Toward a better estimation of catchment-wise evapotranspiration

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(a) Purpose of study or research hypothesis

Evapotranspiration occupies a large portion of hydrological cycle, while its estimation is of high uncertainty. We aim to reduce such uncertainty by adopting cross-disciplinary principles.

(b) Key issue(s) or problem(s) addressed

*Long-term evapotranspiration can be at least roughly estimated from water budget, but downscaling the estimated value into daily scale has been a challenge.
*Classical methods to measuring evaporation is to use the evaporation pan. However, this is merely for potential evaporation. Further, a growing number of pan evaporation sites are removed due to financial reason and so we need a model to continuous estimation.
*Ultimately, we need evapotranspiration estimation over an entire catchment but this is of high uncertainty and little observation.

(c) Methodology or approach used

*Downscaling method to estimate daily value from annual value using precipitation signal will be discussed.
*We will also discuss about a mathematical model to estimate pan evaporation.
*Maximum entropy production principle is used for catchment-wise evapotranspiration.

(d) Results or conclusions derived from the project

*We demonstrate that precipitation signal can be a good proxy of humidity and so can be useful for downscaling.
*We build a mathematical model to simulate evaporation from Korean D20 pan, which can replace current practice of Penman-Monteith equation.
*We apply the Maximum entropy production principle to estimate catchment-wise evapotranspiration.

(e) Implications of the project relevant to congress themes

For IWRM, obtaining basic data about hydrological fluxes such as precipitation, runoff, and evapotranspiration is elementary requirement. Among those, evapotranspiration is of largest uncertainty. In this talk, efforts to reduce such uncertainty and research needs will be addressed.

Keywords : evapotranspiration