Using Seasonal Forecasting Data for Vessel Routing

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We present an assessment of seasonal forecasting of surface wind speed, significant wave height and ocean surface current speed in the North Pacific for potential use of vessel routing from Singapore to San Diego. WaveWatchIII is forced with surface winds and ocean surface currents from the Community Climate System Model 4 (CCSM4) retrospective forecasts for the period of 1982-2015. Several lead time forecasts are used from zero months to six months resulting in 2,720 model years, ensuring the findings from this study are robust. July surface wind speed and significant wave height can be skillfully forecast with a one month lead time, with the western North Pacific being the most predictable region. Beyond May initial conditions (lead time of two months) the El Niño Southern Oscillation (ENSO) Spring predictability barrier limits skill of significant wave height but there is skill for surface wind speed with January initial conditions (lead time of six months). In a separate study of vessel routing between Norfolk, Virginia and Gibraltar we demonstrate the benefit of a multimodel approach using the North American Multimodel Ensemble (NMME). In collaboration with Charles River Analytics an all-encompassing forecast is presented by using machine learning on the various ensembles which can be using used for industry applications.