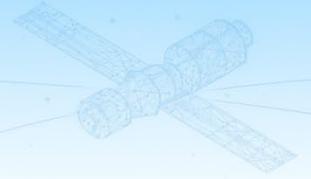




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under the auspices of UNESCO



# **HIST: ST-based Solutions for World Heritage Protection and Sustainable Development**

**Huadong GUO**

**Director, International Center on Space Technology  
for Natural and Cultural Heritage under the auspices of UNESCO (HIST)**

**May 15, 2024 Kuala Lumpur, Malaysia**

# Who We Are



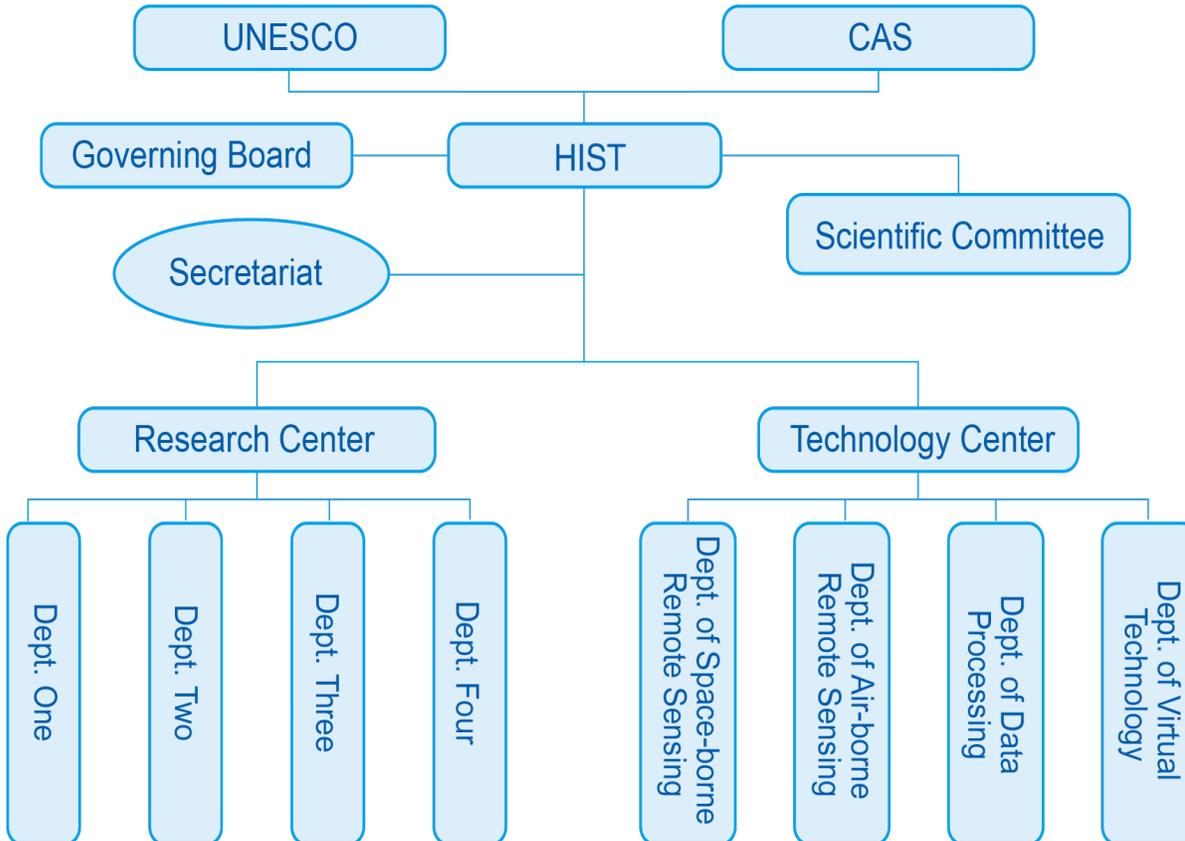
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**Our Vision in Brief:** accessible space technology, shared data, ideas, and knowledge

## Organization Structure



## Governing Board

9 leading experts from  
*UNESCO, IUCN, ICOMOS*



- 64 Scientists & Staffs
- 30 Graduate Students
- 19 SC Members



# Mission and Objective



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## MISSION

Make full use of space technologies to help UNESCO and its Member States to better protect and manage UNESCO-designated sites and promote their sustainable development.

