Developed new ways of gathering data

Description

Forest inventory method used worldwide

 A multi-source forest inventory method developed by professor Erkki Tomppo has been recognized internationally since he received The Marcus Wallenberg Prize in 1997. Here is his own story about how he continues to develop the process, adding new features to make the results more reliable.

"Until the mid of the 1990's I had focused primarily on the development of the multi-source forest inventory method and on the practical questions to get it to run smoothly operationally. It is the method that was awarded by the Marcus Wallenberg Prize in 1997. The method combines information from different sources, such as satellite images and digital maps, in addition to traditional field measurements. It produces accurate forest resource statistics for small areas, with a few or no field plots at all, at a reasonable additional cost compared to the expensive field measurements. It also produces forest information in map form.

The prize ceremony was something extraordinary. Sometimes it is even hard to believe it happened. I was also glad and honoured to participate as a member of the evaluation team in 2011, when Erik Næsset was awarded.

The prize inspired me to work even harder, although I have worked practically without any longer breaks, such as vacations, until then. Running of several projects, including Finnish National Forest inventory and also simultaneously research projects meant quite busy years. Some projects focused on improving the quality of the results of the multi-source forest inventory.

I received numerous invitations from my international colleagues to participate in their research projects, and also from students to supervise their PhD theses. The decade starting 2000 was extremely busy but also fascinating when I lead a big COST Action project funded by the European Commission. The main objective was to harmonize forest inventory concepts and definitions in such a way that the inventory results from different countries are comparable. Practically all European national forest inventories participated as well as many universities and research institutes. All major forest countries worldwide collaborated in writing the final product, National Forest Inventories – Pathways for common reporting, published by Springer, 2010.

I also received invitations to assist many countries in establishing and further developing national forest inventories, for example Brazil, Mexico, Tanzania, Vietnam and Russian Federation. I have had, and still have, much pleasure in hosting colleagues from other countries, such as all Nordic countries, Germany, Italy, Spain, Ireland, China, Belarus and Bosnia-Herzegovina.

The Food and Agriculture Organization of the United Nations, FAO, also used my expertise. At times I worked for FAO in Finland and in 2011 in Rome. I still collaborate with leading forest inventory

scientists worldwide. In short, the method that was awarded by the prestigious Marcus Wallenberg Prize is now recognized internationally. It is the most widely used remote sensing aided forest inventory method and under very active trial.

I have continued developing the methods to use remote sensing in forest inventories, adding new features to make the results more reliable. One example is the use of genetic algorithm in the weighting of the variables of remote sensing data and other ancillary data. I also collaborate with ecologists in assessing the habitat quality of the flora and fauna. The map form forest information from the multi-source inventory plays a key role in those studies.

The very recent research is focusing on the methods to assess forest albedo, which is the fraction of the radiation of the sun reflected from a surface, as well as the use of airborne laser scanner data in forest inventories. Albedo plays a role in global radiation balance and thus has an impact on the climate."

Erkki Tomppo

The use of genetic algorithms in weighting variables is just one example of how Professor Erkki Tomppo has continued developing the methods of remote sensing in forest inventory. Photo: Ekki Oksanen.

Marcus Wallenberg Prize 1997

Laureate: Erkki Tomppo, professor of forest inventory

Institution: The Finnish Forest Research Institute, Vantaa, Finland.

Research field: Forest inventory designs and methods