



# ASSAY

A NEWSLETTER ABOUT ACID SULFATE SOILS

No 36. December 2003

## Change of direction for acid sulfate soils in NSW

After six years of furthering the management of acid sulfate soils, the NSW Acid Soil Action Program has come to an end. Overseen by the Acid Sulfate Soil Management Advisory Committee (ASSMAC), the program funded over 75 projects that have developed the skills within local communities necessary to manage acid sulfate soils across the state.

Milestone achievements of the program include:

- overseeing the development of a strategic plan which now serves as the basis of the *National Strategy for the Management of Coastal Acid Sulfate Soils*,
- production of acid sulfate soil risk maps,
- development of assessment and management guidelines,
- introduction of planning and development controls,
- extension and adoption of new management technologies, and the
- commencement of hotspot remediation projects on a sub-catchment scale.

Since 1999 a shift has commenced in the delivery of natural resource management across NSW. A move has occurred away from state based initiatives and programs towards more regionally based boards and authorities. Catchment Management Boards were established and have since identified regional priorities in 'blueprints'. These Blueprints will set the direction for natural resource management and investment of Natural Heritage Trust funding for the next ten years.

With the announcement that the Catchment Management Boards will develop into Authorities, regional bodies are earmarked to assume more responsibility for the management of natural resources in the years to come. As a consequence ASSMAC has been formally disbanded after nine years of leadership and direction in acid sulfate soil management. It is envisaged that the capacity building projects and initiatives of ASSMAC will enable local stakeholders to continue managing acid sulfate soils in their local areas.

For further information on NSW Catchment Management Boards visit

<http://www.dlwc.nsw.gov.au/care/cmb/index.html>



ASSMAC members during their field trip to the Hastings Catchment, earlier this year.

## ASSAY continues

Whilst the NSW Acid Soil Action Program has not been refunded, the ASSAY newsletter will continue. As a component of a communication project, the Northern Rivers Catchment Management Board (Far North Coast of NSW) has kindly funded the publication of ASSAY over the next 12 months.

NSW Agriculture has been successful in tendering for the project, which commenced in November. The project will employ an advisory officer who will develop extension material, hold field days and workshops as well as producing ASSAY.

Chrisy Clay (nee Collins), who was previously an ASSPRO funded project officer, will be the new face behind the scenes of ASSAY. Chrisy has worked on the Far North Coast for the last three years, developing on-ground projects with landowners and working with local government and industries on acid sulfate soil management.

Please contact Chrisy with any inquiries or submissions for ASSAY.



Chrisy Clay is the new face behind the scenes of ASSAY.

## Shaping ASSAY's future

Since it was first published in 1993, ASSAY has documented the gains in knowledge and improvement in the management of acid sulfate soils across Australia. ASSAY has reflected the current status of management and research, growing from a one page, brief newsletter focussed mainly on the Far North Coast of NSW to today's current ten page summary of news from around the country.

ASSAY is a free newsletter for people involved and interested in managing acid sulfate soils. It aims to increase communication between stakeholders on new management options, available funding, research findings and new planning regulations.

At this stage in ASSAY's life, we are interested to know why do you read ASSAY? what do you find useful about it? what would you change? or how would you like to see it take shape in the future? Enclosed with this newsletter is a brief survey. Please take the time to fill it out, as your feedback will be used to review the current format and style of ASSAY. At the same time please check your contact details are correct and if you wish to continue receiving ASSAY make sure you confirm your continuing subscription. Please note that if you do not confirm your details, it will be assumed that you no longer wish to receive ASSAY.

## NSW Updates

### Snapshot of Success - Hastings Catchment

The Hastings River, on the Mid North Coast of NSW, is an important asset to the local community. The river is home to one of the most productive oyster industries in northern NSW. Located within the catchment is the popular destination of Port Macquarie, making tourism also very important to the local economy. In the past poor water quality from floodplain drainage has threatened the viability of these industries which centre on the Hastings River.

