

Texas A & M University and U.S. Bureau of Reclamation
Hydrologic Modeling Inventory
Model Description Form

July 18, 2007

Name of Model: Global Hydrologic Evaluation Model (GHEM)

Model Type: Quasi-Three Dimensional

Model Objective(s): Simulate hydrologic system response to hydroclimatic system perturbations in a Monte Carlo format.

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Model Structure or Mathematical Basis: Eigenfunction expansion of state variables

Model Parameters: Atmospheric water content, quasi-geostrophic potential vorticity, land/sea surface temperature, hydrologic water storage; parameters for land cover, clouds, radiation absorption/emission, sensible heat, evaporation/condensation

Model Spatial Scale: 5 degrees latitude by 5 degrees longitude

Temporal Scale: Daily time step with monthly or seasonal mean output

Input Data Requirements: Initial state variable amplitudes, Hydroclimatic perturbation data

Computer Requirements: Workstation level computer (e.g. – SGI Origin 2000)

Parameter Estimation/Model Calibration: Satellite data used for parameter estimation;
Calibration to Observed Climatic Zonal Mean and Variance

Model Testing and Verification: Site specific match to observed climatic parameters

Model Application/Case Studies: Hydrologic response over western continental United States to ENSO event

Documentation: Dissertation by M. Anderson