Highlights

- GIS and Remote Sensing in Tonga
- GIS and Remote Sensing in Niue
- GIS and Remote Sensing in FSM

Highlights

- GIS and Remote Sensing in Fiji
- Remote Sensing for Tree Measurement
- ISPRS Link to South Pacific Islands

Fiji South Pacific and GIS/RS news

The Newsletter of the GIS/Remote Sensing User Forums
Issue 00/02
September 2000

Back on Track .....

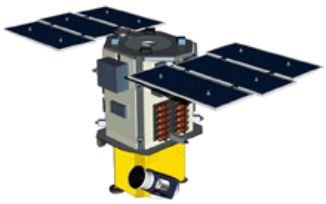
The civil unrest in Fiji must have been remotely sensed by all our readers from wherever your locations are. From after May 19 up until about the end of August, work disruptions was the norm in Fiji. At the Secretariat we struggled to maintain the work output by investing in generators to keep vital IT links with the outside world operational at the height of the power disruptions. The full extent of the effect of the events of May 19 and the aftermath will not be known until we write our end-of-the-year reports and compare our performance with previous years. Right now work performance is back to normal at SOPAC and USP as the two organisations serving the South Pacific in the area of GIS and Remote Sensing.

The newsletter shows that in most of the Pacific Island States GIS is operational. GIS, Remote Sensing and IT activities of the region are also reflected in the newsletters of the Pacific Power Association "Pacific Power", the Newsletter of the International Tropical Timber Organisation "Tropical Forest Update" and in the congress notes of the International Society of Photogrammetry and Remote Sensing. For all applications up to date image backdrop will be an important push for GIS development. SOPAC is now preparing to start a new area, where spaceborne images will be used for mapping at 1:10,000 scale. IKONOS one of the four satellites, displayed on the bottom of the page, is already in space the other three will be launched during the next months. Image backdrop at 1:50,000 scale is mainly suitable for larger islands such as Fiji, Vanuatu, Solomons and PNG. Smaller Pacific islands such as Niue, Tuvalu, Tonga, FSM, etc. require image larger image scale and depended on aerial photographs. SOPAC will assist to purchase and pre-process the images and together with USP train the interpretation. The USP course Remote Sensing is as booked as never before and SOPAC is assisting USP. Since July 2000, SOPAC is regional member of the International Society for Photogrammetry and Remote Sensing in order to deliver new methods and techniques of image analysis to the member countries.

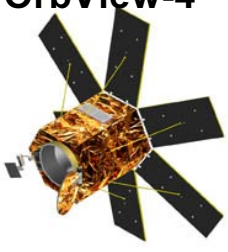
Cheers, Wolf

For further information about available satellite data for Pacific Island Countries:
http://www.sopac.org.fj/Projects/GISRS/RSNews/index.html

QuickBird



OrbView-4



Download your coloured version from SOPAC's web site ..!

ISSN 1562-4250

Contents

IKONOS b&w 1m resolution

To save mailing costs, the newsletter is sent via air mail for further distribution to the following persons:

Cook Islands	*Ben Parakoti*
Hawaii	*Rhett Rebold*
Niue	*Coral Pasisi*
Samoa	*Sagato Tuiafiso*
Solomon Islands	*Bryan Pitakia*
Tonga	*Edwin Liava'a*
Tuvalu	*Opetaia Simati*
Vanuatu	*vacant*

This one-meter resolution black-and-white image of San Francisco was collected October 11, 1999 by Space Imaging's IKONOS satellite. The image features Aquatic Park and Fisherman's Wharf. Credit: "Space Imaging"

Articles please send to:

Wolf Forstreuter (SOPAC)
fax: +679-370 040
e-mail: wolf@sopac.org.fj

James Britton (USP)
fax:: +679-301 487
e-mail: britton_j@usp.ac.fj

IKONOS in Space !

IKONOS Satellite:

- Speed: 4 miles per second or 7 kilometers per second
- Altitude: 680 kilometers
- Orbit Period: once every 98 minutes (14 times per day)
- Revisit Cycle: every one to three days
- Cost for South Pacific Island Countries: USD 34 per km^2

This four-meter resolution color image of San Francisco was collected 11 October 1999 by Space Imaging's IKONOS satellite. The image features the Marina Green, the Presidio and Lombard Street. Credit: "Space Imaging"

GIS and Remote Sensing Activities in Tonga

Edwin Liava'a
Tonga Electrical Power Board

Introduction

Coordination and collaboration of users throughout several organizations is no doubt the key issues for a successful GIS/RS, not only within sectors but also at a national level. To further enhance its development the following are also essential: dedication of users, continual managerial support and recognition of this powerful information tool from higher levels of authority.

Below are the various GIS/RS activities undertaken by different organizations within Tonga and their current situations.

Ministry of Lands and Survey

Prior to 1999, Department of Lands and Survey started a GIS Section. They started building a database on land allotments as a Township layer based on existing maps and digital spatial information, available from their Geodetic Survey Section. Certainly they could provide the greatest input to GIS at a national level as they have all the cadastral surveyed data and geodetic expertise that would contribute to the basis of the GIS/RS graphical platform.

