Climate Relevant interactions and feedbacks: the key role of sea ice and Snow in the polar and global climate system

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on behalf of project team

Project website: https://www.crices-h2020.eu/

EU Polar Cluster meeting meeting, ASSW
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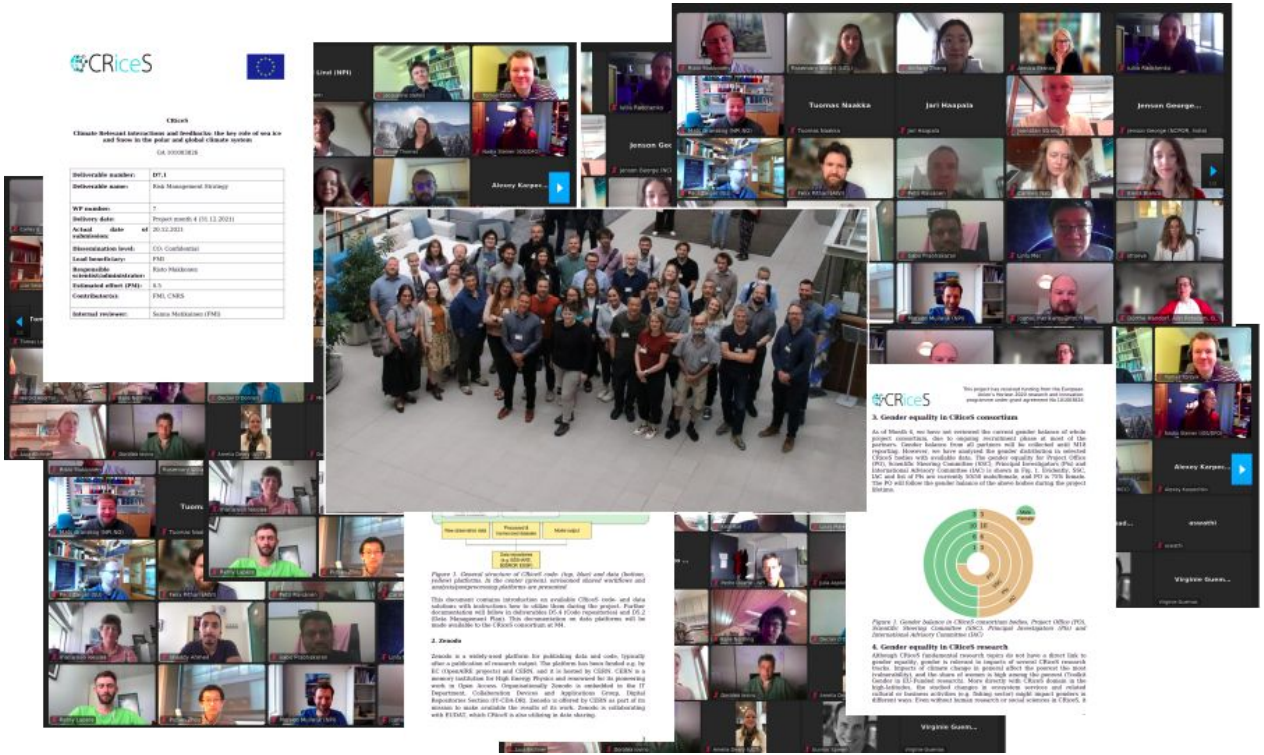
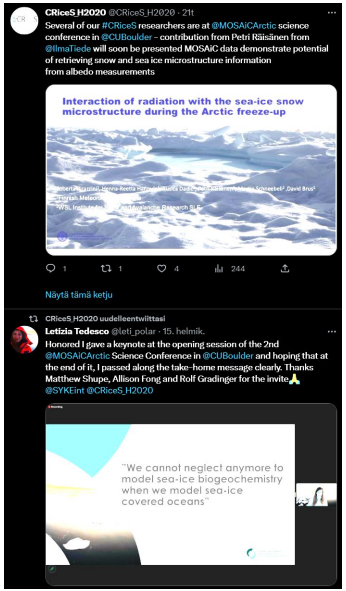


