

How do aquatic plant species and abiotic factors differ in Van Courtland Park's artificial wetlands from natural wetlands in Black Rock Forest?

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INTRODUCTION

- Outside of New York City, natural wetlands have survived in Black Rock Forest.
- Some wetlands still exist within the city limits, such as those remaining in Van Courtland Park like Jerome Wetland.
- We will assess plant-life data from both parks to determine if the urban environment around Jerome wetland and natural environment around the Black Rock Forest wetland have a significant effect on the wetland conditions and survival of neighbouring plant life.

QUESTIONS & HYPOTHESIS

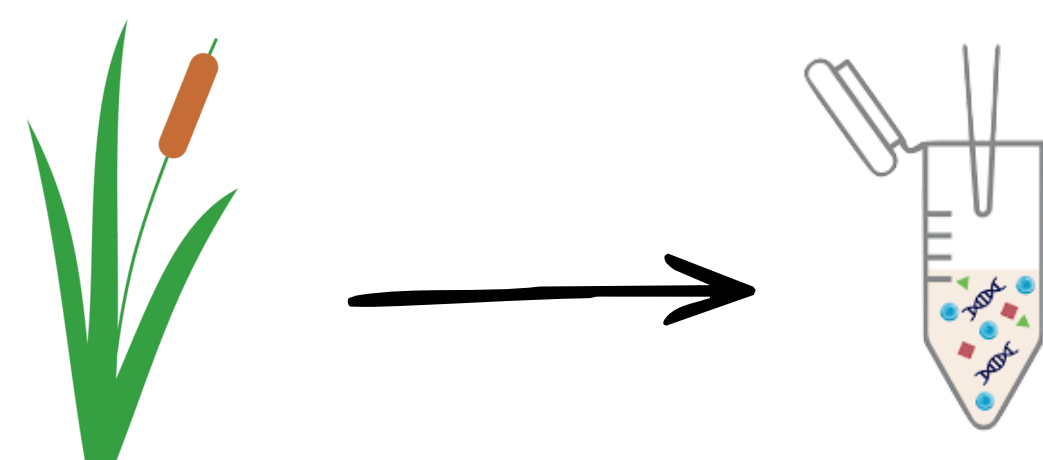
- Are the plant species in wetlands in Van Courtland Park and Black Rock Forest different?
- How is soil in Van Courtland different from Black Rock?

We hypothesized more neutral pH and exemplary conductivity readings (160-580 $\mu\text{S}/\text{cm}$) from the wetland in Black Rock Forest. We also expect there to be fewer invasive species in Black Rock Forest wetlands and more wetland species as a whole.

