Welcome to the Soil News

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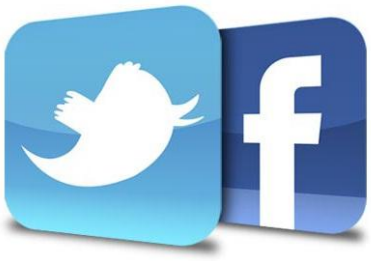
In this issue...

Your contributions are required - New Zealand Soil News is your newsletter

John Drewry
Bioeconomy Science Institute (Manaaki Whenua - Landcare Research)
Private Bag 11052 Manawatu Mail Centre
Palmerston North 4442
email: drewryj@landcareresearch.co.nz



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Officers of the NZSSS December 2024-2026

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Council: Chris Anderson (Massey University); Kirstin Deuss (Bioeconomy Science Institute - Manaaki Whenua - Landcare Research; Early Career Researcher); Brendon Malcolm (Bioeconomy Science Institute - Plant & Food Research; Awards); Tanya O'Neill (Waikato University); Dori Torres-Rojas (Massey University); Haydon Jones (Waikato Regional Council; Policy); Jim Moir (Lincoln University); Fiona Curran-Cournane (Ministry for the Environment)

From the Editor

Welcome to this issue of Soil News.

Jen Owens has resigned as the BSI Scion correspondent. We thank her for her contribution. If any Scion readers would like to be the Soil News correspondent, please get in touch with the editor.

President's report

Dr Pierre Roudier, Bioeconomy Science Institute -- Maiangi Taiao

Tēnā koutou kātoa,

Time flies! With 2026 well underway, we are now more than halfway into the term of the current Council. And what a year it has been: hot on the heels of a very successful joint conference with our Australian and South Pacific colleagues and friends in Rotorua, the New Zealand science sector is now undertaking deep changes, at an unprecedented pace. The merging of the CRIs into PROs is a significant event for soil science in this country, and we note that soils is one of the main science themes that is common to AgResearch, Scion, Plant and Food, and Manaaki Whenua -- all now merged into a single entity, the Bioeconomy Science Institute/Maiangi Taiao.

I'd like to think that our members are playing a significant role in facilitating the merging of those entities. Indeed, soil science in New Zealand is a small, but very well-connected collective, and a sense of community that, historically, has always prevailed on the major structural changes of the science sector. Long may it last!

Beyond the reorganisation of scientific research structures, soils are also in the policy spotlight, which really illustrates the relevance of the mahi our community is doing. An example is recent report "Reviewing the use of the Land Use Capability system in a regulatory context" by the Parliamentary Commissioner on the Environment, Simon Upton [1]. The report is asking valid questions and challenges the use of the Land Use Capability (LUC) for policy, both the classification system and its spatial expression at the national level. The latter, in particular, is problematic, and raises serious needs to update the spatial datasets underpinning the national LUC maps. But the report will also be seen as controversial by many of us, as it opposes the expert-led classification system used historically by the LUC, with modern mapping techniques using remote sensing and advanced statistics, said to be more objective. My personal take is that an expert-based system can very well accommodate modern sensing techniques, and that purely statistical approaches also bring their fair share of challenges... but I invite you all to read the report for yourself, and share your own perspective.

As our input to those key questions has never been so important, we are also looking forward to meeting again in person at the end of the calendar year: the NZSSS Conference will this year be held in Ōtautahi Christchurch, from the 30th November to the 3rd December, at Chateau on The Park [2]. The local organising committee,

expertly led by Carol Smith (Lincoln University), is already hard at work to make it one to remember. Make sure to put those dates in your agendas!

Finally, I would like to extend my warmest thanks to my fellow NZSSS Councillors: they are a small group of exceptionally hard-working and dedicated individuals, and I continue to be inspired by their wisdom, intelligence, and commitment to our soils. I would like to acknowledge John Drewry, who has served as our Soil News Editor for many years, a role that is vital for maintaining strong connections within our community. My thanks also go to Lea Boodee, whose support is absolutely essential to the Council's day-to-day operations, as well as to the successful organisation of our conferences and events.

Nāku iti nei, nā

Pierre Roudier
President of the NZSSS

[1]: https://pce.parliament.nz/media/hmbjgw3u/reviewing-the-use-of-the-luc-system-in-a-regulatory-context-9122025.pdf
[2]: https://www.soilscience.org.nz/about-2026-conference

Celebrating our 2025 Award Recipients

Compiled by Dr Brendon Malcolm, NZSSS Awards Convenor (2017-present)

Our Society's inter-conference regional forums in Hamilton, Palmerston North and Lincoln, held as part of the Norman Taylor Lecture series, provided valuable opportunities to recognise and celebrate those who have made significant contributions to soil science through our long-established awards portfolio.

The Lincoln event also featured a mini-forum hosted by the Lincoln University Soils Society, where current students showcased their work, while the Palmerston North lecture was held in conjunction with the FLRC (Farmed Landscapes Research Centre) conference in February 2026.

Below, we briefly profile the awards presented and their recipients. On behalf of Council, congratulations to all who were recognised for their achievements.

The Norman Taylor Memorial Award

The Norman Taylor Memorial Award (Lecture) is awarded by the President of the NZSSS in recognition of outstanding contributions to soil science in New Zealand. Our recipient of the Norman Taylor Memorial Award for 2025 was **Dr Steve Wakelin** of the Bioeconomy Science Institute (Scion group).

Steve gave a fascinating lecture on the breadth and importance of soil microbiology in our agricultural ecosystems, and the need to better understand and harness its potential in an ever-changing environment. The title of his lecture was: "Biological view into productive soils in Aotearoa NZ".

Dr Steve Wakelin receiving the Norman Taylor Memorial Lecture award from our President Dr Pierre Roudier in Lincoln, December 2025 (left; photo D. Selbie) and

Steve giving his lecture at FLRC in Palmerston North, February 2026 (right; photo, B. Malcolm).

Steve is an internationally respected soil microbiologist whose research has significantly advanced our understanding of how below-ground microbial communities influence ecosystem function, soil and plant productivity, and overall resilience. His work brings together cutting-edge molecular approaches, ecological modelling, and comprehensive field studies to deepen insight into how soil microbes respond to land-use change, climate pressures, and management practices.

After completing his PhD on soil-borne diseases, Steve spent ten years with CSIRO Land and Water in Australia—colloquially known as "Club Mud"—before returning to Aotearoa to apply his expertise across forest, agricultural, and restoration environments. His scientific interests include nutrient cycling, deep soil systems, soil carbon, and plant-microbe interactions, all of which are central to sustainable land management.

Steve's influence extends well beyond his own research. He has led and contributed to numerous national and international initiatives aimed at improving land-use sustainability through microbial ecology. With more than 160 peer-reviewed publications to his name, he is widely recognised for his scientific leadership and impact. Steve now continues to advance soil science as part of the newly formed Bioeconomy Science Institute, based in Christchurch

Fellowship of the Society

Fellowship of the New Zealand Society of Soil Science is an honour conferred for distinction in any or all of the following areas; research, technology, teaching, extension, and/or the advancement of soil science. In 2025, the Society had great pleasure in appointing **Dr Ian Lynn** as Fellow of the Society.

Dr Ian Lynn is awarded with the NZSSS Fellowship of the Society by our President, Dr Pierre Roudier (photo, D. Selbie).

Ian has devoted more than five decades to advancing soil and land resource science in New Zealand. His work has shaped national standards for land resource evaluation and classification, including key contributions to the NZ Land Resource Inventory and the Land Use Capability Survey Handbook. Ian's leadership in

developing extended legends and standardising Land Use Capability units has provided a consistent framework used across the country today.

Alongside these achievements, Ian was a founding member of the S-map team, helping modernise soil mapping and registering numerous surveys that expanded knowledge of South Island landscapes. Known as a ‘quiet achiever,’ Ian combines technical excellence with generosity in sharing his expertise, mentoring colleagues and supporting projects well beyond his official retirement. His legacy is one of precision, collaboration, and enduring impact on New Zealand’s land science.

The Postgraduate Bursary Award

The Postgraduate Bursary Award recognises the efforts and present, or likely, contribution to New Zealand soil science arising from a Doctorate study. Eligible candidates for this award must be PhD students entering their 3rd year of study, working on the properties, productivity or sustainability of NZ’s soil and land resources.

The recipient of Postgraduate Bursary award for 2025 went to Henry Ota of University of Waikato.

Henry Ota receiving the Postgraduate Bursary by our Treasurer Dr Natalie Bartlett at the Waikato Norman Taylor forum in December 2025 (photo, L. Schipper).

Originally from Nigeria, Henry brings international experience and academic excellence to his research on how pasture management—particularly cut-and-carry systems—affects soil carbon and nitrogen dynamics. His work includes comparing carbon stocks between dairy goat and cow farms, measuring carbon flows using eddy covariance, and assessing nitrous oxide emissions during pasture renewal. These findings provide valuable insights for New Zealand agriculture and greenhouse gas mitigation. Beyond his research, Henry is a dedicated team member, actively supporting teaching, mentoring, and fieldwork.

