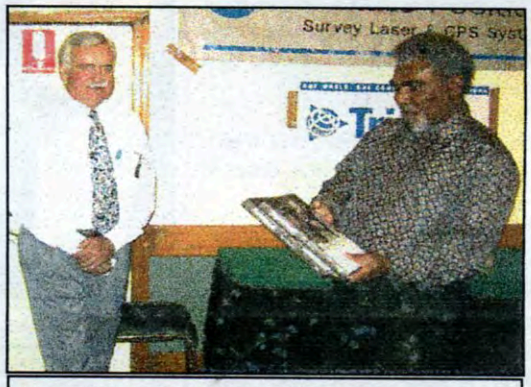
"Fore-Sight"

"Fore-Sight"-Quarterly Newsletter of the Association of Surveyors of P.N.G.

"Mastmak" Book Launch Huge Success

Port Moresby July 12 : On a memorable occasion, the Prime Minister of PNG, the Hon. Sir Mekere Morauta, officially launched the book ***"Mastamak—The Land Surveyors of Papua New Guinea".***

Sir Mekere acknowledged the vital role surveyors have made in the exploration and development of PNG, and paid tribute to those nationals who have labored tirelessly to help the surveyors with their work. Fred Pratt was congratulated by Sir Mekere for sponsoring the publication that forms an important written record of the surveying history of PNG from the time of the early explorers to Independence in 1975.



Above : Honorable Sir Mekere Morauta congratulates book sponsor Fred Pratt on a marvelous achievement.

Sir Mekere gave special recognition to the author James Sinclair, who was an official guest at PNG's 25th Independence Anniversary celebrations last year. James Sinclair has written some 26 books on PNG's history, life and culture and has spread the word that PNG is a land of substance and opportunity.

Author James Sinclair

Special guests at the launching included Judith and Bronwyn, daughters of George Ballam the surveyor who appears on the front cover of ***"Mastamak".***

Past and present Surveyors-General of PNG were well represented on the occasion with Graham Matheson, Kisakou Pochapon and Tony Luben being in attendance.

Overseas guests were suitably impressed with the event that was well covered by the local news media including *Post Courier, The National and EMTV.*

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August 2001

COMING EVENTS :

September 25 to 28

Brisbane, Australia

42nd Australian Surveyors Congress

INSIDE THIS ISSUE :

REPORT : 41st Annual General Meeting, July 2001

The 41st Annual General Meeting of the **ASPNG** was held in Port Moresby on Friday 13th July, 2001.

The Minutes from the 40th AGM held on 26th August 2000 were confirmed with few matters arising from the Minutes.

Both the Secretary's Report (Kohu Heni) and the Treasurer's Report (Rod Gould) were well received. The ASPNG is maintaining a steady membership of some 94 members. Financially, the association remains in a healthy situation. Walia Bale was commended for his work on the Secretariat, especially in regard to reducing membership fee arrears.

Council reported that three meetings were held in the previous 12 months to deal with routine business as required.

The President's Address by Steve Low highlighted the fact that while the Association was doing well, and we were having a very successful Survey Congress, that we possibly needed to expand our outlook in order to improve and grow.

The Council elected for this coming 12 months comprises the following members :-

President :	Steve Low
Secretary :	Dickson Taunagita
Treasurer :	Rod Gould
Councillor :	Luther Sipison
Councillor :	Stephen Lummis

(continued page 2)

WOW - WHAT A CONGRESS !!!

Special Report—2001 ASPNG Survey Congress

The 35th ASPNG Survey Congress was held in Port Moresby between July 12th and 14th. Michael Larmer had promised this Congress would be a good one, and we weren't disappointed !!! (Left : Michael Larmer)

From the Formal Opening by Dr. Beno Boeha, Director of the National Research Institute, that was followed by a stirring Keynote Address by Sir Anthony Siaguru, surveyors were assured that this Congress would be a fitting start to the new millenium. The theme, *"From Mastamak to Spatial Data Professional"* highlighted both the history of surveying and the evolution of modern day practises. That the launch of the book ***"Mastamak—The Land Surveyors of Papua New Guinea"*** would conclude the first day's proceedings was a fitting and timely event.

