Spatial Data Infrastructure – Africa Newsletter

GSDI
Global Spatial Data Infrastructure

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Spatial Data Infrastructure - Africa (SDI-Africa) is a free, electronic newsletter for people interested in GIS, remote sensing, and data management in Africa. Published monthly since May 2002, it raises awareness and provides useful information to strengthen SDI efforts and support synchronization of regional activities. ECA/CODIST-Geo, RCMRD/SERVIR, RECTAS, AARSE, EIS-AFRICA, SDI-EA, and MadMappers are some of the other regional groups promoting SDI development.

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The SDI-Africa newsletter is prepared for the GSDI Association by the Regional Centre for Mapping of Resources for Development (RCMRD) in Nairobi, Kenya. RCMRD builds capacity in surveying and mapping, remote sensing, geographic information systems, and natural resources assessment and management. RCMRD has been active in SDI in Africa through its contributions to the African Geodetic Reference Frame (AFREF) and SERVIR-Africa, a regional visualization and monitoring system initiative. RCMRD also implements projects on behalf of its member States and development partners.

If you have news or information related to GIS, remote sensing, and spatial data infrastructure that you would like to highlight (e.g., workshop announcements, publications, reports, websites of interest, etc.), kindly send them in by the 25th of each month. I'd be happy to include your news in the newsletter.

PLEASE share this newsletter with colleagues who may find the information useful and suggest that they subscribe themselves.

Back issues of the newsletter are at the GSDI website: http://www.gsdi.org/newsletters.php
Best regards, Gordon Ojwang, Editor, SDI-Africa AT gsdi.org or sdiafrica@rcmrd.org or gojwang@rcmrd.org

Input to this Issue

Thank you to Kate Lance, NASA/SERVIR-Africa (USA); Hussein Farah, RCMRD (Kenya) and Karen Levoleger, Kadaster (Netherlands) for their contributions to this issue of the newsletter.

SDI News, Links, Papers, Presentations

2011-2012 GSDI Small Grants Program

The GSDI Association also hosts an **SDI-Africa E-mail Discussion List** with intermittent news and The Global Spatial Data Infrastructure (GSDI) Association, the FGDC, and GISCorps have announced the Small Grants Program for the year 2011-12. The Small Grants Program provides awards of $2500 USD in cash and/or contributed volunteer professional services for technical or institutional projects. A list of typical projects follows - but this list is not exhaustive:

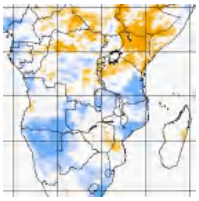
- Convening of national or sub-national seminars or workshops related to SDI,
- Producing SDI- and EOS-related training manuals and modules (these materials must not duplicate existing materials),
- Establishing metadata and clearinghouse nodes (catalog services),
- Establishing standards-based web mapping and data access services,
- Accomplishing geospatial data and/or SDI surveys or inventories,
- Producing and disseminating newsletters and awareness-raising materials about SDI,
- Drafting policy and legislation related to SDI,

Priority will be given to projects in developing nations and countries with economies in transition. Grants can be awarded to SDI coordinating bodies (councils, committees) and GIS user groups, but the GSDI Association asks that one institution take responsibility for receiving/depositing the funds. Grants cannot be used to cover organization overhead expenses. Project proposals should have a maximum of 4000 words. Application deadline: 31 October 2011.
Additional information: Overview of GSDI - http://memberservices.gsdi.org/files/?artifact_id=844 (MS PowerPoint), GSDI Strategic Plan - http://portal.gsdi.org/files/?artifact_id=544 (PDF), Global Earth Observation System of Systems (GEOSS) and the Group on Earth Observations (GEO) - http://www.earthobservations.org/

Forecasters 'warned of Horn of Africa drought' last year

Forecasting systems were warning about a serious drought in the Horn of Africa as much as a year ago - but communication problems between scientists and decision-makers meant the alerts went largely unheeded, according to forecasters. Warnings about the drought - which the United Nations says is the worst in 60 years - were issued last August, when the Famine Early Warning Systems Network (FEWS NET) released a brief on food security in East Africa following the declaration of a La Niña event, a cooling of the sea surface in the Pacific Ocean known to affect weather in Africa. "We were very confident that the October to December rains were going to be poor," Chris Hillbruner, a food security early warning specialist with FEWS NET, told SciDev.Net. "And there was an increased likelihood that the March to May rains was going to be poor as well." Once the predictions for October–December proved correct, the agency started releasing food security alerts for the region in November, February, March, May and June, and organising multi-agency meetings in Nairobi, in February, March and May. The drought is now affecting ten million people in Djibouti, Ethiopia, Kenya, Somalia and Uganda.
Chris Funk, a climatologist with FEWS NET, said that the organisation's experts have been "a little frustrated that we provided this information quite early" but not enough has been done to make good use of it. "The technology has outpaced the response systems," he said. "We are still developing rapid response capability around that." And Hillbruner added: "At the technical level, there's been agreement about the situation for the past five months. ”What we've demonstrated over time, but particularly in the last year, is that systems have got to the point where they can do pretty good early warning within a timeframe that offers opportunities for response."
In the humanitarian community, Andrew Collodel, an emergency programme coordinator with the aid agency HelpAge International agreed that the forecasts had been made and communicated. HelpAge had listened to early warnings and worked in the region to prepare for the drought, but it had failed to garner sufficient funds in advance of the crisis. Donors had faced "confounding issues" such as the global financial situation, troubled local politics such as the chaotic situation in Somalia, and several other recent major crises that had raided their resources, such as the one following the Haiti earthquake and the tsunami in Japan. "The early warning systems are not a problem, how we react to them is," he told SciDev.Net. Read more on the above article.. See also: Link to FEWS NET's initial August 2010 brief on food security in East Africa [PDF-219kB] and Link to full 'A Better Climate for Disasters Risk Management' [PDF-5.98MB].

African rainfall data 'will improve climate predictions



A comprehensive 30-year dataset of African rainfall could soon help test climate change predictions and improve climate models, according to a UK researcher. David Grimes, who studies satellite data at the University of Reading, told SciDev.Net that his group will release the complete, open-access data set within a year. Researchers can already provide good short-term forecasts of Africa's weather but lack the detailed and consistent long-term data needed for accurate climate predictions.
The new data come from a European Meteosat satellite that has been collecting data over Europe and Africa. The data will supplement the poor ground data on rainfall to help improve climate predictions, which are often contradictory. "Some models predict an increase in rainfall in some areas, other models predict a decrease of rainfall in the same area, and part of the reason for that is that data coming out of Africa [are] very poor and very sparse," Grimes said. Many experts think that climate change will make the African climate more variable, with more extreme events, such as this summer's drought in the Horn of Africa.

This increased variability may also raise the risk of floods. Geoff Pegram, emeritus professor at the University of KwaZulu-Natal in South Africa, expects "longer periods of dryness and, when we do have rain, it is likely to be heavier". The lack of good rainfall data has prevented climate models making robust predictions about how the climate will change at specific locations. The new data "can tell us whether the rainfall and the climate in particular areas, at particular times of year or seasons, have been changing in the past 30 years, and then we can compare that with what climate models predict," said Grimes. "If the climate models say the same thing as our datasets, then that would give us much more confidence in their future predictions." Previous data sets have lacked consistency. The Global Precipitation Climatology Project, for example, has global rainfall data but uses different methods of calculation for different periods, said Grimes, making it harder to understand how the climate has changed. Tufa Dinku, a researcher at the International Research Institute for Climate and Society at the Columbia University, United States, said: "This data set is unique in that it uses a single algorithm and single satellite sensor, which ensures the consistency of the time series. There is no other satellite rainfall product that goes back to 1983 at ten-daily time scale and spatial resolution of about five kilometres. "But the dataset is as good as the number of stations used for calibration," he said. Before the data set can be used, it must be calibrated against ground data. Satellites provide rainfall estimates, but they must be compared with ground data to know how they translate to actual amounts of rainfall. Grimes is planning to run a series of workshops in Africa to calibrate the estimates against their rain-gauge data and train scientists on how to use the data set. "Africa is the worst continent, outside Antarctica, for the distribution of rain gauges - that's really the reason we do the satellite monitoring, because if you just use the gauges you can't get a complete picture of what's happening," he said. "If you don't know what the climate is to start with, then you can't really decide whether it's changing or not."

African Union launches the foundation stone of the African Observatory for Science, Technology and Innovation (AOSTI)

The Heads of State and Government of the African Union, meeting at their 17th Ordinary Session in Malabo, Equatorial Guinea, started their Summit agenda on 30 June 2011, with the placing of the foundation stone of the African Observatory for Science, Technology and Innovation (AOSTI). This institution was established by an Assembly Decision of February 2009 which decided that the headquarters would be in Malabo. The Host Country Agreement signed between the African Union and the Government of Equatorial Guinea in June 2010 makes provision for the government to provide premises for the headquarters, equipped offices, supplies and the initial financial contribution for the establishment of AOSTI. The ceremony of the laying of the foundation stone took place in the presence of President Teodoro Obiang Nguema Mbasogo, Chairperson of the African Union (AU) and Mr. Jean Pierre Ezin, Commissioner for Human Resources Science and Technology of the AU Commission.

The vision of AOSTI is to enable Africa to develop, harness and apply science, technology and innovation (STI) to eradicate poverty, achieve sustainable development and ensure that Africans are fully able to contribute to the global pool of scientific knowledge and have the capacity to draw upon and apply that knowledge. The mission of AOSTI is to collect, process, analyse and disseminate statistical information on STI to support evidence based policy-making in the member states of the African Union and by interested parties, and to collect and review STI policies in member states in order to raise awareness of potential policy mixes, means of implementing policies and ways of measuring impact.

