



International Knowledge Centre
for Engineering Sciences and Technology
under the Auspices of UNESCO
联合国教科文组织国际工程科技知识中心



Disaster Risk Reduction
Knowledge Service
防灾减灾知识服务

Correlation and Discovery of Disaster Big Data - DRR Knowledge Service

Juanle WANG

**Institute of Geographic Sciences and Natural Resources Research,
Chinese Academy of Sciences**

April 4, 2019

Outline

- 1. Requirements of DRR Knowledge Service**
- 2. Methodology of DRR Knowledge Service**
- 3. Knowledge service applications online**
- 4. Cooperation in the near future**

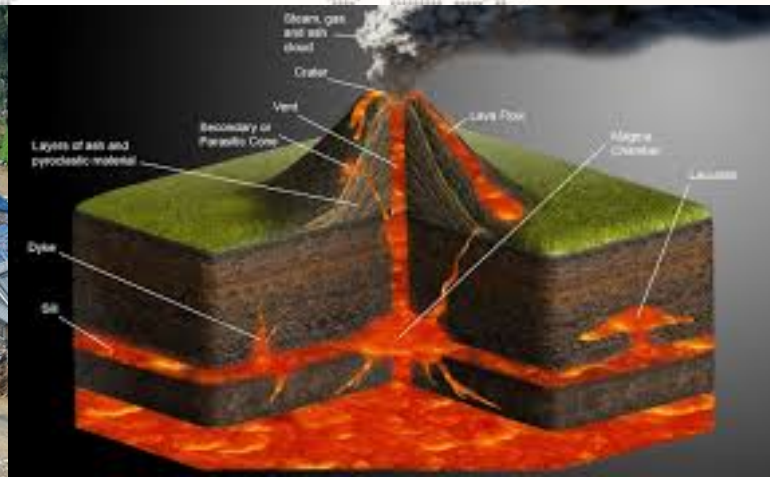
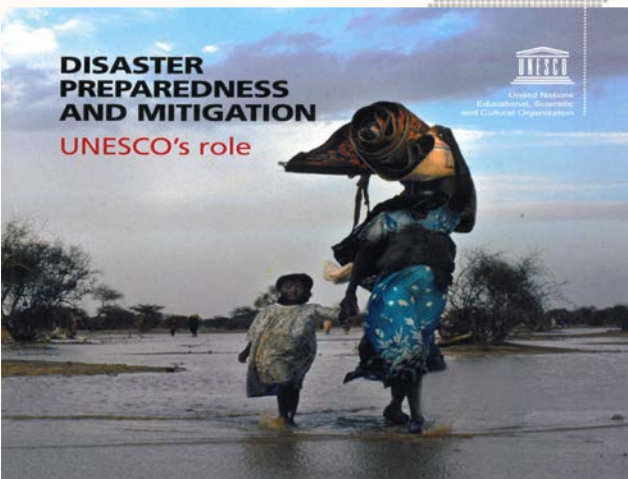
1 Requirements of DRR Knowledge Service



UNESCO

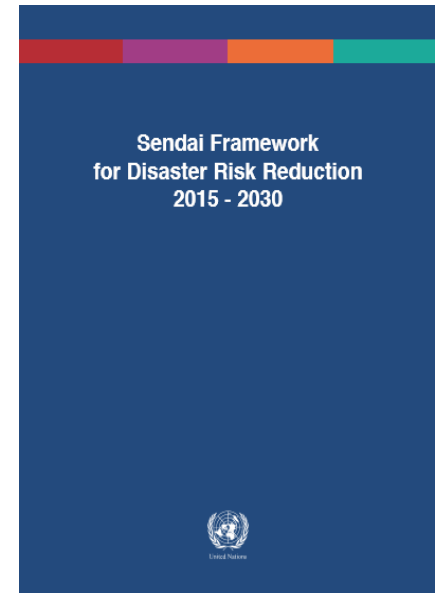
Role in Science for DRR

- Establishing / strengthening **platforms for Knowledge Exchange and Scientific Cooperation**
- Strengthening Scientific **Capacities for Disaster Risk Reduction**
- Making Disaster Risk Reduction a Priority through **Policy Recommendations**
- Multi Disciplinary Approach: **Science & Education**



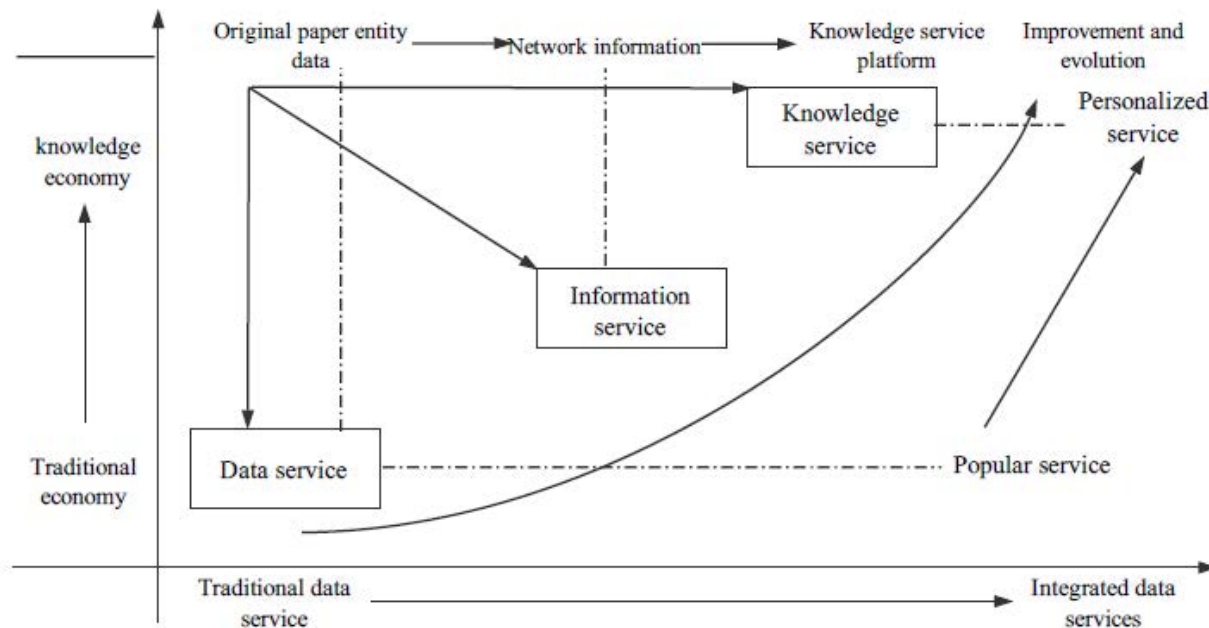
Sendai Framework for Disaster Risk Reduction 2015 - 2030

- The citations of 'Data' from the Sendai Framework can be summarized in 3 Pillars.
- Pillar 1 : The Sendai Framework is promoting **open exchange and dissemination** (1,2,3,7,10)
 - Pillar 2: The Sendai Framework calls for **tools and voluntary mechanisms** (3,4,8,9) and includes the use of **social media** (5)
 - Pillar 3: The Sendai Framework finally asks for guidance on **methodologies and standards** for risk assessments, disaster risk modeling and the use of data (6)



Knowledge service

- Knowledge service was put forward in **1990s**.
- **It is a higher-level information service** based on advanced information acquisition, processing, analysis and application technology. **It is a product of knowledge intensive service**, which is a combination of knowledge management, knowledge organization and knowledge market.



Organize architecture of DRR knowledge Service



The project is hosted by the Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences

2 Methodology of DRR Knowledge Services

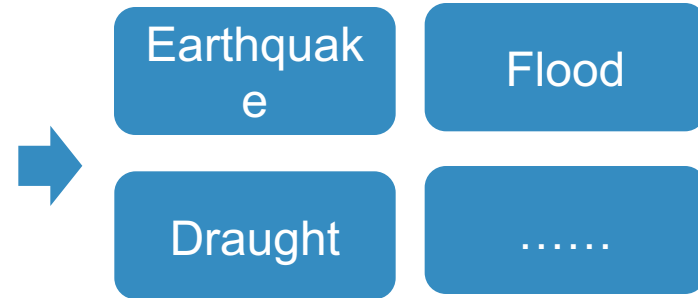
Function architecture

3



Services capacity **building**

4



Knowledge services **application**

2

Resources construction



domestic

1

Metadata and catalog collection

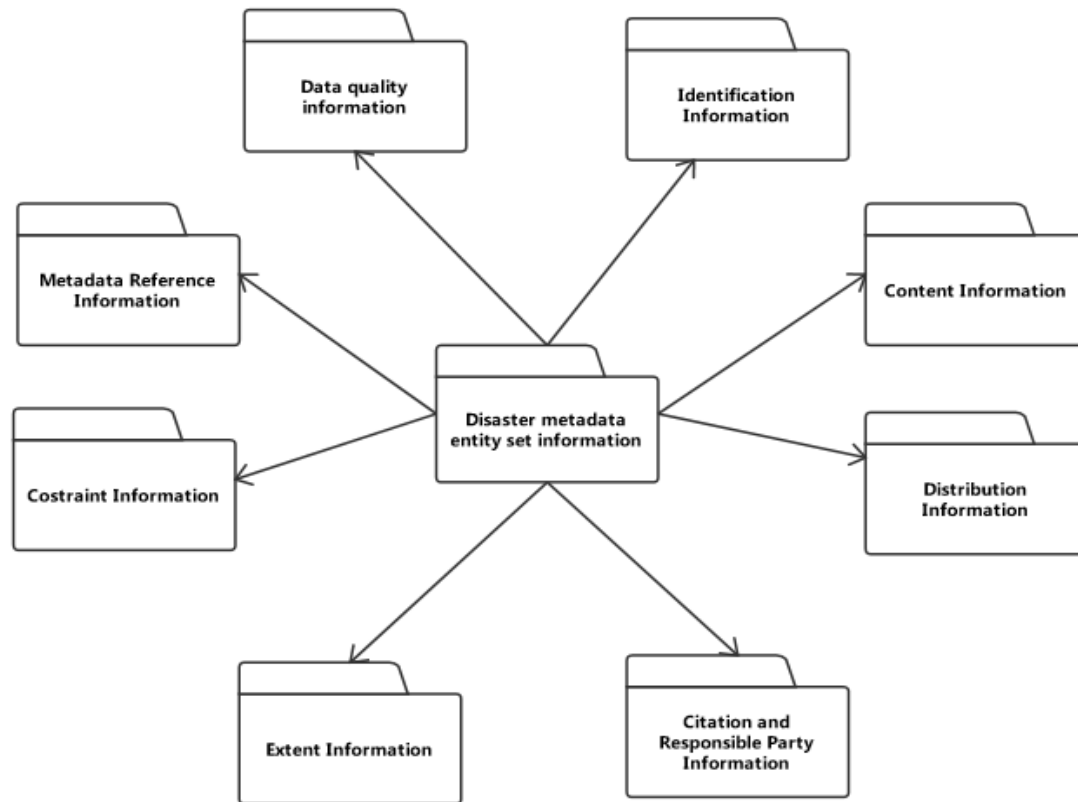


international

1) Metadata Disaster Standard

➤ Metadata packages

Through UML model diagrams and data dictionary to illustrates the Disaster Metadata Standard for Disaster Risk Reduction Knowledge Service System. This standard uses nine packages to describe Disaster Metadata standards.

