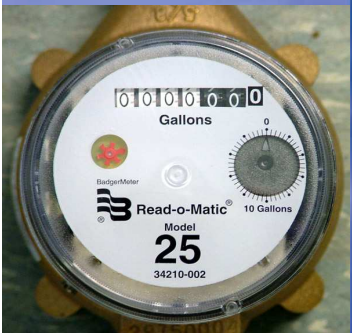




Australian Government
Bureau of Meteorology

A national DEM for hydrology.



Rob Vertessy
Bureau of Meteorology

*National Elevation Data Framework Workshop
Canberra
March 18, 2008*



Australian Government
Bureau of Meteorology

Why hydrologists need DEMs.



- Computing water and material fluxes in landscapes, requiring *accurate* delineation and characterization of:
 - contributing areas (sources)
 - flow pathways (inc. position, gradient, topology)
 - sinks (floodplains)
- How accurate depends on purpose, such as:
 - **Water accounting and water resource assessment**
 - Pollutant generation and delivery
 - Management of floodplain/wetland ecosystems
 - Flood inundation mapping

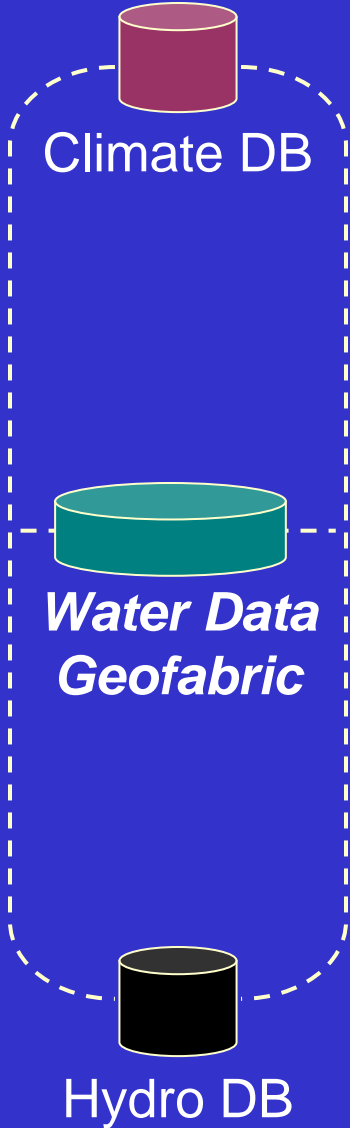
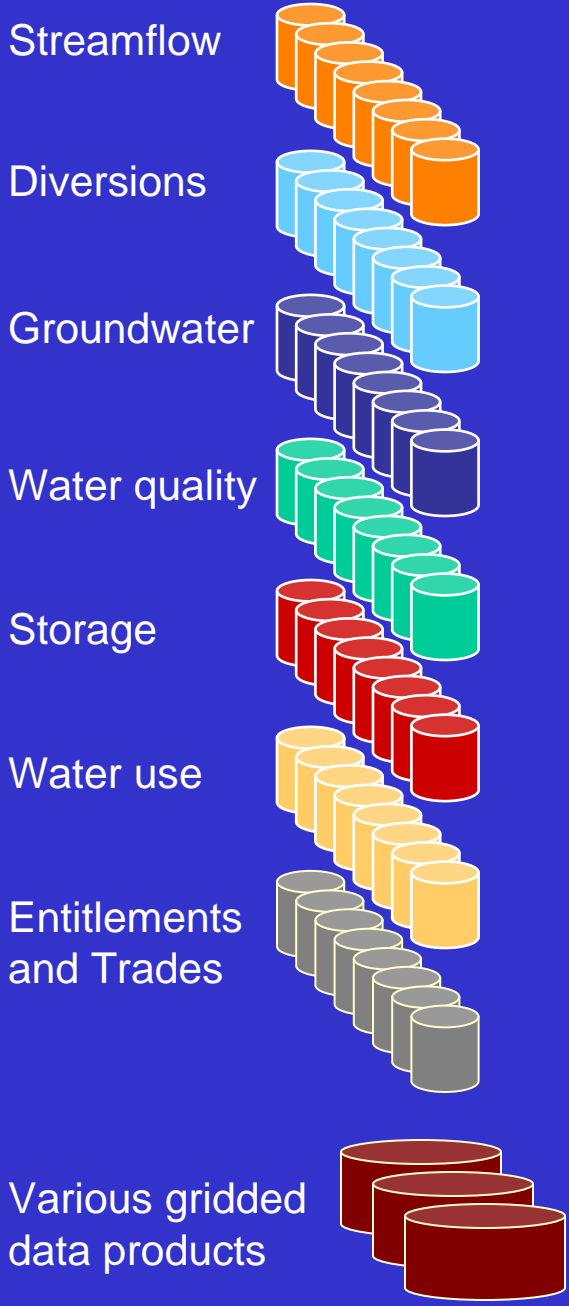
Provider data



