

# Tom J Langbehn

POSTDOCTORAL RESEARCH FELLOW, THEORETICAL ECOLOGY GROUP

Department of Biological Sciences, University of Bergen, Norway

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*I am a marine biologist with a keen interest in evolutionary ecology and global change biology, i.e., how climate change and human activities such as fisheries shape biological interactions and processes across various levels of organisation. I aim to solve real-life problems by identifying and understanding how processes at the individual level drive ecosystems. In my work, I combine mechanistic modelling, often informed by theory, with observation from the field. I enjoy thinking broadly and across disciplines and have a particular fascination for polar ecosystems and the ocean twilight zone.*

## Education

### PhD in Marine Evolutionary Ecology

Bergen, Norway

DEPARTMENT OF BIOLOGICAL SCIENCES, UNIVERSITY OF BERGEN

Feb 2016 - Mar 2019

- Dissertation title: "Light and visual foraging in the pelagic: Opportunities and constraints along gradients of seasonality"
- Committee members: Prof. PhD Christian Jørgensen (University of Bergen), Prof. PhD Øyvind Fiksen (University of Bergen) and Associate Prof. PhD Øystein Varpe (University Centre in Svalbard).
- Opponents: Prof. PhD Michael T. Burrows (Scottish Association for Marine Science, UK), PhD Xabier Irigoien (AZTI, Spain)
- PhD position part of the European Training Network on "Marine Management and Ecosystem Dynamics under Climate Change - MARmaED"

### Bergen Summer research School

Bergen, Norway

UNIVERSITY OF BERGEN

Aug 2016

- Course: Water, Climate & Society

### ClimEco5 Summer School

Natal, Brazil

IMBeR

Jun 2016

- Topic: "Towards more resilient oceans: Predicting and projecting future changes in the ocean and their impacts on human societies"

### Graduate Programme Marine Biology (MSc)

Bremen, Germany

FACULTY 2 BIOLOGY/CHEMISTRY, UNIVERSITY OF BREMEN

Oct 2013 - Oct 2015

- Thesis title: "Feeding success in an extreme light environment: modelling seasonal prey encounter of Arctic fish"
- Committee members: Prof. Dr. Wilhelm Hagen (University of Bremen) and Associate Prof. PhD Øystein Varpe (University Centre in Svalbard)
- Final grade: Excellent

### Graduate Course Ecosystem-based Management of Arctic Marine Systems

Longyearbyen, Svalbard, Norway

DEPARTMENT OF ARCTIC BIOLOGY, UNIVERSITY CENTRE IN SVALBARD

Aug - Sep 2014

- Duration: 2 month
- Final grade: Excellent

### International Degree Course in Environmental and Industrial Biology (BSc)

Bremen, Germany

FACULTY 5 NATURE AND ENGINEERING, UNIVERSITY OF APPLIED SCIENCES BREMEN

Sep 2009 - Feb 2013

- Thesis title: "Morphological diversity in parr of Atlantic salmon (*Salmo salar* L.) in Iceland"
- Committee members: Prof. Dr. Heiko Brunken (University of Applied Sciences Bremen) and Prof. PhD Guðrún Marteinsdóttir (University of Iceland)
- Final grade: Excellent

### Graduate Marine and Fisheries Sciences Summer Programme

Reykjavík, Iceland

INSTITUTE OF BIOLOGY, UNIVERSITY OF ICELAND

May - Jul 2012

- Courses: "Data Analysis for Scientists using R", "Fisheries Ecology" and "Marine Mammals"
- Duration: 3 month
- Final grade: First class with distinction

### International Degree Course Ecology and Conservation

Evenstad, Norway

INLAND NORWAY UNIVERSITY OF APPLIED SCIENCES

Aug - Dec 2011

- Undergraduate study semester abroad
- Courses: "Evolution", "Conservation Biology", "Population Dynamics" and "Practice in Wildlife Research"
- Duration: 5 month
- Final grade: Excellent

