DEVELOPMENT BANK OF LATIN AMERICA

GeoSUR Newsletter

News of Interest to the Geospatial Community in the Americas
(Original in Spanish)

September 2015 Volume 2, Number 9

"GeoSUR develops geographic services on a free-access web platform"

Inside this Issue:

The Editor's Note

In this newsletter we highlight developments and projections of Terra-i: An early warning system to monitor habitat changes in Latin America. In the permanent columns, the renewed initiative of GeoUSR to provide technical support to organizations in documenting metadata is discussed, as well as the strategy of PAIGH to contribute to the development of geospatial information through the creation of the "Integrated Map of Latin America." An invitation to participate in the general census of geography in the Americas 2015 also stands out.

GeoSUR newsletter seeks to disseminate GeoSUR Program's achievements and characteristics as well as events, projects and best practices for the application of GI into sustainable development and decision making in the region, as part of the Geospatial Data Infrastructure of the Americas. The Portuguese translation is performed by **Eduardo Freitas**, Manager of the GEOeduc Institute of Brazil. Please send your contributions and suggestions to: **Nancy Aguirre**, Editor of GeoSUR Newsletter, at: cnaguirre@ipgh.org.

Louis Reymondin (in the middle) is an expert in software development to combine big and georeferenced data. He did his undergraduate in software development at University of Applied Sciences Western Switzerland and did his PhD in Geography at King's College London. Louis' PhD research focused on the development and implementation of Terra-i. He has about 10 years of experience in coordinating the Terra-i project and researches involving the use of artificial intelligence and data mining to better understand the dynamics between human activities and the environment.

Louis Reymondin, developer and coordinator of Terra-i, speaks on the system's projection for the tropics

Terra-i: an early warning system to monitor changes in habitat throughout Latin America, detects natural vegetation loss in near real-time in different ecosystems, thus new data are continuously being updated every 16 days (http://www.terra-i.org/terra-i/data/data-statistics.html). You are the Terra-i's developer and technical coordinator, with plans to expand the system in 2015 to cover the pan-tropics. Please help us to have more insight on this system.

How did Terra-i started and which are its main accomplishments?

Terra-i started in 2006. Back then, only one country located in the tropics monitored deforestation: Brazil. Indeed, there was no consistent estimation of deforestation trends in the world (figures based on statistics provided by governments). Furthermore, the methods to detect deforestation only worked for dense humid forests, leaving unmonitored many important ecosystems.

At first, Terra-i was a collaboration between the International Center for Tropical Agriculture (CIAT), the Western-Switzerland University of applied Science (HEIG-VD) and the Nature Conservancy (TNC). Later on, the King's College London (KCL) joined the team and funds were provided by the Forest Trees and Agroforestry (FTA) CGIAR Program and the World Resource Institute (WRI).

From the beginning, Terra-i objectives are to create a system that can:

- Detect deforestation with a resolution detailed enough to be used at global and local scale
- Be updated frequently
- Work with many ecosystems
- Be applied at large scale (continental, now pan tropical)
- Be implemented with few financial and hardware resources

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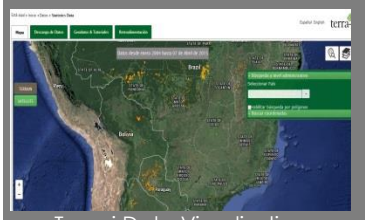

Terra-i Data Visualization

Louis Reymondin… *continues*

Since the web-platform (www.terra-i.org) was officially launched in June 2012 during Rio+20, Terra-i has had great outcomes.

1. Terra-i is now used by the Peruvian Ministry of Environment (MINAM) to quickly identify new areas of rapid vegetation loss, due to mining activities for instance.
2. Terra-i data are now one of the datasets displayed on Global Forest Watch providing this platform with frequently updated data about Latin America and soon the whole tropics. We are also working with other platforms such as InfoAmazonia, CartoChaco and GeoSUR of course.
3. Terra-i portal count with more than 2000 users from more than 400 institutions. These users integrated Terra-i data in many reports, scientific publication, academic works and newspaper. For instance, the most outstanding publication based on Terra-i data made by our users is a paper published in Science January 2014: Drug Policy as Conservation Policy: Narco-Deforestation. In this paper, a team led by Kendra McSweeney used Terra-i deforestation data to show the relationship between drug trafficking and deforestation in eastern Honduras. More recently, Mongabay displayed Terra-i data to show the impact of mining in the Peruvian Amazon.

What is relevant on the historical vegetation loss in Latin America and their key application?

To have access to a global dataset about vegetation loss in Latin America was crucial to understand that deforestation is not only about the Brazilian Amazon.

