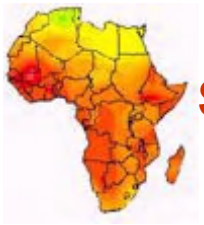

Spatial Data Infrastructure – Africa Newsletter

GSDI
Global Spatial Data Infrastructure

SDI-Africa Newsletter **March 2010** **Vol. 9, No. 3**

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.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); Samuel Ng'ang'a, RCMRD (Kenya) and Flore Devriendt, ENDELEO (Belgium) for their contributions to this issue of the newsletter.

SDI News, Links, Papers, Presentations

Geographers to use GIS to study climate change adaptation in East Africa

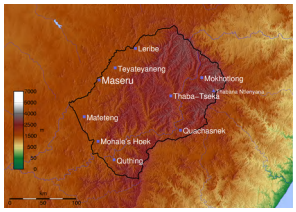
Environmental experts fear that climate change - rising temperatures and changing rainfall patterns could have a devastating impact on agricultural and pastoral communities in Africa. An innovative research project led by Ohio University geographers uses Geographic Information Systems (GIS) to draw on the local knowledge of these rural societies, in an effort to explore options for community-based adaptation to climate change.

Ohio University geographer Thomas Smucker and colleagues received a $571,859 grant from the National Science Foundation to support the participatory research project. Communities in Northern Tanzania will work with the research team to collect information on rural livelihoods and environmental management.

The project will use the latest mapping technologies and develop a GIS for integrating field data and climate change projections. GIS-based analysis will enable the team to better assess future climate stresses and

ways local communities can adapt to them. The researchers want to avoid the pitfalls of many past development projects in Africa in which outside experts have implemented unsustainable or inappropriate projects for local communities, Smucker noted. Participatory GIS (PGIS) expands the conventional scope of GIS by incorporating local knowledge and perceptions into the program. For example, in a related project in South Africa, community input created a more accurate, detailed understanding of soil quality than would have been possible using the conventional data collection methods used by GIS experts, he said.
The project brings together the diverse expertise of scholars at various universities - Ohio University, Michigan State University, Oberlin College, University of Florida, the University of Dar es Salaam, Sokoine University of Agriculture, the Center for Energy, Environment, Science and Technology and the LINKS Trust - that include geospatial techniques, cartography and human-environment analysis. The project will result in maps the community can use to document climate change impacts over time. An online version of the PGIS and curriculum development workshops will contribute to modules that will be integrated into university courses in Tanzania and the United States, Smucker added. For further information, contact: Thomas Smucker, (740) 593-1832, smucker@ohio.edu; Daniel Weiner, (740) 593-1889, weinerd1@ohio.edu; Director of Research Communications Andrea Gibson, (740) 597-2166, gibsona@ohio.edu.

Combination of aerial photography and satellite imagery used in mapping Lesotho



Lesotho's Department of Land Surveys and Physical Planning requested 2m contours across the lowlands and 20 m contours across the highlands of the country. This was achieved in two parts – one part via aerial photography and one part via satellite imagery. Existing photography, captured by AOC, was used to create a digital elevation model (DEM) across the lowlands. The data was subsequently manually edited and contours created. In addition, AOC captured the capital Maseru with lidar and provided 0,5 m contours, a digital terrain model and a 13 cm resolution orthophoto. The highland contours were generated through the use of triplet sets of satellite imagery. The Japanese Advanced Land Observing Satellite (ALOS) captured stereoscopic images along the satellite's track which were best suited for high resolution DEM generation. The coverage of ALOS was incomplete, so a single strip of SPOT 5 DEM was merged to create a comprehensive terrain model. The AAMHatch Group generated a DEM from the ALOS data and subsequently contours across the highlands were created. Considerable time was spent ensuring that the data was consistent between the lowland and highland mapping. The data was checked for accuracy via a series of ground control points collected across the country. Results confirmed the project was within specification. Read more. [Source: Servir Community Blog]

European satellite to assist solving the Ebola enigma in north-western Congo

As a new outbreak of Ebola haemorrhagic fever strikes north-western Congo, the European Space Agency (ESA) is set to gather satellite data to help resolve the scientific enigma of this deadly disease. A Gabonese research centre is to evaluate the data, which could stop an outbreak before it begins. Whenever Ebola strikes Central Africa it can kill in large numbers. More than two dozen people have so far died during the latest epidemic, centered on the town of Mbomo in the Cuvette West region of Congo Brazzaville, near the Gabonese border. The disease causes runaway internal bleeding in humans and also apes. "The Ebola virus undoubtedly has its home in deep tropical jungle, but its natural host organism or 'reservoir' remains unknown," ESA recalls in a statement issued.
The sheer biological diversity and geographical inaccessibility of the Central African rainforest makes that a difficult task. However from next year ESA will be supplying Earth Observation (EO) data of the region to CIRMF as one component of a new project called Epidemio. In Libreville, Mr Moussavou hopes that this data - once imported into geographical information system (GIS) software - may provide some additional clues: "Characterising the ecological parameters of the whole area of study just can't be done just by ground-based means," he says. "But remote sensing and GIS can do it at low cost, and with regular updating a possibility." By mapping the areas where infected animals are found within a GIS, areas with similar environmental features can be highlighted as suspected sites for priority study. And in future CIRMF plans to begin a study of Ebola antibody prevalence in the human population, helping to identify potential infection risk zones.

Nigeria government embarks on re-certification of land titles

To meet public expectations on Land Use Administration and Management in the state, in line with the New Face of Imo philosophy, Imo State government has procured a fully computerized facility under the Imo

Geographical Information Service (IGIS), to re-certify land titles. Disclosing this to newsmen, Commissioner for Lands, Survey and Urban Planning, Hon. Levi Oguike, said the IGIS would offer electronic processing and storage of all state land records into a digital database and electronic lands and deeds registry, with a non refundable processing fee of N20,000.

Oguike said in the case of Ekwema Layout, applicants for Certificate of Occupancy (C of O) would be required to pay N2.5 million capital contribution for infrastructural development and another N92,000 for statutory fees, while N750 would be paid per square metre. He said the capital contribution would be applicable only to undeveloped layouts in Owerri, Okigwe, Orlu, Oguta among others.

"Government has, therefore, come to the unavoidable decision to issue new title documents with appropriate security features, which in some cases, would include biometrics, to all government property title holders such as Certificates of Occupancy, Deeds of Assignments and all other legal land titles registered in the lands and deeds registry of the state, beginning from January 4, 2010," he said. Oguike reminded those who cornered government lands to be ready to pay, adding that "if you hold 10 land titles, you are going to pay for each of them in respect to capital development. If you don't have money to pay for them, then you can off-load some of them and pay for the ones you can afford."

Grant awarded for enabling local communities to protect forest habitat and profit from reducing carbon emissions in Tanzania

The Royal Norwegian Embassy in Tanzania recently awarded more than $2.7 million (USD) to the Jane Goodall Institute (JGI)-Tanzania. The three-year grant will enable JGI to provide local community-based organizations and district governments with the training, equipment and other materials needed to protect their forestland and ultimately benefit from income earned through the sale of carbon credits through the financing mechanism known as Reduced Emissions from Deforestation and Degradation (REDD).

The funds provided by the Norwegian Embassy will support JGI's work in the Masito-Ugalla Ecosystem. Over the course of the three-year project, JGI will develop methodologies and provide technical training to communities and local and national government partners to help inventory, monitor and manage the forest. JGI will utilize a number of cutting-edge technologies in partnership with Google, ESRI and DigitalGlobe such as mobile Android/ODK and web-based mapping systems along with GIS and high-resolution satellite imagery. "By using geospatial technologies and the Internet, local communities will be able to interact directly with the global carbon marketplace and demonstrate unequivocally the concrete benefits of their efforts to protect the forest," said Dr. Lilian Pintea. "As a result, local information will inform and influence national and global decisions regarding climate change."

The project will primarily conserve approximately 70,000 hectares of pristine forests and woodlands found in one of the last large expanses of intact forest in Tanzania, enhancing biodiversity and ecosystem functions such as providing habitat for chimpanzees. Communities will be eligible to earn credits for the carbon stored in their protected forest areas. They will then have the opportunity to sell these credits in the international marketplace in order to raise funds to support forest management efforts and improve community living conditions.

Pastoral Atlas of the ELMT/RELPA Operational Area in Ethiopia

Under the ELMT/RELPA program, LVIA was contracted by CARE Ethiopia to produce a cartographic database of the ELMT/RELPA operational area. The aim of the maps was to highlight to governments, NGOs and other agencies the cross border similarities in order that these are considered when programming.

The data was compiled with the collaboration and assistance of a number of agencies including: the Food and Agriculture Organisation (FAO), the Somali Water and Land Information Management (SWALIM), Word Food Program (WFP), UN Office for the Coordination of Humanitarian Affairs (UNOCHA), Famine Early Warning System Network (FEWS-NET) and others.

The maps elaborated are of two types: some are based on regional data that have been clipped to the ELMT/RELPA operational area, while others are based on national data that has been combined and elaborated from several different archives. Main geo-processing activities concerned treatment of acquired elevation data; attributes information re-organization, editing adjustment and re-classification processes for

vector format national data (in particular along the national borders). Spatial interpolation techniques have been used for climatic and remote sensed data with seasonal character. All regional Atlas maps are available in pdf format and downloadable without any restriction.

Pastoralists use maps and satellite images to depict land use in Ethiopia

In an effort to better understand changing land patterns and preserve indigenous knowledge, a team of researchers combine maps, satellite images and participatory mapping techniques to develop an accurate picture of land use among pastoralists in southern Ethiopia. Spatial visualization tools, such as three-dimensional modeling, rural appraisal community maps, printed maps and even screen-based computer planning exercises with communities, can help to give an overview of natural available resources and how they are shared among the various land users.

These techniques are commonly used to improve land planning, promote communication, encourage debate and research, and develop environmental management strategies. In some cases, they have even solved boundary disputes between ethnic groups. Drawing a sketch map to show the resources of an indigenous community became an important contact point between local knowledge systems and the scientific world. This is particularly important because traditional relationships with the environment have been so poorly understood and neglected in recent times. When working with pastoralists, for example, the outlines gave researchers a better understanding of local perceptions about the status and quality of pastures, rangelands, water sources, livestock types, the movement of people and their relative pressures on the local ecosystems. The Lay Volunteer International Association (LVIA) tested this methodology for the first time in Moyale and Miyo woredas (districts) of southern Ethiopia at the beginning of April 2009. The project used the same idea as community maps, but substituted a piece of paper with geo-referenced maps and remotely-sensed imagery. LVIA identified four woredas, spread over more than 2,300 sq km, and used 1:25,000 scale maps to carry out a series of participatory exercises with 15 different groups of pastoralists. In combination with high resolution satellite images, the community members were asked to identify a variety of features on the maps.

The study area still has a wide variety of animal and plant species. Because of this, the government has designated a large part of the study region as a protected area, and it could soon be established as a reserve. While the main focus of the research was to preserve indigenous knowledge and the pastoralists' way of life, the results will also improve understanding of the needs of all land users and help to maintain a rich diversity of life.

Satellites used to track illegal logging, rosewood trafficking in Madagascar

Analysts in Europe and the United States are using high resolution satellite imagery to identify and track shipments of timber illegally logged from rainforest parks in Madagascar. The images could be used to help prosecute traders involved in trafficking and put pressure on companies using rosewood sourced from Madagascar.

Illegal logging of precious hardwoods in Madagascar's national parks exploded in the aftermath of a military coup last March. The coup, which displaced the increasingly autocratic, but democratically elected president, Marc Ravalomanana triggered a collapse in governance, which was exacerbated when donor countries pulled financial aid. Without funding, and under pressure from criminal syndicates operating primarily in the northeastern part of the country, park rangers abandoned their posts and loggers moved in, harvesting hundreds of millions of dollars worth of rosewood and ebony from tens of thousands of hectares of protected areas. Typically the logs were transported from forest areas to ports, where they were loaded onto ships. Much of the cargo was carried by foreign freighters to Reunion and Mauritius before going on to China. But since the harvesting and trafficking of rosewood was illegal, a large portion of the logs were hidden in stockyards and buried on beaches.

But while traders may be able to evade detection locally by concealing their contraband or through bribery, timber stocks and timber-carrying trucks and boats are clearly visible to the rest of world via regularly-updated, high resolution satellite imagery. Organizations and international law enforcement agencies are therefore capable of monitoring storage and movement of the illegally sourced timber. Furthermore, new techniques make it possible to determine the origin of wood through its chemical composition, giving

authorities powerful investigative capabilities when working to enforce trade laws like the Lacey Act in the United States and FLEGT in Europe. These regulations put the burden of responsibility on importing companies, holding them to the environmental laws of producing countries, even when those countries are unwilling or unable to enforce their rules.

