



United Nations  
Educational, Scientific and  
Cultural Organization

联合国教育、  
科学及文化组织



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

国际工程科技知识中心  
由教科文组织支持

# **An open science infrastructure: Disaster Risk Reduction Knowledge Service in IKCEST**

## **Juanle Wang**

**International Knowledge Centre for Engineering Sciences and Technology (IKCEST)**  
under the Auspices of UNESCO

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

**May, 2024**



# UNESCO Science Centres Coordination Meeting

## 联合国教科文组织科学中心主任工作会议

May 15-18, 2016

Beijing • China





# Signing and Unveiling Ceremony

- **Establishment** of International Knowledge Centre for Engineering Sciences and Technology (IKCEST) under the Auspices of UNESCO was approved by the 37th session of the UNESCO General Conference in 2013. The **Signing and Unveiling Ceremony** of IKCEST was held in Beijing **on June 2, 2014**.





# A **Bridge** for Engineering Communities of UNESCO Member States

## **VISION**

to promote global information and knowledge sharing of engineering, education, and implement technical exchanges and knowledge services for the international community.

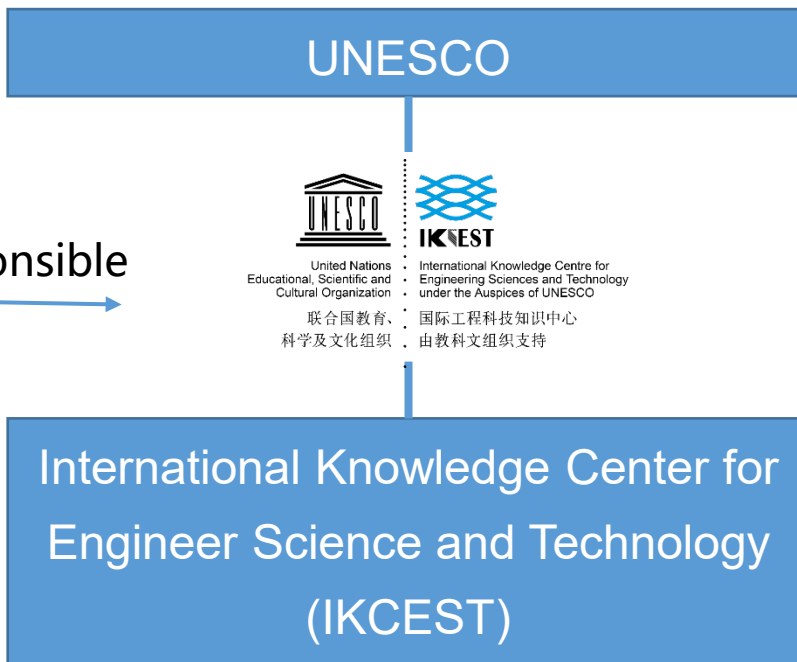
## **MISSION**

to construct a knowledge base on which to share expertise and experience on engineering science and technology internationally, thus contributing to UNESCO' s Engineering Initiative and promoting the dissemination and utilization of engineering knowledge to facilitate the development of a knowledge-based society.





Responsible



Engineering  
education



**Disaster Risk  
Reduction**



Silk Road  
Science & Tech

Intelligent  
City



...  
...



# Disaster Risk Reduction



## UNESCO Global Tsunami Early Warning and Mitigation Programme



Provides support in assessing tsunami risk, implementing Tsunami Early Warning Systems (EWS) and in educating communities at risk about preparedness measures.



## DesInventar Sendai



Contains systematic collection, documentation and analysis of data about losses caused by disasters associated with natural hazards.

## IKEST Disaster Risk Reduction Knowledge Service



Provides publications, data, information and services related to natural disasters and disaster risk reduction.

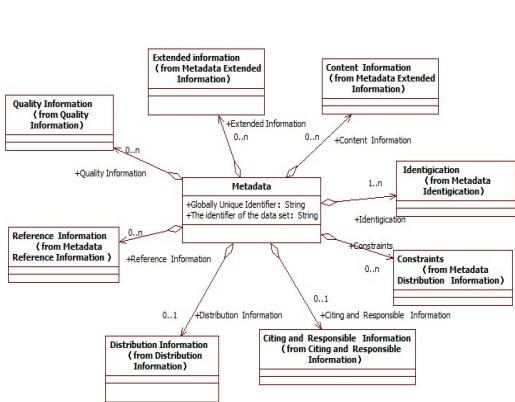
## African Flood and Drought Monitor

Allows monitoring, forecasting meteorological, agricultural and drought at various and spatial scales.

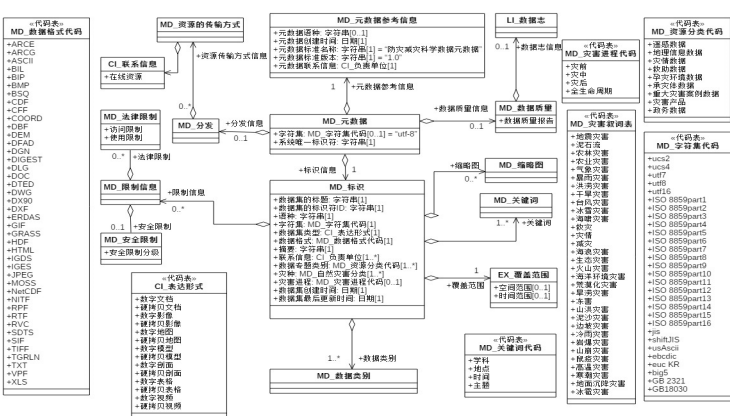




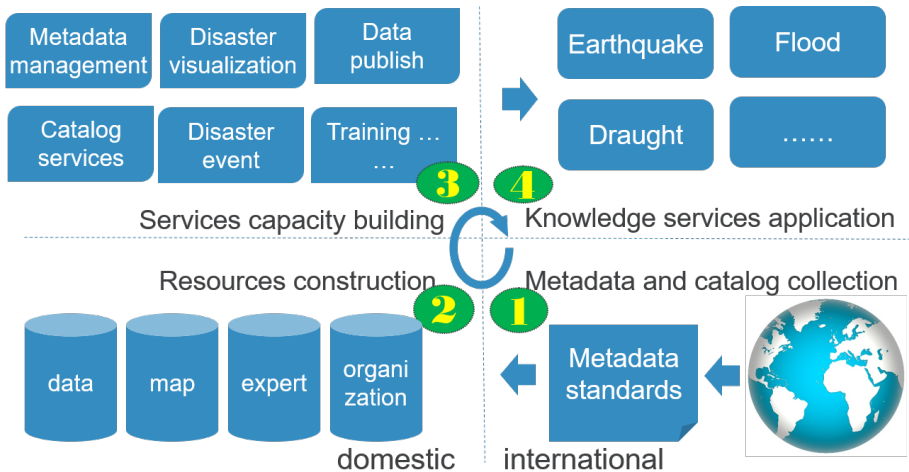
**Build UNESCO knowledge service system for Disaster Risk Reduction, and gather more than 1.5 million disaster data resources in 2016-2023**



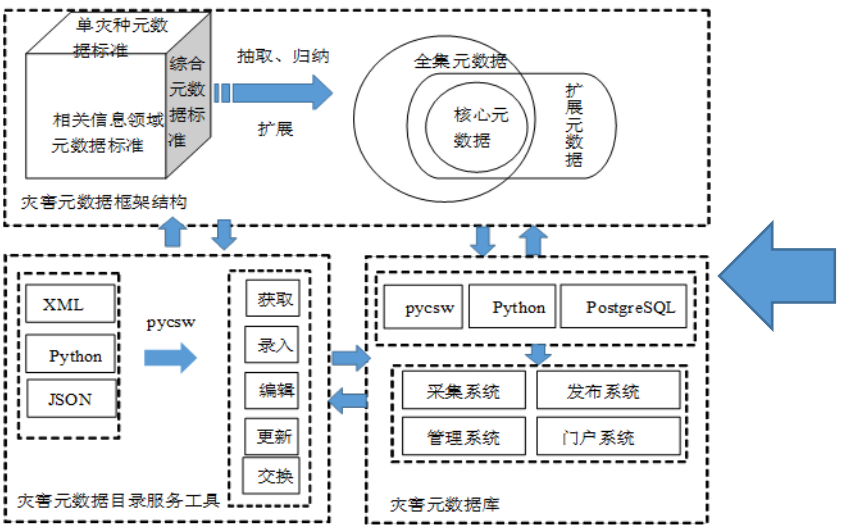
## Disaster metadata standard



## Disaster resource correlation framework



## International Disaster resources convergence



- **disaster data**
- **disaster documents**
- disaster databases
- disaster events
- disaster maps
- knowledge applications
- expert information
- institutional information
- video courseware
- research reports



# DRR Knowledge Service of IKCEST (<http://drr.ikcest.org>)

IKCEST-DRR launched in 2016.

## Data

- Data files reach 4600,000+ pieces
- 100,000+ linked meta database
- 370,000+ disaster literature
- 1587 disaster maps
- 381 scientific data sets
- 413 expert metadata
- 404 Institutional metadata
- 23 knowledge applications
- 115 training videos
- 2268 disaster events

## Service

- International training, International workshop,
- The cumulative visits reached 2.25 million. International users accounted for 67.1%+.





