[] Dendrochronology Program Library Run M1B3 Program COF 15:32 Tue 06 Feb 2012 Page 1

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[] P R O G R A M C O F E C H A Version 6.06P 28163

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 QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

 Title of run: MIC001\_BEAL\_Corr3-40

 File of DATED series: MIC001\_BEAL\_Compact\_Corr3

 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)

 Text in file: 313

 Time span of Master dating series is 1932 to 2011 80 years

 Continuous time span is 1932 to 2011 80 years

 Portion with two or more series is 1932 to 2011 80 years

 Text in file: 313

 >> 14a 1973 absent in 1 of 10 series, but is not usually narrow: master index is .243

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

 \*C\* Number of dated series 12 \*C\*

 \*O\* Master series 1932 2011 80 yrs \*O\*

 \*F\* Total rings in all series 640 \*F\*

 \*E\* Total dated rings checked 640 \*E\*

 \*C\* Series intercorrelation .354 \*C\*

 \*H\* Average mean sensitivity .291 \*H\*

 \*A\* Segments, possible problems 20 \*A\*

 \*\*\* Mean length of series 53.3 \*\*\*

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

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

 14a 1 absent rings: 1973

 1 absent rings .156%

PART 2: TIME PLOT OF TREE-RING SERIES: MIC001\_BEAL\_Corr3-40 15:32 Tue 06 Feb 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

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

 . . . . . . . . . . . . . . . . . . <=======> . 12a 1 1932 2011 80

 . . . . . . . . . . . . . . . . . . <=======> . 12b 2 1932 2011 80

 . . . . . . . . . . . . . . . . . . .<====> . 13a 3 1965 2011 47

 . . . . . . . . . . . . . . . . . . .<====> . 13b 4 1961 2011 51

 . . . . . . . . . . . . . . . . . . <=====> . 14a 5 1950 2011 62

 . . . . . . . . . . . . . . . . . . .<====> . 14b 6 1964 2011 48

 . . . . . . . . . . . . . . . . . . .<====> . 15a 7 1961 2011 51

 . . . . . . . . . . . . . . . . . . <=======> . 15b 8 1932 2011 80

 . . . . . . . . . . . . . . . . . . . <===> . 16a 9 1970 2011 42

 . . . . . . . . . . . . . . . . . . .<====> . 16b 10 1963 2011 49

 . . . . . . . . . . . . . . . . . . . <==> . 17a 11 1987 2011 25

 . . . . . . . . . . . . . . . . . . . <==> . 17b 12 1987 2011 25

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

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

 1950 .488 4 2000 -.215 12

 1951 -.256 4 2001 -.398 12

 1952 .892 4 2002 .045 12

 1953 -.708 4 2003 .148 12

 1954 .033 4 2004 .917 12

 1955 .314 4 2005 -.298 12

 1956 1.017 4 2006 -.607 12

 1957 .505 4 2007 .831 12

 1958 .172 4 2008 .911 12

 1959 -.252 4 2009 1.298 12

 1960 -.501 4 2010 -.145 12

 1961 -.780 6 2011 -2.359 12

 1962 -2.309 6

 1963 -.752 7

 1964 .428 8

 1965 .740 9

 1966 .262 9

 1967 1.112 9

 1968 .546 9

 1969 .317 9

 1970 .387 10

 1971 -.181 10

 1972 .752 10

 1973 .243 10 1<<

 1974 .316 10

 1975 .044 10

 1976 -1.697 10

 1977 -1.365 10

 1978 .213 10

 1979 .451 10

 1980 .142 10

 1981 -.275 10

 1932 .528 3 1982 .336 10

 1933 .997 3 1983 -.023 10

 1934 1.382 3 1984 -.630 10

 1935 1.069 3 1985 -1.108 10

 1936 -5.284 3 1986 .061 10

 1937 -1.640 3 1987 .269 12

 1938 -.949 3 1988 1.276 12

 1939 -.356 3 1989 1.022 12

 1940 .688 3 1990 .290 12

 1941 .614 3 1991 -.356 12

 1942 .763 3 1992 -.149 12

 1943 1.159 3 1993 .354 12

 1944 1.889 3 1994 .662 12

 1945 .054 3 1995 -.138 12

 1946 .211 3 1996 -.204 12

 1947 .014 3 1997 -.916 12

 1948 -1.605 3 1998 -.138 12

 1949 -.524 3 1999 -.044 12

PART 5: CORRELATION OF SERIES BY SEGMENTS: MIC001\_BEAL\_Corr3-40 15:32 Tue 06 Feb 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 1920 1940 1960 1980

