

HyDaP

Latest technologies of remote sensing in research and education

Department of Remote Sensing
František Zemek

Operational Programme: Education for Competitiveness
2.4 Partnership and networks

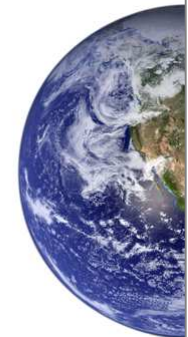


What are the objectives of the project?

To establish **cooperation** between/across **universities, research institutions, non-profit and business sector**

To **increase the knowledge** potential for the application of the latest technologies **of remote sensing in different disciplines**

To **use and disseminate** gained experience **in university education**



What are the key topics of the cooperation?

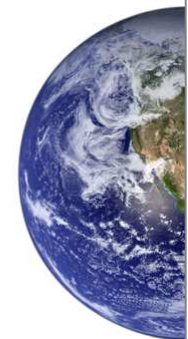
Advancement in airborne remote sensing

- new technical facilities for data acquisition and processing

hyperspectral, LiDAR, thermal data, fusion of data

Application of RS technologies

fresh water quality, soil properties, assessment of vegetation, agroecosystems, thermal and water regime of landscape



Who the partners of the project?

Czech x foreign partners

Remote sensing teams

Teams of “ecosystem” disciplines

Universities

Research institutes

Non-profit and business sector



Foreign partners of the HyDaP

Remote sensing teams

Boston University

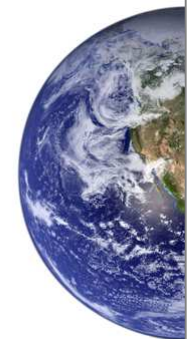
- HS data, RT models, theory of invariants

DLR German Aerospace Center

- atmospheric corrections of HS data

Forschungszentrum Jülich – Institute of Bio-and Geosciences - vegetation chlorophyll fluorescence

Idaho State University, Boise Center Aerospace Laboratory - LiDAR data acquisition and processing



Foreign partners of the HyDaP

Remote sensing teams

Tel Aviv University

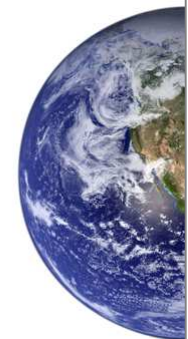
- sensor calibration, soil properties from HS

University of Colorado at Boulder, CIRES

- RS principles, TIR, ecosystem changes

Vienna University of Technology

- LiDAR data processing



Czech partners of the HyDaP

Research institutes

Biological Centre AS CR, České Budějovice, Institute of Soil Biology

– soil, vegetation, carbon sequestration

Global Change Research Centre AS CR, Brno, Department of Remote Sensing

– airborne hyperspectral and thermal data, radiative transfer modelling



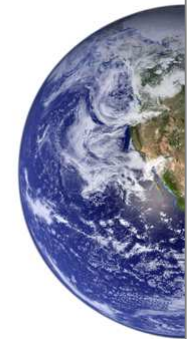
Czech partners of the HyDaP

Universities

Mendel University in Brno, Department of Agrosystems and Bioclimatology - modelling of agriculture production in changing climatic conditions

University of South Bohemia in České Budějovice (JCU), Department of Landscape Management – thermal regimes of ecosystems

Brno University of Technology – Faculty of Civil Engineering – LiDAR in practical applications



Czech partners of the HyDaP

Non-profit and business sector

ENKI, o.p.s., Třeboň

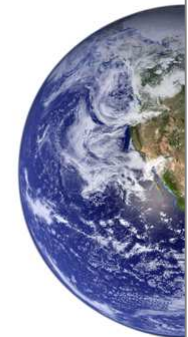
– water and thermal regimes of landscape

**DAPHNE ČR – Institute of Applied Ecology,
České Budějovice**

– ecological farming and services

RAWAT consulting s.r.o., Brno

– fresh water quality, algae in water reservoirs



How will the project be run?

