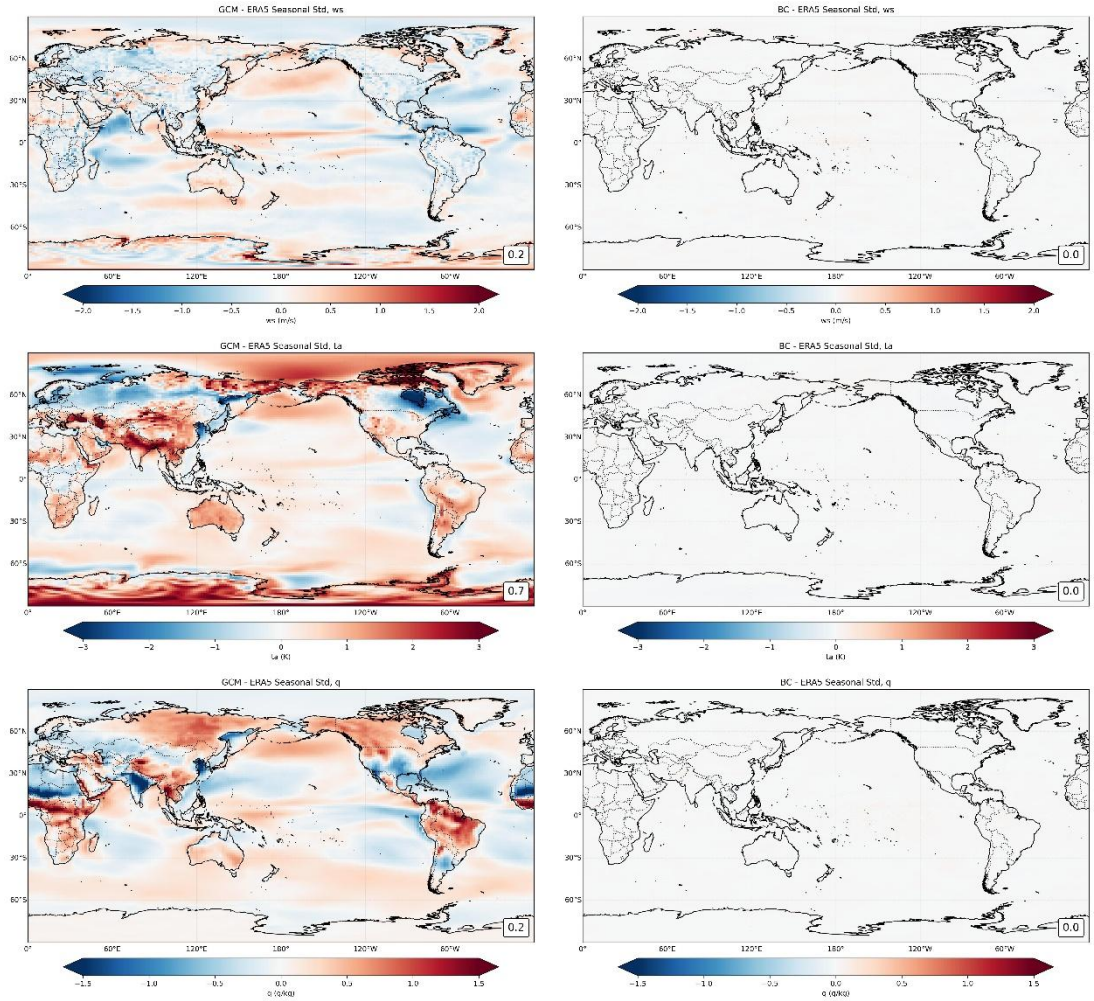


Figure 2-2 As in Figure 2-1, but for standard deviation

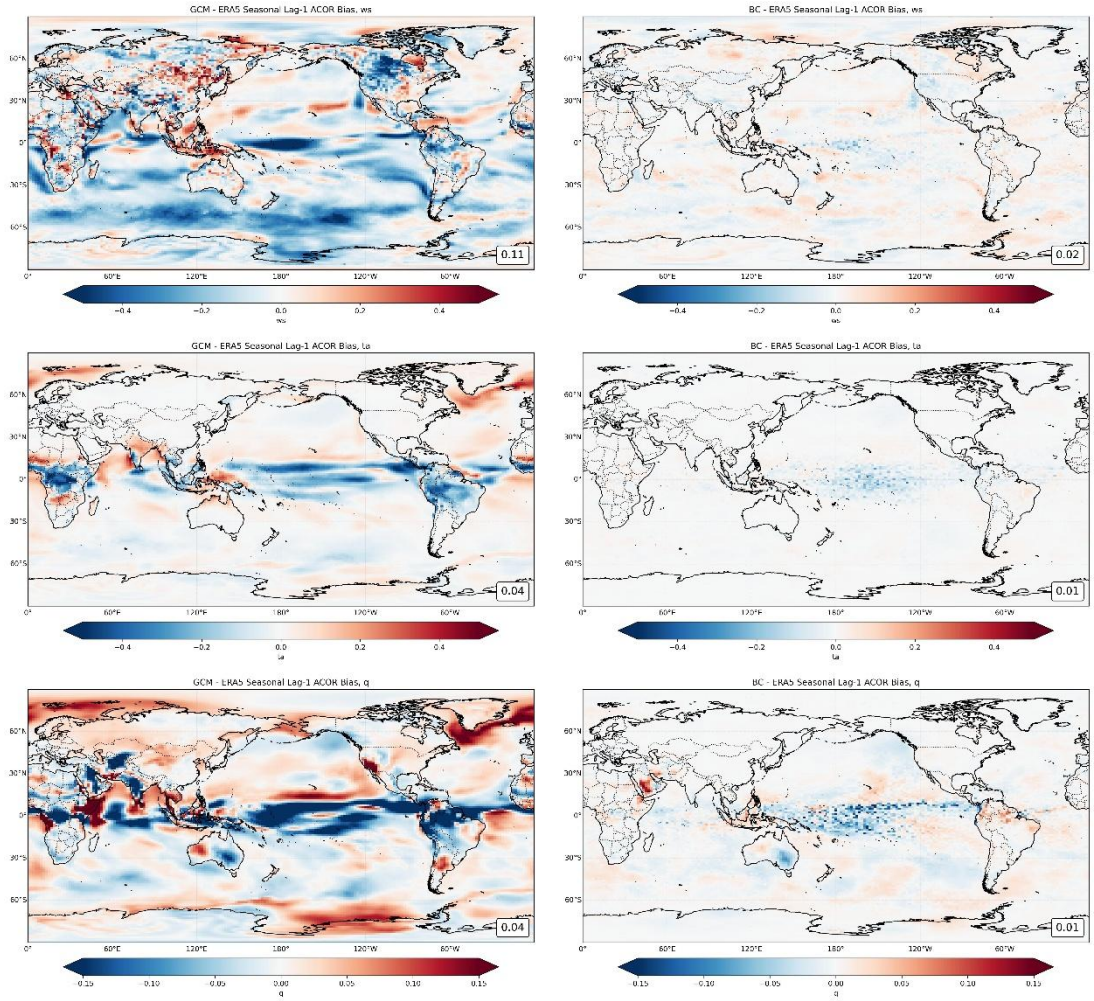


Figure 2-3 As in Figure 2-1, but for lag1 auto-correlation

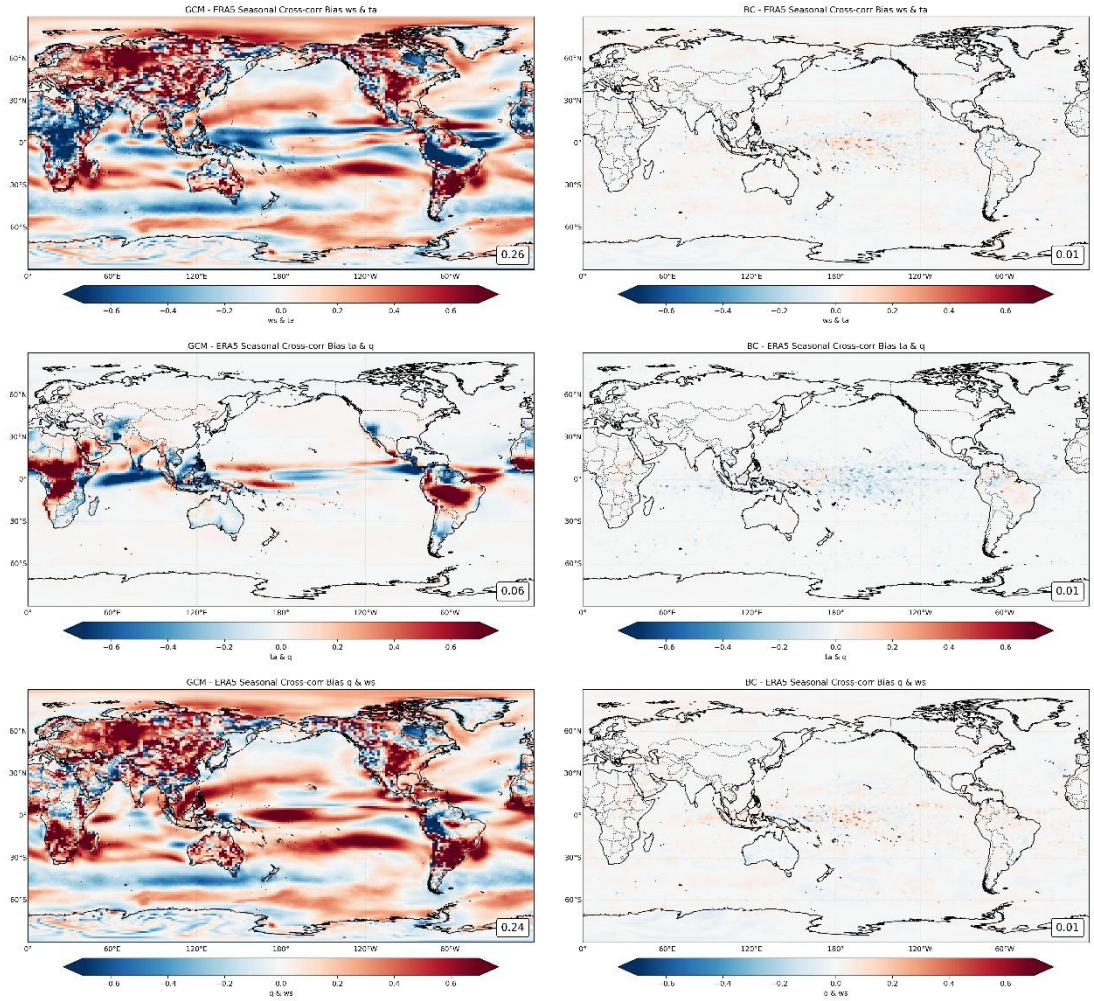


