



Summer 2013/14 – Hydrological summary

Environmental Science Department

Greater Wellington Regional Council (GWRC) presents this summary of hydrological data that have been collected at selected monitoring locations in the Wellington region. GWRC monitors and collects environmental data such as rainfall, river levels and flow, groundwater level and quality, freshwater quality, coastal water quality, aquatic ecosystems and recreational water quality at many more locations than have been presented in this document. This report is a brief data summary with limited interpretation of the results.

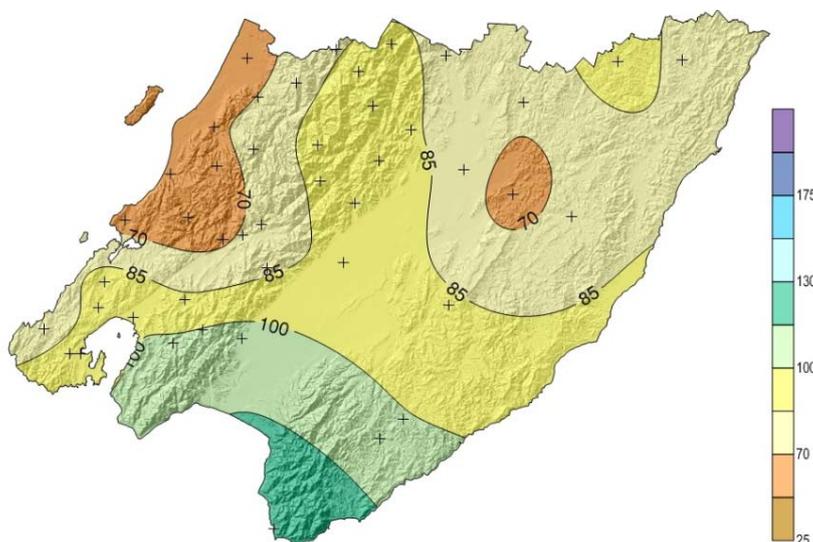
Readers are referred to the GWRC website where maps of all monitoring locations and up to date data can be found - <http://www.gw.govt.nz/environmental-science/>.

Summer rainfall

The figure to the right shows the percentage of average rainfall that occurred during the 2013/14 summer season (December to February inclusive) across the Greater Wellington region. Rainfall was largely below average over much the area. South-eastern Wairarapa and the Rimutaka Ranges were the only areas to register average or above average rainfall amounts.

The Kapiti Coast and north-eastern Wairarapa were drier than normal, getting down to as low as 70% of the average summer rainfall totals.

Summer 2013-14 rainfall as a percentage of long term average (crosses are monitoring stations used to build map)



Rainfall statistics for a selection of monitoring sites are presented in the table below. The number of days where more than 1 millimetre (mm) of rain occurred, termed ‘wet days’, was lower than normal across all sites with the exception of our Waikanae site. Total rainfall at Waikanae was 72% of the summer average but there was actually more than the normal number of days when rainfall occurred.

Rainfall statistics for summer (Dec 2013–Feb 2014) for selected monitoring sites in the Wellington region

