

## Curriculum Vitae

Karl Michael Attard

Nordcee

HADAL

Danish Institute for Advanced Study

**Email:** karl.attard@biology.sdu.dk

**Phone:** +4565508409



## About

I study the cycles of elements such as oxygen and carbon to understand rates and drivers of productivity in aquatic ecosystems. Seafloor habitats are a key focus of my work, because they represent hotspots of biodiversity and productivity but they remain poorly studied. Filling in this knowledge gap requires a novel interdisciplinary approach that investigates productivity rates in combination with other factors of influence such as sunlight and nutrient availability, hydrodynamics, and biodiversity. The success of this work is tightly linked to the use of new and evolving technologies such as aquatic eddy covariance and microsensors techniques.

## Employment

### **DIAS assistant professor**

Nordcee

SDU

Odense M

12. May 2022 → 30. Mar 2024

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HADAL

SDU

12. May 2022 → 30. Mar 2024

### **DIAS Assistant Professor**

Danish Institute for Advanced Study

SDU

Odense, Denmark

8. Apr 2022 → present

### **Postdoctoral Researcher**

University of Helsinki

Helsinki, Finland

1. Feb 2016 → 31. Jan 2018

## Social media

Google Scholar: <https://scholar.google.com/citations?user=-6gnncMAAAAJ&hl=en>

Researchgate: [https://www.researchgate.net/profile/Karl\\_Attard2](https://www.researchgate.net/profile/Karl_Attard2)

Twitter @KMAttard

## Teaching

University of Southern Denmark:

BB844: MSc Field Course in Marine Biology

Guest lecturer at University of Helsinki:

BSc course in Aquatic Biogeochemistry (ENV-312)

MSc course in Advanced Sediment and Aquatic Biogeochemistry

## Student supervision

MSc Ms Emma Hald Boldreel, University of Southern Denmark

MSc Ms Anna Lyssenko, University of Helsinki

I am happy to supervise students at ISA, BSc, MSc level, and I am also eager to support incoming Postdoctoral fellows. Please get in touch to discuss possibilities.

## Peer-reviewed scientific articles

### **Intracellular nitrate storage by diatoms can be an important nitrogen pool in freshwater and marine ecosystems**

Stief, P., Schauburger, C., Lund, M. B., Greve, A., Abed, R. M. M., Al-Najjar, M. A. A., Attard, K., Bonaglia, S., Deutzmann, J. S., Franco-Cisterna, B., García-Robledo, E., Holtappels, M., John, U., Maciute, A., Magee, M. J., Pors, R., Santl-Temkiv, T., Scherwass, A., Sevilgen, D. S., de Beer, D., & 3 others Glud, R. N., Schramm, A. & Kamp, A., Jul 2022, In: Communications Earth and Environment. 3, 1, 11 p., 154.

### **Positive contribution of macrofaunal biodiversity to secondary production and seagrass carbon metabolism**

Rodil, I. F., Lohrer, A. M., Attard, K. M., Thrush, S. F. & Norkko, A., Apr 2022, In: Ecology. 103, 4, 13 p., e3648.

### **Aquatic Eddy Covariance: The Method and Its Contributions to Defining Oxygen and Carbon Fluxes in Marine Environments**

Berg, P., Huettel, M., Glud, R. N., Reimers, C. E. & Attard, K. M., Jan 2022, In: Annual Review of Marine Science. 14, p. 431-455

### **Benthic O<sub>2</sub> uptake by coral gardens at the Condor seamount (Azores)**

Rovelli, L., Carreiro-Silva, M., Attard, K. M., Rakka, M., Dominguez-Carrió, C., Bilan, M., Blackbird, S., Morato, T., Wolff, G. A. & Glud, R. N., 2022, In: Marine Ecology Progress Series. 688, p. 19-31

### **Macrofauna communities across a seascape of seagrass meadows: environmental drivers, biodiversity patterns and conservation implications**

Rodil, I. F., Lohrer, A. M., Attard, K. M., Hewitt, J. E., Thrush, S. F. & Norkko, A., Sep 2021, In: Biodiversity and Conservation. 30, 11, p. 3023-3043

### **Variable contributions of seafloor communities to ecosystem metabolism across a gradient of habitat-forming species**

Rodil, I. F., Attard, K. M., Gustafsson, C. & Norkko, A., May 2021, In: Marine Environmental Research. 167, 10 p., 105321.

