

WRF-Hydro Output Data:

May 2015

WRF-Hydro Development Team

```
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'dstGridName="geo_em.d03.nc"  
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ng.ncl
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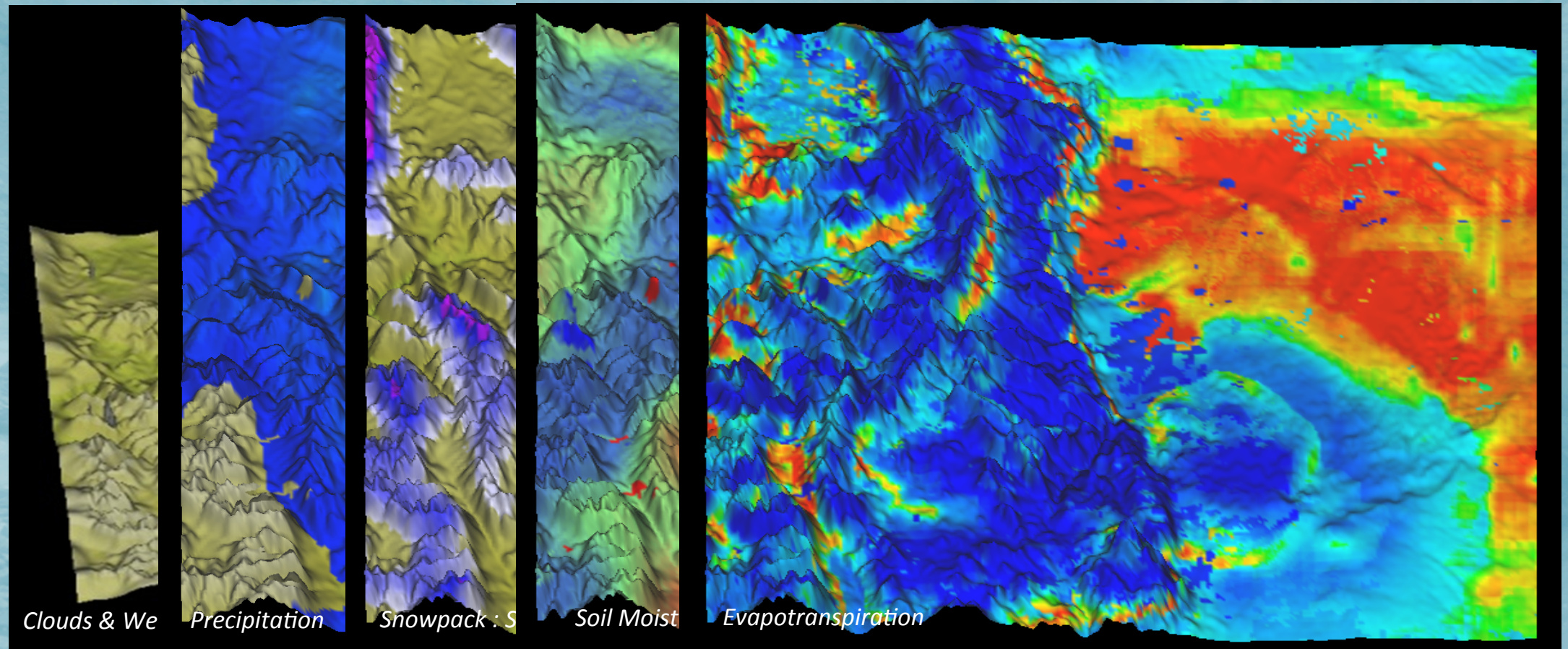
WRF-Hydro Outputs:

1. Model Outputs:

- a) Standard WRF model output, when run in coupled mode... “wrfout”
- b) LSM gridded output (netcdf) “LDASOUT”
- c) Routing outputs:
 - a) High resolution gridded output (netcdf, not common due to filesize) “RTOUT”
