[] Dendrochronology Program Library Run PMT Program COF 12:44 Tue 30 Dec 2014 Page 1

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[] P R O G R A M C O F E C H A Version 6.06P 29220

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QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

File of DATED series: pmt1.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 1717 to 2012 296 years

Continuous time span is 1717 to 2012 296 years

Portion with two or more series is 1782 to 2012 231 years

>> PMT23 1927 absent in 1 of 18 series, but is not usually narrow: master index is .201

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

\*C\* Number of dated series 22 \*C\*

\*O\* Master series 1717 2012 296 yrs \*O\*

\*F\* Total rings in all series 3543 \*F\*

\*E\* Total dated rings checked 3478 \*E\*

\*C\* Series intercorrelation .595 \*C\*

\*H\* Average mean sensitivity .323 \*H\*

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

\*\*\* Mean length of series 161.0 \*\*\*

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

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

PMT01 1 absent rings: 1954

PMT03 4 absent rings: 1834 1888 1895 1914

PMT23 2 absent rings: 1926 1927

7 absent rings .198%

PART 2: TIME PLOT OF TREE-RING SERIES: 12:44 Tue 30 Dec 2014 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

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

. . . . . . . . . . . . . .<=============================> . PMT01 1 1717 2012 296

. . . . . . . . . . . . . . . <====================> . PMT02 2 1803 2012 210

. . . . . . . . . . . . . . . <======================> . PMT03 3 1784 2012 229

. . . . . . . . . . . . . . . <======================> . PMT04 4 1782 2012 231

. . . . . . . . . . . . . . . <=====================> . PMT05 5 1794 2012 219

. . . . . . . . . . . . . . . <======================> . PMT06 6 1787 2012 226

. . . . . . . . . . . . . . . . <==================> . PMT07 7 1822 2012 191

. . . . . . . . . . . . . . . . . <==========> . PMT08 8 1900 2012 113

. . . . . . . . . . . . . . . . . <===========> . PMT09 9 1896 2012 117

. . . . . . . . . . . . . . . . . . <=====> . PMT10 10 1950 2012 63

. . . . . . . . . . . . . . . . . . <======> . PMT11 11 1949 2012 64

. . . . . . . . . . . . . . . . . . <========> . PMT12 12 1925 2012 88

. . . . . . . . . . . . . . . . . . <========> . PMT13 13 1929 2012 84

. . . . . . . . . . . . . . . . . . <========> . PMT14 14 1929 2012 84

. . . . . . . . . . . . . . . <====================> . PMT20 15 1809 2012 204

. . . . . . . . . . . . . . . .<===================> . PMT21 16 1816 2012 197

. . . . . . . . . . . . . . . . .<==============> . PMT22 17 1868 2012 145

. . . . . . . . . . . . . . . . . <===========> . PMT22b 18 1899 2012 114

. . . . . . . . . . . . . . . . . <=============> . PMT23 19 1877 2012 136

. . . . . . . . . . . . . . . . .<==============> . PMT26a 20 1860 2012 153

. . . . . . . . . . . . . . . . <=================> . PMT26b 21 1836 2012 177

. . . . . . . . . . . . . . . .<===================> . PMT28 22 1811 2012 202

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

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: 12:44 Tue 30 Dec 2014 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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1750 .722 1 1800 -.653 5 1850 .913 11 1900 .867 17 1950 .752 22

