

RAINFALL & RIVER FLOW MONTHLY REPORT OTAGO REGIONAL COUNCIL

October 2005

In Brief

October was drier than normal across most of Otago, with the exception of above average rain in North Otago, and average rain for the Alexandra, Ettrick and Moa Flat areas.

The driest areas included Dunedin, the Taieri Plains, most of south Otago, and the Queenstown lakes area. Rainfall totals were **less than half of normal** in these areas.

In the Strath Taieri, Maniototo, and Shag areas, rainfall totals ranged from **normal to 40% below normal**. Some reasonably heavy falls in the first week of October gave some relief from the recent dry conditions in these areas.

Approximately **normal** rainfall was recorded in the Alexandra, Ettrick, Idaburn and Moa Flat areas this month.

North Otago was considerably **wetter than normal**, with rainfall totals 50 to 60% higher than the historical average at several sites.

River levels and lake levels across the region were well **below average**, with the exception of the Kakanui, Deep Stream and Pomahaka rivers. The monthly average flow in the lower Kakanui was almost double the normal October flow, while Deep Stream and the Pomahaka were close to normal flow this month.

The lowest flows were recorded in the Silverstream, where the monthly average was just one quarter of normal. Other rivers where average monthly flow was approximately half of normal included the Leith, Nenthorn in the Strath Taieri, Waitahuna in South Otago, Manuherikia River, Shotover and Dart Rivers in the Queenstown lakes region.

Summary text and graphs are provided for the following districts.

- North Otago
- Dunedin
- Lower Taieri and Strath Taieri
- South Otago
- Central Otago
- Queenstown Lakes

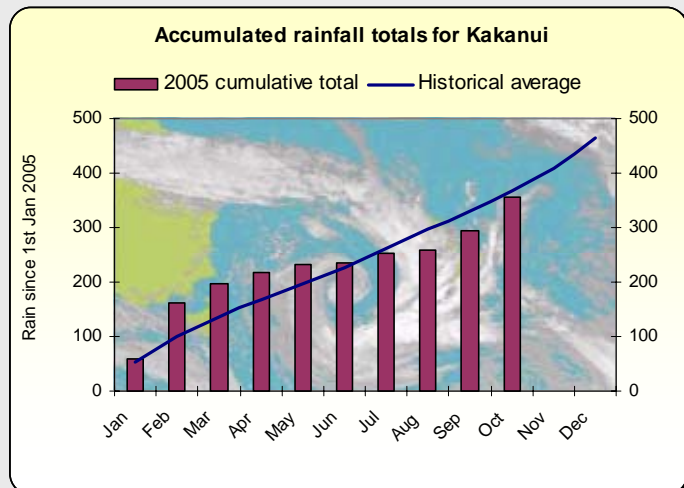
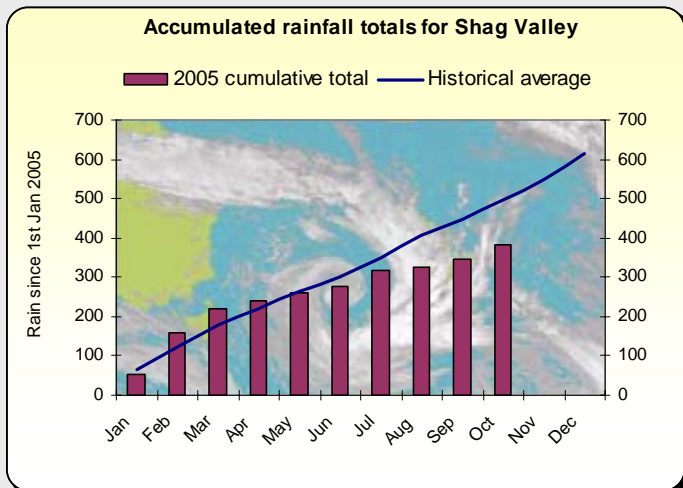
A summary table of flow and rainfall is attached to this report, which gives more detail on sites in each of these areas. Several rainfall sites which are normally available are not presented in this table, due to computer server hardware problems at the National Climate Database.

