[] Dendrochronology Program Library Run JUNI Program COF 10:42 Fri 04 Sep 2020 Page 1

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[] P R O G R A M C O F E C H A Version 6.06P 31295

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 QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

 File of DATED series: SCBI\_juni.rwl

 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 1880 to 2010 131 years

 Continuous time span is 1880 to 2010 131 years

 Portion with two or more series is 1891 to 2010 120 years

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

 \*C\* Number of dated series 31 \*C\*

 \*O\* Master series 1880 2010 131 yrs \*O\*

 \*F\* Total rings in all series 2518 \*F\*

 \*E\* Total dated rings checked 2507 \*E\*

 \*C\* Series intercorrelation .475 \*C\*

 \*H\* Average mean sensitivity .315 \*H\*

 \*A\* Segments, possible problems 9 \*A\*

 \*\*\* Mean length of series 81.2 \*\*\*

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

 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: 10:42 Fri 04 Sep 2020 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

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

 . . . . . . . . . . . . . . . . . <===========> . 131360 1 1880 2009 130

 . . . . . . . . . . . . . . . . . <==========> . 72424 2 1891 2009 119

 . . . . . . . . . . . . . . . . . <==========> . 162355 3 1898 2009 112

 . . . . . . . . . . . . . . . . . <=========> . 122295 4 1904 2009 106

 . . . . . . . . . . . . . . . . . <=========> . 202941 5 1907 2008 102

 . . . . . . . . . . . . . . . . . .<========> . 200577 6 1910 2009 100

 . . . . . . . . . . . . . . . . . .<========> . 112323 7 1913 2009 97

 . . . . . . . . . . . . . . . . . .<========> . 30226 8 1914 2003 90

 . . . . . . . . . . . . . . . . . .<========> . 30315 9 1914 2009 96

 . . . . . . . . . . . . . . . . . .<========> . 80694 10 1915 2009 95

 . . . . . . . . . . . . . . . . . .<========> . 162575 11 1915 2009 95

 . . . . . . . . . . . . . . . . . .<========> . 190483 12 1916 2009 94

 . . . . . . . . . . . . . . . . . .<========> . 161554 13 1918 2009 92

 . . . . . . . . . . . . . . . . . . <=======> . 172453 14 1923 2009 87

 . . . . . . . . . . . . . . . . . . <=======> . 202585 15 1924 2009 86

 . . . . . . . . . . . . . . . . . . <=======> . 152623 16 1925 2009 85

 . . . . . . . . . . . . . . . . . . <=======> . 10010 17 1928 2009 82

 . . . . . . . . . . . . . . . . . . <=======> . 10122 18 1929 2009 81

 . . . . . . . . . . . . . . . . . . <======> . 192588 19 1930 2002 73

 . . . . . . . . . . . . . . . . . . <======> . 180906 20 1933 2000 68

 . . . . . . . . . . . . . . . . . . <======> . 201261 21 1934 2002 69

 . . . . . . . . . . . . . . . . . . <=======> . 10296 22 1935 2010 76

 . . . . . . . . . . . . . . . . . . <=====> . 172637 23 1943 2009 67

 . . . . . . . . . . . . . . . . . . <=====> . 12354 24 1945 2009 65

 . . . . . . . . . . . . . . . . . . <=====> . 150048 25 1948 2009 62

 . . . . . . . . . . . . . . . . . . <====> . 40024A 26 1950 2009 60

 . . . . . . . . . . . . . . . . . . <====> . 190074 27 1955 2009 55

 . . . . . . . . . . . . . . . . . . <====> . 30135 28 1958 2009 52

 . . . . . . . . . . . . . . . . . . .<===> . 150761 29 1962 2009 48

 . . . . . . . . . . . . . . . . . . .<===> . 12387 30 1966 2009 44

 . . . . . . . . . . . . . . . . . . . <==> . 180341 31 1981 2010 30

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

 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: 10:42 Fri 04 Sep 2020 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

