1.1 Surface Water

The Kaipara River – North Shore water resource management area has two high use management streams, the Waimauku Stream and the Kumeu River. Both these are sub-catchments of the Kaipara River (Fig 22). The flow-monitoring site lies upstream of the Waimauku Stream and the Kaipara River confluence (45311), catchment area 155.40km^2. For 2004-2005 the flows at this site were above the MALF. Contrasting results were recorded in March 2006 where the flow fell below the MALF (144l/s) on three occasions with 108l/s being the lowest. The flow-monitoring site on the Kumeu River (45315), catchment area 47.60km^2, recorded flow levels below the MALF on 9 occasions, the lowest reading 22.2l/s (Table 8). The low flows at Kaipara are due to low rainfall in February whilst low flows at Kumeu are due to a combination of low rainfall and individual days of high abstraction.

Table 8: Kaipara River – North Shore high use streams low flow statistics for 2005 – 2006

Stream Name	Site No	MALF l/s	Date Flow fell below MALF	Time Below MALF	Lowest flow l/s
Kaipara River	45311	1441	8/03/2006	11.8 Days	108.72
			13/03/2006	23.3 Hours	138.07
			21/03/2006	7.6 Days	109.59
Kumeu River	45315	29.3	1/03/2006	4.4 Hours	28.46
			5/03/2006	2.0 Days	24.20
			5/03/2006	3.4 Hours	29.20
			7/03/2006	1.8 Days	24.54
			12/03/2006	1.4 Hours	29.20
			14/03/2006	18.4 Hours	28.46
			21/03/2006	6.1 Hours	22.23
			22/03/2006	17.6 Hours	27.35
			26/03/2006	1 Day	28.82

1 The estimate of MALF has been revised from previous reports as a result of a review of the flow record for this site.

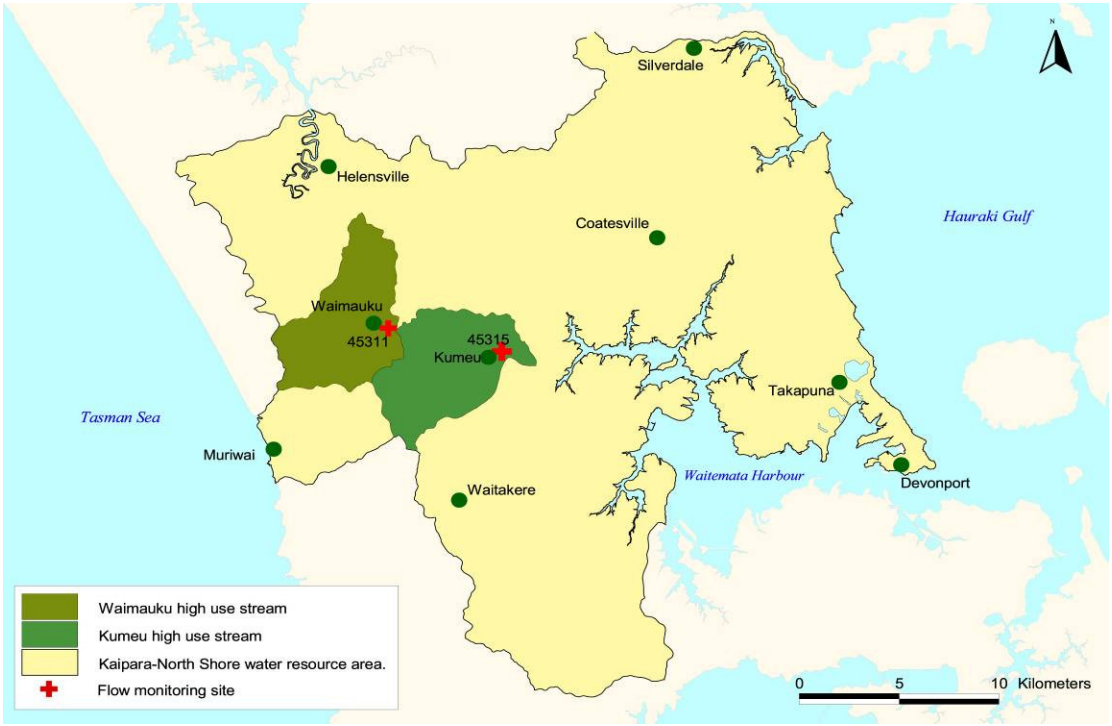


Figure 22: Kaipara River – North Shore water resource area, high use stream management areas and flow-monitoring sites.

1.2 Groundwater

The Kaipara River – North Shore water resource area has only one high use management aquifer called the Kumeu - Waitemata aquifer (Fig 23). For management reasons the area is divided into three different zones due to the variation in density of demand for groundwater. Zone 1 is fully allocated (although use is less than availability), Zones 2 and 3 are not fully allocated and the aquifer as a whole is not fully allocated.

Figure 23: Kaipara River – North Shore water resource area, high use aquifer management area and groundwater monitoring site

The ARC representative groundwater-monitoring site is located at Selaks vineyard in Kumeu (6475003). It is used to monitor long-term baseline groundwater levels (Fig 24). From June 2005 to May 2006 the minimum monthly groundwater levels exceeded the monthly average. The groundwater levels from June to Sept 2005 were high due to the winter recharge and lower extraction. January 2006 to March 2006 show a decrease in groundwater levels probably due to extraction and reduced rainfall especially in February.

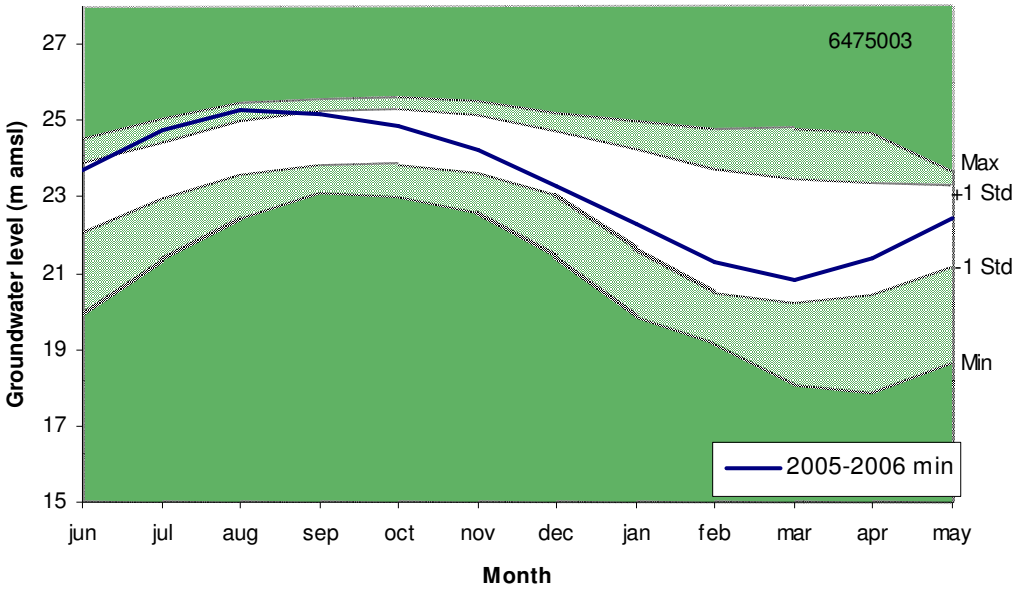


Figure 24: Groundwater envelope for Kumeu – Waitemata aquifer monitoring site at Selaks vineyard, Kumeu (6475003)

1.3 Water Allocation and Use

The Kaipara River – North Shore is the second most urbanised of the water resource areas, with major urban centers in North Shore and Waitakere. There are also significant levels of horticulture, farming and forestry beyond the urban limits (Crowcroft and Bowden, 2002).

The quantity of surface water allocated for industry has remained the same as May 2005 (500,000m^3) whilst the usage has dropped from 300,000m^3 to 150,000m^3. This is due to several large consents being inactive. The number of surface water consent holders has decreased from 82 in May 2005 to 71 in May 2006.

The Kumeu - Hobsonville Waitemata aquifer has been divided into management areas or "zones" 1, 2 and 3. Zone 1 has been further divided into zone 1a to 1f. The zones do not represent a hydrogeological boundary. They were based on concentrations of permits within the area. Zones 1a and 1f are currently over allocated. All the remaining zones are not over allocated. Overall the allocations are within the total for the aquifer specified (1,559,000 m^3/year) in the Proposed Auckland Regional Plan: Air, Land and Water.

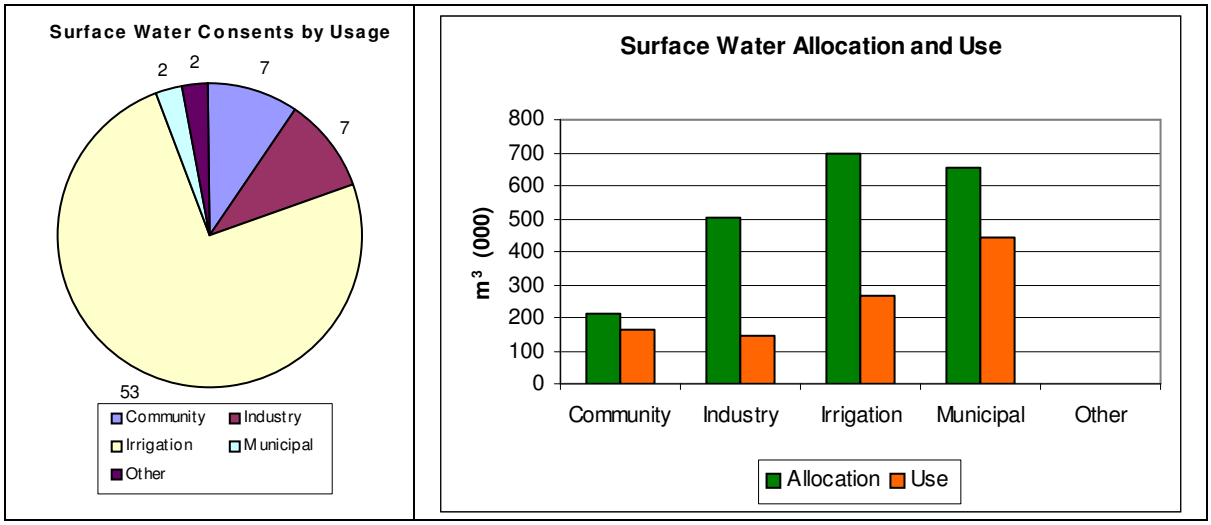
When permits expired in 1994 zone 1a was 228% over allocated. Since then where possible the allocations have been reduced. The allocation of 136,000 m^3/year (excluding one replacement application) for zone 1a represents 117% of availability. While there appears to be an increase in allocation in zone 1f there has been no actual increase. The apparent increase is due to a correction in the data. One consent was previously attributed to the incorrect zone. Zones 1a and 1f are surrounded by zone 2. The area of zone 1f is extremely small and only one property wide in some locations. There is currently sufficient surplus of water available in the surrounding zone 2 area to balance the deficit in zone 1a and 1f. Actual use in these areas is currently within the

availability and no significant adverse effects on the aquifer have been detected. Further rationalisation of allocations may occur where consents are surrendered, can be reviewed or expire and replacement consents are considered.

From June 2005 to May 2006 the groundwater usage has been considerably less than the allocation. Only 40% for the allocated water for irrigation was used (Fig 25). The number of groundwater consent holders fell from 271 in May 2005 to 268 in May 2006.

Table 9: Kumeu-Waitemata high use aquifer management area groundwater availability, allocation and use for 2004-2005 and 2005-2006.

Kumeu Waitemata Aquifer sub area	Availability m^3 (000)	2004-2005		2005-2006	
		Allocation m^3 (000)	Use m^3 (000)	Allocation m^3 (000)	Use m^3 (000)
1a	116	136	103	136	113
1b	21	16	16	16	19
1c	30	29	20	26	24
1d	33	33	5	30	2
1e	6	6	2	6	3
1f	5	9	11	13	0.04
1	211	229	157	227	161.04
2	586	532	264	540	180
3	762	73	19	70	31



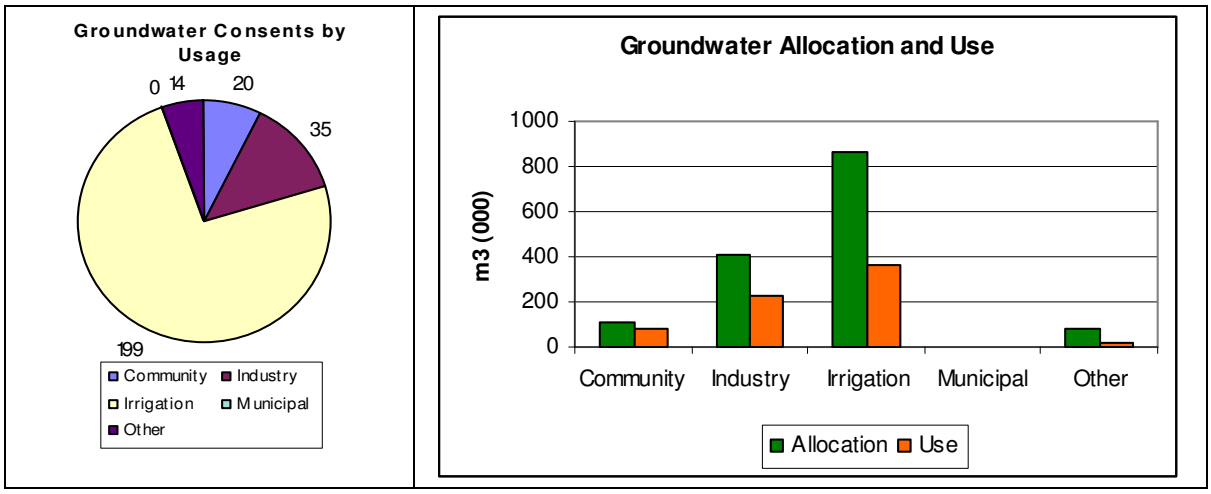


Figure 25: Surface water and groundwater allocation and use for Kaipara River – North Shore water resource area and the number of consents held for each purpose.

