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ERRATUM

Erratum to: Summer interactions between weather regimes and surface ocean in the North-Atlantic region

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The statistical test chosen to estimate the significance level of the difference between the persistence of a regime in a sensitivity experiment and in the control experiment underestimated the uncertainty on this difference. The resulting decision making procedure rejects too frequently the null hypothesis H_o that this difference equals 0. A new bootstrap test has therefore been developed:

The mean persistence of a weather regime in an experiment is computed 1,000 times by drawing randomly and with replacement the same number of values of persistence than the sample size, where the sample size is the number of weather regime episodes. Then, 1,000 differences are computed between the 1,000 persistence values in the sensitivity experiment and the 1,000 ones in the control experiment. These 1,000 differences allow to build a histogram and thus to estimate the distribution of the difference between the persistence of the regime in the sensitivity experiment and its persistence in the control. From this distribution, we can perform a two-sided test of hypothesis to assess if this difference is equal to zero or not. We obtain significance levels ranging from 70 to 90% instead of 85 to 99% as given in the original article.

To state whether the changes in mean persistence induced by sea surface temperature anomalies are statistically relevant or not, the set of five experiments consisting of an ensemble of 50 simulations of the summer (June–August) season was complemented by another set of ensembles of 50 simulations. From the five experiments consisting each of 100 members, the significance level of the difference between the persistence of a regime in a sensitivity experiment and its persistence in the control can be computed according to the test described above.

The only change in mean persistence which reaches the 95% significance level is the decrease in NAO-persistence by 1.11 days when the atmosphere is forced with the pattern of SST induced by the NAO-regime instead of the climatology (CTL). The p value is lower than 0.01. We conclude that the interaction with the ocean surface induces a negative feedback onto the NAO-regime persistence. However, the results about the role of the interaction with the marine surface on transitions from the Atlantic Ridge toward the NAO-regime and from the Atlantic Low toward the Blocking regimes do not seem to be robust. Furthermore, the role of the marine surface as producing a positive feedback on the Blocking regime do not seem to be robust.

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