Progress Report
On “Development and Service of WDC for Seismology, Beijing”

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China Earthquake Administration
CONTENT

- General Situation
- Progress of Data Criteria Construction
- Progress of Database Construction
- Progress of Data Platform Construction
Source of The project:
The construction content of this project is part of the “Development and Service of Earth Sciences Data Center, China”, funded by the Ministry of Science and Technology, China and China Earthquake Administration.
The Project Purpose:

- Reorganization and Integration of Seismic Data;
- Construction of Main Database;
- Improving Distributed Network Service and Sharing;
- Navigation of Global Seismic Data Resources.
The Project Tasks:

- Improvement of Classification Criteria of Seismic Data Sharing;
- Survey of Global Seismic Data Resources;
- Internet Sharing of the Main Seismic Database;
- Improving Metadata and Index Database;
- Improvement of Seismic Data Navigation System.
Construction of this project has been lasting for 6 years, in two stages:

- **First Stage:** 1999 - 2001,
  - Construction of Seismological Database and Website, and the Framework of WDC for Seismology, Beijing;
- **Second Stage:** 2002 - 2004,
  - Improvement and Service of WDC for Seismology, Beijing.
More than 50 scientists and technicians participated in this project.
Progress Summary and Technical Reports of WDC for Seismology, Beijing.
CONTENT

- General Situation
- Progress of Data Criteria Construction
- Progress of Database Construction
- Progress of Data Platform Construction
Ⅰ、Report on the Classification of Seismic Data

We investigate current seismic data at home and abroad, analyze the characteristics of the seismic data in China, and classify seismic data from different angles.
Setting up “the compilation Guideline for Seismic Metadata (primary draft)”

In accordance with ISO/19115 and reference to relevant national criteria, combined with real characteristics of seismic data, we set up “the compilation Guideline for Seismological Metadata (primary draft)”. 
Ⅲ 、 Setting up “Technical Standard of Seismic Database System” and “Management and Service Standard of Seismic Data”

On the basis of broad survey of seismic data, we analyze the structural features of various types of data, set up the table structure of database and the management and service standard of seismic data.
CONTENT

- General Situation
- Progress of Data Criteria Construction
- Progress of Database Construction
- Progress of Data Platform Construction
1、Basic Seismic Database(11)

1、China Historical Earthquake Catalogue

The China Historical Earthquake Catalogue Database collects the destructive earthquake occurred in period of 1831 B.C. –A.D. 1979. (M ≥ 4.7), totaling about 6059 items.

Data volume: 0.5 MB
中国历史地震目录库

查询历史地震目录库条件

- 选择查询条件
- 选择查询范围
- 点击查询按钮

Chinese Version

Please input searching condition of historical catalogue

The data is from China Historical Catalogue database. This catalogue collects the destructive earthquakes occurred in period of (55) B.C.-1979 A.D. (M>4.0). The total is 4000 pieces.

Please input search condition. Date format is YYYYMMDD, for example 19700101, BC year need add minus sign. Latitude format is DDD.D, Longitude format is DDD.DD. Please input lacking number as zero, for example, Longitude 90 degrees should be inputted as 09000.

1. Date
2. Latitude
3. Longitude
4. Magnitude

Submit Reset

English Version
1. **Basic Seismic Database**

2. **Earthquake Catalogue of China Seismic Network**

   The Earthquake Catalogue Database contains the catalogue of national basic survey station since 1978. It can be searched by earthquake time, epicentral longitude and latitude, depth, magnitude and reference name.
Search Results from the Earthquake Catalogue
Database of China Seismic Network

World Data Center for Seismology, Beijing

CSN catalog

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I. Basic Seismic Database

3. China Micro-earthquake Catalogue

The China Micro-earthquake Catalogue Database collects the earthquake occurred since 1978 (M ≥ 1.0), totaling about 300,000 items. It can be searched by origin time, longitude and latitude, depth, magnitude, and reference name.
Catalogue of Microseismic Event in China

Date: 2003-01-01 - 2003-12-31

Longitude and Latitude: -
4. **Large Earthquake Sequences Catalogue**

It is a catalogue containing 16 earthquakes larger than M7.0 from mainland China, numbered more than 80,000 items, including origin time, epicenter longitude and latitude, depth, magnitude, location quality, region code, reference name, data source and notes.

Data volume: 10MB.
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5. China Seismic Network Bulletins

The China Seismic Network Bulletins are from 24 stations for international exchange since 1996. They include: **The station data** - the code number, the name and location of the station. **Earthquake catalogue** - the origin time, longitude and latitude, magnitude, etc. **Phase data** - code number, seismic moment, the arrival time, residual error, period, etc. **Data volume** - 250MB.
# CSN phase report

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Basic Seismic Database

6. Rapid Reporting Catalogue of Large Earthquakes

It contains earthquakes larger than M5.0 from China and larger than M7.0 from the globe rapidly located and reported by China Seismic Network. It remains for one year and continuously revised.

