RAINFALL & RIVER FLOW MONTHLY REPORT

OTAGO REGIONAL COUNCIL

May 2005

In Brief

Reasonably settled weather over much of Otago resulted in drier than normal conditions for North Otago, Taieri, and Southwest Otago. This month, North Otago and North Dunedin in particular were considerably drier than normal, with some rain gauge totals less than half the long term average. Central Otago and the Queenstown Lakes districts generally received normal rainfall totals.

There were no significant flood events during May, only a small event during the middle of the month in the Pomahaka, Waipahi and Waitahuna catchments in Southwest Otago. At the head of Lake Wakatipu, the Dart experienced two 350 cumec flow peaks, although this is not at all exceptional for this river. Flow in the Taieri, Kakanui and Manuherikia Rivers gradually declined during May, and were well below average by the end of the month. Average lake levels for the month were slightly below normal for Wakatipu and Wanaka.

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 at the end of the report gives more detail on sites in each of these areas.

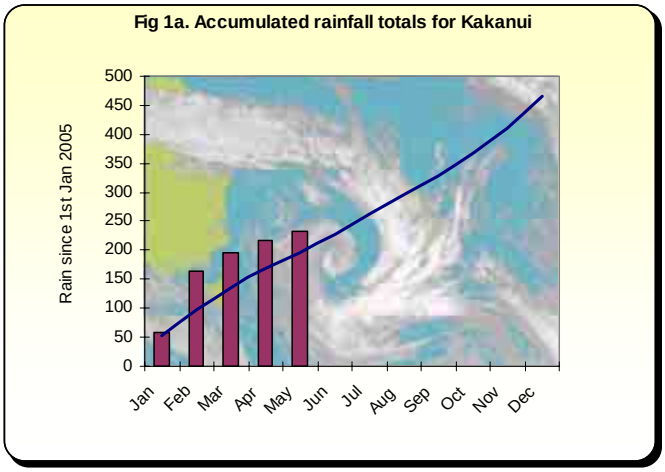
Rainfall & river flows around the region

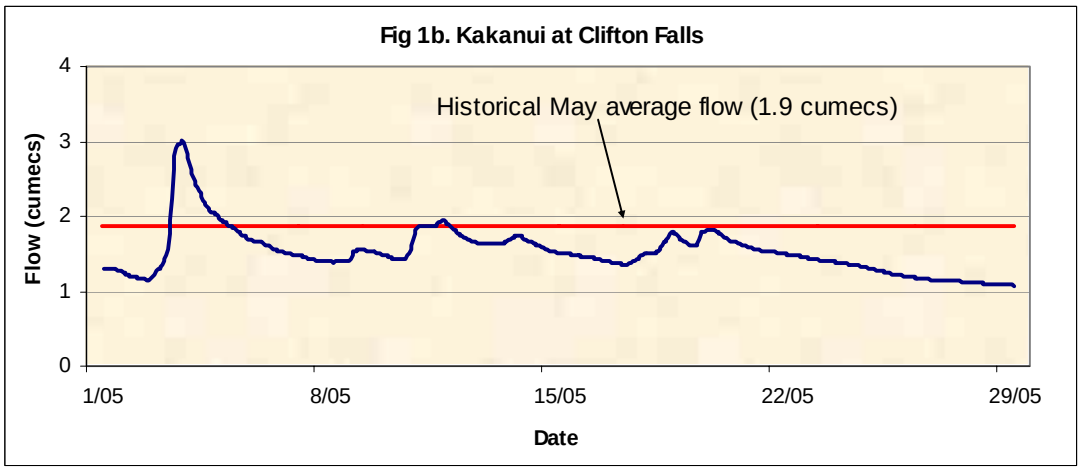
North Otago

Rainfall totals in North Otago were below normal for the second consecutive month. Oamaru recorded the least rainfall with **15mm**, which is **less than half** the historic average for May. The Dome Hills gauge - situated at the head of the Maerewhenua catchment - collected the highest total for North Otago with **45mm**, which is **normal** for May. In the Shag catchment, the Stoneburn gauge recorded **20.5mm**, which is **half** the average May total.

