Biol 112 Stream Lab Assignment
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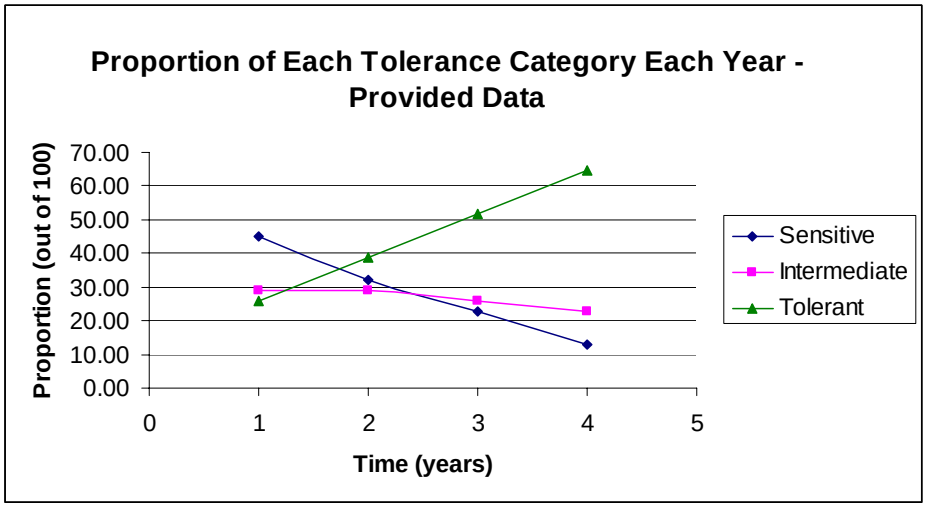
1. Give a qualitative description of each site on Morgan Creek using the visual assessment criteria.

Downstream site (Mason Farm): Sandy substrate, large woody debris (logs) near side of stream, water slow and not too deep (0.25-0.75 meter on average), trapezoidal channel shape, no riffles, wider width than depth, shallow banks with much vegetation, few signs of erosion, tree roots growing to the edge of the streambank; trees were young and not too advanced in succession.

Upstream site: Rocky substrate covered with algae where in water, some leaves, shallow and slow water (0.10 meter or less), rectangular channel shape, water too shallow for riffles, wider width than depth, steep banks with much vegetation, more signs of erosion, minimal vegetation disruption on streambanks; trees were young and not too advanced in succession. There were more forest gaps here than downstream. Streambank on one side highly polluted from drainage pipe input, and filmy substance across entire surface of the water.

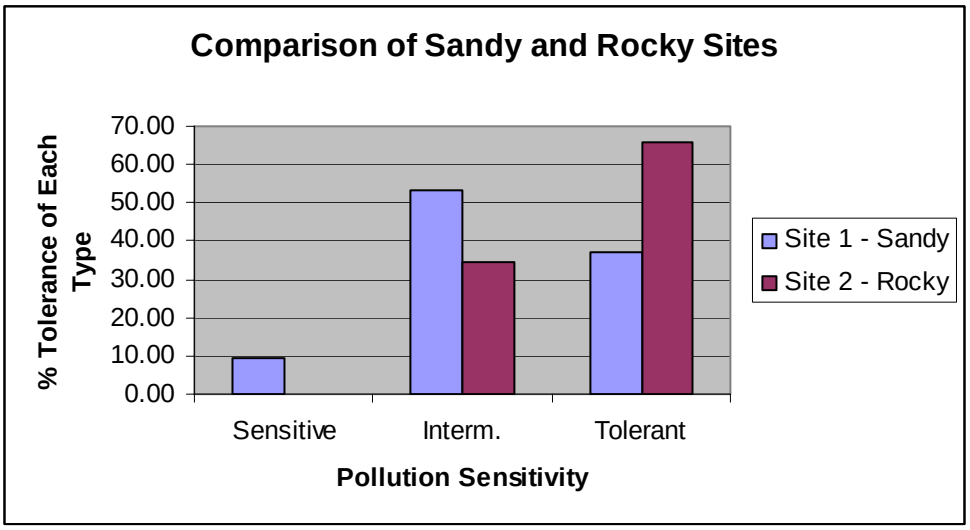
2. Using the data provided (which are representative of a typical stream in the Eastern US), calculate the proportion of individuals represented by each tolerance category for each year. How do the proportions change from year to year? Does the degree of dominance change? (i.e. do a few species increase in abundance while others decrease?) What does this tell you about the health of the stream from one year to the next?

Over time, the pollution-sensitive species decline in abundance while pollution-tolerant species increase rapidly. There is only a slight decline in intermediate species, but the decline increases with time. The rise in tolerant species coupled with the decline in sensitive species means that stream health is becoming poorer as time passes.



Do the same calculations with the data we collected. What does this tell you about the health of each site along Morgan Creek?

The sandy downstream site has a greater abundance of sensitive and intermediate species than the rocky upstream site, which has nearly two-thirds tolerant species and zero sensitive species. The graph at right shows that the upstream site is by far more polluted than the downstream site.



3. Describe the changes that might occur if the vegetation along Morgan Creek were removed. Why would that cause some organisms to increase in abundance while others decrease (consider trophic strategies)? What other effects might that have on the broader stream community?

Removing the vegetation would create more erosion, washing more nutrient-containing sediment into the stream. This might cause declines in filter feeder abundance due to suffocation. However, if the trees were gone, more light would be entering in from above. Coupled with the increased nutrient load, the extra light would increase algal growth, the abundance of zooplankton that eat the algae, and the abundance of larvae that eat the zooplankton. The abundance of species that feed on decaying leaf litter or require fallen branches and logs would decline because there would no longer be terrestrial vegetation input into the stream.