[] Dendrochronology Program Library Run SBS Program COF 17:37 Mon 06 Feb 2017 Page 1

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[] P R O G R A M C O F E C H A Version 6.06P 29989

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 QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

 File of DATED series: sbs\_final.txt

 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 1855 to 2015 161 years

 Continuous time span is 1855 to 2015 161 years

 Portion with two or more series is 1856 to 2015 160 years

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

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

 \*O\* Master series 1855 2015 161 yrs \*O\*

 \*F\* Total rings in all series 2095 \*F\*

 \*E\* Total dated rings checked 2094 \*E\*

 \*C\* Series intercorrelation .515 \*C\*

 \*H\* Average mean sensitivity .374 \*H\*

 \*A\* Segments, possible problems 8 \*A\*

 \*\*\* Mean length of series 99.8 \*\*\*

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

 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: 17:37 Mon 06 Feb 2017 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

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

 . . . . . . . . . . . . . . . . . .<=========> . SBS01A 1 1916 2015 100

 . . . . . . . . . . . . . . . . . . <=======> . SBS01B 2 1934 2015 82

 . . . . . . . . . . . . . . . . . . .<====> . SBS03A 3 1963 2015 53

 . . . . . . . . . . . . . . . . . .<=========> . SBS04A 4 1919 2011 93

 . . . . . . . . . . . . . . . . . <==========> . SBS05A 5 1902 2015 114

 . . . . . . . . . . . . . . . . . .<=========> . SBS05B 6 1914 2015 102

 . . . . . . . . . . . . . . . . . .<=========> . SBS06A 7 1912 2015 104

 . . . . . . . . . . . . . . . . . .<=========> . SBS06B 8 1913 2015 103

 . . . . . . . . . . . . . . . . . . <=======> . SBS07A 9 1933 2014 82

 . . . . . . . . . . . . . . . . . . <========> . SBS07B 10 1924 2013 90

 . . . . . . . . . . . . . . . . . <==========> . SBS08A 11 1907 2014 108

 . . . . . . . . . . . . . . . . <===============> . SBS09A 12 1855 2015 161

 . . . . . . . . . . . . . . . . .<==============> . SBS09B 13 1863 2015 153

 . . . . . . . . . . . . . . . . . .<=========> . SBS10A 14 1910 2015 106

 . . . . . . . . . . . . . . . . . . <=======> . SBS10B 15 1939 2013 75

 . . . . . . . . . . . . . . . . <==========> . . SBS11A 16 1856 1965 110

 . . . . . . . . . . . . . . . . . . <========> . SBS12A 17 1928 2015 88

 . . . . . . . . . . . . . . . . . . <========> . SBS12B 18 1925 2015 91

 . . . . . . . . . . . . . . . . . .<=========> . SBS13A 19 1912 2015 104

 . . . . . . . . . . . . . . . . . .<=========> . SBS13B 20 1915 2015 101

 . . . . . . . . . . . . . . . . . . <======> . SBS14B 21 1941 2015 75

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

 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: 17:37 Mon 06 Feb 2017 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 .796 3 1950 -.288 20 2000 .803 20

