

Testing compost use in Phoenix city parks: impacts on soil nutrients and biology

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Introduction:

- Composting harnesses the biological decomposition of organic materials that results in nutrient rich topsoil that can be applied to land
- Application of compost products in other regions has shown the following benefits for turf:
 - Decrease soil pH
 - Increase available nitrogen
 - Increase bacterial and fungal colonies in soil
 - Increase organic matter, dissolved organic carbon
 - Green up faster in spring and retain color longer in winter
 - Increase Clip Yield
- As a part of efforts to reach its Reimagine Phoenix waste diversion goal by 2020, the City of Phoenix has developed a composting facility for large scale compost production
- Since the Phoenix parks use turf grass there is the potential that compost can be used on them but first it must be tested to see if it is effective as a soil amendment

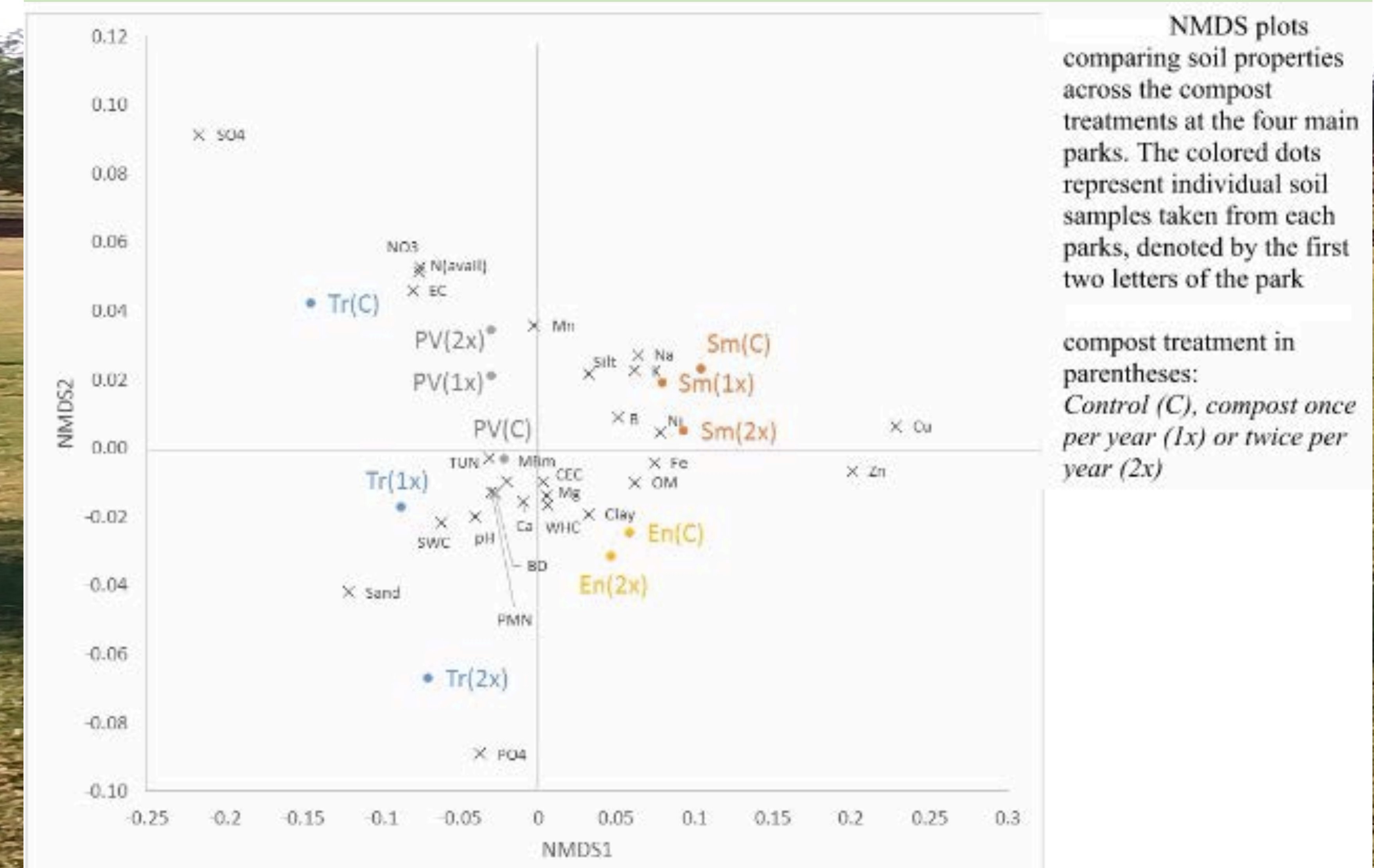


Methods:

- 6 replicate city parks in the Phoenix metropolitan area (Smith, Tramanto, Encanto, Paradise Valley, Cesar Chavez, and Hance)
- Each location has 3 plots that are the subject of testing
- One plot has no compost added (control), another plot has compost added once annually (1x), and the last plot receives compost amendment twice annually (2x)
- 1/4" of compost is applied just after aeration to the designated plots in October and again in March to the 2x plots
- At both times, we take soil samples just prior to application
- For collecting the samples a soil corer is being used to take and bulk 8 samples from each plot in order to account for the differences within plots.
- On each of the samples we measure soil water content (gravimetric oven drying), organic matter (loss on ignition), infiltration of water (using single-ring infiltrometer), and soil invertebrate communities (using heat extractions by Tullgren funnel)
- Samples are also taken to Western Technologies where they are testing using Cd-reduction, the Olsen P test, NH₄OAc and DTPA to measure certain elements in the soil

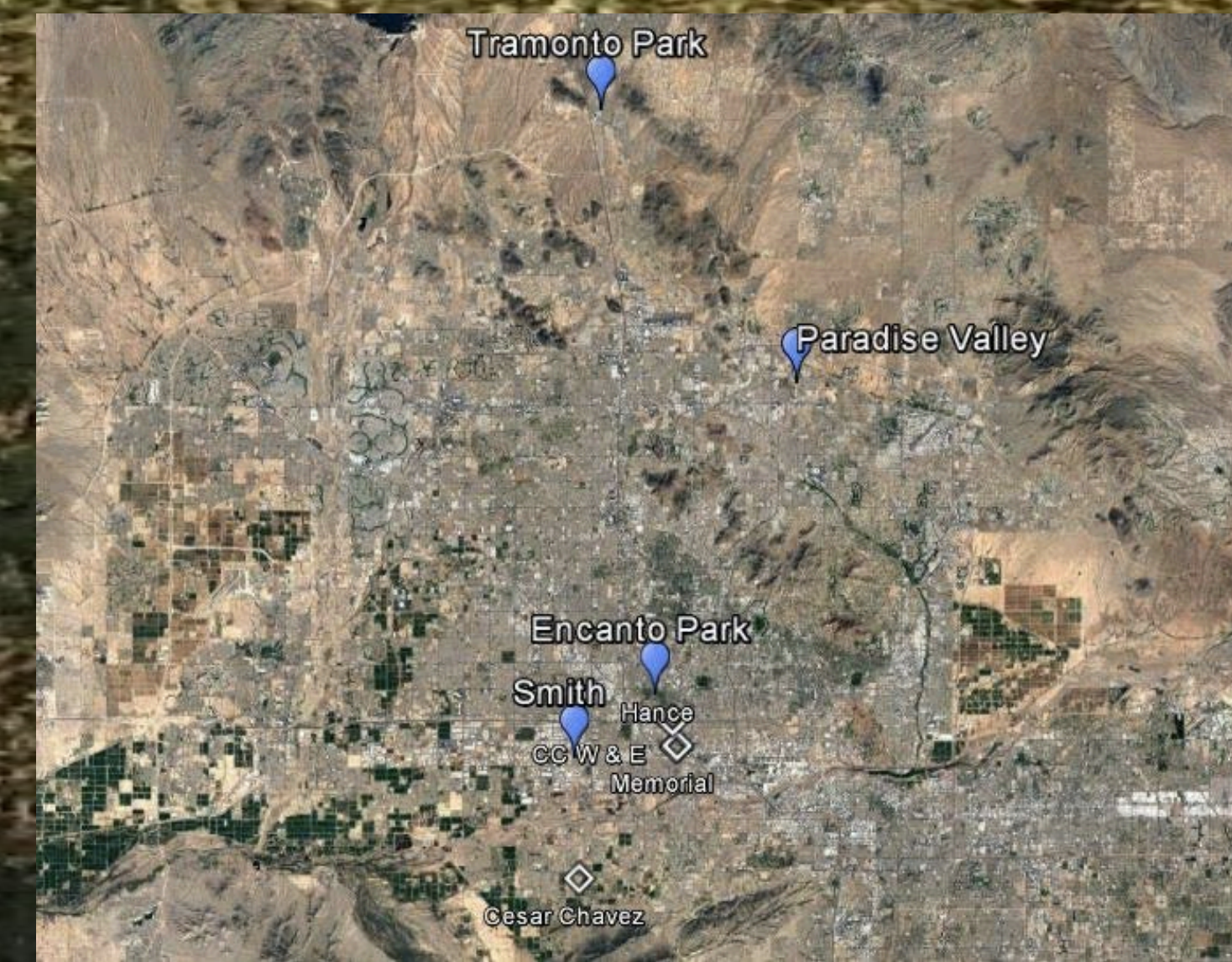
Results:

- Due to the fall 2016 samples still being processed the only data available is from the fall 2015 and spring 2016 results
- Non-metric multidimensional scaling showed that the parks differed from each other in their soil properties
- These differences can be attributed to their composition or texture (i.e. more clay or sand)
- The testing has not yet shown differences between control and test plots



Project Goals:

- Evaluate turf and soil quality improvements as well as water retention and percolation after long-term compost application
- Identify best practices and operational changes required for Parks & Recreation to modify their processes to using compost products instead of existing fertilizer based processes
- Provide an overall benefit to Phoenix residents with greener, more vibrant and sustainable recreation areas
- Demonstrate the benefits of compost in order begin using it in all city parks



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