#### Catchment snapshot

Hastings river catchment	3,600km <sup>2</sup>
High risk acid sulfate soils	21,000 ha
Engineered drains	160km
Drainage discharge points	49
Recognised acid sulfate soil 'hotspots'	5

In 2000 Hastings Council enacted an environmental levy. This gave Council the financial means to become involved in natural resource management. In 2002 a dedicated position was created within Council to address issues such as acid sulfate soils and floodplain drainage.

<b>Remediation snapshot</b>	
Management Plans	13
Drain management commenced	28 of 49
Wet pasture trials	5 trials, ~49ha total
Funds leveraged from outside sources	\$897,000

Thor Aaso, Environmental Officer for Hastings Council, attributes the progress made to a number of factors. By dedicating a large percentage of its environmental levy and environmental officer's time to floodplain management, Council has demonstrated its commitment to local stakeholders. Hastings Council has used this commitment to leverage other funding enabling it to undertake a wide range of projects and engage further landowners.

Typically most landowners on the Hastings floodplain have small holdings, off-farm incomes and are relatively new to the area.



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**Contact:** Graham Lancaster  
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Past awareness programs delivered by Council, industry and consultant Bob Smith have created a solid foundation for further extension work. Thor's current strategy is to identify the different management units of a property, eg levee, toe or backswamp, and their characteristics, eg high or low hydraulic conductivity. Then, with the landowner, discuss various management options for different units. This process has led to many landowners with low lying scalds trialing wet pasture management to not only improve water quality but also boost productivity.

Acid sulfate soil farm management plans are developed for landowners by Thor and often include a schedule of works, such as drain maintenance, that would otherwise require a development application. Based with Council, Thor is in a position where he can broker agreements over drain maintenance activities, which can be an incentive for landowners to become involved in remediation.

A strong show of commitment from local government, a property planning focussed extension strategy and the ability to broker agreements between regulation and remediation are the key components of the strategy used in the Hastings. With another 97 hectares of backswamp going under wet pasture management in mid October, this approach is a solid model for other areas and issues.

For more information on please contact Thor Aaso on (02) 6581 8692 or [thor.aaso@hastings.nsw.gov.au](mailto:thor.aaso@hastings.nsw.gov.au)



Many Hasting landowners are trialing wet pasture management on low lying scalds.

## Ripping lime in the Shoalhaven

Can lime be injected into the banks of acidic drains to improve water quality? This is the question NSW Agriculture, Shoalhaven City Council and University of Wollongong staff are asking in a trial being undertaken near Broughton Creek, Sth Coast of NSW.

Undertaken as part of the Acid Sulfate Soil Hot Spot Program the trial deposited nine tonnes of hydrated lime (CaOH concentration >90%) into 680 meters of drain bank. The 'lime ripping' was done using a holding tank connected to 4 tines and a motorised pump, and an indicator to control the rate of injection. The lime was mixed in varying ratios of water and was injected into the top 40-50cm of soil.

The approximate cost including labour, equipment hire and materials per hectare for the trial was \$1900. The injection took four hours under suitably dry conditions to avoid the plant slipping, and to allow for optimal cementation of the lime slurry.

A trial to test the effective neutralising capacity of a lime-fly ash barrier above the potential acid sulfate soil layer (1.2m below ground surface) is being undertaken by University of Wollongong research student Laura Banasiak. This deep lime injection is scheduled to take place this month.

For more information on the lime ripping contact Marcus Morgan, Shoalhaven City Council at [morgan@shoalhaven.nsw.gov.au](mailto:morgan@shoalhaven.nsw.gov.au) and for more information on the lime injection contact Professor Buddhima Indraratna, University of Wollongong (02) 4221-3046.



Local farmer Don Hodgson inspects the lime ripping at the experiment site.

## Board focuses on local councils

During September the Northern Rivers Catchment Management Board (Far North Coast of NSW) held a workshop for state agency staff involved with the Catchment Blueprint. The workshop, organised by Local Government Support Officer, Alison Carmichael, aimed to increase awareness about how local government operates and the opportunities and constraints of Council's becoming involved in natural resource management.

