FEBRUARYNEWS

The last meeting was held Tuesday 8 February at FLIS, Gorrie Street, Suva.

- Abinesh Krishan, FLIS, outlined the LIS/GIS training program which provides comprehensive in-house and institutional training
. USP outlined receipt of 20 PCs and 1 digitiser with IDRISI and Arc/Info software.
- MRD highlighted the urgent need for the compilation of national GIS documentation and suggested that SOPAC would be an appropriate facilitator. GIS documentation is defined as a catalogue of available data including description, origin, format, owner and custodian. SOPAC advised that there is the infrastructure available to carry out this function and FLIS advised that it had the mandate to undertake the coordination of GIS documentation of Fiji's land based data. MRD then suggested that there should be two sets of documentation, one for Fiji inshore or land based data and the second covering additional data includes coastal, offshore and climatic. It was also highlighted in the discussion that FLIS is responsible for all data belonging to government sectors while there is a need for a catalogue which includes data from non-government organisations as well where this catalogue could be compiled and maintained by SOPAC.

- Kemueli Masikerei, FLIS, reported on the annual AURIS Conference.
- Customary land tenure systems and GIS was presented by Mele Rakai, MAFF,
- A comparison of GIS systems was presented by Silika Tuivanuavou, FLIS.

GIS & REMOTE SENSING NEWS

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e lcome to the fifth issue of this newsletter. This month there are contributions from FLIS, SOPAC and Drainage and Irrigation, MAFF, as well as NLTB and MSD, MAFF, FLIS provide a report of their comprehensive in-house and institutional training program while SOPAC outline the results of the GIS and Remote Sensing data sharing initiative which was addressed at the SPOCC meeting in February at Apia. The benefits of LIS is examined by Mele Rakai and the FLIS action plan for NLTB is outlined. A report by F. Simas de Andrade who was attached to MSD provides an overview of environmental monitoring in Brazil where remote sensing is assisting land management, in particular the valuable forestry resources. This situation is very relevant for South Pacific countries where it has been agreed that there is a need to apply remote sensing. Technical tips details running VGA-ERDAS under Microsoft Windows and the benefits from the latest DOS upgrade. Meanwhile, we look forward to your continuing support through any articles, tips or hints.@

SATELLITE NEWS

* SPOT 3 continues to run successfully since 29 November 1993. While SPOT 1 and SPOT 2 are dedicated to acquiring imagery over Europe and other areas on special missions, SPOT 3 stores images recorded anywhere on the globe onto the on-board tape recorders for subsequent downloading in Europe. SPOT 4 is under construction and will include a mid-infrared band and a wide area vegetation monitoring sensor. A laser telecommunication capability will allow the transmission of high band-width data to a geostationary communications satellite that will relay the data to earth. Up to now, tape recorders give a limitation of data recording. [see GIS World, March 1994].

* The Russian space station MIR [see January 1994 GIS/RS News] continues observing the earth's surface. Single and multiband cameras take real photographs (not digital images) from 400 km height. Using a ground resolution of approximately 7.5 m and coloured film, it is possible to detect small details not visible with the current sensors of Landsat and SPOT. In the October 1993 GIS/RS News, Osea Tuinivanua highlighted the need for good spectral resolution of remote sensing data for forest applications. The available MIR aerial photographs do not cover the mid infrared but the sub 10 metre spatial resolution together with colour may allow the monitoring of selective logging. Investigations with photographs taken from MIR Space station are carried out in Germany from an area in Kalimantan (Indonesia). [see F. Siegert, V. Liebig, A. Wanninger "Fernerkundung zum Schutz des Regenwaldes", Geographische Rundschau December 1993). This Newsletter will follow up the progress of the research.

* DARA in Germany is currently Preparing a catalogue of available MOMS-02 (Modular Optoelectronical Multispectral Scanner) data. During the Space Shuttle mission, in spring 1993, 1500 scenes were recorded. Radiometric problems caused by extreme variation of temperature during the flight must still be solved, but the catalogue is expected, soon.

- The MOMS-02 sensor is a further development of the 01 version which was onboard the Space Shuttle during 1983 and 1984. [see January 1994 GIS/RS News] provides multispectral images in the following bands:

440 - 505 nm
530 - 575 nm
645 - 680 nm
770 - 810nm

The area covered on the ground is 78 x 43 km with a pixel size of 13.5m.

- MOMS-02 can also provide 4.5 x 4.5 m high resolution panchromatic digital image data in the 520 - 760 nm band. This is a higher resolution than the SPOT sensors in panchromatic mode which have 1 Om resolution.

- MOMS-02 also provides

panchromatic 520 - 760 nm stereo images with 13.5 x 13.5 m ground resolution. It should be noted that the stereo images are taken at the same time so there is no change on the ground. However, SPOT stereo images are taken on different days and sometimes weeks apart.

. MOMS-02 will be installed on board of the Russian space station MIR where it can stay in space for a long time (years).The Russian station also allows a repetition rate of 2 to 7 days. [see P. Seige, D. Meissner "MOMS-02: An advanced high resolution multispectral stereo scanner for Earth observation" GIS I/I 993]

• In the February 1994 GIS/RS News, the plan for a portable ground station (PGS) was mentioned. Now, we have received the news that this ground station will be built by EOSAT and Telespatio, to be operational in 1994! The PGS will be able to receive Landsat TM and MSS, ERS-1 and SPOT data. However, there are no plans at present to base the station in the South Pacific. The first planned location will be equatorial Africa.

