[] Dendrochronology Program Library Run 127 Program COF 09:51 Mon 14 Mar 2011 Page 1

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[] P R O G R A M C O F E C H A Version 6.06P 27833

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QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

File of DATED series: 127\_MRG

CONTENTS:

Part 1: Title page, options selected, summary, absent rings by series

Part 2: Histogram of time spans

Part 3: Master series with sample depth and absent rings by year

Part 4: Bar plot of Master Dating Series

Part 5: Correlation by segment of each series with Master

Part 6: Potential problems: low correlation, divergent year-to-year changes, absent rings, outliers

Part 7: Descriptive statistics

RUN CONTROL OPTIONS SELECTED VALUE

1 Cubic smoothing spline 50% wavelength cutoff for filtering

32 years

2 Segments examined are 50 years lagged successively by 25 years

3 Autoregressive model applied A Residuals are used in master dating series and testing

4 Series transformed to logarithms Y Each series log-transformed for master dating series and testing

5 CORRELATION is Pearson (parametric, quantitative)

Critical correlation, 99% confidence level .3281

6 Master dating series saved N

7 Ring measurements listed N

8 Parts printed 1234567

9 Absent rings are omitted from master series and segment correlations (Y)

Time span of Master dating series is 1927 to 2010 84 years

Continuous time span is 1927 to 2010 84 years

Portion with two or more series is 1928 to 2010 83 years

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*C\* Number of dated series 20 \*C\*

\*O\* Master series 1927 2010 84 yrs \*O\*

\*F\* Total rings in all series 1510 \*F\*

\*E\* Total dated rings checked 1509 \*E\*

\*C\* Series intercorrelation .649 \*C\*

\*H\* Average mean sensitivity .239 \*H\*

\*A\* Segments, possible problems 0 \*A\*

\*\*\* Mean length of series 75.5 \*\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

ABSENT RINGS listed by SERIES: (See Master Dating Series for absent rings listed by year)

510A 2 absent rings: 2003 2005

510B 1 absent rings: 2003

3 absent rings .199%

PART 2: TIME PLOT OF TREE-RING SERIES: 09:51 Mon 14 Mar 2011 Page 2

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1050 1100 1150 1200 1250 1300 1350 1400 1450 1500 1550 1600 1650 1700 1750 1800 1850 1900 1950 2000 2050 Ident Seq Time-span Yrs

: : : : : : : : : : : : : : : : : : : : : -------- --- ---- ---- ----

. . . . . . . . . . . . . . . . . . <=======> . 501A 1 1930 2010 81

. . . . . . . . . . . . . . . . . . <========> . 501B 2 1927 2010 84

. . . . . . . . . . . . . . . . . . <=======> . 502A 3 1931 2010 80

. . . . . . . . . . . . . . . . . . <========> . 502B 4 1928 2010 83

. . . . . . . . . . . . . . . . . . <======> . 503A 5 1946 2010 65

. . . . . . . . . . . . . . . . . . <=======> . 503B 6 1938 2010 73

. . . . . . . . . . . . . . . . . . <=====> . 504A 7 1953 2010 58

. . . . . . . . . . . . . . . . . . <=======> . 504B 8 1937 2010 74

. . . . . . . . . . . . . . . . . . <=======> . 505A 9 1933 2010 78

. . . . . . . . . . . . . . . . . . <=======> . 505B 10 1931 2010 80

. . . . . . . . . . . . . . . . . . <=======> . 506A 11 1931 2010 80

. . . . . . . . . . . . . . . . . . <=======> . 506B 12 1931 2010 80

. . . . . . . . . . . . . . . . . . <======> . 507A 13 1945 2010 66

. . . . . . . . . . . . . . . . . . <======> . 507B 14 1941 2010 70

. . . . . . . . . . . . . . . . . . <=======> . 508A 15 1932 2010 79

. . . . . . . . . . . . . . . . . . <=======> . 508B 16 1934 2010 77

. . . . . . . . . . . . . . . . . . <=======> . 509A 17 1938 2010 73

. . . . . . . . . . . . . . . . . . <=======> . 509B 18 1937 2010 74

. . . . . . . . . . . . . . . . . . <=======> . 510A 19 1936 2010 75

. . . . . . . . . . . . . . . . . . <=======> . 510B 20 1931 2010 80

: : : : : : : : : : : : : : : : : : : : :

1050 1100 1150 1200 1250 1300 1350 1400 1450 1500 1550 1600 1650 1700 1750 1800 1850 1900 1950 2000 2050

PART 3: Master Dating Series: 09:51 Mon 14 Mar 2011 Page 3

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Year Value No Ab Year Value No Ab Year Value No Ab Year Value No Ab Year Value No Ab Year Value No Ab

