[] Dendrochronology Program Library Run S1F2 Program COF 17:06 Fri 06 Jan 2012 Page 1

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[] P R O G R A M C O F E C H A Version 6.06P 28131

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QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

Title of run: SUG001\_FAGR\_Corr2-40

File of DATED series: SUG001\_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 1901 to 2011 111 years

Continuous time span is 1901 to 2011 111 years

Portion with two or more series is 1902 to 2011 110 years

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

\*C\* Number of dated series 20 \*C\*

\*O\* Master series 1901 2011 111 yrs \*O\*

\*F\* Total rings in all series 1640 \*F\*

\*E\* Total dated rings checked 1639 \*E\*

\*C\* Series intercorrelation .589 \*C\*

\*H\* Average mean sensitivity .261 \*H\*

\*A\* Segments, possible problems 10 \*A\*

\*\*\* Mean length of series 82.0 \*\*\*

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

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

5b 1 absent rings: 2011

1 absent rings .061%

PART 2: TIME PLOT OF TREE-RING SERIES: SUG001\_FAGR\_Corr2-40 17:06 Fri 06 Jan 2012 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

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

. . . . . . . . . . . . . . . . . . <=====> . 1a 1 1953 2011 59

. . . . . . . . . . . . . . . . . . <=======> . 1b 2 1933 2011 79

. . . . . . . . . . . . . . . . . . <======> . 2a 3 1944 2011 68

. . . . . . . . . . . . . . . . . . <======> . 2b 4 1941 2011 71

. . . . . . . . . . . . . . . . . . <=======> . 3a 5 1938 2011 74

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

. . . . . . . . . . . . . . . . . <==========> . 4a 7 1907 2011 105

. . . . . . . . . . . . . . . . . . <=======> . 4b 8 1933 2011 79

. . . . . . . . . . . . . . . . . . <========> . 5a 9 1928 2011 84

. . . . . . . . . . . . . . . . . .<=========> . 5b 10 1919 2011 93

. . . . . . . . . . . . . . . . . . <======> . 6a 11 1946 2011 66

. . . . . . . . . . . . . . . . . . <=======> . 6b 12 1934 2011 78

. . . . . . . . . . . . . . . . . <==========> . 7a 13 1901 2011 111

. . . . . . . . . . . . . . . . . <==========> . 7b 14 1902 2011 110

. . . . . . . . . . . . . . . . . . <=======> . 8a 15 1938 2011 74

. . . . . . . . . . . . . . . . . . <=======> . 8b 16 1932 2011 80

. . . . . . . . . . . . . . . . . . <=====> . 9a 17 1953 2011 59

. . . . . . . . . . . . . . . . . . <=====> . 9b 18 1950 2011 62

. . . . . . . . . . . . . . . . . .<=========> . 10a 19 1912 2011 100

. . . . . . . . . . . . . . . . . <==========> . 10b 20 1906 2011 106

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

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

1950 .253 18 2000 -1.689 20

1901 1.956 1 1951 .485 18 2001 -.286 20

1902 1.267 2 1952 .419 18 2002 -.898 20

1903 .935 2 1953 -1.879 20 2003 -1.145 20

1904 -.531 2 1954 .021 20 2004 .460 20

1905 -2.137 2 1955 1.724 20 2005 1.001 20

1906 .823 3 1956 .724 20 2006 .083 20

1907 .059 4 1957 -.348 20 2007 .762 20

1908 .211 4 1958 .826 20 2008 .480 20

1909 .314 4 1959 -.073 20 2009 1.163 20

1910 -1.231 4 1960 .521 20 2010 -.214 20

1911 .092 4 1961 .712 20 2011 -1.673 20 1

1912 -1.228 5 1962 -.207 20

1913 .011 5 1963 .621 20

1914 .781 5 1964 .159 20

