

# Polar Environment Data Science Center / DS / ROIS

## 極域データの国際連携 と学術データベース

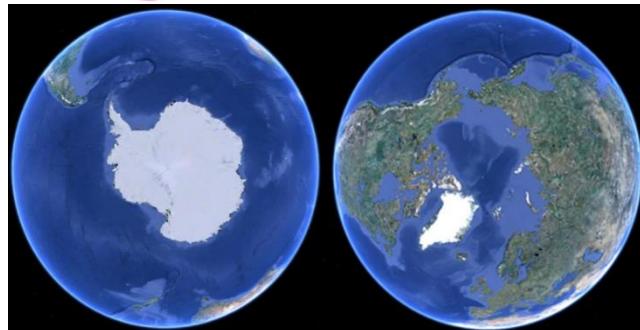


金尾 政紀

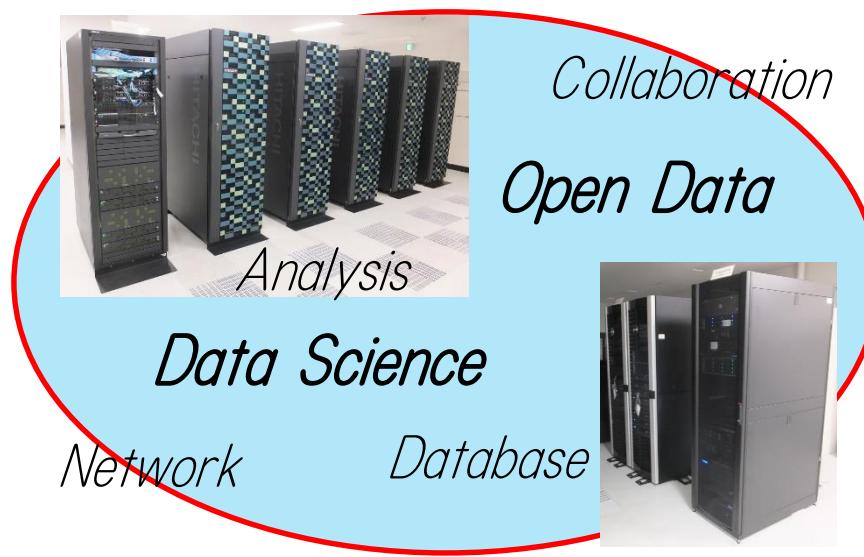
極域環境データサイエンスセンター



# Polar Environmental Data Science Center (PEDSC) DS/NIPR-ROIS



Upper  
Atmosphere



Meteorology  
and  
Glaciology



Geoscience



Bioscience



# Polar Environment Data Science Center / DS / ROIS



極域環境データサイエンスセンター  
Polar Environment Data Science Center

日本語 | English

> センターについて > 活動 > 関連データ > 統合データベース > 成果 > 共同研究

## 研究者向け

### 総合的データベース



極地研学術データベース



北極域データアーカイブ



南極マスター・ディレクトリ  
— Japan



極地研学術情報リポジトリ

### 宇宙圏



超高度大気メタデータベース  
(AGOONET データベース)



オーロラデータセンター



北極域・南極点・マクマード・ラムゼー観測データベース



EISCATデータベース



南極昭和基地大型大気レーダー (SORCE) データベース

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



**PEDSC**  
Polar Environment Data Science Center

# Polar Environment Data Science Center / DS / ROIS

NIPR

Observation and Research activity  
in Arctic and Antarctic regions

DS/ROIS

Polar Environment Data Science Center

## Digital data

- Space and Upper Atmospheric Sciences Group  
PANSY, EISCAT, aurora, magne, ULF, VLF, CNA
- Meteorology and Glaciology Group  
CO<sub>2</sub>, CH<sub>4</sub>, aerosole, meteorological satellite
- Geoscience Group: seismology, gravity, VLBI
- Bioscience Group: marine biology, genome data

## Sample data

- Ice core
- Meteorite
- Rock
- Greenhouse effect gas
- Biodiversity

Integrated Database

## Data Base System

- Science Data Base
- ADS (Arctic Data archive System)
- IUGONET (Inter-university Upper atmosphere Global Observation NETwork)
- Antarctic GIS system

Collaboration with national and international communities

Data Science, Collaborative research

Data Publication (Polar Data Journal)

External Community

- University, College
- Research Institution
- Company
- Public

- ArCS
- GRENE
- JCAR
- IASC
- SIOS

- SCAR/ICSU
- WDS/ICSU
- CODATA/ICSU
- GCMD/NASA

# SCADM (南極データマネージメント委員会)

- Standing Committee on Antarctic Data Management -

The collage includes:

- A top banner featuring the SCAR logo and the text "Scientific Committee on Antarctic Research".
- An orange box containing the text "Scientific Committee on Antarctic Research (SCAR / ICSU->ISC)".
- A navigation menu with links to HOME, ABOUT US, SCIENCE, POLICY, and PRODUCTS.
- A "PRODUCTS MENU" section showing a group photo of SCAR members on a staircase.
- A blue header for the "STANDING COMMITTEE ON ANTARCTIC DATA MANAGEMENT (SCADM)".
- A photograph of a meeting room where the SCADM is in session.
- A small image of a penguin at the bottom left.
- Page footers for "Resources" and "Data".