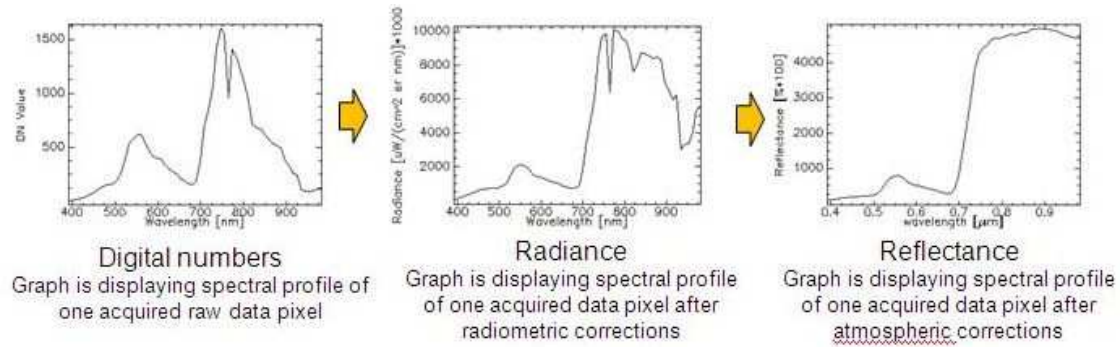
Four theoretical and training oriented RS workshops
airborne HS, TIR and LiDAR data

data acquisition



How will the project be run?

data postprocessing



Digital numbers
Graph is displaying spectral profile of one acquired raw data pixel

Radiance
Graph is displaying spectral profile of one acquired data pixel after radiometric corrections

Reflectance
Graph is displaying spectral profile of one acquired data pixel after atmospheric corrections

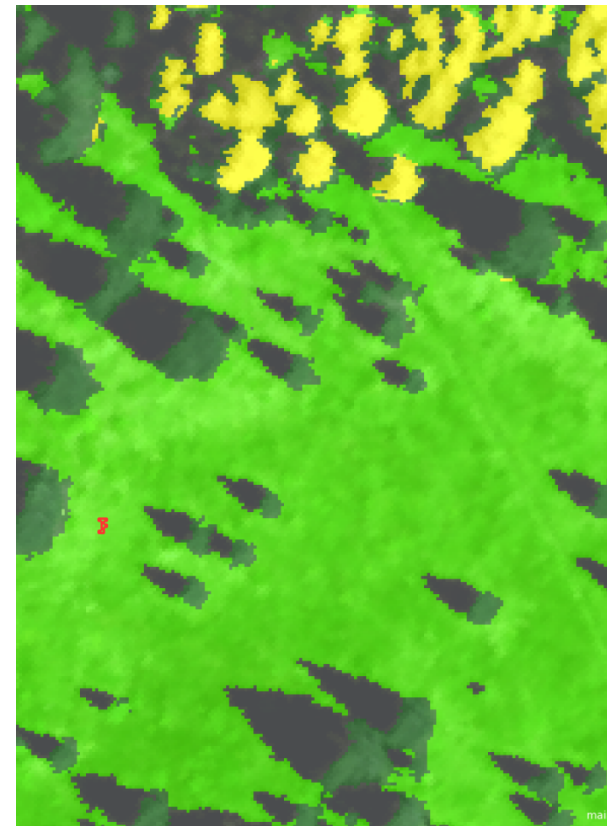
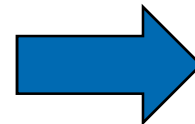
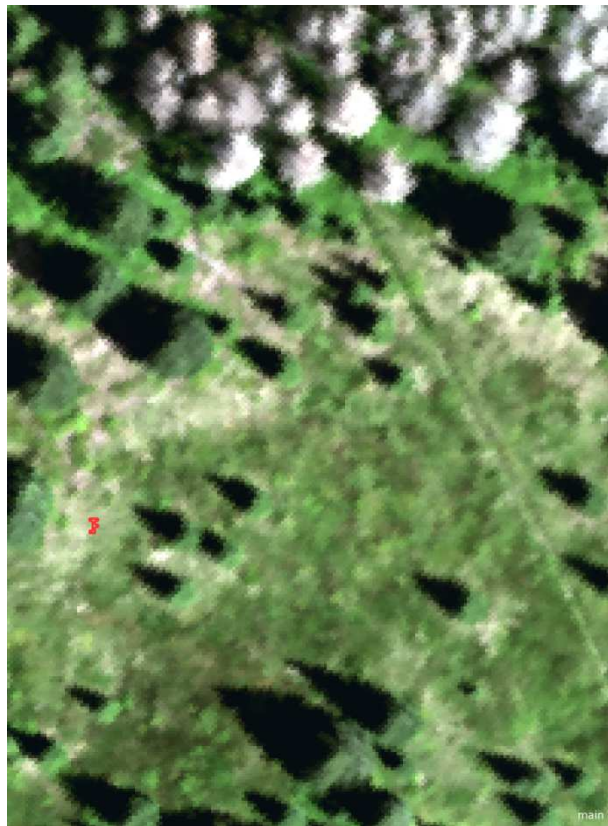


