STATE SALINITY COUNCIL
Newsletter of the Western Australian State Council
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Recharge management and salinity

Recent research has shed new light on groundwater recharge and its effects in battling salinity.

Scientists from Agriculture Western Australia, Murdoch University and CSIRO did a rapid assessment of the impact that reducing recharge levels would have on the extent of salinity in WA's agricultural areas.

Recharge is the water that replenishes the groundwater systems and which drives the rising water table which is central to the salinity problem.

Recharge reduction means reducing the amount of rainfall that can make its way into the groundwater system.

The main conclusions of the modelling were:

- A large reduction in recharge levels is needed to produce a relatively small reduction in the area that we refer to as 'salinity'.
- However, there is a big variation among different catchments, with a 50 per cent reduction in recharge producing between 10 to 40 per cent reduction in the area estimated that will go 'saline'. Some of this variation may be due to catchment shape.
- Recharge management in the eastern and central regions would slow the rate of salinisation and restrict the area that would become 'saline'.
- Recharge management in western areas would both slow the rate of spread, and in the case of medium and high levels of intervention, reduce the potential area.
- Pumping would be able to manage salinity in some areas, although comparability with other options was not considered, i.e. whether pumping would be too expensive and difficult.

The model considered that when the watertable came within one metre of the surface, the land was "saline".

The researchers stressed that all catchments were different, in terms of their soils and landforms, and would respond differently.

However as a general rule, the modelling revealed that the steeper the slope on the landscape, the greater the impact of treatments.

The research was done in July 1999 on behalf of the State Salinity Council by Richard George (Agriculture Western Australia), Christoper Clarke (Murdoch University), and Tom Hatton and Paolo Reggiani (both from CSIRO Land and Water).

Drainage working party

Primary Industry Minister Monty House has established a Drainage Working Party, chaired by Agricultural Region MLC Dexter Davies.

The working party is developing a protocol to coordinate deep drainage practices in catchment areas.

The working party has had discussions with members of the Salinity Council and some of the work will be incorporated into the revised Salinity Action Plan.

Other members of the working party: Gordon Davidson (Dumbleyung), Mike McFarlane (Doodlakine), Noel Dodd (Kalannie-Goodlands), Ken Pech (Gnowangerup), Michael Georgeff (Narembeen) and David Hartley (Agriculture Western Australia).

Agroforestry Expo

The salinity message was taken to yet another audience last month at the Agroforestry Expo '99 in Boyup Brook.

The Water and Rivers Commission was one of the event's sponsors and as part of its support for the August 14 expo, the Commission promoted messages about ongoing work in the water resource recovery catchments identified in the Salinity Action Plan.

To ensure drinking water quality into the future, the Collie, Warren, Kent, Denmark and Helena rivers and their catchments have been identified as requiring priority management to restore and maintain water quality.

The Commission staged a display highlighting the work being done in the catchments to tackle salinity.

The links were made between agroforestry opportunities and salinity outcomes, but the Commission also reinforced that other actions such as planting perennial crops, remnant vegetation management and fencing were valuable options in the salinity toolkit.

Tree planting in the Kent River catchment

CALM voluntary conservation covenants

Landholders wanting to protect the conservation values of their property can now register their interest with CALM to develop nature conservation covenants.

Placing a covenant on the land title is voluntary and involves an agreement between the landholder and, in Western Australia, one of three organisations: Agriculture Western Australia, CALM or the National Trust.

The first covenants under CALM's new nature conservation covenant program are now being negotiated.

This involves assessing the conservation values of the land, determining the landholder's requirements and working with the landholder to develop a management plan.

Funding assistance for fencing and some management will be available, where appropriate.

In Salinity Action Plan recovery catchments, any land with nature conservation values that are deemed to be viable in the long term with reasonable management inputs would be eligible.

Viability is difficult to determine but is based on a judgment of the resilience of the vegetation community to known threats such as weeds, the size of the area, its position in the landscape in relation to rising water tables and likely management inputs. Land low in the landscape will be problematic if it is under threat from rising water tables.

For further information, contact Ken Atkins on (08) 9334 0455.

Modelling the impact of farm plans on salinity

Most farmers are now convinced of the potential of trees and other deep-rooted perennials to lower water tables and therefore reduce soil salinity.

However, there are still many questions to answer: Is tree planting the most effective means of controlling groundwater? How many should farmers plant and where? What other groundwater control strategies will work on any given farm?

One of the Blackwood Catchment Regional Initiative projects, jointly run by Agriculture Western Australia's Catchment Hydrology group and the Blackwood Basin Group aims to help farmers answer some of these questions.