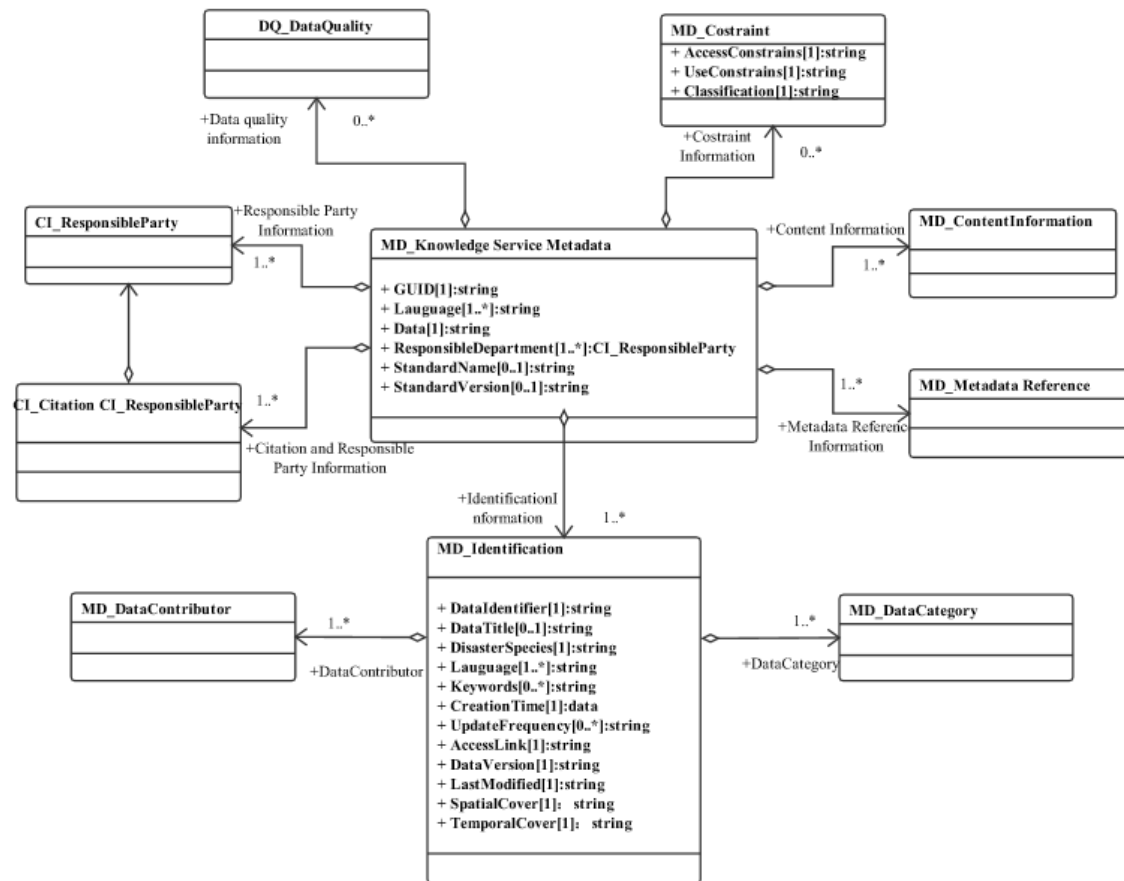


1) Metadata Disaster Standard

➤ Core Metadata

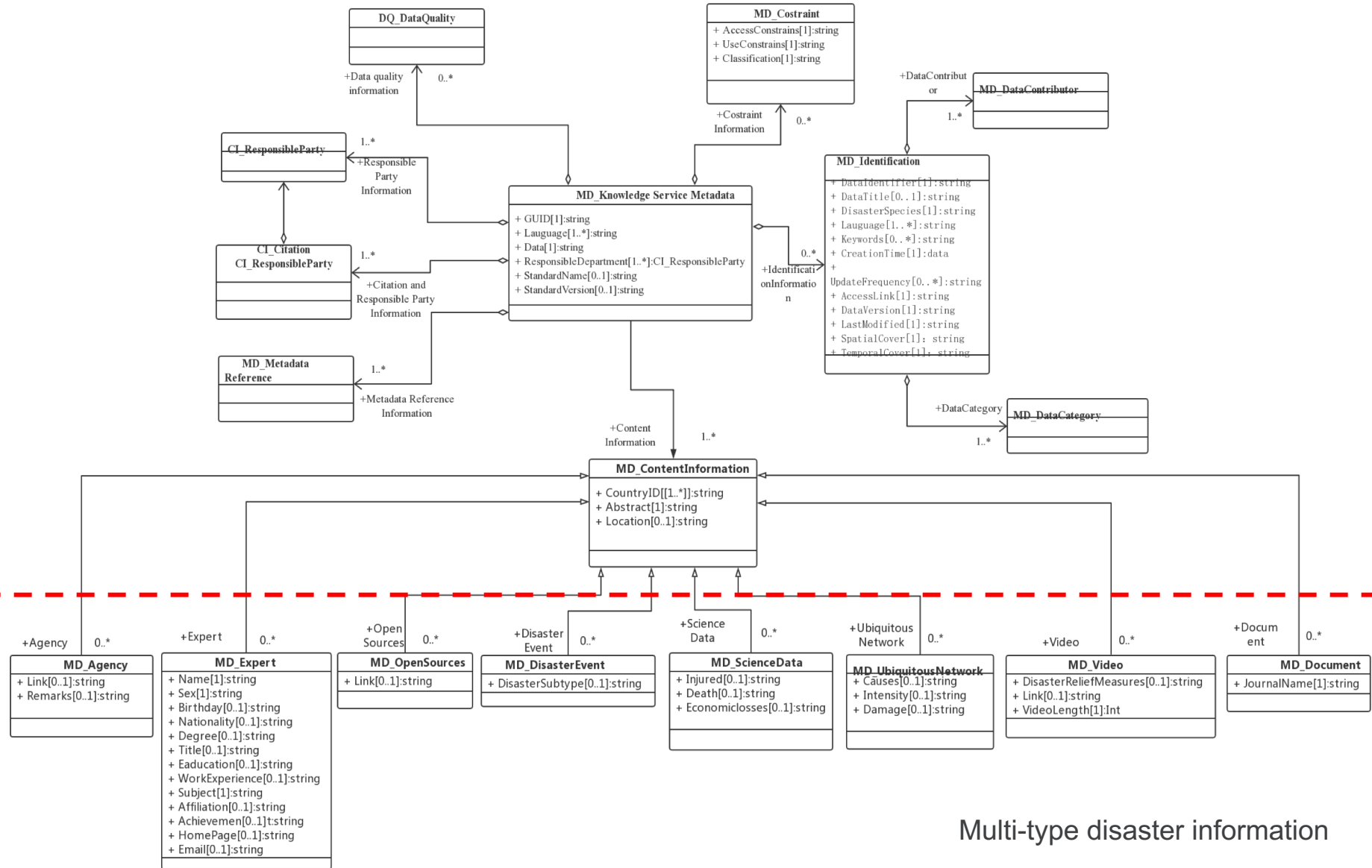
Core metadata consists of 23 metadata elements and 2 metadata entities.

Globally Unique Identifier (M)	Dataset Title (M)	Data Language (M)	Last Modified (O)
Metadata Language (M)	Data Identifier (M)	Data Category (M)	Spatial Cover (M)
Metadata Creation Data (M)	Data Version (M)	Creation Time (O)	Temporal Cover (M)
Metadata Responsible Department (M)	Data Contributor (M)	Update Frequency (O)	Access Constrains (O)
Metadata Standard Name (O)	Key Words (O)	Data Quality (C)	Use Constrains (O)
Metadata Standard Version (O)	Abstract (M)	Access Link (M)	Classification (M)
DisasterSpecies(M)			



1) Metadata Disaster Standard

➤ Metadata extension



2) DRR scientific data


Basic national information database of Singapore

Collection Edit Review Reclassify
Delete

Label: Singapore Belt and Road
geographical national information
natural resources politics and economy

Date: 2017-09-30
author: fangzaiyi

Views: 23



The Administration Map of Singapore

Legend

5 10 20 km

Data Abstract

The basic geographical national information data of countries and regions along the Belt and Road, is an important basis for disaster risk reduction. The basic geographical national information dataset of Singapore includes three categories, namely, basic national condition, natural resources, politics and economy. The detail elements in the classification include geographical location, administrative division, topography, soil, climate, rivers and lakes, environment, land resources, water resources, forest resources, animal resources, plant resources, energy resources, mineral resources, non-metallic mineral resources, tourism resources, language, nationality, religion, festivals, political diplomacy, economy, science and technology, education, sports, hospital bed density, etc.

Data Identifier

Subject Id	Environmental and Textile
Country ID	SG

★★★★★ Five Stars

Relevant information

- Historical earthquake data for China
- Basic national information database of Azerbaijan
- Basic national information database of Mongolia
- Basic national information database of Qatar
- Basic national information database of Bangladesh
- Earthquake data of 1990-2015 in Qinghai - Tibet Plateau
- Basic national information database of Kuwait
- Basic national information database of Philippines

Category

- Experts
- Organization
- Science Datasets

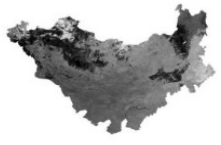
MODIS enhanced vegetation index from 2000 to 2012 in Mongolian Plateau

Collection Edit Review Reclassify
Delete

Label: Enhanced vegetation index MODIS
Mongolian Plateau

Date: 2017-07-28
author: jiping

Views: 181



Data Abstract

The Mongolian Plateau, as the largest and and semiarid Plateau in Northern hemisphere, plays an important role in the climate changes and sustainable development of the ecological environment. To extract EVIT via sinusoidal projection and 16 days' synthetic data. We should also take the atmospheric correction problems into account. The calculation of the date is based on BRDF correction and a variety of mask processing. Compared to the NDVI EVI time series, seasonal time series is more obvious, which can better reflect the seasonal variation characteristics of high vegetation covered area.

Data Identifier

Subject Id	Environmental and Textile
Country ID	MN
Language	English
Data Category	
Category Name	Basic Geography
Category Code	01
Category Standard Name	Data classification standard of Disaster Risk Reduction Knowledge Service
Category Standard Revision	V1.0
Spatial Cover	Mongolia Plateau
Temporal Cover	2000-2012

★★★★★ Five Stars

Relevant information

- Surface vegetation coverage data in Mongolian Plateau
- Basic national information database of Brunei
- Basic national information database of Indonesia
- Basic national information database of Philippines
- Basic national information database of Syria
- Historical earthquake data for China
- Inversion dataset of suspended solids concentration from 2000 to 2013 in Poyang Lake, China
- The assessment of damaged vegetation caused by ice-snow disaster

Category

- Experts
- Organization
- Science Datasets

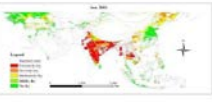
The drought level database of cropland in Belt and Road Area from 2001 to 2013

Collection Edit Review Reclassify
Delete

Label: Belt and Road
spatio-temporal distribution of drought in cropland
Tropical Rainfall Measuring Mission Satellite (TRMM)
Precipitation Anomaly Percentage

Date: 2017-09-28
author: fangzaiyi

Views: 80



Data Abstract

Based on the Tropical Rainfall Measuring Satellite (TRMM) 3B43 precipitation data, we used the Precipitation Anomaly Percentage drought model to study the monthly spatio-temporal distribution of drought in south region of N50° of OBOR area from 2001 to 2013. Yearly spatio-temporal distribution from 2001 to 2013 of cropland in OBOR area was extracted based on the MODIS MCD12Q1 dataset and there were 156 monthly drought levels in the cropland region according to the overlaying of drought and agricultural land layers.

Data Identifier

Subject Id	Environmental and Textile
Country ID	CN
Language	English
Data Category	
Category Name	Basic Geography
Category Code	01
Category Standard Name	Data classification standard of Disaster Risk Reduction Knowledge Service

★★★★★ Five Stars

Relevant information

- Dataset of changes in spatial distribution of polders around Dongting Lake, China (1949-2013)
- Basic national information database of Syria
- Snow and ice disaster intensity across southern China in 2008
- Basic national information database of Qatar
- Basic national information database of Philippines
- Vegetation phenology data based on EVI time series
- Basic national information database of Kazakhstan
- Earthquake data of 1990-2015 in Qinghai - Tibet Plateau

Category

- Experts
- Organization
- Science Datasets


Historical earthquake data for China

Collection Edit Review Reclassify
Delete

Label: China earthquake history data

Date: 2017-09-28
author: fangzaiyi

Views: 134



Data Abstract

This dataset is acquired from China Earthquake Networks Center by data crawl, which describes some earthquake information about time, latitude, longitude, depth, magnitude, et al. And the dataset counts the earthquake event occurred in China from 780 BC to 2015 AD, which includes 15398 data in total. This dataset can give use the information about temporal and spatial distribution of earthquake occurrence, and provide strong support for earthquake prevention, mitigation and related scientific research.

Data Download

ftp://121.42.29.253/juzhaigoudataset_08267.zip

Data Identifier

Subject Id	Environmental and Textile
Country ID	CN
Language	English
Data Category	
Category Name	Basic Disaster information
Category Code	03
Category Standard Name	Data classification standard of Disaster Risk Reduction Knowledge Service
Category Standard Revision	V1.0
Spatial Cover	China

★★★★★ Five Stars

Relevant information

- Inversion dataset of suspended solids concentration from 2000 to 2013 in Poyang Lake, China
- The drought level database of cropland in Belt and Road Area from 2001 to 2013
- Basic national information database of Mongolia
- Dataset of changes in spatial distribution of polders around Dongting Lake, China (1949-2013)
- Basic national information database of Philippines
- Basic national information database of Malaysia
- Land cover data of Mongolian Plateau (2005)
- Basic national information database of Tajikistan

Category

- Experts
- Organization
- Science Datasets

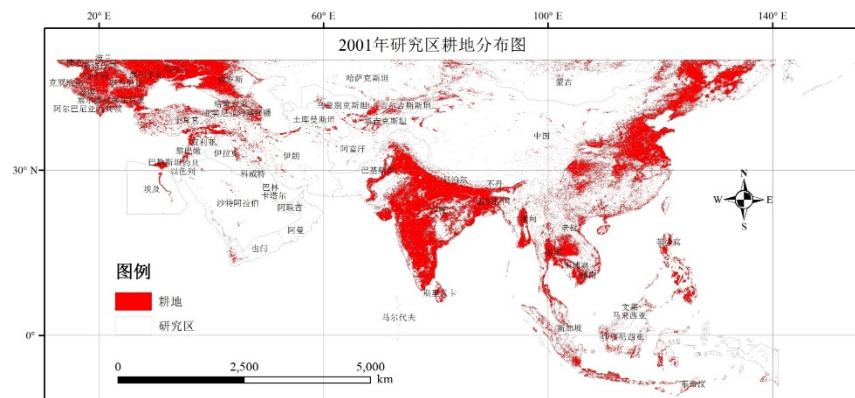
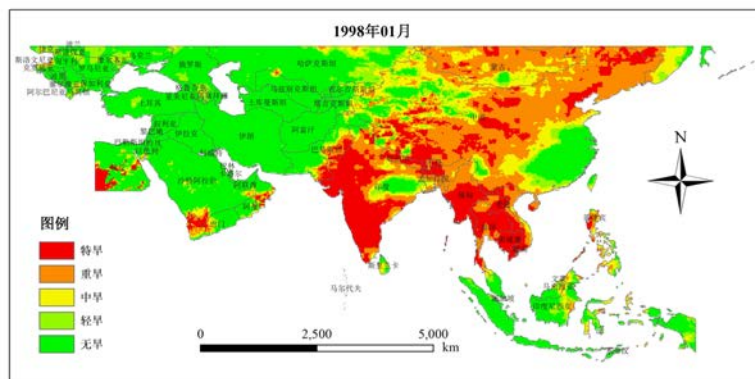
2) DRR scientific data

- **Pregnant environment:** Basic national conditions database along One Belt One Road area;
- **Draught disaster:** MODIS enhanced vegetation index from 2000 to 2012 in Mongolian Plateau, Spatio-temporal distribution of drought in the Belt and Road Area during 1998-2015 based on TRMM precipitation data, et al.
- **Earthquake disaster:** Earthquake data of 1990-2015 in Qinghai - Tibet Plateau, Historical earthquake data for China, et al.
- **Flood disaster:** Inversion dataset of chlorophyll-a concentration from 2009 to 2012 in Poyang Lake, China, Dataset of changes in spatial distribution of polders around Dongting Lake, China (1949–2013), et al.
- **Frozen rain and ice disaster:** Southern forest snow and ice damage assessment data set, southern ice and snow disaster intensity data set, et al.

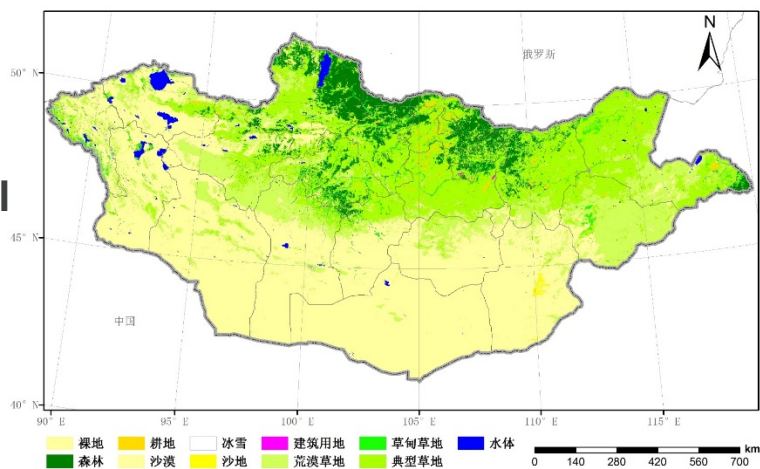
By the end of November 2018, DRR has completed **45 countries' basic national conditions** database along One Belt One and **69 thematic disaster**.

