

Profile Newsletter



Tim Overheu CPSS-2 Federal President Soil Science Australia

Presidents Message

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Welcome to 2015 and the International Year of Soils (IYS). What exciting time to have an interest in soil and to be an advocate for Australian soils, celebrating our national asset under foot. 2015 also marks the beginning of my Federal Presidency, after being elected to the role back in November, 2014. I look forward working with a new and dynamic leadership team in setting strategic vision for Soil Science Australia, together with participating in a number of Branch events and IYS activities over the coming year.



On behalf of the Society Executive, I would like to express sincere thanks to the immediate past President, Dr Richard Doyle, who through his term demonstrated his passion for soil science leadership and education – a testament to his determination to promote the value of soil science to national leaders and the broader community. Richard will still be a part of the team, working in the background as the Immediate Past President, while also leading the prominent E[ART]H Project which aims to explore the connection between science and aboriginal art through soil. Appreciation is also extended to the outgoing Secretary, Sarah Richards. We wish all those who have given their time on Federal Council over the last two years (including Branch Presidents), all the very best with their future endeavours.

Likewise, we also extend a warm welcome to new members of incoming 2015/16 Federal Executive: Dr. Jane Aiken (Vice President); Noel Schoknecht (Secretary) and continuing from the previous year, Cath Botta (Treasurer).

As we continue on the journey to achieving the Soil Science Australia vision under the leadership of the new executive team, I would like to also personally acknowledge the guidance and support from the Society Executive Officer, Linda Bennison, who offers a great deal of patience and due diligence in assisting with many of the society's administrative needs.

The National Soil Science Conference in November 2014 provided quality presentations, opportunities for professional networking and excellent field trips. Around 400 delegates from throughout Australia and beyond attended this conference, with a broad field of specialisations represented.

The conference program covered a breadth of soil related topics providing something for everyone involved to improve our understanding and management of soils. We received insight on

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Profile News

Acknowledgement

Sincere thanks to 2014 editor Dr Sarah Richards, Tasmania for editing the Profile newsletter over the past two years. It is no easy task as a volunteer especially when serving as the Federal Secretary.

With the launch of the Soil Science in Australia magazine and the IYS Soils calendar the executive decided to reschedule issue 176 to 2015. Whilst distributed in 2015 it is badged as a 2014 issue with three issues planned for 2015.

Change in Format proposed

Communications are becoming more interactive with web based blogs and Soil Science Australia is looking to trial a new format in 2015. The communication strategy will be loosely based on the following methods:

1. Tweets for alerting members to soil news. One line of text per tweet.
2. Soil Crumbs - smaller and more regular to provide basic details of news and events. One paragraph of text.
3. Web based blog where members can contribute via an online format. This will be the home of the more serious articles.
4. Profile newsletter - traditional member newsletter delivered quarterly by email.
5. Soil Science in Australia magazine format delivered to members with the calendar featuring the best articles on Soil Science and a summary of the year's soil events. This option is being considered as many members miss reading Profile during the year and providing the best content to members just prior to the Christmas break will be more useful.

The Federal Executive would love to have your feedback on this suggestion.

Send comments to
office@soilscienceaustralia.org

In the interim

Please send any contributions for the April Profile by March 31 to
office@soilscienceaustralia.org

Reports, photographs, poetry, artwork, interesting soil profiles - anything to do with soil is welcome.

Advertising welcome

If you would like to advertise in the April issue of Profile please send your contribution to

office@soilscienceaustralia.org

before March 31.

Advertising rates for the April issue are

FULL PAGE \$500
HALF PAGE \$250
QUARTER PAGE \$150
BACK PAGE \$650

Profile is distributed electronically to just under 1000 members and can be downloaded from the web by the general public.

If your audience is in the soil science community then advertising in Profile is valuable.

Publication and Advertising dates

April issue - articles and advertising to be received by March 20

August issue - articles and advertising to be received by July 20

December issue - articles and advertising to be received by November 20

Pictured above

At the Federal Council meeting held prior to the 2014 National Soil Conference (L to R) Linda Bennison (EO) Marcus Hardie (TAS) Gillian Kopitke (QLD) Tim Overheu (WA) Cath Botta (VIC) Richard Doyle (TAS) Bernie Powell (QLD) Jane Aiken (NSW) Sarah Richards (TAS) Helen Suter (VIC) Erica Donner (SA) Richard MacEwan (VIC).

SOIL SCIENCE AUSTRALIA

Promoting the field of soil science

Furthering the expertise in soil science of members

Providing a forum for discussion in soil science

Increasing Government and community awareness of soil

Liaising and cooperating with other organisations in support of mutual interests

Encouraging research and extension in soil science

Promoting wise management of the soil resource throughout Australia

PRESIDENT

Mr. Timothy Overheu CPSS-2

VICE PRESIDENT

Dr. Jane Aiken CPSS-2

SECRETARY

Mr. Noel Schoknecht

TREASURER

Mrs Cath Botta CPSS-2

EXECUTIVE OFFICER

Linda Bennison

CPSS CHAIR

Mr Bernie Powell CPSS-3

SOCIETY PATRON

Dr Penelope Wensley AC

PO Box 1349 Warragul VIC
3820

ABN 96 080 783 10



Soil Science Australia Priorities for 2015-2016

The society will promote soil science in five priority areas.

1. Celebrating the International Year of Soil 2015

Through a range of activities and media celebrate the 2015 International Year of Soils and promote the role of Soil Science Australia in this celebration.

2. Focusing on education, communication and extension of soil science.

Support a range of activities that promote this priority, including a national soil judging competition, a soil education forum, webinars and the soil science magazine.

3. Contributing to the national Soil Research, Development and Extension Strategy

Take an active role in the implementation of the strategy.

4. Recognising leadership and excellence in soil science

Recognise society members that take active roles within the society to promote its goals. Host a gala dinner to celebrate 60 years of Soil Science Australia.

5. Implementing an improved CPSS scheme

Launch a new streamlined scheme, and actively promote membership of the scheme. Continue to develop CPSS specialist competency themes aimed at supporting regulations and seek opportunities for international recognition of CPSS.

PLANNING FOR 2015 AND 2016

FEDERAL STRATEGIC PLANNING MEETING HELD NOVEMBER 2014

Left to right

Linda Bennison (Executive Officer)
Federal Office VIC

Noel Schoknecht (Secretary)
Dept Ag Food and Wine WA

Tim Overheu (President)
Dept Ag. Food and Wine WA

Dr Jane Aiken CPSS-2 (VicePresident)
LendLease NSW

Richard Doyle CPSS-3 (Past President)
University of Tasmania TAS

Cath Botta (Treasurer)
PCB Consulting VIC

ASSISTANCE FOR MEMBERS TO LOGIN TO THE NEW ONLINE MEMBERSHIP PORTAL



Gillian Kopittke Qld Branch President (left) and Caroline Bennison (right) at the Soil Science Trade Display organised by Caroline at the National Conference using images from previous years Soil calendars.

Members at the 2014 Soil Science Australia National Conference had an opportunity to meet the Membership Manager, Caroline Bennison. Caroline's role is to assist members with enquiries, logging into the new membership portal, assist the branches with the online event registration software and drive the 1000+ members campaign in 2015.

With multiple digital profiles and logins it can be hard to remember which username matches which login account – if you need assistance contact Caroline. When logging into your membership portal remember your username starts with a capital 'S' and is followed by your member number expressed as a 5 digit number.

If you have any questions about your membership to Soil Science Australia, please email

membership@soilscienceaustralia.org.



Dr Penelope Wensley AC Patron IYS Message

For most people, the start of a new year is a time of optimism and anticipation: a time for planning and resolutions, with the year stretching ahead, full of possibilities for what might be achieved. 2015 is a year of special promise for soil scientists, as all around the world, communities plan activities to mark the International Year of Soils. The year offers an unprecedented opportunity to raise awareness of the importance of soil to human life and gain greater support for soil science as a vital area of specialisation, critical for assuring the health not only of our soils, but of the planet.