Figure 2-4 As in Figure 2-1, but for lag0 cross-correlation

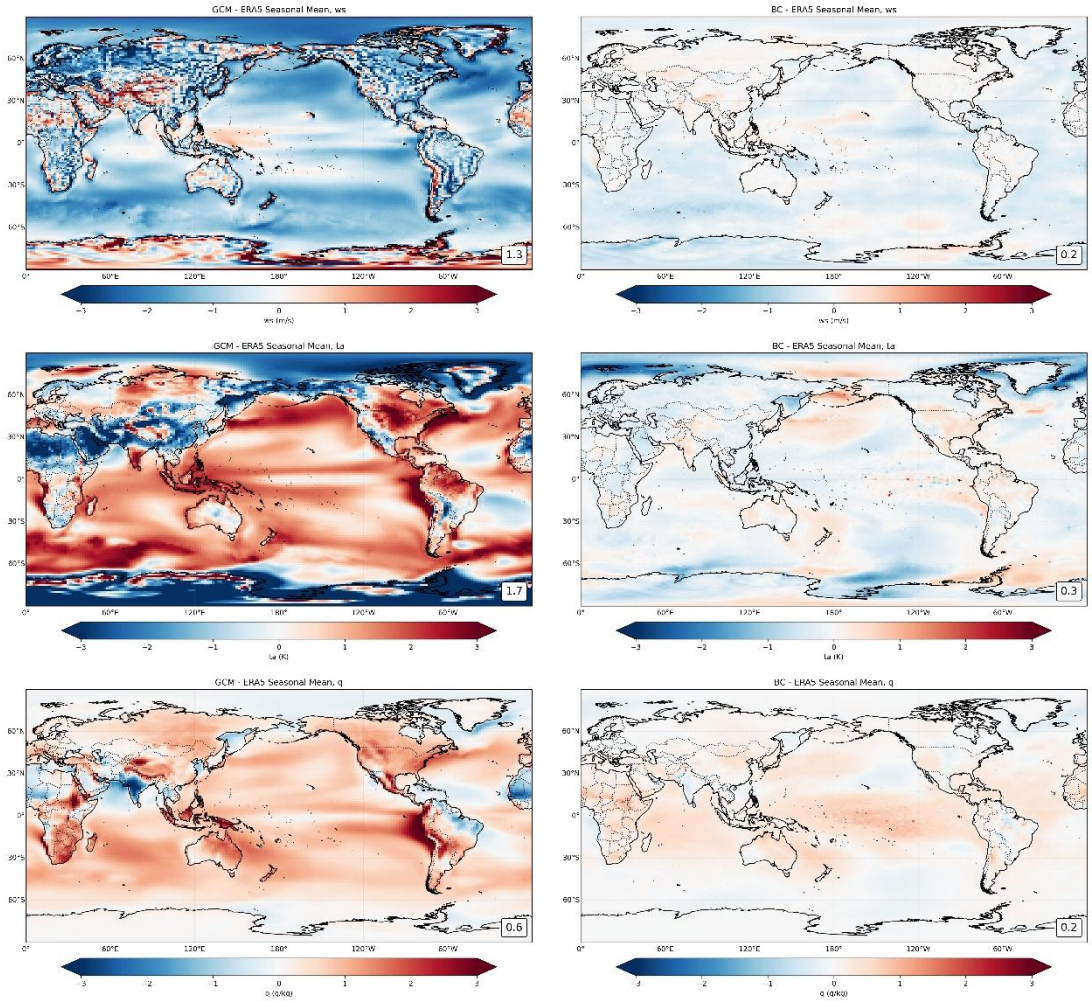


Figure 2-5 Climatological mean bias maps comparing ERA5 with GCM outputs before (left panels) and after (right panels) bias correction (BC), evaluated at the lowest model level on a seasonal time scale for the validation period (1990–2020). The panels show results for wind speed (ws), air temperature (ta), and specific humidity (q). The number at the bottom right shows the mean absolute error.

