

Supplementary Materials for

Estimation of the maximum annual number of North Atlantic tropical cyclones using climate models

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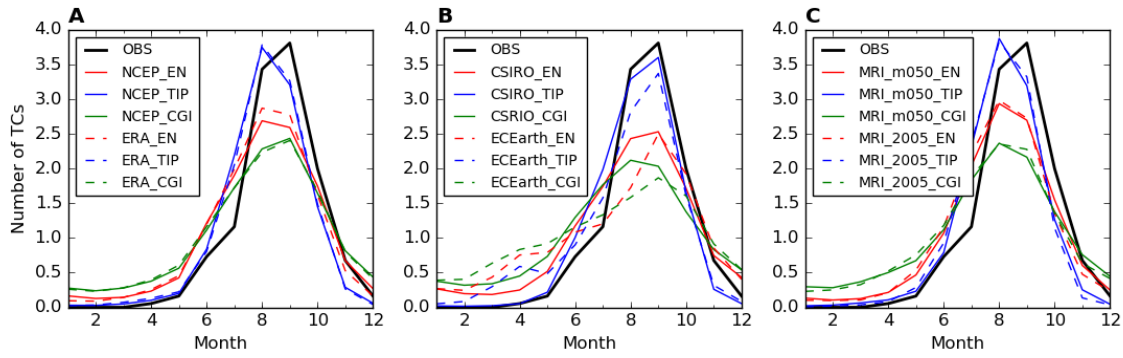


Fig. S1. Annual variability in North Atlantic TCs. Annual cycle of observed TC numbers (all TCs) and GPIs calculated in **A** ERA and NCEP reanalysis, **B** CSIRO and EC-Earth model simulations and **C** MRI single ensemble (m050) and 100-member ensemble of 2005, averaged over the North Atlantic region.

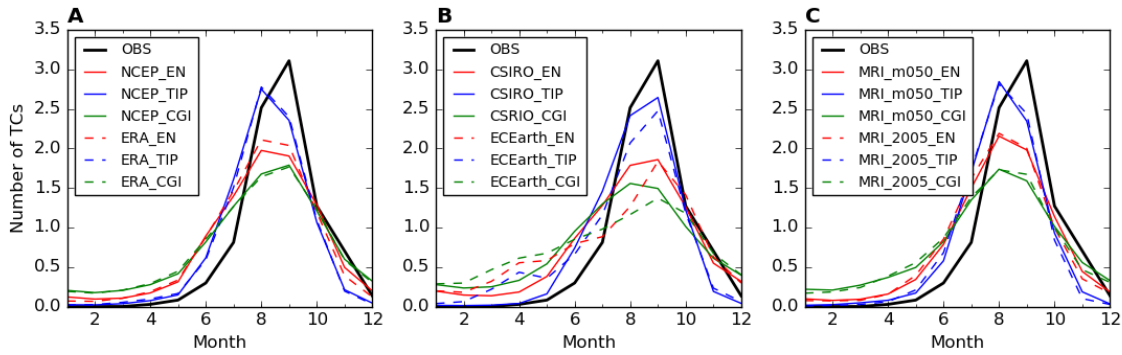


Fig. S2. As in fig. S1 but scaled to long-lived TCs.

