

**2013 Esri Europe, Middle East and Africa
User Conference**

October 23-25, 2013 | Munich, Germany

**The Project *GIT* for
*Sustainable Development in
Eastern Neighboring Countries***

Dietrich Schröder

The GIDEC overall Objective

The project *GIT for Sustainable Development in Eastern Neighboring Countries* (GIDEC) aims to modernize higher education in geographic information technology (GIT) in

- Armenia,
- Ukraine and
- Moldova

to support sustainable development

The project is funded in the framework of the EU TEMPUS program

GIDEC



Programul TEMPUS 2010-2013

„GEOGRAPHIC INFORMATION TECHNOLOGY
FOR SUSTAINABLE DEVELOPMENT IN EASTERN
NEIGHBOURING COUNTRIES“



SWEDEN



REPUBLIC OF
MOLDOVA



SPAIN



UKRAINE



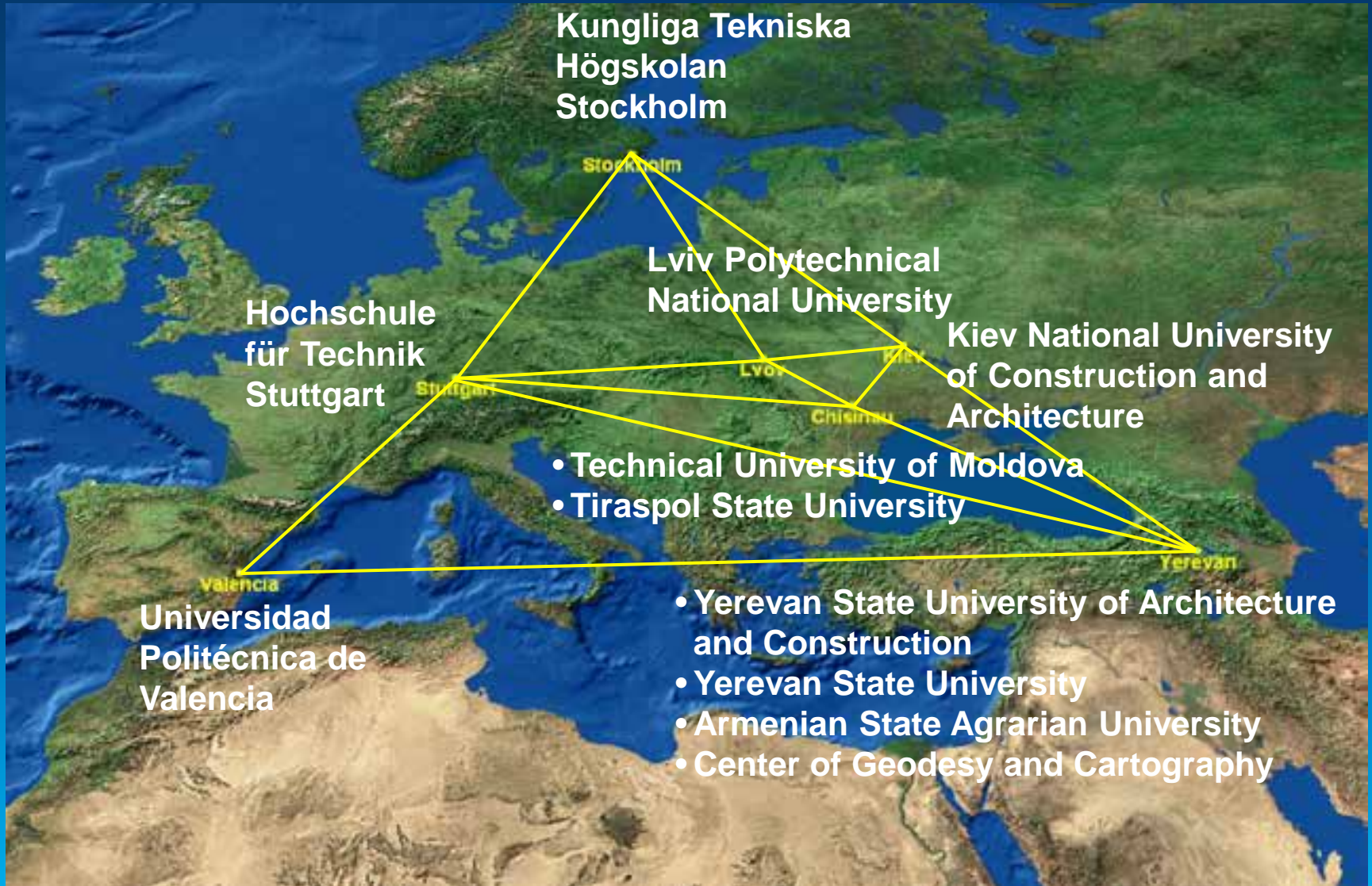
GERMANY



ARMENIA

TEMPUS is the European Union's program which supports the modernization of higher education in the Partner Countries of Eastern Europe, Central Asia, the Western Balkans and the Mediterranean region, mainly through university cooperation projects

The GIDEC Consortium



The GIDEC Goals

- Strengthening the link between GIT education and society
- Reforming existing and creating new GIT curricula