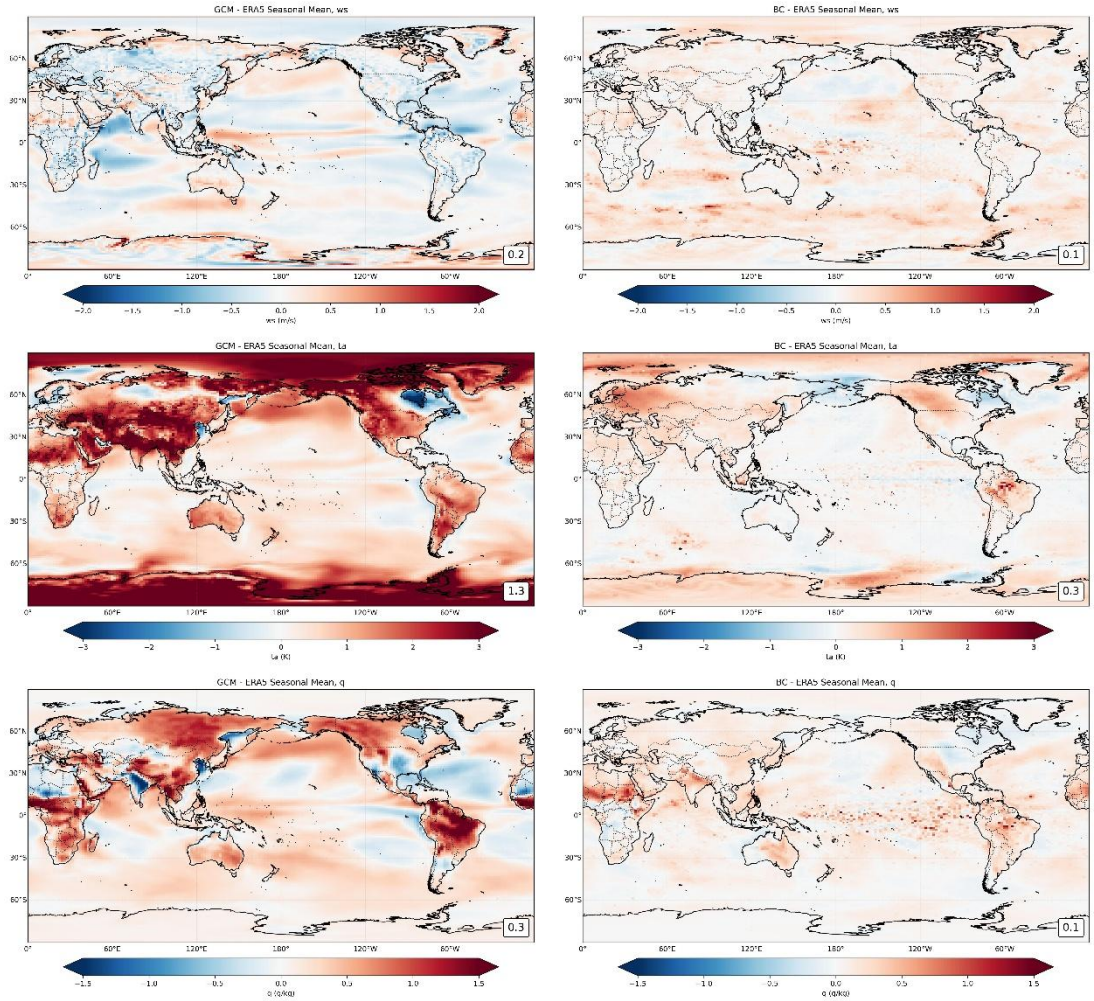


Figure 2-6 As in Figure 2-5, but for standard deviation

