[] Dendrochronology Program Library Run SNCLO Program COF 12:35 Fri 13 Dec 2013 Page 1

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[] P R O G R A M C O F E C H A Version 6.06P 28838

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QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

Title of run: Run4

File of DATED series: SNCLow\_ACRU\_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 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 1935 to 2012 78 years

Continuous time span is 1935 to 2012 78 years

Portion with two or more series is 1936 to 2012 77 years

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

\*C\* Number of dated series 14 \*C\*

\*O\* Master series 1935 2012 78 yrs \*O\*

\*F\* Total rings in all series 811 \*F\*

\*E\* Total dated rings checked 810 \*E\*

\*C\* Series intercorrelation .409 \*C\*

\*H\* Average mean sensitivity .207 \*H\*

\*A\* Segments, possible problems 31 \*A\*

\*\*\* Mean length of series 57.9 \*\*\*

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

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

No ring measurements of zero value

PART 2: TIME PLOT OF TREE-RING SERIES: Run4 12:35 Fri 13 Dec 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

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

. . . . . . . . . . . . . . . . . . <=======> . 502A 1 1936 2012 77

. . . . . . . . . . . . . . . . . . <=====> . 502B 2 1950 2012 63

. . . . . . . . . . . . . . . . . . . <==> . 514A 3 1982 2012 31

. . . . . . . . . . . . . . . . . . . <==> . 514B 4 1981 2012 32

. . . . . . . . . . . . . . . . . . . <===> . 515A 5 1978 2012 35

. . . . . . . . . . . . . . . . . . .<====> . 519A 6 1966 2012 47

. . . . . . . . . . . . . . . . . . .<====> . 519B 7 1968 2012 45

. . . . . . . . . . . . . . . . . . <=====> . 522A 8 1950 2012 63

. . . . . . . . . . . . . . . . . . <=====> . 523B 9 1951 2012 62

. . . . . . . . . . . . . . . . . . <=====> . 524A 10 1950 2012 63

. . . . . . . . . . . . . . . . . . <======> . 524B 11 1945 2012 68

. . . . . . . . . . . . . . . . . . <=======> . 530A 12 1939 2012 74

. . . . . . . . . . . . . . . . . . <======> . 531A 13 1940 2012 73

. . . . . . . . . . . . . . . . . . <=======> . 531B 14 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: Run4 12:35 Fri 13 Dec 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

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

1950 .212 8 2000 -1.031 14

1951 .300 9 2001 -1.116 14

1952 -.345 9 2002 1.333 14

1953 .493 9 2003 .086 14

1954 -1.443 9 2004 -.991 14

1955 1.013 9 2005 .479 14

1956 -.547 9 2006 .173 14

1957 -.121 9 2007 -.738 14

1958 .355 9 2008 .992 14

1959 -.266 9 2009 -.421 14

1960 .149 9 2010 -1.512 14

1961 -.190 9 2011 -.189 14

1962 -1.294 9 2012 1.939 14

1963 -.441 9

1964 -1.808 9

1965 -.643 9

1966 -.243 10

1967 -.430 10

1968 .127 11

1969 1.708 11

1970 1.590 11

1971 1.145 11

1972 -.226 11

1973 1.045 11

1974 -.727 11

1975 .164 11

1976 -1.449 11

1977 .749 11

1978 1.191 12

1979 -.527 12

1980 .248 12

1981 .792 13

1982 -.781 14

1983 -1.165 14

1984 -1.082 14

1935 .648 1 1985 -1.051 14

1936 -.164 2 1986 -1.841 14

1937 -.905 2 1987 .534 14

1938 .193 2 1988 1.100 14

1939 .891 3 1989 .220 14

1940 1.696 4 1990 .837 14

1941 1.073 4 1991 .796 14

1942 .124 4 1992 -.235 14

1943 .059 4 1993 .449 14

1944 -.074 4 1994 .833 14

1945 -1.497 5 1995 1.702 14

1946 -2.417 5 1996 -1.081 14

1947 .450 5 1997 -1.558 14

1948 -.769 5 1998 -.321 14

1949 2.671 5 1999 1.079 14

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

PART 4: Master Bar Plot: Run4 12:35 Fri 13 Dec 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

