[] Dendrochronology Program Library Run AJR Program COF 14:33 Wed 08 Nov 2017 Page 1

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[] P R O G R A M C O F E C H A Version 6.06P 30264

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 QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

 File of DATED series: ajr.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 1790 to 2016 227 years

 Continuous time span is 1790 to 2016 227 years

 Portion with two or more series is 1814 to 2016 203 years

 >> AJR04B 1902 absent in 1 of 16 series, but is not usually narrow: master index is .252

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

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

 \*O\* Master series 1790 2016 227 yrs \*O\*

 \*F\* Total rings in all series 2823 \*F\*

 \*E\* Total dated rings checked 2799 \*E\*

 \*C\* Series intercorrelation .552 \*C\*

 \*H\* Average mean sensitivity .186 \*H\*

 \*A\* Segments, possible problems 4 \*A\*

 \*\*\* Mean length of series 148.6 \*\*\*

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

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

 AJR04B 1 absent rings: 1902

 1 absent rings .035%

PART 2: TIME PLOT OF TREE-RING SERIES: 14:33 Wed 08 Nov 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

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

 . . . . . . . . . . . . . . . . . . <=======> . AJR01A 1 1931 2016 86

 . . . . . . . . . . . . . . . . . <=============> . AJR01B 2 1872 2016 145

 . . . . . . . . . . . . . . . . . <=============> . AJR02A 3 1876 2016 141

 . . . . . . . . . . . . . . . . . <==========> . AJR02B 4 1900 2016 117

 . . . . . . . . . . . . . . . . . <===========> . AJR03A 5 1897 2016 120

 . . . . . . . . . . . . . . . . . <===========> . AJR03B 6 1895 2016 122

 . . . . . . . . . . . . . . . . <=================> . AJR04A 7 1834 2016 183

 . . . . . . . . . . . . . . . .<===================> . AJR04B 8 1814 2016 203

 . . . . . . . . . . . . . . . . . <==========> . AJR05A 9 1903 2016 114

 . . . . . . . . . . . . . . . . . <=============> . AJR05B 10 1872 2016 145

 . . . . . . . . . . . . . . . . . <============> . AJR06A 11 1881 2016 136

 . . . . . . . . . . . . . . . . .<==============> . AJR06B 12 1860 2016 157

 . . . . . . . . . . . . . . . . <===============> . AJR07A 13 1856 2016 161

 . . . . . . . . . . . . . . . . . .<=========> . AJR07B 14 1919 2016 98

 . . . . . . . . . . . . . . . .<===================> . AJR08A 15 1815 2016 202

 . . . . . . . . . . . . . . . . <================> . AJR08B 16 1841 2016 176

 . . . . . . . . . . . . . . . . .<==============> . AJR09A 17 1869 2016 148

 . . . . . . . . . . . . . . . . . <=============> . AJR10A 18 1875 2016 142

 . . . . . . . . . . . . . . . <=====================> . AJR10B 19 1790 2016 227

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

 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: 14:33 Wed 08 Nov 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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 1800 -1.603 1 1850 -.630 5 1900 -.133 16 1950 .634 19 2000 -.037 19

