[] Dendrochronology Program Library Run 167 Program COF 10:55 Mon 21 Mar 2011 Page 1

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QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

File of DATED series: 167\_HUB

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 30 years lagged successively by 15 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 .4226

6 Master dating series saved N

7 Ring measurements listed N

8 Parts printed 1234567

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

Time span of Master dating series is 1932 to 2010 79 years

Continuous time span is 1932 to 2010 79 years

Portion with two or more series is 1941 to 2010 70 years

>> 542B 1958 absent in 1 of 7 series, but is not usually narrow: master index is 1.684

>> 542B 1959 absent in 1 of 8 series, but is not usually narrow: master index is 1.387

>> 546B 1996 absent in 1 of 10 series, but is not usually narrow: master index is -.366

>> 546B 1998 absent in 1 of 10 series, but is not usually narrow: master index is .132

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

\*C\* Number of dated series 10 \*C\*

\*O\* Master series 1932 2010 79 yrs \*O\*

\*F\* Total rings in all series 592 \*F\*

\*E\* Total dated rings checked 583 \*E\*

\*C\* Series intercorrelation .386 \*C\*

\*H\* Average mean sensitivity .282 \*H\*

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

\*\*\* Mean length of series 59.2 \*\*\*

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

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

542B 2 absent rings: 1958 1959

543A 2 absent rings: 1982 1983

546B 4 absent rings: 1995 1996 1997 1998

8 absent rings 1.351%

PART 2: TIME PLOT OF TREE-RING SERIES: 10:55 Mon 21 Mar 2011 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

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

. . . . . . . . . . . . . . . . . . <======> . 542A 1 1947 2010 64

. . . . . . . . . . . . . . . . . . <======> . 542B 2 1948 2010 63

. . . . . . . . . . . . . . . . . . <=====> . 543A 3 1952 2010 59

. . . . . . . . . . . . . . . . . . <=====> . 543B 4 1959 2010 52

. . . . . . . . . . . . . . . . . . <=====> . 544A 5 1958 2010 53

. . . . . . . . . . . . . . . . . . .<====> . 544B 6 1968 2010 43

. . . . . . . . . . . . . . . . . . <=======> . 545A 7 1932 2010 79

. . . . . . . . . . . . . . . . . . <=====> . 545B 8 1951 2010 60

. . . . . . . . . . . . . . . . . . <======> . 546A 9 1941 2010 70

. . . . . . . . . . . . . . . . . . .<====> . 546B 10 1962 2010 49

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

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

PART 3: Master Dating Series: 10:55 Mon 21 Mar 2011 Page 3

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Year Value No Ab Year Value No Ab Year Value No Ab Year Value No Ab Year Value No Ab Year Value No Ab

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

1950 -.757 4 2000 .169 10

1951 .512 5 2001 -.167 10

1952 -.467 6 2002 .497 10

1953 -2.075 6 2003 -.953 10

1954 -.209 6 2004 1.422 10

1955 .296 6 2005 .035 10

1956 .807 6 2006 .757 10

1957 1.527 6 2007 .281 10

1958 1.684 7 1<< 2008 -.309 10

1959 1.387 8 1<< 2009 .832 10

1960 .083 8 2010 -.185 10

1961 1.099 8

1962 -.476 9

1963 .118 9

1964 -.882 9

1965 .206 9

1966 -.316 9

1967 .340 9

1968 .450 10

1969 .662 10

1970 -.794 10

1971 -.430 10

1972 -.448 10

1973 -.324 10

1974 -.582 10

1975 -.824 10

1976 .683 10

1977 -.332 10

1978 -1.349 10

1979 -.915 10

1980 1.466 10

1981 -.250 10

1932 1.045 1 1982 -1.443 10 1

1933 -.204 1 1983 -1.217 10 1

1934 -.627 1 1984 -.815 10

1935 1.322 1 1985 .673 10

1936 1.613 1 1986 .022 10

1937 .303 1 1987 .649 10

1938 2.255 1 1988 .137 10

1939 -.554 1 1989 -.015 10

1940 -3.111 1 1990 1.076 10

1941 -1.062 2 1991 .495 10

1942 -1.362 2 1992 .990 10

1943 -2.569 2 1993 .733 10

1944 -1.603 2 1994 .022 10

1945 1.665 2 1995 -.527 10 1

1946 .024 2 1996 -.366 10 1<<

1947 1.040 3 1997 -1.620 10 1

1948 .474 4 1998 .132 10 1<<

1949 1.069 4 1999 -.914 10

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PART 4: Master Bar Plot: 10:55 Mon 21 Mar 2011 Page 4

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Year Rel value Year Rel value Year Rel value Year Rel value Year Rel value Year Rel value Year Rel value Year Rel value

