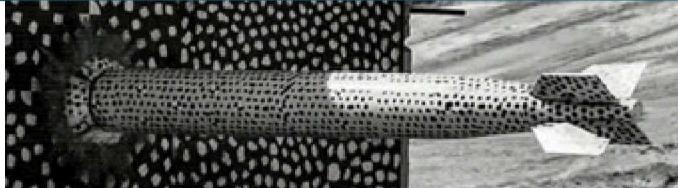


Automating multi-scale connections for global climate and hydrology models to local water policy models



Daniel Villa, Vincent Tidwell, Nicole Jackson



Sandia National Laboratories is a multimission laboratory managed and operated by National Technology & Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA0003525.

Automating multi-scale connections for global climate and hydrology models to local water policy models

- GOAL: Automatic connection between Global Circulation Models (GCM's) and local hydrology/policy
- Variable Infiltration Capacity (VIC) model -- runoff, baseflow, evapotranspiration
- **Routing VIC (RVIC) model**
 - Global Dominant River Tracing (DRT) hydrography dataset

River Basin scale

Depletions: Local evaporation, evapotranspiration, and adjustments to daily max/min temperature

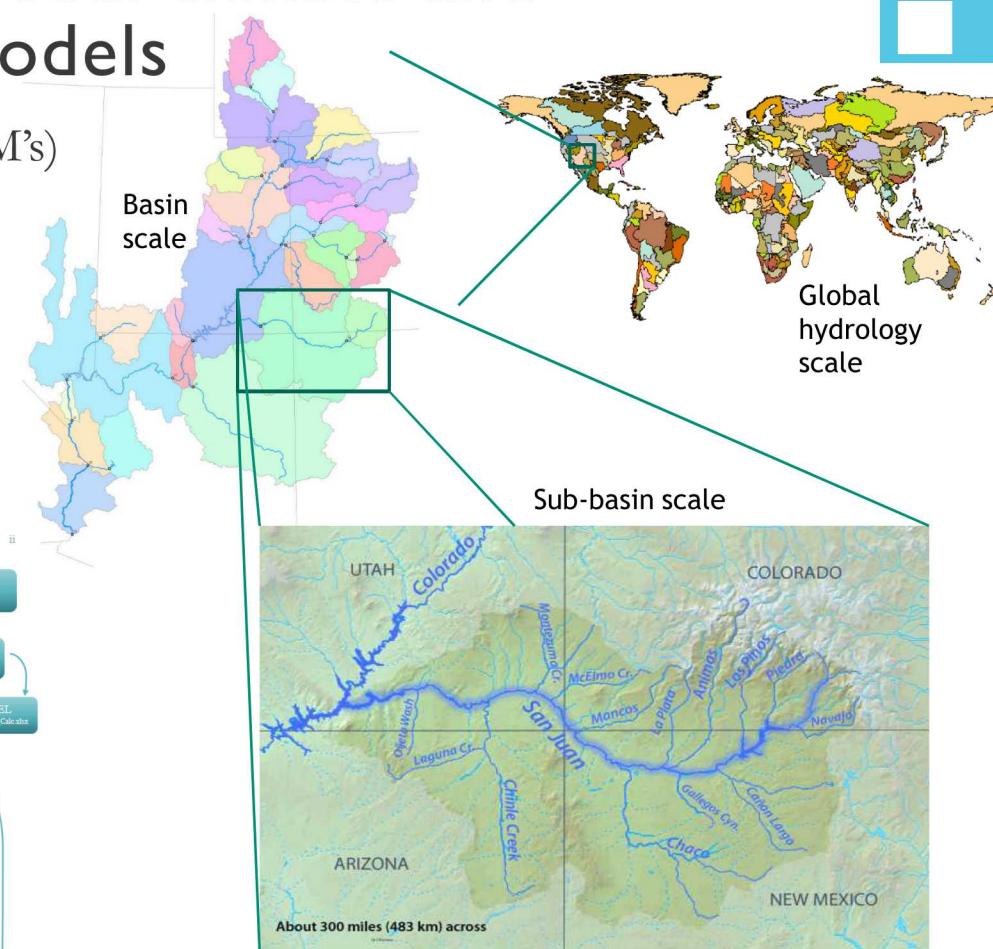
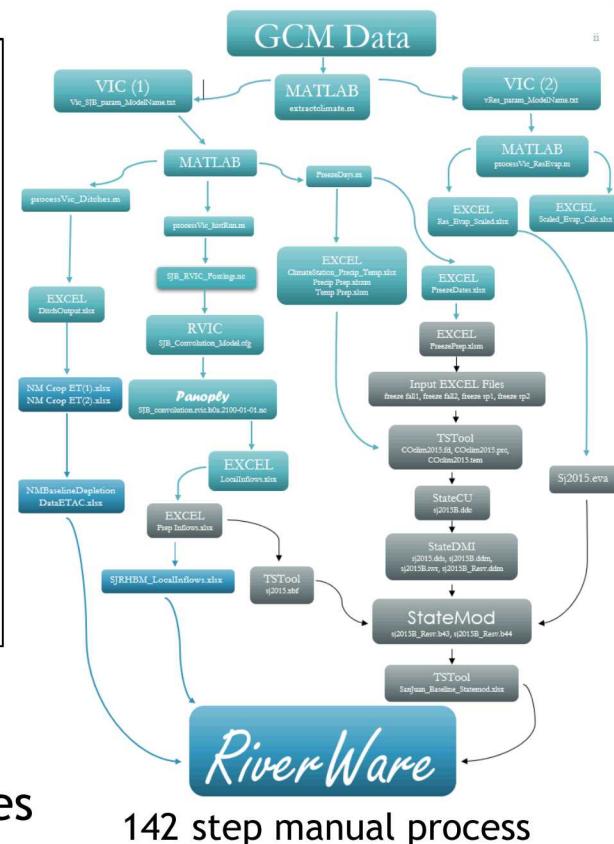
Reservoir surface evaporation

Runoff due to snow-pack

Reservoir operations rulesets

Inter-scale comparisons

Daily San Juan vs. Monthly Colorado River
Global vs. River basin scale



Gaps:

1. Continuous scaling
2. Global datasets adjusted by intuition
3. Globalized gridded demand “structure”
4. River-basin to sub-basin dynamic links for rulesets across scales

Online data sources → Python → Analysis results for several scales

RiverWare
142 step manual process