**Meeting with Gergana** – 16 January

* focus on habitat loss/biodiversity loss rather than effects on climate
* add non zotero references to zotero by inputting info
* add Background sub-heading and combine 3 short paragraphs under one background
* add more concrete topic sentence at start of document
* my prediction is that you can detect the effects, but it is already a well-recognized fact that land use change and socio-political events can be linked
* can frame it like: can you see the signature of this happening from space?
* This study is important for understanding the rate of change and variation across country
* get the CORINE data set to get more classifications (with more classes) after to get more detailed results
  + then can say - from looking at other data, these intensive land classes used to be X class
* LUCAS data set to ground truth classification - use for validation
  + Is field data with abandonment
  + find points of abandonment and compare with visually and statistically to assess accuracy of classification
* join GEE user group

**Meeting with Gergana** – 23 January

Questions beforehand

* If I’m coming from a satellite perspective i.e. is there a marked signature notable from space, should I be focusing the background on satellites? Or why this is important in terms of land-use change? Or both?
* Should my questions allow for different answers after each event? Or is this implied?
* Need to change to more hypothesis testing framework
  + Was thinking of changing more to “how/what” questions but there are no clear answers to this – may make my study less quantifiable
  + E.g. Through land-use change, how marked are key socio-political events in Latvia as detected by satellite imagery?
  + E.g. What is the strength and direction of land-use change for each land-use type?

Notes

* What the results would mean e.g. if there is a signature, it means this…
  + Doesn’t mean we have to change the question
* Is this driver so strong that you can see it for the whole country using satellite data?
  + Is this homogeneous or heterogeneous – implying that the results are different and having different effects
  + Signature is homogeneous – socio-political is main driver
  + Heterogeneous – fine scale variation, socio-political is not main driver or it’s interacting with other aspects
* Overarching question and then specifically look at how (1), (2) and (3) etc.
* Prediction for each question and give reasoning
  + Hypotheses don’t give reasoning, just a statement of what you think will happen

**Meeting with Isla** – 28 January

* Goals for Friday:
  + Finish dissertation plan
  + Do a few GEE tutorials
  + Load MODIS, CORINE, LUH into GEE as different layers and take a few screenshots – can ask Gergana for starter code here
* Better to fully answer first question, then move on to next etc. so can remove a question if I run out of time rather than answering them all poorly
* Should have a full answer to Q1 by end of Feb (as in the result)
* Should write methods as I go
* Prediction figures are a good idea – make in PowerPoint
* Continually work on Introduction
* Set goals in the beginning of each week – super ambitious ones and then ones that absolutely need to get done

**Feedback from Gergana on full plan to consider in future**

* Use active voice
* Make sure first and last sentences are stand-alone and link together
* Can make a conceptual diagram about objectives
* Even if one reference has everything, use a variety of new and old papers
* Potential to make hypotheses even more specific/directional – something to think about
* Split up methods by sub-question to make clearer
* Add model equations

**Meeting with Gergana** – 6February

* How to load LUH dataset – historical states.nc
* Need to include the different stages of abandonment
* Don’t use fusion tables, use import asset as a shape file
* Draw around a few points of abandoned land at a time and see what happens

**Meeting with Gergana** – 27 February

Questions beforehand

* Is this the best choice for getting the agricultural data points? seems like best choice is to use 2012, 2015 and 2018 – Use U410 and filter for the B, D and E land cover (cropland, shrubland and grassland). Also, can filter for U112, D10 and D20, which are stated to be abandoned agricultural land
* Is it okay that the CRS won’t work/assign properly?
  + Think it is fine because the default projection in GEE is WGS84, which is the same as LUCAS
* How do I set the boundary? In the tutorial, they had another file that they needed to combine with but that’s not the case for me
* Feedback about prediction figures

Notes

* CRS("+init=epsg: 3857”): specific for GEE
* atc\_m <- projectRaster(atc\_mar, crs = "+proj=longlat +datum=WGS84 +no\_defs +ellps=WGS84 +towgs84=0,0,0") 🡪 change projection
* bt\_spatial\_df\_m <- SpatialPointsDataFrame(coords\_m, bt\_coords\_m)
* set extent as boundary of Latvia
* exclude any non-natural for U410
* U420 – spontaneously re-vegetated land (land cover) 🡪 add this
* Do trial about just 2012 data and then if time/can do, add 2015 to see change accurately if so
* Feedback about prediction figures in PowerPoint

**Meeting with Gergana** – 6 March

Questions beforehand

* Something has gone wrong with my classifier – abandoned class covering everything! – potential ideas
  + When troubleshooting – thought it may be because I only have one class – was getting errors saying no training data found
    - Changed class value from 0 to one and now everything is abandoned
  + Think it has to do with when I say for it to get training data – no columns (but this was the case for the tutorial I completed on classification?)
  + Could be that the polygons I created represent all bands? But how would I know if this is the issue?
  + Could it be the way that I’m visualizing it that is an issue? But then still one class would be covering a lot of area
  + **Because I’m creating a classification on one class?** 
    - Create an everything else dataset – how do you do that?
* How to apply classification to each year – especially if need to switch to different satellite imagery 🡪 image iteration? <https://developers.google.com/earth-engine/ic_iterating>
  + Would you create a list of images and then iterate through them?
  + How do deal with different pixel size?
* Extensive and intensive datasets – want to confirm that I will be using CORINE?

