UNITED NATIONS
Office for Outer Space Affairs

UN-SPIDER
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NEWSLETTER

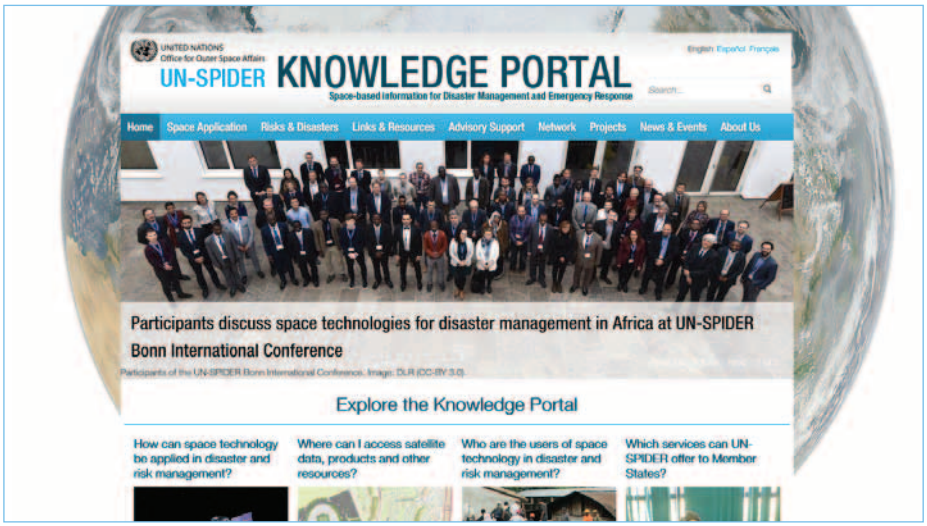
In Focus

UN-SPIDER Knowledge Portal

When assessing the risk of a potential disaster, or responding to the impacts of a disaster, access to data is key. Disaster risk managers and emergency responders face the challenges of identifying and accessing this data under extreme time pressure.

In this context, tools such as Earth observation data portals, cloud-based GIS applications and ready-to-use information products can provide essential insights and help practitioners all over the world access the data they need quickly. In many cases, however, identifying relevant resources and developing the capacity to use them remains a challenge.

The UN-SPIDER Knowledge Portal helps to address this issue by providing a gateway to access space-based data and information relevant for all phases of disaster management – from prevention and mitigation measures before a disaster to rehabilitation and recovery activities afterwards. The website, which attracts over 30,000 users a month, complements the technical advisory support that the UN-SPIDER programme offers to UN Member States. It also supports its work bringing together the disaster management and space communities all over the world to discuss needs and space-based solutions.



Frontpage of the UN-SPIDER Knowledge Portal, accessible at www.un-spider.org (© UNOOSA)

The Portal provides a wide range of content that visitors can explore through a number of parameters such as the type of natural hazards and phase of the disaster management cycle the content relates to. These filters help users quickly find relevant information. Through examples of hazard-specific applications, presented in the form of "Data Application of the Month", the Knowledge Portal shows how space-based information can support disaster management efforts.

Access to data or software is not enough to use space-based information in disaster management; users also need the capacity and skills to apply the resources available. Together with its Regional Support Offices and private sector partners, UN-SPIDER develops step-by-step procedures, so-called Recommended Practices, that outline all actions required for disaster management professionals to create space-based information products such as flood and drought maps. The procedures include detailed instructions for downloading, processing and visualizing space-based data. Through the Recommended Practices, the programme helps turn data into knowledge and insights that can inform decision making. The Practices are also used during in-person training courses that UN-SPIDER conducts at the request of Member States.

This edition of the newsletter provides a closer look at the Knowledge Portal and its resources.

