[] Dendrochronology Program Library Run S2F2 Program COF 13:03 Tue 03 Jan 2012 Page 1

[]

[] P R O G R A M C O F E C H A Version 6.06P 28128

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

QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

Title of run: SUG002\_FAGR\_Corr2-40

File of DATED series: SUG002\_FAGR\_Compact\_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 40 years lagged successively by 20 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 .3665

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 1887 to 2011 125 years

Continuous time span is 1887 to 2011 125 years

Portion with two or more series is 1904 to 2011 108 years

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

\*C\* Number of dated series 14 \*C\*

\*O\* Master series 1887 2011 125 yrs \*O\*

\*F\* Total rings in all series 1328 \*F\*

\*E\* Total dated rings checked 1311 \*E\*

\*C\* Series intercorrelation .706 \*C\*

\*H\* Average mean sensitivity .318 \*H\*

\*A\* Segments, possible problems 5 \*A\*

\*\*\* Mean length of series 94.9 \*\*\*

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

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

1a 1 absent rings: 2011

1b 1 absent rings: 1935

2a 1 absent rings: 1935

2b 2 absent rings: 1935 1936

3a 2 absent rings: 1935 1936

5a 1 absent rings: 1935

20a 2 absent rings: 1935 1946

20b 2 absent rings: 1935 1946

12 absent rings .904%

PART 2: TIME PLOT OF TREE-RING SERIES: SUG002\_FAGR\_Corr2-40 13:03 Tue 03 Jan 2012 Page 2

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

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

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

. . . . . . . . . . . . . . . . . . <========> . 1a 1 1923 2011 89

. . . . . . . . . . . . . . . . . .<=========> . 1b 2 1916 2011 96

. . . . . . . . . . . . . . . . . <==========> . 2a 3 1904 2011 108

. . . . . . . . . . . . . . . . . <============> . 2b 4 1887 2011 125

. . . . . . . . . . . . . . . . . .<=========> . 3a 5 1915 2011 97

. . . . . . . . . . . . . . . . . . <=======> . 3b 6 1930 2011 82

. . . . . . . . . . . . . . . . . . <========> . 4a 7 1924 2011 88

. . . . . . . . . . . . . . . . . . <========> . 4b 8 1923 2011 89

. . . . . . . . . . . . . . . . . .<=========> . 5a 9 1913 2011 99

. . . . . . . . . . . . . . . . . . <========> . 5b 10 1921 2011 91

. . . . . . . . . . . . . . . . . . <========> . 7a 11 1925 2011 87

. . . . . . . . . . . . . . . . . . <========> . 7b 12 1924 2011 88

. . . . . . . . . . . . . . . . . . <========> . 20a 13 1922 2011 90

. . . . . . . . . . . . . . . . . .<=========> . 20b 14 1913 2011 99

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

1050 1100 1150 1200 1250 1300 1350 1400 1450 1500 1550 1600 1650 1700 1750 1800 1850 1900 1950 2000 2050