1751 1.147 1 1801 -.947 5 1851 .000 11 1901 -.437 17 1951 1.251 22

1752 2.175 1 1802 1.005 5 1852 -.136 11 1902 -.115 17 1952 -.110 22

1753 .564 1 1803 -1.517 6 1853 .273 11 1903 .654 17 1953 -1.787 22

1754 1.508 1 1804 .347 6 1854 -.058 11 1904 .632 17 1954 -2.436 22 1

1755 -.441 1 1805 .840 6 1855 -.797 11 1905 .732 17 1955 -.650 22

1756 -.649 1 1806 .295 6 1856 -2.125 11 1906 .566 17 1956 .221 22

1757 -1.885 1 1807 -.008 6 1857 -.135 11 1907 1.183 17 1957 .624 22

1758 -1.484 1 1808 .286 6 1858 -.412 11 1908 -.896 17 1958 .577 22

1759 -.714 1 1809 1.409 7 1859 -.444 11 1909 -1.096 17 1959 .240 22

1760 -.090 1 1810 1.118 7 1860 -.396 12 1910 .287 17 1960 1.426 22

1761 1.622 1 1811 .410 8 1861 -.007 12 1911 -.755 17 1961 .680 22

1762 2.358 1 1812 .280 8 1862 1.098 12 1912 .265 17 1962 .811 22

1763 -1.058 1 1813 -1.047 8 1863 -.020 12 1913 -1.200 17 1963 -.387 22

1764 -.766 1 1814 -.334 8 1864 -1.608 12 1914 -1.996 17 1 1964 -.396 22

1765 -.905 1 1815 -.177 8 1865 .308 12 1915 .600 17 1965 -1.020 22

1766 .149 1 1816 -1.303 9 1866 1.250 12 1916 1.735 17 1966 -2.114 22

1717 1.795 1 1767 1.148 1 1817 -1.275 9 1867 .491 12 1917 1.188 17 1967 -1.365 22

1718 1.163 1 1768 -1.143 1 1818 -.578 9 1868 .021 13 1918 -.169 17 1968 -.165 22

1719 1.173 1 1769 .226 1 1819 -.168 9 1869 .398 13 1919 .281 17 1969 .529 22

1720 .631 1 1770 -1.149 1 1820 .427 9 1870 -.169 13 1920 .439 17 1970 -.658 22

1721 .227 1 1771 -1.075 1 1821 -.381 9 1871 -.555 13 1921 -.490 17 1971 .068 22

1722 -3.377 1 1772 .255 1 1822 .236 10 1872 .473 13 1922 .425 17 1972 -.935 22

1723 .114 1 1773 -2.074 1 1823 1.435 10 1873 .660 13 1923 .363 17 1973 1.290 22

1724 -.915 1 1774 .188 1 1824 .545 10 1874 -.886 13 1924 .536 17 1974 .417 22

1725 -1.183 1 1775 -1.729 1 1825 1.226 10 1875 -.172 13 1925 -1.316 18 1975 .603 22

1726 1.021 1 1776 1.062 1 1826 .225 10 1876 .818 13 1926 -1.034 18 1 1976 .185 22

1727 .648 1 1777 -.147 1 1827 .025 10 1877 .472 14 1927 .201 18 1<< 1977 .128 22

1728 -1.426 1 1778 2.289 1 1828 .636 10 1878 .858 14 1928 1.592 18 1978 -.087 22

1729 1.309 1 1779 .476 1 1829 -.246 10 1879 -1.005 14 1929 .618 20 1979 .147 22

1730 -.266 1 1780 1.653 1 1830 -.481 10 1880 .458 14 1930 -.553 20 1980 1.163 22

1731 -.982 1 1781 1.993 1 1831 -.970 10 1881 -1.107 14 1931 -.031 20 1981 .530 22

1732 -.912 1 1782 1.343 2 1832 -.829 10 1882 .201 14 1932 .401 20 1982 1.734 22

1733 .067 1 1783 1.184 2 1833 -.086 10 1883 1.333 14 1933 -.432 20 1983 -.366 22

1734 1.282 1 1784 .118 3 1834 -1.921 10 1 1884 .643 14 1934 -1.094 20 1984 -1.786 22

1735 2.857 1 1785 -.774 3 1835 .153 10 1885 -.193 14 1935 -.198 20 1985 .624 22

1736 1.383 1 1786 .744 3 1836 .708 11 1886 -.087 14 1936 -2.356 20 1986 .978 22

1737 -.966 1 1787 .571 4 1837 1.551 11 1887 -1.014 14 1937 -1.391 20 1987 .905 22

