EAGE

4467

Gravity and magnetic data management in PDO; How it made a difference!

R. Heinbockel (Fugro Robertson), F.H. Al-Kindy* (PDO - Petroleum Development Oman), F. Zhu (PDO), H. Friesacher (Shell) & S. Hatmiy (PDO)

SUMMARY

Between 2006-2007, Petroleum Development of Oman (PDO) executed a project to digitally inventorize and archive all their gravity and magnetic data. The task was to compile various data sets including over 30 gravity surveys and 20 magnetic surveys, some of which were over 50 years old. Many challenges were faced including non-standard file formats, coordinate systems, missing reports and so on. Ultimately however, most data were compiled, inventorized and made digitally available to company staff in an easily accessible manner. Due to this effort, a renewed interest in gravity and magnetic data emerged amongst asset holders and interpreters resulting in modeling and interpretation projects. The project was conducted in three stages: 1. Data QC and inventorizing, 2. Archiving into a GIS project, 3. Data promotion through an interactive website.

The first two stages of this work were mainly carried out under contract (and collaboration) with Fugro.

Data QC and inventorizing:

As an initial stage of the project, a work flow was created based on problems faced in the past and to ensure that company needs were met. The workflow was then followed to QC and inventorize the data as follows:

- Locate data from different sources (disks, tapes, various computer folders etc.) and centralize storage location,
- Visual inspection,
- Standardize data to same file type, coordinate system and units in accordance with PDO standards,
- Correction to standard datum where possible,
- Use standard 'info-sheet' for each data set including year of survey, contractor, line spacing, number of points, references etc.,
- Scanning of old 'hard copy' documents where possible,
- Issuing inventory report with all the obtained information.

Archiving into a GIS project:

Once data were identified and QCed, the second step was to archive them in an easily accessible manner. For this, data were put into a GIS project which can incorporate geographic and concession boundaries, pipelines, infrastructure and so on. This can also help identify any anomalies/noise due to infrastructure if required. The project can be easily accessed by staff. For staff who are not familiar with GIS software, we created a simple "PowerPoint' manual which gives steps to extract data into an spreadsheet by data set or region etc. (Figure 1).

The GIS system also makes gridding, interpolation, change of coordinate system, extraction and data addition very straightforward. An added advantage of using the GIS environment is that it is linked to other databases so any additional data such as block boundary changes, infrastructure addition or change etc. are updated in accordance with 'master' files supported by the GIS teams therefore need not be individually updated.

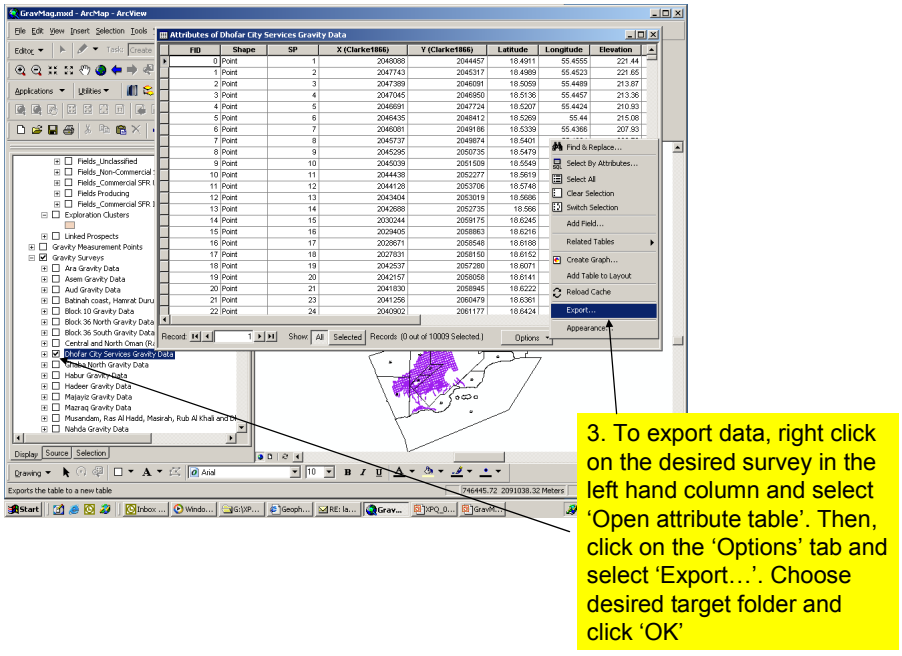

Figure 1: Example slide from 'manual' for data extraction.

Data promotion through interactive website:

Once data were archived and report collated, the final step was to promote the data through the company intra-web. A website was especially constructed and consists of links to all gravity and magnetic surveys with adjoining 'info sheets' in HTML format with screen captures from the GIS software for each survey (Figures 2a and 2b). The advantage is that the GIS software needn't be used for a first-pass look at the data and to know what's available. This is also encouraging for users who have not used the GIS software before. There is also a link to the report and the dedicated manual for using the GIS software for data extraction. Finally, there is a link which automatically launches the GIS project containing all the data.

As a result of the website, many interpreters have shown renewed interest in gravity and magnetic data and as a result, some projects were initiated, particularly for areas where the seismic data is unavailable or failing to clearly show structures such as salt edges and volcanics.

