[] Dendrochronology Program Library Run SNC Program COF 14:56 Thu 07 Nov 2013 Page 1

[]

[] P R O G R A M C O F E C H A Version 6.06P 28802

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

QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

Title of run: SNC4

File of DATED series: SNCMid\_BEAL\_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 1895 to 2012 118 years

Continuous time span is 1895 to 2012 118 years

Portion with two or more series is 1896 to 2012 117 years

>> 550A 1960 absent in 1 of 19 series, but is not usually narrow: master index is .134

>> 550A 1961 absent in 1 of 19 series, but is not usually narrow: master index is -.022

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

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

\*O\* Master series 1895 2012 118 yrs \*O\*

\*F\* Total rings in all series 1669 \*F\*

\*E\* Total dated rings checked 1668 \*E\*

\*C\* Series intercorrelation .489 \*C\*

\*H\* Average mean sensitivity .274 \*H\*

\*A\* Segments, possible problems 20 \*A\*

\*\*\* Mean length of series 87.8 \*\*\*

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

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

550A 2 absent rings: 1960 1961

2 absent rings .120%

PART 2: TIME PLOT OF TREE-RING SERIES: SNC4 14:56 Thu 07 Nov 2013 Page 2

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

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

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

. . . . . . . . . . . . . . . . . .<=========> . 539A 1 1910 2012 103

. . . . . . . . . . . . . . . . . .<=========> . 539B 2 1916 2012 97

. . . . . . . . . . . . . . . . . . <========> . 541B 3 1920 2012 93

. . . . . . . . . . . . . . . . . . <=======> . 547A 4 1934 2012 79

. . . . . . . . . . . . . . . . . . <=======> . 547B 5 1932 2012 81

. . . . . . . . . . . . . . . . . <==========> . 550A 6 1900 2012 113

. . . . . . . . . . . . . . . . . . <=====> . 550B 7 1952 2012 61

. . . . . . . . . . . . . . . . . . <======> . 556A 8 1946 2012 67

. . . . . . . . . . . . . . . . . . <========> . 556B 9 1922 2012 91

. . . . . . . . . . . . . . . . . <===========> . 561A 10 1895 2012 118

. . . . . . . . . . . . . . . . . . <=======> . 563B 11 1935 2012 78

. . . . . . . . . . . . . . . . . <===========> . 564A 12 1897 2012 116

. . . . . . . . . . . . . . . . . . <======> . 564B 13 1945 2012 68

. . . . . . . . . . . . . . . . . . <=====> . 565A 14 1958 2012 55

. . . . . . . . . . . . . . . . . . <=====> . 565B 15 1954 2012 59

. . . . . . . . . . . . . . . . . .<=========> . 570A 16 1915 2012 98

. . . . . . . . . . . . . . . . . . <========> . 570B 17 1922 2012 91

. . . . . . . . . . . . . . . . . . <========> . 571A 18 1929 2012 84

. . . . . . . . . . . . . . . . . <===========> . 571B 19 1896 2012 117

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

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: SNC4 14:56 Thu 07 Nov 2013 Page 3

