Art & Maps –
Detail on page......7
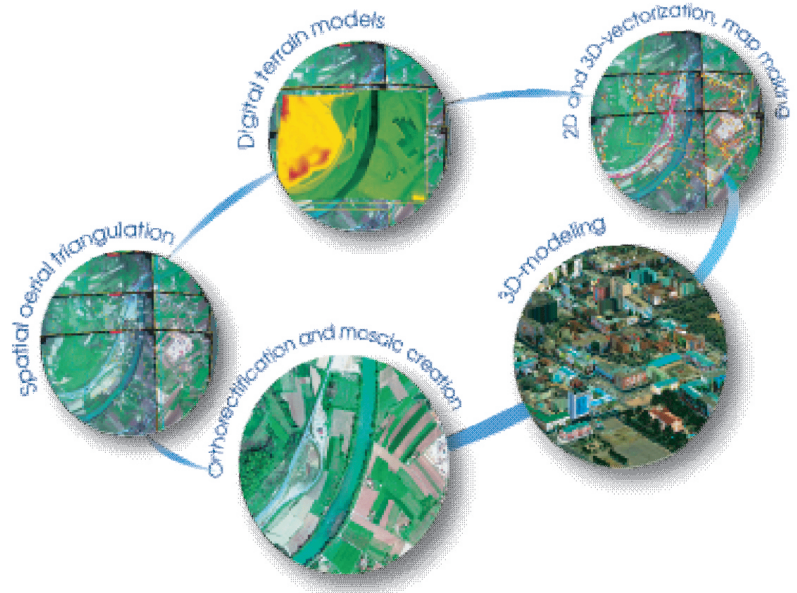
shoreline of the Skrin pond -
Details on page........ 13

Overview

RACURS, Russia

The PHOTOMOD software family comprises a wide range of products for the remote sensing data photogrammetric processing. This state-of-the-art software allows the extraction of geometrically accurate spatial information from almost all commercially available types of imagery, whether obtained by film or digital cameras, UAS, high resolution satellite scanners.

PHOTOMOD's flexible modular architecture and powerful import/export tools permit a variety of configurations: **Complete Digital Photogrammetric Workstation** (standalone configuration), high productivity distributed network environment for accomplishing large projects, complementary workplaces that can be used along with third-party systems to increase the overall productivity during the most time-consuming and labor-intensive operations like feature extraction and DTM creation.

Today PHOTOMOD is the most popular digital photogrammetric software in Russia and is also used in 70 countries all over the world. PHOTOMOD is the only digital photogrammetric system with the Russian Federation Ministry of Defense certificate and also the main digital photogrammetric software for the Federal Space agency of the Russian Federation (ROSCOSMOS) and Russian Federal Service for State Registration, Cadastre and Cartography (ROSREESTR)

General questions: info@racurs.ru
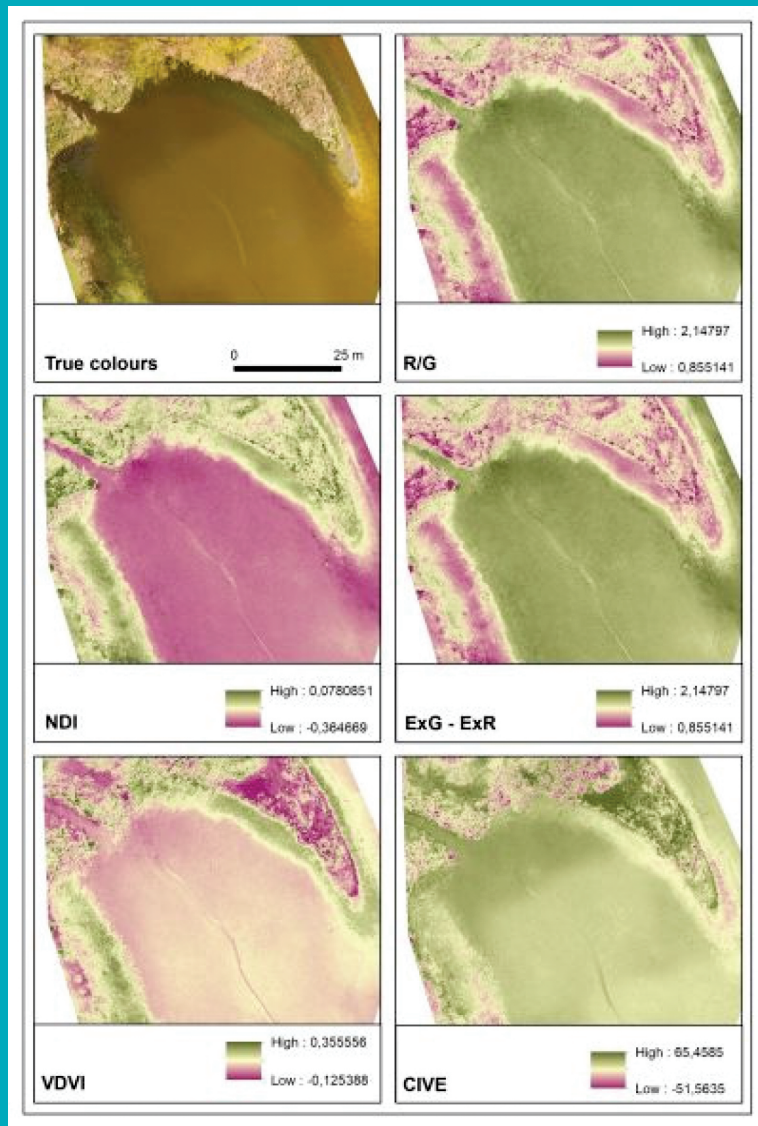
Area of interest and calculated vegetation indices.
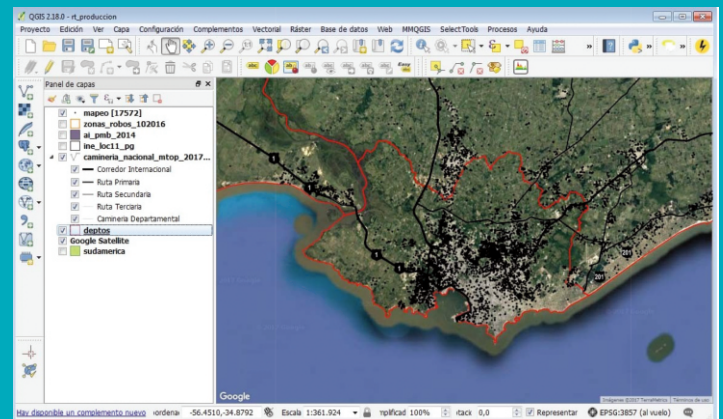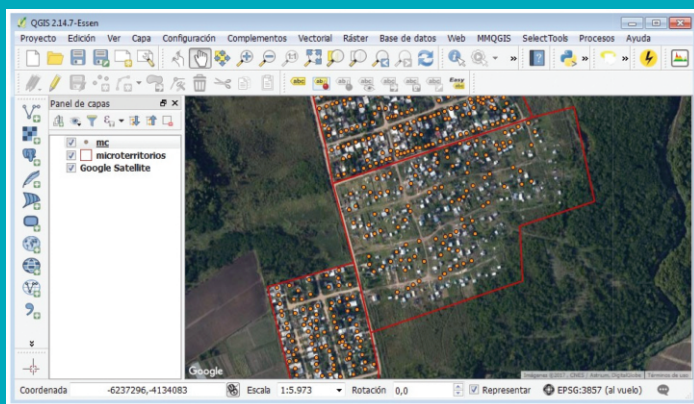
Use of QGIS at the Ministry of Social Development of Uruguay (MIDES)
https://www.qgis.org/en/site/about/case_studies/uruguay_mides.html

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HONOURS & AWARDS

Geospatial World Excellence Award 2018
Best Professionally Managed Company 2014
Geospatial Company of the year 2013
National award for Excellence in Engineering Consultancy 2012
Project of National Excellence - Urban Infrastructure 2011
Export Excellence Award 2008 & 2010
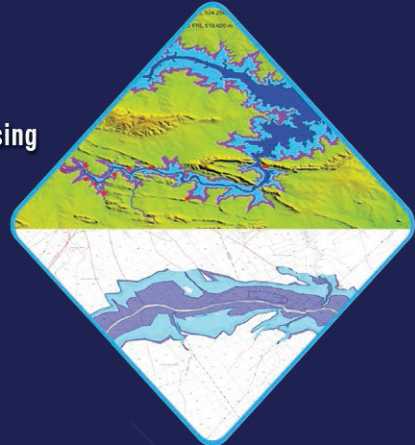
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MAPS TODAY

Monthly Publication May2019

CONTENT

MAPS TODAY

Monthly Publication

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5 Years	Rs. 4700/-	Rs. 4200/-

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Editorial

Case studies of successful use of Open Source GIS softwares are high light of this issue.

Census data enhances GIS data bases. An example of use of census data of USA is included in this issue.

The following articles are informative and interesting….

- Unsuitability of high resolution stereo satellite imagery for canopy height measurement
- Low cost application of UAV for shore line study

Many cities are implementing Swachh Bharat national programme. GIS/Maps help in planning and implementing, Hyderabad example is covered in this issue.

