

# Activities of the Polar Environment Data Science Center



**Akira Kadokura**

Polar Environment Data Science Center,  
Joint Support-Center for Data Science Research,  
Research Organization of Information and Systems

# Research Organization of Information and Systems

## ROIS <http://www.rois.ac.jp/en/>

大学共同利用機関法人  
情報・システム研究機構  
Research Organization of Information and Systems

ACCESS | CONTACT US | STAFF | JAPANESE

Home About Collaboration Education

Research Organization of Information and Systems

**NiPR**  
National Institute of Polar Research

**NII** Inter-University Research Institute Corporation /  
Research Organization of Information and Systems  
**National Institute of Informatics**

Research Organization of Information and Systems  
**The Institute of Statistical Mathematics**

Research Organization of Information and Systems  
**National Institute of Genetics**

**Joint Support-Center for Data Science Research**  
Research Organization of Information and Systems (ROIS)

**NiPR**  
National Institute of Polar Research

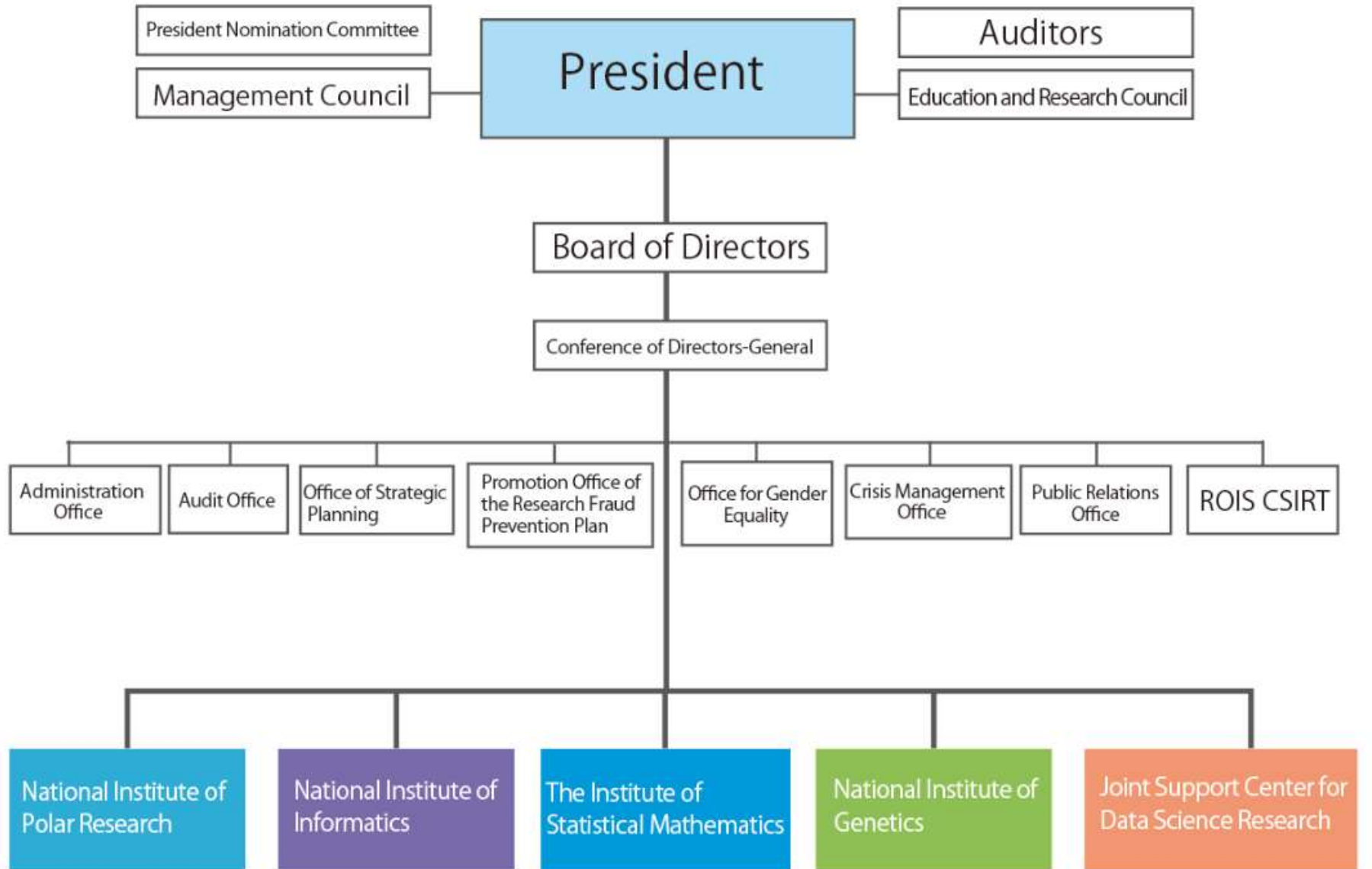
**NII** Inter-University Research Institute Corporation /  
Research Organization of Information and Systems  
**National Institute of Informatics**

Research Organization of Information and Systems  
**The Institute of Statistical Mathematics**

Research Organization of Information and Systems  
**National Institute of Genetics**

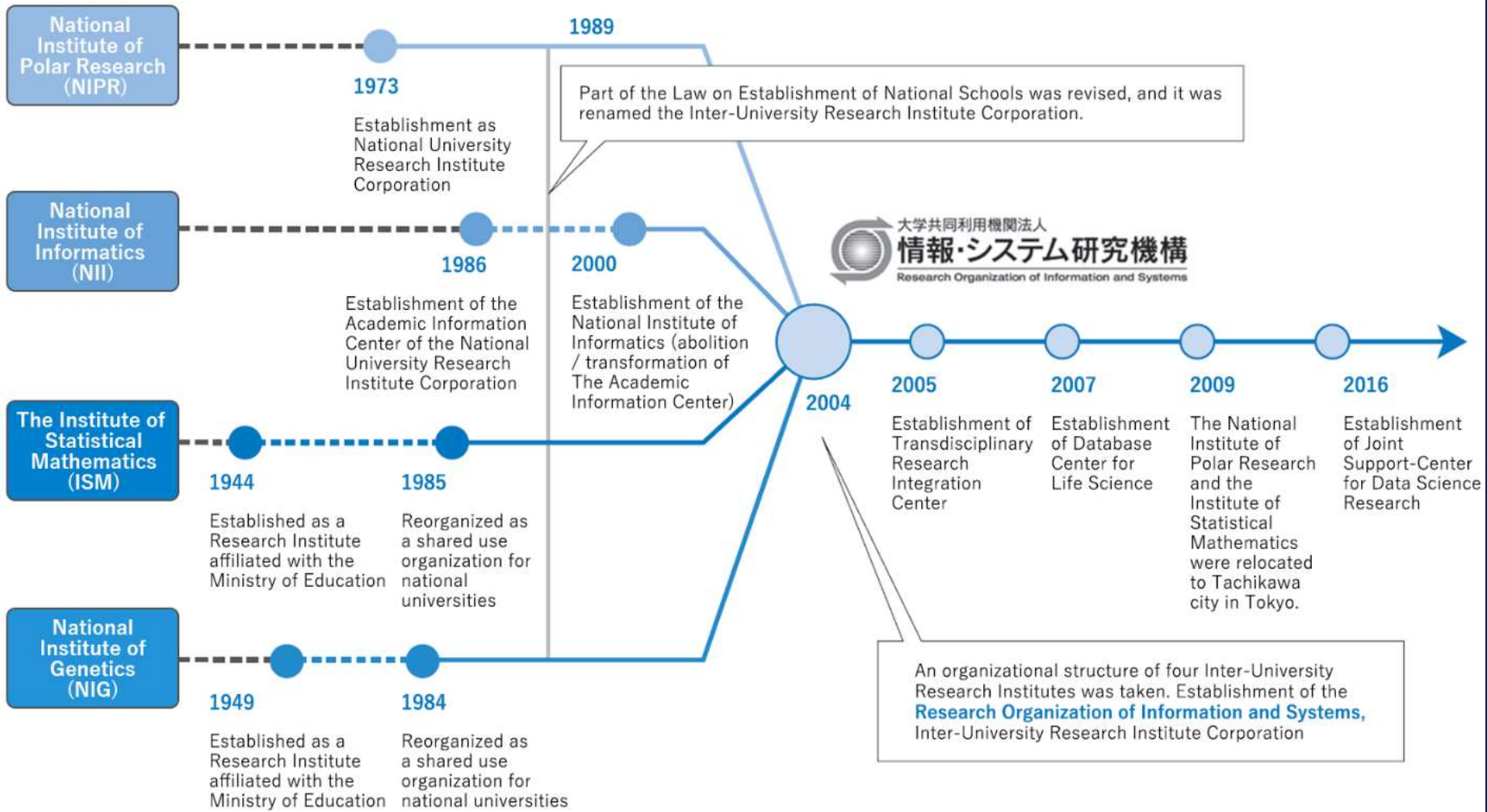
Joint Support-Center  
for Data Science Research (DS)

# ROIS Organizational Chart

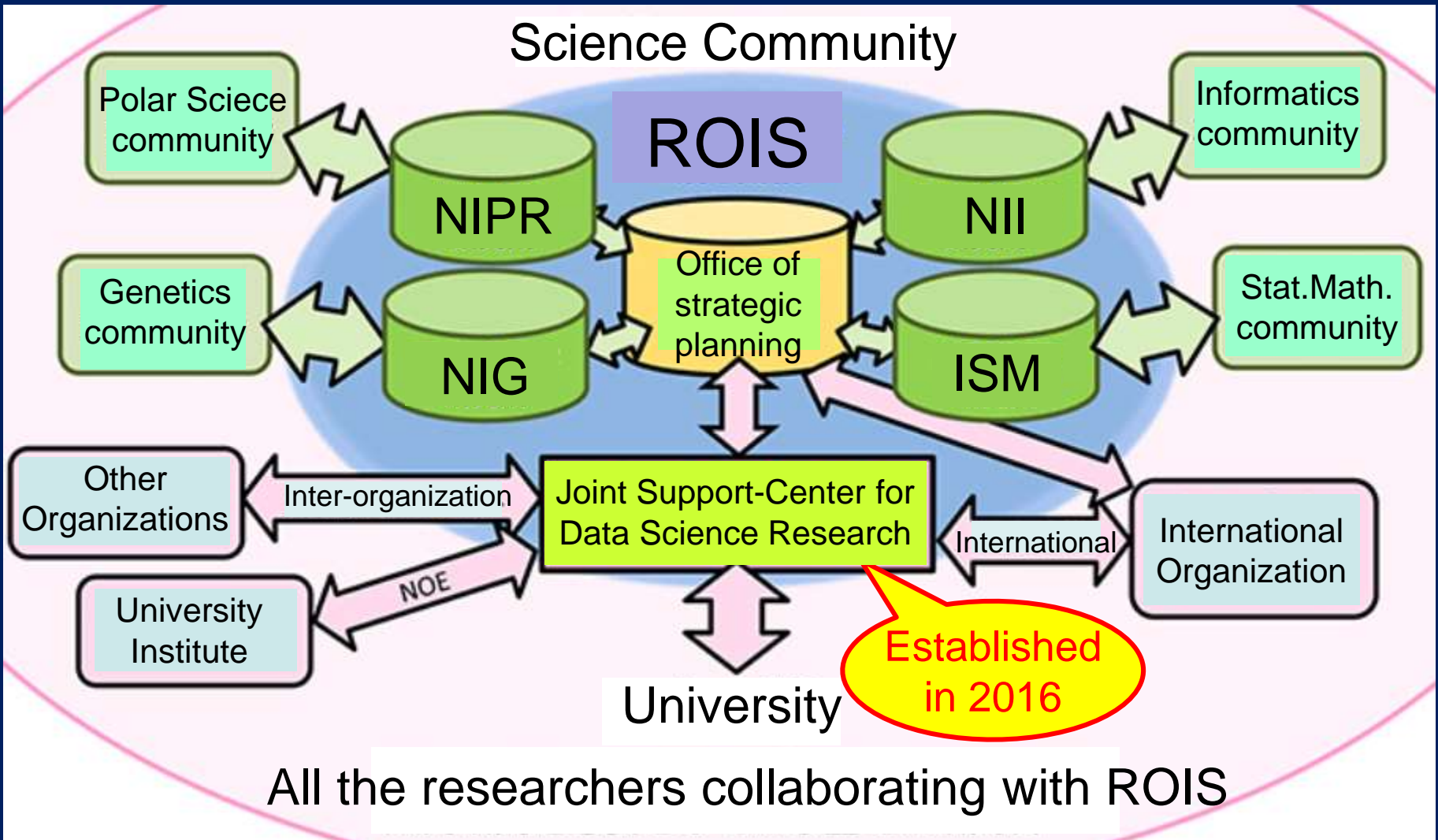




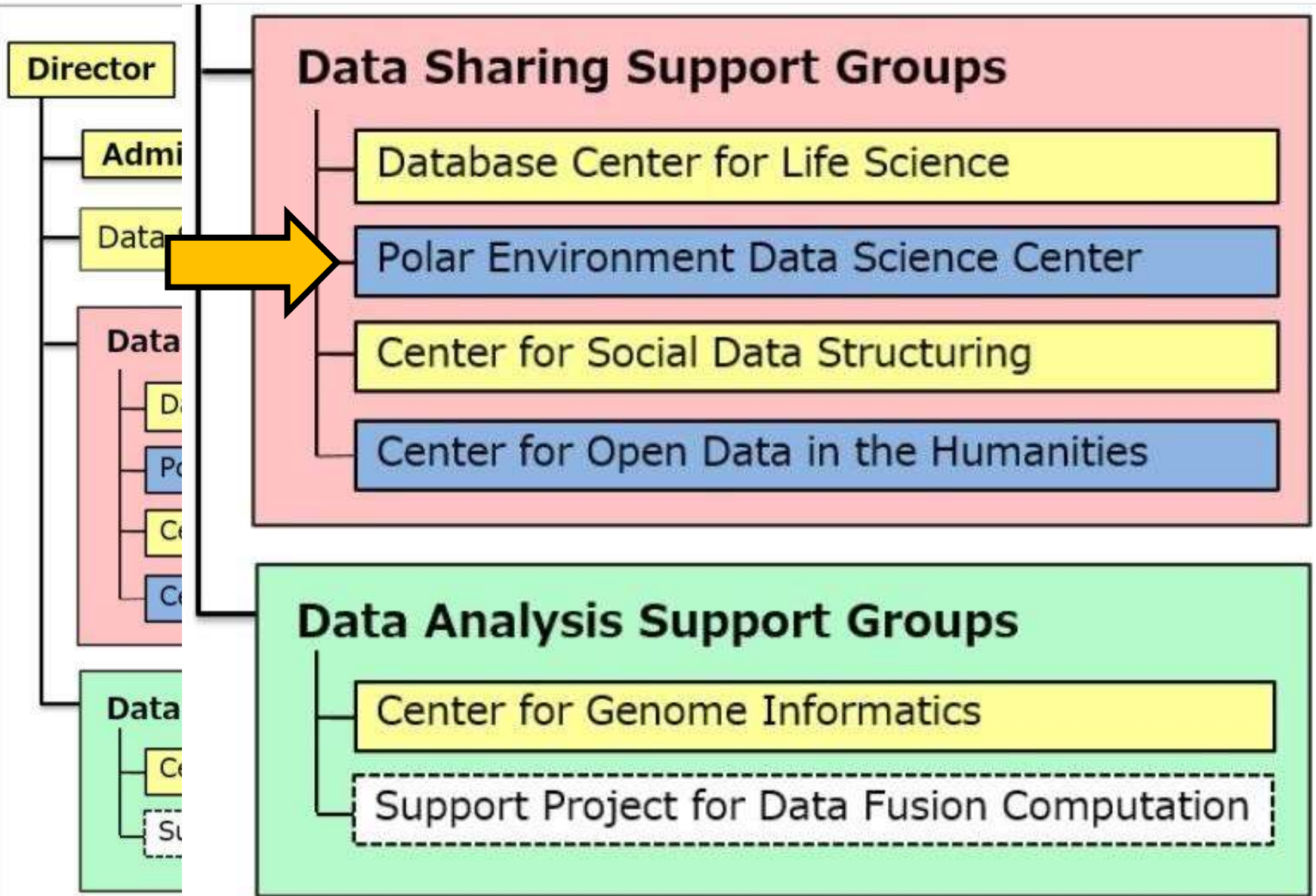
# ROIS History



# Research Organization of Information and Systems



# Joint Support-Center for Data Science Research





# Joint Support-Center for Data Science Research

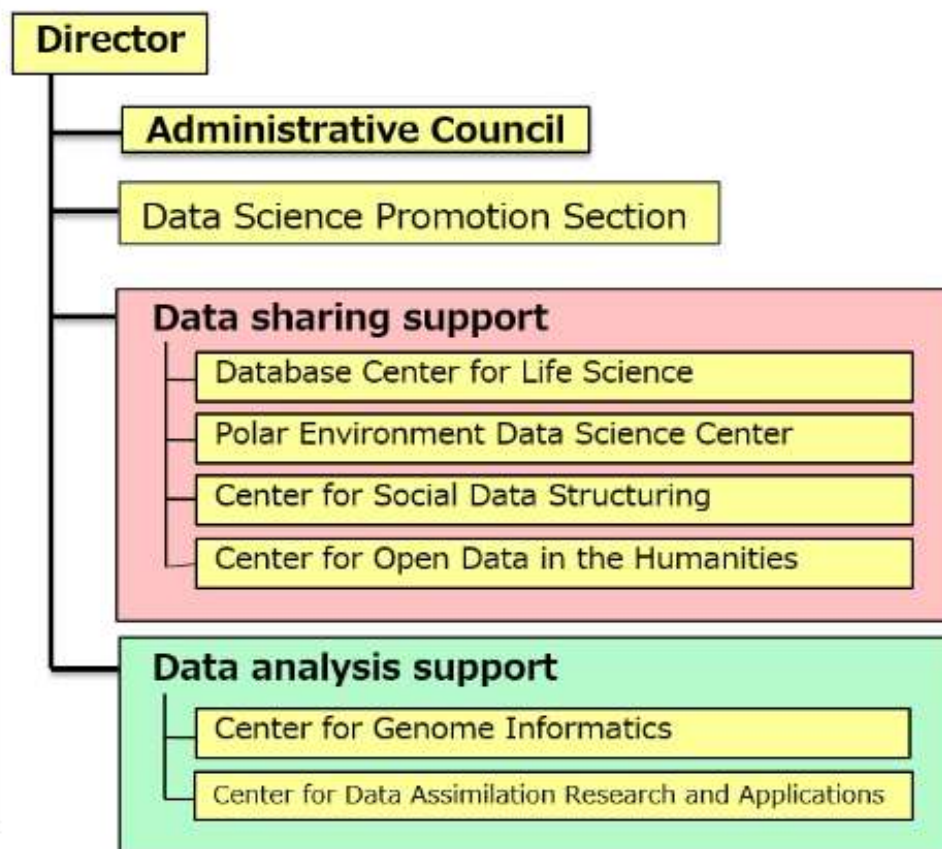
The Joint Support-Center for Data Science Research ("ROIS-DS"), established in 2016, is the newest organization of ROIS.

