Svalbard Integrated Arctic Earth Observing System (SIOS)

List of existing infrastructure (Status February, 2012)

Table 1. KT 1 - Vertical coupling in the arctic atmosphere downward from space

Location	Parameters	Platform	Operator	Start	Op. secured until	Country
Radars and radio receivers						
Longyearbyen, EISCAT	Ionospheric plasma parameters (like Ne, Te, Ti, Vi)	Incoherent Scatter Radar with 32 and 42 m antennas (500 MHz)	EISCAT	1996 & 1999		International
Longyearbyen, EISCAT	Radar imaging of fine-scale plasma structures	3 interferometry antennas (500 MHz)	UIT, RAL, KTH, USO	2005		Norway, UK, Sweden
Longyearbyen, EISCAT	TEC and ionospheric scintillation	Ionospheric Scintillation Receiver	CRIRP	2008		China
Longyearbyen, EISCAT	Detection of Space Debris	Space Debris Receiver	EISCAT	2000		International
Longyearbyen, EISCAT	Electron density profiles in ionosphere	Dynasonde	EISCAT	2009		International
Longyearbyen, SPEAR	Electron density profiles in ionosphere	Dynasonde	EISCAT	2009		International
Longyearbyen, SPEAR	Active experiments in ionosphere	High-Power Heating Facility (4.45 MHz)	UNIS, ULEI	2004		Norway, UK
Longyearbyen, SPEAR	Passive experiments in ionosphere	Low-Power All-Sky HF radar	UNIS, ULEI	2004		Norway, UK
Longyearbyen, SPEAR	Electron density profiles in ionosphere	Cadi Ionosonde	ULEI	1997		UK
Longyearbyen, KHO	Cosmic noise absorption maps (1 s)	64-beam Imaging Riometer	DMI, UIT	1995		Denmark, Norway
Longyearbyen, KHO	0.3-6 MHz auroral radio emiss. (1 s)	Auroral Radio Spectrograph	TOU	2008		Japan
Longyearbyen, KHO	Doppler spectra of HF radio stations. Remote monitoring of	HF acquisition system (Doppler HF receiver)	IRA	2008		Ukraine

	Tromso heater, SPEAR and HAARP					
Longyearbyen, SOUSY	Winds in upper troposphere/lower stratosphere and mesosphere, PMSE, PMWE	MST radar	UIT	2003		Norway
Longyearbyen, SOUSY	wind, temperature, 80-100km	Meteor Wind Radar	UIT, NIPR	2001		Norway, Japan
Longyearbyen, SOUSY	TEC and ionospheric scintillation	Ionospheric Scintillation Receiver	INGV	2004		Italy
Ny-Ålesund, Chinese Station	Cosmic noise absorption (38.2 MHz)	Imaging Riometer	PRIC	2008		China
Ny-Ålesund, Chinese Station	TEC and ionospheric scintillation	Ionospheric Scintillation Receiver	CRIRP	2007		China
Ny-Ålesund, Italian Station	TEC and ionospheric scintillation	Ionospheric Scintillation Receiver	INGV	2003		Italy
Ny-Ålesund, Statkart	TEC and ionospheric scintillation	Ionospheric Scintillation Receiver	INGV	2003		Italy
Barentsburg	TEC and ionospheric scintillation	Ionospheric Tomography Receiver	PGI	2004		Russia
Barentsburg	Stimulated EM emissions (1.5-32 MHz), remote monitoring of SPEAR	Radio Interferometer	PGI	2008		Russia
Barentsburg	Amplitude of cosmic noise absorption (0.1 s)	30 MHz riometer	AARI	2005		Russia
Barentsburg	Amplitude of signals from St. Petersburg (time delay-frequency, every hour)	Oblique ionospheric sounding receiver	AARI	2002		Russia
Hornsund	Cosmic noise absorption	30 MHz riometer	SGO	1980's		Finland
Hornsund	Electron density profiles in ionosphere	Digital Ionosondes (vertical and oblique)	SRC PAS	2009 Sep.		Poland
Hornsund	Cosmic noise absorption	30 MHz Riometer	NRCAN	2009 Sep.		Canada
Þykkvibær (Iceland)	Horizontal plasma flow in ionosphere over Svalbard	SuperDARN HF ionospheric radar	ULEI	1995		UK
Hankasalmi (Finland)	Horizontal plasma flow in ionosphere over Svalbard	SuperDARN HF ionospheric radar	ULEI	1995		UK
Bjørnøya	Winds in 80-100km altitude	Meteor radar	UIT, NAU	2007		Norway, Japan

Optical instruments						
Longyearbyen, EISCAT	Images of 427.8, 562.0, 673.0, 732.0 and 777.4 nm emissions in 42m radar beam (20-32 fps, 3x3 deg FOV)	Auroral Structure and Kinetics Imagers (ASK)	USO, KTH	2005		UK, Sweden
Longyearbyen KHO	General purpose bushbroom hyperspectral imager 400-700nm (VIS)	FS-IKEA	UNIS			Norway
Longyearbyen KHO	Small hyperspectral calibration sphere		UNIS			Norway
Longyearbyen KHO	Near Infrared emission (OH 6-2 airglow)	All-Sky Airglow Imager	UNIS	2010		Norway
Longyearbyen KHO	VIS and NIR	1m diameter integrating sphere	UNIS	2011		Norway
Longyearbyen, KHO	Images of 557.7 and 630.0 nm emissions (4-6 fpm, wide FOV)	All-Sky Imager	UIO, UNIS	1996		Norway
Longyearbyen, KHO	High-speed monochrome movie of the sky (30 fps, wide FOV)	All-Sky Camera	UAF	1997		USA
Longyearbyen, KHO	Images of 427.8, 557.7 and 630.0 nm emissions (3-4 fpm, wide FOV)	All-Sky Imager	FMI	1996		Finland
Longyearbyen, KHO	RGB color images of the sky (every 5 min, wide FOV)	All-Sky Colour Imager	UCL	2008		UK
Longyearbyen, KHO	High-speed monochrome movie of the sky (25 fps, wide FOV)	All-Sky Camera	UNIS	2008		Norway
Longyearbyen, KHO	RGB color images of the sky (2-12 fpm, wide FOV)	All-Sky dSLR Camera	UNIS	2006		Norway
Longyearbyen, KHO	Spectrum of 420-740 nm emissions (every 1-2 min, along meridian)	Auroral Spectrograph	NIPR	2000		Japan
Longyearbyen, KHO	NIR spectrum (every 2 min, near zenith)	CCD Spectrograph	ERAU	1993		USA
Longyearbyen, KHO	NIR image (>2 min exposure, wide FOV)	NIR All-Sky Imager	UNIS	2008		Norway
Longyearbyen, KHO	Intensity of 5 auroral lines along the meridian (every 16 s)	Meridian Scanning Photometer	UAF	1978		USA
Longyearbyen, KHO	Spectrum of 7250-8650 nm emissions,	1 m “Silver” Ebert-Fastie	UAF	1980		USA

	i.e. OH airglow (every 5 min, near zenith)	Spectrometer				
Longyearbyen, KHO	Spectrum of proton aurora, variable range in UV-NIR (every 8-300 s, near zenith)	1 m 'Green' Ebert-Fastie Spectrometer	UAF	1978		USA
Longyearbyen, KHO	Spectrum of proton aurora, variable range in UV-NIR (every 8-300 s, near zenith)	1/2 m 'Black' Ebert-Fastie Spectrometer	UAF	1978		USA
Longyearbyen, KHO	Spectrum of proton aurora, variable range UV-NIR (every 12-300 s, along meridional)	1/2 m 'White' Ebert-Fastie Spectrometer	UNIS, UIT	1996		Norway
Longyearbyen, KHO	Spectrum of OH airglow (20 s)	Michelson Interferometer	ERAU	1993		USA
Longyearbyen, KHO	Thermospheric winds and temperatures (every 30 s, several directions)	Imaging Fabry-Perot Interferometer	UCL	1986		UK
Longyearbyen, KHO	Thermospheric winds and temperatures (every 1-2 min, wide FOV)	Scanning Doppler Imager	UCL	2006		UK
Longyearbyen, KHO	Measurements of fine-scale aurora in narrow FOV along B; movie (25 fps), spectrum, and 4 photometers	Spectrographic Imaging Facilities	USO, UCL	2000		UK
Ny-Ålesund, Sverdrup Station	Images of 557.7 and 630.0 nm emissions (4-6 fpm, wide FOV)	All-Sky Imager	UIO	1997		Norway
Ny-Ålesund, Sverdrup Station	Intensity of 2 auroral lines along the meridian (20 s)	Meridian Scanning Photometer	UIO	1988		Norway
Ny-Ålesund, Chinese Station	Images of 557.7, 630.0, and 427.8 nm emissions (10 fpm, wide FOV)	All-Sky Imagers	PRIC	2003		China
Ny-Ålesund, Italian Station	Images of 427.8, 557.7 and 630.0 nm emissions (6 fpm, wide FOV)	All-Sky Camera	IFSI	1999		Italy
Ny-Ålesund, Dasan Station	Mesospheric Temperature (OH layer)	FTIR spectrometer	KOPRI	2002		Korea
Barentsburg	Monochrome movie of the sky (wide FOV, VHS format, ~6 fps)	All-Sky Television Camera	PGI	2000 (digital 2008)		Russia
Barentsburg	Emissions at 557.7 and 630.0 nm (every 25 ms)	4-channel Photometer	PGI	2008		Russia
Barentsburg	Imaging of aurora and airglow in	PhotonMax Camera	PGI	2008		Russia

