Cultural drivers of landscape change in a historical context

When I chose this topic I wasn’t sure what I was expecting. While I’d like to say that I approach a reading with my assumptions put away, the readings I found really surprised me. The papers we’ve been reading in class focused on moving away from isolated pristine ecosystems to the study of matrices, gradients, and nodes; these papers make a case for including a temporal and cultural metric to landscape ecology.

Two of the gaps considered in a lot of the papers we’ve been reading in class have been processes and the temporal scale. By choosing the topic of cultural drivers of landscape change in a historical context, I found a lot of research that aims to create a framework, and attempt to identify methods to eliminate any of the pitfalls that come with working in an interdisciplinary fashion and at different time scales.

The paper by Antrop provided a great overview of major landscape changes and their cultural drivers. Antrop divides major landscapes into three temporal categories: The traditional, 16th century to WWII (revolutionary), and the post-modern landscape.

Papers contained in my bibliography considering the traditional landscape focus on agricultural practices. One of the surprising findings I found from reading these papers is how essential the authors found these agricultural practices to be in order to maintain biodiversity. One paper that I have found being cited quite often, authored by Burgi, considers the disappearing practice of collecting forest litter in Europe.

The author notes in this paper that by ceasing this practice, nutrient levels and light levels return to a level that are suitable for a good amount of species that are now extinct. The increased forest litter also suppresses germination as well. This point surprised me because it really sets the idea of the pristine environment aside and demonstrates how integral this cultural tradition is to maintaining biodiversity in that ecosystem.
I could not find a lot of studies on the period Antrop describes as the revolutionary period, but in his paper he mentions that a lot of traditional landscapes were eradicated, and then abandoned. He also mentions that not many records were taken during this period, which might explain that gap.

However a study authored by Hall, while looking at patterns of forest cover in Massachusetts over a 300 year period, reveals an interesting pattern around the 1900s. Because of the shift to industry around this time period, agricultural was abandoned to allow for a large rebound in forest cover. I can’t say this pattern would be the same in Europe as the America during that time had a lot more room for expansion.

I only cite one paper in my bibliography considering the post-moden period. I did this mainly because I wanted to stick with the historical context, hoping to at least go back 50 years or more. The paper I chose considers the relationship between socio economic status and vegetation cover over a period of twenty years. What really stuck out for me in this paper, written by Luck, was the amount of data the authors included. The papers studying traditional landscapes continuously mention the need for more data, while this paper, much like the Grove paper seems to be awash in the amount of data that can be used to measure socioeconomics and vegetation cover.

Antrop notes that one of the obstacles in studying this time period is to figure out what data are important when creating a study.

Antrop also notes that landscapes in the post modern period develop irregardless of the previous land scape. This is in stark contrast with research being done on the traditional period, and I will cite a study done by Zerbe that draws a positive relationship between the geology, past industry, and present day land use.

I think the complications that come with the post modern period have to do with the shift in land use. A study by Louise Fortmann and Peter Walker look at the failure of conservation measures to pass In Sierra Nevada, and cite a divide between those citizens who use the
landscape for industry or agriculture, vs those who use the landscape for their hobbies but do not have their livelihood tied to it.

The complications that stem from trying to find the right socioeconomic variables to correlate with ecological change I think comes from the disconnection of livelihood and the landscape.

This is probably why relationships are easier to draw in traditional landscapes vs modern ones. The occupation, industry, and land use matches the ecology and geology of the environment in the traditional landscape.

Nassauer is another name that I found cited a lot while looking at this topic. The paper I found authored by her addresses this issue. Specifically, what are people’s effects on the landscape and more importantly what is it about the landscape the influences people?

Nassauer describes the relationship between landscape change and human behavior and a cyclical relationship, instead of humans acting and causing landscape change in a one-way relationship.

One of the more interesting points she makes is when she cites Kevin Lynch, who observed people in cities, and noted that they prefer landscapes that helped them navigate, Participants specifically preferred landscapes that had nodes, land makers, and corridors. Both Antrop and Nassauer note that landscapes are important for transportation, and that human beings shape landscapes for better efficiency, which would explain why landscapes are shaped the way they are.

