

## References#

### Bibliography#

- Aniol, R.W. (1983) 'Tree-ring analysis using CATRAS'. *Dendrochronologia* **1**, 45-53.
- Aniol, R.W. (1987) 'A new device for computer measurement of tree-ring widths'. *Dendrochronologia* **4**, 135-141.
- Brewer, P.W. (2014) 'Data management in dendroarchaeology using Tellervo'. *Radiocarbon* **56**, and *Tree-Ring Research* **70**, S79-83. <https://journals.uair.arizona.edu/index.php/radiocarbon/article/view/18320>
- Brewer, P.W., Murphy, D. & Jansma, E., (2011) TRiCYCLE: a universal conversion tool for digital tree-ring data. *Tree-Ring Research* **67**, 135-144. <http://www.treeringsociety.org/TRBTRR/TRBTRR.htm>
- Brewer, P.W., Sturgeon, K., Madar, L. & Manning, S.W., (2010) A new approach to dendrochronological data management. *Dendrochronologia* **28**, 131-134. DOI: [10.1016/j.dendro.2009.03.003](https://doi.org/10.1016/j.dendro.2009.03.003)
- Eckstein, D. & Bauch, J. (1969) 'Beitrag zur Rationalisierung eines dendrochronologischen Verfahrens und zur Analyse seiner Aussagesicherheit'. *Forstwissenschaftliches Centralblatt* **88**, 230-250.
- Historic England (1998) *Dendrochronology: Guidelines on producing and interpreting dendrochronological dates*. <https://historicengland.org.uk/images-books/publications/dendrochronology-guidelines/>
- Jansma, E. (2002) 'Veldhandleiding dendrochronologisch onderzoek'. In A. Carmiggelt & P.J.W.M. Schulten (eds.), *Veldhandleiding archeologie; archeologie leidraad 1*, CvAK, 111-114. <http://www.academia.edu/2576134/>
- Jansma, E. (2006) 'Dendrochronologie'. In *Nationale Onderzoeksagenda voor de Archeologie (NOAA)*, version 1.0, accepted January 2006. <http://archeologiein nederland.nl/sites/default/files/3%20DEF%20Jansma%20Dendrochronologie.pdf>
- Jansma, E. (2013) 'Towards sustainability in dendroarchaeology: the preservation, linkage and reuse of tree-ring data from the cultural and natural heritage in Europe'. In Bleicher et al. (eds.) *DENDRO - Chronologie, -Typologie, -Ökologie*. Freiburg, 169-176.
- Jansma, E., Haneca, K., Kosian, M. (2014) 'A dendrochronological reassessment of three Roman boats from Utrecht (the Netherlands)'. *Journal of Archaeological Science* **50**, 484-496. DOI: [10.1016/j.jas.2014.07.019](https://doi.org/10.1016/j.jas.2014.07.019)
- Jansma, E., Brewer, P.W. & Zandhuis, I. (2010): TRiDaS 1.1: The tree-ring data standard. *Dendrochronologia* **28**, 99-130. DOI: [10.1016/j.dendro.2009.06.009](https://doi.org/10.1016/j.dendro.2009.06.009)
- Jansma, E. & Van Lanen, R.J. (2016) 'The dendrochronology of Dorestad: placing early-medieval structural timbers in a wider geographical context'. In Willemson, A. & Kik, H. (red.) *Golden Middle Ages in Europe. New Research into Early-Medieval Communities and Identities*. Brepols Publishers, Turnhout, 99-144.

Jansma, E., Van Lanen, R.J., Brewer, P.W. & Kramer, R. (2012a) 'The DCCD: a digital data infrastructure for tree-ring research'. *Dendrochronologia* **30**, 249-251. <http://www.sciencedirect.com/science/article/pii/S1125786512000367>

Jansma, E., Van Lanen, R.J., Sturgeon, K., Mohlke, S. & Brewer, P.W., (2012b) 'TRiDaBASE: A stand-alone database for storage, analysis and exchange of dendrochronological metadata'. *Dendrochronologia* **30**, 209-211. DOI: [10.1016/j.dendro.2011.09.002](https://doi.org/10.1016/j.dendro.2011.09.002)

Jansma, E., Haneca K. & Kosian M. (2014) 'A dendrochronological reassessment of three Roman boats from Utrecht (the Netherlands)'. *Journal of Archaeological Science* **50**, 484-496.

Knibbe, B. (2008) *PAST4-Personal Analysis System for Tree-Ring Research Version 4.5* SCIEM. <http://www.sciem.com/>.

Lanen, R.J. van, Kosian, M., Groenewoudt, B. & Jansma, E. (2015a) 'Finding a way ? modelling landscape prerequisites for Roman and early-medieval routes in the Netherlands'. *Geoarchaeology* **30**(3), 200-222. DOI: [10.1002/gea.21510](https://doi.org/10.1002/gea.21510).