Figure 1a shows that despite a relatively dry month at Kakanui at Clifton Falls, the accumulated total for the year is still above normal, due to a very wet period in February. Just **16.5mm** fell at Clifton Falls this month (**40% below** normal).

River flow in the Kakanui at Clifton Falls was **below average** for most of May (Figure 1b), and had dropped to **1 cumec** at the end of the month. In the Shag catchment, average flow for the month at the Grange recording site was **0.5 cumecs**, **40% below** the long term average for May of 0.8 cumecs.

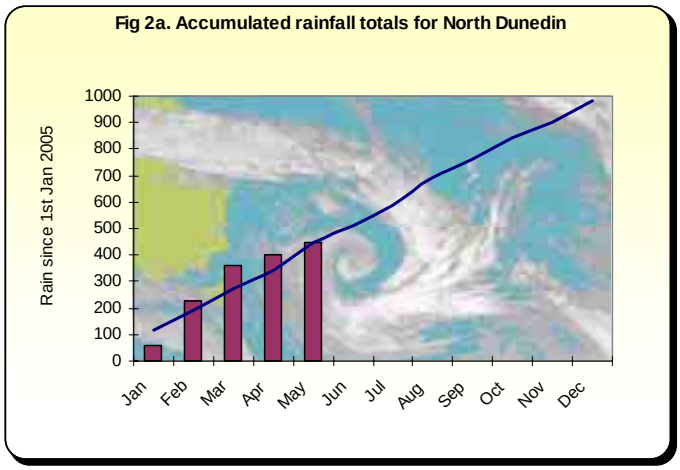


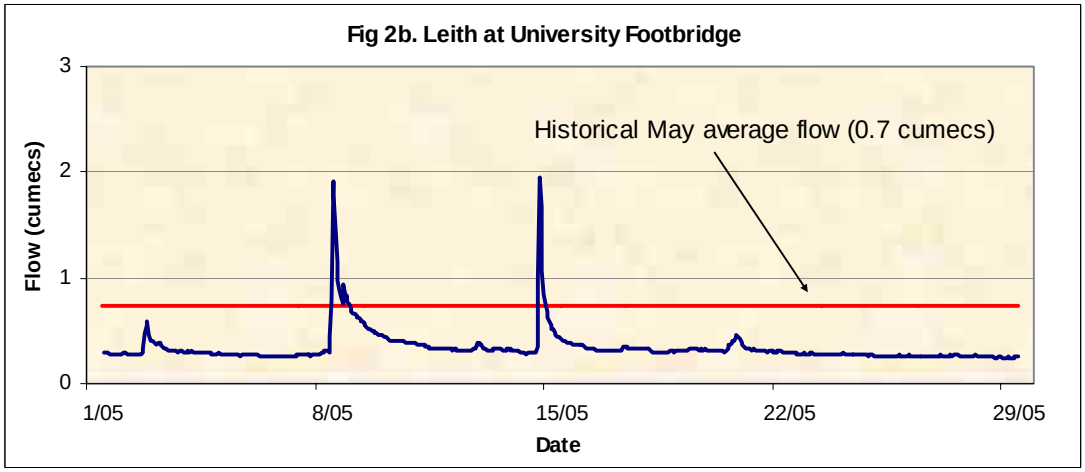


Dunedin

Rainfall totals for May were also **below normal** in the Dunedin area. Pine Hill in North Dunedin recorded **46.5mm, less than half** the long term average of 102mm (Figure 2a). Across the city, Musselburgh rainfall was similar to that in Pine Hill, with **48mm** recorded, **30% below** the long term average of 67 mm. Accumulated annual rainfall up to the end of May at the Pine Hill gauge is now similar to the long term average (Figure 2a).

