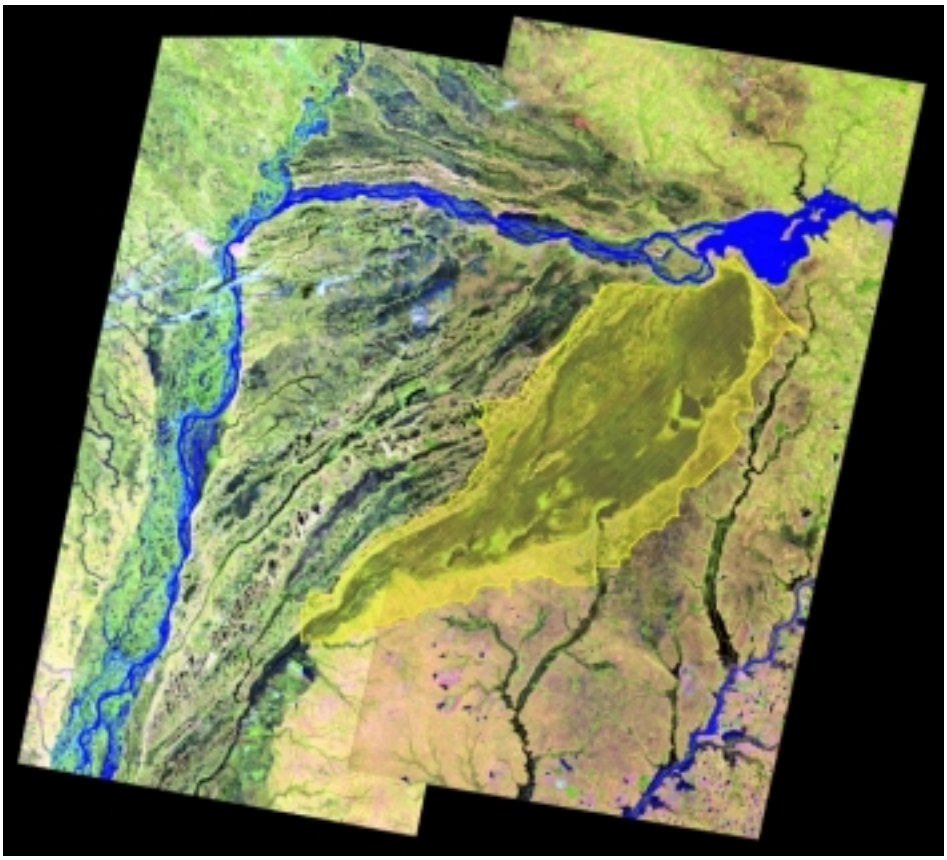

Figure 14. (Watershed & LANDSAT from 1998)

the available images, as the example shows *(Figs. 15 (brightness), 16 (greenness) & 17 (wetness)).*

When the MTC transformations are combined using Brigthness band as red, Greenness band as green and Wetness band as blue, a so called **Synthetic Map** (*Fig. 18*) is obtained. This kind of maps can be used as a base for an unsupervised classification, due to the amount of information they contain.

At this point, it is clear that the information contained in the synthetic maps exceeds the boundaries of the Esteros. The information beyond the watershed is not needed because its variability could incorporate noise in our future use of these maps. In order to eliminate those extra-watershed pixels we used a binary image of the watershed overlapping the synthetic maps in order to remove the unwanted sectors (*Fig. 19*).

Habitat Quality Index and Vegetation Roughness

However, the information present in the cut-out-synthetic maps is still too detailed. One way to reduce the amount of information is through **a multispectral classification process**. A multispectral classification is a process that organizes pixels onto a finite number of classes or data categories, based on the data value of each pixel. One pixel is assigned to a given class when a set of criteria is verified.

