

# Trond Kristiansen

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Languages: Norwegian and English

[Google Scholar](#)

[github.com/trondkr](https://github.com/trondkr)

## Expertise

I have led several projects focusing on understanding climate change impacts, fisheries, and ecosystem dynamics in the Arctic Ocean and the North Atlantic. My work has broad applications for climate risk assessments, ocean management, and population dynamics and can easily be adapted for other needs. I have developed and applied the following models:

- Regional Ocean Modeling System (ROMS)
- Agent (Individual) -based modeling (ABM)
- Assimilation schemes (4DVAR)
- Coupled biophysical model systems
- Earth System Models
- Climate model downscaling
- Particle tracking
- Cloud infrastructure

## Professional experience

06/2019 - present Principal Scientist – Farallon Institute for Advanced Ecosystem Research, Petaluma, CA

12/2016 - present Senior Scientist at Norwegian Institute for Water Research (NIVA), Oslo, Norway

- Project lead for Arctic 2030 project on effects of melting of permafrost on Arctic ecosystems
- NIVA lead for GLIDER project on autonomous monitoring of ecosystems
- NIVA lead for EU ResponSEable project and for delivering an interactive platform for informing the general public on their dependence and responsibility of marine ecosystems
- Responsible for development of real-time quality control of dataflow from autonomous platforms and ships of opportunity
- NIVA lead for JMP EUNOSAT project on using satellite data for habitat assessment
- Responsible for cruises and hydrographic monitoring in ecosystem assessments

4/2011 - 11/2016 Senior Scientist at Institute of Marine Research, Oslo, Norway

- Project leader for ocean re-analysis of the North Sea dynamics ([online data archive, copernicus.eu](#))
- Co-chair for international working group on understanding climate impacts on Arctic and sub-Arctic ecosystems including commercial fisheries
- Project leader for downscaling high-resolution Earth System Model for the Arctic Ocean
- Lead developer for applying an agent-based modeling approach for high performance computing
- Representing Norway in [COST ES1402](#) Evaluation of Ocean Syntheses working group

2011 - 2015 Visiting Scientist at NOAA, Silver Spring, Maryland, USA

- Liaison between Institute of Marine Research (Norway) and National Oceanic Atmospheric Administration (USA)

4/2008 - 4/2011 Postdoctoral Scientist at Institute of Marine Research, Bergen, Norway

- Led ecosystem analysis related to ARCWARM, a multi-country research project focused on understanding future climate change through the lens of historical warm and cold periods
- Led analysis evaluating impacts of climate change at multiple trophic levels in the North Atlantic
- Developed mechanistic agent-based model for fish

4/2008-5/2009 Visiting Scholar at Institute of Marine and Coastal Sciences, Rutgers University, NJ, USA.

- Analysed past trends in ocean dynamics across the North Atlantic and evaluated consequences for Atlantic cod and haddock
- Developed toolbox for marine spatial analysis and ocean modeling. The toolbox was programmed using a combination of Python and FORTRAN programming languages, and was optimized for speed. The toolbox is available online (<https://github.com/trondkr/model2roms>).

3/2007-4/2008 Postdoctoral scientist at Department of Marine Sciences, University of North Carolina at Chapel Hill, USA

- Modeled the feeding behavior of larval Atlantic cod on Georges Bank and compared the results to observations
- Setup [ROMS](#) model for the Gulf of Maine region

## Education

2003-2007 Ph.D. in Marine Biology at Department of Biology, University of Bergen, Norway

- Dissertation title: Modeling early life history of cod

1999-2001 M.Sc. in Oceanography at Department of Geosciences, University of Oslo, Norway

- Dissertation title: Hydrography and Dynamics of the West Spitsbergen Current

1994-1999 B.S. in Oceanography and Meteorology at Department of Geosciences, University of Oslo, Norway

## Research interests

- How will large-scale physical features of climate change affect local ecosystem dynamics in coastal areas?
- What are the effects of climate change on ocean production and food web dynamics?
- How can regional climate models be applied to better inform management and decision making?
- What are the consequences of anthropogenic activities such as oil spills on fisheries recruitment?

## Publications

I have published more than 30 peer-review articles since 2007. I have an h-index of 19, an i10-index of 26, and 1083 citations of my work. My publications are also available through my [ResearchGate profile](#).

