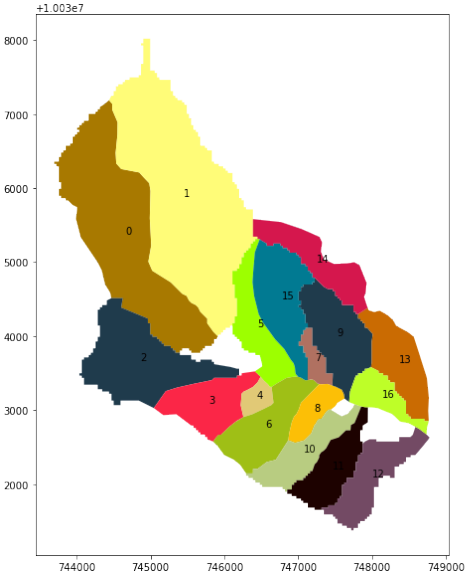
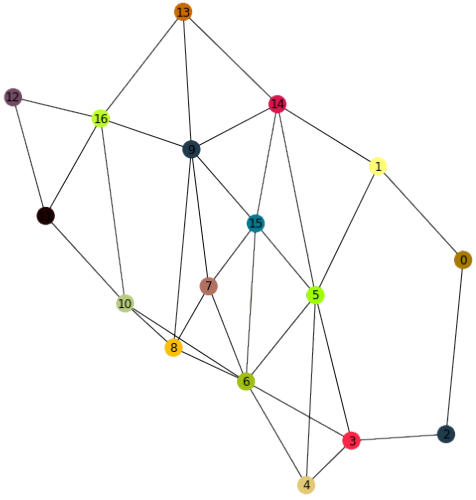
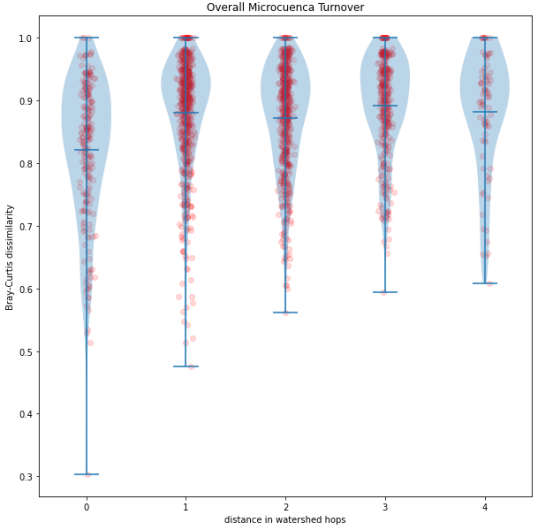
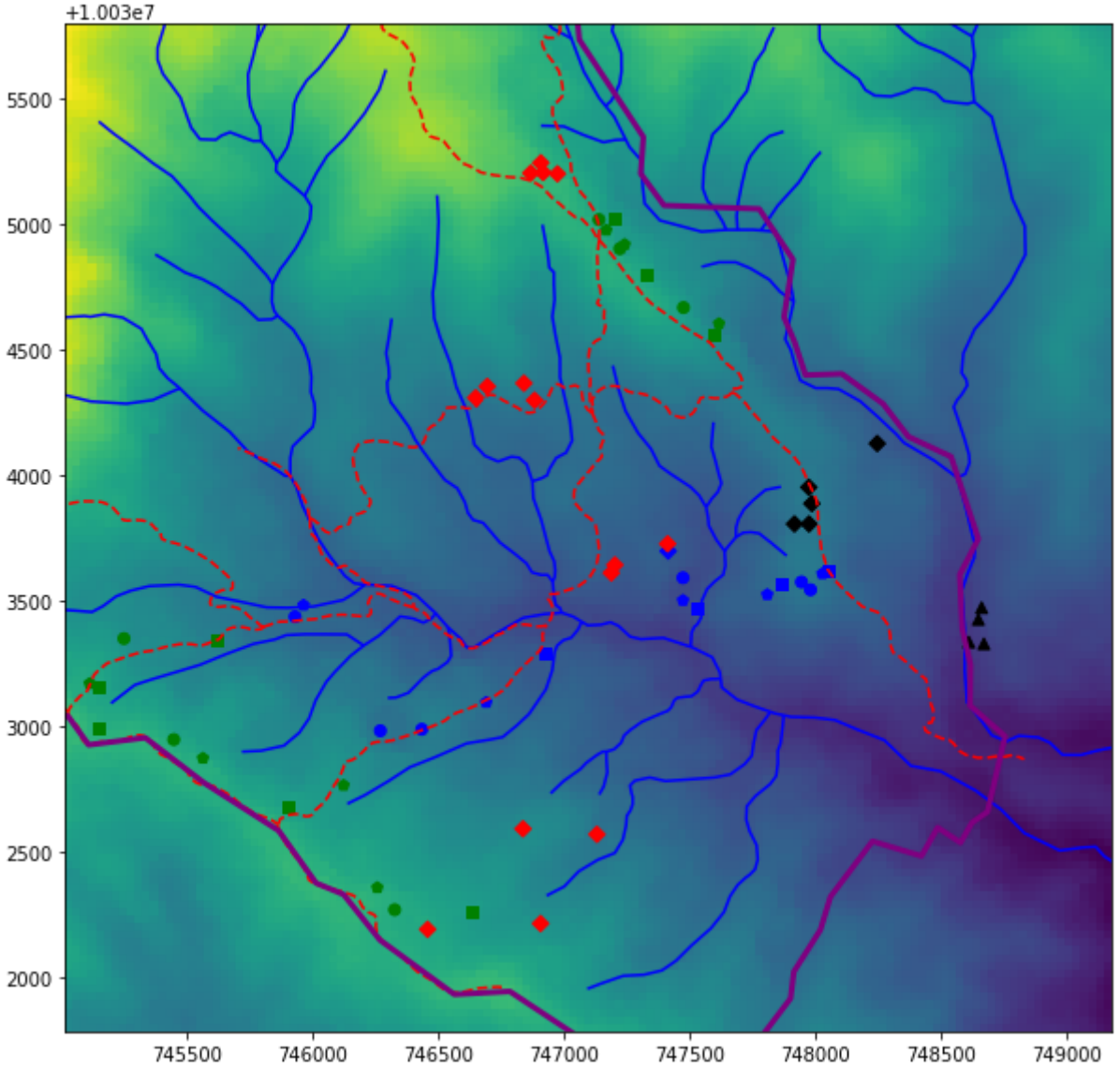






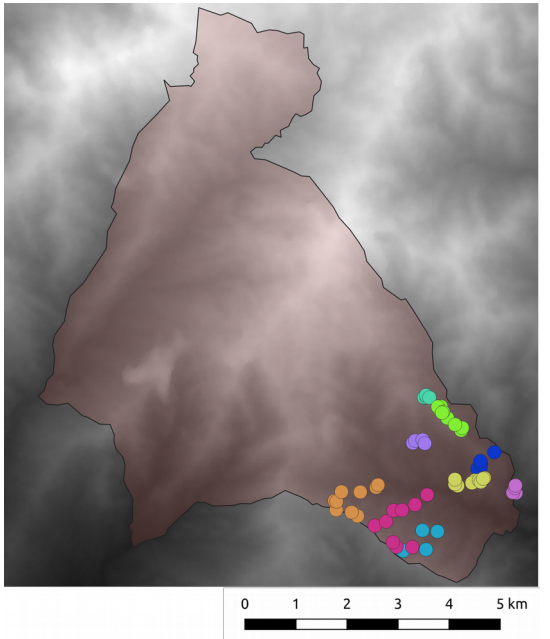
What has Dan been doing with the data?

And are we ready to start writing?