## MISSION

The mission of "ROIS-DS" is to support variety of researchers to conduct projects on the subjects of data-driven or data-oriented sciences (collectively called here as data science) using technologies for big-data analysis, for example, through collaborations with the members of our CENTERS.

## ORGANIZATION

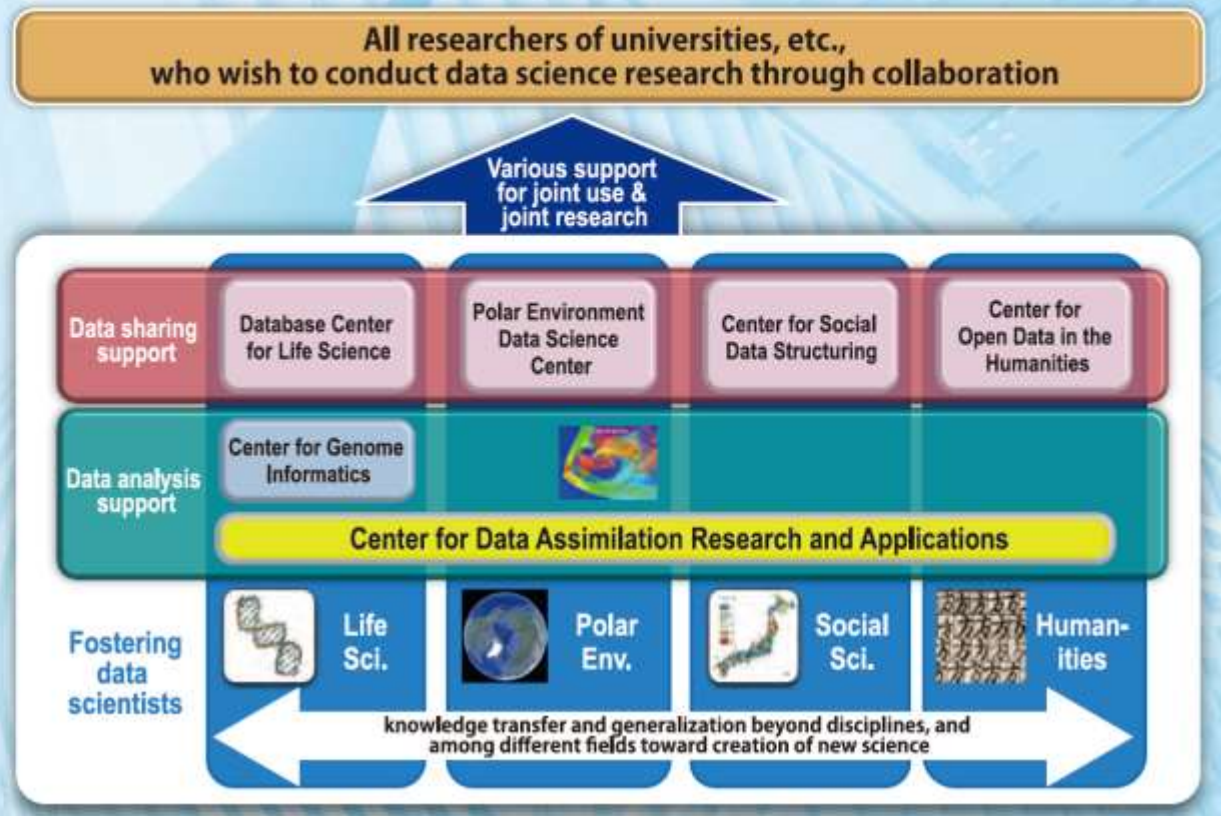
"ROIS-DS" consists of six CENTERS



# Joint Support–Center for Data Science Research

## Supporting research through data sharing, data analysis support, and human resource development

The six centers of the ROIS-DS facilitate research across a broad range of diverse domains spanning life sciences, polar environment, and statistical mathematics as well as the humanities and social sciences. The centers conduct research and provide support to activities centered around the three pillars of data science — data sharing, data analysis, and human resource development. The facilities work to strengthen the research capabilities of universities while actively cooperating with communities from various fields of academia and society in order to make meaningful contributions to academic development and social innovation.





**Joint Support-Center for Data Science Research**  
Research Organization of Information and Systems (ROIS)

日本語 S M L 大学共同利用機関法人 情報・システム研究機構  
Research Organization of Information and Systems

HOME ABOUT US MISSION INFORMATION ACCESS

## Polar Environment Data Science Center

HOME > Polar Environment Data Science Center

### Our staff

Akira Kadokura	Director, Prof.
Masaki Kanao	Assoc. Prof.
Hironori Yabuki	Appointed Assoc. Prof.
Yoshimasa Tanaka	Appointed Assoc. Prof.
Koji Nishimura	Appointed Assoc. Prof.

### Related data and database

- Science Database
- Arctic Data archive System (ADS)
- Inter-university Upper atmosphere Global Observation NETWORK (IUGONET)
- Database of the National Institute of Polar Research

➡ Home page of the Polar Environment Data Science Center

➡ Polar Data Journal

PEDSC will proceed the following specific items as its activity plan.

Centers

- Data Science Promotion Section
- DBCLS Database Center for Life Science
- Polar Environment Data Science Center
- Center for Social Data Structuring
- Center for Open Data in the Humanities
- Center for Genome Informatics
- Support Project for Data Fusion Computation

# Polar Environment Data Science Center HP

<http://pedsc.rois.ac.jp/en/>

The screenshot shows the homepage of the Polar Environment Data Science Center (PEDSC). At the top left is the logo, a stylized globe with blue and green segments, followed by the text "Polar Environment Data Science Center". To the right of the logo are two language selection links: "Japanese" and "English". Below the header is a green navigation bar with a series of white arrows pointing to the right, followed by the menu items: "About", "Activity", "Related Data", "Database", "Achievement", and "Collaboration". The main content area features a large background image of the aurora borealis in shades of green and blue over a dark landscape with silhouettes of scientific instruments. Centered on this image is the text: "Facilitate sharing and analysis of valuable data on changes in the polar environment and the earth system". Below the image is a white section titled "Latest News" with a row of six small circles, the second of which is orange. There are two news items listed below:

- TOPICS** April 25, 2018  
PEDSC website has been released.
- TOPICS** DECEMBER 5 to 7, 2018  
"International Workshop on Sharing, Citation and Publication of Scientific Data across Disciplines" was held.

# Polar Environment Data Science Center

## ➤ Purpose :

- To play a central role of the data activity in polar science in Japan by promoting the opening and sharing of the data obtained in polar regions, and contribute to the research on the global environmental change.

## ➤ History :

- FY2015 :  
    Planning of the next 6-year project of ROIS
- FY2016 :  
    Set a preparation office of PEDSC in NIPR.  
    Planning of details of PEDSC
- FY2017 :  
    PEDSC started



# Polar Environment Data Science Center

## Staff in FY2017

■ Research staff: 5, Assistant: 2

Name	Title	Task
Akira Kadokura	Prof.	Director, Upper atmosphere data
Masaki Kanao	Assoc. Prof.	Science Database, Seismological data
Hironori Yabuki	Appointed Assoc. Prof.	ADS
Yoshimasa Tanaka	Appointed Assoc. Prof.	IUGONET, Upper atmosphere data
Koji Nishimura	Appointed Assoc. Prof.	PANSY data
Ayuko Ibaraki	Assistant	Office work, Seismological data
Keiko Endo	Assistant	Office work, Upper atmosphere data

# Polar Environment Data Science Center

## Staff in FY2018

■ Research staff: 5, Assistant: 2

Name	Title	Task
Akira Kadokura	Prof.	Director, Upper atmosphere data
Masaki Kanao	Assoc. Prof.	Science Database, Seismological data
Hironori Yabuki	Appointed Assoc. Prof.	ADS
Yoshimasa Tanaka	Appointed Assoc. Prof.	IUGONET, Upper atmosphere data
Koji Nishimura	Appointed Assoc. Prof.	PANSY data
Ayuko Ibaraki	Assistant	Office work, Seismological data
Yuka Kadowaki	Assistant	Office work, Upper atmosphere data

# Polar Environment Data Science Center

## Staff in FY2019

■ Research staff: 5, Assistant: 3

Name	Title	Task
Akira Kadokura	Prof.	Director, Upper atmosphere data
Masaki Kanao	Assoc. Prof.	Science Database, Seismological data
Hironori Yabuki	Appointed Assoc. Prof.	ADS
Yoshimasa Tanaka	Appointed Assoc. Prof.	IUGONET, Upper atmosphere data
Koji Nishimura	Appointed Assoc. Prof.	PANSY data
Ayuko Ibaraki	Assistant	Office work, Seismological data
Yuka Kadowaki	Assistant	Office work, Upper atmosphere data
Shiori Uchino	Assistant	Office work, IUGONET, Integrated database



# Polar Environment Data Science Center

## Staff in FY2019

■ Concurrent member since 1st Oct., 2019

No	Name	Title	Research Division	Research field	Concurrent advising task in PEDS	Effort (%)
1	Sakae Kudoh	Prof.	Bioscience	Aquatic Ecology	On bioscience database	5
2	Naohiko Hirasawa	Assistant Prof.	Meteorology and Glaciology	Climatology	On Meteorological database	5
3	Yasunobu Ogawa	Associate Prof.	Space and Upper Atmospheric Sciences	Ionospheric Physics	On Ionospheric database, especially, for the EISCAT and auroral image data	5
4	Tomokazu Hokada	Associate Prof.	Geoscience	Geology	On geological database, especially rock samples	5
5	Akira Yamaguchi	Associate Prof.	Geoscience	Meteoritics	On Meteorites database	5
6	Yoshifumi Nogi	Prof.	Geoscience	Solid Earth Geophysics	On geophysical database, including the Antarctic GIS system	1

# Polar Environment Data Science Center

## Staff in FY2020

■ Research staff: 5, Assistant: 3, Concurrent member: 6

Name	Title	Task
Akira Kadokura	Prof.	Director, Upper atmosphere data
Masaki Kanao	Assoc. Prof.	Science Database, Seismological data
Hironori Yabuki	Appointed Assoc. Prof.	ADS
Yoshimasa Tanaka	Appointed Assoc. Prof.	IUGONET, Upper atmosphere data
Koji Nishimura	Appointed Assoc. Prof.	PANSY data
Ayuko Ibaraki	Assistant	Office work, Seismological data
Yuka Kadowaki	Assistant	Office work, Upper atmosphere data
Shiori Uchino	Assistant	Office work, IUGONET, Integrated database
Concurrent member: Sakae Kudoh, Naohiko Hirasawa, Yasunobu Ogawa, Tomokazu Hokada, Akira Yamaguchi, Yoshifumi Nogi		

# Polar Environment Data Science Center

## Staff in FY2021

■ Research staff: 5, Assistant: 3, Concurrent member: 7

Name	Title	Task
Akira Kadokura	Prof.	Director, Upper atmosphere data
Masaki Kanao	Assoc. Prof.	Science Database, Seismological data
Hironori Yabuki	Appointed Assoc. Prof.	ADS
Yoshimasa Tanaka	Appointed Assoc. Prof.	IUGONET, Upper atmosphere data
Masayoshi Kozai	Project Researcher	Multidisciplinary Database development
Ayuko Ibaraki	Assistant	Office work, Seismological data
Yuka Kadowaki	Assistant	Office work, Upper atmosphere data
Shiori Uchino	Assistant	Office work, IUGONET, Integrated database
Concurrent member: Sakae Kudoh, Naohiko Hirasawa, Yasunobu Ogawa, Tomokazu Hokada, Akira Yamaguchi, Yoshifumi Nogi, Taishi Hashimoto		



# Data treated by the Polar Environment Data Science Center

Antarctic  
Observation

Scientific Data obtained by research activities  
in polar regions



Research activity



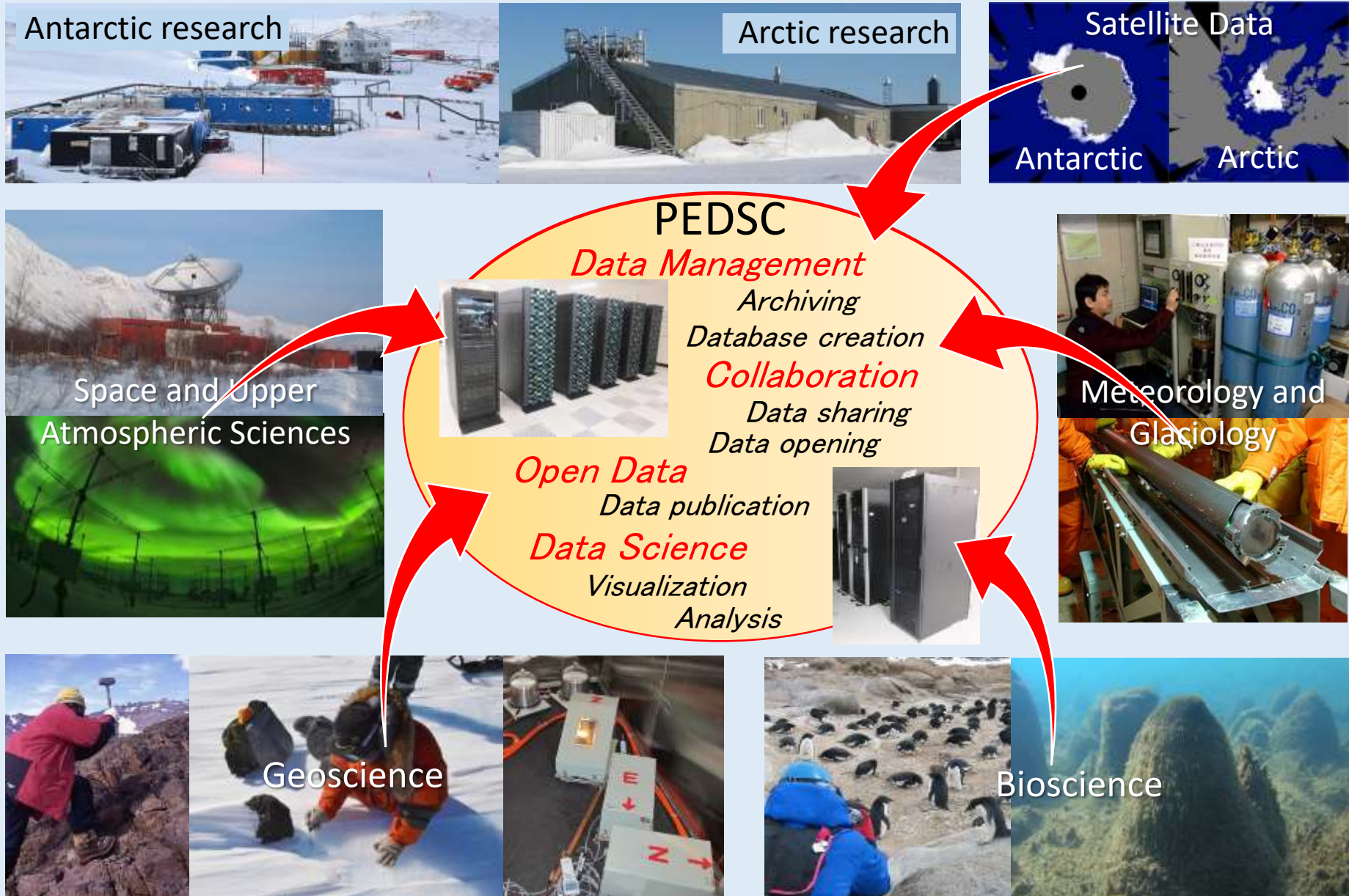
Arctic  
Research





# Task of PEDSC: Support Polar Science

Using the data obtained in both polar regions led by NIPR



# Data treated by the Polar Environment Data Science Center

## ■ Various data in various research field :

- **Space and Upper Atmospheric Sciences** : Aurora, Ionosphere, Upper atmos.
- **Meteorology and Glaciology** : Greenhouse gas, Aerosole, Cloud, Ice core
- **Geoscience** : Rock, Meteorite, Seismology, Gravity, VLBI data
- **Bioscience** : Big Animals, Land-Dwelling Creature, Marine Biology, Biodiversity

## ◆ Time series digital data :

Continuous observation data sampled with a fixed interval, and recorded in digital form during a long-term or a certain period at fixed sites or platforms.

## ◆ Sample data :

Materials sampled at fixed locations.

e.g., Air sample, Sea water, Snow, Ice core, Rock, Meteorite, Biological sample, etc.

# Data treated by the Polar Environment Data Science Center

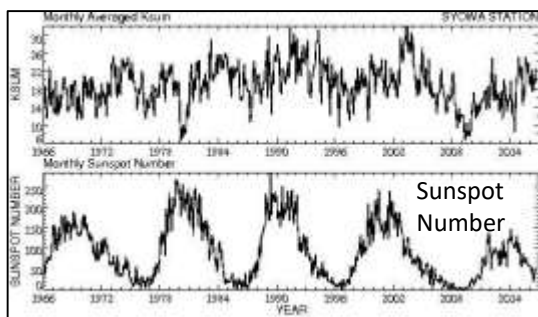
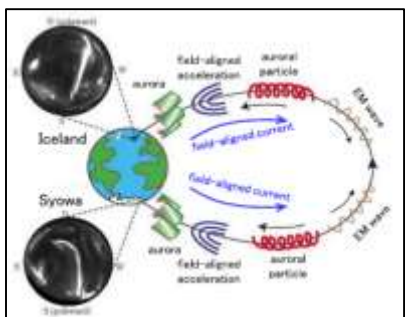
## Space and Upper Atmospheric Sciences Group

Sun-Earth environment data

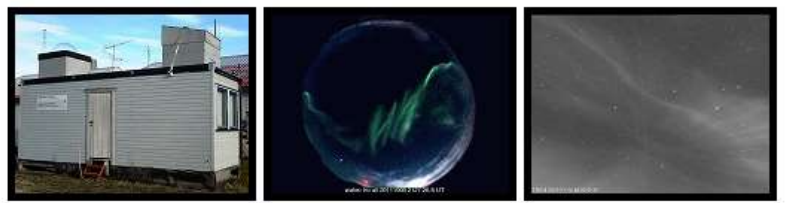
**Aurora Data since IGY (1957-1958)**

**Syowa-Iceland Conjugate Observation**

**Long-term monitoring magnetic observation**



**Modern Auroral Network Data in both polar regions**



PRE Annex at the EISCAT Tromsø site, and examples of aurora images.



