

REVEALS based reconstruction of regional changes in Estonian vegetation during the Holocene

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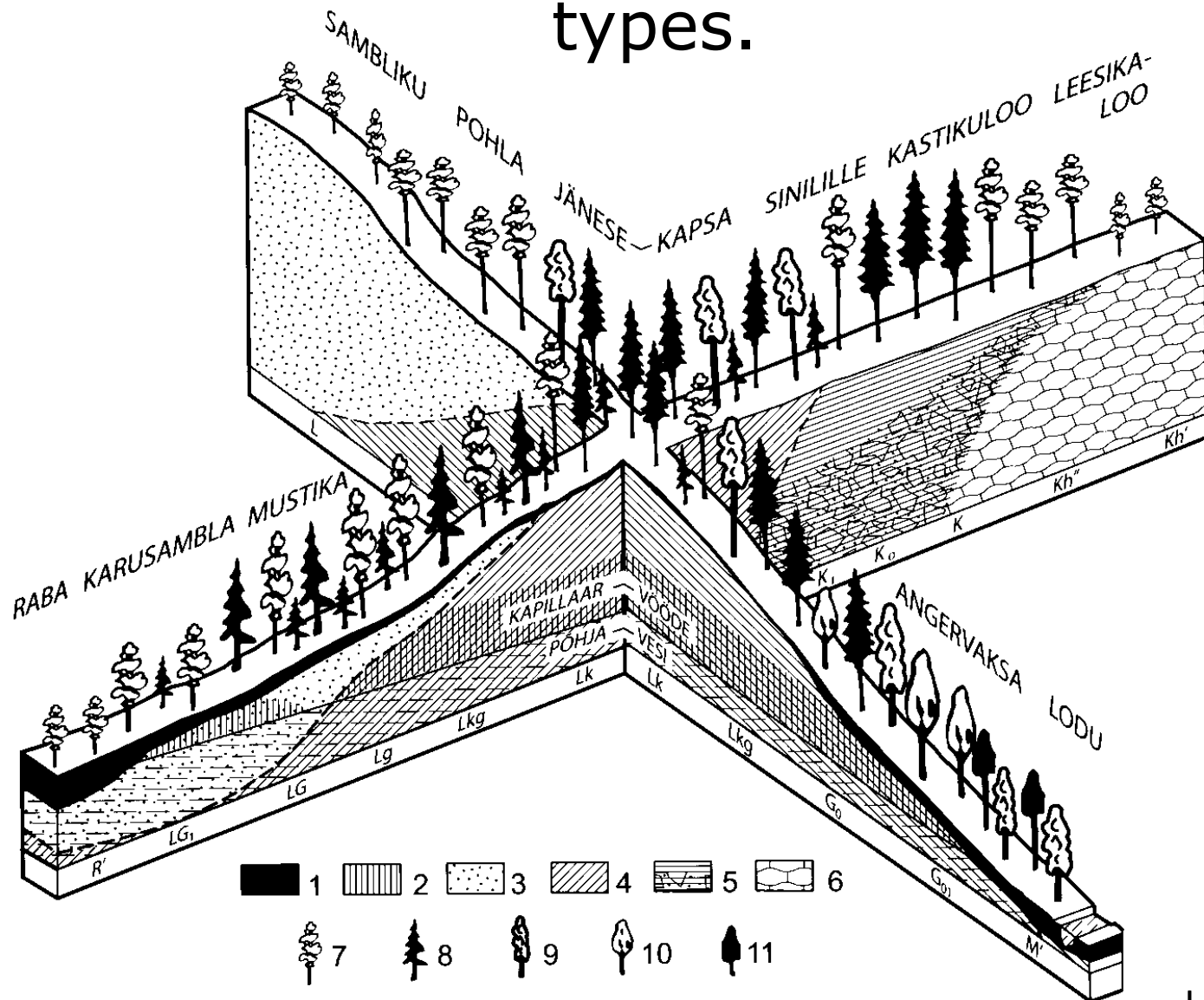


The highest number of lakes are:

- in South-East Uplands: Haanja, Otepää and Karula Heights (more than 25 lakes per 100 sq km)
- in North-East: Kurtna Kamefield (40 lakes on 30 sq km)

~1200 lakes (>1 ha), half of them are <3 ha, 45 are >100 ha
 Covers ~6.1% of the territory
 Two biggest together ~90% of Estonia's lake areas.

Correlation between the Estonian forest types and bedrock type, hydrological conditions, soil types.



