BULETIN GIS

JAWATANKUASA PEMETAAN DAN DATA SPATIAL NEGARA

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PENDAHULUAN

Jemaah Menteri berasaskan Kertas Kabinet No.243/385/65 bertajuk *National Mapping Malaysia* telah meluluskan jawatan dan terma-terma rujukan *"Surveyor-General Malaya and Singapore"* sebagai Pengarah Pemetaan Negara Malaysia dan mengesahkan keanggotaan serta terma-terma rujukan Jawatankuasa Pemetaan Negara pada 31 Mac 1965.

Cabutan para-para 2(b), 2(c) dan 2(d) daripada kertas kabinet tersebut mengenai keanggotaan dan terma-terma rujukannya adalah seperti berikut:

"2(b) National Mapping Committee

That a National Mapping Committee be appointed to comprise the following:

i. Director of National Mapping;
ii. Director of Lands & Surveys, Sabah;
iii. Director of Lands & Surveys Sarawak;
iv. Representative of the Ministry of Defence;
v. Representative of the Ministry of Rural Development (now substituted by the Ministry of Natural Resources and Environment);
vi. Assistant Director of Survey, FARELF.

2(c) The terms of reference of the National Mapping Committee to be as follows:

i. to advise the Director of National Mapping on matters relating to mapping policy;
ii. to advise the Director of National Mapping on mapping priorities.

2(d) That the Committee be empowered to appoint a Secretary and to co-opt persons who would be required to assist the Committee,"

Seterusnya pada 22 Januari 1997, Jemaah Menteri telah meluluskan pindaan terhadap nama, keanggotaan dan bidang-bidang rujukan Jawatankuasa Pemetaan Negara kepada Jawatankuasa Pemetaan dan Data Spatial Negara (JPDSN), bagi mencerminkan peranannya yang diperluaskan ke bidang data pemetaan berdigit. Keanggotaan JPDSN pada masa kini adalah terdiri daripada agensi-agensi seperti berikut:

1. Jabatan Ukur dan Pemetaan Malaysia
2. Jabatan Tanah dan Ukur Sabah
3. Jabatan Tanah dan Survei Sarawak
4. Wakil Kementerian Pertahanan
5. Jabatan Mineral dan Geosains Malaysia
6. Jabatan Perhutanan Semenanjung Malaysia
7. Jabatan Pertanian Semenanjung Malaysia
8. Jabatan Perhutanan Sabah
9. Pusat Infrastruktur Data Geospatial Negara (MaCGDI) *(co-opted)*
10. Jabatan Pertanian Sabah
11. Jabatan Pertanian Sarawak
12. Pusat Remote Sensing Negara (MACRES)
13. Universiti Teknologi Malaysia
14. Universiti Teknologi MARA *(co-opted)*
15. Universiti Sains Malaysia *(co-opted)*
16. Jabatan Laut Sarawak *(co-opted)*
17. Jabatan Perhutanan Sarawak
18. Jabatan Perancangan Bandar dan Desa

Buletin GIS ini yang diterbitkan dua kali setahun merupakan salah satu aktiviti yang dijalankan oleh Jawatankuasa Pemetaan dan Data Spatial Negara. Ia adalah sebagai salah satu media pendidikan dan penyebaran maklumat dalam mendidik masyarakat memanfaatkan maklumat spatial dalam pembangunan negara. Walau bagaimanapun, sebarang kandungan artikel-artikel adalah tanggungjawab penulis sepenuhnya dan bukan melambangkan pandangan penerbit.

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Dari Meja Ketua Editor

Rancangan Malaysia Kesembilan (tahun 2006 -2010) yang menjadi fokus utama kerajaan hari ini dan agensi-agensinya, dilaksanakan bagi pembangunan negara dan kesejahteraan rakyat. Bagi maksud ini, antara lain beberapa wilayah ekonomi yang pembangunannya bernilai ratusan bilion ringgit telah dilancarkan oleh YAB Perdana Menteri iaitu Wilayah Pembangunan Iskandar (WPI) pada 04 November 2006, Wilayah Ekonomi Koridor Utara (NCER) pada 30 Julai 2007 dan Wilayah Ekonomi Koridor Timur (ECER) pada 29 Oktober 2007. Tidak ketinggalan, koridor pertumbuhan bagi wilayah-wilayah di Sabah dan Sarawak juga akan turut dilancarkan. Wilayah-wilayah ekonomi ini akan dimajukan bertujuan untuk merencanakan pembangunan ekonomi yang seimbang dan saksama antara negeri-negeri dan wilayah-wilayah di Semenanjung serta Sabah dan Sarawak. Sehubungan dengan itu, perancangan yang rapi bagi wilayah-wilayah ekonomi ini akan memerlukan peta bercetak dan data berdigit yang kemas kini dengan maklumat yang relevan untuk kegunaan pelabur dan pengguna.

Melalui Sistem Maklumat Geografi, ahli-ahli JPDSN berupaya menonjolkan komitmen jabatan masing-masing dengan menyedia dan menyebarkan maklumat yang dikehendaki, yang akan menyokong perancangan pembangunan negara secara terancang dan sistematik di samping tidak mengabaikan tanggungjawab pemuliharaan alam sekitar. Semoga tumpuan fungsi jabatan diuruskan seiring dengan visi dan aspirasi pembangunan serta agenda negara ketika ini.

Ketua Editor

UPDATING SPATIAL DATABASE AT NEAR REAL TIME USING MOBILE GPS

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ABSTRACT

Publication process of thematic map has changed from manual to fully digital process. Compilation of map sheet has been taken over by spatial database as the data source for producing a map. The accuracy of any information displayed on maps relies on the data contained from the database. An unupdated database will cause the maps to display inaccurate information especially with regards to the physical changes brought about by time. Conventional updating process which depends on the data from topographic mapping activities is often do not portray with current information due to lengthy production of topographic maps. Therefore a method that is quick, cost effective, and suitable with the accuracy required by the produced map scale should be seeked so that each thematic map produced displays current information in accordance with the year it is produced.

1.0 INTRODUCTION

The era of manual publication has ended. Compilations of map sheet, which are previously the source of data for map production works, have been replaced by digital spatial database. The development and maintenance of spatial database are now part of the important tasks for agencies associated with mapping. For that purpose, a spatial database known as *Pangkalan Data Tematik Kartografi (PDTK)* is developed by the *Seksyen Kartografi, Jabatan Ukur* dan *Pemetaan Malaysia (JUPEM)* devoted especially for the production of thematic maps.

A thematic map is a map designed and produced for a special purpose or based on a specific theme. Usually the map is produced in various scale and presentation specification. Even though the thematic map production now has changed to digitise method, the data source for thematic map publication, which is from topographic map, still continues conceptually. This situation occurs since the data source for developing PDTK is also comprised of existing topographic maps such as map series L7030 of scale 1:50 000, and series L808 of scale 1:10 000.

1.1 Problem Statement

The main source of data for PDTK is the existing topographic maps. Nevertheless, the progress of publishing topographic mapping is not parallel with the country's rapid development and the requirement for thematic map production. The generation of thematic maps from a database that is not updated will produce maps which do not portray current reality. By depending entirely on the conventional method for updating PDTK, a lot of time and cost is incurred. This problem arises since the collection of data for topographic mapping activities must comply with the MS ISO 9002 standard as stipulated for every activity of topographic mapping publication.

1.2 Research Objective

This research is performed to achieve the following goals:-

- To update medium scale cartography thematic database, using mobile GPS, so that the thematic maps produced display up-to-date information which corresponds with the year they are produced.
- To prepare a standard procedure, for collecting, processing and updating spatial database, that is efficient and cost effective of the quality suitable with the requirements of medium scales of PDTK.

1.3 Research Benefit

From this research it is hoped that another method for updating spatial data which is efficient, cost effective and of accuracy that suits the map scale can be obtained and accepted as the standard operation procedure (SOP) for updating thematic maps database. With an updated database, mapping products generated will be of quality not only in design but also accuracy of information.

1.4 Relationship of Spatial Resolution, Scale and Accuracy of Map.

Spatial resolution is the smallest character or distance that can be recorded according to the map scale. Scale is defined as the size or distance ratio of a character on map with relation to the actual size or distance on earth. By regarding the smallest line that can be drawn on map is 0.5mm, then the spatial resolution on map of scale 1:50 000 is 25 metres with 50 metres accuracy. The following table illustrates the relationship between spatial resolution, scale, and the accuracy of maps.

Maps Scale	Resolution (Precision)	Accuracy
1:1 000 000	500m	1000m
1:500 000	250m	500m
1:250 000	125m	250m
1:100 000	50m	100m
1:50 000	25m	50m
1:10 000	5m	10m

Table 1.0: Relation between map scale, resolution and map accuracy

1.5 Map Scale

Maps have 3 categories of scales, which are:-

- Large scale maps (1 : 3000 – 1 : 12500)
- Medium scale maps (1 : 25000 – 1 : 50000)
- Small scale maps (1 : 50000 above)

1.6 Cartography Thematic Database (PDTK)

PDTK is the Cartographic Section spatial database developed to fulfil these requirements:-

- To provide data source of digital base map for the production of various small and medium scale thematic maps.
- To realise the concept of data sharing for mapping requirements and geographical information system required by numerous organisations and individuals.

1.7 Scheme of Cartographic Thematic Database

The main source for PDTK development is the existing topographic maps. The maps are of various series with a variety of scales, from 1:3 000 to 1:750 000. To ensure that the thematic maps produced are suitable with the data source spatial resolution, PDTK has been designed with four different schemes based on the scale of data source used. The following table shows the scheme in PDTK which shows the scale range, data source scale, and the scheme name:-

Scale Range	Data Source Scale	Scheme Name
250k ≥ X ≥500k	Data captured at scales smaller than 1:250K	KARTONATIONAL
100k ≥ X ≥250k	Data captured at scales smaller than 1:100k but larger than 1:250K	KARTOSMALL
25k ≥ X ≥100k	Data captured from scales 1:25k to 1:100k	KARTOMEDIUM
3k ≥ X ≥ 25k	Data captured at scale 1:3k to 1:12.5k	KARTOLARGE

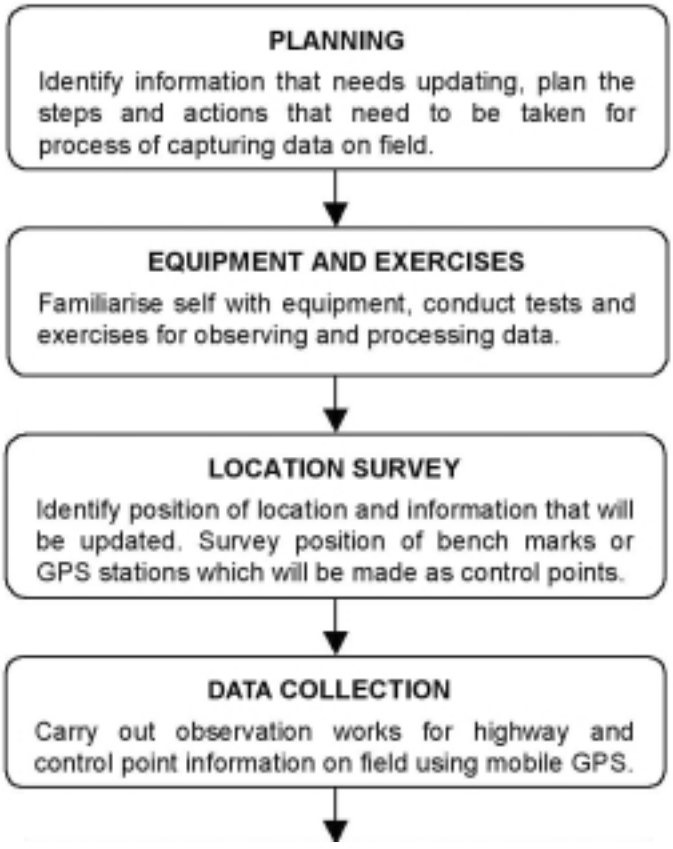
Table 2.0: Cartography Thematic Database Scheme

1.8 Creation of Thematic Database Data Model

Data Model is a method to portray an entity as an object in the database. For that reason, PDTK in general has adopted the standard as stipulated by the Geographic Information/Geomatic- Features and Attribute Codes MS 1759-2004 for the production of its model data.

2.0 RESEARCH METHODOLOGY

Research implementation is shown in Figure **1.0 Research Methodology Flow Chart.**



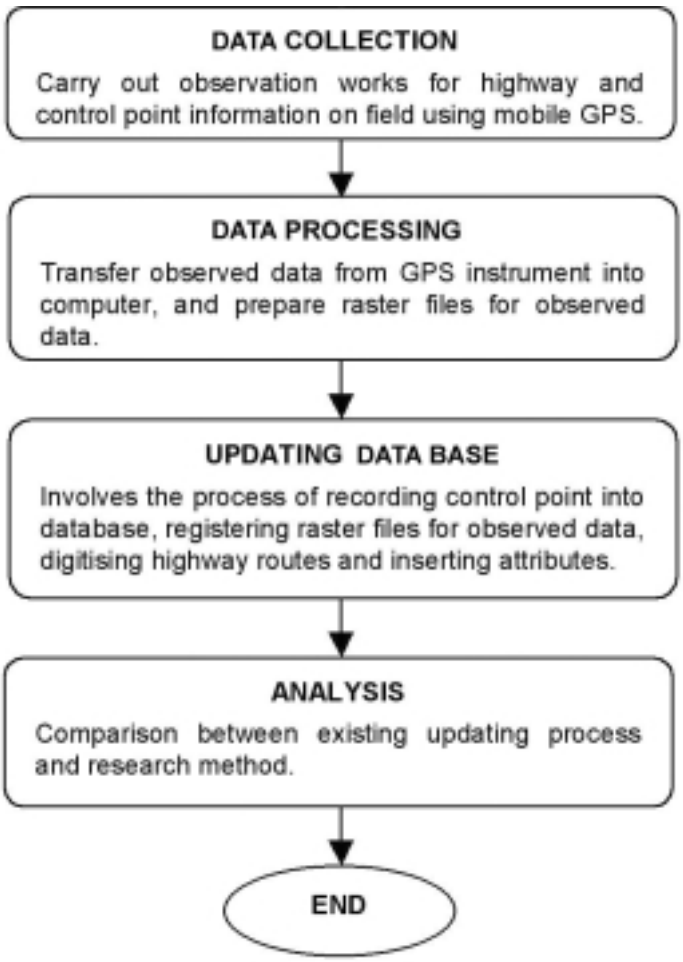


Figure 1.0: Research Methodology Flow Chart

2.1 Planning

This stage entails the process of identifying the information that needs updating, and planning the steps and actions that needs to be taken for the process of capturing data on field.

