



How Are Water Flow Pathways Influenced by the Monsoon?

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Water Flow Pathways are the different courses followed by water fluxes within a catchment, namely: surface runoff, subsurface flow, groundwater flow and transpiration (Fig. 1).

Problem Statement

The flow of water through different pathways within a forested catchment influences the timing and magnitude of surface runoff, residence times of water within the catchment, and thus water discharge at the outfall of the catchment. Precipitation amount and intensity as well as other processes can exert a strong influence on water flow pathways.

Objectives

1. To quantify fluxes of the water balance of a forested catchment.
2. To quantify residence times of water within a forested catchment.
3. To quantify the temporal variability of water flow pathways within a forested catchment and identify the main processes regulating this variability.

Hypotheses

1. The residence time of water increases with soil depth and does not vary with lateral distribution.
2. The contributions of subsurface and groundwater flow to storm hydrographs increase with antecedent soil moisture conditions.
3. The runoff ratio of storm hydrographs displays a consistent threshold response to the sum of antecedent soil moisture and precipitation amount.

Relevance of the Project within the TERRECO-IRTG

The project will provide a **process-based conceptual model of water flow pathways within a forested catchment under the influence of the monsoon**. This conceptual model will be used to:

- Improve the parameterization and calibration of the Soil and Water Assessment Tool in relation to the water balance estimation of the Soyang Lake and Watershed
- Assess the influence of the monsoon on water quality through water flow pathways and residence times by integrating information on nutrient transport and processing from projects such as Lee et al. and Parra et al.
- Compare the processes of water flow pathways and nutrient transport between forested areas and agricultural areas by using the results of projects such as Bartsch et al. and Shope et al.
- Facilitate the transfer of knowledge between scientists and policy-makers

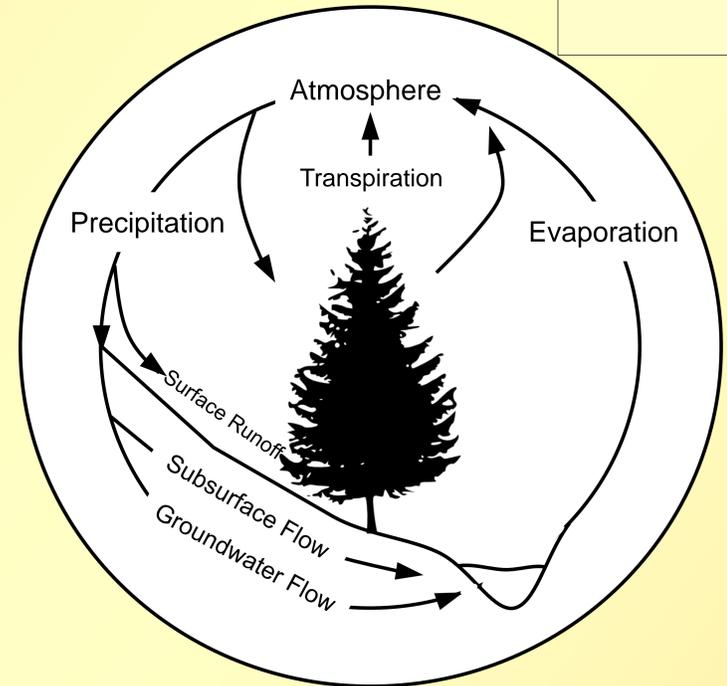


Figure 1. Water fluxes within a forested catchment (adapted from Brown, 1980).

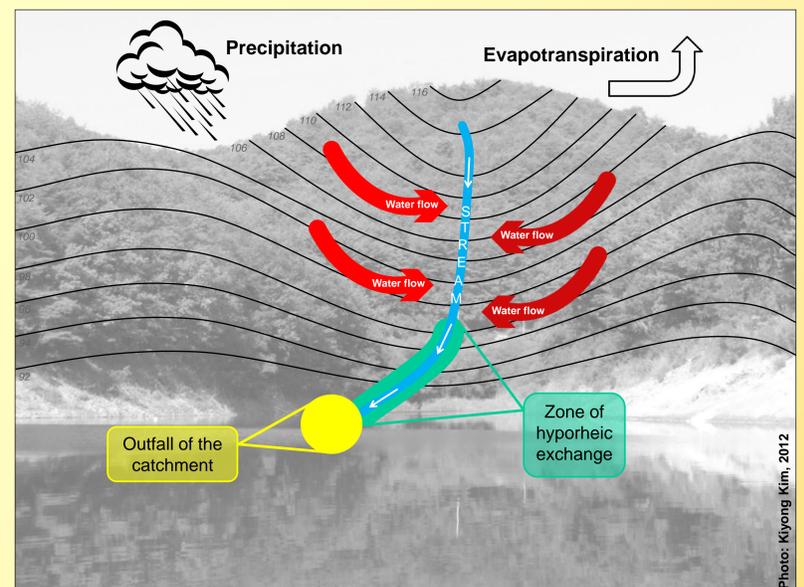


Figure 2. Graphic representation of a simplistic conceptual model of water flow within a forested catchment.