SOPAC

Basic Geographic Information System, Global Positioning System and Remote Sensing Training

Mineral Resources Department, Fiji
2-6 April 2009

Elizabeth Lomani-Whippy and Vilisi Tokalauvere
SOPAC Secretariat

SOPAC Training Report 130   *June 2009*

SOPAC trainer conducting the training, while the participants followed from their computers.

For more copies of this report, apply to the SOPAC Secretariat at the address below:

PACIFIC ISLANDS APPLIED GEOSCIENCE COMMISSION
SOPAC Secretariat
Private Mail Bag
GPO, Suva
FIJI ISLANDS
http://www.sopac.org
Phone: +679 338 1377
Fax: +679 337 0040
E-mail: director@sopac.org

TABLE OF CONTENTS

SUMMARY

The Mineral Resources Department in Fiji own three Geo-XTs Global Positioning System units, Pathfinder office software for processing GPS (Global Positioning System) raw data and MapInfo licences for their GIS (Geographical Information System) mapping purposes; but the system was not being utilised. In addition, the newly employed graduates that make up more than seventy percent of the field work team have no knowledge of using the system.

SOPAC was therefore requested to conduct a basic training course on GIS), (GPS) and remote sensing (RS) training to optimise the use of their existing GPS equipment and enhance their mapping capabilities. The course was carried out by two SOPAC staff for five days (2 – 6 April). A total of 14 trainees attended the training course.

- Miss Vilisi Tokalauvere
- Miss Elizabeth Lomani Whippy.

TRAINING

The course was a mixture of theory presentations and hands on practical training. Each participant was assigned a computer to follow the instructors on a given exercise. The course was divided into four components.

Items	Duration	Date
Theory Presentations	½ day -	02/03/09
Basics of GIS	1½ day	02/03/09 – 03/03/09
GPS Mapping	1½ day	04/03/09 – 05/03/09
Image Rectification	1½ Day	05/05/09 – 06/05/09

Theory Presentations

For the theory presentations, the trainers explained the theory behind the topics listed below:

- GIS Backdrops.
- Image Characteristics.
- Geometric Corrections.
- GPS and DGPS (Differential Global Positioning System).
- GPS Application.
- GPS Development.

Geographic Information System

The participants were taught how to work in a GIS environment with MapInfo software by performing these steps:

- opening a backdrop in MapInfo;
- coordinates system in MapInfo – practical exercise;
- creating a MapInfo table on top of a backdrop;
- establishing a table structure in MapInfo;
- digitising a line and calculating its length;
- digitising a polygon and calculating the area;
- digitising a point and calculating its position;
- create thematic maps;

- displaying labels;
- modifying a MapInfo table structure;
- data cleaning; and
- editing features such as lines, points and polygons in MapInfo.

GPS Mapping

The GPS mapping component was divided into two; field mapping and post processing.

FIELD MAPPING

The participants were taught how to capture data using a GPS in the field by:

- Observing the number of satellites in view and the maximum percent dilution of position (PDOP) in relation to data capture.
- Accessing the different Menu offered by the Terrasync software to configure the GPS receiver to maximise data capture.
- Ensuring maximum number of signals received from the satellites is logged when capturing a point or line element.

Figure 1: SOPAC trainer showing the participants how to capture data in the field using a GPS.