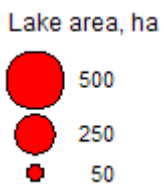
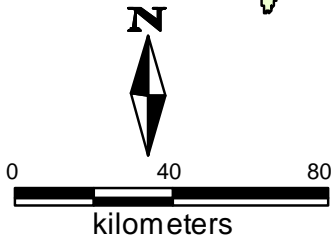
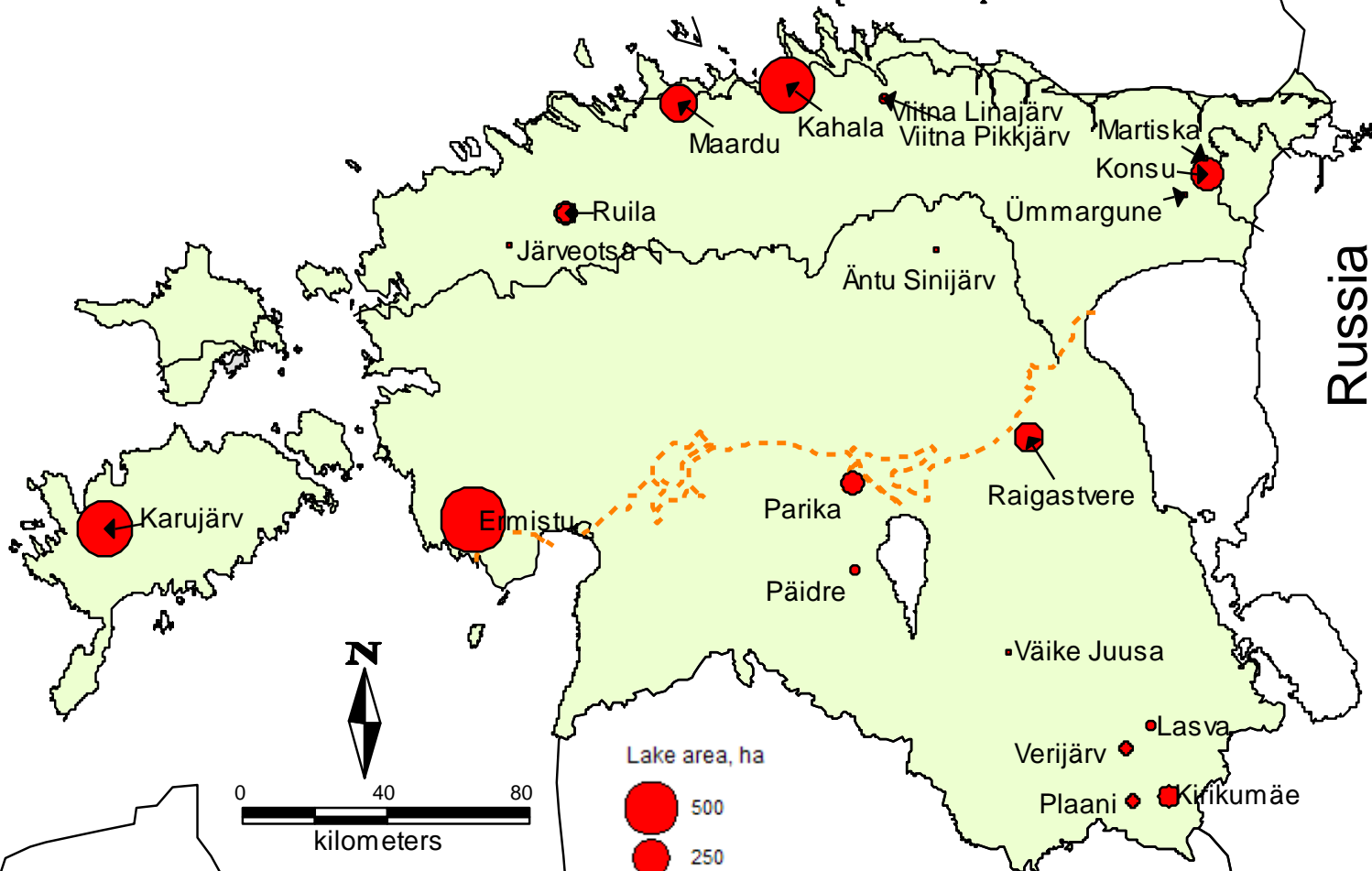
Baltic Sea

