Supplement Material

**Figure S1.** The $mRMSE$ time series of the predictions of (a)LETKF-Ext and (b)RC-Obs noisy observation. Each color corresponds to the value of observation error parameter $e$.

**Figure S2.** The $mRMSE$ time series of the predictions of (a)LETKF-Ext and (b)RC-Obs with temporary sparse observation. Each color corresponds to the value of observation frequency. (If observation frequency is set to $n$, then we use the observation once in $n$ timesteps.)
Figure S3. The \( rmse \) time series of the predictions of RC-Anl with various length of training data.

Each color corresponds to the value of the size of training data.