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Learn about the potential of space-based information for disaster and disaster risk management

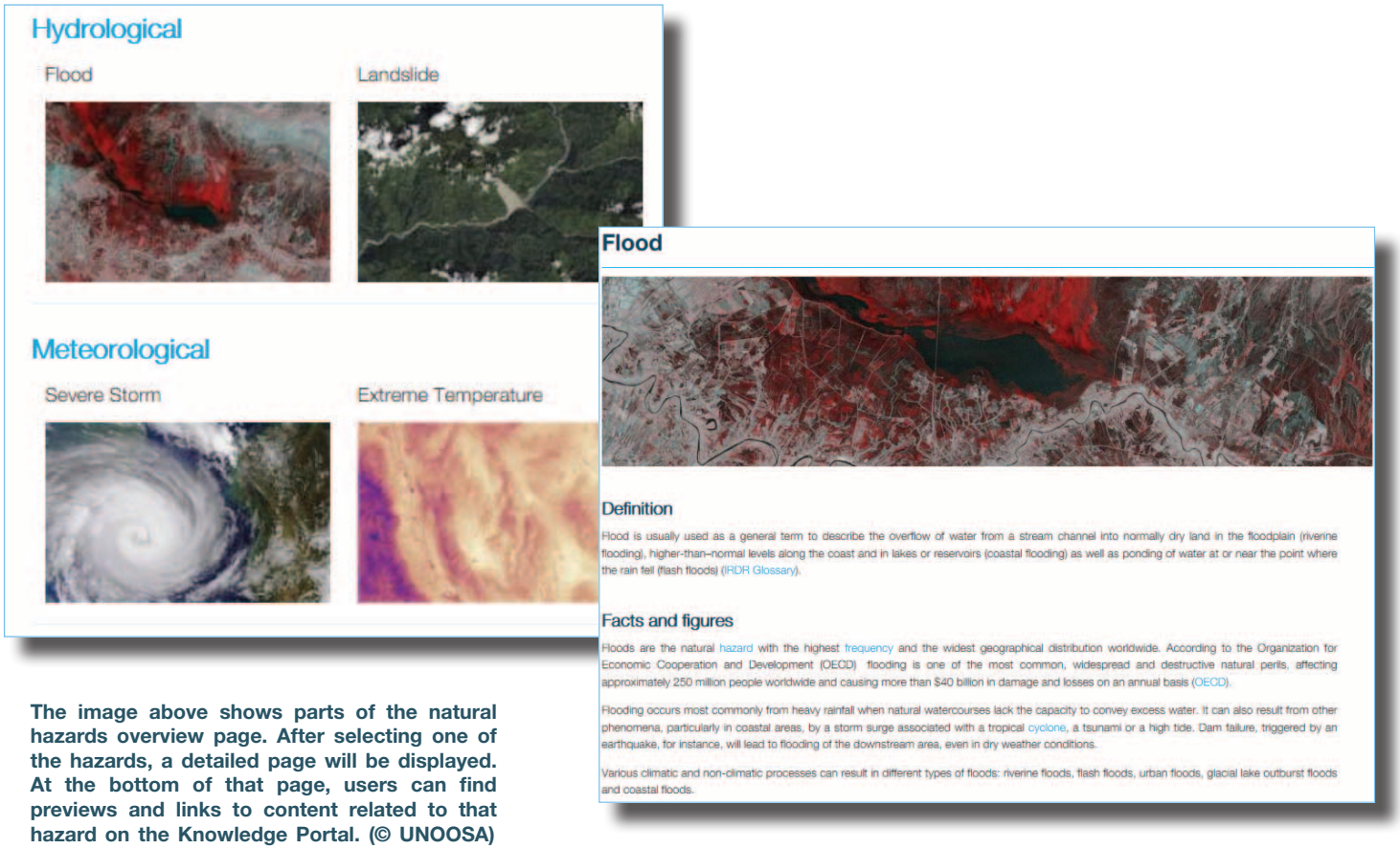
The UN-SPIDER programme targets end-users and decision makers of the disaster management communities as well as representatives of the space community. Our goal is to raise awareness among all stakeholders about the potential of space technologies in all phases of disaster management. The Knowledge Portal offers entry points to explore how space-based information can be used in disaster management, through examples and relevant material.

