

Personal Details

Name of Organisation:	Centre for Ecology & Hydrology
Name of Person:	Bridget Anne EMMETT
Nationality:	British
Profession/specialisation:	Soil and Ecosystem Scientist
Position in organisation:	Head of Site, Section Head & CEH Soil Science Area Lead (Band 3)
Specialisation in organisation:	Soils, ecosystem science, climate change, air pollution, land management

Qualifications / Awards etc.

Marsh Award for Climate Change Research, British Ecological Society, 2016
 Fellow of the Learned Society of Wales, 2015
 Fellow of the British Society of Soil Science, 2015
 Fellow of the Royal Society of Biology, 2010
 Honorary Professorship, Bangor University, 2009
 PhD (Soil Ecology) University of Exeter 1990.
 Bachelor of Science (First Class Honours, Plant Science) University of Aberdeen 1985.

Career Outline

2009 - Return to duties as Head of Site CEH Bangor & Head of 'Emmett' Section (Band 3[S]) and appointed CEH Soils Science Area Lead
 2008 - 2008 Acting CEH Director Biogeochemistry (Band 2 [S]) (6 months)
 2004 - 2008 Head of Site Bangor, Deputy Director of Biogeochemistry, CEH, and Head of 'Emmett' Section (Band 3[S])
 2001 - 2004 Director of CEH-Bangor, Band 3[S]
 1998 - 2001 Principal Scientific Officer Band 4 [S], Centre for Ecology and Hydrology (CEH - a organisation formed from 4 NERC Institutes: ITE, IFE, IH and IVEM)
 1994 - 1998 Senior Scientific Officer Band 5 [S], ITE Bangor
 1988 - 1994 Higher Scientific Officer Band 6 [S], Institute of Terrestrial Ecology (ITE), Bangor

Membership of committees, boards etc.

2016 - Learned Society of Wales – Cellular, Molecular, Evolutionary, Organismal and Ecosystem Sciences Scrutiny Committee
 2016 - NERC Science Programme Advisory Group
 2016 - 2016 Specialist Adviser to House of Commons Environment Audit Committee Inquiry on Soil Health
 2015 - Chair of the NERC Soil Security Programme Advisory Board
 2014 - 2014 BBSRC Rothamsted Mid Term Review Panel
 2014 - 2016 Defra Smarter Environmental Legislation Working Group
 2014 - UK representative for EU COST Action – ClimMani: Climate Change Manipulation experiments in Terrestrial Ecosystems Networks and Outreach.
 2014 - 2014 BBSRC SARISA grant review panel
 2014 - Scientific Advisory Board for Department of Geosciences and Natural Resource Management, University of Copenhagen
 2014 - Welsh Water Independent Environment Advisory Panel
 2013 - 2014 RCUK UK Energy Research Centre Phase 3 Commissioning Advisory Group
 2013 - UK Land Use, Land Use Change and Forestry Greenhouse Gas Inventory Steering Committee
 2012 - 2013 NERC *ad hoc* Sustainable Use of Natural Resources Advisory Committee (covers Theme Leader duties)
 2012 - 2012 BBSRC Rothamsted Research Institute Assessment Panel
 2012 - 2013 Welsh Government Chief Scientist Bovine-TB Advisory Group
 2012 - 2014 UK National Ecosystem Assessment Follow-on Phase Expert Panel
 2012 - 2012 BBSRC Institute Strategic Programme Grant Review Panel

