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Educational, Scientific and  
Cultural Organization



International Centre on Space Technologies for  
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under the auspices of UNESCO

# HIST: Serves the Conservation and Management of UNESCO Designated Sites

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# Outline

I

**HIST and its Mission**

II

**UNESCO Designated Sites & Challenges**

III

**Projects undertaken**

IV

**Capacity Building and Conferences**





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# I. HIST and its Mission



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# Establishment of HIST

**On 24 July, 2011**, the Launching Ceremony of HIST was successfully held in Beijing.

The center is hosted by and built on the premises of the Institute of Remote Sensing and Digital Earth of the Chinese Academy of Sciences.



**Ms. Gretchen Kalonji, Assistant Director-General of UNESCO for Natural Sciences gives an address**



**Ding Zhongli, CAS Academician and Vice-President of CAS, gives an address**



**CAS Academician Xu Guanhua, gives an address**



**Guo Huadong, Director General of CEODE and Director of HIST, addresses the audience**  
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# Vision

HIST's vision is to make full use of space technologies for better identification, conservation, management and sustainable development of natural and cultural heritage of humankind.



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# Mission

HIST's mission is to assist UNESCO's programme and Member States, that desire to receive such assistance, on the use of applied space technologies for UNESCO's activities with respect to natural and cultural heritage, biosphere reserves and geoparks (hereafter called "UNESCO designated areas").





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# Overall Objective

To strengthen the capacity of UNESCO member states to manage the sustainable development of their natural and cultural heritage, biosphere reserves and geoparks accommodating the impacts of climate change and natural disasters, through the use of earth observation technologies and through education.

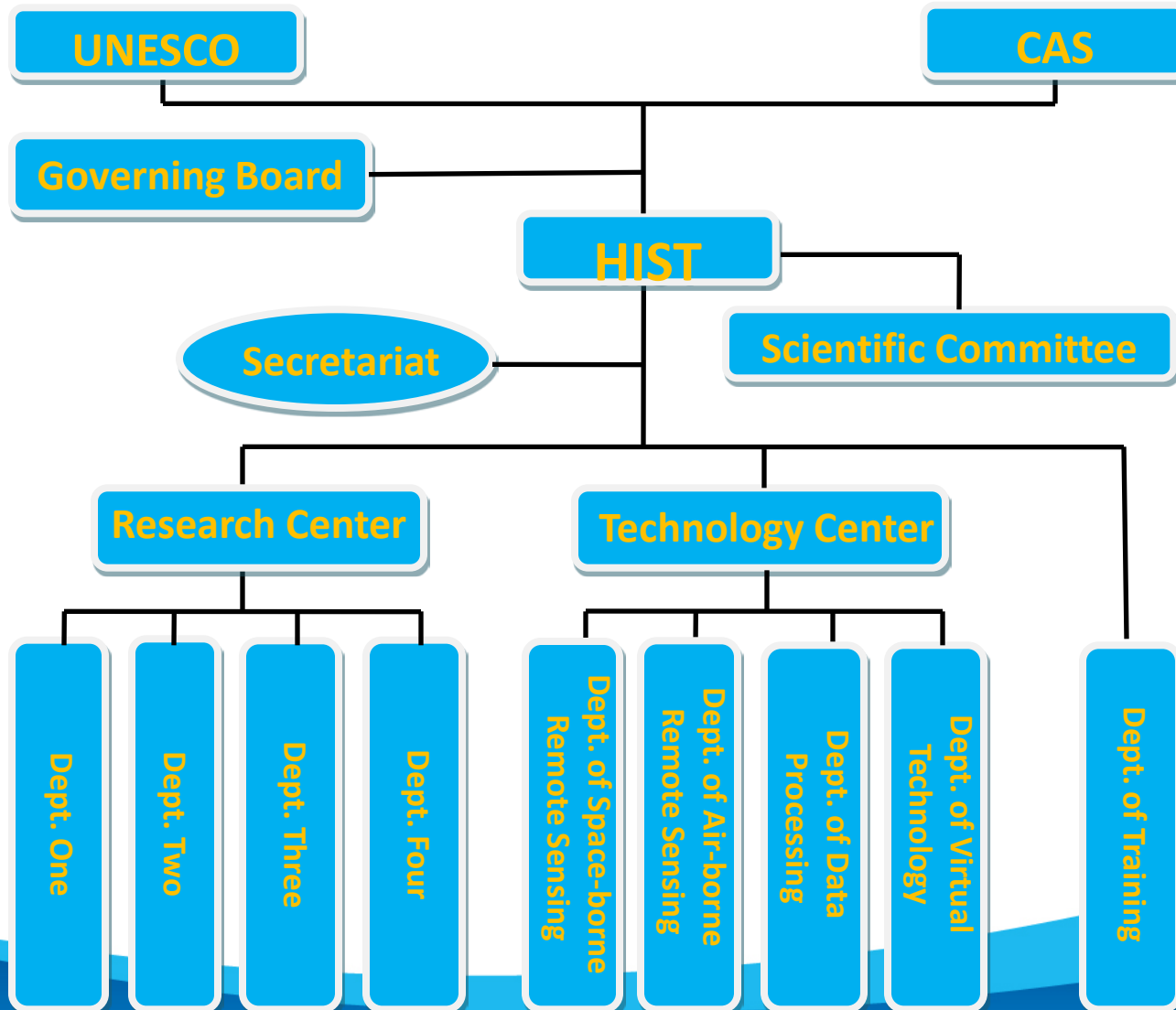


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# Organizational Structure





2011年理事会

创新创业 创造未来

# Governing Board

International Centre on  
Space Technologies for Natural and Cultural Heritage  
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MID-TERM STRATEGIC  
2013 - 2016