. EOSAT has signed a data source agreement with Sovinformsputnik of Moscow in Russia, to distribute their high-resolution satellite imagery. [see EOSAT Notes, November 1993]

• Michel Larue, SOPAC, attended the 7th Australasian Remote Sensing Conference I-4 March 1994, Melbourne,Australia. Highlights of the conference and items of interest to South Pacific users will be reported in the next newsletter.@

COMPUTER SYSTEMS TIPS

MS-DOS 6.2 upgrade
Users with MS-DOS 6.0 should upgrade to 6.2 and users with 5.0 or earlier should upgrade directly to 6.2, The compelling reasons for the upgrade is the additional safety features with the disk compression utility, DoubleSpace, as well as support for CD-ROM caching which provides improved performance. Despite the extra safety features with DoubleSpace, a user should remove unwanted files, run a thorough surface test and back up data files before installing compression. The new features of 6.2 are summarised as follows:

• ScanDisk detects, diagnoses, and repairs disk errors on uncompressed drives and DoubleSpace compressed drives.

• DoubleSpace now includes DoubleGuard

REMOTESENSING USERGROUP

The South Pacific Organisations Co-ordinating Committee (SPOCC) at its sixth meeting in Apia on 14- 15 February endorsed the formation of a formal regional user group consisting of FFA, SOPAC, SPREP, SPC and USP as well as LATICAL and **SPT** which are remote sensing laboratories in New Caledonia and Tahiti. The provisional record of proceedings yields the following:

The Committee noted its previous decision that SPC should be the lead organisation in regard to GIS and Remote Sensing. The program currently being run by SPC using remote sensing imagery had been reduced in scope and would only be sufficient to provide for SPC's internal requirements for their fisheries program.

The Committee noted the potential for several SPOCC organisations and their member countries to utilise any imagery obtained by other organisations and the consequent cost saving to be realised. In order to do this however, additional payments are required, to permit access for more than one user. It noted the operations of the Regional GIS users group.

SPOCC endorsed a continuation of the Regional GIS Users Group, and gave its support to its activities that would result in savings in the cost of data acquisition and data sharing. The Committee endorsed the role of SPREP in compiling and updating the Regional directory of GIS/RS data and the expertise available. It also endorsed the recommendation that a formal user group consisting of representatives from FFA, SOPAC, SPREP, SPC, USP, LATICAL and SPT be created to purchase satellite images and that additional copyright be paid so that these images could be shared amongst the community of users. The Committee also endorsed the recommendation that a catalogue of existing and planned satellite images be created and provided to all organisations on a permanent basis with one organisation being responsible for organising this task. As an interim measure the Committee agreed that special copyright arrangements be made to enable common use, until a formal arrangement is entered into. SPOCC also decided that SOPAC should prepare a draft Memorandum of Understanding for the consideration of the special meeting of SPOCC to be held in Brisbane.@

safety checking, which protects against data corruption by verifying data integrity before writing data to disk.

• DoubleSpace automatically mounts compressed floppy disks and other compressed removable media even when Windows is running.

• Uncompress a DoubleSpace drive or uninstall DoubleSpace from memory.

• SMARTDrive caches CD-ROM drives which should enhance performance.

• HIMEM automatically tests system memory during startup to assist in identifying unreliable memory chips.

• Setup now configures SMARTDrive as a read-only cache by default. Even if write-caching is enabled, MS-DOS does not display the command prompt until SMARTDrive has written its cache to disk tc prevent turning off the computer before data in memory saved.

• MOVE, COPY, and XCOPY commands ask for confirmation before copying a file over another file with same name.

- Bypass or carry out individual commands in AUTOEXEC.BAT and other batch programs through use of F8 key. (In MS-DOS 6, capability was limited to CONFIG.SYS file).

- DoubleSpace can be bypassed during startup to assist in troubleshooting.

- DISKCOPY command faster by use of hard disk as an interim storage.

* DEFRAG faster through use of extended memory.

- DIR, MEM, CHKDSK and FORMAT output easier to read through use of thousands separators.

NOTES
- The Windows permanent swap file must be stored on the uncompressed (host) volume while a temporary swap files can be stored on either the compressed or uncompressed volumes
- Windows NT cannot be installed on a compressed volume.⊕

POST GRADUATE LIS RESEARCH

(Mele Rhkai has recently completed her Master of Surveying Science degree by research in which she examined the policy and management issues implementing LZS in developing countries that operate under customary land tenure systems. Her thesis was titled "F'iji: Incorporating Customary Lund Tenure into an LIS")

Land Information Systems (LIS) have been developed primarily to capitalise on the rapid developments in computer and communications technology and to improve work efficiencies in the land administration fields. Effectively this means that LIS has been designed for economies that are driven by the property market - such economies being those of the western world. Thus countries with land tenure systems that are based on the property market have been able to more readily absorb the innovations associated with land information systems. In such countries land is conceived as being a property that can be easily bartered and conveyed from one person to another.

Such a concept however is not upheld by many developing countries, such as those of Africa, the South Pacific, and the Americas. Here an emotional attachment to the land, based on historical, cultural, and family ties, is still an important, influential factor in land related matters. These countries, operating under such customary concepts of land tenure, will need land information systems that are not solely driven by the property market concept. Although many of these countries are now experiencing a real move towards becoming a property market driven economy, they will still continue to operate with their inherent traditional economies based principally on cultural and family ties.

To fulfil the requirements of a Master of Surveying Science degree with the University of Melbourne, I examined the ideas of implementing LIS in developing countries such as Fiji that operate under both western and customary land tenure systems. Since much of the problems of developing LIS have been on-technical ones, the research concentrated on the non technical (i.e. managerial) issues of developing LIS. The research was therefore largely conceptual, based on existing systems in Fiji and other countries.

