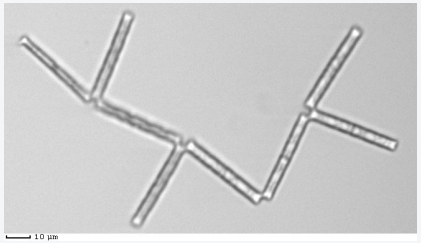
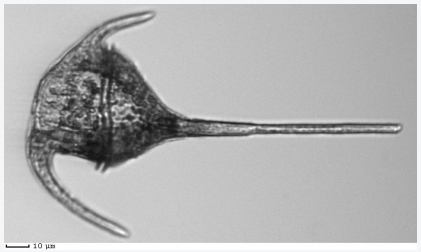
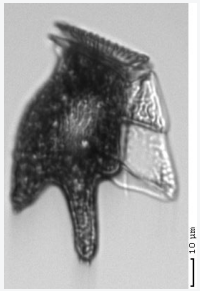






Plankton imaging data flow: Establishing a European data flow for phyto- and microzooplankton data from automated AI-assisted imaging in flow analyses

Anders Torstensson, Mikael Hedblom

Swedish Meteorological and Hydrological Institute

Data host and data centre

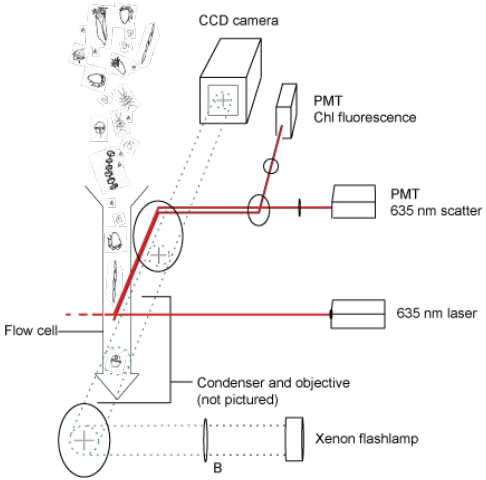
- National data host for oceanographic and marine biological data appointed by Swedish Agency for Marine and Water Management
- Since 2017 we are a National Oceanographic Data Centre (NODC) appointed by UNESCOs IOC/IODE
- Swedish Ocean Archive (**S**venska **H**avs **ARK**iv), SHARKweb and SHARKdata
- Deliver data to ICES and EMODnet Biology

SMHI datasets in EMODnet Biology

Description of dataset	records	Coverage
SHARK - National and regional marine environmental monitoring of Picoplankton in Sweden since 2002	2 921	Baltic Sea and Skagerrak
SHARK - National environmental monitoring of Grey seal in Sweden since 1989	26 685	Baltic Sea and Skagerrak
SHARK - National environmental monitoring of Harbour seal in Sweden since 1988	21 708	Baltic Sea and Skagerrak
SHARK - National marine environmental monitoring of Bacterioplankton in Sweden since 1989	1 864	Baltic Sea
SHARK - National marine environmental monitoring of Phytoplankton in Sweden since 1983	12 799	Baltic Sea and Skagerrak
SHARK - National marine environmental monitoring of Ringed seal in Sweden since 1995	23 621	Baltic Sea
SHARK - National marine environmental monitoring of Zoobenthos in Sweden since 1971	41 538	Baltic Sea and Skagerrak
SHARK - National marine environmental monitoring of zooplankton in Sweden since 1979	6 659	Baltic Sea and Skagerrak
SHARK - Regional marine environmental monitoring, recipient control and monitoring projects of Phytoplankton in Sweden since 1985	21 128	Baltic Sea and Skagerrak
SHARK - Regional marine environmental monitoring, recipient control and monitoring projects of Zoobenthos in Sweden since 1972	63 866	Baltic Sea and Skagerrak
SHARK - Regional marine environmental monitoring and monitoring projects of Epibenthos in Sweden since 1994	73 383	Baltic Sea and Skagerrak
SHARK - National marine environmental monitoring of Epibenthos in Sweden since 1992	54 811	Baltic Sea and Skagerrak
SHARK - National environmental monitoring of Harbour Porpoise in Sweden since 2015	6 509	Baltic Sea
SHARK - National environmental monitoring of Jellyfish in Sweden since 2007	352	Baltic Sea and Skagerrak

