



**Crop Monitoring as an
E-agricultural tool in
Developing Countries**



DESCRIPTION OF RUM DATABASES

Reference: *E-AGRI D42.2*

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1.0	28/01/2014		This document refers to the deliverable D42.2 RUM database.xlsx.	Qinghan Dong, Herman Eerens

1. Reference file

D42.2 RUM Database.xlsx

The RUM database refers to the database of Regional Unmixed Mean database containing the mean values of five bio-physical variables in six prefectures on Huaibei Plain.

2. Notion of Regional Unmixed Means:

Regional Unmixed Means (RUMs) for a certain bio-physical variable (e.g. DMP) represent the average value of this variable within a certain geographical entity. This average can be "unmixed" per land use or crop type. Then, only the contribution of the pixels belonging to a specific land use or crop type within that geographic entity is averaged. These values are called Regional Unmixed Means (RUM), and are stored in a database.

In this study, the only land-use or crop class which will be taken into consideration is the class of winter wheat. The resulted values are the values of the concerned biophysical variables contributed by the class winter wheat.

3. Data and methods used to generate the RUM images and RUM databases

In order to calculate these RUMs, two ancillary maps have to be present, one representing the land use or crop type and the second representing the geographic entities. Both should be in raster format, cover exactly the same geographic area and be at the same resolution as the images.

For this study, the cropland map GLCropV2 established by the JRC-FoodSec is used. This crop land map is actually a 0/1-cropmask at 250m resolution. It was compiled from different sources: GlobCover V2.2, CORINE-2000, AfriCover, the SADC data set and the USGS Cropland Use Intensity data set. The mask covers exactly the same region as the global SPOT-VGT, but the resolution is four times higher, i.e. $1^{\circ}/112/4$ or roughly 250m along a great circle. The image is framed such that each VGT-pixel exactly covers 4x4 mask pixels. From this 0/1-mask we derived a 1km resolution “Area Fraction Image” (AFI) which indicates for each 1km pixel the area fraction covered by cropland. This AFI is used for this project.

Figure 1 shows the AFI GLCrop V2 covering the province of Anhui and Figure 2 illustrates the boundaries and id numbers of the districts used in this study.

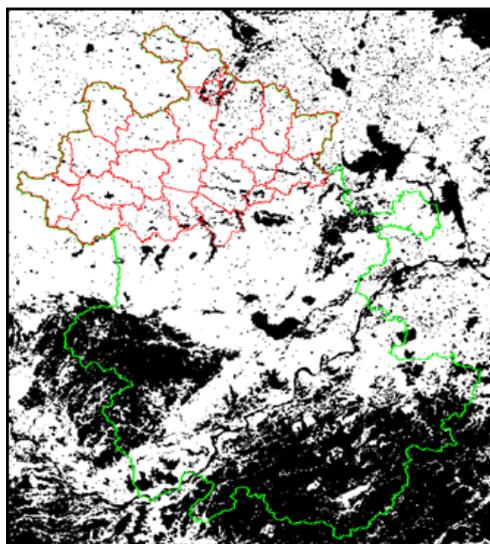


Figure1: Extract of the cropland AFI GLCropV2 covering the province of Anhui. Cultivated areas are shown in white.

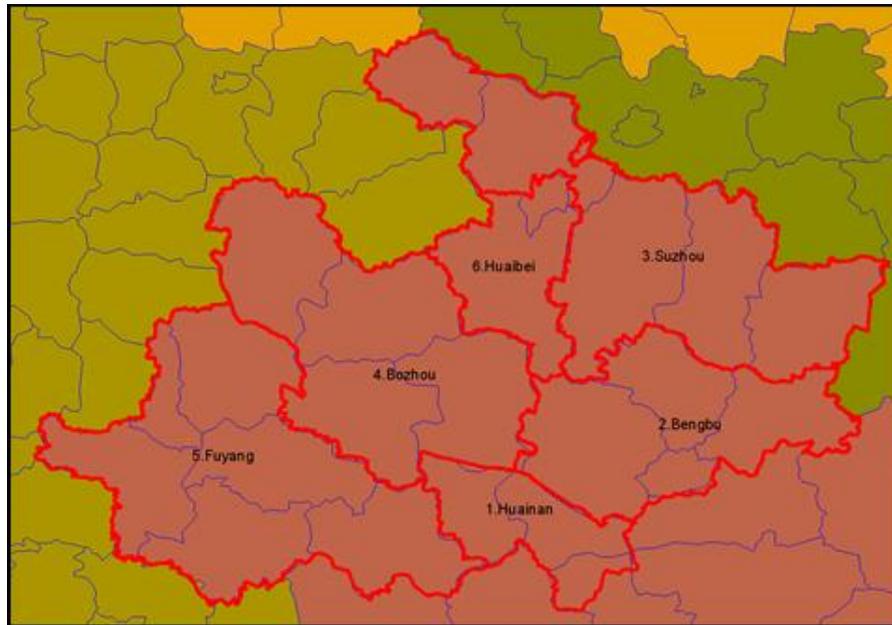


Figure 2: The Huaibei Plain occupies the northern part of the province of Anhui. Official statistics are available for the six shown districts. Main land use is cropland, pastures are very exceptional.

Computationally, a method has been developed to extract the RUM values. For each dekad, a RUM-file is computed for each concerned variable: i-NDVI, a-FAPAR, k-NDVI, b-FAPAR, y-DMP using the program IMG2RUM. RUM-files are ASCII-formatted and contain all the values for the concerned variable and period (in this case dekad), for all considered regions and each land use or crop class. In our case there is only one crop class for the winter growth season, the winter wheat. The RUM values are the mean value of the concerned variable for all “cropland pixels” in each prefecture. As “cropland” were considered all pixels having an area fraction of 100% in the cropland AFI.

The final RUM-values are provided in three different forms and files. All are ASCII-TXT and work with “comma-separated values” (CSV) which facilitates the import in EXCEL of other spreadsheets.