Africa launches the Wildlife Enforcement Monitoring System (WEMS)

The Lusaka Agreement Task Force for Co-operative Enforcement Operations directed at Illegal trade in Wild Fauna and Flora (LATF) in Kenya, the United Nations University Institute of Advanced Studies (UNU-IAS) in Japan, and the Faculty of Geo-Information Science and Earth Observation (ITC) at the University of Twente in the Netherlands, through a tripartite partnership agreement, launched the Wildlife Enforcement Monitoring System (WEMS) in Africa. The inauguration of the system took place on 18 July 2011 at the seat of LATF in Nairobi, Kenya, as part of a series of events leading to the African Elephant Law Enforcement Day celebrations on 20 July 2011.

The Wildlife Enforcement Monitoring System (WEMS), developed by the United Nations University (UNU), is the culmination of seven years of interdisciplinary field research involving policy makers, enforcement officials, computer scientists and civil society groups to address the challenges relating to documenting illegal wildlife exploitation and to provide a clear picture of trends regarding trans-boundary illegal wildlife

trade. The main goal of WEMS in Africa is to strengthen information and reporting processes as well as analysis capabilities pertaining to monitoring of illegal wildlife trade at both the national and regional levels.
The implementation of WEMS in Africa will take place in phases through the establishment of a regional environmental governance framework for research and development co-operation between LATF, UNU-IAS and ITC. The pilot implementation of the project will involve three member states to the Lusaka Agreement, namely, Kenya, Tanzania and Uganda. A second phase will expand to include the remaining Lusaka Parties (Congo, Zambia and Lesotho). Other interested African countries will have the opportunity to participate at a future stage, with the ultimate objective of implementing the WEMS model in each CITES member country, to establish an effective global information base. The research and development efforts aim at systematically bringing good governance and information and communication technology (ICT) enabled initiatives in managing wildlife crime information to Africa. UNU-IAS, through its Science and Technology for Sustainable Societies programme, will focus on the sustainable use of ICT by harvesting the power of cloud computing and mobile technology in achieving the UN Millennium Development Goals (MDGs), especially focusing on MDG7 on environmental sustainability and MDG 8 (target 8F) on making available the benefits of new technologies to Africa, in co-operation with the private sector. “UNU-IAS is pleased to be a partner in this important research and capacity building project in Africa using the WEMS platform in partnership with LATF and ITC Netherlands”, says UNU Vice-Rector and UNU-IAS Director, Prof. Govindan Parayil. “This is amongst several initiatives that UNU is undertaking to enhance our engagement with our partners and other stakeholders in Africa”.
Scientific experts at ITC will develop appropriate governance models for effective interagency sharing of wildlife crime data and for resolving the existing problems in governance on sharing and usage of information from the national to regional levels. “Geospatial technology alone may not be a solution to the problem of transnational sharing of spatial information, especially when the information crossing borders is politically sensitive", says Tom Veldkamp, ITC Rector. "Our research on wildlife enforcement monitoring (WEMS) aims to understand the civic, scientific and bureaucratic cultures that interact when spatial information for WEMS is shared across national borders”. For WEMS Software Demo: www.youtube.com/watch?v=xef5r5leuS4.
Further information on the tripartite agreement or WEMS, please contact Habiba Wato of LATF (tel: +254(0)714 214 797; habiba@lusakaagreement.org), Makiko Arima of UNU-IAS (tel: +81 (0)45 221 2327; arima@ias.unu.edu) or Janneke Kalf of ITC (tel: +31 (0)53 4874411; kalf@itc.nl). Further information is also available on the WEMS website (http://wems - initiative.org).

Kenya allows public online access to Government datasets

Kenya's open data, one of the first and the largest government data portals in Africa, provides unlimited access to researchers, web and software developers, journalists, students, civil society and the general public via the Internet and mobile phone platforms. An estimated 11.5 million Kenyans, over 28 percent of the population, use the Internet while 25 million, or over 80 percent of the adult population, uses mobile phones. The country’s drive to become a knowledge economy and empower its citizens through open data moved a notch higher on July 8 with the official launch of an open government web portal, www.opendata.go.ke in Nairobi. The site enables the public to access several large government datasets, including the national census, and statistics on government spending at national and county levels. "The Government data website will be particularly useful to policy makers and business persons who require timely and accurate information in formulating policies and making business decisions," said President Mwai Kibaki, who clicked the button to launch the portal. "It will also be helpful to scholars and students undertaking research work in various areas of the public sector." Moreover, the portal will enable citizens to hold the government accountable for the use of public resources, Kibaki said, underlining his government's commitment to facilitate the free flow and access to information as a critical requirement for the creation of an open society in line with Kenya's new constitution.
The data on Kenya government portal is drawn from several sources, including the ministries of Finance, Planning, Health and Education, the Kenya National Bureau of Statistics, and the World Bank. It is powered by Socrata (www.socrata.com) and other partners including private web and software developers. The World Bank, which is supporting Kenya's ICT developed through a US$114.4 million Transparency and Communications Infrastructure Project, launched its open data in April 2010, providing free, open and easy access to statistics and indicators about development for all users through a its portal data.worldbank.org.
Open Data: this site makes public government data accessible to the people of Kenya. High quality national census data, government expenditure, parliamentary proceedings and public service locations are just a

taste of what's to come. There's something for everyone: maps to start exploring, interactive charts and tables for a deeper understanding, and raw data for technical users to build their own apps and analyses. Our information is a national asset, and it's time it was shared: this data is key to improving transparency; unlocking social and economic value; and building Government 2.0 in Kenya.

Kenya Government embraces technology to forecast impact of climate change

A new tool has been developed and launched on 8 July 2011 in Nairobi to enhance Kenya's efforts in mitigating the risks and impacts of climate change as the country continues to implement policies aimed at promoting the achievement of the country's economic blue print Vision 2030. The latest model dubbed "Kenya Threshold 21 model" seeks to put in place an adaptation framework to provide a practical response strategy to climate variability and change. The Government of Kenya through the Ministry of State for Planning, National Development and Vision 2030 signed a contract with the Millennium Institute last year in October, to develop T21 which is a dynamic modeling system, to help integrate the analysis of the risks and impacts of climate change across the major sectors of the economy, society and environment.

Speaking during the T21 stakeholders' workshop at a Nairobi hotel, Dr. Edward Sambili, Permanent Secretary Ministry of State for Planning, National Development and Vision 2030 said that once completed the model will enable policy makers better understand the key challenges and issues related to long term development. Dr. Sambili noted that the instrument will also enable policy makers and experts better understand their interrelations across sectors and impacts over time. "The policies formed will benefit from cross fertilization of sector analyses and generate more clarity on the costs and benefits of interventions including the non-economic gains accruing to society and this will also help the Government determine the costs of adaptation programmes and efficient allocation of resources," said the PS.

Environment and Mineral Resources PS Mr. Ali Mohamed said T21's objective was to strengthen the country's institutional and systemic capacity and leadership to address climate change risks and opportunities through a national approach. Mr. Mohamed described T21 as a dynamic, quantitative and transparent planning tool saying it would be mainstreamed to ensure long-term integrated development planning through scenario analysis of adaptation options. "The ultimate T21 Kenya Version will complement available budgetary models and other short term and medium term planning tools. It will provide comprehensive long term perspective development which will include issues of climate change, millennium development goals and Vision 2030," he said.

The Millennium Institute was tasked to develop this Dynamic Systems Modeling tool through funding and support by UNDP in partnership with Ministry of State for Planning, National Development and Vision 2030, Africa Adaptation Programme (AAP), Ministry of Environment and Mineral Resources, and JICA. The President of Millennium Institute Mr. Hans Herren who was present urged Kenyans to be conscious and decide on the best policies in the implementation of the adaptation to climate change program.

Satellite Sentinel Project documents new eyewitness reports and visual evidence of mass graves in Sudan

The Satellite Sentinel Project (SSP) has revealed visual evidence of mass graves in South Kordofan, which corroborates new eyewitness reports, obtained by SSP, of systematic killings and mass burials in this conflict-torn region of Sudan. The evidence found by SSP is consistent with allegations that the Sudan Armed Forces (SAF) and northern militias have engaged in a campaign of killing civilians.

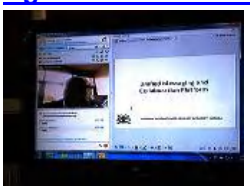
Based on Harvard Humanitarian Initiative's analysis of DigitalGlobe satellite imagery and eyewitness reports, SSP has identified a site in Kadugli consistent with three mass graves. SSP's new evidence corroborates four, independent eyewitness accounts that SAF, northern militias and other forces aligned with the Government of Sudan (GoS) are present in Kadugli and are alleged to be methodically searching houses for civilians. The four eyewitnesses claim that the SAF and GoS-aligned forces are systematically killing those suspected of supporting the Sudan People's Liberation Movement (SPLM) and others. "This evidence demonstrates the urgent need for a full-scale international investigation into the violence in South Kordofan, and underlines the imperative to protect civilian populations from their own government in Khartoum," said Enough Project Co-founder John Prendergast, who co-founded SSP with George Clooney after they traveled together to South Sudan in October 2010. "With all the killing that has occurred in Darfur, Abyei and the Nuba Mountains, we surely can't say we didn't know this could

happen. SSP has also found evidence consistent with a possible pile of people in body bags or white plastic tarps in Kadugli. This imagery corroborates an eyewitness account of bodies being placed in body bags or some form of white plastic tarp by SAF and GoS-aligned forces.
"Detailed situation reports from UN agencies and other aid providers are severely limited due to the lack of free and unfettered access to Kadugli town," said Harvard Carr Center Executive Director Charlie Clements, MD. "In the absence of on-the-ground reports from humanitarian actors and journalists, eyewitness reports from those who were in Kadugli town within the past month, combined with satellite imagery analysis, offer the only available means at present of assessing threats to civilians there." More..
Read the SSP report, "Crime Scene: Evidence of Mass Graves in Kadugli": http://www.satsentinel.org/report/crime-scene-evidence-mass-graves-kadugli-sudan. View or download imagery: http://www.flickr.com/photos/enoughproject/sets/72157627189996106/.

