

Regional Climate System Modeling for the Baltic Sea region – an overview about Baltic Earth activities (10min)



Markus Meier and Baltic Earth community

Baltic Earth
Earth System Science for the Baltic Sea Region

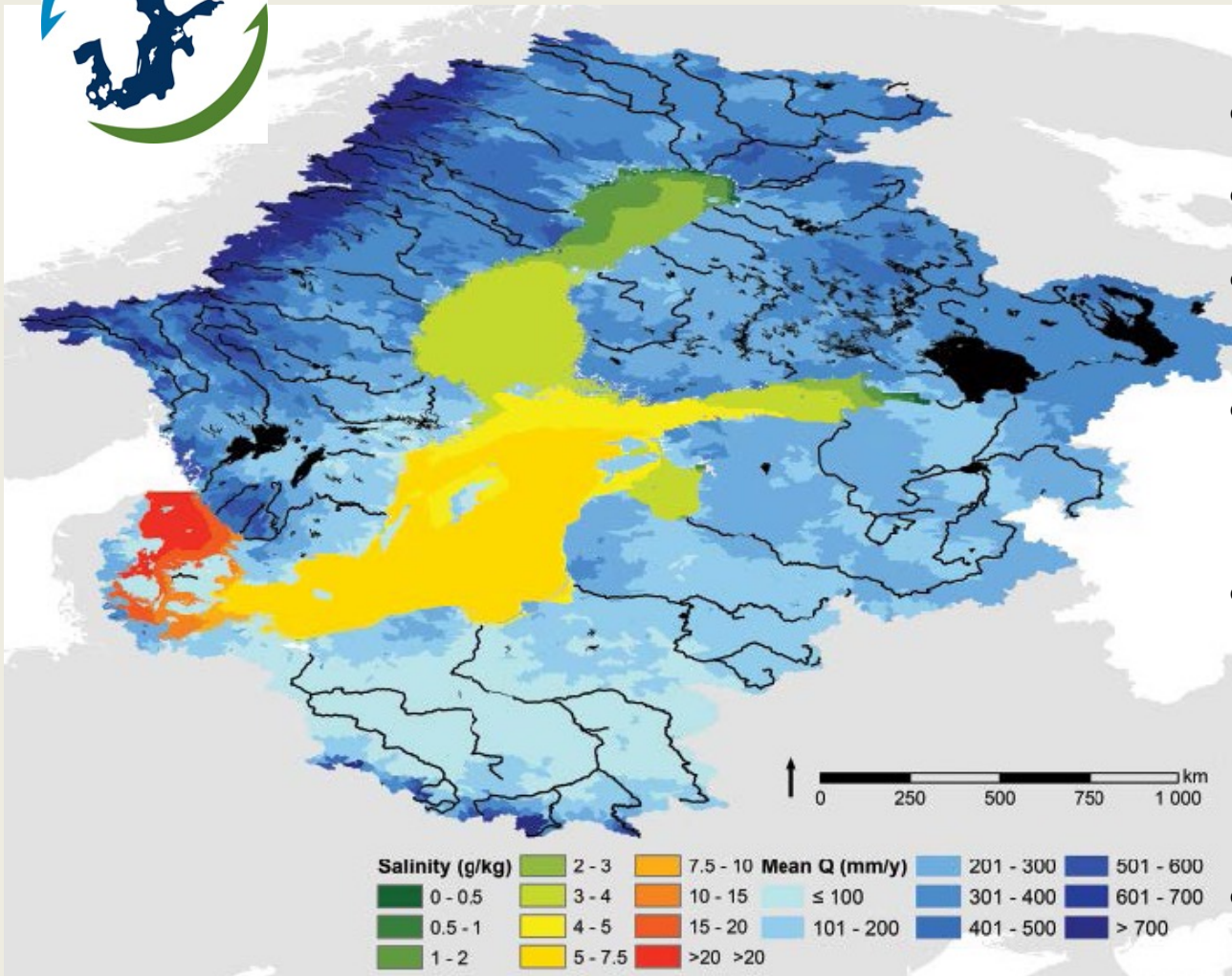
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The Baltic Sea Region

