

# Institute of Landscape Ecology

## Slovak Academy of Sciences



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# Institute of Landscape Ecology SAS

- Interdisciplinary organisation for basic (70 %) and applied (30 %) landscape-ecological research
- Scientific organisation
- Educational organisation



# Institute of Landscape Ecology SAS

- All personnel: 53
- Research staff: 29
- PhD students: 10

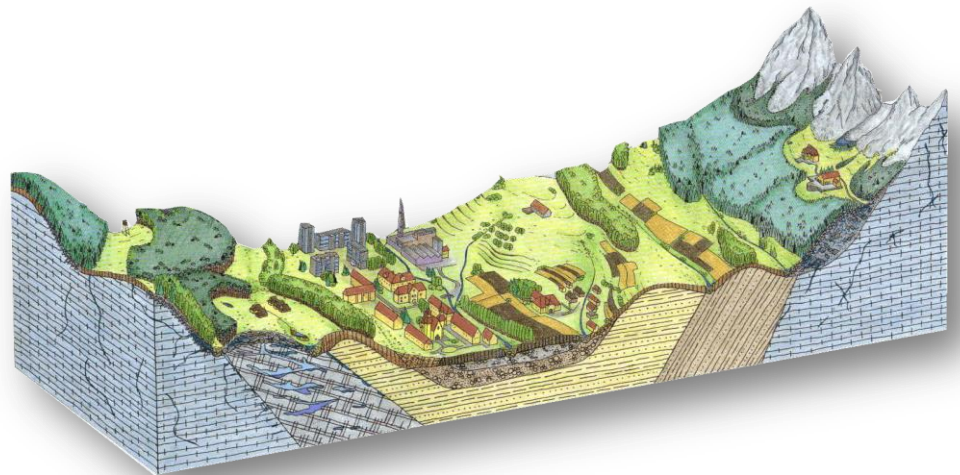


- Department of ecosystem analyses
- Department of landscape-ecological syntheses
- Department of diversity of ecosystems and landscape - Branch Nitra
- The Research Station Východná

# Institute of Landscape Ecology SAS

## The object of research: Landscape

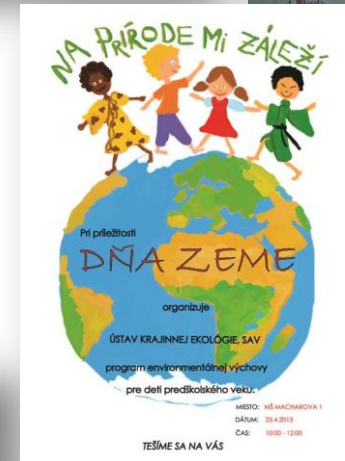
- Develops a theory and methods of landscape ecology
- Research of landscape, its components and processes, socio-ecological systems at different scales
- Research is built on interdisciplinary and transdisciplinary basis





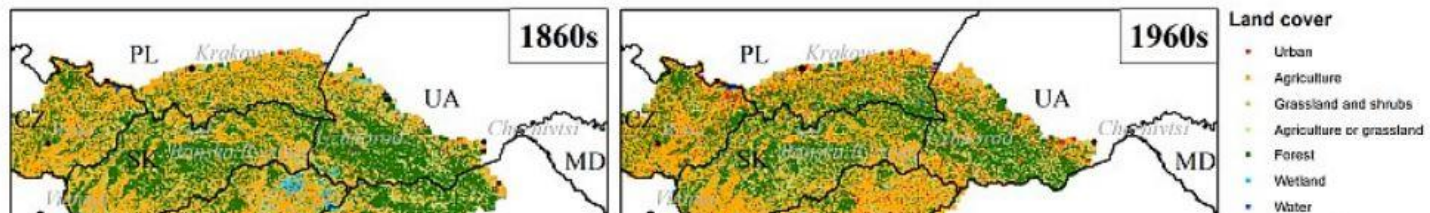
# Pillars of the ILE SAS

- Basic research
- Applied research
- Promotion of research results
- Educational activities



# Basic research

## Research of landscape changes, their driving forces and social impact



- **INSPIRATION** - Integrated Spatial Planning, land use and soil management Research Action (**HORIZON 2020 project**)
- 200 years of changes in landscape use and land cover and their driving forces in the Carpathians (**NASA LCLUC Programme project**)
- **VEGA projects**





# Basic research

## Mapping and assessment of traditional agricultural landscape (TAL)

- national inventory (3013 sites)
- POINT - Policy Influence of Indicators (FP7 project)
- Atlas of landscape archetypes of Slovakia (APVV project)
- Diversity of the agricultural landscape and its ecosystem services (VEGA project)



