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Distribution Map of Ecological Stations of CERN

Map by Qu Cuiyu

Monitoring, Research & Demonstration

CERN

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中国生态系统研究网络

CERN

Chinese Ecosystem Research Network

A Network of Scientists and Graduates
Committed to Long-term Ecological
Monitoring, Research and Demonstration

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Chinese Ecosystem Research Network

Human depends on the earth's ecosystems for living. These ecosystems provide various benefits that the society needs, including water, food, recreation and other services, through cropland, forests, grassland, lakes, rivers and oceans, etc.

In spite of this, the planet that we live today is increasingly under greater pressure due to natural and human-induced changes, and the society is facing a major problem on how to balance the economic development and ecological protection. To help address this challenge, it is necessary to better understand the structures, functions and dynamics of these ecosystems on a long-term basis, with an objective of wisely using the natural resources and sustainably managing the ecosystems.

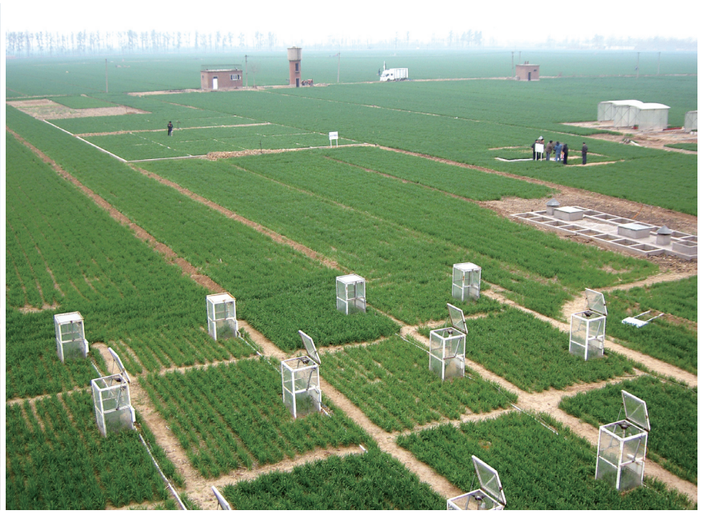
Among the long-term ecological research(LTER) networks that have been established, the Chinese Ecosystem Research Network (CERN), created by the Chinese Academy of Sciences (CAS), is one of the earliest developed networks in the world for that purpose.

Overview of CERN

Since early 1950s, the CAS has begun to set up field stations on resources and environmental sciences to conduct observation, experiment and outreach activities in different parts of China. In 1988, the Chinese Ecosystem Research Network (CERN) was formally established, comprising the selected sites that represent the major ecosystems in China. Currently, it consists of 36 field stations, 5 sub-centers and 1 synthesis center. The ecological stations of the same ecosystem type conduct observation, experiment and analysis according to standard protocols and operation procedures, with the same types of facilities and instruments. The sub-centers are responsible for developing monitoring protocols, calibrating instruments, data quality control and organizing the field stations for thematic studies, while the Synthesis Center takes charge of the service of data sharing, and involves the sub-centers and field stations in synthesis studies on various ecosystems.

Through nearly two decades of development, CERN has become an important facility to conduct researches on ecology, environment and natural resources in China, thanks to the data measured and collected on long-term and continuous basis, as well as the up-to-date facilities and instruments in the field stations. Up to now, an aggregated number of over 2000 scientists, technicians and graduate students are engaged in its activities.

Observation plot in Ansai Field Station © Zhang Yifei/CERN



Observation plot in Luancheng Field Station © Zhang Yifei/CERN

Long-term monitoring site in Ansai Field Station © Zhang Yifei/CERN

Chlorophyll meter © Luancheng Station/CERN

Marshes in Sanjiang plains © Zhao Shidong/CERN

Vision of CERN

The vision of CERN is to conduct monitoring and research on the major ecosystems and their environmental conditions on a long-term basis by integrating ground-based networking observation and experiment with simulation and modeling, remote sensing, GIS and sensors, with an ultimate goal to advance the ecological research, and offer data and information to scientists and policy-makers which will contribute to ecosystem management, wise use of natural resources and sustainable socio-economic development in China.

Major Missions and Outputs

Major Outputs

●Long-term ecosystem monitoring

Implementing long-term monitoring on the water, soil, atmosphere and biological elements of major ecosystems in China, i.e. cropland, forest, grassland, desert, marshes, lakes, and bays, and their important ecological processes such as the energy and matter flows according to standard protocols, and providing updated information on the state of major ecosystems across China. A total of over 800 ecological indicators are measured on annual basis at the 36 field stations under CERN.

●Long-term ecological research

Exploring the structure, function and dynamics of major ecosystems in China, as well as on the approaches and tools for sustainable ecosystem management. So far, a large number of significant outputs have been achieved on site and cross-site levels in CERN. Over the period of 2001-2005, CERN has been granted 9 Second-Grade National Prizes of S&T Innovation, and 48 Prizes of Scientific Achievement at the provincial and ministerial levels.

●Demonstration for Ecosystem Management

Disseminating the best practices of ecosystem management to a wider area, based on the results of long-term monitoring, experiments and research, for sustainable development of ecological conservation and socio-economic growth in China. These best practices range from the restoration and rehabilitation of ecologically-fragile areas, sustainable agricultural development, protected areas establishment and management.

Collaboration, Exchange and Data Service

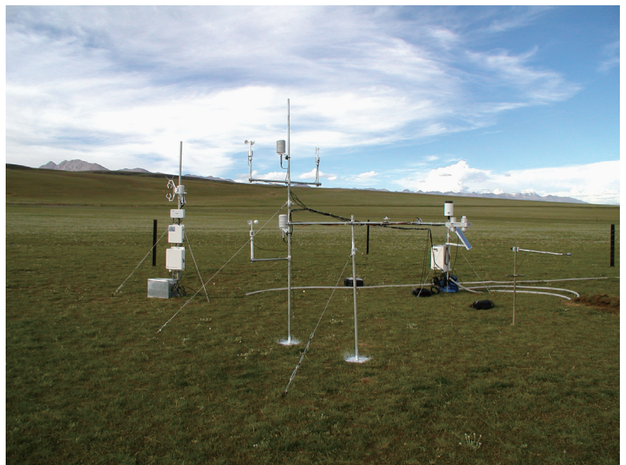
Since 1988 when it was established, CERN has been linking closely with the ILTER network and its member networks, particularly the research institutions and universities in the United States, the United Kingdom, Japan and other countries. In addition, an annual work meeting/symposium, China Ecological Forum and some workshops are held in CERN to enhance communication and academic exchange among the scientists.

A series of database have also been established by CERN and made available to the scientific community and the public. The database include: long-term monitoring database, spatial information database of the field stations, observation database for the carbon budget of terrestrial ecosystems in China, land resources database in China, and 1×1 km meteorological grid database in China, among others.

Donghu Field Station © Zhao Shidong/CERN

Carban flux tower © Dinghu Mt. Field Station/CERN

CO_2 flux measurement © Lhasa Field Station /CERN



Changbai Mountain © Zhao Shidong/CERN