[] Dendrochronology Program Library Run SPRUC Program COF 00:00 ®¯® 00 0000 Page 1

[]

[] P R O G R A M C O F E C H A Version 6.06P -30

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

QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

Title of run: sprucemid

File of DATED series: Sprucemid.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 0.3281

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 1801 to 2011 211 years

Continuous time span is 1801 to 2011 211 years

Portion with two or more series is 1816 to 2011 196 years

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

\*C\* Number of dated series 48 \*C\*

\*O\* Master series 1801 2011 211 yrs \*O\*

\*F\* Total rings in all series 5129 \*F\*

\*E\* Total dated rings checked 5114 \*E\*

\*C\* Series intercorrelation 0.466 \*C\*

\*H\* Average mean sensitivity 0.224 \*H\*

\*A\* Segments, possible problems 32 \*A\*

\*\*\* Mean length of series 106.9 \*\*\*

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

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: sprucemid 00:00 ®¯® 00 0000 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

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

. . . . . . . . . . . . . . . . . .<=========> . 04p0t482 1 1917 2011 95

. . . . . . . . . . . . . . . . . .<=========> . 04p0t481 2 1917 2011 95

. . . . . . . . . . . . . . . . . .<=========> . 04p0t932 3 1913 2011 99

. . . . . . . . . . . . . . . . . .<=========> . 04p0t931 4 1913 2011 99

. . . . . . . . . . . . . . . . . .<=========> . 05p0t141 5 1919 2011 93

. . . . . . . . . . . . . . . . . <==========> . 05p0t592 6 1909 2011 103

. . . . . . . . . . . . . . . . . <==========> . 05p0t591 7 1909 2011 103

. . . . . . . . . . . . . . . . . .<=========> . 05p0t142 8 1918 2011 94

. . . . . . . . . . . . . . . . . . <========> . 07pt2321 9 1929 2011 83

. . . . . . . . . . . . . . . . . . <========> . 07pt2322 10 1926 2011 86

. . . . . . . . . . . . . . . . . . <=======> . 08p0t241 11 1936 2011 76

. . . . . . . . . . . . . . . . . . <======> . 08p0t302 12 1942 2011 70

. . . . . . . . . . . . . . . . . . <=======> . 08p0t242 13 1936 2011 76

. . . . . . . . . . . . . . . . . . <======> . 08p0t301 14 1942 2011 70

. . . . . . . . . . . . . . . . . . <=======> . 09p0t262 15 1930 2011 82

. . . . . . . . . . . . . . . . . . <=======> . 09p0t261 16 1930 2011 82

. . . . . . . . . . . . . . . . . . <=====> . 09p02582 17 1953 2011 59

. . . . . . . . . . . . . . . . . . <=====> . 09p02581 18 1953 2011 59

. . . . . . . . . . . . . . . . . <==========> . 10p02021 19 1904 2011 108

. . . . . . . . . . . . . . . . . <==========> . 10p02022 20 1904 2010 107

. . . . . . . . . . . . . . . . . <============> . 11p0t191 21 1880 2011 132

. . . . . . . . . . . . . . . . . <============> . 11p0t192 22 1880 2011 132

. . . . . . . . . . . . . . . . . . <======> . 11p0t331 23 1949 2011 63

. . . . . . . . . . . . . . . . . . <======> . 11p0t332 24 1949 2011 63

. . . . . . . . . . . . . . . . <===============> . 11p03831 25 1859 2011 153

. . . . . . . . . . . . . . . . .<==============> . 11p03832 26 1863 2011 149

. . . . . . . . . . . . . . . . .<==============> . 15p04251 27 1865 2011 147

. . . . . . . . . . . . . . . . .<==============> . 15p04252 28 1869 2011 143

. . . . . . . . . . . . . . . . <================> . 15p04302 29 1847 2011 165

. . . . . . . . . . . . . . . .<==================> . 15p04301 30 1816 2008 193

. . . . . . . . . . . . . . . . . <============> . 15p03052 31 1881 2011 131

. . . . . . . . . . . . . . . . . <============> . 15p03051 32 1883 2011 129

. . . . . . . . . . . . . . . . <===============> . 16p03271 33 1859 2011 153

. . . . . . . . . . . . . . . . <===============> . 16p03272 34 1859 2011 153

. . . . . . . . . . . . . . . . . <=============> . 16p04201 35 1879 2011 133

. . . . . . . . . . . . . . . . .<==============> . 16P04202 36 1868 2011 144

. . . . . . . . . . . . . . . . .<==============> . 16p04291 37 1862 2011 150

. . . . . . . . . . . . . . . . <===============> . 16p04292 38 1855 2011 157

. . . . . . . . . . . . . . . . . . <======> . 23p02401 39 1947 2011 65

. . . . . . . . . . . . . . . . . . <======> . 23p02402 40 1947 2011 65

. . . . . . . . . . . . . . . . . . <=====> . 23p02411 41 1957 2011 55

. . . . . . . . . . . . . . . . . . <=====> . 23p02412 42 1957 2011 55

. . . . . . . . . . . . . . . . . . <======> . 23p02991 43 1946 2011 66

. . . . . . . . . . . . . . . . . . <======> . 23p02992 44 1946 2011 66

. . . . . . . . . . . . . . . <====================> . 28p04502 45 1801 2011 211

. . . . . . . . . . . . . . . . . . <========> . 28p02492 46 1925 2011 87

. . . . . . . . . . . . . . . . . . <========> . 28p02491 47 1925 2011 87

. . . . . . . . . . . . . . . . .<==============> . 28p0t451 48 1869 2011 143

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

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: sprucemid 00:00 ®¯® 00 0000 Page 3