2011 - 2013	INRA Environment, Agro-ecosystem, Biogeochemical Cycles and Biodiversity (SOERE-ACBB) Assessment Panel
2010 -	Science Advisory Council for Wales (Advisory group for Welsh Gov. Chief Scientist)
2010 - 2010	NERC Moderating Panel for Network of Sensors RP call
2009 - 2013	Steering Committee of ESF funded ClimMani project (Climate change – Manipulation experiments in terrestrial ecosystems)
2009 -	UK Government Dept for Environment, Food and Rural Affairs Demonstration Catchment Advisory Panel
2009 - 2011	UK Government Dept for Environment, Food and Rural Affairs National Ecosystem Assessment Expert Panel
2009 - 2015	Welsh Assembly Government Land Use and Climate Change Group
2008 - 2016	Management Board of Wales Environment Research Hub
2007 - 2011	US EPA Review Group on N deposition Effects on Ecosystems
2007 - 2011	Steering Committee for the Centre for Integrated Research in the Rural Environment, Research and Enterprise Partnership, Bangor and Aberystwyth University (CIRRE)
2007 - 2009	BBSRC Review of Environmental Change Research Panel
2006 - 2010	Ecological Continuity Trust Steering Committee
2006 - 2009	UK NERC/BBSRC Soils Research Advisory Committee (SRAC)
2006 - 2013	Ecological Continuity Trust Steering Committee
2006 - 2008	UK Government Dept for Environment, Food and Rural Affairs Soils Action Plan Forum / Soils Advisory Forum
2005 - 2015	Steering Committee for Danish Climate Change Centre (CLIMAITE)
2004 -	UN/ECE Working Group on Effects, Joint Expert Group on Dynamic Modelling
2002 - 2005	Vice-President British Ecological Society
2001 - 2002	NERC Randall Report Implementation Group and NERC Corporate Development Group
1999 - 2002	Member of NERC Promotion Panel III
1999 - 2005	Member of NERC Global Nitrogen Enrichment Thematic Programme Steering Committee
1997 - 2000	Council member of British Ecological Society

Research Grants and Contracts currently held (ca. £9M competitively won grants and contracts currently held and led by BE)

- BBSRC Newton Fund UK-China Virtual Joint Centre for Improved Nitrogen Agronomy (CINAG), . PI T. Misselbrook (Rothamsted), CoIs **B Emmett (CEH)** and 4 others + 5 Chinese CoIs. £2,965,000 total, £500,000 managed by BE.
 - NERC eDNA: LOFRESH Understanding the ecological relevance of eDNA in freshwater lotic ecosystems. PI: Simon Creer (Bangor), CoI **B Emmett (CEH)** and 4 others. £1,000,000 total, £164k to CEH.
 - NERC Turf-2-Surf PI: Macronutrient project. Co-PIs: A. Wade (Reading) **B. Emmett (CEH)**, C. Jago (Bangor). Sept 2012 – Aug 2016. , £3,200,000 total. £2,000,000 to CEH managed by BE.
 - NERC Biodiversity and Ecosystem Services (BESS) small grant exploring spatial configurations of land management and implications for ecosystem services. PI: **B Emmett (CEH)**. £120k
 - Welsh Government Glastir Monitoring and Environment Evaluation Programme. PI: **B Emmett (CEH)** . 6th Sept 2012 – 31st Aug 2016. £8,490,000 total. 10 organisations as subcontractors
 - Defra funded Integrated Data and Modelling Platform. PI: **B Emmett (CEH)**. £600,000; 4 subcontractors
 - Defra Sustainable Intensification Platform Project 2 (landscape interactions). PI: Michael Winter (Exeter). £215,000 to CEH managed by **B Emmett (CEH)**.
 - Various other small contracts (< £100k) with JNCC, Defra etc.)
Projects recently completed
 - EPSRC Internet of the Wild Co-PIs: G Blair (Lancaster), **B Emmett (CEH)**, D Jones (Bangor). (July 2014 – Dec 2015), £370,000 total. £140,000 to BE.
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- NERC Innovate grant. PI: Piran White (York). £100k total. £25K to be managed by CoI **B. CEH/NERC National Capability UK Soil Observatory**. PI: M. Bailey (CEH) £500,000. Managed by **B Emmett (CEH)**
 - NERC Environmental Virtual Observatory Pilot. **NERC. BA Emmett (CEH)**, R Gurney (Reading) and A McDonald (Leeds) (Co-PIs) with 13 other institution and 17Co-Is. (July 2010 – Dec 2012), £2,000,000 total; £367,000 to CEH managed by BE.
 - EU Infrastructure facility for climate change - INCREASE. **BA Emmett** (PI for UK contribution) £7,000,000 total project. (Jan 2009 – Dec 2013); £750,000 to BE
 - EU NitroEurope. European research into the nitrogen cycle. 2006 – 2011. **EU. CEH Bangor component BA Emmett** (Co-I) for CEH component. (February 2008- March 2011), £350k total to BE.
 - Defra Terrestrial Umbrella; The Impacts of Nitrogen in Terrestrial Ecosystems. **DEFRA. BA Emmett** (PI and PM) with co-investigators from Imperial, York, Manchester Metropolitan University & Sheffield universities, James Hutton Institute, ADAS, Forest Research ((April 2007 -Oct 2011), £1,500,000 total; £300,000 to BE
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Research Areas