The standard of papers was excellent, with a broad range of topics being offered from both local and overseas authors. Papers in order of presentation included ...

- *PNG 2001 : A Spatial Odyssey* (Alan Dunley, MASPNG)
- *The Status of GPS or the Next Generation Global Navigation Satellite Systems* (Bob Curley, MASPNG)
- *Looking Backwards into the Future* (Grahame Lindsey, OAM, LS, overseas guest)
- *Information Based Planning, Surveying & Land Management* (Mary Iatau, MASPNG)
- *From Surveying to Spatial Science—The Challenge for the Professionals* (Malcolm McCoy, President Institution of Surveyors Australia - overseas guest)
- *A Brief History of the Charting and Surveying of Papua New Guinea and Australia—500 Years of Measurement* (Bob Linke, MIS, MCS- overseas guest)
- *Surveyor George Ballam—The New Guinea Years* (Frederick C. Pratt, FASPNG)
- *The Spot 5 Program* (Rob Lees, Manager Spot Imaging Services)
- *Queensland's Spatial Data Exchange* (Bryan R. McLennan, Director Spatial Data Exchange P/L, Brisbane & Director Asia Pacific Surveys, Pt. Moresby)
- *Superstar Surveying- Hollywood Style* (John F. Brock, FISA—overseas guest)

Forum Topics discussed on the Saturday :

- Final amendments to the new PNG Survey Act (Tony Luben, Surveyor-General of PNG)
- Implications and ramifications of the growth in spatial data and the availability of modern surveying tools to a wide variety of technical disciplines - to absorb the growing number of people involved or to preserve the surveying profession as it is (???)
- Customary land registration - a paradox in PNG (basically - damned if you do, and damned if you don't)

Above (L to R) : Malcolm McCoy (President ISA), Steve Low (President ASPNG), Micahael Larmer (Congress Manager), Prime Minister Sir Mekere Morauta, author James Sinclair, John Brock (FISA) and Fred Pratt (FASPNG).

The **ASPNG** also acknowledges and thanks the exhibitors who made the Congress Trade Display a success -

- Ian Truscott of C.R. Kennedy & Co, Mackay, representing Leica Systems
- Garry Essex of Herga in Brisbane, representing Trimble
- Peter Ludlow from Cairns representing Sokkia

As Michael Larmer says "these guys might not sell much kit, but we do appreciate their being here".

Right (L to R) : Graham Matheson newly elected Hon. Fellow ASPNG, Dickson Taunagita, Hon. Secretary ASPNG, and Kisakou Pochapon, PNG's 1st national Surveyor—General

2001 AGM Report (continued)

During General Business, it was decided by the meeting to hold the 2002 Survey Congress in Lae. Our thanks to Luther Sipison in volunteering to be the Congress Manager. He will be ably assisted by Terrence Kuniaka and Bob Curley (both Lae based) and we thank them for their support.

A sub-committee was proposed to generally review how the ASPNG might expand and grow by capitalising on the impact and growth of spatial data in the surveying profession and allied fields. Alan Dunley volunteered to Chair the sub-committee and will be assisted by Mary Iatau and Terrence Kuniaka. After approval by Council a questionnaire will be circulated among members to gauge their views.

Rare Distinction for Ex Surveyor-General

Graham Matheson, Surveyor-General of PNG from 1963 to 1975 was awarded the rare distinction of being elected an **Honorary Life Fellow** by the **Association of Surveyors of Papua New Guinea**.

Graham is well known to many members of the Association, and is widely respected for his professional integrity, surveying knowledge and experience. Graham was the founding member behind **ASPNG**, and his elevation to Hon. Life Fellow status is a tribute to his long standing contribution to the profession and the Association. We wish him well with his future endeavors and look forward to seeing him back in PNG on a regular basis.

