**Arctic Observatory FRAM**

FRAM (FRontiers in Arctic Marine Monitoring) targets a modern vision of integrated underwater infrastructure. FRAM enhances sustainable knowledge for science, society and maritime economy as it enables truly year round observations from surface to depth in the remote and harsh arctic sea.

Cutting edge technologies are being (further) developed and used to record essential ocean variables to improve our understanding of the Arctic and it’s ongoing processes. Data will be made freely available to the public via the AWI data portal.

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**Ice buoys and ice-tethered platforms** installed on ice floes in the central Arctic Ocean measure solar radiation, albedo, snow height, ice thickness, temperature, and algal activity. The data are delivered year round in part by real time. The AWI sea ice buoy network is part of an international effort.

An newly developed **under ice ROV** with extensive sensing capabilities provides unique pictures of the under ice world and can be used for many manipulation / intervention tasks.

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A molecular microbial observatory investigates the effect of ongoing environmental changes on marine microbial communities and how these changes will alter their role in global element cycling. Innovative and remotely controlled automated water sampling and filtration techniques with cutting edge molecular analyses are used to gain highly resolved information on microbial communities in the Arctic Ocean throughout the year.

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3-dimensional sampling in the Arctic

Groundtruthing of space borne Sentinel satellite data (e.g. chlorophyll-a) by underway measurements on board of R/V POLARSTERN and additional traditional chemical sample analysis provides best possible data verification and validation for the Arctic. The data output assists in environmental and climate modelling.

The geographical information system IceOS is developed to improve economic and ecological ship efficiency.

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AWI scientists are developing the world’s first multisolution Ocean General Circulation Biogeochemical Model. Ocean and sea-ice simulations are performed on a mesh resolution of 5 km or smaller and allows local refinement of the mesh in areas of interest. The Model is a combination of the Finite Element Sea Ice-Ocean Model (FESOM) and an Regulated Ecosystem Model 2 (RRegA2).

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The AWI data portal will support scientists and other stakeholders in bringing them all together in a user-friendly one-stop-shop framework, which will be freely offering comprehensive information on individual research platforms and respective devices/sensors, near real time data streams and a map-based “Studio”, in which users can put together maps tailored to their needs, e.g. to follow the output of dives from small vehicles (e.g. MOOS, PAl, ROV) or track R/V POLARSTERN data.

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