# 30 Otway Coast basin

**Table 30-1 Key features of the Otway Coast basin, 2005/06**

- Inflows in 2005/06 were 53% of the long term average and roughly half of those estimated in 2004/05 and 2003/04.
- 93% of the total inflows left the basin into Bass Strait.

## 30.1 Otway Coast basin seasonal overview for 2005/06

The Otway basin is one of the wettest basins in Victoria. Rainfall in the Otway Coast basin in 2005/06 was, however, below average (80-100%). Streamflows in the basin were 53% of the long term average (884,000 ML). Despite rainfall similar to that of the previous two years, 2005/06 inflows were significantly lower than those recorded in 2004/05 and 2003/04 which were of the order of 100-110% of the long term average.

## 30.2 Responsibilities for management of water resources

Table 30-2 shows the responsibilities of various authorities within the Otway Coast basin.

**Table 30-2 Responsibilities for water resources management within the Otway Coast basin, 2005/06**

| Authority | Irrigation and rural water supply | Licensing | Urban water supply | Storage management, waterway management, environmental obligations |
|---|---|---|---|---|
| Southern Rural Water | | Groundwater and surface water licensed diversions | | |
| Wannon Water | Domestic and stock supply to farms to the west across parts of the Otway Coast, Corangamite, Hopkins and Portland Coast basins(1) | | Urban water supply to towns in the west of the basin including Cobden, Timboon, Peterborough and Port Campbell(1) | Obligation to meet passing flow requirements |
| Barwon Water | | | Urban water supply to the majority of towns in the basin including Torquay, Anglesea, Lorne and Apollo Bay. Also transfers to Colac | West Gellibrand Reservoir<br><br>Obligation to meet passing flow requirements |
| Corangamite Catchment Management Authority | | | | Waterway management for the whole of the Otway Coast basin |

Note:

(1) The Otway water supply system extends westward to Warrnambool and Koroit and north to Lismore and Derrinallum, supplying Cobden, Camperdown, Terang and Allansford on the way. Port Campbell, Timboon and Peterborough are supplied via a separate linked system drawing on the Dilwyn aquifer at Port Campbell.

## 30.3 Location of water resources

### Figure 30-1 Map of the Otway Coast basin

## 30.4 Total water resources in the basin

The total volumes of water available and supplied from water resources in the Otway Coast basin are shown in Table 30-3.

There was a net transfer of water out of the Otway Coast basin. Barwon Water transferred 4,788 ML from the Otway Coast basin into the Corangamite basin to supply Colac and surrounds. Wannon Water transferred 10,342 ML from the Otway Coast basin to supply water to towns and farms in the Corangamite, Hopkins and Portland Coast basins. Barwon Water transferred water from the Barwon basin into the Otway Coast basin to supply 1,949 ML to the towns of Torquay and Anglesea. (This volume is included in the Barwon basin water balance).

An overview of the methodology used to derive the information presented in this chapter is set out in Chapter 5.

**Table 30-3 Summary of total water resources and water use in the Otway Coast basin, 2005/06**

| Water source | Total water resource (ML) | Total use (ML) |
|---|---|---|
| Surface water | 467,300 | 32,200 |
| Groundwater(1) | Not available | Not available |
| Recycled water | 1,360 | 360 |

Note:

(1) The total groundwater resource and use is provided only where all GMAs and WSPAs have more than 90% of their surface areas within the river basin boundary as it is not possible to split groundwater use between the basins.

## 30.5 Surface water resources

### 30.5.1 Water balance

A surface water balance for the Otway Coast basin is shown in Table 30-4.

The only major storage in the basin is the West Gellibrand Reservoir which started the year close to full capacity, and finished the year at 54% of capacity.

