[] Dendrochronology Program Library Run PMR Program COF 13:54 Mon 12 Jan 2015 Page 1

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[] P R O G R A M C O F E C H A Version 6.06P 29233

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QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

File of DATED series: pmr.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 1861 to 2012 152 years

Continuous time span is 1861 to 2012 152 years

Portion with two or more series is 1876 to 2012 137 years

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

\*C\* Number of dated series 47 \*C\*

\*O\* Master series 1861 2012 152 yrs \*O\*

\*F\* Total rings in all series 4723 \*F\*

\*E\* Total dated rings checked 4708 \*E\*

\*C\* Series intercorrelation .590 \*C\*

\*H\* Average mean sensitivity .196 \*H\*

\*A\* Segments, possible problems 3 \*A\*

\*\*\* Mean length of series 100.5 \*\*\*

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

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: 13:54 Mon 12 Jan 2015 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

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

. . . . . . . . . . . . . . . . . <===========> . PMR29A2 1 1897 2012 116

. . . . . . . . . . . . . . . . .<==============> . PMR03B 2 1861 2011 151

. . . . . . . . . . . . . . . . . <==========> . PMR15B 3 1900 2011 112

. . . . . . . . . . . . . . . . . <==========> . PMR17B 4 1905 2012 108

. . . . . . . . . . . . . . . . . . <=======> . PMR20B 5 1936 2012 77

. . . . . . . . . . . . . . . . . . <=======> . PMR21B 6 1935 2012 78

. . . . . . . . . . . . . . . . . <===========> . PMR10A 7 1895 2012 118

. . . . . . . . . . . . . . . . . <===========> . PMW07A 8 1890 2012 123

. . . . . . . . . . . . . . . . . <==========> . PMR02A 9 1909 2012 104

. . . . . . . . . . . . . . . . . . <======> . PMR01B 10 1944 2012 69

. . . . . . . . . . . . . . . . . .<=========> . PMR27A 11 1912 2012 101

. . . . . . . . . . . . . . . . . <==========> . PMR06B 12 1905 2012 108

. . . . . . . . . . . . . . . . . . <======> . PMR18A 13 1944 2012 69

. . . . . . . . . . . . . . . . . . <======> . PMR16B 14 1940 2012 73

. . . . . . . . . . . . . . . . . <==========> . PMR19B 15 1905 2012 108

. . . . . . . . . . . . . . . . . <===========> . PMR26A 16 1897 2012 116

. . . . . . . . . . . . . . . . . <===========> . PMR29B 17 1895 2012 118

. . . . . . . . . . . . . . . . . <==========> . PMR07B 18 1903 2012 110

. . . . . . . . . . . . . . . . . . <=======> . PMR025A 19 1939 2012 74

. . . . . . . . . . . . . . . . . . <=======> . PMR30B 20 1932 2012 81

. . . . . . . . . . . . . . . . . . <=======> . PMR20B 21 1936 2012 77

. . . . . . . . . . . . . . . . . .<=========> . PMR02B 22 1915 2012 98

. . . . . . . . . . . . . . . . . . <=======> . PMR04A 23 1936 2012 77

. . . . . . . . . . . . . . . . . <===========> . PMR06A 24 1894 2012 119

. . . . . . . . . . . . . . . . . <==========> . PMR09A 25 1907 2012 106

. . . . . . . . . . . . . . . . . .<=========> . PMR09B 26 1911 2012 102

. . . . . . . . . . . . . . . . . .<=========> . PMR02B 27 1915 2012 98

. . . . . . . . . . . . . . . . . <==========> . PMR10B 28 1902 2012 111

. . . . . . . . . . . . . . . . . <==========> . PMR14B 29 1903 2012 110

. . . . . . . . . . . . . . . . . .<=========> . PMR16A 30 1910 2012 103

. . . . . . . . . . . . . . . . . <==========> . PMR19A 31 1904 2012 109

. . . . . . . . . . . . . . . . . <==========> . PMR20A 32 1907 2012 106

. . . . . . . . . . . . . . . . . <==========> . PMR22B 33 1902 2012 111