1950--c 2000------A

1951-------B 2001----a

1952---b 2002-------B

1953h 2003-d

1954----a 2004----------F

1955------A 2005-----@

1956--------C 2006--------C

1957----------F 2007------A

1958----------G 2008----a

1959----------F 2009--------C

1960-----@ 2010----a

1961---------D

1962---b

1963-----@

1964-d

1965------A

1966----a

1967------A

1968-------B

1969--------C

1970-c

1971---b

1972---b

1973---a

1974--b

1975-c

1976--------C

1977---a

1978e

1979-d

1980----------F

1981----a

1932---------D 1982f

1933----a 1983-e

1934--c 1984-c

1935---------E 1985--------C

1936----------F 1986-----@

1937------A 1987--------C

1938----------I 1988-----A

1939--b 1989-----@

1940l 1990---------D

1941-d 1991-------B

1942e 1992---------D

1943j 1993--------C

1944f 1994-----@

1945----------G 1995---b

1946-----@ 1996---a

1947---------D 1997f

1948-------B 1998-----A

1949---------D 1999-d

PART 5: CORRELATION OF SERIES BY SEGMENTS: 10:55 Mon 21 Mar 2011 Page 5

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Correlations of 30-year dated segments, lagged 15 years

Flags: A = correlation under .4226 but highest as dated; B = correlation higher at other than dated position

Seq Series Time\_span 1935 1950 1965 1980 1995

1964 1979 1994 2009 2024

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

1 542A 1947 2010 .58 .57 .62 .43 .34A

2 542B 1948 2010 .41A .43 .52 .54 .55

3 543A 1952 2010 .39A .23B .54 .52

4 543B 1959 2010 .34B .25B .34A .19B

5 544A 1958 2010 .16B .23B .34A .35B

6 544B 1968 2010 .32B .43 .33B

7 545A 1932 2010 .32B .32B .55 .42 .42A

8 545B 1951 2010 .44 .39A .50 .47

9 546A 1941 2010 .46 .43 .40B .56 .52

10 546B 1962 2010 .43 .33A .57 .53

Av segment correlation .44 .39 .39 .47 .42

PART 6: POTENTIAL PROBLEMS: 10:55 Mon 21 Mar 2011 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 30-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

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

542A 1947 to 2010 64 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

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

1981 2010 0 -.11 -.19 -.16 -.06 -.01 .00 -.01 .02 .27 -.20 .34\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .495) is:

Lower 2002< -.056 1962> -.040 1964> -.024 2010> -.018 1993< -.013 1998< -.012 Higher 1953 .030 1980 .024

1981 to 2010 segment:

Lower 2002< -.146 1993< -.034 2010> -.033 1998< -.032 2005> -.019 1983> -.010 Higher 1981 .071 1997 .068

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

542B 1948 to 2010 63 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

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

1948 1977 0 -.08 .18 .01 -.11 -.02 -.05 .05 -.07 .33 -.28 .41\* .06 .00 -.02 .18 -.04 -.17 .26 .19 .14 -.13

[B] Entire series, effect on correlation ( .281) is:

Lower 1958< -.172 1960> -.052 1982> -.031 1959< -.030 1983> -.009 2005> -.008 Higher 2004 .041 1997 .031

1948 to 1977 segment:

Lower 1958< -.257 1960> -.085 1959< -.041 1966> -.011 1948< -.003 1964> -.002 Higher 1957 .054 1970 .037

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

1959 1960 4.5 SD

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

1958 1.684 7 1 >> WARNING: Ring is not usually narrow

1959 1.387 8 1 >> WARNING: Ring is not usually narrow

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

1958 -4.9 SD; 1959 -4.6 SD

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

543A 1952 to 2010 59 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

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

1952 1981 0 .07 .05 -.17 .09 -.35 -.35 .11 -.45 .17 -.01 .39\*-.07 .25 -.30 .06 -.04 -.01 -.22 .10 .04 .29

1965 1994 5 -.31 .03 -.21 .16 -.05 -.06 .09 -.04 .18 .03 .23|-.14 -.10 -.35 .18 .39\*-.07 -.09 .13 .26 -.07

[B] Entire series, effect on correlation ( .461) is:

Lower 1981> -.037 1978> -.028 1953> -.017 1970> -.017 1975> -.014 2000< -.012 Higher 2004 .027 1980 .019

1952 to 1981 segment:

Lower 1981> -.070 1978> -.046 1954< -.029 1975> -.028 1970> -.022 1969< -.013 Higher 1980 .060 1962 .025

1965 to 1994 segment:

Lower 1981> -.073 1978> -.055 1970> -.034 1975> -.023 1969< -.009 1974> -.006 Higher 1982 .118 1980 .040