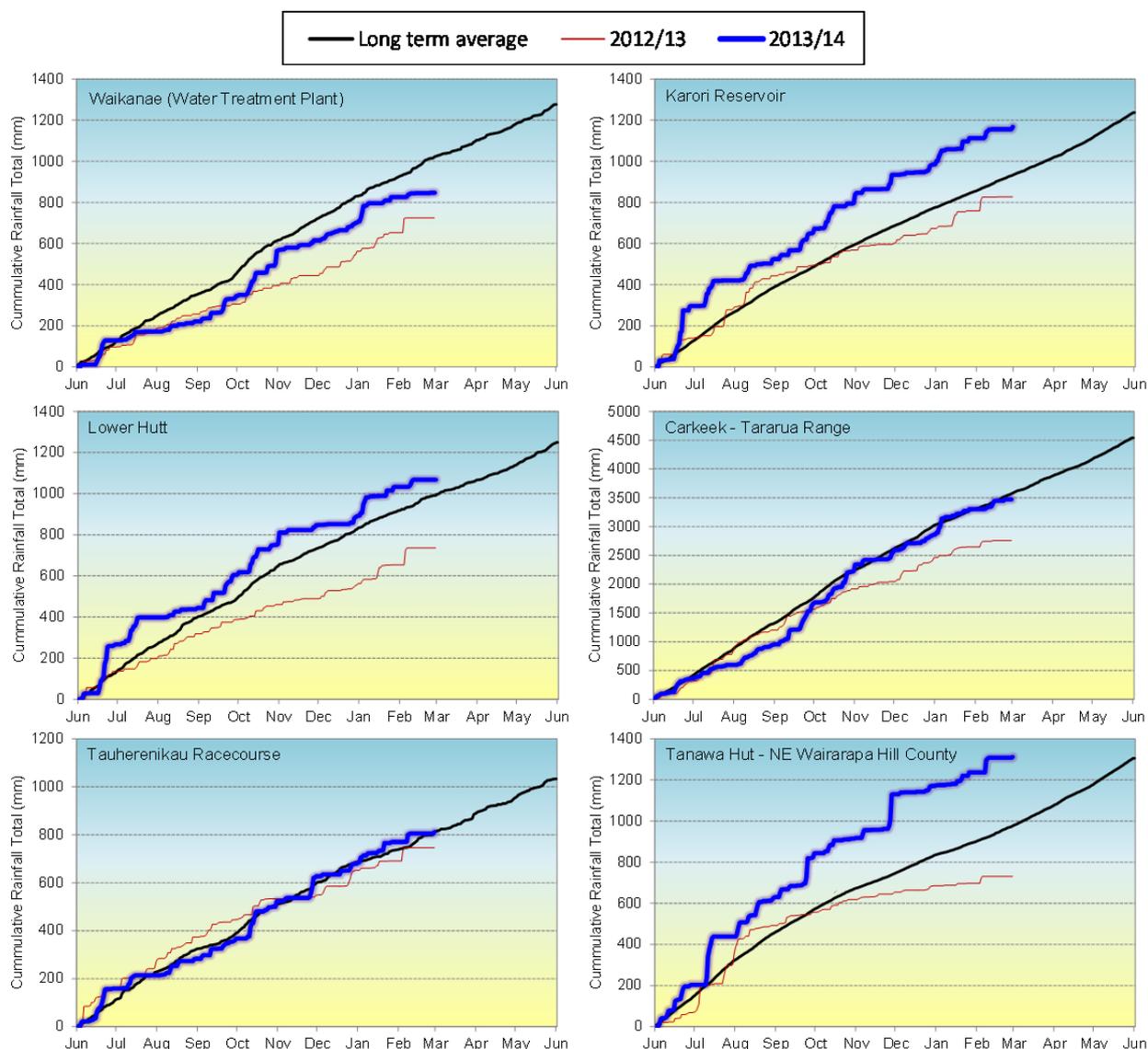
Rain gauge location	Total rainfall (mm)	Percentage of normal	Number of wet days (>1mm rain)	Percentage of normal
Otaki	152	61%	18	69%
Waikanae	230	72%	28	114%
Kaitoke	333	73%	30	77%
Karori Reservoir	234	93%	23	85%
Wainuiomata (‘Reservoir’)	344	101%	22	69%
Tararua Range (Angle Knob)	1346	95%	48	100%
Masterton	147	80%	20	101%
Featherston (Racecourse)	184	85%	23	106%
NE Wairarapa (Tanawa Hut)	182	78%	18	82%
SE Wairarapa (Longbush)	148	88%	20	81%

Rainfall for the year to date: June 2013–February 2014

Cumulative rainfall graphs for the year beginning in June are shown in the plots below for a range of rainfall monitoring sites across the region. The current year up to the end of summer 2013/14 is compared to the long-term average and the same period in 2012/13.

Rainfall at Waikanae has been below the average accumulation for most of the year to date, but has not dropped to the lows experienced in the previous year. Karori and Lower Hutt rainfall has tracked above average accumulations the entire 2013/14 period, with the Karori total being 233mm (or about 25%) above the average amount by the end of summer. Summer rainfall in the Tararua Range has been occurring at a similar accumulation to normal but the total for the year to date is above average due to the wet spring.