One point that Nassauer makes, which I feel she points right at ecologists is the need to understand that ecology is not a value free science. That is, the human populations have different preferences, such as a well-manicured lawn, that aren’t necessarily wrong but are just are. She argues that these values are not static, but just as dynamic as ecosystems are over time, and need to be taken into account when making management decisions.
Overall I found these papers to be really illuminating. I’m very interesting in looking at the post modern landscape and the traditional landscape, which does not only reflect a change in how landscapes are used, but also reflects a change in how the science is performed, because of the large amount of data now recorded. Cultural drivers and the spatial time scale appear to be a natural extension of landscape ecology, and critical to managing ecosystems.
Annotated Bibliography


This article deals with different strategies into the best implementation of historical data. The first part of this paper is a historiography of approaches to landscape research, specifically focused on landscape research involving human influences. The author centers on the industrial revolution as an event that caused researchers to look to past research to look at land use traditions in relation to the large changes that were going on. One of the issues that this paper looks at is bridging the gap between the ecological and social study of landscapes. The author suggests dividing the study into three different sections: the physical landscape, the social landscape, and the perception (or values) of the landscape placed on it by people.

This paper also talks about the political implications of landscape ecology, as well as the importance of understanding the past to make better management decisions. Overall it is a good primer into looking at landscape history and cites some very good sources.


This paper is an extremely detailed article on the human drivers of landscape change. The author begins by identifying three different landscapes, Pre-industrial landscapes, landscapes between the industrial revolution and WWII, and Postmodern landscapes.

The section on driving forces is one that I found particularly interesting. Among the four listed calamities was a force that the author felt spurred people to consider landscape decisions that they wouldn’t have otherwise. That particular sectioned reminded me of post hurricane Sandy, specifically the plan to buy back property on the coast of NY and New Jersey for wetland restoration.

I found it interesting that the author separates landscape ecologist and applied landscape researchers, stating “applied landscape research deals with other landscape types that are in the scope of policy makers”. Which implies a gap between ecologists and policy makers, and I was hoping that this author would elaborate on why that gap exists.

While this paper was very informative and accessible, there were a lot of sections that could have been elaborated on. I feel that this paper could be broken up into several others given the amount of material it goes over.

The focus of this paper was on the importance of historical structures of agricultural landscapes. The author argues that human structures should be important markers to landscape ecologists (water mills, fields, scattered settlements). The paper makes many claims about how human intervention (using past agriculture practices) allowed for a variety of biotopes, increased biodiversity, and variety of services not currently valued by the market (climate regulation, soil preservation, preventing erosion).

The author argues (through case studies) that the abandonment of these traditional agricultural practices (because these landmarks are no longer valued culturally or agricultural practice have shifted, resulting in abandonment of lots) have allowed other species to colonize these lots.

Unfortunately the author was non-specific about what species have taken over, and merely stated the secondary successional species colonized the area, reducing biodiversity.

While the argument in this paper is compelling, and recommends subsidies to maintain older agricultural practices, a few data tables (perhaps specifying species composition) would have been nice to support their point.


The objective of this article was two fold. The first part reviews different approaches to landscape ecology, and the second part applied their approach to the changing patterns of leaf litter collection in Europe.

By crafting their argument this way, the authors have successfully put their own thought processes in a larger context, as well as expressing their chosen methods as a way to avoid any undue error.

The author also puts their study into a management context, drawing a line between preservation and restoration. By separating these two things, the author argues that in order to restore an area, managers and researchers need an understanding of current and past processes, and this case, human beings traditionally removing leaf litter from the forest floor would be an important part of the ecological process.

The author further pushes the point of considering human leaf litter removal as important by noting that as leaf litter accumulates, light levels decrease, and nutrient levels increase, making habitat available for organisms that are now extinct.

Overall I feel that this paper did a good job balancing the differing topics of methodology, ecology, and the importance of cultural tradition.

The author of this paper uses the location of Sandstein-Spessart, an area between Frankfurt and Wurzburg to look at how past land use influences present day patterns. What really impressed me about this paper is how well rounded the research was. The author did not just look at one layer of the ecosystem but several. He began with the geology of the study area, then the climatic zone, the social factors, and then the present day land uses and vegetation. For example, in the South eastern section of the study area the author begins by describing the geology as mostly made up of loess, then goes on to say that colonization before 1000 AD consisted of clearing and agricultural uses, which has led the way to present day agricultural use. In this case, while a lot of these papers argue that cultural traditions are drivers of landscape change, I would argue that there is an argument in this paper that it is the geology of an area that ultimately drives landscape change.

I was also really impressed by the authors use of a variety of sources, from pollen records, to archeological findings and forest documents; the author, I felt did a good job creating a well rounded argument without stretching it out too far.


As I was looking through papers related to landscape ecology, history, and human drivers of landscape change, I realized that there were a fair amount that lacked a good amount of hard data (due to it being unavailable) and leaned toward the conceptual side.