Geo-orthorectification



How will the project be run?

results interpretation



How will the project be run?

Five workshops with practical applications of RS:

- 1. assessment of fresh-water reservoirs (RAWAT, ENKI, JCU)**
- 2. evaluation of soil properties (Biological Center, JCU)**
- 3. modelling of agroecosystems functioning in changing climatic conditions (Mendel Univ., CVGZ)**
- 4. 3-D modelling from LiDAR data (Technical Univ. Brno)**
- 5. synergistic use of airborne remote sensing data (HS, TIR, LiDAR) for the evaluation of vegetation (CVGZ)**



How will the project be run?

Visits to partner's institutes

**Preparation of common projects,
publication and a monograph**

**Dissemination of results – university
education, participation in conferences**

**Project duration
10/2012 – 9/2014**



Objectives of the kick-off workshop

Presentation of basic principles of remote sensing, the current use of different types of remote sensing data in various subject fields, information on building the global geo-information database GEOSS, and data availability

Introduction of each project partner, his research activities and the expected benefits of remote sensing applications for the discipline

Round table discussions about cooperation between project partners - the preparation of common topics for next practical workshops, projects and publications

Logistics and practical aspects of running the project



Logistics of the kick-off meeting

Organizer

Department of Remote Sensing, CVGZ

Administration of the project - meeting of partner administrators

Project web page: <http://hydap.czechglobe.cz>,
intranet

Lunch – Sheringham hotel



Program Nov.14th

- 9:30 – 12:30 **Basic principles of remote sensing, the current use of different types of remote sensing data in various disciplines**
Siri Jodha Singh Khalsa, CIRES, University of Colorado
discussion
- 10:45 – 11:00 Coffee break
- 12:30 – 13:00 Discussion – common topics
- 13:00 – 14:00 Lunch
- 14:00 – 14:30 **Remote sensing in the CzechGlobe, Jan Hanuš**
- 14:30 – 17:00 **Soils, vegetation, carbon sequestration processes in spoil heaps after brown coal mining**
Jan Frouz, Biological Center, Institute of Soil Biology
discussion
- 15:30 – 15:45 Coffee break
- 17:00 – 17:30 Discussion – common topics



Program Nov. 15

- 9:00 – 12:00 **Agriculture production in changing climatic conditions**
Zdeněk Žalud team, Mendel Univ.
discussion
- 10:30 – 10:45 Coffee break
- 12:00 – 12:30 Discussion – common topics
- 12:30 – 14:00 Lunch
- 14:00 – 16.30 **LiDAR - a tool for 3D object recognition**
Technical Univ. Brno team
discussion
- 15:15 – 15:30 Coffee break
- 16:30 – 17:30 **DAFNE partner and its role in HYDAP**
Martin Střelec and DAFNE team, České Budějovice
discussion



Program Nov. 16

- 9:00 – 12:00 **Thermal and water regime of different ecosystems**
Jakub Brom team, University of South Bohemia and Jan Pokorný team, ENKI Třeboň discussion
- 10:30 – 10:45 Coffee break
- 12:00 – 12:30 **discussion – common topics**
- 12:30 – 14:00 Lunch
- 14:00 – 16:30 **Eutrophication of fresh water reservoirs**
Blahoslav Maršálek team and RAWAT team discussion
- 15:15 – 15:30 Coffee break
- 16:30 – 17:00 **discussion – common topics**
- 17:00 – 17:30 **Workshop summary and next steps (RS team + all partner leaders)**

