

# Identifying potential groundwater discharge areas using remotely sensed evapotranspiration

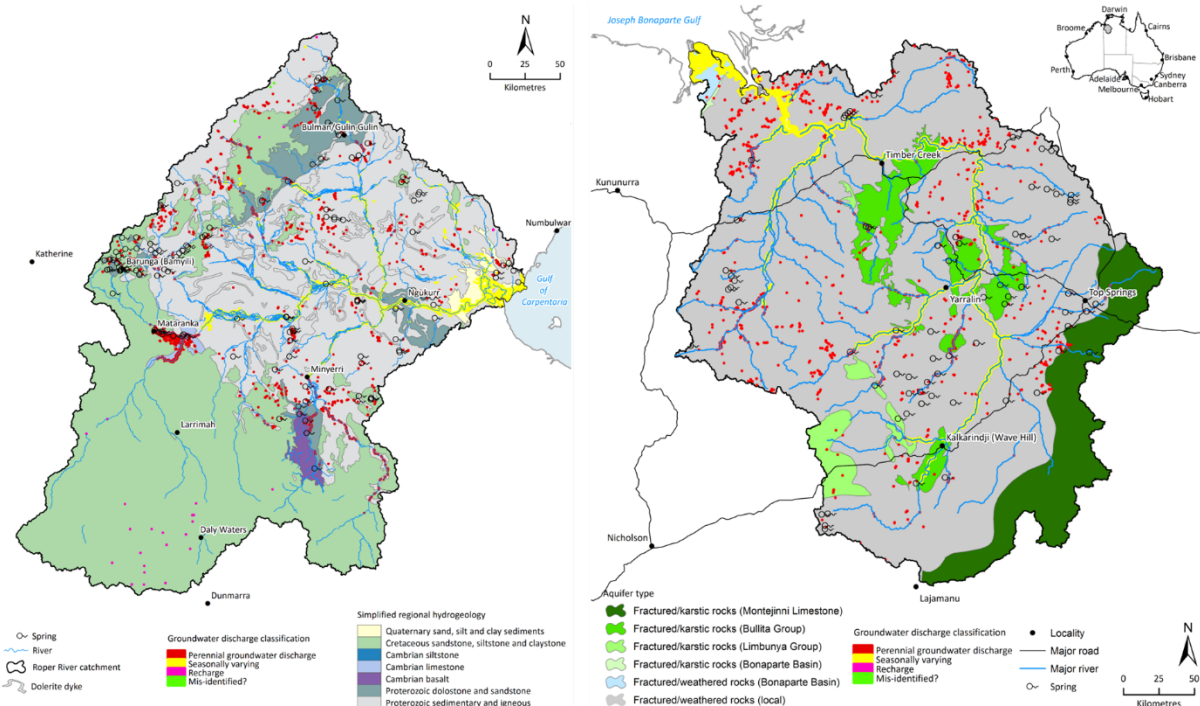
**R.S. Crosbie, A.R. Taylor and J.L. Pritchard**

*CSIRO Environment, Adelaide, Australia  
 Email: russell.crosbie@csiro.au*

**Abstract:** Groundwater discharge areas can be localised such as springs, seeps and soaks or diffuse areas such as riverbeds or areas of terrestrial phreatophytic vegetation. These areas provide a consistent supply of water in dry times that makes them important ecologically (and/or culturally). In developing a conceptual model of groundwater flow paths, it is important to identify discharge areas and understand their source of water so that future development can be sited to minimize impacts on these areas. This piece of work is focused on using the CMRSET v2.2 remotely sensed evapotranspiration (ET) data to identify areas of groundwater discharge across the Roper and Victoria catchments in the Northern Territory (NT).

Areas with comparatively high evapotranspiration in October in the wet/dry tropics potentially have another source of water as there has been minimal rainfall for the preceding six months. The interannual variability of the October ET has been used to further discriminate between stored surface water (e.g. floodplains) with high variability and groundwater discharge areas (e.g. springs and diffuse seepage) that have low variability. There were some anomalously high ET areas associated with bare red or black soils, these areas were removed using Digital Earth Australia's Fractional Cover dataset. Each identified area was then manually inspected and assigned one of four classes (Figure 1): (i) Perennial groundwater discharge, (ii) Seasonally varying, (iii) Recharge and (iv) Mis-identified?

This process successfully identified all previously mapped major springs within the Roper and Victoria catchments and had a median of 280 m from the minor springs in the Roper and 660 m in the Victoria catchment. It also identified over 1000 potential discharge points that are yet to be investigated.



**Figure 1.** Areas identified as potential groundwater discharge areas in the Roper and Victoria catchments in the Northern Territory. Note: the size of the polygons has been exaggerated so they can be seen at this scale

**Keywords:** *Surface water – groundwater interactions, northern Australia; remote sensing*