Geostatistics in the SPRING
Exercise 1

Course: Master of Science on Geospatial Technologies
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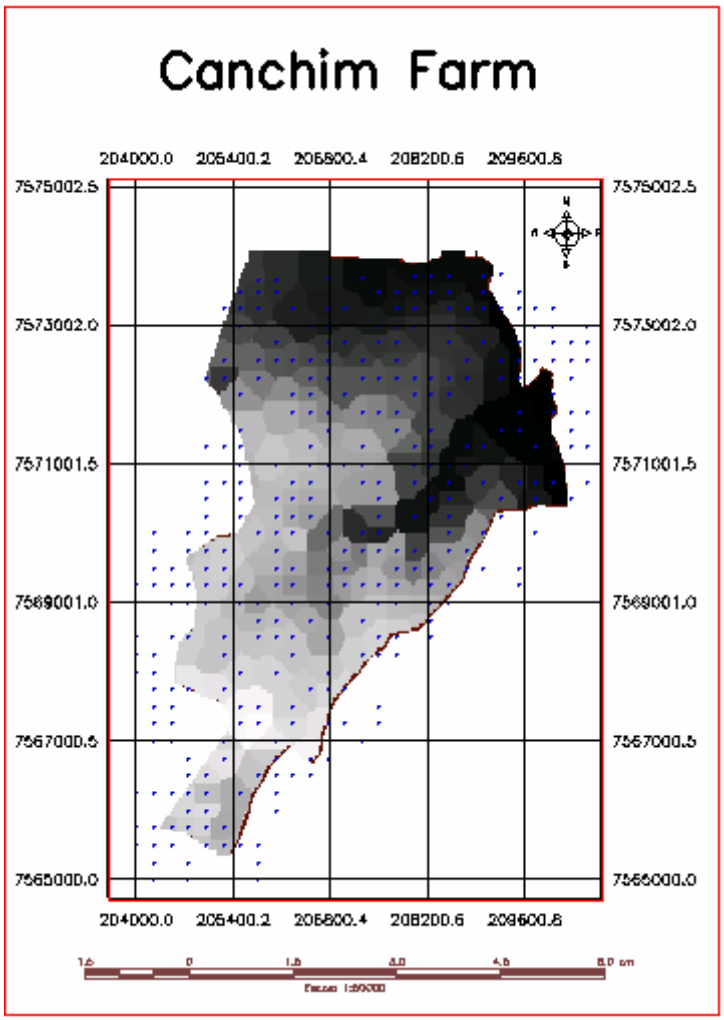
Contents

1 Presentation of the spatial data to be used

The study are belongs to an experimental Farm, named Canchim, that is one physical base for researches developed in the EMBRAPA institute in Brazil. The farm is located in the São Carlos municipality of the Brazilian São Paulo state. This region contains an area equal to 2660 hectares and is located between the coordinates 21°55'00'' and 21°59'00'', latitude south, and between 47°48'00'' and 41°52'00'', longitude west.

For purpose of geostatistics modeling it will be used a set of sample points irregularly distributed in the Canchim region

The figure below illustrates the geographic localization of the Canchim farm along with this bounding and the sample set of elevations (altimetry) inside the Canchim region. The background map is the Dirichlet map (that shows the influence region of each sample) presented in gray level following the legend attached to the figure.



