



Newsletter Issue 2: December 1997

Hereford & Worcester RIGS Group is primarily engaged in the recording of all useful sites within the County. The aim of the 5-year project is to produce a comprehensive archive which will include details of sites that have been designated as regionally important. During the first phase the Group does not intend to have a major programme of field work, lectures, field trips nor site maintenance. These activities may develop subsequently but are currently best placed within existing societies. Some of the latter have a long and prominent history, e.g. the Woolhope Naturalists' Field Club and the Worcester Naturalists' Field Club.

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Notice of AGM

Notice is hereby given of the first AGM of the Group. It will be held at Worcester College of Higher Education, in the Geography Department, on Tuesday 13th January 1998, at 10.30 am. Initially, please come to reception. Parking is available nearby. Nominations for the position of Chairman, Secretary and Treasurer should be sent to the Recording Centre. Membership of the Group will be conferred on those signing the register at the AGM (or by writing to the recording centre) and purchasing the Fieldwork Safety Guidelines folder (price £1).

Representatives from the County Wildlife Trusts, museums, geological societies, County Council, schools and colleges would be most welcome.

The Agenda will be:

- Chairman's report
- Director's report
- Election of officers
- Any other business

Global Positioning System

The Group has made a contribution towards the purchase of the Geography Department's new

sophisticated surveying system known as GPS. Such a system allows rapid and accurate mapping of outcrops and points or features of interest at a site. Trials with the equipment have taken place at Penny Hill Quarry with the extensive co-operation of the owners, Shanks and McEwan plc. Here a steeply dipping limestone / shale sequence of the Much Wenlock Limestone Formation (Silurian) is exposed with interesting variations in lithology and fossil distribution. More information and results will be given in the next issue. Meanwhile, of the system itself, Patrick Hopcroft (Physical Geography Technician) writes:

The Global Positioning System (GPS) is based on a constellation of 24 satellites orbiting the Earth at very high altitude. Each satellite continuously transmits data regarding its position and a time code. A receiver on the surface of the Earth can track these satellites and use the data they transmit to calculate the distance between the receiver and the satellite. As long as the receiver can track four satellites, the receivers' location on the Earth's surface can be fixed with remarkable accuracy. The applications of GPS are widespread, and obviously include all forms of field survey. It is now possible to record the location of any point and record information about that point using handheld equipment, and without the need for traditional surveying methods.

However, GPS is administered by the US Department of Defence and to prevent its misuse by hostile forces' the system is set so that the satellites transmit two sets of data simultaneously - an encrypted military code and a civilian user code. To the latter they introduce a fluctuating random error to degrade the accuracy of the system. This is known as Selective Availability (SA). This ensures that with a single standard GPS receiver, such as those marketed for outdoor recreation uses, accuracy is reduced to 100m of the true of the true location, with the error more commonly approaching 400-500m in practice. Obviously this data would be of no use for surveying purposes so Differential GPS (DGPS) systems have been developed.

With DGPS systems virtually all sources of error, including SA, can be eliminated. The principle is based on the simultaneous use of two GPS receivers - one carried by the user to record data in the field (the rover unit), and a second recording data whilst stationary at a known location (the base station). Data recorded by the base station allows the magnitude and direction of the SA error at any instant in time to be calculated, and the correction then applied to the rover data. In this manner locations anywhere on Earth can be fixed to the nearest few cm if required.

Equipment: The market leader in professional GPS/DGPS systems is Trimble Navigation. The equipment package in use consists of:

- Trimble ProXR rover unit. This comprises a small dome antenna, 8 channel receiver and 2Mb data logger to record not only location, but all attributes of the point of interest.
- Secondly, a 12 channel base station. This antenna is roof mounted at Worcester College and the receiver run by a PC to collect static base station data.
- Finally, Trimble's own Pathfinder Office software. This allows the raw data to be post-processed (i.e. corrected) and includes analysis options such as importing Ordnance Survey digital map data or air photo images to use with the collected data. Data can be exported in any GIS or mapping format for any further work.

