

## John Prytherch

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### Employment

2018–present Research Engineer, Department of Meteorology, Stockholm University.  
2017–2018 Postdoc' Research Fellow, Department of Meteorology, Stockholm University.  
2014–2017 Postdoc', School of Earth and Environment, University of Leeds, UK.  
2011-2013 Postdoc', National Oceanography Centre, Southampton, UK.  
2006 Research Assistant, National Oceanography Centre, Southampton, UK.  
2004-2006 Higher education textbook sales representative, Pearson Education, Harlow, UK.

### Education

2011 Ph.D. Physical Oceanography, University of Southampton, UK.  
– Measurement and parameterisation of the air-sea CO<sub>2</sub> flux in high winds.  
2007 M.Res. (71%) Ocean Science, University of Southampton, UK.  
2002 B.Sc. (Hons, 2:1) Mathematics and Physics, University of Warwick, UK.

### Field Experience

Jul.-Sep. 2021, Synoptic Arctic Survey 2021: 9-week Arctic expedition onboard icebreaker Oden. I lead a work package, comprising 2 people, that was responsible for the design, installation and operation of a turbulent air-sea flux system built around a fast-response cavity enhanced laser spectrometer (CELS) for determining eddy covariance CH<sub>4</sub> and CO<sub>2</sub> flux, a trace gas chamber flux system consisting of another CELS deployed on sea ice, and extensive meteorological in situ and remote sensing instruments including turbulence sensors, cloud radar and radiosounding (weather balloon) systems.

Nov. 2018 – Nov. 2021, Baltic coastal methane upscaling: designed, installed and maintained an autonomous air-sea trace gas flux tower at coastal site, obtaining annual cycles of eddy covariance CH<sub>4</sub> and CO<sub>2</sub> fluxes. The principal instrument was a fast response CELS. Complementary measurements were made using a manually-deployed chamber flux system.

Aug.-Sep. 2018, Arctic Ocean 2018: 8-week expedition onboard icebreaker Oden. I was responsible for the design, installation and operation of an extensive suite of meteorological and oceanographic instrumentation onboard Oden, including an air-sea eddy covariance system (including a CELS and an infrared gas analyser), a pCO<sub>2</sub> system, and surface imaging and radiosounding systems. In addition, I led an experiment targeting gas exchange through sea ice leads, designing and deploying on-ice instrumentation including infrared gas analysers, a pCO<sub>2</sub> system and a CPC, and analysing sea water samples for CH<sub>4</sub> and CO<sub>2</sub> concentration using a GC.

Aug.-Sep. 2016, Arctic Ocean 2016: 6-week expedition onboard icebreaker Oden. I installed and operated turbulent flux, trace gas water sampling, surface imaging and radiosounding systems.

July-Oct. 2014, SWERUS-C3: second 6-week leg of a 3-month Arctic Ocean expedition on icebreaker Oden. I installed and operated foremast eddy covariance turbulent flux systems, a wave buoy deployed from the ship's side, meteorology instrumentation and radiosounding systems.

Dec. 2008, JR194: 3-week hydrographic expedition, Falkland Islands to Rothera, Antarctica. I operated the CTD, ADCP and meteorological instrumentation.

2007-2009, HiWASE: I contributed to the installation and maintenance of autonomous turbulent air-sea flux and meteorological instrumentation on a Norwegian weather ship.

### Funding Awarded

Bolin Centre Research Area 4, flagship funding, 2019. Co-I, 300 000 SEK, upscaling of methane emissions from coastal Baltic habitats.

Bolin Centre Research Areas 2 and 4 discretionary funding, 2018. 80 000 SEK, pCO<sub>2</sub> instrumentation for Arctic air-sea trace gas exchange research.

Bolin Centre Research Area 2 discretionary funding, 2017. 125 000 SEK, instrumentation for Arctic air-sea trace gas exchange research.

## Teaching

Supervisor for Masters project “Vertical structure of the Arctic atmosphere during the SAS2021 expedition”, 30HP, Ellen Carneheim, 2022.

Co-supervisor for Masters project “A temporal and spatial study of CH<sub>4</sub> sea-to-air fluxes from shallow bays in the archipelago of Stockholm and Trosa”, 60HP, Thea Bisander, 2021. Awarded the Dyrssen award, by the Swedish Society for Marine Sciences, 2022.

MO8010, Turbulent boundary layers in the atmosphere and ocean. Laboratory/field practicals and lecture. 2022: 10 hours, 2021: 10 hrs, 2020: 20 hrs, 2019-2017: 2hrs.

Oceanography in the Earth System (3<sup>rd</sup> year BSc course, Uni. Leeds, UK). 2015 & 2016: 2 hrs.