1738 -.477 1 1788 -.254 4 1838 .619 11 1888 -2.723 14 1 1938 .648 20 1988 -1.985 22

1739 .468 1 1789 -.304 4 1839 -1.170 11 1889 -.070 14 1939 1.328 20 1989 -1.386 22

1740 1.149 1 1790 -1.271 4 1840 .254 11 1890 1.395 14 1940 -.301 20 1990 -.744 22

1741 -.582 1 1791 .601 4 1841 -1.082 11 1891 .722 14 1941 -.619 20 1991 -.505 22

1742 -1.609 1 1792 .357 4 1842 -.695 11 1892 1.156 14 1942 .926 20 1992 -.988 22

1743 -1.723 1 1793 .897 4 1843 -.561 11 1893 .346 14 1943 .346 20 1993 -.949 22

1744 -1.655 1 1794 -1.257 5 1844 .639 11 1894 -.641 14 1944 -1.265 20 1994 -.599 22

1745 -1.245 1 1795 -1.312 5 1845 .455 11 1895 -2.399 14 1 1945 .027 20 1995 .838 22

1746 -.296 1 1796 -.161 5 1846 .433 11 1896 -.220 15 1946 .910 20 1996 .392 22

1747 -.004 1 1797 .209 5 1847 -.090 11 1897 1.193 15 1947 .981 20 1997 .062 22

1748 .470 1 1798 -.326 5 1848 .307 11 1898 -.890 15 1948 .353 20 1998 1.487 22

1749 .721 1 1799 -.282 5 1849 .855 11 1899 -.614 16 1949 .863 21 1999 1.205 22

PART 3: Master Dating Series: 12:44 Tue 30 Dec 2014 Page 4

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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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2000 -.533 22

2001 .418 22

2002 .468 22

2003 -.854 22

2004 1.210 22

2005 .652 22

2006 .893 22

2007 -1.598 22

2008 -.759 22

2009 .217 22

2010 .817 22

2011 .616 22

2012 -2.165 22

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PART 4: Master Bar Plot: 12:44 Tue 30 Dec 2014 Page 5

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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