. . . . . . . . . . . . . . . . . <===========> . PMR23A 34 1894 2012 119

. . . . . . . . . . . . . . . . . .<=========> . PMR24A 35 1913 2012 100

. . . . . . . . . . . . . . . . . . <======> . PMR27B 36 1949 2012 64

. . . . . . . . . . . . . . . . . . <========> . PMR18B 37 1920 2012 93

. . . . . . . . . . . . . . . . . <==========> . PMR14A 38 1906 2012 107

. . . . . . . . . . . . . . . . . <==========> . PMR01A 39 1905 2012 108

. . . . . . . . . . . . . . . . . .<=========> . PMR15A 40 1916 2012 97

. . . . . . . . . . . . . . . . . <==========> . PMR28A 41 1902 2012 111

. . . . . . . . . . . . . . . . . <============> . PMR23B 42 1881 2011 131

. . . . . . . . . . . . . . . . . <=============> . PMR03A 43 1876 2012 137

. . . . . . . . . . . . . . . . . . <======> . PMR30A 44 1949 2012 64

. . . . . . . . . . . . . . . . . <==========> . PMW02A 45 1901 2012 112

. . . . . . . . . . . . . . . . . . <=====> . PMR17A 46 1950 2012 63

. . . . . . . . . . . . . . . . . . <=======> . PMR25B 47 1937 2012 76

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

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: 13:54 Mon 12 Jan 2015 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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1900 .117 11 1950 .929 47 2000 1.324 47

1901 -1.245 12 1951 .240 47 2001 1.076 47

1902 .847 15 1952 -1.521 47 2002 .341 47

1903 .911 17 1953 -1.930 47 2003 1.022 47

1904 -.726 18 1954 -2.551 47 2004 .615 47

1905 .207 22 1955 .732 47 2005 -.143 47

1906 .589 23 1956 .709 47 2006 .547 47

1907 .483 25 1957 1.165 47 2007 -2.144 47

1908 -1.689 25 1958 1.467 47 2008 -.931 47

1909 .107 26 1959 .501 47 2009 .506 47

1910 .513 27 1960 .602 47 2010 .498 47

1861 -.769 1 1911 -1.004 28 1961 .751 47 2011 .322 47

1862 2.189 1 1912 .253 29 1962 .142 47 2012 -1.185 44

1863 .456 1 1913 -1.057 30 1963 .758 47

1864 -.869 1 1914 -1.041 30 1964 .180 47

1865 2.768 1 1915 1.084 32 1965 -.252 47

1866 -.398 1 1916 1.616 33 1966 -1.523 47

1867 -2.480 1 1917 .403 33 1967 -.780 47

1868 -.598 1 1918 -.421 33 1968 .524 47

1869 1.342 1 1919 .207 33 1969 -.108 47

1870 1.010 1 1920 -.015 34 1970 .123 47

1871 -1.862 1 1921 -.680 34 1971 -1.112 47

1872 .158 1 1922 .291 34 1972 -2.350 47

1873 -.934 1 1923 .143 34 1973 .501 47

1874 -1.616 1 1924 1.109 34 1974 1.169 47

1875 .774 1 1925 -1.685 34 1975 .720 47

1876 1.610 2 1926 .082 34 1976 .434 47

1877 .647 2 1927 .090 34 1977 .580 47

1878 -.535 2 1928 1.199 34 1978 .696 47

1879 -1.220 2 1929 .658 34 1979 -.021 47

1880 -1.055 2 1930 -.641 34 1980 -.026 47

1881 -.440 3 1931 .025 34 1981 .553 47

1882 -.518 3 1932 .657 35 1982 1.047 47

1883 -.615 3 1933 -1.173 35 1983 -1.779 47

1884 -1.483 3 1934 -1.090 35 1984 -1.953 47

1885 -.047 3 1935 .352 36 1985 .160 47

1886 1.178 3 1936 -2.424 39 1986 .315 47

1887 -.277 3 1937 -.294 40 1987 .199 47

1888 -.008 3 1938 1.683 40 1988 -1.670 47

1889 1.002 3 1939 1.151 41 1989 .542 47

1890 -1.546 4 1940 -.219 42 1990 -.235 47

1891 .715 4 1941 -.215 42 1991 -.612 47

1892 1.349 4 1942 .802 42 1992 .810 47

1893 -.210 4 1943 -.011 42 1993 .212 47

1894 .171 6 1944 -1.682 44 1994 -.466 47

1895 .120 8 1945 .407 44 1995 .720 47

1896 .613 8 1946 .443 44 1996 -.888 47

1897 .793 10 1947 1.018 44 1997 -1.475 47

1898 .247 10 1948 .396 44 1998 .809 47

1899 -.430 10 1949 .524 46 1999 .828 47

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PART 4: Master Bar Plot: 13:54 Mon 12 Jan 2015 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-----@ 1950---------D 2000----------E

