International Centre on Space Technologies for
Natural and Cultural Heritage under the Auspices of UNESCO

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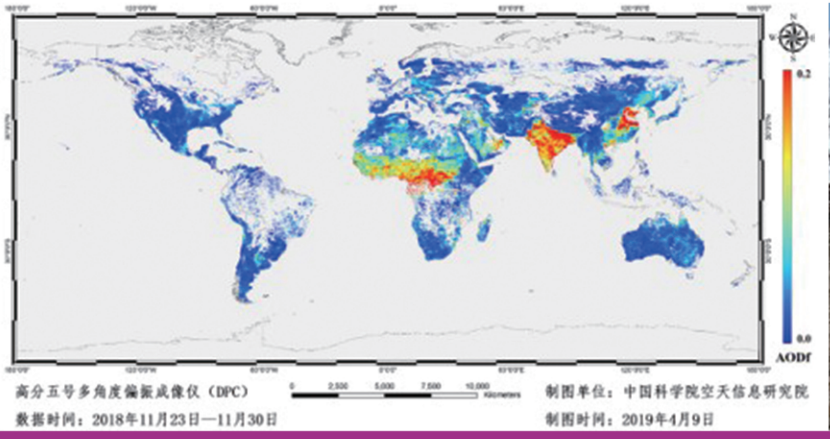
United Nations
Educational, Scientific and
Cultural Organization

International Centre on Space Technologies for
Natural and Cultural Heritage
under the auspices of UNESCO

Newsletter

April – June, 2019



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Special Focus

● HIST's achievement included in the List of "Top 10 Remote Sensing Events of China 2018"

On March 22, the List of "Top 10 Remote Sensing Events of China 2018" was released by China Association of Remote Sensing Application. This list aims to focus on major events of the Chinese remote sensing industry every year, highlights and promotes innovative and major developments in the industry with the aim to inspire future developments in China's remote sensing industry, and strengthen social publicity and dissemination of science. "First Discovery of Archaeological Sites along the 'Belt and Road' Outside China by Means of Remote Sensing Technology", recommended by the Aerospace Information Research Institute, Chinese Academy of Sciences, the host institute of HIST, was also included in the list of 2018.

The Research Team, led by Prof. Wang Xinyuan, Deputy Director of HIST, discovered ten archaeological sites of ancient Rome in Tunisia at the western end of the Silk Road over the past two years utilizing Big Earth Data. The chain of evidence formed by these sites reflects the military defense system of the southern frontier during the ancient Roman period. The new discovery is significant in the study of the military defense system and agricultural irrigation system of ancient Rome, the direction of the western Silk Road, the transition of the ancient oasis, as well as the environmental change and its impact.

These developments are significant as this is the first time Chinese scientists have discovered archaeological sites outside China using remote sensing technology. It is a major

HIST Deputy Director Wang Xinyuan (R1)

archaeological discovery for China's Digital Belt and Road Program (DBAR) in Tunisia. In collaboration with scientists from Tunisia, Italy, and Pakistan, Chinese scientists took the lead in carrying out systematic archaeological research and discovered new archaeological ruins. It is also a significant milestone towards improving international cooperation and research of Chinese scientists along the "Belt and Road" and developing a new model of research techniques and methods in remote sensing archaeology.

It is the second time that the research team's project has been included in this prestigious list. Previously the research team was recognized in 2012-2013 for utilizing remote sensing techniques for studying the Guazhou (Anxi)-Shazhou (Dunhuang) section of Gansu province along the major route of the Ancient Silk Road.

● CCTV "Morning News" Reports HIST's Remote Sensing Archaeological Project

On April 13, 2019, CCTV "Morning News", in its feature program "Belt & Road", broadcast a segment highlighting the discovery of archaeological sites in Tunisia by HIST's scientists. Following is the transcript of the broadcast:

The Beijing-based Chinese scientists from the "Digital Silk Road" international scientific program discovered several archaeological sites of ancient Rome in Tunisia at the western end of the Silk Road when they carried out indoor remote sensing image processing, interpretation and analyses. Following three surveys and verifications, scientists finally confirmed ten archaeological sites which belong to the ancient roman period.

