[] Dendrochronology Program Library Run STRA4 Program COF 11:25 Tue 14 May 2013 Page 1

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 QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

 Title of run: STRA4\_4

 File of DATED series: STRA4\_4COMP

 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 1912 to 2012 101 years

 Continuous time span is 1912 to 2012 101 years

 Portion with two or more series is 1914 to 2012 99 years

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

 \*C\* Number of dated series 21 \*C\*

 \*O\* Master series 1912 2012 101 yrs \*O\*

 \*F\* Total rings in all series 1768 \*F\*

 \*E\* Total dated rings checked 1766 \*E\*

 \*C\* Series intercorrelation .562 \*C\*

 \*H\* Average mean sensitivity .200 \*H\*

 \*A\* Segments, possible problems 16 \*A\*

 \*\*\* Mean length of series 84.2 \*\*\*

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

 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: STRA4\_4 11:25 Tue 14 May 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

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

 . . . . . . . . . . . . . . . . . . <========> . 141A 1 1920 2012 93

 . . . . . . . . . . . . . . . . . . <========> . 141B 2 1920 2012 93

 . . . . . . . . . . . . . . . . . . <========> . 142A 3 1926 2012 87

 . . . . . . . . . . . . . . . . . .<=========> . 142B 4 1914 2012 99

 . . . . . . . . . . . . . . . . . . <=====> . 143A 5 1951 2012 62

 . . . . . . . . . . . . . . . . . . <========> . 144A 6 1923 2012 90

 . . . . . . . . . . . . . . . . . . <========> . 144B 7 1928 2012 85

 . . . . . . . . . . . . . . . . . . <=======> . 145A 8 1935 2012 78

 . . . . . . . . . . . . . . . . . . <========> . 145B 9 1920 2012 93

 . . . . . . . . . . . . . . . . . . <======> . 146B 10 1943 2012 70

 . . . . . . . . . . . . . . . . . . <======> . 147A 11 1946 2012 67

 . . . . . . . . . . . . . . . . . . <=====> . 147B 12 1952 2012 61

 . . . . . . . . . . . . . . . . . .<=========> . 148A 13 1914 2012 99

 . . . . . . . . . . . . . . . . . . <=====> . 149A 14 1953 2012 60

 . . . . . . . . . . . . . . . . . .<=========> . 149B 15 1914 2012 99

 . . . . . . . . . . . . . . . . . . <========> . 150A 16 1924 2012 89

 . . . . . . . . . . . . . . . . . . <========> . 150B 17 1925 2012 88

 . . . . . . . . . . . . . . . . . . <=====> . 151A 18 1950 2012 63

 . . . . . . . . . . . . . . . . . . <========> . 151B 19 1920 2012 93

 . . . . . . . . . . . . . . . . . .<=========> . 152A 20 1915 2012 98

 . . . . . . . . . . . . . . . . . .<=========> . 152B 21 1912 2012 101

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

 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: STRA4\_4 11:25 Tue 14 May 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 .178 18 2000 -.565 21