South pole station and optical hut in Arrival heights in McMurdo station.

## EISCAT database in NIPR



EISCAT Svalbard radar (The photo was taken in August 2001)

**PANSY radar**



**Cutting-edge Big Atmospheric Radar**

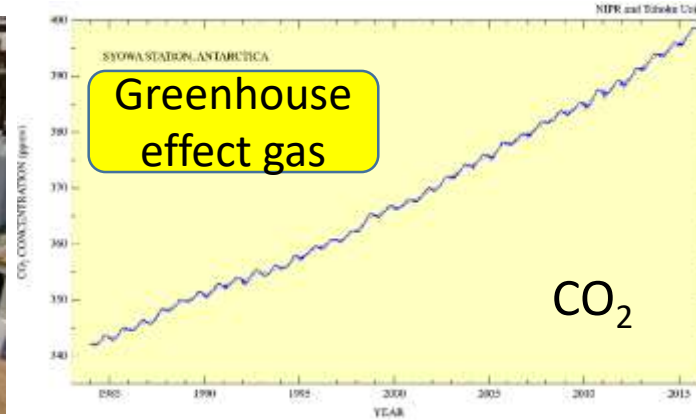
**EISCAT (European Incoherent Scatter) radar Big international Project**



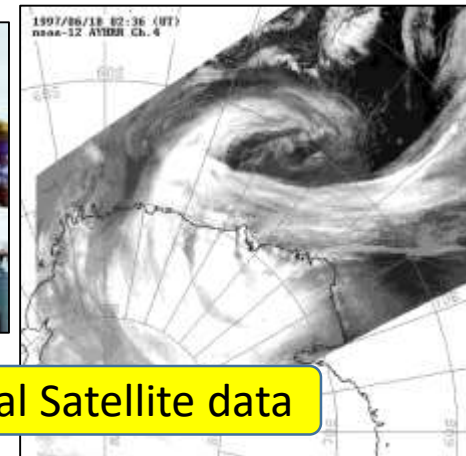
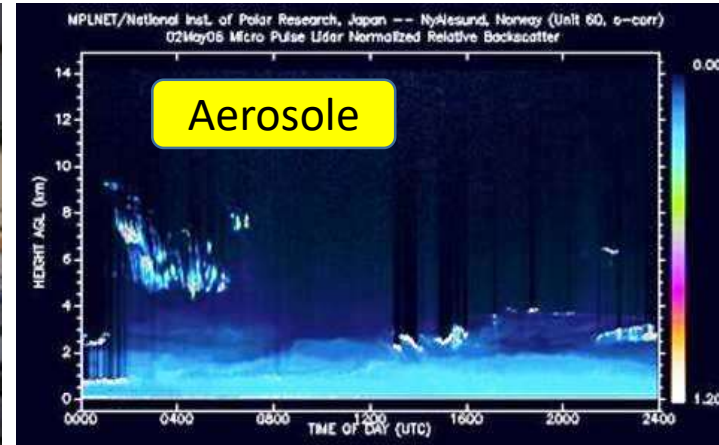
# Data treated by the Polar Environment Data Science Center

## Meteorology and Glaciology Group

Climate change data

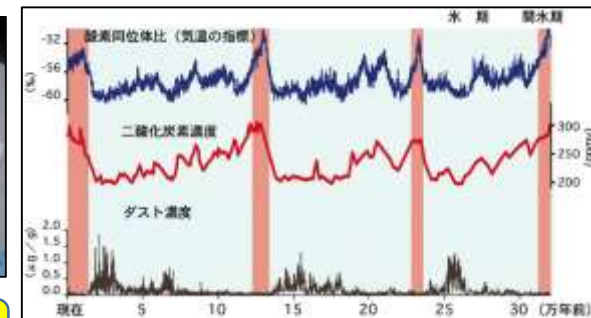


Cloud and weather



Ice Core Data

Dome Fuji Ice core data  
3,035m, 0.72 M year





# Data treated by the Polar Environment Data Science Center

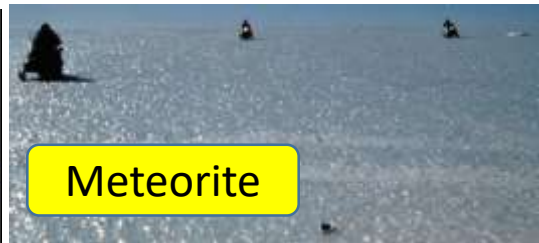
## Geoscience Group

History of solar and earth evolution

	標本番号: 岩石(鉱物)名: 採取地:	NIPR-0027 含コランダム(サファイア)岩 宗谷海岸, スカーレン
	標本番号: 岩石(鉱物)名: 採取地:	 NIPR-0027 含コランダム(サファイア)岩 宗谷海岸, スカーレン
	標本番号: 岩石(鉱物)名: 採取地:	NIPR-0027 含コランダム(サファイア)岩 宗谷海岸, スカーレン



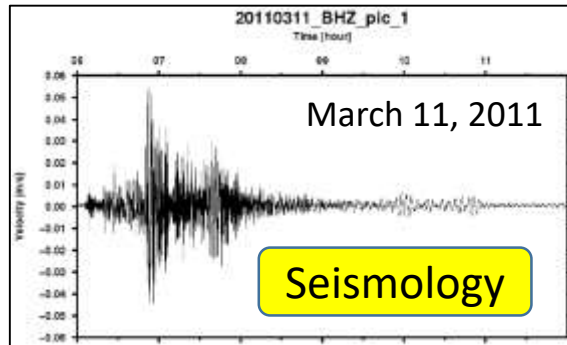
Rock Sample



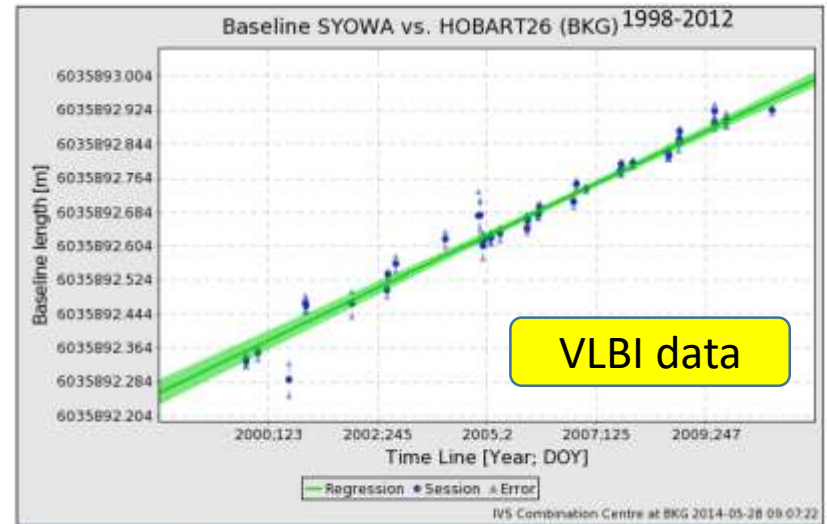
Meteorite



17,000 Meteorites in NIPR



Seismology



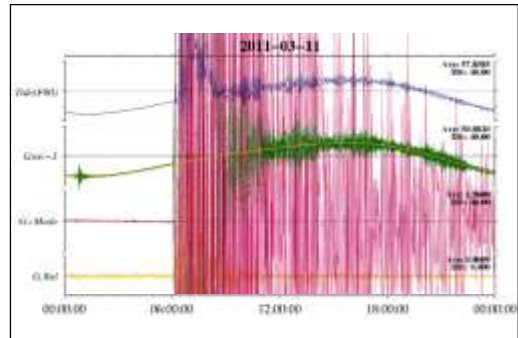
VLBI data

Slope [mm/a]	Y-intercept [m]	WRMS [m]	Sessions	Excluded
52.74 ± 0.99	6035884.922 ± 0.147	0.016	44	1

Distance between Syowa and Hobart



Gravity



## Bioscience Group

Change of ecosystem

海洋動物の行動  
●水境にはばまれた未知の世界  
国立極地研究所生物部門 大塚亮子動物研究グループ

南極域  
SIPENS  
Sea Ice and Penguin Study  
ペンギン  
南極海氷域  
ウロコ調査  
デュモンデュビル

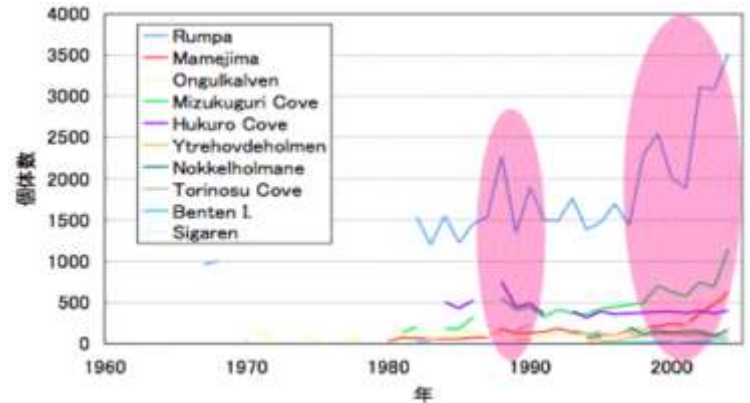
北極域  
ウミガラス  
天売島  
ウトウ  
ウミウ

**Big Animals**

THE PENGUINESS BOOK  
A DATABASE OF DIVING RECORDS



Long-term monitoring of number of Penguin



- 極地生物多様性画像データベース
- 極域植物標本データベース
- 南極昭和基地周辺の藓苔類
- 南極昭和基地周辺の地衣類
- 南極昭和基地周辺の淡水藻類
- 北極・南極域の種子植物
- その他のデータベース
- NEW 冷凍標本データベース
- 極域動物標本データベース

写真公開 (画像をクリックすると拡大写真を見ることができます)

本データベースの一部は独立行政法人日本学術振興会  
平成15~19年度 科学研究費補助金(研究成果公開促進費)の交付を受け公開しております。

## Database of Polar Biodiversity

性画像データベース  
研究グループ

**Land-Dwelling Creature**

**Biological Specimen**

海洋生物 : 計 90

No image

日本南極地域観測隊 基本観測 (海洋物理・化学) データ

観測についての項目

タイトル	日本南極地域観測隊 基本観測 (海洋物理・化学) データ
サブタイトル	
データ説明	日本南極地域観測隊 (JARE)では、1963年より継続した南極大陸の海洋観測を実施してきた。2013年 (JARE54)から、さらに観測を目的としてWorld Ocean Circulation Experiment (WOCE-レベル)、東京海洋大学「南極丸」を有償で要請し110度ラインのモニタリング観測を開始した。なお、本観測は文部科学省の委託事業として実施している。

観測場所

観測内容

観測開始/観測終了

データ取得開始

データ取得終了

データについての項目

データ名	日本南極地域観測隊 基本観測 (海洋物理・化学) データ
データ形式	CSV, XLS
データ取得サンプリング	
観測機器	CTD
サンプリング	水深40度・水深110度の水深・塩分・水素の6項目

公開についての項目

データ公開方法

**Marine Biology**



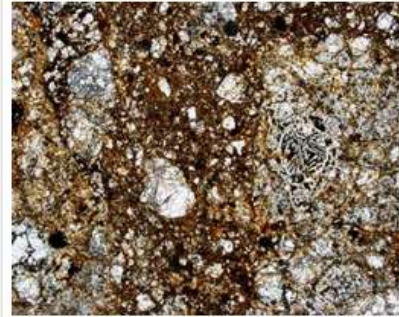
# Data treated by the Polar Environment Data Science Center

## Facilities in NIPR for Higher order analysis of various samples

### Analysis of Biological sample



### Analysis of Meteorite



### Mass analysis of secondary Ion



### Analysis of Ice core sample



# Database System for Polar science

## ① Science Database : <https://scidbase.nipr.ac.jp/>

- Metadata Database for all the data in all the field, Data catalog
- Relationship with International data activities: SCAR/SCADM, NASA/GCMD etc.

## ② ADS (Arctic Data archive System) : <https://ads.nipr.ac.jp/>

- Data system created mainly for Arctic project (GRENE, ArCS)
- Metadata system
- Online visualization and analysis system for Actual data
- Collaboration with international Arctic research community
- Can be extended to the data in both polar regions

## ③ IUGONET data system (Inter-university Upper atmosphere Global Observation NETWORK) : <http://www.iugonet.org/>

- Metadata system
- Created in the Inter-university project among NIPR and 4 Universities
- Search the data stored in each institution in a cross-sectional way
- Display and Analysis software (UDAS: iUgonet Data Analysis Software) for Actual data
- Collaboration with international data activity

# Database System for Polar science



## Science Database



日本語

English



Menu	Metadata List	Related Databases
<a href="#">Home</a>	<a href="#">Space and Upper Atmospheric Sciences</a>	
<a href="#">About Polar Meta Database</a>	<a href="#">Meteorology and Glaciology</a>	
<a href="#">Science Category</a>	<a href="#">Geoscience</a>	
<a href="#">Space and Upper Atmospheric Sciences</a>	<a href="#">Bioscience</a>	
<a href="#">Meteorology and Glaciology</a>	<a href="#">Governmental Institutions</a>	
<a href="#">Geoscience</a>	<a href="#">Project</a>	
<a href="#">Bioscience</a>	<a href="#">Monitoring</a>	
<a href="#">Governmental Institutions</a>	<a href="#">IPY</a>	
<a href="#">Project</a>	<a href="#">Arctic</a>	
<a href="#">Monitoring</a>	<a href="#">Umitakamaru</a>	
<a href="#">IPY</a>	<a href="#">New Metadata</a>	
<a href="#">Arctic</a>		
<a href="#">Umitakamaru</a>		
<a href="#">Data Policy</a>		

<https://scidbase.nipr.ac.jp/>

- Metadata Database for all the data in all the field, Data catalog
- Relationship with International data activities



# Science Database : Database System for Polar science

## Relationship with international data activities

SC-ADM

HOME ABOUT SC-ADM ADMIN DATA CENTRES

Standing Committee on Antarctic Data Management / SCAR

International Polar Year Data and Information Service

IPY Data and Information Service / IPY-DIS

PIC

Polar Information Commons / CODATA

World Data System<sup>\*</sup> CODATA / ICSU

Science Metadata Base (English & Japanese)

<http://scidbase.nipr.ac.jp/>

NIPR Science Database

Home

Navigation List

Related Databases

New Modules

2014/03/13 03 Data Observation

2014/03/11 01 Sea Ice

2014/03/10 00 Satellite Synthetic Aperture Radar Data

2014/03/09 00 Arctic and Antarctic Observations of the State of the Environment (ASOS)

2014/03/08 00 Arctic data of quantitative observation (ARQO)

2014/03/07 00 Arctic observation of a Chinese Station

2014/03/06 00 Continuous GPS observation

2014/03/05 00 Winter Operation of Inland Ice Sheet Platform in LARS CARS

2014/03/04 00 Remote Sensing and Satellite of Sea Ice Data collected from Inland Station, Antarctica in 2004/01

2014/03/03 00 Observation of a concentration of sea surface

ANTARCTIC MASTER DIRECTORY

Antarctic Master Directory / GCMD

Japanese Antarctic Portal (AMD\_JP)

NIPR

Japanese Arctic Portal (Arctic\_JP)

INTERNATIONAL 2007 & 2008 POLAR YEAR

IPY Portal in GCMD

International Data Management Organization / Committee

Exchange of Data & Information


Science Database in Polar Data Center / NIPR

Exchange of Data & Information


NASA / GCMD / Antarctic Master Directory

# Antarctic Master Directory Portal for NIPR

[https://gcmd.gsfc.nasa.gov/KeywordSearch/Home.do?Portal=amd\\_jp&MetadataType=0&lbnode=mdlb5](https://gcmd.gsfc.nasa.gov/KeywordSearch/Home.do?Portal=amd_jp&MetadataType=0&lbnode=mdlb5)
















**NiPR**  
National Institute of Polar Research



A Global Change Master Directory Portal for  
The National Institute of Polar Research, Japan


- About Portals
- GCMD Portal Listings
- Add to AMD
- Search the AMD
- NIPR Website

### Find Data Sets by Topic:

 <p><a href="#">Agriculture</a> soils, ...</p>	 <p><a href="#">Oceans</a> bathymetry/seafloor topography, coastal processes ...</p>
 <p><a href="#">Atmosphere</a> aerosols, air quality...</p>	 <p><a href="#">Paleoclimate</a> ice core records, land records ...</p>
 <p><a href="#">Biological Classification</a> animals/invertebrates, animals/vertebrates...</p>	 <p><a href="#">Solid Earth</a> geodetics, geomagnetism ...</p>
 <p><a href="#">Biosphere</a> ecological dynamics, ecosystems...</p>	 <p><a href="#">Spectral/Engineering</a> infrared wavelengths, microwave ...</p>
 <p><a href="#">Climate Indicators</a> atmospheric/ocean indicators, sun-earth interactions...</p>	 <p><a href="#">Sun-Earth Interactions</a> ionosphere/magnetosphere dynamics, solar activity ...</p>
 <p><a href="#">Cryosphere</a> glaciers/ice sheets, sea ice...</p>	 <p><a href="#">Terrestrial Hydrosphere</a> snow/ice, surface water ...</p>
 <p><a href="#">Human Dimensions</a> environmental impacts, public health...</p>	<p><a href="#">Data Centers</a> - <a href="#">Locations</a> - <a href="#">Instruments/Sensors</a> - <a href="#">Platforms/Sources</a> - <a href="#">Projects</a></p>
 <p><a href="#">Land Surface</a> geomorphic landforms/processes, soils...</p>	

