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United Nations Platform for Space-based Information for Disaster Management and Emergency Response

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SpaceAid

Pakistan: space-based information at the service of relief operations

"You can see that there are areas where people are still cut off, where people still have not got access to the very basic things they need... It is a human tragedy here in Pakistan, and we as a UN community have a role to play, but the world as a whole has a role to play." said Valerie Amos, the new UN Under-Secretary-General for Humanitarian Affairs and Emergency Relief Coordinator, on her visit to the devastated provinces beginning of September.*

Ever since the monsoon floods began in July, the emergency situation has continued to unfold and floods have affected approximately one fifth of the country. Due to the large extension of the flooding parts of the country are already in the early recovery phase while other parts still need support with the imme-

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United Nations Office for Outer Space Affairs Vienna International Centre P.O. Box 500, A-1400 Vienna, Austria. Email: un-spider@unoosa.org Online: www.un-spider.org diate response. About 20 million people are affected by this disaster and have lost property, housing, and farmland. A huge humanitarian community including government institutions, national and international NGOs, and the United Nations is trying to respond and deal with the rising numbers of affected people and land area. In order to do so, reliable geographical information enhanced by up-todate satellite imagery is indispensible.

UN-SPIDER worked together with its Regional Support Office, Pakistan's Space and Upper Atmospheric Research Commission (SUP-ARCO), from the very beginning of the ongoing disaster. SUPARCO provided the coordinates of the affected areas for tasking the collection of satellite imagery by various providers. UN-SPIDER, through its SpaceAid Framework, was the first in coordinating with SUPARCO and ensuring information exchange with the major international mechanisms and satellite providers. Following this, SUPARCO developed several maps in addition to the ones that were provided by other international mechanisms and organizations, showing the flood extent and damage assessment and providing them to the National Disaster Management Authority and the Ministry of Food and Agriculture, among others, where they served for supporting relief operations. Not only national bodies and the UN worked with satellite imagery, but also humanitarian NGOs such as iMMAP and Pakistan Youth Organization used such data for their operations.

In close coordination with SUPARCO, the UN-SPIDER SpaceAid Framework supported the activities of the major international mechanisms that were activated: the International Charter Space and Major Disasters, Sentinel

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SpaceAid continued

Asia, and Services and Applications for Emergency Response (SAFER). DubaiSat-1, which is not part of any of these mechanisms or other agreements, collected imagery for disaster response and made it available through UN-SPIDER SpaceAid for the first time. Upon the request of UN-SPIDER, the International Centre for Integrated Mountain Development (ICIMOD) provided enormous mapping support to Pakistan. ICIMOD obtained images through Sentinel Asia and generated a series of maps which were shared with SUPARCO.

Especially during the first weeks of the disaster, a steady communication was established where UN-SPIDER and SUPARCO shared information about the situation on the ground and updates about the work of the different international mechanisms on a daily basis. Furthermore, a series of teleconferences was held under the moderation of the US Office of Foreign Disaster Assistance (OFDA). They brought together representatives of the UN Office for Outer Space Affairs (UNOOSA), UN Office for the Coordination of Humanitarian Affairs (OCHA), UN Institute for Training and Research (UNITAR/UNOSAT), German Aerospace Center (DLR), Canadian Space Agency (CSA), US Geological Survey (USGS), ICIMOD, Pacific Disaster Center, Red Cross, University of Georgia, and Hope International University to ensure better coordination between these institutions, the UN, and other organizations delivering and working with satellite imagery and geographical data.

A considerable amount of post and pre-disaster optical and radar satellite data was collected and processed and served for relief operations, including COSMO-SkyMed, ALOS PALSAR, RapidEye, SPOT 5, TerraSAR-X, Aqua MODIS, DubaiSat-1, IRS-P6, FORMO-SAT-2, WorldView-1, WorldView-2, Landsat-7, and ENVISAT ASAR. Links to available spacebased information, including a satellite tasking table and contact details are published on: http://www.un-spider.org/pakistanfloods.

*In her video message on ochaonline.un.org.