2. Creating the initial DataBase in the SPRING

2.1 Activating the SPRING program

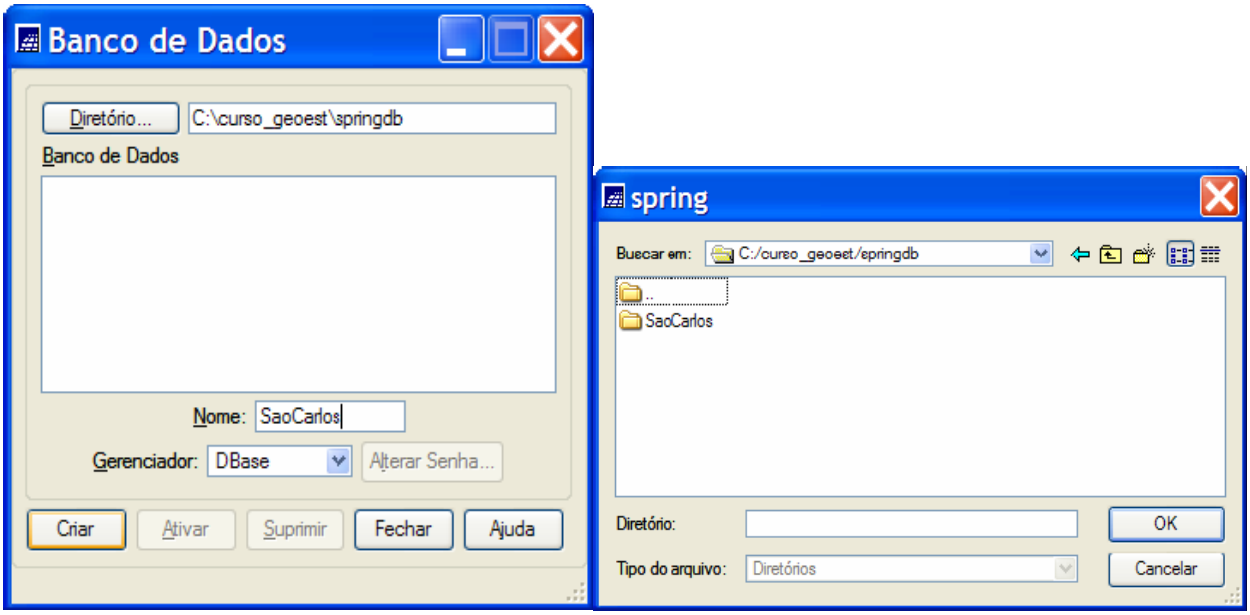
- Copy the contents of the zipped file input_text_data.zip to a directory named c:\curso_geoest\springdb

- Double click on the SPRING icon  in desktop area of your computer

2.2 Creating a database named SaoCarlos

- From the **File menu** of the SPRING, select the **DataBase** option
- Click on the **Directory… button** of the DataBase window
- In the Directory Selection window
  - Select: c:*curso_geoest**springdb* (or other directory with your data)
  - Click on the **OK button** to return to the DataBase window

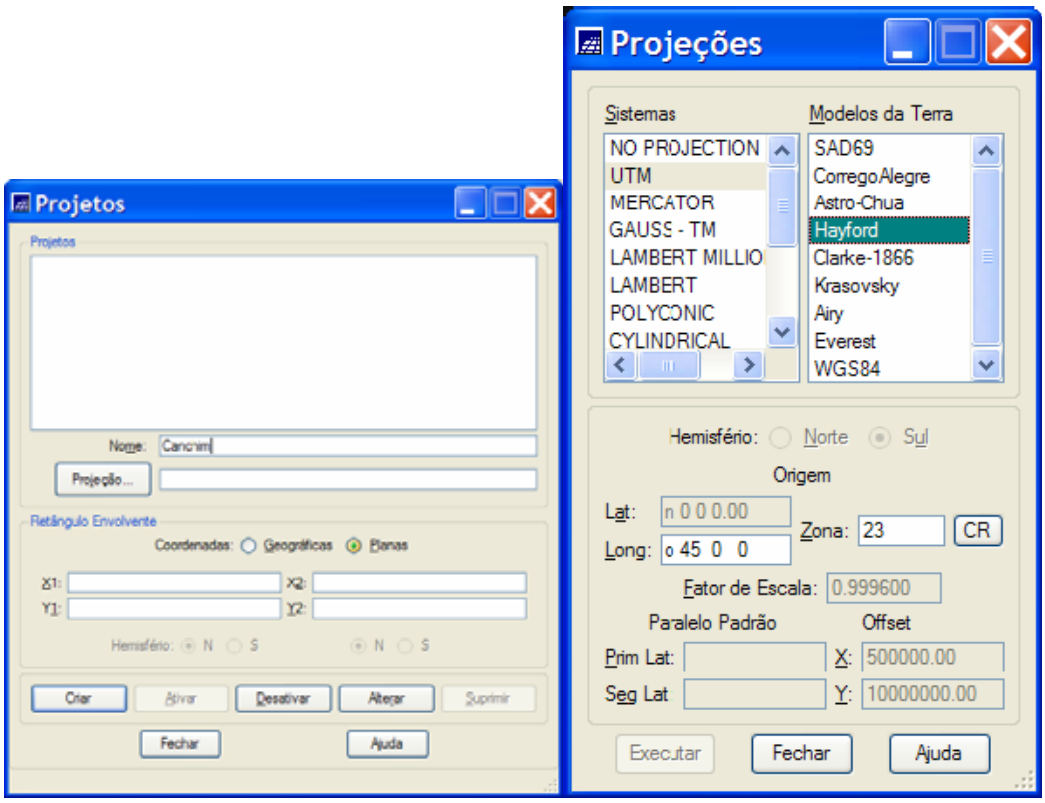
- In the DataBase window
  - Fill out the **Name field** with the name: *SaoCarlos*
  - Select as your **DBMS (Data Base Management System)**: *DBase*
  - Click on the **Create button**
  - Select, in the **DataBase list,** the database *SaoCarlos*
  - Click on the **Apply button** in order to activate the *SaoCarlos* database