1950------A 2000-d

1951------A 2001-d

1952---a 2002---------E

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

1954f 2004-d

1955---------D 2005-------B

1956---b 2006------A

1957----@ 2007--c

1958-------A 2008---------D

1959----a 2009---b

1960-----A 2010f

1961----a 2011----a

1962-e 2012----------H

1963---b

1964g

1965--c

1966----a

1967---b

1968-----A

1969----------G

1970----------F

1971---------E

1972----a

1973---------D

1974--c

1975------A

1976f

1977--------C

1978---------E

1979---b

1980------A

1981--------C

1982--c

1983-e

1984-d

1935-------C 1985-d

1936----a 1986g

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

1938------A 1988---------D

1939--------D 1989------A

1940----------G 1990--------C

1941---------D 1991--------C

1942-----@ 1992----a

1943-----@ 1993-------B

1944----@ 1994--------C

1945f 1995----------G

1946j 1996-d

1947-------B 1997f

1948--c 1998----a

1949----------K 1999---------D

PART 5: CORRELATION OF SERIES BY SEGMENTS: Run4 12:35 Fri 13 Dec 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 1935 1950 1965 1980 1995

1964 1979 1994 2009 2024

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

1 502A 1936 2012 .10B .17B .36B .56 .60

2 502B 1950 2012 .33A .19B .34A .42A

3 514A 1982 2012 .40A .43

4 514B 1981 2012 .31B .39B

5 515A 1978 2012 .41A .35B .38A

6 519A 1966 2012 .42A .37B .35B

7 519B 1968 2012 .34B .44 .56

8 522A 1950 2012 .02B .39B .59 .68

9 523B 1951 2012 .62 .43 .28B .30A

10 524A 1950 2012 .38A .56 .47 .38A

11 524B 1945 2012 .51 .45 .57 .58 .40A

12 530A 1939 2012 .20B .25B .22B .32A .36A

13 531A 1940 2012 .53 .59 .64 .63 .66

14 531B 1935 2012 .21B .43B .54 .50 .55

Av segment correlation .31 .36 .42 .44 .46

PART 6: POTENTIAL PROBLEMS: Run4 12:35 Fri 13 Dec 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

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

502A 1936 to 2012 77 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

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

1936 1965 8 - - - - - - - - - -.34 .10|-.09 .09 .05 .10 -.21 .13 -.03 .26\* .07 -.05

1950 1979 4 -.24 -.17 .04 .03 -.16 .08 -.02 .05 -.10 -.46 .17|-.10 .05 .02 .36\* .10 -.03 .28 .10 .09 -.05

1965 1994 -3 -.07 -.10 -.12 -.13 -.05 -.28 -.28 .41\*-.10 -.03 .36| .27 -.01 -.01 .11 -.06 -.27 .24 -.04 -.03 -.21

[B] Entire series, effect on correlation ( .372) is:

Lower 1964> -.029 1938< -.027 1937> -.024 1936> -.024 1985< -.023 1950< -.022 Higher 1949 .026 1996 .023

1936 to 1965 segment:

Lower 1938< -.061 1964> -.055 1936> -.046 1937> -.044 1950< -.039 1962> -.030 Higher 1949 .118 1945 .055

1950 to 1979 segment:

Lower 1964> -.088 1962> -.047 1976> -.045 1975< -.033 1966> -.030 1950< -.027 Higher 1969 .061 1979 .042

1965 to 1994 segment:

Lower 1976> -.053 1966> -.037 1975< -.032 1985< -.029 1992> -.023 1986> -.022 Higher 1982 .043 1969 .034

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

1937 1938 -4.5 SD

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

502B 1950 to 2012 63 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

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

1950 1979 0 -.22 -.12 -.25 -.11 -.13 -.02 -.21 .29 .11 -.04 .33\*-.16 .15 .10 -.12 .18 -.13 .23 .24 -.10 .14

1965 1994 7 -.15 -.25 -.28 -.31 -.10 -.13 -.18 .35 -.07 -.13 .19| .00 .04 -.08 .14 .14 .10 .37\* .04 .15 -.08

1980 2009 0 -.05 -.19 -.27 -.05 .03 -.15 -.20 .13 -.24 -.11 .34\* .01 -.26 .12 - - - - - - -

1983 2012 0 .02 -.10 -.37 -.01 .06 -.16 -.23 .15 -.30 -.14 .42\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .370) is:

Lower 1986> -.041 1950> -.029 1983> -.027 2003< -.020 1978< -.020 1984> -.018 Higher 1996 .034 1964 .029

1950 to 1979 segment:

Lower 1950> -.075 1978< -.043 1977< -.029 1954> -.026 1959< -.026 1957< -.021 Higher 1964 .079 1969 .045

1965 to 1994 segment:

Lower 1986> -.092 1983> -.061 1978< -.053 1984> -.041 1977< -.038 1980< -.020 Higher 1979 .061 1969 .047

1980 to 2009 segment:

Lower 1986> -.081 1983> -.052 2003< -.044 1984> -.034 1998< -.024 1980< -.015 Higher 1996 .077 2002 .050

1983 to 2012 segment:

Lower 1986> -.082 1983> -.052 2003< -.049 1984> -.034 1998< -.025 2004> -.014 Higher 1996 .065 2002 .040

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

514A 1982 to 2012 31 years Series 3

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

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

1982 2011 0 .15 -.10 -.42 .04 -.02 -.15 .24 .23 -.09 .20 .40\*-.22 - - - - - - - - -

[B] Entire series, effect on correlation ( .362) is:

Lower 1982> -.066 1987< -.045 2012< -.039 2004> -.019 1983> -.018 2009> -.015 Higher 2010 .050 1986 .047

1982 to 2011 segment:

Lower 1982> -.071 1987< -.054 2004> -.019 1983> -.018 2009> -.015 1984> -.011 Higher 1986 .039 2010 .035

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

514B 1981 to 2012 32 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

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

1981 2010 -4 .18 -.22 -.27 .19 -.16 -.18 .38\* .16 -.01 .23 .31|-.26 -.28 - - - - - - - -

1983 2012 -4 .21 -.21 -.25 .15 -.11 -.23 .42\* .23 -.08 .22 .39| - - - - - - - - - -

[B] Entire series, effect on correlation ( .320) is:

Lower 1981< -.050 1986< -.050 1996> -.025 1982> -.022 2009> -.021 1983> -.018 Higher 1995 .035 2010 .033

1981 to 2010 segment:

Lower 1981< -.055 1986< -.051 1996> -.028 1982> -.024 2009> -.021 1983> -.019 Higher 1995 .042 2010 .033

1983 to 2012 segment:

Lower 1986< -.124 1996> -.033 2009> -.024 2005< -.021 1983> -.021 1985> -.014 Higher 2010 .033 1995 .033

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

515A 1978 to 2012 35 years Series 5

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

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

1978 2007 0 .37 -.15 -.05 -.01 -.18 -.07 -.04 .15 .10 -.02 .41\* .14 -.05 -.02 -.06 -.30 - - - - -

1980 2009 -10 .37\*-.14 .00 -.03 -.19 -.07 -.02 .10 .13 -.03 .35| .20 .00 -.10 - - - - - - -

1983 2012 0 .34 -.19 .00 -.09 -.13 -.12 .12 .02 -.01 .03 .38\* - - - - - - - - - -

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

Lower 1984< -.124 2008< -.049 2001> -.032 1983> -.021 2010> -.017 1989< -.009 Higher 2012 .036 1996 .032

1978 to 2007 segment:

Lower 1984< -.158 2001> -.037 1983> -.025 1995< -.014 1989< -.012 1981< -.010 Higher 1996 .035 2002 .027

1980 to 2009 segment:

Lower 1984< -.120 2008< -.056 2001> -.038 1983> -.026 1989< -.009 2003> -.009 Higher 1996 .037 2002 .031

1983 to 2012 segment:

Lower 1984< -.142 2008< -.055 2001> -.039 1983> -.027 2010> -.024 2003> -.010 Higher 2012 .044 1996 .036

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

519A 1966 to 2012 47 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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1966 1995 0 .26 -.10 .20 .20 -.12 -.02 .26 .09 .07 .19 .42\*-.39 -.23 -.08 -.22 -.27 -.08 .18 -.07 -.12 .01

1980 2009 -4 .17 -.16 .10 .33 -.25 -.02 .45\* .12 -.45 .22 .37|-.49 -.19 .35 - - - - - - -

1983 2012 -4 .14 -.19 .12 .33 -.22 -.01 .49\* .06 -.46 .18 .35| - - - - - - - - - -

[B] Entire series, effect on correlation ( .353) is:

Lower 2010> -.060 1996> -.040 1982> -.027 1990< -.022 1979> -.022 1968< -.020 Higher 1986 .029 2012 .025

1966 to 1995 segment:

Lower 1982> -.066 1979> -.051 1990< -.041 1967< -.038 1968< -.036 1993< -.023 Higher 1986 .057 1976 .045

1980 to 2009 segment:

Lower 1996> -.078 1982> -.053 1990< -.036 2001< -.032 1997> -.027 1993< -.021 Higher 1986 .040 1995 .037

1983 to 2012 segment:

Lower 2010> -.098 1996> -.069 1990< -.034 2001< -.024 1997> -.023 1993< -.020 Higher 2012 .046 1986 .040

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

519B 1968 to 2012 45 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

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

1968 1997 -10 .38\* .19 .04 .16 -.24 -.43 -.20 -.40 -.16 .01 .34|-.14 -.13 .08 -.02 -.15 .04 .04 .09 .09 .32