Data Set Text Search

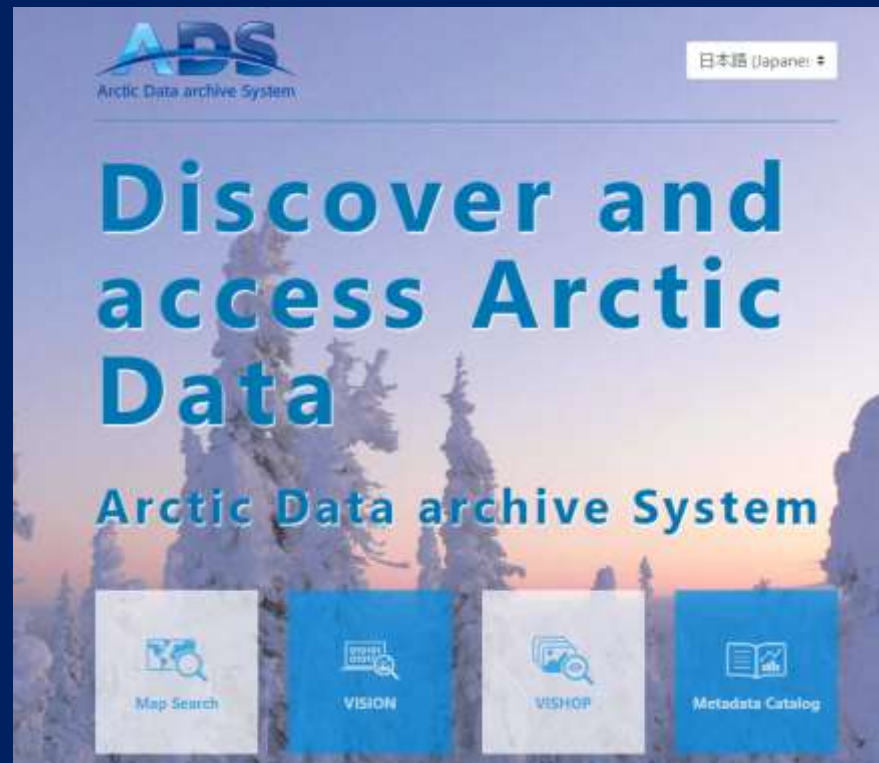
[Go](#)

[Search tips](#) 

Existing Database System handled by the PEDC

## ADS ( Arctic Data archive System)

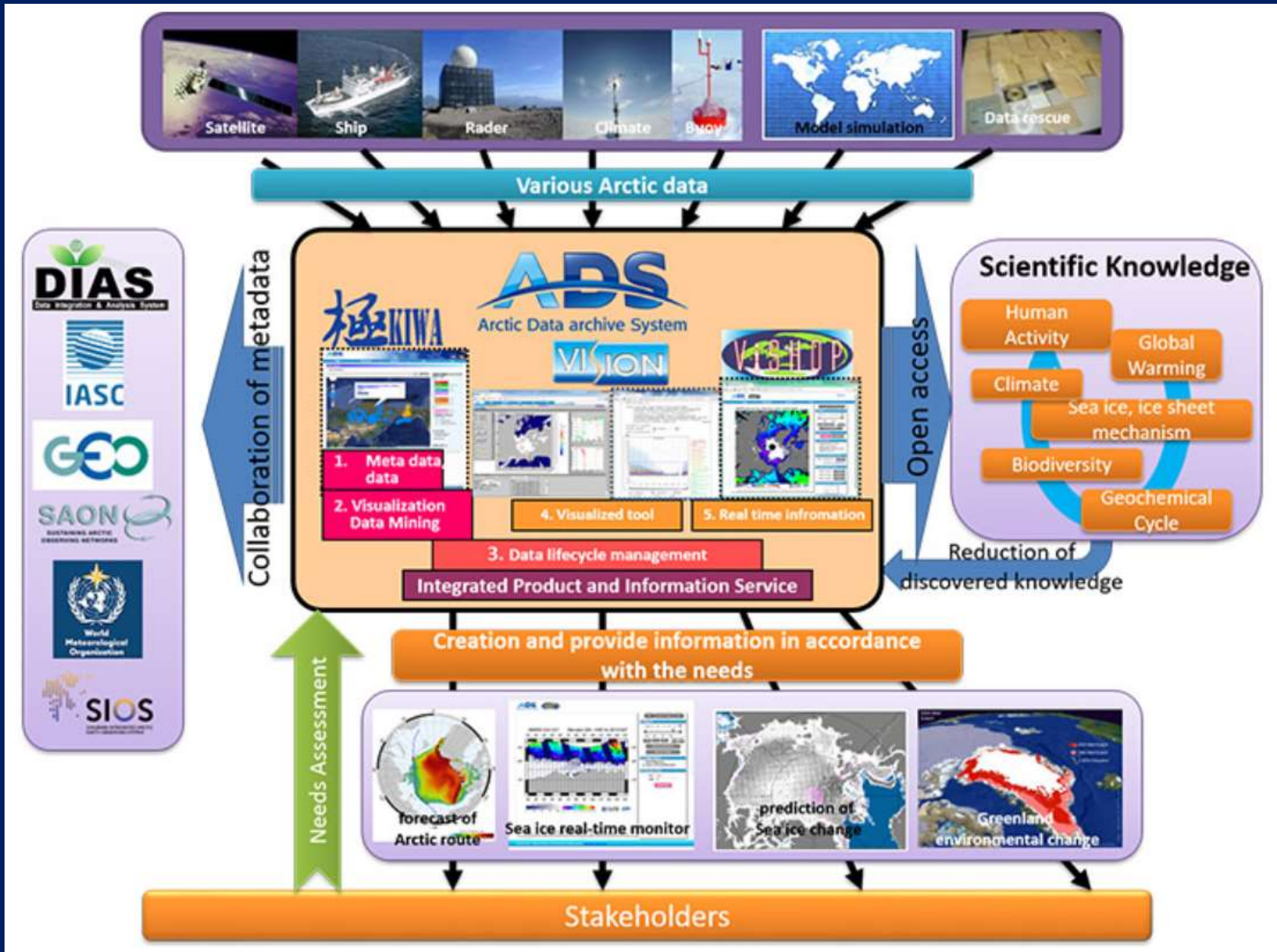
<https://ads.nipr.ac.jp/>



- Data system created mainly for Arctic project (GRENE、ArCS)
- Metadata system
- Online visualization and analysis system for Actual data
- Collaboration with international Arctic research community

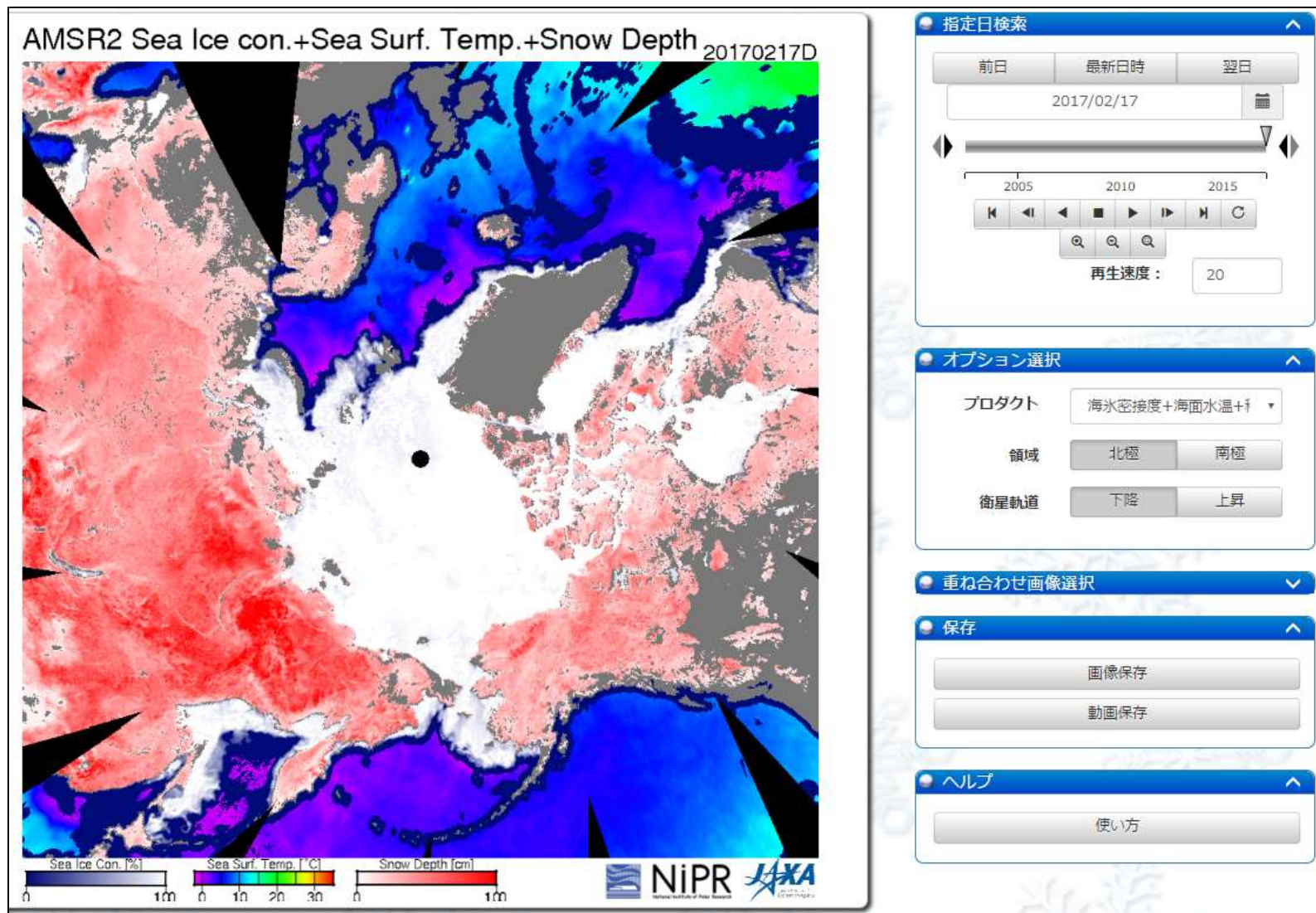


# ADS (Arctic Data archive System)



# ADS (Arctic Data archive System) : Database System for Polar science

## Application for Visualization of Actual data



- Can be extended to the data in both polar regions

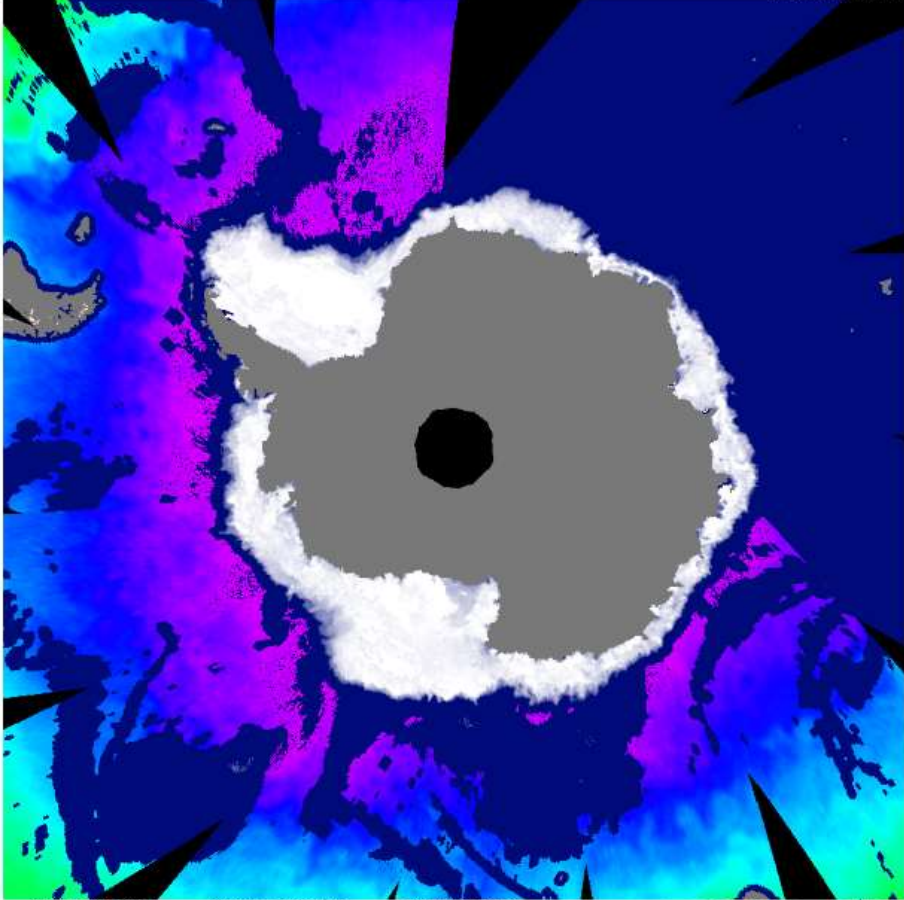


# ADS : Quasi-real-time monitor system : VISHOP

ADS Arctic Data archive System VISHOP English

VISHOP Monitor View Monitor Gallery Extent Graph About VISHOP

### AMSR2 Sea Ice con.+Sea Surf. Temp.+Snow Depth 20190504D



Sea Ice Con. [%] Sea Surf. Temp. [°C] Snow Depth [cm]

NIPR JAXA

#### TIME SELECTOR

Prev. Latest Next

2019/05/04

2005 2010 2015

PLAY SPEED : 20

#### SELECT OPTION

PRODUCT SeaIce+SSTen

REGION Arctic Antarctic

ORBIT Descend Ascend

#### OVERLAY OPTION

#### SAVE

SAVE AS IMAGE

SAVE AS ANIMATION

# Existing Database System of NIPR/PEDSC

## IUGONET data system

Inter-university Upper atmosphere Global Observation NETwork

<http://www.iugonet.org/>

**IUGONET** About Data AnalysisSoftware Workshop/Activity Paper/CaseStudy Rules Contact 日本語

**About IUGONET** Outline Timeline Organization Pamphlet News Letter

The Research Organization of Information and Systems (ROIS),  
National Institute of Polar Research (NIPR)  
Polar Environment Data Science Center  
Space and Upper Atmospheric Sciences Group

Kanazawa University

Kyoto University  
Research Institute for Sustainable Humanosphere (RISH)  
Data Analysis Center for Geomagnetism  
and Space Magnetism, Graduate School of Science  
(DACGSM, WDC for Geomagnetism, Kyoto)  
Kwasan and Hida Observatories, Graduate School of Science

Kyushu University  
International Center for Space Weather Science  
and Education (ICSWSE)

Hokkaido University

Tohoku University  
Planetary Plasma and Atmospheric Research Center,  
Graduate School of Science (PPARC)

National Institute of Information and Communications Technology (NICT)

Japan Meteorological Agency (JMA)

National Astronomical Observatory of Japan (NAOJ)

The Japan Aerospace Exploration Agency (JAXA)

Nagoya University  
Institute for Space-Earth Environmental Research (ISEE)

White: Host Organization  
Yellow: Cooperators

- Metadata system
- Created in the Inter-university project among NIPR and 4 Universities
- Display and Analysis software (UDAS : iUgonet Data Analysis Software) for Actual data
- Collaboration with international data activity

# Database System for Polar science

## IUGONET data system

Inter-university Upper atmosphere Global Observation NETwork

IUGONET Web Service  
Upper Atmosphere xJDL x Web Technology  
Type-A

Inter-University Upper Atmosphere Global Observation NETWork

UDAS web Available! | Rules of the Road | About Type-A |

### IUGONET Data Set

[LIST](#) [MAP](#)

Instrument/Project	Observed Region			
Satellite:				
<input type="checkbox"/> <a href="#">AKEBONO</a>	<input type="checkbox"/> <a href="#">CHAMP</a>	<input type="checkbox"/> <a href="#">COSMIC</a>		
Ground-Based:				
<input type="checkbox"/> <a href="#">SMART (Telescope)</a>	<input type="checkbox"/> <a href="#">DST (Telescope)</a>	<input type="checkbox"/> <a href="#">FMT (Telescope)</a>	<input type="checkbox"/> <a href="#">Refractor (Telescope)</a>	<input type="checkbox"/> <a href="#">Muon (Telescope)</a>
<input type="checkbox"/> <a href="#">Geomagnetic Indices</a>	<input type="checkbox"/> <a href="#">WDC Geomag., Kyoto</a>	<input type="checkbox"/> <a href="#">Geomag., Kakioka</a>	<input type="checkbox"/> <a href="#">MAGDAS/CPMN</a>	<input type="checkbox"/> <a href="#">MM210</a>
<input type="checkbox"/> <a href="#">Induction</a>	<input type="checkbox"/> <a href="#">Magnetometer</a>	<input type="checkbox"/> <a href="#">SuperDARN</a>	<input type="checkbox"/> <a href="#">EISCAT</a>	<input type="checkbox"/> <a href="#">Imager</a>
<input type="checkbox"/> <a href="#">PWING</a>	<input type="checkbox"/> <a href="#">OMTI</a>	<input type="checkbox"/> <a href="#">Lidar</a>	<input type="checkbox"/> <a href="#">Ionosonde</a>	<input type="checkbox"/> <a href="#">Riometer</a>
<input type="checkbox"/> <a href="#">VLF/ELF</a>	<input type="checkbox"/> <a href="#">MU Radar</a>	<input type="checkbox"/> <a href="#">EA Radar</a>	<input type="checkbox"/> <a href="#">MF Radar</a>	<input type="checkbox"/> <a href="#">MW Radar</a>
<input type="checkbox"/> <a href="#">VHF Radar</a>	<input type="checkbox"/> <a href="#">GPS Receiver</a>	<input type="checkbox"/> <a href="#">AWS</a>	<input type="checkbox"/> <a href="#">BL/LT/WP Radar</a>	<input type="checkbox"/> <a href="#">Radiosonde</a>
<input type="checkbox"/> <a href="#">X-Band Radar</a>	<input type="checkbox"/> <a href="#">Others</a>			

Keyword:

Timespan:  To  [Set Detail](#)

- Metadata system
- Created in the Inter-university project among NIPR and 4 Universities
- Display and Analysis software (UDAS: iUgonet Data Analysis Software) for Actual data
- Collaboration with international data activity



# IUGONET: Metadata & Data Quick Look system

IUGONET Web Service  
Upper Atmosphere x JDL x Web Technology

Inter-University Upper Atmosphere Global Observation NETWORK

**Type-A**

UDAS web Available! | [Rules of the Road](#) | [About Type-A](#)

## IUGONET DataSet

[LIST](#) [MAP](#)

Instrument/Project	Observed Region	ERG Campaign
--------------------	-----------------	--------------

### Information

Quick Look Images about Geomagnetic Data (WDC Kyoto), 26 Nov. 2018.

## Geomagnetic Data

Quick-Look images about **437** Geomagnetic Observatories since **1883** year are now available, using IUGONET Data Analysis Software **UDAS**.

