


# Max Lindmark

*Curriculum vitae*

## Contact

Swedish University of Agricultural Sciences  
Department of Aquatic Resources  
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## Professional experience

Researcher	2022–
Swedish University of Agricultural Sciences, Institute of Marine Research	
Post-doctoral researcher	2020–2022
Swedish University of Agricultural Sciences, Institute of Marine Research	

## Education

Ph.D. Ecology, Swedish University of Agricultural Sciences. <i>Temperature- and body size scaling: effects on individuals, populations and food webs.</i>	2016–2020
MRes. Applied Marine and Fisheries Ecology (Distinction), University of Aberdeen. <i>Predicting spatial distribution of fish stocks by updating informative survey-based priors with commercial data in a Bayesian framework</i>	2014–2015
BSc. Biology, University of Gothenburg	2011–2014

## Publications

[*Preprints*]

- Norén, K., Svensson, F., **Lindmark, M.** 2025. Evaluating the potential of underwater television to contribute to marine litter assessments alongside bottom trawling. *EarthArXiv*, <https://doi.org/10.31223/X5GB06>
- Lindmark, M.**, Anderson, S.C., Thorson, J. 2024. Estimating scale-dependent covariate responses using two-dimensional diffusion derived from the SPDE method. *bioRxiv*, <https://doi.org/10.1101/2024.12.17.628864>
- Audzijonyte, A., Andersen, K.H., Atkinson, D., Bigman, J., Blanchard, J.L., Coghlan, A.R., Heather, F., **Lindmark, M.**, Morrongiello, J.R., Pauly, D. 2024. Temperature affects fish body sizes. Which sizes? *Authorea*, DOI: 10.22541/au.171813253.38400021/v1.
- Lindmark, M.**, Maioli, M., Anderson, S.C., Gogina, M., Bartolino, V., Sköld, M., Ohlsson, M., Eklöf, A., Casini, M. 2024. Quantifying competition between two demersal fish species from spatiotemporal stomach content data. *bioRxiv*, <https://doi.org/10.1101/2024.04.22.590538>

**Lindmark, M.\***, Ohlberger, J.\*, Gårdmark, A. 2024. Stronger effect of temperature on body growth in cool than in warm populations suggests lack of local adaptation. *bioRxiv*, <https://doi.org/10.1101/2024.01.17.575983>. \* Dual first authorship

*Papers are removed from here when published in open access journal*

[Publications]

16. Ortega-Cisneros, K., Arcos, L.D.F, **Lindmark, M.\***, [...] Blanchard, J.L. 2024. An Integrated Global-to-Regional Scale Workflow for Simulating Climate Change Impacts on Marine Ecosystems. *Earth's Future*. 13(2) <https://doi.org/10.1029/2024EF004826>. *Author list truncated* \*3/40
15. Blanchard, J. L. [...] **Lindmark, M.\*** [...] Tittensor, D. 2024. Detecting, attributing, and projecting global marine ecosystem and fisheries change: FishMIP 2.0. *Earth's Future*. 12(12). <https://doi.org/10.1029/2023EF004402> *Author list truncated* \*31/43
14. Maioli, M., Weigel, B., **Lindmark, M.**, Manfredi, C., Zupa, W., Bitetto, I., Russo, T., Casini, M. 2024. Assessing the overlap between fishing activities and chondrichthyan distribution exposes high-risk areas for bycatch of threatened species. *Ecosphere*. 15(11). <https://doi.org/10.1002/ecs2.70050>
13. Hansen, H. H., Bergman, E., Kopf, K., **Lindmark, M.** 2024. Resistance of Australian fish communities to drought and flood: implications for climate change and adaptations. *Ecography*. 2025(1), e07442. <https://doi.org/10.1111/ecog.07442>
12. Reum, J.C.P., Woodworth-Jefcoats, P., Novaglio, C., Forestier, R., Audzijonyte, A., Gårdmark, A., **Lindmark, M.**, Blanchard, J.L. 2024. Temperature-dependence assumptions drive projected responses of diverse size-based food webs to warming. *Earth's Future*. 12(3). <https://doi.org/10.1029/2023EF003852>
11. **Lindmark, M.**, Anderson, S.C., Gogina, M., Casini, M. 2023. Evaluating drivers of spatiotemporal variability in individual condition of a bottom-associated marine fish, Atlantic cod (*Gadus morhua*). *ICES Journal of Marine Science*, 80(5), 1539–1550 <https://doi.org/10.1093/icesjms/fsad084>
10. **Lindmark, M.**, Karlsson, M., Gårdmark, A. 2023. Larger but younger fish when growth outpaces mortality in heated ecosystem. *eLife*, 12, e82996. <https://doi.org/10.7554/eLife.82996> \*Featured on [The Naked Scientist](#) podcast
9. Belgrano, A, **Lindmark, M.** 2023. Biodiversity transformations in the global ocean: a climate change and conservation management perspective. *Global Change Biology*, 29(12), 3235–3236. <https://doi.org/10.1111/gcb.16665>
8. Woods, A.H, Moran, A.L. [...] **Lindmark, M.\*** [...], Verberk, C.E.P. 2022. Integrative approaches to understanding organismal responses to aquatic deoxygenation. *The Biological Bulletin*, 243(2), pp. 85–103. <https://doi.org/10.1086/722899> *Author list truncated* \*16/26
7. Audzijonyte, A., Jakubavičiūtė, E., **Lindmark, M.**, Richards, S.A. 2022. Mechanistic temperature-size rule explanation should reconcile physiological and mortality responses to temperature. *The Biological Bulletin*, 243(2), pp. 220–238. <https://doi.org/10.1086/722027>
6. **Lindmark, M.**, Audzijonyte, A., Blanchard, J.L. and Gårdmark, A. 2022. Temperature impacts on fish physiology and resource abundance lead to faster growth but smaller fish sizes and yields under warming. *Global Change Biology*, 28(21), 6239–6253. <https://doi.org/10.1111/gcb.16341>
5. **Lindmark, M.**, Ohlberger, J., Gårdmark, A. 2022. Optimum growth temperature declines with body size within fish species. *Global Change Biology*, 28(7), pp. 2259–2271. <https://doi.org/10.1111/gcb.16067>
4. Thunell, V., **Lindmark, M.**, Huss, M., Gårdmark, A. 2021. Effects of warming on intraguild predator communities with ontogenetic diet-shifts. *The American Naturalist*. 196(6). 706–718. <https://doi.org/10.1086/716927>

