

UN-SPIDER Training Programme

New Satellite Resources and Digital Tools for Emergency Response

Venue Hilton Hotel, Beijing, China

Dates 15–16 September 2026

(Held prior to the 11th Annual UN-SPIDER Conference, 17–18 September 2026)

The event is jointly organised by the United Nations Office for Outer Space Affairs (UNOOSA), through its UN-SPIDER programme, and the National Disaster Reduction Centre of China (NDRCC) under the Ministry of Emergency Management (MEM), in partnership with the Asian and Pacific Training Centre for Information and Communication Technology for Development (APCICT), and the Asia-Pacific Space Cooperation Organization (APSCO). It is designed for decision-makers and technical staff from national disaster management agencies.

A blue banner with white text and a satellite image of Earth on the right. The text reads: "UN-SPIDER TRAINING PROGRAMME", "NEW SATELLITE RESOURCES AND DIGITAL TOOLS FOR EMERGENCY RESPONSE", "15-16 SEPTEMBER 2026", and "BEIJING, PEOPLE'S REPUBLIC OF CHINA".

UN-SPIDER TRAINING PROGRAMME

NEW SATELLITE RESOURCES
AND DIGITAL TOOLS FOR
EMERGENCY RESPONSE

15-16 SEPTEMBER 2026
BEIJING, PEOPLE'S REPUBLIC OF CHINA

Co-Organizer

 **United Nations**
Office for Outer Space Affairs

 **中华人民共和国应急管理部**
MINISTRY OF EMERGENCY MANAGEMENT OF THE PEOPLE'S REPUBLIC OF CHINA

 **NDRCC**

Partners

 **ESCAP**

 **APCICT**
Asian and Pacific Training Centre
for Information and Communication
Technology for Development

 **APSCO**
ASIA-PACIFIC SPACE COOPERATION
ORGANIZATION

Modules at a Glance

Full descriptions and learning outcomes for each module follow.

#	Module title	Delivered by	Duration
1	Global Human Settlement Data for Exposure Assessment	European Commission's Joint Research Centre (JRC)	Half day
2	Country specific EO-based crop monitoring using CropWatch Cloud	Aerospace Information Research Institute, CAS (AIRCAS)	Half day
3	AWARE Platform (Early Warning, Early Action and Early Finance)	International Water Management Institute (IWMI)	Half day
4	Climate Smart Governance (CSG) Dashboard	International Water Management Institute (IWMI)	Half day
5	Use of Risk Changes for Multi-hazard Risk Assessment and Risk Reduction Planning	Asian Institute of Technology (AIT) and UNESCAP/APCICT	Full day
6	Hyperspectral Satellites in Forest Monitoring / MANGROVE007 Platform	Star.Vision	Half day
7	Night-time Light Remote Sensing : Concept and Practices	Wuhan University	Half day
9	Satellite Remote Sensing for Emergency Monitoring and Applications	National Disaster Reduction Center of China (NDRCC)	Half day
10	Role of Space Datasets in Early Warning System	Pakistan Space & Upper Atmosphere Research Commission (SUPARCO)	Half day

Modules 2, 7, and 8 are listed pending confirmation of their descriptions and learning outcomes.

Module Details

MODULE 1

HALF DAY

Global Human Settlement Data for Exposure Assessment: Copernicus Exposure Mapping, GHSL, and GEO Human Planet

Delivered by: Mr. Michele Melchiorri (Project Officer, European Commission Joint Research Centre)

The Global Human Settlement Layer (GHSL), the Copernicus Exposure Mapping Component, and the GEO Human Planet initiative together form a powerful ecosystem of open, satellite-derived datasets for characterising where people live, how densely, and in what type of built environment (information that is essential for rapid exposure and risk assessments before, during, and after disasters). This module introduces participants to each resource, explains how they relate to one another, and demonstrates practical workflows for integrating population grids, built-up surface layers, and functional urban area classifications into emergency response operations. Participants apply the datasets to a realistic scenario estimating population exposure within an affected area using pre-prepared EO datasets and open-source GIS tools.