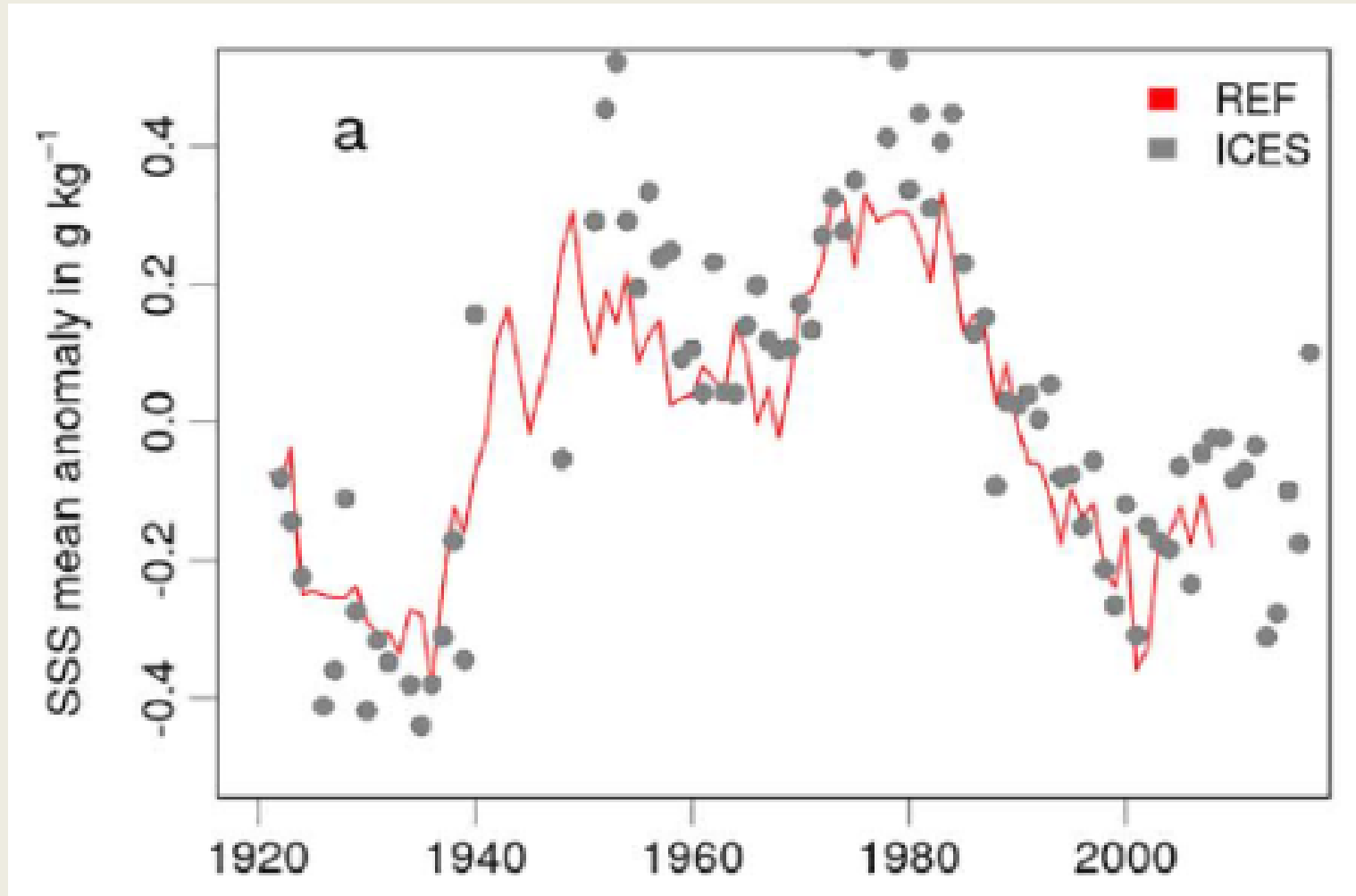


- Basin: 2.13 Mill. km² (20% of the European continent)
- Baltic Sea: 380 000 km²
- 85 million in 14 countries
- Variable climate and topography
- Considerable seasonal, inter-annual, decadal and long-term variations
- Unique, challenging region for climate and environmental studies (data, models and observations, budgets)
- Environmental issues of concern