The research methodology adopted was to first review Fiji's land tenure systems in order to be able to appreciate how and why Fiji's two land tenure systems developed as they did. Fiji has two land tenure systems, one based on the 'western' property market concept, the other based on the 'traditional' subsistence market concept. Surprisingly, the research indicated that both systems have been inspired, influenced, and moulded by a British Colonial Government that was at once sympathetic to the aspirations of the capitalistic non-Fijian, largely European settlers at the time: and the non-capitalistic aspirations of the Fijian communities at the time. The conflicting aspirations of the two dominant communities has resulted in the existence in Fiji today, of two land tenure systems that continue to engender land problems that affect the economic development of Fiji. The ability of the LIS to more efficiently gather, store, and analyse land related data provides Fiji with a tool to evaluate its land tenure systems and bring it more in line with Fiji's existing development hopes and aspirations.

The next step in my research was to review LIS developments in those developed countries with economies that are based on the western property market concept, and in three developing countries that have economies that are influenced by both western and traditional land tenure concepts. Sweden, South Australia in Australia and New Zealand were selected for the developed countries, while Vanuatu, Papua New Guinea and the Solomon Islands were selected from the developing Pacific countries. This was then followed by a review of LIS developments in Fiji. The reviews highlighted the fact that LIS's in both developed and developing countries have been developed to cater for lands that have been alienated for the property market. This is hardly surprising, given the basic fact that customary land tenure information has never actually been documented and legally formalised. Herein lies the problem, since by its very nature, customary land tenure is unwritten, which therefore allows for much of its flexibility. The act of recording customary land tenure will bring with it, as it always has in the past, the rigid finality that the written word always brings to informal arrangements.

Technically, there is a need to modify the design of LIS technology, to make them more appropriate and fully applicable for the implicit, largely

NLTB/LISACTION PLAN

The Native Lands Trust Board at a meeting of the Fiji Land Information Council in July 1993 requested that a detailed study be carried out in the future direction of the Board's Land Information System.

The joint study was conducted by the New Zealand Department of Survey and Land Information, the Fiji Land Information Systems Support Centre and the Information Systems Department of NLTB. The Report recommends changes to the Native Land Trust Board Land information System now necessary because of new technological developments and the existence of the Fiji Land Information System (FLIS).

Access to the various enquiry systems available through the Fiji Land Information System is considered essential for NLTB staff in Divisional Offices and Head Office in Suva. The current implementation of PC-based

undocumented and culturally driven nature of customary land tenures. However the root of the problem lies basically with Fiji and other developing countries that continue to operate under both western and customary land concepts. The two concepts are based on totally different values and aspirations and therefore can never be aligned - one will always have to give way to the other. Until countries such as Fiji are able to define their developments priorities, and thus what the LIS is to be used for - i.e. is it to be used for people living on alienated lands only, or is it to be used for the benefit of people living on both alienated lands and unalienated lands - the LIS will continue to engender the land problems that exist in Fiji today.

The conclusions derived from the research were as follows:

• that the problem of implementing LIS's that are relevant and appropriate to the needs of developing countries like Fiji will only be resolved when the conflict between encouraging capitalistic interests and maintaining traditional social and cultural values is resolved, and an effective policy formulated accordingly.

• that the design of the LIS be revised to document and incorporate those features of customary land tenure that can be documented but so far have not been incorporated into existing LIs's.

• despite the above inherent existing drawbacks the LIS does offer an opportunity for countries such as Fiji to evaluate their land tenure systems, in order to identify areas that need to be reformed.

For further information contact Ms Mele Rakai Registered Surveyor Drainage & Irrigation, Ministry of Agriculture, Fisheries and Forestry. Tel: (679) 312356. Fox (679) 305546.

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computer networks within those offices will provide the means of accessing this land information.

Furthermore, the report recommends that the current data capture project to capture NLC Sheets for all of Fiji should continue and a continued effort made to complete the project by the end of 1993. The acquisition of data transfer software is essential to allow the exchange of cadastral mapping data with the similar FLIS project in the Department of Lands & Survey (that is working to similar completion deadlines) and be extremely valuable in the exchange of spatial land information between different agencies involved in LIS/GIS.

A NLTB LIS training programme should be developed incorporating suggestions in the report and a staff member should be designated as responsible for overseeing its implementation and annual review.

As part of this study a Joint NLTB/FLIS Technical Working Party has been established to oversee the implementation of this report and provides the Board and Land Information Council with regular progress reports.

For further information contact Fiji Lund Information Service. Tel (679) 314399 Fax: (679) *305029.*⊕

■ *by Flavio Simas **de Andrade***

ENVIRONMENTAL
MONITORING IN BRAZIL

Introduction

During the last forty years the Brazilian population increased from 55 million in 1950 up to almost 140 million in 1993. Not only was there a brutal boost in the number of inhabitants but its distribution was altered radically.

In 1950 Brazil was a predominantly rural country but by 1970 the population was concentrated mainly in large cities like Sao Paulo. Rio de Janeiro, Belo Horizonte, and Porto Alegre.

To correct this great imbalance, the Brazilian Military Government decided that the time had come to colonize the Amazon Region to provide land for landless farmers and alleviate pressure in big towns.

Rondonia was the state selected to host the first group of settlers. Families were provided with 100 hectare lots in dense or open tropical rain forest zones. To set up and maintain properties they had to remove at least 1 or 2% of the natural vegetation. barge stretches of forest were cut down and burnt in order to honour commitments to the Federal Government.

Results achieved by agricultural production from these farms during the first years of the colonization program were considered satisfactory, even when compared to the traditional agricultural states like Sao Paulo, Parana, and Rio Grande lo Sul. Enormous publicity given to the small success stories by the press encouraged the government to expand the number of colonies and states involved in the program.