Participants will be able to:

- Navigate the GHSL data portfolio (GHS-POP, GHS-BUILT-S, GHS-SMOD, time series and GHS-WUP projections) and select the appropriate layer and epoch for a given operational need.
- Access and interpret Copernicus Exposure Mapping products, understanding the characteristics and usage opportunities.
- Familiarise with GEO Human Planet datasets and understand how the initiative coordinates global human settlement mapping across agencies.
- Produce a population grid at high-spatial resolution and combine exposure estimates with hazard maps.
- Critically evaluate spatial resolution, temporal currency, and thematic accuracy trade-offs when choosing between the three data sources for a specific emergency context.

MODULE 2

HALF DAY

Country specific Earth observation-based crop monitoring using CropWatch Cloud

Delivered by: Aerospace Information Research Institute under the Chinese Academy of Sciences (AIRCAS)

Enhancing crop information transparency is essential to stabilize food markets and progress toward SDG 2 (Zero Hunger). Yet many developing countries lack the technical and financial capacity to proactively use Earth observation (EO) for crop monitoring. The CropWatch Cloud provides developing countries with free access to a powerful EO-based crop monitoring platform without requiring additional investment in storage or computing. This session introduces the CropWatch system, its operational workflows, and how participants can customize it to national and sub-national priorities.

Participants will be able to:

- Navigate the CropWatch cloud platform and access near-real-time crop condition indicators.
- Generate national and sub-national crop monitoring data/information using Earth observation data and write analytical reports.
- Customize the system to local cropping systems, growing season, and for user-defined monitoring units.

- Integrate CropWatch outputs into national/regional agricultural and food security decision-making processes.

MODULE 3**HALF DAY**

AWARE Platform (Early Warning, Early Action and Early Finance)

Delivered by: *International Water Management Institute (IWMI)*

The AWARE Platform (Early Warning, Early Action and Early Finance) is an integrated digital decision-support system developed by the International Water Management Institute to strengthen climate and disaster resilience through anticipatory action. The platform combines real-time hydro-meteorological monitoring, multi-hazard forecasting, exposure and vulnerability analytics, and crisis mapping to support governments, humanitarian agencies, and development partners in proactive risk management. It enables timely preparedness and response for floods, droughts, and climate extremes by translating early warning information into actionable insights for emergency operations, planning, and financing mechanisms. The training focuses on enhancing user capacity in operational use of the platform, interpretation of risk analytics, and application of early warning information for informed decision-making and coordinated response planning.

Participants will be able to:

- Understand the core concepts of Early Warning, Early Action and Early Finance within the AWARE Platform framework.
- Navigate the platform interface and access real-time hazard monitoring, forecasting, and risk analytics.
- Interpret flood, drought, and climate-risk information for operational decision-making and preparedness planning.
- Apply exposure and vulnerability analytics to support anticipatory action and emergency response coordination.
- Utilize platform outputs for evidence-based reporting, planning, and stakeholder communication.

MODULE 4**HALF DAY**

Climate Smart Governance (CSG) Dashboard

Delivered by: *International Water Management Institute (IWMI)*

The Climate Smart Governance (CSG) Dashboard is an integrated decision-support and analytics platform developed by the International Water Management Institute to support evidence-based climate adaptation planning, risk-informed governance, and climate finance decision-making. The platform integrates multi-hazard risk assessments, climate projections, socio-economic vulnerability indicators, adaptation investments, and policy analytics into a unified framework for governments and development partners. It enables users to visualize climate risks, assess adaptation priorities, identify financing gaps, and support strategic planning across sectors such as water, agriculture, infrastructure, and disaster risk management. The training focuses on building user capacity in navigating the dashboard, interpreting climate-risk

analytics, scenario analysis, and applying insights for policy formulation, investment prioritization, and resilience planning.

Participants will be able to:

- Understand the role of climate-risk analytics in governance, adaptation planning, and climate finance.
- Navigate the CSG Dashboard and access multi-hazard, socio-economic, and climate projection datasets.
- Interpret adaptation investment needs, financing gaps, and risk scenarios across sectors and geographies.
- Conduct scenario-based analysis to support policy formulation and resilience planning.
- Use dashboard insights to strengthen strategic decision-making, investment prioritization, and climate-informed governance processes.