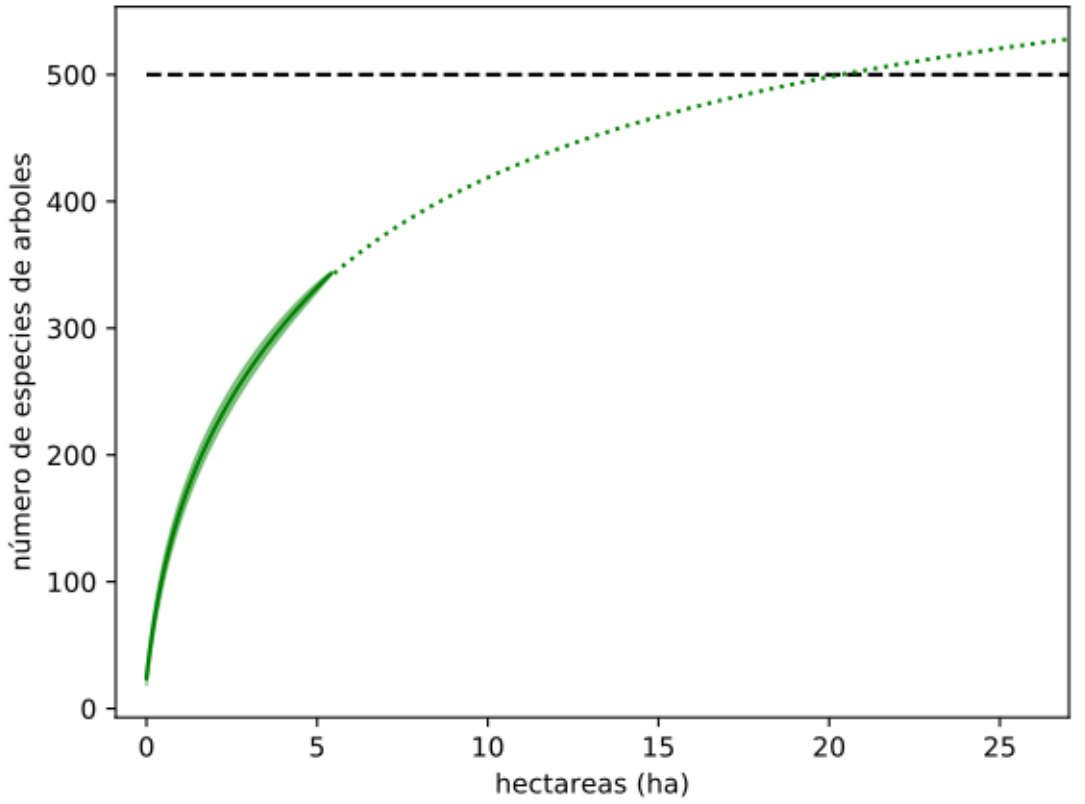


Old forest:
BC = circles
BS = pentagons
CLB = squares

Disturbed:
RCA = triangles
RG = diamonds

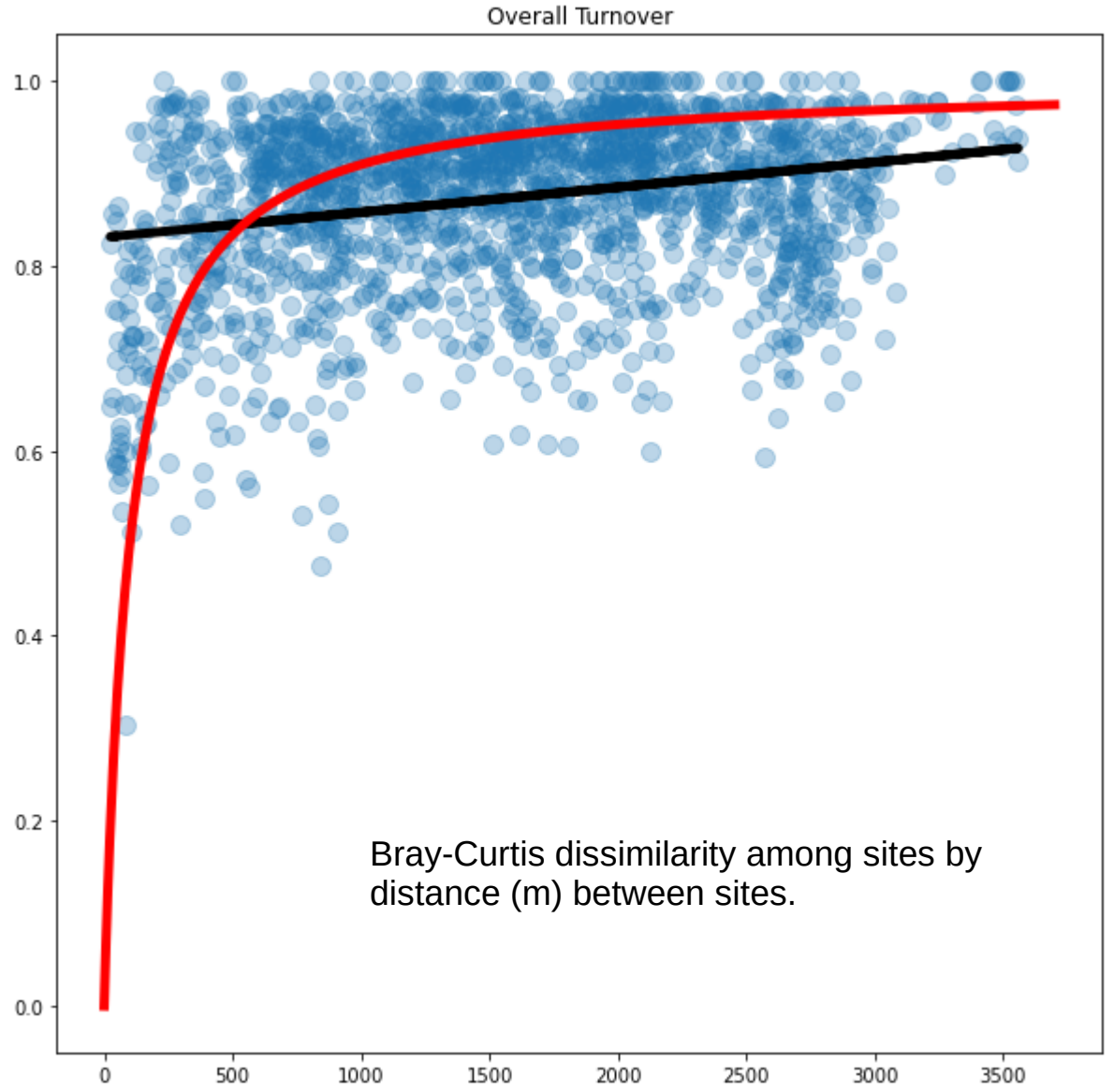


Lots of tree diversity. Among adults only, probably 500 species of tree in the southern third of Los Cedros.

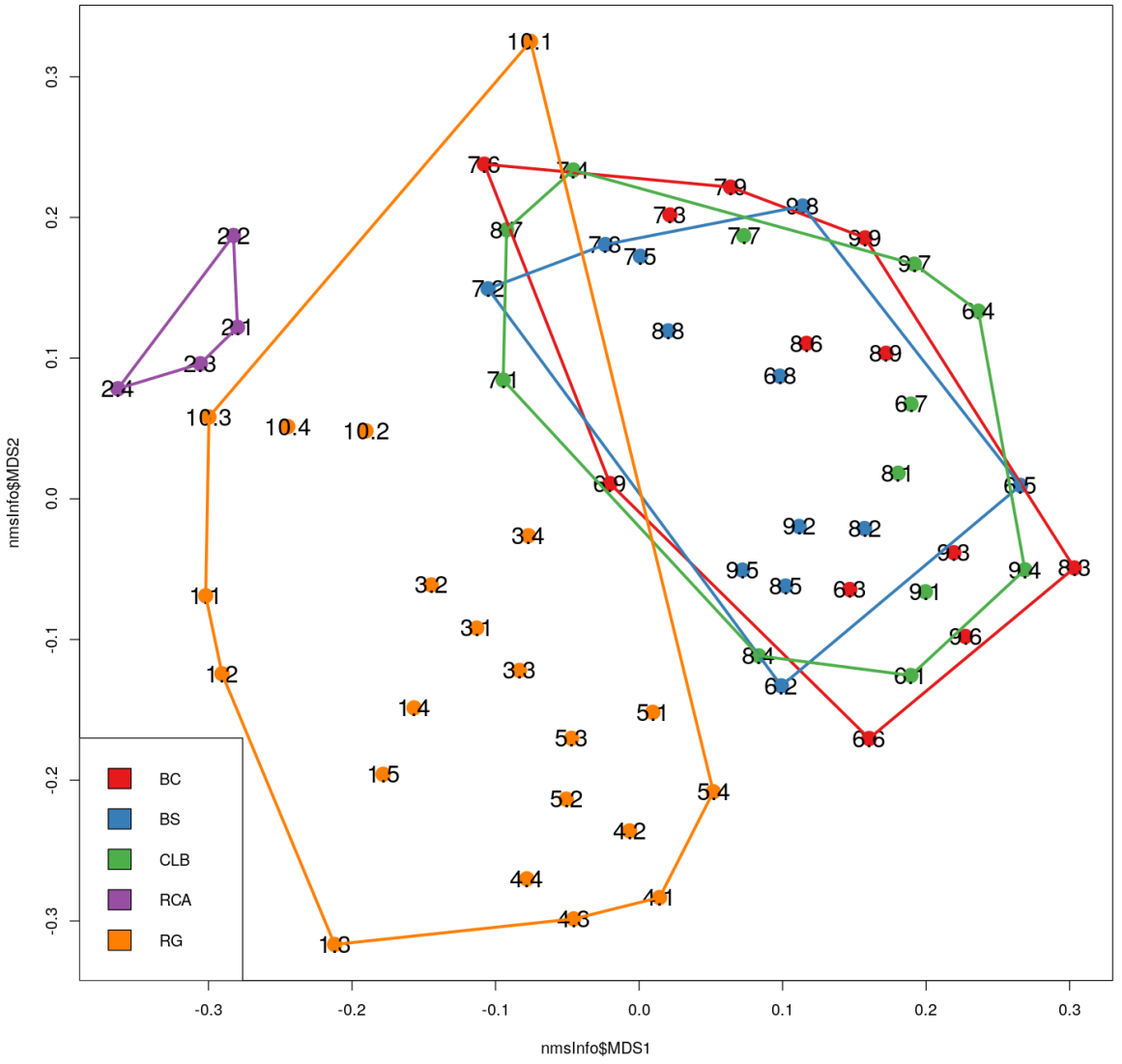


	Species	chao	chao.se	jack1	jack1.se	jack2	boot	boot.se	n
All sites	343	516.3946	39.15056	483.6557	21.60728	566.8038	404.4403	10.54889	61

There is a spatial nature to this diversity. = Very high turnover, even sites very close to each other are very different. This tendency difference increases with distance.



Ana's team sampled sites with several different categories of land-use history.



"Natural" forest:
BC = bosque cerrado, undisturbed primary forest.

