

Publications

Peer-reviewed articles

2026

StPierre, M., **Kjellsson, J.**, Park, W., Borchert, L.F., Latif, M., (2025) Emergence time of CO₂-forced European summer climate trends. *Scientific Reports*, 16, 9707. DOI: 10.1038/s41598-026-44761-5
[\[http link\]](#)

Sieker, T., **Kjellsson, J.**, Park, W., (2026) Coupled model bias in the North Atlantic in the FOCI-OpenIFS coupled climate model. *Climate Dynamics*, 64, 144. DOI: 10.1007/s00382-026-08110-6
[\[http link\]](#)

Krüger, J., **Kjellsson, J.**, Lohmann, K., Matei, D., Pilch-Kedzierski, R. Improved European heat event simulation in General Circulation Models with an eddy-permitting ocean. *Nature Communications Earth & Environment*, 7, 123. DOI: 10.1038/s43247-025-03145-9
[\[http link\]](#)

2025

Savita, A., **Kjellsson, J.**, Latif, M., Nnamchi, H., Wahl, S., (2025) Causes of Eurasian Winter-Cooling During the late 20th and Early 21st Century. *Geophysical Research Letters*, 52. DOI: 10.1029/2024GL114140
[\[http link\]](#)

Liu, Y., **Kjellsson, J.**, Savita, A., Park, W. (2025) Impact of horizontal resolution and model time step on European precipitation extremes in the OpenIFS atmosphere model. *Geosci. Model Dev.*, 18, 5435–5449, DOI: 10.5194/gmd-18-5435-2025
[\[http link\]](#)

2024

Ayres, H., Ferreira, D., Park, W., **Kjellsson, J.**, Ödalen, M. (2024) A comparison of the atmospheric response to the Weddell Sea polynya in AGCMs of varying resolutions. *Weather Clim. Dynam.*, 5, 805–820, doi: 10.5194/wcd-5-805-2024
[\[http link\]](#)

Savita, A., **Kjellsson, J.**, Pilch-Kedzierski, R., Latif, M., Rahm, T., Wahl, S., Park, W. (2024) ECMWF-OpenIFS climate sensitivity to horizontal resolutions and model time step. *Geoscientific Model Development*. 17, 1813–1829, doi: 10.5194/gmd-2023-101
[\[http link\]](#)

2023

Krüger, J., **Kjellsson, J.**, Pilch Kedzierski, R., Claus, M. (2023) Connecting North Atlantic SST variability to European heat events in recent decades. *Tellus A: Dynamic Meteorology and Oceanography*, 75(1), 358-374, doi: 10.16993/tellusa.3235
[\[http link\]](#)

Latif, M., Bayr, T., **Kjellsson, J.**, Lübbecke, J.F, Martin, T., Nnamchi, H.C., Park, W., Savita, A., Sun, J., Dommenges, D. (2023) Strengthening atmospheric circulation and trade winds slowed tropical Pacific surface warming. *Nat. Communications Earth & Environment*, 4, doi: 10.1038/s43247-023-00912-4
[\[http link\]](#)

2022

Streffing, J., ..., **Kjellsson, J.** et al. (2022) AWI-CM3 coupled climate model: description and evaluation experiments for a prototype post-CMIP6 model. *Geosci. Mod. Dev.*, 15, 6399-6427, doi: 10.5194/gmd-15-6399-2022
[\[http link\]](#)

2021

Nnamchi, H., Latif, M., Keenlyside, N., **Kjellsson, J.**, Richter, I. (2021) Diabatic heating governs the seasonality of the Atlantic Niño. *Nat. Comm.*, 12 (1), doi: 10.1038/s41467-020-20452-1
[\[http link\]](#)

2020

Groeskamp, S., **Kjellsson, J.** (2020) NEED: The Northern European Enclosure Dam for if climate change mitigation fails. *Bull. Am. Met. Soc.* 101 (11), doi: 10.1175/BAMS-D-19-0145.1
[\[http link\]](#)