1901-e 1951-----A 2001---------D

1902--------C 1952-f 2002------A

1903---------D 1953h 2003---------D

1904--c 1954j 2004-------B

1905-----A 1955--------C 2005----a

1906-------B 1956--------C 2006-------B

1907-------B 1957---------E 2007i

1908g 1958----------F 2008--d

1909-----@ 1959-------B 2009-------B

1910-------B 1960-------B 2010-------B

1861--c 1911-d 1961--------C 2011------A

1862----------I 1912-----A 1962-----A 2012-e

1863------B 1913-d 1963--------C

1864--c 1914-d 1964-----A

1865----------K 1915---------D 1965---a

1866---b 1916----------F 1966-f

1867j 1917------B 1967--c

1868--b 1918---b 1968-------B

1869----------E 1919-----A 1969----@

1870---------D 1920----@ 1970-----@

1871g 1921--c 1971-d

1872-----A 1922-----A 1972i

1873--d 1923-----A 1973-------B

1874f 1924---------D 1974---------E

1875--------C 1925g 1975--------C

1876----------F 1926----@ 1976------B

1877--------C 1927----@ 1977-------B

1878--b 1928----------E 1978--------C

1879-e 1929--------C 1979----@

1880-d 1930--c 1980----@

1881---b 1931----@ 1981-------B

1882--b 1932--------C 1982---------D

1883--b 1933-e 1983g

1884-f 1934-d 1984h

1885----@ 1935------A 1985-----A

1886---------E 1936j 1986------A

1887---a 1937---a 1987-----A

1888----@ 1938----------G 1988g

1889---------D 1939---------E 1989-------B

1890f 1940---a 1990---a

1891--------C 1941---a 1991--b

1892----------E 1942--------C 1992--------C

1893---a 1943----@ 1993-----A

1894-----A 1944g 1994---b

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

1896-------B 1946------B 1996--d

1897--------C 1947---------D 1997-f

1898-----A 1948------B 1998--------C

1899---b 1949-------B 1999--------C

PART 5: CORRELATION OF SERIES BY SEGMENTS: 13:54 Mon 12 Jan 2015 Page 5

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Correlations of 50-year dated segments, lagged 25 years

Flags: A = correlation under .3281 but highest as dated; B = correlation higher at other than dated position

