University *of Ljubljana*

Biotechnical Faculty and
University Graduate Study Programme
Environmental Protection

INTERNATIONAL SUMMER SCHOOL

ENVIRONMENTAL AND RESOURCE MANAGEMENT

Ljubljana, July 18th to August 1st, 2010

University of Ljubljana
http://www.uni-lj.si/en/study_at_the_university/summer_schools_2010/international_summer_school_environmental_and_resource_management_2010.aspx

Summer School 2010 official site: www.let-group.com

University *of Ljubljana*

Dear Student,

We invite you to the International Summer School on

Environmental and Resource Management

which will be held in Ljubljana from July 18th to August 1st, 2010.

This summer school is a joint initiative of different universities. It brings together students and academic staff from partner institutions in the beautiful city of Ljubljana to study and discuss environmental issues in an interactive and intensive way.
www.turningtechnologies.com/highereducationinteractivelearning.cfm

The academic staff comes from all over Europe, making the summer school a truly international and multidisciplinary experience.

The aim is to invite 35 well-motivated, advanced undergraduate or postgraduate students with at least two years of academic experience from member, associated universities and partners, regardless of their fields of study to experience this new and, hopefully, rewarding opportunity.

Enclosed you will find information on the Republic of Slovenia and its capital city of Ljubljana, information on the University of Ljubljana, and its summer school together with practical details about your stay.

If you have any additional questions do not hesitate to contact franc.lobnik@bf.uni-lj.si. Please turn your application to Franc Lobnik, Biotechnical Faculty, Jamnikarjeva 101, 1000 Ljubljana, Slovenia or thru Application Form on www.let-group.com by May 5th, 2010.

All universities involved are encouraged to grant their students academic recognition for their participation in this intensive seminar.
The total workload is measured at 5 ECTS. This includes attendance at all lectures and seminars, presentation and successful completion of the final essay.

UNIVERZA V LJUBLJANI / UNIVERSITY OF LJUBLJANA

International Summer School Environmental and Resource Management
Ljubljana, Summer School: July 18th - August 1st 2010

Academic Committee: F. Lobnik, B. Gunnarsson, F. Evers, K. Nilsson, P. Novak, J. Rakovec, H. Wiggering, W. Blum, I. Dubus, J. Mencinger, D. Kos. M. Brilly

Head of School: F. Lobnik
Organization, web site and video production: e**mail: matjaz.lobnik@gmail.com**
Contact person for application: Franc Lobnik email: franc.lobnik@bf.uni-lj.si
Contact person for organization: Kolja Popov email: kolja.popov@gmail.com
Wording: F. Lobnik

Invited lecturers:

B. Gunnarson, School for Renewable Energy Science (Iceland)
D. Kos, University of Ljubljana, (Slovenia)
F. Evers, Commission for EIA (Netherlands)
F. Lobnik, University of Ljubljana, (Slovenia)
H. Wiggering, ZALF (Germany)
I. Dubus, FOOTPRINT (France)
J. Mencinger, University of Ljubljana (Slovenia)
J. Rakovec, University of Ljubljana, (Slovenia)
K. Nilsson, University of Copenhagen (Denmark)
M. Brilly, University of Ljubljana, (Slovenia)
P. Novak, University of Ljubljana, (Slovenia)
W. Blum, BOKU (Austria)

Fieldtrips:
M. Pintar, University of Ljubljana, (Slovenia), 1. field trip
M. Zupan, University of Ljubljana (Slovenia), 2. field trip

Illustrations and Pictures: Archives
of The Council for Environmental Protection
of the Republic of Slovenia, http:// www.svo-rs.si

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University *of Ljubljana*

INTERNATIONAL SUMMER SCHOOL

ENVIRONMENTAL AND RESOURCE MANAGEMENT

Ljubljana, July 18th - August 1th, 2010

Students from invited Universities can apply
before 5 May, 2010 via electronic application form
from organizer of Summer school.

Lecturers from 7 different countries will hold courses amounting to
a workload of 5 ECTS credits.
All universities involved are encouraged to grant their students
academic recognition for their participation in this intensive seminar.

The fee of 500 € includes tuition, study materials, organised excursions
and accommodation in double rooms with breakfast and lunch.

Some universities offer scholarships to cover part of the fee.
Please inquire at your International Office.

www.uni-lj.si www.let-group.com

INTERNATIONAL SUMMER SCHOOL

ENVIRONMENT AND RESOURCE MANAGEMENT

University of Ljubljana, 18th July - 1st August, 2010

Introduction to the International Summer School:

- *We constantly interact with the environment.*
- *Environment influences us and we modify it in everything we do.*
- *We respond to the environment and to our perceptions of it.*
- *If environment stimulates us in ways we do not like, we take action.*
- *We can manipulate the environment with human activities. When we do so, we may have a long-term impact on the environment.*
- *What can we do to promote harmony between our thoughts, actions and the environment we construct?*
- *Sometimes our relationships with the environment have strong biological, geological, chemical, physical roots. Over time, these may be captured in experience, tradition and culture.*

The objectives are to present scientific knowledge about Environmental and Resource Management, explain the vulnerability of the environment to different sources of degradation, and explore solutions to environmental problems that involve all relevant stakeholders and employ sustainable technology. We will also debate the essential questions of how best to transfer knowledge and recommendations to policy makers, regulators, local authorities and business.

University of Ljubljana (Rectorate)

Main Universities and Partners invited to send students to Summer school

Aarhus (Denemark)	Krakow (Poland)
Antwerp (Belgium)	Leipzig (Germany)
Basel (Switzerland)	Lille I USTL (France)
Belfast Queen's University (N. Ireland)	Ljubljana (Slovenia)
Bergen (Norway)	Lund (Sweden)
Bochum (Germany)	Madrid - University Complutense (Spain)
Bologna (Italy)	Malta (Malta)
Brno (Czech Republic)	Reykjavik (Iceland)
Budapest - Eötvös Lorand (Hungary)	Strasbourg I, II and III (France)
Coimbra (Portugal)	Thessaloniki (Greece)
Cork (Ireland)	Utrecht university & arts school (Netherlands)
Helsinki (Finland)	Vilnius (Lithuania)
Hull (England)	Graz (Austria)
Riga (Latvia)	Bratislava (Check Republic)

Baylor University	University of Nebraska at Kearney
Iowa State University	University of Nebraska at Lincoln
Kansas State University	University of Nebraska at Omaha
University of Kansas	University of Oklahoma
University of Missouri-Columbia	Oklahoma State University
University of Missouri-Kansas City	South. Illinois University Carbondale
University of Missouri-Rolla	University of Texas at Austin
University of Missouri-St.Louis	Texas Tech University

Edith Cowan University	University of Tasmania
Deakin University	University of Western Sydney
Griffith University	University of Wollongong
Macquarie University	

PARTNERS

Cranfield University (UK)	Centre for Agricultural Landscape Research ZALF (Germany)
Council for Environmental Protection of the Republic of Slovenia	University of Copenhagen (Denmark)
BOKU University of Natural Resources and Applied Life Sciences, Vienna (Austria)	

Last years we organized a fruitful "Environmental Resource Management" Summer School, discussing environmental issues with diverse group of students from three continents. Participant's various backgrounds were the cause for a lively discussion among them, which reflected in their workshop results as well.
The Summer school in first three years was under the patronage of the Utrecht Network. This network is a group of 27 universities from almost all European countries co-operating in the area of internationalization in the broadest sense of the word. The Utrecht Network is associated to the Mid-America Universities International (MAUI), a consortium of 16 institutions in the Midwest region of the United States and the Australian European Network (AEN), a consortium of 7 Australian universities. The Utrecht Network is not anymore sponsor of the Summer School "Environmental Resource Management". The School is now organized by Ljubljana University and partners; Cranfield University (UK), Centre for Agricultural Landscape Research ZALF (DE), Council for Environmental Protection of the Republic of Slovenia, BOKU University of Natural Resources and Applied Life Sciences, Vienna (A), University of Copenhagen (DK).
Beside students from the Utrecht Network, the students from universities which have Agreements with the University of Ljubljana and partners are welcome.
If students need ECTS credits, they need acknowledgement of sending institution.

GENERAL INFORMATION

Target group

About 35 students will be selected to participate in the summer school. The target group will consist of advanced undergraduates and postgraduates, irrespective of their academic background, though some affinity with the subject is recommended.
Major selection criteria will include maturity skills, and a clear indication of motivation and expectations that programme will bring as the impact on your further study.