# 南極科学委員会(SCAR) に関する データのインフラストラクチャー

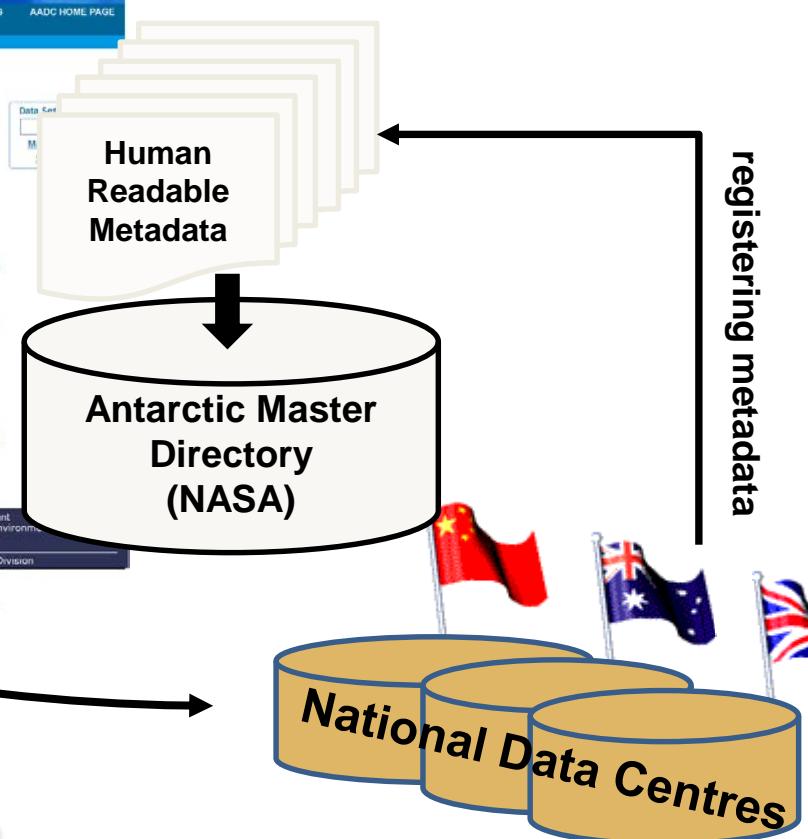
Antarctic Master Directory (AMD) / GCMD / NASA

南極マスター・ディレクトリー



A user can search a  
metadata catalogue. Data  
might be linked ??

Antarctic Data Management System (ADMS)  
= AMD + NADCs



National Antarctic Data Centers (NADC)  
各国のデータセンター

# GCMD; SCAR related portals

A Global Change Master Directory Portal

## Customized NADC/SCAR Portals



AMD\_JP+Arctic\_JP; N=300



A screenshot of a web portal titled "A Global Change Master Directory Portal for the Antarctica and the Global Climate System". It features the AGCS logo and a map of the Southern Hemisphere. On the left, there's a sidebar with links like "About Portals", "GCMD Portal Listings", and "Search AMD". In the center, there's a section titled "Find AGCS Projects:" with links to various projects such as ASPECT, CASO, ICE-READER, MET-READER, OCEAN-READER, and US-ITASE. At the bottom, there's a "GCMD" link with a "Search the entire GCMD database" button. To the right of the main content is a circular graphic showing flags of countries associated with the portal, centered around the continent of Antarctica.

Providing DIFs to GCMD by using WAF (web accessible folder) inside NIPR metadata portal

南極マスターディレクトリー(AMD)  
/汎地球変動マスターディレクトリー( GCMD ) /アメリカ航空宇宙(NASA)

# 極域の学術(メタ)データベース

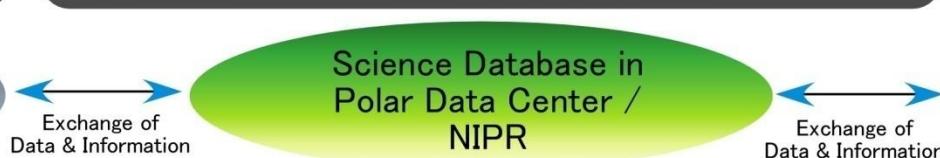
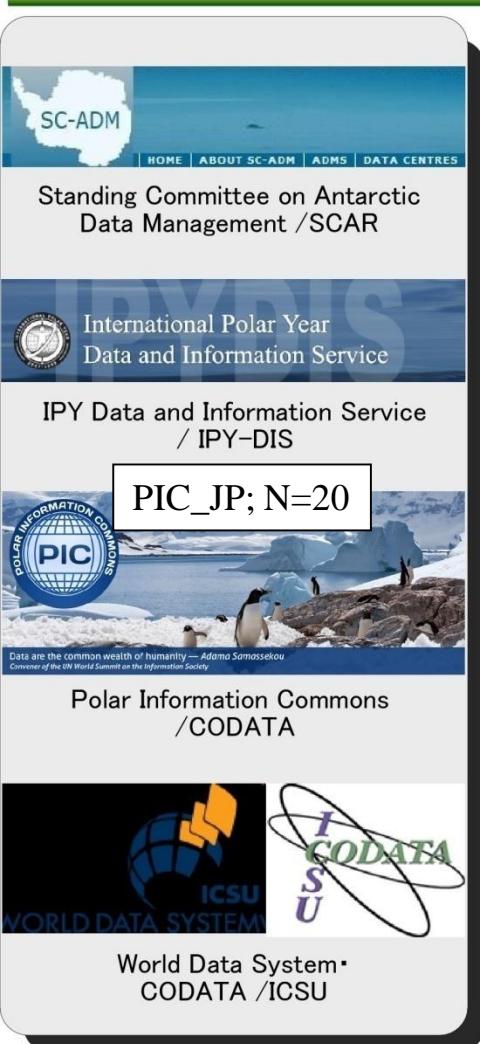
- ◆ 南極観測事業(JARE)をはじめ、(北極を含む)両極域での調査・研究活動により取得された科学的データのメタ情報を収集・公開
  - IGY(1957-58)以後の長期間に渡るモニタリング観測
  - 短期間に集中的に行うプロジェクト研究
  - 極地研(研究分野別) + 定常官庁
- ◆ 文字情報・数値形式の所在情報(メタデータ)として、括して集積
- ◆ 専用のポータルサーバ <http://scidbase.nipr.ac.jp/>
- ◆ NASAの南極マスター directory (Antarctic Master Directory) 等とも連携



The screenshot shows the homepage of the National Institute of Polar Research Science Database. The top navigation bar includes links for "metaDB", "NIPR", and "Polar Information Commons". The main content area displays a "meta data list" with several entries, each with a thumbnail image and a brief description. The sidebar on the left contains links for "Space and Upper Atmospheric Sciences", "Geoscience", "Bioscience", "Governmental Institutions", "Related Links", "Contact", "Login", "Logout", "Register now!", "Lost Password?", "Search", "Options", and "Counter". The "Counter" section shows a total of 5,666 entries. The right sidebar lists "Related Databases" such as NIPR, Polar Data Center, EISCAT Japan, THE PENGUIN'S BOOK, Antarctic Meteorite Database, and Polar Seas. At the bottom, there is a "PIC Norms" section with a license notice.