Since little control existed on the alotment of plots, many farmers sold their parcels and moved on to another district requesting a new piece of land.

The second phase of the operation included establishing cattle ranches in Para, Mato Grosso, Rondonia, Acre, **Amapa** and Amazonas states. The Superintendency for Amazon Development (SUDAM) offered fiscal incentives to farmers or companies that were willing to install cattle breeding projects in the region.

This policy substantially augmented the destruction of natural forests, since grazing fields were introduced in vast extensions of forest lands and legislation permitted deforestation of 50% of the domain for this purpose.

Because of the great sizes of these cattle ranches, "farmers" purchased more than double the amount of land that was necessary and 50% of it was cleared. These estates were later divided into two or more parts and the other segments were sold for great profit. The new proprietor had the same behaviour as his landlord and soon the locality was totally deprived of its original vegetation.

After a successful start, many cattle ranches were simply abandoned because the soils had lost their fertility and the initial productivity could not be sustained.

Agricultural practices and cattle ranches were instituted in the Amazon for political reasons. No technical input was considered. Basic research was not carried out in time to determine: a) an adequate colonization model for the territory; b) if the region had the necessary infrastructure for such an undertaking c) if the soils were suitable for cultivation d) what type of crop should have been introduced and e) if cattle raising projects were really essential and profitable.

Mining also became a very profitable operation which contributed highly to the destruction of the Amazon

WHEN YOU MADE THIS MAP, WHY DIDN'T YOU INDICATE THIS AREA WAS WATER?

I RAN OUT OF BLUE CRAYON
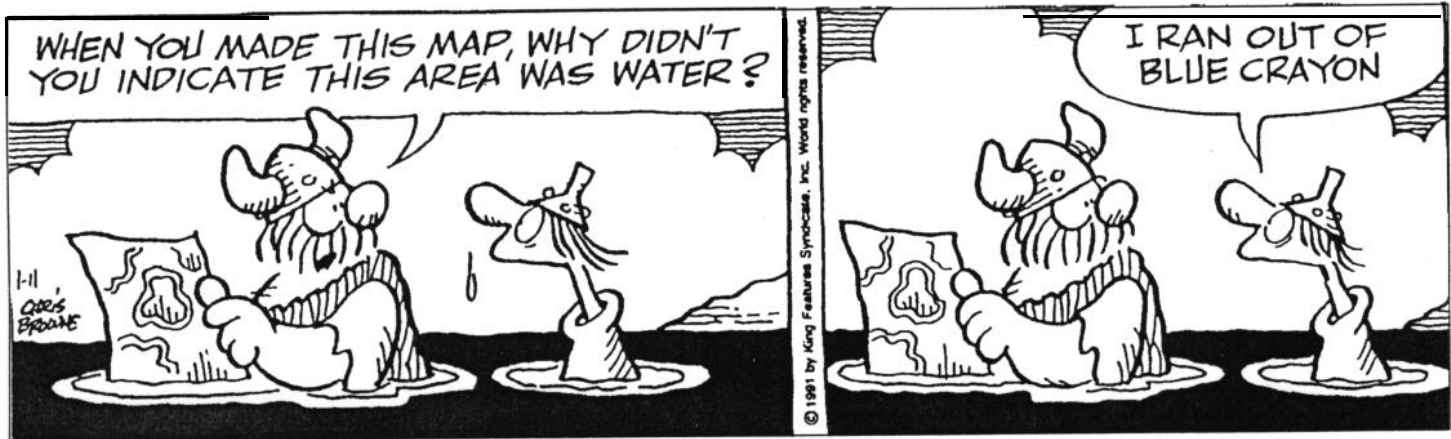
environment. The greatest gold mine in Brazil's history (Serra Pelada) was discovered in the Municipality of Maraba in Para state. News spread rapidly and more than 60,000 miners flocked to the site to try their luck, creating a huge crater in the ground.

The most destructive form of gold mining occurred in rivers either by the employment of mercury to separate the soil from the mineral or by the quantity of silt in the water.

The planet's greatest iron ore reserve was also detected in the Municipality of Carajas in Para. The Carajas Sao Luis railway was constructed to transport production from mining location to Sao Luis Port (Maranhao State). Severa metallurgic plants were inaugurated near the locality and according to government instruction these companies could utilize wood charcoal produced from natural forests in the first years of operation but had to carry out a reforestatior program in order to replace the energy source. Government instructions were never implemented.

Another factor that expanded the destruction of tropical rain forests was the enormous hydroelectric plant? constructed in the jungle (Tucurui and Balbina). Tucurui is the smaller in energy production size but its dam is the larger one. Lengthy legal wranglings prevented most of the timber from being removed on time before the area was flooded.

By the end of 1978 several institutions (government, private, NGO's, etc.) were motivated to employ satellite imagery to identify and determine the extent of devastation that Brazilian tropical rain forests and other natural ecosystems had gone through. The Brazilian Forest Cover Monitoring Program (PMCFB) and the Space Research Institute (INPE) were pioneers in the utilization of airborne data for environmental monitoring.

The **Brazilian Forest Cover Monitoring Program - PMCFB**
The Brazilian Forest Cover Monitoring Programme (PMCFB), linked to the Brazilian Institute for Forestry Development (IBDF). and the Space Research Institute (INPE) mapped the deforestation that was under way in the entire Brazilian Amazon territory by means of visual interpretation of satellite imagery for the first time in 1978.

This surveillance program continued throughout the 1980's and PMCFB managed to monitor deforestation and its impact on natural forests. Special emphasis was given to the Amazon territory because of the continuing colonization program carried out by the Federal Government.

