[] Dendrochronology Program Library Run QUAL2 Program COF 09:47 Thu 12 Nov 2015 Page 1

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[] P R O G R A M C O F E C H A Version 6.06P 29537

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 QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

 Title of run: QUAL\_CORE2ROWO\_Corr2-50

 File of DATED series: QUAL\_CORE2ROWO\_Corr2

 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 Y

 8 Parts printed 1234567

 9 Absent rings are omitted from master series and segment correlations (Y)

 Time span of Master dating series is 1839 to 2015 177 years

 Continuous time span is 1839 to 2015 177 years

 Portion with two or more series is 1843 to 2015 173 years

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

 \*C\* Number of dated series 34 \*C\*

 \*O\* Master series 1839 2015 177 yrs \*O\*

 \*F\* Total rings in all series 4413 \*F\*

 \*E\* Total dated rings checked 4409 \*E\*

 \*C\* Series intercorrelation .612 \*C\*

 \*H\* Average mean sensitivity .228 \*H\*

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

 \*\*\* Mean length of series 129.8 \*\*\*

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

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

 No ring measurements of zero value

 1850 .757 5 1900 .357 23 1950 .575 34 2000 1.607 34

 1851 .144 5 1901 .432 23 1951 1.489 34 2001 .210 34

 1852 .614 5 1902 1.420 23 1952 -2.092 34 2002 2.154 34

 1853 -.411 6 1903 1.383 23 1953 -.019 34 2003 -.793 34

 1854 .093 7 1904 1.239 23 1954 -.080 34 2004 .366 34

 1855 .094 7 1905 -.573 23 1955 1.120 34 2005 -.597 34

 1856 -.174 7 1906 1.066 23 1956 .780 34 2006 .243 34

 1857 -.287 8 1907 -.370 23 1957 .050 34 2007 .441 34

 1858 -1.519 8 1908 -1.350 23 1958 -.217 34 2008 -.681 34

 1859 1.044 8 1909 -1.619 23 1959 -.765 34 2009 1.878 34

 1860 1.019 8 1910 -1.190 24 1960 .717 34 2010 -.448 34

 1861 -.614 8 1911 -1.642 24 1961 .867 34 2011 .193 34

 1862 .797 8 1912 -.951 24 1962 -1.133 34 2012 .037 34

 1863 .491 8 1913 .236 24 1963 -3.166 34 2013 .582 34

 1864 -.860 9 1914 .811 24 1964 -1.796 34 2014 -.076 34

 1865 -.332 9 1915 .211 25 1965 -1.486 34 2015 -1.756 33

 1866 -1.934 9 1916 -.675 25 1966 -.329 34

 1867 -.972 9 1917 .273 25 1967 .035 34

 1868 -.032 9 1918 -1.967 25 1968 -.640 34

 1869 1.090 9 1919 -.755 27 1969 1.210 34

 1870 .046 11 1920 -2.002 28 1970 .755 34

 1871 .341 11 1921 .407 28 1971 .737 34

 1872 -.698 11 1922 .424 30 1972 1.424 34

 1873 .377 11 1923 .121 32 1973 .730 34

 1874 .999 11 1924 .172 32 1974 1.629 34

 1875 -.572 11 1925 1.463 33 1975 1.405 34

 1876 -.452 12 1926 -.440 33 1976 .584 34

 1877 -.563 13 1927 .519 33 1977 -.072 34

 1878 .674 14 1928 .636 33 1978 .886 34

 1879 1.107 14 1929 -.631 33 1979 1.143 34

 1880 .628 15 1930 -.688 34 1980 1.380 34

 1881 1.161 15 1931 .193 34 1981 -1.771 34

 1882 -.383 15 1932 1.565 34 1982 -3.163 34

 1883 .020 17 1933 -.474 34 1983 -.970 34

 1884 -1.078 18 1934 1.064 34 1984 -.694 34

 1885 -.389 19 1935 .465 34 1985 .050 34

 1886 .881 19 1936 -.435 34 1986 -.609 34

 1887 -.566 19 1937 1.135 34 1987 .528 34

 1888 .411 21 1938 .675 34 1988 .300 34

 1839 .264 1 1889 .230 22 1939 .823 34 1989 1.358 34

 1840 .144 1 1890 -.180 22 1940 -.032 34 1990 -.290 34

 1841 1.111 1 1891 -.238 22 1941 -1.405 34 1991 -2.716 34

 1842 2.457 1 1892 -.176 22 1942 -.006 34 1992 -.265 34

 1843 1.883 2 1893 -.547 22 1943 -.413 34 1993 -1.138 34

 1844 -.865 2 1894 -1.557 22 1944 1.053 34 1994 -.804 34

 1845 -1.527 2 1895 -.282 22 1945 .413 34 1995 .747 34

 1846 -1.054 2 1896 .730 22 1946 -.428 34 1996 -.348 34

 1847 -.847 3 1897 1.569 22 1947 -1.281 34 1997 -1.060 34

 1848 .644 5 1898 .450 23 1948 -.348 34 1998 1.161 34

 1849 -.081 5 1899 -.178 23 1949 -1.055 34 1999 -.127 34

 PART 5: CORRELATION OF SERIES BY SEGMENTS: QUAL\_CORE2ROWO\_Corr2-50 09:47 Thu 12 Nov 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 1825 1850 1875 1900 1925 1950 1975