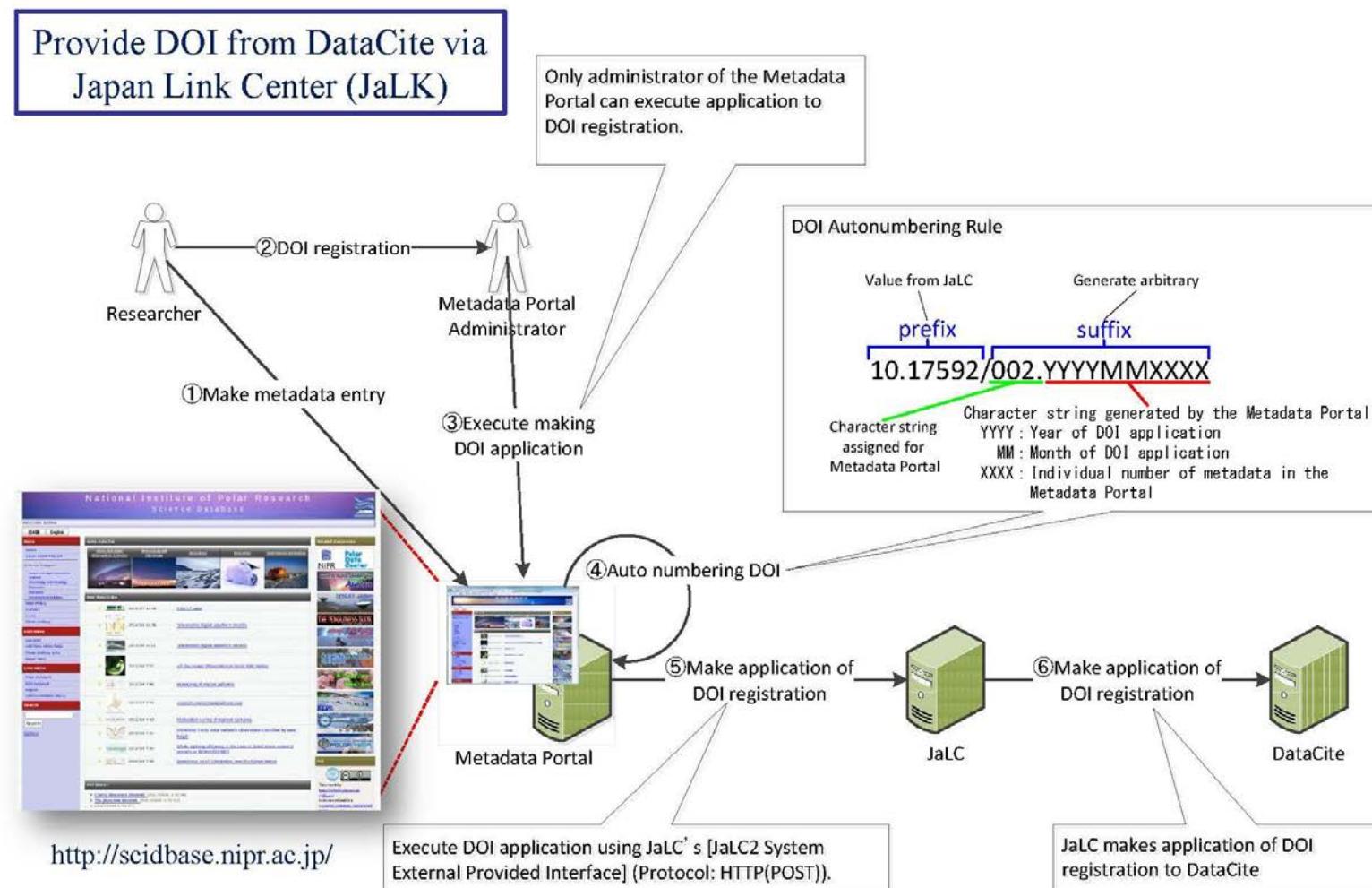
# Flow Chart of Data Publication on Polar Science

データ共有(相互利用)の促進



# Data Publication

## ( DOI assignment to the data inside PEDSC metadata portal)



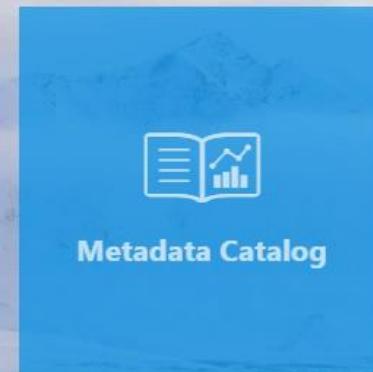
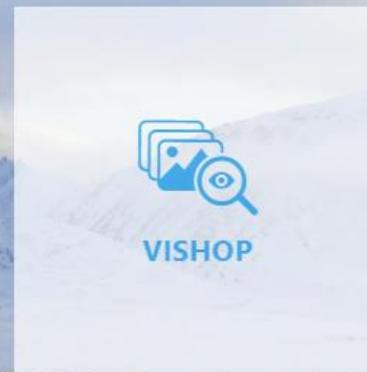
A flow chart to obtain the DOI prefix from DataCite to the PEDSC metadata portal server (<http://scidbase.nipr.ac.jp/>) via the JaLC gateway interface.