Finland

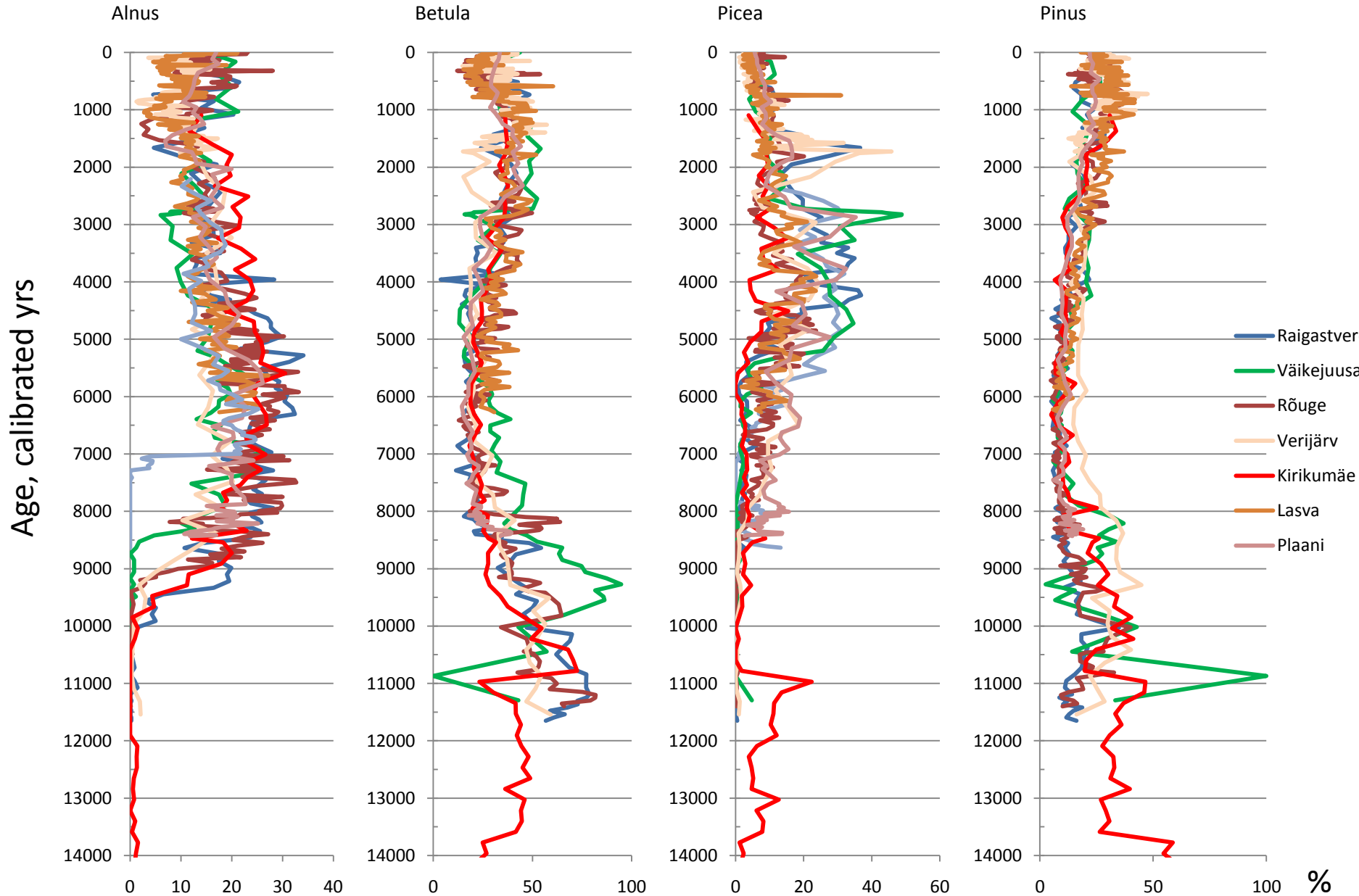
Gulf of Finland

Russia

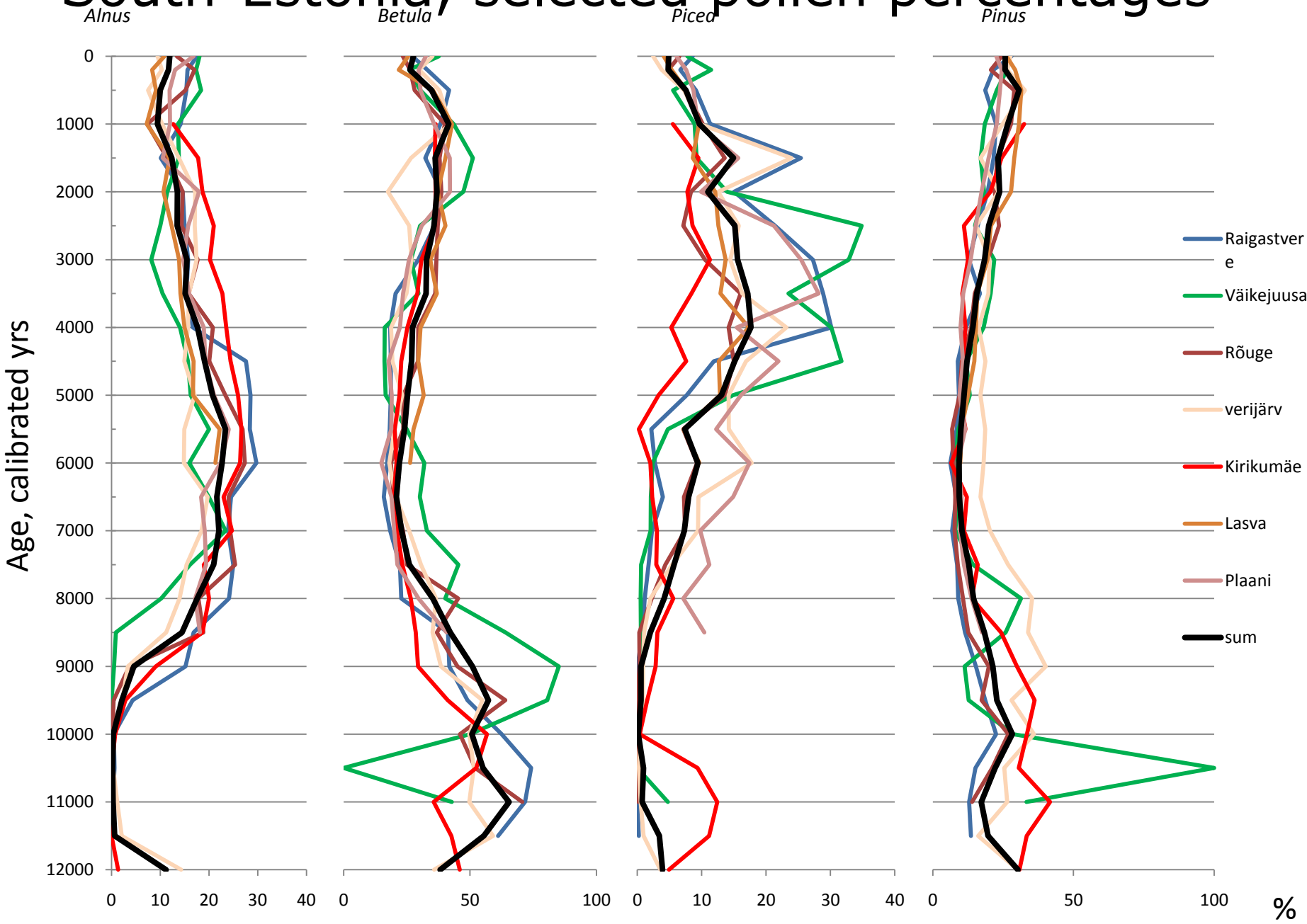