# ➤ DRR scientific data

Welcome to the IKCEST

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国际工程科技知识中心 由教科文组织支持

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

Home Document **Data** Maps Education Subject-Catalogue Application

Subject database for earthquake  
Subject database for drought  
Subject database for flood  
Subject database for frozen  
Subject database for heat wave  
Subject database for wild fire  
Subject database for ecology & environment  
Subject database for urban  
Subject database for social media mining

Regional basic database for the Belt and Road  
Regional disaster database for the Belt and Road  
Regional database for China-Mongolia-Russia Economic Corridor  
Regional database for China-Pakistan Economic Corridor  
Regional database for Bangladesh-China-India-Myanmar Economic Corridor

381 datasets

Data (381)

Creation time Update time Browse times

**Satellite Map of Buildings in Turkey Before and After the Earthquake**

Abstract: According to the China Earthquake Networks: local time on February 6, 2023 at 4:17 (Beijing time 2023...

after the earthquake Turkey Comparison of buildings parts of Gaziantep province

**Dataset of Water Systems in Southern Turkey and Northern Syria**

Abstract: The data set refers to the river system data of several provinces in southern Turkey and northern Syr...

basin spatial distribution Turkey Syria

**Historical seismic point data in turkey quake epicentre extending 200km area**

Abstract: A 7.8-magnitude earthquake occurred in Turkey at 4:17 local time on February 6, 2023 (Beijing time 09...

the epicentre of the earthquake in the past years, Turkey Epicentre around 200 kilometers

**Soil raster data in turkey quake epicentre extending 200km area**

Abstract: The data set is the 200km soil raster data of the epicenter of the Turkey earthquake of magnitude 7.8...

earthquake

## Mongolian Plateau Drought Distribution Dataset from 1981 to 2012

2012

Legend: severely drought, drought, moderate drought, extreme drought

Help edit

Label: Mongolian plateau spatio distribution drought disaster

Date: 2020-10-28

View counts: 4292

Browse document: Browse document

Download Dataset: Log in

This dataset was the drought distribution data of the Mongolian plateau from 1981 to 2012. It mainly described the drought conditions of different maps and different years of the Mongolian plateau. There were 32 grid files in total. They were collected and organized by the Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences. They could be used to study the occurrence and distribution of drought disasters, and provided an important basis for preventing drought disasters and reducing the negative impact of it.

## Metadata

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

## Data Documentation



# ➤ Disaster maps

Home Document ▾ Data ▾ **Maps** Education ▾ Subject-Catalogue ▾ Application Scholar ▾

In the process of development, there are a large number of natural disasters and mitigation engineering maps, the application of maps is an important part of the DRR. The computer-automated means such as encoding, splitting, projection conversion or format conversion of the maps or drawings are applied in process of development. The list of maps contain various category of map resources, such as Foreign Map, Chinese History Map, World History Map, Natural Geographic Map, Humanities and Social Sciences Map and so on. The online operations are done in a map application, the users could operate maps with zooming, maps shift-invariant, view geographic coordinates and relevant information, map overlay, data processing of maps, edit Toolbar, cancel and repeat and save and download the maps and metadata. Users could quote the map and meta. More information is available on the operating instruction.

📍 China Historical Disaster ( 557 )

China Nature Disaster [\(370\)](#)

Disaster impact [\(141\)](#)

Prevention Project [\(37\)](#)

Geographic Factors for Disaster [\(9\)](#)

📍 Earthquake Disasters ( 120 )

Earthquake Disasters [\(70\)](#)

Earthquake Impact [\(50\)](#)

📍 Flood Disasters ( 138 )

Mountain Flood [\(7\)](#)

Rainfall Flood [\(4\)](#)

Storm Flood [\(127\)](#)

📍 Biological Disasters ( 25 )

Crop Pests [\(3\)](#)

Forest Disasters [\(22\)](#)

📍 Meteorologic Disasters ( 296 )

Drought and Hot [\(73\)](#)

Rain Disasters [\(22\)](#)

Snow or Cold Wave [\(39\)](#)

Typhoon [\(37\)](#)

Frost and fog [\(16\)](#)

Sandstorm [\(11\)](#)

Others [\(98\)](#)

📍 Geological Disasters ( 157 )

Landslide [\(5\)](#)

Debris Flow [\(11\)](#)

Ground Fissure [\(1\)](#)

Land Subsidence [\(1\)](#)

Soil Salinization [\(2\)](#)

Others [\(137\)](#)

📍 Raster Data ( 6 )

Inversion data [\(0\)](#)

Thematic raster data [\(6\)](#)

📍 Vector Data ( 263 )

Basic geography data [\(259\)](#)

Thematic vector data [\(4\)](#)

➤ DRR released a total of **1587 disaster maps**, including geological, flood, earthquake, meteorological and other disaster types.



# ➤ DRR Scholar

DDR Scholar covers **370,789 papers published since 1900**, including typhon, drought, wild fire, heat weaves, tsunami, flood, earthquake, disaster early warning, disaster reduction, et al.

Research Direction	Typhoon Disaster	Drought disaster	Forest Fire Disaster	High Temperature Heatwave	Tsunami Disaster	Flood Disaster	Earthquake Disaster	Geological Hazards	Disaster Mitigation	Disaster Warning
Number of literatures	21274	106683	19314	2104	13267	78907	105879	7016	71834	66287

出版年	文献数量
2022	22501
2021	35181
2020	30930
2019	27189
2018	23973
2017	20398
2016	19458
2015	17883
2014	16112
2013	15477
2012	13354
2011	12330
2010	11409
2009	10459
2008	9535
2007	8375
2006	7841
2005	6629
2004	6453
2003	5862
2002	5239

出版物标题	文献数量
JOURNAL OF GEOPHYSICAL RESEARCH	6557
GEOPHYSICAL JOURNAL INTERNATIONAL	6350
GEOPHYSICAL RESEARCH LETTERS	6045
NATURAL HAZARDS	5611
BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA	5050
SCIENCE OF THE TOTAL ENVIRONMENT	5000
GEOPHYSICS	4461
JOURNAL OF HYDROLOGY	4428
WATER	4260
REMOTE SENSING	4174
TECTONOPHYSICS	4072
SUSTAINABILITY	3687
SOIL DYNAMICS AND EARTHQUAKE ENGINEERING	3299
FOREST ECOLOGY AND MANAGEMENT	2779
CHINESE JOURNAL OF GEOPHYSICS	2728
NATURAL HAZARDS AND EARTH SYSTEMS	2727
INTERNATIONAL JOURNAL OF DISASTER PREVENTION AND MANAGEMENT	2701
PURE AND APPLIED GEOPHYSICS	2695
INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH	2625
EARTH AND PLANETARY SCIENCE LETTERS	2545
GEOMORPHOLOGY	2496
ENVIRONMENTAL EARTH SCIENCES	2289
JOURNAL OF GEOPHYSICAL RESEARCH	2262
WATER RESOURCES RESEARCH	2239


文献类型	文献数量
Article	353631
Proceeding Paper	13261
Review Article	11939
Early Access	3210
Editorial Material	2370
Meeting Abstract	1206
Note	458
Correction	415
Letter	344
Book Chapters	306
News Item	180
Data Paper	111



# ➤ Expert database and Institution database

Experts (413)

↓ Creation time ↓ Update time ↓ Browse times




**Scott C. Doney** [Edit](#)

**Affiliation :** University of Virginia

**Introduction :** University of California San Diego: La Jolla, CA, US 1982-09 to 1986-06 | BA (Chemistry) Massachusetts Institute of Technology: Cambridge, MA, US 1986-06 to 1991-08 | PhD (Joint Program in Oceanography). National Center for Atmospheric Research: Boulder, CO, US 1991-08 to 1993-09 | Postdocal Fellow (Advanced Studie...

spans oceanography climate and biogeochemistry




**Chris Langdon** [Edit](#)

**Affiliation :** University of Miami

**Introduction :** Lawrence University 1972 to 1976-05-10 | BA (Biology) University of Rhode Island 1988-08-06 | PhD (Graduate School of Oceanography). Columbia University: New York, NY, US 2004-08 (LDEO) Employment; University of Miami: Coral Gables, FL, US 2005-08-01 to present | Professor and Chair (RSMAS).


ocean warming acidification



**Steven M.A.C. van Heuven** [Edit](#)

**Affiliation :** University of Groningen

**Introduction :** 2015-03-01 to 2017-06-30 | Postdoctoral Researcher (Ocean Systems Sciences); 2017-07-01 to 2018-06-30 | Temporary technician, Aerosol lab (Centre for Isotope Research); 2018-07-01 to 2019-03-31 | Postdoctoral Researcher Atmospheric Chemistry (Centre for Isotope Research); 2019-04-01 to present | Scientific Engineer, Atmosp...



**Christopher Hunt** [Edit](#)

**Affiliation :** University of New Hampshire

**Introduction :** 1996-09 to 2000-05 | BS (Chemistry) 2000-09 to 2003-05 | MS (Earth Sciences). 2004-05 to present | Research Scientist (Ocean Process Analysis Laboratory) Employment.

Organization (403)

↓ Creation time ↓ Update time ↓ Browse times

**French National Institute for Agriculture, Food, and Environment (INRAE)** [Edit](#)

INRAE is the French National Institute for Agriculture, Food and the Environment, established on January 1, 2020, by the merger of the French National Institute for Agricultural Research INRA and the French National Institute for Environmental Science and Technology IRSTEA and Agriculture. INRAE was formed by the merger of INRA, the French Nationa...

Climatological

**World Agroforestry Centre** [Edit](#)

World Agroforestry (ICRAF) is a scientific and development centre of excellence dedicated to harnessing the benefits of trees for people and the environment. Drawing on the world's largest repository of agroforestry science and information, we develop knowledge practices from the farmer's field to the global scale to ensure food security and envi...

Climatological

**The Nature Conservancy** [Edit](#)

Climate change is the greatest environmental challenge of the 21st century, and its impacts are rapidly intensifying, including prolonged droughts, rising sea levels, record heat, extreme storms, and significant economic losses. The damage caused by climate change could undo the environmental protection work of recent decades and seriously threat...