To highlight that map is also a product of art, some extracts from an article on Dance, based on *'integrating mapping projections with dance items'*, is included in this issue.

Under '*Mohan's Musings',* Direct Geo Referencing, a topic of importance is covered.

A 'Feed Back' column is included in this issue….Readers can now send their views & suggestions to mapstodaygis@gmail.com

During exit polls and also while results of *2019 Elections '*in India were being telecast, Maps and data were predominant on the screens and other media. Better days ahead for Maps & GIS...

A new page on,*'Students Forum'* covers related and interesting news/activities. Schools and colleges can send mails to : *mapstodaygis@gmail.com* or Dr. Raghavaswamy V *<raghavaswamy53@gmail.com>*

Mohan's

Direct Georeferencing

Georeferencing is the process of attaching geographic coordinates to a photograph / an image acquired by aerial or satellite imaging. In Remote Sensing world, it is conventionally done by establishing a math model between image and Ground Control Points (GCPs). While the process is simple, it calls for collecting many GCPs and the models are not robust enough to handle complex terrains. Hence, Universal Sensor Models are now being employed to overcome these limitations.

In Photogrammetry, this is done somewhat differently. The photographs are stitched by common points lying in overlapping areas for relative stability and then augmenting by well-distributed GCPs to determine the camera position and attitude (Exterior Orientation). This is popularly known as Aerial Triangulation. This process is critical, highly procedural, time-taking and often less-appreciated.

What is direct georeferencing?

The research efforts to reduce the demand on GCPs resulted in a novel and revolutionary technique called Direct Georeferencing (DG). The camera on-board is integrated with devices for determination of position and orientation angles. GPS, a popular technique by now, gets the position. An Inertial Measurement Unit, commonly known as an *IMU*, is an electronic device that measures the orientation, velocity, besides gravitational forces through the use of accelerometers and gyroscopes.

GPS/IMU technology ushered in a new paradigm in digital photogrammetry. These 6 EO parameters (XYZ from GPS and omega-phi-kappa of the sensor) are critically needed in photogrammetry. If you are using open source tools, use *gdalinfo* to print the ground coverage of a DG photograph.

The method of recording EO directly from GPS/IMU is called Direct Georeferencing. Based on DG ability, theoretically, it does not require GCPs and it can obviate the complex AT process. In other words, the role of Control Points is limited to performing QC checks. This means, getting EOs is faster, cheaper and hence workflow becomes simple. Without AT, you can directly produce ortho photos. It is like half of the job is already done!

How reliable is DG?

Are we so lucky every time that we don't need GCPs when DG is adopted? Well, it depends. There are various makes of GPS/IMU that come with associated accuracies. (Leica IPAS20, IGI AEROcontrol, Applanix POS/AV are some of the popular GPS/IMU units used for direct georeferencing.) And of course, it also matters if the EOs are refined through post-processing.

But yes, photogrammetrists reported DG-derived EOs are comparable with conventional AT results. That is quite a promising observation. As a mandatory QC check, it is a good practice to overlay the GCPs on the stereo models and check for the compliance. And also watch for the menacing Y-parallax, as it disturbs the stereo-compilation process if present. It is difficult for the operator to determine the elevation of the feature (such as building height) from parallax-affected stereo-models. To overcome the residual Y-parallax, AT is done using GCPs, albeit in much lesser number.

Finally, how is geocoding different from georeferencing?

The process of associating an address or a placename with coordinates on the map is called *Geocoding*. *Georeferencing* is the process of assigning a coordinate system and coordinates to an image or a vector coverage by translating, transforming, and warping it into a position relative to the reference spatial data, such as survey locations, or road intersections.

SHSHSHSH-A silent Revolution in Sanitation

Saaf Hyderabad, Shandaar Hyderabad

Maj. Dr. Shiva Kiran, Sukuki Exnora, 9849047827

SHSHSHSH……..A silent revolution is sweeping the lanes and by lanes of the historic city of Hyderabad. Ranked 35th in the Swachh Survekshan 2018, the GHMC Commissioner wanted to go beyond rankings and after many a brainstorming sessions the outcome was SH-SH "*Saaf Hyderabad- Shandaar Hyderabad".*

625 Sqkms, 150 wards, 30 circles, 6 zones, 9000km of road length, 1 Cr Population, 22 lakh households, 5000 tonnes of waste per day, 20,000 sanitation workers. The figures were indeed humongous. But the task had to be taken up

HYDERABAD WARD MAP

https://www.google.com/search?q= ward+map+of+Hyderabad+city)
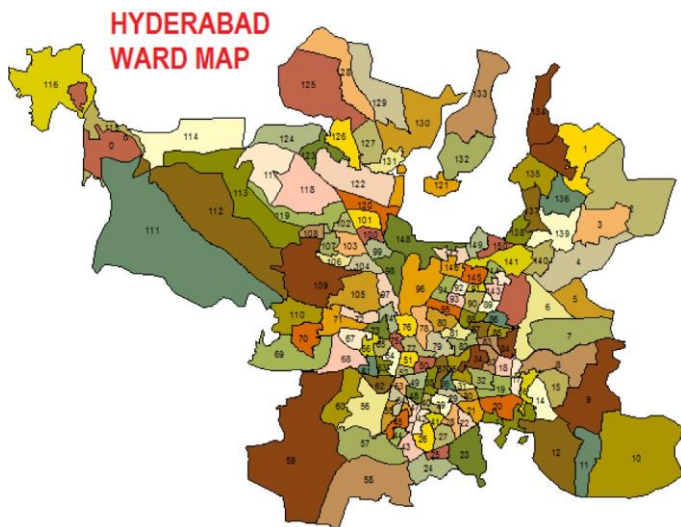
SH-SH, began as a soft launch. The objective was loud and clear. The mind-set of the people of Hyderabad, the behavioural attitude of the citizens had to undergo a paradigm shift for the better, to understand their stake in the city and to take ownership of Hyderabad. Collaborative and sustainable sanitation which could usher in perceptible change at the grass roots was what the city needed and that's what it got through SH-SH.

Apart the regular GHMC staff, 30 NGOs were selected –one for each circle, teams from Indore- which enabled Indore emerge the Cleanest City in the Country, were brought in. 150 ward level teams are constituted, comprising of LSO- Location Specific Officer, ES- Environment Specialist, SFA-Sanitary Field Assistant, Social Activist –NGO, CRP- Community Resource Person, SAT-Swachh Auto Trolley- Driver. Deputy Commissioner of Circles, Assistant Medical Officers of Health, Zonal Commissioners, are given the monitoring role. The Commissioner himself is reviewing each zone, once a week. A 19- parameter evaluation matrix has been designed with the personal involvement of the Commissioner to evaluate SH-SH.

Contiguous and mixed socio economic clusters of 2500 households are identified for intensive monitoring. Over the next three months it is expected that issues of door to door collection, segregation of waste at source, removal of bins, elimination of Garbage Vulnerable Points, Open points, counsellng of households, Meetings with diverse stake holders including RWAs, Religious leaders, fitness enthusiasts, sportspersons are all scheduled.

Reporting mechanisms have been put in place at different levels and social media platforms are being extensively used to get a realistic and ground level feel.

SHSHSHSHSH- A silent revolution, is indeed quite audible !!

Welcome to Saaf Hyderabad ; Shandaar Hyderabad

(An appropriate activity to use GIS - Editor)

Maps and Art

Cartography is defined as *the art and science of graphical representation of a geographical area, usually on a flat surface such as a map or chart. It may involve the superimposition of political, cultural, or other non-geographical divisions onto the representation of a geographical area.*

(Some excerpts from the article quoted below prove the above concept – Editor)

A surreal dance act?

DECCAN CHRONICLE. - JAYWANT NAIDU

PublishedMay 25, 2019,

Led by the Bharatanatyam and Kuchipudi dancer Ananda Shankar Jayant and her disciples, the production started with the entry of the 'bull, tiger, peacock, and mooshika', which comprise a part of the Lord Shiva's family. As it progressed, all elements of nature namely the earth, water, air, fire, and space formed part of the dance, with the majestic mountains of Himachal Pradesh projected in the background.

xxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Author and Performer of music on Hawaiian Guitar and creator of 'Jaywant Guitar' from Hyderabad,India

