Statistical Downscaling Using Multi-Model Ensemble Seasonal Forecasts

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Demand for high resolution seasonal climate forecasts in variety of socio-economic sectors, like agriculture, energy, health, tourism, and insurance is continuously increasing.. Practical interest of seasonal predictions lie in their potential economic benefits in planning for future. Most end users require seasonal climate information on much finer spatial scale than that of present day operational global seasonal prediction models which typically have a resolution of few hundred kilometers. Although these General Circulation Models (GCM) s are able to simulate large scale features reasonably well, they exhibit a rather poor skill in simulating finer spatial as well as temporal scales. To fill the gap between coarse resolution outputs available from GCMs and need of the end users, a variety of statistical downscaling techniques have been developed. Statistical Downscaling methods establish a historical empirical statistical relationship between one or several large scale variables (predictors) and local scale variables (predictands) and then predict future local changes by means of sensibly projecting the predicted large scale information on the local scale. In the recent decade the Multi-Model Ensemble (MME) technique has gained tremendous popularity in operational seasonal climate prediction. It has been demonstrated that MME forecasts in general have better skills relative to that of individual constituent models. Combining both MME and statistical downscaling, a method is developed for seasonal forecasting of temperature and precipitation in East Asia at station level. The method, some results, prospectus for operational local seasonal prediction, associated challenges and future plan is discussed.