Rainfall & river flows around the region

North Otago

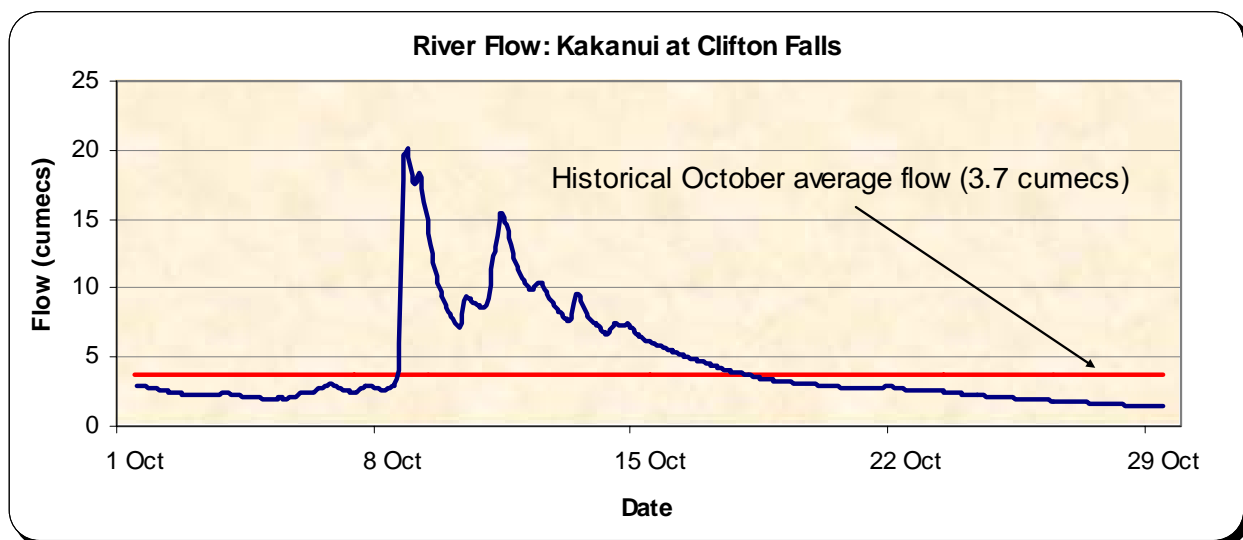
October rainfall was once again **below normal** in the Shag catchment this month, with Stoneburn receiving **35mm, 30% below normal**. For the rest of North Otago, rainfall was **normal to above normal**, with most sites receiving 20 to 30mm more than usual for October. The wettest sites were Dome Hills and Fairview in the headwaters of the Maerewhenua, which recorded **104** and **89mm** respectively.

There were no major storm events, and the heaviest rainfall events occurred on the 8th and 29th of the month.



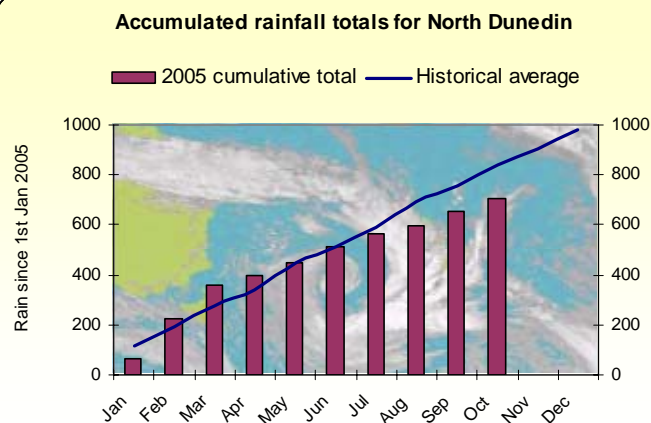
The accumulated rainfall total for the Shag at Stoneburn continued to drop further below the historical average this month. Further north, the Kakanui at Clifton Falls received above average rainfall this month, and the cumulative total for 2005 is now just slightly below normal.

River flow in the Kakanui at Clifton Falls was consistently above average during the middle part of the month, peaking at 20 cumecs on the 10th October. This was followed by a steady decline in flow over the last half of the month. In the Shag River at The Grange, average flow for the month was **1.4 cumecs, 30% below the normal** October flow of 2 cumecs.