### Table 30-4 Balance of surface water in the Otway Coast basin

| Water account component | 2005/06 (ML) | 2004/05 (ML) |
|---|---|---|
| **Major on-stream storage** | | |
| Volume in storage at start of year | 1,900 | 2,000 |
| Volume in storage at end of year | 1,000 | 1,900 |
| **Change in storage** | **-900** | **-100** |
| **Inflows** | | |
| Catchment inflow[1] | 467,300 | 981,420 |
| Transfers from other basins | 0 | 0 |
| Return flow from irrigation | 0 | 0 |
| Treated wastewater discharged back to river | 20 | 80 |
| **Sub-total** | **467,300** | **981,500** |
| **Usage** | | |
| Urban diversions | 16,100 | 15,590 |
| Licensed private diversions from unregulated streams | 3,300 | 3,900 |
| Small catchment dams | 12,800 | 12,800 |
| **Sub-total** | **32,200** | **32,300** |
| **Losses** | | |
| Net evaporation losses from major storages | 200 | 0 |
| Evaporation from small catchment dams | 3,400 | 3,400 |
| In-stream infiltration to groundwater, flows to floodplain and evaporation[2] | 0 | 0 |
| **Sub-total** | **3,600** | **3,400** |
| **Water passed at outlet of basin** | | |
| River outflows to the ocean | 432,400 | 945,900 |

Notes:

(1) Inflows have been back-calculated from outflows plus diversions.

(2) Assumed to be zero because data is not readily available.

### 30.5.2 Small catchment dams

Specific information on small catchment dam usage and losses for 2005/06 is not readily available, and the values provided in Table 30-5 below are based on the estimated average annual impact.

### Table 30-5 Small catchment dam information, 2005/06

| Type of small catchment dam | Capacity (ML) | Usage (ML) | Total water harvested (ML) |
|---|---|---|---|
| Domestic and stock (not licensed) | 10,700 | 5,400 | Not available |
| Registered commercial and irrigation | 8,800 | 7,400 | Not available |
| **Total** | **19,500** | **12,800** | **16,200** |

### 30.5.3 Water entitlement transfers

There were no temporary or permanent transfers of water entitlements or diversion licences within the basin in 2005/06.

### 30.5.4 Volume diverted

The volume of water diverted under each water authority's bulk entitlement is shown in Table 30-6. Compliance with individual bulk entitlement volumes is deemed to occur if water use is not more than the maximum volume allowed to be diverted in 2005/06.

Licensed diversions from unregulated streams are estimated based on irrigation demand modelling and climate information.

**Table 30-6 Volume of water diverted under surface water entitlements in the Otway Coast basin**

| Bulk entitlement | Bulk entitlement period (years) | Average bulk entitlement over period (ML/year) | Net temporary transfer 2005/06 (ML) | Volume diverted 2005/06 (ML) | Entitlement volume compliance? |
|---|---|---|---|---|---|
| *Barwon Water* | | | | | |
| Aireys Inlet | 1 | 317 | 0 | 226 | Yes |
| Apollo Bay and Skenes Creek | 1 | 365 | 0 | 313 | Yes |
| Colac | 1 | 5,400 | 0 | 4,788 | Yes |
| Gellibrand | 1 | 60 | 0 | 24 | Yes |
| Lorne | 1 | 510 | 0 | 408 | Yes |
| *Wannon Water* | | | | | |
| Otway system | 1 | 12,580 | 0 | 10,342 | Yes |
| **Total annual volume of bulk entitlements 2005/06** | | **19,232** | **0** | **16,101** | |
| **Total annual volume of bulk entitlements 2004/05** | | **19,232** | **0** | **15,586** | |
| *Licensed diversions from unregulated streams 2005/06* | | *6,298* | | *3,300* | |
| *Licensed diversions from unregulated streams 2004/05* | | *5,439* | | *3,900* | |

## 30.6 Groundwater resources

A summary of licensed entitlements and use for groundwater management units that overlap the Otway Coast basin, excluding domestic and stock use, is presented in Table 30-7.