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

BIENNIAL WORK PLAN  
2013 - 2014

Adopted by the Governing Board  
on 27 June, 2013

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ANNUAL REPORT  
(2013)

Adopted by the Governing Board  
on 10 December, 2013

2012年理事会

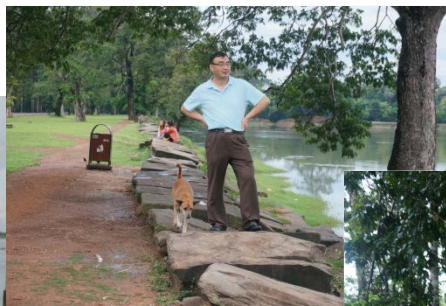
2013年理事会

2015年理事会





# Executive Team





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## II. UNESCO Designated Sites and Challenges



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# 1. UNESCO Designated Sites



**World Heritage**



**1007**

**Biosphere Reserve**



**621**

**Global Geopark**



**111**





# Maps of UNESCO Properties

## Distribution of GGN Members

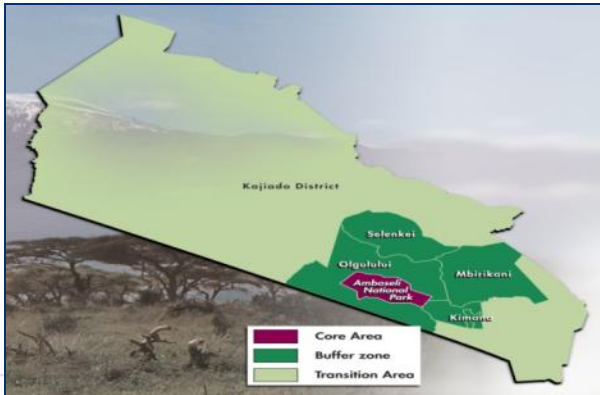


审图号: GS (2008) 1895 号

2012年5月



## 2. Situations and Challenges(1)



Earthquake  
Landslides  
Flood  
Forest fire  
Global change

.....

Resource over-exploitation  
Deforestation  
Land encroachment  
Hydroelectric project  
Pollution  
Urbanization  
Uncontrolled tourism

.....

Natural  
influence

Human  
induced



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## 2. Situations and Challenges(2)

**Number ever  
increasing**

World Heritage sites,  
Biosphere Reserves  
and Global Geoparks

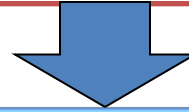


**Various characteristics**

Spatial scale, categories,  
evolution, impacts, etc.



**Observation difficulty**



Calling for new technologies  
to support monitoring and conservation of  
UNESCO designated sites  
for sustainable development



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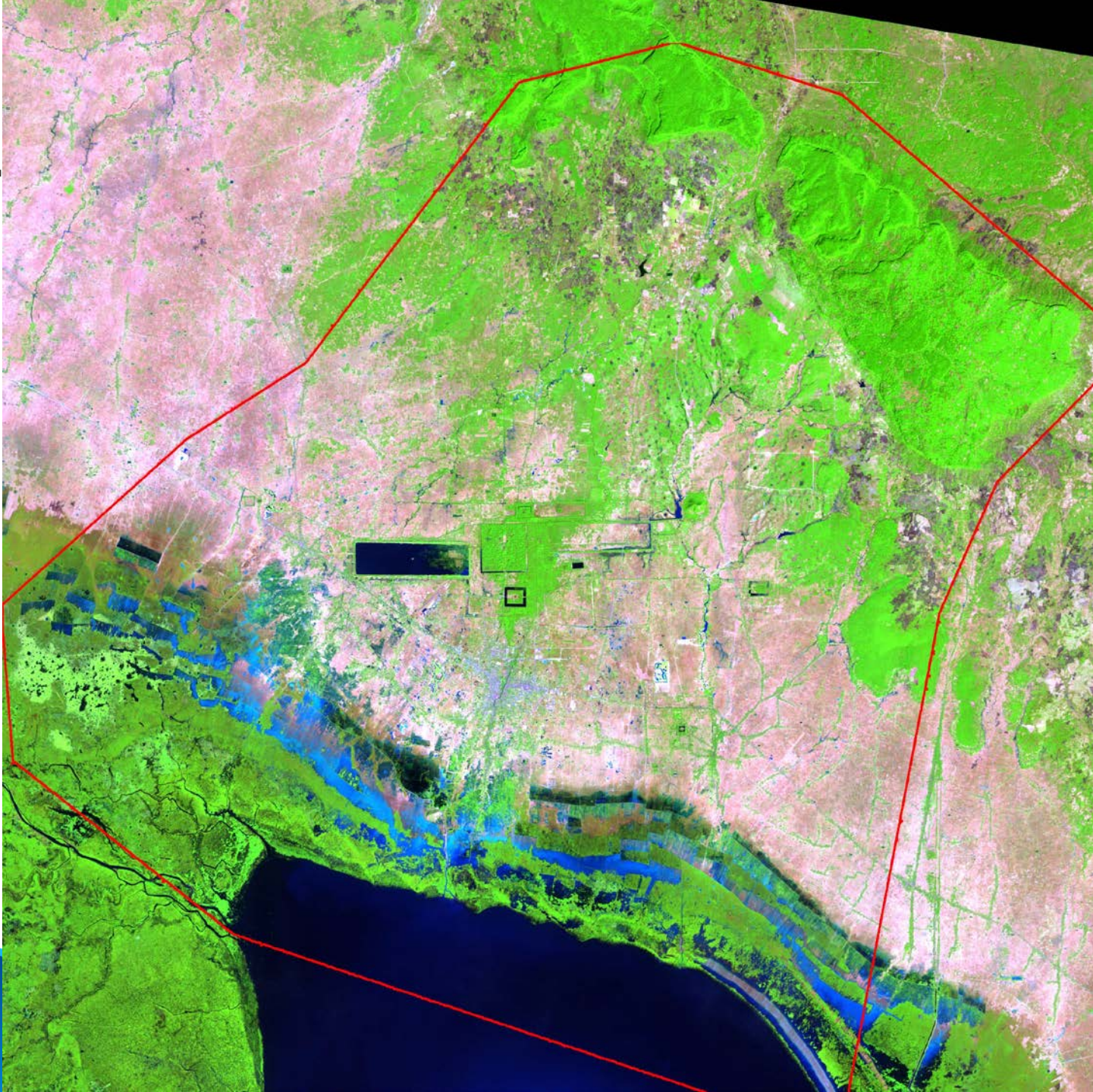