**WDC Kyoto**  
- World Data Center for Geomagnetism -

## ERG (Arase) and Ground-Based Campaign in March - April 2017

1. Husafell (Iceland), PWING/PSA
2. Athabasca (Canada), PWING/PSA
3. Tromso (Norway), EISCAT
4. Tromso (Norway), EISCAT
5. Gakona (Alaska), PWING/PSA
6. Tromso (Norway), EISCAT
7. Gakona (Alaska), PWING/PSA
8. Tromso (Norway), EISCAT

## IUGONET x PWING

### PWING Data Come

Data information and Quick-Look images are now available

- All-sky airglow/aurora camera
- Loop antenna
- Induction Magnetometer
- Riometer
- EMCCD camera

# IUGONET: UDAS: Data analysis software for SPEDAS

IUGONET

About

Data

AnalysisSoftware

Workshop/Activity

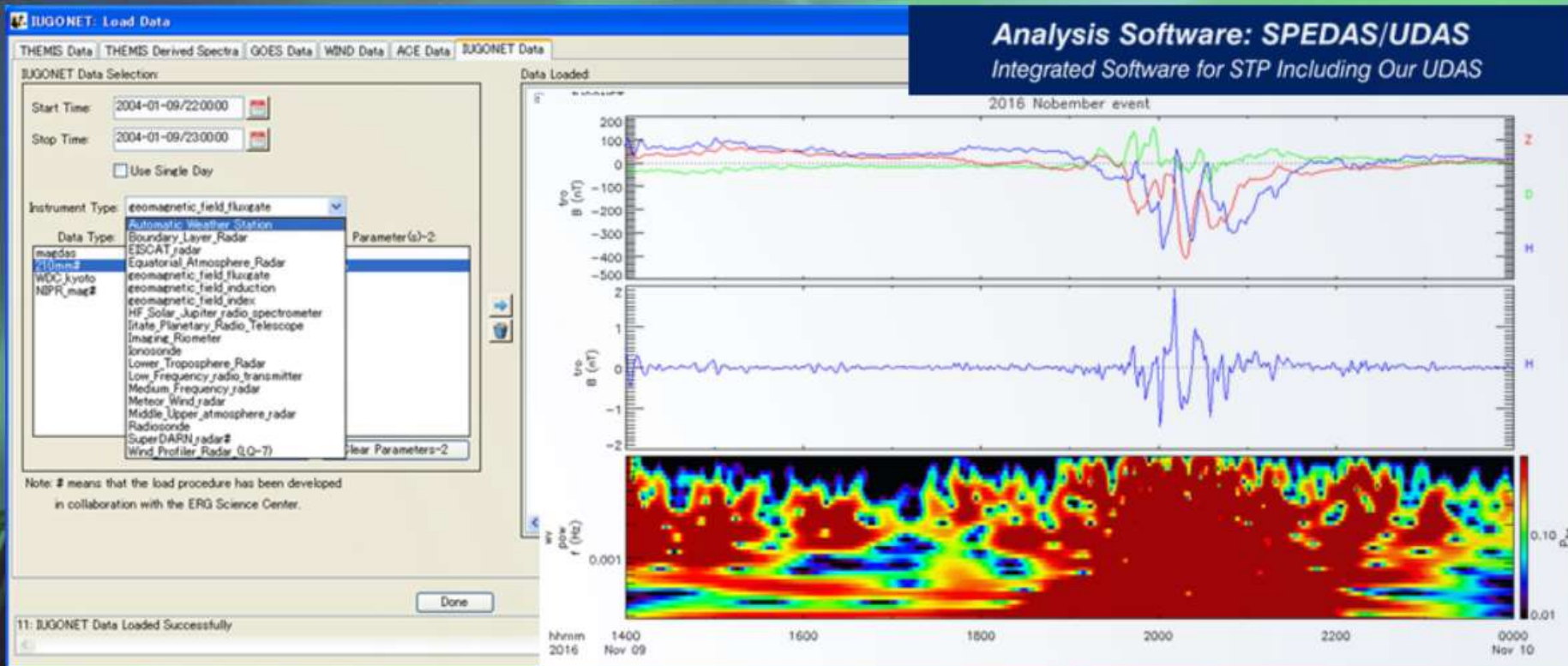
Paper/CaseStudy

Rules

Contact

日本語

## Analysis Software



## Data Analysis Software: SPEDAS

SPEDAS (Space Physics Environment Data Analysis Software) is a set of IDL (Interactive Data Language) libraries that provides an integrated analysis platform for Solar-Terrestrial Physics.

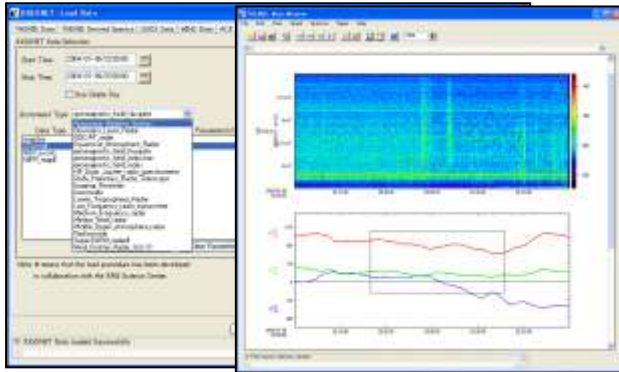


# IUGONET : Database System for Polar science

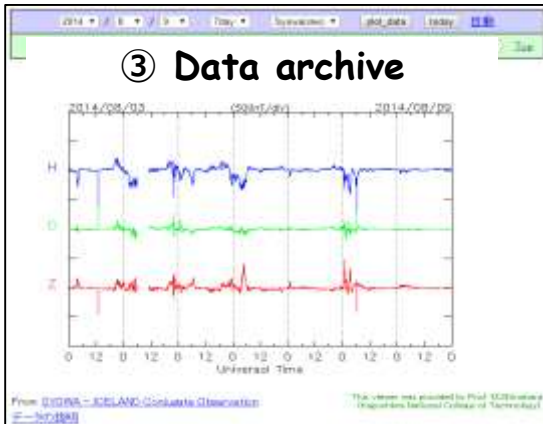
① Metadata database



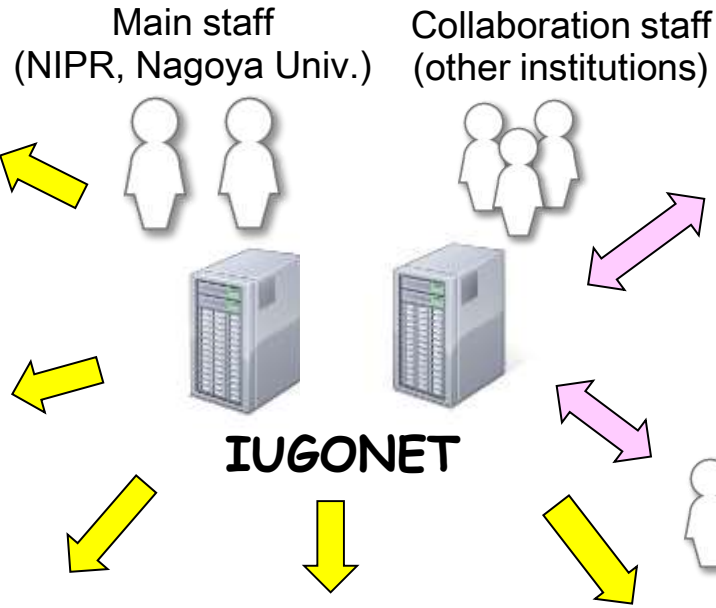
② Analysis software (UDAS)



③ Data archive



## IUGONET activity



④ IUGONET Web site



⑦ International collaboration



- ◆ U.S.A. : THEMIS, SPASE  
NASA/Virtual Observatory
- ◆ Europe : ESPAS
- ◆ Asia-Africa : related community

⑥ Collaboraion in Japan

⑤ Workshop, school



# Polar science data : Current problem

## ■ Data in each research field :

- There are no unified database to overlook all the data in all the research fields of polar science.
- Status of archiving and opening of the data in each field is various and depends on the status of human, hardware, and software resources in each group.

## ■ Database System :

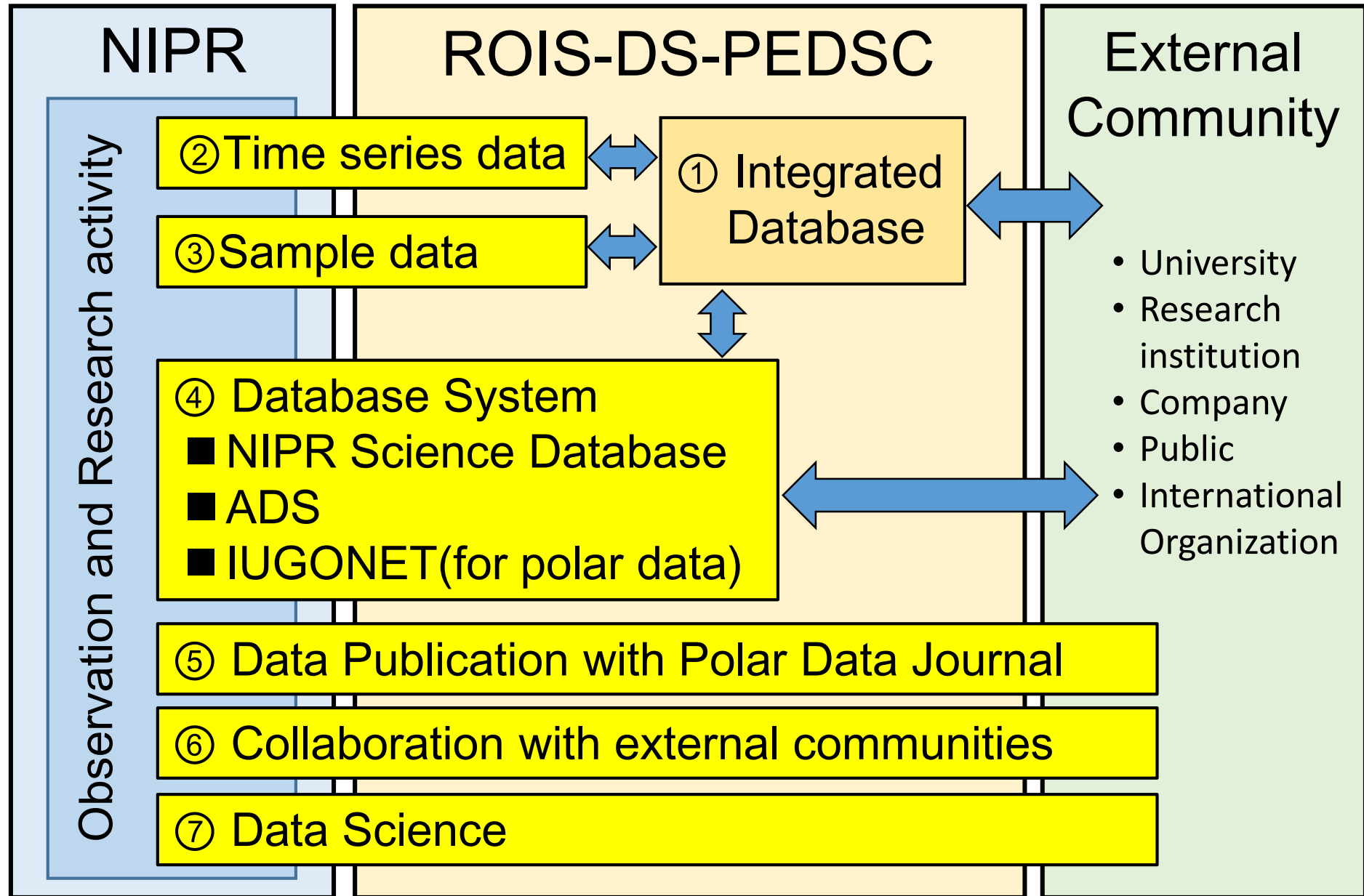
- There are no unified database system to search, visualize, and analyze all the data in all the research fields.

# Task of PEDSC

1	To construct a <b>Integrated database</b> system to cover all the data in all the research fields of polar science.
2	To make the <b>existing database systems</b> ( <b>Science Database, ADS, IUGONET</b> ) upgraded and interoperable with each other.
3	To promote archiving, opening, and sharing of the <b>time series digital data</b> in each research field.
4	To promote archiving, opening, and sharing of the <b>sample data</b> in each research field.
5	To promote publication of the scientific data, using the <b>Polar Data Journal</b> of NIPR.
6	To promote <b>collaboration</b> with external communities (universities, other institutions, international communities).
7	To promote <b>data science</b> using the database and database system.



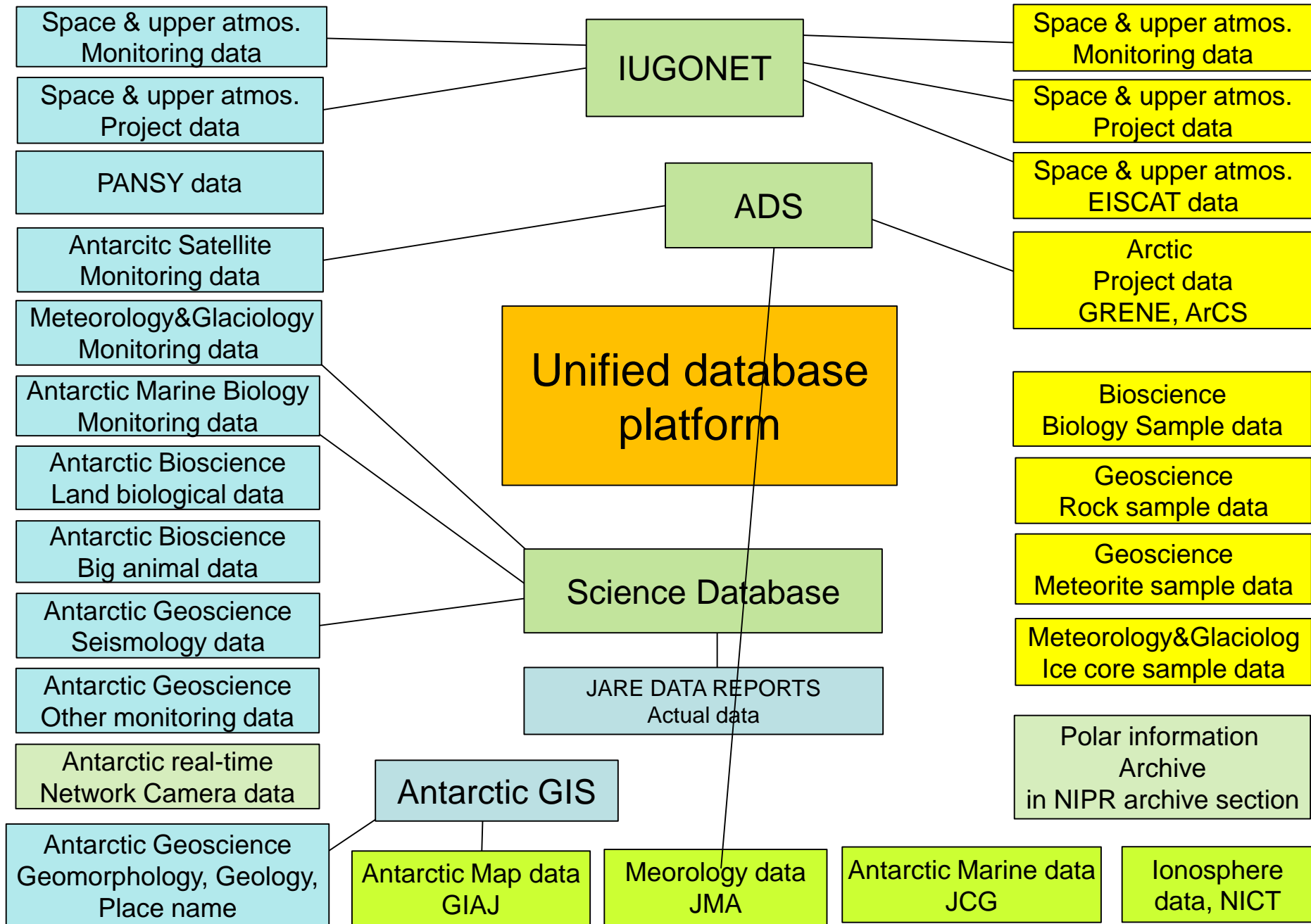
# Task of PEDSC



# Polar Environment Data Science Center: Annual plan

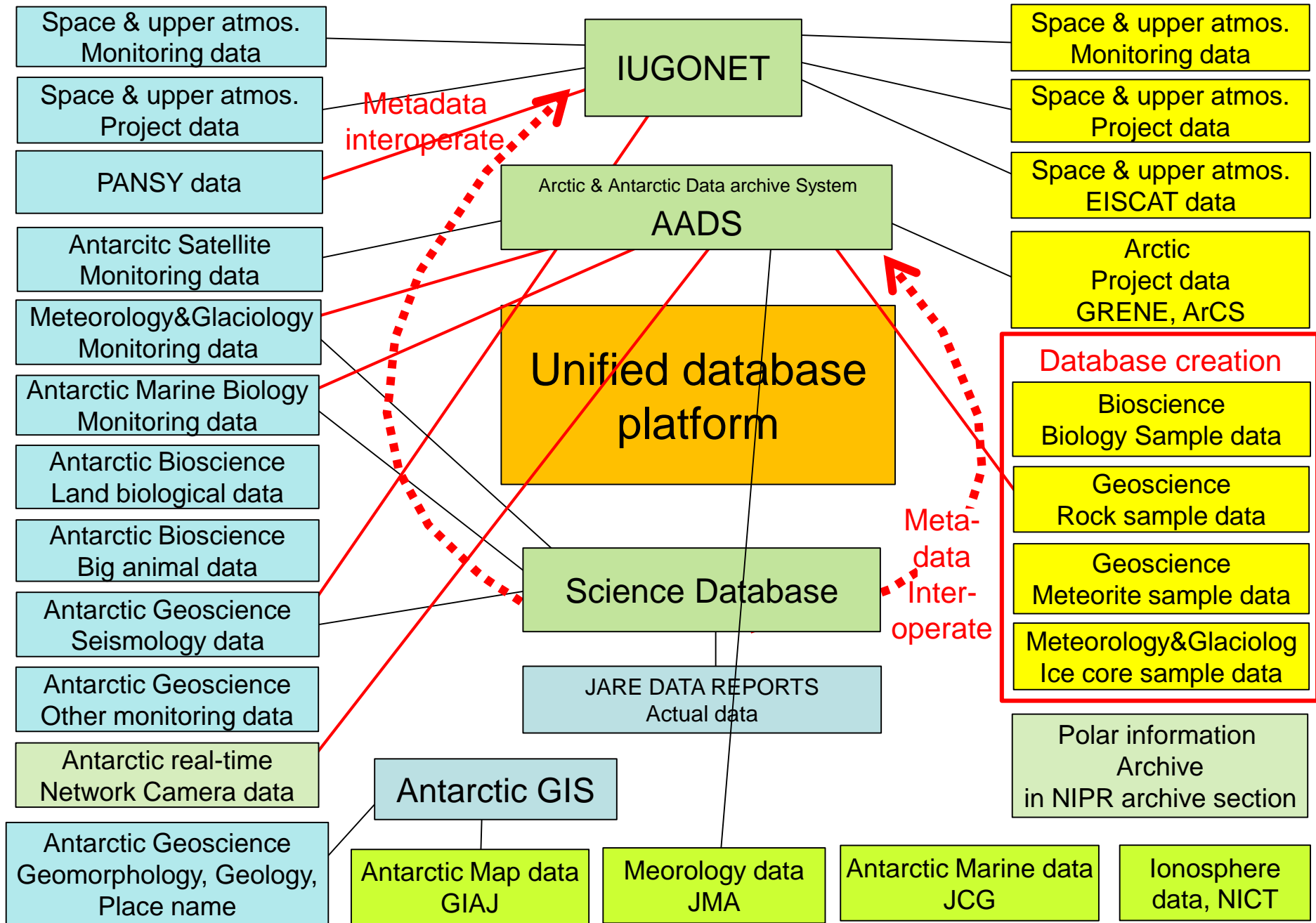
	Item	H29 (2017)	H30 (2018)	H31 (2019)	H32 (2020)	H33 (2021)	
1	Integrated Database		Development		Operation		
2	Database system upgrade and interoperate						
2.1	ADS	Continuous operation					
	Upgrade to the system for both polar regions		Development		Operation		
2.2	IUGONET (for polar data)	Continuous operation					
	System upgrade	Occasionally					
	Apply to other research fields	Occasionally					
2.3	NIPR Science Database	Continuous operation					
	Upgrade to Unified Database		Development		Operation		
	Interoperate with ADS		Development		Operation		
	Interoperate with IUGONET		Development		Operation		
3	Database creation of time series data in each research field						
	PANSY	Continuous					
	EISCAT	Continuous					
	Space and Upper Atmospheric Sciences data	Continuous					
	Geoscience data	Continuous					
	Meteorology and Glaciology data		Development		Operation		
4	Database creation of sample data in each research field						
	Rock sample		Development		Operation		
	Biological sample			Development	Operation		
	Meteorite				Development	Operation	
	Snow and Ice					Development	Operation
5	Data Publication with the Polar Data Journal	Continuous					
6	Collaboration with external communities	Continuous					
	International meeting						
7	Data science and research activities with external scientists	Continuous					

# Current status of Data processing of PEDSC





# Data processing plan of PEDSC



# PEDSC: Activities in FY2017

- Move to the new Data Science building in July.
- Making the future activity plan during FY2017-2021.