With the advent of a Geographical Information System designated 'SGI" and a Digital Image Processing System (SITIM) in 1986, developed by the Space Research Institute (INPE), PMCFB initiated a new phase, automating operations that in the past were accomplished manually.

The **Brazilian Institute of Environment and Renewable Natural Resources - IBAMA**
The Brazilian Institute of Environment and Renewable Natural Resources, created by Presidential Decree No.7735 in February 1988, is a Federal Autarchy linked to the Ministry of Environment.

IBAMA superceded the Brazilian Institute for Forestry Development (IBDF); the Environmental Secretariat (SEMA): the Rubber Superintendency: and the Fishery Superintendency (SUDEPE). The Technical and administrative staff of these organisations were incorporated into the new IBAMA structure.

IBAMA accounts for the formulation, co-ordination, execution, and implementation of the Brazilian environmental policy and it is also responsible for the preservation, conservation, supervision, and promotion of natural renewable resources.

The Institute monitors and supervises 30 Ecological Stations, 34 National Parks, 23 Biological Reserves, 38 National Forests, 9 Extractive Reserves, and 6 Ecological Reserves, preserving over 300,000 km^2 of Brazilian natural and artificial ecosystems. This figure represents approximately 5.4% of all Brazilian territory (5.5 million km^2).

The Remote Sensing Centre - CSR
The Remote Sensing Centre (CSR) is linked to IBAMA's Research Directory and was formally founded in January 1989. affiliating the Brazilian Forest cover Monitoring Programme (PMCFB/IBDF) and SEMA's Ecosystems Directory. It embraces a multidisciplinary team of Foresters, Biologists, Geographers, and Agronomers with more than ten years of practical experience in Remote Sensing.

The Centre's main objectives are to:
(a) Plan and implement research projects aimed at monitoring environmental transformations of natural ecosystems that are constantly under human occupation processes:
(b) Promote the dissemination of remote sensing techniques to all members of the National Environmental System (SISNAMA) and Remote Sending Centres in Brazil:
(c) Provide information for environmental zoning and land use planning programs: and
(d) Promote technical and scientific interchange with national and international organizations.

CSR is involved with several projects utilizing modern Remote Sensing technology such as Geographical Information System and Digital Image Processing Systems developed by INPE Visual interpretation is still being used in some cases. The main projects are :
. Monitoring the Modifications of the Brazilian Forest Cover, specially in the Amazon Region:
. Identification of Desertification Processes in the Northeast of Brazil;
. Monitoring IBAMA's Conservation Units and Surrounding areas;

Problems faced by Government Institutions
(a) Institutional - Constant changes in the Federal Government affects normal activities carried out by IBAMA since its formal structure is often modified;
(b) Software - Brazilian computer pograms SGI and SITIM have a reasonable standard when compared to similar programs produced abroad but its development is affected by institutional problems that the Space Research Institute

is facing in the last years:
(c) Hardware – Brazilian made computers have low performance and reliability when compared to the those manufactured in developed countries. Fortunately modification made recently to information legislation now permits importing modern computers into Brazil; and
(d) Training - Training of professional staff is not adequate in view of budget shortage.8

MULTI-TASKING UNDER MICROSOFT WINDOWS USING VGA-ERDAS

It is possible to run muliple processes of VGA-ERDAS under Windows or run ERDAS in the background or do other Windows or non-Windows functions providing you have the minimum configuration of a 486/33 PC with 8 Mb RAM and 16 Mb swap space and Windows is running in Enhanced Mode. Note that VGA-ERDAS needs expanded memory and EMM386.EXE must be run in CONFIG.SYS with appropriate parameters to provide this memory.

1. In Microsoft Windows, click on the PIF Editor icon and Create a new PIF file named VGA.PIF with the Save As command.
2. Fill in the following responses. See example Window.

Program Filename	COMMAND.COM
Window Title	Your preference
Start-up Directory	Usually the data directory for ERDAS
Video Memory	High Graphics
Memory Requirements	500.506 (use highest you can based on available in system]
EMS Memory	1260.1260 for 640 x 480 resolution
XMS Memory	0,0
Display Usage	Full Screen if you want to run display related programs
Background	ON
Close Window on Exit	ON
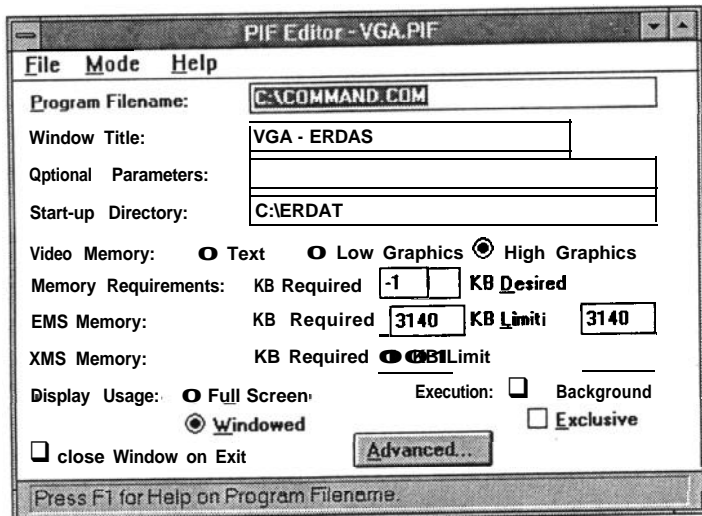
In Advanced Options, fill in the following (see example Window)

Background priority	50 (default)
Foreground Priority	100 (default)
Detect Idle Time	ON
Memory	EMS locked ON all others OFF
Display	all OFF
Other	Allow Fast Paste
Application Shortcut	Optional

SUVA AUTHORITIES MEET

Urban users meeting
The most recent meeting was held on 22 February with PWD, FPTL and SCC. The other authority that is a major user is FEA and FLIS have decided that they will make a visit and request further involvement of FEA. The meeting was quite informal with the groupsdescribing their latest successes and intentions.