POST-PROCESSING

After each field work exercise, the participants were taught how to download the data from the GPS using pathfinder office and edit the data in MapInfo GIS software. Trainers also explained about the importance of data editing using MapInfo GIS software to ensure clean data, as shown in Figure 2.
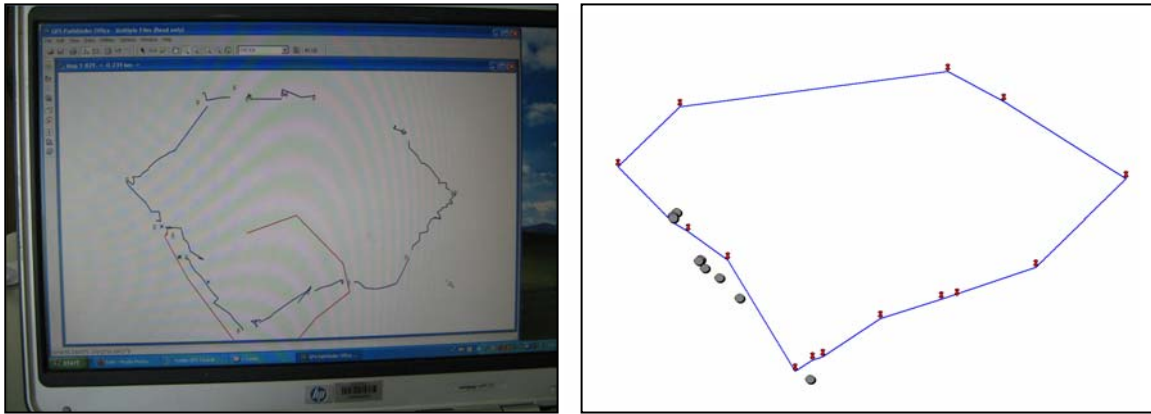
Figure 2: Comparison pictures of raw GPS data downloaded from the GPS (left) and edited GPS data in MapInfo software (right).

Image Rectification

Each participant was given a map of Suva to geometrically correct by performing the different steps listed below:

- Setting preferences;
- importing and exporting images;
- layer stacking;
- viewing images;
- converting images;
- setting projection;
- rectifying Images – satellite images;
- rectifying maps; and
- digitising.

TRAINING MATERIALS

At the start of the training, the participants were issued an interactive training CD that consisted of all training documents. At the end of the training, a cd containing the training exercises attempted throughout the week was issued for future reference.

