



Spatial Data Infrastructure – Africa Newsletter



SDI-Africa Newsletter

November 2012

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



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.gsd.org/newsletters.php>
Best regards, Gordon Ojwang, Editor, [SDI-Africa AT gsd.org](mailto:SDI-Africa_AT_gsd.org) or sdiafrica@rcmr.org or gojwang@rcmr.org



Input to this Issue

Thank you to Kate Lance, GSDI listserv moderator (USA), Hussein Farah, RCMRD (Kenya); Andy Tatem, [University of Florida \(USA\)](#) and Karen Levoleger, Kadastre (Netherlands) for their contributions to this issue of the newsletter.

SDI News, Links, Papers, Presentations

[GIS Day, November 14, 2012](#)

On November 14 join in the worldwide celebration of GIS Day, the annual salute to geospatial technology and its power to transform and better our lives. Be a part of the festivities by hosting, supporting, or attending a GIS Day event.

Have you registered your GIS Day Event? Hosting a GIS day event in your organization, school, college or university gives you the perfect opportunity to:

- Discover and explore the benefits of GIS
- Showcase your GIS work to your organization/institution or community
- Show those who are new to GIS what it can do for them and their organizations/ institutions
- Build and nurture your GIS community
- Celebrate GIS with everyone

Register your GIS day event at www.gisday.com and benefit from:

- Downloadable and customizable GIS Day templates to promote your event.

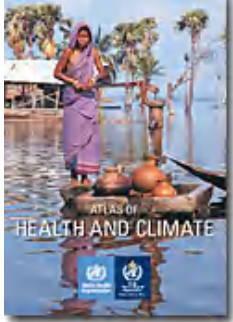


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- Suggestions on activities that can make your GIS day celebrations fun and memorable.
- Being found by others near you who are also organizing GIS day events.
- Get an opportunity to share stories, experiences and photos with other after your GIS day event.

WHO and WMO launch the “Atlas of health and climate”



The Atlas of health and climate is a product of this unique collaboration between the meteorological and public health communities. It provides sound scientific information on the connections between weather and climate and major health challenges. These range from diseases of poverty to emergencies arising from extreme weather events and disease outbreaks. They also include environmental degradation, the increasing prevalence of non-communicable diseases and the universal trend of demographic ageing.

Publication details - Number of pages: 68; Publication date: 2012; Languages: English; ISBN: 978 92 4 156452 6.

Downloads - [Full version in English](#) (pdf, 17.97Mb); [Section 1: infections](#) (pdf, 8.89Mb); [Section 2: emergencies](#) (pdf, 4.26Mb); [Section 3: emerging environmental challenges](#) (pdf, 4.78Mb).

Africa not just a mobile-first continent - it's mobile only



The internet in Africa is entirely different to the internet used in the developed world. In America or Europe, the internet is generally something you surf on a computer or tablet - a device with a 10-inch to 15-inch screen. In Africa, hundreds of millions of people will experience the internet for the first time on a 2-inch cellphone screen. Probably in black and white and probably only as text. They may not even know they are using the internet. Google, for instance, offers search and Gmail via SMS, the text message service that is still the most popular form of communication.

Text messaging is important because it works on any kind of phone, especially the older so-called feature phones that still dominate. While the rest of the developed world is rushing headlong into smartphone heaven - with powerful touchscreen devices that are more mini computer than voice-calling phone - Africa's workhorses are the kinds of phone seen in European cities circa 1998. The reason is simple: With a dearth of infrastructure, the vast majority of people (an estimated 1.5-billion globally, according to the UN) have no electricity. More people in Africa have a mobile phone than access to electricity. That means, for a phone to be functional, it needs decent battery life. These feature phones have anywhere up to a week. Secondly, many have the two other must-have features: an FM radio and a torch. Radio remains the killer app in Africa, especially for mass communication.

[Read more: How cultural differences affect mobile use](#)

Historically Africa has been bereft of wired telecoms infrastructure until mobile phones came along. Cellphones have made it possible for anyone to have a phone - to make calls, send SMSes and, using clever payment systems like Kenya's M-Pesa, send mobile money to another phone user. Half of Kenya's GDP now moves through mobile money, and M-Pesa reportedly handles \$20-million a day in transactions. Mobile money is projected to become a \$617-billion industry by 2016, according to researchers Gartner, who predict mobile transactions will reach \$171-billion this year. Already, 80% of the world's mobile money transactions are happening in East Africa, driven by Kenya, the epicentre of mobile innovation. Other services are also flourishing: ways for consumers to check whether medicine is authentic and hasn't expired ([mPedigree](#)); for farmers to find out where they can get the best price for their produce ([Farmerline](#)); for people to do real-time live mapping of disasters or elections ([Ushahidi](#)); and for communities to communicate with each other ([Mxit](#) and [FrontlineSMS](#)).

[Read more: 7 ways mobile has changed lives in Africa](#)

Mobile phones, by their nature, are better suited to Africa's historical inadequacies and current challenges. Smartphones, which are growing but not nearly at the same rate as in the developed world, are appearing; and with them, an app market is slowly developing. Computers have always been too expensive for the majority of Africans, most of whom have never had a home phone line. A cellphone is cheaper to buy, cheaper to run and is always on you. In South Africa, for instance, Google says 25% of its searches during the week are via mobile, rising to 65% on the weekends. Simply put, Africa is not just a mobile-first continent. It is mobile-only.



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[Ministerial conference adopts integrated African strategy for Meteorology](#)



The Second Session of the African Ministerial Conference on Meteorology adopted an Integrated African Strategy for Meteorology that seeks to address the challenges posed by climate change and extreme weather hazards. The ministerial conference, which took place from 15-19 October 2012, in Victoria Falls, Zimbabwe, was organized by the World Meteorological Organization (WMO), the African Union Commission (AU) and the Government of Zimbabwe. It focused on how to improve weather and climate services for sustainable development, particularly for agriculture, water, health, disaster risk reduction (DRR) and transport.