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## III. Projects Undertaken



Edu





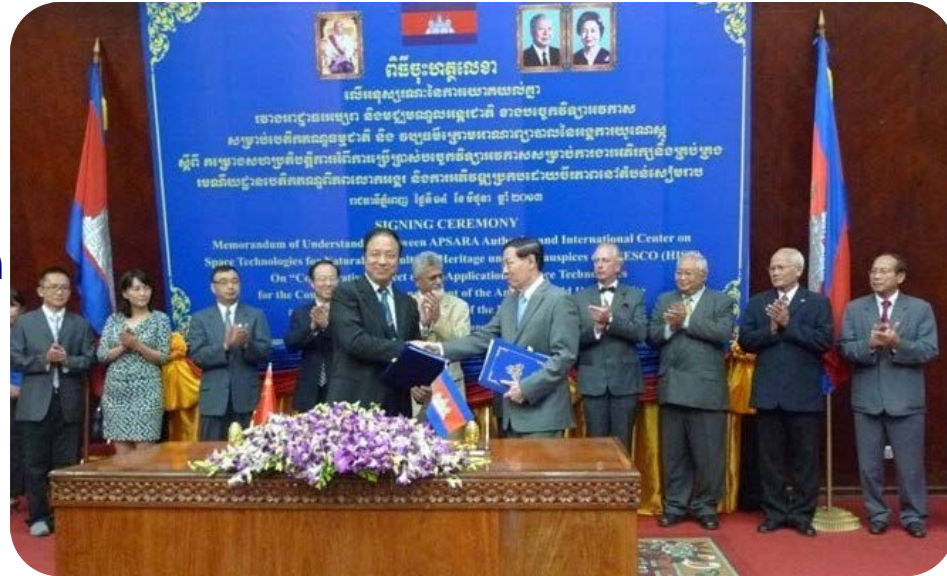


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# Background

➤ Prof. Huodong Guo of HIST and RADI and Director BUN Narith of APSARA signed an MOU during the 37th session of the UNESCO World Heritage Committee in Phnom Penh, June 2013



➤ Cambodian Deputy Prime Minister H. E. Dr. Sok An met with the HIST/RADI delegation, and expressed full support for the proposed collaborative project





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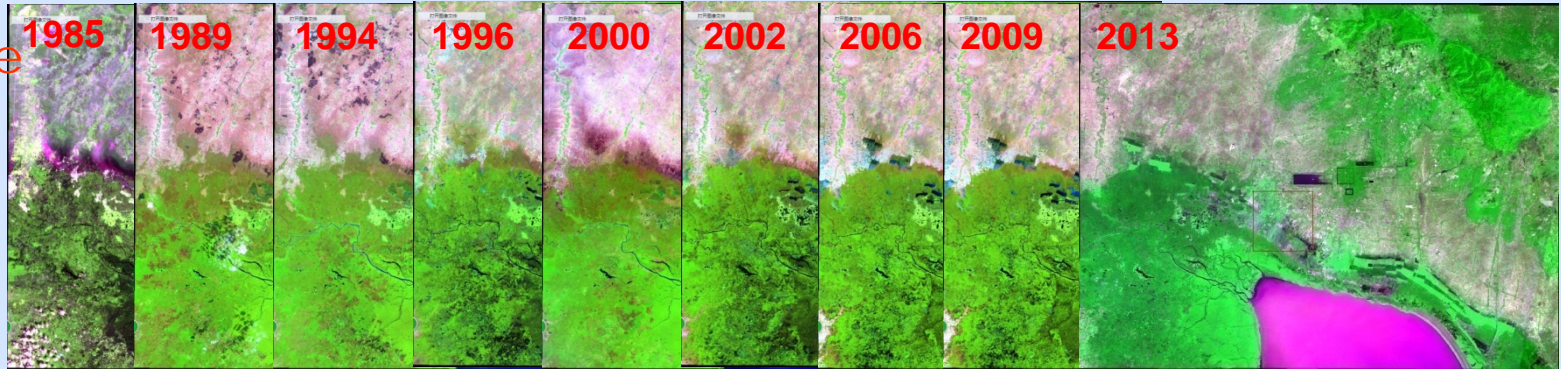


