An effective management strategy for the future is often dependant upon a comprehensive understanding of the past. Oscar Aldred, Chief Landscape Archaeologist of Somerset County Council, recently took time out of his schedule to review the efforts and methods of the Council in unearthing the secrets of yesterday that are affecting the land management tasks of the present.

Here Oscar Aldred explains how Somerset County Council are using the abilities of ER Mapper in order to gain an understanding the landuse issues of the past which are affecting the land management tasks of the present.

The Historic Landscape Characterisation project (HLC) is funded by English Heritage and carried out by Local Government officers and/or archeological sub-contractors and is part of a national project that has to date covered about a third of the country.

The earliest stages of the project did not use GIS, but the availability of computing technology to analyse data has improved since then and the current working projects have GIS and other applications very much at their core.

The Somerset and Exmoor National Park HLC started in September 1999. The study area measures 3700 sq km, and covers a variety of different "landscape" types, including upland, lowland, wetland and coastal areas, each exhibiting a range of different historic landscapes. Given the variety of landscape topographies in Somerset, the field patterns...
created through time reflect these variants.

The HLC project subdivides the landscape into its component parts: Enclosed, Unenclosed and Other.

Enclosed for the purposes of the project is the landscape of fields and woodland and represents over 60% of land within the study. The Unenclosed areas are defined as unimproved land and coastal areas.

The “other” ingredient within this land use mix can be seen largely as modern intrusions onto the landscape such as industrial areas. The study however also covers the more historic settlements and their later expansion dates.

Discreet polygons are created for each category and are then digitised through the use of MapInfo. This results in a map of “no white” areas, and characterises, and adds distinctiveness to, the larger Character Areas created by the Countryside Agency and English Nature. Each polygon then has information tagged to it. For example, the Enclosed group contains information related to the pattern, form and size of a collection of fields which all display similar characteristics. This produces a theoretical map which shows where differing types of field creation processes have occurred.

The aim of the project is to create a map showing the development of the land through time.

The use of GIS for vector handling and other topographic applicators such as ERMapper, for raster data, allow a more complex analysis of the landscape to occur. The same can also be applied to settlement form. Settlement is topographically biased, as well as influenced by choice, which is in turn promoted by external circumstances. By producing an analysis of settlement location, whether on valley side or bottom, plateau or hilltop, further understanding is possible. From an archeological and environmental view point such abilities are very important in assessing the importance of particular sites, and understanding the landscape resource.

ERMapper was used because of its unique ability to perform contouring analysis.

One of the ways in which the data from the HLC project was examined independently of the main body of data, created in MapInfo was by using ERMapper. Topographic influences on the landscape were excluded from the characterisation process to avoid undue bias, and therefore needed to be analysed separately from the main data set. ERMapper was used because of its unique ability to perform contouring analysis.

Through the Contouring Wizard and using the Contour data set, provided by OS Mapping, algorithms can be processed which create digital data relating to Slope and Aspect. These data sets are then analysed in MapInfo with the MapImagery plug-in and the HLC characterisation polygons.

For example, polygons containing form and pattern type regular and straight, may have a bias towards high ground and land which until the 19th century was considered too hard to farm. This then meant that by...
the time of Parliamentary Enclosure it was prime land for new field creation of this type.

By identifying where on the ground this field type is located, hypotheses can be tested regarding the processes involved in their creation. The results show that the fields on certain sloped land give rise to a particular type of field, and the data set can be given a suggested interpretation into the process of field creation for that type.

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As of yet no comprehensive work has been done that compares the type of field pattern with the slope types. As a result the angle/percent of slope has to be tried and tested, though there are several hypotheses for the analysis.

Slopes which are greater than 45 degrees, for example, may show a prevalence towards field boundaries that have regular patterns. The ease of working such a piece of land limits the usage of the slope and therefore the type of process involved in its creation. Slopes with very steep sides, for example, with an association with water can indicate something of the process involved in their creation. The patterns that are created from the interrogation of pattern and slope may assist interpretation of field process and land usage.

The aspect of slope should also show some interesting examples of fields with particular patterns. For example, south facing slopes may have particular patterns as the soil type, direction of light favours arable agriculture. In the south-west there is greater amounts of pastoral agriculture as opposed to arable agriculture.

**Figure 4:** Unformulated slopes - Slope filter enables character types to be analysed with topographic detail produced by ER Mapper.

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**About The Technology**

ER Mapper is the world's leading image processing software, ideal for companies and organisations with the requirement to process vast amounts of data.

ER Mapper can process any form of data from satellite to aerial photographs, from raster maps to geophysical data, from LIDAR to ASCII text.

ER Mapper combines advanced remote sensing tools with easy to use wizards such as the Land Application Wizard which automate complex processes such as orthorectification, image mosaicing, colour balancing, gridding and contouring, compression, in fact everything required to efficiently prepare and compress data in a single bundled package.

**ER Mapper Includes;**

- Imports for 100’s of image formats
- Orthorectification Wizard
- Image Mosaic Wizard
- Airphoto Colour Balance Wizard
- ECW Compression Wizard
- Surface Gridding Wizard
- 3 D presentations
- Map Production
- Raster to Vector conversion
- Classification
- Plus Free plugins to: ArcView®, MapInfo Professional®, AutoCAD Map®, Geosoft, Microsoft Office®, Adobe Photoshop

All this and more for the general or specialist user.
A resulting factor that dictates that the types of fields created will differ depending on their previous usage. For example, curved field boundaries were typically created in medieval arable fields, whereas a majority of fields do not have these patterns. But does this mean that they were not arable field types. The distribution of fields on south facing slopes may show an important grouping of types, which have lost most of their medieval arable characteristics.

The end product of the project gives a map describing areas of similar field morphologies. The data set can then be analysed in a number of different ways to produce a variety of different maps that can be specifically tailored for the requirements of a particular agency, department or district. In Somerset where there is a diverse number of topographic landscapes, comparing the field morphology in one discreet area with another means that a correspondence process can be identified across the range of topographies.

The use of ERMapper in aiding the interpretation of the data set is crucial in the analysing of the affects that these topographic influences have had on the process of enclosure.

Those using the project to look at historic features as derived from the present landscape, now have an effective tool through which to look at fulfilling research objectives, Agenda 21 and local distinctiveness, village design statements, informing on planning policies (PPG’s) and creating a common language between groups involved with the management of the landscape.