- Click on the **Close button** to quit the DataBase window.

2.3 Creating the Canchim project

- Select the **Project option** from the **File menu** of the SPRING,
- In the Projects window
  - Fill out the **Name field** with: *Canchim*
  - Click on the **Projection... button** to open the Projection window
  - In the projection window
    - Choose from the **list of Systems**: *UTM*
    - Choose from the **list of Earth Models**: *Hayford*,
    - Fill out the Zone field with the value 23 and click on CR button at the right side of the Zone field
    - Click on the Apply button
    - Click on the Close button to quit the Projections window

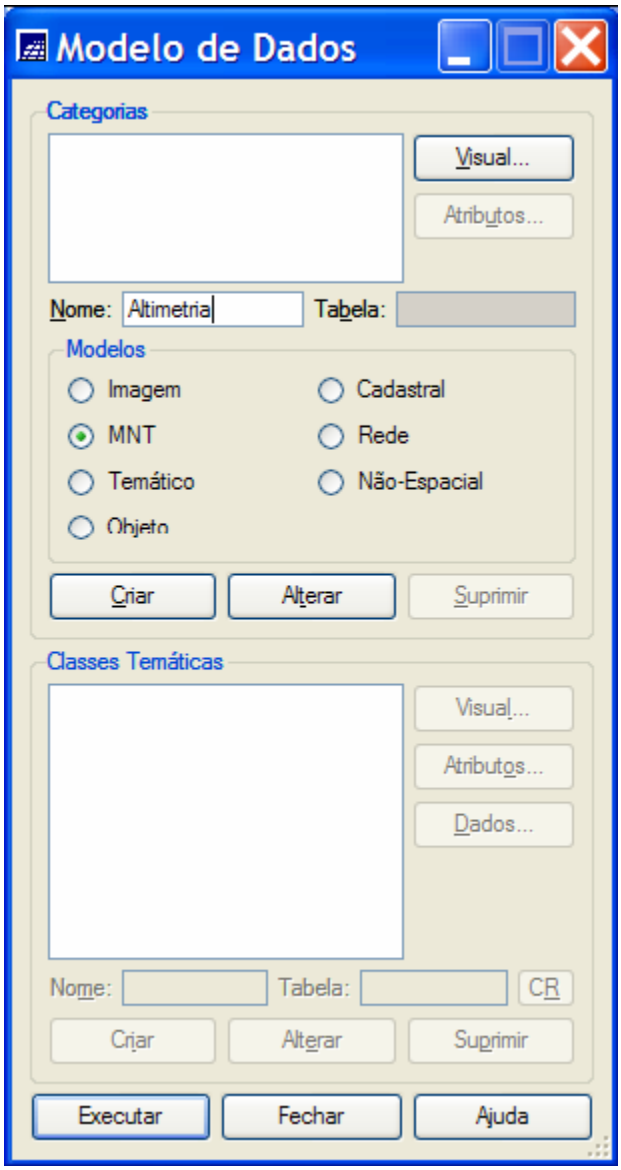


- Back to the Projects window
  - Choose **Planes** to define the Bounding Box of the project
  - Fill out the bounding box text fields with the following values
    - X1: ***204000*** X2: ***211000***
    - Y1: ***7565000*** Y2: ***7575000***
  - Choose **S** as Hemisphere for both coordinate points above defined
  - Click on the **Create button** to create the project
  - Activate the project clicking on the **Load button**
  - Click on the **Close button** to quit the Projects window