To assist UNESCO's programme, as well as Member States that desire it, to receive such assistance on the use of applied space technologies for UNESCO's activities related to natural and cultural heritage, sustainable development education, climate change and natural disasters.





# CAS EO Satellite Ground Station Network



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North Pole  
Station



Miyun Station  
Headquarter



Kashi Station

Kunming Station  
Sanya  
Station



The receiving coverage of ground station network can cover China's total territory and 70% of land area in Asia. The North Polar Station can improve the capability to rapidly access global remote sensing data.

# Digital Heritage Platform Developed by HIST

## A prototype monitoring & evaluation info service system for NH & CH

2D (Video presentation)

3D (Video presentation)

The system modules



The Natural and Cultural Heritage Monitoring and Assessment Information Service System was established in 2023 after five years of collaborative research. It has realized **the integrated integration of multiple functional modules, including monitoring and protection, assessment and warning, decision support, and visual display.**

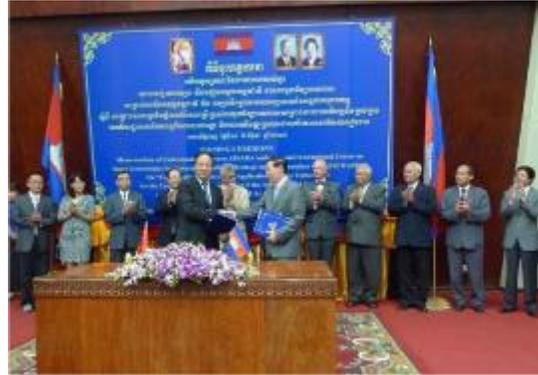
# China-Cambodia Cooperation on Remote Sensing for Environment of Angkor Site



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SCIENCE ADVANCES | RESEARCH ARTICLE

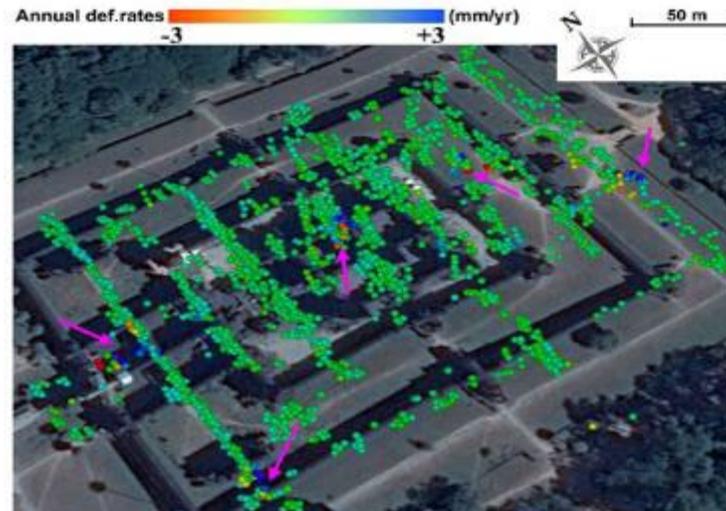
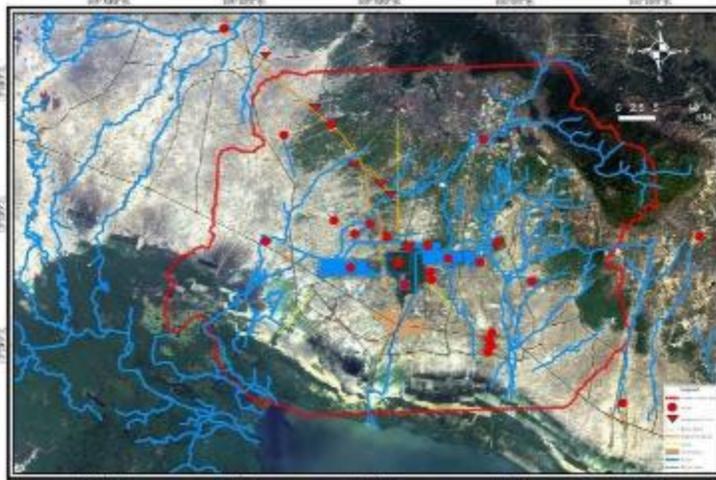
ENVIRONMENTAL STUDIES