Research bldg. (NIPR, ISM, NIJL)



# PEDSC: Activities in FY2017

## ① Integrated Database:

- System design started.

## ② Operation of database systems:

- **Science Database:** Registration of new data: JARE data (Zooplankton data, CO2 data at Syowa Station); Interoperability with IUGONET and ADS: Consideration on the metadata format.
- **ADS:**
  - Database for the Satellite monitoring data received at Syowa Station: Consideration of data processing schedule; Start of construction of the data publishing platform.
  - Data viewing system for the Outdoor Web camera data at Syowa Station: System construction.
  - Satellite data processing for supporting the activity of the JARE-59: Processing the sea ice distribution data around Syowa Station.
  - Outreach activity: Booth exhibition at JpGU2017 (20-25 May, Makuhari, Chiba).
  - Development of the AADS (Antarctic & Arctic Data archive System) system: Start of the system design
- **IUGONET:**
  - System upgrade: Quick Look function; Web-base interactive plotting function.
  - Data processing: Data from related projects (ERG (Arase) satellite, PWING, PsA, PSTEP, etc.); Creation of metadata and CDF data.
  - Outreach activity: Lecture: at JpGU (25 May), in Nigeria (14 Sep.), Indonesia (9 March, 2018); Science meeting: at NICT (13-15, Sep.); Booth exhibition: at JpGU (20-25 May), WDS Asia-Oceania Conference (27-29 Sep.).

## ③ Processing of Time series data:

- **PANSY data:**
  - Data processing: Analysis of new physical value (turbulence energy dissipation rate) with a new algorithm.
  - Real time data processing system: System upgrade for the ionospheric echo autocorrelation analysis process.
  - Data management and publishing system: System design for the new database system.
  - Data publishing: Consideration of the DOI assignment and metadata creation for the IUGONET for the already published data.
- **Seismological data:** continued: Processing of the JARE data, Providing the data to the International Seismological Centre (ISC), Construction of a real time monitor system
- **Auroral data:** continued: Processing the data from Antarctic stations (Syowa, South Pole, McMurdo) and arctic observatories (Iceland, Tromso, Longyearbyen, etc.) obtained in FY2017. Processing the old auroral movie data at Syowa Station.

## ④ Processing of Sample data:

- **Rock sample:** Database for the Rock sampled in Antarctica: Start of construction, System design of the database.

## ⑤ Data publication: Polar Data Journal: publish 1, under review 4, reject 1 (as of 31 March, 2018)

## ⑥ Collaboration with external communities :

- International workshop hosted:「International Workshop on Sharing, Citation and Publication of Scientific Data across Disciplines」(Dec. 5-7, Tachikawa, Attendance: 73 (overseas 8 from 5 countries))
- Join the regular SCADM (Standing Committee on Antarctic Data Management) meeting (Sep.16-18, Montreal)

## ⑦ ROIS-DS-JOINT research collaboration program:

- 3 research subjects relating with PEDSC were accepted.

## ■ Others: Participate in the “Committee on data management” in NIPR



# PEDSC: Activities in FY2018

## ① Integrated Database:

- System design and system construction

## ② Operation of database systems:

- **Science Database:** Registration of data: JARE oceanography database, Teleseismic traveltime and hypocentral records, Zooplankton samples (UM10-04 cruise), CO2 concentration; DOI assignment service start.
- **ADS:**
  - Satellite monitoring data received at Syowa Station: Construction of the data publishing platform.
  - Satellite data processing for supporting the activity of the JARE: Processing the sea ice distribution data around Syowa Station.
  - Historical data archive: Construction of the database
  - Outreach activity: Booth exhibition at JpGU2018 (20-24 May, Makuhari, Chiba).
  - Development of the AADS (Antarctic & Arctic Data archive System) system: continued
- **IUGONET:**
  - Operation, Data processing: continued
  - Outreach activity: Lecture: at JpGU (24 May), in Malaysia (7 Aug.), at NICT (13 Sep.), at PRIC (Shanghai, China) (31 Jan.,2019), in Indonesia (18-22 Mar.,2019); Science meeting: at NICT (14, Sep.); Booth exhibition: at JpGU2018 (20-24 May)..

## ③ Processing of Time series data:

- PANSY data: Improvement of Real time data processing system and Data management and publishing system.
- Seismological data: continued: Processing of the JARE data, Providing the data to the International Seismological Centre (ISC), Real time monitor
- Auroral data: continued: Processing the data from Antarctic stations (Syowa, South Pole, McMurdo) and arctic observatories (Iceland, Tromso, Longyearbyen, etc.) obtained in FY2018.
- SuperDARN data: Database & WEB system maintenance and operation
- JARE data: Create Data treatment policy & Meta data sheet in collaboration with Center for Antarctic Programs in NIPR. PEDSC is assigned as the center to handle the data obtained in the NIPR-related JARE activity from JARE-60.

## ④ Processing of Sample data:

- Rock sample: Construction of the database system 「Rock sample repository」, data publishing start.
- Ice core sample: Registration of published 14 data to ADS; Making the data visualization site for the CFA (Continuous Flow Analysis) data

## ⑤ Data publication:

- Polar Data Journal: publish 6, after review 1, under review 3, reject 1 (as of 31 March, 2019)

## ⑥ Collaboration with external communities:

- International workshop hosted:「ROIS-DS International Workshop on Data Science - Present & Future of Open Data & Open Science –」 (Nov. 12-15, Mishima, Attendance: 120 (overseas 10 from 7 countries))
- Join the regular SCADM(Standing Committee on Antarctic Data Management) meeting (June)

## ⑦ ROIS-DS-JOINT research collaboration program:

- 8 research subjects relating with PEDSC were accepted.

## ■ Others:

- Prepare a Web site for public for the Open campus day of NIPR on 4 Aug., 2018.

# PEDSC: Activities in FY2019

## ① Integrated Database:

- Registration of metadata for upper atmosphere, meteorite, biological sample, seismology, infrasound data
- Open the database system internally to the metadata provider.

## ② Operation of database systems:

- **Science Database:** Registration of data continued.

### - ADS:

- Collect and register the metadata of the JARE (Japanese Antarctic Research Expedition) data.
- Satellite data processing for supporting the activity of the JARE: Processing the sea ice distribution data around Syowa Station.
- JARE activity information display system: Web site construction, and publicly open
- NIPR historical data archive 「NIPR digital archive」: system construction finished, and publicly open
- Registration and DOI assignment of the data published in the Polar Data Journal
- Outreach activity: Booth exhibition at JpGU2019 (26-30 May, Makuhari, Chiba).
- Development of the AADS (Antarctic & Arctic Data archive System) system: continued

### - IUGONET:

- Operation, Data processing: continued
- Outreach activity: Lecture: 29 May, 12-13 Sep.; Booth exhibition: at JpGU2019 (26-30 May).

## ③ Processing of Time series data:

- PANSY data: Improvement of Real time data processing system and Data management system.
- Seismological data: continued: Processing of the JARE data, Providing the data to the International Seismological Centre (ISC), Real time monitor
- Auroral data: continued: Processing the data from Antarctic stations (Syowa, South Pole, McMurdo) and arctic observatories (Iceland, Tromso, Longyearbyen, etc.) obtained in FY2019. Construct a Web site 「Auroral Quicklook Viewer of NIPR ground-based network」 and open for public: <http://133.57.20.115/www/AQVN/>
- SuperDARN data: Database & WEB system maintenance and operation

## ④ Processing of Sample data:

- Rock sample: operation continued for the 「Rock sample repository」
- Meteorite sample: creation of metadata and registration in the Integrated Database.
- Biological sample: creation of metadata for the catalogue data and registration in the Integrated Database.

## ⑤ Data publication:

- Polar Data Journal: publish 12, under review 2, reject 1 (as of 31 March, 2020)

## ⑥ Collaboration with external communities:

- Join international conference 「World Data System Asia-Oceania Conference 2019」 (May, Beijing), 「Polar Data Forum III」 (Nov., Helsinki)
- Join the regular SCADM (Standing Committee on Antarctic Data Management) meeting (May)

## ⑦ ROIS-DS-JOINT research collaboration program:

- 9 research subjects relating with PEDSC were accepted.

- **Others:** Construct and open a Web site for public: <http://polaris.nipr.ac.jp/~pedsc/pedsc-ippan/>

# PEDSC: Activities in FY2020

## ① Integrated Database:

- Improvement of the system. Promotion of the metadata creation and making CDF data for the data in various research field.
- Start of the try to collaborate with the “next generation JAIRO Cloud demonstration experiment” of NII (National Institute of Informatics).

## ② Operation of database systems:

- **Science Database**: Registration of data continued. Registered data number: 390. DOI assignment: 4
- **ADS**: Collect and registrate the metadata of the JARE (Japanese Antarctic Research Expedition) data. Registration and DOI assignment of the data published in the Polar Data Journal
- **IUGONET**: Operation of Web service 「IUGONET Type-A」 continued.; Data processing continued for the data of Hokkaido Univ., Tohoku Univ., NIPR, Nagoya Univ., and Kyoto Univ.; Outreach activity: Lecture in May, June, March.; Science meeting in September.

## ③ Processing of Time series data:

- PANSY data: Improvement of observation control software and real time data processing software; Improvement of data distribution system; DOI assignment to PANSY data with the Science Database.
- Seismological data: continued: Processing of the JARE data, Providing the data to the International Seismological Centre (ISC), Real time monitor
- Auroral data: continued: Processing the data from Antarctic stations (Syowa, South Pole, McMurdo) and arctic observatories (Iceland, Tromso, Longyearbyen, etc.) obtained in FY2020. Publication of the data with the Web site 「Auroral Quicklook Viewer of NIPR ground-based network」
- SuperDARN data: Database & WEB system maintenance and operation
- Cosmic ray data: Improvement of the WEB site to open the data by using the ROIS-DS-JOINT program.

## ④ Processing of Sample data:

- Rock sample: operation continued for the 「Rock sample repository」
- Meteorite sample: creation of metadata and registration in the Integrated Database.
- Biological sample: creation of metadata for the catalogue data and registration in the Integrated Database.

## ⑤ Data publication:

- Polar Data Journal: publish 24, after review 3, under review 1, reject 1 (as of 31 March, 2021)

## ⑥ Collaboration with external communities :

- International symposium hosted: 「International Symposium “Global Collaboration on Data beyond Disciplines” 」(online, Sep.23-25, 2020, [https://ds.rois.ac.jp/article/dsws\\_2020/](https://ds.rois.ac.jp/article/dsws_2020/), Attendance: 412 from 46 countries)
- Join the regular SCADM (Standing Committee on Antarctic Data Management) meeting (online)

## ⑦ ROIS-DS-JOINT research collaboration program:

- 7 research subjects relating with PEDSC were accepted.



# PEDSC: Activities in FY2021

## ① Integrated Database :

- A newly joined project researcher is in charge of the development of the Multidisciplinary Database system called as “AMIDER”.
- Confirmed and investigated the status of the system which had been developed so far.
- Considered an improvement of the user interface of the system and ordered it to a contract company.
- Promotion of the metadata creation and making CDF data for the data in various research field.
- Continued the collaboration with the “next generation JAIRO Cloud demonstration experiment” of NII (National Institute of Informatics).

## ② Operation of database systems :

- **Science Database:** Registration of data continued. Registered data number: 394.
- **ADS:** Collect and registrate the metadata of the JARE (Japanese Antarctic Research Expedition) data. Registration and DOI assignment of the data published in the Polar Data Journal
- **IUGONET:** Operation of Web service 「IUGONET Type-A」 continued.; Data processing continued for the data of Hokkaido Univ., Tohoku Univ., NIPR, Nagoya Univ., and Kyoto Univ.; Outreach activity: Lectures in June, September.; Science meeting in September; Promotion of arrangement with the SPASE consortium in the U.S.A. on registration of the IUGONET metadata to the Heliophysics Data Portal. Attended the meeting of the International Heliophysics Data Environment Alliance (IHDEA).

## ③ Processing of Time series data :

- PANSY data: Continued operation and maintenance of data publication and distribution servers; Development of data archive and analysis system for the meteor wind observation with PANSY.
- Seismological data: continued: Processing of the JARE data, Providing the data to the International Seismological Centre (ISC), Real time monitor
- Auroral data: continued: Processing the data from Antarctic stations (Syowa, South Pole, McMurdo) and arctic observatories (Iceland, Tromso, Longyearbyen, etc.) obtained in FY2021. Publication of the data with the Web site 「Auroral Quicklook Viewer of NIPR ground-based network」
- SuperDARN data: Database & WEB system maintenance and operation
- Cosmic ray data: continued Improvement of the WEB site to open the data by using the ROIS-DS-JOINT program.
- EISCAT data: Created CDF files and opened them from WEB site for the data obtained in EISCAT special experiments and campaign observations with ERG satellite.

## ④ Processing of Sample data :

- Rock sample: operation continued for the 「Rock sample repository」
- Meteorite sample: creation of metadata and registration in the Integrated Database.
- Biological sample: creation of metadata for the catalogue data and registration in the Integrated Database.

## ⑤ Data publication:

- Polar Data Journal: publish 33, after review 1, under review 2, reject 1 (as of 31 March, 2022)
- Special issue of the CODATA Data Science Journal: Joined as a guest editor from PEDSC for the papers on the COVID-19 session in the international workshop held in September, 2020. Publish: 6 papers.

## ⑥ Collaboration with external communities :

- Attended International symposium: 「Polar Data Forum IV」(online, Sep.20-24, 2022, Attendance: 436 from 55 countries)
- Join the monthly regular SCADM(Standing Committee on Antarctic Data Management) meeting (online)

## ⑦ ROIS-DS-JOINT research collaboration program :

- 8 research subjects relating with PEDSC were accepted.