Prof. Acad. Guo Huadong said that "science and data have no boundaries, and we aim to serve sustainable development of the Belt and Road by advocating the concept of no- boundaries for both". So far, the "Digital Silk Road" international scientific cooperation program has cooperated with 53 countries, international organizations and international programs, aiming to provide scientific services for the monitoring of agricultural trends, heritage sites, ecological & environmental changes, coastal evolution, natural disasters, urban expansion, and construction of major projects by sharing data, technologies and knowledge and experience.

Cooperation and Exchange

• The DBAR ICoE-Potenza Established and Launched Space Archaeology Sino-Italian Joint Investigation

On May 14th, 2019, Prof. WANG Xinyuan, Deputy Director of HIST and Co-Chair of DBAR-Heritage, led a delegation to attend the inaugural ceremony of DBAR International Center of Excellence Potenza (ICoE-Potenza) in Italy.

The DBAR ICoE-Potenza is one of eight overseas ICoEs approved by DBAR to be jointly operated by Institute of Methodologies for Environmental Analysis of the Italian National Research Council (CNR-IMAA) and Institute of Archeological Heritage - monuments and Sites of Italian National Research Council (CNR-IBAM). Prof. Rosa Lasaponara of CNR-IMAA, member of HIST Governing Board, serves as Director of the center, and Prof. WANG Xinyuan and Nicola Masini of CNR-IBAM will serve as Science Directors.

Prof. Vincenzo Lapenna, Director of CNR-IMAA, delivered a speech, emphasizing that the establishment of DBAR ICoE-Potenza is of great significance because it sets an excellent example to Chinese and Italian scientific and technological institutions to strengthen international cooperation under the Belt and Road Initiative. She hoped that China and Italy would use the center as a platform to make outstanding contributions to world heritage monitoring and protection. Prof. Rosa Lasaponara introduced the goals and missions of the center, as well as operational mechanism and collaborative research scheme. She also made specific recommendations on developing capabilities through data sharing, talents exchange, technical cooperation and other mechanisms.

Address by Prof. Vincenzo Lapenna, Director of CNR-IMAA and Prof. Rosa Lasaponara, Director of DBAR ICoE-Potenza

A Report by Prof. WANG Xinyuan, Deputy Director of HIST and Co-Chair of DBAR-Heritage

After the ceremony, both sides co-organized academic seminar with the theme of "Recording, Monitoring, Protection and Sustainable Development of China-Italian Natural and Cultural Heritage". Prof. WANG Xinyuan delivered a report entitled "DBAR-Heritage: Towards the Sustainable Development of Natural and Cultural Heritage", elaborating its idea, vision, goal, research framework and cooperation model, and introducing the scientific strategy of DBAR-Heritage to use the Big Earth Data platform to serve Belt and Road natural and cultural heritage sustainable development, as well as the progress in related research areas.

It was decided that DBAR ICoE-Potenza will define sustainable development of natural and cultural heritage as the core goal, under the DBAR scientific framework, with the support of DBAR-Heritage, and in collaboration with the other DBAR working groups. DBAR ICoE-Potenza will focus its research on the space-time evolution and driving mechanism of ontology and environmental changes for heritage influenced by human activities, and climate change utilizing Big Earth Data. It will widely promote technical achievements for conservation and sustainable use of natural and cultural heritages along the Belt and Road, and increase public awareness about the benefits of science to heritage thereof. It will also work to provide big data services, facilitating implementation of the United Nations Sustainable Development Goals (SDGs).

DBAR ICoE-Potenza Inauguration Ceremony

• The Delegation of RCSSTEAP visited HIST

On March 28, 2019, The Delegation of Regional Centre for Space Science and Technology Education in Asia and the Pacific (China)Affiliated to the United Nations (RCSSTEAP) visited HIST.

