CV - Brian Keith Sorrell

Plant Ecophysiologist & Associate Professor at Aarhus University. Co-author and Editor of the textbooks *Arctic Sea Ice Ecology* and *Freshwaters of New Zealand.* Honorary Life Member of the New Zealand Society of Freshwater Scientists.

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Born 31 December 1961, Auckland, New Zealand. Nationality: New Zealand

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Publications:
109 papers in peer reviewed scientific journals (66 as first or last author), 2 peer-reviewed books and 6 peer-reviewed reviews or book chapters.

Citation Metrics (as of 23 May 2022) in Google Scholar: Sum of Times Cited **5573**; i10-index **91**; h-index: **39.**

Education:
1988 PhD in Botany, University of Auckland, NZ
1983 BSc in Botany, University of Auckland, NZ

Positions:
2008-now: Associate Professor, Department of Biology, Aarhus University, Denmark
1996-2008 Principal Scientist and Group Manager, NIWA, Christchurch, New Zealand
1993-1996 Assistant Professor, Department of Plant Ecology, Aarhus University, Denmark
1987-1993 Research Scientist, Murray-Darling Freshwater Research Centre, Australia

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Teaching Profile

Aarhus University – Basic courses (1st&2nd year): 'Biological Research in Theory and Practice', 'Plant Structure, Function and Metabolism', 'Ecology'.

Aarhus University – Advanced courses (3rd&4th year): 'Aquatic Biology', 'Plant Ecophysiology', 'Freshwater Ecosystems', 'Plant Biology and Biotechnology', 'Experimental Evolutionary Biology'

Aarhus University in collaboration with Greenland Institute for Natural Resources/Pinngortitaleriffik: 'Arctic Research Partnership: Sea Ice Ecosystems'.

Aarhus University PhD-courses: 'Postgraduate Course in Scientific Writing and Speaking', 'Use of Wetlands in Water Pollution Control'

MSc students supervised or co-supervised: 23**; PhD students supervised or co-supervised:** 9

Scientific Profile: Prof. Sorrell's research expertise is on understanding how plants in aquatic ecosystems acquire carbon in photosynthesis, sustain their growth and productivity, and control ecosystems. His work on primary production and photosynthesis has spanned a uniquely wide range of plant types, from single-celled algae in the Arctic and Antarctica to mangrove trees. His research has contributed to establishing the limits of photosynthetic performance in aquatic environments, understanding how plant photosynthesis and respiration controls their distribution and abundance in lakes and wetlands, and the role of plants in carbon cycling and greenhouse gas balances in wetlands. He also pioneered the application of chlorophyll fluorescence techniques for quantifying distribution and abundance of microscopic algae in sea ice, including research establishing new minimum light intensities necessary for photosynthesis in the plant kingdom.

His work is published in high-impact peer-reviewed journals such as *Limnology and Oceanography, New Phytologist, Journal of Ecology, Science of the Total Environment*, and *Journal of Geophysical Research*. Prof. Sorrell has been on the editorial review boards of *Functional Ecology, Aquatic Botany*, and *NZ Journal of Marine and Freshwater Research*. He has more than 20 years' experience as programme leader on large externally funded research programmes including in both New Zealand and Denmark.

Recent Research Grants:

2021: 2.2 mill DKK, EU Horizon Climate and Research Programme: WET HORIZONS - upgrading knowledge and solutions to fast-track wetland restoration across Europe

2021: 668.858 DKK, Carlsberg Foundation: High Resolution Automated Greenhouse Gas Analysers for Freshwater Ecosystems

2020: 2.9 mill DKK, Danish Council for Independent Research (FNU-thematic research): From Sink to Source: Maximising Carbon Accumulation in Restored Peatlands

2014: 2.0 mill DKK, The Innovation Fund – international projects: CINDERELLA Comparative analysis, Integration and Exemplary Implementation of Climate Smart Land Use Practices on Organic Soils – Progressing Paludicultures after Centuries of Peatland Destruction and Neglect.

