Examination paper for GEOG3523 GIS Data Capture and Mapping

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Examination date: 30.05. 2013
Examination time: 3 hours
Credits: 7.5
Grades to be announced on: 20.06. 2013
Permitted examination support material: None
Language: English
Number of pages: 2
Number of pages enclosed: 0
Question 1. Give short and concise answers. (20%)

1a) What are single use and multiuser geodatabases? What are the differences and advantages of the two types of geodatabases? Which database would you choose for a web-GIS, justify your answer?

1b) What are the three different continuous data types to store elevation data?

1c) Give brief explanations of **spatial resolution**, **spectral resolution**, **radiometric resolution** and **temporal resolution**. How does spatial resolution and spectral resolution differ between for example a Landsat image and an aerial photograph?

1d) By analyzing the returning LiDAR waveform different ground objects can be automatically classified. Why is this useful for mapping vegetation, infrastructure and geology?
Question 2 - Cartography (40%)

Provide an assessment of the map shown below. If you mean the map could be improved, suggest some ways on how. Ground your answers on why these changes would improve the map.
Question 3 - Essay (40%)

You are newly employed at a small consultancy company specializing in GIS and map making. A small developing country in the southern hemisphere has problems with soil erosion due to vegetation change and a lack of drinking water. The United Nations, through the Norwegian foreign department, contracts your company to map:

- Vegetation and land use change for the last 15 years
- Demographic change during the same time period
- Availability of drinking water per person

The project budget allows you to buy satellite images to map vegetation and land use, and travel together with two colleagues to the country for field work and interviews.

You have access to basic spreadsheets with demographic data (CIA world factbook). You have virtually no prior knowledge about drinking water availability and most likely have to interview local people. Your company has access to GIS workstations at home and GPS equipped tablet computers for fieldwork.

Describe how you would tackle the problem, from designing the database, interpretation of satellite data, field check, interviews and cartographic layout. Discuss potential errors in the data capture and how to communicate those errors in your map. Sketch a map layout showing how you would present the data and include the sketch in your essay.