The Otway Coast basin contains all of the Jan Juc GMA and Newlingrook GMA as well as part of the Colongulac GMA, Gellibrand GMA, Paaratte GMA and Nullawarre WSPA. The volumes described in the tables below are totals for the management areas and include the area that falls outside the Otway Coast basin. Groundwater entitlements and use for unincorporated areas have not been included in the 2005/06 water accounts.

## Table 30-7 Compliance with licensed groundwater volumes, Otway Coast basin 2005/06

| Water supply protection area/ Groundwater management area[1] | GMA/ WSPA depth limits[2] (m) | Allocation limit[3] (ML/year) | Licensed entitlement allocated[4] (ML/year) | Metered use (ML) | Estimated use in unmetered bores[5] (ML) | Total licensed groundwater use (ML) 2005/06 | Total licensed groundwater use (ML) 2004/05 |
|---|---|---|---|---|---|---|---|
| Colongulac GMA (56%) | ≤60 | 14,271 | 3,577 | 0 | 1,073 | 1,073 | 1,260 |
| Gellibrand GMA (92%)[6] | All depths | 0 | 0 | 0 | 0 | 0 | 0 |
| Jan Juc GMA (100%) | All depths | 6,804 | 4,000 | 0 | 1,200 | 1,200 | 1,400 |
| Newlingrook GMA (100%) | All depths | 74,970 | 1,968 | 0 | 590 | 590 | 689 |
| Paaratte GMA (84%) | >120 | 4,606 | 3,192 | 0 | 958 | 958 | 1,117 |
| Nullawarre WSPA (11%)[7] | ≤250 | 22,238 | 22,238 | 10,500 | 0 | 10,500 | 9,490 |

Notes:

(1) The percentage of the GMA/WSPA by surface area within the river basin is given in the parentheses. Those GMAs/WSPAs with <5% surface area within the basin have not been included.

(2) This column indicates the aquifer depth limits for which the GMA/WSPA applies.

(3) The allocation limit represents the sum of licensed allocations for WSPAs and the permissible consumptive volume for GMAs.

(4) Allocated volume includes domestic and stock usage in those cases where it is part of a licensed allocation.

(5) In non-metered areas, Southern Rural Water has estimated use at 30% of licensed entitlement.

(6) The permissible annual volume and allocations for the Gellibrand GMA are set at zero because studies indicate that any groundwater extractions will directly impact on streamflow in the Gellibrand River.

(7) Depth limit was incorrectedly stated in 2004/05 State Water Report and has been adjusted.

An estimate of domestic and stock groundwater use is provided in Table 30-8.

## Table 30-8 Number of domestic and stock bores and estimated use, 2005/06

| Water supply protection area/ Groundwater management area | No. of domestic and stock bores[1][2] | Estimated domestic and stock use (assuming 2ML/bore) (ML) |
|---|---|---|
| Colongulac GMA | 208 | 416 |
| Gellibrand GMA | 0 | 0 |
| Jan Juc GMA | 0 | 0 |
| Newlingrook GMA | 0 | 0 |
| Paaratte GMA | 4 | 8 |
| Nullawarre WSPA | 1,197 | 2,394 |

Notes:

(1) There are a number of licensed groundwater allocations that also incorporate domestic and stock use. The estimated use for these bores is included in the licensed allocation in Table 30-7.

(2) The numbers of domestic and stock bores are those registered in the state database as being drilled since 1965.

In the Otway Coast basin, groundwater is used for urban water supply in the townships of Port Campbell, Timboon, Peterborough and Koroit as well as the areas around Carlisle and Curdie Vale. The licensed entitlements and metered use for these groundwater supplies is provided in Table 30-9.

### Table 30-9 Urban groundwater usage

| Town supplied | Licensed allocation (ML) | Metered use 2005/06 | Metered use 2004/05 |
|---|---|---|---|
| Otway system (Carlisle) | 1,800 | 109 | 115 |
| Otway system (Curdie Vale) | 2,150 | 0 | 0 |
| Port Campbell, Timboon and Peterborough | 1,009 | 387 | 352 |

## 30.7 Seasonal allocations and restrictions on water use, diversions and extractions

Restrictions applying to urban customers and licensed diversions are shown in Table 30-10.

