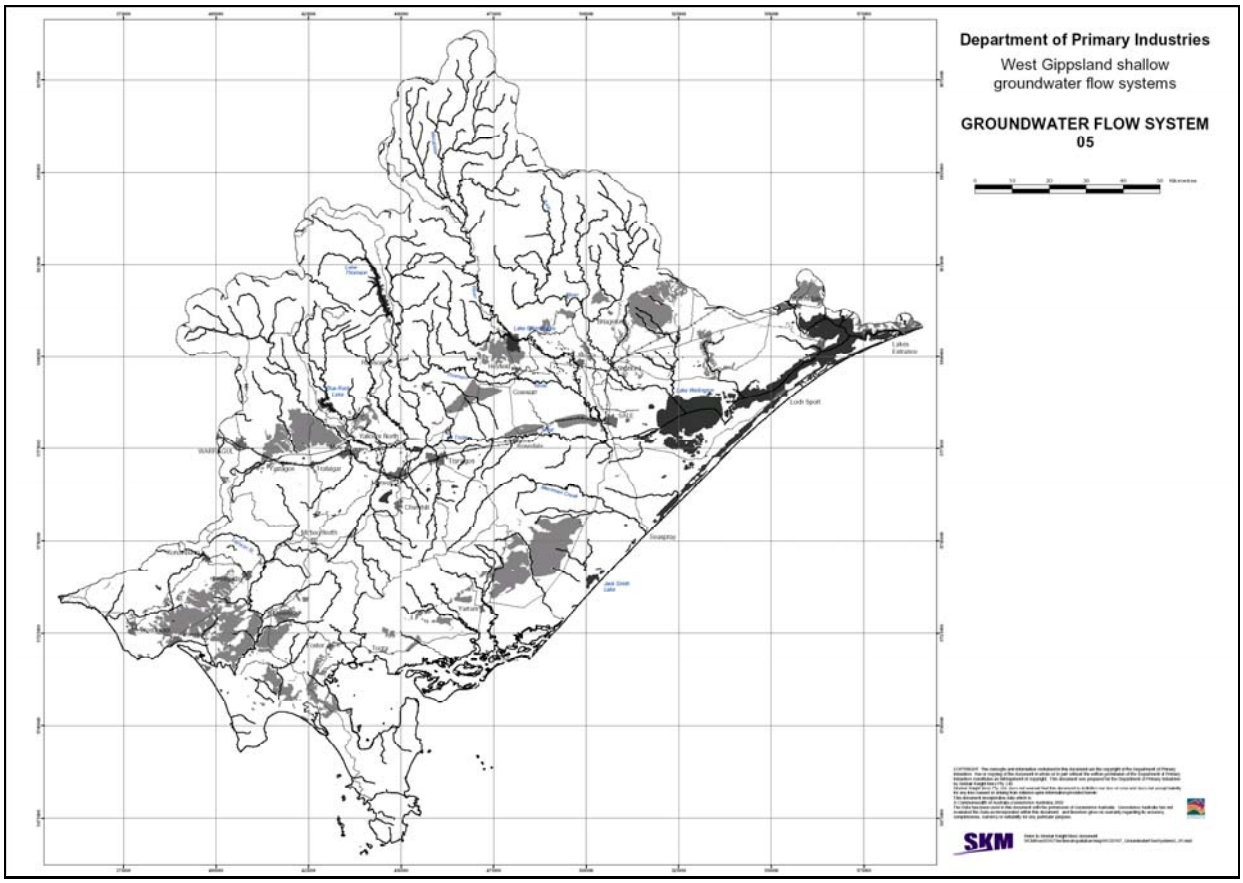
GFS 5: Tertiary sediments – general

1. GFS definition



Geology constraint: All Tertiary sediments except Tvo and Tml

Slope Constraint: <5 degrees

Area constraint: All areas except Rosedale area

Rationale for choice of GFS: Tertiary sediments have different hydraulic characteristics than other unconsolidated sediment aquifers with possible connection to deeper Boisdale Aquifer. Plain deposits differentiated from low slope deposits due to their longer flow path

GFS priority: High

2. The salinity problem

Salinity occurrence: 415 hectares (Source: West Gippsland Land Salinity GIS layer)

Assets being affected: Agricultural land north of Yarram and between Inverloch and Leongatha. Potentially urban salinity in coastal townships.