## Other skills

15 years of MATLAB programming, and experience with Linux shell scripting and automation.

English native speaker. På svenska genomför jag Stockholms universitets kurs C för anställda i maj 2022.

Driving license.

## Selected publications (from a total of 23 with 809 citations, h-index 17; Google Scholar, 22-11-26)

Srivastava, P., Brooks, I. M., **Prytherch, J.**, Salisbury, D. J., Elvidge, A. D., Renfrew, I. A., and Yelland, M. J.: Ship-based estimates of momentum transfer coefficient over sea ice and recommendations for its parameterization, *Atmos. Chem. Phys.*, <https://doi.org/10.5194/acp-22-4763-2022>, 2022.

Roth, F., Sun, X., Geibel, M. C., **Prytherch, J.**, Brüchert, V., Bonaglia, S., Broman, E., Nascimento, F., Norkko, A. and Humborg, C.: High spatiotemporal variability of methane concentrations challenges estimates of emissions across vegetated coastal ecosystems. *Glob. Change Biol.* <https://doi.org/10.1111/gcb.16177>, 2022.

**Prytherch, J.** and Yelland, M. J.: Wind, Convection and Fetch Dependence of Gas Transfer Velocity in an Arctic Sea-Ice Lead Determined From Eddy Covariance CO<sub>2</sub> Flux Measurements, *Global Biogeochem. Cycles*, <https://doi.org/10.1029/2020gb006633>, 2021.

Thornton, B. F., **Prytherch, J.**, Andersson, K., Brooks, I. M., Salisbury, D., Tjernström, M., and Crill, P. M.: Shipborne eddy covariance observations of methane fluxes constrain Arctic sea emissions, *Sci. Adv.*, <https://doi.org/10.1126/sciadv.aay7934>, 2020.

**Prytherch, J.**, Brooks, I. M., Crill, P. M., Thornton, B. F., Salisbury, D. J., Tjernström, M., Anderson, L. G., Geibel, M. C., and Humborg, C.: Direct determination of the air-sea CO<sub>2</sub> gas transfer velocity in Arctic sea ice regions, *Geophys. Res. Lett.*, <https://doi.org/10.1002/2017gl073593>, 2017.

Yang, M., **Prytherch, J.**, Kozlova, E., Yelland, M. J., Parenkat Mony, D., and Bell, T. G.: Comparison of two closed-path cavity-based spectrometers for measuring air–water CO<sub>2</sub> and CH<sub>4</sub> fluxes by eddy covariance, *Atmos. Meas. Tech.*, <https://doi.org/10.5194/amt-9-5509-2016>, 2016.

Yang, M., Bell, T. G., Hopkins, F. E., Kitidis, V., Cazenave, P. W., Nightingale, P. D., Yelland, M. J., Pascal, R. W., **Prytherch, J.**, Brooks, I. M., and Smyth, T. J.: Air–sea fluxes of CO<sub>2</sub> and CH<sub>4</sub> from the Penlee Point Atmospheric Observatory on the south-west coast of the UK, *Atmos. Chem. Phys.*, <https://doi.org/10.5194/acp-16-5745-2016>, 2016.

**Prytherch, J.**, Yelland, M. J., Brooks, I. M., Tupman, D. J., Pascal, R. W., Moat, B. I., and Norris, S. J.: Motion-correlated flow distortion and wave-induced biases in air–sea flux measurements from ships, *Atmos. Chem. Phys.*, <https://doi.org/10.5194/acp-15-10619-2015>, 2015.

Tjernström, M., Shupe, M. D., Brooks, I. M., Persson, P. O. G., **Prytherch, J.**, Salisbury, D. J., Sedlar, J., Achtert, P., Brooks, B. J., Johnston, P. E., Sotiropoulou, G., and Wolfe, D.: Warm-air advection, air mass transformation and fog causes rapid ice melt, *Geophys. Res. Lett.*, <https://doi.org/10.1002/2015gl064373>, 2015.

**Prytherch, J.**, Farrar, J. T., and Weller, R. A.: Moored surface buoy observations of the diurnal warm layer, *J. Geophys. Res. Oceans*, <https://doi.org/10.1002/jgrc.20360>, 2013.

**Prytherch, J.**, Yelland, M. J., Pascal, R. W., Moat, B. I., Skjelvan, I., and Neill, C. C.: Direct measurements of the CO<sub>2</sub> flux over the ocean: Development of a novel method, *Geophys. Res. Lett.*, <https://doi.org/10.1029/2009gl041482>, 2010.

## Data publication

20 Arctic meteorological and oceanographic datasets published open access with DOIs, on the Bolin Centre Database (22-11-26).