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

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

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

1900 .674 4 1950 .818 16 2000 1.328 19

1901 .179 4 1951 .672 16 2001 -.519 19

1902 .320 4 1952 .662 17 2002 .618 19

1903 .820 4 1953 .602 17 2003 -.573 19

1904 .667 4 1954 .357 18 2004 .864 19

1905 -.760 4 1955 .766 18 2005 -1.002 19

1906 -1.185 4 1956 .844 18 2006 -1.380 19

1907 -2.486 4 1957 .120 18 2007 -1.214 19

1908 -.629 4 1958 -.155 19 2008 .473 19

1909 -.886 4 1959 -2.229 19 2009 .663 19

1910 -.462 5 1960 .134 19 1<< 2010 -.001 19

1911 -.533 5 1961 -.022 19 1<< 2011 .154 19

1912 -.266 5 1962 -.448 19 2012 .846 19

1913 -1.424 5 1963 -.348 19

1914 -2.056 5 1964 -.227 19

1915 -1.307 6 1965 -.843 19

1916 -.685 7 1966 -1.390 19

1917 .750 7 1967 .137 19

1918 1.159 7 1968 -.016 19

1919 .050 7 1969 .546 19

1920 1.896 8 1970 .774 19

1921 1.468 8 1971 .140 19

1922 .392 10 1972 .797 19

1923 .009 10 1973 .818 19

1924 .885 10 1974 .355 19

1925 .459 10 1975 -.629 19

1926 -.062 10 1976 -.936 19

1927 .166 10 1977 .182 19

1928 .187 10 1978 .797 19

1929 -.006 11 1979 .348 19

1930 -.080 11 1980 .362 19

1931 .450 11 1981 -.084 19

1932 -.654 12 1982 .989 19

1933 -1.420 12 1983 .524 19

1934 -.263 13 1984 -.280 19

1935 .227 14 1985 -.746 19

1936 -3.608 14 1986 -1.008 19

1937 -.756 14 1987 -.465 19

1938 .330 14 1988 -.437 19

1939 .499 14 1989 -.940 19

1940 1.099 14 1990 .586 19

1941 .499 14 1991 .027 19

1942 1.285 14 1992 -.585 19

1943 1.766 14 1993 -.740 19

1944 1.193 14 1994 .774 19

1895 -3.021 1 1945 .622 15 1995 .331 19

1896 .782 2 1946 -1.587 16 1996 1.027 19

1897 2.024 3 1947 .380 16 1997 -.271 19

1898 1.868 3 1948 -3.173 16 1998 .552 19

1899 .979 3 1949 .023 16 1999 .705 19

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

PART 4: Master Bar Plot: SNC4 14:56 Thu 07 Nov 2013 Page 4

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

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

1900--------C 1950---------C 2000----------E

1901-----A 1951--------C 2001--b

1902------A 1952--------C 2002-------B

1903---------C 1953-------B 2003--b

1904--------C 1954------A 2004---------C

1905--c 1955--------C 2005-d

1906-e 1956---------C 2006-f

1907j 1957-----@ 2007-e

1908--c 1958---a 2008-------B

1909-d 1959i 2009--------C

1910--b 1960-----A 2010----@

1911--b 1961----@ 2011-----A

1912---a 1962---b 2012---------C

1913-f 1963---a

1914h 1964---a

1915-e 1965-c

1916--c 1966-f

1917--------C 1967-----A

1918----------E 1968----@

1919----@ 1969-------B

1920----------H 1970--------C

1921----------F 1971-----A

1922------B 1972--------C

1923----@ 1973---------C

1924---------D 1974------A

1925-------B 1975--c

1926----@ 1976-d

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

1928-----A 1978--------C

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

1930----@ 1980------A

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

1932--c 1982---------D

1933-f 1983-------B

1934---a 1984---a

1935-----A 1985--c

1936n 1986-d

1937--c 1987--b

1938------A 1988---b

1939-------B 1989-d

1940---------D 1990-------B

1941-------B 1991----@

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

1943----------G 1993--c

1944----------E 1994--------C

1895l 1945-------B 1995------A

1896--------C 1946f 1996---------D

1897----------H 1947------B 1997---a

1898----------G 1948m 1998-------B

1899---------D 1949----@ 1999--------C

PART 5: CORRELATION OF SERIES BY SEGMENTS: SNC4 14:56 Thu 07 Nov 2013 Page 5

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

