Antarctic Treaty
Electronic Information Exchange System

Party: Czech Republic
2014/2015 Annual Information

Scientific Information - Forward Plans

Science Plan/Program/Project:	**The permanent offer of scientific collaboration and logistic co-operation with the Czech National Antarctic Programme within the James Ross Island area**
Planned Operating Period:	**From** **To**
Contact Point:	**Organisation:**
	Name: Pavel Kapler
	Job Title or Position: Executive secretary of CNCPRR & Mendel Station manager
	Phone:
	Email: kapler@sci.muni.cz
Details/Description:	All interested parties are welcomed!
Link (URL):	http://www.sci.muni.cz/CARI/contact.html
Additional Information:	
Discipline:	

Areas of Activity

Scientific Information - Science Activities in Previous Year

Project Name/Number:	**Diatomology, Algology & Limnology**
Discipline:	Biodiversity of terrestrial diatoms, Seal carcasses colonization
Principal Investigator:	Barbora Chattova (Masaryk University), Dr. Katerina Kopalova (Charles University Prague) & Prof. Milos Bartak (Masaryk University)
Main Activity/ Remarks:	Samples of soil, mosses and microbiological mats from more than 60 individual sampling sites located on deglaciated part of James Ross Island were taken to estimate biodiversity of Antarctic terrestrial diatoms. Typically, the following compartments of Antarctic ecosystems were sampled: soils, seepages, wet rock walls, cryoconites. At wet sampling sites, pH and conductivity of water was mesured and the subsamples of substrate matter were dried out for consequent analyses of physical and chemical parameters related to sampling sites. Using optical microscopy, some diatoms were identified during expedition in Mendel station laboratory, e.g. Gleocapsa sp. from wet rock walls and Pinnularia borealis from moss samples. Majority of samples were put on WC medium and/or DNA buffer, transferred to the Czech Republic and co-operating institution (Univ. Ghent, Belgium) for further taxonomic ad genetic studies exploiting electron microscopy and molecular biology methods. Samples from seal carcases were taken so that diatoms diversity could be evaluated. The samples represented small pieces of skin, bone tissue, substrate affected by organic matter input from decaying seal bodies and unaffected control (mineral substrate in close neighbourhood of the carcases. Diatoms, cyanobacteria and algae were isolated from the samples and cultivated on a Z and WC agar. Colonization of seal carasses by lichens and mosses was studied as well with the main ephasis given to the species richness in a close neighbourhood of the carcasses as dependent on liquid water availability and stage of dissintegration of seal remnants.
Link (URL):	http://botzool.sci.muni.cz/?lang=en
Additional Information:	
Operating Period:	**From:** 07 Jan 2015 **To:** 20 Feb 2015

Areas of Operation

Ulu Peninsula

Project Name/Number:	**Durability and stability of advanced plastic materials in Antarctica**
Discipline:	Construction & material science
Principal Investigator:	Assoc. Prof. Jiri Tochacek (Central European Institute of Technology at the Brno Technical University)
Main Activity/ Remarks:	Advanced plastic materials were exposed to the Antarctic conditions in order to observe the level of degradation caused by the UV-radiation. Results will be taken in the next season. Absolutely no material is to be left as the harm to the local environment.
Link (URL):	http://www.vutbr.cz/en/people/jiri-tochacek-32308
Additional Information:	
Operating Period:	**From:** 10 Jan 2015 **To:** 20 Feb 2016

Areas of Operation

Mendel Station

Project Name/Number:	**Geological & geomorphological research**
Discipline:	Geology, geomorphology & geochemistry
Principal Investigator:	Assoc. Prof. Daniel Nyvlt (Czech Geological Survey & Masaryk University), Jan Kavan (Masaryk University & University of South Bohemia in Ceske Budejovice), Dr. Ondrej Zverina & Filip Hrbacek (both Masaryk University)
	Boundaries of marine Cretaceous formations have been mapped in the field. James Ross Island brings the best opportunity to study glacier-volcano interaction, therefore we continued on the study of a wide variety of depositional processes associated with sub-glacial volcanism. In Jan-Feb 2015, glacier-volcano interactions were studied in sedimentary strata of James Ross Island Volcanic Group (JRIVG). Continuous studies of sedimentary strata associated with JRIVG led to detailed lithofacies description of debris-flow sediments below the main Lachman Crags delta, where a mixture of glacigennic, glaciomarine and volcanoclastics facies has been recorded including marine molluscs. The field lithofacies description has been supplemented with petrological, magnetic susceptibility and X-Ray spectrofluorometric (XRF) studies to reveal provenance of transported material. Rock varnish geochemistry was studied on hamada-like surface boulders from semi-arid