The Northern Rivers Catchment Management Board has created Alison's position specifically to liaise between the Board and local Councils assisting in the formation of partnerships and is the only Board in NSW to have done so.

During the workshop General Managers of Ballina Shire and Lismore City Council, Stewart McPherson and Paul O'Sullivan discussed how individual councils have their own structure, culture and history and this must be considered when developing partnerships.

Alison summarised the key messages of the workshop as;

- natural resource management is only one of the many responsibilities of local government
- natural resource management can fall across a number of Council sections such as civil services, regulatory services and strategic planning
- identify the priorities of the Council you are working with to find areas of joint interest
- find out each Council's budgetary and planning timeframes
- meaningful engagement of Council is necessary in the planning and prioritisation stages of programs if they are to be involved in delivering the outcomes.

For further information please contact Alison Carmichael on (02) 6628 7079 or [alison@naturallyresourceful.com.au](mailto:alison@naturallyresourceful.com.au)

## Weirs go in at Collombatti - Clybucca

Earthen weirs that will control acidic ground water seepage have been installed at the Collombatti-Clybucca Hotspot on the Mid North Coast of NSW. As a component of the Acid Sulfate Soil Hot Spot Program managed by Kempsey Shire Council, two weirs have been located in the main feeder drains of the larger Seven Oaks drainage system.

The soils at Clybucca have a high hydraulic conductivity, which allows acidic groundwater to enter the drain when drain water levels are low. The weirs will attempt to hold a controlled amount of water within the drains to prevent groundwater seepage.

The height of the weirs were determined from an elevation survey of the surrounding floodplain and were chosen to create high drain water levels whilst still maintaining the flood mitigation capacity of the drains. With the use of sandbags the structures are currently set at trial heights of 0.0 AHD and 0.1 AHD.

Whilst local landholders are supportive of holding water in their drains, a trial of the final crest heights will be undertaken to confirm there are no negative impacts on their properties before the weirs are permanently modified. Meaningful consultation with local landholders and the Seven Oaks Private Drainage Board has paved the way for the weirs to be installed.



One of the weirs recently installed on the Macleay Floodplain.

The effectiveness of the weirs and other completed works at the Clybucca Hot Spot such as the stock exclusion fencing of acid scald areas will be closely monitored during the upcoming (hopefully) summer wet season.

For more information contact Tim Morris at Kempsey Council  
tim.morris@kempsey.nsw.gov.au

## Natural Heritage Trust funding flows in NSW

After the lengthy process of developing Catchment Blueprints and investment strategies, NSW stakeholders are happy to see Natural Heritage Trust funds flow to the regions for natural resource management.

An interim round of funding was announced earlier this year in which funds to continue awareness raising and remediation of floodplain drainage were included.

Recipients of the funding include;

- NSW Agriculture for the aforementioned information project on acid sulfate soils. Includes employing an advisory officer to undertake awareness raising and communication activities (\$80,000),
- Tweed Shire Council received funds to support capacity building and site assessment on the floodplain (\$45,000)
- Richmond River County Council, to undertake additional works on the Dungarubba system to reinstate tidal flow (\$100,000) and support for the Richmond Floodplain Project (\$45,000)
- Wetland Care Australia to assess and prioritise wetlands for future on-ground works (\$180,000) and to develop a restoration strategy for the Belongil/Cumbebin area (\$45,000)
- Clarence River County Council to continue work with floodgate and drain management (\$243,000)
- Kempsey Shire Council received funds to conduct works to improve water quality and habitat of the floodplain drainage systems (\$33,000) and to continue the Macleay

- River Floodplain Project (\$58,000), and
- Hastings Council to continue remediation works addressing water quality and habitat on the floodplain (\$33,000).