Notes

* Make a forest class/natural vegetation for another class
  + Something that’s different but similar to abandoned land
* Resolution as fixed effect in analysis but no way to correct for that as of now
* Can map LUCAS on CORINE to see if what you think in LUCAS is intensive/extensive is correct
  + See papers using CORINE/LUCAS for advice
* Conceptual diagram of project
* Diagram of workflow
* Writing 100 words a day
  + Then get feedback as you go and not so overwhelming
* Can write code for graphs as you go as well and for stats models
  + Will help see what results you need as well
* Five key paragraphs of a paper -- on Team Shrub mentorship page
  + Perfect these!
* Perth is 8 hours ahead of time 🡪 Skype at 9am would be 5pm Perth time, or 8am would be 4pm
* <https://code.earthengine.google.com/309ed9d52a82249a21b106798fea495b> - Gergana’s code about going through many images

**Meeting with Isla** – 14 March

Questions beforehand

* Do I need to correct more for clouds?
  + Could do something like choose the pixels with the least amount of clouds
* Can CORINE be used as a validation set, because it in itself is a classification? Maybe it would be best to use LUCAS (2015) as a validation set? Is this possible even though if it’s for a different year?
* Can I just assume that my points loaded correctly, because a lot of things ride on the fact that this is true, which is a bit scary? Some of them were in water bodies which is obviously not correct.
* Do I need to divide up Latvia into sections if I’m looking at pixels/area covered? If so, how should I go about doing this?
* Should I make an ‘other’ classification? Not all land will be abandoned, extensive or intensive or forestry (which I use as my other category when classifying abandoned). I think this would improve accuracy but maybe there’s a better way to do this.
* How to apply classification over time: 2 parts to this question/issue and I think basically it is necessary to find an innovative way to do this to prevent error and promote organization to get data for each year

1. How to extract the pixels for each year ---
   1. When I try to do this, I only figured out how to do it by loading a chart and then exporting the underlying data as a csv – surely there is a better way to do this, but I can’t find it so far. When I do this for more than one year, GEE runs out of memory and can’t display the graph and therefore can’t get the underlying data
   2. Would be good to find a way to save it all into one csv to prevent error and save time and memory
   3. Maybe also this is not a good way of doing it because it would be good to have each pixel value to see what pixels are turning into what i.e. is intensive land coming from abandoned, extensive or neither
2. How to apply classification for each year –
   1. Prone to error if do this manually and run out of memory very quickly doing this in the same script

* What other datasets should I compare my classification to? To me, it makes more sense to compare it to CORINE/other classifications, rather than using these classifications as validation data. How do I assess accuracy of other classifications though? Is it more that I would see how the areas overlap, but can I really determine which one is more accurate?
* If you look at my accuracy/error spreadsheet, why is my accuracy going down with more points? Could this be normal or does this indicate that I’ve done something wrong?
* I’ve set the border of Latvia as the bounds of the Landsat image, but it doesn’t actually seem to be applying the classification just to Latvia 🡪 is this affecting the area size?
  + When I downloaded the csv of the pixel area of each class, it did not add up to the total area of Latvia – have I calculated something wrong or perhaps it’s the bounds that caused this?
* How do you recommend determining if the land is extensive or intensive?
  + Option 1: Use LUCAS again and make own decisions about whether land is extensive/intensive (see decisions document on GitHub). I so far did this and split it by industrial agriculture versus “kitchen gardens” which is basically allotments. However, there are a lot of industrial agriculture points as compared to the extensive ones. Potentially I need to refine more and filter by irrigation type?
    - I tried to compare my points visually to the CORINE dataset, but when I loaded this, the band will not display in the inspector tab. Do you know how to fix this?
  + Option 2: Split up points by nitrogen input using the CAPRI dataset – Common Agricultural Policy Regionalised Impact dataset (Temme and Verburg, 2011 had methods for this), but this seems a lot more difficult. I tried to download the data, but it is in a GDX file. I spent about an hour trying to open it and it wouldn’t work. The methods seem a lot more complicated, but could be less subjective?
* I filtered the date from the start to the end of the year, but I saw somewhere that you could take a median of this. Would this be better? Is it inaccurate to filter the date for a whole year span, as there are multiple images in this?
* Should I include fallow land at all (land set aside for more than a year as part of field rotation or set aside long term)? If so, how would I determine if this was extensive or intensive, or is there a way to see if that pixel was intensive/extensive the previous year and apply it to that year?
  + There is a temporary grassland category that is already included in my datasets