How does the quality of soil affect plant diversity in Portland, as compared to Gresham?

The problem we’re addressing is the urbanization in our region that lacks oversight by the industrial complexes that leak harmful fuels and chemicals into the environment. Those pollutants contaminate the soil and water in neighboring areas, which has a negative impact on regional plant life.

Hypothesis:

We hypothesize that increased pollution in urban areas will hinder plant diversity. The soil samples from Portland will demonstrate increased levels of hydrogen, nitrogen, phosphorous and potassium, yielding less plant diversity in Portland, as compared to Gresham.

Who cares?

The environment we inhabit is very fragile. Pollution affects the environment very negatively; active community members, students and policy makers can all work to prevent the negative effects of pollution.

Portland is more industrialized compared to Gresham. In Portland there are more highways and factories and people which all cause pollution. Gresham is less populated than Portland and will likely yield the results we predicted in our hypothesis.
We collected soil samples and tested for phosphorous, nitrogen, pH and potassium levels. At each site we observed plant diversity by counting different plants within our plots and analyzed the plant diversity with the Simpson’s Diversity Index. We chose sites that were less maintained to gather more accurate data. We chose to compare Portland and Gresham because the students from Rosemary Anderson go to school in these two areas.

**What did we learn?**

- How to test for plant diversity using the Simpson’s Diversity Index
- How to use soil testing kits
- Chemicals in soil that may be affected by pollution.
- Teamwork
- Communication
- There is no statistically significant difference in the nutrient levels or the plant diversity in Portland and Gresham.

**Mean Nutrient Concentrations**

<table>
<thead>
<tr>
<th></th>
<th>Smith Bybee</th>
<th>Springwater Corridor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphorous</td>
<td>20.833</td>
<td>8.33</td>
</tr>
<tr>
<td>Nitrogen</td>
<td>7.5</td>
<td>10</td>
</tr>
<tr>
<td>Potassium</td>
<td></td>
<td>86.667</td>
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<tr>
<td></td>
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<td>57.504</td>
</tr>
</tbody>
</table>

**Further Exploration:**

- Test other cities in Oregon
- Test water quality
- Test air quality
- Test more places in Portland and Gresham
- Take more samples at each site

**Resources:**


[http://www.countrysideinfo.co.uk/simpsons.htm](http://www.countrysideinfo.co.uk/simpsons.htm)