Imaging FlowCytobot (IFCB) on R/V Svea

Monthly cruises
Baltic Proper
Kattegat
Skagerrak



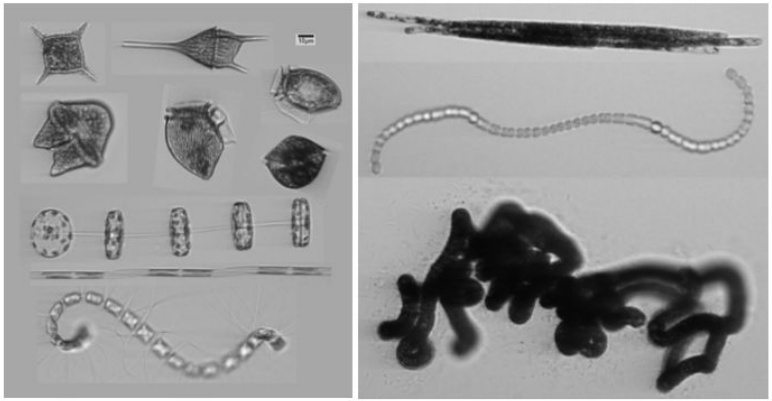


Fig. 2. Examples of images from IFCB. Left: Phytoplankton from the Swedish west coast. Right: Cyanobacteria from Utö Marine Research Station, Northern Baltic Proper.

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Automated sampling every ~20 minutes
Appr. 350-400 samples per cruise

Data flow - automated analysis of phytoplankton using IFCB

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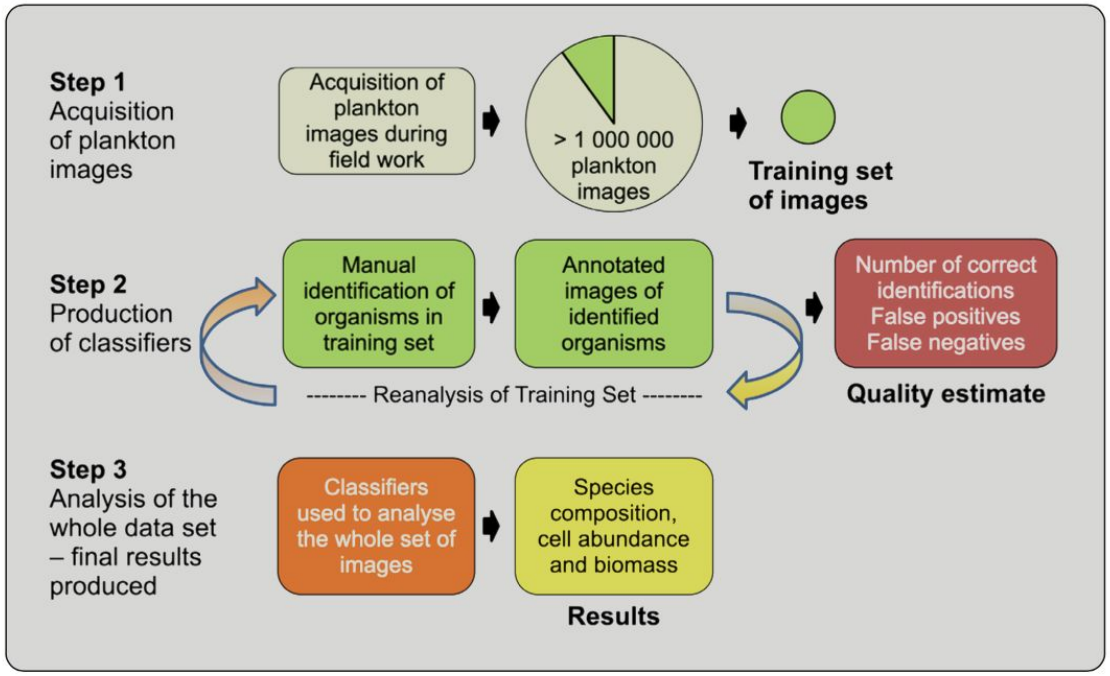
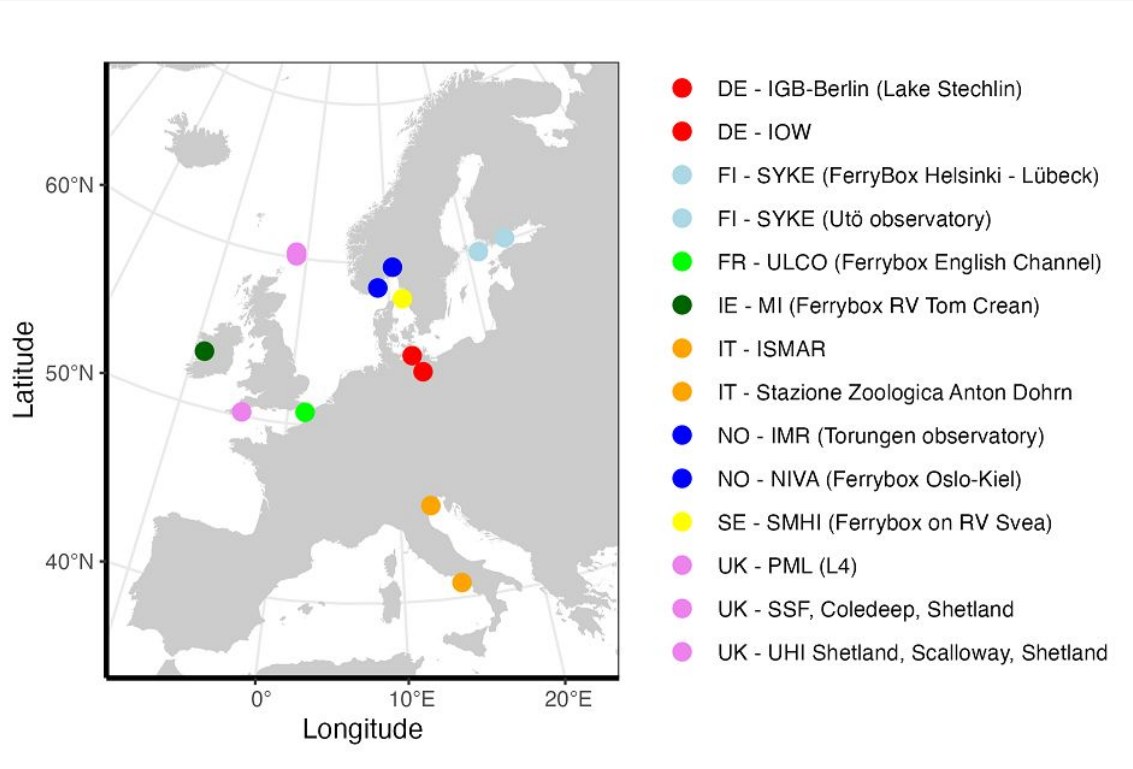