 - b) Channel-inflow (ascii timeseries) “qstrmvolt_accum.txt”
 - c) Station observations (netcdf point file AND ascii timeseries)
“frxst_pts_out.txt” “CHANOBS_DOMAIN3
 - d) Full channel network output (netcdf point file) “CHRTOUT_DOMAIN3”
 - e) Lake/reservoir output (netcdf point file) “LAKEGRID”
 - f) Groundwater/baseflow output (3 ascii timeseries files)

WRF-Hydro Outputs:

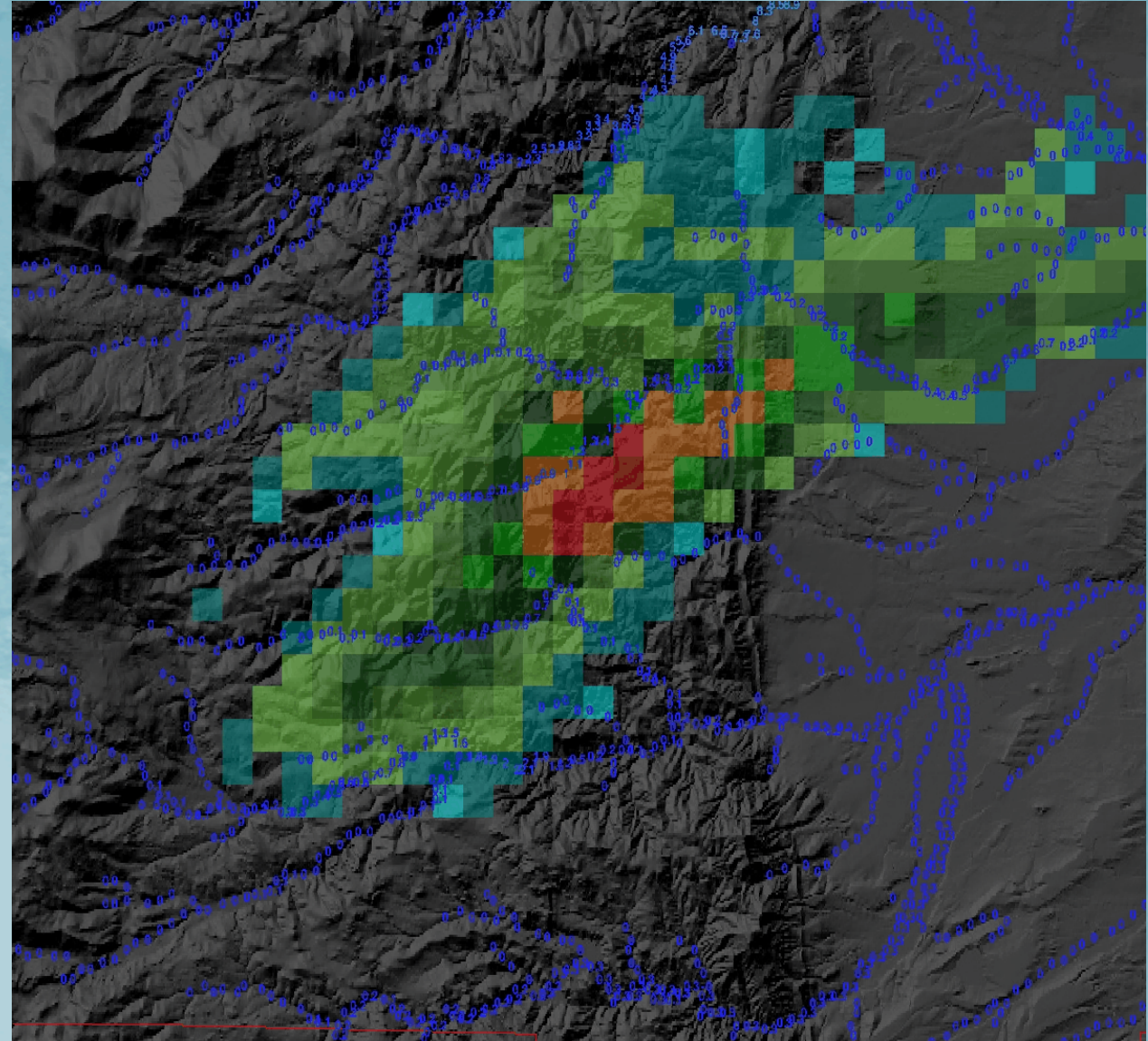
- Standard WRF/LSM outputs: (IDV visualization)



WRF-Hydro Outputs:

