# Application of a Distributed Model Based on OHyMoS to Korea River Basin

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## 1. Background

Physics-based distributed rainfall-runoff models are now commonly used in a variety of hydrologic applications such as to estimate flooding, water pollutant transport, sedimentation yield and so on. Moreover, it is not surprising that GIS has become an integral part of hydrologic research since this technology offers abundant information about spatial heterogeneity for both model parameters and the input data that control hydrological processes. In Korea, various hydrologic modeling systems have been available for a flood control of large scale basins. However, most modeling systems were developed based on a simple lumped rainfall-runoff model, not able to take account of basin topography. In addition, several modeling system excluded a dam reservoir effect on rainfall-runoff process even though it is very significant on large basin's water management. This study aims at developing an integrated hydrological model for Korea major river basin (Guem-river basin) by combining a distributed rainfall-runoff module with a dam reservoir operation module under Object-oriented Hydrological Modeling System (OHyMoS).

## 2. Introduction of Guem-river Basin Model (GBM)

The GBM consists of the following three element modules of OHyMoS.

1) Slope Runoff Element Module (SREM); the SREM represents saturated-unsaturated subsurface and surface runoff of each grid cell within a sub-catchment of interest.
2) River Routing Element Module (RREM); this module performs river routing using the simplified kinematic wave method along the channel network derived from digital vector or raster channel data.
3) Dam Reservoir Element Module (DREM); this module reflect specific operation rules to each dam reservoirs within a study site.

## 3. GBM Construction (still ongoing)

The Guem-river basin (9,900km$^2$) was delineated by 250m DEM and then it was divided into 14 mid-catchments and 80 sub-catchments where correspond to the Water Management Information System (WAMIS) digital map in Korea. Each sub-catchment was represented by slope components and channel components and water flow among these elements was simulated by SREM and RREM. Moreover, two multi-purpose dams' outflow were calculated by DREM and then used as downstream inflows. The GBM can provide sub-catchment outflow and dam in/outflow such that users can readily obtain the integrated hydrological information regarding the Guem-river basin.

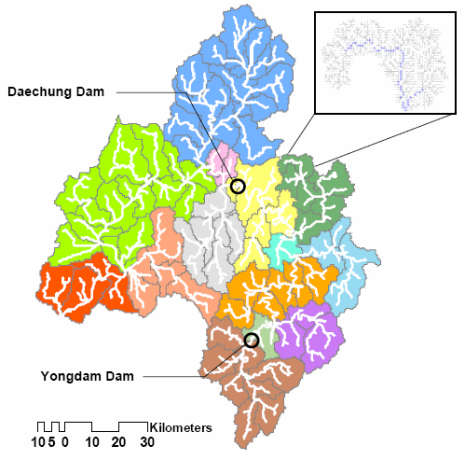


**Fig. 1** Geo-data processing for the GBM building.