Using the power of mapping to support South Sudan


The Google Map Maker team, along with the World Bank and UNITAR/UNOSAT, held a unique event at the World Bank Headquarters in Washington, D.C., and a satellite event in Nairobi at the same time. More than 70 members of the Sudanese diaspora, along with regional experts from the World Bank, Sudan Institute, Voices for Sudan, The Enough Project and other organizations gathered together to map what became the world's newest country later this year: the Republic of South Sudan. South Sudan is a large but under-mapped region, and there are very few high-quality maps that display essential features like roads, hospitals and schools. Up-to-date maps are particularly important to humanitarian aid groups, as they help responders target their efforts and mobilize their resources of equipment, personnel and supplies. More generally, maps are an important foundation for the development of the infrastructure and economy of the country and region.
The Map Maker community - a wide - ranging group of volunteers that help build more comprehensive maps of the world using online mapping tool, Google Map Maker - has been contributing to the mapping effort for Sudan since the referendum on January 9. To aid their work, updated satellite imagery of the region has been published covering 125,000 square kilometers and 40 percent of the U.N.'s priority areas, to Google Earth and Maps. The goal of the event was to engage and train members of the Sudanese diaspora in the United States, and others who have lived and worked in the region, to use Google Map Maker so they could contribute their local knowledge of the region to the ongoing mapping effort, particularly in the area of social infrastructure. Our hope is that this event and others like it will help build a self-sufficient mapping community that will contribute their local expertise and remain engaged in Sudan over time. We look forward to seeing the Southern Sudanese mapping community grow and flourish.
Similar event - **South Sudanese sing and map their way to independence** was organized in Nairobi on June 30 by the World Bank, UNOSAT, RCMRD, Satellite Sentinel Project and Google. This was the second in a series of mapping events intended to encourage locals to create accurate and detailed maps of South Sudan, to help them navigate their path to independence. Over 100 attendees, mostly Sudanese - university students, humanitarian workers, journalists, developers, donors, citizens - coming from Nairobi and its surroundings, but also as far as Juba, the capital of South Sudan attended. South Sudan was officially declared independent, becoming Africa's 54th state on July 9.
For Charles Mona, Director GIS, Remote Sensing & Cartography of the South Sudan Government, quality health resource maps would be great tools for improved health care planning, resource allocation, advocacy, as well as increased access to health services for the local population. This is only one example of how accurate maps can help various organizations provide better services to the South Sudanese. Happy Independence Day to the South Sudanes! The next Community Mapping event will be in Juba.

Uganda launches centralized data centre



Government of Uganda has launched a state-of-the art centralized data center. Information Communication Technology minister, Ruhakana Rugunda launched the Government unified messaging and Collaboration Platform at NITA-U. The data Centre is part of the IT infrastructure that will host key Government applications starting with secure messaging and collaboration systems. The facility was built with redundancy; secure biometric access control systems, and environmental monitoring systems. This center will save Government money on cost of building multiple data centers and duplication

of infrastructure. Secure messaging and collaboration system currently being piloted at NITA-U is to be rolled out to ICT ministry and State House in September 2011. This includes secure email, instant messaging, Voice and Video conferencing.

Uganda Mapping Day

On 4 July 2011, 40 people came together on Uganda's first Mapping Day. Everyone went out to map a specific part of the real world in the morning, and added features to openstreetmap in the afternoon. Mapping was done around 4 themes:

- Electricity
- Roads & Trenches
- Landuse & Parking
- Plots & Barriers

One group was able to walk around with GPS units. Their tracks were uploaded to openstreetmap.org. Everyone used walkingpapers to map. These were uploaded to www.walkingpapers.org after the even (Sample). After the event, interns at Mountbatten combined all retrieved data, and kept on improving the map. View Larger Map.

Zambia's climate information alerts boost poor farmers

The Zambian government has been one of the first in Africa to recognize the need for timely and accurate advance early warnings information as climate change intensifies, bringing more extreme weather, as well as seasonal and longer-term changes for effective adaptation in rural areas. The collection and distribution of local rainfall information can help smallholder farmers to adjust their crop production methods to changing seasonal precipitation patterns.

Through its RANET (Radio and Internet for the Communication of Hydro-Meteorological Information) Project, the Zambia Meteorological Department is tapping remote communities across several provinces to collect climate information. In the past four years, some 3,060 farmers have been provided with rain gauges to take rainfall measurements which are fed back to the meteorological service's local weather stations through mobile phones. Farmers are encouraged to report other local weather observations. To motivate farmers taking part, RANET periodically recharges their phones with free airtime, and FrontLine SMS software is now being tested to help minimize the service cost. The Zambian Met Office is now considering providing automatic weather stations and rudimentary meteorological training to rural farmer cooperatives across the country.

RANET Project sends weather alerts via SMS text and has assisted rural areas to establish community FM broadcasting stations, which pick up regional climate information from satellites, translate relevant weather information into local languages and use to broadcast timely weather warnings. The project has provided communities with solar wind-up radio receivers to access the broadcasts, 3,000 of which have been distributed to date. In Mali, similar weather forecast bulletins, broadcast every 10 days, have helped low income smallholder farmers to increase yields by providing vital information on when and what to plant, depending on the climatic conditions. More..

Angola's satellite system to cover remote areas

The chairman of the Board of the Angolan Institute of Communications, Mendes de Carvalho said the launch of the first Angolan satellite will create conditions to overcome the difficulties of telephone communication in the intermediate space among some localities of the country. Speaking to the press about the communication systems in the country, the manager said that the launch of the satellite Angosat will ensure that the components of a VSAT communication technology (similar to satellite dishes) is strengthened and contributes to cover all areas in telephone communication.

Health Early Warning System (HEWS) in Angola

A consortium of Portuguese and Italian companies, led by the Portuguese National Health Institute and with the support of ESA, is developing a Health Early Warning System designed to enable timely detection and tracking of emerging threats to public health and safety via satellite. The Health Early Warning System (HEWS) is being developed as an integrated management platform devised to support epidemiologic surveillance, public health monitoring, crisis management and civil protection.

HEWS was recently put to the test in Angola, Africa, through the collaboration of local health institutions and the involvement of higher-level Angolan institutions such as the Ministry of Health. The scenario for this test was a simulated surge of the Marburg virus. See also video: http://iap.esa.int/node/51.

Namibia launches observation department

Namibia's Polytechnic Department of Land Management launched its Earth Observation and Satellite Applications Research and Training Centre (EOSA-RTC) in July, which could help boost food security in the country. The centre's main objective will be to enhance the base of information from which farmers, government and researchers can draw upon.

The data beamed to the centre will provide various resources for the agricultural industry, including providing information on ground vegetation, soil moisture, rainfall estimates and information on the timing, extent and frequency of veld fires. According to the head of Land Management, Charl-Thom Bayer, the ultimate goal of the centre, aside from providing improved opportunities for students and teachers, is to provide interested parties in Namibia access to a wide variety of information that will boost agriculture. Bayer said the centre has been "technically operational" for the last month and the "basics are up and running". The centre will act as an "additional information base" to existing informational pools farmers and others use.

The EOSA centre will download satellite imagery and data from a satellite positioned over Africa, which provides real-time recordings on "environmental variables to assess the actual conditions of natural resources". For instance, Bayer explained that one of the goals of EOSA-RTC is to be able to calculate biomass, which could boost food security in the country. "Based on rainfall and grass coverage, you can calculate grass volumes, you can estimate how long the grass will last," he explained. Based on the data available, farmers could potentially increase livestock on their farms in a good year, or prevent overpopulating grazing areas before problems could arise. Other uses include identification of areas that require controlled fires, fairly accurate predictions of drought.

UNEP launches 2011 Ozone Africa Media Award

The United Nations Environment Programme (UNEP), through its assistance plan for Africa, launched the Ozone Africa Media Award, aiming at encouraging high quality and excellence in environmental and scientific report focused on the issue. The Ozone Africa Media Award, which was established in 2010, encourages highest standards of excellence in environmental and scientific reporting, focusing on how ozone issues are addressed in Africa. The award places emphasis on compelling stories with a human face, showing how the consequences of a global environmental issue can affect us and how we as individuals can be part of the solution.

The Regional Coordinator of UNEP Ozone Compliance Assistance Programme in Africa, Jeremy Bazye said: "We have developed a strategic partnership with journalists, which materializes in the provision of capacity building in environmental reporting and information sharing. We need to consolidate this important capital. This competition provides another great opportunity to harness the power of the media and further engage journalists in the work lying before us." The best examples of journalistic practice in the coverage of Ozone issues in Africa in print, audio-visual and electronic media will be awarded also bearing in mind the specific conditions in which the work is being carried out. The competition will run through to 10 September 2011 and the winners will be announced on the International Day for Ozone preservation on 16 September.