Latest publications:

- Kenneth F. Drinkwater and **Trond Kristiansen** (2018). A synthesis of the ecosystem responses to the late 20th century cold period in the northern North Atlantic. *ICES Journal of Marine Science*, [doi:10.1093/icesjms/fsy077](https://doi.org/10.1093/icesjms/fsy077).
- Kristina Ø. Kvile, Giovanni Romagnoni, Knut-Frode Dagestad, Øystein Langangen, **Trond Kristiansen** (2018). Sensitivity of modelled North Sea cod larvae transport to vertical behaviour, ocean model resolution and interannual variation in ocean dynamics. *ICES Journal of Marine Science* [doi.org/10.1093/icesjms/fsy039](https://doi.org/10.1093/icesjms/fsy039).
- Andrew A Rosenberg et al. (2018). Applying a new ensemble approach to estimating stock status of marine fisheries around the world. *Conservation Letters*.
- R Gregory Lough, Elisabeth A Broughton, **Trond Kristiansen** (2017). Changes in spatial and temporal variability of prey affect functional connectivity of larval and juvenile cod. *ICES Journal of Marine Science*.
- Desiree Tommasi et al. (2017). Managing living marine resources in a dynamic environment: the role of seasonal to decadal climate forecasts. *Progress in Oceanography*.
- Teunis Jansen, Søren Post, **Trond Kristiansen**, Guðmundur J. Óskarsson, Jesper Boje, Brian R. MacKenzie and Helle Siegstad (2016). Ocean warming expands habitat of a rich natural resource and benefits a national economy. *Ecological Applications*.
- Kevin D. Friedland, Nicholas R. Record, Rebecca G. Asch, **Trond Kristiansen**, Vincent S. Saba, Kenneth F. Drinkwater, Stephanie Henson, Robert T. Leaf, Ryan E. Morse, David G. Johns, Scott I. Large, Solfrid S. Hjøllø, Janet A. Nye, Mike A. Alexander, Rubao Ji (2016). Seasonal phytoplankton blooms in the North Atlantic linked to the overwintering strategies of copepods. *Elementa: Science of the Anthropocene* 4 (1). [doi: 10.12952/journal.elementa.000099](https://doi.org/10.12952/journal.elementa.000099)
- Michael J. Fogarty, Andrew A. Rosenberg, Andrew B. Cooper, Mark Dickey-Collas, Elizabeth A. Fulton, Nicolás L. Gutiérrez, Kimberly JW Hyde, Kristin M. Kleisner, **Trond Kristiansen**, Catherine Longo, Carolina V. Minte-Vera, Cólín Minto, Iago Mosqueira, Giacomo Chato Osio, Daniel Ovando, Elizabeth R. Selig, James T. Thorson, Yimin Ye (2016). Fishery production potential of large marine ecosystems:

- A prototype analysis. *Environmental Development* 17:211-219. doi: [10.1016/j.envdev.2016.02.001](https://doi.org/10.1016/j.envdev.2016.02.001)
- Kevin D. Friedland, Robert T. Leaf, and **Trond Kristiansen**, Scott Large (2015). Layered Effects of Parental Condition and Larval Survival on the Recruitment of Neighboring Haddock Stocks. *Canadian Journal of Fisheries and Aquatic Sciences* 72:1672-1681. doi: [10.1139/cjfas-2015-0084](https://doi.org/10.1139/cjfas-2015-0084)
  - Svein Sundby and **Trond Kristiansen** (2015). The Principles of Buoyancy in Marine Fish Eggs and Their Vertical Distributions across the World Oceans. *PLoS ONE* 10 (10). doi: [10.1371/journal.pone.0138821](https://doi.org/10.1371/journal.pone.0138821)
  - C. Stock, K. Pegion, G.A. Vecchi, M. A. Alexander, D. Tommasi, N.A. Bond, P.S. Fratantoni, R. E. Gudgel, **T. Kristiansen**, T. O'Brien, Y. Xue, X. Yang (2015). Seasonal sea surface temperature anomaly prediction for coastal ecosystems. *Progress in Oceanography* 137:219-236. doi: [10.1016/j.pocean.2015.06.007](https://doi.org/10.1016/j.pocean.2015.06.007)
  - Øystein Varpe, Malin Daase, Trond Kristiansen (2015). A fish-eye view on the new Arctic lightscape. *ICES Journal of Marine Science* doi: [10.1093/icesjms/fsv129](https://doi.org/10.1093/icesjms/fsv129)
  - Robert G. Lough and **Trond Kristiansen** (2015). Potential growth of pelagic juvenile cod in relation to the 1978–2006 winter–spring zooplankton on the Northeast US continental shelf. *ICES Journal of Marine Science* 72 (9):2549-2568. doi: [10.1093/icesjms/fsv145](https://doi.org/10.1093/icesjms/fsv145)
  - **Trond Kristiansen** and Eyvind Aas (2015). Water type quantification in the Skagerrak, the Kattegat and off the Jutland west coast. *Oceanologia* 57 (2):177-195. doi: [10.1016/j.oceano.2014.11.002](https://doi.org/10.1016/j.oceano.2014.11.002)
  - **Trond Kristiansen**, Charles Stock, Kenneth F. Drinkwater, Enrique Curchitser (2014). Mechanistic insights into the effects of climate change on larval cod. *Global Change Biology* 20 (5):1559-1584. doi: [10.1111/gcb.12489](https://doi.org/10.1111/gcb.12489)
  - **Trond Kristiansen**, Knut W. Vollset, Svein Sundby, and Frode Vikebø (2014). Turbulence enhances feeding of larval cod at low prey densities. *ICES Journal of Marine Science* 71 (9): 2515-2529. doi: [10.1093/icesjms/fsu051](https://doi.org/10.1093/icesjms/fsu051)
  - Frode B. Vikebø, Petter Rønningen, Vidar S. Lien, Sonnich Meier, Mark Reed, Bjørn Ådlandsvik, **Trond Kristiansen** (2014). Spatio-temporal overlap of oil spills and early life stages of fish. *ICES Journal of Marine Science* 71 (4): 970-981. doi: [10.1093/icesjms/fst131](https://doi.org/10.1093/icesjms/fst131)
  - Margaret M. McBride, Padmini Dalpadado, Kenneth F. Drinkwater, Olav Rune Godø, Alistair J. Hobday, Anne B. Hollowed, **Trond Kristiansen**, Eugene J. Murphy, Patrick H. Ressler, Sam Subbey, Eileen E. Hofmann, Harald Loeng (2014). Krill, climate, and contrasting future scenarios for Arctic and Antarctic fisheries. *ICES Journal of Marine Science* 71: 1934-1955. doi: [10.1093/icesjms/fsu002](https://doi.org/10.1093/icesjms/fsu002)
  - Kenneth F. Drinkwater, Martin Miles, Iselin Medhaug, Odd Helge Otterå, **Trond Kristiansen**, Svein Sundby, Yongqi Gao (2013). The Atlantic Multidecadal Oscillation: Its manifestations and impacts with special emphasis on the Atlantic region north of 60 N. *Journal of Marine Systems* 133:117-130. doi: [10.1016/j.jmarsys.2013.11.001](https://doi.org/10.1016/j.jmarsys.2013.11.001)
  - Elizabeth C. Siddon, **Trond Kristiansen**, Franz J. Mueter, Kirstin K. Holsman, Ron A. Heintz, Edward V. Farley (2013). Spatial match-mismatch between juvenile fish and prey provides a mechanism for recruitment variability across contrasting climate conditions in the eastern Bering Sea. *PLoS ONE* 8 (12). doi: [10.1371/journal.pone.0084526](https://doi.org/10.1371/journal.pone.0084526)
  - Kenneth Drinkwater, Eugene Colbourne, Harald Loeng, Svein Sundby, **Trond Kristiansen** (2013). Comparison of the atmospheric forcing and oceanographic responses between the Labrador Sea and the Norwegian and Barents seas. *Progress In Oceanography* 114:11-25. doi: [10.1016/j.pocean.2013.03.007](https://doi.org/10.1016/j.pocean.2013.03.007)
  - Jeffrey M. Leis, Jennifer E. Caselle, Ian R. Bradbury, **Trond Kristiansen**, Joel K. Llopiz, Michael J. Miller, Mary I. O'Connor, Claire B. Paris, Alan L. Shanks (2013). Does fish larval dispersal differ between high and low latitudes? *Proceedings of the Royal Society B: Biological Sciences* 280 (1759): 20130327. doi: [10.1098/rspb.2013.0327](https://doi.org/10.1098/rspb.2013.0327)
  - Frode Vikebø, Petter Rønningen, Vidar Lien, Sonnich Meier, Martin Reed, Bjørn Ådlandsvik, **Trond Kristiansen** (2013). Spatiotemporal overlap of oil spill and early life stages of fish. *ICES Journal of Marine Science* . doi: [10.1093/icesjms/fst131](https://doi.org/10.1093/icesjms/fst131)
  - **Trond Kristiansen**, Kenneth F. Drinkwater, R. Gregory Lough, and Svein Sundby (2011). Recruitment variability in North Atlantic cod and match-mismatch dynamics. *PLoS ONE* 6 (3): e17456. doi: [10.1371/journal.pone.0017456](https://doi.org/10.1371/journal.pone.0017456)