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 1875 1900 1925 1950 1975

1924 1949 1974 1999 2024

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

1 539A 1910 2012 .57 .49 .21B .22B

2 539B 1916 2012 .77 .73 .68 .58

3 541B 1920 2012 .37 .44 .36 .42

4 547A 1934 2012 .55 .56 .49

5 547B 1932 2012 .43 .39 .48

6 550A 1900 2012 .58 .58 .23B .32A

7 550B 1952 2012 .63 .54

8 556A 1946 2012 .31A .10B .27B

9 556B 1922 2012 .33 .37 .12B .19B

10 561A 1895 2012 .52 .65 .53 .01B .13B

11 563B 1935 2012 .62 .23B .45

12 564A 1897 2012 .62 .69 .60 .30A .30B

13 564B 1945 2012 .70 .69 .42

14 565A 1958 2012 .37B .20A

15 565B 1954 2012 .47 .30A

16 570A 1915 2012 .47 .50 .44 .30A

17 570B 1922 2012 .46 .48 .35 .52

18 571A 1929 2012 .75 .36 .53

19 571B 1896 2012 .55 .64 .73 .20B .32A

Av segment correlation .56 .55 .55 .35 .37

PART 6: POTENTIAL PROBLEMS: SNC4 14:56 Thu 07 Nov 2013 Page 5

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

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

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

539A 1910 to 2012 103 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 1999 -8 .06 .04 .26\*-.10 -.10 -.05 .02 .12 .08 .11 .21|-.12 -.05 -.22 -.18 -.17 -.11 -.16 .05 .08 .06

1963 2012 -8 .14 .08 .48\*-.11 -.13 -.09 .19 .11 .03 -.03 .22| - - - - - - - - - -

[B] Entire series, effect on correlation ( .445) is:

Lower 1967< -.047 1995< -.014 1974< -.011 2008< -.011 1938< -.010 1922< -.009 Higher 1948 .046 1936 .037

1950 to 1999 segment:

Lower 1967< -.125 1995< -.027 1986> -.025 1974< -.023 1994< -.021 1996< -.012 Higher 1959 .098 1966 .044

1963 to 2012 segment:

Lower 1967< -.117 2008< -.028 1995< -.026 1986> -.024 1974< -.022 1994< -.020 Higher 2005 .048 2004 .042

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

539B 1916 to 2012 97 years Series 2

[B] Entire series, effect on correlation ( .688) is:

Lower 1967< -.027 1947< -.012 2012< -.012 1975> -.011 1932> -.010 1922< -.009 Higher 1936 .074 1959 .026

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

541B 1920 to 2012 93 years Series 3

[B] Entire series, effect on correlation ( .382) is:

Lower 1922< -.060 1940< -.022 1936> -.020 1975> -.012 2004< -.012 1929< -.011 Higher 1946 .030 1948 .019

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

1935 1936 4.0 SD

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

547A 1934 to 2012 79 years Series 4

[B] Entire series, effect on correlation ( .557) is:

Lower 1936> -.034 1939< -.023 1978< -.017 1944< -.014 2002< -.010 1957> -.010 Higher 1959 .061 1948 .033

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

547B 1932 to 2012 81 years Series 5

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

Lower 1981< -.094 1932> -.025 1936> -.015 1991> -.014 1935< -.011 1982< -.010 Higher 1948 .038 1946 .024

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

550A 1900 to 2012 113 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

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

1950 1999 4 .02 -.05 .06 -.05 .10 -.15 -.05 -.06 -.04 -.18 .23| .14 .07 .04 .24\* .12 .07 -.06 .09 -.15 .03

1963 2012 0 -.14 .03 -.10 -.05 -.16 .02 .05 -.15 .11 -.29 .32\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .462) is:

Lower 1978< -.030 1902< -.023 1948> -.023 1976> -.017 1954< -.012 2000< -.011 Higher 1936 .131 2001 .017

1950 to 1999 segment:

Lower 1978< -.080 1976> -.053 1954< -.026 1955< -.025 1960< -.024 1989> -.018 Higher 1997 .055 1959 .039

1963 to 2012 segment:

Lower 1978< -.088 1976> -.053 2000< -.036 2012< -.030 1989> -.018 1993> -.013 Higher 2001 .087 1997 .041