# Arctic and Antarctic Data archive System (AADS)



English

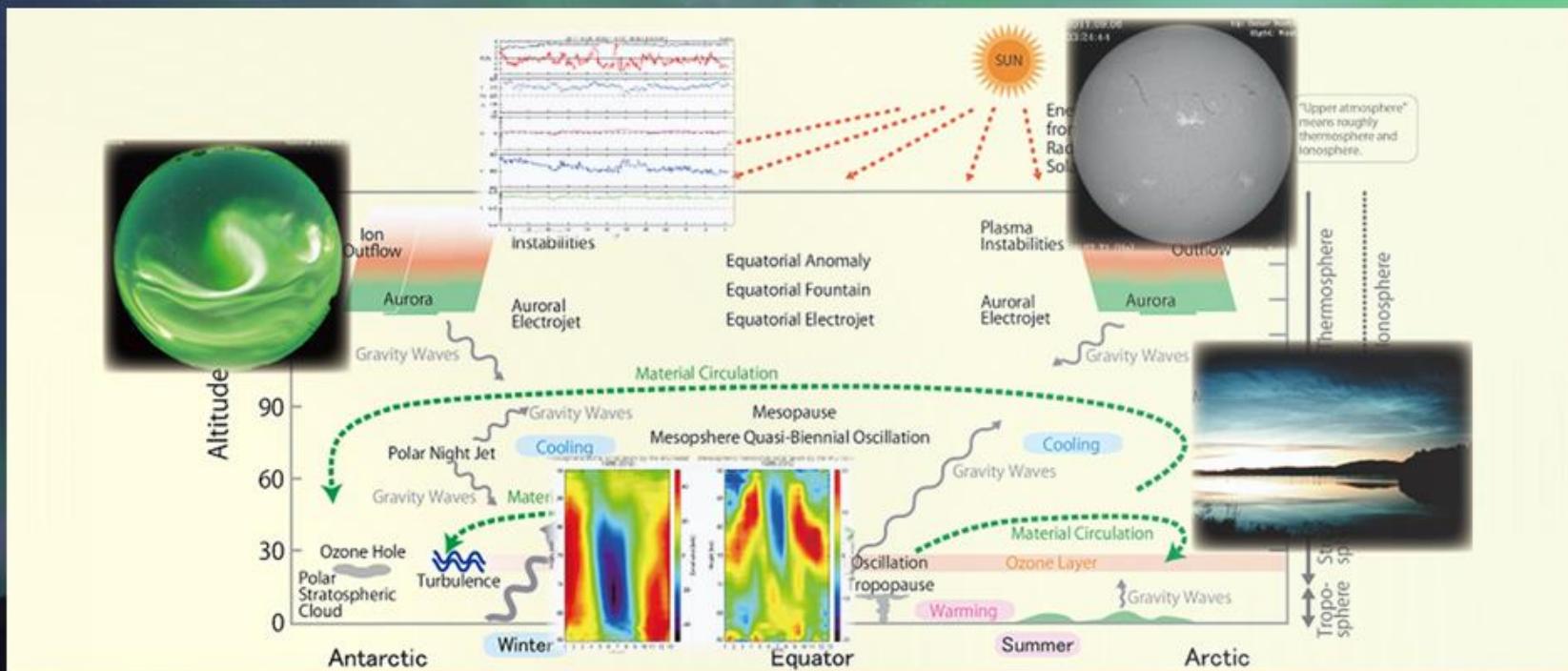
## Arctic and Antarctic Data archive System



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

Now started to compile annual JARE metadata into the new AADS  
(JARE; Japanese Antarctic Research Expedition)

### About IUGONET

[Outline](#)[Timeline](#)[Organization](#)[Pamphlet](#)[News Letter](#)

### Outline

### Background

Global phenomena observed in the Earth's upper atmosphere are the results of many complex processes, such as the energy and momentum i

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

IUGONET is based to make-up a new integrated database of polar science in near future.

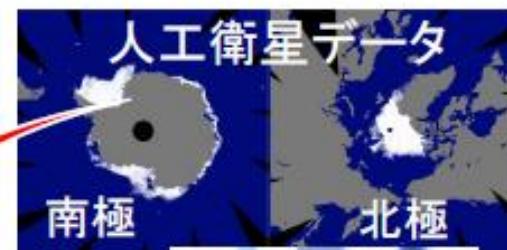
# 極域データの統合データベース



昭和基地



ニーオルスン基地



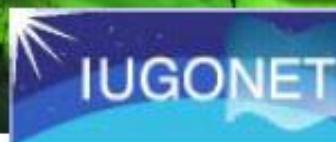
人工衛星データ

南極

北極



宇宙圏



極地研の多種多様な  
データの検索、データ  
取得、描画、解析等が  
可能なデータベース



気水圏



2019/08/27



地圏



極域のオープンデータ・オープンサイエンス  
から  
開拓する研究課題会



生物圏



3

# 統合データサイエンスプラットフォーム

<https://amider.jp>

## ターゲット:

- 研究者、及び、一般市民(主として教員や大学生・高校生)。
- 一般市民により重心を置く。

## データ

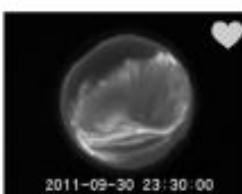
Data

一般市民の興味  
を引く写真ベース  
の表示



南極昭和基地のSuperDARN  
Syowa Southレーダーで得られた電離圏データ

2011.04.01



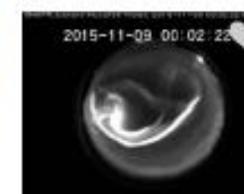
南極昭和基地の白色全天イメージ  
（Watec社製）で撮影された  
オーロラ動画

2014.03.12



南極ドームふじの氷床コアの  
氷温復元（過去34万年間）の初期  
結果

2018.06.13



アイスランド・フッサフェルの  
白色全天イメージ（Watec社  
製）で撮影されたオーロラ動画

2014.03.12



南極・H37のフラックスゲート  
磁力計で得られた地磁気1秒値  
データ

2011.04.01



南極・昭和基地フラックスゲー  
ト磁力計で得られた地磁気2秒  
値データ

2011.04.01



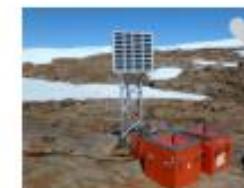
アイスランド・エティ  
(AED) のフラックスゲート磁  
力計で得られた地磁気2秒値  
データ

2011.04.01



南極昭和基地の誘導磁力計で得  
られた地磁気0.05秒値データ

2013.07.09



南極・インホーブ（IHD）のフ  
ラックスゲート磁力計で得られ  
た地磁気1秒値データ

2011.04.01



アイスランド・チヨルネス  
(TJO) の誘導磁力計で得られ  
た地磁気2秒値データ

2013.07.23

日・英両言語に  
対応

現在、いくつかの極地研究所が所有する研究データ（宇宙圏、気水  
圏、地圏、生物圏等）を登録し、関係者公開中。

構築準備中！

# Polar Environment Data Science Center / DS / ROIS



日本語 | English

> センターについて

> 活動

> 関連データ

> 統合データベース

> 成果

> 共同研究

## 地図



南極GISポータルサイト



国立極地研究所岩石試料リポジトリ



岩石鉱物標本データベース



地震観測（南極昭和基地）



測地観測データ（南極モニタリング観測）

## Seismic Observations

Seismic monitoring observations at **Syowa Station** (SYO; 69.0°S, 39.6°E), East Antarctica started using a short-period seismometer with a 1.0 s natural period in 1959 (Eto, 1962). A three readings of the teleseismic events, detected on the three-component short- and long-period seismograms, have been reported currently to US Coastal Geodetic Survey (USCGS), and to the International Seismological Summary (ISS) since 1963.