Fig. 4. The principle for using expert trained AI-machine learning for automated analysis of images acquired using imaging-in-flow instruments

Karlson, B., Berdalet, E., Kudela, R.M., 2022. The GlobalHAB mini-symposium on automated plankton observations. Harmful Algae News 71, 1-4.

European IFCB network

- 14 instruments in Europe
- Regular meetings
- Standardize methods
- Share results



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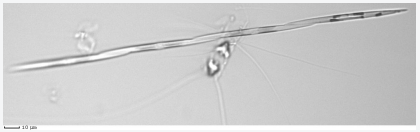
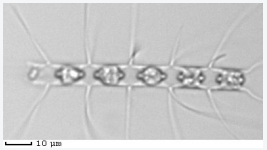
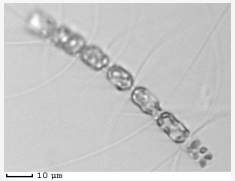
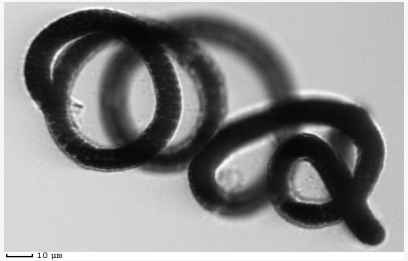
Project objectives

- Harmonize data formats for European IFCB users
- Share training image datasets for improved comparison between different image classifiers and instruments
- Establish a data pipeline for plankton automated imaging from the IFCB to EMODnet Biology
  - Standalone pipeline from a standard data format for imaging data
  - Swedish data: via established DwC-A data flows to EMODnet Biology



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Thank you for your attention!