南極条約第７条５に基づく事前通告のための電子情報交換システム（EIES）について

外務省地球環境課

１　背景

（１）南極条約第７条５は，各締約国に以下の活動についての通報を求めている。

「各締約国は，この条約がその国について効力を生じた時に，他の締約国に対し，次のことについて通報し，その後は，事前に通告を行う。

（ａ）自国の船舶又は国民が参加する南極地域向けの又は同地域にあるすべての探検隊及び自国の領域内で組織され，又は同領域から出発するすべての探検隊

（ｂ）自国の国民が占拠する南極地域におけるすべての基地

（ｃ）第１条２に定める条件に従って南極地域に送り込むための軍の要員又は備品

（参考：第１条 2＝この条約は，科学的研究のため又はその他の平和的目的のために，軍の要員又は備品の使用を妨げるものではない。）

（２）これに基づき，南極条約協議国会議（ATCM）は 2001 年に「決議 6」を採択し，事前に通報・通告すべき事項をとりまとめた。

（３）その後，通報のための共通フォーマットとして「電子情報交換システム(Electronic Information Exchange System: EIES)」　が，2008 年の ATCM で合意された。各締約国がフォーマットに必要事項を入力，承認することで通報内容が公開されるというもの。

２　今回提出する資料

（１）年次報告（Annual Report）＝2018 年４月～2019 年３月に行った活動の事後報告

ア　今期に実施した研究・観測活動を別紙にて提出（2.1）

イ　使用基地，観測船（しらせ）・航空機・飛翔体に関する報告（2.2）

ウ　保護区域への立ち入り，動植物の採捕等に関する許可に関する報告（2.3）

エ　環境保護関連事項に関する報告（環境保護法施行規則の改正，廃棄物処理の実施等）(2.4)

（２）常設報告（Permanent Information）＝恒久的に設置されている設備などの報告

ア　基地・観測船・航空機，自動観測点につき報告（3.1，3.2）

イ　環境保護関連事項に関する報告(廃棄物管理計画，燃料漏出緊急対応計画等)(3.3)

なお，年次報告（Annual Report）の Scientific Information 中，Forward Plans 及び事前報告（Pre-season Information＝2019 年～2020 年に行う活動の事前の通告。使用予定基地，観測船・航空機・飛翔体等）については，第 61 次観測隊の計画が確定次第，本年秋に開催される南極地域観測統合推進本部総会で報告予定。

（了）

2. Annual Report (2018 / 2019)

2.1 Scientific Information

2.1.1 Forward Plans

2.1.2 Science Activities in Previous Year

Please see Table 1

2.2 Operational Information

2.2.1 National Expeditions

A. Stations

Name: Syowa
Type: winter
Location: Higashi-Ongul To, Lützow-Holmbukta
Latitude: 69°00′25″ S
Longitude: 39°35′01″ E
Max. Population: 130
Medical Facilities: Minimum required surgical operation facilities and dental emergency
Remarks / Description:
Elevation: 28.9 m
Established: January 29, 1957
Major Field Activities: Biological and geophysical observations in Lützow-Holmbukta area

Name: Dome Fuji
Type: Seasonal
Location: On the top of Dronning Maud Land
Latitude: 77°19′01″S
Longitude: 39°42′12″E
Max. Population: 14
Medical Facilities: None
Remarks / Description:
Elevation: 3,810m
Established in January 29, 1995
There are 9 buildings below snow surface. 9 people can be accommodated.
Operating Period: from November to February
Major Field Activities: Glaciological survey

B. Vessels

Name: R/V Shirase

Country of registry: Japan
Maximum Crew: 179
Maximum Passengers: 80
Remarks: The Indian sector of the Southern Ocean (SO) and SO south of Australia will be visited.
Voyage Departure Date: 30, November, 2018
Voyage Departure Port: Fremantle, Australia
Voyage Arrival Date: 18 March, 2019
Voyage Arrival Port: Sydney, Australia
Voyage Purpose: Transportation of cargo and personnel / Support of oceanographic and field observations
Site Name: Lützow-Holmbukta, Kronprins Olav Kyst

C. Aircraft
Type: CH-101
Quantity: 2
Category: Local helicopter flights
Period From: December, 2018
Period To:March, 2019
Remarks: transportation of cargo and personnel / support of field observations
Flight Departure Date: December, 2018
Flight Purpose: Logistics

Type: AS350B2
Quantity: 1
Category: Local helicopter flights
Period From: December, 2018
Period To:March, 2019
Remarks: transportation of cargo and personnel / support of field observations
Flight Departure Date: December, 2018
Flight Purpose: Logistics

D. Research Rockets
Please see Table 2

E. Military
None

2.2 Operational Information

2.2.2 Non-governmental Expeditions

Vessel-Based Operations

None

Land-Based Operations

None

Aircraft Activities

None

2.3 Permit Information

2.3.1 Visits to Protected Areas

ASPA No	Number of people:	Permit Period:	Purpose:	Summary of activities:	Event or project name/number:
No.141 Yukidori Valley, Langhovde	8	From: 5 Nov 2018 To: 31 Jan 2020	Research	Precise geodetic network surveys	60th Japanese Antarctic Research Expedition
No.141 Yukidori Valley, Langhovde	3	From: 5 Nov 2018 To: 31 Jan 2020	Research	Ecological survey of birds	60th Japanese Antarctic Research Expedition
No.141 Yukidori Valley, Langhovde	4	From: 5 Nov 2018 To: 31 Jan 2020	Research	Surveying geological phenomena in the valley	60th Japanese Antarctic Research Expedition
No.141 Yukidori Valley, Langhovde	5	From: 5 Nov 2018 To: 31 Jan 2020	Research	Analyzing bio-community structure in the valley	60th Japanese Antarctic Research Expedition
No.141 Yukidori Valley, Langhovde	5	From: 5 Nov 2018 To: 31 Jan 2020	Research	Observing the weather and the underwater environment in the valley	60th Japanese Antarctic Research Expedition
No.141 Yukidori Valley, Langhovde	2	From: 5 Nov 2018 To: 31 Jan 2020	Research	Gathering information for educational purposes	60th Japanese Antarctic Research Expedition
No.141 Yukidori Valley, Langhovde	1	From: 5 Nov 2018 To: 31 Jan 2020	Research	Inspection of observance of Law relating to Protection of the Environment in Antarctica	60th Japanese Antarctic Research Expedition

2.3.2 Taking and harmful interference with flora and fauna

No	Permit period:	Species:	Location:	Amount:	Purpose:
1	From: 5 Nov 2018 To: 31 Jan 2020	Adelie penguin	Ongul islands (69°00'S, 39°35'E) and Langhovde (69°14'S, 38°44'E)	210 Adélie penguins	Research
2	From: 5 Nov 2018 To: 31 Jan 2020	Adelie penguin, Chinstrap penguin and Gentoo penguin	Ongul Island (69°01'S, 39°36'E), Langhovde (69°14.5'S, 38°44'E) , Skarvsnes (69°27'S, 39°40'E) and Amundsen Bay (66°47'S, 50°34'E)	15 snow petrels and 5 south polar skuas	Research
3	From: 5 Nov 2018 To: 31 Jan 2020	Moss plants	Ongul Island (69°01'S, 39°36'E), Langhovde (69°14.5'S, 38°44'E), Skarvsnes (69°27'S, 39°40'E), Skallen (69°40'S, 39°30'E), Inhovde (69°50'S, 37°05'E), Padda Island (69°37'S, 38°16'E) and Amundsen Bay (66°47'S, 50°34'E)	At 200 locations ×1 kg:200 kg in total	Research

4	From: 5 Nov 2018 To: 31 Jan 2020	Moss plants and algae	Langhovde (69°14.5'S, 38°44'E)	10 kg (wet weight, approximately 90 % of the weight is water)	Research
5	From: 5 Nov 2018 To: 31 Jan 2020	Algae (e.g. *Prasiola* spp.)	Ongul Island (69°01'S, 39°36'E), Langhovde (69°14.5'S, 38°44'E), Skarvsnes (69°27'S, 39°40'E), Skallen (69°40'S, 39°30'E), Inhovde (69°50'S, 37°05'E), Padda Island (69°37'S, 38°16'E) and Amundsen Bay (66°47'S, 50°34'E)	At 8 locations : 80 kg in total (wet weight, approximately 90 % of the weight is water)	Research
6	From: 5 Nov 2018 To: 31 Jan 2020	Algae	Syowa Station (69°00'S, 39°35'E)	At 20 locations ×5 g:100 g in total	Research

2.3.3 Introduction of non-native species

No	Permit period:	Species:	Location:	Purpose:
1	From: 5 Nov 2018 To: 31 Jan 2020	Poultry meat (e.g. chicken, turkey, duck, foie gras, and entrails)	Showa station (69°00'S, 39°35'E)	Food
2	From: 5 Nov 2018 To: 31 Jan 2020	5 tons of variety of fresh vegetables and 10 kg of seeds for hydroponics	Showa station (69°00'S, 39°35'E)	Food
3	From: 5 Nov 2018 To: 31 Jan 2020	1 kg of yeast, 1 kg of beer yeast, 5 kg of rice-malt, and 100 kg of mushroom bed for cultivation of mushroom	Showa station (69°00'S, 39°35'E)	Food

2.4 Environmental Information

2.4.1 Compliance with the Protocol (Notification of Measures)

Measure Title:

Revision of the Ministerial Ordinance of "*the Law relating to Protection of the Environment in Antarctica*."