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

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

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

1850 -1.333 3 1900 0.732 18 1950 -0.669 44 2000 0.324 48

1801 1.593 1 1851 -0.288 3 1901 -1.383 18 1951 0.363 44 2001 1.142 48

1802 0.278 1 1852 -0.656 3 1902 -0.936 18 1952 0.296 44 2002 0.898 48

1803 -0.388 1 1853 0.592 3 1903 1.558 18 1953 -0.453 46 2003 -1.303 48

1804 1.917 1 1854 -1.917 3 1904 0.293 20 1954 0.620 46 2004 -1.779 48

1805 -0.021 1 1855 -2.004 4 1905 0.448 20 1955 0.875 46 2005 -2.077 48

1806 -1.464 1 1856 -0.101 4 1906 0.574 20 1956 -1.301 46 2006 -0.002 48

1807 -0.515 1 1857 -0.470 4 1907 0.374 20 1957 0.846 48 2007 1.314 48

1808 -0.921 1 1858 -1.221 4 1908 0.942 20 1958 1.459 48 2008 -0.133 48

1809 -1.420 1 1859 0.540 7 1909 -2.388 22 1959 0.743 48 2009 0.299 47

1810 -1.153 1 1860 0.701 7 1910 0.581 22 1960 -0.098 48 2010 1.154 47

1811 4.039 1 1861 0.518 7 1911 -1.027 22 1961 1.109 48 2011 0.603 46

1812 2.358 1 1862 1.207 8 1912 -0.138 22 1962 -0.850 48

1813 -1.091 1 1863 0.274 9 1913 0.052 24 1963 0.056 48

1814 -1.022 1 1864 -0.179 9 1914 -0.205 24 1964 0.300 48

1815 -0.679 1 1865 0.438 10 1915 -0.052 24 1965 0.384 48

1816 -1.357 2 1866 -0.161 10 1916 0.790 24 1966 -1.145 48

1817 -0.310 2 1867 -0.241 10 1917 -0.553 26 1967 -0.555 48

1818 0.081 2 1868 -0.380 11 1918 -1.352 27 1968 -1.189 48

1819 -0.664 2 1869 -0.663 13 1919 -0.288 28 1969 -0.609 48

1820 0.703 2 1870 -0.189 13 1920 -0.230 28 1970 0.372 48

1821 -1.806 2 1871 -0.502 13 1921 0.110 28 1971 1.612 48

1822 0.109 2 1872 -0.249 13 1922 0.365 28 1972 -0.165 48

1823 -1.082 2 1873 -0.878 13 1923 -0.960 28 1973 -0.699 48

1824 -0.417 2 1874 1.499 13 1924 1.508 28 1974 -0.747 48

1825 -1.009 2 1875 0.936 13 1925 -0.800 30 1975 0.371 48

1826 -0.431 2 1876 1.928 13 1926 0.011 31 1976 0.163 48

1827 -1.066 2 1877 -0.894 13 1927 0.196 31 1977 -0.171 48

1828 2.458 2 1878 0.275 13 1928 0.533 31 1978 -0.250 48

1829 1.592 2 1879 -0.693 14 1929 0.244 32 1979 0.352 48

1830 0.358 2 1880 0.580 16 1930 0.602 34 1980 1.025 48

1831 1.584 2 1881 -0.179 17 1931 0.935 34 1981 -1.971 48

1832 2.193 2 1882 -0.284 17 1932 0.957 34 1982 -2.295 48

1833 0.538 2 1883 -1.038 18 1933 -0.150 34 1983 -0.341 48

1834 0.277 2 1884 -0.250 18 1934 -0.031 34 1984 -1.137 48

1835 0.481 2 1885 -0.046 18 1935 -2.127 34 1985 0.038 48

1836 1.138 2 1886 1.604 18 1936 -1.490 36 1986 -0.388 48

1837 2.268 2 1887 -2.266 18 1937 -0.962 36 1987 0.407 48

1838 0.279 2 1888 -0.252 18 1938 0.634 36 1988 1.154 48

1839 -0.288 2 1889 -0.037 18 1939 -0.033 36 1989 0.646 48

1840 2.317 2 1890 -0.778 18 1940 -0.601 36 1990 0.663 48

1841 0.937 2 1891 0.317 18 1941 1.086 36 1991 0.337 48

1842 -0.200 2 1892 0.008 18 1942 0.542 38 1992 1.141 48

1843 1.530 2 1893 -0.590 18 1943 -0.488 38 1993 1.028 48

1844 0.291 2 1894 0.995 18 1944 -0.365 38 1994 -0.737 48

1845 -0.176 2 1895 0.511 18 1945 -0.096 38 1995 -0.614 48

1846 -0.816 2 1896 1.312 18 1946 -0.426 40 1996 -1.438 48

1847 0.948 3 1897 0.284 18 1947 -0.305 42 1997 -1.108 48

1848 -0.218 3 1898 0.123 18 1948 -1.787 42 1998 -0.503 48

1849 -0.290 3 1899 -0.504 18 1949 0.058 44 1999 0.818 48

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

PART 4: Master Bar Plot: sprucemid 00:00 ®¯® 00 0000 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

1850-e 1900--------C 1950--c 2000------A

1801----------F 1851----a 1901-f 1951-------A 2001---------E

1802------A 1852--c 1902-d 1952------A 2002---------D

1803---b 1853--------B 1903----------F 1953---b 2003-e

1804----------H 1854h 1904------A 1954--------B 2004g

1805-----@ 1855h 1905-------B 1955---------D 2005h

1806f 1856-----@ 1906--------B 1956-e 2006-----@

1807---b 1857---b 1907-------A 1957---------C 2007---------E

1808-d 1858-e 1908---------D 1958----------F 2008-----a

1809-f 1859--------B 1909j 1959--------C 2009------A

1810-e 1860--------C 1910--------B 1960-----@ 2010---------E

1811----------P 1861--------B 1911-d 1961---------D 2011--------B

1812----------I 1862---------E 1912----a 1962--c

1813-d 1863------A 1913-----@ 1963-----@

1814-d 1864----a 1914----a 1964------A

1815--c 1865-------B 1915-----@ 1965-------B

1816-e 1866----a 1916--------C 1966-e

1817----a 1867----a 1917--b 1967--b

1818-----@ 1868---b 1918-e 1968-e

1819--c 1869--c 1919----a 1969--b

1820--------C 1870----a 1920----a 1970-------A

1821g 1871---b 1921-----@ 1971----------F

1822-----@ 1872----a 1922-------A 1972----a

1823-d 1873-d 1923-d 1973--c

1824---b 1874----------F 1924----------F 1974--c

1825-d 1875---------D 1925--c 1975-------A

1826---b 1876----------H 1926-----@ 1976------A

1827-d 1877-d 1927------A 1977----a

1828----------J 1878------A 1928--------B 1978----a

1829----------F 1879--c 1929------A 1979-------A

1830-------A 1880--------B 1930--------B 1980---------D

1831----------F 1881----a 1931---------D 1981h

1832----------I 1882----a 1932---------D 1982i

1833--------B 1883-d 1933----a 1983---a

1834------A 1884----a 1934-----@ 1984-e

1835-------B 1885-----@ 1935i 1985-----@

1836---------E 1886----------F 1936f 1986---b

1837----------I 1887i 1937-d 1987-------B

1838------A 1888----a 1938--------C 1988---------E

1839----a 1889-----@ 1939-----@ 1989--------C

1840----------I 1890--c 1940--b 1990--------C

1841---------D 1891------A 1941---------D 1991-------A

1842----a 1892-----@ 1942--------B 1992---------E

1843----------F 1893--b 1943---b 1993---------D

1844------A 1894---------D 1944---a 1994--c

1845----a 1895-------B 1945-----@ 1995--b

1846--c 1896---------E 1946---b 1996f

1847---------D 1897------A 1947----a 1997-d

1848----a 1898------@ 1948g 1998---b

1849----a 1899---b 1949-----@ 1999--------C

PART 5: CORRELATION OF SERIES BY SEGMENTS: sprucemid 00:00 ®¯® 00 0000 Page 5

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

Correlations of 50-year dated segments, lagged 25 years

Flags: A = correlation under 0.3281 but highest as dated; B = correlation higher at other than dated position