 1959 1979 1999 2019

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

 1 12a 1932 2011 .63 .43 .46 .28B

 2 12b 1932 2011 .23B .03B .11B .17B

 3 13a 1965 2011 -.02B .21B

 4 13b 1961 2011 .08B .13B

 5 14a 1950 2011 .24B .24B .35A

 6 14b 1964 2011 .34A .44

 7 15a 1961 2011 .35A .27A

 8 15b 1932 2011 .63 .35A .31A .36A

 9 16a 1970 2011 .45 .64

 10 16b 1963 2011 .40 .59

 11 17a 1987 2011 .06B

 12 17b 1987 2011 .46B

 Av segment correlation .50 .26 .27 .33

PART 6: POTENTIAL PROBLEMS: MIC001\_BEAL\_Corr3-40 15:32 Tue 06 Feb 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

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

 12a 1932 to 2011 80 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

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

 1972 2011 -5 -.26 -.15 .07 -.07 -.10 .35\*-.02 -.11 -.25 -.08 .28| - - - - - - - - - -

 [B] Entire series, effect on correlation ( .502) is:

 Lower 2011> -.040 1996< -.025 1939> -.023 1995> -.021 1952< -.021 1957> -.018 Higher 1936 .221 1962 .037

 1972 to 2011 segment:

 Lower 2011> -.117 1995> -.053 1996< -.042 1988< -.036 1974< -.018 1977> -.018 Higher 1976 .161 2007 .030

 12a Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1932 106 95 112 106 13 55 96 172

 1940 121 89 128 177 188 134 131 120 40 96

 1950 101 71 73 117 154 180 172 200 181 136

 1960 140 154 88 125 158 156 139 187 188 195

 1970 163 159 204 202 124 127 32 115 284 264

 1980 208 143 106 153 128 67 124 132 96 85

 1990 93 116 103 123 157 180 54 35 54 54

 2000 48 50 60 60 68 48 55 69 47 49

 2010 21 25

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

 12b 1932 to 2011 80 years Series 2

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

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

 1932 1971 5 - - - - - - - - - - .23| .01 -.10 -.01 -.14 .27\*-.17 -.29 .03 .11 -.23

 1940 1979 -1 - - -.13 -.11 .26 -.29 -.08 -.07 .05 .32\* .03|-.02 -.05 .08 -.14 .28 .01 -.16 .04 -.09 -.28

 1960 1999 -1 .08 .11 -.04 -.15 -.05 -.09 -.05 -.06 .09 .40\* .11| .05 -.14 -.13 -.02 .12 -.01 -.11 .13 -.26 .02

 1972 2011 -1 -.01 .12 -.07 -.18 .18 .09 -.15 -.23 -.18 .58\* .17| - - - - - - - - - -

 [B] Entire series, effect on correlation ( .184) is:

 Lower 1957< -.042 1976> -.028 1951> -.021 2005> -.020 1942< -.016 1949< -.013 Higher 2011 .073 1936 .048

 1932 to 1971 segment:

 Lower 1957< -.099 1951> -.040 1942< -.032 1949< -.027 1937< -.023 1961< -.009 Higher 1936 .125 1944 .027

 1940 to 1979 segment:

 Lower 1957< -.090 1976> -.069 1951> -.051 1942< -.038 1949< -.030 1978< -.011 Higher 1944 .047 1962 .044

 1960 to 1999 segment:

 Lower 1976> -.118 1986< -.032 1978< -.018 1988< -.013 1987> -.010 1968< -.010 Higher 1967 .060 1962 .041

 1972 to 2011 segment:

 Lower 1976> -.107 2005> -.062 1986< -.026 2010> -.017 2007< -.015 1978< -.015 Higher 2011 .305 1972 .021

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

 1936 1937 -5.6 SD

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

 1936 +4.5 SD

 12b Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1932 145 159 174 156 85 52 65 93

 1940 161 191 114 146 174 126 102 108 84 64

 1950 143 209 211 122 74 81 153 87 128 109

 1960 125 88 107 118 160 171 200 314 205 205

 1970 256 188 309 308 366 270 289 36 48 125

 1980 165 137 233 253 224 108 53 274 207 213

 1990 208 127 126 102 98 76 87 74 123 176

 2000 167 131 85 70 61 97 57 50 44 45

 2010 43 24

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

 13a 1965 to 2011 47 years Series 3

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

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

 1965 2004 1 .02 -.06 .31 -.06 -.34 .04 -.04 -.35 -.13 .01 -.02| .33\* .08 .13 .01 -.05 .30 .03 - - -