Data volume: 0.01MB.
## Current Worldwide Earthquake List

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<td>09:10:22.6</td>
<td>28.0</td>
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<td>YUSHU QINGHAI, CHINA</td>
</tr>
<tr>
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<td>YUSHU QINGHAI, CHINA</td>
</tr>
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<td>33</td>
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</table>
Basic Seismic Database

China Geophysical and Geochemical Database

It contains 1425 items of results including geomagnetic, geoelectrical, gravity, geodesical, stress and strain, water level and hydrochemical observations from about 350 precursory stations nationwide.

Data volume: 400MB.
全国地震前兆观测数据

按台站索引

北京 天津 河北 山西 内蒙古
辽宁 吉林 黑龙江 上海 江苏
浙江 安徽 福建 江西 山东
河南 湖北 湖南 广东 广西
海南 四川 贵州 云南 西藏
陕西 甘肃 青海 宁夏 新疆

按方法索引

地震颤 重力 地磁 地电
应力应变 形变 水化 水位 水温
Basic Seismic Database

8. Waveform dataset of Globally Recorded Earthquakes from China

It contains waveform data of earthquakes greater than M5.7 occurred in China since 1988, recorded globally by 137 stations, including other helping information.

Data volume: 3.7MB.
Station: BJ - Baijiatun, Beijing, China
Network: CB - China Seismic Network
Lat: 40.018 Lon: 116.17° Elev: 19°
Available Channels: SHE, SHN, SHZ

Sample Waveforms

- SH Waveform
- Sample of seismic wave data from the station at different times.

CSN WILBER

Event: 2006/05/22 11:12:00.1 Mag: 6.7 Lat: 60.84 Lon: 165.68 Depth: 17.00
Description: EASTERN SIBERIA, RUSSIA  Source: China Seismic Network

Available Channels:
- SHE
- SHN
- SHZ

Available Data Formats: Time Window Data, Personal Information
9. Focal Parameter Dataset of Earthquakes from China

It contains 2576 records of focal mechanism solutions of 1838 earthquakes occurred in China from 1904 to 1989.

Data volume: 336MB.
AUTO-CMT Solution

China Center for Digital Seismic Network

2006-11-26 8:49:44.8
Lat=29.55 Long=115.73 Dep=11.7 (km)
D革命 waves (10.0, 12.0, 20.0, 22.0 m/s)
3.8e+13 -6.0e-15 -3.0e+15 (Nm)
Mo=2.27e+6 (Nm) Mw=4.9
84/82/98 34/6/8-8
op-e-0.17 /D-0.0%
1、Basic Seismic Database

10、Isoseismic Map Dataset (Chinese Version)

It contain 800 isoseismic maps of historical earthquakes from China.

Data volume: 3000MB.
图6 唐山7.8级地震等震线图

Fig. 6 Isoseismal map of the M=7.8 Tangshan earthquake
Basic Seismic Database

Globally Recorded Digital Waveform Dataset of Large Earthquakes from China

It contains digital waveform data of 137 earthquakes greater than M6 occurred in China recorded by GDSN, stored in 7 discs.

Data volume: 3700MB.
Seismic Datasets Stored in Discs
1 Seismic Metadata Database from China

It contains 7 types of earthquake data, including seismic data, precursory data (geomagnetic, geoelectrical, geodesic and ground fluids), field survey data, seismic experiment data, seismic disaster data, earthquake prediction and mitigation data, totaling about 49 tables, 5000 data items.
II、Metadata Database

2、Global Seismic Metadata Database

It contains information about 27 international seismic data collection and service units from 22 countries.
1. China Seismic Station Database

It contains about 400 observation stations from China, (seismic, geomagnetic, geoelectrical, gravity, geodesic and fluids observation stations) and 20 teleseismic networks, totaling about 19 database tables, about 6MB.
Seismic Monitoring Systems

- 1300 seismic observatories
- 128 regional telemetry seismic networks with 345 substations
- 78 crust deformation observatories
- 154 strain and stress observation stations
- 130 hydro-chemical observation stations
- 126 underground groundwater observation stations
- 124 geomagnetic observatories
- 80 geoelectric observatories
- 15 gravity base stations
2. Global Seismic Station Database

It contains information about 10,000 global seismic stations, including station code and coordinates etc.
summary

I、Basic Seismic Database(11)
1、China Historical Earthquake Catalogue
2、China Network Earthquake Catalogue
3、China Micro-earthquake Catalogue
4、Large Earthquake Sequences Catalogue
5、China Seismic Network Bulletins
6、Rapid Reporting Catalogue
7、China Geophysical and Geochemical Database
8、Waveform dataset of China Recorded
9、Focal Parameter Dataset of Earthquakes
10、Isoseismic Map Dataset
11、Globally Recorded Digital Waveform Dataset

II、Metadata Database(2)
1、Seismic Metadata Database from China
2、Global Seismic Metadata Database

III、Seismic Station Database(2)
1、China Seismic Station Database
2、Global Seismic Station Database
Histogram of Seismic Database

MB

Base

Meta.