A three-component broadband seismometer (STreckeisen Seismometer; STS-1, Streckeisen and Messegeraete, 1987) was installed in April 1989, based on the recommendation from the Working Group on Antarctic Research (SCAR). Syowa Station has also an important role in the framework of the Federation of Digital Seismological Network (FDSN), together with the Japanese Pacific Orient Seismograph Network (POINET) and the Pacific Seismograph Network (PACIFIC21).

In this page, present status on seismic observations and procedure for data exchanges of the archived waveforms, hypocenters, and arrival-times at Syowa Station are presented.

## INDEX

[Present Status on Observations](#)

[Data Priority and Release Schedule](#)

[Data Publication Service](#)

[Recent Studies Using Broadband Data](#)

[References](#)

[Links](#)



## Waveforms & Spectrums Data

\* Polar Environment Data Science Center (PEDSC), Joint Support-Center for Data Science Research (DS), Research Organization of Information and System (ROIS)

\*\* Geoscience Group, National Institute of Polar Research (NIPR), ROIS / HP revised @ June 2017

Contact: Masaki Kanao / kanao (at) nipr.ac.jp

## 波形情報 表示

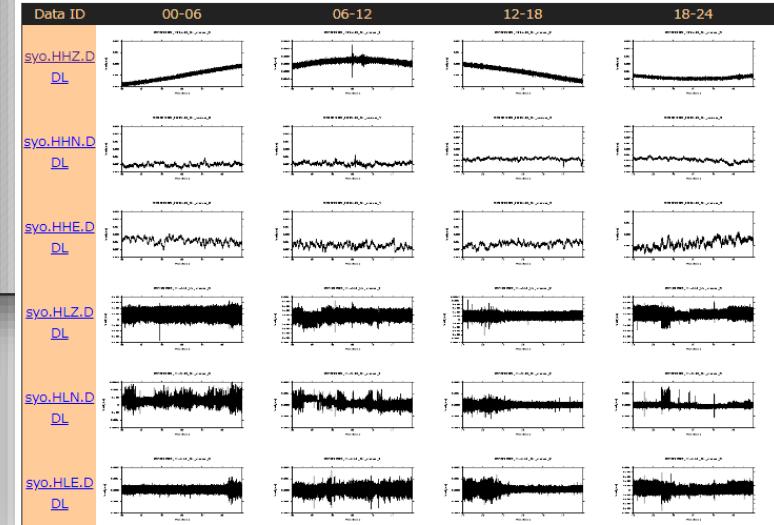
表示日付指定 : 2019/12/03

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

表示種類指定 :  スペクトログラム  波形情報

[表示更新](#)

表示中のデータ 日付 : 2019/12/03 種類 : 波形情報





# Polar Data Journal



## Aims and Scope

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, that 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.

In order to ensure data quality, Polar Data Journal requires to be passed our peer-review process. Before submitting your manuscript, authors should deposit their data/dataset to [trustworthy data repository](#). Data authenticity is also guaranteed by publishing report of all review process, which will be published with author's manuscript at the same time.

## Publication with Regard to Polar Data Journal

NIPR launches a new data journal "Polar Data Journal".

A large number of scientific data collected in the Polar regions are easily buried after publishing articles. NIPR has been publishing the scientific data obtained in the polar regions as "JARE Data Reports" and "NIPR Arctic Data Reports". However recent progress of the open science requires the robust management of the scientific data.

"Polar Data Journal" aims to provide high quality data to researchers.

"Polar Data Journal" is a peer reviewed journal.

"Polar Data Journal" is an free-access journal.

"Polar Data Journal" is thoroughly edited through on-line editing system for quick publishing. Reviewer reports is published with each paper at the same time.

We hope the new "Polar Data Journal" enhances the preservation of the high quality science data to be reused by other researchers, and contributes the development of the open science.

Dr. Kazuyuki SHIRAIISHI

General, National Institute of Polar Research

Published; 8 articles, under review 1 articles,  
IPY special issue, under submission

## Submit Your Paper

### Menu

[Polar Data Journal](#)

#### [About This Journal](#)

- [Editorial Board](#)
- [Advisory Board](#)

#### [For Authors](#)

- [For Reviewers](#)