2 Waitakere

2.1 Rainfall

There was an increase in annual rainfall in the Waitakere water resource area of around 6%. The recurring rainfall trend was evident in Waitakere monitoring sites; with higher than average rainfall in July, October 2005, April, May 2006 and extremely dry weather in August 2005 and February 2006 (Fig 26).

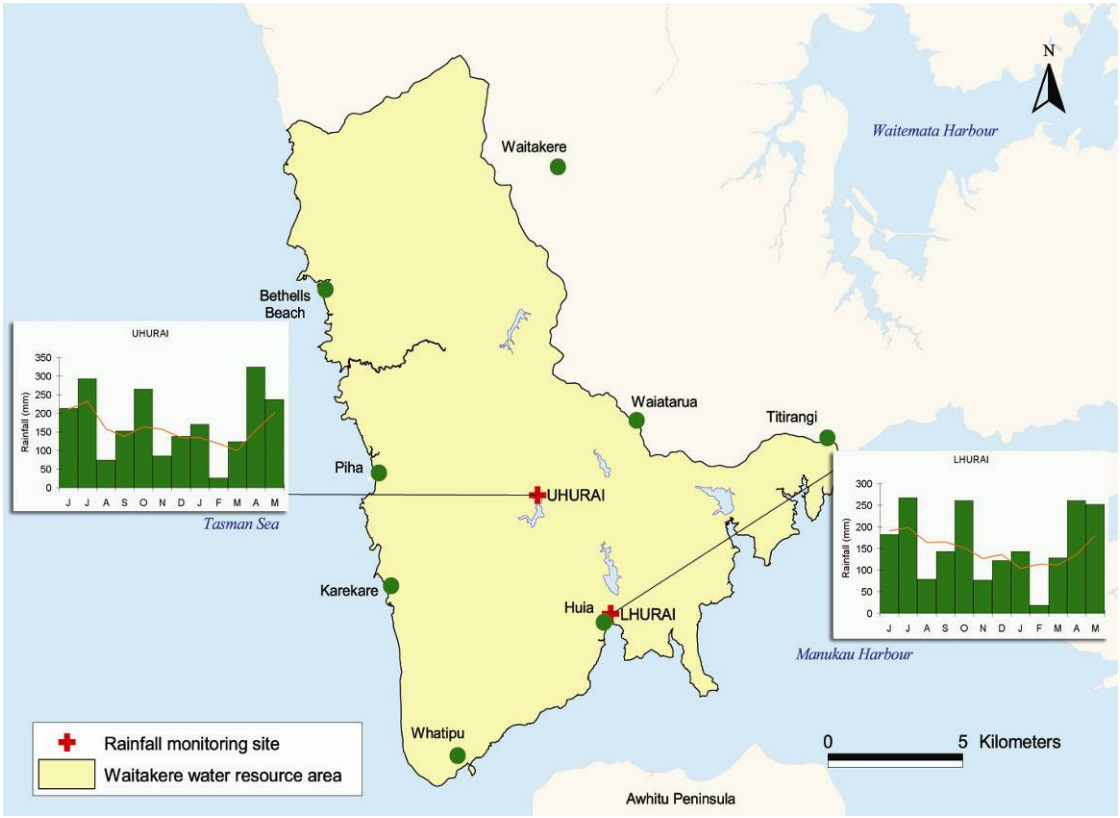


Figure 26: Total monthly rainfall (bars) and long term mean monthly rainfall (line) at 2 sites in the Waitakere water resource area.

2.2 Surface Water & Groundwater

The Waitakere water resource area does not contain any high use stream or high use aquifer management areas. This area does, however, have the second highest water allocation in Auckland Region due to the surface water taken from dams by Watercare Services Ltd.

2.3 Water Allocation and Use

Watercare abstraction from large municipal supply dams in the Waitakere Ranges is the foremost use of water in the Waitakere water resource area. These include the Waitakere Dam in the Waitakere River catchment, the Upper and Lower Nihotupu dams on the Nihotupu stream, and the Upper and the Lower Huia dams on the Huia Stream (Crowcroft and Bowden, 2002). The allocated volume of the Watercare consents represents approximately 99% of the total water allocated in the Waitakere region (Fig 27). There has been an 8.7Mm^3 increase in water usage at the Watercare consent sites since 2004-2005. Watercare Services Ltd changes the usage of water from one water resource area to another to region each year. The surface water allocation and usage is approximately the same as 2004-2005 when the Watercare values have been excluded (Fig 28). Groundwater usage has increased from the previous year at Waitakere golf course. This could be attributed with the low rainfall in summer and the need for greater water abstraction. The number of groundwater consent holders has stayed at 2 and surface water consents have increased to 10.

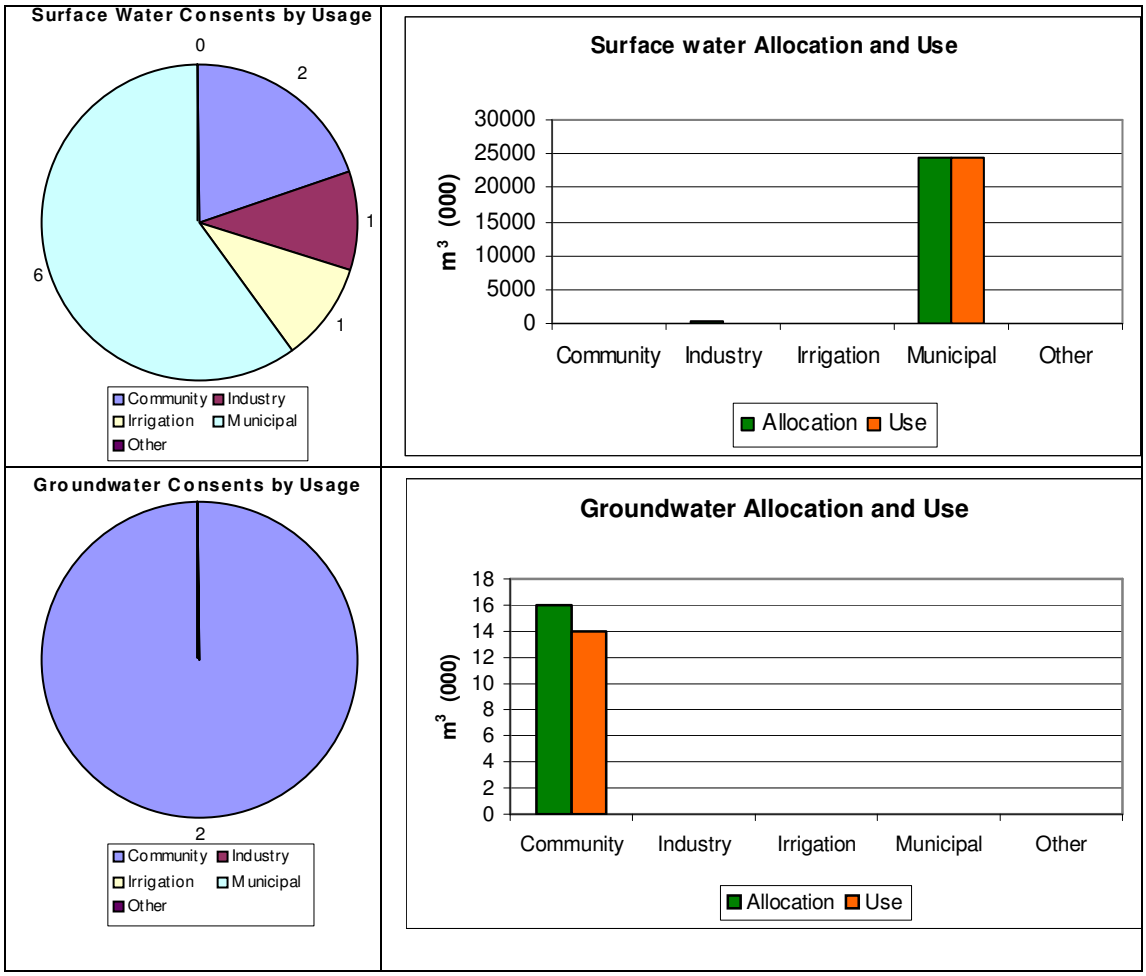


Figure 27: Surface water and groundwater allocation and use for Waitakere water resource area and the number of consents held for each purpose.

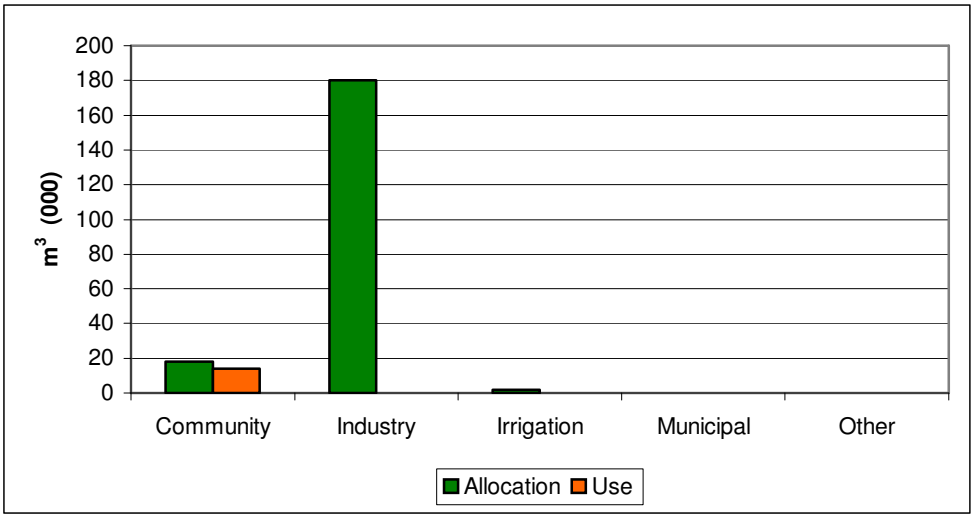


Figure 28: Surface water allocation and use for Waitakere water resource area excluding Watercare Services Ltd. Data.

3 Gulf Islands

3.1 Rainfall

The Gulf Islands is one of the driest areas in the Auckland region. The 2005-2006 total rainfall was 17.8% lower than the average. The Gulf Islands has a below average rainfall for most of the year with exceptions in October 2005, January, April and May 2006. These months have produced rainfall totals well above average in most of the areas in the Auckland region (Fig 29). Rainfall is very important to islanders because they collect and store water for domestic and commercial purposes.

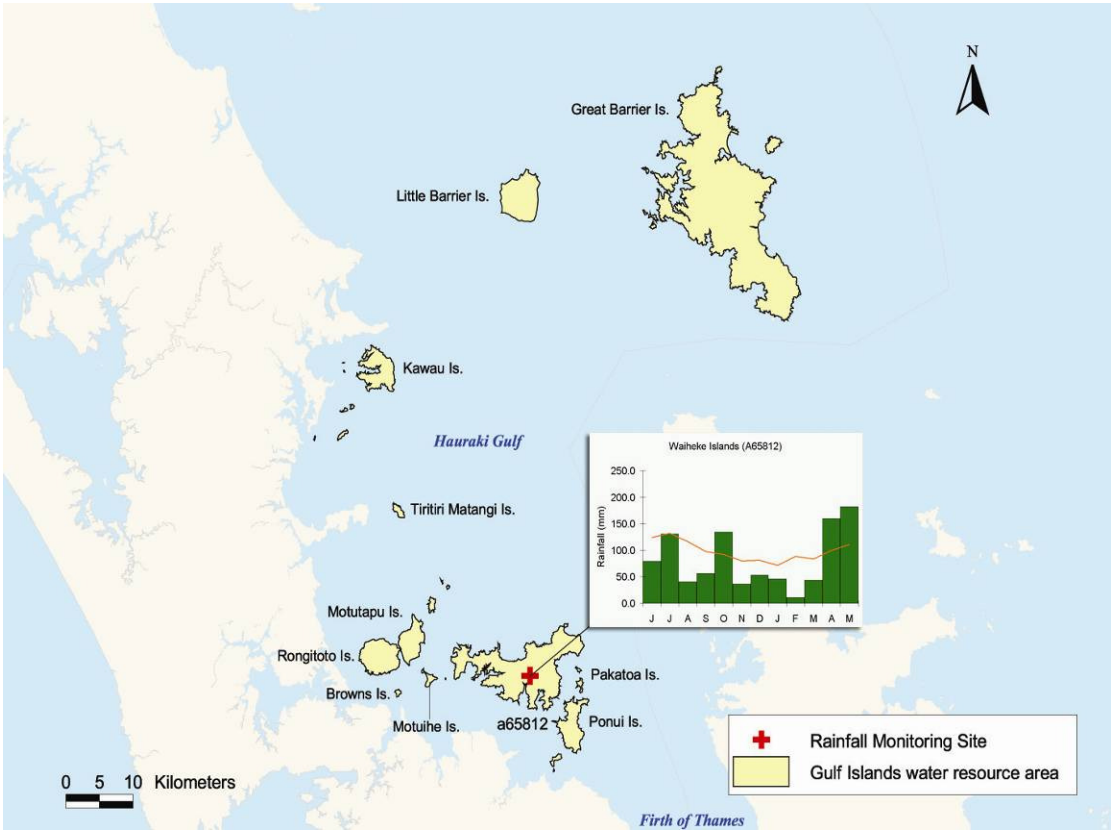


Figure 29: Total monthly rainfall (bars) and long term mean monthly rainfall (line) at Waiheke Island in the Gulf islands resource area.