3. Huss, M., **Lindmark, M.**, Jacobson, P., van Dorst, R., Gårdmark, A. 2019. Experimental evidence of gradual size-dependent shifts in body size and growth of fish in response to warming. *Global Change Biology*, 25(7), pp. 2285–2295. <https://doi.org/10.1111/gcb.14637>
2. **Lindmark, M.**, Ohlberger, J., Huss, M. Gårdmark, A. 2019. Size-based ecological interactions determine effects of warming on food web stability. *Ecology Letters*, 22(5), pp. 778–786. <https://doi.org/10.1111/ele.13235>
1. **Lindmark, M.**, Huss, M., Ohlberger, J. Gårdmark, A. 2018. Temperature-dependent body size effects determine population responses to climate warming. *Ecology Letters*, 21(2), pp. 181–189. <https://doi.org/10.1111/ele.12880>

## Reports

6. ICES. 2024. Joint ICES-PICES Working Group on Impacts of Warming on Growth Rates and Fisheries Yields (WGGRAFY; outputs from 2023 meeting). ICES Scientific Reports. 6:70. 48 pp. <https://doi.org/10.17895/ices.pub.26356351>
5. Jacobsen, N.S., Nadolna-Altyn, K., Ustups, D., **Lindmark, M.**, Griffiths, C., Abdullah, M., Balliu, D., Bartolino, V., Belgrano, A., Boois, I. de, Casini, M., Celie, L., Couce, E., Hal, R. van, Josias Nielsen, J., Kokubun, E.E., Kruze, E., Kvaavik, C., Lamb, P.D., Lemey, L., Levinsky, S.E., Maertens, I., Pachur, M., Pawlak, J., Pinnegar, J.K., Plantener, N., Quirijns, F.J., Raat, H., Rakowski, M., Scherffenberg Lundgaard, L., Sics, I., Stenersen Hansen, S.B., Stolk, D., Thompson, M.S.A., Torreblanca, E., Vingaard Larsen, P., Vinther, M., Wikström, K., Wittoeck, J.. Study on stomach content of fish to update databases and analyse possible changes in diet or food web interactions, 2023, doi: [10.2926/683598](https://doi.org/10.2926/683598)
4. ICES. 2023. Workshop 2 on Fish Distribution (WKFISHDISH2; outputs from 2022 meeting). ICES Scientific Reports. 5:7. 127 pp. <https://doi.org/10.17895/ices.pub.21692246>
3. Havs- och vattenmyndigheten 2019. Fisk- och skaldjursbestånd i hav och sötvatten 2018. Resursöversikt. Havs- och vattenmyndighetens rapport 2019:4. Göteborg, 305 s.
2. Havs- och vattenmyndigheten 2018. Fisk- och skaldjursbestånd i hav och sötvatten 2017. Resursöversikt. Göteborg, 273 s.
1. Havs- och vattenmyndigheten 2016. Fisk- och skaldjursbestånd i hav och sötvatten 2016. Resursöversikt

