Geoinformation Technologies, Spatio-Temporal Approaches, and Full Carbon Account for Improving Accuracy of GHG Inventories

Prepared by
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Project overview

7FP – Marie Curie Actions
International Research Staff Exchange Scheme
Grant Agreement N° 247645

• Project duration: June 2010 – May 2014
• 4 partners from 3 countries
• Coordinator: Systems Research Institute PAS, Poland
• EU contribution: € 192,600
• Over 100 secondment months for 22 researchers
## Consortium

<table>
<thead>
<tr>
<th>Consortium Member</th>
<th>Location</th>
<th>Early stage researchers</th>
<th>Experienced researchers</th>
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</thead>
<tbody>
<tr>
<td>1. Systems Research Institute, Polish Academy of Sciences</td>
<td>SRI, Poland, Warsaw</td>
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<td>3</td>
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<tr>
<td>2. International Institute for Applied Systems Analysis</td>
<td>IIASA, Austria, Vienna</td>
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<td>3. Lviv Polytechnic National University</td>
<td>LPNU, Ukraine, Lviv</td>
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<tr>
<td>4. National University of Life and Environmental Sciences of Ukraine</td>
<td>NULESU, Ukraine, Kyiv</td>
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• Greenhouse gases (GHG) inventories involve uncertainty.
• For most countries, the emission uncertainty is higher than the emission changes agreed on under the Kyoto Protocol.
• Reducing inventory uncertainty is essential to quality of compliance.

The project builds on earlier cooperation, formed already during the workshops on *Uncertainty in Greenhouse Gas Inventories*: the 1st (Warsaw, 2004), 2nd (Vienna, 2007), and 3rd (Lviv, 2010).
**Project objective**

To **improve accuracy** of GHG inventories in countries with diverse regions, and/or large afforestation, where standard inventory procedures are insufficient.

**Means**

→ spatially distributed inventories
→ detailed forest modeling

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**Global carbon budget**

- Land use change
- Fossil fuel

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**Work Package 1**

**Work Package 2**

**Work Package 3**
As one of the cosignatories of the UNFCCC and the Kyoto Protocol, Poland is obliged to annually submit National Inventory Reports.

**Our aim** is to get **spatially resolved** GHG inventory. Regionalization of emission factors allows to decrease inventory uncertainty.

**Deliverables**
- Digital maps of GHG emission with respect to sectors
- Information technology for spatial GHG inventory
- Proposals of effective ways for uncertainty reduction
Improving accuracy of inventories by means of spatio-temporal statistical methods

Development of spatial GHG inventory crucially depends on availability of low resolution activity data. In Poland, relevant information needs to be acquired from national/regional totals.

**Goal**
Application of *statistical scaling methods* to produce higher resolution activity data

**Deliverables**
- Detailed map of GHG related activity data in Poland (to be used in WP1)
- Methodology for spatial scaling of GHG activity data
- Spatially resolved activity data of potential use for other emissions
Full carbon account of forest ecosystems: Adaptation for Ukraine

**Why forests?**
- highly complicated and poorly understood role of forests in global carbon cycle
- complicated structure of forest ecosystems

**Goal**
Modification and adaptation of FCA methodology for Ukraine

**Deliverables**
- Database containing forest live biomass measurements
- Semi-empirirical models for assessing dynamics of live forest biomass
- Spatial distribution of major indicators of the FCA
- Analysis of uncertainty
- Assessment of biospheric role of Ukrainian forests and their impact on the global carbon cycle

**Two Major Goals of the Full Carbon Account (FCA)**
- To quantify all carbon pools and fluxes included in the account
- To reliably estimate uncertainties
Knowledge transfer in the project
**Pros**

- Mutual benefit of the **knowledge transfer**
- Opportunity to conduct **direct joint research**, guaranteed by formal agreements
- For researchers from Ukraine, in particular the **young ones**, a chance to contact the EU research centres

**Cons**

- **No funds** for research activities or expenditures such as data acquisition
- No possibility of secondments **within the EU**
- Need for **legal expertise** in the preparation of Partnership and Consortium Agreements
Thank you for your kind attention.

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