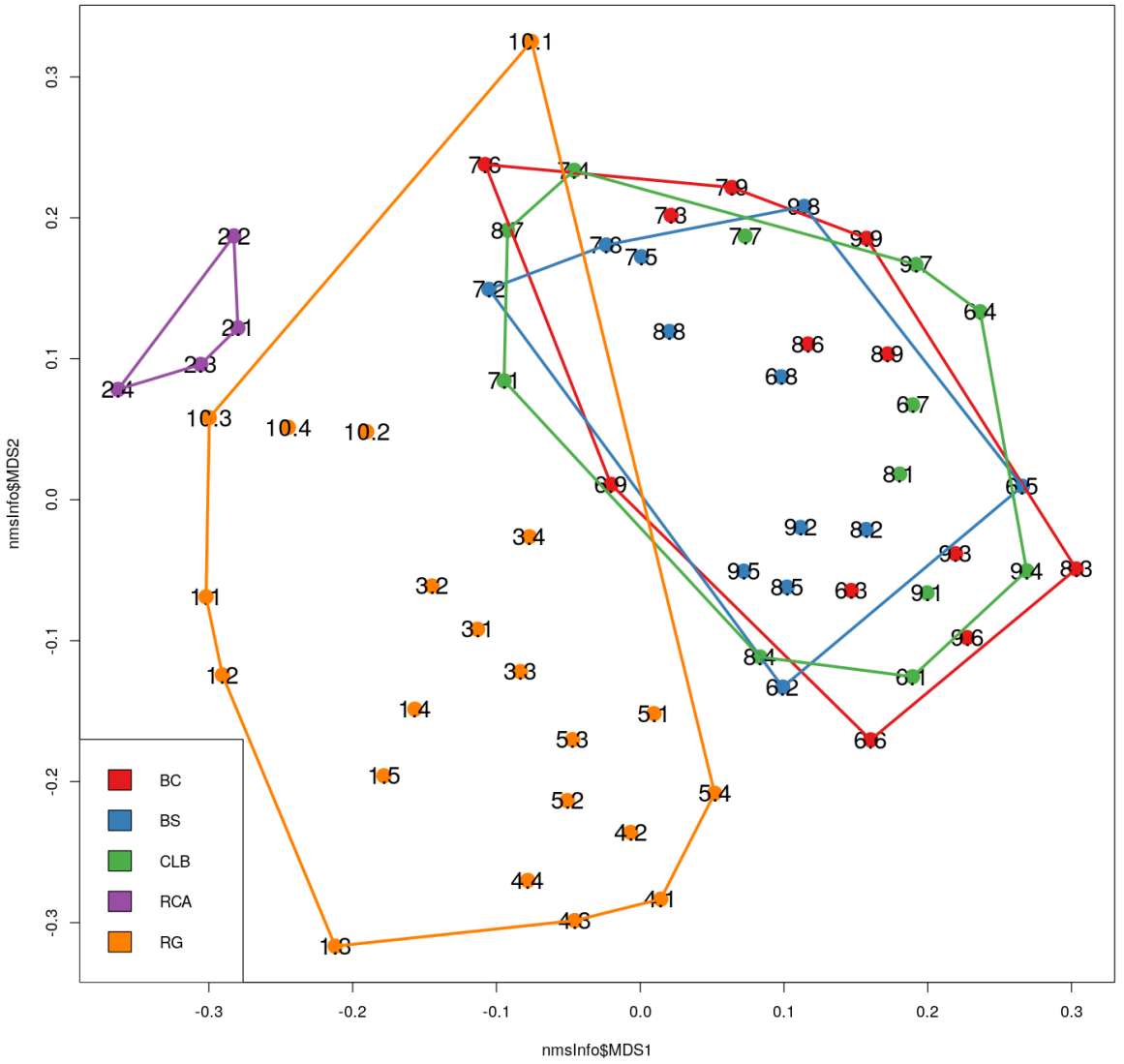
BS = bosque secondario, primary forest recovering from natural disturbance.

CLB = claro del bosque, natural gaps in primary forest.

Anthropogenic disturbance:
RCA = regeneración cañaveral, intensive agriculture

RG = regeneración, regenerating pastures.

These categories show that “natural forests” have very similar tree communities.



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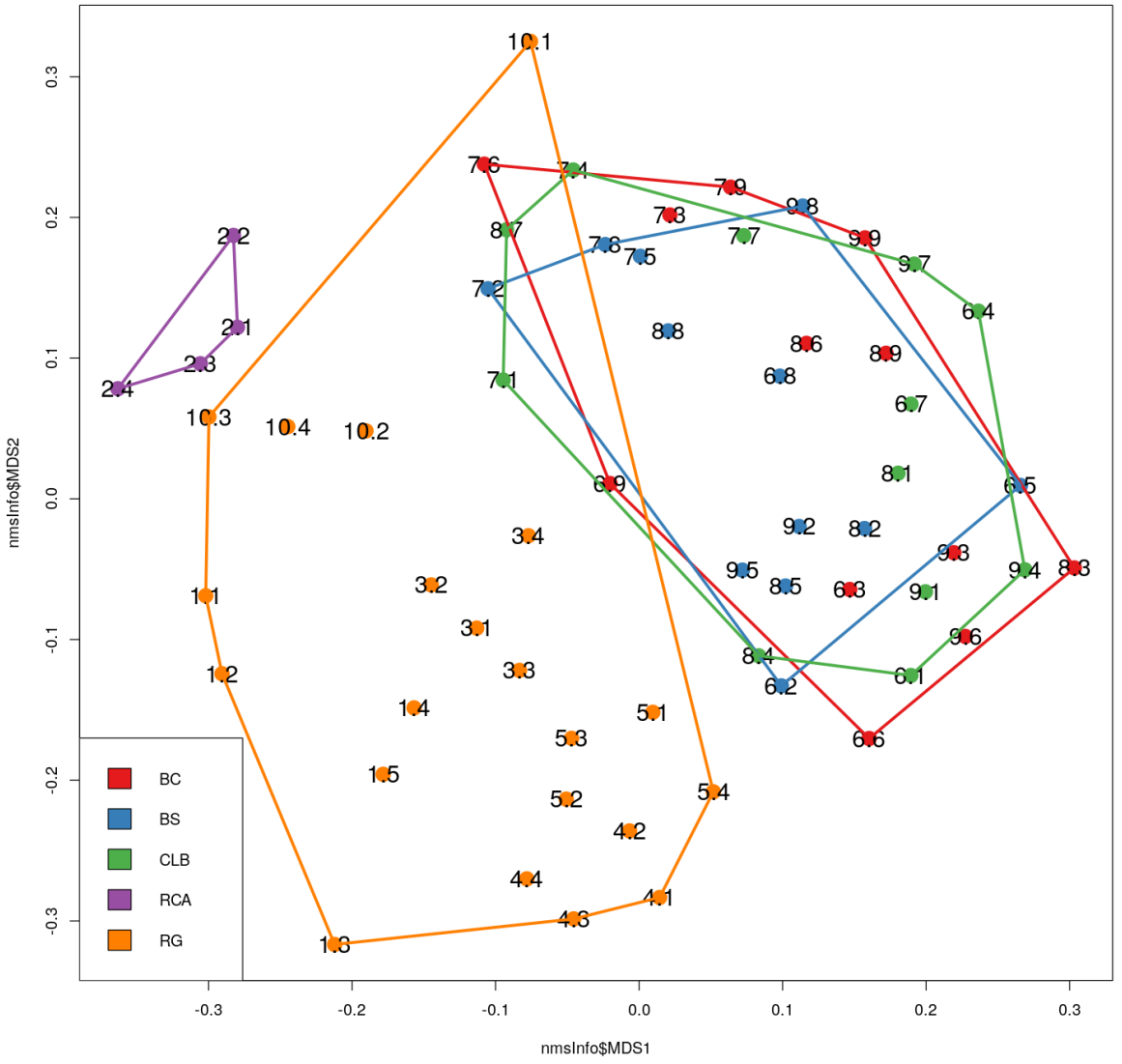
RG = regeneración, regenerating pastures.

Intensive agriculture sites are very different, and regenerating pasture sites are intermediate between these two.