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

 1900 .433 3 1950 .804 26 2000 .509 31

 1901 1.658 3 1951 .483 26 2001 .626 30

 1902 -3.337 3 1952 -.027 26 2002 -.060 30

 1903 2.894 3 1953 .629 26 2003 -.448 28

 1904 .432 4 1954 .735 26 2004 .473 27

 1905 .283 4 1955 .792 27 2005 -.491 27

 1906 -.561 4 1956 .413 27 2006 -.278 27

 1907 -.111 5 1957 .080 27 2007 .230 27

 1908 -.237 5 1958 .395 28 2008 .806 27

 1909 -.467 5 1959 -1.104 28 2009 .871 26

 1910 .270 6 1960 -.074 28 2010 -1.155 2

 1911 -.879 6 1961 -.573 28

 1912 .197 6 1962 -.814 29

 1913 1.411 7 1963 -1.408 29

 1914 .009 9 1964 -1.270 29

 1915 .477 11 1965 -.109 29

 1916 1.654 12 1966 -3.151 30

 1917 .169 12 1967 -.131 30

 1918 -1.500 13 1968 .505 30

 1919 .550 13 1969 .762 30

 1920 -.030 13 1970 1.056 30

 1921 -.534 13 1971 -.139 30

 1922 .900 13 1972 .764 30

 1923 -1.073 14 1973 .103 30

 1924 .007 15 1974 -.326 30

 1925 -1.231 16 1975 .523 30

 1926 -.274 16 1976 1.105 30

 1927 .130 16 1977 -.488 30

 1928 1.527 17 1978 1.101 30

 1929 -.593 18 1979 -1.291 30

 1880 .454 1 1930 -2.606 19 1980 -.387 30

 1881 1.012 1 1931 .808 19 1981 .418 31

 1882 -.856 1 1932 -.013 19 1982 .884 31

 1883 -2.983 1 1933 .539 20 1983 .422 31

 1884 -.343 1 1934 -.077 21 1984 -.161 31

 1885 .044 1 1935 -.127 22 1985 .585 31

 1886 -1.460 1 1936 .717 22 1986 1.033 31

 1887 -.297 1 1937 .852 22 1987 -.816 31

 1888 -.390 1 1938 -.103 22 1988 -.651 31

 1889 3.082 1 1939 -.642 22 1989 .762 31

 1890 1.918 1 1940 .497 22 1990 .733 31

 1891 1.938 2 1941 .717 22 1991 -1.526 31

 1892 .038 2 1942 .847 22 1992 .138 31

 1893 -.657 2 1943 -.684 23 1993 .809 31

 1894 -.991 2 1944 -.647 23 1994 .435 31

 1895 .435 2 1945 .499 24 1995 .002 31

 1896 -.416 2 1946 -1.839 24 1996 -.782 31

 1897 -.474 2 1947 .107 24 1997 -1.097 31

 1898 .637 3 1948 -.588 25 1998 .127 31

 1899 -1.721 3 1949 .344 25 1999 -1.106 31

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PART 4: Master Bar Plot: 10:42 Fri 04 Sep 2020 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