1915 -3.797 5 1965 -.096 20

1916 -1.243 5 1966 -.058 20

1917 -.287 5 1967 -.477 20

1918 .285 5 1968 -2.295 20

1919 .079 6 1969 .261 20

1920 .992 6 1970 .193 20

1921 .910 6 1971 .566 20

1922 1.479 6 1972 .215 20

1923 -.159 6 1973 -.858 20

1924 .558 6 1974 -.393 20

1925 -.620 6 1975 -.106 20

1926 .552 6 1976 -.658 20

1927 .267 6 1977 .046 20

1928 -.265 7 1978 .328 20

1929 -.366 7 1979 -.074 20

1930 .084 8 1980 -.615 20

1931 1.172 8 1981 -1.957 20

1932 1.118 9 1982 -.083 20

1933 .317 11 1983 -1.510 20

1934 .841 12 1984 -.991 20

1935 .650 12 1985 .080 20

1936 -4.808 12 1986 .524 20

1937 .173 12 1987 .433 20

1938 .088 14 1988 .967 20

1939 .258 14 1989 .741 20

1940 .149 14 1990 1.632 20

1941 -1.173 15 1991 .848 20

1942 .424 15 1992 1.189 20

1943 .538 15 1993 .161 20

1944 .752 16 1994 .533 20

1945 -.199 16 1995 .294 20

1946 -.109 17 1996 .166 20

1947 .445 17 1997 -.085 20

1948 -.629 17 1998 .295 20

1949 -.881 17 1999 -.135 20

PART 5: CORRELATION OF SERIES BY SEGMENTS: SUG001\_FAGR\_Corr2-40 17:06 Fri 06 Jan 2012 Page 5

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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 1953 2011 .39 .27B .36A

2 1b 1933 2011 .42 .58 .42 .40

3 2a 1944 2011 .54 .50 .59

4 2b 1941 2011 .46 .43 .63

5 3a 1938 2011 .51B .52B .52 .58

6 3b 1930 2011 .57 .56B .53 .55

7 4a 1907 2011 .67 .80 .36A .38 .61

8 4b 1933 2011 .62 .51 .47 .46

9 5a 1928 2011 .54 .58 .51 .73

10 5b 1919 2011 .80 .78 .51 .63 .59

11 6a 1946 2011 .54 .42 .40

12 6b 1934 2011 .64 .56B .62 .48

13 7a 1901 2011 .82 .80 .46 .58 .63

14 7b 1902 2011 .80 .77 .47 .54 .72

15 8a 1938 2011 .34B .47 .48 .28A

16 8b 1932 2011 .57 .47 .68 .47

17 9a 1953 2011 .58 .52 .50

18 9b 1950 2011 .64 .50 .56

19 10a 1912 2011 .78 .78 .65 .77 .73

20 10b 1906 2011 .69 .63 .37 .34A .63

Av segment correlation .76 .63 .51 .50 .54

PART 6: POTENTIAL PROBLEMS: SUG001\_FAGR\_Corr2-40 17:06 Fri 06 Jan 2012 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 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

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1a 1953 to 2011 59 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

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

1960 1999 -8 -.05 -.11 .28\*-.28 .02 -.11 .21 -.08 .03 -.10 .27| .11 .01 .22 .12 .15 -.09 .05 -.11 .13 -.39

1972 2011 0 -.11 -.15 .10 -.15 -.04 -.24 .21 .02 -.09 -.08 .36\* - - - - - - - - - -

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

Lower 1981> -.036 1983> -.034 1973> -.032 1991< -.031 1957> -.028 1955< -.016 Higher 1953 .094 2000 .049

1960 to 1999 segment:

Lower 1983> -.058 1973> -.057 1981> -.055 1991< -.052 1985< -.023 1975> -.010 Higher 1968 .108 1976 .032

1972 to 2011 segment:

Lower 1981> -.053 1983> -.052 1973> -.048 1991< -.048 1985< -.021 2003> -.016 Higher 2000 .119 2011 .026

1a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1953 217 336 344 337 409 371 336

1960 370 296 255 298 254 212 257 218 184 222

1970 252 268 205 244 214 258 148 164 196 145

1980 120 173 204 193 165 129 169 178 153 180

1990 168 96 129 137 162 122 135 81 129 113

2000 29 51 82 97 133 106 38 74 69 67

2010 38 17

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

1b 1933 to 2011 79 years Series 2

[B] Entire series, effect on correlation ( .417) is:

Lower 1936> -.082 1948> -.028 1981> -.024 1986< -.014 1988< -.014 1985< -.012 Higher 1953 .045 1968 .035

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

1936 1937 -4.3 SD

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

1936 +4.7 SD; 1948 +3.1 SD; 1968 -4.6 SD; 1981 +3.2 SD

1b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1933 83 73 121 18 28 36 42

1940 51 115 146 141 173 180 190 370 427 307

1950 338 322 289 194 277 401 348 291 337 280

1960 304 326 262 309 290 281 301 339 169 275

1970 355 330 273 245 192 200 206 228 211 244

1980 263 247 277 180 119 106 108 151 131 160

1990 217 155 180 153 153 116 126 106 127 141

2000 71 148 130 125 181 174 71 105 149 175

2010 120 37

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

2a 1944 to 2011 68 years Series 3

[B] Entire series, effect on correlation ( .584) is:

Lower 1970< -.027 1981> -.023 1948< -.022 2005< -.016 1984> -.012 1973> -.011 Higher 2011 .017 1968 .014

2a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1944 145 112 125 179 88 63

1950 98 129 122 84 161 185 176 111 148 109

1960 142 135 73 83 52 69 56 29 19 40

1970 19 23 33 41 39 72 40 55 81 61

1980 39 65 77 63 140 187 230 223 252 210

1990 249 226 195 160 205 193 177 170 161 124

2000 92 100 72 39 161 112 107 96 178 190

2010 119 46

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2b 1941 to 2011 71 years Series 4

[B] Entire series, effect on correlation ( .572) is:

Lower 1968> -.033 2007< -.022 1960< -.022 1973> -.014 1950< -.014 1945> -.014 Higher 1953 .040 2000 .029

2b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1941 120 140 193 175 195 220 259 142 122

1950 101 128 124 69 132 148 146 68 140 79

1960 64 132 86 96 76 84 87 62 67 83

1970 72 63 64 77 96 109 75 71 87 71

1980 60 61 96 89 123 223 204 185 171 147

1990 238 240 223 175 195 157 200 166 183 152

2000 85 121 120 105 172 174 192 113 165 259

2010 198 66

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3a 1938 to 2011 74 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

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

1938 1977 8 -.13 .31 -.08 -.06 -.05 .40 -.07 -.08 .05 -.26 .51|-.11 -.34 .17 .00 .04 -.16 -.05 .53\* .00 -.25

1940 1979 8 -.17 .32 -.09 -.03 -.04 .38 -.05 .01 -.16 -.23 .52|-.12 -.33 .05 .03 .01 -.14 -.03 .54\* .04 -.23

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

Lower 1945< -.048 1969< -.017 2004< -.013 1938< -.011 1994< -.009 1949> -.009 Higher 1941 .024 1968 .017

1938 to 1977 segment:

Lower 1945< -.059 1969< -.026 1949> -.017 1938< -.016 1962> -.013 1976> -.013 Higher 1941 .046 1948 .021

1940 to 1979 segment:

Lower 1945< -.066 1969< -.028 1949> -.016 1971< -.014 1962> -.012 1976> -.012 Higher 1941 .044 1948 .021

3a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1938 211 232

1940 240 205 234 239 264 196 235 312 226 251

1950 273 277 300 222 296 306 228 183 223 148

1960 181 188 195 209 186 178 172 115 76 72

1970 70 68 74 37 71 77 71 77 93 70

1980 53 44 58 42 33 55 59 90 93 80

1990 120 94 110 92 65 60 75 103 109 106

2000 50 62 59 35 35 53 73 134 96 102

2010 37 31

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3b 1930 to 2011 82 years Series 6

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

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

1940 1979 -5 -.10 -.06 .04 -.10 -.07 .59\*-.27 .03 -.17 -.04 .56|-.11 -.26 -.04 .06 .13 -.02 .13 .34 -.02 .01

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

Lower 1941< -.032 1953> -.014 1980> -.011 1967< -.011 1986< -.009 2002> -.008 Higher 1968 .031 1936 .018

1940 to 1979 segment:

Lower 1953> -.081 1949> -.015 1963< -.013 1943< -.010 1971< -.009 1966> -.008 Higher 1968 .083 1955 .028

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

1936 +3.0 SD

3b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1930 194 256 225 188 240 316 141 241 263 279

1940 288 74 233 189 205 185 187 279 219 258

1950 324 347 389 263 315 370 287 228 219 173

1960 202 200 166 132 127 116 138 58 30 64

1970 61 52 57 23 42 38 33 39 51 45

1980 59 43 61 43 32 43 39 63 84 107

1990 132 117 117 104 84 64 63 86 110 118

2000 73 126 103 42 80 81 59 62 54 92

2010 44 19

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4a 1907 to 2011 105 years Series 7

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

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

1940 1979 0 .06 .13 -.06 -.05 -.08 -.12 .19 -.16 -.36 -.05 .36\* .06 .03 .20 -.04 .07 -.03 .12 .15 -.32 -.22

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

Lower 1915> -.042 1968> -.021 1917> -.014 1941> -.014 1908> -.010 1965< -.009 Higher 1936 .164 1955 .009

1940 to 1979 segment:

Lower 1968> -.076 1941> -.053 1965< -.037 1952< -.024 1963< -.022 1959> -.020 Higher 1955 .088 1953 .072

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

1915 +3.6 SD

4a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1907 217 261 241

1910 210 226 198 244 269 232 232 306 251 254

1920 296 276 306 238 261 273 248 253 234 218

1930 252 303 354 228 312 363 55 196 187 158

1940 152 182 163 156 192 124 100 122 119 115

1950 133 123 90 70 98 171 134 94 146 141

1960 115 96 80 62 49 18 29 52 71 100

1970 91 108 95 73 57 56 41 46 53 54

1980 50 37 55 36 46 60 49 73 67 92

1990 122 72 79 71 42 48 28 46 28 19

2000 11 38 23 20 23 34 38 40 53 46

2010 20 11

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4b 1933 to 2011 79 years Series 8

[B] Entire series, effect on correlation ( .565) is:

Lower 1935< -.031 1968> -.028 1941> -.017 2009< -.015 2000> -.014 1958< -.013 Higher 1936 .099 1953 .039

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

2001 +3.5 SD

4b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1933 171 226 66 18 169 159 176

1940 183 196 213 215 242 205 197 262 199 178

1950 205 253 210 126 150 260 208 147 152 177

1960 172 189 198 263 210 186 130 153 160 187

1970 132 142 180 101 88 103 111 129 168 172

1980 167 110 172 133 186 175 192 165 188 210

1990 264 189 229 171 151 143 117 127 143 137

2000 132 212 111 101 92 99 92 119 56 38

2010 18 25

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5a 1928 to 2011 84 years Series 9

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

Lower 1935< -.171 1967> -.013 1947< -.010 1994< -.008 1979> -.006 1971< -.005 Higher 1936 .124 1953 .023

5a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1928 246 236

1930 258 240 215 210 240 81 24 168 196 212

1940 215 160 196 207 192 184 154 129 141 142

1950 182 201 181 119 160 239 211 148 189 173

1960 147 138 137 149 143 143 125 149 112 113

1970 94 94 106 97 83 84 108 144 176 201

1980 124 63 135 97 145 162 202 210 240 229

1990 247 191 168 128 121 152 156 152 133 128

2000 93 139 110 111 126 156 113 171 112 108

2010 68 38

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5b 1919 to 2011 93 years Series 10

[B] Entire series, effect on correlation ( .738) is:

Lower 1941> -.020 1947< -.014 1976> -.012 1920< -.011 1924< -.010 1996< -.008 Higher 1936 .157 1968 .015

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

2011 -1.673 20 1

>> WARNING: Last ring in series is ABSENT

5b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1919 210

1920 204 217 265 184 180 181 204 201 162 200

1930 205 262 239 169 203 223 39 176 162 163

1940 127 170 219 169 204 183 150 103 103 128

1950 159 120 128 99 150 220 139 114 192 178

1960 160 137 99 111 120 135 98 116 70 115

1970 108 161 108 87 95 92 125 114 106 91

1980 126 102 136 85 122 148 145 143 164 177

1990 201 181 137 105 119 107 68 87 73 75

2000 61 71 68 96 109 127 75 104 111 113

2010 41 0

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6a 1946 to 2011 66 years Series 11