 1972 2011 -5 .08 -.08 .13 -.09 -.33 .31\* .01 -.26 -.23 -.17 .21| - - - - - - - - - -

 [B] Entire series, effect on correlation ( .120) is:

 Lower 1970< -.103 1977> -.037 1991> -.028 1974< -.023 1975< -.018 1995> -.018 Higher 1976 .070 2011 .056

 1965 to 2004 segment:

 Lower 1970< -.118 1977> -.046 1991> -.034 1974< -.027 1972< -.022 1995> -.021 Higher 1976 .143 1967 .044

 1972 to 2011 segment:

 Lower 1977> -.050 1991> -.038 1974< -.032 1981< -.028 1975< -.027 1972< -.024 Higher 1976 .075 2011 .053

 13a Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1965 850 742 757 686 643

 1970 339 385 348 331 243 181 156 345 405 381

 1980 378 209 272 295 227 197 302 465 461 337

 1990 250 469 387 296 267 336 232 163 138 123

 2000 260 398 441 565 464 148 147 165 201 197

 2010 96 39

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

 13b 1961 to 2011 51 years Series 4

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

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

 1961 2000 -8 .02 .28 .42\* .18 -.12 -.14 -.14 -.21 -.05 -.25 .08|-.07 -.01 .00 .03 .06 .24 .30 .22 -.24 -.24

 1972 2011 -8 .10 .08 .37\* .01 -.10 .04 .02 .01 .07 -.18 .13| - - - - - - - - - -

 [B] Entire series, effect on correlation ( .142) is:

 Lower 2011> -.066 1989< -.063 1972< -.023 1996> -.020 1963> -.017 1978< -.017 Higher 1976 .046 2007 .031

 1961 to 2000 segment:

 Lower 1989< -.097 1972< -.035 1996> -.029 1978< -.026 1963> -.025 1970< -.019 Higher 1976 .086 1962 .061

 1972 to 2011 segment:

 Lower 2011> -.096 1989< -.082 1972< -.030 1996> -.026 1978< -.022 2008< -.012 Higher 1976 .065 2005 .042

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

 2011 +3.0 SD

 13b Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1961 525 431 585 558 686 478 460 360 240

 1970 188 140 142 146 281 332 211 189 167 194

 1980 254 262 270 210 185 201 289 349 393 223

 1990 189 191 194 159 184 187 269 198 152 103

 2000 66 54 66 60 127 35 5 91 44 65

 2010 38 27

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

 14a 1950 to 2011 62 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

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

 1950 1989 8 -.16 .01 -.05 -.14 .04 .22 -.13 -.01 -.03 -.17 .24|-.16 -.22 -.37 .08 -.04 .09 -.08 .42\* .40 .10

 1960 1999 5 .04 .20 -.15 -.13 -.05 .07 -.15 -.20 -.14 -.23 .24| .12 -.15 -.13 .18 .27\* .21 -.12 .15 .11 .09

 1972 2011 0 .17 -.04 -.23 -.07 .04 .12 .00 -.42 -.24 -.09 .35\* - - - - - - - - - -

 [B] Entire series, effect on correlation ( .176) is:

 Lower 1973< -.088 1959> -.023 1994< -.019 1984> -.018 2007< -.017 1957> -.016 Higher 1953 .022 2009 .022

 1950 to 1989 segment:

 Lower 1973< -.104 1959> -.032 1984> -.024 1957> -.022 1960> -.013 1963> -.012 Higher 1962 .037 1953 .035

 1960 to 1999 segment:

 Lower 1973< -.116 1994< -.027 1984> -.027 1960> -.014 1963> -.014 1985> -.011 Higher 1962 .039 1988 .021

 1972 to 2011 segment:

 Lower 1973< -.160 1994< -.028 1984> -.027 2007< -.027 1985> -.011 1998> -.005 Higher 2009 .033 2005 .024

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

 1973 1974 4.4 SD

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

 1973 .243 10 1 >> WARNING: Ring is not usually narrow

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

 1973 -6.9 SD

 14a Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1950 255 191 268 178 240 274 340 344 280 363