	daylight (25 deg FOV, every 10 s)					
Barentsburg	Sky luminosity (730-890 nm, 4 fpm)	Near-infra-red Spectrometer	PGI	2008		Russia
KHO/Barentsburg	VIS	All-sky hyperspectral cameras	UNIS, PGI			Norway/Russia
Magnetometers						
Longyearbyen, KHO	ULF magnetic wave activity (2 axes, 0.1 s)	Search-coil Magnetometer	AC, UNH	2007		USA
Longyearbyen, KHO	Magnetic field (3 axes, every 10 s)	Fluxgate Magnetometer	UIT	1993		Norway
Ny-Ålesund	Magnetic field (3 axes, every 10 s)	Fluxgate Magnetometer	UIT	1967		Norway
Ny-Ålesund	ULF magnetic wave activity (2 axes, 0.1 s)	Search-coil Magnetometer	AC, UNH	2007		USA
Barentsburg	Magnetic field wave activity (3 axes, 0.1-20 Hz, every 25 ms)	Induction Magnetometer	PGI	2000		Russia
Barentsburg	Magnetic field wave activity (3 axes, 0.1-20 Hz)	Induction Magnetometer	UO	2005		Finland
Barentsburg	Magnetic field (3 axes, every 0.1 s)	Fluxgate Magnetometer	PGI	2000		Russia
Barentsburg	Magnetic field (3 axes, every 0.1 s)	Fluxgate magnetometer	AARI	2002		Russia
Hornsund	Magnetic field (3 axes, every 1 s)	Torsion Photoelectric Magnetometer	IGFPAS	1978		Poland
Hornsund	Magnetic field (3 axes, every 1 s)	Fluxgate Magnetometer	IGFPAS	2001		Poland
Hornsund	Absolute measurements (twice a week)	DI - Fluxgate Magnetometer	IGFPAS	1996		Poland
Hornsund	Absolute measurements (twice a week)	Proton Magnetometer	IGFPAS	1980		Poland
Hornsund	ELF electomagnetic field wave activity (Schumann resonance, 1-33Hz, every 0.01 s)	Induction Magnetometer and Electric Ball Antenna	IGFPAS	2004		Poland
Hornsund	ULF magnetic wave activity (2 axes, 0.1 s)	Search-coil Magnetometer	AC, UNH	2007		USA
Isfjord	ULF magnetic wave activity (2 axes, 0.1 s)	Search-coil Magnetometer	AC, UNH	2007		USA
Bjørnøya, Hopen, Jan Mayen	Magnetic field (3 axes, every 10 s)	Fluxgate Magnetometer	UIT	1997 (Bjørnøya:1932)		Norway

Other instrument types						
Ny-Ålesund, Blue House	Neutron flux and energy spectrum	Neutron Monitor (Bonner Sphere spectrometer)	HZM	2006	Germany	Germany
Barentsburg	Cosmic rays (every 10 s)	Neutron Monitor	PGI	2007		Russia
Barentsburg	ULF magnetic wave activity, remote monitoring of SPEAR	HF Doppler receiver sounder	ULEI	2005		UK
Hornsund	TEC and ionospheric scintillation	3 Spaced GPS Receivers	SRCPAS	2007		Poland
Hornsund	Ground atmospheric electric field	Radioactive collector and field mill	IGFPAS	1980s		Poland
General infrastructure						
Ny-Ålesund, SvalRak	Sounding Rocket Facility	Rocket Launcher	ARR	1997		Norway
Longyearbyen, KHO	General purpose of viewing stars	Telescope	UNIS	1995		Norway
Svalbard Science Park, UNIS	Narrow-field-of-view calibration	Optical lab	UNIS	2004		Norway
Longyearbyen, KHO	General purpose of viewing stars	Telescope	UNIS	1995		Norway

Table 2. KT 2 - The Arctic troposphere – boundary layer – surface system and radiation feedback processes

Location	Parameters	Platform	Operator	Start	Op. secured until	Country
Atmospheric composition						
AWIPEV Base, Ny-Ålesund	Vertical profiles of ozone	Ozonesondes	AWI	1988		Germany
AWIPEV Base, Ny-Ålesund	Vertical profiles of ozone, PSCs, strat. T, density	Stratospheric ozone lidar	AWI	1988		Germany
AWIPEV Base, Ny-Ålesund	trace gases in the stratosphere and lower mesosphere	Microwave radiometer	UB	1991		Germany
AWIPEV Base, Ny-Ålesund	columns of stratospheric trace gases: ozone, HCl, HF, NO_2, HNO_3, $ClONO_2$, CFCs, …	FTIR spectrometer	AWI, UB	1991		Germany
AWIPEV Base, Ny-Ålesund	Ozone, NO_2, OClO, BrO, IO (column abundance)	DOAS	UB	1994		Germany
Sverdrup Station, Ny-Ålesund	Total ozone, NO_2, PSC	SAOZ	NILU, CNRS	1991		Norway, France
Sverdrup Station, Ny-Ålesund	UV irradiance, total ozone	GUV	NILU	1996		Norway
Rabot Station, Ny-Ålesund	Total ozone - UV spectra	Brewer No. 50	IDASC-CNR	1999		Italy
Hornsund	Column of water vapor content	CE-318-2	NASA, IGFPAS	2005		USA/Poland
Hornsund	Water vapor profile	Raman lidar	IGFPAS	2009		Poland
Radiation measurements						
AWIPEV Base, Ny-Ålesund	Direct, diffuse, global radiation, UV, upward/ downward long-wave radiation, solar spectrum,…	BSRN station	AWI	1991		Germany
Sverdrup Station, Ny-Ålesund	UV fluxes at 300-380 nm - Ozone content - Erithemal/DNA dose rates	UV-RAD ISAC radiometer equipeed with 7 very narrow channels (1 nm	ISAC-CNR	2007		Italy

		FWHM) (300 nm, 306 nm, 310 m, 314 nm, 325 nm, 338 nm, 364 nm)				
Kohlhaven , Ny Alesund (Amundsen- Nobile Tower)	Donwelling and Net radiation, at 33 m Upwelling radiation at 25 m albedo	CNR1 Net radiometer; CGR4 pyrgeometer and CMP22 pyranometer for upwelling fluxes	ISAC-CNR	2009		Italy
Hornsund	Total radiation	Pyranometr CM-11	IGFPAS	2005		Poland
Hornsund	UV-A&Erythemal Radiation	UV-S-AE-T Biometer	IGFPAS	2005		Poland
Hornsund	Sunshine duration	CSD-1	IGFPAS	2005		Poland
r.v. Oceania/ Svalbard	Solar radiation fluxes	Eppley Precision spectral Pyranometers	IOPAS	1993		Poland
r.v. Oceania/ Svalbard	Upward and downward radiation fluxes	Kipp&Zonen net radiation meter	IOPAS	2000		Poland
Grønfjorden, Barentsburg	Incoming global radiation (300-3000 nm)	Barentsburg research station	MHS, AARI	1985	2011	Russia
NCU University Base, Kaffioyra	Upward and downward radiation fluxes	Kipp&Zonen net radiation meter	NCU	2010		Poland
Hopen	Downward solar and terrestrial radiative fluxes	Kipp&Zonen CMP21 & CGR4	METNO	2008	IPY funding	Norway
Bjørnøya	Downward solar and terrestrial radiative fluxes	Kipp&Zonen CMP21 & CGR4	METNO	2010	IPY funding	Norway
Jan Mayen	Downward solar and terrestrial radiative fluxes	Kipp&Zonen CMP21 & CGR4	METNO	2009	IPY funding	Norway
Aerosol & cloud measurements						
Zeppelin Observatory, Ny-Ålesund	Particle light absorption	Soot photometer	SU			Sweden
Zeppelin Observatory, Ny-Ålesund	Particle number density	Condensation Particle Counter (CPC)	SU			Sweden
Zeppelin Observatory, Ny-Ålesund	Particle size distribution	Differential Mobility Analyzer (DMA)	SU			Sweden

