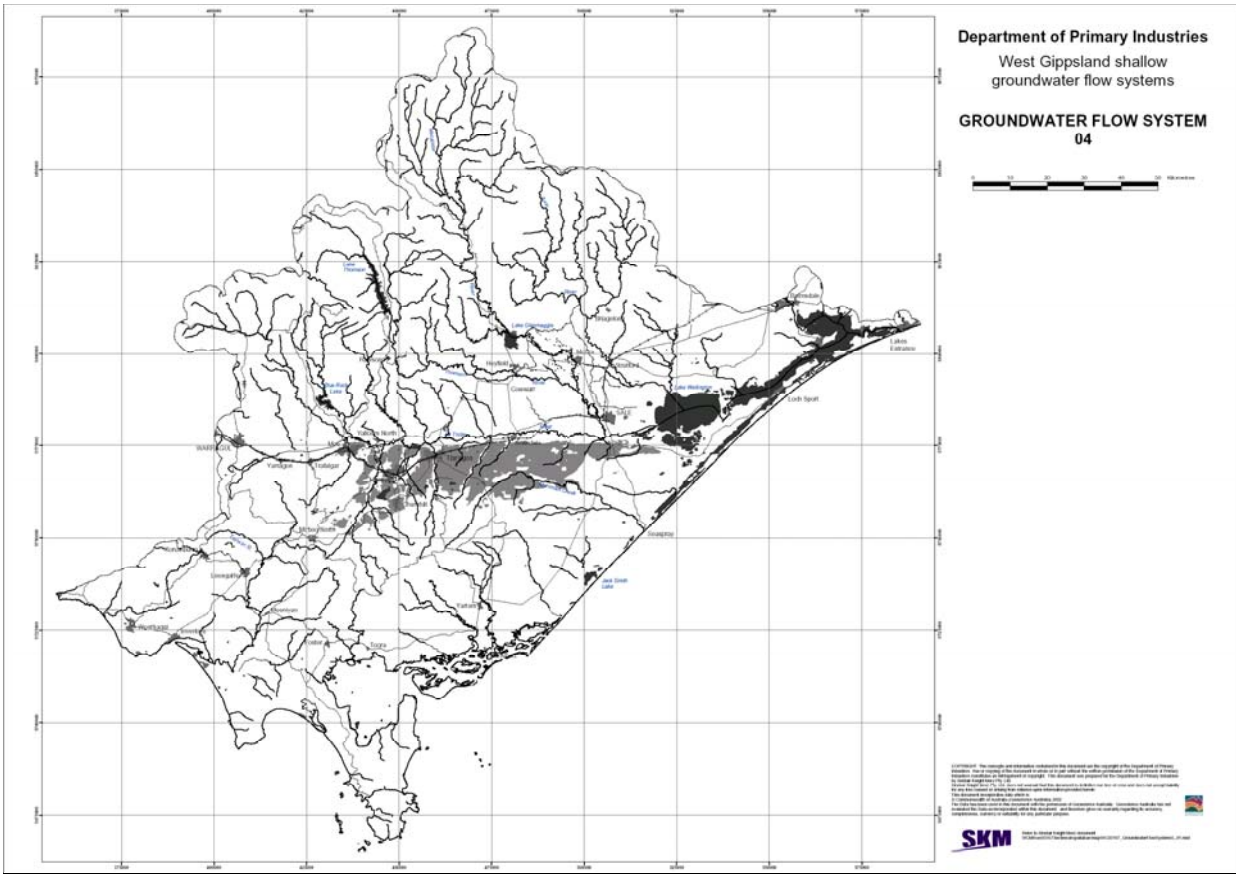
GFS 4: Tertiary sediments – Rosedale area including Sale to Moe

1. GFS definition



Geology constraint: All Tertiary sediments except Tvo and Tml

Slope Constraint: <5 degrees

Area constraint: 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: 150 hectares (Source: West Gippsland Land Salinity GIS layer)

Assets being affected: Agricultural land around Rosedale. Possible urban salinity in Rosedale township (Rural Salinity: DNRE (2000) and WGCMA (2005) Urban salinity: SKM (2005 in prep))

Area of mapped land salinity: 4ha Class 1, 6ha Class 2, 140ha undifferentiated
(Source: West Gippsland Land Salinity GIS layer)

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

Area of wetland salinity: No known wetland salinity

Surface water salinity: Stations with <100% attainment of 90 percentile salinity SEPP: Flynns Ck at Princes Hwy (60%), Sheepwash Ck at Princes Hwy (16%), Waterhole Ck at Princes Hwy (90%), Bennetts Ck at Jeeralang Rd (82%)

Salinity process: Recharge likely to be occurring on upper parts of low rolling hills and discharge on the lower lying floodplains. Additional terrace south of Rosedale may be influencing salinity in the area. (GFS workshop)

Current area of less than 2m depth to water table: 246ha <2m (West Gippsland DTWT GIS layer)

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

Land salinity trend: Unknown

Groundwater level trend: Unknown. Limited borehole data.