Working language and language proficiency

The working language of the Summer school is English. In order to assure active participation of all students, a good command of English in all its aspects (spoken, written and comprehension) is a prerequisite.

Fees

The contribution fee of 500 € covers tuition, study materials, organized field trips and accommodation in double rooms with breakfast and lunch.

Application procedure

Please complete the application form available on www.let-group.com online or send as a attachment to franc.lobnik@bf.uni-lj.si before May 5th, 2010.

A confirmation letter and a full information package will be addressed to all selected students in the second half of May. It will include practical information as well as reading material available at www.let-group.com as an essential preparation for successful attendance of the programme.

We invite you to apply and we are looking forward to meet you soon in Ljubljana.

The students are requested to contact the international relations office of their university in order to apply for a potential scholarship. The member universities are encouraged to contribute by making an extra small student grant available.

Programme

All the technical knowledge in the world does not necessarly lead societies to change environmentally damaging behaviour. Hence a critical understanding of socio-economic, political and cultural processes and structures has been acknowledged of central importance in approaching environmental problems. An increasing number of environmental courses is now being introduced at many universities.
The Credit system in Europe is allowing a much more intensive student exchange programme and Summer Schools are effective tools for getting students together from different cultural and social surroundings.

The Summer School Program will provide short topic - centred lectures on environmentally relevant areas. This will reflect the fact that students will approach their subject matter from a great variety of different disciplinary backgrounds; not just within social sciences and humanities, but from physical and natural sciences, too. And for those students who may not be familiar with the background to some of the topics, they will be intensively co-opted in the workshop program, which will be guided by lecturers. To achieve the right mix of flexibility, depth and breadth, and volume, the program with most modular courses is designed carefully to create maximum accessibility from a variety of backgrounds.

Each lecture leads into its topics by giving an adequate introduction, and each leads out by pointing towards complexities and areas for further development and study. Data, case studies, overview diagrams, summary charts and self-check questions and exercise are some of the pedagogical devices that will be found. We hope that Summer School will provide sufficient depth to maintain the interest of students with relevant backgrounds because programs will cover public policies, human resource management, environmental conflicts, environmental law, landscape architecture and environment, air quality and global changes, water management, land use and soil pollution, agriculture, food and society indicators and sustainability, sustainable energy management, spatial analysis and the use of GIS in environmental management.

We have to acknowledge that sustainable development must fulfil economic, social and environmental objectives. The survival of the natural environment is crucial for economic and social development in the long run, they have focused on the environmental dimension of sustainability.

The aims of the summer school are:

- How to develop a comprehensive environment for a European programme addressing in particular trans boundary environmental problems
- To provide a sound basis for effective measures strategies and policies to address environmental problems nationally and regionally; and
- To inform the participants and raise awareness about our common responsibility for the environment.

BIOTECHNICAL FACULTY
and
University Graduate Study Programme
Environmental Protection

INTERNATIONAL SUMMER SCHOOL 2010
Environmental and Resource Management
19th July – 01st August 2010, LJUBLJANA, Slovenija

Summer school web: http://www.let-group.com
Head of school: Franc Lobnik
franc.lobnik@bf.uni-lj.si
Contact person for application: franc.lobnik@bf.uni-lj.si
Contact person for organization: kolja.popov@gmail.com

July 19 Monday		
	10:00 – 10:30	**Introduction into the Environmental and Resource Management** *F. Lobnik, Head of School*
	10:30 – 10:45	**Information about University Graduate Study Programme Environmental Protection** *M. Brilly, Head of Gratuated Study Programme (Slovenia)*
	10:45 – 11:15	**Sponsors**
	11:15 – 12:45	**Sustainable Development, Global Problem?** *F. Lobnik, University of Ljubljana (Slovenia),* **audience response solutions**
	12:45 – 14:00	**Lunch**
	14:00 – 16:00	**Ljubljana sightseeing tour**
July 20 Tuesday	**Workshop I.**	**Environmental management, economy and governance**
	9:00 – 10:45	**Negotiating for Sustainability development by the mutual gains approach** *F. Evers, Commission for EIA (Netherland)* *F. Evers:* **Introduction**
	10:45 – 11:00	**Break**
	11:00 – 12:45	**Negotiating for Sustainability development by the mutual gains approach** *F. Evers, Commission for EIA (Netherland)* *F. Evers:* **Introduction**
	12:45 – 14:00	**Lunch**
	14:00 – 15:45	**Global economic crisis and green new deal** *J. Mencinger, University of Ljubljana (Slovenia)*

		J. Mencinger: **Case studies for workshop and audience response solutions**
	15:45 – 16:00	**Break**
	16:00 – 17:45	**Social perception of environmental risks** *D. Kos, University of Ljubljana (Slovenia)* *D. Kos:* **Case studies for workshop and audience response solutions**
July 21 Wednesday	**Workshop I.**	**Environmental management, economy and governance**
	9:00 – 10:45	**Negotiating for Sustainability development by the mutual gains approach** *F. Evers, Commission for EIA (Netherland)* *F. Evers:* **MGA** group simulation
	10:45 – 11:00	**Break**
	11:00 – 12:45	**Negotiating for Sustainability development by the mutual gains approach** *F. Evers, Commission for EIA (Netherland)* *F. Evers:* **MGA** group simulation
	12:45 – 14:00	**Lunch**
	Workshop II.	**Climate change: Low Carbon Society or Adaptation**
	14:00 – 15:45	**Environmental Security: Impacts of Climate Change in the Arctic** *B. Gunnarsson, School for Renewable Energy Science (Iceland)* *B. Gunnarsson:* **Case studies for workshop and audience response solutions**
	15:45 – 16:00	**Break**
	16:00 – 17:45	**Energy and low carbon society** *P. Novak, University of Ljubljana, (Slovenia)* *P. Novak:* **Case studies for workshop and audience response solutions**
July 22 Thursday	**Workshop I.**	**Environmental management, economy and governance**
	9:00 – 10:45	**MGA** Results presentation *F. Evers, EEAC (Netherland)*
	10:45 – 11:00	**Break**
	Workshop II.	**Climate change: Low Carbon Society or Adaptation**
	11:00 – 12:45	**Historical long time-scale climate changes versus recent short time-scale change** *J. Rakovec, University of Ljubljana (Slovenia)* *J. Rakovec:* **Case studies for workshop and audience response solutions**
	12:45 – 14:00	**Lunch**

	14:00 – 15:45	**Peri - urban Land use relationships - strategies and sustainability assessment tools for urban - rural linkages** *K. Nilsson, University of Copenhagen (Denmark)* *K. Nilsson:* Case studies for workshop and audience response solutions
	15:45 – 16:00	**Break**
	16:00 – 17:45	**Workshop II.** *(B. Gunnarsson, P. Novak, J. Rakovec)* **Instructions to participants of workshop II.** Workshop III. participants are free
July 23 Friday	**Workshop II.**	**Climate change: Low Carbon Society or Adaptation**
	9:00 – 11:00	**Workshop II.** *(B. Gunnarsson, P. Novak, J. Rakovec)* **Instructions to participants of workshop II.** Workshop III. participants are free
	11:00 – 11:15	**Break**
	11:15 – 12:45	**Workshop II.** *(B. Gunnarsson, P. Novak, J. Rakovec)* **Instructions to participants of workshop II.** Workshop III. participants are free
	12:45 – 14:00	**Lunch**
	14:00 – 15:45	**Workshop II.** *Chairman: B. Gunnarsson*
	15:45 – 16:00	**Break**
	16:00 – 17:45	**Workshop II.** *Chairman: B. Gunnarsson* **Discussion**
July 24 Saturday		
	7:30 – 22:00	**Field trip to Koper area: Innovative Soil, Land and Water Management Strategies for enhancing a sustainable use of natural resources** *M. Pintar*
July 25 Sunday		
		FREE DAY