## Radar interferometry offers new insights into threats to the Angkor site

Fulong Chen,<sup>1,2\*</sup> Huadong Guo,<sup>1,2</sup> Peifeng Ma,<sup>3</sup> Hui Lin,<sup>3</sup> Cheng Wang,<sup>1,2</sup>  
Natarajan Ishwaran,<sup>1,2</sup> Peou Hang<sup>4</sup>

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of Science. Distributed  
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Preliminary Comprehensive Map of Water-Road-Resthouse-Temple in Angkor Based Multi-Source Data



# China-Tunisia Joint Research on Space Archaeology and Cultural Heritage

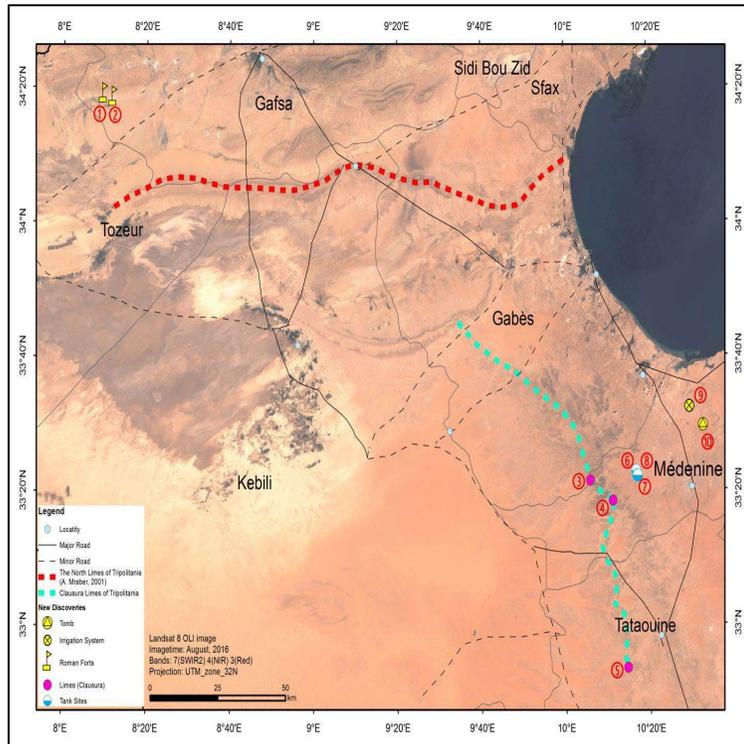


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HIST partnered with Tunisian National Heritage Institute (INP), Tunisian Arid Regions Institute (IRA), Italian National Research Council (CNR) and other partners **discovered 10 new archaeological sites in Tunisia dating to ancient Rome using Chinese space-based remote sensing technology.**