Chafik, L., Hártun, H., **Kjellsson, J.**, Larsen, K., Rossby, T., Berx, B. (2020) Discovery of an unrecognised pathway carrying overflow waters toward the Faroe Bank Channel. *Nat Comm.*, 11 (1), doi: 10.1038/s41467-020-17426-8
[\[http link\]](#)

2018

van Sebille, E., et al. (2018), Lagrangian ocean analysis: Fundamentals and practices, *Ocean Modelling*, 121, 49–75, 10.1016/j.ocemod.2017.11.008.
[\[http link\]](#)

2017

Döös, K., **Kjellsson, J.**, Zika, J., Laliberté, F., Brodeau, L., Campino, A. (2017), The coupled ocean-atmosphere hydrothermohaline circulation, *Journal of Climate*, 30(2), 10.1175/JCLI-D-15-0759.1.
[\[http link\]](#)

Kjellsson, J., Zanna, L. (2017), The Impact of Horizontal Resolution on Energy Transfers in Global Ocean Models, *Fluids*, 2 (3), 45, 10.3390/fluids2030045.
[\[http link\]](#)

Döös, K., Jönsson, B., **Kjellsson, J.** (2017), Evaluation of oceanic and atmospheric trajectory schemes in the TRACMASS trajectory model v6.0, *Geoscientific Model Development*, 10 (4), 1733–1749, 10.5194/gmd-10-1733-2017.
[\[http link\]](#)

2015

Kjellsson, J., Holland, P., Marshall, G., Mathiot, P., Aksenov, Y., Coward, A., Bacon, S., Megann, A., Ridley, J. (2015), Model sensitivity of the Weddell and Ross seas, Antarctica, to vertical mixing and freshwater forcing, *Ocean Modelling*, 94, 141–152, 10.1016/j.ocemod.2015.08.003.
[\[http link\]](#)

Laliberté, F., Zika, J., Mudryk, L., Kushner, P., **Kjellsson, J.**, Döös, K. (2015), Constrained work output of the moist atmospheric heat engine in a warming climate, *Science*, 347(6221), 10.1126/science.1257103.
[\[http link\]](#)

Kjellsson, J. (2015), Weakening of the global atmospheric circulation with global warming, *Climate Dynamics*, 45 (3-4), 975–988, 10.1007/s00382-014-2337-8.
[\[http link\]](#)

2014

Kjellsson, J., Döös, K., Laliberté, F., Zika, J. (2014), The Atmospheric General Circulation in Thermodynamical Coordinates, *J. Atmos. Sci.*, 71, 916–928.
[\[http link\]](#)

2013

Kjellsson, J., Döös, K., Soomere, T. (2013), Evaluation and Tuning of Model Trajectories and Spreading Rates in the Baltic Sea using Surface Drifter Observations, in *Preventive Methods for Coastal Protection*, edited by T. Soomere and E. Quak, Springer International Publishing. DOI: 10.1007/978-3-319-00440-2_8.
[\[http link\]](#)

Döös, K., **Kjellsson, J.**, Jönsson, B. (2013), TRACMASS - A Lagrangian Trajectory Model, in *Preventive Methods for Coastal Protection*, edited by T. Soomere and E. Quak, Springer International Publishing.
[\[http link\]](#)

2012

Kjellsson, J., Döös, K. (2012), Lagrangian decomposition of the Hadley and Ferrel cells, *Geophysical Research Letters*, 39(15), 10.1029/2012GL052420.
[\[http link\]](#)

Kjellsson, J., Döös, K. (2012), Surface drifters and model trajectories in the Baltic Sea, *Boreal Environment Research*, 17, 447–459.
[\[http link\]](#)

Anthologies

Kjellsson, J. (2014), Atmospheric & Oceanic Applications of Eulerian and Lagrangian Transport Modelling, Ph.D. thesis, Stockholm University. URN: urn:nbn:se:su:diva-97348
[\[http link\]](#)