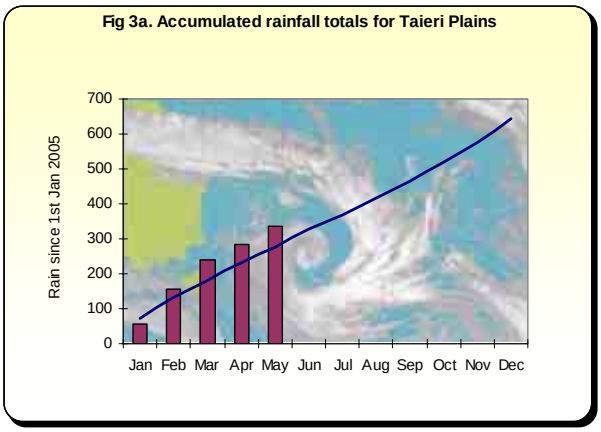
The lower than normal rainfall totals led to reduced flows in local Dunedin streams. Figure 2b shows the flow in the Leith at University footbridge was well below average for May, with the exception of two small events earlier in the month.

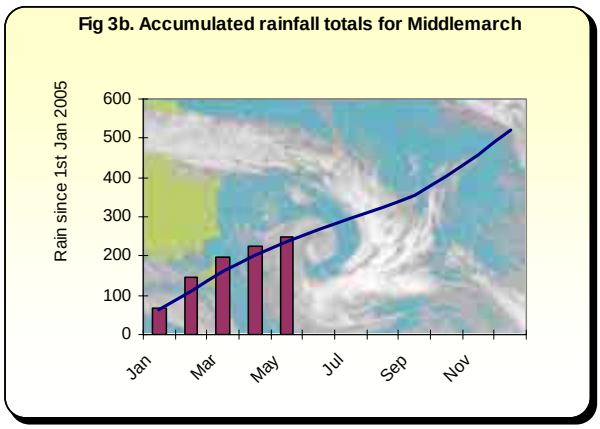




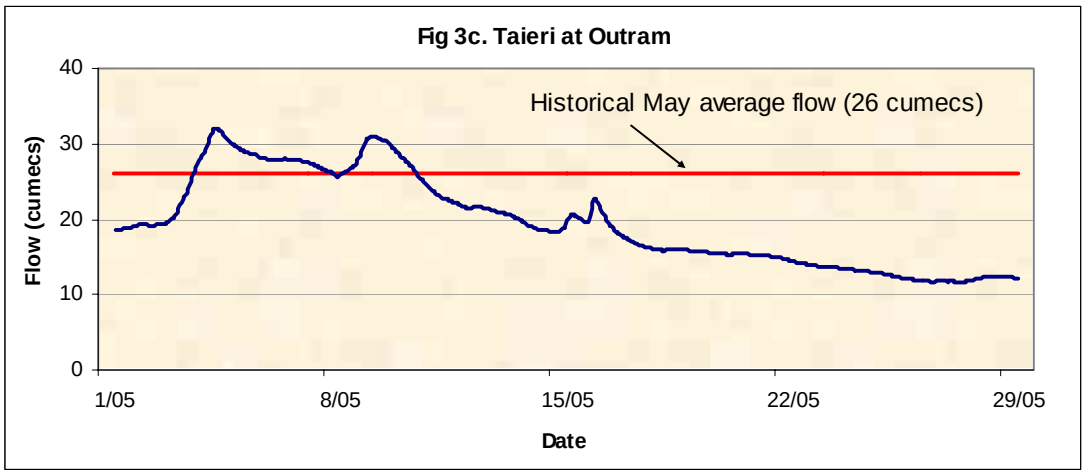
Lower and Strath Taieri

Rainfall on the Taieri Plains ranged from **52mm** at Riccarton Road (**30% above average**) to **30mm** at nearby Dunedin Airport (**46% below average**). On the Strath Taieri, Middlemarch received **26mm**, **23% below** the long term average of 34mm. The accumulated rainfall total for the Taieri Plains at Riccarton Road is still above the long term average line (Figure 3a), while in the Strath Taieri, Middlemarch accumulated rainfall is currently the same as the long term average (Figure 3b).





