

Potential Predictability of Seasonal Mean River Discharge in Dynamical Ensemble Prediction using MRI/JMA GCM

Tosiyuki NAKAEGAWA

([tnakaega at mri-jma.go.jp](mailto:tnakaega@mri-jma.go.jp))

Meteorological Research Institute, Japan Meteorological Agency, Tsukuba, Japan

The potential predictability of seasonal mean river discharge at a river mouth is investigated based on a dynamical ensemble approach with an atmospheric general circulation model. The difference in predictability between river discharge and net water flux into the ground (P_E) tends to increase with an increase in basin area because the collection of total runoff through the river routing network reduces unpredictable variability. The travel time through the river channel network shifts the phase of the predictability of river discharge and inverts the magnitude relation of the concurrent predictability between river discharge and P_E. Snow accumulation and the melting process also delay the phase in mid- and high latitude river basins. The effects of land surface hydrological processes on river discharge include improvement, phase shift, and smoothing of the predictability, leading to unique features in the potential predictability of seasonal mean river discharge, different from those of P_E.