



## NEWSLETTER

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### In Focus

## Networking on a global scale: UN-SPIDER's Regional Support Offices

Any organization that wants to make a change on a global level needs a global network to support it, because no single actor possesses the whole set of required skills. Since its establishment in 2006, UN-SPIDER has therefore devoted considerable efforts to building its network of Regional Support Offices (RSOs). 16 RSOs in Latin America and the Caribbean, Africa, Asia and Eastern Europe are currently cooperating with the programme.

This network of RSOs is quite diverse. Some RSOs are national agencies, including space agencies, civil protection agencies, national geographic institutes or national research facilities or universities. Others are regional



Participants of the fifth Regional Support Offices meeting in Vienna in March 2014

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organizations working on remote sensing applications, disaster risk management, regional development or emergency response. All RSOs have notable experience in the use of space technologies for disaster risk reduction and emergency response.

The network of RSOs works in close collaboration with staff in the three UN-SPIDER offices of Beijing, Bonn and Vienna. Furthermore, UN-SPIDER regularly organises Regional Support Office meetings, where the experts can exchange experiences and develop new projects.

Joint activities are cross-cutting in UN-SPIDER's pillars of work: Technical Advisory Missions, training activities and other capacity building measures, ad-hoc emergency support, and bridging knowledge gaps in the use of space technologies in disaster risk reduction or emergency response. For

example, the RSOs use their expertise to develop tailor-made training material and to conduct one-week training courses with the aim of strengthening the skills of staff in Government agencies on the use of specific software applications to process satellite imagery.

This newsletter informs on the critical support the network of RSOs provides to UN-SPIDER's programme of work. It describes how the members of the network contribute with experience, knowledge and resources to UN-SPIDER's various activities. The newsletter also presents different examples of how Regional Support Offices in Central America, Eastern Europe, the Hindu Kush Himalaya region and Eastern Africa have contributed to UN-SPIDER's goal to help countries make more efficient use of satellite technologies.

## Xavier Rodriguez, Dominican Republic: The inter-institutional group EIGEO and the role of UN-SPIDER's RSOs



### How was EIGEO set up and what is its role in the Dominican Republic?

In January 2010, UN-SPIDER conducted a Technical Advisory Mission to the Dominican Republic, just two weeks after the tragic Haiti earthquake. One of the key recommendations made to the Government of the Dominican Republic was the establishment of an inter-institutional group, which should focus on the processing of satellite imagery to generate relevant space-based information for disaster-risk reduction and emergency response. In November 2011, a first inter-institutional workshop was held. On 4 March 2014, 14 Ministers, Directors and Heads of Government ministries and agencies and of the University of Santo Domingo signed a Memorandum of Understanding officially establishing EIGEO.

EIGEO is composed of professionals from Government agencies and universities. The team meets on a monthly basis to work on a set of defined activities. The workplan includes tasks such as the generation of data and information to contribute to the National Integrated Information System on Risks and Disasters. In addition, EIGEO has established a platform to host a database of layers of data and information provided by a variety of institutions. Currently, EIGEO is approaching several Govern-

Mr Xavier Rodriguez has been working for the Civil Defence of the Dominican Republic since 2007. He coordinates the efforts of the Inter-Institutional Team on Geospatial Information for Disaster-Risk Management and Emergency Response (EIGEO). He is also the focal point with UN-SPIDER on behalf of the National Emergency Commission of the Dominican Republic and has been representing EIGEO in conferences and expert meetings organised by UN-SPIDER. In our interview, Mr Rodriguez explains how EIGEO works and how UN-SPIDER's Regional Support Offices (RSOs) CATHALAC (Panama), IGAC (Colombia), and CONAE (Argentina) support the activities of the group.

ment agencies to include additional layers of data in this database.