Kjellsson, J. (2009), Lagrangian Decomposition of the Hadley Cells, Master thesis, Stockholm University. URN: urn:nbn:se:su:diva-8732
[\[http link\]](#)

Other academic articles

Maisonnave, E., **Kjellsson, J.** (2021) OASIS Dedicated Support, 5th annual summer, Technical Report, TR/CMGC/21/150, CECI, UMR CERFACS/CNRS No 5318, France
[\[http link\]](#)

Groeskamp, S., **Kjellsson, J.** (2021) NEED Northern European Enclosure Dam, Europhysics News, 52 (2), doi: 10.1051/ejn/2021201
[\[http link\]](#)

Kjellsson, J., Streffing, J., Carver, G., Koehler, M. (2020), From weather forecasting to climate modelling using OpenIFS, ECMWF Newsletter, 164, doi: 10.21957/469hc10jk5
[\[http link\]](#)

Hannachi, A., **Kjellsson, J.**, Tjernström, M., Carver, G. (2012), Teaching with OpenIFS at Stockholm University: leading the learning experience, ECMWF Newsletter, 134, doi: 10.21957/v4u9zv8r
[\[http link\]](#)

In progress

Kjellsson, J., Park, W. Multi-centennial variability of AMOC variability in the FOCI-OpenIFS climate model. In prep.

Kjellsson, J., Wahl, S., Bischof, S., Kummer, L., Martin, T., Pilch-Kedzierski, R., Zeller, M., Ödalen, M., Park, W. Reducing Southern Ocean surface biases in the FOCI climate model. In review for Journal of Advances in Modelling Earth Systems. doi: 10.22541/essoar.169447339.96217761/v1

Kjellsson, J., et al. FOCI 3.0: Tuning strategy, mean state climate and CMIP DECK integrations. In prep. for Geoscientific Model Development.

Ayres, H.C., Ferreira, D., Wong, C., **Kjellsson, J.**, Ödalen, M. Robust Coupled Ocean–Atmosphere Processes of the Weddell Sea Polynya in CMIP6 Models. Submitted to Journal of Climate

Gözlet, M.S, **Kjellsson, J.**, Latif, M. Recent and future trends in jet-stream waviness on the Northern Hemisphere. Submitted to GRL.

Jong, T., Puthiyaveetil, N., **Kjellsson, J.**, Bidlot, J., Park, W. Impact of wave coupling and the Charnock parameter on tropical circulations in a climate model. Submitted to Climate Dynamics.

Liu, Y., **Kjellsson, J.**, Savita, A., Nnamchi, H., Park, W. Contrasting Impacts of Atlantic and Pacific Decadal Variability on Regional Sahel Precipitation. Submitted to Climate Dynamics.

Ödalen, M., Savita, A., **Kjellsson, J.**, Wahl, S., Ferreira, D., Ayres, H., Roquet, F., Park, W. Coupled climate effects of eddy rich model resolution in and south of the Agulhas. In prep.

Ojha, S., **Kjellsson, J.**, Martin, T., Chafik, L., Maisonnave, E., Park, W., (2025) Meridional heat transport in the North Atlantic region: Effects of ocean and atmosphere grid resolutions. Submitted to Geosci. Mod. Dev.

Savita, A., Nnamchi, H., **Kjellsson, J.**, Latif, M., Wahl, S. North Atlantic Sea Surface Temperature-Driven Predictability of the North Atlantic Oscillation. In prep.

StPierre, M., Latif, M., **Kjellsson, J.**, Park, W., Borchert, L., (2024) Evident decrease in future European soil moisture in the Kiel Climate Model grand ensemble. In review for Climate Dynamics.

[[http link](#)]

Zhang, Q., **Kjellsson, J.**, Black, E., Krüger, J. Trends in Heat Stress During Heat Waves Across Europe (1979-2023). In review for Geophys. Res. Lett.