Measure Description:

The Government of Japan worked to implement the Measures, new and revised management plans for ASPAs adopted at the 41th Antarctic Treaty Consultative Meeting (ATCM), through revision of the Ministerial Ordinance of "*the Law relating to Protection of the Environment in Antarctica*."

Date of Effect:

August 10, 2018

2.4.2 Contingency Plans

No new plans were made or implementation action taken during this reporting period.

2.4.3 List of IEEs and CEEs

Type: IEE
Activity: Construction (Constructions at Syowa station)
Year: 2018
Title: 60th Japanese Antarctic Research Expedition
Location: Syowa Station (69°00'S, 39°35'E)
Organization responsible: Headquarters of the Japanese Antarctic Research Expedition
Decision: Proceed (No more than a minor or transitory impact)

2.4.4 Monitoring activities report

None

2.4.5 Waste Management Plans

Title: Waste Management Guide
Fixed Site / Field Camp / Ship: Station and Field
Implementation Report: Disposal of wastes in the stations and fields is implemented in accordance with Annex III of the Protocol on Environmental Protection to the Antarctic Treaty and the relevant national legislation. Sewage and gray water from summer accommodation are treated by non-biological method (Coagulation-Sedimentation Method), and Sewage and gray water from year-round accommodation are treated by membrane separation activated sludge process and the treated water is discharged into the sea. All the wastes are sorted and treated properly. Combustible wastes are disposed of by a two-stage incinerator. The ash is taken back to Japan. Wet food waste is treated by a dehydrating instrument. The residue is directly taken back to Japan or incinerated, and its ash is also taken back to Japan. The other waste is taken back to Japan.
Contact Point:
Name: Kazuo
Surname: Higuchi
Job Title or Position: Head of Logistics Section, National Institute of Polar Research
Phone: +81-42-512-0779
Email: higuchi.kazuo@nipr.ac.jp

2.4.6 Measures taken to implement the provisions of Annex V

None

2.4.7 Procedures relating to EIAs

None

2.4.8 Prevention of marine pollution

None

Table 1

Scientific Activities - JARE 59W 60S

ID	Project name	Main Activities / Remarks	Site Name	Latitude, Longitude	Discipline	PI	URL
	Research Project						
	Prioritized Research Project: Investigation of changes in the Earth system from Antarctica						
AJ0901	A study on the global atmosphere system based on high-resolution observations of the Antarctic atmosphere	Observations of the Antarctic atmosphere were performed during JARE59 in order to examine various processes and their role in the global atmospheric system by utilizing (1) the PANSY (Program of the ANtarctic SYowa MST/IS) radar, which is the largest atmospheric radar in the Antarctic, and (2) related instruments such as resonance/Rayleigh scatter lidar, millimeter wave spectrometer, MF radar, OH IR airglow imager, OH spectrometer, high-speed auroral imager, and proton auroral spectrograph. The third and forth campaigns of Interhemispheric Coupling Study by Observations and Modeling (ICSOM) were also successfully conducted.	Syowa	69°00'25"S, 39°35'01"E	Atmospheric sciences	Name: Kaoru Surname: Sato Job Title or Position: Professor, Graduate School of Science, The University of Tokyo Phone: +81-3-5841-4668 Email: kaoru@eps.s.u-tokyo.ac.jp	
AJ0902	Research of Ocean-ice Boundary Interaction and Change around Antarctica	Unmanned observations such as under-ice oceanographic, seafloor and cryospheric observations using ROV, geodetic network observations of ice/ocean motion and deformation using GPS/ GNSS, and oceanographic observations using tethered and moored profiling observation systems were carried out. These remote observation techniques will be applied to the new horizons such as Lutzow-holm Bay and Cape Darnley regions for the understandings of the mechanisms of different ice-ocean interaction regimes.	Lützow-Holmbukta Shirase Glacier Cape Darnley		Climate studies	Name: Shigeru Surname: Aoki Job Title or Position: Associate Professor, ILTS, Hokkaido University Phone: Email: shigeru@lowtem.hokudai.ac.jp	
AJ0903	Antarctic paleoenvironmental reconstructions for unraveling the Earth system variations	Inland traverse from S16 to Dome Fuji. Snow observations and sampling along the route and in the vicinity of Dome Fuji station. Around Dome Fuji, ice radar and other glaciological/meteorological observations.	Syowa station, Dome Fuji, Droning Maud Land	69°00'25"S, 39°35'01"E	Environmental sciences	Name: Kenji Surname: Kawamura Job Title or Position: Associate Professor, NIPR Phone: +81-42-512-0684 Email: kawamura@nipr.ac.jp	
	Ordinary Research Project						
AP0901	Space weather study using cosmic ray observations at Syowa Station in Antarctica	Continue cosmic ray observations with newly installed a pair of neutron monitor and muon detector at Syowa base. Duty cycle of this observations was >93%. Although solar activity is now, a few space weather events have been observed by the detectors at Syowa base. It has also been started to create DB and a web page showing data as a QL.	Syowa Station	69°00'25"S, 39°35'01"E	Astrophysics	Name: Chihiro Surname: Kato Job Title or Position: Professor, Shinshu University Phone: +81-263-37-2514 Email:ckato@shinshu-u.ac.jp	
AP0902	Large area network observation of auroral phenomena using unmanned system	Low-power autonomous auroral observation system at Amundsen Bay has been working continuously all through the year. Unmanned magnetometer network around Amundsen Bay and Lützow-Holmbukta area was maintained.	Syowa Station Amundsen Bay Skallen, Inhhovde, H68 Mizuho, MD364, Dome Fuji	69°00'25"S, 39°35'01"E	Earth and atmospheric sciences - other	Name: Akira Surname: Kadokura Job Title or Position: Professor, ROIS Phone: +81-42-512-9105 Email: kadokura@nipr.ac.jp	
AP0903	Dynamics of magnetosphere and ionosphere by using mult-wavelength, simultaneous observations of auroras at South Pole and McMurdo stations	We conducted auroral observation at South Pole Station and McMurdo Station.	South Pole Station McMurdo Station		Earth and atmospheric sciences - other	Name: Yusuke Surname: Ebihara Job Title or Position: Associate Professor, Kyoto University Phone: +81-774-38-3844 Email: ebihara@rish.kyoto-u.ac.jp	

