[] Dendrochronology Program Library Run SNC Program COF 17:13 Thu 06 Mar 2014 Page 1

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[] P R O G R A M C O F E C H A Version 6.06P 28921

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QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

Title of run: Final

File of DATED series: SNCLow\_ACSH\_4

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 1918 to 2012 95 years

Continuous time span is 1918 to 2012 95 years

Portion with two or more series is 1920 to 2012 93 years

>> 505A 2012 absent in 2 of 17 series, but is not usually narrow: master index is 2.218

>> 523A 1963 absent in 1 of 17 series, but is not usually narrow: master index is .157

>> 523A 2005 absent in 1 of 17 series, but is not usually narrow: master index is .239

>> 533B 2002 absent in 1 of 17 series, but is not usually narrow: master index is -.102

>> 533B 2009 absent in 2 of 17 series, but is not usually narrow: master index is 1.083

>> 534B 2009 absent in 2 of 17 series, but is not usually narrow: master index is 1.083

>> 535A 2011 absent in 1 of 17 series, but is not usually narrow: master index is .881

>> 535A 2012 absent in 2 of 17 series, but is not usually narrow: master index is 2.218

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

\*C\* Number of dated series 17 \*C\*

\*O\* Master series 1918 2012 95 yrs \*O\*

\*F\* Total rings in all series 1334 \*F\*

\*E\* Total dated rings checked 1332 \*E\*

\*C\* Series intercorrelation .436 \*C\*

\*H\* Average mean sensitivity .343 \*H\*

\*A\* Segments, possible problems 15 \*A\*

\*\*\* Mean length of series 78.5 \*\*\*

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

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

505A 1 absent rings: 2012

505B 1 absent rings: 2010

523A 3 absent rings: 1962 1963 2005

523B 1 absent rings: 1964

533A 1 absent rings: 2001

533B 4 absent rings: 1988 2002 2009 2010

534B 2 absent rings: 2009 2010

535A 3 absent rings: 2010 2011 2012

536B 1 absent rings: 1974

17 absent rings 1.274%

PART 2: TIME PLOT OF TREE-RING SERIES: Final 17:13 Thu 06 Mar 2014 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

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

. . . . . . . . . . . . . . . . . . <=======> . 505A 1 1930 2012 83

. . . . . . . . . . . . . . . . . . <======> . 505B 2 1940 2012 73

. . . . . . . . . . . . . . . . . . <======> . 508A 3 1946 2012 67

. . . . . . . . . . . . . . . . . . <=======> . 508B 4 1931 2012 82

. . . . . . . . . . . . . . . . . . <======> . 509A 5 1941 2012 72

. . . . . . . . . . . . . . . . . . <========> . 509B 6 1929 2012 84

. . . . . . . . . . . . . . . . . . <======> . 518B 7 1949 2012 64

. . . . . . . . . . . . . . . . . . <=======> . 523A 8 1936 2012 77

. . . . . . . . . . . . . . . . . . <=======> . 523B 9 1939 2012 74

. . . . . . . . . . . . . . . . . . <=======> . 533A 10 1930 2012 83

. . . . . . . . . . . . . . . . . . <=======> . 533B 11 1934 2012 79

. . . . . . . . . . . . . . . . . .<=========> . 534B 12 1918 2012 95

. . . . . . . . . . . . . . . . . . <========> . 534A 13 1920 2012 93

. . . . . . . . . . . . . . . . . . <=======> . 535A 14 1932 2012 81

. . . . . . . . . . . . . . . . . . <=======> . 535B 15 1935 2012 78

. . . . . . . . . . . . . . . . . . <======> . 536A 16 1943 2012 70

. . . . . . . . . . . . . . . . . . <=======> . 536B 17 1934 2012 79

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

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: Final 17:13 Thu 06 Mar 2014 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