Conference participants noted that many National Meteorological and Hydrological Services (NMHSs) in Africa operate with poor infrastructure and limited capability. The Integrated African Strategy on Meteorology (Weather and Climate Services) adopted at the conclusion of the conference aims to, inter alia: increase political support and recognition of NMHSs and related Regional Climate Centres; support the provision of weather and climate services for climate change adaptation and mitigation; and strengthen partnerships with relevant institutions and funding mechanisms. The Strategy will enhance cooperation among African countries and improve the capacity of NMHSs to implement the Global Framework for Climate Services (GFCS), which is being developed by WMO and its UN partners to improve climate services, especially for the most vulnerable. [[WMO Press Release](#)].

[Challenges for drought mitigation in Africa: The potential use of geospatial data and drought information systems](#)

Sergio M. Vicente-Serrano | Santiago Beguería | Luis Gimeno | Lars Eklundh | Gregory Giuliani | Derek Weston | Ahmed El Kenawy | Juan I. López-Moreno | Raquel Nieto | Tenalem Ayenew | Diawoye Konte | Jonas Ardö | Geoffrey G.S. Pegram

Abstract: Understanding, monitoring and mitigating drought is a very difficult task as a consequence of the intrinsic nature of the phenomenon. In addition, assessing the impact of drought on ecosystems and societies is also a complex task, because the same drought severity may have different consequences in different regions and systems due to the underlying vulnerabilities. New technologies based on geospatial information are available to determine the risk and vulnerability of a system to a drought and to develop monitoring and early warning systems based on real-time information to support decision making. To improve drought preparedness and mitigation, geospatial datasets based on climate information, Earth Observation Systems and statistical and dynamical modelling methodologies can make a noticeably difference in mitigating drought impacts in Africa. In this article we illustrate how the development of drought information systems based on geospatial technology, that combines static and real-time information, could improve the possibilities of drought mitigation in Africa. We stress that it is necessary to go beyond past attempts to manage drought risk based on a reactive crisis-response approach, by promoting drought mitigation and preparedness at the national and regional levels. For this purpose the development of drought information tools is fundamental for the implementation of drought management plans and to support real-time decision-making.

[Climate change and human health: Spatial modeling of water availability, malnutrition, and livelihoods in Mali, Africa](#)

Marta M. Jankowska | David Lopez-Carr | Chris Funk | Gregory J. Husak | Zoë A. Chafe

Abstract: This study develops a novel approach for projecting climate trends in the Sahel in relation to shifting livelihood zones and health outcomes. Focusing on Mali, we explore baseline relationships between temperature, precipitation, livelihood, and malnutrition in 407 Demographic and Health Survey (DHS) clusters with a total of 14,238 children, resulting in a thorough spatial analysis of coupled climate-health dynamics. Results suggest links between livelihoods and each measure of malnutrition, as well as a link between climate and stunting. A 'front-line' of vulnerability, related to the transition between agricultural and pastoral livelihoods, is identified as an area where mitigation efforts might be usefully targeted. Additionally, climate is projected to 2025 for the Sahel, and demographic trends are introduced to explore how the intersection of climate and demographics may shift the vulnerability 'front-line', potentially exposing an additional 6 million people in Mali, up to a million of them children, to heightened risk of malnutrition from climate and livelihood changes. Results indicate that, holding constant morbidity levels, approximately one quarter of a million children will suffer stunting, nearly two hundred thousand will be malnourished, and over one hundred thousand will become anemic in this expanding arid zone by 2025. Climate and health research



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conducted at finer spatial scales and within shorter projected time lines can identify vulnerability hot spots that are of the highest priority for adaptation interventions; such an analysis can also identify areas with similar characteristics that may be at heightened risk. Such meso-scale coupled human-environment research may facilitate appropriate policy interventions strategically located beyond today's vulnerability front-line.

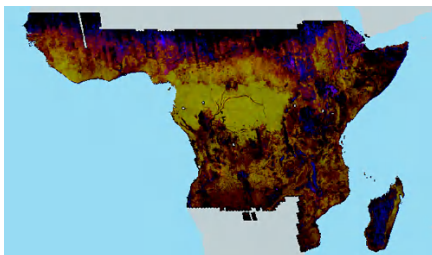
US Expert advocates GIS use in community development

In support of the global importance attached to urban development, the Public Affairs Section of the US Consulate General Lagos, in partnership with Practical habitat Limited, a leading housing solutions company, hosted a lecture by Mr. Shawn Strange on Urban Planning and Policy Analysis for stakeholders and professionals in this sector. The programme was designed to serve as a strategic workshop to develop dynamic and practical Regional and Urban Planning policies to protect the interests of all key stakeholders from the Government at all levels to the citizenry, developers, financiers, mortgage providers and others.

Program Manager of the Sustainability Education and Economic Development (SEED) Centre, an initiative of the American Association of Community Colleges (AACC), Washington, DC, Mr. Shawn Strange stressed the importance of Geographic Information System (GIS) in tackling the challenges of community development. He stated that GIS as a technology, with its quantitative capabilities and qualitative opportunities, provides an easy and a coordinated approach towards the creation of robust communities. He discussed how the tool can be used in displaying data on migration or economic activity as well as more complex data compositions; such as community resilience, and said it can also help with other political and social indices and climate modeling data. "Such a model can expose areas of climatic insecurity and vulnerability at a continental level," he said. He also noted that local government partnerships can identify common issues in specific geographic locations that make the use of mapping tools valuable, due to their inherent representational nature. "Through this model, a facilitated process emerges for all participants, particularly at the academic level with the contribution of local government and community input. It also enhances community access facilitated at all levels through civil society organisations with government interaction and information sharing, which spurs community and market economic development," he said.

Also speaking at the event, CEO Practical Habitat Group Mr. Abdel Nasser Quadri elucidated the critical need for data Integrity, research and development, proper planning, financing and investment in projects in Nigeria. Quadri, stated that if reliable data was available and properly used, it would provide information, which would help in decision-making, financing and proper planning. He further stressed the importance of research and development and its relevance if it is reliable. "In Nigeria, the following has been observed about research and development: quality time is not spent on research and development and there is often no political will."

