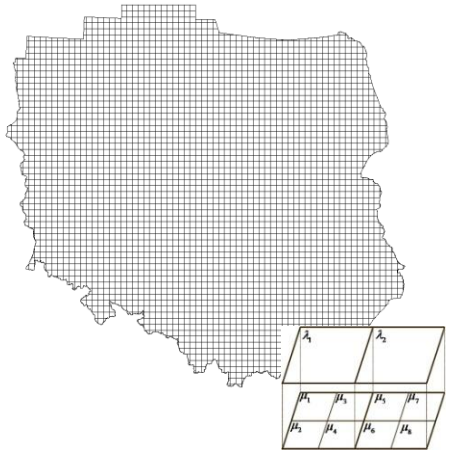
Geoinformation Technologies, Spatio-Temporal Approaches, and Full Carbon Account for Improving Accuracy of GHG Inventories



Prepared by
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Systems Research Institute
Polish Academy of Sciences

International Institute for Applied Systems Analysis
IIASA www.iiasa.ac.at

Project overview

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

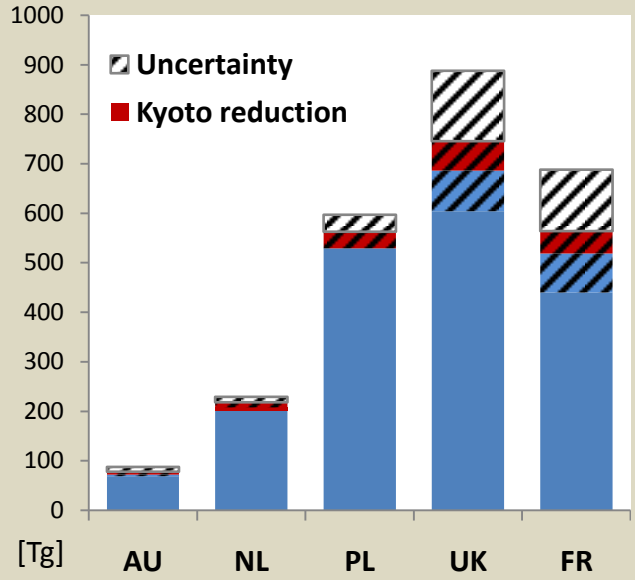
- Project duration: June 2010 – May 2014
- 4 partners from 3 countries
- Coordinator: Systems Research Institute PAS, Poland
- EU contribution: € 192,600
- Over 100 secondment months for 22 researchers

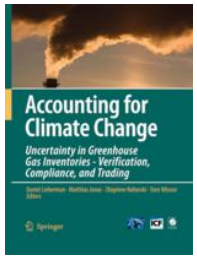
Consortium

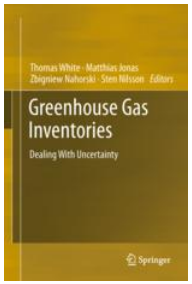
				Early stage researchers	Experienced researchers
1	Systems Research Institute, Polish Academy of Sciences	SRI	Poland, Warsaw	-	3
2	International Institute for Applied Systems Analysis	IIASA	Austria, Vienna	-	7
3	Lviv Polytechnic National University	LPNU	Ukraine, Lviv	2	4
4	National University of Life and Environmental Sciences of Ukraine	NULESU	Ukraine, Kyiv	3	3

Project background

- 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).

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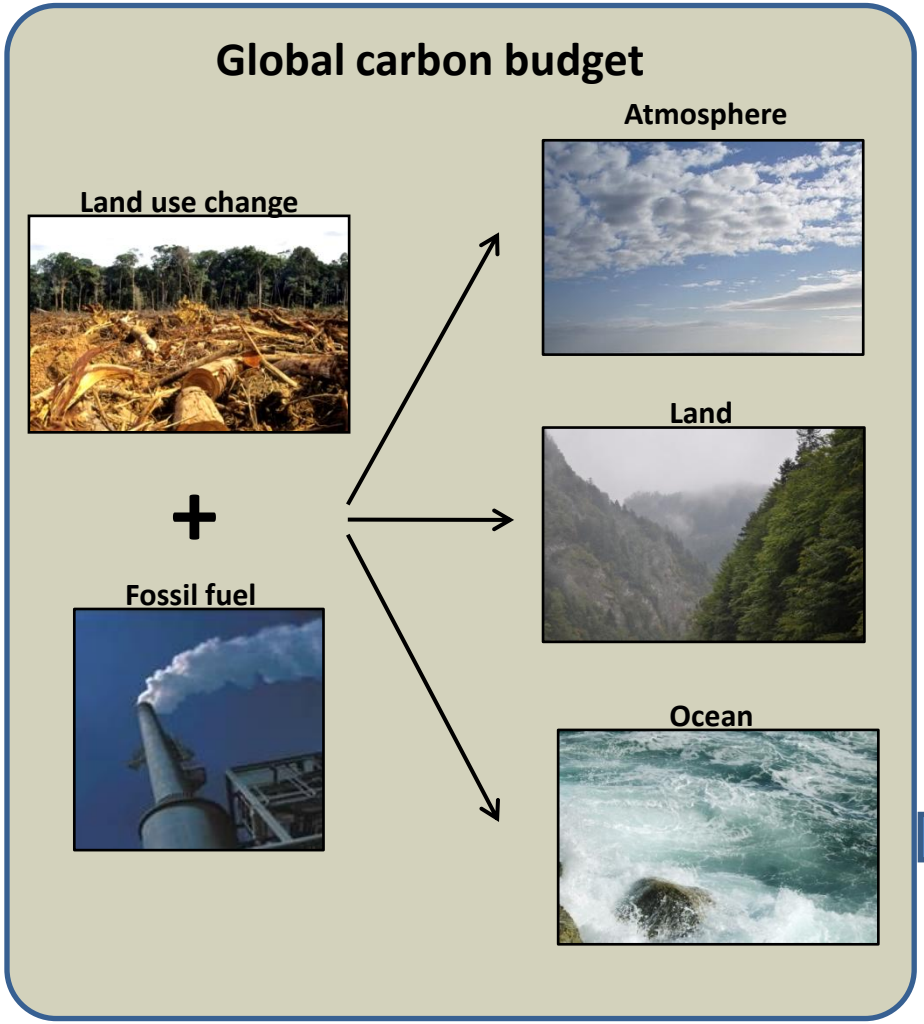
Project framework



