

Report to the Rural Services and Wairarapa Committee
from Matthew Morgan, Section Leader, Resource Investigations

Wairarapa Annual Hydrology Reports for 1998

1. Purpose

To inform the Committee of some of the major findings from the Wairarapa Annual Hydrology Reports.

2. Introduction

- 2.1 The Resource Investigations Section has recently completed its annual hydrology reports for the 1998 year. This report summarises some of the major findings from these annual reports.
- 2.2 Hydrologically, 1998 was a year of extremes. Drought affected the eastern Wairarapa for most of the year while October saw record rain in the Tararua Ranges and large floods in the western rivers. It was therefore a busy and challenging year for staff.

3. Rainfall

- 3.1 1998 saw the transition from a strong El Nino index to a moderate La Nina index although, rainfall over the Wairarapa in 1998 was consistent with what we would normally expect from El Nino conditions. Rain was well above average in the high part of the Tararuas and well below average in the Wairarapa eastern hill country.
- 3.2 The table below gives the 1998 rainfall as an approximate percentage of long term average annual rain for different climatic areas of the Wairarapa.

Area of the Wairarapa	1998 rainfall as an approximate percentage of the long term average annual rain
Tararua ranges - high altitude	110 – 130 %
Tararua ranges - foothills	100 – 110 %
Western side of the Wairarapa valley	90 – 100 %
Eastern side of the Wairarapa valley	70 – 80 %
Eastern hill country	60 – 70 %

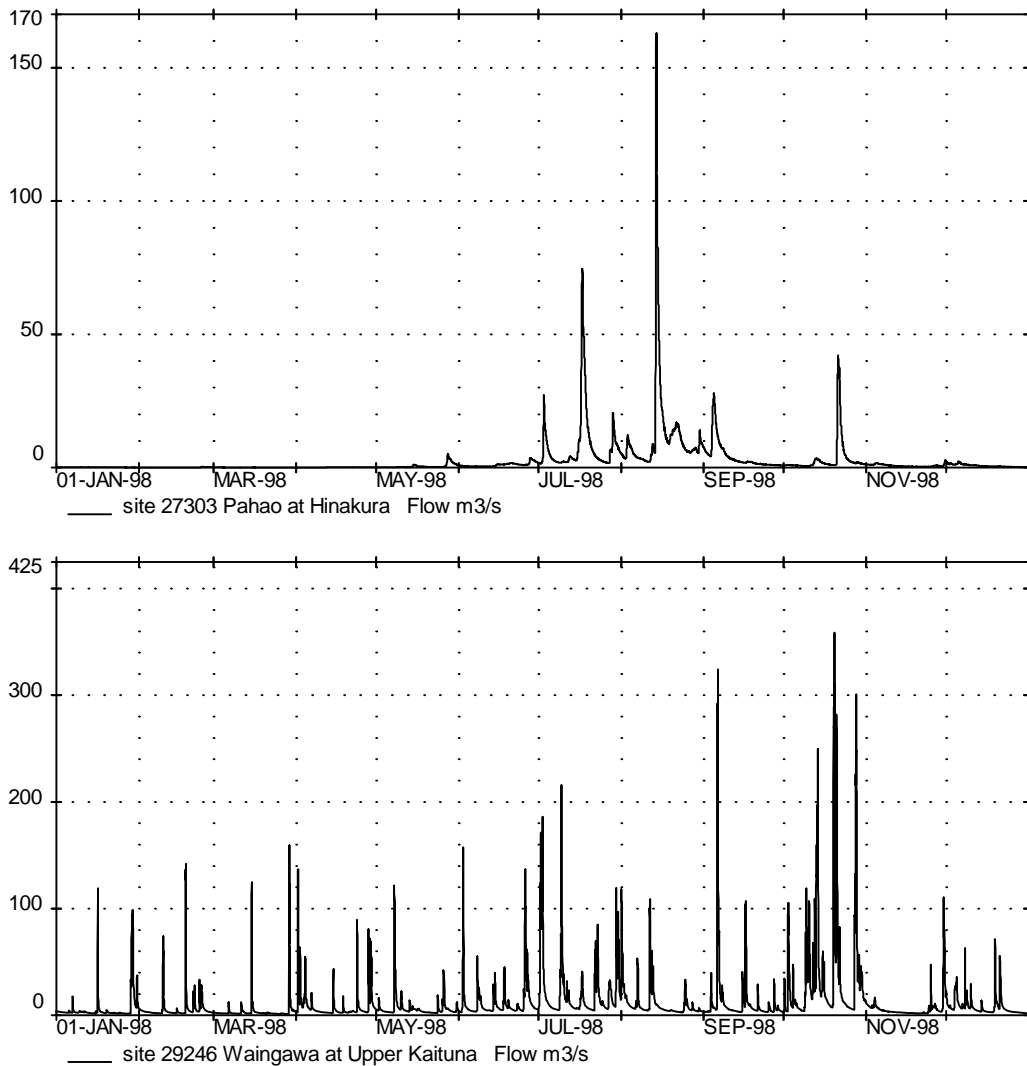
- 3.3 The maximum and minimum annual rainfall recorded by Regional Council rain gauges in 1998 was:-