CONCLUSION

The basic training covered a variety of topics within one week which proved to be hectic for the participants. This is evident in the evaluation form analysis result, question seven.

Nevertheless the participants were able to grasp the basic skills and concept of GPS/RS and learnt to integrate them with GIS.

In order to maintain their new found skills, the participants should therefore use GIS/RS and GPS for their required mapping activities.

ANNEX 1

Evaluation Forms Summary

Fourteen people participated in the training. Out of the fourteen, thirteen took part in the questionnaire. In general the responses of the participants about the training were satisfactory but recommended that the duration of the training should be extended.

1. What is your overall evaluation of the training?
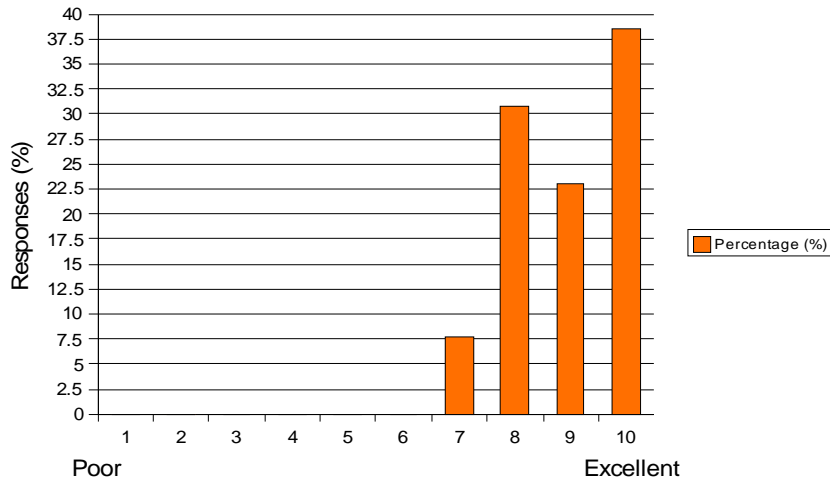
2. How would you rate the trainer in terms of knowledge and presentation style?
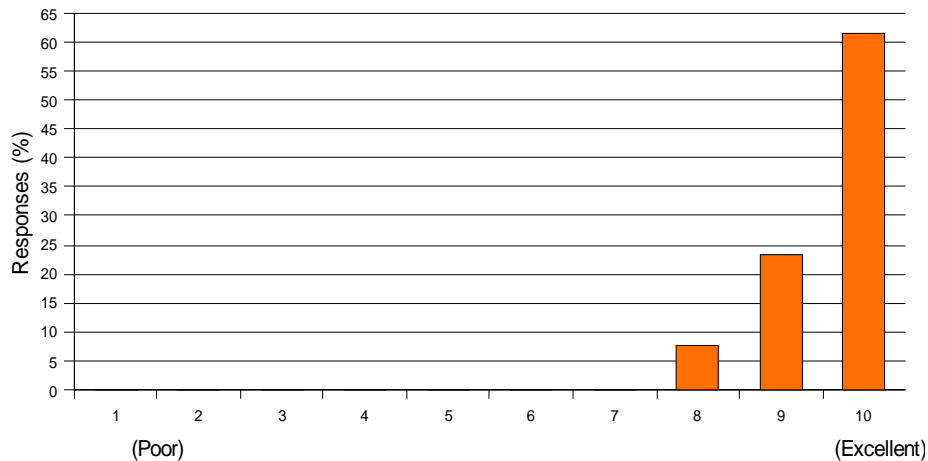
3. Please list two examples of how you can apply what you have learnt to your job.

