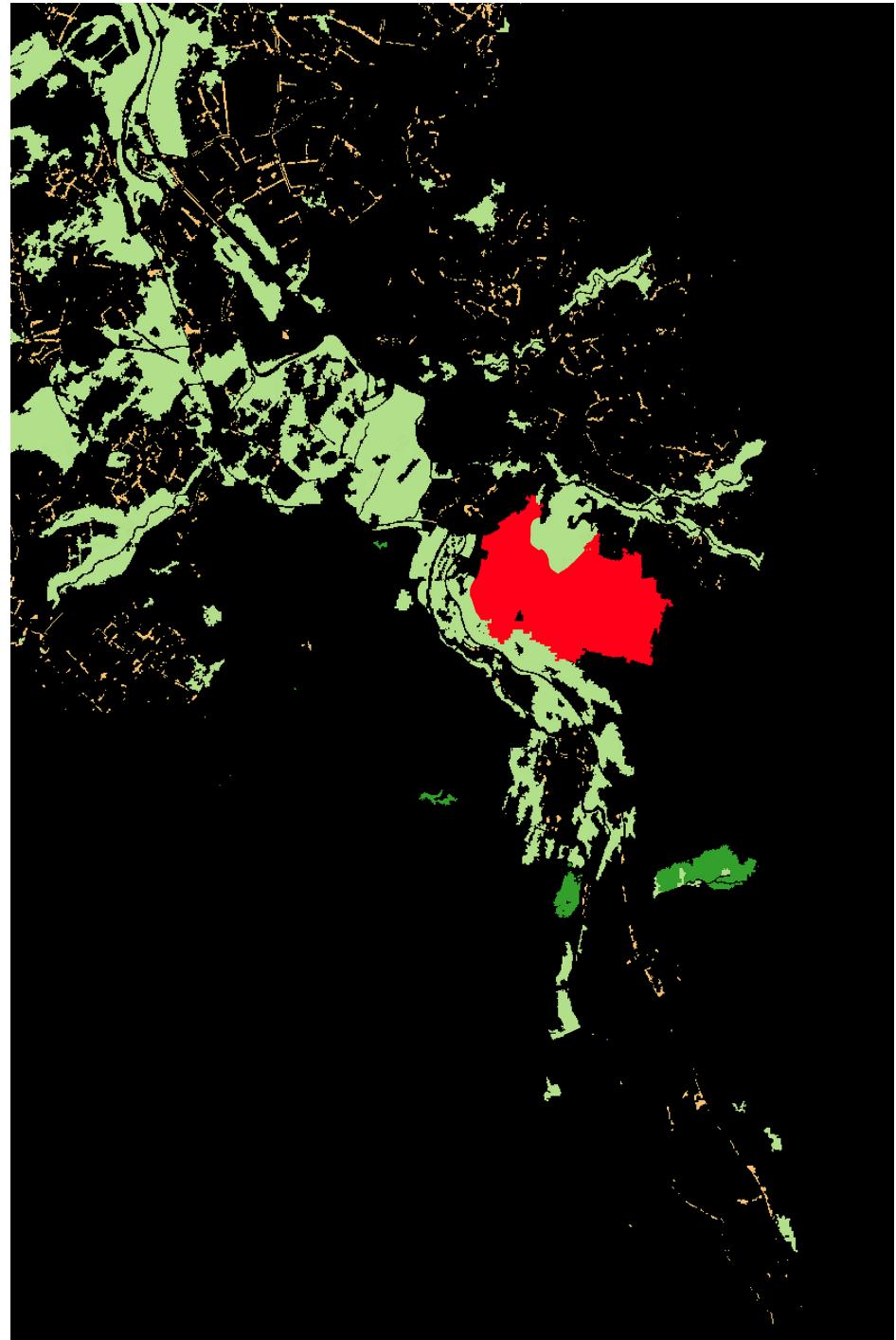
