# THE EVOLUTION OF LAND COVER DATA, IN A SOUTH AFRICAN CONTEXT, IN LINE WITH EVER INCREASING USER DEMANDS

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South Africa produced it's first national land cover data set in the 1990s to meet the needs of primarily governmental departments. The use of the data set was almost exclusively in environmental applications. Over time, land cover data is being used by progressively more diverse industries and users, which now focus predominately on commercial applications. This has resulted in a market-driven shift in the level of detail required of land cover data sets.

There is demand for higher spatial resolution land cover data sets to meet the planning and decision-making requirements of these new users, particularly in urban and built-up areas. Land cover data has evolved from the initial data set which was manually mapped off Landsat imagery using acetate at a scale of 1:250 000, to the National Land Cover 2000 at 1:50 000 scale, to the current land cover data sets, which can be used at scales of 1:10 000. The most noticeable shift has been from cover mapping (e.g. urban), with soft boundaries which indicate the presence and extent of land cover types, to feature/object cover mapping, where the actual boundaries of features are delineated (e.g. building outlines). The legends have also evolved in accordance with user requirements, with customised land cover legends being developed for specific user groups.

Various factors have been influential in the evolution of land cover data. As technologies in various sectors have improved, so the demand for accurate, high resolution data to support these technological improvements has arisen. For example, the increased use of complex databases, including spatially-enabled databases, requires equally high level of details to support applications and the queries that run on them. Another example is the shift in the telecommunications industry from first to third generation technology, which requires greater levels of detail for planning and implementation.

In addition, there has been a shift from basic services to more specialised and personalised services. These require high levels of detail in order to facilitate better and more informed decision-making. These include the financial and banking industry, risk assessment and engineering projects. The planning requirements of residential, commercial, services, utilities, infrastructure and transport development necessitate data at high levels of detail to meet current needs and the changes in both National and Provincial legislation. The high level of detail now available for land cover mapping overcomes the incompatibility of scales that previously hindered decision-making and planning. These cadastre and feature level land cover data sets facilitate the integration and development of derivative data sets not previously possible.

The high level of detail in land cover data sets has been made possible by the ever increasing spatial resolution available from commercial providers of satellite imagery. With the users now being more business orientated, the higher cost of high resolution imagery is more feasible as the cost is off-set by the benefit of using high detail land cover. In addition, there has been a reduction in the cost of high resolution imagery as demand, competition and technology have increased.

Obviously, methodologies have evolved with the developments in source imagery. This includes shifting from manual mapping, to simple unsupervised classifications, through to complex integration of on-screen digitising, object-orientated segmentation and supervised classifications. In addition, developments in hardware and software have allowed for the processing of such large data sets. This together with new processing methods has facilitated the rapid generation of land cover data sets.

The resulting high-resolution land cover mapping procedures and data sets currently used in South Africa allows for complex and specific modelling for wide-ranging purposes, far beyond those of the initial coarse scale land cover data set. The new applications, spin-offs and derivative data sets continue to multiply, making these land cover data sets invaluable for geo-spatial technology decision support for future development in South Africa.