As Patron of Soil Science Australia, it is my hope that Australia will be a stand-out among the countries celebrating the IYS; that we will see a determined and vigorous effort in all States and Territories to promote the Year and its key messages. SSA has laid the foundations for this, with the publication of the Special Edition and 2015 calendar, both excellent promotional tools that members can distribute and use-and I encourage you all to make the most of these.

I welcome the efforts already underway by the Executive, Branches and individual members, to organise specific IYS activities, but believe there is scope for more networking and collaboration to expand the number and broaden the impact of these activities. Federal and State government departments and agencies, local governments and

regional councils, are obvious partners for such collaborative efforts, but so, too, are schools, universities, scientific and research institutes and NGO's. Business groups, Chambers of Commerce, community clubs and community service organisations, like Rotary, Lions, Zonta, BPW and others which meet regularly and organise speakers to address their members on diverse subjects could also be drawn into the program of activities.

Some members no doubt already have connections with such groups: why not suggest soils and the IYS as a good subject to include in their 2015 speakers programs? And why not go even further and volunteer to be a speaker yourself? Public speaking may not be your forte, but first-hand knowledge and experience is a firm basis for effective advocacy- and who better than a soil scientist to argue the case for soils? Another fruitful area could be to identify and approach community organisations and special interest groups and ask them to make soils and soil-related issues one aspect of their activities during 2015. The possibilities seem boundless.

Organisations with an interest in the UN and international affairs, such as the UNAA, UNYA, the Australian Institute of International Affairs and their State branches, the Global Foundation and others might logically wish to look at the larger picture and Australia's contribution to international efforts to address soil challenges.

'Think-tanks', like the Lowy Institute or ASPI could consider soil security

as an aspect of national and international security policy.

Health and humanitarian organisations and those interested in development issues could be encouraged to consider soil health and soil management policies as a critical element in poverty alleviation efforts and the achievement of sustainable development.

Environmental groups, concerned about climate change, biodiversity loss and ecosystem degradation would surely be receptive to giving special attention to soils at this time, especially as the linkages between these subjects become more evident.

Groups with an interest in promoting and advancing the status of women could readily find 'women's angles' in relation to soil education, management and soil security- or perhaps make soils a feature of their 2015 celebration of International Women's Day, in March or of the International Day of Rural Women, in October.

Landcare and NRM groups, active all around Australia, are an obvious point of like-minded interest, with scope for shared activities during the year. So, too, rural organisations, those with a focus on agriculture, agricultural production and food security. Some of these might provide platforms for advocacy or be persuaded to fund some targeted local activities.

The Show movement and local show societies-also with an extended network of committed supporters across the country- could be encouraged to include special

displays or features on soils at local shows. IYS posters and banners would be helpful in this regard.

Arts and crafts organisations and galleries could be invited to feature soils in some imaginative way in their 2015 programs.

Soil Science Australia's EARTH project is but one exciting initiative in this area. Indigenous art, with its emphasis on interpreting and understanding the land, ceramics and pottery using soils and clays from different regions, textiles in rich 'earth' colours, jewellery that somehow highlights the qualities and features of soil, photography that shows the dramatic diversity and beauty of Australia's landscape and soils, films about soil or with themes that convey, even indirectly, messages about the importance of soil, that could be included in 2015 film festivals....all are things to be considered, as different vehicles for the promotion of IYS.

This is by no means an exhaustive list-just some suggestions for things that individual members and Branches of the Association might think about pursuing in their own communities and regions, that are a bit different from the usual workshops, seminars and symposia. Of course, we want those, too, during this Year of Soils- and I hope there will be many interesting and successful events of this kind that will benefit and strengthen Australia's soil science community.

But for the core goal of IYS to be realised -of raising public awareness of the importance of soils-then as well as technical symposia, some more imaginative and colourful approaches are needed to connect with and engage the interest of local communities in the subject. Activities that will help ordinary Australians realise what an extraordinary resource

our soils are and how vital it is to manage and protect those resources for the future.

As the end of January approaches and this time for making 'New Year resolutions' draws to a close, I hope all SSA members will add a final resolve to their personal list for 2015- to be as creative and energetic as possible in promoting the International Year of Soils, making it a resounding success for Australia- and a truly memorable year for Soil Science Australia, as it marks the sixtieth anniversary of its foundation.



International Year of Soils 2015 – Soil Atlas: Facts and figures about earth, land and fields



The international community has set itself three important goals: to stop the loss of biodiversity, keep global warming to 2° Celsius, and ensure everyone has the right to adequate food. Without fertile soil, none of these objectives will be achieved. In fact, the soil can do its job only if the life it contains is intact, the humus layer is healthy, and land rights are protected.

2015 is the International Year of Soils, a special opportunity for us all to further the goal of soil protection. The Soil Atlas, published today, shows why soils should concern us all and what can be successfully achieved by determined people and organisations.

The Atlas is published by the *Heinrich-Böll-Stiftung* in co-operation with the *Institute for Advanced Sustainability Studies*, *Friends of the Earth Germany* and *Le Monde diplomatique*. It is available in [English](#) and [German](#) (including graphic download). It will also be made available at the [European Commission's soil webpage](#), promoting the sustainability of this limited and life sustaining natural resource.

Within the context of the International Year of Soils we kindly remind you of the opportunity to share information on any educational and outreach activities you plan to carry out in the course of the year by writing to env-iy-2015@ec.europa.eu - to be published at our [IYS webpage](#). Please feel free to further disseminate this info.

Best regards,

**The Soil Team
European Commission**



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Agriculture, Forests and Soil Unit
DG ENV.B.1

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[http://ec.europa.eu/environment/
land_use/index_en.htm](http://ec.europa.eu/environment/
land_use/index_en.htm)

2014 NATIONAL SOILS CONFERENCE MELBOURNE AWARDS PRESENTED

Prescott Medal - *Dr Jeff Baldock (1)*
 Publication Medal - *Dr Shu Kee Lam (2)*
 CG Stephens Award for the Best PhD Thesis - *Dr Alla Marchuk (3)*
 LJH Teakle Award - *Mr Bruce Carey Qld (4)*
 Fellow International Union of Soil Science - *Emeritus Prof. Robert White CPSS 3 (5)*
 Fellow, Soil Science Australia - *Dr Pichu Rengasamy CPSS-3 (6)*
 Honorary Life Member - *Dr Nicholas Uren (7)*
 Certificate of Appreciation awarded to *Prof Steven Raine CPSS-3* - In recognition of his outstanding contribution as Chair of the CPSS Board 2013-2014 to *Dr Michael Crawford* - In recognition of his outstanding contribution as Convenor of the 2014 National Soil Conference
 Soil Judging Competition Overall Team Winner - *University of Sydney (8)*
Stephen Cattle Conference Awards:
 Best oral presentation over 35 - *Zhe Weng*
 Best oral presentation under 35 - *Clayton Buttery*
 Best poster presentation over 35 - *Andrew Biggs*
 Best poster presentation under 35 - *Ashleigh Broadbent*

NOMINATIONS ARE INVITED FOR THE 2015 SOIL SCIENCE AUSTRALIA AWARDS

Nomination forms and conditions for the awards can be found on the Soil Science Australia awards page.

Closing date for all awards is **MAY 31.**

2015 awards include the Prescott Medal, Publication Medal, Teakle Award, CG Stephens Award, Soil Science Australia Fellow, Honorary Life Member.



Sincere thanks to Mark Imhof for taking the photographs at the 2014 National Soils Conference.

Tim Overheu CPSS-2 Federal President Soil Science Australia

Presidents Message continued

Securing Australia's soils for profitable industries and healthy landscapes, the National Soil Research, Development and Extension Strategy, CPSS accreditation and the early career workshop provided valuable information and direction for the future. Sincere thanks to Michael Crawford and his team in organising the event.

