FG1: **Forest condition, disturbance & biomass**

Frantisek Zemek, Bogdan Zagajewski, Jana Albrechtova et al.

Inputs for reporting: recommendations and action items

FG1: **Forest condition, disturbance & biomass**

FG1: Members - Teams

Czech Republic:

• *Frantisek Zemek, CzechGlobe:* combined space/airborne data, forest decline and forest regeneration process

•*Jana Albrechtová, Lucie Kupková, Zuzana Lhotáková CU Prague &* Monitoring forest conditions using VNIR spectroscopy, hyperspectral data

•Lukáš Brodský (Gisat, Czech Life Univ.) – forest pedology , spectroscopy, multispectral, hyperspectral data

•***US: Petya Campbell, UMBC & NASA/GSFC*** –

•**JRC** *Lorenzo Busett o, JRC/EU: forest fires*

•**Poland:** *Bogdan Zagajewski, University of Warsaw/Poland* hyperspectral images and neural networks, Vegetation mapping

Romania:*Vladimir Gancz, Forest Research and Management Institute, Voluntary, Romania* clear cutting of forest detection on Landsat imagery

Bulgaria: *Lachezar Filchev:SRTI-BAS/* Bulgaria

FG1: **Forest condition, disturbance & biomass**

1. **National overview/general RS-based forest research trends, topics**
2. **Methodology – quantitative or qualitative RS (multispectral, hyperspectral, LIDAR, etc.) combinations, problems to solve**
3. **Facilities, products, data available**
4. **Research questions/tasks (data, tools, projects support, cooperation etc.)**
5. **Research needs/lacks (data, tools, projects support, cooperation etc.)**
6. **List of current RS forest research projects (national, international)**
7. **Links of projects web pages and other national forest research related links**
8. **Other remarks…..**

FG1: **Forest condition, disturbance & biomass**

1. National overview/general RS-based forest research trends, topics

- **CZ, PL:**

- Specific ecosystem/forest processes: C fluxes, elevated CO2, limate change, bark beetle
- Monitoring forest health by qualitative RS,
- Monitoring forest composition, community by combiend quantitative et qualitat. RS
- natural ecosystem disturbances in protected areas
- Validation of the forest cover products
- Grassland functioning, detection of grassland management

BG:
Ro:
Uk:
SK:

JRC:
NASA-….

FG1: **Forest condition, disturbance & biomass**

2. Methodology – quantitative or qualitative RS (multispectral, hyperspectral, LIDAR, etc.) combinations, problems to solve

- **Combination of airborne/space RS**
- **LIDAR**
- **Hyperspectral, VNIR Spectroscopy, PLSR modeling**
- **Poor data availability**

FG1: **Forest condition, disturbance & biomass**

3. Facilities, products data available

- **GLOBAL:**

CZ
PL:
BG:
Ro:
Uk:
SK:
JRC:
US-NASA…

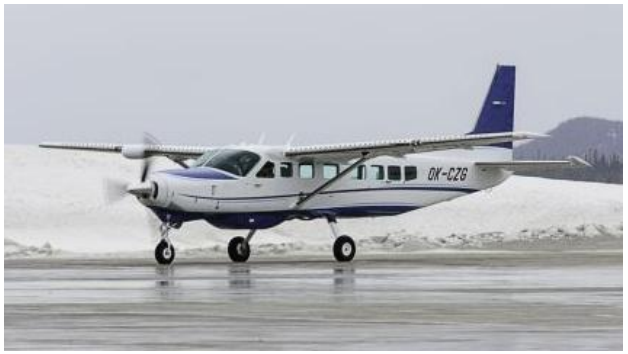
CzechGlobe
Centrum výzkumu globální změny AV ČR, v.v.i.

