

Dr. Marianne Bechmann

NIBIO – Norwegian Institute of Bioeconomy Research

Born: 6th February 1959
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Current position: Research professor

Career (post-PhD)

2015 – Research professor, Norwegian Institute of Bioeconomy Research - NIBIO
2013 – Research professor, Norwegian Institute for Agricultural and Environmental Research
2012 - Senior scientist, Norwegian Institute for Agricultural and Environmental Research
2008 - Head of department Land Use and Water Quality, Norwegian Institute for Agricultural and Environmental Research
2006 - Senior scientist, Norwegian Institute for Agricultural and Environmental Research

Education

2005 PhD *The phosphorus index tool for assessing phosphorus transfer from agricultural areas in Norway*. Norwegian University of Life Sciences, Norway
1985 MSc. from The Royal Veterinary and Agricultural University, Denmark

International exchange

2016 Department of Bioscience, Århus University, Denmark. 1 month scientific exchange
2015 Department of Bioscience, Århus University, Denmark. 2.5 months scientific exchange
2002 USDA-ARS State College, Pennsylvania, USA – 7 months exchange related to PhD-studies.

Project leader (last five years):

- 2018-2019. "Effects of extreme weather on agricultural production and environment". A Nordic network funded by the Nordic Joint Committee for Agricultural and Food Research (NKJ).
- 2002-d.d. "The Norwegian Agricultural Environmental Programme (JOVA)". Project leader for soil erosion and nutrient losses. Funded by the Ministry of Agriculture and Food.
- 2007-d.d. "Effective production systems with least negative effects on the climate and water quality". Funded by Ministry of Agriculture and Food.
- 2013-2019. "Soil tillage effects at low erosion risk – the Kjelle plot study". Funded by Norwegian Agriculture Agency.
- 2016. "Evaluation and revision of management plan for lake Tunevann". Funded by Sarpsborg municipality.
- 2016. "Evaluation of the Norwegian manure legislation with regards to effects on greenhouse gas emissions and loss of ammonia to air and nitrogen to water". Funded by Norwegian Environment Agency.
- 2011-2014. "Effects of reduced soil tillage". Funded by the The Norwegian foundation of soil and peat investigations.
- 2009-2014. "Reference conditions for phosphorus runoff from forested areas with arable soil properties". Funded by the Norwegian research council.
- 2009-2013. "Effect of peat and organic soil on water quality in agricultural areas". Funded by the The Norwegian foundation of soil and peat investigations.

Books and journals

- Guest editor of a special issue. 2015. Nutrient status of soil and its consequences for yield and environment in China and Norway. *Acta Agriculturae Scandinavica*. Vol. 65.
- Guest editor of a special issue. 2014. Nitrogen losses from agriculture in the Baltic Sea region. *Agriculture, Ecosystems and Environment*. Vol 198.
- Book editor: Bechmann, M. and Deelstra, J. 2013. *Agriculture and Environment – Long Term Monitoring in Norway*. Akademika Publishing, Trondheim, Norway, ISBN nr. 978-82-321-0014-9. 392pp.
- Guest editor of a special issue. 2012. Soil Erosion in Nordic countries. Special Issue of *Acta Agriculturae Scandinavica*, 62, Suppl. 2.

Most relevant scientific positions

- Member of the Nordic Centre of Excellence - BIOWATER
- Associate editor of *Journal of Environmental Quality* 2014-2016.
- Co-convenor for session at the EGU, Vienna, Austria, 2015, 2016 and 2017.
- Scientific committee for the International interdisciplinary conference on Land Use and Water Quality 2015 and 2017 (LuWQ)

Selected peer-reviewed publications (total 46)