3.2 Surface Water & Groundwater

There are no high use stream management areas in the Hauraki Gulf Islands water resource area (Fig. 30). All aquifers on Waiheke Island are classified as high use aquifer management areas. Several groundwater monitoring sites have been established on the islands, but insufficient data has been collected to report any long term trends. In 2004 ARC initiated a 3-year study of the island's groundwater resources to determine how much is available and to develop a suitable water management regime.

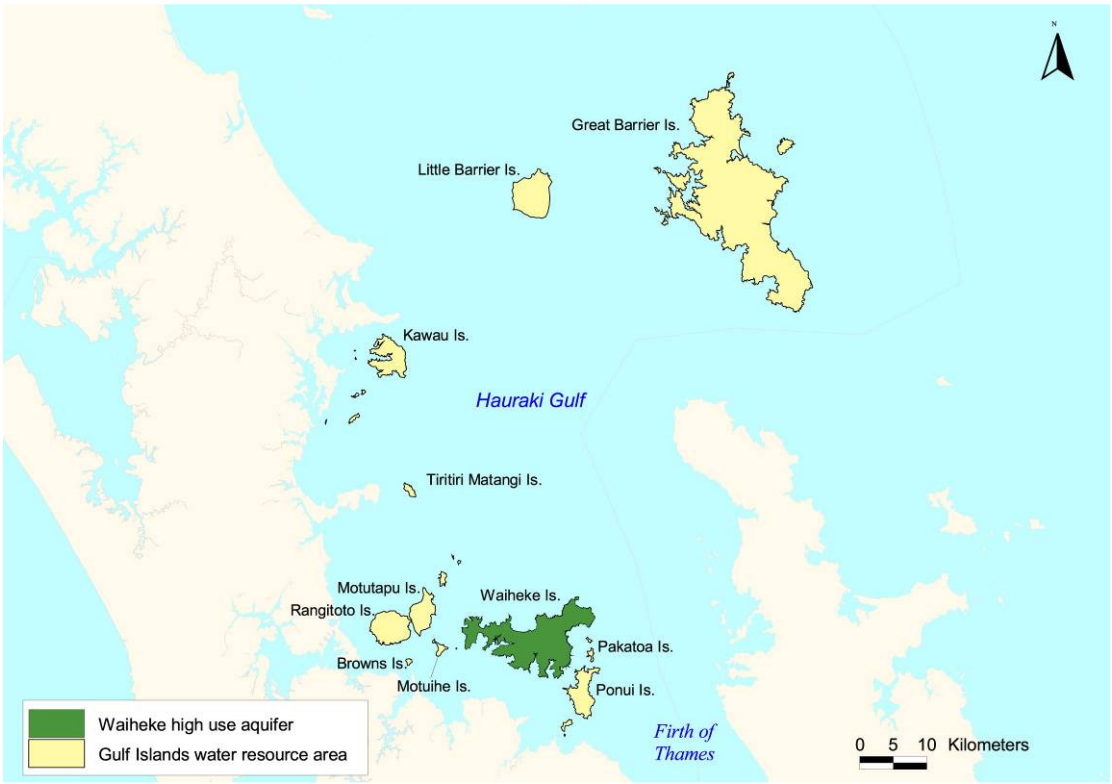


Figure 30: Gulf Islands water resource area and high use aquifer management.

3.3 Water Allocation and Use

Most private homes use roof tanks to catch rain water for household use. Resource consents have been granted for community water supplies (water tanker suppliers), school supply, irrigation and hotel supply. There were 13 surface water consent holders in May 2006, the same as in May 2005 (Fig 31). The number of groundwater consent holders has increased from 38 in May 2005 to 41 in May 2006. The majority of water use is for community supply, industrial use and domestic and stock watering purposes.

Waiheke Island water demand is high but small streams and low yielding aquifers limit supply. Water demand is forecast to increase and already numbers of applications to drill bores, predominantly for domestic supplies, have increased over previous years.

ARC is currently undertaking investigation of groundwater resources in the western side of the island.

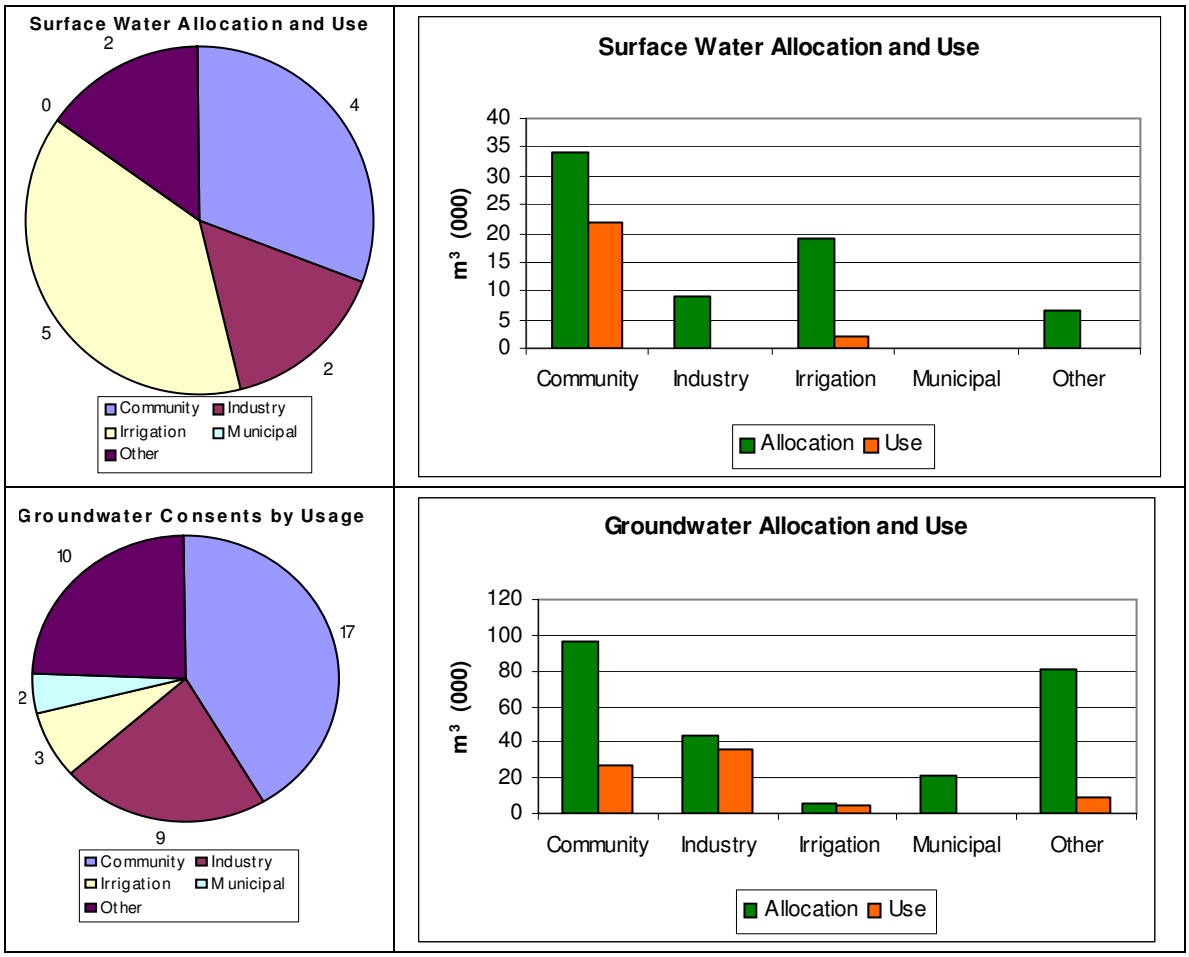


Figure 31: Surface water and groundwater allocation and use for the Gulf Islands water resources area and the number of consents held for each purpose.

4 Auckland Central

4.1 Rainfall

Rainfall in central Auckland increased between 13.3 and 18.4% when compared to the mean annual rainfall (Table 10). Auckland Central received the highest increase in rainfall throughout the Auckland region. During the 2005-2006 hydrological year July and October 2005 and April and May 2006 received rainfall 50% higher than normal. August to September 2005 was a dry period with February 2006 producing extremely dry conditions (Fig 32).

Table 10: Comparison of 2005 – 2006 rainfall with long term mean at 4 sites

Site Number	Site Name	Mean Annual Rainfall June-May (mm)	Total Rainfall June 2005-May2006 (mm)	% Deviation from Average Rainfall
649723	Onehunga at Rowe street	1190	1377	+ 15.7
649820	Pakuranga at Village	1150	1362	+ 18.4
658011	Beachlands at Anakena	1250	1457	+ 16.6
740815	Puhinui at Botanic Garden	1206	1367	+ 13.3

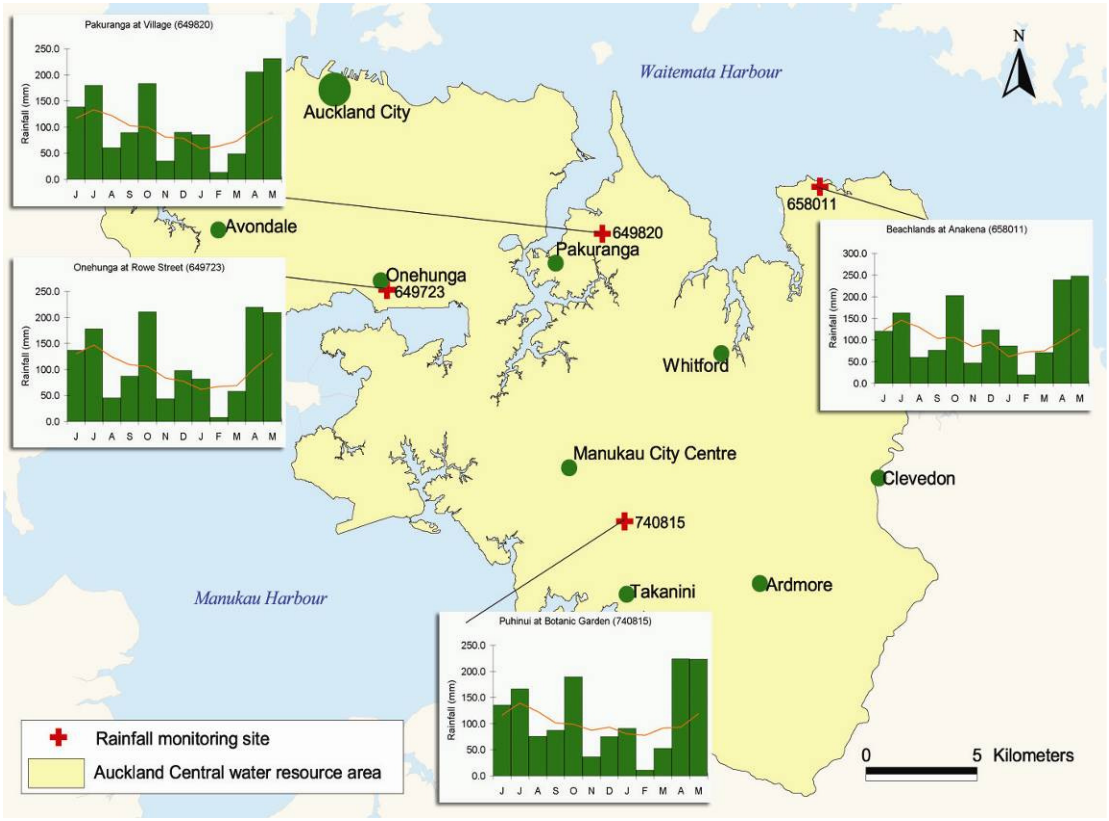


Figure 32: Total monthly rainfall (bars) and long term mean monthly rainfall (line) at 4 sites in the Auckland Central water resource area

4.2 Surface Water

In the Auckland Central water resource area there are three high use management streams, Puhinui, Hays Creek and Taitaia, a sub-catchment of the Wairoa River (Fig 33). The Puhinui Stream (43807), catchment area 11.60km^2, is the only one that has a monitoring site. It is located upstream from the consented water abstractors and downstream from large storm water containment. The MALF for the site is 13l/s and the lowest recorded flow during 2005-2006 was 17.20l/s.