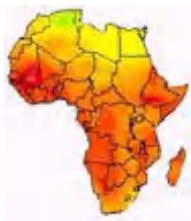
Pan-tropical forest cover mapped with cloud-free radar imaging



Tropical deforestation and forest degradation account for an estimated 20% of the world's anthropogenic emissions of carbon dioxide, a significant greenhouse gas contributor. Despite the important services that tropical forests provide, there is incomplete data and knowledge of their condition and coverage, and thus no accurate baseline for evaluating and monitoring future changes. As international initiatives develop under the UNFCCC to provide a policy mechanism for slowing tropical deforestation, a baseline for evaluating and monitoring forest cover and associated biomass changes needs to be

established across the forested tropics of Central Africa, Latin America and Southeast Asia.

The Woods Hole Research Center has initiated a three-year project focused on pan-tropical mapping of forest cover and associated carbon stocks stored in above-ground biomass. The project encompasses two approaches (See sidebar for link to MODIS approach as well as capacity building component.) The approach detailed below focuses on the production of a pan-tropical database of high-resolution ALOS/PALSAR data and their use for pan-tropical forest cover mapping as baseline data for subsequent deforestation and forest degradation monitoring. Radar images from the Japanese ALOS satellite-borne PALSAR sensor are collected since its successful launch by the Japan Aerospace Exploration Agency (JAXA) in 2006. The sensor is cloud penetrating due to the use of long wavelength (23 cm, L-Band) for imaging of Earth's surfaces. As part of a systematic observation strategy for global mapping, cloud-free, pan-tropical datasets of PALSAR radar data are now acquired within a couple of months every year. The first near-complete

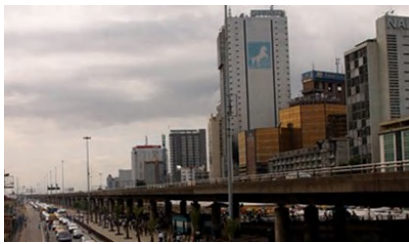


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collection of pan-tropical data in a dual-polarimetric mode, which proves very useful for forest mapping, was achieved in June-September 2007, with some minor acquisition gaps filled during 2008 and 2009 observations cycles. [Load Google Earth Pan-Tropical KMZ File](#). For ALOS data to appear, some zooming in may be necessary. You can view pan-tropical, cloud-free ALOS radar data within the Google Earth Plugin. (Some browsers are not compatible with the plug-in yet.)

Expert predicts increased business growth with Data Centre



With the emergence of cloud computing and virtualisation, Data Centre holds the key to future Information and Communications Technology (ICT) infrastructure management, technology expert has said. The prediction is premised on the earlier predictions that more than 75 per cent of all businesses will adopt some form of cloud computing for their ICT infrastructure within the next few years.

According to the Director of business and Strategy of KITS Technologies limited, Mr. Taofeek Okoya, the enormous bandwidth capacity that the fibre marine cable players like Main One, Glo1 and

recently WACS offers Data Centre, would create a viable business enabler towards cloud computing. It is evident now that the evolution of ICT infrastructure is massively influenced by consolidation, virtualisation, and automation as enterprise businesses and firms work to increase services levels and lower costs while introducing the flexibility necessary to keep up with rapidly changing business needs.

Okoya explained that the recent Google CEO/CIO conference, where Google showcased how its application suits hosted in the cloud could simplify business communication and collaboration, speaks volume of how Data Centre would rapidly simplify ICT business operations and reduce bottom-lines. "It is against this background that KITS technologies will be hosting industry stakeholders to a 5 day intensive training geared towards creating key ICT transformations that will have significant impacts on how we design, plan, build and manage our data centres. The training focuses on excellent understanding of the key elements of Data Centre design including how to layout the rooms and the racks and size the air conditioning and electrical systems as well as understanding other systems such as fire protection, detection and suppression as in addition to Data Centre security," he said. According to him, efficient Data Centre management would also be discussed, covering all policies and procedures which should be in place to run the Data Centre with core emphasis on reliability, efficiency and security.

Rwanda: Police Officers acquire managerial skills



Fifteen senior police officers drawn from the Southern region were on Saturday awarded certificates after completing a course in management. The course, which was conducted in partnership with the National University of Rwanda (NUR), opened in mid-September. The Police officers were trained in the areas of Information Technology, Geographic Information Systems (GIS) with a focus on GPS and managerial skills; with topics ranging from Human resources management, communication skills, planning and leadership skills).

Speaking to The New Times after the ceremony, the Regional Police Commander, Chief Supt Elias Mwesigye, noted that the course was needed for the officers to improve the quality of work. He noted that the topics covered are in line with the daily work of police officers. "We, for instance, need GPS skills to map crime areas or accidents spots" he said. "The skills we acquired will add on the existing knowledge of our police officers to improve their work to the benefits of the society."

Prof. Manasseh Mbyonye, the NUR vice rector in charge of academic affairs, observed that the course is part of the University's commitment to serve the community. He noted that the Police force was offering a valuable work of guaranteeing people's security and thus needed skills to make it better. "The more they are educated, the more they can do their job well and the more the society is secure", he said. He noted that the university is still committed to helping police officers improve their skills in various fields. The course is the first of its kind to be organised for senior police officers operating in the Southern Region, according to officers.

Angola: SINIFIC runs workshop on Geographical Information System



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ArcGis in Angola, called "EUEAngola 2012" will be promoted on 6 November in Luanda by consulting companies Sinfic, Esri and Arc Gis. Speaking Wednesday to Angop, the Sinfic director, Fernando Santos, said that the meeting will be held under the motto "A map to every story" and will gather more than 100 specialists attached to the branch.

He added that the workshop will discuss topics such as maps for the census, maps for elections, drone and image classification, as well as optimizing the production of maps. The event will also approach the issues such as the temporal evolution of maps, creation of Microsoft office maps and other stories about maps. It will also centre on marketing Sinfic, the field for ArcGIS, analysis of image in ArcGIS, as well as the creation of location sketch maps and social networks.