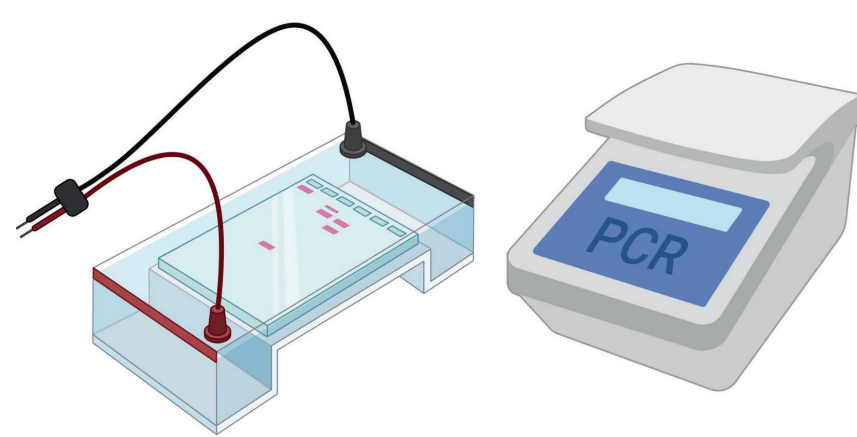
METHODS



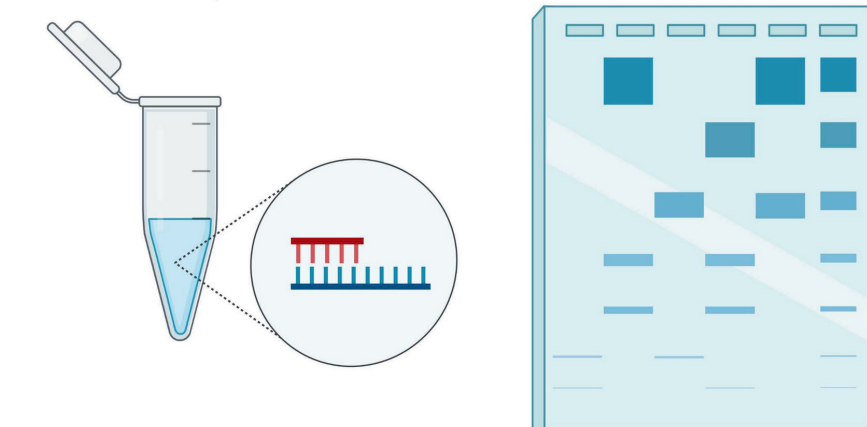
- We used a soil testing probe to take readings of pH, while also collecting plant samples (15 for each location)



- We then extracted the DNA from plants in both sites.



- The DNA was then ran through PCR and gel electrophoresis before being put in the BLAST database for species identification.