MODULE 5

FULL DAY

Use of Risk Changes for Multi-hazard Risk Assessment and Risk Reduction Planning

Delivered by: *Asian Institute of Technology (AIT) and UNESCAP/APCICT*

Disaster risk reduction increasingly requires decision-makers to understand not only where hazards may occur, but also how exposed populations, infrastructure, services, and economic assets may be affected. In many countries, risk is shaped by multiple hazards, changing land use, rapid urbanization, climate change, and evolving patterns of exposure and vulnerability. Effective risk reduction planning, therefore, depends on spatially explicit evidence to identify risk hotspots, compare potential interventions and mitigation measures, and support better-informed investment and policy decisions.

RiskChanges is a decision-support tool designed to support multi-hazard risk assessment and risk reduction planning. It enables users to integrate hazard, exposure, and vulnerability information to assess potential losses and risks, and explore how risk may change when risk reduction measures or future development scenarios are considered. The tool is particularly useful for supporting risk-sensitive land-use planning, preparedness, and mitigation, as well as for prioritizing interventions and communicating risk information to the public and decision-makers.

This training session will introduce participants to the basic concepts and practical workflow of RiskChanges. Through a combination of short lectures, demonstrations, and guided exercises, participants will learn how to use the tool to organize input data, assess exposure and vulnerability, generate loss and risk information, and compare risk reduction alternatives. The session will emphasize the practical use of risk assessment outputs for disaster risk reduction planning and resilience building.

Participants will be able to:

- Understand the basic concepts of hazard, exposure, vulnerability, loss, and risk in a multi-hazard context.
- Recognize the spatial data requirements for multi-hazard risk assessment.
- Describe the RiskChanges workflow and its role in supporting risk-informed decision-making.
- Explore freely available hazard maps and elements-at-risk datasets.
- Understand how elements-at-risk and vulnerability information are integrated for loss and risk assessment.
- Interpret risk assessment outputs, including exposure, loss, and risk maps.

- Understand how risk may change when risk reduction alternatives, land-use changes or future scenarios are considered.
- Appreciate how risk information can support planning, prioritization of interventions, preparedness, and resilience building.

Expected outcomes:

The session will provide participants with a practical introduction to RiskChanges and its application for multi-hazard risk assessment. Participants will gain an overview of how geospatial data and risk analytics can be used to support evidence-based disaster risk reduction planning, with particular attention to translating technical risk information into decisions that reduce current and future disaster risks.

MODULE 6

HALF DAY

Applications of Hyperspectral Satellites in Forest Monitoring and Hands-on Practice with the MANGROVE007 Intelligent Mangrove Analysis Platform

Delivered by: *Mr. Hongwei Li (Postdoctoral Researcher, Star.Vision), Ms. Wenqi Xiong (AI Product Manager, Star.Vision)*

This course will center on the application of hyperspectral satellite remote sensing in forest ecosystem monitoring, with a particular focus on its value for mangrove resource surveys, vegetation classification, and ecological change detection. The course will feature real-world case studies and hands-on demonstrations using the MANGROVE007 intelligent analysis platform. Participants will learn practical methods for utilizing multi-source satellite data in long-term mangrove monitoring, boundary change analysis, ecological assessment, and automated report generation. Additionally, the course will introduce the use of artificial intelligence technologies in remote sensing data processing and environmental management. The overarching goal is to equip participants with practical skills in hyperspectral remote sensing and intelligent geospatial analysis, thereby supporting forest resource management, wetland conservation, and the sustainable development of coastal ecosystems.

Participants will be able to:

- Understand the basic principles, data characteristics, and application value of hyperspectral satellite remote sensing for forest and mangrove monitoring.
- Recognize how AI algorithms and hyperspectral data can support mangrove identification, vegetation classification, boundary change analysis, and ecological monitoring.
- Understand how GeoAI Agents can enhance GIS and remote sensing workflows through natural language interaction, task automation, spatial analysis, and report generation.
- Use the MANGROVE007 intelligent analysis platform to conduct practical mangrove monitoring workflows with multi-source satellite data.
- Interpret key platform outputs, including mangrove distribution, boundary changes, ecological assessment results, and automated monitoring reports, to support evidence-based decision-making.