Average monthly flow in the Silverstream at Riccarton Road was far below normal (**0.17 cumecs**, compared to the long term average for May of 0.5 cumecs). Flow in the Taieri River at Outram was also generally below normal (Figure 3c), and by the end of the month had declined to approximately 12 cumecs. Average flow for the month for Taieri at Outram was **27% below** normal, while Deep Stream at SH87 average flow was 1.3 cumecs (half the long term average).



South Otago

South Otago rainfall totals were generally below normal this month, with the exception of Moa Flat (**78mm** recorded, **32% above** normal). Waipahi at Cairn recorded the highest rainfall total of **90.5mm** (**45% below** normal), while Balclutha collected **50mm** (**23% below** normal). Figure 4a shows accumulated rainfall totals for 2005 at Balclutha are now slightly below the long term average line.

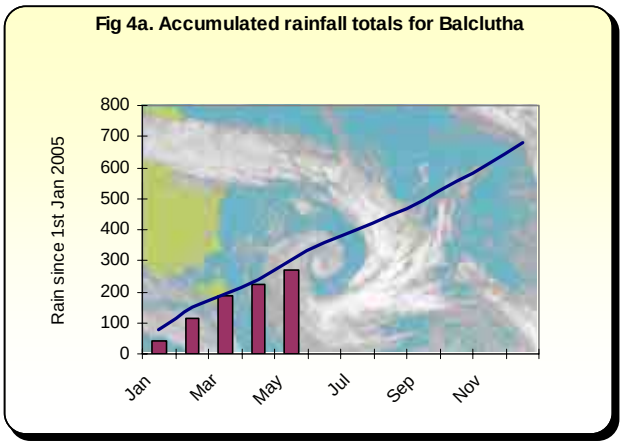
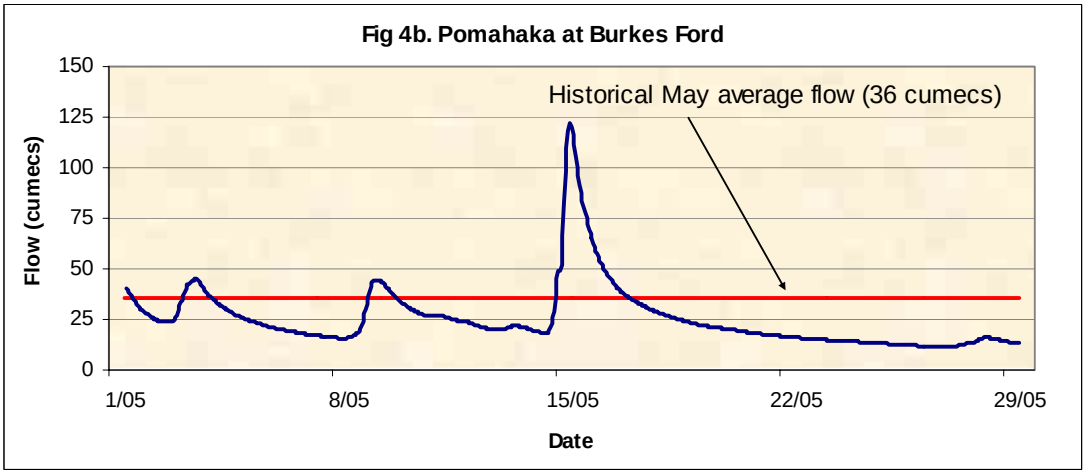
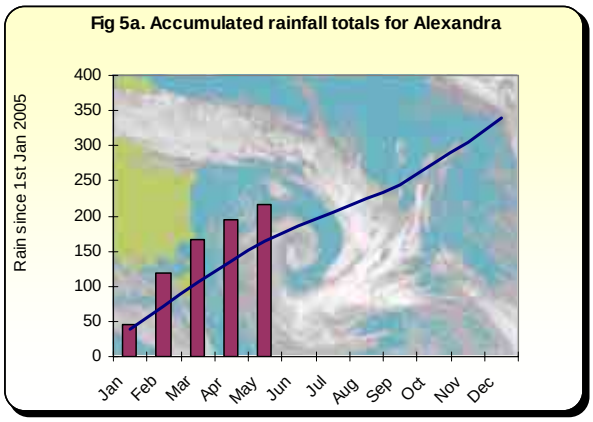


Figure 4b shows flow in the Pomahaka at Burkes Ford during May. Apart from a reasonable sized event (122 cumecs) in the middle of the month, flow was generally below the average line. The average for May was **30% below** normal at **25 cumecs**.