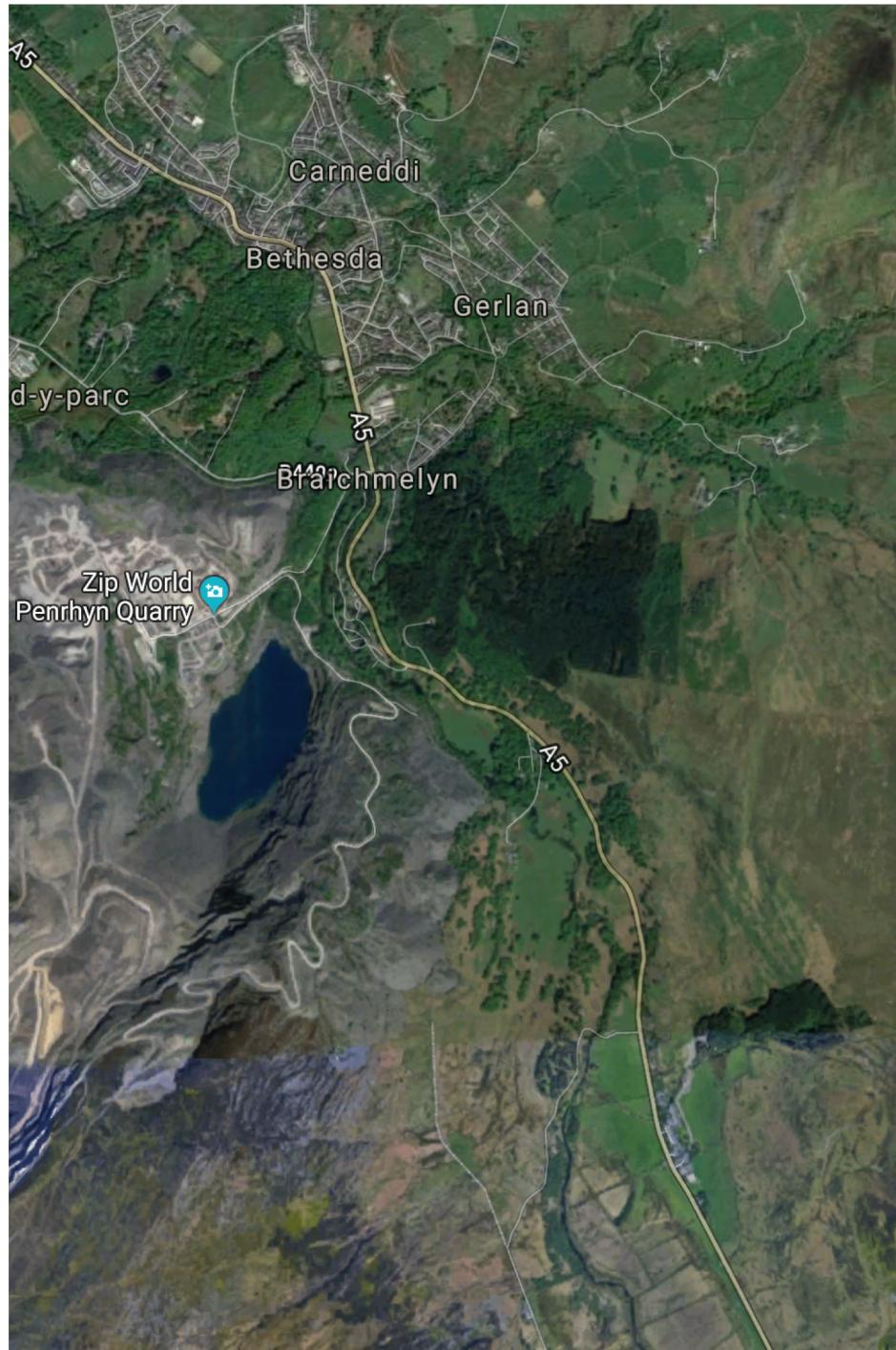
