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6th UN-SPIDER Conference
19-21 September Beijing, China

Understanding disaster risk through Earth observation

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United Nations Office for Outer Space Affairs
United Nations Office at Vienna
www.unoosa.org

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About UNOOSA and UN-SPIDER

- United Nations Committee on the Peaceful Uses of Outer Space (**COPUOS)**
- **Programme on Space Applications**
- Executive Secretariat – International Committee on Global Navigation Satellite Systems **(GNSS)**
- United Nations Platform for Space-based Information for Disaster Management and Emergency Response (**UN-SPIDER**)
- **UNISPACE+50**

UNISPACE+50 initiative

SDGs

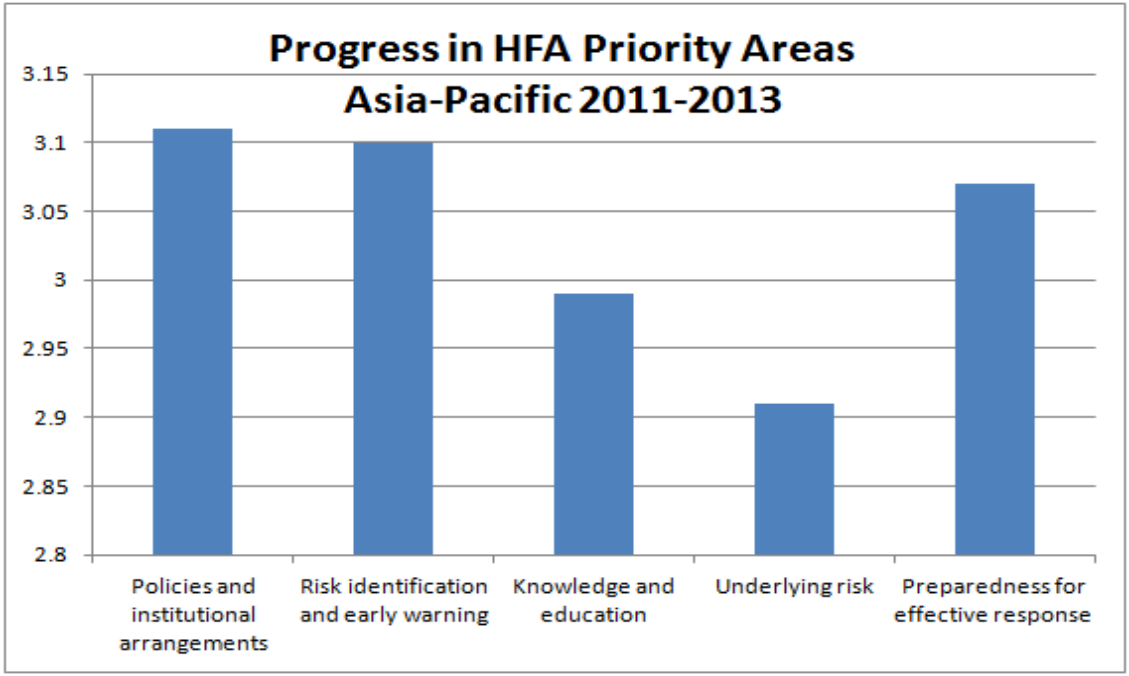
Sendai Framework

Climate change agreement

The UN-SPIDER programme contributes to **Sendai Framework** by ensuring **effective use of space based information in all stages of disaster management.**

The Hyogo Framework for Action (HFA) learning

- Progress made in disaster management but **much less in reducing risk**
- The space for addressing the **underlying causes of risk in development** under the HFA has not been filled
- Local progress drags behind
- **Risks have increased faster than they have been reduced** and the magnitude of risk is large



Reference: ISDR

How Sendai Framework addresses the learnings?

From managing disaster to managing risk

- **Outcome**: Substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries …

- **Goal**: Prevent creation of new risk, Reduce exisitng risk and Strengthen resilience

- **Scope**:
  - Adds slow-onset, small-scale, biological and man-made hazards
  - Increases the scope of action in recovery, and reconstruction to Build Back Better

Reference: ISDR

Reference: ISDR

13 GUIDING PRINCIPLES

Responsibility for DRR

- States have primary responsibility
- Shared responsibility with stakeholders

Engagement

- All of society
- All state institutions
- Local government empowerment

Approach

- Regard for human rights
- DRR & development relationship
- Multi-hazard & inclusive
- Local expression of risks
- Post disaster action & resolve underlying risks
- Build back better

Partnerships

- International cooperation & global partnerships
- Support to developing countries

Reference: ISDR

Reference: ISDR

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Understanding disaster risk - National level
(relevant to Earth observation)

Promote the collection, analysis, management and use of relevant data and practical information.

