[] Dendrochronology Program Library Run STER9 Program COF 15:24 Wed 03 Apr 2013 Page 1

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[] P R O G R A M C O F E C H A Version 6.06P 28584

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QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

Title of run: STER9\_5

File of DATED series: STER9\_5COMP

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 30 years lagged successively by 15 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 .4226

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 1910 to 2012 103 years

Continuous time span is 1910 to 2012 103 years

Portion with two or more series is 1911 to 2012 102 years

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

\*C\* Number of dated series 19 \*C\*

\*O\* Master series 1910 2012 103 yrs \*O\*

\*F\* Total rings in all series 1744 \*F\*

\*E\* Total dated rings checked 1743 \*E\*

\*C\* Series intercorrelation .588 \*C\*

\*H\* Average mean sensitivity .232 \*H\*

\*A\* Segments, possible problems 17 \*A\*

\*\*\* Mean length of series 91.8 \*\*\*

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

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

19B 2 absent rings: 1965 1966

2 absent rings .115%

PART 2: TIME PLOT OF TREE-RING SERIES: STER9\_5 15:24 Wed 03 Apr 2013 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

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

. . . . . . . . . . . . . . . . . .<=========> . 17A 1 1919 2012 94

. . . . . . . . . . . . . . . . . .<=========> . 17B 2 1917 2012 96

. . . . . . . . . . . . . . . . . . <=======> . 18A 3 1931 2012 82

. . . . . . . . . . . . . . . . . .<=========> . 18B 4 1916 2012 97

. . . . . . . . . . . . . . . . . .<=========> . 19A 5 1913 2012 100

. . . . . . . . . . . . . . . . . .<=========> . 19B 6 1914 2012 99

. . . . . . . . . . . . . . . . . . <========> . 21A 7 1929 2012 84

. . . . . . . . . . . . . . . . . . <========> . 21B 8 1929 2012 84

. . . . . . . . . . . . . . . . . . <=======> . 22A 9 1933 2012 80

. . . . . . . . . . . . . . . . . .<=========> . 23A 10 1917 2012 96

. . . . . . . . . . . . . . . . . .<=========> . 23B 11 1911 2012 102

. . . . . . . . . . . . . . . . . . <=======> . 25A 12 1933 2012 80

. . . . . . . . . . . . . . . . . .<=========> . 25B 13 1916 2012 97

. . . . . . . . . . . . . . . . . .<=========> . 26A 14 1913 2012 100

. . . . . . . . . . . . . . . . . .<=========> . 26B 15 1913 2012 100

. . . . . . . . . . . . . . . . . .<=========> . 27A 16 1910 2012 103

. . . . . . . . . . . . . . . . . . <========> . 27B 17 1920 2012 93

. . . . . . . . . . . . . . . . . . <=======> . 28A 18 1934 2012 79

. . . . . . . . . . . . . . . . . . <=======> . 28B 19 1935 2012 78

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

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: STER9\_5 15:24 Wed 03 Apr 2013 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 -.316 19 2000 .695 19