## Research experience

## Postdoctoral Research Fellow

THEORETICAL ECOLOGY GROUP, DEPARTMENT OF BIOLOGICAL SCIENCES, UNIVERSITY OF BERGEN

Bergen, Norway

Sep 2019 - Present

- Project: "The fundamental role of mesopelagic fishes for the structure and change of Northeast Atlantic marine ecosystems", funded by the Research Council of Norway, #294819

## Researcher

ARVEN ETTER NANSEN (NANSEN LEGACY), UNIVERSITY CENTRE IN SVALBARD

Longyearbyen, Svalbard, Norway

Feb 2019 - Mar 2020

- Project: "The pelagic riskscape and consequences for zooplankton size along gradients of light and sea-ice in the Barents Sea"

## Research Assistant

THUENEN INSTITUTE OF BALTIC SEA FISHERIES

Rostock, Germany

Jul 2014 - Nov 2014

- Assisting during the Rügen Herring larvae survey

# Working Experience

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## Freelance tour guide

SVALBARD WILDLIFE EXPEDITIONS AS

Longyearbyen, Svalbard, Norway

May - Jul 2015

- Contracted for guided tours about the history and wildlife of Svalbard

## Freelance Ecological Consultant

BUND, FRIENDS OF THE EARTH GERMANY

Bremen, Germany

2012 - 2014

- Contracted to develop and evaluate nature friendly methods of ditch clearance in FFH sites of high importance for the aquatic fauna

## Freelance Ecological Consultant

ECOSURV.HEIN - ANGEWANDTE FISCH- & GEWÄSSEROÖKOLOGIE

Bremen, Germany

2013

- Contracted to assist in electro fishing surveys

## Freelance Ecological Consultant

ÖKOLOGIS UMWELTANALYSE + LANDSCHAFTSPLANUNG GMBH

Bremen, Germany

2013

- Contracted to map selected breeding birds in the FFH-site Werderland

## Freelance Ecological Consultant

BIOCONSULT SH GMBH & Co. KG

Husum, Germany

2009 - 2011

- Contracted to assist in offshore maintenance of harbour porpoise detectors, seabird at sea counts, and radar image assessment for quantitative migratory bird counts used in environmental impact assessments

## National Park Warden

SCHUTZSTATION-WATTENMEER E.V., GERMANY

Hörnum, Sylt, Germany

Oct 2008 - Jun 2009

- In fulfilment of the German Civilian Service
- Responsibilities included to oversee several scientific monitoring programs (e.g migratory bird counts and OSPAR litter monitoring), outreach and environmental education, as well as local coordination with nature conservation authorities
- The civilian service was extended by two internships periods, Aug 2008 - Sep 2008 and Jun 2009 - Aug 2009

# Academic mobility

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(only research stays longer than two month are listed)

## PhD research secondment

CENTRE FOR OCEAN LIFE, NATIONAL INSTITUTE OF AQUATIC RESOURCES, TECHNICAL UNIVERSITY OF DENMARK

Copenhagen, Denmark

Nov - Oct 2017

- Duration: 2 month
- Project: "Can a food systems approach redefine ecosystem-based fisheries management?"
- Visiting Ken H. Andersen

## Guest Master student

DEPARTMENT OF ARTIC BIOLOGY, UNIVERSITY CENTRE IN SVALBARD

Longyearbyen, Svalbard, Norway

Mar - Oct 2015

- Duration: 8 month
- Project: "Feeding success in an extreme light environment: modelling seasonal prey encounter of Arctic fish"
- Visiting Øystein Varpe

## Undergraduate research semester abroad

MARINE ACADEMIC RESEARCH IN ICELAND (MARICE), INSTITUTE OF BIOLOGY, UNIVERSITY OF ICELAND

Reykjavík, Iceland

Jan - May 2012

- Duration: 5 month
- Project: "Impact of climate change on processes that influence survival of Atlantic cod eggs and larvae in Icelandic waters"
- Visiting Guðrún Marteinsdóttir