 1900-------B 1950---------C 2000-------B

 1901----------G 1951-------B 2001--------C

 1902m 1952-----@ 2002----@

 1903----------L 1953--------C 2003---b

 1904-------B 1954--------C 2004-------B

 1905------A 1955---------C 2005--b

 1906--b 1956------B 2006---a

 1907----@ 1957-----@ 2007------A

 1908---a 1958------B 2008---------C

 1909--b 1959-d 2009---------C

 1910------A 1960----@ 2010-e

 1911-d 1961--b

 1912------A 1962-c

 1913----------F 1963f

 1914-----@ 1964e

 1915-------B 1965----@

 1916----------G 1966m

 1917-----A 1967----a

 1918f 1968-------B

 1919-------B 1969--------C

 1920----@ 1970---------D

 1921--b 1971----a

 1922---------D 1972--------C

 1923-d 1973-----@

 1924-----@ 1974---a

 1925-e 1975-------B

 1926---a 1976---------D

 1927-----A 1977--b

 1928----------F 1978---------D

 1929--b 1979e

 1880-------B 1930j 1980---b

 1881---------D 1931---------C 1981-------B

 1882-c 1932-----@ 1982---------D

 1883l 1933-------B 1983-------B

 1884---a 1934----@ 1984----a

 1885-----@ 1935----a 1985-------B

 1886f 1936--------C 1986---------D

 1887---a 1937---------C 1987-c

 1888---b 1938----@ 1988--c

 1889----------L 1939--c 1989--------C

 1890----------H 1940-------B 1990--------C

 1891----------H 1941--------C 1991f

 1892-----@ 1942---------C 1992-----A

 1893--c 1943--c 1993---------C

 1894-d 1944--c 1994-------B

 1895-------B 1945-------B 1995-----@

 1896---b 1946g 1996--c

 1897--b 1947-----@ 1997-d

 1898--------C 1948--b 1998-----A

 1899g 1949------A 1999-d

PART 5: CORRELATION OF SERIES BY SEGMENTS: 10:42 Fri 04 Sep 2020 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 1875 1900 1925 1950 1975

 1924 1949 1974 1999 2024

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

 1 131360 1880 2009 .41 .39 .36 .38 .43

 2 72424 1891 2009 .55 .51 .27A .34 .32A

 3 162355 1898 2009 .63 .59 .42 .49 .57

 4 122295 1904 2009 .20B .45 .35 .41

 5 202941 1907 2008 .59 .64 .39 .43

 6 200577 1910 2009 .57 .57 .46 .35

 7 112323 1913 2009 .36 .51 .76 .71

 8 30226 1914 2003 .57 .53 .30A .30A

 9 30315 1914 2009 .58 .57 .58 .53

 10 80694 1915 2009 .37 .32A .46 .52

 11 162575 1915 2009 .60 .57 .49 .48

 12 190483 1916 2009 .61 .65 .57 .48

 13 161554 1918 2009 .61 .59 .73 .75

 14 172453 1923 2009 .40 .45 .49 .38

 15 202585 1924 2009 .56 .56 .63 .64

 16 152623 1925 2009 .71 .76 .67

 17 10010 1928 2009 .56 .63 .75

 18 10122 1929 2009 .42 .59 .43

 19 192588 1930 2002 .30A .45 .44

 20 180906 1933 2000 .61 .55 .54

 21 201261 1934 2002 .51 .44 .43

 22 10296 1935 2010 .37 .36 .43

 23 172637 1943 2009 .69 .68 .63

 24 12354 1945 2009 .54 .45 .45

 25 150048 1948 2009 .53 .56 .56

 26 40024A 1950 2009 .33B .47

 27 190074 1955 2009 .55 .48

 28 30135 1958 2009 .60 .59

 29 150761 1962 2009 .50

 30 12387 1966 2009 .50

 31 180341 1981 2010 .30A

 Av segment correlation .53 .50 .51 .51 .50

PART 6: POTENTIAL PROBLEMS: 10:42 Fri 04 Sep 2020 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

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

 131360 1880 to 2009 130 years Series 1

 [\*] Early part of series cannot be checked from 1880 to 1890 -- not matched by another series

 [B] Entire series, effect on correlation ( .358) is:

 Lower 1945< -.034 1966> -.032 1892> -.019 1921> -.014 1902> -.012 1915< -.011 Higher 1930 .048 1903 .032

 [E] Outliers 3 3.0 SD above or -4.5 SD below mean for year

 1930 -5.2 SD; 1945 -5.1 SD; 1966 +3.6 SD

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

 72424 1891 to 2009 119 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

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

 1925 1974 0 -.28 -.10 .08 .04 .01 -.04 .00 -.02 -.01 .00 .27\* .05 .06 .17 -.16 .05 -.12 -.02 -.07 -.28 -.02