- Establishing GIS laboratories
- Re-training partner country staff through intensive training courses
- Introducing new pedagogical methods and quality assurance mechanism
- Creating web-based e-learning system

Strengthening the link between GIT education and society

**Survey:
Need of specialists**

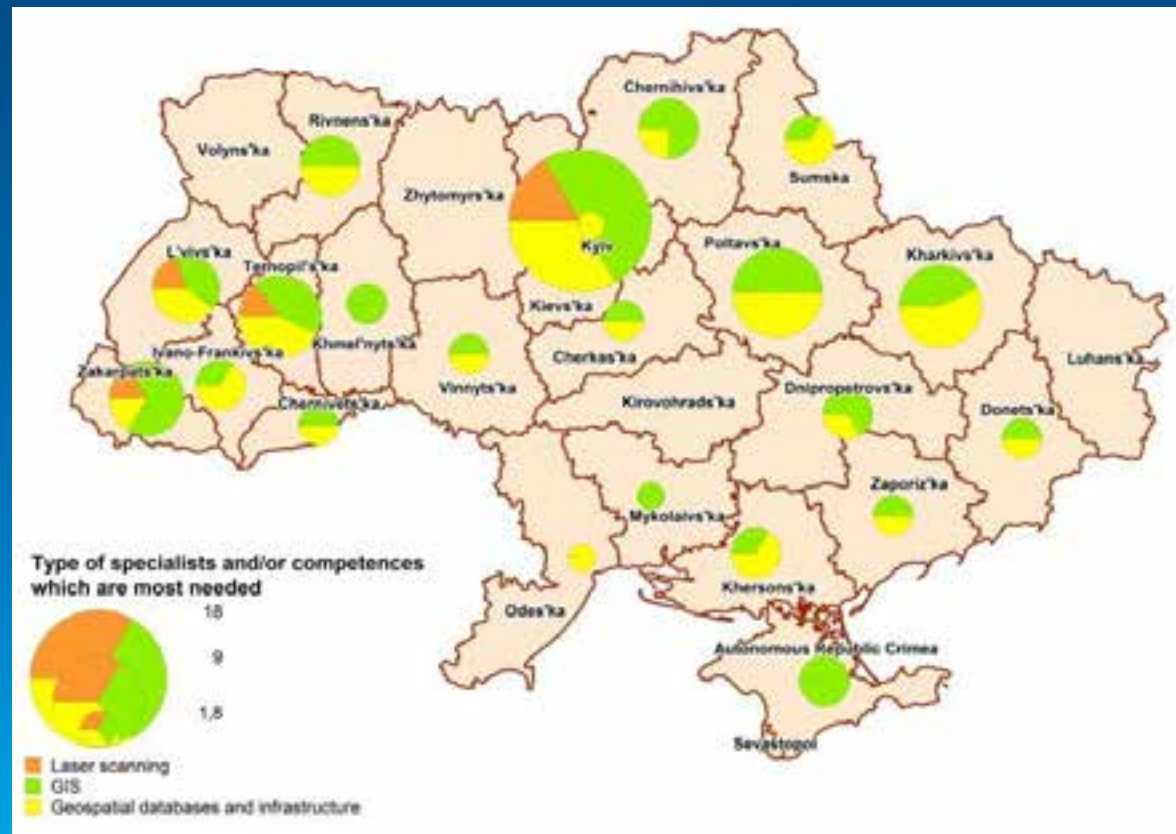
Specialization and/or competence of specialists, in which the greatest need	The quantity of specialists which are needed to organizations								Total
	Architecture and urban planning	Environmental Protecting	Land cadastre and Land management	Geodesy and Surveying	GIS	local government	Educational institution	Other	
Land cadastre and Land Management	233	431	2464	1700	585	678	24	1475	7590
Surveying works, engineering and geodetic research	472	216	1512	1700	650		24	1625	6199
GIS	331	872	1288	1139	455		24	300	4409
Geospatial databases and geospatial data infrastructure	282	549	1036	799	455	678	47	300	4146
GPS, GLONASS	49	431	616	680	390		24	300	2490
Geodetic reference systems and network	190		336	799	260			150	1735
Laser scanning	49		140	221	130			150	690
Photogrammetry			336	60	70		50	12	528
Other	92		140						232
Remote Sensing			5	20	60		50	6	141