FLIS described the discussions held with NLTB on transferring data which will lead to a common use of layers among all users in Fiji. This is a critical first step as each authority begins to ensure that all data is easily copied and easily understood.

Other issues discussed were the capture of data in Suva Central Business District, use of the new FLIS total station, photographing old drawings on Microfiche and the importance of making Permanent Secretaries aware of content of these "technical level" discussions.

Next meeting 9.30 am, 30 March.

Overcoming the problems of computer illiteracy
A common problem all Suva urban users have is how to introduce computers into an office where there has been no previous use. Another problem is training up two or three draftsmen for two years and then a private organisation offers them more money.

The solution chosen by PWD is to train the entire office together which is accomplished by training sessions at lunch time. A further step was to buy a notebook computer so that officers could take it home and learn in their own time. The program is in its infancy but there are strong indications that it will be successful.

The following software has been chosen for its simplicity: Fastcadd, Word Perfect, Excel, Dbase IV and Geocomp.
For further information contact Phil Wright, PWD, Tel 3 15244, Fax *303023*.
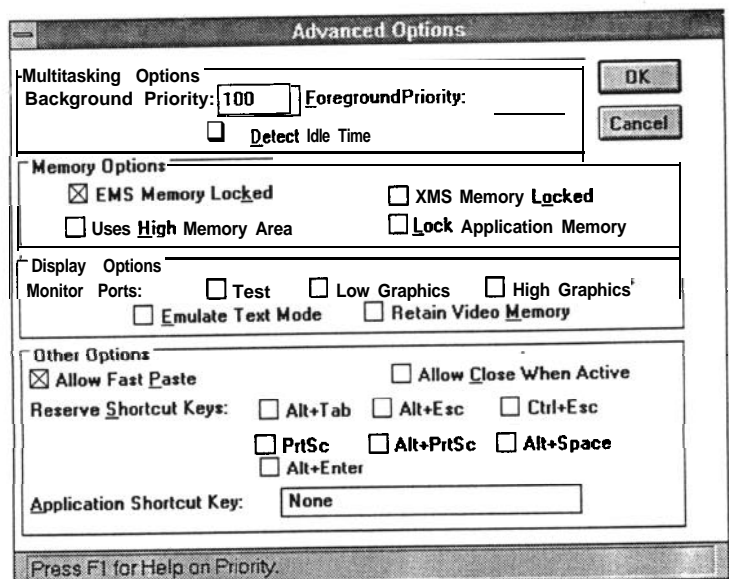
Click OK to exit the Advanced window, then click File … Save to save these changes in the PIF file.

3. In the group that you want the icon to appear, click File . . . New, select the Program option and click OK. An example of the fields to fill in follows:
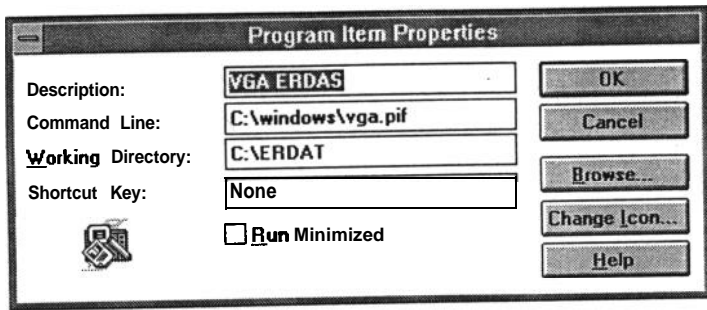
Click OK to save.

You can now run ERDAS in a window where any non display programs can be run. However, you must be in full screen mode to run display related programs.

This information is from ERDAS Monitor and provided by Critchlow, *Critchlow* Associates, Wellington, New Zealand. Tel: (64) 4 4726695 Fax: (64) 4 *4728244.*⊕

1994 FLIS TRAINING PROGRAM

Introduction
The Land Information Strategy for the Republic of Fiji identified the need for a comprehensive training regime "... to **ensure that in the long term the** management **and** development of a National **L/S can be in the** hands of **local** personnel . ..'

The 1994Training Programme is the third of such programmes to be prepared as part of the FLIS Programme. Although significant deficiencies still exist within departments associated with the FLIS programme insofar as computing expertise is concerned, the implementation of the 1992 and 1993 Programmes has resulted in a dramatic improvement. So much so that the fulfillment of the LIS Strategy objective is well on its way.

It is important that the role of the Advisor in training is highlighted. Amongst other things the LIS Strategy spells out that " . . . the **presence of an overseas advisor would be beneficial from the training view point . . .** " The Advisor, apart from his many other duties, has already established successful training courses for the LIS Support Centre staff.

FLIS will continue to vigorously comply with the Public Service Commission (PSC) Policy on affirmative action in training placements for staff of indigenous (i Taukei or Rotuman ancestry. The importance placed on land by the **i *Taukei*** is unfortunately not reflected in the current scholarship schemes adopted by the PSC or the Fijian Affairs Board. The PSC training division needs to elevate land related training as an area that needs urgent attention.

1993 **Training Program Summary**
Successful placement of officers in overseas academic courses was a major achievement. Two officers proceeded to undertake a one year Post-Graduate Diploma in Land Information programme at the University of Otago and the Principal Technical Officer attended a Post-Graduate Diploma in Land Management at the University of East London, United Kingdom.

