

INTRODUCTION TO DENDROCHRONOLOGY LAB (GEOS, GEOG, WSM, ANTH 439a/539a)

8/17/2016

Lab Session Schedule

Overview: There are 14 lab sessions plus a Final Lab Practical Examination (15 total lab classes). The tasks you will need to complete during the 15 sessions include: two introductory exercises, dating of 17 tree cross sections, and preparation and dating of the tree cores we will collect during a class field trip. A general description of the sessions is included below.

Session 1 (8/23) Basic information/orientation.

- 1) Skeleton plotting online applet (group) and then working in pairs to skeleton plot a paper bristlecone pine (BCP) cross-section.
- 2) Skeleton plot two radii on the first tree cross section, ZMT08. This cross-section is Douglas-fir (*Pseudotsuga menziesii*, PSME). Have instructor check both skeleton plots to receive the "clue." You will then assign real calendar-year decades to ZMT08.

*Purpose: To learn the procedure of **skeleton plotting**.*

Session 2 (8/30)

- 1) Finish ZMT08.
- 2) Plot and date two radii for ZMT19.
- 3) After dates have been checked, make a composite master chronology from your first four skeleton plots. Remember, the composite master is a mirror image of the normal skeleton plot. See example in lab manual (pg 4).
- 4) Begin skeleton plots on two radii of ZMT18. Identify the year and season (earlywood or latewood) of the growth change in ZMT18. This cross section is also Douglas-fir (PSME).

*Purpose: Make skeleton plots of real wood cross sections (two radii per sample). Construct a skeleton plot **composite master chronology** from these skeleton plots. Verify crossdating of ZMT18 on the composite master and to provide a crossdate for the damage/event seen in the wood.*

Session 3 (9/6)

- 1) Finish and have instructor check ZMT18.
- 2) Begin plotting two radii for ZMT14, also a Douglas-fir (PSME). Extend master chronology. Plot a radius from the top of ZMT14 to solve the dating problems of absent and locally absent rings from the lower portion of ZMT 14.

*Purpose: to compare the radii from ZMT14 to the composite master to obtain the correct crossdates and identify the **absent or locally absent rings**. Also, to extend the composite master back in time with the additional inner rings. Introduce the concept of "stacked cones" of growth.*

Session 4 (9/13)

- 1) Finish and have instructor check both cross sections (bottom and top) from ZMT14.
- 2) Plot two radii from ZMT31 a Douglas-fir (PSME).

*Purpose: to solve **absent and locally absent ring** problems and confirm the inner portion of the composite master.*

Session 5 (9/20)

- 1) Finish and check ZMT31.
- 2) Plot two radii from ZMT108, also a Douglas fir (PSME).

*Purpose: to identify **false rings** and provide crossdates for events seen in the wood. ZMT108 is also intended to confirm and extend the composite master chronology.*

Session 6 (9/27)

- 1) Finish and check ZMT108.
- 2) Plot two radii from ZMT113.

*Purpose: to introduce a new species, ponderosa pine (*Pinus ponderosa*, PIPO) and compare the wood anatomy & the crossdating characteristics of this species to that of the Douglas-fir. Please take notice of the differences and similarities of these two species. Also note the locally absent, absent and false rings in this cross section and how it confirms or varies from the composite master chronology.*

Session 7 (10/4)

- 1) Finish and check ZMT113.
- 2) Plot two radii from ZMT11. This is a ponderosa pine (PIPO).

*Purpose: to solve locally absent and absent ring problems and **injury/events** seen in the wood and to compare ZMT11 & ZMT113 to each other and to the previous samples of Douglas-fir. Also, to add pertinent information and confirm the inner portion of the composite master chronology.*

Session 8 (10/11)

- 1) Finish and check ZMT11.
- 2) Plot two radii from ZMT39.

*Purpose: to introduce a new species and its wood anatomy and crossdating characteristics. This is a pinyon pine (*Pinus edulis* PIED). Please notice the differences between Douglas-fir, ponderosa pine and pinyon pine. This piece will also demonstrate that climatically **complacent** ring series can be as difficult to crossdate as climatically sensitive ring series and to also demonstrate ecological amplitude.*

Session 9 (10/18)

- 1) Finish and check ZMT39.
- 2) Plot two radii from ZMT42. This is a pinyon pine (PIED).
- 3) Some portion of this lab session will be devoted to the glue mounting of increment cores collected on the field trip.

Purpose: to extend the composite master chronology and to solve somewhat complex locally absent and absent ring problems and identify and crossdate injury/events in the wood of the cross section.

Session 10 (10/25)

- 1) Finish and check ZMT42.
- 2) Plot two radii on ZMT04 and two radii on ZMT15.

These two cross sections are from Rocky Mountain juniper (*Juniperus scopulorum*, JUSC).

Purpose: to introduce a new species that is fairly different in appearance from the previous three species examined, but will still crossdate on the composite master chronology. These juniper trees have some very "real" appearing false rings, but using information from many of the previous cross sections plus the crossdating of the composite master these false ring problems can be solved.

Session 11 (11/1)

- 1) Finish and check ZMT04 & ZMT15.
- 2) Plot two radii on BLF01 and two radii on BLF24. These two cross sections are from quaking aspen (*Populus tremuloides*, POTR).

Purpose: These cross sections are not only a different species. They are from an entirely different plant family. Up to this point all the samples were from conifers in the gymnosperms. These quaking aspens are diffuse porous wood angiosperms. They will crossdate with the composite master chronology.

Session 12 (11/8)

- 1) Finish and check BLF01 & BLF24.
- 2) Plot two radii from ZMT05 and ZMT22.

*Purpose: These two cross sections are from gambel oak (*Quercus gambelii*, QUGA), which is a ring porous wood angiosperm. The "search image" for rings in oak can initially be confusing. However, these cross sections can also be crossdated using the composite master chronology though they do have some specific problems that need to be explained when plotting them.*

Session 13 (11/15)

- 1) Finish and check ZMT05 & ZMT22.
- 2) Crossdate the cores collected on the Class Fieldtrip

Purpose: This ends the required lab exercise sets. Session 14 is for work on student projects or special applications such as archaeology, ecology eg. fire history, geomorphology, etc.

It should be noted that some cross sections (i.e. ZMT14, 11, 42 and perhaps some other sections) might need more than one lab session to complete so that Lab Sessions 14 & 15 might be needed to finish the required exercise sets.

Week of Thanksgiving (11/21-11/25). No class. Open lab hours/office hours Tuesday (11/22) from 2-5. Can use this time to finish any outstanding sections or ask additional questions.

Session 14 (11/29)

- 1) Finish and check crossdating the Field Trip cores.
- 2) Student projects or applications and a review and preparation for the Lab Practical Exam.

Session 15 (12/6) 2-5PM The Laboratory Practical Examination.

Purpose: to use the methods and techniques learned during the year to crossdate a tree-ring sample and interpret the dates.