## Awards

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### Best Presentation Award

ICES ANNUAL SCIENCE CONFERENCE 2019

Hamburg, Germany

2019

### Student Choice and Special Mention Poster Award

IMBER CLIMECO5 SUMMER SCHOOL

Natal, Brazil

2016

### Best Poster Award

YOUMARES 7 CONFERENCE, GERMAN SOCIETY FOR MARINE RESEARCH

Hamburg, Germany

2016

### Runner-up Best Poster

MARMAED ANNUAL MEETING

Banyuls-sur-Mer, France

2016

### MARUM Research Award for Marine Science

MARUM CENTER FOR MARINE ENVIRONMENTAL SCIENCE

- Awarded in recognition of an outstanding Masters

Bremen, Germany

2015

### Best Speaker Award

YOUMARES 6 CONFERENCE, GERMAN SOCIETY FOR MARINE RESEARCH

Bremen, Germany

2015

### Best Student Poster

FISHERIES ECOLOGY SUMMER SCHOOL, UNIVERSITY OF ICELAND

Reykjavík, Iceland

2011

## Research Cruises

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I have participated in **9 research cruises**, including **one as a cruise leader**, and spent in total **> 50 days at sea**, with some cruises lasting up to two weeks. I have worked both on research and commercial fishing vessels, in the North Sea, the Baltic Sea, Icelandic waters, Norwegian coastal waters, the Barents Sea and Arctic waters up to the marginal ice zone.

## Teaching Experience

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### UNIVERSITY COURSES

#### Guest lecturer – BIO300A Academic writing

UNIVERSITY OF BERGEN

- Lecture title: "Visual storytelling"

Bergen Norway

Nov 2020

#### Guest lecturer – SDG214 Life below water

UNIVERSITY OF BERGEN

- Lecture title: "How to design better scientific figures and posters"

Bergen Norway

May 2019

#### Guest lecturer – BIO241 Behavioural Ecology

UNIVERSITY OF BERGEN

- Lecture title: "How to design better scientific figures and posters"

Bergen Norway

May 2019

#### Guest lecturer – AB338 Life History Adaptations to Seasonality

UNIVERSITY CENTRE IN SVALBARD

- Lecture title: "Climate-driven range shifts and life history adaptations to seasonality"

Longyearbyen, Svalbard, Norway

Jun 2018

#### Teaching assistant – AB204 Arctic Ecology and Population Biology

UNIVERSITY CENTRE IN SVALBARD

- Supervised the integrated Teach2Learn module as part of bioCEED a Centre of Excellence in Biology Education

Longyearbyen, Svalbard, Norway

Sep 2016

#### Teaching assistant – AB202 Marine Arctic Biology

UNIVERSITY CENTRE IN SVALBARD

- Responsible for seabird at sea census techniques and fisheries data sampling

Longyearbyen, Svalbard, Norway

May 2015

#### Teaching assistant – Math preparation course for BSc students

UNIVERSITY OF APPLIED SCIENCES BREMEN

Bremen, Germany

Oct 2010

## WEBINARS

### “Visual storytelling”

DEEP: NORWEGIAN RESEARCH SCHOOL FOR DYNAMICS AND EVOLUTION OF EARTH AND PLANETS

Virtual

Dec 2020

### “Creating good scientific posters”

BIOCEED – CENTRE FOR EXCELLENCE IN BIOLOGY EDUCATION

Virtual

Nov 2020

### “Creating good scientific posters”

NANSEN LEGACY

Virtual

Oct 2020

## WORKSHOPS

### “Introduction to data wrangling with tidyverse”

NANSEN LEGACY

Virtual

Jan 2021

## Supervision

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### Astrid Holtan Fredriksen, MSc

MASTER THESIS

Aug 2019 - Jul 2021

- Project: “Trophic position of myctophids in the Northeast Atlantic”
- Role: co-supervisor

### Andéol Bourgoïn, Msc

MASTER THESIS

Jan 2020 - Jul 2020

- Project: “Exploring the emergent niche of Greater argentine (*Argentina silus*) along gradients of topography and light”
- Role: main supervisor

### Cecilie Iden Nilsen, Bsc

BIO299 RESEARCH PRACTICE IN BIOLOGY

Sep 2019 - Apr 2020

- Project: “Developing methods for lipid extraction in mesopelagic fish”
- Role: co-supervisor

## Publications

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### PUBLICATIONS TRACK RECORD

During my career I have published a **total number of 8 peer-reviewed papers**. Thereof **7 publications in international peer-reviewed scientific journals** and **1 in peer-reviewed conference proceedings**. According to Google Scholar (as of 22 Dec 2020) these have been **cited a total of 79 times**, thereof **45 times within 2020**. I have an ***h-index* of 4**.