- Regional Earth System Modeling
- Baltic Earth Assessment Reports (BEARs)
- Education of climate scientists on master and PhD level



Sea surface salinity

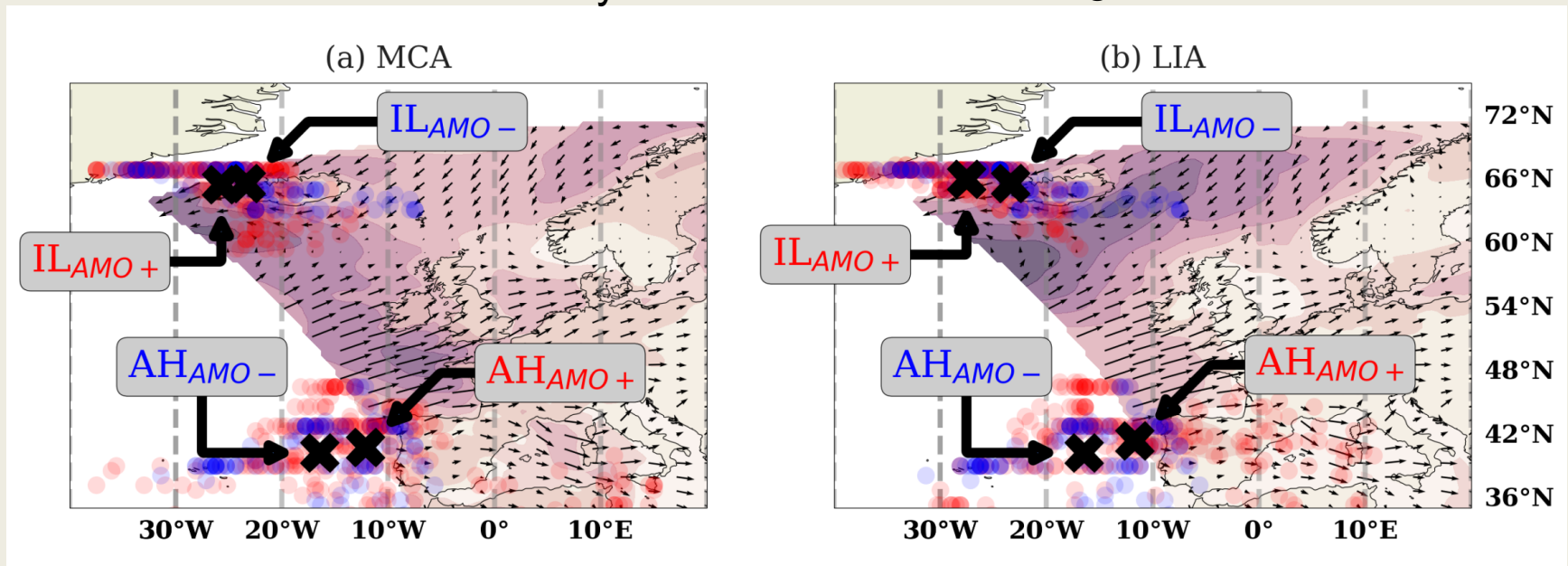


(Source : Madline Kniebusch et al., 2019)

