Archaeological Monitoring Addendum
Phase 1A Archaeological Documentary Study

Rutgers Slip

Between Cherry and South Streets
New York, New York

Prepared for:
Lower Manhattan Development Corporation
One Liberty Plaza, 20th Floor
New York, NY 10006

Prepared by:
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June 2012

Management Summary

SHPO Project Review Number:	06PR06649
LPC Project Review Number:	HUD/106-M
Involved Agencies:	New York City Department of Parks and Recreation Lower Manhattan Development Corporation
Phase of Survey:	Archaeological Monitoring
Project Location:	Rutgers Slip between Cherry and South Streets
Minor Civil Division:	06101: Manhattan
County:	New York County
Location Information:	
Survey Area:	Approximately 6 feet by 6 feet
USGS 7.5 Minute Quadrangle Map:	Brooklyn
Report Author:	Diane Dallal, RPA Jason B. Smith
Date of Report:	June 2012

Section 1: Introduction

A. INTRODUCTION AND PROJECT BACKGROUND

In May 2009, AKRF, Inc. prepared a Phase 1A Archaeological Documentary Study that focused on the area formerly known as Rutgers Slip (AKRF, Inc. 2009; 06PR06649/HUD106-M). The archaeological Area of Potential Effect (APE) for this proposed project included the streetbed of Rutgers Street, between Cherry and South Streets (**Figure 2** of the Phase 1A report). As part of the proposed project, new crosswalks would be constructed across Rutgers Slip along the southern side of Cherry Street and the northern side of South Street. The eastern and western curbs of Rutgers Slip would be repaved and new trees would be planted. New catch basins and storm sewers would be constructed at the intersection of Rutgers Slip and South Street to replace existing street drains (**Figure 1**). The new storm sewers would be connected to existing manholes. In other locations throughout the project site, manholes would be relocated, benches would be installed, and other improvements made to improve access to the East River via Rutgers Slip. The excavation necessary to complete the proposed project was expected to be approximately 1 to 2 feet throughout the majority of the site but it was possible it would extend as deep as 4 to 5 feet in certain locations. Excavation was expected to be deepest for the installation of the new storm sewers and catch basins and for the excavation of tree pits.

The Phase 1A report concluded that the project site was composed of landfill and landfill retaining structures, that these features do not appear to have been disturbed by the installation of utilities at varying depths and that because the elevation of the streetbed has not changed significantly since the late 19th century, landfill deposits and landfill retaining structures may be present at relatively shallow depths where utility disturbance is minimal. The Phase 1A report recommended archaeological monitoring for those areas where excavation for the proposed project will exceed 2 feet below the ground surface. The New York Office of Parks, Recreation, and Historic Preservation (NYOPRHP) and the New York Landmarks Preservation Commission (NYLPC) agreed with the conclusion. The Phase 1A should be consulted for additional information.

The planned excavation of the storm drains occurred in April 2011 and possible landfill retaining structures were observed. AKRF Archaeologists, in consultation with NYOPRHP and NYLPC (personal communication, April 6, 2011, conducted archaeological monitoring during excavation and documented and sampled the landfill structures. The present addendum to the 1A provides the results and conclusions of that monitoring effort.

Section 2: Results & Analysis

A. RESULTS OF MONITORING

In April 2011, workmen excavating the new catch basin at the northwest corner of Rutgers Slip and South Street uncovered a timber approximately 6 feet below ground surface in the south wall. The contractor covered the pit with metal plates pending investigation by an AKRF archaeologist. The archaeologist visited the site the next morning. Measurements indicated that the pit was 7 feet deep in the center and 6 feet on each side. The exposed timber was partially covered by water when the steel plates were removed. The contractor installed a pump and the timber was examined. The exposed timber was approximately 3 feet long, 15 inches wide and extended into the trench walls to the north and south (**Photographs 11** and **12**).