Responses:

- Create database for our seismic data in access for MapInfo purposes.
- Create thematic map for our seismic data available.
- Rectify image for marine surveying.
- Applying all principles leant on MapInfo, GPS and rectification of images on open GIS softwares.
- GPS features learnt such as data dictionary will assist in projects and will save time.
- Image rectification and MapInfo skills achieved will help in the productivity of better and accurate maps.
- GPS Pathfinder Office: By creating the Data Dictionary Table, it is easier to collect the data you need from the field.
- Export of Database files from Access to MapInfo enables us to easily link the data from Microsoft Access to MapInfo. This enables us to link our data table and include these data with our maps in MapInfo.
- GPS transfer to MapInfo. Import data from Microsoft to MapInfo. Create thematic maps. Image rectification.
- Proper digitising of points (rock & sediment samples) and creating thematic maps.
- Using data dictionary for easy and useful data storage back in office.
- Creating databse for the sampling points for water and soil samples using MapInfo ie. different chemicals present at different point such as heavy metals.
- GPS the points of samples.
- GPS data transfer to MapInfo.
- Create thematic maps according to information input into Mapinfo and Access.

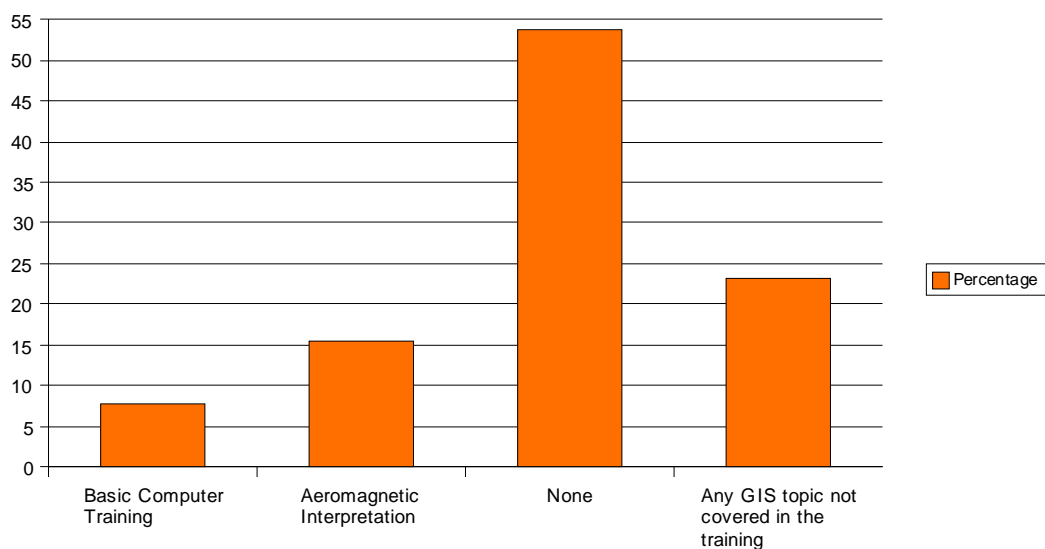4. Was there enough opportunity for interaction and participation?
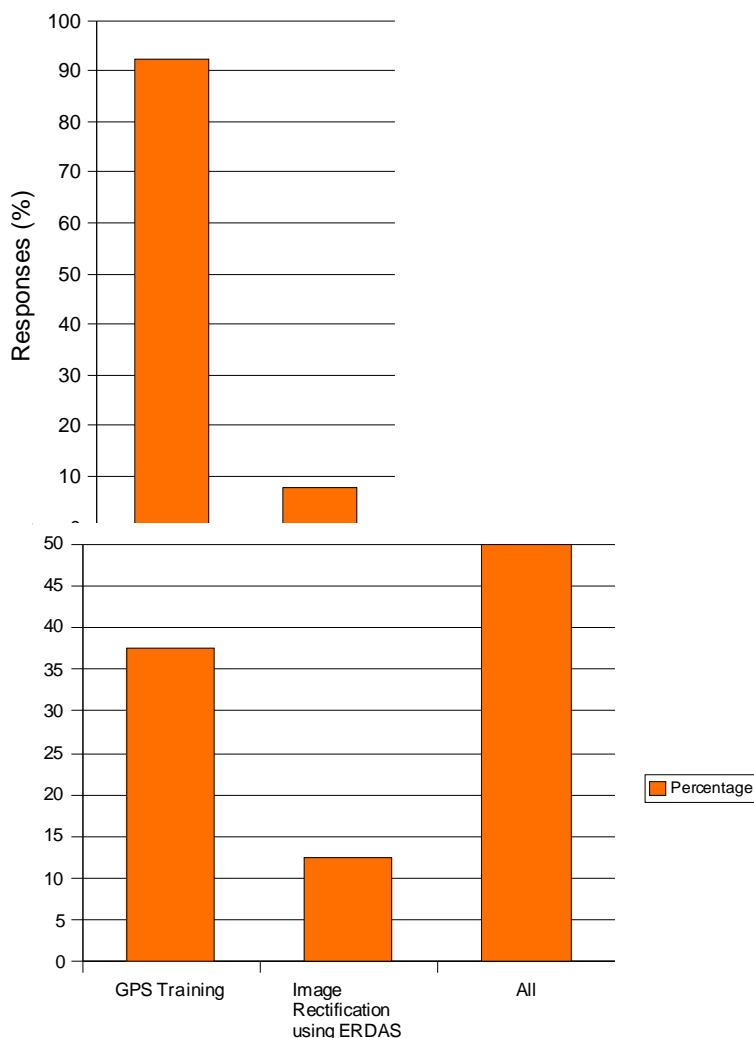
5. What part(s) of the training did you find most useful?

[& Tokalauvere]

