

Nitrogen economy of a pine forest ecosystem

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Conclusions

- Effect of N addition on N stores in a pine ecosystem are still significant after 29 years
- Soil is the dominant sink for added N
- Liming decreased the N sink capacity of the soil
- N addition increased N export from the pine ecosystem

Background

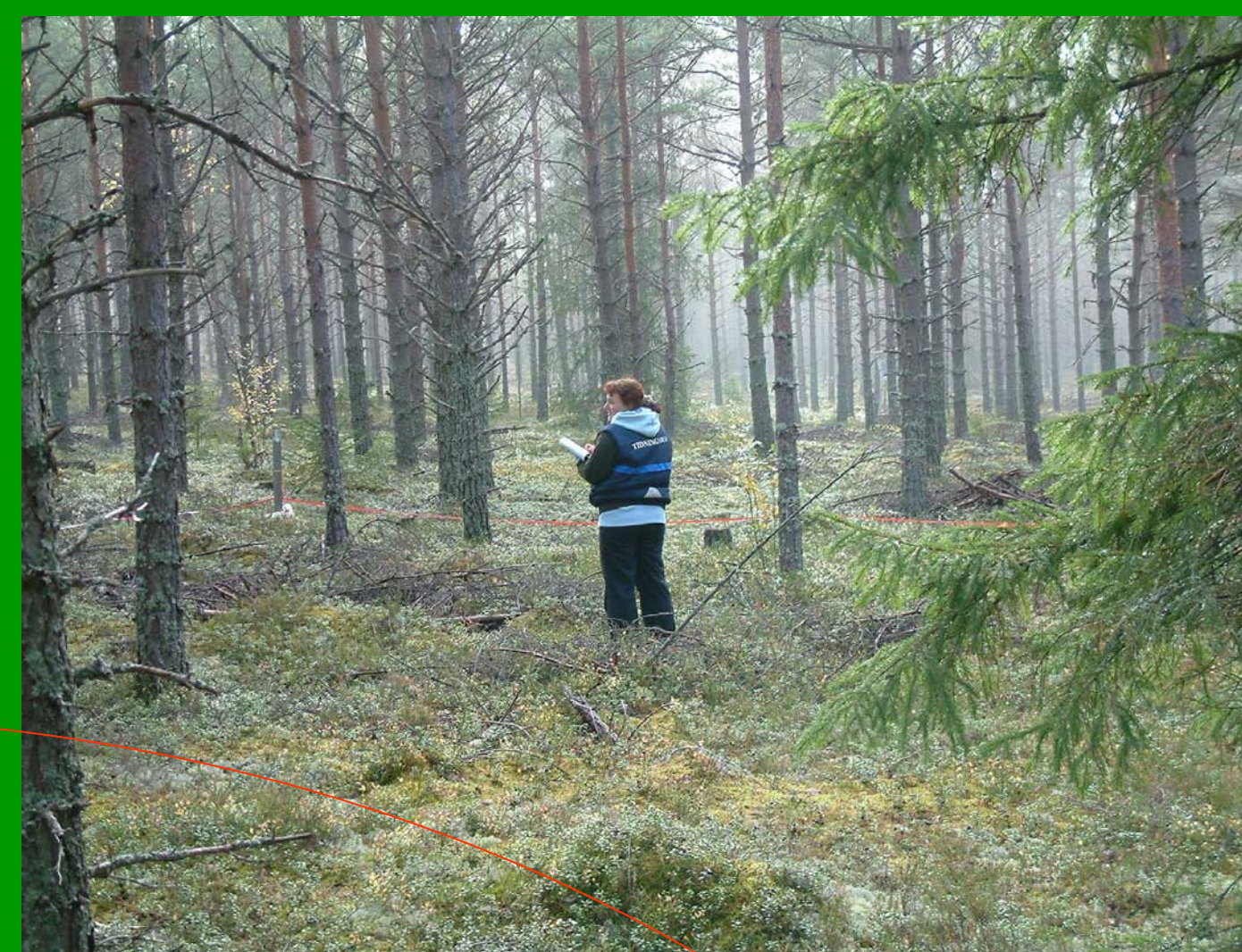
The effects of temperature on the growth of trees are mediated by nutrient availability and the ecosystem perspective is fundamental in predicting the response of growth of trees to environmental changes. However, there is no agreement on how to simulate nutrient uptake. Therefore nutrient budgets have been widely used as an accounting method to elucidate the complex nutrient cycle.