Climatological

**Centre for Environment, Fisheries and Aquaculture Science** [Edit](#)

Our rivers, seas and the ocean are facing significant global threats. These precious environments regulate our climate, are home to up to 80% of life on earth and provide essential resources that we all rely on. Many are now seriously degraded and communities around the world are facing the devastating consequences of climate change, biodiversity...

➤ 413 experts metadata and 404 Institutional metadata



# ➤ DRRKS thematic knowledge application

## • 23 knowledge applications

### Knowledge Application

#### Information Aggregation



Information Retrieval based on World Countries and Regions Map



Knowledge Map Service for Major Organizations



Disaster knowledge application of China Pakistan Economic Corridor



Accurate regulation method and coordination web platform development of animal husbandry in the Selenge River Basin, Mongolia



Global earthquake spatial distribution mapping since 2150 BC



Global Earthquake Daily Distribution Map Service



Natural disaster risk assessment on agricultural production over Heilongjiang - Amur Transboundary River Basin



DRRKS Data Sharing for 2023 Earthquake Disaster Reduction in Turkey and Syria

#### Application Using Web GIS



Map Visualization Services of China's Historical Disasters



China and International Experience in Natural Disaster Relief

### Scientific Data Visualization



Forest freezing, rain and snow disaster prevention and reduction in southern China



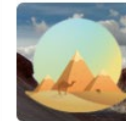
Spatio-temporal Distribution of Arable Land Drought along the Belt and Road Initiative Area



Annual Spatial Distribution Data for Drought Monitoring in the Mongolian Plateau (1981-2012)



Total Factor Data of Land Cover in Disaster Pregnancy Environment in Mongolia



Desertification monitoring in Mongolia section of China-Mongolia railway



Flood Control in Songliao Basin



Suspended Solids Concentration Inversion from 2000 to 2013 in Poyang Lake, China



Spatial Distribution of the Seasonal Chlorophyll-a Concentration in Poyang Lake, China (2009-2012)



Spatio-temporal Distribution of Major Historical Disasters in the China-Mongolia-Russia Economic Corridor

### Natural Science Research Work



Temporal and Spatial Distribution of Public Sentiment on Shouguang Flood



Historical meteorological space mapping in the Belt and Road



Grassland yield in China-Mongolia-Russia Economic Corridor



Multi-scale assessment of heat wave disaster risk in typical region-case study in Dhaka, Bangladesh in South Asian



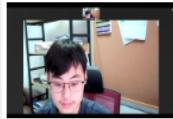
## ➤ Training video

By 2023, IKCEST DRR has released **115 training videos in various topics.**

Link: <https://drr.ikcest.org/filter/2102>

Number	Title (2023)	Number	Title (2023)
1	Introduction to commission for geoscience information of IUGS and progress of DDE standards	9	Progress in "BRI" and Collaborative Disaster Management in China-Pakistan Economic Corridor
2	Understanding collective responses to urban disasters from human's digital footprints: rhythm, pattern, and perception	10	China Efforts on Earth Observation Data Sharing
3	Heat wave risk and impact assessment	11	Bilateral Cooperation on Science and Technology along CPEC
4	Rapid Assessment of Building Damage Triggered by Earthquakes	12	Global SDGs related products and applications based on Big Earth Observation data
5	Towards an Integrated MHEWS for All in Tackling the Climate Crisis	13	Social-ecological resilience and regional development for the countries along the Belt and Road
6	A Flood and Drought Monitoring and Forecasting System over China	14	Earth Science Data Sharing and Interoperability: Progress and Prospective
7	Geospatial data ontology: the semantic foundation of geospatial data integration and sharing	15	Urban flood risks and emerging challenges in the Greater Bay Area: the case of coastal megacities
8	National Tibetan Plateau Data Center		


Creation time
Update time
Browse times



**Urban climate hazards: dynamic risk assessment and management**

Abstract: Abstract: Global climate change is increasing the likelihood of extreme events, such as flooding and...


Urban climate hazards dynamic risk 2021



**Urban flood risks and emerging challenges in the Greater Bay Area: the case of coastal megacities**

Abstract: Abstract: "By the 2050s, more than 120 million people are predicted to settle in the Greater Bay Area..."


2021 Urban flood Greater Bay Area coastal megacities



**Strategies for Strengthening International Collaboration on Disaster Risk Reduction on the Belt and Road**

Abstract: Abstract: This course mainly introduced the strategic importance of international cooperation in com...

Strategies Disaster Risk Reduction the Belt and Road 2021



**Automatic Data Matching for Geospatial Models: a new paradigm for geospatial data and models sharing**

Abstract: Abstract: With the development of global climate and environmental research, geospatial models are ...

2021 Automatic Data Matching Geospatial Models





**GDMD-Disaster Data Hub**



# What is GDMD

GDMD means Global Disaster Data Master Directory. It is a directory, a hub and a clearinghouse for disaster data in the world. **It is also a tool for disaster data directory presenting, searching, publishing, mining and analyzing.**

- Presenting: show the directory in same classification system with rich metadata.
- Searching: search the directory in local database, federated database, and spatial map style.
- Publishing: release the metadata in local or harvest the data catalog with same interface.
- Mining: mine the metadata semantic and produce more labels for data discovery.
- Analyzing: analyze the linked data and produce disaster data knowledge graph.



# How to create GDMD

## Resource → Standard → Coding → Platform

- Resource:

- Besides the resources in IKCEST-DRR, we collect the resources in 120+ platforms in the world.
- Harvested resource
- Federated search resource

- Standard:

- OGC standard      XML format

- Coding:

- PYCSW tool

- Platform:

- <https://drr.ikcest.org/directory/>



- GDMD has presented 1463 open datasets for scientific research.

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Disaster Risk Reduction Knowledge Service

防灾减灾知识服务

Login | Register

English | 中文

Keyword search

Search

Advanced search

Home

Document

Data

Maps

Education

Subject-Catalogue

Application

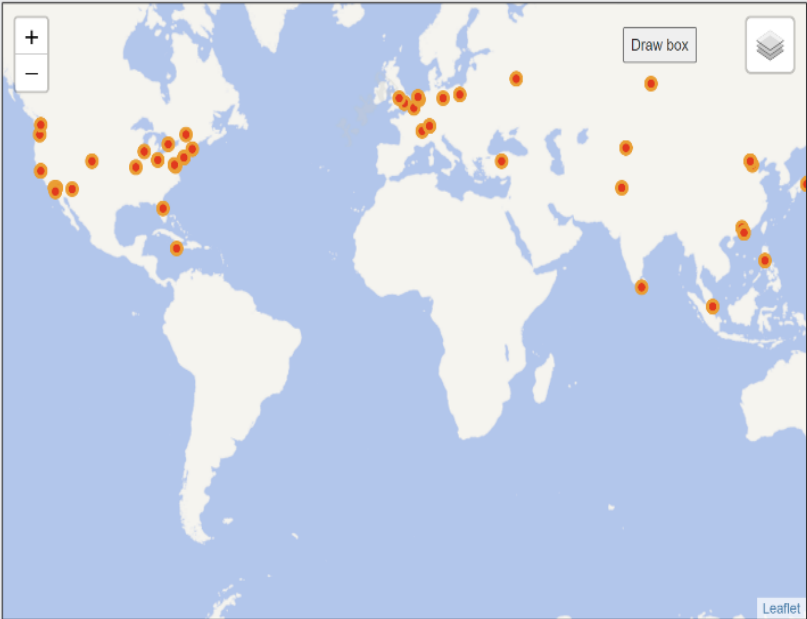
Directory

Scholar

+

-

Draw box



Leaflet

Hydrometeorological hazards

Drought (20)

Flood (99)

Typhoon (27)

Biological hazards

Disease (1)

Wildfires (93)

Others (1)

Searching in Directory

Keywords

Enter the keywords

Boundary box(Drawing the box on left map)

Searching Scope

Local

Federated

Search

Introduction

In order to exchange and interoperate metadata with other data centers, DRRKS deploys pycsw tool to publish metadata.

Pycsw is the Python language implementation of OGC CSW server, and is also the CSW tool recommended by OGC. Because pycsw uses many open source geospatial libraries, it is easier to install under the Linux operating system. In practical use, Debian Linux is deployed with Python 3.5 runtime environment.

Unlike other CSW servers, pycsw has the ability to

Humanitarian Information service

World and Regional Distribution

Release time: 2022-12-10

Browsing times: 13


Tag:

View Metadata (in XML format)

ReliefWeb is a humanitarian information service provided by the United Nations Office for the Coordination of Humanitarian Affairs (OCHA). The service is managed by the Digital Services Section of OCHA's Information Management Branch. ReliefWeb's editorial team monitors and collects information from more than 4,000 key sources, including humanitarian agencies at the international and local levels, governments, think-tanks and research institutions, and the media. Our editors select, classify, curate and deliver the content that is most relevant to global humanitarian workers and decision-makers on a 24/7 basis, enabling them to make informed decisions and to plan effective response. Key content, including the latest reports, maps and infographics from trusted sources, is delivered through various channels - the reliefweb.int website, social media networks, subscription services, and other specialized OCHA platforms such as HumanitarianResponse.int, and OCHA corporate site through API or RSS - so that humanitarian workers can access a range of latest humanitarian information anywhere, any time.

