WRF-Hydro Output Data:

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WRF-Hydro Development Team
ncl 'interp_opt="conserve"
'srcGridName="NLDAS_FORA0125_H.2013091623.nc"
'dstGridName="geo_em.d03.nc"
ESMF_genWgts_NLDAS2WRFHYDRO_forcing.ncl
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) “qstrmvolrt_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:
  – Ponded 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

![Image](image_url)
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
WRF-Hydro Implementation Workflow:

1. Collect geospatial terrain and hydrographic data
2. Prepare: Land model grids (WPS) Routing Grids/Networks (ArcGIS)
3. Collect & Prepare Meteorological Forcings: (uncoupled runs)
4. Conduct uncoupled model runs -physics selection -calibration -assimilation &/or spinup
5. Execute uncoupled forecast cycles: Nowcasts, NWP QPF
6. Prepare Atmospheric Model: (coupled runs)
7. Execute coupled-model forecast cycles
8. Create output forecast & evaluation products
Visual forecast products...Web map service interfaces: GoogleMaps/Earth, ESRI ArcGIS, OpenLayers
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: ‘rwrffhydro’ scripting capabilities for streamflow forecast verification and general time-series analysis and some graphing