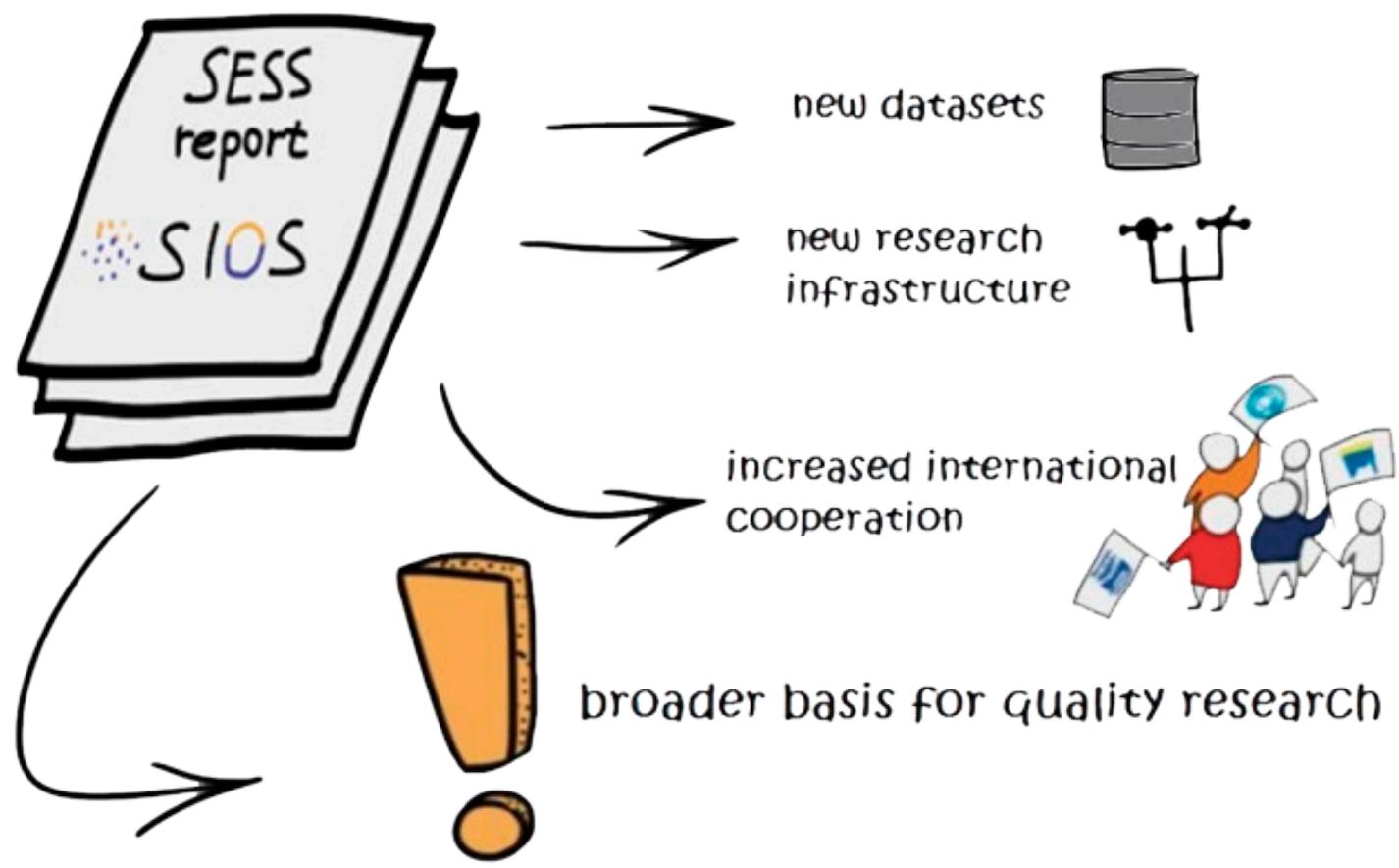




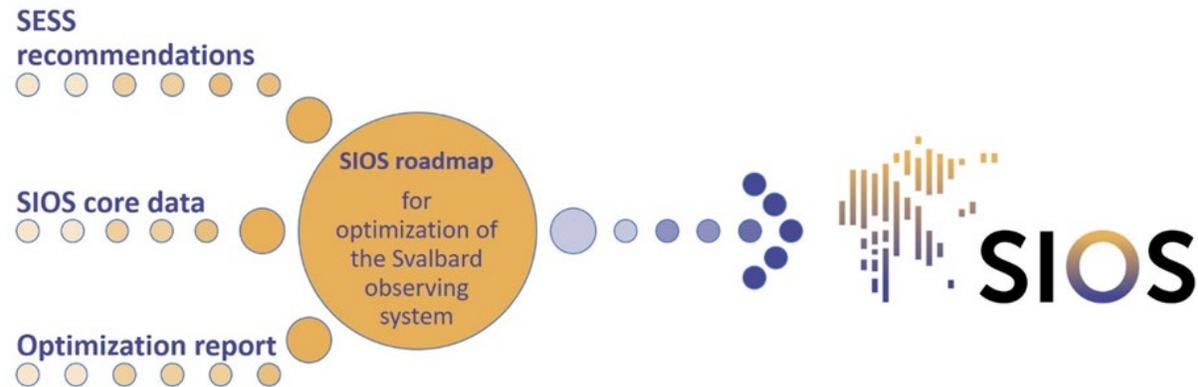
# **SESS REPORT RECOMMENDATIONS – MARINE ENVIRONMENT**