BED-based Archaeological Discoveries of Rome Limes



VR of the Carthage WHS



# Fine monitoring of land cover changes in boundary areas of natural WHSs

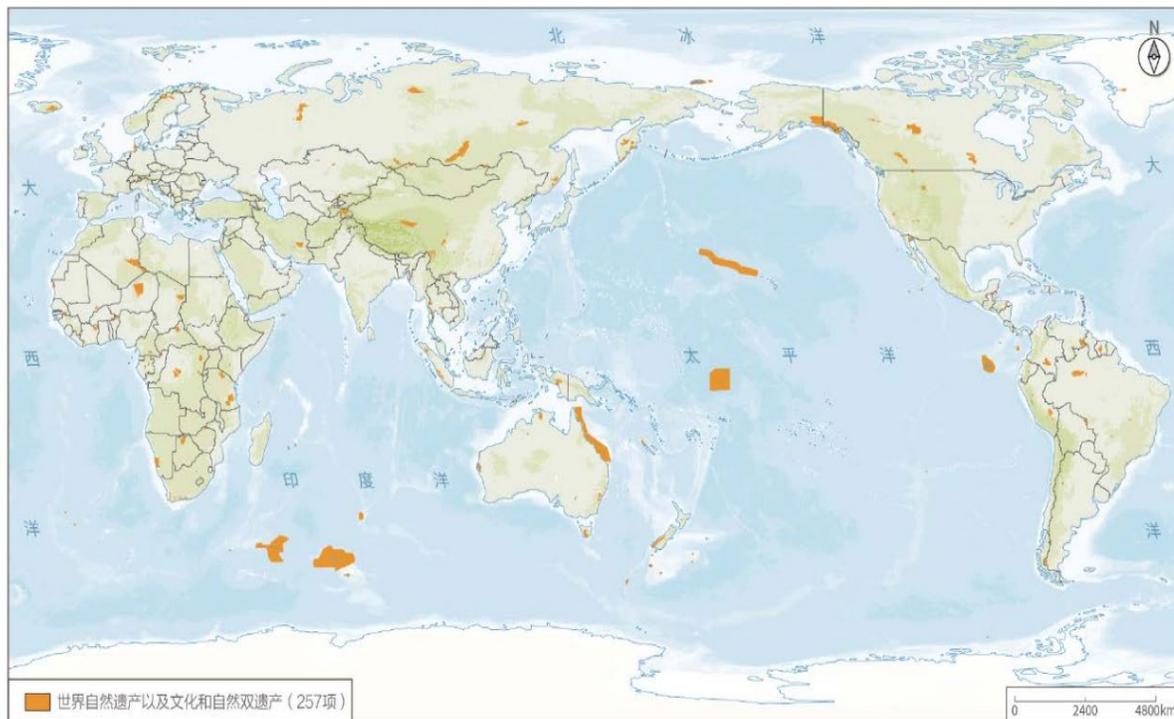


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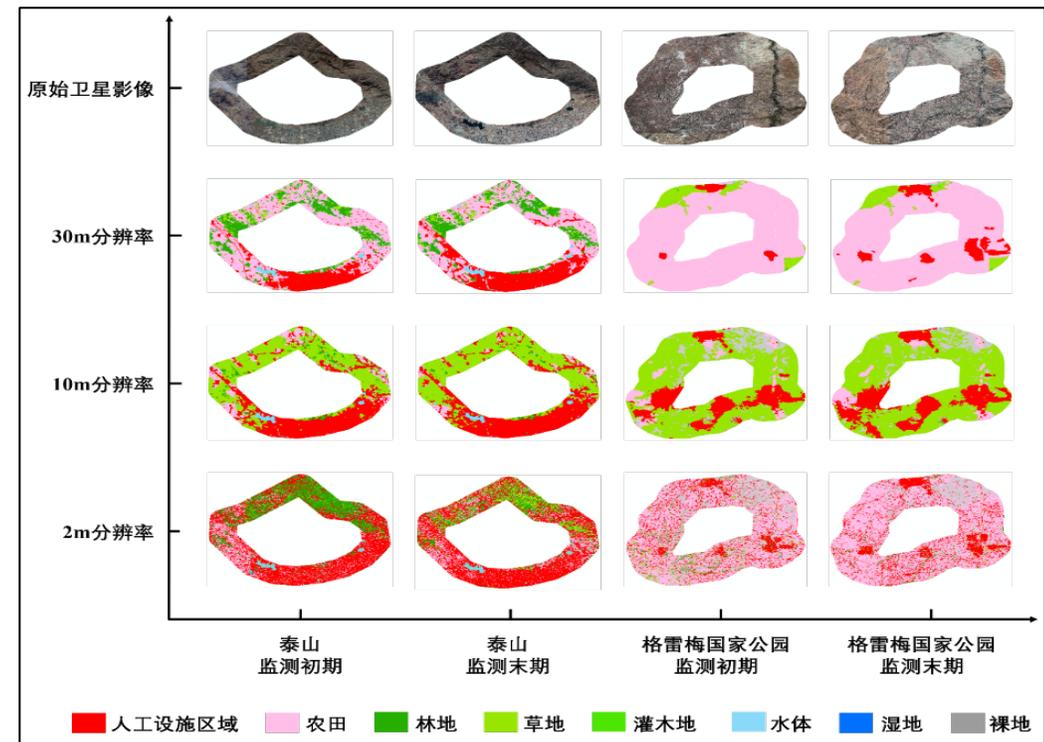


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- ❑ Build a geospatial database of the boundaries of 257 natural WHSs.
- ❑ Fine monitoring results show that **76%** have no significant changes in land cover, **8%** have weakened land cover changes, and **16%** have intensified land cover changes.