Aim

- To measure N pools in the pine ecosystem
- To address the question: where does N accumulate within a pine ecosystem

Site

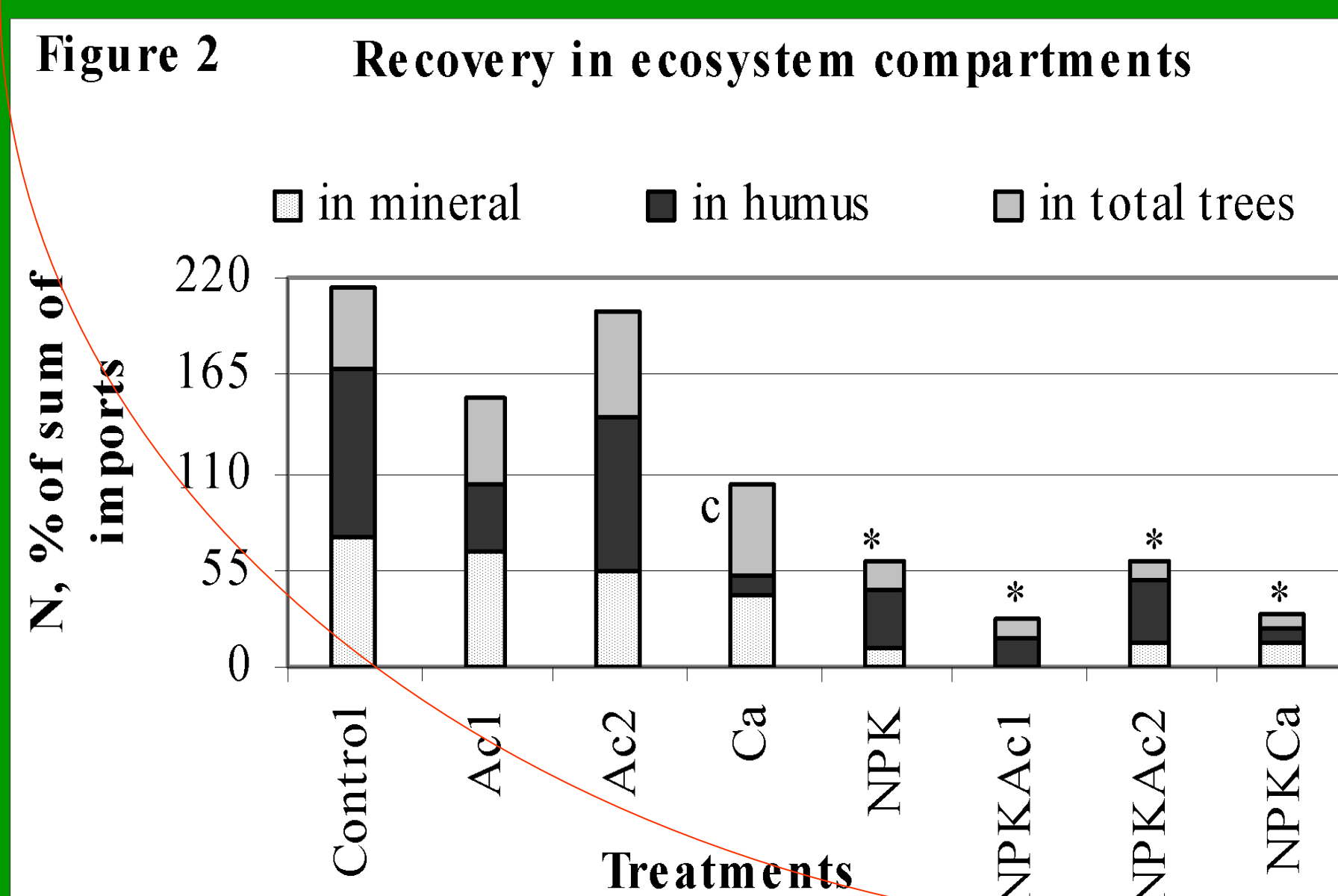
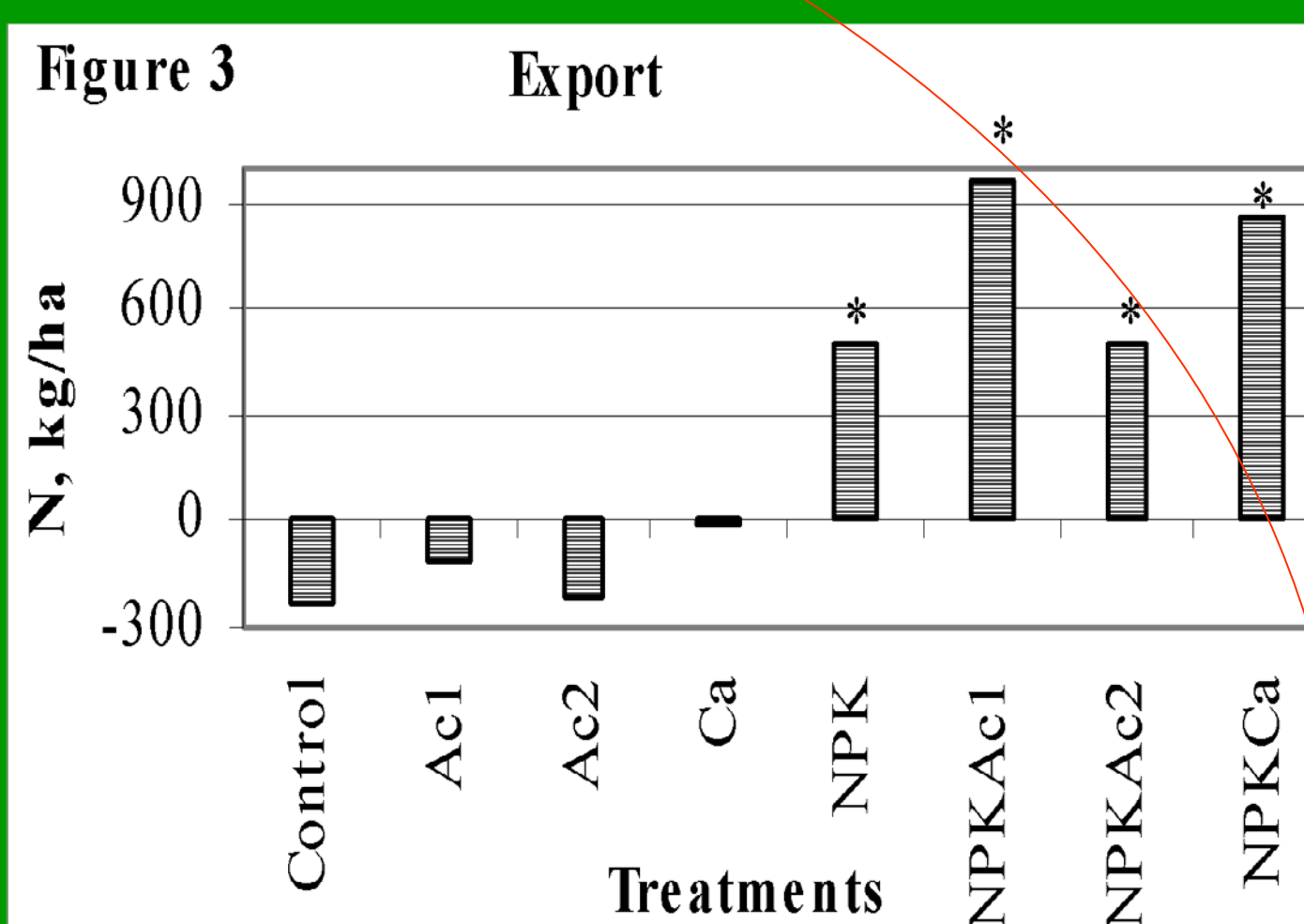
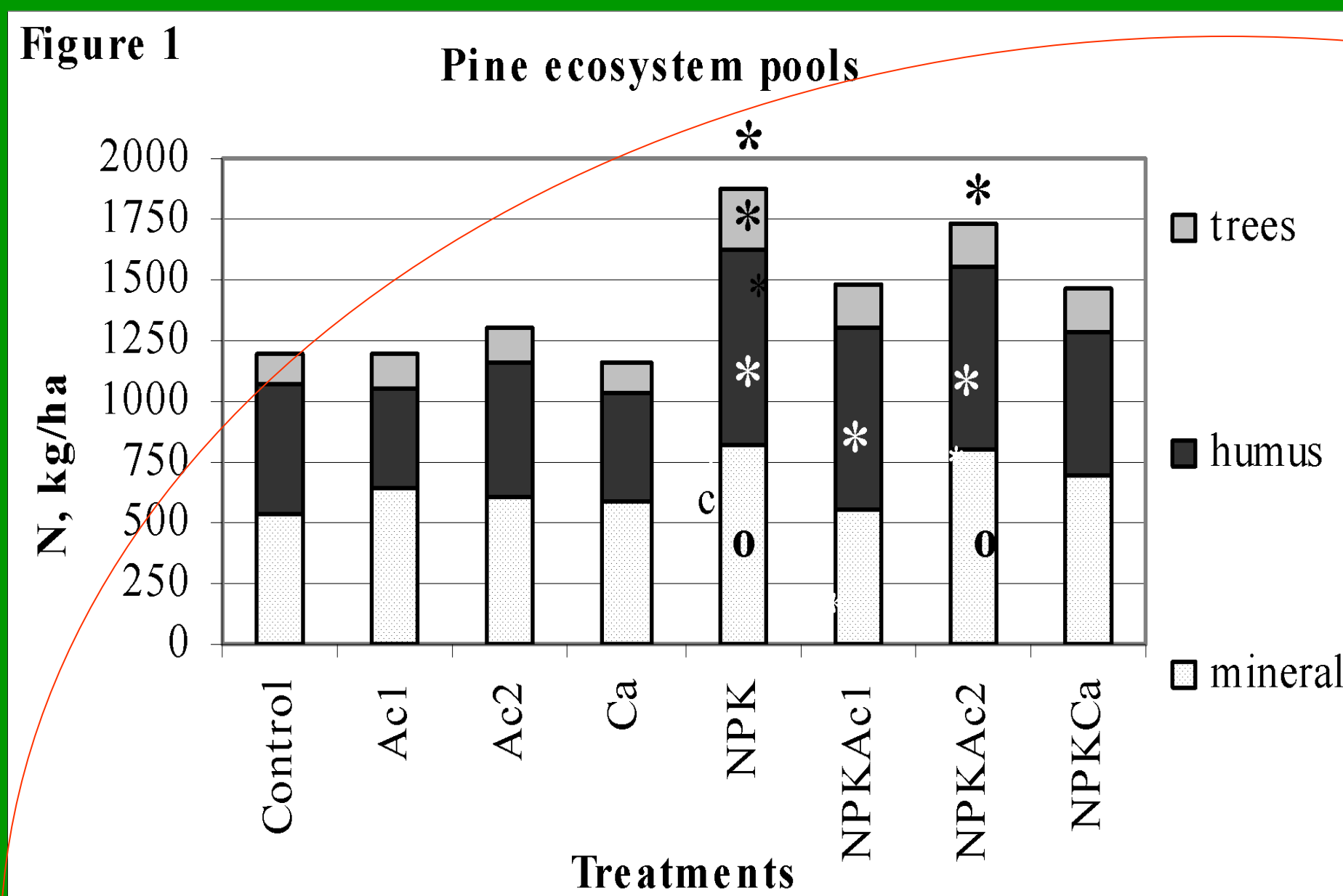
The plots of Exp. E42 at Lisselbo (Central Sweden).



Method



We estimated the total content of N in the three most important pools in the ecosystem (whole trees biomass, humus and mineral soil) 12 years after the cessation of 14 years of annual N additions and used this plot-specific information in budget calculations. The calculations were done for eight different treatments with different additions of nutrient and acids. A total of 1040 kg N/ha was added to the N-treated plots.



Results:

Fig.1. N stores in ecosystem compartments;

Fig.2. Recovery of added N in ecosystem compartments;

Fig. 3. N export from the ecosystem.

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