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# SIOS OBJECTIVES



The objective of SIOS is to optimise and develop the observing system in Svalbard by implementing the roadmap for the optimal development of the observing system.

SESS recommendations should become an important indicator for stakeholders, grant funders and scientists for the coming years

Optimization report will highlight the most relevant recommendations for the integration of the observing system and research communities for better development of the long-term monitoring, improvement of scientific quality and increasing of data harmonisation

# Recommendations for **new studies** to be conducted in and around Svalbard

- Observations of chlorophyll, Turbidity/SPM, DOC, PAR, primary productivity, and hydrography
- Perform oceanographic cruises in winter-spring season
- Implement Continuous Plankton Recorder routes using different ships
- Acquire high-resolution multibeam data to investigate the role of bathymetry at shelf/slopes
- Obtain additional multi-corer samples to deepen the knowledge on the sedimentary records
- Use satellite images for the analysis of wind, waves, and sea ice cover variability
- Conduct a comprehensive microbial habitat classification and activity study
- Study microplastic in the unexplored parts of Svalbard to establish a risks for the environment and humans
- Conduct new observations in coastal area: biodiversity, productivity, ecological roles and marine mammal FECs



Image: J.Schmaltz and J. Stevens, LANCE/EOSDIS, NASA



Image: S. Kwasniewski



Image: K. Deja

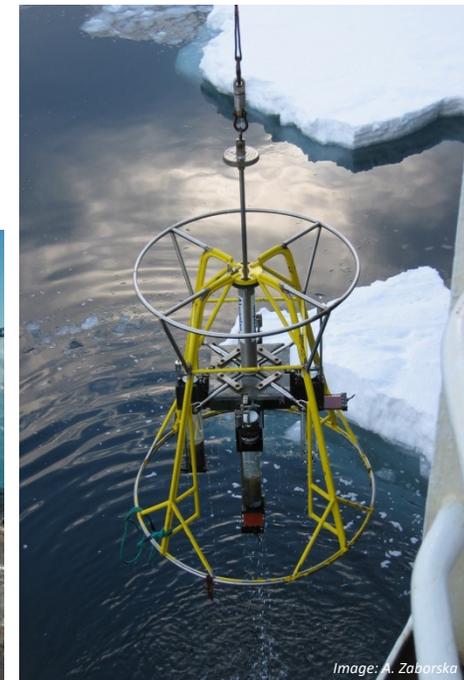
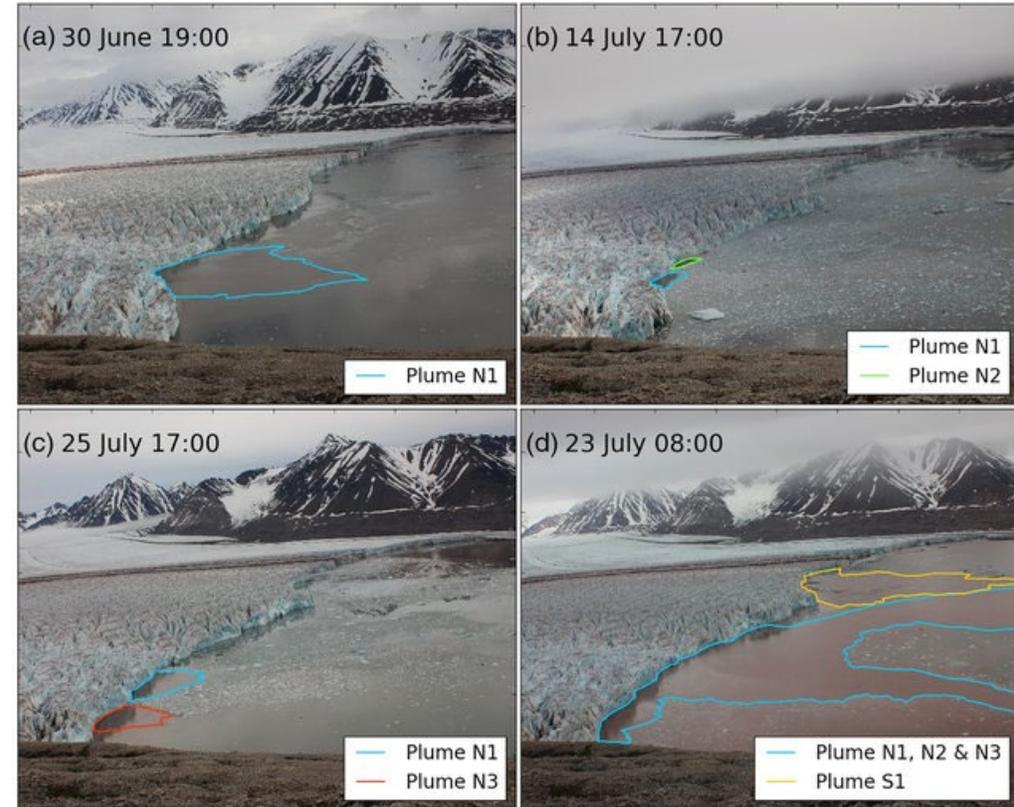