This system yields a post-processed accuracy of 75cm or better

Safety in Fieldwork

Peter Oliver has been giving some thought recently to fieldwork safety and its impact on RIGS Groups. A variety of written advice and guidelines specifically related to Earth science fieldwork has become available in recent years. Certain publications are very helpful, but they all suggest that

the major responsibility of an organisation engaged in fieldwork is to have a code of practice. The publications listed below state that the code should incorporate a number of guidelines including: leaders should have attended a residential field leadership training course; there should be site pre-visits and safety checks; appropriate equipment must always be used; the level of supervision must be adequate; a full itinerary and timetable must be produced; medical conditions of participants must be known beforehand; lone working should be discouraged; one or more members of the party should be trained in first aid; the expedition leader is responsible for accident and emergency procedures; adequate instruction should be given to participants about likely hazards and they should receive a copy of the code before fieldwork begins.

All this comes as something of a headache to those undertaking fieldwork. To focus your minds even more the Management of Health and Safety at Work Regulations (1992) state that the person in charge must assess risks to health and safety of employees and/or persons not in their employment. The court case detailed in the Geological Society booklet is very informative. It should be noted that disclaimers may be worthless, that risk assessments must be carried out by the RIGS Group and if a code of practice is not implemented before an incident, the employer is at fault.

Useful publications include:

- Safety in Earth Science Fieldwork by ESTA Promotions. Available from G Nicholson, 28 Harthill Avenue, Beverley, East Yorkshire, HU17 7LN. £1 including postage and packing, cheques should be made payable to ESTA.
 - Code of Practice for Safety in Fieldwork from Universities and Colleges Employers Association. Tel: 0171 383 2444. £3.50 including postage and packing.
 - Safety in Geoscience Fieldwork from the Geological Society. Tel: 0171 434 9944.
- Health and Safety Regulations from the Health and Safety Executive. Tel: 0114 289 2345.

Proposal for a Conference of English RIGS Groups.

The possibility of holding a conference for English RIGS Groups, subject to funding and support, is now being investigated. It would be hosted by Hereford & Worcester RIGS Group at Worcester College of Higher Education. A proposal will be put to Entrust in the near future with a view to obtaining sponsorship from a major waste disposal operator under the terms of the Landfill Tax credit system. This funding would allow perhaps two representatives from each RIGS Group to attend the 3 day conference free of charge. It is hoped that other organisations, such as local authorities, colleges and universities, wildlife trusts and conservation bodies would also attend.

With the RIGS initiative forging ahead there are many issues that are the subject of debate, and without a proper national secretariat for co-ordinating council there is clearly a need for those making and implementing policy at County level to have a forum. The latter may even become an annual or biennial event, and it may give rise to an improved structure of the movement.

The conference would provide a lecture programme, workshops, business displays, and field trips as well as social events. Excellent conference and residential facilities exist on the Worcester campus and an extensive section of the geological column is represented nearby. A tentative date has been suggested for the first week in September 1998.

Views from all those interested in the proposal would be most welcome, especially with regard to conference agenda. Anyone wishing to present a paper should write in as soon as possible. Progress with regard to the proposal will be reported in 'RIGS Briefing' and the next newsletter.

Hereford & Worcester RIGS Groups' current focus:

The Group is currently concentrating on recording in the following areas:

- The geology and drainage of the Woolhope Dome, which is a Silurian inlier. The Woolhope Naturalists' Field Club has been looking at the influence of geology on drainage patterns.
- Terraces and post-glacial river features of the Severn and the Stour. This is in the early stages but should gain pace over the next few months.
- The geology of the Abberley Hills, in particular the structure, 'way-up' criteria, fossiliferous localities, Silurian/Triassic junction and historical research.
- The northern edge of the Forest of Dean syncline; in particular the Old Red Sandstone/Carboniferous Limestone junction. The geomorphology of the River Wye, with its incised meanders, and the influence of geology on topographical development.
- Worcester Museum has an extensive collection of geological specimens (10,000 plus) and many of these were collected in Worcestershire. There is a strong possibility that a joint project to produce a permanent display of the geology and topography of Worcestershire will get underway.
- Fossiliferous sites within the County. The distribution and their use for educational and research purposes and the consequent conservation issues.

In the next issue:

- The Panel of Assessors
- Geomorphology at Worcester College of HE
- Specimens from Herefordshire sites in Hereford Museum
- Historical Geology
- English RIGS Groups Conference