Management and Outreach Roles:

Technical Consultant to New Zealand Ministry for the Environment Wetland Classification Scheme and Science-based Indicators of Wetland Condition. Co-author of Manual for Monitoring Wetland Condition. Secretary-Treasurer of the New Zealand Freshwater Sciences Society. Trustee of the National Wetland Trust of New Zealand. Environmental consulting work with District and Regional Councils and hydro-electric power companies on effects of water management on wetlands; on weed invasion of wetlands; on pollution effects on lakes and rivers; on development of water quality standards for protecting wetlands; on national standards for setting environmental flows; on status and trends in lake water quality.

International Research Collaboration:

Dr Cath Lovelock, Centre for Marine Studies, University of Queensland (Australia)
Dr Peter van Bodegom, Dept Systems Ecology, Free University of Amsterdam (The Netherlands)
Dr Ian Hawes, University of Canterbury, Christchurch (NZ)
Dr Ilka Peeken, Alfred Wegener Institute, Bremerhaven, Germany
Dr Siyuan Ye, Qingdao Inst. of Marine Geology, China
Prof Leon Lamars, Drs Christian Fritz & Jeroen Guerts, Radboud University, The Netherlands

Member of the Australian Society of Plant Scientists; Australian Freshwater Sciences Society; New Zealand Freshwater Sciences Society; International Society for Plant Anaerobiosis.

Publication List – Brian K. Sorrell

Peer-reviewed Monograph:

Lund-Hansen LC, Søgaard DH, **Sorrell BK**, Gradinger R, Meiners KM (2020) *Arctic Sea Ice Ecology: Seasonal Dynamics in Algal and Bacterial Productivity.* Springer Nature Switzerland AG, Cham, Switzerland, ISBN 978-3-030-37472-3

Peer-reviewed publications:

109 (66 as first or last author).

Citation Metrics (as of 23 May 2022) in Google Scholar: Sum of Times Cited **5573**; i10-index **91**; h-index: **39.**

Peer-reviewed Articles in the last 5 years:

1. Vroom RJE, van den Berg M, Pangala SR, van der Scheer OE,, **Sorrell BK**. (2022) Physiological processes affecting methane transport by wetland vegetation - a review. *Aquatic Botany*, in press.

2. Jespersen E, Kirk GH, Eller F, Brix H, **Sorrell BK** (2021) Shade and salinity responses of two dominant coastal wetland grasses: implications for light competition at the transition zone. *Annals of Botany* 128: 469-480. (Impact factor 4.357)

3. Lund-Hansen LC, Bjerg-Nielsen M, Stratmann T, Hawes I, **Sorrell BK** (2021) Upwelling irradiance below sea ice – PAR intensities and spectral distributions. *Journal of Marine Science and Engineering* 9: art. no. 830, doi: 10.3390/jmse9080830

4. **Sorrell BK**, Hawes I, Stratmann T, Lund-Hansen LC (2021) Photobiological effects on ice algae of a rapid whole-fjord loss of snow cover during spring growth in Kangerlussuaq, a West Greenland Fjord. *Journal of Marine Science and Engineering* 9: art. no. 814, doi: 10.3390/jmse9080814.

5. Eller F, Arias CA, **Sorrell BK**, Brix H (2021) Wetland ecosystems – functions and use in a changing climate. *Hydrobiologia* 848: 3255-3258.

6. Søgaard DH, **Sorrell BK**, Sejr MK, Andersen P, Rysgaard S, Hansen PJ, Skytta A, Lemcke S, Lund-Hansen LC (2021) An under-ice bloom of mixotrophic haptophytes in low nutrient and freshwater-influenced Arctic waters. *Scientific Reports* 11: art. no. 2915, doi: 10.1038/s41598-021-82413-y.

7. Lund-Hansen LC, Petersen CM, Søgaard DH, **Sorrell BK** (2021) A comparison of decimeter scale variations of physical and photobiological parameters in a late winter first-year sea ice in southwest Greenland. *Journal of Marine Science and Engineering* 9: art. no. 60, doi: 10.3390/jmse9010060.

8. Manolaki P, Tooulakau G, Byberg CU, Eller F, **Sorrell BK**, Klapa MI, Riis T (2020) Probing the response of the amphibious plant *Butomus umbellatus* to nutrient enrichment and shading by integrating ecophysiological with metabolomics analyses. *Frontiers in Plant Science* 11: art. no. 581787, doi: 10.3389/fpls.2020.581787.

