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**NEON Intern Work Plan**

**Summer 2015**

1. What is the overall objective of your project? Title?

The overall objective of my project is to create a statistical model that can accurately predict root biomass by depth on a large scale. Title: *Pedological and Climatic Factors Explain Root Biomass by Depth at the Continental Scale.*

1. What are the specific products or deliverables for you project?
2. Proficiency in R
3. Improvement of scientific Writing Skills
4. Improvement of statistical analysis skills
5. Learning how to submit articles and papers to Scientific Journals
6. **Weekly Update**: brief list of what you worked on during the week, what you plan on doing for the following week: aim for submitting every Monday, when we have weekly check-in.
7. What key tasks will you need to accomplish, and by when, to complete your project? (List at least five)
8. Review Previous NEON Soil Biomass Posters and Abstracts (May 23rd)
9. Learn R (June 1st)
10. Literature Review (June 3rd)
11. Statistically analyze all soil data (June 13th)
    1. Just some more specific ideas:
    2. Predictor vs. predictor variable plots (scatterplots, box-plots)
    3. Statistical distribution patterns of total root biomass; distribution of root biomass with depth
12. Work at D5 soil pit (June 12th or June 19th).
13. Create flexible factors for statistical model (Continuous throughout project)
    1. Read up on different types of variables:
       1. <http://en.wikipedia.org/wiki/Confoundin>g
       2. <http://en.wikipedia.org/wiki/Latent_variabl>e
    2. You will also want to explore and report model diagnostics:
       1. http://en.wikipedia.org/wiki/Regression\_diagnostic
14. Test multiple models to find best fit (July 1st)
    1. Informal approach (model diagnostics, model performance): <http://stats.stackexchange.com/questions/79745/how-to-compare-performance-of-multiple-regression-models>
       1. Example: Using performance (mean-squared error) and observed vs. predicted fit (the ‘regression of the regression’)
    2. More formally: <http://en.wikipedia.org/wiki/Model_selectio>n
       1. Using AIC (Akaike’s Information Criterion) – search for “multi-model inference” by Burnham and Anderson
15. Create Poster and Paper Drafts (July 11th)
    1. Paper:
       1. Outline; topic sentences for sections and paragraphs.
       2. Figure List
       3. Table List
       4. Intro
          1. Lit Review
       5. Methods
       6. Results
       7. Discussion
       8. Conclusion
    2. Poster:
16. Which tasks depend on someone or something else? Think about limitations of their availability. Be sure to factor these dependencies in to your time estimates.
17. Getting access to updated soil biomass information (depends on Aly updating soil database)
    1. Meeting with Aly (6/1/2015)
18. Getting precipitation data for *all* sites. You currently only have precip data for a limited number of pits.
19. Any other external data (e.g. vegetation, organic matter, whatever) you are hoping to use will need to be located, munged, and derived. External data = data not generated by NEON.