Nigeria states called to embrace geospatial technologies for revenue generation

GLOBAL Mckens Limited, an international solutions outfit has called on the Federal, States and Local Governments to embrace its newly articulated Geospatial technologies that would help them enhance their revenue generation. The company disclosed that its Geographical Information System (GIS) technology helps to build data required by all the tiers of government including private organizations to enhance their revenue profile and meet their specific need through proper planning. Speaking to newsmen in Lagos weekend, Mr. Kenneth Igben, Vice President, GIS Technology of Global Mckens Limited, said, " Our Property Appraisal System modernizes the tax appraisal operations and advance intelligibility in the taxation arrangement, thereby facilitating improvement in revenue generation. The core requirement of the system is the complete documentation of information that will facilitate well-organized administration and tax collection. The principal goals of this system are the automation of property enumeration and tax records, systemic mapping of all properties and related-entities such as roads/streets. Other property and road conditions help to facilitate instantaneous service improvements and property reassessment.

GIS Technology solutions include: Property Enumeration and Tax Collection System, Utility Route Design and Management System, Law Enforcement Crime Pattern Monitoring System amongst others. Enumeration process can be developed to enable government visualize tax payment methodology and track payment. Relational Database Management System (RDMS) can also be developed and deployed for property and tax records using industry-tested methodologies to manage property and tax records, and connect property maps with tax records to enable spatial view of information and well segregated property assessment. Apart from revenue generation, GIS solution can also provide the foundation data to plan, to build roads and even prevent crime. The project will pay for itself in the first year of usage and make money for them. Other usefulness of databases is in education, where governments need to know where to build more schools by assessing the population and buildings in a particular area.

GIS in grassroots social movement in Kenya

The Green Belt Movement (GBM) founded by Dr Wangari Maathai in 1977 as a development and community empowerment grassroots social movement comprising and led mainly by women empowers people and builds their capacity to restore the environment, promote good governance and develop sustainable livelihoods. The organization supports more than 600 community networks across Kenya that care for over 4000 tree nurseries. So far, more than 40 million trees have been planted in private and public land, protected reserves and sites of cultural significance, and in urban centers.

The past three years have seen many organizational, technical, data acquisition and analysis advances in GBM. GBM has established a state-of-the-art GIS lab that has allowed the organization to cope with the increasing demand for reliable data for decision making to support its tree planting, conservation and community development projects in Kenya.

GBM is working with World Bank on a BioCarbon Fund Project to rehabilitate 1,800 hectares of degraded forest land in the Aberdares and Mt. Kenya region as part of the Clean Development Mechanism (CDM) programme under the Kyoto Protocol and Marrakech Accords. Based on the maps and information from the mapping exercises and baseline surveys, GBM has been engaging the community groups living around these ecosystems to establish tree nurseries and plant trees in the identified sites. GIS has enabled the development of extremely valuable tools that are making it easier for field staff to capture and analyse data describing the location of tree planting sites, tree species, and status of the young trees in the forest and other critical data. Related applications that are currently being developed at GBM will add near real-time field information related to each tree planting site and tree nursery to GBM's database and speed up analysis and decision making by using up-to-date and accurate spatial data.

ESRI's ENVI and Leica's software have added a whole new layer of analytical sophistication to GBM work by automating the process of change detection, which is critical for understanding what's happening with Kenya's forests. GBM has initiated a project to map and identify forest cover change over time, identify high priority tree planting areas in the country, and monitor the growth and survival of the planted trees in the

forest. With the ability to visualize individual tree crowns and a more accurate portrait of the forest cover in parts of the five 'water towers', GBM has tremendously increased its effectiveness and efficiency in planning and monitoring tree planting projects. Using both ESRI software and Google Earth, GBM started developing valuable tools for visualizing and communicating environmental issues in Kenya. KMLs and ArcGIS ArcGlobe movie files developed from field data have provided powerful 3D digital maps that are being used to educate and visually inform local communities, government leaders, and the international community about the status of forests, the devastating effects of forest change in critical watersheds and to visualize GBM tree nurseries and tree planting sites on the globe.

National drought insurance for Malawi (January 2010)

Malawi has experienced several catastrophic droughts over the past few decades. The impact of these shocks has been far reaching, and the resulting macroeconomic instability has been a major constraint to growth and poverty reduction in Malawi. This paper describes a weather risk management tool that has been developed to help the government manage the financial impact of drought-related national maize production shortfalls. The instrument is an index-based weather derivative contract designed to transfer the financial risk of severe and catastrophic national drought that adversely impacts the government's budget to the international risk markets. Because rainfall and maize yields are highly correlated, changes in rainfall - its timing, cumulative amount, and distribution can - act as an accurate proxy for maize losses. An index has been constructed using rainfall data from 23 weather stations throughout Malawi and uses daily rainfall as an input to predict maize yields and therefore production throughout the country.

The index proposed for Malawi – the Malawi Maize Index (MMI) – has been constructed using rainfall data from 23 weather stations throughout the country. The MMI is based on the Malawi Meteorological Services' (MMS) national maize yield assessment model, used by the government since 1992 to produce national maize production forecasts each February. The MMS's national maize yield assessment model is based on 75 weather stations and rain gauges throughout the country. Because only 23 stations within the Malawi network satisfy the strict criteria for risk transfer to the weather risk market, the MMI only uses these 23 primary stations. Other than this difference, the methodologies and input parameters for the two models are precisely the same. The MMS (and MMI) model is a modified version of the FAO's Water Requirement Satisfaction Index (WRSI) adapted to Malawian conditions, and uses daily rainfall as the only varying input to predict maize yields and therefore production throughout the country. In this way the model, and therefore the index, isolates the impact of only rainfall variability on maize production. Based on a water balance calculation, the model captures not only the total amount of rainfall received at each station, but also its distribution during the agricultural season and how these rainfall deficits impact maize yields. By using such a model, a contract can be structured to reflect conditions which would impact national maize production and therefore food security. Read more. [Source: Servir Community Blog]

Progress in use of Earth Observation for fighting hunger

The power of satellite imagery-derived information for alleviating food insecurity is well known. Spatial information based on remote sensing has being used for nearly 30 years in famine early warning systems and for supporting vulnerability assessments and mapping. The interest for timely information at the regional scale continues to increase, triggered by recent global challenges to food security such as soaring food prices or the rapidly growing numbers of undernourished people. However, while the remote sensing research community is one of the most prolific in producing high-level scientific outputs, when it comes to implementing and running operational systems and providing decision-makers with reliable and clear information only few organizations worldwide can provide continuous and standard services. Effective communication from the scientific level to the decision-makers often remains a problem and the final impact on improving food security for vulnerable societies is not well known. For these reasons, it appears of high interest to present recent progress in bridging the gap between science and society in the use of satellite information in a food security context and to provide an overview of the systems that are faced daily with the challenge of translating science into action. The European Commission Joint Research Center, the Famine Early Warning Systems Network (FEWSNET), and the Food and Agriculture Organization (FAO) have worked over many years in developing new methodologies and will present recent results and future challenges. For information, Read more, Luca Alinovi, Food and Agriculture Organization - How Does Earth

Observation Support Decision-Making for Food Security?, Felix Rembold, JRC Institute for the Protection and Security of the Citizen - Crop Monitoring for Food Security from Space: Challenges, Progress, and Limitations , James Verdin, U.S. Geological Survey - Extended Satellite Crop Monitoring in Response to the Global Food Crisis. [Source: Servir Community Blog]

World Meteorological Day 2010: 60 years of service for your safety and well-being

Each year, on 23 March, the World Meteorological Organization, its 188 Members and the worldwide meteorological community celebrate World Meteorological Day around a chosen theme. This day commemorates the entry into force, on that date in 1950, of the WMO Convention creating the Organization. Subsequently, in 1951, WMO was designated a specialized agency of the United Nations System. This year, the theme is “60 years of service for your safety and well-being”.

Call for abstracts: **International Conference on ˜Deltas in Times of Climate Change**, 22 September -2 October 2010, Rotterdam, The Netherlands

The conference pursues three main goals:

1. exchanging up-to-date top science on climate change and delta planning
2. strengthening international cooperation between deltas and delta cities
3. exploring and strengthening the links between science, policy and practitioners

Disciplinary and multi-disciplinary contributions in the fields of planning, policy science, geo-sciences, meteorology, economics, governance, engineering and ecology are welcomed. The abstracts will be expected to fit within one of the themes:

- Regional climate, sea level rise, storm surges, river run-off and coastal flooding
- Fresh water availability under sea level rise and climate change
- Climate change and estuarine ecosystems
- Climate change and climate proofing in urban areas
- Competing claims and land use in deltas under climate change
- Governance and economics of climate adaptation
- Decision support instruments for climate adaptation policy
- Climate and health in delta areas
- Managing extreme weather risks

Abstracts for an oral or poster presentation for the scientific sessions of the conference can be submitted before 15th March 2010. Contact: o.van.steenis@programmabureauklimaat.nl or visit www.climatedeltaconference.org.

Preliminary Announcement 9th EUMETSAT User Forum in Africa, 27 September - 1 October 2010, Ouagadougou, Burkina Faso

The 9th EUMETSAT User Forum in Africa will be hosted by the Directorate General of Civil Aviation and Meteorology of the Ministry of Transport of Burkina Faso. The purpose of the EUMETSAT User Forum in Africa is to reinforce the well-established dialogue between EUMETSAT and the African user community to optimize the use of EUMETSAT satellite data throughout the continent. It is one of EUMETSAT's key activities in Africa, complementing the extended coverage of the continent by its satellite, data dissemination, training, and support of development projects. This year the theme of the forum will be "Impact of climate change on water management for crop-land and range-land in Africa". The invitation, call for papers and poster presentations, and preliminary programme will be published at the end of March 2010. Participants will then be able to register on the dedicated website. See the EUMETSAT User Forum in Africa for more details.

2010 ICT/GIS Security Workshop, 26 March 2010 9:00 AM - 5 PM, Panafric Hotel, Nairobi, Kenya

The annual ICT/GIS Security Workshop has become the greatest ICT security sensitization conference, bringing together, CEO, IT Managers, GIS Professionals, ICT Security experts of private companies, NGO and government to showcase ICT security innovations and discuss recent developments, share knowledge, identify gaps and co-ordinate on future actions and work areas in line with security challenged posed Fibre Optic Cable. The Workshop will include overviews of the work being done in the area of security across standards and technical bodies, along with presentations

from major organizations involved in security initiatives. Benefits of attending:

- Developing a successful ICT/GIS Security Policy
- Performing Information System Audit
- Securing GIS Portals and Geodatabases
- Securing GIS Networks
- Improve your company's ICT Security effectiveness
- Enhance Data Security in Fibre Optic Connection
- Assess and spotlight ongoing work on ICT security
- Sharing ideas and proposals on security innovation, prioritization of efforts and implementation evaluation.
- Localize the gaps and duplication in security standardization.
- Certificate of Participation.

Charges: KSh. 5,500 plus VAT (inclusive of Certificate, Training Material, Food). More Info contact: Events@zebotech.co.ke /Register Online: http://www.zebotech.co.ke/Events.html.

Call for papers: ESEA Climate Change Conference, 19-21 May 2010, Nairobi, Kenya

The Ecological Society for Eastern Africa (ESEA) will host its 3rd Regional Scientific Conference, from the 19th to 21st May, 2010 at Kenyatta University, Nairobi, Kenya. The theme for the Conference is: "Climate Change and Natural Resource use in Eastern Africa: Impacts, adaptations and mitigation." The Ecological Society for Eastern Africa (ESEA) is not-for-profit, networking organization, bringing together individuals and institutions participating in ecological research and applications to development in Eastern Africa. Member countries are: Ethiopia, Uganda, Kenya and Tanzania with the secretariat based in Nairobi, Kenya. The conference will address a wide range of climate change topics with the aim of increasing awareness of vulnerabilities, impacts and targeted adaptation measures that can be applied in the region with the aim of distilling knowledge and raising awareness on:

- Impacts on natural and human systems
- Best practices of adapting to the impacts
- Mitigation strategies
- User friendly methods of communicating climate change issues in eastern Africa.

The conference is open to all professionals who are involved with science and practice of ecology within the eastern African region. Students are encouraged to use this forum to share their work with other scientists in the region. Students should submit an abstract (electronic and in compatible MS Word version) to the ESEA via the normal submission procedures established by the Conference organizers. Abstract title should begin with "Student Competition". Abstract deadline: 15 March 2010. Address any inquiry on this conference to conference@ecsea.org. [Source: SERVIR-Africa community news]

Call for papers: 3rd worldwide online climate conference CLIMATE 2010/KLIMA 2010, 1-7 November 2010, Hamburg University

The Hamburg University of Applied Sciences is pleased to inform that the call for papers for the third worldwide online climate conference CLIMATE 2010/KLIMA 2010 has just opened. Use this unique opportunity to present and discuss your work with fellow researchers, practitioners, NGOs and the interested public from all around the world.