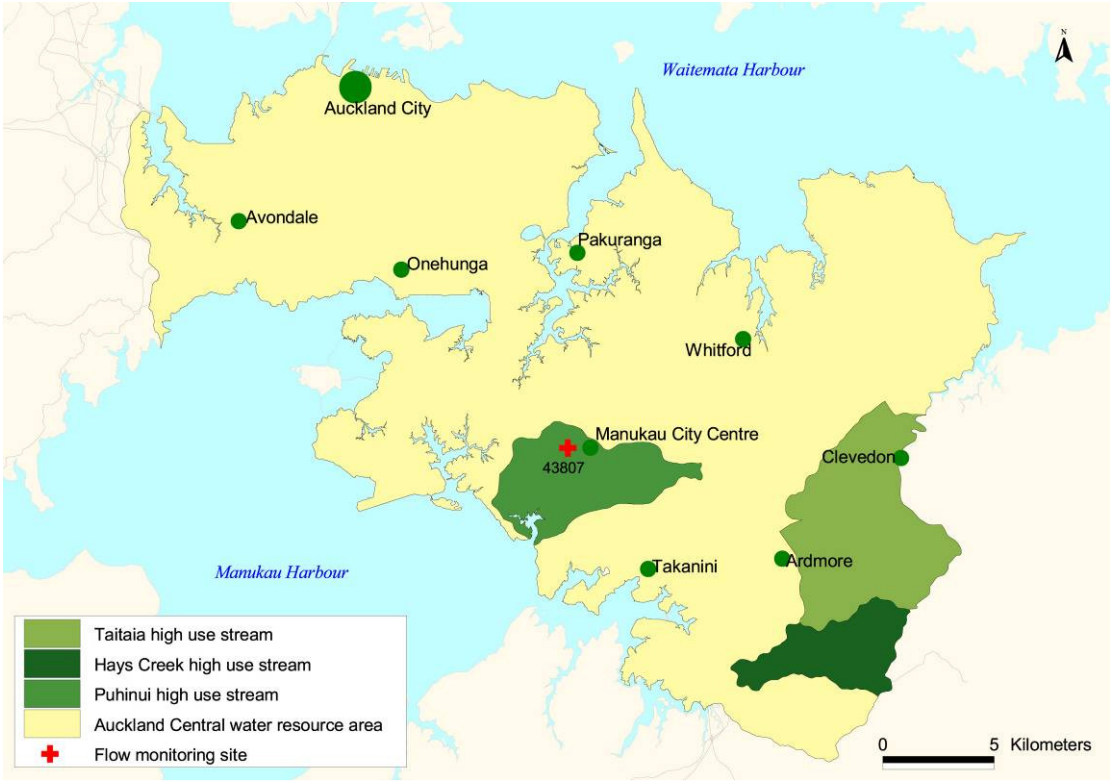


Figure 33: Auckland Central water resource area, high use stream management areas and flow-monitoring site

4.3 Groundwater

In the Auckland Central water resource area there are four high use management aquifers (Fig 34). These are the Onehunga-Mt Wellington Volcanic aquifer, Manukau Waitemata aquifer, Manukua Kaawa aquifer and the Clevedon Waitemata aquifer. There is currently no water availability value for the Manukau Kaawa aquifer.

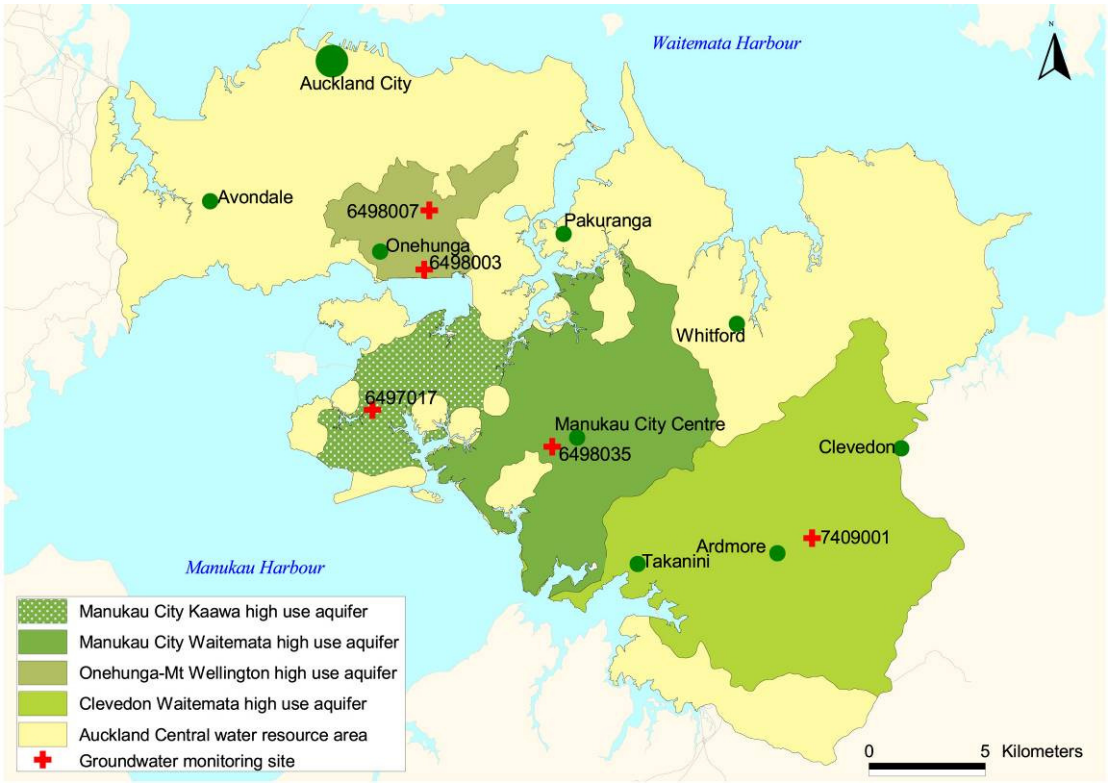


Figure 34: Auckland Central water resource area, high use aquifer management areas and groundwater monitoring sites.

Isthmus volcanic aquifers are very responsive to rainfall events particularly as most storm water is discharged directly into the aquifer. The groundwater envelopes can display the aquifers responsiveness to dry and wet periods. The Central Park bore (6498007) (Fig 35) recorded varying levels of minimum groundwater throughout the year. July, October and May showed very high groundwater levels whilst March was very close to the monthly average. This envelope closely follows the rainfall recorded in central Auckland.

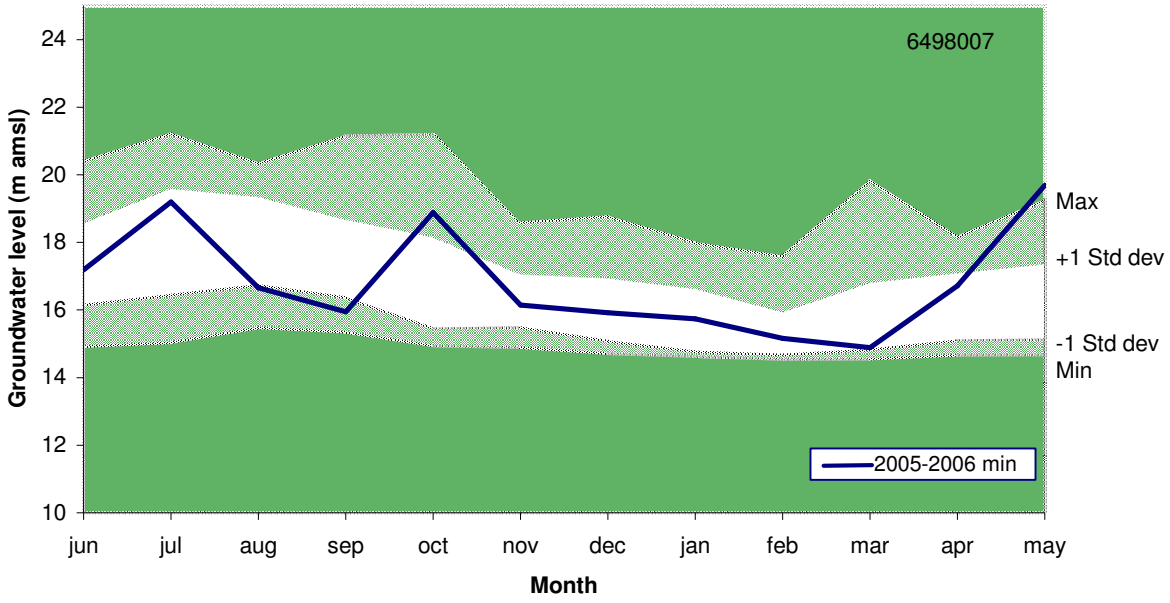


Figure 35: Groundwater envelope for Central Park (6498007) Onehunga-Mt Wellington volcanic aquifer bore.

The Angle Street bore (6498003) has a consistent minimum monthly groundwater level for 2005-2006 (Fig 36). The groundwater level increases sharply from March to May 2006. This is due to the heavy rainfall that was recorded at this time.

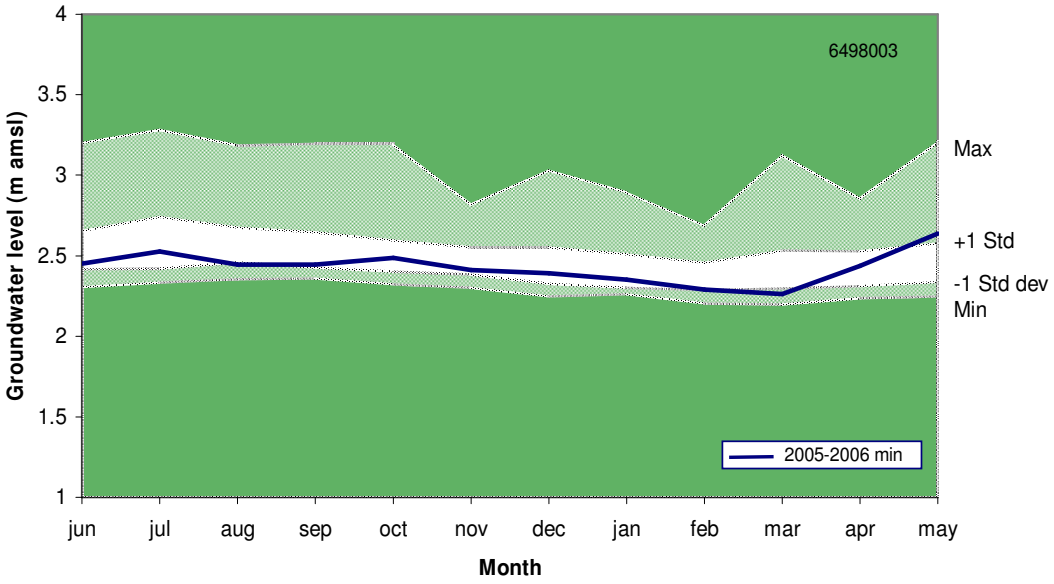


Figure 36: Groundwater envelope for Angle Street Onehunga-Mt Wellington volcanic aquifer (6498003) bore

The Waitemata aquifer in Manukau is monitored at Lambie Drive bore (6498035). The minimum monthly groundwater level for 2005-2006 was 24.20m amsl which is well above the minimum monthly average. The groundwater level has continued to rise

since the site was established in 1993 (Fig 37). This is possible due to the reduced groundwater usage in the water resource area.

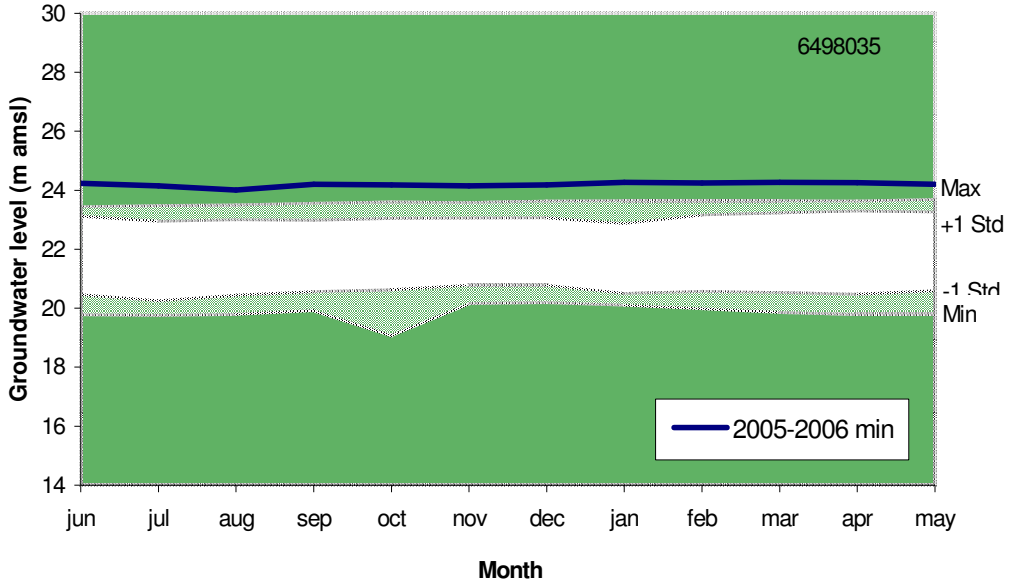


Figure 37: Groundwater envelope for Lambie Drive Manuaku Waitemata (6498035) bore

In the Manukau Kaawa aquifer groundwater levels are monitored at Amelia Earhart Drive bore (6497017). There is insufficient data to form a groundwater envelope since groundwater levels were only collected since August 2001 (Fig 38). The absence of a summer water level decline since 2002/2003 is due to surrender of two large irrigation take consents.