ID	Project name	Main Activities / Remarks	Site Name	Latitude, Longitude	Discipline	PI	URL
AP0904	Study on polar upper atmosphere in possible grand minimum period and inner magnetosphere dynamics with SuperDARN radars	With SENSU SuperDARN HF radars at Syowa station and auroral all-sky imager network at Dome Fuji, Zhongshan and South Pole stations under FOVs of the SENSU radars, simultaneous observation will be conducted to try to reveal the influence of low solar activity period on upper atmosphere and the dynamics of inner magnetosphere. Remarks: NIPR all-sky imager at Zhongshan terminated at the end of 2018 season and deinstalled in 2018-2019 austral summer (and move to collboration with PRIC imager there.)	Syowa station Dome Fuji, Zhongshan South Pole stations	69°00'25"S, 39°35'01"E	Earth and atmospheric sciences - other	Name: Akira Sessai Surname: Yukimatu Job Title or Position: Associate Professor, NIPR Phone: Email:	URL: http://polaris.nipr.ac.jp/~SD/
AP0908	Long-term observation of water vapor in the Antarctic stratosphere	Balloon-borne water vapor observations were successfully performed in each season at Syowa Station. Especially in winter (July/August), 6 observations were performed on a campaign basis, which aimed at capturing a fine vertical structure across the winter tropopause.	Syowa	69°00'25"S, 39°35'01"E	Atmospheric sciences	Name: Yoshihiro Surname: Tomikawa Job Title or Position: Associate Professor, NIPR Phone: +81-42-512-0660 Email: tomikawa@nipr.ac.jp	
AP0929	Global lightning activities and atmospheric disturbances derived from electromagnetic wave and electric field measurements	Continuous measurements of ELF electromagnetic waves in the frequency range of 1-100Hz and atmospheric DC electric field were carried out. During the 2018-2019 season, there was no serious trouble with the observation systems. We succeeded in acquiring the continuous ELF and atmospheric electric field waveform data.	Nishi-Ongul To (Island) Higashi-Ongul To (Island)		Earth and atmospheric sciences - other	Name: Mitsuteru Surname: Sato Job Title or Position: Lecturer, Faculty of Science, Hokkaido University Phone: +81-11-706-2763 Email: msato@ep.sci.hokudai.ac.jp	
AP0910	Changing of East Antarctic aerosols in global biogeochemical environment	1) Observation of optical property and aerosol concentration along cruise track of R/V Shirase by ship borne, aureolemeter, condensation particle counter, optical particle counter, nephelometer, aethalometer, ceilometerduring summer. 2) Aerosol sampling for chemical constituent analyses along cruise track of R/V Shirase during summer. 3) Measurement of optical absorption coefficient of aerosol at Syowa Station by an aethalometer and MAAP all year round. 4) Bio-aerosol sampling were carried out along cruse track of R/V Shirase, S17, Syowa Station, and Fukuro-ura. Bio-aerosol sampling in upper atmosphere was carried out using UAV at S17 site. 5) Vertical profile of aerosol size distributions were observed using OPC and CPC with an Engine powered UAV and a balloon assisted UAV.	Along cruse track of R/V Shirase Syowa Station S17 site, Syowa Station, Fukuro-ura, along cruse track of R/V Shirase S17 site	69°00′ 25″ S, 39°35′ 01″ E	Atmospheric sciences	Name: Masahiko Surname: Hayashi Job Title or Position: Professor, Faculty of Science, Fukuoka University Phone: +81-871-6631 ex.6168 Email: mhayashi@fukuoka-u.ac.jp	
AP0911	Mechanism of variation in surface condition of the ice sheet and heat and moisture budget in east Antarctica	1) Radiosonde observation was carried out along the traverse route from Relay Point to S17 in October 2018 and at Dome Fuji and on Shirase in 2018/19 summer. 2) AWS (Automatic Weather Station) was installed at Relay Point in October 2018. 3) Surface snow sampling was done every 10 km along the traverse route from S17 to Relay Point in September 2018 and from S17 to Dome Fuji in 2018/19 summer to obtain the isotopic and chemical properties. 4) Isotopic properties (water vapor) over Antarctic Ocean from Fremantle, Australia to Syowa and from Syowa to Sydney was observed on Shirase in 2018/19 summer.	Syowa Droning Maud Land (along traverse route from S17 through Relay Point to Dome Fuji)	69°00'25"S, 39°35'01"E	Climate studies	Name: Naohiko Surname: Hirasawa Job Title or Position: Assistant Professor, NIPR Phone: +81-42-512-0685 Email: hira.n@nipr.ac.jp	
AP0913	A study on physical interaction between the atmosphere, ocean, cryosphere and solid earth by using seismic and infrasonic waves	Multiple-sites arrayed observation of infrasound was carried out to reveal the energy transportation among the ionosphere, atmosphere, ocean, cryosphere, and geosphere in Antarctica. The target was to identify the infrasound generated by icequake, motion of ice sheets and ice fields, blizzard, aurora, etc. by the arrayed observation. The infrasound, long-period barometric waves, might be a good proxy for studying climate changes.	Syowa Langhovde Skarvsnes Skallen Rundvågshetta Akarui-Misaki	69°00′ 25″ S, 39°35′ 01″ E 69°15'00"S, 39°43'01"E	Geophysics and seismology	Name: Masaki Surname: Kanao Job Title or Position: Associate Professor, NIPR Phone: +81-42-512-0713 Email: kanao@nipr.ac.jp	

ID	Project name	Main Activities / Remarks	Site Name	Latitude, Longitude	Discipline	PI	URL
AP0914	Search for extraterrestrial materials in Antarctica	20 boxes (0.06 m^3 per box) of surface snow were collected near the Dome Fuji station.	Dome Fuji		Planetary science	Name: Akira Surname: Yamaguchi Job Title or Position: Associate Professor, NIPR Phone: +81-42-512-0707 Email: yamaguchi@nipr.ac.jp	
AP0936	Crustal evolution in Polar region	Geological survey was carried out in outcrops and nunataks around Lützow-Holm Bay, Prince Olav Coast and Enderby Land areas. Rock specimen (2,000 kg) for the laboratory works were collected.	Lützow-Holm Bay area Prince Olav Coast Enderby Land		Geology	Name: Tomokazu Surname: Hokada Job Title or Position: Associate Professor, NIPR Phone: +81-42-512-0714 Email: hokada@nipr.ac.jp	
AP0922	Responses of marine predators to environmental change: year-round tracking approach	Foraging location, diving behaviour, feeding rate, under-ice prey field, diet composition, reproductive success, and winter migrations of Adélie penguins were examined at a breeding colony in the Langhovde area in Lützow-Holmbukta.	Langhovde	69°15'00"S, 39°43'01"E	Biological sciences – other	Name: Akinori Surname: Takahashi Job Title or Position: Associate Professor, NIPR Phone: +81-42-512-0741 Email: atak@nipr.ac.jp	
AP0923	Marine Ecosystem of the Indian Ocean Sector of the Southern Ocean	Understanding of the ecosystem beneath sea ice is essential for ecological studies of both krill- and myctophid-based food webs. Water collections at some depths and plankton collections as well as acoustic sonding are carried out at stations, including those in ice covered areas. The community compositions at various depths as well as the vertical distributions of temperature, salinity and nutrients are observed for elucidating the environmental changes of the Southern Ocean. A drifting buoy system with sediment traps and sensors for biological parameters was deployed by the Shirase. This system will be retrieved on the inbound voyage by f the same ship.	the Indian Ocean Sector of the Southern Ocean		Biological sciences – other	Name: Masato Surname: Moteki Job Title or Position: Associate Professor, Tokyo University of Marine Science and Technology Email: masato@kaiyodai.ac.jp	
AP0924	Medical researches on Antarctic expeditioners under extreme environment	A study on dental health of expedition personnel was carried out.	Syowa	69°00'25"S, 39°35'01"E	Biological sciences – other	Name: Satoshi Surname: Imura Job Title or Position: Professor, NIPR Phone: +81-42-512-0602 Email: imura@nipr.ac.jp	
AP0937	The origin and geohistory of biodiversity on the terrestrial ecosystem in Antarctica	Vegetation and soil samples were collected from terrestrial and limnetic environment from some ice free area in the vicinity of Syowa Station in Antarctica.	Syowa Langhovde Skarvsnes Skallen Innhovde Mt. Riiser-Larsen	69°00′ 25″ S, 39°35′ 01″ E 69°15'00"S, 39°43'01"E	Biology	Name: Satoshi Surname: Imura Job Title or Position: Professor, NIPR Phone: +81-42-512-0602 Email: imura@nipr.ac.jp	
	Exploratory Research Project						
AH0902	Spreading of polar science by imaging from UAV	1) Photograph and movies during scientific and logistic flights have been taken by on-board camera in wintering of JARE59. 2) Photograph and movies during scientific and logistic flights have been taken by on-board camera in summer of JARE60. 3) Movie taking of daytime aurora from 30km a.s.l. were tried using balloon borne UAV, however, it is not succesfull. Logistics for launching and operations for balloon borne UAV were confirmed.	Syowa Station S17 site	69°00'25"S, 39°35'01"E	Other	Name: Masahiko Surname: Hayashi Job Title or Position: Professor, Faculty of Science, Fukuoka University Phone: +81-871-6631 ex.6168 Email: mhayashi@fukuoka-u.ac.jp	
AH0905	Behavioral ecology of fish under the sea ice	In the coastal area of Syowa Station, experiments of receiving distance and underwater acoustic propagation of ultrasonic biotelemetry system were conducted. In addition, several fish were caught and tracked at Kita-no-ura by using the ultrasonic biotelemetry system.	Syowa Station	69°00'25"S, 39°35'01"E	Biological sciences – other	Name: Yoshinori Surname: Miyamoto Job Title or Position: Professor, Tokyo University of Marine Science and Technology Phone:+81-3-5463-0488 Email: miyamoto@kaiyodai.ac.jp	
AH0907	Full-layer drilling to reveal a mechanism for growth and preservation of ultra multi-year landfast ice	One sea-ice core has been sampled down to 3.8m depth with the mechanical drill system.	Syowa Station Lützow-Holmbukta	69°00'25"S, 39°35'01"E	Oceanography	Name: Shuki Surname: Ushio Job Title or Position: Professor, NIPR Phone: +81-42-512-0676 Email: ushio@nipr.ac.jp	