Figure 2.0: Location of study area which shows the Guthrie Corridor Expressway and Route B49 not yet incorporated into electronic version of Selangor state map produced in 2005

2.2 Equipment and Exercises

Equipment used for observing data are divided into two types. Which is

i. Hardware

ii. Software

2.3 Hardware

i. Pocket PC and Accessories, comprised of iPAQ 3760 with Microsoft Mobile Operating System and accessories such as Ipaq extension pack, Compact Flash memory card, PCMCIA card adapter

ii. Teletype GPS Signal Receiver

iii. Workstation Compaq Evo 8000 with Windows XP Operating System

Figure 3.0: Equipment used for data observation

2.4 Software

Two primary software are used:-

i. Teletype GPS

Teletype GPS is software developed for Navigation purposes using the GPS technology. The Teletype software installed in the Pocket PC will tracks and processes satellite signals received by the GPS signal receiver connected to Pocket PC.

ii. Geomedia Professional 5.1

Geomedia Pro 5.1 is high level solution software for geographic information system (GIS). This software is produced by the US Intergraph Corporation. It provides the facility for analyses such as attribute and spatial enquiries, buffer zone, spatial and thematic overlay, and also the facility for map layout for visualisation of spatial information.

2.5 Location of Survey

Survey of location is carried out to examine the location condition, roads, and the position of marks which will be used as control points.

2.6 Data Collection

This stage entails carrying out observation works in fields for the information of highways and control points using mobile GPS. Tracking technique, using mobile GPS mounted at vehicles, is used to gather road information. The positions of control points are observed by using the Waypoints facility.

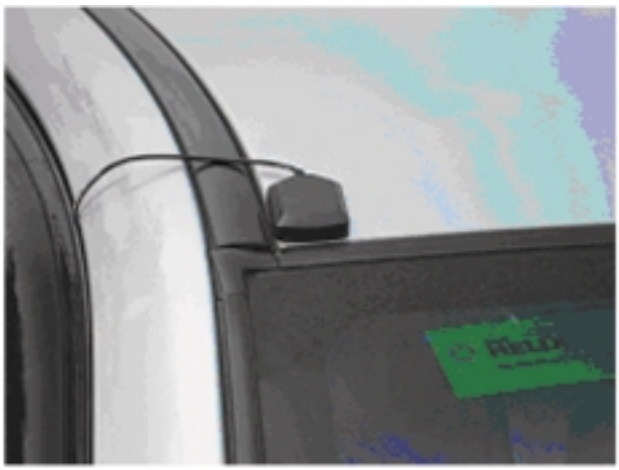


Figure 4.0: Tracking road information

2.7 Data Processing

Involves the process of transferring data from Pocket PC to work station and converting data format from *.ttm to raster.

Figure 5.0: Bench Marks used as control points for this study

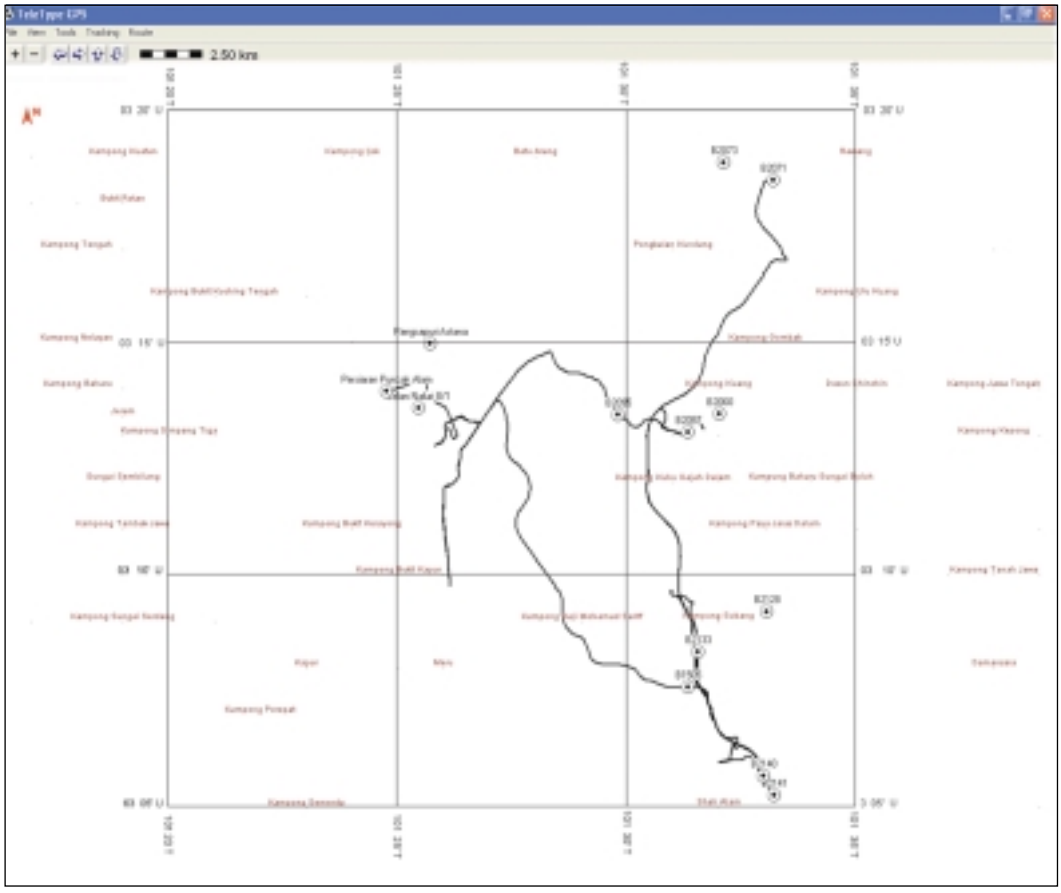


Figure 6.0: Observed Data in Raster format

2.8 Updating Process

The process commences with the insertion of control points positions into database(**Figure** 7.0). The next step is to incorporate images of observed data and registering the images,which also have control points images, into the corresponding control points which have already been previously recorded into database (**Figure** 8.0). Images successfully registered (**Figure** 9.0) will thenbe digitised (**Figure** 10.0). All of these processes are performed using the Geomedia Professional 5.1 software and Compaq Evo 8000 workstation with Windows XP Professional Operating System.

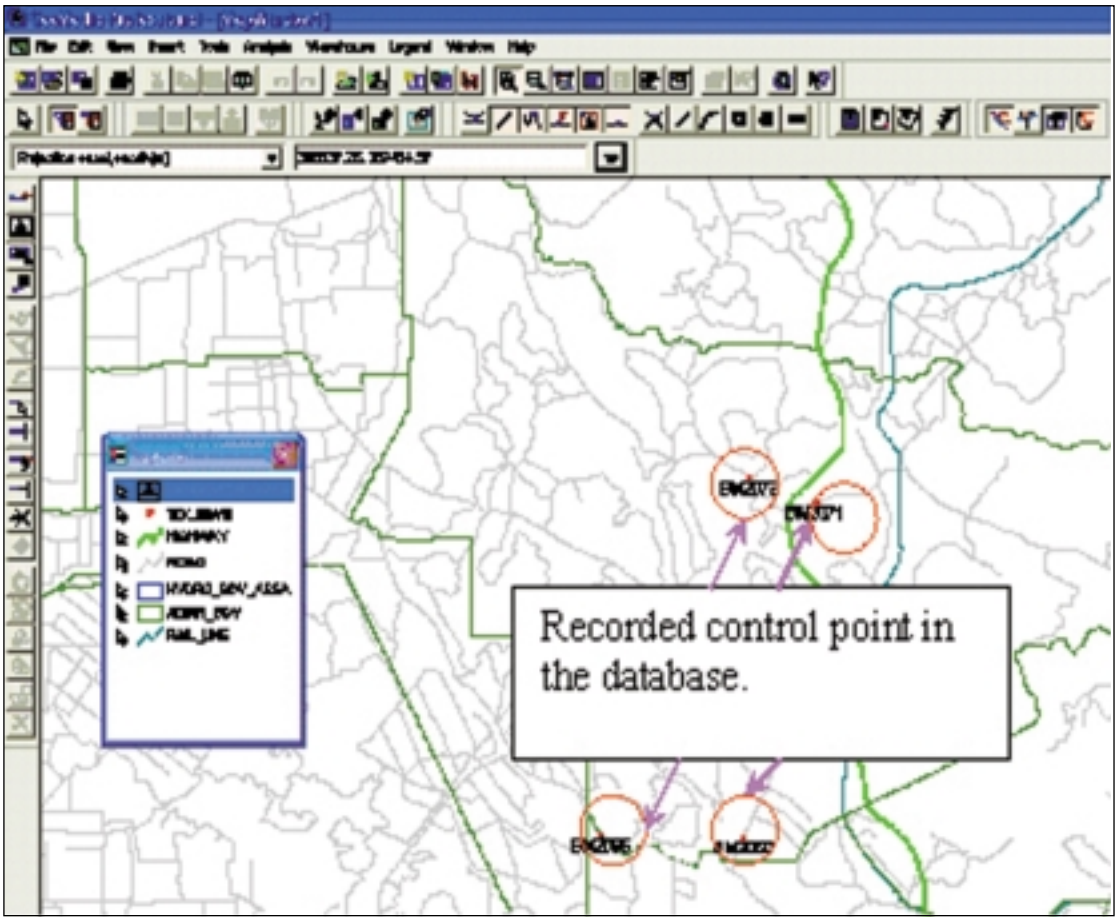


Figure 7.0 Location of the bench mark (control point) in the Selangor Cartographic thematic database