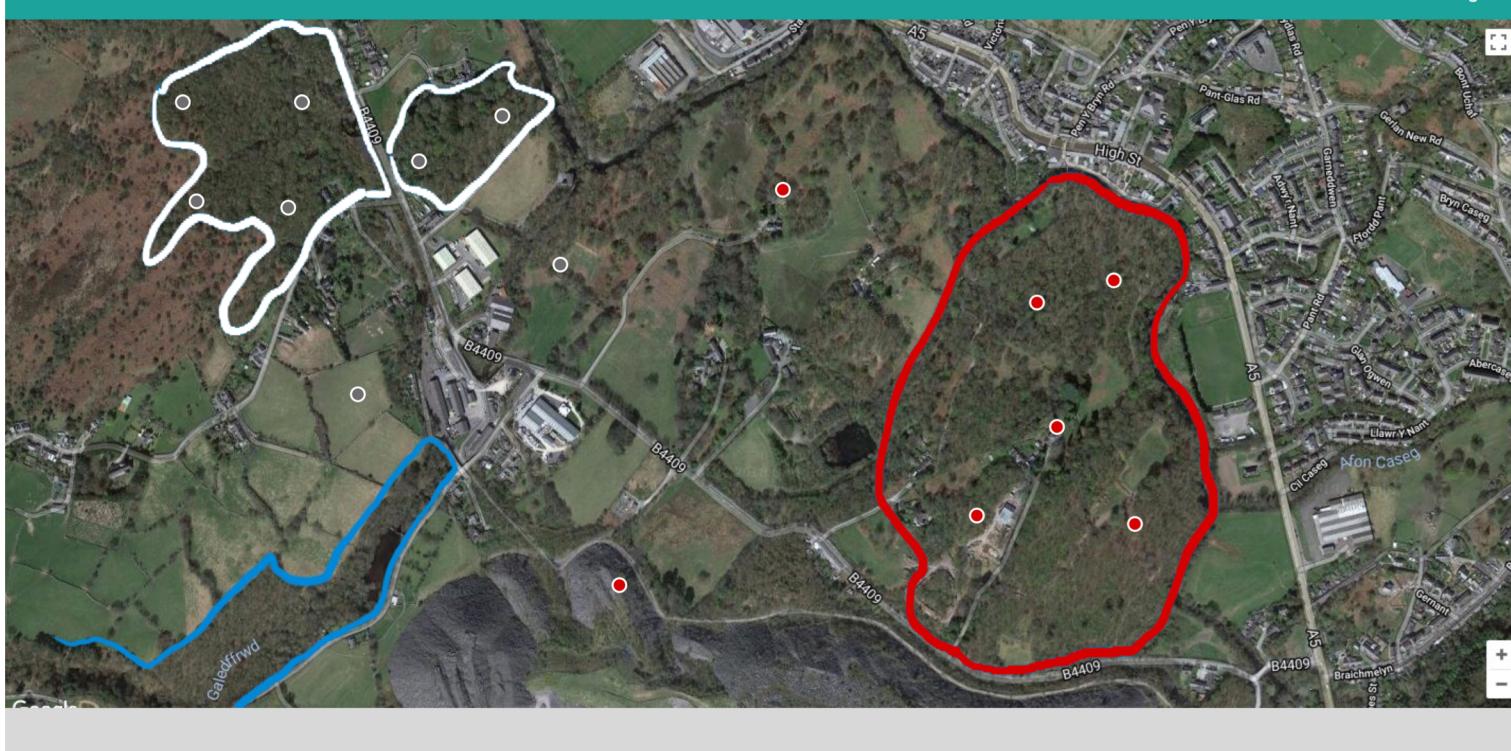


