[] Dendrochronology Program Library Run MWN Program COF 15:02 Mon 05 Jun 2017 Page 1

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[] P R O G R A M C O F E C H A Version 6.06P 30108

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QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

File of DATED series: mwnfinal.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 1819 to 2016 198 years

Continuous time span is 1819 to 2016 198 years

Portion with two or more series is 1845 to 2016 172 years

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

\*C\* Number of dated series 19 \*C\*

\*O\* Master series 1819 2016 198 yrs \*O\*

\*F\* Total rings in all series 2204 \*F\*

\*E\* Total dated rings checked 2178 \*E\*

\*C\* Series intercorrelation .550 \*C\*

\*H\* Average mean sensitivity .237 \*H\*

\*A\* Segments, possible problems 2 \*A\*

\*\*\* Mean length of series 116.0 \*\*\*

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

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: 15:02 Mon 05 Jun 2017 Page 2

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1050 1100 1150 1200 1250 1300 1350 1400 1450 1500 1550 1600 1650 1700 1750 1800 1850 1900 1950 2000 2050 Ident Seq Time-span Yrs

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

. . . . . . . . . . . . . . . . . <============> . MWN01A 1 1887 2016 130

. . . . . . . . . . . . . . . . . <==========> . MWN01B 2 1900 2016 117

. . . . . . . . . . . . . . . . . . <=======> . MWN02A 3 1935 2016 82

. . . . . . . . . . . . . . . . . . <=======> . MWN02B 4 1938 2016 79

. . . . . . . . . . . . . . . . <=============>. . MWN03A 5 1855 1998 144

. . . . . . . . . . . . . . . . .<============>. . MWN03B 6 1861 1994 134

. . . . . . . . . . . . . . . .<===================> . MWN04A 7 1819 2016 198

. . . . . . . . . . . . . . . . .<==============> . MWN04B 8 1863 2016 154

. . . . . . . . . . . . . . . . .<==========> . . MWN05A 9 1863 1975 113

. . . . . . . . . . . . . . . . . <======> . . MWN05B 10 1902 1975 74

. . . . . . . . . . . . . . . . . . <=====> . MWN06A 11 1951 2016 66

. . . . . . . . . . . . . . . . . . <========> . MWN07A 12 1925 2016 92

. . . . . . . . . . . . . . . . . <============> . MWN07B 13 1887 2016 130

. . . . . . . . . . . . . . . . . .<=========> . MWN08A 14 1917 2016 100

. . . . . . . . . . . . . . . . . <=============> . MWN08B 15 1870 2016 147

. . . . . . . . . . . . . . . . . <==========> . MWN09A 16 1908 2016 109

. . . . . . . . . . . . . . . . . . <=======> . MWN09B 17 1939 2016 78

. . . . . . . . . . . . . . . . <================> . MWN010A 18 1845 2016 172

. . . . . . . . . . . . . . . . . . <=======> . MWN010B 19 1931 2015 85

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

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: 15:02 Mon 05 Jun 2017 Page 3

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

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1850 -1.186 2 1900 .783 10 1950 1.261 18 2000 .170 15