### What are some examples of the activities of EIGEO?

With the support of a volunteer from the Australian Volunteers for International Development (AVID), the EIGEO team developed a training manual on the use of the Quantum GIS software and conducted a training course targeting several Government agencies. In addition, the EIGEO team was very active in a recent hurricane simulation organised by the Science, Technology and Experimentation Division of the United States Southern Command in July 2014. The role of the EIGEO team was to contribute to the testing of the GeoSHAPE tool developed by this Division in the context of the National Emergency Operations Center of the Dominican Republic. This activity was coordinated by UN-SPIDER.

### How does EIGEO benefit from UN-SPIDER's RSOs in the region?

In my view, the RSOs have contributed substantially to the institutionalization of the use of space-based information in the Dominican Republic in several ways.

For example, the initial Technical Advisory Mission in January 2010 benefited from the support of CATHALAC. The inter-institutional workshop carried out in November 2011 benefited from the participation of experts from CATHALAC and IGAC.

In 2013 and 2014, the RSOs took an

active role in training the members of EIGEO. In May 2013, experts from IGAC, CATHALAC and UN-SPIDER joined forces to conduct a training course on the use of remote sensing applications in the case of floods. Subsequently, in March 2014, CONAE carried out a virtual course on the use of radar imagery in case of floods.

In addition, CATHALAC has provided EIGEO member agencies with satellite imagery covering the whole territory of the Dominican Republic and IGAC has offered virtual training courses on the use of GIS software.

### Which future activities are planned with UN-SPIDER's RSOs?

The EIGEO team has been tasked by the Government to coordinate the National Integrated Information System on Risks and Disasters. In addition, EIGEO will play a role in the Center of Excellence that the Government is setting up as part of the HOPE FOR Initiative, which was launched a few years ago by the Dominican Republic, Qatar and Turkey. As a way to carry out these tasks and to generate relevant information, we would welcome the advice of UN-SPIDER and its capacity to mobilise CATHALAC, CONAE, IGAC and other institutions, so that the EIGEO team may be able to fulfil this task on behalf of the institutions that compose it. The EIGEO team is looking forward to subsequent activities with UN-SPIDER and its RSOs here in the Dominican Republic and abroad.



# Sharing experience: recommended practices on the use of space technologies for disaster risk management

UN-SPIDER aims to bridge the gap between science and practice by promoting useful and operational methodologies on the use of space technologies for disaster risk management. Since 2012, UN-SPIDER and its Regional Support Offices (RSOs) have been working on the elaboration of recommended practices according to defined context-specific user requirements and information needs for the full disaster management cycle.

The practices consider scientific and technological aspects, but also take into account human and financial resource constraints. The recommended practices do not necessarily include the most complex and latest scientific approaches but are rather sound methodologies that users with a remote sensing background can quite easily replicate in their own settings with little resources.

The recommended practices are intuitively accessible in a user-friendly way on the UN-SPIDER Knowledge Portal. They are structured into three parts: 1) detailed step-by-step tutorials; 2) an overview on the applicability, strengths

and weaknesses; and 3) more in-depth information on the background of the methodology.

One of the first recommended practices published is dealing with flood mapping using Synthetic Aperture Radar (SAR) data. It was elaborated by the Ukrainian RSO hosted by the Space Research Institute of the National Academy of Sciences of Ukraine and the National Space Agency of Ukraine (SRI NASU-SSAU).

Since flooding often occurs under cloudy conditions, SRI NASU-SSAU uses radar sensors because of their ability to acquire data through clouds. In this practice, Radarsat-2 data is processed using freely available remote sensing and GIS software packages. The Next ESA SAR Toolbox (NEST) is used for the pre-processing steps of calibration and speckle filtering. Based on a histogram analysis, a threshold is selected to separate water from non-water surfaces. The final flood extent map is produced using Quantum GIS.