(Source: Rural Salinity: DNRE (2000) and WGCMA (2005) Urban salinity: SKM (2005 in prep))

Area of mapped land salinity: 385ha Class 1, 10ha Class 2, 1ha Class 3, 19ha undifferentiated
(Source: West Gippsland Land Salinity GIS layer)

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Area of primary and secondary land salinity: 340ha secondary, 75ha unknown
(Source: West Gippsland Land Salinity GIS layer)

Area of wetland salinity: No known areas of wetland salinity

Surface water salinity: Stations with <100% attainment of 90 percentile salinity SEPP: Andersons Ck at Yallourn Nth Rd (26%)

Salinity process: Recharge likely to be occurring on upper parts of low rolling hills and discharge on the lower lying floodplains. (GFS workshop)

Current area of less than 2m depth to water table: 1484ha <2m, 534ha coastal plain (<2m AHD) = total 2018ha (Source: West Gippsland DTWT GIS layer)

Groundwater salinity: Low (generally less than <500mg/L TDS), some areas 1000-1500mg/L TDS
(Source: SKM (1998a), Warragul/Sale hydrogeological map (1995))

Land salinity trend: Unknown

Groundwater level trend: Rising in the Inverloch and Yarram areas. Falling in Bengworden and the MID surrounding areas (likely due to below average rainfall and therefore increased extractions).
(Source: SKM, 2004b)

- **Figure 16: Salinity at the base of Snake Ridge, Kilmany**

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3. Landscape attributes

Area: Low hills

Geology: Tertiary sediments (except Tvo and Tml)

Topography: Low rolling hills on the edge of the Strzelecki Ranges

Soil permeability: Large area of moderate permeability with areas of very low, low and high permeability comprising most of the remainder. (Source: West Gippsland Soil Permeability GIS layer)

Annual Rainfall: 900-1000mm Wonthaggi area, 600-700mm Jack Smith Lake and Heyfield areas, 700-800mm Bairnsdale and Munro areas. (Source: West Gippsland Annual Rainfall GIS layer)

Annual Evaporation: 950->1000 Wonthaggi, 950-975mm Jack Smith Lake, 975->1000mm Heyfield, Munro, Bairnsdale. (Source: West Gippsland Annual Evaporation GIS layer)

Landuse: Mostly dairy and beef farming with large areas of plantation forestry and areas of native vegetation. There is also a small mining component. (Source: West Gippsland Landuse GIS layer)

4. Hydrogeology

Geology: Sands, gravels, clays

Aquifer type: Unconsolidated sediments

Hydraulic conductivity: Unknown

Aquifer transmissivity: Unknown

Aquifer storage coefficient: Unknown

Hydraulic gradient: Unknown

Yield: Low (<0.5L/s on average) (Warragul/Sale hydrogeological Map (1995))

Temporal recharge distribution: Likely to follow rainfall pattern (ie most recharge in winter and spring)

Spatial recharge distribution: Most recharge likely to be from permeable soils on upper slopes of low rolling hills

Recharge estimate: Unknown

Aquifer uses: Stock and domestic

Scale of groundwater flow path: Predominantly local with some intermediate influence

Responsiveness to land management: Reasonably responsive given the local nature of flow systems

National GFS type most like (ref Coram et al., 1998): Local 4 – Discharge from colluvial/alluvial slopes (GFS workshop)

Groundwater flow between GFSs: Flow from GFS 5 to GFS 12 and GFS 9 (in Heyfield area)

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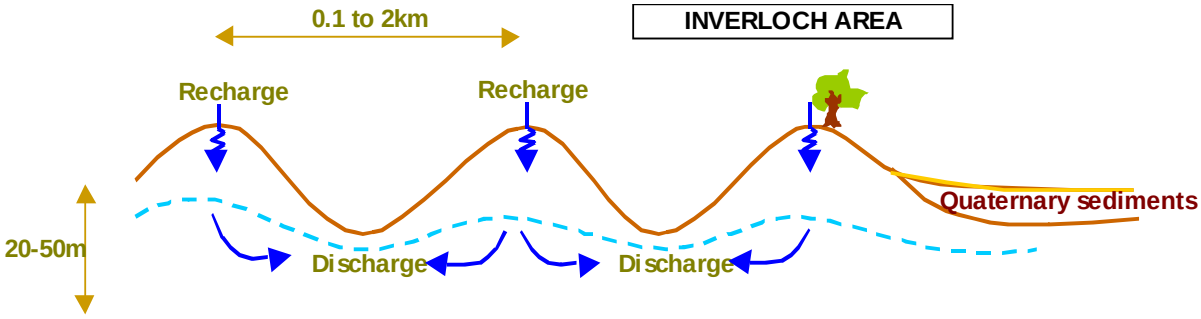
- **Figure 17: Tap Tap Rd**

5. *Conceptual model of recharge discharge relationship*



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6. Salinity Management Options

Current salinity management: Trees being planted along some fence lines; some saline agriculture being explored (Source: WGCMA (2005))

Recharge control options: High rainfall is likely to suit tree planting- perhaps farm forestry. However, economically trees can't compete with dairy around Inverloch and the area is a little further from markets for forestry. At a local level, need to look for highly permeable sites to get maximum recharge benefit. Improved drainage may help. (Source: WGCMA (2005) and GFS workshop)

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

Groundwater discharge enhancement options: Little opportunity for expensive groundwater pumping options to protect agricultural land given gross margin values. (Source: WGCMA (2005))

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

Living with salt options: Yes – salt tolerant pastures and crops (Source: WGCMA (2005))

Conflicts with other NRM programs: Need to ensure salt tolerant crops and pastures do not become weeds (eg Tall Wheat Grass)

Synergies with other NRM programs: Strong synergy with biodiversity and soil erosion programs. (Source: WGCMA, 2005)