 1960 333 270 214 306 282 225 277 257 203 256

 1970 246 109 234 0 275 193 170 158 278 332

 1980 252 207 296 229 318 273 287 216 268 241

 1990 194 182 235 219 155 134 141 189 256 237

 2000 219 193 269 199 226 102 106 112 172 239

 2010 136 106

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

 14b 1964 to 2011 48 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

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

 1964 2003 0 .05 -.19 -.10 -.27 -.18 .01 -.01 -.06 -.14 .11 .34\* .11 -.09 -.01 .20 .13 -.06 -.01 -.05 - -

 [B] Entire series, effect on correlation ( .411) is:

 Lower 1997> -.035 2003< -.029 2001< -.023 1994< -.023 1973< -.017 2000> -.014 Higher 1976 .114 2011 .057

 1964 to 2003 segment:

 Lower 1997> -.057 2003< -.038 1994< -.032 2000> -.022 1973< -.020 1965< -.020 Higher 1976 .225 1977 .032

 14b Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1964 325 301 320 326 347 358

 1970 308 268 300 235 263 254 180 172 288 322

 1980 318 257 340 347 317 309 283 296 345 356

 1990 341 309 303 333 265 207 187 307 345 349

 2000 379 217 378 250 302 285 325 324 426 574

 2010 351 176

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

 15a 1961 to 2011 51 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

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

 1961 2000 0 -.01 .04 .05 .02 .04 -.07 -.17 .01 -.22 .18 .35\* .10 -.05 -.24 -.14 -.21 -.10 .16 .18 -.10 -.08

 1972 2011 0 .08 -.08 .11 -.06 .03 .04 -.28 .04 -.26 -.06 .27\* - - - - - - - - - -

 [B] Entire series, effect on correlation ( .342) is:

 Lower 1998< -.054 2011> -.038 1986< -.034 1969< -.030 1971> -.027 2001> -.025 Higher 1962 .132 1976 .048

 1961 to 2000 segment:

 Lower 1998< -.067 1986< -.044 1971> -.043 1969< -.037 1981> -.036 1977> -.027 Higher 1962 .207 1976 .059

 1972 to 2011 segment:

 Lower 1998< -.084 1986< -.050 2001> -.034 2011> -.030 1981> -.029 1977> -.017 Higher 1976 .090 2007 .043

 15a Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1961 91 47 67 135 164 122 93 94 64

 1970 91 203 200 167 124 128 77 85 222 215

 1980 153 137 132 82 35 43 44 54 76 63

 1990 37 22 47 79 91 56 48 79 64 68

 2000 85 173 165 186 261 218 160 389 420 330

 2010 151 92

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

 15b 1932 to 2011 80 years Series 8

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

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

 1940 1979 0 - - .03 .02 -.18 .09 -.25 .08 -.13 -.11 .35\* .12 .14 .11 -.02 -.18 -.07 -.18 .00 -.10 -.13

 1960 1999 0 -.18 .05 .09 .11 .05 -.18 -.15 .13 -.14 .09 .31\* .19 .16 -.18 -.31 -.01 -.18 .08 .09 -.39 .02

 1972 2011 0 -.15 .16 .16 -.07 .11 .08 -.10 -.01 -.33 .05 .36\* - - - - - - - - - -

 [B] Entire series, effect on correlation ( .548) is:

 Lower 1948> -.020 1939< -.016 1996> -.015 1960< -.013 2009< -.012 1937> -.012 Higher 1936 .237 1944 .011

 1940 to 1979 segment:

 Lower 1960< -.038 1956< -.027 1948> -.023 1979< -.022 1958< -.022 1949> -.021 Higher 1962 .067 1976 .049

 1960 to 1999 segment:

 Lower 1996> -.044 1960< -.042 1997> -.033 1998< -.025 1979< -.025 1994< -.025 Higher 1962 .072 1976 .054

 1972 to 2011 segment:

 Lower 1996> -.041 2009< -.036 1997> -.031 1998< -.026 1979< -.024 1994< -.024 Higher 1976 .043 1988 .040

 15b Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1932 222 269 268 251 104 201 173 140

 1940 173 171 202 172 203 128 150 134 129 160

 1950 152 130 201 105 159 136 98 100 63 46

 1960 25 23 27 38 96 124 125 184 189 176

 1970 262 263 303 270 216 205 130 126 175 126

 1980 122 181 150 135 105 116 199 186 276 207

 1990 120 97 95 145 109 98 193 177 89 159

 2000 119 92 100 129 187 114 41 99 99 60

 2010 26 21

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

 16a 1970 to 2011 42 years Series 9

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

 Lower 1976> -.036 2006> -.029 1970> -.022 1978< -.017 1980< -.016 2002< -.010 Higher 2011 .155 2009 .018