 1874 1899 1924 1949 1974 1999 2024

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

 1 1560A 1922 2015 .66 .70 .80 .71

 2 1560B 1925 2015 .73 .84 .80

 3 1572A 1883 2015 .56 .66 .65 .81 .67

 4 1572B 1910 2015 .56 .64 .61 .56

 5 1579A 1930 2015 .74 .81 .71

 6 1579B 1915 2015 .48 .58 .71 .68

 7 1578A 1889 2015 .55 .46 .54 .75 .78

 8 1578B 1888 2015 .47 .45 .66 .77 .67

 9 1558A 1923 2015 .62 .63 .66 .71

 10 1566A 1885 2015 .58 .64 .49 .66 .65

 11 1566B 1898 2015 .41 .43 .47 .66 .70

 12 1569A RE 1883 2015 .46 .48 .61 .70 .70

 13 1569B 1878 2015 .41B .53 .60 .72 .75

 14 1574A 1919 2015 .74 .77 .79 .70

 15 1574B 1923 2015 .60 .62 .88 .80

 16 1571A 1870 2015 .47 .48 .65 .57 .64 .64

 17 1568A 1880 2015 .47 .46 .59 .77 .61

 18 1568B 1884 2015 .44 .48 .65 .82 .62

 19 1575A 1888 2015 .71 .72 .69 .78 .84

 20 1575B 1870 2015 .43 .46 .48 .45 .63 .64

 21 1570A 1857 2015 .52 .54 .58 .68 .70 .57

 22 1570B 1853 2014 .38 .49 .60 .68 .73 .67

 23 1573A 1877 2015 .32A .61 .78 .83 .63

 24 1559A 1919 2015 .55 .65 .77 .70

 25 1559B 1920 2015 .81 .81 .83 .66

 26 1576A 1864 2015 .66 .66 .58 .66 .73 .73

 27 1576B 1843 2015 .40 .42 .59 .53 .66 .77 .78

 28 1590B RE 1854 2015 .56 .64 .67 .68 .83 .85

 29 1581A RE 1848 2015 .34 .33 .59 .49 .52 .59 .52

 30 1581B 1839 2015 .45 .52 .60 .52 .64 .70 .58

 31 1571B RE 1848 2015 .35 .34 .57 .55 .49 .67 .78

 32 1590A RE 1847 2015 .60 .61 .71 .68 .65 .73 .76

 33 1558B 1922 2015 .37 .40 .58 .75

 34 1573B RE 1876 2015 .33A .63 .74 .77 .74

 Av segment correlation .43 .48 .52 .57 .63 .74 .70

PART 6: POTENTIAL PROBLEMS: QUAL\_CORE2ROWO\_Corr2-50 09:47 Thu 12 Nov 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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 1560A 1922 to 2015 94 years Series 1

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

 Lower 1922< -.026 1946< -.023 1933< -.021 1947> -.013 1995< -.011 2005> -.006 Higher 1963 .036 1952 .026

 1560A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1922 202 445 374 448 300 333 349 267

 1930 335 368 423 252 292 300 289 313 348 293

 1940 228 215 252 233 247 204 135 183 169 123

 1950 205 202 114 143 155 238 157 143 153 137

 1960 146 144 103 41 64 97 83 103 109 198

 1970 189 208 175 129 156 178 143 160 140 152

 1980 129 62 40 55 51 69 55 73 62 80

 1990 58 39 45 67 38 47 57 62 118 112

 2000 149 158 178 132 160 165 152 148 156 240

 2010 156 152 133 176 137 134

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 1560B 1925 to 2015 91 years Series 2

 [B] Entire series, effect on correlation ( .767) is:

 Lower 1965< -.015 1933< -.012 2014< -.012 2015> -.011 2010< -.010 1959> -.008 Higher 1991 .024 1982 .020

1560B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1925 460 328 291 341 296

 1930 287 254 345 225 296 278 225 256 306 268

 1940 219 176 219 188 231 211 161 158 150 152

 1950 229 275 141 168 167 201 160 138 147 154

 1960 143 150 80 59 56 32 77 99 70 93

 1970 124 107 144 134 121 132 115 96 114 115

 1980 100 48 22 52 56 56 44 71 73 92

 1990 66 30 53 43 49 127 103 104 147 115

 2000 168 181 192 120 149 125 163 172 155 214

 2010 118 175 143 191 125 140

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 1572A 1883 to 2015 133 years Series 3

 [B] Entire series, effect on correlation ( .596) is:

 Lower 2014< -.021 1884> -.018 1891< -.014 1933> -.013 2003> -.009 1991> -.009 Higher 1952 .019 1981 .013

 1572A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1883 45 65 44 67 51 35 36

 1890 39 22 44 28 32 26 37 37 40 20

 1900 40 42 46 78 70 36 56 43 31 40

 1910 54 40 46 60 115 99 54 96 29 83

 1920 69 108 127 166 178 224 168 202 201 210

 1930 165 206 267 284 272 280 224 249 203 247

 1940 184 162 232 287 377 195 214 170 128 165

 1950 190 193 113 119 153 154 141 142 142 107

 1960 188 122 86 73 64 70 92 109 94 125

 1970 139 124 139 153 147 132 84 83 136 129

 1980 112 40 34 46 42 50 51 60 63 82

 1990 43 40 49 38 44 67 56 42 94 68

 2000 116 85 149 111 110 75 111 136 98 116

 2010 102 105 115 120 104 115

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1572B 1910 to 2015 106 years Series 4

 [B] Entire series, effect on correlation ( .580) is:

 Lower 1991> -.029 1910> -.024 1945< -.015 1990< -.012 1983< -.012 2015> -.011 Higher 1981 .025 1918 .020

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

 1910 +4.0 SD

 1572B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1910 67 38 46 46 64 66 62 103 51 79

 1920 81 135 214 251 257 280 246 248 260 204

 1930 278 306 297 228 265 205 163 307 236 297

 1940 240 141 214 280 242 140 132 109 133 152

 1950 181 253 159 180 168 143 187 145 115 81

 1960 181 198 118 78 97 80 86 106 84 142

 1970 118 133 166 141 145 155 98 79 128 99

 1980 121 52 44 32 51 58 58 48 39 47

 1990 29 38 35 40 39 45 36 41 68 50

 2000 97 66 96 75 67 56 83 118 108 148

 2010 103 103 86 116 89 103

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 1579A 1930 to 2015 86 years Series 5

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

 Lower 1945< -.031 1991> -.017 2010> -.015 2013< -.013 1980< -.013 2006< -.006 Higher 1952 .032 1982 .021

 1579A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1930 256 299 348 307 366 291 243 255 282 299

 1940 248 219 251 198 227 161 183 173 180 167

 1950 175 198 99 175 173 176 149 134 143 98

 1960 117 118 80 49 60 66 81 83 70 125

 1970 130 188 172 159 163 147 154 135 156 157

 1980 114 82 68 121 122 157 130 195 193 183

 1990 137 126 170 151 136 191 150 115 154 132

 2000 145 138 174 114 141 131 116 123 123 162

 2010 133 112 100 84 112 72

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1579B 1915 to 2015 101 years Series 6

 [B] Entire series, effect on correlation ( .595) is:

 Lower 1920> -.014 1925< -.013 1991> -.011 1929> -.011 1937< -.011 1951< -.010 Higher 1952 .039 1982 .039

 1579B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1915 209 241 237 231 283

 1920 315 463 618 389 203 210 207 237 346 360

 1930 367 259 251 178 229 213 155 160 175 220

 1940 178 123 131 116 121 126 123 106 115 89

 1950 95 84 45 118 101 104 84 105 108 61

 1960 112 100 75 46 73 52 62 92 56 141

 1970 160 154 137 132 140 153 138 116 122 148

 1980 124 79 39 133 133 157 157 181 223 218

 1990 162 143 189 148 193 178 152 147 153 137

 2000 163 125 181 117 157 138 133 114 129 122

 2010 97 80 112 97 109 56

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 1578A 1889 to 2015 127 years Series 7

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

 Lower 1939< -.036 1920> -.013 1918> -.013 1952> -.010 1929< -.009 1987< -.009 Higher 1963 .026 1991 .012

 1578A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1889 172

 1890 102 87 71 74 81 114 159 141 106 105

 1900 98 84 86 109 120 74 101 76 55 35

 1910 50 30 49 93 143 115 98 123 121 145

 1920 148 167 198 220 174 213 177 204 181 136

 1930 178 155 159 150 195 176 166 164 133 109

 1940 146 112 135 99 154 124 96 113 107 84

 1950 87 149 87 97 75 102 86 63 74 61

 1960 64 84 49 31 23 32 38 34 43 59

 1970 51 61 64 59 61 75 56 47 61 54

 1980 94 33 25 21 20 27 22 20 37 41

 1990 28 23 38 39 41 54 43 51 64 48

 2000 72 78 77 55 67 59 72 72 59 107

 2010 61 69 75 69 80 65

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1578B 1888 to 2015 128 years Series 8

 [B] Entire series, effect on correlation ( .623) is:

 Lower 1928< -.022 1985< -.015 1920> -.014 1909< -.010 2005< -.009 1926> -.009 Higher 1991 .017 1963 .016

 1578B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1888 210 200

 1890 141 144 120 105 102 111 116 137 94 70

 1900 78 92 89 95 82 56 71 70 58 37

 1910 41 65 70 89 101 120 88 106 99 90

 1920 120 154 174 193 135 156 176 157 108 122

 1930 138 152 195 173 239 174 144 155 148 123

 1940 119 119 120 114 160 136 123 118 136 95

 1950 103 146 91 99 92 106 104 95 88 73

 1960 96 91 43 29 46 37 43 47 50 74

 1970 52 53 68 57 65 72 42 42 65 55

 1980 73 41 19 30 21 16 33 39 41 47

 1990 38 26 47 33 54 60 56 65 80 63

 2000 94 87 93 67 73 49 78 86 75 124

 2010 71 82 72 114 99 93

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 1558A 1923 to 2015 93 years Series 9

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

 Lower 1954< -.091 1947> -.021 2010> -.017 2014> -.010 1962> -.008 1993> -.007 Higher 1952 .046 1963 .042

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

 1954 -5.8 SD

 1558A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1923 183 203 301 249 358 390 313

 1930 306 392 567 415 431 306 274 293 326 360

 1940 273 170 224 200 206 231 208 250 223 176

 1950 224 194 64 109 40 111 102 105 110 92

 1960 96 95 86 42 59 64 80 78 68 103

 1970 121 116 115 88 102 104 106 75 92 106

 1980 106 54 39 61 60 113 98 103 126 117

 1990 87 50 55 84 70 77 77 71 98 84

 2000 99 83 118 80 99 96 105 123 97 117

 2010 125 104 97 102 141 112

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1566A 1885 to 2015 131 years Series 10

 [B] Entire series, effect on correlation ( .570) is:

 Lower 2004< -.052 1886< -.026 1961< -.017 1932< -.009 1989< -.009 1887> -.008 Higher 1991 .033 1981 .021

 1566A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1885 93 65 115 156 164

 1890 127 143 79 87 73 114 153 200 134 135

 1900 151 144 232 198 149 117 172 115 73 79

 1910 107 57 76 83 112 107 78 87 69 116

 1920 81 166 172 175 166 178 126 193 194 127

 1930 111 103 103 86 113 120 85 118 100 98

 1940 95 96 102 108 97 126 113 72 96 58

 1950 102 77 63 56 77 95 61 86 52 57

 1960 75 45 58 51 55 50 92 89 106 125

 1970 96 107 116 117 166 120 107 80 100 100

 1980 106 62 65 119 106 138 87 145 113 92

 1990 85 50 100 80 77 104 77 74 119 88

 2000 126 103 143 88 62 104 113 130 101 185

 2010 93 128 109 111 105 110

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 1566B 1898 to 2015 118 years Series 11

 [B] Entire series, effect on correlation ( .556) is:

 Lower 1961< -.026 1911> -.020 1913< -.018 2013< -.014 1944< -.011 1909> -.011 Higher 1991 .045 1981 .022

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

 1911 +3.1 SD

 1566B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1898 154 130

 1900 196 225 389 345 224 156 273 144 146 178

 1910 187 221 148 88 115 105 83 112 67 73

 1920 49 143 178 215 240 264 235 291 255 201

 1930 232 209 199 106 175 169 127 231 272 212

 1940 189 166 224 203 146 204 160 120 122 76

 1950 123 89 69 80 60 90 68 55 48 61

 1960 67 38 53 45 57 67 74 99 115 183

 1970 129 133 183 119 207 143 150 113 159 142

 1980 139 75 79 98 87 134 111 135 103 103

 1990 94 56 89 66 87 89 60 84 109 83

 2000 103 68 142 81 83 93 99 130 115 175

 2010 94 111 119 80 93 89

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 1569A RE 1883 to 2015 133 years Series 12

 [B] Entire series, effect on correlation ( .586) is:

 Lower 1955< -.018 1894> -.016 1936> -.014 1905> -.013 1944< -.011 1899> -.009 Higher 1963 .039 1918 .018

 1569A RE Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1883 212 180 151 160 118 138 112