Our News section (un-spider.org/news-and-events/news) provides a broad overview of the activities of the space and disaster management communities. It features new datasets, applications, information products, projects, studies, satellite launches and disaster trends.

Our Events section (un-spider.org/news-and-events/events) features a regularly-updated events calendar with conferences, workshops and other meetings.

Our background information pages on Space Applications (un-spider.org/space-application) introduce space-based information for disaster management. For example, the Satellite Technology section (un-spider.org/space-application/satellite-technology) provides an overview of satellite missions relevant for disaster management applications and explains how they can help address specific hazards.

To strengthen mutual understanding among target communities, the Knowledge Portal also features background information on Disaster and Disaster Risk Management (un-spider.org/risks-and-disasters) efforts, including on the Sendai Framework for Disaster Risk Reduction 2015-2030. Users can learn more about the characteristics of a wide range of natural hazards (un-spider.org/risks-and-disasters/natural-hazards) on dedicated pages that provide definitions as well as facts and figures about floods, droughts, forest fires and other natural hazards around the world. The pages also act as one of several entry points to content on the Knowledge Portal, as they allow users to discover news articles, data sources and other items filtering by the hazard they relate to.



The image above shows parts of the natural hazards overview page. After selecting one of the hazards, a detailed page will be displayed. At the bottom of that page, users can find previews and links to content related to that hazard on the Knowledge Portal. (© UNOOSA)

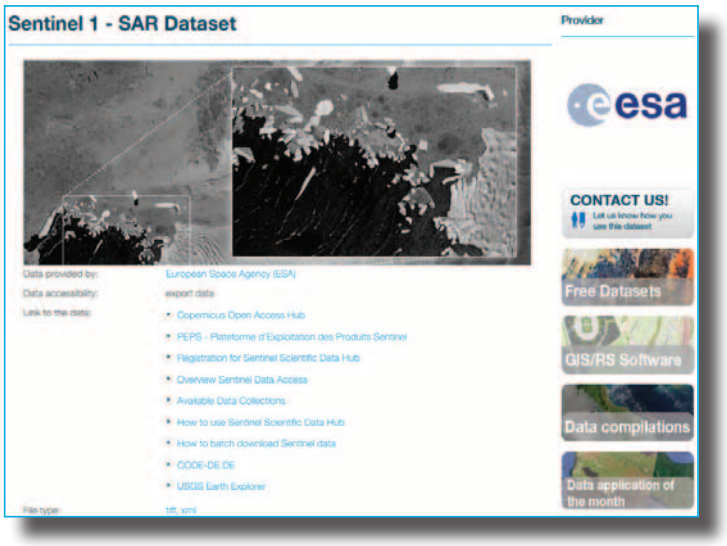
Explore examples of the application of space-based data

To highlight areas where space-based information is used to support disaster management efforts, the UN-SPIDER team regularly compiles an overview of relevant applications. The Data Application of the Month provides background information on specific hazards and how they can be monitored from space, in addition to links to related data sets, information products and references for further reading. They also cover examples of applications based on Earth observation and remote sensing data that indirectly support disaster management efforts such as digital elevation models and population and settlement information.

Data Application of the Month overview page. (© UNOOSA)

Data Application of the Month on harmful algal blooms. (© UNOOSA)

Find data sources and software



Example of a data source included in the data sources database (© UNOOSA)

An effective use of space-based information in all phases of the disaster management cycle requires access to relevant data and software as well as knowledge of relevant methods. When data is accessible and the capacity to use it is there, national or international organizations can create space-based information products tailored to their individual needs and conditions. To support users in finding data that is relevant to them and tools to process it, the Knowledge Portal hosts databases of Data Sources (un-spider.org/links-and-resources/data-sources) and GIS and Remote Sensing Software (un-spider.org/links-and-resources/gis-rs-software). Both can be searched using criteria such as relevant disaster cycle phase, spatial and temporal coverage, data type and costs. Most entries are free and open data sources and software solutions that interested users can easily use.

