Surface Water Balance (SWB) Model

(Modified Thornthwaite-Mather water balance model)

Newly developed by the US Geological Survey & the Wisconsin Geological and Natural History Survey:

- estimate temporal and spatial distribution of recharge at the watershed scale using:
  1. soil type
  2. land use
  3. climate
  4. topography
- very oriented toward GIS-based data
- balance between complexity, accuracy and practicality.

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Surface Water Balance (SWB) Model

Unique features:

- daily accounting
- surface water routing toward infiltration
- recharge at each cell location

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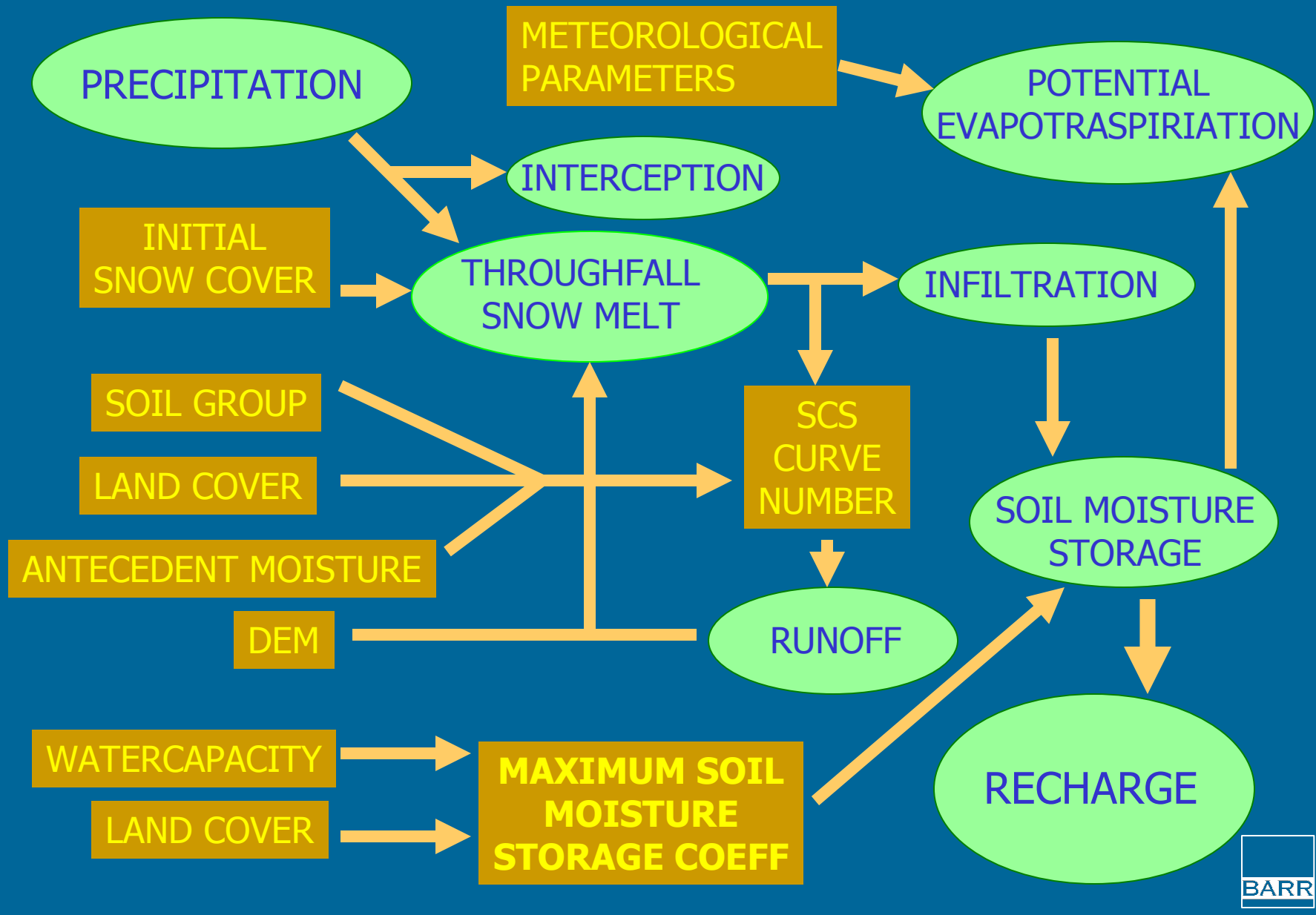
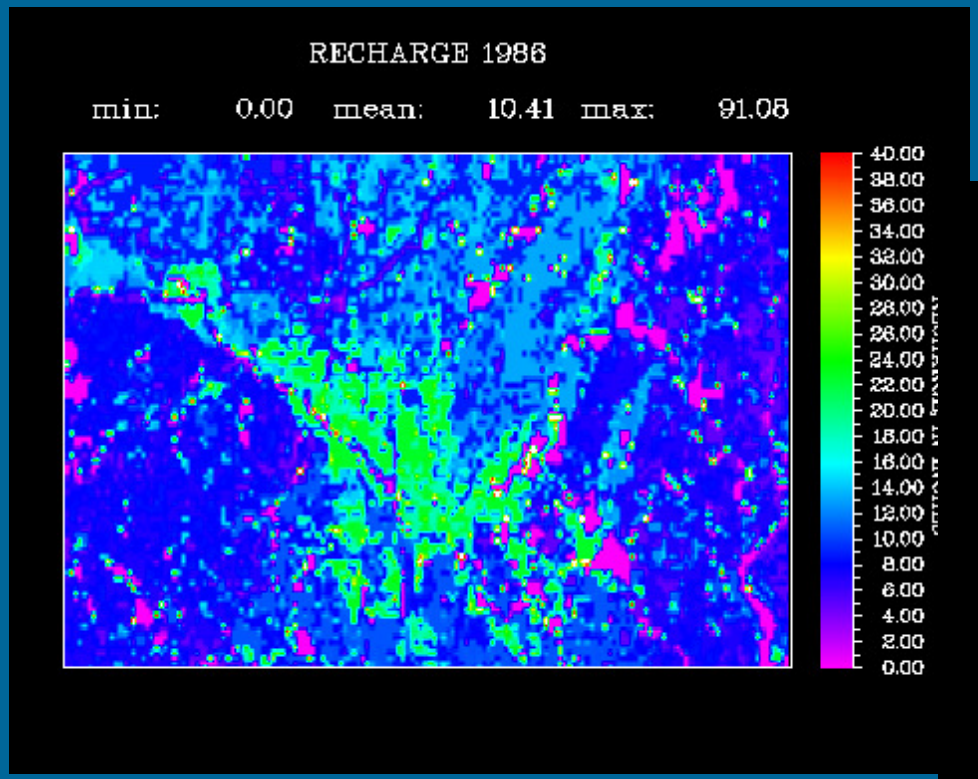
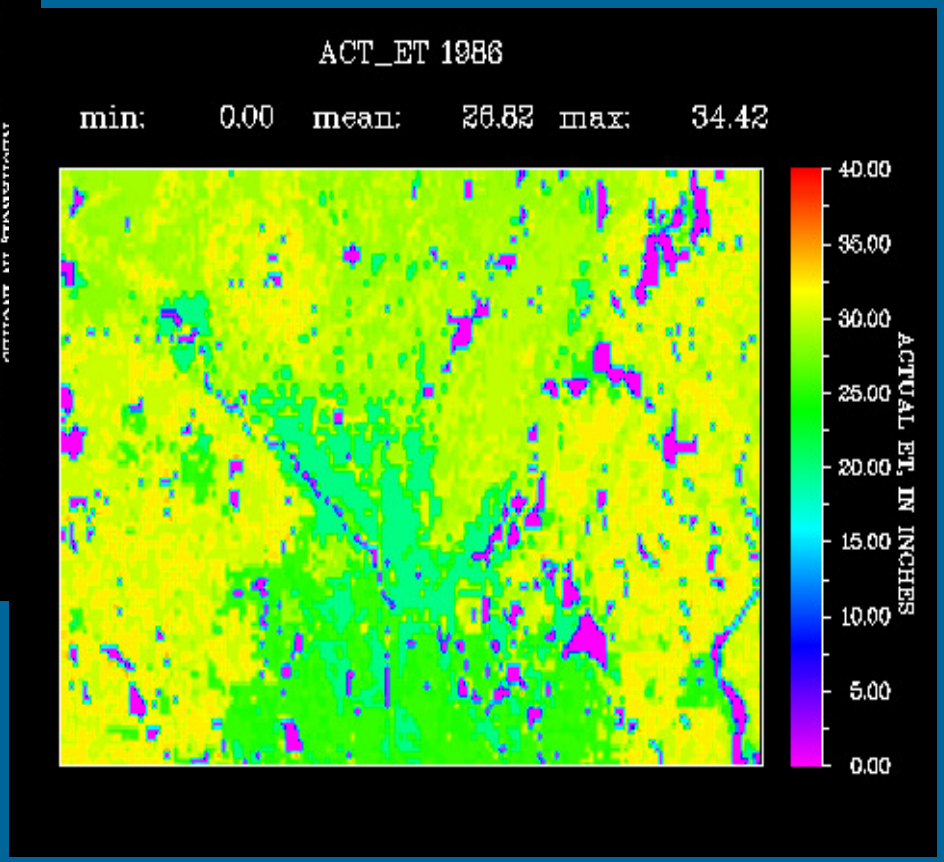
Surface Water Balance Model



Surface Water Balance Model (SWB)





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Surface Water Balance (SWB) Model

Designed to be used for:

- obtaining recharge values for regional GW models
- defining general patterns and degree of regional spatial variability
- assess annual & monthly temporal patterns and variability.

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Surface Water Balance (SWB) Model

Limitations:

- not for small, "site" scale – geologic properties used are generalized
- not for short time spans - does not consider depth to water table
- does not handle recharge refusal - frozen or saturated ground

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Dripps, W.R., Bradbury, K.R., A simple daily soil-water balance model for estimating the spatial and temporal distribution of groundwater recharge in temperate humid areas, Hydrogeology Journal (2007) 15: 433-444.