To the attention of the President of ROIS
Report
of the International Strategic Advisor

Introduction

As part of the International Advisory Programme funded by the Research Organization of Information and Systems (ROIS), the Director of the International Seismological Centre (ISC), Dr Dmitry A. Storchak visited the Polar Environment Data Science Centre (PEDSC) of the Joint Support Centre for Data Science Research (ROIS-DS) during the period from November 25 to December 6, 2024.

PEDSC building is based in a research campus in a suburban city of Tachikawa in Tokyo, adjacent to the buildings of the National Polar Research Institute (NIPR) and the Institute of Statistical Mathematics (ISM). Dmitry Storchak was kindly provided with an office in the PEDSC (DS) building for the entire duration of his visit under the Programme. Further advice was provided on use of facilities and every help and guidance was offered when requested.

Visit Schedule

The schedule of the visit involved several important events:

- Familiarization with the DS building, Computer Server Room;
- Introduction to PEDSC Director, prof. Akira Kadokura and PEDSC staff;
- Introduction to the Deputy-Director of ROIS-DS and the ISM Director-General Prof. Hiroe Tsubaki;
- Introduction to the Director-General of NIPR, Prof. Youshifumi Nogi;
- Visit to Polar Science Museum;
  [this visit helped to learn the history of Japan Antarctic Research Expedition (JARE); seismological materials from JARE were contributed to the ISC data holdings and completeness of this collection is checked and remaining small gaps filled in.]
- Presentation on the NIPR Special Seminar titled: “The International Seismological Centre (ISC): Products and Services for Polar Regions”;
  [*this presentation detailed the specifics of the ISC mission, collaboration with 150 institutions around the world, including NIPR and ROIS-DS/PEDSC, principles of data exchange, licenses as well as a description of ISC services relevant to polar research.]*
- Presentation on the ROIS-DS Special Seminar titled: “The International Seismological Centre (ISC): Principles of Data Collection, Management, Protection and Distribution”;
  [*this presentation detailed the characteristics of data products served by the ISC, specified ISC’s efforts in setting the two principle policies: Data Collection and Data*

Management and discussed the pros and cons of moving the computer facilities and infrastructure to the cloud.]

- Presentations on the Polar Geosciences [OG] and Polar Data Science (ID) sessions of the 15th Symposium on Polar Science at NIPR;
- In addition to NIPR, side-visits took place to meet relevant staff of JMA, JAMSTEC and IISEE-BRI to help maintain Japan's data contributions to the ISC and their use of the ISC data.

Current Status and Recommendations

The Joint Support Center for Data Science Research as well as the Polar Environment Data Science Center (PEDSC) are currently engaged in:

- Data sharing support in several science fields;
- Data analysis support;
- Training of Data Scientists;
- Collaboration programs.

We would recommend strengthening the work of ROIS-DS and PEDSC by:

- Attracting additional dedicated data systems support staff;
- Continuing work on establishing data and metadata standards;
- Gaining WDS's CoreTrustSeal Certification;
- Further strengthening Japan's contribution to international science;
- Continuing good work on running both in-person and on-line international meetings of data scientists from all countries that proved exceptionally useful to maintain collaboration and exchange experiences, data, methods and strategies of scientific research;
- Continuing to dedicate resources to scientific publishing in the field of data sciences;
- Finding and popularising examples how methods of working with data used in one science group have been successfully transferred to be used in another group of sciences;
- Investing further resources into digitization of Legacy data collections;

Recommendation of the Benchmark Institutions

Our advice is mostly related to the international organizations and institutions working in the field of Seismology, although some general approaches to data might be applicable to general data storage, management, licensing and distribution issues.

I believe that in our field, the PEDSC, ROIS-DS and NIPR should both cooperate and benchmark themselves up against the following organizations:

- **EarthScope Consortium** (formerly IRIS) where it comes to storing and distributing the seismic waveforms (time rows) from seismic stations and arrays of stations openly and freely available on-line;
- **International Seismological Centre** (ISC), where it comes to storing and distributing the parametric seismic event (earthquake etc) information for seismic events of the past and up to a year after event occurrence; in particular, data of the ISC are useful when establishing the ability of seismometers at Syowa Base station (SYO) to detect seismic events of particular magnitude at a particular distance as well as when performing a calibration work on current recordings by SYO;
- **United States Geological Survey (USGS)**, where it comes to dealing with seismic events occurring in near-real time;
- **Word Data Systems (WDS)**, where it comes to designing the database and meta-data, seeking guidelines on the usage of FAIR principles (findability, accessibility, interoperability, and reusability) as well as data licensing and data citation;
- **NORSAR**, where it comes to establishing observational networks and sharing digital data in real time in Polar regions.

Specific recommendations with respect to the Legacy Data

At present, preservation of the Legacy data is taken rather seriously in different fields of science, including Geophysics. In particular, we suggest that PEDSC jointly with the NIPR work together with the ISC, IASPEI and EarthScope on preserving the seismogram records of SYO station, the SYO station bulletins containing arrival times of seismic waves from earthquakes around the world as well as digitizing these arrival times for use in location of legacy events.

Major parts of the work described above have already been advancing for several years, but we would like to encourage ROIS-DS to provide further resources to complete this work to preserve the investment made by Japan in JARE expeditions over several tens of years.

Note of apology

The author apologizes for a small delay in submission of this report that is mostly due to the annual vacation and UK festivals in Dec-Jan period that immediately followed his visit to Japan.

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