### **Resolving community metabolism of eelgrass *Zostera marina* meadows by benthic flume-chambers and eddy covariance in dynamic coastal environments**

Camillini, N., Attard, K. M., Eyre, B. D. & Glud, R. N., 4. Mar 2021, In: Marine Ecology Progress Series. 661, p. 97-114 18 p.

### **Technical Note: Estimating light-use efficiency of benthic habitats using underwater O<sub>2</sub> eddy covariance**

M. Attard, K. & N. Glud, R., 28. Aug 2020, In: Biogeosciences. 17, 16, p. 4343-4353

### **Metabolism of a subtidal rocky mussel reef in a high-temperate setting: Pathways of organic C flow**

Attard, K. M., Rodil, I. F., Berg, P., Mogg, A. O. M., Westerborn, M., Norkko, A. & Glud, R. N., 9. Jul 2020, In: Marine Ecology Progress Series. 645, p. 41-54

### **Estimating Respiration Rates and Secondary Production of Macrobenthic Communities Across Coastal Habitats with Contrasting Structural Biodiversity**

Rodil, I. F., Attard, K. M., Norkko, J., Glud, R. N. & Norkko, A., 2020, In: Ecosystems. 23, p. 630-647

### **Benthic primary production and respiration of shallow rocky habitats: a case study from South Bay (Doumer Island, Western Antarctic Peninsula)**

Rovelli, L., Attard, K. M., Cárdenas, C. A. & Glud, R. N., Aug 2019, In: Polar Biology. 42, 8, p. 1459-1474

**Seasonal ecosystem metabolism across shallow benthic habitats measured by aquatic eddy covariance**

Attard, K. M., Rodil, I. F., Glud, R. N., Berg, P., Norkko, J. & Norkko, A., 16. Jun 2019, In: *Limnology and Oceanography Letters*. 4, 3, p. 79-86 8 p.

**Seasonal metabolism and carbon export potential of a key coastal habitat: the perennial canopy-forming macroalga *Fucus vesiculosus***

Attard, K., Rodil, I., Berg, P., Norkko, J., Norkko, A. & Glud, R. N., 24. Jan 2019, In: *Limnology and Oceanography*. 64, 1, p. 149-164

**Towards a sampling design for characterizing habitat-specific benthic biodiversity related to oxygen flux dynamics using Aquatic Eddy Covariance**

Rodil, I. F., Attard, K. M., Norkko, J., Glud, R. N. & Norkko, A., 2019, In: *PLOS ONE*. 14, 2, 21 p., e0211673.

**Headwater gas exchange quantified from O<sub>2</sub> mass balances at the reach scale**

Rovelli, L., Attard, K. M., Heppell, C. M., Binley, A., Trimmer, M. & Glud, R. N., Oct 2018, In: *Limnology and Oceanography: Methods*. 16, 10, p. 696-709

**Oxygen fluxes beneath Arctic land-fast ice and pack ice: towards estimates of ice productivity**

Attard, K. M., Søgaard, D., Piontek, J., Lange, B. A., Katlein, C., Sørensen, H. L., McGinnis, D. F., Rovelli, L., Rysgaard, S., Wenzhöfer, F. & Glud, R. N., Oct 2018, In: *Polar Biology*. 41, 10, p. 2119-2134