Zeppelin Observatory, Ny-Ålesund	Aerosol light scattering	Nephelometer TSI 3563	SU			Sweden
Zeppelin Observatory, Ny-Ålesund	Particle-bound lead-210	high-volume sampler	FMI	2001		Finland
Sverdrup Station, Ny-Ålesund	Aerosol optical depth	PFR Sun photometer	NILU, PMOD	2001		Norway, Switzerland
AWIPEV Base, Ny-Ålesund	Aerosol optical density	Sun/moon/star photometer	AWI	1990		Germany
AWIPEV Base, Ny-Ålesund	particle backscatter coefficient, particle depolarization ratio, vertical profiles	miniaturized 532 nm elastic backscattering and depolarization lidar MULID	ISAC-CNR	UPDATE 2008		Italy
AWIPEV Base, Ny-Ålesund	Cloud base	Laser ceilograph	AWI	1991		Germany
AWIPEV Base, Ny-Ålesund	Aerosol profiles	Aerosol Raman lidar	AWI	1994		Germany
Gruvebadet, Ny-Ålesund	aerosol size distribution in the range 3 - 1000 nm	TSI 3034 Scanning Mobility particle sizer (SMPS) and TSI 3321 Aerodynamic Particle Sizer (APS)	UFI	2010		Italy
Gruvebadet, Ny-Ålesund	aerosol absorption coefficient at 440, 550, 870 nm	PSAP absorption photometer (3 wavelengths)	ISAC-CNR	2010		Italy
Gruvebadet, Ny-Ålesund	aerosol scattering coefficient at 532 nm	M903 Radiance Research nephelometer	ISAC-CNR	2010		Italy
Gruvebadet, Ny-Ålesund	aerosol chemical composition (integral and size-segregated)	aerosol sampling systems (single stage, multistage, 2 DLPI 12 stages DEKATI)	UFI	2010		Italy
Gruvebadet, Ny-Ålesund	Aerosol concentration in the range 5 600 nm	TSI ultrafine counter particle	ISAC-CNR	2010		Italy
Rabben, Ny-Ålesund	aerosol optical depth, scattering phase function	Sky-radiometer, Prede POM-02	NIPR	2000		Japan
Rabben, Ny-Ålesund	All-sky 3-color images	All-sky camera, Prede PSV-100	NIPR	2004		Japan
Longyearbyen KHO	Cloud detector	Ceilometer	UNIS, AVINOR			Norway

Hornsund	Aerosol Optical Depth, 440-870 Ångström exponent, fine and coarse modes Aerosol Optical Depth, fine mode fraction	CE-318-2	NASA, IGFPAS	2005		USA, Poland
Hornsund	Profile of backscattering and extinction coefficient for 355, 532, 1064, 387 and 407 nm (aerosols, clouds, water vapour)	Multi-wavelength Elastic & Raman Scattering LIDAR	IGFPAS	2009		Poland
r.v. Oceania/ Svalbard	Aerosol profiles	Lidar LB 10 (532 nm)	IOPAS	2009		Poland
r.v. Oceania/ Svalbard	AOD	Microtops II sunphotometers	IOPAS	2001		Poland
r.v. Oceania/ Svalbard	Coarse aerosol size distribution and conc.	PMS laser particle counter CSASP-100	IOPAS	1993		Poland
r.v. Oceania/ Svalbard	Fine mode aerosol concentration	TSI Condensation Particle Counter	IOPAS	2007		Poland
Meteorological observations						
Hornsund	T, p, wind, RH, prec., snow depth, clouds, visibility	Synoptic met. station (partially automatic)	IGFPAS, METNO	operational		Poland /Norway
Hornsund	Global/ reflex radiation, albedo, upward/ downward long-wave radiation, net rad.	Automatic Weather Station (AWS)	USI, IGFPAS	2008-present		Poland
Ny-Ålesund	T, p, wind, RH, prec., snow depth, clouds, visibility	Synoptic met. station (partially automatic)	METNO	operational		Norway
Bear Island	T, p, RH, prec., snow depth, clouds, visibility, radiosonde	Synoptic met. station (manual)	METNO	operational		Norway
Jan Mayen	T, p, RH, prec., snow depth, clouds, visibility, radiosonde	Synoptic met. station (partially automatic)	METNO	operational		Norway
Hopen	T, p, RH, prec., snow depth, clouds, visibility, radiosonde	Synoptic met. station (manual)	METNO	operational		Norway
Edgeøya, Verlegenhuken, Karl XII Land	T, p, RH, wind	meteorological station (automated)	METNO	p.d. not operational		Norway

Svea	T, p, RH, wind	meteorological station (automated)	SNSK	operational		Norway
Svalbard lufthavn, Longyearbyen	T, p, wind, RH, prec., snow depth, clouds, visibility, etc.	Synoptic met. station (partially automatic)	AVINOR	operational		Norway
Kapp Lee (Edgeøya, automated - GSM)	T, p, wind, Sea ice camera http://158.39.11.100:8181/	Campbell sciemtific	UNIS	2007		Norway
Vestpynten, Longyearbyen	T, p, RH, wind, turbulent fluxes	Tower: T, RH at 14 and 25m, wind at 10, 14, 19 and 25 m CSAT3 at 15m	UNIS	2008		Norway
Adventdalen, Longyearbyen	T, p, RH, wind	Tower measurements at 2 and 10m	UNIS	2009		Norway
Breinosa, Longyearbyen	T, p, RH, wind	Meteorological station	UNIS	2007		Norway
Janssonhaugen, Longyearbyen	T, p, RH, wind	Meteorological station	UNIS	2007		Norway
Gruvefjellet, Longyearbyen	T, p, RH, wind	Meteorological station	UNIS	2006		Norway
Rijpfjorden	T, p, RH, wind	Meteorological station	UNIS	2007		Norway
AWIPEV Base, Ny-Ålesund	Vertical profiles of T, p, wind, RH	Radiosondes	AWI	1990		Germany
AWIPEV Base, Ny-Ålesund	Vert. profiles of met. Parameters	Tethered balloon	AWI	2006		Germany
AWIPEV Base, Ny-Ålesund	p, T, wind, RH at 2/ 10 m	Meteorological tower	AWI	1991		Germany
Zeppelin Observatory, Ny-Ålesund	Wind, temperature, RH	Meteorological observations	NILU	1989		Norway
Kohlhaven , Ny Alesund (Amundsen- Nobile Tower)	Atmospheric profiles in surface layer (PBL) - P, T, RH, wind at 4 level (3, 7,10, 34 m)	4 propeller anemometers 05106, 4 thermo igrometers vaisala HMP45, 1 Vaisala Barometer CS100	ISAC-CNR	2009		Italy
Kohlhaven , Ny Alesund (Amundsen- Nobile Tower)	Turbulent fluxes of moisture, momentum, temperature	KH-20 fast hygrometer, Gill sonic anemometer	ISAC-CNR	2009		Italy
Kohlhaven , Ny Alesund (Amundsen- Nobile Tower)	Snow height	Campbell Snow level SR50	ISAC-CNR	2009		Italy
Kohlhaven , Ny Alesund	Thermal flux into snow	Flux plate HFp01	IBIMET	2009		Italy

