

**Abstract template for the conference “A century of national forest inventories – informing past, present and future decisions”**

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| <b>Abstract title:</b>                                                                                                                                                               |                          | Using NFI-data and the Heureka system for evaluating the bioenergy potential in Swedish forests.                                                |
| <b>Take-home message:</b>                                                                                                                                                            |                          | NFI data has large potential to be used for complex analyses in advanced decision support system for analysing the future bioenergy production, |
| <b>Presenter name:</b>                                                                                                                                                               |                          | Karin Öhman                                                                                                                                     |
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| <b>General topic, see website:</b><br><br>(please double click on the check box and activate the relevant one)                                                                       | <input type="checkbox"/> | Improving future NFIs by learning from the past                                                                                                 |
|                                                                                                                                                                                      | <input type="checkbox"/> | NFIs today and in the future                                                                                                                    |
|                                                                                                                                                                                      | <input type="checkbox"/> | <b><u>Cutting edge and futuristic inventory techniques and technologies</u></b>                                                                 |
| <b>Preferred presentation form:</b>                                                                                                                                                  | <input type="checkbox"/> | <b><u>Oral presentation</u></b>                                                                                                                 |
|                                                                                                                                                                                      | <input type="checkbox"/> | Poster                                                                                                                                          |
| <p><i>Abstracts will be reviewed by members of our scientific committee and you will be given information on decisions in due time after the submission deadline has passed.</i></p> |                          |                                                                                                                                                 |

# Using NFI-data and the Heureka system for evaluating the bioenergy potential in Swedish forests.

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**Introduction:** A transition to a sustainable bio-based economy is a prerequisite for mitigating future climate change. As a result the society strive to break free from a dependence on fossil fuels and instead change to more sustainable alternatives like wood fuels. For forest rich countries like Sweden there are good opportunities to use wood as fuel, combined with timber and pulpwood production. However, at increased extraction rates of forest products, the ecosystem and its ability to contribute with fundamental services will be affected, and a key question is: Can an increased production of forest biomass and forest based products be done in a sustainable way? One way to answer this question is to use a decision support system that could describe the future development of the forest including biodiversity and the provision of other ecosystem services. Our aim is to present how national forest inventory (NFI)-data can be used in an advanced decision support system for analysing the bioenergy potential in Swedish forests.

**Materials and methods:** By using data from the Swedish NFI together with the Heureka decision support system the potential for increasing bioenergy production within forestry was analysed. The long-term effects on a set of different indicators for various ecosystem values were analysed together with an evaluation of which combination of management strategies that was most effective. Heureka is a tool for analyzing different forest management options in order to identify the best approach based upon different objectives and restrictions, i.e. a system for forest impact assessments and consequence analysis. Heureka is based on projections of the tree cover development. Future state of the forest and the provision of ecosystem services are predicted by using data on current conditions, models for applied management actions (regeneration, thinning etc), and models for different ecological processes such as forest growth and mortality. Due to its versatile and advanced functions the system is unique in an international perspective.

**Results:** Preliminary results indicate that the effect on other ecosystem values (such as recreational values) was negative when the demand for bioenergy increased. In addition, it seems to be impossible to provide a high production of bioenergy when simulating restrictive legislation settings regarding when and where biofuel can be harvested.

**Conclusion:** If the society is going to change to a bio-based economy there is a need for adequate forest data and decision support systems that can both evaluate alternative management strategies and the effects on other ecosystem values. As a result using NFI data for advanced analyses in systems like e.g. Heureka could provide important insights of the potential of forestry to contribute to climate change mitigation.