Tender: Study on Governance - eHealth for Sub-Saharan Africa Programme (eHSA)

Together with the EU-Africa Infrastructure Trust Fund (ITF) and Lux-Development (Lux-Dev), ESA is pleased to announce the first Invitation to Tender (ITT) within the eHSA programme addressing healthcare governance aspects in Sub-Saharan Africa. In the frame of the phase 1 activities of the "Satellite-Ehanced Telemedicine and eHealth for Sub-Saharan Africa Programme - eHSA", this ITT will be open to industry from 108 states.

In general the eHSA programme has been divided in two phases:

- Phase 1 foresees four studies addressing basic but critical success factors for all e-Health and Telemedicine services development, including governance, regulatory aspects, interoperability and sustainability ("Horizontal Studies").
- Phase 2 will be dedicated to the implementation of projects stimulating and addressing the four thematic areas defined in the programme: eCare, eLearning, eSurveillance and eGovernance/eAdministration ("Thematic Areas Projects").

The requested study shall investigate the healthcare governance situation in sub-Saharan Africa prior to any eHealth service implementation consequentially allowing for an adequate adoption as well as service provision. Objectives of the study are:

- Analyse the responsibilities and the interaction required by local authorities in sub-Saharan Africa on district, country, and regional level while synthesizing a suitable and comprehensive governance model.
- Identify the role and responsibility of local stakeholders on various levels of the healthcare system, and, if needed, other entities.
- Identify and propose suitable governance models for the thematic areas of eCare, eLearning, eSurveillance and eGovernance/eAdministration which will also be addressed by the projects initiated in phase 2 of the eHSA programme.

Bidders from ESA Member States can download the ITT documentation via ESA's EMITS system (http://emits.esa.int), under the reference AO 6824 (under "Open Invitations to Tender"). Bidders from EU Member States, Africa, the Carribean, and Pacific Group Member States, can download the ITT documentation through the EU-Africa Infrastructure Trust Fund (ITF) Portal (http://www.eu-africa-infrastructure-tf.net) and the Lux-Development (Lux-Dev) Portal (http://www.lux-development.lu). Closing date: 31 August 2011.

AfricaGIS 2011: A geospatial technology revolution in Africa

EIS-AFRICA has announced that the AfricaGIS 2011 will be held in Abuja, Nigeria between the 7th and 11th of November 2011. Sub-themes:

- Spatially-enabled Governance;
- Enterprise GIS and Land Administration: the building blocks of sustainable development;
- New Trends: crowd-sourcing, volunteered geographic information (VGI), and web services in the cloud;
- Business Geographic's: the geospatial advantage

The organisation will be supported by Agencies and Organizations in Nigeria including GEOSON,NIS, OSGOF, AGIS, SURCON, NGSA, RECTAS, NASRDA, National Population Commission, NCA, ARCSSTE-E(African Regional Centre for Space Science and Technology Education - English, Ile-Ife), FSS (Oyo), Dept of Surveying and Geoinformatics (Unilag, Nnamdi Azikwe Univ.), Geography Dept (OAU, U.I.) amongst others. Please submit abstracts to secretariat@eis-africa.org immediately.

See DRAFT Resolutions (http://www.eis-africa.org/EIS-Africa/1africagis2009_draft_resolutions.docx) resolved during the 9th AfricaGIS 2009 conference and exhibition held from 26th to 30th of October in Kampala, Uganda on the theme 'Geospatial Information and Sustainable Development in Africa; Facing Challenges of Global Change' representing the Geospatial Science and Technology community of Africa, realising the critical importance of geo-information in addressing these challenges and the role of geo-information in galvanizing the sustainable development of Africa.

OGC seeks comment on candidate Earth Observation profile of coverage standard

The Open Geospatial Consortium (OGC®) seeks public comment on the candidate Earth Observation profile for the OGC Web Coverage Services (WCS) 2.0 standard. This profile will facilitate on-line data access to Earth observation data products. The OGC WCS 2.0 standard defines a general interface and operations that enable interoperable access to geospatial coverages, such as sensor data, satellite imagery, digital elevation models, and climate/ocean data.

The candidate OGC Web Coverage Services Application Profile for Earth Observation Sensors (EO-WCS) defines an interface for interoperable access to Earth Observation data. The candidate Earth Observation profile for the OGC Web Coverage Services (WCS) 2.0 standard documents are available for review and comment at http://www.opengeospatial.org/standards/requests/81. Comments are due by 20 August 2011.

The OGC is an international consortium of more than 415 companies, government agencies, research organizations, and universities participating in a consensus process to develop publicly available geospatial standards. OGC Standards support interoperable solutions that "geo-enable" the Web, wireless and location-based services, and mainstream IT. OGC Standards empower technology developers to make geospatial information and services accessible and useful with any application that needs to be geospatially enabled.

Further information contact: info@opengeospatial.org. Also visit the OGC website at http://www.opengeospatial.org.

4th Euro-Africa Cooperation Forum on ICT Research, 14-15 November 2011, Cape Town, South Africa

This major event is the fourth of a series of very successful conferences organised by the EuroAfrica-ICT initiative under the aegis of the European and the African Union Commissions. Hosted by the Government of South Africa through the Department of Science & Technology (DST), the 4th event edition will mainly aim at strengthening and supporting development of cooperation on ICT research between Africa and Europe by:

- Allowing European and African stakeholders involved in the development of cooperation on ICT to get together
- Allowing participants to exchange views, share information, and identify synergies in order to increase the impact of their activities
- Further supporting policy dialogues, apprehending medium-to long term perspectives and agreeing on an overall and coherent vision
- Increasing the number of African organisations involved in EU/FP7 collaborative projects on ICT research thus enhancing the development of Euro-African collaborative projects in the field

The conference organisers are calling for papers: the Euro-African ICT community is invited to share information on technological developments that will support the strengthening of cooperation between the two regions. Contributions from players across the entire ICT sphere intended to reflect ongoing technological advances and capabilities within R&D/ICT communities as well as forthcoming commercial deployments are welcomed. Contributions have to include a consideration of relevant challenges in emerging economies and markets. All received abstracts will be carefully evaluated on the following criteria: originality, significance, technical soundness, clarity of expression and interest to a wide audience.

Practical SDI implementation materials from within and outside of Africa

Contribution of remote sensing to Digital Observatory for Protected Areas (DOPA)

The Digital Observatory for Protected Areas (DOPA) is a biodiversity information system currently developed as a set of interoperable web services at the Joint Research Centre of the European Commission in collaboration with other international organizations, including GBIF, UNEP-WCMC, Birdlife International and RSPB. DOPA is not only designed to assess the state and pressure of Protected Areas (PAs) and to prioritize them accordingly, in order to support decision making and fund allocation processes, but it is also conceived as a monitoring and modelling service. To capture the dynamics of spatiotemporal changes in habitats and anthropogenic pressure on PAs, the automatic collection and processing of remote sensing data are at the heart of the system. The purpose of this paper is to highlight the variety of uses of remote sensing data by the DOPA, the integration with other data sources, the practical implementation according to an architecture grounded in international initiatives such as GEOSS, GSDI and INSPIRE, and applications in monitoring and ecological modelling.

To capture the dynamics of spatio-temporal changes in habitats and anthropogenic pressure on PAs, the automatic collection and processing of remote sensing data are core functions of the system. Both the DOPA and the eStation are completely based on OpenSource software and on architecture of open standards and specifications. It is therefore a flexible and costeffective platform for the implementation of information services needed for environmental and natural resources policy orientation, management and assessment, in different thematic areas, like the monitoring of natural vegetation, agricultural production, water resources, coastal and marine regions. Ongoing short and long term efforts are currently focusing on extending our applications to the marine environment and on making our remote sensing information available online with the help of catalogues and to publish the eStation as a web service to be potentially consumed by other environmental services. It is becoming increasing important to provide efficient means to publish and discover information resources though interoperable catalogues and search mechanisms, including tools such as brokers which can handle semantic differences across multi-lingual and multi-disciplinary boundaries.

GIS mapping of rice fields in Ghana

The Agricultural Development and Value Chain Enhancement Programme is to carry out a Geographic Information Systems (GIS) mapping exercise of rice, soya and maize fields in Ghana's Northern, Upper East and Upper West regions. The programme funded by the United States Agency for International Development (USAID) is scheduled to begin from July to August this year with the aim of increasing the competitiveness of the food crops through better use of improved technologies. A Communications Specialist of

the programme, Adwoa Mensima Sey, said the programme is to help farmers to calculate their plot sizes for production, planning and resource allocation. It will also involve 53 students who will be trained as Geographic Information System surveyors, from the University of Ghana, Cape Coast University, University of Development Studies and the Kwame Nkrumah University of Science and Technology.

Cartography for advocacy in Cameroon

A new video was posted to the Conversations with the Earth (CWE) Youtube Channel about Gamo forests in Ethiopia. Among the video series is entitled 'Cartography' which documents cartography for advocacy project in Cameroon. Using picture based GPS machines the Baka of Cameroon are seen documenting their traditional uses of the forest, which have increasingly been under threat from logging and illegal exploitation.

GIS Tools, Software, Data

SERVIR success: Developing a new SERVIR One-Stop geospatial data platform

The SERVIR Program, a joint project between USAID, NASA, and dozens of governmental and non-governmental organizations worldwide, continues to develop a specialized platform to provide tools that help developing nations observe and respond to their environment. Through its network of hubs in Mesoamerica, East Africa, and the Hindu Kush-Himalayas, SERVIR provides access to and analysis of data and models from NASA and other partners, allowing real-time or near-real-time observations of weather, fires, volcanoes, earthquakes, landslides, red tides, and other hazards. Now SERVIR is taking its technical platform to the next level, allowing an exciting new range of possibilities for accessing and interpreting geospatial information in the developing world.