Latvia



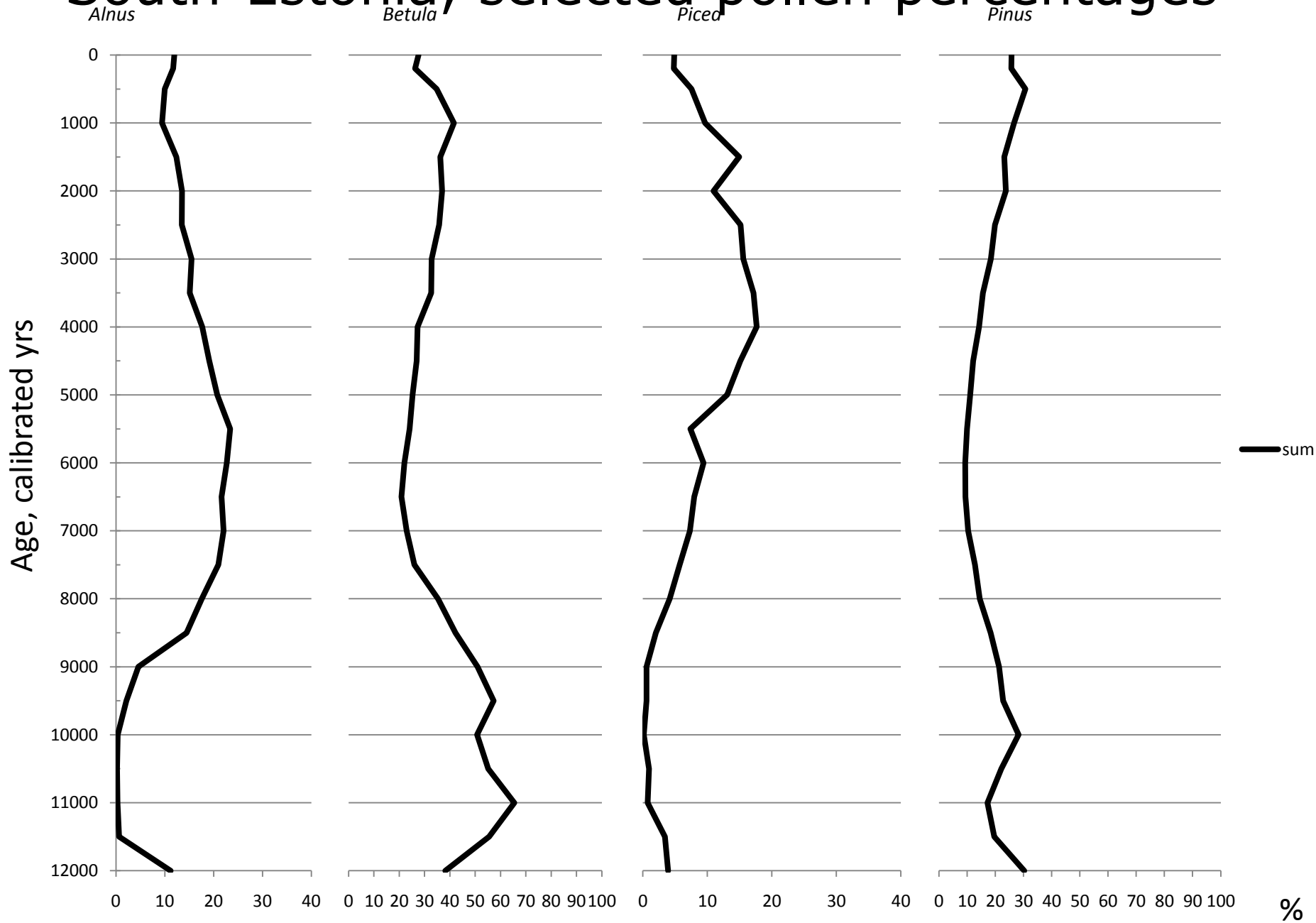
South-Estonia, selected pollen percentages