(Amundsen- Nobile Tower)						
Kohlhaven , Ny Alesund (Amundsen- Nobile Tower)	Snow temperature gradient	2 pt100 at 2 different levels (3W-Half Bridge)	IBIMET	2009		Italy
Kohlhaven , Ny Alesund (Amundsen- Nobile Tower)	snow/soil skin temperature	IR sensor	ISAC-CNR	2009		Italy
Barentsburg	T, p, wind, RH, prec., snow depth, clouds, visibility, incoming global radiation	Synoptic met. Station (manual)	MHS	operational		Russia
Corbel base (6 km east of Ny Alesund)	T, wind, radiation	Automatic weather station (20m asl)	AWIPEV	2006		France
Petuniabukta area	T, p, RH, soil temperature and moisture, precipitation; incoming and reflected radiation, PAR (at one site)	4 AWS including radiation sensors	BUTBN	2008		Czech Republic
r.v. Oceania/ Svalbard	Wind speed pulsations	GILL acoustic anemometer	IOPAS	2007		Poland
r.v. Oceania/ Svalbard	Meteorological parameters	Meteorological station	IOPAS	1993		Poland

Table 3. KT3 - Oceanic and sea ice processes

Location	Parameters	Platform/ instrument	Operator	Start	Op. secured until	Country
Repeat Ocean Sections						
Bear Island W section along 74° 30'N	T/S, – time series of Atlantic Water properties	RV J Hjort/G.O. Sars/H. Mosby, J Mayen, CTD, ADCP	IMR	1977		Norway
Sørkapp W section along 76° 20'N across the WSC	T/S, – time series of Atlantic Water properties	RV J Hjort/G.O. Sars/H. Mosby, J Mayen, CTD, ADCP	IMR	1977		Norway
Fugløya-Bear Island section from Norway to Bear Island	T/S, Currents – time series of Atlantic Water properties and dynamics	RV J Hjort/G.O. Sars/H. Mosby, J Mayen, CTD, ADCP	IMR	1964/1997 (6 times/yr since 1977)		Norway
Vardø-N section east of Svalbard along 31°13'E	T/S, – time series of Atlantic Water and Arctic Water properties	RV J Hjort/G.O. Sars/H. Mosby, J Mayen, CTD, ADCP	IMR	1953 (4 times/yr since 1977)		Norway
All marine areas around Svalbard	Temperature, Salinity, Density, Pressure++	RV J Hjort/G.O. Sars/H. Mosby, J Mayen, CTD, ADCP	IMR	1965/2000		Norway
Line along 76º 30'N across the WSC	T/S, Currents – time series of Atlantic Water properties and dynamics	RV Oceania CTD, ADCP, LADCP	IOPAS	1996	?	Poland
West of Svalbard across the WSC	T/S, Currents - time series of AW properties and currents structure	RV Oceania CTD, ADCP, LADCP	IOPAS	2000	?	Poland
West of Spitsbergen across the WSC	T/S, Currents - time series of AW properties and currents structure	RV Mosby CTD, ADCP	UNIS	2000		Norway
Isfjorden & Kongsfjorden	T/S, Currents - time series of fjord properties and currents structure	RV Mosby CTD, ADCP	UNIS	2000		Norway
Storfjorden	T/S, Currents - time series of dens water formation properties, sea ice production and currents structure	RV Mosby CTD, ADCP	UNIS	2000		Norway

Across Fram Strait at 78°50’N	T/S, Currents, tracers at the yearly repeated section between the Greenland and Svalbard shelves	Polarstern	AWI	1995	2012 (at least)	Germany
Across Fram Strait	Tracers (S, d18O, N:P, alkalinity), revealing the sources of the Arctic Ocean freshwater components	CTD rosette water samples	NPI	2008		Norway
Across Fram Strait	Temperature and salinity of Arctic Ocean inflow (WSC) and outflow (EGC): Snapshots each September	CTD	NPI	1997		Norway
Fram Strait, line along 79º N across the East Greenland Current	Ice thickness and drift velocity across the Transpolar Drift where it exits the Arctic Ocean: Time series	Four Ice Profiling Sonars and four ADCPs	NPI	1990		Norway
Fram Strait along and nearby the 79º N line across the EGC and over the East Greenland Shelf	Ice and snow thicknesses and freeboard across the Transpolar Drift where it exits the Arctic Ocean: Snapshots each August/September	EMbird and EM31, drillings, stake meas.	NPI	2003		Norway
Fram Strait, mooring array across the East Greenland Current at 79º N	Time series of Arctic Ocean outflow in the East Greenland Current (EGC) (temperature, salinities, current velocities)	Arctic Ocean Outflow Observatory (AOBS) (16 microcats, 16 RCMs, five ADCPS, one TS string)	NPI	1997		Norway
all research vessels; on moorings on selected marine mammal species on a rotational basis	Temperature, Salinity, Density, Pressure++	CTD	NPI, AWI, IMR, IOPAS, MMBI, KOPRI, PRIC, NERC, SU			Norway, Germany, Poland, Russia, Korea, China, Sweden
Eularian Platforms (fixed)						
Kvitøya	T/S/Currents	Single Mooring	IMR	2010		Norway
SW Svalbard Shelf	T/S/Currents	Single Mooring	IOPAS	Summer 2009		Poland
Fram Strait at 78°50’N	T/S/Currents/PAR (long-term measurements in Fram Strait Observatory)	Array of 12 moorings between 2°W and 8°40’E	AWI	1997	2012 (at least)	Germany

Kongsfjorden	T/S/Currents (profile), sediments, Fluorescence, PAR	Single Mooring	SAMS	2002	2011	UK
Rijpfjorden	T/S/Currents (profile), sediments, fluorescence, PAR	Single Mooring	SAMS	2006	2011	UK
Billefjorden	T/S/Currents (profile), sediments, fluorescence, PAR	Single Mooring	UNIS	2008	2011	Norway
Fram Strait	T/S/Currents	Single Profiling Mooring (MMP)	IOPAS	2008		Poland
Storfjorden sill and shelf-break off Sørkapp	T/S/Currents (profile)	Single Mooring	UIB	2004		Norway
F0: Eastward continuation of the AWI/NPI mooring section in FramStrait	T/S/Currents	Single Mooring	UNIS	2007		Norway
Kongsfjorden	Temperature, salinity, currents	Multi-parameter mooring (Aanderaa RCM)	UNIS	2001		Norway
Kongsfjorden, inner part	Sea ice thickness, snow thickness, freeboard, fast ice extent	Drillings, stake measurements, visual observations, photography	NPI	2003		Norway
Storfjorden, Inglefieldbukta	Sea ice thickness, snow thickness, freeboard	Drillings, stake measurements, EM (ca. 2 snapshots/season)	NPI	2006		Norway
Hopen, east coast near station	Sea ice thickness, snow thickness, freeboard, general ice situation	Drillings, stake measurements, visual observations, photography	NPI, met.no	1966		Norway
Isfjorden mouth, Kapp Linné	Temperature, salinity, currents, turbidity	Multi-paraqmeter mooring (Aanderaa RDCP and SeaGuard, Seabird SBE37)	UNIS	2005-2008, 2010		Norway
meteorological station (automated - GSM) Kapp Lee (Edgeøya)	T, p, wind, Sea ice camera http://158.39.11.100:8181/	Campbell sciemtific	UNIS	2007		Norway
Barentsburg	CTD, turbidity	CTD RBR X-640	AARI	2009		Russia
Barentsburg	Ocean current, T, depth	Vector	AARI	2010		Russia

Grønfjorden	T/S, sea ice and snow physical properties (thickness, temperature, salinity, turbidity, sediment concentration)	Winter – from fast ice Summer – small board "Barentsburg"	AARI, ACC	2008	2011	Russia
Acoustic sources and receiver system for the Fram Strait	Acoustic data for measurment of mean ocean temperature, ocean currents, and for navigation of floats and gliders	Four moorings	NERSC	2008	2012	Norway
Acoustic passive listening system	Passive system for monitoring ambient noise	1 mooring	NERSC	2010	2012	Norway
Lagrangian Platforms (moving)						
Fram Strait	T/S	ARGO Floats	IOPAS	2009		Poland
Eastern and central Fram Strait	T/S, DO, Fluorescence (repeated sections)	Glider	AWI	2008	2012	Germany
Various	T/S	Seals	NPI	2007 (?)		Norway
Specialist Observational Infrastructure						
Under-ice boundary layer	High frequency T/S/Currents for ocean microstructure	Sea ice mounted	UNIS	2002		Norway
Oceanic	High frequency T/S/Currents for ocean microstructure profiling	Ship	GFI-UIB	2001		Norway
Fram Strait (Deep)	Ocean acoustic data	Acoustic Arctic Laboratory	NERSC	2008	2012 (partly funded)	Norway
Fram Strait (WSC)	Mean temperature from tomography	Mooring	NERSC	2008	?	Norway
Fram Strait, north of Svalbard and Barents Sea	Ice thicknesses of drifting ice floes during UNIS cruise: Snapshots each April	EM31	UNIS	2009		Norway