+

-



Leaflet

Type	Reports, Maps, Infographics
Source	https://reliefweb.int/disasters
Metadata	local
Wkt geometry	POLYGON((-180 00 -90 00, -180 00 83 63, 180 00 83 63, 180 00 -90 00, -180 00 -90 00))
Insert date	2022-12-11T10:07:57Z
Typename	csw.Record
Schema	http://www.opengis.net/cat/csw/2.0.2
Subject	Meteorological

GDMD Service

https://drr.ikcest.org/csw

Total directory items: 1463

DRRKS catalogued: 749

Havested: 714

Technical Environment

pycsw 3.0-dev

Ubuntu 22.04.1 Server, 64bit

Nginx 1.18.0

Python 3.10.6-1

Postgresql 2.3.2-2

PostGIS 3.2.0

Last update: 2022-12-10



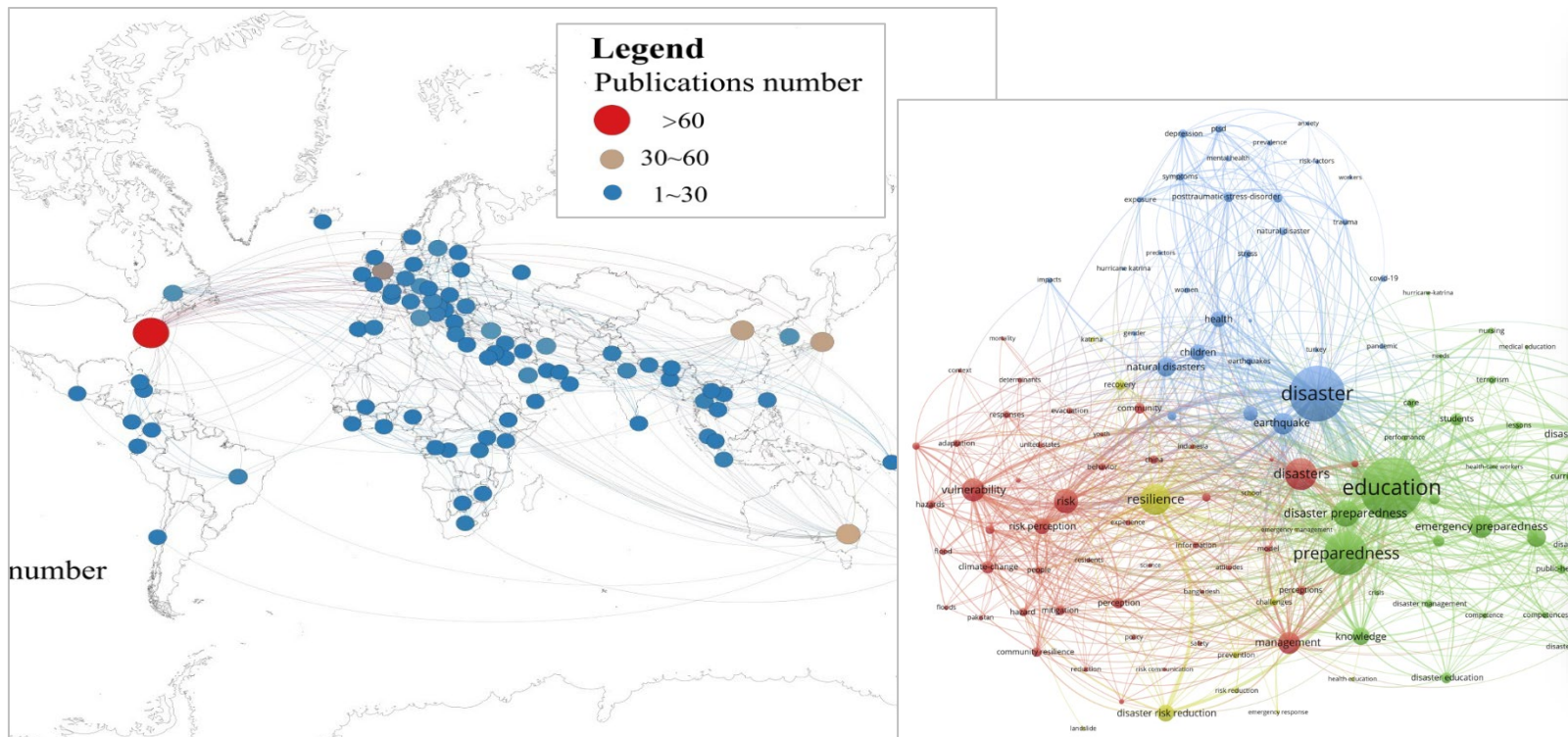


# **Disaster Knowledge Graph**



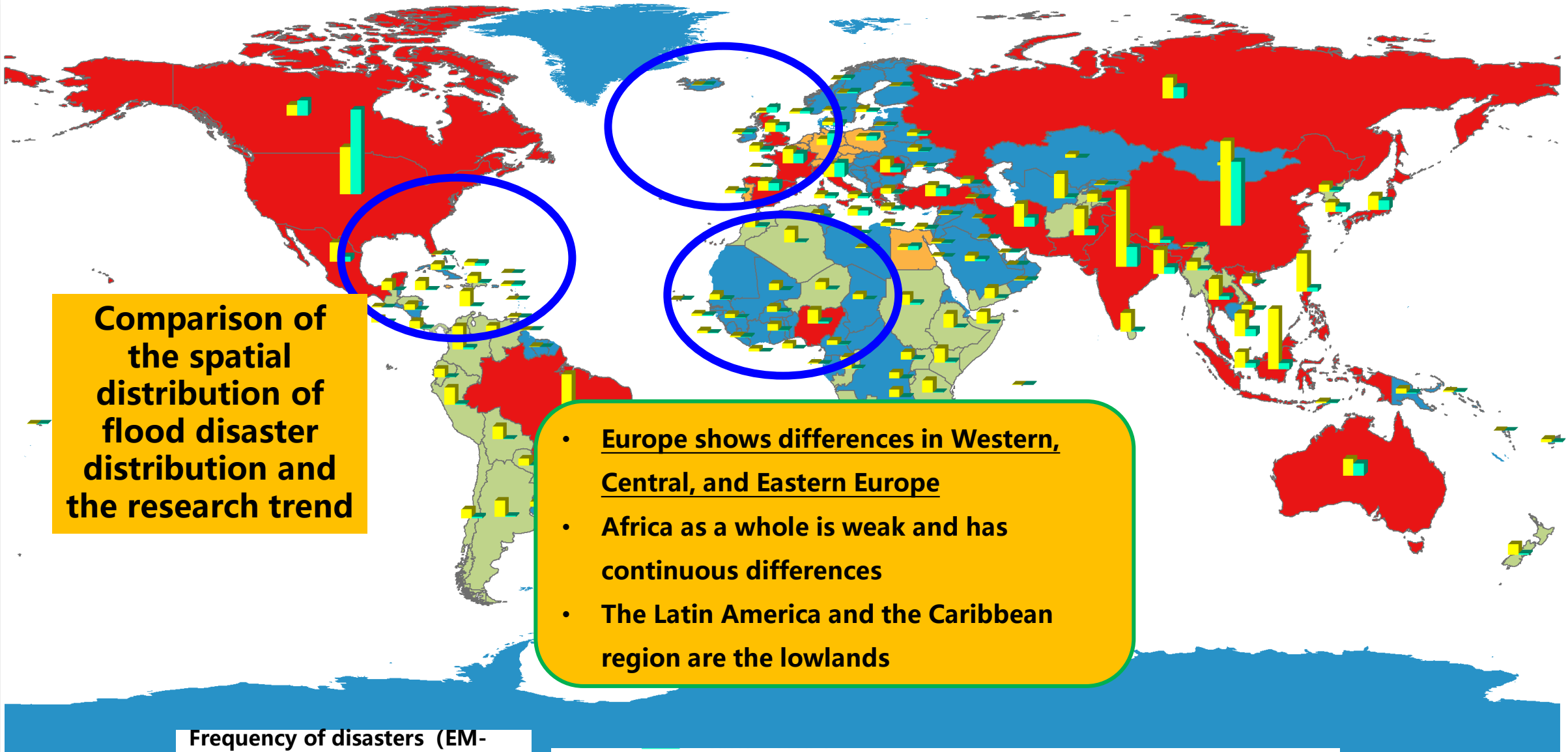
# Trend analysis of global disaster education research

The largest number of publications countries are **the United States, China, Australia, Japan** (183, 72, 59, and 51 respectively). Among the main contributors to disaster education research, **developed countries account for three-quarters**. It also found the top list university on disaster education research.



Institution	Number of Publications
Kyoto Univ	10
Flinders Univ S Australia	10
Univ Piemonte Orientale	9
Hong Kong Polytech Univ	8
Sichuan Univ	7
Harvard Univ	7
Chinese Acad Sci	6
Massey Univ	5
Univ Auckland	5
Chinese Univ Hong Kong	5
Clin Emergency Hosp	5
Columbia Univ	5





**Comparison of the spatial distribution of flood disaster distribution and the research trend**

- Europe shows differences in Western, Central, and Eastern Europe
- Africa as a whole is weak and has continuous differences
- The Latin America and the Caribbean region are the lowlands

**Legend**

0.5 Disaster occurrence  
Disaster research

Frequency of disasters (EM-DAT)  
Frequency of disaster research (Abstract Text)

H-H L-H  
H-L L-L

0 5,000 10,000 km

**14,000 flood disaster literature abstracts** from 1990 to 2020 were excavated to analyze the spatial distribution and research situation of disaster hot spots



# Scenario application based on flood disaster knowledge graph

Entities	149
Relationships	398
Documents	114
Types of model methods	18
Types of flood disasters	9 ( <b>urban flood, storm surge flood, flash flood, Ponding flood, etc</b> )
Subjects	6 ( <b>disaster management, simulation and warning, disaster risk, etc</b> )
High frequency software tools	ArcGIS, ENVI, etc





# **Emergency Disaster Response**



# Emergency disaster relief service for Pakistan flooding, 2022



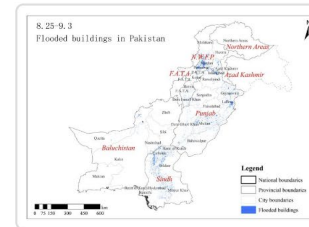
- 2022.09.03: Earthquake Information of 34 km W of ...
- 2022.09.02: Earthquake Information of 266 km NNE ...
- 2022.09.01: Earthquake Information of 258 km NE of ...
- 2022.08.31: Earthquake Information of 15 km NW of ...
- 2022.08.30: Earthquake Information of 39 km SSW ...
- 2022.08.30: Earthquake Information of 39 km SSW ...
- 2022.08.29: Earthquake Information of 170 km WS...