 1890 102 102 85 67 98 89 90 97 75 95

 1900 57 82 55 49 38 58 46 37 27 29

 1910 24 31 42 55 65 52 57 61 32 84

 1920 74 101 107 122 122 157 105 113 142 108

 1930 115 116 114 95 123 111 145 118 104 120

 1940 97 63 99 101 76 90 61 77 69 72

 1950 95 104 60 80 62 45 49 58 56 49

 1960 59 76 55 28 35 53 59 62 44 64

 1970 65 64 78 63 76 108 95 98 88 96

 1980 84 42 39 66 98 107 74 80 73 91

 1990 69 47 49 63 42 100 84 64 134 113

 2000 143 115 151 110 125 129 123 120 130 132

 2010 119 140 149 137 125 116

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 1569B 1878 to 2015 138 years Series 13

 [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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 1878 1927 2 .01 -.14 -.03 -.27 -.29 -.09 -.23 .05 .02 .27 .41| .14 .42\*-.13 .12 -.05 -.05 .04 .09 .19 .12

 [B] Entire series, effect on correlation ( .605) is:

 Lower 1920> -.014 1894> -.010 1885< -.010 1957< -.009 1906< -.008 1918> -.008 Higher 1982 .032 1991 .025

 1878 to 1927 segment:

 Lower 1920> -.042 1885< -.033 1906< -.031 1894> -.029 1886< -.027 1884> -.019 Higher 1925 .036 1909 .033

 1569B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1878 250 236

 1880 191 251 204 180 175 117 123 116 117 100

 1890 92 128 90 98 103 113 97 113 114 56

 1900 82 79 99 64 77 62 46 39 31 27

 1910 38 37 46 86 73 84 57 83 73 67

 1920 89 86 101 105 113 142 104 120 108 112

 1930 81 92 111 91 133 129 109 113 104 123

 1940 124 79 83 69 107 106 79 76 60 54

 1950 84 91 49 68 51 48 43 31 48 45

 1960 42 58 44 32 49 45 60 73 43 64

 1970 79 57 84 61 87 74 73 75 68 71

 1980 71 45 25 61 63 83 75 85 63 85

 1990 68 34 68 64 37 67 63 38 68 56

 2000 84 106 113 63 100 113 117 95 83 127

 2010 82 96 90 173 117 104

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 1574A 1919 to 2015 97 years Series 14

 [B] Entire series, effect on correlation ( .710) is:

 Lower 2012> -.016 1948< -.011 2006< -.008 1919> -.008 2010> -.007 1973< -.006 Higher 1963 .031 1952 .029

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

 2012 +3.3 SD

 1574A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1919 387

 1920 323 336 328 297 280 340 228 262 313 210

 1930 287 321 317 209 232 201 227 239 216 242

 1940 163 153 179 156 173 160 142 126 103 124

 1950 117 139 70 92 102 113 153 102 101 102

 1960 106 123 82 56 92 77 87 97 74 115

 1970 114 113 108 82 136 124 104 96 124 118

 1980 152 68 37 65 73 85 96 109 128 117

 1990 66 43 54 33 58 92 51 76 87 75

 2000 117 83 111 56 97 85 68 79 83 90

 2010 89 87 137 86 88 63

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 1574B 1923 to 2015 93 years Series 15

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

 Lower 1940< -.036 1936< -.019 1927< -.015 1997> -.010 1943< -.009 1949> -.008 Higher 1963 .024 1991 .023

 1574B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1923 267 308 429 312 242 430 384

 1930 355 352 420 324 307 273 172 285 290 317

 1940 166 196 235 154 273 289 202 180 166 202

 1950 198 236 127 140 161 251 177 152 182 166

 1960 168 181 120 67 83 85 102 114 104 127

 1970 146 167 154 144 188 157 123 115 138 134

 1980 131 66 31 62 56 94 93 113 138 137

 1990 83 33 48 56 77 114 87 88 83 76

 2000 86 62 88 54 72 72 74 86 73 117

 2010 95 112 114 114 125 73

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1571A 1870 to 2015 146 years Series 16

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

 Lower 1878< -.027 1875> -.021 1887> -.021 1871< -.011 1965> -.010 1920> -.009 Higher 1918 .019 1981 .015

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

 1875 +3.5 SD; 1887 +3.3 SD

 1571A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1870 52 45 63 72 70 95 70 68 52 79

 1880 70 85 86 69 57 79 103 119 96 94

 1890 80 75 79 69 65 78 95 94 78 61

 1900 62 53 68 57 71 41 51 36 23 27

 1910 27 32 47 51 50 56 49 61 43 60

 1920 76 91 89 98 91 122 111 125 116 125

 1930 158 185 223 146 172 189 190 161 183 203

 1940 201 137 174 132 179 124 131 68 95 90

 1950 98 103 72 97 101 89 82 56 47 51

 1960 69 97 54 45 55 85 89 64 64 68

 1970 77 86 84 78 104 102 68 64 83 76

 1980 66 43 49 60 113 93 60 68 101 110

 1990 91 69 113 97 102 98 114 92 127 84

 2000 124 99 161 78 110 80 109 105 74 83

 2010 58 81 58 54 63 56

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 1568A 1880 to 2015 136 years Series 17

 [B] Entire series, effect on correlation ( .554) is:

 Lower 2007< -.034 1936< -.031 1990> -.009 2000< -.009 1982> -.008 1918> -.007 Higher 1991 .029 1981 .025

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

 1936 -4.6 SD

 1568A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1880 356 202 149 142 130 147 164 122 142 111

 1890 120 95 112 106 89 78 90 81 72 59

 1900 67 67 65 82 86 75 88 77 63 57

 1910 61 44 51 268 232 174 164 173 136 111

 1920 124 159 169 172 174 211 193 213 200 162

 1930 169 204 216 172 176 156 120 169 152 157

 1940 177 130 132 155 198 179 114 132 154 143

 1950 138 150 99 97 134 128 144 115 121 89

 1960 130 130 79 70 65 85 100 108 103 126

 1970 148 144 193 197 183 158 152 125 139 170

 1980 240 98 101 130 140 175 151 165 207 185

 1990 189 82 119 114 102 124 104 84 128 122

 2000 91 65 107 94 81 70 106 57 66 109

 2010 67 92 85 95 95 74

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 1568B 1884 to 2015 132 years Series 18

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

 Lower 1889< -.024 2007< -.015 2013< -.014 2001< -.012 1926> -.011 1894> -.010 Higher 1963 .037 1982 .026

