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Module 7

LAND COVER MAP 2000

Fifth Quarterly Progress Report

CSLCM/Prog5

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- This is the Fifth Progress Report on Land Cover Map 2000 (LCM2000), a part of Countryside Survey 2000. The Report covers work done to 21 May 1999.
- LCM2000 is making a census survey of the land cover / widespread Broad Habitats of Great Britain using satellite imagery and automated image processing techniques to achieve a classification accuracy of 90% for target classes.
- Image searches have now been completed for the winter of 1998-9. The acquisition rates were poor reflecting the wet and cloudy weather over Britain during this period. A small number of winter scenes may be purchased from late winter once suitable summer 1999 images have been selected. However, even if no further scenes are added, acquisitions in winter 1997-98 give near complete winter coverage.
- Procedural developments from the early stages of LCM2000 are now fully operational. It is envisaged that some development work will continue at a reduced level to improve performance and address new problems which might arise.
- Problems were recently encountered with the use of the illumination correction procedure with winter images of areas with limited topography. This was traced to a memory problem unreported by the software. A new version of the illumination correction procedure was provided by the software vendor and has been tested and found to work correctly.
- A second IGIS licence has been installed at Monks Wood doubling the production capabilities. A third licence has been supplied and will be installed early in the next quarter.
- The delay in starting production mapping has resulted in the area classified being behind schedule. Currently, around 10 % of GB is in the classification phase, with a further 15 % at the end of the pre-processing phase. The improvements to the procedure are starting to provide time savings over those originally envisaged. This will gradually bring production back on schedule.
- In light of discussions at a recent demonstration of the LCM2000 initial results, some slight changes have been made to LCM2000 classes in coastal regions and their relation to widespread Broad Habitats (Figure 1).
- A criticism of the Land Cover Map of Great Britain (LCMGB), produced in 1990, was its failure to distinguish ericaceous upland bogs. To improve classifications in LCM2000, members of the field reconnaissance team had a Technical Meeting with field surveyors from SNH, in mid-May, on Rannoch Moor, Scotland; liaison with CCW and the Northern Ireland Countryside Survey is also scheduled.
- The Scottish meeting helped to clarify the very real problem of the LCMGB ‘bog’ and ‘heath’ classes. The ‘Open dwarf shrub heath’; was not entirely ‘heath’ but rather included ‘heath’ and ‘bog’ types. For field reconnaissance, the Key to Broad Habitats (see Barr, 1998) is a good but necessarily simplistic guide, identifying species diagnostic of bog. The combination of additional field training plus the Key allows the LCM2000 team to identify ericaceous and grassy bogs in reconnaissance.
- If the SNH experiences are repeatable, ITE will be able to distinguish these classes spectrally. The LCM2000 classification now incorporates these proposed refinements (Figure 1).
- The SNH meeting discussed the availability of other data sets for training, knowledge-based correction and validation. SNH expressed a willingness, in principle, to pass on various field datasets on peatland - not necessarily fully geo-registered but a clear guide to NVC and other categories to be found in sample areas. Contact with Helen Gray at SNH has also led to a proposal to provide woodland survey data. In addition, DETR earlier provided digitised urban boundaries for knowledge-based corrections and

validation. Negotiations with relevant parties, over use of other external data, will continue.

- The field reconnaissance surveys for 1999 have been planned to cover the following areas; southern Pennines, south west England, southern Scotland, the Lake District, Wales, Northern Ireland and Northern Scotland. Preparations for these surveys are currently in hand. These will complete the reconnaissance surveys for all 'mainland' Britain and Northern Ireland by September 1999, leaving only the Orkneys, Shetlands and Hebrides to cover in 2000, and then only if spatial extrapolation from the 'mainland' maps proves inappropriate.
- Overall success in Broad Habitat classification in general will only become clearly apparent once definitions for the Broad Habitats are finalised, classification results are widely available and validation has been applied in that context. To ensure that validation procedures meet requirements, a Technical Meeting on validation will take place in late autumn 1999.
- The initial LCM2000 validation, using check-polygons to validate the results derived from independent training polygons, has been applied to the areas currently under classification and, even before knowledge-based correction, the correspondence is approaching 90 % at the widespread Broad Habitat level. The first classifications have shown that, in principle, the Broad Habitat classification can be achieved. Validation against CS2000 field survey data will provide an independent assessment.
- The first refereed paper on CLEVER-Mapping, proposed in the Specification, has been submitted to the *International Journal of Remote Sensing* (Smith & Fuller, in prep.): using Jersey as the example, it presents most of the principles applied in LCM2000.
- The GANNT (Figure 2) records progress in scene-pair equivalents. The production, as stated above, is behind schedule, but the remaining tasks are at the points anticipated and in some cases additional work has been undertaken which was not originally envisaged.

References

Barr, C.J. 1998. *Countryside Survey 2000: Field Handbook. 3rd Draft.* Institute of Terrestrial Ecology, unpublished.

Smith, G.M. & Fuller, R.M. In prep. An integrated approach to land cover mapping: the land cover of Jersey. *International Journal of Remote Sensing*