Encourage the use of and **strengthening of baseline and periodically assess disaster risks**

Develop, update periodically and disseminate, as appropriate, **location-based disaster risk information, including risk maps to decision makers**, the general public and communities at risk to disaster in an appropriate format by using, as applicable, geospatial information technology

Promote **real-time access to reliable data**, make use of space and in situ information, including **geographic information systems (GIS)**, and use information and communications technology innovations

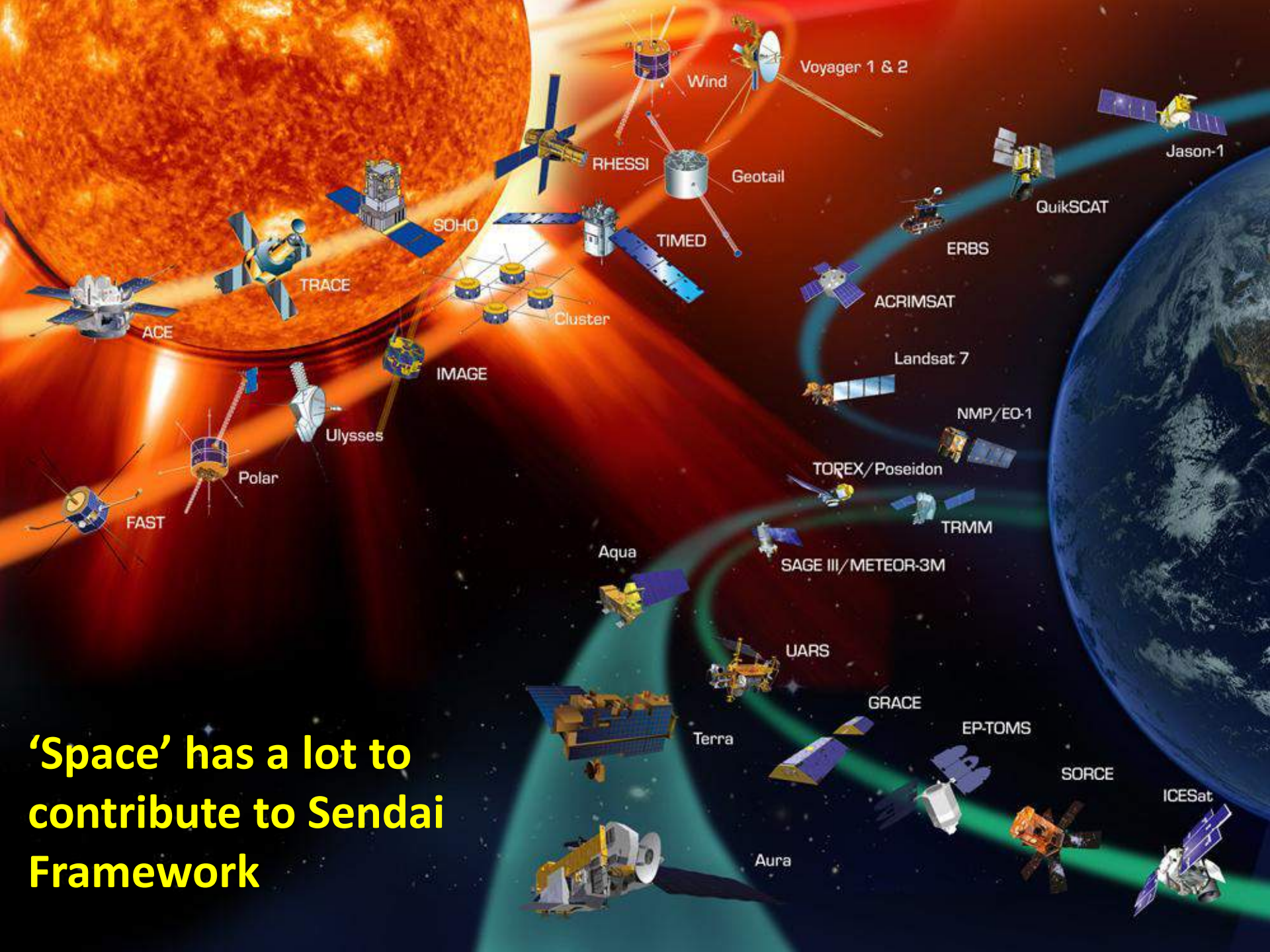
Build the knowledge of government officials at all levels, civil society, communities and volunteers, as well as the private sector, through sharing experiences, lessons learned, good practices and training and education on disaster risk reduction,

Understanding disaster risk – Global level
(relevant to Earth observation)

Enhance the development and dissemination of **science-based methodologies and tools** to record and share disaster losses and relevant disaggregated data and statistics, as well as to **strengthen disaster risk modelling, assessment, mapping, monitoring and multi-hazard early warning systems**

Promote common efforts in partnership with the scientific and technological community, academia and the private sector to **establish, disseminate and share good practices internationally**

Enhance the scientific and technical work on disaster risk reduction and its mobilization through the coordination of existing networks and scientific research institutions at all levels and all regions with the support of the UNISDR Scientific and Technical Advisory Group



‘Space’ has a lot to contribute to Sendai Framework

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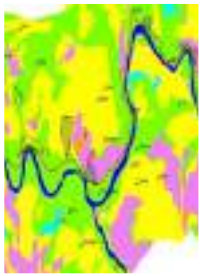
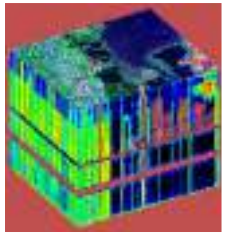
Earth observation to understand disaster risks

