Plain Language Summary: This study systematically evaluates the accuracy, trends, and error sources of three centers as the China Meteorological Administration (CMA), Joint Typhoon Warning Center (JTWC), and Regional Specialized Meteorological Center Tokyo-Typhoon Center (RSMC-Tokyo) for western North Pacific tropical cyclone (TCs) intensity forecasts between 2005 and 2018. The results of the study confirm the steady progress of the intensity forecast in the three centers in recent years. Meanwhile, the intensity forecast skill still needs to be greatly improved for the rapidly intensification (RI) TCs.
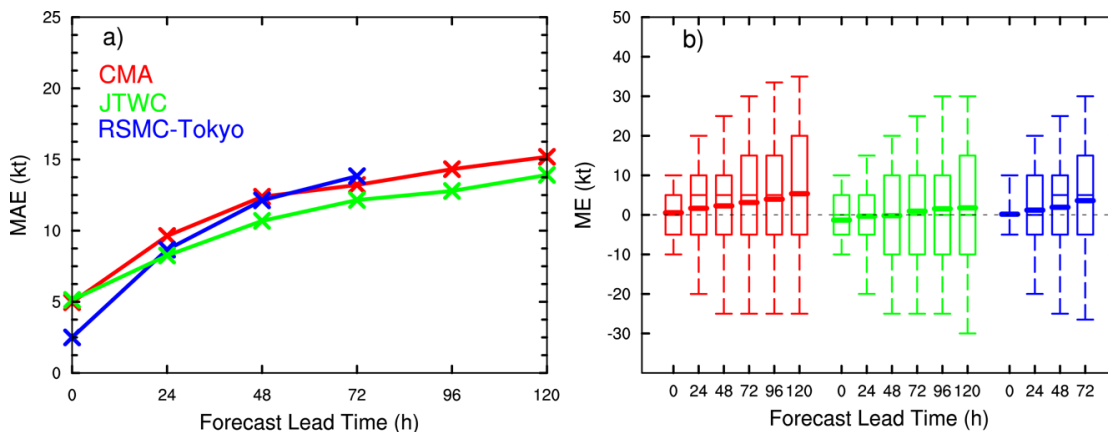
Fig. 1. The (a) MAE and (b) ME of the (red) CMA, (green) JTWC, and (blue) RSMC-Tokyo relative to RSMC-BTD. In the boxplot, the bars at the top (bottom) of the lines represent the 95th (5th) percentile of the ME. The top (bottom) bounds of the boxes represent the 75th (25th) percentile of the ME. The thick (thin) bars inside the boxes represent the mean (median) of the ME.

Highlights:

- The TC intensity forecast accuracy performances are as follows: 24–48 h, JTWC > RSMC-Tokyo > CMA; 72 h, JTWC > CMA > RSMC-Tokyo; and 96–120 h, JTWC > CMA.
- The improvements in TC intensity forecasting are marginal but steady for all three centers. The 24–72 h improvement rate is approximately 1%–2% yr^{-1}.
- The three centers generally have higher skill scores associated with forecasting of rapid weakening (RW) events than rapid intensification (RI) events. Overall, the three centers are not skillful in forecasting RI events more than three days in advance.