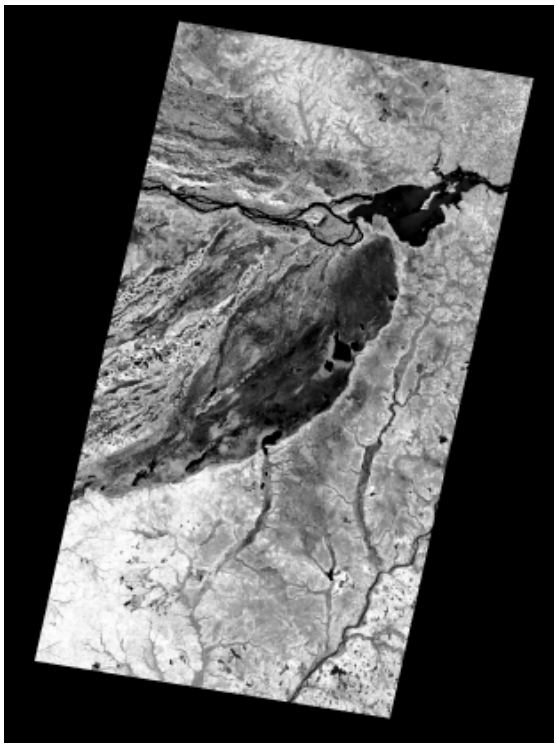

Figure 15. Modified Tasselled Cap transformation: brightness index.

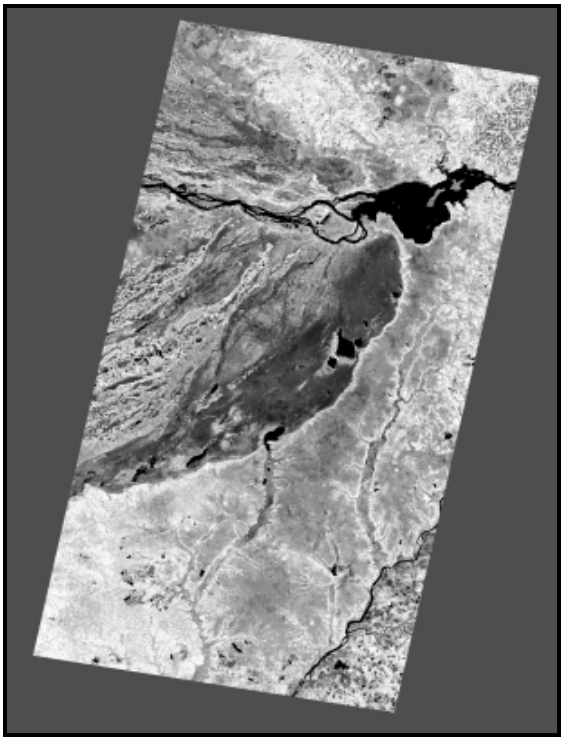

Figure 16. Modified Tasselled Cap transformation: greenness index.

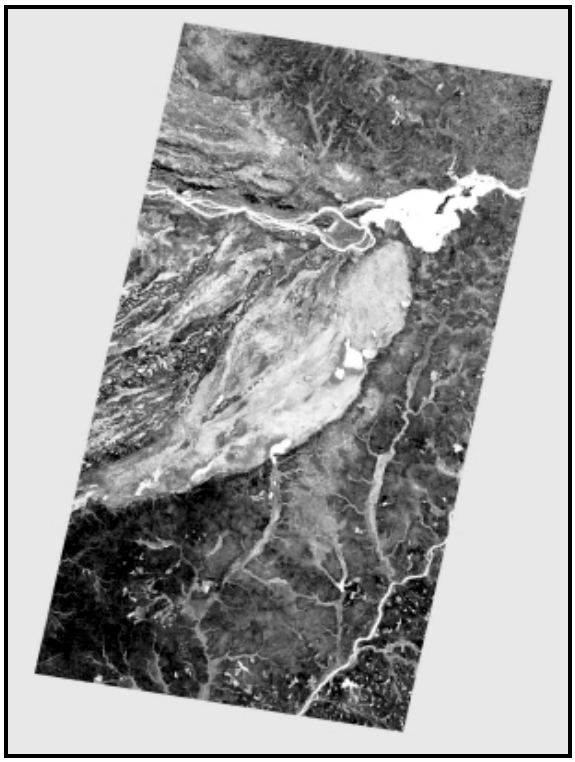

Figure 17. Modified Tasselled Cap transformation: wetness index.