Seq Series Time\_span 1800 1825 1850 1875 1900 1925 1950 1975

1849 1874 1899 1924 1949 1974 1999 2024

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

1 04p0t482 1917 2011 .59 .53 .55 .54

2 04p0t481 1917 2011 .35 .49 .63 .60

3 04p0t932 1913 2011 .40 .51 .55 .57

4 04p0t931 1913 2011 .23A .43 .59 .55

5 05p0t141 1919 2011 .57 .58 .54 .62

6 05p0t592 1909 2011 .49 .61 .48 .51

7 05p0t591 1909 2011 .49 .59 .64 .54

8 05p0t142 1918 2011 .61 .62 .47 .53

9 07pt2321 1929 2011 .25B .58 .58

10 07pt2322 1926 2011 .36 .50 .63

11 08p0t241 1936 2011 .45 .46 .41

12 08p0t302 1942 2011 .56 .59 .58

13 08p0t242 1936 2011 .46 .46 .53

14 08p0t301 1942 2011 .49 .58 .61

15 09p0t262 1930 2011 .34 .40 .42

16 09p0t261 1930 2011 .27B .45 .37

17 09p02582 1953 2011 .34 .44

18 09p02581 1953 2011 .65 .62

19 10p02021 1904 2011 .56 .41 .23B .22A

20 10p02022 1904 2010 .26B .46 .48 .40

21 11p0t191 1880 2011 .72 .48 .20B .30A .41

22 11p0t192 1880 2011 -.07B .19B .35 .31A .46

23 11p0t331 1949 2011 .39 .38 .39

24 11p0t332 1949 2011 .31B .28B .21A

25 11p03831 1859 2011 .57 .66 .65 .55 .28B .41

26 11p03832 1863 2011 .69 .64 .53 .45 .27A .39

27 15p04251 1865 2011 .32B .42 .64 .56 .55 .40

28 15p04252 1869 2011 .48 .56 .74 .69 .65 .66

29 15p04302 1847 2011 .39 .39 .69 .67 .54 .62 .61

30 15p04301 1816 2008 .01B .04B .43 .65 .61 .43 .56 .46

31 15p03052 1881 2011 .48 .38 .29A .40 .36

32 15p03051 1883 2011 .26A .20B .30A .47 .36

33 16p03271 1859 2011 .51 .63 .58 .57 .66 .71

34 16p03272 1859 2011 .47 .55 .58 .32A .51 .55

35 16p04201 1879 2011 .44 .37 .55 .63 .58

36 16P04202 1868 2011 .60 .48 .30A .43 .51 .54

37 16p04291 1862 2011 .45 .49 .53 .12B-.17B-.05B

38 16p04292 1855 2011 .57 .53 .45 .49 .64 .70

39 23p02401 1947 2011 .51 .52 .64

40 23p02402 1947 2011 .61 .62 .65

41 23p02411 1957 2011 .63 .73

42 23p02412 1957 2011 .72 .76

43 23p02991 1946 2011 .42 .46 .52

44 23p02992 1946 2011 .51 .50 .56

45 28p04502 1801 2011 .29B .32A .36 .32A .40 .55 .68 .68

46 28p02492 1925 2011 .39 .68 .70

47 28p02491 1925 2011 .32A .64 .62

48 28p0t451 1869 2011 .48 .51 .49 .40 .47 .60

Av segment correlation 0.15 0.25 0.49 0.50 0.48 0.45 0.50 0.52

PART 6: POTENTIAL PROBLEMS: sprucemid 00:00 ®¯® 00 0000 Page 5

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

For each series with potential problems the following diagnostics may appear:

[A] Correlations with master dating series of flagged 50-year segments of series filtered with 32-year spline,

at every point from ten years earlier (-10) to ten years later (+10) than dated

[B] Effect of those data values which most lower or raise correlation with master series

Symbol following year indicates value in series is greater (>) or lesser (<) than master series value

[C] Year-to-year changes very different from the mean change in other series

[D] Absent rings (zero values)

[E] Values which are statistical outliers from mean for the year

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

04p0t482 1917 to 2011 95 years Series 1

[B] Entire series, effect on correlation ( 0.570) is:

Lower 1969<-0.016 1966>-0.015 1944<-0.010 1941<-0.009 1943>-0.009 1992<-0.008 Higher 1935 0.040 1956 0.018

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

04p0t481 1917 to 2011 95 years Series 2

[B] Entire series, effect on correlation ( 0.467) is:

Lower 1924<-0.036 1917>-0.024 1950<-0.021 2003>-0.021 1972>-0.012 1966>-0.011 Higher 1981 0.058 1956 0.024

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

04p0t932 1913 to 2011 99 years Series 3

[B] Entire series, effect on correlation ( 0.461) is:

Lower 1936>-0.023 1918>-0.018 2007<-0.014 1955<-0.012 1917>-0.012 1948>-0.012 Higher 1935 0.060 2004 0.015

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

04p0t931 1913 to 2011 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

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

1913 1962 0 .20 -.21 -.03 -.03 .10 -.15 .14 .12 .02 -.08 .23\*-.12 .16 -.09 .05 -.09 -.03 -.02 -.02 -.08 .13

[B] Entire series, effect on correlation ( 0.414) is:

Lower 1936>-0.033 1917>-0.021 1915<-0.019 2009<-0.014 1925>-0.013 1928<-0.013 Higher 1981 0.057 1935 0.028

1913 to 1962 segment:

Lower 1936>-0.068 1917>-0.042 1915<-0.039 1928<-0.029 1925>-0.021 1923>-0.015 Higher 1935 0.100 1958 0.044

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

1936 +3.9 SD

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

05p0t141 1919 to 2011 93 years Series 5

[B] Entire series, effect on correlation ( 0.579) is:

Lower 1981>-0.027 1960>-0.015 1920<-0.013 1937>-0.012 1954<-0.012 1976<-0.012 Higher 1948 0.018 1982 0.013

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

05p0t592 1909 to 2011 103 years Series 6

[B] Entire series, effect on correlation ( 0.492) is:

Lower 1911>-0.031 1992<-0.017 2007<-0.015 1965<-0.014 1950>-0.011 1918>-0.010 Higher 1935 0.029 1909 0.022

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

1935 -4.7 SD

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

05p0t591 1909 to 2011 103 years Series 7

[B] Entire series, effect on correlation ( 0.496) is:

Lower 2003>-0.031 1911>-0.025 1910<-0.022 1956>-0.012 1936>-0.011 2007<-0.011 Higher 1935 0.042 1981 0.035

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

05p0t142 1918 to 2011 94 years Series 8

[B] Entire series, effect on correlation ( 0.567) is:

Lower 1981>-0.033 1918>-0.023 1976<-0.022 1974>-0.011 1936>-0.010 1950>-0.009 Higher 1956 0.026 1948 0.016

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

07pt2321 1929 to 2011 83 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

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

1929 1978 4 -.01 -.09 .13 .00 .21 -.16 -.09 -.03 .12 -.21 .25|-.14 -.13 .11 .30\*-.08 .12 -.22 -.02 .11 -.15

[B] Entire series, effect on correlation ( 0.404) is:

Lower 1931<-0.110 1935>-0.035 2001<-0.031 1966>-0.013 1999<-0.013 1936>-0.010 Higher 1981 0.070 2003 0.026

1929 to 1978 segment:

Lower 1931<-0.165 1935>-0.055 1966>-0.021 1936>-0.016 1940>-0.012 1972>-0.010 Higher 1941 0.029 1957 0.026

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

07pt2322 1926 to 2011 86 years Series 10

[B] Entire series, effect on correlation ( 0.514) is:

Lower 1994>-0.033 1955<-0.020 1935>-0.018 2004>-0.018 1940>-0.015 1950>-0.014 Higher 2003 0.037 1982 0.036

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

08p0t241 1936 to 2011 76 years Series 11

[B] Entire series, effect on correlation ( 0.472) is:

Lower 1974<-0.025 1968>-0.018 1999<-0.018 1994>-0.018 1978<-0.017 1966>-0.014 Higher 1956 0.032 1996 0.016

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

08p0t302 1942 to 2011 70 years Series 12

[B] Entire series, effect on correlation ( 0.594) is:

Lower 1982>-0.054 1994>-0.026 1944>-0.020 1966>-0.015 1989<-0.011 1975<-0.009 Higher 1981 0.061 2003 0.033

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

1944 +3.5 SD

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

08p0t242 1936 to 2011 76 years Series 13

[B] Entire series, effect on correlation ( 0.473) is:

Lower 2004>-0.026 1981>-0.019 1943>-0.017 1958<-0.014 2009<-0.013 1989>-0.012 Higher 1982 0.034 2005 0.023

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

08p0t301 1942 to 2011 70 years Series 14

[B] Entire series, effect on correlation ( 0.569) is:

Lower 1975<-0.043 1982>-0.027 1943>-0.027 1986>-0.013 1948>-0.013 1952<-0.011 Higher 1981 0.056 2003 0.032

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

09p0t262 1930 to 2011 82 years Series 15

[B] Entire series, effect on correlation ( 0.376) is:

Lower 1988<-0.023 1935>-0.019 1936<-0.017 1930<-0.015 1937>-0.014 1971<-0.012 Higher 1956 0.043 1948 0.018

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

09p0t261 1930 to 2011 82 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

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

1930 1979 -1 -.02 .07 -.02 -.20 -.05 .03 -.28 .06 -.04 .29\* .27| .02 -.24 .08 .04 -.11 -.09 .11 -.02 -.21 -.05

[B] Entire series, effect on correlation ( 0.305) is:

Lower 1935>-0.052 2003>-0.046 1930<-0.021 1945<-0.021 1981>-0.021 1985<-0.013 Higher 2005 0.031 1948 0.026

1930 to 1979 segment:

Lower 1935>-0.098 1930<-0.036 1945<-0.032 1972>-0.020 1973>-0.014 1965<-0.014 Higher 1948 0.052 1956 0.026

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

09p02582 1953 to 2011 59 years Series 17

[B] Entire series, effect on correlation ( 0.409) is:

Lower 1988<-0.053 1955<-0.039 1975<-0.029 1968>-0.017 1990<-0.016 1991<-0.015 Higher 2005 0.044 1981 0.028

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

09p02581 1953 to 2011 59 years Series 18

[B] Entire series, effect on correlation ( 0.627) is:

Lower 2004>-0.041 1954<-0.018 1996>-0.017 1976>-0.016 2010<-0.015 1960>-0.010 Higher 1982 0.026 2005 0.021

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

10p02021 1904 to 2011 108 years Series 19

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

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

1950 1999 4 -.04 -.03 -.05 -.16 -.07 -.03 .17 .18 .10 .04 .23|-.14 -.11 -.24 .28\*-.02 .06 .17 .01 -.01 -.10

1962 2011 0 .00 .11 -.02 -.19 -.21 .06 .06 .12 .12 .13 .22\* - - - - - - - - - -

[B] Entire series, effect on correlation ( 0.411) is:

Lower 1977<-0.063 1981>-0.032 1925>-0.016 1970<-0.014 1982>-0.012 1904>-0.008 Higher 1909 0.045 1948 0.014

1950 to 1999 segment:

Lower 1977<-0.091 1981>-0.060 1970<-0.025 1982>-0.022 1973>-0.016 1994>-0.011 Higher 1961 0.029 1992 0.027

1962 to 2011 segment:

Lower 1977<-0.095 1981>-0.058 1970<-0.024 1982>-0.022 1973>-0.016 1994>-0.012 Higher 1992 0.029 1966 0.021

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

10p02022 1904 to 2010 107 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

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

1904 1953 -2 .22 -.05 .00 -.09 -.11 .04 .00 -.20 .43\*-.24 .26|-.06 .01 .20 -.03 -.23 .16 .00 .11 -.02 -.18

[B] Entire series, effect on correlation ( 0.327) is:

Lower 1911<-0.037 1925>-0.020 2007<-0.019 1922<-0.013 1906<-0.011 1904>-0.011 Higher 1962 0.012 1961 0.010

1904 to 1953 segment:

Lower 1925>-0.037 1909>-0.024 1922<-0.021 1906<-0.020 1918>-0.018 1904>-0.017 Higher 1924 0.021 1910 0.019

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

1910 1911 -4.7 SD

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

1911 -5.5 SD

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

11p0t191 1880 to 2011 132 years Series 21

[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 -4 .04 -.14 .02 -.03 .00 -.26 .27\* .15 -.02 -.21 .20| .26 -.16 -.12 -.01 -.19 -.04 .07 -.22 .22 .03