# PEDSC: Activities in FY2017

## ■ ROIS-DS-JOINT: Collaboration Program of ROIS-DS

No	Category	Name	Affiliation	Title	PEDSC contact	New/continuous	Budget 1000yen
1	research	Yasuyuki Minamiyama	NIPR	Building “digital archive” system for utilizing historical pictures about Antarctic and Arctic regions	Yabuki	new	900
2	research	Shin Suzuki	Aichi Univ.	Data publishing framework for multi-station airglow imaging with IUGONET system	Tanaka	new	308
3	research	Tomokazu Hokada	NIPR	Development of Antarctic rock samples repository	Kanao	new	564

# PEDSC: Activities in FY2018

## ■ ROIS-DS-JOINT: Collaboration Program of ROIS-DS

No	Category	Name	Affiliation	Title	PEDSC contact	New/co ntinuous	Budget 1000yen
1	research	Keisuke Hosokawa	Univ. of Electro-Commu.	Database of optical flow using data from Longyearbyen and Iceland	Tanaka	New	742
2	research	Sotaro Baba	Univ. of The Ryukyus	Development of Antarctic rock samples repository	Yabuki	Cont.	960
3	research	Masashi Kamogawa	Tokyo Gakugei Univ.	Development of database and data analysis system of ground-based atmospheric electric field observation data for global electrical circuit study	Kadokura	New	920
4	research	Chihiro Kato	Shinshu Univ.	Development of a real time database system for Cosmic Ray data observed at Syowa Station	Kadokura	New	920
5	research	Masa-yuki Yamamoto	Kochi Univ. of Technology	Construction of archiving/information disclosure system for infrasound observation in Antarctica	Kanao	New	928
6	research	Yusuke Ebihara	Kyoto Univ.	Development of integrated database using various kinds of optical data obtained in South pole and McMurdo stations	Kadokura	New	860
7	meeting	Yasuhiro Murayama	NICT	"Science and Data" --- In search of future directions of Open Science and Data-driven Science	Tanaka	New	200
8	research	Taguchi Satoshi	Kyoto Univ.	Redundant data server system for the service of the real-time information of geomagnetic field data and indices	Tanaka	New	898



# PEDSC: Activities in FY2019

## ■ ROIS-DS-JOINT: Collaboration Program of ROIS-DS

No	Category	Name	Affiliation	Title	PEDSC contact	New/continuous	Budget 1000yen
1	research	Chihiro Kato	Shinshu Univ.	Development of a real time database system for Cosmic Ray data observed at Syowa Station	Kadokura	Cont.	800
2	research	Mitsuteru Sao	Hokkaido Univ.	Sharing and Visualization of 1-100Hz ELF Waveform Data Obtained at Syowa Station	Tanaka	New	656
3	research	Kazue Suzuk	Hosei Univ.	Method for detection of the snowy cloud and estimation of snowfalling amount based on NOAA/AVHRR images	Yabuki	New	698
4	research	Sotaro Baba	Univ. of The Ryukyus	Development of Antarctic rock samples repository	Yabuki	Cont.	686
5	research	Masa-yuki Yamamoto	Kochi Univ. of Technology	Construction of archiving/information disclosure system for infrasound observation in Antarctica	Kanao	Cont.	799
6	research	Seiji Tsuboi	JAMSTEC	Application of machine learning to hypocenter determination for Seismic observation network in Showa base	Kanao	New	800
7	research	Masayuki Yamamoto	NICT	Development of a signal processing method for improving quality of wind and turbulence products obtained by atmospheric radars	Nishimura	New	897
8	research	Norio Umemura	Nagoya Univ.	Research for participatory consortium for accelerating data-driven science	Tanaka	New	678
9	meeting	Kazunari Nawa	AIST	Problems on mutual use and integrated analysis of solid earth science data	Kanao	New	152

# PEDSC: Activities in FY2020

## ■ ROIS-DS-JOINT: Collaboration Program of ROIS-DS

No	Category	Name	Affiliation	Title	PEDSC contact	New/con tinuous	Budget 1000yen
1	research	Konosuke Sugiura	Toyama Univ.	Evaluation of classification techniques for snow deposition and erosion patterns in the Antarctic ice sheet using a machine learning method	Hirasawa	New	239
2	research	Seiji Tsuboi	JAMSTEC	Application of machine learning to hypocenter determination for Seismic observation network in Showa base	Kanao	Cont.	562
3	research	Chihiro Kato	Shinshu Univ.	Development of a real time database system for Cosmic Ray data observed at Syowa Station	Kadokura	Cont.	656
4	research	Norio Umemura	Nagoya Univ.	Connection to organizations by participatory consortium for accelerating data science	Tanaka	New	692
5	research	Masashi Kamogawa	Tokyo Gakugei Univ.	Development of database and data analysis system of ground-based atmospheric electric field observation data for global electrical circuit study	Kadokura	New	800
6	research	Mami Nakamoto	Association for the Development of Earthquake Prediction	Construction of information sharing system for earth science observations in polar region	Kanao	New	700
7	research	Masa-yuki Yamamoto	Kochi Univ. of Technology	Construction of archiving/information disclosure system for infrasound observation in Antarctica	Kanao	Cont.	800

# PEDSC: Activities in FY2021

## ■ ROIS-DS-JOINT: Collaboration Program of ROIS-DS

No	Category	Name	Affiliation	Title	PEDSC contact	New/con tinuous	Budget 1000yen
1	research	Kazue Suzuki	Hosei Univ.	A development of prediction system for the transport of atmospheric aerosol particles at Syowa Station by Machine Learning	Hirasawa	New	779
2	research	Chihiro Kato	Shinshu Univ.	Development of a real time database system for Cosmic Ray data observed at Syowa Station	Kadokura	Cont.	504
3	research	Masashi Kamogawa	Univ. of Shizuoka	Development of database and data analysis system of ground-based atmospheric electric field observation data for global electrical circuit study	Kadokura	Cont.	800
4	research	Koji Nishimura	Kyoto Univ.	Development of Accurate Antenna Measurement Techniques for Interferometric Radar Inversion	Hashimoto	New	532
5	research	Makoto Okubo	Kochi Univ.	Establishment of new techniques for nano- crustal strain signals detection and utilization of ultra-precision observation records	Kanao	New	640
6	research	Yoshihiro Kakinami	Hokkaido Information Univ.	Development of website for data visualization of PSD and FK analyses for utilizing Antarctic infrasound observation	Kanao	New	655
7	research	Shuji Abe	Kyushu Univ.	Connection to organizations by participatory consortium for accelerating data science	Tanaka	Cont.	175
8	research	Konosuke Sugiura	Toyama Univ.	Evaluation of classification techniques for snow deposition and erosion patterns in the Antarctic ice sheet using a machine learning method	Hirasawa	Cont.	681



# PEDSC: Activities in FY2017

## ■ Presentation at Science meeting, Symposium:

Year	Date	Meeting	Venue	PEDSC member
2017	May 3-5	IconSpace2017	Malaysia	Tanaka
	May 23	JpGU-AGU Joing meeting 2017 「a side meeting for informal Open Science discussions」	Makuhari, Chiba	Kadokura, Kanao, Yabuki, Tanaka
	June 26	RDUF symposium: international movement on Open science	JST Tokyo	Yabuki
	July 10-14	VarSITI-2017	Russia	Tanaka
	Sep. 13-15	IUGONET research meeting	NICT	Tanaka, Kanao
	Sep. 16-18	SCADM: Standing Committee on Antarctic Data Management	Montreal	Kanao
	Sep. 27-29	WDS Asia – Oceania Conference	Kyoto Univ.	Kadokura, Kanao, Tanaka
	Dec. 5-7	ROIS-DS International Workshop on Sharing, Citation and Publication of Scientific Data across Disciplines	NIPR・NINJAL	All PEDSC member
	Dec. 8	The Eighth Symposium on Polar Science 「Polar data science」(PEDSC proposed session)	NIPR	All PEDSC member
2018	Jan. 16	Fifth International Symposium on Arctic Research (ISAR-5) 「Understanding the Changing Arctic through Data: Stewardship, Publication, and Science」 session	Hitotsubashi Hall	Kadokura, Kanao, Yabuki, Tanaka
	March 1-2	Workshop for Promoting Open Science Data	Kyoto Univ.	Tanaka
	March 8	Science data meeting・WDS domestic symposium in Japan	JST Tokyo	Kadokura, Kanao
	March 14-15	Science meeting on observation and education of Space Weather research in local network	Kyushu Univ.	Tanaka

# PEDSC: Activities in FY2018

## ■ Presentation at Science meeting, Symposium:

Year	Date	Meeting	Venue	PEDSC member
2018	May 20-24	JpGU2018	Makuhari, Chiba	Kadokura, Kanao, Yabuki, Tanaka
	Jun. 15-26	POLAR2018:SCAR & IASC Conference SCADM (June 15-17)	Davos, Switzerland	Kanao
	Jun. 18-19	Japan Open Science Summit 2018 (JOSS2018)	National Center of Sciences	Tanaka, Kadokura
	Aug. 7	ICeSSAT 2018	Malaysia	IUGONET other member
	Sep. 12-14	IUGONET research meeting & lecture Joingly with ROIS-DS research meeting (Sep. 14)	NICT PEDSC sponsored	Tanaka, Kanao, Kadokura
	Oct. 5	NIPR research meeting 「Open data and Open science for Polar science」	NIPR PEDSC sponsored	All PEDSC member
	Oct. 11-12	Asian Forum for Polar Science (AFoPS) Annual General Meeting 2018, Data Management Session 「Data and Metadata Sharing Among AFoPS Countries」	Xiamen, China	Kanao, Tanaka
	Nov. 12-15	ROIS-DS International Workshop on Data Science - Present & Future of Open Data & Open Science –	Mishima DS-PEDSC sponsored	All PEDSC member
	Nov. 19	Open symposium of Science Council of Japan “Science data management, utilization, and international collaboration”	Science Council of Japan	Kadokura, Kanao
2019	Jan. 31	IUGONET lecture at Polar Research Institute of China	Shanghai, China	Tanaka, Kadokura
	Mar. 18-22	IUGONET lecture at International School on Equatorial Atmosphere	LAPAN, Indonesia	IUGONET member

# PEDSC: Activities in FY2019

## ■ Presentation at Science meeting, Symposium:

Year	Date	Meeting	Venue	PEDSC member
2019	May 7-8	World Data System Asia-Oceania Conference 2019	Beijing, China	Kadokura, Tanaka, Kanao
	May 26-30	JpGU2019 IUGONET (IDL) lecture	Makuhari, Chiba	Kadokura, Kanao, Yabuki, Tanaka
	May 27-29	SCADM annual meeting	Brussels, Belgium	Kanao
	Aug. 27	NIPR research meeting 「Open data and Open science for Polar science II」	Tachikawa PEDSC sponsored	All PEDSC member
	Sep. 12-13	IUGONET research meeting	Kyoto Univ.	Tanaka
	Nov. 18-22	Polar Data Forum III	Helsinki, Finland	Kanao, Yabuki

# PEDSC: Activities in FY2020

## ■ Presentation at Science meeting, Symposium:

Year	Date	Meeting	Venue	PEDSC member
2020	May 26	IUGONET (IDL) lecture	Online	Tanaka
	June 9	IUGONET (SPEDAS) lecture	Online	Tanaka
	June 29	SCADM monthly meeting	Online	Kanao
	Aug. 4	SCAR/SCADM session: 「Improving the FAIRness of Antarctic Data: Strategies, Tools, and Future Directions」	Online	Kanao
	Aug. 31	SCADM monthly meeting	Online	Kanao
	Sep. 23-25	「International Symposium “Global Collaboration on Data beyond Disciplines” 」	Online	All PEDSC member
	Sep. 29-30	IUGONET research meeting	Online	Tanaka
	Sep. 28	SCADM monthly meeting	Online	Kanao
	Oct. 26	SCADM monthly meeting	Online	Kanao
	Nov. 23	SCADM monthly meeting	Online	Kanao
	Dec. 15	SCADM monthly meeting	Online	Kanao
2021	Jan. 15	NIPR research meeting on preservation, publication, and utilization of research data	Online	All PEDSC member
	Jan. 18	SCADM monthly meeting	Online	Kanao
	Feb. 5	ROIS-DS research meeting	Online	Kanao, Tanaka
	March 2	RISH mission symposium	Online	Tanaka
	March 8	IUGONET (SPEDAS) lecture in 「PWING-ERG conference and school on the inner magnetosphere」	Online	Tanaka



# PEDSC: Activities in FY2021

## ■ Presentation at Science meeting, Symposium:

Year	Date	Meeting	Venue	PEDSC member
2021	May 3	SCADM monthly meeting	Online	Kanao
	June 7	SCADM monthly meeting	Online	Kanao
	June 18	IUGONET (IDL&SPEDAS) lecture	Online	Tanaka
	July 5	SCADM monthly meeting	Online	Kanao
	Aug. 2	SCADM monthly meeting	Online	Kanao
	Sep. 6	SCADM monthly meeting	Online	Kanao
	Sep. 20-24	International Symposium 「Polar Data Forum IV」	Online	Kanao
	Sep. 29-30	IUGONET research meeting	Online	Tanaka
	Sep.27-Oct.1	International Heliophysics Data Environment Alliance (IHDEA) meeting	Online	Tanaka
	Oct. 4	SCADM monthly meeting	Online	Kanao
	Oct.12	NIPR research meeting on preservation, publication, and utilization of research data II	Online	All PEDSC member
	Nov. 8	SCADM monthly meeting	Online	Kanao
	Dec. 20	ROIS Inter-Disciplinary Cross-talk	Online	Tanaka,Kadokura
2022	Jan. 27	ROIS-DS research meeting	Online	Yabuki,Tanaka, Kadokura
	March 7	SCADM monthly meeting	Online	Kanao
	March 30	WDS symposium & meeting	Online	Kadokura,kanao, Tanaka,Yabuki, Kozai

# PEDSC: Activities in FY2017

International WS sponsored by ROIS-DS-PEDSC

## International Workshop on Sharing, Citation and Publication of Scientific Data across Disciplines

Joint Support-Center for Data Science Research (DS), Tachikawa, Tokyo  
5–7 December 2017

<http://polaris.nipr.ac.jp/~pseis/data.ws-2017/main.dwt>



- Attendance : 73 (ROIS:35、non-ROIS:38 (overseas:8 : US,UK,AU,CA,BE))
- Presentation: oral:33, poster:10



# PEDSC: Activities in FY2018

## International WS sponsored by ROIS-DS-PEDSC

### International Workshop on Data Science - Present & Future of Open Data & Open Science - 12 - 15 November 2018 Mishima Citizens Cultural Hall, Mishima, Shizuoka, Japan

Scope of the Workshop: IWD52018 focuses on recent topics of interest in the field of scientific data, which are attributed to play a crucial role in global trend on accelerating "Open Science" and "Open Data". Contributions from all scientific disciplines are welcomed, including life and bio science, social and human science, as well as polar science. Inter-disciplinary orientated topics on data management are especially encouraged.

Session Themes:

- International data activity
- National data activity
- Current status of data science
- Current status of Inter-disciplinary science
- Industry-academia collaboration, education and capability building
- Legacy data, historical data, future on data science

Event Schedule:

Public Lecture: Monday 12 November  
Workshop : Tuesday 13 - Thursday 15 November  
Poster Session: Tuesday 13 November  
Visit to NiG: Wednesday 14 November

Important Dates:

Registration & Abstract submission open: 01 July 2018  
Fixing the sessions & program: 31 August 2018  
Abstract submission deadline: 15 September 2018

Advisory Committee (AC): P. Bricher, T. De Bruin, S. Christoffersen, H. Enomoto, A. Fujiyama (Chair), Ø. Godøy, K. Hayashi, H. J. Imker, T. Iyemori, Y. Kohara, E. LeDrew, K. S. Mwitondi, Y. Murayama, T. Odate, M. Parsons, P. Pulsifer, H. Takeda, S. Tsuboi, A. Van de Putte, R. Yoshino

Local Organizing Committee (LOC): M. Arita, T. Baba, S. Goto, R. Ikuya, A. Kadokura, M. Kanao (Chair), N. Kato, A. Kitamoto, T. Maeda, M. Minowa, S. Nakano, T. Nakazato, K. Nishimura, H. Noguchi, A. Nomizu, Y. Tanaka, H. Yabuki

Contact Address: data.ws.loc.2018@niprac.jp  
[https://ds.rois.ac.jp/article/dsws\\_2018/](https://ds.rois.ac.jp/article/dsws_2018/)



### データサイエンス一般講演会 「暮らしの中のデータサイエンス」

日時：平成 30 年 11 月 12 日 (月) 16:00~17:30 (15:30 開場)  
場所：三島市民文化会館【ゆゅゆホール】1 階小ホール

静岡県三島市で開催するデータサイエンス国際ワークショップの一環として、その初日に一般の方々をお招きする講演会です。どなたでもご参加いただけます。当日参加も歓迎いたします。  
【登録不要・入場無料】

自然災害とデータサイエンス  
「東海地震と富士山噴火の歴史」  
中西一郎  
京都大学 教授



農業とデータサイエンス  
「DNA データが加速する新品種の育成」  
田畑哲之 かずさ DNA 研究所 所長



会場：三島市民文化会館  
静岡県三島市一番町 20 番 5 号  
(三島駅南口より徒歩 3 分)  
※駐車場はありませんので、近隣の有料駐車場又は公共の交通機関をご利用下さい。

主催・共催：大学共同利用機関法人 情報・システム研究機構、データサイエンス共同利用基盤施設、国立遺伝学研究所  
お問合せ：データサイエンス共同利用基盤施設 DSWs 実行委員会 data.ws.loc.2018@niprac.jp TEL：042-513-9254





# PEDSC: Activities in FY2018

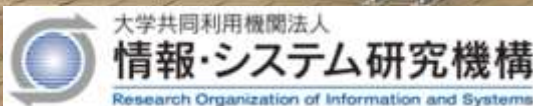
International WS sponsored by ROIS-DS-PEDSC

## International Workshop on Data Science

- Present & Future of Open Data & Open Science -

12 - 15 November 2018

Mishima Citizens Cultural Hall Mishima, Shizuoka, Japan





# PEDSC: Activities in FY2020

International symposium (online) held by ROIS-DS-PEDSC



International Symposium - DSWS-2020 -

## “Global Collaboration on Data beyond Disciplines”

23 – 25 September 2020

Online Conference

[https://ds.rois.ac.jp/article/dsws\\_2020/](https://ds.rois.ac.jp/article/dsws_2020/)

- Attendance: 412 (ROIS:51、non-ROIS:361 (overseas:287 : 45 countries))
- Presentation: 72 in 7 sessions

# PEDSC: Activities in FY2020

## International symposium (online) held by ROIS-DS-PEDSC

International Symposium "Global Collaboration on Data beyond Disciplines"  
23-25 September 2020, Online Conference

PROGRAMME			
Dates	Time-slot 1	Time-slot 2	Time-slot 3
23 SEP (WED)	Participants: 412 (pre-registration) Overseas: 287, Japanese:125	Opening Addresses, Key-note Talks, 10 Years Event of WDS-IPO 75 participants (05:00-08:00 UTC) (14:00-17:00 JST)	WDS Members' Forum 2020 107 participants (12:00-15:00 UTC) (21:00-24:00 JST)
24 SEP (THU)	Regional Activities on Data in the Asia-Oceania Area 48 participants (01:00-03:30 UTC) (10:00-12:30 JST)	WDS-ORCID Strategic Workshop 60 participants (05:00-08:00 UTC) (14:00-17:00 JST)	Sharing of the COVID-19 Data ap.59 participants (38,38,38) (10:00-16:00 UTC) (19:00-25:00 JST)
25 SEP (FRI)	Forum of Early Career Data Scientists in the Asia-Oceania Area 42 participants (01:00-03:30 UTC) (10:00-12:30 JST)	Promotion of Multi-Disciplinary Data Analysis, Conclusive Addresses 46 participants (05:00-08:30 UTC) (14:00-17:30 JST)	



# PEDSC: Activities in FY2020

## International symposium (online) held by ROIS-DS-PEDSC

International Symposium "Global Collaboration on Data beyond Disciplines"  
23-25 September 2020, Online Conference

Opening Addresses, Key-note Talks, 10 Years Event of WDS-IPO

Participants (from top-left to bottom-right):

- Kassim Mwitondi
- LIU Chuang (DSWSNCC/M. Kenao)
- ZoomWatanaba
- yasuhiko murayama
- 藤井 良一
- Mark Parsons
- Mazlen Othman
- Kaz Hayashi@NISTEP
- Jens Klump (CSIRO)
- Dmitry Storchak
- NICT Hideyuki Takuda
- Akira Kadokura
- ROIS-DS NOMIZU
- Toshihiko Iyemori
- Hirayuki Enomoto
- Taco de Bruin (NIOZ, Ne...)
- ingridillo
- Tomoya Baba
- hatsunetunui
- Auwal Shehu Ali
- Kazuhiko Takeuchi
- Niels Batjes
- Rüdiger
- zehairmey ali

Zoom controls at the bottom: 音の停止, セキュリティ, 参加者 (64), チャット, 画面を共有, 録音を一時停止/停止, ブレークアウトセッション, 反応

# Data publication with the Polar Data Journal

<https://pdr.repo.nii.ac.jp/>

**Call For Paper**

We are pleased to announce that the new data journal "Polar Data Journal" is now open for submissions. Polar Data Journal is a free-access, peer-reviewed and online journal. It is dedicated for publishing original research data/dataset, furthering the reuse of high-quality data and the benefit to polar sciences.