 1951 .724 19 2001 .657 21

 1952 .140 20 2002 1.666 21

 1953 .564 21 2003 .142 21

 1954 1.180 21 2004 .057 21

 1955 1.009 21 2005 .011 21

 1956 .116 21 2006 -.949 21

 1957 1.023 21 2007 .370 21

 1958 2.465 21 2008 -.224 21

 1959 -.423 21 2009 .240 21

 1960 -.572 21 2010 .990 21

 1961 .614 21 2011 -1.784 21

 1912 -1.680 1 1962 -.502 21 2012 1.951 21

 1913 1.570 1 1963 -.656 21

 1914 1.258 4 1964 .122 21

 1915 1.003 5 1965 .460 21

 1916 -.694 5 1966 -.469 21

 1917 -.415 5 1967 -1.163 21

 1918 1.454 5 1968 -1.517 21

 1919 1.117 5 1969 -.967 21

 1920 -.897 9 1970 -1.260 21

 1921 .635 9 1971 .557 21

 1922 -.434 9 1972 -.925 21

 1923 .087 10 1973 -.330 21

 1924 1.408 11 1974 .519 21

 1925 1.132 12 1975 .482 21

 1926 .087 13 1976 .073 21

 1927 .821 13 1977 -.362 21

 1928 .672 14 1978 -.485 21

 1929 .158 14 1979 -.557 21

 1930 -.983 14 1980 .101 21

 1931 -1.614 14 1981 -1.259 21

 1932 -1.014 14 1982 .221 21

 1933 -1.744 14 1983 -.117 21

 1934 -.911 14 1984 -1.147 21

 1935 -1.067 15 1985 .183 21

 1936 -.718 15 1986 .599 21

 1937 -1.320 15 1987 1.113 21

 1938 -.004 15 1988 .998 21

 1939 -.455 15 1989 .580 21

 1940 -1.066 15 1990 1.222 21

 1941 .700 15 1991 1.870 21

 1942 .578 15 1992 1.819 21

 1943 -.718 16 1993 1.079 21

 1944 -.116 16 1994 -2.369 21

 1945 .386 16 1995 -.673 21

 1946 .530 17 1996 -1.792 21

 1947 1.440 17 1997 -.974 21

 1948 -2.044 17 1998 -1.568 21

 1949 -.074 17 1999 .444 21

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PART 4: Master Bar Plot: STRA4\_4 11:25 Tue 14 May 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---b

 1951--------C 2001--------C

 1952-----A 2002----------G

 1953-------B 2003-----A

 1954---------E 2004-----@

 1955---------D 2005-----@

 1956-----@ 2006--d

 1957---------D 2007------A

 1958----------J 2008----a

 1959---b 2009------A

 1960---b 2010---------D

 1961-------B 2011g

 1912g 1962---b 2012----------H

 1913----------F 1963---c

 1914---------E 1964-----@

 1915---------D 1965-------B

 1916---c 1966---b

 1917---b 1967-e

 1918----------F 1968f

 1919---------D 1969--d

 1920--d 1970-e

 1921-------C 1971-------B

 1922---b 1972--d

 1923-----@ 1973----a

 1924----------F 1974-------B

 1925---------E 1975-------B

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

 1927--------C 1977----a

 1928--------C 1978---b

 1929-----A 1979---b

 1930-d 1980-----@

 1931f 1981-e

 1932-d 1982------A

 1933g 1983----@

 1934--d 1984-e

 1935-d 1985------A

 1936--c 1986-------B

 1937-e 1987---------D

 1938-----@ 1988---------D

 1939---b 1989-------B

 1940-d 1990---------E

 1941--------C 1991----------G

 1942-------B 1992----------G

 1943--c 1993---------D

 1944----@ 1994i

 1945------B 1995---c

 1946-------B 1996g

 1947----------F 1997--d

 1948h 1998f

 1949----@ 1999-------B

PART 5: CORRELATION OF SERIES BY SEGMENTS: STRA4\_4 11:25 Tue 14 May 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 141A 1920 2012 .65 .43 .25B .75 .81 .84

