

Whangārei catchment water quantity update

This document is about rainfall, river flows and demand in the Whangārei Catchment.

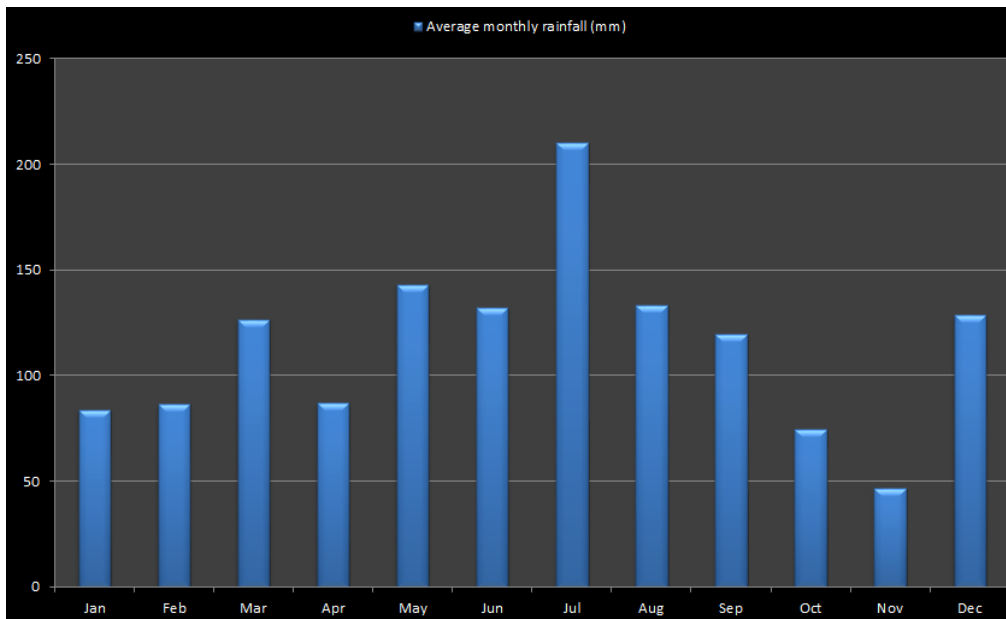
The Northland Regional Council (NRC) monitors rainfall, river flows and consented water permits at many Northland locations. Computer modelling is also used to predict water quantity, based on the monitoring information gathered.

In Northland, rainfall is usually highest from autumn – spring and lowest from spring - autumn. Storm events also happen throughout the year. Rainfall affects river flows. Low river flows limit native fish habitat and recreational opportunities. High river flows are important for flushing out nuisance plant growth. High demand for river water may mean the water resource needs to be carefully managed.

Monitoring data

1.1.1 Rainfall

NRC operates the Waiarohia rainfall station within the Whangārei Harbour Catchment. Records show rainfall is generally lowest in late-spring/summer, peaks in winter with medians occurring in autumn and spring.

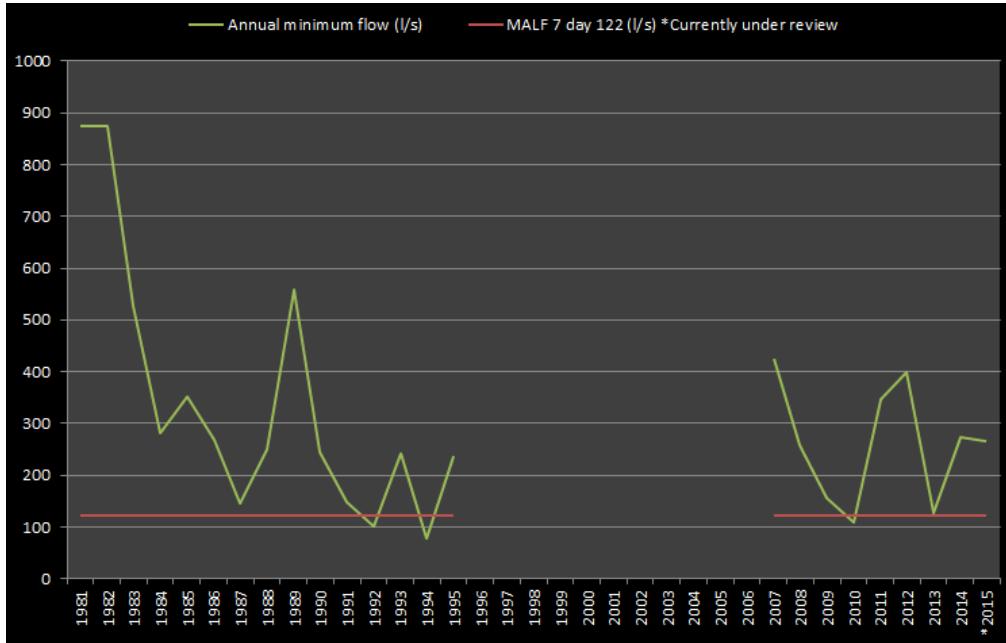


Statistics for the Rainfall station Waiarohia at NRC (547338):

- Minimum monthly total 1.0 mm (Jan 2010)
- Minimum annual total 1001mm (1994)
- Maximum annual total 2122 mm (2014)
- Average monthly totals 1414mm

River flow – Low Flows

The graph below shows the variation in annual river low-flows at the Whareora recording station since 1981. The 7-day mean annual low flow (MALF) is approximately 122 l/s. The lowest annual low-flow calculated since 1981 was 43 l/s in 1992.