**Example:
Ukraine**

Strengthening the link between GIT education and society

Survey: Spatial distribution of needed experts

Example:
Ukraine



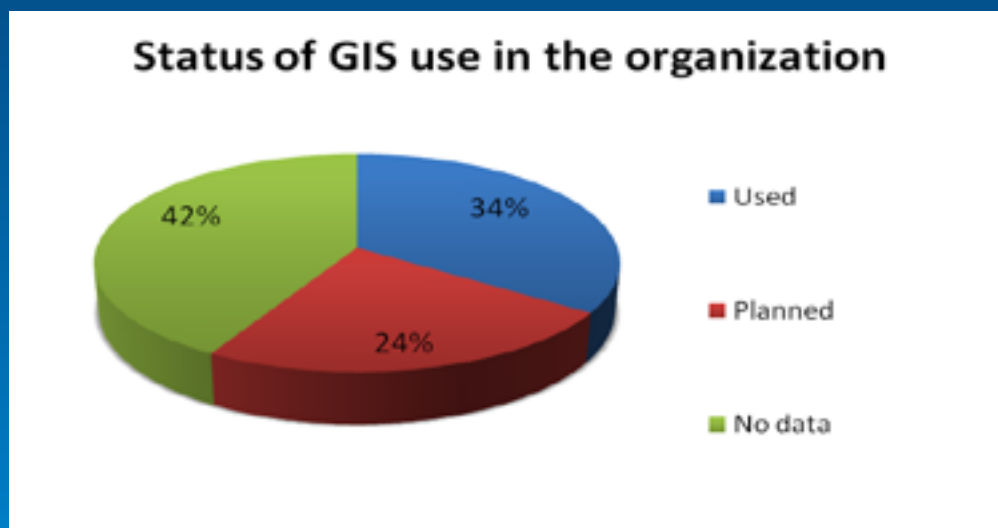
Strengthening the link between GIT education and society

Survey: Need of well trained staff

Example:
Ukraine

Conclusion:

Insufficient level of use of modern technologies in the field of geodesy, cartography and land management, as well as a significant potential for GIS technologies



Strengthening the link between GIT education and society

National Professional Advisory Groups

**Meeting of the
Moldovan
national
advisory board**



**Invited members are representatives of ministries,
governmental agencies, municipalities, private
companies, and local GIDEC project coordinators**

Strengthening the link between GIT education and society

- **GIT Labor Market Days**
- **Student's Career Service Centers**
- **Open Door Days**