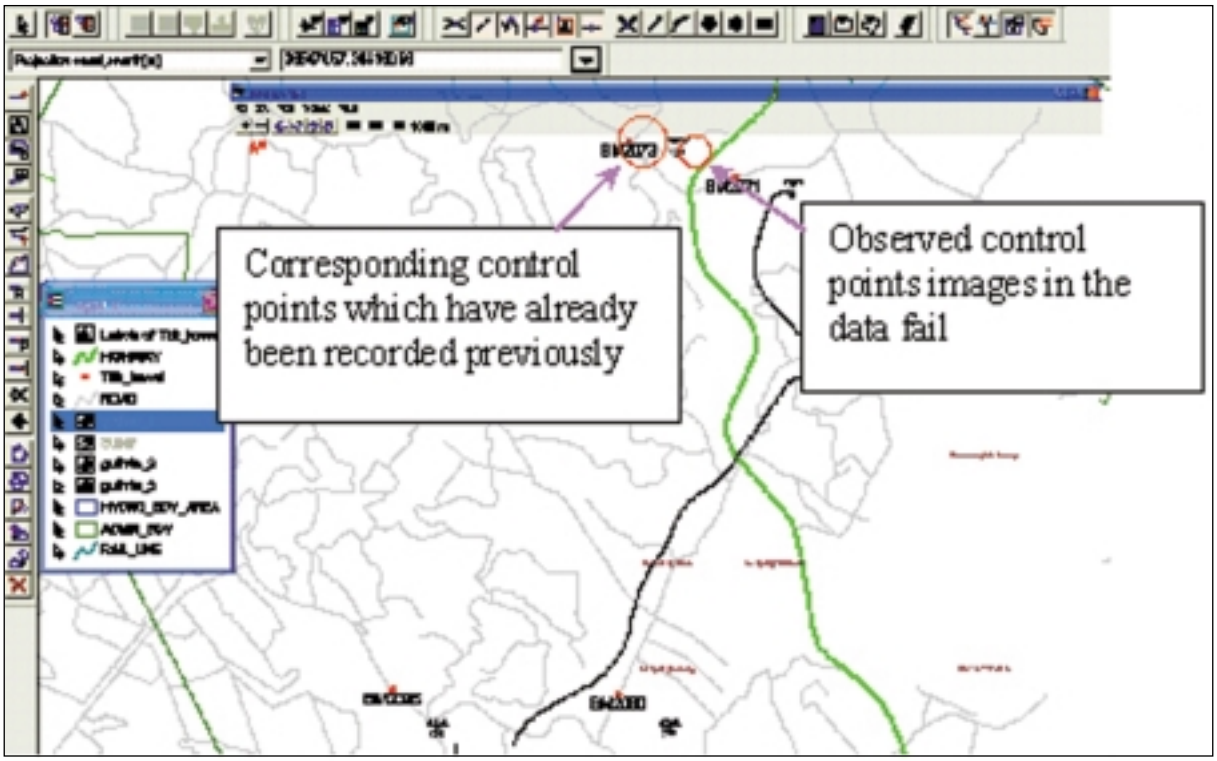


Figure 8.0: Attach data fail into database

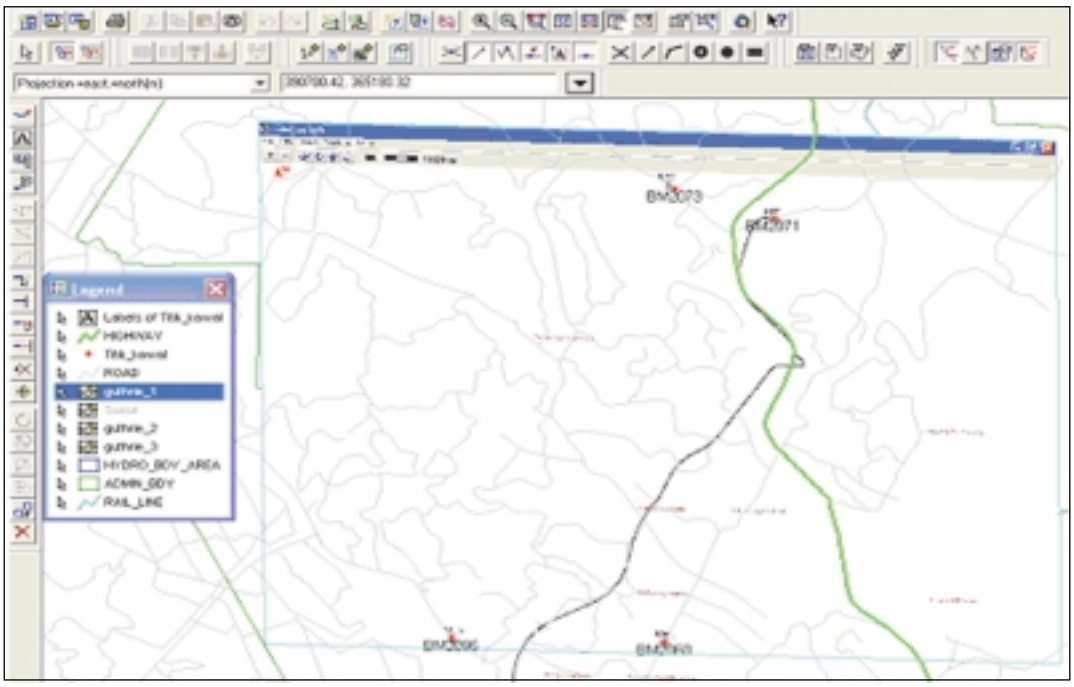


Figure 9.0: Succesfull Registed Image

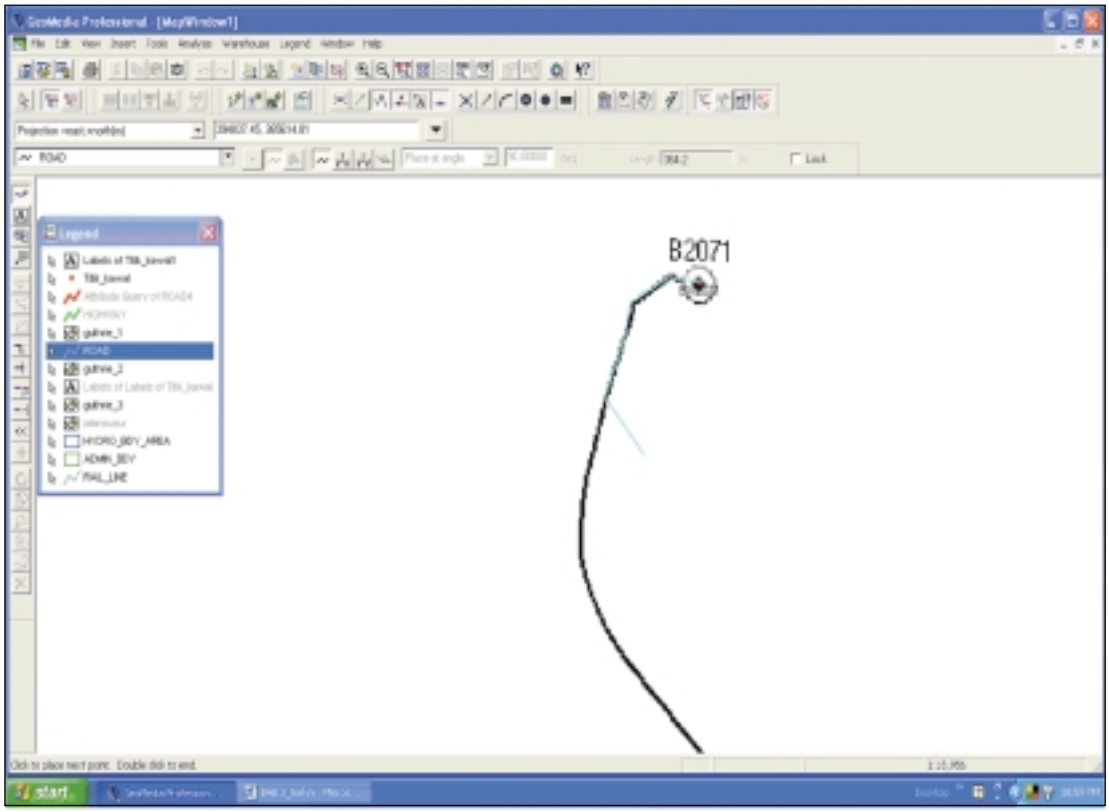


Figure 10.0: Digitising Process

3.0 ANALYSIS OF RESEARCH RESULT

Updating results are shown by comparing the maps produced from old database **(Figure 11.0)** and the maps produced from updated database **(Figure 12.0).**

Figure 11.0: Map of research location before update

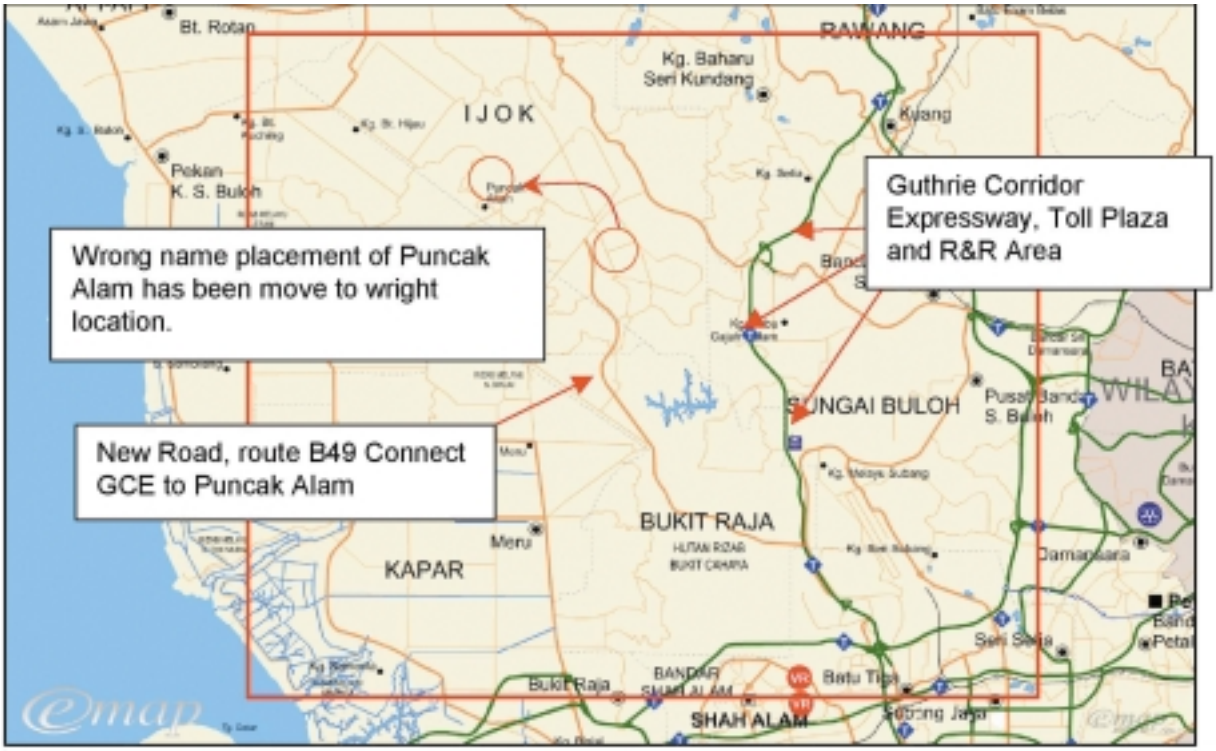


Figure 12.0: New map produced from updated database

3.1 Analysis of comparison between conventional updating method and research method

Research finding will be compared with two conventional methods currently being practiced for updating spatial database, which are:-

i. Updating data from existing topographic maps.

ii. Updating data from high resolution satellite images.

This study will be analysed by comparison with the conventional method on these aspects:-

i. Efficiency of time updating technique.
ii. Cost effectiveness.
iii. Quality of data.
    a. Positional accuracy.
    b. Temporal accuracy.

3.2 Analysis of efficiency updating technique.

3.2.1 Updating data from existing topographic maps.

This is the most efficient method if the latest information to be updated is in the map. However, it frequently fails since the existing maps normally do not contain uptodate information, due to long process of production and the long period of repeat production.

According to the standard publication of topographic maps, the period of data collection commencing from planning stage up to the printed map, requires 765 days which is almost two (2) years. This long period means data contained in the newly produced maps may then have backdated by two years. Stages of processes involved for the production of topographic maps according to MS ISO 9002 is as shown in **Table 3.0**

Item	Process	Period (days)
1	Airborne Data Acquisition	90
2	Earth Control Point Process	45
3	Earth Control Point Measurement	75
4	Scanning and Ratification	70
5	Digitized	95
6	Preparation of Topographic Data Set/Field Completion Plot	120
7	Updating Topographic Details	210
	TOTAL	**765**
		109 week **2 years**

Table 3.0

3.2.2 Updating data from high resolution satellite images compare to research method.

The process of collecting high resolution satellite data entails the process of government procurement which must undergo a strict financial procedure. A time period of at least between one to two months is needed to obtain various approvals in order to purchase the required satellite image. High resolution satellite image needs large data storage and high capacity computer to process the image. For data of scene size 16.5km x 16.5km, the size is as big as 300 MB. Approximated minimum 10 weeks required to complete updating process using this method.

Using research method observation works for information can be conducted at any time, day or night, whenever required. Data obtained is real time data, whilst data observed is digital data which is easy to manage and stored. Observed data file of format *.ttm is small in size even with distance of up to tens of kilometres. Data observation works and update of highway information database can be completely accomplished within only one to two weeks.

The method of employing mobile GPS takes a time period of only two weeks or 9 % compared to the period needed for updating database from topographic mapping activities. By contrast with the technique of using high resolution satellite imagery that requires 10 weeks, the mobile GPS technique can conserve time by 80%. As a conclusion, it is evident that the method of updating database using mobile GPS is really effective and efficient.

3.3 Cost Efficiency Analysis

In this study, the comparison of costs only includes the cost of manpower, costs to be paid to third party and also the costs of additional equipment needed to acquire data. Cost for existing equipment and software is not taken into consideration since it does not incur any extra costs.

3.3.1 The cost of updating data from high resolution satellite image compare to research method.

The cost of obtaining high resolution image from satellite is rather high. The price charged by suppliers for procuring this data depends on when the data is observed. In general, the price offered in Malaysia is RM 75.00/km^2. Therefore the cost required for research area of 780km^2 is RM 58,500.00.

Updating spatial database in this research requires several equipment and also additional cost for the purpose of data acquisition fieldworks. In spite of this, the equipment cost, which is the highest, is a one-time cost which is non-repetitive. Repetitive costs for each data observation work are only the costs of transportation and workers.

Item	Type of Cost	Cost (RM)
i.	**Equipment Cost (one-time cost)**	
	a. Pocket PC & Accessories	2850.00
	b. GPS Signal Receiver	700.00
	c. Telytype Software	250.00
	Equipment Cost	**3800.00**
ii.	**Cost of fieldwork (200 km/day@10 days)**	
	a. Manpower, (2 nos technicians)	1500.00
	b. Transportation, (5 days of fieldworks)	1400.00
	Fieldwork Cost	**2900.00**
	Total Cost	**6700.00**

Table 4.0

With the assumption that equipment depreciates in value at twenty percent per year and the equipment is used twelve times a year, the cost of equipment for the research period of one month is then:-

Equipment Cost 1/12 months x (20% X 3800) = RM 63.33
Fieldwork Cost = RM 2900.00
Total Cost of Research = RM 2963.33

From the table, it is obvious that the cost for updating data by topographic mapping activities incurs the highest cost which exceeds RM 100,000.00. For the technique of updating data from high resolution satellite images, a cost of RM 58,000.00 alone is needed to obtain the images. Whereas for research method of using mobile GPS only RM 3,000.00 is required, which is a mere 3% compared to

the cost of procuring data from topographic mapping activities and 5.2% compared to the cost of acquiring high resolution satellite images.

3.4 Data Quality Analysis

In this analysis, data quality will be evaluated with these aspects:-

i. Accuracy of position coordinates

ii. Temporal accuracy

3.4.1 Analysis on the accuracy of position coordinates from topographic mapping activities.

The accuracy of position coordinates, for data updated from existing topographic maps, depends upon several factors. Among the factors are the position accuracy of maps used, resolution capacity of digitising equipment and the scanning resolution of map images used. Apart from that, production factors such as generalisation can also vary the position accuracy of maps produced. MS ISO 9002 documents stipulate that the planimetric accuracy for map scale 1:50 000 is within $\pm$ 5 metres or position accuracy of 10 metres. Assuming that the rest of the aforesaid factors do not influence accuracy of data, then the data from topographic universal activities is able of yielding position accuracy up to 10 metres.

Analysis on the accuracy of position coordinates from high resolution satellite images.

Spatial resolution up to 0.61 metres for panchromatic image proves that satellite images are able to provide better position accuracy up to almost 1.22 meter, depending upon the precise registering of images into database. Supposing that the control points used are class 1 GPS control points with planimetric accuracy up to centimetres, then the data from this method is able to yield accuracy of at least 2 metres.

3.4.2 Analysis on the quality of position coordinates from the research method.

In this study, resolution from the image of observed data produced from Print Screen technique is 72 dpi. The image is of scale 1:40 000. Hence, spatial resolution for the image is obtained as:-

Spatial Resolution (1 pixel) = 40 000 / 72

= 555.55 inch

= 14.11 metres

Position accuracy of research method is 28.22 metres.

3.4.3 Conclusion of position accuracy quality analysis.

High resolution satellite image is able to supply the highest position accuracy compared to other methods. It is capable of providing accuracy up to 2 metres. Data from topographic activities is able to yield maximum accuracy up to 10 metres. In contrast, the accuracy can be offered by the research method is only around 28 metres (see **Table 5.0**) However, the accuracy value from the application of mobile GPS is sufficient for maps of scale 1:50 000 and higher because allowable accuracy is 50 metre (see **Table 1.0**)

Data Source	Accuracy (metre)
Topographic mapping activities	10
High resolution satellite images	2
Mobile GPS	28

Table 5.0

3.4.4 Analysis on the temporal accuracy quality of topographic mapping activities.

Referring to **Table** 5.0, the period between aerial photography activities until the completion of maps is three years. However, if only the period between preparations for Topographic Data Set/Field Completion Plot up to the completion of topographic database is considered, the time incurred is only 72 weeks. This means that the temporal accuracy of data obtained from topographic mapping activities is 72 weeks.

3.4.5 Analysis on the temporal accuracy quality of high resolution satellite images.

For high resolution satellite images of type *quick bird* from Digital Globe, the revisit period is between 1 to 3 days. However, this period does not guarantee that the image can be obtained for each revisit wherein other factors such as cloud cover can extend the period for acquiring image. Apart from technical grounds mentioned above, other factors such as financial matters etc can also prolong the process of obtaining data. In general, the shortest possible period is approximately four (4) weeks.

