Groundwater Recharge in the Murray Mallee

What is groundwater recharge?

Groundwater recharge occurs when water not taken up by plants or lost to evaporation drains through the soil and reaches the watertable

Groundwater recharge is a part of the water cycle in the Murray Mallee region. Rain that falls in the Mallee is either used by the plants of the region, lost by evaporation, or drains through the soil to the watertable, which ultimately discharges into the River Murray. In the past only a small amount of rainfall drained past the root zone of the deep-rooted, perennial mallee vegetation that once covered the region.

With the clearance of the native mallee vegetation and its replacement with annual crops and pastures drainage of water through the soil and groundwater recharge have increased. This process is starting to have an impact on the groundwater and the River Murray.

Natural Heritage Trust

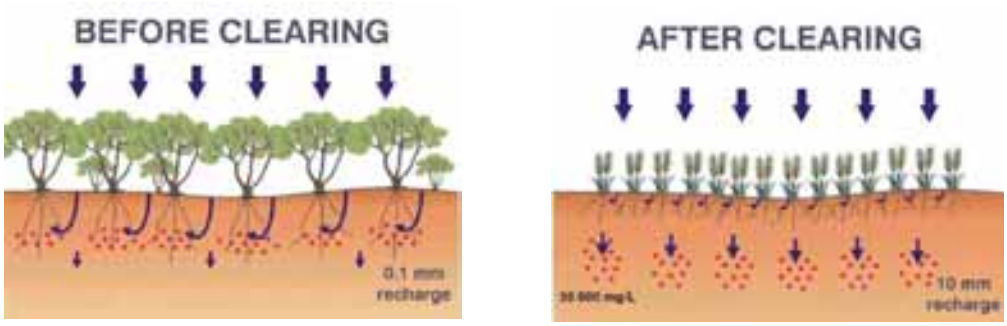
MURRAY MALLEE

Why is recharge increasing?

The clearing of the Mallee for agriculture has changed the water balance of the region - annual crops and pastures use less water than native vegetation

Clearing the Mallee

The removal of native vegetation for dryland agriculture and irrigated crops has increased the amount of water draining through the soil to the watertable.



Soils, Landscapes and Recharge

Soils influence recharge by affecting plant growth and movement of water into and through the soil. Soils with a high clay content can store more moisture and drain more slowly than sandy soils. Recharge is usually higher on sandy and stony soils as water drains more easily through these.

Influence of clay content and soil texture on water-holding capacity of the top 50cm of soil and estimated recharge

% Clay	Soil Texture	Water-holding Capacity (mm)	Recharge (mm/year)
0-5	Sand	30	35
5-15	Loamy sand	40	10
15-20	Sandy loam	55	5

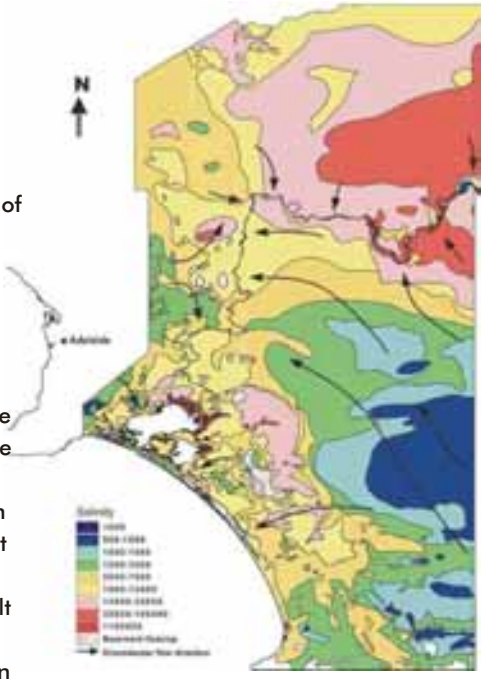
In the short-term land managers need to use as much of the excess water in the soil profile as possible, before it drains through to the watertable. In the longer-term the whole agricultural system of the region must become more effective at utilising the rain that falls and reducing recharge rates to a more sustainable level.

Why is it a problem?

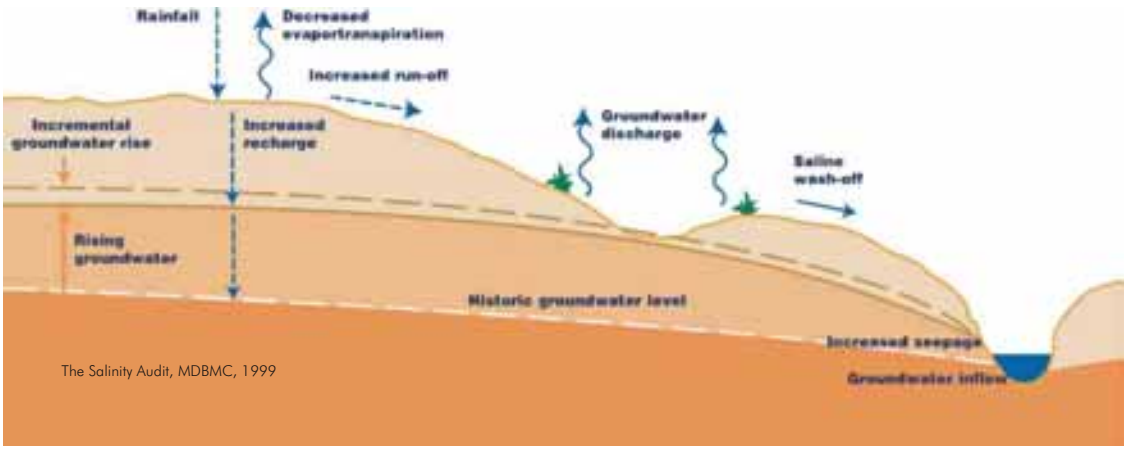
Increased recharge flushes salt normally stored in the soil into the watertable and increases the flow of saline groundwater into the River Murray

Salty Waters

The groundwater in many parts of the Murray Mallee region has always been very saline. The salinity ranges from around 1,000 ppm to over 35,000 ppm. That's saltier than seawater! The River Murray is a natural drain for the discharge of groundwater that flows beneath the Murray Mallee. As recharge increases the discharge of saline groundwater will also increase.



Recharge has already raised the watertable in some areas, which will increase the flow of saline water into the river. This water is becoming more saline because the water draining through the system dissolves salts stored in the soil. Based on current management practices it is predicted that in 2100 the saline groundwater draining from dryland regions will deliver about 2 tonnes of salt per kilometre into the River Murray everyday. There will be some variation due to differences in the extent of clearing, soil type and watertable depth along the river.



The Salinity Audit, MDBMC, 1999

What can we do about it?

Recharge can be reduced by continuing to improve farming practices, including more perennial plants in farming systems and protecting native vegetation.

Revegetation and Sustainability

Murray Mallee farmers are starting to adopt more sustainable farming practices and are using revegetation to help address land management issues. Revegetation projects, particularly on sandy and stony soils, can reduce recharge and groundwater salinity.

Many revegetation options exist that can reduce groundwater recharge and address other land management issues in the Murray Mallee region. Revegetation projects such as protecting and enhancing native vegetation remnants, establishing new plantings of native species, woodlots, shelterbelts, product blocks (eg. broombush, oil mallees, bush tucker), alley farming, fodder blocks (eg. saltbush) and perennial pastures (eg. lucerne) can all reduce groundwater recharge.

The Mallee Futures Program, administered by the Murray Mallee Local Action Planning Association Inc., provides landholders with financial incentives and free technical advice for revegetation projects that address the issues of groundwater recharge, soil erosion and native vegetation decline.

For more information please contact:
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