Main Activity/ Remarks:	marginal Antarctic environment. Field XRF measurements of rock varnish from basalt and granitoids scattered around the ice-free area of northern Ulu Peninsula, James Ross Island revealed prominent enrichment of manganese in superficial rock varnish. This is in contrast with more arid continental Antarctic areas, where rock varnish is prominently enriched in iron, rather than manganese. However, it was found, that the enrichment of these two elements is dependent on the original amount of these elements in host rocks, rather than on the chemical composition of wind-blown sandy material in this area. Holocene advances of local land-terminating glaciers were studied using field XRF measurements of prominent hyaloclastite boulders in the Abernethy Flats area provided data for reconstruction of their origin from individual volcanic sequences in the Stickle Ridge/Smellie Peak and Davies Dome area and thus useful data for palaeoglaciological reconstruction of Holocene advances of Whisky Glacier and Davies Dome outlets in this flat territory of northern James Ross Island. Since 2012, heavy metal contents have been analysed regularly in different compartments (ecosystems) of deglaciated area of James Ross Island, with a special emphasis to mercury (Hg). Within the study performed in Jan-Feb 2015, 150 samples from lakes, ponds, streams, soils, lake sediment, and lichens were collected as a part of a follow up study. Streams margins, perpendicular rock walls, a close neighbourhood od seal carcasses, microbiological mats, fine fraction of mineral material from lakes and ponds bottom, lichens and mosses were collected in order to determine Hg content in these compartments of Antarctic ecosystems. The samples were dried out in a laboratory at Mendel station and transferred to a laboratory in the Czech republic, where Hg contents is analyzed by AAS and gas chromatography with atomic fluorescence spectrometry (GC-AFS).
Link (URL):	http://www.sci.muni.cz/CARI/Clima_Geo_Lab.htm
Additional Information:	
Operating Period:	**From:** 07 Jan 2015 **To:** 20 Feb 2015

Areas of Operation

Ulu Peninsula

Project Name/Number:	**Glaciological & permafrost research**
Discipline:	Glaciology & peri-glacial geomorphology
Principal Investigator:	Assoc. Prof. Daniel Nyvlt (Czech Geological Survey & Masaryk University), Dr. Kamil Laska (Masaryk University), Dr. Zbynek Engel (Charles University), Filip Hrbacek (Masaryk University) & Jan Kavan (Masaryk University & University of South Bohemia in Ceske Budejovice)
Main Activity/ Remarks:	Field works were performed at the Davies Dome ice cap and Whisky Glacier in Jan – Feb 2015 as a part of long-term research. Field camp was established close to Monolith Lake to provide a better acccess to glaciological research carried out at the two glaciers. Ablation and/or accumulation rates were evaluated using bamboo stakes and GPS. The data allowed determination of glacier volumes that are used for mass balance determination. Yearly data (2014-2015) on the microclimate of both glaciers were downloaded from 5 automatic weather stations located (1) at the top of the Davies Dome ice cap (530 m a.s.l.) and (2) the upper part of the Whisky Glacier (356 m a.s.l.), and Triangular Glacier (120-230 m a.s.l.). The automatic weather stations were partly repaired and adjusted to actual height of snow accumulations. In January 2015, a new weather station was established at terminal part of Whisky Glacier. Energy supply to the automatic weather stations was provided by high-capacity batteries supplemented with external photovoltaic panels. Monitoring of mass balance changes and glacier flow of small local glaciers (Whisky Glacier and Davies Dome) continued during this season. These changes are supplemented by meteorological data from individual automatic weather stations located at both glaciers and their forefields. In Jan-Feb 2015, the measurements of the permafrost depth along a 6-km-long profile (Mendel station-Johnson mesa - Brandy Bay) was done using a probe approach. The data were compared to those recorded in previous season. At two monitoring plots covering an area of 5.600 m2, soil samples in vertical profile of some probes were taken for further analyses of grain size and mass/volume soil characteristics. Periglacial research was focused on evaluation of thermal properties of active layer of permafrost and the upper layer of permafrost using a profile method. Altogether, 14 profiles were investigated. Active layer thickness was measured by a probe at 71 particular points. Soil samples were collected at Abernethy Flats, Cape Lachman and Berry Hill for grain size and soil humidity evaluation. Periglacial processes were monitored by 5 sensors evaluating regelation of permafrost active layer and solifluction rate (8 particular plots).
Link (URL):	http://www.sci.muni.cz/CARI/Clima_Geo_Lab.htm
Additional Information:	
Operating Period:	**From:** 07 Jan 2015 **To:** 20 Feb 2015