Indeed, deforestation rates in the Gran Chaco, the second biggest forest in Latin America, are equivalent, if not higher, than what is observed in the Amazon.

Furthermore, although the deforestation rates are decreasing in the Brazilian Amazon, they tend to increase in others countries.

This kind of analysis and conclusions are only possible with a global dataset.

Which are main challenges of this near real time system?

There is first a technical challenge. A combination of massive volumes of data, billions of values must be analysed every month, and large amounts of noise in the time-series make this endeavour a challenge.

We overcame this challenge by developing data storage and processing software that automates the process from downloading the satellite images to publishing the results.

The second challenge is to have an impact on the ground.

To inform the community about vegetation loss is a first step but to actually mitigate deforestation rates is far more difficult.

I believe that to make our data and software open and free of charge is an efficient way to get our data used and thus increase the awareness about deforestation issues.

Collaboration with government, such as what we are doing in Peru, is also a key component to reach an impact on the ground.

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Louis Reymondin… *continues*

Terra-i applied to examining ecosystem service impacts of deforestation in Colombia

"The importance of this enhanced dataset is to identify rapidly natural vegetation changes in areas where land use change is happening at accelerated rates…"

"We are therefore keen to collaborate with other team to see how our data could be integrated with other dataset available on GeoSUR to understand better vegetation loss in Latin America and the tropics."

What are the plans to expand Terra-i to cover the entire tropics, and why is this significant?

We are working intensively on making Terra-i data available for the whole tropics.

Indeed, we already finished to apply the system in Africa and Asia. We will very soon release a web visualization of these data.

Nonetheless, we will go through a calibration and field validation process before we release these data for download.

The importance of this enhanced dataset is to identify rapidly natural vegetation changes in areas where land use change is happening at accelerated rates, it is important to release data up to date of regions such as Borneo where the establishment and expansion of industrial crops have strong impacts on land use conversion.

Indeed, as in Latin America, natural vegetation conversion is contributing to widespread loss of biodiversity and other critical ecosystem services, yet in many parts of the tropics the scale and pattern of loss goes unmonitored.

Decision makers at multiple scales (local to national to regional) are desperate for timely information on vegetation loss, requiring it to be as accurate and recent as possible to prioritize interventions and act upon new patterns of change in a timely manner.

With the data so far accumulated by Terra-i, what can you tell us about the connection between vegetation loss in Latin America and the incidence on climate change?

Although the link between climate change and vegetation loss is a very interesting topic we haven't studied it yet.

It is known that locally, vegetation loss has a great impact on ecosystem services and on water cycle.

For instance, it has been shown that the deforested areas in the Brazilian Amazon are much dryer, and more propitious to severe droughts, than when covered by forest.

Terra-i is now a key addition to the Global Forest Watch (GFW) platform. Which potential associations do you foresee between Terra-i and GeoSUR Program?

GeoSUR is a great platform where many different datasets are available.

Vegetation loss data alone are interesting but to understand the underlying deforestation processes and drivers we must combine those data with other key datasets.

We are therefore keen to collaborate with other team to see how our data could be integrated with other dataset available on GeoSUR to understand better vegetation loss in Latin America and the tropics.

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What is said from the Coordination of GeoSUR?

By Santiago Borrero

On the metadata issue, how are we in GeoSUR?

Metadata and associated catalogs are one of the pillars forming the core architecture of GeoSUR. The same metadata and catalogs are part of spatial data infrastructure in the region. Any spatial product is not concluded if metadata is not available to adequately describe, discover and get it. Thus, their development is, or should be part of, the essential processes for production of spatial databases. The higher the number of attributes included in the metadata the better use of the database to which it belongs; and the better the quality and compliance with international standards the best its applicability and interoperability.

Therefore we talk about a key element to the development of SDI in the Americas. Occasional reiteration of the above is convenient.

Until 2013, perhaps, metadata and catalogs available on the Program's geoportal grew to become the main source of information on Latin America and the Caribbean, and GeoSUR provided opportunities for important training in this ground with participation of technicians from multiple countries, disciplines and sectors.

We now prepare for a new effort in collaboration with the PAIGH and the technical support of the IGN Geographic Information National Center (CNIG) of Spain.

The central idea is to support participating organizations on their information documentation processes, with highest possible quality and in strict compliance with international standards beginning with the Latin American Metadata Profile (LAMP), commonly used in international projects promoted by GeoSUR and PAIGH. We are currently engaged with this endeavor in GeoSUR.

How is your institution regarding metadata?

Santiago Borrero, GeoSUR Program Coordinator

"We now prepare for a new effort in collaboration with the PAIGH and the technical support of the IGN Geographic Information National Center (CNIG) of Spain. The central idea is to support participating organizations on their information documentation processes, with highest possible quality and in strict compliance with international standards..."