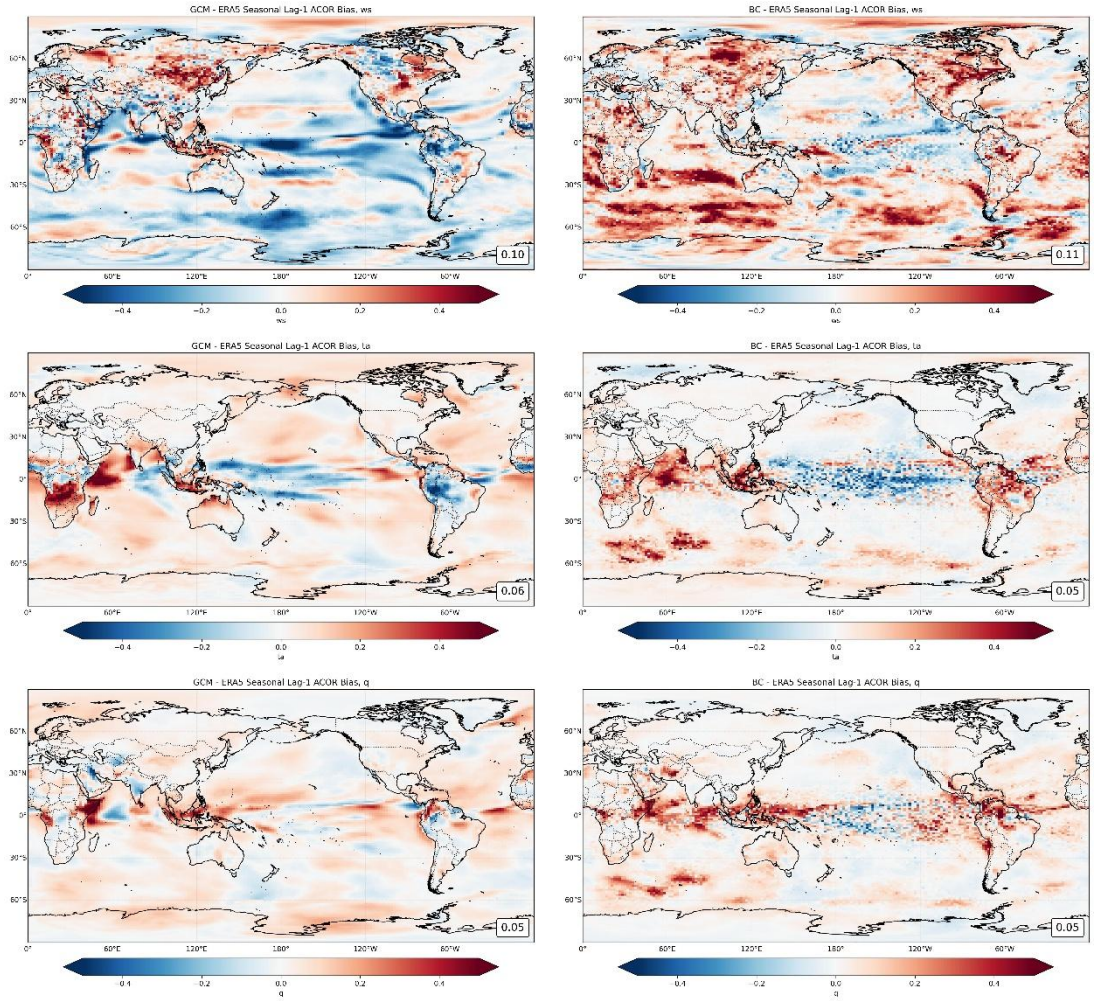


Figure 2-7 As in Figure 2-5, but for lag1 auto-correlation

