A prediction model for the Atlantic Basin tropical storm frequency using a year-to-year increment approach

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This sutdy presents a year-to-year increment approach to forecasting the Atlantic tropical storm frequency (ATSF) for the major storm season (June-October). The year-to-year increase or decrease in ATSF is first forecasted to yield a net ATSF prediction. Seven key predictors for the year-to-year increment in the number of Atlantic tropical storm have been identified that are available before May 1, so that the operational seasonal forecast can be made a month in advance. The forecast model for the year-to-year increment of ATSF is first established using a multi-linear regression method based on data taken from 1965-2007 and the forecast model of ATSF is derived. The prediction model for ATSF shows a good prediction skill in a cross-validation test for 1965-2006, with an average absolute error (MAE) of 2 and a correlation coefficient of 0.77, accounting for 60% of ATSF variability. This work demonstrates that the year-to-year increment approach has the potential to improve the operational forecasting skill for ATSF