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| **Author(s):** |  |
| **Title:** | **Preliminary material** |
| **Source:** | IAWA Journal, Volume 20, Issue 3 |
| **Publication Year:** | 1999 |
| **Pages:** | 223-225 |
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| **Abstract:** |  |
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| **Author(s):** | Gregg M. Garfin-Woll |
| **Title:** | **Interannual Variability of Asian Monsoon Precipitation, 1953-1982, Using Instrumental Records** |
| **Source:** | IAWA Journal, Volume 20, Issue 3 |
| **Publication Year:** | 1999 |
| **Pages:** | 227-238 |
| **Keywords:** | EI Niño-Southern Oscillation; Asian monsoon; spatial and temporal patterns |
| **Abstract:** | Instrumental records were used to assess the interannual variability of precipitation for the greater Asian monsoon region (50°N-15°S, 60°E-150°E). Correlation analysis shows intriguing teleconnections between subtropical and midlatitude precipitation regions. Principal components analyses show that ENSO (EI Niño-Southern Oscillation) is the dominant factor associated with recent interannual variation of precipitation in the region. The strongest relationships between ENSO and boreal summer precipitation were found in subtropical regions, as weIl as North Central China and southeastern Kazakhstan; boreal winter precipitation in the tropics and subtropics also exhibited strong relationships with ENSO. Scenarios for reconstructing spatial and temporal patterns of Asian monsoon precipitation variation were generated by selecting individual records based on 1) correlation with regional time series and 2) length of record. Spatial patterns were highly dependent on the type of record selected; however, temporal patterns were reasonably weIl reproduced regardless of station selection criteria. The implication of the latter result is that the dominant modes of boreal summer and winter precipitation for East Asia might be reconstructed using relatively few sites. |
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| **Author(s):** | Rolf Borchert |
| **Title:** | **Climatic Periodicity, Phenology, and Cambium Activity in Tropical Dry Forest Trees** |
| **Source:** | IAWA Journal, Volume 20, Issue 3 |
| **Publication Year:** | 1999 |
| **Pages:** | 239-247 |
| **Keywords:** | climate; cambium activity; phenology; periodicity; Tropical trees |
| **Abstract:** | The seasonal time course of vegetative phenology and cambium growth is compared for tree species from Central America and Asia growing in tropical climates with a long, severe dry season. Although the inhibition of plant growth by water stress is weH established, responses to seasonal drought vary widely among such trees, and their annual development is not weH synchronized by climatic seasonality. In deciduous trees growing at microsites with low soil moisture storage, phenology and cambium growth are weH correlated with each other and with seasonal rainfall, and most trees have distinct annual rings. Phenology and cambium growth are progressively uncoupled from climatic seasonality in brevideciduous and evergreen trees growing at microsites with large soil water reserves which buffer trees against seasonal drought and thus may prevent the formation of distinct annual rings. There is some experimental evidence conceming the control of growth initiation in apical meristems and the cambium, but little is known about the mechanisms which arrest growth and deterrnine qualitative changes in organ development and cambium cell differentiation. |
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| **Author(s):** | David W. Stahle |
| **Title:** | **Useful Strategies for the Development of Tropical Tree-Ring Chronologies** |
| **Source:** | IAWA Journal, Volume 20, Issue 3 |
| **Publication Year:** | 1999 |
| **Pages:** | 249-253 |
| **Keywords:** | tropics; Annual tree rings; dendrochronology |
| **Abstract:** | This paper outlines efficient strategies for the development of long, climatically sensitive tree-ring chronologies in the tropics. Effective strategies include sampling useful temperate or subtropical species that extend naturally into the tropics; sampling species in botanical families that have already provided examples useful for dendrochronology (e. g., Pinaceae, Taxodiaceae, Verbenaceae); targeting deciduous species in seasonally dry forests; and sampling species described in the literature or found in xylaria that have promising anatomical features such as ring porosity and marginal parenchyma. Dendrochronology can also be used to test the annual nature of growth banding in tropical species. The cross-dating oflong ring-width time series between individual trees and between multiple sites in a region is strong evidence that the growth rings are indeed synchronized with the annual calendar. This can be confirmed if the ring-width data are also strongly correlated with long annual or seasonalized records of climate variability. Blind cross-dating tests to identify the cutting dates of known-age timbers can provide a final proof that a species produces reliable annual growth rings. |
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| **Author(s):** | Martin Worbes; Wolfgang Johannes Junk |
| **Title:** | **How Old are Tropical Trees? the Persistence of a Myth** |