## Sentinel synthetic image dataset throughout Pakistan

With the support of the GEE platform, Sentinel 2 images were synthesized throughout Pakistan for...

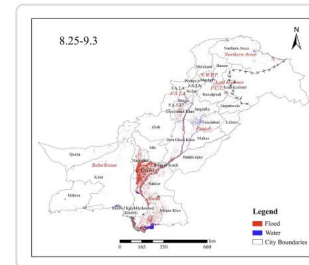
Pakistan Sentinel2 Remote Sensing Image



## A dataset of flooded buildings across Pakistan (2022)

This data is the distribution data of flooded buildings in Pakistan as of September 3, 2022. This data is ob...

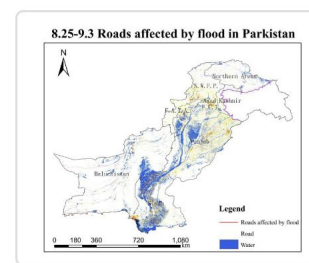
Pakistan flood building construction



## Dataset of flood distribution in Pakistan (2022)

This dataset is the spatial distribution map of floods in Pakistan. The Google Earth Engine is used to process senti...

Pakistan flood Google Earth Engine



## Dataset of flooded roads across Pakistan (2022)

This dataset is a spatial distribution map of flooded roads in Pakistan from 2022 to September 3, 2022. Water...

Pakistan flood flooded road



### Knowledge Application

More



Public opinion analysis for COVID-19



Information Retrieval based on World Countries and Regions Map



Global earthquake spatial distribution mapping since 2150 BC



Knowledge Map Service of Major Organization for Disaster Risk Reduction



Global Earthquake Daily Distribution Map Service



Map Visualization Services of China's Historical Disasters



China and International Experience in Natural Disaster Relief



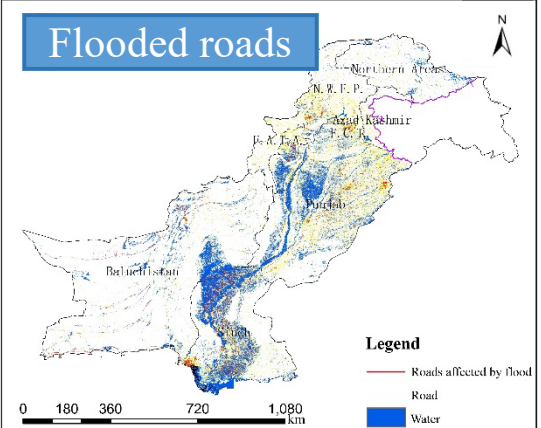
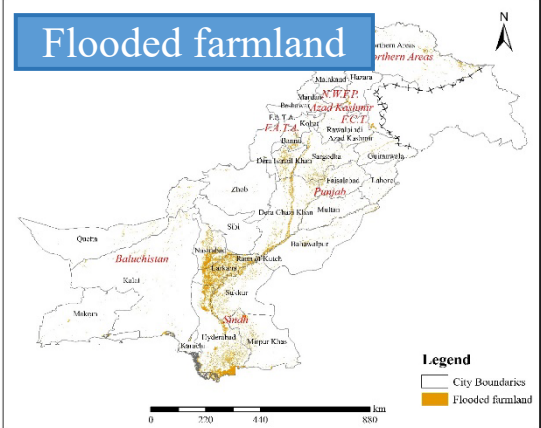
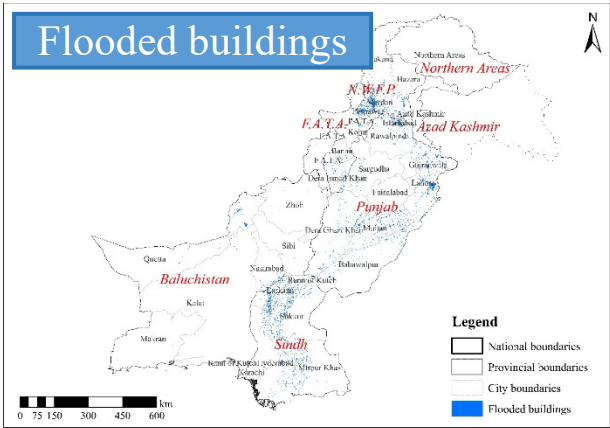
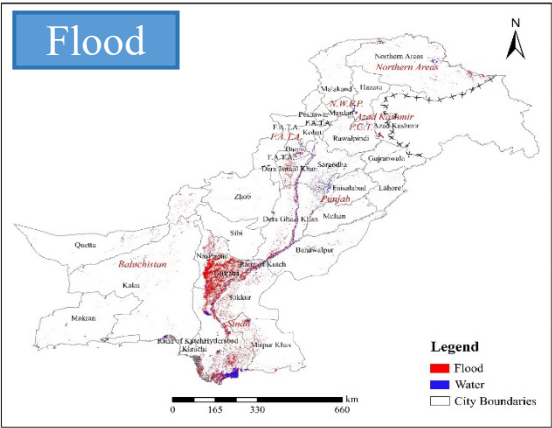
Spatio-temporal Distribution of Arable Land Drought along the Belt and Road Initiative

<http://drr.ikcest.org>

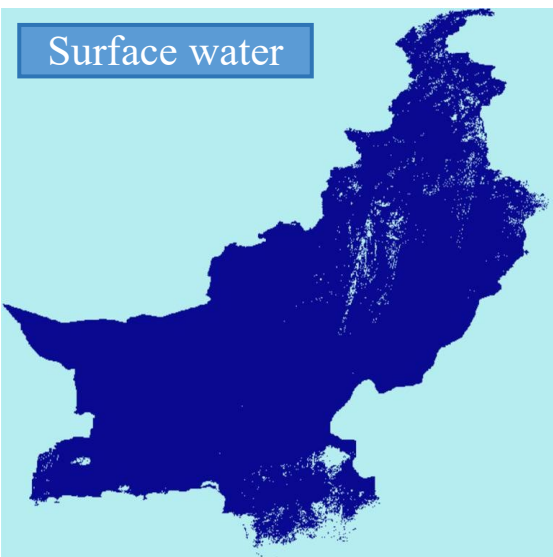
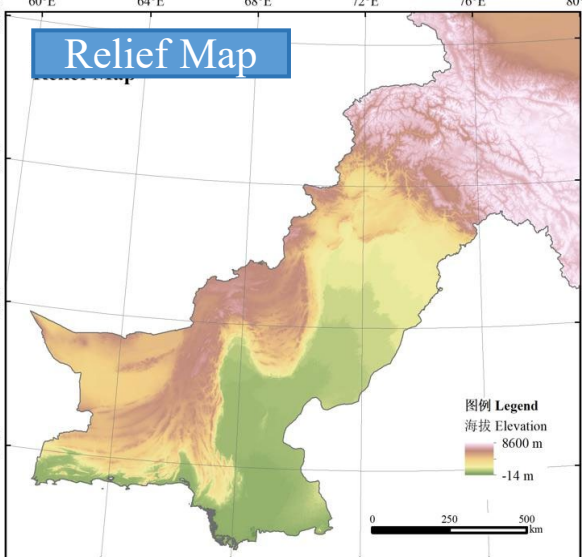
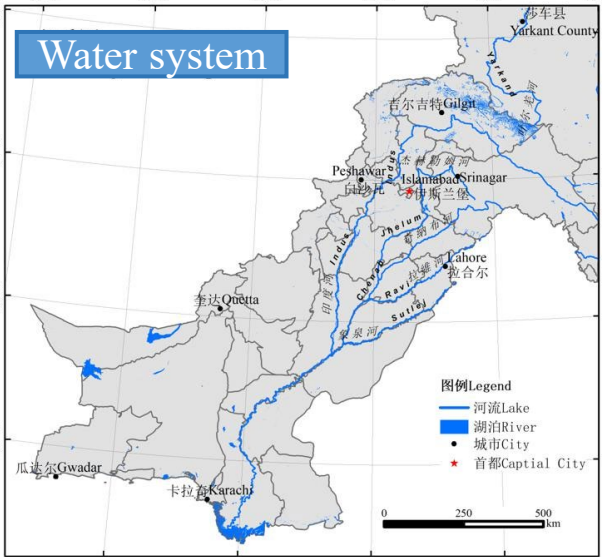
PV:4576, downloads: 282.45GB  
(As of December, 2023)