CLIMATE 2010 is organized in cooperation with UNEP, IPCC, WMO, FAO and world bodies. Building on the success of the previous online conferences, this year's interactive, free of charge online vent will specifically focus on Climate Change and the sustainable management of water resources. Researchers from around the globe, in particular researchers from developing countries should submit their scientific abstracts online until 31 March 2010 at the latest to the unique CO2-friendly virtual conference, relating to one of the four following categories:

- Geochemical and physical impacts of climate change
- Socio-economic aspects of Climate Change (relating to water supply and use)
- Climate Change, policy-making and sustainable water use
- Projects on Climate Change and sustainable water use (education and awareness-raising initiatives)

All submissions will be full papers to be subject to peer review. Besides online publication throughout the conference week from 1-7 November 2010, the best English papers will be considered for publication in the "International Journal of Climate Change Studies and Management" and/or the book publication "Climate Change and the Sustainable Management of Water Resources" as part of the Climate Change Management

Series (Springer). Additional opportunity exists to promote own climate-related projects and publications - input for the CLIMATE 2010 climate library and project database. Apply with studies/reports for incorporation in the CLIMATE 2010 website. Contact: info@klima2010.net.

Practical SDI implementation materials from within and outside of Africa

Addressing the challenges associated with census mapping in Africa

The role of maps in a census is to provide the cartographic basis for enumeration and the platform for spatial census data products such as census atlases. This paper focuses mainly on mapping solutions for enumeration. The paper assesses the traditional methods of census mapping in African countries and aims to provide modern alternatives to the traditional methods that are realistic and achievable given the unique circumstances of the African continent. The paper is therefore of a practical rather than an academic nature. The author strives to provide hands-on and practical solutions based on experience gained in several countries over the last decade. The paper could therefore be of potential use to readers that are responsible for the planning and implementation of the 2010 round of population and housing censuses.

2010 World population and housing census

The United Nations Statistics Division issues standards and methods approved by the Statistical Commission to assist national statistical authorities and other producers of official statistics in planning and carrying out successful population and housing censuses.
For the 2010 World Population and Housing Census Programme, the Statistical Commission at its 36th session, requested that the United Nations Statistics Division proceed with its work on the revision and update of the *Principles and Recommendations for Population and Housing Censuses.* The Principles and Recommendations for Population and Housing Censuses, Revision 2 were adopted by the Statistical Commission at its 38th session in 2007. The main objective of the Principles and Recommendations is to provide international principles and recommendations for use by national statistical offices and census officials in countries throughout the world in planning and organizing their censuses. In addition, the United Nations Statistics Division has issued the following guidelines

- Census Data Capture Methodology
- Handbook on Geospatial Infrastructure in Support of Census Activities
- Handbook on Measuring the Economically Active Population and Related Characteristics in Population Censuses (Final draft)
- Principles and Recommendations for Population and Housing Censuses, Rev.2 English (2008, 2.5MB) / Russian (2009, 2.8MB) / Arabic (2009, 2.4MB)
- Handbook on Census Management for Population and Housing Censuses
- Handbook on Population and Housing Census Editing

The Proven Benefits of OGC Standards

The population of end users who benefit from the use of OGC standards today is global - much to the credit of the growing complement of geospatial technology practitioners in organizations who have been advancing OGC standards as members. The uptake of OGC standards is now sufficient to make further deployment inevitable. In one user do-main after another, "it just makes sense" to extend standards-based Internet and Web resources with geospatial data and processing services. It's not hard. It just requires using software equipped with interfaces that implement OGC's open standards.
A few examples of the capabilities and benefits being reaped as a result of im-plementing OGC standards is illustrated in the following examples: Agriculture and Agri-Food Canada is not an OGC member, but its website features a growing number of interactive mapping applications that implement OGC standards. SLEWS, a prototype Landslide Monitoring and Early Warning Sys-tem, is being developed in Germany by a team that includes just one OGC member. Dan Mandl, EO-1 Mission Manager at NASA's Goddard Space Flight Center, sees cost savings and flexibility that enable his team to do more despite a shrinking budget. Kylie Armstrong, Manager, Business Programs, Landgate, Western Australia, sees no other way to effectively access and fuse data from multiple agencies for decision making in Western Australia. Andrew Terhorst at CSIRO's Tasmanian ICT Centre is implementing a hydrological sensor web on OGC's open platform, and this is enabling much faster and more comprehensive observation, understanding and prediction of water quality and floods and droughts. Stewart Robinson, energy resources consultant, Energy

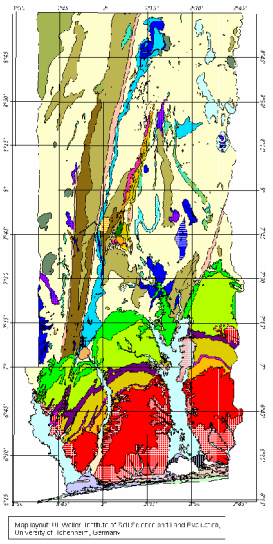
Development Unit, Department for Business, Enter-prise and Regulatory Reform, United Kingdom, oversees a transition to XML-based forms for geospatial data, and OGC provides the required international standards. In these countries and in many other countries, agencies at lower levels of government are following the lead of federal agencies, resulting in the coherent National Spatial Data Infrastructures that were first envisioned twenty years ago. [Source: OGC Website]

A Unified Modeling Approach to Climate System Prediction

There is a new perspective of a continuum of prediction problems, with a blurring of the distinction between short-term predictions and long-term climate projections. At the heart of this new perspective is the realization that all climate system predictions, regardless of time scale, share common processes and mechanisms; moreover, interactions across time and space scales are fundamental to the climate system itself. Further, just as seasonal-to-interannual predictions start from an estimate of the state of the climate system, there is a growing realization that decadal and longer-term climate predictions could be initialized with estimates of the current observed state of the atmosphere, oceans, cryosphere, and land surface. Even though the prediction problem itself is seamless, the best practical approach to it may be described as unified: models aimed at different time scales and phenomena may have large commonality but place emphasis on different aspects of the system. The potential benefits of this commonality are significant and include improved predictions on all time scales and stronger collaboration and shared knowledge, infrastructure, and technical capabilities among those in the weather and climate prediction communities.

GIS Tools, Software, Data

Atlas of Natural and Agronomic Resources of Niger and Benin



At this site, one can read online or download the data. There are full text summaries, map images, and analytical reports. See also, the French version.

Maps of natural resources and agricultural production:

- The geological setting in western Niger
- SOTER-map (SOil and TERrain) of south-west Niger
- Bio-climatic zones
- Production risk for pearl millet in south-west Niger
- Land evaluation and agricultural yield potentials in south-west Niger
- Recommendations for fallow vegetation management in south-west Niger
- Land use and agropastoral systems in the Filingue region
- Seasonal livestock migration and grazing potentials in south-east Niger
- Niger's economy between subsistence and market
- Case study: marketing patterns of farming systems in south-west Niger
- Potential for mechanised cultivation in south-west Niger

Overview Benin:

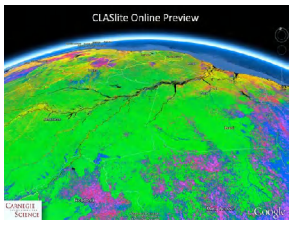
- Political borders - current
- Political borders - planned (not currently used)
- Population
- Geology and geomorphology of southern Benin
- SOTER - map (SOil and TERrain) of southern Benin
- Land use dynamics in the region of Abomey-Bohicon between 1954 and 1982
- Changes of land use and vegetation near the village of Houéto between 1981 and 1995
- Water availability in southern Benin
- Potential maize yield in southern Benin
- Maize in Benin: Production, Markets and Transport
- Major crops and their regional distribution in Benin
- The origin of "acadja" branches and transport routes in the Province Atlantique
- Farming systems diversity and the suitability of innovations for managing soil fertility

WISDOM: A GIS-based supply demand mapping tool for woodfuel management

In this paper, it is argued that adequately assessing the implications of the current patterns of woodfuel production and use, and the sustainable potentials of woodfuel resources, requires a holistic view and a better knowledge of the spatial patterns of woodfuel supply and demand. There is a need to conduct multi-

scale spatially explicit analyses of woodfuel supply and demand that are able to articulate local heterogeneity at the regional and national levels. Studies that provide full-country coverage and are based on consistent integration of data at lower geographical scales are woefully lacking. This paper describes the Woodfuel Integrated Supply/Demand Overview.
Mapping model (WISDOM). This is a GIS-based tool, aimed at analyzing woodfuel demand and supply spatial patterns from a new perspective that includes: (a) the assembling of existing but dispersed information into single data sets, (b) a modular integration of these data sets, based on the analysis of key variables associated with woodfuel demand and supply patterns, and (c) a multiple-scale and spatially explicit representation of the results, in order to rank or highlight areas in which several criteria of interest coincide. The final objective of WISDOM is to assess the sustainability of woodfuel as a renewable and widespread energy source, while supporting strategic planning and policy formulation.

Online version of Land Change Modeler application



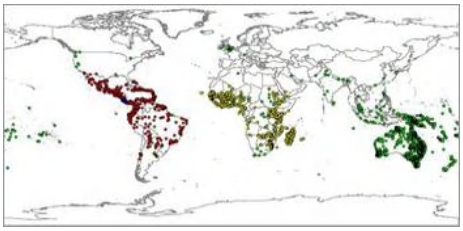
Google has taken a step towards boosting the deforestation monitoring capabilities the Google Earth Engine by contracting Massachusetts-based Clark Labs to develop an online version of its Land Change Modeler application. Clark Labs' Land Change Modeler is a geographic information system (GIS) software package that enables users to estimate of historical deforestation rates and patterns, identify the drivers of deforestation, and project future deforestation scenarios and associated greenhouse gas emissions. The firm has been marketing the tool for use in projects under the proposed REDD program, a U.N.-backed climate change mitigation mechanism that aims to compensate developing countries for reducing emissions from deforestation and forest degradation. According to a statement from Clark Labs, Google's philanthropic arm, Google.org, is looking to add Land Change Modeler functionalities to the Google Earth Engine, an online platform which leverages technologies developed by scientists to rapidly analyze and map vegetation, land use, and other environmental data. The engine, unveiled in December at climate talks in Copenhagen, initially launched with forest monitoring tools developed by Carnegie Institution for Science and IMAZON. These tools allow analysts to track changes in forest cover at extremely high resolution in near real-time in the Amazon. The project was coordinated and supported by the Gordon and Betty Moore Foundation. "The objective of Earth Engine is to enable organizations such as Clark Labs to run their algorithms on-line, powered by Google's computational capacity, with easy access to massive earth observation data sets," said Dr. Amy Luers, Senior Environment Program Manager for Google.org. Clark Labs says the Land Change Modeler is currently being used by "many governmental and non-governmental organizations" for REDD project development. The Land Change Modeler is a software extension to ArcGIS, a suite of GIS software products generally used for viewing spatial data, creating maps, and performing spatial analysis.

Google Earth boosts deforestation capabilities

It what could be a critical development in helping tropical countries monitor deforestation, Google has unveiled a partnership with scientists using advanced remote sensing technology to rapidly analyze and map forest cover in extremely high resolution. The effort could help countries detect deforestation shortly after it occurs making it easier to prevent further forest clearing.
Deforestation and forest degradation is a larger source of greenhouse gas emissions than all the world's cars, trucks, planes, trains, and ships combined. It is also a threat to biodiversity, indigenous cultures, and critical ecosystem services like rainfall provision and flood control. Thus a newly proposed mechanism that aims to slow deforestation by compensating countries and landowners for protecting forests has won wide support at climate talks in Copenhagen. But to qualify for payments under Reducing Emissions from Deforestation and Degradation (REDD), countries must be able to quantify reductions in deforestation against a historical baseline - a tall order for most countries (not even wealthy countries like Australia and Canada provide accurate data on their forests). Therefore a tool that enables countries to measure past deforestation and track forest disturbance and loss shortly after it occurs would be of great value in efforts to fight climate change by cutting greenhouse gas emissions from deforestation.

Two institutions have developed technologies that come a long way towards making this tool a reality: the Carnegie Institute for Science's CLASlite system (led by Greg Asner), which uses satellite imagery and laser deployed from airplanes (airborne Light Detection and Ranging - LiDAR) to build high-resolution, 3-D maps of forests that can measure logging and other disturbance; and Imazon's Sistema de Alerta de Deforestation (SAD) (led by Carlos Souza), which uses satellite imagery to rapidly detect and report deforestation. Now through a prototype project, Google brings the power of these technologies online, harnessing its massive computing cloud. The technology is so far only available for the Amazon and the Andes region in South America, but it may someday be expanded to the Congo basin, other parts of Latin America, and Southeast Asia. Eventually the system could be truly global with near real-time monitoring of forest cover (as is currently available with fire-tracking). For more on how remote sensing can help save forests and wildlife, see How satellites are used in conservation.

