*1)* ***Folder Name:*** *RW*

***Files:*** *(Site)\_(Species).rwl*

***Summary:*** Data is organized across plots (LF1, LF2, LF3) and species (ACRU, BEAL, FAGR, QURU, TSCA, PIST, HAVI; see below for example of abbreviations). This folder contains eighteen raw ring-width (.rwl) files for each species sampled at each plots.

**Species abbreviation:**

First two letters = genus; Last two letter = species

Example: ACRU = *Acer rubrum* (red maple)  
 BEAL = *Betula alleghaniensis* (yellow birch)  
 FAGR = *Fagus grandifolia* (American beech)  
 HAVI = *Hamamelis virginiana* (witch-hazel)

PIST = *Pinus strobus* (eastern white pine)

QURU = *Quercus rubra* (red oak)

QUVE = *Quercus velutina* (black oak)

TSCA = *Tsuga canadensis* (eastern hemlock)

***Data format:*** Measurements in units of 0.001 mm for the thickness of tree ring for each year. Each file consists of all the measurements for usable cores and portions of usable cores for a given plot. Some cores had too much rot or other issues to be useful. The end of each series is indicated by the -9999 sentinel. The 10 values following the decade are the annual measurements for the 10 years of that decade. The first and last decade rows for each core may contain less than 10 values depending on when each tree was cored and the year of the first measurable ring. The standard tree-ring format, aka Tucson format, is:

Core ID is found in the columns (or spaces) 1-6

- Formatted in **SSSTTC** (S = Site ID, T = Tree number, C = Core ID).

- Example: **LF101n** is Lyford Plot 1 (**LF1**), Tree 1 (**01**), Core direction north (**n**).

Decade columns 9-12

- First year measured for each row

Data Values columns 13-73, 6 columns/measurement, Fortran Format: 10F6.3

- Up to 6 digits per annual measurement in units of 0.001 mm.

- Example: a value of 425 = 0.425 mm; 1192 = 1.192 mm; etc.

**Full Series Example for Lyford Plot 1, Tree 2, north core:**

LF102n 1932 3974 3135 2503 2504 2320 2747 2600 1573

LF102n 1940 2805 2562 3194 3954 4994 3460 3414 4829 5041 4443

LF102n 1950 5673 3804 3863 3838 3948 4626 3922 4583 3969 3224

LF102n 1960 3205 3458 3246 3426 3767 3468 3237 3395 3632 4144

LF102n 1970 2801 2848 2757 2845 2442 2602 2345 2355 1764 1910

LF102n 1980 1842 1195 1580 1424 1897 2030 1506 1888 1974 2220

LF102n 1990 1758 1676 1506 1782 2114 1590 1562 1461 1772 1349

LF102n 2000 1611 1608 1712 1175 1237 1102 1367 1595 1260 1141

LF102n 2010 1527 1294 1516 -9999

- ***First row***: Start of series for that core. Measurements are present for the years 1932-1939.

- ***Second row***: Continuation of measurements for next decade (1940-1949)

….

- ***Last row***: End of series; measurements for years 2010-2012;  
 -9999 in 2013 indicates end of series (no measurement for 2013 and beyond)

***NOTE:*** Data can be read as a space-delimited file in most coding languages. In R, package *dplR* has built-in function *read.rwl* that converts .rwl files to a data frame (rows become years; columns become ring-width series).

*2)* ***Folder Name:*** *RW\Combined*

***Files:*** *Lyford\_(Species).rwl*

***Summary:*** Data is organized by species for entire site (all three plots). This folder contains eight raw ring-width (.rwl) files for each species sampled at all plots.

***Data Format***: Same as Folder ‘*RW’* above.

*3)* ***Folder Name:*** *RW\Combined\Cofecha\_Outputs*

***Files:*** *LF(Species)COF.OUT*

***Summary:*** Cofecha outputs for computational verification of cross-dating accuracy. This folder contains eight Cofecha output (.OUT) text files for each species sampled at all plots. Information for interpreting Cofecha output files can be found in the following document: <http://www.ltrr.arizona.edu/~sheppard/Raul/GrissinoCOFECHA.pdf>

*4)* ***File Name:***  *LyfordAllPlots.csv*

***Summary:***Field notes typed into a spreadsheet format (comma-separated values). Columns 7 and 8 place each tree in space from the PalEON plot centers. Columns 10-12 in Field\_Notes tab further characterize downed woody debris (Status: Lo, Sn, St, or Sh).

***Data Format:***First two rows of metadata describing plot.

Starting at row 3 there are ten columns of field data:

**Column 1:** Site ID (Site)

**Column 2:** Tree Number

**Column 3:** Species Identifier (Species)

First two letters = genus; Last two letter = species

Example: ACRU = *Acer rubrum*

**Column 4:** Canopy position (Canopy)

suppressed, intermediate, codominant, or dominant

**Column 5:** Alive or Dead Status(Status)

Log (Lo), Snag (Sn), Stump (St), or stump hole (Sh)