A PLATE FULL OF ... "Kai kai bilong ting ting"

Contribution by Richard Stanaway, Geodetic Surveyor

If the 1.0m shift of the Tokua PSM during the November 2000 quake seemed unbelievable, re-observations of the PSMs adjacent to the Weitin fault on New Ireland earlier this year have shown massive 9m + displacements between October and November 2000. Most of the displacement would have occurred within several minutes of the 8.0 quake which ruptured the Weitin fault over hundreds of kilometres on 16th November 2000. Surveyors from UniTech and RVO have observed the monitoring network twice this year, observing significant relaxation of the post-seismic displacement. Nature really makes a mockery of geodetic control in many parts of PNG.

The largest earthquake in modern history occurred in Chile in 1960. The Magnitude 9.5 quake also resulted in massive land movements (12m horizontal, 2m vertical) and triggered tsunamis which caused widespread destruction in Japan, Hawaii and along the Siberian coast. Many statues on Easter Island were also thrown down by the tsunami.

How are the shifts measured ?

3 - 5 days of continuous GPS observations are collected at a widespread network of monitoring marks (usually PSMs or Pillars) spanning known tectonic plate boundaries. The data is then sent to the Research School for Earth Sciences at the Australian National University in Canberra for processing of the positioning solution. Software packages GAMIT and GLOBK derive mm accurate positions using precise orbit models determined from the global IGS (International GPS Service) tracking network. The same site is observed over several epochs and a time-series plotted, showing any station movement between epochs.

Implications on Geodetic Datums in PNG (PNG94)

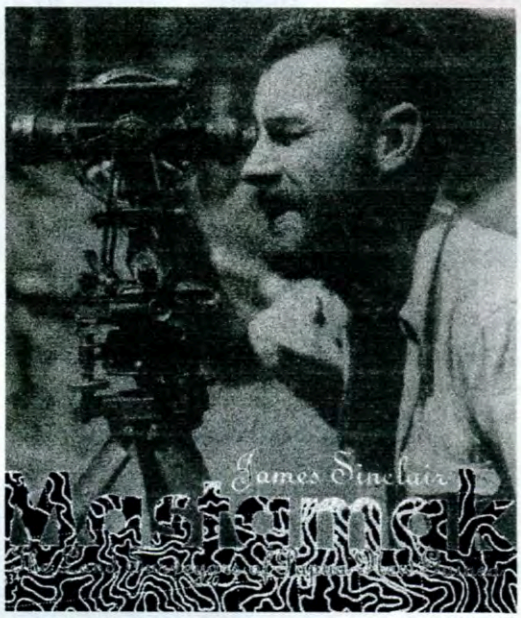
Major earthquakes generally occur every few decades in PNG. The dislocation resulting from these quakes nullifies any geodetic datum where relative movement of several metres can occur within the seismic area.

Most of the PNG mainland (with the exception of the Huon Peninsula) lies on the Australian-Indian plate, moving NE at about 7mm a year. The Huon Peninsula, New Britain and Southern New Ireland lie on the South Bismarck Plate, which is slowly rotating clockwise. The Gazelle Peninsula at the eastern end of the Bismarck Plate, is moving South at about 6mm/yr. The rest of New Ireland, Bougainville, etc lies on the Pacific Plate and is moving NW about 8mm / yr.

PNG 94 was designed as a static datum, so with the increasingly widespread adoption of GPS by surveyors, where baselines can be measured over long distances to mm accuracy, it will soon become apparent that a static PNG94 datum will become incompatible with GPS Control network which span plate boundaries. A network solution fully constrained by tabulated PNG co-ordinates will be very weak, and in error if the relative tectonic movement is not accounted for in the adjustment. This has implications for surveyors who use data from any of the GPS base stations in PNG to establish control in an area lying on a different tectonic plate !!

Our thanks to Richard Stanaway for this contribution to "Fore-Sight". Richard is a Geodetic Surveyor with the Research School of Earth Sciences, Australian National University, Canberra.

Get Your Copy of "Mastamak- The Land Surveyors of PNG"



Mastamak Front Cover : Surveyor George E. Ballam, Lower Watut River Survey, November, 1936

Copies of the book ***"Mastamak - The Land Surveyors of Papua New Guinea"*** are available in Port Moresby from the following sources :-

- **Arman Larmer Surveys,** Survey Haus, Varahe Street, Gordons. ALS have 3 boxes of the book in stock including one box of leather-bound gilt-edged DeLuxe Editions and two boxes of standard editions (six books have been sold in the first few days).
- PNG Chamber of Mining & Petroleum, The Lodge Building, downtown Port Moresby.