The Morice Fieldes Memorial Award

The Morice Fields Memorial Award recognises a PhD theses from the previous calendar year of exceptional merit. In 2025, the judges found two theses of such exceptional and closely matched merit that they could not be fairly separated.

Accordingly, two recipients were honoured with the award – **Lucy Bell** of Lincoln University for her thesis *"Soil carbon stocks under fencelines and adjacent paddocks to test the importance of dung returns"*, and **Janani Palihakkara** of Massey University for her thesis *"Phosphorus speciation in submerged agricultural soils"*.

For Lucy's thesis, the judges noted that it was exceptionally well written—logical, easy to follow, and supported by clear objectives and conclusions. They also highlighted the originality of her research question, which provides valuable new insight into dung and carbon dynamics. When evaluating Janani's thesis, the judges commended the strong relevance of the topic, addressing soils that are continuously or intermittently saturated—an issue of wide global importance. They also recognised the thesis for its comprehensive and thorough presentation of the research and its evaluation.

Joint winners of the Fieldes Memorial award, Lucy Bell (left; photo, D. Selbie), and Janani Palihakkara (right; photo, B. Malcolm). Presented by our President, Dr Pierre Roudier.

The Sir Theodore Rigg Memorial Award

The Sir Theodore Rigg Memorial Award recognises a Masterate theses of exceptional merit from the previous calendar year. **Holly Hay**, University of Waikato, was our recipient of the award for 2025, for her thesis *"Soil carbon stocks under fencelines and adjacent paddocks to test the importance of dung returns"*.

The judges noted that the thesis was exceptionally well written—logical, easy to follow, and supported by clear objectives and conclusions. They also highlighted the originality of the research question, which advances understanding of dung and carbon dynamics.

Recipient of the Rigg Memorial Award Holly Hay in action in the field (photo provided by L. Schipper).

Undergraduate Prizes

Each year the Society awards the best performing third year undergraduate student in each of the three major universities (Lincoln University, Massey University and University of Waikato). For 2025, the recipients of the undergraduate prizes were **Beaulah Pragg** (Lincoln University), **Lisa Lyons** (Massey University), and **Jenny Lux** (University of Waikato).

Our recipients of the undergraduate awards, from left to right, Beaulah Pragg (photo provided by L. Schipper), Associate Professor Lucy Burkitt receiving the award on behalf of Lisa Lyons (photo, B. Malcolm), and Jenny Lux (photo sourced from Soil & Health Association website).

Congratulations again to all our deserving award winners.

NZSSS Award Recipients

President's Invitation Lecture
1972 W A Pullar
1973 T W Walker
1974 A J Metson
1975 H S Gibbs

Norman Taylor Memorial Award
1976 I L Baumgart
1977 G D Smith
1978 J D McCraw
1979 G G Cossens
1980 A C S Wright
1981 C During
1982 C G Vucetich
1983 N Wells
1984 G M Will
1985 J K Syers
1986 L C Blakemore
1987 W M H Saunders
1988 K R Tate
1989 P J Tonkin
1990 E J B Cutler
1991 C Childs
1992 D R Scotter
1993 No award
1994 A Sinclair
1995 B Clothier
1996 A Hewitt
1997 K M Goh
1998 A Mackay
1999 J Watt
2000 V Neall
2001 S Saggar
2002 D J Lowe
2003 P Singleton
2004 G Sparling
2005 R McLaren
2006 G Yeates
2007 A Carran
2008 M Balks
2009 P Fraser
2010 C de Klein
2011 T Webb
2012 M McLeod
2013 M Hedley
2014 S Ledgard
2015 R McDowell
2016 L Schipper
2017 T Clough
2018 A Roberts
2019 M Camps
2020 C Smith
2021 L Condron
2022 M Beare
2023 H Di
2024 P Almond
2025 S Wakelin

NZSSS Postgraduate Awards
1971 D W Ives
1972 I Nairn
1973 -none-
1974 V E Neall
1975 -none-

Morice Fieldes Memorial Award for PhD Thesis
1976 J C Ryden
1977 -none-
1978 A N Sharpley
1979 K W Steele
1980 -none-
1981 A G Hogg
1982 A W Limmer
1983 A B Cooper
1984 A D Mackay
1985 R A Petch & P J Tonkin
1986 I R Phillips
1987 D J Horne
1988 J S Rowarth
1989 A W Young
1990 P B Greenwood
1991 C D A McLay
1992 A W Rate
1993 L A Schipper
1994 D Tambunan
1995 No award
1996 R Lieffering
1997 H Wang
1998 P Almond
1999 B Robinson
2000 T J van der Weerden
2001 B Miller
2002 G Barkle
2003 C Rooney
2004 J Menneer
2005 H Jones / F Moreno
2006 D Houlbrooke
2007 S Gaw
2008 M Hughes
2009 M Bloomberg
2010 S Carrick
2011 N Schon
2012 A Eger
2013 N Balaine
2014 P Mudge
2015 B Welten
2016 D Huang
2017 S McNally & J Owens
2018 M Bucci
2019 C Gardiner
2020 F Rambags
2021 J Ratcliffe
2022 B Robertson
2023 H Thompson-Morrison
2024 F Hasan
2025 L Bell & J Palihakkara

Sir Theodore Rigg Award for Masterate Thesis
1976 K D Earl
1977 T H Webb &
N E Logan
1978 -none-
1979 D A McKie
1980 C Hedley (née Hubbard)
1981 D Karageorgis
1982 D J Lowe
1983 L A Benny
1984 K B Marsh
1985 B McLaughlin
1986 -none-
1987 C D A McLay
1988 B E Green
1989 S P Cameron-Lee
1990 P J de Lange
1991 G N A Wigley
1992 R B Doyle
1993 -none-
1994 P L Carey
1995 J Moir
1996 -none-
1997 S Park
1998 S Thiagarajan
1999 H Jones
2000 R Dragten
2001 B Robinson
2002 S Tutua
2003 D J Palmer
2004 M W Hughes
2005 R Standish
2006 D Dewar
2007 E Hoftsee
2008 N Watkins
2009 DA Lloyd
2010 P Mudge
2011 DF Wallace
2012 E Harris
2013 A Barnett
2014 A Robinson
2015 T Norris
2016 N Laubscher
2017 J Robinson
2018 O Petrie
2019 J Millar
2020 M Kokiri Huirama
2021 K Numa
2022 A van de Laar
2023 S Ray
2024 M Farrant
2025 H Hay

Postgraduate Bursary Award 2024
Was Fertiliser Association Award 2019
Was Bert Quin Award 2014
Was Summit Quinphos Bursary (renamed Altum Award 2012)
1993 J Luo
1994 W J Morrell
1995 I Vogeler

1996 C W Gray
1997 B Robinson & B Miller
1998 A Mitchell
1999 A Khan
2000 Chengrong Chen
2001 Suman Mishra
2002 S Gaw
2003 D Houlbrooke & R Bhandral
2004 D Palmer
2005 J Singh
2006 S Khan
2007 B Kusomo
2008 S Carrick
2009 P Jeyakumar
2010 G Lucci
2011 N Wells
2012 R Dodd
2013 No award
2014 S McNally
2016 J Pronger
2018 T Geretharan
2019 A Wecking
2020 T Corbett
2021 K Deuss
2022 C Chisholm
2023 M Nightingale
2024 F González
2025 H Ota

The L C Blakemore Award
(Biennial award)
1992 N P Smith
1994 H Kettles
1996 No award
1998 L Currie
2000 B Daly
2002 P Theobald
2004 T Hendry
2006 B Toes
2008 C Smith
2010 M Sprosen
2012 C Tregurtha
2014 M Premaratne
2016 J Jiao
2018 B Moorhead
2020 R Cresswell
2022 J Dando
2024 L Hassall

The M L Leamy Award
(Biennial award)
1992 B E Clothier
1994 A Hewitt
1996 No award
1998 S Cronin
2000 H J Di
2002 K R Tate
2004 N S Bolan
2006 S Saggar
2008 R McDowell
2010 Not awarded
2012 D Curtin
2014 L Schipper
2016 D Selbie, L Buckthought, M Shepherd (jointly)
2018 J Luo
2020 D Curtin, M Beare (jointly)
2022 A Hewitt, M Balks, D Lowe (jointly)
2024 D Leslie

The T W Walker Prizes
1992 (oral paper) —S T Olykan
(poster)—G N Magesan
1994 (oral paper)—J Luo
1995 J Zanders & S Park
1998 (oral paper)—J Menneer
(poster)—C P Rooney
2000 (oral & poster papers) —L Barton
2002 (oral paper)–D Houlbrooke
(poster)—K Wilkins
2004 (oral paper)─J Singh
(poster)–D Dewar
2006 (oral paper)-R Parkinson
(poster)–F Scherr
2008 (oral paper) – P. Mudge
(poster) – G M Lucci
2010 Not awarded
2012 Not awarded
2014 (oral paper) O Jordan
(poster) J Owens
2016 (oral paper) – R Woods
(poster) – A Carlton2018
2018 (oral paper) – A Tumbure
(poster) – K Deuss
2020 -none-
2022 (oral paper) – H Ruffell
(poster) – C Chisholm
2024 (oral paper) – J. Palihakkara
(poster) – E Livingstone

