#### Issued 13 January \_\_\_\_\_2021

# **RIMU Hydrology** Situation Report

Research and Evaluation Unit

RIMU



# Rainfall | Soils | Rivers | Aquifers

## Regional summary for December 2020 to 13 January 2021

Rainfall in December was below the normal range for all sites. Two rain events in early January recorded 30 to 50mm of rainfall. Soil moisture fell at all sites throughout December due to low rainfall but increased following January rains. Low soil moisture persists in the north and central sites, but high soil moisture was recorded at other sites in the north-central and south. River flows fell across the region in December, however increased after January rains. Almost all sites remained above the mean annual low flow (MALF). Groundwater levels varied according to geology and water use pressures. Low groundwater levels were observed in shallow volcanic and deep Waitematā sandstone aquifers.

## **Current drought index**

The New Zealand Drought Index (NZDI) is used to determine the severity of drought conditions across the country. The latest NZDI value for Auckland is 1.14 (10 Jan 2021), which is within the second NZDI category of Very Dry (1.0-1.25). A chart of the NZDI for the Auckland region is shown in Figure 1.



Figure 1: Auckland Region Drought Index 2018-2021 (data source: NIWA).

# Rainfall

All sites in the network recorded rainfall well below normal rainfall totals for the month of December 2020. Sites in the east generally recorded the lowest rainfall totals (many with less than the 25th percentile). The locations of sites, December rainfall totals, and rainfall categories are shown in Figure 2.

There were two notable rain events since the beginning of January 2021 with greater than 50mm (2 January) and 30mm (8 January 2021), respectively, recorded at several gauges across the region.



Figure 2: Total rainfall (mm) for the month of December 2020 with rainfall category.



Two soil moisture sensor sites in the north and two in central Auckland had soil moisture levels below the normal range for this time of the year (mid-January) based on long-term data (Figure 3). This highlights the lasting impacts of severe hydrological drought from last summer. However, other sites in the north, west, and south show soil moisture levels at or greater than the normal range.



Figure 3: Current soil moisture category relative to long-term statistics for 12 January 2020.

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## **River flows**

River flows dropped throughout December 2020, but most remain above the mean annual low flow (MALF). The streams with flows below the MALF are predominantly small urban streams. Two sites have flows below MALF which are also in catchments with abstractive water use: the Waiteitei River near Wellsford and the Waitangi Stream near Waiuku. No sites had flows below specified minimum flows set in Appendix 2 of the Auckland Unitary Plan. The locations of sites and the flow relative to MALF are shown in Figure 4.



Figure 4: Stream flow relative to the mean annual low flow (MALF).

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## **Aquifer water levels**

Groundwater levels in aquifers vary considerably across the region and relate to the geology of the aquifer and water use pressures. Groundwater levels dropped below the normal range for several sites in the region, including unconfined volcanic aquifers in the Auckland Isthmus and south Auckland which respond quickly to rainfall. Several sites in deep sandstone Waitematā Group aquifers continue to have low groundwater levels due to low antecedent water levels and continued water use pressure. Groundwater level at the Tawaipareira monitoring well on Waiheke Island recently dropped out of the normal range and is now very low (other Waiheke sites vary from normal to low groundwater levels). Other monitoring wells in the region with very low groundwater levels include Alfred Street (Onehunga volcanic aquifer), Karaka North Road (Karaka Waitematā aquifer), and Revell Court (Pukekohe Central volcanic aquifer). Groundwater monitoring sites and groundwater level s.



Figure 5: Groundwater levels relative to long-term statistics for 12 January 2021.

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# Disclaimer

This report contains provisional data and is intended for informational purposes only. For detailed questions concerning hydrometric data, please email <u>EnvironmentalData@aucklandcouncil.govt.nz</u>.

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