

Description of fieldworks on Forlandsundet Region

10 AWS (Automatic Weather Stations) measuring main meteorological elements including solar irradiance have been established at three west-east cross-sections: Kaffioyra and Waldemar Glacier Region (1A), Prins Karls Forland (1B), St. Jons Fjord Region (1C). Year round continuous measurements of temperature and humidity have being performed and compared with oceanographic, glaciological, and hydrological data. The role of the atmospheric circulation in shaping weather and climate in the study area is investigated using circulation types (Niedzwiedź's catalogue) and different circulation indices (e.g. NAO, AO).



Table 1. Meteorological sites working during summer 2010 in Forlandsundet region (Spitsbergen)

No.	Sites		φ	λ	h (m a.s.l.)
1	KH	Kaffioyra-Heggodden	78°41'34" N	11°51'39" E	11.5
2	SAT	Sarstangen	78°43'38" N	11°28'50" E	2.0
3	SAO	Sarsøyra	78°42'55" N	11°43'26" E	9.0
4	KT	Terasa	78°40'39" N	11°58'03" E	90.0
5	ATA	ATA	78°40'31" N	11°59'30" E	137.0
6	KU	Kuven	78°40'53" N	12°00'53" E	193.0
7	GF	Gråfjellet	78°39'59" N	12°00'33" E	345.0
8	LW1	Lodowiec Waldemara-tongue	78°40'31" N	12°00'01" E	130.0
9	LW2	Lodowiec Waldemara-cirque	78°40'59" N	12°05'15" E	375.0
10	PH1	Prins Heinrichfjella-1	78°40'51" N	11°59'28" E	500.0
11	PH2	Prins Heinrichfjella-2	78°41'01" N	12°06'25" E	590.0
12	PK1	Prins Karls Forland-west	78°28'10" N	11°11'56" E	9.0
13	PK2	Prins Karls Forland-middle	78°30'18" N	11°12'47" E	68.0
14	PK3	Prins Karls Forland-Klubben	78°32'46" N	11°14'42" E	8.0
15	PK4	Prins Karls Forland-east	78°40'52" N	11°59'28" E	6.0
16	SJ1	St. Jonsfjord Cooper	78°30'10" N	12°43'03" E	2.0
17	SJ2	St. Jonsfjord Hus	78°31'36" N	12°51'53" E	4.0
18	SJ3	St. Jonsfjord mutton	78°34'10" N	13°09'22" E	14.0

Project Partners:

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Contact details:

For further information about the project, please visit the AWAKE website:
<http://water.iopan.gda.pl/projects/AWAKE/>

about WP3 see also: <http://www.zklim.umk.pl/awake>

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Arctic Climate and Environment of the Nordic Seas and the Svalbard – Greenland Area (AWAKE)



Project presentation

AWAKE Workpackage 3: Climate Change in the Atlantic Arctic During the last 200 Years and its Causes

Funded by Polish-Norwegian Fund

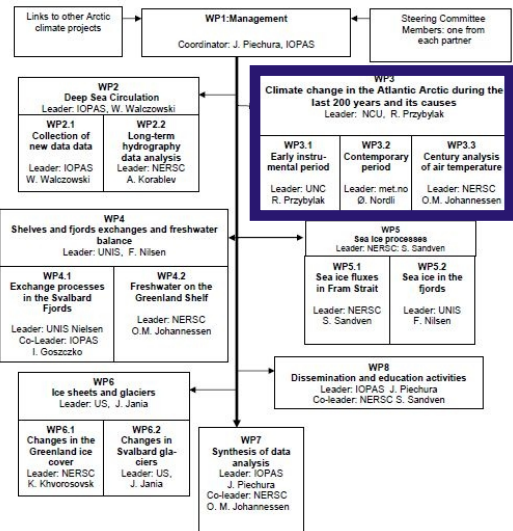


Project outlook

The aim of AWAKE project is to study changes in atmosphere, ocean, sea ice and glaciers in the Atlantic sector of the Arctic in order to improve our understanding of the dramatic climate change in this region. Experienced scientists from Poland and Norway have joined their resources, skills and knowledge to investigate key processes, links and interactions between atmosphere, ocean and glaciers. Climate change in the Arctic has large impact on environment, socio-economic conditions in Europe and world-wide. AWAKE will contribute to improved knowledge of Arctic climate processes, which is essential for climate change impact assessment and policies.

AWAKE has a multidisciplinary approach where data from atmosphere, ocean, sea ice and glaciers are analyzed and compared with model results. Collection and analysis of more observational data from field observations will allow better processes parameterization and models validation. The work tasks of AWAKE are carried out in close cooperation with other ongoing projects funded by EU and nationally.

AWAKE Project Structure



WP3 - the work package coordinated by Department of Climatology, Nicolaus Copernicus University, Toruń, Poland.

Work description of WP3 (outline):

1. Historical Data Collection and Reconstruction:
Two kinds of activities are conducted within this part of the WP3:

- a) reconstruction of historical climate for the entire study area based on documentary evidence, which have been gathered mainly in libraries and archives located in different institutions in Norway, Great Britain, Sweden, Denmark, Finland and Russia,
- b) reconstruction of Svalbard climate for the turn of 19th and 20th centuries based on campaign measurements performed with automatic weather stations (AWS) in historical four sites, where meteorological stations previously have been operating.



2. Meteorological Observations at the West-east Cross-section through Prins Karls Forland, Forlandsundet, Kaffiøyra and Waldemar Glacier as well as in the St. Jonsfjorden Region.

- Objectives:
- a) to describe topoclimatological differences in the western part of Spitsbergen,
 - b) to establish the influence of Prins Karls Forland on the climate of central part of Spitsbergen,
 - c) to determine the influence of the ocean on the Spitsbergen climate.

The research sites are located in the Forlandsundet Region (Fig. 1. and Table 1).



Fig. 1. Location of meteorological sites used in this study shown on a topographic map produced by the Norwegian Polar Institute (A- Kaffiøyra region; B- Prins Karls Forland; C-St. Jonsfjorden; KH, LW1, etc. - meteorological sites, see Table 1)

The Polar Station of the N. Copernicus University (NCU)

Nicolaus Copernicus University Polar Station is the northernmost Polish research unit (78°41'N, 11°51'E). It is located in the northern part of coastal plain called Kaffiøyra, on the northwestern Spitsbergen, the biggest island in the arctic archipelago Svalbard. The Station is situated in the area called Heggodden (KH), about 150 m from the seacoast and at the foot of the marginal moraine of the Aavatsmarkbreen (Fig. 1A). The Station was established in 1975. Since then undertaken research has included meteorology and climatology, hydrology, glaciology, geomorphology, geology, permafrost and periglacial processes and botanical studies.