



From long-term monitoring and time series to foresight analyses and projections (C4h)



Jean-Luc Peyron

Origins of the session

- Because forests are composed of long-lived organisms, historical facts and long time series are very useful to make decisions
- These decisions have to look at the future through projections and foresight analyses, the latter becoming increasingly important due to global changes and associated uncertainty
- The link between historical analyses, monitoring, modeling and foresight is obviously very promising
- Many different areas are concerned, such as land use change, tree volume and growth, timber prices and management costs, ecosystem services values, changes in the environmental, social and economic context

Presentations

- Harri Mäkinen (Luke, Finland)
 - Large trees have increased greatly in Finland during 1921-2013, old trees have not
- Aline Canetti (U. do Parana, Brazil)
 - Growth pattern of timber species in an ecotone among Amazon forest types
- Evaldo Braz (Embrapa, Brazil)
 - Analysis of the diametric structure of the Amazonian forests from the point of view of forest management
- Katarina Merganicova (Czech U. of life sciences)
 - Forest responses to environmental perturbations in Central Europe: from permanent research plots to model projections
- Johannes Wildberg (U. of Göttingen, Germany)
 - Applying empirical data of a forest accountancy network to show the effects of tree species diversity on financial risk and economic return in private forest enterprises
- John Kershaw (U. of New Brunswick, Canada)
 - An imputation/copula approach to modeling long-term species dynamics in the Acadian forest of northeastern North America.



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Harri Mäkinen (Luke, Finland)

- Large old trees have been in focus because of their role as a versatile provider of ecosystem services. Combining tree size data with age information provides deeper insight on the ecological role of today's large trees.
- In Finland, the dependence of the national economy on forest industries has involved pressure for increasing wood production via intensive silvicultural measures. As a consequence, both the growing stock and the density of large trees have increased substantially, but no increase of old trees was observed, which suggests that additional measures are needed to preserve biodiversity.
- There is a difference between large and old trees

Aline Canetti (U. do Parana, Brazil)

Evaldo Braz (Embrapa, Brazil)

- The analysis of tree rings is a way to study the past growth of trees considered individually and then at the stand level.
- It allows to support the decision at which trees or stands should be harvested. Doing so, it is important to think per unit area and then to add more economic approaches
- The analysis of the diametric structure of the Amazon forest from 13 forest inventories shows that some thresholds seem to occur when studying the growth. 325 years are necessary to recover after logging.
- Interest to study the long term-growth of trees and the diameter structure of the Amazonian forest.

Katrina Merganicova (Czech U. of life sciences)

- Linking long-term monitoring data and ecosystem models increases the capacity to simulate forest ecosystem dynamics.
- It is also more efficient to support sustainable forest management under global change.

Johannes Wildberg (U. of Göttingen, Germany)

- He combines finance theory with empirical accounting data from 1969 to support the hypothesis that tree species diversity reduces the risk of volatile returns
- It is useful for the manager to understand that diversification of species can be supported both by ecological and economic arguments.

John Kershaw (U. of New Brunswick, Canada)

- Application of copulas to forestry
- It is a powerful approach to model the long-term dynamics of mixed stands, eventually under climate change



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