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

Work Package 1
Work Package 2
Work Package 3

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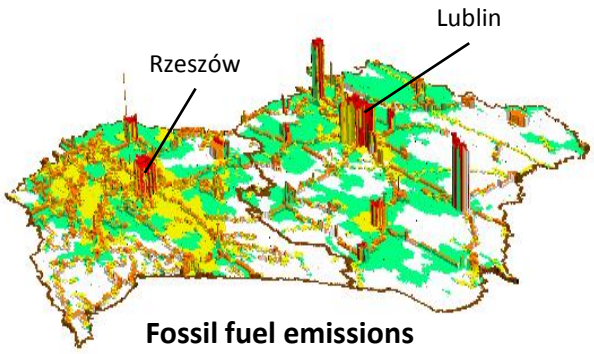
Spatially resolved GHG inventory for Poland

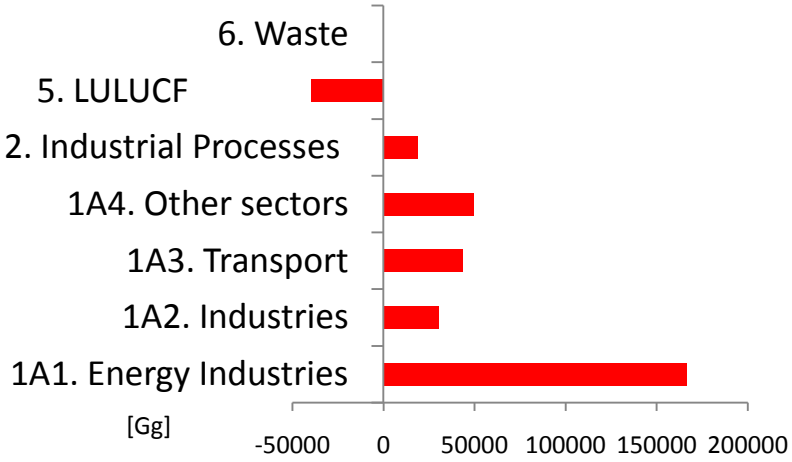
Work Package 1

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.



Fossil fuel emissions



CO_2 emissions in Poland, NIR 2009

Deliverables

- Digital maps of GHG emission with respect to sectors
- Information technology for spatial GHG inventory
- Proposals of effective ways for uncertainty reduction

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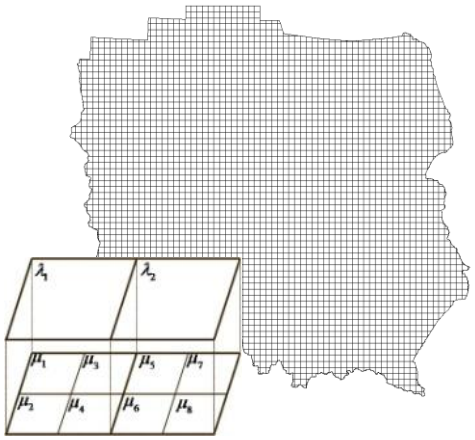
Improving accuracy of inventories by means of spatio-temporal statistical methods