 1568B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1884 122 139 145 129 181 111

 1890 143 123 125 110 115 129 144 115 106 70

 1900 69 60 91 72 117 57 68 65 44 55

 1910 63 72 130 200 235 212 163 148 73 129

 1920 121 158 142 141 169 233 241 239 196 205

 1930 171 183 190 141 168 154 146 164 190 159

 1940 204 152 149 163 185 159 121 145 152 133

 1950 182 197 120 122 168 164 160 115 127 121

 1960 142 158 130 86 120 125 111 123 132 171

 1970 180 156 175 136 140 113 126 93 100 132

 1980 144 82 55 75 96 107 93 122 126 150

 1990 132 70 87 85 99 125 97 78 99 109

 2000 121 67 107 80 65 74 89 60 73 82

 2010 69 83 86 55 76 54

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 1575A 1888 to 2015 128 years Series 19

 [B] Entire series, effect on correlation ( .754) is:

 Lower 1938< -.010 1993> -.008 1958< -.007 1910> -.006 1946< -.006 1965> -.005 Higher 1991 .019 1981 .012

 1575A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1888 74 70

 1890 54 57 34 31 25 30 45 72 101 106

 1900 113 141 157 141 139 94 168 105 94 86

 1910 139 73 157 178 176 182 163 223 192 210

 1920 176 269 325 346 393 456 383 482 449 345

 1930 408 443 577 457 525 426 395 444 310 329

 1940 326 283 299 284 367 275 177 135 181 168

 1950 212 309 154 231 241 235 233 222 115 143

 1960 122 143 91 77 108 130 146 141 123 152

 1970 114 115 137 158 184 174 137 137 139 146

 1980 167 68 49 60 72 80 88 77 67 86

 1990 69 36 88 82 89 88 65 66 78 65

 2000 94 77 95 61 84 62 69 80 72 94

 2010 73 78 82 80 71 64

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 1575B 1870 to 2015 146 years Series 20

 [B] Entire series, effect on correlation ( .519) is:

 Lower 1938< -.048 1911> -.017 1970< -.013 1941> -.012 1963> -.011 1871< -.011 Higher 1918 .016 2002 .013

 1575B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1870 197 147 130 177 182 166 168 155 147 111

 1880 131 136 74 84 69 88 86 76 53 44

 1890 39 27 28 24 19 23 27 48 63 83

 1900 83 87 104 114 118 57 102 79 71 104

 1910 122 204 165 236 264 235 230 224 155 182

 1920 215 309 298 315 337 373 255 264 268 208

 1930 269 286 308 263 281 273 255 288 180 207

 1940 170 199 160 174 202 169 117 102 124 102

 1950 118 139 84 121 123 159 148 136 68 57

 1960 84 85 59 67 66 68 113 97 100 122

 1970 74 100 98 93 107 116 96 84 94 116

 1980 106 68 55 59 58 51 51 74 61 93

 1990 58 52 79 66 64 73 66 48 52 48

 2000 76 46 85 42 51 44 47 44 39 50

 2010 42 42 55 60 47 41

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 1570A 1857 to 2015 159 years Series 21

 [B] Entire series, effect on correlation ( .585) is:

 Lower 1991> -.030 1887< -.019 1958< -.016 2015> -.013 1872> -.010 2010> -.010 Higher 1952 .019 1982 .017

 1570A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1857 146 161 264

 1860 223 167 240 185 149 180 121 164 147 194

 1870 157 174 216 216 224 166 157 129 174 212

 1880 266 173 132 140 127 134 130 65 108 79

 1890 85 83 87 100 93 108 125 135 110 105

 1900 121 103 134 91 103 96 123 80 78 52

 1910 37 34 56 50 62 51 46 82 57 69

 1920 35 104 79 75 93 120 81 92 115 147

 1930 112 158 250 184 205 191 256 273 270 221

 1940 179 150 152 147 214 204 232 153 221 147

 1950 202 210 104 154 134 148 180 116 65 75

 1960 102 114 75 62 72 81 85 103 101 128

 1970 106 114 147 111 138 124 126 114 104 132

 1980 115 64 43 59 57 49 49 55 61 61

 1990 40 53 39 35 46 49 48 39 63 58

 2000 71 55 77 54 85 55 65 78 66 78

 2010 81 60 65 92 66 81

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 1570B 1853 to 2014 162 years Series 22

 [B] Entire series, effect on correlation ( .590) is:

 Lower 1858> -.023 1918> -.013 1958< -.012 1982> -.011 1889< -.009 2008< -.007 Higher 1963 .022 1991 .021

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

 1858 +3.1 SD

 1570B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1853 104 115 107 128 144 197 322

 1860 190 116 161 138 88 126 105 124 96 109

 1870 88 77 75 150 162 112 147 131 129 202

 1880 152 172 172 172 132 107 141 68 89 62

 1890 88 101 106 130 100 129 132 148 139 122

 1900 122 109 159 124 154 125 184 121 95 61

 1910 47 27 35 50 47 62 60 97 81 87

 1920 61 156 95 83 123 116 98 119 119 106

 1930 96 135 184 138 182 143 172 213 218 218

 1940 177 162 179 208 217 200 192 123 181 137

 1950 190 180 119 166 145 170 183 133 83 120

 1960 92 99 73 51 87 88 91 133 119 134

 1970 122 120 124 124 155 147 127 113 123 137

 1980 137 63 70 59 57 41 44 61 54 65

 1990 60 39 54 48 62 80 74 57 78 78

 2000 106 93 115 98 99 101 104 121 89 136

 2010 117 115 107 123 105

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 1573A 1877 to 2015 139 years Series 23

 [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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 1877 1926 0 .06 .04 .19 .04 .10 -.05 .17 .04 .06 .03 .32\* .13 .00 -.06 -.02 -.23 -.04 .01 -.02 -.02 -.05

 [B] Entire series, effect on correlation ( .570) is:

 Lower 1887> -.024 2012< -.022 1892< -.016 1909> -.012 2015> -.010 1905> -.009 Higher 1991 .036 1963 .012

 1877 to 1926 segment:

 Lower 1887> -.071 1909> -.034 1892< -.031 1905> -.027 1914< -.025 1888< -.023 Higher 1918 .065 1911 .047

