



Figure 1. 10-year series of monthly-mean, spatially averaged 2 meter surface temperature from the MIROC5. Top plots in each panel correspond to NCEP-2 and ERA-Interim reanalyses. The three remaining plots in each panel correspond to the three different types of simulations, in vertical descending order, decadal, historical, control (labeled “M-” for model in the header). Three realizations of each model simulation are indicated by different line types. Top panels: Global (left) and tropical (right). Bottom panels: Northern (left) and Southern Hemisphere (right).

widespread use in climate science. We develop a data-driven model diagnostic method and protocol with potential application to future CMIP model evaluation.

Many attempts have been made to characterize the climate response to external and internal forcing simulated in the CMIP5 experiments. Simulated internal variability is of particular interest as there is evidence it influences trends in regional temperatures making model evaluation a challenge (Kay et al., 2015; Gibson et al., 2017; Perkins-Kirkpatrick et al., 2017). Separating