South Africa: Committee for Spatial Information (CSI) adopts solution to overcome SA data custodian hurdle

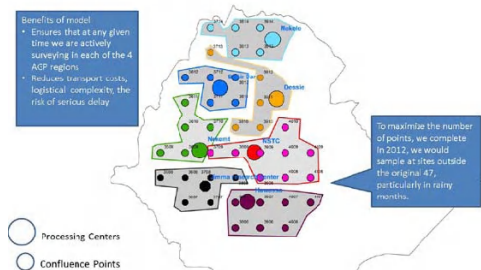
A full quorum of the Committee for Spatial Information (CSI) met on 1 October 2012 and agreed to adopt several recommendations proposed by its Data Sub-committee relating to the definition of base spatial datasets, criteria for base spatial datasets, criteria for data custodians, and the identification of an initial list of base spatial datasets and data custodians. Included in these recommendations is a solution which overcomes the complex issue of selecting data custodians for datasets with multiple de facto dataset custodians. This major step towards the creation of a Spatial Data Infrastructure (SDI) for South Africa (<http://www.ngi.gov.za/index.php/Image-tabs-home/south-african-spatial-data-infrastructure.html>) came about as a result of the CSI's decision to follow a transparent and consultative process with a wide variety of stakeholders from all spheres of government and the private sector.

The first recommendation provides a new definition for base spatial datasets, namely that: "Base geospatial datasets are those identified as the minimum set of essential datasets that are widely used as a reference base at various administrative levels to accomplish South Africa's national and international priorities."

The second recommendation provides compulsory and conditional criteria for base spatial datasets that are to be determined in consultation with custodians on an individual bases for each base spatial dataset. Compulsory conditions are that the datasets should aim at complete coverage of the area of interest; a diversity of users from different sectors should often derive significant benefit from their use; the datasets should have sufficient detail and accuracy for widespread use; and that these datasets cannot be easily or generally substituted. The conditional criteria are that the dataset should be produced as a result of the core mandate of the custodian and that the dataset should be a source for accurately referencing other datasets or for displaying the results of an analysis.

The third recommendation proposed the following criteria for data custodians of base spatial datasets which are to be implemented in consultation with custodians and on an individual bases for each base spatial dataset. There must be a mandated responsibility in the form of legislation, regulations, and policy on the part of the data custodian (compulsory); the data custodian should have sufficient capacity, resources and infrastructure to fulfill the responsibility of a custodian (conditional); and it must be requested by the CSI (compulsory). See link for full article ([PositionIT, October 2012](#)).

Continued collaboration in Ethiopia to build a National Soil System



Africa Soil Information Service (AfSIS) partners in Ethiopia, the Agriculture Transformation Agency and the Ministry of Agriculture, have made great progress in the past few months. The Ethiopian Soil Information Service (EthioSIS) operations team, supported by AfSIS staff, has nearly completed the roll out of the soil surveying teams. They are now heavily focused in supporting Ethiopia's soil laboratories and turning their attention more and more to the work of concerting raw data into digital soil maps.

EthioSIS has trained 38 soil survey- ors to use AfSIS survey methods, and the surveyors have visited 22 sample sites around

the country. The teams have collected more than 4000 soil samples, and the samples are now being processed at six processing centers. "With the launch of the project, Ethiopia is jumping to the front of the queue in using satellite technology and spectral analysis to create one of the world's most comprehensive digital soil maps. EthioSIS will help Ethiopians to make informed land use decisions and to better manage soil resources," explained Sam Gameda, Director, Soil Health and Fertility, Agricultural Transformation Agency.



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[Protected Area Watch for the Albertine Rift \(PAWAR\) Data Access](#)



As part of the Woods Hole Research Center's efforts to advance the understanding concerning the threats to the ecosystem integrity of the Albertine Rift, an interactive WebGIS tool has been developed in collaboration with the Uganda Wildlife Authority and the Wildlife Conservation Society. This tool assists decision makers and park managers with biodiversity conservation and promotes strategic planning for the entire region.

The map provides links to land-cover and land use change information for several protected areas of Western Uganda. The ranger patrol data sets have been collected by the Uganda Wildlife Authority from 1997-2007, providing valuable information about

sightings of wildlife and threats to the parks. Data are currently available for:

- Budongo and Bugoma Forest Reserves
- Kibale National Park
- Murchison Falls National Park
- Queen Elizabeth National Park
- Semuliki National Park

One of the key features of this WebGIS is the ability to upload your own files into the application and overlay them with various remote sensing derived layers (e.g., satellite imagery, land-cover, percent tree cover). Please note that these files must be in ESRI shapefile format, geographic coordinate system, WGS84 datum. For more details on some of the key features on how to use our WebGIS application, please [click here](#). (This opens in a new window). For additional information or questions about this project, please [Nadine Laporte](#).

[CCAFS assists East African pastoralists to record their climate reality](#)



Sharing their experiences on adapting to seasonal and annual climatic variability, East African pastoralists have been trained to develop short videos on climate change and other aspects of their lives through the "Pastoralist Transformations to Resilient Futures: Understanding Climate from the Ground Up" project.

The project is funded in part by the Climate Change Agriculture and Food Security Program (CCAFS) of the Consultative Group on International Agricultural Research (CGIAR). The Maasai filmmakers work was shared at local meetings, and will be adapted into a collaborative film that will present the variety of views of stakeholders in the East African drylands. Films made by the Masai pastoralists can be viewed on the CCAFS blog. [[CCAFS Press Release](#)].

