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UN-SPIDER Advisory Services with Focus on Drought Monitoring

From

United Nations Platform for Space-based Information for Disaster Management and Emergency Response
(UN-SPIDER)

Dr Shirish Ravan

shirish.ravan@un.org

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VISION

Bringing the
benefits of space to humankind

MISSION STATEMENT

to promote international cooperation
in the use of outer space
to achieve the sustainable development goals

Natural hazards trend – 2000-2019

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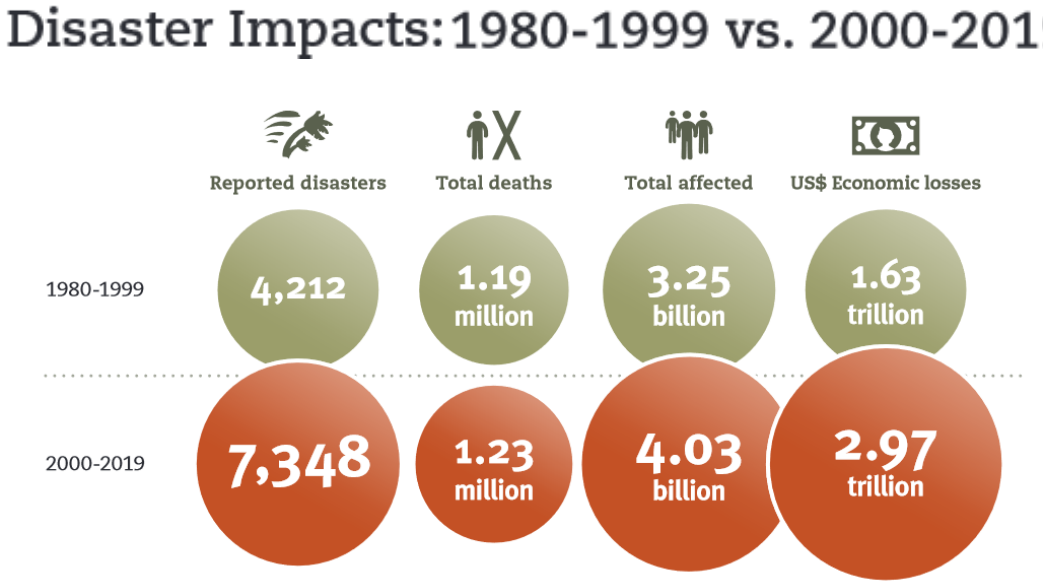
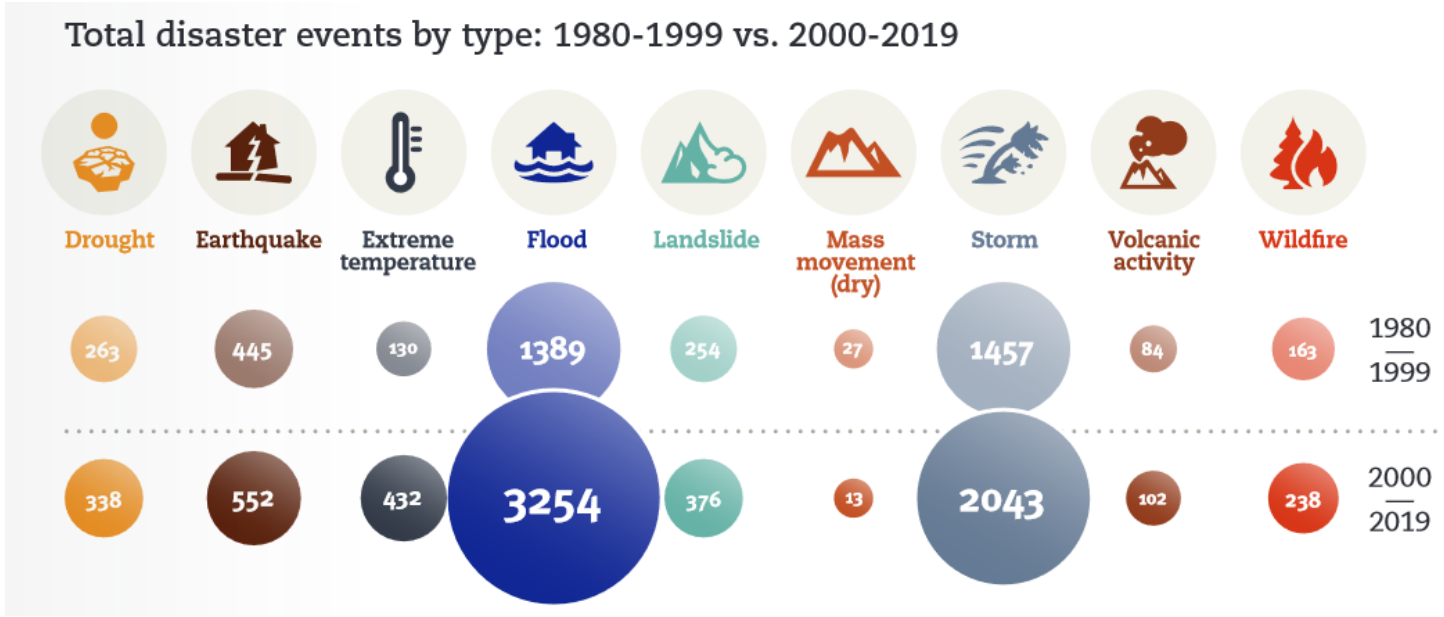


