

THE EXTENT OF ACID-PRODUCING SEDIMENTS IN INLAND NSW WATERWAYS

overview of the project

This project explored the presence of mineral sulphides in the sediments of inland New South Wales wetlands. Sulphidic sediments are a potential problem in wetland systems, not only because of their direct toxicity but because they can be converted to harmful acids. Acidity can arise from sulphidic sediments when wetlands are artificially dried, as happens increasingly in wetland management. Sulphidic sediments have been recognised as an issue in coastal environments, but this is the first study to look at the impact on inland wetlands.

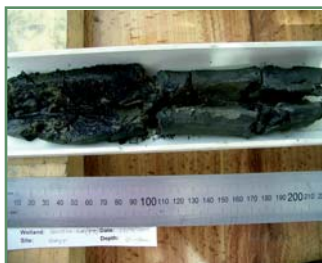
The project achieved its two aims: to survey a large number of inland NSW wetlands for the presence of sulphidic sediments and to develop a decision-making tool to help managers identify wetlands containing these sediments. The team sampled 81 locations along seven major rivers. Testing revealed that about 20 per cent of the samples tested either definitely or probably contained sulphidic sediments, and half of these may undergo acidification. The assessment tool will help managers decide whether they need to undertake further tests on sediments with the potential to be sulphidic. This tool will help in decision-making in wetland management.



Site showing acid sulphate soils

how the project was carried out

The team chose to survey either wetlands of significance or those where management planned to actively manipulate water levels. A total of 81 locations along seven major rivers



A core sample of wetland sediment

were sampled. At each site, they took sediment and water samples, and conducted multiple observations and tests. Each sample was subjected to three measures of acidity and analysis of two different forms of sulphide.

This multi-faceted approach

was chosen to gain the most accurate picture. Incorrect estimations could have implications for future wetland management, so it was critical to get the experimental design correct.

The team compared these results for acidity and sulphides against a set of criteria for each site. Some of these criteria included management history, soil colour and pH, and salinity of the soils and water. These parameters built up an environmental picture for each wetland, and showed that the sites containing sulphides tended to come from wetlands with a certain set of features such as a rusty colour in the sediment. These features were used to develop the assessment tool.

outcomes now and in the future

Of the 81 wetlands sampled, 17 (about 20 per cent) either definitely or probably contained sulphidic sediments. Of these, about half had results suggesting a potential for damaging

acidification. From the collected data, the team developed the decision support tool consisting of ten questions relating to features of a site. Managers can now work through the questions step by step to help decide whether a site contains sulphides. Decisions in the tool include whether the water levels would be artificially altered, the appearance of the sediment and a combination of results of simple lab tests.

The results were published and presented to interest groups including wetland managers. The team hopes to formulate a project to provide further help for managers and to find cost-effective ways of restoring the health of wetlands containing potentially acid-producing sediments.

benefits, challenges & lessons learned

This project has provided useful information for wetland managers. There is now a picture of the extent of the sulphidic sediment problem across NSW. A valuable practical tool is now in place to assist the management decision-making process. Wetland managers can now avoid unnecessary and costly testing. The decision making tool is already being used successfully around the Murray River wetlands.

The logistics of the project were sometimes a challenge for the team. The sampling of a large number of wetlands meant that weather occasionally intervened. Some rivers had to be excluded because of flooding. The research demanded extensive and time consuming travel, and a huge number of costly laboratory tests, which were aided by Trust funding.