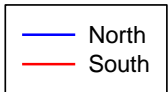
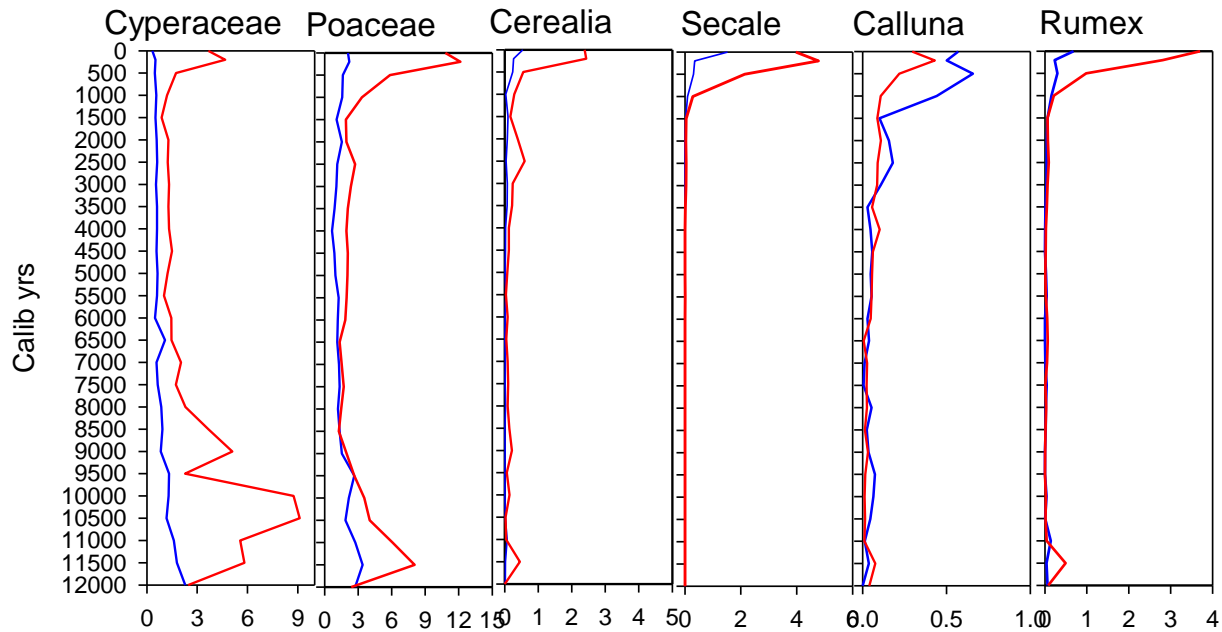
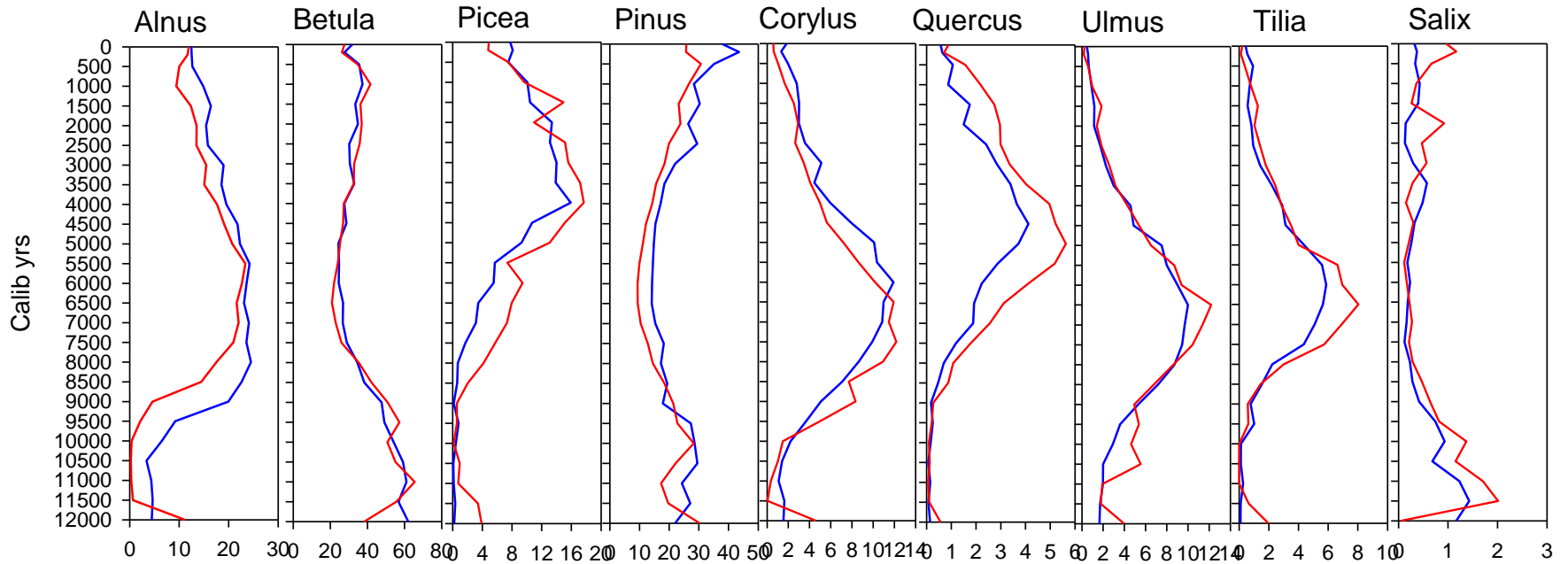
South-Estonia, selected pollen percentages



South-Estonia, selected pollen percentages



North and south Estonia, pollen percentages



Landscape Reconstruction Algorithm

Sugita (2007a,b) *The Holocene*, **17**,
229-241 & 243-257

Generalized Extended R-value Model
(Prentice & Parsons 1983; Sugita 1994)
by incorporating changes in regional
vegetation and landscape, and thus
background pollen, through time

estimates of
pollen
productivity

Generalized R-value Model (Davis
1963) by incorporating (1)
intertaxonomic differences in
pollen dispersal characteristics
and (2) basin size

estimates of
the relevant
source area
of pollen at
target sites

Step

REVEALS model expresses regional vegetation composition of *species i* within 50-100 km as;

$$\hat{V}_i = \frac{n_{i,k} / \hat{\alpha}_i \int_R^{Z_{\max}} g_i(z) dz}{\sum_{j=1}^m \left(n_{j,k} / \hat{\alpha}_j \int_R^{Z_{\max}} g_j(z) dz \right)}$$

Required: pollen productivity estimates
 (Sugita 1998; Broström et al 2004; Nielsen 2004),
 pollen dispersal function and pollen counts
 from sites ≥ 100 -500 ha in size.