## Grants

Oscar and Lili Lamm Memorial Foundation	2023
Principal Investigator of a one-year grant (grant no. FO2023-0037) 2024–2025. Project title: <i>Is the decline in size and body growth of Baltic Sea cod due to lack of food?</i> (995 546 SEK)	
Formas research projects for early-career researchers	2022
Principal Investigator of a four-year (2023–2016) grant from the Swedish Research Council Formas for Early Career Researchers (grant no. 2022-01511). Project title: <i>Improving estimates of climate-driven body size changes and range shifts in fishes by accounting for fine-scale spatial heterogeneity.</i> (3 990 209 SEK)	
Sven och Dagmar Saléns stiftelse (Travel grant) (5 616 SEK)	2019

Knut and Alice Wallenbergs foundation (Travel grant) (24 000 SEK)	2018
SLU funds for internationalization of graduate education (Travel grant) (28 000 SEK)	2016

## Awards

SORTEE Finalist of the SORTEE Open Science Researcher Award	2023
Lindsay Laird Prize In recognition of all-round performance in the Applied Marine and Fisheries Ecology program throughout the year.	2015
Fishmonger's Award, Scholarship recipient Full fees payment (£3400) awarded to 1 MRes/MSc student on academic merit by the Fishmonger's Company	2014
Gothenburg Biological Society Stipend for well accomplished bachelor's thesis: By-catch in pelagic fisheries: A study on by-catch in Swedish herring fisheries on the west coast in the winter of 2013/2014	2014

## Invited talks

PICES-2023 Annual Meeting (Seattle) <i>Non-linear growth-temperature relationship leads to opposite responses to warming in cold versus warm populations</i>	October 2023
3rd Internal Water Seminar at SLU (Uppsala) <i>Embracing local scale processes in climate-driven range shifts</i>	March 2023
Svensk Fiskhälsa (Uppsala) <i>Fish and fisheries in a changing climate</i>	Dec 2022
Gulf of Maine Research Institute May Seminar (GMRI) (video) <i>Understanding the effects of climate warming on food webs via individual-level physiology</i>	May 2021

## Conferences

PICES-2023 Annual Meeting (Seattle) <i>Non-linear growth-temperature relationship leads to opposite responses to warming in cold versus warm populations</i>	October 2023
PICES 5th International Symposium on the Effects of Climate Change on the World's Ocean (ECCWO-5), Bergen <i>Local changes in demersal fish biomass in relation to oxygen, temperature, and the metabolic index in a warming and deoxygenating ecosystem</i>	2023
Swedish Oikos Meeting, Gothenburg <i>Quantifying competition between two demersal fish species</i>	2023
ICES ASC (Remote talk) <i>Higher mortality rates leave heated ecosystem with similar size structure despite larger,</i>	2022

*younger, and faster growing fish*

ICES/PICES Early Career Scientist Conference (Talk)	2022
<i>Evaluating drivers of spatiotemporal changes in the condition of Eastern Baltic cod</i>	
Swedish Oikos Meeting, Online (Talk)	2021
<i>Evaluating drivers of spatiotemporal changes in the condition of Eastern Baltic cod</i>	
Baltic Sea Science Congress, Stockholm (Talk)	2019
<i>Warming alters the effect of fishing on the size spectra of an exploited temperate food web</i>	
Society for Experimental Biology, Seville (Talk)	2019
In Satellite: Is global warming causing animals to shrink? evidence, mechanisms and models	
<i>Physiological constraints to growing large in warm waters?</i>	
Swedish Oikos Meeting, Uppsala (Talk)	2019
<i>Physiological constraints to growing large in warm waters?</i>	
Models in Population Dynamics, Ecology, and Evolution, Leicester (Talk)	2018
<i>Species interactions determine effects of warming on stability in a stage-structured food chain</i>	
Nordic Oikos Meeting, Trondheim (Talk)	2018
<i>Species interactions determine effects of warming on stability in a stage-structured food chain</i>	
Swedish Oikos Meeting, Lund (Talk)	2017
<i>Climate change and size-structured populations. Temperature dependent allometry and ontogenetic asymmetry shape warming responses of size structured populations</i>	

## Working groups

WGGRIFY	2020-present
Chair of joint ICES/PICES Working Group on Impacts of Warming on Growth Rates and Fisheries Yields (WGGRIFY)	

## Teaching

<i>Blå omställning för hållbara hav och vatten ("Blue transformation for sustainable oceans")</i>	2024
Lecture on global and national fisheries <a href="https://github.com/maxlindmark/MOOC-course">https://github.com/maxlindmark/MOOC-course</a>	
<i>Principles in Fisheries Science</i>	2018–
Teaching assistant. Wrote R lab Impacts of fishing in an ecological context.	
Lecture on ecological interactions <a href="https://github.com/maxlindmark/pfs">https://github.com/maxlindmark/pfs</a>	
<i>Sustainability perspectives on contemporary fisheries. Where have all the fishes gone?</i>	2019
Teaching assistant. Lecture on climate impacts on global fisheries.	
<i>Ecology for fish management and conservation</i>	2016–2019
Teaching assistant. Wrote R lab Population dynamics and harvesting, lecture on fish morphology, physiology, and energetics, supervising and grading student projects, exam questions and marking.	