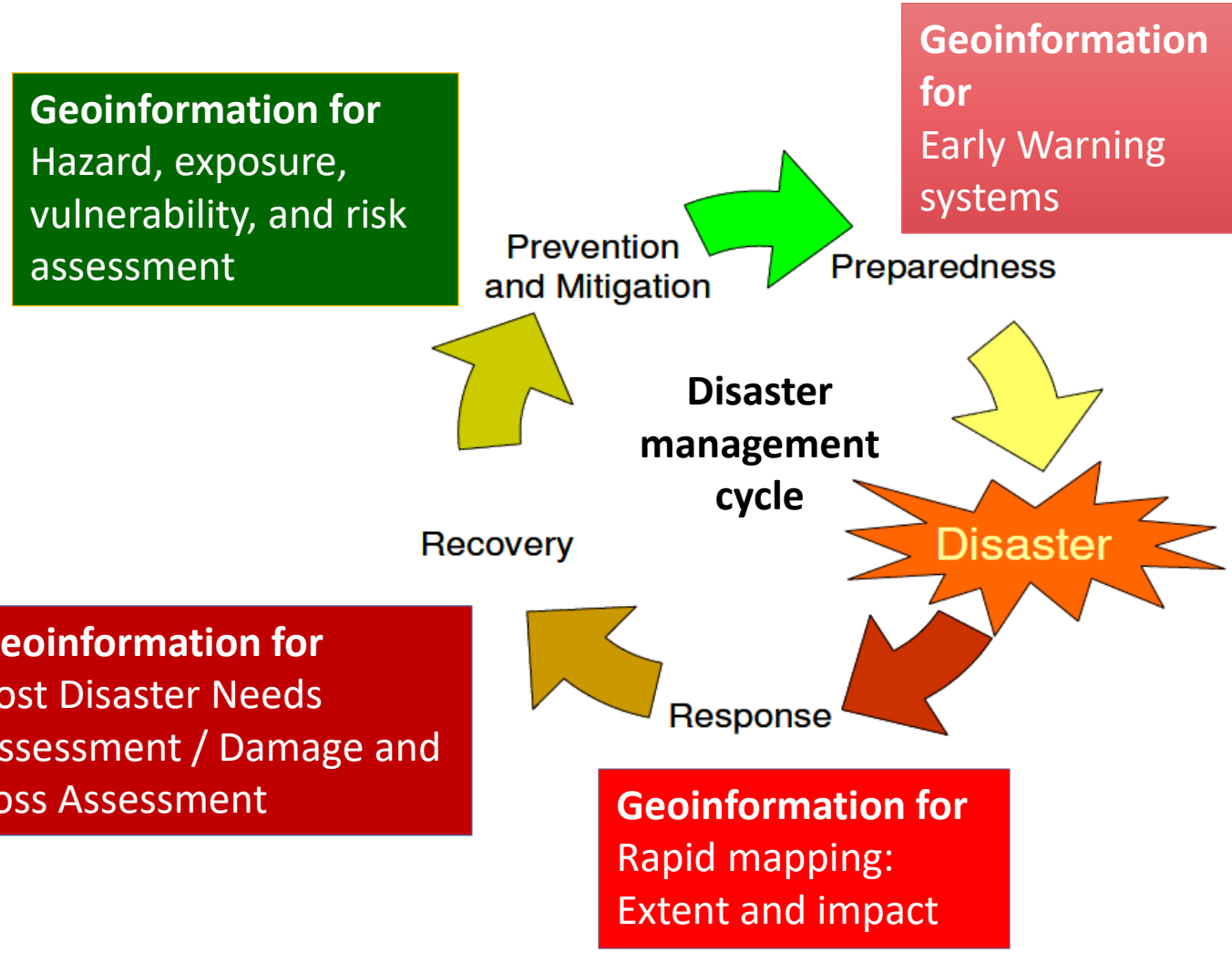


Source: UNDRR 2020 report: *The human cost of disasters: an overview of the last 20 years (2000-2019)*

United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER)

Ensure that all countries have access to and develop the capacity to use all types of space-based information to support the full disaster management cycle

United Nations Resolution 61/110, Dec. 2006



Space technologies for disaster Risk management

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Earth observation

Satellite meteorology

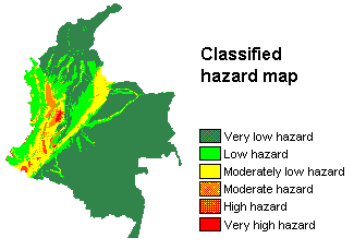
Global Navigation Satellite Systems (GNSS)