Particular interest in soils, biogeochemical and ecosystem science. Specific research areas include; impact of land management on natural capital and the implications for ecosystem services; impacts of air pollution and climate change on soils and ecosystem function; new knowledge systems exploiting advances in computer science. Specialist science focus is on soil health and function; biogeochemical cycling and implications for ecosystem structure and function including the nitrogen, phosphorus and carbon cycles, vegetation composition, water quality and greenhouse gas emissions. Techniques include national-scale surveys and monitoring, large long-term, field-scale manipulation experiments, range of field and laboratory techniques including the use of natural and enriched isotopes at the field scale and collaboration with ecosystem modellers. Income generation has come from a wide range of funders including NERC, EPSRC, DEFRA, EU & Welsh Government Examination board for PhD students for various universities in UK and abroad. International involvement includes over 9 EU projects over the last 10 years (acting as lead for the UK in 7 of these projects). Various past and on-going collaborative projects with groups internationally involving modelling, isotopic studies and meta-analysis of ecosystem experimental studies.

Current Role

Head of Site for CEH's Bangor station with *ca.* 50 staff and students with a focus on biogeochemistry and ecosystem function. Responsibilities as Head of Site CEH Bangor and Section Head include all personnel, financial and research activities of science staff. Staff have expertise covering ecophysiology, soils, ecology, biodiversity, catchment science, biogeochemistry, ecosystem science, coastal research and modelling. Lead for CEH Soils research coordinating all activities relating to soils research.

PUBLICATIONS

H-index = 42

Total publications = 135 journal papers

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Researcher id: D-6199-2011

<http://www.ceh.ac.uk/staff/bridget-emmett>

Refereed Journal Papers

1. Reinsch S, Koller E, Sowerby A, deDato G, Estiarte M, Guidolotti G, Kovacs-Lang E, Larsen KS, Liberati D, Penuelas J, Ransijn J, Robinson DA, Schmidt IK, Smith AR, Tietema A, Dukes JS, Beier C, **Emmett BA** (2017) Shrubland primary production and soil respiration diverge along European climate gradient. *Scientific Reports* 7: srep43952. DOI: 10.1038/srep43952.
2. Smart SM, Glanville HC, Blanes MC, Mercado LM, **Emmett BA**, Jones DL, Cosby BJ, Marrs RH, Butler A, Marshall MR, Reinsch S, Herrero-Jauregui C, Hodgson JG (2017) Leaf dry matter content is better at predicting above-ground net primary production than specific leaf area. *Functional Ecology*. DOI: 10.1111/1365-2435.142832.