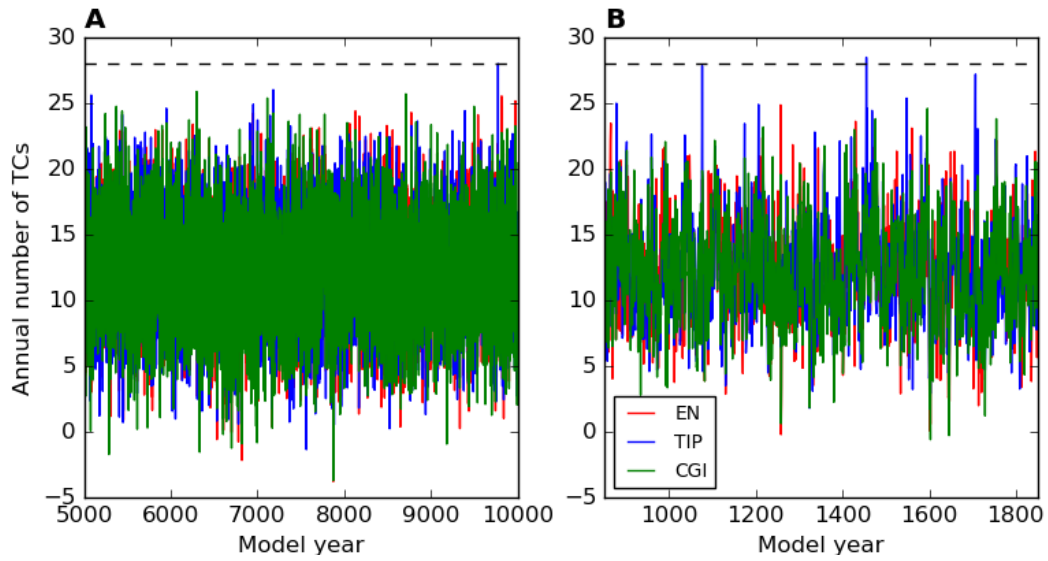


Fig. S3. Interannual variability of modeled GPIs. Variance-scaled output for the North Atlantic region from the **A** CSIRO and **B** EC-Earth models on a $5^\circ \times 5^\circ$ grid, for the three different GPIs. The observed number of NATl TCs in 2005 is shown by the dashed line at 28.

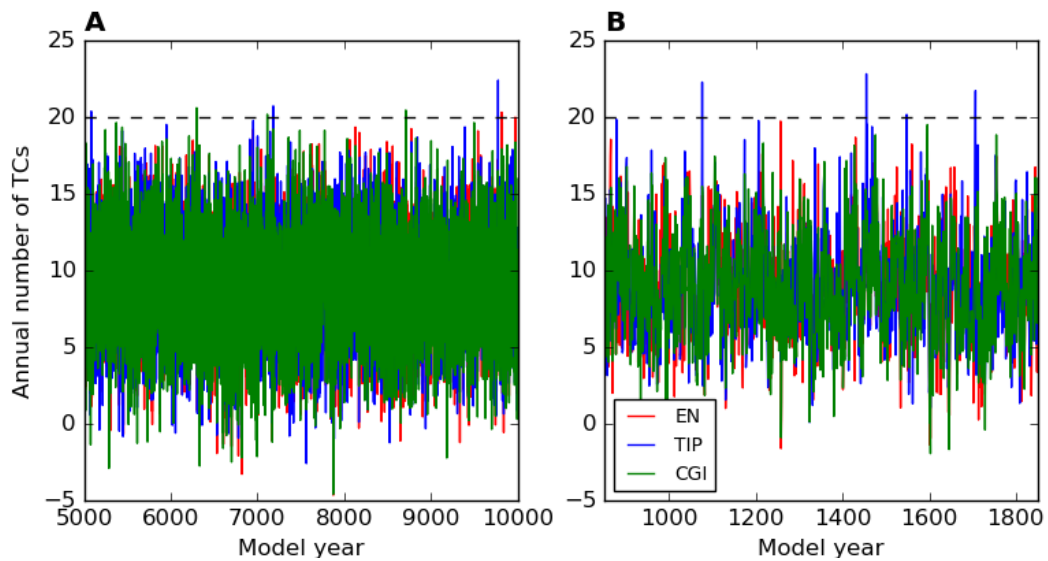


Fig. S4. As in fig. S3 but scaled to long-lived TCs. The observed number of NATl long-duration TCs in 2005 is shown by the dashed line at 20.