# Basic research

## Assessment of ecosystems and ecosystem services



- OpenNESS - Operationalisation of Natural Capital and EcoSystem Services (FP7 project)
- Evaluation of ecosystem functions and services of the cultural landscape (APVV project)
- Biodiversity and ecosystems assessment (ETC BD project)





# Basic research



## Long-Term Ecological Research (LTER)

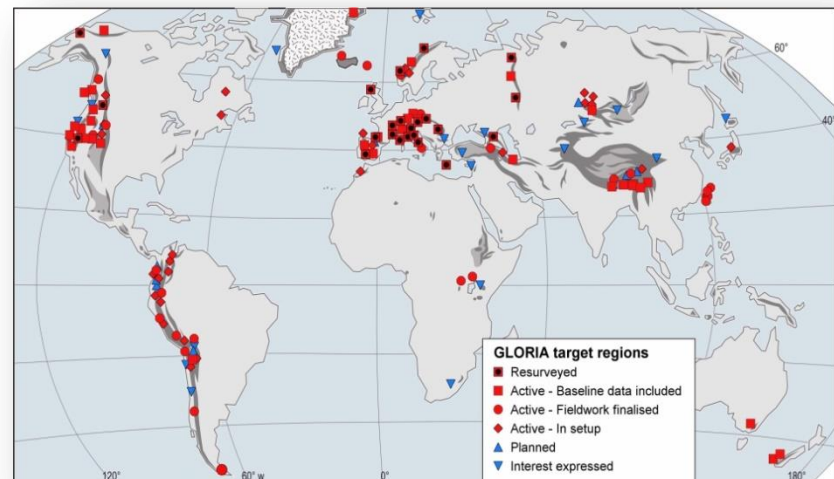
- Member of global network ILTER, founder of LTER-Europe
- Co-ordination of national network LTER Slovakia
- Co-ordination of research in 4 LTER sites and 2 LTSEER platforms



- eLTER - European Long-Term Ecosystem and Socio-Ecological Research Infrastructure (**HORIZON 2020 project**)
- Advance\_eLTER - Advancing the European Long-Term Ecosystem, critical zone and socio-ecological Research Infrastructure towards ESFRI (**HORIZON 2020 project**)

# Basic research

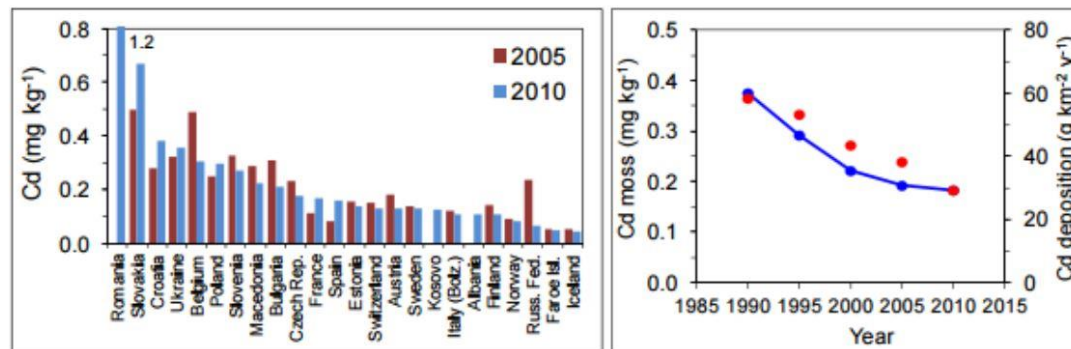
- Observing, monitoring and assessment of mountain flora affected by climate changes: follow-up activities of the project GLORIA - observing the effect of climate change on species composition of vegetation
- ILE SAS - member of monitoring network of research sites: 128 active target regions located in the alpine zones of Europe, Asia, North and South America, Africa, Australia and Oceania
- Study area in SK: Vysoké and Západné Tatry Mts.