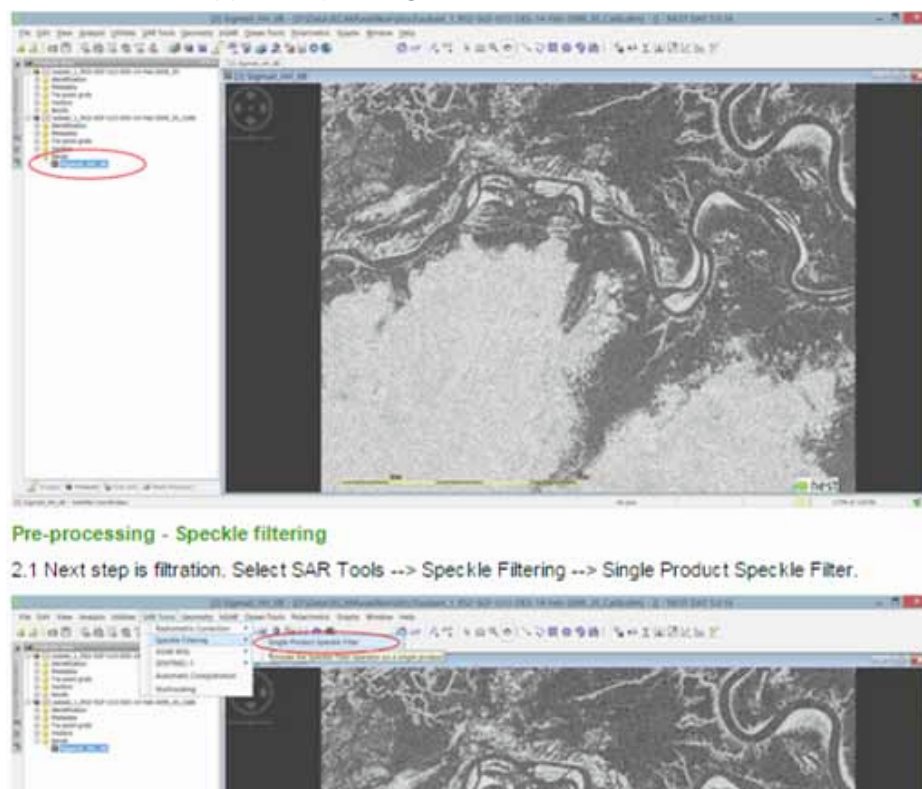
SRI NASU-SSAU has already successfully applied this methodology to

map the extent of several floods in Australia, Africa and Asia. Flood extent mapping is especially useful in the disaster response phase to quickly provide an overview on the affected areas to relief agencies.

UN-SPIDER and its network aim to guide users to the most appropriate methodology based on a thorough evaluation and comparison of recommended practices in different test sites. UN-SPIDER invites more experts to collaborate in submitting additional recommended practices as well as to participate in a peer group of experts to review and validate these practices.

Several RSOs are currently working on the development of additional recommended practices. These include practices on drought monitoring by ISA (Iran), crop yield prediction by SRI NASU-SSAU, land degradation by RCMRD (Kenya), and flood susceptibility maps jointly by NASRDA (Nigeria), CONAE (Argentina), and IGAC (Colombia). Other RSOs also offered contributions including ASAL (Algeria) on locust monitoring, CATHALAC (Panama) on monitoring rainfall anomalies and monitoring of landslides, ISA on dust storm monitoring, LAPAN (Indonesia) on tropical storms and forest fires, and SUPARCO (Pakistan) on snow and ice monitoring for flood forecasts in combination with vulnerability analysis of dikes.

Complementary to the recommended practices, some RSOs have elaborated booklets on lessons learnt in using space technologies. A first booklet was published by SUPARCO (Pakistan) focusing on their experience in utilising satellite data for floods, such as SPOT data or Aqua/Terra satellite data. The booklet is available for download on the UN-SPIDER Knowledge Portal. The RSOs LAPAN and ISA are currently working on additional booklets on forest fires and drought, respectively.



