

YEH(葉) LAB.

[Hydro-climatic Analysis and Modeling]

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Hydroclimatic Analysis and Modeling

Surface Hydrology Modeling & Water Balance, Storage, and Circulation in Atmosphere and on Land Surface Innovation Project Climate Change Prediction 21 (21世紀気候変動予測革新プログラム)

Hydrologic Responses to Climate Change

Our research focus is to enhance understanding and predictions of the fundamental hydro-climatic processes, and their mutual interactions governing the water and energy cycles over a wide spectrum of spatial and temporal scales. The main approach used is the macro-scale hydrologic modeling in combination with *in-situ* and remote sensing observations from the regional- to global-scale.

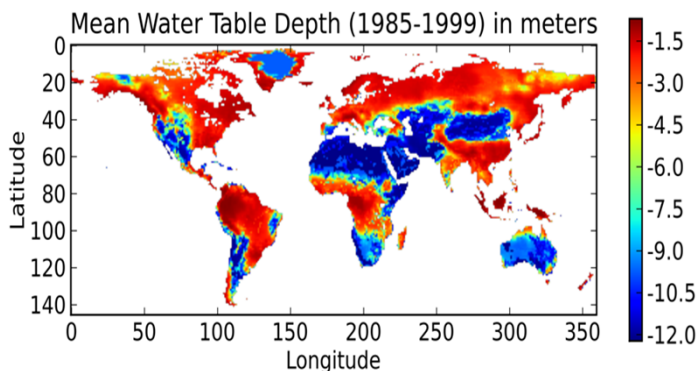


Fig. 2. Global pattern of 1985-99 mean groundwater depth as simulated by the land surface hydrological model MATSIRO.

YEH laboratory was established in Sept. 2007 under the financial support of the Kakushin Project "Innovation Project Climate Change Prediction 21 (21世紀気候変動予測革新プログラム)".

The research in this laboratory are strived to investigate important issues under changing climate conditions such as the impacts on the sustainability of regional water resources, agriculture and ecosystem, the prediction of regional droughts and floods as sources of significant hazards to human welfare, and the assessment of mutual impacts and feedbacks between climate changes and regional to global hydrologic cycle.

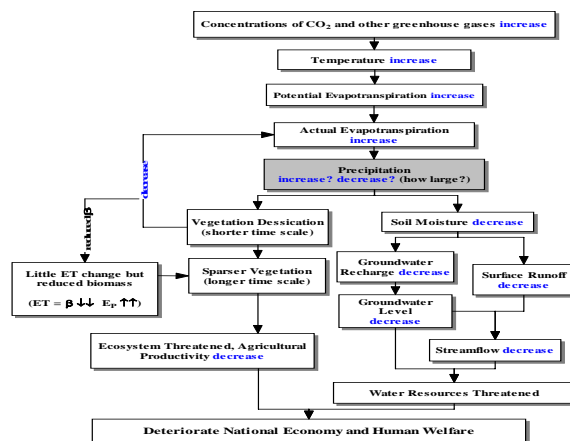


Fig. 1 Environmental Problems related to Hydrology caused by climate change due to increased greenhouse gases.

Our current research directions include:

- (1) Representation of water table dynamics in global hydrological model;
- (2) Remote sensing in hydrology – GRACE observations of terrestrial water storage;
- (3) Role and response of groundwater in the hydro-climate system and under changing climate;
- (4) Scale issue: sub-grid variability and spatial aggregation.

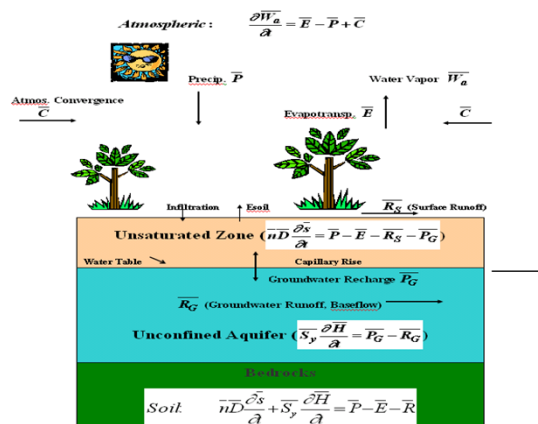


Fig. 3. A schematic Diagram of the Land Surface Balance and Atmosphere Water Balance