
Spatially Distributed Hydrologic Modeling

Issue Area	Development of GIS-Based Hydrologic Simulation Models for Streamflow Forecasting, Soil Erosion Prediction, and Water Quality Modeling
What's the Challenge?	<ul style="list-style-type: none">• Development of the next-generation of hydrologic simulation models that can provide not only streamflow but also spatial information on snow distribution, soil moisture, and runoff source areas• Making full use of GIS, digital elevation models, and spatial data sets for the parameterization of models• Improving the physical basis of models, while at the same time making them easier to calibrate• Development of models that can address multiple resource management issues, such as streamflow prediction, soil erosion, water quality, and effects of land management practices
What Are We Doing?	<ul style="list-style-type: none">• Collaborating with the ARS (Boise, Idaho) in the development and application of a spatially distributed energy budget snow simulation model• Collaborating with the Ruhr University (Bochum, Germany) in the development and application of a spatially distributed water balance and streamflow simulation model• Testing additional sensors (solar radiation, wind, humidity) at SNOTEL sites to provide needed data for modeling• Participating in the development of the AGNPS98 model• Developing spatial interpolation algorithms to provide fields of meteorological model input data derived from point observations at SNOTEL and climate stations
Status	<ul style="list-style-type: none">• Test applications of the spatially distributed snow model have been made for the Park City area of Utah and the Boise River basin in Idaho• Second application of snow model to the Boise River is underway, and an application to the Prüm watershed in Germany is planned• Snow model is being linked to the water balance model to simulate streamflow hydrographs
What's Left?	<ul style="list-style-type: none">• Complete model testing• Revise model algorithms based on test applications• Incorporate models into a standard interface / modeling environment, such as the Modular Modeling System of the USGS• Develop input data preparation utilities and links with databases to streamline the operational use of the models