Mapping greenhouse emissions to prevent climate change

Published by Anonymous (not verified) on Wednesday, 11/06/2014
Last modified by Anonymous (not verified) on Tue, 30/12/2014 - 12:40

- Achievements [1]

EU-funded researchers have used advanced modelling and geo-spatial information to compile more accurate greenhouse gas inventories for Poland and Ukraine. The approach could substantially improve the accuracy of national inventories of greenhouse gases and boost Europe’s efforts to reduce emissions.

Date:
11/06/2014 - 16:57

Project:
Geoinformation technologies, spatio-temporal approaches, and full carbon account for improving accuracy of GHG inventories


[2]
© Calin Tatu - Fotolia.com

The work by the researchers in the GESAPU project aims to plug information gaps in existing methods for assessing greenhouse gas emissions. This gap is especially true for countries that are heavily forested or have large areas of variable landscape, where it is more difficult to measure emissions using current techniques, says project coordinator Professor Zbigniew Nahorski of the Systems Research Institute, Polish Academy of Sciences.

Using the latest satellite geo-information and modelling techniques developed by Austria's International Institute for Applied Systems Analysis (IIASA), a project partner, the project has resulted in a comprehensive methodology and software tools to improve the accuracy of data collected on greenhouse gas emissions.

The project, which is due to be competed in June 2014, has so far produced more detailed greenhouse gas emission maps of Poland and for the western parts of Ukraine compared to traditional inventories, says Prof. Nahorski. The maps specify emissions by source (for example industry, residential sector, agriculture, or transport) and distinguish by type (for example, electricity or heat production). The team's high-resolution maps also show the impact of regional economic activity, fossil fuel use and new technological processes on as detailed a scale as 2 x 2 km.

To produce a more accurate greenhouse gas account for Ukraine's forests the team has integrated ground data and new remote sensing information, for example, from radar. The project has also developed new software that combines different mathematical models, digital maps and geo-referenced databases.

"There is a clear need to improve greenhouse gas accounting methods to ensure reliable information is provided on industrial, land-use, land-use changes and forestry categories in national reporting," says Prof. Nahorski. *"Our teams are working on advanced methods to resolve this problem."*

Taking stock

The accurate accounting of greenhouse gas emissions is key to the functioning of the European Union Emissions Trading Scheme (ETS). This is a market-based approach that established a quantifiable, legally enforceable limit on emissions. The scheme came into force in 2005 and covers heavy industry and power generation in the EU.

While Ukraine is not in the EU, it has agreed to cut emissions under the Kyoto Protocol, an international agreement linked to the UN's Framework Convention on Climate Change.

But due to gaps in the data and the use of imperfect accounting methods (such as those related to the forestry sector), the scheme does not provide a reliable account (equivalent to that of the Kyoto Protocol) of all man-made sources of emissions, says Prof. Nahorski.

For example, productive and sustainably managed forests can absorb more carbon from the atmosphere. For this advantage to be captured, new methods are required that are based on more thorough studies of the carbon cycle in forest ecosystems, he adds.

To achieve the required accuracy in the inventory of industrial emissions, GESAPU's researchers are working with advanced information technologies and scaled statistical modelling services provided by IIASA and Ukraine's Lviv Polytechnic National University.

The application of this kind of technique to large regions in West Ukraine resulted in a substantial decrease of uncertainties in accounting for greenhouse gas emissions, says Prof. Nahorski. For example by applying distributed emission factors. GESAPU researchers are currently applying and adapting the approach for Poland.

Carbon cycling

The team is also studying the carbon cycle of forest ecosystems in Ukraine. Using remote-sensing data, new models and other tailored methods, GESAPU is building on IIASA's carbon-accounting model for ecosystems so as to provide a more reliable and comprehensive assessment.
The project will result in a valuable and more accurate stocktaking tool for greenhouse gases in Europe and beyond, says Prof. Nahorski. The team is also developing a database that will provide a more detailed measurement of the impact of forest ecosystems in reducing greenhouse gas

GESPAU

See also:

CORDIS [3]

Rapid Press Release:

Do Not Publish as Rapid Press Release

Links
[1] http://ec.europa.eu/programmes/horizon2020/en/newsroom-item-type/achievements
[2] http://ec.europa.eu/programmes/horizon2020/sites/horizon2020/files/newsroom/fotolia_59591370_subscription_small_7047_0.jpg
[3] http://cordis.europa.eu/projects/index.cfm?fuseaction=app.details&TXT=gesapu&FRM=1&STP=10&SIC=&PGA=&CCY=&PCY=&SRC=&LNG=fr&REF=97282