According to Samuela Vehikite (GIS, Lands and Survey) "Discrepancy in Computing Equipment (Hardware) and limited human resources (man-power)…" are the major issues that hinder in the progress of their GIS. But he also stated that the future looks promising, as there are "two personnel, currently undergoing overseas training in disciplines of GIS…" In the meantime he is doing his best to maintain input all information into their GIS.

Ministry of Works (MOW)

MOW has made great advancement in capturing data on roads network, contour lines, etc within Tongatapu and Outer Islands i.e. Vava'u, Eua and Ha'apai. So far most roads on Tongatapu, Vava'u and Eua with proposed new main roads have been designed and captured digitally.

MOW GIS originated from a "Nuku'alofa Urban Roads and Drainage Study" that was implemented by SMEC International for MOW in 1993. The SMEC GIS/LIS proposal for Tonga stressed that "…roads designers must have accurate road easement detail and this information should be the input of Lands and Survey Department who are custodians of all cadastral data and made accessible for use…"

Ministry of Agriculture and Forestry (MAF)

MAF have both the hardware and software including digital information on land allotments. Attempts were made to build a database but problems arose due to inadequate planning, design and implementation causing data redundancy thus producing unreliable reports. The other peculiarity is that Macs are used to collection data and digitise.

Department of Fisheries

The Fisheries department acquired the base data from Tonga Water Board. They started the deployment of GIS/RS with the intention of having a geographical overview of existing Fish Fences and Experimental Farms.

Apart from that, they have a software application written in FoxPro to automate MapInfo. According to Saia Tulua (Fisheries) "The program identifies fish catches within Tonga waters…and is updated every 6 months by the South Pacific Community (SPC)". Also designed is a Vessel Monitoring System (VMS) that shows route tracks of fishing boats.

Tonga Water Board (TWB)

Launching into the new millennium, TWB completed the imput of all reticulation system for Tongatapu and most parts of the outer Islands i.e. Eua, Vava'u and Ha'apai into their GIS. This was been a result of their consistent progress with the deployment of GIS in conjunction with ACT/EW Corporation, boothed with cooperation from SOPAC and TEPB under the EU Lome 111 Project. TWB GIS also played a major role in preparation of a project proposal for renewal of existing aged pipes in the current reticulation system with proposed new branches to areas not covered by the current system.

The next challenge then for TWB is to complete their customers layer and relevant tables in the current database.

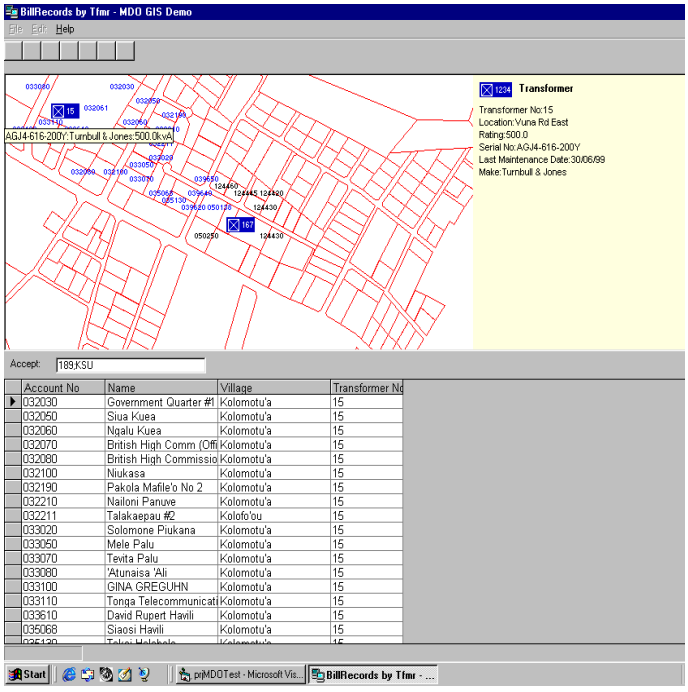


Figure 1: *The MDO demo*

Tonga Electric Power Board (TEPB)

After the completion of the "GIS for Utilities Project" , funded by EU Lome III, TEPB continued to exploit the technology and the application of GIS/RS in designing, planning and managing of existing assets.

Third Phase – Current Status

a) Establishing all geographical objects on GIS platform using GPS Survey data collection, see also Fig. 3.

Proposed implementation schedule was due for completion by the end of October. Due to bad weather and other work commitments the TEPB GIS team have completed between 50% - 75% of the GPS data collection for Tongatapu Island, but will continue and extend project time frame to the end of the year i.e. Dec 2000.

b) Development of a Program with Visual Basic using Magiq Data Object (MDO) and Map-X to connect this using LIVE data from our Billing NCS Unix-box. See Fig 1.1 MDO Demo.

c) GIS/RS on the Local Area Network (LAN), TEPB Intrane and Extranet. See Fig 2. Proposed Radio Link to Engineering Department

d) Pole Fuse Project

e) Deployment of GIS for locating customers for re-inspection of existing protection devices i.e. poles fuses and installations on customers not protected

f) Loss Reduction Project

- Balancing Loads
- LV lines losses

TEPB is currently using information available in the GIS for calculations and improving design to decrease losses on existing low voltage lines network. Feedback crucial for updates

g) Feedback from field teams and supervisors will be used to update existing information on the GIS.

h) Continual support from SOPAC, sharing of information and equipment with Tonga Water Board.