The delegation first watched promotional videos on Digital Earth Science and Space Technologies for World Heritage. Participants appreciated the concise and informative content in videos and considered them to be stimulating and engaging to develop interest in space technologies for natural and cultural heritage preservation.

Participants then visited the Digital Earth platform, Airborne Satellite Remote Sensing Centre and Satellite Operation and

Management Department, etc. During the visit, the delegation came to have a better understanding of the relationship between theoretical knowledge and practical cultural heritage protection. Concise and intriguing presentations were given, piquing the interest of all the participants. The visit concluded with a speech from Prof. Hong Tianhua, Executive Deputy Director & Secretary General of HIST. He summarized a report of HIST on UNESCO-designated sites and finished his speech with comments on the current work being done with countries in need of space technologies.

Participants Visits the Airborne Remote Sensing Centre

Prof. Hong delivering his speech

Discussion

Group Photo

AIR News

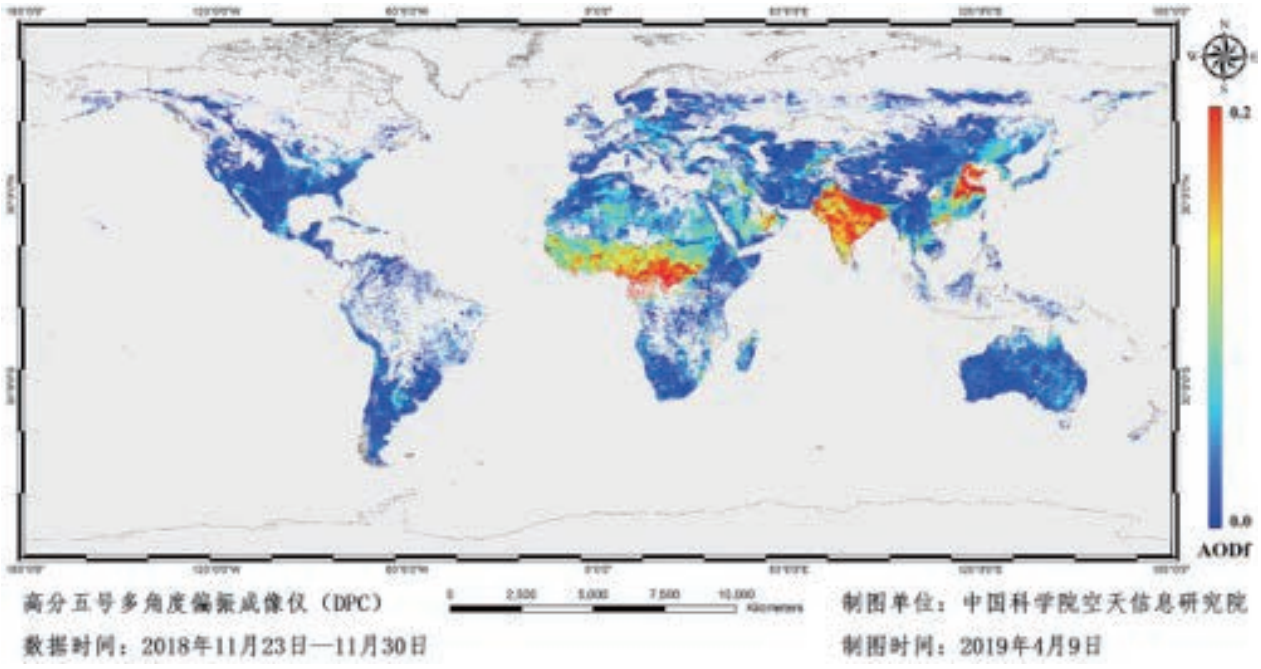
● Gaofen-5 Satellite Image Gives Insight into Global Haze Distribution

Apr 28, 2019

Recently, based on the Directional Polarization Camera (DPC) onboard GF-5 satellite, the first global high-resolution (3.3 km) map of fine-mode aerosol optical depth (AODf) over land has been obtained together by both the Aerospace Information Research Institute of CAS, and the Anhui Institute of Optics and Fine Mechanics of CAS(the manufacturer of DPC sensor)and several other institutes. This AODf remote sensing observation dataset has the highest spatial resolution in the world. It can reflect the spatial information of major air pollutants (PM2.5, etc.) and provide basic important information for atmospheric scientists to "unveil" global haze distribution.