Baltic Sea

Finland

Gulf of Finland

N-E-Estonia

N-Estonia

Russia

S-Estonia

Latvia

Lake area, ha



500

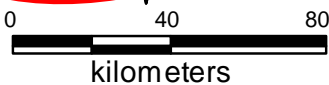


250

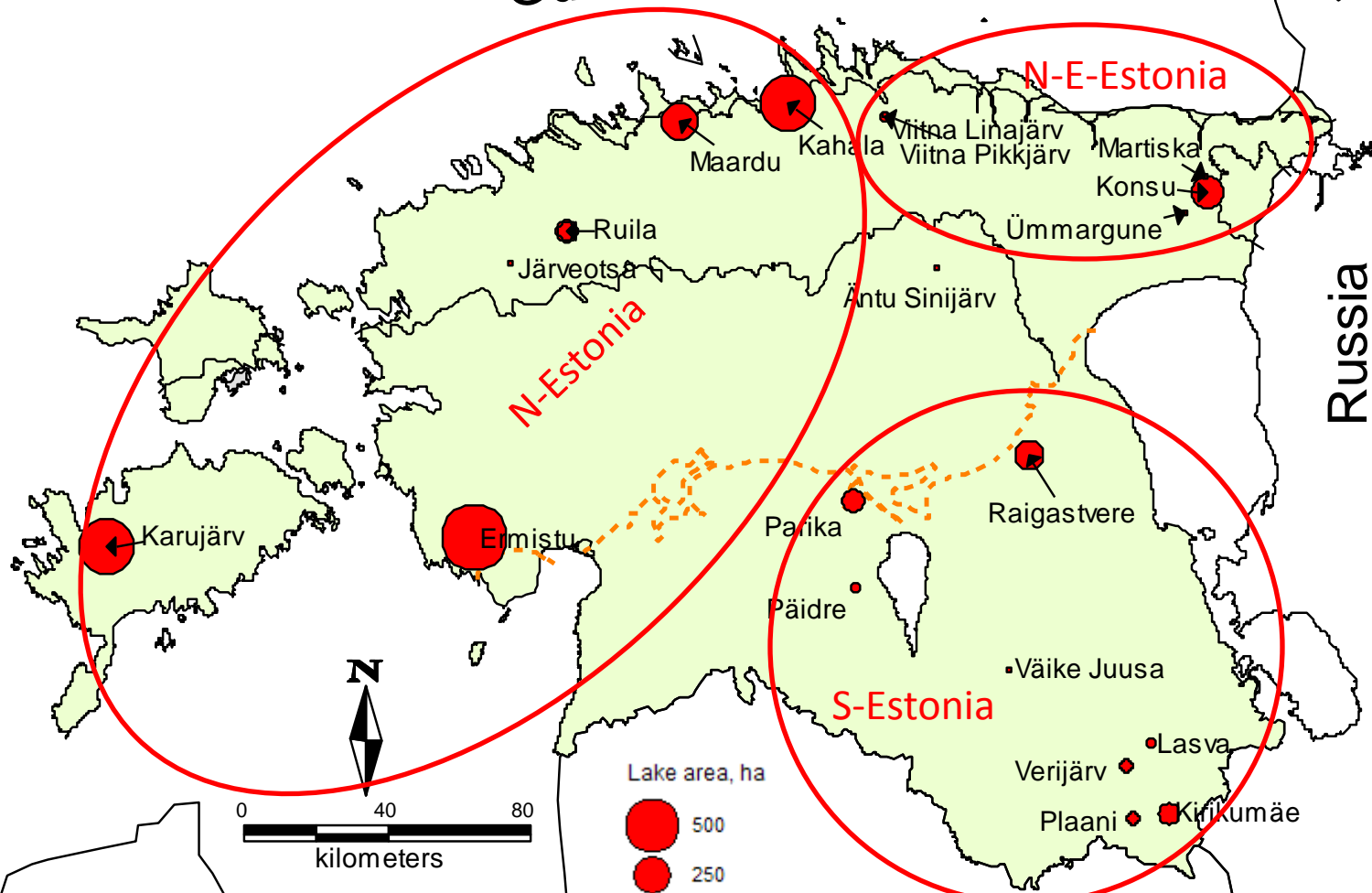


50

N



kilometers



Ruila