[B] Entire series, effect on correlation ( .499) is:

Lower 1987< -.068 1985< -.020 1969< -.019 2003> -.014 1962> -.013 1990< -.012 Higher 1968 .074 2011 .043

6a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1946 187 270 238 227

1950 278 261 299 251 279 513 361 369 397 487

1960 478 535 557 535 455 492 406 290 125 193

1970 379 385 324 235 316 469 397 434 428 252

1980 306 213 260 214 167 144 218 125 208 197

1990 197 187 285 203 308 266 204 180 208 179

2000 149 161 128 166 142 204 200 184 137 165

2010 120 50

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6b 1934 to 2011 78 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

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

1940 1979 -5 -.12 -.02 .16 -.35 -.03 .64\*-.08 -.02 -.33 .03 .56|-.12 -.14 .05 .15 .05 -.11 .20 .20 -.07 -.28

[B] Entire series, effect on correlation ( .576) is:

Lower 1941< -.042 2001< -.038 2002> -.018 2010> -.008 2004< -.008 1968> -.007 Higher 1936 .055 2011 .018

1940 to 1979 segment:

Lower 1941< -.058 1968> -.042 1944< -.013 1961< -.012 1953> -.011 1978< -.010 Higher 1955 .053 1973 .017

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

1941 -5.1 SD; 2001 -4.7 SD

6b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1934 223 323 102 242 277 259

1940 219 61 170 307 230 226 209 259 212 187

1950 228 270 331 238 264 431 345 276 323 278

1960 310 232 221 206 212 169 152 134 117 215

1970 236 175 150 58 59 74 69 74 73 87

1980 139 38 174 152 230 229 336 292 413 389

1990 417 312 326 220 259 265 238 158 148 124

2000 113 65 153 131 103 117 106 115 68 56

2010 48 24

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7a 1901 to 2011 111 years Series 13

[\*] Early part of series cannot be checked from 1901 to 1901 -- not matched by another series

[B] Entire series, effect on correlation ( .734) is:

Lower 1969< -.017 1941> -.015 1989< -.014 1947< -.014 1910> -.012 1902< -.011 Higher 1936 .091 1915 .041

7a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1901 214 160 156 112 82 114 94 102 88

1910 93 95 76 92 102 51 81 82 102 112

1920 144 151 149 120 118 98 125 102 96 80

1930 103 124 93 88 96 90 25 74 104 119

1940 118 118 141 115 128 78 87 53 76 62

1950 77 103 88 55 69 151 115 97 132 141

1960 129 152 112 123 93 105 90 100 51 49

1970 67 87 59 69 68 61 72 77 74 84

1980 65 51 83 61 63 92 98 108 99 68

1990 97 109 113 88 93 96 104 88 74 64

2000 38 59 26 38 61 72 66 66 74 102

2010 35 25

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7b 1902 to 2011 110 years Series 14

[B] Entire series, effect on correlation ( .722) is:

Lower 1908< -.014 1990< -.012 1912> -.011 1947< -.009 1951< -.009 1970> -.007 Higher 1936 .106 1915 .028

7b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1902 241 179 112 68 137 121 77 108

1910 66 76 81 76 73 35 47 57 62 66

1920 98 102 80 68 85 54 97 78 72 58

1930 59 73 68 64 63 65 16 73 92 113

1940 77 70 95 88 74 62 54 48 46 75

1950 108 76 82 66 93 126 98 110 137 120

1960 91 116 80 98 106 101 72 78 64 87

1970 134 133 83 53 56 52 55 87 90 92

1980 84 49 69 45 47 63 90 101 107 84

1990 70 61 77 66 83 80 83 81 79 69

2000 42 39 31 28 45 67 57 72 69 77

2010 60 38

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

8a 1938 to 2011 74 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

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

1938 1977 -3 -.04 .00 .05 -.22 -.06 -.08 .01 .38\* .01 -.32 .34|-.08 -.22 -.06 .05 -.19 -.03 -.17 .07 .21 -.21