#### [Policies](#)

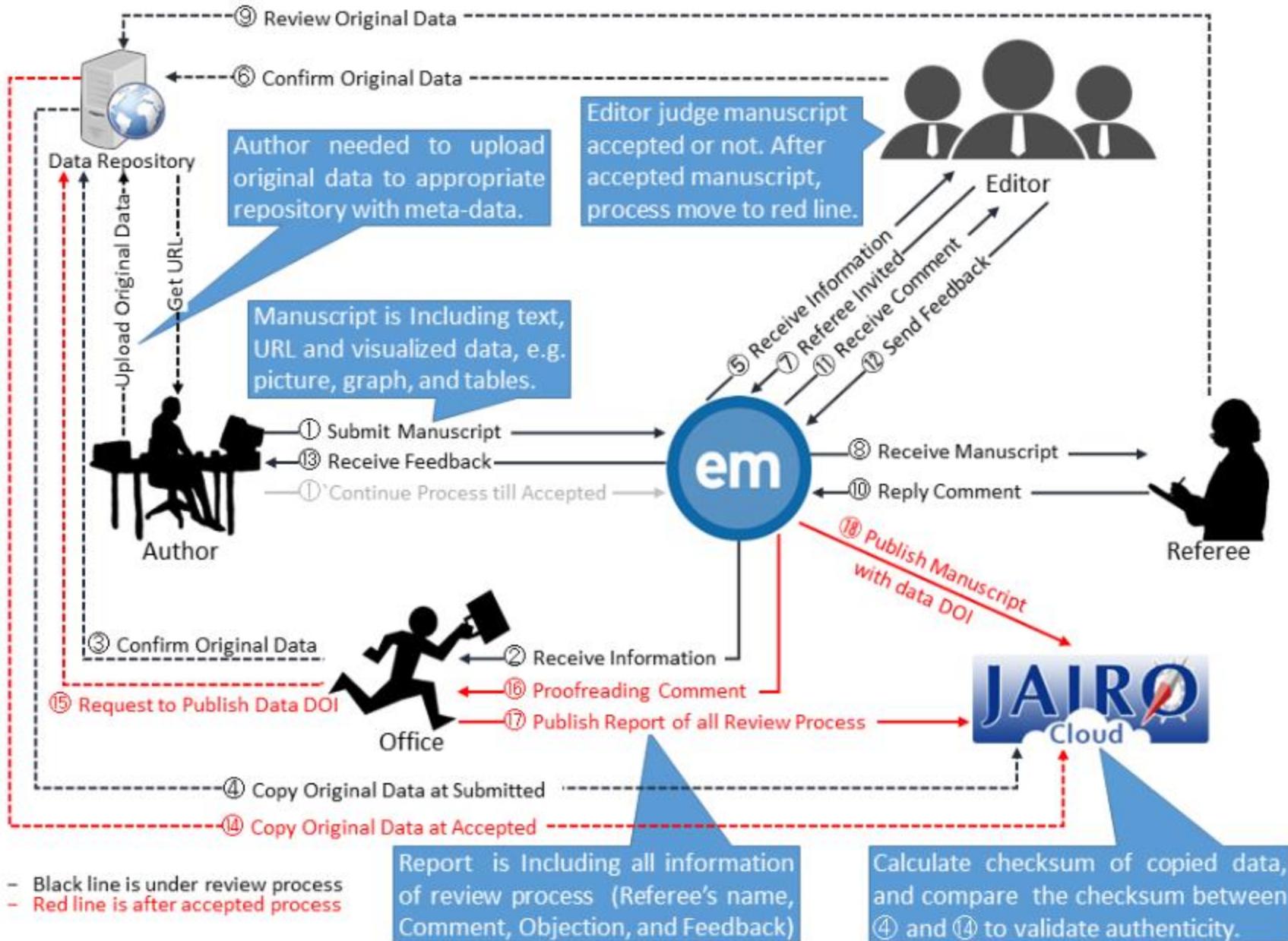
- [Contact Information](#)
- [History of Website](#)

### Announcements

view number 10 [RSS](#)

<a href="#">Review Diagram Uploaded</a>	12/06 15:22
<a href="#">NIPR launches a new data jo...</a>	12/06 14:47
<a href="#">ページ追加と編集、背景の統一</a>	11/23 15:58
<a href="#">1. Authorship The requireme...</a>	11/23 15:54
<a href="#">NameAffiliationORCIDTaco De...</a>	11/23 15:35
<a href="#">NameAffiliationORCIDRobert ...</a>	11/23 15:19
<a href="#">ページ内容更新</a>	10/19 15:39
<a href="#">Polar Data Journal is a fre...</a>	10/19 15:35

# Polar Data Journal : Review Process



# Polar Data Journal : 投稿論文の例

## Infrasound observation at Japanese Antarctic Station "Syowa": 11 years observations and results

Yoshiaki ISHIHARA<sup>1\*</sup>, Takahiko MURAYAMA<sup>2</sup>,  
Masa-yuki YAMAMOTO<sup>3</sup>,  
Takeshi MATSUSHIMA<sup>4</sup>, and Masaki KANAO<sup>5</sup>

July 30, 2019

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<sup>4</sup>Faculty of Science, Kyushu University, 2 Shinyama, Shimabara-shi, Nagasaki  
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and Systems, 103 Midori-cho, Tachikawa, Tokyo 190-8518.

\*Corresponding author. Yoshiaki ISHIHARA (ishihsra.yoshiaki@nies.go.jp)

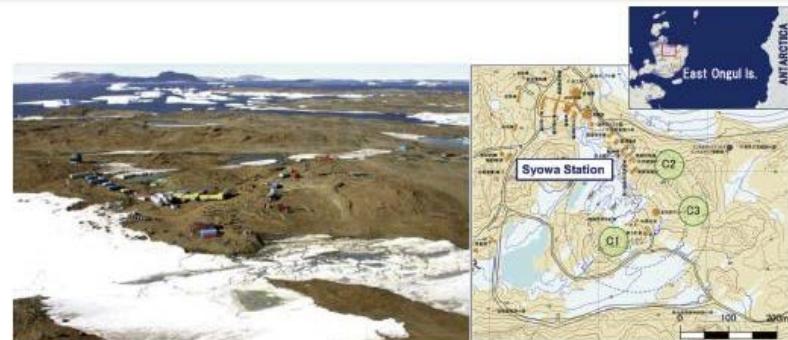


Figure 1: Overview of Syowa Station in East Ongul Island, LHB and location of the infrasound array at Syowa Station.

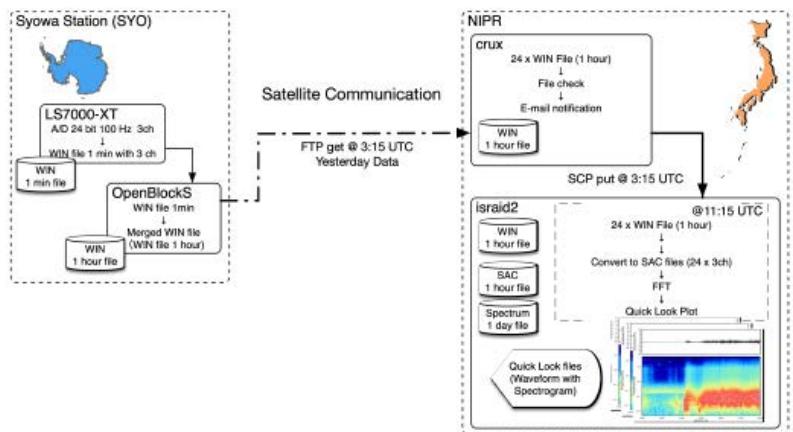


Figure 3: Schematic diagram of the data recording and transfer flow of the SYO infrasound observation system. (SYO) Infrasound signal are digitized by a datalogger (Datamark LS7000-XT) with 24 bit / 100 Hz sampling and then stored in the logger as 1 min WIN format file. At the same time, the data was copied to a small linux box (OpenBlockS) and a merged WIN file (1 hour long WIN file) will be created and stored. (NIPR) Infrasound data files (1 hour long WIN files) recorded on the previous day are automatically transferred to master linux server (crux) using satellite communication, then those files checked and stored. After that, those files transferred to another linux workstation (israid2) and then file format conversion to SAC files , FFT analysis, Quick Look Plot processes are executed.

