

Publication

Integrative and Comprehensive Understanding on Polar Environments (iCUPE)
- concept and initial results**JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**

ID 4618433

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Author(s) at UniBasel Osterwalder, Stefan ;**Year** 2020**Title** Integrative and Comprehensive Understanding on Polar Environments (iCUPE) - concept and initial results**Journal** Atmospheric Chemistry and Physics**Volume** 20**Number** 14**Pages / Article-Number** 8551-8592

The role of polar regions is increasing in terms of megatrends such as globalization, new transport routes, demography, and the use of natural resources with consequent effects on regional and transported pollutant concentrations. We set up the ERA-PLANET Strand 4 project "iCUPE - integrative and Comprehensive Understanding on Polar Environments" to provide novel insights and observational data on global grand challenges with an Arctic focus. We utilize an integrated approach combining in situ observations, satellite remote sensing Earth observations (EOs), and multi-scale modeling to synthesize data from comprehensive long-term measurements, intensive campaigns, and satellites to deliver data products, metrics, and indicators to stakeholders concerning the environmental status, availability, and extraction of natural resources in the polar areas. The iCUPE work consists of thematic state-of-the-art research and the provision of novel data in atmospheric pollution, local sources and transboundary transport, the characterization of arctic surfaces and their changes, an assessment of the concentrations and impacts of heavy metals and persistent organic pollutants and their cycling, the quantification of emissions from natural resource extraction, and the validation and optimization of satellite Earth observation (EO) data streams. In this paper we introduce the iCUPE project and summarize initial results arising out of the integration of comprehensive in situ observations, satellite remote sensing, and multi-scale modeling in the Arctic context.

edoc-URL <https://edoc.unibas.ch/82570/>**Full Text on edoc** No;

Digital Object Identifier DOI 10.5194/acp-20-8551-2020

ISI-Number 000554945900003

Document type (ISI) Article