RESULTS

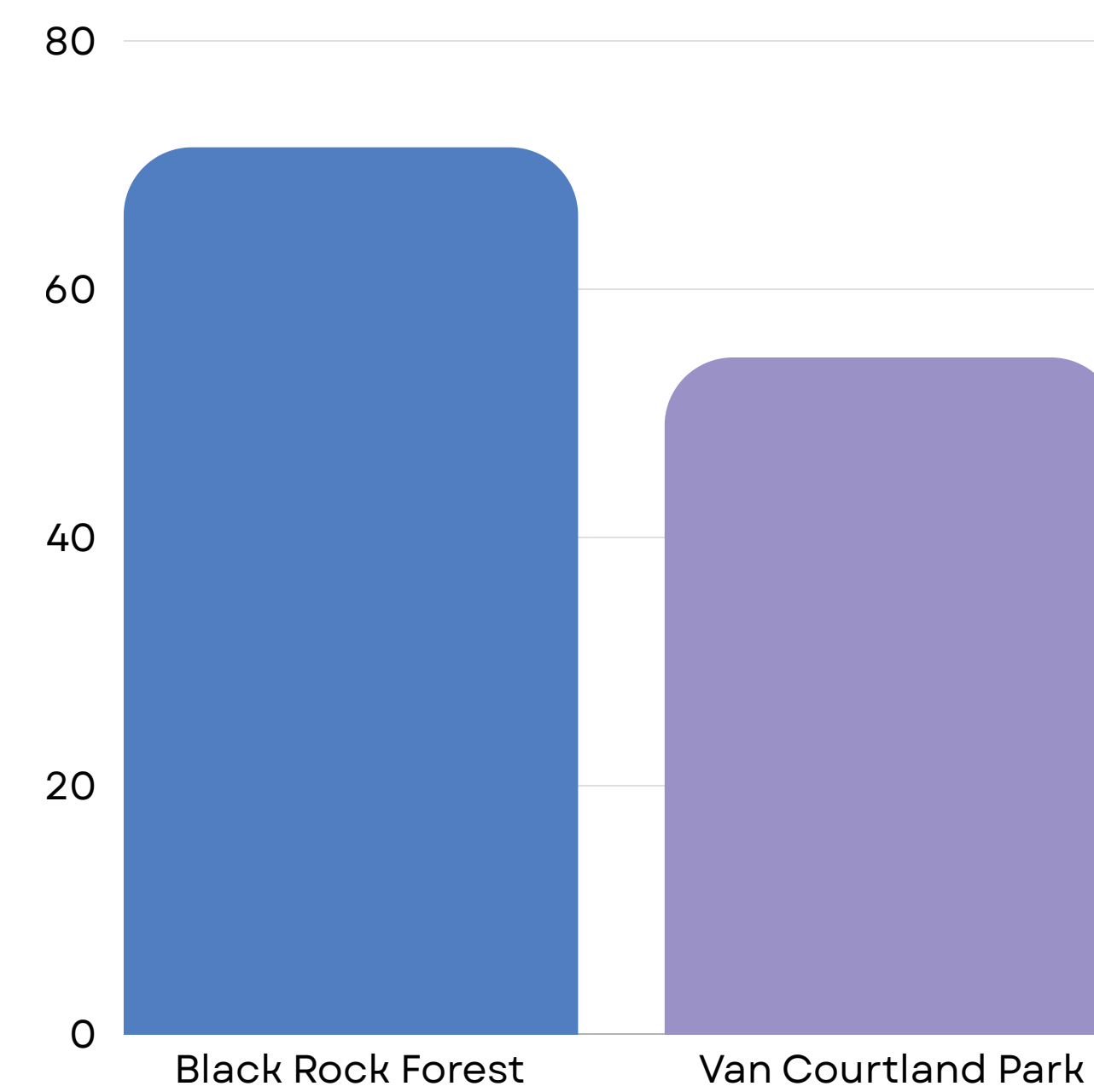


Figure 1. Bar graph showing % wetland species in Black Rock Forest compared to Van Courtland Park. N=11 for Black Rock Forest, N=10 for Van Courtland Park

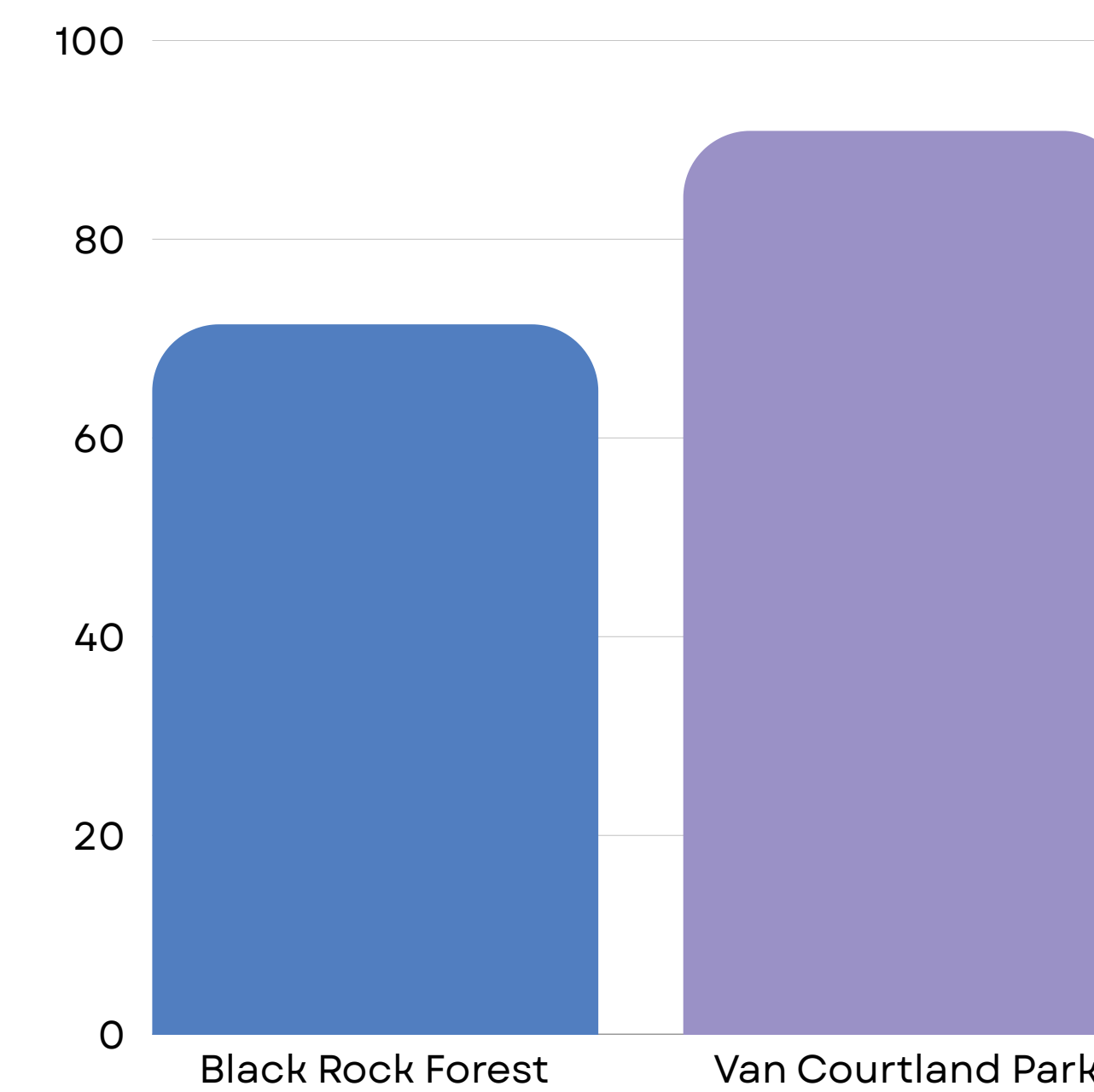


Figure 2. Bar graph showing the average percentage of invasive species in Black Rock Forest compared to Van Courtland Park. N=11 for BRF, N=10 for VC

