

Phase-2 Massive Open Online Course (MOOC)

Geospatial Applications for Disaster Risk Management

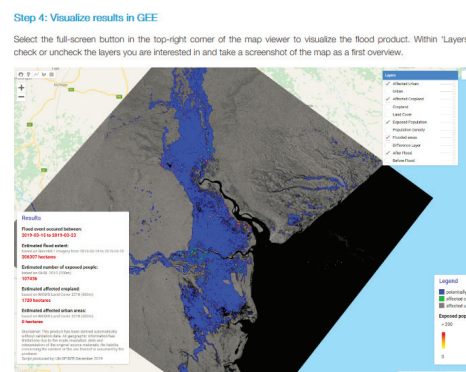
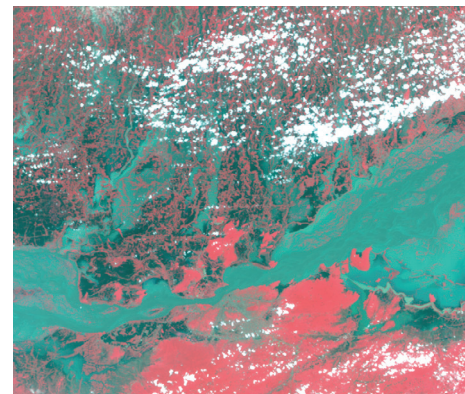


Fig. 12: Full-screen view of the results in Google Earth Engine map viewer.



Organized by



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Office for Outer Space Affairs

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Massive Open Online Course (MOOC)
On
Geospatial Applications for Disaster Risk Management Phase 2
(Registration opens June 1, 2021)

Learning objectives

During the challenging times of the COVID-19 outbreak, MOOCs are an effective way of reaching a large number of participants to share knowledge. The United Nations Office for Outer Space Affairs and the Centre for Space Science and Technology Education for Asia and the Pacific (Affiliated to the United Nations) launched a Massive Open Online Course (MOOC) on “Geospatial Applications for Disaster Risk Management” on 13th October, 2020 the International Day for Disaster Risk Reduction. The MOOC received an overwhelming response with registration from 29727 participants from as many as 148 countries. MOOC provided a free and flexible online training programme during pandemic time to everyone who wanted to enhance their capabilities related to the use of geospatial and Earth observation technologies in disaster risk management.

Based on the feedback and request for continuation of MOOC a second phase of MOOC is planned to be launched, with additional lectures and hands on session. The proposed Phase 2 of the MOOC registration will open on 01st June, 2021. MOOC aims to strengthen efforts of disaster management professionals to contribute to achieving the targets of the Sendai Framework for Disaster Risk Reduction 2015-2030, the 2030 Agenda for Sustainable Development and the Paris Agreement stemming from the 21st Conference of the Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC).

Target audience

Government officials and professionals, educators, university students and other stakeholders working in the field of disaster management.

Sessions by experts from the following organisations

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



Structure of the MOOC

The MOOC is structured in two tracks:

| Tracks | Track-1 (Basic Module) | Track-2 (Advanced Module) |
|---------------------------|--|--|
| Who Can attend | Professionals interested in enhancing awareness of the latest trends in disaster risk management and how geospatial and Earth observation technologies contribute to it. | Professionals interested in sharpening skills in use of geospatial and Earth observation technologies in all phases of disaster management. Track 1 is a prerequisite for participating in Track 2. |
| Track-1 to Track-2 | Candidates completing Track- can either leave the training programme or continue with Track-2 | Track-2 can only be undertaken if Track-1 is completed |
| Certification | Candidates completing Track 1 will receive a certificate for completing the Basic Module | Candidates completing the basic and advanced module will receive a certificate for the entire MOOC |
| Track Overview | Module 1: Overview of disaster risk management (DRM) and the relevance of geospatial technologies Module 2: Earth observation and disaster management | Module 3: Earth Observation and geospatial intelligence for disaster management Module 4: EO system and Hydro-meteorological disasters Module 5: EO system and geological disasters Module 6: EO system and environmental disasters |
| Assessment | Each Module ends with a Self Assessment. The completion of the Self Assessment allows participants to access other modules | |
| Language | All lectures and training materials will be in the English language | |

| | |
|-----------------------------|---|
| Registration Opening | Registration Opens: 01-June-2021 <ul style="list-style-type: none"> Participants will receive details on accessing the course content after registration. Registration closes on 15-August-2021 |
| MOOC Closing | MOOC closes midnight of 31-August-2021. |
| Duration | Track 1 and Track 2 training modules are of 12 hours duration each. With a flexible schedule, the MOOC can be completed anytime during the duration the course remains open. |
| Course Fee | Course is Free |

Opportunities for participants attending the MOOC

- Access to experiences of experts from institutions and practitioners around the world involved directly in DRR.
- Insight into international frameworks related to disaster management, sustainable development and climate change from organizations such as the United Nations Office for Outer Space Affairs (UNOOSA), and mechanisms like the International Charter “Space and Major Disasters”
- Unleash the potential of open datasets and tools needed for disaster risk management
- Access to the methodologies for effective utilization of space-based and other geospatial information for disaster risk reduction and emergency response

Course content

Track 1: Basic Module

Basic course suitable for non-experts (a person without professional or specialized knowledge of the subject)

This track aims at the imparting basic knowledge on disaster risk reduction, remote sensing and geospatial technologies with few assignments and targets. The participants need not have specific knowledge or expertise in the areas of disaster management, geospatial technologies or Earth observation to complete Track 1.