Satellite communication

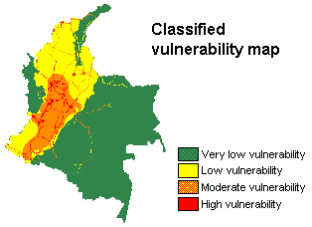
Global scale

Local scale

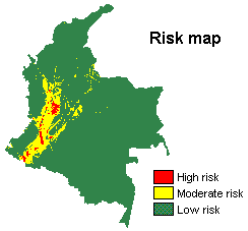
Life Saving Products



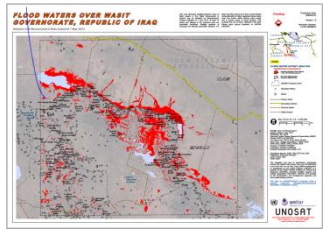
Hazard maps



Vulnerability maps



Risk maps



Response maps

Thematic areas of UN-SPIDER

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Knowledge Portal

The UN-SPIDER Knowledge Portal is a web-based tool for information, communication and process support

Fostering Cooperation

UN-SPIDER fosters alliances and creates forums where both space and disaster management communities can meet

Capacity Building

UN-SPIDER facilitates capacity building and institutional strengthening, including the development of curricula and an e-learning platform (e-SPIDER)

Advisory Support

UN-SPIDER provides support to countries in assessing national capacity and in evaluating disaster and risk reduction activities, policies and plans

Countries that received SPIDER missions since 2006

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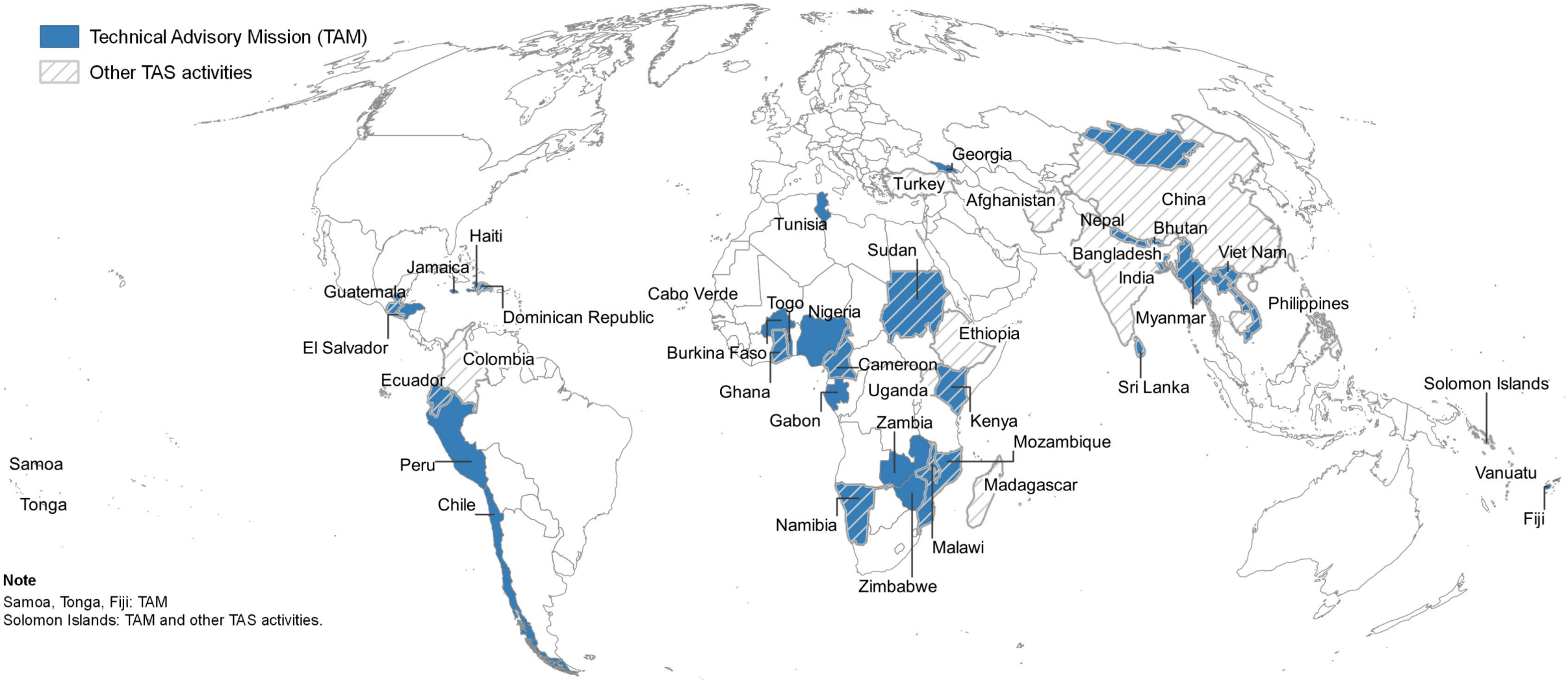

Note

Samoa, Tonga, Fiji: TAM
Solomon Islands: TAM and other TAS activities.