The younger scientists were well represented in the soil judging competition and oral and poster sessions. I hope they enjoyed the fellowship and networking and left the conference inspired.

2015, the International Year of Soil will be a significant event for the Society. This conference has served as a great launching pad into what will be a year of increased focus and promotion on the importance of soils. IYS2015 presents a great opportunity for Soil Science Australia members to raise awareness and promote the sustainability of our limited soil resources. We all have a valuable role in communicating vital information on soils, a life sustaining natural resource. Therefore, we need your help to promote the story of soil by leading or participating in your local IYS activities or by using the various social media tools available to post and share soil science to the general community.

May I also encourage you to visit the new Soil Science Australia website, where you will find a calendar of Australian IYS activities. While there will be ongoing improvements to the website, you should take note of some of the enhancements, including the frequent Twitter feeds, links to the Certified Professional Soil Scientist scheme, links to the FaceBook group page "Soil Science in Australia" and many more items. It is hoped that through the year, the Society will be launching its LinkedIn group and soil science blog-spot. I'm sure any feedback on the website or Twitter feeds would be most welcome. Enjoy the new tools and online resources available, and have a look too at what the other global partners are doing to celebrate soil in their location.

Please also take the opportunity to circulate the most excellent 2014 Australian Soil Science magazine (and Calendar) to relevant science leaders in your community. The distribution of this magazine I believe gives Soil Science Australia an avenue for dialogue with policy leaders and decision makers. Spare copies are available by contacting Exec Officer, Linda Bennison or forwarding / sharing the digital copies on the society website.

Happy advocating and communicating "soil." The next edition of Profile will certainly illustrate some of the IYS activities.

I also invite you all to attend the WA Soil Science Conference "Celebrating Soils 2015" in Mandurah, WA in September 2015 where we will be celebrating soils from a WA perspective in this very special soils year.

Timothy Overheu CPSS-2
 Federal President, Soil Science Australia



2014 NATIONAL SOILS CONFERENCE MELBOURNE CPSS WORKSHOP

Chaired by Bernie Powell the CPSS Workshop provided delegates with an opportunity to hear from a range of speakers on the value and need for professional accreditation for soil scientists and to consider the future direction of the CPSS program.

Under the leadership of Professor Steven Raine the CPSS accreditation program has addressed competency of candidates and recognised core competencies in soil survey, soil erosion assessment and management, and contaminated site assessment and management.

The challenge asked of the Board and the accredited members by the Federal Executive is to launch a more streamlined accreditation program, and actively promote membership of the CPSS accreditation, continue to develop CPSS specialist competency themes aimed at supporting regulations and seek opportunities for international recognition of CPSS.



Questions Answers and Comments from the CPSS Workshop

What are Government Departments looking for?

If Government Departments want soil science employees to be members of a professional organisation and accredited is there a case for the employer to a) require employees to be accredited and/or b) pay for the membership and accreditation of employees?

CPSS has an enormous amount to offer the EPA

How can CPSS be built into government legislation and how can we work with other organisations to increase our influence and recognition of CPSS accredited members?

Expert Witness

CPSS has proved valuable to accredited members in establishing their credentials as an expert witness in court.

Professional Development in a Career

CPSS provides structure for professionals to develop their career from undergraduate to leading professional soil scientist.

Complementing the Fundamentals Exam

How do we make the Fundamental Exam and the Core Body of Knowledge required of an accredited soil scientist correlate with University soil science subjects being taught?

How does Soil Science Australia increase the role of soil scientists in the workplace?

Emphasise the role of soil science in bigger decision making/solving teams

The Society has a role of PR and a strategy to better promote soil science

The Society needs to promote and encourage the number of soil science subjects being taught

Future direction of Competencies

A regulatory driver is needed for a specialist competency to be recognised.

Three stages of accreditation or ?

Many professional accreditation programs have two stages of accreditation. A stage for the new graduate similar to an apprentice stage and a stage for the competent professional. Is the CPSS stages 2 and 3 confusing the public and industry?

How many stages of accreditation should be offered?

The workshop response was; Two stages - 22 out of 38, Three stages - 12 of 38 and Unsure - 4 of 38

During 2015 the CPSS Board invites current and future CPSSs to engage in discussions, put forward suggestions and assist Soil Science Australia meet the challenge of having a credible, robust and marketable accreditation program for soil scientists (see next page).

CONGRATULATIONS

Declan McDonald

Timothy Nash

**who sat and passed the
Fundamentals Exam in
November 2014.**

Successful completion of the exam satisfies the academic requirement of the CPSS accreditation program. Members trained in engineering, environmental science or other fields without the prerequisite four courses in soil science can use a pass in the Fundamental Exam to satisfy the academic requirement for CPSS accreditation.



YOUR OPINION IS INVITED. Following the 2014 national conference workshop a draft career pathway for a soil scientist was developed as the starting point for discussion. Members are invited to send their comments on the draft to office@soilscienceaustralia.org

DRAFT

University training – Undergraduate to postgraduate

Alternate entry for non–university trained applicants via the Fundamentals Exam

ASSOCIATE

APSS recognises graduates and non-graduates with less than 10 000 hours (5 years work experience not including the undergraduate study)

CERTIFIED PROFESSIONAL SOIL SCIENTIST

CPSS recognises soil science professionals with more than 10 000 hours soil experience

SPECIALIST CPSSs

CPSS-3 members identified as a specialist in their field of expertise thus allowing the public to distinguish between CPSSs eg Alex McBratney skilled in DSM and Mark Imhof skilled in Soil Classification are both CPSSs. Categories below were developed by the CPSS Board in 2005 and have been used to start the process but it is not the ultimate list.

Training, advice and consultation services

Soil Management and Conservation

- Soil conservation and land rehabilitation (legislation, guidelines)
- Urban property planning
- Contaminated land/soil/site assessment management amelioration
- Mine site & land-fill capping & landscape re-vegetation
- Soil erosion by wind and water assessment management amelioration
- Soil acidity, salinity, sodicity assessment management amelioration
- Soil structure assessment management amelioration
- Acid sulfate soils assessment management amelioration

Soil Survey & Classification

- Site surveys, mapping
- Pedology, soil classification
- Soil surveys for irrigation and land-use planning
- Soil Fertility
- Soil testing & nutrient management, fertilizer advice
- Plant nutrition (crops, pasture, horticulture, forestry)
- Soil pollutants assessment management amelioration

Hydrology and wastewater management

- Wastewater treatment and management on-site
- Hydrology (water and/or wastewater management eg wetlands)
- Effluent disposal by land irrigation
- Contaminant hydrology
- Integrated catchment processes and modelling

COMPETENCY ACCREDITED CPSSs

Recognition of Competency in fields of soil science regulated by government are available to all CPSSs.

Contaminated site assessment and management

Soil erosion assessment and management

? **Acid sulfate soil**

? **Carbon**

Australian Soil Survey

Applied Research Expertise

- Forensic studies for criminal law
- Soil carbon and climate change (carbon sequestration in soils)
- Paleo-soil studies for archaeological investigations
- Soil and regolith studies for exploration of minerals
- Soil and farm database management
- Geographical information systems
- Chemistry and risk assessment of organic pollutants
- Digital terrain analysis

Basic research expertise

- Soil chemistry
- Soil physics (soil water, soil mechanics)
- Soil biology

APPLICATIONS FOR CPSS ACCREDITATION INVITED

APPLY NOW FOR 2015

The CPSS Application Process

Step 1

Read the [Guide to Assessment of Eligibility for CPSS Accreditation](#) and the [Standards for Professionals in Soil Science](#). Ensure you meet the criteria before you apply. Members that do not have the academic qualifications but may have professional experience may enter the program by sitting and passing the Fundamentals Exam. Further information on the Fundamentals Exam can be found on the CPSS website Standards tab.

Step 2

Contact the federal office and ask for an invoice to be forwarded for payment. Please note that only financial members of the society may apply for accreditation.