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APSARA

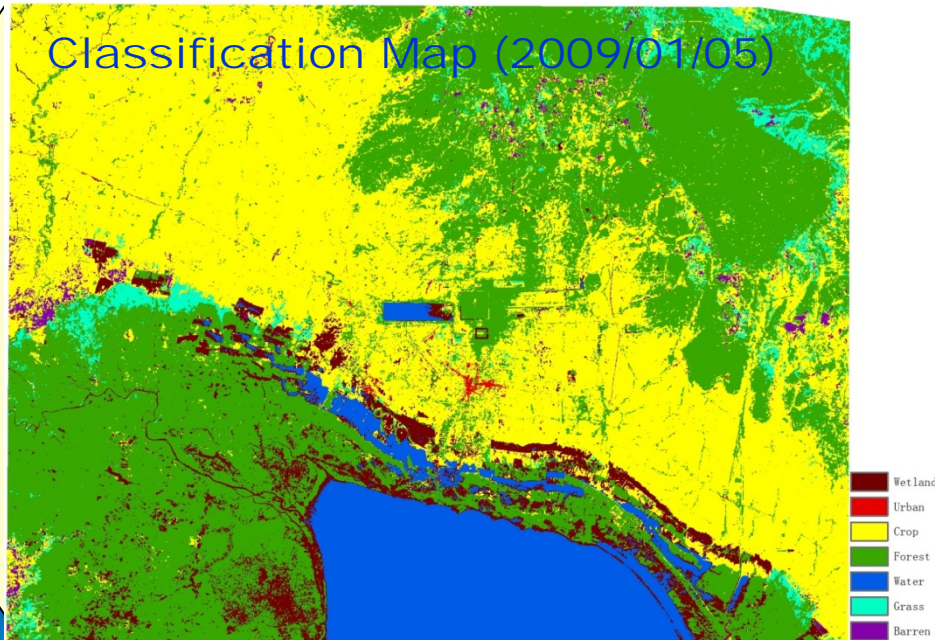
# Research Progress: Land Use & Land Cover Change

Data source  
(1985-2013)

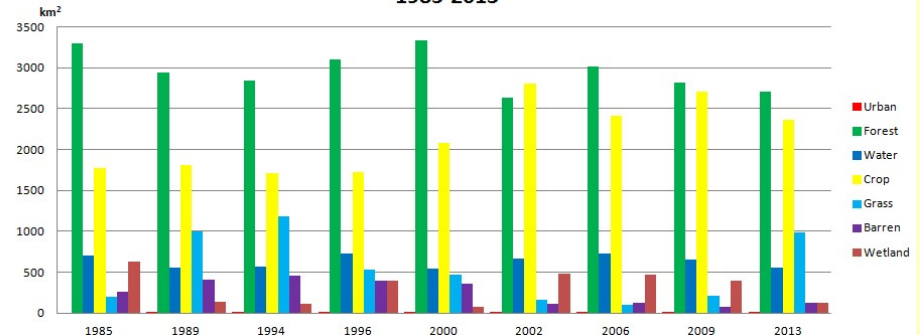
- Landsat MSS
- Landsat TM
- HJ-1A



Classification Map (2009/01/05)



1985-2013



- Urban area: gradually increasing
- Forest area: unstable growth
- Water area : seasonal fluctuations





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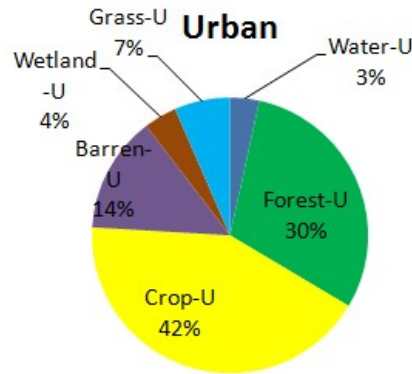
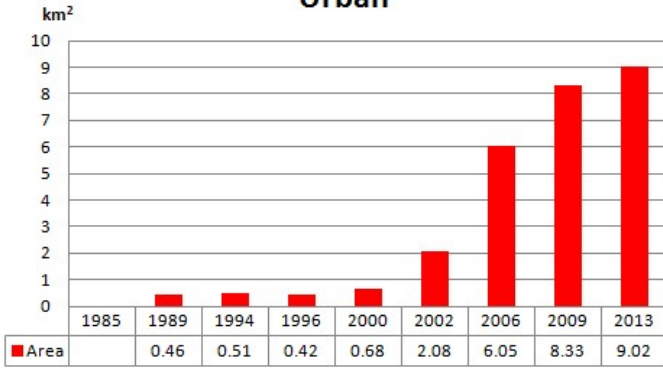
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# Research Progress: Urban Change analysis

