

Protocol for collecting data to groundtruth the Maputaland landcover map

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Introduction

This document describes a protocol for collecting data to measure the accuracy of the Maputaland landcover map. This map is based on Landsat ETM and ASTER satellite imagery and will have a resolution of 25 m. It will show the distribution of 27 natural landcover types, which are associated with 5 ecological zones, and 5 transformed landcover types (see Appendix 1). Two complementary sampling regimes are described below, together with instructions on the type of data that should be collected.

Sampling regimes

The sampling regimes described below have been developed to allow the rapid collection of data over a large area whilst minimising sampling bias. The first technique collects data along transects to ensure that large amounts of data are collected and this is supplemented with targeted data collection to provide information on landcover types with a more restricted distribution.

A) Collection along transects

The start of each transects should be located close to an access point, such as a road, and the transect length should depend on the amount of time available for data collection. The transect compass bearing should be selected at random but could be modified to avoid known obstacles. The sampling system should also be designed so that the data collectors do not spend large amounts of time walking through areas that have already been sampled.

One method to achieve this is to ensure that the transect end is also close to an access point. Alternatively, two parallel transects could be sampled with the end of the second transect being located close to the beginning of the first transect, although these transects should be at least 500 m apart. Data should be collected at points every 100 m along the transect and this distance can be measured by using the GPS unit's "nearest recorded location" option. Data should also be collected at points whenever there is a change in the landcover type, unless the landscape is highly fragmented by agricultural land and recording changes in landcover type would be too time-consuming.

B) Targeted data collection

After a period of transect-based data collection, it should be possible to identify landcover types that have not been sampled adequately (each landcover type should be sampled at least 10 times). Known patches of these under-sampled landcover types should then be visited so that sampling can take place within them. These patches could either be identified using local

knowledge or by referring to Landsat or ASTER satellite images. Ideally a number of widely distributed patches should be sampled but this might not always be possible for logistical reasons. Sampling points within a patch should be chosen to be typical of the landcover type and should be at least 200m apart (this can be determined by saving all of the sampling locations in the GPS unit memory and using the “nearest point” to ensure adequate spacing).

Collecting data on landcover type

The following information should be recorded in the landcover data collection sheets:

Location

The X and Y coordinates of the sampling point should be recorded using a GPS unit, ideally using the GPS averaging function to increase accuracy. The location should be recorded in decimal degrees (eg 32.0012, -26.4654) using the WGS84 datum.

It is not always possible to reach a particular ground-truth point, either because it is inaccessible or part of a wetland. In these cases it is best to estimate where the point is located and to judge whether the landcover type can be assessed at a distance from an accessible location. If it is possible then the field worker should stand as close to the sampling point as possible and record their location. They should then estimate the distance and compass bearing to the sampling point and record this information.

Physiognomic characteristics

The physiognomic characteristics of the surrounding vegetation should be assessed. This should be classed as sand/rock, grassland, woodland, thicket, forest or agricultural land. If other physiognomic types are found within a 20 m radius then the presence of these should also be recorded.

Presence of characteristic plant species

The presence of any plant species that is characteristic of particular landcover types (see Appendix 1) should be recorded. In addition, the common and Latin name of the most abundant tree and shrub species should be recorded whenever possible, using a field guide such as Pooley (1997). In some cases it might be necessary to take samples of key plant species to check their identification with relevant experts.

Presence of anthropogenic features

The presence of any human related factors, such as buildings, fields or domestic animals within 100 m should be recorded.

Landcover type

Based on the physiognomic and plant species characteristics, the observer should record the landcover type at the sampling point. However, in some cases it might be difficult to restrict the classification to one type because the point is on the interface between several landcover types. In this case, the observer should write down the alternative landcover types that could be used to describe the sampling point.

References

Pooley, ES (1997). *The complete field-guide to trees of Natal, Zululand and Transkei*. Natal Flora Publication Trust, Durban.