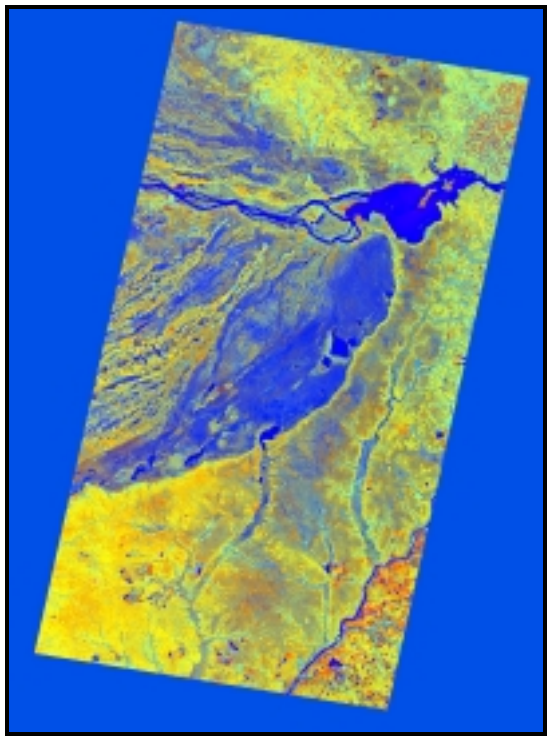

Figure 18. MTC transformations combined into a Synthetic Map.

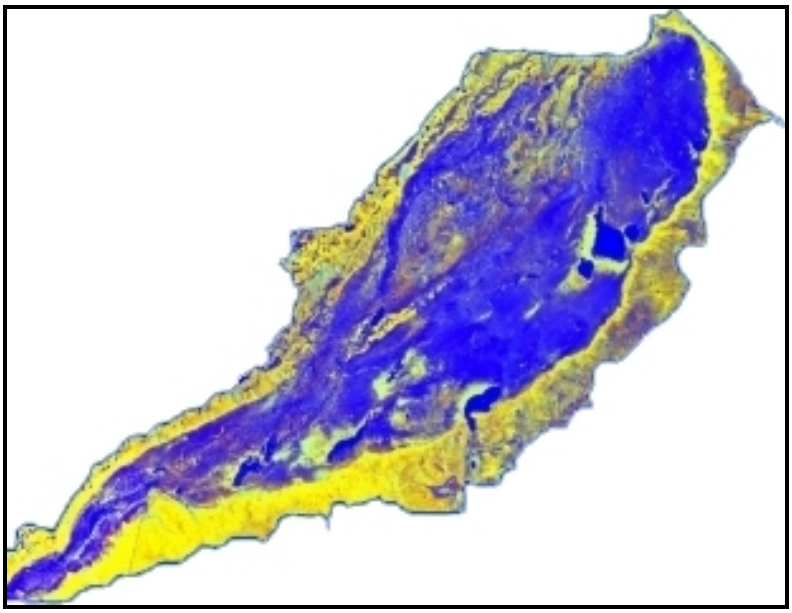

Figure 19. Synthetic Map of the Ibera Watershed.

Classification process is divided in two groups: **supervised** and **unsupervised classification**. A supervised classification process needs a description (kwon as Spectral Signatures) of some key spots in the image. An unsupervised classification does not need any information about the field. It was decided to run an unsupervised classification process due to the lack of sufficient field data to develop particular signatures.

Unsupervised classification is also known as **Clustering** because it is based in the natural clustering of pixels in the images. One clustering technique known as **ISODATA clustering** (**Iterative Self-Organizing Data Analysis Technique clustering**) was selected to make the unsupervised classification of all the images of the Iberá watershed. The classification of **MTC images** was done choosing **10-Classes images** (*Fig. 20*). The 10-Classes images must be evaluated later, before using them in any model. Also, a false color definition was used so that the classes could be differentiated easily (*Fig. 21*).

One of the objectives was to develop some kind of index appropriate for evaluating **Habitat Quality** that could be incorporated into the species models. For each one of the 10 classes, the information that corresponds to Brightness, Greenness, and Wetness can be recovered, so that by combining this information with given species preferences, it is possible to assign an index of Habitat Quality to each class.

Another objective was to develop some kind of index to evaluate the **vegetation roughness parameters** that conditions the surface flow in the Hydrological Modelling. First of all, we separate the inner watershed from the images (*Fig. 22*). The inner watershed was defined from wetness index (from MTC) taking into account a threshold value that represent areas with permanent water. The inner watershed map was classified with ISODATA clustering technique obtaining 8 classes of terrain with different roughness (*Fig. 23*).