# Basic research

## Evaluation of quality of the environment

- Assessment of spatial and time trends of accumulation of heavy metals and nitrogen in mosses in Slovakia for 25 years (ICP Vegetation)
- Evaluation of environmental quality of rural settlements (VEGA project)
- Green Infrastructure of Slovakia (VEGA project)





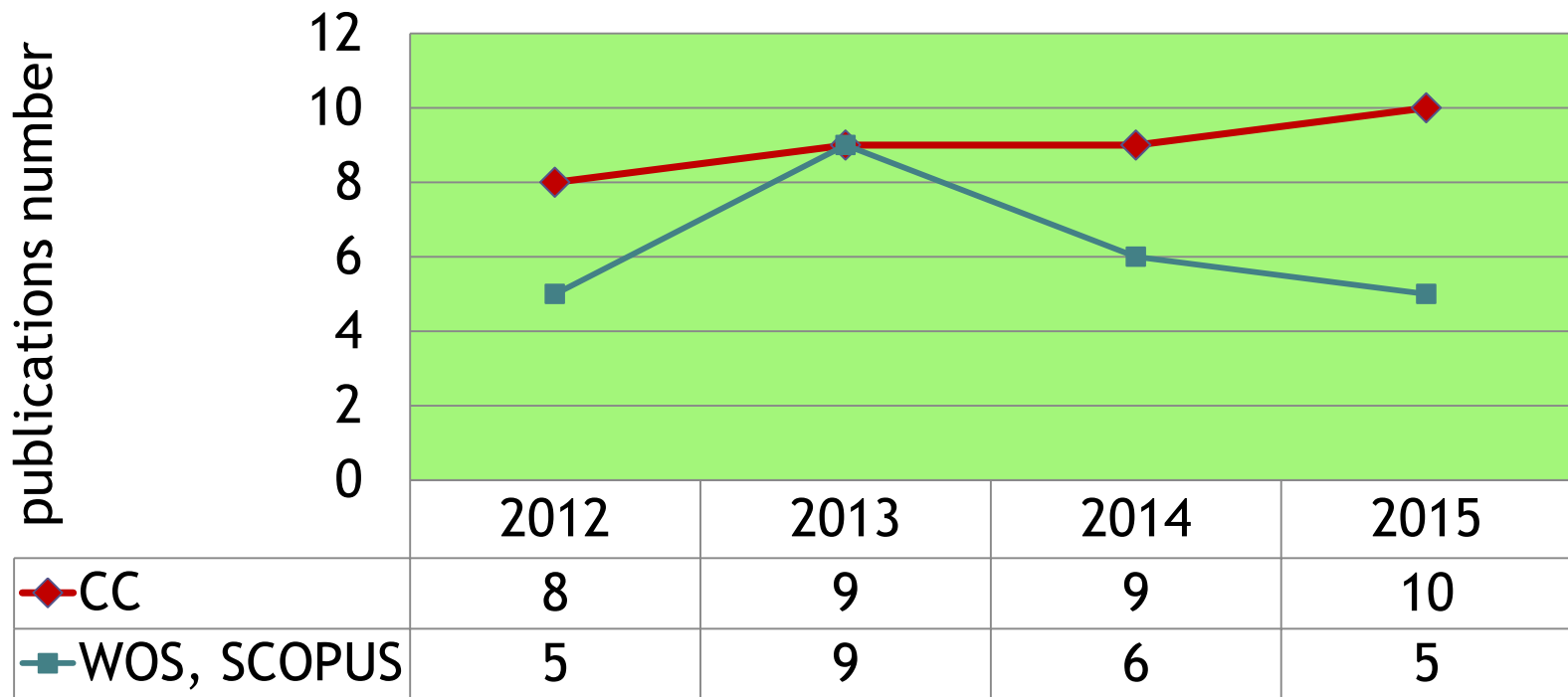
# Basic research

## Research, development and application of advanced methods of geoinformatics and remote sensing

- EBONE - The European Biodiversity Observation Network (FP7 project)
- Development of the adaptive plant protection forecasting system within a collaboration of border viticultural areas for purpose to increase their competitiveness (HU-SK project)
- The ecological model of tourism development based on assessment of localization and realization assumptions of landscape with use of GIS tools and quantitation methods (VEGA project)

