

Preface: Sustainable management of acid sulfate soil

The distinguishing feature of acid sulfate soil is either the presence of inorganic sulfide sufficient to cause severe acidification, or severe acidity as a result of inorganic sulfide oxidation. The estimated worldwide extent of acid sulfate soil is 24 million ha. This soil type occurs in all continents, from the polar regions through to the tropics and from coastal regions into the continental interiors. The mismanagement of acid sulfate soil can cause extensive and severe pollution of surrounding environments. In many respects the capacity of acid sulfate soil to contaminate and degrade the environment far exceeds that of any other soil type (indeed, it is often referred to as 'the nastiest soil in the world').

The environmental degradation that can be caused by inappropriate management of acid sulfate soil includes:

- chronic and acute effects on animals (e.g. massive kills of fish and benthic organisms, scouring of stock drinking contaminated waters);
- decreased yields of crops and pastures;
- extensive and persistent scalding;
- increased corrosion of infrastructure such as bridges, building foundations, and pipes;
- degradation of water in drains, streams, rivers and groundwaters (water severely affected by acid sulfate soil often may be the only source for human consumption with consequent dire effects on health).

Clearly, the management of acid sulfate soil is an important issue. The first international conference to address acid sulfate soil was held in Wageningen (The Netherlands) in 1973. The Acid Sulfate Soils Working Group of the International Union of Soil Sciences under the Chairmanship of Dr Freeman Cook was primarily responsible for convening the 5th International Acid Sulfate Soil Conference at Tweed Heads (Australia) from 25 to 30 August 2002. The conference covered 4 main themes: (i) the characteristics of acid sulfate soil, (ii) management of acid sulfate soil, (iii) planning, legislation and regulation, and (iv) communication and education. There were 49 oral presentations and 84 poster presentations delivered at the conference. Two mid-conference field trips were conducted:

one in south-east Queensland, and the other in New South Wales looking at the Tweed River and Richmond River catchments.

The *Australian Journal of Soil Research*, in recognition of the international importance of acid sulfate soil research, agreed to publish peer-reviewed papers from this conference in this special issue. Over 20 papers are published here with contributions examining acid sulfate soil in Australia, Europe, Asia, and North America. The topics covered in this special issue range from monosulfides, pyrite oxidation, heavy metal contamination, and acid sulfate soil scalding, through to management issues. This special issue provides the most comprehensive collection of innovative acid sulfate soil research that is currently available.

I would like to thank the other members of the Conference Organising Committee and also to especially acknowledge the contributions of Dr Freeman Cook (Conference Chair), Dr Ben Macdonald, Mr Robert Quirk, Mr Geoff Carlin, Dr Annabelle Keene, Associate Professor Mike Melville, Marggie Hall, and Glenys Kirkham.

The major sponsor of the conference was Virotec International Ltd. The conference was also supported financially and otherwise by the following organisations:

- Department of Natural Resources and Mines, Queensland
- Limestone Association of Australia
- Environment Australia
- New South Wales Department of Agriculture
- International Union of Soil Sciences
- University of New South Wales
- Centre for Acid Sulfate Soil Research, Southern Cross University
- The Write Communications Group
- Tweed Shire Council
- New South Wales Acid Sulfate Soils Management Advisory Committee

Associate Professor Leigh Sullivan

Chair, International Union of Soil Sciences' Acid Sulfate Soil Working Group

19/6/2004