Data sets examples:

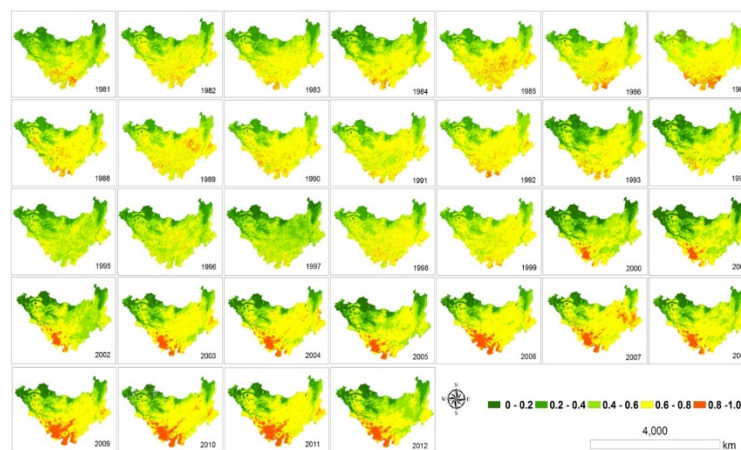
Global



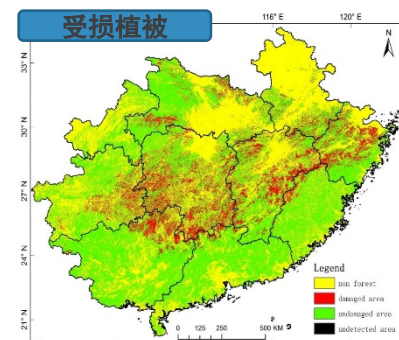
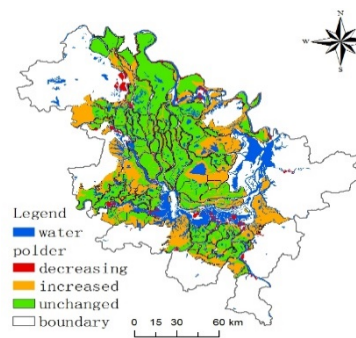
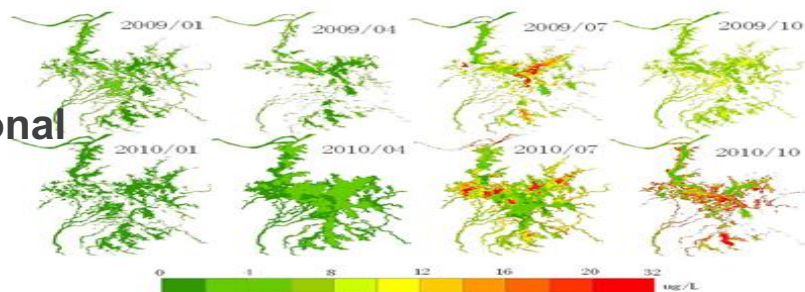
蒙古土地覆被 (2010)



National

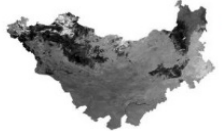


Regional



Metadata and Data Documentation of Scientific Data

MODIS enhanced vegetation index from 2000 to 2012 in Mongolian Plateau



Collection Edit Review Reclassify
Delete

Label: Enhanced vegetation index MODIS
Mongolian Plateau
Date: 2017-07-28
author: jiping
Views: 181

Data Abstract
The Mongolian Plateau, as the largest arid and semiarid Plateau in Northern hemisphere, plays an important role in the climate changes and sustainable development of the ecological environment. To extract EVI via sinusoidal projection and 16 days' synthetic data. We should also take the atmospheric correction problems into account. The calculation of the date is based on BRDF correction and a variety of mask processing. Compared to the NDVI EVI time series, seasonal time series is more obvious, which can better reflect the seasonal variation characteristics of high vegetation covered area.

Data Identifier

Subject ID	Environmental and Textile
Country ID	MN
Language	English
Data Category	
Category Name	Basic Geography
Category Code	01
Category Standard Name	Data classification standard of Disaster Risk Reduction Knowledge Service
Category Standard Revision	V1.0
Spatial Cover	Mongolia Plateau
Temporal Cover	2000-2012

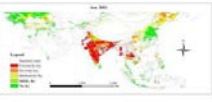
Relevant information

- Surface vegetation coverage data in Mongolian Plateau
- Basic national information database of Brunei
- Basic national information database of Indonesia
- Basic national information database of Philippines
- Basic national information database of Syria
- Historical earthquake data for China
- Inversion dataset of suspended solids concentration from 2000 to 2013 in Poyang Lake, China
- The assessment of damaged vegetation caused by ice-snow disaster

Category

- Experts
- Organization
- Science Datasets

The drought level database of cropland in Belt and Road Area from 2001 to 2013



Collection Edit Review Reclassify
Delete

Label: Belt and Road
Spatio-temporal Distribution of Drought in Cropland
Tropical Rainfall Measuring Mission Satellite (TRMM)
Precipitation Anomaly Percentage
Date: 2017-09-28
author: fangzaiyi
Views: 80

Data Abstract
Based on the Tropical Rainfall Measuring Satellite (TRMM) 3B43 precipitation data, we used the Precipitation Anomaly Percentage drought model to study the monthly spatio-temporal distribution of drought in south region of NSO' of OBOR area from 2001 to 2013. Yearly spatio-temporal distribution from 2001 to 2013 of cropland in OBOR area was extracted based on the MODIS MCD12Q1 dataset and there were 156 monthly drought levels in the cropland region according to the overlaying of drought and agricultural land layers.

Data Identifier

Subject ID	Environmental and Textile
Country ID	CN
Language	English
Data Category	
Category Name	Basic Geography
Category Code	01
Category Standard Name	Data classification standard of Disaster Risk Reduction Knowledge Service

Relevant information

- Dataset of changes in spatial distribution of polders around Dongting Lake, China (1949-2013)
- Basic national information database of Syria
- Snow and ice disaster intensity across southern China in 2008
- Basic national information database of Qatar
- Basic national information database of Philippines
- Vegetation phenology data based on EVI time series
- Basic national information database of Kazakhstan
- Earthquake data of 1990-2015 in Qinghai-Tibet Plateau

Category

- Experts
- Organization
- Science Datasets

Disaster Risk Reduction Knowledge Service of IKCEST.

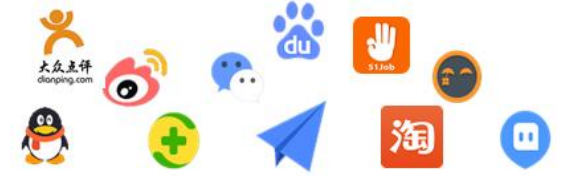
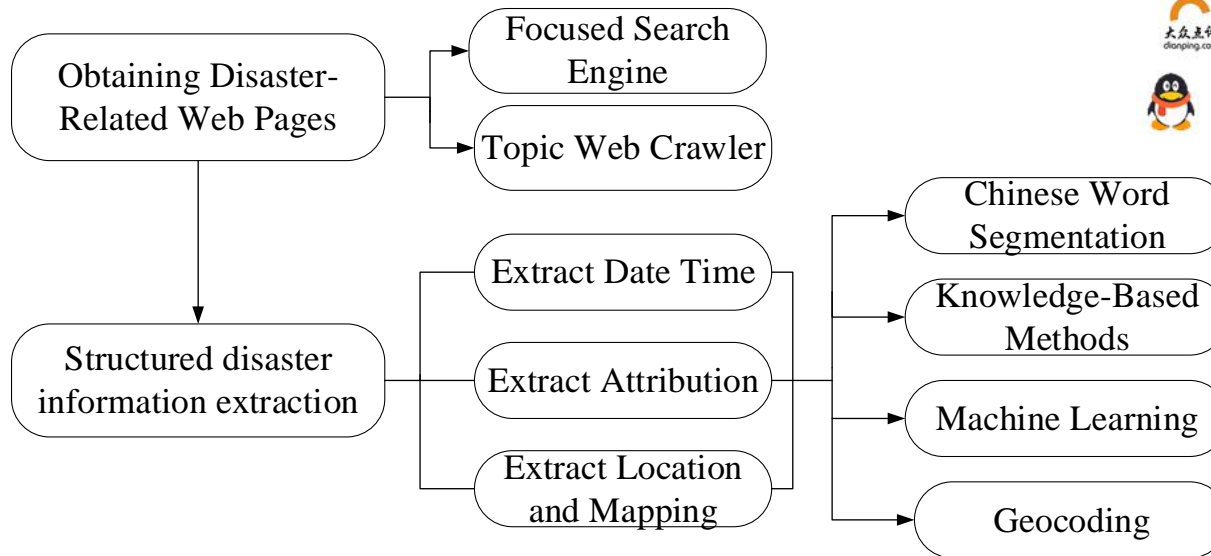
Dataset/atlas name (equivalent to resource name in metadata)¹⁾

Data Documentation²⁾

I. Dataset/atlas content features	4 ³⁾
i. Abstract.....	4 ⁴⁾
ii. Elements (content fields)	4 ⁴⁾
iii. Temporal cover.....	5 ⁴⁾
iv. Spatial cover	5 ⁴⁾
II. Subject/industry scope of dataset/atlas	5 ⁴⁾
i. Subject scope.....	5 ⁴⁾
ii. Industry scope.....	5 ⁴⁾
iii. Other classifications (optional).....	5 ⁴⁾
III. Accuracy of dataset/atlas	5 ⁴⁾
i. Time frequency.....	5 ⁴⁾
ii. Spatial reference, accuracy, and granularity.....	6 ⁴⁾
IV. Dataset/atlas storage management	6 ⁴⁾
i. Data quantity	6 ⁴⁾
ii. Type format	6 ⁴⁾
iii. Update management.....	6 ⁴⁾
V. Quality control of the dataset/atlas.....	6 ⁴⁾
i. Production mode	6 ⁴⁾
ii. Data sources (condition selection).....	6 ⁴⁾
iii. Methods of the data acquisition and processing (condition selection)	6 ⁴⁾
VI. Sharing and usage method of the dataset/atlas	7 ⁴⁾
i. Sharing methods and restrictions.....	7 ⁴⁾
ii. Contact information of the sharing service (condition selection)	7 ⁴⁾
iii. Conditions and methods of usage.....	7 ⁴⁾
VII. Intellectual property rights of the dataset/atlas	7 ⁴⁾
i. Property rights (optional).....	7 ⁴⁾
ii. Reference method of the dataset/atlas	7 ⁴⁾
iii. Usage contacts of the datasets/atlas.....	8 ⁴⁾
VIII. Others (optional)	8 ⁴⁾

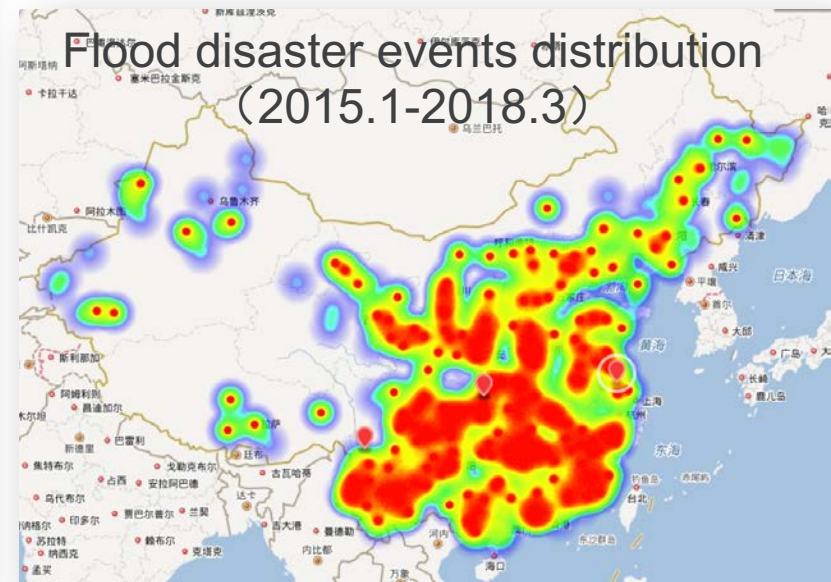
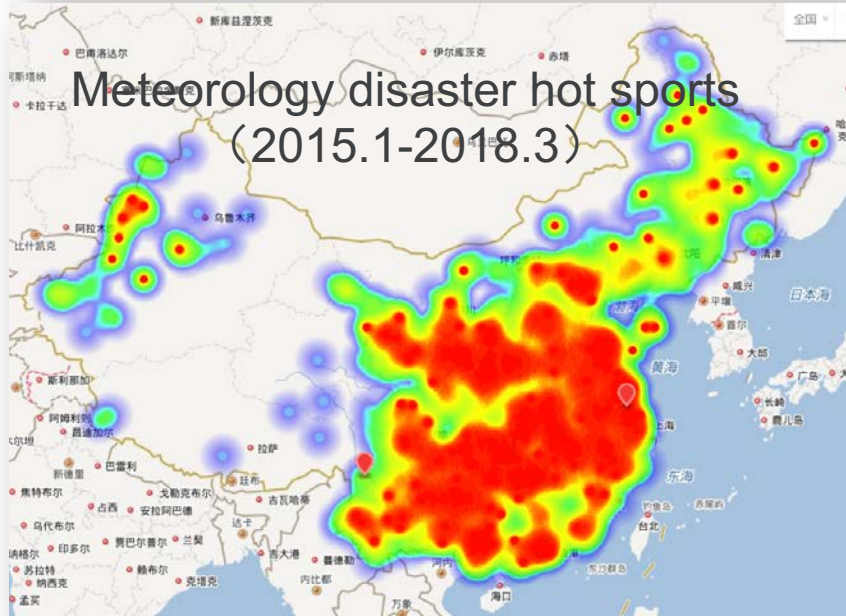
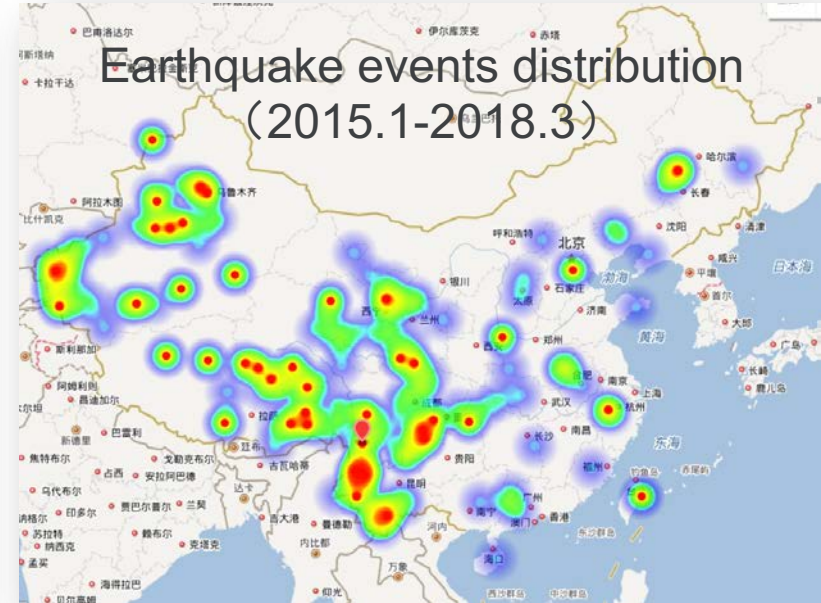
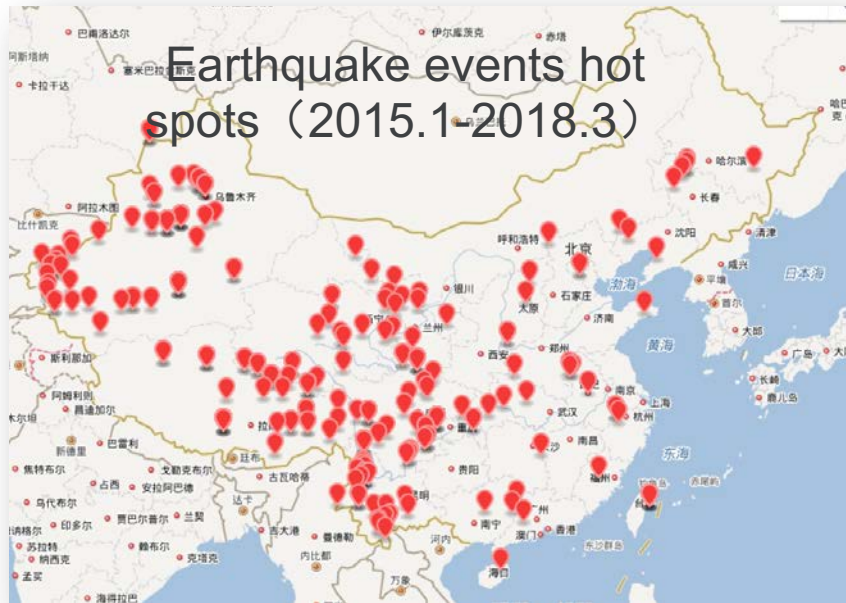
3) DRR Information Extraction from Web Pages

Collected 7500 news reports of global disasters, and extracted the news theme, release time, URL address and webpage text information .