A second timber was exposed in the southeast corner of the unit, along South Street at about 8 feet below ground surface. This second timber was 12 inches in diameter by 39 inches long, including the shredded end which was likely damaged by the excavating equipment. The timber extended north to south. Cobbles were noted along the east side of the catch basin at this time (**Photograph 13**). The contractor cut out a section of the second timber which was approximately 15.5 inches in width and 45.5 inches long (**Photographs 14** and **15**). A third course of timber, probably a tie back, was situated on top of the second course of timber. It measured 12 inches by 5 inches by 53 inches and extended all the way across the trench in a north-south direction. Cobbles were present to the southwest of the timber.

The contractor continued excavating the three courses of timber throughout the day. The archaeologist noted that jagged rocks made up approximately 80 percent of the fill while soils consisting of loose dark grey silts mixed with lighter brown sandy silt made up the rest. Few artifacts were present; however a leather shoe, a green bottle base, and some clear bottle glass were recovered at approximately 8.5 feet below ground surface.

Using a backhoe, the contractor cut out a section of the third course, a large square timber, approximately 14 inches by 14.5 inches in size (**Photograph 16**). A fourth course of timber was present beneath the removed third course.

Later in the month of April 2011, the contractor notified AKRF that excavation would take place for a catch basin located on the northeastern corner of Rutgers Place at the corner of South Street, directly opposite the first catch basin. No wood or artifacts were present in this unit.

B. ANALYSIS

The timbers in the catch basin at the northwestern corner of Rutgers Slip and South Street were identified as pitch pine and white pine by the Tree-ring Laboratory of the Lamont-Doherty Earth Observatory at Columbia University (Leland 2012; **Appendix B**). Attempts to date the timbers through dendrochronological analysis were unsuccessful; however it has been determined that the tree from which the pitch pine timber was taken was about 60 years old at the time of harvest. Pitch pine and white pine are native tree species to New York. These trees grow in a

range from Maine south along the Appalachian Mountains to northern Georgia. Pitch pine is found mainly east of the Appalachian Mountains while white pine can be found as far west as Minnesota. Attempts to identify the specific location of the trees at the time of harvest have also been unsuccessful (Ibid).

A total of 14 artifacts were recovered during archaeological monitoring (**Appendix A**). All artifacts were recovered from the catch basin at the northwest corner of Rutgers Place and South Street which contained the timbers. The artifacts included ceramics (7), glass (4), leather shoe heel/sole (1), coal (1), and coral (1). The coral recovered is Elkhorn coral which is found only in the Caribbean. Coral is often found during archaeological excavations of New York City's landfill sites and was likely used as ballast in a ship's hold.

Unfortunately neither the dendrochronological analysis nor the artifact assemblage provides a credible date for the construction of this landfill structure or for the landfill. One sherd of underglaze polychrome hand painted, sprig decorated whiteware provides a TPQ of 1835, suggesting that the area was filled sometime after that date. At this time, historic maps provide the best evidence for dating. The maps indicate that Rutgers Slip had been filled in to South Street by the early 1850s.