 1801 -2.305 1 1851 .375 5 1901 .245 16 1951 1.098 19 2001 .958 19

 1802 .281 1 1852 -.389 5 1902 .252 16 1<< 1952 -.548 19 2002 -.062 19

 1803 .516 1 1853 -1.110 5 1903 .496 17 1953 -2.014 19 2003 -.919 19

 1804 -2.755 1 1854 .226 5 1904 -.090 17 1954 -.746 19 2004 -.446 19

 1805 1.682 1 1855 -.338 5 1905 1.034 17 1955 -1.390 19 2005 1.014 19

 1806 1.696 1 1856 .483 6 1906 .860 17 1956 .871 19 2006 .332 19

 1807 .176 1 1857 .059 6 1907 .460 17 1957 1.443 19 2007 -.146 19

 1808 1.830 1 1858 -.969 6 1908 .268 17 1958 1.113 19 2008 -.541 19

 1809 -.216 1 1859 -3.579 6 1909 .070 17 1959 -.060 19 2009 .795 19

 1810 -1.386 1 1860 -1.277 7 1910 .987 17 1960 .145 19 2010 .412 19

 1811 -.705 1 1861 .203 7 1911 -.613 17 1961 1.291 19 2011 .923 19

 1812 1.116 1 1862 -1.470 7 1912 -.649 17 1962 .712 19 2012 .274 19

 1813 1.854 1 1863 .512 7 1913 1.027 17 1963 -.299 19 2013 -1.916 19

 1814 .550 2 1864 .066 7 1914 -.503 17 1964 .387 19 2014 .129 19

 1815 1.548 3 1865 1.020 7 1915 -2.260 17 1965 .989 19 2015 .360 19

 1816 .069 3 1866 1.866 7 1916 1.127 17 1966 .285 19 2016 .216 19

 1817 -.406 3 1867 1.074 7 1917 1.210 17 1967 -1.767 19

 1818 .197 3 1868 .355 7 1918 .960 17 1968 -1.817 19

 1819 1.200 3 1869 -.910 8 1919 -1.443 18 1969 1.054 19

 1820 1.084 3 1870 1.545 8 1920 -1.530 18 1970 1.579 19

 1821 -.275 3 1871 -.281 8 1921 -1.582 18 1971 -.006 19

 1822 -.627 3 1872 -1.563 10 1922 -.337 18 1972 -.269 19

 1823 -.802 3 1873 .008 10 1923 -.092 18 1973 -1.326 19

 1824 -.114 3 1874 .207 10 1924 -1.038 18 1974 .176 19

 1825 -.582 3 1875 -1.755 11 1925 .970 18 1975 -1.190 19

 1826 -1.342 3 1876 .080 12 1926 .031 18 1976 -.168 19

 1827 -.744 3 1877 .761 12 1927 1.201 18 1977 .284 19

 1828 -1.430 3 1878 .532 12 1928 .931 18 1978 -.005 19

 1829 -1.078 3 1879 .311 12 1929 .750 18 1979 .705 19

 1830 -1.540 3 1880 .238 12 1930 .713 18 1980 -.495 19

 1831 .283 3 1881 .263 13 1931 -1.183 19 1981 .851 19

 1832 .687 3 1882 2.062 13 1932 -.105 19 1982 .326 19

 1833 -.246 3 1883 .859 13 1933 .370 19 1983 1.039 19

 1834 1.460 4 1884 .891 13 1934 -.909 19 1984 .237 19

 1835 -.182 4 1885 -.122 13 1935 -.426 19 1985 -1.670 19

 1836 -.281 4 1886 -.657 13 1936 1.521 19 1986 .435 19

 1837 .480 4 1887 -1.181 13 1937 .100 19 1987 1.382 19

 1838 .558 4 1888 -.801 13 1938 .815 19 1988 1.332 19

 1839 -1.151 4 1889 -1.653 13 1939 .187 19 1989 -1.193 19

 1790 -.087 1 1840 -.546 4 1890 .521 13 1940 .401 19 1990 -.392 19

 1791 2.085 1 1841 .505 5 1891 .134 13 1941 .463 19 1991 -.658 19

 1792 2.245 1 1842 1.151 5 1892 -.353 13 1942 -.289 19 1992 -1.027 19

 1793 .170 1 1843 -.057 5 1893 -.272 13 1943 -.087 19 1993 .178 19

 1794 -2.307 1 1844 .708 5 1894 -1.821 13 1944 1.056 19 1994 1.154 19

 1795 -.951 1 1845 .756 5 1895 -1.297 14 1945 -.262 19 1995 -.932 19

 1796 1.388 1 1846 -.590 5 1896 -1.423 14 1946 -1.061 19 1996 .216 19

 1797 -.429 1 1847 1.417 5 1897 1.477 15 1947 -1.784 19 1997 -.245 19

 1798 -.991 1 1848 1.025 5 1898 .796 15 1948 -.668 19 1998 -.609 19

 1799 .412 1 1849 -.250 5 1899 .226 15 1949 -.531 19 1999 .185 19

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PART 4: Master Bar Plot: 14:33 Wed 08 Nov 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