From its inception in 2005 to the present, SERVIR has demonstrated the value of increasing access to geospatial data in developing nations and building capacity to use and interpret the data to solve environmental problems. In 2011 and 2012, SERVIR is building upon this foundation to develop an online "one-stop shop" for geospatial information on partner regions, called the SERVIR One-Stop. The One-Stop will feature a redesigned, user-friendly website with access to SERVIR's geospatial data catalog and data holdings, an interactive mapping tool, access to online geospatial data feeds from a wide range of sources, customized applications for mapping or interpreting Earth observations, training and other capacity building materials, and examples of success stories and news from the community of users.

Behind the scenes, SERVIR is developing state-of-the-art, "cloud computing"-based geospatial information technology (GIT) infrastructure to support the One-Stop. SERVIR will implement quality assurance and quality control programs to improve existing data management and ensure that new datasets, which can be submitted and shared by non-SERVIR users ("crowd-sourced"), adhere to standards approved by the international GIT community. The result will be a searchable, virtual library of geospatial information and online visualization services that would allow users to "check out a volume" of NASA data, combine it with a map of their home region, and send the result to others or download it to their home computer. As SERVIR's platform for accessing and representing data continues to improve, users around the world will have more and better tools to help in understanding the state of the planet's environment. [Source: Servir News].

Interactive infrastructure atlases for Africa

You can download a large number of interactive infrastructure atlases [Interactive PDF Maps] that allow you to easily create your own customized infrastructure maps ready for use in documents and presentations. For the more technical user, the public domain GIS data underlying these atlases can also be downloaded in the form of shape files for further analysis.

The AICD work program emphasized spatial modeling as an integral input to the infrastructure analysis. To support this analysis, an African GIS database has been collated from diverse sources to permit the overlay of geophysical, agro-ecological, demographic, and economic features together with geo-referenced data on the location, type, capacity and condition of various infrastructure networks, primarily relating to the ICT, power and transport sectors. The specific layers available for each sector are:

- ICT: International gateways, Backbone networks, and GSM coverage
- Power: Power plants and Transmission network
- Transport: Airports and air traffic, Ports and sea traffic, Roads (condition and traffic), and Railways

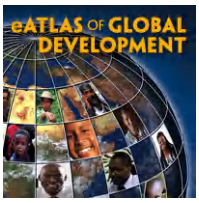
In addition to the maps, ARC GIS Shape Files have been placed on the website. They are suitable for GIS professionals or other interested parties who can use the underlying data to inform their own analysis and

create their own maps. Only public domain data has been placed on the site, hence not all of the layers available in the interactive infrastructure atlases are available in ArcGIS form.

Data and statistics in Africa

This site brings together information and resources dealing with statistics on Africa, both from within the World Bank and from many other sources identified by World Bank staff.
On the left-hand menu, you will find three sections: Data, Methods and Tools, and Resources. Under Data there is information on the Africa Development Indicators, the most detailed collection of development data on Africa (including data from over 50 African countries and more than 500 development indicators).
Information on statistical research and development work supported by the World Bank in Sub-Saharan Africa can be found under Tools and Methods. Under Resources, you will find key sources of statistics in African organizations, including academic and research institutes, national statistics offices, and regional institutions as well as other international and donor partner organizations. Inclusion of information on this site does not imply specific endorsement by the World Bank. Nor does the absence of information imply any deliberate exclusion. We are aware that information may be incomplete, and we are continually building the information pool and adding to resources. See: http://go.worldbank.org/NBFQ8U3TD0.

New data visualization tool maps development indicators



Fast forward nearly half a century. The World Bank launches its e-Atlas of Global Development, a sophisticated online, interactive tool that maps and graphs more than 175 indicators from the World Bank's development database. Developed in collaboration with HarperCollins, the e-Atlas of Global Development allows users to easily and quickly transform data into customized visual comparisons across time, countries, and regions. The resulting full color maps and graphs can subsequently be exported for sharing and later use (watch e-Atlas video here).
The e-Atlas lets you map more than 175 indicators for up to 200 countries over time including creating two maps to compare progress. Other features include scalable maps, timeline graphing, ranking tables, and import and export functions. Critical issues such as poverty, food production, population growth, climate change, international trade, and foreign direct investment are covered.

TanBIF-GIS Tool

TanBIF-GIS Tool is an application that provides data viewing, editing, and analysis capabilities. Please click the link to download software you may also download video demo for installations and uses. TanBIF is an extensive, decentralized system of national biodiversity information units that intends to provide free and universal access to data and information regarding Tanzania's biodiversity. It is a national node of the Global Biodiversity Information Facility (GBIF). TanBIF was the main aspiration of the GBIF Capacity Enhancement Programme for Developing Countries (CEPDEC) Pilot Project in Tanzania.

Geospatial Research, Applications, Reference Material

Mapping South African farming sector's vulnerability to climate change and variability: A subnational assessment

A new paper from International Food Policy Research Institute (IFPRI) analyzes the vulnerability of South African farmers to climate change and variability by developing a vulnerability index and comparing vulnerability indicators across the country's nine provinces. Nineteen environmental and socioeconomic indicators reflect the three components of vulnerability: exposure, sensitivity, and adaptive capacity. The results of the study show that the regions most vulnerable to climate change and variability also have a higher capacity to adapt to climate change. Furthermore, vulnerability to climate change and variability is intrinsically linked with social and economic development. The Western Cape and Gauteng provinces, which have high levels of infrastructure development, high literacy rates, and low shares of agriculture in total GDP, are relatively low on the vulnerability index. In contrast, the highly vulnerable regions of Limpopo, KwaZulu Natal and the Eastern Cape are characterized by densely populated rural areas, large numbers of small-scale farmers, high dependency on rainfed agriculture, and greater land degradation. These large differences in the extent of vulnerability among provinces suggest that policymakers should develop region-specific policies and address climate change at the local level.

A new methodology for quantifying emission reductions from unplanned deforestation

A new methodology for quantifying emission reductions from projects that reduce unplanned deforestation could help unlock carbon market revenues for countries and poor communities across Africa, Asia and Latin America, boosting the conservation of forests and creating new livelihoods.

The new REDD methodology - officially approved on July 14 by the Verified Carbon Standard (VCS) Association - allows projects in the voluntary market to calculate avoided emissions by reducing deforestation either on the edge ("frontier") of large cleared areas, like agricultural zones, or in a patchwork pattern ("mosaic") within standing forests. A key to finalizing the "Unplanned Deforestation" Methodology was the decision to merge two methodologies that were being separately developed by the World Bank and the Brazilian NGO Fundação Amazonas Sustentável (FAS), together with Carbon Decisions International (CDI) and the Institute for Conservation and the Sustainable Development of Amazonas (Idesam), with the financial support from Marriott International. By addressing a whole range of unplanned deforestation scenarios common across developing countries, this new methodology fills an important niche compared with other methodologies for reducing emissions from deforestation and forest degradation (REDD).

For further details, please see http://www.v-c-s.org/news-events/news/vcs-approves-new-redd-methodology-avoid-unplanned-deforestation.or contact Elizabeth Cavalcanti, Fundação Amazonas Sustentável, ph: +55 11 4009 8900, elizabeth.cavalcanti@fas-amazonas.org and Isabel Hagbrink, World Bank, ph: +1 202 458 0422, ihagbrink@worldbank.org.

Training Opportunities

Have you signed up to receive **SDI-Africa Newsletter** notices? It only takes a minute, and then the GSDI Association can notify you when a new issue of the SDI-Africa newsletter is available, plus alert you to particular GSDI announcements (like a call for GSDI grants, or a call for papers for a GSDI conference).

The GSDI Association also hosts an **SDI-Africa E-mail Discussion List** with intermittent news and announcements of opportunities (this discussion list is separate from the SDI-Africa Newsletter list).

- The **SDI-Africa E-mail Discussion List** is open and available to anyone to read on the web. To submit messages or to receive submitted comments or notices by e-mail, one first must register.
- To see the collection of prior postings to the list, visit the **SDI-Africa E-mail Discussion List Archives**.
- To post a message to the list, send an email to sdi-africa@lists.gsdi.org.

African Regional Centre for Space Science and Technology Education in English (ARCSSTE-E)

The African Regional Centre for Space Science and Technology Education in English (ARCSSTE-E) is established in Nigeria at Obafemi Awolowo University Campus, Ile-Ife. Within the frame work of its mandate to build capacity in core areas of Remote Sensing and GIS, Satellite Communication, Satellite Meteorology and Global Climate and Basic Space and Atmospheric Sciences Applications.

The Space Education courses comprise a 9-month Post Graduate Diploma programme (January to September) every year; and an optional 12 months MSc degree programme. The list of courses:

- Satellite Communication (SATCOM)
- Satellite Meteorology (SATMET)
- Remote Sensing/Geo Information System (RS/GIS)
- Basic Space

The Center trains participants mostly from English speaking African countries: Angola, Botswana, Cameroon, Egypt, Ethiopia, Ghana, Kenya, Lesotho, Liberia, Malawi, Mozambique, Namibia, Nigeria, Sierra Leone, South Africa, Sudan, Swaziland Tanzania, The Gambia, Uganda and Zimbabwe. Deadline for applications: 30 September of each year.