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

1960 .134 19 1 >> WARNING: Ring is not usually narrow

1961 -.022 19 1 >> WARNING: Ring is not usually narrow

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

550B 1952 to 2012 61 years Series 7

[B] Entire series, effect on correlation ( .622) is:

Lower 1982< -.029 1960< -.025 1976> -.018 2012< -.014 1993> -.014 1967< -.014 Higher 1959 .117 2001 .035

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

556A 1946 to 2012 67 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

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

1946 1995 0 .15 .22 -.04 .00 -.09 .01 .17 .02 .05 -.31 .31\*-.24 .26 .11 -.25 -.24 -.09 -.08 .07 -.31 -.11

1950 1999 -4 .02 .24 .04 -.04 -.04 .07 .28\* .13 -.03 -.30 .10|-.15 .18 .11 -.16 -.20 -.06 -.11 .07 -.27 .01

1963 2012 -4 .11 .20 .01 -.10 .01 -.13 .45\*-.14 .19 -.33 .27| - - - - - - - - - -

[B] Entire series, effect on correlation ( .398) is:

Lower 1973< -.043 1968< -.040 1959> -.031 1976> -.017 1975> -.014 1963< -.013 Higher 1948 .068 2001 .045

1946 to 1995 segment:

Lower 1973< -.061 1968< -.055 1959> -.030 1976> -.022 1963< -.018 1975> -.017 Higher 1948 .133 1946 .049

1950 to 1999 segment:

Lower 1973< -.062 1968< -.027 1976> -.026 1975> -.020 1984> -.018 1986> -.014 Higher 1950 .027 1989 .024

1963 to 2012 segment:

Lower 1973< -.059 1968< -.037 1976> -.030 1975> -.025 1984> -.021 1986> -.017 Higher 2001 .133 2000 .029

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

556B 1922 to 2012 91 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 1999 1 .10 .02 .14 -.09 .23 -.19 -.12 -.18 .10 .00 .12| .25\*-.09 .10 .23 -.10 -.03 -.18 .07 -.06 .18

1963 2012 -6 .07 .00 -.02 -.21 .54\*-.14 -.06 -.35 .15 -.02 .19| - - - - - - - - - -

[B] Entire series, effect on correlation ( .330) is:

Lower 1965< -.054 1959> -.028 1922> -.028 1966> -.024 2005> -.023 1986> -.011 Higher 1936 .074 1948 .055

1950 to 1999 segment:

Lower 1959> -.058 1966> -.054 1986> -.023 1991> -.017 1956< -.017 1999< -.017 Higher 1997 .027 1990 .025

1963 to 2012 segment:

Lower 1966> -.058 2005> -.055 1965< -.038 1986> -.024 1991> -.018 1999< -.018 Higher 1997 .024 2008 .024

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

1965 1966 5.5 SD

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

1965 -6.1 SD

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

561A 1895 to 2012 118 years Series 10

[\*] Early part of series cannot be checked from 1895 to 1895 -- 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

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

1950 1999 10 .14 .14 .06 .01 .01 .09 -.07 -.27 -.07 -.09 .01|-.03 .01 .10 .00 -.03 .14 -.10 .09 .00 .17\*

1963 2012 -10 .20\* .09 .06 -.17 .08 .06 .01 -.23 -.13 .02 .13| - - - - - - - - - -

[B] Entire series, effect on correlation ( .393) is:

Lower 1998< -.057 1991< -.021 1928< -.017 1959> -.017 1914> -.012 1922> -.010 Higher 1948 .090 1936 .054

1950 to 1999 segment:

Lower 1998< -.099 1965> -.020 1962> -.020 1970< -.017 1982< -.017 1992> -.016 Higher 1975 .037 1996 .033

1963 to 2012 segment:

Lower 1998< -.121 1965> -.022 1982< -.020 1970< -.020 1992> -.018 2001> -.014 Higher 2005 .030 1975 .030