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

 1938 +3.3 SD

1573A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1877 106 125 95

 1880 82 77 66 63 53 68 66 88 59 88

 1890 64 58 40 53 45 39 47 48 38 33

 1900 43 44 53 61 37 46 69 39 36 41

 1910 41 17 14 24 18 28 35 41 28 41

 1920 36 70 80 106 103 127 114 147 160 143

 1930 147 156 178 161 216 191 180 260 337 253

 1940 191 165 170 137 169 160 132 106 94 94

 1950 117 150 103 103 107 133 137 111 89 67

 1960 93 101 63 45 52 32 51 61 54 83

 1970 84 79 112 96 91 98 86 72 102 85

 1980 99 60 41 38 43 44 41 39 48 58

 1990 50 33 67 56 66 72 73 70 116 93

 2000 113 96 122 101 119 92 118 116 77 92

 2010 86 102 69 67 74 74

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 1559A 1919 to 2015 97 years Series 24

 [B] Entire series, effect on correlation ( .624) is:

 Lower 1920> -.032 1944< -.029 2007< -.016 2005> -.015 1962> -.009 1919< -.008 Higher 1952 .032 1991 .028

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

 1920 +3.0 SD

 1559A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1919 169

 1920 422 361 424 354 282 401 192 275 351 293

 1930 250 248 400 257 344 344 254 380 289 252

 1940 237 151 261 218 155 226 181 146 137 165

 1950 177 180 94 95 114 122 129 149 114 104

 1960 143 147 109 60 44 51 59 68 58 113

 1970 123 139 132 118 115 107 111 72 87 85

 1980 86 55 33 39 46 65 59 69 49 65

 1990 60 30 37 36 28 55 49 54 64 60

 2000 81 61 76 40 72 97 71 48 56 74

 2010 67 110 91 109 89 67

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1559B 1920 to 2015 96 years Series 25

 [B] Entire series, effect on correlation ( .728) is:

 Lower 2010< -.034 1944< -.017 2008> -.016 1927< -.008 1928< -.007 1989< -.006 Higher 1952 .027 1982 .017

 1559B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1920 161 187 195 227 233 329 230 200 197 203

 1930 232 332 463 313 310 362 257 369 381 342

 1940 268 169 274 208 154 186 147 112 179 124

 1950 156 184 71 117 97 122 119 93 96 83

 1960 139 125 86 47 43 52 77 96 78 133

 1970 130 110 114 98 127 127 134 116 117 133

 1980 131 58 18 40 39 60 56 65 59 51

 1990 46 25 36 23 47 62 69 61 76 80

 2000 86 70 87 68 80 77 64 67 96 136

 2010 55 87 61 91 92 71

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 1576A 1864 to 2015 152 years Series 26

 [B] Entire series, effect on correlation ( .673) is:

 Lower 1930< -.016 1991> -.015 1932< -.012 1992< -.012 1908> -.011 1916> -.009 Higher 1982 .020 1963 .013

 1576A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1864 57 64 43 44 86 115

 1870 134 139 76 104 130 93 95 99 106 117

 1880 116 136 117 105 76 124 123 79 100 99

 1890 97 90 97 89 79 107 97 186 125 105

 1900 129 124 138 133 208 74 114 89 107 51

 1910 50 57 59 74 95 87 128 140 78 112

 1920 74 114 111 111 127 145 139 170 164 107

 1930 77 139 129 140 197 227 203 337 236 165

 1940 236 155 205 180 218 156 153 129 133 137

 1950 139 199 128 145 136 166 147 146 143 124

 1960 149 174 100 69 69 69 101 119 139 151

 1970 120 153 186 171 225 154 108 139 166 150

 1980 147 90 49 125 162 137 102 152 94 152

 1990 90 72 44 48 47 92 76 77 119 73

 2000 162 130 172 96 131 126 160 122 119 180

 2010 121 170 147 173 129 88

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1576B 1843 to 2015 173 years Series 27

 [B] Entire series, effect on correlation ( .630) is:

 Lower 1947> -.018 1982> -.008 1846> -.008 1951< -.008 1918> -.008 1851> -.007 Higher 1963 .027 1991 .027

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

 1947 +3.3 SD

 1576B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1843 241 107 91 129 110 89 119

 1850 139 172 172 93 56 61 46 48 42 58

 1860 78 71 84 81 72 87 57 52 77 82

 1870 68 86 69 84 89 80 85 102 111 100

 1880 106 181 87 128 100 109 176 110 113 118

 1890 110 95 127 121 113 113 127 155 97 85

 1900 112 136 156 136 164 61 69 59 46 63

 1910 47 63 65 89 151 109 124 91 90 104

 1920 85 161 121 119 119 126 67 105 155 83

 1930 89 125 123 109 120 120 99 136 94 84

 1940 114 71 80 108 122 128 98 124 91 61

 1950 80 65 49 63 60 78 60 54 53 37

 1960 63 58 47 32 51 43 59 56 63 77

 1970 72 66 78 70 76 74 67 52 79 78

 1980 102 45 45 58 49 50 32 52 54 57

 1990 54 14 45 22 29 40 31 39 52 37

 2000 61 49 71 47 61 52 58 78 68 92

 2010 66 74 70 79 73 63

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 1590B RE 1854 to 2015 162 years Series 28

 [B] Entire series, effect on correlation ( .704) is:

 Lower 1887< -.014 1937< -.014 1957< -.007 1861< -.007 1904< -.006 2008> -.006 Higher 1991 .022 1952 .012

 1590B RE Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1854 100 112 110 108 92 109

 1860 122 57 78 74 67 72 68 63 104 141

 1870 82 97 98 148 123 92 94 98 123 144

 1880 140 129 106 105 90 88 101 73 105 97

 1890 94 102 102 95 70 104 86 93 93 102

 1900 92 86 109 121 78 68 83 78 57 57

 1910 66 63 59 114 151 119 119 181 133 138

 1920 82 155 176 165 232 277 230 303 337 277

 1930 259 265 378 258 266 266 261 234 286 276

 1940 240 213 244 256 264 212 218 183 183 190

 1950 239 196 136 139 151 155 142 110 145 140

 1960 169 170 113 100 122 111 134 143 143 174

 1970 136 169 187 194 239 195 167 169 166 187

 1980 184 112 97 139 128 135 123 146 136 165

 1990 120 85 137 132 144 154 133 114 182 167

 2000 214 160 217 168 160 146 155 217 211 289

 2010 186 173 203 199 179 150

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 1581A RE 1848 to 2015 168 years Series 29