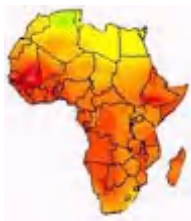
OGC seeks comment on GML Coverage GeoTIFF extension and WCS 2.0 GeoTIFF extension standard



The Open Geospatial Consortium (OGC seeks comment on a GeoTIFF extension to the OGC GML Coverages (GMLCOV) 1.0 Standard and on a GeoTIFF extension to the OGC Web coverage service (WCS) 2.0 Standard, based on the former. The OGC Geography Markup Language (GML) Encoding Standard is a widely used XML encoding for geospatial data of all types. OGC "coverage", which can be encoded in GML, associate positions within a bounded space to feature attributes values. Examples of this geospatial coverage include Earth images, referenced and non-referenced raster, curvilinear grids, and point clouds.

The OGC GML 3.2.1 Application Schema – Coverage (GMLCOV), based on OGC Abstract Topic 6 (which is identical to ISO 19123), provides a unified method for encoding OGC coverages in GML, the OGC Sensor Web Enablement (SWE) Common Standard, and the OGC Web Coverage Service (WCS) Interface Standard. As GMLCOV is independent of a particular service definition, it allows coverage data to be exchanged through different types of services that implement these OGC standards.

To provide maximum flexibility in sharing coverage data, the GML Coverage GeoTIFF extension provides a way to encode coverage that are represented in encoding formats other than GML, such as GeoTIFF. The WCS 2.0 GeoTIFF extension binds the former extension to WCS 2.0 to allow usage of GeoTIFF encoded coverage with WCS. The OGC seeks public comment on the OGC documents describing the candidate GMLCOV and WCS extension standards for encoding GeoTIFF data in GMLCOV and using them with WCS. These documents are free and can be downloaded from <http://www.opengeospatial.org/standards/requests/92>. The deadline for comment is 29 November 2012. Visit the OGC website at <http://www.opengeospatial.org/contact>. Contact: info@opengeospatial.org.



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Practical SDI implementation materials from within and outside of Africa

[Earthquake aftershock forecasting 'must be improved'](#)



The need to speed up work on a reliable system for predicting potential aftershocks in the days following a strong earthquake has become more urgent, say US scientists, after a rare quake earlier this year was found to have triggered many large, and potentially damaging, earthquakes around the world. Writing in Nature last month (26 September), researchers said that the magnitude 8.6 earthquake that struck off the coast of Sumatra, Indonesia, on 11 April this year unleashed an unprecedented number of large events as far away as Japan and Mexico.

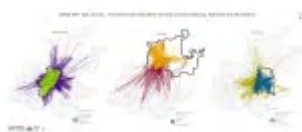
"The number of earthquakes worldwide of more than [magnitude 5.5] increased by a factor of five over a six-day period," Roland Burgmann, a professor in the Department of Earth and Planetary Science at the University of California, United

States, and one of the authors of the report, told SciDev.Net. "No other recorded earthquake has triggered as many large aftershocks around the world. We believe this was because it was the largest 'strike-slip' earthquake (where the two sides of a fault slip horizontally past each other) ever recorded, involving horizontal motions. "Seismic waves from this type [of earthquake] are particularly strong and last long enough to affect distant fault zones," he said.

Last April's quake followed 6–12 days of exceptionally low global seismicity, which - coupled with the strength and duration of the shaking related to the strike-slip geometry of the fault - may have been behind the large jump in global seismicity. John Vidale, a seismologist at the University of Washington, United States, told SciDev.Net: "Prior work documented that earthquakes can trigger more earthquakes up to a certain size, up to a certain distance. But why should only small earthquakes get triggered ... And why should there be a distance beyond which triggering doesn't work? "With just a single triggering 'megaquake', the conclusions will remain tentative until confirmed with follow-up studies, but our understanding of how earthquakes trigger one another has just gained a step up," Vidale added. The strong and potentially damaging on-land shaking in Indonesia, Japan and Mexico caused by the Sumatra event has implications for the effect of a large earthquake on the global seismic hazard, the paper says.

According to Burgmann, earthquakes triggered at much larger distances should be included in the definition of aftershocks if they occur immediately or just within a few days of a major earthquake. "It would make sense to include distant triggering of hazardous events in operational earthquake forecasting, that estimates the hazard of likely aftershocks following a large event," he added. [Link to full study in Nature.](#)

[Oct 2012 - Movement into and within Gauteng's Metros](#)



[Download map PDF](#)

To highlight October transport month 2012, movement into and within Gauteng's metropolitan municipalities, as measured in the GCRO's 2011 Quality of Life survey, are depicted in this map. Each survey respondent's main trip (such as to go to work, look for work, travel to a place of study, shop, take the children to school, etc.) is mapped as a 'desire line' from place of residence to the

destination suburb. Note: only movement within Gauteng was captured in the QoL survey and movement into Gauteng from the neighbouring provinces, for example, the daily commutes in areas north east of Gauteng from Thembisile in Mpumalanga to Pretoria, are not reflected but form an important part of the city-regional transport picture.

It is clear that the City of Johannesburg is a central transport hub for Gauteng, with a significant transport corridor visible along the Johannesburg-Ekurhuleni (Edenvale/Modderfontein) boundary. In Tshwane, the central Pretoria area is a major destination with significant travel from the north western areas of Winterveld-Mabopane. The three maps highlight the major inter-municipal movement between the metros and the need for an integrated transport plan for Gauteng.

[ITTO publication reviews timber tracking technologies](#)



The International Tropical Timber Organization (ITTO) has released a review of technologies for tracking timber. The report, titled 'Tracking Sustainability,' provides a summary of electronic and semi-electronic technologies employed to follow the path of timber and timber products through the supply chain.



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The report considers constraints, advantages and costs of each system, through case studies from Brazil, Indonesia, Liberia and New Zealand, as well as regional projects in Central and South America. Processes reviewed include mass balance, in which batches of timber are tracked, and physical tracking, in which a single unit is tracked. Within these processes, the report considers different identification methods such as paint markings, plastic tags, barcoding, radio frequency identification and DNA and isotonic sampling.

The report concludes with a series of recommendations on the selection of a timber tracking system, highlighting the importance of industry-wide consensus, adapting systems to national and local conditions, and making use of well-established barcoding and data capture technologies. The report also presents recommendations on the development of timber tracking systems related to funding, information sources, access to technologies and governance. [Publication: [Tracking Sustainability](#)].