In the Wairarapa, the Ruamahanga valley has experienced normal rainfall accumulation as shown at Tauherenikau. In the north-eastern hill country (Tanawa Hut) the rainfall has been about average to below average for the 2013/14 summer period but the annual total accumulation is sitting well above average due to large rainfall events in July, September and November (which can clearly be seen as large steps in the 2013/14 trace).



Cumulative rainfall for the year to date (June 2013–February 2014) compared to the same period last year (June 2012–February 2013) and the long term average for the full year (June–June)

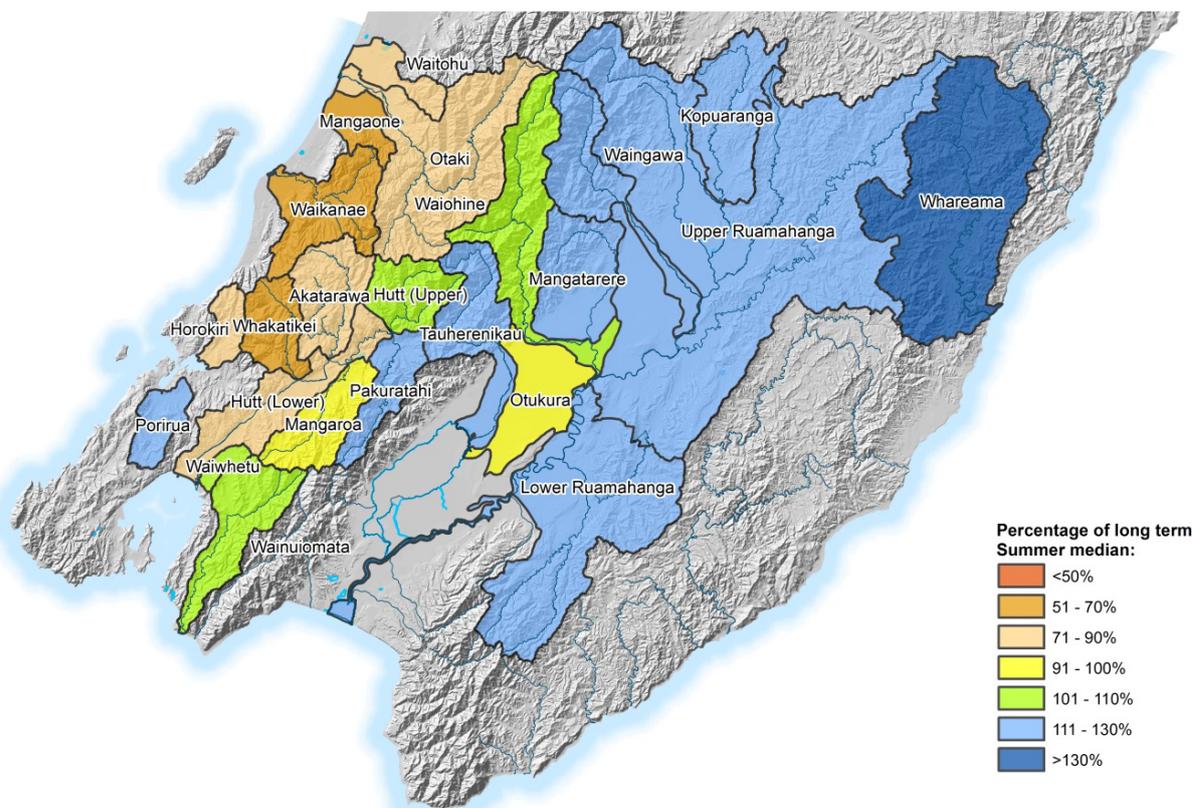
River flows during summer

The table below shows that the highest recorded river flows in many catchments during summer were associated with two rainfall events that occurred very closely together on the 3rd and 5th January 2014. The recorded peak flows were lower than a mean annual flood event in the catchments detailed.