Undergraduate Prizes
1994 R McDowell
(Lincoln University)
R Hodgson
(Massey University)
M Boyes
(Waikato University)
1995 W R Cookson
(Lincoln University)
A Reyland
(Massey University)
J C Menneer
(Waikato University)
1996 R Dragten
(Waikato University)
1997 J McCaw
(Lincoln University)
C Eastwood
(Massey University)
V Gough
(Waikato University)
1998 L Garrett
(Waikato University)
N Treloar
(Massey University)
C Rissman
(Lincoln University)
1999 A Manderson
(Massey University)
K McLauchlan
(Waikato University)
S Petrie
(Lincoln University)
2000 S Pitcher-Campbell
(Massey University)
N Dunn
(Waikato University)
C Ducey
(Lincoln University)
2001 C Davies-Colley
(Waikato University)
M Buchan
(Lincoln University)
P Nelson
(Massey University)
2002 A Souness
(Lincoln University)
T A O'Neill
(Massey University)
D Worthy
(Waikato University)
2003 S O'Driscoll
(Waikato University)
F Shanhun
(Lincoln University)
2004 M Clancey
(Waikato University
J Bertram
(Lincoln University)
2005 Vanessa Coombe
(Waikato University)
Samuel Dennis
(Lincoln University)
2006 Laura Buckthought / Georgina Mackie
(Lincoln University)
Louise Fisk / Paul Mudge
(Waikato University)
2007 Paul Bowater
(Lincoln University)
Hamish Mulcock
(Massey University)
Georg Kruger
(Waikato University)
2008 Glen Treweek
(Waikato University)
Emma Anne Phillips
(Massey University)
Nicola Jane Kelland
(Lincoln University)
2009 Rebecca Bylsma
(Waikato University)
Helen Free
(Massey University)
Sean Gresham
(Lincoln University)
2010 Josh Scarrow & Jack Pronger

(Waikato University)
Louise Anne McCormack (Massey University)
Aimee Elizabeth Robinson (Lincoln University)

2011 AM Carter (Waikato University)
Joel Perry (Massey University)
Roshean R Fitzgerald (Lincoln University)

2012 L Creswell (Waikato University)
J Howes (Massey)
A Whitley (Lincoln)

2013 H Bredin-Grey (Waikato)
Massey – N Hyslop
N Mesman – (Lincoln)

2014 D Le Lievre – (Waikato)
J Winters – (Massey)
S Rayner – (Lincoln)

2015 T Leabourn (Massey)
B Robertson (Lincoln)
F Garrity (Waikato)

2016 M O'Grady (Waikato)
H Jensen (Lincoln)
SA Whiteman (Massey)

2017 C Tomlinson (Waikato)
S Pike (Massey)
I Setiawan (Lincoln)

2018 M Hall (Waikato)
M Van Baarle
C Chisholm

2019 E Kitchen (Waikato)
S Earl-Goulet (Lincoln)

2020 A Carrington (Waikato)
P Chapman (Lincoln)

2021 R Brodnax (Waikato)
E Stubbs (Massey)
A Wells (Lincoln)

2022 H Hay (Waikato)
B Deacon (Massey)
M Dumaine (Lincoln)

2023 E Morgan (Waikato)
O Arnold (Massey)
M Picard (Lincoln)

2024 K Chow (Waikato)
D Hannan (Massey)
G Higinbottom (Lincoln)

2025 J Lux (Waikato)
L Lyons (Massey)
B Pragg (Lincoln)

Fellows of the NZ Society of Soil Science

L C Blakemore
M R Balks
N Bolan
K C Cameron
I B Campbell
C W Childs
J Churchman
B E Clothier
I S Cornforth
R Naidu
V E Neall
R L Parfitt
J A Pollock
AHC Roberts
S Saggar
A G Sinclair
G Sparling
T W Speir
H J Di
K M Goh
P Gregg
R J Haynes
S F Ledgard
D J Lowe
J D McCraw
A Mackay
L Schipper
L Condron
D Ross
T Clough
R McDowell
R G McLaren
P Fraser
J Luo
I Lynn
J K Syers
K R Tate
B K G Theng
P J Tonkin
T W Walker
J H Watkinson
G W Yeates
A Hewitt
M Beare
M Hedley
C De Klein
R Monaghan
D Curtin
D Houlbrooke
C Hedley
D Hicks

Honorary Fellow

B Miller

Life Members of the N.Z. Society of Soil Science

L C Blakemore
I B Campbell
C W Childs
R J Furkert
R Lee
R B Miller
V Orchard
W M H Saunders
J K Syers
P J Tonkin
T W Walker
J P C Watt
J Adams
R McLaren
P Gregg
A Mackay
P Fraser
B Quin
D Lowe
M Balks
A Hewitt

Grange Medal

(Biennial award)

2012 K Tate
2014 B Clothier
2016 G Rys
2018 M Hedley
2020 F Curran-Cournane
2022 K Cameron
2024 L Condron
S Ledgard

Early Career Researcher

(Biennial award)

2024 S McNally

NZSSS Awards 2026

Nominations for the following awards open **1 March 2026** (with the exception of the US/NZ Exchange Award, for which nominations open 25 January). Key details regarding nomination requirements are provided in the table below. Please contact the NZSSS Awards Convenor for full award details (Brendon.Malcolm@plantandfood.co.nz).

Award	Presented	Nominations close	Nominee eligibility	Nominator eligibility
NZSSS Fellowship	Annually	31 July 2026	Nominees must be active members of the Society at the time of nomination.	Nominations must be made by two Full Members, or Life Members of the Society.
The Grange Medal	Biennially (conference year)	31 July 2026	Open to both non-members of the Society as well as members, fellows, or life members of the NZSSS.	Nominations must be made by two or more active members of the Society.
The Blakemore Award	Biennially (conference year)	31 July 2026	Open to technicians/support staff who have been employed in the field of science for at least three years.	Any two active members of the NZSSS can nominate an eligible candidate from a university, CRI, or other organisation (e.g. a Regional Council).
The Leamy Award	Biennially (conference year)	31 July 2026	Open to the author or authors of the most meritorious New Zealand contribution to soil science, published in the previous three calendar years.	Any two active members of the NZSSS can nominate an eligible candidate(s) from a university, CRI, or other organisation (e.g. a Regional Council).
The Postgraduate Bursary	Annually	31 July 2026	Open to postgraduate (PhD) students in soil science about to enter their third year of study. Candidates must be either student or full members of the NZSSS and should not be on the academic or technical staff of the department that nominates them.	Nominations must be received in writing from the Head of the Soil or Earth Science Department/Group at a New Zealand University. Only one nomination will be accepted from each University Department/Group.

The Morice Fieldes Award	Annually	31 July 2026	A PhD thesis submitted within the previous calendar year.	The Head of the Soil or Earth Science Department/Group at a New Zealand University may nominate the best PhD thesis from their department/group.
The Rigg Award	Annually	31 July 2026	A Masterate thesis submitted within the previous calendar year.	The Head of the Soil or Earth Science Department/Group at a New Zealand University may nominate the best Masterate thesis from their department/group.
Early Career Researcher (ECR) Award	Biennially (conference year)	31 July 2026	Open to ECR's within eight years of completing their highest research qualification (Masterate or Doctorate).	No more than 2-page written nomination by any two active members of the NZSSS.
Undergraduate Prizes	Annually	31 December 2026	A third-year student in Soil or Earth Sciences.	The Head of the Soil or Earth Science Department/Group at Massey, Lincoln, and Waikato University may each nominate the best third-year student from their department/group.
The US/NZ Exchange Award	Annually	15 April 2026 for initial submission (18 April for final submission)	Nominees are required to have at least seven years of membership in SSSA or the NZSSS. Former recipients of this Award are not eligible.	This award allows self-nominations.
Soil Judging Stipend ($2,000)	Annually	31 July 2026	Open to student teams for attendance at a conference-related soil judging competition in New Zealand or Australia. Priority will be given to the highest performing team from the previous calendar year.	The Head of the Soil or Earth Science Department/Group at a New Zealand University may nominate a team from their department/group.

Nominations and requests for further information regarding NZSSS awards should be addressed to:

Dr Brendon Malcolm
NZSSS Awards Convenor
C/O Plant & Food Research
Private Bag 4704, Christchurch Mail Centre, Christchurch 8140 (normal post), or
Canterbury Agriculture & Science Centre, Gerald St, Lincoln 7608 (courier)
New Zealand

Email: Brendon.Malcolm@plantandfood.co.nz

NZSSS Conference 2026

Save the date!