2.4 Creating a category of a DTM model

- Select the **Data Model… option** from the **File menu** of the SPRING

- In the Data Model window
  - Fill out the **Name field** with: *Altimetria*
  - Choose from options of **Models** : *DTM*

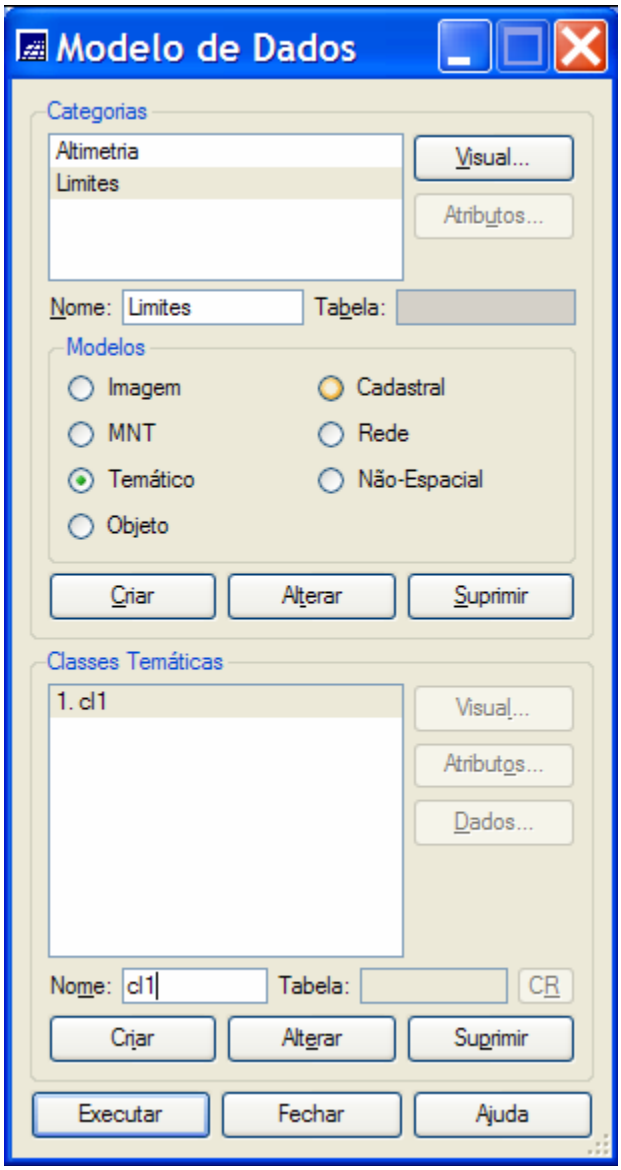


  - Click on the **Create button** to create the category
  - Click on the **Apply button**
  - Click on the **Close button** to quit the Data Models window

2.5 Creating a category of a Thematic model

- Select the **Data Model… option** from the **File menu** of the SPRING

- In the *Data Model window*
  - Fill out the **Name field** with: *Limites*
  - Choose from options of **Models** : *Thematic*
  - Click on the **Create button** of the Categories
  - Type the **Name** *cl1* as the first name of the Thematic Classes
  - Click on the **Create button** of the Thematic Classes
  - Click on the **Apply button**