July 26 Monday	**Workshop III.**	**Land Management Relation to Ecosystem Services & Soil Protection and Impact Assessment Procedures**
	9:00 – 10:45	**Soil functions, soil ecosystem services and the European Strategy for Soil Protection** *W. Blum, BOKU (Austria)* *W. Blum:* **Case studies for workshop and audience response solutions**
	10:45 – 11:00	**Break**
	11:00 – 12:45	**EcoSystem Services + Impact Assessment = Land Management** *H. Wiggering, ZALF (Germany)* *H. Wiggering:* **Case studies for workshop and audience response solutions**
	12:45 – 14:00	**Lunch**
	14:00 – 15:45	**FOOTPRINT, creating tools for pesticide risk assessment and management in Europe** *I. Dubus, FOOTPRINT (France)* *I. Dubus:* **Case studies for workshop and audience response solutions**
July 27 Tuesday		
	9:00 – 10:45	**Workshop III.** *(H. Wiggering, W. Blum, I. Dubus)* **Instructions to participants of workshop III.**
	10:45 – 11:00	**Break**
	11:00 – 12:45	**Workshop III.** *(H. Wiggering, W. Blum, I. Dubus)* **Instructions to participants of workshop III.**
	12:45 – 14:00	**Lunch**
	14:00 – 17:30	**Workshop III.** *III. (H. Wiggering, W. Blum, I. Dubus)* **Instructions to participants of workshop III.** Workshop II. participants have free day
July 28 Wednesday		
	9:00 – 10:45	**Workshop III.** *Chairman: H. Wiggering*
	10:45 – 11:00	**Break**
	11:00 – 12:45	**Workshop III.** *Chairman: H. Wiggering* **Discussion**
	12:45 – 14:00	**Lunch**

July 29 Thursday		
	12:00 – 13:00	**TEST**
	13:00 – 14:30	**Lunch**
	19:00 – 21:30	**Farewell dinner and granting of certificates**
July 30 and 31 Friday and Saturday		
	Departure at 7:30h Arrival second day at 22h	**2 days field trip : Celje zinc smelter, Thermo electrical plant Šoštanj, Fly ash remediation, Mežica lead mine, Impact of lead mining on environment** *M. Zupan*
August 01 Sunday		
		Departure

Each lecturer shall provide written material (cases studies) and books necessarv for students workshops presentations;
Conference room will have available equipment for overhead projector and computer presentation, (Power point presentation);
Separate room with computers connected to the internet, copy machine and printer will be available;
All activities will be video recorded;
Students Laptops are welcome;
Sportswear for excursions is recommended.

Official site of International Summer School
"Environmental and Resource Management"
www.let-group.com

Other useful information's:
Flights: http://www.amadeus.net
Train: http://www.slo-zeleznice.si/en/passengers
Welcome to Slovenia: http://www.slovenia.info/?lng=2
Ljubljana Turist Information: http://www.visitljubljana.si/

Summary

July 19, Monday

INTRODUCTION TO ENVIRONMENTAL AND RESOURCE MANAGEMENT SUMMER SCHOOL

F. Lobnik: Head of School

We constantly interact with the environment. The objective is how to present the current scientific knowledge about Environmental and Resource Management, how tolerant the environment is to the different pollution sources and how environmental problems can be solved. Also important is the transfer of the results to the policy makers. Local authorities and engineering companies will also be debated to give an overview of the future of some techniques in the treatment of different pollution sources. The survival of nature is crucial for future, and the sustainable development must fulfill economic, social and environmental objectives.

SUSTAINABLE DEVELOPMENT, GLOBAL PROBLEM?

F. Lobnik, University of Ljubljana (Slovenia)

Our twenty-first century civilization is known as knowledge based economy. If so, we should not move onto an economic path that was environmentally unsustainable. Many earlier civilizations also found themselves in environmental trouble. According to historians; the Sumerians, the Mayans, and other early civilizations that were not able to make needed adjustments in time, collapsed and disappeared. Are we now in the same situation? Do we have enough knowledge and information to prevent such an occurrence? General opinion is that we have to educate young generation if we want to raise responsible society. Our global economy is outgrowing the capacity of the earth to support it. Shrinking forests and eroding soils, falling water tables, collapsing fisheries, expanding deserts, deteriorating rangelands, melting glaciers, more-powerful storms, disappearing species, and soon, shrinking energy supplies are unsustainable trends which have been confirmed by recent international assessments. Sustainable development should be a fundamental component of all education curricula (primary, secondary, tertiary).

INFORMATION ABOUT UNIVERSITY GRADUATE STUDY PROGRAMME ENVIRONMENTAL PROTECTION

M. Brilly, Head of Gratuated Study Programme (Slovenia)

With the University Post-graduate Study Programme in Environmental Protection the University of Ljubljana has entered into the worldwide flows of environmental protection. The study of environmental protection at the University of Ljubljana connects experts from various faculties and departments with a common goal of environmental protection. As to content, the program has been by its different orientations and as a whole harmonized with present-day study programs in Europe, in particular in the EU, and in USA. Numerous elective courses offer a wide selection of knowledge in environmental protection.

The aim of the study program is to provide experts, who will be able to protect the environment against pollution prior and after it takes place. In the first case, prevention measures will be taken: with public participation, proper distribution of activities in land use an management, sustainable use of natural resources, proper technical measures etc. In the second case, they will have to help eliminate the consequences, reduce pollution and introduce measures of environmental upgrading primarily with technical, remediation, medical and hygienic measures, measures of spatial planning and other.

The post-graduate education programme is carried out by the following faculties of the University of Ljubljana:

- *Biotechnical Faculty*
- *Faculty of Economics*
- *Faculty of Social Sciences*
- *Faculty of Civil and Geodetic Engineering*
- *Faculty of Chemistry and Chemical Techology*
- *Faculty of Mathematics and Physics*
- *Faculty of Maritime Studies and Transport*
- *Faculty of Mechanical Engineering*
- *Faculty of Arts*
- *Faculty of Medicine*
- *Faculty of Natural Sciences and Engineering*
- *Faculty of Law*
- *Veterinary Faculty*

July 20, Tuesday

NEGOTIATING FOR SUSTAINABILITY DEVELOPMENT BY THE MUTUAL GAINS APPROACH

Frans W. Evers, Commission for EIA Netherlands

Sustainable development evolved as a geopolitical answer to the conflicts in the eighties between the social-economic interests of developing countries and the concerns in the western world over the rapid disappearance of natural resources. It is also an answer to the enormous pollution that resulted from the economic activities in the western world.

It is very useful when trying to make sustainable development operational, to present dynamic vision of sustainable development. Sustainable development is not a characteristic of a static situation and it is therefore difficult to capture it in a fixed set of criteria or in a precise definition. Maybe, sustainable development can be best described as a dynamic process of permanent negotiation between often opposing convictions and interests. In the course of this process the parties must continuously search for a common framework of norms and values. And since these norms and values will depend on time and place, the concrete content of sustainable development will also continue to change.

This process is of course a negotiation process, where participants try to build an optimum for themselves and for the other stakeholders, a consensus. Consensus is essential for sustainable development, since participants try to find an optimum result. A compromise is never an optimum, a result that participants want to defend at home before there constituency. Traditional negotiating to find a compromise, as politicians usually do, can never result in sustainable development. Effective design and management of participation, consultation and consensus building processes helps to ensure the transparency, credibility and ultimate acceptability of development decisions.

Consensus building is a way to structure and facilitate this process of multi-stakeholder, multi-issue negotiation, using several steps and tools. As we can learn from recent negotiations about climate change and other items on Agenda 21, development decisions are often framed by negative history among parties to be successful, parties must all be involved (including government, multilaterals, NGOs, community orgs and the private sector). They must share information, learn each other's interests, explore options jointly, and build consensus. Using the mutual gains approach to negotiation increases the likelihood of achieving and maintaining stakeholder consensus on sustainable development issues. This approach is different from conventional negotiations tactics for development issues.

It seeks to maximize joint gains, and then distribute them through agreed upon criteria. This process can help to ensure the transparency, credibility and ultimate acceptability of development decisions through the framing of process goals, engagement of appropriate stakeholders, development of ground rules & work plans that clarify stakeholder roles and responsibilities for information sharing; joint fact-finding and option development and binding decisions. The mutual gains approach has five basic

principles: focus on interests, not positions; know your BATNA (Best Alternative to a Negotiated Agreement), create value before you distribute value and make sure to agree on follow through. It takes a certain kind of conversation - one that is cooperative, creative, has positive energy where stakeholders are able to see possibilities.

The first step is to identify stakeholders, assessing their interests, capacities, and potential for reaching consensus-based agreements. In the field of international development, intergovernmental agencies like UNDP frequently play a convenor role, e.g., in bringing together government and international agencies to build agreement on development priorities, design and implement programs. Public officials, Advisory councils and bodies, NGOs and foundations can also play convenor roles when they meet the criteria listed above.