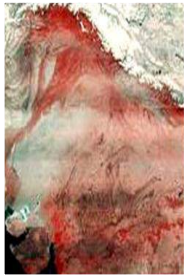


Spatially extensive mapping

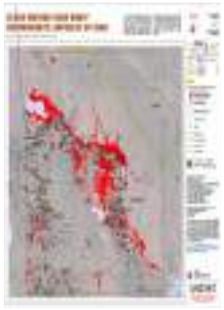


Beyond ‘human eye’ capability

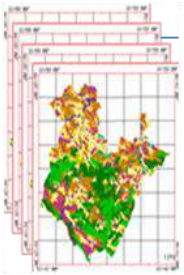
Localised event detection



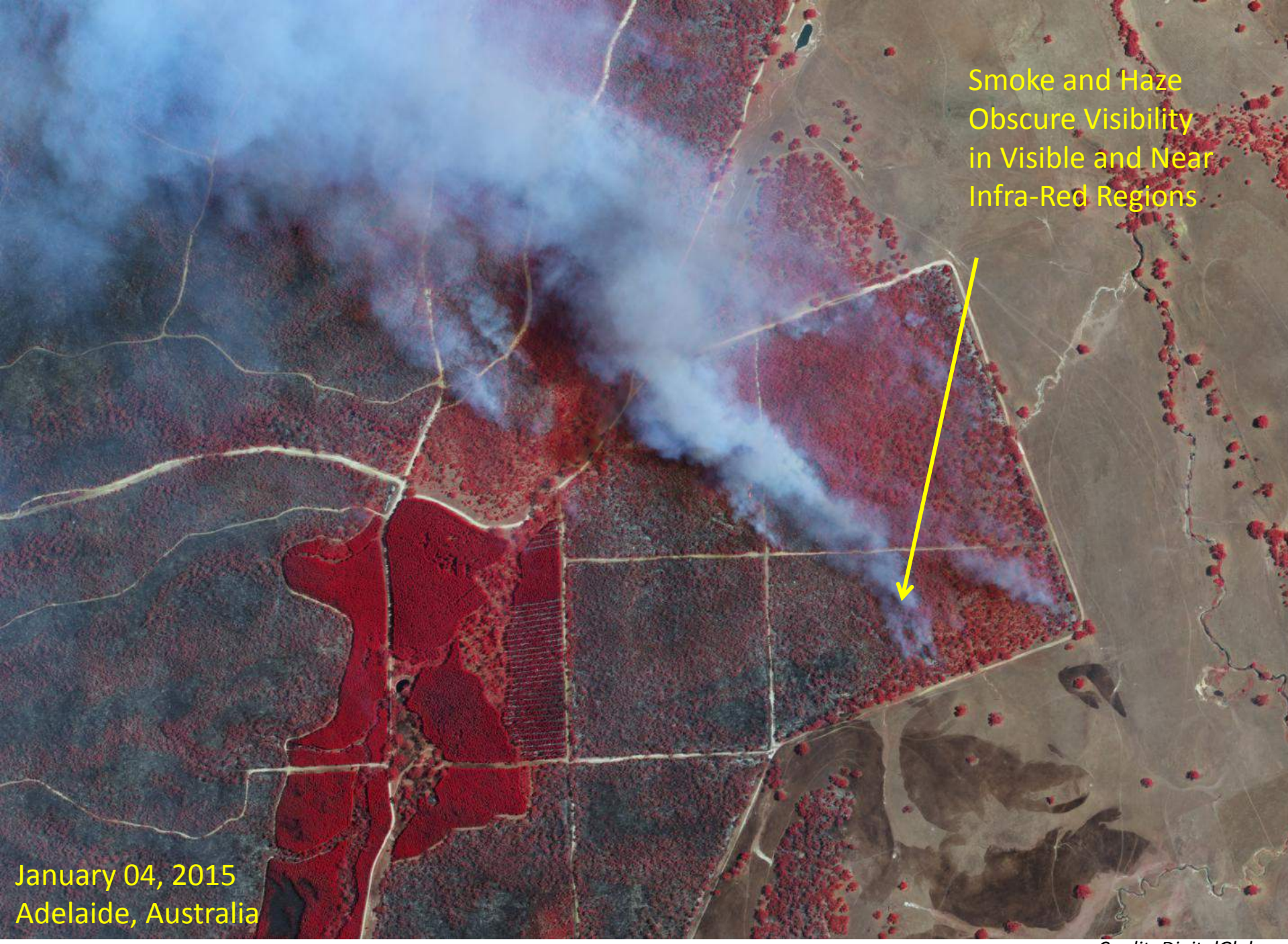
