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For living old trees growing in northern boreal sites (62 -69°N) in Fennoscandia, Femundsmarka (in south eastern Norway; FE) and Sivakkovaara (in south eastern Finland; SI) all at similar latitudes, and in Kessi (in northern Finland; KE) at a higher latitude, 400 years of isotope ratio series of carbon, oxygen and hydrogen were produced. We analysed the correlations of stable isotope ratios of tree ring celluloses with local climate parameters for the periods which instrumental data were available, and compared the temporal changes in isotope series at sites and between sites. Correlations between isotope ratios and climate parameters during the 20th century were strongest and positive for carbon and oxygen with summer (Jul-Aug) temperature, and weaker and negative with precipitation. Hydrogen isotope ratios correlated positively with summer (Jul) temperatures at both southern sites (FE and SI), but negatively (Jun) at the northern site (KE). The annual isotope ratios between different elements in the same trees in the 20th century showed the strongest correlations between oxygen and carbon at all sites and between hydrogen and carbon at southern sites (FE and SI). The correlation between hydrogen and oxygen was weaker; positive at FE, negative at KE and negligible at SI. During the full 400 years the correlations between the elements varied greatly among different centuries. Common patterns in isotope series between sites were found in variations of hydrogen isotope ratios in both southern sites (FE and SI) in the 20th century showing positive correlation with summer (JJA) North Atlantic Oscillations.

Theme: O06. Stable isotopes in dendrochronology

Presentation Type: Poster

DENDROECOLOGY OF SEBASTIANIA COMMERSONIANA (BAILL.) L.B. SM. & DOWNS IN AN ATLANTIC FOREST REMNANT AFFECTED BY AN OIL SPILL EVENT IN SOUTHERN BRAZIL

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A dendroecological study of *Sebastiania commersoniana* (Euphorbiaceae) was conducted in a remnant of Alluvial Araucaria Forest (Atlantic Forest), with environmental and floristic characteristics common to southern Brazil, Uruguay and parts of Argentina and Paraguay. The species is one of the most abundant and representative of this forest type. The study area is located in Araucaria (25°34'02.5' S; 49°20'53.5' W), Parana, Brazil, near a floodplain forest heavily impacted by a spill of four million liters of crude oil by Petro leo Brasileiro S.A. in 2000. The research objective was to evaluate differences in water table height and the possible effects of the oil spill on the growth in stem diameter of the species. Three radial time series from the wood of individuals were collected using increment probes in two geographical locations, both on hydromorphic soils (Haplic Gleisol), but differing in the depth of the water table: Site 1 (n = 13) of average depth and Site 2 (n = 6) of shallow depth. Radial time series were developed and correlated with the climate data in the region. Results showed that individuals from both sites had similar growth patterns, that of decreasing radial increment over time. Precipitation influenced growth only in Site 1. Minimum temperature is a limiting factor, while maximum temperatures are important in the early growth period. On the other hand, in warmer months the occurrence of very high temperatures can be limiting, likely promoting transpiration losses.

Theme: O01. Tropical dendrochronology

Presentation Type: Poster

ANALYSIS OF GROWTH RINGS OF SEBASTIANIA COMMERSONIANA IN A RIPARIAN FOREST FROM THE RAIN FOREST BIOME IN SOUTHERN BRAZIL

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Several species in tropical and subtropical regions present potential characteristics for dendroecological studies, among them *Sebastiania commersoniana* (Baill.) L.B. Sm. & Downs, typical tree of Alluvial Araucaria Forest, pertaining to the Atlantic Forest, with environmental characteristics (hydromorphic soil) and floristic common to southern Brazil, Uruguay and parts of Argentina and Paraguay. Were selected and cut 56 trees of this species in a forest remnant (25°34' 02, 5'S, 49°20'53, 5' W) on the banks of Barigui river, a major tributary of the Alto Rio Iguacu, Araucaria, PR, in 2001, in a section subjected to rectification of the bed about 30 years ago. With the grinding process of the riverbed, possibly the dynamic growth of these trees have been altered. Thus, the present study aimed to investigate these relationships by: (i) the analysis of time series developed from the analysis of discs (cross-sections of the trunk) taken at breast height (1.30 m), (ii) standardization of these series in order to remove biological growth trends and highlight climate signals, (iii) the construction of a chronology for the study area, and (iv) the correlation with climatic variables of precipitation and temperature (minimum, average and maximum). The results support the potential application of the species in dendroecological studies, considering the timing of data and sensitivity to climatic variables (minimum temperature). It found a reduction of growth presented from the mid-1960s which was concomitant with the period of rectification of the riverbed.

Theme: O01. Tropical dendrochronology

Presentation Type: Poster

δ18O AND δ13C FLOATING CHRONOLOGIES FROM LATE-GLACIAL NEW ZEALAND KAURI (AGATHIS AUSTRALIS)

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Carbon and oxygen isotopes in tree rings have proven high potential for climate reconstructions, with a sample depth of four to five trees considered sufficient for reaching a representative population signal for a site. Here we seek to derive high-resolution palaeoclimate proxy data from relative changes in stable carbon and oxygen isotope content in kauri (*Agathis australis*). Kauri is a long-lived conifer endemic to New Zealand, and previous studies have established a significant relationship between its ring widths and climate. The wood for our study was excavated from a peat bog at Towai in Northland, New Zealand. The resulting isotope chronologies span a period of 1,200 years, from approximately 13,100 to 11,900 cal BP a period generally characterised by asynchronous abrupt climate changes in the Northern (Younger Dryas) and Southern (Antarctic Cold Reversal) Hemisphere. We analysed the cellulose from six trees at a decadal resolution. We found that the similarity between individual δ13C series was low, whereas δ18O series showed stronger coherence. Factor(s) affecting oxygen isotope fractionation (origin of air masses, precipitation amounts and vapour pressure deficit) in the trees may therefore have a more common influence, than those acting on carbon isotope fixation (stomatal conductance and assimilation). We compare our stable isotope records with tree-ring widths and other available proxy archives, and discuss their climatological significance.

Theme: O06. Stable isotopes in dendrochronology

Presentation Type: Oral

TREE RING GROWTH, ICE COVER AND SOLAR IRRADIANCE

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The results of comparison the dendrochronologies of Kola Peninsula, local temperatures records, ice cover of the Barents sea and sea surface temperature records are presented. Tree-ring series over the last 100 years