The Future – Conclusion

a) Designated geographical objects on the GIS platform in all sectors reached its completion

b) GIS/RS on the Intranet/Extranet

c) Collaboration and continued cooperation with TWB and other organization that requires assistance.

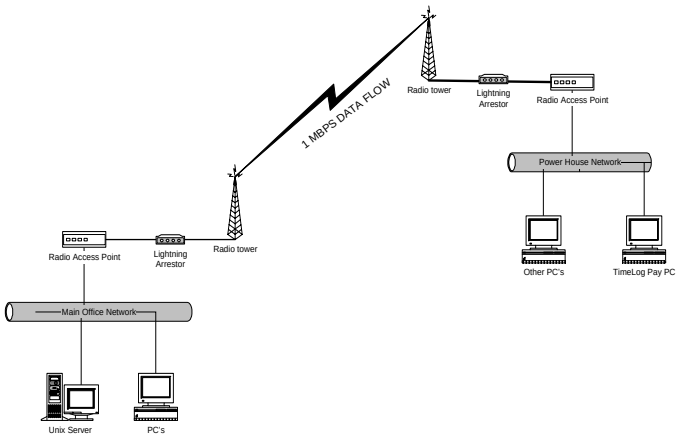


Figure 2: *The radio link to the power house for computer nenetworking*

d) Systems becomes transferable

e) Overall, there has been significant achievements in the GIS/RS activities in Tonga and "Everyone is Happy".

For further information contact Edwin Liava'a, TEPB, ittepb@tongatapu.net.to

Figure 3: *GPS field work, capture of road network by recording from the back of a TEPB truck.*

GIS comes to Kosrae, Federted States of Micronesia (FSM)

Doug Ramsay

Kosrae State in the FSM is the latest island to join the Pacific GIS community with the development of a GIS system for the use of government departments and public utilities on the island. In August 1999, Kosrae requested assistance from the Australian Embassy Small Grants Scheme for the development of the Kosrae State Information System, a Geographical Information System (GIS) for the island. The project was approved and funding for the implementation of Phase I was received. This involved the purchase of GIS equipment and initial training in GIS for representatives from various government departments on Kosrae.

The project was coordinated on Kosrae by the Development Review Commission (DRC) who, with the assistance of SOPAC purchased the computer hardware and software. The DRC also organised a two-week GIS training workshop. This was conducted between 27 March and 7 April by SOPAC. Representatives from twelve government departments and public utilities attended and gained practical hands-on

Figure 1: *The GIS introduction workshop in Kosrae*

experience of a range of GIS applications. Enthusiasm for training in GIS was such that at one point there were over 30 individuals expressing interest in the workshop. Unfortunately numbers had to be limited to one person per department. Despite this, it was still necessary to split into a morning group and an afternoon group to accommodate everyone.

On an island the size of Kosrae it was seen to be important from the outset, that the GIS system was not just "owned" by one department. Hence to guide the development of GIS on Kosrae, a Steering Committee was formed from the participants of the GIS workshop. The first meeting was held before the workshop began to decide on the roles and responsibilities of the Committee. The main purpose of the Committee is to:

- Identify information held within each of the Departments that should be entered into the GIS system
- Decide on the priorities and the work schedule for entering this information
- Assist in the development of databases of department specific information for inclusion into the GIS system
- Provide a point of contact for each department
- Share practical experience and knowledge of the GIS system

Over the next year, much of the work will concentrate on entering existing paper-based information into the system and the establishment of MapInfo compatible databases. Already work is well underway in digitising the US Geological Survey topographical map of the island, converting the cadastral maps into MapInfo format, and establishing a Development Permit MS-Access database.

Figure 2: *The GIS introduction workshop in Kosrae*

The development of the GIS System and initial training is seen as a first, but very important step in developing more efficient data collection, data storage and analysis with respect to land management decision making on Kosrae. Already a number of other initiatives are being actively developed to further the effectiveness of the GIS System. These include:

- The recruitment of a Kosraean who will be responsible for much of the data entry over the next year before hopefully obtaining an Australian Regional Development Scholarship to allow him to start the Diploma in GIS at USP in February 2001.
- The purchase of high-resolution IKONOS satellite imagery of the entire island to provide an up-to-date back drop for the GIS and to conduct reef and vegetation mapping.
- The development of GPS capacity on island in association with Kosrae Utilities Authority

Kosrae State and the Development Review Commission would like to express our gratitude to the Australian Embassy in Pohnpei for supporting and funding this valuable project. We would also like to thank SOPAC for both advising and assisting in the purchase of the GIS equipment and for conducting an excellent two-week training course.

Geographical Information Systems on Niue

Coral Pasisi

The Environmental Planning Unit, Department of Justice, Lands and Survey has been formulating a Land and Marine Resource Use Plan for the island over the last 3 years. One of the outputs of this project was a good information base upon which to make decisions affecting the development of Niue's resources. As a result MapInfo was used to build a GIS.