3. Jones L., Norton L., Austin, Z., Browne, A.L., Donovan, D., **Emmett, B.A.**, Grabowski, Z.J., Howard D.C., Jones, J.P.G., Kenter, J.O., Manley, W., Morris C., Robinson, D.A., Short C., Siriwardena, G.M., Stevens C.J., Storkey, J., Waters, R.D., Willis, G.F. 2016. Stocks and flows of natural and human-derived capital in ecosystem services. *Land Use Policy* 52 (2016): 151-162.
4. Sharps, K., Masante, D., Thomas, A., Jackson, B., Redhead, J., May, L., Prosser, H., Cosby, **B.**, **Emmett, B.** & Jones, L. (2017) Comparing strengths and weaknesses of three ecosystem services modelling tools in a diverse UK river catchment. *Science of the Total Environment* 584-585:118-130.
5. Carey, J.C., Tang, J., Templer, P.H., Kroeger, K.D., Crowther, T.W., Burton, A, Dukes, J.S., **Emmett, B.**, Frey, S., Heskell, M., Jiang, L., Machmuller, M., Mohan, J.E., Panetta, A.M., Reich, P.B., Reinsch, S., Wang, X., Allison, S.D., Bamminger, C. Bridgham, S.D., Collins, S.L., Dato, G., Eddy, W.C., Enquist, B.J., Estiarte, M., Harte, J., Henderson, A., Johnson, B.R., Larsen, K.S, Luo, Y., Marhan, S., Melillo, J., Peñuelas, J., Pfeifer-Meister, L., Poll, C., Rastetter, E.B., Reinmann, A., Reynolds, L.L., Schmidt, I.K., Shaver, G.R., Strong, A.L., Suseela, V., Tietema, A. (2016) Temperature response of soil respiration largely unaltered with experimental warming. *Proceedings of the National Academy of Sciences*. 113: 13797 – 13802.
6. Crowther, T.W., Todd-Brown, K.E.O., Rowe, C.W., Wieder, W.R., Carey, J.C., Machmuller, M.B., Snoek, L.B, Fang, S., Zhou, G., Allison, S.D., Blair, J.M., Bridgham, S.D., Burton, A.J., Carrillo, Y., Reich, P.B., Clark, J.S., Classen, A.T., Dijkstra, F.A., Elberling, B., **Emmett, B.**, Estiarte, M., Frey, S.D., Guo, J., Harte, J., Jiang, L., Johnson, B.R., Kröel-Dulay, G., Larsen, K.S., Laudon, H., Lavellee, J.M., Luo, Y., Lupascu, M., Ma, L.N., Marhan, S., Michelsen, A., Mohan, J., Niu, S., Pendall, E, Peñuelas, J., Pfeifer-Meister, L., Poll, C., Reinsch, S., Reynolds, L.L., Schmidt, I.K., Sistla, S., Sokol, N.W., Templer, P.H., Treseder, K.K., Welker, J.M., & Bradford, M.A.(2016) Quantifying global soil C losses in response to warming. *Nature* 540: 104-108.
7. Dominguez MT, Smith AR, Reinsch S, **Emmett BA** (2016) Inter-annual variability of soil respiration in wet shrublands: do plants modulate its sensitivity to climate? *Ecosystems*. DOI: 10.1007/s10021-016-0062-3.
8. Estiarte M, Vicca S, Penuelas J, Bahn M, Beier C, **Emmett BA**, Fay PA, Hanson PJ, Hasibeder R, Kigel J, Kröel-Dulay G, Larsen SL, Lellei-Kovács E, Limousin JM, Ogaya R, Ourcival JM, Reinsch S, Sala OE, Schmidt IK, Sternberg M, Tielbörger K, Tietema A, Janssens IA (2016) Few multi-year precipitation-reduction experiments find a shift in the productivity-precipitation relationship. *Global Change Biology* 22: 2570-2581. DOI: 10.1111.gcb.13269.
9. **Emmett, B.A.**, Cooper D., Smart S., Jackson B., Thomas A., Cosby, B., Evans C., Glanville H., McDonald J.E., Malham, S.K., Marshall M., Jarvis S., Rajko-Nenow P., Webb, GP., Ward, S., Rowe E., Jones, L., Vanbergen, A.J., Keith, A., Carter, H., Pereira, M.G., Hughes, S., Robinson, I., Wade, A. and Jones, D.L. (2016). Spatial patterns and environmental constraints on ecosystem services at a catchment scale (In Press) *Science of the Total Environment*. 572: 1586-1600.
10. DeLuca T.H., Glanville, H.C., Harris, M., Emmett, B.A., Pingree, M.R.A., deSosa, L.L, Cerda-Moreno, C., (2015) A novel biologically-based approach to evaluating soil phosphorus availability across complex landscapes. *Soil biology and biochemistry* 88:110-119.
11. Keith AM, Griffiths RI, Henrys PA, Hughes S, Lebron I, Maskell LC, Ogle SM, Robinson DA, Rowe EC, Smart SM, Spurgeon D, Wood CM & Emmett BA (2015). Monitoring soil natural capital and ecosystem services utilising large-scale survey data. In: Stromberger, Lindbo & Comerford (eds.) *Soil Ecosystem Services*. ASA-CSSA-SSSA. doi:10.2136/2015.soilecosystemsservices.2014.0070
12. Jones L., Norton L., Austin, Z., Browne, A.L., Donovan, D., Emmett, B.A., Grabowski, Z.J., Howard D.C., Jones, J.P.G., Kenter, J.O., Manley, W., Morris C., Robinson, D.A., Short C., Siriwardena, G.M., Stevens C.J., Storkey, J., Waters, R.D., Willis, G.F. 2016. Stocks and flows of natural and human-derived capital in ecosystem services. *Land Use Policy* 52: 151-162
13. Robinson, D.A., S.B. Jones, I. Lebron, S. Reinsch, M.T. Domínguez, A.R. Smith, D.L. Jones, M.R. Marshall, and B.A. Emmett. 2016. Experimental evidence for drought induced alternative stable states of soil moisture, *Scientific Reports* (6: 20018)
14. Dominguez M.T., A. Sowerby, A.R. Smith, D.A. Robinson, S. Van Baarsel, R.T.E. Mills, M.R. Marshall, E. Koller, I. Lebron, J. Hall, B.A. Emmett. 2015. Sustained impact of drought

