Aridlands Ecology Lab Protocol
Modified: 2010.03.11, S.Castle
Adapted from the Connie Woodhouse Lab

Counting Rings and Dating Cores

Materials:
Microscope (either boom stand scope or Leica)
Pencil
Graph paper
Sanded cores or cookies

Preparation for Dating:

1. The key to dating cores and cookies is to have a nice clean surface. Make sure that you have belt sanded to 320 grit and then right before dating hand sand with 400, 600, or even 1200 grit paper. Cells should be clear and "pop out at you" under the microscope.
2. Get together your cheat sheets. This will help you with identifying false rings and missing rings. Go to the international tree ring database (ITRDB) and grab 2-5 chronologies collected geographically close to yours. It is not wise to date directly off another chronology, even if it collected nearby, but these can serve as a reality check if you are unsure of absent rings. Look through chronologies and mark the narrow years or the "indicator years." Keep these years in mind when you are dating your cores.
3. Start working with the easy cores first. Pick out the 4-5 fattest most complacent and youngest series to work with (these will be the least likely to have problems). Start to build a master chronology with these.
4. The Laboratory for Tree Ring Research has a great interactive website that allows you to learn the basics of skeleton plotting. It is a good idea to try it out here before starting this process (http://www.ltrr.arizona.edu/skeletonplot/introcrossdate.htm).

Counting Rings

1. Establish the year in which the samples were collected. This year will be the last year of growth and will give you a date to work backwards from.
2. For cookies, it is important to chose a path from bark to pith that is least affected by any damage, disturbances, or deformations. These often skew or change the size and shape of the rings. It is easiest to count following a straight line from bark to pith, but sometimes abnormal rings will force you to change locations half way through.
3. Set core or cookie up under the microscope, using the microscope lights to best highlight the wood cells.
4. Mark the decades in pencil. If you hit a spot that doesn't match with your cheat-sheet, not the discrepancy in your dating notes and pick up another core. If you can make it back to the inner rings without any worries, write the inner date on the core mount or plywood (in pencil) and pick up the next core. When you are done with 4-5 cores and the patterns appear to match start skeleton plotting the master and confirm that the dating is the same.
5. Work your way up to the older and more sensitive tree series. Trees are least likely to drop rings in the first 20-50 years of growth. By adding cores that are slightly order that the previous ones, you can minimize dating problems. Sat the really long ones for last. If you come to a rough spot and are unsure of the dating, note the discrepancy and set the core aside. It does no good to struggle with it in the beginning, as the patterns should become more clear once you have worked the other cores out.

6. Occasionally update the master chronology. When you encounter a core that have nice, sensitive rings add it to the master by weighting it relative to the other series that are already contributing to it. For example, if the master has 1969 as a “3” and the core in hand plots 1969 as a “6” then perhaps you can bump 1969 to a “4” on the master. As you work with more sensitive series it is natural to increase the lengths of bars on the plot.