Opportunities

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Support through UN-SPIDER Network

UN-SPIDER Regional Support Offices

Achievements 2006-2020

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UN-SPIDER has served:

- About 100 missions (Technical Advisory Missions, Institutional Strengthening Missions, expert missions)
- About 55 countries with missions
- Over 40 technical advisory missions (TAM)
- Various countries with remote support, attendance at training workshops and conferences

Space technologies for Drought monitoring

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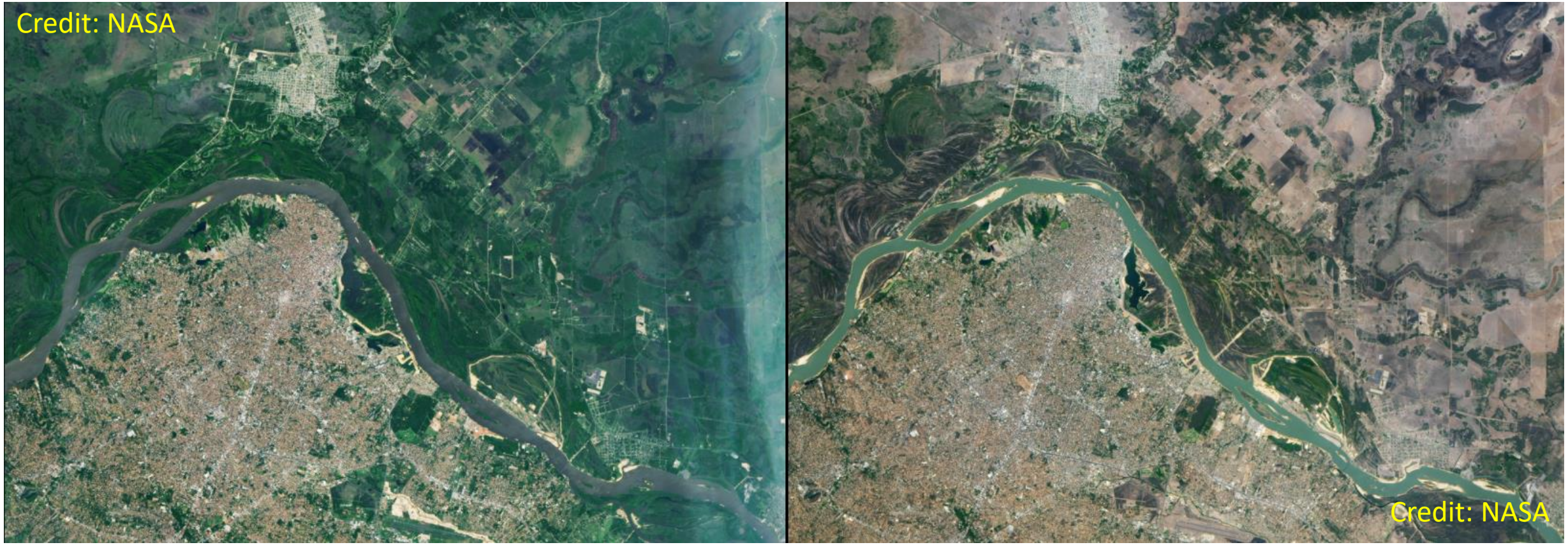
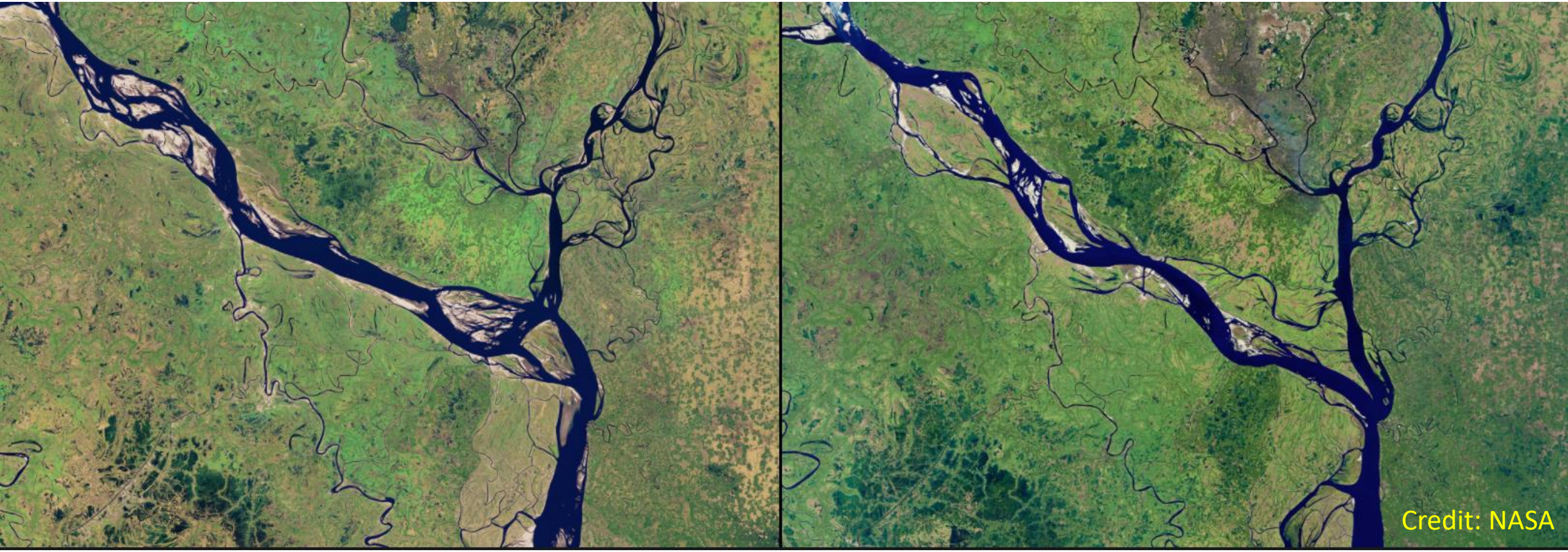