 1901 -.184 3 1951 .550 20 2001 -.612 20

 1902 .574 4 1952 -1.998 20 2002 -.018 20

 1903 -1.821 4 1953 -1.521 20 2003 .576 20

 1904 -1.954 4 1954 -1.613 20 2004 1.160 20

 1855 .697 1 1905 -.173 4 1955 .189 20 2005 -.766 20

 1856 -.845 2 1906 1.297 4 1956 .699 20 2006 -.454 20

 1857 1.072 2 1907 1.442 5 1957 .687 20 2007 -1.150 20

 1858 .587 2 1908 .903 5 1958 .747 20 2008 .104 20

 1859 -.585 2 1909 .583 5 1959 -.933 20 2009 .294 20

 1860 1.307 2 1910 .722 6 1960 .515 20 2010 1.446 20

 1861 1.180 2 1911 .256 6 1961 -1.025 20 2011 1.379 20

 1862 -.019 2 1912 -.531 8 1962 1.598 20 2012 -.760 19

 1863 -.242 3 1913 -.951 9 1963 .793 21 2013 -1.052 19

 1864 -.220 3 1914 -.197 10 1964 .960 21 2014 -1.165 17

 1865 1.028 3 1915 .266 11 1965 .164 21 2015 1.055 15

 1866 -.461 3 1916 -.027 12 1966 -.910 20

 1867 -1.165 3 1917 -.509 12 1967 -.862 20

 1868 -1.827 3 1918 -.720 12 1968 -.609 20

 1869 .286 3 1919 -.265 13 1969 1.232 20

 1870 -.582 3 1920 .371 13 1970 .256 20

 1871 -.048 3 1921 .202 13 1971 .301 20

 1872 -.311 3 1922 -.400 13 1972 -1.818 20

 1873 -1.147 3 1923 .680 13 1973 -.260 20

 1874 1.306 3 1924 .174 14 1974 -.607 20

 1875 -.448 3 1925 1.119 15 1975 -.573 20

 1876 -1.743 3 1926 -.226 15 1976 -1.375 20

 1877 2.492 3 1927 .637 15 1977 -.725 20

 1878 1.292 3 1928 .341 16 1978 .935 20

 1879 1.021 3 1929 .741 16 1979 .240 20

 1880 -.797 3 1930 -.234 16 1980 1.227 20

 1881 -2.120 3 1931 -.551 16 1981 1.363 20

 1882 .243 3 1932 -.728 16 1982 1.744 20

 1883 -1.265 3 1933 -.611 17 1983 .069 20

 1884 1.615 3 1934 -1.226 18 1984 -2.029 20

 1885 1.436 3 1935 -.316 18 1985 .562 20

 1886 .305 3 1936 -1.989 18 1986 .263 20

 1887 -.578 3 1937 .400 18 1987 -.020 20

 1888 -1.086 3 1938 .812 18 1988 -1.565 20

 1889 -2.402 3 1939 .758 19 1989 -.315 20

 1890 -.472 3 1940 .229 19 1990 -1.083 20

 1891 1.313 3 1941 -.481 20 1991 -.270 20

 1892 -1.410 3 1942 1.592 20 1992 .039 20

 1893 1.519 3 1943 -.076 20 1993 1.679 20

 1894 1.038 3 1944 -1.238 20 1994 .571 20

 1895 .724 3 1945 1.092 20 1995 .387 20

 1896 -1.615 3 1946 -.765 20 1996 -1.654 20

 1897 .989 3 1947 1.165 20 1997 -1.144 20

 1898 .926 3 1948 1.205 20 1998 -.687 20

 1899 1.235 3 1949 .689 20 1999 .183 20

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PART 4: Master Bar Plot: 17:37 Mon 06 Feb 2017 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--------C 1950----a 2000--------C