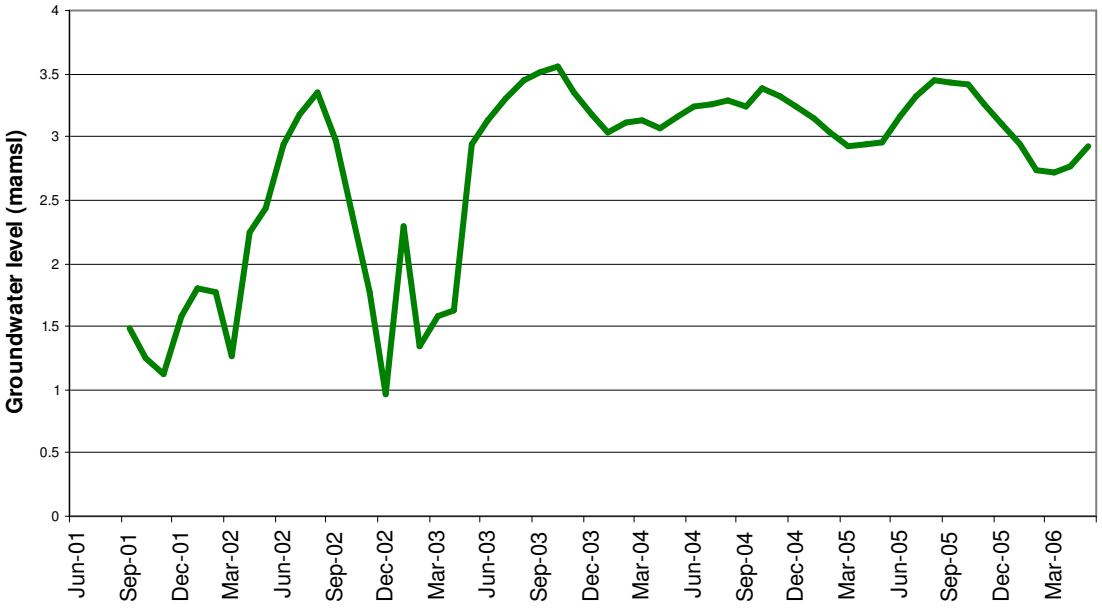


Figure 38: Groundwater levels in Amelia Earhart bore (6497017)

4.3.1 Clevedon Waitemata Aquifer

The groundwater levels at the Burnside bore (7409001) during June 2005 to May 2006 followed the seasonal trend of higher groundwater levels during the spring and lower in the summer. The groundwater in June is lower than expected because it is recovering from the low rainfall in May 2005 (Fig 39).

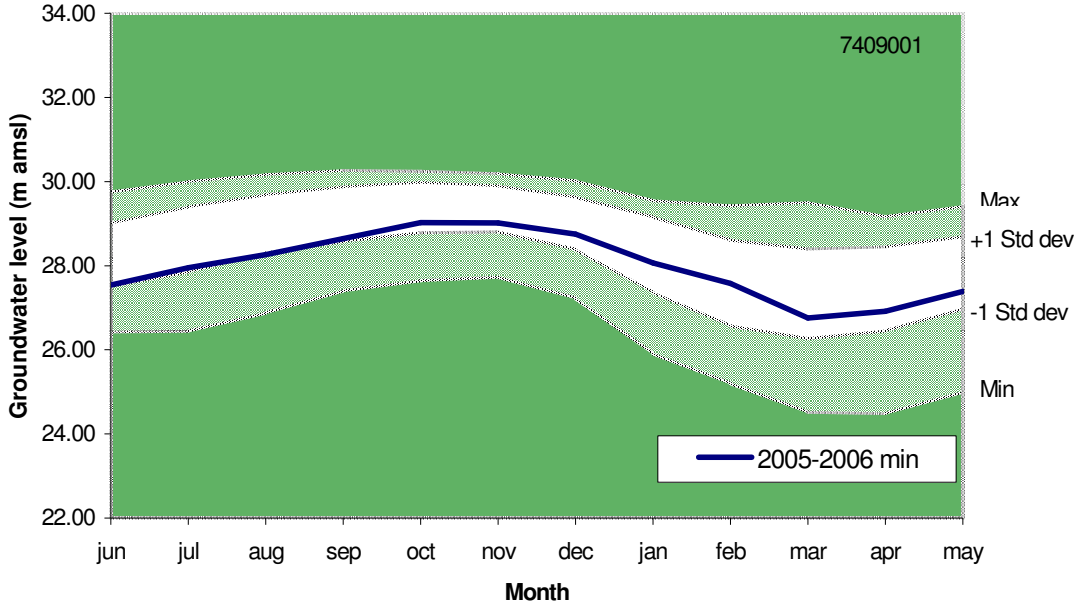


Figure 39: Groundwater envelope for Burnside Road Clevedon Waitemata East (7409001) bore

4.4 Water Allocation and Use

Auckland Central is the most urbanised and populated water resource area in the Auckland Region. The Auckland Central water resource area extracts most of its water from 5 high use management aquifers (Table 11). Watercare is the major surface water abstractor with its consent at Hays Creek Dam

Table 11: High Use aquifers, groundwater availability, allocation and use in Auckland Central.

Management Area	Aquifer	Availability m^3 (000)	2004-2005		2005-2006	
			Allocation m^3 (000)	Use m^3 (000)	Allocation m^3 (000)	Use m^3 (000)
Clevedon	Clevedon Waitemata-East	379	157	97	155	86
Clevedon	Clevedon Waitemata-West	964	877	534	815	423
Manukau	Manukau-Waitemata	660	357	125	359	148
Onehunga-Mt. Wellington Volcanic	Onehunga-Mt. Wellington Volcanic	15,038	9,354	5,683	8,959	5,200
Manukau Kaawa	Manukau Kaawa	-	167	60	196	24

Surface water for municipal use has fallen dramatically since last year. There is a 99% reduction in usage at consent 14011, which is a take from Hays Creek Dam by Watercare Services Ltd. They have recently closed the Papakura water treatment plant which received water from Hay's creek dam. This is the reason for dramatic reduction in water usage (Fig 40).

In surface water there was an increase in allocation for industry and municipal supply but water usage has stayed relatively constant. Groundwater allocation for industry has increased by 4Mm^3 since last year due to a new consent for dewatering a quarry. The number of surface water consent holders has fallen from 39 in May 2005 to 37 in May 2006. The groundwater consent numbers have fallen from 201 in May 2005 to 199 in May 2006.

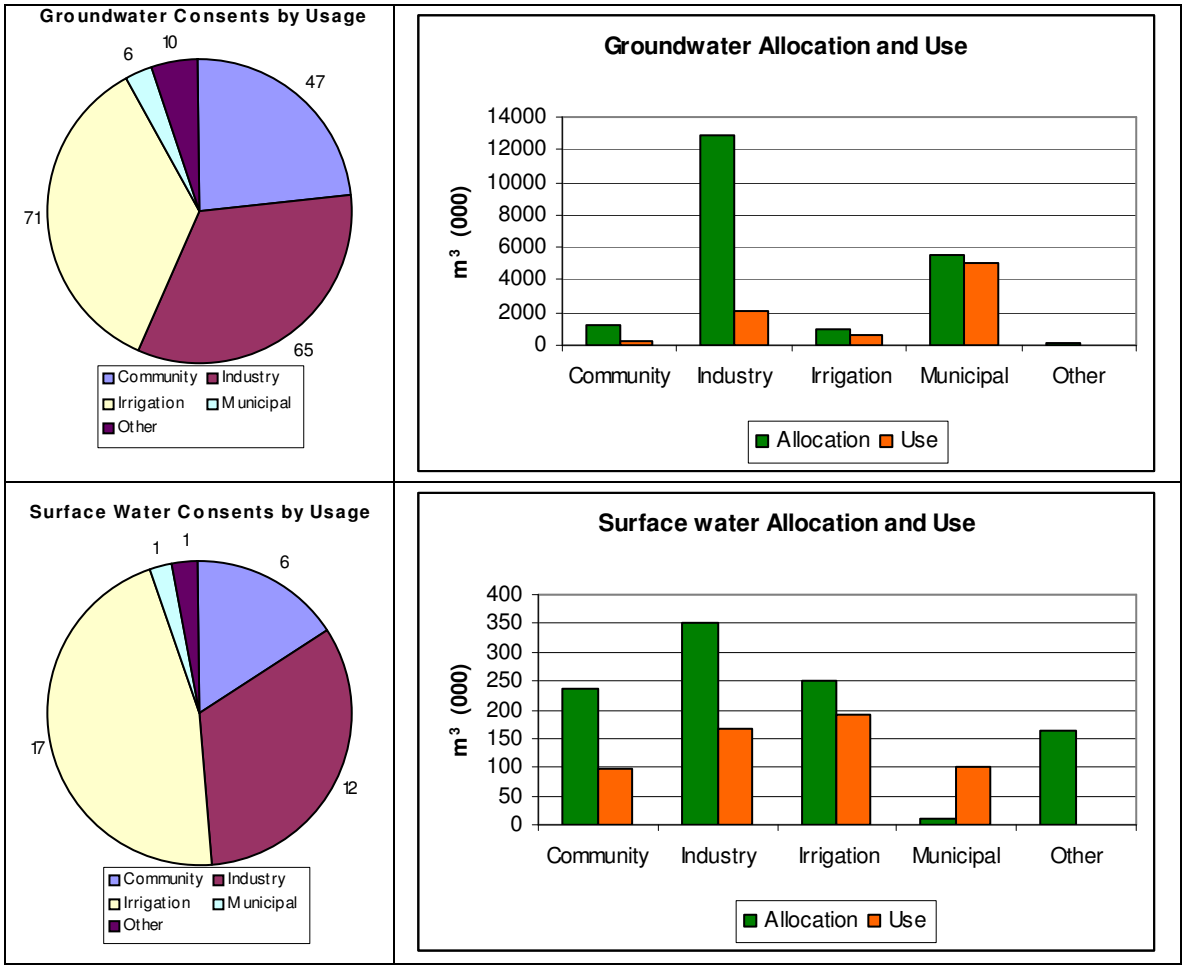


Figure 40: Surface water and groundwater annual allocation and use for Auckland Central water resource area and the number of consents held for each purpose.

5 Hunua

5.1 Rainfall

The total rainfall for the Hunua water resource area was between 8.7 and 15.1% above average for the 2005-2006 hydrological year (Table 12). The monthly totals when compared to the average show a varied pattern. August, November 2005, and February 2006 show a 50-75% reduction in rainfall totals whilst July, October 2005, April and May 2006 show an increase in over 50% in rainfall totals (Fig 41).

Table 12: Comparison of 2005 – 2006 rainfall with long term mean at 2 sites.