Järveotsa

Maardu

Kahala

Viitna Linajärv

Viitna Pikkjärv

Martiska

Konsu

Ümmargune

Äntu Sinijärv

Karujärv

Ermistu

Parika

Raigastvere

Päidre

Väike Juusa

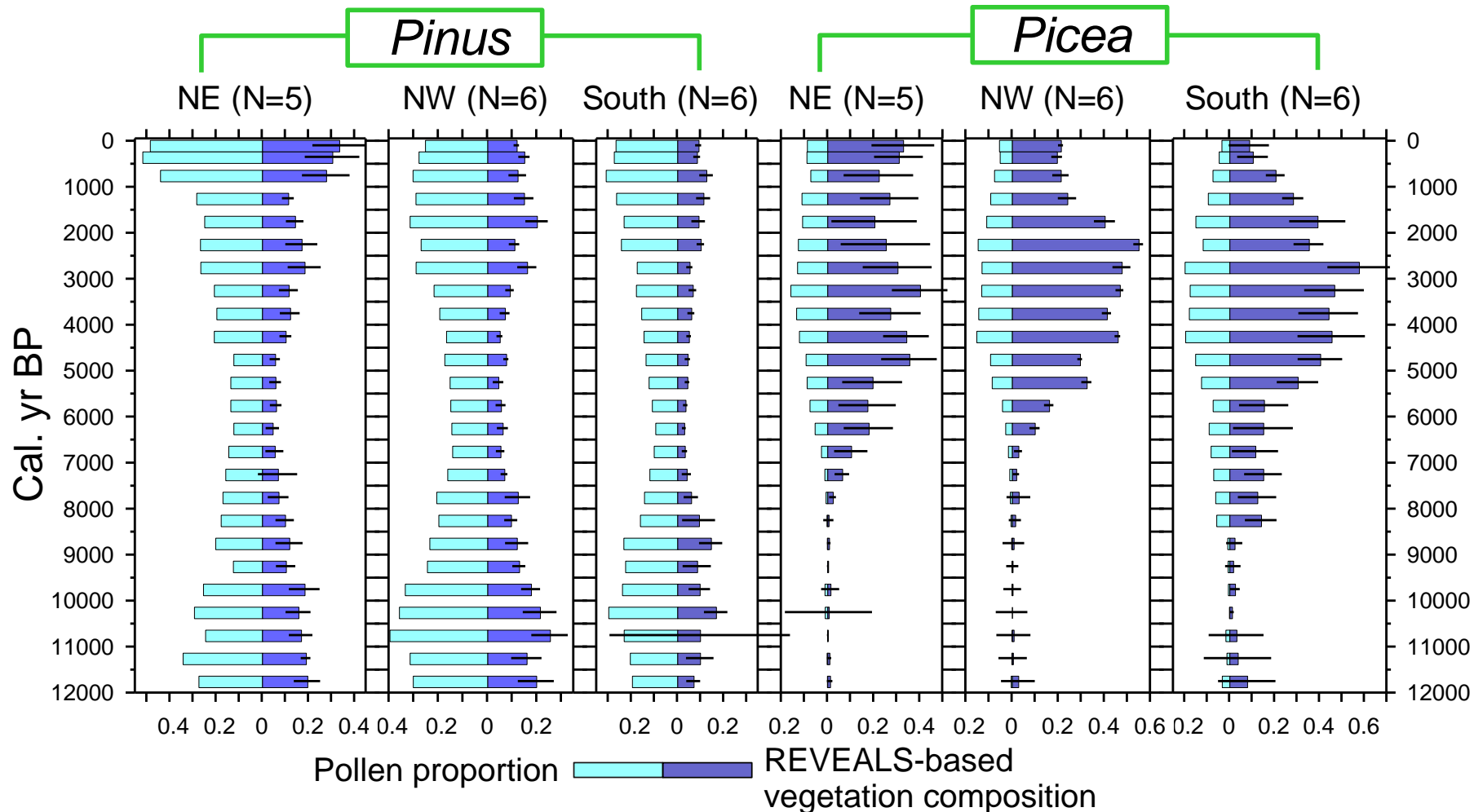
Verijärv

Lasva

