CI-WATER
A Utah-Wyoming Cyberinfrastructure Water Modeling Collaboration

EPSCoR Wyoming

NSF

Variable-Resolution Multi-Physics Modeling of the Upper Colorado River Basin

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University of Wyoming
New Thinking

In cooperation with:

BYU
Brigham Young University

Utah State University
College of Engineering

The University of Utah

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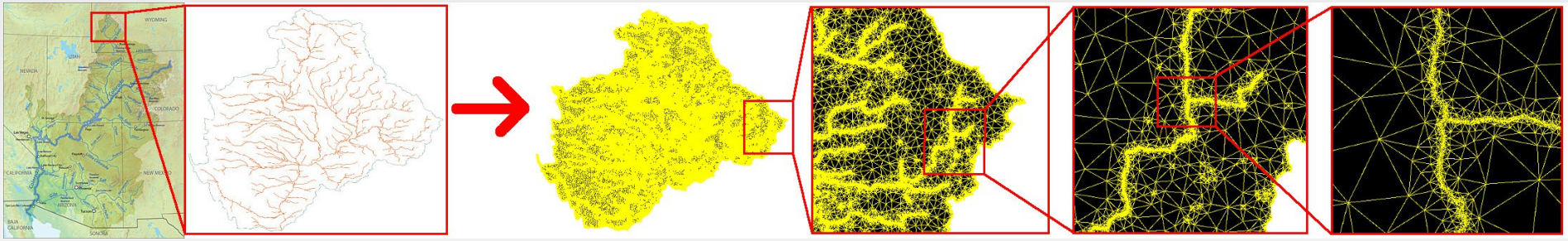
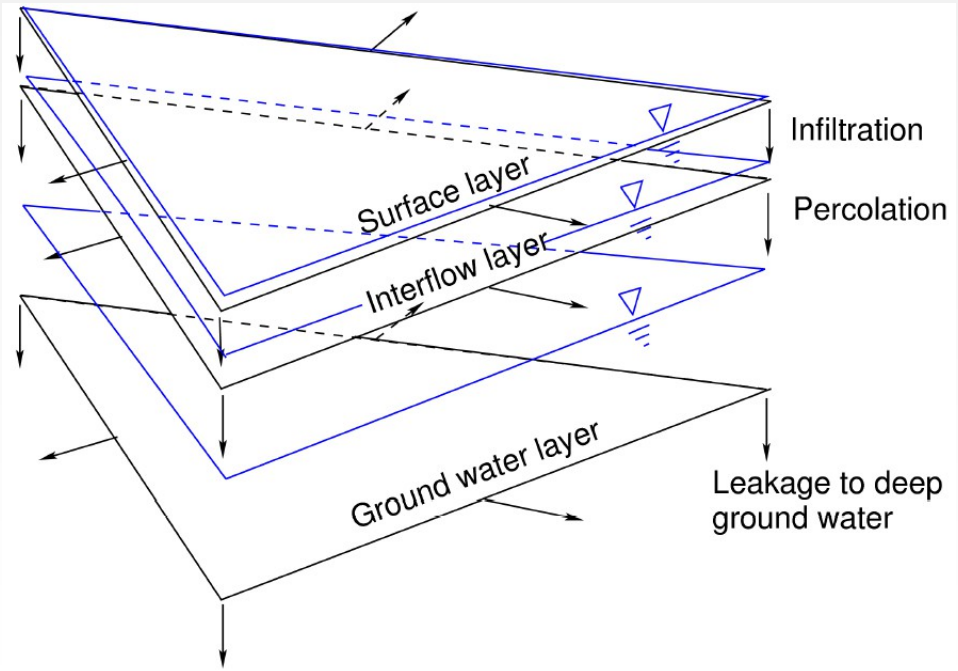
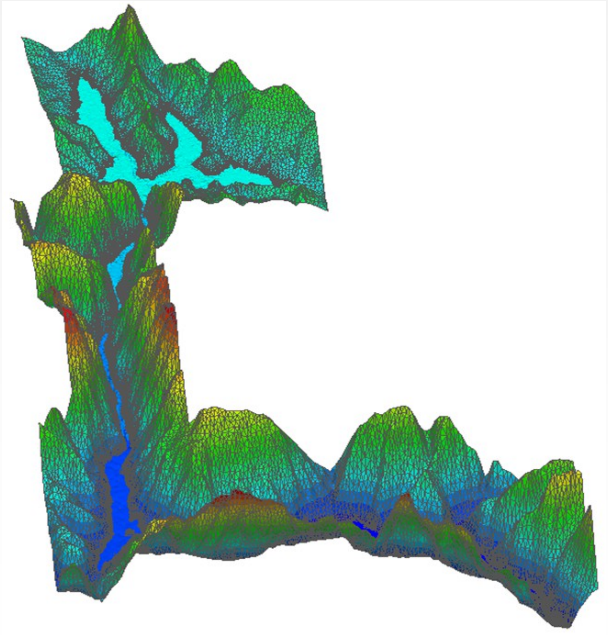
ADHydro

Variable Resolution Large Watershed Model







Model Design Philosophy

- Well defined and documented Application Programming Interface (API)
- Written in standard C
- Parallel load balancing by sub-watershed
- Open source (no proprietary code)
- Designed to facilitate addition of alternative process mathematical descriptions

Model Inputs

- Topography: USGS NED, SRTM
- Land use/land cover: remotely sensed or modeled.
- Soils: texture, layers, thicknesses
- Aquifers: alluvial and tributary transmissivity
- Streams: thalweg elevation, cross section, roughness distribution, lake/reservoir bathymetry
- Management: diversions, irrigated areas, water rights
- Forcing: dynamically downscaled climate simulations using Weather Research Forecasting (WRF) model

Cross-Section Estimation

- Channel forming discharge ~ 2y flow
- Tests of simple scaling in Rocky Mountains reveals three populations, all with slope ~ 0.75

Objectives for next 12 months

- Parallelize ADHydro code
- Incorporate Utah Energy Balance and Wyoming Energy Balance snowmelt schemes
- Test ADHydro in Green River headwaters catchment
- Communicate data needs/input structures/work flow to Utah
- Set up partitioner
- Run ADHydro in Parallel on entire Green River in Wyoming, February, 2014
- Release code and establish user community, 2014
- Collaborate with USBR and upper Basin water managers in developing reservoir simulation component.
- Incorporate irrigated areas, begin developing irrigation simulator, summer 2014

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Thank you