North Atlantic Circulation

Medieval Climate Anomaly

Little Ice Age



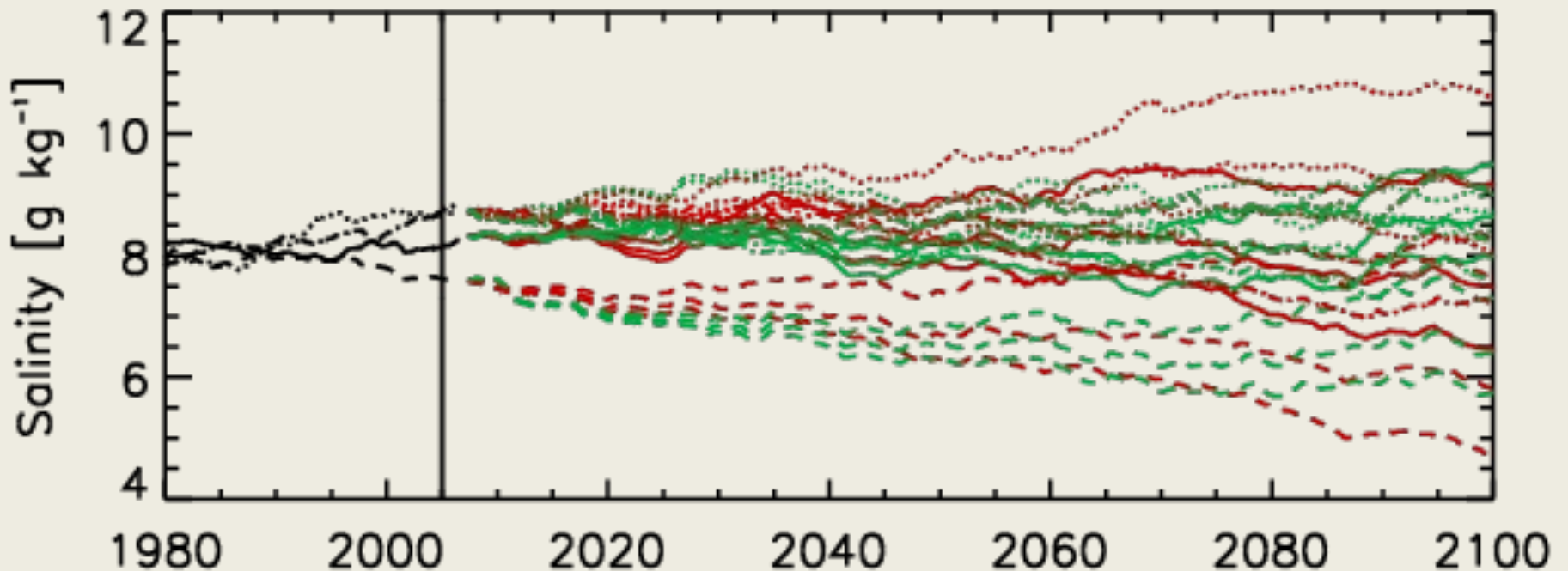
Börgel et al. (2020, 2022, 2023)

Meier et al. (2023)



Volume averaged salinity

„Medium“ RCP 4.5, „High-end“ RCP 8.5, 9/12 models (indicated by line types)



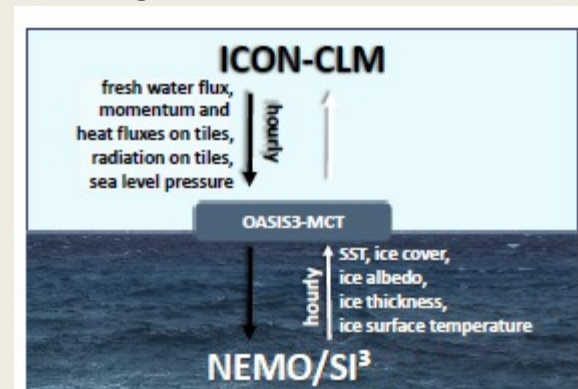
(Source : Meier et al., 2021)