> **………we considered the possibility of integrating mapping projections.**

Nataraja', with motion graphics created by city graphic designer Gunjan Ashtaputre in its backdrop. "My wife Aditi Rao has been training under Ananda Shankar for 14 years now. During our discussions, we considered the possibility of integrating mapping projections… I think he wanted to convey showing pictures in back drop to sync with dance …..with the production. Ananda liked the idea.
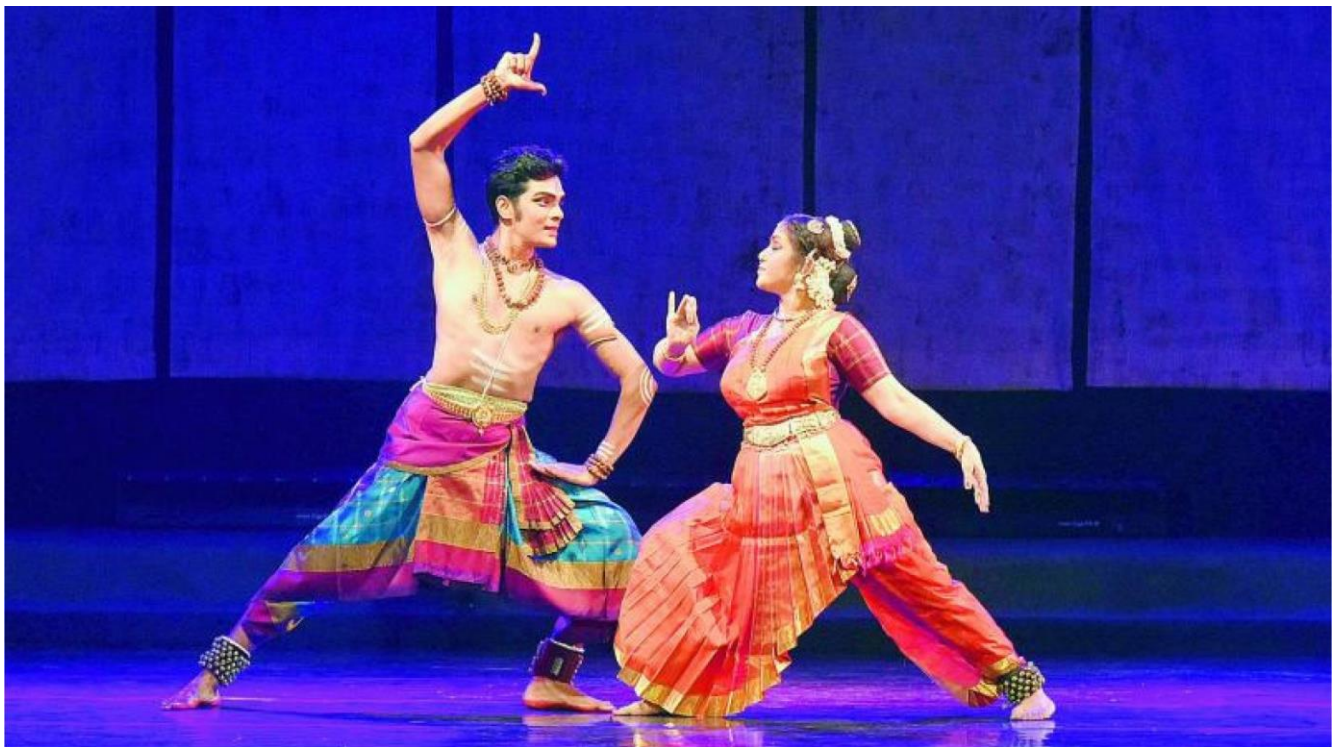
Open Source GIS Applications

QGIS geoprocessing model to simplify first level seismic microzonation analysis

The Institute of Environmental Geology and Geoengineering (IGAG) of the National Research Council (CNR) is located in Rome, in the Area of Research "Roma 1". It was founded in 2002 by regrouping five former research Institutes and Centers that had been active for more than 40 years in their field of expertise. IGAG covers a wide range of scientific topics in the field of Earth sciences, mainly focusing towards the study of:

- Environmental geochemistry and remediation of contaminated soils and waters;
- Mineral deposits and mineral processing, including the treatment of waste waters;
- Geoengineering and safety of rock excavations;
- Recent geological evolution;
- Mitigation of natural hazards;
- Geoarchaeology and archaeometry.
- Marine Geology
- Geomatics, GIS analysis and development.

The level 1 seismic microzonation study of the Pietramontecorvino area (Apulia, Southern Italy, located along the Central-Southern Apennine chain) is part of a project, in collaboration with the Basin Authority of Apulia (Puglia AdB) and the Department of Geology and Geophysics (DGG) of the University of Bari, aimed at the seismic microzonation of 63 Municipalities of the area of Foggia. The activity was promoted by the Italian Department of Civil Protection (DPC) and financed by the Interministerial Committee for Economic Planning (CIPE n. 20/2004).

QGIS geoprocessing tool for first level seismic microzonation studies

The seismic microzonation evaluate the seismic hazard at the local scale proposing to identify areas of territory characterized by homogeneous seismic behavior. The first level of seismic microzoning has the purpose of defining the lithological properties and geometry of geological units that characterize these portions of territory (microzones).

The observation of the damage caused by an earthquake often shows variations at local scale caused not only by geological structures but also by different quality and type of building structures, resulting in different seismic hazards.

The seismic microzonation evaluates the local seismic hazard, through the identification of areas of territory characterized by homogeneous seismic behavior.

The Guidelines and Criteria for Seismic microzoning 2008 (http://www.protezionecivile.gov.it/jcms/it/view_pub.wp?contentId=PUB1137) provide standards for seismic microzoning studies on Italian territory; they distinguish three levels of increasing depth (from 1 to 3).

The first level seismic microzonation consists in the creation of three thematic maps:

1. Survey map containing the surveys for seismic microzonation studies;

2. Geo-lithological map, obtained from detailed scale geological and geomorphological maps integrating existing lithological, stratigraphic and geotechnical data related to surveys;

3. Level 1 seismic microzonation map (the principal product of level 1 microzonation), identifying the microzones into three categories of local hazards:

   - Stable zones;
   - Stable zones prone to ground amplification;
   - Unstable zones.

The scope of this work is to contribute to the creation of a methodology for processing topographical, geological, geophysical and geo-technical data aimed at level 1 seismic microzonation map drafting, through the use of open source tools.

The Graphical Modeler tool integrated in the latest version of QGIS (2.8.1 as of writing) has been used for the creation of a simple geoprocessing model. This tool is useful to automate one of the analysis commonly performed for the creation of level 1 seismic microzonation maps, in particular to identify unstable zones as polygon features.

The model makes use of different open source software and libraries (GRASS, GDAL, QGIS),

demonstrating the usefulness of QGIS as a simplified and unified interface for heterogeneous GFOSS (Geospatial Free and Open Source Software) tools.

The model takes as input

- A shapefile of contour lines containing a field with elevation values;
- The name of the field containing elevation values;
- The desired raster resolution in meters for DEM and Slope (default 10);
- A polygon shapefile from which features intersecting areas with slope greater than 15 degrees will be extracted;
- The name of the resulting polygon layer.

When launched, the model performs the following operations:

- The GRASS tool v.to.rast.attribute converts contour elevation lines to raster, taking the contour shapefile, the name of the z field and the raster resolution as input;
- The GRASS tool r.surf.contour generates the elevation model taking as input the rasterized temporary output from previous step and the raster resolution;
- The GDAL tool "gdaldem" generates the slope expressed as degrees from the elevation model;
- The GRASS tool r.mapcalculator is used to generate a 1 bit raster identifying areas with slope greater than 15 degrees (this value is coded in the microzonation guidelines, and so it is fixed), using the expression:

if(A>15,1,null())

where A is the temporary slope raster generated by gdaldem;

- The GDAL tool "gdal_polygonize" converts the 1 bit raster to polygons;
- The QGIS tool "Intersection" is used to overlay the areas with slope greater than 15 degrees with the chosen intersection layer.

The result is a polygon layer with areas prone to instability due to a slope value greater than 15 degrees, automatically extracted from a thematic map such as a landslides polygon layer (Fig. 3) or a lithological map.
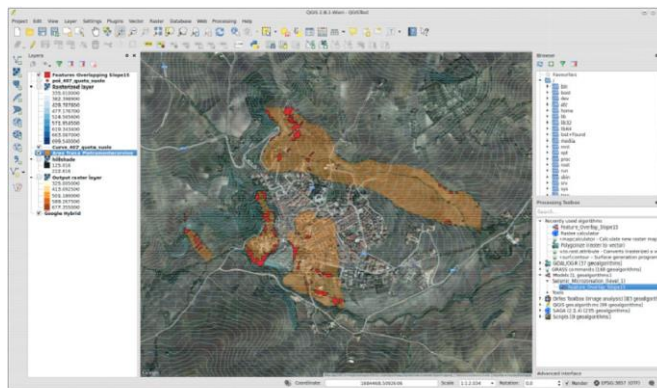
(Fig. 3) The model output (in red) shows highly unstable areas extracted from a landslides layer (orange).

Conclusions

This work clearly demonstrates that open source GIS tools like QGIS, GRASS, GDAL/OGR, can successfully be used for spatial analysis and data processing aimed at first level seismic microzonation studies. In this example work, QGIS has been used as a simplified and unified interface for different high quality GFOSS tools; the Graphical Modeler allows to intuitively construct geoprocessing models that can be easily shared as portable and cross-platform tools that doesn't require expensive software licenses. The tool leverages the QGIS modeling capabilities to graphically chain different algorithms, defining input and output parameters and leaving to the software the task of managing intermediate data output. The use of GRASS algorithms does not require defining and using a GRASS database and mapset, greatly simplifying the design of the model. Future developments include the creation of a package of tools and models, based on open source software, that can be used to simplify and speed up spatial analysis tasks necessary for seismic microzonation studies.