GIS Tools, Software, Data

[Location models and GIS tools for retail site location](#)

Rafael Suárez-Vega | Dolores R. Santos-Peñate | Pablo Dorta-González

Abstract: Competitive location models and GIS are combined to build decision-aid tools in a franchise distribution system when a single facility has to be located in a continuous space. Several objectives are involved, which are sometimes in conflict, and a certain equilibrium among these objectives is desirable. Competitive location models are used to represent the interrelationships among decision makers, and GIS tools are designed to provide both a map representing market share and a map showing the cannibalization effect. These tools allow the incorporation of forbidden regions and other restrictions and visualization of the effects produced by the opening of a new facility.

Automatic production and updating of topographic maps - A case study

During a time of dwindling financial and human resources, the most important reason to strive towards automation is to guarantee timely and consistent production and updating cycles that maintain the high quality of maps. Although automatic generalization and updating depend on a number of well-functioning algorithms, the main challenge is imitating the steps that a cartographer takes to produce readable maps. This can only be done with a system logic that allows for the high-quality, economical automation of the generalization and updating processes.

A case study from Germany about automation of topographic maps in the scales 1:10K, 1:25K, 1:50K and 1:100K have been published. Send an email to media@axes-systems.com and get your free copy of this case study.

AsiaPop, AfriPop, AmeriPop updates

Latest updates on spatial demographic data are available from AsiaPop, AfriPop, and now AmeriPop:

- Following the release of population distribution datasets for eight Asian countries earlier in the year at <http://www.asiapop.org/>, a further seventeen country datasets are now freely available for download. 2010 and 2015 population count datasets (unadjusted and adjusted to UN national total estimates) for *India, Sri Lanka, Singapore, Indonesia, Papua New Guinea, Timor Leste, Nepal, Solomon Islands, North Korea, South Korea, Kyrgyzstan, Tajikistan, Georgia, Taiwan, Mongolia, Laos* and *Pakistan* are now available for download.
- As part the AfriPop demography project (<http://www.afriipop.org/>), Africa-wide 1km datasets representing separate male and female population counts by 5-year age groupings in 2010 (adjusted to match UN estimates) are now freely available. The full set of data is large, so please contact Andy Tatem to arrange access if you are interested.
- *AmeriPop Project: www.ameripop.org has been launched.

You can now obtain regular updates on new datasets through Twitter - just follow: @AfriPopProject, @AsiaPopProject, @AmeriPopProject. Contact:

Andy Tatem, andy.tatem@gmail.com.

[Above-Ground Woody Biomass Map of Africa 2000](#)

Africa has one of largest remaining blocks of tropical humid forest in the world, second only to the Amazon basin. The threat of deforestation or degradation of these forests means a high potential for increased emissions. The carbon – and by extension, the biomass stored in these forests – is poorly studied. A better



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understanding of the quantity and distribution of carbon in these forests will help to more accurately estimate emissions of carbon dioxide.

In 2008, the Woods Hole Research Center produced a first map of the distribution of above-ground biomass covering the tropical region of Africa by utilizing images from the Moderate Resolution Imaging Spectrometer (MODIS) satellite (1-km resolution) along with data from recent forest inventories covering the period from 2000 to 2003. By completing an [online registration form](#), the national level data is available to download.

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.

Call for application for postgraduate diploma in applied Geo-Information

The National University of Rwanda through its centre for GIS and Remote Sensing (CGIS-NUR) wishes to call for 2012 intake application for its Postgraduate Diploma Programme in Applied Geographic Information Science: Geographic Information System, Remote Sensing, and their various applications. Further information, visit: www.nur.ac.rw and www.cgisnur.org. The program is run at Kigali or Butare, as evening or day program depending on the availability of students. All about postgraduate diploma programme or guidelines for filling and submitting the application: <http://www.nur.ac.rw/spip.php?article30>.

ESRI Technical Certification

ESRI has set the industry standard for GIS technology and is now establishing benchmark standards for individuals who use Esri software with the recently launched Esri Technical Certification Program. The ESRI Technical Certification Program recognizes qualified individuals who are proficient in best practices for using Esri software and are awarded in different areas of expertise at both an Associate and Professional level. The program is open to ESRI users worldwide and consists of 13 certifications recognizing expertise in desktop, developer, or enterprise use of ArcGIS. Users achieve certification by successfully completing computer-based examinations, which are offered in more than 5,000 testing locations in 165 countries. Users are able to test for five certifications. 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. ESRI is available to advice you on the best training for a particular certification and also offer you the training that you need to prepare for your certification. [Read more](#).

ESRI South Africa presents a full spectrum of GIS courses: November-December 2012



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'



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Various training venues are available at Esri South Africa, for further information contact: 011 238 6300 [email the training team](#)

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 experienced 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://esrietraining.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.

University of Twente - ITC Faculty of Geo-Information and Earth Observation: Registration for courses (2012-13)



Faculty of Geo-Information Science and Earth Observation

UNIVERSITY OF TWENTE

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 and water resources) or location in the course finder at www.itc.nl/CourseFinder. For printed copy of the study brochure, email: alumni@itc.nl.

