Week 3 Team Meeting Minutes

9th November 2023

Bonus points Benni and Mabel for holding down the fort for the last ~2 weeks

Mabel's Implementation and Landlab
Mabel's implementation enables us to share patches between python and netlogo
Also enables us to call commands in netlogo from python
Landlab should work well with this
We press go in python

Benni found landlab
Package for modelling land processes
Includes soil moisture, evapotranspiration as packages
Found model of vegetation we can repurpose

Timestep choices
Agents make decisions once per year
But hydro model needs to update lots
Implementation to be decided

Landlab technicalities
How to talk between landlab/python/netlogo
Landlab needs boundaries as equations
Technical point: landlab grid will be a tile bigger on each side for this reason

Model scope
Where to scope the model?
Could include atmosphere, precipitation
Unfortunately we definitely don't have time
Landscape scale changes go into the future research

We know how to do things
But we don't have an actual design
Two week deadline on model
Aim for minimum viable product
Actually what are we modelling?

How many farmers
Real world context 500 lead farmers teaching to 3000 farmers
Model:
3000 farmers

100x100 grids
Reasoning: small holders with ~3 plots each
Match scale to real world

General structure
Farmer decides to have cover cropping
Hydrology model responds
Whether the farmer perceives the benefit
Parameter for perception of hydrological benefits

Social passing of knowledge
Belief in WSA as a value that farmers have
What about difference in outcomes of WSA and non-WSA farms
Over complex?
→ spreading of ideas network issues future paper
Diffusion is a good approach
^ this became irrelevant due to neighbour jealousy

How do agents decide to use WSA?
Desperation vs jealousy pathway
Once you make a decision, you have to commit for ~3 years
Could expand to averages of neighbours with WSA/nonWSA - but save for later implementation
KEEP IT SIMPLE (no exponential equations stolen from economics)

Farmers' size of farms may impact decisions? Disregarded for now
Farmers only know about WSA if a neighbour has previously implemented WSA
* we could have a church system (this got shot down) ((Mabel says postponed))

How many farmers are lead farmers?
Keep it simple, just start with ~20
But later we can have a continuous education system

Observe yields each year for data
***Canicula is the first thing to extend because it's crucial

General structure revisited
WSA decisions feed into hydrology model
Hydrology model returns yields
Farmers decide jealous or desperate based on yields
Make WSA decisions, repeat

Work divisions
Benni and Marina are on hydrology model
- How is hydrology model initialised?

- Rainfall and temperature data from Marina
- Or can be made up if necessary
- Mission statement: Receive cover cropping decisions, return yield and soil moisture
- EVERYTHING can be simplified

Mabel and Ali B are on the rest of the model

- Mabel sets up a framework to do all this in NetLogo/Python
    - Farmers owning fields
    - Detecting neighbours
- Alastair
    - Jealousy and desperation
    - Make decisions about ODD design