Urban



1989



1989.01.22

2009



2009.01.05





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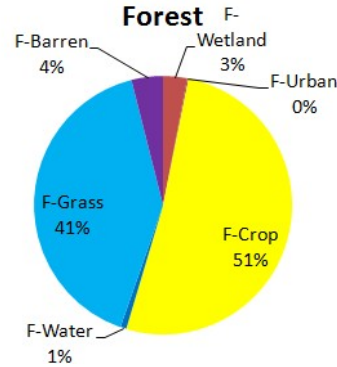
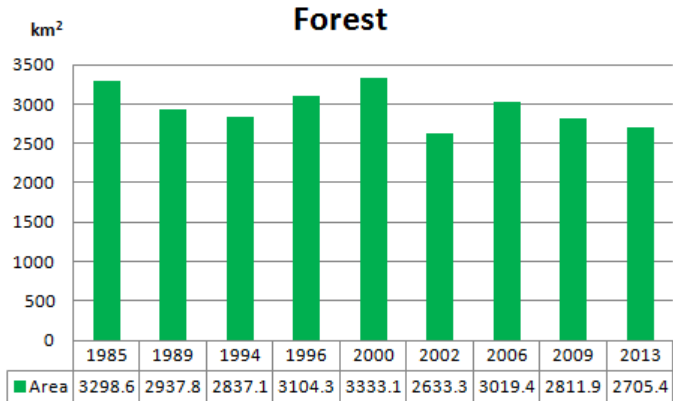


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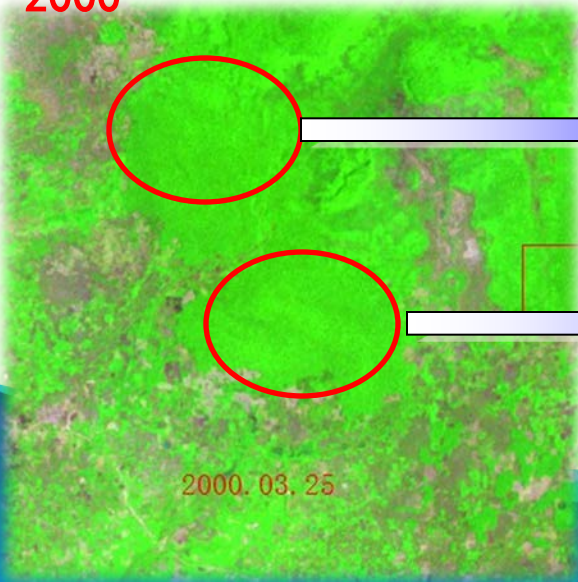
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# Research Progress: Forest Change Analysis

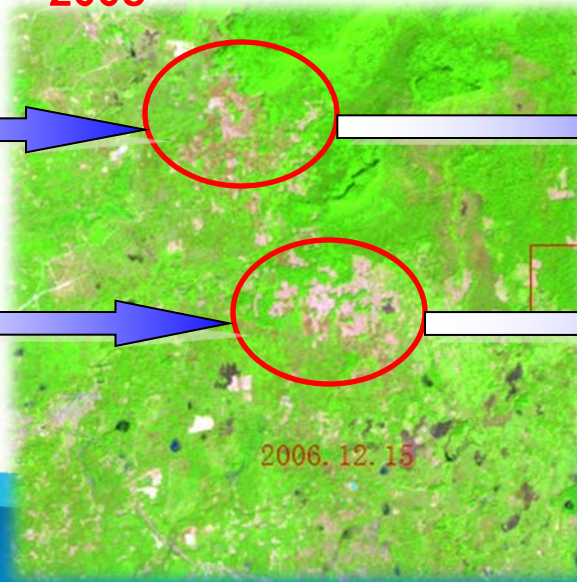


- Forest area reduced **593.2 km<sup>2</sup> (18% of the whole forest)**
- The forest loss mainly converted to crops and grassland