DWD/BSH/Hereon



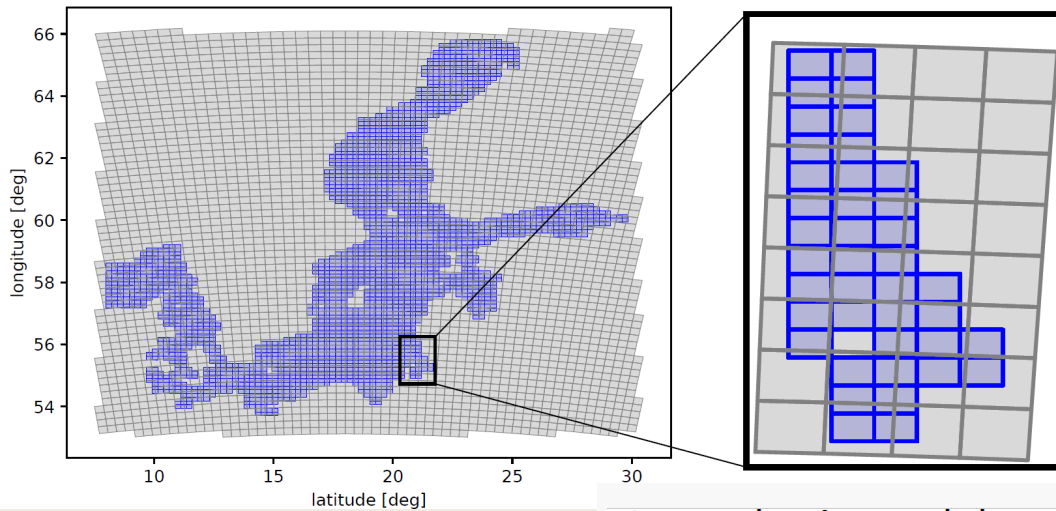
Calibration of the new regional ocean-atmosphere model based on ICON and NEMO for the EURO-CORDEX domain

ICON-CLM
NEMO 4.2

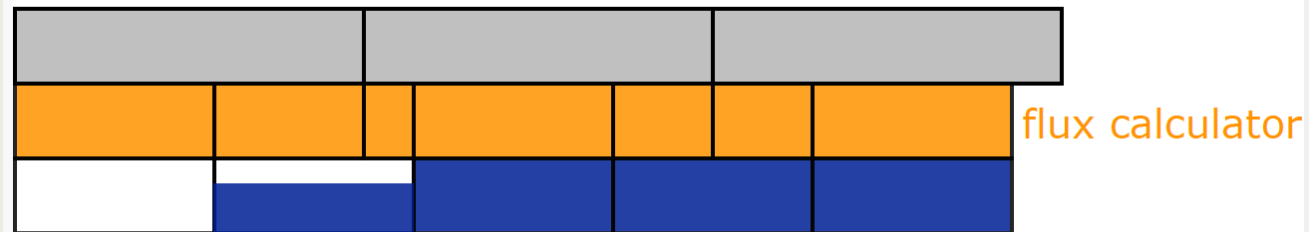


(A1 poster: Vera Maurer et al., 2023)