1900 -.832 1 1950 -.801 14 2000 -1.471 14

1901 -1.606 1 1951 -.004 14 2001 -.171 14

1902 -1.456 1 1952 -.853 14 2002 .410 14

1903 .370 1 1953 -1.011 14 2003 -.110 14

1904 .548 2 1954 .534 14 2004 2.000 14

1905 -1.170 2 1955 1.811 14 2005 .863 14

1906 -2.393 2 1956 1.555 14 2006 1.060 14

1907 -1.151 2 1957 .933 14 2007 1.704 14

1908 .118 2 1958 .747 14 2008 -.123 14

1909 1.297 2 1959 .298 14 2009 -.124 14

1910 .253 2 1960 .032 14 2010 -.213 14

1911 -.618 2 1961 .300 14 2011 -.997 14 1

1912 .702 2 1962 -.508 14

1913 -1.169 4 1963 -.931 14

1914 1.131 4 1964 -.875 14

1915 .361 5 1965 -.898 14

1916 -.712 6 1966 -2.488 14

1917 -1.032 6 1967 .292 14

1918 -1.045 6 1968 .522 14

1919 .321 6 1969 1.338 14

1920 .776 6 1970 1.295 14

1921 1.006 7 1971 .794 14

1922 1.520 8 1972 .903 14

1923 .705 10 1973 .901 14

1924 -.054 12 1974 .616 14

1925 -.154 13 1975 .341 14

1926 .590 13 1976 -.094 14

1927 .641 13 1977 .304 14

1928 .723 13 1978 .371 14

1929 .501 13 1979 .095 14

1930 1.150 14 1980 .080 14

1931 .344 14 1981 -1.114 14

1932 .049 14 1982 .391 14

1933 .765 14 1983 -1.558 14

1934 .801 14 1984 .947 14

1935 -3.950 14 7 1985 .040 14

1936 -2.456 14 2 1986 .324 14

1887 .976 1 1937 .634 14 1987 -1.602 14

1888 .916 1 1938 .184 14 1988 -.171 14

1889 .560 1 1939 .836 14 1989 .382 14

1890 .049 1 1940 .511 14 1990 -.183 14

1891 -.681 1 1941 .424 14 1991 -.340 14

1892 .114 1 1942 .130 14 1992 .413 14

1893 1.323 1 1943 -.439 14 1993 -.803 14

1894 2.142 1 1944 -.722 14 1994 -1.035 14

1895 -.734 1 1945 -.160 14 1995 -.421 14

1896 1.584 1 1946 -2.088 14 2 1996 .474 14

1897 -.793 1 1947 -.457 14 1997 -.159 14

1898 -.894 1 1948 -.675 14 1998 .634 14

1899 -1.325 1 1949 -1.166 14 1999 .228 14

PART 5: CORRELATION OF SERIES BY SEGMENTS: SUG002\_FAGR\_Corr2-40 13:03 Tue 03 Jan 2012 Page 5

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

Correlations of 40-year dated segments, lagged 20 years

Flags: A = correlation under .3665 but highest as dated; B = correlation higher at other than dated position

Seq Series Time\_span 1900 1920 1940 1960 1980

1939 1959 1979 1999 2019

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

1 1a 1923 2011 .36A .76 .70 .71

2 1b 1916 2011 .68 .69 .82 .66 .61

3 2a 1904 2011 .69 .66 .64 .49 .55

4 2b 1887 2011 .56 .59 .63 .66 .65

5 3a 1915 2011 .34A .72 .83 .70 .62

6 3b 1930 2011 .87 .69 .67 .71

7 4a 1924 2011 .81 .65 .48 .40

8 4b 1923 2011 .90 .64 .37 .39

9 5a 1913 2011 .66 .60 .65 .59 .59

10 5b 1921 2011 .83 .60 .35B .46

11 7a 1925 2011 .88 .47 .41B .72

12 7b 1924 2011 .87 .59 .31A .52

13 20a 1922 2011 .61 .59 .51 .58

14 20b 1913 2011 .59 .64 .61 .61 .65

Av segment correlation .59 .72 .66 .54 .58

PART 6: POTENTIAL PROBLEMS: SUG002\_FAGR\_Corr2-40 13:03 Tue 03 Jan 2012 Page 5

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

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

[A] Correlations with master dating series of flagged 40-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

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

1a 1923 to 2011 89 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

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

1923 1962 0 -.08 .01 .21 -.03 -.10 .07 .22 -.09 -.34 .18 .36\* .20 .11 -.03 -.13 -.03 .08 -.09 -.32 -.22 -.14

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

Lower 1935> -.125 1924< -.019 1939< -.013 1991> -.010 1981> -.010 2008> -.006 Higher 2004 .024 1987 .017

1923 to 1962 segment:

Lower 1935> -.091 1924< -.058 1939< -.030 1929< -.013 1931> -.011 1945< -.009 Higher 1955 .050 1937 .035

