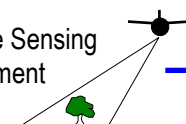




GeoRange first interim report

Reporting period: 01/01/2001 – 31/01/2001

Section 2: Executive publishable summary





Contract n°	EVK2-CT-2000-00091	Reporting period:	01/01/2001 – 31/12/2001
Title	GeoRange – Geomatics in the Assessment and Sustainable Management of Mediterranean Rangelands		
<p>Objectives</p> <p>During the first months of the GeoRange, prime attention was awarded to conceptual foundations, such as the development of a conceptual model for the assessment of multi-functional Mediterranean rangelands, and the definition of the data model to be followed in the setup of the site-specific GIS modules.</p> <p>Further conceptual work focussed on the setup and evaluation of concepts to characterise rangeland biodiversity, and to assess their degradation status and trend based on the information conveyed in the spatial structure of landscapes. Additionally geostatistical procedures for assessing land condition in terms of both resource use efficiency and landscape conservation issues have been analysed.</p> <p>Based on the already published information, the conceptual model and first experiences gained from field work, the formalisation of an assessment procedure to characterise Mediterranean rangelands by criteria defined before was initiated towards the end of the first year. Eventually, this will result in the development of a GIS rule-base to support the interpretation of the different datasets.</p> <p>Beside these conceptual issues the first year of the project was mainly devoted to primary data acquisition, the compilation of spatial data bases and the standardised processing of large volumes of remote sensing data. Specific field data collection and mapping exercises to be launched by the theme-oriented research teams were considered vital for verifying some of the criteria and indicators to be agreed upon during the first meeting and to be laid down in a common field data protocol.</p> <p>Major efforts have also been dedicated towards the preparation of the base GIS layers for the GeoRange GIS environment, comprising spatialised information on both physical determinants as well as on socio-economic factors and being complemented by geo-referenced information as collected in field.</p> <p>Another important objective was the acquisition and pre-processing of long time-series of Earth Observation Satellite data covering the GeoRange sites. This is a prerequisite of the project philosophy not only to concentrate on the present state of rangelands, but also to assess past developments which have shaped or determined present conditions.</p> <p>Finally, the communication of the project's outline and results to the public was pursued.</p> <p>Scientific achievements</p> <p>The conceptual model for the assessment of multi-functional rangelands has been agreed on during the first project meeting. Target rangeland functions and the related management activities are identified, and indicators of range condition that allow the evaluation of these activities are chosen.</p> <p>In this context a catalogue of pressure state indicators has been agreed on, which can be used to characterise multi-functional rangelands. A field data protocol has been ascertained listing the parameters to be assessed in field or be derived from other datasets. It relates both to the local and the regional scale and aims at a consistent collection of field data for all sites, while site-specific aspects may be pursued on a local scale. The collection of field data will be conducted at different stages throughout the project. It is the basis upon which existing information is complemented and forms the link between field- and remote sensing-derived parameters.</p> <p>Beside a harmonised collection of reference data, a consistent data structure is essential to support the exchange of datasets. A GIS model has been defined, providing the descriptions of standards and formats to be used in setting up the spatial data bases. For purposes of data documentation, it establishes the FGDC content standard for geospatial data as the metadata standard.</p> <p>Based on already existing project results and on literature review, a formalised concept for the assessment of multi-functional rangelands is being developed, which will provide the link from theoretical frameworks to a practical application by transferring it into a GIS rule-base. It is supposed to be finalised in the frame of the second project plenary meeting.</p>			





Supporting the practical application of the assessment frameworks developed before, the acquisition of primary data on physical and socio-economic determinants and the procurement of the respective spatial databases was pursued. Depending on data availability, base GIS layers have been compiled, documented and stored in the project data server. In the course of the project, these databases will be updated and complemented with geo-referenced field data, satellite data and derived information.

The satellite data base mainly encompasses Landsat-TM, -ETM and, where required, -MSS and SPOT data. The dedicated selection of satellite images has been based on the evaluation of NOAA-AVHRR based 10-day NDVI composites to account for phenological cycles and select optimum acquisition dates. A precise geometric rectification of satellite data has been performed using data from digital elevation models to account for terrain-induced distortions. In order to ensure the inter-comparison and quantitative interpretation of satellite data over long time periods, the data are radiometrically corrected to account for changes in the sensitivity of sensors and atmospheric conditions during the acquisition, as well as for illumination effects due to the local topography. This has been achieved with a modified 5S radiative-transfer-code which has been implemented in an in-house developed software package.

