American Chestnut Tree Conservation Field Course

Antinanco Earth Arts School
Instructors: Mariya Chechina, Ph.D., Yannick Neveux, M.Sc.

1. **Background on forest composition (Fieldwork)**

    Topics:

    - Recognizing forest disturbances (natural: fire, hurricanes, floods or introduced: invasive species, climate change, fragmentation, forest extraction…etc.). We will concentrate on local forest disturbance by wind.
    - Wind has been a recurring natural disturbance in our woods, with many trees blown down; some standing dead trees and some live trees. Examples are plentiful. Root pads may deserve examination and discussion relative to soil conditions, tree age, location, etc.
    - Recognizing forest age (early growth forest, mid growth or climax forest).

    Fieldwork:

    - Visiting preselected forest patches to examine examples of natural and introduced disturbance and examine forest age. Looking for signs of wind disturbance, signs of forest cut or plantation.
    - Emerald Ash Borer has killed many Ash trees. Many are standing dead trees allowing for discussion of signs and symptoms of introduced invasive pest.
    - Learning to identify dominant species, understory species.
    - Learning the principles of basic tree identification.
    - Measuring the diameter at breast height and tree density with a core sample to determine tree age. Denser trees are late successional (hardwood, old and slow growth species) while fast growing young forest species have lighter density wood.)
    - Looking at tree rings to determine tree age. Determining winter and summer growth rings.
    - Measuring the soil pH and humidity as indicators of what species may grow in that environment.
    - A high water table, numerous natural springs and waterways have had an impact on tree growth, in the forested areas.

    Tools and equipment needed: pH Meter or pH strips and/or homemade test with baking soda/vinegar, hygrometer or handmade humidity indicator

2. **Species identification (Fieldwork and Lab)**

    Topics:
    - American chestnut ecological history and distribution, favorable soil conditions, companion plants and animals that depend on and disperse the chestnut, major disturbances (natural and introduced) that impacted the chestnut distribution and ultimate disappearance.
    - Learning to identify the American chestnut vs. Chinese and European chestnut and their different genotypes.
    - Learning to identify companion plants that grow well with the chestnut.

Field: Conduct forest transects to identify and collect specimens, record presence of different species.

Lab:

- Labeling, pressing and looking at leaves of different chestnuts and companion plants under a microscope and learning to note the differences to distinguish the species.
- Using or making an identification key with pressed leaves noting local name, scientific name, natural range and key characteristics.

Tools and equipment needed: rope, compass, measuring tape, leaf press (handmade with boards and clamps), and microscopes.

3. <u>**Forest ecology data collection and questions it can answer (fieldwork and lab)**</u>

Topics:
- Measuring biological diversity, tree growth, tree health. Learning about biodiversity measures (small scale or alpha diversity and larger scale or beta and gamma diversity).
- Learning about the importance of tree crown position in the forest for light access to learn about tree competition and compatibility.
- Analyzing tree cover density to understand the wildlife that can be found there. Larger animal species need high understory density for cover.

Lab:

- Preparing data sheets: making new or using existing field data collection forms which could be modified to meet our needs.
- Recording field data and learn to take precise measurements with measuring tape, DBH tape, and compass.

Field:

- Establishing forest plots using tape measure, rope and poles (or metal stakes), assess vegetation cover.
- Measuring young tree height, measuring adult tree height and trunk girth (diameter at breast height or DBH).
- Using the compass to measure tree height and relative location on the plot.
- Measuring tree canopy cover using a square mirror with gradations.

Forest data analysis lab:

- Performing simple biodiversity calculations, calculating basal area (area of the forest occupied by tree trunks), and tree density calculations (trees per hectare).
- Learning to compile explanatory summary of the forest stand in a table.

Tools and equipment needed: pencils, clipboards, compass, mirrors, tape measure and/or DBH tape, and poles/stake.

4. <u>**Chestnut ecology (Lab and field)**</u>

Topics:
- American chestnut propagation and reforestation.

- Chestnut blight.

Field and lab:
- Learning to collect and propagate chestnut seeds (if we can identify a fruiting tree nearby).
- Noting planting environment and deciding on best planting site.
- Testing and correcting soil pH.
- Learning how and when to plant chestnut seedlings for best survival.
- Applying deer and rodent guards.
- Applying fertilizer.
- Pruning, natural weed control.
- Recognizing signs and symptoms of blight and natural blight management.
- Identifying other tree diseases present to teach Disease Identification principles.
- Long term tree monitoring.

Tools and equipment needed: potting soil mix, long pots for chestnut propagation, plastic tubes, chicken wire, wire cutters, fertilizer.