1750--------C 1800--c 1850--------D 1900--------C 1950--------C 2000---b

1751---------E 1801-d 1851-----@ 1901---b 1951---------E 2001------B

1752----------I 1802---------D 1852----a 1902----@ 1952----@ 2002-------B

1753-------B 1803f 1853------A 1903--------C 1953g 2003--c

1754----------F 1804------A 1854----@ 1904-------C 1954j 2004---------E

1755---b 1805--------C 1855--c 1905--------C 1955--c 2005--------C

1756--c 1806------A 1856h 1906-------B 1956-----A 2006--------D

1757h 1807----@ 1857----a 1907---------E 1957-------B 2007f

1758f 1808------A 1858---b 1908--d 1958-------B 2008--c

1759--c 1809----------F 1859---b 1909-d 1959-----A 2009-----A

1760----@ 1810---------D 1860---b 1910------A 1960----------F 2010--------C

1761----------F 1811------B 1861----@ 1911--c 1961--------C 2011-------B

1762----------I 1812------A 1862---------D 1912------A 1962--------C 2012i

1763-d 1813-d 1863----@ 1913-e 1963---b

1764--c 1814---a 1864f 1914h 1964---b

1765--d 1815----a 1865------A 1915-------B 1965-d

1766-----A 1816-e 1866---------E 1916----------G 1966h

1717----------G 1767---------E 1817-e 1867-------B 1917---------E 1967-e

1718---------E 1768-e 1818---b 1868-----@ 1918----a 1968----a

1719---------E 1769-----A 1819----a 1869------B 1919------A 1969-------B

1720-------C 1770-e 1820------B 1870----a 1920------B 1970--c

1721-----A 1771-d 1821---b 1871---b 1921---b 1971-----@

1722n 1772------A 1822-----A 1872-------B 1922------B 1972--d

1723-----@ 1773h 1823----------F 1873--------C 1923------A 1973---------E

1724--d 1774-----A 1824-------B 1874--d 1924-------B 1974------B

1725-e 1775g 1825---------E 1875----a 1925-e 1975-------B

1726---------D 1776---------D 1826-----A 1876--------C 1926-d 1976-----A

1727--------C 1777----a 1827-----@ 1877-------B 1927-----A 1977-----A

1728-f 1778----------I 1828--------C 1878--------C 1928----------F 1978----@

1729---------E 1779-------B 1829----a 1879-d 1929-------B 1979-----A

1730----a 1780----------G 1830---b 1880-------B 1930---b 1980---------E

1731-d 1781----------H 1831-d 1881-d 1931----@ 1981-------B

1732--d 1782----------E 1832--c 1882-----A 1932------B 1982----------G

1733-----@ 1783---------E 1833----@ 1883----------E 1933---b 1983---a

1734---------E 1784-----@ 1834h 1884--------C 1934-d 1984g

1735----------K 1785--c 1835-----A 1885----a 1935----a 1985-------B

1736----------F 1786--------C 1836--------C 1886----@ 1936i 1986---------D

1737-d 1787-------B 1837----------F 1887-d 1937-f 1987--------D

1738---b 1788----a 1838-------B 1888k 1938--------C 1988h

1739-------B 1789---a 1839-e 1889----@ 1939---------E 1989-f

1740---------E 1790-e 1840------A 1890----------F 1940---a 1990--c

1741---b 1791-------B 1841-d 1891--------C 1941--b 1991---b

1742f 1792------A 1842--c 1892---------E 1942--------D 1992-d

1743g 1793--------D 1843---b 1893------A 1943------A 1993-d

1744g 1794-e 1844--------C 1894--c 1944-e 1994---b

1745-e 1795-e 1845-------B 1895j 1945-----@ 1995--------C

1746---a 1796----a 1846------B 1896----a 1946--------D 1996------B

1747----@ 1797-----A 1847----@ 1897---------E 1947---------D 1997-----@

1748-------B 1798---a 1848------A 1898--d 1948------A 1998----------F

1749--------C 1799----a 1849--------C 1899--b 1949--------C 1999---------E

PART 5: CORRELATION OF SERIES BY SEGMENTS: 12:44 Tue 30 Dec 2014 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 1775 1800 1825 1850 1875 1900 1925 1950 1975