- Frode B Vikebø, Bjørn Ådlandsvik, Jon Albretsen, Svein Sundby, Erling Kåre Stenevik, Geir Huse, Einar Svendsen, **Trond Kristiansen**, Elena Eriksen (2011). Real-time ichthyoplankton drift in north-east Arctic cod and Norwegian spring-spawning herring. PLoS ONE 6 (11). [doi: 10.1371/journal.pone.0027367](https://doi.org/10.1371/journal.pone.0027367)
- **Trond Kristiansen**, Christian Jørgensen, R. Gregory Lough, Frode Vikebø, and Øyvind Fiksen (2009). Modeling rule-based behavior: habitat selection and the growth-survival trade-off in larval cod. Behavioral Ecology 20 (3):490-500. doi: [10.1093/beheco/arp023](https://doi.org/10.1093/beheco/arp023)
- **Trond Kristiansen**, Frode Vikebø, Svein Sundby, Geir Huse, and Øyvind Fiksen (2009). Growth and feeding of larval cod (*Gadus morhua*) in large-scale latitudinal environmental gradients. Deep Sea Research II, Vol 56, Issue 21-22, pages 2001-2011. [doi: 10.1016/j.dsr2.2008.11.011](https://doi.org/10.1016/j.dsr2.2008.11.011)
- Colleen M. Petrik, **Trond Kristiansen**, R. Gregory Lough, Cabell S. Davis (2009). Prey selection by larval haddock and cod on copepods with species-specific behavior: an individual-based model analysis. Marine Ecology Progress Series 396: 123–143. [doi:10.3354/meps08268](https://doi.org/10.3354/meps08268)
- **Trond Kristiansen**, R. Gregory Lough, Francisco E. Werner, Elisabeth Broughton, and Larry J. Buckley. Individual-based modeling of feeding ecology and prey selection of larval cod in Georges Bank (2009). Marine Ecology Progress Series, 376: 227-243. [doi: 10.3354/meps07796](https://doi.org/10.3354/meps07796)
- Øyvind Fiksen, Christian Jørgensen, **Trond Kristiansen**, Frode Vikebø, and Geir Huse (2007). Linking behavioural ecology and oceanography: larval behaviour determines growth, mortality, and dispersal. Marine Ecology Progress Series 347: 195-205. [doi: 10.3354/meps06978](https://doi.org/10.3354/meps06978)
- Frode Vikebø, Christian Jørgensen, **Trond Kristiansen**, and Øyvind Fiksen (2007). Drift, growth and survival of larval Northeast Arctic cod with simple rules of behaviour. Marine Ecology Progress Series 347: 207-219. [doi: 10.3354/meps06979](https://doi.org/10.3354/meps06979)
- **Trond Kristiansen**, Øyvind Fiksen, and Arild Folkvord (2007). Modelling feeding, growth and habitat selection in larval cod (*Gadus morhua*): observations and model predictions in a macrocosm environment. Canadian Journal of Fisheries and Aquatic Sciences 64 (1): 136-151. doi: [10.1139/F06-176](https://doi.org/10.1139/F06-176)

## Books and book chapters

- M. J. Fogarty, A. A. Rosenberg, A. B. Cooper, M. Dickey-Collas, B. Fulton, N. Gutiérrez, K.J.W. Hyde, K. M. Kleisner, **T. Kristiansen**, C. Longo, C. Minte-Vera, C. Minto, I. Mosqueira, G. C. Osio, D. Ovando, E. R. Selig, J. T. Thorson, Y. Ye (In press). Book chapter 6.2 Fishery production potential of large marine ecosystems: a prototype analysis, Transboundary water assessment programme (TWAP) - Large Marine Ecosystems Component, UNEP
- Griffis and Howard (Eds.) (2013) Oceans and Marine Resources in a Changing Climate: A Technical Input to the 2013 National Climate Assessment. [Island Press](https://www.islandpress.com/), pp. 288.
- Jennifer Howard et al. (2013) Oceans and Marine Resources in a Changing Climate. Oceanography and Marine Biology. An Annual Review, Volume 51:71-192. R. N. Hughes, D. J. Hughes, and I. P. Smith CRC Press. [ISBN: 978-1-4665-6866-2](https://www.islandpress.com/)

## Working groups and workshops

- Member of [ICES WGOOFE](https://www.ices.dk/workinggroups/Operational%20Oceanographic%20Products) - Working Group on Operational oceanographic products for fisheries and environment
- I organized and led a two-day international workshop on “Climate Change Effects on Fisheries” on Iceland in 2013. [The Research Council of Norway project description](https://www.researchcouncilofnorway.no/en/working-groups/Climate-Change-Effects-on-Fisheries).
- I co-chaired an ICES/PICES Strategic Initiative on Climate Change effects on Marine Ecosystems (SIC-CME) workshop entitled “Climate Change effects on fish and fisheries: a modelling workshop” that took place in Seattle in August 2015. [ICES CM 2015/SSGEPD:19](https://www.ices.dk/workinggroups/SIC-CME)
- I am one of two co-chairs of “Working Group on Bioenergetics”. This working group is part of the Ecosystem Studies of Sub-Arctic Seas (ESSAS).
- I am a co-chair of the [Wakefield Symposium 2017](https://www.wakefieldsymposium.com/) - “Impacts of a Changing Environment on the Dynamics of High-latitude Fish and Fisheries”
- I represent Norway in the EU working group [COST ES1402](https://www.cost.eu/Programme/ES1402) Evaluation of Ocean Syntheses.