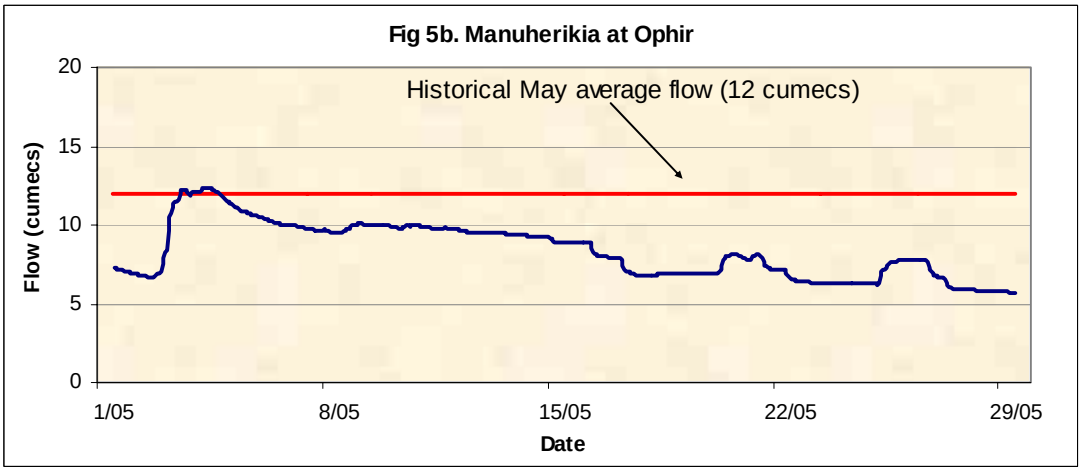


Central Otago

Rainfall totals in Central Otago were close to normal at most sites. Totals ranged from **22mm** at Alexandra (**17% below** normal), to **35mm** at Hills Creek (**normal**), and **61mm** at Millers Flat (**13% above** normal). Figure 5a shows that the accumulated rainfall total for Alexandra is still well ahead of the average line, despite the total for May being slightly below average.



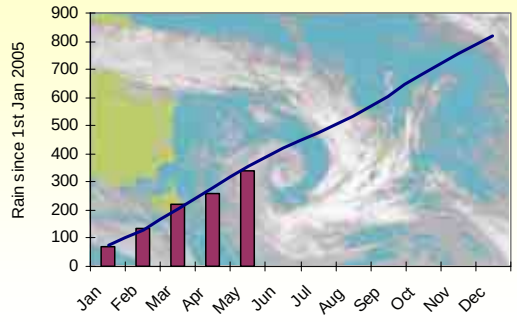
Flow in the Manuherikia at Ophir continued to decline this month as a result of average rainfall, with a significant proportion of that rain falling as snow in the high country. Figure 5b shows declining flow during the month, with the long term average of 12 cumecs only being exceeded once. There were no significant flow events during May.



Queenstown Lakes

Rainfall totals in the Queenstown Lakes district were also close to normal. Rainfall in Queenstown was **79mm** - normal for May - while the Wanaka rainfall total was **57mm**, which is also approximately average. The highest total for the area was **209mm**, recorded at Routeburn Station, which is also typical for this time of year. Hunter Valley Station, on the shores of Lake Hawea, recorded **105mm**, **22% above** the average total of 86mm. Figure 6 shows accumulated rainfall totals for Queenstown are slightly below the historic average.

Fig 6. Accumulated rainfall totals for Queenstown



Average river flows were generally slightly below normal for May, with the exception of the Clutha at Cardrona Confluence which was **12% above** average. Average flow in the Shotover at Peat's Hut was **14 cumecs**, **25% below** normal, while the Dart at the Hillocks averaged **61 cumecs**, **20% below** normal. The Dart experienced two 350 cumec flow peaks, although this flow is not at all exceptional for this river.