ESRI Technical Certification

Beginning in January 2011, users will be able to test for five certifications. The remaining eight are still in development and will be available later in the year. Establishing an industry recognized benchmark of expertise in using ESRI software will:

- Improve success with GIS by creating a community of professionals proficient in using ESRI software.
- Help organizations maximize their investment in ESRI products by employing a workforce certified in using best practices.
- Create professional development opportunities.

- Provide an opportunity for individuals, partners, consultants, and other organizations to distinguish themselves among their peers.
- Assist hiring organizations in assessing candidate skills and abilities.

Workplace experience, combined with GIS education and ESRI training courses, is the best preparation. The ESRI Technical Certification Web site lists specific skills that will be assessed in each exam, as well as training courses that aid in acquiring and improving these skills. Advice on the best training and preparation for a particular certification is available. Read more.

ESRI South Africa presents a full spectrum of GIS courses: August 2011

- The course covers GIS theory and functionality: The desktop products (ArcView, ArcEditor, and ArcInfo; Server products (ArcGIS server and ArcSDE); Programming to enable customization of the product, ArcGIS extensions, as well as Introductory and advanced courses in ERDAS Imagine Remote Sensing Software'

Various training venues are available at Esri South Africa, for further information contact: 011 238 6300 Email the training team

Free ESRI Courses

Free online course modules from ESRI's Virtual Campus site. Learn the basics of many of their software packages and extensions or take some concept courses such as a review of projections.

GIS and Remote Sensing Courses at Esri Eastern Africa

ESRI Eastern Africa is now offering update courses to conform to improvements in ArcGIS 10 and ENVI 4.8, conducted with skilled and experiences instructors together with conducive and state-of-the-art training facilities. Courses in the following tracks are offered:

- Fundamentals of ArcGIS Desktop
- Data and Map Production
- Geoprocessing and Analysis
- Enterprise GIS
- Multi-user Geodatabases
- Remote Sensing

Make plans and take advantage of the courses offered at the Authorized Learning Centre in Nairobi, Kenya. Arrangements can also be made for client's site training on request for 12-16 students. Download our course catalogue and current class schedule at http://www.esriea.co.ke/index.php/instructor-led-training. To register, visit http://esrieatraining.cloudapp.net/. For more information, contact by email: training@esriea.co.ke, telephone: +254 20 2713630/1/2 or visit the offices located on 3rd floor, KUSCCO Centre, Kilimanjaro Avenue, Upper Hill, Nairobi, Kenya.

Training at Oakar Services

Oakar Services continues to building capacity for geospatial solutions within Eastern Africa. The following courses are available in 2011, which are offered at Oakar's Training Centre or client's site.

GIS based courses	Duration (Days)
• Introduction to GIS	2
• Fundamentals of ArcGIS	5
• Managing Water Utilities Using ArcGIS	3
• Introduction to Web Mapping	3
• GIS for Natural Resources Management	3
• Using GIS for Resource Planning and Management	3
• Working with ArcGIS 3D Analyst	2
GPS based courses	
• Data Collection Using GPS	2
• Mobile Mapping Using MobileMapper Field software	2
• Mobile Mapping Using ArcPad	2
Remote Sensing based	
• Introduction to Remote Sensing	2
• Image Processing with ERDAS Imagine	3
• Fundamentals of ERDAS IMAGINE I	4

- Fundamentals of ERDAS IMAGINE II 3
- Introduction to Leica Photogrammetry Suite (LPS) 4
- Stereo Analyst for ArcGIS 3

Specialist Course

- ArcFM UT (Utilities Solution) 5
- Introduction to Cellular Expert and Implementation 5

You can register for Focused Training Events on GIS, GPS and Remote Sensing. Futher information and enrollment - www.osl.co.ke or email at training@osl.co.ke or call Catherine or Teddy on Tel: +254-20-2718321 / 2715276 | Mobile: 0721-244785 / 0733-448255.

University of Twente - ITC Faculty of Geo-Information and Earth Observation: Registration for courses (2012-2013)

Apply online for courses starting in the academic year 2012-2013. Browse by programme (degree, diploma, and certificate), course domain (disaster management, earth sciences, geoinformatics, governance, land administration, natural resources, urban planning, water resources) or location in the course finder at www.itc.nl/CourseFinder. For printed copy of the study brochure, email: (alumni@itc.nl).

ITC Short Course: Remote Sensing and GIS for Geological and Mineral Exploration (2 weeks)

The course will start on 7 November 2011 at the SEAMIC premises in Dar es Salaam, Tanzania. Registration deadline: 1 November 2011.

The course provides an introduction into the application of GIS, remote sensing and airborne geophysics to geologic mapping and mineral resources exploration. The course contents include:

- Analysis and interpretation of geological data sets, such as ASTER satellite imagery, aeromagnetics and gamma-ray spectrometry and geochemistry,
- Integration of different data sets to enhance geologic interpretations, and
- Mineral prospectivity modelling with GIS to generate exploration targets.

Concepts and theories are explained in interactive lectures and their application will be practiced in hand-on exercises of East-African and other case studies. Target group: Geologists working in the field of geological mapping and/or mineral resources exploration who want to deepen their knowledge of the use of digital data sets in a GIS environment to increase the efficiency of geologic mapping and exploration campaigns. Further information and registration: www.itc.nl/Pub/study/Courses/C11-ESA-TM-05.html.

NFP Course List 2011-2012

Short courses in agriculture, forestry and fishery, fellowship provided. Application deadlines: 1 October 2011.

L'Ecole Régionale post-universitaire d'Aménagement et de gestion Intégrés des Forêts et Territoires tropicaux (ERAIFT) [Regional School on Integrated Management of Tropical Forests and Territories] – l'ÉRAIFT est une école d'avant-garde au service du développement humain et durable de l'Afrique.

Elle a pour vocation de former des Spécialistes (DESS & Ph.D) de l'Aménagement et de la Gestion des Forêts et Territoires Tropicaux, par une Approche Interdisciplinaire, Globale et Intégrée, autrement dit Systémique. Contact: info@eraift.org.

Short-courses offered by RECTAS in 2011, Ile-Ife, Nigeria

The Regional Centre for Training in Aerospace Surveys (RECTAS) is offering a number of three-week courses. Also note that RECTAS is able to package and deliver customised training for intrested organisations. These could be either advanced or other certificate programs. Contact: info@rectas.org or thontteh@rectas.org.

RCMRD - Courses offered by the department of Remote Sensing, GIS and Mapping

The Centre offers the following courses in geo-information. The courses last between one week to three months, and offered through out the year.

- Introduction to Remote Sensing & Image Processing
- Introduction to Geographic Information Systems (GIS)
- Introduction to Global Positioning Systems (GPS)
- Application of Remote Sensing & GIS in natural resources management.

- Application of Remote Sensing & GIS in Early Warning Systems for Food Security Application of RS & GIS in Disaster Risk Management
- Geospatial database development and management for use in planning process and decision making
- Principles of Digital Cartography
- Application of GPS technology in resource surveys and mapping
- Integrated Water Management
- Application of GIS in poverty mapping, health care & good governance
- Land Information Management Systems
- Service and Repair of Survey equipment

Funding Opportunities, Awards, Support

PhD Scholarship: Climate change, vector-borne diseases and vulnerability, Rwanda

A PhD position in climate change, vector-borne diseases and vulnerability (to commence in October 2011 and run for 3 years) is currently available through the Healthy Futures project. The PhD position is embedded in a sandwich program jointly carried out between the Centre for Geographic Information System & Remote Sensing at the National University of Rwanda (CGIS-NUR; http://www.cgisnur.org/) and the Centre for Geoinformatics, University of Salzburg (Austria; Z_GIS, http://www.uni-salzburg.at/zgis). The candidate will be registered and supervised at NUR. A co-supervisor will be appointed by the University of Salzburg, whereas the candidate will have the opportunity to carry out the research at Z_GIS (travel for 2-3 visits for 3 +- months). The reimbursement and stipend for the research will follow the NUR requirements. This PhD position is reserved for African-based scientists.

The PhD scholarship will cover maintenance (monthly stipend), university fees, and includes funds to carry out research (including funds for fieldwork, laboratory work and to attend workshops and conferences). The funding will also enable the scholarship-holder to spend periods of time Z_GIS at the University of Salzburg, Austria. The deadline for application is 15 August 2011.

Download the PhD Announcement at http://www.healthyfutures.eu/images/news_feed/nur-plus-healthyfutures-phd_final.pdf and NUR Form 5. For further information, please contact: Dr Theophile Niyonzima (National University of Rwanda – CGIS) at tniyonzima@nur.ac.rw, mobile: (+250) 788450488 and Dr. Stefan Kienberger (University Salzburg – Z_GIS) at stefan.kienberger@sbg.ac.at, tel.: +43 662 8044 5267, fax: +43 662 8044 5260, http://www.uni-salzburg.at/zgis/kienberger.

Global Monitoring for Environment and Security (GMES) Masters Competition

The Global Monitoring for Environment and Security (GMES) has opened this year's competition for the best new ideas and services for the best use of Earth observation data from Europe's Global Monitoring for Environment and Security program. The competition is launched in a collaborative effort by ESA, the Bavarian Ministry of Economic Affairs, the German Aerospace Center DLR, T-Systems and Anwendungszentrum Oberpfaffenhofen.

The competition is open to students, researchers, entrepreneurs, start-up companies and small and medium enterprises to develop new applications for data from the GMES initiative. The categories include:

- Best Service,
- Ideas,
- ESA App,
- DLR Environmental,
- T-Systems Cloud Computing.

Prizes will be awarded for the winners of each category. In addition, an overall winner will be awarded the GMES Master which comes with an additional cash prize of 20,000 Euros. The competition is open until 15 September 2011.