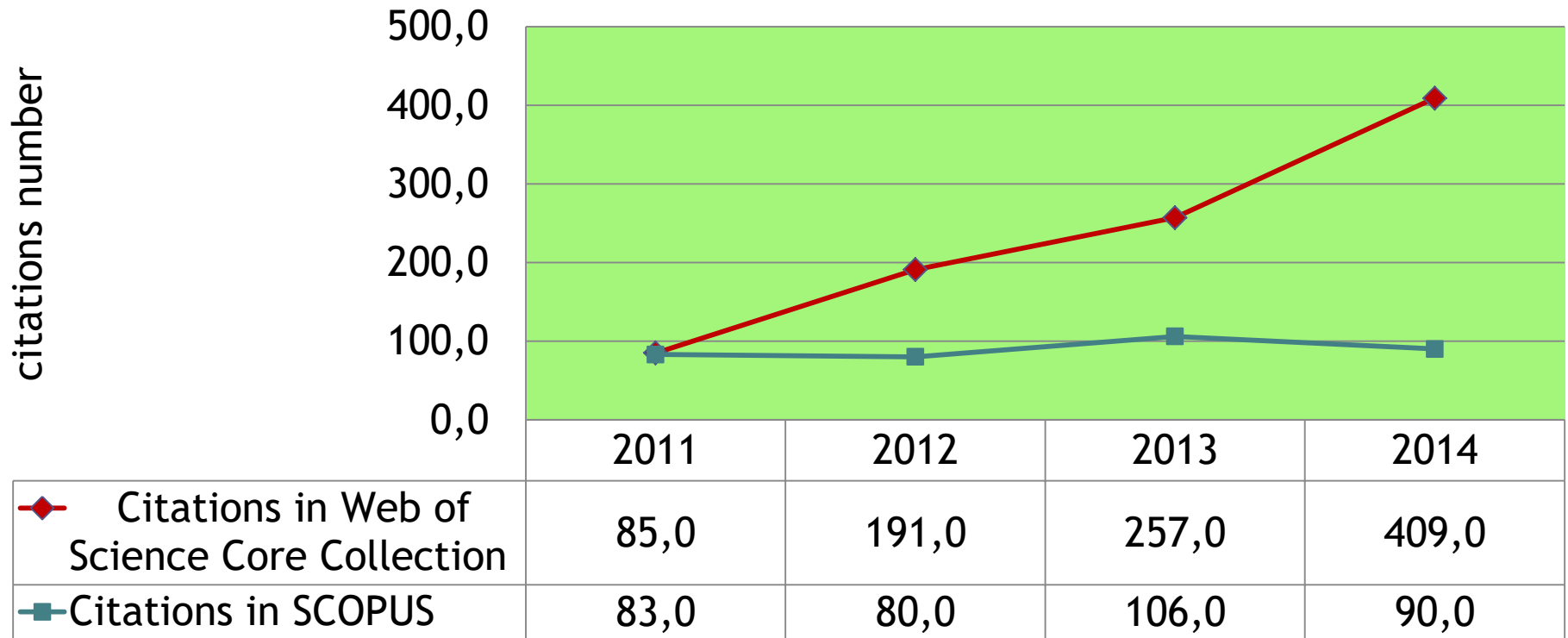
# Basic research

## Number of publications in CC, WOS core collection, SCOPUS (2012 - 2015)



# Basic research

## Number of citations in WOS and SCOPUS (2011-2015)





# Applied research

Main goal: **transfer of scientific knowledge into real practice**, especially in landscape planning, nature conservation, decision-making and environmental legislation process

## Our clients:

- EU bodies: DG Research, DG Environment, DG Agriculture, European Environment Agency (Copenhagen)
- State administration
- Regional and local municipalities





# Applied research

## European Topic Centre on Biological Diversity

- Client: European Environmental Agency, Copenhagen
- Since 2002, current project 2014-2018
- 13 partners led by the Nature History Museum, Paris

### ILE SAS main tasks:

- Support to EU nature reporting: Habitats Directive Art17, HD Annexes Adaptation, State of Environment Report
- Natura 2000 and Emerald: Natura 2000 sufficiency assessment - 16 EU member countries
- Biodiversity and Ecosystem Assessments: Ecosystem Map and Assessment, Grassland Assessment, Copernicus



# Applied research



## External monitoring team of LIFE Programme

- Client: DG Environment, EASME
- Since 2005, current project 2015-2018
- NEEMO EEIG - legal entity comprising 9 companies, partnership with 3 other companies



- **Main task:** Monitoring of LIFE projects (currently 111 projects) in six countries (SK, CZ, PL, HU, HR, RO)
- 16 monitors: 3 internal staff, 13 foreign contracted experts
- Technical assistance, Administration and financial management



# Applied research

## New Biogeographical Process

- Client: DG Environment
- Since 2011, current project 2015-2017
- 6 partners: ECNC (lead), Eurosite, ILE SAS, ELO, CEEweb, and EUROPARC
- **Main task:** Scientific and technical background information for the benefit of Natura 2000 Seminars

[http://ec.europa.eu/environment/nature/natura2000/seminars\\_en.htm](http://ec.europa.eu/environment/nature/natura2000/seminars_en.htm)