Access difficult or dangerous sites



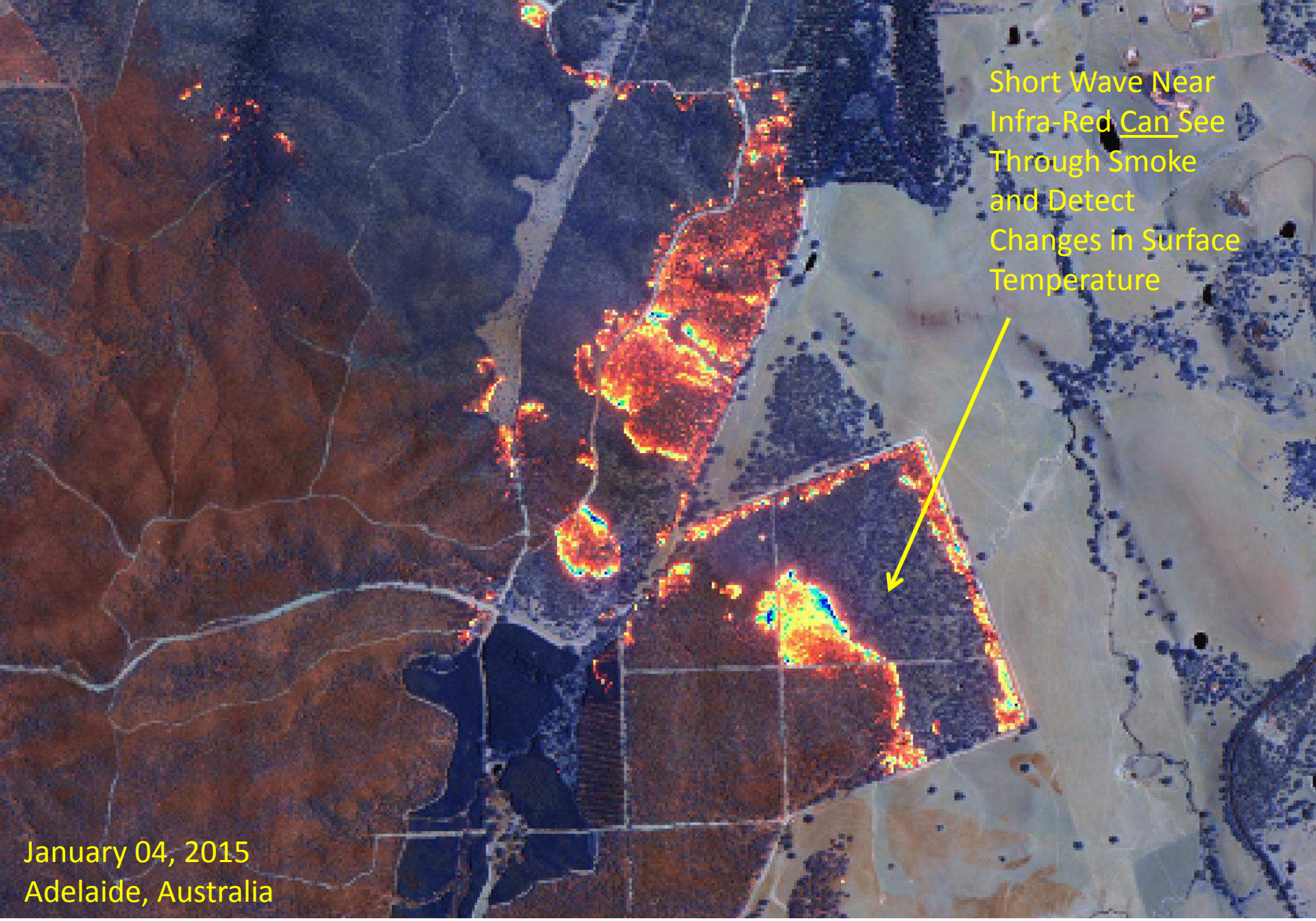
Near real time response



Geo-referenced and calibrated

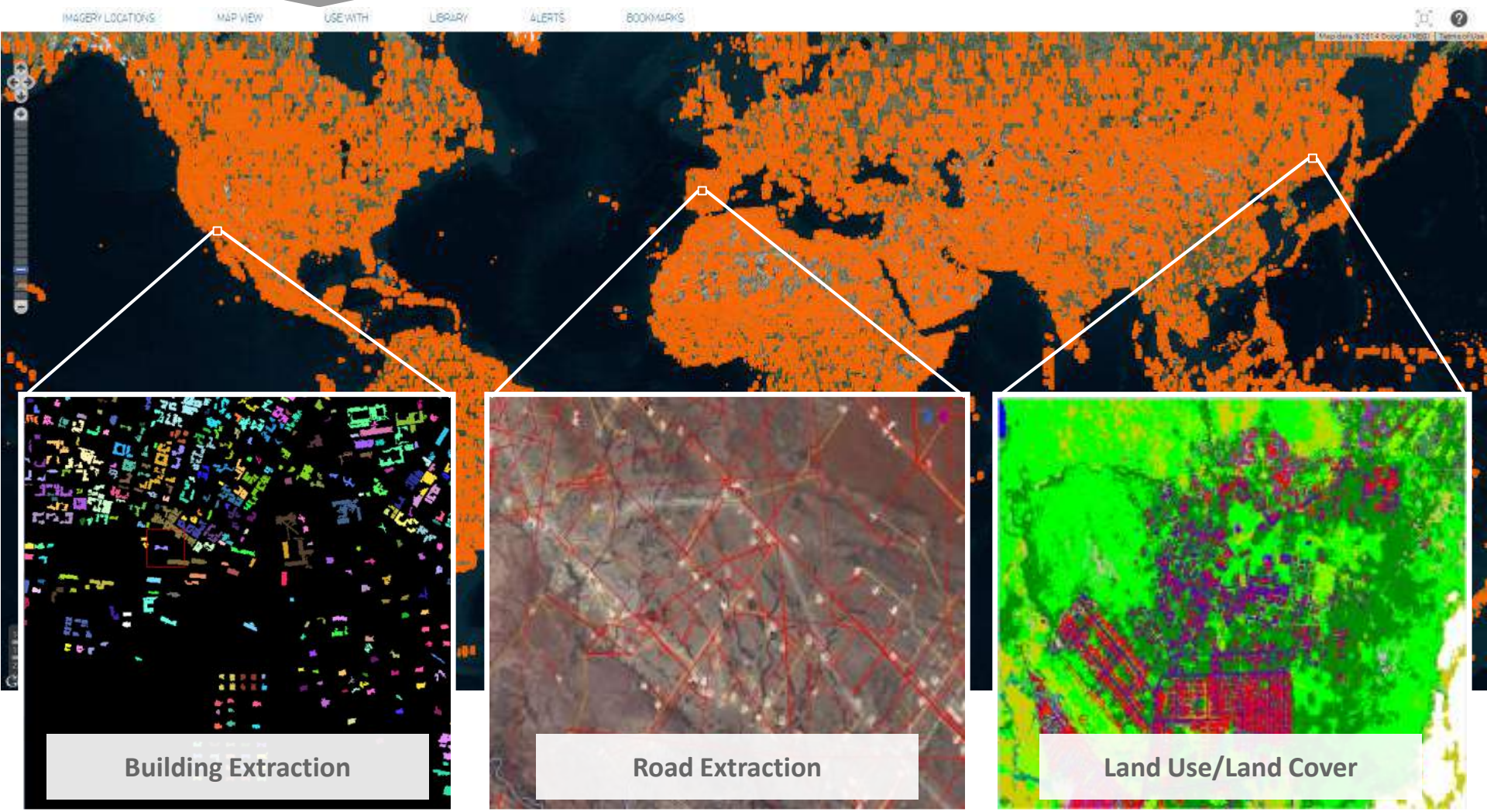


Credit- DigitalGlobe



Beyond eye capability