- Bol, R., Gruau, G., Mellander, P.E., Dupas, R., **Bechmann, M.**, Skarbøvik, E., Bieroza, M., Djodjic, F., Glendell, M., Jordan, P., VanderGrift, B., Rode, M., Smolders, E., Verbeeck, M., Gu, S., Klumpp, E., Pohle, I., Fresne, M., Gascuel-odoux, C. 2018. Challenges of reducing phosphorus based water eutrophication in the agricultural landscapes of Northwest Europe. *Frontiers in Marine Research*, section Marine Biogeochemistry Vol 5 Article 276. doi.org/10.3389/fmars.2018.00276.
- Cassidy, R., Jordan, P., **Bechmann, M.**, Kronvang, B., Kyllmar, K., Shore, M. 2018. Assessments of composite and discrete sampling approaches for water quality monitoring. DOI: 10.1007/s11269-018-1978-5
- M.Z. Bieroza, A.L. Heathwaite, M. **Bechmann**, K. Kyllmar and P. Jordan. 2018. The concentration-discharge slope as a tool for water quality management. *Science of the total environment*.
- Jian Liu , Peter J. A. Kleinman, Helena Aronsson, Don Flaten, Richard W. McDowell, Marianne **Bechmann**, Douglas B. Beegle, Timothy P. Robinson, Ray B. Bryant, Hongbin Liu, Andrew N. Sharpley, Tamie L. Veith. 2018. A review of regulations and guidelines related to winter manure application. *Ambio* DOI 10.1007/s13280-018-1012-4.
- Per-Erik Mellander, Phil Jordan, Marianne **Bechmann**, Ophélie Fovet, Mairead M. Shore, Noeleen T. McDonald & Chantal Gascuel-Odoux. 2018. Integrated climate-chemical indicators of diffuse pollution from land to water. *SCIENTIFIC REPortS* | (2018) 8:944 | DOI:10.1038/s41598-018-19143-1.
- Bispo, D.F.V., Silva, M.L.N., Marques, J.J.G.S.M., **Bechmann, M.**, Batista, P.V.G., Curi, N. 2017. Phosphorus transfer at a small catchment in southeastern Brazil: distributed modelling in different land use scenarios. *Ciência e Agrotecnologia*, 41(5):565-579, Sep/Oct. 2017. <http://dx.doi.org/10.1590/1413-70542017415012217>.
- Refsgaard, K., **Bechmann, M.** 2016. Cost-effectiveness of tillage methods to reduce phosphorus loss from agricultural land. *Journal of Environmental Planning and Management*, 2016. <http://dx.doi.org/10.1080/09640568.2015.1082902>.
- Sharpley, A., Bergstrom, L., Aronsson, H., **Bechmann, M.**, Bolster, C.H., Borling, K., Djodjic, F., Jarvie, H., Schoumans, O., Stamm, C., Tonderski, K., Ulen, B., Uusitalo, R., Withers. P. 2015. Future agriculture with minimized phosphorus losses to waters: Research needs and direction. *AMBIO* 2015, 44 (Suppl. 2): S163–S179 DOI 10.1007/s13280-014-0612-x

