

## Decadal Climate Prediction: Challenges and Opportunities

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Forcing atmospheric models with the observed time history of global sea surface temperatures (SSTs) has often produced understanding of past climate anomalies. For predictions of climate change over the next few decades, it is therefore essential to have the future patterns of SSTs around the globe simulated as accurately as possible. It is not possible to make such predictions without initialization of the oceans and other aspects of the climate system. The extent to which this leads to predictability is not yet clear, but the underlying hypothesis is that there is significant predictability, in addition to that associated with anthropogenic climate change, that can be exploited for improved adaptation and planning by decision makers. Early tests of this approach show the promise and benefit of initializing models; yet, there are significant challenges. For instance, initial conditions for the global ocean could be provided by existing ocean data assimilation exercises, but salinity reconstructions prior to the ARGO float near-global upper ocean salinity and temperature data remain a significant problem. Coping with systematic errors in models is also a challenge in assimilating real observations. I will give an overview of these and other challenges, as well as some of the tantalizing evidence that suggests there is decadal predictability in the system.