The recommended practice from Ukraine focuses on radar data for flood mapping

[www.un-spider.org/advisory-support/recommended-practices](http://www.un-spider.org/advisory-support/recommended-practices)

## Regional knowledge for regional challenges: Building technical capacities in the Hindu Kush Himalaya region

When a country wishes to improve its disaster risk reduction or disaster response activities using space technologies, a lack of technical skills in processing and applying satellite imagery is a common challenge. UN-SPIDER aims to fill knowledge gaps by providing tailor-made technical training courses on the use of remote sensing and Earth observation for specific hazards.

In doing so, UN-SPIDER works closely together with its network of Regional Support Offices, as they can offer valuable technical advice as well as in-depth knowledge on the specific context of a certain country or region. That way, countries requesting assistance receive valuable support that is relevant both to their needs and their hazard-specific context.

UN-SPIDER joined forces with its Regional Support Office ICIMOD to provide a training course in Nepal on multi-level flood risk management in June 2014. ICIMOD is the International Centre for Integrated Mountain Development, a regional intergovernmental learning and knowledge-sharing centre serving the Hindu Kush Himalayas region. It has been a UN-SPIDER Regional Support Office since 2013.

The Hindu Kush Himalayas region is prone to several natural hazards due



**Dr. Mandira Shrestha, Senior Water Resource Specialist of ICIMOD, during the introductory session**

to its fragile geology, complex topography and tectonic activities. ICIMOD Member States have been hit by 1912 major hydro-meteorological disasters and earthquake events between 1900 and 2012. The estimated economic loss from the accounted disasters is in the range of USD 46 million.

The gravity of these impacts makes the need for a strong disaster response and effective disaster risk reduction very apparent. In the joint UN-SPIDER-ICIMOD training course, 20 officials from Nepal, Bhutan, Bangladesh, Pakistan, Myanmar, India and China learned about the potential of space technologies as well as about specific applications for flood and landslide management.

The participants were introduced to methods of using Earth observation data and remote sensing tools in the context of floods and landslides. A great emphasis was placed on hands-on exercises, so that the participants would not only acquire theoretical, but also practical knowledge. A comprehensive manual and data were made available to that purpose.

In a session taught by ICIMOD, participants learned how to apply the indicator-based approach for hazards, vulnerability and risk mapping approaches using ArcGIS. By combining physical and socio-economic data, the participants developed risk profiles at the national and sub-national level.

The flood session focused on flood mapping techniques using optical and radar sensors. The aim was to build capacities on the use of satellite data to support post-flooding interventions as such data increases the situational awareness. The session on landslides covered semi-automatic detection of landslides through image processing. This method is useful for inventory development and landslide susceptibility mapping, which provide input for land use policies and plans.

The participants furthermore learned about SERVIR-Himalaya, a NASA-backed mechanism for emergency response.



**Participants experimenting with landslide detection/mapping algorithms**



## RCMRD's partnership with UN-SPIDER as a Regional Support Office

by Denis Macharia, Disasters Program Lead, RCMRD, Kenya

The Regional Centre for Mapping of Resources for Development (RCMRD), based in Nairobi, Kenya, is at the forefront of promoting the use of geo-spatial technologies for disaster risk reduction in Africa.

RCMRD, in collaboration with NASA SERVIR, has developed a comprehensive disaster risk reduction framework, which guides the Centre's engagement in the region in disaster management. This includes the procedures to identify projects to be implemented in Member States and strategic partnerships with development partners and collaborators working in the region. Amongst many of these partnerships is RCMRD's role as a UN-SPIDER Regional Support Office (RSO). This partnership has been operational for several years now. Among the activities jointly implemented under the partnership is capacity building for professionals in institutions in RCMRD Member States who are involved in different aspects of disaster management including early warning, response, and mitigation. These activities also include capacity building for RCMRD's staff involved in disaster management projects through participation in international conferences and training workshops.

RCMRD has actively participated in four Technical Advisory Missions (TAMs) organised by UN-SPIDER. TAMs aim to assess the current and potential use of space-based information in all the aspects of disaster risk management and emergency response and to provide specific recommendations to improve the use of space technologies.