MapInfo V 3.0 was used in the first year then it was upgraded from SOPAC to V 5.0, which is being used today. Other Technical equipment included 2 Magellan ProMARX X GPS units which have been used for various data collection from bush tracks, to conservation boundaries to capturing utility services such as electricity and water lines.
Using this data, plus a SPOT 1994 image, as well as registered

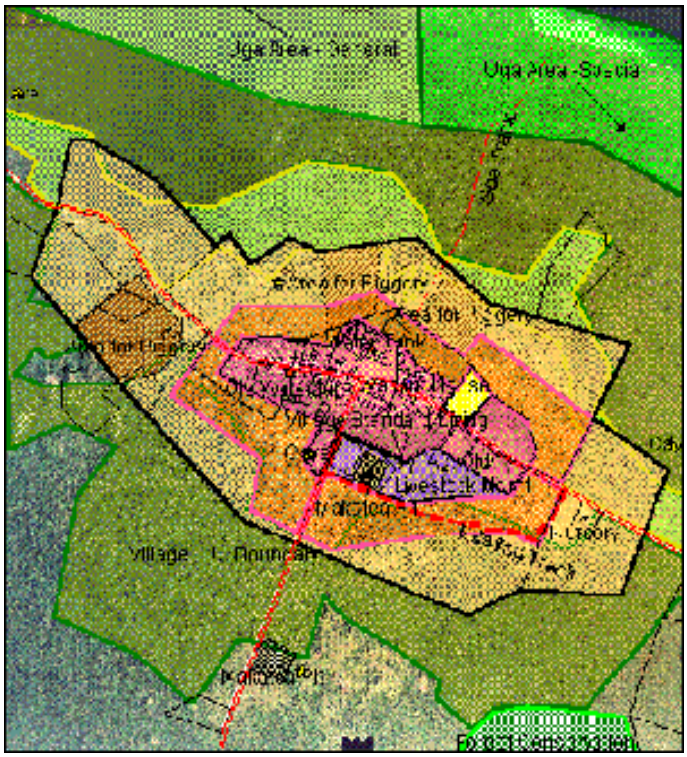


Figure 1: *Lakepa Village Local Area Plan*

aerial photography (1981), data was collected from the Community in various different areas. These areas ranged from bush protection for cultural purposes, to food gathering areas, to marine reserves, future design of villages, possible new access roads etc. This data was then modified, digitized and added to the GIS in layers of information for each Village. From this data Planners were able to design Integrated local area plans (ILAPs) for each village involved (Example Figure 1.). These plans shall be taken back to the communities and any final adjustments made before they are added to the Sustainable Development guidelines under the Resource Use Plan. It is hoped that this Resource Use Plan and its various components shall be enforced with the passing of the Environmental Planning and Management Bill some time in 2001.

Information was also gathered on a national basis at a 2-day National Mapping Forum. Stakeholders from various government departments and the Public sector were invited to do a similar exercise as the villages, however focused on a national development level. As a result of the information gathered at this Forum the Environmental Planning Unit was able to combine this data with some scientific data from earlier research as well as recommendations from various experts in the field. From this information planners have developed "Opportunity-based Maps" of Niue, for different Resource Use themes. These included; Tourism Opportunities, Conservation (Figure 2), Waste Management, Major Land Use (Bulk Fuel relocation, Aggregate Quarrying), Residential Development, Agriculture, and Forestry, with the ability to do similar mapping for other fields as needed.
Other developments in the use of GIS include the training and transfer of some layers to other resource use agencies such as Forestry, Soils and Agriculture and Water Supply. Water Supply has had a consultant in to map their alignments and now have a comprehensive small GIS located at their department.
The Niue Power Corporation is keen to start the mapping of their utilities in order to upgrade their management abilities

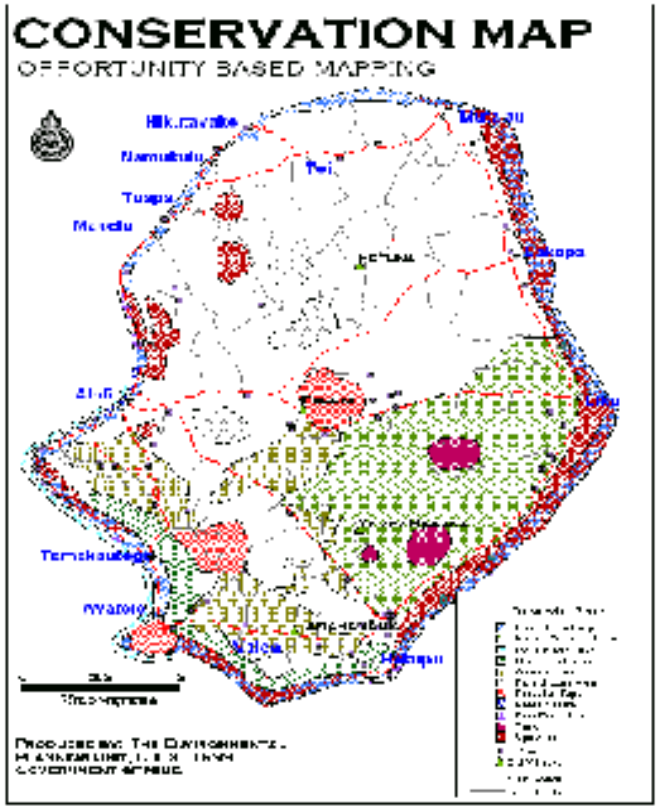


Figure 2: *Opportunity based Map for Conservation*

over their assets. It is envisaged that response times to power cuts will decrease with capture of data and having it available in a comprehensive GIS base.