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Giuseppe Cosentino

microzonation and environmental characterization of the lands in contaminated sites. Areas of interest: geological and environmental hazards, cartography, structural geology, explorative drillings.

Francesco Pennica provides GIS and WebGIS software development and data management: GeoServer, MapServer, ArcGIS Server, GeoNetwork OGC standard based webgis services, Java, HTML, CSS, Javascript, Python, PHP languages

Francesco Pennica

and frameworks, WebGIS front-end development with OpenLayers, ExtJS, GeoExt, JQuery, GWT, Ext-GWT, Google Maps API SQL, geodatabase management, PostgreSQL, PostGIS, GIS desktop software based analysis and scripting (ArcGIS, GRASS, GFOSS tools), Software configuration and management in Linux and Windows based servers and desktops.

QGIS and GRASS for modelling ecological corridors for wolves in North Portugal

The Iberian wolf is a sub-species of the gray wolf that exists only in north of Portugal and Spain, with small isolated groups in the south of Douro river. During the last century, it suffered a high regression, being a "vulnerable" species in Spain and "endangered" in Portugal. Nowadays, there are only around 300 wolves in Portugal, due to the high persecution, destruction and fragmentation of the habitat.

Study area in Portugal

Ribeira de Pena is a municipality in the Vila Real district in the north of Portugal. It is a rural municipality, characterized by agriculture, grazing livestock, forest, mountains, valleys and diverse fauna, along with low human density, that provides shelter and food for wolves. Located in a zone of transition between the harsh and mountainous Trás-os-Montes and the verdant Minho, Ribeira de Pena is one of the municipalities that can work like an ecological corridor between areas with higher wolf concentration in the north with lower concentration in the south.

I started using GIS software during my biology course, and more often during my master thesis. At that time I used mainly proprietary software. After I finished my master degree, I lost access to the proprietary software.

Meanwhile, I entered in the new world of Linux. After that I was contacted to help some researchers to model ecological corridors for wolves in Ribeira de Pena, using GIS, since they never worked with this kind of software. Because I was already using Linux instead of windows, my first problem was which software to use. Then I heard about QGIS and decided to give it a try, although it seemed very simplistic and incomplete, when compared to what

I already knew. I quickly realized how mistaken I was, and got really enthusiastic with the analytical capabilities QGIS provided, specially with GRASS integration.

To model the ecological corridors, we used the QGIS along with the GRASS plugin. We used several geographic information along with presence data of the species to model the ecological corridors. Here are some of the functions of both QGIS and GRASS used in this case, just to name a few:

- plugin Interpolation in QGIS: to create a Digital Elevation Model

- r.watershed in GRASS: to create water streams from DEM

- r.grow.distance in GRASS: generates a raster map layer of distance to features in input layer

- r.reclass in GRASS: to reclassify map layers

- r.slope.aspect.slope in GRASS: to calculate the slope from the DEM

- r.mapcalculator in GRASS: to calculate some simple map algebra

- r.cost.coord in GRASS: creates a raster map showing the cumulative cost of moving between different geographic locations on an input raster map whose cell category values represent cost

- r.drain in GRASS: Traces a flow through an elevation model on a raster map — the one used to create the corridors

With this work we obtained a map with the potential ecological corridors for wolf in Ribeira de Pena municipality. These are areas to be considered by the city council technicians when planning conservation measures for the species. These corridors are of extreme importance because they can connect the fragile wolf packs in Vila Real in the south with those in the north, which are continuous with those from Peneda-Gerês and Spain far more stable. It is from particular importance those corridors that cross human settlements, like small villages, cities and roads. These areas must be considered critical for wolf conservation, and applied measures to reduce human impact in this species.

Conclusion

Both QGIS and plugin GRASS are very intuitive with user-friendly interface, with all essential functions to perform most analysis. For what I could see, QGIS and GRASS perform equally as well as the proprietary programs I was most familiar with from college days, with the big advantage of free open-source software, usable in every computer or notebook without licenses, constant upgrades and the ultimate advantage to contribute to it's improvement and/or tip the developers about some essential function.

Changing to Linux and then to QGIS and GRASS was one of my best calls, and although there can be some missing issues, easily resolved in the future with the developers, I don't regret my decision and advise everyone to use them.

Author

Monica Almeida

This article was contributed in July 2012 by Monica Almeida. She is conservation biologist working in an non-governmental organiz
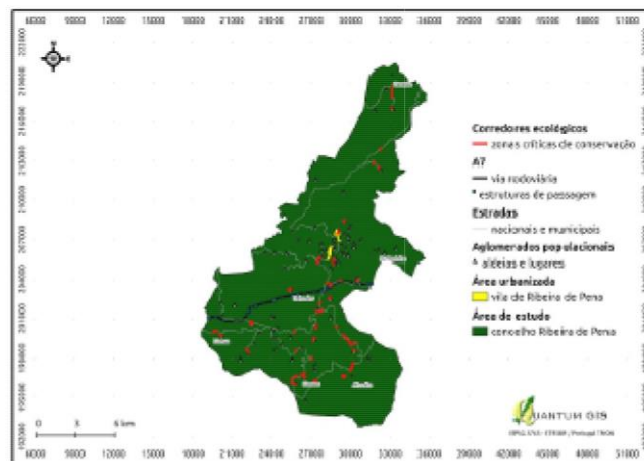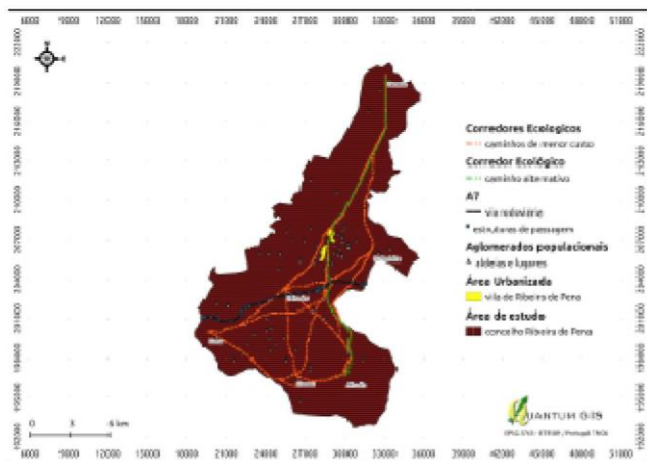
Ecological corridors and critical conservation areas for wolves in northern Portugal.

Welcome to OSGeoLive 12.0

http://live.osgeo.org/en/contact.html

OSGeoLive is a self-contained bootable DVD, USB thumb drive or Virtual Machine based on Lubuntu @, that allows you to try a wide variety of open source geospatial software without installing anything. It is composed entirely of free software, allowing it to be freely distributed, duplicated and passed around.
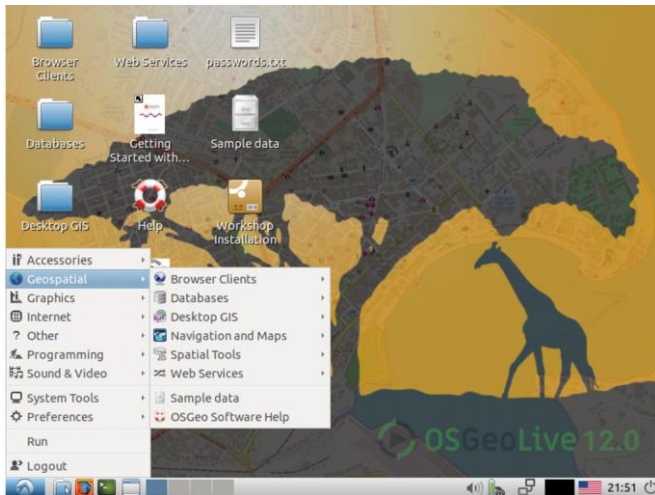
It provides pre-configured applications for a range of geospatial use cases, including storage, publishing, viewing, analysis and manipulation of data. It also contains sample datasets and documentation.

To try out the applications, simply:

1. Insert DVD or USB thumb drive in computer or virtual machine.

2. Reboot computer. (verify boot device order if necessary)

3. Press "Enter" to startup & login.

4. Select and run applications from the "Geospatial" menu.

OSGeoLive is an OSGeo Foundation project. The OSGeo Foundation is a not-for-profit supporting Geospatial Open Source Software development, promotion and education.

Quick Starts

- Getting started with the OSGeoLive DVD

- Change language or keyboard type

- Install OSGeoLive on your hard disk

- Run OSGeoLive in a Virtual Machine

- Create an OSGeoLive bootable USB thumb drive

- Running in a Hyper-V Virtual Machine

Presentation

A half hour presentation, highlighting all OSGeoLive applications, is available with slides, script, and abstract.

English | Deutsch | Español | Français | Hungarian

@ Lubuntu is a fast and lightweight operating system with a clean and easy-to-use user interface. It is a Linux system, that uses the minimal desktop LXDE/LXQT, and a selection of light applications. Because of this, Lubuntu has very low hardware requirements. Lubuntu was founded by Mario Behling and has been grown for many years by Julien Lavergne.