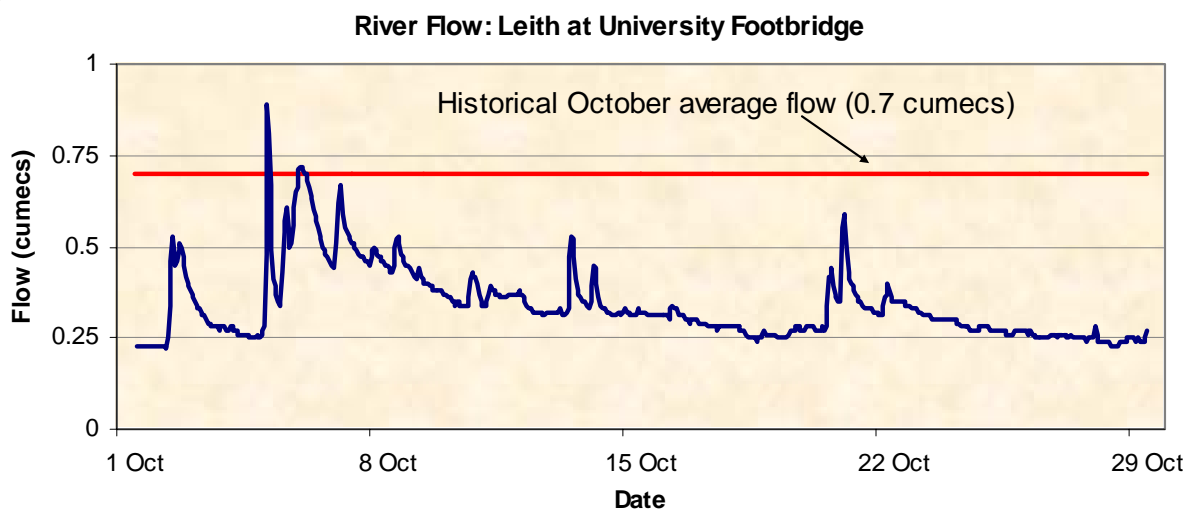
Dunedin

Rainfall totals in the Dunedin area were **below normal** this month. Pine Hill recorded **49mm**, 30mm less than normal. At Musselburgh, **24mm** was recorded, less than half of the normal October total of 65mm.



Another dry month saw accumulated rainfall decline further below the long term average in North Dunedin. **698mm** has been collected so far this year, compared to the historical average of **840mm** for the first 10 months of the year.

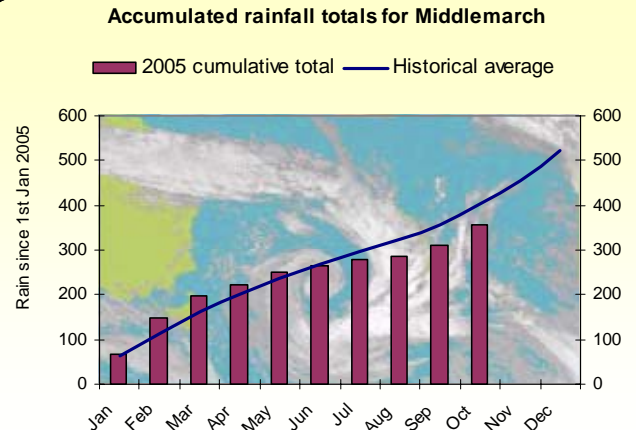
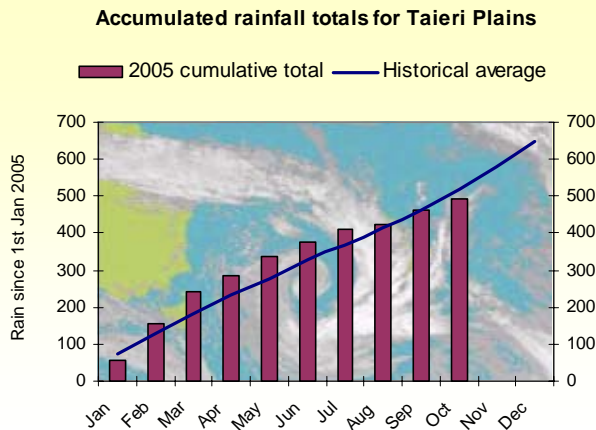
River flows remained low in local Dunedin streams this month. In the River of Leith at the University Footbridge, flow was **below average** for most of October, with the exception of two small events at the start of the month. The average flow for the month was **0.33 cumecs**, less than half of the historical October average flow.



Lower and Strath Taieri

On the Lower Taieri, rainfall was approximately **half** of normal for October. The Riccarton Road site recorded **32mm**, while Dunedin Airport collected **24mm**.

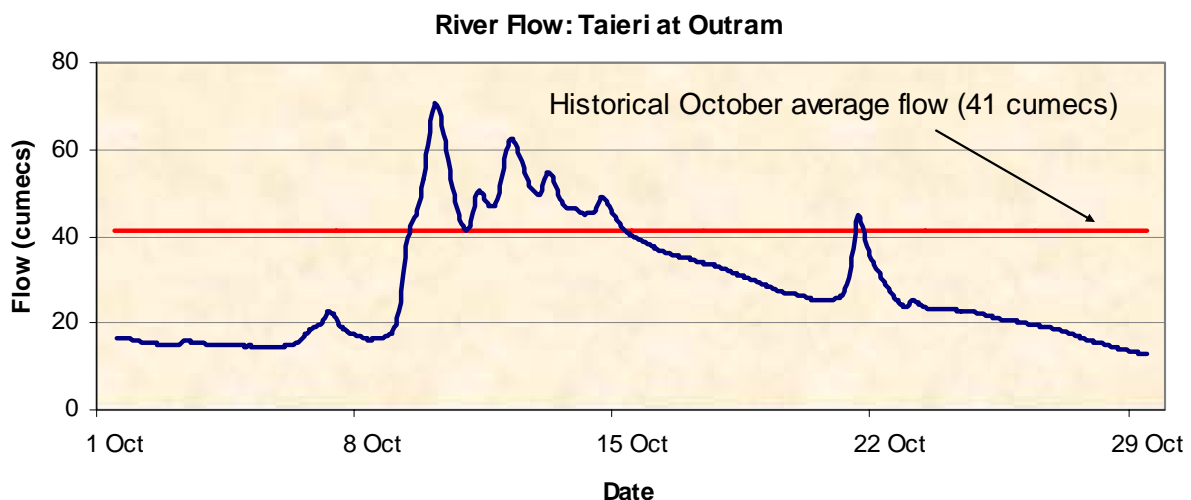
In the Strath Taieri, rainfall at Mt Stoker and Deep Stream was approximately **two thirds** of the long term average for October, with **31mm** at Mt Stoker, and **41mm** at Deep Stream. **44mm** was recorded at Middelmarsh, **normal** for October.