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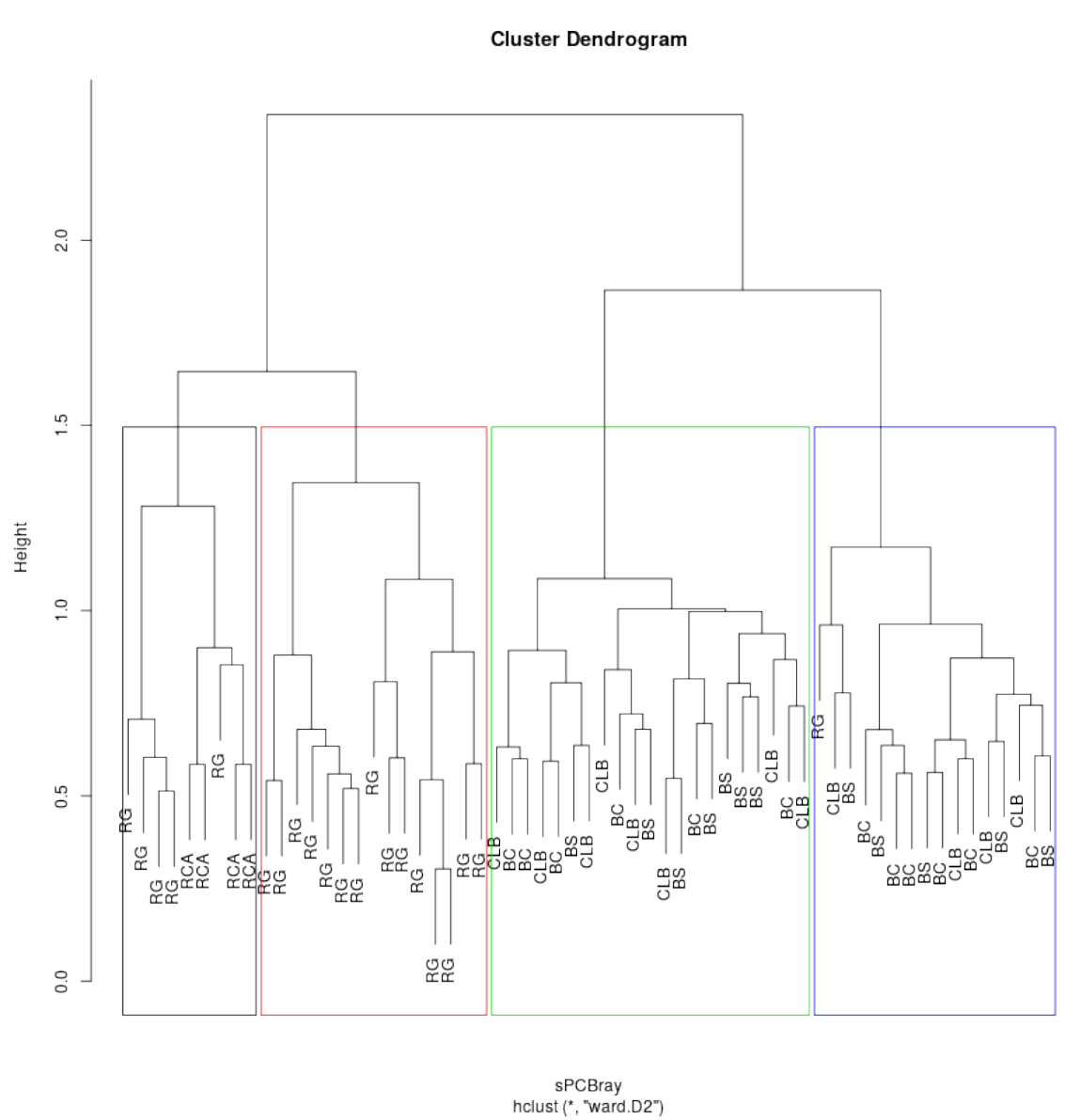
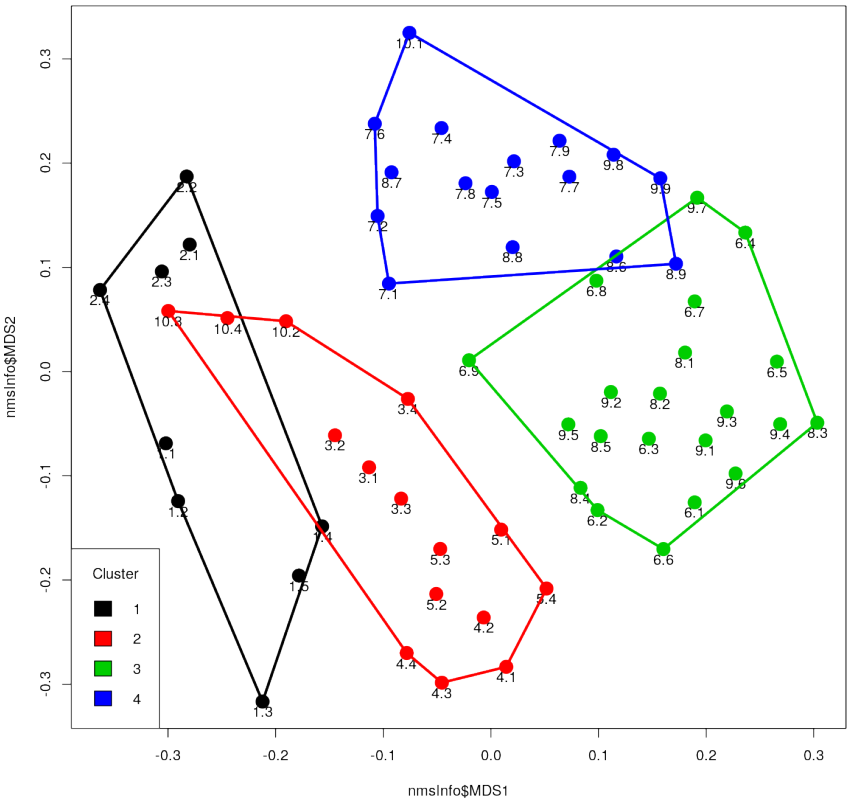
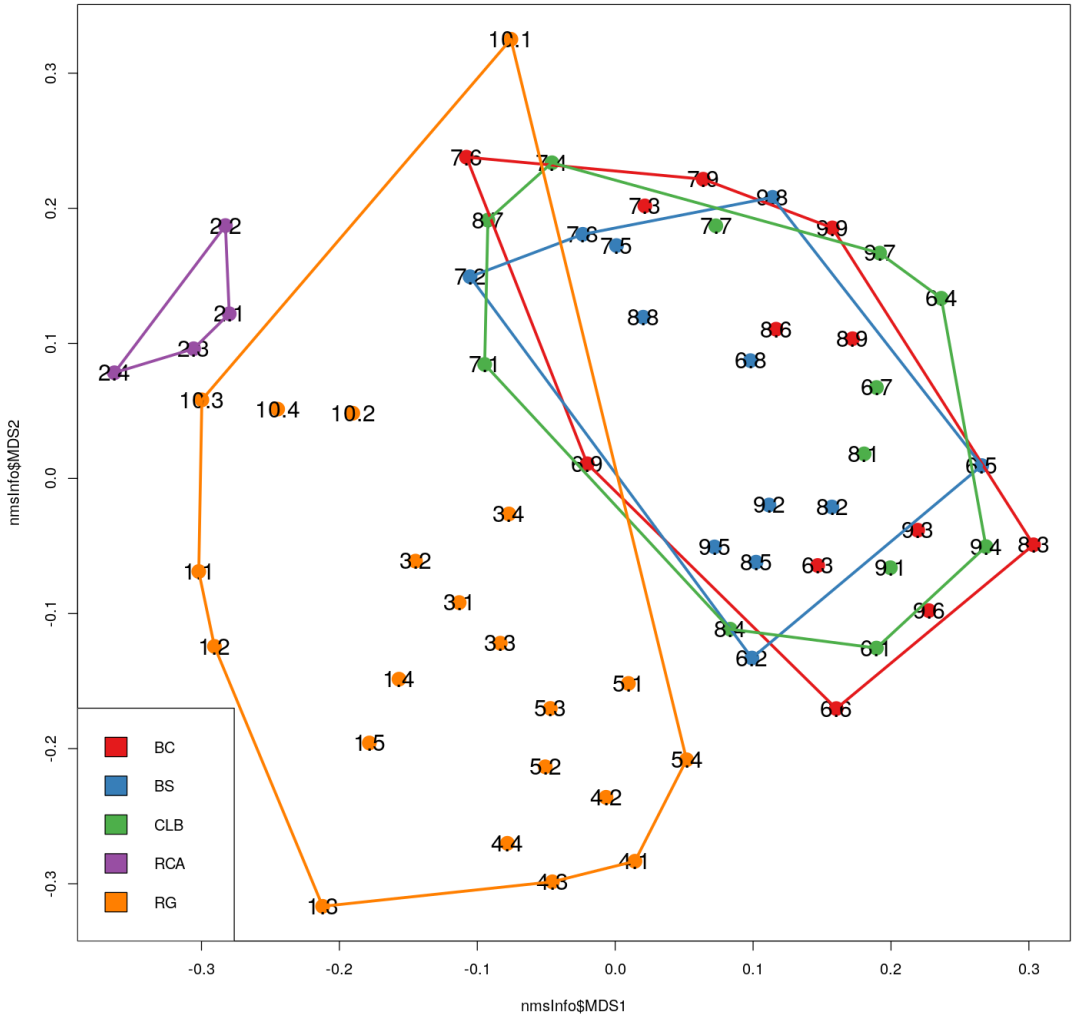
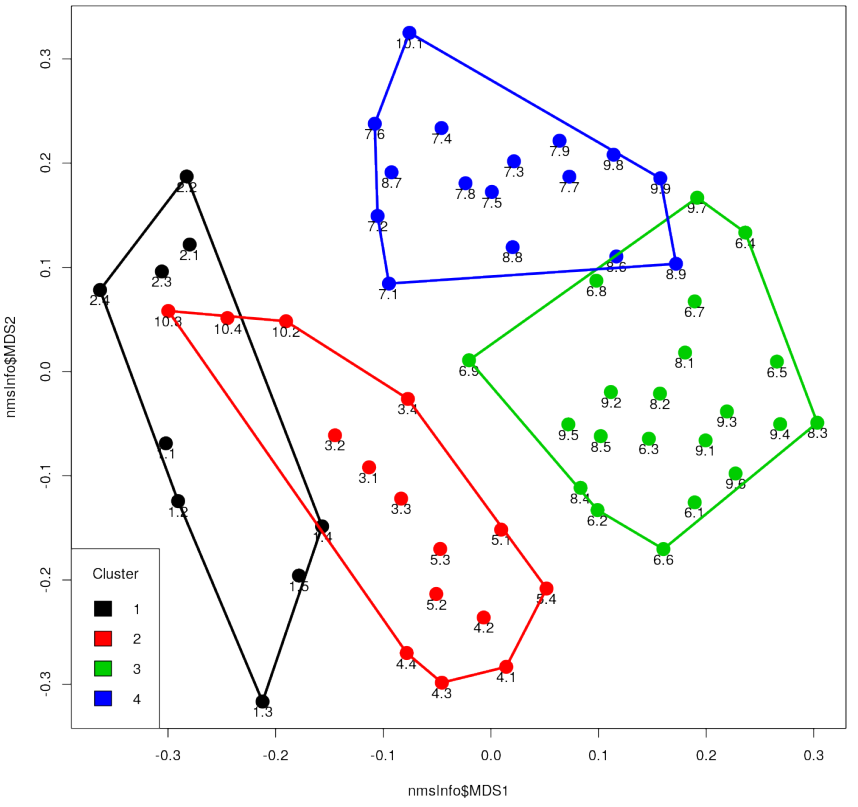


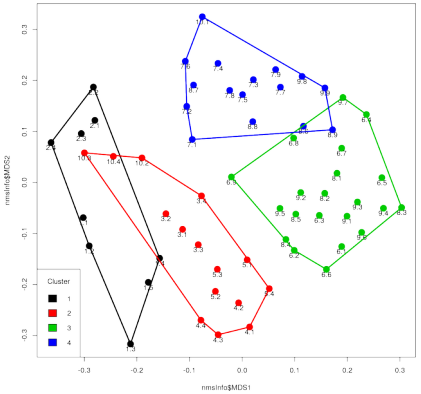
We can run an unsupervised clustering process on the sites, and 4 types of sites seem to emerge:

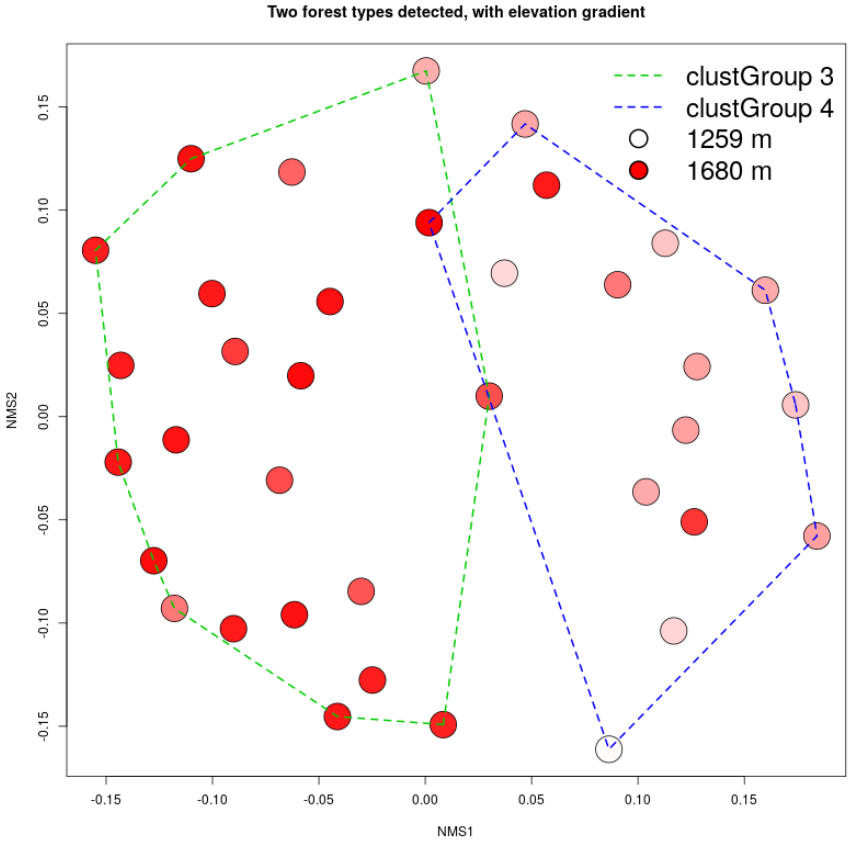


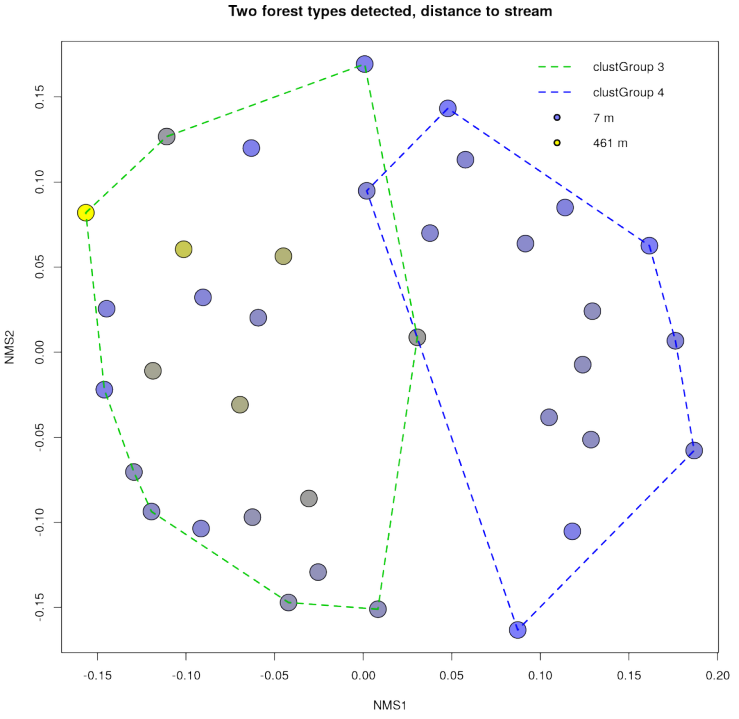

nmsInfo$MDS2
nmsInfo$MDS1
BC
BS
CLB
RCA
RG


nmsInfo$MDS2
nmsInfo$MDS1
Cluster
1
2
3
4

Old forests – two types. Why?



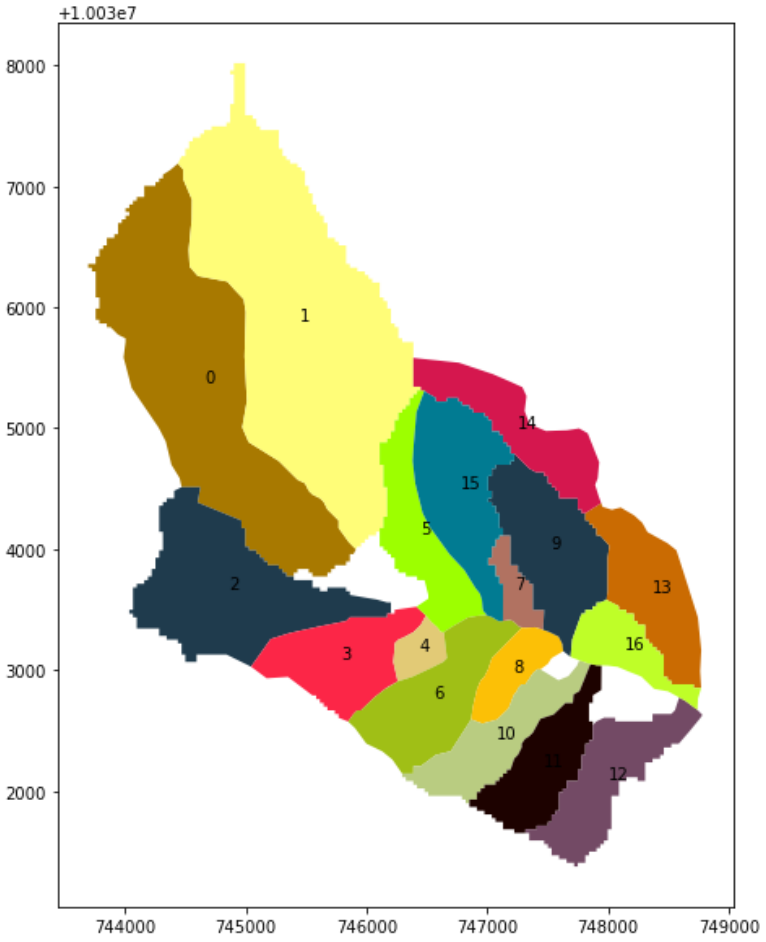


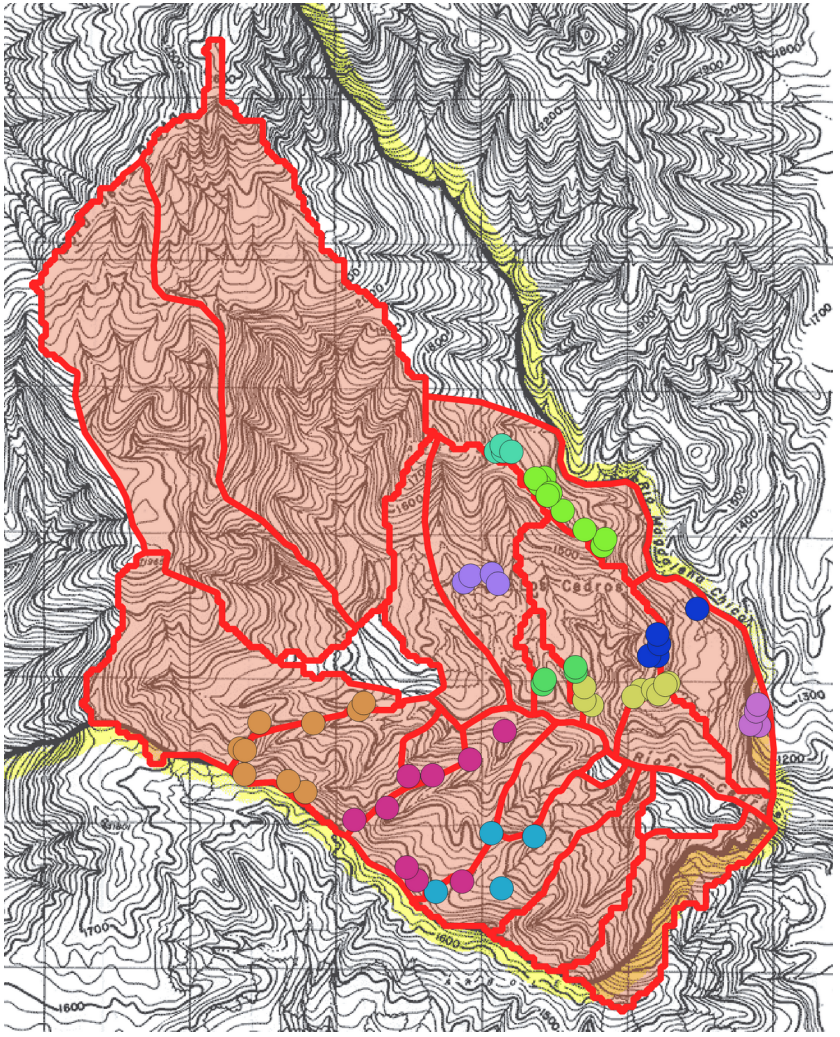


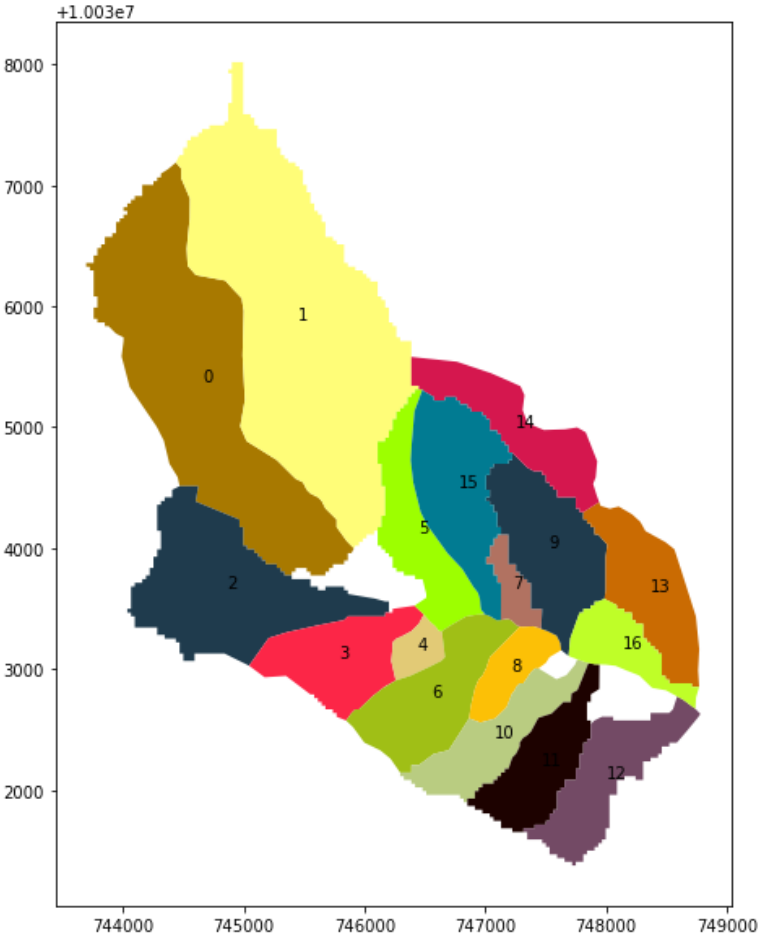
In each of these categories of mature trees, both land use history categories and among cluster groups, we can pick up indicator species.

This is not the case with the juvenile trees (these data are discussed below).

We can also view this ecological turnover in terms of watersheds.