3.4.6 Analysis on the quality of temporal accuracy from research method.

Temporal accuracy using the research method is high since data obtained is real time data throughout observation. Hence the data used to update database in this research method is the data approaching real time in which the temporal accuracy does not exceed a week.

3.4.7 Conclusion of temporal accuracy quality analysis.

Data Source	Temporal Accuracy (week)
Topographic mapping activities	72
High resolution satellite images	4
Mobile GPS	1

Table 6.0

It is obvious that temporal accuracy provided by the data from mobile GPS is really high. This is because the age of given data is approaching real time compared to the data obtained from topographic mapping activities which is nearly two years of age. It is apparent that the method for acquiring data with mobile GPS is very suitable for updating cartographic thematic database, since it is capable of supplying current data required to guarantee that the thematic map products are not only good in design but also offers latest information corresponding with the year they are produced.

4.0 CONCLUSION

The research method that had been conducted in updating spatial database approaching real time using mobile GPS, managed to prove that the use of simple and inexpensive equipment is able to meet the targets laid out in the research objective. Research results also demonstrates that updating database by mobile GPS is not only efficient, inexpensive, and supplies information approaching real time, but also able of yielding position accuracy suitable for the production of thematic maps of scale 1:50 000 or smaller.

The capability of this equipment for observing road information which is of linear feature can be further extended to other similar features such as drains, canals, boundary lines, power and telephone lines, etc. In addition, the ability to observe control points can be expanded to other point features such as signboard positions, kilometre signs, hydrants, location names, etc. which form a major part of the information displayed in small scale maps.

As a conclude, it can be deduced that the application of mobile GPS equipment is highly suitable for updating near real time medium and small scale spatial database.

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INTEROPERABILITY OF GEOSPATIAL DATA : SUPPORTING NATURAL RESOURCES AND ENVIRONMENTAL ADMINISTRATION IN MALAYSIA

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1.0 Introduction and Motivation

Most geospatial data collecting organisation may have a few management systems in place for captured data and processed data, but they are situated in different locations, not accessible to all who need this information and do not allow a single view of all the datasets. Geographic Information System (GIS), a combination of a computer application and database system, allows for storing, manipulating and managing spatial and non-spatial datasets in a single view. It is a powerful management, planning and decision-making tool. The GIS field began around 1960, with the discovery that maps could be 'programmed' using simple code and then stored in a computer allowing for future modification when necessary. Since then, GIS has been acknowledged to provide many solutions to management and planning issues. It has the power of managing geospatial datasets, creating maps, manipulating information, viewing current scenarios, solving complex problems, promoting new and useful ideas and developing effective solutions that cannot be realised using other techniques. GIS technology provides the ability to analyse disparate data, model and predict the impact of human and natural events to plan and decide on a course of action.

Implementing GIS projects requires the management of large sets of disparate types of data such as vector maps, aerial photographs and satellite imagery. All of the data should be integrated and view in one application so that useful and reliable information can be extracted and applied in decision making and natural resources and environmental planning. Essentially GIS and databases cannot be separated in accomplishing a powerful system for geospatial data and information management. Most of the countries globally are using GIS to assist in the planning and management of land resources, infrastructure systems and environment.

As for Malaysia, use of GIS technology continues to grow as more government agencies and local municipal councils are developing and utilising GIS system especially those in the area of natural resources and environmental management. Under the Ministry of Natural Resources and Environment (NRE) Malaysia, there are a total of 10 agencies, which deploy GIS technology in order to deliver their daily business and future planning. However due to different needs, the massive amounts of geospatial and related data regarding natural resources collected by the agencies were fragmented, with each agency having its own database and system. As such, the scattered data is not conducive to quick and well-informed decision making by the top ministerial management. This is because detailed information of various items of natural resources and environmental is needed in the economic planning for a state or nation and it takes time to compile the reports from the various agencies.

In order to help resolve issues, to assist planning and management of natural resources effectively and efficiently, an integrated cross-agency natural resource management approach is desired. Therefore, Malaysian Centre for Geospatial Data Infrastructure (MaCGDI) has developed a single view natural resource and environment management system, in belief that this system will benefit to all users and result in significant saving for all parties. **Figure 1** shows the concept of the system.

FIGURE 1: Single access geoportal concept for multi-agencies within the NRE

2.0 Aims and Objectives

An integration of different geospatial and non-spatial dataset within NRE agencies is required. Therefore, the research is aimed to design and develop a better natural resource management and dissemination tool by using current GIS technology. An appropriate and effective system is a must to ensure data to be integrated and delivered in a meaningful and accurate manner. Issues and problems pertaining to national agenda can be tabled and informed interactively, thus, assist and streamline the process of planning and decision making. There are three key elements in the successful development and implementation of management tool and can be given as follows:

i) To investigate, review and study the geospatial data within the NRE that is stored in different locations in the agencies;

ii) To develop a comprehensive standardized GIS database; and

iii) To design and develop a natural resource and environmental management system to handle, integrate, displaying multi-disciplinary geospatial data to support problem-solving activities by using contemporary GIS application and technology.

3.0 G4NRE – An Improved Natural Resources and Environment Management using Geospatial Technology

With the objective of integrating multi-disciplinary data from various NRE agencies, an effective management system by using current GIS technology is being worked out. This application is also known

as Geoinformation for NRE, going by the acronym G4NRE.

Today, the growth of World Wide Web (WWW) technology allows quick and accessible distribution of the desired information. Thus, the importance and role of web for dissemination of geospatial information is recognized. In order to provide timely access to those integrated natural resource related data, the web-based GIS technology is chosen.

3.1 Review of Geospatial Data within the NRE

A task was carried out to investigate and review the existence of geospatial data in 10 agencies under NRE. Meetings and calls to these agencies took several months and more than two times the agencies were visited to achieve an overarching strategy and theme that would help to structure and table the needed data. The linkages and relationship among these data were discovered and noted. This provides capabilities to structure and manage them in the spatial database so that they can be used efficiently and intelligently for analysis and visualisation for planning and decision making purposes concerning natural resources and environment.

The results of the data study offered views of what data is really required for natural resources and environmental issues and planning. Currently, several issues such as flood, illegal logging, biodiversity poor conservation, river pollution, and water and air pollution have been greatly debated demanding for solution. Gathering all geospatial that are associated with these issues has been the main focus of the review exercise. When all data and information have been gathered designing GIS web-based system is carried out.

3.2 Map Engine Architecture

After evaluating a number of options, MaCGDI has chosen Autodesk MapGuide as its online map engine to develop G4NRE application. The Autodesk MapGuide was used because of its known ability to incorporate and to work well with data in a variety of GIS, CAD and database formats. This map engine consists of three core components – MapGuide Server, MapGuide Author and MapGuide Viewer that were developed for distributed network environments. These components work together with a web server to serve dynamic maps to a web browser. **Figure 2** shows the overview of product architecture using in G4NRE development.

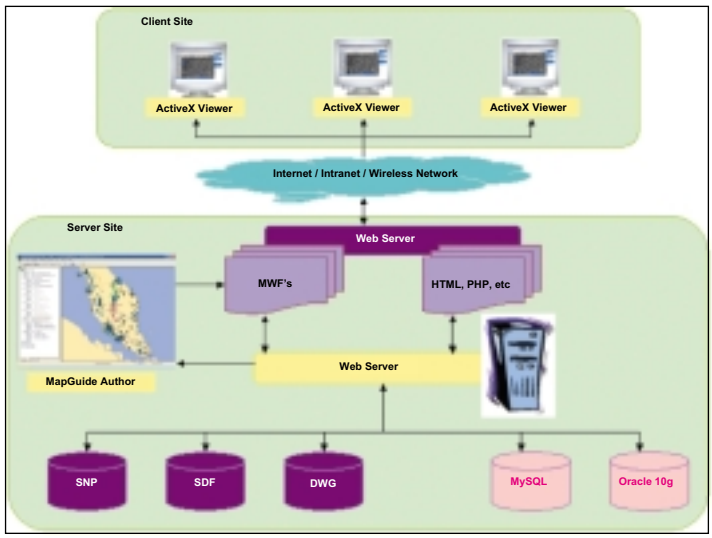

Figure 2: Simple and efficient Autodesk MapGuide architecture

3.3 G4NRE Geoportal Implementation

Generally, there are two major components to be constructed in order to develop and implement the G4NRE geoportal, namely the GIS database component and the web component. The development of GIS database that gathers and integrates a number of disparate sources is accomplished in several phases such as user requirement study, data collection, data processing and database design. Indeed, a comprehensive GIS database requires good design in order to manage the variety of data in the database. **Figure 3** illustrates the entire process of GIS database management for this research.

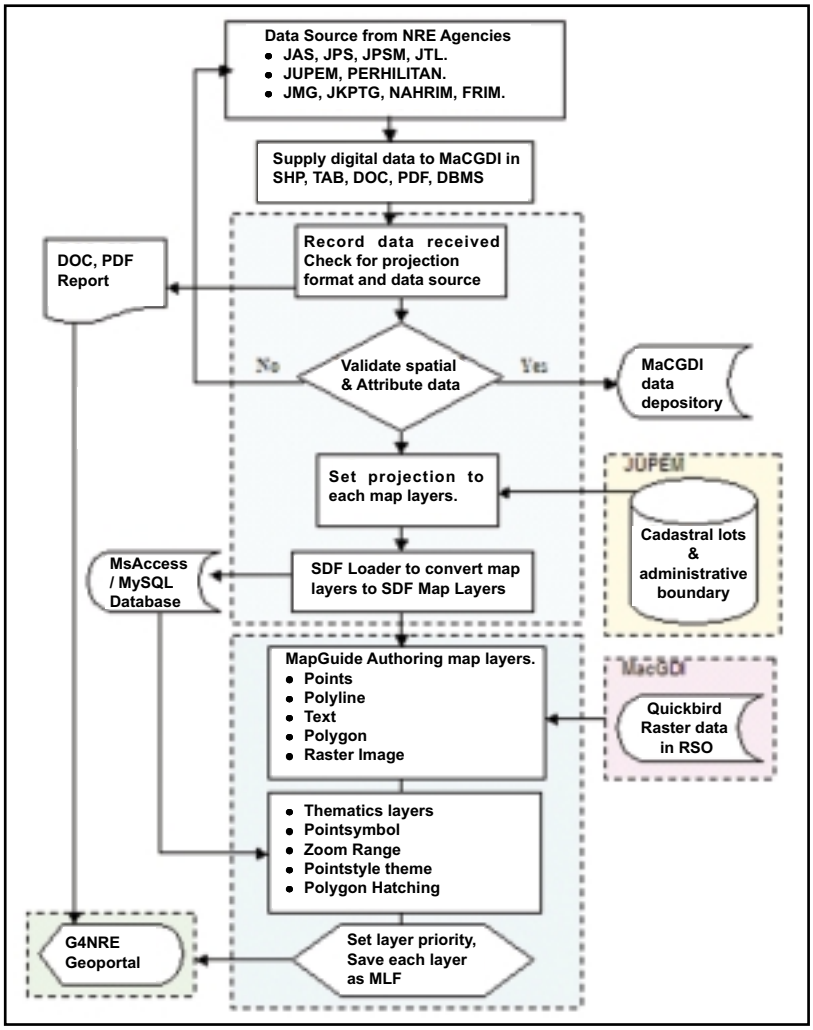

Figure 3: Workflow of data capturing and integrating activities for G4NRE

There are a variety of geospatial data format collected from NRE agencies such as ArcView shapefile, MapInfo tab etc. Data checking was required to ensure the completeness and accuracy of the data. After that, the typical data processing like cleaning, building topology, and defining the projection were carried out. The data is then converted to web-based GIS format that is supported by Autodesk MapGuide. This is followed by inserting layers, setting symbology, labelling, creating thematic map and so forth to generate the online map. By using the selected map engine, it can now readily incorporate base cartographic and natural resource data, such as hydrology, topography, mineral, forestry into maps. The technical staff can then combine this information with satellite imagery to produce sophisticated

maps for presentation to top ministerial management in a fraction of the time it took before. While, the MySQL server is used to manage the non-spatial data.

The construction of web component takes part concurrently with database development. In order to develop an effective and user-friendly natural resource and environmental management structure, system design plays a very important role. **Figure 4** shows the designed system architecture. It consists of intelligence framework containing the business flow and business related components like user interface component, security component, data access component etc used for timely retrieval of data for quick decision making and processing.