From the PAIGH's Secretary General

By Rodrigo Barriga

PAIGH, which is also an integral part of GeoSUR Program, participates also with SIRGAS and UNGGIM: Americas in the "Joint Action Plan on Geospatial Data Infrastructure Development in the Americas."

In this regard, there are various activities in which we are contributing. On this occasion I would like to highlight the designed strategy to contribute to geospatial information development for creating an integrated continental map.

The concept to generating an integrated mapping began with the creation of the "Global Map of the Americas Working Group" in 2005, as a result of consultations of the PAIGH's Cartography Commission held that year in Caracas, Venezuela, which was convened for securing and promoting the development of a continental mapping based on the "Global Map" international initiative rules.

This objective was partially met through the project "Global Map Data Integration in South America", which was finalized in late 2012, thus motivating the implementation of participatory mapping activities.

Participation of Secretary General of the PAIGH in the 27th International Cartographic Conference, Rio de Janeiro, Brazil, August 23-28, 2015

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From the PAIGH's Secretary General… *continues*

Subsequently, based on formulation by the United States National Section through the Technical Assistance Program of the PAIGH, the "Integrated Map of Central America" initiative begun and was undertaken between 2009 and 2014 through a series of participatory workshops conducted mainly in El Salvador, allowing the production of a unified digital map database comprising Belize, Costa Rica, El Salvador, Guatemala, Honduras, Southern Mexico, Nicaragua and Panama.

Results are published on the GeoSUR website and the respective metadata are documented based on the Latin American Metadata Profile (LAMP) based on the ISO 19115 standard.

Moreover, starting this year, the "Integrated Northern Andean Map - MIAN" project is in full development with participation of Bolivia, Colombia, Ecuador, Panama, and Peru.

In this case, Panama allows bonding the Central American map initiative. It is expected that this stage concludes during 2016 to continuing with subsequent phases of cartographic continental integration.

For the above, cooperation of the United States Geological Survey (USGS), and the National Geographic Information Center of Spain (CNIG); as well as participation of geographic institutes of all countries involved, and the important sponsorship of CAF (Development Bank of Latin America) and US DOI ITAP, were secured.

Dialogues with other South American countries to move forward an initiative to achieving the 'Integrated Latin America Map' have recently started.

This is intended to establishing a continental geospatial information platform that supports multiple applications and services to help increasing geographic knowledge and supporting decision-making for the benefit of the population's life quality improvement.

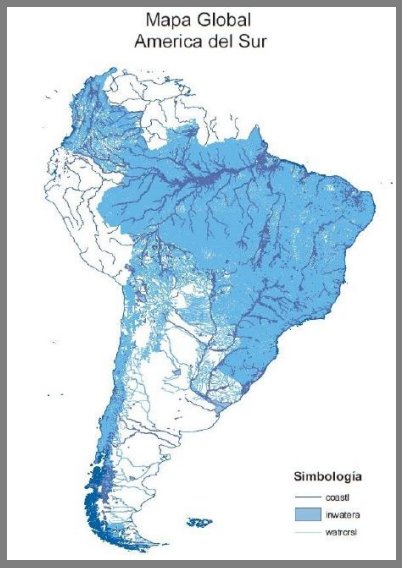
Ongoing institutional strengthening processes are crucial to enable geospatial-services progress through implementation of Spatial Data Infrastructure, in particular, by making different services and applications available on the Internet.

Outcomes of this initiative were recently presented at the 27th International Cartographic Conference held in Rio de Janeiro, Brazil, on August 23-28 this year.

In a plenary session about the Pan American Agenda were highlighted among other issues -particularly in regard to mapping and geospatial topics-, the Joint Action Plan to Accelerate the Development of the Americas' SDI, the GeoSUR Program, the PAIGH's technical assistance program and publications, the projects carried out in collaboration with other agencies such as the Environment Agency of Abu Dhabi, and the cooperation with IGN-CNIG of Spain.

In addition, interesting meetings were held in the context of this conference with members of the International Cartographic Association, the Brazilian Institute of Geography and Statistics (IBGE), and between the President of PAIGH's Cartography Commission and the Brazilian Cooperation Agency (ABC) leading to good mutual cooperation prospects.

Participation of Secretary General of the PAIGH in the "4th Workshop on Data Integration and Technical-Capabilities Development in Central America" held in El Salvador (September/October 2014)



Global Map of South America

"Dialogues with other South American countries to move forward an initiative to achieving the 'Integrated Latin America Map' have recently started."

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Novelties in GeoSUR Portal

Geodatabase of IDEAL Infrastructure Projects

New information on infrastructure projects in the transportation, electric power, gas transportation telecommunications and integral management sectors (IDEAL) have been implemented in the GeoSUR regional map viewer. The map layer "IDEAL Infrastructure" alike that of "IIRSA Infrastructure" contains sub-topics represented as point projects, linear projects, and IDEAL polygons.