Squirrel Sim

An introduction to individual-based modelling







Experiment 1 overview

30

Years of simulation

2,347

Hectares simulated

357

Interventions

23

Landscape changes

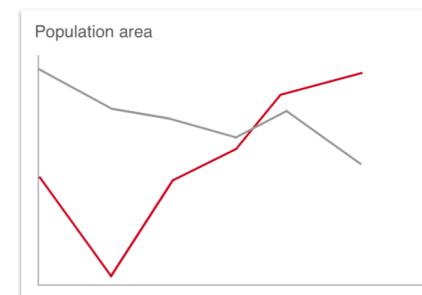
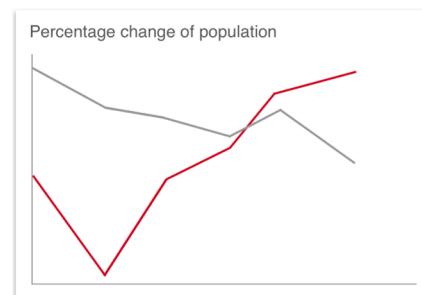
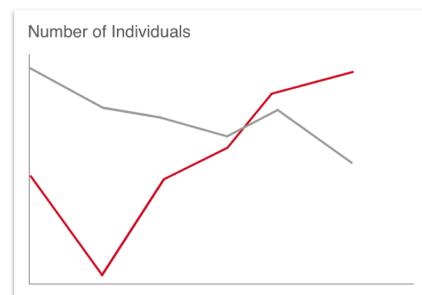
50%

Reduction in grey squirrel numbers

129%

Increase in red squirrel numbers

Squirrel Population Change

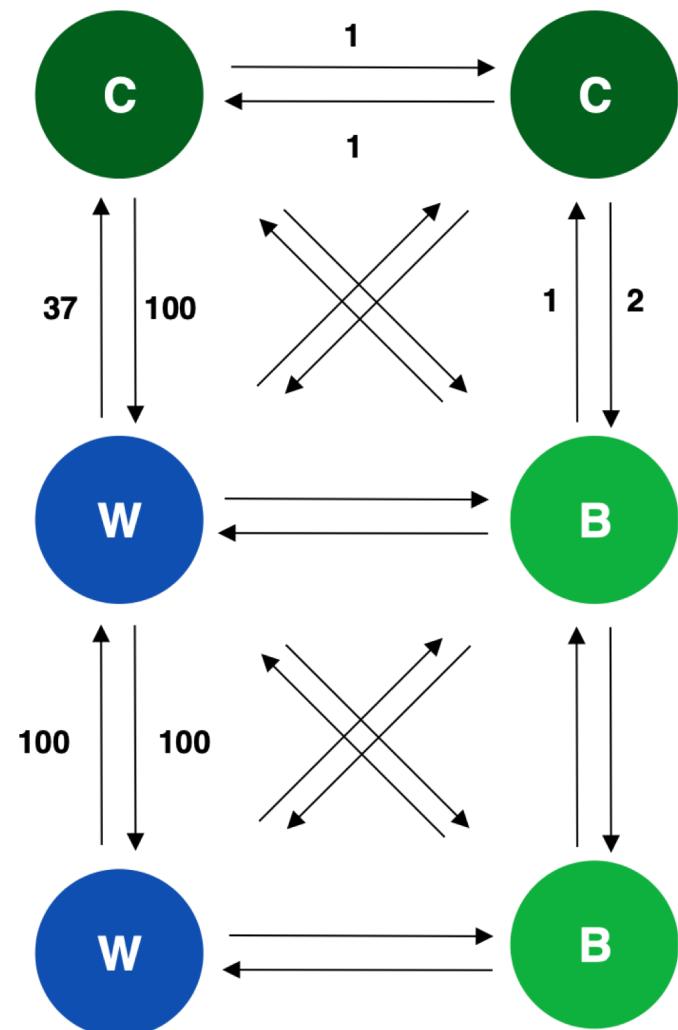


Step 1 - Research

- Talk to squirrel experts, yes they exist
- Read way too many scientific papers and books on squirrel behaviour.
- Draw a list of basic attributes including:
 - Age range
 - Food sources
 - Mating behaviour
 - Where they live
 - How they move around