Net.
CONTENT

- General Situation
- Progress of Data Criteria Construction
- Progress of Database Construction
- Progress of Data Platform Construction
1. **Construction of Information Service System**

1. **Seismic Data Resource Service System**

   It consists of two parts: information release and management systems. Information release system is a website open to public; Information management system revises and maintains the database contents.
欢迎您，来到地震数据资源信息服务系统！

查询说明

中国地震数据资源信息是由WDC中国地震学科中心建立的元数据库提供的中国地震数据的元数据，通过网络向用户提供关于地震数据的信息，从而方便用户了解地震数据分布状况、获取渠道及使用方法。

步骤：

- 先选择模拟数字台网，还是数字化台网
- 然后再按学科选
1. Construction of Information Service System

2. Comprehensive Guide System For User

   Using Linux operation system, Oracle database management system and XML language, we constructed a comprehensive seismic data management and user guide system, including a management subsystem and a guide subsystem.
欢迎使用《综合地震信息库及用户服务引导系统》，本系统可以提供以单个地震为核心的综合服务，为对该地震的综合性研究提供便利。

系统管理功能包括：
1. 用户的管理：使用分级或分权限的方式对用户进行管理，增强系统的安全性；
2. 数据库的维护：包括数据库的备份、复制、和与其他系统之间的数据交换等等；
3. 数据本身的管理：各种数据的增加、删除、修改等功能，大部分均可在浏览器中完成。

网络服务功能包括：
1. 信息的查询、浏览和下载，数据库所提供的各种数据几乎都能在浏览器中通过不同的形式显示，用户可以使用多种方式进行处理，得到关于某个地震的综合信息；
2. GIS的应用……

信息定制功能包括：
1. 数据定制：专家用户可以从数据库中导出需要的数据，得到不同形式的产出，如文本、图片、二进制数据等。系统可以成为求定制光盘数据产品的基础平台；
2. 专题定制：系统可以生成专题分析报告的基础平台。专题内容应包括：地震描述、灾害图片及其描述、灾害数据、地震分布图、等震参数；地震背景图：地震分布图、震中分布图、地震目录等；地震波形图：必要的台站位置数据、文献资料……
SeisMIS (科学版)

地震波形

ARU BHE 87
ARU BHN -187
ARU BHZ -486

1991-3-26 4:17:41

4时10分 4时20分 4时30分 4时40分
II. Website Construction

The website “WDC for Seismology Beijing” include Chinese and English version.
1、Construction of Seismic Website(Chinese)

The website “WDC for Seismology Beijing” contains 10 sections, including introduction, earthquake sequences, global seismic information, seismic data resource, seismic data, seismic data navigation, project, seismic web navigation, earthquake case in China, seismic observation stations, etc. Revised home page in 2002, and important contents added.
世界数据中心地震学科中心，北京

中心介绍

最新地震 (中国台网测)

- 2006年10月17日09时25分，在青海省门源县发生7.0级地震
- 2006年10月12日22时46分，在台湾以东海中发生5.8级地震
- 2006年10月11日14时43分，在南海发生5.7级地震
- 2006年10月11日09时26分，在南海发生5.3级地震
- 2006年10月11日09时24分，在南海发生5.3级地震
- 2006年10月9日18时43分，在南海发生5.1级地震
- 2006年10月9日18时06分，在南海发生5.7级地震
- 2006年10月9日18时01分，在南海发生5.3级地震
- 2006年09月24日08时12分，在新疆和田发生5.4级地震
- 2006年08月25日13时51分，在云南盈江发生5.1级地震
- 更多地震...

地震序列

全球地震信息

地震数据资源

地震数据

数据分类

项目跟踪

地震网站导航

中国震例

地震台站信息

WDC Map

WDC for Seismology, Denver

WDC for Seismology, Beijing
2. Construction Of a Seismic Website (English)

This English website contains 14 sections.
[EQ Catalogue] The data is from China EQ Catalogue Database. It contains the catalogue of national basic survey stations from 1978 to 2005. The DB can be searched by earthquake time, epicentral longitude and latitude, depth, magnitude and epicentral area.

[EQ Report] The data is from China EQ report Database. The data of 24 stations for international exchange from 1986 to 2005, it include: The station data: the code number, the name and location of station. Earthquake catalogue: it includes earthquake time, epicentral longitude, latitude, magnitude, etc. Phase data: code number, epicentral moment, the arrived time of phase, residual error, period, etc.