1824 1849 1874 1899 1924 1949 1974 1999 2024

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

1 PMT01 1717 2012 .32A .51 .64 .75 .52 .35B .41B .60 .66

2 PMT02 1803 2012 .37 .52 .62 .66 .51 .48 .58 .70

3 PMT03 1784 2012 .33 .31A .34 .43 .23B .46 .67 .66 .58

4 PMT04 1782 2012 .36 .40B .41 .66 .75 .75 .72 .77 .64

5 PMT05 1794 2012 .27B .33 .42 .51 .69 .63 .57 .65 .75

6 PMT06 1787 2012 .58 .63 .56 .56 .69 .77 .75 .71 .70

7 PMT07 1822 2012 .45 .43 .45 .48 .46 .55 .74 .79

8 PMT08 1900 2012 .40B .58 .63 .66

9 PMT09 1896 2012 .50 .52 .55 .51 .50

10 PMT10 1950 2012 .65 .65

11 PMT11 1949 2012 .52 .51 .53

12 PMT12 1925 2012 .66 .76 .73

13 PMT13 1929 2012 .54 .77 .70

14 PMT14 1929 2012 .70 .70 .63

15 PMT20 1809 2012 .58 .43 .57 .73 .63 .64 .69 .76

16 PMT21 1816 2012 .48 .49 .64 .69 .73 .79 .72 .77

17 PMT22 1868 2012 .34 .41 .75 .76 .80 .81

18 PMT22b 1899 2012 .74 .73 .73 .77 .76

19 PMT23 1877 2012 .67 .66 .58 .56 .54

20 PMT26a 1860 2012 .58 .61 .62 .56 .63 .65

21 PMT26b 1836 2012 .31A .44 .68 .74 .71 .72 .75

22 PMT28 1811 2012 .45 .38 .59 .75 .64 .65 .72 .67

Av segment correlation .38 .45 .45 .55 .61 .61 .63 .68 .68

PART 6: POTENTIAL PROBLEMS: 12:44 Tue 30 Dec 2014 Page 6

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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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PMT01 1717 to 2012 296 years Series 1

[\*] Early part of series cannot be checked from 1717 to 1781 -- 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

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

1782 1831 0 -.14 .14 -.02 -.10 -.15 .21 -.05 .10 .06 -.15 .32\*-.06 -.24 -.12 .05 -.12 -.15 -.26 -.07 .04 .31

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

1900 1949 1 .02 -.16 -.14 .02 -.06 .11 -.01 .13 .04 -.23 .35| .41\*-.24 -.43 -.04 .11 -.07 -.17 .16 .10 .21

1925 1974 1 .10 -.12 -.12 -.01 -.21 -.16 -.06 -.02 -.02 .09 .41| .47\* .01 -.36 .02 .02 -.11 -.23 .03 .08 .00

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

Lower 1795> -.010 1935< -.010 1917< -.008 1803< -.008 1937> -.007 1916< -.007 Higher 2007 .012 1888 .010

1782 to 1831 segment:

Lower 1795> -.051 1784< -.026 1786< -.014 1826> -.011 1796> -.011 1814> -.011 Higher 1803 .035 1816 .025

1900 to 1949 segment:

Lower 1935< -.030 1917< -.029 1937> -.027 1916< -.024 1914> -.023 1921> -.016 Higher 1913 .054 1925 .041

1925 to 1974 segment:

Lower 1935< -.037 1937> -.026 1953> -.024 1973< -.021 1928< -.016 1932< -.016 Higher 1954 .061 1925 .029

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

1953 1954 -4.2 SD

[D] 1 Absent rings: Year Master N series Absent

1954 -2.436 22 1

[E] Outliers 5 3.0 SD above or -4.5 SD below mean for year

1795 +4.0 SD; 1803 -5.4 SD; 1912 +3.9 SD; 1937 +3.3 SD; 1954 -7.2 SD

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

PMT02 1803 to 2012 210 years Series 2

[B] Entire series, effect on correlation ( .553) is:

Lower 1803> -.014 1829> -.012 1928< -.012 1812< -.010 1921> -.008 1887> -.008 Higher 1888 .018 2012 .016

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

1805 +3.4 SD; 1829 +3.6 SD; 1870 +3.4 SD

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PMT03 1784 to 2012 229 years Series 3

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

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

1800 1849 0 -.11 .06 .10 .14 -.01 .23 .26 .07 .16 -.24 .31\*-.01 -.01 .04 -.31 .08 -.36 -.32 -.12 .06 .17

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

1875 1924 -2 .01 -.05 -.07 .16 .07 .26 -.23 -.38 .33\*-.16 .23| .30 .01 -.37 -.09 -.10 .01 .15 .18 -.15 -.09

[B] Entire series, effect on correlation ( .530) is:

Lower 1909> -.011 1805< -.010 1900< -.008 1897< -.008 1898> -.007 1916< -.007 Higher 1834 .019 1895 .017

1800 to 1849 segment:

Lower 1805< -.044 1841> -.032 1838< -.026 1836< -.018 1831> -.012 1822< -.012 Higher 1834 .168 1803 .048

1875 to 1924 segment:

Lower 1909> -.047 1900< -.032 1897< -.030 1898> -.030 1916< -.027 1899> -.022 Higher 1895 .079 1888 .073