 [B] Entire series, effect on correlation ( .471) is:

 Lower 1873< -.022 1941> -.015 1852< -.015 1923< -.014 1982> -.013 1853> -.010 Higher 1981 .026 1920 .009

 1581A RE Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1848 106 93

 1850 92 69 59 86 89 78 66 51 47 72

 1860 64 54 54 57 46 38 34 43 48 46

 1870 49 76 54 28 45 42 49 36 84 127

 1880 80 109 98 113 85 101 129 115 101 120

 1890 108 111 119 102 71 108 125 144 103 108

 1900 109 103 98 101 69 51 94 76 58 47

 1910 34 30 31 52 67 71 32 55 47 52

 1920 15 53 75 35 75 72 63 95 107 97

 1930 93 131 168 140 185 117 122 113 141 173

 1940 149 173 143 87 141 70 91 46 81 73

 1950 69 115 56 90 114 118 91 99 66 54

 1960 62 63 41 39 42 43 56 65 29 58

 1970 39 36 56 56 39 58 42 29 35 36

 1980 43 15 27 33 27 27 20 30 20 47

 1990 25 26 50 34 40 63 48 43 51 41

 2000 46 49 44 40 31 25 37 41 21 48

 2010 41 35 48 30 35 22

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 1581B 1839 to 2015 177 years Series 30

 [\*] Early part of series cannot be checked from 1839 to 1842 -- not matched by another series

 [B] Entire series, effect on correlation ( .571) is:

 Lower 1911> -.017 1988< -.012 1940< -.011 1941> -.011 2009< -.010 2003> -.009 Higher 1982 .029 1952 .026

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

 1911 +3.4 SD

1581B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1839 115

 1840 110 124 149 131 85 71 64 78 79 67

 1850 76 71 86 106 121 110 125 106 89 128

 1860 108 85 109 115 90 81 57 77 77 98

 1870 70 113 93 91 121 79 101 89 141 149

 1880 138 146 128 165 125 129 183 130 132 138

 1890 120 135 130 105 76 92 124 149 108 116

 1900 103 86 103 111 115 53 90 62 49 48

 1910 58 101 66 79 80 52 50 83 65 72

 1920 32 78 83 67 112 170 128 166 163 140

 1930 140 159 210 159 171 162 140 172 120 147

 1940 93 145 135 109 154 124 127 83 110 90

 1950 90 119 61 99 124 112 109 104 96 76

 1960 114 86 45 53 85 76 85 83 68 104

 1970 88 59 91 59 74 92 56 60 62 51

 1980 61 37 21 43 46 40 27 43 25 57

 1990 47 34 45 38 34 49 40 36 49 39

 2000 42 52 43 42 42 33 42 49 29 34

 2010 42 37 41 49 36 24

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 1571B RE 1848 to 2015 168 years Series 31

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

 Lower 1928< -.021 1861> -.012 1965> -.012 1957< -.011 1859< -.011 1941> -.009 Higher 1982 .030 1963 .015

 1571B RE Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1848 166 157

 1850 183 173 174 84 96 86 64 93 31 54

 1860 86 90 100 64 56 74 53 73 83 110

 1870 106 92 63 51 66 41 44 37 42 41

 1880 37 49 52 46 50 61 51 64 75 78

 1890 77 68 64 54 31 54 58 88 49 50

 1900 57 39 50 50 48 29 32 22 19 23

 1910 34 19 39 34 45 52 32 51 34 61

 1920 48 83 110 97 88 133 100 128 68 104

 1930 69 152 161 145 174 193 151 202 144 177

 1940 140 155 120 87 162 109 117 72 129 104

 1950 101 152 89 114 103 100 90 51 58 70

 1960 64 87 57 45 65 92 76 65 55 84

 1970 83 97 99 84 104 103 91 85 88 80

 1980 77 56 44 97 103 133 103 124 122 140

 1990 123 87 144 120 109 120 85 81 119 124

 2000 143 127 167 83 138 88 110 106 50 141

 2010 42 63 70 85 73 53

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 1590A RE 1847 to 2015 169 years Series 32

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

 Lower 1951< -.014 1956< -.009 2003> -.008 1936> -.007 1900< -.006 1996> -.006 Higher 1963 .018 1982 .012

 1590A RE Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1847 141 271 157

 1850 177 133 159 96 116 111 102 100 55 82

 1860 82 62 77 90 57 58 57 81 93 121

 1870 138 134 68 106 114 65 59 69 97 106

 1880 100 79 78 73 58 64 95 61 84 90

 1890 94 112 110 96 70 79 87 96 97 89

 1900 71 90 110 93 83 70 113 81 53 66

 1910 57 65 76 86 93 87 68 84 43 80

 1920 52 87 92 94 110 140 112 144 128 128

 1930 119 119 172 165 213 198 213 218 208 201

 1940 184 153 146 150 146 150 150 126 141 120

 1950 131 117 109 132 119 138 111 120 143 122

 1960 143 158 121 91 105 116 149 162 166 176

 1970 166 173 169 179 195 180 159 141 163 193

 1980 195 135 94 167 119 148 114 130 133 163

 1990 112 89 124 104 136 139 180 143 187 186

 2000 188 173 215 184 164 153 156 169 176 240

 2010 177 162 177 191 166 127

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 1558B 1922 to 2015 94 years Series 33

 [B] Entire series, effect on correlation ( .560) is:

 Lower 1954< -.071 1947> -.015 1924< -.013 1981> -.013 1962> -.012 1942< -.012 Higher 1991 .045 1952 .039

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

 1954 -5.0 SD

 1558B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1922 157 124 106 184 175 247 290 216

 1930 195 163 263 211 203 179 170 283 167 197

 1940 135 82 79 83 131 132 125 125 109 97

 1950 121 91 30 62 19 51 56 53 44 37

 1960 57 34 43 31 24 43 44 37 38 45

 1970 53 39 42 43 67 57 58 40 78 80

 1980 81 46 28 37 50 63 58 53 46 55

 1990 47 18 55 37 36 65 45 38 64 52

 2000 75 45 93 38 80 53 63 66 55 69

 2010 62 63 50 56 62 31

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 1573B RE 1876 to 2015 140 years Series 34