This particular paper focuses on year time span, specifically looking at the temporal relationship between socioeconomic factors and vegetation cover. While it the study starts at a fairly recent date in comparison to the other papers in this bibliography, I felt that the same basic theme was covered, but on a micro scale, and was particularly relevant given that a lot of the papers we’ve been reading in class have mentioned the lack of research with the temporal scale.

It was interesting how much more complex this paper was in comparison to other studies that focused on a larger time scale. At one point the author comments that even though education and income are slightly redundant they would rather keep both because education still contains different types of data. This is really reflects to me how much data is available for researching current phenomenon in comparison with past events.

Unlike the Zerbe paper that seems to indicate that geology is more of a driver of landscape change, this paper indicates that the biophysical factors are less important than the socioeconomic ones. This could be explained by the fact that the Zerbe paper is considering the pre industrial time period, and this paper is considering the post industrial time period.

Nassauer argues that even though landscape ecology easily lends itself to studying cultural drivers of landscape change, the opportunity to do so has not been exploited by researchers. The author proceeds to layout four practices to consider in order to better facilitate this type of research.

One of the main arguments that Nassauer presents is that human beings do not just drive landscape change, but that landscapes influence human beings, resulting in a cyclical relationship. The author then argues that ecology itself is a science based on value, and brings up many interesting supporting examples such as groups of people preferring open spaces due to evolutionary pressures (to spot predators), and even goes further to note that cities have a node and matrix structure, and cites a study that states that people prefer that type of structure for better navigation.

What really struck me about this paper is how Nassauer describes how art and literature of western landscapes influenced value, and almost pointedly states to landscape ecologists the importance of considering changing values in order to better optimize ecosystem function, as well as to make better decisions that align with the political structure of the area being considered.


Using GIS and historical data, this study aimed to look at how changing land-use influenced forest structure and composition over a 300 year period in Massachusetts. While this study found that the clear cutting practices that came with European settlement increased the population of early successional species, the authors note that overall the entirety of the landscape did not undergo any major changes. They also note that before European arrival, burning and clearing areas was a practice done by the Native Americans, but European arrival and settlement made this a more widespread practice.

The graphs that show percent agricultural land and percent forest cover shift dramatically around the 1900s, which matches with the Antrop paper, which describes 16th century-WWII as an industrial landscape. The only area that didn’t change dramatically was the northeastern coastal zone, and I can imagine development along the coast was probably still important even with declining agriculture.

Even with the interesting patterns revealed in this study, the amount of caution the authors expressed about looking at historical data was refreshing given the strength of their findings.

This paper highlights the lack of understanding of processes in landscape ecology. The authors of this paper provide a framework to pursue this topic, including looking at cultural, political, temporal, socioeconomic, and technological drivers of change. The authors emphasized what seems to be a running theme in all these articles, which is to move away from the idea of the pristine ecosystem, and move towards an approach that looks at restoration through several lenses.

The authors also focus on the importance of considering proper metrics. Because a lot of the drivers mentioned in this paper fall into the realm of social science, the authors make the recommendation that both ecologists and social scientists consider the type of data they collect, as well as the time frame it is collected in.


Using 100 year old land cover maps and aerial photographs, this paper asks if there is a relationship between past landscape structure and present day species diversity, specifically in plants, in Sweden. The author chose two time periods to compare the present, 100 years ago because of a change in agricultural practices, and 50 years ago because of the abandonment of agriculture and a movement to timber production.

Species richness and past connectivity for the fifty-year time frame and the 100 year time frame seemed to yield pretty modest r–squared values, but nothing fantastic.

What was interesting was the poor relationship between present day species richness and present day connectivity. This article highlights the fact that if there is indeed a lag time between habitat destruction and extinction, there is a window into saving and improving species diversity, but in order to understand it ecologists need to look at the temporal scale.

This paper covers the failure of the conservation measure NH 2020 to pass in Sierra Nevada. While not an article on landscape ecology, I found the authors explanation really helped illuminate the divide between the users of the traditional landscape and a post modern one.

The authors note that there is a divide between those that use the landscape for their livelihood, specifically industries that use the landscape to derive natural resources, and recent migrants that use the landscape for their hobbies. The authors go over the history of this particular area, and note that initially the area was booming from gold rush. As time marched on, land use shifted from natural resource exploitation to recreational.

Even though the traditional landscape and the post modern landscape are divided by a large gap temporally, this example shows that this difference is still important when considering management measures, or even attempting to implement them.