 1800f 1850--c 1900----a 1950-------C 2000----@

 1801i 1851------B 1901------A 1951---------D 2001---------D

 1802------A 1852---b 1902------A 1952--b 2002----@

 1803-------B 1853-d 1903-------B 1953h 2003--d

 1804k 1854------A 1904----@ 1954--c 2004---b

 1805----------G 1855---a 1905---------D 1955-f 2005---------D

 1806----------G 1856-------B 1906--------C 1956--------C 2006------A

 1807-----A 1857-----@ 1907-------B 1957----------F 2007----a

 1808----------G 1858-d 1908------A 1958---------D 2008--b

 1809----a 1859n 1909-----@ 1959----@ 2009--------C

 1810-f 1860-e 1910---------D 1960-----A 2010-------B

 1811--c 1861------A 1911--b 1961---------E 2011--------D

 1812---------D 1862-f 1912--c 1962--------C 2012------A

 1813----------G 1863-------B 1913---------D 1963---a 2013h

 1814-------B 1864-----@ 1914---b 1964-------B 2014-----A

 1815----------F 1865---------D 1915i 1965---------D 2015------A

 1816-----@ 1866----------G 1916---------E 1966------A 2016------A

 1817---b 1867---------D 1917---------E 1967g

 1818-----A 1868------A 1918---------D 1968g

 1819---------E 1869--d 1919-f 1969---------D

 1820---------D 1870----------F 1920f 1970----------F

 1821---a 1871---a 1921f 1971----@

 1822--c 1872f 1922---a 1972---a

 1823--c 1873-----@ 1923----@ 1973-e

 1824----@ 1874------A 1924-d 1974-----A

 1825--b 1875g 1925---------D 1975-e

 1826-e 1876-----@ 1926-----@ 1976----a

 1827--c 1877--------C 1927---------E 1977------A

 1828-f 1878-------B 1928--------D 1978----@

 1829-d 1879------A 1929--------C 1979--------C

 1830f 1880------A 1930--------C 1980---b

 1831------A 1881------A 1931-e 1981--------C

 1832--------C 1882----------H 1932----@ 1982------A

 1833----a 1883--------C 1933------A 1983---------D

 1834----------F 1884--------D 1934--d 1984------A

 1835----a 1885----@ 1935---b 1985g

 1836---a 1886--c 1936----------F 1986-------B

 1837-------B 1887-e 1937-----@ 1987----------F

 1838-------B 1888--c 1938--------C 1988----------E

 1839-e 1889g 1939-----A 1989-e

 1790----@ 1840--b 1890-------B 1940-------B 1990---b

 1791----------H 1841-------B 1891-----A 1941-------B 1991--c

 1792----------I 1842---------E 1892---a 1942---a 1992-d

 1793-----A 1843----@ 1893---a 1943----@ 1993-----A

 1794i 1844--------C 1894g 1944---------D 1994---------E

 1795-d 1845--------C 1895-e 1945---a 1995-d

 1796----------F 1846--b 1896-f 1946-d 1996------A

 1797---b 1847----------F 1897----------F 1947g 1997----a

 1798-d 1848---------D 1898--------C 1948--c 1998--b

 1799-------B 1849----a 1899------A 1949--b 1999-----A

PART 5: CORRELATION OF SERIES BY SEGMENTS: 14:33 Wed 08 Nov 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 1800 1825 1850 1875 1900 1925 1950 1975