- on wet shrublands mediated by soil physical changes. *Biochemistry Letters*, DOI 10.1007/s10533-014-0059-y
15. Kroel-Dulay, G., Ransijn, J., Schmidt, I.K. Beier, C., Angelis, P., Dato G., Dukes, J.S., Emmett, B., Estiarte, M., Garadnai, J., Kongstad, J., Kovačcs-Lańg, E., Larsen, K.S., Liberati, D., Ogaya, R., Riis-Nielsen, T., Smith, A., Sowerby, A., Tietema, A., Penuelas, J., (2015) Increased sensitivity to climate change in disturbed ecosystems. *Nature Communications* 6:6682. DOI: 10.1038/ncomms7682
 16. Erisman, Jan Willem; Leach, Allison; Adams, Mark; Agboola, Julius I.; Ahmetaj, Luan; Alard, Didier; Austin, Amy; Awodun, Moses A.; Bareham, Simon; Bird, Theresa L.; Bleeker, Albert; Bull, Keith; Cornell, Sarah E.; Davidson, Eric; De Vries, Wim; Dias, Teresa; Emmett, Bridget; Goodale, Christine; Greaver, Tara; Haeuber, Richard; Harmens, Harry; Hicks, W. Kevin; Hogbom, Lars; Jarvis, Paul; Johansson, Matti; Russell, Zoe; McClean, Colin; Paton, Bill; Perez, Tibisay; Plesnik, Jan; Rao, Nalini; Schmidt, Susanne; Sharma, Yogendra B.; Tokuchi, Naoko; Whitfield, Clare P.. 2014 Nitrogen deposition effects on ecosystem services and interactions with other pollutants and climate change. In: Sutton, Mark A.; Mason, Kate E.; Sheppard, Lucy J.; Sverdrup, Harald; Haeuber, Richard; Hicks, W. Kevin, (eds.) *Nitrogen deposition, critical loads and biodiversity*. Dordrecht, Springer, 493-505.
 17. Jones, L.; Provins, A.; Holland, M.; Mills, G.; Hayes, F.; Emmett, B.; Hall, J.; Sheppard, L.; Smith, R.; Sutton, M.; Hicks, K.; Ashmore, M.; Haines-Young, R.; Harper-Simmonds, L.. 2014 A review and application of the evidence for nitrogen impacts on ecosystem services. *Ecosystem Services*, 7. 76-88. 10.1016/j.ecoser.2013.09.001
 18. Dominguez, Maria T., Sowerby, Alwyn, Smith, Andrew R., Robinson, David A., Van Baarsel, Susie, Mills, Rob T. E., Marshall, Miles R., Koller, Eva, Lebron, Inma, Hall, Jane, Emmett, Bridget A. (2015) Sustained impact of drought on wet shrublands mediated by soil physical changes. *Biogeochemistry* 122: 151 - 163
 19. Raffaelli, D., J.M. Bullock, S. Cinderby, I. Durance, B. Emmett, J. Harris, K. Hicks, T.H. Oliver, D. Paterson, and P.C.L. White. 2014. "Big Data and Ecosystem Research Programmes". *Advances in Ecological Research*. 51: 41-78
 20. Field, Chris D., Nancy B. Dise, Richard J. Payne, Andrea J. Britton, Bridget A. Emmett, Rachel C. Helliwell, Steve Hughes, et al. 2014. "The Role of Nitrogen Deposition in Widespread Plant Community Change Across Semi-natural Habitats". *Ecosystems*. (23).
 21. Mills, R. T. E., Tipping, E., Bryant, C. L., Emmett, B. A. (2014) Long-term organic carbon turnover rates in natural and semi-natural topsoils. *Biogeochemistry* 118: 257 – 272
 22. Jones, David L., Simfukwe, Paul, Hill, Paul W., Mills, Robert T. E., Emmett, Bridget A. (2014) Evaluation of Dissolved Organic Carbon as a Soil Quality Indicator in National Monitoring Schemes PLOS ONE 9: AR e90882
 23. Lawley, Russell, Emmett, Bridget A. and Robinson, David A. (2014) Soil observatory lets researchers dig deep. *Nature* 509: 427
 24. Rowe, E. C., Smart, S. M., Emmett, B. A. (2014) Phosphorus availability explains patterns in a productivity indicator in temperate semi-natural vegetation. *Environmental Science Processes and Impacts* 16: 2156- 2164
 25. Emmett, B.A.. 2013 An integrated ecological, social and physical approach to monitoring environmental change and land management effects: the Wales Axis II Monitoring and Evaluation Programme. In: Boatman, Nigel; Green, Mike; Marshall, Jon; Musters, Kees; Peach, Will; Peel, Steve; Siriwardena, Gavin; Smith, Barbara, (eds.) *Environmental Management on Farmland*. Wellesbourne, UK, Association of Applied Biologists, 31-39. *Aspects of Applied Biology*, 118.
 26. Maskell, L.C., Crowe, A., Dunbar, M.J., Emmett, B., Henrys, P., Keith, A.M., Norton, L.R., Scholefield, P., Clark, D.B., Simpson, I.C. & Smart, S.M. (2013) Exploring the ecological constraints to multiple ecosystem service delivery and biodiversity. *Journal of Applied Ecology*, **50**, 561-571.
 27. Mills, R.T.E., Dewhurst, N., Sowerby, A., Emmett, B.A. & Jones, D.L. (2013) Interactive effects of depth and temperature on CH₄ and N₂O flux in a shallow podzol. *Soil Biology & Biochemistry*, **62**, 1-4.
 28. Quilliam, R.S., Rangecroft, S., Emmett, B.A., Deluca, T.H. & Jones, D.L. (2013) Is biochar a source or sink for polycyclic aromatic hydrocarbon (PAH) compounds in agricultural soils? *Global Change Biology Bioenergy*, **5**, 96-103.
 29. Reynolds, B., Chamberlain, P.M., Poskitt, J., Woods, C., Scott, W.A., Rowe, E.C., Robinson, D.A., Frogbrook, Z.L., Keith, A.M., Henrys, P.A., Black, H.I.J. & Emmett, B.A. (2013) Countryside Survey: National "Soil Change" 1978-2007 for Topsoils in Great Britain-Acidity, Carbon, and Total Nitrogen Status. *Vadose Zone Journal*, **12**.