MosquitoMap and the Mal-area calculator: new web tools to relate mosquito species distribution with vector borne disease



Mosquitoes are important vectors of diseases but, in spite of various mosquito faunistic surveys globally, there is a need for a spatial online database of mosquito collection data and distribution summaries. Such a resource could provide entomologists with the results of previous mosquito surveys, and vector disease control workers, preventative medicine practitioners, and health planners with information relating mosquito distribution to vector-borne disease risk.

Results: A web application called MosquitoMap was constructed comprising mosquito collection point data stored in an ArcGIS 9.3 Server / SQL geodatabase that includes administrative area and vector species x country lookup tables. In addition to the layer containing mosquito collection points, other map layers were made available including environmental, and vector and pathogen/disease distribution layers. An application within MosquitoMap called the Mal-area calculator (MAC) was constructed to quantify the area of overlap, for any area of interest, of vector, human, and disease distribution models. Data standards for mosquito records were developed for MosquitoMap. [Source: *International Journal of Health Geographics* 2010]

A web-based tool to monitor vegetation dynamics in Kenya

The ENDELEO project aims at promoting good environmental governance of vulnerable ecosystems in Kenya, by facilitating access to updated remote sensing based information on the status of these natural ecosystems. ENDELEO provides a web-based monitoring tool, developed to allow easy exploration of the vegetation conditions. It consists of an image viewer, interactive graphs and the calculation of statistics. These sections are updated every ten days with new images. In addition, detailed patterns of change are analysed for a number of focus areas based on high resolution satellite images. A help section including a manual and background information on remote sensing is available. As a result, the ENDELEO tool fulfils the increased demand from ecosystem managers, both government agencies and environmental NGO's, for easy visualisation and analysis of remote sensing data to assess the extent of vegetation changes, to determine the drivers of change and to evaluate policy measures. ENDELEO is a cooperation project between Ghent University (Belgium), the Flemish Institute for Technological Research (VITO) (Belgium), the United Nations Environmental Programme (UNEP), the Kenyan government represented by the Department of Resource Surveys and Remote Sensing (DRSRS), together with multiple stakeholders. The project is financed by the Belgian Science Policy Office (BELSPO).

Checklist of online vegetation and plant distribution maps

For more maps and information on other parts of Africa including Southern Africa, North-Western Africa, North-Eastern Africa, Central Africa, East Africa, North Africa, West Africa, Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Congo (Brazzaville), Congo (Zaïre), Côte d'Ivoire, Egypt, Eritrea, Ethiopia, Gabon, Ghana, Guinea, Kenya, Liberia, Libya, Madagascar, Malawi, Mauritania, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sahara, Saint Helena, Sierra Leone, Somalia, Sudan, Tanzania, Togo, Tunisia, Uganda, Victoria, Lake Region and Zambezi Basin visit: http://www.lib.berkeley.edu/EART/vegmaps.html.

World Fire Atlas (WFA)

More than 50 million hectares of forest are burnt annually, and these fires have a significant impact on global atmospheric pollution, with biomass burning contributing to the global budgets of greenhouse gases, like carbon dioxide.
For a decade now, ESA satellites have been continuously surveying fires burning across the Earth's surface. Worldwide fire maps based on this data are now available online in near-real time through ESA's ATSR World Fire Atlas. In addition to maps, the time, date, longitude and latitude of the hot spots are provided.

HydroSHEDS: Innovative global hydrological database

WWF's Conservation Science Program is currently developing a new and innovative global hydrological database, termed HydroSHEDS. For many parts of the world these data and the tools built to use them will open up a range of previously inaccessible analyses and applications related to freshwater conservation and environmental planning.
HydroSHEDS is based on high-resolution elevation data obtained during a Space Shuttle flight for NASA's Shuttle Radar Topography Mission (SRTM). HydroSHEDS stands for "**Hydro**logical data and maps based on **SH**uttle **E**levation **D**erivatives at multiple **S**cales."
At the most basic level, HydroSHEDS will allow scientists to create digital river and watershed maps. These maps can then be coupled with a variety of other geo-spatial datasets or applied in computer simulations, such as hydrologic models, in order to estimate flow regimes. HydroSHEDS thus allows scientists and managers to perform analyses ranging from basic watershed delineation to sophisticated flow modeling.
HydroSHEDS can be used for a wide range of applications. WWF has already applied the data to create aquatic habitat classification maps for remote and poorly mapped regions such as the Amazon headwaters and the Guiana Shield. Taxonomists will ultimately be able to link their field site locations directly to digital river maps. And WWF researchers hope to use HydroSHEDS in the future to assess the possible impacts of climate change to freshwater ecosystems. Data for South America, Central America, and Asia are now available. Other continents are scheduled for completion within a year. HydroSHEDS data documentation and download are freely available for non-commercial use.

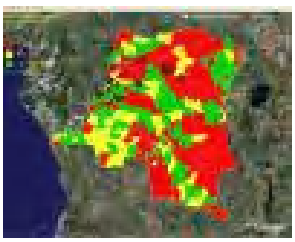
WWF Conservation Science Program datasets

- WildFinder Database
- Marine Ecoregions of the World
- Terrestrial Ecoregions Base Global Dataset
- Terrestrial Ecoregions of the World
- HydroSHEDS (global hydrological database)
- Global Lakes and Wetlands Database (GLWD)
- Global 200 Ecoregions

Links to SADC custodians of geospatial data

Geospatial Research, Applications, Reference Material

Tracking the polio virus down the Congo River: a case study on the use of Google Earth in public health planning and mapping



The use of GIS in public health is growing, a consequence of a rapidly evolving technology and increasing accessibility to a wider audience. Google Earth (GE) is becoming an important mapping infrastructure for public health. However, generating traditional public health maps for GE is still beyond the reach of most public health professionals. This paper explains through the example of polio eradication activities in the Democratic Republic of Congo, how GE Earth is used as a planning tool and the methods used to generate public health maps are shared.
The Congo River is the second longest river in Africa (4700 km). Because it is readily navigable in sections, especially between Kinshasa and Kisangani, it is a major trade route and sees intense movement of persons

and goods. The geospatial distribution of polio cases showed that the outbreak seemed to follow the course of the Congo River; this raised suspicion that the river could play an important role in the propagation of the outbreak to neighboring districts. Detailed maps of entire sections of the river were not known or available, with the consequence that potential populations eligible for vaccination services and living on islands or along tributaries to the river were not included in immunization micro-plans, and therefore, not reached by routine vaccination or SIA services. The overall objective of the River Strategy was to stop the progression of WPV1 along the river by insuring that the entire eligible population living "on the river" was vaccinated against polio during the SIA. The groups targeted by the strategy included mobile populations on boats, canoes and rafts, populations of seasonal villages and fixed population on islands and stilt villages.
The use of GE improved field operations and resulted in better dispatch of vaccination teams and allocation of resources. It also allowed the creation of maps of high quality for advocacy, training and to help understand the spatiotemporal relationship between all the entities involved in the polio outbreak and response.

Monitoring temporary ponds dynamics in arid areas with remote sensing and spatial modeling

A hydrologic pond model was developed that simulates daily spatial and temporal variations (area, volume and height) of temporary ponds around Barkedji, a village located in the Ferlo Region in Senegal. The model was tested with rainfall input data from a meteorological station and from Tropical Rainfall Measuring Mission (TRMM) satellites. During calibration phase, climatic, hydrologic and topographic field data of Barkedji pond collected daily during the 2002 rainy season was used. The Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) Digital Elevation Model (DEM) and a QuickBird satellite image acquired in August 2005 (2.5 m pixel size) were used to apply the hydrologic model to all ponds (98 ponds) of the study area. With input rainfall data from the meteorological station, simulated water heights values for years 2001 and 2002 were significantly correlated with observed water heights for Furdu, Mous 2 and Mous 3 ponds, respectively with 0.81, 0.67 and 0.88 Nash coefficients.
With rainfall data from TRMM satellite as model input, correlations were lower, particularly for year 2001. For year 2002, the results were acceptable with 0.61, 0.65 and 0.57 Nash coefficients for Barkedji, Furdu and Mous 3 ponds, respectively. To assess the accuracy of our model for simulating water areas, we used a pond map derived from Quickbird imagery (August 2007). The validation showed that modelled water areas were significantly correlated with observed pond surfaces ($r2$=0.90). Overall, our results demonstrate the possibility of using a simple hydrologic model with remote sensing data (Quickbird, ASTER DEM, TRMM) to assess pond water heights and water areas of a homogeneous arid area.

Catchment hydrology management using GIS: case study of the Modder River Basin, South Africa

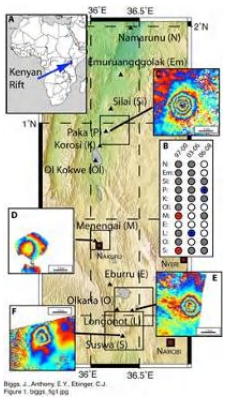
Water is constantly flowing through the landscape in response to weather events and most often, in the form of streams and rivers. This water flow carries micro-organisms, dissolved chemicals and sediment, which define water quality. We need to understand these flow- and quality-patterns and how they change in order to properly manage the water resources of river basins. Hydrological analysis and modelling of water flow and quality are provided by hydrological simulation models, whilst GIS describes the physical environment through which the water flows. Integrating hydrological modeling and GIS involves connecting geospatial data, which describe the physical environment, with hydrological process models, which explains how water moves through the environment.
Even though there is a significant synergy between geospatial and temporal water resources information, it is difficult to capture because, up to now, the data (geospatial and temporal) have been held in different formats and archiving environments. One of the aims of this project was therefore to create a geodatabase (GBase) where geospatial and temporal data are captured and stored in one environment. Another aim was to achieve communication and data exchange between GBase, HYDSTRA, a hydrological database and BASINS, an environmental analysis system. The overall purpose, however, was to create an integrated platform, including the above programmes, to provide tools to pre-process data for different independent models, which can then be used to investigate the impact of changes or developments in the river basin. The Modder River Basin, which forms part of the Upper Orange Water Management Area in South Africa, was used as study area.

CyberGIS: Empowering the Synthesis of Computational and Spatial Thinking

Spatial thinking and associated geographic approaches, supported by geographic information systems (GIS), play essential roles in solving scientific problems and improving decision-making practices of significant

societal impact. Fulfilling such roles is increasingly dependent on the capabilities of synthesizing spatial and computational thinking (Wing 2006) enabled by cyberinfrastructure. Cyberinfrastructure promises to revolutionize how science and engineering are conducted in the 21st century as computation has become the third pillar of science and engineering (along with theory and experiment) (NSF 2003). CyberGIS represent a new GIS modality comprising a seamless blending of cyberinfrastructure, GIS, and spatial analysis capabilities to empower computational and spatial thinking and, thus, promise to transform geospatial problem-solving and decision-making while advancing cyberinfrastructure.

Using Satellite Imagery to Identify Active Magma Systems in East Africa's Rift Valley



A team from the University of Miami, University of El Paso and University of Rochester has employed Interferometric Synthetic Aperture Radar (InSAR) images compiled over a decade to study volcanic activity in the African Rift. The study, published in the November issue of *Geology*, studies the section of the rift in Kenya.

"The Kenyan Rift volcanoes are part of a larger Great Rift Valley complex that extends all the way from Mozambique to Djibouti; their presence in East Africa attests to the presence of magma reservoirs within the Earth's crust," said Lead Author Dr. Juliet Biggs, Rosenstiel Postdoctoral Fellow at the University of Miami. "Our study detected signs of activity in only four of the 11 volcanoes in the area - Suswa, Menengai, Longonot and Paka — all within the borders of Kenya."

Small surface displacements, which are not visible to the naked eye, were captured using InSAR, a sophisticated satellite-based radar technique. Using images from European Space Agency satellites ERS and Envisat, the team was able to detect the smallest ((<1 cm) of surface displacements at a very high resolution. From 1997 – 2000 they discovered that the volcanoes at Suswa and Menengai subsided 2-5 cm, and between 2004 and 2006 the Longonot volcano experienced uplift of 9 cm. However, the most dramatic uplift unfolded at Paka, which had uplift of ~21 cm during a nine month period in 2006-2007. This pulse of activity was preceded by transient uplift and subsidence at a second source, associated with the magma flow through the complex underground plumbing system. Overall the events were short in duration and episodic rather than continuous, which means discrete pulses of magma were arriving at the crust, similar to a stop valve that is being turned on and off intermittently. "The fact that these areas are so close to a major metropolitan area pose a challenge in terms of a large volcanic or seismic event" says co-author Cindy Ebinger. Suswa, Menengai and Longonot are all located in densely populated areas within 100 km of Nairoibi. The study also provides insight as to the geothermal potential of the region.