Seq Series Time\_span 1875 1900 1925 1950 1975

1924 1949 1974 1999 2024

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

1 PMR29A2 1897 2012 .47 .50 .58 .52 .54

2 PMR03B 1861 2011 .40 .52 .60 .52 .38

3 PMR15B 1900 2011 .74 .76 .68 .61

4 PMR17B 1905 2012 .75 .77 .55 .55

5 PMR20B 1936 2012 .61 .66 .69

6 PMR21B 1935 2012 .64 .58 .47

7 PMR10A 1895 2012 .63 .69 .73 .69 .65

8 PMW07A 1890 2012 .64 .73 .53 .47 .50

9 PMR02A 1909 2012 .68 .70 .70 .70

10 PMR01B 1944 2012 .78 .75 .75

11 PMR27A 1912 2012 .68 .72 .58 .60

12 PMR06B 1905 2012 .42 .65 .61 .43

13 PMR18A 1944 2012 .71 .71 .66

14 PMR16B 1940 2012 .74 .67 .61

15 PMR19B 1905 2012 .61 .61 .46 .46

16 PMR26A 1897 2012 .74 .74 .78 .69 .66

17 PMR29B 1895 2012 .67 .64 .69 .71 .63

18 PMR07B 1903 2012 .59 .63 .52 .51

19 PMR025A 1939 2012 .68 .67 .70

20 PMR30B 1932 2012 .54 .70 .74

21 PMR20B 1936 2012 .61 .66 .69

22 PMR02B 1915 2012 .69 .70 .61 .61

23 PMR04A 1936 2012 .51 .50 .56

24 PMR06A 1894 2012 .61 .60 .56 .53 .51

25 PMR09A 1907 2012 .64 .73 .80 .73

26 PMR09B 1911 2012 .63 .68 .77 .66

27 PMR02B 1915 2012 .69 .70 .61 .61

28 PMR10B 1902 2012 .45 .70 .67 .50

29 PMR14B 1903 2012 .75 .77 .78 .77

30 PMR16A 1910 2012 .65 .75 .72 .68

31 PMR19A 1904 2012 .76 .71 .53 .53

32 PMR20A 1907 2012 .60 .52 .50 .56

33 PMR22B 1902 2012 .30A .64 .74 .65

34 PMR23A 1894 2012 .53 .55 .54 .48 .45

35 PMR24A 1913 2012 .45 .55 .50 .46

36 PMR27B 1949 2012 .62 .62 .65

37 PMR18B 1920 2012 .73 .72 .47 .36

38 PMR14A 1906 2012 .89 .82 .68 .52

39 PMR01A 1905 2012 .39 .53 .70 .70

40 PMR15A 1916 2012 .34 .45 .63 .65

41 PMR28A 1902 2012 .60 .52 .30A .42

42 PMR23B 1881 2011 .34 .51 .52 .55 .35

43 PMR03A 1876 2012 .43 .66 .62 .56 .52

44 PMR30A 1949 2012 .54 .54 .57

45 PMW02A 1901 2012 .31A .76 .73 .70

46 PMR17A 1950 2012 .67 .61

47 PMR25B 1937 2012 .69 .67 .66

Av segment correlation .55 .60 .65 .62 .59

PART 6: POTENTIAL PROBLEMS: 13:54 Mon 12 Jan 2015 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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PMR29A2 1897 to 2012 116 years Series 1

[B] Entire series, effect on correlation ( .525) is:

Lower 1923< -.019 1962< -.017 1971> -.016 1966> -.014 1910< -.014 1913> -.013 Higher 1972 .032 2007 .016

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PMR03B 1861 to 2011 151 years Series 2

[\*] Early part of series cannot be checked from 1861 to 1875 -- not matched by another series

[B] Entire series, effect on correlation ( .423) is:

Lower 1890> -.052 1995< -.023 1903< -.018 2007> -.016 2011< -.016 1984> -.014 Higher 1972 .033 1983 .029

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

1890 +4.3 SD; 1978 +3.6 SD; 1984 +3.0 SD

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

PMR15B 1900 to 2011 112 years Series 3

[B] Entire series, effect on correlation ( .709) is:

Lower 1984> -.046 1939< -.011 1968< -.010 1944> -.009 2004< -.008 1997> -.008 Higher 1983 .020 1954 .018

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

1984 +4.8 SD

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

PMR17B 1905 to 2012 108 years Series 4

[B] Entire series, effect on correlation ( .643) is:

Lower 1990< -.013 1920< -.010 1988> -.010 1996> -.009 2001< -.008 1957< -.008 Higher 1936 .048 1972 .022

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

1989 +3.3 SD

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

PMR20B 1936 to 2012 77 years Series 5

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

Lower 1943< -.049 1995< -.028 1960< -.014 2011< -.010 1978< -.009 1941> -.008 Higher 1936 .026 1983 .022

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PMR21B 1935 to 2012 78 years Series 6

[B] Entire series, effect on correlation ( .562) is:

Lower 2003< -.037 1938< -.018 1971> -.015 1986< -.014 1988> -.014 1972> -.014 Higher 1983 .048 1954 .031

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PMR10A 1895 to 2012 118 years Series 7

[B] Entire series, effect on correlation ( .654) is:

Lower 1897< -.015 1975< -.013 1925> -.013 2005< -.011 1983> -.011 1941< -.010 Higher 1936 .031 2007 .029

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PMW07A 1890 to 2012 123 years Series 8

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

Lower 1954> -.032 1899> -.018 1890< -.018 1947< -.014 1968< -.013 2007> -.010 Higher 1936 .025 1925 .022

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

1899 +3.1 SD; 1954 +3.2 SD; 1978 +3.0 SD; 1979 +3.2 SD

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PMR02A 1909 to 2012 104 years Series 9

[B] Entire series, effect on correlation ( .681) is:

Lower 1944> -.026 1996> -.014 1937< -.013 1983> -.009 2008> -.008 1989< -.008 Higher 1925 .022 1954 .018

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PMR01B 1944 to 2012 69 years Series 10

[B] Entire series, effect on correlation ( .770) is:

Lower 2002< -.012 1962< -.012 1997< -.009 1967> -.008 1971< -.008 1979> -.007 Higher 2007 .016 1988 .011

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PMR27A 1912 to 2012 101 years Series 11

[B] Entire series, effect on correlation ( .640) is:

Lower 1981< -.031 1972> -.025 1988> -.022 1914> -.022 1944> -.011 1933> -.010 Higher 1936 .040 2007 .034

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

1914 +3.5 SD

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

PMR06B 1905 to 2012 108 years Series 12

[B] Entire series, effect on correlation ( .447) is:

Lower 1908> -.032 1907< -.027 1914> -.020 2012> -.020 1911> -.017 1944> -.015 Higher 1925 .045 1954 .024

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

1914 +3.3 SD; 1976 +3.3 SD

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PMR18A 1944 to 2012 69 years Series 13

[B] Entire series, effect on correlation ( .696) is:

Lower 1979< -.025 2007> -.025 1958< -.011 2002< -.010 1992< -.010 1993< -.010 Higher 1954 .028 1988 .025

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PMR16B 1940 to 2012 73 years Series 14

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

Lower 2010< -.027 1993< -.027 1998< -.017 1984> -.012 1988> -.011 1980< -.007 Higher 1983 .042 1953 .011

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PMR19B 1905 to 2012 108 years Series 15

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

Lower 1908> -.020 1966> -.019 1974< -.015 1928< -.015 1927> -.014 1911< -.013 Higher 1936 .062 1944 .013

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

1927 +3.6 SD

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PMR26A 1897 to 2012 116 years Series 16

[B] Entire series, effect on correlation ( .697) is:

Lower 1953> -.013 1995< -.013 1988> -.013 1921> -.010 1923> -.008 1950< -.007 Higher 1983 .018 1925 .016

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PMR29B 1895 to 2012 118 years Series 17

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

Lower 1937< -.013 1963< -.012 1946< -.012 1902< -.011 1930> -.009 2007> -.008 Higher 1936 .044 1983 .016

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PMR07B 1903 to 2012 110 years Series 18

[B] Entire series, effect on correlation ( .543) is:

Lower 1997> -.023 2012> -.019 1908> -.018 1919< -.017 1967> -.013 1959< -.012 Higher 1972 .032 1925 .027

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

1967 +3.0 SD; 1997 +3.3 SD

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PMR025A 1939 to 2012 74 years Series 19

[B] Entire series, effect on correlation ( .708) is:

Lower 1972> -.036 1954> -.012 1963< -.011 1964< -.009 1994< -.008 1978< -.008 Higher 1983 .025 2007 .015

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PMR30B 1932 to 2012 81 years Series 20

[B] Entire series, effect on correlation ( .674) is:

Lower 1936> -.046 1940< -.040 1972> -.034 1963< -.010 1953> -.009 1991> -.007 Higher 2007 .038 1954 .029

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PMR20B 1936 to 2012 77 years Series 21

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

Lower 1943< -.049 1995< -.028 1960< -.014 2011< -.010 1978< -.009 1941> -.008 Higher 1936 .026 1983 .022

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PMR02B 1915 to 2012 98 years Series 22

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

Lower 1978< -.018 1983> -.015 1955< -.012 1944> -.012 2002< -.010 2000< -.009 Higher 1925 .025 2007 .025

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PMR04A 1936 to 2012 77 years Series 23

[B] Entire series, effect on correlation ( .516) is:

Lower 1954> -.033 1999< -.029 1973< -.026 1960< -.019 1996> -.012 1950< -.011 Higher 1983 .054 1988 .019

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PMR06A 1894 to 2012 119 years Series 24

[B] Entire series, effect on correlation ( .557) is:

Lower 1987< -.032 1988> -.025 1935< -.014 2012> -.013 1927< -.008 1948< -.007 Higher 2007 .041 1908 .031

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PMR09A 1907 to 2012 106 years Series 25

[B] Entire series, effect on correlation ( .677) is:

Lower 1925> -.021 1908> -.013 2007> -.011 2009< -.010 2005> -.008 1975< -.008 Higher 1972 .018 1954 .013

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PMR09B 1911 to 2012 102 years Series 26

[B] Entire series, effect on correlation ( .642) is:

Lower 1925> -.031 1911> -.026 1999< -.019 1971> -.017 1937< -.010 1941> -.010 Higher 1954 .027 1983 .027

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

1911 +3.0 SD

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PMR02B 1915 to 2012 98 years Series 27

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

Lower 1978< -.018 1983> -.015 1955< -.012 1944> -.012 2002< -.010 2000< -.009 Higher 1925 .025 2007 .025

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PMR10B 1902 to 2012 111 years Series 28

