

# Teaching GIS in Romanian Universities

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# Geography in higher education

- The geography are represented in almost all major universities centers
- In the present time are about 12000 students, grouped in 10 universities
- The biggest universities, where are enrolled 80% from students are: University of Bucharest, “Gheorghe Asachi” University from Iasi (N), “Babes-Bolyai” University from Cluj Napoca and West University from Timisoara (W).

# GIS in higher education – first steps

- In 1996 was launched first course named “Geographical Information Systems (1 semester) at the Faculty of Geography from University of Bucharest – master level
- We have the following system: 4 – 5 (DL) years for BSc, 1-2 years for MSc, 4-7 years for PhD (we will change this starting with the next year in 3 yr for BSc + 1 or 2 for MSc and 3 yr for PhD)
- In 2000 was launched one semester course entitled GIS for undergraduates (4<sup>th</sup> level)

# GIS in higher education

- From 2002 the number of courses offered has growing
- From 2003 – was introduced a specialization for Environmental Science students – GIS (minor diploma)
- From 2003 first doctoral programmes with GIS subject (geomorphologic risks, habitat suitability for species...)

# GIS in higher education – a technical problem

- The diversification of courses was related with numbers of computers
- In 1996 in Faculty of Geography at University of Bucharest was only a computer (not for students) ... now we have about 200 computers for 1200 students
- First course for using computers was setting up by professor for Liverpool Hope University College

# GIS in Romanian higher education

- In this year the GIS module are based on:
  - **core discipline:** Geoinformations, Introduction in GIS, Remote sensing, Data bases
  - **optional discipline:** Spatial analysis, Using ESRI software, Using IDRISI, Using ERDAS, Using Geomedia software, Using core Intergraph software, CAD for geographer, GIS in hydrology, GIS in conservation biology, GIS in biogeography, GIS in landscape ecology, GIS in planning territory, GIS in oceanography, Digital imagines

# GIS in Romanian higher education

- Firsts softwares: Surfer, ArcView and Map Info
- Now: ArcInfo, ArcView, ArcGis, Geomedia, Spatial Analyst, 3D Analyst, ArcPad, IDRISI, ERDAS, RAMAS Multispecies Analyst, LOAS (Location on the Earth), BIOTAS etc.

# GIS in Romanian higher education: differences between faculties

- There are many differences between universities, each one has the own point of view about the importance of GIS
- The factors who affect the curricula are: the background of teachers, the relations with software resellers, the price of the software, the numbers of the computers
- For example in Iasi university the core area are remote sensing and GIS in raster format, in Cluj Napoca university are ESRI oriented
- In any situation the lectures are run out with a few licensed application and a lot of demo applications

# GIS in Romanian higher education

- For example in Romanian universities (not only for geography) are only 214 license for ESRI family
- The Intergraph and Map Info has decide to gave free license for 25% of computer from Bucharest University (because in 10 year was sold only 5 license for Map Info)

# GIS in Romanian higher education weak points

- The diversity between universities
- Lack of license for software (the are very expenses in Romania, for example ESRI Lab Tool kit is 8500 EURO for 1 license, in US are about 1500 USD)
- Limited access at literature, especially for students
- The GIS examples in the classroom are not related with the fieldwork (with GPS for example)
- There are no viable quality assurance systems

# GIS in Romanian higher education good chance for future

- High training level for the teacher
- Good connections with other EU and US universities
- Good hardware equipments
- Good broadband internet connection
- High level of computers skills for students
- Orientation for application (learning with GIS, research with GIS)