Credit- DigitalGlobe

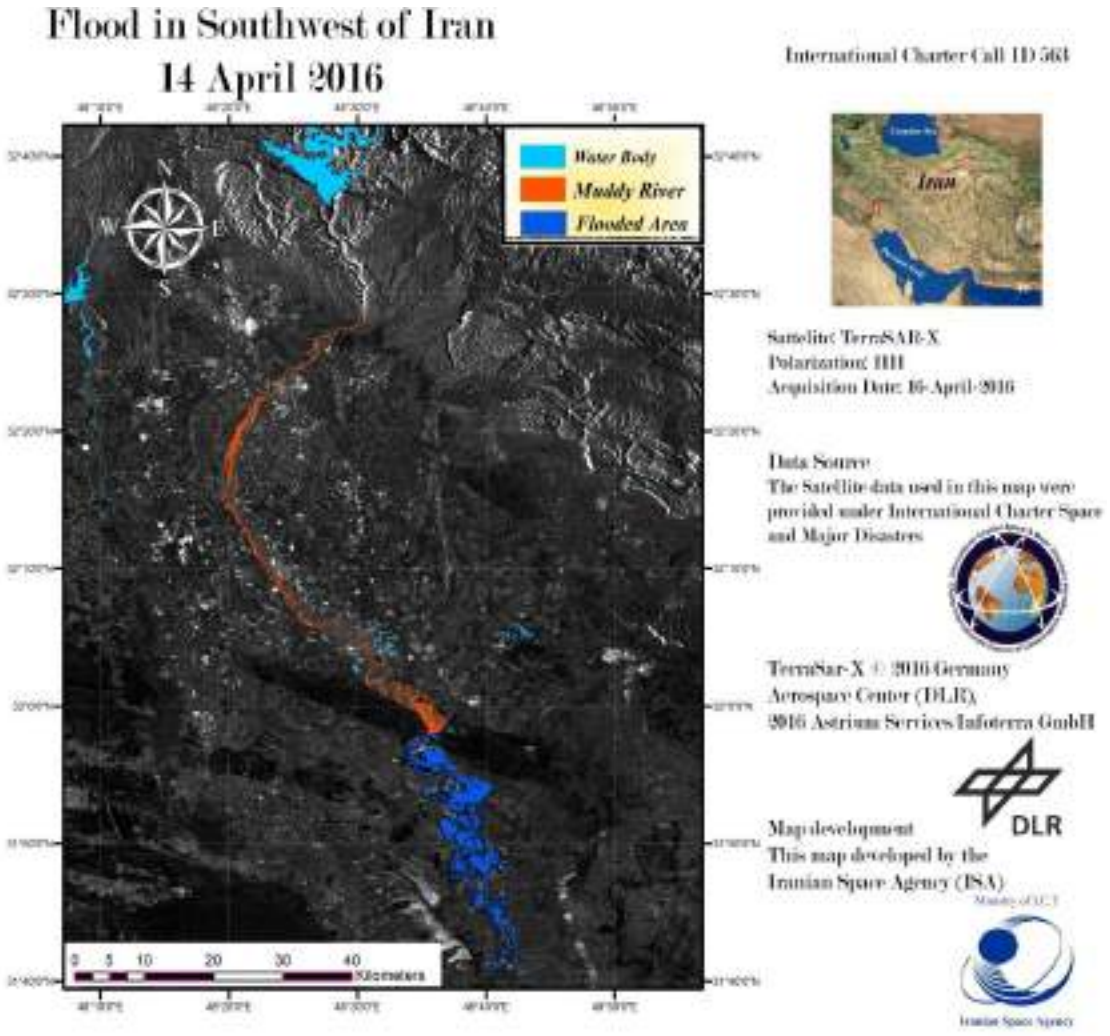


Extracting information needed to understand risk

Credit- DigitalGlobe

Extracting building roof outline – Critical information needed for urban risk assessment