Step 3

Complete the [CPSS Application form](#) and [Ongoing Professional Development Diary](#) (Excel 2003 format (.xls)).
[Ongoing Professional Development Diary](#) (Excel 2007/2010 format (.xlsx)).
Ensure you have (PDF) certified true copies of academic testamur/s or certificates, certified true copies of academic transcripts showing courses, subjects or units studied and results gained in each, curriculum vitae and publications list and ongoing professional development diary and if required a statement or evidence of English-language competency and evidence of work based learning if applicable. Once you have all this information please upload your application using the [Submit Application link](#).
Note that applicants are encouraged to apply for the stage commensurate with their experience and are not necessarily expected to start at the Stage 1 level.

Step 4

Advise your referees that the Soil Science Australia federal office will be contacting them with a request to provide a referee report.

USING NARRATIVES IN YOUR CPSS APPLICATION

A narrative is a story that outlines your contribution/activities to **soil science** in a particular project or instance. It is used to assess whether you meet the competencies claimed in your CPSS application.

The best narratives are those that reflect the strength of your work in **soil science** not necessarily the biggest, most important projects you have been loosely associated with. In writing a narrative the following points are particularly important.

- a) It should be clear from the narrative what your actual **soil science** contribution was to a project. Did you work under supervision collecting samples, supervise the work of others, analyse the results and/or write the report? Especially important is, did you make a physical or intellectual contribution to the **soil science** component of the project?
- b) The narrative needs to define not only the type of contribution you had to a project but also its importance (i.e. your responsibilities) in the context of delivering **soil science**. Were you occasionally responsible for a field team or totally responsible for them, their work practices and their performance? Were you one of many who contributed verbally to the final report or were you the/an author of the report?
- c) Any claimed contributions to a project should be supported by associated documentation (e.g. publications list) and/or **independent** referee reports.
- d) Your seniority or management responsibilities that do not relate specifically to the **soil science** described in the narrative (i.e. with which you did not have first-hand involvement) are not relevant to a CPSS application. For example a mid-level manager may obtain funding for or administrate a range of projects with **soil science** components but those activities do not include the practice of **soil science**.

In preparing your CPSS application and the associated narratives it is important to check the range of competencies and consider all of your experiences in that context. The CPSS Accreditation process is rigorous and can be daunting. If you require additional help in preparing your application or would like to discuss your particular case, please do not hesitate to contact Linda and the staff at the Soil Science Australia office who will be pleased to help. Please call 03 5635 2370 or email office@soilscienceaustralia.org





2014 NATIONAL SOILS CONFERENCE MELBOURNE

Student Soil Judging Competition Melbourne 22-23 November

10 teams 8 universities 43 competitors

Teams;

University of Melbourne

University of Sydney

University of Queensland

University of Southern Queensland & the
Queensland University of Technology

University of Adelaide

University of South Australia

University of Tasmania

Final section winners

Individual

- 1 David Coleman University of Sydney Blue
- 2 Michaela Dolk University of Sydney Blue
- 3 James Diack University of Sydney Blue

Team

Equal First - University of Sydney Blue and Team
QLD (University of Southern Queensland/
Queensland University of Technology)

- 2 University of Sydney Gold
- 3 University of Melbourne Beta

Overall competition winner and runners up

- 1 University of Sydney Blue
- 2 University of Sydney Gold
- 3 Team QLD

Organisers

Dr Gary Clark La Trobe University

Dr Tony Weatherley Melbourne University

Selection and description of soil profiles for the practice and competition pits

Mark Imhof and David Rees

The second Australian Soil Judging Competition was held in Melbourne on the weekend preceding the National Soil Conference. Teams of four students travelled from Adelaide, Brisbane, Hobart, Toowoomba and Sydney, and there were two local teams from the University of Melbourne. Despite the extensive travel, there were 43 keen competitors ready for an early start on the Saturday morning.

While the conference venue was the MCG, very close to the centre of Melbourne, the judging contingent comprising the teams and coaches, and also importantly the organisers, had to travel farther afield, a consequence of Melbourne's urban sprawl. The first day was scheduled for a practice and 'calibration' to the local conditions at the NMIT campus at Yan Yean, about one hour north of the CBD. The Sunday was reserved for the competition to be held at an undisclosed location. The weather was exceptionally kind, if not a bit warm for field work and slabs of bottled water were supplied to keep everyone hydrated.

After a short coaches meeting, a 'classroom' session outlined the activities for the day and more importantly outlined the geomorphological setting for the region. Teams were bussed out to the seven soil pits on a range of parent materials and different topography. The 'hills' comprise mostly of Silurian-aged sandstone and shale deposits (shallow Sodosols), which then graded into the lower slopes of colluvial material (deeper Sodosols) and then variously aged alluvial-derived flats. Soils on older alluvium with well-structured heavy clay subsoils were classified as Grey Sodosol. In contrast, an area of more recent alluvium with weak pedogenesis posed a challenge to define the horizons was classified as a Tenosol. Additionally, the western edge of the property abuts the quaternary basalt flows, giving rise to a Black Vertosol.

The experience with soil description varied between the teams and therefore the coaches used the practice time at each pit to 'drill' the students to enable optimum use of the allocated time during the 'real' competition. Importantly, most students were able to hone their observational and practical skills necessary for describing a soil profile in-situ.

At the end of the day, all groups had practice on at least three pits. A final debrief at the conclusion of the day allowed

clarification of the judging criteria for site description and land capability. Then it was back to Melbourne for some well-earned rest for the night.

The competition on the Sunday was based in two locations. Team judging was held at a DEPI site at Atwood, which is just east, and under the flight path, of Melbourne Airport. Two profiles presented a reasonable challenge for most teams, with most correctly describing the horizons, boundaries and textures of these Sodosols on granite colluvium. Individual judging, was based at the University of Melbourne Vet School at Werribee. This was a tough profile to describe and the conjecture extended to the experts (see article by Andrew Briggs). Interestingly, some of the student descriptions were fairly close to the 'mark'.

Teams returned to the MCG and the judges retired to commence the most difficult part of the day namely judging the correct entries and compiling the marks. There was considerable pressure, as conference welcome drinks and dinner were on downstairs and the students were eagerly awaiting the results at the London Tavern in Richmond. However, with lots of help from the coaches, and Mark Imhof and David Rees, we managed to declare the winners that evening.

Final section winners;

Individual

- | | | |
|---|---------------|---------------------------|
| 1 | David Coleman | University of Sydney Blue |
| 2 | Michaela Dolk | University of Sydney Blue |
| 3 | James Diack | University of Sydney Blue |

Team

- | | |
|-----------|---|
| =1 | University of Sydney Blue |
| | Team QLD (University of Southern Queensland |
| & | Queensland University of Technology) |
| 2 | University of Sydney Gold |
| 3 | University of Melbourne Beta |

Overall competition winner and runners up

- | | |
|---|---------------------------|
| 1 | University of Sydney Blue |
| 2 | University of Sydney Gold |
| 3 | Team QLD |

We would like to thank the society for sponsoring the teams to come to Melbourne, and for provision of transport and lunches for two days. In addition, a very large thank you to Mark Imhof and David Rees for help with selection and description of soil profiles for the practice and competition pits (for more information see web).

A challenging soil - Andrew Biggs

At the recent Melbourne Conference, I assisted in the soil judging competition. Being involved in such an exercise is always challenging from many perspectives – you get to see some different soil types, but you are also challenged in terms of your own skills and knowledge. One of the misconceptions about soil description (and the soil judging competition) is that it is all about soil classification. This is far from the case – it is as much about your powers of observation and understanding of landscapes and pedogenesis than anything else. A number of people commented to me at the conference that there are not many people left in Australia who are true experts in this area and the need for all soil scientists to understand a little bit – irrespective of whether you are a soil chemist, soil biologist, academic, consultant etc.

One of the pits used for the judging was very challenging in that it contained contrasting materials that could have been formed from a number of possible pedogenetic scenarios. It thus could have been described and classified in a number of ways. The following text describes some of these permutations, but I do not profess to have the 'answer' – for reasons that are described below.