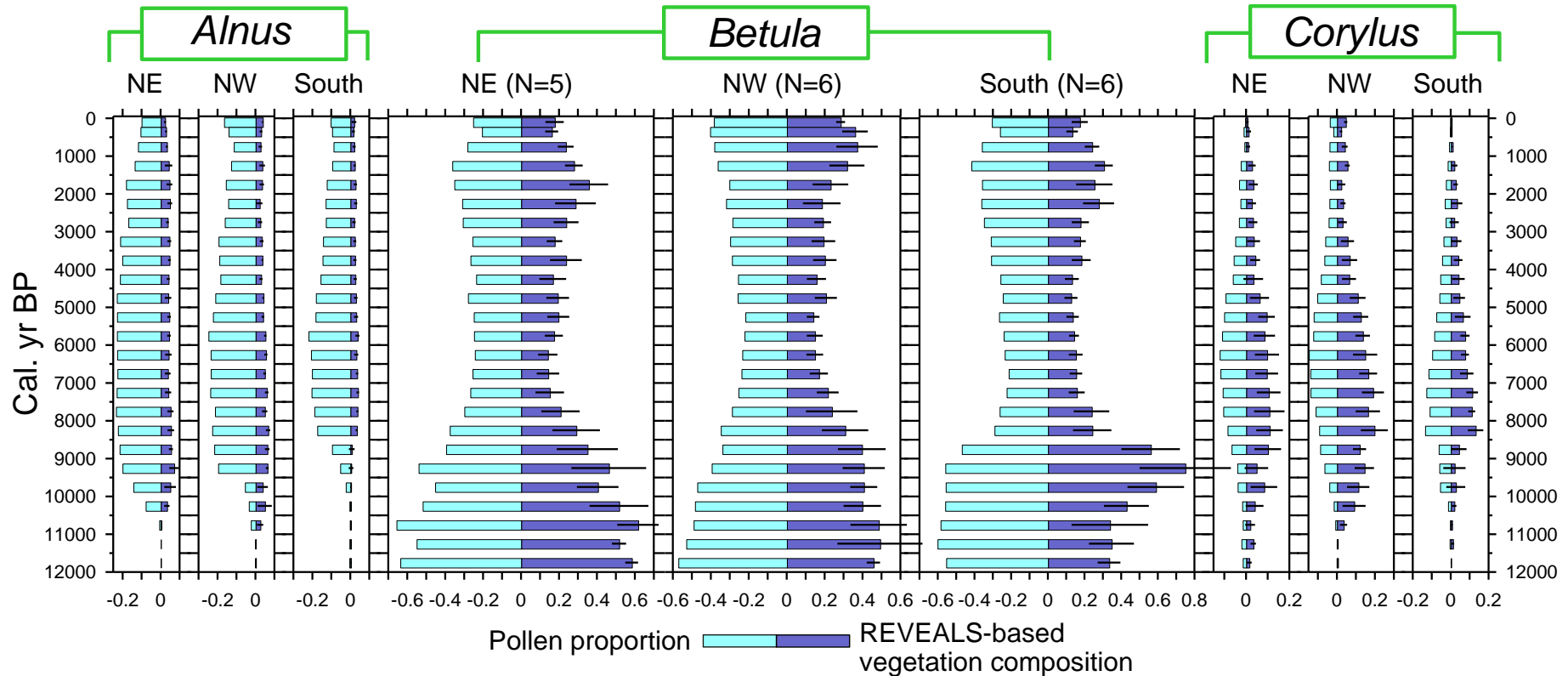
Plaani

Kirikumäe

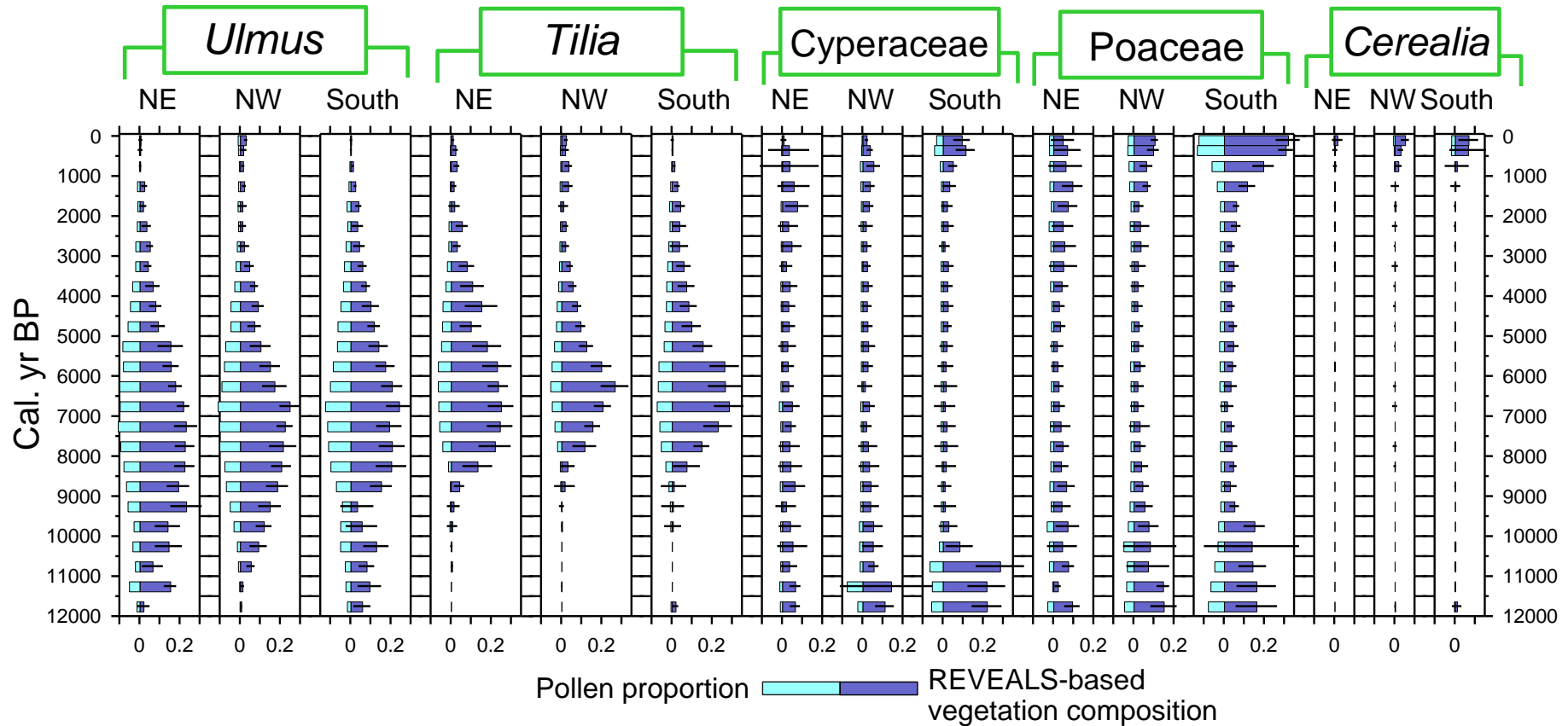
Regional changes in vegetation and land cover in Estonia (Sugita, Kangur, Koff and others, in prep)



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