Short-courses offered by RECTAS, 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 interested organisations. These could be either advanced or other certificate programs. Contact: info@rectas.org or thonteh@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

Partnerships for Enhanced Engagement in Research (PEER) Science

The Partnerships for Enhanced Engagement in Research (PEER) Science program is now accepting proposals from developing country researchers interested in collaborating with their U.S. counterparts. PEER



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Science is a partnership between the U.S. Agency for International Development (USAID) and the National Science Foundation (NSF) that is designed to address development challenges through international research collaboration. This competitive grants program will allow scientists in developing countries to apply for funds to support research and capacity-building activities in partnership with their NSF-funded collaborators on topics of importance to USAID. Areas in which both NSF and USAID have strong mutual interests include, but are not limited to, the following:

- Food security topics such as agricultural development, fisheries, and plant genomics
- Climate change impacts such as water sustainability, hydrology, ocean acidification, climate process and modeling, and environmental engineering
- Other development topics including disaster mitigation, biodiversity, water, and renewable energy

Proposals in these topical areas of interest are being accepted from researchers in 87 eligible developing countries. Additionally, PEER Science invites proposals from applicants in the following specific countries or working on the following topical areas, for which USAID missions and offices have allocated resources to foster science and development goals: Indonesia, Biodiversity Conservation and Clean Energy in the Philippines, Water for the Middle East and North Africa, Climate Change for Lower Mekong Initiative, and Maldives Climate Change Adaptation. Regardless of the country or topic, all applicants must have a U.S. collaborator with an active NSF award. Proposals should be submitted electronically via the PEER Science application Web site by 11:59 PM (U.S. Eastern Standard Time) on December 4, 2012. Contact details: peer@nas.edu.

Call for Applications for the 2013-2014 Faculty for the Future Fellowships

The Schlumberger Foundation Faculty for the Future program, launched in 2004, awards fellowships to women from developing and emerging economies to pursue PhD or post-doctoral studies in the physical sciences engineering and technology at leading universities abroad. The Schlumberger Foundation is accepting applications for the 2013-2014 Faculty for the Future Fellowships: - From September 10th to November 16th, 2012 for the new applications; - From September 10th to November 9th, 2012 for renewal applications. All information about the Faculty for the Future programs is found at www.facultyforthefuture.net. If you believe you are eligible please apply online at www.fff.slb.com until November 16th, 2012. Contact Details: Eve Millon Communications and Community Coordinator Schlumberger Foundation emillon@slb.com.

Employment Opportunities

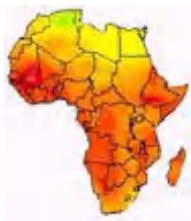
Land Surveyors (2 Posts), Seychelles

The Ministry of Land Use & Housing, Seychelles wishes to fill the above positions to lead and manage unit(s) / subunits of the survey establishments, establish surveying priorities, assign work to survey technicians and reassign survey parties to maximize efficiency, provide appropriate guidance and advise staff under his/her supervision, plan and organize all types of surveys which fall under the jurisdiction and the responsibility of the Director of Survey, examine cadastral survey records for subsequent approval by Director of Survey, liaise with other establishments of the ministry on survey related matters, and prepare reports on activities and performance of unit(s) under his/her responsibility. The incumbent should possess:

- BSc degree in Land Surveying
- At least 3 years of experience in cadastral/engineering surveying
- Very IT literate
- Experience in AutoCAD and other surveying software
- Proficient with GNSS practical/processing
- Very mature and have strong leadership aptitude
- Possession of excellent oral and written communication skills in English is crucial

Interested candidates should submit a completed Employment Application Form found at www.rcmrd.org, along with a covering letter, detailed Curriculum Vitae as well as copies of relevant certificates and references in electronic format to:

Director General, Regional Centre for Mapping of Resources for Development (RCMRD), P.O Box 632, 00618, Ruaraka, Nairobi. Through e-mail: jobs@rcmrd.org so as to be received not later than 7th November, 2012. Ministry of Land Use and Housing, Human Resources Management and Administration Division, Independence House, P. O. Box 648, Victoria, Mahe, Seychelles, Telephone (248)4 2846933 – Fax (248) 4225086. Email: pfreminot@gov.sc.



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Range Land Ecologist - Drylands, Nairobi, Kenya

ILRI seeks to recruit a rangeland ecologist to contribute to its research on Dryland Systems, within its People, Livestock and the Environment Theme. The successful candidate will be well networked in pastoral/agro-pastoral areas, with international recognition for their knowledge in this area. S/he will have a broad understanding of livestock research for development issues. Responsibilities

- Contribute to the assessments of environmental and ecological impacts of ILRI's Index-Based Livestock Insurance (IBLI) program (www.ilri.org/ibli)
- Lead and manage collaboration around spectral 'ground-truthing' of remotely-sensed data that underpin IBLI contracts with the aim of increasing the precision and value of satellite-based measures of forage availability and quality.
- Undertake research on ecosystem services in rangeland systems, including how management practices affect the quality and quantity of these services.
- Undertake research on restoration of degraded lands under pastoral and agropastoral systems.
- Undertake research on the dynamics of change in rangeland ecology, particularly how changes in mobility and access to key grazing areas and water points are affecting rangelands.
- Work with climate and rangeland modelers on future scenarios for African rangelands.
- Lead proposal writing efforts on the above topics.

Requirements:

- A PhD in livestock or natural resource/rangeland management or ecology, ideally with some knowledge of combining research on social science and biophysical perspectives.
- A sound knowledge of rangeland ecological research in pastoral/agropastoral systems in developing countries, with a minimum of five years of experience and preferably more (level of appointment will be commensurate with experience).
- A systems perspective, especially related to the challenges of sustainability and vulnerability of pastoral and agro-pastoral livelihoods.
- Experience with GIS/Remote sensing analysis and natural resource modeling.
- Good publications record with strong written and oral communication skills in English and the ability to communicate with diverse audiences.
- Ability to work in multi-disciplinary and multi-cultural teams in developing country environments.

The position is based at ILRI's Headquarters in Nairobi, Kenya. Extensive travel to other countries and regions will be required. Applicants should address a cover letter and CV to Human Resource Director explaining their interest in the position, what they can bring to the job and the names and addresses (including telephone and email) of three referees who are knowledgeable about the candidate's professional qualifications and work experience. Email your application to ilri-rangeecologist@cgiar.org before 30 November 2012. The position title and reference number: RE/PLE/10/12 should be clearly marked on the subject line of the online application.