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1950 .277 19 2000 -.700 20

1951 .709 19 2001 .910 20

1952 -.778 19 2002 1.413 20

1953 -2.856 20 2003 -1.060 20 2

1954 .576 20 2004 -1.004 20

1955 .309 20 2005 -1.581 20 1

1956 -2.022 20 2006 -.487 20

1957 .425 20 2007 .970 20

1958 .726 20 2008 .602 20

1959 -.073 20 2009 .372 20

1960 -1.268 20 2010 1.187 20

1961 .690 20

1962 -.554 20

1963 .239 20

1964 .639 20

1965 .565 20

1966 -.752 20

1967 .222 20

1968 .020 20

1969 .725 20

1970 1.188 20

1971 2.439 20

1972 .347 20

1973 -.799 20

1974 -.121 20

1975 .093 20

1976 .719 20

1927 -3.995 1 1977 -.073 20

1928 1.113 2 1978 .105 20

1929 .097 2 1979 -.166 20

1930 -.238 3 1980 .329 20

1931 -.717 8 1981 -2.731 20

1932 1.264 9 1982 -1.245 20

1933 .660 10 1983 -1.185 20

1934 .682 11 1984 -.667 20

1935 1.111 11 1985 .113 20

1936 -.407 12 1986 -.203 20

1937 .006 14 1987 .969 20

1938 .007 16 1988 .629 20

1939 -.250 16 1989 -.289 20

1940 -1.861 16 1990 -.016 20

1941 -.138 17 1991 -.221 20

1942 -.716 17 1992 .924 20

1943 .177 17 1993 1.422 20

1944 .176 17 1994 .722 20

1945 .697 18 1995 .254 20

1946 .586 19 1996 .237 20

1947 .950 19 1997 .193 20

1948 -.194 19 1998 -.858 20

1949 .905 19 1999 -.466 20

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PART 4: Master Bar Plot: 09:51 Mon 14 Mar 2011 Page 4

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Year Rel value Year Rel value Year Rel value Year Rel value Year Rel value Year Rel value Year Rel value Year Rel value

1950------A 2000--c

1951--------C 2001---------D

1952-c 2002----------F

1953k 2003-d

1954-------B 2004-d

1955------A 2005f

1956h 2006--b

1957------B 2007---------D

1958--------C 2008-------B

1959----@ 2009------A

1960-e 2010----------E

1961--------C

1962--b

1963-----A

1964-------C

1965-------B

1966-c

1967-----A

1968----@

1969--------C

1970----------E

1971----------J

1972------A

1973-c

1974---@

1975-----@

1976--------C

1927p 1977----@

1928----------D 1978-----@

1929-----@ 1979---a

1930---a 1980------A

1931-c 1981k

1932----------E 1982-e

1933--------C 1983-e

1934--------C 1984--c

1935----------D 1985-----@

1936--b 1986---a

1937----@ 1987---------D

1938----@ 1988-------C

1939---a 1989---a

1940g 1990----@

1941---a 1991---a

1942-c 1992---------D

1943-----A 1993----------F

1944-----A 1994--------C

1945--------C 1995------A

1946-------B 1996-----A

1947---------D 1997-----A

1948---a 1998-c

1949---------D 1999--b

PART 5: CORRELATION OF SERIES BY SEGMENTS: 09:51 Mon 14 Mar 2011 Page 5

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Correlations of 50-year dated segments, lagged 25 years

Flags: A = correlation under .3281 but highest as dated; B = correlation higher at other than dated position

Seq Series Time\_span 1925 1950 1975

1974 1999 2024

--- -------- --------- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ----

1 501A 1930 2010 .34 .49 .46

2 501B 1927 2010 .59 .49 .52

3 502A 1931 2010 .65 .56 .65

4 502B 1928 2010 .55 .61 .55

5 503A 1946 2010 .74 .73 .64

6 503B 1938 2010 .56 .63 .61

7 504A 1953 2010 .71 .70

8 504B 1937 2010 .73 .79 .77

9 505A 1933 2010 .76 .82 .81

10 505B 1931 2010 .69 .69 .60

11 506A 1931 2010 .74 .83 .76

12 506B 1931 2010 .56 .76 .78

13 507A 1945 2010 .74 .77 .77

14 507B 1941 2010 .64 .71 .77

15 508A 1932 2010 .60 .59 .75

16 508B 1934 2010 .85 .79 .74

17 509A 1938 2010 .60 .60 .61

18 509B 1937 2010 .50 .65 .62

19 510A 1936 2010 .64 .70 .68

20 510B 1931 2010 .77 .74 .65

Av segment correlation .65 .68 .67

PART 6: POTENTIAL PROBLEMS: 09:51 Mon 14 Mar 2011 Page 5

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For each series with potential problems the following diagnostics may appear:

[A] Correlations with master dating series of flagged 50-year segments of series filtered with 32-year spline,

at every point from ten years earlier (-10) to ten years later (+10) than dated

[B] Effect of those data values which most lower or raise correlation with master series

Symbol following year indicates value in series is greater (>) or lesser (<) than master series value

[C] Year-to-year changes very different from the mean change in other series

[D] Absent rings (zero values)

[E] Values which are statistical outliers from mean for the year

====================================================================================================================================

501A 1930 to 2010 81 years Series 1

[B] Entire series, effect on correlation ( .395) is:

Lower 1946< -.100 1938< -.017 1952> -.016 1930< -.013 1965< -.013 1951< -.012 Higher 1953 .048 1956 .036

====================================================================================================================================

501B 1927 to 2010 84 years Series 2

[\*] Early part of series cannot be checked from 1927 to 1927 -- not matched by another series

[B] Entire series, effect on correlation ( .563) is:

Lower 1996< -.023 1959> -.015 1930> -.014 2008< -.013 1951< -.011 1931> -.011 Higher 2003 .027 1971 .023

====================================================================================================================================

502A 1931 to 2010 80 years Series 3

[B] Entire series, effect on correlation ( .648) is:

Lower 1953> -.043 1985< -.013 1942> -.012 1981> -.012 1959< -.011 1966> -.010 Higher 1940 .037 1956 .030

====================================================================================================================================

502B 1928 to 2010 83 years Series 4

[B] Entire series, effect on correlation ( .551) is:

Lower 1939< -.027 1975< -.023 1934< -.022 2000< -.016 1948> -.016 1984> -.013 Higher 1956 .035 2003 .021

====================================================================================================================================

503A 1946 to 2010 65 years Series 5

[B] Entire series, effect on correlation ( .726) is:

Lower 1977< -.040 1983> -.016 1994< -.014 2010< -.013 2005> -.011 1982> -.010 Higher 1981 .052 1953 .040

====================================================================================================================================

503B 1938 to 2010 73 years Series 6

[B] Entire series, effect on correlation ( .589) is:

Lower 1940> -.083 1983< -.027 1994< -.024 1984< -.020 1973> -.014 2000> -.007 Higher 2003 .025 1956 .020

[E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

1940 +3.5 SD

====================================================================================================================================

504A 1953 to 2010 58 years Series 7

[B] Entire series, effect on correlation ( .695) is:

Lower 1960< -.022 1966> -.021 1974< -.016 2008< -.015 1958< -.014 1953> -.013 Higher 1956 .044 1981 .042

====================================================================================================================================

504B 1937 to 2010 74 years Series 8

[B] Entire series, effect on correlation ( .707) is:

Lower 1940> -.052 1950< -.015 1987< -.014 1960> -.011 1974< -.010 1999< -.009 Higher 1981 .051 1953 .034

====================================================================================================================================

505A 1933 to 2010 78 years Series 9

[B] Entire series, effect on correlation ( .751) is:

Lower 1942< -.030 1940> -.025 1952> -.022 1987< -.010 1967< -.007 1988< -.006 Higher 1981 .054 1953 .030

====================================================================================================================================

505B 1931 to 2010 80 years Series 10

[B] Entire series, effect on correlation ( .646) is:

Lower 1942< -.031 1955< -.022 1948> -.018 2010< -.018 1952> -.012 1982> -.011 Higher 1981 .037 1956 .037

====================================================================================================================================

506A 1931 to 2010 80 years Series 11

[B] Entire series, effect on correlation ( .762) is:

Lower 1935< -.022 1948> -.015 1972< -.014 1933> -.009 1945< -.009 1984< -.008 Higher 1981 .050 1940 .021

====================================================================================================================================

506B 1931 to 2010 80 years Series 12

[B] Entire series, effect on correlation ( .645) is:

Lower 1933< -.071 1956> -.026 1940> -.022 1977> -.013 1942> -.011 1938> -.007 Higher 1953 .044 1981 .043

====================================================================================================================================

507A 1945 to 2010 66 years Series 13

[B] Entire series, effect on correlation ( .738) is:

Lower 1948> -.023 1972> -.013 1993< -.009 1947< -.009 1988< -.009 1962> -.007 Higher 1981 .042 1971 .013

[E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

1981 -4.9 SD

====================================================================================================================================

507B 1941 to 2010 70 years Series 14

[B] Entire series, effect on correlation ( .692) is:

Lower 1944< -.030 1947< -.019 1959< -.019 1966> -.018 1956> -.010 1942> -.010 Higher 1981 .083 1953 .020

====================================================================================================================================

508A 1932 to 2010 79 years Series 15

[B] Entire series, effect on correlation ( .616) is:

Lower 1956> -.045 1958< -.031 1953> -.017 1943< -.011 2000> -.009 1997< -.007 Higher 1981 .051 1940 .032

====================================================================================================================================