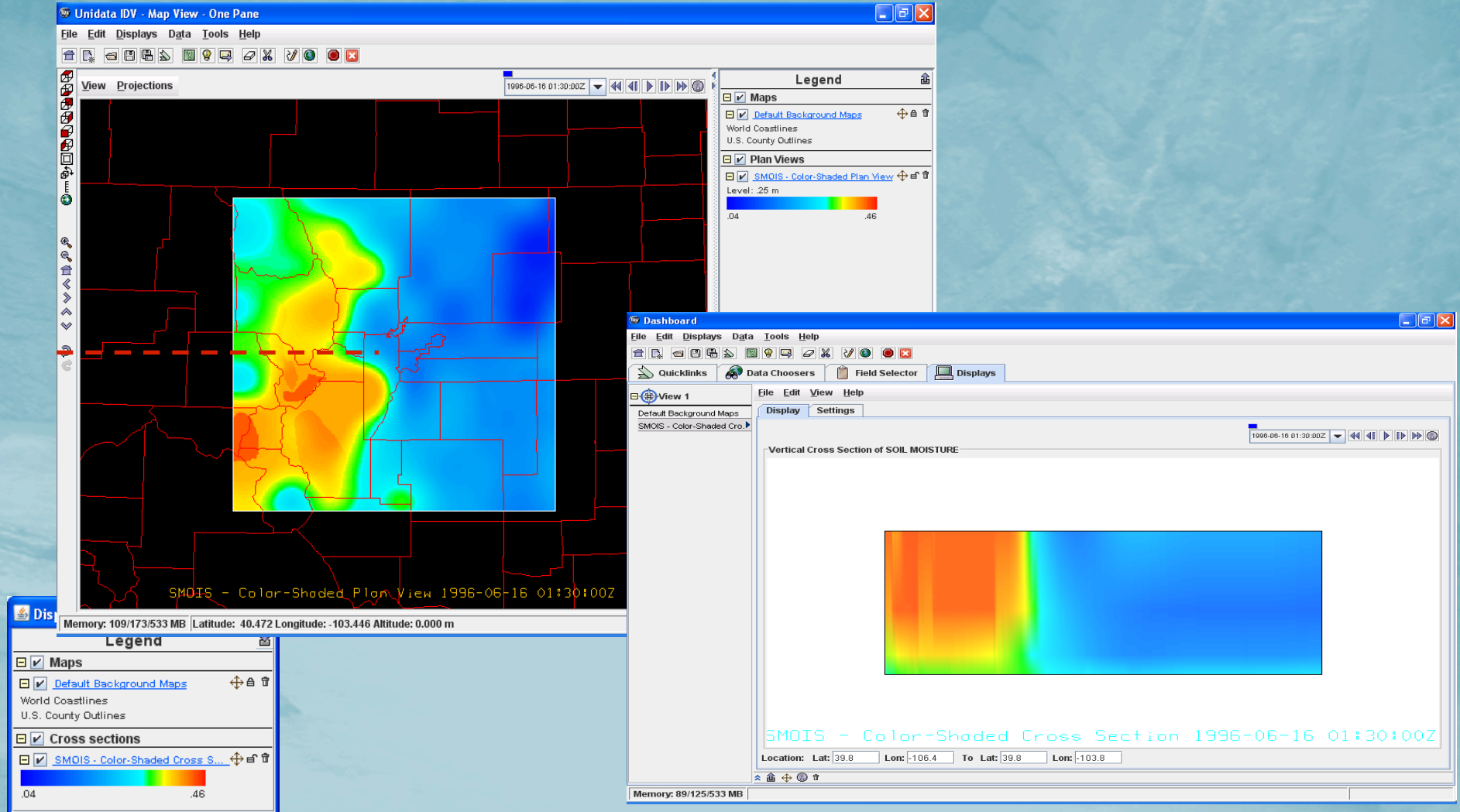
- ‘Hydro’-specific data:
 - Pondered water
 - Streamflow
 - Water table depth

IDV – overlays of accumulated rainfall and streamflow



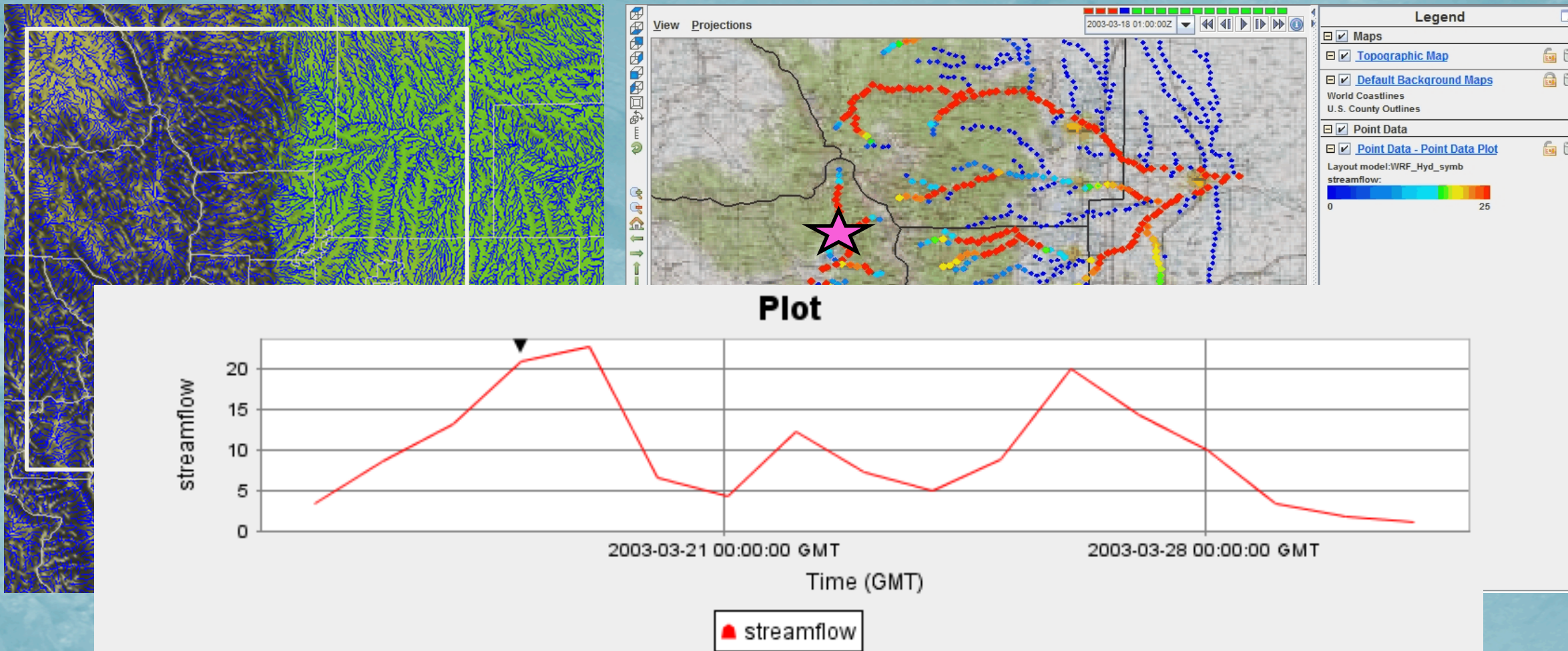
WRF-Hydro output products: IDV

- Soil moisture plan view and vertical cross-section



WRF-Hydro output products: Additional examples...IDV

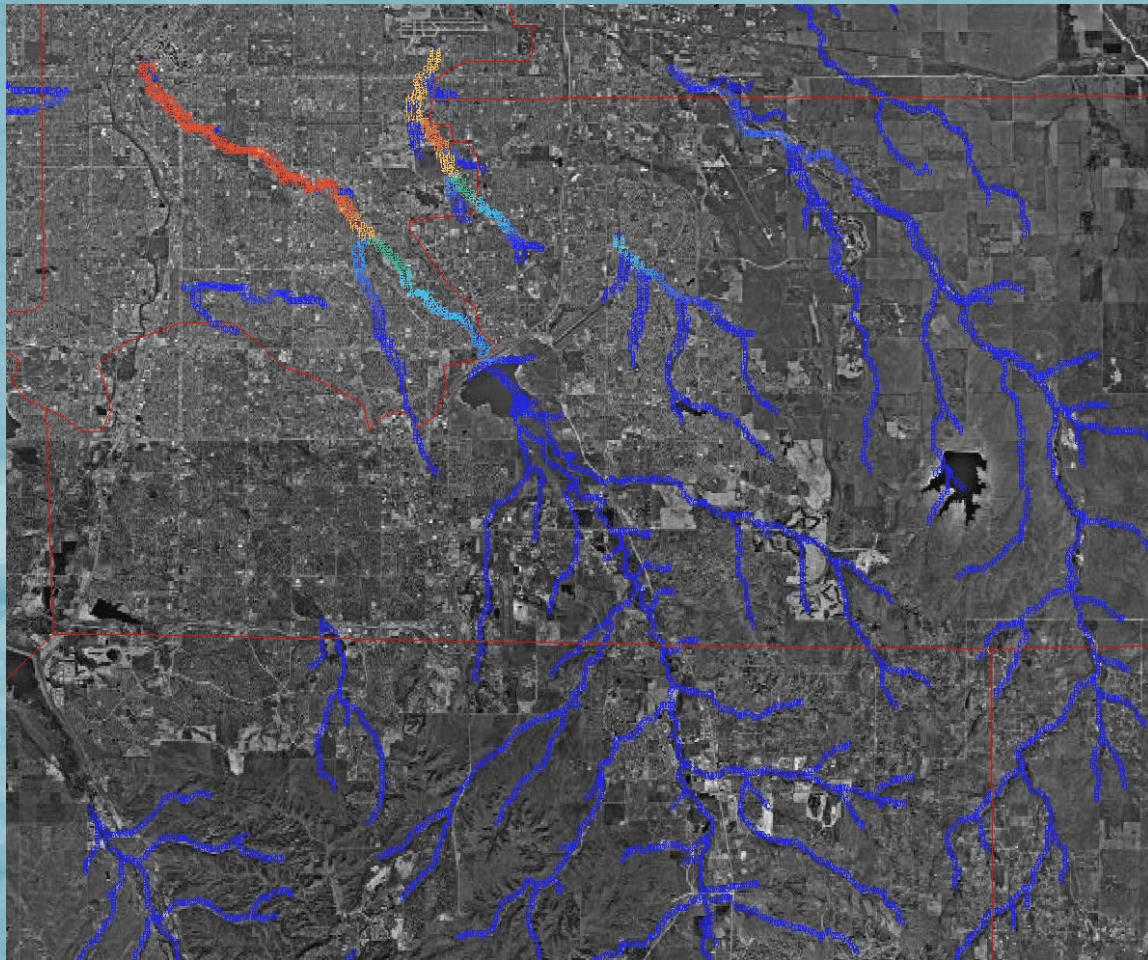
Channel Flows at spatial resolutions of 10s to 100s of meters



WRF-Hydro output products: Additional examples...