No bans or restrictions were imposed on groundwater use in the Otway Coast basin during 2005/06.

### Table 30-10 Seasonal allocations and restrictions on water use in Otway Coast basin, 2005/06

| Type of restriction | Area | Nature of restriction |
|---|---|---|
| Urban | Apollo Bay, Marengo, Skenes Creek | Stage 1 from November to December 2005, increasing to Stage 2 from January to June 2006<br>Permanent water savings measures applied from March 2006 (Wannon Water) and May 2006 (Barwon Water) |
| Licensed diversions from unregulated streams | Curdies River | Stage 3 (50% reduction) July 2005, and from January to April 2006 |
| | Gellibrand River | Stage 1 (roster) in July 2005, Stage 3 from January to April 2006, back to Stage 2 (25% reduction) from May to June 2006 |
| | Lake Purrumbete | Irrigation Ban January 2006 to May 2006 |

## 30.8 Recycled water

Wastewater treatment plants within the Otway Coast basin are operated by Barwon Water and Wannon Water. In 2005/06, 27% of the volume of treated wastewater was used within the Otway Coast basin (Table 30-11). This was a reduction from 33% in 2004/05 primarily due to the Timboon treatment plant which recycled a greater amount in 2004/05 because of a carryover from 2003/04.

### Table 30-11 Volume of recycled water

| Treatment plant | Volume produced (ML) | Volume recycled (ML) | % Recycled | End use type for recycled water (ML) | | | | Volume discharged to the environment (ML) | Release to ocean / Other (ML)[3] |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Urban & industrial | Agriculture | Beneficial allocation[1] | Within process[2] | | |
| Aireys Inlet | 101 | 101 | 100% | 0 | 101 | 0 | 0 | 0 | 0 |
| Anglesea | 259 | 96 | 37% | 0 | 73 | 0 | 24 | 0 | 187 |
| Apollo Bay | 366 | 15 | 4% | 0 | 0 | 0 | 15 | 0 | 367 |
| Lorne | 300 | 15 | 5% | 0 | 0 | 0 | 15 | 0 | 300 |
| Cobden | 189 | 103 | 54% | 0 | 103 | 0 | 0 | 0 | 87 |
| Port Campbell | 65 | 20 | 30% | 0 | 20 | 0 | 0 | 0 | 45 |
| Simpson | 20 | 3 | 12% | 0 | 3 | 0 | 0 | 18 | 0 |
| Timboon | 59 | 10 | 18% | 0 | 10 | 0 | 0 | 0 | 48 |
| **Total 2005/06** | **1,360** | **363** | **27%** | **0** | **309** | **0** | **54** | **18** | **1,033** |
| **Total 2004/05** | **1,447** | **472** | **33%** | **0** | **415** | **0** | **58** | **81** | **894** |

Notes:

(1) Volume used to deliver specific environmental flow benefits.

(2) Water that is reused in wastewater treatment processes, e.g. backflushing of filters.

(3) Other refers to a change in on-site wastewater storage, or other item affecting the annual water balance for recycled water that is not otherwise accounted for.

## 30.9 Water for the environment

### 30.9.1 Environmental Water Reserve (EWR)

In 2005/06 the Otway Coast basin EWR comprised the following components:

- passing flows released as a condition of consumptive bulk entitlements held by Barwon Water and Wannon Water
- all other water in the basin not allocated for consumptive use.

### 30.9.2 Compliance with passing flow requirements

Table 30-12 shows the passing flow requirements in the Otway Coast basin for selected bulk entitlement compliance points. While there are other compliance points, the points below have been chosen as they were judged to be of community interest.