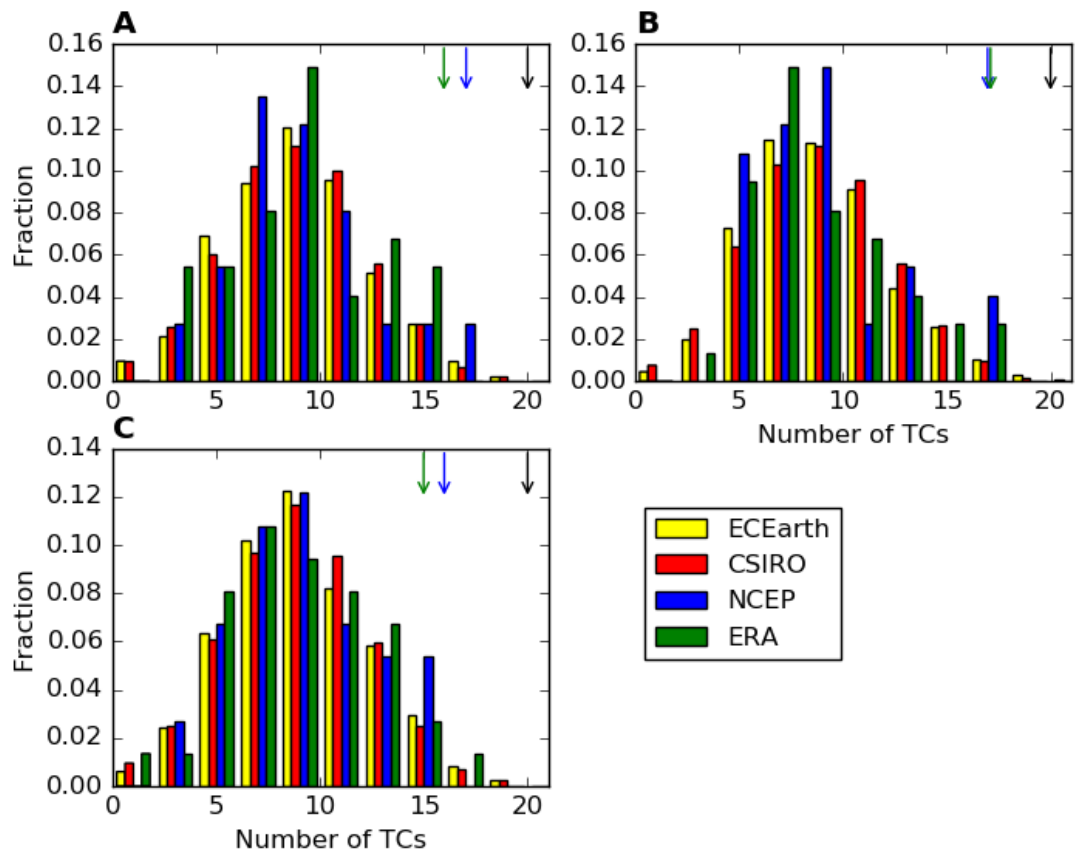


Fig. S5. As in Fig. 1 but scaled to long-lived TCs.

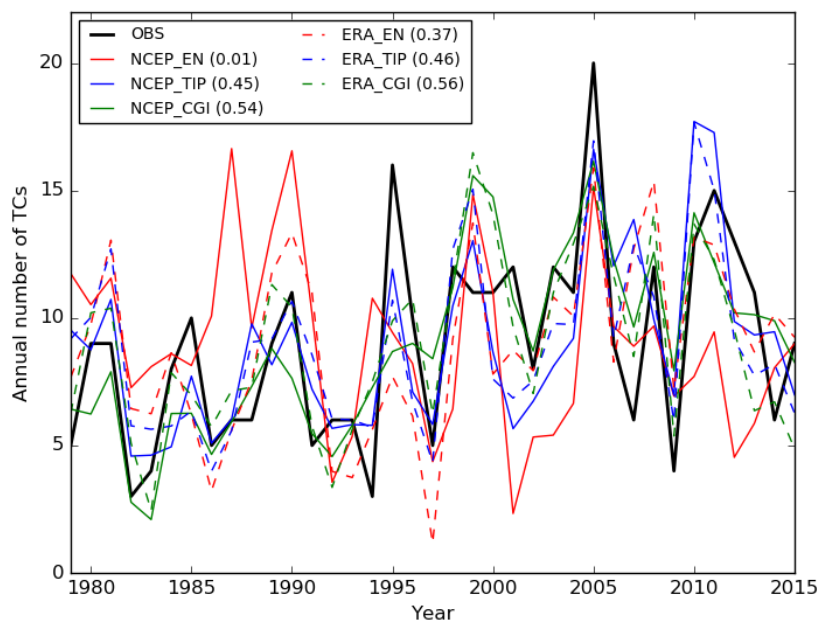


Fig. S6. As in Fig. 3 but for long-lived TCs.