NASA: 2009 second warmest year on record

According to NASA's Goddard Institute for Space Studies (GISS), last year was tied for the second warmest year on record after 2005, the warmest year on record. If just looking at the southern hemisphere, however, 2009 proved the warmest yet recorded since record-taking began in 1880. Overall 2009 tied a total of five other years - four from the 2000s for the second warmest on record. But, researchers say what is most important was that the past decade, from January 1st 2000 to December 31st 2009, proved the warmest on record. "There's always interest in the annual temperature numbers and a given year's ranking, but the ranking often misses the point," James Hansen, GISS director, said in a press release. "There's substantial year-to-year variability of global temperature caused by the tropical El Nino-La Nina cycle. When we average temperature over five or ten years to minimize that variability, we find global warming is continuing unabated." The year before last, 2008, was the coolest year of the 2000s due to a strong La Nina event that cooled the tropical Pacific Ocean, however warm temperatures made a comeback last year as the La Nina event fell back. Even an unseasonably cool December in North America did little to stem the overall warming trend in 2009. "The contiguous 48 states cover only 1.5 percent of the world area, so the United States' temperature does not affect the global temperature much," Hansen explained. While the United States, Europe, and China may have been colder than usual this winter, the Arctic and the Southern Hemisphere remained significantly warm. Climatologists have pointed out recently the importance of understanding the difference between weather (day-to-day localized events) and climate (longterm trends).

Overall GISS has measured an upward trend in the global temperature of about 0.36 degrees Fahrenheit (0.2 degrees Celsius) every ten years over the past three decades. Since 1880, temperatures have risen about 1.5 degrees Fahrenheit (0.8 degrees Celsius). The GISS uses slightly different temperature analysis than other temperature research groups, such as the Met Office Hadley Centre in the UK, which omits

temperature readings from large parts of the Arctic and Antarctic because monitoring stations are sparse. Despite these small differences both GISS and Met Office Hadley Centre record that the 2000s was clearly the warmest decade on record. "There's a contradiction between the results shown here and popular perceptions about climate trends," Hansen said. "In the last decade, global warming has not stopped."

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.

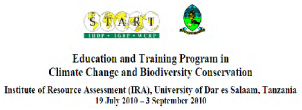
RCMRD conducting a Postgraduate Certificate course in Application of Earth Observation and GIS in Integrated Water Resources Management (IWRM)

In January 2010, the Regional Centre for Mapping of Resources for Development (RCMRD) initiatecd for the fourth time the Postgraduate Certificate Course in Application of Earth Observation and GIS in Integrated Water Resources Management. This is a 16 week training course on principles of Integrated Water Resources Management. Participants were drawn from Kenya, Zimbabwe, Sudan and Ethiopia. This is a joint program with Unversity of Twente, Faculty of Geo-Information Science and Earth Observation (ITC) (The Netherlands), Egerton University (Kenya), United Nations University, and Regional Centre for Mapping of Resources for Development (Kenya) and Addis Ababa University (Ethiopia). The course covers the following subjects:

1. Principles of IWRM - 1 week - venue - RCMRD
2. Principles of Remote Sensing and GIS - 5 weeks – RCMRD
3. Catchment Hydrology - 2 weeks - Egerton University
4. Catchment Modeling including DEM Hydro-Processing - 3 weeks - Egerton University
5. Ground Water System analysis and Modeling - Egerton University
6. Application of GIS and RS in Integrated Water Resources management - 3 weeks - RCMRD.

Candidates eligible for this course should be working with water organizations, must be conversant with computer operations, and must have a sponsor to meet tuition fee and costs of airfare and subsistence allowances. Limited fellowships are available under NUFIC (The Netherlands Embassy) for participating countries. For further information, contact: Samuel Nga'nga' at sammyn@rcmrd.org.

Call for Applications: Training in climate change and biodiversity conservation



START and the Institute of Resource Assessment, University of Dar es Salaam, with support from the MacArthur Foundation have announced the 2010 Education and Training Program on Climate Change and Biodiversity Conservation in the Albertine Rift Region of Africa. Applications are invited from early to mid-career conservation researchers and practitioners; masters-level graduate students; and university educators currently teaching courses related to conservation and natural resource management. Applicants must be African nationals; priority will be given to applicants from Albertine Rift countries i.e. Burundi, Democratic Republic of Congo, Rwanda, Tanzania and Uganda.
The program will offer interdisciplinary learning through the use of course modules that allow participants to acquire knowledge and skills in assessing climate change risks to ecosystems and biodiversity, and strategies for their conservation, and through field externship projects whereby participants are able to apply what they have learned in the course to actual conservation efforts in the region. Participants who are university educators will receive focused training in the use and application of distance learning modules on climate change and biodiversity conservation, rather than participating in field externship projects. The

course modules will be offered at Institute of Resource Assessment, University of Dar es Salaam from July 19 - September 3, 2010. Externship projects will commence immediately following completion of coursework, and are anticipated to last approximately two months. Training in distance learning modules will commence on 6 September 2010 and last approximately one week. The deadline for applications is: March 12, 2010. For further enquiries, please contact: Jyoti Kulkarni, International START Secretariat: jkulkarni@start.org. Dr. Pius Yanda, Director, Institute of Resource Assessment: yanda@ira.udsm.ac.tz.

Scholarships for Erasmus Mundus Masters course in Environmental Sciences, Policy and Management

MESPOM is an Erasmus Mundus Masters course in Environmental Sciences, Policy and Management. It is operated by four leading European and two North American Universities and supported by the European Commission. MESPOM prepares students for identifying and implementing solutions to complex environmental challenges, especially in an international context. Interested scholars are required to apply to the MESPOM Consortium by e-mail by April 1, 2010.

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.

Course on Demographic and Health Surveys, June 21-25, 2010, Nairobi, Kenya

University of Nairobi Enterprises and Services Ltd is offering professional short course on Demographic and Health Surveys. The course provides an overview of the DHS surveys and how to use DHS data to improve health programs. Demographic and Health Surveys (DHS) are nationally-representative household surveys that provide data for a wide range of monitoring and impact evaluation indicators in the areas of population, health, and nutrition. Demographic and Health Surveys provide countries with a standardized tool to obtain indicators for the effective monitoring of national programs such as those on HIV/AIDS, health and family planning services available in a country. Contact: Prof. Mwanthi, mmwanthi@uonbi.ac.ke.

ESRI Eastern Africa Hands-on Training for GIS Professionals

ESRI Eastern Africa

The following courses are offered at the ESRI Authorized Learning Centre in UpperHill, Nairobi, Kenya. Special arrangements can be made on request for client-site training.

Fundamentals of ArcGIS Desktop	Duration (Days)
• ArcGIS Desktop 1: Getting Started with GIS	3
• ArcGIS Desktop 2: Tools and Functionality	4
• ArcGIS Desktop 3: Workflows and Analysis	3
• **Data Production and Editing with ArcGIS**	
• Field Data Collection Using ArcPad and ArcGIS Desktop **(NEW)**	3
• Building Geodatabases	4
• Data Production and Editing Techniques **(NEW)**	4
Analysis with ArcGIS	
• Performing Analysis with ArcGIS Desktop **(NEW)**	4
• Working with ArcGIS Spatial Analyst	4
• Working with ArcGIS Network Analyst	3
Cartography with ArcGIS	
• Creating and Publishing Maps with ArcGIS **(NEW)**	4
• Working with Cartographic Representations **(NEW)**	3
Enterprise GIS	
• Introduction to ArcGIS Server	3
• Introduction to the Multiuser Geodatabase	3
• Managing Editing Workflows in a Multiuser Geodatabase **(NEW)**	4
Programming with ArcGIS	
• Introduction to Programming ArcObjects using VBA	4
• Introduction to Programming ArcObjects using .NET **(NEW)**	4
• Introduction to Geo-processing using Python **(NEW)**	3

Contact ESRI Eastern Africa by email: training@esriea.co.ke, telephone: +254 20 2713630/1/2 or fax: +254 20 2713633 for the course catalogue, class registration form, class schedule and any other training related enquiry.

ESRI South Africa course schedule for March and April 2010
Contact: Midrand: Queen Mofokeng, qmofokeng@esri-southafrica.com; Durban: Patricia van Schalkwyk, pvanschalkwyk@esri-southafrica.com; Port Elizabeth: Queen Mofokeng, qmofokeng@esri-southafrica.com; Cape Town: Kathi Wöhl, kwohl@esri-southafrica.com.

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] **–**

Promotion : inscriptions ouvertes, Kinshasa, République Démocratique du Congo. Le cursus de l'ERAIFT aboutit à l'obtention d'un Diplôme d'Etudes Supérieures Spécialisées (DESS). Ce diplôme est l'équivalent d'un Master du système « LMD » (Licence, Master, Doctorat) des Accords de Bologne. Il est reconnu par le Conseil Africain et Malgache pour l'Enseignement Supérieur (le CAMES). Le programme du DESS comprend 16 chaires dont l'enseignement s'étend sur une période de 12 mois. L'étudiant dispos ensuite de 6 mois pour rédiger son mémoire. Le contenu de ce dernier repose sur l'approche systémique, et s'inscrit dans le cadre de l'aménagement intégré du territoire, du développement humain, durable et écologiquement viable, de la lutte contre la pauvreté et de la gestion rationnelle de l'environnement. L'autre grade décerné par l'ERAIFT est le Diplôme de Philosophiae Doctor (Ph.D.) en Aménagement et gestion intégrés des forêts et territoires tropicaux. Bourses disponibles, mais limitées en nombre. Contact: info@eraift.org.

Short-courses offered by RECTAS in 2010, 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.

ITC Distance Learning - Certificate

- GIS Data Quality (6 weeks). Starting date: 15 March 2010. Deadline for application: -. Register.
- Multi-Hazard Risk Assessment (6 weeks), Starting date: 17 May 2010. Deadline for application: 26 April 2010. Register.
- Principles of Remote Sensing (8 weeks). Starting date: 17 May 2010. Deadline for application: 26 April 2010. Register.
- Environmental Impact Assessment and Strategic Environmental Assessment using spatial decision support tools (6 weeks). Starting date: 7 June 2010. Deadline for application: 17 May 2010. Register.
- Principles of Geographical Information Systems (7 weeks). Starting date: 6 September 2010. Deadline for application: 16 August 2010. Register.
- Spatial Decision Support Systems (8 weeks). Starting date: 11 October 2010. Dealine for application: 20 September 2010. Register.
- Learning IDL for Building Expert Applications in ENVI. Starting date: 25 Oct 2010. Deadline for application: 4 October 2010.
- Digital Terrain Model extraction, processing and parameterization for Hydrology (3 + 3 weeks). Starting date: 29 November 2010. Deadline for application: 8 November 2010. Register.
- Principles and Applications of Remote Sensing and GIS in Natural Resources Management at KNUST, Kumasi, Ghana (12 weeks). Starting date: 20 September 2010. Register.

MSc and PG Diploma

- Water Resources and Environmental Management (Mc degree -18 months), Netherlands. Starting date: 13 Sep 2010. Deadline for application: 1 July 2010. Register.
- Water Resources and Environmental Management (PG Diploma - 9 months), Netherlands. Staring date: 13 September 2010. Deadline for application: 1 July 2010. Register.

Programme de Formation au CRTS 2010, Maroc
Le Centre Royal de Teledetection Spatiale est l'Institution Nationale responsable de l'utilisation, de la promotion et du developpement de la teledetection spatiale au Maroc. Il est charge de coordonner et de

gerer les programmes nationaux de teledetection spatiale en partenariat avec les ministr¨res, les universites et les operateurs privates.

Geoinformatics (GFM.4) joint education diploma course of ITC and ARU, September 2010 - June 2011 (9 months), Dar es Salaam, Tanzania
The course is run at Ardhi University (former UCLAS, www.aru.ac.tz) campus in Dar es Salaam, Tanzania. The aim of the course is to provide participants with the theoretical education and practical training needed to contribute to the digital production of maps and geoinformation using appropriate, state-of-the-art technology with in-depth knowledge in one of the specific aspects of the production process. GFM4 Course Application Form, Contact: Head Geomatics Department, Ardhi University at geomatics@aru.ac.tz.

Training Course: Offre et Programmation des séminaires de formation Pour le premier semestre de l'année 2010, Ouagadougou, Burkina Faso
Les séminaires de formation à l'IAVS visent le renforcement des capacités d'approche globale de la problématique des changements climatiques en lien avec les questions de développement et la maîtrise des outils et des méthodologies pour la prise en compte des considérations liées à ces changements climatiques dans les politiques et actions de développement. La programmation des séminaires pour le premier semestre de l'année 2010 se présente comme suit:

- Séminaire méthodologique sur la prise en compte des considérations liées aux changements climatiques dans la planification urbaine - Du 22 au 26 Mars
- Prévention et gestion des effets des changements climatiques dans le secteur de la sécurité alimentaire - Du 26 au 30 avril
- Séminaire méthodologique sur la prise en compte des changements climatiques dans la planification du développement national - Du 24 au 28 Mai
- Elaboration et mise en œuvre de campagnes d'information et de sensibilisation sur les changements climatiques et leurs implications - Du 21 au 25 juin

Short course: Introduction to GIS Standards, September 6-7, 2010, University of Pretoria, South Africa
The course provides an introduction to geographic information standards such as those developed by the ISO/TC 211, Geographic information/Geomatics and Open Geospatial Consortium (OGC). Course content shows where to find these standards, how to read, interpret and implement them.

