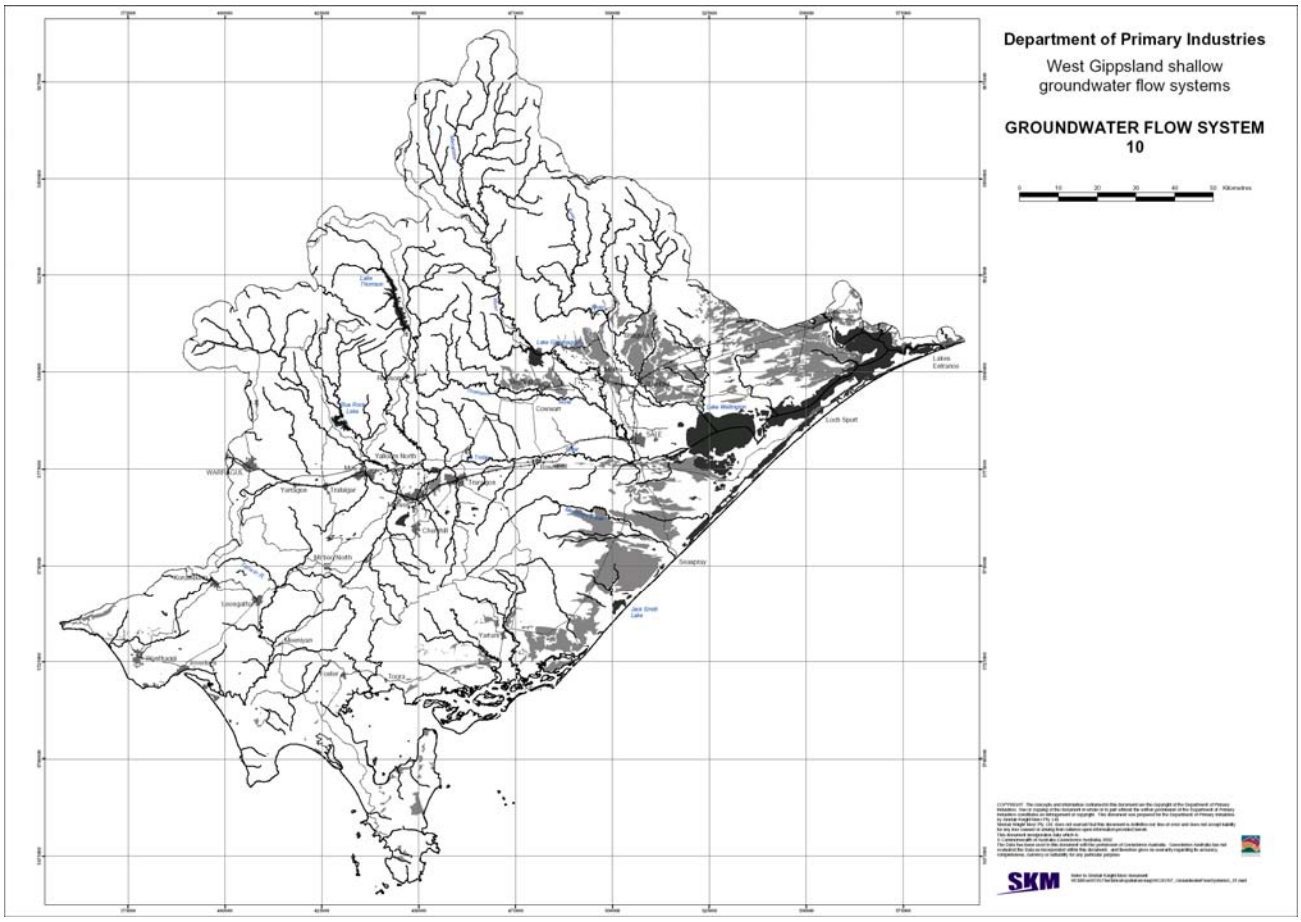
GFS 10: Quaternary sediments – general (low-mid slope)