1951 .268 19 2001 .575 19

1952 .073 19 2002 1.518 19

1953 .326 19 2003 -2.335 19

1954 .597 19 2004 -1.626 19

1955 -.278 19 2005 -1.451 19

1956 -.676 19 2006 -.985 19

1957 1.182 19 2007 -.630 19

1958 1.288 19 2008 -.963 19

1959 -.331 19 2009 .824 19

1910 -1.536 1 1960 -.139 19 2010 .943 19

1911 -.384 2 1961 .977 19 2011 .222 19

1912 -.521 2 1962 .137 19 2012 1.596 19

1913 .267 5 1963 -.485 19

1914 .031 6 1964 -1.476 19

1915 1.972 6 1965 -2.232 19 1

1916 1.006 8 1966 -1.905 19 1

1917 -.296 10 1967 -1.597 19

1918 .677 10 1968 -.718 19

1919 -1.429 11 1969 .675 19

1920 .496 12 1970 1.286 19

1921 .820 12 1971 1.739 19

1922 -.180 12 1972 .953 19

1923 -1.548 12 1973 1.325 19

1924 .757 12 1974 -.077 19

1925 .895 12 1975 -1.414 19

1926 .101 12 1976 -.089 19

1927 1.238 12 1977 -.775 19

1928 -.816 12 1978 -.002 19

1929 .305 14 1979 -.100 19

1930 -.369 14 1980 .276 19

1931 .026 15 1981 -.994 19

1932 .368 15 1982 -.068 19

1933 -.837 17 1983 .422 19

1934 -.246 18 1984 -.912 19

1935 -1.411 19 1985 -.409 19

1936 -1.444 19 1986 -.469 19

1937 -1.891 19 1987 .054 19

1938 .679 19 1988 -.332 19

1939 -.071 19 1989 -.001 19

1940 .178 19 1990 .340 19

1941 2.187 19 1991 -.143 19

1942 1.193 19 1992 1.292 19

1943 .279 19 1993 1.576 19

1944 -.059 19 1994 .435 19

1945 2.022 19 1995 .129 19

1946 -.164 19 1996 .261 19

1947 .591 19 1997 -.815 19

1948 -2.296 19 1998 -.161 19

1949 .790 19 1999 1.535 19

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PART 4: Master Bar Plot: STER9\_5 15:24 Wed 03 Apr 2013 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------A 2001-------B

1952-----@ 2002----------F

1953------A 2003i

1954-------B 2004g

1955---a 2005-f

1956--c 2006--d

1957---------E 2007--c

1958---------E 2008--d

1959---a 2009--------C

1910f 1960----a 2010--------D

1911---b 1961--------D 2011------A

1912---b 1962-----A 2012----------F

1913------A 1963---b

1914-----@ 1964-f

1915----------H 1965i

1916---------D 1966h

1917---a 1967f

1918--------C 1968--c

1919-f 1969--------C

1920-------B 1970---------E

1921--------C 1971----------G

1922----a 1972--------D

1923f 1973---------E

1924--------C 1974----@

1925--------D 1975-f

1926-----@ 1976----@

1927---------E 1977--c

1928--c 1978-----@

1929------A 1979----@

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

1931-----@ 1981--d

1932-------A 1982----@

1933--c 1983-------B

1934---a 1984--d

1935-f 1985---b

1936-f 1986---b

1937h 1987-----@

1938--------C 1988---a

1939----@ 1989-----@

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

1941----------I 1991----a

1942---------E 1992---------E

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

1944----@ 1994-------B

1945----------H 1995-----A

1946----a 1996------A

1947-------B 1997--c

1948i 1998----a

1949--------C 1999----------F

PART 5: CORRELATION OF SERIES BY SEGMENTS: STER9\_5 15:24 Wed 03 Apr 2013 Page 5

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Correlations of 30-year dated segments, lagged 15 years

Flags: A = correlation under .4226 but highest as dated; B = correlation higher at other than dated position

Seq Series Time\_span 1905 1920 1935 1950 1965 1980 1995

1934 1949 1964 1979 1994 2009 2024

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

1 17A 1919 2012 .55 .54 .58 .42A .45 .76 .77

2 17B 1917 2012 .38A .46 .57 .48 .47 .69 .66

3 18A 1931 2012 .44 .45 .67 .58 .76 .73

4 18B 1916 2012 .42A .65 .79 .66 .31A .62 .65

5 19A 1913 2012 .61 .63 .67 .65 .57 .49 .52

6 19B 1914 2012 .38A .46 .40A .44 .44 .47 .48

7 21A 1929 2012 .70 .73 .61 .63 .59 .63

8 21B 1929 2012 .19B .25B .47 .72 .76 .76

9 22A 1933 2012 .73 .73 .28B .20B .60 .62

10 23A 1917 2012 .66 .69 .68 .60 .65 .69 .72

11 23B 1911 2012 .44 .74 .72 .59 .45 .54 .61

12 25A 1933 2012 .49 .53 .50 .57 .57 .66

13 25B 1916 2012 .62 .58 .51 .61 .54 .56 .62

14 26A 1913 2012 .64 .77 .77 .71 .72 .71 .73

15 26B 1913 2012 .62 .72 .83 .74 .68 .63 .60

16 27A 1910 2012 .33A .56 .62 .58 .50 .66 .43B

17 27B 1920 2012 .72 .76 .61 .36B .31A .37A

18 28A 1934 2012 .65 .67 .65 .60 .71 .73

19 28B 1935 2012 .60 .72 .48 .44B .41B

Av segment correlation .51 .60 .62 .58 .52 .61 .62

PART 6: POTENTIAL PROBLEMS: STER9\_5 15:24 Wed 03 Apr 2013 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 30-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

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

17A 1919 to 2012 94 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

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

1950 1979 0 -.01 -.22 -.16 .15 -.18 -.29 -.22 .00 -.09 .23 .42\* .25 .28 .00 .03 -.03 -.18 -.32 -.28 .10 .00

[B] Entire series, effect on correlation ( .599) is:

Lower 1973< -.019 1948> -.018 1964> -.012 2008< -.011 1928> -.009 1922< -.009 Higher 2003 .090 1941 .015