Areas of Operation

Ulu Peninsula

Project Name/Number:	**Hydrological characteristics of streams and lakes**
Discipline:	Hydrology
Principal Investigator:	Jan Kavan (Masaryk University & University of South Bohemia in České Budějovice)
Main Activity/ Remarks:	Stream discharge was measured on 3 representative basins (Algal stream, Bohemian stream, Phormidium stream) at northern part of James Ross Island using the approach of automated hydrostatic pressure sensors calibrated by manual measurements (Acoustic Doppler current profiler - ADCP). Moreover, suspended sediment load was assessed in Algal and Bohemian Streams using direct sampling and mineral particles fraction analysis. Annual courses of water temperature data were downloaded from data loggers placed into Green Lake, Monolith Lake, and Great Lachman Lake. In addition, short-term measurements of surface thermal properties of selected lakes and their surroundings were done using a thermo camera approach. The data will be used for characterisation of relief-, season-, and atmospheric parameters-related differences between lakes of contrasting genesis. Within the period of January-February 2015, single measurements of water pH and conductivity was done at 90 different streams, lakes and ponds in order to relate such parameters to stream/lake general characteristics and genesis.
Link (URL):	http://polar.prf.jcu.cz/jenik.htm
Additional Information:	
Operating Period:	**From:** 07 Jan 2015 **To:** 20 Feb 2015

Areas of Operation

Ulu Peninsula

Project Name/Number:	**Long-term manipulated warming of vegetation**
Discipline:	Plant physiology
Principal Investigator:	Prof. Milos Bartak & Dr. Peter Vaczi (Institute of Experimental Biology of the Faculty of Science of Masaryk University, Brno, Czech Republic)
Main Activity/ Remarks:	A long-term experiment with manipulated warming of vegetation cover using open top chambers (OTCs) was established in 2007. Since that time, vegetation cover as well as microclimate in 12 OTCs, located in three contrasting localities of James Ross Island have been investigated. The localities represents: (A) coastal vegetation oasis, (B) plateau of a table mountain (350 m a.s.l.), and (C) freshly deglaciated area close to the glacier margin (410 m a.sl.) are investigated. In January 2015, microclimatic data from OTCs and control plots from the A, B and C sites were downloaded and analyzed in order to evaluate chamber effect. The data represent a set of the following parameters (measured both in OTCs and outside control plots): air temperature at 30 cm above soil surface, surface temperature and air humidity, soil temperature at 5, 10 and 15 cm depth. Yearly data on effective quantum yield of photosynthetic processes in PS were downloaded from fluorometers permanently-installed over moss (Bryum sp.) carpets in OTC and outside control plots. The data indicated subperiods of physiologically active and inactive state of the moss caused by freezing temperature, dehydration and light limitation. On A, B, and C sites, photographs of vegetation cover inside the OTC and control plots were taken using a grid method in order to evaluate growth responses to long-term elevated temperature. The vegetation cover area, bare soil area and area covered by stones were evaluated using image processing software. From typical sites in OTCs and outside control plots, moss and soil samples were taken for analysis of microbial community so that the effect of long-term elevated air temperature could be evaluated.
Link (URL):	http://www.sci.muni.cz/CARI/EEE_Lab.htm
Additional Information:	
Operating Period:	**From:** 07 Jan 2015 **To:** 20 Feb 2015