Listed as *dead* if status is unknown

**Column 6:** Diameter at breast height in cm (DBH)

**Column 7:** Distance from plot center in m (Distance)

**Column 8:** Number of degrees from due north (Azimuth)

North = 0 º; East = 90 º; South = 180 º; West = 270 º

**Column 9:** Permanent tag number in field, if available (Tag)

**Column 10:** Distance from center in m for **top of dead log** (DistTop)

**Column 11:** Degrees from due north for **top of dead log** (AzTop)

**Column 12:** Decay Class 1-5 (Decay)

*5)* ***File Name:***  *LyfordPlot1.xls, LyfordPlot2.xls, LyfordPlot3.xls*

***Summary:***Field notes typed into a spreadsheet format. First tab (Field\_Notes) contains raw field notes; second tab (Comments) contains tree-specific notes recorded in the field; third tab (Saplings) contains sapling counts for large saplings with DBH for each (>/= 5 cm & < 10 cm DBH; 0-9 m from plot center) and small saplings (< 5 cm DBH; 0-5 m from plot center). Columns 7 and 8 in Field\_Notes tab place each tree in space from the PalEON plot centers. Columns 10-12 in Field\_Notes tab further characterize downed woody debris (Status: Lo, Sn, St, or Sh).

***Field\_Notes***

***Data Format:***First seven rows of metadata describing plot.

Starting at row 8 there are nine columns of field data:

**Column 1:** Tree Number

**Column 2:** Species Identifier (Species)

First two letters = genus; Last two letter = species

Example: ACRU = *Acer rubrum*

**Column 3:** Canopy position (Canopy)

suppressed, intermediate, codominant, or dominant

**Column 4:** Alive or Dead Status (Status)

Log (Lo), Snag (Sn), Stump (St), or stump hole (Sh)

Listed as *dead* if status is unknown

**Column 5:** Diameter at breast height in cm (DBH)

**Column 6:** Distance from plot center in m (Distance)

**Column 7:** Number of degrees from due north (Azimuth)

North = 0 º; East = 90 º; South = 180 º; West = 270 º

**Column 8:** Quadrant of plot (Plot)

**Column 9:** Tree number according to the long-term Harvard Forest

Lyford Plot census study (Tag)

**Column 10:** Distance from center in m for **top of dead log** (DistTop)

**Column 11:** Degrees from due north for **top of dead log** (AzTop)

**Column 12:** Decay Class 1-5 (Decay)

*6)* ***File Name:*** *LyfordPlots\_LogsheetAll\_FINAL.xls*

***Summary:*** Contains metadata on **ALL** cores for **ALL** species at **ALL** plots. Some columns (e.g., Columns 12-16) are mostly empty. They will be completed following further analysis of the Lyford ring-width series.

***\*\* This files contains both the LDEO core labeling system as well as the HF Lyford Plot tree number. \*\****

***Data Format:*** One sheet with seventeen columns. The following text details what is contained in each column. Words in parentheses are the titles of each column.

**Column 1:** Site and plot (SITE)

**Column 2:** Tree number (TREE)

**Column 3:** Core cardinal direction (CORE)

**Column 4:** Species ID of individual series (SPECIES)

**Column 5:** Estimate of innermost year (INNER\_YEAR)

**Column 6:** Estimation of outermost year (OUTER\_YEAR)

**Column 7:** Year of innermost ring-width measured (MEAS\_INNER)

**Column 8:** Year of outermost ring-width measured (MEAS\_OUTER)

**Column 9:** Total number of rings measured (RINGS)

**Column 10:** Estimated number of rings from pith or at pith (PITH)

**Column 11:** Location, in years, of gaps in mounted cores (Gap)

**Column 12:** List of years with missing rings in series (Missing)

**Column 13:** List of years with false rings in series (False)

**Column 14:** List of years with incomplete/partial rings in series (Incomplete)

**Column 15:** List of years with “reaction wood” in series (Reaction)

**Column 16:** Gap, no gap, or unknown [G/N/U] in early growth years (Canopy)

**Column 17:** Core-specific comments (COMMENTS)

*7)* ***File Name:*** *LyfordRawFieldScans.pdf*

***Summary:*** Raw scans of written field notes. Note that initial written deadwood entries from May 2013 (pages 5, 6, and 9) were not used and resampled in June 2015 following updated protocol (pages 12-14).

***Additional Notes:***

*\* LF3 Tree 36 (ACRU) is missing from the ring-width files. The cause of the missing data is accounted for in the “Notes” tab of the field notes file for plot 3 (LyfordPlot3.xls).*

*\* Due to sampling early in the growing season (May 2013), some hardwood samples (all ACRU, FAGR, BELE, HAVI, and BEAL) from LF1 Trees 1-21, LF2 Trees 1-31, and LF3 Trees 1-27 did not have measurable partial rings for 2013. In contrast, samples from QURU and TSCA had measurable earlywood from 2013, which is included in the ring-width files. All other samples were taken in November 2014, and should have full rings through 2014, unless otherwise indicated. Details of the range of years measured for each series are included in the core notes (LyfordAllPlotsLogsheet.xls).*

*\* Red oak and black oak have been merged into QURU files due to species ID uncertainty. However, field notes have current species ID (QURU or QUVE). Plots will be revisited to confirm identification on other potential QUVE trees.*

*\* Lyford census tag numbers were determined by mapping and co-locating trees using distance, DBH, and species identification. Trees were not tagged in the field during the census, but mapped Cartesian coordinates are available via the Harvard Forest archives. Dead trees were co-located as best as possible, although some were not located due to a lack of nearby trees with similar DBH and species IDs. Trees that were too decayed to obtain a species ID (e.g., stump holes, and decay class 5 logs and stumps) were not assigned census plot tag numbers.*