New Zealand Society of Soil Science Conference 2026 will be in Christchurch

Venue: Chateau on the Park

Conference: Monday 30th November to Thursday 3rd December

Soil Judging Competition: Friday 27th to Sunday 29th November

Related Society Notices

To keep up with the latest updates, follow NZSSS on LinkedIn and visit our website:

- LinkedIn: https://www.linkedin.com/company/nzsss/
- Website: https://www.soilscience.org.nz/

News from the Regions

Waikato/Bay of Plenty

University of Waikato

Annual Norman Taylor Lecture - Steve Wakelin
It was a great pleasure to host the Norman Taylor lecturer this year – **Steve Wakelin,** whose talk explored the past, present, and future of soil microbiology. Many thanks to NZSSS for promoting the event and providing a light lunch.

Academic Awards
We were excited for **Henry Ota,** who was awarded the Postgraduate Bursary Award. Henry is in his final year of his PhD, comparing soil carbon stocks and nitrous oxide emissions from cut-and-carry and grazed pastures. **Holly Hay** received the Sir Theodore Rigg award for best masterate thesis that demonstrated that soil carbon stocks of pastures were greater than under adjacent fencelines. She attributed this difference to dung deposition on the paddocks that did not occur under fences. **Jenny Lux** received the award for best third-year student studying soil science.

Figure 1. Henry Ota receives his Postgraduate Bursary Award from Natalie Bartlett, representing the NZSSS.

International Visit - Karl Richards

It was a pleasure to host **Karl Richards** (Head of the Teagasc Climate Centre), who visited us to discuss our research on greenhouse gas emissions from drained peat soils, including sampling blueberry ice cream.

Figure 2. Karl Richards, Aaron Wall and Dave Campbell at Gamma farm, where we have been measuring carbon balance and nitrous oxide emissions at paddock scales from drained peats grazed by dairy cows.

WaiBER Group at the FLRC Conference

PhD students from the University of Waikato attended the Farmed Landscapes Research Centre (FLRC) Conference at Massey University on February 3 and 4. They presented their latest findings on carbon and nutrient dynamics in New Zealand's agroecosystems:

- **Mohan K C** (supervised by Louis Schipper): *"How much carbon do pastures lose during drought conditions?"*
- **Henry Ota** (supervised by Louis Schipper): *"Do soil carbon and nitrogen stocks differ between cut-and-carry and grazed pastures?"*
- **Charlotte Robertson** (supervised by Mark Lay): "Improving crop yields with organic waste"

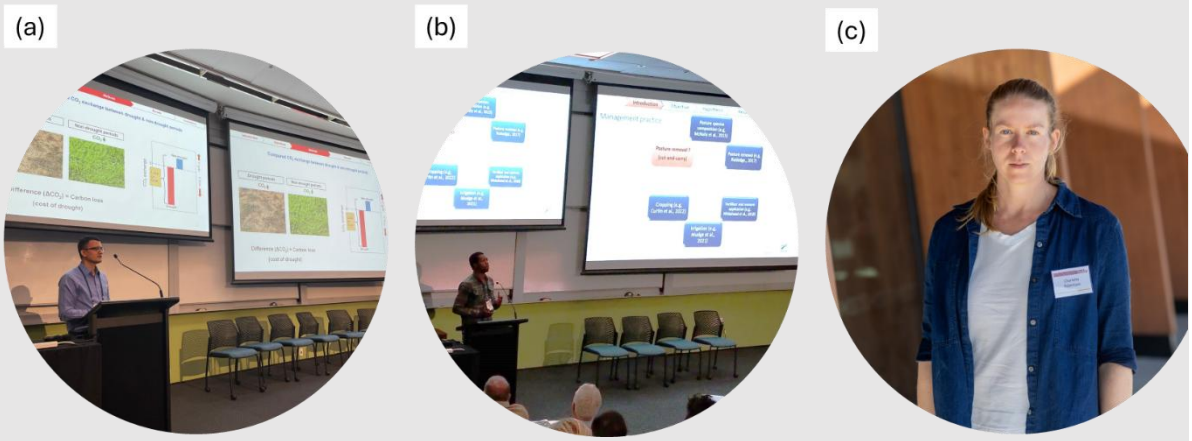


Figure 3. (a) Mohan K C, (b) Henry Ota, and (c) Charlotte Robertson at the FLRC Conference.

Manawatū

Bioeconomy Science Institute (Plant & Food Research)

New Zealand – China Water Research Centre Workshop.
Lincoln University did a superb job in hosting the New Zealand – China Water Research Centre Workshop in November. Well done Prof Di & team. A great meeting.

The Plant & Food Group of the Bioeconomy Science Institute were represented by Wei Hu and Brent Clothier, along with several of their collaborators. These colleagues included Prof. Xi Benye (Beijing Forestry University) and his students Xiaoning Zhao and Wenhan Yang who are spending a year in New Zealand on China Scholarship Council studentships. Our collaborators Prof. Guangxuan Yan (Henan Normal University), Prof. Jiabao Zhang and Prof. Donghao Ma (Institute of Soil Science, CAS), Prof. Quanjiu Wang and Prof. Zhi Qu (Xi'an University of Technology), Prof. Bing Zhang and Prof. Zhipeng Liu (Nanjing Agricultural University), Prof. Ying Zhao (Ludong University), plus Prof. Stephan Peth and Dr Xinjun Huang (Leibniz Universität Hannover) also attended.

After the meeting Xi and Yan visited Brent in Palmerston North, and they went fishing with success at Foxton Beach.

Mansoor's Graduation at Massey University

Steve Green and Brent Clothier have been working in the United Arab Emirates (UAE) since 2013. This programme of research has been funded by Environment Agency – Abu Dhabi (EAD), and in addition to providing EAD with valuable advice on the allocation of water for irrigation in the deserts of the UAE, it has led to three Emiratis graduating from Massey University with PhDs. Mansoor Al-Tamimi is the last of these, and Mansoor graduated in November 2025. Brent & Mansoor after graduation in The Square, Palmerston North.

Mansoor's thesis was entitled "**Measurement and Modelling of Salt and Nutrient Dynamics under *Salicornia* Irrigated with Saline Groundwater, Desalination Reject-Brine, and Aquabrine"** and Mansoor's research provided benefit-cost assessments of the food-fodder-fuel values of *Salicornia*, and the impact modelling on groundwater of using the brine from desalination units and aquaculture tanks to irrigate this halophyte with saline waters in the hyper-arid deserts of the Emirates.

Bioeconomy Science Institute (Manaaki Whenua - Landcare Research)

To mark World Soils Day 2025 (5 December) Pierre Roudier and Paul Mudge held a LINK seminar 'World Soils Day 2025. Raising soil's profile'. They explored why raising the profile of soil's value matters now more than ever and they aimed to (re)start a national conversation on the research priorities needed to future-proof our living soil systems.
https://www.landcareresearch.co.nz/events/linkonline

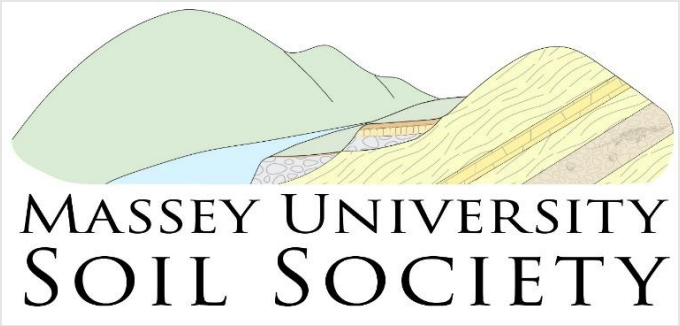
To celebrate World Soils Day here's a podcast from Pierre Roudier:
The soils beneath our feet · Plant & Food Research

Host Rebecca Bloomer is joined by soil scientist Pierre Roudier, President of the New Zealand Society of Soil Science, to explore how soils support ecosystems, store carbon, manage water, reduce flood risk and even shape urban planning. Pierre reveals how modern soil science is transforming our understanding of the land – from advanced mapping tools like S-map to new ways

of monitoring change. These innovations help guide land-use decisions and protect high-value soils from urban pressure. The episode also looks ahead to the future of soil science, including soil moisture monitoring, carbon sequestration and viewing soil as a living ecosystem.

There was also an invitation to mark World Soil Day by taking a moment to notice and appreciate the soils beneath our feet. S-Map link: https://smap.landcareresearch.co.nz

Massey University



🌱 Massey University Soil Society Field Trip to South Taranaki

In late 2025, 37 enthusiastic participants – mostly undergraduate and postgraduate students, along with a few supportive family members – joined our field trip to South Taranaki organised by the Massey University Soil Society.

Callum Rees guided us from the Manawatū to South Taranaki, explaining the fascinating land formations and soil changes along the route. His engaging commentary turned the journey into a travelling soil science lesson!
Once we arrived in South Taranaki, we visited a landfarming site to see how soils are used to treat drilling mud from the oil and gas industry. Landfarming involves spreading drilling mud over recontoured dunes, mixing it with the dune sand, then re-applying topsoil and re-establishing vegetation.

We also dug a soil pit in a newly established landfarming site to observe the soil horizons and profile — a great hands-on experience that helped everyone understand how drilling mud is incorporated into the sand and how the soil develops over time.

Landfarming relies on natural biological activity, dilution, and weathering to break down hydrocarbons and other compounds in the drilling mud.