To support the analysis of the landscape spatial structure, an operational framework to assess the landscape condition has been established based on literature review and previous approaches. It is based on the fact that land degradation is manifesting in the level of organisation at which relevant ecological processes take place, and can thus be detected by testing the range of resolutions where spatial patterns can be significantly associated to environmental patterns. Additionally, a procedure has been introduced to employ structures becoming apparent from digital elevation models to stratify large areas with respect to their representativity according to certain driving factors.

Aiming at the dissemination of the project, a web site has been established. It is accessible at { HYPERLINK "<http://www.georange.org/net>" }, and informs interested parties about the progress of GeoRange.

Socio-economic relevance and policy implications

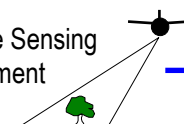
Most of the project achievements so far primarily serve as an input to the subsequent analysis and interpretation. However, since the project test sites are based on administrative boundaries and direct links have been established with the local administrative authorities, the procurement of the spatial databases is also of major importance, because it provides them with spatial information that has in many cases not been available before. Another aspect noteworthy is the importance of the databases for the rangeland assessments and definitions of specific management options for the respective test sites, that are expected to be applied by local planning responsables.

Mediterranean rangelands widely differ from rangelands in other parts of the world by their high heterogeneity. As a consequence, the conceptual work undertaken in GeoRange is not only vital for the progress of the project, it also tackles the specific European perspective of rangeland management and strengthens the position of European research in that field. Considering the extension, socio-economic and ecological importance of Mediterranean rangelands, their adequate management and protection is a major goal of European policies. In this view, generalised concepts that can also be transferred to other areas with similar determinants add a valuable contribution.

Conclusions

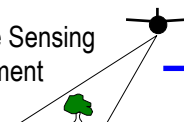
After the first year of GeoRange the foundation for the further progress of the project has been laid. The conceptual framework for the assessment of multi-functional rangelands has been established as well as a common strategy for the collection of calibration data in the field and the processing chain to produce multi-temporal datasets based on satellite imagery. The required spatial and non-spatial data as well as the necessary satellite images and ancillary data have been acquired, and the procurement and processing of the resulting information layers is well under way. After completion of these important stages of the project, the next step will be to integrate the different sources of data and commence the process of modelling, analysis and interpretation.

Keywords





Multi-functional Mediterranean rangelands, sustainable management, remote sensing, GIS database



Publications (cumulative list)¹

Non refereed literature:

Authors / Editors	Date	Title	Event	Reference	Type ²
Röder, A., Hostert, P., Hill, J., Tsiourlis, G.M., Kasapidis, P.	2001	Resource Assessment to Support the Sustainable Management of Mediterranean Ecosystems. An Approach Integrating Remote Sensing and Ecology.	International Workshop on Geo-Spatial Knowledge Processing for Natural Resource Management, held June, 28 th -29 th , University of Insubria, Varese (Italy)	Belward, A., Binaghi, E., Brivio, P.A., Lanzarone, G.A., Tosi, G. (eds.), 2001. Proceedings of the International Workshop on Geo-Spatial Knowledge Processing for Natural Resource Management, held June, 28 th -29 th , University of Insubria, Varese (Italy), pp. 303-309	Po Pro
Brundu, G., Hill, J., Sommer, S.	2001	GeoRange project focuses on Sardinian rangelands	International Workshop on Geo-Spatial Knowledge Processing for Natural Resource Management, held June, 28 th -29 th , University of Insubria, Varese (Italy)	Belward, A., Binaghi, E., Brivio, P.A., Lanzarone, G.A., Tosi, G. (eds.), 2001. Proceedings of the International Workshop on Geo-Spatial Knowledge Processing for Natural Resource Management, held June, 28 th -29 th , University of Insubria, Varese (Italy), pp. 205-208	Po Pro
Hill, J., Röder, A., Tsiourlis, GM., Sommer, S., Mehl, W., Papanastasis, V., Vallejo, R., del Barrio, G., Puigdefabregas, J., Brundu, G.	2001	Geomatics in the Assessment and Sustainable Management of Mediterranean Rangelands – The GeoRange approach	Int. Conf. on Forest Research: a challenge for an integrated European approach	Radoglou (ed.), 2001. Proceedings of the Int. Conf. on Forest Research: a challenge for an integrated European approach, Vol. 1, pp. 147-152	Po Pro

¹ Two copies of publications issued during reporting period should be annexed to the report, specific cases should be agreed by the Project Officer

² Type: Abstract, Newsletter, Oral Presentation, Paper, Poster (Po), Proceedings (Pro), Report, Thesis

