

# Groundwater discussion support tool

SQNSW Innovation Hub region



**Background:** Chronic groundwater decline reported in many agricultural landscapes of Australia and the world. Groundwater is often seen as a reliable water source during drought and periods of decreased surface water availability. During these periods the extraction rates may exceed recharging, there is increasing concern that under climate change or unsustainable rates of extraction the groundwater level tends to decrease. In addition, groundwater provides potential support to livestock and irrigated production systems. Therefore, it is necessary to continuously monitor the groundwater recharge across landscapes and vulnerable regions. With this background we planned to study the groundwater level and bore hole drill depth and distribution across the Southern Queensland and Northern New South Wales (SQNSW) Hub region.

**Methodology and Data:** The historical data set for ground water and bore depth is collected from the Australian Groundwater Explorer, Bureau of Meteorology for the period of 1991 to 2022. The data analytics performed for the regions covered by SQNSW Hub region, Australia. For region wise better understanding and visualization, the groundwater and bore drill depth maps and charts are presented.

## Distribution of bore depth across the SQNSW Hub region

The actual bore drill depth in meters and location identification with co-ordinates (Latitude and longitude), past 20-years data for the period of 2001 to 2020 is used for plotting and preparing distribution map across the SQNSW Hub region. Some of parts of Goondiwindi, Balonne, Western Downs, Maranoa, Backall Tambo, Longreach and Winton in Southern Queensland, Moree plains and Walgett in Northern New South Wales have higher bore drill depths to reach groundwater supplies.

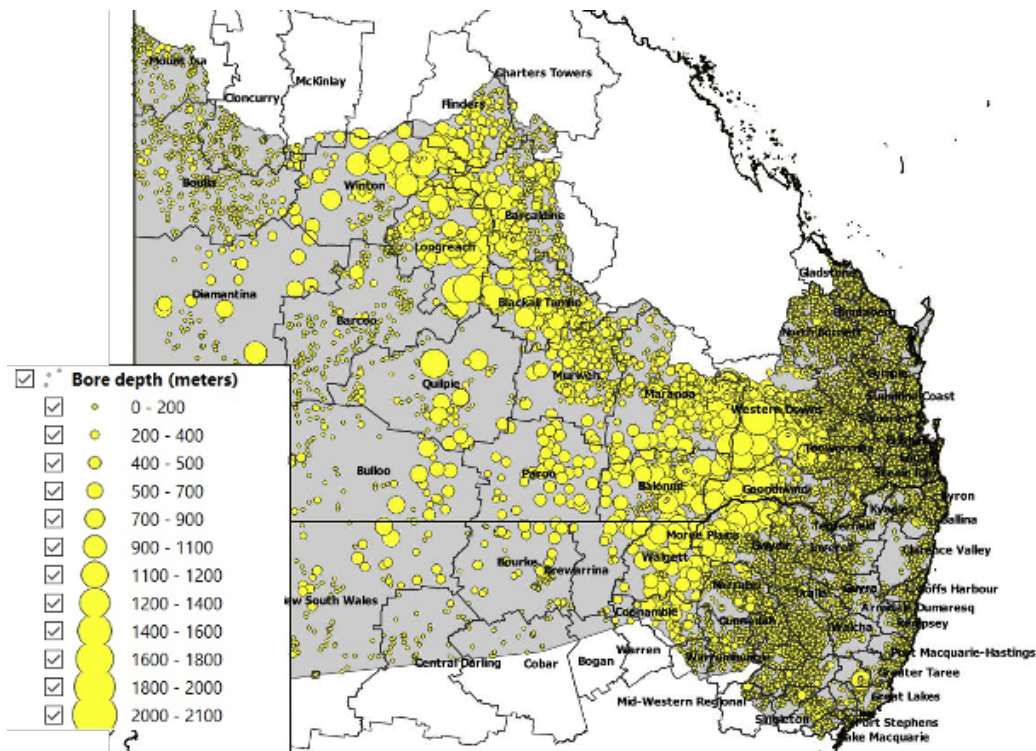


Figure 1: Map showing distribution of bore drill depth across the SQNSW Hub region.

## Groundwater level and bore hole depth

For example, At Maranoa region the bore hole drilled depths in 2021 varied between 90m to 1000m (average of 398m), and the groundwater level between 2005 and 2022 varied in the range of 60m to 350m. This is part of the information from the developing groundwater level discussion support tool.

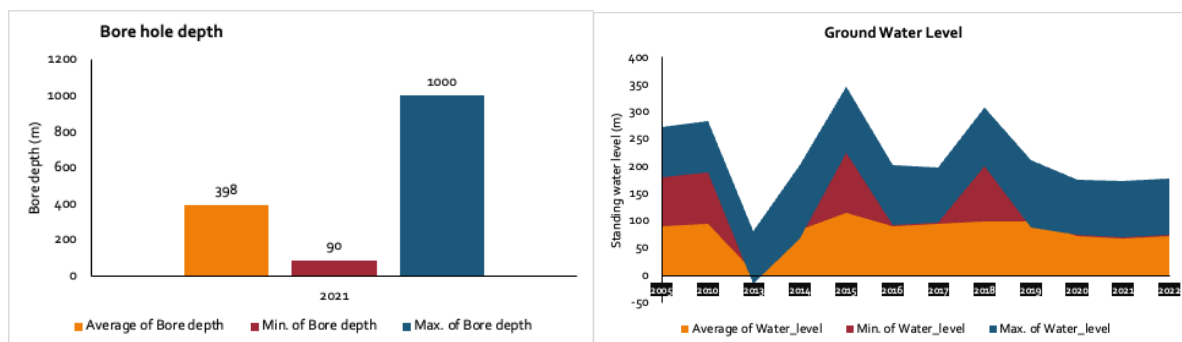


Figure 2. In Maranoa region, (a) The bore hole drill depth range in 2021 and (b) Groundwater level comparison between 2005 and 2022. Standing water level (SWL): Measurements from the reference point on the bore (e.g. the top of casing) to the groundwater level. Positive values are below the reference point and negative values are above the reference point.

## Economics of borehole drilling and installation

The groundwater level and depths differ and varies across the varying agricultural landscapes, therefore bore hole drilling depth to reach and get groundwater for domestic/stock and irrigation production system purpose also changes. In this regard, there is a need to know the average cost of borehole drilling and installation including pump for various borehole depths (ranges) and budgeting the cost into the farm business and risk management.

**Methodology:** Economic data collected from commercial water and bore drilling agents presented for indicative reference purpose only. Please contact local agents for actual quotes and more information. For example, the bore hole drilling and installation including pump cost ranges between \$75,000 to \$100,000 for the bore depths ranging from 150m to 250m.

**Table 1.** Format for calculating the bore hole drilling and installation.

Stock & domestic	Project mobilisation & demobilisation	Site preparation	Drill 8" to 120m	Drill 6" to 250m and above	PVC casing supply and install 120m	Diesel	Pump & installation	Flow test	Others	Total cost
Estimated depth (m)										

Cross-reference and link: For more information on the Ground water level, visit the online Australian Groundwater Explorer <http://www.bom.gov.au/water/groundwater/explorer/map.shtml>