1950 1999 0 -.08 .06 -.17 -.09 -.12 -.14 .08 .00 .00 .07 .30\* .19 -.19 -.06 -.23 -.18 -.09 .06 .02 .02 .04

[B] Entire series, effect on correlation ( 0.473) is:

Lower 1939<-0.057 1948>-0.023 1955<-0.020 1984>-0.011 1974>-0.010 1973>-0.009 Higher 1887 0.045 1909 0.027

1925 to 1974 segment:

Lower 1939<-0.076 1948>-0.054 1955<-0.043 1974>-0.021 1973>-0.019 1960>-0.013 Higher 1966 0.037 1935 0.036

1950 to 1999 segment:

Lower 1955<-0.067 1984>-0.034 1974>-0.034 1973>-0.028 1960>-0.021 1964<-0.019 Higher 1956 0.041 1966 0.037

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

11p0t192 1880 to 2011 132 years Series 22

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

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

1880 1929 -1 -.25 .03 -.03 .00 .07 -.03 .00 .05 -.29 .55\*-.07|-.01 .03 -.17 .17 -.02 -.11 .06 -.09 .22 -.03

1900 1949 9 -.11 -.04 .22 -.10 -.15 -.16 .18 .04 -.24 .20 .19| .13 .03 -.05 .01 -.22 -.13 .02 -.12 .32\* .06

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

1950 1999 0 -.13 -.10 -.15 -.17 .14 -.12 .10 .12 -.20 .03 .31\* .04 -.20 .06 -.10 -.26 .06 .15 -.03 .25 .07

[B] Entire series, effect on correlation ( 0.161) is:

Lower 1887>-0.080 1888<-0.057 1910<-0.017 1911>-0.015 1894<-0.013 1948>-0.011 Higher 2003 0.026 1958 0.014

1880 to 1929 segment:

Lower 1887>-0.135 1888<-0.045 1911>-0.025 1910<-0.025 1894<-0.019 1908<-0.012 Higher 1924 0.033 1886 0.029

1900 to 1949 segment:

Lower 1911>-0.050 1910<-0.050 1948>-0.039 1908<-0.024 1900<-0.019 1913<-0.019 Higher 1924 0.039 1925 0.030

1950 to 1999 segment:

Lower 1959<-0.039 1950>-0.028 1977>-0.019 1963<-0.018 1971<-0.018 1964<-0.013 Higher 1956 0.046 1958 0.040

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

1886 1887 4.8 SD 1887 1888 -5.5 SD 1910 1911 4.0 SD

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

1887 +4.8 SD

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

11p0t331 1949 to 2011 63 years Series 23

[B] Entire series, effect on correlation ( 0.415) is:

Lower 2003>-0.039 1961<-0.036 1982>-0.032 1978<-0.030 1964<-0.029 1996>-0.025 Higher 1981 0.078 1956 0.033

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

11p0t332 1949 to 2011 63 years Series 24

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

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

1949 1998 6 .10 -.06 .07 -.19 .02 -.05 .17 -.02 .04 -.28 .31|-.09 -.20 .10 .03 .04 .43\*-.09 .12 -.12 .05

1950 1999 6 .10 -.06 .05 -.21 .03 -.04 .17 -.01 .05 -.26 .28|-.09 -.22 .09 .05 .04 .43\*-.07 .09 -.14 .04

1962 2011 0 .01 .06 .04 -.14 .10 -.08 .14 -.04 -.01 -.19 .21\* - - - - - - - - - -

[B] Entire series, effect on correlation ( 0.282) is:

Lower 2000<-0.058 1982>-0.051 1976<-0.032 1968>-0.021 2001<-0.018 1990<-0.014 Higher 1962 0.028 2004 0.020

1949 to 1998 segment:

Lower 1982>-0.069 1976<-0.058 1968>-0.027 1990<-0.023 1961<-0.021 1972>-0.016 Higher 1962 0.039 1992 0.023

1950 to 1999 segment:

Lower 1982>-0.069 1976<-0.053 1968>-0.028 1990<-0.021 1961<-0.020 1972>-0.017 Higher 1962 0.040 1992 0.023

1962 to 2011 segment:

Lower 2000<-0.064 1982>-0.055 1976<-0.035 1968>-0.022 2001<-0.021 1990<-0.017 Higher 1962 0.035 2004 0.025

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

1982 +3.2 SD

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

11p03831 1859 to 2011 153 years Series 25

[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 9 -.20 -.06 -.32 -.16 .01 -.12 .11 .09 -.16 -.05 .28| .01 -.28 .08 -.09 -.03 .03 .03 .24 .42\* .27

[B] Entire series, effect on correlation ( 0.540) is:

Lower 1982>-0.029 1956>-0.017 1904<-0.015 1898<-0.011 1925>-0.009 1862<-0.009 Higher 1909 0.042 1887 0.024

1950 to 1999 segment:

Lower 1982>-0.108 1956>-0.054 1971<-0.022 1970<-0.015 1984>-0.012 1963<-0.012 Higher 1958 0.033 1962 0.030

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

1982 +3.6 SD

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

11p03832 1863 to 2011 149 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 0 .02 -.05 -.21 -.34 -.05 -.10 .06 .02 -.16 -.06 .27\* .00 -.09 .19 .21 .10 .02 -.16 .09 .15 .00

[B] Entire series, effect on correlation ( 0.513) is:

Lower 1982>-0.018 1917>-0.014 1925>-0.013 1992<-0.013 1924<-0.010 1932<-0.010 Higher 1887 0.041 1935 0.020

1950 to 1999 segment:

Lower 1982>-0.054 1992<-0.045 1984>-0.023 1956>-0.019 1959<-0.019 1961<-0.018 Higher 1981 0.081 1958 0.028

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

15p04251 1865 to 2011 147 years Series 27

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

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

1865 1914 4 .15 -.23 -.11 -.04 .05 -.16 .15 -.27 .06 -.09 .32|-.15 .06 -.09 .38\*-.16 .16 -.08 .13 -.11 .28

[B] Entire series, effect on correlation ( 0.403) is:

Lower 1887>-0.018 1865<-0.017 1987<-0.016 2007<-0.016 1884<-0.013 1990<-0.011 Higher 1982 0.023 1909 0.023

1865 to 1914 segment:

Lower 1865<-0.043 1884<-0.033 1887>-0.030 1890>-0.024 1905<-0.019 1883<-0.017 Higher 1909 0.078 1901 0.034

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

15p04252 1869 to 2011 143 years Series 28

[B] Entire series, effect on correlation ( 0.582) is:

Lower 1878<-0.018 1883>-0.014 1876<-0.014 1873>-0.009 1945<-0.008 1993<-0.008 Higher 1909 0.039 2003 0.013

