

RING-WIDTH DATA FORMATS USED FOR THE
INTERNATIONAL TREE-RING DATA BANK

The two forms of tree-ring data which may be submitted to the International Tree-Ring Data Bank at this time are raw ring widths and standardized site chronology indices. Indices will not be accepted without accompanying ring-width measurements. The ring-width measurements are usually expressed in 100ths of a mm, but can be any other consistent unit. The standardized data are expressed as indices or percentages of departure from the mean.

FORMAT FOR PUNCHED CARDS OF RAW RING-WIDTH DATA

Ring widths are obtained from dated measurements along each of two radii of a tree. Each radius or core sample is usually assigned a unique identification number and is assumed to be accurately dated before being key-punched (or before it is placed in the Data Bank collection). As a matter of practice, the first three digits of the identification number refer to the site, the fourth and fifth to the tree number, and the sixth to the tree radius (usually designated as 1 or 2), Figure 1B. One 80-column computer card of ring-width data will normally contain the following:

<u>FORMAT CODE</u>	<u>CONTENTS</u>
A6	6-digit identification number
2X	2 spaces (columns 7 and 8)
I4	Decade date
10I6	10 ring-width values of 6 digits each, <u>right-justified within</u> the 6-digit group or data field. For example, if the measurement for 1870 were 2.10 mm, the 3

digits 2, 1, and 0 would be punched in columns 16, 17, and 18 leaving 13, 14, and 15 blank. The decimal is not punched.

Zeros should be punched for locally absent rings (Fig. 1B). All cards for a given radius must contain the same identification number, and the decade years must appear in sequential order. In cases where B.C. dates are used, a constant of 8000 should be added to the decade digits for all radii in the site so that the year A.D. 0001 is assigned a date 8001. A year for "0 B.C." (8000) is added to facilitate computations, therefore when converting back to true B.C. age allowance for the extra year must be made by subtracting the computer year from 8001. For example, 7998 = 3 B.C.

Exceptions may occur in the first and last decade card (Fig. 1A and 1C). These may contain from one to ten ring-width values. The first card contains only enough ring-width values to complete the first decade (Fig. 1A). For example, in Figure 1A the year is not an even decade but rather the year 1742. All ring-width values on the first card begin with the left-most data field. A card beginning with this data must contain values for the eight years, 1742 through 1749; the remaining two data fields on the right are blank. The data in columns 9 through 12 in this first card must correspond to the year of the first punched ring-width value. All following cards begin with an even decade, 1750, 1760, etc. (Fig. 1B), and must contain 10 ring-width values ranging from 0 to 9.98 mm, except for the last card. Decimal points are never entered on the cards.

The last card contains a "999" after the last valid ring width (Fig. 1C). That is, if the last measured tree ring is for 1967, the ring-width value will appear in the eighth position on the last card (1960 is the first position and

1967 the eighth position [Fig. 1A]), and the ninth position will contain a number of 999. This 999 is never processed as data. It is read and used as a signal to the computer that the last decade has been encountered and the next card, if there is one, either contains ring widths for another radius or sample, or is a control card. If the last value is in the tenth position, the following card must contain the identification number, the next decade date, and 999 in the first data position. All other positions to the right of a 999 are ignored. This feature limits the use of the cards to ring-width series where no value is larger than 9.98 mm. If a ring width exceeds this value, it must be reduced to proper scale along with all other measurements in a radius by multiplying all values for that radius by an appropriate constant. It is important to point out where any scaling has been used when sending data to the ITRDB. While this scaling affects ring widths, it will not later affect the index values, since they are expressed as percentages.

FORMAT FOR PUNCHED CARDS OF INDICES

The index cards differ from ring-width data cards mainly in that they allow space in each data field for recording the number of observations (radii) used in determining each yearly index value. The first three digits of the identification number for the final index chronology refer to the site, the fourth and fifth to the species, and the sixth digit should be a 0 identifying it as a chronology having 2 radii per tree.

With the possible exception of the first and last decade card, there will be ten ring-width indices per card (Fig. 2B). One 80-column computer card for indices will normally contain the following:

<u>FORMAT CODE</u>	<u>CONTENTS</u>
A6	6-digit identification number
I4	(no spaces) decade year (columns 7-10)
10(I4,I3)	10 data fields: 4 digits for index value, then 3 digits for number of observations (N).

The first and last index cards should have 9990 punched for all data fields at the beginning or ending where there are no index values (Fig. 2A and 2C). The computer tests for values of 9990 to distinguish absence of data from true values of zero. Thus, unlike ring-width cards, the values for indices on the first decade card are right-justified (that is, they occupy the right-most data fields).

Index cards contain values of indices in columns: 11-14, 18-21, 25-28, 32-35, 39-42, 46-49, 53-56, 60-63, 67-70, and 74-77 (Fig. 2), right-justified within each data field. The sample size or the number of radii (N) that were averaged together to obtain each index value in the final index chronology are punched in the columns following the respective indices: 15-17, 22-24, 29-31, 36-38, 43-45, 50-52, 57-59, 64-66, 71-73, and 78-80, and digits are right-justified within each data field. When several master chronologies are averaged, they are weighted according to the value of N.

FIGURE 1 RING WIDTHS

A {
 190161 1742 101 218 132 162 254 250 059 212
 00 00000000000000 00000000000000000000000000000000 000 000000000000000000000000000000
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

B {
 190161 1750 069 104 000 052 054 042 038 034 067 071
 00 00000000 000 000000 0000 000 000000 000000 000000 000000 000000 000000 000000 000000000000
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

C {
 190161 1960 046 041 033 015 042 046 056 032 999
 00 00000000 000 000000 000000 000000 000000 000000 000000 000000 000000 00000000000000000000000000
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

FIGURE 2 INDICES WITH N

A {

I.D.	YEAR 1 ST	N 2 ND	N 3 RD	N 4 TH	N 5 TH	N 6 TH	N 7 TH	N 8 TH	N 9 TH	N 10 TH	N
52364015059990	09990	09990	09990	01367	10946	10025	11014	21645	21003	2	

 00000 00 0000 00 000 00 000 00 000 00 00000000 000000 000005000000000000000000 0000
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

B {

52364015100857	20682	00721	00876	00799	20964	90000	101149	100896	101149	10
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 00000 000 000000 000000 000000 000000 000000 000000 00 000000 00000 000000
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

C {

52364015201424	101353	41595	41595	49950	09990	09990	09990	09990	09990	09990
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 00000 000 000000 00000000000000000000000000000000 00 000 00 000 00 000 00 000 00 000 00
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80