3. Landscape attributes

Area: Plains

Geology: Tertiary sediments (except Tvo and Tml)

Topography: <2° slope

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

Annual Rainfall: 600mm-800mm on average. (Source: West Gippsland Annual Rainfall GIS layer)

Annual Evaporation: 925-975mm on average. (Source: West Gippsland Annual Evaporation GIS layer)

Landuse: Mostly dairy, beef and sheep grazing, with large areas of plantation forestry and areas of native vegetation. Some irrigation sourced from rivers and bores. 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: 1-10m/day (Source: Warragul/Sale hydrogeological Map (1995))

Aquifer transmissivity: Low to moderate – MID area Haunted Hills Gravels considered to have low permeability, Moe GMA likely to have low to moderate transmissivity (Source: MID: SKM (1998); Moe GMA: SKM (1998a))

Aquifer storage coefficient: $4x10^{-4}$ - 0.1 (Source: Warragul/Sale hydrogeological Map (1995))

Hydraulic gradient: Unknown

Yield: 0.5-5L/s (Source: Warragul/Sale hydrogeological Map (1995))

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

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Spatial recharge distribution: Knowledge gap on recharge pathway. Potentially from rolling hills to the south.

Recharge estimate: Unknown

Aquifer uses: Stock and domestic

Scale of groundwater flow path: Expected to be intermediate in this area

Responsiveness to land management: Moderately responsive given the intermediate nature of flow systems

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

Groundwater flow between GFSs: Flow from GFS 4 to GFS 12 (recent alluvials)

- **Figure 15: Leongatha-Inverloch Rd**

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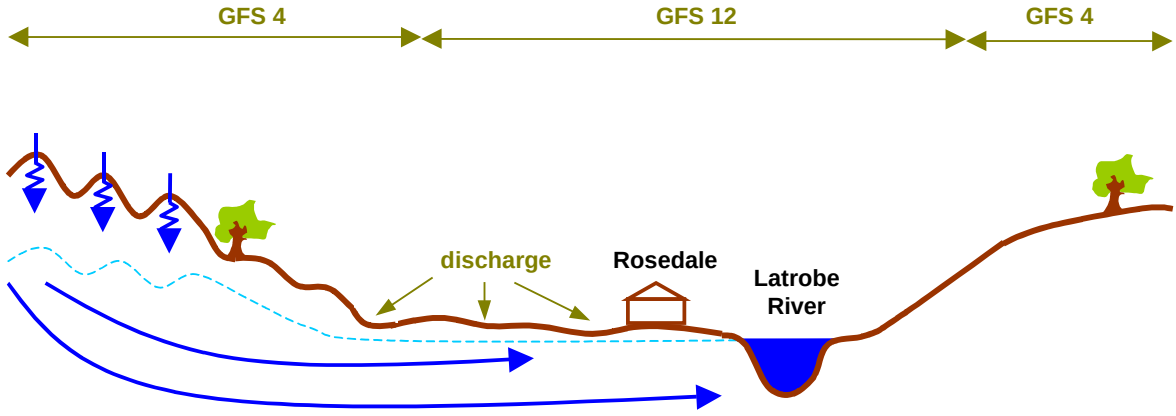
5. Conceptual model of recharge discharge relationship



6. Salinity Management Options

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

Recharge control options: Low rainfall is likely to suit tree planting and perennial pasture establishment - perhaps low rainfall farm forestry (GFS workshop). However, intermediate system likely to take decades to respond to a change in landuse. Irrigation management will reduced groundwater recharge. Living with salt and engineering options may be more suitable.

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

Groundwater discharge enhancement options: Little opportunity for expensive groundwater pumping options to protect agricultural land given gross margin values. Possible groundwater pumping options to protect urban assets in Rosedale (WGCMA, 2005)

Public groundwater control pumping potential	*Private groundwater pumping potential*	*Tile and mole drain potential*	*Break of slope tree planting potential*
Moderate (urban areas only)	Moderate	None	Moderate

Living with salt options: Yes – salt tolerant pastures and crops are likely to be the key salinity control option (WGCMA, 2005)

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Conflicts with other NRM programs: Need to ensure salt tolerant crops and pastures do not induce a weed problem (eg Tall Wheat Grass spread into river bank and other ecologically sensitive areas)

Synergies with other NRM programs: Strong synergy with biodiversity and soil erosion programs. Protection and enhancement of remnant vegetation is a priority in this area. (WGCMA, 2005)