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

563B 1935 to 2012 78 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

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

1950 1999 1 .00 .15 -.15 .08 .00 -.19 .00 .04 -.04 -.04 .23| .25\* .05 -.01 .24 -.04 .02 -.35 .06 -.13 .08

[B] Entire series, effect on correlation ( .591) is:

Lower 1959> -.053 1955< -.045 2010< -.024 1966> -.023 1983< -.017 1940< -.012 Higher 1936 .103 1948 .076

1950 to 1999 segment:

Lower 1959> -.102 1955< -.090 1966> -.047 1983< -.028 1997> -.022 1990< -.015 Higher 1996 .030 1982 .029

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

564A 1897 to 2012 116 years Series 12

[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 1999 0 -.09 -.07 .12 .01 -.22 -.09 .01 -.02 -.08 .13 .30\*-.19 .09 -.10 -.23 .14 -.04 -.05 .01 .23 .07

1963 2012 -8 .00 -.20 .33\*-.01 -.08 -.16 .21 -.12 .03 -.19 .30| - - - - - - - - - -

[B] Entire series, effect on correlation ( .491) is:

Lower 2009< -.021 1970< -.012 1979< -.010 1937< -.010 1975> -.009 1903< -.008 Higher 1936 .050 1948 .025

1950 to 1999 segment:

Lower 1970< -.031 1975> -.027 1994< -.022 1960< -.021 1988> -.020 1962> -.019 Higher 1959 .080 1966 .078

1963 to 2012 segment:

Lower 2009< -.046 1970< -.029 1975> -.027 1994< -.020 1988> -.019 2007> -.017 Higher 1966 .072 2004 .036

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

564B 1945 to 2012 68 years Series 13

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

Lower 2001> -.055 2004< -.033 1977< -.022 1965> -.008 1985> -.007 1999< -.007 Higher 1959 .072 1948 .023

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

565A 1958 to 2012 55 years Series 14

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

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

1958 2007 4 -.16 .00 .02 .06 -.01 .02 .05 -.13 -.07 -.19 .37|-.22 -.10 -.08 .45\*-.13 - - - - -

1963 2012 0 -.03 .06 .05 .09 .01 .05 .15 -.25 -.08 -.21 .20\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .335) is:

Lower 2001> -.045 2005> -.042 1972< -.031 1989> -.022 2008< -.020 1986> -.014 Higher 1959 .124 1997 .025

1958 to 2007 segment:

Lower 2001> -.046 2005> -.042 1972< -.038 1989> -.021 1986> -.013 1965> -.013 Higher 1959 .128 1990 .024

1963 to 2012 segment:

Lower 2001> -.048 2005> -.047 1972< -.036 1989> -.026 2008< -.023 1986> -.017 Higher 1997 .058 1990 .034

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

565B 1954 to 2012 59 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

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

1963 2012 0 .02 -.07 -.04 -.19 .11 .07 .17 -.15 -.24 .04 .30\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .420) is:

Lower 1956< -.041 1971< -.038 1984> -.028 1997> -.025 2004< -.024 2011< -.020 Higher 1959 .165 2001 .022

1963 to 2012 segment:

Lower 1971< -.050 1984> -.037 2004< -.032 1997> -.031 1990< -.026 2011< -.026 Higher 2001 .049 1994 .025

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

570A 1915 to 2012 98 years Series 16

[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 .24 .00 .11 -.31 -.07 .06 .25 -.17 -.18 -.05 .30\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .417) is:

Lower 1996< -.026 1922> -.018 1998< -.017 1966> -.015 1931< -.014 1919> -.012 Higher 1959 .078 1948 .041

1963 to 2012 segment:

Lower 1996< -.081 1998< -.053 1966> -.044 1970< -.036 1981> -.022 1965> -.016 Higher 2001 .085 2004 .038

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

1959 -5.8 SD

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

570B 1922 to 2012 91 years Series 17

[B] Entire series, effect on correlation ( .480) is:

Lower 1933> -.025 1922> -.017 1971< -.011 1949< -.010 1959> -.009 1946> -.009 Higher 1948 .074 1936 .044