Peak flows (cubic metres per second) during summer 2013/14 compared with mean annual flood peak

River gauge location	Peak recorded flow during Summer (raw data)	Mean annual flood
Waikanae River at Water Treatment Plant	125 m ³ /s on 5 January	157 m ³ /s
Otaki River at Pukehinau	610 m ³ /s on 5 January	950 m ³ /s
Hutt River at Taita Gorge	596 m ³ /s on 3 January	835 m ³ /s
Wainuiomata River at Manuka Track	26 m ³ /s on 5 January	30 m ³ /s
Porirua Stream at Town Centre	22 m ³ /s on 3 January	35 m ³ /s
Waingawa River at Kaituna	225 m ³ /s on 5 January	289 m ³ /s
Waiohine River at Gorge	625 m ³ /s on 5 January	885 m ³ /s
Ruamahanga River at Wardells (mid)	364 m ³ /s on 5 January	487 m ³ /s
Ruamahanga River at Waihenga (lower)	849 m ³ /s on 5 January	1062 m ³ /s

The median recorded summer river flow at some of our monitored catchments is compared to long-term median flows in the map below. It is evident that median flows during summer were largely below normal on the Kapiti Coast and parts of the Hutt catchment, while they were normal to above normal east of the Tararua Ranges over much of the Wairarapa. This situation is the complete opposite of the 2012/13 summer when Kapiti Coast and Hutt catchments were above the average and all of the Wairarapa was below average.



Median river flows during summer 2013/14 (Dec–Feb inclusive) for primary catchments in the Wellington region as a percentage of the long term seasonal median

Minimum recorded river and stream flows for autumn 2014 are tabled below for a number of monitoring sites across the region.

In terms of the lowest recorded river flows during summer 2013/14, there were no significant low flow events. Only two monitored rivers recorded minimum summer flows that were below their mean annual low flow – these being the Waikanae and Akatarawa rivers that share a headwater catchment boundary before the Waikanae River flows to the Kapiti Coast and the Akatarawa River flows to the Hutt River.

Minimum recorded flows (7-day average) during summer 2013/14 compared with mean annual low flows.