The project uses a computer model of groundwater flow to predict the depth to the water table under different management options. This allows farmers and catchment groups to test the effects of different treatments on salinity before they choose the best option for themselves.

The model shows where groundwater is within two metres of the ground surface. This depth is usually where salinity will affect agricultural production.

For more details contact hydrologist Paul Raper from Agriculture Western Australia's Bunbury District Office on (08) 9780 6295.

Focus on salinity at Newdegate

Agriculture Western Australia was one of the major exhibitors at this year's Newdegate Machinery Field Days, with salinity as a key theme.

Senior development officer Brian Beetson said a display of the Land Monitor Project highlighted the use of satellite imagery and aerial photography to provide farmers, catchment managers and land-use planners with maps showing the extent of salinity.

"These tools can be used to map the development of salinity over the past 10 years, and identify areas at risk within the next 20 years," Mr Beetson said.

"Satellite imagery and aerial photography can reveal the amount of and recent changes to remnant vegetation and plantation timber.

"The project will also provide accurate land-height information at two-metre contour intervals."

Mr Beetson said the three-year Land Monitor Project, jointly funded by the Natural Heritage Trust, six State Government agencies and the CSIRO, covered 18 million hectares of agricultural land in the South West of the State.

All products were available at low cost in digital and hard copy forms.

Salinity and the West Midlands

Recent community concern about the health of the Lake Indoon wetland near Eneabba has widened speculation about salinity in the West Midlands area of the Northern Agricultural Region.

The West Midlands is composed primarily of Perth Basin sandplain and traditionally has not been thought of as having a salinity problem.

The area is considered extremely important, because of its large, potable groundwater resources.

This groundwater forms the basis for many expanding industries in the West Midlands and is considered a valuable resource for future industry and domestic water supply.

As part of Agriculture Western Australia's commitment to supporting the Lake Indoon Catchment Management Group, several observation bores and piezometers have been established in the Lake Indoon catchment.

The drilling program has uncovered many instances of salinity progressing at an alarming rate throughout the catchment, particularly in relation to waterlogging of low lying areas.

Agriculture Western Australia has embarked on an investigation program in two West Midlands catchments to identify the hydrological processes that are driving the growing salinity problems and to develop management options.

Pumps boost at Toolibin Lake

A program to pump rising saline groundwater from under one of the last freshwater lakes in the wheatbelt is to be expanded.

Toolibin Lake, east of Narrogin, is listed as a wetland of international importance under the Ramsar Convention and is one of four recovery catchments for natural diversity nominated to date under the State Salinity Action Plan.

The groundwater pumping program, begun in March 1997, is one of several actions under the Toolibin Lake Recovery Plan being implemented by CALM, with support from Agriculture Western Australia and the Water and Rivers Commission.

The Lake Toolibin Catchment Group is also working to combat the threat from both rising groundwater levels and surface waterlogging, by implementing a combination of revegetation, surface water diversion and remnant vegetation protection programs.

The aim of the pumping program at Toolibin Lake is to draw down the saline, regional water table to at least 1.5 metres below the soil surface. It is an emergency solution to prevent the vegetation across the lakebed from being killed and, in the longer term, will be replaced by revegetation in the catchment.

Results to date have been very good, with reductions in the water table depth of up to 15 metres, and visual evidence of improvement in tree health close to some of the pumps.

There are now eight pumps operating on the western side of the lake, removing an average of 240,000 litres of water per day, which is pumped downstream to the already saline Taarblin Lake.

Five new pumps will be installed at Toolibin Lake this financial year, based on the successful results achieved and predictions from a digital groundwater model.

Separator gate shut, winter 1996, showing buildup and overflow into Toolibin Lake.

Salt water use options

A consultant has been employed to assess the possible use of saline groundwater for salt harvesting and aquaculture, rather than disposing of it at Taarblin Lake which is saline.

A trial project at Toolibin is proposed to develop and test commercial uses for the saline water.

The aim is to find a cost neutral, or profitable, method of disposing of salt in an environmentally sound manner.

This is also part of a broader program under the Salinity Action Plan to develop new industries that contribute to sustainable land use.

A fresh future for Collie catchment water

The recent scouring of the Wellington Dam has highlighted the issue of salinity in the Collie catchment.

Salinity has become such a problem in the Collie catchment area over the past few decades that the region was identified as a priority area for remediation in the State Salinity Action Plan.

In the past 15 years, more than 6000 hectares of land in the Collie catchment have been revegetated.