Geospatial product of the boundary of natural WHSs (2023)



Land cover change monitoring in typical natural WHSs

# Global SDGs Data Products



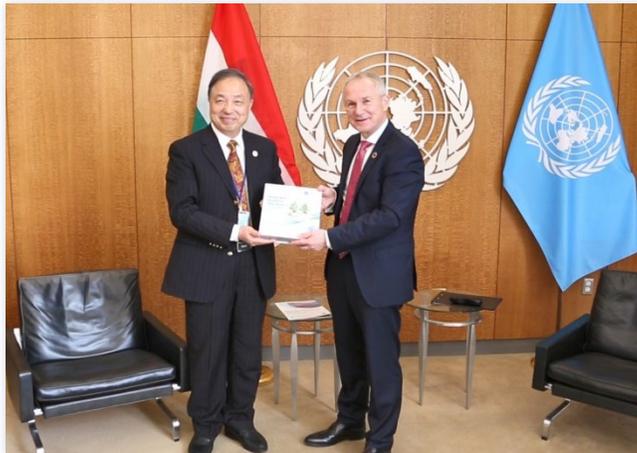
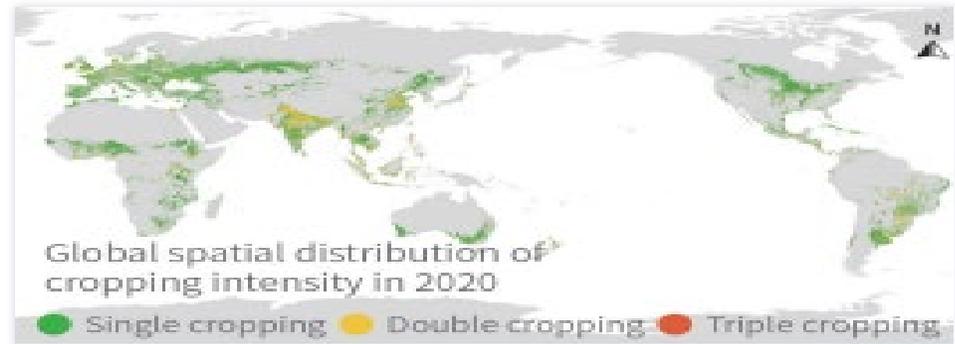
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Big Earth Data in Support of SDGs



# Academic Publications

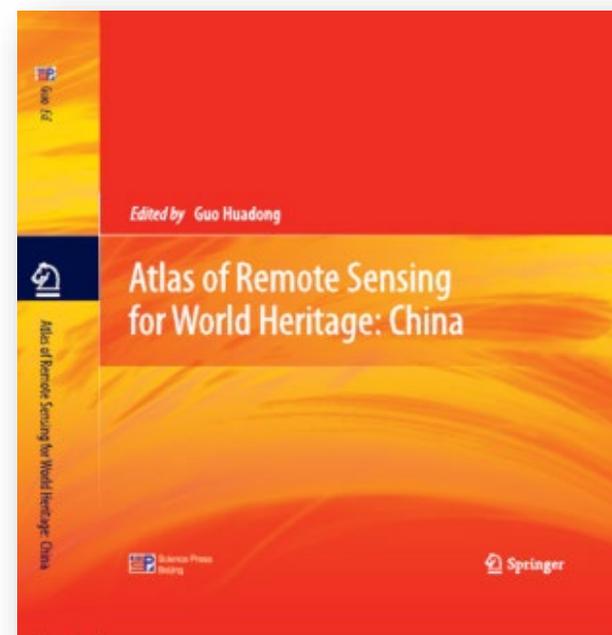
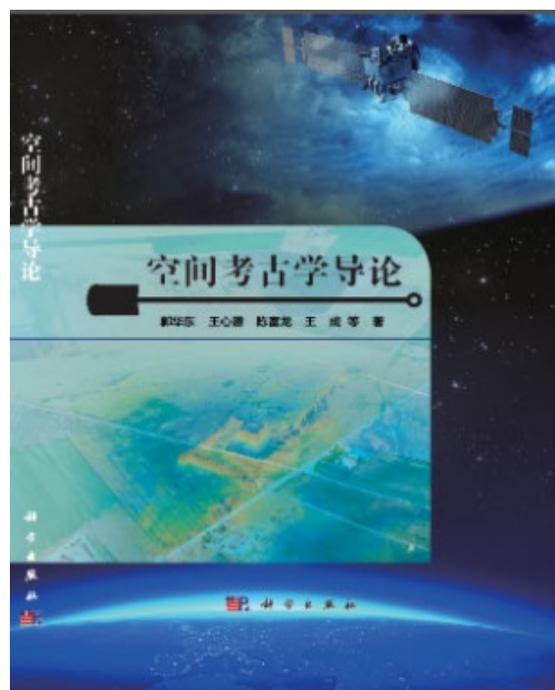
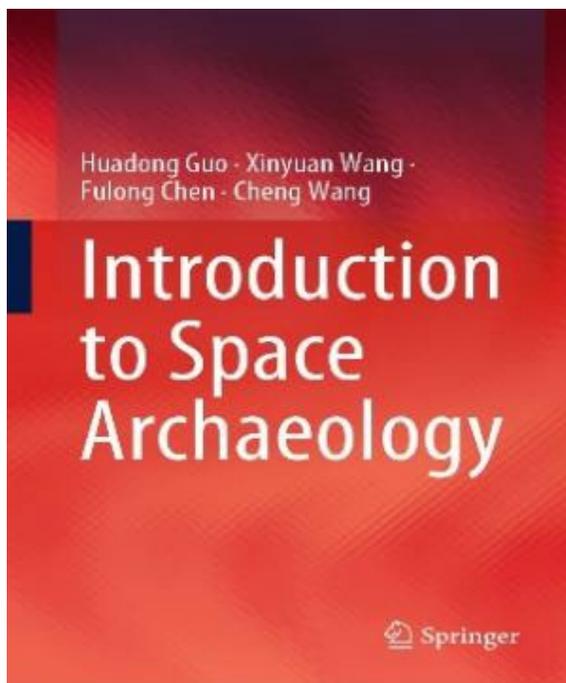