Earth observation

Satellite meteorology

Global Navigation Satellite Systems (GNSS)

Satellite communication



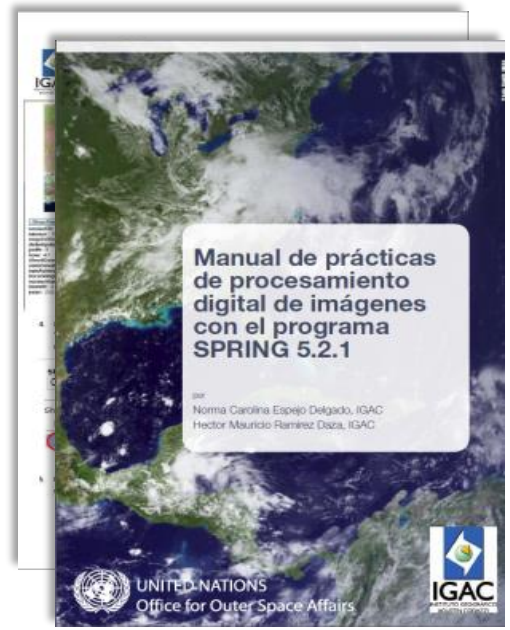
Changeable Padma river in Bangladesh, 2000-2008

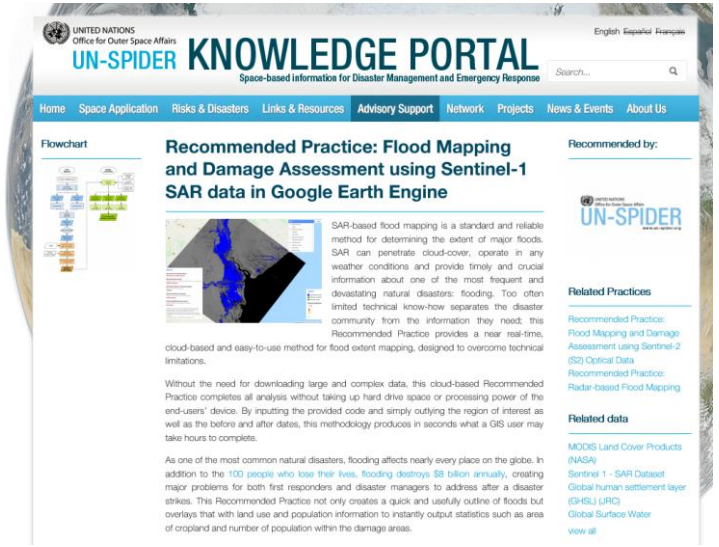
Assistance in building disaster resilience

- Policy-relevant advice during Technical Advisory Missions
- Incorporating space-based technologies in National DRR strategies
- Developing specific tools
- Providing access to Earth observation data

Capacity-building and institutional strengthening

- Training courses on the use of Earth observation in disaster management:
- Procedural guidelines
- Recommended Practices
- Massive open online courses