The accumulated rainfall total for the Taieri Plains at Riccarton Road has now dropped slightly below the long term average, with drier than normal conditions since June. At Middelmarsh, some heavier falls were recorded this month, although accumulated rainfall to the end of October is still slightly below normal.

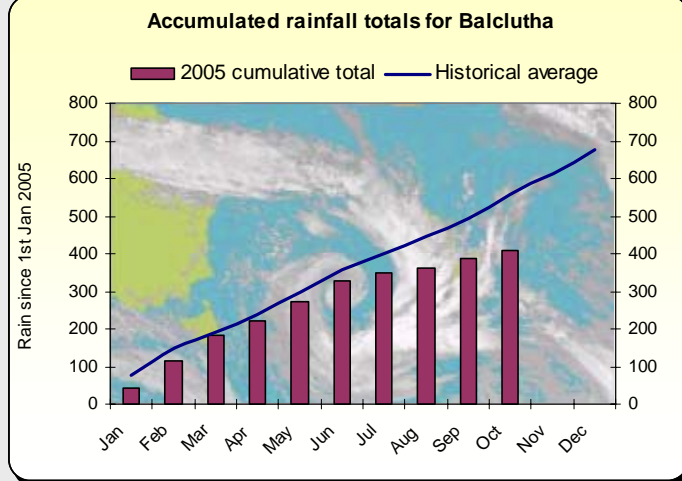
Average monthly flow in the Silverstream at Riccarton Road was **0.2 cumecs**, which is **one quarter** of the long term average for October.

Steady rain in the upper Taieri catchment during the second week of October resulted in several small flow events, with the largest peaking at 71 cumecs at Outram. Average monthly flow at Outram was **27 cumecs**, approximately **two thirds** of normal.

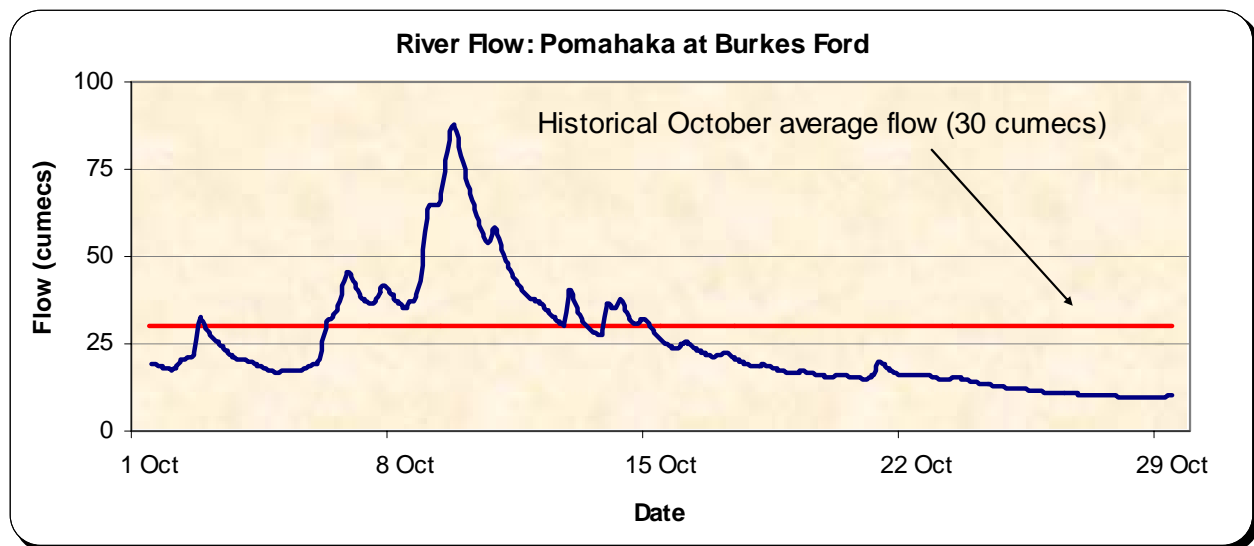


Southwest Otago

Almost all of the southwest part of Otago was drier than normal this month, with most sites receiving approximately **half** normal rainfall. Balclutha was the driest area, recording just **21mm** this month. Elsewhere, Waitahuna at Clarks Flat recorded **41mm**, and Waipahi at Cairn **61mm**. The highest total in Southwest Otago was **76mm**, recorded at the Moa Flat rain gauge, which is approximately **normal** for October.