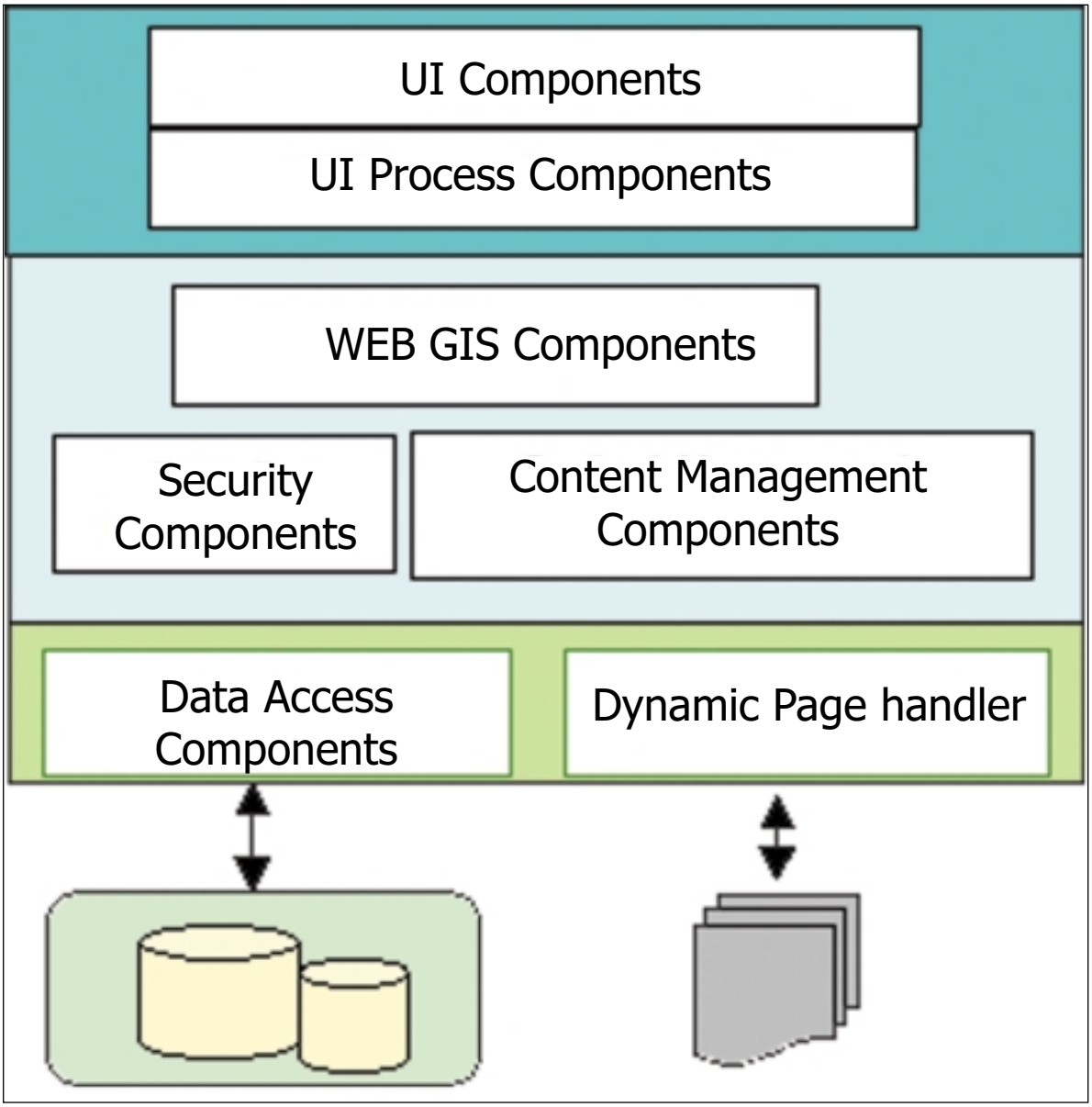

Figure 4: G4NRE geoportal architecture

The G4NRE geoportal web-component can be further divided into two components, a front-end system for top management and NRE agencies consumption (end-users) and a back-end system for the use of technical staff. Technically, the back-end system allows handling layers and data attribute, and bridging the gap between the map engine, and its massive data repository, and the end-users interface. **Figure 5** illustrates the difference between the front-end and back-end user interface.

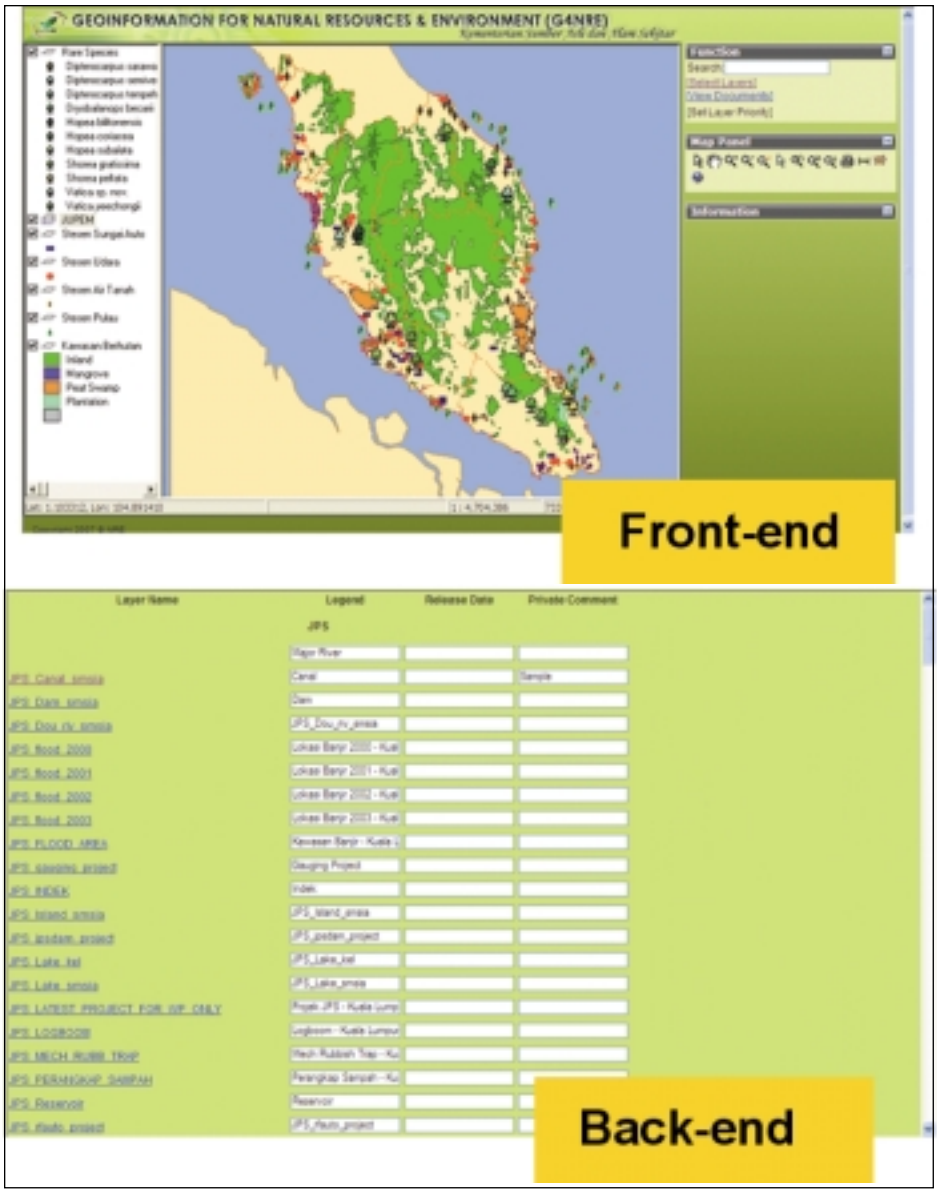

Figure 5: Differencebetween front-end and back-end user interface and functionality

The modules or functions included in both designs vary depending on the purposes of developing them. The back-end system of the portal focuses on the fine-tuning of the massive data collection and information to be returned to the end-user. It was designed to provide technical users the ability to rename raw data attribute fields to more meaningful and human friendly names, to remove raw data attributes not conducive to decision making and refining the portals ability to search for related data. By using this metadata and layer management system, it is easier to handle, search and analyse the massive amounts of geospatial data available.

Figure 6: Some sample modules of back-end G4NRE system

While for the front-end system, a lot of modules and functions have been developed to offer a complete and user-friendly geoportal. For instance, the view in Google Earth function shown in **Figure 7**, has a tighter Google Earth integration by exporting selected geospatial features to Google Earth for easier cross-referencing and visualisation of data upon satellite ground images. Meanwhile, this geoportal also offer the ability to visualize historical and near real-time data such as Air Pollution Index (API) from Environmental Department. Again, it enhances the ministry's ability for good governance. In addition, security system module, layer selection (Figure 8) and priority module, search and locate function, click and display function, simple analysis function like buffering, area and length calculation and others have been developed in the G4NRE geoportal.

Figure 7: Exporting select features to Google Earth

Figure 8: Layer Selection Interface

4.0 Discussion

G4NRE is a practical solution to a problem currently faced by the top ministerial management, to get timely cross-referencing of data from different sources. By using the MapGuide engine, G4NRE can provide the user with integrated geospatial data in the form of dynamic maps and information. Elements within the map are linked to related databases and data tables. These links give users real-time access to both tabular data and additional geospatial information. The development of G4NRE can ensure that the much-needed land-related information could be made available to users through a single interface. This allows the NRE agencies to share data among themselves in a quick and cost-effective way. The planning and decision can be made based on the most up-to-date information. The ability of assembling a massive and huge geospatial database, providing web delivery of data and performing real time mark-up of maps has provided an effective solution to turn around legislative requests for information overnight.

The integrated and single portal access provides vision of how agencies can work together to acquire and share high resolution and strategic geographic data layers for the entire ministry. This would encourage agencies to collaborate on GIS data management. Some NRE agencies would find motivation to cooperate because it makes sense for a good return of investment and will enrich their individual GIS capabilities. As a matter of fact, there is a high cost and level of effort involved to autonomously and independently build high quality data. Agencies find the need to have information readily available when they need it, especially when high profile ministerial management urgently asks for it for an undertaking or issue of national concern. Agencies have discovered that geographic information should be complete, serve multiple purposes, multiple users and be easily shared.

Throughout the implementation of G4NRE, there has been significant time saving and efficiency gains. It was estimated that much of collection and compilation work could now be accomplished several times faster than before. The efficiency of the entire operation by allowing for quick and easy retrieving and visualizing is increasing. In addition, G4NRE offers the users access to a wealth of natural resource information at the touch of a button. The users can review related documents, as well as make spatial queries of geospatial data contained in the databases. Furthermore, it helps to support natural resource management business and decision-making toward ensuring the best use of the country's finite land and natural resources, strengthening the operational efficiency of NRE agencies.

5.0 Conclusion

In conclusion, it can be said that the described way of storing and managing geospatial datasets using G4NRE has promoted an intelligent, highly scalable, timesaving, many-to-one portal access administration and integration of data as well as achieving the government wide data sharing and accessing vision. It is hoped that this GIS-based management system could be expanded to achieve a holistic system for the nation involving all ministries that would enhance government sector capabilities and delivery system, with emphasis on homeland security and disaster management system.

VERIFIKASI DATA GEOSPATIAL G4NRE JABATAN TAMAN LAUT DI PULAU TIOMAN, PAHANG

Oleh
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1.0 Pengenalan

G4NRE atau *Geoinformation for NRE* merupakan aplikasi *Geographic Information System* (GIS) berdasarkan web yang dibangunkan oleh MaCGDI untuk kegunaan pencapaian data geospatial oleh pihak pengurusan Kementerian Sumber Asli dan Alam Sekitar (NRE) dan Jabatan di bawahnya. Jabatan Laut Malaysia merupakan salah sebuah agensi penyumbang data aplikasi ini. Jabatan Taman Laut Malaysia dalam proses untuk mendapatkan maklumat berkenaan kedudukan boya penambat, boya penanda kawasan, Pejabat Pusat Taman Laut, jeti dan kemudahan asas yang lain di sekitar kawasan Taman Laut. Didapati maklumat yang dibekalkan oleh Unit Taman Laut Negeri Pahang adalah kurang tepat dari segi kedudukan latitud dan longtitud. Sehubungan dengan itu, Jabatan Taman Laut Malaysia dengan kerjasama Juruukur dari MaCGDI telah menjalankan kerja verifikasi dan pengumpulan data bagi Unit Taman Laut Negeri dengan cara pengukuran *Global Positioning System* (GPS) supaya mendapatkan kedudukan butiran yang tepat dan jitu.

2.0 Objektif

Objektif utama dalam projek kerja lapangan ini adalah:

i) Untuk mendapatkan data butiran terperinci yang bakal dibekalkan kepada aplikasi G4NRE;
ii) Untuk menjalankan verifikasi data GIS sedia ada yang dibekalkan oleh pihak Unit Taman Laut Pulau Tioman;
iii) Untuk menubuh satu titik rujukan GPS di Pejabat Pusat Taman Laut;
iv) Untuk mengadakan *technology transfer* yang lebih praktikal mengenai pengetahuan pencerapan data GPS kepada personel Unit Taman Laut Pulau Tioman.

3.0 Perlaksanaan Kerja Di Pulau Tioman

Kerja-kerja ukuran cerapan GPS telah dimulakan pada 8 hingga 10 Ogos 2007 dan diwakili oleh kakitangan dari MaCGDI, Jabatan Taman Laut Malaysia dan *Forest Research Institute Malaysia* (FRIM).

Peralatan, perisian dan data yang telah digunapakai semasa kerja lapangan terdiri daripada peralatan *Trimble Pro XRS GPS* dan *HP iPAQ pocket PC*, perisian *Pathfinder Office* dan *TerraSync Professional*, maklumat station GPS di Stn GPS DCA Pulau Tioman, maklumat data sedia ada digital lot kadaster Pulau Tioman dan topografi Pulau Tioman (WGS84).

4.0 Pelaksanaan Kerja Pengukuran GPS

Kerja ukur GPS telah dijalankan di kawasan darat dan diberi keutamaan kepada kawasan Teluk Mesoh dimana terletaknya Pejabat Pusat Taman Laut dan Kg. Tekek – Lapangan Terbang (TH20) dan

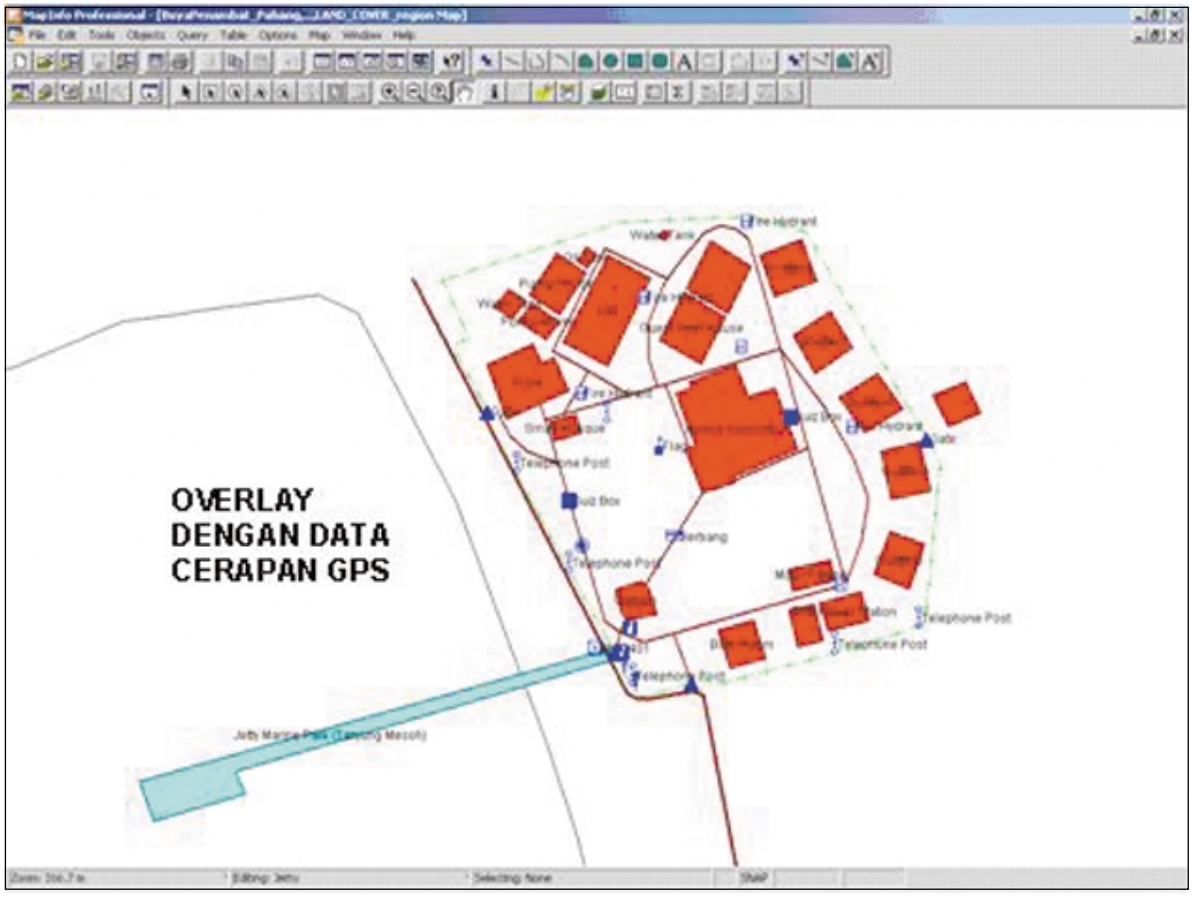
jalan manakala kerja ukuran di kawasan laut tertumpu kepada Kg. Salang, Monkey Bay dan Kg. Mukut.