[D] 4 Absent rings: Year Master N series Absent

1834 -1.921 10 1

1888 -2.723 14 1

1895 -2.399 14 1

1914 -1.996 17 1

[E] Outliers 4 3.0 SD above or -4.5 SD below mean for year

1828 +3.4 SD; 1834 -7.6 SD; 1899 +3.2 SD; 1909 +4.0 SD

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

PMT04 1782 to 2012 231 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

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

1800 1849 -5 .22 -.16 -.01 -.13 -.22 .43\*-.19 .17 -.06 .06 .40|-.21 .13 -.06 -.07 -.03 -.26 -.06 -.12 -.24 -.18

[B] Entire series, effect on correlation ( .592) is:

Lower 1844< -.024 1827< -.017 2007> -.015 2006< -.012 1846< -.010 1790> -.009 Higher 1888 .015 1856 .010

1800 to 1849 segment:

Lower 1844< -.096 1827< -.062 1846< -.040 1830> -.017 1831> -.015 1833> -.015 Higher 1834 .071 1839 .037

[E] Outliers 5 3.0 SD above or -4.5 SD below mean for year

1810 +3.3 SD; 1827 -5.0 SD; 1833 +3.4 SD; 1844 -5.7 SD; 1855 +3.1 SD

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PMT05 1794 to 2012 219 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

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

1794 1843 5 .17 -.08 -.26 -.17 -.25 -.08 -.26 -.10 -.04 .16 .27| .00 .16 .28 -.01 .37\*-.23 .00 -.03 -.23 -.24

[B] Entire series, effect on correlation ( .520) is:

Lower 1803> -.036 1851< -.024 1794> -.021 1855> -.017 1958< -.015 1867< -.008 Higher 2012 .020 1888 .016

1794 to 1843 segment:

Lower 1803> -.150 1794> -.077 1812< -.021 1798< -.017 1821> -.014 1814< -.011 Higher 1834 .089 1837 .045

[E] Outliers 6 3.0 SD above or -4.5 SD below mean for year

1794 +3.8 SD; 1803 +5.9 SD; 1851 -6.4 SD; 1855 +4.8 SD; 1958 -4.9 SD; 2012 -6.0 SD

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PMT06 1787 to 2012 226 years Series 6

[B] Entire series, effect on correlation ( .635) is:

Lower 1788> -.008 2007> -.007 1794< -.007 1848< -.007 1862< -.007 1878< -.006 Higher 1988 .008 1954 .008

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

1794 -4.5 SD; 1865 +3.1 SD; 1991 +3.5 SD

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PMT07 1822 to 2012 191 years Series 7

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

Lower 1918< -.028 1936> -.024 1854< -.016 1946< -.013 1888> -.011 1897< -.005 Higher 2007 .011 2012 .011

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

1844 +3.6 SD; 1854 -5.7 SD; 1936 +3.4 SD

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PMT08 1900 to 2012 113 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

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

1900 1949 -1 .05 -.06 -.05 .05 -.04 -.20 .07 -.06 -.20 .42\* .40|-.02 -.05 -.03 .33 -.07 -.10 -.16 -.11 .01 -.16

[B] Entire series, effect on correlation ( .513) is:

Lower 1953> -.033 1925> -.026 1908> -.024 1912< -.013 1901> -.013 2006< -.012 Higher 1936 .053 1988 .022

1900 to 1949 segment:

Lower 1925> -.057 1908> -.053 1901> -.028 1913> -.025 1912< -.023 1907< -.021 Higher 1936 .182 1916 .034

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

1925 +3.6 SD; 1953 +4.1 SD

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PMT09 1896 to 2012 117 years Series 9

[B] Entire series, effect on correlation ( .488) is:

Lower 1908> -.038 1907< -.022 1971< -.020 1902< -.017 1898> -.016 1972> -.014 Higher 1936 .045 1988 .022