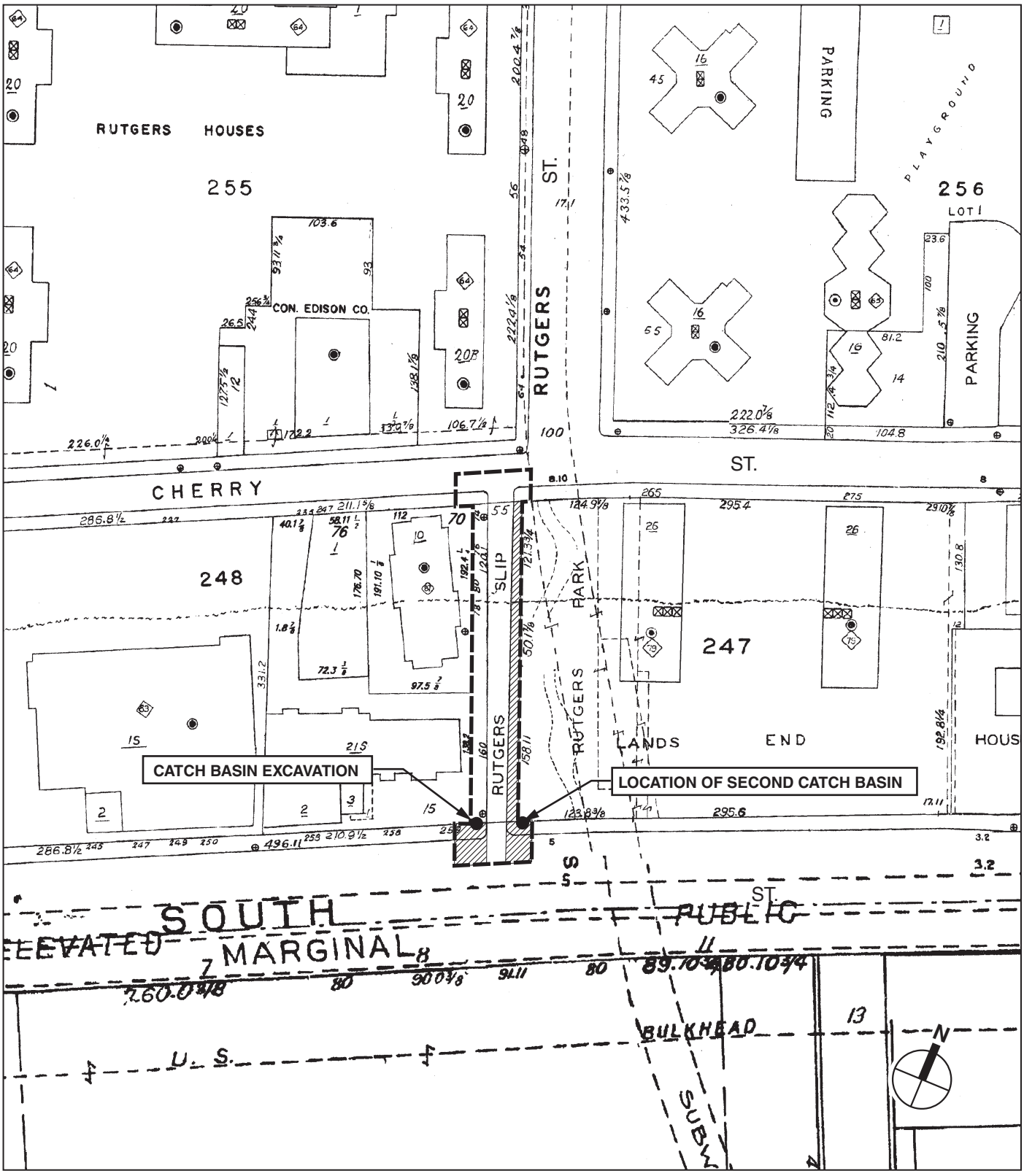
Section 3: Conclusions and Recommendations

The archaeological monitoring resulted in two conclusions. The small portion of a landfill structure identified during monitoring and the artifacts recovered do not appear to possess sufficient research value or significance to warrant a determination of State/National Register eligibility. The landfill structure could not be tightly dated and not enough of the feature was exposed to determine its function or details of its construction. The artifacts are typical of those found in landfill and also are not significant.

However, the presence of intact landfilling structures at the corner of Rutgers Slip and South Street supports the conclusion that remains are present and in situ below the pavement of Rutgers Slip, the observed structure extends further to the north and south, and has not been disturbed by utility placement. This is in concurrence with the Phase 1A report. The Phase 1A report concluded that the project site was composed of landfill and landfill retaining structures, that these features do not appear to have been disturbed by the installation of utilities at varying depths and that because the elevation of the streetbed has not changed significantly since the late 19th century, landfill deposits and landfill retaining structures may be present at relatively shallow depths where utility disturbance is minimal. The archaeological monitoring supports this conclusion.