The cumulative rainfall total for 2005 at Balclutha is now well below normal, with the last four months being well particularly dry. **408mm** has fallen at Balclutha this year, compared to the historic average of **571mm**, for the period up to the end of October.



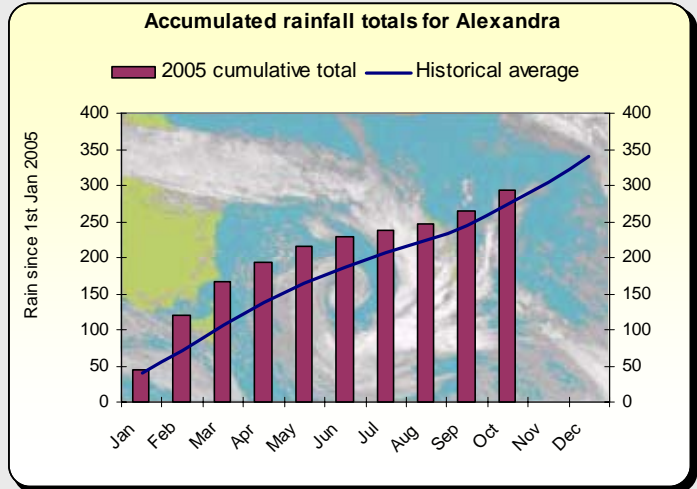
Steady rain in the Pomahaka catchment saw the Pomahaka River at Burkes Ford peak at 88 cumeecs early in the month. Average flow for the month was **30 cumeecs**, **20% below normal** for October.

Elsewhere in the district, average flow for the month in the Waipahi and Waitahuna rivers was **half of normal**, as a result of lower than normal rainfall in these areas.

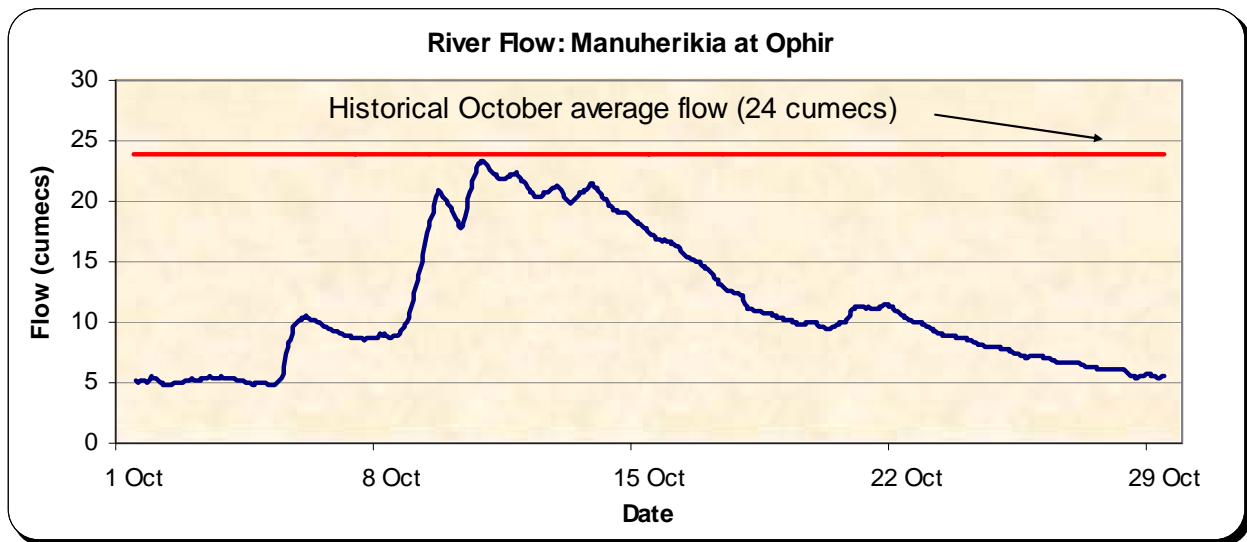
Central Otago

Rainfall totals in the Central Otago area were **below normal** at Ranfurly (**22mm**) and Tima (**47mm**). At the other end of the scale, Lauder recorded **56mm**, almost twice the long term October average.

Alexandra had normal rainfall for October, with **31mm**, while in the Poolburn, Merino Ridges also collected **31mm**. The Hills Creek area received **51mm**, normal for October.



The accumulated rainfall total for Alexandra is still slightly above the long term average line.