Database	Data	DDL	Design	SQL
<div> <input type="button" value="Refresh"/> </div>				
rowid <small>(primary)</small>	title_news	url <small>(varchar)</small>	time <small>(datetime)</small>	
1	7月20日17时37分四川广元市青川发生3.0级地震	http://news.163.com/17/0720/17/CQPA96V0001/	网易 2017年07月20日 17:14	3条相同新闻-->
2	四川广元市梓潼县发生3.8级地震	http://www.ifeng.com/a/20170720/51467135_0_0	凤凰网 2017年07月20日 17:33	
3	四川广元市青川发生4.9级地震	http://www.dzwww.com/baiwen/shehuixinwen/2017/	大众网 2017年07月18日 10:47	2家相同新闻-->
4	四川广元市青川发生地震 兰渝铁路沿线展开排查	http://gansu.sgcc.cn.cn/system/2017/07/18/011	中国甘肃网 2017年07月18日 07:00	
5	四川广元市青川梓潼县发生4.9级地震	http://www.zhaoqiangwang.cn/shenye/xinwen/shehui	中国交通在线 2017年07月17日 17:00	
6	四川广元市青川发生4.9级地震 居民心里都吓坏了	http://photo.china-news.com/xipie/2017/07/17-	中国新闻网 2017年07月17日 17:00	
7	四川广元市青川发生4.9级地震 震源深度2.1千米	http://www.rmngb.com.cn/news/guonei/2017/07/	内蒙古晨报 2017年07月17日 16:00	
8	7月17日晚6时55分四川广元市青川发生4.9级地震	http://news.ifeng.com/a/20170717/51445704_0_0	凤凰网 2017年07月17日 16:22	
9	四川广元市青川发生4.9级地震 震源深度2.1公里 暂未接到人员伤亡报告	http://www.zonline.com.cn/news/2017-07-17/505466	金陵热线 2017年07月17日 15:45	2条相同新闻-->
10	四川广元市青川发生4.9级地震 汉中宁强县发布消息	http://www.snrb.com/content/2017-07-17/conte	陕西网络。 2017年07月17日 15:15	
11	四川广元市青川发生4.9级地震 蜀黍明哥觉得有点慌	http://credit.egold.org/cn/2017-07-17/cr3183182	金投网 2017年07月17日 14:45	
12	四川广元市青川发生4.9级地震	http://news.sina.com.cn/s/2017-07-17/dic-shibei	新浪新闻 2017年07月17日 14:00	
13	四川广元市青川发生4.9级地震 汉中部分区域有强震	http://news.cer.cn/inative-city/20170717/20170717	中国广播网 2017年07月17日 12:00	2条相同新闻-->
14	四川广元市青川发生4.9级地震 当地电网运行正常	http://news.ifeng.com/a/20170717/51444150_0_0	凤凰网 2017年07月17日 11:14	4条相同新闻-->
15	四川广元市青川发生4.9级地震 江陕甘多地将有感——热点地理——贵州·	http://www.jnews.com.cn/comeweisystem/2017/	贵州新闻网 2017年07月17日 11:00	
16	四川广元市青川发生4.9级地震 江陕甘多地将有感	http://jining.dzwww.com/gnql/20170720/20170717	大众网 2017年07月17日 11:00	

Web information mining for historical disaster events in China from 2015.1 to 2018.3



4) Expert database and Institutional database

The screenshot displays the 'Subject Database' section of the IKEST website. The header includes the IKEST logo and navigation links. The main content area lists several experts with their names, photos, and brief biographies. Each entry includes a 'Report' button and a 'Disaster Risk Reduction' link. The sidebar on the right contains a search bar and a list of categories: Experts, Organization, and Science Database.

Home - Subject Database [Published Subject Database Data](#)

Subject Database

Zhang Chuan [Edit](#)
Born: Citizenship: China Graduated university: Gufu Normal University Occupation: Beijing Normal University secondary ...
[Report](#) [Disaster Risk Reduction](#)

Wang Kehu [Edit](#)
Born: Citizenship: China Graduated university: Shijiazhuang Railway Institute Occupation: the National Disaster Relief...
[Report](#) [Disaster Risk Reduction](#)

Li Jingping [Edit](#)
Born: January 1958 Citizenship: China Graduated university: North China University of Water Resources and Electric Power ...
[Report](#) [Disaster Risk Reduction](#)

Tao Fendong [Edit](#)
Born: July 1954 Citizenship: China Graduated university: Department of geography, Lanzhou University Occupation: Profess...
[Report](#) [Disaster Risk Reduction](#)

Zhang Gongcheng [Edit](#)
Sex: male Born: 1954 Citizenship: China Graduated university: Wuxian University Occupation: Professor of Renmin University...
[Report](#) [Disaster Risk Reduction](#)

Liu Yinhua [Edit](#)
Born: April 15, 1950 Citizenship: China Graduated university: University of Science and Technology of China Occupation: ...
[Report](#) [Disaster Risk Reduction](#)

Liu Yueshen [Edit](#)
Born: September 15, 1945 Citizenship: China Graduated university: September 1952 Occupation: Served as deputy director. ...
[Report](#) [Disaster Risk Reduction](#)

Filter
Category
■ Experts
■ Organization
■ Science Database

The screenshot displays the 'Web Directory' section of the IKEST website. The header includes the IKEST logo and navigation links. The main content area lists various institutions and organizations, each with a logo, name, and brief description. Each entry includes an 'Edit' button and a 'Disaster Risk Reduction' link. The sidebar on the right contains a search bar and a list of categories: Documents, Data, Journal, Data, and Portal.

Home - Web Directory [Published Web Directory Data](#)

Web Directory

China Earthquake Science Network [Edit](#)
China Earthquake Science Network hosted by the China Earthquake Administration and organized by China Earthquake Defense ...
[Disaster Risk Reduction](#)

Institute of Engineering Mechanics, China Earthquake Administration [Edit](#)
Institute of Engineering Mechanics, China Earthquake Administration was founded in 1954, is the senior Research inst...
[Disaster Risk Reduction](#)

The China Seismic Network [Edit](#)
The Division of Wildlife is a direct descendant of the Chio Fish Commission, which was created by the General Assembly ...
[Seismic](#)

China Seismic Information [Edit](#)
China Seismic Information is an important business hub of China's earthquake disaster reduction work, an important win...
[Seismic](#)

Multidisciplinary Center for earthquake [Edit](#)
The introduction of this website is as follow: NCCSR is a national center of excellence dedicated to the discovery and ...
[Seismic](#)

American Geophysical Union [Edit](#)
The introduction of this website is as follow: The purpose of the American Geophysical Union is to promote discovery in...
[Seismic](#) [Geophysical](#)

Earthquake Research Institute, University of Tokyo [Edit](#)
An overview of Research Institute. In the research field of science and technology, Earthquake Research Institute, more...
[Seismic](#) [Seis](#)

Regional Seismic Network of Northwestern Italy [Edit](#)
The entire content of this website is aimed to provide reliable scientific information to the national and international...
[Seis](#)

International Association of Seismology and Physics of the Earth's Interior [Edit](#)
The introduction of this website is as follow: IASPEI promotes the study of the structure, properties, and processes of...
[Seismic](#) [Physics](#)

Language
[All](#) [English](#) [Chinese](#) [French](#) [Spanish](#)
[Arabic](#) [German](#) [Japanese](#) [Portuguese](#)
[Other](#)

Subject
[All](#) [Ocean](#) [Geophysics](#) [Geology](#)
[Meteorology](#) [Geography](#) [Atmosphere](#)
[Astronomy](#) [Ecology](#) [Agriculture](#) [Environment](#)

Category
■ Documents
■ Data
■ Journal
■ Data
■ Portal

➤ It has updated **150 experts metadatas** and **170 Institutional metadatas**.

5) DRR open resources and Disaster event database

Home Cases Documents Events Data Maps Catalog Knowledge Training MetaData PopSci User

Home / Web Directory / Published Web Directory Data

Web Directory

Bangladesh Land Port Authority (BLPA) [Edit](#)
Bangladesh land port authority (Bangladesh Land Port Authority, BLPA) is an autonomous body that manages all border por...
[Bangladesh](#)

Government Office for Science (Britain) [Edit](#)
The office (Government Office Science) is the UK government's body, the agency to scientific evidence and long-term thi...
[Science](#) [Britain](#)

Agriculture and Global Environmental Change [Edit](#)
Welcome to the CIESIN Thematic Guide on Agriculture and Global Environmental Change. The purpose of this guide is to hel...
[Environment](#) [Agriculture](#)

Berkeley Seismology Lab [Edit](#)
Berkeley Seismological Laboratory: Sound science, serving society
Standing nearly on top of the Hayward Fault, the Berk...
[Seismology](#)

Central experimental methodical expedition [Edit](#)
The Russian Seismic Network, is the first regional continuous telemetric network of very broadband seismic data inRussi...
[Earthquake](#)

Seismological Society of America [Edit](#)
The Introduction of this website are as follow : Advancing seismology and understanding of earthquakes for the benefit o...
[Earthquake](#) [Seismological](#)

Filter

Language [All](#) [English](#) [Russian](#) [French](#) [Spanish](#) [Italian](#)

Event

September 11, 2018 Earthquake Information of 99km E of Mutsu, Japan [Edit](#)
Introduction to the earthquake Magnitude : 4.9 mww Location uncertainty : 41.251 N; 142.407 E Depth uncertainty : 44.0 k...
[earthquake](#) [Japan](#)

September 10, 2018 Earthquake Information of 202km WNW of Ile Hunter, New Caledonia [Edit](#)
Introduction to the earthquake Magnitude : 6.3 mww Location uncertainty : 22.027 S; 170.129 E Depth uncertainty : 12.0 k...
[earthquake](#) [New Caledonia](#)

September 9, 2018 Earthquake Information of 91km NNE of Ozernovskiy, Russia [Edit](#)
Introduction to the earthquake Magnitude : 4.9 mb Location uncertainty : 52.232 N; 157.121 E Depth uncertainty : 143.7 k...
[earthquake](#) [Russia](#)

September 8, 2018 Earthquake Information of 18km WSW of Lianzhu, China [Edit](#)
Introduction to the earthquake Magnitude : 5.6 mww Location uncertainty : 23.332 N; 101.552 E Depth uncertainty : 10.0 k...
[earthquake](#) [China](#)

September 7, 2018 Earthquake Information of 126km SE of Bam, Iran [Edit](#)
Introduction to the earthquake Magnitude : 5.5 mb Location uncertainty : 28.342 N; 59.315 E Depth uncertainty : 10.0 km ...
[earthquake](#) [Iran](#)

➤ It has updated **100 open resources** and **827 disaster events** .

6) DRR thematic knowledge application

The screenshot displays the homepage of the International Knowledge Centre for Engineering Sciences and Technology (IKCEST) under the auspices of UNESCO. The header includes the UNESCO and IKCEST logos, a search bar with tabs for Scholar, News, Technology, Dataset, and Other, and a navigation menu with links to Home, News, Symposium, Training Workshop, Collaboration, Assisting UNESCO, Technology, and About IKCEST. The main banner features a blue background with the text 'The First International Workshop for Disaster Risk Reduction Knowledge Service' held from Nov. 21-22, 2017, in Beijing, China. It lists co-hosts and organizers. To the right, a 'Knowledge Services' sidebar lists 'Disaster Risk Reduction', 'Engineering Education', 'Silk Road sciences and Technology', and 'Intelligent City'. Below the banner, a 'Knowledge based APPs' section displays eight app icons: 'China's Experience in Natural Disaster Relief' (DRR), 'Macroeconomic Database of the Belt and Road' (SRST), 'Academic Voice & Focus' (ENGEDU), 'Cultural Heritage Protection' (IKCEST), 'Technology Trends' (IKCEST), 'Earthquake disaster risk reduction thematic' (DRR), 'University Alliance of the New Silk Road' (SRST), and 'Scholar's Network' (ICTY). On the far right, there are banners for 'IKCEST International Symposium', 'IKCEST International Training Workshop', and 'The Belt and Road'.

← Knowledge services online

→ Knowledge APPs online

7) International training

25 training videos have been released.

Data Shari

**Pattern and dynar
on objec**

**Qingh
Databases, data**

**Luo Ze (luoze@cnic.c
Computer Networ
Apr**

课程1-1 课程1-2 课程1-3 课程1-4

课程2-1 课程2-2 课程2-3 课程2-4

课程3-1 课程3-2 课程3-3 课程3-4

课程4-1 课程4-2 课程4-3 课程4-4

**Workshop on
Res and Envir**

**Impact assessment
the grasslands of
eau**

经济学方法与案例

Prof.)

+86-10-6488 8155
20, 2015



ation Studies


**Resources
ences (CAS)**

Shanshan Wei


8) Science popularization

Welcome to the IKCEST

  International Knowledge Centre for Engineering Sciences and Technology under the Auspices of UNESCO
联合国教科文组织国际工程科技知识中心

 Disaster Risk Reduction Knowledge Service
防灾减灾知识服务

Info Doc Map Knowledge

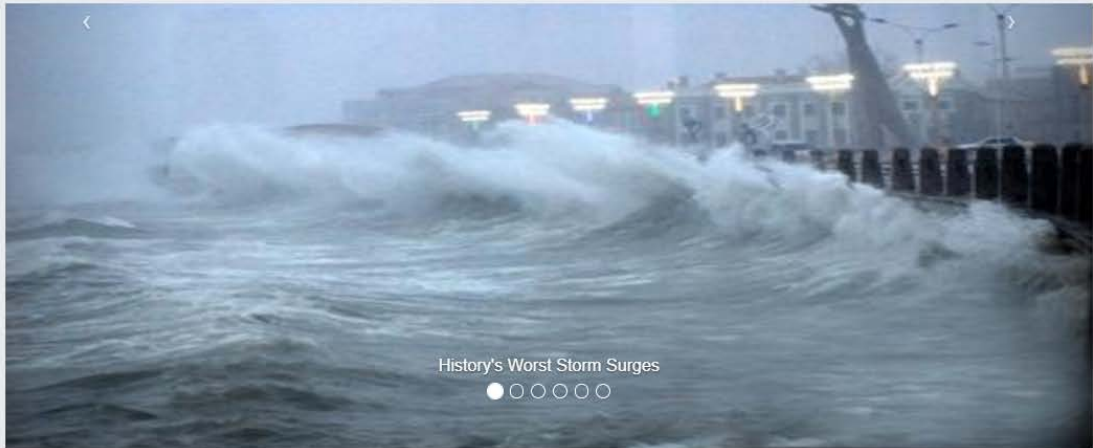
Keyword search 

Home Documents Events Data Maps Catalog Knowledge Training MetaData PopSci User

Home / Science Popularizing

Natural Sciences MORE

- History's Worst Storm Surges
- Cascadia Earthquakes and Tsunami Hazard Studies
- Flooding may spur algae in Lake Erie
- Soft rime and snow-break – when ice and snow bend the...
- Natural Hazards-Tropical Cyclones (Hurricanes)
- Precipitation of Northeast of China



History's Worst Storm Surges



More than 16 multi-media science popularization works.