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

 1960 2009 0 -.06 -.07 .06 .03 -.09 -.04 .02 -.15 -.23 .03 .32\* .24 - - - - - - - - -

 [B] Entire series, effect on correlation ( .407) is:

 Lower 1892< -.018 1909< -.017 2009< -.015 1945< -.014 1934> -.013 1917< -.012 Higher 1902 .089 1903 .029

 1925 to 1974 segment:

 Lower 1945< -.038 1934> -.031 1957> -.025 1941< -.023 1949< -.017 1946> -.016 Higher 1930 .048 1925 .028

 1960 to 2009 segment:

 Lower 2009< -.045 1978< -.027 1966> -.020 2004< -.017 2003> -.017 1986< -.014 Higher 1987 .032 1963 .028

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

 1957 +3.0 SD

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 162355 1898 to 2009 112 years Series 3

 [B] Entire series, effect on correlation ( .544) is:

 Lower 1946> -.027 1993< -.022 1985< -.016 1949< -.015 1950< -.014 1939> -.013 Higher 1902 .077 1966 .046

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

 1902 -4.6 SD

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 122295 1904 to 2009 106 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

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

 1904 1953 -4 .11 -.09 .15 -.20 .19 -.15 .26\* .07 -.13 -.04 .20| .17 -.13 .03 -.19 -.02 .09 -.32 -.08 .10 -.20

 [B] Entire series, effect on correlation ( .276) is:

 Lower 1912< -.055 1918> -.028 1911> -.020 1910< -.020 1979> -.018 1904> -.014 Higher 1946 .033 1991 .028

 1904 to 1953 segment:

 Lower 1912< -.089 1918> -.048 1911> -.034 1910< -.031 1904> -.024 1950< -.018 Higher 1946 .062 1930 .033

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

 1911 1912 -4.6 SD

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

 1929 -5.1 SD

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 202941 1907 to 2008 102 years Series 5

 [B] Entire series, effect on correlation ( .517) is:

 Lower 1991> -.028 1999> -.025 1953< -.017 1995< -.016 1967< -.013 1908> -.013 Higher 1946 .041 1966 .028

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 200577 1910 to 2009 100 years Series 6

 [B] Entire series, effect on correlation ( .472) is:

 Lower 2009< -.038 1977> -.028 1938> -.024 1916< -.024 2005> -.014 1989< -.013 Higher 1930 .044 1946 .044

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

 1938 +3.5 SD; 1977 +3.2 SD

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 112323 1913 to 2009 97 years Series 7

 [B] Entire series, effect on correlation ( .510) is:

 Lower 1939< -.057 1913< -.018 1940< -.016 1918> -.014 1923> -.014 1919< -.013 Higher 1946 .031 1979 .018

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

 1939 -6.2 SD

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 30226 1914 to 2003 90 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 1999 0 .01 .09 -.01 .17 -.05 -.01 -.04 .26 -.07 -.30 .30\*-.26 .14 .10 .13 .26 -.10 .11 .09 -.07 .10

 1954 2003 0 -.03 .03 .01 .28 -.03 -.05 -.04 .20 -.07 -.32 .30\*-.26 .12 .08 .12 .20 -.07 .15 - - -

 [B] Entire series, effect on correlation ( .454) is:

 Lower 1994< -.036 1969< -.022 1993< -.022 1948> -.017 1922< -.016 1979> -.015 Higher 1966 .040 1946 .027

 1950 to 1999 segment:

 Lower 1994< -.052 1969< -.036 1993< -.036 1979> -.028 1987> -.021 1956< -.019 Higher 1966 .115 1978 .038

 1954 to 2003 segment:

 Lower 1994< -.053 1969< -.036 1993< -.036 1979> -.027 1987> -.020 1956< -.020 Higher 1966 .112 1978 .037

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 30315 1914 to 2009 96 years Series 9

 [B] Entire series, effect on correlation ( .554) is:

 Lower 1944< -.054 1948> -.014 1987> -.011 1983< -.011 1979> -.011 1930> -.009 Higher 1946 .032 1966 .016

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

 1944 -5.1 SD

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 80694 1915 to 2009 95 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

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

 1925 1974 0 -.17 -.12 .02 .00 .01 -.13 -.09 -.08 -.19 -.14 .32\*-.02 .04 .16 .12 .08 .10 .05 .22 .07 .15

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

 Lower 1936< -.030 1996> -.023 1966> -.019 1943> -.019 1935> -.014 1940< -.012 Higher 1930 .025 1916 .019

 1925 to 1974 segment:

 Lower 1936< -.061 1943> -.031 1940< -.025 1952< -.022 1935> -.021 1958< -.020 Higher 1930 .070 1963 .025

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 162575 1915 to 2009 95 years Series 11

 [B] Entire series, effect on correlation ( .538) is:

 Lower 1967< -.034 1954< -.025 1932< -.020 1994< -.018 1992< -.016 2008< -.015 Higher 1966 .031 1930 .023

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 190483 1916 to 2009 94 years Series 12

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

 Lower 1923> -.021 1979> -.018 1941< -.016 1999> -.015 1975< -.015 1993< -.011 Higher 1930 .063 1966 .046

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 161554 1918 to 2009 92 years Series 13

 [B] Entire series, effect on correlation ( .637) is:

 Lower 1945< -.018 1943> -.015 1949< -.013 1932> -.012 1983< -.011 1996> -.008 Higher 1966 .067 1979 .014

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 172453 1923 to 2009 87 years Series 14

 [B] Entire series, effect on correlation ( .358) is:

 Lower 1923> -.033 2000< -.021 1929> -.018 1948> -.018 1991> -.014 1941< -.013 Higher 1966 .045 1946 .022

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 202585 1924 to 2009 86 years Series 15

 [B] Entire series, effect on correlation ( .581) is:

 Lower 1933< -.068 1948< -.015 1929> -.014 1991> -.009 2008< -.008 1959> -.007 Higher 1930 .057 1946 .030

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 152623 1925 to 2009 85 years Series 16

 [B] Entire series, effect on correlation ( .667) is:

 Lower 2000< -.037 1925> -.017 1932< -.016 1967< -.013 1952< -.010 1996> -.008 Higher 1966 .050 1946 .023

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 10010 1928 to 2009 82 years Series 17

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

 Lower 1948< -.045 1952< -.026 1950< -.025 1946> -.025 1954< -.021 1991> -.013 Higher 1966 .039 1979 .016

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

 10122 1929 to 2009 81 years Series 18

 [B] Entire series, effect on correlation ( .308) is:

 Lower 2009< -.094 1930> -.074 1989< -.018 1993< -.018 1931< -.011 1977> -.009 Higher 1966 .155 1991 .027

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

 1930 1931 -4.3 SD

 [E] Outliers 3 3.0 SD above or -4.5 SD below mean for year

 1930 +3.6 SD; 1943 -4.9 SD; 2009 -5.7 SD

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 192588 1930 to 2002 73 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

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

 1930 1979 0 -.16 -.16 .09 -.09 -.27 -.04 -.08 .10 -.28 -.14 .30\* .11 .24 .05 .01 .14 .24 -.29 .23 -.13 -.03

 [B] Entire series, effect on correlation ( .308) is:

 Lower 1946> -.042 1933< -.032 1990< -.023 1942< -.017 1937< -.016 1939> -.015 Higher 1930 .069 1979 .035

 1930 to 1979 segment:

 Lower 1946> -.058 1933< -.040 1939> -.020 1942< -.020 1937< -.019 1948> -.018 Higher 1930 .085 1979 .042

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

 180906 1933 to 2000 68 years Series 20

 [B] Entire series, effect on correlation ( .534) is:

 Lower 1999> -.063 1957< -.017 1940< -.016 1939> -.016 1953< -.015 1989< -.014 Higher 1966 .117 1987 .022