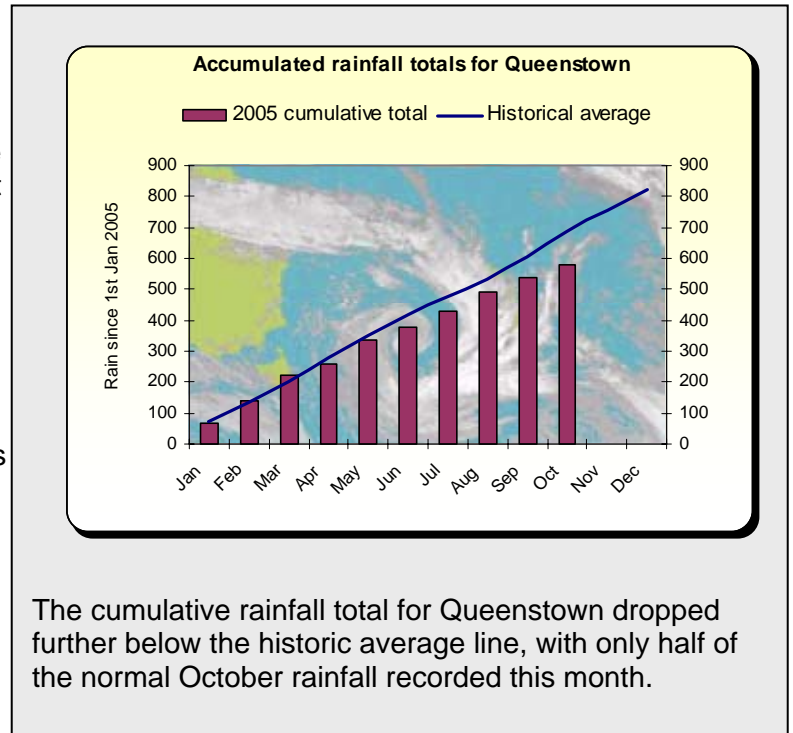
The heavy rain that fell in the Idaburn on the 4th and 8th of October resulted in the Manuherikia River climbing rapidly, and peaking at 23 cumecs, the highest it has been since February. Unfortunately this was not backed up with any further significant rain, and the river had dropped back to 5 cumecs by the end of the month. Average flow for the month in the Manuherikia at Ophir was **11 cumecs**, which is **half** the historical average flow for October.

Further upstream, the Dunstan Creek at Beatties Road recorder measured an average flow of **2.9 cumecs** this month. This site has only been running for 3 years. Previous October average flows were 4.0 cumecs in 2004, and 4.8 cumecs in 2003.

Queenstown Lakes

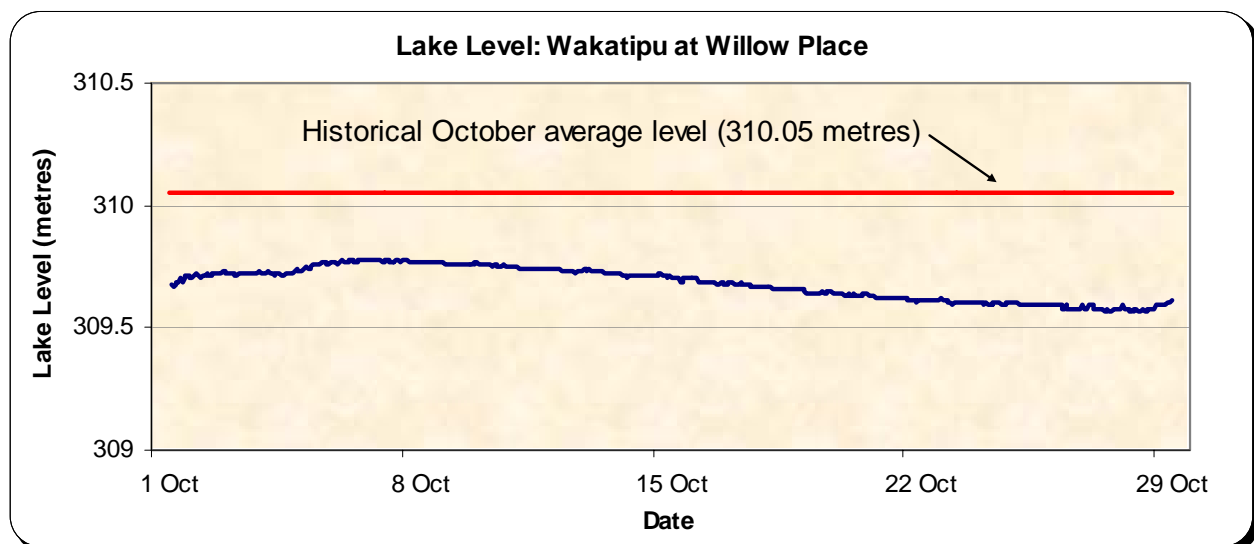
The Queenstown Lakes district was particularly dry this month. Rainfall totals for the Hunter Valley, Wanaka, Glenorchy, and Queenstown were all approximately **half of normal**. West Wanaka recorded 48mm, while Wanaka Airport received 28mm. Glenorchy at The Hillocks collected **84mm**, compared to the long term average of 179mm. Queenstown received **41mm**.