Table 4. KT 4 - Marine transport of energy, nutrients and pollution (horizontally, vertically and through the food chain)

Location	Parameters	Platform	Operator	Start	Op. secured until	Country
Repeat Ocean Sections						
All marine areas around Svalbard	Nutrients Phytoplankton taxonomy, abundance Chlorophyll a measurements	Water samples	IMR	1984/2000		Norway
All marine areas around Svalbard	Zooplankton composition and abundance	WP2	IMR	1984/2000		Norway
All marine areas around Svalbard	Fish species and abundance	Pelagic and bottom trawl	IMR	1965/2000		Norway
All marine areas around Svalbard	Benthic fauna and biomass	Bottom trawl and grab	IMR	2003		Norway
All marine areas around Svalbard	Currents, movement of particles in the water column	ADCP	NPI, AWI, IMR, IOPAS, MMBI, KOPRI, PRIC, NERC, SU			Norway, Germany, Poland, Russia, Korea, China, Sweden
Transects KongHAU, Rijpfjorden, Isfjorden, Hornsund	Mesozooplankton (abundance, community structure, taxonomy)	Multi Plankton Sampler (=Multinet)	NPI, AWI, IOPAN			Norway, Germany, Poland
Transects KongHAU, Rijpfjorden, Isfjorden, Hornsund	Mesozooplankton	WP2	NPI, UNIS, IOPAN			Norway, Germany, Poland
Transects KongHAU, Rijpfjorden, Isfjorden, Hornsund	Makrozooplankton	WP3	NPI, UNIS, IOPAN			Norway, Germany, Poland
Transects KongHAU, Rijpfjorden, (Isfjorden, Hornsund)	Makro-Megazooplankton, ichtyoplankton	MIK	NPI			Norway
Transects KongHAU,	Water samples for	Niskin Bottles	All boats (together with			

Rijpfjorden, Isfjorden, Hornsund	- nutrient analysis - phytoplankton taxonomy, abundance - Chlorophyll a measurements		CTD on the CTD rosette)			
Transects KongHAU, Rijpfjorden, Isfjorden, Hornsund	phytoplankton taxonomy	Nets	NPI, UNIS, IOPAN			Norway, Poland
Transects KongHAU, Rijpfjorden, Isfjorden, Hornsund	Chlorophyll a, fluorescence	Fluorometer	NPI, UiT, AWI			Norway, Germany
Hornsund	Phyto & mesoplankton, zoobenthosa	Multi Plankton Sampler (=Multinet), Van Venn grab	IOPAS	1996	2011+	Poland
Transects KongHAU, Rijpfjorden, Isfjorden, Hornsund	Light, Photosynthetically Active Radiation (PAR 400-700 nm)	Li Cor Par	NPI, …			Norway
Kongsfjord, KongHAU, Hornsund, Bellsund, Rijpfjorden	Infaunal macrobenthos (medium size, restricted mobility)	Van Veen Grab	APN, NPI, UNIS, AWI, IOPAN	1996	2011+	Norway, Germany, Poland
KongHAU	Macro- Megabenthos	Agassiz trawl	AWI			Germany
Barents Sea Polar Front Transect	Infaunal Macrobenthos	Van Veen Grab	APN			Norway
Geographically dynamic	Detailed positional information, behavior of top trophics on a year-round basis	Top trophic distribution and foraging behavior	NPI (& IMR partners)			Norway et al.
Marine areas around Svalbard	Contaminants; hydrocarbons, persistent organic pollutants (PCB, DDT, HCH, HCB) and radionuclides.	Water samples, sediment and samples from marine biota	IMR, NRPA, NGU, NIFES	1993		Norway
Eularian Platforms (fixed)						
HAUSGARTEN, Kongsfjorden, Bellsund	Sediment, Meiofauna, Macrofauna	Box corer	AWI, APN			Germany, Norway
HAUSGARTEN, Kongsfjorden, Bellsund	Sediments, Meiofauna	Multiple Corer (video guided)	AWI, APN			Germany, Norway

HAUSGARTEN	Benthic fauna	Towed underwater camera (OFOS)	AWI			Germany
HAUSGARTEN	Temperature, salinity, div. chemical and biological parameters	AUV (autonomous underwater vehicles)	AWI			Germany
HAUSGARTEN	Experiments, observations and measurements on the sea floor	Freefalling Lander Systems / benthic lander	AWI			Germany
HAUSGARTEN	Oxygen and H_2S concentration, pH and electrical resistivity at the sediment-water interface	In-situ Microprofiler	AWI			Germany
HAUSGARTEN	Bottom water samples for biogeochemical and microbiological investigations	Horizontal Bottom Water sampler	AWI			Germany
Kongsfjorden, HAUSGARTEN, Rijpfjorden	Long term records of temperature, salinity, currents, sedimentation etc.	Mooring (Sea observatories)	AWI, NPI, SAMS			Germany, Norway, UK
Kongsfjorden, HAUSGARTEN, Rijpfjorden	Sedimentation in the water column	automated time-series sediment trap	AWI, NPI, SAMS			Germany, Norway, UK
Billefjorden	Sedimentation in the water column	Automated time-series sediment trap	UNIS, SAMS	2008	2011	Norway
Billefjorden	Zooplankton biomass	ADCPs	UNIS,	2008	2011	Norway
Barents Sea Polar Front	Growth rate; shell geochemistry	Bivalve shells	APN, NPI, UNIS			Norway
Pan-Svalbard	Growth rate; shell geochemistry	Bivalve, shells	APN, NPI, UNIS			Norway
Komsomolets at 73˚43’ N and 13˚16’E	Cs-137, Tc-99, Sr-90, Pu-238, Pu-239,240 and Am-241, Ra-226 and Po-210	Water samples and sediment	IMR, NRPA, NGU, NIFES)	1993		Norway
Lagrangian Platforms (moving)						
Grønfjorden, all research vessels, from sea ice	Light, Photosynthetically Active Radiation (PAR 400-700 nm)	Li Cor (PAR)	AARI	2010		Russia
Grønfjorden, all research vessels, from sea ice	Underwater irradiance, 250-929nm	TRIOS RAMSES	NPI, AARI	2010		Norway-Russia
Ny-Ålesund, Marine Laboratory, “Teisten”	Temperature, Salinity, Density, Pressure	CTD	KBAS	2007		Norway

research vessel						
Longyearbyen, UNIS, “Viking Explorer” research vessel			UNIS	2006		Norway
Other infrastructure						
Longyearbyen, Forskningsparken	Running seawater lab with experimental tanks	UNIS Marine Laboratory	UNIS	2005		Norway
Longyearbyen, Forskningsparken	CTDs, PAR sensor, various sampling gear for marine biological sampling	UNIS Marine Laboratory	UNIS			Norway
Longyearbyen, Forskningsparken	DNA extraction, PCR, qPCR, bioanalyzer, electrophoresis systems	UNIS Molecular laboratories	UNIS	2005		Norway
Longyearbyen, Forskningsparken	Chl-α biomass	Spectrophotometers and fluorometer	UNIS			Norway
Ny-Ålesund	All kinds of oceanographic and biological parameters of marine samples	Ny-Ålesund Marine Laboratory	KBAS	2005		Norway
Ny-Ålesund, Kings Bay AS Marine Laboratory	Radiation	Scintillation counter	KBAS, UIB	2005?		Norway

Table 5. KT 5 – Glacier and ice cap evolution (mass balance and dynamics)