AWRIS



Information products



Dynamic



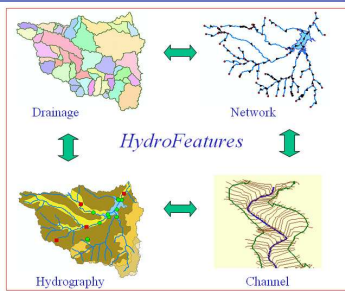
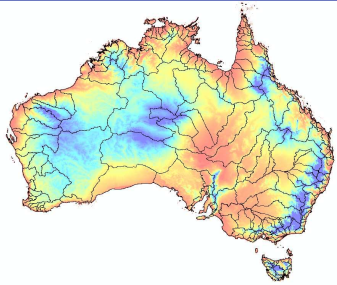
Static





Australian Government
Bureau of Meteorology

A national 'Water Data Geofabric'.

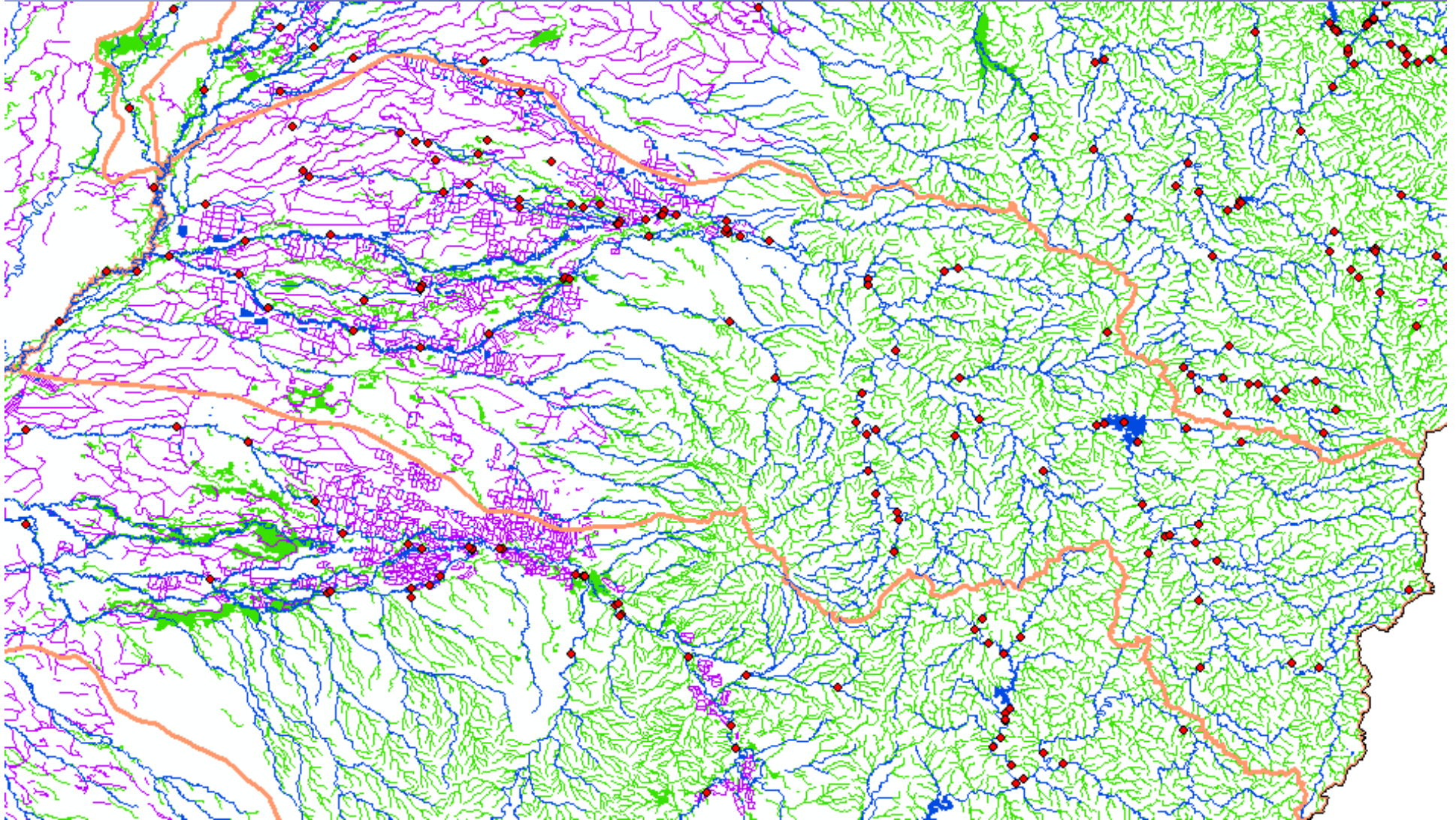


- Digital representation of:
 - Surface water catchments and groundwater systems
 - River reaches, diversions and other water bodies
 - Floodplains
 - Irrigation system delivery and drainage channels
 - Hydrometric monitoring stations (on river, on land)
 - Water extraction points (metered and non-metered)
- Entailing:
 - Topology, Properties, 'Reasonable' positional accuracy
 - National consistency (can be multi-resolution)
- *See the US National Hydrographic Dataset (NHD-Plus) to discover where we need to start.*



Australian Government
Bureau of Meteorology

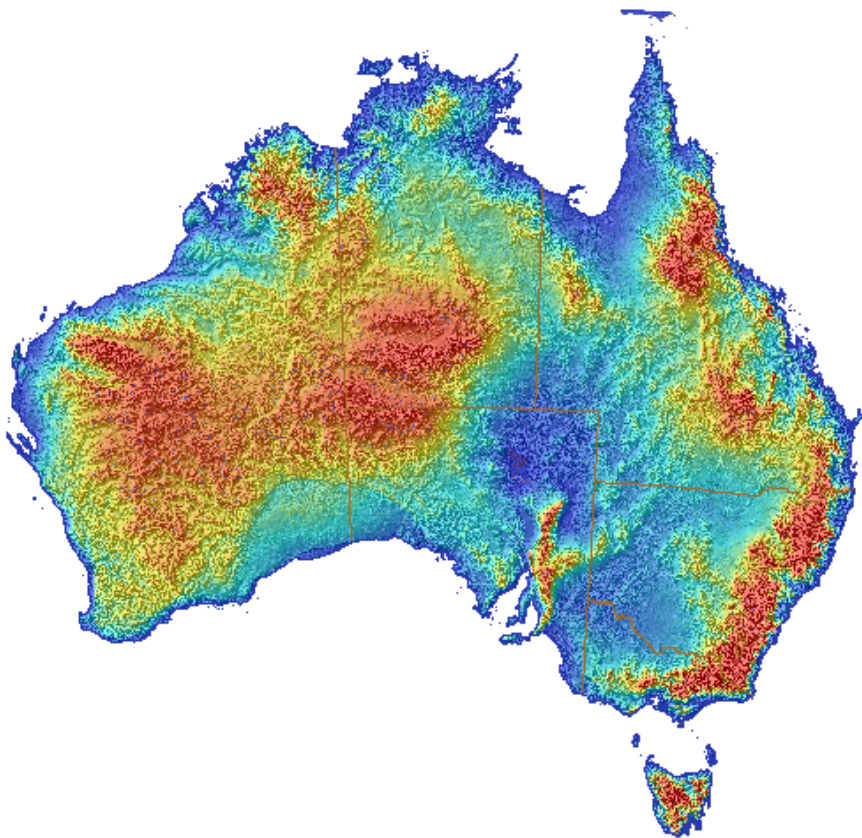
Subset of the Gwydir catchment, NSW.





Australian Government
Bureau of Meteorology

Australia's National (9") DEM.



- The 9" (250m) DEM is the only nationally consistent DEM which includes drainage enforcement.
- V3 is about to be released and is a major upgrade, being the culmination of a decade of work by CRES.
- Would meet many of our needs in steep, dendritic terrain.
- Not sufficient to define surface water catchments in low relief terrain. I won't bore you with examples but there are many.



Australian Government
Bureau of Meteorology

The minimum DEM we need.



- First: An accurate and hydrologically-correct blue-line network to enforce drainage in a higher resolution DEM.
 - Why? DEM-derived flow lines won't be accurate in low-relief terrain.
- National coverage DEM, between ~3"/90m and ~1"/30m resolution, depending on situation.
- No vegetation or structure artefacts (bare earth).
- Elevation accuracy of ~2-5m.