### ARTICLES IN PEER-REVIEWED JOURNALS

\*indicates equal author contributions

Butler, W. E., Guðmundsdóttir, L., Logemann, K., **Langbehn, T.J.**, & Marteinsdóttir, G. (2020). Egg size and density estimates for three gadoids in Icelandic waters and their implications for the vertical distribution of eggs along a stratified water column. *Journal of Marine Systems*, 204(2019), 103290. <https://doi.org/10.1016/j.jmarsys.2019.103290>

Kaartvedt, S., **Langbehn, T.J.**, & Aksnes, D. L. (2019). Enlightening the ocean’s twilight zone. *ICES Journal of Marine Science*, 76(4), 803–812. <https://doi.org/10.1093/icesjms/fsz010>

**Langbehn, T.J.**, Aksnes, D., Kaartvedt, S., Fiksen, Ø., & Jørgensen, C. (2019). Light comfort zone in a mesopelagic fish emerges from adaptive behaviour along a latitudinal gradient. *Marine Ecology Progress Series*, 623, 161–174. <https://doi.org/10.3354/meps13024>

- Sguotti, C., Otto, S. A., Frelat, R., **Langbehn, T.J.**, Ryberg, M. P., Lindegren, M., ... Möllmann, C. (2019). Catastrophic dynamics limit Atlantic cod recovery. *Proceedings of the Royal Society B: Biological Sciences*, 286(1898), 20182877. <https://doi.org/10.1098/rspb.2018.2877>
- Geoffroy, M., Berge, J., Majaneva, S., Johnsen, G., **Langbehn, T.J.**, Cottier, F., ... Last, K. (2018). Increased occurrence of the jellyfish *Periphylla periphylla* in the European high Arctic. *Polar Biology*, 41(12), 2615–2619. <https://doi.org/10.1007/s00300-018-2368-4>
- Langbehn, T.J.**, & Varpe, Ø. (2017). Sea-ice loss boosts visual search: fish foraging and changing pelagic interactions in polar oceans. *Global Change Biology*, 23(12), 5318–5330. <https://doi.org/10.1111/gcb.13797>. *The Ecological Society of America featured this article as a dispatch Melting sea ice may open polar oceans to new predators in Frontiers in the Ecology and the Environment*.
- Katzenberger, J., **Langbehn, T.J.**, & Zacharias, D. (2013). Erstnachweis von *Hydrellia tarsata* (Diptera: Ephydriidae) für Bremen in Blüten von *Stratiotes aloides*. *Abhandlungen Des Naturwissenschaftlichen Vereins Zu Bremen*, 47(1), 193–195.

## WORKING PAPERS UNDER REVISION OR REVIEW

*in. prep.* articles are only listed when ready to submit

- Geoffroy, M., **Langbehn, T.J.**, Priou, P., Varpe, Ø., Johnsen, G., LeBris, A., ... Berge, J. (in prep.). Pelagic fish and zooplankton avoid artificial light from scientific instruments, including red light. *Tbd.*
- Langbehn, T.J.**, Aksnes, D. L., Kaartvedt, S., Fiksen, Ø., & Jørgensen, C. (in prep.). Poleward distribution of mesopelagic fishes is constrained by seasonality in light. *Tbd.*
- Ljungström\*, G., **Langbehn\*, T.J.**, & Jørgensen, C. (under revision). Light and energetics at seasonal extremes limit poleward range shifts. *Nature Climate Change*.

## ARTICLES IN PEER-REVIEWED CONFERENCE PROCEEDINGS

- Langbehn, T.J.**, & Schoenle, A. (2016). Deep | Dark | Cold - Frontiers in Polar and Deep-Sea Research. In M. Bode, C. Jessen, & V. Golz (Eds.), *Youmares 7 conference proceedings* (pp. 59–68). German Society for Marine Research, Working Group on Studies; Education, Deutsche Gesellschaft für Meeresforschung (DGM) e.V.