1851 -2.408 2 1901 -.513 10 1951 1.198 19 2001 1.725 15

1852 -1.884 2 1902 1.173 11 1952 -.263 19 2002 -.265 15

1853 -1.592 2 1903 1.675 11 1953 .375 19 2003 1.011 15

1854 -.399 2 1904 .369 11 1954 -1.192 19 2004 -.657 15

1855 -1.353 3 1905 -.357 11 1955 1.474 19 2005 -.662 15

1856 -1.654 3 1906 -1.064 11 1956 .494 19 2006 1.020 15

1857 -.592 3 1907 -.233 11 1957 1.419 19 2007 -1.298 15

1858 .593 3 1908 -.620 12 1958 1.621 19 2008 -1.409 15

1859 1.909 3 1909 .027 12 1959 -.347 19 2009 -1.232 15

1860 .466 3 1910 -.510 12 1960 .248 19 2010 .692 15

1861 -.270 4 1911 -1.176 12 1961 -.712 19 2011 .163 15

1862 1.025 4 1912 .518 12 1962 -.722 19 2012 -.143 15

1863 .754 6 1913 .004 12 1963 -.586 19 2013 -.066 15

1864 .518 6 1914 -1.348 12 1964 -1.355 19 2014 1.024 15

1865 .273 6 1915 1.351 12 1965 -1.031 19 2015 1.267 15

1866 1.475 6 1916 1.526 12 1966 .362 19 2016 -.385 14

1867 .522 6 1917 1.082 13 1967 -.461 19

1868 -.210 6 1918 -.399 13 1968 .173 19

1819 -2.617 1 1869 .108 6 1919 -1.150 13 1969 .094 19

1820 -.508 1 1870 .268 7 1920 .730 13 1970 -1.525 19

1821 .988 1 1871 -1.242 7 1921 -1.317 13 1971 -.192 19

1822 .399 1 1872 .542 7 1922 -1.274 13 1972 .602 19

1823 1.377 1 1873 .400 7 1923 -.418 13 1973 1.724 19

1824 1.410 1 1874 -.962 7 1924 1.211 13 1974 1.143 19

1825 .028 1 1875 1.736 7 1925 .140 14 1975 -1.092 19

1826 -.973 1 1876 .314 7 1926 -.062 14 1976 -.414 17

1827 1.695 1 1877 -.536 7 1927 .291 14 1977 -.575 17

1828 2.440 1 1878 .865 7 1928 .857 14 1978 -.065 17

1829 .593 1 1879 -.005 7 1929 .573 14 1979 -.077 17

1830 1.004 1 1880 .564 7 1930 -1.588 14 1980 1.176 17

1831 -1.780 1 1881 -.492 7 1931 -.604 15 1981 .608 17

1832 -1.854 1 1882 .905 7 1932 1.494 15 1982 .437 17

1833 -2.463 1 1883 .138 7 1933 .437 15 1983 -.172 17

1834 -.862 1 1884 -.389 7 1934 -1.102 15 1984 -.322 17

1835 -1.092 1 1885 -1.738 7 1935 .520 16 1985 .719 17

1836 .762 1 1886 -2.401 7 1936 -1.911 16 1986 .571 17

1837 -.674 1 1887 -1.270 9 1937 .075 16 1987 .131 17

1838 -.646 1 1888 -.948 9 1938 .497 17 1988 -1.052 17

1839 -.751 1 1889 .721 9 1939 1.290 18 1989 -.278 17

1840 1.019 1 1890 .009 9 1940 .126 18 1990 -.662 17

1841 -.554 1 1891 .465 9 1941 -1.873 18 1991 -.565 17

1842 .732 1 1892 .413 9 1942 -.144 18 1992 .638 17

1843 1.600 1 1893 -.364 9 1943 .323 18 1993 1.661 17

1844 1.121 1 1894 -.409 9 1944 -.380 18 1994 -.367 17

1845 2.028 2 1895 -.726 9 1945 .913 18 1995 -.364 16

1846 .807 2 1896 .410 9 1946 -.177 18 1996 -.666 16

1847 .878 2 1897 1.394 9 1947 -.846 18 1997 -.559 16

1848 .554 2 1898 .877 9 1948 -1.071 18 1998 1.093 16

1849 .408 2 1899 -.736 9 1949 -.430 18 1999 -.946 15

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PART 4: Master Bar Plot: 15:02 Mon 05 Jun 2017 Page 4

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Year Rel value Year Rel value Year Rel value Year Rel value Year Rel value Year Rel value Year Rel value Year Rel value