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

 1999 +3.2 SD

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 201261 1934 to 2002 69 years Series 21

 [B] Entire series, effect on correlation ( .431) is:

 Lower 1991> -.040 1992< -.031 1987> -.017 1944> -.016 1961< -.015 1953< -.014 Higher 1946 .033 1959 .027

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

 10296 1935 to 2010 76 years Series 22

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

 Lower 1956< -.071 1975< -.032 1970< -.028 1971> -.022 1976< -.016 1977> -.015 Higher 1966 .111 1946 .033

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

 1956 -5.3 SD

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

 172637 1943 to 2009 67 years Series 23

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

 Lower 1946> -.033 1996< -.024 2004< -.018 1987> -.016 1972< -.013 1980< -.013 Higher 1979 .026 1991 .024

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 12354 1945 to 2009 65 years Series 24

 [B] Entire series, effect on correlation ( .499) is:

 Lower 1966> -.060 1979> -.026 1958< -.026 1980> -.017 1996> -.015 1960< -.014 Higher 1946 .049 1991 .022

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

 150048 1948 to 2009 62 years Series 25

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

 Lower 1986< -.045 1948< -.031 1959> -.029 1996> -.027 1999> -.025 1965< -.014 Higher 1966 .132 1991 .021

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

 40024A 1950 to 2009 60 years Series 26

 [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 .10 -.11 .22 .03 -.19 .05 -.05 .01 -.19 -.30 .33|-.02 -.12 .08 .13 .14 .12 -.20 .48\*-.06 -.28

 [B] Entire series, effect on correlation ( .293) is:

 Lower 1958< -.121 2001< -.046 1963> -.018 1959> -.016 1952> -.015 1976< -.014 Higher 1991 .053 1966 .050

 1950 to 1999 segment:

 Lower 1958< -.158 1963> -.020 1959> -.019 1952> -.017 1976< -.016 1964> -.015 Higher 1991 .054 1966 .049

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

 1958 1959 5.0 SD

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

 1958 -6.2 SD

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

 190074 1955 to 2009 55 years Series 27

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

 Lower 1962> -.046 1976< -.033 2005> -.028 2001< -.022 1985< -.019 1978< -.019 Higher 1966 .251 1959 .019

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

 1966 -4.5 SD

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

 30135 1958 to 2009 52 years Series 28

 [B] Entire series, effect on correlation ( .607) is:

 Lower 1962> -.035 1978< -.018 1987> -.018 1982< -.017 1975< -.017 1996> -.017 Higher 1966 .041 1991 .037

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

 150761 1962 to 2009 48 years Series 29

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

 Lower 1976< -.047 1989< -.028 1986< -.025 1977> -.023 2002> -.018 1987> -.017 Higher 1966 .077 1991 .066

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

 12387 1966 to 2009 44 years Series 30

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

 Lower 1966> -.116 1976< -.054 1997> -.021 1978< -.013 1971> -.011 2004< -.011 Higher 1991 .077 1987 .037

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

 180341 1981 to 2010 30 years Series 31

 [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 0 .11 -.08 -.08 .09 .06 .00 -.06 .10 -.23 -.28 .30\* - - - - - - - - - -

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

 Lower 1999> -.085 1994< -.073 1991> -.072 1990< -.031 2007< -.029 2001< -.021 Higher 2010 .075 2000 .037

 1981 to 2010 segment:

 Lower 1999> -.085 1994< -.073 1991> -.072 1990< -.031 2007< -.029 2001< -.021 Higher 2010 .075 2000 .037

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PART 7: DESCRIPTIVE STATISTICS: 10:42 Fri 04 Sep 2020 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 131360 1880 2009 130 5 0 .358 1.62 5.55 1.021 .713 .348 2.63 .319 -.012 1