# Pakistan flooding relief datasets



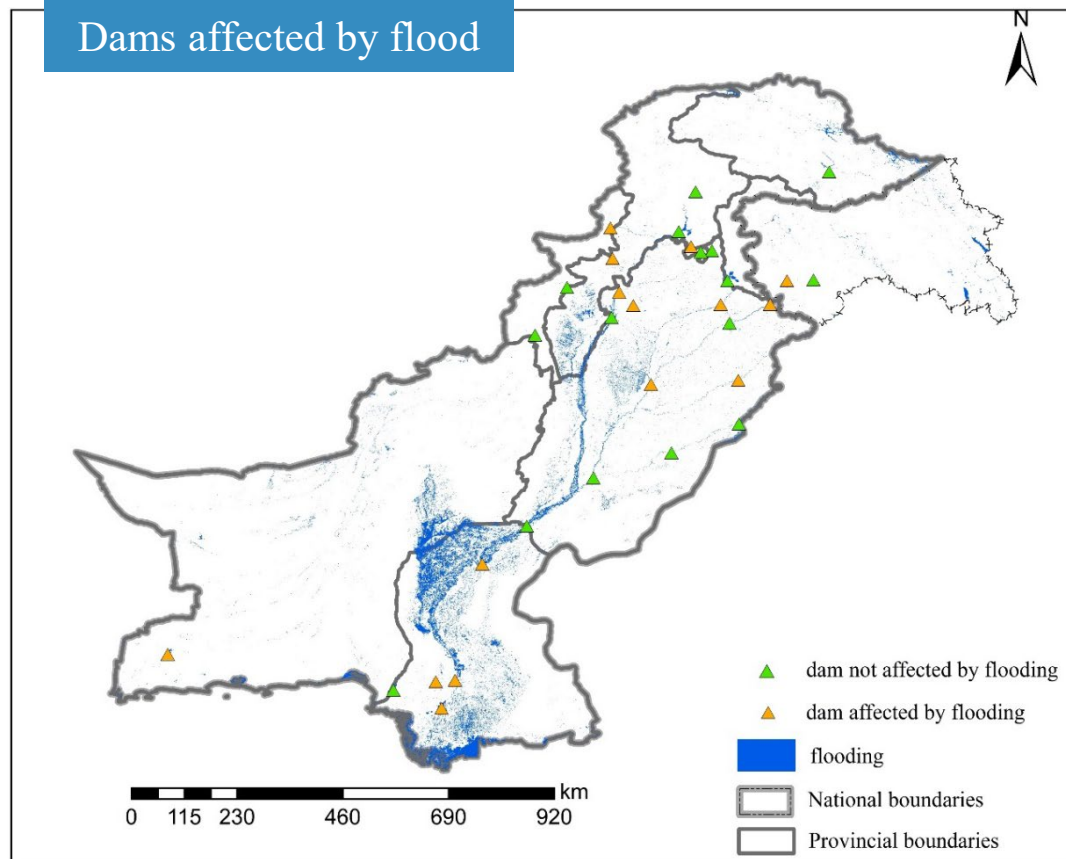
8.25-9.3 Flood Damage in Pakistan



Pakistan Basic Datasets

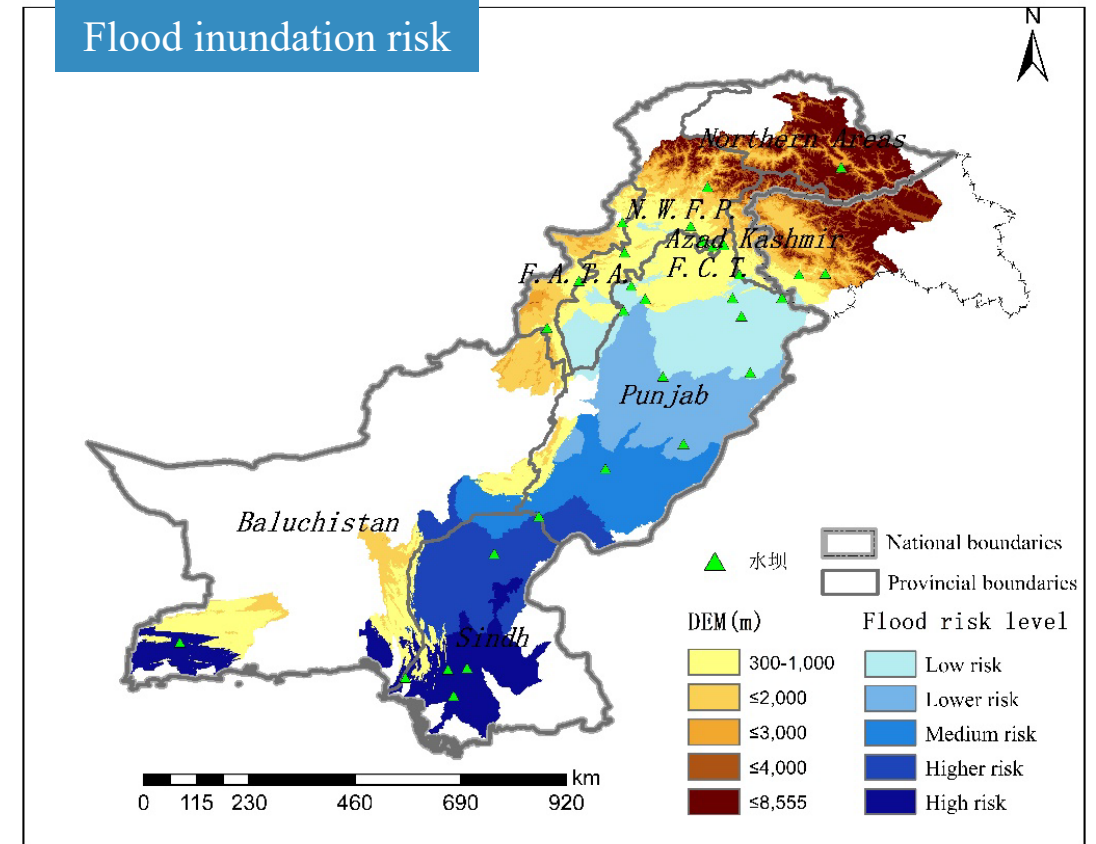


# Dams affected by flood in Pakistan



- Among the total 30 dams in Pakistan, 16 dams were affected in this flooding **(53%)**.

# Flood inundation risk in Pakistan



- Risk mapping of the flooding caused by dam damage. It showed that high risk regions cover 71.9 thousands km<sup>2</sup>; higher risk regions cover 76.2 thousand km<sup>2</sup>; medium risk regions cover 72.9 thousand km<sup>2</sup>; low risk regions cover 83.3 thousand km<sup>2</sup>; lower risk regions cover 84.1 thousand km<sup>2</sup>.



# Emergency disaster relief service for Turkey and Syria Earthquake, 2023



## DRRKS Data Sharing for 2023 Earthquake Disaster Reduction in Turkey and Syria

Turkey and Syria are located at the key nodes of the ancient Silk Road, and are important bridges for the economic and trade development of contemporary Asia and Europe. The North Anatolian Fault, located between the African and Eurasian plates, runs through Turkey from east to west, making earthquakes the most significant natural disaster in Turkey and its adjacent regions.

According to the China Earthquake Network Center (CENC), a 7.8 magnitude earthquake occurred in Turkey at 4:17 local time on February 6, 2023 (09:17 on February 6, 2023, Beijing time), with a depth of 20 km and an epicenter located at 37.15 degrees north latitude and 36.95 degrees east longitude. The average elevation within 5 km of the epicenter is about 1001 meters; the population density near the epicenter is not low, with 33 large and medium-sized cities within 300 km. The nearest city is Gaziantep, the sixth largest city in Turkey, about 40 km from the epicenter. The largest earthquake in the last 10 years within 200 km of the epicenter is this 7.8 magnitude earthquake, 659 km from the 6.1 magnitude earthquake on November 23, 2022. This earthquake caused many neighboring countries such as Syria, Iraq, Israel and Palestine to be affected to varying degrees. The U.S. Geological Survey (USGS) said that at least 18 aftershocks with magnitude over 4 were recorded after the strong earthquake in southern Turkey, including 7 with magnitude over 5. According to the latest news from the CENC, a 7.8-magnitude earthquake occurred in Turkey (38.00 degrees north latitude, 37.15 degrees east longitude) at 13:24 local time (18:24 Beijing time) on Feb. 06, with a depth of 20 kilometers. As of 07:00 on February 9, Beijing time, the strong earthquake has caused more than 12,000 deaths in both Turkey and Syria.

IKCEST-DRR organized data collection and consolidation quickly after the earthquake disaster. And through this data sharing column, IKCEST-DRR provide sharing services to global users to support emergency disaster relief in earthquake-affected areas of Turkey and Syria.

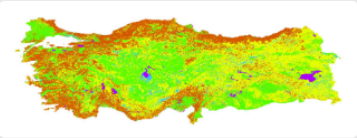


DRRKS Data Sharing for 2023 Earthquake Disaster Reduction in Turkey and Syria

## Data

More

- Historical seismic point data in turkey quake epicentre...
- Satellite Map of Buildings in Turkey Before and After t...
- Turkey earthquake disaster history table
- Soil raster data in turkey quake epicentre extending 2...
- Hydrological elements data in turkey quake epicentre ...
- River runoff station data in turkey quake epicentre ext...
- Dataset of Water Systems in Southern Turkey and No...
- Watershed data within 200km of Turkey epicenter
- River flow data within 200km of Türkiye seismic region
- Location of Turkey quake epicentre
- Turkey quake epicentre extending 200km
- Turkey quake epicentre sentinel1 image
- Turkey quake epicentre sentinel2 image
- Turkey quake epicentre Landsat8 image
- Location of Turkey quake epicentre GF6 image
- Turkey and Syria DEM data
- Turkey 10 m Resolution Land Cover Product,2021
- Turkey 30 m Resolution Land Cover Product,2020

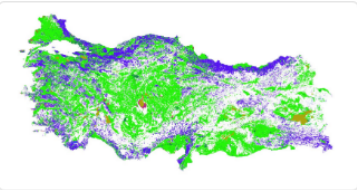


## Turkey 10 m Resolution Land Cover Product,2021

Land use Land cover Resolution 10 m

2023-02-20

The 10 m land cover data for Turkey in 2021 is a global 10 m resolution land cover data processed according to Sentry data release...