Hyderabad State 1759-1853

(Source: Internet)

Old maps have their own importance. Here is the old map of Hyderabad State. It will be interesting to compare with exising States of this area.
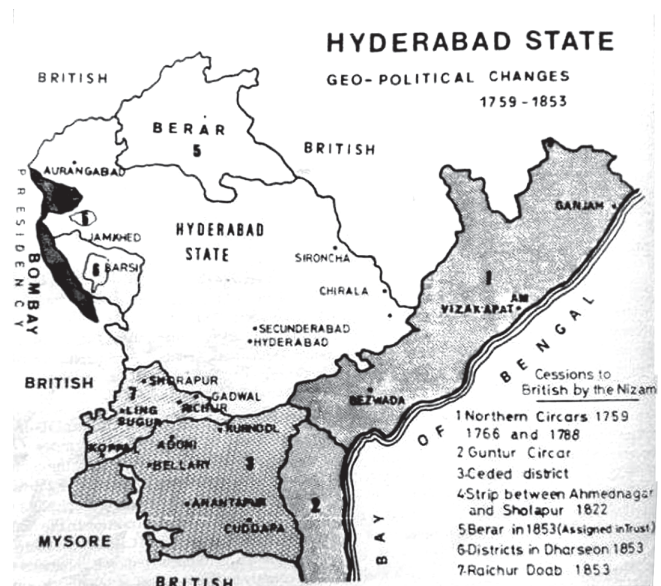
Hyderabad State – Geo-Political Changes – 1759-1853

Hyderabad State

UAV based mapping of Shoreline Vegetation

UAV Spectral Image Mapping of Shoreline Vegetation

Identification Based on Visible Spectral Bands

Jitka Komárková, Pavel Sedlák - **- 04/07/2018**

https://scholar.google.co.in/scholar?q=
UAV+Spectral+Image+Mapping+of+
Shoreline+Vegetation+Identification+
Based+on+Visible+Spectral+Bands

Rapid identification of a clear water surface, shoreline and vegetation can serve as a means of monitoring of the water level and as an important indicator of changes. In cases when a high level of detail or on-demand data collection is required, unmanned aerial vehicles (UAVs or 'drones') can provide a good service.

It is important to think about the costs of the UAV and the connected sensors as well. Multispectral and thermal cameras are still very expensive in comparison to visible cameras. This article shows how a commercially available middle-class drone (DJI Phantom 3 with built-in camera), which collects data only in the visible spectral bands and is affordable even for individuals, can be easily used to calculate colour spectral indices to identify shoreline, vegetation and water.

An area lying to the north of the city of Pardubice in the Czech Republic is very rich in ponds. The area of interest is flat, lying approximately 220 metres above sea

Figure 1: Area of interest – shoreline of the Skrin pond.

level. It comprises clear water surfaces, seasonally flooded greenery, vegetation including treetops, dry reeds (including dry grass) and dry trees (see Figure 1).

Flight Planning and Data Collection

The dataset was captured on 20 April 2018, i.e. in spring. The flight was planned in advance in DJI GO and then sent to the drone. The drone automatically flew according to the plan. It took approximately 15 minutes to cover the area of 0.0285km^2 so no break in the flight was necessary. The total length of the flight was 1,545m, and it was planned in seven main lines consisting of 64 waypoints in total. Front and side overlap were both 60%. Average speed was 2.2m/s, altitude was 39.6m and resolution was 1.7cm per pixel.

Data Processing to Calculate Vegetation Indices

Two software tools were used: Pix4Dmapper 4.2.27 trial and ArcGIS for Desktop 10.5.1. Pix4Dmapper was used for a mosaic building and calculating all indices. ArcGIS was used for visualisation of the resulting indices. WGS 84 – UTM zone 33N was used as a coordinate system.

The final mosaic was created from 33 images, covering 0.012km^2. Certain types of land cover require a higher overlap, so images showing only treetops were not aligned because of the lack of common points. Nevertheless, the final mosaic covered the whole shoreline so it was perfectly usable for the next step.

The survey team calculated various colour-based vegetation indices, which are based only on red, green and blue bands: CIVE, ExG, ExR, GRVI, NDI, TGI, VARI and VDVI. Several colour band combinations and combinations of particular indices were calculated as well to include different approaches described in the literature.

ArcGIS was used for visualisation of the results because it provides more visualisation methods and better tools for map creation. The "Pink to YellowGreen Diverging, Bright" colour ramp was used for all indices, which helped to visually distinguish between particular land cover types. The other settings were: stretched visualisation, percent clip stretch (both min. and max. 0.5). Green colour represents the highest values, dark pink represents the lowest values, and yellow represents

CIVE	Colour Index of Vegetation Extraction	$0.441*Red - 0.81*Green + 0.385*Blue + 18.78745$
ExG	Excess Green	$2*g - r - b$
ExR	Excess Red	$1.3*r - g$
NDI	Normalised Difference Index	$(Green - Red)/(Green + Red)$
VDVI	Visible-band Difference Vegetation Index	$(2*Green - Red - Blue)/(2*Green + Red + Blue)$

Figure 3: Calculation formulas used to calculate vegetation indices.

medium values in all cases to simplify comparison of the results. An inverted scale would be more natural in some cases, e.g. for displaying vegetation with the green colour.

See Figure 2 on cover page 3: Area of interest and calculated vegetation indices.

Results and Interpretation

Based on the visual interpretation and literature, the following colour indices were chosen as the most suitable ones: CIVE, ExG – ExR, NDI, Red/Green ratio and VDVI (see Figure 2 for results and Figure 3 for calculating algorithms).

The clear water surface is highlighted by R/G, ExG – ExR (dark green in both cases) and NDI (dark pink). The water surface can be easily distinguished from the seasonally flooded greenery. The borderline between the clear water surface and seasonally flooded greenery is indiciated by the yellow line. Green vegetation is highlighted by all indices. VDVI and CIVE clearly highlight treetops, displaying green and dry vegetation in dark colours so that these two types of land cover can be easily distinguished. Seasonally flooded greenery is well visible with R/G, NDI, ExG – ExR and VDVI because it is bordered by a yellow line. The best result is provided by VDVI (green colour). Dry reeds and dry trees are well highlighted by VDVI (dark pink) and CIVE (dark green).

Comments on the Indices

VDVI is very useful for differentiating green vegetation from dry vegetation. R/G (and its opposite G/R) makes it easy to distinguish between vegetation and the clear water surface. The ExG – ExR difference makes it possible to distinguish all vegetation from the clear water surface. NDI makes it possible to distinguish all vegetation from the clear water surface. CIVE clearly highlights green vegetation, which can be easily distinguished from dry vegetation (both trees and reeds). The clear water surface cannot be easily distinguished because it is visualised in a similar way as dry vegetation.

Conclusion

Shoreline, vegetation and the clear water surface can be easily monitored by a middle-class UAV equipped with a camera recording only in the visible spectral bands. It provides data with a very high spatial resolution on demand and at acceptable costs. It can significantly help with monitoring of less accessible areas such as overgrown or waterlogged terrain, as in this case. Particular land cover types can be easily distinguished by a visual interpretation as the first step. Vegetation indices based on visible spectral bands appropriately complement the visual interpretation. They can quickly highlight vegetation, seasonally flooded vegetation and the clear water surface to enable identification of the shoreline as well. Each index emphasises different types of land cover so it is beneficial to combine multiple indices.

Acknowledgement

Further Reading

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Last updated: 20/03/2019

Limitations of HRSI

Limitations of high resolution satellite stereo imagery for estimating canopy height in Australian tropical savannas

Highlights

- Very High Resolution (VHR) stereo satellites were assessed for estimating vegetation canopy height in Australian savannas.

- Semi-global dense matching (SGM) image-based techniques produced poor results (8–9% tree detection rate).

- The highest tree detection rates were achieved by using the near-infrared (NIR) band.

- Poor image matching results likely stem from the clumping crown structure and erectophile foliage of the dominant *Eucalypt*spp.

- Cross-satellite (mixed) models couldn't improve the quality of extracted CHM.

Abstract

Obtaining reliable measures of tree canopy height across large areas is a central element of forest inventory and carbon accounting. Recent years have seen an increased emphasis on the use of active sensors like Radar and airborne LiDAR (light detection and scanning) systems to estimate various 3D characteristics of canopy and crown structure that can be used as predictors of biomass. However, airborne LiDAR data are expensive to acquire, and not often readily available across large remote landscapes. In this study, we evaluated the potential of stereo imagery from commercially available Very High Resolution (VHR) satellites as an alternative for estimating canopy height variables in Australian tropical savannas, using a semi-global dense matching (SGM) image-based technique. We assessed and compared the completeness and vertical accuracy of extracted canopy height models (CHMs) from GeoEye 1 and WorldView 1 VHR satellite stereo pairs and summarised the factors influencing image matching effectiveness and quality.