- Paruch, L., Paruch, A., Blankenberg, A.-G.B., **Bechmann**, M., Mæhlum., T. **2015**. Application of host-specific genetic markers for microbial source tracking of faecal water contamination in an agricultural catchment. 2015. *Acta Agriculturae Scandinavica*, Section B – Soil and plant Science, Vol 65, No Supplement 2, 164-172
- Pengerud, A., Stålnacke, P., **Bechmann**, M., Blicher-Mathiesen, G., Iital, A., Koskiahho, J., Kyllmar, K., Lagzdins, A., Povilaitis, A. **2015**. Temporal trends in phosphorus concentrations and losses from agricultural catchments in the Nordic and Baltic countries. *Acta Agriculturae Scandinavica*, Section B – Soil and plant Science, Vol 65, No Supplement 2, 173-185
- Kronvang, B., **Bechmann**, M. **2015**. Agriculture and stream water quality – future challenges for monitoring. *Acta Agriculturae Scandinavica*, Section B – Soil and plant Science, Vol 65, No Supplement 2, 139-143
- Bechmann**, M., **2014**. Long-term monitoring of nitrogen in surface and subsurface runoff from small agricultural dominated catchments in Norway. *Agriculture, Ecosystems and Environment* 198 (2014) 13-24
- Bechmann**, M. **2014**. The effect of phosphorus application and balance on concentrations of phosphorus in streams from agricultural dominated catchments in Norway. *Acta Agriculturae Scandinavica* Section B — Soil & Plant Science, 63: sup2, 162-171
- Bechmann**, M., Blicher-Mathiesen, G., Kyllmar, K., Iital, A., Lagzdins, A., Salo, T., **2014**. Nitrogen application, balances and the effect on nitrogen concentrations in runoff from small catchments in the Nordic-Baltic countries. *Agriculture, Ecosystems and Environment* 198 (2014) 104-113
- Andersen, H.E., Blicher-Mathiesen, G., **Bechmann**, M., Povilaitis, A., Iital, A., Lagzdins, A., Kyllmar, K., **2014**. Mitigating diffuse nitrogen losses in the Nordic-Baltic countries. *Agriculture, Ecosystems and Environment* 198 (2014) 127-134
- Kyllmar, K., **Bechmann**, M., Deelstra, J., Blicher-Mathiesen, G., Iital, A., Jansons, V., Koskiahho, J., Povilaitis, A., **2014**. Long-term monitoring of nutrient losses from agricultural catchments in the Nordic and Baltic region - A discussion of methods, uncertainties and future needs. *Agriculture, Ecosystems and Environment* 198 (2014) 4-12
- Øygarden, L., Deelstra, J., Lagzdins, A., **Bechmann**, M., Greipsland, I., Kyllmar, K., Povilaitis, A., Iital, A. **2014**. Climate change and the potential effects on hydrology and nitrogen losses. *Agriculture, Ecosystems and Environment* 198, 114-126.
- Bechmann**, M., Chen, X., Øygarden, L. **2014**. Preface for the 'Special Issue: Nutrient status, yields and water quality in Norway and the Heilongjiang province in China. *Acta Agriculturae Scandinavica*, section B. Plant and soil. 97-99.
- Bechmann**, M. **2014**. The effect of phosphorus application and balance on concentrations in streams from agricultural dominated catchments in Norway. *Acta Agriculturae Scandinavica*, section B. Plant and soil. 162-171.
- Schoumans, O., Chardon, W.J., **Bechmann**, M.E., Gascuel-Oudou, C., Hofman, G., Kronvang, B., Rubæk, G.H., Ulén, B., Dorioz, J-M. **2014**. Mitigation options to reduce phosphorus losses from the agricultural sector and improve surface water quality: A review. *Science of the Total Environment* – 468-469, 1255-1266.
- Farkas, C., Beldring, S., **Bechmann**, M., and Deelstra, J. **2013**. Soil erosion and phosphorus losses under variable land use as modelled by the INCA-P model. *Soil Use and Management* 29, 124–137.
- Bechmann**, M., Deelstra, J. (eds.) **2013**. *Agriculture and Environment – Long Term Monitoring in Norway*. Akademika Publishing, Trondheim. ISBN 978-82-321-909014-9. 392p.
- Skøien, S.E., Børresen, T. & **Bechmann**, M. **2012**. Effect of tillage methods on soil erosion in Norway. *Acta Agriculturae Scandinavica* Section B. Soil and Plant 62, Suppl. 2, 191-198.
- Bechmann**, M. **2012**. Effect of tillage on sediment and phosphorus losses from a field and a catchment in south eastern Norway. Special Issue on Soil in erosion in Nordic countries. *Acta Agriculturae Scandinavica*, section B. Plant and soil 62, Suppl. 2, 206-216.