1950 to 1979 segment:

Lower 1973< -.070 1964> -.069 1959> -.044 1952> -.043 1979< -.023 1978< -.021 Higher 1957 .069 1965 .062

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

17B 1917 to 2012 96 years Series 2

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

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

1917 1946 0 - - - .31 .03 -.35 .22 .03 .06 -.38 .38\*-.14 .05 -.06 .21 .13 -.07 .03 -.27 .07 -.13

[B] Entire series, effect on correlation ( .497) is:

Lower 1919> -.029 1948> -.029 1928> -.018 1984> -.015 1926< -.015 1932< -.014 Higher 2003 .117 1941 .015

1917 to 1946 segment:

Lower 1919> -.085 1928> -.050 1932< -.047 1926< -.047 1942< -.033 1925< -.028 Higher 1941 .065 1945 .050

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18A 1931 to 2012 82 years Series 3

[B] Entire series, effect on correlation ( .614) is:

Lower 1948> -.060 1942> -.012 2006> -.010 1986> -.009 1976< -.009 1988> -.009 Higher 2003 .123 2002 .009

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

18B 1916 to 2012 97 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

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

1916 1945 0 - - - - .03 -.27 .28 -.07 .19 .14 .42\* .11 -.20 -.15 -.11 .09 -.25 .16 -.17 -.13 .09

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

1965 1994 0 .17 .24 -.06 -.08 -.10 -.06 -.11 .02 .22 .12 .31\*-.27 -.25 -.24 -.27 -.01 -.07 .28 -.12 .00 -.09

[B] Entire series, effect on correlation ( .604) is:

Lower 1990< -.029 1929< -.025 1918< -.019 1921< -.014 1972< -.012 1988> -.009 Higher 2003 .075 1948 .046

1916 to 1945 segment:

Lower 1929< -.078 1918< -.059 1921< -.042 1917> -.028 1926> -.020 1922> -.013 Higher 1945 .064 1923 .049

1965 to 1994 segment:

Lower 1990< -.113 1972< -.044 1988> -.038 1981> -.026 1984> -.020 1989< -.017 Higher 1965 .046 1971 .043

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19A 1913 to 2012 100 years Series 5

[B] Entire series, effect on correlation ( .585) is:

Lower 2003> -.025 1939> -.015 1946> -.012 2004> -.011 1933> -.011 1959> -.009 Higher 1948 .030 1941 .011

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19B 1914 to 2012 99 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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1914 1943 0 - - - - - - -.22 .06 -.03 -.31 .38\*-.09 -.02 -.11 .02 -.32 .35 -.12 -.27 .00 .04

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

1935 1964 0 -.22 .20 -.06 .09 -.19 .22 .07 -.21 -.03 -.07 .40\*-.28 .01 -.14 .06 -.31 .25 -.24 .09 -.14 -.19

[B] Entire series, effect on correlation ( .483) is:

Lower 1942< -.039 1988< -.036 1959> -.019 1946> -.013 1984> -.012 1969< -.009 Higher 1948 .040 1965 .012

1914 to 1943 segment:

Lower 1942< -.107 1936> -.025 1917> -.025 1935> -.021 1914> -.018 1928> -.018 Higher 1937 .043 1933 .039

1935 to 1964 segment:

Lower 1942< -.141 1959> -.056 1946> -.037 1936> -.023 1940< -.021 1947< -.020 Higher 1948 .187 1937 .040

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

1965 -2.232 19 1

1966 -1.905 19 1

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

1988 -5.0 SD

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21A 1929 to 2012 84 years Series 7

[B] Entire series, effect on correlation ( .659) is:

Lower 1952< -.022 1933> -.018 2004> -.015 1963> -.012 1947< -.011 2006< -.009 Higher 1948 .044 2003 .025

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21B 1929 to 2012 84 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

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

1929 1958 -4 -.12 -.17 -.06 .31 -.05 -.24 .37\*-.11 .36 -.24 .19|-.18 .02 -.04 -.08 .04 .09 -.10 -.10 .11 -.01

1935 1964 -4 -.01 -.19 -.06 .23 .03 -.20 .33\* .09 .22 -.21 .25|-.17 .14 -.24 -.02 -.17 .11 -.28 .04 .10 .03

[B] Entire series, effect on correlation ( .502) is:

Lower 1948> -.098 1958< -.028 1930< -.024 1940< -.020 1933> -.014 2006< -.013 Higher 2003 .114 1945 .016

1929 to 1958 segment:

Lower 1948> -.223 1958< -.048 1933> -.031 1940< -.026 1939> -.015 1932< -.010 Higher 1945 .071 1941 .064