The second step is to determine whether to proceed with a consensus building process, and starting the process with clear goals, ground rules, work plan and timetable. After the stakeholders have reviewed this assessment, the convenor should hold one or more organizational meetings so that stakeholders can consider and modify the process that has been proposed, and determine whether they want to participate. The third step is to use joint fact finding to resolve technical and factual questions and help the group focus on the development of feasible options. Joint fact finding is a process to help stakeholders build a shared understanding of technical and scientific issues and their implications for policy. It can also help resolve disputes about scientific and technical methods, data, findings and interpretations.

The fourth step is to manage the process of deliberation among those stakeholders to maximize the chances for reaching agreements that are technically sound and politically acceptable. This is the stage of a consensus building process where individuals can make major contributions to achieving agreed goals by using the mutual gains approach: preparing effectively, focusing on interests, exploring options without committing, and developing shared criteria to guide decision-making, promoting consensus agreements where possible, and enabling near-consensus alternatives when full consensus is not possible. After the group has gone through the process of joint fact finding, clarifying interests, brainstorming to invent options, and developing multiple proposals for each possible clause, it will still need to reach agreement. The fifth step is to provide opportunities for stakeholders to revisit and revise their agreements as necessary during the implementation phase. At the end of a consensus building process, stakeholders are asked to endorse the final recommendations. It is extremely important to devise a means of holding the parties to their commitments. Some agreements can be nearly selfenforcing, because they are closely aligned with the interests of all stakeholders and no additional resources are needed to implement them. Others may require legal or regulatory changes, additional resources and/or organizational capacity building to be fully implemented.

GLOBAL ECONOMIC CRISIS AND GREEN NEW DEAL

J. Mencinger, University of Ljubljana (Slovenia)

The sub-prime mortgages were just the trigger for the current economic crisis; without "financial innovations" it would not have gone global. When the crisis is over the world will be different. Will it be better? Perhaps. There are several indications that creation of virtual wealth will come back when current panic on financial markets calms, when states intervene with billions of new "assets" and a significant amount of the lost "wealth" is recovered. Shall we again become obsessed with limitless competitiveness? The crisis is generating possibilities for a break with the present, and the search for a new economic order. The economy could be restarted by increased demand which could be generated if we resolve social problems and protect the environment.

SOCIAL PERCEPTION OF ENVIRONMENTAL RISKS

D. Kos, University of Ljubljana (Slovenia)

On the one side there is a lot of information on environmental risks available in contemporary technological advanced societies, but on the other side there exists clear information and knowledge divide. In fact the environmental reflexivity is undermined as a consequence of information overload as well. How to communicate environmental facts how to establish productive communication between expert groups and general public avoiding too big generalization, i.e. simplifications? In fact, the main question is how to establish and support competent discussion on existential environmental questions. At the same time this is also the answer to the question how to sustain the ontological security on the level of everyday life as the quality of life basic condition.

July 21, Wednesday

ENVIRONMENTAL SECURITY: THE IMPACTS OF CLIMATE CHANGE IN THE ARCTIC

Björn Gunnarsson, School for Renewable Energy Science (Iceland)

This lecture discusses some of the environmental changes which have occurred in the Circumpolar Arctic as a result of Arctic warming, as well as further changes which are likely to occur in the next few decades. The information presented is largely based on the results of the Arctic Climate Impact Assessment (ACIA, 2004) and the Intergovernmental Panel of Climate Change assessments (e.g., IPCC, 2007) which predict an average 3-9 °C temperature rise in the Arctic over the next 100 years, or twice as high as the Earth's average.

The environmental changes in the Arctic being highlighted include various effects of higher temperatures (particularly winter temperatures) in the northern part of the Russian Federation; increased river flows of Siberian rivers and flooding; reduced Arctic Ocean sea ice thickness and extent; effects of thawing of previously frozen

ground (permafrost); increases in storm surges and coastal erosion; environmental impacts of increased natural resource utilization and shipping in the Arctic Ocean; as well as effects of local and trans-boundary pollution on human health, and on Arctic ecosystems in general.

The rapid increase in the exploitation of oil and gas in the Arctic increases the danger of serious oil spills and other industrial accidents. Recent studies suggest that the effects of oil spills in a high-latitude, cold ocean environment last much longer and are far worse than first suspected. Oil breaks down very slowly and is difficult to clean up in ice-covered waters, and oil can be transported with drifting ice over long distances. The overall strategy for Arctic oil spills must therefore be preventative. Transportation and industry in the Arctic will increasingly by disrupted by the shortening of the periods during which ice roads and tundra are frozen sufficiently to permit travel. As frozen ground thaws, many Arctic population centers, buildings, roads, railroads, pipelines, airports, river terminals, oil and natural gas production complexes, power stations, and other industrial facilities are likely to be increasingly destabilized, requiring substantial rebuilding, maintenance, and investment. Permafrost thawing is also likely to adversely affect sanitation infrastructure and drinking water quality, limit efficient delivery, and cause direct damage to facilities and lead to adverse impacts on human health.

Winds, rivers and ocean currents bring contaminants into the Arctic. Contaminants emitted from industrial sites in Western Europe, North America and South-East Asia are transported to the Arctic where they may become concentrated as they move up the food chain (bioaccumulation). As temperature rise, snow and ice accumulated over the years and decades will melt, and the contaminants stored within will be released in melt water. POPs and heavy metals (mercury) become increasingly concentrated as they move up the food chain, resulting in high levels in polar bears, Arctic fox and various seals, whales, fish, seabirds, and birds of prey. Arctic people that eat those species are thus exposed to potentially harmful levels of these pollutants. Same applies to radioactive pollutants, e.g. leakage from old military installations, nuclear test sites, weapon storage sites, waste sites, and reprocessing plants.

Thinner, less extensive sea ice creates more open water, allowing stronger wave generation by winds, thus increasing wave-induced erosion along Arctic shores. When the buffer provided by the shore ice has been lost, the full force of ocean waves are allowed to surge against the coastline and coastal villages. Sea-ice decline, sea-level rise, storm surges, and thawing coastal permafrost are very likely to force the relocation of some coastal villages and create increasing stress on others, causing substantial social impacts. Coastal erosion will pose increasing problems for many ports, tanker terminals, and other industrial and transportation facilities. Attempts to control this erosion will become increasingly expensive as the surrounding coastline continues to retreat. Many current coastal sites could become uninhabitable. Low-lying coastlines experiencing land subsidence are particularly vulnerable. Soil slopes are made less stable by thawing permafrost, and this will result in more landslides. In general, Arctic coastal infrastructure will be impacted with more frequent floods,

mudslides, rockslides and avalanches. These events are closely associated with heavy precipitation events, high river runoff and elevated temperatures.

LOW CARBON ENERGETIC – TECHNOLOGIES AVAILABLE AND IN DEVELOPMENT

P. Novak, University of Ljubljana, (Slovenia)

Present and future energy system. Low carbon energy conversion systems. Renewable energy technologies. Economics and social impact.

July 22, Thursday

HISTORICAL LONG TIME-SCALE CLIMATE CHANGES VERSUS RECENT SHORT TIME-SCALE CHANGE

J. Rakovec, University of Ljubljana: Regional Climatic Resources

Recent climate change and is a rather rapid response of the atmosphere response to the increased amount of greenhouse gasses, while in geological eras climate has been changing more or less periodically with a much longer time scales of these periods. In a lecture an overview of the main driving causes of both will be given and a comparison between the main causes, their time scales, and between the magnitudes of responses of the atmosphere and oceans will be presented.

PERI-URBAN LAND USE RELATIONSHIPS – STRATEGIES AND SUSTAINABILITY ASSESSMENT TOOLS FOR URBAN-RURAL LINKAGES

K. Nilsson,

Changing land use relationships within emerging rural-urban regions, and their manifestation in phenomena such as urban sprawl and development of large transport corridors have long-lasting consequences for the regions' sustainability. The drivers of land use changes and how they interact with regional, national and European policies need to be better understood to minimise negative consequences of urbanisation and to enhance the adaptive capacity of rural-urban regions. Rural-urban regions can become centres of sustainable development, but this requires strategies that are developed by means of participatory planning and decision making.

These challenges form the basis for the PLUREL project. PLUREL is a large integrated research project funded within the 6th Research Framework Programme of the European Union. 31 partners from 14 European countries and China participate in the project, which is coordinated by the Danish Centre for Forest, Landscape and Planning at the University of Copenhagen.

