Max Lindmark

Curriculum vitae

Contact

Swedish University of Agricultural Sciences
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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. 2016–2020
Temperature- and body size scaling: effects on individuals, populations and food webs.

MRes. Applied Marine and Fisheries Ecology (Distinction), University of Aberdeen. 2014–2015
Predicting spatial distribution of fish stocks by updating informative survey-based priors with commercial data in a Bayesian framework

BSc. Biology, University of Gothenburg 2011–2014

Publications

[*Preprints*]

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.

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. *ESS OPEN ARCHIVE*, DOI: 10.22541/essoar.171587234.44707846/v1. https://essopenarchive.org/users/713516/articles/937957-an-integrated-global-to-regional-scale-workflow-for-simulating-climate-change-impacts-on-marine-ecosystems?commit=1fbb7a961192410ec607e673b623b923bed82925 *Author list truncated* *3/40

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*]

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*. Accepted. *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 chondrichthyans distribution exposes high-risk areas for bycatch of threatened species. *Ecosphere*. Accepted.

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*. Early view. 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

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: *Is the decline in size and body growth of Baltic Sea cod due to lack of food?* (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: *Improving estimates of climate-driven body size changes and range shifts in fishes by accounting for fine-scale spatial heterogeneity.* (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 2023
Finalist of the SORTEE Open Science Researcher Award

Lindsay Laird Prize 2015
In recognition of all-round performance in the Applied Marine and Fisheries Ecology program throughout the year.

Fishmonger's Award, Scholarship recipient 2014
Full fees payment (£3400) awarded to 1 MRes/MSc student on academic merit by the Fishmonger's Company

Gothenburg Biological Society 2014
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

Invited talks

PICES-2023 Annual Meeting (Seattle) October 2023
Non-linear growth-temperature relationship leads to opposite responses to warming in cold versus warm populations

3rd Internal Water Seminar at SLU (Uppsala) March 2023
Embracing local scale processes in climate-driven range shifts

Svensk Fiskhälsa (Uppsala) Dec 2022
Fish and fisheries in a changing climate

Gulf of Maine Research Institute May Seminar (GMRI) (video) May 2021
Understanding the effects of climate warming on food webs via individual-level physiology

Conferences

PICES-2023 Annual Meeting (Seattle) October 2023
Non-linear growth-temperature relationship leads to opposite responses to warming in cold versus warm populations

PICES 5th International Symposium on the Effects of Climate Change 2023
on the World's Ocean (ECCWO-5), Bergen
Local changes in demersal fish biomass in relation to oxygen, temperature, and the metabolic index in a warming and deoxygenating ecosystem

Swedish Oikos Meeting, Gothenburg 2023
Quantifying competition between two demersal fish species

ICES ASC (Remote talk) 2022
Higher mortality rates leave heated ecosystem with similar size structure despite larger, younger, and faster growing fish

ICES/PICES Early Career Scientist Conference (Talk) 2022
Evaluating drivers of spatiotemporal changes in the condition of Eastern Baltic cod

Swedish Oikos Meeting, Online (Talk) 2021

Evaluating drivers of spatiotemporal changes in the condition of Eastern Baltic cod

Baltic Sea Science Congress, Stockholm (Talk) 2019
Warming alters the effect of fishing on the size spectra of an exploited temperate food web

Society for Experimental Biology, Seville (Talk) 2019
In Satellite: Is global warming causing animals to shrink? evidence, mechanisms and models
Physiological constraints to growing large in warm waters?

Swedish Oikos Meeting, Uppsala (Talk) 2019
Physiological constraints to growing large in warm waters?

Models in Population Dynamics, Ecology, and Evolution, Leicester (Talk) 2018
Species interactions determine effects of warming on stability in a stage-structured food chain

Nordic Oikos Meeting, Trondheim (Talk) 2018
Species interactions determine effects of warming on stability in a stage-structured food chain

Swedish Oikos Meeting, Lund (Talk) 2017
Climate change and size-structured populations. Temperature dependent allometry and ontogenetic asymmetry shape warming responses of size structured populations

Working groups

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

Teaching

Principles in Fisheries Science 2018–
Teaching assistant. Wrote R lab Impacts of fishing in an ecological context. Lecture on ecological interactions https://github.com/maxlindmark/pfs

Sustainability perspectives on contemporary fisheries. Where have all the fishes gone? 2019
Teaching assistant. Lecture on climate impacts on global fisheries.

Ecology for fish management and conservation 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

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 | Oikos | Peer J | PLOS ONE | PNAS | Proceedings of the Royal Society B | Reviews in Fish Biology and Fisheries | 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