Funding Opportunities, Awards, Support

ERNWACA Research Grants Programme 2010
The Educational Research Network for West and Central Africa (ERNWACA) was created to increase research capacity, strengthen collaboration among researchers and practitioners, and promote African expertise on education so as to positively impact educational practices and policies. This grant program is open to young researchers, doctoral students, education specialists, administrators living in one of the ERNWACA member countries. Age limit is 40. Twenty-five studies will be financed in the 16 ERNWACA member countries. Deadline for submission: 15 March 2010.

e8 Scholarship Programme 2010
Established in 2001 to support outstanding students in advanced studies of sustainable energy development, the e8 Scholarship Programme offers two-year scholarships to Masters Students. The e8 considers an outstanding student to be one

- who graduates with excellent grades in the top 20% of her/his class
- who is determined to advance her/his knowledge and understanding
- who has a history of community involvement
- who is committed to sustainable energy
- who is committed to return and contribute to her/his home country

Students must:

- plan to undertake studies at the Masters level or Post-Doctoral level in areas directly related to sustainable energy development
- be citizens of the developing countries and territories identified for OECD official development aid in the DAC List of ODA Recipients effective as of 2006

Scholarships of US$ 23,000 per year for up to two years are offered for Masters level students. Information and the Application Forms can be obtained online, the e8 General Secretariat or e8generalsecretariat@hydro.qc.ca. Applications for the Masters programme must be received by March 19, 2010. (See also Version française)

Nominations Invited for 2010 Tech Awards

An annual program of the Tech Museum of Innovation, the Tech Awards are designed to inspire global engagement in applying technology to humanity's most pressing problems. The awards recognize individuals, organizations, and companies from around the world that are utilizing innovative technology solutions to address urgent issues in the areas of education, equality, environment, health, and economic development. Each year, candidates are nominated and then invited to submit applications. Individuals, for-profit companies, and not-for-profit organizations are eligible. Self-nominations are accepted. International panels of judges will review the applications and select fifteen laureates. Awards will be presented in five categories: health, education, environment, economic development, and equality. Deadline for nominations: March 31, 2010.

University of Edinburgh Southern African Scholarships

The University of Edinburgh will offer two scholarships for postgraduate study in any subject offered by the University to students from Southern African countries. One of the scholarships will be available for a one year Master's degree programme and the other scholarship for a three year PhD degree programme. The scholarship covers the overseas rate of tuition fee and University accommodation for the duration of the postgraduate degree programme. The scholarship will be awarded to applicants from Southern African countries who are accepted for admission on a full-time basis for a postgraduate Master's programme of study or PhD degree programme at the University of Edinburgh. Applicants may apply from the following countries: Angola, Namibia, Botswana, South Africa, The Democratic Republic of Congo, Swaziland, Lesotho, United Republic of Tanzania, Malawi, Zambia, Mozambique and Zimbabwe. The scholarship will be awarded on the basis of academic merit. Deadline: April 1, 2010.

World Forest Institute International Fellowship Program: Oregon, USA

Fellowship targets professionals in natural resources from around the world to conduct a practical research at the World Forestry Center. Download Fellowship brochure for details. Applications accepted year- round.

URISA Exemplary Systems in Government (ESIG) Awards

The Urban and Regional Information Systems Association (URISA) have recently posted the 2010 application materials for its prestigious Exemplary Systems in Government (ESIG) Awards. The awards recognize exceptional achievements in the application of geospatial information technology that have improved the delivery and quality of government services.

Applications may be submitted in two categories, Single Process and Enterprise Systems. Applications must be submitted by 3 May 2010. Winners in each category will be recognized at URISA's 48th Annual Conference, 28th September to 1st October 2010 in Orlando (FL, USA).

ESRI 2010 Mashup Challenge

Create an innovative mashup using ArcGIS Online and Web Mapping **APIs** for the chance to win one of four cash prizes. Awards will be based on originality, creativity, and analytic process.

- 1st Place: $10,000
- 2nd Place: $5,000
- 3rd Place: $2,500
- 4th Place: $2,500

Getting Started - Build a mashup using ArcGIS Online and ESRI Web Mapping APIs. Shoot a video of your application and post it on YouTube. Submit your mashup.

Resources - Choose an API and download it. An ESRI Global Account is required to download the Flex (Flex samples) and Silverlight (Silverlight samples) libraries. There is no download for JavaScript (JavaScript samples). Add data to your map (Get map layers). **Deadline:** 5 March 2010.

Captain Planet Foundation Funding for Youth Environmental Projects

The mission of the Captain Planet Foundation is to fund and support hands-on environmental projects for children and youth. The foundation's objective is to encourage innovative programs that empower children and youth around the world to work individually and collectively to solve environmental problems in their neighborhoods and communities. Through environmental education, the foundation believes that children can achieve a better understanding and appreciation of the world in which they live. The foundation offers small grants of $500 or less each, as well as a limited number of grant awards ranging from $500 to $2,500 each. Applicants must be at least 18 years old to submit a proposal. Deadlines for submitting grant applications are June 30, September 30, December 31, and March 31. Grant proposals are reviewed over a period of three months from the date of the submission deadline. Visit the Captain Planet Foundation Web site for complete program information and guidelines.

Japan/World Bank Scholarship

To apply for a JJ/WBGSP scholarship under the Regular Program, an applicant should read carefully the application procedure as outlined in the following documents:

- Benefits
- Application Guidelines
- Preferred Universities in 2010-2011
- How to Apply

An applicant must:

- Be a national of a World Bank member country eligible to borrow.
- Be born after March 31, 1970.
- Have, by March 31, 2010, at least 2, preferably 4 to 5, years of recent full time professional experience acquired after a university degree, in the applicant's home country or in another developing country.
- Hold a bachelor's degree or its equivalent.
- Be in good health.
- Be of good character.
- Not be a permanent resident or a national of any industrialized country.
- Not be residing in an industrialized country for more than one year.
- Not be an Executive Director, his/her alternate, staff of the World Bank Group (the World Bank, International Finance Corporation, International Development Association, Multilateral Investment Guarantee Agency, and International Center for Settlement of Investment Disputes), consultant, or relative of the aforementioned.

Contact: jjwbgsp@worldbank.org.

Employment Opportunities

Knowledge Management Advisor, Juba, Sudan

Working for Management Systems International (MSI), the Knowledge Management Specialist will create and oversee knowledge management systems (A USAID/Sudan Web Portal; Geographic Information Systems), organize and share information among USAID staff located in Juba, Khartoum, Nairobi, Darfur, and Washington, provide to the Mission options for building an internal GIS capacity by surveying existing resources in southern Sudan. Candidates must have:

- Demonstrated knowledge of GIS within the context of international development; knowledge of GIS and cartographic concepts, theory and practices;
- Extensive knowledge of computers, internetworking and related tools, systems, software and applications used in knowledge management;
- Ability to establish and maintain effective working relationships through remote communications with co-workers and clients at USAID
- Proven ability to work independently with minimal instruction and direction;
- Ability to maintain accurate records, good organizational and planning skills;
- Experience with project management and USAID regulations a plus.

Deadline for application: 19 March 2010.

Expert on Continental Early Warning System & Preventive Diplomacy, Addis Ababa, Ethiopia

A vacancy exists with AU Continental Early Warning System (CEWS). Under the direct supervision of the Head of the Conflict Management Division, the incumbent shall be engaged in data collection, analysis and

report writing on conflict early warning, using the CEWS methodology, as well as activities to establish, implement and monitor the Continental Early Warning System of the African Union. The incumbent should have:

- A Masters degree, with 8 to 10 years relevant experience in Political Science, International Relations, International Law and Conflict Prevention and Resolution, working in Research Centers/Institutes', United Nations and its agencies or other international organizations or lecturing at a University in Political Science, International Law or undertaking research in Political Science;
- Must have excellent presentation and drafting skills and excellent knowledge of current political, social and economic developments in Africa and the World and must be well versed in applying social science methodology;
- Must have the ability to work with a team of professional staff and capacity for creativity and initiative as well as capacity to produce early warning reports/briefs under pressure;

Applications should be addressed to: au-recruits@africa-union.org. Deadline: 12 March 2010.

Nyungwe Project Director, Gisakura, Rwanda
Working for the Wildlife Conservation Society, Africa Program, oversee the implementation of project activities and supervise project staff, partners and develop management systems in and around Nyungwe National Park. This position requires a postgraduate degree holder in conservation biology or related subject and at least 5 years experience working in similar field. Experience and skills in technical areas related to the project might include: wildlife ecology research methods, natural resource management, GIS and land use planning and/or protected area management. For further information and how to apply for the position, contact Jennifer Kennard, jkennard@wcs.org. Deadline: 27 March 2010.

WCS Marine Technical Director, Antananarivo, Madagascar
Lead WCS's marine conservation efforts in Madagascar. The program goal is to promote marine conservation in Madagascar by developing and leading science-based, community-driven field conservation and capacity building programs in priority seascapes, which focus on priority species, sustainable fisheries management and adaptive management in the face of climate change. These site-based initiatives will serve as models for affective marine conservation to inform national marine conservation strategic development. No deadline given.

Protected Area Manager, Kinshasa, DR Congo
Working for WWF, the Global Conservation Organization, the Protected Areas Project Manager is responsible for spearheading the Protected Areas Program for WWF DRC, working to develop and implement a coordinated plan for supporting the DRC government on establishment and effective management of their protected area network. Candidates must have an advanced university degree in an appropriate field (conservation / environment / natural resource management / forestry). If interested, send your application letter with a CV stating your availability to the Human Resources Manager, wwfrdc@wwfcarpo.org.

Internship (x 6) with Sustainable Alternative for Development (ADD), Mbalmayo, Abong-Mbang or Sangmelima in Cameroon (announcement in French)
See project abstract for more information on the ADD project. If interested in an internship, send your motivation letter and CV to altdur@yahoo.fr. Deadline: 15 March 2010.

Information Management Intern - GIS Unit, Global Logistics Clulster Support Cell, Italy, Rome
Under the immediate supervision of the Global Logistics Cluster Support Cell Information Management Officer in Rome, he/she will perform the following tasks:

- Develop a methodology of comparison of different roads and infrastructure data/layer and geo-database using spatial data infrastructure for transport system. SDI-T.
- Work with GIS Coordination Officer to establish priority data collection/processing activities based on emerging information requirements and update SDI-T database
- Ensure that the GLCSC GIS Unit and other collaborating agencies are operating with the most up-to-date geographic data available on roads and infrastructure;
- Ensure the smooth delivery of newly acquired data from the field for cleaning and processing on;
- Process and clean incoming field data for delivery to Cartographic Officer.

- Collect and analyze other information sources such as situation reports, field bulletins, and other situational reporting from operational agencies in their area of responsibility, and translate the information content into geographic data;
- As required, assist the GIS Coordination Officer and Cartographic Officer in the production of maps and other GIS products in order to meet tight deadlines.

The intern must be:
Student with knowledge and experience in Geo-database using SDI technology within interest for international humanitarian organizations (UN and International NGOs) and/or complex humanitarian emergencies environments; Knowledge of all these languages/platform: Experience in Database and GIS management (MySQL, PostGresSQL, ORACLE, ARCGIS 9.3, WMS, ESRI personal Geodabase or other); Some graphic design capability would be desirable; Working knowledge of two official UN languages (English + French). Italian a plus. Deadline: 15 March 2010.

GIS Specialist, International Committee of the Red Cross, Geneva, Switzerland
GIS specialist to contribute, within a small team, to map production related to emergencies and operations for the headquarters and ICRC delegations. The incumbent will Produce emergency and operational ICRC maps according to the need, Maintain and develop the ICRC geodatabase, Support and advises ICRC headquarters and the delegations on geographical information management and maintenance, Contribute to the development and maintenance of the various Water & Habitat Unit software, Contribute to ICRC GIS officers recruitment and training in delegations, Reinforce the GIS network, within and outside the humanitarian community.
Training and experience required:

- Academic qualification in GIS or equivalent experience
- Strong knowledge in ArcGIS software, ESRI
- Knowledge of other GIS software: (SGBD, image processing, remote sensing, Opensource GIS, GIS Server, etc)
- Good basis in programming (SQL, VB, HTML, XML, SOAP, Javascript, etc)
- Good knowledge of cartography representation and semiology
- Good command of data gathering, digitisation and integration
- Experience in humanitarian and emergency cartography
- Fluent in French and English

Deadline: 16 March 2010.