Outreach

Working towards a Plan of Action for Africa: UN-SPIDER Regional Workshop in Addis Ababa



rom 6 to 9 July 2010, UN-SPIDER successfully conducted the regional workshop "Building Upon Regional Space-based solutions for Disaster Management and Emergency Response for Africa" in Addis Ababa, Ethiopia, in cooperation with the United Nations Economic Commission for Africa (ECA). More than 80 experts and decision-makers from 27 countries and international organizations participated in this 4-day event, which benefitted considerably from the support provided by the Government of Austria and Secure World Foundation. The workshop was officially opened by Mr. Josué Dioné, the Acting Head of ECA and Director of ECA's Food Security and Sustainable Development Division.

Through this workshop, UN-SPIDER was able to gather elements to update its Plan of Action for activities in Africa. This includes in particular identifying strategies to bridge the gap between the space and the disaster management communities, and improving the communication and coordination among existing initiatives in Africa regarding access to and use of space-based technologies for disaster-risk management, emergency response, climate change, and health-related issues. The opportunity was also used to present and discuss various aspects of the UN-SPIDER programme such as the SPIDER Thematic Partnership for Africa, UN-SPIDER's SpaceAid Framework, and the Knowledge Portal. Taking advantage of the workshop, UN-SPIDER was able to receive several country profiles which will allow the Programme to tailor its activities to the specific needs of African countries. Discussions were also held on additional nominations of National Focal Points for UN-SPIDER.

Throughout the week, plenary presentations, panel discussions, and discussion sessions were conducted with participants representing government agencies, regional and international organizations, as well as private companies. Ultimately, the workshop was successful in involving African experts in discussions on how to institutionalize access to, and use of space-based applications and solutions targeting disaster-risk management, emergency response, climate change, and health-related issues in Africa.

Taking advantage of the event, an agreement was signed with the Regional Centre for Mapping of Resources for Development (RCMRD) for the establishment of a new UN-SPIDER Regional Support Office in Nairobi, Kenya.

In terms of follow-up activities, the workshop provided the opportunity to initiate the planning of several UN-SPIDER Technical Advisory Missions to African countries, and a technical workshop featuring a hands-on training of selected staff on the use of space-based information for emergency response focusing on countries in Western and Central Africa.

Civil protection agencies and staff of the UN Office for the Coordination of Humanitarian Affairs (OCHA) present at the conference were also requested to assist in a survey to be conducted by UN-SPIDER on how spacebased information is used in case of disasters within emergency operation centers in different countries of the continent.

The final workshop report as well as all presentations and background information can be downloaded from: www.un-spider.org/ workshop-addis-2010.

Network

RCMRD in Nairobi establishes ninth Regional Support Office

The Regional Center for Mapping of Resources for Development (RCMRD) and the United Nations Office for Outer Space Affairs (UNOOSA) signed a cooperation agreement on the occasion of the UN-SPIDER Regional Workshop "Building Upon Regional Space-based Solutions for Disaster Management and Emergency Response for Africa" in Addis Ababa on 7 July 2010.

This makes RCMRD the ninth member of the network of Regional Support Offices (RSO) which support the implementation of the UN-SPIDER programme in their respective regions by contributing with their particular expertise and capabilities.

In its role as UN-SPIDER RSO, RCMRD will support the development and strengthening of national capacities in the Eastern African region, and contribute to horizontal cooperation and technical assistance to countries and organizations involved in disaster prevention and mitigation. The Center will also assist in generating and sharing knowledge for the use of valuable space-based information in decision making processes.

RCMRD was established in Nairobi, Kenya in 1975 under the auspices of the United Nations Economic Commission for Africa and the then Organization of African Unity, today African Union. It is an inter-governmental organization and currently has 15 contracting Member States in the Eastern and Southern Africa regions. Its mission is to provide quality geo-information and allied ICT products and services in environmental and resource management for sustainable development in its member countries and beyond.



Interview

Interview with Dr. Iván Darío Gómez Guzmán, Director General of the Agustín Codazzi Geographic Institute and Executive Secretary of the Colombian Space Commission

Dr. Iván Darío Gómez Guzmán is an Economic Planner who leads the Agustín Codazzi Geographic Institute (Instituto Geográfico Agustín Codazzi, IGAC) since 2002, which currently serves as the Executive Secretariat of the Colombian Space Commission (Comisión Colombiana del Espacio, CCE). He has also developed a number of environmental and natural resource management projects for public and private companies.