The GF-5 satellite was launched on May 9, 2018, carrying six advanced sensors including the Directional Polarization Camera (DPC). GF-5 is designed as an environmental monitoring flagship among Gaofen satellite series.

DPC is China's first space-borne wide field-of-view imager with multi-spectral, multi-angle and multi-polarization measuring capabilities. The spectral range covers from visible to near infrared bands. DPC is able to detect three polarization components at 9 to 12 imaging directions, with swath width about 1850 km. DPC has special channels for detecting aerosol, cloud, water vapor, oxygen and other atmospheric constituents, as well as monitoring abilities for both land and oceanic environment.



Global-level distribution map of fine mode aerosol optical depth (AODf) over land produced by DPC/GF-5. Red indicates high AODf regions, while light grey indicates cloud regions or lack of valid data.

• International Journal of Digital Earth's Impact Factor Hits New High

Jun 25, 2019

The *International Journal of Digital Earth* (IJDE) has received a new impact factor of 3.985 in 2019, ranking tenth among 50 geographic journals worldwide atQ1 zone, and eighth among 30 remote sensing journals atQ2 zone.

Sponsored by the International Society for Digital Earth and co-published by Taylor & Francis Group from the UK, IJDE mainly publishes relevant researches in the fields of Digital Earth theories, technologies and applications. GUO Huadong, CAS Academician, serves as the editor-in-chief of the Journal. The editorial board consists of 30 experts from 19 countries including China, the United States, , Canada, the United Kingdom, France, Germany, Italy, Australia, New Zealand and Japan, among which foreign members accounted for 93%. The editorial office is located at the Aerospace Information Research Institute, CAS.

Launched in March 2008, the Journal was successfully indexed by SCI-E database 18 months later, and achieved its impact factor of 0.864 in 2010 for the first time. Currently it has been included into 12 databases such as Scopus, Cambridge Scientific Abstracts, and New Journal. With its impact factor rising steadily in recent years, the Journalhas become a flagship publication in the global Digital Earth field, contributing to the development of Digital Earth science and related discipline construction.

The International Society for Digital Earth is a non-governmental international academic organization launched by the Chinese Academy of Sciences in cooperation with domestic and foreign institutions and scholars in the field under the joint initiative of scientists from over 10 countries including China, Canada, the United States, Japan and the Czech Republic. The Society aims to communicate the concept of Digital Earth, promote international academic exchange and cooperation in the field of digital earth science and technology, drive applications of Digital Earth technologies in social and economic sustainable development, promote information technology and narrow the digital divide.

UNESCO News

• Protecting biodiversity is as vital as fighting climate change

06 May 2019

Describing nature's decline as unprecedented and citing among many indicators, 1,000,000 species threatened with extinction, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) laid bare the threats to all life on earth in its Global Assessment Report, released at UNESCO headquarters today.

UNESCO Director-General Audrey Azoulay says the report put the world on notice. "Following the adoption of this historic report, no one will be able to claim that they did not know. We can no longer continue to destroy the diversity of life. This is our responsibility towards future generations," she said. "This report reminds us of the urgent need to act for biodiversity, our global environmental heritage. We can and must all mobilize, urgently and together, to save our planet and thus humanity. Protecting biodiversity is as vital as fighting climate change."

#IPBES7 Media Launch #GlobalAssessment Webcast (English)

UNESCO is among IPBES' main institutional United Nations partners, together with FAO, UNDP and UNEP, and has provided support and engagement from the very early stages of its creation. UNESCO's Local and Indigenous Knowledge Systems programme (LINKS) hosts the Technical Support Unit for the IPBES Task Force on Indigenous and Local Knowledge Systems.