IOW-ESM

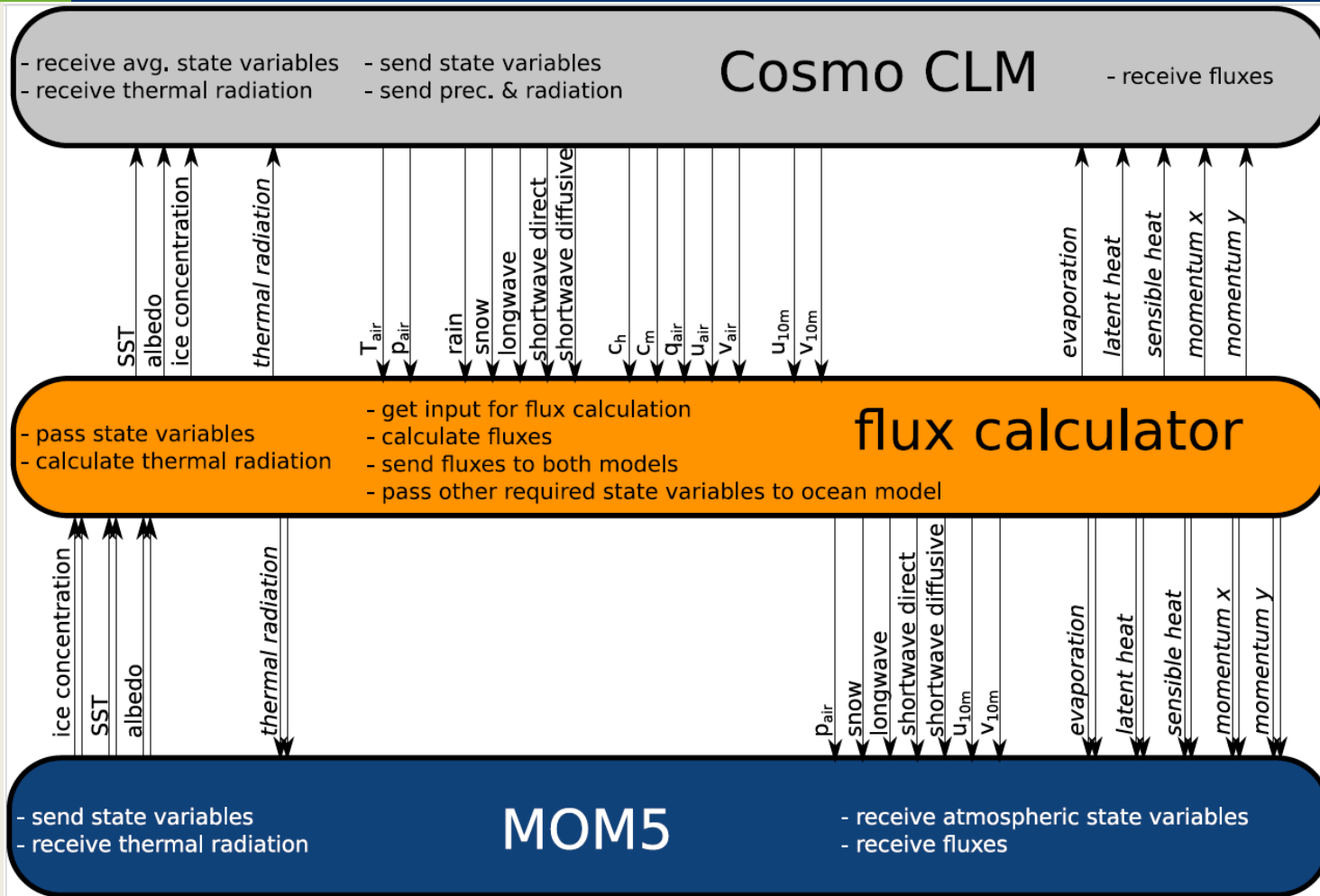


atmospheric model



ocean/ice model

Exchange-grid coupling approach for the IOW Earth System Model (version 1.04.00) of the Baltic Sea region (Karsten et al. submitted manuscript)



Exchange-grid coupling approach for the IOW Earth System Model (version 1.04.00) of the Baltic Sea region (Karsten et al. submitted manuscript)



2022

https://esd.copernicus.org/articles/special_issue1088.html

Special issue with 10 articles, 109 co-authors from 14 countries, knowledge about processes and changes in the Baltic Sea basin from 2822 different scientific articles and institutional reports have been assessed

Earth Syst. Dynam., 13, 1–136, 2022
https://doi.org/10.5194/esd-13-1-2022

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Earth System
Dynamics



Climate change in the Baltic Sea region: a summary

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- Knowledge gain since 2013 based upon peer-reviewed papers
- 33 parameters (atmosphere, cryosphere, land, terrestrial biosphere, ocean and sediment, marine biosphere), no anthroposphere (!!!)
- Past, present and future climate changes
- 47 scientists, 137 pp inc 35 figures, 15 tables, 800-900 references
- <https://esd.copernicus.org/preprints/esd-2021-67/>

EN CLIME 

Climate Change in the Baltic Sea 2021 Fact Sheet

Information, e.g., for MSP, climate adaptation or nutrient load abatement strategies such as BSAP



baltic.earth
Earth System Science for the Baltic Sea Region

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