## New peat research

Southern Cross University honours student, Simon Allery, has been investigating the mineralogy and oxidation behaviour of peat acid sulfate soils. In conjunction with Drs Leigh Sullivan and Richard Bush, his research has shed some interesting findings that will have management implications for such areas.

From his research Simon has found that the mineral marcasite, which is generally considered to be a rare sulfide mineral in coastal floodplain soils was of common abundance in peat acid sulfate soils. This has significant implications for the management of these areas because marcasite is more reactive than pyrite. Simon's research then went on to observe the oxidation behaviour and acidification of peat acid sulfate soils.

Due to rapid acidification of peat acid sulfate soils materials, i.e. compared to marine gel clay acid sulfate soil and the naturally slightly acidic nature of the majority of peats acid sulfate soils it was concluded that the 'action-criteria' for peat acid sulfate soils should be minimal (0.03% reduced inorganic S the same as for sand acid sulfate soils).

For further information please contact Simon Allery on (02) 6624 1334 or 0405 131 334.

## Call for Expressions of Interest from Cane Growers

A joint program between the NSW Sugar Milling Cooperative and NSW Agriculture will assist cane growers to fill in unwanted farm drains that may be creating water quality problems. As cane growers adopt technology such as laser levelling and understand more about acid sulfate soils, farms are being re-developed to need less drainage. Expressions of interests are being called from NSW growers who require financial assis-

tance to fill in the deeper drains that may remain on their property.

The program will only apply to private farm drains that have no habitat value and if filled in would have no impact on surrounding properties. All expressions of interest will be ranked according to the potential of improvement to water quality. Once the level of interest is determined funding will be sought from a range of sources.

Please contact Chrisy Clay on (02) 6626 1355 or christina.clay@agric.nsw.gov.au for further information or to register your interest.

## Unlimited Fish Project

Furthering their interest in stewardship payments as an incentive for changed landuse, Wetland Care Australia has been successful in obtaining over \$200,000 from the Sustainable Regions Program. Their new project called 'Fish Unlimited' aims to repair over 130 ha of fish habitat from Tweed Heads to Ballina over the next 18 months.

Through the project, landowners will be paid to conduct agreed on-ground works and

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also receive fair market value stewardship payments for lost productivity. The funds will also be used to employ a Fish Habitat Project Officer, who will work with landowners to assess potential habitat and determine the public benefit of any land use change.

Wetland Care believes that in five years this wetland repair project could equate to an extra five million fish, or more than four times the annual commercial catch in the region. Based on the findings of a 1990 study in Morton Bay, Queensland which found that from one hectare of mangroves more than four thousand fish totalling over 600 kilos were caught over a 12 month period. While many of these fish were juveniles their direct weight equates to \$1,846 worth of fish per hectare - not including high value prawns (\$7/kg) and mud crabs (\$16/kg).

Although primarily focussed on fish and fish habitat, the project sets to improve water quality and biodiversity of floodplain areas, including those with high risk acid sulfate soils.

For further information on 'Fish Unlimited' contact the Ballina office of Wetland Care Australia on (02) 6681 6169



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## Qld Updates

### 2003 Lab methods guidelines update

Progress is continuing on the Queensland lab methods guidelines. The first draft of the section dealing with dry sample methods was distributed for comment in August with further sections to be released in the near future.

Feedback to date has been positive, with the concept of 'acid base accounting' being generally well accepted.

Acid base accounting refers to a procedure to assess the risk of soil material generating net acidity. To do this, an account must be made of the potential acid-producing, potential acid-neutralising and existing acidity components in ASS.

The new guidelines detail two approaches to acid base accounting. The first approach uses chromium reducible sulfur and other selected analyses depending on soil pH. The second uses the complete SPOCAS method that includes analyses that can be used in acid based accounting. Other combinations may be used in deriving the acid-based account, but this is usually uncalled for in normal circumstances.

Concern has been raised over the limited number of laboratories that are currently performing the new SPOCAS method and the resultant slow turn-around time on samples. It is anticipated that a transition period will occur whilst laboratories adopt the changed methods and the sample exchange process continues.

