

**Supplemental Fig. 2** First three leading EOF patterns, as in Fig. 10, but of high-pass SSTA in the North Atlantic for a selection of model simulations and observations. In addition to the observations, the CMIP3 and CMIP5 super models, the models with the largest (CSIRO-Mk3.0) and smallest (CGCM3.1 (T47)) RMSE $_{EOF}$  value are shown.