Kerja memproses data telah dilakukan dengan bantuan Perisian *TerraSync Professional*, *Pathfinder Office* dan *ArcMap (ArcGIS).* Perisian TerraSync Professional dalam iPAQ Pocket PC digunakan semasa kerja cerapan di padang dimana *Pocket PC* telah disambungkan dengan alat *Trimble Pro XRS GPS* untuk menyimpan data butiran yang dicerap.

Manakala Perisian *Pathfinder Office* digunakan untuk memproses data cerapan ke dalam bentuk GIS (*point line dan polygon*) dan melakukan sedikit kerja-kerja suntingan. Akhir sekali, perisian ArcMap digunakan untuk menyunting, membuat pertindihan hasil data cerapan butiran dengan imej satelit serta membuat perbandingan data cerapan lama dengan yang baru.

5.0 Hasil Keputusan Kerja Pengukuran GPS

Butiran yang dicerap sepanjang kerja lapangan ini telah dikategorikan kepada 16 butiran seperti *Bench Mark, Building, Buoy, Electricity, Fench, Fire Hydrant, Flag, Gate, Gerbang, GPS, Jetty, Road, Sign Board, Suiz Box, Telephone, Track*. Semua *features* tesebut adalah dalam format *Shp* dan *Tab* (WGS84). Data ini boleh diserahkan kepada Jabatan Taman Laut Malaysia untuk kegunaan aplikasi G4NRE **(Rujuk rajah 1)**. Butiran data koordinat *feature* yang dicerap melalui GPS adalah seperti pada **Jadual 1 & 2**.



Rajah 1: Cerapan Butiran di Pusat Taman Laut Pulau Tioman

Attributes of Building_region

FID	Shape	ID	CODE	NAME	NAME0	AREA_M2	DATE
0	Polygon	1	UA0030	Power Station	TNB Power Station	91.724	9/8/2007
1	Polygon	2	BA0010	Residential Building	Quarters	142.756	9/8/2007
2	Polygon	3	BA0010	Residential Building	Quarters	141.719	9/8/2007
3	Polygon	4	BA0010	Residential Building	Quarters	140.101	9/8/2007
4	Polygon	5	BA0010	Residential Building	Quarters	139.083	9/8/2007
5	Polygon	6	BJ		Gazebo	78.498	9/8/2007
6	Polygon	7	BF0010	Building of Worship	Small Mosque	39.493	9/8/2007
7	Polygon	8	BJ		Toilet	69.723	9/8/2007
8	Polygon	9	BJ0070	Parking Area	Motor Paking	66.056	9/8/2007
9	Polygon	10	BJ		Store	253.664	9/8/2007
10	Polygon	11	BJ		Lab	341.652	9/8/2007
11	Polygon	12	UC0080	Pump House	Pump House	55.009	9/8/2007
12	Polygon	13	UC0100	Suction Tank	Water Tank	35.245	9/8/2007
13	Polygon	14	UD		Oil Tank	15.498	9/8/2007
14	Polygon	15	UC0100	Suction Tank	Water Tank	5.261	9/8/2007
15	Polygon	16	BA0010	Residential Building	Quarters	124.294	9/8/2007
16	Polygon	17	UB0240	Telecom Tower	Telecommunication Tower	87.302	9/8/2007
17	Polygon	18	BJ		Bath Room	106.005	9/8/2007
18	Polygon	19	UC0080	Pump House	Pump House	127.555	9/8/2007
19	Polygon	20	BA0010	Residential Building	Guest Rest House	182.743	9/8/2007
20	Polygon	21	BA0010	Residential Building	Guest Rest House	182.261	9/8/2007
21	Polygon	22	BD0010	Institutional Building	Marine Park Office	852.234	9/8/2007

Record: 1 Show: All Selected Records (0 out of 22 Selected)

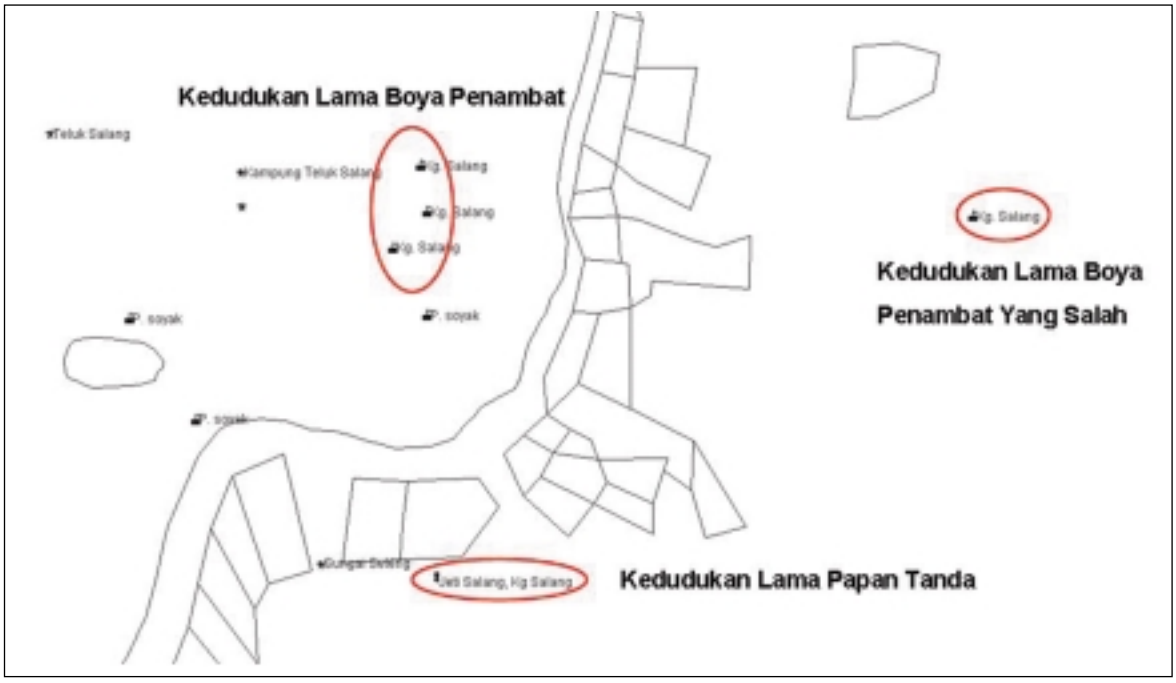
Jadual 1: Data Koordinat butiran yang dicerap

Attributes of Fire Hydrant_point

FID	Shape	ID	CODE	NAME	NAME0	LATITUDE	LONGITUDE	DATE
0	Point	1	UC0130	Fire Hydrant	Fire Hydrant	2.834704	104.16271	9/8/2007
1	Point	2	UC0130	Fire Hydrant	Fire Hydrant	2.834411	104.162686	9/8/2007
2	Point	3	UC0130	Fire Hydrant	Fire Hydrant	2.834301	104.162312	9/8/2007
3	Point	4	UC0130	Fire Hydrant	Fire Hydrant	2.833852	104.162937	9/8/2007
4	Point	5	UC0130	Fire Hydrant	Fire Hydrant	2.834224	104.162964	9/8/2007
5	Point	6	UC0130	Fire Hydrant	Fire Hydrant	2.834527	104.162461	9/8/2007

Record: 1 Show: All Selected Records (0 out of 6 Selected)

Jadual 2: Data Koordinat butiran yang dicerap



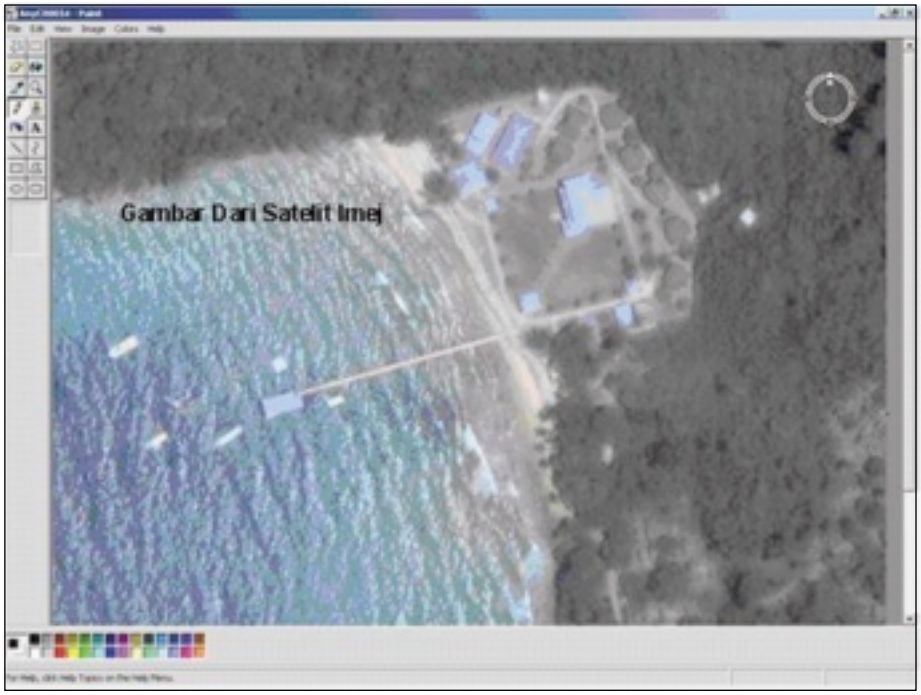
Rajah 2: Kedudukan Boya Penambat dan Papan Tanda sebelum pembetulan

Selepas disemak didapati kesilapan yang berlaku (nilai latitud dan longitud yang diberikan oleh Unit Taman Laut Pulau Tioman) di mana kedudukan boya penambat yang berada di darat serta papan tanda taman laut yang berada di laut adalah disebabkan oleh kesilapan semasa membaca koordinat

atau merekodkan nilai koordinat. Boya di laut yang telah dipeta sebagai terletak di atas darat telah diverifikasikan dan kedudukan yang sebenar dan betul telah dikenalpasti seperti dalam **Rajah 2 & 3.**

Rajah 3: Kedudukan Boya Penambat dan Papan Tanda sebelum pembetulan

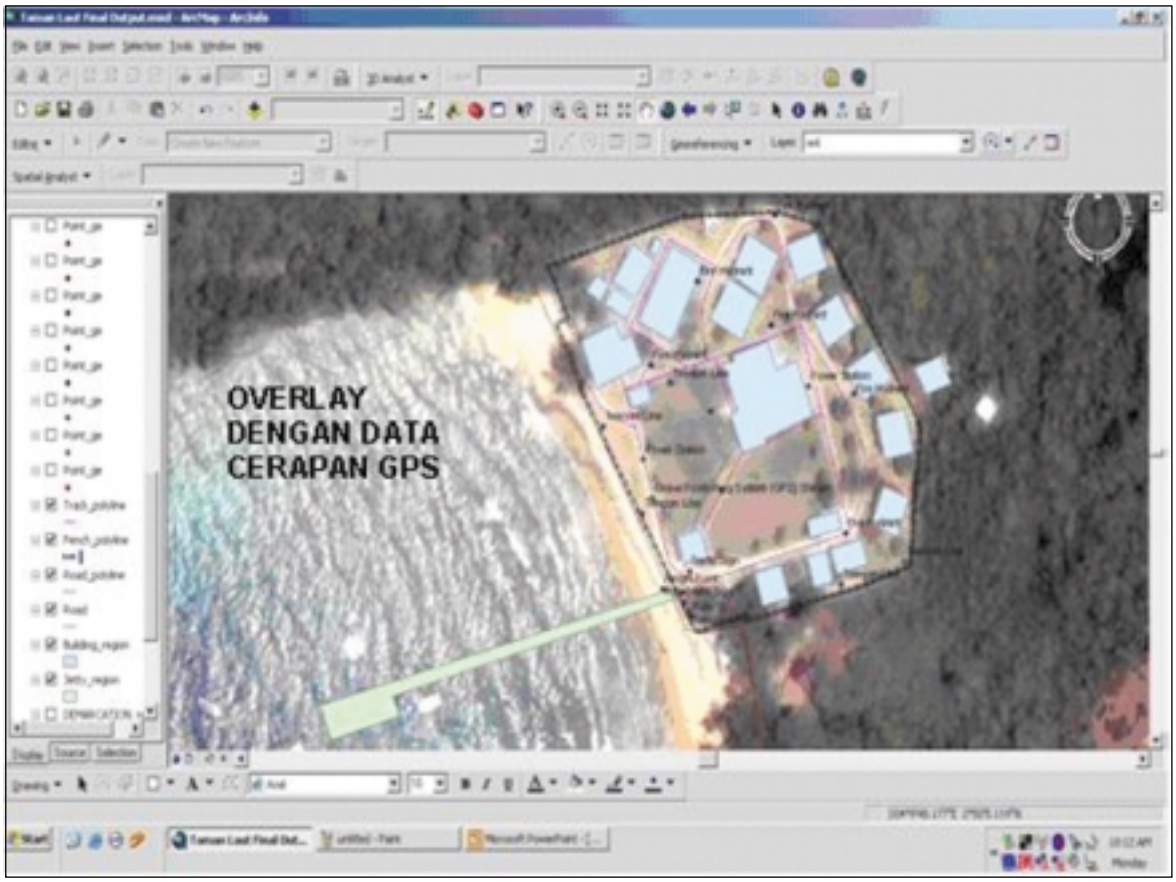
Gambar imej satelit Quickbird dari Google Earth telah digunakan sebagai perbandingan di antara butiran yang dicerap di Pejabat Pusat Taman Laut. **(Rujuk rajah 4 & 5)**



Rajah 4: Imej Satelit Pejabat Pusat Taman Laut dan jetinya

6.0 Cadangan dan Kesimpulan

Hasil daripada kerja lapangan ini, didapati beberapa cadangan boleh diberikan kepada pihak



Rajah 5: Tindihan Imej Satelit dan Data Cerapan GPS

Jabatan Taman Laut Malaysia untuk penambahbaikan pada masa hadapan. Cadangan tersebut adalah merangkumi aspek-aspek seperti kelengkapan dari segi peralatan, perisian, tenaga mahir serta cara cerapan data, pengendalian data dan menghasilkan pelan. Pihak Jabatan Taman Laut disarankan supaya menggunakan alat GPS yang memberi *accuracy* yang lebih baik daripada peralatan sedia ada sekarang. Ini penting supaya kedudukan butiran dapat dipeta dengan lebih tepat terutama bagi lokasi penangkapan haram dan pencerobohan nelayan asing ke kawasan perairan Malaysia. Spesifikasi peralatan GPS kepunyaan MaCGDI yang digunakan dalam projek ini boleh digunakan oleh Jabatan Taman Laut untuk perolehan akan datang.