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

1934 1935 4.2 SD

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

2011 -.997 14 1

>> WARNING: Last ring in series is ABSENT

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

1935 +4.5 SD

1a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1923 60 26 47 53 77 67 33

1930 31 44 50 35 21 11 9 47 32 13

1940 8 14 15 6 4 5 6 18 11 14

1950 16 34 37 52 79 200 176 127 138 111

1960 111 100 84 60 87 70 51 175 158 210

1970 305 278 297 209 189 194 174 195 188 169

1980 182 181 192 130 177 167 141 111 122 128

1990 117 146 150 92 112 86 141 96 113 76

2000 34 85 108 76 224 110 117 135 89 78

2010 24 0

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

1b 1916 to 2011 96 years Series 2

[B] Entire series, effect on correlation ( .762) is:

Lower 2000> -.019 1985< -.011 1990> -.010 1939< -.009 1920< -.008 1994> -.007 Higher 1935 .115 1946 .011

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

1935 -3.950 14 7

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

1990 +3.1 SD

1b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1916 57 63 36 103

1920 76 141 132 86 58 64 74 110 85 93

1930 93 77 96 73 62 0 32 64 47 27

1940 26 21 20 13 14 19 3 15 9 6

1950 15 36 28 45 72 165 156 124 138 120

1960 140 113 78 54 94 78 98 325 376 392

1970 349 295 361 362 299 302 251 248 270 211

1980 276 257 251 178 287 205 242 196 263 278

1990 272 247 208 168 195 172 226 173 194 137

2000 153 135 115 157 253 147 130 153 66 36

2010 40 25

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

2a 1904 to 2011 108 years Series 3

[B] Entire series, effect on correlation ( .688) is:

Lower 1987< -.095 2008> -.011 1943> -.008 1984< -.006 1913> -.006 1924> -.006 Higher 1935 .089 2004 .013

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

1935 -3.950 14 7

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

1987 -6.1 SD

2a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1904 8 8 5 10 21 35

1910 28 21 40 33 56 57 23 16 17 39

1920 57 57 79 77 81 74 66 60 44 49

1930 53 36 25 32 30 0 6 23 17 25

1940 21 22 19 23 15 20 13 20 14 16

1950 26 27 19 15 71 104 122 107 84 66

1960 70 74 55 103 133 140 124 231 248 241

1970 242 234 213 201 216 243 232 236 212 180

1980 208 157 178 148 144 137 158 78 104 107

1990 81 84 89 79 62 68 82 76 94 77

2000 54 63 69 65 137 86 92 104 88 69

2010 69 21

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

2b 1887 to 2011 125 years Series 4

[\*] Early part of series cannot be checked from 1887 to 1903 -- not matched by another series

[B] Entire series, effect on correlation ( .713) is:

Lower 1913> -.018 1915> -.018 1990< -.014 1947> -.012 2000> -.010 1994< -.009 Higher 1935 .095 2004 .009

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

1935 -3.950 14 7

1936 -2.456 14 2

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

1913 +3.1 SD; 1915 +3.1 SD; 1936 -5.1 SD; 1947 +4.4 SD

2b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1887 53 50 43

1890 34 23 29 45 57 14 40 10 9 5

1900 8 4 5 17 19 5 4 11 21 38

1910 28 23 39 42 54 84 33 27 23 46

1920 69 72 80 61 64 72 73 61 50 52

1930 55 31 22 36 26 0 0 22 17 24

1940 24 19 13 20 15 22 10 60 43 19

1950 35 30 20 17 77 87 92 70 76 51

1960 66 77 61 81 110 136 112 215 204 290

1970 267 250 221 189 200 183 155 170 157 175

1980 143 109 151 109 166 110 136 100 114 94

1990 62 69 85 68 45 55 62 60 76 72

2000 68 93 83 75 145 103 78 129 9 39

2010 66 34

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

3a 1915 to 2011 97 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

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

1915 1954 0 .11 .11 .16 -.11 -.10 -.01 .08 .10 .19 -.15 .34\* .12 -.01 .22 .17 -.33 -.16 -.08 -.05 -.21 -.01

[B] Entire series, effect on correlation ( .700) is:

Lower 1915< -.046 1918> -.017 1916> -.015 1919< -.010 2005< -.010 1987> -.008 Higher 1935 .123 1946 .012

1915 to 1954 segment:

Lower 1915< -.085 1918> -.034 1916> -.030 1919< -.016 1947> -.015 1921< -.009 Higher 1935 .331 1946 .020

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

1935 -3.950 14 7

1936 -2.456 14 2

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

1915 -5.3 SD; 1918 +3.3 SD; 1936 -4.7 SD

3a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1915 50 83 71 116 88

1920 98 86 148 151 117 106 128 123 98 92

1930 116 69 45 47 44 0 0 22 23 35

1940 28 35 41 36 30 33 15 81 45 35

1950 41 57 53 56 97 202 192 172 168 151

1960 123 164 128 110 121 109 65 121 177 234

1970 238 192 192 198 170 148 142 133 150 135

1980 175 119 136 106 142 109 160 128 145 161

1990 147 125 101 67 64 67 73 70 127 116

2000 86 78 88 64 105 61 118 146 94 88

2010 100 61

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

3b 1930 to 2011 82 years Series 6

[B] Entire series, effect on correlation ( .814) is:

Lower 1948> -.013 1977< -.012 1983> -.010 1990< -.010 2001< -.005 1967< -.005 Higher 1935 .092 2004 .011

3b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1930 122 86 72 65 68 5 13 47 36 61

1940 56 53 62 41 50 51 28 44 81 61

1950 68 93 64 61 93 127 188 174 178 173

1960 146 183 138 134 138 110 78 125 153 178

1970 209 206 213 201 197 170 126 108 135 127

1980 124 117 150 121 187 152 167 112 101 123

1990 72 70 106 59 66 74 87 65 108 98

2000 61 59 100 69 169 94 95 98 67 90

2010 68 50

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

4a 1924 to 2011 88 years Series 7

[B] Entire series, effect on correlation ( .662) is:

Lower 1929< -.025 2008> -.014 1971< -.013 2000> -.010 1924> -.010 1985> -.009 Higher 1935 .182 2004 .021

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

1966 -5.7 SD; 2009 +3.2 SD; 2011 +3.1 SD

4a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1924 143 109 119 107 89 34

1930 41 57 33 102 89 7 9 48 42 50

1940 52 43 40 37 45 73 43 49 74 75

1950 92 99 72 75 130 217 187 160 205 219

1960 186 228 174 185 159 150 104 175 226 251

1970 229 184 196 233 209 195 211 256 260 232

1980 179 123 191 140 154 169 122 89 68 42

1990 43 25 17 15 9 12 12 7 8 9

2000 4 14 4 7 21 7 5 7 5 13

2010 10 7

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

4b 1923 to 2011 89 years Series 8

[B] Entire series, effect on correlation ( .675) is:

Lower 1966< -.056 1990> -.016 1993> -.015 1984< -.011 1965> -.008 1972< -.006 Higher 1935 .158 1955 .010

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

1966 -5.1 SD; 1993 +3.4 SD

4b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1923 141 168 129 188 244 192 165

1930 171 106 116 126 103 6 16 48 32 55

1940 74 67 79 70 66 72 42 62 48 54

1950 51 107 89 91 174 369 332 327 347 325

1960 279 318 289 241 237 299 112 237 267 327

1970 301 262 211 260 226 230 229 233 202 111

1980 63 64 61 31 34 18 18 15 23 41

1990 104 83 92 85 55 56 50 37 27 39

2000 14 13 11 20 41 39 26 33 16 8

2010 11 6

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

5a 1913 to 2011 99 years Series 9

[B] Entire series, effect on correlation ( .716) is:

Lower 1983< -.044 1924> -.008 1996< -.007 1923> -.006 1949> -.006 1952> -.006 Higher 1935 .089 1955 .008

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

1935 -3.950 14 7

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

1924 +3.0 SD; 1983 -8.8 SD

5a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1913 58 107 85 74 79 69 99