Our results showed that stereo dense matching using the SGM technique severely underestimates tree presence and canopy height. The highest tree detection rates were achieved by using the near-infrared (NIR) band of GE1 (8–9%). WV1-GE1 cross-satellite (mixed) models did not improve the quality of extracted canopy heights. We consider these poor detection rates and height retrievals to result from: i) the clumping crown structure of the dominant Eucalyptus spp.; ii) their vertically oriented leaves (affecting the bidirectional reflectance distribution function); iii) image band radiometry and iv) wind induced crown movement affecting stereo-pair point matching. Our detailed analyses suggest that current commercially available VHR satellite data (0.5 m resolution) are not well suited to estimating canopy height variables, and therefore above ground biomass (AGB), in Eucalyptus dominated north Australian tropical savanna woodlands.

Feedback

.Prof Wickramagamage article on GIS published in Jan,2019 of Maps Today

Thank you so much for giving this opportunity to Prof. Wickramagamage who is among the first to explore and settle the entire GIS and RS programs at the department (with gratitudes to Mr. Nawfhal too). I am happy to say that with Prof. Wickramagamage's instructions and encouragement, we are going to start BSc in GIS from 2020 at the department. I am sure GIS/RS education (having with the good teaching panel) at Peradeniya will be strong and success in the future.

Thanks

Rekha

****

Prof. K.W.G. Rekha Nianthi (PhD)

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University of Peradeniya

Sri Lanka

(Received through Dr.V.Raghava Swamy)

Q GIS

Use of QGIS at the Ministry of Social Development of Uruguay (MIDES)

https://www.qgis.org/en/site/about/case_studies/uruguay_mides.html

Introduction

The Ministry of Social Development of Uruguay (MIDES, , for its acronym in Spanish) is responsible for the national social policies. MIDES is also accountable for the coordination -at both sectoral and territorial levels- articulation, monitoring, supervision and evaluation of plans, programs and projects, within the areas of its competence, aiming at the consolidation of a progressive redistributive social policy.

The National Division of Evaluation and Monitoring (DINEM) is a section of MIDES that oversees the monitoring and evaluation of plans, programs, actions, devices and social projects through the national territory. DINEM also produces and manages necessary information to improve their design and implementation.

The Department of Geography of DINEM is responsible for the production, management and analysis of geographical information,

> **In that way, as the QGIS project was refined (fewer bugs and more functionalities), we were able to satisfy our needs using QGIS**

QGIS at the Department of Geography of the DINEM

Ever since the consolidation of the Department of Geography in 2012, we have tried to incorporate open source software to fulfill our duties. In particular, the management of an extensive field work, consisting in the annual implementation of approximately 40,000 visits to socially vulnerable households throughout the country. The objective was to conform a thorough georeferenced database of target households, in order to improve social policies implementation. Particularly, data was collected to enhance the scope of monetary transfer programs ("Asignaciones Familiares – Plan de Equidad" and "Tarjeta Uruguay Social"). The survey form applied contemplates social, housing, and environmental aspects.

Logistics to viabilize such fieldwork involved using statistical packages to manage the database generated, together with an intensive use of GIS to organize field trips and georeference relieved data.

Although proprietary software was implemented when the working process started, the development of the tasks themselves gradually demanded it to be converted to open source software. As the process as a whole became more computerized -incorporating a workflow engine and a PostGIS geospatial database-, license requirements and benefits offered by free and open source software (FOSS) options encouraged us to make the change. In that way, as the QGIS project was refined (fewer bugs and more functionalities), we were able to satisfy our needs using QGIS. PostGIS associated tools allowed the workgroup to rapidly coordinate the tasks needed to viabilize daily field trips, together with subsequent analysis tasks on the same data fieldwork generated, shortly after it was relieved and digitized.
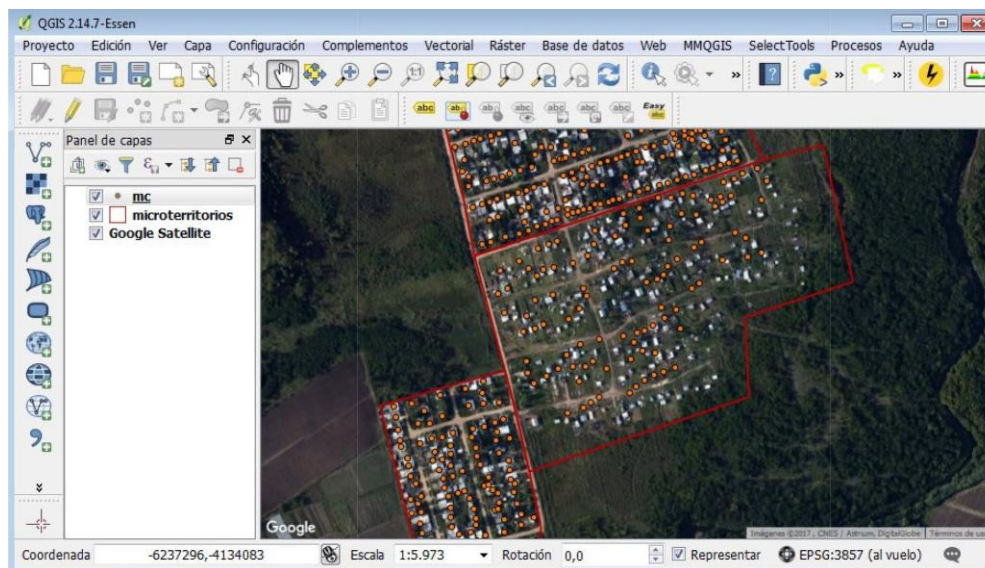
QGIS at work: identifying houses on informal settlements to implement fieldwork

With "qgis2web" we were able to produce interactive maps, which have become the main way to communicate the results of such investigations

In addition to information management and field work implementation, we constantly use QGIS typical geospatial tools to produce thematic cartography, and in spatial analysis tasks. This last, as much about the data that the fieldwork generates, as with other ministry programs information, and frequently even to aid inter-institutional projects. With "qgis2web" we were able to produce interactive maps, which have become the main way to communicate the results of such investigations. They allow human resources within other programs and agencies to easily and effectively manage higher amounts of information than with a collection of static maps, even when these resources are not used to reading spatial data.

Conclusion

QGIS has become a fundamental software to the Department of Geography at DINEM. It presents an excellent performance to work with heavy files and to interact with PostGIS and with our workflow engine. This allows us to have an excellent management of geographic data, which also makes for the production of basemaps and thematic cartographies of superior quality.

At the same time, extra features that are incorporated through plugins are of great value to us. For instance, the possibility of exporting "leaflet" map viewers, as well as incorporating high resolution satellite imagery directly into the GIS work area through "OpenLayers" to manually vectorize information, among others.

This variety of options is precisely what has allowed us to develop the specific and at the same time very different technical solutions that programs and agencies have been needing through past years. As mentioned in this article, we can state that QGIS meets the necessary requirements to be used in public administration as desktop GIS software. Also it has been a cornerstone in helping this institution to set up a web map, offering general population much information about social issues (SIG MIDES, OpenLayers based WEB GIS developed by the IT division).

Contact: mapas@mides.gub.uy
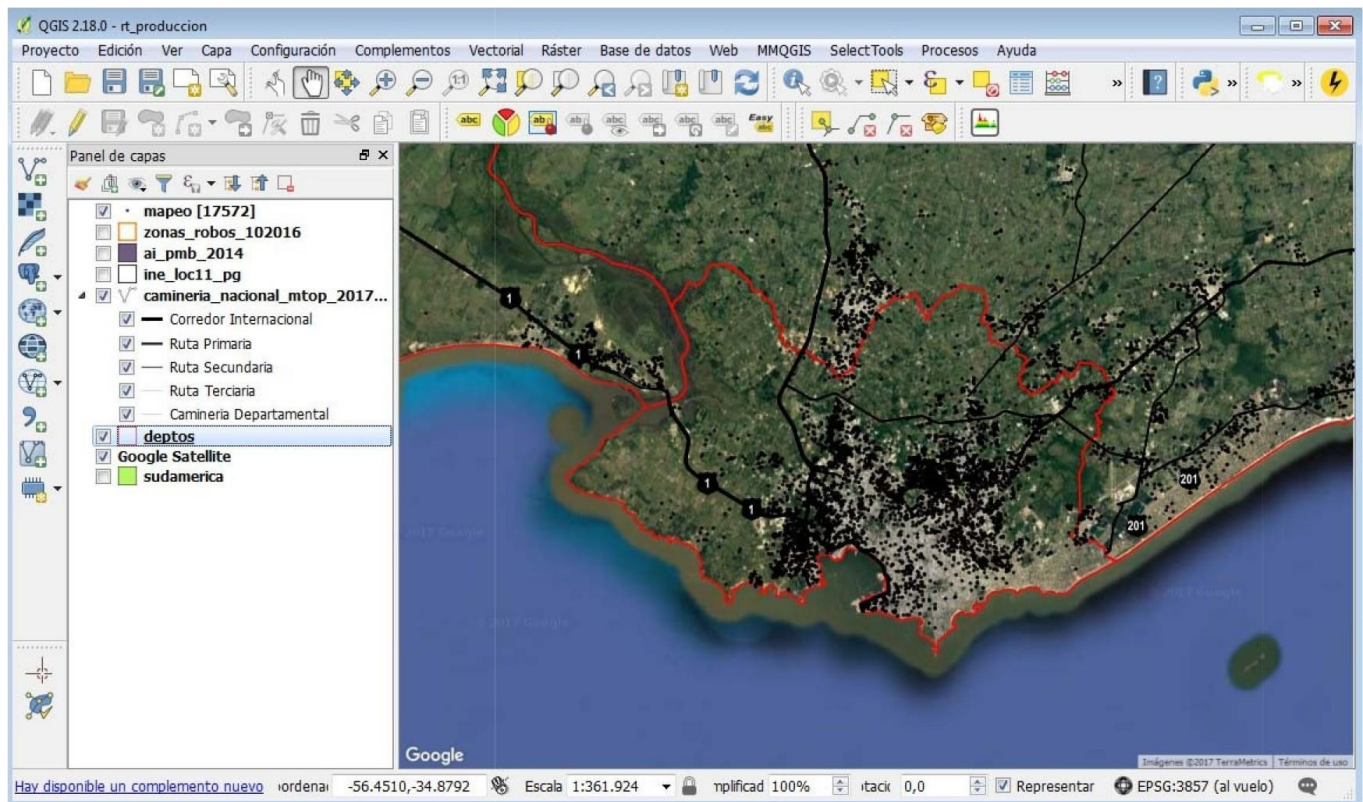
QGIS at work: Montevideo, Uruguay's capital and most populated city, overlayed with PostGIS layer showing to-do visits (mostly composed of socially vulnerable households, in the outskirts of the city)