Research led by the Farmed Landscape Research Centre at Massey University is investigating the long-term effects of landfarming on soil and pasture quality. Early findings show that treated soils have higher cation exchange capacity and may help with pasture production by increasing moisture availability in summer. Ongoing work is being undertaken to track pasture production through the season

and confirm if there are any advantages or disadvantages associated with this practice.

A big thank-you to Callum Rees, the farm manager and staff for their time, and to everyone who joined and made it a day full of learning, exploration, and great discussions!

Callum Rees digging a soil profile with some enthusiastic students to check how the drilling mud has been incorporated into the underlying iron sand.

Students observing hydrophobic zones developed in a natural sand dune soil at the site thought to relate to the accumulation of organic compounds (alkane hydrocarbons, triglycerides and long-chain fatty acids) that form ‘waxy’ coatings on soil particles (Horne and McIntosh, 2000). Agricultural production in these well to excessively well drained soils is limited by moisture availability in summer.


Group photo of the students on the field trip to South Taranaki.

Reference:
Horne, D. J., & McIntosh, J. C. (2000). Hydrophobic compounds in sands in New Zealand–extraction, characterisation and proposed mechanisms for repellency expression. Journal of Hydrology, 231, 35-46.

Canterbury and Otago

Lincoln University

Lincoln student success in Australian Soil Judging Competition

Last week Lincoln University sent two teams of students to the 2025 Australian Soil Judging Competition, hosted by the University of New England in Armidale, NSW. With now over 200+ participants and dubbed ‘Soil Christmas’ this event has become a must attend for budding soil science students and professionals. The event involves two training days where participants put their skills of soil description into practice followed by a day of competition describing unfamiliar soils. This involves soil horizons, texture, structure, colour and geology all which inform the suitability of a soil for particular land uses and management. Not only does this event teach essential skills outside of the classroom and exemplifies experiential learning in the field, it is also a fantastic opportunity for soil enthusiasts to make new connections with fellow students and working professionals which can guide them in their future careers.

Meila Picard, Breanna Holt and Max Singers, known as team ‘Pore Decisions 1’ placed second overall in the university team competition against a strong cohort of 88 students from across Australia. Our other Lincoln University students, Carys Luke and Kayley Wiffen teamed up with Massey University students Oliver Arnold and Donna Hannan and performed strongly. Oliver Arnold took home second place overall in the university individual competition, out of 88 students. Our soil judgers were accompanied by a coaching team of Josh Nelson, Roger McLenaghen and Peter Almond. Regardless of results, the students took home a vastly improved

ability to describe and understand soils in the field. The students worked hard during the year to raise sponsorship in order to attend; and want to thank both the University and the Lincoln University Soil Society for their support. The connections made will set these students up well for exciting careers in the future, in soil science and beyond!

Report on the 11th International Association of Geomorphologists (IAG) International Conference on Geomorphology, Christchurch, 7-11 February.

In early February, the 11th International Association of Geomorphologists (IAG) International Conference on Geomorphology, was held in Christchurch This was the first time it had been hosted in New Zealand, and only the second time in the southern hemisphere. Located in Te Pae, the conference brought together over 900 delegates from more than 45 countries. With 4 days of talks, spanning 10 concurrent sessions and over 1000 oral papers, it was exciting to see the largest global gathering of geomorphologists in New Zealand for the first time, and to finally see this conference kick off, after over 5 years in the planning. Staff and students from Soil and physical sciences were well represented, with Peter Almond and Carol Smith on the local organising committee.

Peter convened sessions on earth surface processes and carbon dynamics and presented “Linking geomorphology and biogeochemistry to predict soil organic carbon stocks at landscape scales”. Mohammed Arar presented “Seasonal nitrate concentration and flow regimes control nitrous oxide saturation across multiple channels in braided rivers” (photo 1) and was involved with delivering one of the mid conference trips with Naomi Wells. Meila Picard presented “Baseline weathering rates and CO2 drawdown from an agricultural landscapes (photo 2) and undergraduate Beaulah Pragg presented “Climate cooling and enhanced CO2 drawdown: a paradox of silicate weathering” (Photo 3). Beaulah also won the highly commended student oral presentation in her section (Earth surface processes and carbon dynamics). This was particularly significant, as Beaulah is a 3rd year undergraduate, presenting alongside postgraduate students.

Being a geomorphology conference, field trips and tours were well attended, and there was a full program of activities for ECR geomorphologists. Peter and Carol helped lead a 1-day trip for this group to Cass basin, in conjunction with Sam McColl from GSNZ. Mid conference field trips included a fluvial geomorphology trip involving which Naomi Wells and PhD student Mohammed Arar. Peter Almond teamed up with local vulcanologist, Sam Hampton to lead a mid-conference trip: "Landscape layers of Te Pataka o Rakaihautu Banks Peninsula: Volcanic and soil geomorphology and their connections to place" which took in Birdlings flat, Onawe Peninsular and Okains Bay.

Post conference field tour: the geomorphology of the Southern Alps | Kā Tiritiri o te Moana, 7-12 February.

Immediately following the conference, 51 delegates from 15 countries departed Te Pae, to circumnavigate and explore the geomorphology of the Southern Alps. Peter Almond lead this tour, alongside Sam McColl (Earth Sciences New Zealand) and Ian Fuller (Massey). Carol Smith and Meila Pickard completed the team.

Day1- Christchurch to Hokitika. Departing Te Pae, we crossed the Canterbury plains and into the Southern Alps, passing through the Castle Hill Basin and pausing at the Otira Viaduct near Arthurs Pass. Traversing onto the Australian Plate, we stopped at Kumera to investigate the glacial history of the MIS 3/2 transition (photo 4), and then onward to Hokitika to look at late glacial shorelines at Arahura and higher terraces associated with the penultimate (Karoro) interglacial MIS 7.

Day 2 saw us travel south through the super humid west coast podocarp forests to see landslides, river dynamics and hazards near Franz Josef. We visited the Mt Adams landslide and discussed the impact of alpine fault earthquakes and alluvial fan dynamics. Moving on to Franz Josef, we discussed the glacier dynamics, including the seminal work of Walker and Syers (1976) on P fractions on chronosequences. Updated evidence for the Waiho loop origins were traversed. At the Waiho river in Franz Josef, we also looked at the multiple hazards of flooding and the proximity to the Alpine Fault. Here, the real issues of river aggradation and flooding threaten the town. To combat this real threat, there are contrasting approaches: stop bank river engineering versus the concept of giving "room for rivers", and most importantly how this fits with community land use adjacent to rivers.

Day 3 saw us continue our exploration of the west coast glacier dynamics, with a walk up the Fox glacier valley to view the rapidly aggrading Mills Creek debris flow fan (photo 6). A walk round Lake Matheson, combined with clear blue skies made for memorable photos of the classic reflection of the Southern alps in Lake Mathesons clear waters (photo 9). In the afternoon, we visited the Haast dune soil chronosequence; the site of Andre Eger's PhD study. It was a great example of how pedogenesis can be used to provide more evidence for geomorphologists to understand relative age development in this dune sequence, aligned with sediment delivery linked to alpine fault earthquakes.

Day 4. Two days based in and around Queenstown allowed us to explore natural hazards and landscapes around Lake Wakatipu and Glenorchy. Rock avalanches were discussed as the origin for the curious shaped (and now we know rock cored) hills at the Hillocks. Moving to Kinloch, the rapidly aggrading delta dynamics and associated flooding were a foretaste of the hazards that exist in this part of the southern lakes. The active dynamics of the braid plain of the Rees river poses flooding hazards to Glenorchy. Addition of stop banks to protect the bridge over the Rees river is constraining the lateral migration of the river, leading to aggradation (photo 5). A similar situation to what we observed at the Waiho rover in Franz Josef. A repeat of the 1999 floods due to elevated lake levels in Lake Wakatipu is a risk, as are debris flows from the Buckler burn which have been modelled to flow through the township. Lastly, much of Glenorchy is built on deltaic deposits, which are prone to liquefaction in the event of an earthquake.

Day 5, and we move into the dry, arid landscape of Central Otago. – driving from Queenstown to Aoraki Mt Cook (photo 7). A view over the Shotover fan where it enters Lake Wakatipu, demonstrated the power of sediment discharge into lake / Wakitipu and the resultant delta. Now that we were in the schist dominated landscapes, there were many slow deep seated slope deformations, especially around Lake Dunstan and the Clyde dam.

Day 6. The final day brought a spectacular clear blue skiey with light winds. Perfect for viewing the debris fans around Aoraki- Mt Cook village. We again considered the natural hazards in alpine landscapes, especially the Black Birch Fan. The final day was based in Aoraki Mt Cook to look at the glacial moraines and debris fan hazards, forming part of Mt. Cook village. Seven metres of aggradation in one event on the Black Birch fan demonstrates the risks posed to infrastructure when building on these fan surfaces. A quick walk up the Hooker valley to some of the Mueller glacier moraines allowed a view into contemporary glacial landscapes (photo 8). Our final stop was a view onto the Tasman proglacial lake system, and a reflection on how different the glaciers east of the main divide are, compared to the Fox and Franz Joseph glaciers on the west coast.