Credit- DigitalGlobe



Seeing through clouds

Credit- Iranian Space Agency

Monitoring change

Credit- DigitalGlobe

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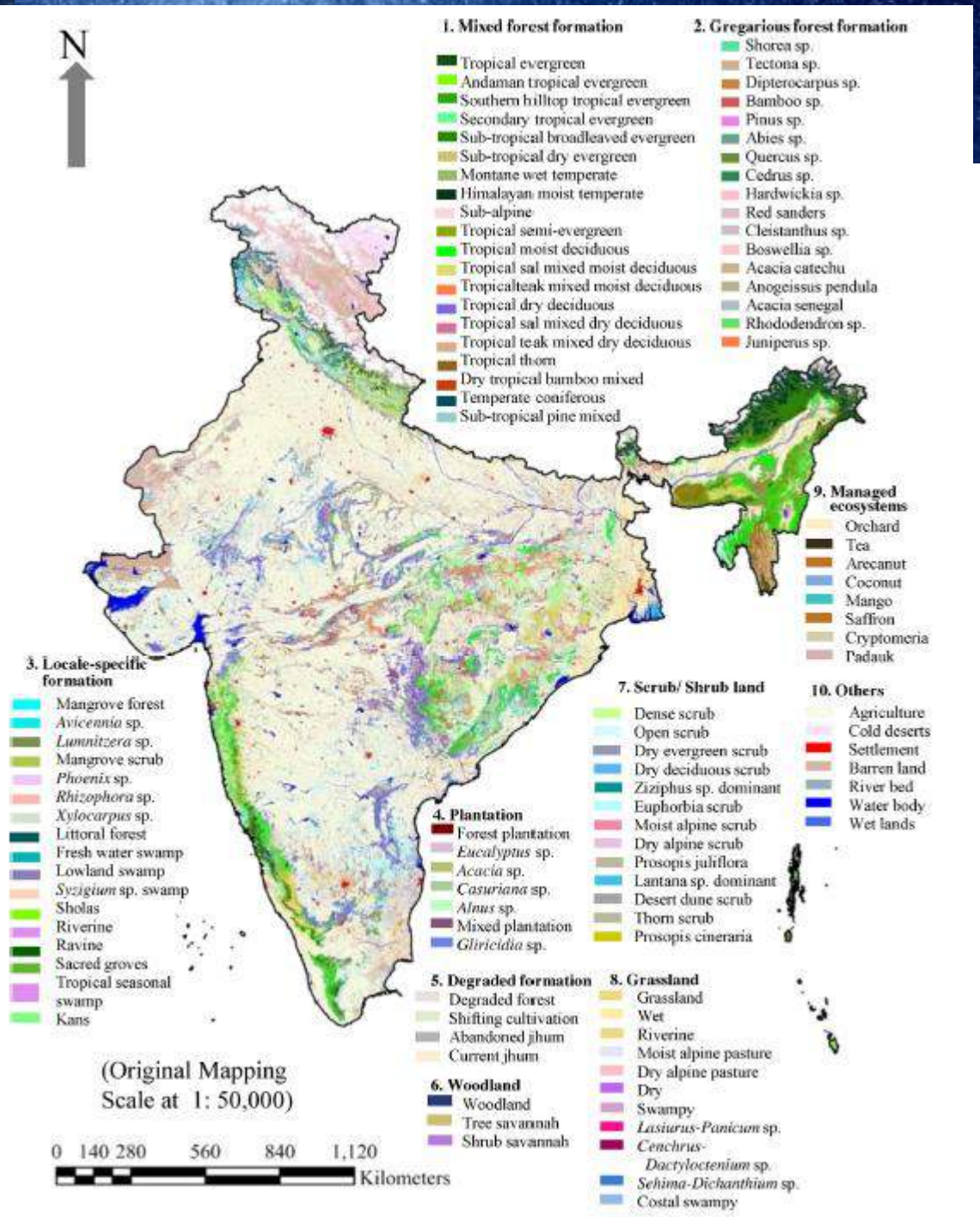
Vegetation type map of India

Source: P.S. Roy et al. / International Journal of Applied Earth Observation and Geoinformation 39 (2015) 142–159

The presenter is one of the co-authors

Such datasets are needed for planning **ecosystem based disaster risk reduction (EcoDRR) measures**



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United Nations International Conference on Space-based Technologies for Disaster Management – "A consolidating role in the implementation of the Sendai Framework on Disaster Risk Reduction: 2015-2030"

14-16 September 2015, Beijing, China

Outcomes from UN-SPIDER Conference 2015 on Priority 1 – Understanding the risk

- Build and enhance the **capacity for using Earth observation (EO)** data at all levels;
- promote a culture of **continuous risk assessment using EO** at the national and local levels;
- promote a culture of **sharing non-sensitive data** at all levels;
- **raise awareness among politicians** of the usefulness of Earth observation data in disaster risk reduction;
- enhance the **political will** of Governments at the highest level **to carry out risk assessments and promote the effective use of Earth observation data**;
- Government agencies should **include Earth observation technology in their disaster management strategies**, plans and policies, as those are further transformed into implementable actions.