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

1971 1972 4.0 SD

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

1908 +3.7 SD; 1971 -5.2 SD

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PMT10 1950 to 2012 63 years Series 10

[B] Entire series, effect on correlation ( .690) is:

Lower 1980< -.022 1993> -.018 1998< -.017 1972> -.016 1992> -.011 1971< -.009 Higher 1988 .039 2007 .022

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PMT11 1949 to 2012 64 years Series 11

[B] Entire series, effect on correlation ( .528) is:

Lower 1989> -.027 1986< -.026 1955> -.023 1999< -.021 2003> -.019 1980< -.014 Higher 1988 .043 1954 .027

[E] Outliers 4 3.0 SD above or -4.5 SD below mean for year

1955 +3.8 SD; 1966 -5.5 SD; 1989 +3.6 SD; 1990 +3.1 SD

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PMT12 1925 to 2012 88 years Series 12

[B] Entire series, effect on correlation ( .687) is:

Lower 1926> -.015 1925> -.014 1927< -.011 1950< -.009 2003> -.008 2009< -.008 Higher 1936 .033 2012 .017

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

1926 +3.5 SD

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PMT13 1929 to 2012 84 years Series 13

[B] Entire series, effect on correlation ( .592) is:

Lower 1943< -.072 1946< -.020 2005< -.016 1934> -.012 1955> -.012 2000> -.010 Higher 1936 .044 1988 .026

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

1955 +3.2 SD

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PMT14 1929 to 2012 84 years Series 14

[B] Entire series, effect on correlation ( .651) is:

Lower 2012> -.041 1986< -.015 1954> -.013 1983> -.013 1978< -.012 2011< -.012 Higher 1936 .046 2007 .021

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

1935 +3.4 SD

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PMT20 1809 to 2012 204 years Series 15

[B] Entire series, effect on correlation ( .641) is:

Lower 1864> -.021 1852< -.007 1908> -.007 1866< -.007 1986< -.006 1904< -.006 Higher 1988 .013 2012 .007

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

1864 +4.3 SD

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PMT21 1816 to 2012 197 years Series 16

[B] Entire series, effect on correlation ( .670) is:

Lower 1834> -.018 1921< -.014 1982< -.009 1951< -.008 1818> -.007 1868< -.007 Higher 1936 .017 1988 .012

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

1818 +3.2 SD

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PMT22 1868 to 2012 145 years Series 17

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

Lower 1878< -.038 1881> -.025 1879> -.022 1869< -.017 1889< -.009 1868> -.009 Higher 1936 .026 2012 .020

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

1878 1879 4.3 SD

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

1868 +3.2 SD; 1878 -5.0 SD; 1881 +3.8 SD

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PMT22b 1899 to 2012 114 years Series 18

[B] Entire series, effect on correlation ( .768) is:

Lower 1988> -.017 1936> -.011 1901< -.008 1930> -.008 1981< -.007 2000> -.006 Higher 2012 .014 1954 .009

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PMT23 1877 to 2012 136 years Series 19

[B] Entire series, effect on correlation ( .599) is:

Lower 1926< -.015 1988> -.014 1925> -.014 1927< -.011 1917< -.010 2008< -.008 Higher 1895 .016 1936 .012

[D] 2 Absent rings: Year Master N series Absent

1926 -1.034 18 1

1927 .201 18 1 >> WARNING: Ring is not usually narrow

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PMT26a 1860 to 2012 153 years Series 20

[B] Entire series, effect on correlation ( .627) is:

Lower 1882< -.015 1944> -.013 1973< -.012 1908< -.012 1917< -.010 1945< -.008 Higher 2007 .013 1936 .012

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PMT26b 1836 to 2012 177 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

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1836 1885 0 .21 .13 .05 -.05 -.34 .08 -.06 -.07 -.23 .25 .31\*-.14 -.27 .04 .09 -.16 -.02 -.06 -.07 .05 -.16