Lake levels at the end of May were also slightly **below normal** for Wakatipu and Wanaka. Average levels for the month were also slightly **below normal**.

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 John Threlfall, Director Environmental Information and Science on 03 474 0827.

More detailed rainfall and river flow data is available from Chris Arbuckle, Manager Resource Science, on 03 474 0827 or e-mail: chris.arbuckle@orc.govt.nz

Mailing list

This report is available by email

To update your contact details on our mailing lists, please contact Neil Allison: neil.allison@orc.govt.nz; tel: 03 474 0827.

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 (May 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	15.100	37.0	-59.19	191.50	203.00	-5.67
Grandview	North Otago	20.300	35.0	-42.00	269.50	221.00	21.95
Glenrowan	North Otago	29.100	33.0	-11.82	282.50	267.00	5.81
Waikoura	North Otago	26.500	43.0	-38.37	229.50	231.00	-0.65
Clifton Falls	North Otago	16.500	28.0	-41.07	232.50	194.00	19.85
The Dasher	North Otago	30.500	60.0	-49.17	309.00	351.00	-11.97
Stoneburn telemetry	North Otago	20.500	44.0	-53.41	262.00	262.00	0.00
Dome Hills	North Otago	45.000	47.0	-4.26		298.00	
Fairview	North Otago	32.500	40.0	-18.75		274.00	
Leith at Sullivan's Dam	L/S Taieri, Dun	55.000	109.0	-49.54	527.50	507.00	4.04
Leith at Pine Hill	L/S Taieri, Dun	46.500	102.0	-54.41	446.00	445.00	0.22
Musselburgh	L/S Taieri, Dun	47.800	67.0	-28.66	332.20	336.00	-1.13
Taieri Depot	L/S Taieri, Dun	52.000	40.0	30.00	337.50	276.00	22.28
Dunedin Airport	L/S Taieri, Dun	30.300	56.0	-45.89	247.80	295.00	-16.00
Mt Stoker	L/S Taieri, Dun	27.000	22.0	22.73	234.50	201.00	16.67
Glengarry	L/S Taieri, Dun	23.000	41.0	-43.90	273.50	250.00	9.40
Middlemarch-Garthmyl	L/S Taieri, Dun	26.100	34.0	-23.24	255.00	235.00	8.51
Balclutha	Southwest Otago	49.500	64.0	-22.66	272.50	302.00	-9.77
Warepa	Southwest Otago	60.000	83.0	-27.71	348.00	359.00	-3.06
Clarks Flat	Southwest Otago	62.500	68.0	-8.09	303.50	343.00	-11.52
Cairn	Southwest Otago	90.500	164.0	-44.82	402.50	556.00	-27.61
Waikoikoi at Rosebank	Southwest Otago	85.700	85.0	0.82	377.70	404.00	-6.51
Moa Flat	Southwest Otago	78.000	59.0	32.20	469.50	345.00	36.09
Ranfurly	Central Otago	28.000	32.0	-12.50	193.00	209.00	-7.66
Pat-Paerau	Central Otago	31.000	26.0	19.23	244.50	175.00	39.71
Tima	Central Otago	61.000	54.0	12.96	273.50	297.00	-7.91
Ettrick No2	Central Otago	45.000	44.0	2.27	288.70	270.00	6.93
Blackstone Hill	Central Otago	38.000	51.0	-25.49	232.10	292.00	-20.51
Hills Creek	Central Otago	35.000	34.0	2.94	213.00	225.00	-5.33
Lauder EWS	Central Otago	28.000	32.0	-12.50	211.80	220.00	-3.73
Merino Ridges	Central Otago	27.500	28.0	-1.79		198.00	
Alexandra	Central Otago	21.500	26.0	-17.31	215.10	163.00	31.96
Clyde EWS	Central Otago	22.200	27.0	-17.78	198.40	181.00	9.61
Hunter Valley 2	Lakes district	105.000	86.0	22.09		429.00	
Makarora telemetry	Lakes district	188.500	178.0	5.90	653.50	827.00	-20.98
West Wanaka	Lakes district	79.500	85.0	-6.47	332.00	386.00	-13.99
Wanaka Aero AWS	Lakes district	56.800	61.0	-6.89	210.00	280.00	-25.00
Peat's Hut	Lakes district	68.500	64.0	7.03	322.00	279.00	15.41
Routeburn Station	Lakes district	209.200	200.0	4.60		872.00	
Glenorchy telemetry, Hillocks	Lakes district	129.387	144.0	-10.15	554.55	589.00	-5.85
Queenstown	Lakes district	78.900	76.0	3.82	325.60	354.00	-8.02
Queenstown AWS	Lakes district	54.200	67.0	-19.10	286.00	298.00	-4.03