All lab material written by me is available on this github repository:  
<https://github.com/maxlindmark/comp-labs-ecology>

## Supervision

### Postdocs

Viktor Thunell, Swedish University of Agricultural Sciences 2024–

### PhD students

Henry Hansen, Karlstad University (co-supervisor) 2023–2024

### MSc students

Julia Cao Sanchez, Uppsala University 2023  
Main supervisor for project: *Joint species distribution modelling of benthic invertebrate communities*

Leo Sheils, Uppsala University 2023  
Main supervisor for project: *Effects of warming on fish growth and body size*

Malin Karlsson, Swedish University of Agricultural Sciences 2019–2020  
Main supervisor for project: *The effect of temperature on life history traits of perch (Perca fluviatilis) in a large scale natural climate change experiment and its implications for population age- and size structure?*

Mattias Grunander, Swedish University of Agricultural Sciences 2016  
Co-supervisor for project: *Effects of global warming on Eurasian perch (Perca fluviatilis) in the Baltic Sea. - Does the growth response to increased temperatures differ along a latitudinal gradient?*

### BSc students

Lisa Schüttler, University of Gothenburg 2023  
Main supervisor for project: *Effects of heatwaves on fish size-at-age*

## Workshops

*Quantitative skill-sharing sessions* 2024

*Instructor at thesis writing workshop SLU* 2023

*Instructor at sdmTMB workshop in Bergen with IMR* 2023

*Lead grant writing workshop aimed towards ECRs at SLU Aqua* 2022

*Making academic websites using GitHub, Quarto and RStudio* 2022  
<https://github.com/maxlindmark/quarto-website>

*Making graphics in R for popular report on status of fishes in Swedish* 2019  
<https://github.com/maxlindmark/ROM>

*LunchR* 2018  
A department wide R course in data wrangling and plotting (4x1 hour). Solely initiated and organized together with student colleague Philip Jacobson. Material: <https://github.com/maxlindmark/LunchR>

*Modelling population dynamics with MatCont* 2018

Organized a session on numerical continuation analysis of a predator-prey model

## Reviewing

**Journals:** American Fisheries Society | American Naturalist | Canadian Journal of Fishery and Aquatic Sciences | Diversity & Distributions | Ecology | Ecology and Evolution | Ecology Letters | Environmental Biology of Fishes | Fisheries | Fish and Fisheries | Functional Ecology | Global Ecology and Biogeography | ICES Journal of Marine Science | Nature Communications | Nature Ecology and Evolution | Oikos | Peer J | PLOS ONE | Proceedings of the National Academy of Sciences | Proceedings of the Royal Society B | Reviews in Fish Biology and Fisheries | Science | Science Advances | Scientific Reports

Proposals: External evaluation of PhD proposal at Ifremer 2022

## University services

PhD Representative Department of Aquatic Resources, SLU 2019

Class representative Applied Marine and Fisheries Ecology 2014–2015  
I represented students' opinions and views on the program in regular meetings with course- and program coordinators at the University of Aberdeen

Student Ambassador Applied Marine and Fisheries Ecology 2014–2015  
I communicated with prospective students, mostly through social media

## Outreach

Interview about the paper [Larger but younger fish when growth outpaces mortality in heated ecosystem](#) on [The Naked Scientist podcast](#)

Co-managing research group's Instagram account @fishinfoodwebs 2016–2020

SLU 40th Anniversary, Uppsala (Poster) 2017  
*Climate change and size-structured populations. Temperature dependent allometry and ontogenetic asymmetry shape warming responses of size structured populations*

Science evenings (high school), Östhammar municipality (Talk) 2017  
*Effects of warming on fishes*

Gothenburg Biological Society 2014  
Popular talk at the Gothenburg Museum of Natural History on bycatch in small scale pelagic fisheries on the west coast of Sweden

Swedish Society for Nature Conservation 2011–2014  
I have given public talks (presenting on the topic of toxins in the Baltic herring in 2014) at local festivals (go: TO SEA and Västerhavsveckan)

Gothenburg Museum of Natural History 2011–2014  
Arranged seminar (4\*2 per year) with invited speakers, covering all things marine