6. Was there enough variety of training materials?
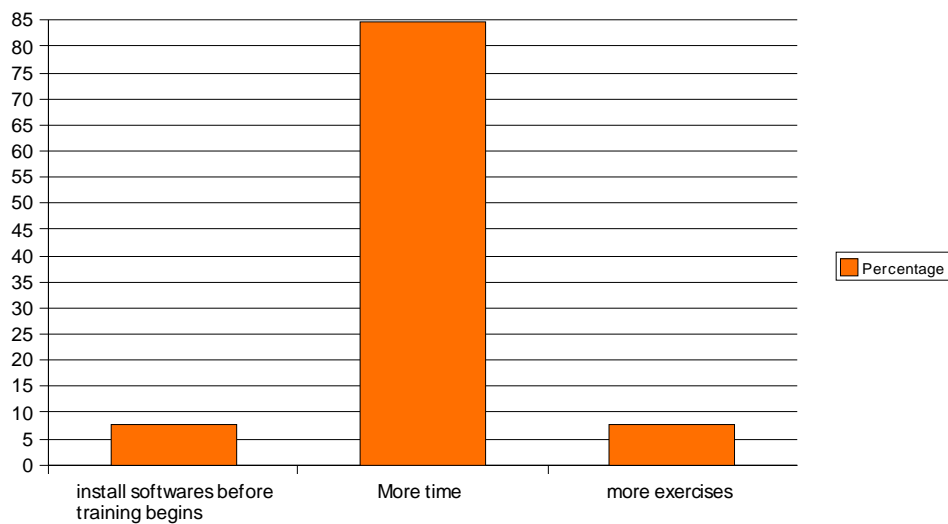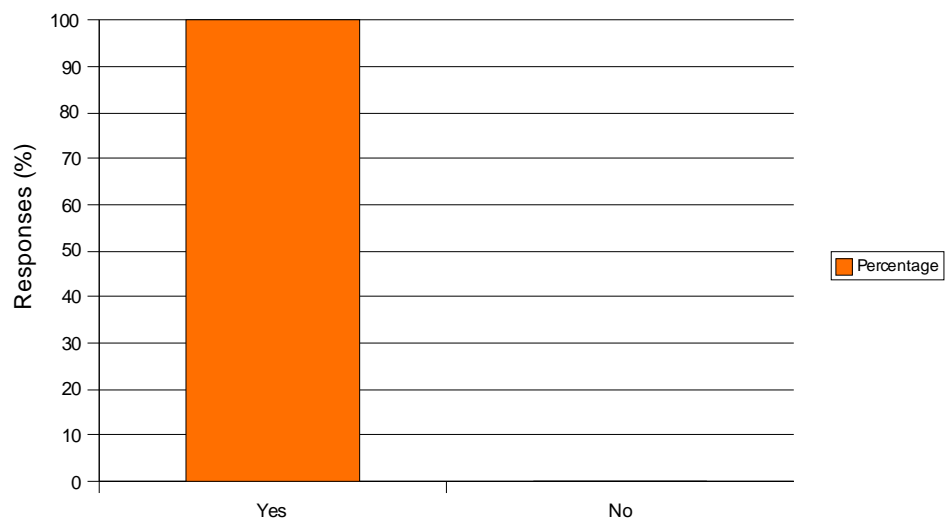
7. How could your training experience have been improved?

8. What other training topics might help you to do your job better?

Additional Comments:

- *Well presented and explained training in a short time, assistance by presenters was excellent. Surely an upgrade in understanding and knowledge and will be useful in the tasks I carry out.*

- *Thanks for your time and patience shown on this past week, if only you can organize training and lots of on field exercise using GPS. Thanks very much.*

- *The training has been helpful towards doing our work.*

- *Too good, awesome and outstanding.*

- *A very useful, informative and proactive GIS Workshop. Thank You. If there can be training on Image Rectification.*

- *More training on GPS.*

- *I thank the facilitators for the knowledge they have delivered and was detailed and understandable regardless of the unfavourable time period.*

ANNEX 2 – Participants' List

Name	Email	Position
Mohammed Saiyaz	saiyaz@mrd.gov.fj	Temp. Scientific Officer
Isikeli Duwai	iduwai@mrd.gov.fj	Temp. Senior Technical Officer
Unaisi Rawaikela	unaisi@mrd.gov.fj	Temp. Senior Technical Officer
Laisenia Rawace	lai@mrd.gov.fj	Temp. Senior Technical Officer
Semi Bolalailai	sbolalailai@mrd.gov.fj	Temp. Technical Officer
Kelera Heitage	kelera@mrd.gov.fj	Trainee IT Officer
Agnes Peter	aggie@mrd.gov.fj	Temp. Technical Officer
Epeli Bola	epeli@mrd.gov.fj	Senior Technical Officer
Sakiusa Waqanisau	sakiusa@mrd.gov.fj	Assistant Technical Officer
Waisea Kotoyawa	waisea@mrd.gov.fj	Temp. Senior Technical Assistant
Sefanaia Koroi	sefa@mrd.gov.fj	Scientific Officer
Matareti Bogitini	matereti@mrd.gov.fj	
Sereima Dovibua-Koli	sdovibua@mrd.gov.fj	Temp. Environmental Officer
Rigieta Ravuiwasa	rigieta@mrd.gov.fj	Temp. Technical Officer