GPS Based Underwater Video Mapping

Landcare NZ is involved with the Forestry Unit of the Department of Agriculture Forestry and Fisheries, in the development of a small Forestry database and GIS that will enable the storage and capture of forest plots and assets, calculation of future needs and expected yields.

GIS is becoming more popular with different agencies, with a keen interest for further training in GIS use and maintenance.

The Status of GIS and Remote Sensing in Fiji

Wolf Forstreuter & James Britton

Native Land Trust Board (NLTB)
In the mid-eighties the NLTB established the first GIS system in Fiji. Over the next eight or so years all information on land cover was captured such as forest boundaries, river system, road network and - most important for NLTB – land ownership boundaries. NLTB required this land cover information to manage lease agreements. The use of stand-alone software and data capture problems connected to the different projections and spheroids used in Fiji, created problems which resulted in high workload levels and decreased quality output. NLTB used a VAX 750-based software called InfoMap by Synercom, which did not provide a translator to data formats used by other organisations in Fiji and everywhere else in the word. The NLTB will finally move to using MapInfo after an unsuccessful attempt to work with an interim software package combination of InfoCAD and Advanced Revelation.

MSD-Forestry
Fiji's Forestry Department was the second institution in Fiji to establish a GIS. In 1991, MSD carried out Fiji's natural forest inventory. It soon became clear a GIS would be required to combine different layers in order to create the required forest function maps. Since more than 10 different layers made up of small forest patches at a scale of 1:50,000 had to be combined, *ERDAS*, a raster data-based system was selected for the task. An *ArcInfoPC* license was purchased at the same time but was not used much in the early years.

To assist in image analysis during the inventory work, a *VGA ERDAS* software package was purchased, which was the start of digital image analysis in Fiji. 1993, German aid installed a monitoring unit at MSD-Forestry and *VGA Erdas* was upgraded to *ERDAS Imagine*. Satellite imagery in the form of a SPOT scene was purchased during 1995/1996 and this enabled the Forestry Department to carry out change detection by comparing this coverage with the forest maps based on TM data recorded 1991/1992. In 1993, AusAID assistance allowed MSD-Forestry to monitor the logging activities at 1:10,000 scale. An analytic stereo-plotter [ZEISS Visopret] was purchased, enabling the Division to create digital terrain models at 1:10,000 scale utilising old aerial photography. This allowed MSD to create logging maps that contained contour lines and highlighted (via hatching) all areas above 30 degrees slope. These highlighted areas were important as they illustrated where logging was prohibited. MicroStation software was used to complete this job.

In 1994, the first GPS base station was established in Fiji. Mapping of all mahogany plantations was carried out in 1995. The requirements to carry out overlay analysis with linked tabular data in vectro data format meant the use of the as-of-yet-unused *ArcInfo-PC* software. MSD-Forestry rounded out their software stable with the recent addition of MapInfo. It is used for routine jobs that require a user-friendly interface with the user. All software packages work together as data format translation does not create problems.

Fiji Land Information System (FLIS)
During 1992 FLIS established the first digital mapping facilities for cadastral mapping. FLIS is using MicroStation software, which was introduced by New Zealand through Terralink Services. The topographic database has also been moved over to the digital world, also using MicroStation. Most recently, FLIS has introduced Vanuaview, a high-speed viewing package for cadastral and associated data. FLIS is also using MapInfo to carry out small pilot projects (such as the Police Crime Mapping Project) that illustrate the uses of FLIS data. FLIS has plans to move into Remote Sensing with the acquisition of an airborne multispectral scanner under USAID funding.

Telecom Fiji (TFL)
In 1996 TFL started its project to put its asset database into spatial form. After a selection process that included input from a number of local GIS experts, it was decided to adopt a system similar to one used in Hong Kong and many other South-east Asian telco corporations. A large data conversion began with Rolta Associates in India and stage one of this Intergraph-based project is completed with the outside assets of TFL now online in the distributed GIS database. Data updates and corrections are performed locally with TFL employees across Fiji able to access the system from remote locations via phone lines.

Fiji Electric Authority (FEA)
In 1998 FEA wanted to manage their assets in a spatial data environment and an EU-funded project established a MapInfo GIS solution in Lautoka, which later was copied to Suva. The specific needs of the electrical utility were such that customisation was required using MapBasic routines which were written in-house by FEA GIS operators.

Fiji Hardwood Corporation
In 1999, Fiji's mahogany plantation management was privatised under the Fiji Hardwood Corporation. In keeping with the work begun with MSD-Forestry, the new organisation had plans to implement GIS for the management of the forest resources. However, before this unit started to perform, the office was burned down.