| **Source:** | IAWA Journal, Volume 20, Issue 3 |
| **Publication Year:** | 1999 |
| **Pages:** | 255-260 |
| **Keywords:** | tropical trees; Age determination; radiocarbon dating; dendrochronology |
| **Abstract:** | The recent report of ancient trees in the Amazon region (Chambers et al. 1998) with a maximum radiocarbon dated age of about 1400 years for the long-living pioneer species Cariniana micrantha is discussed in the light of dendrochronological age determinations from Africa and South America together with the results of indirect age estimations from other sources. There is a tendency in the literature to considerably overestimate the maximum ages of tropical trees. Age determination by the direct counting of annual rings and making estimations for hollow trees by measuring growth rates and diameters result in ages between 400 and 500 years for the largest trunk dimensions, e.g. in Cariniana legalis. |
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| **Author(s):** | Quan Hua; Mike Barbetti; Martin Worbes; John Head; Vladimir A. Levchenko |
| **Title:** | **Review of Radiocarbon Data from Atmospheric and Tree Ring Samples for the Period 1945-1997 Ad** |
| **Source:** | IAWA Journal, Volume 20, Issue 3 |
| **Publication Year:** | 1999 |
| **Pages:** | 261-283 |
| **Keywords:** | nuclear detonation; atmospheric mixing; Atmospheric radiocarbon; tree rings; air-sea exchange |
| **Abstract:** | A summary of 14C data from atmospheric sampling and measurements on wood from annual tree rings for the period 1945-1997 AD is presented and evaluated. Atmospheric records are characterized by different distributions of bomb-test 14C between the Northem and Southem Hemispheres, latitude dependence, and seasonal fluctuations. Radiocarbon data from tree rings are summarised and plotted against atmospheric records from similar latitudes. In some cases, discrepancies are found. Possible reasons for this include: 1) the use of stored carbohydrate from the previous year, 2) different 14C levels in the air around subcanopy trees due to respiration of CO2, 3) regional and local effects of anthropogenic CO2 and 14C sources, 4) sampling of wood material too close to ring boundaries, and 5) insufficient pretreatment of tree ring sampies for dating. But in cases where trees were carefully selected and the sampies adequately pretreated, radiocarbon data from tree rings show excellent agreement with direct atmospheric sampling records. |
| **DOI:** | [10.1163/22941932-90000690](http://dx.doi.org/10.1163/22941932-90000690) |

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| **Author(s):** | Nathsuda Pumijumnong; Won-Kyu Park |
| **Title:** | **Vessel Chronologies from Teak in Northern Thailand and their Climatic Signal** |
| **Source:** | IAWA Journal, Volume 20, Issue 3 |
| **Publication Year:** | 1999 |
| **Pages:** | 285-294 |
| **Keywords:** | Teak; vessels; Thailand; climate |
| **Abstract:** | Five teak trees in northem Thailand were selected for the study of vessels in terms of dendroclimatology. The tree rings were divided into earlywood and latewood, and fourparameters (average vessel area, average vessel diameter, average conductive area, and vessel density) were measured by automatie image analysis technique to obtain 50-year (1947-1996) time series. Two questions were addressed: 1) How strongly are the vessel characteristics related to climate and 2) are these relationships different from those of ring widths? All vessel parameters of the total ring and of the earlywood were negatively correlated with precipitation during the transitional period between the dry and the wet season. The latewood vessel parameters, however, are negatively correlated with J une temperature. The climatic signals of the vessel parameters and of the tree-ring width are different from each other. |
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| **Author(s):** | Hemant P. Borgaonkar; Govind B. Pant; Kolli Rupa Kumar |
| **Title:** | **Tree-Ring Chronologies from Western Himalaya and Their Dendroclimatic Potential** |
| **Source:** | IAWA Journal, Volume 20, Issue 3 |
| **Publication Year:** | 1999 |
| **Pages:** | 295-309 |
| **Keywords:** | Western Himalaya; Tree-ring chronology; tree growth; dendroclimatic potential; conifers |
| **Abstract:** | Tree-ring chronologies of Himalayan conifers (viz. Pinus, Picea, Abies, Cedrus, etc.) were compiled from more than 300 tree core sampIes from 11 different sites covering a wide area of the Western Himalaya. Distinct annual growth and little occurrence of double or missing rings are characteristic features of Himalayan conifers. Dating of individual sampIes was achieved for all sites except for a few from a high elevation glacier which exhibited patches of very narrow rings and a high frequency of resin canals. Moderately high values of common variance and signal-to-noise ratio indicate their usefulness for dendroclimatic studies. Significant improvement of statistical performance is observed for all sites after removing the auto-correlation structure in the series by auto-regressive modeling. A quantitative evaluation of the growth-climate relationships based on response function analysis on a monthly and seasonal scale indicates a similar pattern across several regions of the Western Himalaya. March-April-May (pre-monsoon) climate (temperature and precipitation) is an important limiting parameter for tree growth and can be successfully reconstructed for the past few centuries. |