The soil in question was on a flat surface (<1% slope) that appeared to dip away suddenly in the distance (about 200 m to the south). The geology maps indicated basalt in the wider area, but the site was very close to an area mapped as having aeolian materials. The site was in pasture, but the paddock had been very heavily grazed by cattle.



Upon getting out of the bus, the immediate thought of 'Red Ferrosol on basalt' popped into my head, as there was a conspicuous red soil evident underfoot with a "dusty" surface typical of that found on Ferrosols. Looking in the pit though gave a very different idea. In simple terms, the red clay surface graded into a pale grey, heavy clay subsoil with clear red mottles and very prominent lenticular structure and slickensides. A very

obvious band of large carbonate 'blobs' was present at about 70cm (part way into the grey clay) and there were a few large basalt floaters in the profile.

Ideas that spring to mind are of a polygenetic profile and options such as:

- different deposits of basalt/tephra with differing weathering rates – such things are common in basaltic province
- different alluvial deposits – maybe the pit was on a terrace plain
- the presence of an aeolian deposit
- the influence of shallow groundwater

In the end, I settled on option d) for the following reasons: There was insufficient analytical data to rule a) in or out – things such as base saturation and heavy mineral analysis may have assisted. There was no evidence of sand or stratification suggestive of fluvial processes – although in a purely basaltic backplain environment this would not be surprising. There were no distinctive silty textures in the profile that were indicative of aeolian deposits. The gradation from red to grey started above the carbonate zone and there was no clear demarcation. The grey colours and mottles in the subsoil are certainly indicative of waterlogging

(the subsoil is also sodic) and it is possible that the carbonate zone represents a groundwater feature – I have seen similar at depths of 5-10m in alluvial Vertosols.

If distinct aeolian or fluvial zones had been described, then the profile would have contained A and B horizons over either a D horizon or a buried profile (2B2 etc). Assuming the profile is formed *in situ* and from a singular source material, it contains an A11, A12, A3, B1, B21k and B22. Much debate can be had about the A3 and B1, but that is best had standing in the pit.

In terms of classification, you could end up a number of ways. While the surface of the soil appeared typical of Ferrosols, there were cracks nearby. If the dusty and only sporadic cracking surface condition is attributed to the heavy trampling of stock and the cracks are assumed to be more widespread – a not unreasonable assumption given the clay texture throughout and extensive vertic properties within the profile – then the soil could be classified as a Vertosol. If that option is not taken and the presence of episodic shallow groundwater is assumed (on the basis of the subsoil colour) then the soil would be a Hydrosol – although it would need to be viewed during the winter (wet) time to confirm this. If this option was discounted, the soil would potentially key out as a Ferrosol. The upper 0.5m was red (~10YR3/3) and clearly of basaltic origin. Conventional wisdom would suggest that the material would easily meet the criteria of >5% free iron oxide, thus the soil could be classified as a Ferrosol, although in this case, you could only do so if you described the subsoil as a second (buried) profile. Finally, if all of these options were discounted, the soil would be regarded as a Dermosol.

More than one student made the comment to me during the competition that soil profile description is subjective – there is no disputing that and this soil profile clearly offers lots of opportunities for subjectivity. A good pedologist however integrates their observations of not just the soil profile but also the surrounding landscape with their understanding of pedogenesis and their past experiences to make justifiable decisions regarding the profile description. It is only once that is accomplished that they then classify the soil.

EXPRESSIONS OF INTEREST CALLED FOR THE 2015 FUNDAMENTALS EXAM.

If you are interested in sitting the Fundamentals exam mid-year please advise the federal office via email. If there are sufficient candidates the exam will be offered mid-year as well as at the end of the year.

SOIL BASICS Refresher Training Course

WHAT:

A training course to refresh your soil science basics

WHERE:

The University of Queensland
Rm 132, Building 14
St Lucia Campus

WHEN:

Monday 16 February 2015
8:30am – 5:00pm
(Registration 8:15am)

CONTENT:

An introduction to soils, their uses, formation, components, structure & texture. This course also provides sessions on basic soil chemistry theory and practice using case study examples. A field practical session with hands on participation is included.

COST:

Members:
\$120 students / \$260 professional
Non-member (but please sign me up):
\$120 students / \$260 professional
Non-member: \$290
(Please note the branch does not charge GST)

REGISTER:

<http://www.soilscienceaustralia.com.au/branches/Queensland/soilbasics>





SOIL ART

NZ ANNUAL CONFERENCE 2014

Former Soil Science Australia member Lucy Burkitt, now living in New Zealand, sent these images of soil art taken at the 2014 New Zealand Annual Conference.



DORODANGO is a Japanese art form in which earth and water are molded to create a delicate shiny sphere, resembling a billiard ball. Louis Schipper from the New Zealand Society made the Dorodango (left) and uses them to start conversations with 1st and 2nd year Earth Science students around soils, their composition and structure.

According to Wikipedia a core of the ball is made of basic mud, which has been carefully shaped by hand to be as round as possible. This core is left to dry, and then methodically and carefully dusted with finely sifted soil to create a crust several millimeters thick around the core. This step may be repeated several times, with finer and finer grains of dirt in order create a smooth and shiny surface. A cloth then may be used to gently polish the surface.

The dorodango, once completed, may look like a polished stone sphere, but it is still very fragile. The process requires several hours and careful focus so as not to break the ball.

If you are interested there are several YouTube clips - below is one to get you started

<https://www.youtube.com/watch?v=0YW9VhH-xCs>

E[ART]H PROJECT

UPDATE

Former Federal President Richard Doyle reports that the committee are working hard and looking to launch the project in Sydney later this year. Committee members are Richard Doyle, Martin Moroni (co-leader), Fiona Hamilton (Aboriginal Advisor), Mark Kuilenberg (Creative Adviser) and Prof Maggie Walter (UTAS). Four major activities are planned:

- 1) Planned - Sydney Opera House launch of E(ART)H Project during the "Talking Stick" Indigenous celebrations.
- 2) Complete short video on soil science connecting with Aboriginal artists telling earth creation stories – called "underground songs"
- 3) Commission well know author and UTAS PhD candidate Greg Lehman to prepare an article outlining the project and its aims and goals for the Hobart Mercury
- 4) Work with Prof Maggie Walter at UTAS to try for an ARC Discovery Indigenous grant

FIRE AND WATER AND THE SOIL CONNECTION

How do you travel with fire on a wooden canoe across water with the odds stacked against you?

Fiona Hamilton took the image below of Brendan Buck Brown of Cape Barren Island making a traditional clay hearth to carry fire upon aboard a Traditional Tasmanian Paperbark Canoe (2014).



MEMBER REPORT

Museum of Soil Science, Brazil

The Alexis Dorofeef Museum of Soil Science at Vicoso, Minas Gerais, Brazil is an inspiring venture established by Dr Christine Caroline Muggler who is also a Professor at Universitas Federal Vicoso (UFV).

Christine teaches geology at UFV but has a passion for increasing awareness about soils among children, teachers and the community and inspiring them to take a deeper interest in soils as part of the natural environment. I had the opportunity to visit the Museum with Christine on 15 Oct 2014 while visiting UFV to present at a short course on Land Rehabilitation (Minas Gerais is a major mining state in Brazil) and run a short course on writing for peer reviewed journals (Brazilian science is currently focussed on how to publish more of their science in English-language international journals).

The museum has run many outreach education projects on soil education in schools. Housing a diverse rock and mineral collection, the museum receives school groups almost daily for education and activities on rocks, geology, soils and the environment. Although it is located on the UFV campus it is now recognised as part of the national museum system in Brazil.

Richard Bell CPSS-3 WA



The photograph shows the exterior of the Museum which has been painted by mixing earth pigments into paint. One of the popular activities with schools is to provide a range of earth pigments (which range from pink through red to yellow colours from their deeply weathered regoliths) and encourage the children to paint with these pigments- soil art in a very direct fashion.