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

1950 -.356 17 2000 -1.251 17

1951 -.155 17 2001 -1.350 17 1

1952 -.306 17 2002 -.102 17 1<<

1953 -.029 17 2003 -.028 17

1954 -.483 17 2004 .598 17

1955 1.552 17 2005 .239 17 1<<

1956 .069 17 2006 -1.573 17

1957 -.875 17 2007 -.994 17

1958 .254 17 2008 .432 17

1959 .962 17 2009 1.083 17 2<<

1960 .793 17 2010 -.551 17 4

1961 1.326 17 2011 .881 17 1<<

1962 -.747 17 1 2012 2.218 17 2<<

1963 .157 17 1<<

1964 -1.504 17 1

1965 .057 17

1966 .612 17

1967 -.089 17

1918 2.571 1 1968 -.780 17

1919 1.327 1 1969 .692 17

1920 1.511 2 1970 .450 17

1921 .200 2 1971 -.299 17

1922 .733 2 1972 -.332 17

1923 -.254 2 1973 -.338 17

1924 -1.412 2 1974 -.711 17 1

1925 -.360 2 1975 -1.375 17

1926 -1.453 2 1976 .417 17

1927 .192 2 1977 .772 17

1928 -.884 2 1978 1.103 17

1929 -1.346 3 1979 -.604 17

1930 -.642 5 1980 -.175 17

1931 -.075 6 1981 .428 17

1932 -1.261 7 1982 .640 17

1933 -1.702 7 1983 .234 17

1934 .631 9 1984 .745 17

1935 .840 10 1985 1.073 17

1936 .065 11 1986 -.737 17

1937 .586 11 1987 .509 17

1938 .194 11 1988 -3.482 17 1

1939 1.245 12 1989 -3.357 17

1940 .380 13 1990 .139 17

1941 .600 14 1991 1.065 17

1942 .905 14 1992 .350 17

1943 .205 15 1993 -.700 17

1944 -.191 15 1994 1.697 17

1945 -1.030 15 1995 .744 17

1946 -.849 16 1996 .813 17

1947 -.405 16 1997 .602 17

1948 -1.041 16 1998 .272 17

1949 -.394 17 1999 .418 17

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PART 4: Master Bar Plot: Final 17:13 Thu 06 Mar 2014 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-e

1951----a 2001e

1952---a 2002----@

1953----@ 2003----@

1954---b 2004-------B

1955----------F 2005------A

1956-----@ 2006f

1957-c 2007-d

1958------A 2008-------B

1959---------D 2009---------D

1960--------C 2010--b

1961----------E 2011---------D

1962--c 2012----------I

1963-----A

1964f

1965-----@

1966-------B

1967----@

1918----------J 1968--c

1919----------E 1969--------C

1920----------F 1970-------B

1921-----A 1971---a

1922--------C 1972---a

1923---a 1973---a

1924f 1974--c

1925---a 1975f

1926f 1976------B

1927-----A 1977--------C

1928-d 1978---------D

1929e 1979--b

1930--c 1980----a

1931----@ 1981------B

1932-e 1982-------C

1933g 1983------A

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

1935--------C 1985---------D

1936-----@ 1986--c

1937-------B 1987-------B

1938-----A 1988n

1939---------E 1989m

1940------B 1990-----A

1941-------B 1991---------D

1942---------D 1992------A

1943-----A 1993--c

1944----a 1994----------G

1945-d 1995--------C

1946--c 1996--------C

1947---b 1997-------B

1948-d 1998------A

1949---b 1999------B

PART 5: CORRELATION OF SERIES BY SEGMENTS: Final 17:13 Thu 06 Mar 2014 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 1900 1925 1950 1975

1949 1974 1999 2024

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

1 505A 1930 2012 .30A .58 .63

2 505B 1940 2012 .37 .41 .48

3 508A 1946 2012 .46 .45 .55

4 508B 1931 2012 .27B .53 .49

5 509A 1941 2012 .43 .37 .49

6 509B 1929 2012 .22B .57 .67

7 518B 1949 2012 .30A .34 .41

8 523A 1936 2012 -.13B .38B .42B

9 523B 1939 2012 .21A .49 .56

10 533A 1930 2012 .34 .65 .65

11 533B 1934 2012 .39 .35 .27A

12 534B 1918 2012 .27A .26A .69 .71

13 534A 1920 2012 .29A .24A .57 .68

14 535A 1932 2012 .33 .43 .47

15 535B 1935 2012 .24A .40 .46

16 536A 1943 2012 .35 .38 .49

17 536B 1934 2012 .31A .43 .51

Av segment correlation .28 .29 .47 .53

PART 6: POTENTIAL PROBLEMS: Final 17:13 Thu 06 Mar 2014 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

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505A 1930 to 2012 83 years Series 1

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

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

1930 1979 0 -.05 -.12 .10 .03 -.12 -.04 .02 .04 -.03 .00 .30\*-.08 -.10 .14 .15 -.04 .00 -.12 .20 -.15 -.21

[B] Entire series, effect on correlation ( .391) is:

Lower 2012< -.070 1945< -.061 1964> -.025 2010> -.013 1930> -.012 1931> -.011 Higher 1988 .081 1955 .027

1930 to 1979 segment:

Lower 1945< -.070 1964> -.048 1930> -.021 1931> -.018 1979> -.016 1936< -.012 Higher 1955 .071 1932 .033

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

2012 2.218 17 2 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

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

1945 -5.7 SD

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

505B 1940 to 2012 73 years Series 2

[B] Entire series, effect on correlation ( .421) is:

Lower 1989> -.037 1945> -.018 1957> -.017 1995< -.017 1986< -.016 1953< -.015 Higher 1988 .048 1955 .023

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

2010 -.551 17 4

[E] Outliers 2 3.0 SD above or -4.5 SD below mean for year

1986 -4.8 SD; 1989 +3.1 SD

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508A 1946 to 2012 67 years Series 3

[B] Entire series, effect on correlation ( .490) is:

Lower 1988> -.067 1962< -.026 1946> -.020 1997< -.017 1973> -.015 1957> -.014 Higher 1955 .023 1994 .019

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

1962 -4.6 SD

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508B 1931 to 2012 82 years Series 4

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

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

1931 1980 2 -.10 -.18 .02 .01 -.07 .07 .02 -.02 .17 .17 .27| .04 .29\*-.11 .05 .02 -.09 -.10 -.28 -.06 -.15

[B] Entire series, effect on correlation ( .374) is:

Lower 1931< -.085 1988> -.048 1932> -.032 2003< -.019 1967> -.011 1947< -.009 Higher 1989 .024 1962 .022

1931 to 1980 segment:

Lower 1931< -.159 1932> -.067 1967> -.020 1956> -.015 1944> -.013 1963< -.012 Higher 1962 .059 1955 .038

[C] Year-to-year changes diverging by over 4.0 std deviations:

1931 1932 4.8 SD

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509A 1941 to 2012 72 years Series 5

[B] Entire series, effect on correlation ( .427) is:

Lower 1998< -.037 1996< -.027 1964> -.025 1989> -.023 1956< -.020 1955< -.019 Higher 1988 .121 2006 .026

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509B 1929 to 2012 84 years Series 6

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

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1929 1978 8 .10 .14 .27 .22 .12 -.10 .09 -.04 -.16 -.15 .22|-.17 -.04 -.10 .15 -.18 .00 -.07 .35\*-.28 .15

[B] Entire series, effect on correlation ( .503) is:

Lower 1948> -.035 1954< -.024 1960< -.021 1962> -.020 1931> -.019 2011< -.015 Higher 1988 .175 2012 .016

1929 to 1978 segment:

Lower 1948> -.068 1960< -.044 1962> -.036 1931> -.034 1954< -.024 1949> -.017 Higher 1932 .048 1955 .031

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

1949 +3.0 SD

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518B 1949 to 2012 64 years Series 7

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

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

1949 1998 0 -.08 -.27 -.15 -.05 -.09 -.06 .05 .02 .15 .19 .30\*-.13 -.09 .06 .19 -.06 -.29 .03 -.01 .13 -.11

[B] Entire series, effect on correlation ( .375) is:

Lower 1988> -.049 1949< -.039 1984< -.032 1962> -.021 1990< -.015 1985< -.012 Higher 1989 .040 1964 .035

1949 to 1998 segment:

Lower 1988> -.050 1949< -.043 1984< -.038 1962> -.025 1990< -.018 1985< -.014 Higher 1964 .061 1989 .058

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523A 1936 to 2012 77 years Series 8

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

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1936 1985 -3 -.12 -.14 .21 -.03 .05 -.08 .07 .52\*-.23 .31 -.13| .16 .09 -.12 -.17 -.05 -.04 -.13 -.08 -.10 .14

1950 1999 -1 -.06 .04 .05 -.17 -.12 -.14 -.17 .20 -.12 .40\* .38| .29 -.04 -.05 -.16 -.05 -.19 -.12 -.11 -.22 -.01

1963 2012 -1 -.04 .03 .05 -.16 -.24 -.20 -.15 .15 -.10 .43\* .42| - - - - - - - - - -

[B] Entire series, effect on correlation ( .332) is:

Lower 1964> -.062 1945> -.052 1965< -.038 1979> -.028 1936< -.022 2006> -.018 Higher 1988 .140 1962 .042

1936 to 1985 segment:

Lower 1964> -.102 1945> -.080 1979> -.045 1965< -.044 1936< -.017 1941< -.014 Higher 1962 .177 1948 .034

1950 to 1999 segment:

Lower 1964> -.094 1965< -.060 1979> -.041 1955< -.018 1993> -.016 1986> -.015 Higher 1988 .191 1962 .045

1963 to 2012 segment:

Lower 1964> -.099 1965< -.076 1979> -.044 2006> -.026 1993> -.017 1986> -.014 Higher 1988 .223 1989 .047

[C] Year-to-year changes diverging by over 4.0 std deviations:

1963 1964 4.5 SD

[D] 3 Absent rings: Year Master N series Absent

1962 -.747 17 1

1963 .157 17 1 >> WARNING: Ring is not usually narrow

2005 .239 17 1 >> WARNING: Ring is not usually narrow

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

1945 +3.6 SD

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523B 1939 to 2012 74 years Series 9

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

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

1939 1988 0 .17 -.11 .13 .09 -.07 .08 -.21 -.10 .09 -.11 .21\* .21 .00 -.21 -.01 -.01 .02 -.08 .07 -.25 .02

[B] Entire series, effect on correlation ( .369) is:

Lower 1943< -.068 1962> -.023 1947> -.022 1986> -.019 1993> -.018 1979> -.015 Higher 1988 .054 1964 .052

1939 to 1988 segment:

Lower 1943< -.083 1962> -.030 1947> -.026 1986> -.025 1979> -.019 1948> -.013 Higher 1964 .099 1988 .079

[C] Year-to-year changes diverging by over 4.0 std deviations:

1943 1944 4.4 SD

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

1964 -1.504 17 1

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

1943 -5.7 SD

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533A 1930 to 2012 83 years Series 10

[B] Entire series, effect on correlation ( .545) is:

Lower 1965< -.027 1933> -.021 1930< -.014 2000> -.014 1932> -.013 1938< -.011 Higher 1988 .103 1962 .012

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

2001 -1.350 17 1

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

533B 1934 to 2012 79 years Series 11

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

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

1963 2012 0 -.02 -.20 -.03 -.08 -.10 -.05 -.11 .05 .13 .13 .27\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .361) is:

Lower 2000> -.025 1979> -.021 1980< -.020 1975> -.019 1991< -.018 2009< -.018 Higher 1988 .059 1964 .034

1963 to 2012 segment:

Lower 1980< -.033 2000> -.032 1979> -.028 2009< -.027 1991< -.027 1975> -.024 Higher 1988 .102 1964 .042

[D] 4 Absent rings: Year Master N series Absent

1988 -3.482 17 1

2002 -.102 17 1 >> WARNING: Ring is not usually narrow

2009 1.083 17 2 >> WARNING: Ring is not usually narrow

2010 -.551 17 4

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534B 1918 to 2012 95 years Series 12

[\*] Early part of series cannot be checked from 1918 to 1919 -- not matched by another series

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

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

1920 1969 0 - - - - - - - - .04 .17 .27\*-.10 .04 -.05 .05 -.15 -.09 -.01 -.02 .00 .00

1925 1974 0 - - - -.08 -.04 .16 .08 .12 .06 .23 .26\*-.11 .01 -.08 .05 -.26 -.05 -.08 -.04 -.03 .03

[B] Entire series, effect on correlation ( .504) is:

Lower 1928> -.062 1975> -.019 1945> -.015 1920< -.012 1993> -.009 1957> -.008 Higher 1988 .139 2012 .017

1920 to 1969 segment:

Lower 1928> -.112 1945> -.030 1957> -.017 1931> -.016 1946> -.016 1963< -.014 Higher 1962 .041 1964 .030

1925 to 1974 segment:

Lower 1928> -.121 1945> -.029 1963< -.018 1927< -.016 1957> -.015 1947< -.014 Higher 1962 .046 1964 .034

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

2009 1.083 17 2 >> WARNING: Ring is not usually narrow

2010 -.551 17 4

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534A 1920 to 2012 93 years Series 13

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

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1920 1969 0 - - - - - - - - .22 -.19 .29\* .12 -.04 -.02 .11 .07 .05 -.29 .19 -.26 -.19

1925 1974 0 - - - -.15 -.03 .03 .00 .00 .14 -.21 .24\* .12 -.05 -.01 .24 .06 .04 -.26 .18 -.22 -.09

[B] Entire series, effect on correlation ( .504) is:

Lower 1928< -.045 1978< -.024 1944< -.020 1975> -.018 1959< -.017 1957> -.016 Higher 1988 .133 1962 .013

1920 to 1969 segment:

Lower 1928< -.090 1959< -.033 1957> -.031 1944< -.028 1946> -.026 1947> -.024 Higher 1962 .057 1955 .043

1925 to 1974 segment:

Lower 1928< -.090 1959< -.033 1957> -.031 1946> -.025 1944< -.024 1947> -.023 Higher 1962 .067 1955 .045