Statistics for the flow station Hatea at Whareora (#5538):

- Calculated minimum flow is 43 l/s 01 May 1992
- Measured minimum flow is 77 l/s 24 Mar 1994
- Maximum 412531 l/s 29 Jan 2011
- 7 Day Mean Annual Flow 122 l/s

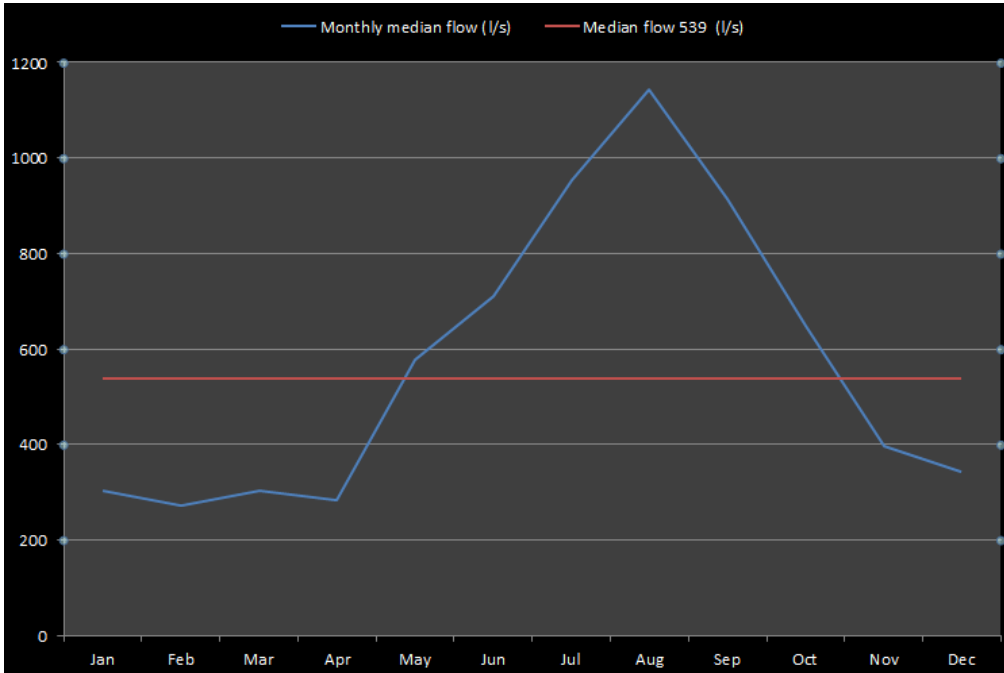
Comment [NB1]: Check figure – seems high

Demand for water from annual low-flows is high in the catchment:

- Consented takes have a variety of cease-to-pump conditions to protect in-stream aquatic species. The lowest cease-to-pump conditions are set at 114l/s (or 93% of MALF), in the Hatea Catchment, and 36 l/s in the Otaika catchment (or 26% of MALF at the bottom of the catchment).
- Non-consented water takes do not have cease-to-pump conditions. However, a Water Shortage Direction can issue a cease-to-pump requirement if deemed necessary.
- Volumetric demand: currently there is a demand of:
 - up to 123 l/s in the Hatea catchment from annual low flows (or 100% of MALF)
 - Consented water takes account for 122 l/s
 - Non-consented water takes (RMA or Regional Plan permitted takes) account for <1 l/s
 - up to 160 l/s in the Otaika catchment from annual low flows (or 118% of MALF)
 - Consented water takes account for 154.2 l/s
 - Non-consented water takes (RMA or Regional Plan permitted takes) account for 5.8 l/s

River flow – Median Flow

The graph below shows the variation in median flow throughout the year. The annual river median-flow in the catchment is approximately 539 l/s. Flows above median flow generally occur in autumn-spring. However, they can also occur during spring-autumn storm events.



Median flow statistics for the Hatea at Whareora

There is a low-moderate demand for the harvesting and storage of flows above the annual median flow:

- There are 2 in-stream dams of significant size which divert and store a proportion of water above median flows (winter or stormflows). These are Whau Valley water supply dam (Whangārei District Council) and the Hopua te Nihotetea stormwater detention dam (Northland Regional Council). In-stream dams may have conditions imposed on them requiring them to bypass low-flows to protect in-stream values.
- There are no out-of-stream dams to store water taken (pumped) from above annual median-flows. The Council is working on a policy for 'supplementary' water permits which would enable the taking and storage/use of water when flows are above median flows (to enable storage and reduce demand from rivers during low flows).