[B] Entire series, effect on correlation ( .446) is:

Lower 1982> -.073 1973< -.038 1979> -.029 1996> -.023 1984> -.019 2003> -.013 Higher 2012 .028 1997 .024

1968 to 1997 segment:

Lower 1982> -.110 1973< -.061 1979> -.042 1984> -.029 1996> -.024 1970< -.014 Higher 1997 .050 1976 .050

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

522A 1950 to 2012 63 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

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

1950 1979 -8 .07 .23 .30\* .03 -.10 -.01 -.38 -.17 -.16 -.09 .02|-.09 .16 -.07 .14 .11 -.14 .24 .05 .15 .22

1965 1994 -10 .43\* .03 .14 -.01 -.10 -.29 -.18 -.08 -.11 -.09 .39| .01 -.04 -.22 .27 -.16 -.20 .09 .06 .01 .20

[B] Entire series, effect on correlation ( .352) is:

Lower 1999< -.047 1964> -.043 1950> -.034 1972< -.025 1959< -.024 1965> -.018 Higher 2010 .037 2012 .027

1950 to 1979 segment:

Lower 1964> -.068 1950> -.059 1979> -.028 1965> -.028 1975< -.024 1955< -.024 Higher 1969 .060 1976 .039

1965 to 1994 segment:

Lower 1972< -.068 1965> -.046 1979> -.039 1975< -.037 1982> -.036 1970< -.036 Higher 1986 .059 1976 .033

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

523B 1951 to 2012 62 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

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

1980 2009 3 .07 .06 .30 -.07 -.31 -.47 .06 -.09 -.33 -.01 .28|-.08 -.12 .51\* - - - - - - -

1983 2012 0 .10 .19 .09 .03 -.32 -.45 .12 -.16 -.39 .05 .30\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .475) is:

Lower 1993< -.062 1986> -.031 1963< -.023 2003> -.022 1959> -.020 1998< -.014 Higher 1982 .024 2010 .018

1980 to 2009 segment:

Lower 1993< -.144 1986> -.053 2003> -.042 1998< -.032 1994< -.027 1985> -.020 Higher 1982 .079 2002 .053

1983 to 2012 segment:

Lower 1993< -.146 1986> -.051 2003> -.042 1998< -.032 1994< -.027 1985> -.019 Higher 2010 .059 2012 .054

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

524A 1950 to 2012 63 years Series 10

[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 -.08 -.23 .16 .01 .10 .09 .22 .01 .12 -.39 .38\*-.13 .28 .00 .18 -.01 -.16 -.23 -.16 -.32 -.05

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

1983 2012 0 .09 -.12 -.05 .12 -.13 -.17 .12 .02 -.16 -.11 .38\* - - - - - - - - - -

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

Lower 1999< -.040 1960< -.028 2010> -.027 1954> -.026 1950< -.023 1976> -.022 Higher 1996 .041 1982 .031

1950 to 1979 segment:

Lower 1960< -.075 1950< -.068 1954> -.061 1976> -.050 1972> -.018 1959> -.012 Higher 1964 .040 1955 .031

1983 to 2012 segment:

Lower 1999< -.094 2010> -.054 1985> -.036 2005< -.030 1986> -.022 2000> -.022 Higher 1996 .106 2012 .052

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

524B 1945 to 2012 68 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

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

1983 2012 0 .23 -.27 -.14 .11 -.19 -.35 .12 -.14 -.24 -.11 .40\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .478) is:

Lower 2010> -.031 2011< -.028 1954> -.023 1959> -.017 1986> -.015 1985> -.013 Higher 1946 .029 1996 .026

1983 to 2012 segment:

Lower 2010> -.070 2011< -.064 1986> -.032 1985> -.029 1998< -.018 2007> -.010 Higher 1996 .100 1983 .024

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

530A 1939 to 2012 74 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

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

1939 1968 9 - - - - - - -.13 -.01 -.12 -.14 .20| .28 .25 .28 -.28 .04 -.26 -.12 -.12 .37\*-.02

1950 1979 2 .17 .09 .07 -.31 -.17 .05 .04 .17 .15 -.03 .25|-.11 .40\* .07 -.05 .02 -.12 -.16 -.21 -.08 .20

1965 1994 -4 -.08 .01 -.18 -.10 .23 -.10 .27\* .19 .24 .12 .22|-.01 .00 -.13 -.06 -.28 -.12 -.29 .10 .06 .05

1980 2009 0 -.19 -.06 -.25 .08 .14 .01 .29 .22 -.08 .02 .32\*-.14 -.37 -.03 - - - - - - -