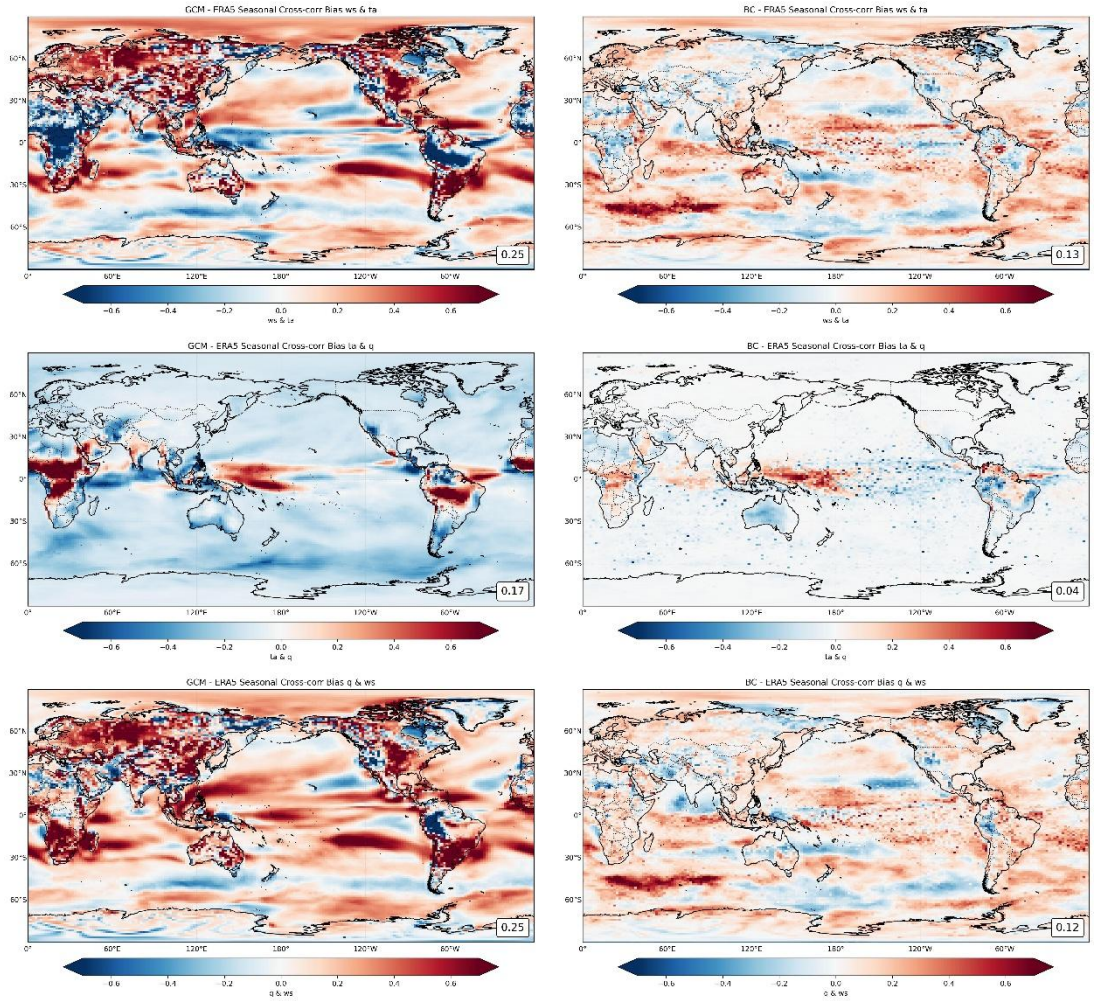


Figure 2-8 As in Figure 2-5, but for lag0 cross-correlation