Thank you to Sam McColl, Ian Fuller and Peter Almond for leading this tour, and for compiling an extremely comprehensive tour guide. And thank you to PhD student Meila Picard, who helped with all aspects of the tour logistics; from clearing pit faces in the Haast dunes; keeping us to time at the stops and making sure everyone was well looked after, especially with the lunches. Thank you to our additional student helpers at the conference: Ksenia Trifonova and Ngima Sherpa (photo 10). It was a privilege for us from Aotearoa New Zealand to showcase the spectacular landscapes of the southern Alps to our international colleagues. The sunny, dry weather allowed us to appreciate all aspects of the landscapes. It was also a fantastic opportunity to share with our geomorphological colleagues the value and information that soils and pedology can add to how we interpret landscape evolution and process-landform relationships.

Walker, T. W., and J. K Syers (1976). The fate of phosphorous during pedogenesis. *Geoderma*, 15, 1-19.

All photos by Carol Smith unless stated.

Photo 1

Photo 2

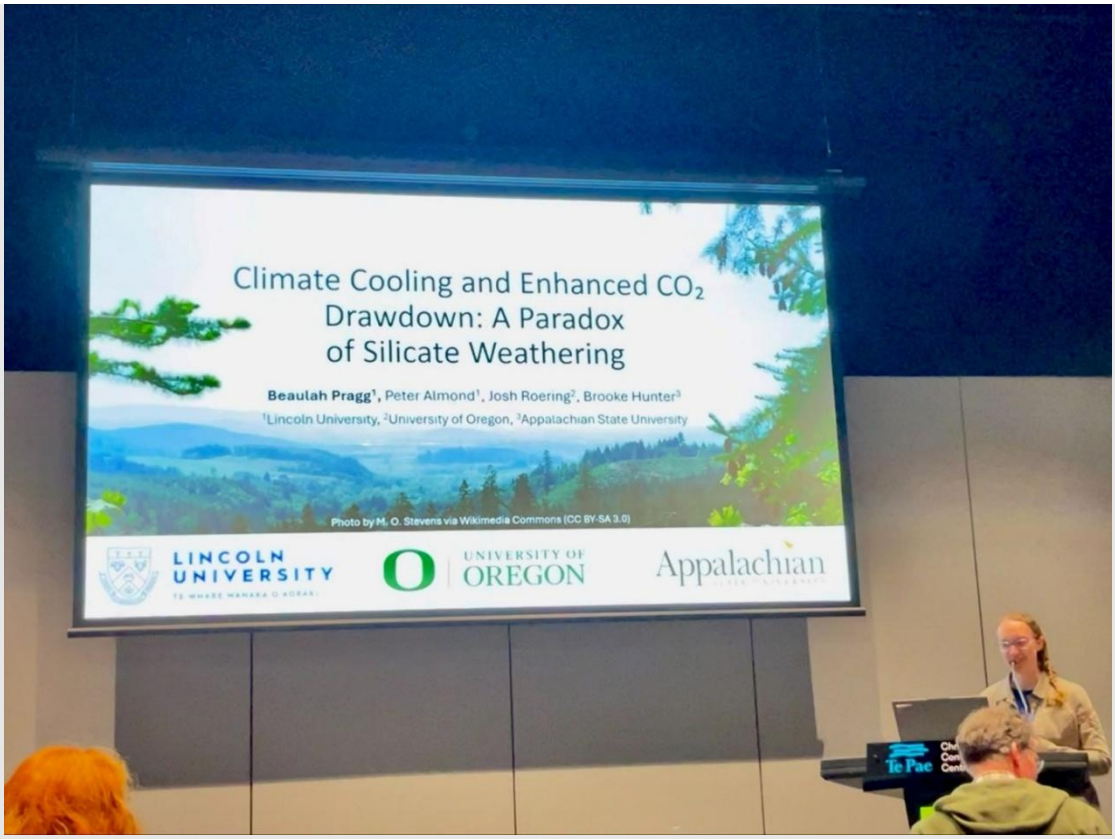


Photo 3


Photo 4. Everyone wanting to get a view of the Larrikins formation, with buried soil and macroscopic balls of Kawakawa tephra in the A horizon, buried by fine textured alluvium in which a podzol has formed.

Photo 5. Rain in the Rees River braidplain

Photo 6. Fox glacier and debris fans (photo Suresh Muthukrishnan)

Photo 7 Aoraki Mt Cook from Lake Pukaki (photo Suresh Muthukrishnan)

Photo 8. Mueller glacier moraines (photo Piotr Mignon)

Photo 9. Lake Matheson and the Mt Tasman, Aoraki Mt Cook.

Photo 10. The Lincoln team

Bioeconomy Science Institute (AgResearch)

Frontiers Planet Prize national winners announced

The Royal Society Te Apārangi has partnered with the Frontiers Research Foundation, based in Switzerland, as part of an international effort to accelerate scientific solutions to planetary challenges. Further information: Frontiers Planet Prize national winners announced

As the national representative body for the Frontiers Planet Prize in Aotearoa New Zealand, the Royal Society Te Apārangi has selected three national winners to be put forward to the international Frontiers Prize jury. One of the national winners is Professor Richard McDowell FRSNZ of Lincoln University for the paper: Anthropogenic nutrient inputs cause excessive algal growth for nearly half the world's population

2026 Soil Science Australia Conference

2026 Soil Science Australia National Conference

Western Australia is hosting the 2026 Soil Science Australia National Conference on Whadjuk Noongar Boodja in Boorloo (Perth), with the theme “Common Ground: Soils for the Anthropocene”.

The conference will be held 1-5 November 2026 at the Pan Pacific Hotel, following the highly-anticipated Australian Soil Judging Competition which is being held 29-31 October.

The 2026 conference is expected to convene over 450 attendees and will serve as a platform for a diversity of voices across science, policy, industry and community to

explore a mutual understanding of soils as the foundation of productivity, security, community and resilience.

Sponsorship opportunities

There are diverse but limited opportunities for organisations to participate as a sponsor or exhibitor. Several sponsors are already on board. The conference sponsorship prospectus is available on the conference website.

Call for abstracts

The call for abstracts to submit oral and poster presentations is now open and will close 24 April 2026. The submission process is simple and is outlined in a comprehensive guide available on the conference website.

Visit the conference website: https://conference.soilscienceaustralia.org.au/

Event: Soil to Brain, Lincoln

Soil To Brain - Kim Hill Hot Topic 2026
Thu, 26 March, 6:30pm - 9:30pm, Lincoln University, Stewart Building
Doors open at 6:30 p.m., and the event starts at 7:30 p.m.

Join us for another thought-provoking "Hot Topic" discussion with Kim Hill!

This year's topic is Soil To Brain - Rethinking Our Connection. Kim Hill will lead a panel of experts to delve into the issues. Once the panel has deliberated their views, the audience will be invited to question panel members.

Panellists:
Julia Rucklidge | University of Canterbury

Pablo Gregorini | Lincoln University

Carolyn Lister | Bioeconomy Science Institute

Hadee Thompson-Morrison | Bioeconomy Science Institute

Soil To Brain - Kim Hill Hot Topic 2026

New Journal: Critical Insights in Agriculture

Aims and scope
Critical Insights in Agriculture (CIAR) is a selective, Open Access journal that publishes quality, forward-thinking, impactful scientific research on the agricultural sector.

CIAR aims to attract research that deals with the critical issues facing the agricultural industry and welcomes cross disciplinary research from across the breadth of agriculture and its related disciplines.

The scope of the journal is split into four sections covering all aspects of:

- Productivity: Improving the production and productivity of agricultural systems with a focus on quantifying appropriate resource use.
- Emissions: Understanding and managing emissions from agricultural systems to land, water, and air.
- Trade and value: The role of agricultural systems in food security, trade, and value chains.
- Nutrition: Ensuring that communities obtain nutritious food with low environmental footprint that rewards farmers fairly.

CIAR is particularly interested in receiving manuscripts that deal with sustainable agriculture and that address the challenges facing the future of the agricultural sector.
https://www.tandfonline.com/toc/tagr20/1/1

R. W. McDowell. Editorial: Facing the critical issues for agriculture: a vision for our new journal. https://doi.org/10.1080/29932106.2025.2603131

Abstracts

Journal of New Zealand Grasslands

The recent annual issue of Journal of New Zealand Grasslands, volume 87, is out now. https://www.nzgajournal.org.nz/index.php/JoNZG/issue/view/vol87

The Journal of New Zealand Grasslands publishes peer-reviewed papers with a focus on temperate grassland research. Articles often include soil and pastoral research topics of interest to Soil News readers. All articles published are open access.

The scope of the journal includes all aspects of pastoral research including agronomy, soils, animals, agricultural extension and farm-systems research. The Journal is owned and published by the New Zealand Grassland Association (NZGA). The Journal has been published since 1932 (prior to 2015 as the Proceedings of the NZ Grassland Association) so provides a long-term resource

reflecting agricultural research and innovation. (Disclaimer: the editor of Soil News is a current member of the New Zealand Grassland Association).