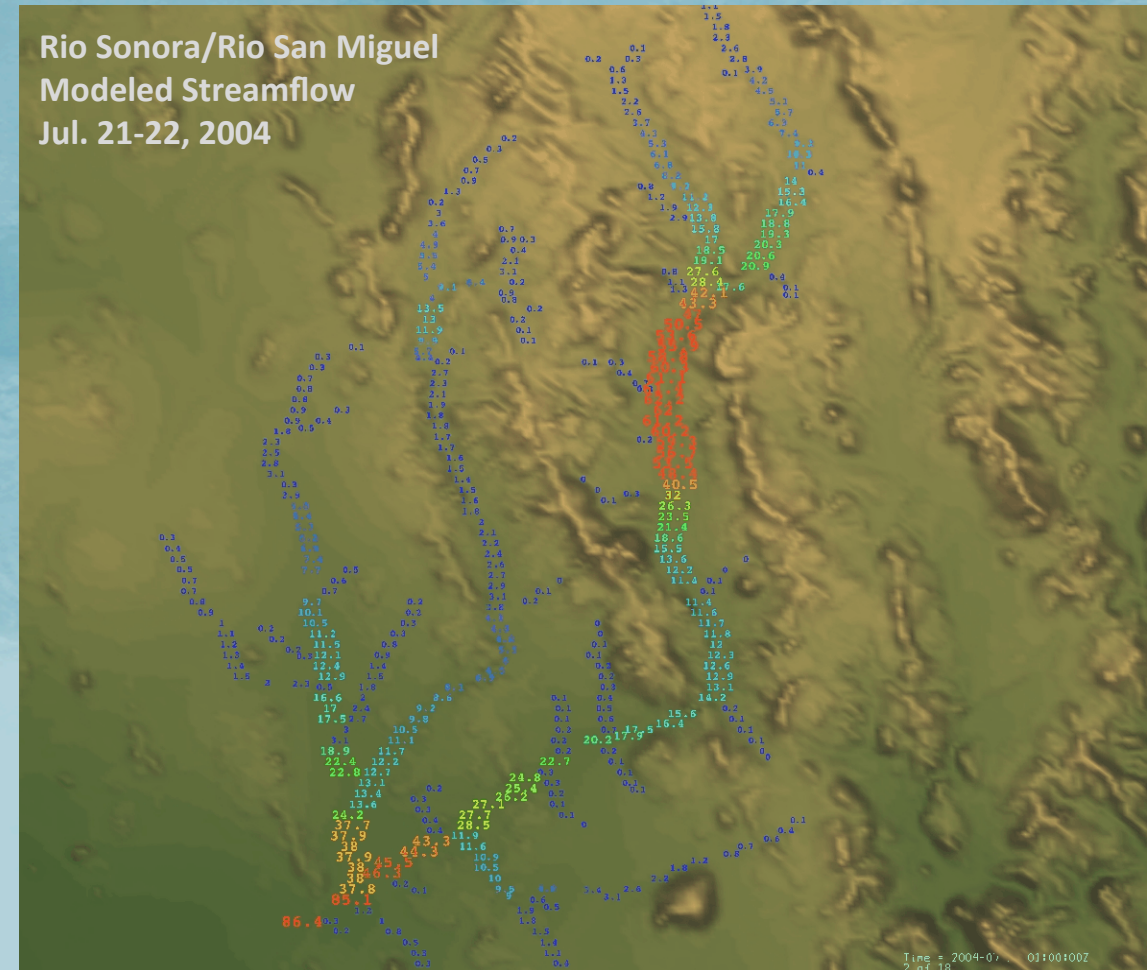
IDV

Urban Flooding: Genoa-2011



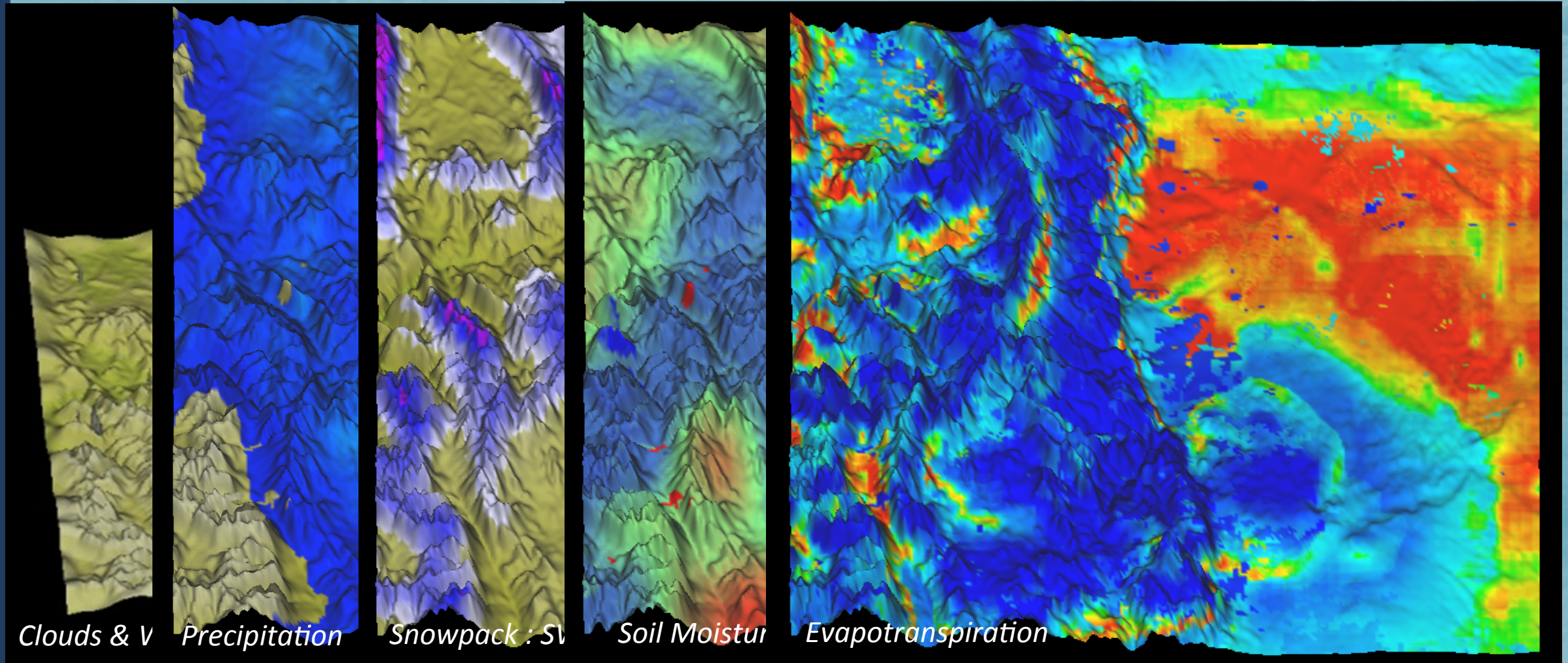
Northwest Mexico

Rio Sonora/Rio San Miguel
Modeled Streamflow
Jul. 21-22, 2004



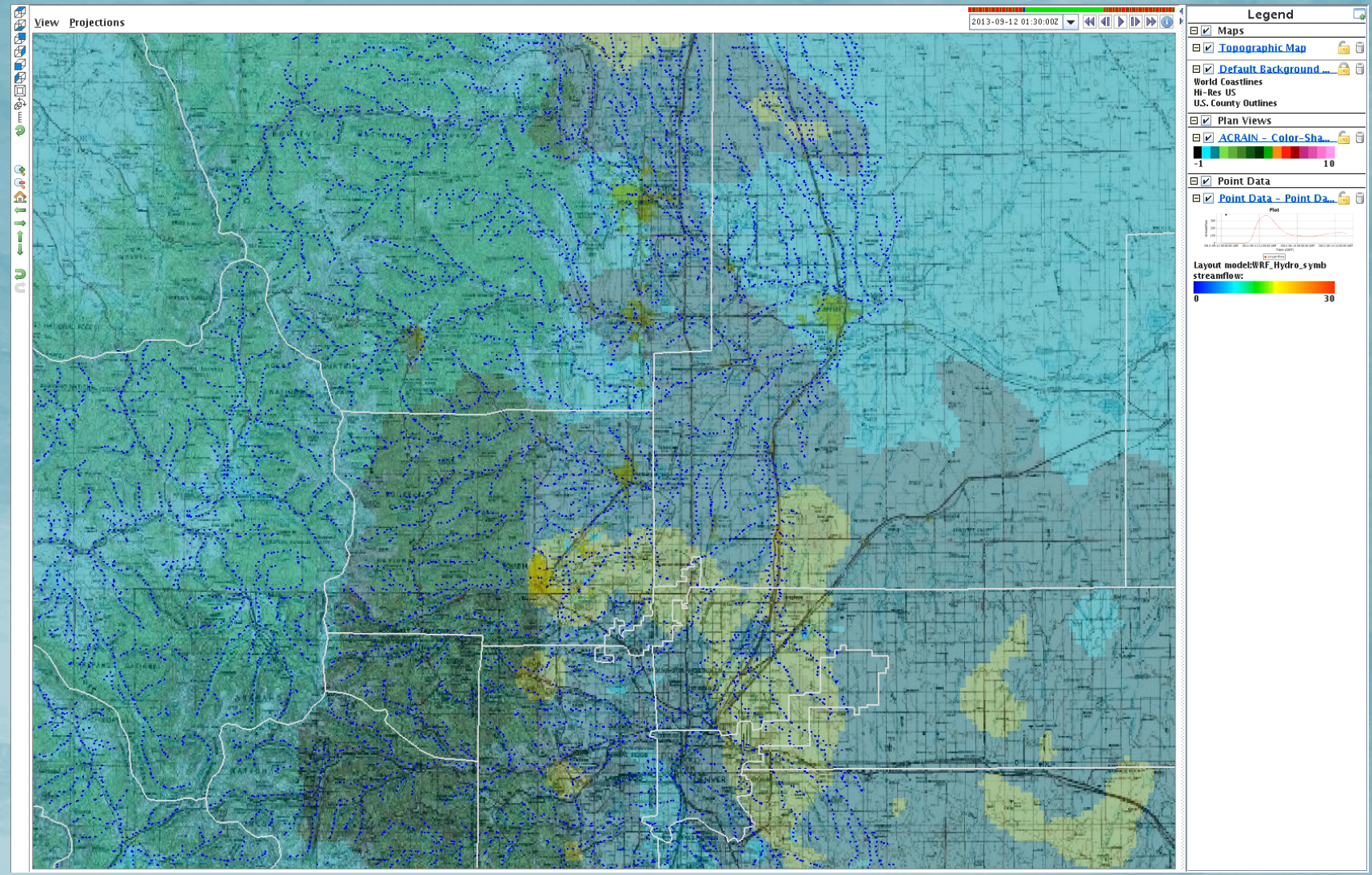
