



ROBBINS PARK

ENVIRONMENTAL EDUCATION CENTER



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Monitoring Workshop Spring 2013
T.U. Master of Landscape Architecture Program
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PHOTO MONITORING PROJECT

Introduction and Description

Project Description

This Field and Applied Monitoring Assignment was designed to help one explore the different aspects of using photography to monitor a site. The assignment required the use 8 specific photograph monitoring techniques to be used at 8 specific location types on a walk through a single site. Photos were to be taken at the same locations using the same techniques on 8 different days spanning the total time frame of the project (February 1- April 19). The specifics of the 8 different points are as follows:

- 1) A 180° panoramic view
- 2) A stereo pair of a feature 30 feet away
- 3) A stereo pair showing foreground, mid ground and far away features
- 4) A ground level view of a feature
- 5) An oblique view of a feature
- 6) A forest canopy view straight up
- 7) A detail of a feature 4 feet from the camera
- 8) A view of a water feature

Other directions given were to use the same camera throughout the entire project, use the same camera settings for each location, avoid shots towards to sun and to find creative ways of marking the spot so that the photograph location can be easily found and repeated.

Site Description

The site chosen for this project was a walk through Robbins Park, which is located on Butler Pike in Ambler, PA. The site was chosen based on its close location to the Temple Ambler campus and the sites familiarity from its use within the capstone restoration project. Robbins Park also has a good variety of features (pond, a creek, wetlands, forests and a meadow) that make it an interesting place to monitor via photography.

Monitoring Description

In order to maintain a consistency between the series of photographs taken for each site a camera stand was created (Figure 1). A camera can be mounted to either face forward or face directly upward (Figures 2 and 3) and will always be at the same height level when the stand is placed in the same location each time. The stand has a metal spike that allows for exact placement and stability. An exact spike position could be created by inserting a metal tube into the ground at the photo position. For this project this was not done, but the placement location was noted using flagging or other none changing features within the landscape, which are noted for each photo series within this document. This stand also allowed for placement along fence posts, which allowed for very easy alignment of camera for a reproducible shot. The camera mount bracket could also be moved along the stand to a limited number of locations, which would allow for some flexibility in the height of the shot, but would also maintain a simple reproducibility. For this project the top most position was used and the stand was flipped for taking a ground a level shot.

The camera used for this project was a Sony Cyber-shot DSC-T70 and in order to keep things simple and reproducible, all of the shots were taken in Auto-mode with no flash and no zoom. If modifications would have been made, they would have been noted and used each time for that location. Some photos were post processed using Adobe Photoshop. The photo stack script was used to auto align all of the pictures. They were then cropped to 4"x6" to ensure that each photo was the same size for easy comparison.

The walking route and the locations of the 8 different photo points are shown in the map on Page 3. The specific type of photo taken at each spot is noted by the type of dot used to show its placement on the map. Photos were taken every Wednesday between 9 and 11am starting February 6th and ending April 17th. The week of March 13th was skipped because of a vacation during the spring break session. A total of 10 photo sessions were done, but because of lack of change in the early part of the monitoring, the missed day during spring break and the assignments requirement of having only 8 sessions; the following 8 days during 2013 were chosen to showcase the monitoring for this report.

February 6, February 20, March 6, March 20, March 27, April 3, April 10 and April 17

These dates were chosen to have a biweekly monitoring during the first half of the project and then switching to a weekly monitoring during the second half. Having a weekly monitoring during the second half was more beneficial because more changes are taking place as the weather begins to warm during the spring season. (All of the photos exist in digital form and will be made available at [www.http://keithdouglass.wordpress.com/](http://keithdouglass.wordpress.com/)) To show the relationship between the weather and the timing of the photographs a plot was made showing the high and low daily temperatures along with the daily precipitation data and is graphed on Page 4. Comparing weather changes to changes seen in photographs could be a good way to document how vegetation growth changes based on temperature and precipitation when compared over many seasons and years.

Report Description

This report is organized by first orienting the reader with the locations of the photo points and the weather patterns associated with the timings of the photographs and then taking them through the walk route by showcasing the images taken during the course of the project. Each location site page has a bit of information to put the images and context and then is followed by a series of the photo with the dates that they were taken. Single photos of the stereo pair series are shown within this document to highlight the change over time and the pair of photos are attached with an envelope as 4"x6" printouts for viewing under the stereoscope.