The conference report is provided to the participants

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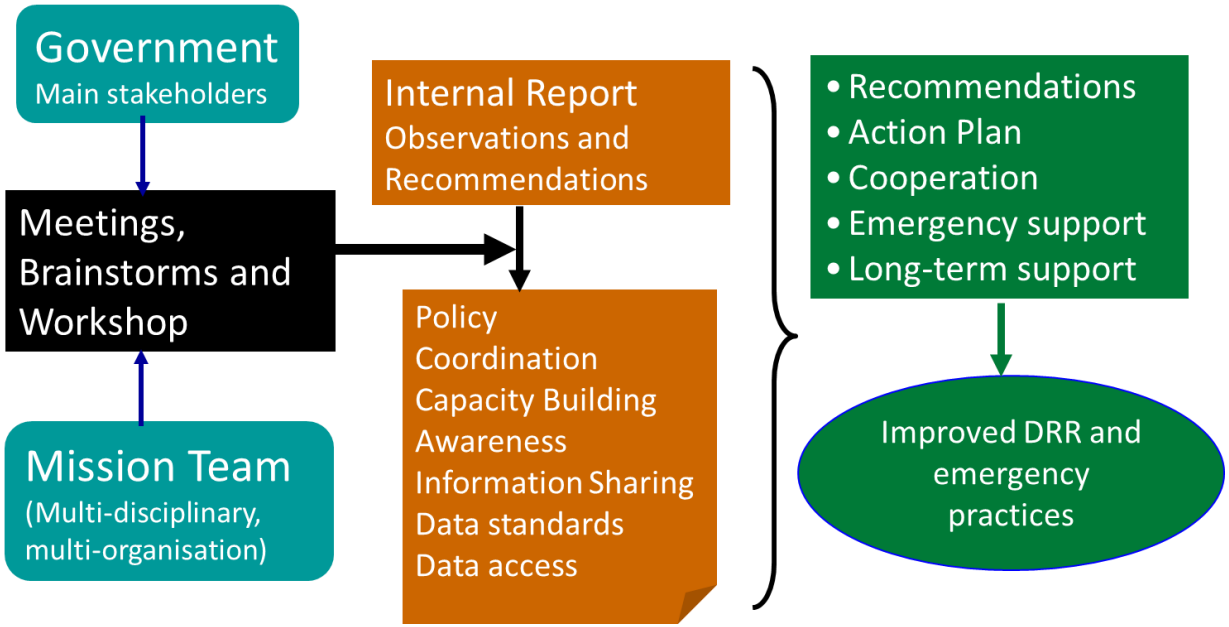
How UN-SPIDER contributes to Sendai Framework?

National Level

UN-SPIDER Technical Advisory Support addresses policy and coordinational level issues at all levels



- **Over 55 countries supported**
- **34 national Technical Advisory Missions (end 2016)**
- **Over 350 recommendations**
- **Support to implement key recommendations**

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UN-SPIDER Technical Advisory Missions and further follow up activities incorporates all relevant elements of Sendai Framework

- Building capabilities
- Strengthening national and regional institutions
- Promoting international cooperation
- Updating policies and coordination
- Raising awareness
- Improving information and data management practices

Myanmar

- 2012 – UN-SPIDER Technical Advisory Mission
- Key recommendation: Establishment of "Hazard Response and Operations Centre"
- Follow up programmes in 2012 & 2016
- Impact:
  - Emergency Operation Centre (EOC) established with "Remote Sensing Unit";
  - Trained personnel in remote sensing/GIS are available at EOC;
  - Disaster Management Training Centre conducts courses in remote sensing/GIS
  - NSDI and one map policy under consideration

Sri Lanka

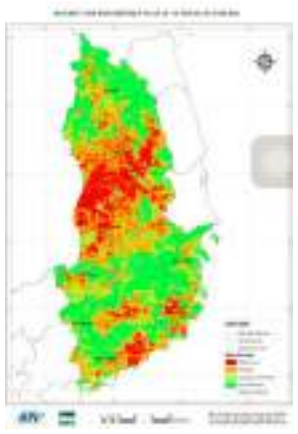
- 2011 – UN-SPIDER **Technical Advisory Mission** strongly recommended **NSDI**
- 2012 & 2014 – Follow up and capacity building activities
- 2013 – **Sri Lanka Spatial Data Infrastructure** (SL SDI) approved by the Cabinet of Ministers
- 2014 – SL SDI Road map prepared
- NSDI components – Data, Data supply, Data Access & Applications, Governance, Legal and Policy

UN-SPIDER Technical Advisory Mission, Sri Lanka

17 – 21 October 2011

Vietnam

- 2013 – UN-SPIDER offered Technical Advisory Mission
- 2014 – Follow up (Geospatially Enabling Communities Collaboration)
- 2015
  - Establishment of Geoinformatics Division at Disaster Management Centre
  - MoU with national and international satellite image providers
- 2016
  - SOP for use of earth observation images during emergency response
  - Data design framework



Disaster Management Centre is used satellite images For Drought Monitoring and other emergencies

How UN-SPIDER contributes to Sendai Framework?