 1901----a 1951-------B 2001---b

 1902-------B 1952h 2002-----@

 1903g 1953f 2003-------B

 1904h 1954f 2004---------E

 1855-------C 1905----a 1955------A 2005--c

 1856--c 1906---------E 1956-------C 2006---b

 1857---------D 1907----------F 1957-------C 2007-e

 1858-------B 1908--------D 1958--------C 2008-----@

 1859---b 1909-------B 1959--d 2009------A

 1860---------E 1910-------C 1960-------B 2010----------F

 1861---------E 1911------A 1961-d 2011----------F

 1862-----@ 1912---b 1962----------F 2012--c

 1863----a 1913--d 1963--------C 2013-d

 1864----a 1914----a 1964--------D 2014-e

 1865---------D 1915------A 1965-----A 2015---------D

 1866---b 1916-----@ 1966--d

 1867-e 1917---b 1967--c

 1868g 1918--c 1968---b

 1869------A 1919----a 1969---------E

 1870---b 1920------A 1970------A

 1871-----@ 1921------A 1971------A

 1872----a 1922---b 1972g

 1873-e 1923-------C 1973----a

 1874---------E 1924-----A 1974---b

 1875---b 1925---------D 1975---b

 1876g 1926----a 1976-f

 1877----------J 1927-------C 1977--c

 1878---------E 1928------A 1978--------D

 1879---------D 1929--------C 1979------A

 1880--c 1930----a 1980---------E

 1881h 1931---b 1981----------E

 1882------A 1932--c 1982----------G

 1883-e 1933---b 1983-----@

 1884----------F 1934-e 1984h

 1885----------F 1935----a 1985-------B

 1886------A 1936h 1986------A

 1887---b 1937------B 1987-----@

 1888-d 1938--------C 1988f

 1889j 1939--------C 1989----a

 1890---b 1940------A 1990-d

 1891---------E 1941---b 1991----a

 1892-f 1942----------F 1992-----@

 1893----------F 1943-----@ 1993----------G

 1894---------D 1944-e 1994-------B

 1895--------C 1945---------D 1995------B

 1896f 1946--c 1996g

 1897--------D 1947---------E 1997-e

 1898--------D 1948---------E 1998--c

 1899---------E 1949-------C 1999------A

PART 5: CORRELATION OF SERIES BY SEGMENTS: 17:37 Mon 06 Feb 2017 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 1850 1875 1900 1925 1950 1975

 1899 1924 1949 1974 1999 2024

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

 1 SBS01A 1916 2015 .26A .41 .57 .51

 2 SBS01B 1934 2015 .32A .64 .51

 3 SBS03A 1963 2015 .47 .43

 4 SBS04A 1919 2011 .48 .53 .48 .48

 5 SBS05A 1902 2015 .26A .54 .64 .68

 6 SBS05B 1914 2015 .73 .74 .73 .61

 7 SBS06A 1912 2015 .72 .81 .70 .62

 8 SBS06B 1913 2015 .71 .79 .73 .71

 9 SBS07A 1933 2014 .80 .82 .65

 10 SBS07B 1924 2013 .83 .82 .77 .54

 11 SBS08A 1907 2014 .54 .64 .40 .22B

 12 SBS09A 1855 2015 .35 .48 .19B .18B .43 .56

 13 SBS09B 1863 2015 .64 .54 .44 .48 .50 .50

 14 SBS10A 1910 2015 .62 .60 .45 .49

 15 SBS10B 1939 2013 .46 .48 .45

 16 SBS11A 1856 1965 .38 .52 .44 .39B

 17 SBS12A 1928 2015 .74 .70 .74

 18 SBS12B 1925 2015 .37B .50 .45

 19 SBS13A 1912 2015 .58 .64 .53 .36

 20 SBS13B 1915 2015 .54 .53 .50 .49

 21 SBS14B 1941 2015 .50 .49 .52

 Av segment correlation .46 .51 .52 .56 .58 .53

PART 6: POTENTIAL PROBLEMS: 17:37 Mon 06 Feb 2017 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

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 SBS01A 1916 to 2015 100 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

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

 1916 1965 0 -.09 .15 -.06 .25 .04 .10 -.13 .09 .19 .10 .26\*-.11 -.02 .05 -.20 -.09 -.28 -.04 -.30 .20 -.33

 [B] Entire series, effect on correlation ( .371) is:

 Lower 1919< -.055 1926> -.036 1936> -.019 2012> -.014 1925< -.014 1998> -.013 Higher 1984 .036 1982 .022

 1916 to 1965 segment:

 Lower 1919< -.087 1926> -.063 1936> -.031 1925< -.024 1916> -.014 1944> -.014 Higher 1961 .030 1942 .025