ID	Project name	Main Activities / Remarks	Site Name	Latitude, Longitude	Discipline	PI	URL
	Fundamental Observation						
	Monitoring Observation						
AMS0901	Data acquisition of Earth observing satellites	Data acquisition of NOAA, METOP-1, DMSP, AQUA, TERRA and NPP polar orbiting Earth observation satellites with L/S/X-band receiving facility at Syowa.	Syowa	69°00'25"S, 39°35'01"E	Other	Name: Hiroshi Surname: Miyaoka Job Title or Position: Professor, NIPR Phone: +81-42-512-0662 Email: miyaoka@nipr.ac.jp	
AMU0901	Auroral optical observation	Auroras were monitored with all-sky electron and proton auroral imagers (EAI and PAI), an all-sky color digital camera (CDC), all-sky black and white TV cameras (ATV), and scanning photometer (SPM) from late February to early October at Syowa.	Syowa	69°00'25"S, 39°35'01"E	Earth and atmospheric sciences - other	Name: Akira Surname: Kadokura Job Title or Position: Professor, ROIS Phone: +81-42-512-9105 Email: kadokura@nipr.ac.jp	
AMU0902	Geomagnetism observation	Absolute geomagnetic observation was carried out every month and geomagnetic variation observation with a 3-axis fluxgate magnetometer was carried out continuously all through the year at Syowa.	Syowa	69°00'25"S, 39°35'01"E	Earth and atmospheric sciences - other	Name: Akira Surname: Kadokura Job Title or Position: Professor, ROIS Phone: +81-42-512-9105 Email: kadokura@nipr.ac.jp	
AMU0903	Monitoring observation of Geospace phenomena at West Ongul Island	Cosmic Noise Absorption (CNA) was observed with two sets of riometers and natural VLF and ULF waves were observed with two sets of loop antennas and two sets of induction magnetometers at West-Ongul To (Island) continuously all through the year.	Syowa West Ongul Island	69°00'25"S, 39°35'01"E	Earth and atmospheric sciences - other	Name: Akira Surname: Kadokura Job Title or Position: Professor, ROIS Phone: +81-42-512-9105 Email: kadokura@nipr.ac.jp	
AMP0901	Monitoring of atmospheric greenhouse gases and related constituents	Monitoring of atmospheric CO2, CH4, CO and O2 concentrations was carried out all year-round at Syowa. Whole air samples were collected periodically for subsequent analyses in Japan. Monitoring of atmospheric N2O concentration was newly started.	Syowa	69°00'25"S, 39°35'01"E	Atmospheric sciences	Name: Daisuke Surname: Goto Job Title or Position: Assistant Professor, NIPR Phone: +81-42-512-0673 Email: goto.daisuke@nipr.ac.jp	
AMP0902	Monitoring of aerosol and clouds	Aerosol and clouds were monitored by remote-sensing and in-situ measurements at Syowa for investigating their climate impact. All-sky images were recorded every 10 minutes to monitor cloud cover all year-round. Vertical distributions of cloud aerosols were monitored continuously with a micro-pulse lidar. A sky radiometer monitored solar radiation and aerosol optical properties from mid-August to early May. Size distribution of aerosol was monitored continuously at the aerosol observation hut all year-round as well as aethalometer observation.	Syowa	69°00'25"S, 39°35'01"E	Atmospheric sciences	Name: Masataka Surname: Shiobara Job Title or Position: Associate Professor, NIPR Phone: +81-42-512-0678 Email: shio@nipr.ac.jp	http://mplnet.gsfc.nasa.gov/
AMP0903	Monitoring of Antarctic ice sheet mass balance	Sea ice thickness and snow depth measurements from Syowa to Tottuki Misaki. Snow accumulation measurements by snow stake method and surface snow samplings from Tottuki Misaki to S16 site. Snow accumulation measurements and surface snow samplings and maintenance of automatic weather station from S16 to Dome Fuji.	From Syowa Station to S16 site via Tottuki Misaki Inland sites from S16 to Dome Fuji		Glaciology	Name: Hideaki Surname: Motoyama Job Title or Position: Professor, NIPR Phone: +81-42-512-0680 Email: motoyama@nipr.ac.jp	
AMP0904	Sea ice and hydrographic observations onboard icebreaker Shirase and in Lützow-Holm Bay oceanography	Measurements of sea ice thickness and ice concentration. Monitoring of vessel movement during ice navigation.	Along cruise track of R/V Shirase, Near Syowa		Oceanography	Name: Shuki Surname: Ushio Job Title or Position: Professor, NIPR Phone: +81-42-512-0676 Email: ushio@nipr.ac.jp	

ID	Project name	Main Activities / Remarks	Site Name	Latitude, Longitude	Discipline	PI	URL
AMG0901	Integrated Geodetic monitoring observation	Monitoring of a fixed point location in Syowa was carried out with a DORIS antenna operating all year-round. Ground temperature was monitored all year-round at sites near the Zakuro Ike in Langhovde and near the Ô-ike, in Nishi-Ongul To (Island). VLBI experiments were carried out 6-8 times a year using a mult-purpose 11 meter diameter dish and gravity was monitored with a super-conductivity gravimeter at Syowa. Tide was monitored near Syowa with a GNSS buoy all year-round. Crustal movements were monitored by GNSS measurements on several outcrop rocks around Syowa.	Syowa Nishi-Ongul Is. (ground temperature) Langhovde (ground temperature) Akarui-misaki Tottuki-misaki Mukai-iwa Langhovde Skarvsnes Skallen Rundvagshetta Padda Is.	69°00'25"S, 39°35'1"E 69°01'20"S, 39°33'31"E 69°10'41"S, 39°38'49"E 68°29'58" S 41°24'23" E 68°54'40"S, 39°49'10"E 69°01'48"S,39°41'43"E 69°14'34"S, 39°42'51"E 69°28'26"S, 39°36'25"E 69°40'16"S, 39°23'56"E 69°54'27"S, 39°02'24"E 69°37'06"S, 38°16'34"E	Geophysics and seismology	Name: Koichiro Surname: Doi Job Title or Position: Associate Professor, NIPR Phone: +81-42-512-0701 Email: doi@nipr.ac.jp	
AMG0902	Seismic monitoring observation	Seismometers were installed to monitor earthquakes at Syowa and four sites on the Sôya Kaigan all year-round.	Syowa Station and four sites on the Sôya Kaigan	69°00'25"S, 39°35'01"E	Geophysics and seismology	Name: Masaki Surname: Kanao Job Title or Position: Associate Professor, NIPR Phone: Email: kanao@nipr.ac.jp	
AMG0903	Marine geophysical observations	Seasurface gravity and geomagnetism were measured on board the R/V Shirase from Fremantle to Sydney. Sea bottom pressure was monitored with a pressure gauge installed and recovered every summer on the sea bottom about 4000 meter deep in the Southern Ocean around 66°50'S and 37°50'E.	Along cruise track of R/V Shirase		Geophysics and seismology	Name: Yoshifumi Surname: Nogi Job Title or Position: Professor, NIPR Phone:+81-42-512-0603 Email: nogi@nipr.ac.jp	
AMG0904	Infrasound observation	Arrayed observation of infrasound was carried out at Syowa all year-round.	Syowa	69°00′ 25″ S, 39°35′ 01″ E	Geophysics and seismology	Name: Masaki Surname: Kanao Job Title or Position: Associate Professor, NIPR Phone: +81-42-512-0713 Email: kanao@nipr.ac.jp	
AMB0901	Population census of Adélie penguins	Census of Adélie penguins at rookeries in the Sôya Kaigan area was carried out in mid-November and early December. Number of the penguins and the pairs were counted.	Sôya Kaigan area		Biological sciences – other	Name: Akinori Surname: Takahashi Job Title or Position: Associate Professor, NIPR Phone: +81-42-512-0741 Email: atak@nipr.ac.jp	
AMB0902	Marine ecosystem monitoring	Oceanographic observations in the Southern Ocean along the cruise track of R/V Shirase were carried out between Fremantle and Sydney via water off Syowa. Surface water was pumped up to measure physical, chemical and biological parameters, including chlorophyll a and pCO2 concentrations. Water collections at some depths and plankton collections are carried out at stations, including those in ice covered areas.	Along cruise track of R/V Shirase		Biological sciences – other	Name: Tsuneo Surname: Odate Job Title or Position: Professor, NIPR Phone: +81-42-512-0738 Email: odate@nipr.ac.jp	
AMB0903	Monitoring of Antarctic terrestrial ecosystems	Environmental parameters of 4 lakes in Langhovde, Skarvsnes and Skallen area were monitored. Flora and environmental parameters were monitored at fixed points along the Yukidori Zawa in Langhovde. Soil samples for analyzing micro-organisms including algae were collected at fixed points around Syowa station.	Syowa Langhovde Skarvsnes Skallen	69°00′ 25″ S, 39°35′ 01″ E 69°15'00"S, 39°43'01"E	Bioscience	Name: Satoshi Surname: Imura Job Title or Position: Professor, NIPR Phone: +81-42-512-0602 Email: imura@nipr.ac.jp	
Routine Observation							
TC02	Tidal observation	Tidal observation	Syowa	69°00'25"S, 39°35'01"E	Oceanography	Name: Katuhiro Surname: Kusunoki Job Title or Position: Director, Environmental and Oceanographic Research Division Hydrographic and Oceanographic Department, Japan Coast Guard Phone: ＋81-3-3595-3606 Email: nankyoku@jodc.go.jp	