Figure 1: Camera stand



Figure 2: Camera mount (horizontal)

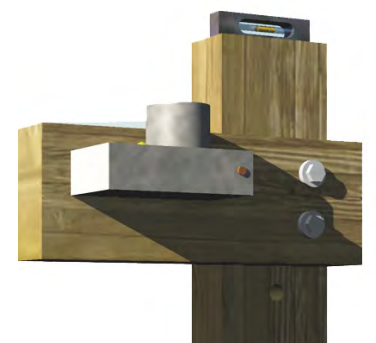


Figure 3: Camera mount (vertical)






Photo Location Map



Legend

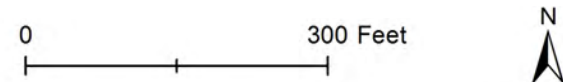
-  Park Boundary
-  Roads
-  Waterways

Photo Points

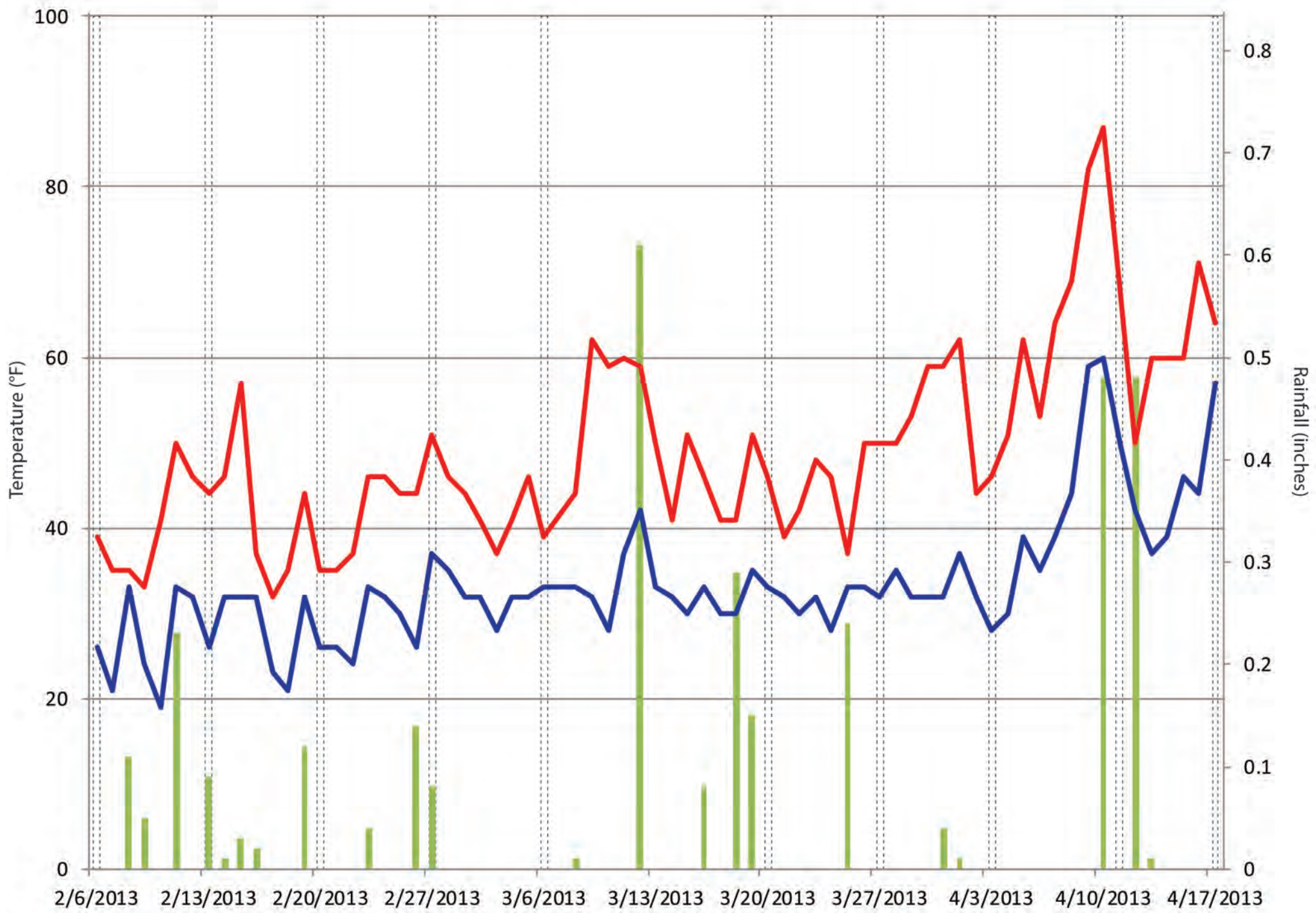
-  180° Panoramic
-  Single Shot
-  Canopy Shot
-  Stereo Shots
-  Walking Route

Map Description

This map shows the walking route that was taken in Robbins Park during each photo monitoring visit. Each dot represents a photo point location and the type of dot represents the type of photograph that was taken at that location.