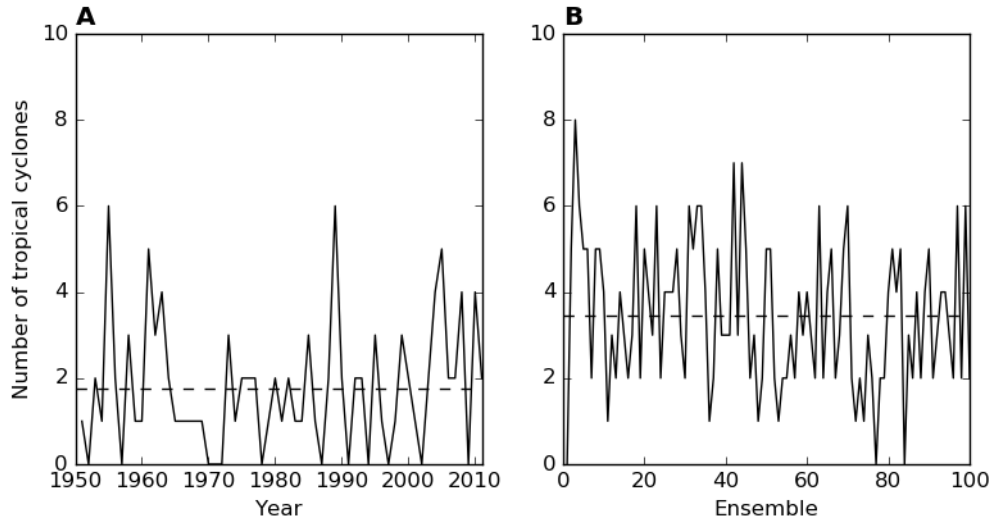


Fig. S7. As in Fig. 4 but for long-lived TCs (>2.0 days).

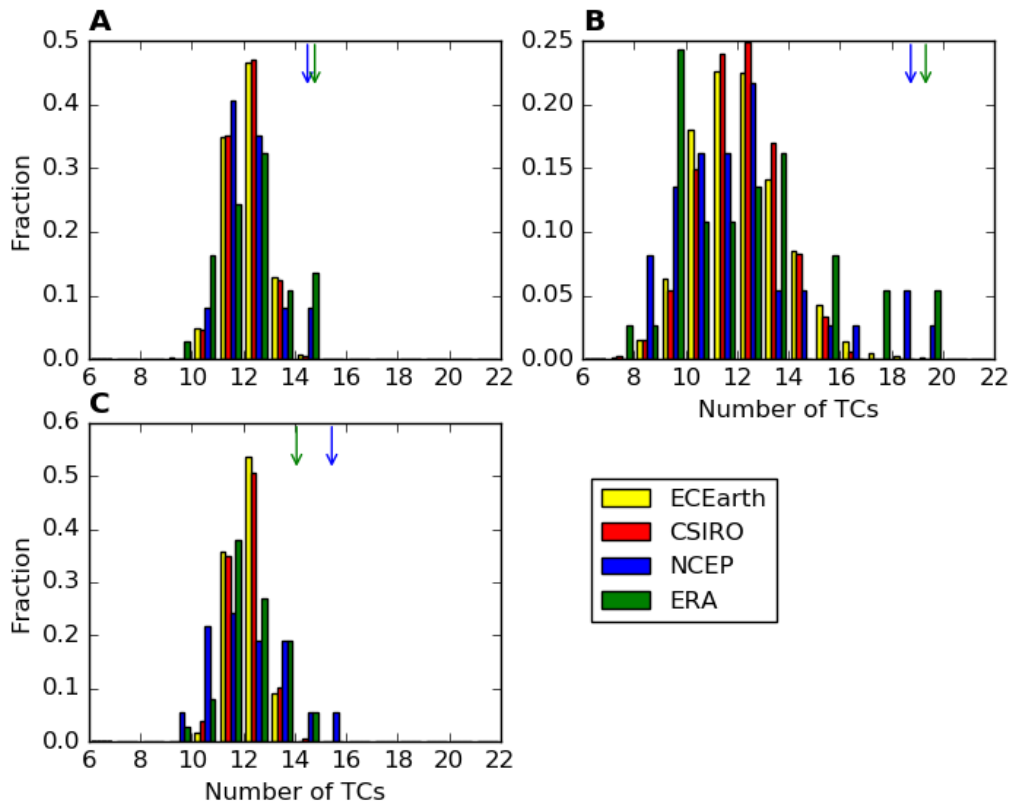


Fig. S8. Distribution of mean-scaled numbers of North Atlantic TCs calculated in reanalysis and model data. Histograms of normalized mean-scaled **A** EN, **B** TIP and **C** CGI calculated annually on a $5^\circ \times 5^\circ$ grid in the CSIRO and EC-Earth models and the NCEP2 and ERA-I data. The arrows show the values for the year 2005 as calculated from the respective GPIs and reanalysis data set, indicated by the arrow color. Note that the observed number of NATl TCs for 2005 (28) is off the scale to the right.