As Director of the IGAC, Dr. Gómez Guzmán aims for the entity to become the provider of basic high quality geographic and digital information for Colombia's sustainable development. Both IGAC and the CCE work closely together to consolidate their mission of serving as sources of space-based information for the country.

Dr. Gómez Guzmán participated in the 2nd Hemispheric Encounter on National Mechanisms and Networks for Risk Reduction held in Santa Marta, Colombia, in April this year, where UN-SPIDER organized and conducted a special session titled "Space-based Applications for Managing Risk Reduction and Emergency Response in Latin America and the Caribbean".

UN-SPIDER: Mr. Gómez Guzmán, thank you for taking the time for this interview. In the special session organized by UN-SPIDER you were one of the representatives of the space community. What do you consider the main accomplishments of the 2nd Hemispheric Encounter in general and of the special session in particular?

Mr. Gómez Guzmán: The 2nd Hemispheric Encounter of Santa Marta constituted an im-



portant forum to raise awareness about the processes and advances in risk management presented by the various space agencies.

As for the special session, it was very interesting and fruitful for the Colombian Space Commission to participate in the discussions on the action plan for the SPIDER Thematic Partnership for Latin America and the Caribbean. Strengthening the capacities of agencies engaged in disaster management that focus on access and use of satellite information for food security purposes is another topic that is relevant for our country and that I followed with great interest.

Overall, the knowledge and experience exchanged, and the contacts established with experts from the different countries will serve as valuable input for discussing and defining programs and activities aimed at risk reduction and disaster response that are carried out within the CCE and the entities that comprise them.

UN-SPIDER: You just mentioned the entities that comprise the Colombian Space Commission. Could you please tell us more about the Commission and how it works?

Mr. Gómez Guzmán: The Colombian Space Commission was established in July 2006 by Presidential Decree. It is an inter-institutional body with the mandate to implement a national policy for the development and application of space technologies. It sees itself as the inter-institutional body for consultation, coordination, orientation, and planning related to space technologies.

UN-SPIDER: How can you describe this inter-institutional structure and its functioning?

Mr. Gómez Guzmán: The Vice President of the Republic of Colombia heads the Colombian Space Commission. It is composed of 11 Ministries, as well as agencies from the government and academic institutions. The Agustín Codazzi Geographic Institute is currently entrusted with the Executive Secretariat of the Commission. The Commission is operating through a framework of seven Working Groups. Each of these Working Groups is coordinated by a government agency and deals with particular topics.

UN-SPIDER: What are the advantages of such an inter-institutional arrangement?

Mr. Gómez Guzmán: The Commission's interinstitutional character has proven to be an advantage when it comes to implementing commitments and strengthening institutional mechanisms to manage geospatial information, such as the Colombian Spatial Data Infrastructure. This structure has allowed the consolidation of production, access and use of geographic information to support decision making and sustainable development programs on a broader scale. This has allowed institutions be aware of the benefits of the use of space-based information and space technologies in Colombia.

UN-SPIDER: What were the major challenges that were targeted through the establishment of the Colombian Space Commission?

Mr. Gómez Guzmán: Through the establishment of the CCE in 2006, the Government sought to encourage further development and application of space technologies as tools that can be useful to solve problems and to meet existing needs in areas such as natural resources management, disaster prevention, and emergency response. It also serves the in the areas of security, transportation by land, sea, river and air, climate change, health, and telecommunications, among others.

The Commission was also established to promote a more active participation in the

country's science and space technologies development by promoting opportunities for international cooperation and through policy-relevant advice.

UN-SPIDER: In Colombia, what are the experiences with the use of satellite images, GPS systems and satellite telecommunications in the area of disaster risk reduction and response?

Mr. Gómez Guzmán: Colombian agencies in charge of disaster risk reduction have implemented various satellite technologies to work more efficiently when it comes to preventing disasters. These technologies have been used as tools to design mitigation and response plans and to identify areas susceptible to certain types of events. Regarding disaster response, these technologies have been useful to quantify losses and damages and to identify target areas.

Also, in the immediate response to various disasters that hit our country, the International Charter Space and Major Disasters proved to be a supremely valuable tool to obtain timely and accurate information to support decision-making.

Similarly, during the recovery phase, satellite technologies have served the country to plan and implement measures targeting the restoration of networks and services and reconstruction or repair of infrastructure for affected populations.

