[JJ] Evening Poster | M (Multidisciplinary and Interdisciplinary) | M-IS Intersection

[M-IS10]Paleoclimatology and paleoceanography

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Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

Past environmental changes and events at multi-decadal to tectonic timescale toward an understanding of Earth climate system by an integration of terrestrial and marine proxy studies and numerical modeling will be discussed. We welcome a variety of paleo-environmental studies from a wide range of background. In particular, a series of presentations relating to the Anthropocene will be planned. This is a merged session of A-OS31 "Linkage between oceanography and paleoceanography in marginal, shelf and coastal oceans" and M-IS23 "Paleoclimatology and paleoceanography" sessions at JPGU 2017. We hope that this session will provide an opportunity to promote communication between participants from multidisciplinary field.

[MIS10-P21]Climatic environments in the 19th century in Amami region, southwestern Japan, seen in tree-ring δ^{18}O of Ryukyu pine (*Pinus luchuensis*)

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Keywords:Amami-Oshima Island, Ryukyu pine, Tree-ring cellulose, Stable oxygen isotope ratio, Intra-ring fluctuation, The Tempo period (early 19th century)

Stable oxygen isotope ratio (δ^{18}O) of tree-ring cellulose is known to reflect well relative humidity at the time of ring formation. Tree-ring δ^{18}O data have been accumulated and long-term δ^{18}O chronologies are built for the northeastern and the central part of Japan, but are very scarce for the Ryukyu Islands (subtropical southwestern Japan). This is due to difficulty in acquiring samples from long-living trees with distinct annual rings in this region. Among islands of the Ryukyus, Amami-Oshima Island hosts relatively large number of old living trees of Ryukyu pine (*Pinus luchuensis*), but those are now endangered from pine weevil. This study aims at high-resolution climatic reconstruction of the subtropical southwestern Japan back to the 19th century using intra-ring δ^{18}O data from a long-living Ryukyu pine tree.

The tree-ring sample used in this study is a giant Ryukyu pine tree that used to grow at the Arimori shrine (28°24'N, 129°32'E, 40m a.s.l.) in Amami-Oshima Island. This tree died from pine weevil in 2013 and fell down in autumn of 2016. Its breast-height diameter is 175cm and the number of rings counted for the collected sample is 184. We extracted cellulose from the wood samples by the "cross-section" method and divided into 12 (or 2, 6, 24, depending on the ring width) segments for each ring using a scalpel. Isotopic measurement was carried out using a continuous flow system with a pyrolysis-type elemental analyzer and an isotope ratio mass spectrometer (TCEA-Delta V Advantage). The measurement intervals at the time of writing this manuscript are 1830-1844, 1850-1875, 1971-1977, and 2002-2013. Comparing yearly δ^{18}O values for each intra-ring segment of rings for the instrumental period and observational data of mean relative humidity for various seasons, strong (negative) correlation was found between δ^{18}O values for the first segment (the earliest portion of ring) and relative humidity for the early to mid-March, and between δ^{18}O values for the 12th segment (the latest portion of ring) and relative humidity for the late December to late January. From this result, the growth season of the sample tree can be estimated approximately as March to January with a short dormancy. For the period of the Tempo famine (1833-1839), although intra-ring δ^{18}O values are very low throughout the growth season for

Hinoki cypress trees in the central part of Japan, such abnormal δ^{18}O values in this period cannot be found for our sample tree. This infers climatic variation patterns in the Little Ice Age are different between the mainland of Japan and the Ryukyus.