30. Robinson, D.A., Hockley, N., Cooper, D.M., Emmett, B.A., Keith, A.M., Lebron, I., Reynolds, B., Tipping, E., Tye, A.M., Watts, C.W., Whalley, W.R., Black, H.I.J., Warren, G.P. & Robinson, J.S. (2013) Natural capital and ecosystem services, developing an appropriate soils framework as a basis for valuation. *Soil Biology & Biochemistry*, **57**, 1023-1033.
31. Tipping, E. Rowe, E.E., Evans, C.D., Mills, R.T.E., Emmett, B.A., Chaplow, J.S., and Hall, J.R. 2012. N14C: A plant–soil nitrogen and carbon cycling model to simulate terrestrial ecosystem responses to atmospheric nitrogen deposition. *Ecological Modelling*, **247**, 11– 26
32. Richard S. Quilliam, Sally Rangecroft, Bridget A. Emmett, Thomas H. Deluca and Davey L. Jones, 2012. Is biochar a source or sink for polycyclic aromatic hydrocarbon (PAH) compounds in agricultural soils? *Global Change Biology Bioenergy*, DOI: 10.1111/gcbb.12007
33. L.R. Norton, L.C. Maskell, S.S. Smart, M.J. Dunbar, B.A. Emmett, P.D. Carey, P. Williams, A. Crowe, K. Chandler, W.A. Scott, and C.M. Wood, 2012. Measuring stock and change in the GB countryside for policy: Key findings and developments from the Countryside Survey 2007 field survey. *Journal of Environmental Management*, **113**, 117-127.
34. Beier, C., Beierkuhnlein, C., Wohlgemuth, T., Penuelas, J., Emmett, B., Korner, C., de Boeck, H., Christensen, J.H., Leuzinger, S., Janssens, I.A. and Hansen, K. 2012. Precipitation manipulation experiments - challenges and recommendations for the future. *Ecology Letters*, **15**, 899-911.
35. Blanes, M.C., Emmett, B.A., Vinegla, B. and Carreira, J.A. 2012. Alleviation of P limitation makes tree roots competitive for N against microbes in a N-saturated conifer forest: A test through P fertilization and N-15 labelling. *Soil Biology & Biochemistry*, **48**, 51-59.
36. Carter, M.S., Larsen, K.S., Emmett, B.A., Estiarte, M., Field, C., Leith, I.D., Lund, M., Meijide, A., Mills, R.T.E., Niinemets, U., Penuelas, J., Portillo-Estrada, M., Schmidt, I.K., Selsted, M.B., Sheppard, L.J., Sowerby, A., Tietema, A. and Beier, C. 2012. Synthesizing greenhouse gas fluxes across nine European peatlands and shrublands - responses to climatic and environmental changes. *Biogeosciences*, **9**, 3739-3755.
37. Holmstrup, M., Sorensen, J.G., Maraldo, K., Schmidt, I.K., Mason, S., Tietema, A., Smith, A.R., Emmett, B.A., Schmelz, R.M., Bataillon, T., Beier, C. and Ehlers B.K. 2012. Increased frequency of drought reduces species richness of enchytraeid communities in both wet and dry heathland soils. *Soil Biology & Biochemistry*, **53**, 43-49.