Soon to be released for comment are the other sections dealing with wet samples, acid sulfate waters and physical methods, as well as a second draft of the dry sample methods (which will include a section on liming validation).

If you have not received a copy of the guidelines and are interested in making comments please contact Kristie Watling, QASSIT (07) 3896 9229, [kristie.watling@nrm.qld.gov.au](mailto:kristie.watling@nrm.qld.gov.au).

## Website/Forums

### Soil forum established

An on-line forum has been established for people interested in soils. The forum is designed to promote discussion on a wide range of soil topics, including acid sulfate soils. The forum is non-commercial, free to use and was created by Bio-track Ltd. Log on to the forum <http://australiansoil.org>.

### Website Update - Wetland Care Australia

Wetland Care Australia has updated its website to provide information on what is happening in wetland rehabilitation and restoration around Australia.

Log on at [www.wetlandcare.com.au](http://www.wetlandcare.com.au)

### New website - OzEstuaries


Developed by Geoscience Australia, the OzEstuaries webpage includes information on:

- a condition assessment of almost 1,000 of Australia's estuaries and coastal waterways
  - conceptual models that illustrate the biophysical processes operating in Australian estuaries and coastal waterways
  - Indicator Fact Sheets containing information on biophysical health indicators, coastal issues and human pressures in the coastal zone,
  - an online GIS containing data for Australia's estuaries and oceans. Data include: geomorphic habitats, estuary condition, colour composite satellite images; oceanic chlorophyll concentrations, suspended solids and sea surface temperatures;
  - a link page containing links to relevant state, national and international websites.
- Log on at [www.ozestuaries.org](http://www.ozestuaries.org)

## Publications

### National Recreational Fishing Survey released

Recreational anglers are an important stakeholder group concerned with the management of acid sulfate soils across the country. The results of a recent survey of the number of fishers, their fishing activities and other social and economic data has been released by AFFA. Results highlight the significance of the group, with 3.36 million Australians going recreational fishing at least once in the last 12 months. Coastal waters and estuaries also attracted 76% of the fishing effort which was clearly concentrated in New South Wales, Queensland and Victoria. For a copy of the report log on to [www.affa.gov.au/rec-fishsurvey](http://www.affa.gov.au/rec-fishsurvey)



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## Wetland Information Kits available

An information kit on wetland management is now available from Wetland Care Australia. Compiled as part of the Farms, Fish and Floodgate Extension Program the kit contains information on acid sulfate soils, water quality, riparian management, funding opportunities and relevant support contacts. The kit will be of interest to landowners, community members and schools. The kits are available from the Ballina WetlandCare Australia office at a cost of \$10.00 which covers printing and postage.

To order a kit phone (02) 6681 6169 or email [cassieburns@wetlandcare.com.au](mailto:cassieburns@wetlandcare.com.au).



Wetland Information Kits are available for purchase.

## New fishnote

NSW Fisheries has recently published a fishnote on the potential impact of acid sulfate soils on oysters. The fishnote prepared by Michael Dove of University of New South Wales and Damian Ogburn of NSW Fisheries, is free of charge and can be obtained from the Port Stephens Fisheries Centre on (02) 4982 1232.