 2 141B 1920 2012 .43 .37B .21B .69 .75 .69

 3 142A 1926 2012 .54 .59 .48 .55 .62 .73

 4 142B 1914 2012 .62 .44 .35A .33A .44 .53 .56

 5 143A 1951 2012 .50 .62 .69 .70

 6 144A 1923 2012 .67 .62 .42 .62 .73 .70

 7 144B 1928 2012 .72 .74 .57 .71 .81 .80

 8 145A 1935 2012 .40A .49 .70 .68 .73

 9 145B 1920 2012 .48 .58 .45 .57 .67 .68

 10 146B 1943 2012 .59 .53 .52 .59 .63

 11 147A 1946 2012 .45 .43 .59 .70 .77

 12 147B 1952 2012 .38A .57 .80 .84

 13 148A 1914 2012 .30A .60 .53 .31A .43 .46 .57

 14 149A 1953 2012 .29B .58 .85 .83

 15 149B 1914 2012 .36A .71 .75 .55 .69 .77 .82

 16 150A 1924 2012 .50 .65 .53 .52 .47 .46B

 17 150B 1925 2012 .73 .72 .50 .69 .67 .75

 18 151A 1950 2012 .51 .60 .58 .61

 19 151B 1920 2012 .42A .56 .68 .57 .69 .71

 20 152A 1915 2012 .60 .39A .50 .47 .58 .59 .59

 21 152B 1912 2012 .49 .68 .68 .44 .18B .42B .57

 Av segment correlation .48 .57 .56 .44 .58 .66 .69

PART 6: POTENTIAL PROBLEMS: STRA4\_4 11:25 Tue 14 May 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

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 141A 1920 to 2012 93 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 -4 -.11 -.32 .13 .02 -.18 -.36 .39\* .00 -.12 .18 .25|-.12 -.03 .31 .14 .15 .06 .08 -.28 .30 .19

 [B] Entire series, effect on correlation ( .568) is:

 Lower 1963< -.105 1959> -.019 1922> -.012 1958< -.010 1941< -.010 1931> -.009 Higher 1948 .060 1994 .054

 1950 to 1979 segment:

 Lower 1963< -.178 1959> -.042 1958< -.027 1974< -.016 1978> -.014 1977> -.012 Higher 1967 .042 1971 .023

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

 1962 1963 -4.1 SD

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

 141B 1920 to 2012 93 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

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

 1935 1964 -4 -.32 -.03 -.01 .01 -.19 -.28 .41\* .06 -.19 -.17 .37|-.20 -.11 -.05 .11 .12 .10 -.04 -.11 .02 -.21

 1950 1979 -4 -.17 -.23 .06 .11 -.22 -.35 .57\* .07 -.19 .22 .21|-.33 -.25 .12 -.03 .06 -.03 .20 -.25 .18 .11

 [B] Entire series, effect on correlation ( .430) is:

 Lower 1963< -.065 1920> -.045 1959> -.026 2011> -.020 1942< -.015 1968> -.011 Higher 1948 .064 1994 .043

 1935 to 1964 segment:

 Lower 1963< -.113 1959> -.072 1942< -.027 1940> -.022 1937> -.019 1939> -.011 Higher 1948 .182 1958 .054

 1950 to 1979 segment:

 Lower 1963< -.092 1959> -.085 1968> -.033 1957< -.011 1951< -.011 1966> -.011 Higher 1958 .102 1967 .032

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 142A 1926 to 2012 87 years Series 3

 [B] Entire series, effect on correlation ( .596) is:

 Lower 1966> -.017 1932> -.012 1968> -.010 1963> -.010 1941< -.009 2005> -.008 Higher 2011 .033 1994 .026

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

 142B 1914 to 2012 99 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

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

 1935 1964 0 -.05 .33 .03 .05 .05 .16 .24 .11 -.04 -.11 .35\*-.19 -.13 .28 .17 .07 -.30 .06 .10 -.05 -.30

 1950 1979 0 .02 .09 -.22 .28 .07 -.14 .21 .00 -.20 -.01 .33\* .14 .24 .25 .15 -.09 .01 .14 -.29 -.47 -.19

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

 Lower 1948> -.030 1959> -.018 2006< -.018 1945< -.014 1966< -.012 1972> -.009 Higher 2012 .020 1991 .011

 1935 to 1964 segment:

 Lower 1945< -.063 1959> -.035 1948> -.031 1960> -.015 1962> -.012 1939< -.011 Higher 1958 .049 1954 .022

 1950 to 1979 segment:

 Lower 1959> -.066 1966< -.040 1972> -.032 1965< -.027 1962> -.016 1960> -.015 Higher 1958 .057 1954 .031