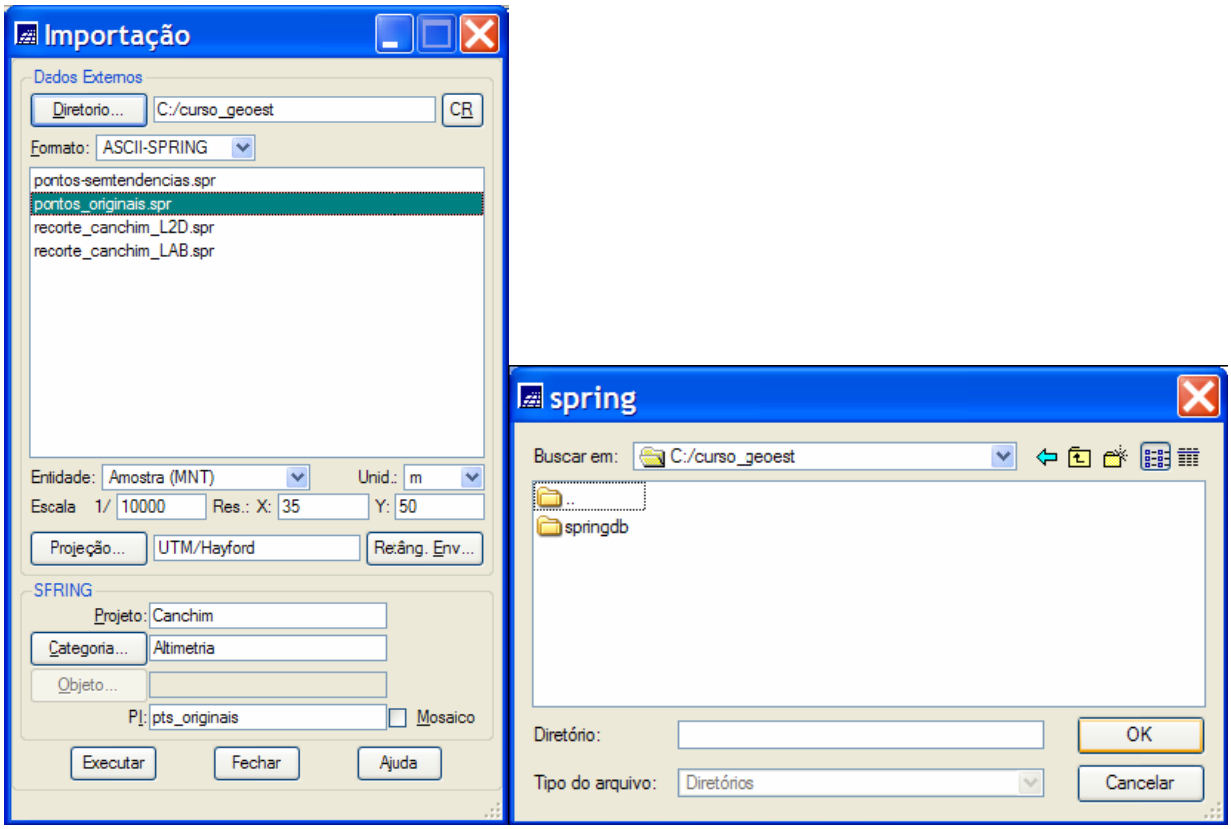
- Click on the **Close button** to quit the Data Models window

2.6 Importing the altimetry data (pontos originais) of the Canchim region

- Select **option Import...** from the **File menu** of the SPRING,
- Click on the **Directory… button**

• In the *Directory window*

- Select as **Directory**: c:*curso_geoest* e click on the **OK button**
- Select as **Format**: *ASCII-SPRING*
- Select as **File:** *pontos_originais.spr*
- Select as **Entity**: *Sample(DTM)*
- Select as **Unity***: m* (meters)
- Define for the **Scale** value: *10000*
- Define the values **Res. X:** *35* and **Res. Y:** *50*
- Keep current values for **Projection** and **Bounding Box** of the project.
- Keep the current **Project Name** (Canchim)
- Click on **Categories... button**
- In the *Category window*
  - Choose **Category** *Altimetria*
  - Click on the **Apply button**
- Fill out the **field IF**(Info Layer) with the name: *pts_originais*
- Click on the **Apply button**