The Deluxe Edition sells for K430.00, and the standard edition for K155.00. All payments / cheques should be made out to F.C. Pratt.

Don't miss this opportunity to obtain a really unique book that apart from being good reading and a handy reference will become a collector's item in years to come.

Surveyors CPD Quiz

Here's one for any "star gazers" that might be out there .....

When the celestial equator and the observer's meridian are used as reference circles for indicating the position of a heavenly body on the celestial sphere, the body is located by its ... ?

A. Azimuth and altitude
B. Right ascension and declination
C. Hour angle and zenith distance
D. Hour angle and declination

Believe it or not, Answer **(A)** was the correct response to the last question—*the Yanks do use metric for cadastral surveys !!!*

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Members & Other News ...

Surveyor Bob Curley says the only name change he would consider for the **ASPNG** would be to substitute the word *Institution* for *Association* as it provides a more finite description. Interestingly enough, if this was to occur we could become the *PNGIS*—its hard to escape those initials ***GIS !!!***

Headline : *"Surveyors apparently left up the creek without a paddle"* - A notable absentee from this year's Annual Dinner, was the presentation of the infamous 'shit-stirrer's paddle'. Has the last recipient claimed it on a perpetual basis (???)

2001 Congress Manager Michael Larmer - not only arranged a superb Congress, but called on divine intervention to have the curfew rolled back from 1900 hrs until mid-night. There were however some mixed feelings about the *Wallabies* win over the *Lions* arranged for the Farewell B.B.Q.

Theodist have for many years been strong supporters of the **ASPNG** - and our thanks to them once again for the printing and binding of papers together with supplying the plastic folders for the 2001 Survey Congress. Well done Kevin and Paul Pini.

"Fore-Sight" thanks **surveyor Bryan McLennan** for the Survey Congress photos appearing in this issue.

PNG GIS USERS' GROUP

The PNG GIS Users' Group has now scheduled its meetings in Port Moresby on a quarterly basis. The last meeting (#32), held on April 26th was hosted by the Department of Health at its offices in Aopi House, Waigani Drive.

Some 30 members attended representing such diversified interest groups as health, education, national mapping, census, statistics, mining & petroleum, telecommunications, fire brigade, national planning, together with various private surveying and mapping firms.

An information page was sought from all groups attending to advise of the various projects and directions being undertaken with regard to GIS and the development of spatial data sets. The individual information pages have been combined into a single document to be presented to the Information Technology Board *(ITB)*.

It is hoped that with the support of the ITB, that funding can be achieved through aid agencies to provide an administrative framework for the management and dissemination of the various datasets available in PNG at this time and those being developed for the future.

CARTOGRAPHERS' CORNER

Increasingly more active, the PNG Institute of Cartographers have established a number of working (sub) committees to consider and review a number of issues :-

- Name change to reflect the influence of modern technology and to incorporate other disciplines
- Review of their Constitution
- Formulate a suitable Code of Ethics / Code of Conduct
- Fund Raising & Social Activities

The PNGIC are looking to hold a major meeting of members in November this year. A consolidated campaign will be launched in 2002 to promote the PNGIC and a strong membership drive will be conducted to attract new members. The PNGIC does have recognition from the Department of Personnel Management with regard to remuneration packages for cartographers.

The PNGIC's new postal address is P.O. Box 220, Waigani. NCD. The President, Raymond Bure, may be contacted by 'phone on 322 4800 or by fax on 322 4824
or e-mail at raymond_bure@placerdome.com

Editorial Comment : Its Good to be a Surveyor ...

The goings-on and events at the recent 2001 Survey Congress really highlighted the fact that its good to be a surveyor. While the current economic climate prevented a number of our 'out of town' members from attending, it was good to see the Congress well supported.

The successful launch of the book ***"MastaMak"*** was a truly magnificent event and one that I will long remember.