+1.003e7
8000
7000
6000
5000
4000
3000
2000
744000
745000
746000
747000
748000
749000
0
1
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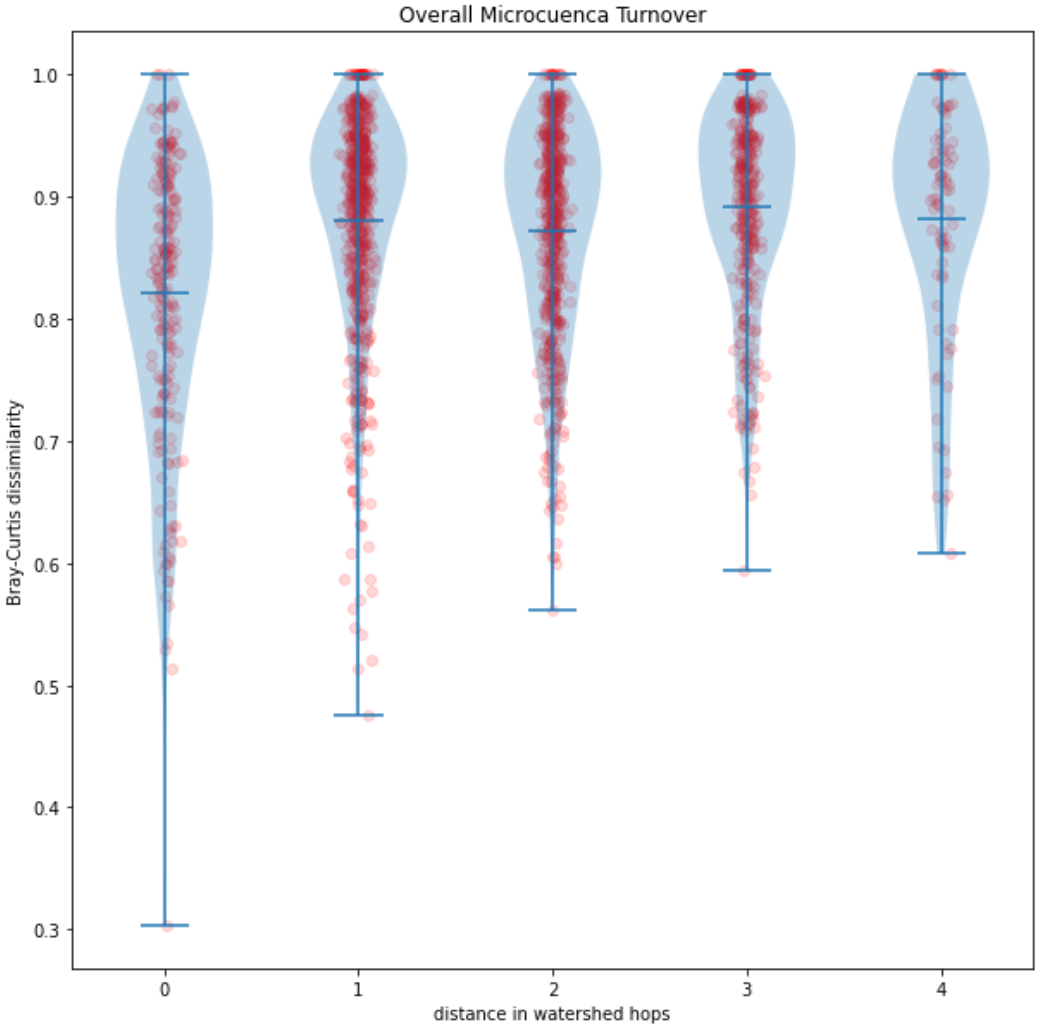
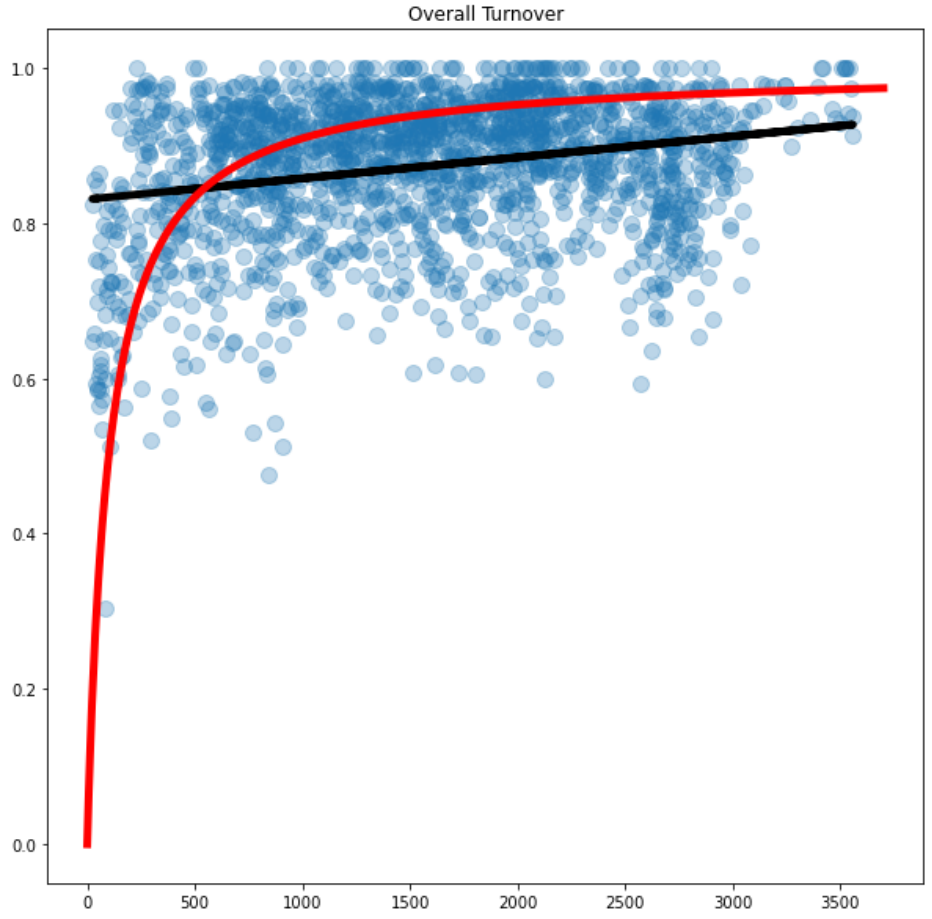
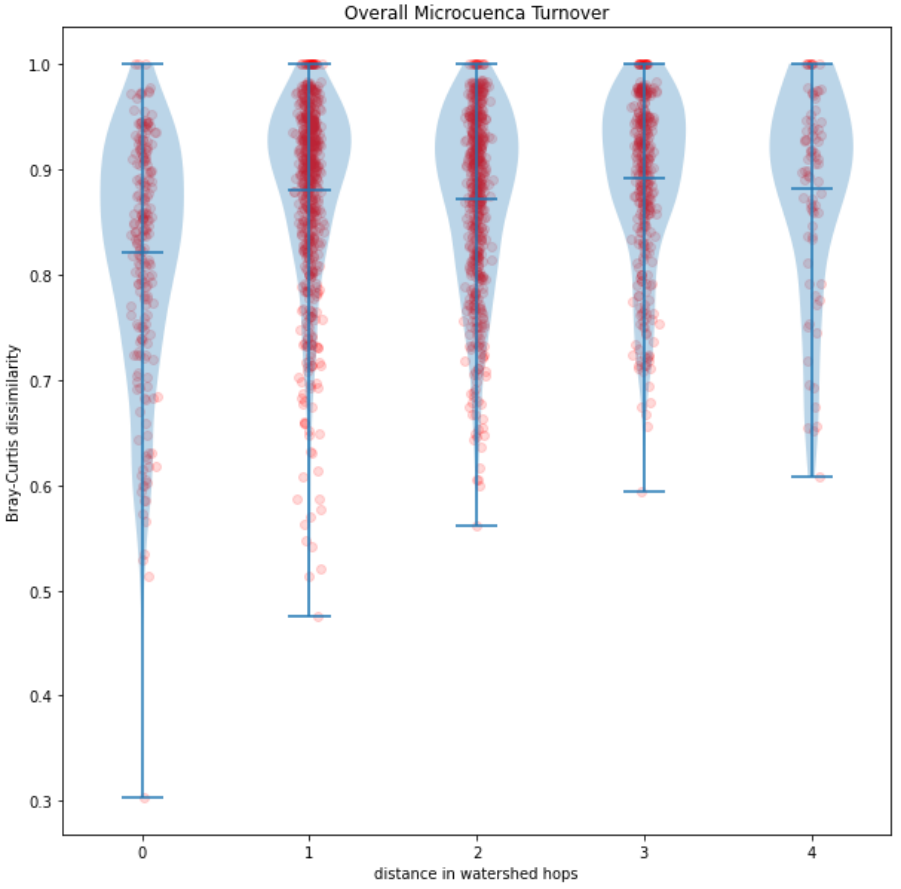
16


Overall Microcuenca Turnover
Bray-Curtis dissimilarity
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0
1
2
3
4
distance in watershed hops