R.W. McDowell et al. 2025. Managing the reduction of soil phosphorus can prolong global reserves of fertilizer phosphorus and improve water quality. One Earth. https://doi.org/10.1016/j.oneear.2025.101448

Excess phosphorus in agricultural soils threatens freshwater quality and long-term fertilizer security. Globally, 27% of soils exceed crop phosphorus needs (plant-available soil test phosphorus as Olsen phosphorus), contributing to runoff that degrades water quality for 3 billion people. Reducing surplus phosphorus through fertilizer cessation ("drawdown") is low cost, but rates remain poorly understood. We analyzed ~12,700 observations from 225 trials in 21 countries to model the time for Olsen phosphorus to reach optimal agronomic thresholds across major crops and improved grassland. Drawdown rates ranged from 9 (Oceania and Asia) to 14 (Europe) years. Our model suggests that global drawdown could save ~190,430 kt of fertilizer, 10 times the annual global use. These findings highlight opportunities to maintain yields, improve water quality, and deliver economic benefits, supporting better-informed agricultural practice and environmental polices worldwide.

Eger A, Winnick M, Larsen I, Condron L, Boitt G, Hynek S, Jercinovic M, Rhodes J 2025. Controls on weathering zone thickness in a rapidly eroding mountain range, western Southern Alps/Ka Tiritiri o te Moana, New Zealand/Aotearoa. Journal of Geophysical Research-Earth Surface 130(11): 20. WOS:001609565100001 https://doi.org/10.1029/2025jf008349

Tectonic fracturing in uplifting mountains facilitates fluid-rock interactions, causing downward propagation of chemical weathering fronts. In contrast, erosion in uplifting mountains removes fractured and chemically altered bedrock, thinning the weathering zone. The interplay of these processes sets weathering zone thickness, but despite the disproportionate influence of chemical weathering in mountains on global biogeochemical cycles, it is unclear where within the weathering zone those chemical reactions predominantly occur. Here we present geochemical data from a 300 m-deep drill core and results from reactive transport modeling to assess weathering zone characteristics in the Southern Alps/Kā Tiritiri o te Moana of New Zealand/Aotearoa. Our findings indicate that soil is thin and chemical weathering fronts are shallow, with only apatite (and likely calcite) weathering extending below the soil-bedrock boundary. Simulations indicate that soil thickness is primarily controlled by porosity-generating plagioclase weathering and that simulated soil thicknesses are consistent with local precipitation and denudation rates. However, simulations also show that if all 6 m of annual precipitation infiltrated bedrock, chemical weathering fronts would extend substantially deeper than observed. We infer that the porosity contrast between soil and rock limits bedrock fluid flow, slowing the propagation of chemical weathering. Erosion and limited fluid-mineral interaction in deep fractures result in a thin weathering zone, suggesting that silicate weathering in uplifting mountains occurs primarily within soil, rather than bedrock. Our measurements suggest that oxidative weathering of petrogenic

carbon has been overestimated previously, but, consistent with prior work, surface processes in the study area result in net consumption of atmospheric CO_2.

Tong Y, Wang Y, Li Z, Zhang P, Hu W, Zhou J, Guo X, Sun H, Comber A, Lauerwald R 2025. Deciphering spatial pattern and environmental drivers of deep soil moisture security: insights from integrating spatial non-stationarity in large-scale analysis. CATENA 261: 109516.
Soil moisture (SM) profoundly influences global ecosystem services and climate change, creating the broad needs for SM management. However, existing single-scale studies have limited representativeness and overlook the spatial non-stationarity, while treating regions with diverse SM conditions as a whole may obscure interactions between environment and different SM levels. Therefore, we expanded the study scale both horizontally and vertically and established an "SM security" framework, which classifies SM conditions based on their impacts on evapotranspiration, vegetation growth, and soil quality. SM was measured to 500 cm depth across the Yellow River Basin (YRB) (795,000 km^2) and categorized into three security zones including "wet zone" that SM ≥ 80 % * field capacity (FC), "transitional zone" that permanent wilting point (PWP) < SM < 80 % * FC, and "dry zone" that SM ≤ PWP. In the YRB, the transitional zone was predominant (61.58 %), followed by wet (20.24 %) and dry (18.17 %) zones. In relatively stable layers (110-500 cm), the wet zone expanded with depth (17.04 % to 25.86 %) while dry zone contracted (20.76 % to 14.99 %). The mean relative SM (dimensionless) and available SM storage, indicating relative soil saturation and vegetation water availability, were 0.84 and 32.14 cm, respectively. Considering spatial non-stationarity, environmental drivers shaping the SM security pattern were: slope in wet zone, vegetation in dry zone, and clay content, vegetation, and slope in transitional zone, with notable coupling among these factors. These findings help characterizing SM security and developing targeted SM management measures in the YRB and similar regions worldwide.

Liu, J., T. Clough, S. Carrick, et al. 2025. Subsoiling combined with winter active Italian ryegrass can reduce nitrous oxide emissions without increasing nitrate leaching: evidence from lysimeter and field plot trials. Soil Use and Management 41 (4): e70155. https://doi.org/10.1111/sum.70155

Subsoiling is a common practice for improving soil structure and has recently been recognised for its potential to reduce nitrous oxide (N_2O) emissions. However, its impact on nitrate (NO_3^--N) leaching must also be considered if it is to be used as a mitigation strategy. This study investigated N_2O emissions, NO_3^--N leaching and grass yield in an Italian ryegrass pasture soil with a compacted subsoil layer using a lysimeter study. Additionally, a separate field study examined mineral nitrogen (N) concentration and the abundance of nitrifying and denitrifying genes. Both studies have four treatments, with non-subsoiling (NS), subsoiling (SS), non-subsoiling and urine (NSU), subsoiling and urine (SSU), and the urine treatments were applied at a rate of 700 kg N ha^{-1}. The results showed that 6 months after subsoiling, soil macroporosity in all treatments remained elevated at a depth of 0-20 cm ($p < 0.01$) compared with all non-subsoiling treatments. This created more aerobic conditions, which suppressed N_2O emissions from denitrification by 20.3% ($p < 0.05$) during 190 days after urine application (NSU vs. SSU). Additionally,

subsoiling had no significant effect on NO_3^--N leaching in the presence of winter-active Italian ryegrass. Molecular analysis of N-cycling microbial communities revealed that subsoiling had no effect on the abundance of *amoA* gene-carrying microorganisms involved in nitrification but reduced the abundance of *nirS* denitrifier genes, indicating that subsoiling primarily affected the denitrification process. These findings suggest that subsoiling can effectively reduce N_2O emissions without increasing NO_3^--N leaching when combined with winter-active ryegrass.

Li J, Hu W, Langer S, Malcolm BJ, Maley S, Jenkins H, Carey P 2026. Catch crops promote soil physical recovery after forage crop grazing. Soil and Tillage Research 255: 106778. https://doi.org/10.1016/j.still.2025.106778

Soil compaction-induced physical degradation is a threat to sustainable crop production and environmental performance. While measures have been evaluated to alleviate compaction, the impact of catch crops establishment on soil physical recovery following winter grazing remains underexplored. Six New Zealand trials over different years investigated: (1) the effects of soil compaction induced by winter forage crop grazing on soil health, and (2) the effectiveness of catch crops establishment in facilitating soil recovery. Our findings revealed that winter grazing resulted in significant soil physical degradation in the top 10 cm, evidenced by significant reduction in total porosity, macroporosity, available water content, saturated hydraulic conductivity (Ks), and soil quality *S* index. The degree of soil degradation was higher under increased grazing intensity (fodder beet grazing compared with kale grazing) and wetter conditions. For example, in Te Pirita-2019 with kale, changes in Ks were not significant. However, in Te Pirita-2019 with fodder beet, Ks decreased significantly from 1548 mm day^{-1} to 88 mm day^{-1}, representing a 94.3 % reduction. Compared with fallow after grazing, growing catch crops promoted soil restoration. Conventional moldboard ploughing and the recently introduced single-pass 'spader-drill' outperformed direct drill for soil recovery. This study highlighted the importance of catch crop establishment using conventional tillage and spade drill to mitigate soil degradation resulting from winter forage crop grazing. The spader-drill, where soil conditions allow, is preferred because it allows earlier sowing of catch crops, leading to broader benefits such as increased crop biomass and reduced nitrogen leaching.