The Sudan TAM carried out in 2011 is one example that highlights the importance of the participation of RCMRD in the TAMs in the region. During this particular mission, the TAM team identified several gaps regarding the access to space-based data for disaster risk reduction and technical capacity to use geospatial technologies for disaster risk reduction. One of the recommendations from the mission was to hold a training workshop targeting staff from the Government and from other agencies working in disaster risk reduction in Sudan. RCMRD together with UN-SPIDER organised a one-week training workshop with RCMRD sending two technical staff (a Data Specialist and a Disaster Risk Expert) and developed training material for the course.

In 2013, the Centre participated in a TAM in Malawi. One of the outcomes of this TAM was the need to assist



**Zambia TAM team, May 2014**

the Malawi Department of Disaster Management Affairs in developing a risk and vulnerability atlas for the whole country. RCMRD, through support from SERVIR, a NASA-USAID programme supporting the use of space-based technologies for societal benefits, responded to this request by dedicating funds and technical expertise to co-develop a national atlas for Malawi showing risk and vulnerability hotspots focusing on four priority hazards (floods, droughts, earthquakes and malaria). This example not only highlights the significance of the TAMs but also shows how RSOs can help implement recommendations following a TAM assessment.

In 2014, TAMs were organised in Kenya and in Zambia. An RCMRD expert participated in both missions. He also took the role of a member of the TAM local organising committee in Kenya together with the Kenya National Space Secretariat and the National Disaster Operations Centre.

Additionally to participating in TAMs and training workshops, RCMRD has participated in UN-SPIDER's annual international conferences organised in Beijing, China every year and has attended RSO meetings held in Vienna and Bonn in the past few years.

RCMRD values this partnership and looks forward to more engagements in the years to come including an expanded mandate to lead TAMs on behalf of UN-SPIDER in the region.



**Discussion session at RCMRD during the Kenya TAM in March 2014**

## UN-SPIDER and its Regional Support Offices: The way ahead

by Luc St-Pierre, Coordinator UN-SPIDER

UN-SPIDER will soon reach 10 years of existence. Its team is working hard to remain a strong partner to the global community by integrating innovative satellite-based approaches to contribute to global disaster resilience. The network of Regional Support Offices (RSOs) is central in this constant effort. The network's future common actions will diversify and it will seek to have more impacts.

The network of RSOs can become a recognised source of regional and global expertise to other initiatives that have similar or complementary goals to those of UN-SPIDER. For example, the RSOs can support the Universal Access initiative of the International Charter: Space and Major Disasters, which gives more countries access to satellite-based emergency maps. Similarly, RSOs can support the activities of the Group on Earth Observation (GEO). UN-SPIDER is already putting an agreement in place to foster these collaborations.