### Table 30-12 Selected passing flow requirements in the Otway Coast basin

| River | Passing flow | |
|---|---|---|
| Painkalac Creek | Instrument where passing flows are specified | Bulk Entitlement (Aireys Inlet) Conversion Order 1997 |
| | Responsible authority | Barwon Water |
| | Compliance point | Painkalac Creek Reservoir |
| | Passing flow rules | • From December to February inclusive: natural flow<br>• From March to November inclusive: the lesser of 0.5 ML/day or natural flow |
| Barham River, Skenes Creek | Instrument where passing flows are specified | Bulk Entitlement (Apollo Bay and Skenes Creek) Conversion Order 1997 |
| | Responsible authority | Barwon Water |
| | Compliance point | Barham River diversion weir |
| | Passing flow rules | • The authority is not obliged to provide minimum passing flows |
| | Compliance point | Skenes Creek diversion weir |
| | Passing flow rules | • The lesser of 1.5 ML/day or natural flow<br>• When flow is between 1.5 and 1.93 ML/day, the authority must pass 1.5 ML/day<br>• When flow is greater than 1.93 ML/day, the authority must pass the entire flow, less 0.43 ML/day<br>• Minimum passing flow is 1.5 ML/day |
| Arkins Creek West, Arkins Creek East, First Creek, Gellibrand River | Instrument where passing flows are specified | Bulk Entitlement (Otway System) Conversion Order 1998 |
| | Responsible authority | Wannon Water |
| | Compliance point | Gellibrand River - North Otway pump station |
| | Passing flow rules | • When flow is equal to or less than 12 ML/day, no passing flow is specified<br>• When flow is between 12 and 22.5 ML/day, the authority must pass 12 ML/day<br>• When flow is between 22.5 and 44.9 ML/day, the authority must pass 17.5 ML/day<br>• When flow is between 44.9 and 54.9 ML/day, the authority must pass 20 ML/day<br>• When flow is 54.9 ML/day or greater, the authority must pass 22.5 ML/day |
| | Compliance point | Gellibrand River - South Otway pump station |
| | Passing flow rules | • When flow is equal to or less than 12 ML/day, no passing flow is specified<br>• When flow is between 12 and 22 ML/day, the authority must pass 12 ML/day<br>• When flow is between 22 and 32.7 ML/day, the authority must pass 17 ML/day<br>• When flow is between 32.7 and 41.2 ML/day, the authority must pass 19 ML/day<br>• When flow is 41.2 ML/day or greater, the authority must pass 21.5 ML/day |

Barwon Water and Wannon Water reported that all passing flow requirements under their bulk entitlements in the Otway Coast basin were met in 2005/06.

### 30.9.3 Streamflow management plans (SFMPs)

Technical studies and administrative processes are underway in preparation for the development of an SFMP for the Gellibrand River.

### 30.9.4 Water leaving the basin

The amount of water flowing from the Otway basin into Bass Strait was 432,400 ML in 2005/06. This represents 93% of the total inflows into the basin, compared to 96% in 2004/05. This water comprises consumptive water that was not used under entitlements and the EWR (passing flows and any water above cap).

## 30.10 Otway Coast basin summary

Otway Coast basin experienced some of the highest rainfall in the state during 2005/06, with between 600mm and 1,200mm of rain falling throughout the region. However, in 2005/06 rainfall was still less than average, continuing the trend witnessed in recent years.

Inflow to the basin was substantially higher than diversions, with only 7% of the 550,000 ML of inflows of diverted for consumptive use.

Water supplies in the basin experienced restrictions and falling storages despite the apparent abundance of water. This has occurred because the water supply systems have small offstream storages as they rely on good summer base flows in the rivers. They are therefore susceptible to water shortages in years of low summer river flows such as 2005/06.

Stage 1 restrictions prevailed for some of Barwon Water's coastal town customers during early summer as the population in the region increased during the holiday season. Restrictions increased to Stage 2 in January 2006 and remained at that level for the rest of 2005/06.