

an increasing in eccentricity was found progressing from the pit to the bark and abrupt growth reductions have been rarely recognized.

This different trees reaction to the wind action can be related to the structure of the woods and the geomorphological settings. In the rocky coast sites the presence of a well-developed shrubs layer acts as a barrier against the direct effect of wind on tree trunks. On contrary, in the coastal plain the wind can flow and spread against the entire trunk, being the trees community even-aged and mostly at the same height level.

## Dating of pine timber from historical buildings in Lithuania

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Thirty samples from Scots pine (*Pinus sylvestris* L.) timber taken from historical buildings of Lithuania were precisely dated and together with living pines used for construction of the long-term chronology. Samples were taken from churches, monasteries and estates located in the central – Kaunas region (Kaunas Karmelitai Church, Kaunas Jezuitai Church, Kaunas City Hall, Aukstoji Freda Estate, Zapyskis Church and Skaruliai Church) and eastern – Vilnius region of Lithuania (Vilnius Evangelikai Reformatai Church, Vilnius Benediktines Church, Vilnius Benediktines Monastery, Vilnius Sv. Mykolas Church, Vilnius Trinitoriai Monastery, Vilnius Cathedral and Vilnius City Hall).

The most valuable material – samples containing more than 100 rings mainly are from old churches and monasteries in Vilnius region. For the dating of younger samples we used two chronologies compiled from living pine trees: Vingis Park – 24 trees (1673-1989) from Vilnius and Panemune Silas – 8

trees (1783-2002) from Kaunas. These two chronologies show very similar radial growth patterns. For the dating of older material, especially from Vilnius churches, we used successfully two long-term pine chronologies: Dannenstern House from Latvia by dr. Maris Zunde (1445-1740) and Polpinus-5 from Poland by dr. A. Zielski (1106-1991). Dating results showed that the pine timber material mainly used in the constructions of Lithuanian Churches and Monasteries is from middle of the 17th century up to middle of the 19th century. This means that the material from older periods is quite almost lost during the war fires in the middle ages and the biggest amount of taken samples are representatives of the reconstruction works.

As a result of the dating work a long-term pine chronology containing 516 rings and spanning 1487-2002 was compiled. Chronology shows strong trans-regional signal – high similarity with the chronology of Dannenstern House ( $t = 7.7$ ) and Polpinus-5 ( $t = 6.6$ ).

Pointer year analysis on the radial growth of dated samples was also carried out. Negative pointer years were established in 1557, 1599, 1619, 1629, 1659, 1762, 1811, 1865, 1889, 1896, 1940 and 1979 and positive in 1559, 1602, 1611, 1656, 1723, 1779, 1866, 1910, 1978 and 1982. Interpretation and further analysis of the older events before the regular meteorological observations could give a valuable information on climate anomalies in Lithuania and neighbouring countries.

## Studying radial and axial variation of stable isotopes within a single oak tree

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Due to carry-over effects of reserve-substances, i.e. carbohydrates, in oak wood, isotopic studies