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

1851j 1901---b 1951---------E 2001----------G

1852h 1902---------E 1952----a 2002----a

1853f 1903----------G 1953------A 2003---------D

1854---b 1904------A 1954-e 2004--c

1855-e 1905----a 1955----------F 2005--c

1856g 1906-d 1956-------B 2006---------D

1857---b 1907----a 1957----------F 2007-e

1858-------B 1908--b 1958----------F 2008-f

1859----------H 1909-----@ 1959----a 2009-e

1860-------B 1910---b 1960------A 2010--------C

1861----a 1911-e 1961--c 2011-----A

1862---------D 1912-------B 1962--c 2012----a

1863--------C 1913-----@ 1963---b 2013-----@

1864-------B 1914-e 1964-e 2014---------D

1865------A 1915---------E 1965-d 2015---------E

1866----------F 1916----------F 1966------A 2016----b

1867-------B 1917---------D 1967---b

1868----a 1918---b 1968-----A

1819j 1869-----@ 1919-e 1969-----@

1820---b 1870------A 1920--------C 1970f

1821--------D 1871-e 1921-e 1971----a

1822------B 1872-------B 1922-e 1972-------B

1823---------F 1873------B 1923---b 1973----------G

1824---------F 1874-d 1924---------E 1974---------E

1825-----@ 1875----------G 1925-----A 1975-d

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

1827----------G 1877---b 1927------A 1977---b

1828----------J 1878--------C 1928--------C 1978-----@

1829-------B 1879-----@ 1929-------B 1979-----@

1830---------D 1880-------B 1930f 1980---------E

1831g 1881---b 1931---b 1981-------B

1832g 1882--------D 1932----------F 1982------B

1833j 1883-----A 1933------B 1983----a

1834--c 1884----b 1934-d 1984----a

1835-d 1885g 1935-------B 1985--------C

1836--------C 1886j 1936h 1986-------B

1837--c 1887-e 1937-----@ 1987-----A

1838--c 1888-d 1938-------B 1988-d

1839--c 1889--------C 1939---------E 1989----a

1840---------D 1890-----@ 1940-----A 1990--c

1841---b 1891-------B 1941g 1991---b

1842--------C 1892------B 1942----a 1992-------C

1843----------F 1893----a 1943------A 1993----------G

1844---------D 1894---b 1944----b 1994----a

1845----------H 1895--c 1945--------D 1995----a

1846--------C 1896------B 1946----a 1996--c

1847--------D 1897---------F 1947--c 1997---b

1848-------B 1898--------D 1948-d 1998---------D

1849------B 1899--c 1949---b 1999-d

PART 5: CORRELATION OF SERIES BY SEGMENTS: 15:02 Mon 05 Jun 2017 Page 5

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Correlations of 50-year dated segments, lagged 25 years

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

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

1874 1899 1924 1949 1974 1999 2024

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

1 MWN01A 1887 2016 .68 .80 .55 .38B .57

2 MWN01B 1900 2016 .56 .49 .45 .48

3 MWN02A 1935 2016 .70 .61 .39

4 MWN02B 1938 2016 .58 .57 .64

5 MWN03A 1855 1998 .47 .55 .55 .50 .51

6 MWN03B 1861 1994 .42 .63 .57 .50 .54

7 MWN04A 1819 2016 .38 .41 .61 .60 .67 .63 .54

8 MWN04B 1863 2016 .46 .44 .41 .61 .54 .47

9 MWN05A 1863 1975 .50 .66 .75 .76 .75

10 MWN05B 1902 1975 .78 .78 .76

11 MWN06A 1951 2016 .43 .53

12 MWN07A 1925 2016 .51 .53 .58

13 MWN07B 1887 2016 .56 .53 .62 .57 .56

14 MWN08A 1917 2016 .62 .62 .64 .67

15 MWN08B 1870 2016 .30A .45 .56 .48 .50 .54

16 MWN09A 1908 2016 .51 .58 .47 .43

17 MWN09B 1939 2016 .67 .72 .55

18 MWN010A 1845 2016 .43 .45 .65 .68 .75 .57 .55

19 MWN010B 1931 2015 .58 .69 .66

Av segment correlation .40 .43 .58 .61 .61 .57 .54

PART 6: POTENTIAL PROBLEMS: 15:02 Mon 05 Jun 2017 Page 5

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

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

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

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

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

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

[D] Absent rings (zero values)

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

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MWN01A 1887 to 2016 130 years Series 1

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

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

1950 1999 8 -.13 -.18 .06 .19 -.10 .37 -.17 -.20 -.12 -.22 .38|-.16 -.09 .06 -.24 .01 .02 .01 .42\* .06 -.23

[B] Entire series, effect on correlation ( .578) is:

Lower 1964> -.039 1970> -.018 1956< -.017 1982< -.015 1965> -.013 1957< -.012 Higher 1930 .019 1936 .013

1950 to 1999 segment:

Lower 1964> -.096 1970> -.042 1956< -.032 1982< -.032 1965> -.030 1957< -.029 Higher 1975 .061 1999 .037

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

1964 +4.6 SD; 1965 +3.9 SD

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

MWN01B 1900 to 2016 117 years Series 2

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

Lower 1949< -.045 1988> -.019 2006< -.014 1964> -.014 1954> -.013 1906> -.013 Higher 1930 .020 1941 .015