ID	Project name	Main Activities / Remarks	Site Name	Latitude, Longitude	Discipline	PI	URL
TG01	Geodetic observations	Precise Geodetic Observations (GNSS Observation) Precise Geodetic Observations (Relative Gravity Survey) Leveling	Syowa	69°00'25"S, 39°35'01"E	Geomorhology	Name: Hidekazu Surname: Minami Job Title or Position: Deputy Director of International Affairs Div., Planning Dept., Geospatial Information Authority of Japan Phone: +81-29-864-6159 Email: gsi-antarctic@gxb.mlit.go.jp	http://www.gsi.go.jp/antarctic/index-e.html
TG02	Geodetic survey	Signal for aerial photography Aerial photography	Syowa	69°00'25"S, 39°35'01"E	Geomorhology	Name: Hidekazu Surname: Minami Job Title or Position: Deputy Director of International Affairs Div., Planning Dept., Geospatial Information Authority of Japan Phone: +81-29-864-6159 Email: gsi-antarctic@gxb.mlit.go.jp	http://www.gsi.go.jp/antarctic/index-e.html
TJM01	Surface synoptic observation	Air Pressure Air Temperature Humidity Wind speed Wind direction Sunshine duration Global solar radiation Snow depth	Syowa	69°00'25"S, 39°35'01"E	Meteorology	Name: Yoshinobu Surname: Tanaka Job Title or Position: Head, Office of Antarctic Observation, Observation Department, Japan Meteorological Agency (JMA) Phone: +81-3-3211-8409 Email: antarctic@met.kishou.go.jp	http://www.jma.go.jp/jma/indexe.html
TJM02	Upper-air observation	Radiosonde/ Atmospheric pressure, Air temperature, Humidity, Wind speed, Wind direction	Syowa	69°00'25"S, 39°35'01"E	Meteorology	Name: Yoshinobu Surname: Tanaka Job Title or Position: Head, Office of Antarctic Observation, Observation Department, Japan Meteorological Agency (JMA) Phone: +81-3-3211-8409 Email: antarctic@met.kishou.go.jp	http://www.jma.go.jp/jma/indexe.html
TJM03	Ozone observations	Total ozone Umkehr Surface ozone Ozonesonde/ Ozone amount, Atmospheric pressure, Air temperature, Humidity, Wind speed, Wind direction	Syowa	69°00'25"S, 39°35'01"E	Meteorology	Name: Yoshinobu Surname: Tanaka Job Title or Position: Head, Office of Antarctic Observation, Observation Department, Japan Meteorological Agency (JMA) Phone: +81-3-3211-8409 Email: antarctic@met.kishou.go.jp	http://www.jma.go.jp/jma/indexe.html
TJM04	Radiation observation	Global solar radiation, Direct solar radiation, Diffuse solar radiation, Composite global solar radiation, Downward longwave radiation, Downward total radiation, UV-B radiation, Reflected solar radiation Upward longwave radiation, Upward total radiation, Atmospheric turbidity Surface spectral ultraviolet radiation	Syowa	69°00'25"S, 39°35'01"E	Meteorology	Name: Yoshinobu Surname: Tanaka Job Title or Position: Head, Office of Antarctic Observation, Observation Department, Japan Meteorological Agency (JMA) Phone: +81-3-3211-8409 Email: antarctic@met.kishou.go.jp	http://www.jma.go.jp/jma/indexe.html
TJM05	Weather analysis	Weather Conditions	Syowa	69°00'25"S, 39°35'01"E	Meteorology	Name: Yoshinobu Surname: Tanaka Job Title or Position: Head, Office of Antarctic Observation, Observation Department, Japan Meteorological Agency (JMA) Phone: +81-3-3211-8409 Email: antarctic@met.kishou.go.jp	http://www.jma.go.jp/jma/indexe.html

ID	Project name	Main Activities / Remarks	Site Name	Latitude, Longitude	Discipline	PI	URL
TJM06	Another observation	Automatic Weather Station observation	Syowa	69°00'25"S, 39°35'01"E	Meteorology	Name:Yoshinobu Surname: Tanaka Job Title or Position: Head, Office of Antarctic Observation, Observation Department, Japan Meteorological Agency (JMA) Phone: +81-3-3211-8409 Email: antarctic@met.kishou.go.jp	http://www.jma.go.jp/jma/indexe.html
TN01	Ionospheric observations	Ionospheric vertical sounding, GPS scintillarion monitoring/ Ionosphere data were reported as Ionospheric Data at Syowa Station (Antarctica). In addition, it was released in semi-real time on the website.	Syowa	69°00'25"S, 39°35'01"E	Earth and atmospheric sciences - other	Name: Hideo Surname: Maeno Job Title or Position: Senior Researcher, Space Environment Laboratory, Applied Electromagnetic Research Institute, National Institute of Information and Communications Technology (NICT) Phone: +81-42-327-6096 Email: maeno@nict.go.jp	http://wdc.nict.go.jp/IONO/wdc/index.html http://iono-syowa.nict.go.jp/
TN02	Data acquisition for monitoring of Space Weather Forecast	Data acquisition of ionospheric vertical sounding, GPS scintillation monitoring, and magnetic field variations Data was referenced for Space Weather Forecast. In addition, it was released in semi-real time on the website.	Syowa	69°00'25"S, 39°35'01"E	Astrophysics	Name: Hideo Surname: Maeno Job Title or Position: Senior Researcher, Space Environment Laboratory, Applied Electromagnetic Research Institute, National Institute of Information and Communications Technology (NICT) Phone: +81-42-327-6096 Email: maeno@nict.go.jp	http://iono-syowa.nict.go.jp/ http://swc.nict.go.jp/en/
	Others						
AAS6001	Cloud fraction with an all-sky camera onboard R/V Shirase	Sky images were successfully obtained in every five-minute along the cruise track of R/V Shirase from August 2018 to April 2019. The data analysis is ongoing and the cloud fraction is going to be derived from the sky images. The results will be compared with the ceilometer and visual observations on R/V Shirase, in addition to the geostationary satellite Himawari-8/AHI and the polar orbiter GCOM-C/SGLI observations.	Along cruise track of R/V Shirase		Atmospheric sciences	Name: Makoto Surname: Kuji Job Title or Position:Associate Professor, Nara Women's University Phone: +81-742-20-3044 Email: makato@ics.nara-wu.ac.jp	
AAS6002	Unique characteristics of polar nitrogen cycling	Samples for incubation experiments and DNA and RNA analyses were collected from five depths using a bucket from the surface and by Niskin bottles. The rates of nitrogen fixation, primary production, nitrate assimilation, and nitrification were determined by 15N and 13C tracer methods.	Along cruise track of R/V Shirase		Oceanography	Name: Takuhei Surname: Shiozaki Job Title or Position: Project Researcher, Japan Agency for Marine-Earth Science and Technology Phone: +81-46-867-9272 Email: takuhei.shiozaki@jamstec.ac.jp	
AAS6003	Monitoring of sea surface pCO2 by drifting buoys in the South Pacific Ocean	Two drifting buoys with CO2 sensor were deployed from the R/V Shirase at two points : 149-59.2E, 60-01.1S,and 150-06.3E, 54-53.0S on 2019/03/11 and 2019/03/12, respectivley.	At two points along the cruise track of R/V Shirase		Oceanography	Name: Akihiko Surname: Murata Job Title or Position: Group Leader Phone: +81-46-897-9503 Email: murataa@jamstec.go.jp	
AAS6004	Continuous measurements of the atmospheric O2/N2 and CO2 on board R/V Shirase	Continuous measurements of the atmospheric O2/N2 ratio and CO2 were carried out using fuel-cell oxygen analyzer and non-dispersive infrared analyzer onboard R/V Shirase.	Along cruise track of R/V Shirase		Atmospheric sciences	Name: Shinji Surname: Morimoto Job Title or Position: Professor, Tohoku University Phone: +81-22-795-5780 Email: mon@m.tohoku.ac.jp	
AAS6005	Studies on the blowing snow contribution on the surface mass balance of Antarctic ice sheet by the direct measurements and the elucidation of spatiotemporal structures	Field observations were carried out on blowing snow and the relevant surface deformation at S17 on the Antarctic ice-sheet near Syowa as last year. The major measurements were on; 1) blowing snow transport by a snow particle counter (SPC), and automatic weather station (AWS), and 2) changes in snow surface topography by a laser scanner.	S17		Climate studies	Name: Kouichi Surname: Nishimura Job Title or Position: Professor, Nagoya University Phone: Email: knishinagoya-u.jp	