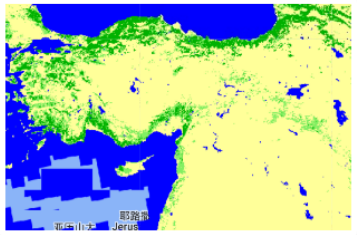


## Turkey 30 m Resolution Land Cover Product,2020

Land use Land cover Resolution 30 m

2023-02-20

Land cover data for Turkey at 30 m spatial resolution, including ten main land cover types, namely cultivated land, forest, grassl...

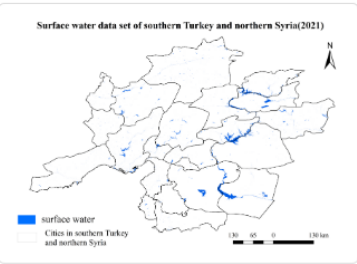


## Regional forest distribution data of Türkiye and Syria in 2021

Türkiye Syria Forest distribution

2023-02-20

This data set is the data in Türkiye and Syria intercepted in PALSAR-2 Global Forest/Non forest Map "2021" provided by Japan Aeros...



## Surface water data set of southern Turkey and northern Syria(2021)

seasonal water temporal distribution Turkey Syria

2023-02-20

This dataset contains maps of the location and temporal distribution of surface water from 2021 and provides statistics on the ext...

<http://drr.ikcest.org>





! 不安全

ikcest-drr.osgeo.cn



🕒 2023-07-14:Earthquake Information of Offshore Chia...

🕒 2023-07-02:Earthquake Information of 132 km NW of ...

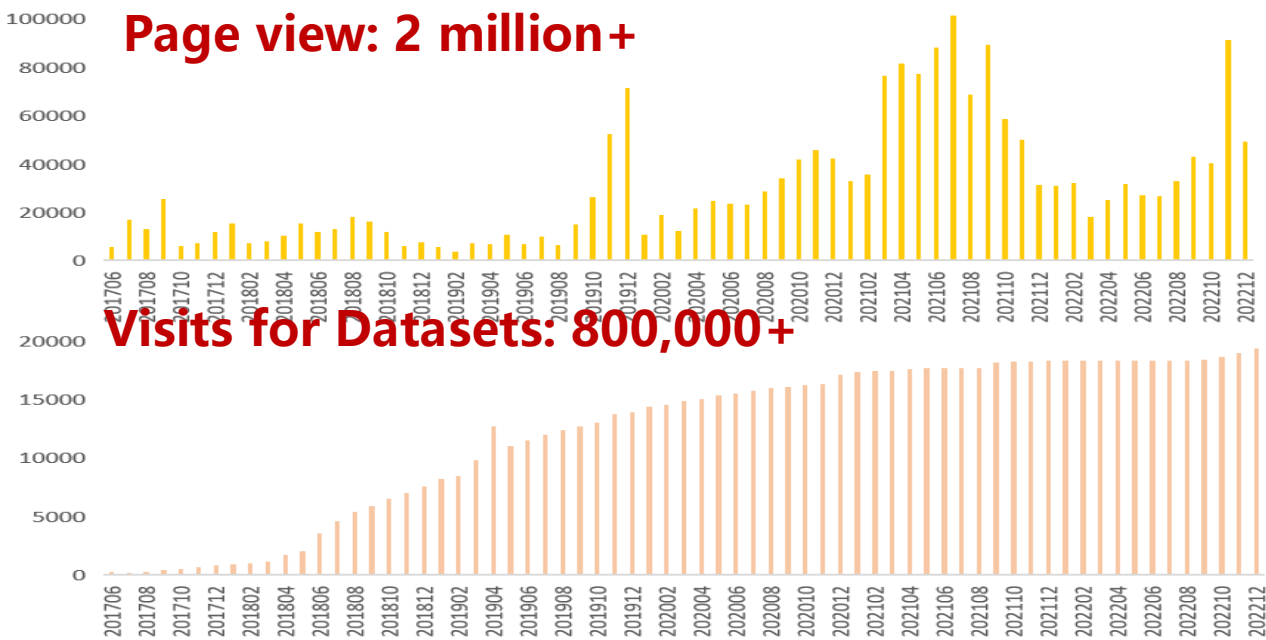
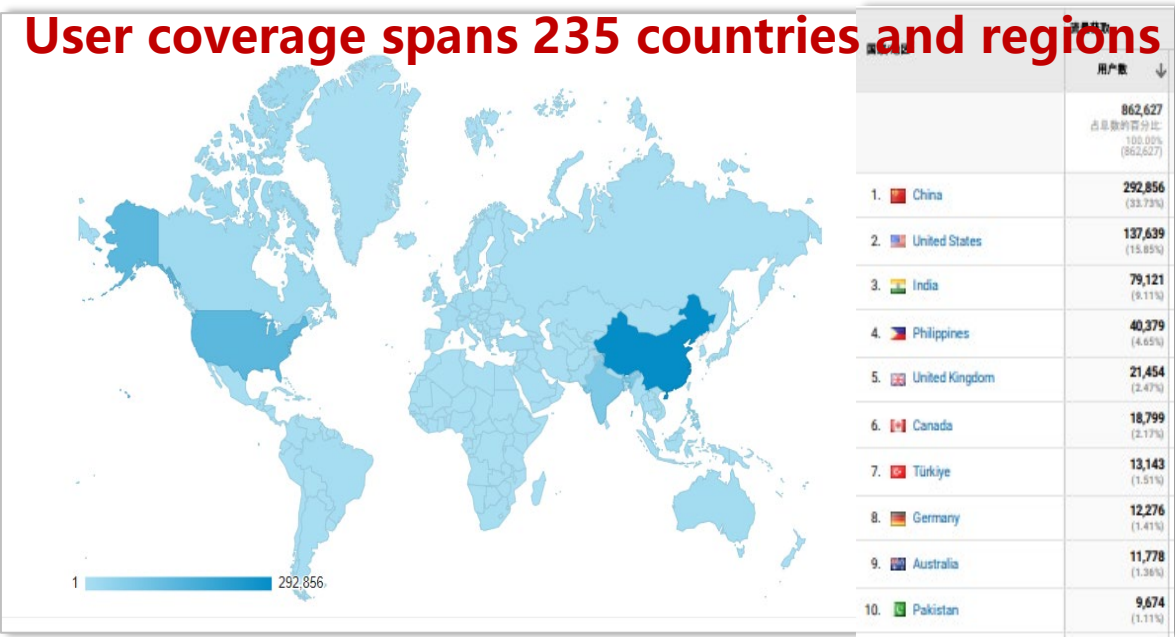
🕒 2023-06-15:Earthquake Information of Mindoro, Philip...



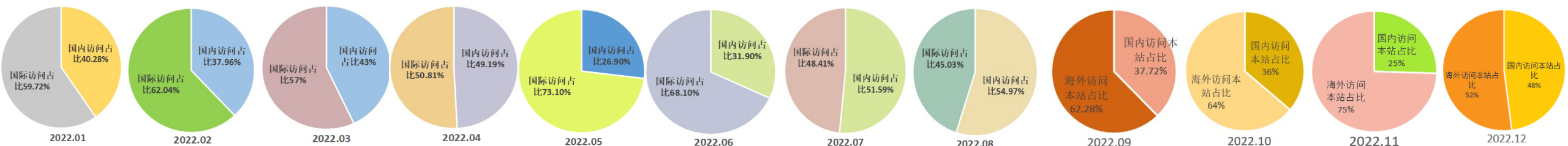


# Analysis of the User Log for DRR

As of December 2023, the cumulative visits to the platform have reached 2.248 million, with a cumulative user base of 902,000. Users span 235 countries and regions worldwide, with 605,000 international user visits, accounting for 67.1% of the total. The top 5 countries for overseas visits are the United States, India, the Philippines, the United Kingdom, Canada.