Member Report from the Mesozoic

Robert van de Graaff, Victoria, recently spent five weeks in Holland and France.

In Wageningen he attended the reunion of the Pyrus Study Association (Soils, Water, Atmosphere). He wrote of it being very interesting with so many enthusiastic young people, although he was by a very long shot the oldest person around.

One of the students just couldn't believe that he was taught by professor Edelman of the Edelman auger. "Really?? Edelman??" Robert had the distinct impression that it sounded like he was from the Mesozoic.

A later conversation with one young student was enlightening as he was doing a study of alluvial formations on Mars. That's what happens when your own country is too small and too well researched!

Achieving Soil Conservation in Queensland



Queensland member Bruce Carey has produced a number of educational resources about soil conservation in Queensland. They feature numerous photographs to add interest to the publications and include:

- A pictorial history of soil conservation in Queensland
- Soil conservation manual and study guides on topics such as contour banks and grassed waterways
- Understanding dispersive soils
- Web pages and videos about soil conservation

The study guides were prepared in 2014 as supplementary material for the 2004 publication Soil conservation measures – Design manual for Queensland. Bruce has used the guides for training staff employed by NRM Regional Bodies and they are intended for use by soil conservation practitioners, farmers, students, academics and staff from industry, Landcare groups and government.

The resources are located on the Landcare Queensland website at

<http://landcare.org.au/resources-links/achieving-soil-conservation-in-queensland/>

MEMBER UPDATE

David Nash

In July 2014 Dr David Nash (CPSS-3) retired from the Department of Environment and Primary Industries (DEPI) after 21 years' service. David is a well-known soil chemist and physicist who specialises in the processes responsible for generating the contaminants from agricultural production and processing that adversely affect downstream resources.

At DEPI David led a small team whose recent work included the development of a contaminant tracing technology based on organic markers and applying the analytical chemistry and mathematical techniques, commonly termed "metabolomics", to investigating the processes responsible for phosphorus and nitrogen exports from agricultural systems, and potential mitigation measures. David has been at the forefront of incorporating these learnings into risk-based decision support tools (both quantitative and qualitative) using Bayesian Networks.

David will be continuing his involvement in agriculture through his company Soil and Allied Services Pty Ltd and can be contacted on 0428245199 or email, SoilandAlliedServices@gmail.com.



NEW MEMBER

Farid Bagheri



I was born in Iran's capital city, Tehran in 1971, but I grew up in the beautiful north of Iran's city, Rasht which is near Caspian Sea and one of the most important regions of agricultural products.

I graduated from Tehran University in 1998 as the honour of graduate student in soil science. I also completed my master degree in soil science at Tarbiat Modares University in 2002.

I successfully defended my thesis entitled "*Estimation of clayey soil hydraulic properties by using pedo-transfer function*" on January 2002.

My lecturers at Tehran University encouraged me to pursue a research career in soil science.

Before immigrating to Australia, I have been working at Tea Research Institute for 11 years as a soil scientist. My researches were focused on soil physics and chemistry, understanding of relationships between soil, water, and plant, plant nutrition and soil fertility. I have also valuable experience in soil and water laboratory management that helped me being successful to pursue my career in Australia.

I've got Australian temporary skilled visa in 2012. In this wonderful journey to Australia my lovely wife, Nooshin accompanies with me. She was a dentist in Iran. She is now getting ready to take Australian Dental Council examination to be qualified in Australia.

Currently, I am working for Peel-Harvey Catchment Council in Mandurah, WA. I have designed and conducted projects of improving water quality of water bodies and control algae blooms with a biological treatment which are supported by City of Mandurah.

I would be honoured to be a member of the Australian Society of Soil Science. I hope I could be a prospective member in such a valuable society. I believe it would be the most important step toward achieving the goals of my new life to Australia.

NEW MEMBER

LIAM RYAN

I'm from a small farm in Toodyay, Western Australia and I work as a grains industry development officer with the Department of Agriculture and Food, WA (DAFWA). My role is to extend research outcomes delivered by industry funded (GRDC) research projects to grain growers, agronomists, advisors and farm consultants to help them better manage their soils for production potential and sustainability. I collaborate with researchers from DAFWA, The University of Western Australia, Murdoch University and the CSIRO to extend information through technical workshops, rural press articles, web pages, twitter feeds, access to decision support tools and presentations at field days.



Prior to this I completed a BA (Communication Studies) and a BSc (Agricultural Science) with 1st class honours from UWA. During my studies I also worked briefly at CSIRO Plant Industry on a project looking at biological nitrification inhibition in wheat, and also worked part-time on my family farm and at a few bars and restaurants in Perth.

I live between our family farm in Toodyay and an apartment in Perth. In my spare time I'm learning Bahasa Indonesian and I'm a mad NBA fan. Through Soil Science Australia I'm hoping to build my understanding about all aspects of soil function and management from wiser heads than my own, and also to learn as much as I can about where we've come from in understanding and managing soils over the past 50 years and where we're heading.

SOIL SCIENCE BADGE

MADE BY SIMON MACEWAN

Simon MacEwan is a Melbourne based artist who works across a range of media from drawing to animation, sculpture, and jewellery. He completed a Bachelor of Fine Art (Sculpture) at RMIT, Melbourne, in 2002.

Recent solo exhibitions in Melbourne include: *all that is solid melts into air* at Anna Pappas Gallery (2012), *The World's Fair* at Anna Pappas Gallery (2011), *You're doing it wrong* at c3 contemporary art space (2010), *Batmania* at Bus Gallery (2009), *built to fail* (2005) and *lost in the woods* (2004) at Seventh Gallery.

Simon is represented in the Artbank collection, the Banyule City Council Art Collection as well as private collections in Australia (pictured below left).



Hand crafted Soil Science Australia badge and a special presentation tin commissioned by Soil Science Australia as a gift for the Patron, Dr Penelope Wensley AM .

WORLD SOIL DAY CANBERRA



The Soil Science Australia Patron and the National Soil Advocate attended the launch of the Soil Science Australia IYS magazine and the 2015 International Soils calendar at the Canberra City Garden on World Soil Day, December 5, 2014 (left). On the patrons right lapel is the badge made by Simon MacEwan.



Welcome to our new members

Many new members joined us at the 2014 annual conference including students competing in the soil judging competition. Please make these members feel welcome at the next branch event you attend.

NEW SOUTH WALES

Martin Blumenthal
Temma Carruthers-Taylor
Bonnie Cannings
Mardee Cassin
David Coleman
James Diack
Michaela Dolk
Simon Eldridge
Patrick Filippi
Edward Jones
Natasha Livingstone
Constance Mort
Stacey Paterson
Nina Potts
Jharna Rani Sarker
Andy Tan
Mitchell Tulau

QUEENSLAND

Neil McKenzie
Byron Brewster
Roberto Cirocco
Richard Jackman
Jamie Maclean
Timothy Nash
Emily Pattison
Mehran Rezaei Rashti
David Rowlings
Clemens Scheer
Peter Spies
Adam Willson

Mingrui Yuan

SOUTH AUSTRALIA

Samuel Aleer
Courtney Creamer
Dougal Currie
Peter Davidson
Ryan Farquharson

SOUTH AUSTRALIA CONTINUED

Giles Forward
Justice Frimpong
Tim Herrmann
Sean Kennedy
Thang lai
David Pratt
Yilu XU

TASMANIA

Brodie Hill
Thomas Killalea
Peri Lucas
Elya Richardson
Peter Targett
Aaron Thomason

VICTORIA

Damien Carew
Corinne Celestina
Sally Cunningham
Nick Dudley
Gregory Foster
Hang Gao
Jizheng He
Hangwei Hu
Murray Johns
Alexander Patterson
Louise Underhill
Charlie Walker
Rashda Zafar

WESTERN AUSTRALIA

Deirdre Gleeson

NEW ZEALAND

Hossein Alizadeh

SOIL SCIENCE AUSTRALIA MEMBERSHIP SPONSOR A STUDENT

Membership of Soil Science Australia is open to any person with an interest in soil.