9) International training

➤ Resource & Environment Scientific **Data Sharing and Disaster Risk Reduction Knowledge Service** for the Belt and Road

International Workshop on Northeast Asia–Central Asia Regional Resources and Environment Data Sharing

Aug. 10–Aug. 29, 2015 Beijing



International Training Workshop on Resources and Environment Data Sharing Technology for the Silk Road Economic Belt

Aug. 6–Aug. 25, 2016



International Training Workshop on Resource & Environment Scientific Data Sharing and Disaster Risk Reduction Knowledge Service for "the Belt and Road"

Oct. 9–Oct. 26, 2018



10) International workshop

From November 21 to 22, 2017, the **First International Workshop for Disaster Risk Reduction Knowledge Service** was convened in Beijing.

<http://www.ikcest.org/article-55918.htm>



International workshop

The Second International Workshop for Disaster Risk Reduction Knowledge Service was held on Oct. 20-21, 2018, Beijing, China.

<http://drr.ikcest.org/post/1d174>



The Second International Workshop for Disaster Risk Reduction Knowledge Service

Oct.20-21,2018



3 DRR Knowledge service applications online

Main functions

- DRR metadata service
- DRR scientific data service
- DRR experts database service
- **DRR knowledge APplication**
- DRR training service
- DRR popular science service



Application



Knowledge Map Service of Major Organization for Disaster Risk Reduction



Global Earthquake Daily Distribution Map Service



Map Visualization Services of China Historical Disasters



China and International Experience in Natural Disaster Relief



Knowledge service of forest freezing, rain and snow disaster prevention and reduction in southern China



Application of Flood Control Knowledge Service in Songliao Basin



The Belt and Road arable land in temporal and spatial display of the topic of knowledge service



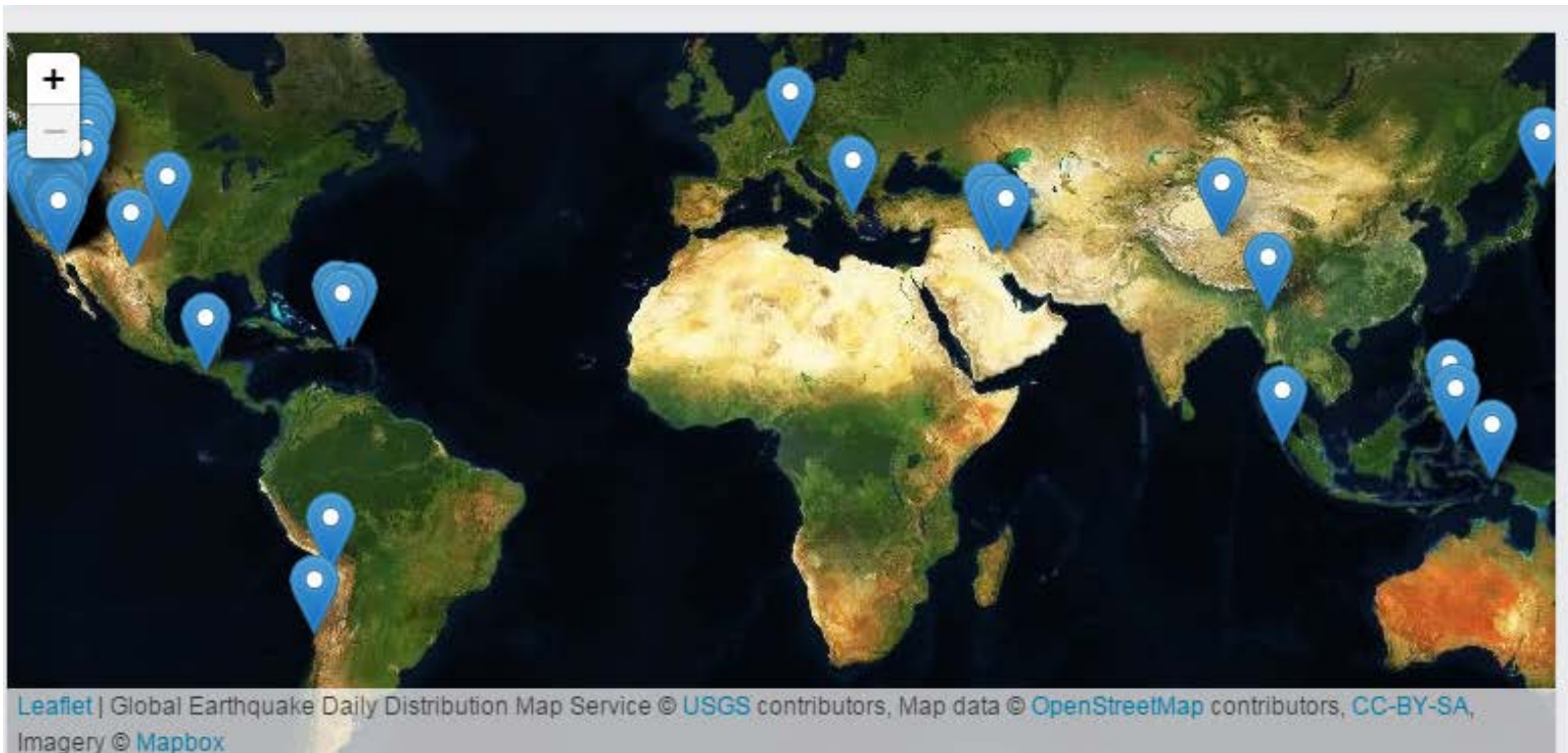
Poyang Lake suspended matter concentration retrieval Season-by-quarter spatial distribution data

1) Global Earthquake Daily Distribution Map Service

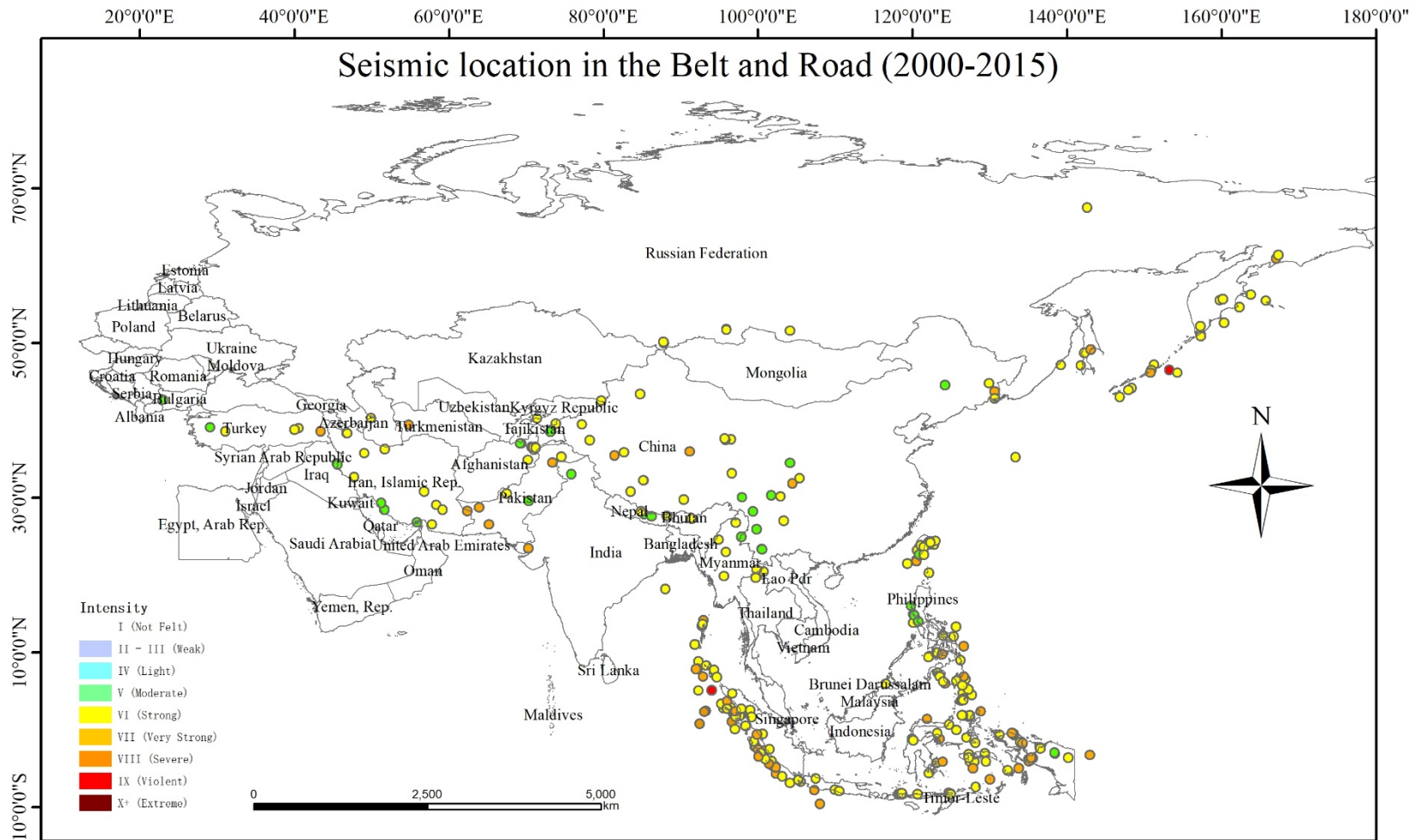


Global Earthquake Daily Distribution Map Service

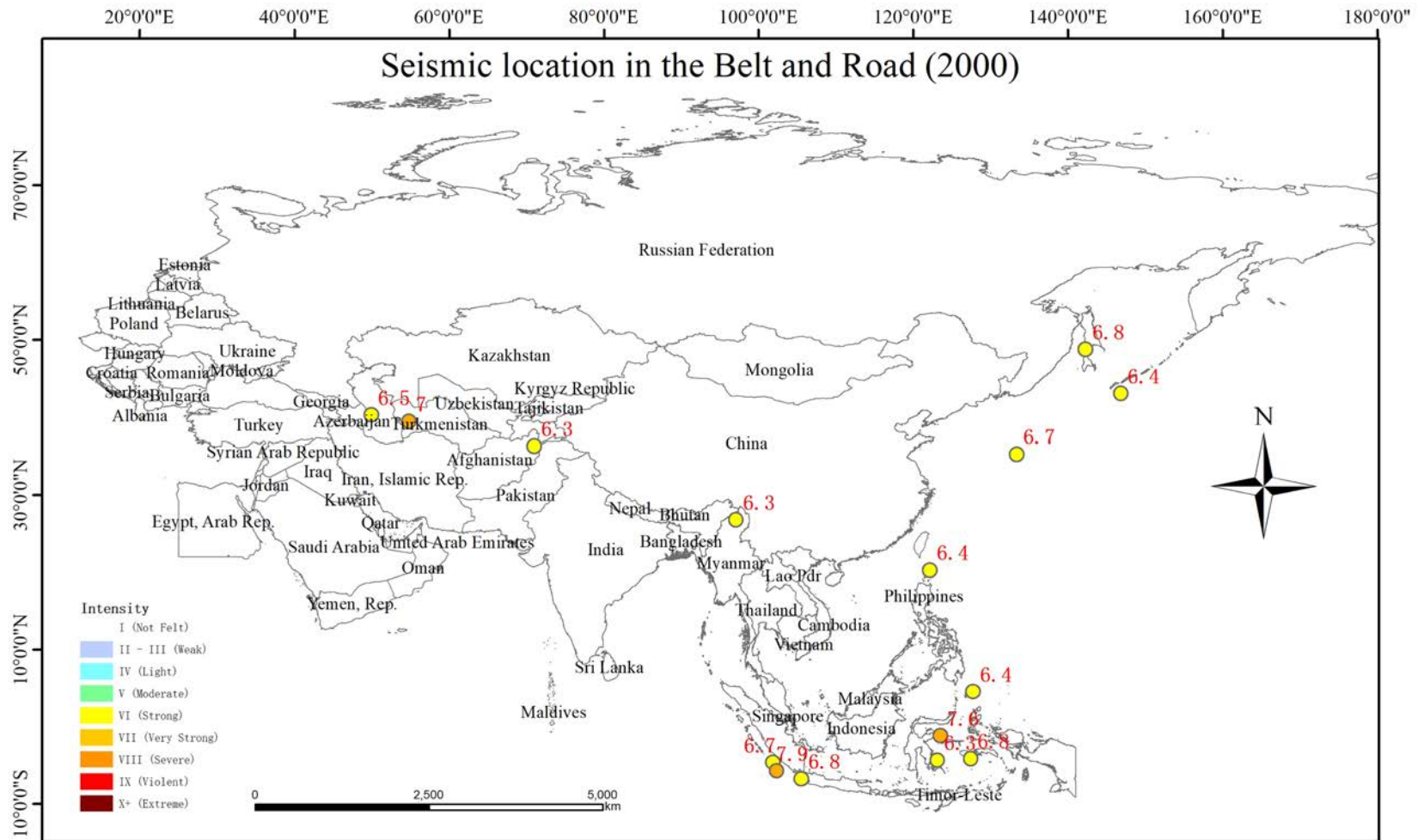
- Daily update of global seismic data, and the freshness of the data is 100%.
- It has updated **191357 global seismic records**.