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 143A 1951 to 2012 62 years Series 5

 [B] Entire series, effect on correlation ( .601) is:

 Lower 1972> -.028 2010< -.024 2006> -.019 1963> -.015 2004> -.011 1960< -.011 Higher 2011 .050 1994 .043

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

 144A 1923 to 2012 90 years Series 6

 [B] Entire series, effect on correlation ( .617) is:

 Lower 1959> -.028 1975< -.020 2011> -.016 1946< -.014 1977> -.013 1932< -.013 Higher 1948 .070 1994 .025

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

 144B 1928 to 2012 85 years Series 7

 [B] Entire series, effect on correlation ( .702) is:

 Lower 1945< -.023 1977> -.014 1930> -.011 1960> -.009 1963> -.009 1958< -.007 Higher 1948 .062 1994 .030

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

 145A 1935 to 2012 78 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

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

 1935 1964 0 -.20 .06 .11 -.03 .09 -.03 -.04 .29 .22 -.29 .40\*-.43 -.07 .18 -.12 -.08 .18 .06 -.11 -.11 .06

 [B] Entire series, effect on correlation ( .550) is:

 Lower 1948> -.035 2007< -.029 1935> -.025 2003> -.019 1972> -.014 1982< -.013 Higher 1994 .059 2012 .021

 1935 to 1964 segment:

 Lower 1935> -.067 1948> -.033 1960> -.029 1950< -.020 1945< -.019 1942< -.018 Higher 1958 .060 1959 .042

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

 145B 1920 to 2012 93 years Series 9

 [B] Entire series, effect on correlation ( .558) is:

 Lower 1922> -.024 1959> -.019 1944< -.016 1994> -.014 1962> -.012 1925< -.012 Higher 1948 .062 2011 .035

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 146B 1943 to 2012 70 years Series 10

 [B] Entire series, effect on correlation ( .593) is:

 Lower 1968> -.024 1998> -.015 1961< -.012 1984> -.011 1970> -.011 1948> -.010 Higher 1994 .035 1959 .033

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 147A 1946 to 2012 67 years Series 11

 [B] Entire series, effect on correlation ( .580) is:

 Lower 1974< -.022 1948> -.020 1950< -.018 1984> -.016 1981> -.016 1978> -.010 Higher 1994 .099 2011 .028

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 147B 1952 to 2012 61 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

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

 1952 1981 0 .04 .15 -.08 .07 -.08 -.29 -.14 .13 -.27 -.22 .38\*-.01 -.05 .32 .25 -.22 .01 .17 .02 -.42 -.12

 [B] Entire series, effect on correlation ( .668) is:

 Lower 1967> -.052 1972> -.018 1984> -.017 1978< -.017 2003> -.012 1963> -.009 Higher 1994 .086 1959 .023

 1952 to 1981 segment:

 Lower 1967> -.124 1972> -.042 1978< -.025 1963> -.022 1965< -.020 1970> -.019 Higher 1959 .130 1958 .053

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 148A 1914 to 2012 99 years Series 13

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

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

 1914 1943 0 - - - - - - - - -.03 .01 .30\*-.54 -.11 .29 -.10 -.21 -.03 -.11 .10 .11 -.07

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

 1950 1979 0 .00 -.06 -.14 .18 .02 .08 -.13 .22 .01 -.04 .31\* .08 .02 -.15 .18 -.20 .24 .06 -.18 -.13 -.07

 [B] Entire series, effect on correlation ( .450) is:

 Lower 1959> -.025 1916> -.025 1949< -.015 1981> -.014 1977< -.014 1922< -.012 Higher 1948 .066 1994 .024

 1914 to 1943 segment:

 Lower 1916> -.096 1917< -.034 1934> -.022 1943> -.022 1922< -.015 1923< -.013 Higher 1920 .064 1924 .039

 1950 to 1979 segment:

 Lower 1959> -.130 1977< -.030 1967> -.023 1963> -.020 1969> -.015 1954< -.013 Higher 1958 .083 1968 .035