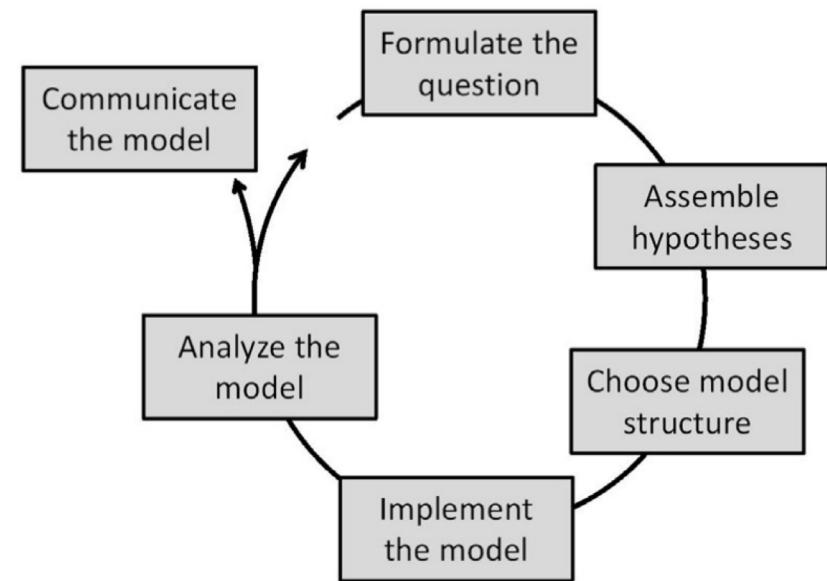
Step 2 - Make a world

- Start basic when you just want to test out your ideas.
- A small grid means the tests run quickly
- I ended up using a graph because it actually mimics how squirrels actually think.
- Decisions to make about how you deal with food production



Step 3 - Invent life

- Start with the smallest possible set of attributes
- Program them in, run the simulation and see what happens
- Decide on your time period
- Allow for variability so not all squirrels are the same
- Run multiple times so it averages out



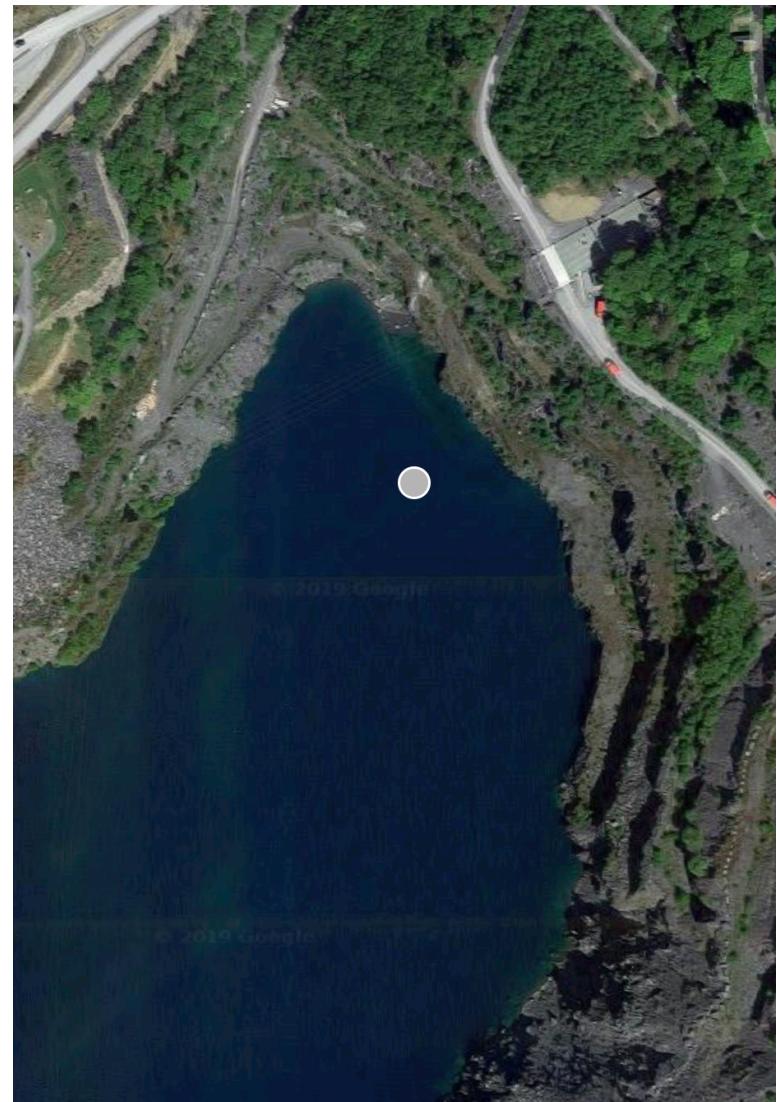
Grimm, V., Railsback, S., 2005. Individual-based Modeling and Ecology. Princeton