UN-SPIDER as Capacity Builder

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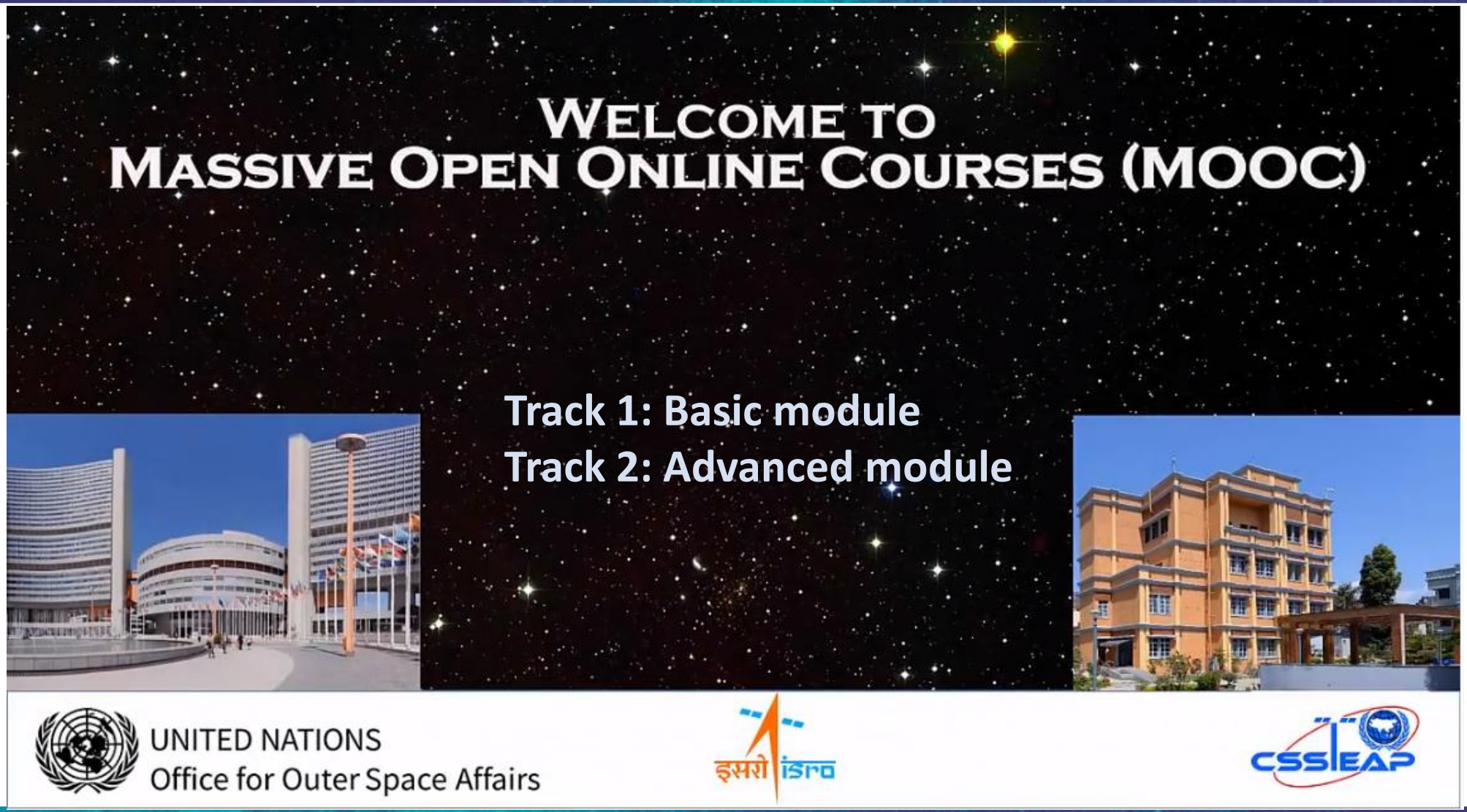
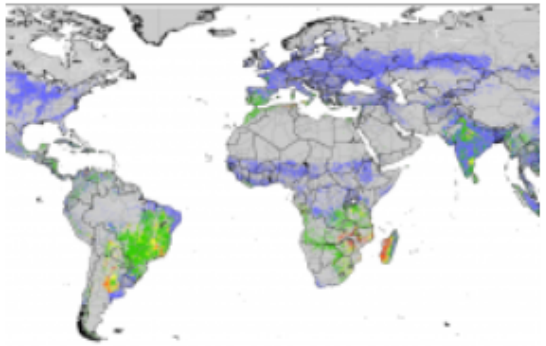


MOOC: Geospatial Applications for Disaster Risk Management

Sessions by experts from 16 organisations

1. United Nations Office for Outer Space Affairs (UNOOSA), Austria
2. Centre for Space Science and Technology Education for Asia and the Pacific (Affiliated
3. to the United Nations), India
4. UN Economic and Social Commission for Asia and the Pacific (ESCAP)
5. Indian Space Research Organization
6. German Aerospace Center (DLR)
7. Joint Research Centre, Italy
8. International Water Management Institute (IWMI), Sri Lanka
9. Delta State University, United States of America
10. University of Salzburg, Austria
11. Ruhr-University Bochum (RUB), Germany
12. Central Building Research Institute (CBRI), India
13. Maxar Technologies, Singapore
14. Indian Meteorological Department (IMD), India
15. Indonesian National Institute of Aeronautics and Space (LAPAN), Indonesia
16. Vasundharaa Geo Technologies, India

Data application of the month: Drought monitoring



Agricultural Stress Index (Image: FAO)

What is drought monitoring used for?

Droughts develop gradually; they are referred to as slow-onset natural hazards. Droughts often do not get any global attention until they trigger a famine or cause wildfires. Unfortunately, response to droughts is too often reactive in terms of crisis management. According to WMO droughts are by far the most damaging of all natural disasters because of their long-term socio-economic impacts. Early detection of droughts is important for managing emerging crop losses to prevent or mitigate possible related famines, and for dealing with increased fire risk. Satellite imagery helps to monitor precipitation, soil moisture, and vegetation health to support drought early warning systems. It is used to feed monthly drought bulletins and to issue warnings.

How are droughts monitored from Space?

Meteorological droughts are defined by rainfall deficiency over an extended period of time. Meteorological droughts can turn into **agricultural droughts**, which are characterized by a soil water deficiency and subsequent plant water stress and reduced yield. Agricultural droughts can then turn into **hydrological droughts**, which refer to deficiencies in surface and subsurface water supplies. The different drought definitions imply that several parameters are used to monitor drought: precipitation, temperature, evapotranspiration, soil moisture, and vegetation. These parameters can be observed from space.