Areas of Operation

Ulu Peninsula

Project Name/Number:	**Long-term monitoring of meteorological characteristics**
Discipline:	Meteorology, climatology
Principal Investigator:	Dr. Kamil Laska & Filip Hrbacek (Institute of Geography of the Faculty of Science of Masaryk University in Brno, Czech Republic)
Main Activity/ Remarks:	In climate research, data download and maintenance of 10 automatic weather stations (AWS) situated at James Ross Island was done in Jan-Feb 2015. Main objective was to continue a long-term monitoring of various abiotic factors (air, surface and soil temperatures, wind speed and

	direction) as well as investigations of spatiotemporal variability of the climatic conditions of the Ulu Peninsula. Another objective was to explain the processes leading to regional atmospheric warming and to determine relief influences on air masses transformation and boundary layer processes.
Link (URL):	http://www.sci.muni.cz/CARI/Clima_Geo_Lab.htm
Additional Information:	
Operating Period:	**From:** 06 Jan 2015 **To:** 24 Feb 2015

Areas of Operation

Ulu Peninsula

Seymour Island

Project Name/Number:	**Medical research**
Discipline:	Human stress physiology
Principal Investigator:	Kristian Brat, M.D. (Masaryk University)
Main Activity/ Remarks:	Medical research focused on health of crew members in January-March 2015 at James Ross Island. The research was based on repeated measurements of blood pressure parameters using a 24 hour-lasting ambulatory blood pressure monitoring. Each crew member was monitored once before the expedition, and at least 2 times during the stay at the J.G. Mendel station. The data will be used for conventional and chronobiological analyses to determine the effects of a crew member stay in Polar region on various parameters of cardiovascular system. Expedition crew members were sampled before the expedition and then two times within the expedition (d 24, and d 45). From blood samples, altogether 17 haematological and immunological parameters were determined. Cell numbers (erythrocytes, leucocytes and their types) were counted and blood differential was determined from stirred blood samples. Antibodies and antigen complexes were determined by turbidimetry. Parameters derived from colour change of samples of blood serum were determined, using spectral-photometric approach. Analysis of data showed several trends in crew members acclimation to cold environment. Among them, it was apparent that at least 5 parameters changed significantly after 45 days of expedition.
Link (URL):	https://www.muni.cz/med/people/60276?lang=en
Additional Information:	
Operating Period:	**From:** 06 Jan 2015 **To:** 24 Feb 2015

Areas of Operation

Ulu Peninsula

Seymour Island

Project Name/Number:	**Microbiological research**
Discipline:	Microbiology
Principal Investigator:	Assoc. Prof. Ivo Sedlacek & Katerina Olejnickova (Masaryk University)
Main Activity/ Remarks:	A) Antimicrobilogical activities of Pseudomonas sp. Microbiological samples were collected from different terrestrial ecosystems of James Ross Island in order to isolate Antarctic Pseudomonas sp. The samples were cultured on agar plates and isolates were transferred to laboratories in Brno, where species determination took place. The mail goal is to detect and identify new bacteriocins (antibacterial proteins) in Antarctic Pseudomonas sp. New pyocins will be characterized using genetics and proteomic approaches and their pharmaceutical (antibiotics) and biotechnological potential will be evaluated. B) Microbiota associated with animals (birds and seals). Microbiological research in the northern part of James Ross Island was focused on sampling and isolation of bacterial and viral communities from mucous membranes and excrements of birds (skuas and pinguins) and seals. Futher bacterial analyses will be done in the laboratories in the Czech Republic, with special attention to presence of gram-positive cocci and Escherichia spp. C) Soil microbiota in long-term warming experiment. To assess the effect of long-term elevated air temperature, soil and vegetation (microbiological mats, soil crusts, lichens and mosses) samples were collected from two long-term research plots (Mendel station, Berry Hill mesa). The samples were taken from open top chambers (elevated temperature) and outside untreated control plots. Preliminary cultivation on agar plates and selection of microorganisms were done in a laboratory at Mendel station. Detailed isolation from cultivations and original samples, as well as taxonomy of the species will be done in a specialized laboratory in the Czech Republic.
Link (URL):	http://www.sci.muni.cz/ccm/index.html
Additional Information:	
Operating Period:	**From:** 07 Jan 2015 **To:** 20 Feb 2015