1. GFS definition



Geology constraint:	All Quaternary sediments except for Qrd, Qrm, Qra and Qpd. (Qpa only for south of Gippsland Lakes and Latrobe River), low permeability soils
Slope constraint:	None
Area constraint:	South of Latrobe River and south of Gippsland Lakes for Qpa, otherwise no restrictions
Rationale for choice of GFS:	Alluvial Quaternary deposits forming large flat plains are likely to be dominated by intermediate or regional flow systems
GFS priority:	High

2. The salinity problem

Salinity occurrence: Coastal tidal flats, estuaries and wetland areas. Low lying agricultural land in the Heyfield, Lake Coleman and Bengworden areas. (Source: West Gippsland Land Salinity GIS layer)

Assets being affected: Wetlands, agricultural land, possibly urban areas (Source: WGCMA (2005))

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Area of mapped land salinity: 851ha Class 1, 190ha Class 2, 146ha Class 3, 165ha undifferentiated (Source: West Gippsland Land Salinity GIS layer)

Area of primary and secondary land salinity: 148ha primary salinity, 1054ha secondary salinity, 150ha unknown (Source: West Gippsland Land Salinity GIS layer)

Area of wetland salinity: Dowd Morass and Lake Coleman are being slightly and severely affected by salinity respectively. Both wetlands are RAMSAR listed. May be other wetlands fringing Lake Victoria which are also affected.

Surface water salinity: Monitoring stations with less than 100% attainment of 90th percentile salinity SEPP: Avon River at Stratford (94%), Merrimans Ck at Prospect Rd (67%)

Salinity process: Influx of ocean water; discharge of intermediate groundwater flow systems (Source: WGCMA (2005))

Current area of less than 2m depth to water table: 4395ha <2m, 344ha coastal plain (<2m AHD) = total 4740ha (West Gippsland DTWT GIS layer, SKM (2004b) and WGCMA (2005))

Groundwater salinity: 500 to 1,000mg/L TDS. (Source: Warragul/Sale hydrogeological map (1995))

Land salinity trend: Likely to be stable or getting slightly worse (Source: WGCMA (2005))

Groundwater level trend: Rising in the Yarram/Port Albert area by approximately 20mm/yr but steady in the Inverloch/Wonthaggi area. (Source: SKM (2004b))

- **Figure 24: Looking south from the South Gippsland Highway at Hedley towards coastal flats**

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3. Landscape attributes

Area: Plains and dunes

Geology: Quaternary sediments

Topography: Low to mid slope

Soil permeability: Equally moderate, low or very low with some areas of high and very high permeability. (Source: West Gippsland Soil Permeability GIS layer)

Annual Rainfall: 600-700mm on average. (Source: West Gippsland Annual Rainfall GIS layer)

Annual Evaporation: 950 to 1000mm on average. (Source: West Gippsland Annual Evaporation GIS layer)

Landuse: Generally farming with some areas of forestry and native vegetation. Predominantly dairy around Yarram, sheep near Giffard, irrigated areas around Yarram. Predominantly perennial pastures though more annual pasture towards Loch Sport. (Source: West Gippsland Landuse GIS layer)

