



Seeking safer saline basins

For more than 25 years, saline disposal basins have been used to store large volumes of pumped saline groundwater and drainage effluent from irrigation. Each year more than one million tonnes of salt enters 190 disposal basins scattered through the Murray-Darling Basin, several of which are leaking badly.

A joint project begun in 1993 by CSIRO Land and Water and the Australian Geological Survey Organisation developed criteria for siting disposal basins, and refined a computer model to simulate hydrological processes in areas containing salt disposal basins.

Project leader, Dr Kumar Narayan, says the higher density fluid on the surface of saline disposal basins usually lies on top of less dense groundwater. Depending on hydrogeologic factors such as permeability, porosity, basin salinity and aquifer, 'fingers' of the denser fluid can sink through convection. Under the right conditions, the movement of densely saline fluid speeds up.

A United States Geological Survey model called SUTRA was used to characterise the factors affecting such movement. After laboratory trials, the model was applied to Lake Tutchewop in Victoria, a formerly freshwater lake which since 1968 has received about 45 000 tonnes of salt per year.

The computer modelling, combined with site analyses, found that Lake Tutchewop was not likely to leak in the foreseeable future, largely because of the

low permeability of the underlying soils. The upgraded SUTRA model has proved a reliable way of predicting which existing sites would leak, and which potential sites would be safest. But Narayan says large scale disposal basins are only an interim measure, with environmental costs. 'Most people would prefer to avoid the further loss of freshwater lake systems,' he says.

To this end, further research is under way to locate potential small-scale, on-farm disposal basins. The on-farm project, funded by the Murray-Darling Basin Commission, the CRC for Catchment Hydrology and Goulburn Murray Water, is concentrating on the riverine plains of NSW and Victoria.

Data will be collected on hydro-chemical status, land use, soil types, hydrogeology, root zone salinity, basin leakage and the origin of salts in drainage water. A computer model will then be developed linking recharge and sub-surface drainage on farms with salt and water movement in and around disposal basins.

'Local people will benefit because planners will get both economic and scientific guidelines for the siting, design and management of the basins,' Narayan says. 'The results will underpin a long-term strategy for community-based management of salt and water in irrigation areas.'

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l e t t e r

Whale shark mystery solved

JUST a quick correction to an article which appeared in *Ecos* 91. The article in question 'Looking beyond the bite', by Chris Viney, refers to the 'mystery' of whale shark reproduction. It was reported in the September 1996 edition of *National Geographic* magazine (Geographica section) that, in 1995 a pregnant female whale shark harpooned by a Taiwanese fisherman was studied by a team from the National Taiwan Ocean University, including famous shark biologist Eugene Clark, and found to contain 300 near full-term embryos between 40 cm and 65 cm in length, 15 of which were still alive, with one surviving and being kept in an aquarium in Japan. Thus indicating the viviparous nature of the species.

I would appreciate it if you could pass this information on to Mr Viney, and, if possible, perhaps to your readers, some of whom like myself may have an interest in these magnificent fish of which so little is known.

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