

LANDIS-II User's meeting

Friday January 13, 2012

Moderated discussion: Scaling up LANDIS results for regional inference

Participants and areas of focus:

Stephen Handler (Great Lakes, forests)

Weimin Xi (Great Lakes, forests)

Matthew Duveneck (Great Lakes, forests)

Anouschka Hof (Sweden, woodpecker habitat analysis)

Pui-Yu (Fish) Ling (North Carolina, forests and ecosystem service markets)

Patrick Bourgeron (Colorado front range)

Hope Humphries (Colorado front range)

Why do we care about scaling up LANDIS results? What is the goal to be achieved?

- Apply LANDIS results to new geographies
- Enable assessment of larger physical areas – be more efficient and do more
- Find new and broader uses for previous LANDIS studies
- Draw inferences from the constellation of LANDIS projects
- New application for management
- Find uses for landscape-scale conservation and management

What are the challenges we currently face?

- Budgets
- Limited pool of experts
- Limited or unavailable data
- Wide variation in future scenarios from past LANDIS studies – hard to compare results
- Past and future climate data is available at different scales – mismatched for analysis
- LANDIS by design has a limited range of application, even though technically you can choose any cell size
- For example, if you were to have a very large cell size the idea of seed dispersal loses meaning, because seeds wouldn't be able to disperse out of the cell
- By changing cell sizes in LANDIS, you have to pay attention to changing drivers at different scales

- Very large assessment areas = very high computational demands and very long computation times
- Hard to know if data from one area will be representative of another area
- Using larger grid cells or coarser input data = losing detail in outputs
- Might not be able to answer some questions at large scales
- LANDIS is a spatially explicit model – cells interact with one another as the model runs...so the context of the model runs is very important. So you might not be able to apply results from one area to another physical location.
- It is a lot of work to assemble input data layers to run the model – looking at an entire state/ region/country will be very challenging.

Possible solutions or tips to keep in mind:

- Pay attention to what questions you are asking and whether or not they are appropriate
- Perhaps LANDIS isn't the tool you need for all questions
- Explore ways to scale up inputs – pseudo-species or species groups?
- Use consistent cell sizes to avoid complications
- Data is increasingly available
- Computers are getting faster all the time and computing power is becoming more available
- Dispersal and other parameters are adjustable with cell sizes
- Look for ways to translate or correlate LANDIS results with Ecological Land Units? Ecological sections or sub-sections? This might be a way to draw comparisons among different factors like:
 - o Species groups
 - o Soil types
 - o Areas with similar land-use history
 - o Areas with similar management regimes/ policies
 - o Areas of similar land ownership
- Conduct sensitivity analyses to test/compare simulations
- Use smaller areas at greater resolution to be samples of the diversity across a larger region