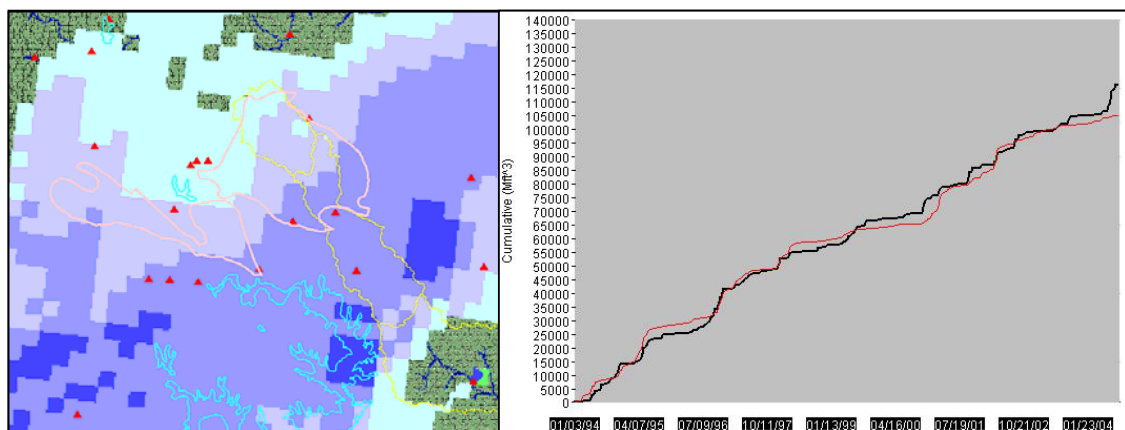


## **Distributed estimation of rainfall, runoff and recharge: Innovative uses of radar, geospatial data and distributed modeling.**

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Understanding the amount of hydrologic water balance components at gauged and ungauged locations is important for establishing available water resources. Estimation of distributed recharge components requires the integration of meteorological measurements for rainfall and evapotranspiration, soil and landcover properties, and digital terrain within a modeling framework. Exploitation of groundwater resources can diminish surface water resources in this coupled surface-groundwater system. Figure 1 shows rainfall input to a distributed model representing the region at 200 m, and simulated runoff volume over a ten year period. Recharge estimation is accomplished using the distributed hydrologic model *Vflo*<sup>TM</sup>. The model is setup using digital datasets for the region, and calibrated to estimate distributed rainfall-runoff and subsequent recharge. Over ten years of NEXRAD radar rainfall at hourly timesteps is input into the model for purposes of simulating runoff. Results indicate that simulated and observed runoff volumes are sensitive to assumed evapotranspiration rates. Calibration of the model through statistical evaluation results in improved estimates of runoff and other hydrologic water balance components. The model setup and calibration of the distributed hydrologic model is accomplished by explicit representation of distributed parameters in GIS format. Adjustment of the parameter maps preserves the spatial distribution while operating on the absolute value. This presentation will describe the study methodology used to identify recharge components of the hydrologic water balance using advanced model and radar rainfall technology.



**Figure 1 : Radar rainfall input to a distributed model (left) and simulated runoff volume (right).**