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

15p04302 1847 to 2011 165 years Series 29

[B] Entire series, effect on correlation ( 0.557) is:

Lower 1861<-0.021 1851>-0.021 1889<-0.016 1935>-0.015 1886<-0.010 1864>-0.008 Higher 1887 0.046 1909 0.027

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

1851 +3.8 SD

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

15p04301 1816 to 2008 193 years Series 30

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

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

1816 1865 -6 -.09 -.01 .12 -.13 .31\*-.13 .10 .14 .06 .00 .01| .20 -.14 .00 -.04 .02 -.04 -.10 -.13 .04 -.02

1825 1874 1 -.05 -.06 .16 -.17 .27 -.08 .13 .14 .10 -.01 .04| .29\*-.20 .07 -.11 .01 .00 -.07 -.22 .02 -.03

[B] Entire series, effect on correlation ( 0.330) is:

Lower 1829<-0.084 1830>-0.021 1823>-0.017 1847<-0.007 1841>-0.007 2004>-0.007 Higher 1909 0.032 1887 0.026

1816 to 1865 segment:

Lower 1829<-0.179 1830>-0.045 1823>-0.027 1841>-0.015 1856<-0.012 1847<-0.011 Higher 1828 0.045 1840 0.044

1825 to 1874 segment:

Lower 1829<-0.189 1830>-0.056 1841>-0.020 1847<-0.011 1856<-0.011 1873>-0.010 Higher 1840 0.045 1828 0.043

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

1828 1829 -4.9 SD 1829 1830 6.4 SD

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

1829 -6.4 SD

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

15p03052 1881 to 2011 131 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

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

1925 1974 0 .12 .06 .21 .21 .05 -.12 .03 -.08 -.19 .12 .29\*-.14 -.29 .06 .11 -.16 .03 .05 .18 .07 .09

[B] Entire series, effect on correlation ( 0.377) is:

Lower 1989<-0.037 2004>-0.023 1935>-0.020 1901>-0.016 1957<-0.011 1948>-0.011 Higher 1981 0.048 1887 0.028

1925 to 1974 segment:

Lower 1935>-0.062 1957<-0.036 1948>-0.031 1966>-0.030 1950>-0.028 1952<-0.014 Higher 1956 0.030 1941 0.026

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

2004 +3.4 SD

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

15p03051 1883 to 2011 129 years Series 32

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

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

1883 1932 0 .08 -.01 .17 .12 .04 .00 .02 .22 .16 -.39 .26\*-.11 .01 .01 -.34 .05 .04 .04 .09 -.05 .02

1900 1949 -8 .08 -.13 .29\* .13 .09 .05 .10 .11 .09 -.37 .20|-.11 -.09 .05 -.07 .14 .14 .11 .01 -.04 .14

1925 1974 0 .09 -.02 .10 .09 .22 -.02 .06 .14 -.32 -.07 .30\*-.20 -.19 .01 .11 -.04 .25 .04 .06 .03 .18

[B] Entire series, effect on correlation ( 0.298) is:

Lower 1989<-0.039 1935>-0.026 1901>-0.019 1883>-0.018 1948>-0.017 2004>-0.014 Higher 1981 0.043 1956 0.025

1883 to 1932 segment:

Lower 1883>-0.049 1901>-0.049 1894<-0.017 1902>-0.016 1886<-0.015 1925>-0.013 Higher 1924 0.039 1911 0.039

1900 to 1949 segment:

Lower 1935>-0.063 1901>-0.046 1938<-0.041 1948>-0.039 1902>-0.014 1928<-0.014 Higher 1924 0.047 1911 0.046

1925 to 1974 segment:

Lower 1935>-0.097 1948>-0.058 1938<-0.045 1925>-0.021 1941<-0.014 1965<-0.014 Higher 1956 0.096 1958 0.033

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

1935 +3.1 SD

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

16p03271 1859 to 2011 153 years Series 33

[B] Entire series, effect on correlation ( 0.606) is:

Lower 1904<-0.047 1877>-0.012 1865<-0.011 1918>-0.009 1884<-0.009 1881>-0.008 Higher 1909 0.040 1887 0.036

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

16p03272 1859 to 2011 153 years Series 34

[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 .02 .00 -.03 -.08 -.12 -.08 .18 -.28 .04 -.07 .32\*-.05 .20 -.03 .09 -.01 .09 -.15 .12 -.20 .08

[B] Entire series, effect on correlation ( 0.509) is:

Lower 1877>-0.028 1971<-0.021 2003>-0.015 1880<-0.015 1881<-0.014 1911>-0.013 Higher 1909 0.052 1887 0.028

1925 to 1974 segment:

Lower 1971<-0.073 1931<-0.031 1930<-0.029 1956>-0.029 1962>-0.021 1925>-0.017 Higher 1948 0.077 1941 0.035

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

16p04201 1879 to 2011 133 years Series 35

[B] Entire series, effect on correlation ( 0.524) is:

Lower 1922<-0.038 1909>-0.023 1911>-0.016 1971<-0.012 1973>-0.011 1879>-0.011 Higher 1887 0.036 1981 0.028

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

16P04202 1868 to 2011 144 years Series 36

[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 0 .19 -.06 .21 -.08 .10 .11 -.29 .12 .15 -.20 .30\*-.26 -.02 -.05 -.06 -.06 -.09 -.04 .23 -.18 .07

[B] Entire series, effect on correlation ( 0.504) is:

Lower 1909>-0.042 1948>-0.021 1924<-0.017 1920<-0.016 1928<-0.016 1907<-0.010 Higher 1887 0.025 1981 0.020

1900 to 1949 segment:

Lower 1909>-0.103 1948>-0.054 1924<-0.041 1928<-0.039 1920<-0.034 1907<-0.025 Higher 1935 0.081 1925 0.032

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

1909 +3.6 SD; 1948 +3.7 SD

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

16p04291 1862 to 2011 150 years Series 37

[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 1 -.20 -.04 .03 -.08 -.22 .04 -.35 -.02 -.07 .00 .12| .48\*-.10 -.10 -.07 .11 -.14 .01 -.08 -.12 -.06

1950 1999 1 -.27 -.14 -.03 .01 -.09 -.03 -.36 -.02 .03 -.05 -.17| .64\*-.02 .01 -.09 .08 -.03 .11 -.04 -.09 -.14

1962 2011 -7 -.20 -.11 -.01 .26\*-.02 -.22 -.32 -.18 .04 -.10 -.05| - - - - - - - - - -

[B] Entire series, effect on correlation ( 0.223) is:

Lower 1961<-0.052 1982>-0.029 1980<-0.027 1993<-0.023 2010<-0.012 1871>-0.008 Higher 1909 0.030 1925 0.016

1925 to 1974 segment:

Lower 1961<-0.179 1972>-0.021 1940>-0.020 1965<-0.018 1962>-0.014 1951<-0.014 Higher 1925 0.066 1935 0.048

1950 to 1999 segment:

Lower 1961<-0.089 1982>-0.063 1980<-0.049 1993<-0.037 1972>-0.014 1965<-0.010 Higher 1981 0.057 1971 0.048

1962 to 2011 segment:

Lower 1982>-0.075 1980<-0.068 1993<-0.055 2010<-0.031 1972>-0.016 2002<-0.015 Higher 2003 0.050 1981 0.049

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

1982 +4.0 SD

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

16p04292 1855 to 2011 157 years Series 38

[B] Entire series, effect on correlation ( 0.535) is:

Lower 1916<-0.016 1909>-0.015 1889<-0.012 1957<-0.012 2011<-0.011 1857>-0.011 Higher 1887 0.042 1981 0.033

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

23p02401 1947 to 2011 65 years Series 39

[B] Entire series, effect on correlation ( 0.578) is:

Lower 1956>-0.070 1995>-0.035 2005>-0.016 1968<-0.014 1966>-0.013 1962>-0.011 Higher 1982 0.036 2004 0.018

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

1956 +3.0 SD; 1995 +3.7 SD

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

23p02402 1947 to 2011 65 years Series 40

[B] Entire series, effect on correlation ( 0.617) is:

Lower 1956>-0.042 1990<-0.023 1995>-0.021 2005>-0.020 1973>-0.018 2011<-0.017 Higher 1981 0.044 2003 0.033

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

23p02411 1957 to 2011 55 years Series 41

[B] Entire series, effect on correlation ( 0.647) is:

Lower 1960<-0.077 1962>-0.015 1975<-0.011 1993<-0.008 1969>-0.007 2011<-0.007 Higher 1981 0.036 2003 0.027

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

23p02412 1957 to 2011 55 years Series 42

[B] Entire series, effect on correlation ( 0.712) is:

Lower 1960<-0.058 2005>-0.042 1977>-0.016 1989<-0.015 1995>-0.012 2010<-0.010 Higher 1981 0.044 2003 0.029

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

23p02991 1946 to 2011 66 years Series 43

[B] Entire series, effect on correlation ( 0.487) is:

Lower 1956>-0.041 1982>-0.029 2005>-0.020 1984>-0.019 1989<-0.013 2011<-0.012 Higher 1981 0.071 2003 0.051

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

23p02992 1946 to 2011 66 years Series 44

[B] Entire series, effect on correlation ( 0.557) is:

Lower 1992<-0.032 1994>-0.024 1949<-0.022 1968>-0.018 1978>-0.017 1995>-0.017 Higher 1981 0.091 2003 0.026

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

28p04502 1801 to 2011 211 years Series 45

[\*] Early part of series cannot be checked from 1801 to 1815 -- 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

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

1816 1865 4 -.13 .03 .27 .05 .04 .11 .12 .15 .13 .00 .29| .06 -.10 .13 .29\*-.20 -.02 -.18 .00 .07 -.06

1825 1874 0 -.22 .03 .24 .04 .17 .16 .08 .23 -.01 .00 .32\* .02 -.17 .04 .23 -.10 .13 -.01 .08 .20 -.05

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

1875 1924 0 .19 -.23 .04 -.06 -.01 .04 .07 .02 .10 -.01 .32\*-.28 .11 -.12 -.02 .01 .06 -.10 .17 -.18 .30

[B] Entire series, effect on correlation ( 0.418) is:

Lower 1830<-0.022 1894<-0.021 1938<-0.016 1823<-0.013 1901>-0.010 1912<-0.008 Higher 1935 0.025 1981 0.014

1816 to 1865 segment:

Lower 1830<-0.076 1823<-0.044 1834>-0.026 1841<-0.025 1818<-0.018 1825>-0.015 Higher 1854 0.051 1840 0.041

1825 to 1874 segment:

Lower 1830<-0.095 1869>-0.034 1841<-0.033 1834>-0.025 1851<-0.020 1865>-0.013 Higher 1854 0.058 1840 0.042

1875 to 1924 segment:

Lower 1894<-0.072 1901>-0.032 1912<-0.028 1891<-0.026 1893>-0.013 1904>-0.013 Higher 1877 0.033 1924 0.033

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

1938 -4.6 SD

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

28p02492 1925 to 2011 87 years Series 46

[B] Entire series, effect on correlation ( 0.540) is:

Lower 1932<-0.066 1935>-0.017 2003>-0.014 1961<-0.009 1964<-0.009 2006<-0.006 Higher 1981 0.033 1982 0.021

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

28p02491 1925 to 2011 87 years Series 47

[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 .10 .03 -.01 -.13 .16 -.37 .24 -.26 .19 -.02 .32\*-.05 -.04 -.13 .06 -.11 .30 -.30 .18 .18 .04

[B] Entire series, effect on correlation ( 0.458) is:

Lower 1927<-0.052 1935>-0.031 1925>-0.027 1981>-0.022 2003>-0.017 1953>-0.012 Higher 1982 0.039 1948 0.018

1925 to 1974 segment:

Lower 1927<-0.073 1935>-0.053 1925>-0.047 1953>-0.020 1963<-0.016 1940>-0.015 Higher 1948 0.040 1971 0.036

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

28p0t451 1869 to 2011 143 years Series 48

[B] Entire series, effect on correlation ( 0.495) is:

Lower 1911>-0.016 1956>-0.014 1883>-0.010 1901>-0.010 1879>-0.010 1937>-0.010 Higher 1887 0.035 1909 0.031

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

PART 7: DESCRIPTIVE STATISTICS: sprucemid 00:00 ®¯® 00 0000 Page 6

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

Corr //-------- Unfiltered --------\\ //---- Filtered -----\\

No. No. No. with Mean Max Std Auto Mean Max Std Auto AR

Seq Series Interval Years Segmt Flags Master msmt msmt dev corr sens value dev corr ()

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

1 04p0t482 1917 2011 95 4 0 0.570 1.10 2.00 0.290 0.567 0.181 2.51 0.384 -0.032 1

2 04p0t481 1917 2011 95 4 0 0.467 1.06 3.36 0.507 0.818 0.204 2.78 0.477 -0.014 2

3 04p0t932 1913 2011 99 4 0 0.461 1.28 2.52 0.417 0.760 0.183 2.67 0.346 -0.043 1