UNESCO is the custodial organization of knowledge and

know-how that is respectful of biodiversity. Through its programmes, the organization promotes the co-production of scientific, indigenous and local knowledge, as well as education for sustainable development.

An example of UNESCO's unique contributions to seeking harmony between people and nature is the World Network of Biosphere Reserves, which is home to more than 250 million people and serves as a path of reconciliation for people and nature. Adding natural World Heritage sites and Global Geoparks with Biosphere Reserves, over 10 million km², an area equivalent to the size of China, is protected.

These networks connect citizens throughout the world to global challenges. These interactions between people and their habitat provide opportunities to explore new solutions and innovations in all key aspects of our lives: sustainable energy, green economies, food, health, transport, leisure and eco-tourism, and waste treatment.

UNESCO supports debate and analysis on the ethical, peace and security dimensions related to biodiversity erosion by promoting and sharing values and cultures that respect all forms of life, including solidarity with other living species (i.e. Great Apes Survival Partnership), and with future generations (youth is one of the organization's global priorities).

UNESCO is a key player in international cooperation, mobilizing citizens, governments, the private sector, civil society, local communities and indigenous peoples, and scientists through its programmes and networks.

At the request of the United Nations General Assembly, UNESCO's Intergovernmental Oceanographic Commission (IOC) had invited the global ocean community to define a scientific roadmap for the next ten years to mobilize all actors and put science at the service of its ecosystems.

UNESCO-IOC's Global Ocean Observation System (GOOS) is providing critical data for monitoring how climate change and humanity's increasing use of the ocean are affecting marine biodiversity, resources and ecosystem habitats, while its Ocean Biogeographic Information System (OBIS) plays a vital role in providing baseline information for global assessments on the state of the marine environment and environmental impact studies.

Water and biodiversity are inextricably linked, which is

Polar bear survival in Arctic© Zanskar/ iStock / Getty Images Plus

why UNESCO is conducting more than 30 eco-hydrology demonstration projects for an integrated understanding of biological and hydrological processes at the watershed scale, in order to create a scientific basis for a sustainable freshwater resources management approach that is socially acceptable, affordable and universal.

One example of this work is the BIOPALT project, where UNESCO is sharing all of its expertise with the countries of the Lake Chad Basin to safeguard and manage sustainably the water, socio-ecosystemic and cultural resources of the region.

The transformation of our world, our ways of life and economies entails sharing values and cultures: UNESCO makes a unique contribution by combining culture, science, local and indigenous knowledge for the implementation of the 2030 Agenda for Sustainable Development.

• Fire ravages Notre Dame Cathedral in Paris, a UNESCO World Heritage Site

16 April 2019

"We are filled with emotion and our hearts are broken," said UNESCO Director General Audrey Azoulay as she witnessed the devastating fire tear through the historic cathedral of Notre Dame de Paris this evening. The cathedral is part of the 1991 World Heritage inscription, Paris, Banks of the Seine, which also includes bridges, quays and the banks of the Seine in the historic part of its course (between the Pont de Sully and the Pont d'Iéna) and the Ile de la Cité and the Ile St Louis.

"Notre Dame represents an architectural, cultural and religious heritage, a unique literary heritage that speaks to the whole world," said Ms. Azoulay. The cathedral is widely regarded as the most beautiful example of French Gothic architecture, which includes innovative use of the rib vault and buttresses, colored stained glass rosettes and sculptural decorations. Construction of the church began in 1160 and continued for a century.

The Director-General also announced that a rapid assessment of the damage would take place as soon as possible. "We are already in contact with experts to assess damage, preserve what can be preserved and consider measures in the short and medium term," she said.

The assessment would be undertaken with the authorities concerned, including national, local, site management and Church authorities to develop an appropriate plan in order to avoid further damaging the site and to recover as much as possible of the original elements. Subsequently UNESCO would accompany and support the authorities in the recovery, rehabilitation and rebuilding of the damaged heritage site based on accurate documentation based on archival material, photos, films, historic documentation, plans and drawings.