Recommended practices on Drought

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Drought monitoring using the Standard Vegetation Index (SVI)

[Recommended Practice: Drought monitoring using the Standard Vegetation Index (SVI) | UN-SPIDER Knowledge Portal]

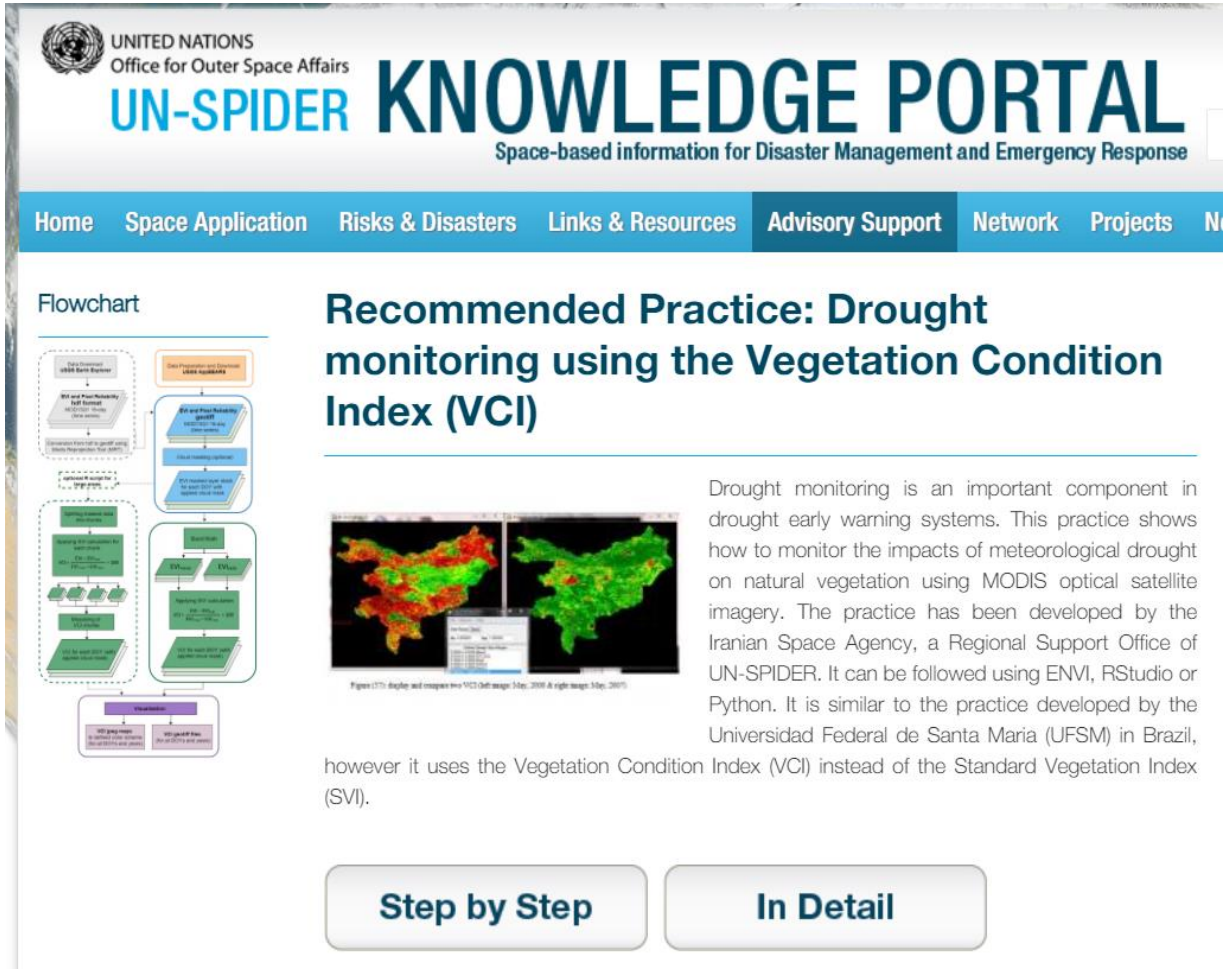
Drought monitoring using the Vegetation Condition Index (VCI)

[Recommended Practice: Drought monitoring using the Vegetation Condition Index (VCI) | UN-SPIDER Knowledge Portal]

Drought monitoring using the Standardized Precipitation Index (SPI)

[Recommended Practice: Drought monitoring using the Standardized Precipitation Index (SPI) | UN-SPIDER Knowledge Portal]

Google Earth Engine, R Studio, Envi software, and in the format of Jupyter notebooks



UN/Iran Workshop

Registration before: Sunday, August 1, 2021

https://un-spider.org/news-and-events/events/united-nationsislamic-republic-iran-workshop-space-technology-applications