PLUREL's main study object is the so-called Rural Urban Region (RUR). The idea of a RUR is an extended form of a Functional Urban Region, i.e. the concept used to describe an urban core and its surrounding commuting ring. The RUR extends beyond today's rings of intense interaction with the core city, as it also includes lands for recreational use, food supply, nature reserve and ecological service functions in predominantly rural areas. In seven case study regions; Montpellier (FR), Leipzig (DE), Warsaw (PL), Koper (SI), Haaglanden (NL), Manchester (UK) and Hangzhou (CN), local stakeholders are involved in analysis of the regional context as well as development of scenarios and strategies.

Of existing scenario frameworks, it is suggested that the basic scenarios of the Intergovernmental Panel on Climate Change (IPCC-SRES scenarios) best satisfy these diverse criteria. These scenarios are used by IPCC to represent the main driving forces of global change and estimate the emissions of green house gases. They are expressed in simple narratives which outline principally different futures. The scenarios can be ordered on two main axes which may be called a governance axis and a value axis: a) whether futures are determined by top-down, global decision-making or bottom-up regional dynamics, and b) whether the policies are geared towards public values or private benefits.

July 26, Monday

SOIL FUNCTIONS, SOIL ECOSYSTEM SERVICES AND THE EUROPEAN STRATEGY FOR SOIL PROTECTION

W. Blum, BOKU (Austria)

Soils have 3 ecological and 3 technical, industrial and socio-economic functions, which are the basis of the delivery of ecosystem services. The 3 ecological functions are the production of biomass, the capacity of filtering, buffering and transformation and the biological habitat and gene reserve.

Under technical and socio-economic aspects, soils are the physical basis for technical, industrial and socio-economic structures and their development, they are a source of raw materials, e.g. clay, sand gravel and others, and are also a geogenic and cultural heritage, protecting and concealing palaeontological and archaeological remnants.

The ecological functions are described and the processes behind the delivery of ecosystem services are explained.

Moreover, it is shown, how fragile this system is and what the main threats for soil protection are, like sealing through urbanisation and industrialisation, contamination, erosion, compaction, decline in soil organic matter, loss of biodiversity, salinisation, and floods and landslides.

Moreover, these threats are classified in order of urgency and the question is raised how to manage the sustainable use of soil resources. For this, a new concept, developed for the European Soil Thematic Strategy, is shown, based on indicators using the DPSIR

indicator framework. On this basis, different research goals and research clusters are identified, as well as the sciences which have to be necessarily involved in these endeavours.
Concluding, it can be summarized that soil ecosystem services are central for humans and the environment. They can be managed with the help of indicators, bridging between science and technology on one side, and stakeholders, decision making and politics on the other side, thus transferring knowledge from those who have it to those who need it.

ECOSYSTEM SERVICES + IMPACT ASSESSMENT = LAND MANAGEMENT

H. Wiggering, ZALF (Germany)

The exponentially increasing speed with which societal demands on natural resources civilizational developments are taking place is increasingly leading to excessive demands made on the buffering capacity of the natural, stabilizing mechanisms. Fundamentally, the carrying capacity of the natural environment sets a limit. Thus, we have to maintain the functions of environmental systems, and in the same way to guarantee a broad use of environment in the sense of the discussion about environmental goods and services within the context to provide so-called EcoSystem Services (ESS). And we have to judge with this, what makes it necessary to deal with complex systems and to develop adequate impact assessment procedures.
For example, land use changes in the past have resulted in substantial net gains in human well-being and economic development, but also have resulted in a 60% degradation of EcoSystem Services (ESS) (MA, 2003). This degradation is reinforced through processes of global climate and economic change. Most ESS are public goods. This implies the risk of suboptimal provision or maintenance by land users and the loss of ESS in the absence of public policy intervention (TEEB 2008). At the regional scale – the spatial level at which different ESS co-exist – local land use and social traditions interact with policy instruments and measures.
The concept of ecosystem services, as adopted by the Millennium Ecosystem Assessment (MA, 2003), is rooted in the field of ecology and was designed for the assessment of (semi-) natural ecosystems. The MA addressed anticipated changes to the world's ecosystems, their services, and their interaction with human well-being. Economic ESS assessments also include those by Costanza et al. (1997) and the TEEB study (TEEB 2008). Barkmann and Marggraf (2004) sought to include future ESS services in the valuation system. However, gaps still remain in the assessment of the role of cultivated landscapes and particularly of land use management in providing ESS (Mander et al., 2007). This is particularly important in areas where population pressures pose high demands on provisioning services (e.g. food and energy) while at the same time supporting and regulating services are required to maintain systems' performance under global change. From these multiple challenges land use conflicts arise (Wiggering et al., 2006; Zhen et al 2006, Bawa et al 2007, Müller et al 2008).
Policy making is one of the key drivers for land use changes. To support evidence based

policy making, ex-ante Impact Assessment is a means to detect side effects of intended policies on the three dimensions of sustainable development and identify trade-offs in policy design (Jacob et al. 2008). The Driver-Pressure-State-Impact-Response (DPSIR) framework (OECD, 2003) is a widely adopted method to structure causal chain relationships within impact assessments. There are some so-called integrated projects on the way trying to develop ex-ante impact assessment tools for land use policies in Europe (Helming et al. 2008a). During the Summer School it is to go beyond these approaches with respect to the analysis of land use management options and patterns and their interrelation with ESS.

How to assess complex systems and the demand for ESS

Over the last two decades, a number of theoretical and methodological perspectives associated with inquiry into sustainability concerns are discernible. The more distant roots lie in mono-disciplinary studies which often highlighted problems of, for example, water quality and quantity, declining biodiversity, land fragmentation, etc., dealing in one or another way with singular environmental goods and services. These studies have rarely, if ever, been capable of transformative change and major leaps forward in sustainability of the most compromised and challenged regions, and instead have taken a 'silo-ed' approach to the resolution of what often are complex interlinked problems. Again and again scientists argue for the need to explore systemic approaches 'as complex, simultaneous interactions between societal, natural and mixed processes at various scales' in a transdisciplinary way (e.g. Ojima et al 2005). Nevertheless, we are still far away from this.

More recently, practitioners from different disciplinary backgrounds have endeavoured to develop transdisciplinary approaches to create sustainability science built on Mode-2 ideas (Martens 2006) which has emerged as a means of addressing the need for transformations towards more sustainable practices. One of the earliest approaches to transdisciplinary analysis was founded in the theory of Ecological Modernisation (Mol and Sonnenfield 2000). It's associated with recognising a creative as well as a destructive role of science and technology, recognition of the centrality of markets, recognition of new emergent forms of governance, especially associated with the role of social movements and a core principle of the need to sustain the sustenance base of society. A second theoretical strand is the exploration of resilience in socio-ecological systems evidenced in the work of Berkes et al. (2003). They see the management of global resources in terms of three interacting social, economic and ecological systems. Central to their analysis is a socio-ecological version of Holling's adaptive renewal cycle, which in the renewal phase offers scope for constructive innovation and socio-ecological system reorganisation. The resilience analysts acknowledge the importance of institutions as mediating factors in land use management. Ostrom's Institutional Analysis and Development (IAD) framework (2005) offers means for a holistic analysis of the interactions between institutions and bio-physical resource sets. Ostrom's 'action arenas' are the socio-ecological entities and analytical frameworks within which resource management challenges can be explored. Just ten years ago, Rotmans et al.

(2000) have introduced the concepts of Transition Management as a new 'visionary evolutionary learning process' to deal with widely recognised and persistent problems where the underlying transition dynamics are complex interaction processes between markets, networks, institutions, technologies, policies, individual behaviour and autonomous trends in the economic, ecological, and socio-cultural domains. A further strand in the development of more sustainable approaches can be found in the Ecosystem Approach as a holistic way of approaching natural resource management. Built around the recognition of the unsustainable exploitation of so many terrestrial and aquatic ecosystems (MEA 2005) the ecosystems approach acknowledges the centrality of human agency in ecosystem management and change.