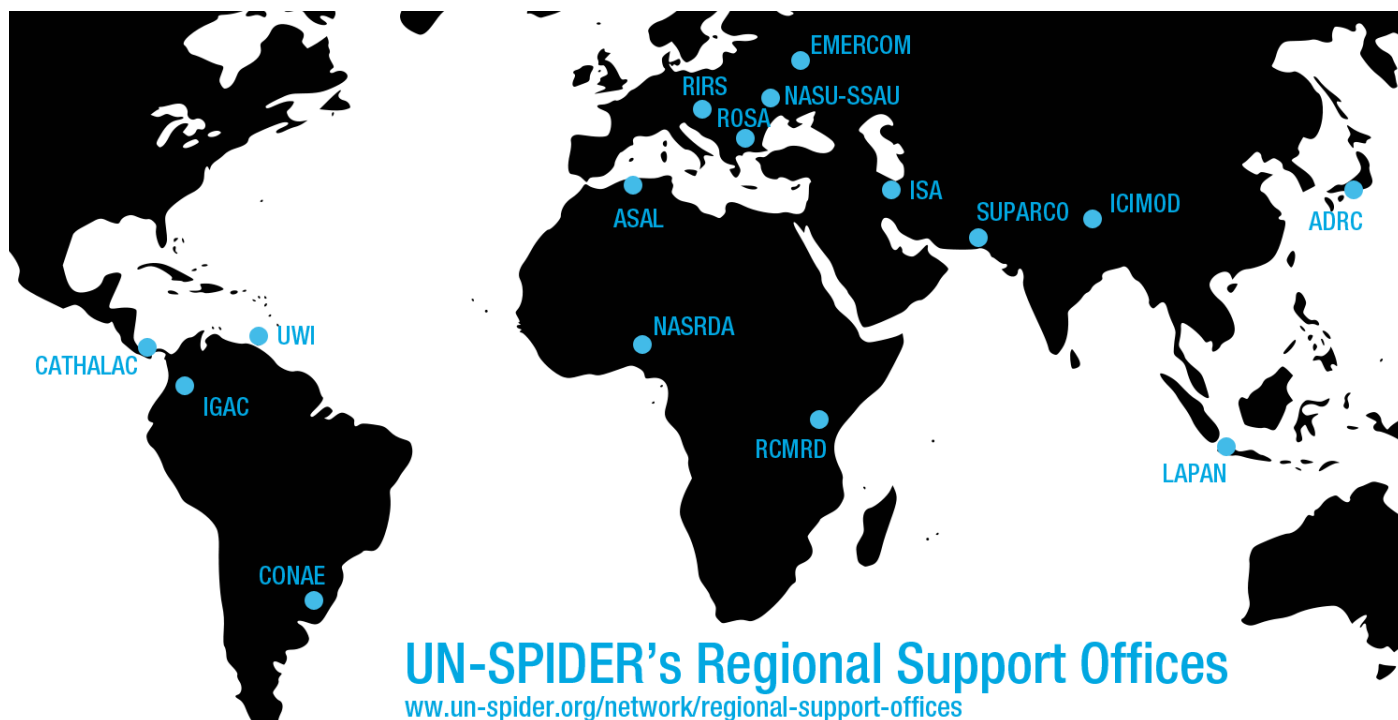
The web-based Knowledge Portal of UN-SPIDER ([www.un-spider.org](http://www.un-spider.org)) is now a well-established source of information for many practitioners in disaster risk reduction and emergency response. To increase the number and quality of services on the Portal, RSOs will contribute to content development, hosting or developing of new features or dissemination of content. The recommended practices (p. 3) are a successful example of this collaboration.

UN-SPIDER also foresees that the RSOs will help assess the impacts of the programme's activities, thus providing relevant input to improve them. How can we measure the impacts of advisory services provided by UN-SPIDER at national and regional levels? How can we provide long-term support to Member States? The RSOs can contribute in an objective manner to these obligations.

Because of the wide scope of services needed in disaster risk management

and emergency response, the RSO network should increase in number of members as well as in overall range of expertise, from national to global reach. UN-SPIDER is already in discussion with a few potential new RSOs. The future of the network depends on the current network remaining highly active and demonstrating unity in its goals and actions. The benefits of the network must be multi-directional: to the programme as well as to the RSOs themselves.

A network is a network if exchanges happen in a multitude of directions. The network should foster collaboration among RSOs, with or without the involvement of UN-SPIDER. Through such collaboration, fund raising, training, and outreach efforts can have more impact. The UN-SPIDER team will continue to work on consolidating the network of RSOs, but it needs to count on a strong willingness and presence of its RSO members, institutionally and individually.



**UN-SPIDER's Regional Support Offices**  
[www.un-spider.org/network/regional-support-offices](http://www.un-spider.org/network/regional-support-offices)



UNITED NATIONS

The United Nations Office for Outer Space Affairs (OOSA) 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 new United Nations programme to be implemented by OOSA. 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. UN-SPIDER Newsletter, Volume 2/14, November 2014. © United Nations Office for Outer Space Affairs.