9. Lambertini C, Gou WY, Ye SY, Eller F, Guo X, Li XZ, **Sorrell BK**, Speranza M, Brix H (2020) Phylogenetic diversity shapes salt tolerance in *Phragmites australis* estuarine populations in East China. *Scientific Reports* 10: art. no. 17645, doi. 10.1038/s41598-020-74727-0.

10. Lund-Hansen LC, Hawes I, Hancke K, Salmansen N, Nielsen JR, Balslev L, **Sorrell BK** (2020) Effects of increased irradiance on biomass, photobiology, nutritional quality, and pigment composition of Arctic sea ice algae. *Marine Ecology Progress Series* 648: 95-110, doi.org/10.3354/meps13411. (Impact factor 2.380)

11. Jørgensen A, **Sorrell BK**, Eller F (2020) Carbon assimilation through a vertical light gradient in the canopy of invasive herbs grown under different temperature regimes is determined by leaf and whole-plant architecture. *AoB PLANTS* 12: art. no. plaa031, doi.org/10.1093/aobpla/plaa031.

12. Geurts JJM, Oehmke C, Lambertini C, Eller F, **Sorrell BK**, Mandiola SR, Grootjans AP, Brix H, Wichtmann W, Lamers LPM, Fritz C (2020). Nutrient removal potential and biomass production by *Phragmites australis* and *Typha latifolia* on European rewetted peat and mineral soils. *Science of the Total Environment* 747: art. no. 141102, doi.org/10.1016/j.scitotenv.2020.141102. (Impact factor 6.551)

13. Manolaki P, Mouridsen MB, Nielsen E, Olesen A, Jensen SM, Lauridsen TL, Baattrup-Pedersen A, **Sorrell BK**, Riis TA (2020) A comparison of nutrient uptake efficiency and growth rate between different macrophyte growth forms. *Journal of Environmental Management* 274: art. no. 111181, doi.org/10.1016/j.jenvman.2020.111181.

14. Eller F, Ehde PM, Oehmke C, Ren L, Brix H, **Sorrell BK**, Weisner SEB (2020) Biomethane yield from different European *Phragmites australis* genotypes, compared with other herbaceous wetland species grown at different fertilization regimes. *Resources 9,* doi.org/10.3390/resources9050057

15. Sola J, **Sorrell BK**, Olesen B, Jørgensen MS, Lund-Hansen LC (2020) Acute and prolonged effects of variable salinity on growth, gas exchange and photobiology of eelgrass (*Zostera marina* L.). *Aquatic Botany* 165: art. no. 103236, doi.org/10.1016/j.aquabot.2020.103236

16. Lund-Hansen LC, Bendtsen J, Stratmann T, Tonboe R, Olsen SM, Markager S, **Sorrell BK** (2020) Will low primary production rates in the Amundsen Basin (Arctic Ocean) remain low in a future ice-free setting, and what governs this production? *Journal of Marine Systems* 205; art. No. 103287, doi.org/10.1016/j.jmarsys.2019.103287. (Impact factor 2.538)

17. Forrest AL, Lund-Hansen LC, **Sorrell BK**, Bowden-Floyd I, Lucieer V, Cossu R, Lange BA, Hawes I (2019) Exploring spatial heterogeneity of Antarctic sea ice algae using an autonomous underwater vehicle mounted irradiance sensor. *Frontiers in Earth Science* 7: art. no. 169, doi: 10.3389/feart.2019.00169.

18. Ren L, Eller F, Lambertini C, Guo W-Y, Brix H, **Sorrell BK**. (2019) Assessing nutrient responses and biomass quality for selection of appropriate paludiculture crops. *Science of the Total Environment* 664: 1150-1161. (Impact factor 6.551)

19. Du J, Zhang Y, Qv M, Li K, Yin X, **Sorrell BK**, Wei M, Ma C (2019) The effects of ZnO nanoparticles on leaf litter decomposition under natural sunlight. *Environmental Science: Nano* 6: 1180-1188.

20. Ren L, Eller F, Lambertini C, Guo W-Y, **Sorrell BK**, Brix H (2018) Minimum Fe requirement and toxic tissue concentration of Fe in *Phragmites australis*: A tool for alleviating Fe-deficiency in constructed wetlands. *Ecological Engineering* 118: 152-160.