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

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

 1876 1925 0 .22 -.10 .08 .09 .17 -.06 .09 .10 -.09 .17 .33\* .09 .01 -.01 -.02 -.08 -.14 -.17 -.15 -.03 -.05

 [B] Entire series, effect on correlation ( .615) is:

 Lower 1887> -.020 1880< -.017 1952> -.014 1888< -.012 1908> -.010 1916> -.009 Higher 1963 .024 1991 .022

 1876 to 1925 segment:

 Lower 1887> -.059 1880< -.042 1888< -.032 1908> -.028 1916> -.026 1881< -.019 Higher 1894 .052 1918 .049

 1573B RE Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1876 109 125 160 127

 1880 87 81 60 62 68 57 70 80 53 77

 1890 47 54 57 51 33 32 48 41 39 40

 1900 45 41 41 66 58 34 54 30 31 19

 1910 15 9 9 17 16 11 35 23 19 22

 1920 24 43 70 84 88 119 107 137 197 183

 1930 217 228 324 247 333 461 418 538 466 380

 1940 296 247 339 245 340 265 239 148 183 145

 1950 159 245 167 195 164 199 174 137 104 75

 1960 82 79 63 33 52 45 75 81 67 102

 1970 86 75 99 91 104 86 87 70 78 86

 1980 62 44 34 41 39 43 49 57 49 76

 1990 46 40 79 80 72 103 106 83 152 103

 2000 144 154 191 130 158 126 128 110 80 118

 2010 100 91 86 121 102 71

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PART 7: DESCRIPTIVE STATISTICS: QUAL\_CORE2ROWO\_Corr2-50 09:47 Thu 12 Nov 2015 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 1560A 1922 2015 94 4 0 .651 1.71 4.48 .969 .857 .227 2.77 .510 -.011 1

 2 1560B 1925 2015 91 3 0 .767 1.55 4.60 .841 .859 .247 2.71 .608 -.018 1

 3 1572A 1883 2015 133 5 0 .596 1.10 3.77 .702 .873 .260 2.70 .409 -.051 1

 4 1572B 1910 2015 106 4 0 .580 1.29 3.07 .771 .855 .253 2.88 .617 -.017 1

 5 1579A 1930 2015 86 3 0 .719 1.59 3.66 .651 .859 .183 2.64 .471 -.044 1

 6 1579B 1915 2015 101 4 0 .595 1.59 6.18 .892 .839 .222 2.54 .378 .009 1

 7 1578A 1889 2015 127 5 0 .627 .90 2.20 .487 .871 .227 2.93 .591 .102 2

 8 1578B 1888 2015 128 5 0 .623 .93 2.39 .448 .864 .214 2.70 .475 .053 1

 9 1558A 1923 2015 93 4 0 .621 1.52 5.67 1.051 .902 .219 2.58 .424 -.033 1

 10 1566A 1885 2015 131 5 0 .570 1.07 2.32 .364 .577 .251 2.81 .490 .014 2

 11 1566B 1898 2015 118 5 0 .556 1.35 3.88 .668 .761 .267 2.67 .441 -.019 2

 12 1569A RE 1883 2015 133 5 0 .586 .88 2.12 .356 .808 .217 2.52 .402 .033 1

 13 1569B 1878 2015 138 5 1 .605 .87 2.51 .408 .819 .236 2.56 .409 .011 1

 14 1574A 1919 2015 97 4 0 .710 1.38 3.87 .821 .901 .228 2.72 .427 .008 1

 15 1574B 1923 2015 93 4 0 .697 1.61 4.30 .956 .858 .230 2.63 .565 .006 1

 16 1571A 1870 2015 146 6 0 .538 .88 2.23 .387 .808 .207 2.66 .421 .007 1

 17 1568A 1880 2015 136 5 0 .554 1.29 3.56 .498 .698 .189 2.70 .434 -.026 2

 18 1568B 1884 2015 132 5 0 .578 1.26 2.41 .444 .777 .202 2.77 .497 -.045 1

 19 1575A 1888 2015 128 5 0 .754 1.69 5.77 1.229 .928 .209 2.56 .417 .004 3

 20 1575B 1870 2015 146 6 0 .519 1.22 3.73 .795 .926 .197 2.78 .464 -.058 1

 21 1570A 1857 2015 159 6 0 .585 1.17 2.73 .589 .834 .223 2.68 .421 .007 2

 22 1570B 1853 2014 162 6 0 .590 1.18 3.22 .460 .735 .214 2.88 .516 -.032 2

 23 1573A 1877 2015 139 5 1 .570 .88 3.37 .514 .900 .208 2.89 .492 -.002 2

 24 1559A 1919 2015 97 4 0 .624 1.43 4.24 1.053 .853 .246 2.63 .547 .000 1

 25 1559B 1920 2015 96 4 0 .728 1.35 4.63 .929 .878 .254 2.63 .435 -.064 1

 26 1576A 1864 2015 152 6 0 .673 1.24 3.37 .455 .606 .246 2.82 .559 .030 1

 27 1576B 1843 2015 173 7 0 .630 .85 2.41 .360 .666 .240 2.84 .419 -.004 1

 28 1590B RE 1854 2015 162 6 0 .704 1.49 3.78 .635 .858 .169 2.69 .435 .012 1

 29 1581A RE 1848 2015 168 7 0 .471 .69 1.85 .365 .807 .275 2.51 .396 -.022 1

 30 1581B 1839 2015 177 7 0 .571 .90 2.10 .396 .803 .235 2.62 .471 .022 1

 31 1571B RE 1848 2015 168 7 0 .582 .87 2.02 .403 .731 .263 2.67 .453 .028 2

 32 1590A RE 1847 2015 169 7 0 .670 1.25 2.71 .447 .800 .180 2.65 .389 -.029 1

 33 1558B 1922 2015 94 4 0 .560 .86 2.90 .629 .858 .295 2.55 .448 .002 1

 34 1573B RE 1876 2015 140 5 1 .615 1.13 5.38 .981 .927 .241 2.66 .473 .013 2

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 Total or mean: 4413 173 3 .612 1.17 6.18 .611 .813 .228 2.93 .464 -.002

 - = [ COFECHA QUAL2COF ] = -