## Talks

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- Langbehn, T.J.**, Aarflot, J. M., & Varpe, Ø. (2021). *The pelagic riskscape and consequences for zooplankton size along gradients of light and sea-ice in the barents sea*. ICES Annual Science Conference 2021, Copenhagen, Denmark. **accepted**.
- Langbehn, T.J.**, Ljungström, G., & Jørgensen, C. (2020). *Equatorwards shifts of marine fishes under climate change: A rule rather than exception?* Ocean Sciences Meeting, 16.- 21. Feb, San Diego, USA.
- Langbehn, T.J.**, Aksnes, D. L., Kaartvedt, S., Fiksen, Ø., & Jørgensen, C. (2019). *Light and the ecology of mesopelagic fish at high latitudes*. Ocean Outlook 2019, 8. May, Bergen, Norway. **Invited**.
- Langbehn, T.J.**, Aksnes, D. L., Kaartvedt, S., Fiksen, Ø., & Jørgensen, C. (2019). *Poleward distribution of mesopelagic fish is constrained by seasonality in light*. ICES Symposium Challenging The Scientific Legacy Of Johan Hjort, 12.- 14. Jun, Bergen, Norway.
- Langbehn, T.J.**, Jørgensen, C., Fiksen, Ø., Aksnes, D. L., & Kaartvedt, S. (2019). *From light, to vision, to species distribution*. Biodagen at the University of Bergen, 15. Mar, Bergen, Norway. **Invited**.
- Langbehn, T.J.**, Jørgensen, C., Ljungström, G., Andersen, K. H., Aksnes, D. L., & Enberg, K. (2019). *Can a food systems approach redefine ecosystem-based?* MARmaED Symposium, 25.- 26. May, Palma de Mallorca, Spain.
- Langbehn, T.J.**, & Varpe, Ø. (2019). *Poleward distribution of mesopelagic fish is constrained by seasonality in light*. BIARRITZ (Bridging International Activity and Related Research Into the Twilight Zone) workshop, 22.- 26. Jun, Southampton, UK. *[Flash talk]*.

- Langbehn, T.J., & Varpe, Ø.** (2019). *Sea-ice loss boosts visual search: Fish foraging and changing pelagic interactions in polar oceans*. Polar Express, Polar Sciences Network, University of Bergen, 15. May, Bergen, Norway. [Flash talk].
- Langbehn, T.J.,** Aksnes, D. L., Kaartvedt, S., Fiksen, Ø., & Jørgensen, C. (2018). *The deadly midnight sun: Visual predators and northern range limits in mesopelagic fish*. ICES annual science conference, 24.- 27. Sep, Hamburg, Germany. **Best Presentation Award.**
- Langbehn, T.J., & Varpe, Ø.** (2018). *Sea-ice loss boosts visual search: Fish foraging and changing pelagic interactions in polar oceans*. ICES annual science conference, 24.- 27. Sep, Hamburg, Germany.
- Langbehn, T.J.** (2017). *Abundance and productivity of mesopelagic fish*. Ocean Conference as part of the naming ceremony for the new research vessel Dr. Fridtjof Nansen, 24. Mar, Oslo, Norway. [Pecha Kucha] **Invited.**
- Langbehn, T.J., & Varpe, Ø.** (2015). *Photoperiodic implications on range expansion in polar marine ecosystems*. 6th YOUMARES Conference, 16.- 18. Sep, Bremen, Germany. **Best Speaker Award.**