Areas of Operation

Ulu Peninsula

Project Name/Number:	**Monitoring of dissolved oxygen content small-area ponds**
Discipline:	Plant physiology, ecology
Principal Investigator:	Prof. Milos Bartak, Dr. Peter Vaczi & Ludek Sehnal (all Masaryk University)
Main Activity/ Remarks:	Using a field system composed of oxygen electrodes, thermocouples, PAR sensors, and data loggers, in situ long-term (1 month in 5 min step) monitoring of dissolved oxygen concentration (DOC) was carried out in 2 ponds. Field set up and 2 localities at James Ross Island were the same as in 2014. DOC was considered a measure of diurnal changes in photosynthetic and respiratory activities of microbial biota forming pond bottom. The DOC data showed daily curves, dependence of DOC on water temperature, postponed daily peak of DOC when compared to photosynthetically active radiation (PAR) daily peak, and an ability of microbial mats to photosynthesize under a thick ice layer covering pond surface that reduced available photosynthetically active radiation bellow 50 micromols m-2 s-1 of PAR incident on a pond bottom.
Link (URL):	http://www.sci.muni.cz/CARI/EEE_Lab.htm
Additional Information:	
Operating Period:	**From:** 07 Jan 2015 **To:** 20 Feb 2015

Areas of Operation

Ulu Peninsula

Project Name/Number:	**Solar radiation monitoring**
Discipline:	Meteorology, climatology
Principal Investigator:	Dr. Kamil Laska & Filip Hrbacek (Institute of Geography of the Faculty of Science of Masaryk University in Brno, Czech Republic)
Main Activity/ Remarks:	Yearly data on global irradiance, photosynthetically active radiation (PAR), UV-A, UV-B radiation were downloaded from particular sensors linked to dataloggers. Special attention was paid to services of the solar radiation sensors and devices (pyranometers, PAR radiometers, UV radiometer and UVB-Biometer), which are situated at the J.G. Mendel station. Prediction of the erythemally effective UVB radiation and evaluation of the influences of atmospheric factors (ozone concentration, optical air mass, aerosols) was studied with the help of nonlinear modelling approach.

Link (URL): http://www.sci.muni.cz/CARI/Clima_Geo_Lab.htm

Additional Information:

Operating Period: **From:** 07 Jan 2015 **To:** 20 Feb 2015

Areas of Operation

Mendel Station

Laboratorio Antártico Multidisciplinario (LAMBI), en Base Marambio

Operational Information – National Expeditions - Stations

Name:	**Johann Gregor Mendel Czech Antarctic station**
Type:	Summer
Location:	**Site Name:** James Ross Island **Lat:** 63º 48´ 00´´ S **Long:** 57º 53´ 00´´ W
Maximum Population:	20
Medical Facilities:	Medical care maintained by Czech physician; Argentinian Marambio Station (Seymour Island) in case of emergencies.
Remarks / Description:	
Operating Period:	**From:** December **To:** March

Operational Information – Non Governmental Expeditions - Vessel-Based Operations

No new information have been provided during the reported period.

Operational Information – Non Governmental Expeditions - Land-Based Operations

Expedition Name:	**Maintenance of Brewer spectophotometer**
Method of transportation to/within/from Antarctica:	Aircraft
Activities:	Science Support
Number of Participants:	3
Date begin:	15 Jan 2015
Date end:	15 Feb 2015
Number of personnel:	
Operator:	**Name:** Milan Janouch, Ph.D. **Contact Address:** Formánkova 519, 500 11 Hradec Králové-Moravské předměstí **Email Address:** janouch@chmi.cz **Website Address:** www.chmi.cz
Remarks:	

Location of Activities

Estación de Monitoreo de Permafrost (Marambio VOR)