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

1982 -1.443 10 1

1983 -1.217 10 1

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

1983 -4.7 SD

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

543B 1959 to 2010 52 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

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

1959 1988 -10 .35\*-.09 .19 .18 -.16 -.09 -.09 -.27 -.21 .00 .34|-.33 .15 .00 .34 -.08 .16 .22 .01 -.10 .22

1965 1994 7 .18 .15 .21 .00 -.09 -.10 -.10 -.23 -.21 -.07 .25|-.31 -.24 .19 .21 .11 .23 .38\* .08 -.07 -.03

1980 2009 0 .04 .08 .02 -.08 .06 -.18 -.22 -.25 -.22 -.47 .34\*-.38 - - - - - - - - -

1981 2010 -10 .19\* .08 .04 -.09 .13 -.20 -.29 -.19 -.15 -.42 .19| - - - - - - - - - -

[B] Entire series, effect on correlation ( .282) is:

Lower 1991< -.034 1983> -.032 2010> -.031 1960< -.026 1970> -.024 1990< -.021 Higher 2004 .053 1980 .050

1959 to 1988 segment:

Lower 1960< -.074 1983> -.045 1970> -.037 1964> -.027 1982> -.016 1977> -.013 Higher 1980 .077 1978 .052

1965 to 1994 segment:

Lower 1983> -.070 1991< -.066 1970> -.051 1990< -.040 1982> -.022 1977> -.022 Higher 1980 .112 1978 .093

1980 to 2009 segment:

Lower 1983> -.077 1991< -.075 1990< -.044 2005> -.033 2009< -.026 1986> -.023 Higher 2004 .095 1980 .090

1981 to 2010 segment:

Lower 1991< -.075 1983> -.068 2010> -.060 1990< -.040 2005> -.029 2009< -.023 Higher 2004 .139 1997 .062

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

1983 +3.3 SD

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544A 1958 to 2010 53 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

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

1958 1987 7 .27 .15 .00 .10 .20 .05 -.19 -.08 .16 .09 .16|-.27 -.09 .00 .02 .06 -.01 .28\*-.02 -.09 .05

1965 1994 -10 .25\* .09 .08 -.04 .18 -.01 -.35 -.18 .16 .16 .23|-.21 -.03 .07 -.03 .04 -.06 .19 -.03 -.02 -.02

1980 2009 0 .08 -.05 .03 -.14 .29 .02 -.35 -.14 .31 -.08 .34\*-.34 - - - - - - - - -

1981 2010 -2 .04 -.03 -.03 -.01 .06 .06 -.43 -.10 .39\*-.17 .35| - - - - - - - - - -

[B] Entire series, effect on correlation ( .282) is:

Lower 1962> -.047 1981> -.032 1971< -.026 1982> -.025 1964> -.024 1972< -.023 Higher 1970 .033 2010 .024

1958 to 1987 segment:

Lower 1962> -.063 1981> -.043 1971< -.038 1972< -.034 1964> -.033 1982> -.032 Higher 1970 .058 1980 .044

1965 to 1994 segment:

Lower 1981> -.072 1982> -.057 1977> -.039 1971< -.037 1972< -.032 1984< -.021 Higher 1970 .071 1980 .048

1980 to 2009 segment:

Lower 1981> -.066 1984< -.061 1982> -.050 1992< -.027 2008> -.015 2001> -.014 Higher 1997 .055 2004 .037

1981 to 2010 segment:

Lower 1981> -.072 1982> -.057 1984< -.049 1992< -.025 2008> -.015 2001> -.012 Higher 2010 .042 1997 .041

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

544B 1968 to 2010 43 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

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1968 1997 -5 .04 .06 .07 -.02 -.16 .37\* .04 -.18 .00 .19 .32|-.05 -.14 .13 -.30 -.13 -.32 .02 -.21 -.18 -.30

1981 2010 -8 .10 .11 .36\*-.10 .11 .21 -.02 -.19 .12 -.26 .33| - - - - - - - - - -

[B] Entire series, effect on correlation ( .287) is:

Lower 1997> -.052 2010> -.047 2005< -.035 1970> -.024 1973> -.024 1986< -.017 Higher 1982 .041 2004 .033

1968 to 1997 segment:

Lower 1997> -.088 1970> -.042 1973> -.039 1986< -.032 1977> -.023 1994< -.018 Higher 1982 .055 1981 .042

1981 to 2010 segment:

Lower 1997> -.094 2010> -.081 2005< -.040 1986< -.018 2001> -.015 2006< -.008 Higher 1982 .055 2004 .046

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545A 1932 to 2010 79 years Series 7

[\*] Early part of series cannot be checked from 1932 to 1940 -- not matched by another series

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

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

1941 1970 9 - .04 -.12 -.06 -.25 -.20 -.07 .15 .07 .14 .32| .03 .16 -.26 -.05 -.32 -.20 .21 .01 .40\*-.29