 1849 1874 1899 1924 1949 1974 1999 2024

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

 1 AJR01A 1931 2016 .63 .65 .69

 2 AJR01B 1872 2016 .49 .48 .57 .67 .72 .62

 3 AJR02A 1876 2016 .51 .52 .57 .51 .41

 4 AJR02B 1900 2016 .53 .66 .69 .58

 5 AJR03A 1897 2016 .33 .30A .60 .61 .60

 6 AJR03B 1895 2016 .48 .55 .66 .59 .57

 7 AJR04A 1834 2016 .74 .81 .70 .60 .66 .64 .57

 8 AJR04B 1814 2016 .23B .41 .53 .71 .57 .47 .56 .43

 9 AJR05A 1903 2016 .54 .47 .49 .48

 10 AJR05B 1872 2016 .58 .53 .48 .38 .53 .61

 11 AJR06A 1881 2016 .77 .63 .69 .79 .73

 12 AJR06B 1860 2016 .67 .67 .46 .52 .60 .58

 13 AJR07A 1856 2016 .62 .70 .59 .54 .46 .40

 14 AJR07B 1919 2016 .64 .60 .66 .48

 15 AJR08A 1815 2016 .35 .45 .69 .60 .67 .60 .49 .46

 16 AJR08B 1841 2016 .70 .70 .66 .66 .68 .57 .53

 17 AJR09A 1869 2016 .68 .77 .73 .74 .61 .56

 18 AJR10A 1875 2016 .56 .62 .53 .39 .33A

 19 AJR10B 1790 2016 .32A .40 .58 .73 .70 .53 .47 .60

 Av segment correlation .30 .54 .64 .61 .58 .59 .58 .54

PART 6: POTENTIAL PROBLEMS: 14:33 Wed 08 Nov 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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 AJR01A 1931 to 2016 86 years Series 1

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

 Lower 1956< -.026 1954< -.021 1996< -.020 1952> -.012 2001< -.012 1964< -.010 Higher 2013 .029 1985 .025

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

 1999 +3.0 SD

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

 AJR01B 1872 to 2016 145 years Series 2

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

 Lower 2015< -.018 1886> -.012 1973> -.011 1999> -.008 1901< -.008 1897< -.007 Higher 1953 .018 1967 .017

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

 1886 +3.3 SD; 1999 +3.5 SD

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 AJR02A 1876 to 2016 141 years Series 3

 [B] Entire series, effect on correlation ( .468) is:

 Lower 1983< -.053 1903< -.016 2014< -.016 2003> -.012 1882< -.012 1991> -.011 Higher 1989 .021 2013 .020

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

 1991 +3.0 SD

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

 AJR02B 1900 to 2016 117 years Series 4

 [B] Entire series, effect on correlation ( .589) is:

 Lower 1937< -.018 2005< -.017 1906< -.014 1983< -.012 1909< -.009 1966< -.009 Higher 1953 .023 1985 .017

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 AJR03A 1897 to 2016 120 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

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 1900 1949 0 .07 .17 -.02 -.04 -.04 -.22 -.14 .16 -.34 .03 .30\*-.14 -.06 -.16 -.06 -.11 -.05 .02 .04 -.31 -.10

 [B] Entire series, effect on correlation ( .491) is:

 Lower 1907< -.029 1986< -.020 1914> -.019 1932< -.015 1905< -.014 1993< -.014 Higher 1989 .031 1985 .025

 1900 to 1949 segment:

 Lower 1907< -.067 1914> -.047 1932< -.033 1905< -.031 1919> -.028 1903< -.021 Higher 1916 .044 1936 .041

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 AJR03B 1895 to 2016 122 years Series 6

 [B] Entire series, effect on correlation ( .535) is:

 Lower 1896> -.026 1902< -.024 1978< -.014 1911> -.011 1939> -.009 1946> -.008 Higher 1915 .021 1967 .016

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

 1896 +3.3 SD; 1939 +3.1 SD

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 AJR04A 1834 to 2016 183 years Series 7