 16a Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1970 174 100 127 84 70 89 57 55 58 83

 1980 51 71 102 51 59 75 226 332 431 476

 1990 468 346 328 321 484 320 258 148 245 242

 2000 252 194 160 154 206 169 206 192 174 204

 2010 127 48

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

 16b 1963 to 2011 49 years Series 10

 [B] Entire series, effect on correlation ( .567) is:

 Lower 1966< -.032 2009< -.022 2002< -.021 1982< -.020 1980< -.018 2010> -.017 Higher 2011 .166 1967 .021

 16b Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1963 117 132 173 112 198 154 156

 1970 241 193 244 202 208 211 113 149 187 123

 1980 80 132 132 149 158 133 353 504 590 624

 1990 638 440 411 385 614 487 428 291 404 394

 2000 393 301 252 321 315 256 279 341 316 248

 2010 228 94

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

 17a 1987 to 2011 25 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

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

 1987 2011 -10 .29\*-.15 -.13 -.19 .02 .04 .10 .26 .22 -.10 .06| - - - - - - - - - -

 [B] Entire series, effect on correlation ( .062) is:

 Lower 1987< -.102 2000< -.067 1996> -.024 2006> -.022 2010> -.011 1998> -.010 Higher 2009 .057 2011 .049

 1987 to 2011 segment:

 Lower 1987< -.102 2000< -.067 1996> -.024 2006> -.022 2010> -.011 1998> -.010 Higher 2009 .057 2011 .049

 17a Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1987 49 128 210

 1990 191 137 110 202 296 226 317 206 365 263

 2000 125 258 389 509 379 242 411 521 572 559

 2010 260 89

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

 17b 1987 to 2011 25 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

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

 1987 2011 -6 .21 -.43 -.11 -.20 .52\* .03 -.23 -.02 .04 .27 .46| - - - - - - - - - -

 [B] Entire series, effect on correlation ( .464) is:

 Lower 1987< -.208 1996> -.035 1995> -.028 2010> -.027 2005> -.020 2003< -.007 Higher 2011 .270 2009 .028

 1987 to 2011 segment:

 Lower 1987< -.208 1996> -.035 1995> -.028 2010> -.027 2005> -.020 2003< -.007 Higher 2011 .270 2009 .028

 17b Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1987 50 127 197

 1990 200 178 209 297 417 348 404 206 225 243

 2000 269 259 318 285 377 335 253 430 443 553

 2010 473 151

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PART 7: DESCRIPTIVE STATISTICS: MIC001\_BEAL\_Corr3-40 15:32 Tue 06 Feb 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 ()

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

 1 12a 1932 2011 80 4 1 .502 1.17 2.84 .566 .695 .309 2.46 .420 -.064 2

 2 12b 1932 2011 80 4 4 .184 1.42 3.66 .753 .666 .309 2.61 .446 -.042 3

 3 13a 1965 2011 47 2 2 .120 3.34 8.50 1.817 .809 .277 2.75 .582 -.040 2

 4 13b 1961 2011 51 2 2 .142 2.25 6.86 1.552 .890 .317 2.71 .592 .092 1

 5 14a 1950 2011 62 3 3 .176 2.25 3.63 .698 .375 .300 2.30 .348 -.070 1

 6 14b 1964 2011 48 2 1 .411 3.06 5.74 .684 .385 .173 2.52 .571 .114 1

 7 15a 1961 2011 51 2 2 .342 1.26 4.20 .866 .759 .333 2.73 .521 .061 3

 8 15b 1932 2011 80 4 3 .548 1.45 3.03 .653 .720 .283 2.43 .329 -.061 1

 9 16a 1970 2011 42 2 0 .623 1.91 4.84 1.259 .860 .289 2.61 .450 .130 1

 10 16b 1963 2011 49 2 0 .567 2.78 6.38 1.503 .847 .240 2.45 .419 -.033 1

 11 17a 1987 2011 25 1 1 .062 2.81 5.72 1.497 .631 .429 2.46 .576 .020 3

 12 17b 1987 2011 25 1 1 .464 2.90 5.53 1.197 .578 .271 2.60 .664 -.050 1

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 Total or mean: 640 29 20 .354 2.04 8.50 .995 .685 .291 2.75 .467 -.005

 - = [ COFECHA M1B3 COF ] = -