MODULE 7

HALF DAY

Night-time Light Remote Sensing : Concept and Practices

Delivered by: *Mr. Xi Li, Professor, Wuhan University*

A one-paragraph description of the session: Nighttime light remote sensing, as a unique remote sensing approach for capturing human socio-economic activities, has developed rapidly in recent years and been

widely adopted by academia and the international community. However, its specific processing and analytical methods are not yet fully understood by many users. This training course begins with the concepts and application cases of nighttime light remote sensing. Building on theoretical foundations, it introduces the data processing methods and workflows for nighttime light imagery. Through a number of practical case studies, participants will learn how to perform basic processing and analysis of nighttime light remote sensing data using open-source GIS software.

Participants will be able to:

- Understand the fundamentals of nighttime light (NTL) remote sensing.
- Master the NTL data processing workflow.
- Conduct basic NTL analysis using open-source GIS software.
- Apply NTL remote sensing to disaster management.

MODULE 9

HALF DAY

Satellite Remote Sensing for Emergency Monitoring and Applications

Delivered by: *National Disaster Reduction Center of Chinese (NDRCC)*

Emergency remote sensing satellites, civil land-observation satellite resources, intelligent remote sensing models, and integrated space-air-ground monitoring technologies together form a comprehensive ecosystem for disaster detection, monitoring, assessment, and risk prevention. This module introduces participants to China's emergency remote sensing capabilities, including the "Space Safeguard for Emergency" equipment, civil satellite resources, remote sensing large models and intelligent agents, and specialised tools for monitoring and assessing typical disasters. Through expert presentations and practical examples, the module demonstrates how satellite data, analytical toolkits, dynamic risk-assessment methods, and integrated spatiotemporal perception can support emergency management throughout the disaster-management cycle.

Participants will be able to:

- Understand the capabilities and applications of emergency remote sensing satellites for disaster monitoring, emergency response, and disaster reduction.
- Familiarise themselves with the "Space Safeguard for Emergency" remote sensing application equipment and its potential uses in emergency management operations.
- Identify China's principal civil land-observation satellite resources and understand how they can support different disaster-management requirements.
- Understand the applications and future potential of remote sensing large models and intelligent agents in emergency management and disaster risk reduction.
- Recognise the functions of the toolkit for emergency remote sensing monitoring and comprehensive assessment of typical disasters.
- Understand approaches for identifying hidden-hazard areas and conducting dynamic risk assessments of typical disaster chains.
- Explore how integrated space-air-ground spatiotemporal perception can strengthen disaster-risk identification, early warning, prevention, and control.

Role of Space Datasets in Early Warning System

Delivered by: *Pakistan Space & Upper Atmosphere Research Commission (SUPARCO)*

This training session will provide an understanding of the Early Warning System and its Components. Participants will get understanding how Space Technology can help in building Early Warning System. This session will also introduce a Flood Hazard Assessment Approach including Modelling and its Data Requirements and how exposure of key elements at risk will be carried out. Session will refer to SUPARCO Recommended Practice published on UN-SPIDER Knowledge Portal related to Flood Hazard Assessment and Flood Mapping and Damage Assessment. Participants will know how Flood frequency analysis is carried out using EasyFit Software and Online calculator. Last but not least, they will know what Flood model input datasets DEM are especially, besides tools to extract current Flood extents from optical and SAR Imagery.

Participants will be able to:

- Participants will be able to learn about EWS components and role of satellite datasets.
- Participants will get hands on experience on Flood Frequency Analysis Tools.
- Participants will become aware of flood modelling and its data requirements, especially DEM, Landcover and Satellite Imagery beside satellite data based development of key elements at risk like crop, population, Gridded data, etc.
- Participants will get first-hand experience on flood mapping and potential exposure/Risk Assessment.
- Participants will know about different data sources for near-real time monitoring.

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