The Water and Rivers Commission is now working in partnership with the community to build on this work and restore the water of the Collie catchment to drinking quality.

South West regional salinity management coordinator John Platt said that the long-term aim was to return the Collie River to drinking water quality by the year 2015.

"The development of an action plan this year will guide the work to be done over the next few years to meet this goal," Mr Platt said.

"Over the coming months, consultants will be looking at possible actions such as revegetation, planting of high water use perennials and engineering options across the catchment.

"This will add to work already underway in the catchment, including a lucerne demonstration site and soil mapping, salinity risk assessment and landscape planning in the Spencers Creek catchment."

A Recovery Team — made up of representatives from the local community and key government agencies — will assess proposals for tree plantings and other actions to improve water quality on a farm or sub-catchment basis, and will negotiate cost-sharing arrangements.

"The Recovery Team is working together so that local action to manage water is based on 'best practice' for the area," Mr Platt said.

To contact your local Recovery Team or for more information on recovery catchment activities, contact regional salinity management coordinator John Platt at the Water and Rivers Commission's Bunbury office on 9721 0666.

Salinity award echoes across 75 years

The salinity crisis that now threatens nearly a quarter of Australia's agricultural lands was first heralded 75 years ago by a Western Australian engineer, Walter Ernest Wood.

In 1924, Mr Wood published the first scientific paper identifying the source of salt (rainfall), the way it is stored in the soil and released into soil and streams following the clearing of native vegetation in the wheatbelt of Western Australia.

Earlier pioneers had identified parts of the salt story but Mr Wood was the first person to accurately describe all of the main processes.

These days, Mr Wood's prophetic observations are being recalled in the presentation of an award commemorating his achievement.

The award was presented last month to Dr Tom Hatton of CSIRO Land and Water.

Dr Hatton has been at the forefront of national work on dryland salinity for the past 10 years, including pioneering research into how much water, trees and vegetation can be removed from the soil – and how their removal affects the hydrological balance.

Dr Hatton's research into the use of water by trees on a landscape scale indicated it may be necessary to turn a significant part of the rural landscape back to trees or other perennials if we are to check rising saline groundwaters.

National Dryland Salinity Program board chairman, and State Salinity Council chairman, Alex Campbell said in addition to his outstanding research record, Dr Hatton had made great efforts to communicate his findings and possible solutions to agencies, governments and communities affected by salinity.

"Unquestionably, he has been responsible for helping to raise the public profile of salinity as a challenge of national significance to all Australians," Mr Campbell said.

"He has also been a leader in devising models which encompass water, soils and land forms, and which can predict the impact of human land uses on whole catchments. These will be crucial in devising solutions to salinity."

The W.E.Wood Award was presented by Deputy Premier Hendy Cowan on 19 August at the launch of the National Dryland Salinity Program Phase 2 in Western Australia.

Grandchildren of W.E.Wood. Joy Wornes (left) and Enid Reitze (right) with Dr Tom Hatton, inaugural W.E.Wood, award winner at the National Dryland Salinity Program Stage 2 Launch on August 19, 1995.

New web site for farm forestry

A new web site has been created by Agriculture Western Australia to widen information services for the rapidly growing farm forestry industry in the south of the State and other audiences.

Farm forestry is a key tool of the Salinity Action Plan, especially in high rainfall areas where commercial returns are a powerful incentive for revegetation, which helps to restore catchment water balance.

The new web site 'Farm Forestry in Western Australia' was developed by the Farm Forestry Advisory Service, which provides information on farm forestry in the greater than 600mm rainfall area of southern Western Australia.

Located at http://www.agric.wa.gov.au/programs/srd/farmforestry/, the site offers 'TreeNotes', an extension fact sheet series produced by the group.

Update update

The update of the Salinity Action Plan is proceeding to schedule with the release planned for November 1999.

Salinity Council chairman Alex Campbell said consultation over the past few months had led to a new approach being taken to the format of the Action Plan.

"We intend publishing a much briefer strategic document which will outline the key planks of the 30-year salinity strategy" Mr Campbell said.

"A separate schedule of required actions will be published and this can be updated more frequently as actions are completed and new issues and priorities emerge and are aligned to budget cycles.

"Other supporting documents will include a guide for on-ground actions to help landowners make management decisions plus other technical notes to give detailed advice on specific issues such as drainage."

Mr Campbell said the 300 public submissions received during consultation on the Salinity Action Plan were still being considered and a separate analysis and response report would be published at the end of the year.

Salinity Council Newsletter — Contributing to WA's Salinity Action Plan

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