## Overseas visits averaged 67%

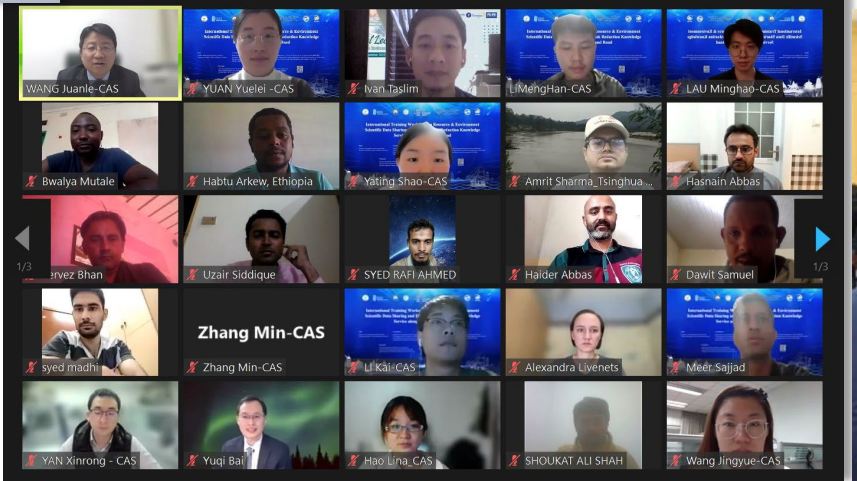
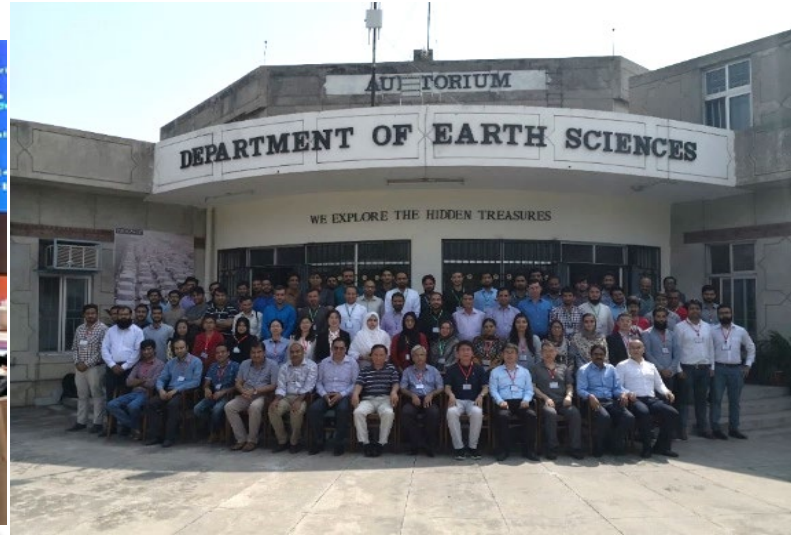
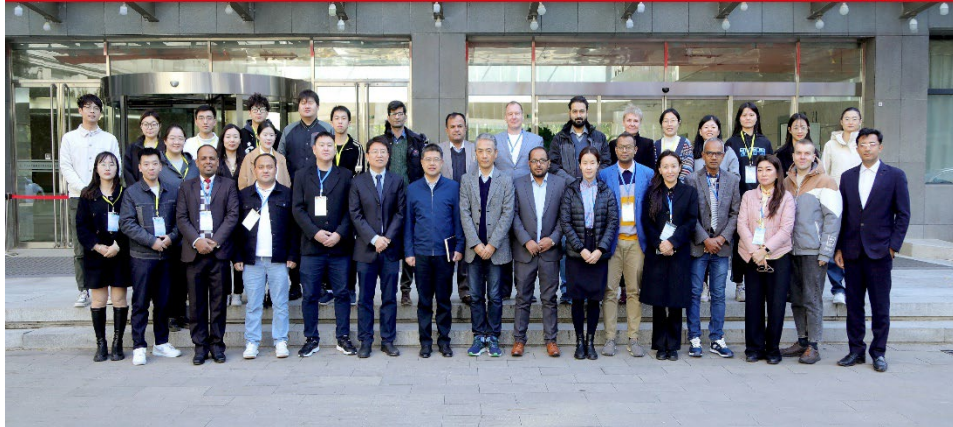




# International training: 1600+ trainees

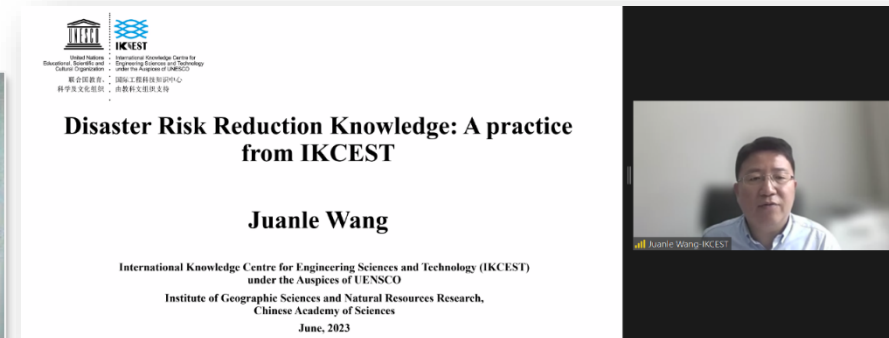
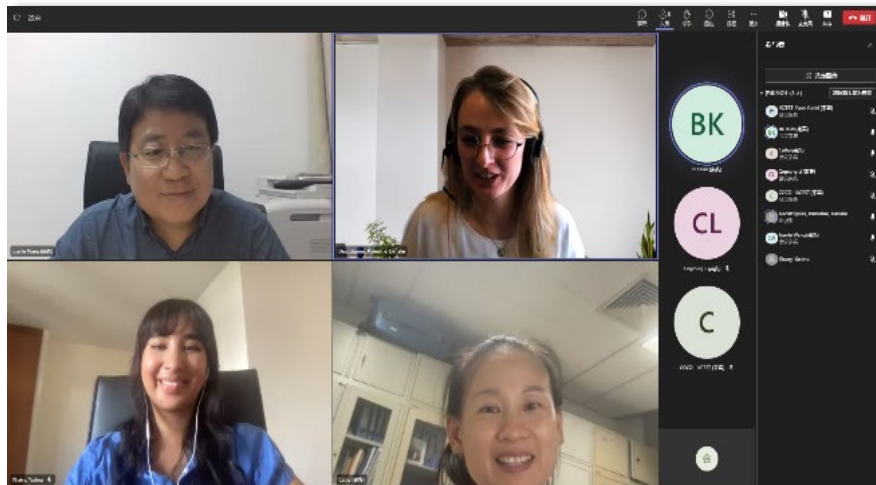
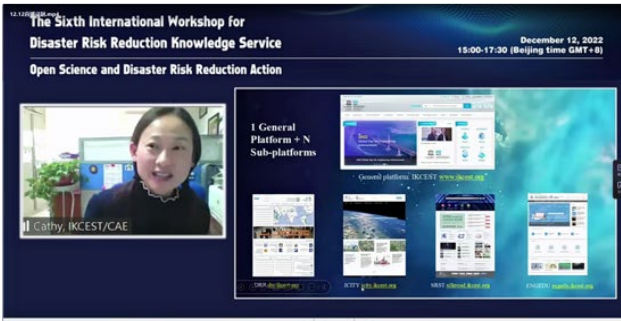
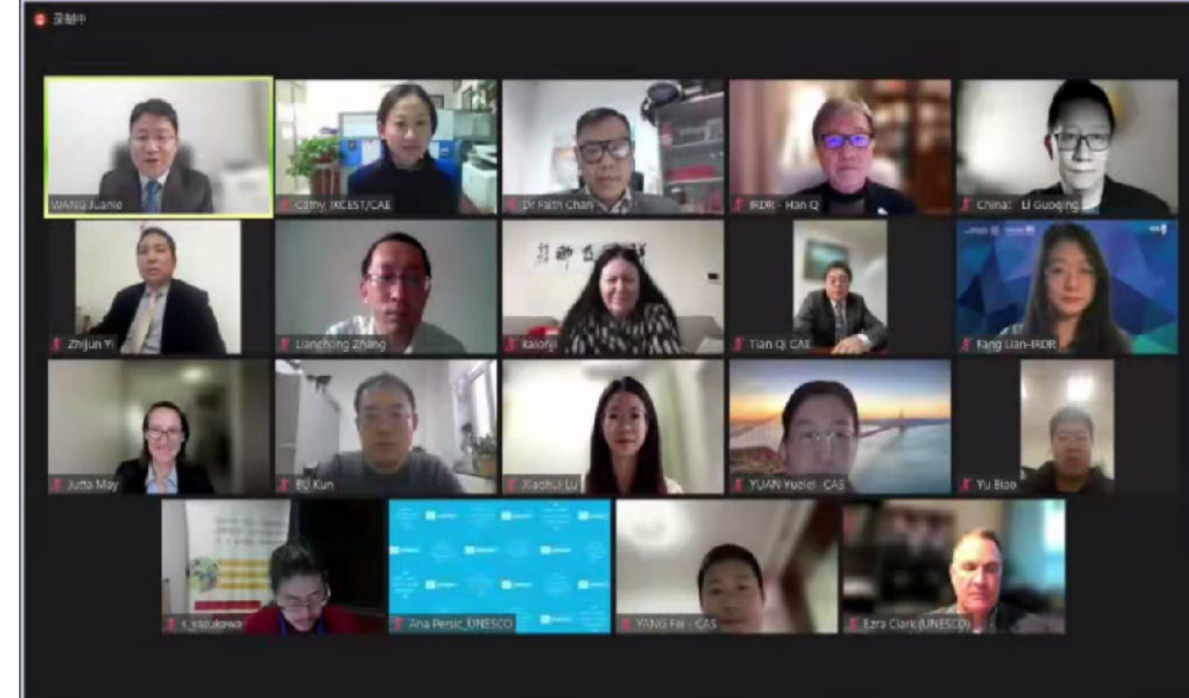
- **International Training Workshop on Resource & Environment Scientific Data Sharing and Disaster Risk Reduction Knowledge Service**
- **Host: IKCEST**

International Training on Resource & Environment Scientific Data Sharing along the "Belt and Road"  
“一带一路”地区资源环境科学数据共享国际培训班  
Nov.4-18, 2023 Beijing, China





# International workshop/dialogue/presentations



STEPAN 3rd Annual Meeting in June



# the Seventh International Workshop for Disaster Risk Reduction Knowledge Service

2023.12



2023.12



**Faduma Hussein Ali gave a speech on "Innovation and Disaster Risk Reduction ".**



# On February 27, 2024, reported on ADG in IKCEST, Beijing







United Nations  
Educational, Scientific and  
Cultural Organization

联合国教育、  
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International Knowledge Centre for  
Engineering Sciences and Technology  
under the Auspices of UNESCO

国际工程科技知识中心  
由教科文组织支持

***Many Thanks !***

**Juanle Wang, Ph.D, Professor**  
**International Knowledge Centre for Engineering Sciences and Technology (IKCEST)**  
**under the Auspices of UNESCO**  
**Institute of Geographic Sciences and Natural Resources Research,**  
**Chinese Academy of Sciences**  
**E-mail: [wangjl@igsnrr.ac.cn](mailto:wangjl@igsnrr.ac.cn)**