Global/Regional Level

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UN-SPIDER @ AMCDRR

Asian Ministerial Conference on Disaster Risk Reduction (AMCDRR), New Delhi, India, 2-5 November 2016

Thematic Session: *Earth observation and geospatial information to support implementation of Sendai Framework*

Procedural Guidelines for utilization of Earth observation during emergencies – ASEAN efforts

- 1st Workshop: 15-16 April, Yogyakarta, Indonesia
- 2nd Workshop: 4-5 June 2015, Hangzhou, China
- 3rd Workshop/expert meeting: December 2015, Sriracha, Thailand
- **4th Workshop: April 2016, Bogor, Indonesia**

Outcomes

- ***Procedural Guidelines** for ASEAN countries to access Earth observation information during emergency response*
- *Promoting universal access to International Charter*

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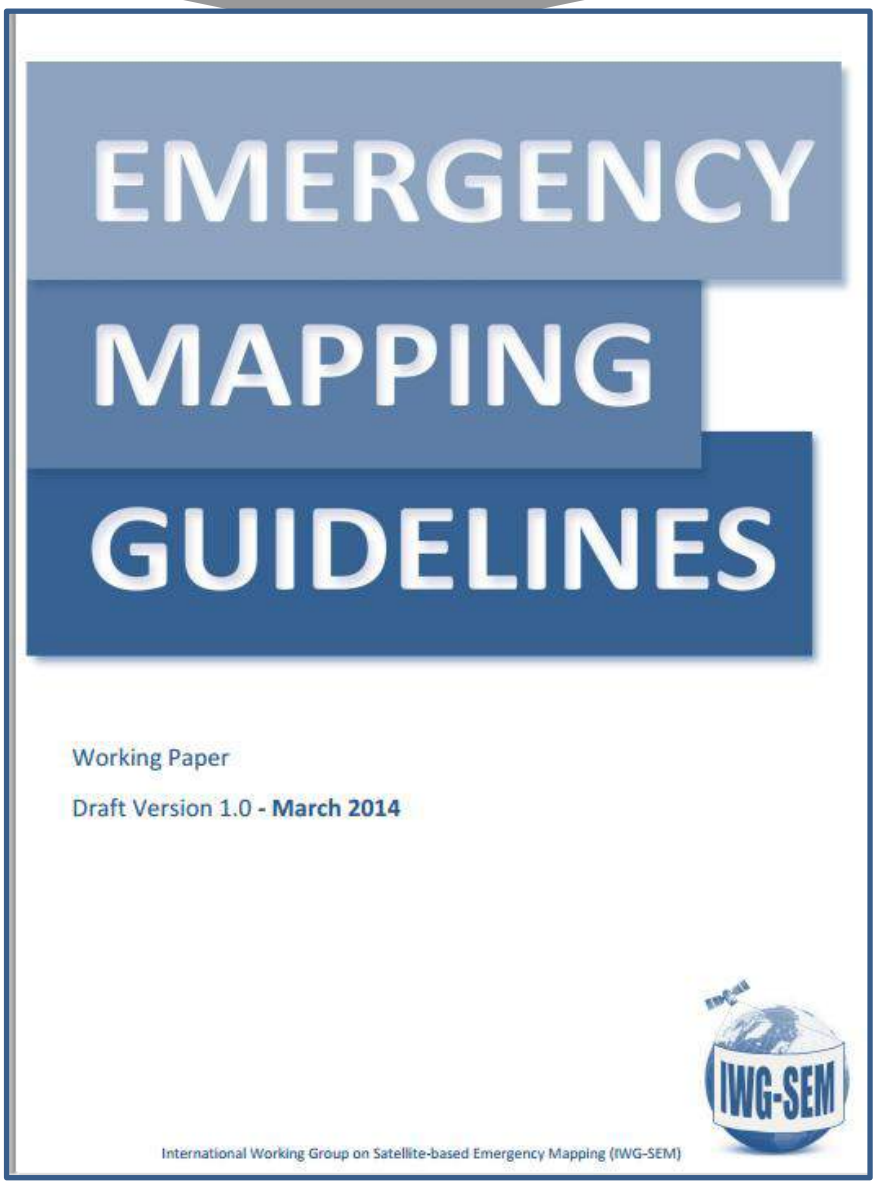

International Working Group on Satellite based Emergency Mapping (IWG-SEM)

IWG-SEM

www.un-spider.org

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Publications

www.un-spider.org

Training material

Flood risk assessment
Drought risk assessment
Earthquake damage assessment
Flood damage and loss assessment
Drought risk assessment
Emergency response mapping etc.

Links and resources

Data sources
GIS and remote sensing software
Training opportunities
Institutions

Recommended Practices

Flood Mapping
Flood Hazard Mapping
Drought monitoring using the Vegetation Condition Index (VCI)

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How to engage with UN-SPIDER

Next 5 years priority

- **Engage with UNISPACE+50 initiative of UNOOSA** that contributes to three global frameworks: SDGs, Sendai Framework and Climate Change Agreement
- **Plan national, regional and international activities** to promote use of Earth observation in risk mapping, early warning, preparing for emergencies etc.
- **Seek UN-SPIDER Technical Advisory Mission** to get support at national level
- **Develop joint follow up actions** after the Technical Advisory Mission
- **Develop projects with UN-SPIDER** to achieve specific actions recommended during the Technical Advisory Mission
- **Support Global Partnership on Earth Observation** to promote space in implementation of Sendai Framework


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