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

1972 2011 0 -.07 -.11 -.18 -.10 .12 -.21 .19 .19 -.05 -.06 .28\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .339) is:

Lower 2011> -.078 1939< -.056 2006< -.029 1955< -.022 1941> -.021 1973> -.014 Higher 1953 .076 2000 .025

1938 to 1977 segment:

Lower 1939< -.109 1955< -.042 1941> -.041 1973> -.026 1956< -.025 1977< -.016 Higher 1953 .147 1969 .028

1972 to 2011 segment:

Lower 2011> -.164 2006< -.067 1973> -.027 1977< -.018 1982< -.010 1972< -.010 Higher 2000 .060 2005 .037

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

2011 +3.8 SD

8a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1938 165 128

1940 181 198 217 281 292 266 293 343 234 168

1950 226 215 193 87 105 75 37 35 46 19

1960 34 47 32 47 39 33 33 16 13 58

1970 29 62 28 45 52 52 34 21 23 19

1980 10 4 9 11 42 119 149 183 218 185

1990 223 279 262 205 210 165 119 94 78 85

2000 40 61 54 35 97 112 43 52 36 40

2010 26 32

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8b 1932 to 2011 80 years Series 16

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

Lower 1959< -.062 2007< -.022 2003> -.012 1974> -.011 1982< -.010 2006< -.008 Higher 1936 .058 1968 .030

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

1959 -4.8 SD

8b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1932 230 140 176 242 89 210 182 122

1940 121 107 159 169 242 227 260 170 156 117

1950 195 262 228 130 117 149 99 81 104 37

1960 60 74 64 63 61 54 62 45 10 78

1970 45 62 51 42 89 84 59 57 72 69

1980 38 19 30 36 33 144 185 109 166 196

1990 229 261 290 228 224 180 205 214 220 192

2000 130 225 189 222 277 222 55 29 66 108

2010 71 38

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

9a 1953 to 2011 59 years Series 17

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

Lower 2000> -.059 1974< -.036 2006> -.022 2003< -.016 1967> -.014 1961< -.012 Higher 1953 .060 1981 .039

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

2000 +3.0 SD

9a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1953 139 248 225 195 183 177 179

1960 208 145 118 170 144 103 152 137 92 112

1970 101 84 87 63 36 49 39 56 86 77

1980 95 56 78 78 72 141 154 131 200 185

1990 254 273 235 200 261 277 252 190 267 227

2000 263 199 151 73 206 219 268 176 121 148

2010 110 47

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9b 1950 to 2011 62 years Series 18

[B] Entire series, effect on correlation ( .622) is:

Lower 2000> -.020 2002> -.016 1971< -.014 1972> -.012 1978< -.012 1965< -.011 Higher 1953 .068 2011 .020

9b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1950 382 415 400 218 323 331 273 183 213 226

1960 265 194 144 166 130 88 87 83 68 98

1970 83 63 101 73 91 91 74 89 64 70

1980 59 62 81 67 65 154 217 289 325 256

1990 314 347 337 335 380 377 390 261 338 294

2000 282 265 300 256 299 285 230 288 265 320

2010 243 95

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10a 1912 to 2011 100 years Series 19

[B] Entire series, effect on correlation ( .715) is:

Lower 1981< -.033 1951< -.008 1918> -.006 1950< -.006 1957> -.005 1952< -.005 Higher 1936 .082 1968 .010

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

1981 -5.6 SD

10a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1912 85 120 129 56 59 88 141 126

1920 108 100 112 89 106 64 83 107 99 84

1930 74 87 122 102 109 133 23 83 86 104

1940 78 30 63 66 55 39 55 57 38 31

1950 38 31 34 35 62 176 213 177 201 163

1960 165 180 146 151 147 133 121 148 110 169

1970 165 181 156 134 159 152 145 179 174 169

1980 148 95 151 109 147 169 213 168 194 189

1990 233 172 180 144 173 157 153 153 133 125

2000 113 159 99 121 169 199 118 202 125 168

2010 50 47

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

10b 1906 to 2011 106 years Series 20

[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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1960 1999 0 .29 -.24 .22 .03 .05 .22 -.23 -.10 .21 -.36 .34\* .33 -.11 .16 -.04 -.04 .26 .06 -.02 .06 -.14