WRF-Hydro output products: Forecasts of water cycle components

Maps of precipitation, soil moisture, ET, snowpack, inundation depth, groundwater depth, streamflow

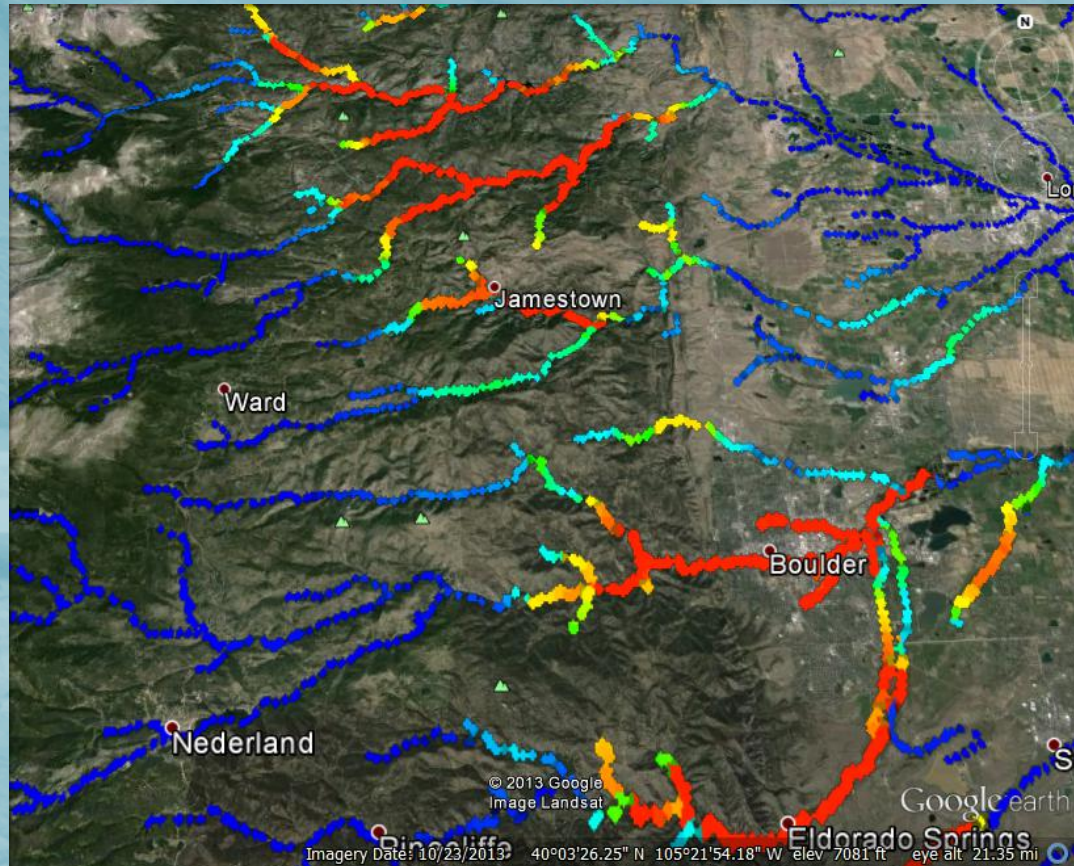


WRF-Hydro output Products: Forecasts of