[B] Entire series, effect on correlation ( .492) is:

Lower 2010< -.066 1925> -.025 1908> -.022 1915< -.016 1909< -.015 1970< -.013 Higher 1936 .069 1988 .013

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PMR14B 1903 to 2012 110 years Series 29

[B] Entire series, effect on correlation ( .765) is:

Lower 1917< -.013 1968< -.012 1984< -.008 1979> -.006 1951< -.006 1933< -.006 Higher 1936 .011 1983 .010

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

PMR16A 1910 to 2012 103 years Series 30

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

Lower 1963< -.016 1911> -.014 1915< -.010 1913> -.010 1923< -.009 1916< -.008 Higher 1936 .050 1954 .014

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PMR19A 1904 to 2012 109 years Series 31

[B] Entire series, effect on correlation ( .608) is:

Lower 1983> -.025 1954> -.023 2005< -.020 1987< -.011 1932< -.011 1965< -.009 Higher 1972 .025 1936 .024

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PMR20A 1907 to 2012 106 years Series 32

[B] Entire series, effect on correlation ( .537) is:

Lower 1996< -.028 1959< -.027 1934> -.018 2007> -.011 1952> -.011 1957< -.008 Higher 1988 .016 1936 .014

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

1934 +3.1 SD

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

PMR22B 1902 to 2012 111 years Series 33

[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 -.12 -.07 .08 -.26 .02 .02 .10 -.03 .23 -.09 .30\*-.20 -.17 .16 -.08 -.18 .11 -.04 .06 .07 .05

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

Lower 1908> -.029 1927< -.020 1938< -.017 1915< -.014 1909< -.014 1910< -.013 Higher 1936 .038 1954 .032

1902 to 1951 segment:

Lower 1908> -.054 1938< -.032 1927< -.031 1915< -.028 1909< -.026 1910< -.024 Higher 1936 .168 1925 .034

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

1932 +3.8 SD

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

PMR23A 1894 to 2012 119 years Series 34

[B] Entire series, effect on correlation ( .518) is:

Lower 1982< -.052 1988> -.035 1936> -.019 1894< -.013 1942< -.011 1956< -.009 Higher 1972 .033 1908 .028

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

1988 +3.2 SD

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

PMR24A 1913 to 2012 100 years Series 35

[B] Entire series, effect on correlation ( .452) is:

Lower 1925> -.058 1983> -.027 1913> -.022 2012> -.017 1938< -.014 1981< -.011 Higher 1936 .081 1972 .042

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

1925 +3.9 SD; 1972 -4.7 SD; 1983 +3.1 SD

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

PMR27B 1949 to 2012 64 years Series 36

[B] Entire series, effect on correlation ( .658) is:

Lower 1972> -.046 1991< -.018 1984> -.015 1961< -.014 1988> -.014 2005< -.014 Higher 1983 .039 2007 .033

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

PMR18B 1920 to 2012 93 years Series 37

[B] Entire series, effect on correlation ( .582) is:

Lower 2007> -.037 1988> -.029 1954> -.012 1977< -.011 1998< -.009 1933> -.009 Higher 1936 .064 1925 .025

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

1988 +3.2 SD

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

PMR14A 1906 to 2012 107 years Series 38

[B] Entire series, effect on correlation ( .719) is:

Lower 2007> -.027 1977< -.023 1989< -.022 2009< -.015 1995< -.008 1963< -.007 Higher 1936 .020 1908 .016

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PMR01A 1905 to 2012 108 years Series 39

[B] Entire series, effect on correlation ( .555) is:

Lower 1908> -.035 1938< -.027 1935< -.021 1929< -.017 1988> -.014 1944> -.013 Higher 1983 .036 2007 .031

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PMR15A 1916 to 2012 97 years Series 40

[B] Entire series, effect on correlation ( .494) is:

Lower 1923< -.027 1934> -.021 1935< -.016 1998< -.013 1927< -.011 1950< -.010 Higher 2007 .037 1988 .034

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

1934 +3.3 SD

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PMR28A 1902 to 2012 111 years Series 41

[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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1950 1999 0 .03 -.16 -.24 -.03 -.03 -.06 -.19 .06 .00 .18 .30\* .27 .11 -.01 .17 -.11 -.07 -.15 -.19 -.09 -.18

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

Lower 1982< -.023 1955< -.019 1996> -.015 1919< -.014 1991> -.011 1966> -.011 Higher 2007 .056 1936 .046