Site Number	Site Name	Mean Annual Rainfall June-May (mm)	Total Rainfall June 2005-May2006 (mm)	% Deviation from Average Rainfall
750010	Wairoa at Hunua Nursery	1410	1533	+ 8.7
750213	Waihihi at Waharau Park	1342	1545	+ 15.1

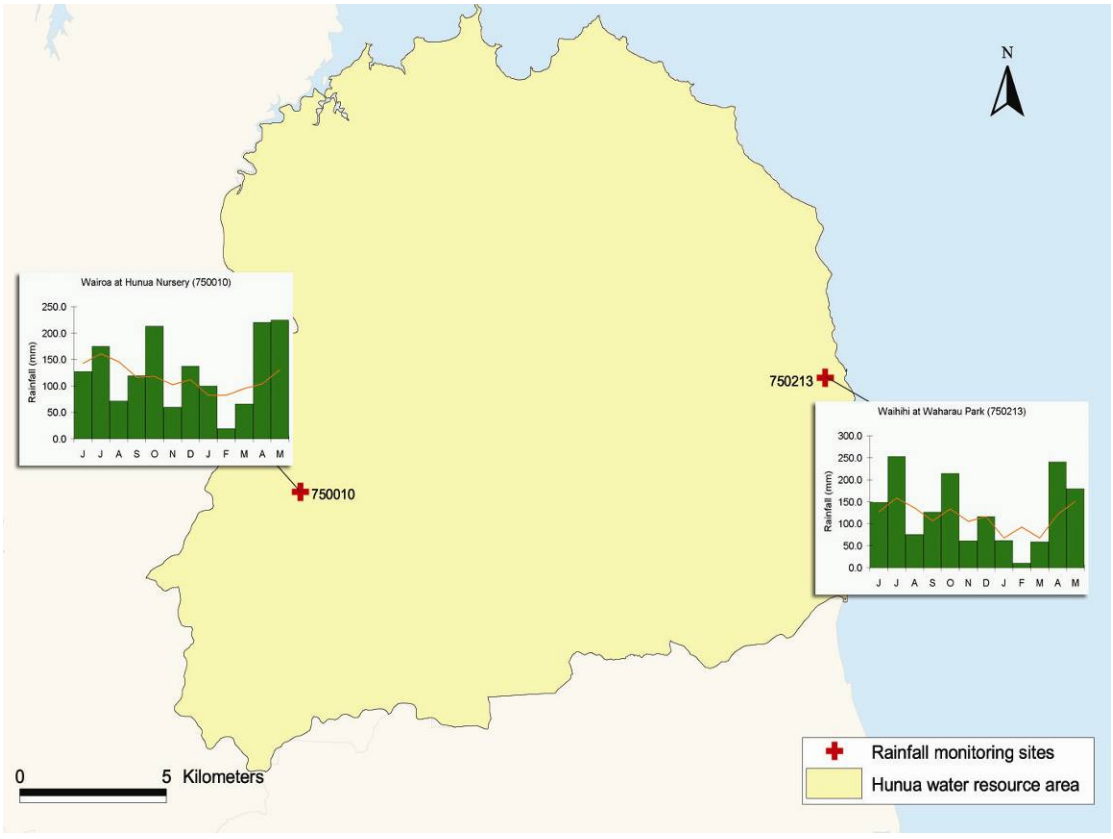


Figure 41: Total monthly rainfall (bars) and long term mean monthly rainfall (line) at 2 sites in the Hunua water resource area.

5.2 Surface Water & Groundwater

There are no high use management streams in the Hunua water resource management area (Fig 42). One monitoring site is located downstream of Wairoa Dam and Cosseys Dam (Watercare Services Ltd) at Tourist Road (8516), catchment area 161km^2, which monitors the Wairoa River level and flow. The consents on these dams do not have specific allocations but conditions have been implemented to maintain the MALF above 380l/s at Tourist Road flow-monitoring site. The lowest measured flow for 2005-2006 was 384l/s.

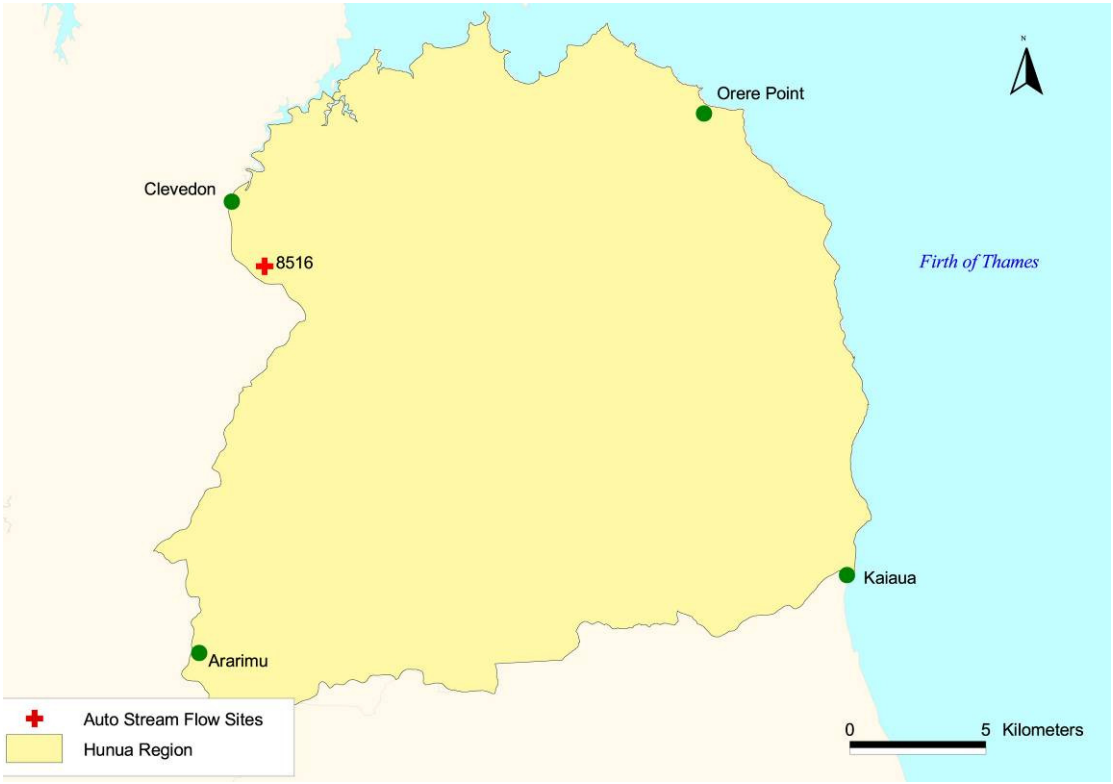


Figure 42: Hunua water resource area and flow-monitoring site

5.3 Water Allocation and Use

Of the allocated surface water in the Hunua water resource area Watercare Services Ltd uses 99% for municipal supply (Fig 43). Watercare Services Ltd does not have designated allocations for its consents, so annual allocation is derived from the annual usage. Watercare Services Ltd. has four dams in the Hunua area. Cosseys dam has an increase of approximately 10Mm^3 water use when compared to last year. This is due to rehabilitation work which took place on the dam in 2004-2005. The Cosseys dam was then used preferentially in 2005-2006. Mangatangi, Mangatawhiri and Wairoa Dams have collectively used 28Mm^3 less water than last year. Overall this causes 18Mm^3 less water usage in the Hunua water resource area.

Whenever the Watercare Services Ltd. data is removed, irrigation has the largest allocation with approximately 53% water usage (Fig 44). Irrigation also has the highest allocation in groundwater but only 14% of this is used. Surface water consents have

dropped from 25 in May 2005 to 20 in May 2006. Groundwater consent holders have stayed the same at 12 in May 2006.

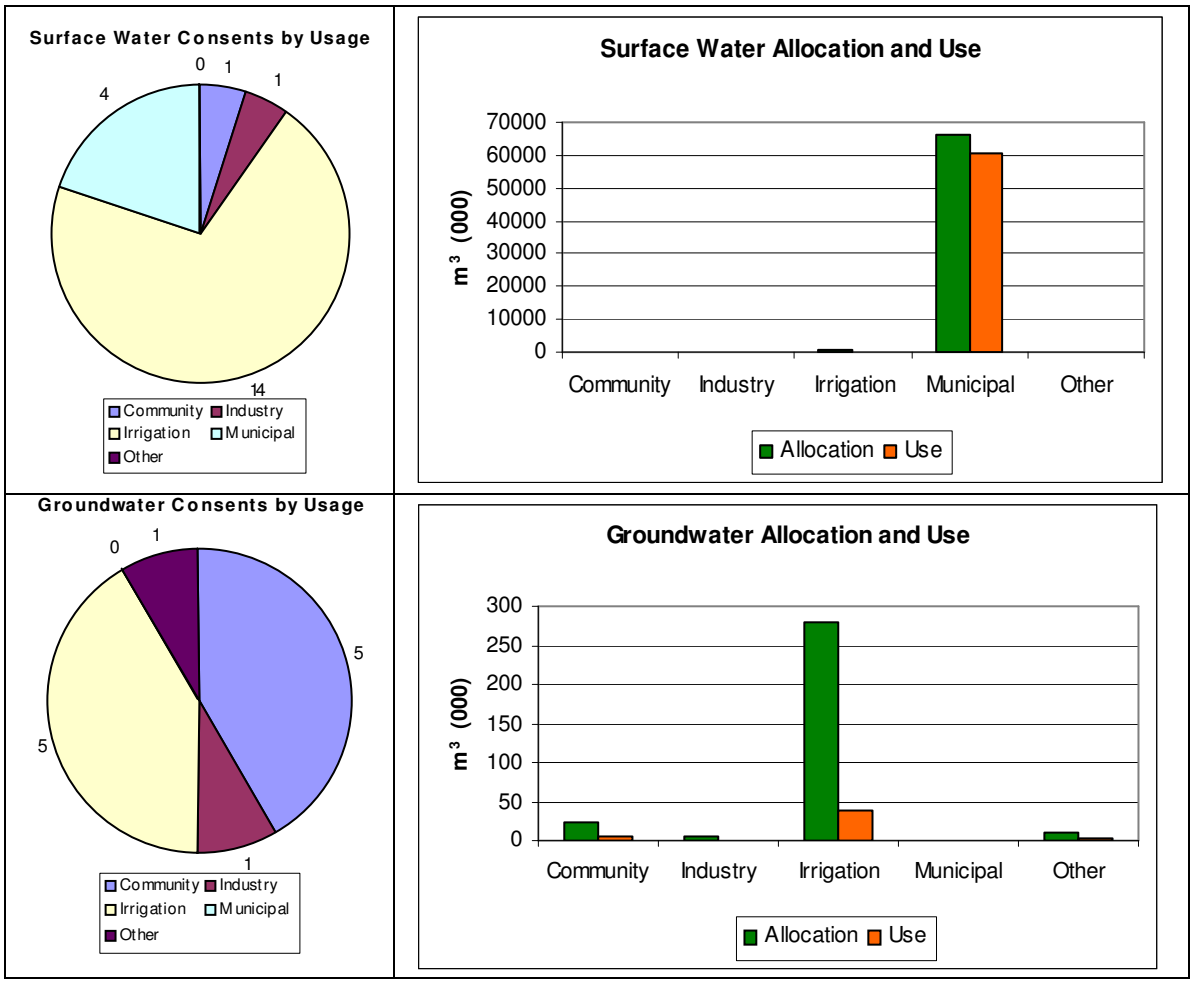


Figure 43: Surface water and groundwater allocation and use for Hunua water resource area and the number of consents held for each purpose.

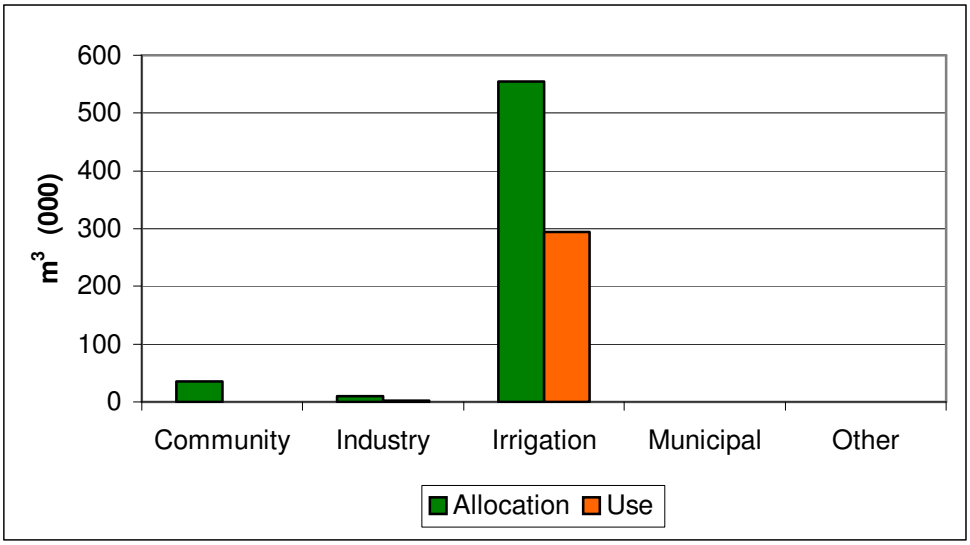


Figure 44: Surface water and groundwater allocation and use for Hunua water resource area excluding Watercare Services Ltd data.

6 South Auckland

6.1 Rainfall

The South Auckland water resource area has between 4.1 to 9.1% increase in rainfall total when compared to the annual average (Table 13). The monthly rainfall totals display the reoccurring rainfall pattern present in the other sections of the Auckland region. July, October 2005 and April 2006 show an increase of 50% in rainfall whilst August, November 2005 and February 2006 show a large decrease from the average rainfall in 2004-2005 (Fig 45).