1920 122 120 124 157 156 107 94 96 89 102

1930 122 68 55 64 96 0 13 92 80 85

1940 45 47 21 16 18 41 11 31 40 59

1950 51 92 94 94 142 212 158 127 93 80

1960 64 129 101 61 110 95 73 187 199 194

1970 235 235 251 253 240 238 231 311 292 267

1980 200 179 163 90 150 146 158 126 134 122

1990 106 109 100 68 59 65 55 54 50 67

2000 45 68 121 63 80 67 74 100 34 17

2010 12 14

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

5b 1921 to 2011 91 years Series 10

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

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

1960 1999 2 .16 -.46 -.07 -.14 .05 -.15 .01 .03 -.08 .06 .35| .00 .38\* .03 -.10 -.10 .18 -.02 -.14 .03 -.26

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

Lower 1964< -.019 1987> -.017 1983> -.017 1980< -.014 2000< -.010 1986< -.010 Higher 1935 .093 1946 .011

1960 to 1999 segment:

Lower 1987> -.049 1983> -.047 1980< -.029 1986< -.025 1988< -.022 1964< -.021 Higher 1981 .033 1969 .030

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

1981 -7.6 SD

5b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1921 207 198 155 103 110 97 96 138 146

1930 150 99 108 115 118 10 21 95 80 93

1940 82 41 25 15 17 33 18 33 45 75

1950 80 110 82 80 126 170 139 127 104 92

1960 72 153 154 134 48 114 115 252 278 290

1970 249 187 198 232 196 175 159 191 174 161

1980 119 93 118 131 144 133 102 100 87 87

1990 103 82 108 81 63 80 84 44 50 57

2000 12 42 70 46 46 51 83 100 20 12

2010 12 7

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

7a 1925 to 2011 87 years Series 11

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

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

1960 1999 -2 .00 -.16 .03 -.04 .07 .07 .43 -.04 .43\*-.28 .41|-.41 .08 -.28 .00 -.25 .02 -.09 .10 -.04 .08

[B] Entire series, effect on correlation ( .747) is:

Lower 1968< -.059 1980> -.013 1967< -.008 1970< -.007 1991< -.007 1981> -.007 Higher 1935 .131 1946 .010

1960 to 1999 segment:

Lower 1968< -.170 1980> -.029 1967< -.020 1970< -.020 1981> -.018 1960> -.015 Higher 1984 .058 1966 .053

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

1968 -7.4 SD; 1980 +3.0 SD; 1981 +3.1 SD

7a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1925 96 109 86 96 109

1930 119 85 60 90 127 23 19 73 68 95

1940 103 84 99 62 79 96 57 85 94 74

1950 108 145 127 121 135 231 242 230 219 208

1960 249 225 206 181 159 172 136 164 103 209

1970 192 221 303 267 232 212 204 206 216 214

1980 324 260 322 206 313 199 213 142 157 152

1990 120 89 124 103 92 102 115 98 82 76

2000 26 56 75 56 102 79 62 73 30 23

2010 24 18

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

7b 1924 to 2011 88 years Series 12

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

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

1960 1999 0 -.04 -.14 .10 -.25 .03 .01 .02 -.11 .03 .00 .31\* .25 .21 -.03 .05 .02 -.06 -.02 -.02 .14 -.06

[B] Entire series, effect on correlation ( .742) is:

Lower 1984< -.019 1961< -.019 1966> -.018 1982< -.014 1986< -.010 1997> -.006 Higher 1935 .172 1946 .014

1960 to 1999 segment:

Lower 1961< -.061 1984< -.053 1982< -.049 1986< -.034 1966> -.029 1997> -.019 Higher 1969 .057 1983 .050

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

1986 -4.9 SD

7b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1924 94 119 115 101 151 147

1930 155 120 105 105 101 10 24 79 67 92

1940 90 87 108 77 88 98 66 106 90 99

1950 100 155 157 147 215 275 234 217 243 226

1960 249 188 221 186 221 201 229 316 308 409

1970 378 306 280 339 288 293 283 319 318 248

1980 298 177 103 65 61 30 21 28 56 86

1990 80 57 64 50 53 54 65 73 65 48

2000 27 64 110 63 152 111 77 78 31 22

2010 17 14

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

20a 1922 to 2011 90 years Series 13

[B] Entire series, effect on correlation ( .747) is:

Lower 1981> -.016 1986< -.015 1983> -.015 1925< -.013 1997> -.009 1966> -.008 Higher 1935 .112 1946 .012

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

1935 -3.950 14 7

1946 -2.088 14 2

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

1983 +3.1 SD; 1987 -5.3 SD

20a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1922 157 124 80 53 79 69 75 54

1930 71 47 48 42 40 0 16 40 37 41

1940 20 29 12 14 11 18 0 10 9 4

1950 18 38 28 42 101 137 166 170 148 154

1960 163 165 103 109 112 127 123 178 249 279

1970 291 269 262 219 207 151 118 106 135 165

1980 130 158 175 140 198 127 82 46 68 110

1990 81 62 77 66 72 91 91 106 152 104

2000 70 83 76 71 137 91 115 141 82 122

2010 62 28

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

20b 1913 to 2011 99 years Series 14

[B] Entire series, effect on correlation ( .790) is:

Lower 1978< -.021 1983> -.011 1923< -.008 1913< -.008 1918> -.007 1936> -.007 Higher 1935 .118 2007 .005

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

1935 -3.950 14 7

1946 -2.088 14 2

20b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1913 50 137 151 101 95 118 144

1920 159 141 134 93 99 77 108 88 94 87

1930 125 85 63 103 81 0 33 65 48 47

1940 26 28 16 21 6 8 0 7 18 11

1950 17 26 19 30 89 142 158 134 133 144

1960 142 158 121 124 158 164 133 217 298 301

1970 300 257 252 224 267 233 195 193 132 154

1980 127 111 161 144 207 190 187 138 142 134

1990 112 100 101 82 59 67 118 70 97 60

2000 29 30 42 24 90 76 92 132 41 36

2010 34 31

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

PART 7: DESCRIPTIVE STATISTICS: SUG002\_FAGR\_Corr2-40 13:03 Tue 03 Jan 2012 Page 6

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

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 1a 1923 2011 89 4 1 .514 .99 3.05 .726 .854 .359 2.75 .430 -.066 1

2 1b 1916 2011 96 5 0 .762 1.39 3.92 1.028 .900 .338 2.55 .361 -.081 1

3 2a 1904 2011 108 5 0 .688 .82 2.48 .678 .942 .288 2.52 .309 -.027 1

4 2b 1887 2011 125 5 0 .713 .70 2.90 .600 .896 .377 2.72 .390 .039 1

5 3a 1915 2011 97 5 1 .700 1.03 2.38 .526 .831 .278 2.54 .388 -.009 1

6 3b 1930 2011 82 4 0 .814 1.04 2.13 .505 .817 .275 2.75 .385 .018 1

7 4a 1924 2011 88 4 0 .662 .98 2.60 .802 .927 .327 2.81 .358 .039 1

8 4b 1923 2011 89 4 0 .675 1.23 3.69 1.045 .908 .311 2.45 .348 -.037 1

9 5a 1913 2011 99 5 0 .716 1.06 3.11 .681 .877 .313 2.48 .362 -.039 1

10 5b 1921 2011 91 4 1 .614 1.05 2.90 .630 .844 .311 2.57 .445 -.046 2

11 7a 1925 2011 87 4 1 .747 1.36 3.24 .760 .850 .258 2.52 .369 -.015 1

12 7b 1924 2011 88 4 1 .742 1.40 4.09 .980 .922 .265 2.50 .305 -.003 1

13 20a 1922 2011 90 4 0 .747 .99 2.91 .675 .899 .372 2.58 .390 .024 1

14 20b 1913 2011 99 5 0 .790 1.07 3.01 .716 .897 .351 2.44 .327 -.044 1

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

Total or mean: 1328 62 5 .706 1.07 4.09 .735 .884 .318 2.81 .368 -.017

- = [ COFECHA S2F2 COF ] = -