[Historical Catalogue] The data is from China Historical Catalogue Database. This catalogue collects the destructive earthquake occurred in period of 1831 B.C.-1979 A.D. (M>4.0), is totally 6059 pieces.
Brief Introduction of WDC for Seismology, Beijing

World Data Center for Seismology, Beijing, is a member of World Data Center (WDC). It was established in 1986 as a member of WDC-D for China. Although WDC system decided not to use the - A, - B, - C, - D in 1999, World Data Center for Seismology, Beijing is still a part of China WCC system. It has been supported and managed by China Seismological Bureau (CSB) and guided by WDC National Committee and Scientific Committee of China.

The primary mission of World Data Center for Seismology, Beijing, is to carry out international exchange of seismic and geomagnetic data. As a matter of fact, this kind of data exchange has been carried out for many years in the Institute of Geophysics, CSB. After the establishment of World Data Center for Seismology, Beijing (the old name is WDC-D for Seismology), the Institute of Geophysics of CSB still is responsible for this task in the name of WDC for seismology, Beijing. This is still an important part of international data exchange in seismology and geomagnetism carried out by WDC for Seismology, Beijing.

Along with the establishment of the Center for Seismic Data and Information (CSDI), CSDI became the host of WDC for Seismology, Beijing. WDC for Seismology, Beijing, committed itself to the establishment of national seismic information network, acquiring of international earthquake data, and offering service to internal customers between 1995 and 2000. By the effort of these years, the China Seismic Information Network opened on Dec 1998. It offers seismic data and information service through network. In 1999, National Science and Technology Department gave support to a project named Database Systems for Geosciences, Part A: Seismology making the aim of WDC for Seismology, Beijing clearer and definite. That is, based on all kinds of earthquake monitoring systems and information network infrastructure in CSB, WDC for Seismology, Beijing, will make itself both a national-level center for seismology and a qualified member of WDC family.

On July 2000, the host institution of WDC for Seismology, Beijing, was moved from CSDI to Center for Analysis and Prediction of CSB according to arrangement of CSB. The new stage of WDC for Seismology, Beijing, began from there. We believe that WDC for Seismology, Beijing, will have great development with the support of CSB and the cooperation of all
On July 6, 2005, World Data Centers set up a team to visit and review the WDC for seismology of Beijing to determine how well they meet the challenges of using the internet to help users find and obtain data, and of dealing with rapidly growing demands for environmental data.
Review Team members come from:
Tohru Araki, Kyoto University, Japan
Jean Bonnin, Université Louis Pasteur, France (leader)
David Clark, NOAA, National Geophysical Data Center, USA (rapporteur)
Li Wenhua, Institute of Geographical Sciences and National Resources Research, China
Evaluation Criteria:
The data directory is being developed using the international metadata standard ISO 19115. Chinese seismological and related data held by the WDC are of major significance to the geophysical community. The WDC adheres to the policy of non-discriminatory data access for all data held in the WDC.

Recommendation:
The WDC for Seismology, Beijing, should be certified as a World Data Center.
THANKS!
WDC for Seismology, Beijing

1. Overall Observations: The WDC for seismology has four full-time employees and is supported by the CENC infrastructure. Website: www-wdcdds.seis.ac.cn.

2. Evaluation Criteria: The data directory is being developed using the international metadata standard ISO 19115. Chinese seismological and related data held by the WDC are of major significance to the geophysical community. The WDC adheres to the policy of non-discriminatory data access for all data held in the WDC.

3. Comments: The Review Panel notes the very strong support from CENC. Better access to WDC data will be accomplished with an English version of the data directories and data sets. Stronger interaction is needed with the WDC for Seismology, Golden (USA). The State Seismological Bureau holds data from the extensive Chinese geomagnetic network. Enhanced availability of the geomagnetic 1-minute data would benefit the global scientific community.

4. Recommendation: The WDC for Seismology, Beijing, should be certified as a World Data Center. Data sets or links to other data sets or data centers on observed macroseismic effects of past events and on strong motion data should be considered for addition to the center’s holdings.

Review Team members, Panel A
Tohru Araki, Kyoto University, Japan
Jean Bonnin, Université Louis Pasteur, France (leader)
David Clark, NOAA, National Geophysical Data Center, USA (rapporteur)
Li Wenhua, Institute of Geographical Sciences and National Resources Research, China
As World Data Center for Seismology, Beijing, the WDCD compiles and maintains an extensive, national database on earthquake parameters, geophysical and geochemical observation data, and their effects that serves as a solid foundation for basic and applied earth science research, and not only for seismology research.
## Current Worldwide Earthquake List

**Update Time:** 2006-10-17 16:20:00

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<td>02:12:20.6</td>
<td>35.5</td>
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