### 1. Background & Summary

The 'infrasound' is human-inaudible sound (pressure wave) whose frequency range is cut-off frequency of sound (3.21 mHz, for a 15-degree C isothermal atmosphere) to 20 Hz, and the wave can be excited by large energy which propagates

# Polar Data Journal : 投稿論文の例

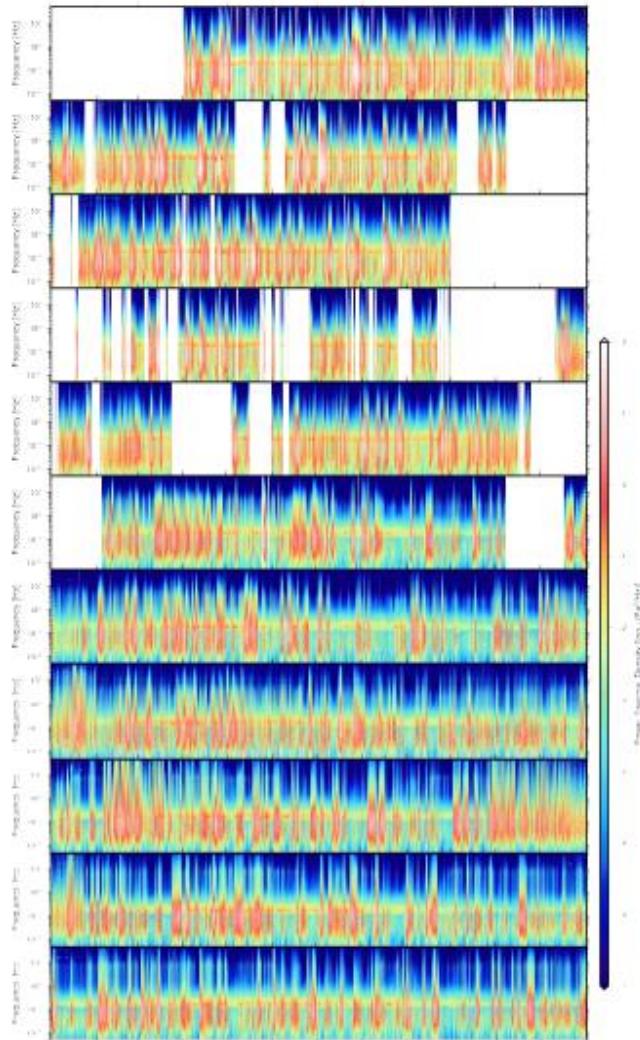


Figure 4: Spectrogram (Power spectral densities (PSD) of infrasound signals for eleven years (2008 (uppermost frame) to 2018 (bottom frame)) from the beginning of pilot observations at Syowa Station (SYO; one of the array sites; C1). The white colored time zones correspond to the lack of data, otherwise any errors occurred during the PSD processing. Predominant frequencies corresponding to the microbaroms (0.1 to 0.3 Hz bands) are clearly identified during the recording periods. The horizontal axis is the month of the year.

13. Murayama, T., Kanao, M., Yamamoto, M.-Y., Ishihara, Y., Matsushima, T., Kakinami, Y., Okada, K., Miyamachi, H., Nakamoto, M., Takeuchi, Y., Toda, S., Timespace variations in infrasound sources related to environmental dynamics around LützowHolm Bay, east Antarctica. *Polar Sci.*, 2017, 14, 3948. <https://doi.org/10.1016/j.polar.2017.10.001>
14. Murayama, T., Kanao, M., Yamamoto, M.-Y., Ishihara, Y., Infrasound Signals and Their Source Location Inferred from Array Deployment in the Lützow-Holm Bay Region, East Antarctica: January-June 2015. *Int. J. Geosci.*, 2017, 08, 181188. <https://doi.org/10.4236/ijg.2017.82007>

## Data Citations

1. Ishihara, Y., T. Murayama, M. Yamamoto, T. Matsushima, M. Kanao, 2019, Infrasound observation at JapaneseAntarctic Station 'Syowa': 11 years observations and results, 1.00, Arctic Data archive System (ADS), Japan, <https://ads.nipr.ac.jp/dataset/A20190705-001>

Because of limitation of disk capacity of archive site, PSD files are provided separately upon e-mail request.

Click here to download Data URL

<https://ads.nipr.ac.jp/dataset/A20190705-001>

15 -16 October 2013

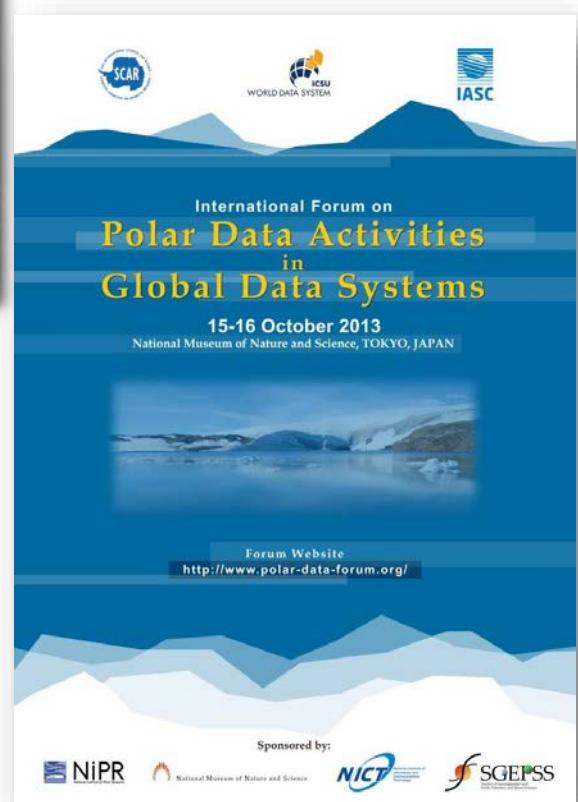


極域データ関連の国際シンポジウム開催

## *International Forum on 'Polar Data Activities in Global Data Systems'*



National Museum of Nature and Science



# International Workshop on Data Science - Present & Future of Open Data & Open Science -

12 – 15 November 2018

Mishima Citizens Cultural Hall & Joint Support-Center for Data Science Research,  
Mishima, Shizuoka, Japan

[https://ds.rois.ac.jp/article/dswo\\_2018/](https://ds.rois.ac.jp/article/dswo_2018/)

## Session Themes :

- ✓ International data activity
- ✓ National data activity
- ✓ Current status of data science
- ✓ Current status of Inter-disciplinary science
- ✓ Industry-academia collaboration, education, capability building
- ✓ Legacy data, historical data, future on data science
- ✓ 120 participants including 20 overseas.



