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## ABSTRACT

# Grids for pan-European land monitoring

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The HELM project has identified two prospective methods for aggregation of national/sub-national data sets in European land monitoring: (1) Database merging and (2) the grid approach. Both methods are to some extent already operational in on-going monitoring programs but the likely time-frame for adaption at the European level is still different. Database merging is already used in CORINE Land Cover by some member states (MS). The grid approach is a long-term solution that requires further development.

*Database merging* in a land-monitoring context is the computer-assisted compilation of land monitoring data from existing databases. Database merging is not a "potential", but an already operational system, used as an alternative production method for CORINE Land Cover (CLC) in several countries. The system coexists with manually produced CLC, contributing to a "dual track" production system.

The *grid approach* is replacing the familiar CLC system with fixed spatial monitoring units and a parameterized classification system (a.k.a. independent diagnostic criteria). A *grid* is in this context a spatial data model using a complete partition of a region into a set of non-overlapping spatial units with identical size and shape. The visual appearance of the grid cells resembles raster pixels, but their functional character is like vector polygons with attributes attached. The grid is "populated" with information from available sources. This information could include but is not restricted to information about land cover and land use. Each land cover class is represented as a separate attribute and the attribute values for a particular grid cell show the proportion of the grid cell covered by the corresponding land cover class.

The land monitoring community is aware of the fact that the grid approach is used by the statistical agencies in their production of harmonized European spatial datasets. A few countries are also using the grid approach in land monitoring. The grid is in a sense a spatial statistical model, supporting statistical analysis and modeling and facilitating closer cooperation between sectorial monitoring communities. The experience with grids in the land monitoring community is, however, limited and further testing is required in order to examine the potential and optimize details like spatial resolution and nomenclature.



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In the land monitoring context, it is important to notice that the grid approach

- allows a "dual track" system where MS proceed differently according the availability of relevant data.
- will benefit from development of a European extension of the ISO 19144-2 LCML standard.
- can utilize the GMES/Copernicus HRL layers
- are INSPIRE compliant
- foster cooperation between the national and pan-European level by involving MS
- allow European monitoring systems to build continuous monitoring programs at the national and sub-national level
- can foster increased cooperation between land monitoring agencies and statistical agencies