Earthquake occurrence map from 2000-2015 in BR area



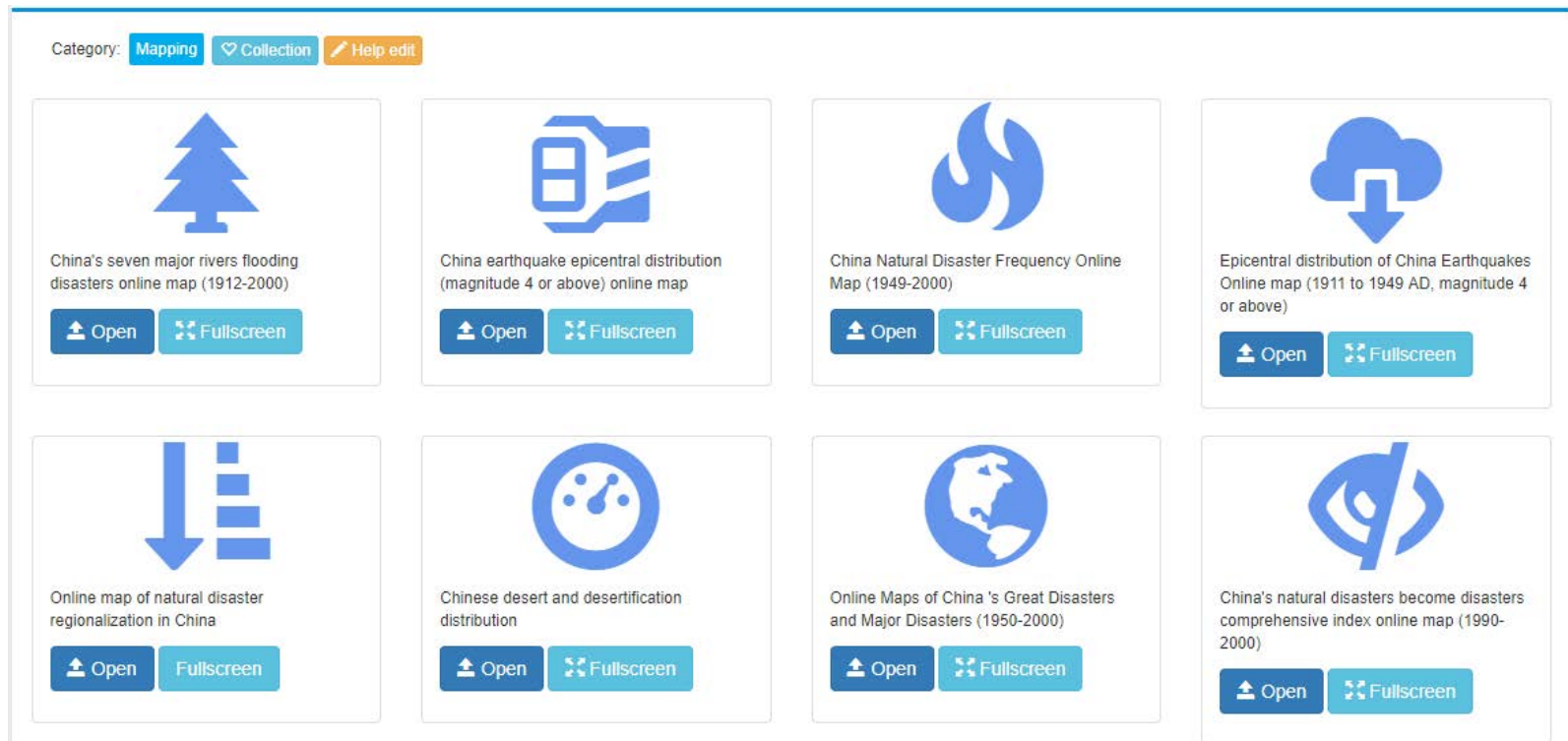
Earthquake occurrence dynamic from 2000-2015 in BRI area



2) Visualization Services of China Historical Disaster Maps

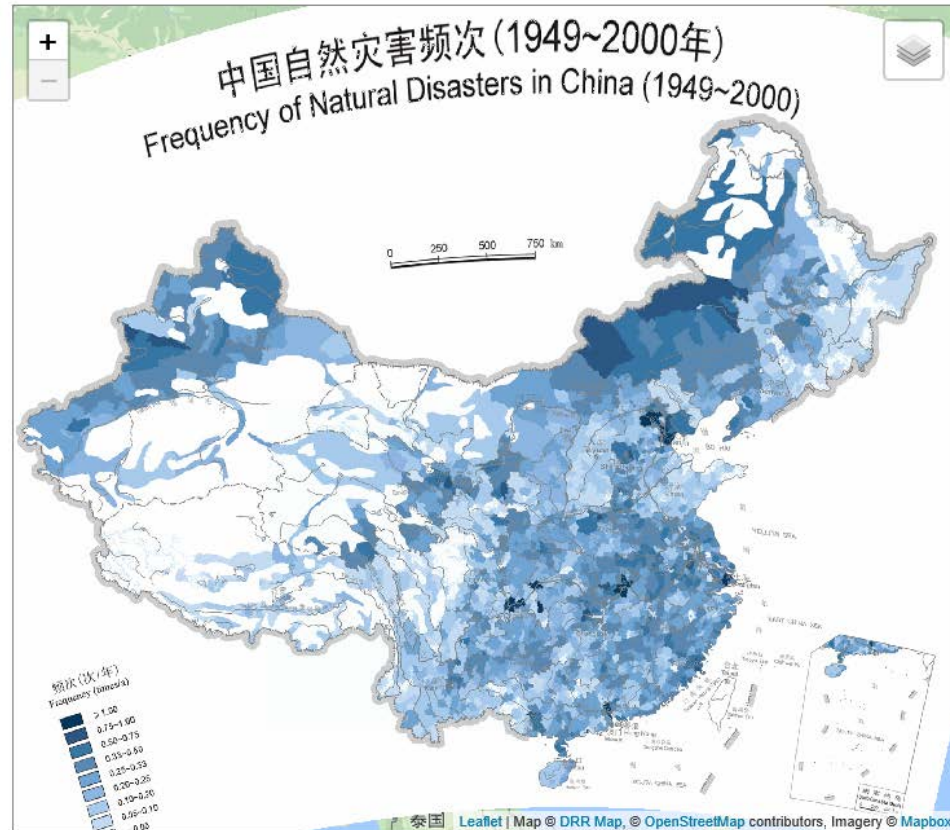


- Continually update of history disaster maps.
- It has scanned and processed **2002 maps of natural disasters in China.**



2) Visualization Services of China Historical Disaster Maps

Category: **Natural disaster map**



[Save](#) [view](#) <http://dr.ikceest.org/map/m0423>

Map overlay

After [logging in](#), can be online overlay operation.

Correlation map

Online map of flood frequency in China during the winter (1949-2000)

Map of Floods, Hail Distribution during Sui Tang and Five Dynasty of China

Online map of frequency of water disasters in China (1949-2005) (1: 32 million)

Online Distribution Map of Earthquake Disaster Loss in China

Online map of the number of houses collapsed in China (1978-2000)

Historical map of flood frequency in China (1949-2000)

Historical map of flood frequency in China (500 BC to 1980 AD)

Online Flooding Frequency Map of China in July (1949-2000)

Recent maps

An online map of Sichuan Province during the Republic of China in 1933

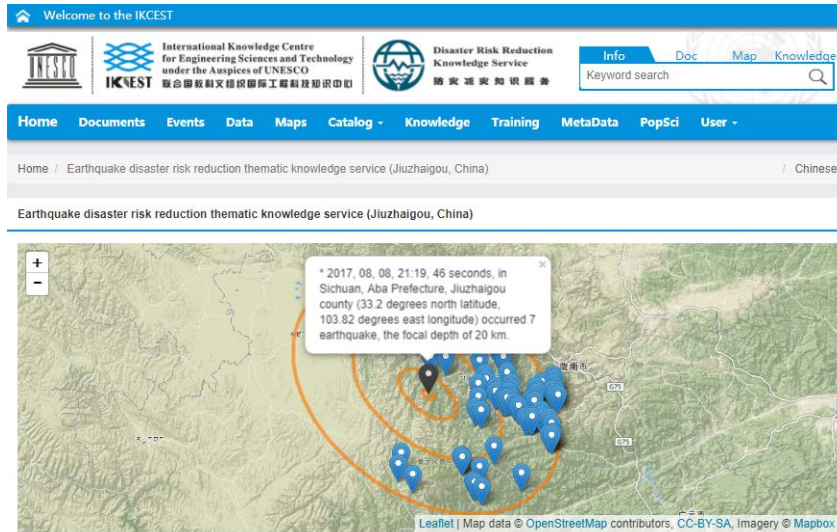
3) Major Organization for Disaster Risk Reduction



- collection of the global disaster risk reduction institutions
- It has added **170 DKR institutions**



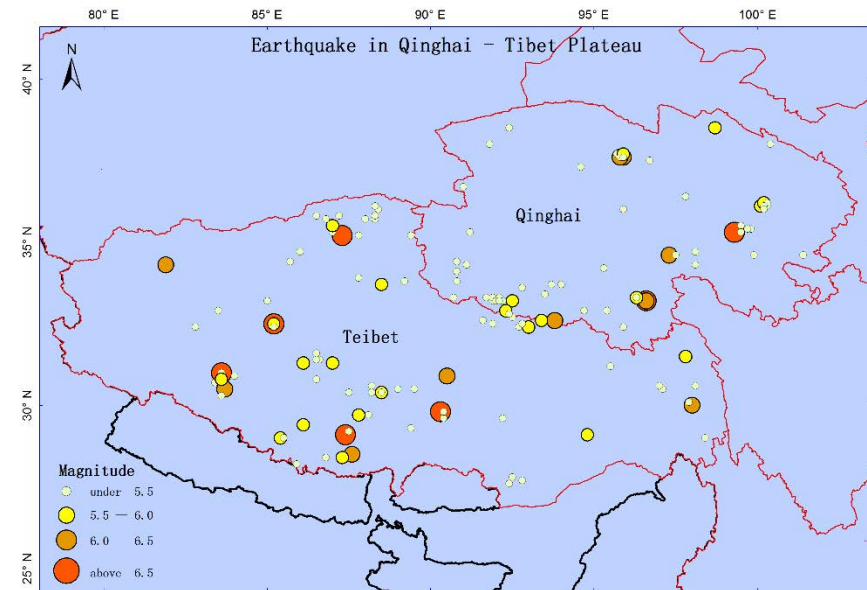
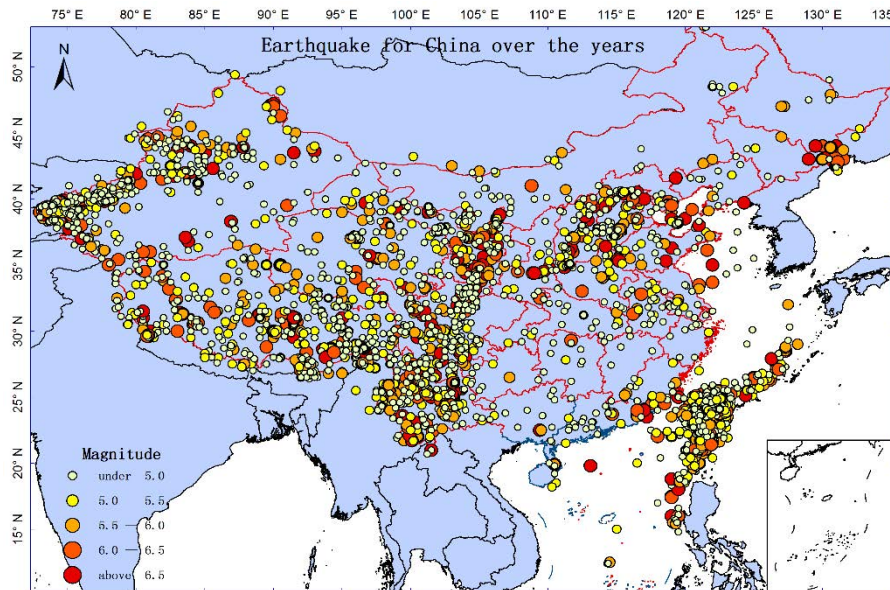
4) Emergency disaster relief service



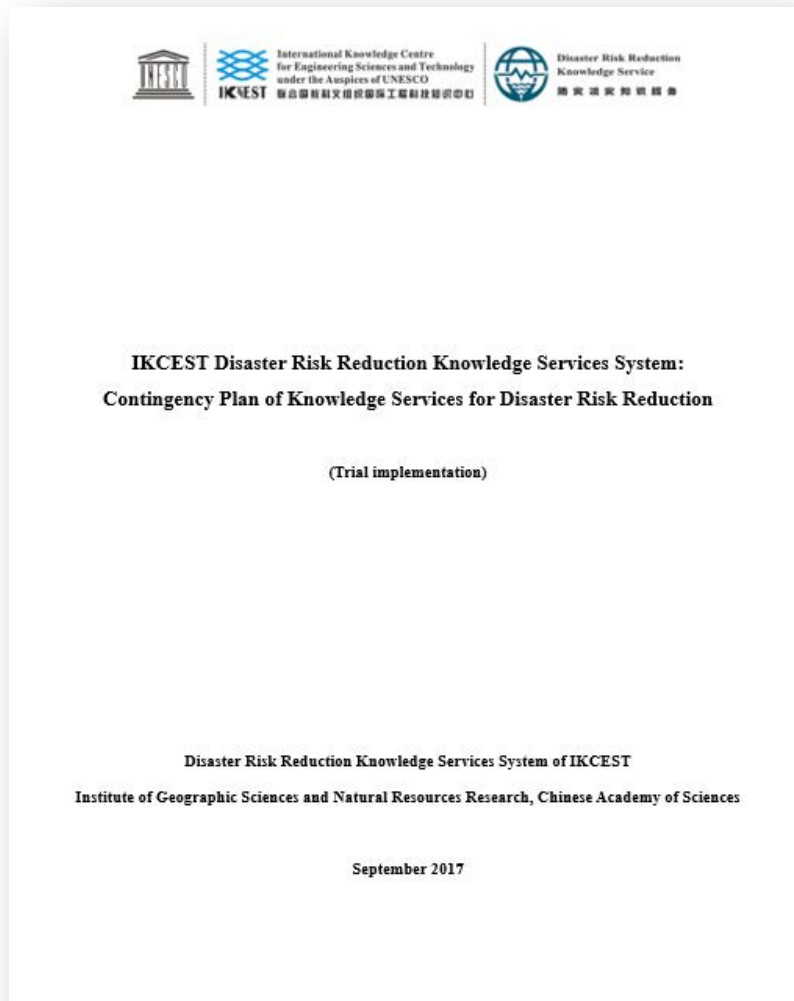
- Facing the urgent disaster relief requirement of **Jiuzhaigou earthquake**, an earthquake disaster risk reduction thematic knowledge service was launched immediately (**in 48 hours**).
- Related data resources, disaster relief information and disaster risk reduction science popularization knowledge were integrated in the thematic knowledge service.
- **More than 156 independent IP users** visited the service in August

4) Emergency disaster relief service

- Related data resources, disaster relief information and disaster risk reduction science popularization knowledge were integrated in the thematic knowledge service. Such as: **Chinese historical earthquake catalog** , **Seismic data of Qinghai Tibet Plateau**, and so on.



Disaster Risk Reduction Knowledge Services System: Contingency Plan of Knowledge Services (CKS) for Disaster Risk Reduction

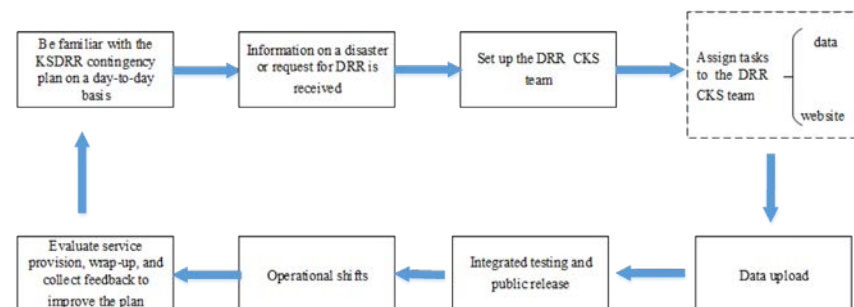


Contents

1. GENERAL PROVISIONS	1
2. THE CONTENT OF THE CKS	1
2.1 SCIENTIFIC DATA SERVICE	2
2.2 DRR INFORMATION SERVICE	2
2.3 POPULAR SCIENTIFIC KNOWLEDGE SERVICE FOR DRR	2
3. WORKFLOW OF THE CKS	3
3.1 PREPARATION OF THE CONTINGENCY PLAN	4
3.2 ORGANIZATION OF THE DRR TEAMS	4
3.3 DATA ORGANIZATION AND PROCESSING	4
3.4 DEVELOPMENT OF THE CKS THEMATIC WEBSITE	7
3.5 DATA UPLOAD AND CHECKING	7
3.6 EXTERNAL RELEASE AND PROMOTION VIA APPLICATIONS	8
3.7 OPERATIONAL SHIFTS	9
3.8 ASSESSMENT AND OVERVIEW	9
4. CONDITIONS FOR ACTIVATION AND IMPLEMENTATION TIMING	10
5. MAINTENANCE INFORMATION ON THE CONTINGENCY PLAN OF THE CKS	10

CKS contents

CKS steps



5) China and International Experience in Natural Disaster Relief



China's Experience in Natural Disaster Relief

- ① Pictures, videos before or after disaster
- ② Disaster atlas with spatial reference
- ③ Vector maps can be processed on line
- ④ Carrying capacity evaluation modules
- ⑤ Rebuilt policy or guidelines after disaster
- ⑥ Popular science works
- ⑦ Disaster loss data

China and International Experience in Natural Disaster Relief

Wenchuan Earthquake More

Wenchuan Earthquake

The 2008 Sichuan earthquake, also known as the First Great Sichuan earthquake or Wenchuan earthquake, occurred at 14:28:01 China Standard Time on May 12, 2008. Measuring at 5.0 Ms the earthquake's epicenter was located 80 kilometres (50 mi) west-northwest of Chengdu, the provincial capital, with a focal depth of 19 km (12 mi). Over 69,000 people lost their lives in the quake, including 68,636 in Sichuan province. 374,176 were reported injured, with 18,222 listed as missing as of July 2008. It was the deadliest earthquake to hit China since the 1976 Tangshan earthquake.