Two officers attended a three month LIS/GIS Course funded by the Australian International Development Assistance Bureau (AIDAB) at the Universities of Queensland and South Australia. A Senior Officer from the Native Lands and Fisheries Commission (NLFC) attended a two week on-the-job attachment in Auckland, New Zealand.

Locally, 24 personnel successfully completed the Certificate in LIS/GIS Course from the Open Polytechnic of New Zealand and in addition a further 10 staff from FLIS member agencies successfully completed an introductory GIS Course from the University of the South Pacific's GIS Unit.

Two officers successfully completed certified Novell training through Computech Electronics Limited.

In-house PC Awareness, Novell Netware and Systems Support training continued and the Advisor's Advanced Revelation troubleshooting classes attracted personnel from each of the FLIS networks.

Apart from fine-tuning the CCMS System, a Consultant from Intergraph Corporation New Zealand also provided useful training that ensured a substantial improvement in the CCMS output.

End User training was successfully conducted in all FLIS Systems by the Training Officer and a tailored PC Awareness Seminar for Senior Management was extremely successful.

Training Strategy
It has been noted that local, Fiji based training has been more effective and economical than overseas training. Getting experts and consultants to run in-house courses means more personnel can be trained for much less costs. Whilst in country the consultants can also be used to fine tune operational sysrems.

Courses at local institutions will be given a priority particularly the University of the South Pacific where plans are well advanced for the establishment of a Diploma Programme in GIS/LIS for the 1994 academic year.

Emphasis will also be given to short courses, part-time study, workshops and seminars. The 1994 FLIS Training Programme is designed so as to ensure that all staff associated with FLIS will undergo some form of training in 1994.

Training Needs
The training needs today are somewhat different from that of 1992 and 1993. Whereas previously in the infancy of the FLIS Programme, substantial computer awareness courses were needed, today the needs are more in specialist areas.

Stage II of the FLIS Programme which commences in 1994, involves the development of a topographical database. These maps are extensively used as base data by a wide range of agencies. Personnel in these user agencies will need to be made aware of Land Information Systems/Geographic Information Systems and trained in the best use of these digital spatial data bases.

Further training of personnel involved with systems management is crucial and training in the data base software supported by FLIS (ORACLE and Advanced Revelation) continues to be essential.

Staff of participating agencies will be encouraged to undertake part-time and extension studies at the **University** of the South Pacific. These will be supplemented by specialist short courses, workshops and seminars and attendance at appropriate conferences for senior management and senior technical staff.

For further information contact Fiji *Land* Information Service. TeL (679) 314399 Fax: (679) 305029.@

TRAINING INITIATIVE	FUNDING	NO.	LOCATION	DURATION	PROPOSED COMMENCING
Diploma in GIS/LIS	Aid	10	USP	**20** weeks	March
Selected Papers - USP	Aid	10	USP	20 weeks	March
Certificate in Land Information Systems	Aid	30	FLISSC	12 weeks	February
Selected Extramural Papers	Aid	2	FLISSC	1 year	February
Bachelor Degree	Fiji	2	New Zealand	3 years	March 1995
Masters/Post Graduate Diploma	Fiji	2	New Zealand	2 years	February 1995
Certified Novell Netware Courses	Aid	3	Local	2 weeks	April
Oracle Database Administrator and Intro SQL	Aid	5	FLISSC	2 weeks	March
Digital Photogrammetric Technology	Aid	1	New Zealand	1 month	April
Overseas Conference	Aid	3	Australia	2 weeks	November
On-the-Job Attachment - FLIS Support Centre	Aid	2	New Zealand	2 weeks	September
MGE Intergraph	Aid	5	FLISSC	2 weeks	May
Spatial Data Transfer Standard	Aid	10	FLISSC	1 week	March
PC Awareness Course	Fiji	50	FLISSC	half day	Year
Introduction to FLIS Systems	Fiji	50	FLISSC	half day	Year
Introductory System Management	Fiji	50	FLISSC	half day	Year
FLIS System Management	Fiji	5	FLISSC	20 weeks	January
Advanced Revelation Troubleshooting	Fiji	5	FLISSC	20 weeks	January
Law Users Seminar	Fiji	50	FLISSC	half day	January
Planning Users Seminar	Fiji	20	FLISSC	half day	January
Surveyors Users Seminar	Fiji	30	FLISSC	half day	January
Dedicated Native Lands Trust Board Training	Fiji	10	FLISSC	2 months	February
Dedicated Bureau of Statistics Training	Fiji	5	FLISSC	2 weeks	March

CONTACTS

The *following list details the organisations who receive and provide contributions to this newsletter in Fiji.*

ORGANISTATION. , FAX
Delegation of the Commission of the Eurooean Communitv. 300370
Department of Energy, 370039
Department of Environment, 303515
Department of Town and Country Planning, 303515
Embassy of the Republic of Marshall Islands
Environmental Consultings Fiji Ltd, 370012
Fiji Forest Industries Ltd, 813088
Fiji Pine, 661784
Fiji Posts and Telecommunications, 313362
Forestry Department, Management Services Division, 320311
Forum Secretariat, 305573
French Embassy, 300937
Federated States of Micronesia Embassy
Harrison and Grierson, 301986
Japanese International Cooperation Agency, 302452
Lands Department, FLIS Support Centre, 305029
MacPacific, 303681
Mineral Resources Department, 370039
Ministry of Agriculture Fisheries and Forestry, Drainage and Irrigation, 305546
Ministry of Foreign Affairs, Civil Aviation & Meteoroloov
Ministry of Primary industries, Drainage and Irriaation. 305546
Ministry of 'Primary Industries and Cooperatives, Land Use Section, 400262
Native Land Trust Board, 303164
Papua New Guinea Embassy
Public Works Department, Hydraulics Section, 303023
Public Works Department, Water and Sewerage Section, 315244
Queensland Insurance, 300285
South Pacific Applied Geoscience Commission, 370040
South Pacific Commission, 370021
Tuvalu Embassy
UNDP, Department of Humanitarian Affairs, 304942
UNDP, Regional Water & Sanitation Project, 302487
UNDP/FAO, South Pacific Forestry Development Programme, 305212
University of the South Pacific, GIS Unit, 301487

University of the South Pacific, School of Pure and Applied Sciences, 302890
Wood & Jepson Consultants, 303361

The following fist details the organisations, sorted by country, who receive and provide contributions to this newsletter outside Fiji.