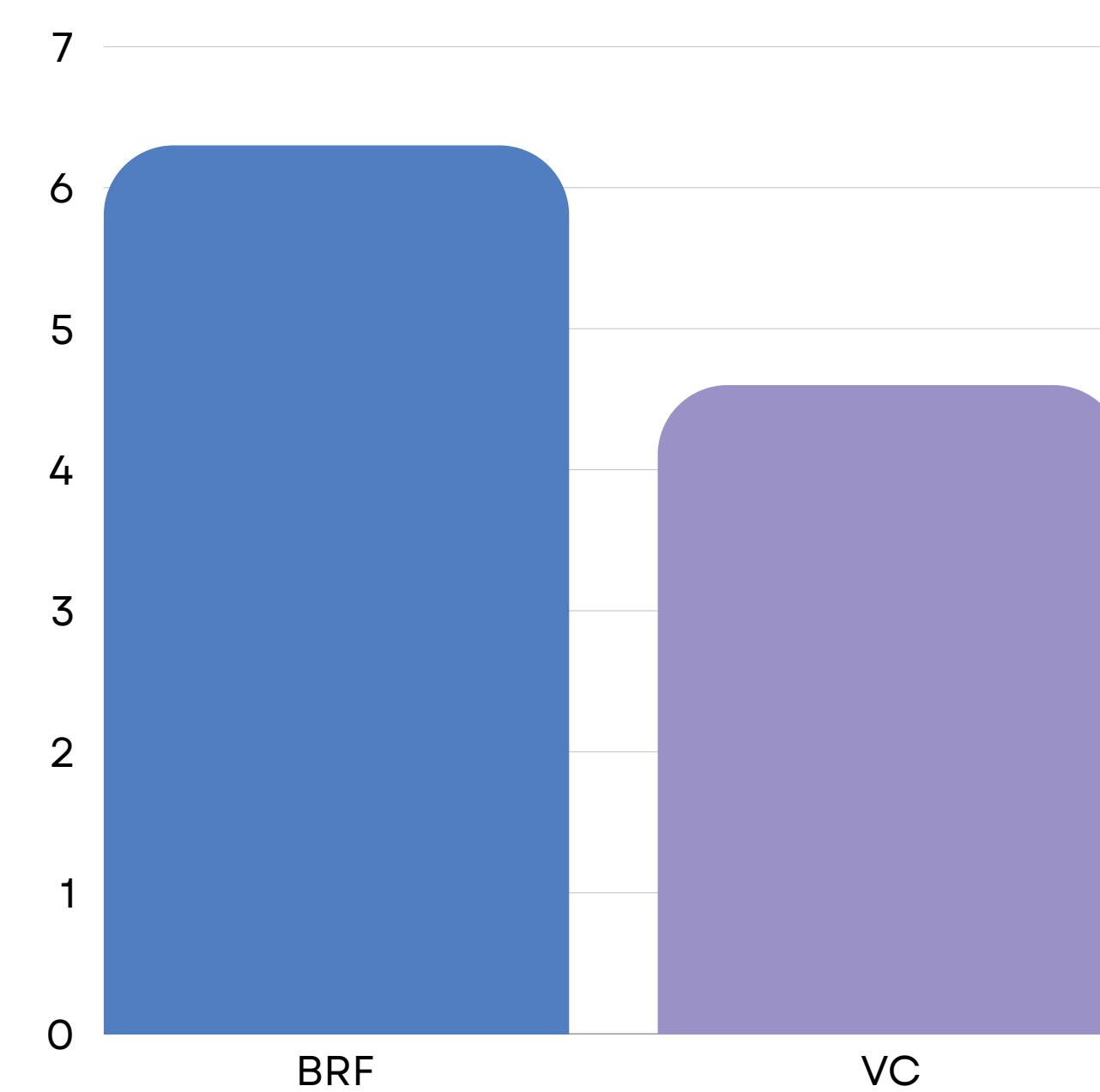


Figure 3. Bar graph showing the average soil pH in Black Rock Forest compared to Van Courtland park. N=9 for BRF, N=5 for VC