Matlamat utama kerja lapangan selama tiga hari ini telah dicapai dengan sempurnanya, iaitu mendapatkan data butiran serta pendedahan dan latihan kepada individu di Unit Taman Laut Pulau Tioman. Manakala untuk proses verifikasi data taman laut untuk aplikasi G4NRE ini turut dilaksanakan dengan berjaya walaupun terdapat beberapa masalah pada permulaan kerja. Secara keseluruhan, matlamat aktiviti kali ini telah dicapai dengan baik dan data dapat digunakan tanpa ragu-ragu untuk aplikasi G4NRE bagi kegunaan pihak pengurusan Kementerian Sumber Asli dan Alam Sekitar serta Jabatan Taman Laut Malaysia.

Melalui aktiviti projek verifikasi ini, didapati bahawa Unit Taman Laut Pulau Tioman telah menunjukkan komitmen yang sangat tinggi serta tahap pemahaman yang baik. Dengan demikian, adalah dicadangkan bahawa latihan dan pendedahan secara berterusan kepada penggunaan GPS dalam cerapan data serta verifikasi data akan dapat membantu melahirkan tenaga mahir keseluruhan kakitangan

Taman Laut di masa hadapan. Di samping itu, pendedahan projek GPS yang dilaksanakan oleh kumpulan ini boleh dimanfaatkan oleh MaCGDI apabila ada keperluan untuk menjalankan kerja-kerja verifikasi data geospatial vektor atau imej satelite yang diproses dan simpan di MaCGDI. Pengukuran GPS merupakan teknologi geospatial yang amat diperlukan dalam projek GIS dan boleh digunakan bukan sahaja untuk membuat pengumpulan data yang jitu tetapi juga untuk memastikan data geospatial mencapai tahap kualiti yang baik.

TAKLIMAT *FRAMEWORK* DAN BENGKEL PENENTUAN HARGA DATA GEOSPATIAL

Oleh
Tang Kieh Ming
Penolong Pengarah
Pusat Infrastruktur Data Geospatial Negara (MaCGDI)
kiehming@macgdi.gov.my

Satu taklimat *framework* dan bengkel penentuan harga data geospatial telah diadakan di Hotel New Pacific, Kota Bharu, Kelantan Darul Naim pada 2 hingga 3 Julai 2007. Taklimat *framework* ini dipengerusikan oleh Dato' Sr. Dr. Abdul Kadir bin Taib selaku Pengerusi Jawatankuasa Teknikal *Framework* MyGDI (JTFM) manakala bengkel penentuan harga data geospatial pula diketuai oleh Encik Yaacub bin Yusoff selaku ketua fasilitator.

Ucapan aluan oleh Pengerusi JTFM

Objektif utama taklimat *framework* dan bengkel penentuan harga data geospatial ini diadakan adalah supaya kumpulan kerja bagi setiap negeri memahami mengenai *framework* MyGDI dan garis panduan bagi harga data geosptial untuk setiap produk yang dihasilkan oleh agensi-agensi yang terlibat.

Taklimat dan bengkel ini telah dihadiri oleh 40 orang pegawai dari agensi-agensi pihak berkuasa tempatan, Jabatan Perancangan Bandar dan Desa dan Unit Perancang Maklumat Negeri bagi negeri Terengganu, Kelantan, Pahang dan Selangor. Sepanjang 2 hari tersebut, para hadirin juga diberi taklimat mengenai data *custodianship* MyGDI, keselamatan data di bawah Akta Rahsia Rasmi 1972, langkah-langkah keselamatan dalam penerbitan dan penyebaran dokumen geospatial terperingkat, lesen hakcipta dan royalti data geospatial serta garis panduan penentuan harga dan penyebaran data geospatial di bawah pekeliling bil. 1/2005 dengan jelas. Antara penceramah yang terlibat menyampaikan ceramah adalah Sr. Dr. Zainal bin Ab. Majeed, Puan Fuziah binti Abu Hanifah, Encik Anual bin Aziz, Puan Hajjah Mariyam


Antara peserta-peserta yang hadir

binti Mohamad, Md. Yasin bin Husin (Jabatan Perdana Menteri) dan Leftenan Azrol dari Cawangan Pemetaan Pertahanan JUPEM.

Kesimpulannya, sesi taklimat dan bengkel ini mampu menyampaikan dan membantu agensi-agensi menentukan kadar harga bagi setiap produk yang dihasilkan dengan panduan yang telah digariskan dalam pelaksanaan MyGDI.

Taklimat disampaikan oleh Encik Md. Yassin bin Husin

Bengkel Penentuan Harga Data Geospatial diketuai oleh Encik Yaacub bin Yusoff selaku Ketua Fasilitator.

Sesi taklimat yang dipengerusikan oleh Dato' Sr. Dr. Kadir bin Taib.

Sesi Bengkel Penentuan Harga Data Spatial.

Sesi soal jawab.

LAPORAN BERGAMBAR

MESYUARAT KE-5
JAWATANKUASA KEBANGSAAN NAMA GEOGRAFI (JKNG)

Oleh
Nornisha binti Ishak
Seksyen Perkhidmatan Pemetaan
Jabatan Ukur dan Pemetaan Malaysia

Jawatankuasa Kebangsaan Nama Geografi (JKNG) telah mengadakan mesyuarat tahunan kali ke-5 bertempat di Hotel Equatorial, Melaka pada 31 Julai 2007. Mesyuarat yang telah dipengerusikan oleh YBhg Datuk Hamid bin Ali, Ketua Pengarah Ukur dan Pemetaan Malaysia selaku Pengerusi JKNG, telah dihadiri oleh 27 orang wakil Setiausaha Kerajaan Negeri dan Jabatan / Agensi Kerajaan Persekutuan yang menganggotai jawatankuasa ini.

YBhg Datuk Hamid bin Ali selaku Pengerusi sedang mempengerusikan Mesyuarat K-5 JKNG yang diadakan di Hotel Equatorial, Melaka.

Dalam ucapan pembukaannya, YBhg Datuk Hamid bin Ali telah menekankan mengenai kepentingan nama-nama geografi yang tekal, betul dan seragam. Beberapa contoh telah diberikan antaranya ialah berkenaan dengan isu tuntutan bertindih ke atas Pulau Batu Putih di antara Malaysia dan Singapura di mana penamaan geografi merupakan aspek yang signifikan di dalam penentuan hak ke atas pulau tersebut. Selain daripada itu, YBhg Datuk Pengerusi turut memaklumkan bahawa tujuan mesyuarat tersebut diadakan adalah untuk meneliti status perkara-perkara berbangkit dalam mesyuarat yang lalu dan mendengar laporan aktiviti-aktiviti yang telah dilaksanakan oleh Jawatankuasa Teknikal Nama Geografi Kebangsaan (JTNGK) dan Jawatankuasa Negeri Nama Geografi (JNNG).

YBhg Datuk Pengerusi turut menyorot kembali pencapaian JKNG semenjak ditubuhkan antaranya ialah berkenaan dengan penerbitan Buku Garis Panduan Penentuan Nama Geografi telah pun diedarkan untuk diguna pakai.

Selain daripada itu, antara objektif utama JKNG adalah untuk membangunkan pangkalan data nama geografi dan gazetir kebangsaan. Sehubungan dengan itu, YBhg Datuk Pengerusi mengharapkan kerjasama yang padu daripada pihak negeri dalam mengesahkan nama-nama geografi bagi negeri

masing-masing supaya maklumat tersebut betul, tepat dan terkini seterusnya dapat disalurkan kepada pengguna. Dalam pada itu juga, beliau turut memaklumkan bahawa penyelarasan urusan penamaan pulau-pulau di Malaysia yang pada ketika ini banyak ditumpukan kepada pulau-pulau di perairan Sabah telah dilaksanakan oleh Kumpulan Kerja Nama Pulau dan Entiti Geografi Luar Pesisir yang dipengerusikan oleh Pusat Hidrografi Nasional.

Selanjutnya, YBhg Datuk Pengerusi memaklumkan bahawa *14th United Nations Group of Experts on Geographical Names (UNGEGN) Asia South-East And Pacific South West Divisional Meeting 2007* dijangka akan diadakan di New York pada 20 Ogos 2007. Manakala *24th Session of UNGEGN dan 9th United Nation Conference on the Standardisation of the Geographical Names* pula akan diadakan pada 20–31 Ogos 2007 di tempat yang sama. Sehubungan dengan itu, beliau mengharapkan agar wakil-wakil daripada peringkat negeri dapat menyertai aktiviti-aktiviti penamaan di peringkat antarabangsa. Dalam mesyuarat-mesyuarat tersebut, delegasi daripada Malaysia berpeluang untuk berinteraksi dengan pakar-pakar UNGEGN mengenai isu-isu yang berkaitan dengan penamaan geografi.

Akhir sekali, YBhg Datuk Pengerusi menyeru agar setiap ahli JKNG serta Jawatankuasa Teknikal dan Negeri memainkan peranan yang lebih aktif dan mendapatkan maklum balas secara berterusan daripada komuniti pengguna terhadap usaha untuk memenuhi kehendak pelanggan. Jawatankuasa-jawatankuasa Teknikal dan Negeri juga disarankan agar berbincang dan bermesyuarat dengan lebih kerap lagi untuk menghasilkan resolusi yang boleh dijadikan dasar bagi diguna pakai oleh ahli-ahli JKNG.

Antara agenda mesyuarat pada kali ini adalah pembentangan laporan daripada tiga (3) Kumpulan Kerja iaitu Kumpulan Kerja Garis Panduan Penentuan Nama Geografi (KKGPPNG), Kumpulan Kerja Pangkalan Data Nama Geografi dan Gazetir Kebangsaan (KKPDNG) serta Kumpulan Kerja Nama Pulau dan Entiti Geografi Luar Pesisir (KKNPELP). Wakil-wakil Setiausaha Kerajaan Negeri turut melaporkan mengenai aktiviti-aktiviti Jawatankuasa Negeri Nama Geografi (JNNG) masing-masing secara ringkas. Selain daripada itu, pihak Pusat Infrastruktur Data Geospatial Negara (MaCGDI) selaku Pengerusi bagi KKPDNG telah menunjukkan demonstrasi bagi Aplikasi Web Gazetir *(MyGeoName)* kepada semua ahli mesyuarat.

Ahli-ahli mesyuarat sedang mendengar pembentangan daripada Kumpulan Kerja Nama Pulau dan Entiti Geografi Luar Pesisir.

Ahli-ahli mesyuarat yang terdiri daripada wakil Setiausaha Kerajaan Negeri dan Jabatan / Agensi Kerajaan Persekutuan

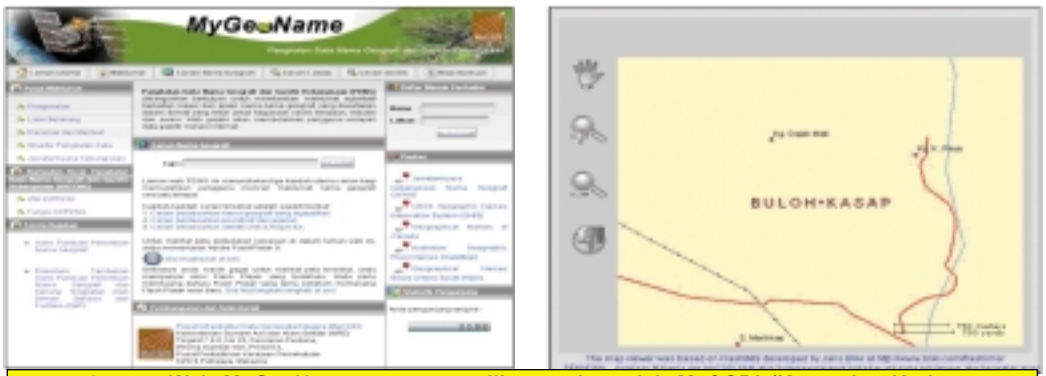
Laman Web *MyGeoName*

Laman web *MyGeoName* telah dibangunkan hasil daripada keputusan Mesyuarat ke-4 JKNG oleh KKGPPNG yang dipengerusikan oleh JUPEM. Laman web ini boleh diakses di alamat www.jupem.gov.my/geonames dalam versi Bahasa Malaysia dan Bahasa Inggeris. Antara kandungan yang terdapat dalam laman web ini ialah maklumat-maklumat berkaitan dengan JKNG seperti peranan JKNG, Jawatankuasa dan Kumpulan Kerja yang terdapat di bawahnya, aktiviti-aktiviti yang telah dijalankan dan juga dokumen-dokumen lain yang berkaitan. Buku Garis Panduan Penentuan Nama Geografi juga turut dimuatkan dalam laman web tersebut.

