ESTEVOL, a space & time analysis tool to better understand urban growth

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1) Introduction

2) Scientific context

3) Methodology

4) First results & furthers
1) Introduction. Where?

- Coastal position
- Very attractive city
- In a group of communes since 1999
1) Introduction. Who?

- The ECOP observatory
  - Spatial analysis & modeling approach

- The ESTE (space & time) program
  - IT approach. Research on space & time dataset modeling, methods and tools
1) Introduction. What?

- Research based on urban spread thematic. Cadastral dataset are used as an imput.
- The aim is to better understand urban spread phenomenon with the help of space & time analysis tools.
2) Scientific Context

- Most of space and time analysis are based on non-continuous data. Satellite images are often used at different periods, and comparisons are made cells to cells or comparisons are made with multi-sources data such as aerial photography or rasterised old maps.
2) Scientific Context

- The cadastral Dataset: From paper to vector
2) Scientific Context

- To propose space and time analysis tools in order to study the urban spread phenomenon. Cadastral dataset is used as an input.
3) Methodology

1. A visualisation tools implemented in a GIS. Not only visualisation, but linked to all spatial analysis tools.

2. A space-time tool. Based on speed of urbanization analysis.

Result: A better approach of geographical phenomenon.
3.1) Space & time analysis tools

We need to see before to analysis

Visualization tools exist:

- TimeMap
- Google Earth (KML with time tag)
- In some GIS

No tool allows both spatial & time analysis basically
3.1) Space & time analysis tools

Estevol: the visualization module
3.1) Space & time analysis tools

Some Space & time tools can help to answer to:

- How fast has the building space consumed the free space?
- What are the most stable areas?
- What are the relations between a road (level of importance) and the nearer urbanization?
3.1) Space & time analysis tools

Estevol: the analysis module
3.1) Space & time analysis tools

Estevol: the analysis module
3.2) First results

Speed of urbanization (per cells)
3.2) First results

Speed of urbanization
(per commune)

Type of profile:
- Linear
- Custom
- Exponential

Graphs showing density over time for profiles 1, 2, and 3.
4) Furthers

First results are the followings:

• A dynamic display of the urban evolution in a GIS.
• A free tool “ESTEVOL”, available for download on esri.com (downloaded more than 100 times). Only visualisation tool is available on this version. Analysis tools come soon…
• A speed of urbanization map.
• For the CDA-LR, space and time analysis are interesting especially for urban engineers, elected representatives and planning managers. For the elected representatives, time visualization is a new way to see the evolution of their territories.