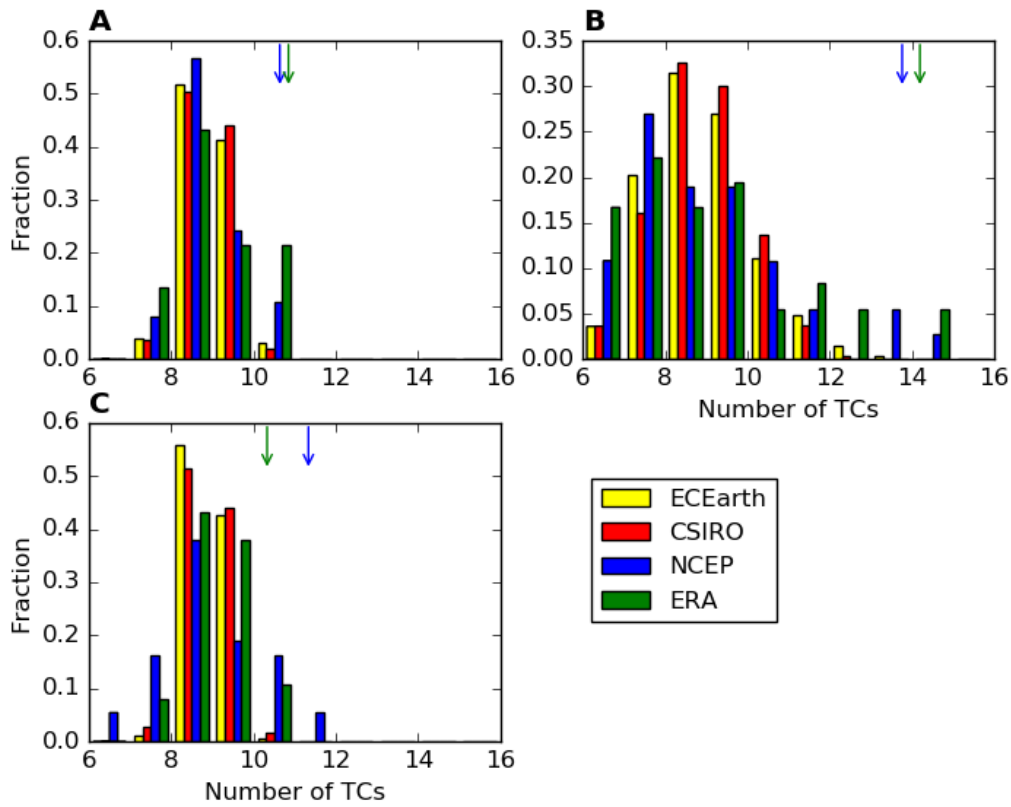


Fig. S9. As in fig. S8 but scaled to long-lived TCs. Note that the observed number of NATl long-duration TCs for 2005 (20) is off the scale to the right.

Table S1. As in Table 1 but for long-lived TCs only.

| Dataset for comparison | GPI | Model | | |
|-------------------------------|------------|-----------------------|-------------------------|--------------------------|
| | | CSIRO (5000 years) | ECEarth (1000 years) | MRI (m050) (61 years) |
| Long-duration only TCs | EN | <0.05 % (1.9 %) | 0 % (2.5 %) | 0 % (4.9 %) |
| | TIP | 0.1 % (2.4 %) | 0.4 % (3.2 %) | 0 % (1.6 %) |
| | CGI | 0.1 % (2.0 %) | 0 % (2.4 %) | 0 % (1.6 %) |

| | | | | |
|-------------|------------|-------------------|-------------------|-------------------|
| ERA | EN | 1.9 % (10.1 %) | 2.4 % (10.7 %) | 4.9 % (13.1 %) |
| | TIP | 1.0 % (7.1 %) | 1.9 % (7.7 %) | 1.6 % (9.8 %) |
| | CGI | 3.7 % (12.6 %) | 4.7 % (14.5 %) | 4.9 % (14.8 %) |
| NCEP | EN | 0.9 % (7.1 %) | 0.9 % (7.6 %) | 0 % (6.6 %) |
| | TIP | 1.3 % (7.4 %) | 2.0 % (8.1 %) | 1.6 % (9.8 %) |
| | CGI | 2.0 % (9.4 %) | 2.2 % (10.9 %) | 1.6 % (11.5 %) |