## Posters

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- Langbehn, T.J.,** Bourgouin, A., Enberg, K., Hallfredsson, E. H., & Jørgensen, C. (2021). *Exploring the emergent niche of greater argentine (argentina silus) along gradients of topography, light and advection*. ICES Annual Science Conference 2021, 6. - 9. Sep, Copenhagen, Denmark. **accepted.**
- Langbehn, T.J.,** Jørgensen, C., & Enberg, K. (2020). *Exploring the emergent niche of greater argentine (argentina silus) along gradients of topography, light and advection*. Ocean Sciences Meeting 2020, 16.- 21. Feb, San Diego, USA.
- Langbehn, T.J.,** Aarflot, J. M., & Varpe, Ø. (2019). *Sea-ice loss is bad news for large copepods*. Nansen Legacy Annual Meeting, 29.- 31. Oct, Oslo, Norway.
- Langbehn, T.J.,** Aksnes, D. L., Kaartvedt, S., Fiksen, Ø., & Jørgensen, C. (2019). *Poleward distribution of mesopelagic fish is constrained by seasonality in light*. BIARRITZ (Bridging International Activity and Related Research Into the Twilight Zone) workshop, 22.- 26. Jun, Southampton, UK.
- Langbehn, T.J.** (2017). *Limits to northwards range shifts of fish stocks under climate warming - a fish can't eat food it can't find*. MARmaED midterm meeting, 11.- 12. Oct, Oslo, Norway.
- Langbehn, T.J.,** Ljungström, G., Aksnes, D. L., Andersen, K. H., Olsen, Y., Ø., & Jørgensen, C. (2017). *Increasing marine food production through ecolabeling*. Havforskermøtet, 20. Sep - 23. Nov, Bergen, Norway.
- Langbehn, T.J.,** Ljungström, G., Fiksen, Ø., & Jørgensen, C. (2017). *Introducing a new hypothesis: Southward shifts of species distributions under climate change?* 3rd International Workshop on Trait-based Approaches to Ocean Life, 23.- 24. Mar, Bergen, Norway.
- Langbehn, T.J.** (2016). *Seasonal seas - limits to northward range shifts of marine organisms under climate warming*. MARmaED workshop, 28. Jul - 3. Aug, Banyuls sur mer, France.
- Langbehn, T.J., & Varpe, Ø.** (2016). *Photoperiodic implications on visual foraging in polar marine ecosystems*. 16th Congress of the International Society for Behavioural Ecology, 28. Jul - 3. Aug, Exeter, UK.
- Langbehn, T.J., & Varpe, Ø.** (2016). *Photoperiodic implications on visual foraging in polar marine ecosystems*. 7th YOUMARES Conference, 11.- 13. Sep, Hamburg, Germany. **Best Poster Award.**
- Langbehn, T.J., & Varpe, Ø.** (2016). *Photoperiodic implications on visual foraging in polar marine ecosystems*. IMBER ClimEco5 Summer School, 10.- 17. Aug, Natal, Brazil. **Student Choice and Special Mention Poster Award.**
- Langbehn, T.J., & Varpe, Ø.** (2015). *Visual search as a trait: Consequences of sea ice change in high latitude oceans*. 2nd International Workshop on Trait-based Approaches to Ocean Life, 5.- 8. Oct, Waterville, New Hampshire, USA.
- Langbehn, T.J., & Landschoff, J.** (2012). *Live fast, die young: What do changes in age structure tell us about management of cod stocks?* Graduate Marine and Fisheries Sciences Summer Programme, Jun 2010, University of Iceland, Reykjavík, Iceland. **Best Student Poster.**

## Review activities

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## Organisation Of Scientific Meetings

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### Theme session convenor, ICES Annual Science Conference

*Copenhagen, Denmark*

INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA

2020

- Session title: Biomass, biodiversity, and ecosystem services in the mesopelagic zone
- Co-conveners: Helena McMonagle (UW SAFS, USA), Peter H. Wiebe (WHOI, USA)
- Due to COVID-19 the ICES ASC 2020 has been postponed to 2021

### Annual meeting of the Norwegian Association of Marine Scientists

*Bergen, Norway*

NORSK HAVFORSKERFORENING

2017

- Part of the local organisers

### Theme session convenor, YOUMARES 7

*Hamburg, Germany*

GERMAN SOCIETY FOR MARINE RESEARCH (DGM)

2016

- Session title: "DEEP | DARK | COLD - frontiers in polar and deep-sea research"

## Current Memberships

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- since 2017 - Norwegian Association of Marine Scientists / Norsk Havforskerforening (NHF)
- since 2015 - Association of Polar Early Career Scientists (APECS)