Long-term training opportunities

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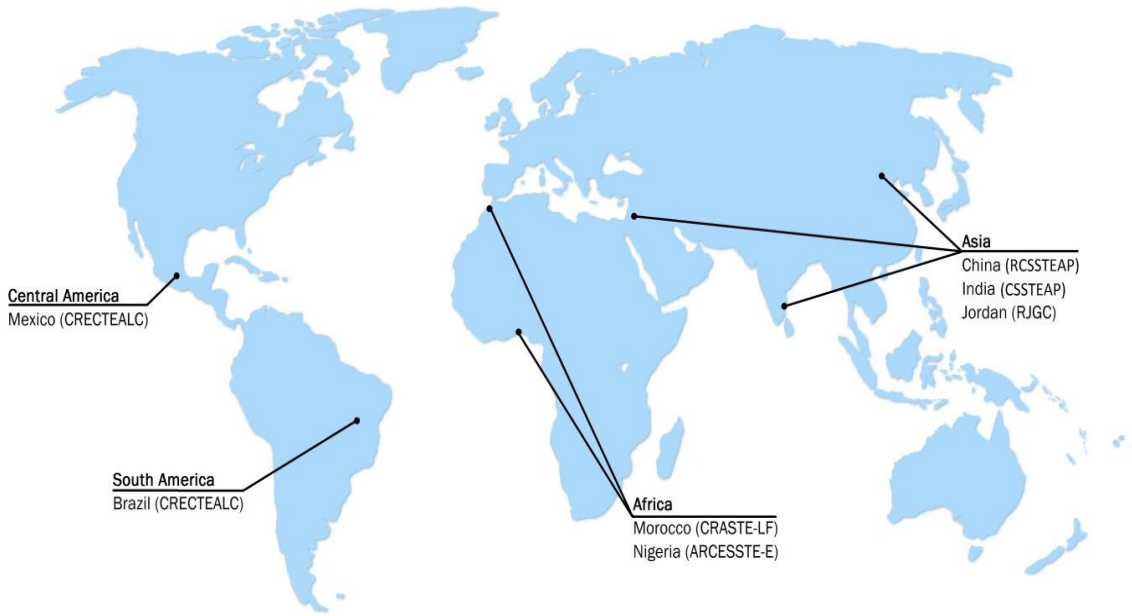
REGIONAL CENTRES FOR SPACE SCIENCE AND TECHNOLOGY EDUCATION (AFFILIATED TO THE UNITED NATIONS)



Post graduate diploma and master courses in

- Remote Sensing and GIS
- Satellite communication
- Satellite navigation
- Satellite meteorology
- Space law

Short course on specific themes

Financial support offered

Supporting emergency response

- Enabling the National Disaster Management Agencies
- Facilitate access to pre and post event earth observation images
- Rapid response mapping

UN-SPIDER Technical Advisory Mission to Armenia

27 June to 1 July 2022

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To assist Armenia in improving **Disaster Risk Management** & **Emergency Response** by effective utilization of the **space-based technologies and Geospatial Information**, thereby helping to achieve **Sustainable Development Goals (SDGs)**

UN-SPIDER Technical Advisory Mission to Armenia

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Programme

Meetings with the

Ministry of Emergency Situations
Ministry of Economy
United Nations in Armenia
Cadastre Committee
Ministry of Foreign Affairs
Ministry of Education, Science, Culture and Sports
Ministry of High Technological Industry
Space Museum
Ministry of Health
Ministry of Labor and Social Affairs
Ministry of Territorial Administration and Infrastructures
RA Police

Workshop

Briefing to the Key Stakeholders

What we observed

- Current strategies and policy framework related to DRR, Space and Geospatial Information
- Availability of Geospatial Information
- Current use of Space-based Technologies
- Institutional linkages and coordination
- Data Sharing practices
- Applications of Geospatial Information
- Existing capacity and needs
- Challenges and constraints

UN-SPIDER Technical Advisory Mission to Armenia

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Long-term engagement of UN-SPIDER with Armenia

- **Support to implement the Sendai Framework** for Disaster Risk Reduction & SDGs
- **Assist on strengthening Disaster Risk Management frameworks and formulating strategies at national/local level –** *Spatial Data Infrastructure or Geospatial policies/ Data sharing framework etc.*
- **Understand, Identify and map the disaster risks–** *Assist in providing access to Earth Observation data, methodology & expertise*
- **Timely assistance during emergency –** *Enable MOES to use the emergency response mechanisms*
- **Assist in capacity building of the Key Stakeholder Organisations –** *Customized training programmes for institutional strengthening*
- **Partner with the UN in and other agencies in Armenia** – *Strengthen ongoing efforts with space technology*

Sri Lanka: National Spatial Database Infrastructure (NSDI), Sendai Framework monitoring tool and support during emergencies

Staff of government agencies of Sri Lanka mobilised to UN-SPIDER events

2011	2012	2014	2017	2019	2020 - 2021
Technical Advisory Mission	Mission: Training activity	Mission: Training activity	National Spatial Database Infrastructure (NSDI) implemented in Sri Lanka DMC becomes an Authorized User of the Charter Mission: Training activity	Geospatial Dashboard to support Sendai Framework monitoring	Support to Sendai Framework monitoring continues, 2 officials to attend PG Diploma in Remote Sensing at CSSTEAP

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Thank you

shirish.ravan@un.org

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