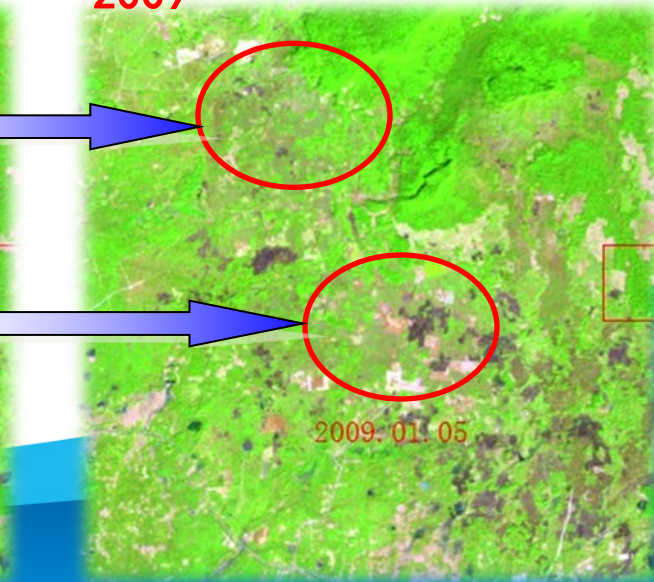
2000



2006



2009



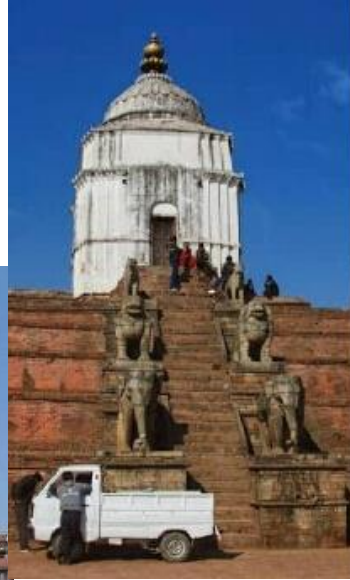




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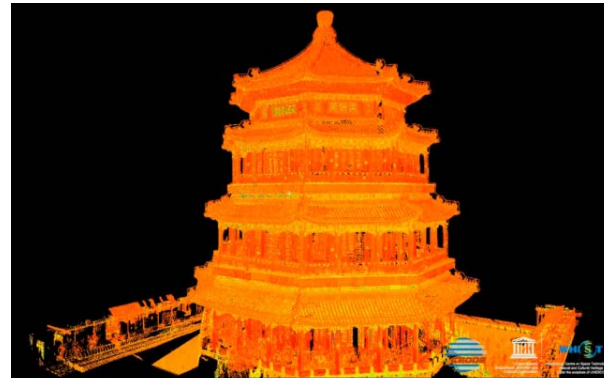


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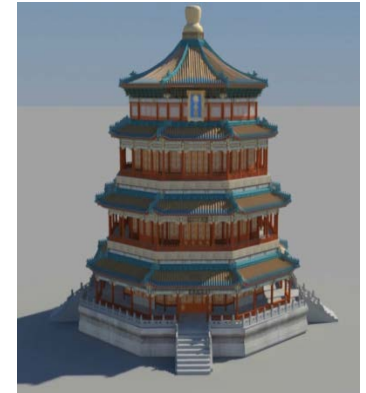




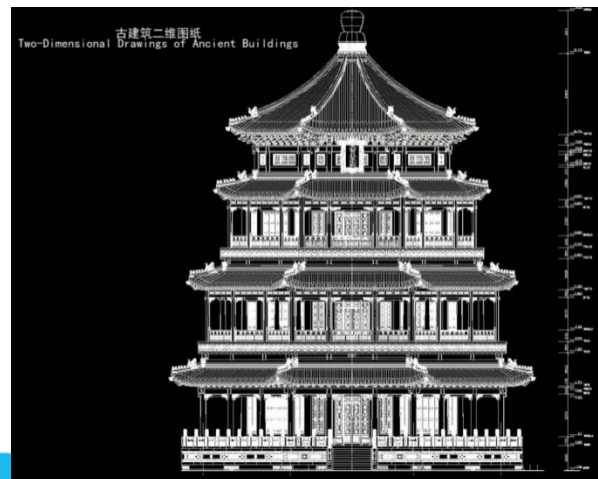
# Project on Summer Palace, a World Heritage Site in China



Rebuilt using point clouds data of Fo Xiang Ge obtained from 3D laser scanning



3D model of Fo Xiang Ge



A design drawing of Fo Xiang Ge



Researchers carrying out field work at the foot of Fo Xiang Ge using LIDAR technology

# Monitoring & Comparison

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2010年6月19日 (Quickbird卫星数据)