CzechGlobe RS Infrastructure

Key components of RS infrastructure

Flying Laboratory of Imaging Systems (FLIS) + field campaign instrumentation

- Photogrammetric **aircraft** with two acquisition open slits for imaging RS instruments



- Airborne imaging **spectroradiometer**
  - visible and near infrared (**VNIR**)
  - short wavelength infrared (**SWIR**)
  - thermal infrared (**TIR**) of EM spectral regions
  - **IMU/GPS** units
- **Full-waveform LiDAR** airborne laser scanner for mapping geometrical characteristics of the Earth surface objects

CzechGlobe
Centrum výzkumu globální změny AV ČR, v.v.i.

Objectives of RS in the CzechGlobe

- **Simultaneous airborne imagery data acquisition** by imaging **spectroradiometers and active LiDAR** scanner and development of standard operational **algorithms** for processing
- Development of **LiDAR and HS fusion within RT models** to estimate reliably of biochemical and biophysical parameters of vegetation
- Testing RS data/technique in detecting the newly identified stress induced functional **links between metabolic indicators and physiological traits**

Data sets acquired by RS Czechglobe

http://mapserver.czechglobe.cz/mapserver.html

3. Facilities, products data available

Facilities

Products

Data

Sites

CZ
PL:
BG:
Ro:
Uk:
SK:

JRC:
NASA-…

FG1: **Forest condition, disturbance & biomass**

4. Research questions/tasks (data, tools, project support, cooperation etc.)

Quantitative and/or qualitative RS?

- Specific ecosystem/forest phenomenon (changes in structure, biochemical properties)
- Changes in health status - which parameters can we estimate from RS as indicators?
- Change in species composition due to anthropogenic impact and/or climate extreme events
- Estimation of above ground biomass, **carbon sequestration**
- Natural ecosystem disturbances in protected areas
- Monitoring forest health by qualitative RS,
- Validation of the forest cover products

- **Spatial extent, data?**

- Specific ecosystem/forest processes: C fluxes, elevated CO2, climate change, bark beetle
- Monitoring forest composition, community by combiend quantitative et qualitat. RS
- natural ecosystem disturbances in protected areas
- Grassland functioning, detection of grassland management
- **Forest fires**
- **Forest LC changes – deforestation**

FG1: **Forest condition, disturbance & biomass**

Research methods (data, processing),

- Field, airborne, satellite data acquisition,
- Data processing chains
- Validation of data processing

Up and down scaling

Validation of the forest cover products
CZ
PL:
BG:
Ro:
Uk:
SK:

JRC:
NASA-…

FG1: **Forest condition, disturbance & biomass**

5. Research needs/lacks (data, tools, project support, cooperation etc.)

- **Poor data availability: data sources, sharing the data through database of SCERIN**
- **Joint projects with collaborators out of the region (and inside)**

CZ
PL:
BG:
Ro:
Uk:
SK:

JRC:
NASA-…

FG1: **Forest condition, disturbance & biomass**

6. List of current RS forest research projects (national, international)

CZ
PL:
BG:
Ro:
Uk:
SK:

JRC:
NASA-…

7. Links of projects web pages and other national forest research related links

FG1: **Forest condition, disturbance & biomass**

Possible SCERIN joint activities in FG 1: Forestry RS research

FG1: **Forest condition, disturbance & biomass**

Name/team	Country	Forest topics, problems	Tools	Area/region	Data available	Collaboration
Frantisek Zemek, CzechGlobe:	CZ	Specific ecosystem/forest processes: C fluxes, climate change, bark beetle - natural ecosystem disturbances in protected areas -Validation of the forest cover products -Grassland functioning, detection of grassland management	Lidar Hyperspectral combined space/airborne data	CZ – Beskydy …		
Jana Albrechtova, Lucie Kupkova Zuzana Lhotakova Charles Univ.	CZ	-Monitoring forest health by qualitative RS, -natural ecosystem disturbances in protected areas -Grassland functioning,	airborne hyperspectral data VNIR spectroscopy	CZ – Krusne hory, Sokolov, Karkonosze	CZ – Krusne h 2013, (Sokolov 2009) Karkonosze 2012, 2013	