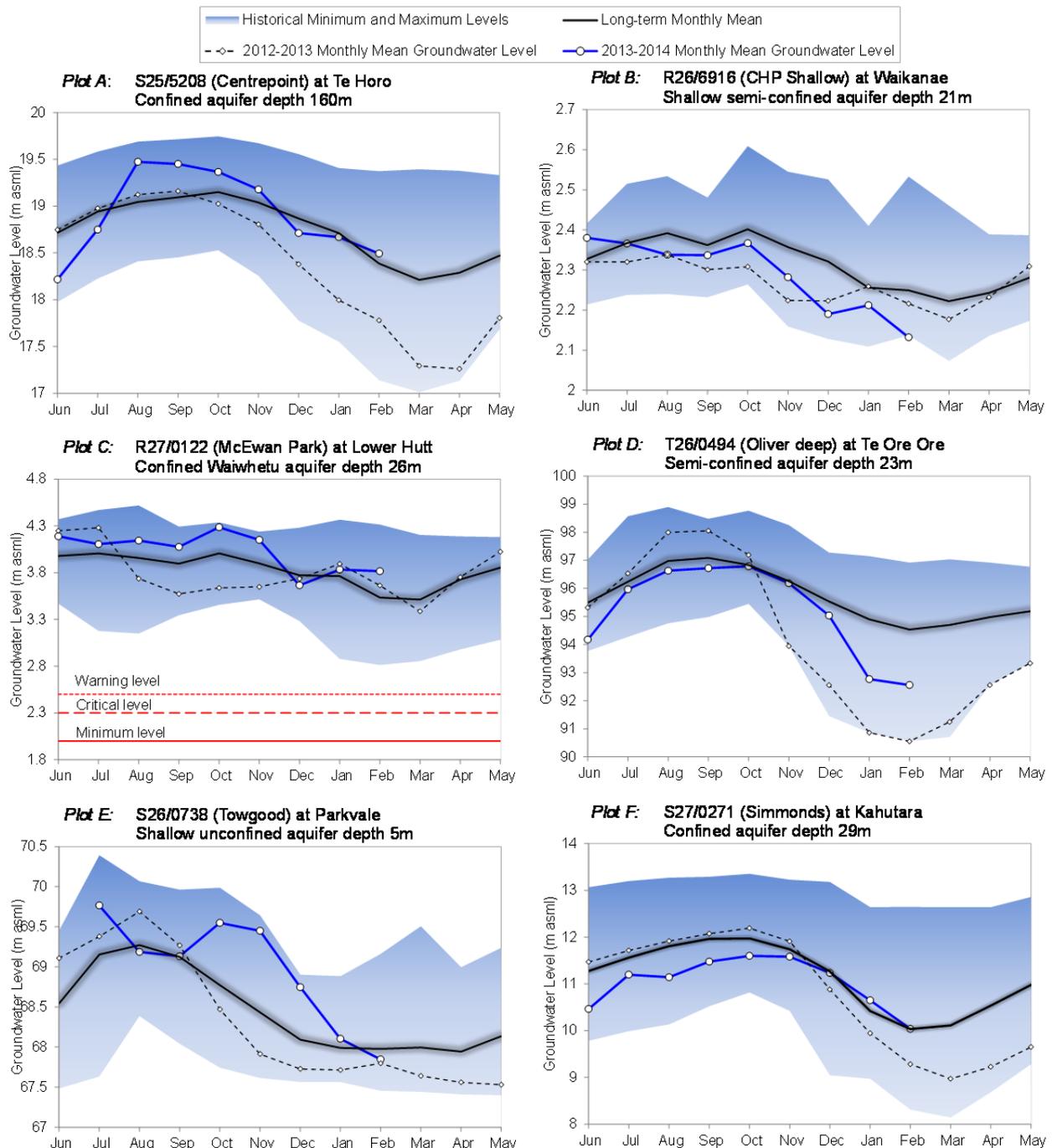
River gauge location	Minimum 7-day duration flow during summer (raw data)	7-day mean annual low flow
Waitohu at water Supply Intake	0.147 m ³ /s beginning 21 Feb	0.151 m ³ /s
Otaki River at Pukehinau	6.843 m ³ /s beginning 21 Feb	5.183 m ³ /s
Waikanae River at WTP	0.902 m ³ /s beginning 21 Feb	1.048 m ³ /s
Akatarawa River at Cemetery	1.018 m ³ /s beginning 21 Feb	1.069 m ³ /s
Mangaroa at Te Marua	0.433 m ³ /s beginning 21 Feb	0.398 m ³ /s
Hutt River at Taita Gorge	4.208 m ³ /s beginning 21 Feb	3.788 m ³ /s
Wainuiomata River at Leonard Wood Park	0.482 m ³ /s beginning 17 Dec	0.291 m ³ /s
Porirua at Town Centre	0.194 m ³ /s beginning 21 Feb	0.163 m ³ /s
Waingawa River at Kaituna	2.010 m ³ /s beginning 15 Dec	1.427 m ³ /s
Waiohine River at Gorge	5.163 m ³ /s beginning 1 Feb	3.612 m ³ /s
Mangatarere at Gorge	0.307 m ³ /s beginning 17 Dec	0.176 m ³ /s
Tauherenikau River at Gorge	1.810 m ³ /s beginning 17 Dec	1.321 m ³ /s
Otukura Stream at Weir	0.091 m ³ /s beginning 21 Feb	0.080 m ³ /s
Kopuaranga River at Palmers	0.430 m ³ /s beginning 21 Feb	0.314 m ³ /s
Ruamahanga River at Wardells	4.319 m ³ /s beginning 21 Feb	3.111 m ³ /s
Ruamahanga River at Waihenga	12.829 m ³ /s beginning 1 Feb	10.433 m ³ /s

Groundwater levels in summer

Recorded groundwater levels at six bores across the region are shown below. The level for the current year to the end of summer is compared to the previous year, the long-term average and the range of recorded levels.

Groundwater levels over the summer were around average in the Te Horo and Lower Hutt aquifers (Plots A and C). The Waikanae shallow semi-confined aquifer (Plot B) began to drop to low levels over summer 2013/14 and by the end of February it was approaching its lowest recorded levels.