2013年5月24日SPOT-6卫星数据

**Satellite images of WuDaLianChi Biosphere Reserve for the monitoring and evaluation**





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# 五大连池景区0.5米分辨率 卫星影像



10.0 m





将在五大连池景区采集老黑山、火烧山及喷气锥碟的高分辨率航空遥感影像



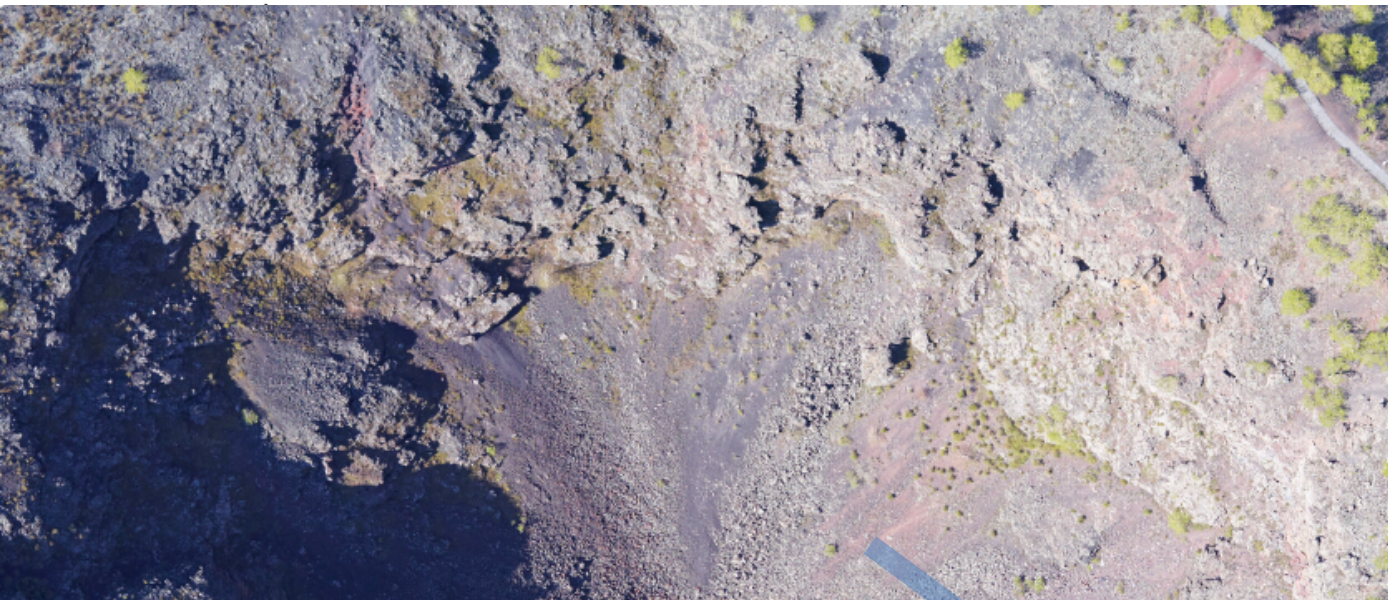


# 老黑山火山0.05米航空 遥感数据

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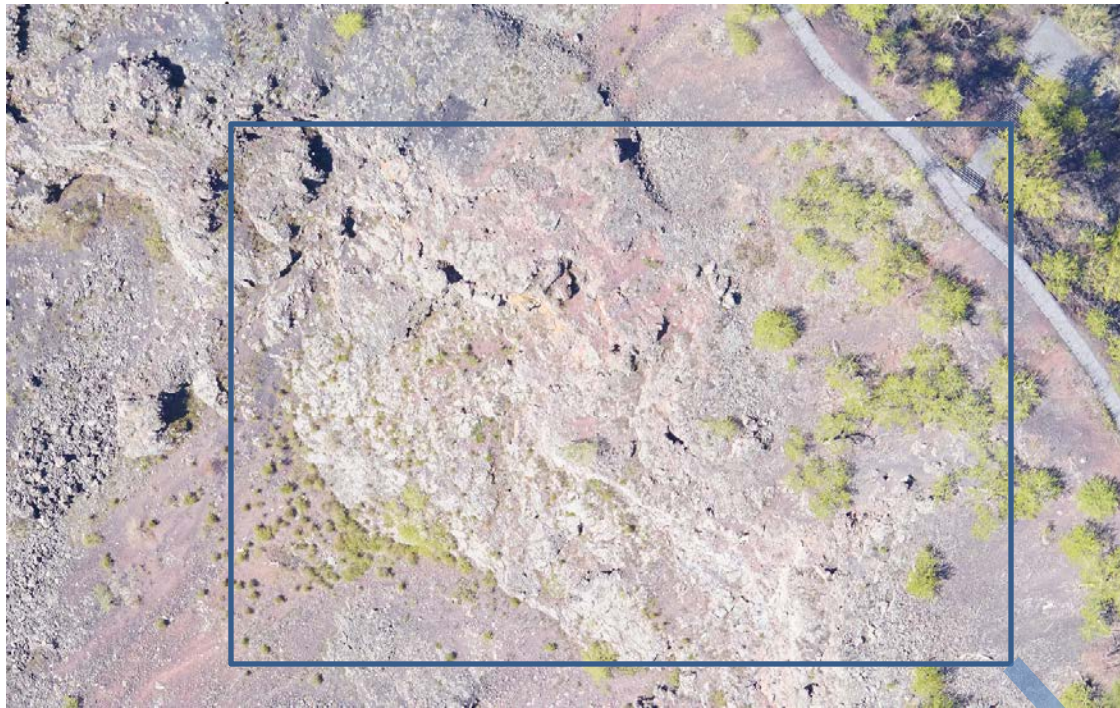