Agriculture and Landuse Tenancy Act (ALTA)
The ALTA landuse section was organised under the former Ministry of Lands, ALTA and Mineral Resources to identify areas suitable for resettlement of farmers, whose leases had expired. In 1998, the section purchased ERDAS Imagine for image interpretation and an ArcInfo license for spatial vector data linked to ERDAS. After a few months of operation, political decisions stopped the work of this unit and the software is based at MSD-Forestry, now. However plans are afoot for the reformation of this unit under the Ministry of Agriculture, Fisheries and Forests.

Bureau of Statistics
Recent efforts to implement GIS with the BoS received a boost last year when GIS development was targeted as part of an overall institutional strengthening project under AUSAid. Using MapInfo, previous work had seen the creation of polygon databases for the BoS Enumeration Areas (EAs). Recent developments include the preliminary proofs of a Social Atlas of Fiji featuring a range of map plates. The Atlas should be published soon. Further GIS products are envisioned as the Unit progresses.

USP and SOPAC team up to Purchase Landsat 7 Imagery

By James Britton, GIS Unit, USP

The power of cooporation and the good sense of open data policies has made it possible for SOPAC and USP to jointly purchase a recent Landsat 7 image of the Suva-Rewa Delta area. The power of cooperation came from three different groups at USP and SOPAC each combining their limited resources to fund the $US 600 purchase. The possibility for different users to combine resources like this would not be possible but for the open data policy of the US EROS Data Center. This policy does not place copyright on the imagery but asks end-users to help cover the costs of image distribution.

At USP, post-graduate Marine Studies student Liza Koshy is studying the reef area off of the Suva peninsula. She is conducting bio-mass evaluations, species enumeration and other studies using on-site data collection and remote sensing methods. While she was able to get some scanned aerial photo imagery, she had no access to good satellite data. While Liza needs the data immediately, the Marine Studies department realises the future need for this data for other students, some of whom may be examining the mangroves in the area or urban-marine interactions. The Geography department realised the need for the data in its undergraduate Remote Sensing techniques course and in geography research projects such as urban agriculture investigations, urban growth analysis as well as bio-regional studies.

As the primary GIS and Remote Sensing technical support provider to a variety of organisations, SOPAC is interested in being able to provide the latest data for applied projects and training to end users. SOPAC is also interested in using the data in its Suva harbour mapping project. They are investigating the potential to transfer this image data to their Hypak software in the form of pyramid layers

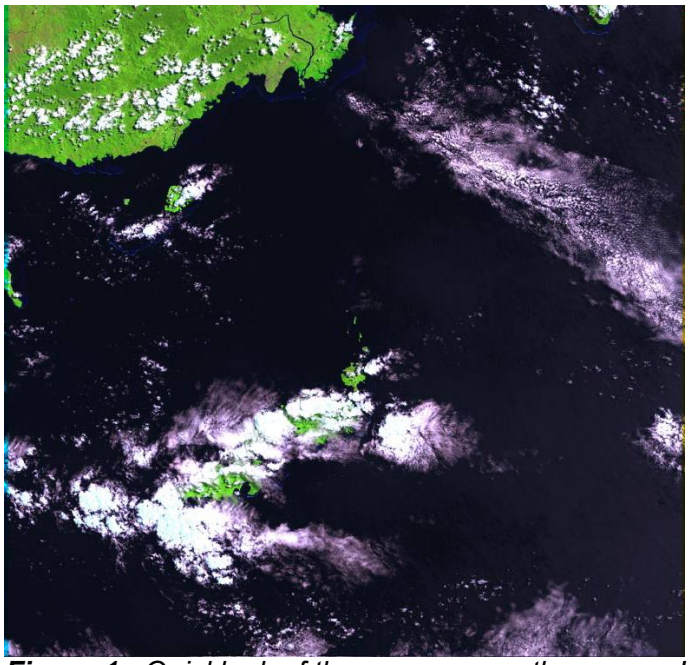


Figure 1: *Quicklook of the scene currently prepared for shipping to Suva*

The 1999 scene, which shows the Suva reefs and most of the Rewa delta was selected from among a variety of images including five scenes recorded in 2000. Some of the other scenes showed Kadavu or Beqa cloud-free, however, these scenes contained cirrus clouds over Suva area and were thus unusable.

Ironically, the high-tech imagery from the latest seven-channel US satellite was purchased by a simple credit card by SOPAC (to speed things along) and the CD-ROM containing the image should be here within two weeks. Once here the image will be rectified to Fiji Map Grid co-ordinates at SOPAC using ERDAS software, copied onto new CD's and then distributed to the participating groups.

The ease with which this model worked shows how it is possible for organisations with limited resources to co-operate in order to acquire imagery that is normally beyond their individual means to obtain. Such an approach is of particular benefit when the characteristics of the Landsat satellite are considered. The area of coverage in comparison to other systems is large. Of greatest importance perhaps is the inclusion of the visible blue band (400 to 500 nm) which is useful for shallow-water mapping and reef and coral analysis.... areas which have particular application within the Pacific Island Countries. All it takes is a little co-operation…and no one knows how to co-operate better than pacific islanders!