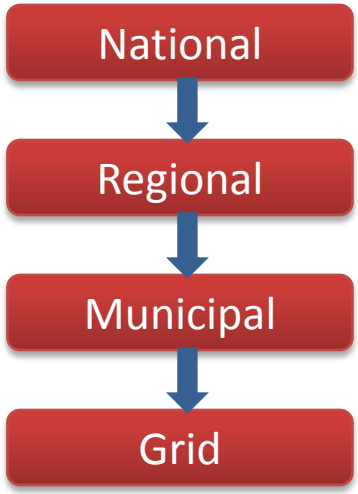
Work Package 2

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





Disaggregation framework

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

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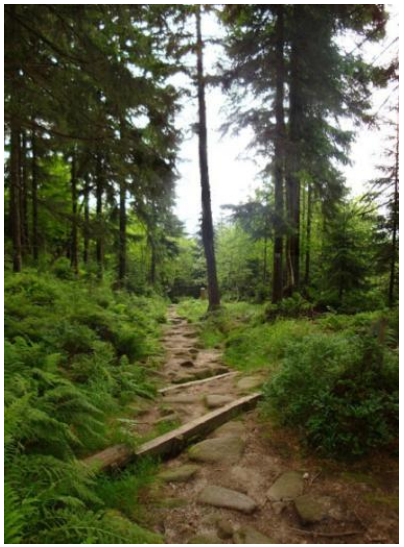
Full carbon account of forest ecosystems: Adaptation for Ukraine

Work Package 3

Why forests?

→ highly complicated and poorly understood role of forests in global carbon cycle

→ complicated structure of forest ecosystems



Two Major Goals of the Full Carbon Account (FCA)

- To quantify all carbon pools and fluxes included in the account
- To reliably estimate uncertainties

Forestry Program IIASA

Goal

Modification and adaptation of FCA methodology for Ukraine

Deliverables

- Database containing forest live biomass measurements
- Semi-emipirical 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

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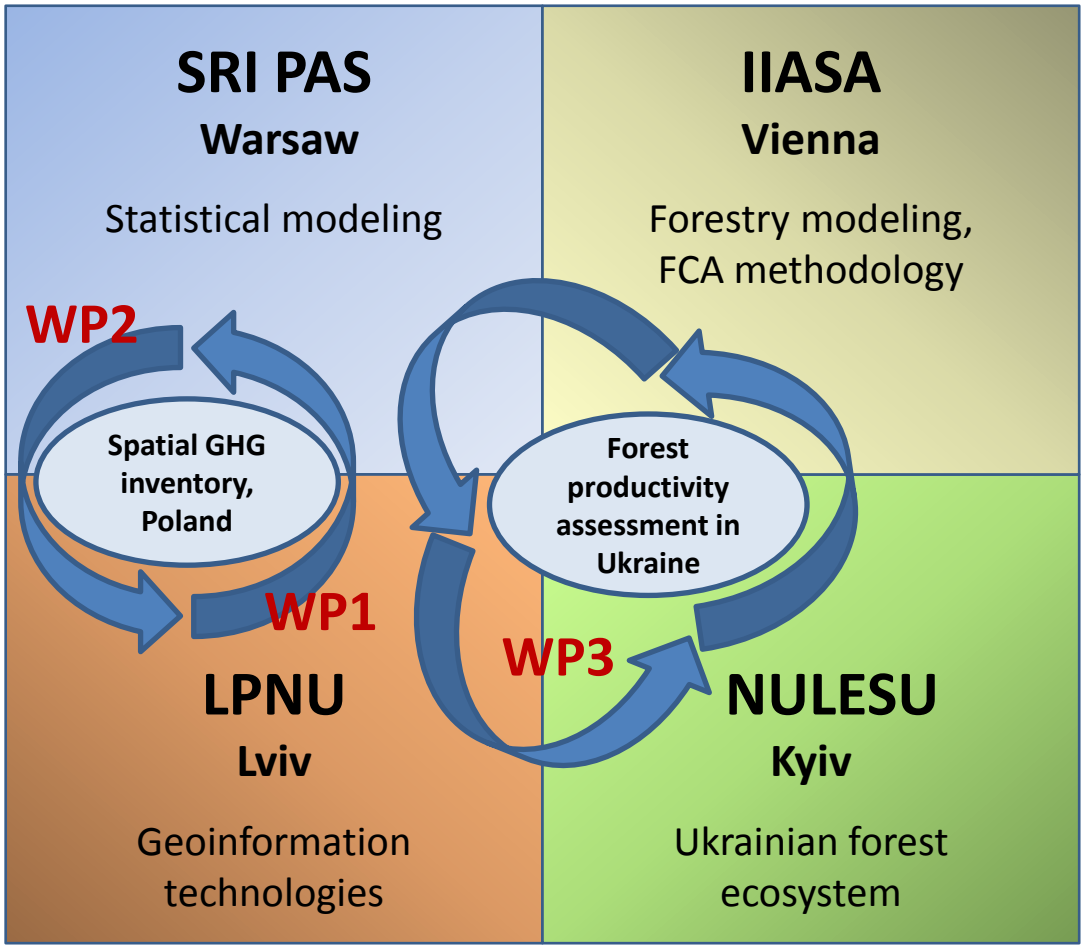
Knowledge transfer in the project



IRSES scheme

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

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Thank you for your kind attention.

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