GIS Labs

GIS Lab at Yerevan State University for Architecture and Construction



- at each partner University
- equipped with ESRI's ArcGIS desktop
- additional soft- and hardware according to the needs of the partners

Re-Training of the teaching staff

GIS related training courses

- **Basics of GIS**
- **Advanced GIS**
project based with special emphasis on
 - data modeling,
 - use of coordinate systems and transformations, and
 - spatial analysis

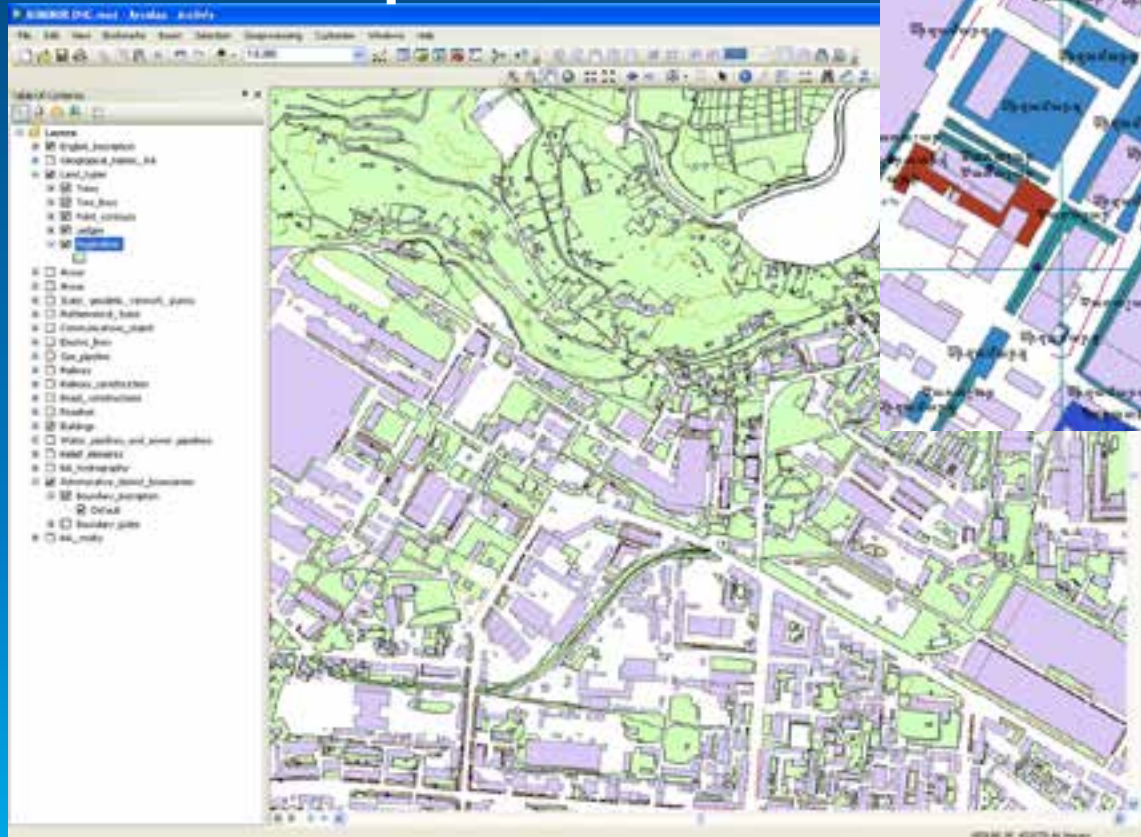
Re-Training of the teaching staff

Topics covered

- **Landslide susceptibility map (with Spatial Analyst)**
- **GIS in tourism (with Network Analyst)**
- **GIS in cadaster and real estate management (incl. Geocoding)**
- **Site selection for waste landfill (Overlay operations and ModelBuilder)**
- **Terrain analysis for hydropower project (Spatial Analyst and ModelBuilder)**