Routes:

Expedition Name:	**unknown**
Method of transportation to/within/from Antarctica:	Boat
Activities:	program "green house"; research of human behaviour in extremely climatic and geographic conditions
Number of Participants:	3
Date begin:	20 Dec 2014
Date end:	20 Feb 2015
Number of personnel:	
Operator:	**Name:** Jaroslav Pavlíček **Contact Address:** Všeteč 19, Všemyslice, 375 01 Týn nad Vltavou **Email Address:** antarctica.cz@email.cz **Website Address:** www.econelson. org
Remarks:	

Location of Activities

Eco Nelson Structures, Nelson Island

Routes:

Environmental Information - Waste Disposal and Waste Management (Waste Management Plans)

Title:	**2014-2015 - Waste management plan for the J.G. Mendel Czech Antarctic Station**	
Fixed Site/Field Camp/Ship:	Mendel Station	
Objective:		
Implementation Report:	The waste management plan for the J.G. Mendel Czech Antarctic Station was prepared and summarized in the Comprehensive Environmental Evaluation for the Czech station. The document is entitled "Czech Scientific Station in Antarctica – Construction and Operation, Czech Republic, January 2004". From January to March 2015, waste management was performed according to the above-specified waste management plan for the station. All combustible waste was disposed in the Norwegian GOLAR combustion furnace at temperatures above 1000 deg.C. Incombustible wastes (metal and glass) were stored in barrels with a volume of 200 l and prepared to be transported to the mainland.	
Contact Point:	**Organisation:**	
	Name:	Pavel Kapler
	Job Title or Position:	Executive secretary of CNCPRR & Mendel Station manager
	Phone:	
	Email:	kapler@sci.muni.cz

Environmental Information - Waste Disposal and Management (Inventory of Past Activities)

Activity Type:	**Standard Station Waste Management**
Location:	**Site Name:** Mendel Station **Lat:** 63º 46´ 00´´ S **Long:** 57º 42´ 00´´ W
Description of Activity:	Standard Station Waste Management is run by the Waste Management Plan designed for the J.G. Mendel Czech Antarctic Station and summarized in the Comprehensive Environmental Evaluation for the J.G. Mendel Czech Antarctic Station. The document is entitled "Czech Scientific Station in Antarctica – Construction and Operation, Czech Republic, January 2004". During the season (i.e. usually from January to March), the waste management is performed according to the above-specified Station Waste Management Plan: A) Any incinerable waste is to be incinerated in the Norwegian GOLAR combustion furnace at the temperatures above 1000 deg. C. B) Any non-incinerable (inert only) waste (i.e. metal, glass and after-incineration ash) is separated and stored in barrels with a volume of 200 l, prepared for the transport to the South America for the eco-friendly disposal. C) Any non-inert and/or non-incinerable waste (e.g. chemicals) is transported back to the country of origin to be eco-friendly disposed.
Period of Activity:	**Date Begin:** **Date End:**
Remaining Equipment or Facilities:	Secured and impermeable metal barrels with inert solid waste content, ready to be transported out of the Antarctica for eco-friendly disposal.

Activity Type:	**Other party´s waste disposal**
Location:	**Site Name:** Monolith Lake **Lat:** 63°53´50´´S **Long:** 57°57´10´´W
Description of Activity:	During the expedition season 2014-15 the remains of the other party´s campsite (one or more years old) at the Monolith Lake site were discovered. The large orange plastic box with cca 30 kgs of badly spoiled food provisions were secured there as the part of the campsite remains. The box´s content was removed and properly incinerated at the J.G. Mendel Station.
Period of Activity:	**Date Begin:** 04 Feb 2015 **Date End:** 04 Feb 2015
Remaining Equipment or Facilities:	Other party´s large orange plastic box ready to be re-used by the original owner or to be disposed during the next season.

Environmental Information - Area Protection and Management (Permit, Visit and Activities)

No new information have been provided during the reported period.

Environmental Information - Area Protection and Management (Change or Damage)

No change or damage was observed during this reporting period.

Other Information - Relevant National Legislation

No new information have been provided during the reported period.