In the Wairarapa, aquifer levels at Parkvale and Kahutara (Plots E and F respectively) were sitting at near average levels by the end of summer. Our monitoring bore at Te Ore Ore showed levels dropping sharply below average over summer but not to the same extent as the previous summer (2012/13).

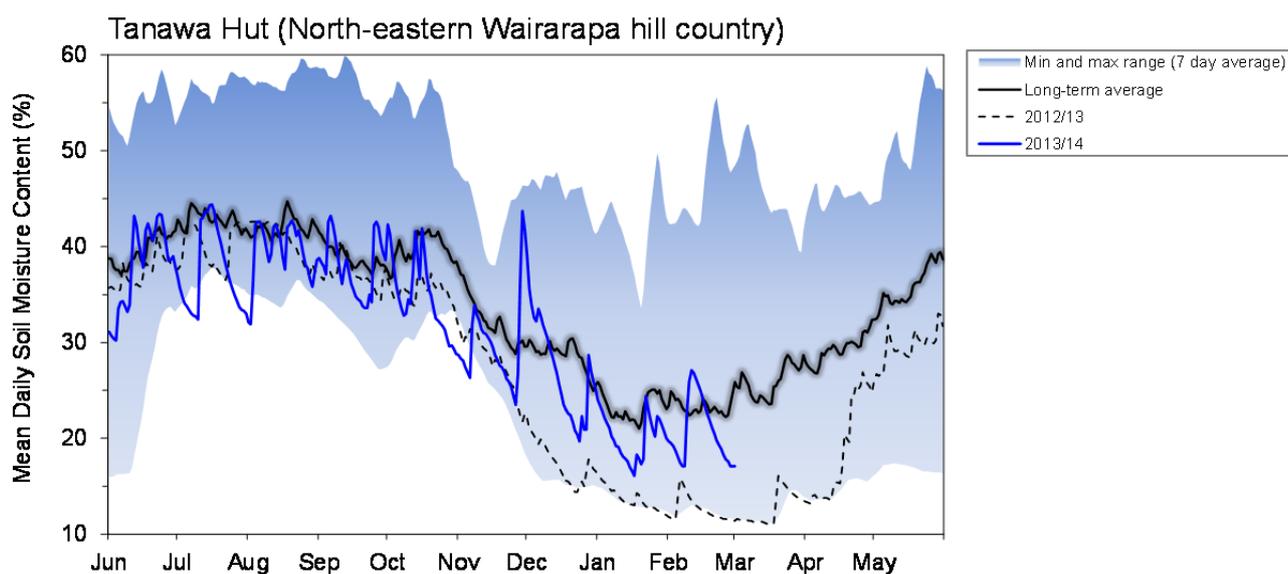


Mean monthly groundwater levels at selected sites in the Wellington region for the year to date (1 June 2013 to 28 February 2014) compared with the previous full year and the historical average and range

Soil moisture in summer

Soil moisture content was slightly below average for much of the 2013/14 summer season. It did not fall to the very low levels experienced during the previous 2012/13 summer due to sufficient rainfall events that kept the moisture content at the levels shown.

A solid rainfall event that lasted for three days and brought 169 mm of rain at the end of November meant that the summer season started with replenished soil moisture levels just as it had been beginning to track downwards as it had in the 2012/13 year.



Mean monthly soil moisture levels in the north-eastern Wairarapa hill country for the past year (up to 1 March 2013) compared with the previous year and the historical average and range

More information

This summary is based on data from selected monitoring locations in the Wellington region. GWRC monitors rainfall, river flows, groundwater levels and soil moisture at many locations that may not be mentioned in this summary report. Maps of site locations and up-to-date data can be found at <http://www.gw.govt.nz/environmental-science/>.

Disclaimer: This report is based on data that have not yet been quality checked. In particular, flow data may be subject to change following adjustment of rating curves. The data presented is the best currently available but due to quality assurance procedures this data may be amended, without notice, at any time.

GWRC accepts no responsibility for any interpretation or use of the provisional data in this report.