Overall Turnover
1.0
0.8
0.6
0.4
0.2
0.0
0
500
1000
1500
2000
2500
3000
3500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1.0
0.9
0.8
0.7
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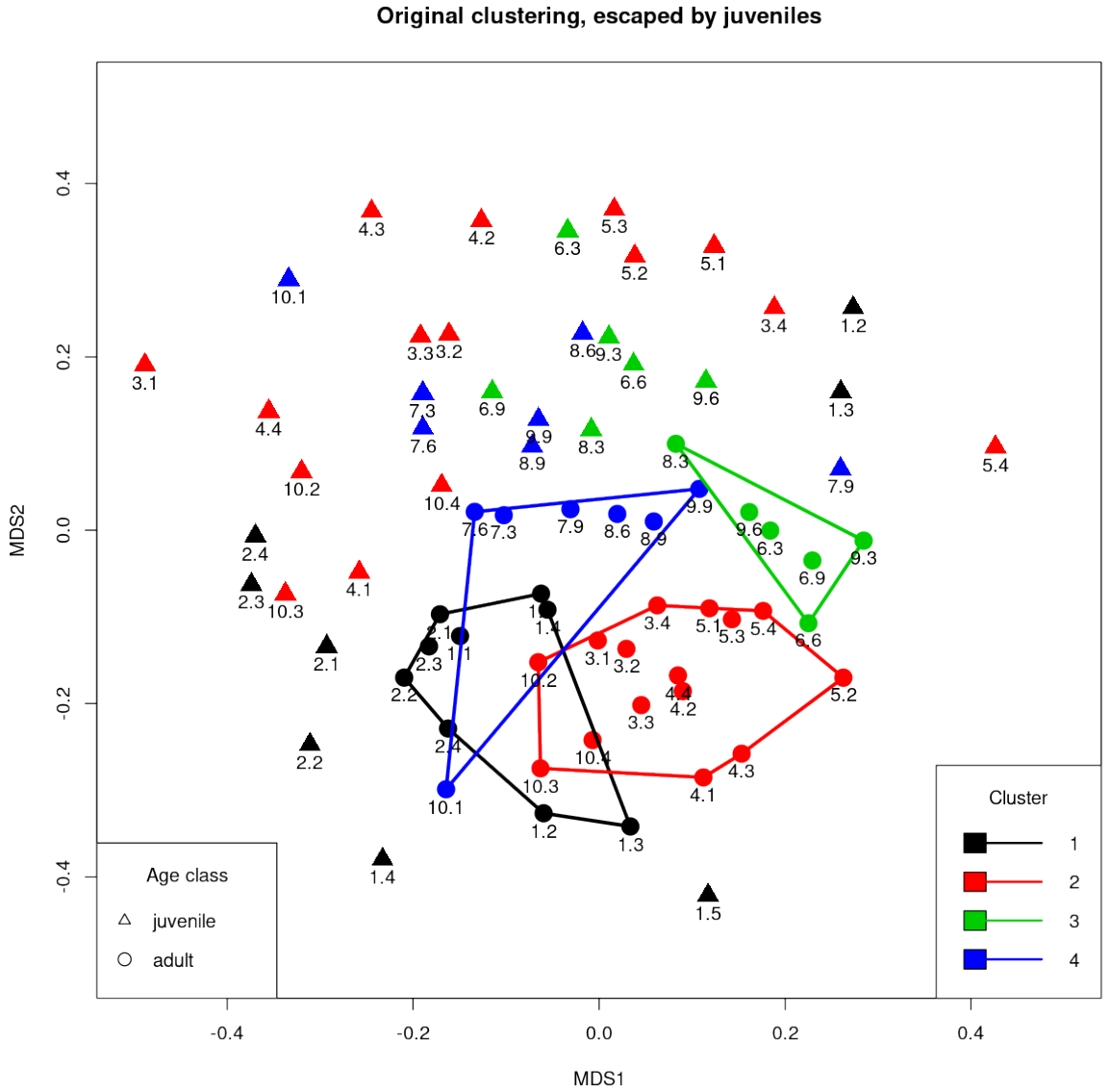
0.5
0.4
0.3
0
1
2
3
4
distance in watershed hops

TRY Plant Trait Database

Juvenile data had to be cleaned up a bit, all data were checked against the growth form data in the TRY database, the STRI herbarium, and the Gentry manual. Had to throw out observations of plants that seemed unlikely to mature into a tree as defined in the other portion of the study (the mature tree observations).

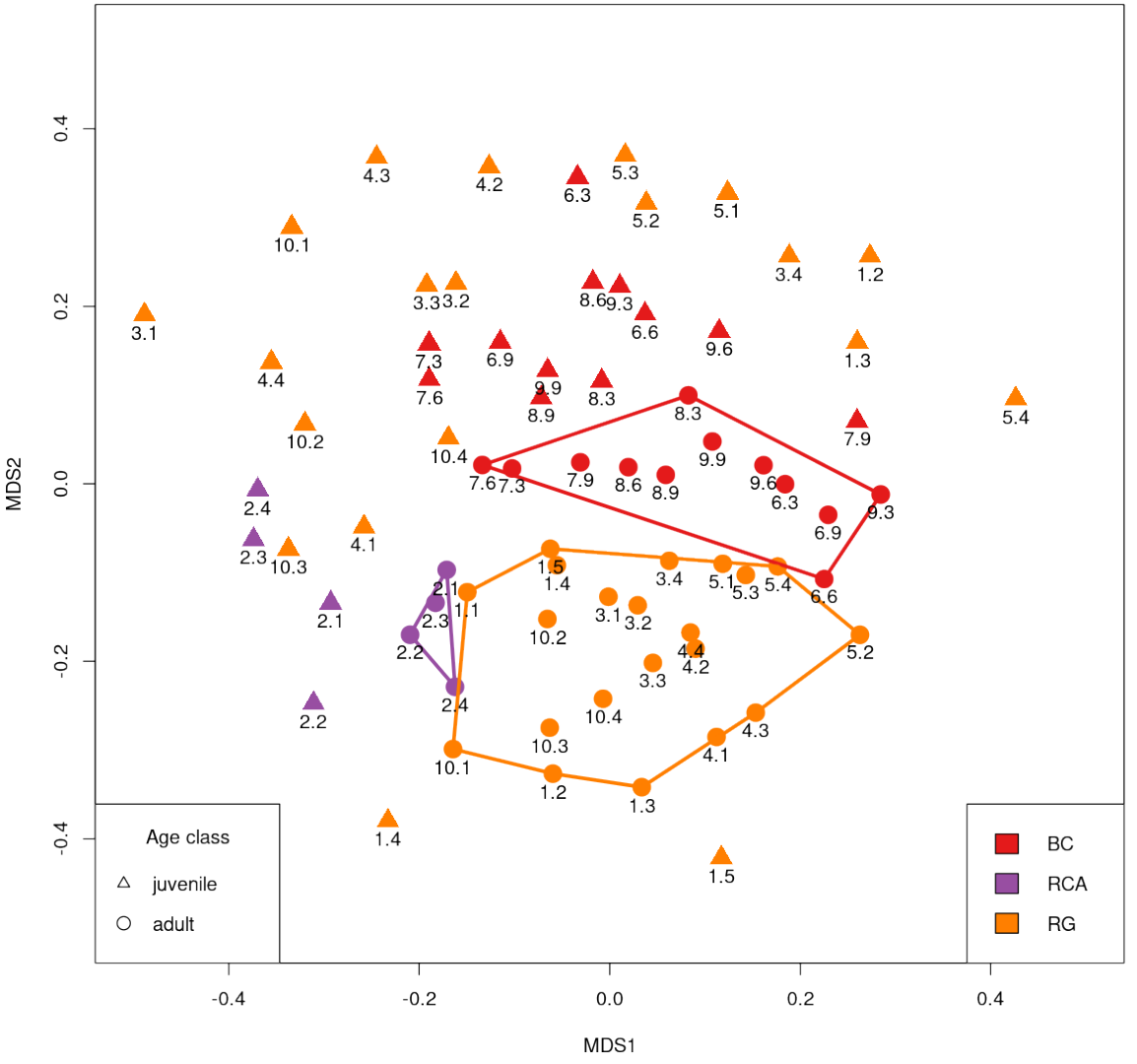
Smithsonian Tropical Research Institute

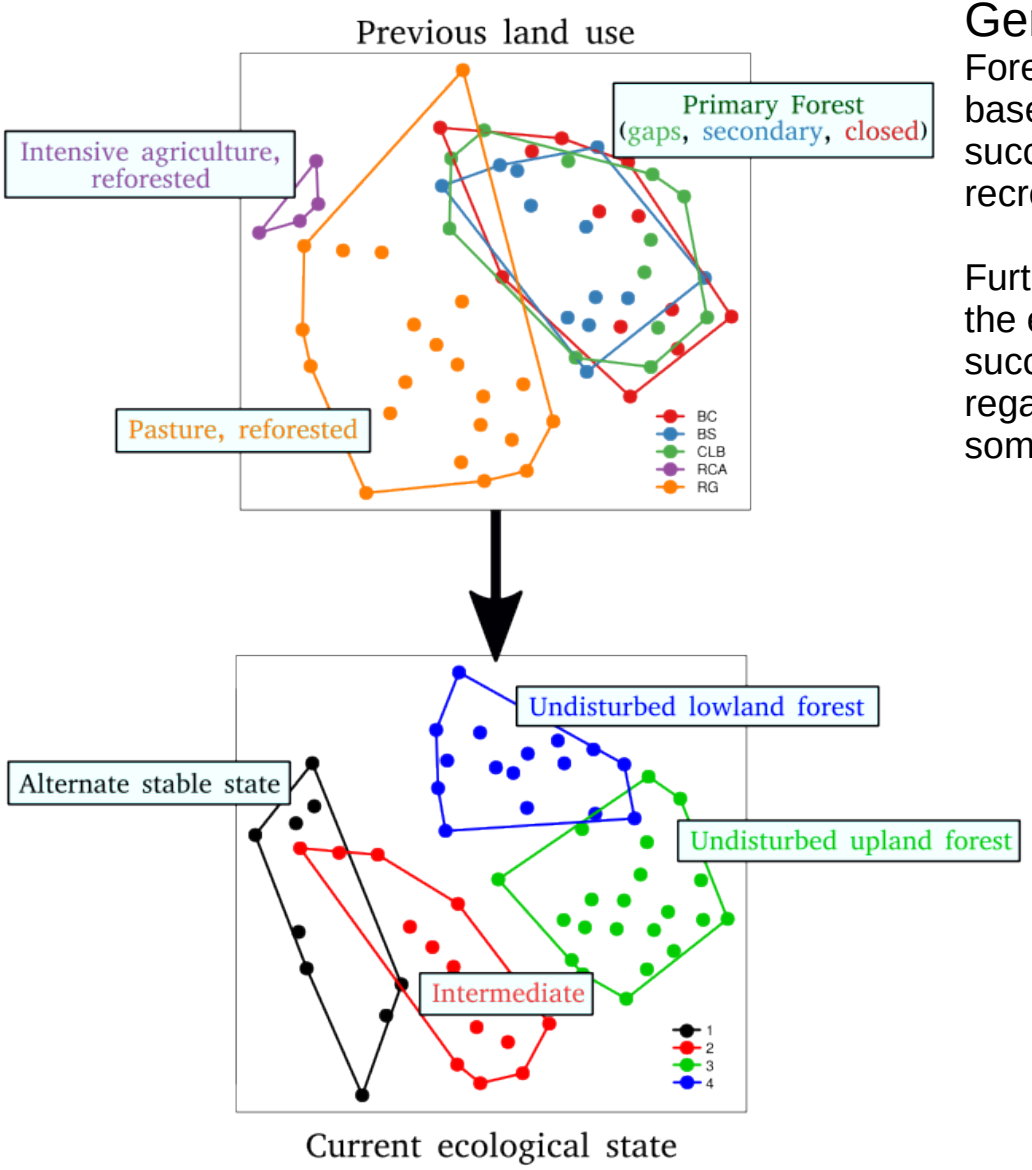
Saccoloma sp.