That my copy of ***"Mastamak"*** has been signed by not only the author James Sinclair, but by Fred Pratt the driving force behind the publication, Graham Matheson the last expatriate Surveyor-General, Kisakou Pochapon - PNG's first national Surveyor-General, Tony Luben the current Surveyor-General of PNG, Michael Larmer - a surveying legend in PNG, and Steve Low - many times President of the ASPNG, is something to treasure and to keep, then hand down to future generations. Thank you friends one and all.

"Fore-Sight", while attempting to focus on news from within our profession, does include news and news items from related fields Many of the papers presented at the 2001 Survey Congress reported on developments in GIS, spatial datasets, and the application of GPS technology to everyday surveying tasks. This is not unique to PNG, and we are privileged that our friends from overseas were able share their views and experience with us at the recent Congress.

It seems that so many technical and professional disciplines appear to overlap these days, and while it may seem somewhat confusing, or even overwhelming at first, I am sure that we can assimilate with what's happening around us.

Still, at the end of the day, ***Its good to be a surveyor*** ... *Ed.*

"Fore-Sight"

Technical Supplement No. 2, August 2001. Courtesy GIS Asia Pacific Magazine

CREATING A GIS IN FOUR EASY STEPS

STEP 2 : CHOOSING THE RIGHT SYSTEM

Step 1 examined the initial planning stages of creating a GIS, and focused on the need to understand the project. Choosing the appropriate hardware and software is never easy. Before making the 'big' decision, there are a number of factors to consider, especially if you're starting up a GIS for the first time. Step 2 will highlight some of the issues you should be considering before you decide.

Get Informed

Of course, it's necessary to be informed and know the status of the current hardware and software markets. But it's also good to know what other local companies, consulting firms, universities and governments are using. Not that this should dominate your decision, but it may provide you with some hardware and software combinations that you have not considered.

Data formats can also be an indicator of current trends in your region. As your data may be initially purchased via local government departments, you should be aware of the formats that these departments are offering - these parties may also reveal some of the reasons behind their choices. Will these formats be compatible with the system that you have in mind ? Of course, these days most GIS software products do offer conversion capabilities. However, the success rate of these conversions vary from product to product. It makes no sense to invest heavily in a product that will limit your ability to acquire and use data from local sources. A separate investment can be made in data translation software products. Regardless of the eventual decision, a keen awareness of the various data formats that you will be handling is essential, prior to purchasing a system.

Identify Specific Needs

Do you require a system with a strong vector component, or a strong raster component ? Will the GIS be used mainly to handle data ? Will data modeling be involved ? Will the GIS later be used for Web publishing ? Make a list of the types of data handling / analysis procedures that may be required. Find out what similar companies are using as their GIS for similar tasks. This may give you an idea of where to look and what to look for. While the local vendor can be an important source of technical information, other users of GIS products can sometimes give more practical insights.

Know the Products

GIS software generally falls into one of two categories : modular or core. There are varying shades of grey, but these are the two standouts. Which type you decide to purchase will depend partly on the type of GIS work to be conducted. A fully-integrated GIS core product may not be necessary. Perhaps your office plans to use the GIS for map publishing purposes only; a fully-integrated GIS might be the last thing you're looking for. A small module or a more simplistic, user-friendly GIS core product may easily suit your needs. Buy what will be used, not what you think or hope will be used in the future. Often, heavy investments are made for full GIS and other related software and hardware, half of which end up gathering dust in a few months - management eventually feels that the large investment was not worthwhile, and potentially takes a negative attitude to the whole GIS field.

Ensure Support is Available

Of course, support and training should be key factors in your decision. Some form of support will be required, whether it be in the form of a good manual, dedicated technical staff, or an outside company. Ideally, look for a software vendor that has support agreements with key local hardware vendors. This will effectively eliminate the age-old debate as to whether it is a hardware or a software problem ; after all, the end-user really doesn't care as long as the problem gets fixed.

Other Considerations

A number of other issues must also be identified and considered :-

- Cost : How much can you afford to invest ?
- Project Demands : Will the GIS meet the demands of the project ? What is the minimum we need to purchase to meet these expectations ?
- Company Attitude : Is GIS viewed as a useful technology or a money pit ? This could influence how much and what you buy.
- Delivery & Availability : Can the specific product be delivered within a reasonable time frame and within budget ?
- Reviews : What are other users and magazines saying about the products ?

