

Research on Chinese Antarctic Data Directory System •

— Collecting, processing, examining and submitting data directory

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Abstract Based on the general framework of ADDS (Antarctic Data Directory System) established by SCAR-COMNAP ad hoc Planning Group on Antarctic data management, the CN-ADDS (Chinese Antarctic Data Directory System) project is going on, of which the research and activity keeps to the available method and technique in ADDS development and allows for the Chinese specific status in Antarctic data management as well. At present, authoring and submitting timely Antarctic data directory in China is one of the key issues that is to be dealt with necessarily. This paper aims at studying the technical procedure in collecting, processing, examining and submitting data directory. In additional, it also discusses the efficient collection of data directory, which needs the effort of administrative and technical support.

Key words ADDS, CN-ADDS, Antarctic Data Directory, collecting, processing, submitting.

1 Introduction

Developing and maintaining ADDS is one of the key issues, which really promotes Antarctic scientific research greatly up to now. This view is not only shared in the Antarctic research sphere, but also is confirmed commonly by ATCM (Antarctic Treaty Consultative Meeting), SCAR, COMNAP (Council of Managers of National Antarctic Programmes) (SCAR 1994).

ADDS is a comprehensive system of technical and administrative description on Antarctic data, covering some detailed information: data description, data source, collection period and so on (SCAR-COMNAP ad hoc Planning Group on Antarctic Data Management 1994). The objective of research and development on ADDS is to make information about Antarctic scientific data readily available to facilitate data access, avoid repetition of data acquisition, maximise the use of data, promote the co-operation between disciplines and countries (Cheng *et al.* 1998). JCADM demands that NADC (National Antarctic Data Center) is responsible for calling for and explanation, compiling and processing, examining and submitting, revising and maintaining Antarctic data directory. The framework and principle of ADDS is described in JCADM meeting reports (SCAR 1994; Cheng *et al.* 1998). As one of tasks of ADDS, CN-NADC is in charge of Chinese-specific work on data directory, based on the principle and implementation action in

ADDS, such as the explanation on collected Antarctic data, authoring (collecting, processing, submitting) and maintaining (operating, circulating, reviewing, and acquiring feedback) Chinese-ADDS, therefore improving operability of Antarctic data management in China.

At present, authoring and submitting timely Antarctic data directory in China is one of the key issues that is to be dealt with necessarily. An integrated process of collecting, processing, examining and submitting data directory is discussed in this paper. Undoubtedly, it provides some concrete methods and framework for the next work. In addition, the efficient management of data directory collection is also discussed to ensure that data directory may be authored and submitted as expected, and that the CN-ADDS will be accomplished and operated successfully.

2 Technical procedure of data collection, processing, examination and submission

Developing and maintaining ADDS is very complicated in practice, and it involves several related factors. It is the favorable way to follow the procedure shown in Fig. 1 in the collecting, processing, examining and submitting data directory. To ensure that CN-ADDS will be operated successfully and regularly, it is necessary to confirm every step feasibly in this procedure chart, then formulate a practicable operating process. As shown in Fig. 1, data collection, processing, examination and submission are the main sectors in the procedure. They are discussed respectively below:

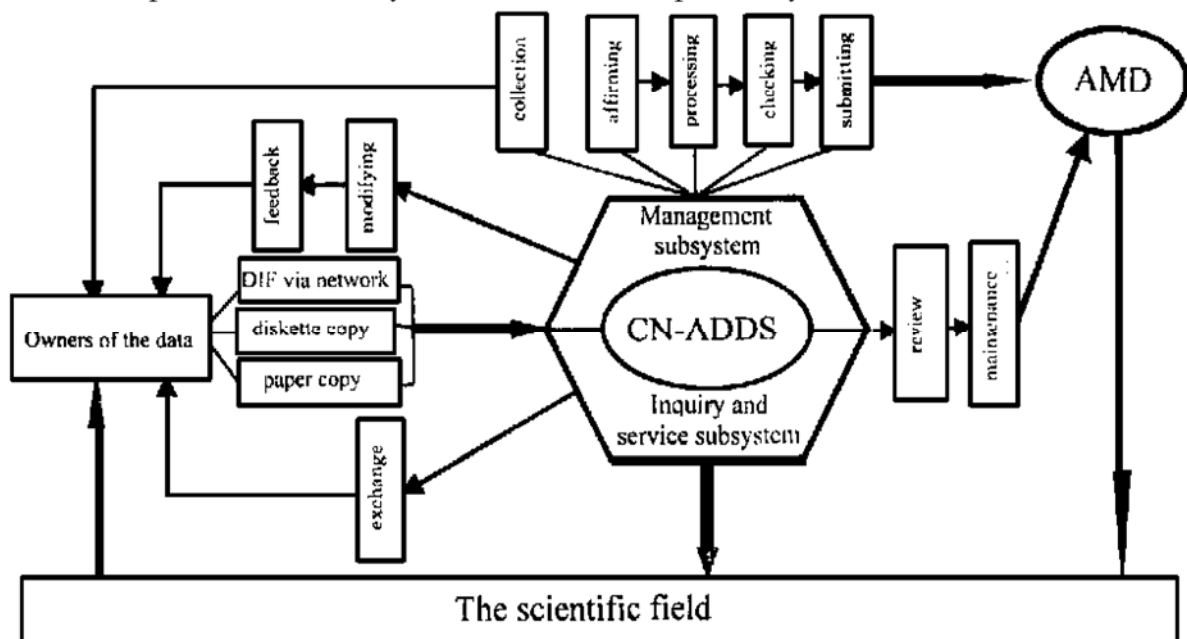


Fig. 1. Sketch showing the procedure of authoring and operating the Chinese Antarctic data directory system.

2.1 Data directory collection

As part of data collection in CN-ADDS, data directory collection (namely, to initiate or organize the explanation of data set) mainly involves three basic parts: **who** to compile, **what** to compile and **how** to compile.

2.1.1 Defining data owner or data center and providing service

It is advisable that the subject group is defined as the main data holder in reference to the Five-Year Plans of Chinese Antarctic Research. The data directory is compiled by the members of subject group, led by the head of subject group. Once recognizing the content of data directory and designating the compiler, CN-ADDS should provide the guidance and help for them, mainly specifying **why** to compile, **what** to compile and **how** to compile.

2.1.2 *Defining the usable data for authoring data directory*

Not all data is necessarily described in the data directory, nor might all data directories be submitted to the AMD(Antarctic Main Directory) host. In contrast, the explanation of data set, recognized as valid and valuable, needs to be compiled into data directory. Up to now, the criterion of selection is not yet established. In general the data coordinator should observe the five principles listed below, referable to the taxonomy of Antarctic data directory (Cheng *et al.* 1998). The result is completely dependent on his or her intelligence, academic level and professional experience.

- (1) Reliability: sensors are up to the technical standard and requirement, and method of data collection is generally acknowledged by the scientists or users.
- (2) Security: it can be open unlimitedly to the scientific community in accord with the related international secrecy provision.
- (3) Regularity: collected in implementing national project or plan.
- (4) Accuracy: readily available for users in accuracy.
- (5) Integrity: to meet the requirement of DIF(Directory Interchange Formats).

2.1.3 *Distribution of the authoring form*

In order to ensure its accuracy and integrality, the compiler is advised to compile data directory in given format and to submit it in time as expected. DIF Authoring Tool (Version 1) software is available for users and can be acquired directly from CN-NADC. Now CN-NADC has designed a specific authoring form of data directory to simplify the authoring process and made it easy. Besides, the data directory is submitted by four ways:

- (1) Form on paper
- (2) Form by E-mail
- (3) Form via www
- (4) Form by disk copy

It involves 12 categories of themes for authoring data directory in DIF Authoring Form: atmosphere, hydrosphere, cryosphere, biosphere, oceans, land, radiance, paleoclimate, solid earth, human factor, solar-physics, space physics. Among them, space physics is added to the theme item and will be submitted to ICAIR for recognition. The detailed theme list is convenient for the compilers of different disciplines to select the suitable form.