Laman Web MyGeoName yang dibangunkan oleh Kumpulan Kerja Garis Panduan Penentuan Nama Geografi

Bagi memudahkan lagi ahli-ahli JKNG mengetahui perkembangan aktiviti-aktiviti yang telah dan akan dijalankan oleh UNGEGN, laman web ini turut dirangkaikan dengan laman web UNGEGN dan juga laman web daripada negara-negara lain seperti Australia, Kanada dan beberapa buah negara lagi yang berkaitan dengan penamaan geografi. Oleh yang demikian, ahli-ahli JKNG boleh mengakses laman web-laman web tersebut dan dapat mengetahui perkembangan aktiviti-aktiviti dan maklumat-maklumat terkini berkenaan penamaan geografi.

Selain daripada itu, KKPDNG yang dipengerusikan oleh MaCGDI turut membangunkan laman web yang juga dikenali sebagai *MyGeoName* khusus bagi Pangkalan Data Nama Geografi (PDNG). Melalui laman web ini, pengguna boleh melayari data gazetir melalui internet yang seterusnya akan memaparkan peta bagi lokasi tersebut. Pengemaskinian secara *online* bagi nama-nama geografi juga boleh dikemas kini oleh pihak berkuasa negeri yang bertanggungjawab melalui *MyGeoName*. Laman web ini boleh diakses di alamat http://gisapp.mygeoportal.gov.my/mygnis/. Pihak MaCGDI telah memberikan taklimat khusus berkaitan pengemaskinian secara *online* di beberapa buah negeri seperti di Negeri Sembilan, Sabah, Selangor dan Johor. Nama-nama geografi tersebut perlulah disahkan terlebih dahulu oleh JNNG sebelum dikemas kini ke dalam PDNG.



Laman Web MyGeoName yang turut dibangunkan oleh MaCGDI (Kumpulan Kerja Pangkalan Data Nama Geografi dan Gazetir Kebangsaan) khusus bagi pengemaskinian Pangkalan Data Nama Geografi dan Gazetir Kebangsaan.

Laporan JNNG

Mesyuarat turut mendengar laporan daripada wakil-wakil negeri yang memaklumkan bahawa Mesyuarat JNNG di negeri masing-masing telah diadakan sekurang-kurangnya sekali dalam setahun. Antara aktiviti-aktiviti yang dijalankan oleh negeri adalah:-

- Penyediaan Garis Panduan Penamaan Pusat Komersil dan Pengumpulan Nama-nama Pelik oleh Jawatankuasa Penamaan Geografi Negeri (JPGN) Sarawak.
- Pembangunan Sistem Maklumat Geografi Negeri Sembilan Darul Khusus (GIS9). Pengemaskinian Pangkalan Data Nama Geografi akan dibuat oleh Urus Setia GIS9 dan akan dimaklumkan kepada pihak MaCGDI.

Keputusan Mesyuarat

Dalam Mesyuarat JKNG ke-4, kesemua ahli mesyuarat bersetuju untuk menubuhkan Kumpulan Kerja Nama Pulau dan Entiti Geografi Luar Pesisir yang berfungsi untuk menyelaraskan urusan penamaan pulau-pulau yang terdapat di Malaysia yang akan dipengerusikan oleh Pusat Hidrografi Nasional. Sehingga kini, Kumpulan Kerja ini telah mengadakan tiga (3) kali mesyuarat dan antara aktivitinya adalah untuk mengenal pasti pulau-pulau yang masih belum dinamakan. Buat masa ini, keutamaan diberikan kepada pulau-pulau yang terdapat di negeri-negeri Sabah, Kedah dan Johor. Dalam pada itu, mesyuarat juga dimaklumkan bahawa JUPEM telah menerbitkan Buku Maklumat Keluasan dan Perimeter Negeri, Daerah dan Pulau di Malaysia. Selaras dengan itu, buku tersebut perlulah dikemas kini sebaik sahaja Kumpulan Kerja mengeluarkan senarai pulau-pulau yang muktamad.

Antara keputusan mesyuarat yang lain adalah JNNG perlu mengenal pasti dan mengemas kini ejaan-ejaan bagi nama daerah dan mukim yang dieja secara berlainan oleh pelbagai agensi dalam sesebuah negeri. Di samping itu, memandangkan pegawai-pegawai yang bertugas di negeri-negeri kerap kali bertukar, masalah bagi pengemaskinian PDNG telah timbul dan seterusnya boleh menimbulkan keraguan berkaitan keselamatan dan kesahihan data tersebut. Sehubungan dengan itu, KKPDNG dan JNNG perlulah berbincang bagi menentukan pihak yang lebih sesuai untuk menguruskan pengemaskinian nama-nama geografi tersebut.

Kesimpulan

Hasil daripada mesyuarat JKNG ke-5 ini, dapatlah dirumuskan bahawa JKNG berfungsi untuk menyelaraskan kegiatan penentuan nama geografi di Malaysia. Penggunaan nama geografi secara tekal akan menyokong perkembangan sosioekonomi, selaras dengan penubuhan infrastruktur data spatial kebangsaan. Dengan perkembangan teknologi yang pesat dan kepekaan pengguna kepada produk dan perkhidmatan yang diberikan oleh Jabatan / Agensi Kerajaan, maka keperluan kepada pangkalan data, standard dan format bagi penukaran data toponimi serta aspek-aspek latihan dan pendidikan, keperluan saintifik dan teknologi serta isu-isu dan faedah pelaksanaan menjadi keutamaan kepada JKNG. Dalam hubungan ini, kerjasama daripada setiap ahli JKNG serta Jawatankuasa Teknikal dan Negeri khususnya dalam pembangunan PDNG perlu diwujudkan agar peranan yang lebih aktif dan efektif dapat dipupuk demi menjayakan matlamat penubuhan JKNG.

KALENDER AKTIVITI GIS 2007/2008

TARIKH	TAJUK	LOKASI	PENGANJUR	TALIAN PERTANYAAN
17 Januari 2007	Kursus Perisian GIS MapInfo (Asas) Sesi 1	INSTUN	MaCGDI	Cik Zarifah bt. Mohd. Mansor Tel : +603 8886 1157 Faks : +603 8889 4851 E-mail : zarifah@macgdi.gov.my
5 Mac 2007	Mesyuarat Jawatankuasa Teknikal *Clearing House MyGDI*	Putrajaya	MaCGDI	Encik Yaacub bin Yusoff Tel : +603 88861254 Faks : + 603 88894851 E-mail : yaacub@macgdi.gov.my
29 & 30 Mac 2007	Mesyuarat Jawatankuasa Pemetaan dan Data Spatial Negara (JPDSN) ke 58	Kuantan, Pahang	JUPEM	Ecik Hamdan bin Ab. Aziz Tel : +603 2617 0603 Faks : + 603 2697 0140 E-mail : hamdan@jupem.gov.my
16 April 2007	*MyGDI Framework Technical Committee Meeting*	Labuan	MaCGDI	Encik Yaacub bin Yusoff Tel : +603 88861254 Faks : + 603 88894851 E-mail : yaacub@macgdi.gov.my
17 April 2007	*Stanrdisation in GIS Seminar*	Labuan	MaCGDI	YM. Raja Abd. Aziz bin Raja Ali Tel : +603 88861253 Faks : + 603 88894851 E-mail : rajaaziz@macgdi.gov.my
29 Mei 2007	*MyGDI National Coordinating Committee (MNCC)*	Melaka	MaCGDI	Puan Hajjah Mariyam bt. Mohamad Tel : +603 8886 1188 Faks : + 603 88894851 E-mail : mmariyam@macgdi.gov.my
18 – 19 Jun 2007	Taklimat Penentuan Harga Data Geospatial Bagi Negeri Pulau Pinang, Perak, Perlis dan Kedah	Pulau Pinang	MaCGDI	Encik Yaacub bin Yusoff Tel : +603 88861254 Faks : + 603 88894851 E-mail : yaacub@macgdi.gov.my
2 - 3 Julai 2007	Taklimat Penentuan Harga Data Geospatial Bagi Negeri Kelantan dan Terengganu	Kota Bharu, Kelantan	MaCGDI	Encik Yaacub bin Yusoff Tel : +603 88861254 Faks : + 603 88894851 E-mail : yaacub@macgdi.gov.my
31 Julai 2007	Jawatankuasa Kebangsaan Nama-nama Geografi (JKNG)	Melaka	JUPEM	Tn. Haji Mazlan bin Hj. Ashaari Tel : +603 2617 0613 Faks : + 603 2697 0140 E-mail :amazlan@jupem.gov.my
14 - 16 Ogos 2007	*Map Asia 2007*	Kuala Lumpur	MaCGDI & GIS Development Sdn. Bhd.	Encik Yaacub bin Yusoff Tel : +603 88861254 Faks : + 603 88894851 E-mail : yaacub@macgdi.gov.my
21 - 22 Ogos 2007	*Geography 2007 Conference*	Petaling Jaya	UM	Prof. Dr. Hamirdin Ithnin Tel : +603 7967 5540/5504 Faks : + 603 7967 5457 E-mail : geoconference@um.edu.my
26 - 30 Ogos 2007	*International Conference on Congratulational Science and Its Application (ICCSA 2007)*	Kuala Lumpur	UTM	Dr. Alias bin Abdul Rahman Tel : +607 5530563/ +6013 7490452 Faks : + 607 5566163 E-mail : alias@fksg.utm.my

TARIKH	TAJUK	LOKASI	PENGANJUR	TALIAN PERTANYAAN
10 - 11 September 2007	Taklimat Penentuan Harga Data Geospatial Bagi Wilayah-wilayah Persekutuan (Labuan, Putrajaya dan Kuala Lumpur)	Kota Kinabalu, Sabah	MaCGDI	Encik Yaacub bin Yusoff Tel : +603 88861254 Faks : + 603 88894851 E-mail : yaacub@macgdi.gov.my
5 - 7 November 2007	*Joint International Symposium and Exhibition on Geoinformation 2007 & International Symposium on GPS/GNSS 2007, ISG/GNSS 2007*	Johor Bahru, Johor	UTM, ISM, UPM, USM, UiTM dan KLIUC	Assoc. Prof. Dr. Md. Nor Kamaruddin Tel : +607 553 0807 Faks : + 607 5566163 E-mail : md.nor@fksg.utm.my
10 - 12 November 2007	*Training Workshop on Spatial Planning and Decision Support Systems*	Kuala Lumpur	UPM, ISPRS, ITC dan MRSS	Prof. Dr. Shattri Mansor Tel : +603 8946 7543 Faks : + 603 8556 6061 E-mail : shattri@eng.upm.edu.my
12 - 16 November 2007	*The 28th Asian Conference on Remote Sensing (ACRS)*	Kuala Lumpur	UTM	Dr. Mazlan bin Hashim Tel : +607 5502873 Faks : + 607 5566163 E-mail : mazlan@fksg.utm.my
14 November 2007	*GIS Day*	Putrajaya	MaCGDI	Encik Yaacub bin Abas Tel : +603 88861209 Faks : + 603 88894851 E-mail : yaba@macgdi.gov.my
20 - 23 November 2007	*International Workshop on Earth Observation Small Satellites for Remote Sensing Applications*	Kuala Lumpur	UTM	Dr. Mazlan bin Hashim Tel : +607 5502873 Faks : + 607 5566163 E-mail : mazlan@fksg.utm.my
18 - 20 Februari 2008	*Advanced Technology in Offshore Survey*	Kuala Lumpur	ISM, KERTAU Resources & SAFA Geoscience	Cik Rajeswary Tel : +603 90746052 Faks : + 603 90768462 E-mail : kertau-info@kertau-safa.com
19 - 22 Ogos 2008	*14th Meeting of Permanent Committee on GIS Infrastructure for Asia and the Pasific*	Kuala Lumpur	JUPEM, University of Melbourne, Australia & United Nation Food and Agricultural Organisation	Encik Ahmad Fauzi bin Nordin Tel : +603 26170841 Faks : + 603 26933618 E-mail : fauzi@jupem.gov.my
26 - 28 Ogos 2008	*Map Asia*	Kuala Lumpur	MaCGDI & GIS Development Sdn. Bhd.	Encik Sunil Ahuja Tel : +601 72929756 Fax : + 603 21447636 E-mail : info@mapasia.org
28 - 30 Oktober 2008	*ISG 2008*	PWTC, Kuala Lumpur	KLIUC	Encik Ranjit Singh Tel : +603 79551773 Faks : + 603 79550253 E-mail : glsdiv@ism.org.my bsdiv@ism.org.my

SUMBANGAN ARTIKEL / *CALL FOR PAPER*

Buletin GIS diterbitkan dua (2) kali setahun oleh Jawatankuasa Pemetaan dan Data Spatial Negara. Sidang Pengarang amat mengalu-alukan sumbangan sama ada berbentuk artikel atau laporan bergambar mengenai perkembangan Sistem Maklumat Geografi di Agensi Kerajaan, Badan Berkanun dan Institusi Pengajian Tinggi.

Panduan Untuk Penulis

1. Manuskrip boleh ditulis dalam Bahasa Malaysia atau Bahasa Inggeris

2. Abstrak dalam setiap artikel mestilah condong *(italic).*

3. Format manuskrip adalah seperti berikut:

Jenis huruf	:	Arial
Saiz huruf bagi tajuk	:	12 (Huruf besar)
Saiz huruf artikel	:	10
Saiz huruf rujukan/*references*	:	8
Langkau (isi kandungan)	:	*1.5*
Margin	:	Atas, bawah, kiri dan kanan = 2.5cm
Justifikasi teks	:	*Justify allignment*
Maklumat penulis	:	Nama penuh, alamat lengkap jabatan / institusi dan e-mel

Satu *'column'* setiap muka surat

4. Sumbangan hendaklah dikemukakan dalam bentuk *softcopy* dalam format Microsoft Word. Semua imej grafik hendaklah dibekalkan secara berasingan dalam format .tif atau .jpg dengan resolusi 150 dpi dan ke atas.

5. Segala pertanyaan dan sumbangan bolehlah dikemukakan kepada:

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