At European level, foresight and assessment tools e.g. of land use changes are being developed to improve both the handling of complex systems and the support of policy decisions. The EU Sustainable Development Strategy (CEC 10917/06) explicitly reinforces the importance of evidence-based ex-ante Impact Assessment (IA) as a means for implementing the SD strategy in the policy making process (CEC, 2005). Thereby, impact assessments should assure equal consideration to the social, environmental and economic dimensions of sustainable development (Jacob et al., 2006) and provide an integrated view across different sectors (Helming et al, 2008b). For the case of land use, European policies (CAP, RDP, environmental policies, infrastructure and transport policies) interfere with external driving forces (climatic changes, global economic developments, demography, consumption patterns) and act upon a variety of socioeconomic and geophysical conditions that make up the European landscapes. Land use reactions are thus complex and spatially diverse. And again the problem isn't solved what kind of data we need to create adequate indicators representing the complex situation and the interactions between the different processes and systems.

A multitude of European foresight and scenario studies have recently been conducted that analyse the future of land for a variety of sectors. These include e.g. EURURALIS for agriculture and bioenergy (Eickhout et al., 2008), PLUREL for urbanisation (Nilsson et al., 2008), PRELUDE on landscapes (EEA, 2007), EFORWOOD on forestry (Lindner et al., 2009), SENSOR for land use interactions with agriculture (Helming et al., 2008b). These studies have provided a rich information base on the future of specific land use sectors and their impacts across the European regions in a spatially explicit context. SENSOR also attempted to provide a cross-sectoral analysis of land use interactions. It focused on a combination of global economic trends and European (CAP) policies but did not consider long-term driving forces related to climate change and other geo-physical developments. It was therefore difficult to detect hot spot areas where land use transitions (e.g. increase of high intensity bioenergy crops) clash with sensitive geo-physical settings (e.g. susceptibility to soil erosion and land degradation) were occurring. Land use change impacts are usually appraised by such indicators, which still describe the relationship between land use change and environmental (water, soil, air, biodiversity), social (employment, income, social inclusion), or economic (GDP, growth) impacts in more or less linear terms (Frederiksen et al.,

2008). Non-linearity, shocks or system changes are usually not detectable with currently available indicators (Wiggering et al., 2006). However, it's such often abrupt non-linear system developments that may compromise the resilience of the environment and therefore lead to serious irreversible changes. Research has to be done on how to detect and adequately describe those critical, often non-linear developments.

Another challenge for foresight and assessment studies is located in their fitness for use in a policy context. On the one hand, policy and decision makers ask for information systems that are transparent, understandable, comprehensible and flexible with respect to their particular questions (Thiel, 2009; Uthes et al., 2009). On the other hand, foresight and assessment studies are often based on complex, integrated modelling systems that are difficult to comprehend and often appear as 'black box' systems to non-modellers (EEA, 2008). Also, the complexity hinders the adaptability to new (policy-related) questions. A balanced trade-off between sophisticated complex modelling and evidence-based information provision on the one hand and quick, easy to use and transparent decision support on the other hand remains a major challenge for research.

The question isn't to know whether we are sustainable (we know we aren't) but how (un)sustainable we are. This can enable us to understand where we stand in relation to sustainability criteria and to find out what we can do to reduce unsustainability. Since the concept of sustainability is complex and not directly measurable, many indicators are needed to assess how far we have to go to reach this goal. This is why so many indicators have been created lately and why the scientific community is still far from reaching international agreement on the best indicators to use. Interesting approaches to the problem have sprung from simplifications of general systems theory, giving rise, for example, to indicators based on emergy, the ecological footprint, exergy and extended exergy.

Thermodynamically, sustainability is an extensive concept because it depends on the total, limited availability of resources and on a finite system's capacity to accept wastes and contaminants. Improvement of intensive parameters (efficiency, CO2 per unit product or person) isn't sufficient to reduce unsustainability. The improvement in efficiency has to be accompanied by a parallel decrease in total consumption, with a consequent decrease in wastes.

Probably no systemic relationships are more interesting that those among humans, and between humans and nature. How these relationships are represented for the purposes of study must reflect their complexity and cannot be modelled in a single dimension, whatever that dimension may be. Many quantities involved in the dynamics of human activities and of the biosphere must therefore be measured, related, developed and entered in models. Clearly, economic parameters cannot do all this. As they are not the only evidence of human behaviour, measures of economic wealth must be completed with physical indicators describing the human-nature system.

Nicholas Georgescu-Roegen (1972) developed a thermodynamic view of the economic system. His bioeconomic proposal springs from two questions: (1) infinite economic growth contradicts the basic laws of nature; (2) the reversible and circular

representation of production and consumption in the economic system needs to be replaced by an evolutionary version of the economic process within the biophysical context that supports it (see also Bonaiuti, 2003). In his view, the economic process is irreversible, like all biological processes, and depends on a material base. In other words, the economic system is an open system characterised by input of precious resources (low entropy, scarcity) and output of valueless waste (high entropy).

Thermodynamically, human systems (economic, social, regional, urban) can be considered open systems, with self-organising properties and multiple relations and feedbacks among internal components and between them and the outside. With regard to the society, Edgar Morin (1995) sustains that its manner of organisation determines its unity, starting from the multiplicity of its components, and enables the emergence of collective properties, such as culture, language and education, that affect all individuals. Social (and economic) systems are complex in their multi-dimensional structures and relationships. For example, they may simultaneously be acentric (working in an anarchic manner through spontaneous interactions), polycentric (characterised by many centres of control or organisation) and centric (having one centre of decision), and they develop networks of relations and feedbacks with the environment. In this context, Morin defines a concept of autonomy based on environmental dependence. Autonomy and dependence are complementary concepts (though they seem in opposition), because systems need resources in order to self-organise and maintain their individuality and originality. Self-organisation and eco-organisation must therefore be interconnected and this is a complex conceptual problem. There cannot be autonomy without dependence.

According to Marques et al. (2009), "general environmental concern gave rise, approximately two decades ago, to the emergence of the idea of sustainable development, but researchers from different disciplines still attempt to understand and define more precisely the meaning of the term. Despite this, the most widely adopted definition has been "development that satisfies present needs without compromising the possibility of future generations satisfying theirs" (Brundtland, 1987). This is a rather vague non-operational definition, which implies that the concept still requires a suitable quantification in socio-economic, cultural and scientific terms. Similarly, the definition of sustainability as the area in which economic, social and environmental spheres satisfy their needs, as proposed by Barbier (1987) and Pearce et al. (1989) is no longer satisfactory. Actually, they are arrangements according to which everyone seems satisfied but no sustainable task is really achieved, because: 1) there is still a large distance among disciplines (economy, sociology, ecology, etc.); 2) the biophysical foundations of human activities (limits) are systematically underestimated (in contrast, just think at the importance given everywhere to the growth in GDP).

Systemic indicators that embrace economy, society and environment are therefore necessary. And if we maintain that economy and society are subsystems of the larger biosphere, then ecological indicators play a key role in determining new pillars of our knowledge of (un)sustainability and, at the same time, a relationship between ecological

and economic entities should be developed. The evaluation of EcoSystem Services is a step forward in this direction.

ENVIRONMENTAL RISK ASSESSMENT FOR PESTICIDES : FROM RESEARCH TO PRACTICAL APPLICATIONS

I. Dubus, FOOTWAYS (France)

Pesticides represent a significant threat to the sustainability of water resources in Europe. Although risk assessment approaches to assess the likelihood of pesticides being transferred to water resources have been developed in the research area, these have not been transferred to water quality managers and the farming community. Hence, up to a recent time, practitioners had no reliable tool to quantify the potential impact of agricultural practices on groundwater and surface water. The lecture will present the European project FOOTPRINT and how its software tools can help farmers and managers limit the contamination of water resources by pesticides. The lecture will also demonstrate the latest tools developed by FOOTWAYS, which connect a web portal to a supercomputer dedicated to pesticide fate modelling.

1. FIELD TRIP – KOPER REGION

Marina Pintar, University of Ljubljana

The Municipality of Koper lies between Italy and Croatia, on the Slovene coast, in the southwest of Slovenia. Its total area is 311 square km, with 17.6 km of coastline. Its territory includes more than one hundred settlements. The population of the municipality in June 2007 was 49,303. It is characterised by Mediterranean climate, with long and hot summers, mild winters and occasional strong winds. The administrative centre of the municipality is the town of Koper, with approximately 24,000 inhabitants, where most of the administrative, economic and cultural activities are concentrated.

