 Baltimore Data Jam: Soil Composition Metadata

The Baltimore Ecosystem Study, BES, is a Long Term Ecological Study funded by the National Science Foundation. Their goal is to conduct long term research at ecological sites in Baltimore City and the surrounding areas. They broaden the idea of ecology to not only focus on the natural world, but include the people and the cities they live in, to better understand their role in the environment.

* **Dataset Variables**
  + Site: House designation or name of Baltimore Ecosystem Study forested reference plot
  + REP#: Used to distinguish between multiple measurements at a single Site
  + Depth: Depth interval from which the soil was collected. Soil in a given depth interval was homogenized prior to analyses.
  + N\_Perc: Percent nitrogen of the mineral soil
  + C\_Perc: Percent carbon of the mineral soil
  + C\_N: Carbon to Nitrogen Ratio of the mineral soil
* **Dataset Timeframe**
  + Soil samples were gathered in the summer of 2007 over a one-month period.
* **Data Collection Methods**
  + Total carbon and nitrogen percentages were gathered by flash combustion/oxidation.
* **Information About Sites**
  + Samples were taken from plots in Oregon Ridge Park and Leakin Park.
  + Leakin Park is an urban forest within the Gwynns Falls Watershed. There are two permanent plots in this area.
  + Oregon Ridge is a rural forest located in Baltimore County, north of Baltimore City. There are 4 plots in this area; 2 mid-slope and 2 upper-slope.
* **Contact Person for Dataset**
  + Dr. Peter Groffman, BES Co-Principal Investigator, (845) 677-7600 x128, [groffmanp@caryinstitute.org](mailto:groffmanp@caryinstitute.org)
  + Web information at: <http://www.caryinstitute.org/science-program/our-scientists/dr-peter-m-roffman>
  + Dr. Groffman specializes in soil ecology and water quality. His research focuses on the role of microorganisms in ecosystems, microbial processes, and nutrient cycling within the environment.
* **Background Information**
  + Carbon is stored in the soil as organic material decays and breaks down. Carbon cycles through the soil and the atmosphere are carbon dioxide (CO2). Due to change in land use and increase in development, carbon dioxide is entering the atmosphere and impacting climate change.
  + Nitrogen is related to soil fertility, and is often limited, restricting how large plants can grow. Most fertilizers used in agriculture and on private lawns add nitrogen to the soil, promoting growth. Nitrogen can also be added to the soil through nitrogen deposition, which is considered pollution. Too much nitrogen in the soil can degrade the area and cause a decline in the health of the plants that grow there.
* **Link to Maryland State Curriculum**
  + Grade six
    - Standard 1.0, Topic B, Indicator 1.
    - Standard 6, Topic. B, Indicator 1
  + Grade seven
    - Standard 1.0, Topic B, Indicator 1.
    - Standard 6, Topic A, Indicator 1
  + Grade eight
    - Standard 1.0, Topic B, Indicator 1.
    - Standard 6, Topic B, Indicator 1
* **Inquiry Idea Starters**
  + Are there any differences between the two sites?
  + Are there any differences between the plots within the same site?
* **Additional Resources**
  + <http://www.soils4teachers.org/fertility>
    - Soils 4 Teachers is a resources created by the Soil Science Society of America to aid teachers in their effort to teach their students about soils.
  + <http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051926.pdf>
    - This document was created by the Natural Resources Conservation Service and explains the nitrogen and carbon cycles and how they impact plant life.

Sources

Leakin Park. *The Baltimore Ecosystem Study.* August 8, 2016, <http://www.beslter.org/virtual_tour/Leakin_Park.html>

Oregon Ridge Park. *The Baltimore Ecosystem Study.* August 8, 2016. <http://www.beslter.org/virtual_tour/OregonRidge.html>

Soil Carbon and Nitrogen Dynamics. *Harvard Forest (Harvard University). August 9, 2016.* <http://harvardforest.fas.harvard.edu/major-research-topics/major-research-topics/soil-carbon-and-nitrogen-dynamics>