1950 1979 9 .25 -.03 .01 -.07 -.23 -.08 -.03 .24 .00 .22 .32| .07 -.12 -.19 -.09 -.28 -.26 .23 -.03 .36\*-.46

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

1981 2010 0 .05 -.18 -.12 .08 -.15 -.04 .31 .24 .15 -.18 .42\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .341) is:

Lower 1943> -.054 1951< -.037 1950> -.033 1998< -.030 1962> -.021 1985< -.012 Higher 1953 .028 2004 .027

1941 to 1970 segment:

Lower 1943> -.081 1951< -.078 1950> -.053 1962> -.036 1941< -.018 1960> -.017 Higher 1945 .055 1953 .053

1950 to 1979 segment:

Lower 1951< -.114 1950> -.089 1962> -.051 1960> -.023 1973> -.021 1955< -.006 Higher 1953 .082 1958 .045

1981 to 2010 segment:

Lower 1998< -.080 1997> -.063 1985< -.035 2000< -.030 2003> -.025 1984> -.020 Higher 2004 .083 1982 .051

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

1943 +3.2 SD

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

545B 1951 to 2010 60 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

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

1965 1994 0 -.21 -.18 -.01 .26 .06 -.04 .30 .14 .07 -.03 .39\* .05 -.04 -.46 .29 .02 .12 -.17 -.07 -.04 -.22

[B] Entire series, effect on correlation ( .439) is:

Lower 1960> -.017 2008> -.017 2000< -.017 1977< -.015 1974> -.013 1972> -.013 Higher 1953 .029 1982 .021

1965 to 1994 segment:

Lower 1977< -.042 1974> -.025 1972> -.024 1968< -.021 1985< -.021 1971> -.020 Higher 1982 .060 1992 .031

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

546A 1941 to 2010 70 years Series 9

[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 1994 -4 -.16 -.25 .18 .05 .03 .22 .54\* .00 -.23 -.05 .40|-.22 -.37 -.09 -.03 -.24 -.12 -.11 .10 .01 .14

[B] Entire series, effect on correlation ( .484) is:

Lower 1960> -.035 1943< -.033 1987< -.015 1941> -.014 1977> -.013 1967< -.012 Higher 1950 .029 1945 .024

1965 to 1994 segment:

Lower 1987< -.055 1967< -.044 1968< -.042 1977> -.041 1985< -.030 1969< -.026 Higher 1980 .109 1978 .064

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

1941 +3.1 SD

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

546B 1962 to 2010 49 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

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

1965 1994 0 .04 -.16 .29 .00 -.10 -.05 .08 .12 -.38 .08 .33\* .21 -.19 .21 .27 .29 -.26 -.30 .03 -.28 -.05

[B] Entire series, effect on correlation ( .459) is:

Lower 1966> -.045 1975> -.029 1972> -.026 1998< -.024 1992< -.020 1971> -.011 Higher 1980 .027 1978 .026

1965 to 1994 segment:

Lower 1966> -.081 1975> -.050 1972> -.045 1992< -.044 1971> -.018 1993< -.017 Higher 1978 .087 1980 .064

[D] 4 Absent rings: Year Master N series Absent

1995 -.527 10 1

1996 -.366 10 1 >> WARNING: Ring is not usually narrow

1997 -1.620 10 1

1998 .132 10 1 >> WARNING: Ring is not usually narrow

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

PART 7: DESCRIPTIVE STATISTICS: 10:55 Mon 21 Mar 2011 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 542A 1947 2010 64 5 1 .495 1.33 3.89 1.015 .785 .302 2.92 .562 -.015 1

2 542B 1948 2010 63 5 1 .281 1.34 5.60 1.222 .826 .413 2.69 .456 .043 1

3 543A 1952 2010 59 4 2 .461 1.78 4.25 .970 .834 .266 2.47 .387 .126 1

4 543B 1959 2010 52 4 4 .282 1.57 4.86 .940 .731 .252 2.70 .499 -.048 1

5 544A 1958 2010 53 4 4 .282 1.74 4.48 1.347 .900 .230 2.80 .655 .204 2

6 544B 1968 2010 43 3 2 .287 1.66 3.86 1.131 .915 .225 2.81 .611 .061 1

7 545A 1932 2010 79 5 3 .341 2.14 5.93 1.227 .794 .304 2.74 .517 .110 1

8 545B 1951 2010 60 4 1 .439 1.68 4.18 .773 .808 .207 2.56 .441 -.095 1

9 546A 1941 2010 70 5 1 .484 1.87 4.20 .884 .788 .253 2.76 .505 .028 1

10 546B 1962 2010 49 4 1 .459 1.31 3.94 .884 .875 .342 2.94 .599 .073 1

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Total or mean: 592 43 20 .386 1.66 5.93 1.042 .821 .282 2.94 .518 .049

- = [ COFECHA 167 COF ] = -