Turn data into knowledge

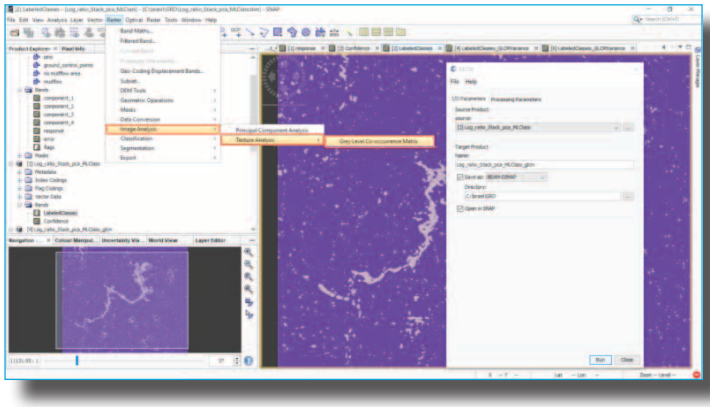
When using space technologies in disaster risk management and emergency response activities, access to space-based data and software is not all that is necessary. One also needs workflows for obtaining and processing satellite imagery to analyse a wide range of natural hazards.

For this reason, UN-SPIDER is joining efforts with its partners to provide step-by-step procedures - the UN-SPIDER Recommended Practices - that have proven effective to assess natural hazards such as floods, drought, landslides and forest fires.

Participants during a training course on the UN-SPIDER Recommended Practice on Burn Severity Mapping, conducted by the Geographic Institute Agustín Codazzi (IGAC) of Colombia, a UN-SPIDER Regional Support Office. (© UNOOSA)

The Recommended Practices cover all phases of disaster management, from mitigation and preparedness (for example in the form of flood hazard assessment procedures) to response and relief operations (for example in the form of flood extent and damage assessment procedures).

UN-SPIDER Recommended Practice on Flood Mapping and Damage Assessment Using Sentinel-2 Optical Data, developed by the Pakistan Space and Upper Atmosphere Research Commission, a UN-SPIDER Regional Support Office. (© UNOOSA)



UN-SPIDER Recommended Practice on Burn Severity Mapping following forest fires. The procedures was initially developed by the programme, and further improved and translated into Spanish by IGAC of Colombia. (© UNOOSA)

Recommended Practices (un-spider.org/advisory-support/recommended-practices) make use of data from different satellites and sensors, for instance Landsat 8 and Sentinel-1, and take users through every step required to develop insightful information products, including data preparation, processing and assessing the results.

To ensure that as many users as possible can benefit from these procedures, UN-SPIDER provides them in a growing variety of desktop and web GIS software packages and programming languages such as QGIS, Google Earth Engine, R and Python.

As part of its technical advisory support, and together with its Regional Support Offices, UN-SPIDER regularly trains civil protection agencies and other stakeholders in developing countries in using the Recommended Practices.

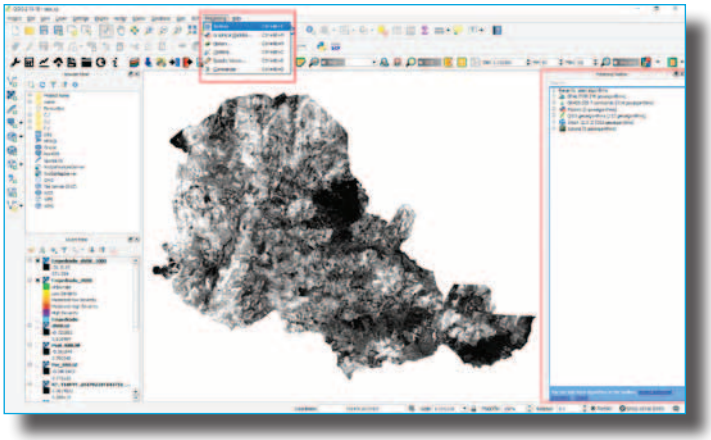


Image of a data processing step in the UN-SPIDER Recommended Practice on Burn Severity Mapping. Recommended Practices include detailed step-by-step instructions along with annotated screenshots for QGIS, R-Studio, Google Earth Engine and other software solutions. (© UNOOSA)