The juvenile tree communities don't cluster simply, unlike the older trees.

Disturbance regime does seem to predict two different poles of attraction for these dynamics. Heavily impacted sites seem to be progressing along a different successional trajectory than the more “natural sites”. But all sites, even old-forest sites, are changing.

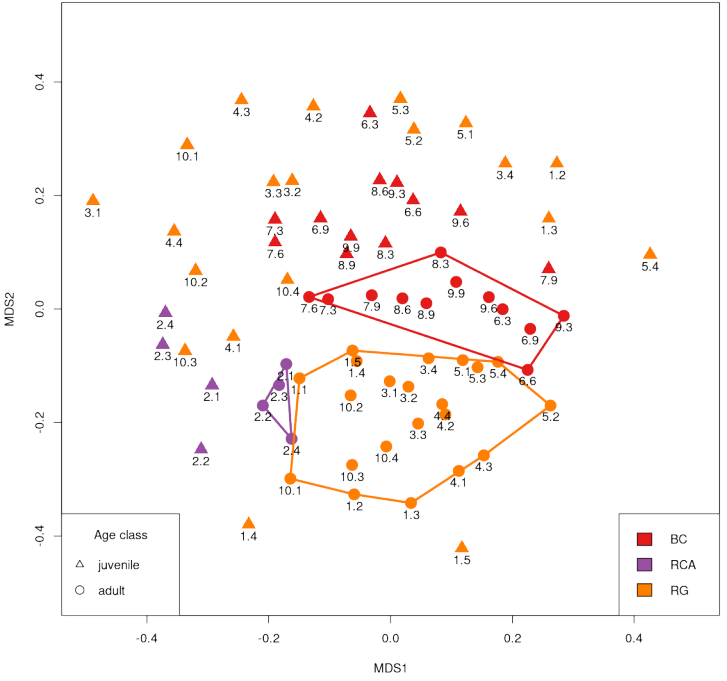




General story:

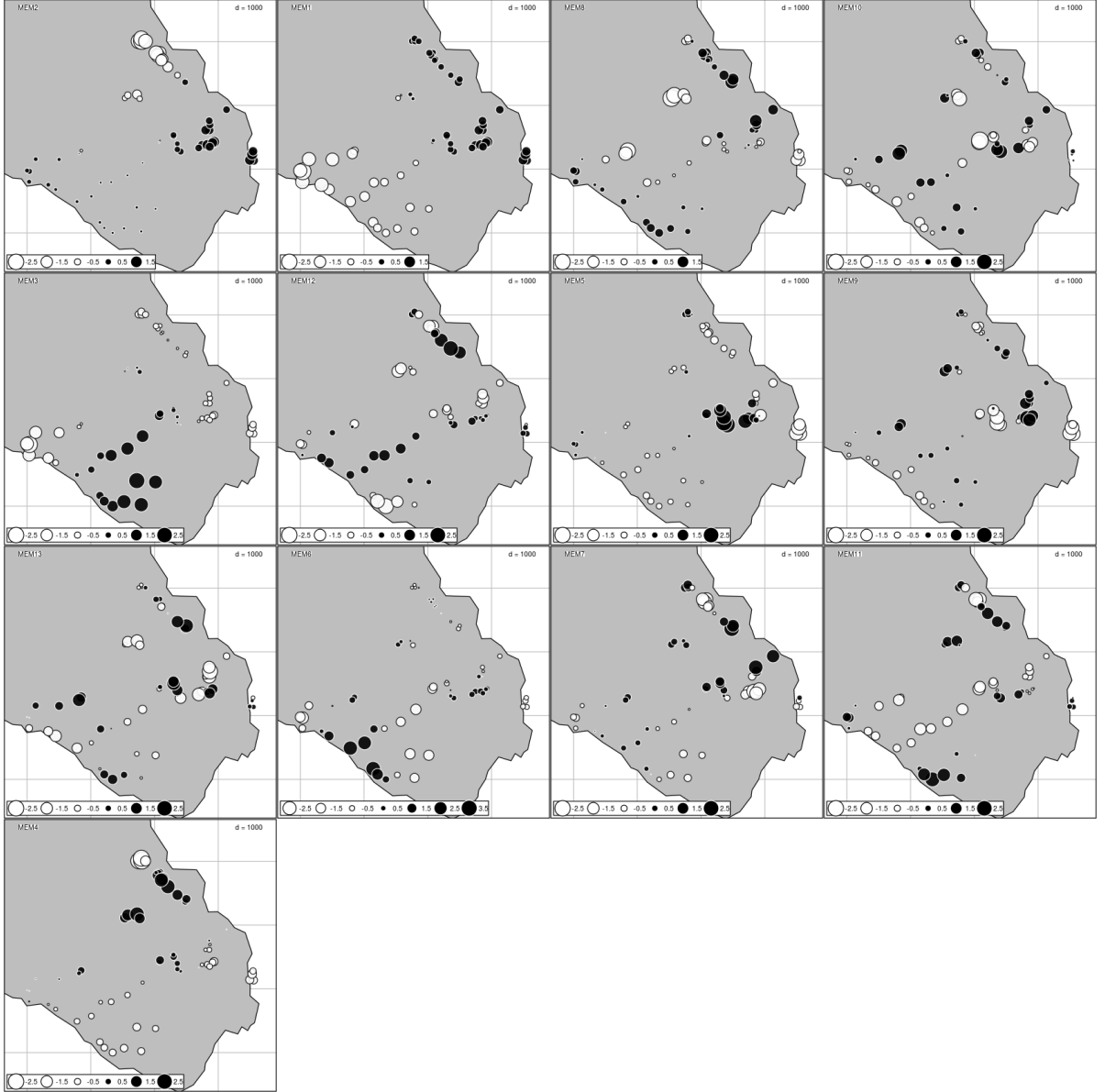
Forest seems to be following different successional trajectories based on their type of disturbance. All the classical ideas of forest succession seem to mostly apply to the “natural” disturbances, i.e. recreating the climax forest after disturbance.

Further complicating this, the next generation of tree communities of the entire forest seem to be changing, perhaps along two successional paths (anthropogenic vs. natural disturbance). But regardless, even primary forest sites are possibly changing into something very different than the historical forest. Climate change?



To do:
- finish MEM models
- fit a model to turnover

MEMs are spatial patterns in correlated with changes in plant community, that are detected by algorithms. The ones shown here are statistically significant, but I have not checked them for correlations with our environmental data or land use history. Needs to be done.



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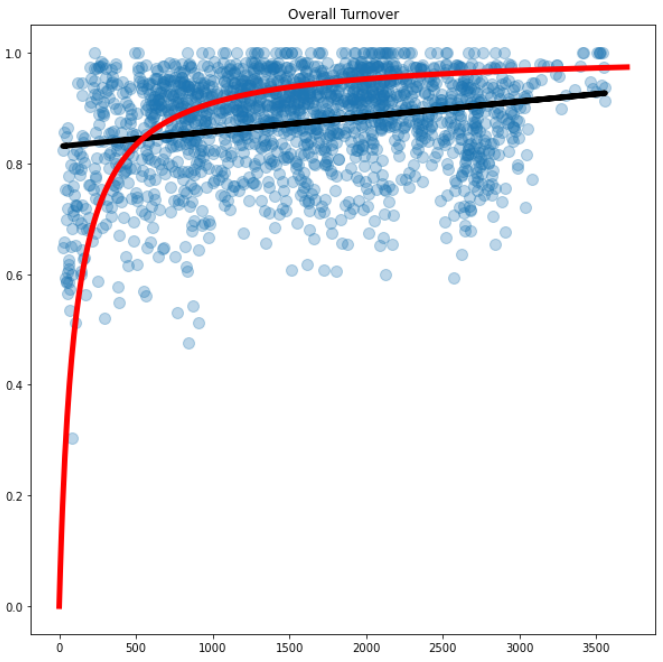
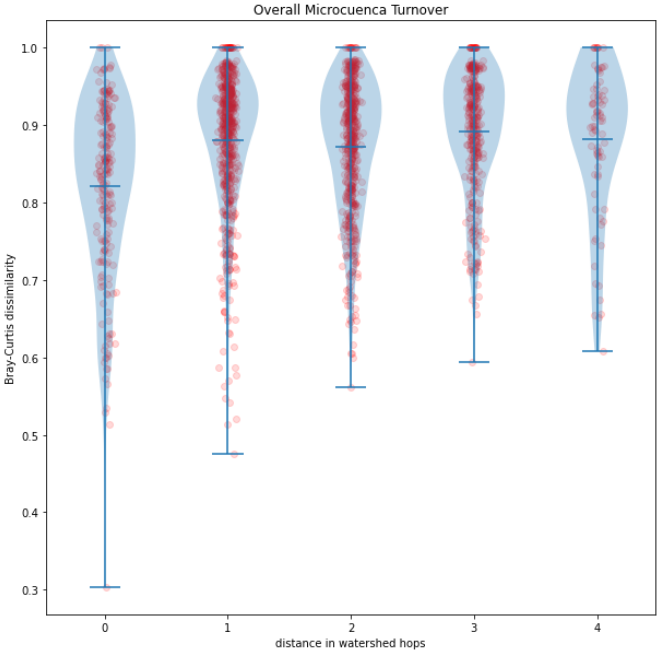
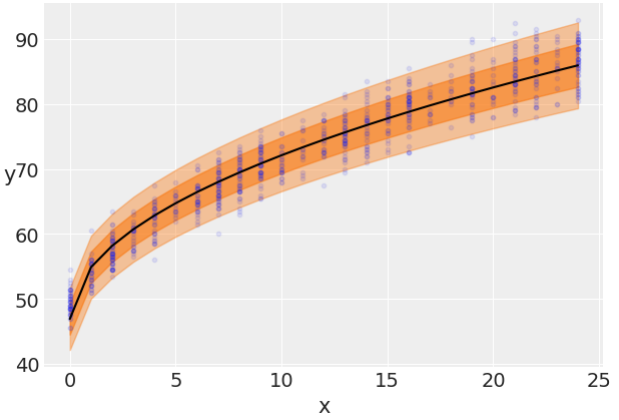




$$y = \frac{x}{100 + x}$$



Can we start writing with this?