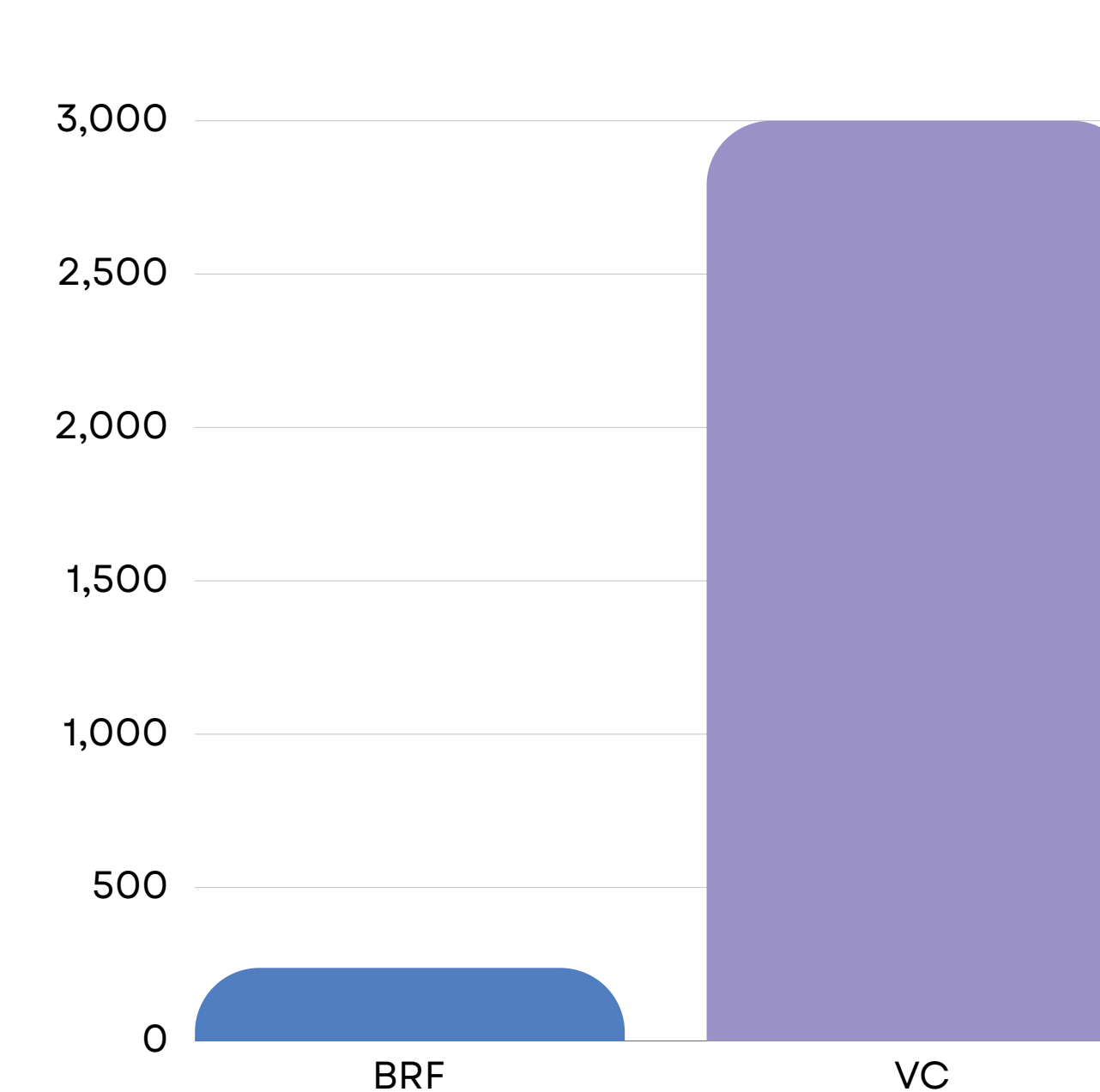


Figure 4. Bar graph showing the average soil conductivity ($\mu\text{S}/\text{cm}$) in Black Rock Forest compared to Van Courtland park. N=9 for BRF, N=5 for VC