1983 2012 0 -.17 -.02 -.28 .12 .18 .02 .28 .19 -.13 -.04 .36\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .303) is:

Lower 1988< -.076 1946> -.034 2003< -.026 1955< -.019 1982> -.015 1952> -.012 Higher 2012 .019 1996 .018

1939 to 1968 segment:

Lower 1946> -.088 1955< -.047 1943< -.031 1952> -.030 1948> -.022 1964> -.018 Higher 1949 .074 1940 .053

1950 to 1979 segment:

Lower 1955< -.080 1952> -.043 1957< -.030 1976> -.025 1964> -.017 1967> -.016 Higher 1973 .037 1970 .026

1965 to 1994 segment:

Lower 1988< -.276 1982> -.037 1976> -.020 1990< -.015 1967> -.014 1984> -.008 Higher 1986 .069 1983 .047

1980 to 2009 segment:

Lower 1988< -.170 2003< -.052 1982> -.051 2000> -.030 1984> -.013 2005< -.009 Higher 1995 .040 2008 .032

1983 to 2012 segment:

Lower 1988< -.170 2003< -.055 2010> -.034 2000> -.030 1984> -.012 2005< -.010 Higher 2012 .043 1995 .034

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

531A 1940 to 2012 73 years Series 13

[B] Entire series, effect on correlation ( .619) is:

Lower 1947< -.021 1967> -.015 1993< -.015 1974> -.014 1954> -.012 1980< -.012 Higher 1949 .018 1982 .014

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

531B 1935 to 2012 78 years Series 14

[\*] Early part of series cannot be checked from 1935 to 1935 -- 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

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

1936 1965 10 - - - - - - - - - -.14 .21|-.11 -.01 -.09 -.19 -.28 .06 -.26 .27 .12 .32\*

1950 1979 -8 .15 .00 .50\*-.16 -.11 -.12 .13 -.01 .24 -.11 .43|-.11 -.09 .20 -.18 -.17 -.11 -.07 .18 -.14 .29

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

Lower 1938> -.027 1945> -.024 1936< -.023 1937< -.020 1997> -.018 1974> -.017 Higher 1949 .029 1982 .027

1936 to 1965 segment:

Lower 1938> -.055 1945> -.050 1936< -.038 1937< -.033 1953< -.027 1959> -.022 Higher 1949 .090 1954 .081

1950 to 1979 segment:

Lower 1974> -.054 1953< -.045 1959> -.032 1976> -.026 1962> -.025 1958< -.019 Higher 1964 .076 1954 .044

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

PART 7: DESCRIPTIVE STATISTICS: Run4 12:35 Fri 13 Dec 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 502A 1936 2012 77 5 3 .372 1.81 3.35 .746 .865 .173 2.62 .517 .021 1

2 502B 1950 2012 63 4 4 .370 2.21 3.42 .646 .707 .187 2.62 .557 .087 1

3 514A 1982 2012 31 2 1 .362 3.59 5.45 1.039 .624 .213 2.37 .509 -.003 2

4 514B 1981 2012 32 2 2 .320 4.17 6.06 .907 .547 .169 2.38 .407 -.066 1

5 515A 1978 2012 35 3 3 .382 2.75 4.62 1.097 .723 .258 2.67 .468 .136 1

6 519A 1966 2012 47 3 3 .353 3.47 6.07 1.384 .883 .175 2.63 .556 -.023 1

7 519B 1968 2012 45 3 1 .446 3.56 6.58 1.098 .783 .170 2.67 .518 .010 1

8 522A 1950 2012 63 4 2 .352 2.22 3.65 .703 .680 .204 2.63 .575 .006 1

9 523B 1951 2012 62 4 2 .475 2.58 3.90 .563 .527 .176 2.61 .495 -.075 1

10 524A 1950 2012 63 4 2 .421 2.19 4.57 1.023 .803 .258 2.58 .512 .019 3

11 524B 1945 2012 68 5 1 .478 2.41 4.47 .872 .653 .274 2.52 .459 .068 2

12 530A 1939 2012 74 5 5 .303 1.74 3.28 .831 .907 .202 2.64 .571 -.001 1

13 531A 1940 2012 73 5 0 .619 1.59 2.75 .512 .692 .224 2.72 .555 .102 1

14 531B 1935 2012 78 5 2 .382 2.55 3.74 .587 .433 .209 2.60 .420 .034 2

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

Total or mean: 811 54 31 .409 2.45 6.58 .814 .705 .207 2.72 .512 .025

- = [ COFECHA SNCLOCOF ] = -