 [B] Entire series, effect on correlation ( .664) is:

 Lower 1930< -.022 1973> -.014 1988< -.011 1848< -.010 1897< -.009 1906< -.008 Higher 1859 .028 1953 .010

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 AJR04B 1814 to 2016 203 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

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

 1814 1863 1 -.02 .04 -.09 .01 .04 .13 -.17 .28 .10 .04 .23| .28\*-.27 .00 .13 .00 -.21 .09 -.04 -.04 .26

 [B] Entire series, effect on correlation ( .394) is:

 Lower 1902< -.069 2001< -.018 1851< -.010 1940< -.008 1974< -.008 1821> -.008 Higher 1985 .015 1875 .012

 1814 to 1863 segment:

 Lower 1851< -.044 1818< -.031 1821> -.029 1814< -.025 1833> -.024 1823> -.021 Higher 1862 .045 1834 .037

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

 1901 1902 -5.4 SD 1902 1903 4.8 SD

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

 1902 .252 16 1 >> WARNING: Ring is not usually narrow

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

 1902 -9.0 SD

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 AJR05A 1903 to 2016 114 years Series 9

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

 Lower 1985> -.017 1989> -.015 1924> -.013 1944< -.012 1903< -.012 1971< -.011 Higher 1919 .015 1975 .013

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 AJR05B 1872 to 2016 145 years Series 10

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

 Lower 1955> -.015 1971< -.014 1953> -.012 1990< -.012 1924> -.010 1886> -.010 Higher 2013 .015 1985 .013

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 AJR06A 1881 to 2016 136 years Series 11

 [B] Entire series, effect on correlation ( .732) is:

 Lower 1973> -.012 1914> -.010 2002> -.008 2004< -.008 1941< -.007 1965< -.005 Higher 1989 .007 1889 .006

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 AJR06B 1860 to 2016 157 years Series 12

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

 Lower 1917< -.015 1999< -.013 2000< -.010 1957< -.010 2003> -.009 1952> -.009 Higher 1985 .016 1967 .016

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

 1935 +3.1 SD

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 AJR07A 1856 to 2016 161 years Series 13

 [B] Entire series, effect on correlation ( .552) is:

 Lower 1874< -.019 1999< -.014 1995> -.014 1977< -.012 1862> -.011 1957< -.011 Higher 1859 .040 1915 .015

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 AJR07B 1919 to 2016 98 years Series 14

 [B] Entire series, effect on correlation ( .549) is:

 Lower 1935< -.035 1943< -.024 1973> -.020 2008< -.020 2013> -.019 1926> -.009 Higher 1953 .024 1967 .015

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 AJR08A 1815 to 2016 202 years Series 15

 [B] Entire series, effect on correlation ( .507) is:

 Lower 1973> -.015 1834< -.013 1921> -.012 1833< -.011 1828> -.010 1837< -.010 Higher 1859 .042 1989 .013

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

 1859 1860 4.2 SD

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

 1859 -7.2 SD; 1921 +3.2 SD

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 AJR08B 1841 to 2016 176 years Series 16

 [B] Entire series, effect on correlation ( .632) is:

 Lower 1853< -.014 1985> -.013 1980< -.012 1973> -.009 1896> -.008 1921> -.008 Higher 1859 .017 1989 .011

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 AJR09A 1869 to 2016 148 years Series 17

 [B] Entire series, effect on correlation ( .656) is:

 Lower 2004< -.015 1985> -.014 1871> -.013 1989> -.011 1975> -.010 1950< -.008 Higher 2013 .013 1953 .010

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 AJR10A 1875 to 2016 142 years Series 18

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

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

 1967 2016 0 -.25 .10 .11 .05 -.14 -.03 .23 -.18 .10 -.33 .33\* - - - - - - - - - -

 [B] Entire series, effect on correlation ( .460) is:

 Lower 1987< -.024 2010< -.023 1985> -.023 1997< -.015 1953> -.014 2003> -.014 Higher 1989 .028 1915 .015