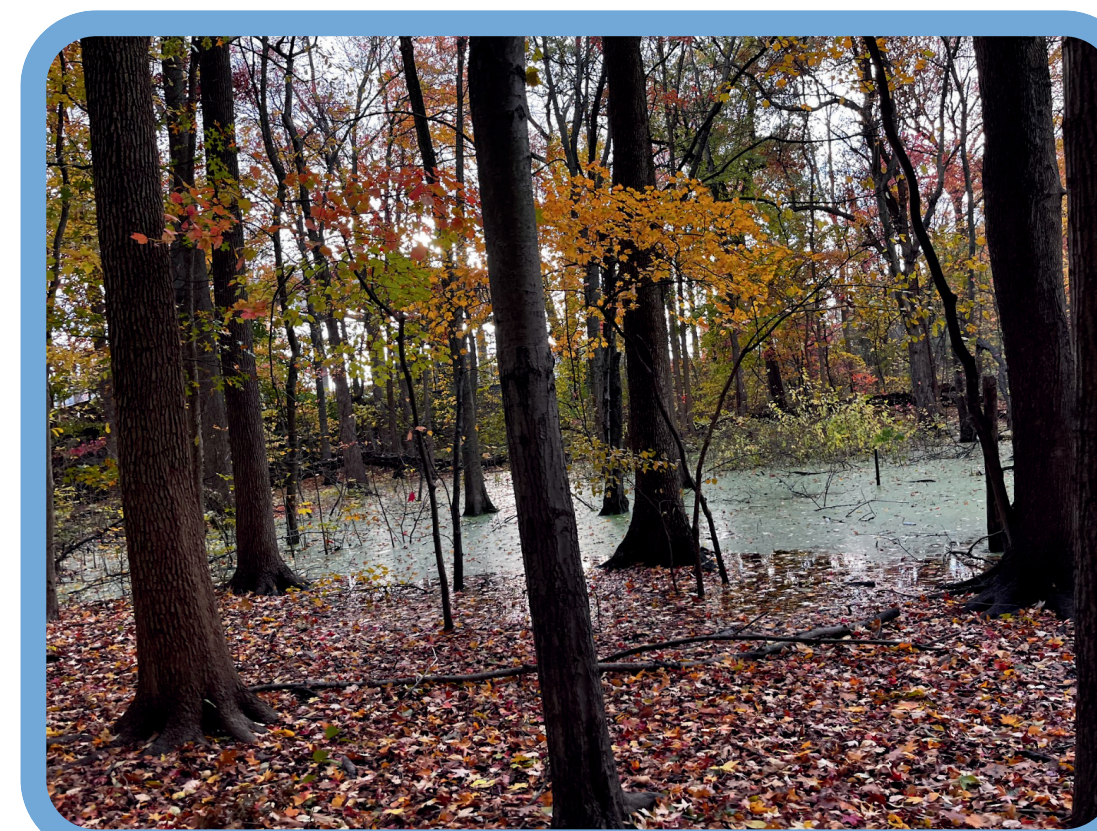


Figure 5. Jerome wetland in Van Courtland Park.



LITERATURE CITED

DISCUSSION

- Our results largely supported our hypothesis, showing significant differences in all averages
 - Despite better numbers than Van Courtland, Black Rock Forest still had imperfect invasive and wetland species statistics (**Figures 1 & 2**)
- BRF's pH was almost neutral (6.3), meaning that the chemical environment is balanced for plant and animal life. VC's pH is much lower (4.6) indicating acidic conditions, restricts biodiversity, disrupts aquatic animal reproduction, and can make heavy metals more toxic. (**Figure 3**)
- VC also had more invasive species and less native wetland species, revealing that its conditions in an urban environment are not as fit for typical wetland species (**Figures 1 & 2**)
- VC has much higher conductivity, which correlates with reduced biodiversity and impaired ecosystem health (**Figure 4**)
- In BRF, we collected samples from many different areas in the forest. In VC, however, we collected samples from only one wetland, which poses a possible limitation for the accuracy of their comparison

FURTHER RESEARCH

- Similar experiments in different locations throughout New York City and beyond
- Research different environmental markers like water quality (turbidity, dissolved oxygen, etc.)
- What can we do (as civilians or as scientists) to improve conditions for urban wetlands?

ACKNOWLEDGMENTS

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