Remote Sensing for Tree Measurements in Fiji

Wolf Forstreuter, SOPAC
Josua Wakolo, MSD-Forestry

Introduction

Fiji's natural forests are characterised by a high biodiversity, many trees and other species growing together. Another characteristic is the effect of tropical cyclones in damaging the tree crowns but not killing natural trees so they are adapted during thousands of years. An inventory has to take into account that there is no medium height of a stand, no typical average tree and that form factors have difficulties to be applied. An inventory must be based on an average timber volume per hectare, which can then be multiplied by the area to get the standing timber volume. Another limitation in Fiji's natural forests is the fact that the tree height is very difficult to measure, it can only be estimated by looking through other crowns. This procedure has a very limited accuracy of approximately plus or minus 5 m.

Figure 1: *The traditional; relascop, which was used for Fiji's natural forest inventory*

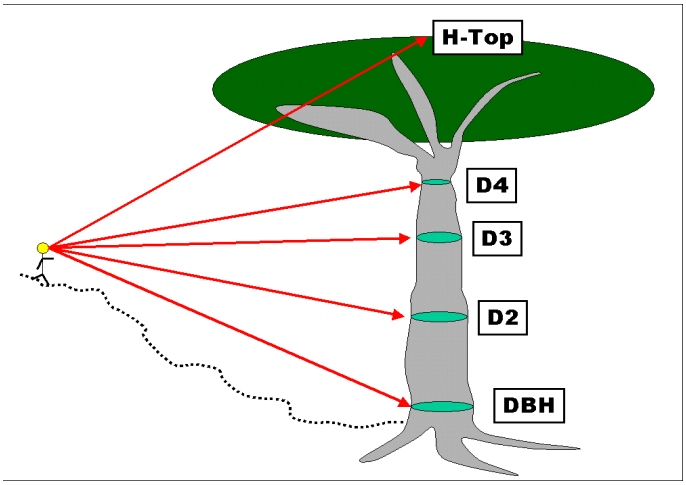


Figure 2: *Volume estimation in Fiji's natural forests, the total height is difficult to record, the tree trunk is calculated from different diameters and corresponding section lengths*

When applying a forest inventory the timber volume of single stems have to be estimated without applying a form factor, which means that the diameters at the bottom and at the end of the commercial stem and if possible at locations in between have to be measured. This was practised in the national forest inventory 1991/1992 by using a Relascop instrument, which allows measuring upper diameters from a distance. This instrument was a step forward compared to the old technique of just measuring the dbh and estimating the volume. However, there were three disadvantages:

1) It was necessary to measure exactly the down slope distance to the tree and the slope angle to be able to calculate the horizontal distance. Somebody must walk up and down the slope carrying the measurement tape.
2) The upper diameters are difficult to measure because the instrument has no optic, which zooms to the spot of measurement.
3) All readings have to be recorded on paper and later typed into a database. This is always a source of error due to typing or writing mistakes.

The Ledha GEO instrument

The Forestry Suppliers Company GRUBE sent a new instrument. This instrument was developed for the former eastern German army tanks to measure the exact distance. The distance measurement is performed by laser technology. The instrument sends a laser beam to the tree and receives the reflection from the target (tree not the other tank). The distance is calculated in cm range and at the same time the angle is recorded. The measurement is not only more precise but also the design of the instrument avoids time consuming running uphill and downhill with a measuring tape. The distance can be measured from any part of the trunk, because the horizontal distance is calculated automatically with the corresponding angle. This allows to record diameters of several trees from the same standpoint, which is another time-saving factor.

Figure 3: *The right two buttons of the instrument control the measurement while the left ones are used to type in or select the tree number out of the internal database. On the front side different menus to measure the tree distance, tree height, compass bearing or tree diameters can be selected.*

The instrument has an optic allowing to zoom in 8 times. Diameter measurements can be recorded much more precisely, now. Especially in dense forests such an optic helps the operator carry out accurate measurements.

Figure 4: *The Ledha-GEO instrument tested by Samueala Lagataki Officer of the Inventory Division of Fiji's Forestry Department. For good reading of upper diameters the use of a tripod is recommended.*

The instrument has an build-in database. All recorded diameters with the corresponding heights are stored in a file, where every tree has itsown number. After finishing a plot, the team downloads the file onto a laptop computer. This avoids writing errors when recording, this also avoids typing errors when the data is entered into a database and finally it saves also on manpower.

Figure5: *The operator focussing on the tree with the instrument's optic (right eye). At the same time, information of the database is displayed for the left eye. He operates with his right hand the measurement and with his left hand the database.*

First Results

Comparisons of test measurements in Viti Levu showed that the instrument is much more accurate than the relascop used before. Like all instruments in will be some time before the staff are really familiar with handling all functions. Improvements could be made by adding a diaphragm to the optic to reduce the entrance of direct sunlight. The instrument arrived shortly after the 19th of May and the activities at Fiji's Forestry Department were limited. Currently tests are being carried out to collect quantitative data of time saving.

Further Developments

So far, the instrument was used to replace the relascop for its function in the inventory design developed for Fiji's natural forests. However, the instrument is capable of measuring more than tree diameter and corresponding heights. The Ledha-GEO has a build-in compass, which also can be recorded by the database of the instrument. If the standpoint location of the operator is recorded by a GPS and will be linked later to the compass bearing and exact distance to the tree everything can be displayed in a GIS. It would allow having an exact picture of tree distribution within a sample plot. If an operator after a period of years returns to the GPS located position and records the trees again the GIS display will allow exact change detection. A visual display would highlight missing trees and which trees have an important increase of diameter.