River Flow Table (May 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	1.454	4.022	2.154	2.409	-10.56
Kakanui River at Clifton Falls	North Otago	0.960	3.017	1.479	1.874	-21.08
Shag River at The Grange	North Otago	0.340	0.894	0.471	0.818	-42.37
Leith at University Foot Br	L/S Taieri, Dun	0.232	2.154	0.339	0.745	-54.58
Silverstream at Taieri Depot	L/S Taieri, Dun	0.061	1.389	0.167	0.520	-67.93
Taieri River at Outram	L/S Taieri, Dun	11.246	32.201	18.865	26.070	-27.64
Taieri River at Sutton	L/S Taieri, Dun	8.139	23.677	13.657	16.028	-14.79
Taieri River at Tiroiti	L/S Taieri, Dun	5.727	17.416	9.714	11.339	-14.33
Taieri River at Waipiata	Central Otago	4.740	17.598	9.048	7.542	19.96
Nenthorn Stream at Mt Stoker Rd	L/S Taieri, Dun	0.266	2.133	0.917	0.666	37.61
Deep Stream at SH 87	L/S Taieri, Dun	0.742	5.206	1.298	2.482	-47.71
Waipori River at Berwick	Southwest Otago	1.121	46.146	21.226	16.693	27.16
Clutha River at Balclutha	Southwest Otago	230.345	697.605	465.937	558.951	-16.64
Waitahuna River at Tweeds Br	Southwest Otago	1.237	15.489	2.054	2.023	1.54
Pomahaka River at Burkes Ford	Southwest Otago	11.533	122.788	24.985	35.739	-30.09
Pomahaka River at Glenken	Southwest Otago	4.726	45.313	10.769	10.977	-1.90
Waipahi River at Waipahi	Southwest Otago	2.096	16.503	5.023	9.994	-49.74
Manuherikia River at Ophir	Central Otago	5.735	12.424	8.260	11.939	-30.82
Clutha at Clyde	Central Otago	108.813	721.945	409.714	490.798	-16.52
Clutha River at Cardrona Confluence	Lakes District	148.460	349.161	264.233	236.202	11.87
Kawarau River at Chards Rd	Lakes District	130.130	205.121	153.995	190.424	-19.13
Shotover River at Bowens Peak	Lakes District	20.413	90.400	24.924	32.445	-23.18
Shotover River at Peat's Hut	Lakes District	9.862	90.721	14.398	19.231	-25.13
Dart River at The Hillocks	Lakes District	24.073	353.634	60.741	75.531	-19.58

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						
Lake Wakatipu	309.602	309.686	309.556	309.813	309.704	309.868
Lake Wanaka	276.664	276.924	276.638	277.043	276.875	277.203

Lake	Lake outflow for the month (m^3/s)					Historic mean outflow (m^3/s)
	First Day	Last Day	Min.	Max.	Mean	
Lake Hawea						
Lake Wakatipu	97.5	114.3	88.6	141.8	118.1	160.44
Lake Wanaka	107.2	143.3	103.8	161.4	136.5	184.25

Notes:
L/S Taieri, Dun = Lower Taieri, Strath Taieri and Dunedin.
** = Controlled Outflows.*