Zhouqu Debris Flow	More
Jiuzhaigou Earthquake	More
Cases in South Asia	More
Kubuqi Desertification	More



The 2008 Sichuan earthquake, also known as the First Great Sichuan earthquake or Wenchuan earthquake, occurred at 14:28:01 China Standard Time on May 12, 2008. Measuring at 8.0 Ms the earthquake's epicenter was located 80 kilometres (50 mi) west-northwest of Chengdu, the provincial capital, with a focal depth of 19 km (12 mi). Over 69,000 people lost their lives in the quake, including 68,636 in Sichuan province. 374,176 were reported injured, with 18,222 listed as missing as



In the early hours of August 8, 2010, a huge mudslide struck the county town of Zhouqu in Gansu province, northwest China. The disaster left 1,765 people dead or missing, in addition to destroying buildings and roads. This is the most serious mountain torrent debris flow disaster since the founding of new china.



A 7.0-magnitude earthquake hit Jiuzhaigou county in Southwest China's Sichuan province at 9:19 pm China Standard Time on August 8, 2017, at a depth of 20 kilometers, according to the China Earthquake Networks Center. As of August 14 twenty-five people died and 525 people were injured, lost six, affected 176492 people (including visitors) and 73671



In May 2015, India was struck by a severe heat wave. As of 3 June 2015, it has caused the deaths of at least 2,500 people in multiple regions. The heat wave occurred during the Indian dry season, which typically lasts from March to July with peak temperatures in April and May. Although it typically remains hot until late October, Indian monsoons often provide some respite from the heat. The South Indian states of Andhra Pradesh and the neighbouring Telangana, where more than 1,735 and 585 people died respectively, were the areas most

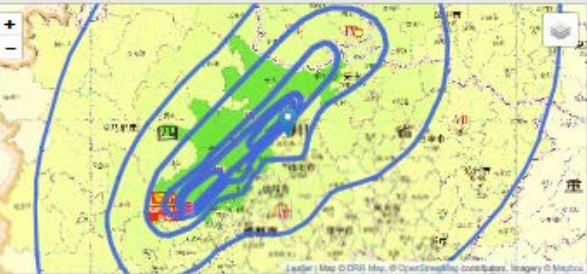


The Kubuqi Desert is located in Inner Mongolia, on the southern bank of the Yellow River in Erdos, and is the seventh largest desert in China with a total area of 16.8 thousand km². The Kubuqi desert has implemented many key projects for ecological environment construction, including the construction of desert-crossing highway and the straw slope protection technology to lock the flow sand, and has achieved harmony between roads and ecological governance. The dynamic change in desertification in Kubuqi Desert can be observed in



Da Hinggan Mountains, Heilongjiang, China, has occurred many forest-fires, because of the vast forest area and complex natural conditions, in the past fifty years. The lives and property of the people and the loss of the country's forest resources are heavy. These fires have caused very serious economic property losses and casualties, and produced a large amount of forest damage area. For example, on May 6, 1987, several forest farms in Da Hinggan Mountains, Heilongjiang Province, started

Wenchuan Earthquake Disaster Relief Knowledge Service



Date	More
Land construction capacity	
Ecological environment carrying capacity	
Population supporting capacity of land	
Map	
Map of Wenchuan earthquake.	

Before disaster

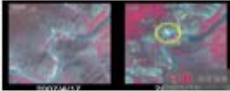
More



Comparison of images before and after the Wenchuan earthquake
Fig 1: the left picture shows the sight of Tianfu hospital before the earthquake; the right picture shows the sight of the same place after the earthquake.



Comparative analysis of satellite remote sensing data between before and after Wenchuan earthquake
The picture above shows the situation of the river before Wenchuan earthquake; the picture below shows the change of the same place after the earthquake.



The contrast of scenery before and after the Wenchuan earthquake
The picture shows the contrast of scenery before and after the Wenchuan earthquake. Released Time: 2008-05-22 Source: china.com.cn Link: http://www.china.com.cn/

Rescue in disaster

More



The picture of Wenchuan after the earthquake disaster
The picture shows the damage of Wenchuan after the earthquake. Released Time: 2008-05-10 Source: xita Link: http://tech.xita.com/



Aerial view of quake-stricken Wenchuan
Wenchuan County, epicenter of a 7.8-magnitude killer earthquake, is seen in the aerial view taken on May 14, 2008. The national earthquake relief efforts are underway.



Fire fighters head for Wenchuan
Fire fighters make preparations in Chengdu, Southwest China, before heading for Wenchuan to join the earthquake relief efforts.

Restoration after disaster

More

Zhouqu Debris Flow Relief Knowledge Service



Date	More
------	------

In the early hours of August 8, 2010, a huge mudslide struck the county town of Zhouqu in Gansu province, northwest China. The disaster left 1,765 people dead or missing, in addition to destroying buildings and roads. This is the most serious mountain town debris flow disaster since the founding of new china.

Before disaster

More



The full view of Zhouqu county before mudslide
The picture shows a peaceful Zhouqu county before mudslide, which were taken on June 5, 2008. Released Time: 2010-08-08 Source: china.com.cn



Zhouqu county before mudslide
A bird-eye view of Zhouqu county in Northwest China's Gansu province before it was hit by a rain-triggered mudslide on Sunday.

Rescue in disaster

More



The street scene of Zhouqu after the mudslide disaster
On August 8, 2010, a massive mudslide hit Zhouqu county, Gansu province. The mudslide washed into the county seat and formed the bar.



Comparison of images before and after Zhouqu mudslide
The left picture shows the sight of a street in Zhouqu county before the calamity; the right picture shows the sight of the same place after the calamity.



Comparison of the aerial imagery map before and after Zhouqu mudslide
The picture above shows the aerial imagery map of Zhouqu county before the calamity; the picture below shows the aerial imagery map after the calamity.

Restoration after disaster

More

6) Application of Flood Control Knowledge Service in Songliao Basin



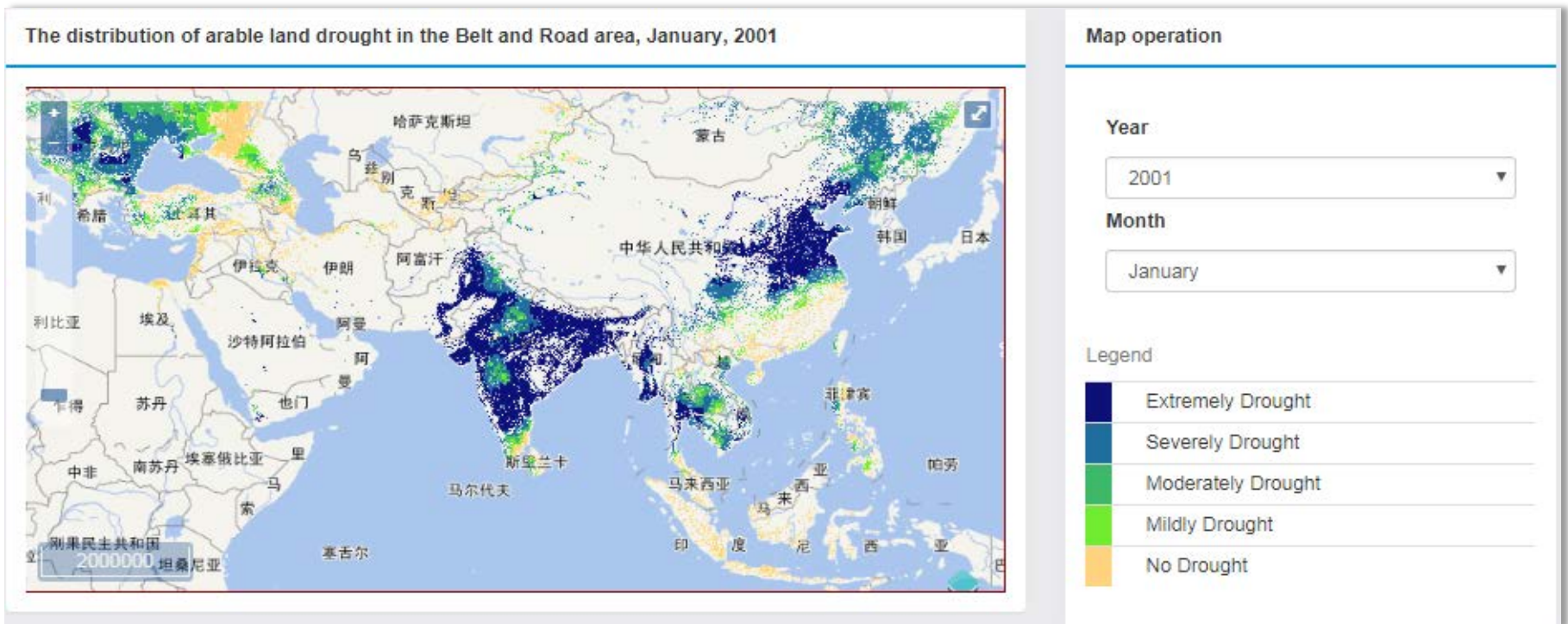
- The **Songliao Basin** is a large terrestrial sedimentary basin surrounded by the Greater Khingan, Lesser Khingan and Changbai mountains in northeast of China. This application shows the related data and information of **basic geographic and hydrologic and flood disaster** of Jilin Province, Liaoning Province, Heilongjiang province and Mongolia autonomous region.



7) Thematic knowledge service for the spatio-temporal distribution of arable land drought in the B&R area



- This knowledge service utilized the Tropical Rainfall Measuring Mission satellite (TRMM) precipitation data to calculate the monthly spatio-temporal distribution of drought in the Belt and Road arable area from 2001 to 2013 based on the Precipitation Abnormity Percentage drought model. This knowledge service expect to provide the results of drought remote sensing monitoring and methods for drought disaster prevention and reduction as well as for agricultural development in the region.

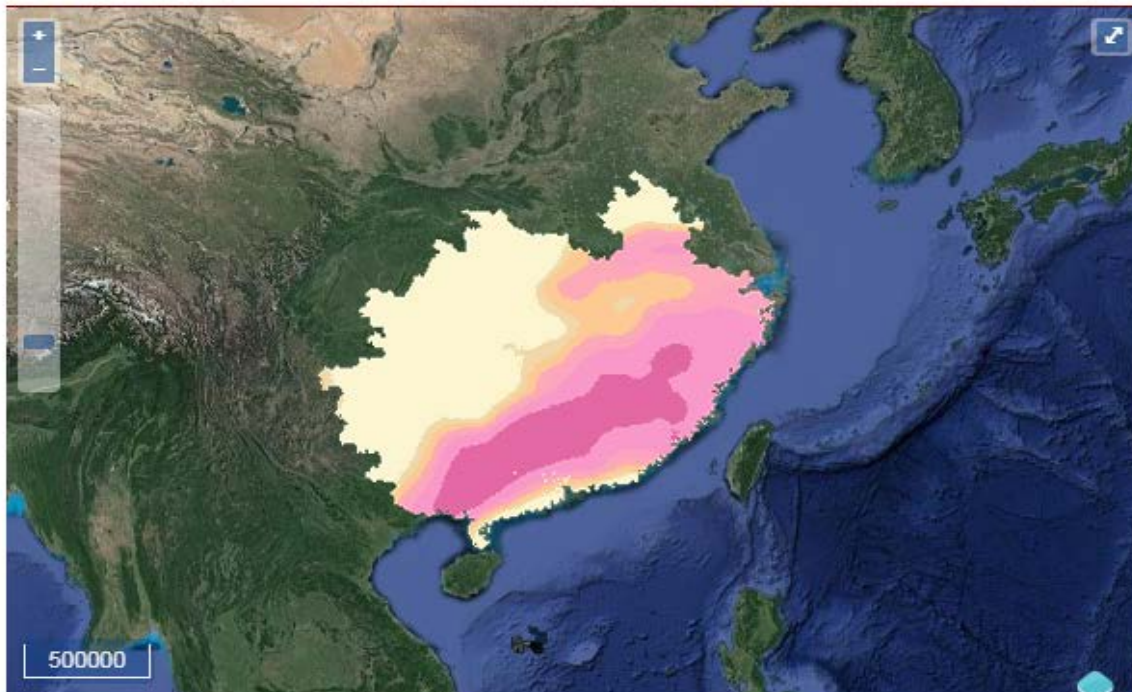


8) Knowledge service of forest freezing, rain and snow disaster prevention and reduction in southern China



- The dataset is produced for **the southern snowstorm disaster in early 2008**, the specific time of which is from 2008/01/10 to 2008/02/02.
- The dataset covers Anhui, Chongqing, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi and Zhejiang Province.