Post doctoral fellow – field hydrology, Addis Ababa, Ethiopia
IWMI seeks to recruit a well qualified Post Doctoral Fellow in Field Hydrology to participate in a Challenge Program on Water and Food project located in the Nile Basin that focuses on integrated rainwater management strategies, technologies, institutions and policies. S/he will work in an inter-disciplinary team that will consider the impact of rain water management technologies and strategies on catchment hydrology – the downstream and groundwater impacts as well as evaporation and transpiration – at different locations within the Nile Basin, with the ultimate aim of evaluating water allocation and water productivity implications. This position will coordinate and implement hydrological field studies conducted to obtain primary data relating to the impacts of different rainwater management technologies on hydrological fluxes and water productivity at different locations in the Nile Basin.
Qualifications and experience:

- A Ph.D. in Hydrology, Hydrochemistry, Soil Science or Hydrogeology
- Experience in hydrology and hydrological flux measurements including installation and operation of field instruments (e.g. weather stations, piezometers, rain gauges, flow gauges, bowen-ratio, soil moisture equipment etc.).
- Experience of hydro-chemical techniques for evaluating hydrological flow pathways would be an advantage.
- Experience in the quality control, interpretation and analyses of field data and modeling hydrological processes.
- Demonstrated ability to work independently in the field.
- Knowledge of hydrologic implications of agricultural practices
- Competence in quantitative applied research methods, and strong quantitative and analytical skills.

- Computer literacy, with skills in handling and quality controlling large volumes of data and hydrological process modeling.
- Good communication and writing skills, with a good command of both oral and written English
- Demonstrated ability to prepare project documents and research publications. A record of relevant peer-reviewed publications is a major advantage.
- Ability to effectively establish priorities, plan, organize and monitor own work in an interdisciplinary and multiple task environment;
- Strong interpersonal skills and ability to establish and maintain effective working relations with people in a multi-cultural, multi-ethnic environment with sensitivity and respect for diversity.
- Previous working experience in developing countries is an advantage.

Post doctoral contracts are available for two years and are non-renewable. Complete application form http://www.iwmi.cgiar.org/About_IWMI/Vacancies/. Application deadline: 31 March 2010.

Post Doctoral fellow - Agro-Ecosystem specialist, Addis Ababa, Ethiopia
IWMI seeks to recruit a well qualified Post Doctoral Fellow with skills in ecosystem analysis to participate in a Challenge Program on Water and Food project located in the Nile Basin that focuses on integrated rainwater management strategies, technologies, institutions and policies. S/he will work in an inter-disciplinary team that will consider the impact of rain water management technologies and strategies on catchment hydrology, livelihoods and landscape functioning at different locations within the Nile Basin, with the ultimate aim of upgrading water and system productivity in mixed farming landscapes.
A Ph.D. ecology, agro-ecosystems, agricultural water management or a related skill; Knowledge of key concepts in ecosystems and resilience theory; Field work in landscape and/or water analysis; Experience in the fields of ecosystems including agro-ecosystems and poverty; Analysis of complex ecological, agricultural and livelihood systems; Demonstrated ability to work independently in the field; Competence in quantitative applied research methods, and strong quantitative and analytical skills; Computer literacy, with skills in handling and quality controlling large volumes of data and hydrological process modeling; Demonstrated ability to prepare project documents and research publications. A record of relevant peer-reviewed publications is a major advantage; Ability to effectively establish priorities, plan, organize and monitor own work in an interdisciplinary and multiple task environment.
Post doctoral contracts are available for two years and are non-renewable. Complete application form http://www.iwmi.cgiar.org/About_IWMI/Vacancies/. Applications will be reviewed after 31 March 2010 or until the position is filled.

Regional Directors (x 3), Cairo, Egypt; Nairobi, Kenya; Singapore
The International Development Research Centre (IDRC), a Canadian Crown corporation, supports research in developing regions of the world to promote growth and development. The result is innovative, lasting local solutions that bring choice and change to those who need it most. After distinguished careers with IDRC, three of our Regional Directors have announced they will be retiring in 2010. These are exciting global management opportunities for dynamic, innovative, experienced leaders.
Reporting to the Vice-President for Corporate Strategy and Regional Management, you will represent IDRC in the region, provide regional intelligence, coordinate the scientific and technical delivery of IDRC's programming in a matrix environment, lead a multidisciplinary team of professionals, and manage the regional office. You will also play a key role in ensuring the coherence and relevance of IDRC's programming in the region. PhD in a discipline related to the work of one of IDRC's Program Areas OR a Master's degree and significant relevant experience
Competencies
Management Excellence: manages research, and human and financial resources to meet current and future organizational needs; communicates effectively in a variety of cultural settings and different fora, adapting message to suit audience; embraces and champions change; and feels at ease leading in a culture of participatory decision making and in a matrix management system
Strategic Agility: contributes to defining IDRC's strategic directions by analyzing and communicating information gathered from various networks and partners in the field
Engagement: creates a sense of direction and purpose that inspires, motivates, and guides the regional office team. On how to apply, visit website: www.idrc.ca/careers, or contact either Wendy Hoskin at whoskin@idrc.ca or Claude Olivier at colivier@idrc.ca. Application deadline: March 12, 2010.

Junior Scientist – Economist, Nairobi, Kenya

ILRI seeks to recruit a Junior Scientist – Economist to join a new multidisciplinary international project designing interventions for genetic improvement in smallholder dairy systems in East Africa. The project aims at identifying appropriate genotypes for smallholder dairy farmers in Kenya and Uganda, and best mechanisms for their delivery. Data will be collected at different levels (community, farm and animal) and different points of time as animals will be monitored over an 18-month period. The Economist will design data collection instruments and coordinate data collection in two countries (Kenya and Uganda), working in close collaboration with other project members in a multidisciplinary team including a Post Doctoral Geneticist. S/he will also be responsible for analyzing field data related to socio-economic preferences for different dairy genotypes, including those related to risk, gender, and spatial factors. The Economist will also be responsible for collecting and analyzing data related to the institutional and organizational issues regarding the delivery of existing dairy cattle genotypes. S/he would further play a key role in developing and sustaining the partnerships and communication activities needed to ensure that the project is conducted smoothly and achieves its objectives.

Preferred Skills:

- A Ph.D. in Economics, Agricultural Economics, or related field with application to agriculture, obtained within the last 2 years
- Experience with primary data collection and survey design in developing countries, preferably in livestock systems
- Strong capabilities in quantitative analysis, with specific expertise in cost-benefit analysis, risk analysis, and econometrics
- Experience of working in multidisciplinary and multicultural teams, in a developing country setting
- Experience in qualitative assessment and gender analysis will be an advantage
- Familiarity with GIS and spatial analysis will be an advantage
- Strong English language skills, both written and spoken; knowledge of Kiswahili will be an advantage
- Willingness to travel frequently to the countries in the region.

Submit application to the Human Resources Office; Telephone 254-20-4223000; Fax 254-20-4223001; email: recruit-ilri@cgiar.org. Screening of applications will begin 15 February 2010 and continue until the post is filled. Closing date: 28 March 2010. Expected starting date is 1 May 2010.

Deputy Executive Secretary, D-1, Bonn, Germany

The application process for the posts of Deputy Executive Secretary to the UN Convention to Combat Desertification (UNCCD) will be open until 17 March 2010.

Requirements:

- Advanced University Degree in law, management studies, social or environmental sciences. A first-level university degree in combination with qualifying experience may be accepted in lieu advanced university degree.
- About fifteen (15) years progressively responsible experience in development, environment and multilateral diplomacy, of which at least 5 years in an international environment.
- Management experience in, and familiarity with United Nations system and procedures are particularly desirable.
- Good organizational skills, ability to work under pressure and respecting deadline.
- Good interpersonal skills and ability to work in a multi-cultural environment, with diplomacy and discretion, particularly at the highest diplomatic levels.
- Fluency in oral and written English and French essential. Knowledge of another United Nations official language is an advantage.

All applicants are requested to complete a United Nations Personal History form (P.11) form available online at http://www.unccd.int/secretariat/vacancies/vacancies.php or at your local UN Office.

Other

Veterinary information system to nationally monitor health and welfare of animals and prevent proliferation of disease

YMS Group successfully implemented its specialized Veterinary Information System for the State Veterinary and Food Administration to transform its approach to monitoring and management of health and welfare of

livestock on farms and modernize the work of veterinary practitioners. Veterinary Information System (VIS) is YMS Group's data integration and graphic information solution developed specifically for state veterinary and food administration bodies. It integrates data from a variety of existing systems and sources into one user interface and allows every authorized member of the veterinary health team (including state employees, veterinary doctors and farmers with livestock) to access it from any location via an internet browser.
VIS contains data on farm operations, livestock origin, health and transportation routes, information on veterinary activity of contracted practitioners, a log of infectious disease outbreaks and steps taken to contain them. "The VIS has helped our large and geographically scattered organization to acquire a single point of access to an enormous amount of data from around the country. It has also simplified an array of routine operations for many state veterinary employees and for hundreds of contracted veterinary doctors working on livestock farms" said MVDr Janiuk, Director of Animal Health Section of the State Veterinary and Food Administration. The VIS comprehensively processes data on infectious diseases of livestock. Infected farms are displayed in GIS and automatically transferred into „protection zone". The State Veterinary and Administration instantly identifies and monitors outbreaks of infectious diseases and quickly detects similar problems in different farms. This allows for faster and more efficient decisions about steps to contain them. The VIS is linked with international information systems ADNS and TRACES, which makes it an important player in international prevention from proliferation of infectious veterinary diseases.

African farmers advised on how to adapt to climate change

Low fertilizer use and poor rain-water management among small-holder farmers in sub-Saharan Africa and Asia will continue to undermine food security, far more than climate change. Using climate and crop growth models to forecast the impacts of global warming on food production, the scientists at the International Crop Research Institute for Semi-Arid Tropics (ICRISAT) found that improved use of fertilizer and harnessing rainwater would increase food production even if climate changes for the worse.
Stressing the need for resilience on the part of dryland farmers in dealing with global warming, ICRISAT Director General Dr William Dar said, "The world is now locked into the inevitable changes of climate patterns and however uncertain those changes might be, farmers must eventually adapt to them." The latest report of the Inter-governmental Panel on Climate Change (IPCC) cites that average global temperatures are currently 0.43oC to 0.54oC higher than the yearly temperatures recorded between 1961 and 1990. All IPCC models concur that temperatures are increasing steadily within the tropics but give divergent predictions on rainfall trends. Increases in temperature reduce the length of growing period, which is defined as the number of days the soil has enough water stored to support crop growth to full maturity. High temperatures also speed up crop growth leading to earlier, premature flowering and, as a result, depressed yields. Most farmers in the semi-arid tropics of sub-Saharan Africa and Asia rely exclusively on highly unpredictable rainfall to produce food and generate income, and are therefore extremely vulnerable even to prevailing climatic shocks and rainfall variability. Climate change is expected to worsen matters for them. Nevertheless, farmers have evolved highly risk-averse mechanisms of coping with erratic rainfall and temperature to minimize possible losses by investing as minimally as possible, in farm inputs.

How do scientists forecast volcanic eruptions?

Scientists use a wide variety of techniques to monitor volcanoes, including seismographic detection of the earthquakes and tremor that almost always precede eruptions, precise measurements of ground deformation that often accompanies the rise of magma, changes in volcanic gas emissions, and changes in gravity and magnetic fields. Although not diagnostic individually, these techniques, when used in combination at well-monitored volcanoes, have resulted in successful predictions. At Pinatubo volcano (Philippines) in 1991, a successful forecast saved thousands of lives. The USGS website discusses these monitoring techniques in more detail.
Monitoring-based forecasts are becoming much more reliable, but they remain imperfect. If scientists are fortunate, precursors to an eruption follow the same course as they followed before previous eruptions. Patterns often change, though, and wholly new behavior is observed. The best forecasts will be based on an integration of geologic history, realtime monitoring, and a deep understanding of the internal plumbing processes of the specific volcano. Even with the best of monitoring and interpretations, reliable forecasts are rarely possible more than a few days in advance of an eruption. Some forecasts of volcanic eruptions are

based on eruption recurrence intervals, but these are notoriously unreliable for two reasons: (a) few volcanoes are sufficiently well studied to provide an accurate eruptive history over the many hundreds of years necessary to establish a reliable recurrence interval; and (b) few volcanoes maintain the same behavior for long (more often than not, as soon as a repetitive pattern becomes apparent, the volcano changes behavior). Volcano observatories make forecasts with great caution as they can have huge impacts on the affected populations, in some cases forcing people to leave behind homes, farms, and livestock. Inaccurate forecasts can lead to unnecessary obligation of scarce resources and/or undermine residents' confidence in future forecasts. Reliable forecasts, however, can be made by volcano observatory staff, who have the experience to interpret their monitoring that detects eruption precursors. Most nations with volcanoes have tasked an established observatory, run by the government or by a university, to provide eruption forecasts to the public. All of these observatories are members of the World Organization of Volcano Observatories (WOVO).