[B] Entire series, effect on correlation ( .638) is:

Lower 1856> -.023 1887< -.016 1879> -.013 1844< -.010 1872< -.008 1865< -.008 Higher 1888 .010 2007 .009

1836 to 1885 segment:

Lower 1856> -.075 1879> -.042 1844< -.037 1872< -.030 1865< -.030 1863> -.017 Higher 1839 .036 1874 .035

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

1879 +3.3 SD; 1887 -4.7 SD

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PMT28 1811 to 2012 202 years Series 22

[B] Entire series, effect on correlation ( .621) is:

Lower 1851> -.013 1873< -.012 1847< -.012 2007> -.010 1867< -.009 1925> -.009 Higher 2012 .017 1988 .010

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

1851 +4.0 SD; 1925 +3.0 SD; 2012 -4.7 SD

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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 ()

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1 PMT01 1717 2012 296 9 3 .512 1.98 7.46 1.395 .827 .334 2.66 .329 -.026 1

2 PMT02 1803 2012 210 8 0 .553 2.12 10.32 1.491 .766 .295 2.72 .404 .004 1

3 PMT03 1784 2012 229 9 2 .530 2.14 6.62 1.027 .654 .349 2.67 .347 .023 1

4 PMT04 1782 2012 231 9 1 .592 1.63 6.37 .888 .816 .262 2.74 .467 -.051 1

5 PMT05 1794 2012 219 9 1 .520 1.60 4.15 .747 .547 .316 2.70 .408 -.037 1

6 PMT06 1787 2012 226 9 0 .635 1.99 4.64 .796 .531 .314 2.62 .404 .013 3

7 PMT07 1822 2012 191 8 0 .569 1.34 4.00 .780 .679 .345 2.90 .437 -.031 1

8 PMT08 1900 2012 113 4 1 .513 3.62 19.24 2.973 .758 .308 2.64 .415 -.022 2

9 PMT09 1896 2012 117 5 0 .488 3.21 6.33 1.273 .459 .347 2.67 .542 .027 2

10 PMT10 1950 2012 63 2 0 .690 5.99 15.37 3.438 .778 .361 2.57 .467 .065 1

11 PMT11 1949 2012 64 3 0 .528 4.95 14.89 3.011 .723 .415 2.66 .435 -.001 2

12 PMT12 1925 2012 88 3 0 .687 3.66 13.21 2.575 .821 .281 2.50 .411 -.043 1

13 PMT13 1929 2012 84 3 0 .592 3.72 8.64 1.651 .671 .304 2.69 .496 .027 1

14 PMT14 1929 2012 84 3 0 .651 4.32 9.12 1.789 .543 .309 2.60 .462 -.041 1

15 PMT20 1809 2012 204 8 0 .641 1.75 3.91 .703 .588 .277 2.88 .482 .001 1

16 PMT21 1816 2012 197 8 0 .670 1.99 6.14 1.161 .781 .308 2.67 .421 .026 1

17 PMT22 1868 2012 145 6 0 .616 1.50 4.34 .754 .501 .352 2.81 .543 -.025 1

18 PMT22b 1899 2012 114 5 0 .768 1.93 5.95 .804 .283 .361 2.92 .529 .056 1

19 PMT23 1877 2012 136 5 0 .599 1.86 4.95 .823 .558 .323 2.76 .545 .049 1

20 PMT26a 1860 2012 153 6 0 .627 1.08 4.72 .825 .787 .307 2.57 .404 -.049 2

21 PMT26b 1836 2012 177 7 1 .638 1.40 3.67 .713 .637 .321 2.83 .467 .013 2

22 PMT28 1811 2012 202 8 0 .621 2.02 5.88 1.034 .533 .387 2.75 .443 -.036 2

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Total or mean: 3543 137 9 .595 2.17 19.24 1.190 .654 .323 2.92 .436 -.006

- = [ COFECHA PMT COF ] = -