Remarks by Dr. Simonetta Di Pippo, Director, UNOOSA

Remarks by Dr. K. Sivan, Chairman, ISRO

Introduction to Track 1: Dr. Prakash Chauhan, Director, CSSTEAP

Module 1: Overview of Disaster Risk Management (DRM) and the Relevance of Geospatial Technologies

- Session 1: Overview of disasters, causes and impact – Dr. Sanjay Srivastava, United Nations Economic and Social Commission for Asia and the Pacific, Thailand
- Session 2: Concept of DRM, disaster management terminologies, methods and tools – Prof. Talbot Brooks, Delta State University, USA
- Session 3: International cooperation for promoting space technologies in disaster management – Dr. Shirish Ravan, United Nations Office for Outer Space Affairs, Austria
- *Module 1 Self Assessment*

Module 2: Earth observation and disaster management

- Session 4: Geospatial technologies to support disaster risk management – Dr. SP Aggarwal, Indian Institute of Remote Sensing, ISRO, India
- Session 5: Earth observation systems for disaster management – Dr. Valerie Graw, Ruhr-University Bochum (RUB)
- Session 6: National/regional disaster support systems/mechanisms
 - International Charter Space and Major Disasters: Jens Danzeglocke, German Aerospace Center
 - Supporting disaster management with satellite data - Example of the operational Copernicus service CEMS: Ms Annett Wania, Joint Research Centre, Italy
 - India Disaster Management System: Dr. P.V.N. Rao, National Remote Sensing Centre, ISRO, India
- **Module 2 Self Assessment**

Use cases

Case 1: Landslide hazard mapping –Dr. P.K. Champati Ray, Indian Institute of Remote Sensing, ISRO, India

Case 2: Flood hazard mapping – Mr. C.M. Bhatt, Indian Institute of Remote Sensing, ISRO, India

Case 3: Use of very high-resolution satellite images for post-disaster damage assessment – Mr. Abhineet Jain, MAXAR

Case 4: Case study on vulnerability assessment – Dr. Stefan Kienberger, University of Salzburg, Austria

Track 2: Advanced Module

Applications of earth observation and other space technologies in disaster management

The participants who have completed Track 1 successfully can access with Track 2, which is more technical and aims at developing skills of the participants in the use of Earth observation in assessing various disasters.

Introduction to Track 2: Dr. Shirish Ravan, United Nations Office for Outer Space Affairs

Module 3: Earth Observation and Geospatial Intelligence for Disaster Management

- Session 1: Fundamentals of remote sensing, Overview of EO systems and data availability – Ms. Shefali Agrawal, Indian Institute of Remote Sensing, ISRO, India
- Session 2: Geospatial intelligence for crisis management – Prof. Talbot Brooks, Delta State University, USA
- *Assignment: Open source Earth observation data and software (weblinks to UN-SPIDER Knowledge Portal, Copernicus Open Access Hub, etc.)*
- **Module 3 Self Assessment**

Module 4: EO system and Hydro-meteorological disasters

- Session 3: Flood mapping, monitoring and modelling – Dr. KHV Durga Rao, National Remote Sensing Centre, ISRO, India
- Session 4: Drought mapping, monitoring & forecasting – Dr. Giriraj Amarnath, International Water Management Institute, Sri Lanka
- Session 5*: Application of Space Technology for Cyclone Forecasting – Dr. M. Mohapatra, India Meteorological Department, India
- Hands-on*: Google Earth Engine based flood mapping using Sentinel-1 data - Mr. Advait Kulkarni, Vasundhara Geo Technologies, India

- *Assignment: Links to the recommended practices for flood and drought mapping (UN-SPIDER Knowledge Portal, IIRS)*
- **Module 4 Self Assessment**

Module 5: EO system and geological disasters

- Session 6: Landslides mapping and monitoring – Dr. D.P. Kanungo Central Building Research Institute, India
- Session 7: Earthquake-induced post-disaster damage assessment – Dr. P.K. Champati Ray, Indian Institute of Remote Sensing, ISRO, India
- Session 8*: Overview of the utilization of remote sensing in supporting disaster management due to volcanic eruptions (case study: Indonesia)– Fanny Aditya Putri, Indonesian National Institute of Aeronautics and Space (LAPAN), Indonesia
- *Assignment: Links to the recommended practices for landslide and earthquake damage assessment (UN-SPIDER Knowledge Portal, IIRS)*
- **Module 5 Self Assessment**

Module 6: EO system and environmental disasters

- Session 9: Forest degradation and forest fire monitoring and damage assessment – Dr. Arijit Roy, Indian Institute of Remote Sensing of ISRO
- Session 10: Land degradation and soil erosion assessment and monitoring – Dr Ajai, Space Applications Centre, ISRO, India
- Hands-on*: Google Earth Engine based burnt area mapping - Dr. Arijit Roy, Indian Institute of Remote Sensing of ISRO
- *Assignment: Links to the recommended practices for landslide and earthquake damage assessment (UN-SPIDER Knowledge Portal, IIRS)*
- **Module 6 Self Assessment**

* *New Sessions/Handson added in Phase-2*

General Information about MOOC

Registration:

ISRO LMS :<https://isat.iirs.gov.in/mooc.php>

System Requirements:

Minimum Browsers Requirements: Google Chrome 11, Firefox 4, Safari 5, Internet Explorer 8

Recommended Settings:

- ✓ Make sure that the browser is set to accept cookies
- ✓ JavaScript must be enabled

Course Coordinator and contact point: Mr. C.M.Bhatt, Centre for Space Science and Technology Education in Asia and the Pacific (CSSTEAP), Affiliated to the United Nations (Email:isat@iirs.gov.in)

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