Re-Training of the teaching staff

Use of local data with a special challenge on Armenian Alphabet

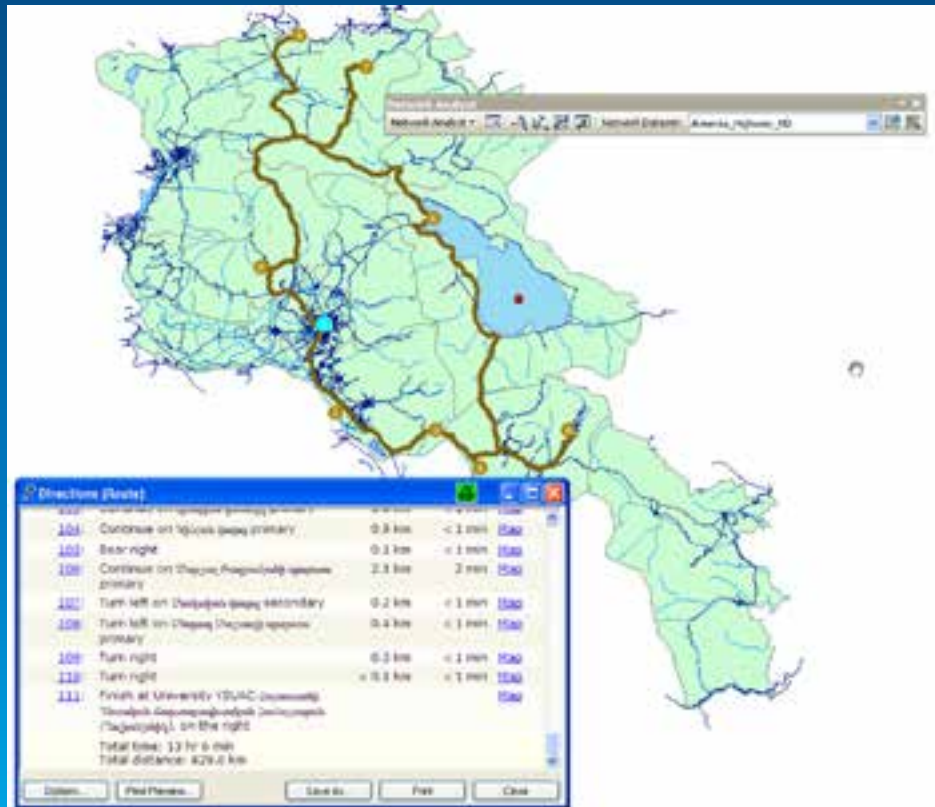


Real Estate Application

Re-Training of the teaching staff

Challenging topics

- using OSM data
- using advanced analysis



GIS in Tourism

Curriculum Development

- **Update of existing GIT courses**
- **Establishing two new Master's programs in Armenia (YSUAC) and Moldova (UST) in Geoinformatics**
- **Introducing new pedagogical approaches**
 - **Problem Based Learning**
 - **eLearning**
- **According to the Bologna Process**
 - **ECTS**
 - **Module description**
 - **Quality assurance system**
 - **focus on employability**

Curriculum Development

APPROVED
 AT ACADEMIC COUNCIL MEETING
 RECTOR: H.V. DUMAJAN
 26

RAHMINISTRY OF EDUCATION AND SCIENCE
 YEREVAN STATE UNIVERSITY OF ARCHITECTURE AND
 CONSTRUCTION
 CURRICULUM

MASTER OF ENGINEERING
 specialist's qualification
 FIVE YEARS
 120 ECTS

SPECIALITY: 271400-Cadastre and Applied Geodesy
 Specialization: a) Applied Geodesy
 b) Urban Cadastre
 c) *GIT (Geographic Information Technology)*