Temperature and Rain Plot



Plot Description

This graph shows a plot of the daily temperature high and low data in °F (Red and Blue/left axis) along with the daily precipitation totals in inches (Green/right axis). The black dotted lines show the days that photographs were taken. When monitoring vegetation growth the weather is an important variable, so having this data to go along with other data may be very helpful, especially if comparing photographs from many different years. Some changes that may be seen could be very weather dependent and should be examined as part of the whole monitoring package of data.

Photo Point #1

Ground Level View

Photo Description

This series of photos were taken at ground level within a wet area of Robbins Park. The hope was to document the changes in both the water level and the lower level herbaceous plant material in the wet area. Some changes in water levels can be seen in the photos and the growth of *Ranunculus ficaria*, which actually begins to block the shot in the last shot. When choosing a photo monitoring location, the future growth of vegetation must be considered in to order to avoid the shot being blocked at a later time.



Photo Procedure

This photo series was taken at six inches from the ground by turning the camera stand upside-down and mounting the camera on the underside. A log was used for consistent placement. The log was marked with orange flagging so that it could be easily found.

Camera GPS Coordinates

N 40° 10' 15.4"

W 75° 12' 7.9"



February 6, 2013



February 20, 2013



March 6, 2013



March 20, 2013



March 27, 2013



April 2, 2013



April 10, 2013



April 17, 2013

Photo Point #2

Water Feature

Photo Description

This series of photos were taken at the pond in Robbins Park. A photo series like this would be very useful in documenting vegetation growth along the edge of the pond as well as the algae growth on the surface. The algae growth is very apparent in this photo series and would be great to do this type of monitoring if a reed bed system was installed to try and clean up the water. Comparing algae growth from pre and post reed bed installation could show well it worked at removing excess nutrients from the pond system.



Photo Procedure

This photo series was taken by placing the camera stand up against the fence post and having the top of stand level with the top of the fence post as shown in the image to the left. Using the fence along with the camera stand allowed for easy alignment of the shot.

Camera GPS Coordinates

N 40° 10' 20.8"

W 75° 12' 2.5"



February 6, 2013



February 20, 2013



March 6, 2013



March 20, 2013



March 27, 2013



April 2, 2013



April 10, 2013



April 17, 2013

Photo Point #3

Oblique View

Photo Description

This series of photos were taken from an elevated walkway and is looking down on Rose Valley Creek at a 45° angle. This type of shot gives a good view of the creek and would allow for documentation of the changes in water level, bank erosion and vegetation growth. This type of shot would be great if doing stream restoration in order to show before and after shots, which could highlight the many benefits of stream restoration. These shots do show some changes in water level, which could be compared to the weather data to show how the rainfall amounts might change the creek water levels.



Photo Procedure

This photo series was taken by placing the photo stand between the horizontal rails of the fencing and locking the metal spike behind the bottom rail. The side of the stand was placed against the vertical fence post. This gave the shot a nice downward angle and also provided some additional height in order to get a wider shot of the area.

Camera GPS Coordinates

N 40° 10' 17.3"
W 75° 12' 14.5"



February 6, 2013



February 20, 2013



March 6, 2013



March 20, 2013



March 27, 2013



April 2, 2013



April 10, 2013



April 17, 2013

Photo Point #4

Stereo Showing Foreground

Photo Description

This series of photos are the left photo of a stereo pair set which are included in the attached envelope for viewing under the stereoscope. This purpose of this shot was to show how well stereo photos work when trying to photograph a scene with features both close and far away. These photos typically help to give depth to a photo (forest in this case), but sometime items that are in the foreground, might disrupt the effectiveness of the stereo.



Photo Procedure

This photo series was taken by centering the shot on a center of a beech tree and taken two shots about 2 feet apart parallel to the object. In this case a log with metal rail posts was used to place the camera stand. The camera stand was moved along the long placing the stand along the two rail supports and each shot used the same center point. The stereo pairs are labeled with a series number and R or L to signify left or right image.