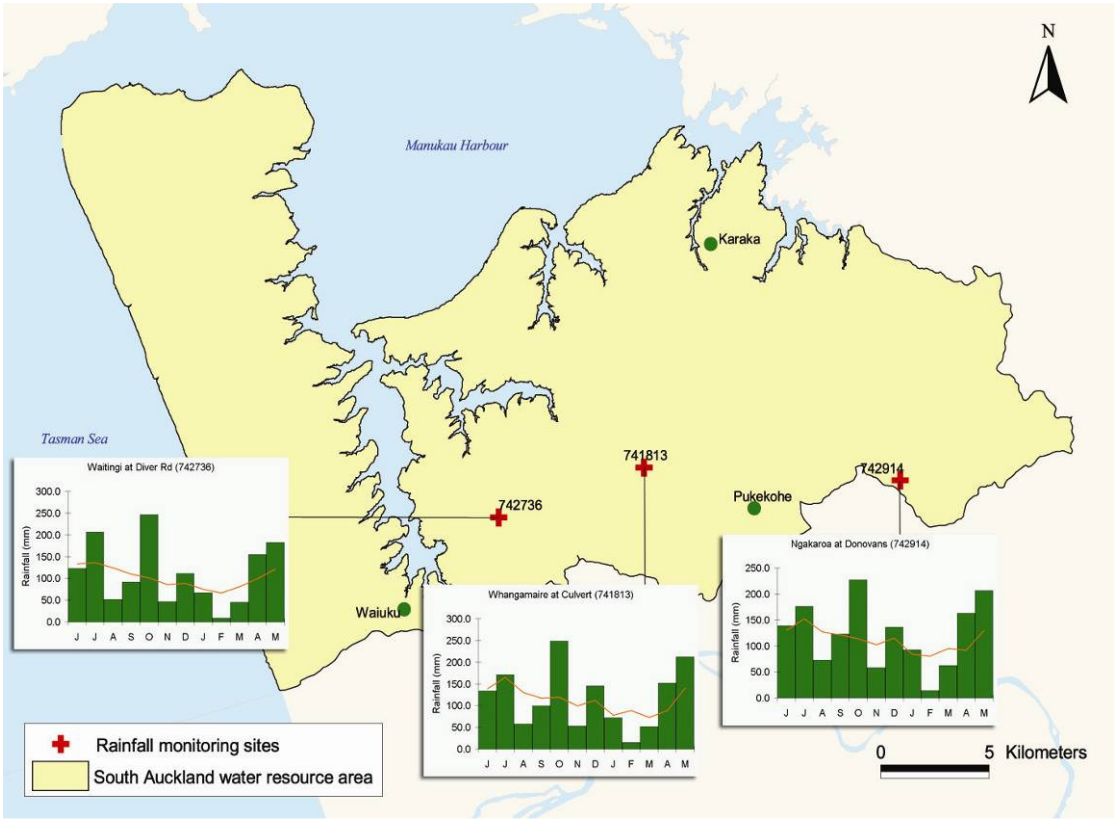


Figure 45: Total monthly rainfall (bars) and long term mean monthly rainfall (line) at 3 sites in the South Auckland water resource area

Table 13: Comparison of 2005 – 2006 rainfall with long term mean at 3 sites

Site Number	Site Name	Mean Annual Rainfall June-May (mm)	Total Rainfall June 2005-May2006 (mm)	% Deviation from Average Rainfall
43602	Waitangi at Diver Rd	1232	1333	+ 8.2
43811	Whangamaire at Culvert	1354	1410	+ 4.1
43829	Ngakaroa at Donovans	1346	1469	+ 9.1

6.2 Surface Water

In the South Auckland water resource area there are three high use management streams, the Ngakaroa (43829) catchment area 4.73km^2, Waitangi (43602) catchment area 17.60km^2 and the Mauku (Fig 46). The Mauku Stream does not have a flow-monitoring site.

On seven occasions during March 2006 the flow at the Ngakaroa stream was recorded below the MALF of 8.67l/s with 5.50l/s being the lowest (Table 14). The hydrograph for this site showed marked drops in stream discharge during March, which suggests low rainfall in February and pumping from the stream. A minimum flow regime is likely to be imposed on consents on this stream in the near future.

The Waitangi Stream has a MALF of 38.6l/s. On seven occasions between February and April 2006, the flow fell below the MALF, 27l/s being the lowest recorded flow. The low flow recorded at the stream is due to the extremely dry weather in February. Most water abstraction during the summer months is downstream of the flow site.

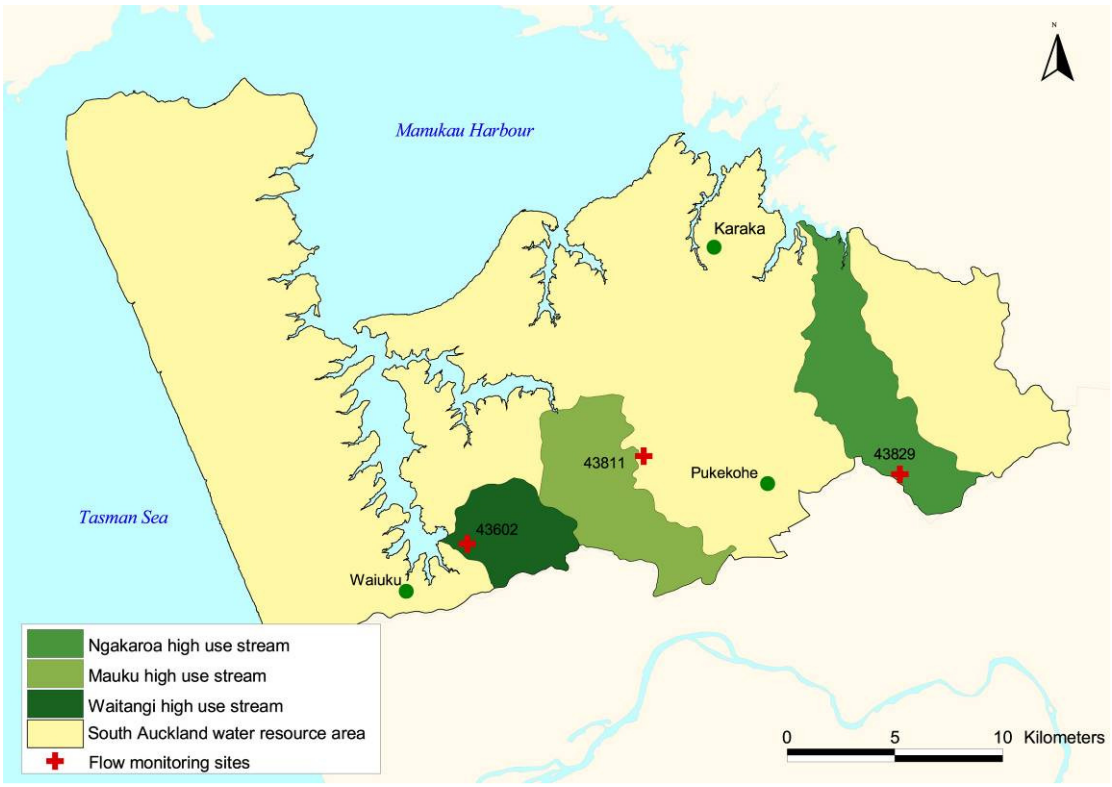


Figure 46: South Auckland water resource area high use stream management areas and flow-monitoring sites

Table 14: South Auckland high use streams low flow statistics for 2005 – 2006

Stream Name	Site No	MALF l/s	Date Flow fell below MALF	Time Below MALF	Lowest flow l/s
Waitangi	43602	38.602	21/02/2006	3.1 Hours	38.30
			22/02/2006	14.9 Hours	37.40
			23/02/2006	5.3 Hours	38.30
			8/03/2006	12.6 Days	30.20
			26/03/2006	17 Days	27.00
			31/03/2006	13 Hours	29.10
			2/04/2006	1.2 Days	33.30
Ngakoroa	43829	8.673	3/03/2006	9.7 Hours	6.00
			4/03/2006	14.2 Hours	7.30
			4/03/2006	9.7 Hours	7.60
			5/03/2006	8.0 Hours	8.00
			21/03/2006	6.2 Hours	6.10
			25/03/2006	14.2 Hours	6.90
			25/03/2006	14.2 Hours	8.50

6.3 Groundwater

The South Auckland water resource area has three high use aquifers, Franklin Volcanic aquifer (which includes Pukekohe basalt, Glenbrook basalt and Bombay basalt), the Franklin Kaawa aquifer and the Drury Sand-Volcanic aquifer (Fig 47).

2 This flow is based on data affected by pumping. The natural MALF is estimated at 40 l/s

3 This flow is based on data affected by pumping. The natural MALF is estimated at 12 l/s

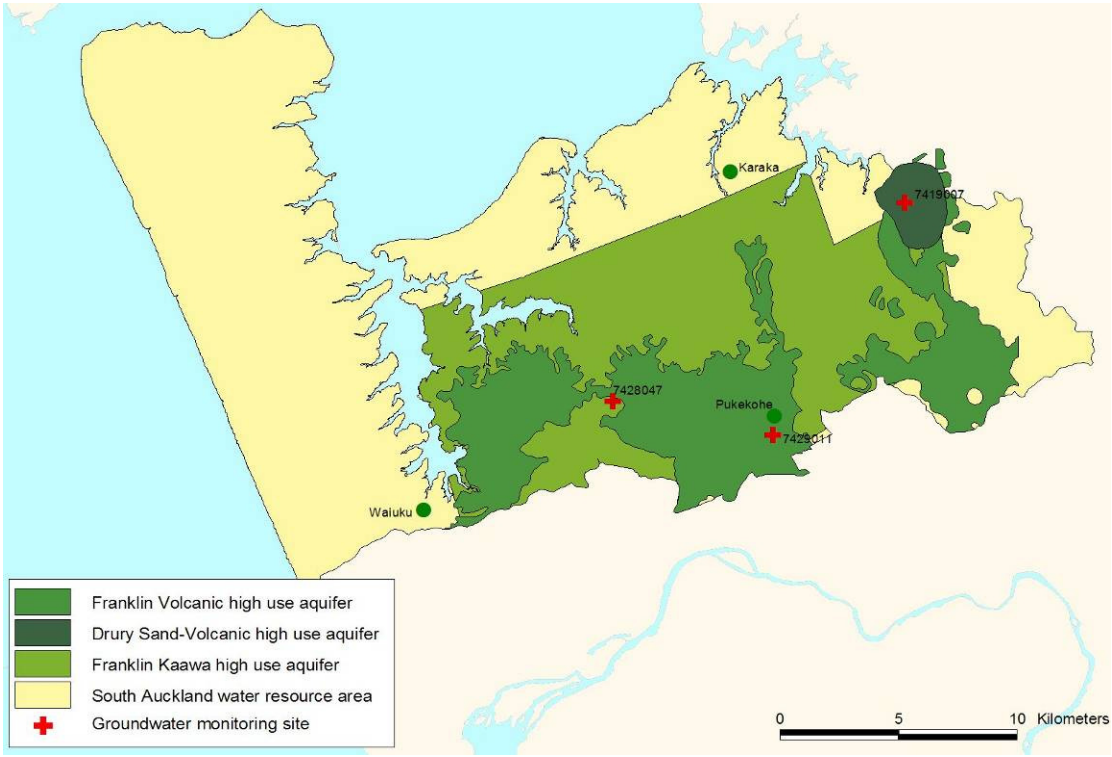


Figure 47: South Auckland water resource area, high use aquifer management areas and groundwater monitoring sites

The Revell Court bore (7429011) is the Franklin Pukekohe Volcanic high use aquifer management area representative monitoring site. The Revell court bore has replaced the DSIR bore (7428001) which is no longer monitored. During 2005-2006 the groundwater level stayed well above the minimum monthly average.

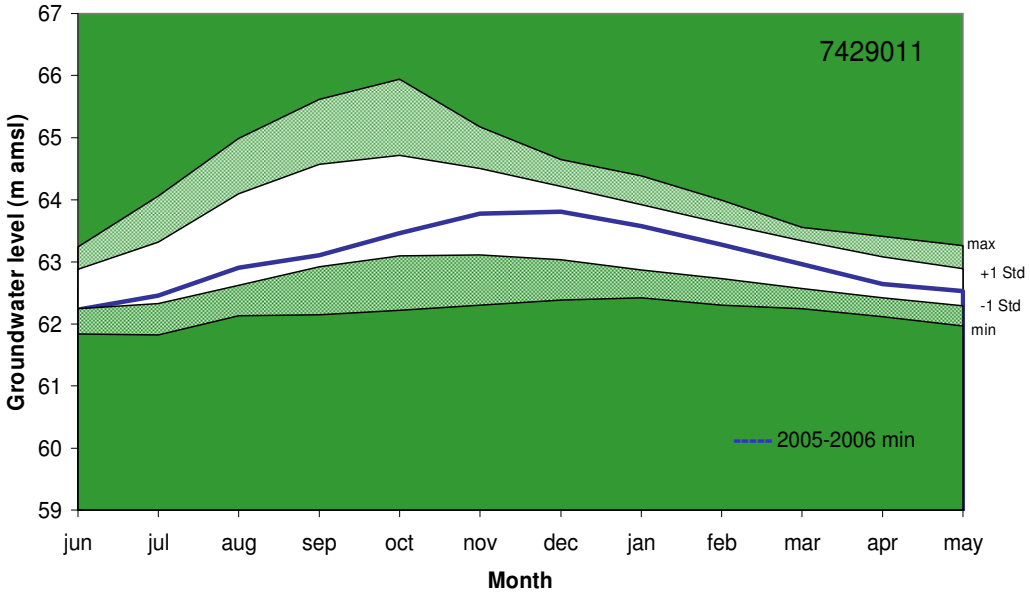


Figure 48: Groundwater envelope for Revell Court Franklin Pukekohe Volcanic bore (7429011)

The Franklin Kaawa high use aquifer management area has numerous groundwater monitoring sites but the Mauku bore (7428047) has been selected for long term groundwater monitoring. The groundwater levels for 2005-2006 show a continuation from the low level of water in May 2005 (Fig 49). The water level is below the minimum monthly average over August-October 2005 and continues to decrease below the average. With the low levels of rainfall during spring and summer the groundwater level continued to decrease until autumn 2006 when heavy rainfall was recorded.