Koper has 2,000 years and more of history behind it. It was initially no more than a humble island settlement, within city walls, where the inhabitants of the vicinity took refuge at the time of the great migrations. In the following centuries, though, Koper flourished, mainly because of its favourable position. Its economic power lasted until the 18th century, when Reka and Trieste were granted the status of free ports. With the downfall of the Venetian Republic and the completion of the Vienna-Trieste railway, Koper finally lost its important role in the wide region. After the Second World War, Koper once more revived and flourished into being the most important economic centre of the Slovenian coast. With Slovenian independence in 1991, Koper became the only commercial port and an important industrial centre of Slovenia. Koper is today the sixth largest town in Slovenia and second in terms of per capita GDP. The basic advantages of its economy are diversity and versatility. In addition to tourism, crafts, industry, entrepreneurship, transport, trade, business and financial services are the most

important activities. The Port of Koper, founded in 1957, continues to be a very important actor, with a major economic and spatial influence on the town and its surroundings and even on the national economy.

The location of the city on the coast, and the medieval city centre provide some limitations for future development. In addition, the Port of Koper occupies a lot of space. Settlement and the development of economic activities are therefore directed even more into the peri-urban area, where there is also the highest pressure for future construction and other interventions. The peri-urban area has very diversified land use: as a built-up area for settlement, as a green and recreational area, favourable conditions for agriculture (the best quality agricultural land) enable agricultural activities, and new infrastructure and industrial zones are also being constructing there. A major part of the municipality is formed by the rural hinterland, which is sparsely settled but with a unique cultural and natural heritage and rich biodiversity.

The Municipality of Koper is currently in process of preparing the new spatial documents. The strategic issues that dominate planning discussions in the municipality are: the adjustment of different development needs, assurance of spatial efficiency in the sense of rational space arrangement and protection of natural resources (the best agricultural land, forests etc.), assurance of quality living conditions (green and recreational areas), efficient public transport, conditions for economic development (industrial and trade zones), maintenance of the cultural landscape and natural and cultural heritage in urban and rural parts of the municipality.

The aim of the field trip is that the students will become familiar with a specific situation that will be partly discussed in the sense of innovative (agricultural) resource management and sustainable landscape development while aiming at regional cohesion and specifically in the sense of peri-urban land use relationships. The theme will be picked up again broadly during later lectures and workshops of the Summer School 2010.

2. FIELD TRIP - CELJE, VELENJE, MEŽICA

Marko ZUPAN, University of Ljubljana

Second field trip is two day tour to the areas where various negative impacts of human activities/technologies were caused environmental problems:

- *Celje municipality with soils polluted by Zn, Cd and Pb,*
- *Velenje in Šalek valley with lignite mine and thermo power plant,*
- *Mežica valley with closed lead-zinc mine and lead smelter.*

Celje is the third largest city in Slovenia (Municipality area 95km^2; 48.000 inhabitants). It lies in the middle of Slovenia in the basin surrounded by Alpine foothills. Pollution of air, water and soil were severe before 1970: metallurgy, brickwork, steel-works, enamel coating, traffic, etc. The main source of industrial pollution was zinc smelter; company was established in 1873 and operated near city centre more than 100 years. Majority of the problems are nowadays solved (air and water quality, waste disposal), except contaminated soils and abandoned industrial sites (brownfield). Soils are contaminated mostly with heavy metals Zn, Cd and Pb where Cd represents main threat to the humans and animals due to high bioavailability. Several issues are discussed on the site like extension of pollution, uptake of HM to plants, accumulation of Cd in edible parts of vegetables and crops, home gardening on polluted soils, remediation measures, eco-remediation projects, brownfield redevelopment, etc.

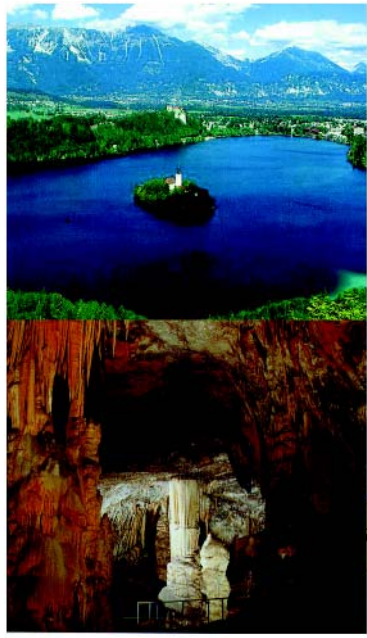
The Šalek valley with the centre Velenje is a young Pliocene basin situated in the Sub-alpine part of Slovenia near the Austrian border. Huge lignite-coal reserves are the crucial factor of human caused changes and pollution of the Šalek valley. The Velenje Colliery is the largest Coal-mine in Slovenija (4 million tons a year) and among the largest underground lignite coal-mines in the world. The thermal power plant located nearby in Šoštanj (ŠTPP) is the biggest power plant in Slovenia. Consequently, all that resulted in a large inhabitant concentration, intensive urbanisation and pollution of the small sub-alpine Šalek Valley. The most remarkable consequence of coal-mining is subsidence lakes. The surface of the Šalek valley has subsided for more than 110 million m^3 until now, approximately 6 km^2 of the valley surface, and the lakes surface is 2,1 km^2, and their volume is over 40 million m^3. In the last decade a lot of environment protection measures have been carried out. And the environment in the Šalek valley has been improved. The development of the subsided area is directed to a better environment. The lake shore is being restored and a lot of recreation and sport activities are already take place there.

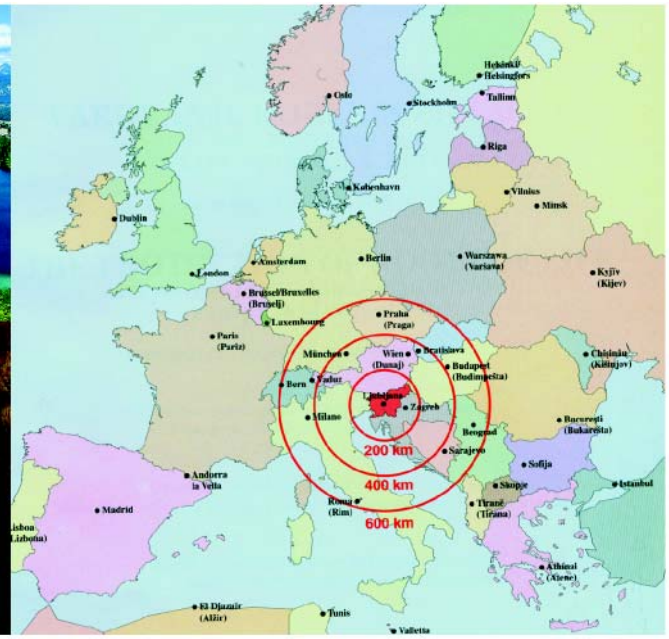
The Upper Meža area with settlements Mežica, Žerjav and Črna na Koroškem is a narrow valley in hilly area on border with Austria. More than three hundred years of active lead mining and smelting gives opportunity for economical development, however mining and smelting caused environmental damages due to poor technology in the past. Soils in the valley are highly polluted with heavy metals, especially with Pb, Cd and Zn, and sounding of smelter was without vegetation because of sulphur emissions - the area of Žerjav was know as 'death valley'. In 1990 lead mining in Mežica stopped, smelter in Žerjav is still work in purpose of recycling old car batteries. Although the lead smelting processing technology was changed in the last decades and lead and sulphur emissions drastically decline, meadow soil and forage in the Upper Meža valley are still polluted. An accidental fire at the landfill in Mežica in December 1995 caused additional pollution. However, people in this area try to find alternative way to survive with environmental limitations and low resources for industrial development.

Landfill in Šalek valley

SLOVENIA AS A NATURAL GARDEN AT THE CROSSROADS OF EUROPE

The Republic of Slovenia, a sovereign state since 1991 and a member of the United Nations from 1992, was founded in 1945 with the uniting of the continental part and the Slovene Coast (this was invaded and occupied from the end of the 1st world war until the end of the 2nd) and established as a national republic within the former federation of Yugoslavia. Slovenia has only short statesmanship from 1991 onwards, but a long national history.





Slovenians now live on the present territory, which was larger earlier, from the creation of the Western European states. It was at first also an independent principality, but from ancient times and the Middle Ages the Slovenian ancestors survived the old Roman Empire, Austro-Hungarian monarchy and other supremacies or occupations. Despite such historical, political and social pressures Slovenes have saved their arable land, forests and culture. Even the representatives of spiritual, cultural and intellectual life, poets, writers and other patriots were progressive rousers of liberation and movements of self management.