4 04p0t931 1913 2011 99 4 1 0.414 1.40 3.48 0.627 0.743 0.220 2.66 0.429 0.040 3

5 05p0t141 1919 2011 93 4 0 0.579 1.29 2.93 0.555 0.764 0.263 2.60 0.458 -0.029 1

6 05p0t592 1909 2011 103 4 0 0.492 1.06 1.97 0.511 0.871 0.222 2.48 0.309 -0.041 1

7 05p0t591 1909 2011 103 4 0 0.496 1.18 2.53 0.609 0.866 0.200 2.58 0.368 -0.072 2

8 05p0t142 1918 2011 94 4 0 0.567 1.10 2.27 0.452 0.802 0.198 2.72 0.470 -0.022 1

9 07pt2321 1929 2011 83 3 1 0.404 1.48 2.86 0.487 0.708 0.217 2.60 0.459 0.004 1

10 07pt2322 1926 2011 86 3 0 0.514 1.73 3.71 0.760 0.870 0.172 2.51 0.522 -0.004 1

11 08p0t241 1936 2011 76 3 0 0.472 1.18 2.70 0.776 0.936 0.232 2.81 0.525 -0.009 1

12 08p0t302 1942 2011 70 3 0 0.594 1.28 1.85 0.314 0.559 0.190 2.71 0.485 0.007 1

13 08p0t242 1936 2011 76 3 0 0.473 1.73 3.67 0.986 0.891 0.237 2.85 0.440 -0.095 1

14 08p0t301 1942 2011 70 3 0 0.569 1.92 2.70 0.346 0.283 0.186 2.44 0.438 -0.028 1

15 09p0t262 1930 2011 82 3 0 0.376 1.57 3.25 0.704 0.838 0.204 2.47 0.397 -0.032 1

16 09p0t261 1930 2011 82 3 1 0.305 1.00 2.42 0.661 0.896 0.195 2.63 0.433 -0.013 1

17 09p02582 1953 2011 59 2 0 0.409 1.19 1.84 0.294 0.471 0.206 2.53 0.507 0.014 2

18 09p02581 1953 2011 59 2 0 0.627 2.01 3.09 0.497 0.566 0.192 2.59 0.473 0.014 1

19 10p02021 1904 2011 108 4 2 0.411 0.58 2.80 0.437 0.831 0.279 2.52 0.360 -0.070 1

20 10p02022 1904 2010 107 4 1 0.327 0.86 3.33 0.668 0.905 0.259 2.37 0.274 -0.054 1

21 11p0t191 1880 2011 132 5 2 0.473 0.92 2.37 0.642 0.892 0.237 2.51 0.383 -0.055 1

22 11p0t192 1880 2011 132 5 3 0.161 0.73 2.46 0.567 0.932 0.208 2.54 0.328 -0.074 1

23 11p0t331 1949 2011 63 3 0 0.415 2.07 4.30 0.732 0.799 0.184 2.44 0.584 -0.073 1

24 11p0t332 1949 2011 63 3 3 0.282 1.62 3.34 0.542 0.635 0.255 2.51 0.498 -0.034 1

25 11p03831 1859 2011 153 6 1 0.540 1.15 3.77 0.862 0.908 0.235 2.78 0.486 -0.031 2

26 11p03832 1863 2011 149 6 1 0.513 0.82 3.14 0.666 0.897 0.237 2.67 0.427 -0.088 1

27 15p04251 1865 2011 147 6 1 0.403 1.12 3.21 0.760 0.847 0.229 2.94 0.433 0.058 1

28 15p04252 1869 2011 143 6 0 0.582 1.25 2.88 0.485 0.785 0.196 2.83 0.485 0.045 1

29 15p04302 1847 2011 165 7 0 0.557 1.16 2.41 0.534 0.851 0.220 2.53 0.380 -0.019 1

30 15p04301 1816 2008 193 8 2 0.330 1.22 3.18 0.780 0.925 0.219 2.55 0.317 -0.039 2

31 15p03052 1881 2011 131 5 1 0.377 0.96 2.04 0.485 0.865 0.232 2.65 0.481 -0.013 1

32 15p03051 1883 2011 129 5 3 0.298 0.97 2.96 0.676 0.915 0.221 2.66 0.440 -0.041 1

33 16p03271 1859 2011 153 6 0 0.606 1.14 3.12 0.563 0.754 0.260 2.72 0.379 -0.092 1

34 16p03272 1859 2011 153 6 1 0.509 0.71 2.24 0.370 0.855 0.231 2.71 0.383 -0.020 2

35 16p04201 1879 2011 133 5 0 0.524 1.10 2.46 0.618 0.878 0.221 2.64 0.450 -0.015 1

36 16P04202 1868 2011 144 6 1 0.504 1.42 3.44 0.796 0.879 0.211 2.72 0.429 -0.042 1

37 16p04291 1862 2011 150 6 3 0.223 1.45 4.94 0.982 0.813 0.263 2.64 0.469 -0.060 1

38 16p04292 1855 2011 157 6 0 0.535 0.99 2.36 0.521 0.864 0.243 2.62 0.455 -0.041 1

39 23p02401 1947 2011 65 3 0 0.578 1.81 4.36 1.112 0.906 0.205 2.92 0.546 0.098 1

40 23p02402 1947 2011 65 3 0 0.617 1.47 4.28 1.124 0.945 0.236 2.71 0.546 0.070 1

41 23p02411 1957 2011 55 2 0 0.647 2.10 4.09 0.671 0.633 0.219 2.76 0.505 0.091 1

42 23p02412 1957 2011 55 2 0 0.712 1.73 4.80 0.842 0.776 0.225 2.62 0.573 0.041 1

43 23p02991 1946 2011 66 3 0 0.487 1.69 4.17 1.165 0.944 0.182 2.48 0.479 -0.036 1

44 23p02992 1946 2011 66 3 0 0.557 2.32 4.24 0.908 0.772 0.208 2.63 0.451 0.042 1

45 28p04502 1801 2011 211 8 3 0.418 1.02 3.06 0.716 0.894 0.287 2.87 0.417 0.006 1

46 28p02492 1925 2011 87 3 0 0.540 1.18 2.85 0.654 0.905 0.206 2.72 0.577 0.022 1

47 28p02491 1925 2011 87 3 1 0.458 1.29 4.05 0.794 0.874 0.229 2.70 0.558 -0.005 1

48 28p0t451 1869 2011 143 6 0 0.495 1.50 3.83 0.709 0.796 0.218 2.71 0.360 -0.020 1

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

Total or mean: 5129 204 32 0.466 1.23 4.94 0.644 0.825 0.224 2.94 0.432 -0.022

- = [ COFECHA SPRUCCOF ] = -