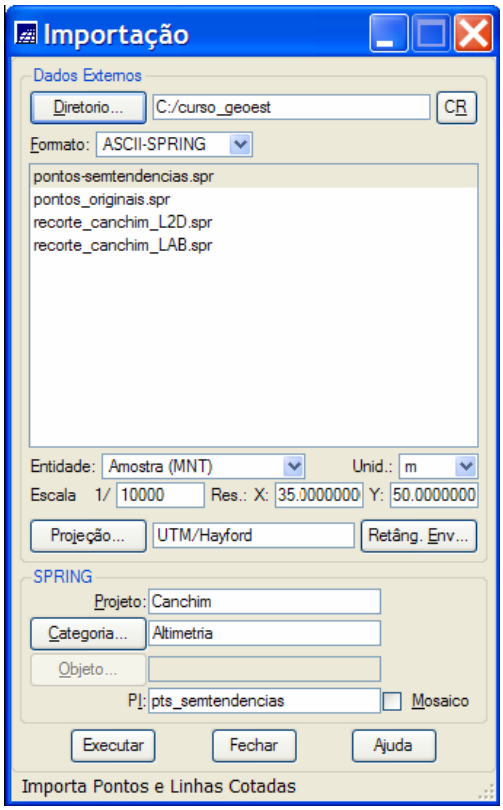
- Quit the import window clicking on the **Close button**

2.7 Importing the altimetry data (pontos sem tendências) of the Canchim region

- Select **option Import...** from the **File menu** of the SPRING,
- Click on the **Directory… button**

• In the *Directory window*

- Select as **Directory**: c:*curso_geoest* e click on the **OK button**
- Select as **Format**: *ASCII-SPRING*
- Select as **File:** *pontos_semtendencias.spr*
- Select as **Entity**: *Sample (DTM)*
- Select as **Unity***: m* (meters)
- Define for the **Scale** value: *10000*
- Define the values **Res. X:** *35* and **Res. Y:** *50*
- Keep current values for **Projection** and **Bounding Box** of the project.
- Keep the current **Project Name** (Canchim)
- Click on **Categories... button**
- In the *Category window*
  - Choose **Category** *Altimetria*
  - Click on the **Apply button**
- Fill out the **field IF** (Info Layer) with the name: *pts_semtendencias*
- Click on the **Apply button**



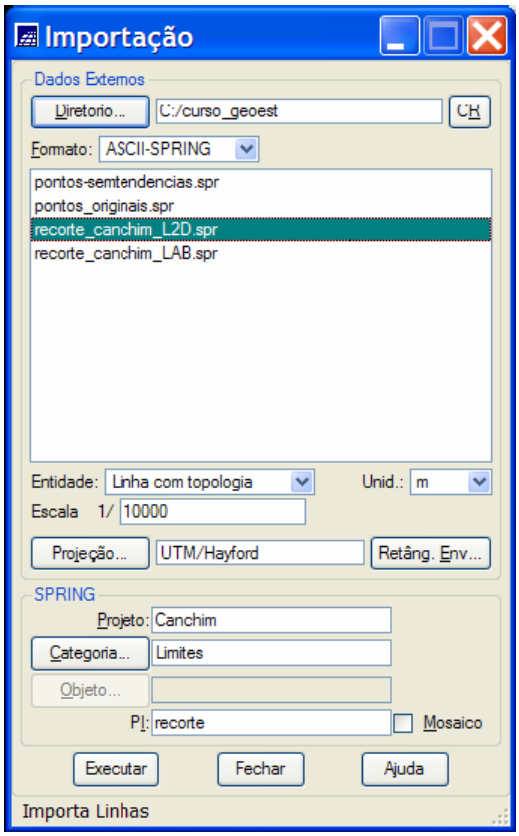
- Quit the import window clicking on the **Close button**

2.8 Importing the farm's bounding data (recorte) of the Canchim region

- Select **option Import...** from the **File menu** of the SPRING,
- Click on the **Directory… button**