CRiceS presence in MOSAIC SC, ASSW, EGU, …



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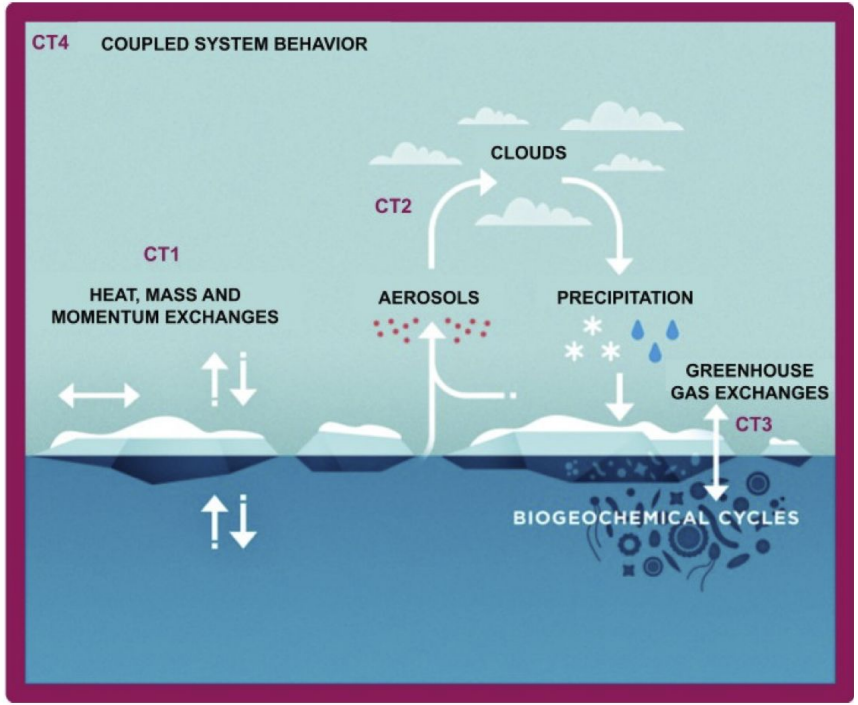