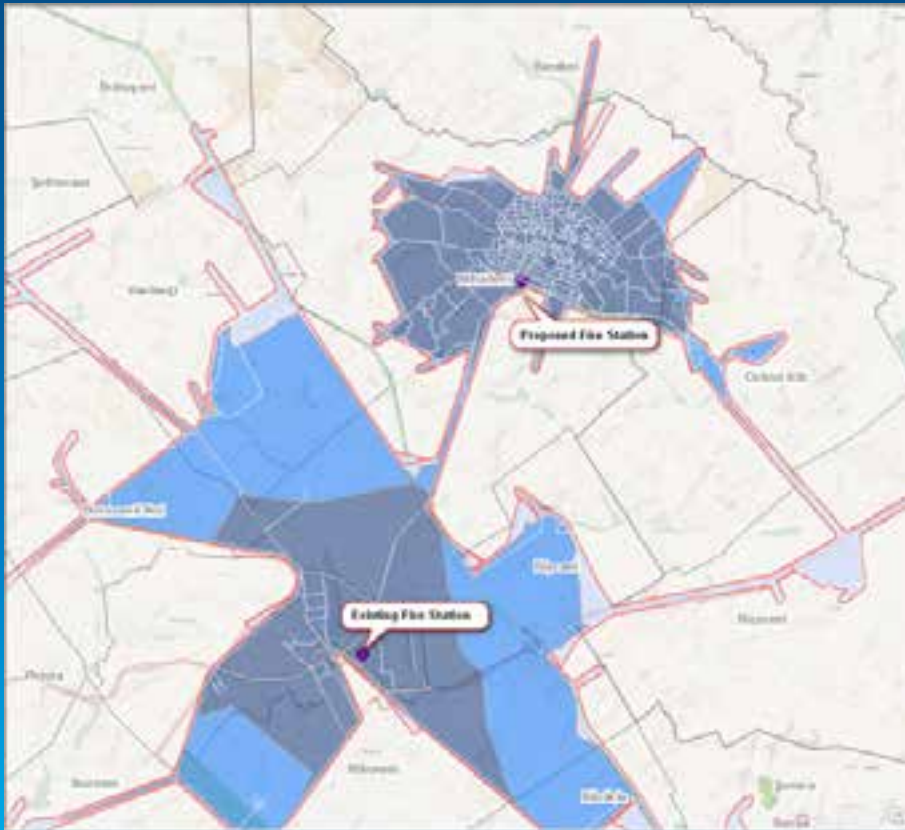
№	SUBJECT	Credits	Practical credits	Assessment				Student's work volume in hours					Distribution in years and semesters								
				Examinations	Test	Course project	Course work	Design projects	Major Total	Classroom studies				1 year		II year					
										Total	Lectures	Tutorial and seminars	Laboratory	Self-study	Individual work	I sem.	II sem.	I sem.	II sem.		
																				Number of weeks per semester	
												Number of weeks per semester									
												Classroom hours per week									
I. Republican Component																					
1.1	Foreign language (English, French, etc.)	6	3/3	1/2			180	64	64	116		0.2	0.2								
1.2	Science theory and methodology of the research work	3	3	1			90	32	32	56		2.0									
1.3	Spain			1/2			96		96			0.3	0.3								
	Total	9	6	5			270	96	32	64	0	174	0	7	6						
2. Mandatory Subjects																					
2.1	Introduction to GIS	2	1+1	2			60	32	36	36	74			3.1							
2.2	Computer Technologies in Science and Education	2	2	1			60	32	32	28		0.2									
2.3	Economics	2	2	1			60	32	36	36	28		1.1								
2.4	Development of Urban Environment	2	2	1			60	32	32		28		2.0								
2.5	The forms of Property and Cultural Cartography	2	2	1			60	48	36	32	17		1.1								
2.6	Digital Photogrammetry	2	2	1			60	48	32	36	17		1.2								
2.7	Remote sensing	2	2	2			60	48	32	36	17		2.1								
2.8	Carto-visualization	2	2	2			60	32	36	36	28		3.1								
2.9	Spatial Analysis	2	2	2			60	32	36	36	28		3.1								
2.10	Project Management and Communication	2	1+1	1			60	48	36	32	17		1.1								
2.11	Research Work	4	3/1	1/4			120	0	0	120				RW	RW						
2.12	Supervisor's Individual Class	28	0/0/0/0/0	2/8	1		840	144	144	0/0/0		0.1	0.2	0.5	0.3						
	Total	52	52	7	0	2	1560	528	192	536	0	1002	0	14	23	19	13	13	16		
	Total (h)	23	23	3	4	1	0/0	272	208	94	0	418	0	7	08	09	09				
3. Elective Subjects																					
3.1.a	Spatial Analysis	3	3	2			90	32	32		56		2.0								
3.1.b	Spatial Data Infrastructure and Web GIS	3	3	1			90	32	32		56		2.0								
3.1.c	Reference systems	4	4	2			120	48	32	36	72		2.1								
3.1.d	Data acquisition technologies	3	3	3			90	32	36	36	56		2.0								
3.1.e	GIS application	3	3	0	3		150	64	32	32	86		3.1								
3.1.g	Advanced image processing	2	2	2			60	32	36	36	28		2.0								
3.1.7	GIS project	4	4	0			120	32	32		88		0.2								
	Total (h)	24	24	3	0	0	720	272	180	112	0	488	0	7	10	10	10				
	Sum Total (h)	84	84	10	18	3	4	0	2520	928	168	590	0	1592	0	21	29	17	29	7	10
	Sum Total (h)	84	84	10	17	3	4	0	2520	896	432	464	0	1624	0	21	29	17	29	7	10
	Sum Total (h)	87	86	10	17	3	4	0	2580	896	384	412	0	1684	0	21	29	17	29	7	10
	Sum of credits	116												28	32	28	32				