## Acid sulfate soils in Canada?

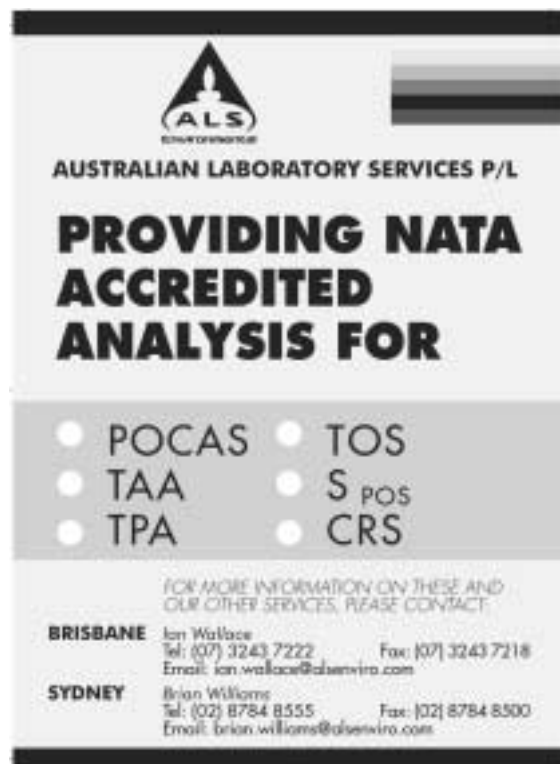
A recently distributed Canadian pamphlet outlines a major issue for the construction industry in that country. In many areas back-fill containing pyrite has been used for housing developments. As the pyrite has become

exposed to oxygen it has oxidised to produce sulfuric acid which in turn is jeopardising the stability of residential buildings. From the pamphlet "the phenomenon has raised anxiety bordering on panic among owners of buildings in the most affected sectors. And the same applies to the real estate market". For an electronic copy, email [christina.clay@agric.nsw.gov.au](mailto:christina.clay@agric.nsw.gov.au)

## OECD Workshop proceedings

During November, 2002 members of the OECD visited Ballina, NSW. Whilst there they attended a workshop to discuss different approaches to integrated ecosystem management - particularly in regard to diffuse source pollution of the environment. Acid sulfate soils were used as a local case study, illustrating the whole of government approach to the issue taken in NSW.

Proceedings from the workshop are now available for purchase from NSW Agriculture for \$25 [bookshop@agric.nsw.gov.au](mailto:bookshop@agric.nsw.gov.au) For further information on the workshop log on to <http://www.agric.nsw.gov.au/reader/oecd2002>



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## Hot off the press

The final report of the NSW benchmarking survey conducted by NSW Agriculture's Alice Woodhead has been released. The report documents the changes in attitude, knowledge and management of acid sulfate soils since 1998. A summary of the reports major findings will feature in the next edition of ASSAY.

For a free copy phone NSW Agriculture on 6626 1355.

## Upcoming publications

Also soon to be released are the floodplain and drainage guidelines resulting from NSW Agriculture's research on floodplain hydrology. The major findings of Scott Johnstons research on the Clarence floodplain and the management implications will be outlined in the document.

## Electronic version of ASSAY

Remember ASSAY is now available electronically. If you would prefer to receive ASSAY via email please contact the editor at christina.clay@agric.nsw.gov.au

## Conferences

### 19-23 April 2004

*Coast to Coast '04*, Australia's national coastal conference "The second decade: coastal planning and management in Australia towards 2014" [www.cdesign.com.au/coast2coast2004](http://www.cdesign.com.au/coast2coast2004)

### 20-25 June 2004

*Response of tropical, temperate and polar estuaries to natural and anthropogenic changes.*

Joint Estuarine and Coastal Sciences Association and Estuarine Research Federation international conference, Ballina NSW. Abstracts for posters and oral presentations are due by February.

[www.scu.edu.au/ecsa37erf2004conference](http://www.scu.edu.au/ecsa37erf2004conference).

## Workshops

### Achieving sustainable production in backswamps

A jointly organised workshop by NSW Agriculture, Wetland Care Australia and the Bungawalbyn Catchment Management Group will be held at Coraki on the 13th of February 2004. *Achieving sustainable production in backswamps* is for landowners. The workshop will highlight how backswamps can be managed for increased productivity and improved sustainability. At the workshop landowners will hear first hand of the gains landowners from other areas have made as well as be brought up-to-date with the latest research and trails.

To register for the workshop please contact Chrisy Clay on 02 6626 1355 or [christina.clay@agric.nsw.gov.au](mailto:christina.clay@agric.nsw.gov.au)

## ASSAY

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*Typeset by Sharon Bailey*