• In the *Directory window*

- Select as **Directory**: c:*curso_geoest* e click on the **OK button**
- Select as **Format**: *ASCII-SPRING*
- Select as **File:** *recorte_canchim_L2D.spr*
- Select as **Entity**: *Lines with topology*
- Select as **Unity***: m* (meters)
- Define for the **Scale** value: *10000*
- Define the values **Res. X:** *35* and **Res. Y:** *50*
- Keep current values for **Projection** and **Bounding Box** of the project.
- Keep the current **Project Name** (Canchim)
- Click on **Categories... button**
- In the *Category window*
  - Choose **Category** *Limites*
  - Click on the **Apply button**
- Fill out the **field PI** (InfoLayer) with the name: *recorte*
- Click on the **Apply button**



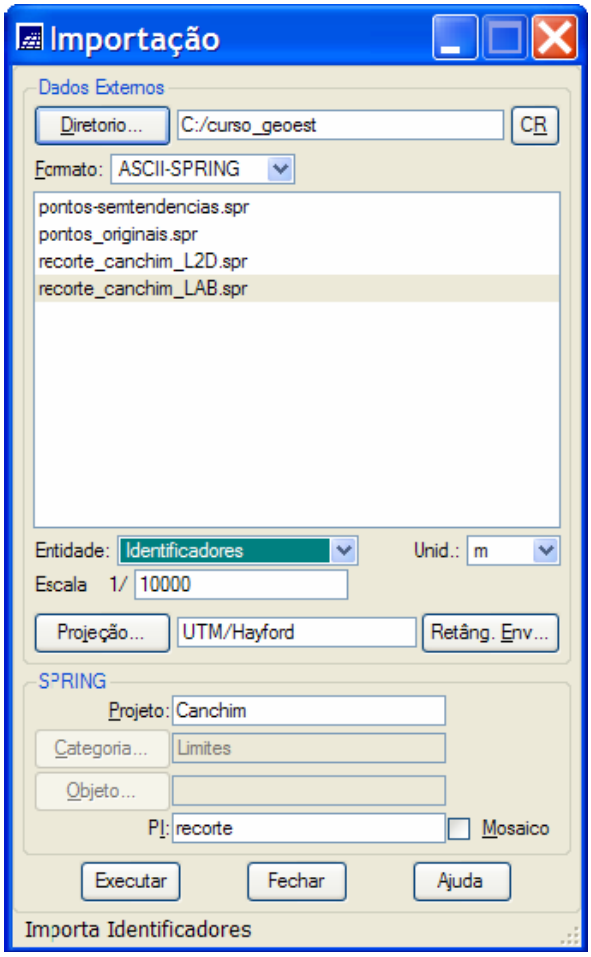
- Quit the import window clicking on the **Close button**

2.9 Importing class identifiers (“labels”) of the Canchim farm

- Select **option Import...** from the **File menu** of the SPRING,
- Click on the **Directory… button**

• In the *Directory window*

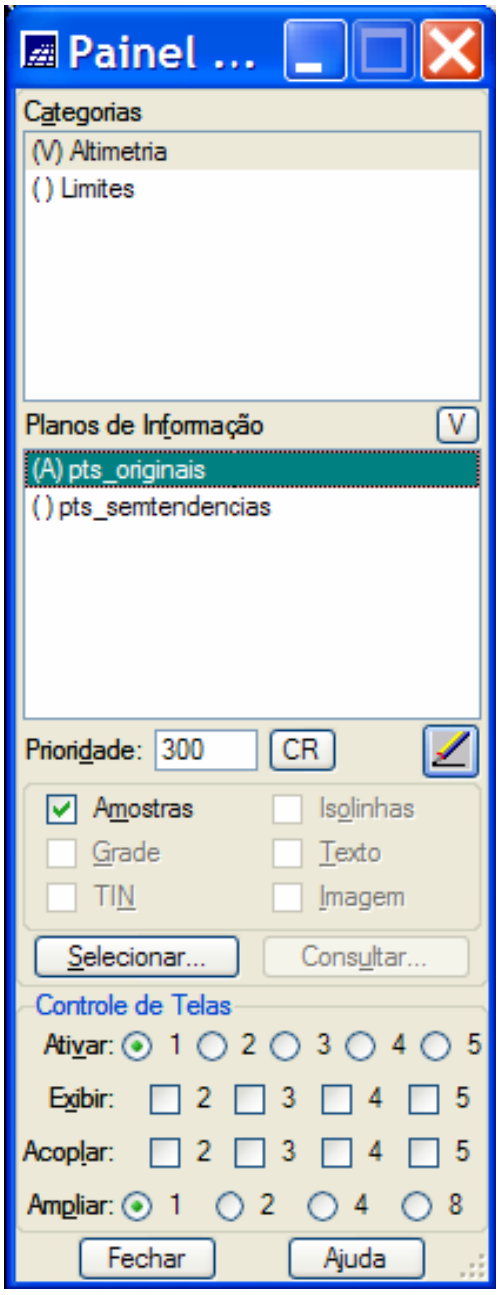
- Select as **Directory**: c:*curso_geoest* e click on the **OK button**
- Select as **Format**: *ASCII-SPRING*
- Select as **File:** *recorte_canchim_L2D.spr*
- Select as **Entity**: *identifiers*
- Select as **Unity***: m* (meters)
- Define for the **Scale** value: *10000*
- Keep current values for **Projection** and **Bounding Box** of the project.
- Keep the current **Project Name** (Canchim)
- Click on **Categories... button**
- Keep the **field PI** (InfoLayer) with the name: *recorte*
- Click on the **Apply button**