spatially-explicit water cycle components

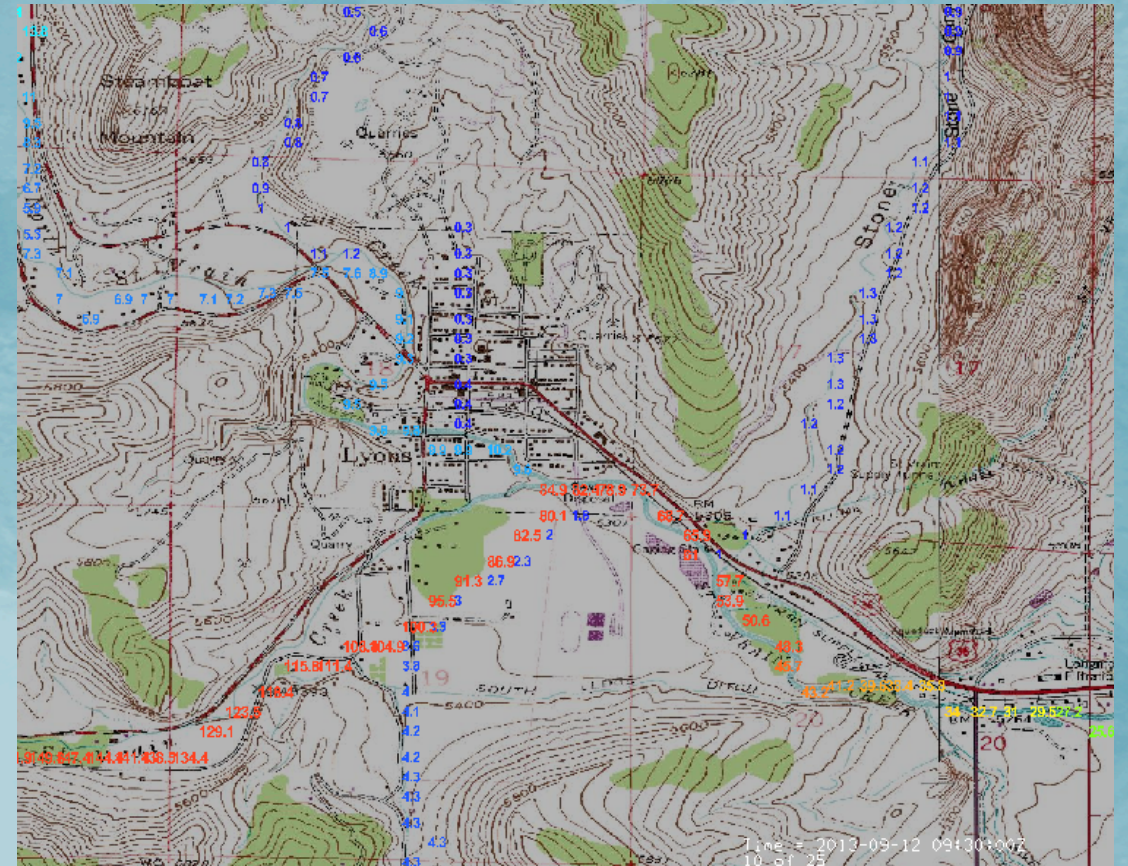
- MPE-driven streamflow during the 2013 Colorado Floods
- Unidata IDV Display of gridded and point netcdf output



WRF-Hydro output products: Additional examples...