ID	Project name	Main Activities / Remarks	Site Name	Latitude, Longitude	Discipline	PI	URL
AAS6006	Elucidation of photosynthetic light response and adaptation processes of photosynthetic organisms under Antarctic habitats	The auto weather measurement system was installed for monitoring of habitat conditions of a photosynthetic organism (*Prasiola crispa*) at Yotsuikedani of Langhovde. Observation items are temperature, humidity, PAR, UV and wavelength characteristics near the ground. A satellite communication system for data collection is not active.	Langhovde	69°15'00"S, 39°43'01"E	Botany	Name: Makiko Surname: Kosugi Job Title or Position: Research Assosiate, Chuo University Phone: +81-3-3817-7174 Email: kosugi@bio.chuo-u.ac.jp	
AAS6007	Polarimetric observation to investigate the polar haze on Jupiter	Continuing observation with a small telescope eqquiped with plarization camera installed at the roof top of Eisei-jushin-to"w in order to capture Jupiter images with information on polarization in the haze of polar region.	Syowa	69°00'25"S, 39°35'01"E	Planetary science	Name: Yukihiro Surname: Takahashi Job Title or Position: Professor, Hokkaido University Phone: +81-11-706-9244 Email: yukihiro@sci.hokudai.ac.jp	
AAK0901	Deployment of drifting buoys requested from Australian Bureau of Meteorology	Surface drifting buoys have been deployed from R/V Shirase in response to the request of the Australian Bureau of Meteorology. Location and sea surface data at each buoy have been transmitted to the satellite.	Along cruise track of R/V Shirase		Meteorology	Name: Joel Surname: Cabrie Job Title or Position: Team Leader, Marine Networks, Bureau of Meteorology, Australia Phone: +61 3 9669 4651 Email:	
AAK0901	Deployment of Argo floats requested from JAMSTEC	No profiling float has been deployed from the icebreaker Shirase in the Southern Ocean due to doubt of instrumental troubles.	Along cruise track of R/V Shirase		Oceanography	Name: Shigeki Surname: Hosoda Job Title or Position: Senior Research Scientist, JAMSTEC Phone: Email:	
AIB0901	Ship performance tests along ice-covered waters and cold regoins	1) Ship motion parameters of R/V Shirease were recorded during cruise. 2) Operating time of water flushing system and sea ice conditions were recorded during icebreaking operation. 3) Water flushing test was conducted on February 3rd and 4th. 4) Seawater spray generated during the navigation of R/V Shirase was recorded. 5) When ship icing occurred, samples of ice, seawater and snow were collected on R/V Shirase.	Along cruise track of R/V Shirase		Other	Name: Hajime Surname: Yamaguchi Job Title or Position: Professor, The University of Tokyo Phone: +81-4-7136-4114 Email: h-yama@edu.k.u-tokyo.ac.jp	
外国基地派遣	Foraging ecology of marine predetors in the Ross Sea	The foraging behavior of Weddell Seals were tracked using biologging devices such as GPS, accelerometers, and video recorders. Collaboration with NIWA, NZ.	NZ Scott Base		Animal tracking	Name: Akinori Surname: Takahashi Job Title or Position: Associate Professor, NIPR Phone: +81-42-512-0741 Email: atak@nipr.ac.jp"	

Forward Plans (JARE58)

Analytical chemistry

Animal tracking

Anthropology

Archaeology

Astronomy

Astrophysics

Atmospheric sciences

Atomic/molecular physics

Bacteriology

Biochemistry

Biogeography

Bioinformatics

Biological sciences – other

Biology

Biophysics

Botany

Cell and molecular biology

Climate studies

Computer sciences

Data processing

Developmental biology

Earth and atmospheric sciences - other

Ecology

Ecosystem modelling

Entomology and parasitology

Environmental policy

Environmental sciences

Evolutionary biology

Fisheries management

Fisheries modelling Genetics

Geochemistry

Geoheritage

Geology

Geomorhology

Geophysics and seismology

Glaciology

Human Impacts

Humanities

Information sciences

Inorganic chemistry

Limnology

Mapping

Marine biology

Meteorology

Microbiology

Microcomputer applications

Natural resource management

Nuclear physics

Forward Plans (JARE58)

Oceanography

Optics

Organic chemistry

Other

Paleobiology

Paleontology

Physical chemistry

Physics

Physics and astronomy - other

Planetary science

Population monitoring

Psychology

Quantum physics

Remediation

Social science

Sociology

Soil biology

Solid state physics

Systems analysis

Systems biology Toxicology

Volcanology

Zoology

Table 2

1.1 Operational information

1.1.1 National Expeditions

D. Research Rockets

Location Launch	Date/Period/Frequency	Direction	Max. Altitude	Impact Area	Type	Specifications	Purpose	Project Title/Number
Syowa	Twice daily, throughout the year and up to 4 times during the summer	All directions, depending on wind	30,000 m	Within a radius of 200-300 km from the site	Rubber balloon	Radiosonde	Aerological observation	Meteorological observations/ Mechanism of variation in surface condition of the ice sheet and heat and moisture budget in east Antarctica
Syowa	1 to 2 times a week, throughout the year	All directions, depending on wind	30,000 m	Within a radius of 200-300 km from the site	Rubber balloon	ECC（Electrochemical Concentration Cell）Type Ozone sonde	Ozone vertical profile measurement	Meteorological observations
Syowa	10 times, throughout the year (mainly in January)	All directions, depending on wind	30,000 m	Within a radius of 200-300 km from the site	Rubber balloon	Water vapor sonde	Water vapor measurement	A study on the global atmosphere system based on high-resolution observations of the Antarctic atmosphere
Syowa	100 times, throughout the year (mainly in March and August)	All directions, depending on wind	30,000 m	Within a radius of 200-300 km from the site	Rubber balloon	Radiosonde and Temperature reference sonde	High-resolution temperature measurement	A study on the global atmosphere system based on high-resolution observations of the Antarctic atmosphere
Dome Fuji	39 times in the summer (from November 2018 to January 2019)	All directions, depending on wind	30,000 m	Within a radius of 100 km from the site	Rubber balloon	Radiosonde	Aerological observation	Mechanism of variation in surface condition of the ice sheet and heat and moisture budget in east Antarctica
R/V Shirase	Twice daily, up to ten days in the summer (from February to March 2019)	All directions, depending on wind	30,000 m	Within a radius of 100 km from the site	Rubber balloon	Radiosonde	Aerological observation	Mechanism of variation in surface condition of the ice sheet and heat and moisture budget in east Antarctica
Relay point	15 times in the winter (from September to November 2018)	All directions, depending on wind	30,000 m	Within a radius of 100 km from the site	Rubber balloon	Radiosonde	Aerological observation	Mechanism of variation in surface condition of the ice sheet and heat and moisture budget in east Antarctica