- Quit the import window clicking on the **Close button**

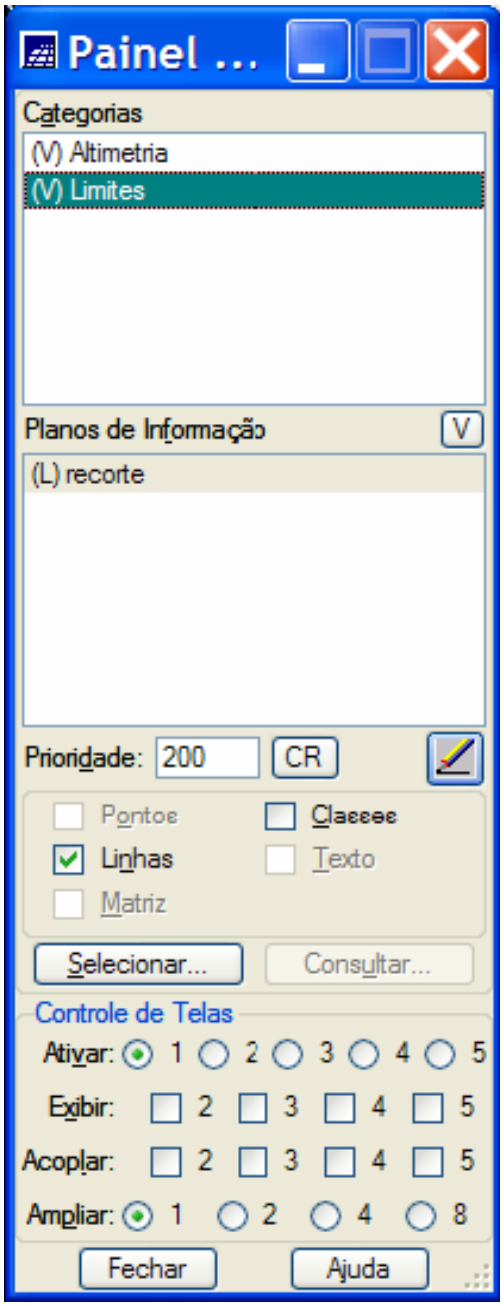
2.10 Displaying the Canchim area and the sample points in the main display (display number 1) of the SPRING

- In the Control Panel
  - Activate the Display 1
  - Select in the **Category list***: Altimetria*
  - Select in the **InfoLayer list**: *pts_originais*
  - Select as representation *Samples*



- In the Control Panel

  - Select in the **Category list*:*** *Limites*
  - Select in the **InfoLayer list**: *recorte*
  - Select as representation *Lines*



  - Click on the **Draw Icon**  **of the Control Panel or of the SPRING tool bar**

• The Figure below illustrates the results of the visualization operations above done