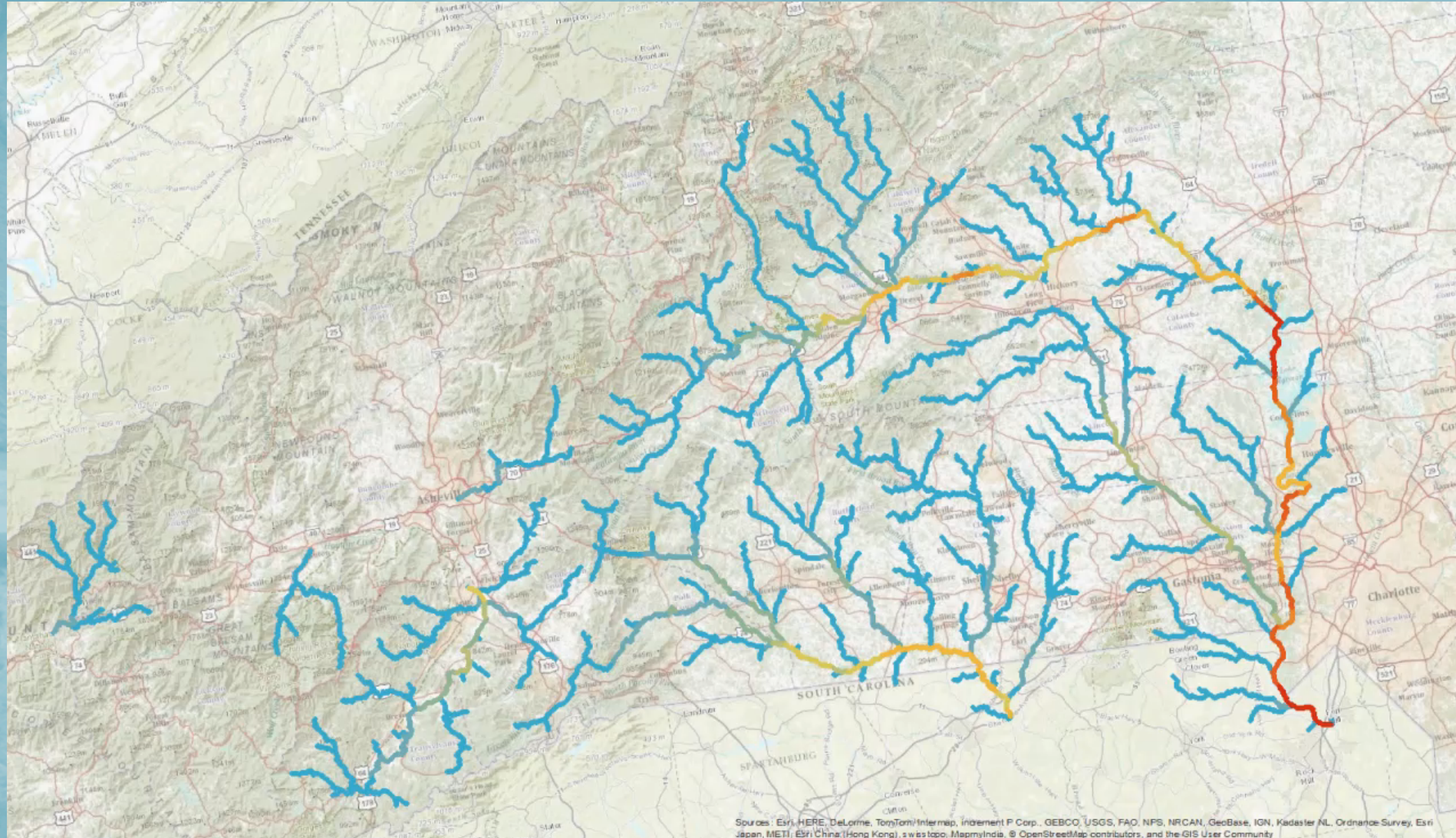


Google Earth (kmz)



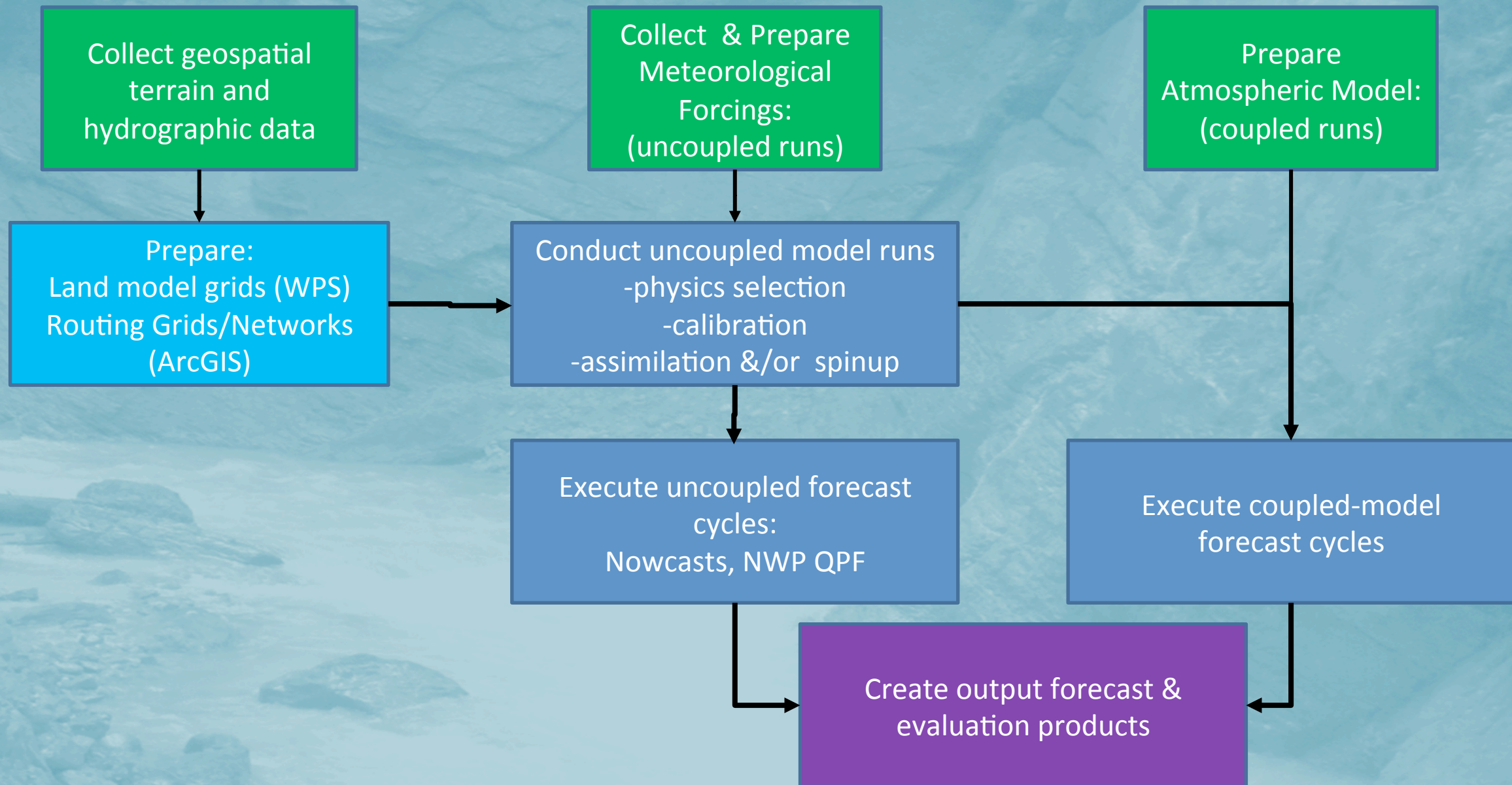
GIS map overlays

Visual forecast products...Web map service interfaces: GoogleMaps/Earth , ESRI ArcGIS, OpenLayers

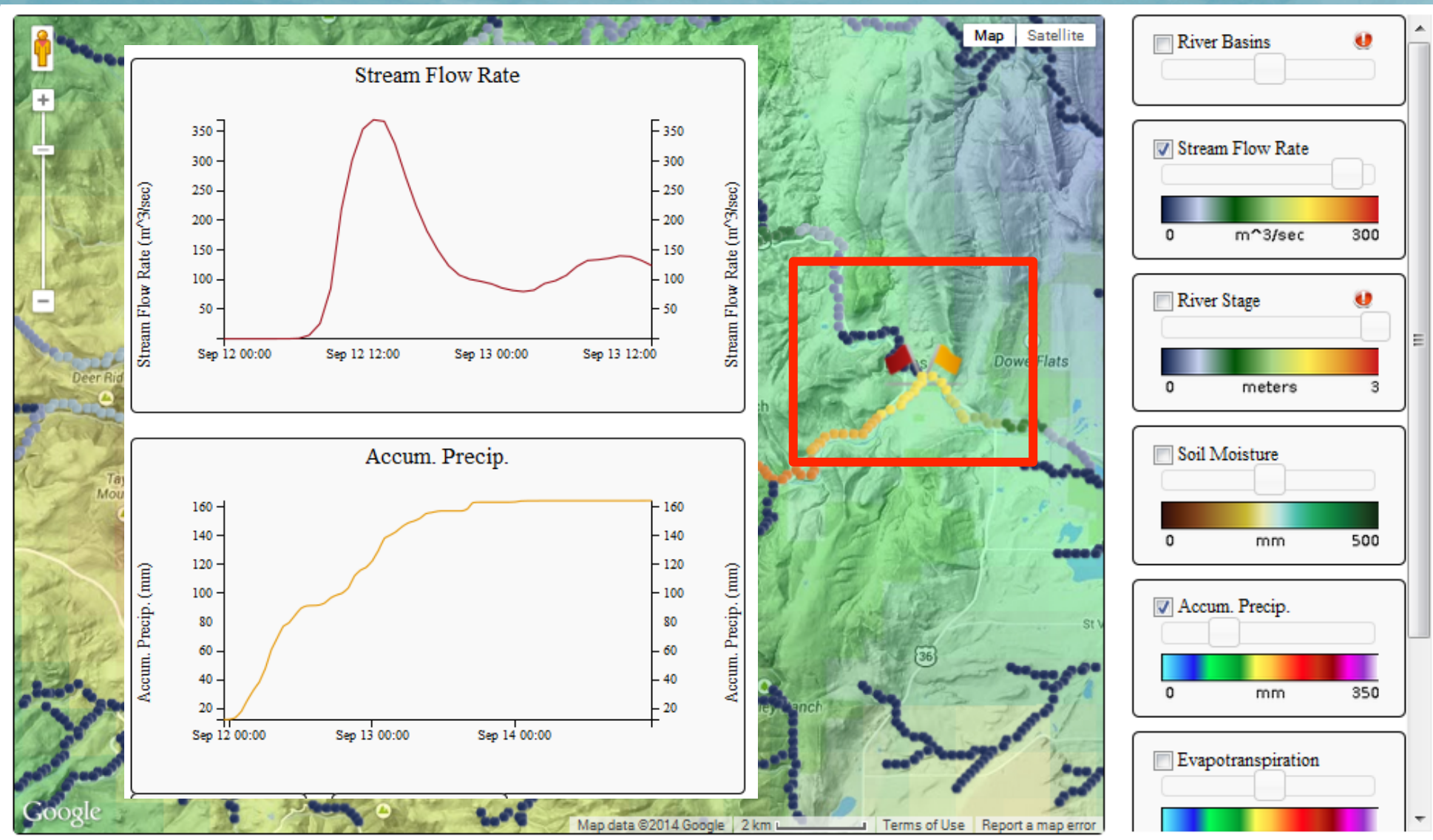


ESRI WMS
display

WRF-Hydro Implementation Workflow:



Visual forecast products...Web map service interfaces: GoogleMaps/Earth , ESRI ArcGIS, OpenLayers



GoogleEarth & GoogleMaps WMS display

WRF-Hydro output tools: other options

- ncview, NASA-Panoply: general netcdf file viewers
- ncl (NCAR command language): good all purpose netcdf-based analysis and visualization scripting language
- ArcGIS, qGIS: Good for integrating with other GIS data layers, have scripts to support import and projection definition for ArcGIS
- R : 'rwrhydro' scripting capabilities for streamflow forecast verification and general time-series analysis and some graphing