IDEAl Infrastructure layers in the GeoSUR map viewer

How to discover and visualize data in GeoSUR?

This time we include an example on land cover maps of the Terra-i project, which have been added to the GeoSUR portal.

By Miguel Blanco, Information Technology Consultant for GeoSUR

This example shows the sequence to access data from the **Regional Map Viewer** as a map service.

To do this, you may perform the following sequence:

1. From the GeoSUR Portal main menu, click on "Regional Map Viewer."
2. Click the "Map Layers" button when the options are visible.
3. Click on the "Check Box" corresponding to "Terra-i Vegetation Change" on the topics' list (Figure 1).
4. When this layer is selected you can see vegetation changes that occurred from 2004 through 2015. Each year has a different color on the map as well as in the legend (Figure 2).
5. To better visualize changes you may use the zoom-in button (1) and make a box with the mouse (2) (Figure 3).
6. You may progressively zoom in using the zoom-in button and making a more detailed box with the mouse.
7. With greater zooming you may see areas with more detailed vegetation change; each color represents an annual return as shown when you click on the arrow in the topics' list (Figure 4).

Figure 1

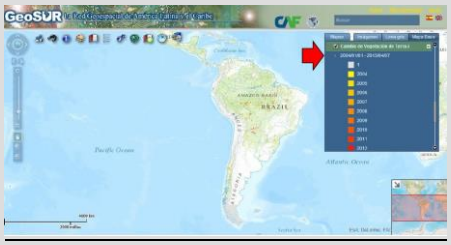

Figure 2

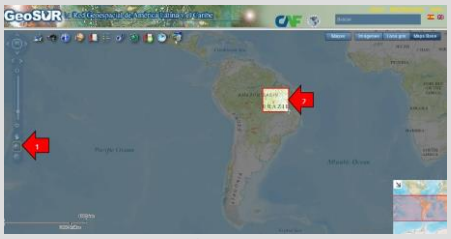

Figure 3

Figure 4

GeoSUR Program: Basic Figures

Years in Operation	8
Participating Institutions	110
Benefitted Countries	26
GeoSUR Network Specialists	550
Officials Trained (6 Regional Workshops)	314
CAF Officials Trained	130
Virtual Workshops Offered	41
Digital Maps Available	20,000
Metadata Available	14,000
Map Services (WMS)	310
WFS Services	25

Webpage: http://www.geosur.info

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Other events in the region

CAF: IDEAL 2014 "ENERGY TRILEMMA"

During presentation of the publication "IDEAL 2014: Infrastructure in Latin American development", it was widely commented the changes taken place in the regional energy sector as well as the investment in gas transportation leading to its consolidation as an energy matrix in the region. The sector faces major strategic dilemmas, which may be summarized in the term "energy trilemma" coined by the World Energy Council (WEC). According to Camacho Garcia, author of the "energy trilemma", this refers to "complications faced by governments to ensure competitive energy supply, in turn providing universal access to energy and promoting environmental protection." [Source: CAF]

"… the "energy trilemma"…refers to "complications faced by governments to ensure competitive energy supply, in turn providing universal access to energy and promoting environmental protection"

GEOGRAPHY IN LATIN AMERICA AND THE CARIBBEAN: COLLABORATIVE DATA COLLECTION PROJECT

Thank you for your consideration in participating in this special effort that is currently underway to collect information about geography, geography organizations, and geographers across the American continent. Our objective is to conduct a type of general geography census in the Americas with the purpose of facilitating communication between geographers across the hemisphere. This information from 2015 will be utilized to study the trajectory of the discipline, compared with results from a 2005 study and a collaborative survey from 2010.

[Source: Geography Commission, PAIGH]

8th Caribbean GIS Conference

PRESENTATION OPPORTUNITY, URISA 8th CARIBBEAN GIS CONFERENCE

Abstract submissions are now being accepted for URISA's 2016 Caribbean GIS Conference. Submissions are due by **December 1**, 2015. The conference will be hosted in Barbados, September 5-8, 2016. The online submission form and details are online: http://www.urisa.org/education-events/urisa-s-caribbean-gis-conference/

[Source: Wendy Nelson, Executive Director – URISA]

PUBLICATIONS: Several low-lying atoll island states are at risk of losing their entire territory due to climate change-induced sea level rise. In the book "*Disappearing Island States in International Law*", Jenny Grote Stoutenburg examines the most relevant and pressing international legal questions facing threatened island states. Excerpts of the book are available here.

[Source: Jenny Grote Stoutenburg, International Court of Justice]