Access selected content in French and Spanish

To raise awareness about the benefits of space-based information for disaster management beyond the English-speaking community, many pages on the Knowledge Portal have been translated into French (www.un-spider.org/fr) and Spanish (www.un-spider.org/es). These include, among others, background pages on space technologies, emergency support mechanisms, disaster and disaster risk management, the Sendai Framework for Disaster Risk Reduction 2015-2030, as well as Recommended Practices on mapping floods, drought and burn severity following forest fires.

French version of the UN-SPIDER Recommended Practice on Flood Mapping. (© UNOOSA)

Spanish version of the UN-SPIDER Recommended Practice on Burn Severity Mapping. (© UNOOSA)

Discover UN-SPIDER Technical Advisory Support activities

Upon the request of Member States, UN-SPIDER carries out Technical Advisory Support missions with a team of experts to a host institution in the requesting country. The goal is to assess the existing national capacity to access and to use space-based information and identify constraints and gaps. This support can take the form of a series of meetings, a workshop or a training, depending on the needs and scope of the request. Reports, results and recommendations from the missions are accessible on the Advisory Missions section (un-spider.org/advisory-missions) of the Knowledge Portal.

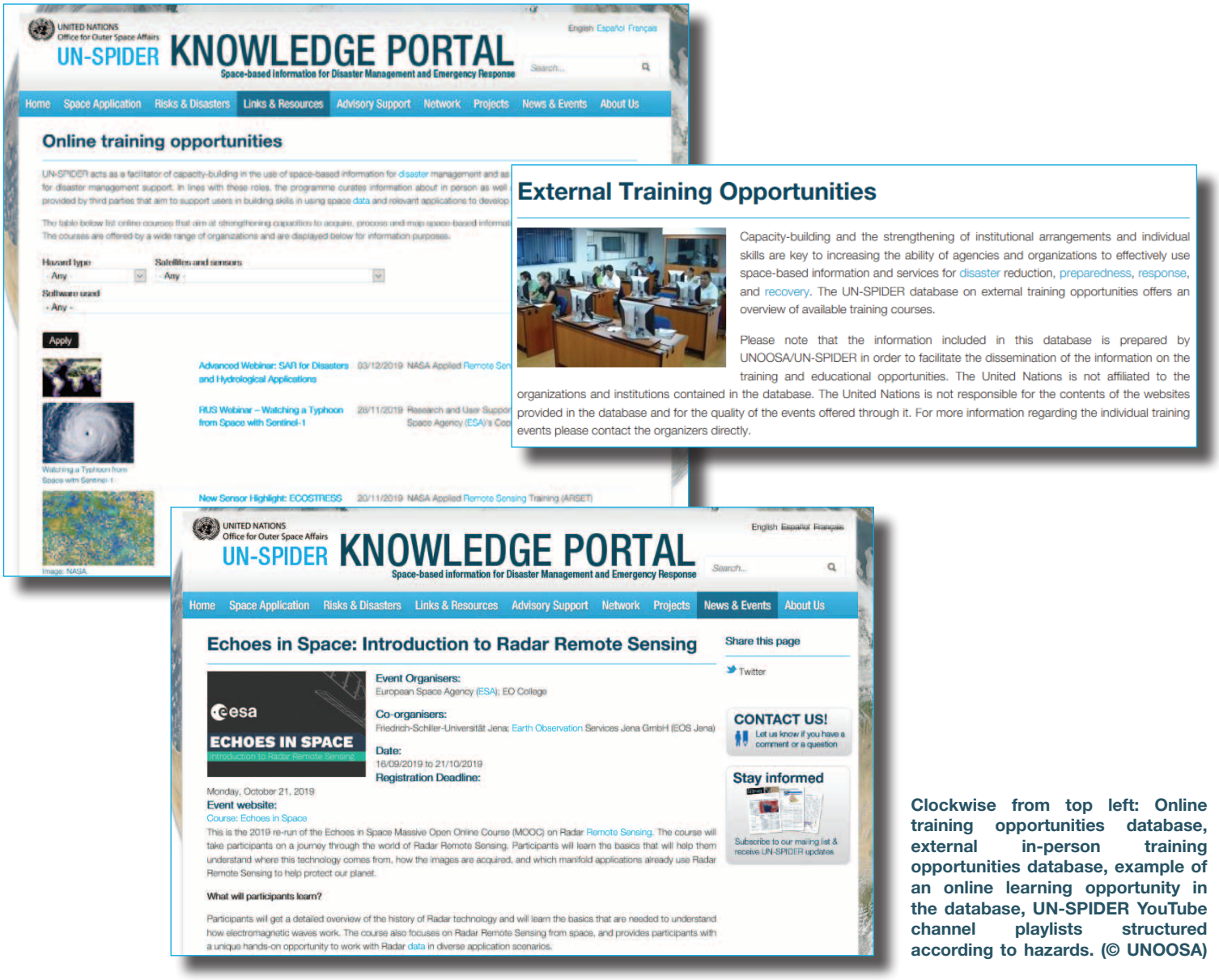
When it comes to using space-based data in disaster management, the needs identified through advisory support activities include:

- **Policies** to incorporate the use of all types of information, including the ones derived from satellite applications
- **Spatial Data Infrastructures** (SDIs) to enhance the capacity of government institutions to exchange and re-use data quickly
- Specialized **training activities** to prepare stakeholders to assess the geographical extent of disasters and their impacts more precisely using remote sensing applications
- Access to data and products provided by **international emergency mechanisms** set up by the space community such as the International Charter “Space and Major Disasters”

Identify learning opportunities

UN-SPIDER also curates lists of in-person training (un-spider.org/links-and-resources/trainingopportunities) and online learning opportunities (un-spider.org/links-and-resources/online-training-opportunities) organized by third parties. These help disaster managers and other relevant professionals find resources to strengthen their skills.

These opportunities can be searched on the Knowledge Portal by the hazard they cover or software they use. They include short-term courses, workshops and academic programmes, along with consistently updated offers of webinars, Massive Open Online Courses (MOOCs) and a range of other digital learning formats. Hazard-specific lists of videos, curated on the UN-SPIDER YouTube channel, also help explore relevant material.



Clockwise from top left: Online training opportunities database, external in-person training opportunities database, example of an online learning opportunity in the database, UN-SPIDER YouTube channel playlists structured according to hazards. (© UNOOSA)

UNITED NATIONS

The United Nations Office for Outer Space Affairs (UNOOSA) implements the decisions of the General Assembly and of the Committee on the Peaceful Uses of Outer Space and its two Subcommittees, the Scientific and Technical Subcommittee and the Legal Subcommittee. The Office is responsible for promoting international cooperation in the peaceful uses of outer space, and assisting developing countries in using space science and technology. In resolution 61/110 of 14 December 2006 the United Nations General Assembly agreed to establish the "United Nations Platform for Space-based Information for Disaster Management and Emergency Response - UN-SPIDER" as a programme to be implemented by UNOOSA. UN-SPIDER is the first programme of its kind to focus on the need to ensure access to and use of space-based solutions during all phases of the disaster management cycle, including the risk reduction phase which will significantly contribute to the reduction in the loss of lives and property.
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