The above issues are, of course, not the only ones to consider. Each situation is unique, and the factors that pertain to these situations must be identified and considered within the scope of the regional GIS environment (other users and data sources). But, whatever you do, be sure to do the necessary background work to ensure that the system will work well for you once it is in place.

Author : Michelle Legault, GIS Analyst Research Centre, Hong Kong.

"Fore-Sight"

Technical Supplement No. 3, August, 2001. Courtesy GIS Asia Pacific Magazine

CREATING A GIS IN FOUR EASY STEPS

STEP 3 : CREATING THE CORRECT DATABASE

Steps one and two discussed the need for understanding the project, and choosing the right system to use. So your goals are now clearly defined and you've chosen an appropriate system. Next step ? The database.

The "I" in Information

The "I" in GIS means information. This information is usually stored in database. If the database is badly constructed and / or the data within it erroneous, you have a big problem on your hands. In such instances, your GIS may now stand for "Garbage Information System".

Before designing the database, you must know your data and how best to represent them. Group the data into logical components - in other words vegetation data, road data, and elevation data should be grouped as separate entities since they have different characteristics. Once grouped, the data can be organized, normalized and checked. Also know the characteristics of your data. Some issues to consider :-

- In what co-ordinate system are the data stored ? Different projections and datums will yield different co-ordinates. And although this may seem obvious, double check the hemispheres and the latitudes and longitudes of the recorded data.
- At what scale are the data ? Were the data recorded from a 1:1,000 map or a 1:1,000,000 map ? How precise are the data ?
- How much attribution should be included in the database ? Many attributes may have been recorded within the data (ie size of a park, the number of visitors, the number of bird species, etc). Decide if some or all of these attributes should be included in the database.
- Should the attribute data be coded or not ? If you plan to use codes, then metadata becomes even more important.
- In what format should the attributes be recorded - sum, mean, percent ?
- How reliable are the data ? Check the source of the data and try to determine its accuracy and usefulness.

Designing the Database

What's the best way to design your database ? That depends on your data. Many database models exist, but the relational database endures. Most, if not all, databases in GIS software packages are based on the relational database model.

How the data for each group should be organized may depend on whether you're a 'grouper' or 'splitter'. Some users believe its best to include as much normalized data into one table as possible, while other users prefers splitting data into smaller, more compact tables. There are pros and cons for each method, but as long as the data are correct and well-managed, the decision is yours. If you need to visualize what you're doing, write column names for each table on cue cards or on a whiteboard, and draw arrows linking key columns in each table. It may be a bit old-fashioned, but its effective. You could also use the database's tree diagram to help guide your decision.

Now, how should you present the data ? Points, lines, polygons, networks ? This is of special consideration in GIS. Choosing the data's representation will not only determine how the data will be visualized, but will also determine how the data will be used. For example, if you choose to represent bird breeding areas as points instead of polygons, you may be limiting your overlay capabilities. However, if the bird breeding areas are very precise static locations, point representation may be the way to go.

The Not-So-Future Database

These days, the data in GIS are being managed by those products that do it well - the database software. It's now easy to link your GIS with Oracle, Access, dBase, etc. The primary difficulty with most commercial databases is their inability to handle spatial data. However, many companies are realizing the importance and ubiquitous nature of spatial data by incorporating spatial data handling properties in their databases. Oracle and their Spatial Data cartridge is a case in point.

Traditionally, spatial data are separated into different files based on their spatial shape (ie points, lines or polygons). What's new about the spatial database is the fact that all of your data can be kept in one file. The data are actually the index, which allows you to mix point, line and polygon spatial data. For example, when you query your data for points, the spatial database will look at the index that was created for point data and retrieve the relevant data. This is a particularly useful option for large databases, as it decreases the querying time.

Use the Data

There's often the danger in thinking 'the database is finally finished—that's it'. The data are there to be used in visualization, spatial analysis, statistical analysis, modeling, etc. So use the 'information' in GIS, and use it well.

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