1935 to 1964 segment:

Lower 1948> -.252 1958< -.064 1940< -.041 1960> -.019 1939> -.016 1954< -.011 Higher 1945 .077 1941 .069

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

1948 +4.4 SD

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22A 1933 to 2012 80 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

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

1950 1979 -3 -.18 -.19 -.13 -.20 -.27 .06 .46 .52\* .31 .24 .28|-.32 -.59 -.36 -.23 -.18 .10 .22 .14 .09 -.07

1965 1994 -3 -.17 -.16 -.42 -.35 -.09 .08 .27 .67\* .43 .11 .20|-.30 -.59 -.35 -.15 -.09 .13 .43 .12 .08 .02

[B] Entire series, effect on correlation ( .567) is:

Lower 1969< -.029 1965> -.017 1996< -.016 1968< -.015 1974> -.012 1940< -.011 Higher 1948 .056 2003 .027

1950 to 1979 segment:

Lower 1969< -.117 1965> -.063 1968< -.048 1974> -.048 1975> -.028 1964> -.026 Higher 1957 .055 1961 .053

1965 to 1994 segment:

Lower 1969< -.105 1965> -.052 1974> -.042 1968< -.035 1975> -.019 1988> -.019 Higher 1981 .062 1973 .052

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

1948 -5.6 SD

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23A 1917 to 2012 96 years Series 10

[B] Entire series, effect on correlation ( .689) is:

Lower 1963> -.011 1924< -.011 1962> -.010 1987> -.008 1958< -.008 1965> -.007 Higher 2003 .039 1948 .035

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

1987 +3.1 SD

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23B 1911 to 2012 102 years Series 11

[B] Entire series, effect on correlation ( .600) is:

Lower 1984< -.032 1914< -.021 1981> -.019 1935> -.013 1911> -.010 1937> -.008 Higher 1948 .046 2003 .035

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25A 1933 to 2012 80 years Series 12

[B] Entire series, effect on correlation ( .573) is:

Lower 1960> -.035 1981> -.026 1997> -.024 1985< -.018 1933> -.018 1935> -.013 Higher 2003 .109 1941 .017

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

1960 +3.8 SD

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25B 1916 to 2012 97 years Series 13

[B] Entire series, effect on correlation ( .592) is:

Lower 1944< -.033 1997> -.018 1963> -.012 1981> -.012 1990< -.011 1933> -.010 Higher 2003 .022 1919 .011

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26A 1913 to 2012 100 years Series 14

[B] Entire series, effect on correlation ( .719) is:

Lower 1962< -.018 1914> -.015 1937> -.011 1996< -.008 1915< -.007 1994< -.006 Higher 1948 .032 1919 .012

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26B 1913 to 2012 100 years Series 15

[B] Entire series, effect on correlation ( .686) is:

Lower 1923> -.016 1929< -.013 2012< -.013 1962< -.012 1921< -.009 1920< -.008 Higher 1948 .037 1919 .011

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27A 1910 to 2012 103 years Series 16

[\*] Early part of series cannot be checked from 1910 to 1910 -- 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

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

1911 1940 0 - - - - - - - - - -.05 .33\*-.07 .29 -.18 -.14 .19 -.22 .00 .01 .27 -.53

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

1983 2012 -7 .07 -.05 -.27 .47\* .16 -.13 -.13 .06 .05 -.28 .43| - - - - - - - - - -

[B] Entire series, effect on correlation ( .473) is:

Lower 2010< -.074 1919> -.029 1984> -.019 1923> -.016 1914< -.011 1977> -.011 Higher 2003 .064 1928 .015

1911 to 1940 segment:

Lower 1919> -.104 1923> -.057 1914< -.035 1911< -.029 1912> -.024 1929< -.023 Higher 1928 .080 1935 .059

1983 to 2012 segment:

Lower 2010< -.224 1984> -.055 2004> -.025 2008> -.017 2011> -.010 1995< -.007 Higher 2003 .255 2002 .027

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27B 1920 to 2012 93 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

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

1965 1994 -1 .14 -.16 -.18 -.11 .07 -.09 -.27 .10 -.05 .45\* .36| .31 .00 .04 -.01 -.55 .06 -.09 -.16 .31 .18

1980 2009 0 .17 .12 -.14 -.01 -.01 -.33 -.16 .08 .02 .09 .31\*-.08 -.23 -.08 - - - - - - -

1983 2012 0 .26 -.09 .10 -.11 -.01 -.36 -.16 .14 -.01 .04 .37\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .518) is:

Lower 1997< -.039 1931< -.027 2003> -.022 1984> -.020 1977> -.011 1982< -.011 Higher 1945 .017 1948 .015

1965 to 1994 segment:

Lower 1984> -.086 1982< -.062 1977> -.049 1988> -.046 1987< -.031 1980< -.029 Higher 1992 .080 1975 .049

1980 to 2009 segment:

Lower 1984> -.044 1997< -.029 2008> -.023 2003> -.022 1982< -.022 1988> -.022 Higher 1992 .047 2002 .035

1983 to 2012 segment:

Lower 2003> -.055 1984> -.044 1997< -.035 2008> -.024 1988> -.023 2011< -.014 Higher 1992 .036 2012 .034

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28A 1934 to 2012 79 years Series 18

[B] Entire series, effect on correlation ( .673) is:

Lower 2004< -.031 1986> -.013 1975> -.012 2008> -.012 1953< -.008 1948> -.008 Higher 2003 .105 1945 .008

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

2004 -4.8 SD

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

28B 1935 to 2012 78 years Series 19

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

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

1980 2009 -7 -.07 .13 -.15 .52\*-.15 -.36 .08 -.04 .02 .34 .44|-.08 .04 .14 - - - - - - -

1983 2012 -1 .04 .00 -.09 .29 -.26 -.34 .03 .00 .03 .42\* .41| - - - - - - - - - -

[B] Entire series, effect on correlation ( .530) is:

Lower 1988< -.040 1948> -.035 2004< -.027 1994> -.024 1974> -.013 1946> -.012 Higher 2003 .020 1945 .016

1980 to 2009 segment:

Lower 1988< -.059 1994> -.042 2004< -.026 1999< -.009 1983< -.009 2008> -.005 Higher 1981 .035 2003 .024

1983 to 2012 segment:

Lower 1988< -.058 1994> -.046 2004< -.022 1999< -.010 1983< -.009 1992< -.005 Higher 2003 .063 2009 .020

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PART 7: DESCRIPTIVE STATISTICS: STER9\_5 15:24 Wed 03 Apr 2013 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 17A 1919 2012 94 7 1 .599 1.15 3.51 .640 .777 .240 2.91 .450 -.062 1

2 17B 1917 2012 96 7 1 .497 1.10 3.08 .714 .875 .251 2.59 .423 -.015 2

3 18A 1931 2012 82 6 0 .614 1.92 3.45 .711 .749 .225 2.65 .387 .039 1

4 18B 1916 2012 97 7 2 .604 1.17 3.27 .651 .860 .235 2.73 .499 .044 1

5 19A 1913 2012 100 7 0 .585 1.10 5.15 1.205 .967 .256 2.60 .393 -.075 1

6 19B 1914 2012 99 7 2 .483 .93 3.77 .828 .923 .312 2.53 .493 -.065 1

7 21A 1929 2012 84 6 0 .659 1.59 3.04 .522 .684 .206 2.75 .569 -.013 1

8 21B 1929 2012 84 6 2 .502 1.44 2.85 .506 .741 .189 2.56 .501 -.144 1

9 22A 1933 2012 80 6 2 .567 1.34 3.13 .590 .709 .275 2.39 .332 -.052 1

10 23A 1917 2012 96 7 0 .689 1.61 3.43 .543 .648 .224 2.62 .417 -.008 1

11 23B 1911 2012 102 7 0 .600 1.54 3.16 .480 .742 .181 2.53 .422 -.006 1

12 25A 1933 2012 80 6 0 .573 1.37 3.11 .583 .659 .266 2.98 .475 -.022 1

13 25B 1916 2012 97 7 0 .592 1.36 2.62 .444 .654 .233 2.53 .543 -.001 1

14 26A 1913 2012 100 7 0 .719 1.23 3.95 .639 .839 .211 2.80 .471 -.061 1

15 26B 1913 2012 100 7 0 .686 1.47 4.68 .800 .810 .224 2.70 .447 -.024 1

16 27A 1910 2012 103 7 2 .473 1.36 2.51 .642 .871 .229 2.54 .497 -.025 1

17 27B 1920 2012 93 6 3 .518 1.16 2.56 .560 .835 .247 2.56 .392 .030 1

18 28A 1934 2012 79 6 0 .673 2.32 4.46 .995 .841 .194 2.43 .404 .103 1

19 28B 1935 2012 78 5 2 .530 1.97 3.89 .843 .839 .208 2.76 .489 .052 1

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Total or mean: 1744 124 17 .588 1.41 5.15 .679 .794 .232 2.98 .453 -.017

- = [ COFECHA STER9COF ] = -