- **Figure 25: Yarram – Port Albert Road south of Alberton**

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4. Hydrogeology

Geology: Sands, gravels, clays

Aquifer type: Unconsolidated sediments

Hydraulic conductivity: Unknown

Aquifer transmissivity: Unknown

Aquifer storage coefficient: Unknown

Hydraulic gradient: Unknown

Yield Variable

Temporal recharge distribution: Unknown

Spatial recharge distribution: Unknown

Recharge estimate: Unknown

Aquifer uses: Stock and domestic

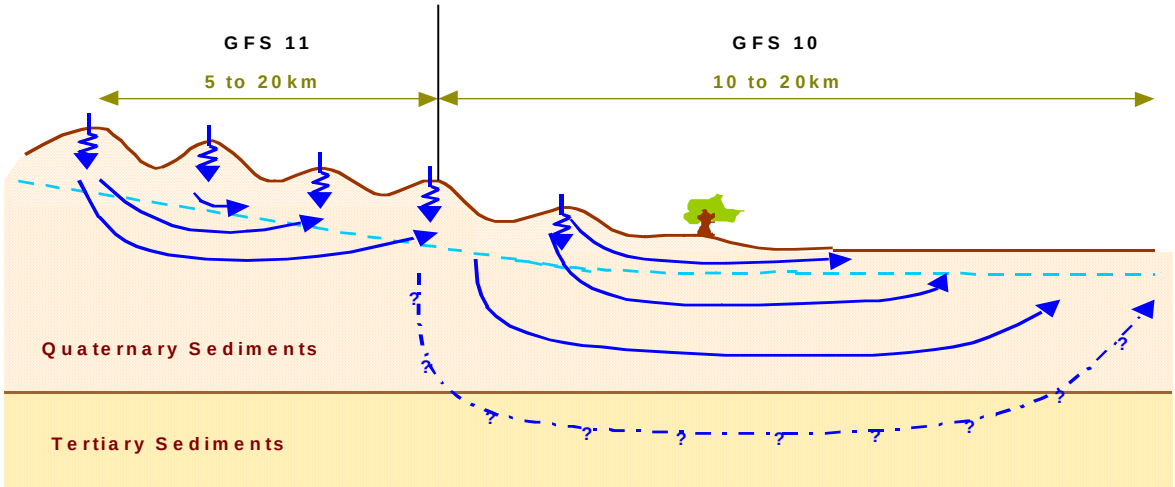
Scale of groundwater flow path: Intermediate

Responsiveness to land management: Moderate

National GFS type most like (ref Coram et al., 1998): Intermediate 4 – Discharge across topographic divides controlled by large, transmissive and linear structures (Source: GFS workshop)

Groundwater flow between GFSs: Flow between GFSs 10 and GFS11. Likely flow from GFS 7 and 8 to GFS10

5. Conceptual model of recharge discharge relationship



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6. Salinity Management Options

Current salinity management: Groundwater monitoring to asses extent of problem, perennial pastures established for production purposes (not necessarily for salinity control) (Source: DNRE (2000) and WGCMA (2005))

Recharge control options: Perennial pastures where rainfall is <600mm/year, farm forestry where rainfall is >600mm/year. Perennial pasture may be useful for limiting recharge from small rainfall events during the year, but not the large events that happen about once every 3 years. Lucerne unlikely to be suitable in the Giffard area due to temporary waterlogging and clay horizon. Trees will have the most effect due to the high rainfall. 650mm suits pine, 700mm suits Eucalypts. In irrigated areas, increased irrigation efficiency will reduce groundwater recharge. Possibly increased drainage may help salinity issue. (Source: DNRE (2000), WGCMA (2005) and GFS workshop)

Pasture or crop potential	*Trees for biodiversity potential*	*Trees for forestry potential*	*Surface drainage potential*	*Irrigation management potential*
Moderate	Strong	Strong	Moderate	Strong

Groundwater discharge enhancement options: Groundwater pumping not likely to be a viable option due to low gross margin of agricultural land and lack of suitable shallow aquifer (Source: DNRE (2000) and WGCMA (2005))

Public groundwater control pumping	*Private groundwater pumping potential*	*Tile and mole drain potential*	*Break of slope tree planting*
Weak	Moderate	None	Weak

Living with salt options: Salt tolerant crop and pasture species. Potentially Tall Wheat Grass (Source: DNRE (2000), WGCMA (2005) and GFS workshop)

Conflicts with other NRM programs: Potential conflict with weed and wetland program if salt tolerant crops and pastures infest areas outside intended saline areas (eg wetland reserves) (Source: WGCMA (2005) and GFS workshop)

Synergies with other NRM programs: Strong synergy with the Farm Forestry program, implementation of West Gippsland Native Vegetation Plan, Landcare works relating to erosion and streambank rehabilitation, Environmental Management Systems, Productivity from farm management perspectives. (Source: WGCMA (2005) and GFS workshop)

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- **Figure 26: Spray irrigation between Tarraville and Manns Beach**