# Polar Data Forum I → II, III

## Polar Data Forum II

Polar Data Forum II, October 2015, Waterloo, Canada

**Polar Data Forum II:**  
International Collaboration for Advancing Polar Data Access and Preservation



27-29 October 2015  
University of Waterloo, Waterloo, Ontario, Canada

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rum  
**ctivities in Global Data Systems**

ure and Science, Tokyo, Japan

## Polar Data Forum I

Polar Data Forum I, October 2013, Tokyo, Japan

[PDF I site](#)



# Third Polar Data Forum



November 18 to 22, 2019 - Helsinki, Finland

Abstracts

Re



## Third Polar Data Forum Themes and Activities

A call for papers, and posters for presentation on Days 1 and 2, and working or hackathon activities for Days 3,4,5

### Paper and Poster Themes

<https://polar-data-forum.org/>

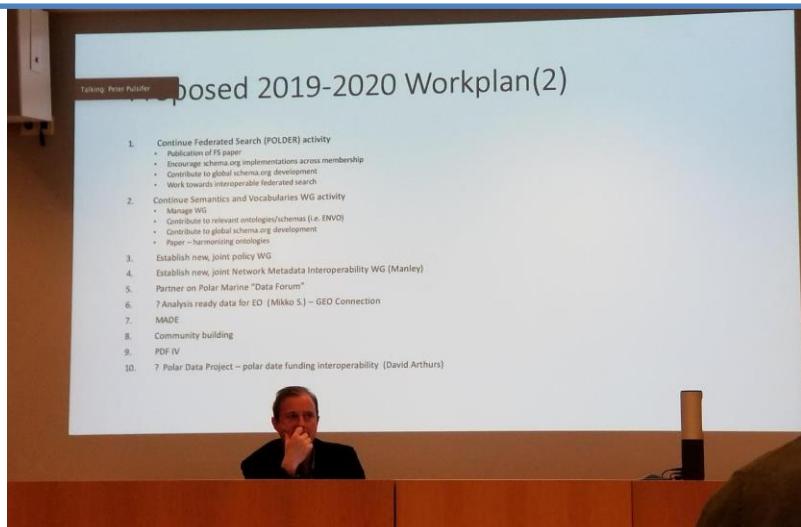
- Community and network building
- Data discovery and federated search
- All aspects of data interoperability (syntactical, structural, semantic, social)
- Standards and protocols to improve data access
- Analysis of user needs
- Enabling data reuse for multiple audiences
- Ethical utilization of data derived from Indigenous knowledge and community based monitoring
- Data management for polar social science and humanities
- Cloud computing and other advanced analytical methods and platforms
- Sensor webs and observing systems
- Critical studies on polar data management (e.g. Science and Technology Studies)
- Any topic relevant to polar data

参加者110名、約20か国、Polar Data Journal に特集号

# Polar Data Forum III @ Helsinki 18-22 Nov. 2019



第3回北極科学大臣会合(ASM III、2020年11月@東京)に  
データポリシー・予算獲得等の提案書(white paper)を提出



# International Symposium “Global Collaboration on Data beyond Disciplines”

23 – 25 September 2020

Science Council of Japan,  
Roppongi, Minato-ku, Tokyo, Japan

## Session Themes :

- Collaborations of international data alliances and data systems
- Reinforce and unification of regional data networks
- Development of new technologies for open science
- New movements in data publication under the FAIR principle
- Recent development on data-centric science
- New multidisciplinary data-driven sciences
- Involvement of young generations in data community
- Strategy of future action
- World Data System (WDS) Forum

## Website :

[https://ds.rois.ac.jp/article/dswns\\_2020/](https://ds.rois.ac.jp/article/dswns_2020/)

## Keynote Speakers (provisional):

- Sandy Harrison (University of Reading, United Kingdom)
- Ingrid Dillo (Data Archiving and Networked Services, Netherland)
- Alex de Sherbinin (University of Columbia, USA)
- Mazlan Othman (Regional Office of Asia and Pacific, International Science Council, Malesia)
- Juanle Wang (China Academy of Science)
- Mark Parsons (Rensselaer Polytechnic Institute, USA)

## Organized & Supported by:



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  
Joint Support-Center for Data Science Research (DS)



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

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## Conference Week Schedule:

- ◆ Monday 21 September 2020; (Business Meetings; day 1)
- ◆ Tuesday 22 September 2020; (Business Meetings; day 2)
- ◆ Wednesday 23 September 2020; Symposium  
(Registration, Sessions; day 1), Reception
- ◆ Thursday 24 September 2020; Symposium  
(Sessions; day 2), Banquet
- ◆ Friday 25 September 2020; Symposium (Sessions; day 3)

## Local Organizing Committee (LOC) : (\* Chair)

\*Masaki Kanao (Polar Environment Data Science Center,  
DS, ROIS), + 11 members

## Advisory Committee (AC) : (\* Chair)

\*Asao Fujiyama (Joint Support-Center for Data Science  
Research, ROIS), +11 Japanese members, + 18  
International members

## Website :

[https://ds.rois.ac.jp/article/dswo\\_2020/](https://ds.rois.ac.jp/article/dswo_2020/)

## Important Dates:

Registration & Abstract submission open: 01 April 2020  
Fixing the sessions & program: 01 July 2020  
Abstract submission deadline: 01 August 2020  
Program booklet online: 01 September 2020  
Registration deadline: 20 September 2020  
Symposium date: 23-25 September 2020

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