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| **Author(s):** | Amalava Bhattacharyya; Ram R. Yadav |
| **Title:** | **Climatic Reconstructions Using Tree-Ring Data from Tropical and Temperate Regions of India - A Review** |
| **Source:** | IAWA Journal, Volume 20, Issue 3 |
| **Publication Year:** | 1999 |
| **Pages:** | 311-316 |
| **Keywords:** | Dendroc1imatology; growth rings; India; c1imate |
| **Abstract:** | There are several reports which indicate that the c1imate over the Himalayan region is linked both with the monsoon variation on the Indian subcontinent and in the whole of South-East Asia as well as with the El-Niño/Southem Oscillation. To understand the behaviour ofthese c1imatic phenomena we need long-term high-resolution c1imatic records which are in generallacking in this part of the globe. Tree-ring studies have therefore been taken up in the tropical and Himalayan region in India to develop millennium-long c1imatic reconstructions. |
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| **Author(s):** | Vandana Chaudhary; Amalava Bhattacharyya; Ram R. Yadav |
| **Title:** | **Tree-Ring Studies in the Eastern Himalayan Region: Prospects and Problems** |
| **Source:** | IAWA Journal, Volume 20, Issue 3 |
| **Publication Year:** | 1999 |
| **Pages:** | 317-324 |
| **Keywords:** | growth rings; dendroc1imatology; Eastern Himalayas |
| **Abstract:** | Tree-ring sampies of different conifer species in various ecological settings from subtropical to temperate regions of the Eastern Himalayan region have been evaluated for their potential for dendroc1imatic reconstructions. Most of these tree species have cross-datable growth rings except Taxus baccata and Tsuga dumosa where series of micro-rings and lack of variation in these suppressed zones make cross-dating difficult. Tree-ring chronologies have been established from Abies densa and Larix griffithiana, the only deciduous conifer species in the Himalayas. Tree growth-climate relationships reveal that temperature is a determinant factor for the growth of trees at high elevations. Abies densa in the western part of Arunachal Pradesh shows a negative response to the July-September temperature whereas Larix griffithiana shows a positive response to the May temperature. |
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| **Author(s):** | Achim Bräuning |
| **Title:** | **Dendroclimatological Potential of Drought-Sensitive tree Stands in Southern Tibet for the Reconstruction of Monsoonal Activity** |
| **Source:** | IAWA Journal, Volume 20, Issue 3 |
| **Publication Year:** | 1999 |
| **Pages:** | 325-338 |
| **Keywords:** | conifers; dendroclimatology; intra-annual density fluctuations; monsoon; Tibetan plateau |
| **Abstract:** | Southem Tibet is influenced by the Asian summer monsoon which causes 70-80% of the annual precipitation to fall between June and August, showing a steep gradient from east to west. Teleconnections between the tree-ring chronologies of a sampling network have demonstrated a distinct dendroecological region in the catchment area of the Yarlung Tsangpo river, where tree growth is mainly limited by summer precipitation. Ring width at these sites is strongly correlated to late summer (August to October) precipitation of the year prior to growth, indicating that the trees bear a high potential for the reconstruction of the rainfall variability at the northwestem fringe of the monsoonal regime. Light rings and other wood anatomical features like intra-annual growth bands can be observed in the westernmost stands of Pinus densata. If these growth bands occur in the earlywood of the tree ring, they can be explained by cold events during spring; ifthey are located in the transition zone between earlywood and latewood, they are caused by dry conditions during May and especially June, which points to a delayed arrival of the moist monsoonal air masses in southem Tibet in the corresponding years. |
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| **Author(s):** | Gordon Jacoby; Rosanne D' Arrigo; Neil Pederson; Brendan Buckley; Chultamiin Dugarjav; R. Mijiddorj |
| **Title:** | **Temperature and Precipitation in Mongolla Based on Dendroclimatic Investigations** |
| **Source:** | IAWA Journal, Volume 20, Issue 3 |
| **Publication Year:** | 1999 |
| **Pages:** | 339-354 |
| **Keywords:** | paleoclimate; Tree rings; Mongolia; climatic change |
| **Abstract:** | Recent tree-ring studies in Mongolia provide evidence of unusual warming that is in agreement with large-scale reconstructed and recorded temperatures for the Northem Hemisphere and the Arctic. The Mongolian proxy record for temperature extends back over 450 years and is an important addition to the global tree-ring database. Precipitation reconstructions based on tree rings reflect recent increases but show that the increases are within the long-term range of variations. There is evidence for quasi-solar periodicity in long-term reconstructed precipitation variation, also shown by previous studies. Mongolia has excellent sampling resources for future studies. |
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