# Educational activities

## PhD study

- Programme: 4.3.1 Landscape protection and landscape utilisation - Environmental studies
- PhD study is provided in cooperation with the Constantine Philosopher University in Nitra, Department of Ecology and Environmental Sciences
- 11 supervisors; ca 9 PhD students annually
- Courses for foreign students: 8 PhD students in 2015/2016 from Poland (6), Spain (1) and Czech Republic (1), two master students from Belgium

# Educational activities

- **Environmental education** at primary and secondary schools, developed a program of **education on sustainable development**
- Preparation of textbooks and teaching materials
- **Environmental Natural Laboratory** in Suchá n/Parnou



# Promotion of results

Presentation of scientific knowledge to public to raise environmental and ecological awareness





# Promotion of results

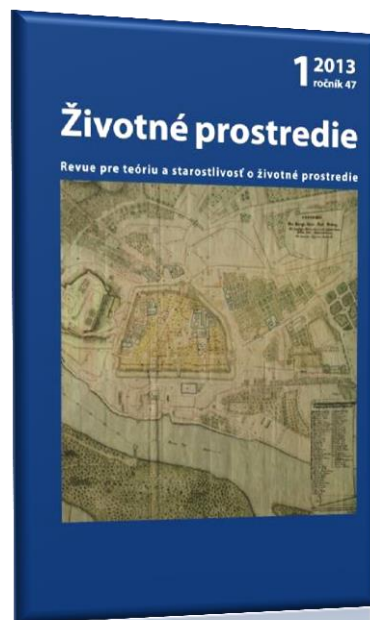
- National exhibitions: AGROKOMPLEX, CONECO
- Researchers night
- Open door day
- Landscape Festival
- Celebrating Earth Day
- Green week EU
- Environmental Natural Laboratory





# Editorial activities

- Ecology (Bratislava)
- Environment (**Životné prostredie**)
- Ecological studies (**Ekologické štúdie**)



# International activities

- **European Commission: Global Change** (including climate change) - FP5, FP6, FP7, HORIZON 2020
- **NATO Science Programme** - environmental panel
- **European Academies Science Advisory Council** - Environmental Steering Panel
- **European Academy of Sciences and Arts**, Salzburg
- **UNESCO Headquarters**, Department for Ecological Sciences and Earth Sciences, Paris



# International activities

- **LIFEWATCH-ERIC** - European infrastructure for biodiversity and ecosystem research
- **EU Strategy for the Danube Region** - Priority Area 7
- **DIVERSITAS** (up to 2014,) now **Future Earth**
- **EPBRS** - European Platform for Biodiversity Research Strategy



# International activities

- **ALTER-Net** - A Long-Term Biodiversity, Ecosystem and Awareness Research Network
- **EucaLand** - European Cultural and Agricultural Landscapes
- **Landscape Europe** network - *Coordination*
- **European Alliance for Global Changes**
- **Science for Carpathians** - *founder, executive committee*



S4C Science for the Carpathians



# Social and policy impact

- Support to EU environmental and nature conservation policy: ETCB, LIFE programme
- Support to national Rural Development Programme: TAL inventory as basis for HNVP protection and management
- Red list of species, habitats and invasive alien species in the Carpathians
- Management Plan for the National Nature Reserve Parížske marshes
- Implementation of ecological networks for 5 regions and 2 villages



# Social and policy impact

## Strategic documents:

- Rural Development Programme 2014 - 2020 - Strategic environmental assessment
- Integrated regional strategy of the Trnava Region
- Territorial Development Strategy of the city of Trnava and its functional area

## EIA, SEA documents

## Application of innovative Earth observation methods

## Implementation of ES concept in the urban and regional planning policy

# Research strategy

The key research topics for next period:

## Global megatrends and their impact on landscape

- Research focused on mapping, spatial modelling and assessment of GMT influences on landscape structure, its individual components and landscape processes
- Transfer of scientific knowledge into environmental policy



# Research strategy

- **Innovative methods for landscape research planning** - developing innovative methods of efficient use of landscape resources and potentials
- **Mapping of ecosystems and assessment of ecosystem services**
- **Spatial-temporal integrated modelling** of response and adaptability of ecosystems to global changes



# Research strategy

- Long-term assessment of traditional agricultural landscape (TAL)
- Long-term ecosystem research in the European LTER network
- Observation and assessment of alpine ecosystems influenced by climate change
- Assessment of air pollution impact to environment
- Observation and assessment of agro-ecosystems for the need of precision farming





**Thank you for the attention!**