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

1949 -4.6 SD; 1988 +3.3 SD

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

MWN02A 1935 to 2016 82 years Series 3

[B] Entire series, effect on correlation ( .538) is:

Lower 2008> -.062 2009> -.021 1994< -.019 1974< -.016 2015< -.014 1958< -.012 Higher 1936 .043 1964 .018

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

2008 +4.1 SD; 2009 +3.8 SD

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MWN02B 1938 to 2016 79 years Series 4

[B] Entire series, effect on correlation ( .614) is:

Lower 1964> -.031 1949> -.022 1974< -.014 1999> -.012 2011< -.007 1978> -.007 Higher 1941 .028 2001 .018

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

1949 +3.3 SD

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MWN03A 1855 to 1998 144 years Series 5

[B] Entire series, effect on correlation ( .497) is:

Lower 1861> -.020 1936> -.020 1964> -.014 1922< -.014 1876< -.011 1899> -.008 Higher 1930 .022 1886 .014

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

1935 +4.0 SD; 1936 +3.5 SD; 1976 +3.2 SD

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MWN03B 1861 to 1994 134 years Series 6

[B] Entire series, effect on correlation ( .489) is:

Lower 1861< -.086 1899> -.012 1929< -.011 1914> -.010 1973< -.009 1964> -.008 Higher 1930 .020 1886 .013

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

1861 -5.6 SD; 1969 +3.0 SD

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MWN04A 1819 to 2016 198 years Series 7

[\*] Early part of series cannot be checked from 1819 to 1844 -- not matched by another series

[B] Entire series, effect on correlation ( .546) is:

Lower 1860> -.013 1992< -.012 1861> -.011 1890> -.010 1870< -.010 1947< -.009 Higher 1936 .009 2008 .008

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

1890 +3.6 SD

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MWN04B 1863 to 2016 154 years Series 8

[B] Entire series, effect on correlation ( .485) is:

Lower 1992< -.017 1920< -.015 1899< -.012 1914> -.012 1930> -.012 2010< -.011 Higher 1936 .019 1970 .015

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

1890 +3.4 SD

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

MWN05A 1863 to 1975 113 years Series 9

[B] Entire series, effect on correlation ( .679) is:

Lower 1874> -.025 1889< -.012 1895> -.010 1900< -.010 1970> -.008 1947> -.008 Higher 1936 .019 1930 .012

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MWN05B 1902 to 1975 74 years Series 10

[B] Entire series, effect on correlation ( .739) is:

Lower 1911> -.016 1975> -.015 1968< -.013 1910> -.012 1905< -.009 1970> -.008 Higher 1936 .028 1930 .017

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MWN06A 1951 to 2016 66 years Series 11

[B] Entire series, effect on correlation ( .517) is:

Lower 1955< -.025 1973< -.024 2007> -.022 1960< -.020 1959> -.017 1986< -.017 Higher 2008 .032 1964 .030

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MWN07A 1925 to 2016 92 years Series 12

[B] Entire series, effect on correlation ( .514) is:

Lower 1939< -.088 1980< -.041 1930> -.024 1979< -.018 1925> -.014 1935< -.011 Higher 1936 .029 2007 .020

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MWN07B 1887 to 2016 130 years Series 13

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

Lower 1993< -.029 1934> -.018 1899> -.012 1947> -.012 1890< -.011 1987> -.010 Higher 1930 .020 2007 .015

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

1987 +3.2 SD; 1992 +3.2 SD

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MWN08A 1917 to 2016 100 years Series 14

[B] Entire series, effect on correlation ( .636) is:

Lower 1930> -.023 1919> -.011 2016> -.009 2002> -.009 1927< -.007 1918> -.007 Higher 1936 .012 1921 .011

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MWN08B 1870 to 2016 147 years Series 15

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

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

1870 1919 0 -.09 -.05 -.06 -.16 -.08 -.04 -.04 .02 .02 -.25 .30\* .08 .10 .04 -.08 .24 -.15 .18 -.18 .27 .06

[B] Entire series, effect on correlation ( .457) is:

Lower 1871> -.039 1930> -.026 1968< -.011 1919> -.010 1954> -.009 1886> -.009 Higher 1941 .017 1932 .012