1950 to 1999 segment:

Lower 1982< -.066 1955< -.053 1996> -.035 1991> -.027 1966> -.021 1993< -.018 Higher 1972 .037 1984 .024

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PMR23B 1881 to 2011 131 years Series 42

[B] Entire series, effect on correlation ( .357) is:

Lower 1882> -.029 1936> -.027 1896< -.027 1884> -.025 2006< -.017 1889< -.015 Higher 1908 .046 1972 .020

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

1882 +3.9 SD; 1890 -5.4 SD; 1995 +3.3 SD

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PMR03A 1876 to 2012 137 years Series 43

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

Lower 1890> -.062 1958< -.013 1988> -.011 1945< -.010 2007> -.008 1926< -.007 Higher 1908 .030 1925 .019

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

1890 +4.6 SD

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PMR30A 1949 to 2012 64 years Series 44

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

Lower 1972> -.040 1976< -.028 1971> -.018 1974< -.018 1992< -.012 1956< -.011 Higher 2007 .066 1954 .054

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PMW02A 1901 to 2012 112 years Series 45

[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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1901 1950 0 .03 .05 .12 .01 -.17 -.13 -.06 .03 -.11 -.05 .31\* .14 .11 -.04 .10 -.14 .02 .05 -.10 -.18 .07

[B] Entire series, effect on correlation ( .525) is:

Lower 1907< -.131 1983> -.015 1904> -.014 1908> -.011 1990> -.008 1914> -.007 Higher 2007 .037 1988 .022

1901 to 1950 segment:

Lower 1907< -.240 1904> -.024 1914> -.013 1909< -.010 1908> -.010 1901> -.008 Higher 1936 .038 1944 .022

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

1907 1908 5.3 SD

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

1907 -7.3 SD

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PMR17A 1950 to 2012 63 years Series 46

[B] Entire series, effect on correlation ( .645) is:

Lower 1999< -.024 1983> -.022 1996> -.022 2001< -.020 2000< -.014 1975< -.012 Higher 1954 .045 1972 .039

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PMR25B 1937 to 2012 76 years Series 47

[B] Entire series, effect on correlation ( .724) is:

Lower 1971< -.049 1972> -.030 1981< -.013 1984> -.013 1988> -.010 1994< -.009 Higher 2007 .022 1954 .020

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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 PMR29A2 1897 2012 116 5 0 .525 1.92 4.75 .951 .901 .162 2.60 .511 -.027 1