The intensity of snow and ice disaster across southern China in 2008, precipitation , January 26th , 2008



Map operation

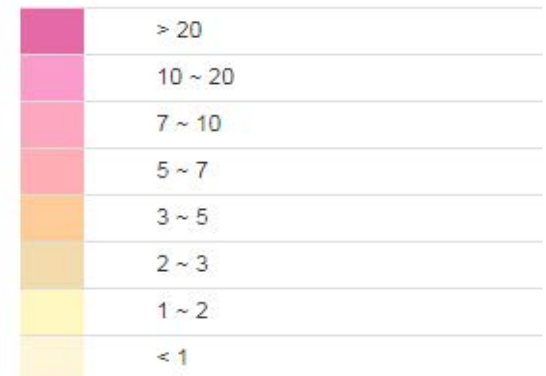
Type

precipitation

Date

January 26th

Legend

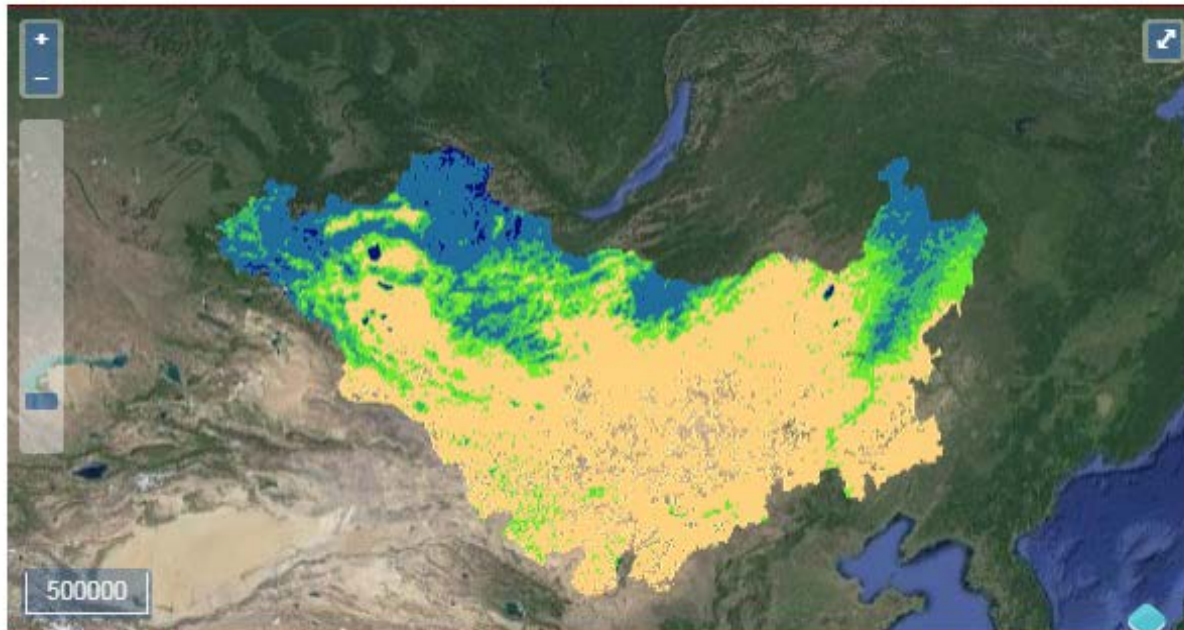


9) Mongolian Plateau drought monitoring Annual spatial distribution data service



- **Drought** is common in the **Mongolian Plateau**, and it is severe drought in some years. Based on the NOAA AVHRR NDVI-PathFinder 10d remote sensing data of 1981-1999 and MODIS vegetation index and the surface temperature 16d data of 2000-2012, the knowledge service inverted Temperature and Drought Vegetation Index (TVDI) by the Ts-NDVI general space.

Mongolian Plateau drought monitoring Annual spatial distribution knowledge service , 1985

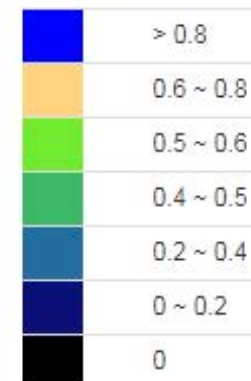


Map operation

Year

1985

Legend

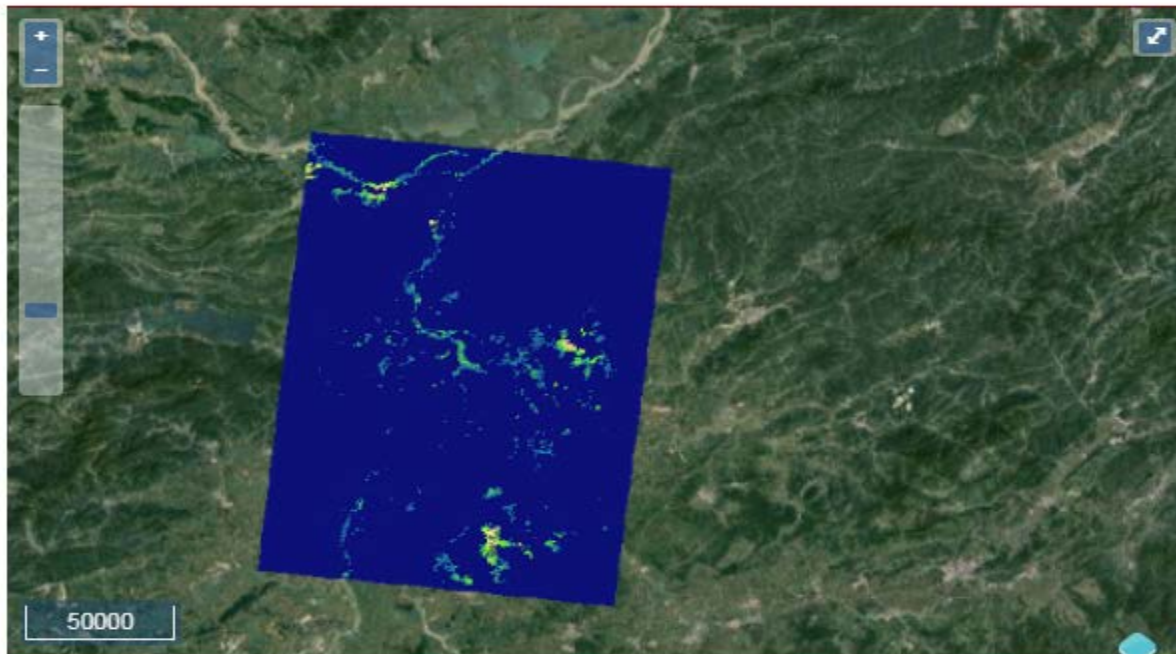


10) Poyang Lake suspended matter concentration retrieval Season-by-quarter spatial distribution data service



- Suspended solids concentration is an important parameter to evaluate the quality and environment of water. It has very important significance to get the time-spatial distribution information of suspended solids concentration in lakes for their environmental management based on the remote sensing technology. This application reveals the suspended solids concentration of the lake in annual spring, summer, autumn and winter seasons from year 2000 to 2013.

Suspended solids concentration inversion seasonal spatial distribution in Poyang Lake, China, January, 2007



Map operation

Year

2007

Month

January

Legend

	> 100
	80 ~ 100
	60 ~ 80
	40 ~ 60
	20 ~ 40
	0 ~ 20
	0

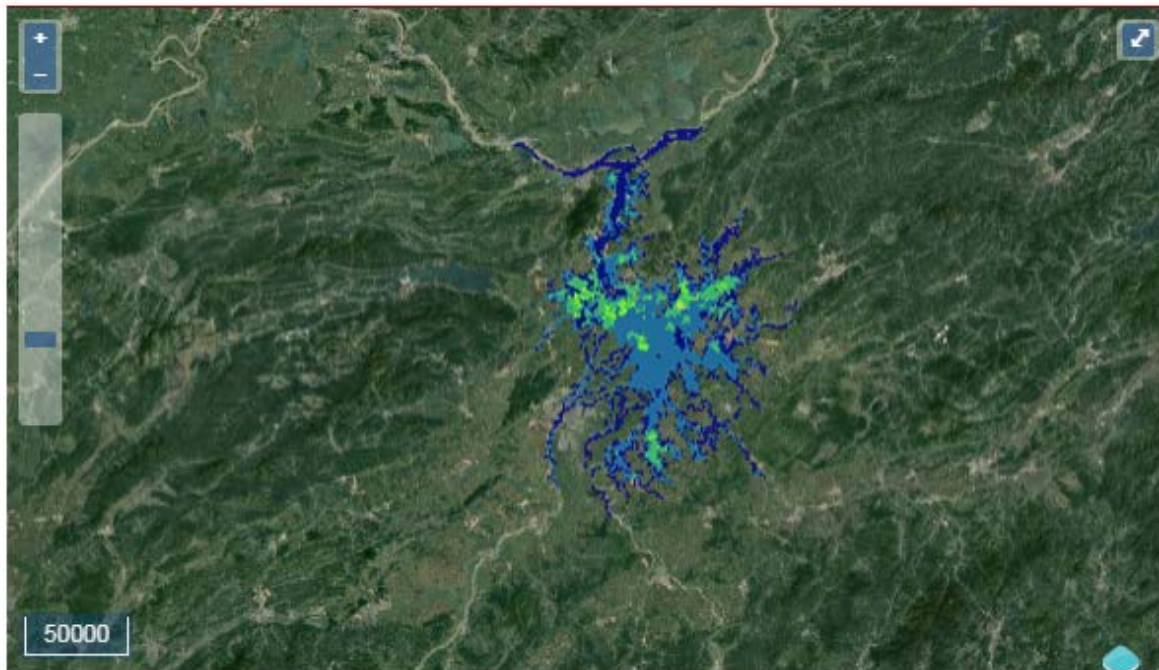
11) Poyang Lake chlorophyll concentration retrieval

Season-by-quarter spatial distribution data service



- Poyang Lake is the largest freshwater lake in China, and it plays an important role in flood control regulation and storage and biodiversity protection. **Chlorophyll-a concentration level** can reflect the status of water primary productivity, and it is also an **important indicator of evaluating the eutrophication degree**. This application shows chlorophyll-a concentration distribution data of Poyang Lake in **January, April, July and October from 2009 to 2012**.

Chlorophyll-a concentration inversion seasonal spatial distribution in Poyang Lake, China , July, 2010



Map operation

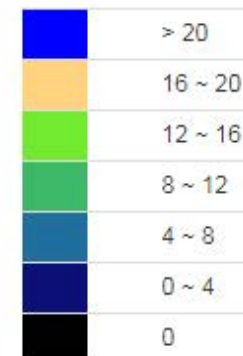
Year

2010

Month

July

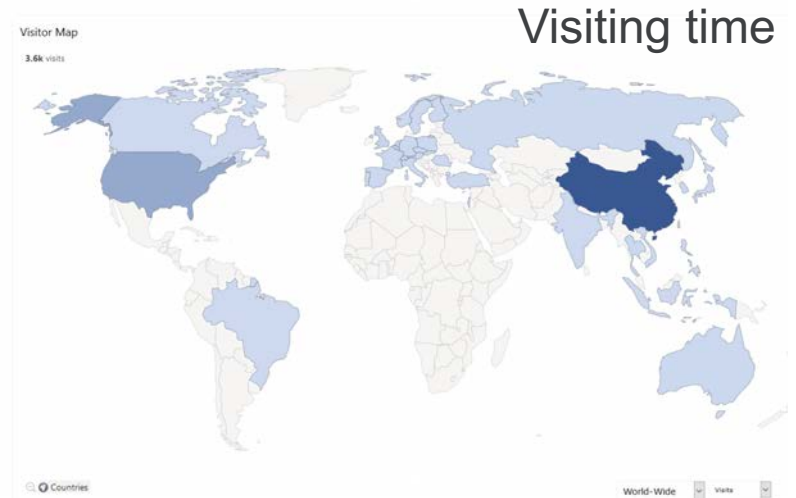
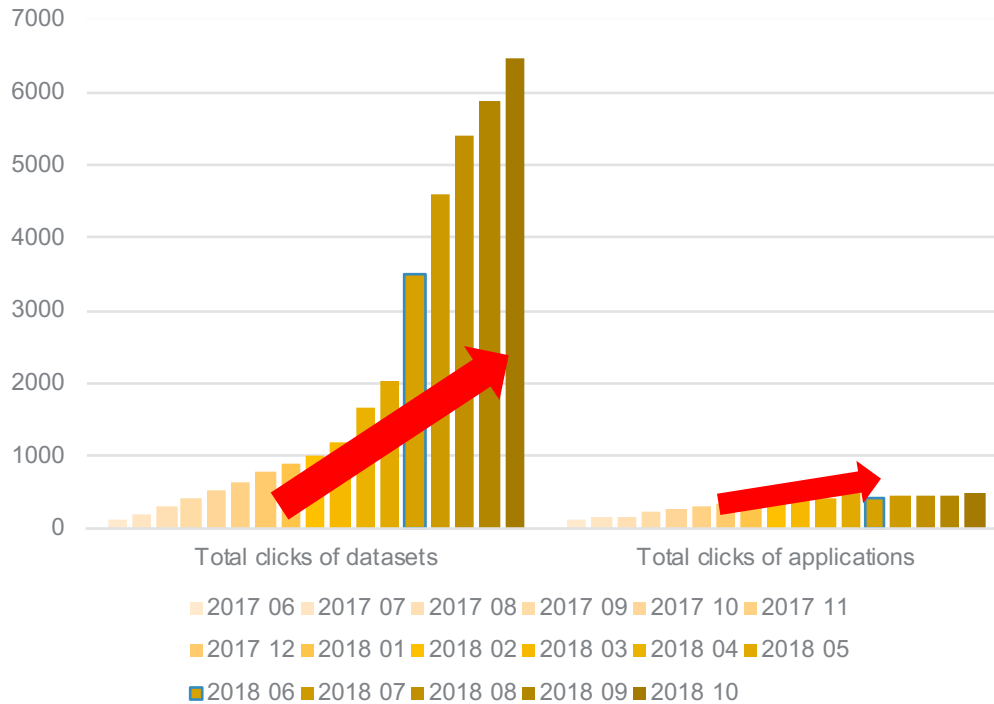
Legend



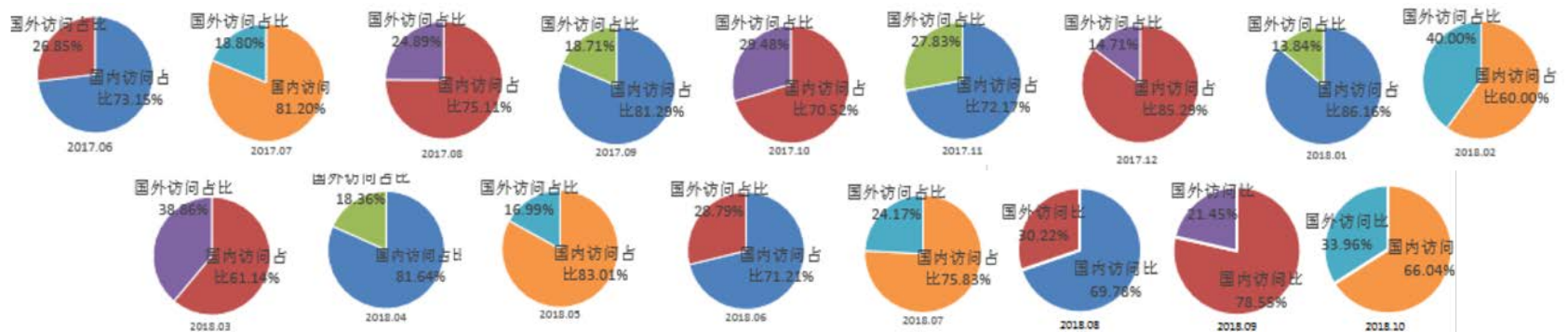
5 Cooperation in the near future

Analysis of the User Log for DRR

Since June 2017, The amount of user visits continue to increase , and form a stable group of international users.



China, USA, Japan, Russia, Canada, Australia, India, Brazil, Europe, South east Asia, Middle east,



Cooperation **network** in domestic and overseas

China



Intern-
ational



Discuss cooperation in the near future

- **Disaster Data Management** course and training
 - Master/Doctor joint education
- **Disaster Risk Reduction Knowledge Service network** for experts, database, application, best practice
- **Joint projects:**
 - OBOR disaster data sharing network
 - OBOR disaster information system/decision support system
 - **OBOR disaster data products or knowledge products**
 - Disaster management standards
 - **Disaster data mining using social media**
 - Disaster data mining using multi sources data (including RS)
 - **SDGs and Sendai Framework oriented research projects**
-



International Knowledge Centre
for Engineering Sciences and Technology
under the Auspices of UNESCO
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