Image: A. Zaborska

## Recommendations for *new methodologies and technical solutions*

- Stimulate the use of time-lapse cameras by different disciplines (glaciology, coastal processes, sea ice tracking, remote sensing cal/val. applications)
- Adopt new methods (e.g. molecular methods) and technology (e.g. autonomous observatories, remote sensing) to secure cost-efficient long-term data series
- Remote-sensing, using spaceborne and airborne sensors, in addition to in-situ observations should play an essential role in monitoring the marine ecosystems and habitat conditions
- Develop methods to use the FLoX-measurements, and especially SIF Measurements, as calibration for different ongoing and coming satellite sensor systems
- Harmonise methodologies on microplastics monitoring: A Workshop is needed to facilitate agreements on how to start microplastics monitoring at Svalbard



How et al., 2017

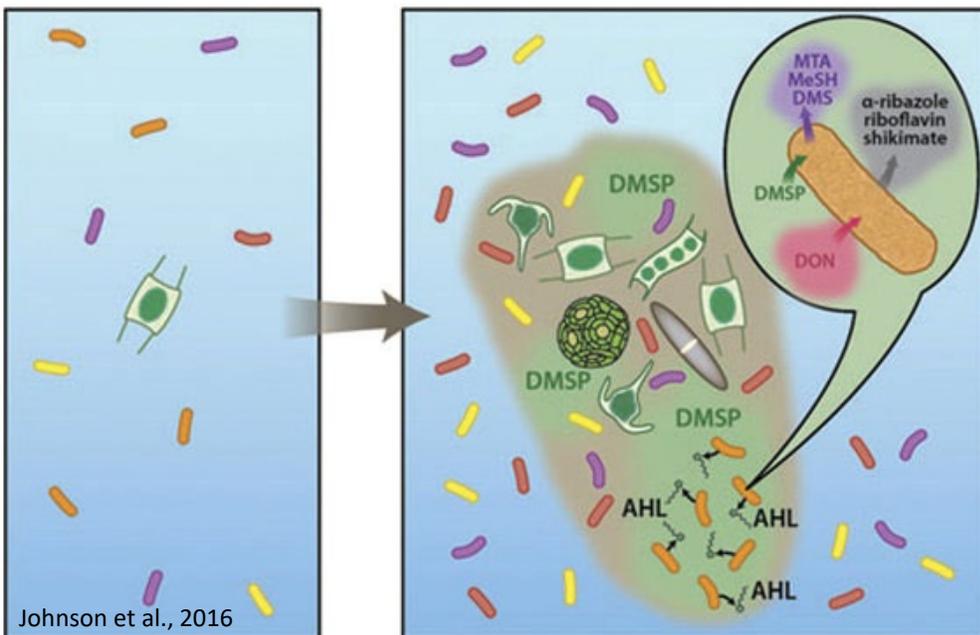
## Recommendations for **data processing and sharing**

- A programme of harmonisation of marine measurements around Svalbard to ensure homogeneous data collection in different areas. A medium-term objective could be to create a handbook of best practices
- Promote links between existing time series from Svalbard fjords with other marine time series around Svalbard
- Support integration of in situ data (fixed ocean and land stations, hydrographic cruises) with other data collection platforms, such as ARGO and SAR in order to ensure a better interpretation of the oceanographic phenomena, especially the extreme ones
- Supporting efficient data mining and harmonisation efforts to allow the construction and monitoring of energy budgets and energy flux trends
- Energy flux estimates in the atmosphere, the ocean, and the cryosphere require broad efforts in data assembly and quality assurance