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535A 1932 to 2012 81 years Series 14

[B] Entire series, effect on correlation ( .460) is:

Lower 2004< -.024 1942< -.024 1975< -.022 1978< -.016 1964> -.015 1933> -.013 Higher 1988 .024 2012 .024

[D] 3 Absent rings: Year Master N series Absent

2010 -.551 17 4

2011 .881 17 1 >> WARNING: Ring is not usually narrow

2012 2.218 17 2 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

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535B 1935 to 2012 78 years Series 15

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

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

1935 1984 0 .11 -.28 .01 -.23 -.02 -.38 .22 -.26 .10 -.05 .24\* .23 -.10 .02 .00 .15 -.12 .18 .06 .12 -.12

[B] Entire series, effect on correlation ( .427) is:

Lower 1966< -.099 2004< -.021 1962> -.015 2008< -.011 1973> -.009 1951> -.009 Higher 1988 .032 1989 .028

1935 to 1984 segment:

Lower 1966< -.148 1962> -.030 1973> -.017 1936> -.015 1956> -.014 1981< -.014 Higher 1964 .048 1979 .025

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536A 1943 to 2012 70 years Series 16

[B] Entire series, effect on correlation ( .428) is:

Lower 1973< -.071 1962> -.023 1961< -.015 1977< -.015 1963< -.012 1972> -.011 Higher 2012 .029 1988 .027

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536B 1934 to 2012 79 years Series 17

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

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

1934 1983 0 -.16 -.20 -.10 -.03 .04 .01 .22 -.06 .30 -.02 .31\*-.02 .02 .10 .04 -.15 -.15 -.23 -.18 .12 -.09

[B] Entire series, effect on correlation ( .457) is:

Lower 1962> -.027 1977< -.024 1986> -.021 1995< -.011 1970< -.010 1951< -.010 Higher 1964 .028 2012 .016

1934 to 1983 segment:

Lower 1962> -.066 1977< -.051 1935< -.021 1970< -.020 1975> -.019 1948> -.019 Higher 1964 .101 1939 .035

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

1974 -.711 17 1

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PART 7: DESCRIPTIVE STATISTICS: Final 17:13 Thu 06 Mar 2014 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 505A 1930 2012 83 3 1 .391 1.46 3.62 .807 .809 .268 2.82 .381 -.029 1

2 505B 1940 2012 73 3 0 .421 1.17 2.59 .621 .873 .277 2.59 .417 -.012 2

3 508A 1946 2012 67 3 0 .490 1.96 4.42 .853 .655 .290 2.67 .410 -.010 1

4 508B 1931 2012 82 3 1 .374 1.97 4.76 1.117 .869 .284 2.61 .503 -.005 1

5 509A 1941 2012 72 3 0 .427 2.33 4.59 1.023 .822 .226 2.66 .565 -.018 1

6 509B 1929 2012 84 3 1 .503 2.36 5.26 1.011 .856 .221 2.47 .358 -.010 1

7 518B 1949 2012 64 3 1 .375 1.39 2.99 .752 .803 .242 2.52 .491 -.016 1

8 523A 1936 2012 77 3 3 .332 .98 2.78 .726 .827 .422 2.93 .482 .066 1

9 523B 1939 2012 74 3 1 .369 .96 2.43 .677 .871 .348 2.51 .385 -.044 1

10 533A 1930 2012 83 3 0 .545 1.38 3.54 .942 .709 .447 2.61 .522 .017 3

11 533B 1934 2012 79 3 1 .361 1.54 5.53 1.387 .678 .561 2.64 .470 -.038 2

12 534B 1918 2012 95 4 2 .504 1.14 3.84 .941 .877 .434 2.42 .324 .004 1

13 534A 1920 2012 93 4 2 .504 1.18 3.41 .851 .889 .340 2.43 .419 -.004 1

14 535A 1932 2012 81 3 0 .460 1.28 3.16 .757 .810 .338 2.60 .457 -.039 3

15 535B 1935 2012 78 3 1 .427 1.34 3.48 .758 .676 .376 2.80 .470 -.039 1

16 536A 1943 2012 70 3 0 .428 1.32 6.24 1.201 .840 .375 2.85 .454 -.014 1

17 536B 1934 2012 79 3 1 .457 1.59 4.16 1.053 .876 .336 2.58 .442 -.005 1

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Total or mean: 1334 53 15 .436 1.49 6.24 .913 .811 .343 2.93 .442 -.011

- = [ COFECHA SNC COF ] = -