Efico Fund - Applications 2011

The Efico Fund (Fonds Efico) makes grants for the sustainable improvement of poor populations which produce coffee and/or cocoa in developing countries. Projects are funded for one or more years up to a maximum of €20 thousand per year. Grants by the Efico Fund are administered through the King Baudouin Foundation, Belgium. The deadline for applications is 1 September 2011.

Global Development Alliance 2011

USAID invites applications for public-private partnerships in its programs for agriculture, climate change, water management, disaster preparedness, and others. Partners are businesses and NGOs in countries where USAID has field missions, with exceptions for multi-country initiatives. Partners contribute resources (in the form of personnel, facilities, materials, and money) in a 1:1 match with USAID. Past awards range from US$50 thousand to US$10 million. Reference M/OAA/GRO/EGAS – 11-002011. TVG Note: "Funds for NGOs" provides a convenient summary of how to apply. Concept notes are accepted through 30 September 2011.

PhD fellowship: Call for applications open

For the application deadline 1 November 2011, the following research topics are available within the two scientific fields of the FONASO programme (i) economics and policy, and (ii) ecology and silviculture. The FONASO topics fall within the following 4 categories:

- Economics and Socio-Economics of Forest and Nature
- Governance, Policy and Sociology of Forests
- Forest Ecosystems and Ecosystem Services
- Silviculture and Sustainable Forest Management

FONASO doctoral candidates will be part of research groups at two or more of the twelve partner institutions. All applicants must choose one of the described topics as base for their doctoral study synopsis.

Stockholm International Water Institute - Stockholm Water Prize 2012

The Stockholm Water Prize is awarded annually for outstanding achievements supporting the availability, conservation, and protection of the world's water resources. The award is open to individuals and organizations of any nationality whose work contributes broadly to the conservation and protection of water resources. The Prize is US$150 thousand and a crystal sculpture. Deadline for nominations: 15 September 2011.

TWAS - Grants for International Meetings 2011

The Academy of Sciences for the Developing World (TWAS) makes grants to support the organization of high-level international and regional scientific activities in developing countries by offering financial assistance for conferences, workshops, symposia, and special meetings held in these countries. Application deadline: 1 December each year.

Employment Opportunities

Senior Lecturer (2 Posts), University of KwaZulu-Natal

The University of KwaZulu-Natal seeks individuals with expertise and experience in sedimentology and/or hydrogeology/environmental geology. The incumbents will teach undergraduate and postgraduate courses in their respective fields of expertise. Dependent on the appointment, they will contribute to courses in sedimentology, fossil fuels, introductory geology and field geology or hydrogeology including hydrogeochemistry and groundwater modelling, environmental geology and introductory geology. The incumbents will be expected to develop and maintain an active research programme that will involve post-graduate students and attract external funding. They are also expected to foster relations with industry both nationally and internationally.

The minimum requirements (Lecturer 1):

- A PhD in a relevant field
- Evidence of recent peer-reviewed research in ISI listed journals appropriate for this level
- Successful supervision of post-graduate students;
- Lecturing experience at tertiary level.

The minimum requirements (Lecturer 2):

- MSc by research with specialisation in appropriate fields of geology;
- Evidence of recent peer-reviewed research in SAPSE accredited journals.

This appointment will be made in line with the Faculty benchmarks which are available on the University Vacancies website on http://vacancies.ukzn.ac.za/FacultyScAgricProm.aspx. The deadline for receipt of applications is 12 August 2011. The University, however, reserves the right to accept late applications or to extend the above date in order to facilitate further searches. Applicants are required to apply on the Vacancies page of the University website at www.ukzn.ac.za. Completed forms must be sent to recruitment-

aes@ukzn.ac.za. Further information on current staff and their research interests is available on the School website at http://www.geology.ukzn.ac.za.

Country Manager, Monrovia, Liberia

The Liberia office was established in 1997 and since then has become the lead country in Fauna & Flora International (FFI)'s West Africa programme. In the past 14 years FFI has supported of Liberia's forest sector reform process, following the approach of integrating Community, Conservation and Commercial interests (the 3 C's). Today, FFI has an in-country staff of ten people, comprising a Country Manager, three project managers and six support personnel. Under the immediate supervision of the Regional Director, Africa and with advice and support from the Programme Manager, Liberia, the Country Manager, Liberia will:

i. Lead and manage the FFI Liberia Programme team in order to ensure efficient, effective development and delivery of FFI's programme in Liberia
ii. Develop programme strategies and plans together with the Regional Director and the Programme Manager
iii. Develop, support and oversee institutional relationships through which FFI Liberia can achieve conservation impacts in line with agreed strategic plans Identify and pursue opportunities to develop and raise funds for projects, in conjunction with in-country partner organisations, in line with the agreed strategic plans
iv. Provide technical advice and support to staff and partners, in line with and acting as a conduit for FFI's institutional experience and expertise
v. Maximize sharing of good practice between and within FFI, its partner organisations, and FFI's wider internal and external international networks, in conjunction with other FFI Africa staff
vi. Take the lead on ensuring that FFI Liberia is well positioned and perceived as valuable by relevant authorities and development actors in Liberia
vii. Facilitate the development of internal systems and approaches that enable FFI Liberia to maintain a small, cost-effective team that supports a diverse network of partner organisations
viii. Ensure the efficient management of FFI Liberia finances, including financial planning and reporting

The incumbent should posses:

- Degree or equivalent level qualification or experience in forestry ,conservation, natural resources management, social sciences or other relevant discipline
- Minimum of five, ideally ten years' experience in forest conservation and/or natural resource management
- Proven experience of working closely with government agencies, NGO's and donor agencies
- In depth knowledge of issues relating to development and conservation, particularly in developing countries

Please view the following document for further details of the position and how to apply: Download Application Pack. The closing date for applications: 5 August 2011.

Senior Research Officer, Cape Town, South Africa

The Energy Research Centre (ERC) at the University of Cape Town is involved in energy research. The Energy Systems Analysis and Planning programme (ESAP) is involved in various aspects of energy modelling, analysis and data management to support energy policy and planning, climate change mitigation, behavioural interventions and energy research. ERC is seeking to appoint an experienced and motivated mid-career researcher who wishes to advance his/her academic career. The responsibilities include:

- Contribution to the team's research programme, including conceptualisation of new projects, writing funding proposals, managing research projects (including budgets and timeous delivery) and supervising and building the research team.
- Conducting research under the ESAP using simulation and optimisation energy modelling platforms such as LEAP and MARKAL
- Writing research reports and supervision of postgraduate students
- Capacity building for energy modelling and analysis, including software training and courses

The incumbent should posses:

- A PhD will be highly preferable. A minimum of a Master's degree in a related discipline coupled with relevant experience may be considered.
- At least 5 years' experience in energy systems analysis
- Experience in the use of simulation and optimisation energy modelling platforms

- Experience in team and project management, demonstrated track record in securing research funding
- Good writing skills and proficiency in English, and computer literacy

Please e-mail the completed UCT Application form to Mrs C Booysen at celeste.booysen@uct.ac.za; Tel: (021) 650 2220; website: www.erc.uct.ac.za. Application deadline: 8 August 2011.

International Rescue Committee Health Coordinator, Rwanda

The International Rescue Committee (IRC) launched the Rwanda program following the genocide tragedy of 1994. At the early stage, the focus was on emergency and relief interventions, shifting afterwards to post conflict development programming. The Health Coordinator in Rwanda will be ultimately responsible for coordinating implementation of the existing health program while striving to expand IRC Rwanda health programs. The incumbent shall be involved in:

- Focal point for the development of new health proposals for IRC Rwanda program. Work with the Managers and officers, the Country Programs Coordinator, Country Director, IRC Health Unit and with community members to develop projects.
- Actively seek new funding opportunities for the IRC health program in Rwanda, supported by the Country Director, the IRC Rwanda Program Director and the Health Unit.
- Ensure that IRC Rwanda health programs are in coherence with national Ministry of Health policies and the IRC worldwide health programming standards.
- Promote a holistic approach within IRC health projects, in line with the IRC's Program Framework and mobilize partners for their involvement.
- Prepare data collection, quality control and monitoring and evaluation systems for the health program in Rwanda following IRC and the Ministry of health standards and procedures.
- Monitor project indicators and provide timely feedback to the field and to partners.
- Organize and facilitate quarterly program performance reviews and monitor the implementation of action plans and disseminate lessons learned.
- Provide required mentorship and training to IRC Rwanda health staff.
- Ensure that the implementation of IRC's health projects promotes capacity building of local communities, Government and non Government institutions and local NGOs as one of the strategies aiming at sustainability. • Support the Ministry of Health capacity building efforts intended to enhance the quality of IRC programming in Rwanda.

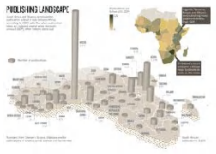
Requirements:

- Master's degree or equivalent in public health or other related fields
- At least 3 years experience in coordination/management of health international programs
- Proven skills in working with ministries, Government and donor liaison
- Good experience in local staff capacity building
- Team building skills
- Program development, monitoring and evaluation experience
- Able to write reports and proposals in English; spoken French

Deadline for application: 14 August 2011. Please apply online: www.ircjobs.org or http://tbe.taleo.net/NA2/ats/careers/requisition.jsp?org=IRC&cws=1&rid=7169.