9148 mm at Angle Knob in the Tararua Ranges
584 mm at Te Weraiti in the Taueru valley

- 3.4 Notable for the year was the drought which affected eastern areas of the Wairarapa. This was probably at its worst from March to May when rainfall for the previous 6 months was statistically in excess of a 100 year drought in some areas (see 1997 annual report for further reports). The east of the Wairarapa continued to experience below average rain until the end of 1998 although rain in the months of July and October were slightly above average.
- 3.5 Also notable for the year was the record monthly rain totals for July and October at most gauges in the Tararua ranges. The October totals were particularly significant causing the three large floods in October. The 2439 mm of rain at Angle Knob in October was the highest monthly total for any site on our records.

4. River Flows

- 4.1 As expected from the above rainfall pattern, eastern rivers recorded well below average flows for 1998 with some rivers like the Whareama, Kaiwhata and Pahao recording their lowest annual flows on record.
- 4.2 Rivers from the Tararuas recorded slightly above annual flows. The lower reaches of the Ruamahanga River recorded slightly below average flows because it has tributaries which contribute from both the Tararuas and the eastern hill country.
- 4.3 Three large floods occurred in October. These floods resulted in the mean monthly flow for October being the highest for most of the Wairarapa's western rivers. The flood on 21 October gave rise to a record peak on the Ruamahanga at Wardells (5.024 m, 1024 m³/s) with an estimated return period of 86 years based on records going back to 1954.



Figures 1 & 2 – 1998 River flows in the Pahao and Waingawa Rivers

5. Lake Levels

5.1 Lake levels in both Lake Wairarapa and Onoke were above average for 1998. The need to backflow from Lake Onoke in August and the floods in October put Lake Wairarapa levels well above target levels for those months. Lake Onoke's outlet to the sea was blocked on at least 12 occasions, this being more than in recent years.

6. Ground Water Levels

6.1 In the year January 1998 to December 1998 there appeared to be no significant overall drop in ground water levels. However by March and April ground water levels in many aquifers were at their lowest recorded.

6.2 Aquifers that that exhibited lower than normal summer levels are once again the deeper aquifers in the Parkvale and Lower Valley Ground

water zones. Figure 3 shows ground water in the deeper Parkvale aquifer were at their lowest recorded throughout much of 1998 although a recovery is evident late in the year.

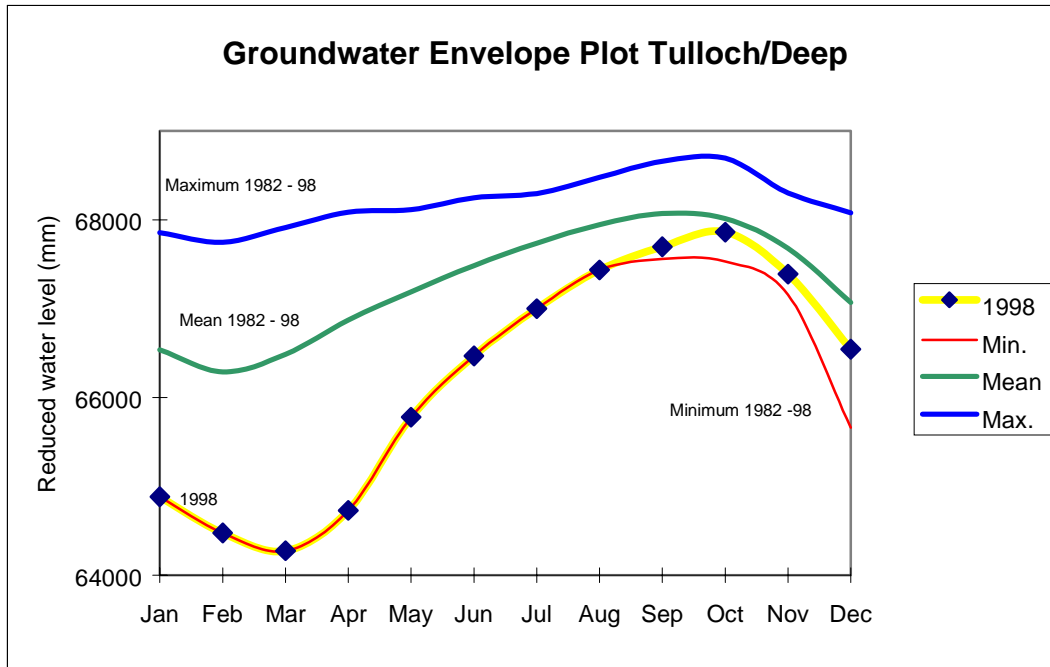


Figure 3 - 1998 Ground water levels in the deeper Parkvale aquifer compared with maximum, minimum and mean ground water levels since 1982.

