Chapter 2: Legacy effects of land-use types on regulatory ecosystem service capacity of park trees

The legacy effects of past land-use types have been demonstrated to influence various ecological processes and functioning. Land use intimately changes the structure of the environment, from differences in soil microbe communities (Ziter ref) to the cultural value assigned to a place (ref). The highly managed nature of cities often being paired with a rapid rate of development often results in little to no landscape-scale planning with respect to proportions and placement of different land cover types.

Another feature of cities associated with the rapid rate of development is high turnover. Land parcels can be transformed from one land-use type to another over the course of a year, a process which is not often seen in less anthropogenic ecosystems. As cities are being developed and re-developed, sometimes a parcel of land will be developed into a park from industrial, agricultural, residential, or even waste management land use types. This begs the question:

What are the legacy effects of past land-use types on our current parks?

More specifically, we know that our parks and the urban trees within them provide many ecosystem services to the surrounding urban residents. But do the type or quantity of services being delivered change depending on the land-use type the park was developed on? And how does that scale over time? Ziter et al determined ….

We hypothesize that the previous land-use type will influence the type and quantity of ecosystem services currently being delivered by urban trees in Montreal’s parks. We also hypothesize that the relationship between time since development and quantity/type of ecosystem services will change across time depending on the previous land use type.

# Approach

We will investigate the land-use legacies on today’s parks in Montreal, Quebec. Using the city’s historical archives, we will determine the year of establishment for parks in the city and the type of land they were developed on. We will then select a set of parks that vary in previous land-use type and age. After selecting the parks, we will measure ecosystem service capacity for a group of regulating services: temperature regulation, soil type, flood mitigation.

# Status

# Preliminary Results

###References