21. Lund-Hansen LC, Hawes I, Nielsen MH, Dahllöf I, **Sorrell BK** (2018) Summer meltwater and spring sea ice primary production, light climate and nutrients in an Arctic estuary, Kangerlussuaq, west Greenland. *Arctic, Antarctic, and Alpine Research* 50, art. no. e1414468. doi: 10.1080/15230430.2017.1414468 (Impact factor 2.231)

22. Lund-Hansen LC, Juul T, Eskildsen TD, Hawes I, **Sorrell BK**, Melvad C, Hancke K (2018) A low-cost remotely operated vehicle (ROV) with an optical positioning system for under-ice measurements and sampling. *Cold Regions Science and Technology* 151: 148-155.

23. Hancke K, Lund-Hansen LC, Lamare ML, Højlund Pedersen S, King MD, Andersen P, **Sorrell BK**. (2018) Extreme low light requirement for algae growth underneath sea ice: A case study from Station Nord, NE Greenland. *Journal of Geophysical Research: Oceans* 123: 985-1000. (Impact factor 3.559)

24. Fernández-Méndez M, Olsen LM, Kauko HM, Meyer A, Rösel A, Merkouriadi I, Mundy CJ, Ehn, JK, Johansson AM, Wagner PM, Ervik Å, **Sorrell BK**, Duarte P, Wold A, Hop H, Assmy P. (2018) Algal hot spots in a changing Arctic Ocean: Sea-ice ridges and the snow-ice interface. *Frontiers in Marine Science* 5, art. no. 75, doi: 10.3389/fmars.2018.00075 (Impact factor 3.070)

25. Olesen A, Jensen SM, Alnoee AB, Baattrup-Pedersen A, Lauridsen TL, **Sorrell BK**, Riis T. (2018) Nutrient kinetics in submerged plant beds: A mesocosm study simulating constructed drainage wetlands. *Ecological Engineering* 122: 263-270.

26. Riis T, Olesen A, Jensen SM, Alnoee AB, Baattrup-Pedersen A, Lauridsen TL, **Sorrell BK**. (2018) Submerged freshwater plant communities do not show species complementarity effect in wetland mesocosms. *Biology Letters* 14 (12) art. no. 20180635, doi: 10.1098/rsbl.2018.0635. (Impact factor 3.323)

27. Sasidharan R, Bailey-Serres J, Ashikari M, Atwell BJ, Colmer TD, Fagerstedt K, Fukao T, Geigenberger P, Hebelstrup KH, Hill RD, Holdsworth MJ, Ismail AM, Licausi F, Mustroph A, Nakazono M, Pedersen O, Perata P, Sauter M, Shih M-C, **Sorrell BK**, Striker GG, van Dongen JT, Whelan J, Xiao S, Visser EJW, Voesenek LACJ. (2017). Community recommendations on terminology and procedures used in flooding and low oxygen stress research. *New Phytologist* 214: 1403-1407. (Impact factor 8.512)

28. Eller F, Skálová H, Caplan JS, Bhattarai GP, Burger MK, Cronin JT, Guo W-Y, Guo X, Hazelton, ELG, Kettenring KM, Lambertini C, McCormick MK, Meyerson LA, Mozdzer TJ, Pyšek P, **Sorrell BK**, Whigham DF, Brix H. (2017) Cosmopolitan species as models for ecophysiological responses to global change: The common reed *Phragmites australis*. *Frontiers in Plant Science* 8: art. no. 1833. doi: 10.3389/fpls.2017.01833

29. Tho BT, Lambertini C, Eller F, Brix H, **Sorrell BK**. (2017) Ammonium and nitrate are both suitable inorganic nitrogen forms for the highly productive wetland grass *Arundo donax*, a candidate species for wetland paludiculture. *Ecological Engineering* 105: 379-386.

30. Kilroy C, Suren AM, Wech JA, Lambert P, **Sorrell BK**. (2017) Epiphytic diatoms as indicators of ecological condition in New Zealand's lowland wetlands. *NZ Journal of Marine and Freshwater Research* 51: 505-527.

31. Jespersen E, Brix H, **Sorrell BK**. (2017) Acclimation to light and avoidance of photoinhibition in *Typha latifolia* is associated with high photosynthetic capacity and xanthophyll pigment content. *Functional Plant Biology* 44: 774-784. (Impact factor 2.491)