Membership dues range from \$120 for ordinary members, \$60 for student members, (who must be full time students) and \$49 for retired members (who must be fully retired and not undertaking any paid work).

Ordinary and Student membership includes membership of the International Union of Soil Science with retired members able to select IUSS membership as an option when they renew.

Student membership dues are heavily subsidised by the Society in recognition that students generally do not have much money.

If you would like to sponsor a student by donating \$60 the federal office will contact University staff in the same State and ask for a recipient to be nominated.

It is hoped that this small contribution to a student may end up in a larger commitment to soil science during their career.

Please call Linda Bennison if you are interested in sponsoring a student on 03 5635 2370 or email office@soilscienceaustralia.org

NEW MEMBER REPORT ON GYPSUM

SEAN KENNEDY *MSc DipEd MAusIMM CPGeol MMICA*

Sean Kennedy is a geologist specialising in industrial minerals. He has explored for gypsum in southeast South Australia. In this article he shares with members a low technology and low environmental impact approach to measuring gypsum he has developed. Sean joined the SA Branch last year.



Measuring Soil Response to Gypsum at Test Tube Scale

In order to determine the sodicity of soils, two low tech test kits have been developed respectively by the CSIRO and the NSW Department of Sustainable Natural Resources. These are the Sodicity Meter and the Emerson Aggregate Test. Both give a qualitative demonstration of soil sodicity by a visual appraisal of soil suspended in water. If the water is cloudy then sodic soil is present. Even without these simple kits, farmers can observe phenomena such as poor drainage, cloudy surface water, gully erosion and tunnel erosion which imply the presence of sodic soil. But these tests and observations do not measure, or even demonstrate, the effect of gypsum on soils. Rather their purpose appears to be to determine the sodicity of soils which, if high, *infers* that gypsum application is desirable.

Gypsum Use

The positive response of sodic soil when gypsum is applied is well known. Gypsum application results in an enhanced permeability of soil. Fine clay particles will flocculate, resulting in larger pore spaces. Water derived from rain or irrigation will permeate faster and further, leading to enhanced root growth and this results in improved plant growth. This effect is observed in crops, pastures, vineyards, fruit trees and also in flowers, lawns, vegetables and shrubs in home gardens.

Just as soils vary from location to location so do gypsums. Purity and particle size are important factors. Results achieved in the work described may not necessarily hold out for other gypsums. Farmers and vineyard managers will appreciate that such a low-tech testing system is easily set up to demonstrate that their soils will respond to gypsum application, and that soil improvement occurs rapidly.

A qualitative demonstration

Two 15cm tubes of 32mm PVC (internal diameter 3.7cm) had a fine cloth filter attached to their base. 50g of sodic soil, screened to <1mm, was added to each tube and then tamped down to produce a soil density of 1.4g/cm³, the same as that for the top 10cm of soil in field conditions. Two grams of gypsum was then sprinkled on the soil in one tube, with the other tube treated as a control with no gypsum added. The tubes were then topped up with water. Timing commenced when water was first observed dripping from the filter of either one of the tubes. Clear plastic cups were placed beneath each PVC tube. While the water was dripping through, to be collected in the cups, the tubes were topped up with water. At the end of each 10 minute interval the cups were removed and replaced with empty cups. The net weight of water, expressed as grams, in the cups, was equated to millilitres.

The experiment was let run for an hour and then final volumes were compared. In contrast to the 126.6 ml passing through the control tube, a total of 157.9 ml flowed through the gypsum treated tube. This demonstrates an improvement of 25% in permeability. The water that dripped through the control soil and filter was cloudy, meaning that no soil was flocculated and that the small sodic clay particles had passed through the filter in suspension. This contrasted with the water that passed through the gypsum treated soil. This water was clear, indicating that the sodic soil particles were being flocculated in situ and soil particles were trapped by the filter. Not all of the 2 gram of gypsum would have been dissolved. The solubility of gypsum is 2.1g/litre and just 157.9ml of water flowed through the soil in the hour of measurement. This means that only 0.33g of

gypsum was responsible for the increase in permeability.

A simple demonstration such as this can easily be set up by the land user and engender confidence that some soils will respond positively and rapidly to gypsum application.

A quantitative demonstration

The next step is to determine how much gypsum is required. For broad acre spreading, application rates range upwards from one tonne/hectare. This equates to 100 gram/m² in home gardens. It can be shown mathematically that 0.036g of gypsum in the test tube operation equates to one tonne/hectare. These rates of gypsum application in the test tube can be accurately achieved by pre dissolving of gypsum to make a saturated solution, then dosing the tubes. For example 17.1ml of saturated gypsum solution provides 0.036g gypsum and equates to one tonne per hectare.

With this above data, the method differed from the qualitative approach. Tubes were partly filled with the appropriate volume of saturated gypsum solution prior to topping up with water. The procedure then followed that of the qualitative experiment. Six clay soils and subsoils were tested and all responded positively to gypsum treatment to a greater or lesser degree. The dosage required to produce maximum

flow rate varied from sample to sample with a range of 200g/metre² to 500g/metre². One sample, a sub soil from Finniss, south of Adelaide, had the lowest control flow rate, and gave a spectacular response of 359% increase in flow rate at a gypsum application of 300g/metre². On repeat, the flow rate showed a 61% increase.

The experiment shows that soils vary in permeability and in their response to gypsum treatment. High rates of gypsum application do not necessarily produce optimum permeability compared with low rates. The reason for this is beyond the scope of this article.

Suggestion

I would recommend testing of soils at this micro level. Farmers are renowned for innovation and could well set up their own kitchen bench experiments as described above. Results would give farmers and vineyard managers confidence in applying gypsum at optimum tonnes per hectare.

Scientists appraise sodic soils by measuring the sodium ion exchange rate. It is the opinion of the author that farmers and viticultuarists would not need to take this step. Results from the experiments described above should be sufficient. The proof of the pudding is in the eating.



CALENDAR OF EVENTS FOR THE INTERNATIONAL YEAR OF SOIL

<http://www.soilscienceaustralia.com.au/component/content/article?id=228>

Check regularly throughout the year as the web page will be updated as events are registered. Sent event details to office@soilscienceaustralia.org



SOIL EROSION REFRESHER DAY

VICTORIA

The Victorian Branch hosted a Soil erosion refresher Day on Friday 26th of September 2014. The day started on a property site near Violet Town in the North East and finished with lunch at the Euroa Butter factory. The day was organised as a refresher for those who need to be able identify and communicate the key features of soil erosion in their work. Around 26 participants attended the day including Landcare representatives, CMA staff, DEPI staff, university lecturers and students, private advisors and consultants.

Victoria DEPI pedologists Mark Imhof & David Rees, kicked off the program outlining the geomorphology and landscape features of the site and describing key features of the soil profile. Soil Conservation Specialist Clem Sturmfels, then provided an outline of key erosion processes. Brad Costin & Kerri Goschnick, DEPI soil erosion specialists gave a brief history of the site and the types of management process that have been used at the site. Soil erosion at the site has its origins in the 1950's with several attempts at fixing the problem over the decades.

Some of the take home messages of the day were how landscape features and soil features affect erosion processes, particularly slope, length of slope and slaking and dispersing soil characteristics. Particle size and settling velocity are important points to consider in designing conservation responses. This helps quantify sediment export and how effective works like sediment basins will be.

A number of management practices have been implemented at the site over time and participants had an opportunity to see these first hand and discuss the relative strengths and weaknesses of these approaches. Reactive solutions at the site will have limited success unless a complete understanding of what is causing the erosion is obtained. In this case, improving soil health to encourage plant growth and slow sediment export. Key approaches at the site included grass establishment, and stock removal. Once that is implemented, sediment traps such as those made at the site with hay bales can assist in slowing sediment.