Future work involving ground disturbance in the sensitive areas of Rutgers Slip should be monitored to document the landfill retaining structures that are present.

Figures and Photographs



Project Site

Areas of Proposed testing based on anticipated project excavation of more than 2 feet

0 200 FEET

SCALE

Location of Catch Basins

Figure 1

Excavation at Rutgers & South Street, facing south **9**

Facing north along Rutgers from South Street **10**

Remains at ~4ft depth facing west **11**

Detail of mud covered squared timber **12**

Disturbed timber and cobbles, facing north **13**

Removal of a timber from the second course **14**

Timber from second course removed **15**

Another removed timber **16**

Appendix A

Appendix A
Artifact Catalog

Unit	Group	Class	Function	Material	Object/ Part	Form	Ware/ Typology	Count	Percent Complete	Production Date(s)	Comments	Source
8.0-8.5 bgs North of timbers	Fauna	Non-Food Fauna/Flora	Unknown	Coral			Elkhorn	2			Found in the Carribean (pieces mend)	
8.0-8.5 bgs North of timbers	Medical	Glass	Pharmaceutical	Common Glass	Base/body	Vial		1	0-25%			
8.0-8.5 bgs North of timbers	Fuel	Non-Food Fauna/Flora	Other (See Comments)	Coal				1				
8.0-8.5 bgs North of timbers	Household	Ceramic	Unknown	Coarse Earthenware	Body	Unknown	Redware	1	0-25%		Waterworn	
8.0-8.5 bgs North of timbers	Household	Ceramic	Unknown	Stoneware	Base	Unknown	Brown salt glazed	1	0-25%			
8.0-8.5 bgs North of timbers	Household	Ceramic	Food Prep & Service	Refined Earthenware	Rim/marley	Plate	Whiteware, undecorated	1	0-25%	1820-+		
8.0-8.5 bgs North of timbers	Household	Ceramic	Food Prep & Service	Refined Earthenware	Rim/body	Bowl	Whiteware, blue tip	1	0-25%	1820-+		
8.0-8.5 bgs North of timbers	Household	Ceramic	Food Prep & Service	Refined Earthenware	Rim/body	Plate	Whiteware, underglaze polychrome, handpainted, sprig decorated	1	0-25%	1835-1870		
8.5-9.0 bgs North of timbers	Personal	Non-Food Fauna/Flora	Other (See Comments)	Leather	Heel/sole	Shoe		1	26-50%			
8.5-9.0 bgs North of timbers	Household	Glass	Unknown	Common Glass	Body		Green	2	0-25%			
8.5-9.0 bgs North of timbers	Household	Glass	Unknown	Common Glass	Base/body	Unknown	Dark Green	1	26-50%		Narrow wine bottle?	
8.5-9.0 bgs North of timbers	Household	Ceramic	Unknown	Stoneware	Body	Unknown	Brown salt glazed	1	0-25%			
8.5-9.0 bgs North of timbers	Household	Ceramic	Unknown	Refined Earthenware	Base	Unknown	Unknown	1	0-25%		Waterworn	

Appendix B

Tree-ring Analysis of Two Samples from Rutgers Slip, NYC

Cari Leland
Analysis completed at the Tree-ring Laboratory of
Lamont-Doherty Earth Observatory, Columbia University
April 2012

Samples: *P. rigida* (left) and *P. strobus* (right)

Introduction:

A request to date timber samples from the retaining wall of a landfill structure near Rutgers Slip, New York City, was given in September of 2011 by Diane Dallal from AKRF. Two timber samples were provided, including one cross-section of white pine (*P. strobus*) and a sample of pitch pine (*P. rigida*). In order to estimate when the retaining wall structure was constructed, dendrochronological analysis was applied to the two samples to establish the year(s) in which the timbers were originally cut.