An Introduction to the US Census
Understanding, Finding, & Accessing Data

Census Workshop Recap

https://atcoordinates.info/2019/03/28/census-workshop-recap/

March 2019

I've been swamped these past few months, revising my census book, teaching a spatial database course, and keeping the GIS Lab running. Thus, this will be a shorter post!

Last week I taught a workshop on understanding, finding, and accessing US Census Data at the Metropolitan Library Council of New York. If you couldn't make it, here are the presentation slides and the group exercise questions.

Most of the participants were librarians who were interested in learning how to help patrons find and understand census data, but there were also some data analysts in the crowd. We began with an overview of how the census is structured by dataset, geography, and subject categories. I always cover the differences between the decennial census and the ACS, with a focus on how to interpret ACS estimates and gauge their reliability.

For workshops I think it's best to start with searching for profiles (lots of different data for one place). This gives new users a good overview of the breadth and depth of the types of variables that are available in the census. Since this was a New York City-centric crowd we looked at the City's excellent NYC Population Factfinder first. The participants formed small groups and searched through the application to answer a series of fact-finding questions that I typically receive. Beyond familiarizing themselves with the applications and data, the exercises also helped to spark additional questions about how the census is structured and organized.

Then we switched over to the Missouri Census Data Center's profile and trends applications (listed on the right hand side of their homepage) to look up data for other parts of the country, and in doing so we were able to discuss the different census geographies that are available for different places. Everyone appreciated the simple and easy to use interface and the accessible tables and graphics. The MCDC doesn't have a map-based search, so I did a brief demo of TIGERweb for viewing census geography across the country.

Once everyone had this basic exposure, we hopped into the American Factfinder to search for comparison tables (a few pieces of data for many places). We discussed how census data is structured in tables and what the difference between the profile, summary, and detailed tables are. We used the advanced search and I introduced my tried and true method of filtering by dataset, geography, and topic to find what we need. I mentioned the Census Reporter as good place to go for ACS documentation, and as an alternate source of data. Part of my theme was that there are many tools that are suitable for different needs and skill levels, and you can pick your favorite or determine what's suitable for a particular purpose.

We took a follow-the-leader approach for the AFF, where I stepped through the website and the process for downloading two tables and importing them into a spreadsheet, high-lighting gotchas along the way. We did some basic formulas for aggregating ACS estimates to create new margins of error, and a VLOOKUP for tying data from two tables together.

We wrapped up the morning with a foreshadowing of what's to come with the new data.census.gov (which will replace the AFF) and the 2020 census. While there's still much uncertainty around the citizenship question and fears of an under count, the structure of the dataset won't be too different from 2010 and the timeline for release should be similar.

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http:// and https:/

Hypertext Transfer Protocol, which is usually shortened to HTTP is a tool that ensures all the content and data for a specific webpage are shown and work correctly in your web browser.

An improved version of this protocol is HTTPS (Hypertext Transfer Protocol Secure). Webpages that begin with "https://" have an extra layer of encryption that **protects your personal information** and passwords from being accessed by others.

This is especially important for e-commerce websites, governmental sites, and online banking because on these sites you use your ID and payment information. So, to know that a web page is secure, look at the URL address of the website and make sure it starts with an "https://" instead of just "http://".


Students Forum

On the suggestion of Dr.V.Raghava Swamy, Co-editor, Maps Today this feature has been taken up. He himself collected news items related to two colleges. The aim of this feature is to associate students with event-workshops, skill training, competitions and so on about maps and map-related *'learn and practice'* activities, which have become important in today's geospatially dependent world

Map Awareness Programme (MAP)

Neelima is a class-9 student of Nishulk School, Khairatabad, Hyderabad.She from an economically backward community. She is under long term guidance of peer Mr. P.Satyanarayana, former Hydro-graphic officer, actively associated with GeoMap Society (GEMS). Neelima has completed the map assignment (standardized by Brig. JS Ahuja on behalf of GEMS) under the Map Awareness Programme (MAP). Her perception of school's *'neighbor-hood'* as understood by her is shown below. She took her inspiration from Google maps. Her answers to two map related points are also reproduced below. *She would receive prize from 'GS Oberoi's Fund' initiated under* Map Awareness Programme.

Neelima's Neighborhood Map of Nisulk School Khairatabad, Hyderabad
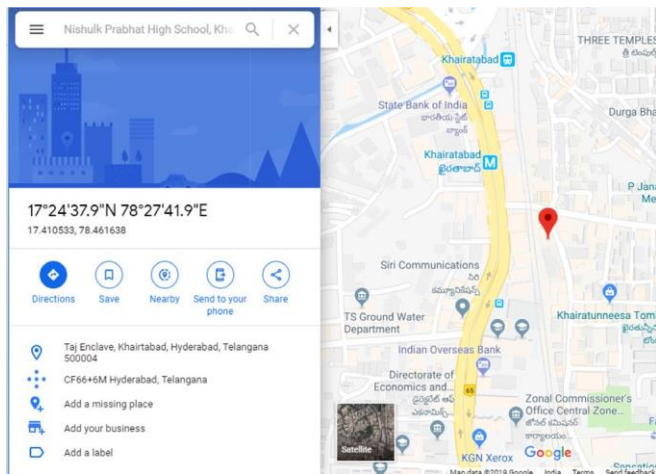
School neighborhood Map prepared by Neelima, class 9 of Nisulk School Khairatabad, Hyderabad . Location of School is shown with a balloon symbol. Latitude-Longitude values (in Northings & Eastings) are in the left side in the box in DMS (Degrees Minutes Seconds) and DD (Degree Decimal).. (Source : Google Maps, Internet)

Length of one second of latitude & longitude in meters

Neelima's response

The distances vary. A degree, minute or second of latitude remains fairly constant from the equator to the poles; however a degree, minute, or second of longitude can vary greatly as one approaches the poles (because of the convergence of the meridians). At 38 degrees North latitude, one degree of **latitude** is approximately 364,000 ft (69 miles), one minute equals 6068 ft (1.15 miles), one-second equals 101 ft; one-degree of **longitude** equals 288,200 ft (54.6 miles), one minute equals 4800 ft (0.91 mile), and one second equals 80 ft.

About Nautical Mile(Mr. P. Satyanarayana's question)

Neelima's response

A **nautical mile** is a unit of measurement used in both air and marine navigation, and for the definition of territorial waters. Historically, it was defined as one minute (1/60) of a degree of latitude. Today, it is defined exactly, 1852 meters. The derived unit of speed is the knot, which equals to one nautical mile per hour.