UN-SPIDER: With a view to enhancing the benefits of the use of space-based information for disaster management in your country, what are the current expectations towards the UN-SPIDER Programme?

Mr. Gómez Guzmán: First of all, it has to be said that the Colombian Space Commission recognizes the value of products and services stemming from space science and technology. To this end it considers using the services provided by UN-SPIDER as a high-priority objective.

UN-SPIDER is particularly attractive due to its operating networks. Its organizational structure based on National Focal Points, Regional Support Offices and Centers of Excellence can contribute to the institutional strengthening of Colombian institutions that are directly involved with the full cycle of disaster management. Likewise, the support provided by groups of experts from UN-SPIDER with respect to specific topics or issues constitutes an opportunity to acquire adequate knowledge to implement appropriate activities in each case.

Let me highlight once again that Colombia has a genuine interest in the development of applications of space science and technology. Therefore it is important to expand those capabilities and skills that focus on methods for solving issues related to disaster management. This is considering both the training acquired in the national training centers, as well as regional or international training centers established by this Programme, and also in the UN-SPIDER Knowledge Portal.

UN-SPIDER: You mention the importance of training centers. Where do you see your institute, the Agustín Codazzi Geographical Institute, in this setting?

Mr. Gómez Guzmán: This topic actually provides a good opportunity to turn the country into a knowledge management center for the region. Given the evolution of online education capacities of institutions like the Agustín Codazzi Geographical Institute with its Regional Tele-center, we can reach a large number of individuals involved in the issue of disaster management. This way, we can provide a valuable contribution to capacity-building in the region and to a greater acceptance and knowledge about the benefits of space technology.

UN-SPIDER: Mr. Gómez Guzmán, thank you very much for this interview!

The seven Working Groups of the CCE:

- Telecommunications
- Satellite navigation
- Earth Observation
- Astronautics, Astronomy and Space Medicine
- Knowledge Management
- Legal and Political Affairs
- Colombian Spatial Data Infrastructure

Flood monitoring by Ukraine Space Research Institute

Ukraine's severe winter of 2010 was characterized by large amounts of snow and ice on rivers that posed a high threat of floods during the melting period. The Ukrainian government led many efforts to prevent and reduce consequences of a potential disaster. The UN-SPIDER Regional Support Office (RSO) in Ukraine played an active role in these efforts. It was established in the beginning of 2010 and is hosted by the Space Research Institute (SRI) NASU-NSAU.



city area.

The images were delivered to the Ukrainian Ministry of Emergency Situations, Council of National Security and Defense, and Ukrainian Hydrometeorological Center. Information on river extent derived from EO-1 images was also used to calibrate and validate hydrological models. This information was used to produce various scenarios of water extent for flood risk assessment.







Figure 1: EO-1 images of Kyiv area for 10 March (left), 23 March (center) and 13 April 2010 (right). The left image shows extensive snow cover in early March. From the image taken on 23 March (center) it can be seen that the snow has already thawed while there is still an ice cover on the river (on top). This ice posed a high threat to the houses and constructions along the river. The right image shows no snow and ice on the land and the river. Data courtesy of the NASA Earth Observing One (EO-1) mission operated by the Goddard Space Flight Center.

he UN-SPIDER RSO in Ukraine is also actively involved in the Namibia Sensor-Web Pilot Project, a joint effort of UNOOSA/ UN-SPIDER, the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA), the German Aerospace Center (DLR), and SRI NASU-NSAU. SRI's main role lies in rapid flood mapping from SAR satellite imagery. More than 20 scenes from Envisat/ ASAR instrument have already been acquired for Namibia during 2010, and corresponding flood maps were produced. Figure 2 shows an example of one of these products. This information along with information and products provided by project partners will be used for the integrated analysis of floods in Namibia.



Figure 2: Flood extent shown in light-blue derived from Envisat/ASAR Wide Swath Mode imagery on 30 May 2010. Image covers Caprivi region of Namibia.