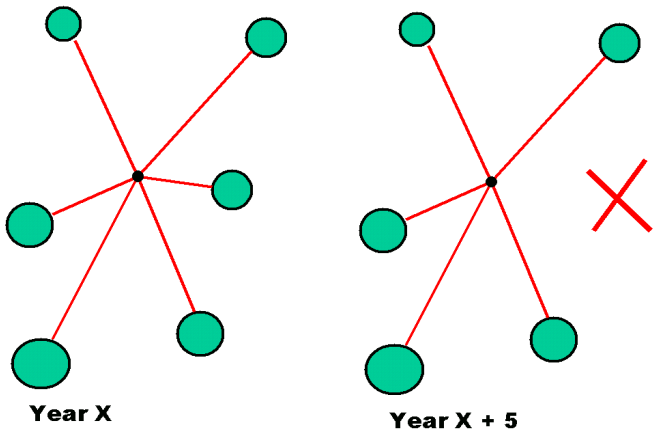


Figure 6: *Possible screen display if the position of the operator is recorded by GPS. Compass bearing and exact distance will allow the comparison of trees after a period of time and will detect missing trees within the sample plots.*

For further information contact:

GRUBE KG
http://www.grube.de
export@grube.de
Fax: +49-5194-900-366

Josua Wakolo / Samuela Lagataki
MSD-Forestry
Fax: +679-320311
jo@msd.forestry.gov.fj
samu@msd.forestry.gov.fj

Wolf Forstreuter
Fax: +679-370040
Wolf@SOPAC.org.fj

SOPAC becomes Regional Member of the International Society for Photogrammetry and Remote Sensing

Wolf Forstreuter, SOPAC

The International Society for Photogrammetry and Remote Sensing (ISPRS) held their international congress this year in Amsterdam. This congress takes place every four years in a different city in the world. At this congress SOPAC became a regional member of ISPRS.

International Society for Photogrammetry and Remote Sensing
Internationale Gesellschaft für Photogrammetrie und Fernerkundung
Société Internationale de Photogrammétrie et de Télédétection

The ISPRS

The ISPRS is a nongovernmental international organisation, devoted to the development of international cooperation for the advancement of photogrammetry and remote sensing and their applications. …….. *fine, how can it help the South Pacific?* …. there are several ways:

a) The international congress every four years which sets impulses of development for the field of remote sensing.
b) There are many working groups in different fields of remote sensing photogrammetry and their application with participants of research institutes and from the industry. These working groups stimulate investigations of new methods of data analysis.
c) The ISPRS ensures a wide international circulation of research results and findings of the working groups mentioned under b).
d) The members are provided with the official publication of the society, which is one of the most interesting journals in the area of remote sensing.
e) The ISPRS will also help to publish new methods and remote sensing applications from the South Pacific.

What does being a Regional Member mean?

There are different memberships possible. SOPAC as a multi-national organisation with the mandate for assistance in the area of GIS and remote sensing falls under the category of a regional member even if some countries apply and become ordinary member. Most Pacific Island Countries will never apply to become a member of ISPRS. SOPAC will act as a focal point for the South Pacific and will stay in touch with the ISPRS and distribute any interesting information to SOPAC's member countries.

Even with a link to the internet, SOPAC was still missing a link to information when it comes to special development in image data application. This gap will hopefully be closed now. On the other hand, there might be applications where the South Pacific region will contribute to the rest of the world. So far, there is very limited remote sensing application compared with the outside world and no ordinary (country) membership. Now, the South Pacific will be recognised by the researchers world wide. A lot of satellite image application will be developed for the specific needs of Pacific Island Countries such as reef monitoring, as the world's most intact and beautiful reefs are here and not in USA or Europe.

isprs
information from imagery

The new ISPRS logo launched at the congress in Holland

GIS and Remote Sensing Updates

James Britton, GIS Unit,USP

Readers of the GIS/RS News must have noticed that our recent issues have not included the detailed reports of the Fiji GIS/RS User Forum meetings. It was felt these included a little too much detail and did not allow for a more balanced overview of what was going on in the regional GIS & Remote Sensing scene. Due to the recent unrest in Fiji, the User Forum was not meeting for a while, however, it has started up again in the last month. This summary will report about two items of regional interest.

1) One decision that has been made is to go ahead with the **GIS/RS User Conference**, November 28, 29, & 30, 2000 at USP in Suva. For more information on this, our third annual user conference please e-mail to james.britton@usp.ac.fj .

2) There was an independent review of a new development project under consideration by the European Union (EU) under its ACP (African, Caribbean, Pacific) programme. Mr. Sandy Macfarlane of CSA, Ireland was recently in the Region examining the feasibility and value of the project prior to making final recommendations on approval to the EU. One focus of this project, which would be carried out by SOPAC, is to assist in the development of a series of uniform remotely sensed geo-rectified and referenced satellite image backdrop images that can be used as a base resource by those working in GIS in a wide range of applications. Each user will be able to do on-screen image interpretation according to the specific needs of their own discipline. The common format of the images and the results obtained will permit the sharing of results between organisations and individuals. Also a digital format will allow for faster updates.