1870 to 1919 segment:

Lower 1871> -.120 1919> -.026 1883< -.020 1906> -.019 1877> -.018 1882< -.017 Higher 1885 .046 1915 .043

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

1871 +4.3 SD

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MWN09A 1908 to 2016 109 years Series 16

[B] Entire series, effect on correlation ( .465) is:

Lower 2008> -.024 1923< -.019 1980< -.019 1949> -.014 1988> -.013 2012< -.012 Higher 1936 .030 1921 .019

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

1935 +3.1 SD; 1949 +3.9 SD

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MWN09B 1939 to 2016 78 years Series 17

[B] Entire series, effect on correlation ( .602) is:

Lower 2008> -.051 1947> -.027 2012< -.021 1948< -.021 2004> -.016 1998< -.010 Higher 1941 .032 2007 .018

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

2008 +3.2 SD

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MWN010A 1845 to 2016 172 years Series 18

[B] Entire series, effect on correlation ( .578) is:

Lower 1850> -.018 1981< -.016 1860< -.015 1987< -.015 1935< -.008 1942< -.008 Higher 1936 .013 1930 .012

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

1872 +3.7 SD

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MWN010B 1931 to 2015 85 years Series 19

[B] Entire series, effect on correlation ( .620) is:

Lower 1947> -.037 1935< -.036 1936> -.020 1978< -.015 1992< -.015 1975> -.010 Higher 1941 .027 2007 .014

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

1947 +3.3 SD; 1980 +3.1 SD

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PART 7: DESCRIPTIVE STATISTICS: 15:02 Mon 05 Jun 2017 Page 6

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

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

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

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

1 MWN01A 1887 2016 130 5 1 .578 2.17 5.05 .892 .588 .245 2.76 .506 .022 1

2 MWN01B 1900 2016 117 4 0 .500 1.80 4.09 .741 .660 .215 2.71 .456 .021 1

3 MWN02A 1935 2016 82 3 0 .538 3.43 9.13 1.416 .583 .256 2.92 .526 -.016 1

4 MWN02B 1938 2016 79 3 0 .614 3.68 8.93 1.468 .412 .296 2.80 .436 .004 1

5 MWN03A 1855 1998 144 5 0 .497 2.25 5.27 .973 .734 .235 2.90 .439 .000 1

6 MWN03B 1861 1994 134 5 0 .489 2.36 5.37 .885 .741 .206 2.64 .407 .012 1

7 MWN04A 1819 2016 198 7 0 .546 1.65 4.28 .873 .818 .224 2.78 .439 .001 1

8 MWN04B 1863 2016 154 6 0 .485 1.63 3.74 .774 .848 .195 2.61 .442 -.044 2

9 MWN05A 1863 1975 113 5 0 .679 2.36 4.49 .960 .793 .212 2.62 .419 -.030 1

10 MWN05B 1902 1975 74 3 0 .739 2.43 3.82 .580 .527 .184 2.71 .552 -.018 1

11 MWN06A 1951 2016 66 2 0 .517 1.65 3.39 .466 .657 .189 2.63 .626 -.008 1

12 MWN07A 1925 2016 92 3 0 .514 3.14 6.84 .968 .375 .235 2.92 .602 -.028 1

13 MWN07B 1887 2016 130 5 0 .558 3.37 7.51 1.164 .567 .221 2.85 .532 -.027 1

14 MWN08A 1917 2016 100 4 0 .636 2.63 6.08 1.068 .732 .228 2.62 .532 .060 1

15 MWN08B 1870 2016 147 6 1 .457 2.26 6.38 1.253 .811 .218 2.92 .482 .087 1

16 MWN09A 1908 2016 109 4 0 .465 2.77 5.76 .880 .367 .264 2.81 .537 -.043 1

17 MWN09B 1939 2016 78 3 0 .602 3.45 6.53 1.190 .307 .314 2.63 .552 -.063 1

18 MWN010A 1845 2016 172 7 0 .578 2.25 6.73 1.276 .747 .276 3.00 .588 .051 1

19 MWN010B 1931 2015 85 3 0 .620 3.41 8.74 1.278 .093 .329 3.20 .676 .017 1

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Total or mean: 2204 83 2 .550 2.45 9.13 1.005 .637 .237 3.20 .503 .003

- = [ COFECHA MWN COF ] = -