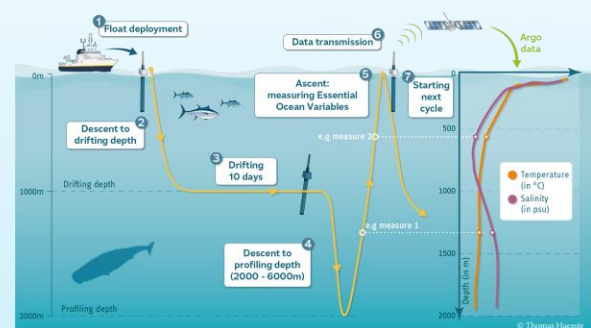
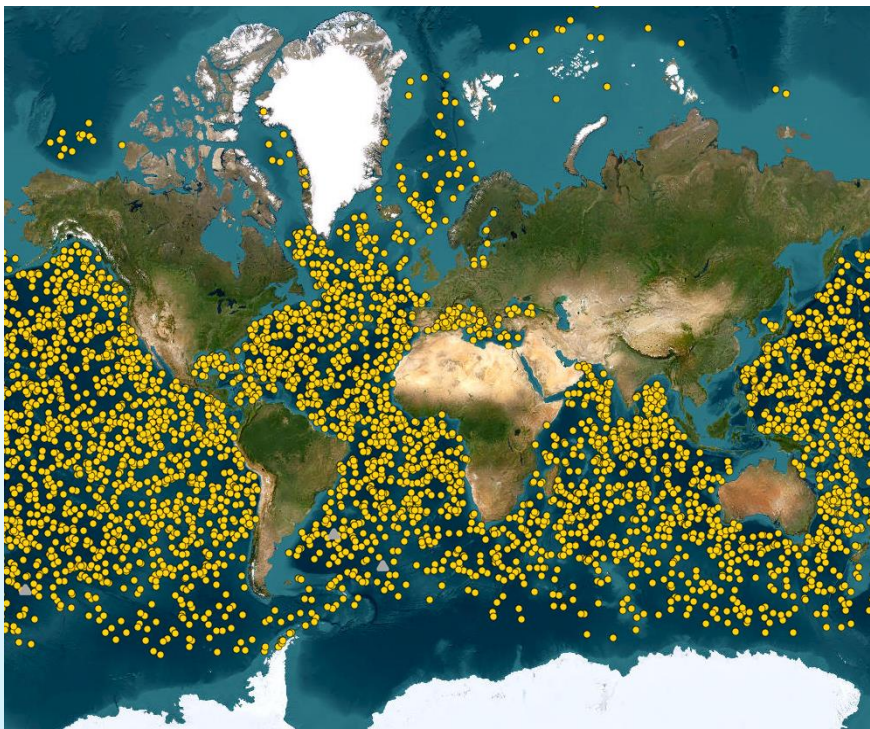


Remote Piloting of Argo Floats



Project Description:

Argo floats are autonomous CTD profilers that form the backbone of global ocean observing. DTU has deployed Argo platforms in challenging environments, from coastal waters to the Arctic where hazards (shorelines, strong currents, ice) can compromise missions. This project aims to develop “remote piloting” software that uses forecast oceanographic fields to steer floats away from danger and toward target regions. Students will integrate model forecasts with control strategies to simulate and evaluate guidance policies, with an eye towards near-real-time decision support and future in-field demonstrations.

Learning Objectives:

- Understand Argo float operations and constraints
- Access, preprocess, and fuse forecast model data (currents, winds, waves) for guidance inputs.
- Design and compare control strategies (rule-based, MPC, or RL) for drift-plus-profile platforms.
- Communicate results with clear visualizations and benchmarking metrics.

Competences

- Good computer science fundamentals, particularly scientific programming for data handling and modelling (Python; xarray, numpy, matplotlib).
- Working with geospatial/ocean datasets (NetCDF/GRIB)
- Control and optimization fundamentals for trajectory guidance under uncertainty.
- Knowledge of git, and reproducible software practices (version control, tests, notebooks, documentation).

Notes: Project likely starting next semester. Patrizio Mariani, pmar@dtu.dk, David O'Brien-Møller, ddyob@dtu.dk