38. Jones, R., Causton, D., Emmett, B., Mur, L. and Gwynn-Jones, D. 2012. Latent soil effects of grazing and ammonium deposition on *Deschampsia flexuosa* tillers inserted and grown in heather moorland soil. *Environmental and Experimental Botany*, **81**, 72-78.
39. Phoenix, G.K., Emmett, B.A., Britton, A.J., Caporn, S.J.M., Dise, N.B., Helliwell, R., Jones, L., Leake, J.R., Leith, I.D., Sheppard, L.J., Sowerby, A., Pilkington, M.G., Rowe, E.C., Ashmorek, M.R. and Power, S.A. 2012. Impacts of atmospheric nitrogen deposition: responses of multiple plant and soil parameters across contrasting ecosystems in long-term field experiments. *Global Change Biology*, **18**, 1197-1215.
40. Rowe, E.C., Emmett, B.A., Frogbrook, Z.L., Robinson, D.A. and Hughes, S. 2012. Nitrogen deposition and climate effects on soil nitrogen availability: Influences of habitat type and soil characteristics. *Science of the Total Environment*, **434**, 62-70.
41. Robinson, D.A., Hockley, N., Dominati, E., Lebron, I., Scow, K.M., Reynolds, B., Emmett, B.A., Keith, A.M., de Jonge, L.W., Schjonning, P., Moldrup, P., Jones, S.B. and Tuller, M. 2012. Natural Capital, Ecosystem Services, and Soil Change: Why Soil Science Must Embrace an Ecosystems Approach. *Vadose Zone Journal*, **11**, DOI: 10.2136/vzj2011.0051
42. Templer, P.H., Mack, M.C., Chapin, F.S., Christenson, L.M., Compton, J.E., Crook, H.D., Currie, W.S., Curtis, C.J., Dail, D.B., D'Antonio, C.M., Emmett, B.A., Epstein, H.E., Goodale, C.L., Gundersen, P., Hobbie, S.E., Holland, K., Hooper, D.U., Hungate, B.A., Lamontagne, S., Nadelhoffer, K.J., Osenberg, C.W., Perakis, S.S., Schleppei, P., Schimel, Schmidt, J.I.K., Sommerkorn, M., Spoelstra, J., Tietema, A., Wessel, W.W. and Zak, D.R. 2012. Sinks for nitrogen inputs in terrestrial ecosystems: a meta-analysis of N-15 tracer field studies. *Ecology*, **93**, 1816-1829.
43. Stevens, C.J., Smart, S.M., Henrys, P.A., Maskell, L.C. Crowe, A., Simkin, J., Cheffings, C.M., Whitfield, C., Gowing, D.J.G., Rowe, E.C., Dore, A.J. and Emmett, B.A. 2012. Terricolous lichens as indicators of nitrogen deposition: Evidence from national records. *Ecological Indicators*, **20**, 196-203.
44. Henrys, P.A., Stevens, C.J., Smart, S.M., Maskell, L.C., Walker, K.J., Preston, C.D.,

- Crowe, A., Rowe, E.C., Gowing, D.J. and Emmett, B.A. 2011. Impacts of nitrogen deposition on vascular plants in Britain: an analysis of two national observation networks. *Biogeosciences*, 8, 3501-3518.
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