ORGANISATION, COUNTRY
ACE Technology Australia Pty Ltd, Australia
Bunnings Tree Farms Pty Ltd, Australia
CSIRO, Division of Fisheries, Australia
SPOT Imaging Services Pty Ltd, Australia
International Development Planning & Management Co, Canada
Ministry of Agriculture, Cook Islands
Ministry of Foreign Affairs, Cook Islands
Ministry of Marine Resources, Cook Islands
Department of Resources & Development, Federated States of Micronesia
Department of Conservation & Resources Surveillance, Division of Forestry, Federated States of Micronesia
GOPA Consultants, Germany
Bureau of Planning, Guam
Department of Agriculture, Guam
Ministry of Environment and Natural Resource Development, Kiribati
Ministry of Foreign Affairs & International Trade, Kiribati
Ministry of Home Affairs and Rural Development, Lands and Survey Division, Kiribati
Marshall Islands Marine Resources Association, Marshall Islands
Ministry of Foreign Affairs, Marshall Islands
Centre ORSTOM de Noumea, New Caledonia
Service des Mines et de l'energie, New Caledonia
South Pacific Commission (SPC), New Caledonia
Critchlow Associates, New Zealand
Monitoring & Evaluation Research Associates, New Zealand
University of Otago, Spatial Information research Centre, New Zealand
Department of Mining and Petroleum, Papua New Guinea
Department of Mining and Petroleum, Corporate Services Division, Papua New Guinea
Department of Mining and Petroleum, Minerals Division, Papua New Guinea
University of Papua New Guinea, Department of Geography, Papua New Guinea
Forum Fisheries Agency (FFA), Solomon Islands

Ministry of Foreign Affairs & Trade Relations, Solomon Islands
Ministry of Natural Resources, Forestry Division, Solomon Islands
Ministry of Natural Resources, Geological Survey Division, Solomon Islands
Department of Agriculture, Tonga
Ministry of Fisheries, Tonga
Ministry of Foreign Affairs, Tonga
Ministry of Lands, Survey and Natural Resources, Tonga
Department of Lands & Survey, Tuvalu
Meteorological Office, Tuvalu
Ministry of Natural Resources, Tuvalu
Office of the Prime Minister, Tuvalu
Public Works Department, Tuvalu
EOSAT, USA
United States Forestry Service, USA
Department of Geology, Mines and Water Resources, Vanuatu
Department of Forestry, Vanuatu
Lands and Survey Department, Vanuatu
Ministry of Foreign Affairs, External Trade & Immigration, Vanuatu
Apia Observatory, Western Samoa
Department of Agriculture Forests and Fisheries, Western Samoa
Department of Lands, Surveys and Environment, Western Samoa
Ministry of Foreign Affairs, Western Samoa
South Pacific Regional Environment Programme (SPREP), Western Samoa

Requests for inclusion in the mailing list for this newsletter as well as the submission of articles for publication should be sent to:

GIS AND REMOTE SENSING NEWS
SOPAC
PRIVATE MAIL BAG, GPO
SUVA, FIJI
     Attention: Les Allinson
                Tel: 381377 Fax: 370040
or

MANAGEMENT SERVICES DIVISION
FORESTRY DEPARTMENT
PO BOX 3890, SAMABULA
SUVA, FIJI
     Attention: Wolf Forstreuter
     Tel: 322635 Fax: 3203 1 l

It would be appreciated if contributions could be sent on floppy disk in Word for Windows (preferred), Wordperfect for Windows or WordPerfect for DOS format. @

ACRONYMS

Acronyms, love them or hate them, are here to stay and we will attempt to expand every one used in this and previous newsletters.

AIDAB	Australian International Development Assistance Bureau
CSIRO	Commonwealth Scientific and Industrial Research Organisation
ESCAP	Economic and Social Commission for Asia and the Pacific
FA0	Food and Agriculture Organisation
FFA	Forum Fisheries Agency
FLIS	Fiji Land Information System
FSM	Federated States of Micronesia
GIS	Geographic Information System
GIS/RS News	GIS & Remote Sensing Newsletter (this newsletter)
GOPA	Gesellschaft fuer Organisation Planung und Ausbildung (Agency for Organisation Planningand Education)
GPS	Global Positioning System
MAFF	Ministry of Agriculture Forests and Fisheries
MIF	MapInfo Interchange Format
MOMS	Modular Optoelectronical Multispectral Scanner
MRD	Mineral Resources Department
MSD	Management Services Division
NLTB	Native Land Trust Board
PGS	portable ground station
ORSTOM	Institut Francais de Recherche Scientifique pour le Developpement en Co-operation
PWD	Public Works Department
SOPAC	South Pacific Applied Geoscience Commission
SPC	South Pacific Commission
SPOCC	South Pacific Organisations Co-ordinating Committee
SPOT	Satellite pour l'observation de la Terre
SPREP	South Pacific Regional Environment Programme
SPT	Station Polynesienne de Teledetection, Papeete
TM	Thematic Mapping
UNDP	United Nations Development Program
USP	University of the South Pacific