- 6.3 The lower than usual 1998 summer groundwater levels for the rainfall recharged aquifers can be attributed to the prolonged and sustained drawoff of groundwater during last years dry summer. Lack of full recovery to rainfall recharge aquifers during the winter can be explained by generally below average rainfall over the winter months. River recharged aquifers like Greytown and Tawaha near Martinborough did not experience particularly low levels in 1998
- 6.4 No major resource availability problems were encountered. However a close eye needs to be kept on water levels in the Parkvale aquifers and some of the Lower Valley aquifers to ensure that the recent trend in water level decline does not continue.
- 6.5 1998 also saw an increased demand for new bores, particularly irrigation bores.

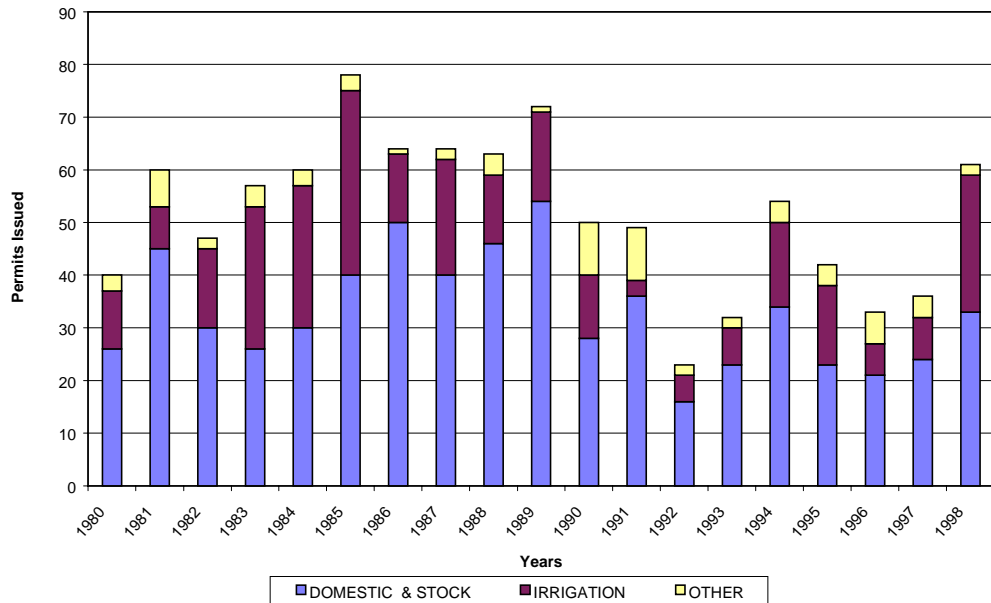


Figure 4 – Bore Permit Statistics, 1980 – 1998.

7. Ground Water Quality

- 7.1 The baseline groundwater quality monitoring sampling programme commenced in November 1997 and consists of 11 quarterly, 18 bi-annual and 22 one off supplementary sampling sites spread throughout the main Valley floor.
- 7.2 A preliminary report of data collected to date has been produced. As expected, there has not been enough information collected to be able to report on any long term changes of groundwater quality or to say with confidence that any seasonal trends that have been observed are in fact seasonal trends. This confirms the need for this project to be long term, as the information collected to date will be more useful with more information collected in the future.
- 7.3 Interesting findings to date include:-
- medium to high nitrates found in areas that were expected, which is an indicator of the current land use occurring in parts of the Wairarapa Valley;
 - occasional positive bacteriological results in shallow aquifers were expected and reinforce information given out to public regarding groundwater quality in shallow aquifers;
 - and Iron and Manganese levels are often above aesthetic and health guidelines.

- 7.4 Further more in-depth analysis of data presently held and collected over the next three years will lead to more conclusive evidence of the state and trends of ground water in the Wairarapa Valley.

8. How 1999 is shaping up

- 8.1 La Nina conditions are bringing more rain to the eastern Wairarapa than in 1998. Tanawa rain gauge in the head of the Whareama catchment has received about 95% of its average rain to the end of May. High altitude Tararua rain is continuing to be slightly above average so far this year.
- 8.2 A dry spell in the Tararua ranges this February/March put many rivers below their water take restriction levels for a short time.
- 8.3 Ground water levels over the summer were generally not as low as during last year's drought summer. Rainfall recharged aquifers are now starting to recover although an above average winter rain will be required to bring them up to average levels prior to the 1999/2000 irrigation season.

9. Summary

- ❑ Hydrologically, 1998 was a year of extremes.
- ❑ Drought affected the eastern Wairarapa for most of the year.
- ❑ October saw record rain in the Tararua ranges and large floods in the western rivers.
- ❑ Ground water levels in many aquifers were at their lowest recorded for much of the year.

10. Communications

These findings will be incorporated in the Council's 1998 Surface Water Hydrology and Underground Water Reports with Executive Summaries provided to the media. This report will be made available to Wairarapa newspapers.

11. Recommendation

That the report be received.

Report prepared by:

Approved for submission by:

Matthew Morgan
Section Leader, Resource Investigations

Steve Blakemore
Manager, Planning & Resources