In the headwaters of Lake Hawea, the Hunter Valley gauge collected **54mm**, compared to the long term average of 107mm. The wettest site was Makarora, with **140mm**, although this was still **40% below** average.



Low rainfall means lower than normal river flows and lake levels, and average monthly river flows in the Queenstown Lakes district were all approximately half of normal this month. The Shotover River at Peat's Hut was flowing at an average of **19 cumecs**, while the Dart River at the Hillocks averaged **46 cumecs**. In the Kawarau at Chards Road, average flow for the month was **149 cumecs**.

Lake levels were also low, with Lake Wakatipu almost **half a metre** below the historical October average for most of the month. Lake Wanaka was also low, finishing the month **0.4 metres** below the October long term average.



Further information

See the Otago Regional Council website for regular rainfall and river flow updates:
<http://www.orc.govt.nz/waterinfo>

For more information phone Chris Arbuckle, Manager Resource Science, on 03 474 0827 or e-mail:
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Mailing list

This report is available by email

To update your contact details on our mailing lists, please contact: environmentalinfo@orc.govt.nz; tel:
0800 474 082.

Acknowledgement

The information produced in this report was derived from rainfall, flow, lake level and lake outflow data collected from stations throughout the region operated by private individuals and corporate bodies, the National Institute of Water & Atmospheric Research Limited, Dunedin City Council and Contact Energy who are gratefully acknowledged.

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RAINFALL TABLE (October 2005)

Station	Area	Total Rainfall for this Month (mm)			Total Rainfall this Year Up to the End of this Month (mm)		
		Recorded	Historic	% Change	Recorded	Historic	% Change
Oamaru AWS	North Otago	50.000	42.0	19.05	314.20	395.00	-20.46
Grandview	North Otago	69.500	43.0	61.63	412.90	439.00	-5.95
Glenrowan	North Otago	61.850	44.0	40.57	430.15	506.00	-14.99
Waikoura	North Otago	50.000	45.0	11.11			
Clifton Falls	North Otago	61.500	38.0	61.84	354.50	365.00	-2.88
The Dasher	North Otago	89.000	63.0	41.27	560.00	656.00	-14.63
Stoneburn telemetry	North Otago	34.500	49.0	-29.59	380.50	501.00	-24.05
Dome Hills	North Otago	104.000	64.0	62.50	550.00	547.00	0.55
Fairview	North Otago	89.000	59.0	50.85			
Leith at Sullivan's Dam	L/S Taieri, Dun	66.500	102.0	-34.80	829.00	1022.00	-18.88
Leith at Pine Hill	L/S Taieri, Dun	49.000	84.0	-41.67	698.50	840.00	-16.85
Musselburgh	L/S Taieri, Dun	23.600	65.0	-63.69	486.70	636.00	-23.47
Taieri Depot	L/S Taieri, Dun	32.500	58.0	-43.97	494.00	524.00	-5.73
Dunedin Airport	L/S Taieri, Dun	23.800	61.0	-60.98	354.10	541.00	-34.55
Mt Stoker	L/S Taieri, Dun	31.500	44.0	-28.41	327.00	369.00	-11.38
Glengarry	L/S Taieri, Dun	41.000	58.0	-29.31	421.00	473.00	-10.99
Middlemarch-Garthmyl	L/S Taieri, Dun	44.000	47.0	-6.38	360.80	402.00	-10.25
Balclutha	Southwest Otago	21.000	61.0	-65.57	407.50	571.00	-28.63
Warepa	Southwest Otago	40.600	75.0	-45.87	609.50	685.00	-11.02
Clarks Flat	Southwest Otago	40.500	75.0	-46.00	515.50	639.00	-19.33
Cairn	Southwest Otago	61.000	127.0	-51.97	889.50	1109.00	-19.79
Crested View	Southwest Otago	49.350	92.0	-46.36			
Waikoikoi at Rosebank	Southwest Otago	46.100	79.0	-41.65	679.00	752.00	-9.71
Moa Flat	Southwest Otago	75.500	80.0	-5.63	734.00	651.00	12.75
Ranfurly	Central Otago	21.600	37.0	-41.62	258.40	357.00	-27.62
Pat-Paerau	Central Otago	42.000	34.0	23.53	353.50	292.00	21.06
Tima	Central Otago	46.500	64.0	-27.34	513.00	538.00	-4.65
Ettrick No2	Central Otago	46.600	55.0	-15.27	477.00	472.00	1.06
Blackstone Hill	Central Otago	51.700	57.0	-9.30	370.80	516.00	-28.14
Hills Creek	Central Otago	51.000	50.0	2.00	336.50	404.00	-16.71
Lauder EWS	Central Otago	56.200	33.0	70.30	305.80	356.00	-14.10
Merino Ridges	Central Otago	31.000	38.0	-18.42			
Alexandra	Central Otago	30.700	29.0	5.86	293.80	271.00	8.41
Clyde EWS	Central Otago	35.400	33.0	7.27	282.20	299.00	-5.62
Hunter Valley 2	Lakes district	53.800	107.0	-49.72			
Makarora telemetry	Lakes district	139.500	224.0	-37.72	1544.00	1785.00	-13.50
West Wanaka	Lakes district	48.500	102.0	-52.45	603.00	859.00	-29.80
Wanaka Aero AWS	Lakes district	28.000	55.0	-49.09	12775.60	542.00	2257.12
Peat's Hut	Lakes district	48.500	78.0	-37.82	580.00	709.00	-18.19
Glenorchy telemetry, Hillocks	Lakes district	84.000	179.0	-53.07	1100.24	1423.00	-22.68
Queenstown	Lakes district	41.400	85.0	-51.29	564.40	690.00	-18.20
Queenstown AWS	Lakes district	35.800	72.0	-50.28	444.80	611.00	-27.20