"Polar Data Journal" aims to cover broad range of research disciplines involving Arctic, Antarctic, or other polar regions, especially earth and life sciences. The Journal primarily publishes data papers, provides detailed descriptions of research data/dataset (e.g. Methods, Data Records, Technical validation). The Journal does not require any new scientific findings, so the Journal also welcomes submissions describing past valuable data/dataset which has not published yet.

Editorial Board welcomes your submission. Manuscript can be submitted by email in advance. If you want to submit manuscripts by email, please read submission guidelines and contact our editorial office.

Sincerely yours,

Editor in Chief (Akira Kadokura, NIPR)  
Executive Editor (Masaki Kanao, NIPR)

**Submit Your Paper**

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- ▶ About This Journal
- ▶ For Authors
- For Reviewers
- ▶ Policies
- Contact Information
- History of Website

**Announcement**

**New Special Issue  
Now calling for papers**

- 19 January, 2017: Newly launched by NIPR
- As of 31 March, 2022: submitted:37 (published:33, after review:1, under review:2, reject:1)
- task of PEDSC: support for editorial process, Data registration & DOI assignment

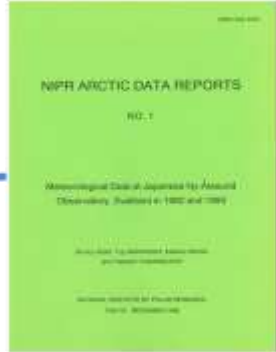


# Polar Data Journal: free-access online journal

JARE Data Reports



Arctic Data Reports



<https://pdr.repo.nii.ac.jp/>



Metadata



Paper



Internet



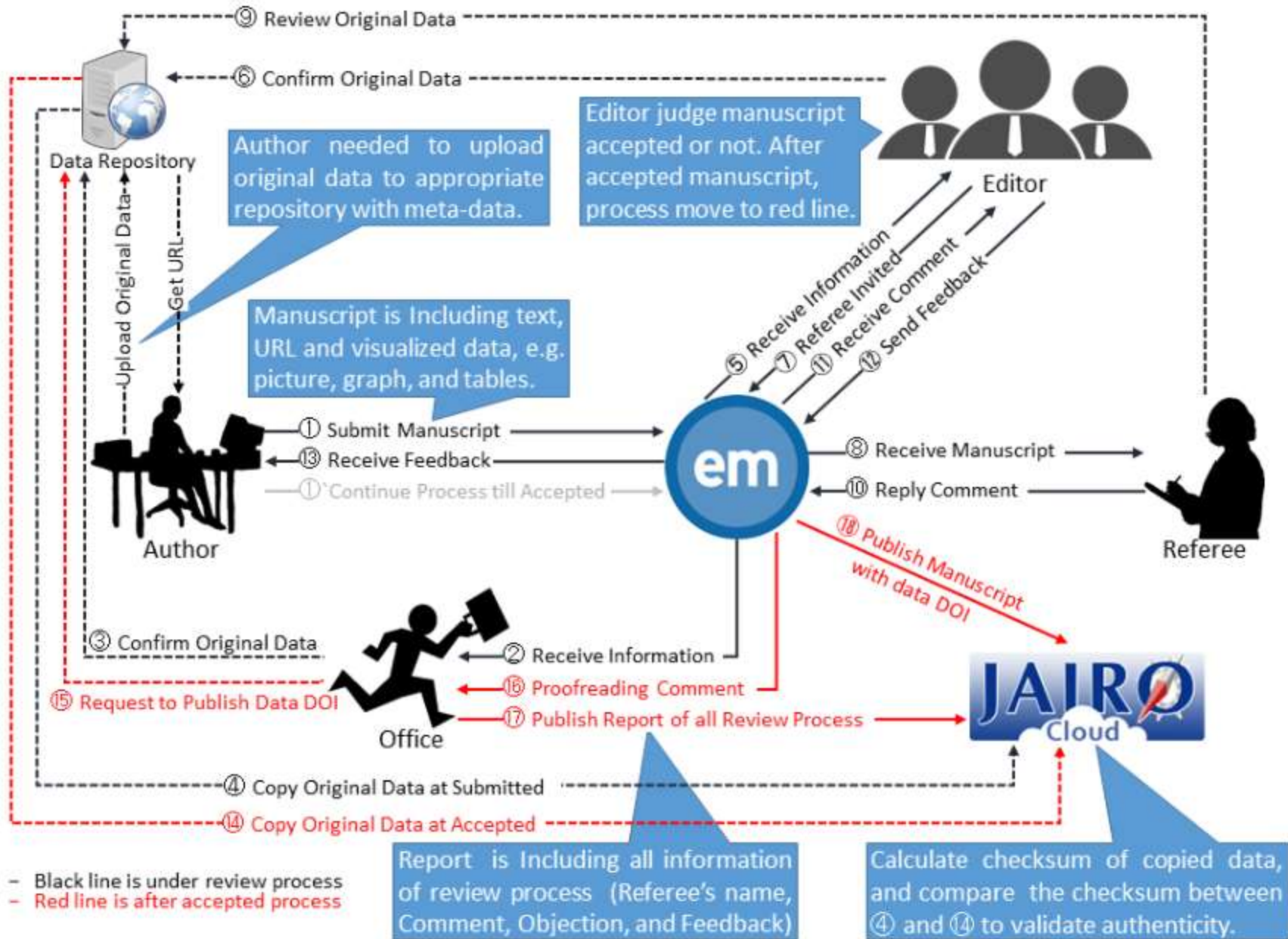
Data Repository



<https://community.repo.nii.ac.jp/>

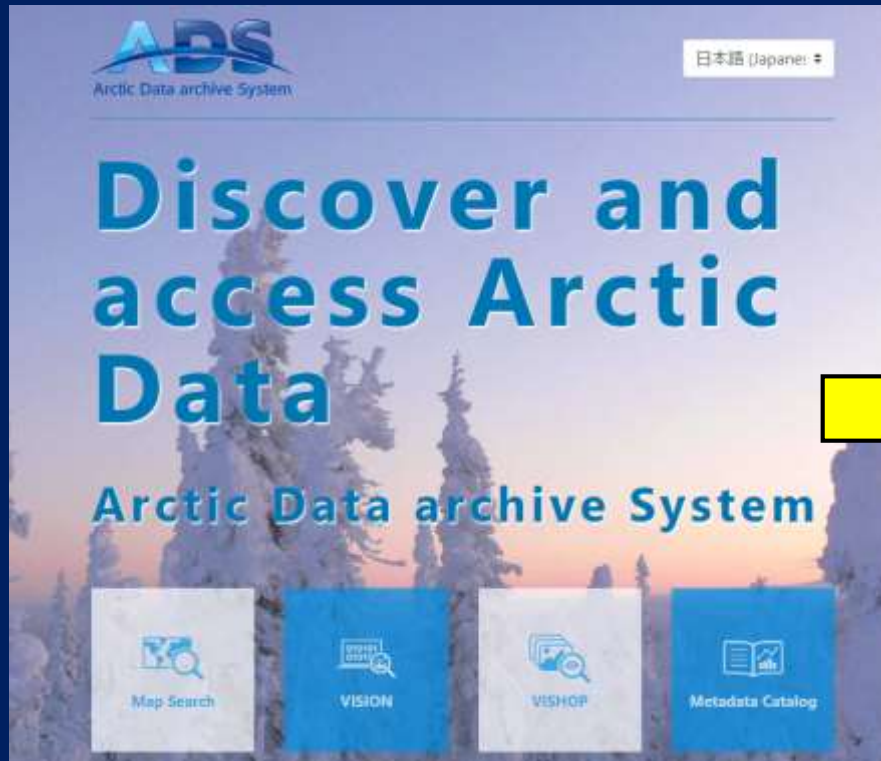
<https://ads.nipr.ac.jp/>

# Polar Data Journal : Review Process



# Existing Database System of NIPR/PEDSC

<https://ads.nipr.ac.jp/>



<https://ads.nipr.ac.jp/antarctic/>



Now Extending from ADS to AADS for the data from both polar regions



# PEDSC: Activities : Data processing Antarctic Rock Sample data

ADS Arctic Data archive System

NRR: NIPR Rock Repository

English

NRR Top List Tile Map

## List of Rocks

Show / Hide Columns...

	Sample Name	IGSN	Classification	Field name (informal classification)	Locality	Country	Field program/Cruise	Collector/Chief Scientist	Collection date	Current Archive
<a href="#">Show</a>	TH161218-T01		Metamorphic>Gneiss	Grt-Bt gneiss (honey-comb weathering)	Point Widdows	Antarctica	JARE58	Tomokazu Hokada	2016-12-18	NIPR Repository Tachikawa Japan
<a href="#">Show</a>	TH16121801A		Metamorphic>Gneiss	chermockitic gneiss	Point Widdows	Antarctica	JARE58	Tomokazu Hokada	2016-12-18	NIPR Repository Tachikawa Japan
<a href="#">Show</a>	TH16121801B		Metamorphic>Calc-Silicate	calc-silicate lens in chermockitic gneiss	Point Widdows	Antarctica	JARE58	Tomokazu Hokada	2016-12-18	NIPR Repository Tachikawa Japan
<a href="#">Show</a>	TH16121801C		Metamorphic>Calc-Silicate	calc-silicate	Point Widdows	Antarctica	JARE58	Tomokazu Hokada	2016-12-18	NIPR Repository Tachikawa Japan



# PEDSC: Activities : Data processing

## Archive system for Satellite data received at Syowa Station

ADS Arctic Data archive System

昭和基地受信衛星画像ギャラリー

TOP X-Band L/S-Band

PROGRAM

- NOAA
- MetOp
- DMS**

SATELLITE

- F-18**
- F-17

PRODUCT

- ir**
- vis

ORBIT

- Day**
- Night

REGION

- Large area**
- Middle area
- Small area

2019/02/21 23:58:00 File Size: 264 KB

2019/02/21 00:11:00 File Size: 265 KB

2019/02/20 00:23:00 File Size: 258 KB

2019/02/18 23:57:00 File Size: 270 KB

2019/02/18 00:10:00 File Size: 266 KB

2019/02/12 15:50:00 File Size: 234 KB

2019/02/11 16:03:00 File Size: 250 KB

2019/02/11 12:40:00 File Size: 211 KB

<https://ads.nipr.ac.jp/satelliteGallery/#/>

# PEDSC: Activities : Data processing Antarctic Satellite Monitoring data



昭和基地周辺衛星画像ギャラリー (ALOS2, Sentinel等)

## Image Gallery

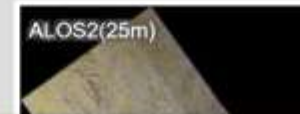
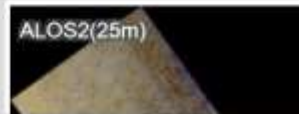
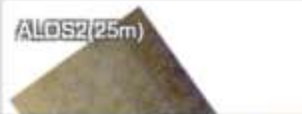
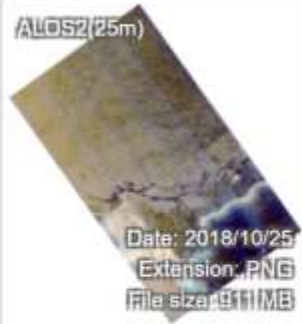
[KML Gallery](#)

[About Syowa Station Satellite Gallery](#)

FILTER :

TIME RANGE :  2014/11/27 to 2018/11/09


SORT :



# PEDSC: Activities : Data processing Antarctic real-time Network Camera data

ADS Arctic Data archive System VISHOP English

VISHOP Monitor View Monitor Gallery About VISHOP



11-10-18 04:03:28

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### TIME SELECTOR

Prev. Latest Next

2018/11/10 10:05

2014 2016 2018

PLAY SPEED : 2

### SELECT OPTION

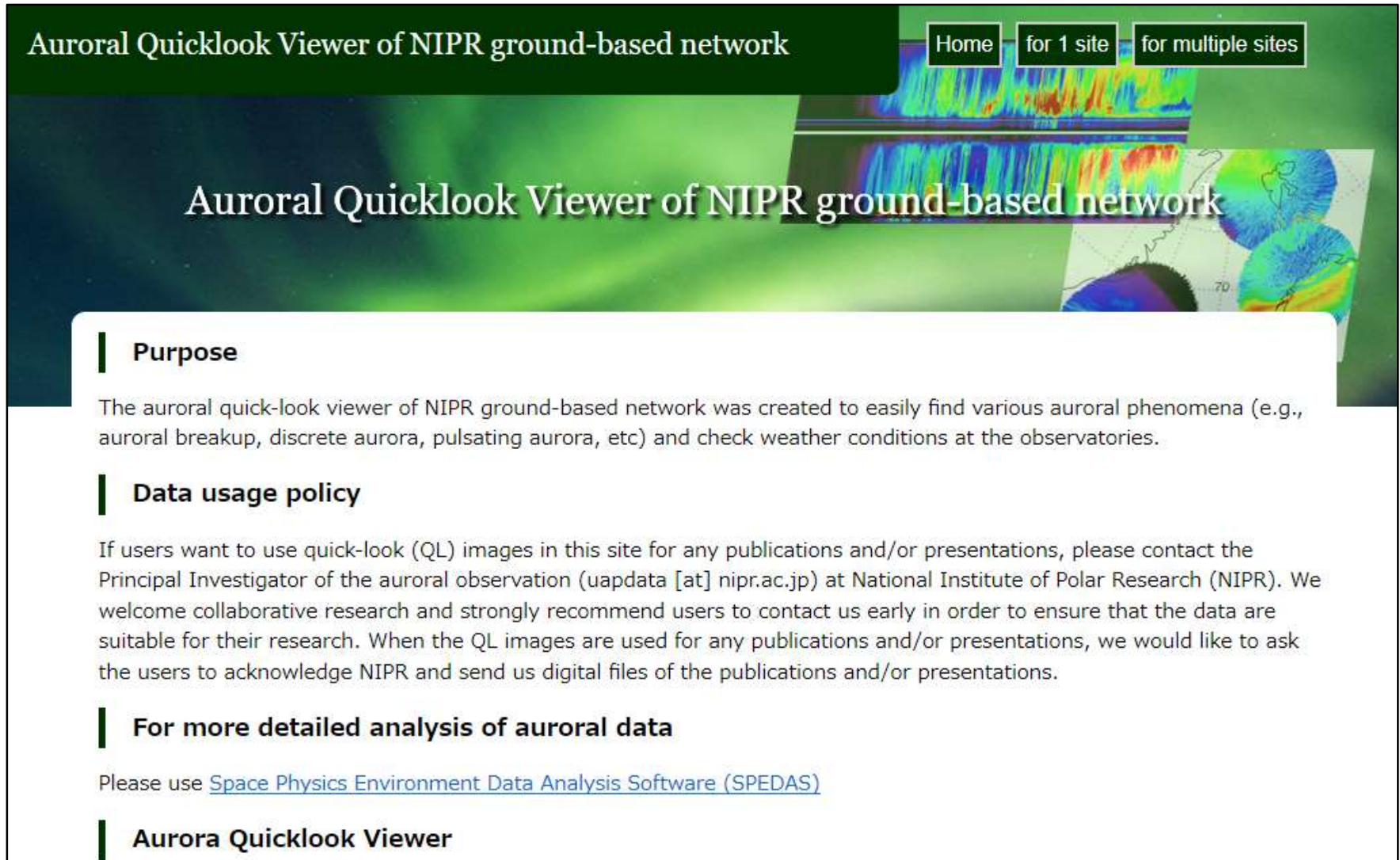
PRODUCT

TENSOKUTENCAM



# PEDSC: Activities : Data processing

## NIPR auroral observation data Quick Look Web site



**Auroral Quicklook Viewer of NIPR ground-based network**

Home for 1 site for multiple sites

### Auroral Quicklook Viewer of NIPR ground-based network

**Purpose**

The auroral quick-look viewer of NIPR ground-based network was created to easily find various auroral phenomena (e.g., auroral breakup, discrete aurora, pulsating aurora, etc) and check weather conditions at the observatories.

**Data usage policy**

If users want to use quick-look (QL) images in this site for any publications and/or presentations, please contact the Principal Investigator of the auroral observation (uapdata [at] nipr.ac.jp) at National Institute of Polar Research (NIPR). We welcome collaborative research and strongly recommend users to contact us early in order to ensure that the data are suitable for their research. When the QL images are used for any publications and/or presentations, we would like to ask the users to acknowledge NIPR and send us digital files of the publications and/or presentations.

**For more detailed analysis of auroral data**


Please use [Space Physics Environment Data Analysis Software \(SPEDAS\)](#)

**Aurora Quicklook Viewer**

<http://133.57.20.115/www/AQVN/index.html>

# PEDSC: Activities

Data Management for the JARE (Japanese Antarctic Research Expedition) data



## Metadata Sheet

Download

English

### ❄ Metadata Input Sheet Download

The template file of the registration form, please download and use from here.

Excel Template: [Download](#)

GCMD science keywords (reference): [Download](#)

(List table of GCMD science keywords. Please use it when finding keyword.)

JARE metadata input manual: [Download](#)

JARE observation data guideline: [Download](#)

Web seminar document: [Link](#)

## Data policy for JARE

Item	Dead line
Metadata submit	1 month
Metadata open	2 month
Actual data submit	1 year
Actual data open	2 year

# Summary

- ✓ Polar Environment Data Science Center (PEDSC) is one of the centers in the Joint Support-Center for Data Science Research (DS) of the Research Organization of Information and Systems (ROIS).
- ✓ Purpose of the PEDSC is to promote the opening and sharing of the data obtained in polar regions.
- ✓ Activities of the PEDSC have been carried out along the following categories since FY2017:
  - ① To construct an unified database system to cover all the data in all the research fields of polar science.
  - ② To make the existing database systems (Science Database, ADS, IUGONET) upgraded and interoperable with each other.
  - ③ To promote archiving, opening, and sharing of the time series digital data in each research field.
  - ④ To promote archiving, opening, and sharing of the sample data in each research field.
  - ⑤ To promote publication of the scientific data, using the Polar Data Journal of NIPR.
  - ⑥ To promote collaboration with universities and other institutions in Japan and international communities.
  - ⑦ To promote data science using the database and database system.