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HIST published more than 10 monographs on space technology for heritage conservation, two maps-the Environmental Context of World Cultural Heritage along Silk Road, and received honors from various organizations.



# Global network



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HIST has established links with research organizations in over **50 UNESCO Member States** and more than **10 international organizations.**



# Participate the TFM and GCSMS



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© **TFM:** A technology facilitation mechanism was adopted to facilitate the 2030 Agenda

© **GCSMS:** To identify the most appropriate institutional arrangements and funding mechanisms required to co-construct and deliver on the **Science Missions for Sustainability**

ONLINE PLATFORM AS A GATEWAY FOR INFORMATION ON EXISTING STI INITIATIVES, MECHANISMS AND PROGRAMS

UNITED NATIONS INTERAGENCY TASK TEAM ON STI FOR THE SDGS (IATT), INCLUDING THE 10-MEMBER GROUP

International Science Council

**Global Commission on Science Missions for Sustainability**

To identify the most appropriate institutional arrangements and funding mechanisms required to co-construct and deliver on the Science Missions for Sustainability, the International Science Council has established a Global Commission.

**Co-chairs**

**HELEN CLARK**  
Former Prime Minister of New Zealand and Administrator of UNDP

**IRINA BOKOVA**  
Former Director-General of UNESCO

**Members**

**ABDULSALAM AL-MURSHIDI**

**ALBERT VAN JAARSVELD**

**BEATRICE WEDER DI MAURO**

**BERNARD SABRIER**

**GUO HUADONG**

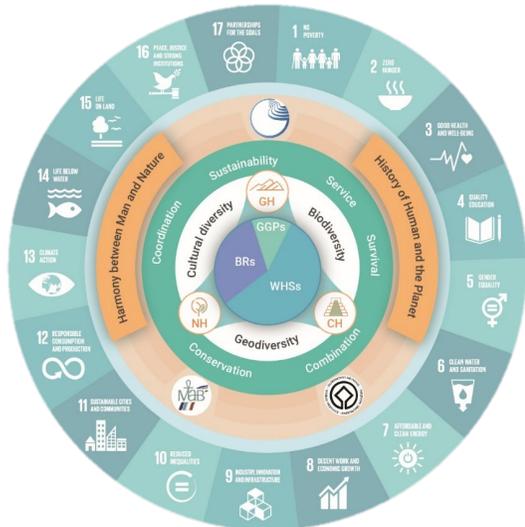
# Advancing heritage-related UN SDGs through ST



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Threaten

Cultural and Natural Heritage

Indicate





# Thanks

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