



Candidate

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Change Detection with Landsat satellite image data in the Karlsruhe region using Erdas Imagine 2010

Referee

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Key Words

Remote Sensing, Supervised Classification, Change Detection, Erdas Imagine 2010

Summary

For doing the change detection three Landsat images of the Karlsruhe region are available. They are from the years 1991, 1999 and 2005 and all have a spatial resolution of 30 m.

Before, a supervised classification have to be done. For that, several training areas for 12 classes are defined. They are set in one satellite image where the land use did not change over the years. For the two other images the data base can be loaded. Then the training areas have to be evaluated to check if they are set well or if they should be modified or even deleted. Erdas Imagine 2010 offers different possibilities. The methods which are used in this work are: the mean values and the standard deviations for all bands of the statistics, the mean plot, the signature separability with the transformed divergence distance and the feature space image. After that, the classification with the maximum likelihood algorithm can be created.

With these classified images a change detection can be done to demonstrate the land use change between the individual images. Erdas Imagine 2010 offers possibilities which are not satisfying. Therefore an appropriate calculation is computed in the model maker. The formula is the following:

$$\text{change detection} = (\text{before image} \times 12) + \text{after image}.$$

The before image is multiplied with 12, which corresponds to the number of classes, to obtain resultant values which occur only once.

The change detection shows some trends, e.g. in the course of time sparse settlement changed to dense settlement. The development of dense settlement between 1991 and 2005 is visualized by the figure below. It is shown that it increased in the centers of the cities (red areas) and decreased around the cities (green areas). The blue area signalizes where happened no changes.

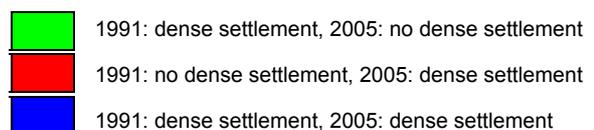
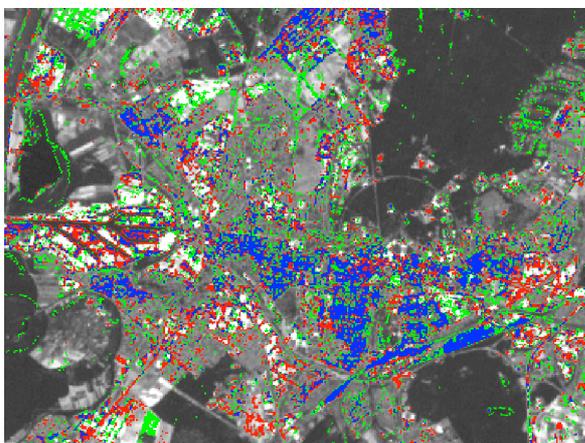


Fig.: Development of dense settlement in Karlsruhe between 1991 and 2005