2.2 *Processing*

All the collected data directories are examined and checked, re-compiled and revised by CN-NADC in order to make it more integral and accurate.

2.2.1 Preliminary processing

(a) Data directory authored directly by using DIF authoring tool software CN-NADC utilizes DIF authoring tool software to examine its field (integrality and accuracy), checks its content (accuracy and reliability) and revises it (discussing it with its compilers) in the end, then come into the formal processing stage.

(b) The data directory authored by specific authoring form of data directory—Whether by form on paper, form by Email or form via www, all acquired data directories are handled as listed above.

2.2.2 Formal processing

The staff or coordinators in CN-NADC reedit, re-check the original data directory formed in section 2.2.1, and then input them into the ACCESS database.

2.3 Examining and submitting

2.3.1 Examining

The CN-NADC manager, together with its coordinators, examines the processed data directory. If necessary, he consults the specialists or scientists familiar with the subject concerning data set.

2.3.2 Submitting

The AMD host ICAIR (International Centre for Antarctic Information and Research) demands that the institution or research staff, other than the SCAR working group, the specialist group and the International cooperation program on the large scale such as IGBP\WCRP\GLOCHANT, should not submit directly Antarctic data directory to ICAIR, but it should be presented to its NADC(or be recognized firstly by NADC and then submitted to ICAIR).

The data directory is submitted in the two steps in CN-ADDS:

- * The compilers submit the original data directory to CN-NADC
- * CN-NADC submits the examined data directory to AMD via Internet

3 The scientific management of data directory collection

It is proved that it is a lasting and arduous task to supervise and urge the compilers to author and submit data directory in time, in the course of which there exist some concrete problems. So a feasible method is needed to solve it (Cheng *et al.* 1998). Whereas the Antarctic expedition is a national activity, as well as an International activity in a certain sense, the scientific management of the acquired data is vital to maximize its scientific materials (Cheng *et al.* 1997). How to exchange or to share them in a broader sphere needs to be dealt with, among which the data directory collection is the most basic and important problem. In our view the scientific management can be achieved by two sides:

(1) On the administration

* To sign “the liability contract on submitting Antarctic data directory” before making all the projects of National Antarctic Scientific Plan.

- * To demand that every project of National Antarctic Scientific Plan should submit data directory before it passes examination of its accomplishment.

- * To increase the dedicated outlay of CN-NADC and place it on the fiscal fund budget of National Antarctic Research.

- * To add the item of submitting data directory into polar archives administrative rules, moreover, to constitute and publish a detailed rules on Chinese Antarctic Data Management.

(2) On the technical effort

- * To survey, verify and sort acquired data available for recognizing the storage location, storage media and data holder.

- * To be concerned with the progress of Chinese Antarctic scientific plan, of which the valuable data need to be understood actively.

- * To realize in time the data collection, data analysis and data processing in national key projects (including sensor, means, accuracy, integrity).

- * To improve the scientist and research personnel's understanding to CN-ADDS by visit and academic intercourse.

- * To set up the standard terminological glossary (keyword list) and provide multi-mode of DIF authoring tool.

- * To present the service on CN-ADDS on the CN-NADC web site, providing access to CN-ADDS and data directory search via Internet.

References

- Cheng SH, Li SG, Zhu JG, Ling XL, Jiang CT(1998): A preliminary study on Antarctic data directory system. *Chinese Journal of Polar Research*, 10(1): 65 - 70.
- Cheng SH, Zhu JG, Ling XL, Fang BX(1997): Preliminary study of Chinese Antarctic data management in accordance with international framework. *Chinese Journal of Polar Research*, 9(3): 216 - 222.
- SCAR (1994): The SCAR-COMNAP ad hoc Planning Group on Antarctic data management report of the 2nd meeting. *SCAR Bulletin*, No. 114.
- SCAR - COMNAP ad hoc Planning Group on Antarctic Data Management (1994): Antarctic data directory system, 3rd report of the SCAR-COMNAP ad hoc Planning Group on Antarctic data management, Rome, Italy.