## Recommendations for *long-term observations*

- A more comprehensive monitoring of physical, biogeochemical (e.g. water quality) and biological (e.g. biodiversity and productivity) parameters related to coastal environments in Svalbard is urgently required to meet the needs of communities, industry, academia and our national government, as well as international objectives such as those outlined in the recent Arctic Biodiversity Assessment (CAFF, 2013) and by the Convention on Biological Diversity
- A long-term monitoring programme should be designed to consider societal needs such that the science can provide advice regarding plastic use in Svalbard, wastewater treatment, effects of cruises and other tourism activities, and fishing

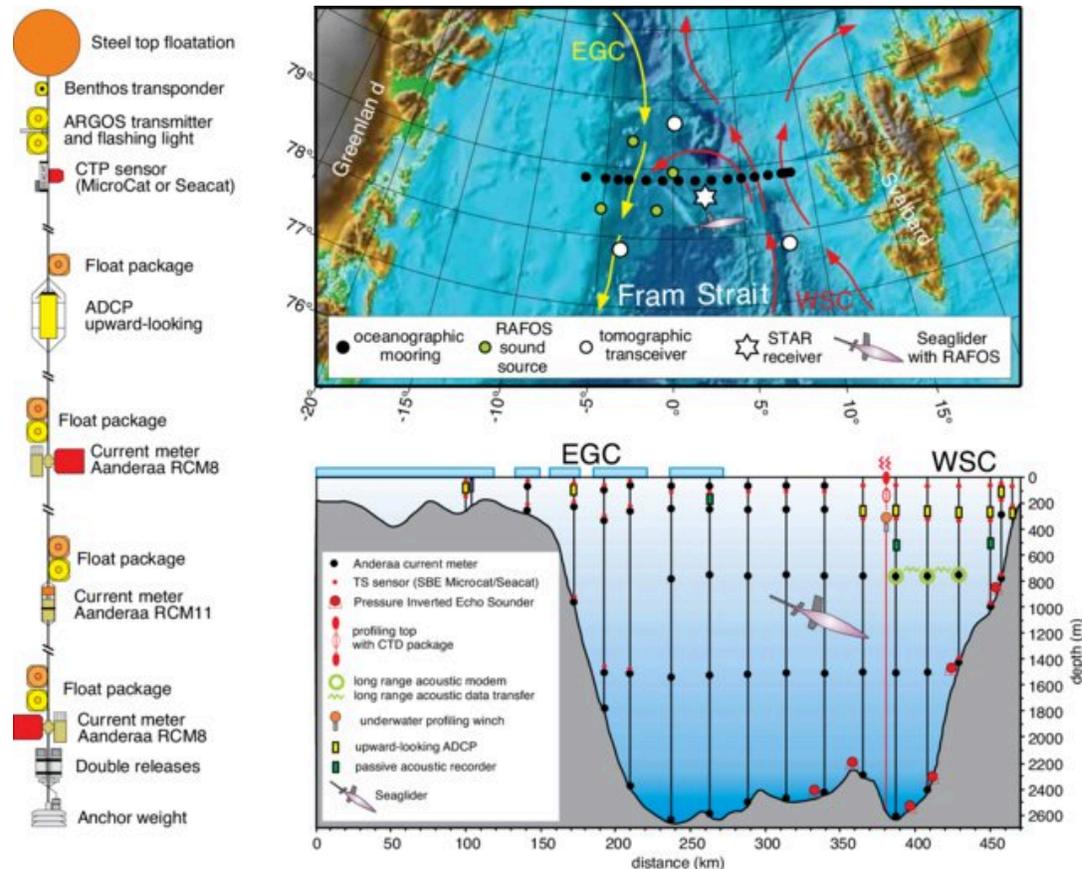


- Establish a systematic long-term monitoring program of phytoplankton populations and associated DMSP production in Kongsfjorden

# MAIN NEEDS

- *Harmonization and cross-disciplinary investigations.*

A programme of harmonization of marine measurements around Svalbard would be desirable to ensure homogeneous data collection in different areas. Prepare a handbook of best measurement practices. Encourage cross-disciplinary investigations linking data related to marine, terrestrial, glacial and atmospheric processes.



- *Develop marine environment observation infrastructure*

Set up autonomous observational sites for long-term monitoring, to achieve time series on ocean dynamic, biogeochemistry and ecology, data would be useful for climatic considerations. Widen the measurement/sampling possibility during the winter/spring season and by using non-scientific ships eg. tourist vessels. Additional multibeam surveys to investigate the shelf-slope dynamics and sampling of marine sediments needed to deepen the knowledge on geological history is needed



## SIOS – PLANS FOR FUTURE

### 1. *Optimization report:*

- Time frame for recommendations implementation (1-10 year goals)
- Multidisciplinarity
- Actions to be taken

### 2. *Implementation actions:*

- SIOS access calls
- grant proposals
- networks
- workshops and trainings organization
- handbooks and articles preparation
- core data handling