

Field Techniques Manual: GIS, GPS and Remote Sensing

- Section D: Planning & Practicalities

Chapter 15: Completing the Project

15 Completing the Project

15.1 GIS analysis

You should try to carry out as much GIS analysis as possible during your fieldwork campaign, as this will allow you to: (i) rapidly detect, correct or resample any erroneous field data; (ii) modify your field sampling to take into account unexpected findings; (iii) give a summary of your preliminary findings to interested parties in the host country. The latter is an important consideration, not just because it builds up good will with your hosts, but also because it a guaranteed way of transferring some of your new-found knowledge back to the people of the host country.

15.2 Useful GIS functions

GIS and geographical analysis techniques are covered in Chapter 7. Once you have collected your field data, it has to be checked and ‘cleaned’ (edited) before GIS analyses can be carried out. The ‘data cleaning’ is aimed at finding ‘messy’ data that might affect map outputs and statistical work, e.g. inconsistent names and spelling, GPS tracking data errors, or incomplete topology. You may have to modify the file formats of your datasets to make them compatible with your GIS or statistical software, although most modern GIS software comes with extensive data import-export capabilities. Once the datasets have been pre-processed, you can use the various analytical techniques available with your GIS. As with all aspects of an expedition, to be sure of a successful outcome you need to plan ahead: consider the types of data that you will be processing, the needs of the project, which analytical techniques are most appropriate, and suitable types of output for the results. Some of the more useful analytical GIS functions are summarised below, with some examples of possible applications:

- *overlaying* point records with a vegetation map
- *classifying* satellite images based on field data
- *correlating* soil and vegetation
- *gap analysis*, useful in deforestation and biodiversity studies
- *modelling* animal habitat distributions
- *change detection and analysis*, e.g. land cover, river migration
- *buffering*, useful when assessing the possible impact of new roads
- *proximity analysis*, e.g. how far do villagers have to walk to collect firewood?
- *error estimation* should always be carried out: how reliable are your findings?

With regard to the last point, information presented in the form of glossy colour maps often carries much authority and important decisions may be made on this (see Pickles 1995). However, uncertainties and errors are not necessarily apparent in maps, so make sure that any limitations are made very clear. State such limitations on the map itself, as the map is liable to be copied or shown without its accompanying text.

15.3 Results and ‘deliverables’

Results are the reason for the whole expedition! The presentation of your results should be a key consideration during your project planning: without a report detailing your findings, your expedition becomes little more than a holiday, no matter how exotic the setting. In addition to assisting with the project planning and fieldwork stages, GIS can help you to assess spatial relationships between your datasets, examine changes over time and produce professional-quality summary maps. The digital nature of the GIS-generated maps facilitates their incorporation in reports, as well as the dissemination of findings via an expedition website. Before the fieldwork, establish:

- What sort of information is needed?
- Who will benefit?
- What form will be most appropriate?

15.3.1 Data dissemination

The potential benefits that can be gained from using GIS include: summaries of your findings in easy to follow maps; spatial databases and summary statistics; monitoring systems and infrastructure development; GIS training and technology transfer; raised levels of awareness and education material based on your findings. That said, unless you carefully consider how you are going to publicise and apply your findings, the only people in the world to know what you have discovered will be the small number of people directly associated with the expedition. So the dissemination and application of your findings should be carefully considered during your project planning. It is particularly important that copies of your final report, ideally with a CD containing your data and maps, goes to agencies and institutes that you liaised with in the host country, as well as sponsoring agencies in your home country. There are various types of ‘deliverables’ that could be produced using the GIS-based part of a fieldwork-based project (Table 12-1); key ones are summarised below:

- maps, reports, databases, models
- a dedicated website, allowing relatively easy public access to your findings
- integrating your data with existing GIS databases (local, national, global)
- technology transfer via training courses that use your data and findings
- publicising your findings via the media (TV, radio, press) in the host country, the UK and internationally
- adding your findings to the RGS-IBG expedition reports archive

Almost all fieldwork projects will find a report, even if only short, a useful product, not only as a record for themselves and others undertaking similar work or visiting the same location, but so others can benefit from the expedition’s findings – whether in research, management, educational, social or other contexts. The chapter on report-writing in Winsor (2004) suggests how to go about this concluding stage of the expedition.

15.4 Continuation and project sustainability

As establishing a GIS is essentially a once-only effort, continuing the GIS is an efficient undertaking that will not require a lot of time, so try to arrange that field studies initiated by your expedition can be continued by your local associates. To ensure that maximum

benefit is gained from your establishing a GIS for mapping or monitoring a given set of features, ask yourself the following questions:

- How might the GIS contribute to local on-going strategies for management, research, monitoring, training and education?
- Who would be potential future users and collaborators? (e.g. universities, NGOs, local schools, Government Departments, National Parks, future expeditions, UK school projects and annual exchanges)
- Can you produce training programmes to: (a) help to build links with local / host groups, (b) help the long-term sustainability of the project? (ideally, your hosts should be able to continue your good work after you have returned home).
- Continuation is unlikely to be easy: how will it be financed, staffed, equipped and used? Would its results justify its continuation?



Figure 15-1 Water supply technicians in Bolgatanga, northern Ghana, discussing the merits of the IDRISI GIS and image processing system during a training course.

If you can train your host country associates in the use of GPS, computers, image interpretation and GIS techniques that may be the most valuable result of your expedition. Training in GISci techniques can enable people to produce some very useful material at very low cost, such as 1:30,000 scale maps of agricultural land use based on US\$60 ASTER satellite imagery. Leake (1995) working in Paraguay, and the Tumucumaque Mapping Project in north east Brazil (see website at www.ethnobotany.org/actnew/BrazilTumucumaqueMapping.html) show how training can bring benefits not so much for research or monitoring programmes, but as a tool for indigenous communities to map their lands, defend their land claims, plan resource use and strengthen their own skills and institutions.

Expertise in GISci survey techniques is a very valuable skill: once trained to use GPS and even the most basic of GIS software packages, your local associates can potentially earn considerable amounts of money as mapping specialists. GISci-based revenues fund many

UK university mapping centres and could be just as effective in the generally far more cash-strapped institutes of developing countries, so giving GISci training to staff at host-country universities or research centres could produce long-term benefits.

Finally, related to the points raised here, is *project sustainability*: if people that you worked with in the study region can continue to collect, archive and analyse data, then you have achieved a significant success. Long-term records of features might then be collected: these are valuable to science and resource management, especially in the remote, environmentally-sensitive regions that are often frequented by expeditions.