Cath Botta CPSS-2



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[CPSS](#)

[WA State Conference](#)

[Membership Renewal](#)

[World Soil Day 2014](#)

[Soil and Food Conversations](#)

[Home Page](#)

In February the Soil Judging and Conference Excursion Field Trip Reports will be added to the Soil Science Australia web site.



Dr Angus McElnea reports on the
**ISO TC190 Soil Quality meeting
 (Berlin, 2014)**

Berlin, the capital of the unified Germany, was the location for the 29th Annual Meeting of the International Organization for Standardization (ISO) Technical Committee on **Soil Quality** (aka TC190). The meeting, held in October 2014 (just a month shy of the 25th anniversary of the fall of the Berlin wall), was hosted by DIN (Deutsches Institut für Normung) or the German Institute for Standardization. The Australian delegation organised by Standards Australia comprised me, and Dr Silvia Black (an expert on soil and water cyanide methods from the WA ChemCentre in Perth). Peter Wilson (from CSIRO), who was also part of the delegation, unfortunately was unable to attend at the last minute. For those unfamiliar with the workings of ISO, TC190 is the body responsible for producing standards that define the physical, biological and chemical characterisation of soils, terminology and codification, as well as covering the sampling of soil, and methods on how to evaluate and assess the quality of soil. The body has published more than 140 ISO Standards and has formal liaison agreements with other ISO and EU technical committees, and with the IUSS.

Having finalised the international Standard series for acid sulfate soils (ISO 14388), the working group that I'd chaired had become 'dormant', so my focus for this meeting changed to the other sub-committees and working groups of which I am a member.

Perhaps of most interest to Australia are the deliberations of the working group on *Data Codification and Management* (SC1/WG3), who are revising the standard on the "Digital exchange of soil-related data" (ISO 28258). A joint meeting with the *IUSS working group on soil information standards* (IUSS WGSIS) in April 2013 had identified concerns with the standard, which are being worked through in the revision. If you want more information about this standard and the work of this group, please get in contact with Peter Wilson). This Working Group also began the revision of ISO 25177 "Field soil description" which is based on the FAO guideline. The object of that

document is to determine information in the field, so a soil classification for the FAO WRB can be made.

The Working group for *Elaborating general aspects of sampling* (SC2/WG10) is in the throes of totally revising, updating and restructuring all the soil sampling standards, under the umbrella of the ISO 18400 series—this is a massive undertaking! Working drafts covering "Preliminary investigations" (ISO/WD 18400-202), "Investigation of potentially contaminated sites" (ISO/WD 18400-203), and "Guideline on sampling of soils gas" (ISO/WD 18400-204), are progressing to the next stage in the Standardisation process.

The Working group on *Screening Methods* (SC3/WG10) is currently busy with a draft for "magnetometric detection for heavy metal hot spots". This method is low cost, uses totally portable instrumentation and is very quick, especially when compared with taking conventional samples followed by laboratory analysis.

Silvia Black attended the meeting of working group SC3/WG4, which covers cyanide related matters. She has been working on the development of an ISO Technical Report titled "Background Information and Guidance on Environmental Cyanide Analysis". This Technical Standard aims to provide background information on the various ISO, CEN, ASTM and EPA cyanide methods; guidance on how to carry out fit for purpose analysis of various forms of cyanide in environmental samples; the significance of the results; how to minimise interference effects and the preservation of samples.

For those laboratories interested, an invitation has been put out for an inter-laboratory validation trial for a method on "Extraction of elements using dilute nitric acid" to be conducted early this year. The trial is being organised by WEPAL (based at Wageningen University in The Netherlands). Also, a method for the "determination of total element content (ISO/CD 14869-3): Dissolution with hydrofluoric, hydrochloric and nitric acids using pressurized microwave technique", is about to be published as a Draft International Standard.

Standards are regularly reviewed, to see if they are still current (e.g. with development of new or improved instrumentation), and whether they need improvements to reflect recent research in the topic. 2015 is a big year for reviews, with a huge range of the 'bread and butter'

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soil methods up for review including: total C, N and S by dry combustion, pH, EC, field redox potential, water-soluble and acid-soluble sulfate, and total N by modified Kjeldahl to name just a selection. If you want any details on any of the draft methods, or those under review, feel free to contact me. Although the TC190 meetings spread out over a week, delegates do get the chance to experience some of the local sights, customs, culture and food. On our arrival to Berlin we were greeted by the Festival of Lights – and amazing laser light show, where the city buildings are used as the screens. Other locations visited included Potsdam, Berlin Zoo, the Botanical Gardens, and a number of museums recommended to me by Ben Harms. I even managed to bring home a small souvenir of part of the Berlin Wall—or so the box said!



2016 CALENDAR THEME

Soils in Action

Image submissions are invited for the 2016 calendar.

By now you will be enjoying the wonderful images of the IYS 2015 special edition of your Society's calendar. We want to make 2016 just as special, and are seeking photos from members around the theme "Soils in Action".

This theme tries to capture something happening with soil in a single photograph. Let your imagination run wild. It could be digging holes, big machines turning the land, lizard tracks across the sand, kids playing in the soil, a dust story or even mud wrestling! Anything that captures a sense of action and wonderment in soil. I look forward to your contributions.

Noel Schoknecht
Chair, Calendar Committee.

To submit images please email office@soilscienceaustralia.org and a link to a dropbox folder will be sent to you for uploading your image(s).



Thank you to the 2015 calendar photographers

Noel Schoknecht, Chair of the Calendar Committee, compiled the soil mosaic above from all of the photographs submitted. The final response for images from members was overwhelming with an amazing collection of international soil images to select from. Whilst only 12 could be featured for the first time all contributors were published in the calendar! The Calendar Committee hope that you have enjoyed your calendar and encourage you to submit your images for the 2016 calendar - the theme being Soils in Action.



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Soil Research



Opportunities and constraints for biochar technology in Australian agriculture: looking beyond carbon sequestration

Balwant Singh, Lynne M. Macdonald, Rai S. Kookana, Lukas van Zwieten, Greg Butler, Stephen Joseph, Anthony Weatherley, Bhawana B. Kaudal, Andrew Regan, Julie Cattle, Feike Dijkstra, Mark Boersma, Stephen Kimber, Alexander Keith and Maryam Esfandbod

Tolerance of young seedlings of different tree species and a cereal to poor soil aeration

Gausul Azam, Robert S. Murray, Cameron D. Grant and Ian K. Nuberg

Using X-ray fluorescence core scanning to assess acid sulfate soils

Ulrike Proske, Henk Heijnis and Patricia Gadd

Seasonal monitoring of soil salinity by electromagnetic conductivity in irrigated sandy soils from a Saharan oasis

Ismail Berkal, Christian Walter, Didier Michot and Kaddour Djili

Temporal variability in rill erodibility for two types of grasslands

Guang-hui Zhang, Ke-ming Tang, Zhen-ling Sun and X. C. Zhang

Development and calibration of a soil carbon inventory model for New Zealand

Stephen J. E. McNeill, Nancy Golubiewski and James Barringer

Ammonia volatilisation from nitrogen fertilisers surface-applied to bare fallows, wheat crops and perennial-grass-based pastures on Vertosols

Graeme D. Schwenke, William Manning and Bruce M. Haigh

Transport of arsenic in some affected soils of Indian subtropics

Indranil Das, Koushik Ghosh, D. K. Das and S. K. Sanyal

Quantification of NO_x and NH₃ emissions from two sugarcane fields

Bennett C. T. Macdonald, O. Tom Denmead and Ian White

Nitrous oxide emission from two acidic soils as affected by dolomite application

Muhammad Shaaban, Qian Peng, Shan Lin, Yupeng Wu, Jinsong Zhao and Ronggui Hu

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Soil Research (continuing *Australian Journal of Soil Research*) is an international journal for publishing research relating to soils in primary production, land and water management, environmental pollution, and remediation.

Editors-in-Chief Balwant Singh and Mark Tibbett



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