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

Lower 1968> -.038 1978< -.009 1947< -.009 1975< -.008 1936> -.007 1917< -.007 Higher 1915 .065 1955 .011

1960 to 1999 segment:

Lower 1968> -.166 1978< -.035 1986< -.027 1975< -.026 1984> -.025 1994< -.014 Higher 1983 .052 1990 .042

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

1915 -4.8 SD; 1968 +3.3 SD

10b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1906 166 130 108 113

1910 65 117 65 65 90 25 68 56 68 57

1920 74 67 85 78 99 79 89 73 60 77

1930 87 132 160 124 115 111 42 70 55 77

1940 69 55 75 59 53 45 63 37 16 19

1950 50 49 60 45 48 159 172 107 116 99

1960 128 109 89 101 97 111 106 87 130 154

1970 129 151 137 114 125 107 112 146 121 143

1980 123 132 172 136 172 205 156 149 177 159

1990 195 180 191 140 137 174 166 183 193 127

2000 88 144 57 71 129 164 93 118 86 116

2010 63 25

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PART 7: DESCRIPTIVE STATISTICS: SUG001\_FAGR\_Corr2-40 17:06 Fri 06 Jan 2012 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 ()

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1 1a 1953 2011 59 3 2 .479 1.82 4.09 .939 .891 .257 2.51 .555 .021 2

2 1b 1933 2011 79 4 0 .417 1.98 4.27 .975 .829 .251 2.37 .354 -.076 2

3 2a 1944 2011 68 3 0 .584 1.16 2.52 .630 .808 .319 2.57 .482 .011 1

4 2b 1941 2011 71 3 0 .572 1.32 2.59 .558 .687 .251 2.65 .503 .004 1

5 3a 1938 2011 74 4 2 .528 1.34 3.12 .832 .917 .219 2.57 .477 -.064 1

6 3b 1930 2011 82 4 1 .555 1.40 3.89 .969 .855 .286 2.42 .403 -.027 1

7 4a 1907 2011 105 5 1 .621 1.29 3.63 .935 .882 .261 2.40 .276 -.079 1

8 4b 1933 2011 79 4 0 .565 1.59 2.64 .559 .630 .244 2.75 .493 .110 1

9 5a 1928 2011 84 4 0 .589 1.54 2.58 .511 .679 .217 2.57 .391 .169 1

10 5b 1919 2011 93 5 0 .738 1.38 2.65 .515 .663 .250 2.43 .304 -.065 1

11 6a 1946 2011 66 3 0 .499 2.75 5.57 1.231 .804 .233 2.71 .507 .017 1

12 6b 1934 2011 78 4 1 .576 1.98 4.31 .987 .757 .285 2.68 .399 -.042 1

13 7a 1901 2011 111 5 0 .734 .92 2.14 .316 .669 .233 2.43 .353 -.031 1

14 7b 1902 2011 110 5 0 .722 .79 2.41 .302 .642 .240 2.43 .313 -.015 1

15 8a 1938 2011 74 4 2 .339 1.05 3.43 .903 .922 .358 2.84 .495 .004 2

16 8b 1932 2011 80 4 0 .537 1.32 2.90 .769 .772 .346 2.62 .448 -.035 1

17 9a 1953 2011 59 3 0 .513 1.53 2.77 .705 .786 .265 2.54 .559 .027 1

18 9b 1950 2011 62 3 0 .622 2.12 4.15 1.129 .885 .207 2.50 .453 -.020 1

19 10a 1912 2011 100 5 0 .715 1.22 2.33 .507 .728 .252 2.54 .400 -.067 1

20 10b 1906 2011 106 5 1 .615 1.05 2.05 .450 .739 .272 2.48 .334 -.070 1

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Total or mean: 1640 80 10 .589 1.42 5.57 .704 .768 .261 2.84 .411 -.016

- = [ COFECHA S1F2 COF ] = -