Location	Parameters	Platform	Operator	Start	Op. secured until	Country
Weather stations						
Hansbreen	Ice temperature profile: 30m	Automatic Weather Station (AWS)	USI, IGFPAS	2008-present		Poland
Hansbreen	T, RH, wind speed & direction, p, snow height, global/reflex radiation, albedo, upward/ downward LWR, net radiation	Automatic Weather Stations (AWS)	USI, IGFPAS, UWR	2007-present		Poland
Austre Lovenbreen top of the glacier	T, wind, radiation	Automatic weather station (; 400 m asl)	AWIPEV	2006		France
Austre Lovenbreen	Air T, wind,(rain)	Automated loggers Air T (22 loggers), wind (9 loggers), rain (9 rain gauges just in Summer time),	AWIPEV, ANR, CNRS	2007 or 2008		France
Nordaustlandet, Austfonna, Etonbreen	Global/ reflex radiation, albedo, upward/ downward long-wave radiation, net rad.	Automatic Weather Station (AWS)	UIO	2004-present		Norway
Aldegondabreen (Grønfjorden)	Air temperature, RH, wind velocity, incoming global and reflective radiation, ice temperature profile: 3m	Automatic Weather Station (AWS) with 4th measurement levels	AARI	2006-present (not every year)		Russia
Kongsvegen stake 6, 78.78041, 13.15416	T, H, upward/ downward long-wave /short-wave radiation, wind speed, wind dir.	Automatic Weather Station (AWS)	NPI	2000		Norway
Kongsvegen stake 1, 78.845177,12.670116	T, H, upward/ downward long-wave /short-wave radiation, wind speed, wind dir.	Automatic Weather Station (AWS)	NPI	2000		Norway
Holtedahlfonna, Stake 1, 78.93351, 13.31003	T, H, upward/ downward long-wave /short-wave radiation, wind speed, wind dir.	Automatic Weather Station (AWS)	NPI	2008		Norway
Holtedahlfonna, Stake 4.5E,	T, H, upward/ downward long-wave	Automatic Weather Station	NPI	2008		Norway

78.984056, 13.61760	/short-wave radiation, wind speed, wind dir.	(AWS)				
Glaciological stations						
Hansbreen	Basal water pressure, basal sliding indicator, icequake counts, vertical ice, atm. p, snow depth	Glaciological Stations (UBC): Subglacial, englacial and supraglacial sensors	UBC, USI	2006-present		Canada, Poland
Waldemarbreen	Ice temperature profile: 15m	Automatic Station	NCU	2007-present		Poland
Irenebreen	Ice temperature profile: 10m	Automatic Station	NCU	2008-present		Poland
Waldemarbreen	ablation-accumulation , mass balance, ice temperature, glacier dynamics	Stakes network, ice temperature boreholes with automated loggers	NCU (Nicolaus Copernicus University)	1996		Poland
Irenebreen	ablation-accumulation , mass balance, ice temperature, glacier dynamics	Stakes network, ice temperature boreholes with automated loggers	NCU (Nicolaus Copernicus University)	2001		Poland
Elisebreen	ablation-accumulation , mass balance, glacier dynamics	Stakes network	NCU (Nicolaus Copernicus University)	2005		Poland
Austre Lovenbreen	ablation-accumulation winter and Summer MB	40 stakes + snow cores	AWIPEV, ANR, CNRS	2007 and 2008		France
Austre Lovenbreen	Survey of glacier surface by photography	8 automatic cameras covering the whole basin	AWIPEV, ANR, CNRS	2007		France
Other instruments						
Hornsund areas	Snow precipitation, glacier thermal structure and mass balance Snow cover distribution on tundra	Ground penetrating radar (GPR)	USI, IGFPAS	2007 - present		Poland
Hansbreen	Glacier dynamics	GPS-stations-automatic	USI, IGFPAS	2003 - present		Poland
Hansbreen and selected glaciers	Glacier dynamics	Time-lapse cameras	USI, IGFPAS	2007 - present		Poland
East Lovenbreen	Photos	Automatic cameras	CNRS, CEPE (?)	2006		France
Tellbreen	10 Mass balance stakes	Differential GPS	UNIS	2008	2012	Norway

Table 6. KT 6 – Greenhouse gas processes and feedbacks in the Arctic climate system

Location	Parameters	Platform	Operator	Start	Op. secured until	Country
Atmospheric concentration meas.						
Zeppelin Observatory, Ny-Ålesund	Carbon dioxide	NDIR radiometer	ITM-SU	1988		Sweden
Zeppelin Observatory, Ny-Ålesund	Radon		ITM-SU/UHD			Sweden/ Germany
Zeppelin Observatory, Ny-Ålesund	halogenated hydrocarbons	ADS-GCMS	NILU	2000		Norway
Zeppelin Observatory, Ny-Ålesund	Ambient methane	GC-FID	NILU	1998		Norway
Zeppelin Observatory, Ny-Ålesund	nitrous oxide	GC	NILU	2010		Norway
Carbon flux measurements						
Bayelva, near Ny-Ålesund	fluxes of CO_2, sensible heat, H_2O; snow depth	Eddy Co-variance system	AWI	2007		Germany
Dasan Station, Ny-Ålesund	CO_2 flux, heat fluxes	Eddy covariance tower	KOPRI			S-Korea
Marine observations						
Fram Strait	CH_4 emissions from seafloor	MASOX Observatory	UiT	2010		Norway

Table 7. KT 7 - Arctic permafrost, geomorphological processes and hydrology, including paleo-climatic studies

Location	Parameters	Platform	Operator	Start	Op. secured until	Country
De Geerdalen/Londonelva, Ny-Ålesund	Water discharge and temperature, suspended sediments (inorganic, organic)	Discharge station	NVE	1989, 1990, 1992		Norway
Ny-Ålesund	Soil water level, soil moisture, soil temperature, snow depth, snow temperature,	Snow and soil monitoring stations	NVE	2008, 2009		Norway
Adventdalen/Longyearbyen	7 permafrost boreholes 4-20 m deep, from 10 to 450 m asl. with thermistor strings for temperature recording	Nordenskioldland Permafrost Observatory, permafrost temperature	UNIS	2008		Norway
Kap Linné	5 permafrost boreholes from 3 to 40 m deep with thermistor strings for temperature recording, from 20 to 60 m asl.	Nordenskioldland Permafrost Observatory, permafrost temperature	UNIS	2008		Norway
Lunckefjell	One 90 m permafrost borehole with thermistor strings for temperature recording at 901 m asl.	Nordenskioldland Permafrost Observatory, permafrost temperature	UNIS, SNSK	2009		Norway
Ny Ålesund	One 10 m permafrost borehole with thermistor strings for temperature recording at 20 m asl.	Nordenskioldland Permafrost Observatory permafrost temperature	UNIS	2008		Norway
Ny-Ålesund	Borehole with soil temperature and soil humidity	Permafrost station	AWI	1997		Germany
Bayelva, near Ny-Ålesund	profiles of soil temperature, soil humidity; climate parameters (Temp., humidity, radiation, wind, precipitation	Permafrost station	AWI	1998		Germany
Endalen/Adventdalen	Solifluction station: Solifluction speed, soil water moisture, pore pressure, active layer temperatures, snow depth with automatic camera	Nordenskioldland Permafrost Observatory, periglacial landform monitoring	NERC, UNIS	2005/2008/ 2009		UK/Norway

Kapp Linné	Solifluction station: Solifluction speed, soil water moisture, pore pressure, active layer temperatures, snow depth with automatic camera	Nordenskioldland Permafrost Observatory, periglacial landform monitoring	UNIS	2007		Norway
Longyearbyen/Adventdalen	Ground surface and air temperature recordings in different landforms around, miniature temperature dataloggers and one-channel sensors	Nordenskioldland Permafrost Observatory, periglacial landform monitoring	UNIS	1999		Norway
Longyearbyen/Adventdalen	Snow and landform activity automatic cameras, 7 automatic digital cameras taking daily photographs of different landforms in the Longyearbyen/Adventdalen area	Nordenskioldland Permafrost Observatory, periglacial landform monitoring	UNIS	2000-2010		Norway
Kapp Linné, Adventdalen, Kaffiøyra (is listed separately also below), Ny Ålesund.	Circumpolar Active Layer Monitoring grids/sites, 2 grids, and several additional one point sites in Svalbard with probing of the active layer thickness annually and for the UNISCALM site progressively through the thaw season	Partly Nordenskioldland Permafrost Observatory, periglacial landform monitoring	ULUND, different Polish institutions, UNIS	1972-2009		Sweden, Poland, Norway
Longyeardalen, Kapp Linné	Rock glacier deformation	Nordenskioldland Permafrost Observatory, periglacial landform monitoring	TSU, UNIS	2005-2008		Japan, Norway
Adventdalen	Ice-wedge dynamics monitoring: high frequency ice-wedge polygon distance manual recordings, heave and settlement of the ground surface, rampart dynamics, one-dimensional ground acceleration recordings, soil moisture	Nordenskioldland Permafrost Observatory, periglacial landform monitoring	UNIS, TSU	2002-2009		Norway, Japan
Adventdalen	Mudboil dynamics, soil water content, active layer temperature, heave and settlement of the ground surface, automatic camera observations of surface	Nordenskioldland Permafrost Observatory, periglacial landform monitoring	TSU, UNIS			Japan, Norway
Central Nordenskiöld Land	Snow avalanche observations regularly	Periglacial landform	UNIS	2007	2009	Norway