RIVER FLOW TABLE (October 2005)

Station	Area	Minimum flow recorded (m ³ /s)	Maximum flow recorded (m ³ /s)	Mean flow for the month (m ³ /s)	Historic mean for the month (m ³ /s)	% Change of Historic Mean
Kakanui River at Mill Dam	North Otago	2.111	68.491	9.694	5.171	87.48
Kakanui River at Clifton Falls	North Otago	1.421	20.298	4.279	3.728	14.77
Shag River at The Grange	North Otago	0.477	8.233	1.413	1.960	-27.89
Leith at University Foot Br	L/S Taieri, Dun	0.218	0.989	0.334	0.699	-52.18
Silverstream at Taieri Depot	L/S Taieri, Dun	0.125	2.213	0.261	0.860	-69.62
Taieri River at Outram	L/S Taieri, Dun	11.141	70.801	27.018	41.124	-34.30
Taieri River at Sutton	L/S Taieri, Dun	7.067	36.958	18.649	26.484	-29.59
Taieri River at Tiroiti	L/S Taieri, Dun	4.356	25.460	12.935	18.324	-29.41
Taieri River at Waipiata	Central Otago	2.999	17.722	10.161	13.522	-24.86
Nenthorn Stream at Mt Stoker Rd	L/S Taieri, Dun	0.149	2.556	0.441	0.992	-55.58
Deep Stream at SH 87	L/S Taieri, Dun	1.073	19.254	3.660	4.086	-10.42
Waipori River at Berwick	Southwest Otago	0.589	28.170	11.131	5.020	121.72
Clutha River at Balclutha	Southwest Otago	202.210	741.141	381.612	637.842	-40.17
Waitahuna River at Tweeds Br	Southwest Otago	0.757	5.574	1.415	2.883	-50.94
Pomahaka River at Burkes Ford	Southwest Otago	9.349	87.797	24.145	30.100	-19.79
Pomahaka River at Glenken	Southwest Otago	5.414	60.414	14.549	16.451	-11.56
Waipahi River at Waipahi	Southwest Otago	1.374	7.222	3.047	5.715	-46.67
Manuherikia River at Ophir	Central Otago	4.766	23.423	10.862	23.913	-54.58
Clutha at Clyde	Central Otago	108.813	772.808	341.432	586.726	-41.81
Clutha River at Cardrona Confluence	Lakes District	117.508	330.250	168.183	292.299	-42.46
Kawarau River at Chards Rd	Lakes District	76.945	194.227	148.588	251.501	-40.92
Shotover River at Bowens Peak	Lakes District	22.708	80.784	29.325	62.435	-53.03
Shotover River at Peat's Hut	Lakes District	12.625	103.266	19.327	37.352	-48.26
Dart River at The Hillocks	Lakes District	23.894	370.467	45.594	109.238	-58.26

LAKE LEVEL AND OUTFLOW TABLE

Lake	Lake level for the month (m above mean sea level)					Historic mean lake level (m above mean sea level)
	First Day	Last Day	Min.	Max.	Mean	
Lake Hawea	340.841	341.310	340.817	341.315	341.078	340.996
Lake Wakatipu	309.700	309.689	309.559	309.821	309.681	310.049
Lake Wanaka	277.101	276.966	276.717	277.184	276.958	277.409

Lake	Lake outflow for the month (m ³ /s)					Historic mean outflow (m ³ /s)
	First Day	Last Day	Min.	Max.	Mean	
Lake Hawea	11.2	70.1	11.2	151.23	20.78	46.48
Lake Wakatipu	117.1	114.9	89.2	143.7	113.6	209.87
Lake Wanaka	164.8	143.7	109.1	178.1	143.5	221.74

Notes:

L/S Taieri, Dun = Lower Taieri, Strath Taieri and Dunedin.

** = Controlled Outflows.*