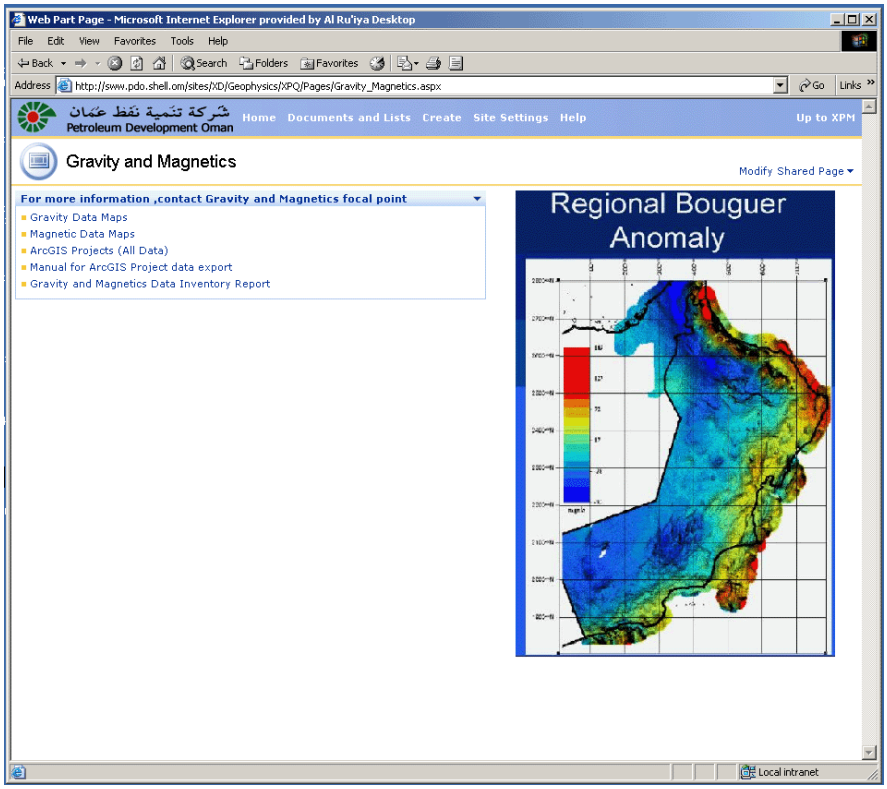

Figure 2a: Gravity and Magnetics main page.

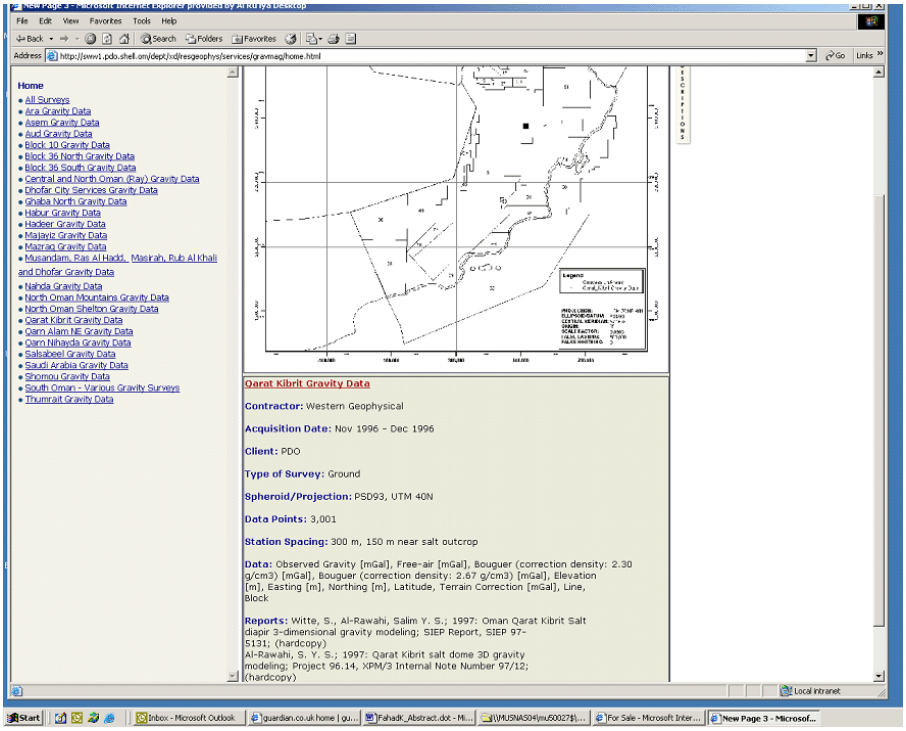

Figure 2b: Snapshot from website showing a gravity survey with accompanying 'info-sheet.

Challenges:

There are many challenges that are to be expected in such work and include:

- Missing data: Some reports refer to older reports or surveys but to date a few of these cannot be located or found
- Hard copies of data: these include some maps and reports that need to be scanned and stored digitally or could be lost
- Data update: it is essential that the GIS project is updated and maintained to incorporate any new data or data corrections. In addition, the website must also be updated accordingly. This can sometimes be difficult if there are staff movements / system changes and so on. A standard workflow must therefore be adapted.

Summary:

An effort was made to archive gravity and magnetic data in PDO. Promoting this data in an easily accessible manner created renewed interest in the data resulting in interpretation projects.

Acknowledgment:

We would like to thank the staff of the PDO Geomatics department for all their help in setting up the GIS project and website.