around Longyearbyen	through the snow season	monitoring				
Longyearbyen/Adventdalen and Kapp Linné areas	InSAR data collection through the late spring, summer and early autumn seasons	Remote sensing of periglacial landforms/ Nordenskioldland Permafrost Observatory, periglacial landform monitoring	NORUT, UNIS	2008		Norway
Austre Lovenbreen basin : Goule river	River discharge and T + multiparameters in Summer time	2 automatic hydrological probes	AWIPEV, ANR, CNRS	2008		France
Austre Lovenbreen basin :Diable river	River discharge and T + multiparameters in Summer time	2 automatic hydrological probes	AWIPEV, ANR, CNRS	2008		France
Austre Lovenbreen moraine area	T of active layer (0.10 to 2 m deep)	3 station with 3 to 6 loggers each	AWIPEV, ANR, CNRS	2009 and 2010		France
Nicolaus Copernicus Polar Station area at Kaffiøyra	T of active layer, thickness of active layer	3 station with 3 to 4 loggers each	NCU	1996/ T2007		Poland
Waldemarbreen catchment basin : Waldemar River	river discharge and T + multiparameters in summer time and winter outflow	3 automatic hydrological stations	NCU	1996		Poland
Hornsund area	Active layer temperature and thickness	String of thermistors, GPR	USI, IGFPAS	2005-present		Poland
Werenskioldbreen River	Water discharge and suspended load,	Hydrological monitoring	USI, UWR	2007-present	2012	Poland
Linnédalen, Kapp Linné	Catchment scale water balance, incl. glacier mass balance, ablation, water discharge, sediment transport, sedimentation in Linnevatnet, 3-5 automatic camera observations sites, sedimentation in Linnevatnet, air temp. snow temperatures.	Hydrology monitoring, periglacial landform monitoring	REU	2002		USA
Ny-Ålesund	Coastal dynamic recordings, erosion and/or sedimentation using direct surveying and camera techniques	Coastal monitoring	UIO, HIG	? 2000		Norway
All Svalbard	NORPERM database: The Norwegian Permafrost database, the Svalbard part (http://www.ngu.no/kart/permafrost_svalbard/)	Permafrost temperature	NGU, UNIS, UIO, METNO, NTNU	2008		Norway

Central Svalbard	The CRYOSLOPE Svalbard avalanche database (www.skred-svalbard.no/).	Snow avalanches in central Svalbard around Longyearbyen	UNIS, NGU	2007-2010	Not operational (no funding), updated occasionally	Norway
Longyearbyen	Sediment magnetic properties	Magnetic susceptibility meter	UNIS	2007-present		Norway
Longyearbyen	Sediment grain size	Sediment particle analyser (Sedigraph) composition	UNIS	2008-present		Norway
Gruvedalen	Aeolian dust plumes extent and frequency	Web camera	UNIS	2009-present		Norway

Table 8. KT 8 - Arctic geohazards caused by climate change processes

Location	Parameters	Platform	Operator	Start	Op. secured until	Country
Ny-Ålesund	Earth Ground Movement	Seismometer (analog)	USGS	1967 – 1986		USA, Norway
Ny-Ålesund	Earth Ground Movement	Seismometer (STS-1 and STS-2)	USGS, AWI	1986 – 1987 1994		International
Adventdalen (Jansonhaugen)	Earth Ground Movement	Seismic Array (15 CMG-3T)	NORSAR	1992		Norway
Barentsburg	Earth Ground Movement	Seismometer (2 geophone sites)	KRSC	2000	1 site closed Sep 2010	Russia
Barentsburg	Earth Ground Movement	Broad-band seismometer (CMG-ESP)	KRSC, NORSAR	Sep 2010		Russia/Norway
Hornsund	Earth Ground Movement	Short period Seismometer network	IGFPAS	1993		Poland
Hornsund	Earth Ground Movement	Broadband seismometer (STS-2)	IGFPAS, NORSAR	09.2007		Poland / Norway
Hornsund area	Tectonic movements	Feeler Gauge	IRSM, UWR	2009 - present		Czech Republic, Poland
Hopen	Earth Ground Movement	Short period Seismometer	UIB	- 10.2007		Norway
Hopen	Earth Ground Movement	Broadband seismometer (STS-2)	UIB, NORSAR	10.2007		Norway
Bear Island	Earth Ground Movement	Broadband seismometer (CMG-3T)	UIB	1992		Norway
Isfjord Radio	Earth Ground Movement	Seismometer (analog)	UIB	1958 – 1963		Norway
Ny-Ålesund	Position	VLBI	NMA			Norway
Ny-Ålesund	Water level		NMA			Norway
Ny-Ålesund	Position	GPS	NMA			Norway
Ny-Ålesund	Gravity field	Gravimeter	NMA			Norway

Table 9. KT 9 - Direct human impact of the Arctic System

Location	Parameters	Platform	Operator	Start	Op. secured until	Country
Ny-Ålesund	Sampling and storage facility, Pollutant uptake and fate studies	Marine Laboratory	Various institutions			International
Ny-Ålesund	Atmospheric Pollutant monitoring , Zeppelin station (POP, VOC, HM), see KT 10	Zeppelin station	NILU, NPI	1991		Norway
Longyearbyen	UNIS-Lab (POP), Environmental pollution lab, see KT 10	UNIS	UNIS	2005		Norway
Barentsburg	Pollution monitoring , POPs, HM, VOC, see KT 10	Laboratory faciities	RPAT	2008		Russia
Hornsund	Pollution monitoring, HM, ions, VOC	Laboratory facilities	IGFPAS and various national institutions	1995		Poland
Longyearbyen	Sampling and storage facility, Pollutant uptake and fate studies	Laboratories and storage facilities	UNIS	2005		Norway
Longyearbyen	Cold lab-facilities	Controlled laboratory experiments	UNIS	2005		Norway
Longyeearbyen	Marine lab facilities	Controlled laboratory experiments	UNIS	2005		Norway
Longyearbyen	CO2-storage and capture lab	Controlled laboratory experiments	UNIS	2009		Norway
Longyearbyen/ Barentburg	Local pollutant monitoring program	Passive sampling for PH and PCB analysis	KLIF, UNIS, NILU	2009		Norway
Svea	Field work facilities	Infrastructures, pollution and ice related field experiments	UNIS, SNSK	1994		Norway
Barentsburg	Sampling and storage facilities	Monitoring station	RPAT, AARI	2002	2010	Russia

Table 10. KT 10 - Inter-compartmental transition processes related to pollutants and impact of climate change on these

Location	Parameters	Platform	Operator	Start	Op. secured until	Country
Zeppelin Observatory, Ny-Ålesund	Mercury air concentration	Tekran Hg monitor	NILU	2000		Norway
Zeppelin Observatory, Ny-Ålesund	Ambient ozone	Ozone analyzer	NILU	1991		Norway
Zeppelin Observatory, Ny-Ålesund	Ambient Hydrogen	GC-HgO	NILU	2005		Norway
Zeppelin Observatory, Ny-Ålesund	Aerosol inorganic chemistry	Filterpack	NILU	1989		Norway
Zeppelin Observatory, Ny-Ålesund	CO	CO monitor	NILU	2001		Norway
Zeppelin Observatory Ny-Ålesund	Monitoring of organic pollutants (LRT)	DH80 High-Volume Air Sampler	NILU	1980 (refurbished 2007)		Norway
Ny-Ålesund	concentration of heavy metals	Precipitation sampler	AWI	1993		Germany
Longyearbyen	Process related studies, up-take, distribution and transformation of pollution (independent of compound specification. Sampling and sample preparation techniques	Environmental chemistry Laboratory	UNIS			Norway
Longyearbyen	Persistent organic pollutants, polycyclic aromatic compounds (PAH), Volatile chemicals (VOC),	Instrument laboratory: GC/MS, GC-ECD, GC-FID, HPLC-DAD, GPC, Active water sampler, and passive samplers.	UNIS	2005		Norway
Longyearbyen	Persistent organic pollutants, polycyclic aromatic compounds (PAH), Volatile chemicals (VOC),	Preparative chemistry lab	UNIS	2005		Norway
Hornsund	Ions and acid compounds	Ion monitoring	IGFPAS	1995		Poland