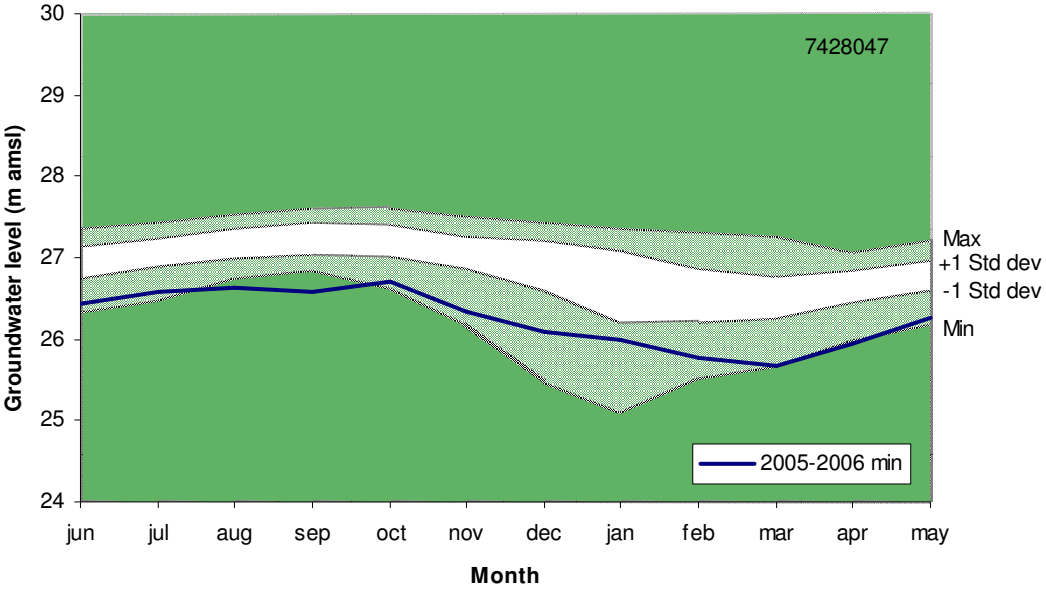


Figure 49: Groundwater envelope for Mauku Franklin Kaawa bore (7428047)

The Fielding Road bore (7419007) is used to monitor groundwater levels at the Drury Sand volcanic aquifer (Fig 50). The groundwater levels for 2005-2006 show a typical response to seasonal recharge and water abstraction apart from a low groundwater level during August 2005, which coincided with below average rainfall.

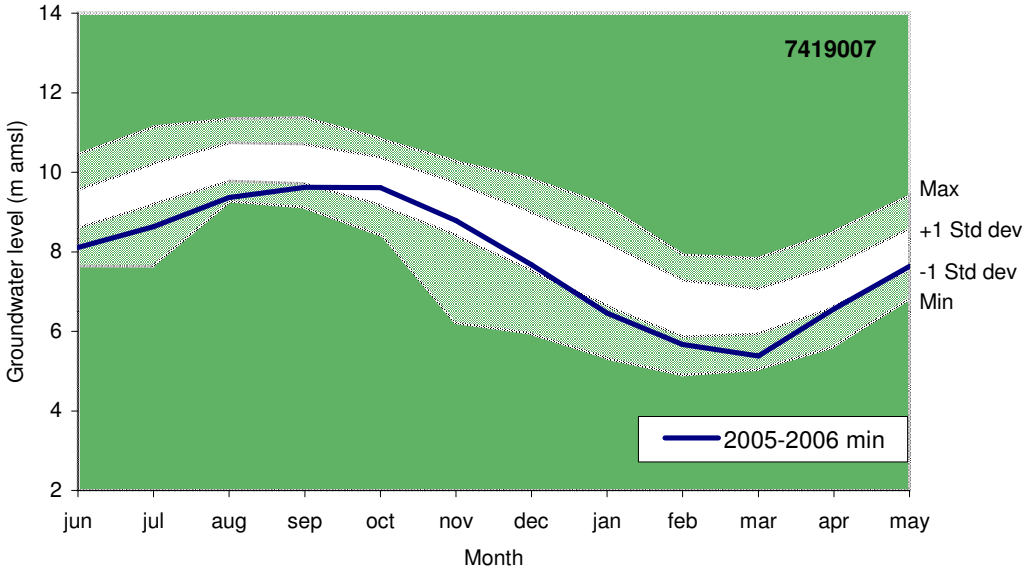


Figure 50: Groundwater envelope for Drury Sand Volcanic Fielding Road Bore (7419007)

6.4 Water Allocation and Use

Market gardening is a major land use in South Auckland, in particular around Bombay and Pukekohe. Much of the growing area is irrigated. Other horticultural uses, such as glasshouses are a feature of this area. The South Auckland water resource area has two high use aquifer management areas, the Franklin Kaawa (Table 15) and the Franklin Volcanic (Table 16). Each high use aquifer management area has a number of zones. The Pukekohe Kaawa aquifer has exceeded the water allocation in the last two years.

Table 15: Franklin Kaawa High use aquifer management area with assessed availability, shown against allocation to Resource Consent Holders and use figures for 2005 – 2006.

Aquifer	Availability m^3 (000)	2004-2005		2005-2006	
		Allocation m^3 (000)	Use m^3 (000)	Allocation m^3 (000)	Use m^3 (000)
Bombay - Drury Kaawa	718	341	239	296	234
Glenbrook/Waiau Pa Kaawa	1,560	1,249	939	1,249	991
Karaka Kaawa	617	520	171	484	168
Pukekohe Kaawa	1,860	1,247	1,425	1,210	1,282
Pukekohe West Kaawa	1,780	466	203	466	236
Waiuku Kaawa	2,450	1,002	331	994	380

Table 16: Franklin Pukekohe Volcanic High use aquifer management area with assessed availability, shown against allocation to Resource Consent Holders and use figures for 2005-2006.

Aquifer	Availability m^3 (000)	2004-2005		2005-2006	
		Allocation m^3 (000)	Use m^3 (000)	Allocation m^3 (000)	Use m^3 (000)
Pukekohe Central	856	535	245	652	286
Pukekohe North	420	116	92	120	91
Pukekohe South	650	129	73	148	88
Pukekohe West	420	276	219	296	299

Irrigation has the largest volume of groundwater allocation and usage in the South Auckland water resource area. The most significant change from last year is the increase in the groundwater allocation (1Mm^3) and usage (0.37Mm^3) for community purposes. For a number of the consent holders in this sector the allocation has been increased. For industry there was a sharp decrease in the usage of surface water which was caused by one of the consents becoming inactive (Fig 51). Groundwater

consent numbers have dropped with 419 in May 2006 compared with 445 in May 2005. Surface water consent holders have remained the same with 115 in May 2006.

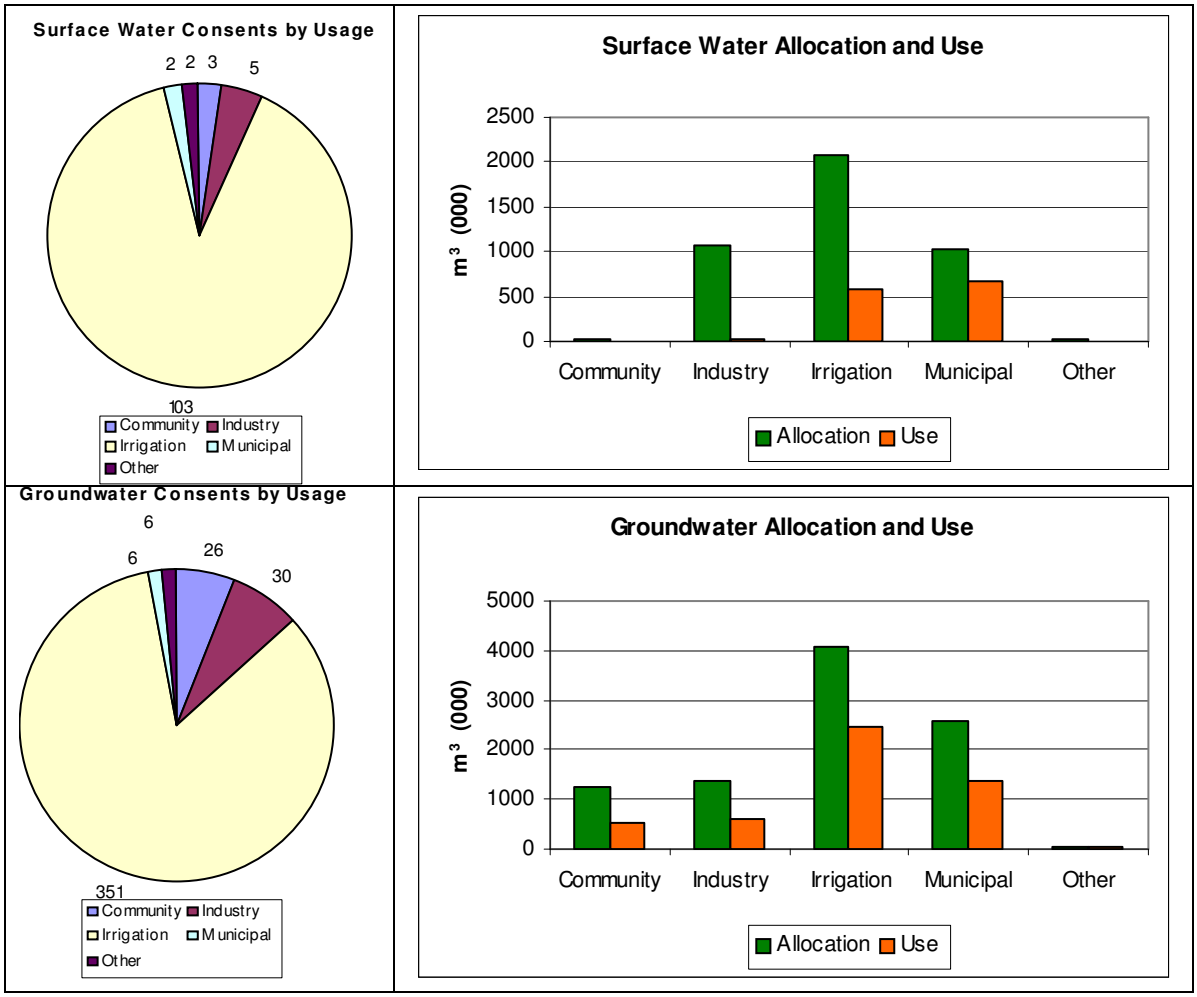


Figure 51: Surface water and groundwater allocation and use for South Auckland water resource area and the number of consents held for each purpose

7 Conclusion

The 2005 – 2006 hydrological year was on average 7% wetter than normal. The summer was dry which led to reduced stream flow below the MALF at some sites. During March 2006 the groundwater levels were close to the minimum monthly average at several aquifers, this was due to water abstraction and an extremely dry February.

There are 26 high use aquifer management areas and 13 high use stream management areas in the Auckland Region (PARP: ALW). Currently Kumeu – Waitemata zone 1 , Omaha - Waitemata and Waiwera Geothermal high use aquifers are fully allocated. Most of the high use aquifers have been assigned a groundwater availability level.

The Kumeu - Waitemata aquifer has a history of high water demand. When groundwater availability for this aquifer was determined groundwater use already exceeded that value. Through the consent process groundwater allocation to consent holders has reduced from over 200% of availability in the 1990's to 120% in 2006. Groundwater use was less than groundwater availability and groundwater levels indicate that the aquifer is not being adversely affected.

Flows in high use management streams in the region ran below mean annual low flows in four of the seven monitored streams. The low flows occurred between late February and early April. This was due to a dry summer, especially February which had only approximately 20% of the average February rainfall. Low flow periods are usually caused by low rainfall and high water abstraction during the summer months.

Water use in the Auckland water resource areas is mainly for municipal purposes. Water has to be supplied to a population of 1.3 million residents (as of 2006 census) in Auckland. Water allocation and usage has dropped for municipal purposes since last year. Water use for irrigation rose marginally during 2005-2006 because of an extremely dry February and increased water abstraction during the summer. Water allocation for community and industrial purposes increased, with their water usage decreasing.

The largest supplier of municipal bulk water for reticulation is Watercare Services Ltd, who takes water from within Auckland and the Waikato River to meet water demand. For the 2005-2006 hydrological year the Watercare water source contribution was, Southern sources (Hunua Dams) - 60.58%, Western sources (Waitakere Dams) - 25.37%, Waikato River - 9.51% and Onehunga bores - 4.55% (data from Watercare Services Ltd., pers comm.).

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