Survey for Sh80b power project set to begin in Kenya

The survey for the Sh80 billion power importation project from Ethiopia began in Decemeber 2009 and should be completed in 2013, Energy Minister Kiraitu Murungi has said. He said the power lines will cut across a stretch measuring 1,000-km from Ethiopia to Longonot. Kiraitu said the multi-billion project will be funded by the World Bank, African Development Bank and the European Investment Bank among others. The Government recently announced it had entered into a power importation deal with Ethiopia to boost electricity supply.

Ethiopia is the only Eastern African country with a sufficient power supply backed by a reserve margin of more than 30 per cent – double the recommended margin of 15 per cent. Kiraitu decried the shortage of transmission engineers. He challenged local universities to develop curriculums that are relevant to the economy. [Source: The Standard Newspaper, 11/12/2009]

Nature reports climate change: More knowledge, less certainty

Kevin Trenberth anticipates that the uncertainty in AR5's climate predictions and projections will be much greater than in previous IPCC reports, primarily because models will attempt new and better representations of important climate processes and their feedbacks. While our knowledge of certain factors does increase, so does our understanding of factors we previously did not account for or even recognize. This could present a major problem for public understanding of climate change.

Climate models project large decreases in permafrost by 2100. Some models used for the IPCC's next assessment will include important feedbacks associated with increased releases of the greenhouse gases methane and carbon dioxide. The climate scientists that comprise the Intergovernmental Panel on Climate Change (IPCC) don't do predictions, or at least they haven't up until now. Instead the scientists of the IPCC have, in the past, made projections of how the future climate could change for a range of 'what-if' emissions scenarios. But for its fifth assessment report, known as AR5 and due out in 2013, the UN panel plans to examine explicit predictions of climate change over the coming decades. In AR5's Working Group I report, which focuses on the physical science of climate change, one chapter will be devoted to assessing the skill of climate predictions for timescales out to about 30 years. These climate forecasts, which should help guide decision-makers on how to plan for and adapt to change, will no doubt receive much attention.

Saving the Mau complex in Kenya

The Mau Forest Complex forms the largest closed canopy forest ecosystem of Kenya. It is as large the forest of Aberdares and Mt Kenya combined. Being the most important water catchment in the Rift Valley and Western Kenya, it is an asset of national importance. The Mau complex helps secure the provision of water supply to urban areas and supports the livelihood of millions of people living in rural areas. It is the home of a minority group of the indigenous forest dwellers, the Ogiek. Many communities are also living in the immediate surroundings of the forest, depending extensively on the forest goods and services. The immediate geospatial requirements include:

- Mapping all legal boundaries of protected forests and 2001 excision
- Identifying the boundaries of settlement
- Schemes, adjudication sections and extent of encroachment.

- Consolidate boundary data of protected forest and 2001 excision.
- Mark survey and demarcate on the ground, through the use of outlines, the boundaries of the remaining protected forests
- Identifying boundaries which require to be further secured and to identify means to secure them.
- Audit land ownership and land rights in the protected forests and the 2001 excision.
- Identifying critical catchment areas in the 2001 forest excision.
- Iidentifying modalities to resettle or relocate people from protected forests
- Identifying modalities to repossess critical catchment areas in the 2001 forest excision

More information from UNEP

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

Conferences, Events

Date	Location	Event
March 2010		
1-3 March 2010	Stellenbosch, South Africa	**Precision Forestry Symposium** Abstract deadline: 30 November 2009.
3-5 March 2010	Nairobi, Kenya	**2nd All-Africa Carbon Forum**
3-5 March 2010	Addis Ababa, Ethiopia	**ILRI Workshop on Adaptation to Climate Change**
6-10 March 2010	Alexandria, Egypt	**International Conference on Coastal Zone Management of River Deltas and Low Land Coastlines**. Abstract deadline: 31 October 2008. Contact: Professor Nabil Ismail, nicoastmarine@gmail.com.
18 March 2010	Johannesburg, South Africa	**Mobile Commerce World Africa -** Current trends and strategies driving the uptake of mobile technology in Africa
22-23 March 2010	Kampala, Uganda	**ICT and Development - Research voices from Africa**
23 -26 March 2010	Fukuoka, Japan	**5th International Workshop on Geographical Analysis, Urban Modeling, Spatial Statistics**
24-26 March 2010	Agadir, Morocco	**2nd International Conference: Integrated Water Resources Management and Challenges of the Sustainable Development (GIRE3D)** Tools and technologies; Impact of climatic changes; Quantitative and qualitative aspects. Abstract: August 31, 2009.
25-26 March 2010	Cape Town, South Africa	**International Conference on Information Management and Evaluation (ICIME 2010)**Organized by University of Cape Town, Department of Information Systems.
26 March 2010	Nairobi, Kenya	**2010 ICT/GIS Security Workshop** Contact: Events@zebotech.co.ke.
25-28 March 2010	Yaounde, Cameroon	**International Conference on ICT for Africa 2010 (ICIA 2010)** Theme: ICT for Development - Contributions of the South. Deadline for full papers: December 1, 2009.
30 March - 1 April 2010	San Jose, CA, USA	**2010 O'Reilly Where 2.0 Conference**
April 2010		
5-9 April 2010	Hammamet, Tunisia	**19th Session of the Near East Forestry Commission** Contact: Moujahed Achouri moujahed.achouri@fao.org.
9-16 April 2010	Sydney, Australia	**International Federation of Surveyors (FIG) 2010**
11-15 April 2010	Cape Town, South Africa	**INORMS 2010 - Organisation for Research Management Societies**
11-16 April 2010	Sydney, Australia	**XXIV FIG International Congress 2010**

12-16 April 2010	Nairobi, Kenya	**African Ministerial Conference on Weather, Climate and Water Information**
14-16 April 2010	Addis Ababa, Ethiopia	**UN-SPIDER Regional Workshop "Building Upon Regional Space-based Solutions for Disaster Management and Emergency Response for Africa"**
14-16 April 2010	Zahedan, Iran	**4th International Congress of Islamic World Geographers (ICIWG2010)** Contact: M_A_Daraei@yahoo.com. Abstract deadline: 22 October 2009.
14-16 April 2010	London, UK	**GISRUK Conference 2010** Theme: Global Challenges
25-29 April 2010	Phoenix, AZ, USA GITA	**2010 Geospatial Infrastructure Solutions Conference (GISC2010)** info@gita.org
May 2010		
3-7 May 2010	Paris, France	**5th Global Conference on Oceans, Coasts, and Islands** For more information contact: Miriam C. Balgos at mbalgos@udel.edu.
10-21 May 2010	Nairobi, Kenya	**4th Meeting of the CBD Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA 14)**
11-14 May 2010	Guimarães, Portugal	**13th AGILE Conference on Geographic Information Science**
17-21 May 2010 ***NEW***	Accra, Ghana	**4th African International Conference on Open Source and the Digital Commons**
19-21 May 2010 ***NEW***	Nairobi, Kenya	**Ecological Society for Eastern Africa (ESEA) Climate Change Conference** Abstract deadline: March 15, 2010.
24-26 May 2010	Rome, Italy	**4th Global Workshop on Digital Soil Mapping** Theme: From Digital Soil Mapping to Digital Soil Assessment: identifying key gaps from fields to continents.
26-28 May 2010	Lusaka, Zambia	**5th International Conference on ICT for Development, Education and Training (eLearning Africa 2010)** Deadline: December 14, 2009.
June 2010		
2 June 2010	Enschede, The Netherlands	**International Society for Photogrammetry and Remote Sensing Symposium on Education & Outreach 2010.**
12-14 June 2010	Nessebar, Bulgaria	**ISDE 2010 Digital Earth Summit** Theme: Digital Earth in the Service of Society: Sharing Information, Building Knowledge. Contact: Temenoujka Bandrova, cartography@abv.bg.
21-22 June 2010	Nottingham, UK	**2nd Open Source GIS UK Conference - OSGIS 2010**
21-24 June 2010	Yogyakarta, Indonesia	**9th GISDECO Conference** Theme: Applying Remote Sensing and GIS in Disaster Management Contact: sliuzas@itc.nl.
27-30 June 2010 ***NEW***	Vancouver, Canada	**GeoWeb 2010**
28 June-2 July 2010	Bergen, Norway	**Living Planet Symposium** Abstract deadline: 1 December 2009.
28 June - 2 July 2010	Edinburgh, Scotland	**18th Commonwealth Forestry Conference** Theme: Restoring the Commonwealth's Forests: Tackling Climate Change. Contact: E-mail: cfcc@in-conference.org.uk.
July 2010		
5-7 July 2010	Vienna, Austria	**ISPRS TC VII Symposium, "100 Years ISPRS - Advancing Remote Sensing Science"**
6-9 July 2010	Salzburg, Austria	**Applied Geoinformatics Forum Symposium and Exhibition Salzburg (GI Forum 2009)- Advancing the GI Dialogue** Deadline for papers and extended abstracts: February 1, 2010.
10-13 July 2010	San Diego, CA, U.S.A.	**ESRI Survey & Engineering GIS Summit**
12-16 July 2010	San Diego, CA, USA	**2010 ESRI International User Conference**

20-23 July 2010	Leicester, U.K.	**Accuracy 2010**
25-30 July 2010	Honolulu, Hawaii, USA	**IEEE International Geoscience & Remote Sensing Symposium "IGARSS 2010"** Contact: publicity@igarss2010.org.
August 2010		
30 August 30 - 3 September 2010 *NEW*	Bilbao, Spain	**International Conference on Electronic Government and the Information Systems Perspective (EGOVIS 2010)** In conjunction with 21st International Conference on Database and Expert, Systems Applications (DEXA 2010, www.dexa.org), Paper submission deadline: March 7, 2010.
September 2010		
6-8 September 2010 *NEW*	Gaborone, Botswana	**3rd IASTED African Conference on Water Resource Management (AfricaWRM 2010)** Theme: Science and Technology Applications for Health and Sustainable Development, Paper deadline: March 15, 2010.
13-15 September 2010	Ghent, Belgium	**8th International Conference on Geostatistics for Environmental Applications (GeoENV 2010)**
14-17 September 2010	Zurich, Switzerland	**GIScience 2010** Full paper deadline: January 29, 2010.
15-17 September 2010	Skopje, Republic of Macedonia	**International Conference on Spatial Data Infrastructures 2010**
22 September – 2 October 2010 *NEW*	Rotterdam, The Netherlands	**International Conference on ˜Deltas in Times of Climate Change** Abstract deadline: 15 March 2010. Contact: o.van.steenis@programmabureauklimaat.nl.
27 September – 1 October 2010 *NEW*	Ouagadougou, Burkina Faso	**9th EUMETSAT User Forum in Africa**
October 2010		
12-14 October 2010 *NEW*	Cape Town, South Africa	**International Conference on Information and Communiction Technology for Development (ICT4D 2010)** Paper deadline: 5 March 2010.
19-22 October 2010	Singapore	**GSDI-12 World Conference**, Theme: Realizing Spatially Enabled Societies. In conjunction with the 16th PCGIAP Annual Meeting. Abstract deadline: 1 April 2010, Book Chapter submission Deadline: 15 March 2010,
25-29 October 2010	Fez, Morocco	**6th World FRIEND Conference (Flow Regimes from International Experimental and Network Data)** Theme: Global Change: Facing Risks and Threats to Water Resources. Contact: friend2010@msem.univ-montp2.fr.
25-29 October 2010	Addis Ababa, Ethiopia	**8th International Conference of the African Association of Remote Sensing of the Environment (AARSE2010)**, Contact: AARSE at dozie@ezigbalike.com.
November 2010		
1-7 November 2010	Hamburg University	**3rd worldwide online climate conference CLIMATE 2010/KLIMA 2010** Abstract deadline: 31 March 2010 Contact: info@klima2010.net.
8-11 November 2010	Sede Boqer Campus, Israel	**3rd International Conference on Drylands, Deserts and Desertification** For more information contact: Dorit Korine at desertification@bgu.ac.il.
December 2010		
2011		
1 January - 31 December 2011	Worldwide	**International Year of Forests 2011**
21-25 February 2011	Nairobi, Kenya	**26th Session of the UNEP Governing Council/Global Ministerial Environment Forum**

10-15 April 2011	Sydney, Australia	**34th International Symposium on Remote Sensing of Environment (ISRSE2011)** Contact: Ian Dowman, idowman@cege.ucl.ac.uk.
18-22 May 2011	Marrakech, Morocco	**FIG Working Week & XXXIV General Assembly** Contact: FIG Office, fig@fig.net.
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.
8-12 July 2012	San Diego, California USA	**ESRI User Conference**
8-12 July 2013	San Diego, California USA	**ESRI International User Conference**

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Gordon Ojwang', Editor, SDI-Africa AT gsdi.org or sdiafrica@rcmrd.org or gojwang@rcmrd.org

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