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

 1918 1919 -4.1 SD

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

 SBS01B 1934 to 2015 82 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

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

 1934 1983 0 -.29 .21 -.24 -.16 -.05 -.11 .20 -.03 .20 .27 .32\* .09 -.07 -.32 -.08 .00 -.13 .01 -.03 .08 -.27

 [B] Entire series, effect on correlation ( .377) is:

 Lower 1945< -.051 1935< -.028 1943> -.024 2005> -.021 1941> -.015 1956< -.015 Higher 1982 .023 1952 .022

 1934 to 1983 segment:

 Lower 1945< -.086 1935< -.049 1943> -.041 1941> -.025 1956< -.025 1947< -.021 Higher 1952 .049 1982 .041

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 SBS03A 1963 to 2015 53 years Series 3

 [B] Entire series, effect on correlation ( .433) is:

 Lower 1996> -.071 2009< -.044 2015< -.029 1993< -.022 1990> -.019 2013> -.015 Higher 1972 .044 1982 .026

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

 1996 +3.2 SD

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 SBS04A 1919 to 2011 93 years Series 4

 [B] Entire series, effect on correlation ( .479) is:

 Lower 1961> -.038 2010< -.029 1956< -.020 2000< -.014 2007> -.014 1975> -.011 Higher 1984 .031 1952 .019

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 SBS05A 1902 to 2015 114 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

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

 1902 1951 0 .06 -.14 .03 .05 -.01 -.17 .09 -.12 -.07 -.07 .26\* .18 .23 .02 -.09 -.06 -.20 -.19 -.02 .02 -.02

 [B] Entire series, effect on correlation ( .500) is:

 Lower 1910< -.018 1946> -.018 1914> -.016 1964< -.012 1992< -.012 1925< -.012 Higher 1952 .024 1984 .021

 1902 to 1951 segment:

 Lower 1910< -.039 1946> -.035 1914> -.031 1925< -.025 1906< -.016 1926> -.016 Higher 1936 .046 1942 .038

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

 1914 +3.5 SD

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 SBS05B 1914 to 2015 102 years Series 6

 [B] Entire series, effect on correlation ( .647) is:

 Lower 2013< -.025 1964< -.024 2007> -.012 1915> -.011 1980< -.009 1967> -.008 Higher 1952 .034 1972 .015

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 SBS06A 1912 to 2015 104 years Series 7

 [B] Entire series, effect on correlation ( .657) is:

 Lower 2005< -.033 1912> -.017 1973< -.012 2001> -.011 1999< -.010 1924< -.009 Higher 1936 .013 1984 .012

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 SBS06B 1913 to 2015 103 years Series 8

 [B] Entire series, effect on correlation ( .711) is:

 Lower 1922< -.027 1984> -.012 1973< -.011 1919> -.010 1915> -.010 1932> -.009 Higher 1942 .009 1996 .009

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 SBS07A 1933 to 2014 82 years Series 9

 [B] Entire series, effect on correlation ( .713) is:

 Lower 2003< -.052 2014> -.020 1954> -.013 1935> -.013 2001> -.012 1990> -.012 Higher 1952 .029 1993 .011

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 SBS07B 1924 to 2013 90 years Series 10

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

 Lower 2007> -.056 1997< -.024 1935> -.018 2011< -.015 2003< -.014 1990> -.013 Higher 1952 .026 1936 .016

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

 2007 +4.1 SD

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 SBS08A 1907 to 2014 108 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

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

 1965 2014 -10 .40\*-.06 -.10 -.22 .08 -.14 .12 -.13 -.11 .03 .22| .29 - - - - - - - - -

 [B] Entire series, effect on correlation ( .415) is:

 Lower 1996> -.023 1927< -.018 2014> -.017 1982< -.016 1966> -.015 2004< -.014 Higher 1952 .035 1942 .020

 1965 to 2014 segment:

 Lower 1996> -.043 2014> -.032 1982< -.029 1966> -.028 2004< -.027 1990> -.025 Higher 1976 .051 1972 .037

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 SBS09A 1855 to 2015 161 years Series 12

 [\*] Early part of series cannot be checked from 1855 to 1855 -- 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

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

 1900 1949 2 -.15 -.05 -.06 -.04 -.02 -.16 -.03 -.02 .11 .22 .19| .10 .29\*-.25 -.08 -.29 -.03 -.05 .02 -.10 -.11

 1925 1974 -1 -.14 -.03 .06 -.13 .11 -.37 .07 -.09 .19 .32\* .18| .03 .13 -.23 -.06 -.08 .02 .07 .04 -.06 -.14

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

 Lower 1915< -.034 1862< -.024 1859> -.022 1936> -.013 1858< -.012 1943> -.012 Higher 1877 .018 1903 .017

 1900 to 1949 segment:

 Lower 1915< -.097 1936> -.045 1943> -.036 1937< -.031 1945< -.022 1917> -.017 Higher 1903 .081 1906 .030

 1925 to 1974 segment:

 Lower 1936> -.042 1943> -.037 1937< -.035 1959> -.029 1945< -.022 1969< -.018 Higher 1962 .038 1948 .028

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 SBS09B 1863 to 2015 153 years Series 13

 [B] Entire series, effect on correlation ( .512) is:

 Lower 1961> -.028 1926> -.014 1863> -.013 1913< -.012 1917> -.010 1977> -.009 Higher 1952 .016 1903 .014

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

 1961 +3.6 SD

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 SBS10A 1910 to 2015 106 years Series 14

 [B] Entire series, effect on correlation ( .539) is:

 Lower 1961> -.022 1924< -.016 1985< -.014 2007> -.014 1972> -.014 1953> -.012 Higher 1936 .023 1946 .014

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 SBS10B 1939 to 2013 75 years Series 15

 [B] Entire series, effect on correlation ( .515) is:

 Lower 1978< -.019 1942< -.017 1990> -.017 2013> -.016 1972> -.015 1984> -.014 Higher 1952 .022 1996 .020

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 SBS11A 1856 to 1965 110 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

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

 1916 1965 -2 -.07 .19 .02 -.02 -.05 -.13 .04 .00 .48\* .05 .39|-.32 -.07 -.08 -.05 .06 -.03 .01 -.18 -.04 -.25

 [B] Entire series, effect on correlation ( .380) is:

 Lower 1862> -.037 1859< -.025 1858> -.018 1955< -.015 1861> -.010 1857< -.010 Higher 1877 .026 1892 .020

 1916 to 1965 segment:

 Lower 1955< -.043 1956< -.029 1946> -.025 1916> -.019 1953> -.018 1938< -.018 Higher 1936 .044 1942 .040

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

 1862 +3.8 SD

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

 SBS12A 1928 to 2015 88 years Series 17

 [B] Entire series, effect on correlation ( .725) is:

 Lower 2000< -.020 1952> -.016 1932> -.016 1988> -.010 1984> -.010 1961> -.010 Higher 1936 .013 1972 .013

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 SBS12B 1925 to 2015 91 years Series 18

 [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 -2 -.12 .14 -.09 .21 -.21 .04 -.03 -.33 .42\*-.01 .37| .06 -.05 -.28 -.14 -.05 .05 -.03 .07 .21 -.26

 [B] Entire series, effect on correlation ( .404) is:

 Lower 1948< -.036 1930> -.031 1988> -.026 1985< -.024 2003< -.024 1925< -.018 Higher 1984 .019 1996 .017

 1925 to 1974 segment:

 Lower 1948< -.071 1930> -.059 1925< -.035 1951< -.027 1938< -.026 1937< -.025 Higher 1952 .032 1947 .031

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

 1930 +3.3 SD

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 SBS13A 1912 to 2015 104 years Series 19

 [B] Entire series, effect on correlation ( .493) is:

 Lower 1982< -.026 1939< -.014 1947< -.014 1916< -.013 1996> -.013 1981< -.012 Higher 1952 .052 1942 .013

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 SBS13B 1915 to 2015 101 years Series 20

 [B] Entire series, effect on correlation ( .506) is:

 Lower 1982< -.024 1926< -.019 1936> -.016 1939< -.015 1996> -.013 1967> -.012 Higher 1952 .026 1972 .025

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 SBS14B 1941 to 2015 75 years Series 21

 [B] Entire series, effect on correlation ( .569) is:

 Lower 1984> -.061 1969< -.023 1990> -.018 2007< -.014 2004< -.014 1951< -.009 Higher 1996 .019 1988 .016

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

 1984 +3.4 SD

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PART 7: DESCRIPTIVE STATISTICS: 17:37 Mon 06 Feb 2017 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 SBS01A 1916 2015 100 4 1 .371 1.25 5.05 .803 .605 .350 2.88 .463 -.057 1

 2 SBS01B 1934 2015 82 3 1 .377 1.55 4.13 .841 .505 .379 2.85 .494 .033 1

 3 SBS03A 1963 2015 53 2 0 .433 2.25 4.68 .721 .436 .261 2.60 .524 -.025 1

 4 SBS04A 1919 2011 93 4 0 .479 1.49 3.70 .837 .400 .450 2.65 .424 .009 1

 5 SBS05A 1902 2015 114 4 1 .500 1.54 3.87 .733 .545 .342 2.87 .523 .076 1

 6 SBS05B 1914 2015 102 4 0 .647 1.77 4.03 .796 .405 .375 2.73 .534 -.051 1

 7 SBS06A 1912 2015 104 4 0 .657 1.94 4.75 .998 .598 .390 2.46 .424 -.039 1

 8 SBS06B 1913 2015 103 4 0 .711 1.55 6.24 .847 .425 .392 2.80 .468 .021 1

 9 SBS07A 1933 2014 82 3 0 .713 2.02 5.08 1.040 .421 .437 2.88 .590 -.013 1

 10 SBS07B 1924 2013 90 4 0 .667 1.87 4.90 1.033 .497 .419 3.02 .558 .050 1

 11 SBS08A 1907 2014 108 4 1 .415 1.62 7.57 1.171 .639 .421 2.89 .429 -.038 4

 12 SBS09A 1855 2015 161 6 2 .330 1.47 5.20 .842 .634 .335 3.03 .475 .017 1

 13 SBS09B 1863 2015 153 6 0 .512 1.42 5.35 .821 .615 .341 2.84 .545 -.012 1

 14 SBS10A 1910 2015 106 4 0 .539 2.13 5.01 1.057 .599 .362 2.73 .511 -.082 3

 15 SBS10B 1939 2013 75 3 0 .515 2.62 5.44 .922 .372 .321 2.64 .451 -.034 3

 16 SBS11A 1856 1965 110 4 1 .380 2.35 6.23 1.412 .773 .314 2.73 .441 .047 1

 17 SBS12A 1928 2015 88 3 0 .725 1.91 4.63 .909 .554 .354 2.74 .591 -.116 1

 18 SBS12B 1925 2015 91 3 1 .404 1.37 4.84 .988 .683 .426 2.95 .574 -.007 1

 19 SBS13A 1912 2015 104 4 0 .493 1.67 4.60 1.101 .714 .400 2.82 .485 .023 3

 20 SBS13B 1915 2015 101 4 0 .506 1.46 4.51 .998 .687 .422 2.92 .481 -.032 3

 21 SBS14B 1941 2015 75 3 0 .569 2.22 5.79 1.156 .601 .375 2.77 .546 -.039 1

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 Total or mean: 2095 80 8 .515 1.74 7.57 .952 .569 .374 3.03 .499 -.011

 - = [ COFECHA SBS COF ] = -