508B 1934 to 2010 77 years Series 16

[B] Entire series, effect on correlation ( .774) is:

Lower 1936> -.017 1993< -.016 1997< -.015 2003> -.013 1968< -.011 1973> -.008 Higher 1981 .047 1956 .022

====================================================================================================================================

509A 1938 to 2010 73 years Series 17

[B] Entire series, effect on correlation ( .620) is:

Lower 1944< -.038 1972> -.031 1955> -.013 1942> -.012 1988< -.007 1997< -.007 Higher 1940 .043 1953 .024

====================================================================================================================================

509B 1937 to 2010 74 years Series 18

[B] Entire series, effect on correlation ( .574) is:

Lower 1945< -.081 1949< -.020 1942> -.017 1962> -.016 1975< -.013 1939> -.012 Higher 1940 .046 1953 .042

====================================================================================================================================

510A 1936 to 2010 75 years Series 19

[B] Entire series, effect on correlation ( .620) is:

Lower 1952< -.052 2002< -.021 1939> -.017 2001< -.016 1944< -.009 1942> -.006 Higher 1953 .030 1971 .021

[D] 2 Absent rings: Year Master N series Absent

2003 -1.060 20 2

2005 -1.581 20 1

====================================================================================================================================

510B 1931 to 2010 80 years Series 20

[B] Entire series, effect on correlation ( .723) is:

Lower 2005> -.016 1960> -.010 1973< -.009 2002< -.008 1962> -.008 1933< -.008 Higher 1940 .028 1956 .021

[D] 1 Absent rings: Year Master N series Absent

2003 -1.060 20 2

====================================================================================================================================

[\*] All segments correlate highest as dated with correlation with master series over .3281

PART 7: DESCRIPTIVE STATISTICS: 09:51 Mon 14 Mar 2011 Page 6

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Corr //-------- Unfiltered --------\\ //---- Filtered -----\\

No. No. No. with Mean Max Std Auto Mean Max Std Auto AR

Seq Series Interval Years Segmt Flags Master msmt msmt dev corr sens value dev corr ()

--- -------- --------- ----- ----- ----- ------ ----- ----- ----- ----- ----- ----- ----- ----- --

1 501A 1930 2010 81 3 0 .395 1.05 3.42 .808 .954 .209 2.59 .417 -.067 1

2 501B 1927 2010 84 3 0 .563 1.00 3.44 .789 .927 .209 2.66 .428 -.064 1

3 502A 1931 2010 80 3 0 .648 .96 2.01 .348 .708 .219 2.65 .482 .074 1

4 502B 1928 2010 83 3 0 .551 .95 2.31 .554 .823 .278 2.72 .620 .023 1

5 503A 1946 2010 65 3 0 .726 1.69 3.52 .583 .724 .208 2.45 .550 -.029 1

6 503B 1938 2010 73 3 0 .589 1.53 3.53 .596 .658 .251 2.70 .532 .051 1

7 504A 1953 2010 58 2 0 .695 1.23 3.07 .678 .832 .256 2.55 .524 -.104 1

8 504B 1937 2010 74 3 0 .707 1.00 1.85 .392 .763 .200 2.55 .506 -.068 1

9 505A 1933 2010 78 3 0 .751 .95 1.86 .328 .669 .208 2.64 .468 -.059 1

10 505B 1931 2010 80 3 0 .646 1.09 2.29 .348 .686 .201 2.77 .507 -.068 2

11 506A 1931 2010 80 3 0 .762 .83 2.13 .345 .727 .240 2.58 .467 -.014 2

12 506B 1931 2010 80 3 0 .645 .86 2.03 .496 .853 .250 2.66 .480 -.048 1

13 507A 1945 2010 66 3 0 .738 .78 1.30 .213 .380 .238 2.43 .330 .016 2

14 507B 1941 2010 70 3 0 .692 .82 1.41 .312 .694 .252 2.59 .435 .048 1

15 508A 1932 2010 79 3 0 .616 1.04 2.28 .275 .572 .178 2.79 .394 -.011 2

16 508B 1934 2010 77 3 0 .774 1.54 2.82 .392 .556 .184 2.71 .488 .027 1

17 509A 1938 2010 73 3 0 .620 .94 2.31 .392 .578 .269 2.78 .532 -.048 2

18 509B 1937 2010 74 3 0 .574 .91 1.79 .362 .699 .257 2.65 .595 -.038 1

19 510A 1936 2010 75 3 0 .620 .96 2.44 .547 .866 .359 2.66 .418 .077 1

20 510B 1931 2010 80 3 0 .723 .81 1.92 .465 .870 .324 2.65 .521 .001 1

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Total or mean: 1510 59 0 .649 1.04 3.53 .462 .731 .239 2.79 .485 -.015

- = [ COFECHA 127 COF ] = -