Outreach

UN-SPIDER meeting with National Disaster Coordinating Council in Philippines

N-SPIDER met in July with officials of the National Disaster Coordinating Council (NDCC) and member agencies with the aim to review and strengthen the support from UN-SPIDER to the Philippines. It has been almost a year since Typhoon Ketsana devastated this country in September of 2009. Back then, UN-SPIDER's SpaceAid Framework assisted the NDCC by placing requests for collection of satellite images from multiple sources and communicated the collection plans to the UN Office for the Coordination of Humanitarian Affairs (OCHA), the United Nations Development Programme (UNDP), the World Bank, NGOs such as MapAction, and other field representatives, so they would know when these images would become available and could include this in planning their assistance.

On 9 July 2010, UN-SPIDER programme officer Mr. Shirish Ravan conducted a half day meeting with NDCC and member agencies who were involved in emergency response to the 2009 typhoon disasters. He elaborated UN-SPIDER's support in 2009 and introduced services offered by UN-SPIDER including the Technical Advisory Mission. He stressed the importance of updating disaster management plans and policies with a focus on space-based information. "Facilitating access to space-based information for disaster risk reduction, post disaster missions and contingency plans for the country would ensure the Philippines with provisions of space-based and geo-information", Mr. Ravan said.



The CEO of the Office of Civil Defense, Dir. Ronald I. Flores, chaired the event and thanked UN-SPIDER for its support during Tropical Cyclone Ketsana. Director Flores explained that the meeting aimed at discussing the availability of space-based information during tropical cyclones and at coming up with recommendations on how to strengthen collaboration with Philippine's Disaster Risk Reduction Management (DRRM) for effective use of such information.

The Philippine Atmospheric, Geophysical and Astronomical Service Administration (PA-GASA) in the July meeting briefed participants on various satellite applications in meteorology, on the satellite facilities of PAGASA, and on satellite applications used during Tropical Cyclone Ketsana. Assistant Weather Specialist Chief for PAGASA, Ms. Esperanza Cayanan, presented the maps received through the updates circulated by UN-SPIDER and recalled that PAGASA forwarded these maps to their emergency handling agencies and to the NDCC during the 2009 disaster.

Participants learned about international me-

chanisms (International Charter Space and Major Disasters, and Support and Applications for Emergency Response, SAFER) that have been developed to aid in disaster management situations. Mr. Ravan also introduced the Digital Globe Crisis Event Service, a web service which provides timely pre- and post-disaster satellite imagery to aid preparedness, response, and recovery measures.

Several observations and action points were drafted based on the discussions and will be shared by NDCC with their member agencies. These action points suggest the mechanism to strengthen preparedness to access and make effective use of space based information in case a disaster like a typhoon strikes again.

As UN-SPIDER's National Focal Point in the Philippines, NDCC was offered technical advisory support to establish a mechanism for effective use of space-based information for disaster management. UN-SPIDER also proposed to work with end users, not only during emergency response but also in the pre-disaster phase such as preparedness planning.

Outreach

JBGIS and UNOOSA publish "Geoinformation for Disaster and Risk Manage-

ment - Best Practices and Examples"

he new booklet published by the Joint Board of Geospatial Information Societies (JBGIS) and the United Nations Office for Outer Space Affairs (UNOOSA) outlines the potential uses of geo-information technologies to reduce the impact of natural or manmade disasters and risks. The publication brings together concise scientific contributions from experts around the world and creates a decision support forum based on



their knowledge. The articles in the booklet cover natural disasters like earthquake, flood, volcano outbreak, tsunami, landslide, dust storm and wildfire, as well as societal issues like health care, refugee camps, urban sprawl and traffic infrastructure security.

According to UNOOSA's Takao Doi, UN Expert on Space Applications, the publication is a "must-read" for all decision-makers involved in risk and disaster management, as it clearly shows that "those technologies offer little-known and rarely-used solutions that could help us reduce disaster risks and losses and mitigate damages to livelihoods and property associated with disasters".

The complete booklet is available for download on http://www.un-spider.org/jbgis-unoosa-booklet

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 Sub-committees, the Scientific and Technical Subcommittee and the Legal Subcommittee. The Office for Outer Space Affairs tion 61/110 of 14 December 2006 the United Nations General Assembly agreed to establish the "United Nations Platform for Space-based Infor-mation for Disaster Management and Emergency Response - UN-SPIDER" as a new United Nations 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. UN-SPIDER Newsletter, Volume 3/10, September 2010. © United Nations Office for Outer Space Affairs.