How to test

- When developing the model visualise early
- Compare your output to expected things like survival rate, average age etc
- Compare to previous models
- Once you're happy with the model go GPS tag some squirrels!

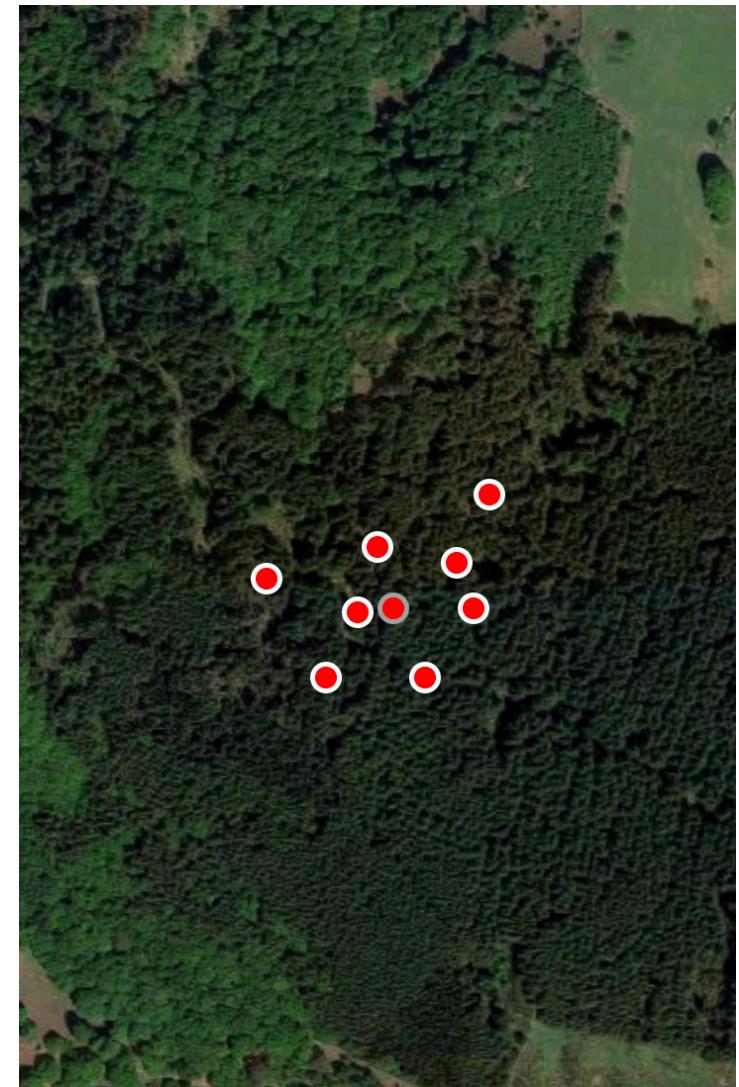
Don't invent pirate squirrels

- There's different coordinates system
- Different data taken at different times
- Just straight up errors in recording



Don't make them too horny

- All squirrels were fine for 6 months and then all quickly died
- Turns out they all went to try and mate with the same female and never left....



Thanks

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