Australian Government
Bureau of Meteorology

Stretching

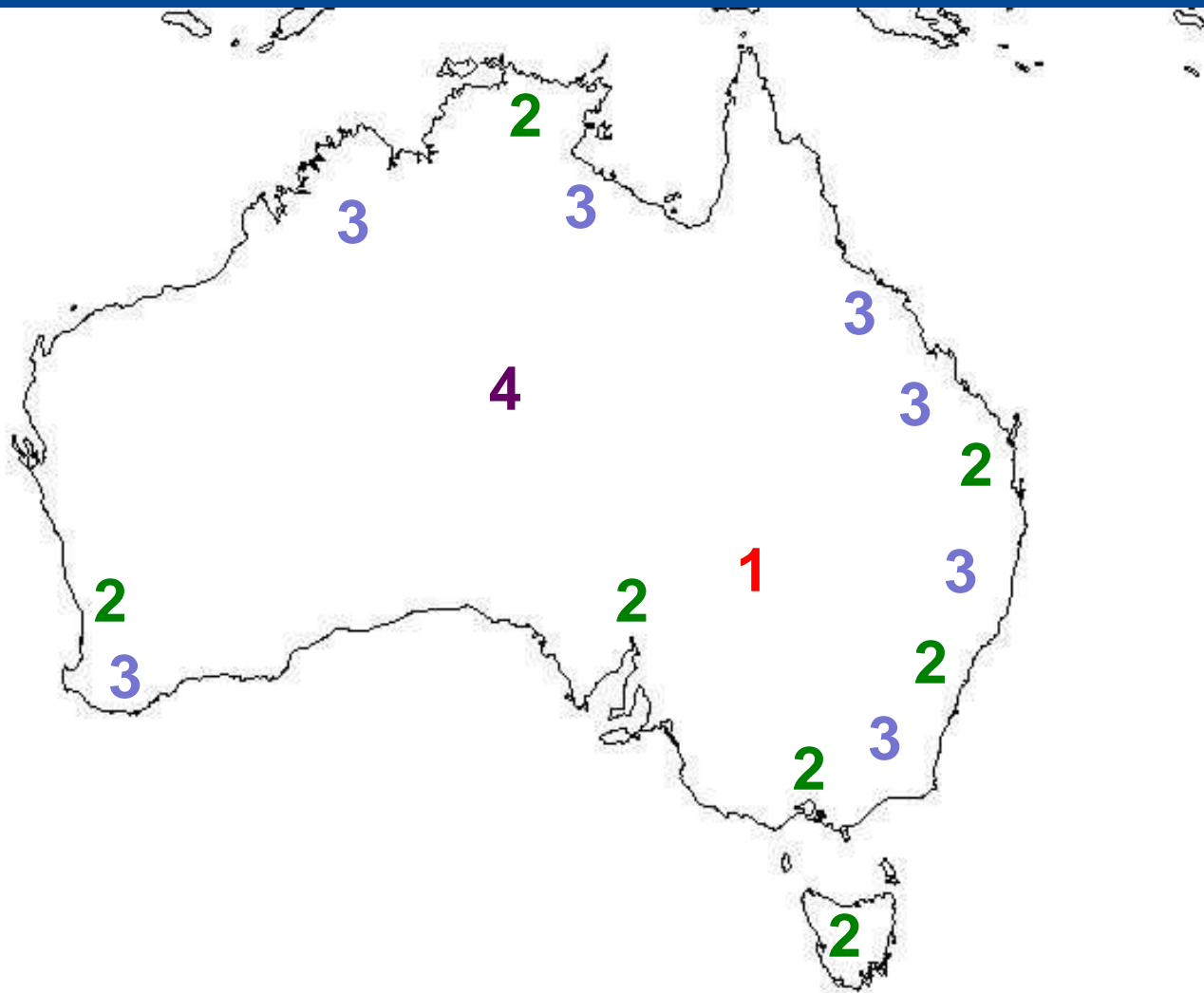


- High resolution in major riverine valleys, particularly in the MDB and northern Australia where the focus is on aquatic ecosystem protection.
- Flood-prone areas of cities and major rural towns.
- For these applications we will need $<1\text{m}$ elevation accuracy and $\sim 10\text{m}$ postings.



Australian Government
Bureau of Meteorology

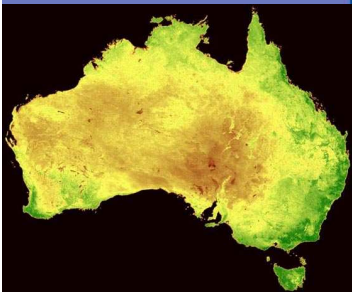
Geographic priorities for water.





Australian Government
Bureau of Meteorology

Going forward.



- An evolving, 10-year project.
- BoM, CSIRO and GA working together.
- Phase I DEM within a year to enable Phase I Water Data Geofabric to be built in late 2009.
- Orderly upgrade path needed.



Australian Government
Bureau of Meteorology

Bureau Water Division contacts.

Rob Vertessy – Deputy Director
r.vertessy@bom.gov.au
02 6232 3501

Tony Boston – Assistant Director
t.boston@bom.gov.au
03 9669 4542

Louise Minty – Assistant Director
l.minty@bom.gov.au
03 9669 4542

Bruce Stewart – Assistant Director
b.stewart@bom.gov.au
03 8638 8203