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 149A 1953 to 2012 60 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

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

 1953 1982 -10 .32\*-.01 -.13 .11 -.06 .32 .19 .07 .18 -.19 .29|-.02 -.40 .02 .06 -.26 .06 -.01 -.19 .18 -.34

 [B] Entire series, effect on correlation ( .533) is:

 Lower 1972< -.048 1953< -.035 1959> -.017 1969< -.013 1960> -.011 1968> -.010 Higher 1994 .055 1996 .014

 1953 to 1982 segment:

 Lower 1953< -.057 1959> -.040 1968> -.023 1967> -.023 1960> -.020 1962> -.018 Higher 1972 .055 1957 .038

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 149B 1914 to 2012 99 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

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

 1914 1943 0 - - - - - - - - -.20 .20 .36\*-.17 -.22 .04 -.02 -.27 -.04 -.27 .02 .13 .30

 [B] Entire series, effect on correlation ( .660) is:

 Lower 1943> -.011 1962> -.011 1926> -.010 1923< -.009 1924< -.009 1921< -.008 Higher 1948 .056 1958 .012

 1914 to 1943 segment:

 Lower 1943> -.050 1923< -.049 1926> -.044 1921< -.036 1924< -.032 1938< -.026 Higher 1920 .052 1941 .043

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 150A 1924 to 2012 89 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

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

 1983 2012 -10 .58\*-.09 .03 -.14 .13 -.25 -.03 -.16 -.05 .10 .46| - - - - - - - - - -

 [B] Entire series, effect on correlation ( .498) is:

 Lower 2004< -.079 2011> -.019 1946< -.017 1972> -.016 1970> -.013 1947< -.012 Higher 1994 .038 1948 .032

 1983 to 2012 segment:

 Lower 2004< -.278 2011> -.037 1984> -.017 2009< -.013 2008> -.009 1985< -.007 Higher 1994 .129 2012 .050

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 150B 1925 to 2012 88 years Series 17

 [B] Entire series, effect on correlation ( .675) is:

 Lower 1975< -.026 2006> -.019 1981> -.015 1940> -.011 1937> -.009 1949< -.009 Higher 1948 .068 1994 .052

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 151A 1950 to 2012 63 years Series 18

 [B] Entire series, effect on correlation ( .542) is:

 Lower 1990< -.027 2011> -.024 2003> -.022 1955< -.021 1965< -.019 1952< -.016 Higher 1994 .059 2012 .025

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 151B 1920 to 2012 93 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

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

 1920 1949 0 - - -.24 -.10 -.22 -.11 -.05 .06 -.06 -.20 .42\* .07 .19 .07 .26 .16 .05 .12 .24 -.12 -.13

 [B] Entire series, effect on correlation ( .559) is:

 Lower 1948> -.020 1920> -.016 1967> -.014 1969> -.010 1943> -.008 1927< -.008 Higher 1994 .025 2012 .016

 1920 to 1949 segment:

 Lower 1920> -.045 1927< -.042 1929< -.032 1939> -.024 1943> -.023 1925< -.019 Higher 1948 .048 1921 .029

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

 152A 1915 to 2012 98 years Series 20

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

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

 1920 1949 0 - - -.23 -.21 .11 -.03 .21 .11 -.25 .11 .39\*-.13 -.04 .11 -.03 .26 .01 -.19 .13 .06 -.19

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

 Lower 1948> -.057 2001< -.017 2000> -.016 2011> -.015 1963> -.014 1986< -.013 Higher 1994 .073 2012 .023

 1920 to 1949 segment:

 Lower 1948> -.248 1921< -.038 1922> -.035 1926< -.018 1927< -.013 1936< -.010 Higher 1924 .049 1920 .031

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 152B 1912 to 2012 101 years Series 21

 [\*] Early part of series cannot be checked from 1912 to 1913 -- 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