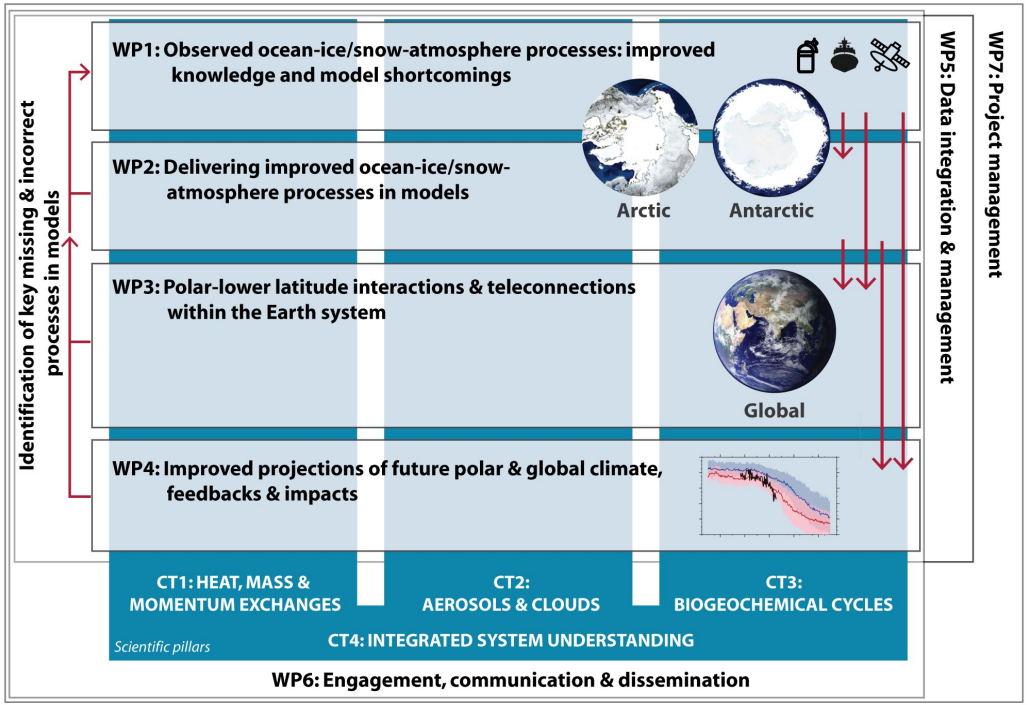

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Research highlights

The Cryosphere

An indicator of sea ice variability for the Antarctic marginal ice zone

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Abstract. Remote-sensing records over the last 40 years have revealed a large year-to-year global and regional variability in Antarctic sea ice extent. Sea ice area and extent are useful climatic indicators of large scale variability, but they do not allow to quantify regions of distinct variability in sea ice concentration (SIC). This is particularly relevant in the marginal ice zone (MIZ), which is a transitional region between the open ocean and pack ice, where the exchanges between ocean, sea ice and atmosphere are more intense. The MIZ is circumpolar and broader in the Antarctic than in the Arctic. Its extent is inferred from satellite-derived SIC using the 15-80% range, assumed to be indicative of open drift or partly closed sea ice conditions typical of the ice edge. This proxy has been proven effective in the Arctic, but it deemed less reliable in the Southern Ocean, where sea ice type is unrelated to the concentration value, since wave penetration and free drift conditions have been reported with 100% cover. The aim of this paper is to propose an alternative indicator for detecting MIZ conditions in Antarctic sea

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Research highlights

EGUsphere

The EGU interactive community platform

Preprints / Preprint egusphere-2022-706

Nudging allows direct evaluation of coupled climate models with in-situ observations: A case study from the MOSAiC expedition

Felix Pithan[1], Marylou Athanase[1], Sandro Dahlke[1], Antonio Sánchez-Benítez[1], Matthew D. Shupe[2,3], Anne Sledd[2,3], Jan Streffing[1,4], Gunilla Svensson[5], and Thomas Jung[1,6]

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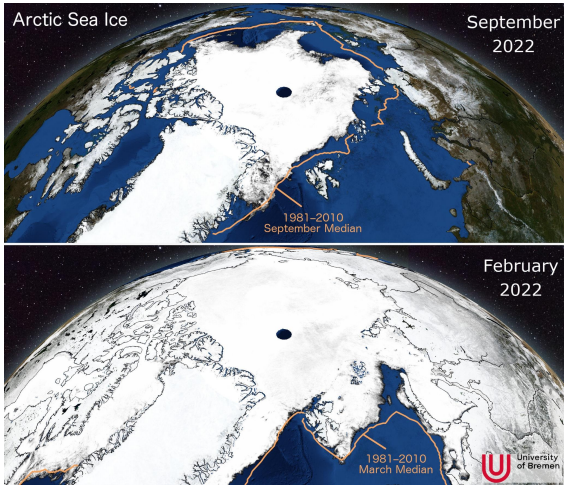
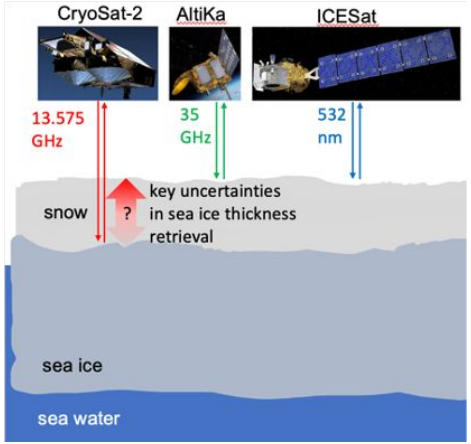
Remote sensing of sea ice & snow