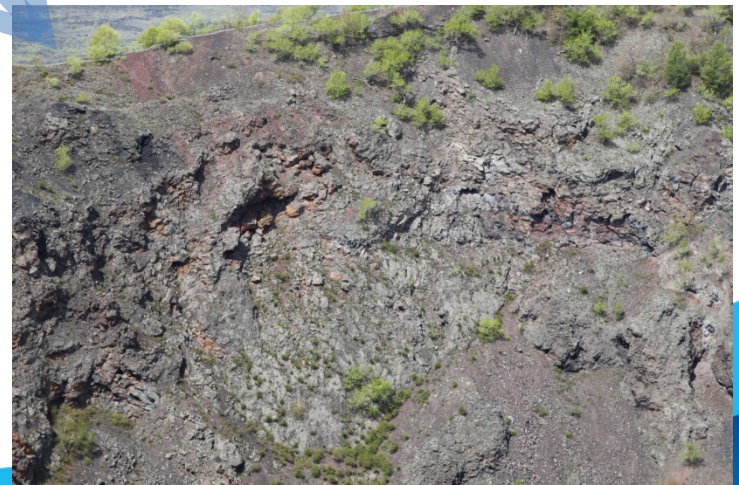
航空遥感数据







航空遥感数据







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Perspective 30°



faces: 6,193,049 vertices: 3,089,361

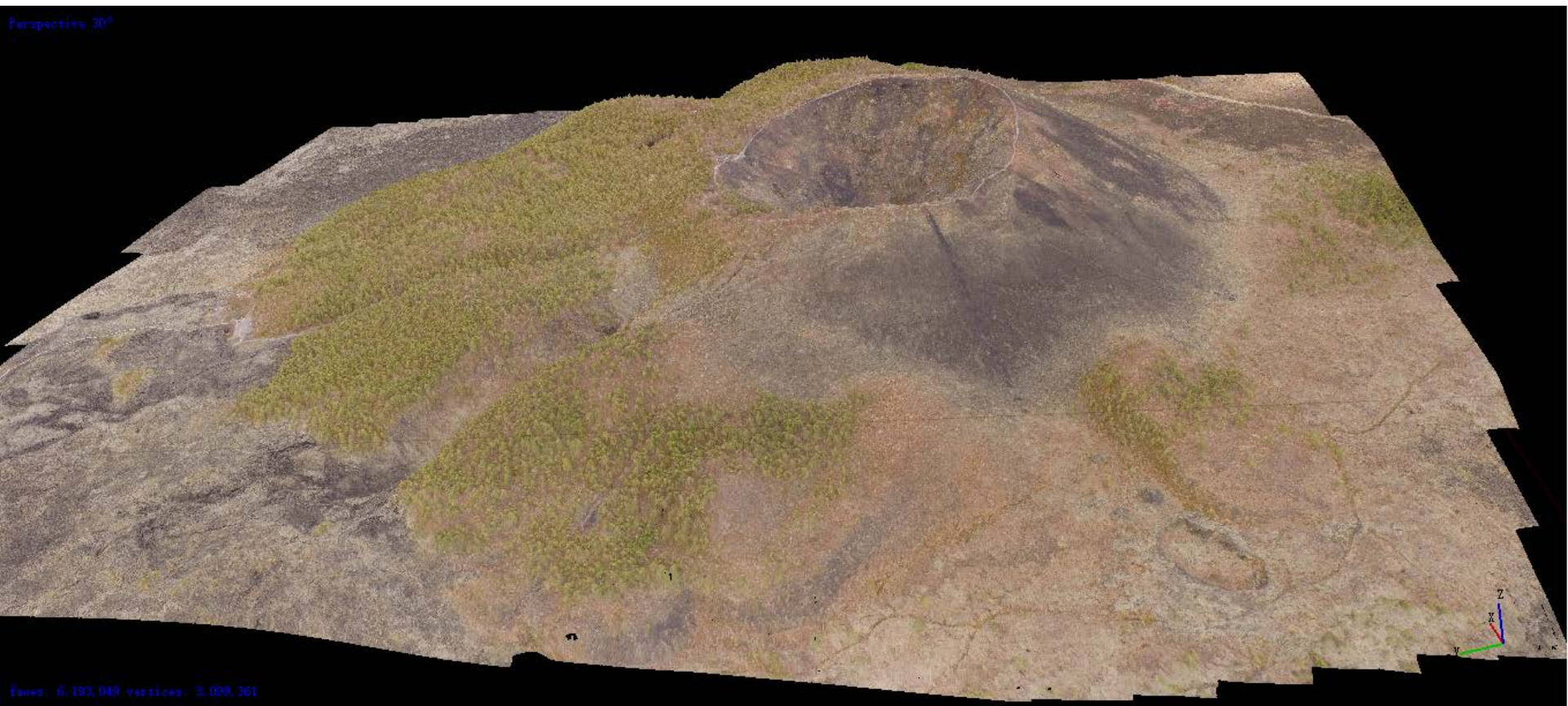




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## **IV. Capacity Building and Conferences**



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## 2.1 Capacity Building – Biosphere Reserves

- **The 3rd EABRN-UNESCO Training Workshop took place in Beijing in 2009.**
- **The 4th EABRN-UNESCO Training Workshop on “Remote Sensing and GIS for Biosphere Reserve Management” was held in Beijing in 11-22 April, 2011.**





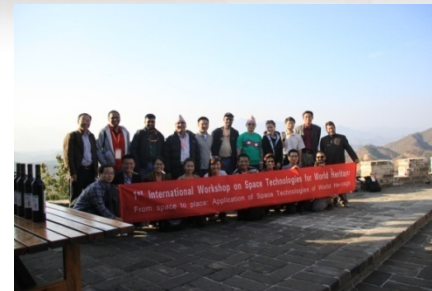


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## 2.2 Capacity Building – 1<sup>st</sup> Workshop on World Heritage Sites

During October 9-28, 2012, the 1<sup>st</sup> International Workshop on Space Technologies for Management and Conservation of World Heritage took place in Beijing. 20 people from 15 developing countries in Asia participated in the Workshop. **The 2<sup>nd</sup> Workshop with the same subject will be held next month.**





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## 2.2 Capacity Building – 2nd Workshop on World Heritage Sites







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## 3.1 Promotion & Publicity – 4<sup>th</sup> ICRSA

On October 24-26, 2012, the 4<sup>th</sup> International Conference on Space Technologies for Archaeology, hosted by HIST and CEODE, was held in Beijing, nearly 300 representatives from around the world participated in the Conference.



4TH INTERNATIONAL CONFERENCE ON REMOTE SENSING IN ARCHAEOLOGY  
第四届国际遥感考古会议  
24-26 October 2012 Beijing · China







# 3.2 Promotion & Publicity – Huangshan Dialogue

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In collaboration with RADI, World Heritage Center, MAB Program of UNESCO and the Global Geopark Network assisted by UNESCO, HIST organized the Huangshan Dialogue at a World Heritage Site and Global Geopark - Huangshan, China from 26-30 May 2014. The Dialogue is the first ever international event that addresses the challenges and prospects for the conservation and sustainable development of UNESCO designated places.









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*Thank you !*

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