Other

Science in Africa: The view from the front line



The forecast for science in Africa has brightened over the past decade. After enduring civil wars and economic crises, many countries have entered a period of rapid growth and leaders are starting to see science and technology as the keys to progress. In 2006, members of the African Union endorsed a target for each nation to spend 1% of its gross domestic product (GDP) on research and development (RD). And at a summit the following year, heads of state in Africa declared 2007 the year for scientific innovation.

The available data show much progress, but many nations have big gaps to overcome. In May, the African Union released African Innovation Outlook 2010, a survey of some of the scientifically most productive sub-Saharan nations. It showed that only three - Malawi, Uganda and South Africa - topped the 1% spending threshold in 2007; most remained far from that mark, even when the support from foreign donors was included. More recent spending totals are not available for most nations, but interviews with scientists and governmental officials across sub-Saharan Africa suggest that funding levels remain low.

Money is just one of many problems, as Nature reports in the following profiles of six nations that highlight some of the issues confronting the region. Many labs are poorly equipped, and science students get little practical research training because research centres are often separate from universities. Financial and logistical support for science is typically divided between many ministries with little coordination, and some states rely too much on intermittent foreign funding. Even when research is successful, it is hard to push developments to the marketplace. And poor governance - from corruption to ineffective bureaucracy - stymies progress in many nations.
Despite these hurdles, some African nations can point to notable achievements, in individual institutes and in areas of research. They will need to build on these advances if they are to have any hope of tackling the problems facing Africa today, such as poverty, rampant infectious diseases, the impacts of climate change and the lack of clean water and energy. The progress described here too easily grinds to a halt when conflicts erupt or governments lose interest in supporting RD. But science and technology leaders say that they are trying to develop and sustain capacity in the research that can most help their nations to develop. That hope has lured Wole Soboyejo, a professor of mechanical and aerospace engineering at Princeton University in New Jersey, temporarily back to Nigeria, where he grew up. As vice-president in charge of academic research and innovation at the African Institute of Science and Technology (AIST) in Abuja, Soboyejo wants to reverse the brain drain that is robbing Africa of many leading scientists and engineers. More..

Mapping the world with Facebook connections

What would a map of the world look like if your only source of data was the half-billion users of Facebook? Paul Butler, an intern on Facebook's data infrastructure engineering team set about answering that question. Butler took a sample of 10 millions pairs of Facebook friends and plotted their locations. The raw geocoding alone of the home locations of the sample set produced rough and identifiable outline of the continents of the world. To get a more refine map, Butler further experimented, explaining:
Instead I found a way to simulate the effect I wanted. I defined weights for each pair of cities as a function of the Euclidean distance between them and the number of friends between them. Then I plotted lines between the pairs by weight, so that pairs of cities with the most friendships between them were drawn on top of the others. I used a color ramp from black to blue to white, with each line's color depending on its weight. I also transformed some of the lines to wrap around the image, rather than spanning more than halfway around the world. Of course, the boldest and best defined countries are those where Facebook is most popular and the population is dense. On viewing the map, the eyes are drawn towards the brighter areas demarking the United States, Europe, India, and Asia. There Russia and China are noticeably dark along with sections of Brazil and Northern/Central Africa. Visit: Visualizing Friendships.

Conferences, Events

Items newly added to this listing of events since the last SDI-Africa issue are marked * NEW *

Date	Location	Event
August 2011		
3-4 August 2011	Kampala, Uganda	**1st Conference on Advances in Geomatics Research (AGRC2011)** Contact: agrc2011@tech.mak.ac.ug.
8-10 August 2011	Addis Ababa, Ethiopia	**African Preparatory Conference for GGIM**
15-17 August 2011	South Africa	**10th Information Security for South Africa (ISSA) 2011**
15-19 August 2011	Nairobi, Kenya	**Applied Geoinformatics for Society and Environment (AGSE) 2011 Conference** Contact: Franz-Josef Behr at franz-josef.behr@hft-stuttgart.de
21-25 August 2011	Merida, Mexico	**SER2011 World Conference on Ecological Restoration**

22-26 August 2011	Wellington, New Zealand	**5th International Symposium on GIS/Spatial Analyses in Fishery and Aquatic Sciences**
23-25 August 2011	Perth, Australia	**The 7th International Symposium on Digital Earth (ISDE7)** Theme: 'The Knowledge Generation', Contact: melissah.johnston@walis.wa.gov.au or walis@walis.wa.gov.au.
September 2011		
4-8 September 2011	Cape Town, South Africa	**The 6th Science Centre World Congress**
6-8 September 2011	Nairobi, Kenya	**Africa Geospatial Forum (AGF)**
12-16 September 2011	Denver, USA	**Call for presentations for FOSS4G 2011**
12-16 September 2011	Ticino, Switzerland	**3rd Symposium on Environmental Weeds & Invasive Plants (Intractable Weeds and Plant Invaders)**
13-15 September 2011	Livingstone, Zambia	**10th IEEE AFRICON 2011** The top-event of IEEE in Africa
19 - 23 September 2011	Cape Town South Africa	**2011 ACSEAC** 2011 African Conference on Software Engineering & Applied Computing (ACSEAC)
26-28 September 2011	Mombasa, Kenya	**4th African Leadership Conference on Space Science and Technology for Sustainable Development (ALC2011)**: Building a shared vision for space in Africa,
27-30 September 2011	Nairobi, Kenya	**6th Annual Internet Governance Forum**
26-30 September 2011	Aberdeen, Scottland	**World Conference on Marine Biodiversity**
October 2011		
3-7 October 2011	Cape Town, South Africa	**International Astronautical Congress 2011** Contact: enquiries@iac2011.com. Contact: enquiries@iac2011.com, Tel: +27 21 460 9357.
4- 6 October 2011	Saly, Senegal	**Call for Abstracts and Scientific Symposium on "Contribution of ocean data and information to sustainable development in Africa"**
5-6 October 2011	Port Harcourt, Nigeria	**Seventh International Conference on Sustainable Development**
5-7 October 2011	Beach Resort, Zanzibar	**6th ESRI Eastern Africa User Conference** Submit abstract by 29 July 2011 on any of the available tracks at events@esriea.co.ke.
11-14 October 2011	Rabat, Morocco	**E-AGRI training workshop - crop yield forecasting based on remote sensing** Contacts: riad.balaghi@gmail.com, qinghan.dong@vito.be.
10-14 October 2011	Kimberley, South Africa	**International Wildlife Ranching Symposium**
10-21 October 2011	Changwon, Korea	**UNCCD COP 10**, Contact: UNCCD Secretariat at secretariat@unccd.int
12-14 October 2011	Coimbra, Portugal	**WG II/4 & ICWG II/IV 7th International Symposium of Spatial Data Quality**
16-21 October 2011	Cairo, Egypt	**AfricaGIS 2011 Conference** Contact: africagis2011@narss.sci.eg or info.africagis2011@narss.sci.eg.
19-21 October 2011	Bloemfontein, South Africa	**1st International Conference on Clays and Clay Minerals in Africa and 2nd International Conference on Geophagia in southern Africa**
31 October - 4 November 2011	Amsterdam, Netherlands	**Call for papers: Young Scientist Workshop, International Water Week**, Contact: ysw(at)waternetwerk.nl or www.internationalwaterweek.com.
November 2011		

1-3 November 2011	Beirut, Lebanon	**Esri Europe, Middle East and Africa User Conference**
1-4 November 2011 * NEW *	Central Drakensberg, South Africa	**Esri South Africa User Conference**
7-11 November 2011	Abuja, Nigeria	**AfricaGIS 2011: A Geospatial Technology Revolution in Africa** Submit abstracts to secretariat@eis-africa.org immediately.
7-12 November 2011	Worldwide	**1st Call for Papers: Worldwide Online Climate Conference (CLIMATE 2011/KLIMA 2011)**
14-15 November 2011 * NEW *	Cape Town, South Africa	**4th Euro-Africa Cooperation Forum on ICT Research**
16 November 2011	Nairobi, Kenya	**GIS Day**
16 - 18 November 2011	Delft, Netherlands	**2nd International Workshop on 3D Cadastres**, Contact: P.J.M.vanOosterom@tudelft.nl
21-23 November 2011	Mbale, Uganda	**International Conference on East Africa Mountains (ICEAM) 2011**, Theme: Reconciling Resource Demands, Climate Change and Conservation. Submit abstract online. Contact: info@iceam2011.org.
22-25 November 2011	Beijing, China	**United Nations International Conference on Space-based Technologies for Disaster Risk Management**
28 November- 9 December 2011	South Africa	**17th Conference of the Parties to the UNFCCC and 7th Meeting of the Parties to the Kyoto Protocol** Contact: UNFCCC Secretariat, secretariat@unfccc.int.
December 2011		
13-15 December 2011	Shah Alam, Malaysia	**Third International Conference on Management of Natural Resources, Sustainable Development and Ecological Hazards**
2012		
21-27 May 2012	Vilnius, Lithuania	**12th World Congress on Environmental Health: New Technologies, Healthy Human Being and Environment**
2-6 July 2012	Galle, Sri Lanka	**MMM3 : Meeting on mangrove ecology, functioning and management**
8-12 July 2012	San Diego, California USA	**ESRI User Conference**
8-12 July 2013	San Diego, USA	**ESRI International User Conference**
5-10 August 2012	Brisbane, Australia	**34th Session of the International Geological Congress (IGC 34)** Enquiries: info@34igc.org.
2015	Durban, South Africa	**14th World Forestry Congress for SA**
1-31 August 2016	Cape Town, South Africa	**35th International Geological Congress** Registration deadline: 30 June 2016.

Please mention SDI-Africa as a source of information in correspondence about items in this issue.

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