 2 72424 1891 2009 119 5 2 .407 1.50 7.24 1.473 .877 .292 2.96 .523 -.078 1

 3 162355 1898 2009 112 5 0 .544 1.42 4.90 .917 .756 .348 2.59 .408 -.061 1

 4 122295 1904 2009 106 4 1 .276 2.10 7.02 1.929 .932 .282 2.60 .383 .009 1

 5 202941 1907 2008 102 4 0 .517 1.67 4.75 1.281 .866 .285 2.53 .437 .063 1

 6 200577 1910 2009 100 4 0 .472 2.01 6.63 1.132 .819 .271 2.91 .541 -.088 1

 7 112323 1913 2009 97 4 0 .510 2.22 4.98 .891 .487 .337 2.59 .398 .032 1

 8 30226 1914 2003 90 4 2 .454 1.47 4.16 .942 .666 .360 2.92 .578 .080 2

 9 30315 1914 2009 96 4 0 .554 2.01 6.84 1.103 .668 .365 2.76 .424 -.040 1

 10 80694 1915 2009 95 4 1 .427 1.20 4.75 .926 .869 .317 2.75 .483 -.025 1

 11 162575 1915 2009 95 4 0 .538 2.11 5.37 1.383 .872 .279 2.66 .616 -.030 1

 12 190483 1916 2009 94 4 0 .545 1.47 4.16 .943 .886 .239 2.64 .444 -.033 2

 13 161554 1918 2009 92 4 0 .637 1.72 4.08 .794 .701 .314 2.57 .448 -.065 1

 14 172453 1923 2009 87 4 0 .358 1.12 3.13 .860 .917 .260 2.52 .409 .034 1

 15 202585 1924 2009 86 4 0 .581 1.49 6.77 1.316 .867 .314 2.55 .553 -.039 1

 16 152623 1925 2009 85 3 0 .667 1.73 3.60 .706 .682 .274 2.65 .584 .063 1

 17 10010 1928 2009 82 3 0 .591 2.69 6.70 1.383 .672 .379 2.51 .480 -.101 1

 18 10122 1929 2009 81 3 0 .308 3.10 10.56 1.927 .779 .269 2.52 .438 -.027 1

 19 192588 1930 2002 73 3 1 .308 1.21 3.24 .896 .829 .400 2.62 .595 -.071 1

 20 180906 1933 2000 68 3 0 .534 2.12 6.49 1.696 .940 .246 2.68 .508 -.030 1

 21 201261 1934 2002 69 3 0 .431 1.14 4.25 1.125 .937 .282 2.78 .527 -.020 1

 22 10296 1935 2010 76 3 0 .375 1.90 7.07 1.556 .768 .459 2.73 .502 -.072 1

 23 172637 1943 2009 67 3 0 .616 2.06 6.16 1.258 .766 .328 2.64 .521 .026 1

 24 12354 1945 2009 65 3 0 .499 2.99 9.88 2.008 .892 .238 2.64 .463 -.018 1

 25 150048 1948 2009 62 3 0 .491 3.06 6.40 1.150 .282 .366 2.63 .525 .019 2

 26 40024A 1950 2009 60 2 1 .293 .71 2.54 .613 .904 .316 2.60 .456 .012 1

 27 190074 1955 2009 55 2 0 .504 2.81 8.09 1.843 .884 .281 2.51 .363 .045 1

 28 30135 1958 2009 52 2 0 .607 1.81 4.65 .893 .448 .397 2.85 .761 -.056 1

 29 150761 1962 2009 48 1 0 .504 2.97 6.87 1.816 .773 .371 2.62 .486 -.050 1

 30 12387 1966 2009 44 1 0 .502 1.85 4.28 .851 .702 .287 2.43 .498 -.044 2

 31 180341 1981 2010 30 1 1 .303 3.59 7.84 1.624 .578 .308 3.01 .647 -.044 1

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 Total or mean: 2518 102 9 .475 1.88 10.56 1.213 .775 .315 3.01 .483 -.020

 - = [ COFECHA JUNI COF ] = -