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

 1965 1994 -3 .17 .13 -.02 -.06 .23 .21 .07 .31\* .29 .21 .18|-.13 -.16 -.05 -.27 -.32 -.16 -.11 .25 .20 .14

 1980 2009 -2 -.37 -.02 -.36 -.09 -.17 -.09 .28 .08 .55\*-.03 .42|-.04 -.05 -.21 - - - - - - -

 [B] Entire series, effect on correlation ( .521) is:

 Lower 1915< -.022 1967> -.020 1966> -.017 2004> -.013 1986< -.012 1994> -.010 Higher 2011 .034 2012 .026

 1965 to 1994 segment:

 Lower 1967> -.069 1966> -.060 1986< -.046 1975< -.030 1985< -.029 1968> -.027 Higher 1994 .115 1991 .070

 1980 to 2009 segment:

 Lower 1986< -.066 2004> -.062 1985< -.040 2007< -.026 2003> -.024 1987< -.020 Higher 1994 .064 1996 .059

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PART 7: DESCRIPTIVE STATISTICS: STRA4\_4 11:25 Tue 14 May 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 141A 1920 2012 93 6 1 .568 1.78 4.11 .782 .814 .204 2.47 .360 -.029 1

 2 141B 1920 2012 93 6 2 .430 1.35 3.02 .597 .727 .228 2.54 .380 -.071 1

 3 142A 1926 2012 87 6 0 .596 1.31 3.34 .833 .914 .210 2.72 .445 -.079 2

 4 142B 1914 2012 99 7 2 .480 1.09 2.92 .724 .929 .260 2.67 .464 -.066 1

 5 143A 1951 2012 62 4 0 .601 1.82 3.38 .590 .822 .152 2.53 .462 .060 1

 6 144A 1923 2012 90 6 0 .617 1.70 5.58 .972 .916 .174 2.56 .485 -.041 1

 7 144B 1928 2012 85 6 0 .702 1.55 2.51 .536 .857 .169 2.40 .396 -.035 2

 8 145A 1935 2012 78 5 1 .550 1.32 2.49 .553 .771 .197 3.12 .590 .081 1

 9 145B 1920 2012 93 6 0 .558 1.54 3.09 .550 .679 .228 2.59 .432 -.046 1

 10 146B 1943 2012 70 5 0 .593 1.68 3.59 .854 .884 .201 2.58 .376 -.016 1

 11 147A 1946 2012 67 5 0 .580 2.34 4.34 .973 .844 .182 2.65 .453 -.004 1

 12 147B 1952 2012 61 4 1 .668 2.60 4.18 .705 .734 .157 2.63 .524 -.027 1

 13 148A 1914 2012 99 7 2 .450 1.20 2.70 .447 .751 .224 2.62 .579 -.078 1

 14 149A 1953 2012 60 4 1 .533 2.55 5.24 .860 .674 .232 2.49 .420 -.081 1

 15 149B 1914 2012 99 7 1 .660 1.78 3.95 .780 .730 .230 2.48 .327 -.080 1

 16 150A 1924 2012 89 6 1 .498 2.58 5.53 1.175 .905 .178 2.63 .426 .073 1

 17 150B 1925 2012 88 6 0 .675 2.12 4.30 1.040 .889 .222 2.47 .390 -.010 1

 18 151A 1950 2012 63 4 0 .542 1.42 2.05 .360 .657 .159 2.89 .740 .049 1

 19 151B 1920 2012 93 6 1 .559 1.55 4.30 .858 .910 .174 2.51 .361 .004 1

 20 152A 1915 2012 98 7 1 .499 1.03 2.70 .626 .907 .192 2.85 .518 -.043 1

 21 152B 1912 2012 101 7 2 .521 1.28 3.52 .686 .823 .186 2.82 .373 .000 2

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

 Total or mean: 1768 120 16 .562 1.65 5.58 .739 .821 .200 3.12 .447 -.024

 - = [ COFECHA STRA4COF ] = -