Chang B, Chu Z, Zhu-Barker X, Ju X, Li S-L, Yan Z, Clough TJ 2026. A soil-specific model to predict N2O emissions from laboratory and field experiments. Soil Biology and Biochemistry 216: 110117. https://doi.org/10.1016/j.soilbio.2026.110117

Numerous models have been developed to simulate nitrous oxide (N_2O) emissions from agricultural soils, yet accurately capturing the spatial and temporal variability of soil N_2O fluxes remains a challenge. To better estimate soil N_2O emissions, we developed a statistical model based on the Gaussian function, with parameters that vary according to edaphic properties. A global database of N_2O emissions from agricultural soils, derived from laboratory incubation experiments, was established to parameterize, calibrate and validate the developed model. Simulations demonstrated that incorporating multiple edaphic properties, including

soil moisture, mineral nitrogen contents, carbon to nitrogen ratio, silt content, bulk density and soil depth, enabled reliable prediction of N_2O emissions from sieved soils. However, the initially parameterized model significantly overestimated emissions from intact soils. To address this, soil structure correction factors, quantified by bulk soil properties, were introduced into the model. Incorporating these structure corrections enabled the model to successfully predict N_2O emissions from intact soils, highlighting the importance of accounting for soil structure in models. The improved model was then employed to simulate N_2O emissions from different field sites with contrasting agricultural treatments, after further taking into account temperature effects. It effectively captured the temporal dynamics of N_2O fluxes, including the timing and magnitude of N_2O emission peaks, particularly under optimal N additions and long-term tillage. Overall, this soil-specific model provides a robust tool to predict the large spatiotemporal variations in N_2O fluxes across different soils under various environmental settings, which is critical for reducing uncertainty in large-scale estimates.

Feeding Aotearoa New Zealand people better: from farm to fork

This special issue of the Journal of the Royal Society of New Zealand, guest edited by Emeritus Professor Elaine Rush MRSNZ, Dr Fiona Curran-Cournane, and Professor Richard McDowell FRSNZ, touches on cross-cutting research that increases our understanding of nutritional health, equity, te ao Māori, environmental sustainability and socioeconomics.
Feeding Aotearoa New Zealand people better: from farm to fork: Journal of the Royal Society of New Zealand
The guest editors say in their editorial that the special issue identifies some gaps and tensions that need addressing for a fairer, more accessible, and more sustainable supply of good food for Aotearoa New Zealand now and in the future.

Macintosh, K. A., Thiange, C. X. O., Wright-Stow, A. E., Heffey, K., Cook, L., Millar, A., & McDowell, R. W. (2026). Assessment of good farming practice implementation by dairy farms in New Zealand: nutrient loss reductions and timeframes for detecting improvement. *Critical Insights in Agriculture*, *1*(1). https://doi.org/10.1080/29932106.2025.2572172

Good Farming Practices (GFP) decrease contaminant losses while minimising impacts on productivity and profitability. In this study we quantified GFP implementation in New Zealand in 2023 using the land area of dairy farms supplying milk to Fonterra Ltd (81% of the dairy sector) and estimated percentage reductions in nitrogen (N) and phosphorus (P) losses relative to 2015 baseline loss rates (kg ha^{-1} yr^{-1}). On average, nationally 64% of dairy land area had implemented GFP in 2023. This reduced N and P losses by 20% and 14%, respectively. Full GFP implementation should reduce losses by 37% for N and 26% for P. Predicted timeframes to reliably detect water quality improvements from dairy land with 64% GFP implementation ranged from 5 to >50 years, with an average of 36 years for N and 41 years for P. With full GFP, average detection times decreased to 18 years for N and 30 years for P. If non-dairy land was included without GFP implementation response times for improvement from dairy

actions may be longer. Our results suggest that GFP implementation on dairy land will lead to nutrient concentration reductions within 1–4 decades, on average, but may take longer without collective action across all land uses.

G. Shrestha, R. Calvelo-Pereira, P. Roudier, G. Kereszturi, P. Jeyakumar, A.P. Martin, R.E. Turnbull, C.W.N. Anderson. 2026. Rapid analysis of farm-scale soil cadmium concentrations using a regional soil spectral library. Geoderma Regional 44, e01063. https://doi.org/10.1016/j.geodrs.2026.e01063

Monitoring soil cadmium (Cd) at farm-scales (average 3 km^2) can potentially be rapid and cost-efficient by implementing proximal sensing techniques benefiting from a leveraged regional-scale (≥ 40,000 km^2) soil spectral library (RSSL). However, prediction models based on RSSL are often of limited use when applied at farm-scales because the coarseness of the RSSL. In this study, a New Zealand RSSL was used to assess the Cd concentration in a farm-scale sample set. For all samples, total Cd was determined, and visible-near-infrared (vis-NIR), mid-infrared (MIR), and portable X-ray fluorescence (pXRF) spectra were collected. A localisation technique to predict farm-scale Cd using RSSL spectral data was developed, based on spectral similarity or land use similarity relative to the farm-scale samples, and/or supplemented with selected farm-scale samples, as input for partial least squares regression and LOCAL algorithms. A model using MIR data from a RSSL pastoral samples subset (n = 283) spiked with 12 extra weighted (×4) farm-scale samples as an input for a LOCAL algorithm, quantified Cd optimally (root mean square error = 0.22 mg Cd/kg; concordance correlation coefficient = 0.78; ratio of performance to interquartile distance = 1.93). Spiking the RSSL subset with farm-scale samples, including otherwise under-represented attributes such as soil order and Cd concentration range, improved the performance of models predicting farm-scale total Cd concentrations. A hybrid technique of localisation approach considered in this study may reduce compliance costs for Cd surveying and management, benefiting farmers.

Jie Qiu, Di Zhao, Wei Hu, Chaopu Ti, Baojing Gu, Yu Wang, Xiaoyuan Yan, Yongqiu Xia. 2026. Revealing the overestimation of phosphorus fertilizer runoff to aquatic phosphorus pollution in China. Resources, Conservation and Recycling 225, 108626. https://doi.org/10.1016/j.resconrec.2025.108626

Phosphorus (P) fertilizer runoff provides a direct, rapid pathway to aquatic systems. Conventional assessments attribute about 25% of China's water P pollution to this source, but often overlook retention in hierarchical water systems. Using an integrated framework combining a P runoff database, Structural Equation Modeling, and a Water Network-based Nutrient Prediction Framework, we reassessed this rapid-response component nationally. Annual fertilizer P loss via runoff totaled 21.66 Gg, with substantial in-stream removal (19.5% by lakes/reservoirs, 27.9% by rivers) before reaching coastal waters. After accounting for cascade retention, current-year fertilizer runoff contributed 7.3% to P concentrations in lakes/reservoirs and 10.1% in rivers—well below previous estimates. While our study excludes legacy P from historical applications, it suggests that the immediate water quality impact of current fertilizer use has been overestimated. Effective management should broaden its focus beyond fertilizer

controls to encompass other sources, including accumulated soil P, while maintaining long-term fertilizer stewardship.

Richard W. Muirhead, Peter Green 2026. Management of critical source areas (CSAs) in pasture grazed by deer to reduce contaminant losses to water. Agricultural Water Management 324, 110106. https://doi.org/10.1016/j.agwat.2025.110106

Agriculture is important for producing food but can have environmental impacts on water quality. There is a need to develop mitigation strategies for pastoral farming systems to find a better balance between food production and environmental footprint. This study used a paired catchment experimental design to test the effectiveness of three mitigation strategies targeting the critical source areas (CSAs) that were ephemeral streams in deer grazed pastures. The runoff from four small catchments on the same hill slope (2.2-3.6 ha) was monitored for 2 years, under typical farm management. The mitigation options of: full fencing, partial fencing and temporary fencing was then applied to the CSA areas in three of the catchments. The fourth catchment was left unchanged as a control to account for different weather conditions in the pre- and post-treatment phases. Post-treatment monitoring was conducted for a further 2 years. The effectiveness of the mitigation options was calculated for both reducing contaminant concentrations (nitrogen, phosphorus, sediment and *E. coli*) under low-flow conditions and contaminant loads during storm events. The effectiveness of the three mitigation options for reducing low-flow concentrations ranged from not effective for filterable reactive phosphorus (FRP), total phosphorus (TP), and total suspended solids (TSS) to 83 % effective for reducing *E. coli*. The effectiveness of the three mitigation options for reducing storm-flow event loads ranged from not effective for FRP to 93 % effective for reducing *E. coli*. The CSA managements all mitigate multiple contaminants and hence will have multiple water quality benefits downstream.

Deadline..... for the next issue of Soil News is 4 May.

We are the New Zealand Soil News:
Editor: **John Drewry** – drewryj@landcareresearch.co.nz
Correspondents: **Thomas Caspari,** Bioeconomy Science Institute - Manaaki Whenua-Landcare Research (Lincoln); **Josie Mazzetto,** Lincoln University; **Callum Rees**, Massey University; **John Drewry**, Bioeconomy Science Institute - Manaaki Whenua - Landcare Research (Palmerston North); **Suzanne Lambie**, Bioeconomy Science Institute - Manaaki Whenua - Landcare Research (Hamilton); **Vitor de Jesus Martins Bianchini**, Waikato University; **Matt Taylor**, Waikato Regional Council (Hamilton); **Nicole Schon**, Bioeconomy Science Institute - AgResearch (Lincoln); **Juliet Clague**, Lincoln Agritech (Hamilton); **Richard Gillespie**, Bioeconomy Science Institute - Plant & Food (Lincoln); **Natalie Bartlett**, Bioeconomy Science Institute - AgResearch (Hamilton); **Matt Norris**, Bioeconomy Science Institute - Plant & Food (Ruakura); **Vacant**, Bioeconomy Science Institute - Scion