Camera GPS Coordinates

N 40° 10' 11.9"
W 75° 12' 18.8"



1L
February 6, 2013



3L
February 20, 2013



5L
March 6, 2013



6L
March 20, 2013



7L
March 27, 2013



8L
April 2, 2013



9L
April 10, 2013



10L
April 17, 2013

Photo Point #5 Tree Canopy

Photo Description

This series of photos would be great to document how much coverage a tree canopy has over a period of time. In this case not much change at all is documented because of the time frame of the photo series. If this was done over the entire growing season, the change in leaf coverage could be documented. These types of photos would be very useful if a restoration project requires a specific canopy closure percentage in order to call the project a success. This monitoring would take many years, but would be very useful documentation to have



Photo Procedure

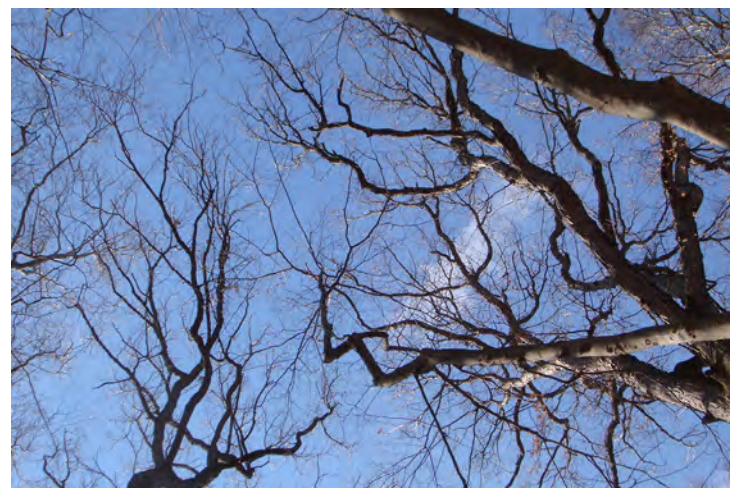
This photo series was taken by mounting the camera on the camera stand so that it was pointing straight up. The camera stand was then placed along a fence post to ensure the same location was chosen each time.

Camera GPS Coordinates

N 40° 10' 9.2"
W 75° 12' 17.3"