New curriculum for GIT specialty at YSUAC

Some impacts of the GIDEC project

Projects from the GIS Labs

Improved cooperation between academic, industry and public bodies



Example
Riscani/Moldova:

Finding new locations for new voluntary rescue bases using real data from Rescue Department and Statistic Agency

with courtesy of
TUM/Chisinau

Some impacts of the GIDEC project

Projects from the GIS Labs

Improved cooperation between academic, industry and public bodies



Example Lviv/Ukraine:

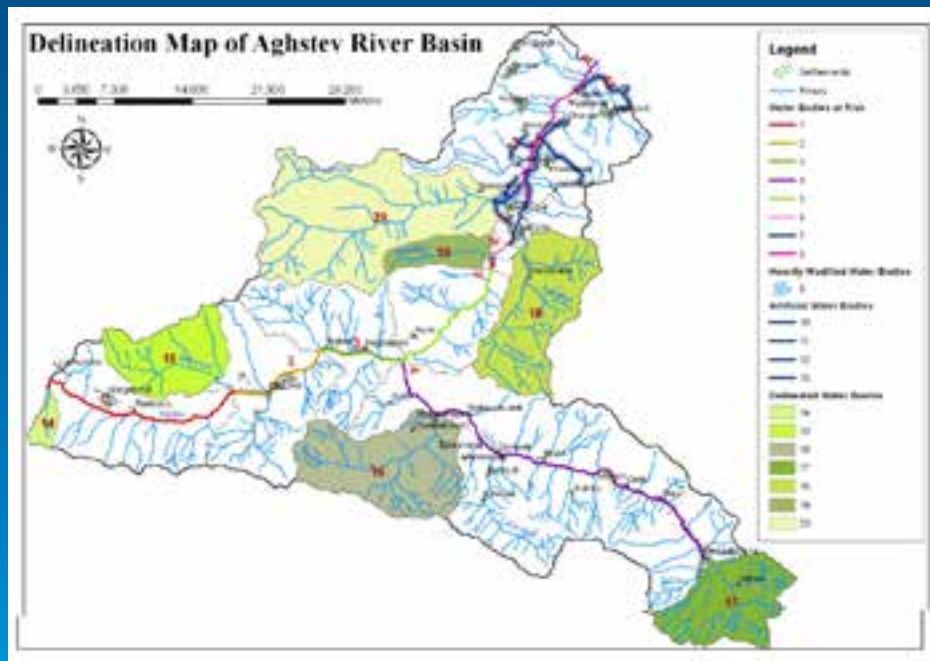
Map of location of potential landfill considering norms and legislation of Ukraine. Red color shows potential areas of landfill location