 1967 to 2016 segment:

 Lower 1987< -.058 1985> -.055 2010< -.052 2003> -.031 1997< -.028 1993< -.014 Higher 1989 .102 1969 .033

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

 1901 +3.8 SD

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 AJR10B 1790 to 2016 227 years Series 19

 [\*] Early part of series cannot be checked from 1790 to 1813 -- 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

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

 1814 1863 0 -.15 -.05 -.22 .28 -.01 -.07 .12 .25 .05 .03 .32\* .05 .19 .06 .00 .08 .05 -.01 -.36 .09 -.06

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

 Lower 1859> -.015 1953> -.014 1849> -.012 1950< -.010 1898< -.009 1820< -.009 Higher 1915 .013 2013 .012

 1814 to 1863 segment:

 Lower 1849> -.039 1820< -.026 1814> -.020 1841< -.019 1817< -.018 1852> -.018 Higher 1862 .040 1834 .032

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

 1849 +3.3 SD; 1901 +3.4 SD; 1922 +3.2 SD

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PART 7: DESCRIPTIVE STATISTICS: 14:33 Wed 08 Nov 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 AJR01A 1931 2016 86 3 0 .637 2.22 3.96 .641 .700 .172 2.71 .557 .018 1

 2 AJR01B 1872 2016 145 6 0 .578 2.40 4.85 .892 .800 .167 2.86 .478 .066 1

 3 AJR02A 1876 2016 141 5 0 .468 1.54 3.38 .635 .844 .167 2.87 .549 -.033 1

 4 AJR02B 1900 2016 117 4 0 .589 3.13 5.74 1.155 .754 .215 2.72 .543 .013 2

 5 AJR03A 1897 2016 120 5 1 .491 2.40 5.62 1.155 .820 .189 2.76 .549 .016 3

 6 AJR03B 1895 2016 122 5 0 .535 2.11 4.85 .962 .829 .180 2.57 .435 -.023 2

 7 AJR04A 1834 2016 183 7 0 .664 1.88 4.12 .885 .847 .221 2.88 .520 .021 1

 8 AJR04B 1814 2016 203 8 1 .394 1.66 4.14 .936 .856 .240 2.47 .280 -.032 2

 9 AJR05A 1903 2016 114 4 0 .513 2.66 4.46 .688 .712 .151 2.68 .434 -.006 2

 10 AJR05B 1872 2016 145 6 0 .520 2.53 4.11 .588 .601 .166 2.91 .572 .002 1

 11 AJR06A 1881 2016 136 5 0 .732 3.06 5.50 .856 .709 .161 2.65 .449 -.007 1

 12 AJR06B 1860 2016 157 6 0 .557 2.14 4.26 .738 .802 .162 2.74 .509 -.013 1

 13 AJR07A 1856 2016 161 6 0 .552 2.34 3.59 .610 .781 .136 2.84 .513 .026 2

 14 AJR07B 1919 2016 98 4 0 .549 3.82 6.53 .943 .812 .118 2.83 .564 .059 2

 15 AJR08A 1815 2016 202 8 0 .507 1.78 3.94 .913 .848 .217 2.45 .311 .013 2

 16 AJR08B 1841 2016 176 7 0 .632 2.03 4.21 .692 .721 .192 2.90 .562 .008 2

 17 AJR09A 1869 2016 148 6 0 .656 2.10 4.42 .860 .809 .179 2.62 .418 -.001 1

 18 AJR10A 1875 2016 142 5 1 .460 1.53 2.93 .483 .712 .183 2.77 .507 -.034 2

 19 AJR10B 1790 2016 227 8 1 .528 1.70 4.13 .775 .772 .228 2.69 .397 -.012 2

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 Total or mean: 2823 108 4 .552 2.18 6.53 .808 .780 .186 2.91 .470 .003

 - = [ COFECHA AJR COF ] = -