The capital of Slovenia is Ljubljana, a town with about 300.000 residents. It lies in the central part of the country, in Ljubljana valley with international junction. Slovenia is growing as a polycentric system: there are 12 administrative regions, but new formal regions are growing with democratic association of communities. Slovenia has three historical parts-central, west-ern and eastern, but other regional centers too. Ljubljana is the biggest university, scientific and cultural centre in the country.

The second region-al and university centre is Maribor. The coastal centre with a new university seat is Koper - Capodistria, but in the Mediterranean part you will also find a regional centre of Nova Gorica too. Then on top of these are region-al centres also in Kranj, Novo mesto, Celje, Velenje, Ravne, Ptuj, Murska Sobota.

Slovenia has a very interesting profile. On the borders of Slovenia are in close touch the Slavonic national group (and Slovenes belong to them) with Roman (westerly), German (northerly) and Ugro-Finnish (easterly) national groups. Our neighbouring states are Italy, Austria, Hungary and Croatia. The sense of this is also the cohabitation of different cultures, but the Slovenian culture is not behind them. An important factor is that the Adriatic Sea as a part of from the Mediterranean comes very deep into the continent of Europe, near the Alps and the Middle Europe, and Slovenia has a small coast line in the northern part of the sea. All over the Slovenian territory, from Trieste Bay and Port of Koper, the easiest way between the Alps and Dinaric Karst with roads and railways that elongate the ocean ways directly to Middle and Eastern Europe. Scenic and biotic diversity with all curiosities are characteristic too.

All of the present Slovenes number nearly 2,2 million, but in the Republic of Slovenia, which has a population of 2 million, there are 1,720.000 of them. Many of the older Slovenian emigrants are living in America (USA, Canada and Argentina), in some west European countries and new emigration group is living in Australia. Slovenia has minorities in border regions of neighbouring countries like Austria, Italy, Croatia and Hungary. There are associated factors for co-operation in all parts, sometimes still asking for more understanding and equality. Meanwhile Italian and Hungarian minorities live in Slovenia, with bilingual cultural and official rights, including some

Germans and newer settlers who want to find jobs and a home in this country. All citizens of Slovenia, minorities included, have equal official and democratic rights and institutions belonging to the nation and nationalities. New capital inflows are bringing new closer relations. Besides this, Slovenia is a very interesting country for foreign tourists.

The social and physical structure of Slovenia is similar to western European countries. As different and attractive the geographical and demographical pictures are, the varied the nature is too. This is caused by changeable climatic inflows from Atlantic, Mediterranean and continental sources from East Europe, and to very heterogeneous relief with naturally different regions. 60 % of the country is covered with forest. There is near to 44 % of the elementary karst, named by the original land of Karst in SW Slovenia. There are more than 6000 caves, from which 27 are accessible and open for tourist visits. Among them are the Řkocjan caves, which are included in the UNESCO register of World heritage.

Also the Postojna caves, the Vilenica cave as a cultural meeting place, periodic Cerknica lake and other curiosities are known worldwide. The lakes Bled and Bohinj are beauties as the remnants of the glacial period in the Alps. Furthermore, there are vineyards, hilly regions in Slovenia, skiing resorts, clean rivers for water sports and fishing etc.

Slovenia as a mountainous country has only 18 % of its territory composed of valleys and depressions, where you find the agricultural land, rivers and water resources,

Lake Bled

towns and where most of population is living, with factories and traffic systems crowded together in a really limited space. At pre-sent 29 % of rivers are over polluted, but by the republic environmental developing plan the sanitation of waters is a priority task and many cleaning systems are in construction. This plan could be achieved only with the second priority of eco-management of the waste and developing of local infra-structures. Many factories develop the ‘co-natural technologies’, bringing in to use environmentally acceptable non dangerous means, modernizing the production and services. The environmental legislation is compatible with that of the European Union. More has to be done in the development of monitoring, in the sector of logistics, in regional planning and with engagement of the public.

We are specially interested to protect the biotic diversity, because in the small part of 0,013 % of land of our planet Earth which belongs to Slovenia (20.2 73 km2) are at present to be found more than 1 % of all in world known species, among them these in carstic underground. Slovenia has some hundred endemic species, and has also the bear, wolf, lynx, salmon trout, thoroughbred lipica’s horses, Carniolan (Slovenian) bee, many birds and protected marshland for them etc.

Another valuable natural resource are the mineral and thermal waters. Slovenia has 18 health resorts and several well known climatic mountain resorts like Bled, Kranjska gora, Bovec and Sośa valley, Logarska and Savinja valley, Rogla etc. Different though are the hills with vineyards from Brda in the west side to Goricko.

Mountains, forest, lakes - place for relaxation

Slovenia has a part of coastal Istria too. Tourism is important too: in hotels and other tourist facilities Slovenia welcomes yearly more than two million guests (58 % of foreigners), nearly equally concentrated between health resorts, coastal, climatic and other tourist localities.

The economy is in transition from technological, environmental and economical points of view. At agriculture's disposal is 34 % of the land. Cattle breeding is prevailing and with quality meat, fruit and a range of wines, al-so some special products (e.g. air-dried ham) are known and esteemed on the world market. About 70 % of all primary and industrially produced goods are still exported to EU countries. The exchange with other countries is growing. There is steel, machine and car production, white technique, electrical, pharmaceuticals, chemicals, pneumatics, furniture, products of leather, typographic etc.

Two fifths of the GDP are contributed by industry and the associated services are prevailing. GDP per capita is still collated with some EU countries (more than 10.000 €).

Slovenia has the crossing of two transeuropean traffic corridors: the fifth in the south of the Alps between West and East Europe (from Italian Po to Pannonian valley), and the tenth between Middle Europe, Adriatic Sea and Southeast of Europe. Slovenian borders are crossed by some ten million cars and trucks yearly and total road cross-border entries by passengers are about 90 million with 60 million foreigners. The Port of Koper has nearly 10 million tons of national and international harbour traffic and goods transported per year.

Rafting exiting sport for youngsters

Traffic, industry and other productions centred around urbanization are causing serious environmental problems; traffic with vehicle fumes, noise and hazardous cargo. More of the road transport should be redirected to the railways.
It is interesting to know that country with a population of 2 million produces yearly 4000 book titles (750 of them in literature) publishes 6 daily journals and 1330 periodicals, has 3 universities with 80.000 students, 53 museums, 9 professional theatres with two operas and four orchestras, good radio and TV broadcasting, etc. There is 44 % of active population, which is similar to EU countries. Millions of foreign tourists visit famous health resorts, the seaside, mountain places, phenomena of Karst and historical places, all of which are a good reference to enlarge our co-operations.
Ljubljana is smaller than one would expect for a capital with a government and parliamentary building, all administrative services, foreign embassies, the head offices of banks and companies, university and many cultural institutions. But it is nice.
Legend relates that the Argonauts fled with the Golden Fleece from the Black Sea to the Adriatic along the river Ljubljanica. A history however speaks of the Romans and the town of Emona, which was established here at the turn of the 1st century A.D. and flourished until its destruction by the Huns.

Izola with marina

It was resurrected at the foot of the castle hill by the Slavs in the 6th century.
The town was first recorded as Luwigana in 1144. From 1335 this town with a Slavic soul acquired Germanic administrative feature and life stile, because the Habsburgs ruled here until the First World War, except a few years as an Illyrian province and centre under Napoleon. Ljubljana entertained the third congress of Holly Alliance 1821, Ljubljana Congress 1870 and other significant meetings or events since its and Slovenian liberation in 1945 and attainment of independence in 1991.
Ljubljana has an important geographical position with heavy frequented road and railway crossing, linking the Mediterranean and inner of european continent. Traffic, commercial, administrative and cultural centre and life form a modern image of the town.
The streets under castle and along the river Ljubljanica were fostered by the Baroque style, while Romanic cultures were revered by the founders of the Academia Operosorum, the first intellectual club and precursor of the subsequent Academy of Arts and Science. In 1701, this was followed by the Academia Philharmonicorum, the predecessor of the present-day Slovene Philharmonic. The city is also seat of the Ljubljana archdiocese. A new middle European image got the town in renewal after earthquake in 1895. From 1918 up to present urban development Ljubljana increased fourfold in population and got many new buildings, institutions and curiosities, mainly in last decades of 20th and even in the beginning of the 21th century.

Ljubljana centre with the river Ljubljanica.

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