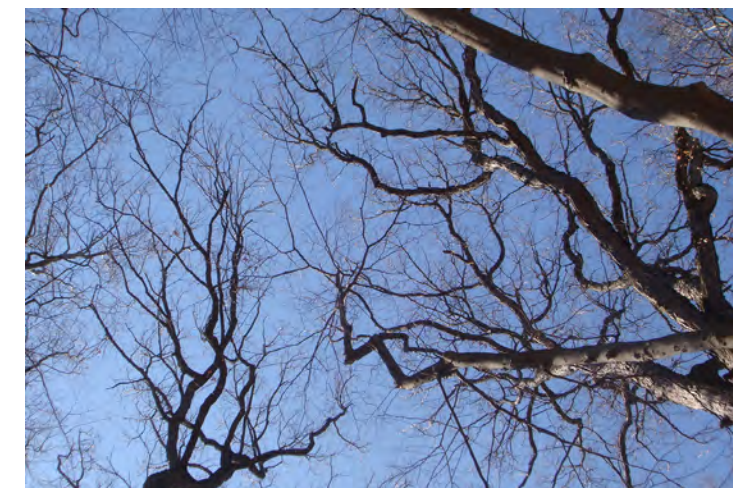
February 6, 2013



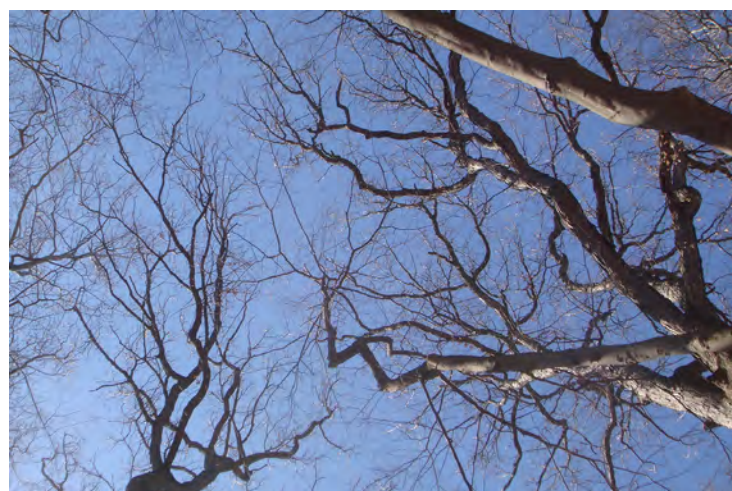
February 20, 2013



March 6, 2013



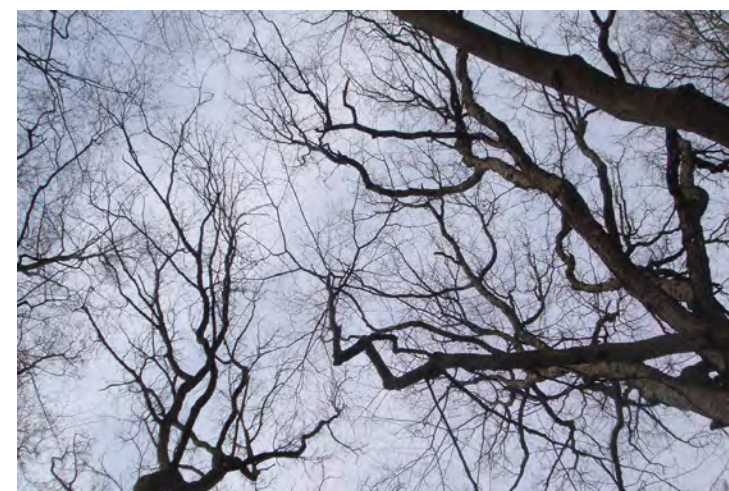
March 20, 2013



March 27, 2013



April 2, 2013



April 10, 2013



April 17, 2013

Photo Point #6

Stereo From 30 Feet Away

Photo Description

This series of photos are the left photo of a stereo pair set which are included in the attached envelope for viewing under the stereoscope. These photos were taken of an eroded stream bank and would be great to use as before, during and after streambank restoration was done on a site. Having them as a stereo pair would help to show the depth of the bank and give a better perspective of the location.



Photo Procedure

This photo series was taken by centering the shot on the center of a down tree in the distance. The placement of the photos were done by using a dead tree log and placing the stand at specific branch nubs along the log. The stereo pairs are labeled with a series number and R or L to signify left or right image.

Camera GPS Coordinates

N 40° 10' 11.4"
W 75° 12' 20.2"



1L
February 6, 2013



3L
February 20, 2013



5L
March 6, 2013



6L
March 20, 2013



7L
March 27, 2013



8L
April 2, 2013



9L
April 10, 2013



10L
April 17, 2013

Photo Point #7

Detail View 4 Feet From Camera

Photo Description

This series of photos documents the growth of skunk cabbage near the wetland seep area within Robbins Park. This type of photo could help to monitor and document the phenology and growth habits of different herbaceous species. In this case the skunk cabbage was the focus of the study. The use of a scale ruler within the image frame would help to document growth rates.



Photo Procedure

This photo was taken 4 feet away from a sprouting skunk cabbage. The photo spot was marked with a stake and orange flagging and a log was used to brace the photo stand, which connected with the log at the mid point of the stand, while maintaining a 4' distance from the base of the skunk cabbage in front of the green moss patch.

Camera GPS Coordinates

N 40° 10' 12.3"

W 75° 12' 22.5"



February 6, 2013



February 20, 2013



March 6, 2013



March 20, 2013



March 27, 2013



April 2, 2013



April 10, 2013



April 17, 2013

Photo Point #8

180° Panoramic View of Wetland

Photo Description

This series of photos are taken of the wetland seep in the central part of Robbins Park. Taken these wide panoramic photos allows one to monitor a large area in a consistent manner. In this case the changing water levels of the wetland areas, as well as the vegetation growth can be monitored very effectively using these photographs.



Photo Procedure

This series of photos are taken as 180° panoramic by combining 8 pictures that are taken so that at least 1/3 of each photo overlaps the previous. Start by placing the camera stand in the nook of the tree as shown to the left and then pivot the camera on the securing bolt. Start by having the camera turned completely to right side and then take a single picture. Now turn the camera while looking through the viewfinder and stop when 2/3rds of the viewfinder is new image. Continue this until the camera has made a full 180° turn to the other side. Post-processing of the images will combine them into a single image.

Camera GPS Coordinates

N 40° 10' 12.4"

W 75° 12' 23.4"



February 6, 2013



February 20, 2013

Photo Point #8
180° Panoramic View of Wetland



February 27, 2013



March 6, 2013



March 20, 2013

Photo Point #8
180° Panoramic View of Wetland



April 3, 2013



April 10, 2013



April 17, 2013