Earth Day at J.Barooah College, Jorhat, Assam

Department of Geography, J.Barooah College, Jorhat, Assam celebrated Earth Day on 22nd ,April 2019. Dr D Dutta, Sr. Scientist, Rain Forest Research Institute, Jorhat delivered the Earth Day invited talk on 'Protect our Species'. Further, the college organized Poster competition, Tree plantation, Display of Theme cards on

Release of BHOGDOI : Group Photo (left to right) DrMinakshi P Hazarika, Dr Mrinal Nath, Head : Department of Geography, Dr Haren Bora ,Ms Anmona Bora , Vice Principal, Dr D Dutta, Sr. Scientist, Rain Forest Research Institute, Dr Bimal Barah, Principal and Ms Riki D Bharali

conservation of Natural Resources, Water scarcity and on Climate Change. Students from neighboring Govt. Schools in Jorhat, also actively took part. A commemorative Volume, 'BHOGDOI' was also released to befit the occasion. (Dr Minakshi P Hazarika, Geography Lecturer, J B College, (Email : minakshi.gse3240@gmail.com)

'Swachh Bharat Abhiyan' atTarakeshwar Degree College, Hooghly, Kolkatta, West Bengal

Workshop on, 'Health & Hygiene' under, 'Swachh Bharat-Swasth Bharat Abhiyan' was held at Tarakeshwar Degree College, Hooghly, Kolkatta, West Bengal on 30th April,2019 - Topics on Healthy society, Lifestyle practices, Personal hygiene, Health awareness, and Cleanliness in surroundings were addressed to students of college by Peers and learned Speakers from S B Devi Charity Home, Kolkata. Nearly, 185 students participated in the interactive one day workshop.(Convener : Dr Chandramallika Biswas,

email : chandramallika2002@gmail.com)

Students and Teachers of Tarakeshwar College, during Workshop

Presentation Session in progress, during Workshop

Reports with Photosfrom Schools & Colleges, with senders name & mail-id may be sent to: *mapstodaygis@gmail.com and / or to raghavaswamy53@gmail.com*

Telangana government plans land titling for less disputes

DECCAN CHRONICLE. | S.A. ISHAQUI

May 6, 2019,

Hyderabad: The Telangana state government is working towards removing the kinks in the land titling system after observing the difficulties that Maharashtra and Rajasthan have faced in attempting to introduce the system.

The demand is for a workable, inclusive and evolving system of land titling and land records which will allow land markets to function effectively, reduce judicial burden and improve the targeting of welfare schemes.

Chief Minister K. Chandrasekhar Rao had outlined the conclusive land titling system he wanted to introduce and explained its advantages.

According to the CM, the main advantage of the system is that it guarantees title to the owner. Civil disputes in courts are likely to reduce drastically and ownership of various properties will be guaranteed. The officers of record keeping offices will issue online certificates of property title that will certify the ownership rights to the extent of share percentage.

Chief Minister K. Chandrasekhar Rao explained that after issuing the conclusive title if any dispute arises and the title proves to be wrong, then the state government will compensate the concerned title owner.

xxxxxxxxxxxxxxxxx

The attempts of the Rajasthan government to introduce the Rajasthan Urban Land (Certification of Titles) Bill, 2016, have not been successful because the Bill is riddled with inadequacies and falls short of requirements to address the real issues.

Though Maharashtra has done better in addressing the problem of conclusive titling by bringing an amendment to the Maharashtra Land Revenue Code, 1966, in 2015, it also has not materialised so far.

The attempt of the administration of Chandigarh Union Territory in the year 2016 also is still on the cards.

Given this backdrop, legal experts say that the state government has to be very cautious in bringing in conclusive land titling as it requires initial surveying of the entire lands in the state, identifying the owners, and making entries in the revenue records of land parcels.

Sanjay Kumar Felicitation

GS Kumar

Sanjay Kumar , Editor & Publisherof Geospatial World Magazine was felicitated on 3 May 2019 at Hyderabad for being honoured to have been appointed as the First Non US citizen Member of US National Geospatial Advisory Committee. Also, for being conferred as 'Global Geospatial Industry Ambassador', by the United Nations.

He deserves more than simple felicitation for taking the Geospatial torch from India to different countries and uplifting GIS to top levels through forums, events, and publications. Another take away for me was the wonderful time spent with Dr M P Narayanan Chairman, Geospatial World/Media & Communications.Dr MP Narayanan

Clockwise from left: GS Kumar, Ms. Sanjay Kumar, Ms. R.Siva Kumar, Ms. Somanath (IIC Technologies), her younger daughter and Dr MP Narayanan

Senior officers from Survey of India, and other dignitaries from Geospatial fields also attended the event, along with their families. known to each other for decades were hugging and exchanging notes/pleasantries.Presence of Senior officers of Survey of India enhanced the flavor of the gathering... Smiles, laughter and jovial conversations combined with delicious snacks and drinks filled the hall with joyful climate. RS Rao's wife's songs added a totally new dimension. Somnath aptly commented- it is she who should also be

L – R : Dr. BVR MohanReddy; Dr. Siva Kumar (host), Dr. MP Narayanan; Mr. Sanjay Kumar; Ms. BVR Mohan Reddy; Ms. Sanjay Kumar; Ms. R Siva Kumar (Hostess), Mr. Rajesh Alla (IIC Technologies)

Speakers appreciated the committed, consistent and dedicated efforts of Mr Sanjay Kumar.

Ms. Rao's intermittent melodious songs touched all hearts. So was the speech of Sanjay Kumar, which was more like a friendly talk. He recalled how from a remote village with humble beginnings, he could reach present position. He particularly recalled the arguments with his father.Though differed on many issues, he allowed Sanjay the freedom to pursue the field of his liking.

He said he had no back ground of GIS. He met Dr MP Narayanan (Nayveli & Coal India fame) who supported his idea of entering into the field of Geospatial Technology. He recalled the hostile situation that developed after the publication of 'Unshackle Maps' a cover page article in Geospatial World monthly lmagazine on the prevailing Restrictions on maps, in the country.He received threats also. All said and done, today he stands tall in Geospatial world in India and also in other parts of the world.

GS Kumar presented two books published by him to Sanjay Kumar. One is Khichdi- Understanding Life; Second is about GIS Principles and Practices.

I end this short note with thanks to Maj. Gen. Dr R Siva Kumar for organizing such a nice and memorable get-together at Sailing Club, Secunderabad.

GEOINT 2019	June 2-5, 2019	TX, U.S.A	http://geoint2019.com/
UAV-g 2019	June 10 – 12, 2019	Enschede, The Netherlands	www.gsw2019.org
Geospatial Week	June 10 – 14, 2019	The Netherlands	www.isprs.org/
Recent Advances in Civil Engineering	July 02, 2019	JNTU Hyderabad	*www. jntuh.ac.in*
19th International Multidisciplinary Scientific GeoConference SGEM 2019	28 June - 7 July 2019	Bulgaria	www.sgem.org
GI_Forum 2019 - Symposium and Exhibit of GIS	July 2-5 2019	Salzburg, Austria	www.gi-forum.org
Esri User Conference	July 8 – 12, 2019	San Diego,	https://www.esri.
WGDC 2019	July 9-10 2019	Beijing, China	http://wgdc.taibo.cn
Society for Conservation GIS 22nd Annual Conference	July 15 – 17, 2019	CA, USA	scgis.org/conference/30
19-23 August URISA GIS Leadership Academy	Aug 19-23 2019	Toronto, Canada	ttps://www.urisa.org/education-events/urisa
FOSS4G 2019 Bucharest	Aug 26-30 2019	Bucharest, Romania	https://2019.foss4g.org/
EUROGEO 2019 'Hidden Geographies'.	Aug 28-31 2019	Ljubljana, Slovenia	http://hiddengeographies
GeoInformation for Disaster Management	September 3-6, 2019	Prague, Czech Republic	www.gi4dm2019.org
INTERGEO 2019	17th – 19th September 2019	Stuttgart, Germany	www.intergeo.de
International Symposium on Digital Earth	September 24-27, 2019	Sesto Fiorentino Italy	www.gis-professional.com/content/event/11th-international-symposium-on-digital-earth-isde-11
MVP BIM 2019 " Prague, Czech Republic	September 24-25, 2019	Prague, Czech Republic	http://mvpbim2019.org/
International Geographical Conference of DGS	September, 27-29, 2019	Jaipur, Rajasthan	*www.thedeccangeographer.org)*
GIS-Pro 2019,	September 28 – October 2, 2019	LA, USA	www.urisa.org/gis-pro
LADM 2019 Workshop SDSC2019 - Conference on Smart Data and Smart Cities GGT2019 - Geomatics Geospatial Technology	Oct 1-3 2019	Kuala Lumpur, Malaysia	isoladm.org/LADM2019 Workshop; http://www.geoinfo.utm.my/geospatial2019
National Seminar Regional Studies	October 9-10, 2019	Hyderabad	*(www : uohyd.ac.in)*
AGIC Education & Training Symposium	October 1 - 4, 2019	USA	www.agicsymposium.org/
International Conference of IGU	October, 19-21,2019	Haryana, India	*(www.cuh.ac.in)*
IMAGERY TO DIGITAL REALITY: ERS & Photogrammetry	Oct 28-31 2019	Seoel, Republic of Korea	http://conf.racurs.ru/conf2019/eng/
Africa GIS 2019.	November 18 – 22, 2019	Kigali, Rwanda	www.eis.africa/
Amsterdam Drone Week, ,	December 2-6, 2019	Amsterdam	www.amsterdamdroneweek.com
Indian Geographical Congress of NAGI	December , 28-30, 2019	Sagar, M.P. India	nagi.org.in
InfraTech 2020	14-16 January 2020	Germany	https://www.infratech.de
FIG Working Week 2020 - "Smart surveyors for land and water management	10-14 May2020	Amsterdam	http://www.fig.net/fig2020/
FME International User Conference	16-19 June 2020	Vancouver, Canada	https://fmeuc.com/
ISPRS Geospatial Week (GSW) 2021	21-25 March 2021	Dubai, U.A.E.	https://www.isprs.org/

Information about events has been compiled from different sources. Readers are advised to check correctness from the organisers