**Reach-scale river metabolism across contrasting sub-catchment geologies: Effect of light and hydrology**

Rovelli, L., Attard, K., Binley, A., Heppell, C. M., Stahl, H., Trimmer, M. & Glud, R. N., 2017, In: *Limnology and Oceanography*. 62, Suppl. 1, p. S381-S399

**The influence of coring method on the preservation of sedimentary and biogeochemical features when sampling soft-bottom, shallow coastal environments**

Mogg, A. O. M., Attard, K. M., Stahl, H., Brand, T., Turnewitsch, R. & Sayer, M. D. J., 2017, In: *Limnology and Oceanography: Methods*. 15, 11, p. 905-915

**Benthic primary production and mineralization in a High Arctic fjord: in situ assessments by aquatic eddy covariance**

Attard, K., Hancke, K., Sejr, M. K. & Glud, R. N., 28. Jul 2016, In: *Marine Ecology - Progress Series*. 554, p. 35-50

**Benthic oxygen exchange in a live coralline algal bed and an adjacent sandy habitat: an eddy covariance study**

Attard, K., Stahl, H., Kamenos, N., Turner, G., Burdett, H. & Glud, R. N., 15. Sep 2015, In: *Marine Ecology - Progress Series*. 535, p. 99-115

**Under-ice eddy covariance flux measurements of heat, salt, momentum, and dissolved oxygen in an artificial sea ice pool**

Else, B., Rysgaard, S., Attard, K., Campbell, K., Crabeck, O., Galley, R. J., Geilfus, N-X., Lemes, M., Lueck, R., Papakyriakou, T. & Wang, F., Sep 2015, In: *Cold Regions Science and Technology*. 119, p. 158-169

**Benthic O<sub>2</sub> uptake of two cold-water coral communities estimated with the non-invasive eddy correlation technique**

Rovelli, L., Attard, K., Bryant, L. D., Flögel, S., Stahl, H., Murray Roberts, J., Linke, P. & Glud, R. N., 9. Apr 2015, In: *Marine Ecology - Progress Series*. 525, p. 97-104

**Seasonal rates of benthic primary production in a Greenland fjord measured by aquatic eddy correlation**

Attard, K., Glud, R. N., McGinnis, D. F. & Rysgaard, S., Sep 2014, In: *Limnology and Oceanography*. 59, 5, p. 1555-1569

**Ikaite crystal distribution in winter sea ice and implications for CO<sub>2</sub> system dynamics**

Rysgaard, S., Søgaard, D. H., Cooper, M., Pucko, M., Lennert, K., Papakyriakou, T. N., Wang, F., Geilfus, N. X., Glud, R. N., Ehn, J., McGinnis, D. F., Attard, K., Sievers, J., Deming, J. W. & Barber, D., 2013, In: *Cryosphere*. 7, p. 707-718

**Maintaining turbidity and current flow in laboratory aquarium studies, a case study using *Sabellaria spinulosa***

Davies, A. J., S. Last, K., Attard, K. & Hendrick, V. J., 2009, In: *Journal of Experimental Marine Biology and Ecology*. 370, 1-2, p. 35-40

## **Other academic merits**

Steering committee member for the FINMARI benthic lander working group, Finland

Steering committee member for EU ASSEMBLE+ scientific diving work package (JRA5)

Board member for scientific diving committee, University of Southern Denmark

Referee for scholarly journals and funding agencies: Marine Ecology Progress Series, Limnology and Oceanography, Limnology and Oceanography Methods, Polar Biology, Biogeosciences, Frontiers in Marine Science, Estuarine Coastal and Shelf Science, US National Science Foundation.

## **Awards**

Postdoctoral scholarship (2016-2018), Walter and Andrée de Nottbeck Foundation, Finland (~€ 85.000)

SAMS Award for Overall Achievement (period 2006-2010)

SAMS Student of the Year 2009 2009

Jane Foster Bursary for Practical Marine Geochemistry, UK (€ 2.200)

Nuffield Foundation Undergraduate Bursary, UK (€ 2.000)