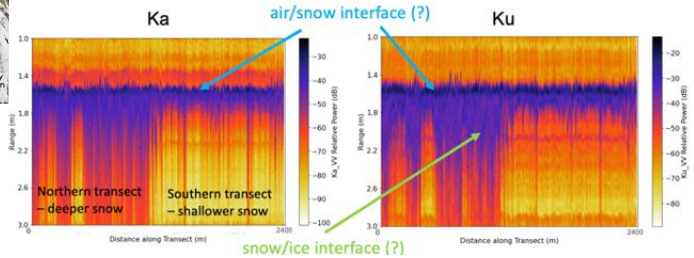
Sea ice and snow - We use existing, long-term sea ice remote sensing observations to evaluate climate models and develop new and improved remote sensing methods and datasets. Our team also contributes to preparing for new missions (e.g. CIMR, CRISTAL).

Sea Ice Concentration

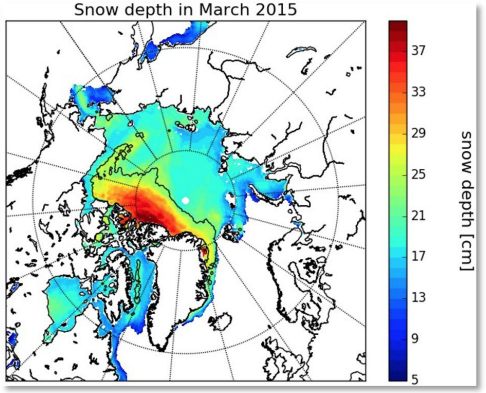


Snow from Altimeter

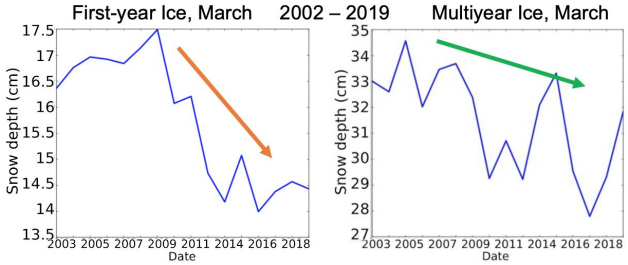




Snow from Microwave Radiometer



Rostosky et al., 2018, 2019



University of Bremen

UCL

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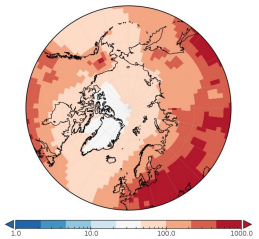
CRiceS

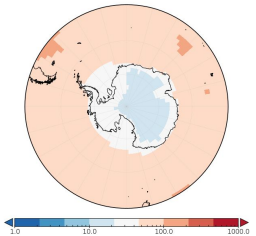
Global Climate / ESMs / Global weather prediction	
EC-Earth	European community ESM based on ECMWFs seasonal forecasting system aimed at climate information/services
NorESM2	Norwegian Earth System Model, v2
CNRM-CM	Global climate model developed by Meteo France/CNRM
UKCA	UK community atmospheric chemistry-aerosol global model
CanESM5	Canadian Earth System Model, v5 With ocean ecosystem models CMOC and CanOE
CMCC-ESM2	CMCC Earth System Model
CESM2	NCAR lead, community developed global climate/ESM
OpenIFS	Weather forecast model based on ECMWF global IFS

We are developing and applying an extensive multiscale modeling platform

Model developments include

Snow on sea ice, sea ice leads, polar aerosol formation and aerosol-cloud interactions, polar ocean and sea ice biogeochemistry, ...





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