3. Permanent Information (2019)

3.1 Science Facilities

3.1.1 Automatic Recording Stations / Observatories

-Location:
Site Name: Mizuho
Latitude: 70° 42′ 00″ S
Longitude: 44° 17′ 21″ E
Type: Automatic Weather Station (ARGOS Type)
Elevation: ellipsoidal height 2,244m
Parameters Recorded: temperature, wind speed, wind direction, atmospheric pressure
Observation Frequency: 10 minutes
Reference Number: AWS No. 21359
Scientific Equipment:

-Location:
Site Name: Relay Point (MD364)
Latitude: 74° 00′ 29″ S
Longitude: 42° 59′ 48″ E
Type: Automatic Weather Station (ARGOS Type)
Elevation: 3,353m
Parameters Recorded: temperature, wind speed, wind direction, atmospheric pressure, humidity, surface height
Observation Frequency: 10 minutes
Reference Number: AWS No. 8918 / WMO No. 89744
Scientific Equipment:

-Location:
Site Name: Dome Fuji
Latitude: 77° 19′ 00″ S
Longitude: 39° 42′ 11″ E
Type: Automatic Weather Station (ARGOS Type)
Elevation: 3,810m
Parameters Recorded: temperature, wind speed, wind direction, atmospheric pressure
Observation Frequency: 10 minutes
Reference Number: AWS No. 8904 / WMO No. 89734
Scientific Equipment:

-Location:
Site Name: JASE2007 (DK379)
Latitude: 75° 53′ 17″ S
Longitude: 25° 50′ 01″ E
Type: Automatic Weather Station (ARGOS Type)
Elevation: 3,661m
Parameters Recorded: temperature, wind speed, wind direction, atmospheric pressure
Observation Frequency: 10 minutes
Reference Number: AWS No. 30305
Scientific Equipment:

-Location
Site Name: New Dome Fuji
Latitude: 77° 47′ 20″ S
Longitude: 39° 03′ 09″ E
Type: Automatic Weather Station (ARGOS Type)
Elevation: 3,763m
Parameters Recorded: temperature, wind speed, wind direction, atmospheric pressure relative humidity, snow height, downward/upward shortwave and longwave radiation, ice temperature
Observation Frequency: 10 minutes
Reference Number: None
Scientific Equipment:

-Location:
Site Name: H128
Latitude: 69° 24′ 05″ S
Longitude: 41° 32′ 41″ E
Type: Automatic Weather Station (ARGOS Type)
Elevation: 1,383m
Parameters Recorded: temperature, wind speed, wind direction, atmospheric pressure relative humidity, snow height, downward/upward shortwave and longwave radiation, ice temperature
Observation Frequency: 10 minutes
Reference Number: None
Scientific Equipment

-Location:
Site Name: New Relay Point (MD364)
Latitude: 74° 01′ 48″ S
Longitude: 43° 00′ 00″ E
Type: Automatic Weather Station (ARGOS Type)
Elevation: 3,353m
Parameters Recorded: temperature, wind speed, wind direction, atmospheric pressure relative humidity, snow height, ice temperature
Observation Frequency: 10 minutes
Reference Number: None
Scientific Equipment

-Location:
Site Name: Langhovde
Latitude: 69° 15′ S
Longitude: 39° 43′ E
Type: Seismic observation by Guralp seismometer
Elevation: 28m
Parameters Recorded: 3 components (NS, EW, Z)
Observation Frequency: nearly year-round by 10 Hz sampling
Reference Number: None
Scientific Equipment:

-Location:
Site Name: Skallen
Latitude: 69° 40′ S
Longitude: 39° 25′ E
Type: Seismic observation by Guralp seismometer
Elevation: 28m
Parameters Recorded: 3 components (NS, EW, Z)
Observation Frequency: nearly year-round by 10 Hz sampling
Reference Number: None
Scientific Equipment:

-Location:
Site Name: Rundvågshetta
Latitude: 69° 55′ S
Longitude: 39° 02′ E
Type: Seismic observation by Guralp seismometer

Elevation: 37m
Parameters Recorded: 3 components (NS, EW, Z)
Observation Frequency: nearly year-round by 10 Hz sampling
Reference Number: None
Scientific Equipment:

-Location:
Site Name: Langhovde
Latitude: 69° 14′ 35″ S
Longitude: 39° 42′ 53″ E
Type: GNSS remote base station
Elevation: 10m
Parameters Recorded: GNSS
Observation Frequency: 30 Seconds
Reference Number: None
Scientific Equipment:

-Location:
Site Name: IGS Tracking Site at Syowa Station (SYOG)
Latitude: 69° 00′ 25″ S
Longitude: 39° 35′ 01″ E
Type: GNSS remote base station
Elevation: 29m
Parameters Recorded: GNSS
Observation Frequency: 1 Second
Reference Number: None
Scientific Equipment:

-Location:
Site Name: Yukidori Zawa
Latitude: 69° 14′ 30″ S
Longitude: 39°44′ 22″ E
Type: Automatic Weather Station
Elevation: 55 m
Parameters Recorded: Air temperature, humidity, Air pressure, Wind direction, Wind speed, Solar radiation, UV radiation, Photosynthetically Active Radiation
Observation Frequency: 10 minutes
Reference Number: None
Scientific Equipment:

-Location:
Site Name: Oyako Ike
Latitude: 69° 28′ 25″ S
Longitude: 39° 36′ 40″ E
Type: Automatic Weather Station
Elevation: 2 m
Parameters Recorded: Air temperature, humidity, Air pressure, Wind direction, Wind speed, Solar radiation, UV radiation, Photosynthetically Active Radiation
Observation Frequency: 10 minutes
Reference Number: None
Scientific Equipment:

-Location:
Site Name: Skallen Oike
Latitude: 69° 40′ 26″ S
Longitude: 39° 24′ 15″ E
Type: Automatic Weather Station
Elevation: 10m
Parameters Recorded: Air temperature, humidity, Air pressure, Wind direction, Wind speed, Solar radiation, UV radiation, Photosynthetically Active Radiation
Observation Frequency: 10 minutes
Reference Number: None
Scientific Equipment:

-Location:
Site Name: Yukidori Zawa
Latitude: 69° 08′ 36″ S
Longitude: 39° 26′ 30″ E
Type: Automatic Microclimate Station
Elevation: 70 m
Parameters Recorded: Ground surface temperature, Photosynthetically Active Radiation, UV radiation, Time-lapse photograph
Observation Frequency: 1 hour
Reference Number: None
Scientific Equipment:

-Location:
Site Name: Oyako Ike

Latitude: 69° 28′ 36″ S
Longitude: 39° 36′ 06″ E
Type: Limnological Station
Elevation: 2 m
Parameters Recorded: Water temperature, Underwater light intensity, Chlorophyll fluorescence, Turbidity, Water level
Observation Frequency: 1 hour
Reference Number: None
Scientific Equipment:

-Location:
Site Name: Naga Ike
Latitude: 69° 29′ 12″ S
Longitude: 39° 35′ 54″ E
Type: Limnological Station
Elevation: 70 m
Parameters Recorded: Water temperature, Underwater light intensity, Chlorophyll fluorescence, Turbidity, Water level
Observation Frequency: 1 hour
Reference Number: None
Scientific Equipment:

-Location:
Site Name: Nurume Ike
Latitude: 69° 13′ 23″ S
Longitude: 39° 39′ 33'E
Type: Limnological Station
Elevation: 2 m
Parameters Recorded: Water temperature, Underwater light intensity, Chlorophyll fluorescence, Turbidity
Observation Frequency: 1 hour
Reference Number: None
Scientific Equipment:

-Location:
Site Name: Dome Fuji
Latitude: 77° 19′ 02” S
Longitude: 39° 42′ 32″ E
Type: Low Power Magnetometer (BAS Type)

Elevation: 3,783m
Parameters Recorded: magnetic 3 components (H, D, Z)
Observation Frequency: 17mHz～1 Hz
Reference Number: None
Scientific Equipment: 3-axis fluxgate magnetometer