Barentsburg	POPs (PCBs, OCPs, PAHs), HM	Field sampling/ meteorology	AARI	2008		Russia
Longyearbyen/Ny-Ålesund - Norwegian mainland transect	Temperature, Salinity, Oksygen, Chlorophyll-a fluorescence, Turbidity, Sampling possibilities for other variables/pollutents	Ferry Box automated monitoring on “MS Norbjørn”	NIVA	2008		Norway
r.v. Oceania/ Svalbard	Ozone profiles	Microtops II ozonometer	IOPAS	2001		Poland
Sverdrup Station, Ny-Ålesund	Inorganic chemistry	Precipitation collector	NILU, PMOD	1980		Norway

Table 11. KT 11 - Arctic ecosystem resilience to climate variability and change

Location	Parameters	Platform	Operator	Start	Op. secured until	Country
Petuniabukta	Vegetation changes due to climate manipulation	Open Top Chambers (OTC)	BUTBN	2009?		Czech Republic
Svalbard (entire)	Vegetation and land cover maps	Landsat 5/7 TM/ETM+	NORUT, NINA	1987-2002 Published 2009		Norway
Svalbard	Biomass maps	Landsat 5/7 TM/ETM+, AVHRR, MODIS aerial photographs	NORUT, NINA	2010-2011		Norway
Svalbard	Geese habitat maps	Landsat 5/7 TM/ETM+	NINA, DMU, UAB	2000-2002 Published 2005-2010		Norway
Endalen	Vegetation monitoring to detect effects of climate change, eutrophication, acid rain, otherpollution	Analysis frames and cameras, soil sampling	NINA	2009		Norway
Endalen	Vegetation: Temperature manipulations	Analysis frames, Open top chambers etc.	ITEX	1991		Norway
Adventdalen	Vegetation monitoring	Analysis frames, NIR-cameras, snow fence studies	UIT	2000?		Norway
Colesdalen	Vegetation monitoring	Analysis frames	UNIS, UIT	2000?		Norway
Nordenskiöldland; Kongs-fjord, Krossfjord, Liefde-fjord, Bockfjord, Woodfjord, Sassendalen, Mimerdalen, Germaniahalvøya etc.	Vegetation and land cover maps	Aerial photographs	UHH	1977-2009		Germany
Edgeøya	Vegetation, land cover and biomass maps 1977	Aerial photographs	RUG	1969-1971 Published 1977		The Netherlands
Svalbard	Vegetation maps over selected areas in	Aerial photographs	NPI	1970-1990		Norway

	Svalbard (e.g. Gipsdalen, Reinsdyrflya, Kvadehuken, Sassendalen, Kongsfjord, etc.)					
Svalbard	Vegetation map of Svalbard in the scale of 1:3.5 mill.	Aerial photographs	UIT	Published 2005		Norway
Svalbard	Vegetation regions Svalbard and Jan Mayen	Aerial photographs	NPI	Published 1986		Norway
Longyearbyen	Climate manipulation studies	Climate rooms	UNIS	2006		Norway
Longyearbyen	Ecophysiology	Research laboratory facilities	UNIS	2006		Norway
Longyearbyen	Invertebrate extraction and preparation, identification and curation.	Invertebrate Taxonomy Laboratory	UNIS	2006		Norway

Institution Acronyms

AARI	Arctic and Antarctic Research Institute of Roshydromet
AC	Augsburg College
ACC	Arktikugol/Trust "Arctic Coal Company"
ANR	Agence nationale de la recherche
APN	Akvaplan-niva AS
ARR	Andoya Rocket Range
AVINOR	Avinor AS (Norwegian Airport Operator)
AWI	Alfred Wegener Institute of Polar and Marine Research
BUTBN	Institute of Botany – Czech Academy of Sciences
CNRS	Centre national de la recherche scientifique/National Centre of Scientific Research
CRIRP	China Research Institute of Radiowave Propagation
DMI	Danish Meteorological Institute
DMU	Det Nationale Center for Miljø og Energi/National Centre of Environment and Energy
EISCAT	European Incoherent Scatter Facility
ERAU	Embry-Riddle Aeronautical University
FMI	Finnish Meteorological Institute
HIG	Høyskolen i Gjøvik/Gjøvik University College
HZM	Hemholtz Zentrum München
IBIMET	Institute of Biometeorology – Italian National Research Centre
IDASC	Institute of Acoustics and Sensors "Orso Mario Corbino" - CNR
IGFPAS	Institute of Geophysics – Polish Academy of Sciences
IFSI	Italian Institute of Physics of Interplanetary Space – National Institute of Astrophysics
IMR	Institute of Marine Research
INGV	Istituto Nazionale de Geofisica e Vulcanologia – Italian National Research Centre
IOPAS	Institute of Oceanology - Polish Academy of Sciences
IPEV	Institut Polaire Francais "Paul Emile Victor"
IRA	Institute of Radio Astronomy NAS Ukraine
IRSM	Institute of the Rock Structure and Mechanics – Czech Academy of Sciences
ISAC	Institute of Atmospheric Sciences and Climate – CNR
ITM-SU	Department of Applied Environmental Science – Stockholm University
KBAS	Kings Bay AS
KLIF	Klima- og forurensningsdirektoratet/Climate and Pollution Agency of Norway
KOPRI	Korea Polar Research Institute
KRSC	Kola Regional Seismological Centre – Geophysical Survey – Russian Academy of Sciences
KTH	Kungliga Tekniska högskolan/Royal Institute of Technology
METNO	Norwegian Meteorological Institute
MHS	Murmansk Hydrometeorological Service
MMBI	Murmansk Marine Biological Institute – Russian Academy of Sciences
NASA	National Aeronautics and Space Administration
NAU	Nagoya University
NCU	Nicolaus Copernicus University Torun
NERC	Natural Environment Research Council
NERSC	Nansen Environmental and Remote Sensing Center
NGU	Norges geologiske undersøkelser
NIFES	National Institute of Nutrition and Seafood Research
NILU	Norwegian Institute for Air Research
NINA	Norwegian Institute of Water Research

NIPR	National Institute of Polar Research
NIVA	Norwegian Institute of Water Research
NMA	Norwegian Mapping Authority
NORSAR	Stiftelsen NORSAR
NORUT	Northern Research Institute
NPI	Norwegian Polar Institute
NRCAN	Natural Resources Canada
NRPA	Norwegian Radiation Protection Agency
NTNU	Norwegian University of Science and Technology
NVE	Norwegian Water Resources and Energy Directorate
PGI	Polar Geophysical Institute – Russian Academy of Sciences
PMOD	Physikalisch-Meteorologisches Observatorium Davos/World Radiation Centre
PRIC	Polar Research Institute of China
RAL	Rutherford Appleton Laboratory
REU	U.S. Research Experience for Undergraduates
RPAT	Research and Production Association “Typhoon” of Roshydromet
RUG	University of Groningen
SAMS	Scottish Association for Marine Science
SGO	Sodankylä Geophysical Observatory
SNSK	Store Norske Spitsbergen Grubekompani
SRCPAS	Space Research Centre – Polish Academy of Sciences
TOU	Tohoku University
TSU	Tsukuba University
UAB	University of Aberdeen
UAF	University of Alaska Fairbanks
UB	University of Bremen
UBC	University of British Columbia
UCL	University College London
UFI	University of Florence
UHD	University of Heidelberg
UHH	University of Hamburg
UIB	University of Bergen
UIO	University of Oslo
UIT	University of Tromsø
ULEI	University of Leicester
ULUND	University of Lund
UNH	University of New Hampshire
UNIS	University Centre in Svalbard
UO	University of Oulu
USGS	U.S. Geological Survey
USI	University of Silesia
USO	University of Southampton
UWA	University of Wales
UWR	University of Wroclaw