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

571A 1929 to 2012 84 years Series 18

[B] Entire series, effect on correlation ( .701) is:

Lower 1959> -.045 1994< -.017 2012< -.017 1981> -.011 1933> -.011 1953< -.009 Higher 1936 .101 1948 .054

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

571B 1896 to 2012 117 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

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

1950 1999 1 .24 .17 -.07 .03 -.06 .14 -.13 .13 -.18 .11 .20| .33\*-.18 -.08 -.30 .19 -.20 -.01 .06 .13 -.10

1963 2012 0 .06 .22 .03 .00 .06 .03 .19 -.01 -.02 .13 .32\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .511) is:

Lower 1910< -.021 1959> -.019 1907> -.016 1915> -.015 1996< -.014 1958< -.014 Higher 1936 .111 1948 .063

1950 to 1999 segment:

Lower 1996< -.042 1959> -.040 1998< -.036 1981> -.029 1990< -.029 1958< -.022 Higher 1966 .069 1994 .026

1963 to 2012 segment:

Lower 1996< -.049 1998< -.042 1990< -.034 1981> -.029 2003> -.028 1975> -.020 Higher 1966 .057 2004 .044

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

PART 7: DESCRIPTIVE STATISTICS: SNC4 14:56 Thu 07 Nov 2013 Page 6

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

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 539A 1910 2012 103 4 2 .445 1.49 2.65 .593 .737 .224 2.66 .481 .041 1

2 539B 1916 2012 97 4 0 .688 1.74 3.38 .574 .594 .221 2.74 .455 .024 1

3 541B 1920 2012 93 4 0 .382 1.11 4.72 1.024 .825 .328 2.77 .409 -.047 1

4 547A 1934 2012 79 3 0 .557 2.17 4.68 .818 .808 .198 2.71 .440 -.085 1

5 547B 1932 2012 81 3 0 .483 1.91 3.95 .854 .802 .262 2.48 .401 .008 1

6 550A 1900 2012 113 4 2 .462 1.33 4.53 .998 .873 .327 2.54 .371 -.048 1

7 550B 1952 2012 61 2 0 .622 2.64 5.86 1.435 .855 .269 2.58 .481 .011 1

8 556A 1946 2012 67 3 3 .398 2.80 8.06 1.616 .810 .296 2.56 .511 -.048 1

9 556B 1922 2012 91 4 2 .330 2.37 8.47 1.327 .677 .302 2.53 .370 -.038 1

10 561A 1895 2012 118 5 2 .393 1.65 3.59 .817 .779 .287 2.54 .465 -.094 2

11 563B 1935 2012 78 3 1 .591 1.96 4.46 .902 .716 .323 2.58 .505 -.079 1

12 564A 1897 2012 116 5 2 .491 1.75 4.05 .835 .829 .247 2.70 .429 -.032 1

13 564B 1945 2012 68 3 0 .616 2.73 4.36 .536 .494 .169 2.41 .380 -.034 1

14 565A 1958 2012 55 2 2 .335 1.92 3.44 .713 .777 .213 2.83 .608 -.035 1

15 565B 1954 2012 59 2 1 .420 1.86 4.16 .770 .752 .207 2.71 .510 -.057 1

16 570A 1915 2012 98 4 1 .417 1.53 3.86 .818 .785 .292 2.45 .328 -.013 3

17 570B 1922 2012 91 4 0 .480 1.57 4.60 1.029 .780 .334 2.77 .426 -.074 1

18 571A 1929 2012 84 3 0 .701 2.23 4.32 .889 .708 .269 2.41 .365 -.050 1

19 571B 1896 2012 117 5 2 .511 1.36 2.68 .595 .609 .339 2.68 .376 -.041 1

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

Total or mean: 1669 67 20 .489 1.83 8.47 .885 .748 .274 2.83 .430 -.036

- = [ COFECHA SNC COF ] = -