-Location:
Site Name: Relay Point (MD364)
Latitude: 74° 00′ 37″ S
Longitude: 42° 59′ 30″ E
Type: Low Power Magnetometer (BAS Type)
Elevation: 3,353m
Parameters Recorded: magnetic 3 components (H, D, Z)
Observation Frequency: 17mHz～1 Hz
Reference Number: None
Scientific Equipment: 3-axis fluxgate magnetometer

-Location:
Site Name: Mizuho
Latitude: 70° 42′ 06″ S
Longitude: 44° 16′ 47″ E
Type: Low Power Magnetometer (BAS Type)
Elevation: 2,250m
Parameters Recorded: magnetic 3 components (H, D, Z)
Observation Frequency: 17mHz～1 Hz
Reference Number: None
Scientific Equipment: 3-axis fluxgate magnetometer

-Location:
Site Name: Skallen
Latitude: 69° 40′ 21″ S
Longitude: 39° 24′ 07″ E
Type: Low Power Magnetometer (NIPR Type)
Elevation: 11m
Parameters Recorded: magnetic 3 components (H, D, Z)
Observation Frequency: 1 Hz
Reference Number: None
Scientific Equipment: 3-axis fluxgate magnetometer

-Location:
Site Name: H68
Latitude: 69° 11′ 32″ S
Longitude: 41° 03′ 01″ E
Type: Low Power Magnetometer (NIPR Type)
Elevation: 1,175m
Parameters Recorded: magnetic 3 components (H, D, Z)
Observation Frequency: 1 Hz
Reference Number: None
Scientific Equipment: 3-axis fluxgate magnetometer

-Location:
Site Name: Innhovde
Latitude: 69° 51′ 21″ S
Longitude: 37° 06′ 31″ E
Type: Low Power Magnetometer (NIPR Type)
Elevation: 57m
Parameters Recorded: magnetic 3 components (H, D, Z)
Observation Frequency: 1 Hz
Reference Number: None
Scientific Equipment: 3-axis fluxgate magnetometer

-Location:
Site Name: Amundsen Bay
Latitude: 66° 47′ 44″ S
Longitude: 50° 34′ 38″ E
Type: Low Power Magnetometer (NIPR Type)
Elevation: 37m
Parameters Recorded: magnetic 3 components (H, D, Z)
Observation Frequency: 1 Hz
Reference Number: None
Scientific Equipment: 3-axis fluxgate magnetometer

-Location:
Site Name: Amundsen Bay
Latitude: 66° 47′ 44″ S
Longitude: 50° 34′ 43″ E
Type: Unmanned Aurora Observatory
Elevation: 87m

Parameters Recorded: all-sky aurora image, magnetic 3 components (H, D, Z), GNSS TEC value
Observation Frequency: all-sky imager:1Hz, magnetometer:1 Hz, GNSS-TEC: every 30 sec
Reference Number: None
Scientific Equipment: All-sky imager, 3-axis fluxgate magnetometer, GNSS receiver

3.2 Operational Information

A. Stations

-Name: Syowa Station
Type: Year-round
Location:
Site Name: Syowa
Latitude: 69° 00′ 25″ S
Longitude: 39° 35′ 01″ E
Maximum Population: 130
Date Established: January 29, 1957
Accommodation Facilities: There are 2 buildings for over-wintering expeditioners and each building has 21 beds. For summer expeditioners, there are 2 buildings. One has 48 beds and cafeteria for 60 people and the other has 40 beds.
Medical Facilities: Minimum required surgical operation facilities and dental emergency facilities are equipped. Two medical doctors stay at the station.
Remarks / Description: Located on Higashi-Ongul To, Lützow-Holmbukta, 28.9m elevation, established in January 29, 1957
Search and Rescue Information:

-Name: Dome Fuji Station
Type: Seasonal
Location:
Site Name: Dome Fuji
Latitude: 77° 19′ 00″ S
Longitude: 39° 42′ 12″ E
Maximum Population: 14
Accommodation Facilities: There are 9 buildings below snow surface. 8 people can be accommodated for wintering.
Medical Facilities: None
Operating Period: from November to February
Remarks / Description: Located on the top of Dronning Maud Land, 3,810m

elevation, established in January 29, 1995
Search and Rescue Information:

-Name: Mizuho Station
Type: Closed
Location:
Site Name: Mizuho
Latitude: 70° 41′ 58″ S
Longitude: 44° 16′ 52″ E
Maximum Population: 8
Accommodation Facilities: N/A
Medical Facilities: None
Operating Period: None
Remarks / Description: Located in Dronning Maud Land, 2,244m elevation, established in July 21, 1970
Search and Rescue Information:

-Name: Asuka Station
Type: Closed
Location:
Site Name: Asuka
Latitude: 71° 31′ 29″ S
Longitude: 24° 07′ 50″ E
Maximum Population: 8
Accommodation Facilities: N/A
Medical Facilities: None
Operating Period: None
Remarks / Description: Located in Sør-Rondane Mountains region, 980.3m elevation, established in March 26, 1985
Search and Rescue Information:

B. Vessels
Name: R/V Shirase
Flag State: Japan
Ice Strength: (Icebreaking capacity: Continuous 1.5 m ice thickness)
Length: 138m
Beam: 28m
Gross Tonnage: (Standard displacement: 12,650 tons)
Type: Supply and Research

Maximum Crew: 179
Maximum Passengers: 80
Description / Remarks:
Search and Rescue Information:

C. Aircraft
Type: CH-101 (on board Shirase)
Quantity: 2
Remarks: transport cargos and personnel / support scientific field operations
Search and Rescue Information:

Type: AS350BA (chartered by an Australia Company)
Quantity: 1
Remarks: support scientific field operations
Search and Rescue Information:

3.3 Environmental Information

3.3.1 Waste Management Plans

Title: Waste Management Guide
Fixed site/Field Camp/Ship: Station and field
Objective: Management of field Wastes, Station Wastes
Implementation Report: Disposal of wastes in the stations and fields is implemented in accordance with Annex III of the Protocol on Environmental Protection to the Antarctic Treaty and the relevant national legislation. Sewage and gray water from summer accommodation are treated by non-biological method (Coagulation-Sedimentation Method), and Sewage and gray water from winter accommodation are treated by membrane separation activated sludge process and the treated water is discharged into the sea. All the wastes are sorted and treated properly. Combustible wastes are disposed of by a two-stage incinerator. The ash is taken back to Japan. Wet food waste is treated by a dehydrating instrument. The residue is directly taken back to Japan or incinerated, and its ash is also taken back to Japan. The other waste is taken back to Japan.
Contact Point:
Name: Kazuo
Surname: Higuchi
Job Title or Position: Head of Logistics Section, National Institute of Polar Research
Phone: +81-42-512-0779
Email: higuchi.kazuo@nipr.ac.jp

3.3.2 Contingency Plans

Title: Syowa Station Oil Spill Contingency Plan

Scope / Coverage of the plan: The expedition contingency plans are made and published for respective operations before departure from Japan and the expedition members act as keeping the plans.

An oil spill contingency plan for Syowa Station was first compiled in 1987 and the plan was revised in 2008.

Objective: Contingency plan to respond safely and promptly to oil spill at Syowa Station and to minimize human, environmental and physical loss or damage.

Contact Point:

Name: Kazuo

Surname: Higuchi

Job Title or Position: Head of Logistics Section, National Institute of Polar Research

Phone: +81-42-512-0779

Email: higuchi.kazuo@nipr.ac.jp

3.3.3 Inventory of Past Activities

Activity Type: Scientific observation, including ice core drilling

Location:

Site name: Mizuho

Latitude: 70° 41′ 58″ S

Longitude: 44° 16′ 52″ E

Description of Activity: Meteorological, glaciological observations and used for a relay station for inland traverses.

Period of Activity:

Date Begin: July 21, 1970

Date End: 1986

Remaining Equipment or Facilities: Five huts including diesel generators, communication antennas and an observation tower.

Activity Type: Scientific observation

Location:

Site name: Asuka

Latitude: 71° 31′ 29″ S

Longitude: 24° 07′ 50″ E

Description of Activity: Meteorological observations and used for a base station for glaciological observations in the Sør Rondane Mountains

Period of Activity:

Date Begin: March 26, 1985
Date End: December, 1991
Remaining Equipment or Facilities: Five huts including diesel generators, communication antennas and a small wind turbine.

3.3.4 Compliance with the Protocol

None

3.3.6 Prevention of marine pollution

None

3.3.7 Measures taken to implement the provisions of Annex V

None

3.4 Other Information

3.4.1 Relevant National Legislation

None