World Vision Geologist, Kenya Office

World Vision Kenya is a leading non-governmental Christian humanitarian, relief, development and advocacy organization with projects in most parts of Kenya. World Vision Kenya wish to urgently recruit highly competent person to co-ordinate borehole drilling/ rehabilitation works in accordance to WVK, Government of Kenya and other stake holders standards, in order to facilitate the process leading to provision of potable water to household livelihoods and in the process directly contributing to the attainment of child well being outcomes. The incumbent should possess:

- At least a Degree in Geology from a recognized university,
- At least over 1 years experience in drilling related work
- Experience in application ground water survey techniques will be added advantage
- Computer literate,
- Must have outstanding oral and written communications and relationship skills,
- Good team player, self starter, has ability to work under minimum supervision and maintain good relationships.

Application Deadline: November 8 2012. Application Email: recruit_kenya@wvi.org.

Other



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[5th On-Line Climate Conference: Climate change and the potential of sustainable technologies for Small Island Developing States](#)

It is already the fifth year that the global online climate conference CLIMATE 2012 will be taking place, exclusively online. The organizers expect to welcome thousands of e-delegates during the conference week. From 5-9 November 2012, researchers, businesses, government agencies, NGOs and the general public will be able to discuss climate change as well as the potential and opportunities for, and provided by, the use of sustainable technologies in Small Island Developing States (SIDS) on this website:

The theme of this year's five-day exclusively virtual conference is 'climate change, island states and sustainable technologies'. Participants will be able to read, comment on and discuss around 50 scientific contributions with their authors 24 hours a day. Live webchats with experts and videos illustrating the impact that changes in the weather and climate variation are already having will be available every day, whilst access will also be provided to an extensive library on climate issues and a database of hundreds of climate projects. Dr Ibn Chambas, General Secretary of the ACP group of states (African, Caribbean and Pacific), is the Patron of the fifth international online conference, CLIMATE 2012. This year's focus on small island states is especially relevant, as most, if not all, of these states are particularly vulnerable to the negative effects of climate change.

[GBIF publishes new guide for creating national species checklists](#)



The Global Biodiversity Information Facility (GBIF) has released a report providing guidance for policy and procedures relating to accessing and capturing information for national species checklists. Noting that such checklists are invaluable resources for research and biodiversity-related activities, the report says they should be integrated, coordinated and disseminated from a single platform and compiled by expert taxonomists, but this is not always the case.

The report, titled "Best Practice Guide for Compiling, Maintaining and Disseminating National Species Checklists," was produced by the South African National Biodiversity Institute (SANBI) through funding from GBIF. The report highlights that national policy and procedures should be documented for compiling and maintaining national checklists of species in order to standardize and show what is included. A core set of fields for national checklists should also be present. Finally, the report notes that the format in which the checklist is disseminated should allow searching using different criteria, and should also enable download of datasets. [Publication: [Best Practice Guide for Compiling, Maintaining and Disseminating National Species Checklists](#)].

[Acting on disaster warnings: Don't miss the human factor](#)



The Great East Japan Earthquake and subsequent tsunami of 11 March 2011 challenged global ideas about responding to disasters. It showed that structural defences alone, such as breakwaters, coastal dykes and tidal barriers, cannot provide protection from tsunamis of such magnitude.

The events of that day also emphasised the importance of 'end-to-end' early warning systems (systems spanning all steps from hazard detection through to community response). A Japanese government study, published in the Japan Times in August 2011, has found that only 58 per cent of people in coastal areas of Fukushima, Iwate and Miyagi prefectures heeded tsunami warnings immediately after the earthquake and headed for higher ground. Of those who attempted to evacuate after hearing the warning, just five per cent were caught by the tsunami. The report's findings raise the question of why some people act on early warnings while others ignore them.

There are barriers to action. The first may be the technical language used by warning systems. Individuals and communities may not be able to understand the meaning of obscure terms such as 'Cyclone Category 4', or the significance of a given wind speed. Even when a community receives a warning, people's perception of risk may discourage them from heading for safety.

In 2008, for example, Myanmar's Department of Meteorology and Hydrology detected Cyclone Nargis at an early stage, but people underestimated its intensity and believed that staying indoors would offer protection from winds, floods, and sea surge. The early warning system itself may underestimate the risk, as occurred when floods struck Mumbai, India, on 26 and 27 July 2005. A subsequent fact-finding committee found a significant gap between rainfall forecast (between 65 millimetres and 124.9 millimetres) and actual rainfall (944 millimetres — the eighth heaviest rainfall during a 24-hour period on record). Several hundred people lost their lives in the flooding.



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A community's decision to act on warnings is also influenced by culture and beliefs. Some might see a disaster as an 'Act of God', or even, as in parts of Nepal, 'Devi-Prakop' - 'God's punishment' - in the face of which humans are powerless and so do not act. The perceived benefits of taking action may not be straightforward. People sometimes hesitate to leave their homes for fear of losing belongings and assets. They also may not be confident of authorities providing facilities and protection at evacuation centres. Another key factor is whether the infrastructure or services required for evacuation are in place. In the case of Cyclone Nargis, local communities had nowhere to take refuge, as safe shelters and evacuation protocols and procedures were lacking.

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

Conferences, Events

Date	Location	Event
November 2012		
06-09 November 2012	Redondo Beach, CA, U.S.A	20th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems
08-10 November 2012	Oporto, Portugal	CAMUSS, the International Symposium on Cellular Automata Modeling for Urban and Spatial Systems
13-14 November 2012	Amsterdam, Netherlands	Be Inspired - Thought Leadership in Infrastructure Event
26-29 November 2012	Montevideo, Uruguay	8th FIG Regional Conference
December 2012		
03-05 December 2012	London, U.K.	European Space Solutions 'Discover what space brings to your life
13-16 December 2012	Enschede, Netherlands	Gi4DM 2012 E-mail: info@gi4dm.net
2013		
13-16 May 2013	Rotterdam, Netherlands	Geospatial World Forum
13-16 May 2013	Beurs, Rotterdam	Geospatial World Forum 2013
8-12 July 2013	San Diego, USA	ESRI International User Conference
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.
17-22 September 2013	Nottingham, U.K	FOSS4G 2013 Conference

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

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