2 PMR03B 1861 2011 151 5 0 .423 3.38 9.53 1.144 .605 .214 3.00 .510 .018 3

3 PMR15B 1900 2011 112 4 0 .709 3.28 8.04 1.014 .464 .240 3.16 .551 -.024 1

4 PMR17B 1905 2012 108 4 0 .643 2.01 3.51 .661 .732 .197 2.77 .443 -.042 1

5 PMR20B 1936 2012 77 3 0 .637 4.63 7.43 1.341 .692 .176 2.65 .545 .017 2

6 PMR21B 1935 2012 78 3 0 .562 2.41 3.90 .721 .687 .193 2.47 .423 .021 1

7 PMR10A 1895 2012 118 5 0 .654 3.00 5.74 .998 .710 .201 2.47 .417 -.013 2

8 PMW07A 1890 2012 123 5 0 .534 3.75 7.54 1.355 .693 .220 2.81 .442 -.066 1

9 PMR02A 1909 2012 104 4 0 .681 3.78 10.71 1.447 .675 .185 2.47 .380 .040 2

10 PMR01B 1944 2012 69 3 0 .770 5.02 7.84 1.357 .671 .170 2.64 .609 .018 1

11 PMR27A 1912 2012 101 4 0 .640 3.72 5.78 .790 .485 .167 2.58 .501 .044 1

12 PMR06B 1905 2012 108 4 0 .447 4.59 9.94 1.653 .620 .201 2.74 .383 -.034 1

13 PMR18A 1944 2012 69 3 0 .696 5.08 8.47 1.221 .592 .168 2.51 .528 -.083 2

14 PMR16B 1940 2012 73 3 0 .660 4.97 8.69 1.862 .778 .195 2.64 .541 -.027 2

15 PMR19B 1905 2012 108 4 0 .559 3.33 6.99 1.299 .858 .164 2.77 .426 .002 1

16 PMR26A 1897 2012 116 5 0 .697 3.04 6.05 .843 .634 .183 2.63 .384 -.017 1

17 PMR29B 1895 2012 118 5 0 .657 2.72 5.03 .840 .778 .164 2.52 .358 .053 1

18 PMR07B 1903 2012 110 4 0 .543 3.26 7.38 1.231 .688 .185 2.73 .480 -.049 1

19 PMR025A 1939 2012 74 3 0 .708 5.18 9.86 1.682 .736 .172 2.42 .347 -.046 1

20 PMR30B 1932 2012 81 3 0 .674 3.76 6.33 1.026 .579 .205 2.47 .516 -.029 1

21 PMR20B 1936 2012 77 3 0 .637 4.63 7.43 1.341 .692 .176 2.65 .545 .017 2

22 PMR02B 1915 2012 98 4 0 .647 3.96 7.54 1.504 .707 .221 2.58 .444 -.015 2

23 PMR04A 1936 2012 77 3 0 .516 3.00 5.42 .964 .644 .202 2.43 .382 -.036 1

24 PMR06A 1894 2012 119 5 0 .557 3.57 6.41 1.205 .816 .162 2.57 .451 -.033 2

25 PMR09A 1907 2012 106 4 0 .677 2.92 12.09 1.428 .679 .201 2.68 .543 .027 2

26 PMR09B 1911 2012 102 4 0 .642 2.90 13.42 1.537 .771 .215 2.65 .549 .066 1

27 PMR02B 1915 2012 98 4 0 .647 3.96 7.54 1.504 .707 .221 2.58 .444 -.015 2

28 PMR10B 1902 2012 111 4 0 .492 2.89 5.07 .894 .608 .189 2.70 .446 -.029 2

29 PMR14B 1903 2012 110 4 0 .765 3.23 11.69 1.383 .637 .214 2.61 .523 .079 1

30 PMR16A 1910 2012 103 4 0 .660 3.25 14.69 1.891 .826 .213 2.65 .377 -.041 2

31 PMR19A 1904 2012 109 4 0 .608 2.43 6.48 1.036 .828 .195 2.56 .476 -.002 1

32 PMR20A 1907 2012 106 4 0 .537 3.16 17.04 1.536 .202 .183 2.48 .386 -.025 2

33 PMR22B 1902 2012 111 4 1 .545 3.03 7.30 1.271 .656 .241 3.19 .565 .037 1

34 PMR23A 1894 2012 119 5 0 .518 1.97 4.09 .665 .800 .153 2.62 .459 -.019 2

35 PMR24A 1913 2012 100 4 0 .452 1.91 4.66 .690 .765 .193 2.48 .334 .004 1

36 PMR27B 1949 2012 64 3 0 .658 5.50 8.59 1.189 .601 .150 2.39 .422 -.034 1

37 PMR18B 1920 2012 93 4 0 .582 4.20 9.56 1.701 .631 .250 2.56 .378 -.050 1

38 PMR14A 1906 2012 107 4 0 .719 3.58 5.78 .888 .448 .194 2.60 .528 .026 1

39 PMR01A 1905 2012 108 4 0 .555 3.14 9.41 1.588 .871 .188 2.81 .442 .019 2

40 PMR15A 1916 2012 97 4 0 .494 3.91 10.25 1.418 .733 .191 2.77 .470 -.049 1

41 PMR28A 1902 2012 111 4 1 .479 2.90 5.93 .799 .533 .203 2.48 .375 -.028 2

42 PMR23B 1881 2011 131 5 0 .357 2.13 3.97 .684 .701 .183 2.81 .358 .008 1

43 PMR03A 1876 2012 137 5 0 .472 3.09 8.39 1.272 .797 .173 2.62 .431 -.053 4

44 PMR30A 1949 2012 64 3 0 .599 4.67 8.93 1.763 .743 .204 2.73 .521 .029 1

45 PMW02A 1901 2012 112 4 1 .525 3.13 5.80 1.281 .690 .293 2.41 .349 -.005 1

46 PMR17A 1950 2012 63 2 0 .645 2.71 4.08 .536 .243 .183 2.73 .562 .024 2

47 PMR25B 1937 2012 76 3 0 .724 4.84 11.36 1.354 .506 .211 2.49 .416 -.026 1

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Total or mean: 4723 184 3 .590 3.37 17.04 1.193 .674 .196 3.19 .453 -.008

- = [ COFECHA PMR COF ] = -