Lanen, R.J. van, Kosian, M., Groenewoudt, B., Spek, M. & Jansma, E. (2015b) 'Best travel options: modelling Roman and early-medieval routes in the Netherlands using a multi-proxy approach'. *Journal of Archaeological Science: Reports* **3**, 144-159.

Lanen, R.J. van, Jansma, E., van Doesburg, J. & Groenewoudt, B.J. (2016): *Roman and early-medieval long-distance transport routes in north-western Europe: modelling frequent-travel zones using a dendroarchaeological approach*. *Journal of Archaeological Science* **73**, 120-137. DOI: [10.1016/j.jas.2016.07.010](https://doi.org/10.1016/j.jas.2016.07.010)

Rinn, F. (2005) *TSAP-WIN. Time-Series Analysis and Presentation for Dendrochronology and Related Applications*. Version 0.53 for Microsoft Windows. User reference.

UNI (2004) *Cultural heritage - Wooden artefacts - Wood dendrochronological dating guidelines*. <http://store.uni.com/magento-1.4.0.1/index.php/uni-11141-2004.html>

## Resources#

### Dendro Data Repositories

- Digital Collaboratory for Cultural Dendrochronology (DCCD). <http://dendro.dans.knaw.nl>
- International Tree-Ring Data Bank (ITRDB). <http://www.ncdc.noaa.gov/data-access/paleoclimatology-data/datasets/tree-ring>

### Software and Data Standards

- Tree Ring Data Standard (TRiDaS). <http://www.tridas.org>
- Tellervo. <http://www.tellervo.org>
- TRiCYCLE. <http://www.tridas.org/tricycle>
- TRiDaBASE. <http://www.tridas.org/tridabase>

## Glossary#

### TRiDaS Project

A project is defined by a laboratory and encompasses dendrochronological research of a particular object or group of objects. Examples include: the dating of a building; the research of forest dynamics in a stand of living trees; the dating of all Rembrandt paintings in a museum. What is considered a 'project' is up to the laboratory performing the research. It could be the

dating of a group of objects, but the laboratory can also decide to define a separate project for each object. Therefore, a project can have one or more objects associated with it.

### **TRiDaS Object**

An object is the item to be investigated. Examples include: violin; excavation site; painting on a wooden panel; water well; church; carving; ship; forest. An object could also be more specific, for example: mast of a ship; roof of a church. Depending on the object type various descriptions are made possible. An object can have one or more elements and can also refer to another (sub) object. For instance a single file may contain three objects: an archaeological site object, within which there is a building object, within which there is a beam object. The list of possible object types is extensible and is thus flexible enough to incorporate the diversity of data required by the dendro community. Only information that is essential for dendrochronological research is recorded here. Other related data may be provided in the form of a link to an external database such as a museum catalogue.

### **TRiDaS Element**

An element is a piece of wood originating from a single tree. Examples include: one plank of a water well; a single wooden panel in a painting; the left-hand back plate of a violin; one beam in a roof; a tree trunk preserved in the soil; a living tree. The element is a specific part of exactly one object or sub object. An object will often consist of more than one element, e.g., when dealing with the staves (elements) of a barrel (object). One or more samples can be taken from an element and an element may be dated using one or more derivedSeries.

### **TRiDaS Sample**

A sample is a physical specimen or non-physical representation of an element. Examples include: core from a living tree; core from a rafter in a church roof; piece of charcoal from an archaeological trench; slice from a pile used in a pile foundation; wax imprint of the outer end of a plank; photo of a back plate of a string instrument. Note that a sample always exists and that it can either be physical (e.g. a core) or representative (e.g. a picture). A sample is taken from exactly one element and can be represented by one or more radii.

### **TRiDaS Radius**

A radius is a line from pith to bark along which the measurements are taken. A radius is derived from exactly one sample. It can be measured more than once resulting in multiple measurementSeries.

### **TRiDaS Measurement Series**

A measurementSeries is a series of direct, raw measurements along a radius. A single measurementSeries can be standardised or a collection of measurementSeries can be combined into a derivedSeries. The measurements themselves are stored separately as values.

### **TRiDaS Derived Series**

A derivedSeries is a calculated series of values and is a minor modification of the 'v-series' concept proposed by Brewer et al (2010). Examples include: index; average of a collection of measurementSeries such as a chronology. A derivedSeries is derived from one or more measurementSeries and has multiple values associated with it.

### **TRiDaS Value**

A value is the result of a single ring measurement. Examples include: total ring width; earlywood width; latewood width. The values are related to a measurementSeries or a derivedSeries. In case of a measurementSeries the variable and its measurement unit (e.g. microns, 1/100th mm etc) are recorded as well.