- Schoumans, O., Chardon, W.J., **Bechmann**, M.E., Gascuel-Oudou, C., Hofman, G., Kronvang, B., Rubæk, G.H., Ulén, B., Dorioz, J-M. **2014**. Mitigation options to reduce phosphorus losses from the agricultural sector and improve surface water quality: A review. *Science of the Total Environment* – 468-469, 1255-1266.
- Withers, P.J.A., May, L., Jarvie, H.P., Jordan, P., Doody, D., Foy, R.H., **Bechmann**, M., Cooksley, S., Dils, R., Deal, N. **2012** Nutrient emissions to water from septic tank systems in rural catchments: uncertainties and implications for policy. *Env. Science & Policy*, 24, 71-82.
- Ulen, B., **Bechmann**, M., Øygarden, L. **2012**. Erosion in the Nordic countries – An introduction. *Acta Agriculturae Scandinavica Section B. Soil and Plant* 62, Suppl. 2, 1-5.
- Ulén, B., Aronsson, H., Bechmann, M., Krogstad, T., Øygarden, L., Stenberg, M. 2010. Soil tillage methods to control phosphorus loss and potential side-effects: a Scandinavian review. *Soil Use and Management* 26, 94-107
- Bechmann**, M., Stålnacke, P., Kværnø, S., Eggestad, H.O., Øygarden, L. **2009**. Integrated risk assessment in agricultural management of soil erosion and losses of phosphorus and nitrogen. *Science of the total Environment* 407, 749-759
- Stålnacke, P., Pengerud, A., **Bechmann**, M., Garnier, J., Humborg, C., Novotny, V. **2009**. Nitrogen driving force and pressure relationships at contrasting scales: implications for catchment management. *International Journal of River Basin Management* 7(3), 221-232
- Heckrath, G. **Bechmann**, M., Ekholm, P., Ulén, B., Djodjic, F., Andersen, H.E. **2008**. Review of indexing tools for identifying high risk. *J. of Hydrology* 349, 68-87.
- Bechmann**, M., Deelstra, J., Stålnacke, P., Eggestad, H.O., Øygarden, L., Pengerud, A. **2008**. Monitoring catchment scale agricultural pollution in Norway – policy instruments, implementation of mitigation methods and trends in nutrient and sediment losses. *Environmental Science and Policy* 11, 102-114.
- Ulén, B., **Bechmann**, M., Følster, J., Jarvie, H.P., Tunney, H. **2006**. Agriculture as a phosphorus source for eutrophication in the northwest European countries Norway, Sweden, United Kingdom and Ireland. *Soil Use and Man.* 23(1), 5-15
- Bechmann**, M., Berge, D., Eggestad, H.O., Vandsemb, S. **2005**. Phosphorus transfer from agricultural areas and its impact on the eutrophication of lakes - two long-term integrated studies from Norway. *J. Hydrology* 304 (1-4): 238-250.

Other selected publications

- Bechmann**, M., Stenrød, M., Greipsland, I., Hauken, M., Deelstra, J., Eggestad, H. O., Tveiti, G. **2017**. Erosjon og tap av næringsstoffer og plantevernmidler fra jordbruksdominerte nedbørfelt. Sammendragsrapport fra Program for jord- og vannovervåking i landbruket (JOVA) for 1992-2016. NIBIO Report 2 (71). 92 s.
- Hellsten, S., Dalgaard, T., Rankinen, K., Tørseth, K., Kulmala, A., Turtola, E., Moldan, F., Pira, K., Piil, K., Bakken, L., **Bechmann**, L. and Olofsson, S. 2017. Nordic nitrogen and agriculture Policy, measures and recommendations to reduce environmental impact. *TemaNord* 2017:547.
- Bechmann**, M., Prestvik, A., Morken, J., Nesheim, L., Grønlund, A. **2016**. Gjødelsvareforskriften – evaluering av forslag til krav i gjødelsvareforskriften for å redusere klimagassutslipp, ammoniakktap og nitrogenavrenning fra jordbruket. NIBIO Report 2(133).
- Bechmann**, M., Kværnø, S., Turtumøygard, S., Haande, S., Poverud, L.M. **2016**. Evaluering og revidering av tiltaksanalyse for Tunevann. NIBIO Report 2(115).
- Bechmann**, M., Collentine, D., Gertz, F., Graversgaard, M., Hasler, B., Helin, J., Jacobsen, B., Rankinen, Refsgaard, K. **2016**. Water management for agriculture in the Nordic countries. Background document for NJF-seminar 487. NIBIO Report 2(2). 60p.
- Bechmann**, M. Kværnø, S.H., Eklo, O.M. **2016**. Kjelle avrenningsforsøk. Årsrapport 2014-2015 for jordarbeidingsforsøk på lav erosjonsrisiko. NIBIO Report 1(80). 66p.