with courtesy of LPNU/Lviv

Some impacts of the GIDEC project

Projects from the GIS Labs

Environmental Research Projects



with courtesy of
YSU/Yerevan

Example Aghstev River/Armenia

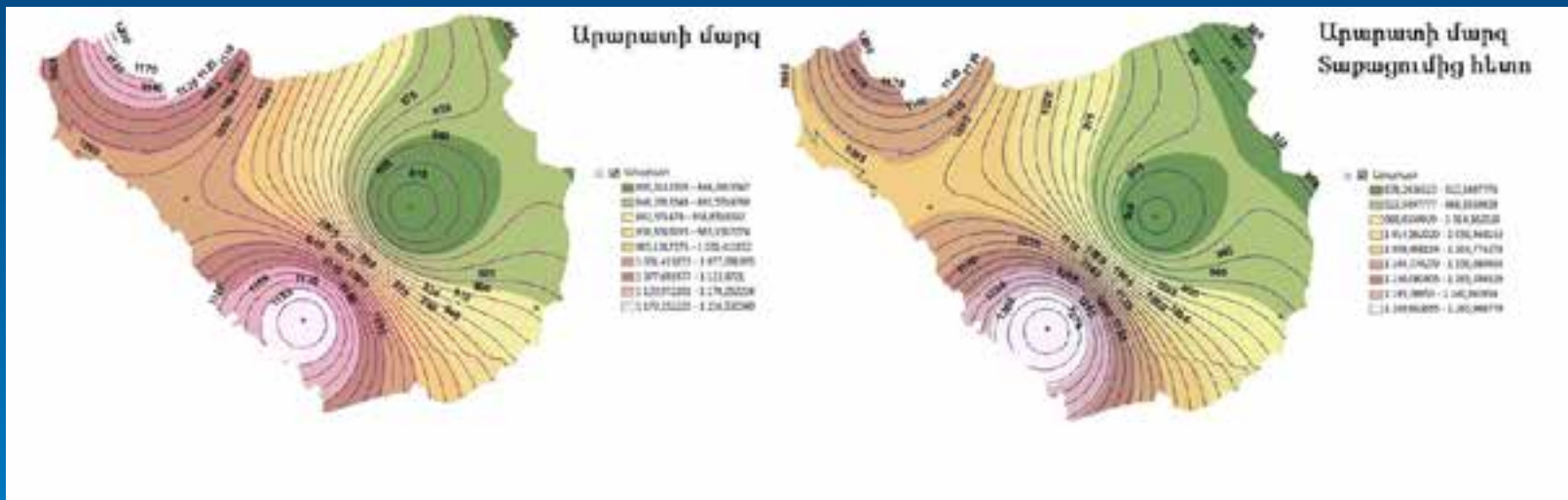
Identification of water bodies according to EU-Directives

- identification of water bodies at risk
- heavily modified water bodies
- delineation of others according to hydro-morphological factors, presence of settlements, industrial enterprises and zones of intensive agriculture

Some impacts of the GIDEC project

Projects from the GIS Labs

Environmental Research Projects



with courtesy of ANAU/Yerevan

Impact of Climate Change: Creating evapotranspiration maps and estimation of irrigation water requirements for agricultural crops for different scenarios of climate change

Conclusion

- **A lot of activities have been initiated**
- **Though the partners have been highly motivated, in many institutions the awareness of the potential of GIT is missing**
- **Re-training of staff for capacity building is very important**

more information about the project:

<http://gidec.abe.kth.se/>

Outlook

- The Tempus program will come to an end on 31/12/2013.
- As of 2014, Tempus-like activities, will be part of a new cooperation program named Erasmus+.
- These activities will concern existing Tempus countries plus Latin America, Asia and African, Caribbean and Pacific countries.
- Erasmus+ will bring together all the current EU and international schemes for education, training, youth and sport (including Tempus), replacing all existing programs with one.

http://ec.europa.eu/education/erasmus-for-all/index_en.htm

Many thanks for your attention