Field Activity – Visualizing potential forest change
Forest "Winners & Losers" in Climate Change
Developed by the Northern Institute of Applied Climate Science

Purpose
This activity will help participants get a tangible sense of how much risk climate change might present for a forest that they're familiar with. It will also be useful practice with tree identification!

Materials
-   4 rolls of plastic flagging - 2 rolls of red, two rolls of green (or similar colors)
-   Tables of "winners and losers" species for "Higher" and "Lower" emission scenarios (provided separately)
-   Suncreeen, bug spray, etc.
-   Optional: "Projected Change in Summer Average Temperature" maps for WI under the "Higher" A2 and "Lower" B1 emission scenarios

Background Information
-   It would be helpful to prepare for this activity with a presentation and discussion on some of the following topics
    o   on-going and future climate change (http://www.wicci.wisc.edu/ has some great Wisconsin-specific materials, http://www.fs.usda.gov/ccrc/climate-basics/education has some national-level video modules)
    o   potential impacts to forests (http://www.fs.usda.gov/ccrc/climate-basics/education has a video module)
    o   potential changes in tree species distributions (http://www.fs.fed.us/nrs/atlas/ is a useful model with lots of maps to look at)

-   At least some of the participants should be familiar with tree identification – this could be a separate lesson or activity. It can be tricky in the winter!

Activity Description
This activity works best in a forested area that is relatively easy to walk around. Stay away from areas with a lot of standing water, fallen trees, or other obstacles.

1. Start the activity with a short description of where you are and why it's important.
    a. Who owns this forest?
    b. What is it used for?
    c. What values does this forest have for the owners? For local wildlife? For the surrounding community?
2. Ask who's comfortable with tree identification. Point out some of the common tree species in your stand and do some practice identification.
3. Split the participants into 4 groups, and make sure each group has at least one person who is confident with tree identification.
4. Pick a tree that will be the center point for your activity, and use flagging or other visual boundaries to divide the stand into 4 quadrants around your center point (could use North-South and East-West lines, or some other method). Assign one group to each quadrant.

5. Distribute the chart of "winners and losers" to each group, one or two copies per group.
6. Assign 2 groups to the "Low" climate change scenario (titled "Lower Emissions-B1scenario on the chart) and 2 groups of the "High" climate change scenario (titled the Higher Emissions-A1FI scenario on the chart)
7. Explain the tasks to the groups:
    a. Move through your quadrant, starting near the center and identify each tree
    b. After you identify a tree, find that species on your handout.
        i. Have one group flag the tree with red tape if it's in the column of Decliners/Losers of their chart
        ii. Have Flag the tree with green tape if it's in the column of Increasers/Winners
        iii. Leave the tree without flagging if it's in the "Little change" or "Not sure" columns
    c. Keep going until you've identified and flagged all the trees within ~10-20 yards of the center point or keep working for a set amount of time (Instructor – you make a judgement call on this based on how dense the forest is and how quickly the teams are working)
8. When the teams are finished, everyone come back to the center for the discussion, and take some time to look at the different quadrants that the teams have marked.
9. Have the group discussion (question ideas below)
10. Remember to clean up the area and remove the flagging when you're done!

> The "Higher Emission" Chart give projected species change under a future with higher fossil fuel usage and carbon emissions. The "Lower Emission" Chart gives projected species change under a future with lower fossil fuel usage and lower carbon emissions than today's rates. Projected changes in Wisconsin temperatures under these scenarios can be visually demonstrated using the "Projected Change in Summer Average Temperature" maps.

Discussion Questions
- What are some of the different outcomes under the two different climate scenarios? Which would be better or worse for this forest?
- Is this forest vulnerable to climate change? Why or why not?
- Are more of the bigger trees at risk or more of the smaller trees?
- What values of this forest might be affected under climate change?
- Remind the participants that these tables of "winners and losers" are generalized for the entire region of northern Wisconsin. What might be special about this particular location that might make it more or less vulnerable to climate change?
    o Species mix
    o Age of trees
    o Soils, slope, aspect, topography – some places on the landscape will be more sheltered from change
    o Past management?
    o Forest health issues – pests, diseases, invasive species, deer, earthworms
    o Proximity to the Great Lakes
    o Surrounding land-use – is this forest connected to other forests, or isolated by farmland, development, or other land-uses?