ALFRED-WEGENER-INSTITUT
HELMHOLTZ-ZENTRUM FÜR POLAR- UND MEERESFORSCHUNG

The research group Scientific Computing at AWI's computing center focuses on different topics of high performance computing and data handling. In collaboration with other research groups from the research devisions of AWI, we work at the interface of algorithmic developments and real applications.


(Photo: Kerstin Rolfes)

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Research Topics

Bioinformatics

Research in bioinformatics puts focus on efficient data management and development of new analyses for large genomic and transcriptomic sequence data sets. Analysis workflows are provided using high-performance computing platforms at AWI.

Data Assimilation

Our research in data assimilation focuses on ensemble-based algorithms. The Parallel Data Assimilation Framework - PDAF - is used to test new algorithms and to perform data assimilation with realistic models, e.g. to improve estimates of the ocean state. PDAF is also distributed as free open-source software.

Grid and Model Data Support

The C3Grid (Collaborative Climate Community Date and Processing Grid) provides an infrastructure for uniform and efficient access to distributed data archives. We are supporting scientists in the archiving process of their model data in repositories according to Rules of Good Scientific Practice.

High-Performance Computing

We operate several parallel computers for all research groups at AWI. In addition, we provide consulting in the use of high-performance computers for users of the supercomputer alliance HLRN through the Bremen Supercomputing Competence Center BremHLR . Furthermore, consulting for users of the climate computing center DKRZ ist provided.

Numerical Methods

In collaboration with other research groups at AWI, we perform research in numerical methods. The work considers solver algorithms as well as the coupling of different model components, like those simulating the ocean and the atmosphere. A particular focus are methods for ocean models with unstructured meshes that are used for ocean and climate predictions as well as tsunami modeling on high-performance computers.

Tsunami Modeling

Tsunami modeling was initiated as a part of the German-Indonesian Tsunami Early Warning System (GITEWS), which now runs operationally in Indonesia. The work encompasses the developement of the tsunami model TsunAWI and the simulation module SIM, which supports the selection of most probable scenarios.