Dendrochronological analysis of timber samples have been valuable for dating historical structures since the early 1900s. Andrew E. Douglass, who pioneered the field of dendrochronology, recognized relationships between climate and tree growth and used crossdating methods to determine absolute calendar dates for individual tree growth-rings (Douglass, 1920; Stokes and Smiley, 1968; Fritts, 1976). These crossdating methods were also applied to archaeological work to determine exact dates when timber samples were cut for construction of historical landmarks. Some of the early most examples of dating historical structures with tree-ring techniques include the dating of pueblo structures in the American Southwest (Douglass 1921; Robinson, 1976). Tree-ring analysis continues to be an important tool for dating historical materials.

Analysis:

Standard techniques were used to prepare the samples for dendrochronological analysis (Stokes and Smiley, 1968). First, both samples were sanded with progressively finer sandpaper in order to identify individual growth rings. The growth rings were measured on at least two radii for each sample with a Velmex measuring system to a precision of ±0.001 mm. The quality control program, COFECHA (Holmes, 1983), was first used to compare the radii within a sample to verify internal crossdating (i.e. to ensure matching of ring-width patterns in different sections of the sample). The radii were combined and a single time series for each sample was produced using the program ARSTAN (Cook, 1985; Cook and Krusic, 2011). The two samples were statistically compared against multiple other independent *P. strobus* and *P. rigida* chronologies from the greater NYC region with the program COFECHA.

Results and Conclusions:

a. P. rigida sample

The *P. rigida* sample, given the code RS1, contained 59 full growth rings and the two measured radii crossdated well with one another (Fig. 1), with an interseries correlation of 0.856. The RS1 time series was compared to several *P. rigida* chronologies from New York and surrounding states, however, we were not able to successfully date the sample. RS1 had relatively few growth years, so it was not possible to determine whether the sample matched any of the regional 'master' chronologies with sufficient statistical confidence.

b. P. strobus sample

The *P. strobus* sample (RS2) had a total of 187 visible growth rings, and was therefore more promising than the *P. rigida* sample for successful dating. Three different radii from RS2 crossdated well internally with a series intercorrelation of 0.567 (Fig. 2). Though we tried to

avoid growth distortions in selecting radii for analysis, some 'noisiness' was still present. Combining the three radii into a single time series for the sample helped reduce the effects of distortions in individual radii.

RS2 was compared against a *P. strobus* master chronology developed primarily from other archaeological material from New York City (data provided by William Edward Wright) (Fig. 3). The dating results for RS2 are found in Table 1. The inner ring for the sample is likely 1599 and *the outer ring date is likely 1785*. The Spearman Rank correlation coefficient (0.32), which describes the level of association between the master NYC chronology and RS2, is significant ($p<0.001$), but not particularly strong. The t-statistic measures the probability of the correlation coefficient to occur by chance; the t-statistic for RS2 versus the NYC master chronology is 4.5 (n=182), which suggests that the correlation between the two series likely did not occur by chance. Though the dating results presented here are statistically significant, the correlation between the two series is not very strong. The results, therefore, can be interpreted such that the year of the outermost ring (i.e. year in which the timber was cut) is *likely* 1785. Further, the edge of the longest radius in the sample was in a highly degraded condition, therefore it's possible that some of the outermost rings eroded away. Additional samples might help improve the statistical confidence of dating results. Dendroarchaeological dating often requires multiple samples (i.e. high replication) for conclusive results.

Table 1: *Final results for the dendrochronological analysis of a cross-section from Rutgers Slip, NYC.* Waney refers to the condition of the outermost part of the sample. "-BE" indicates that bark is not present; [1]. Correlation refers to the robust, non-parametric Spearman's Rank Correlation Coefficient between the sample and the NYC master chronology[2].

ID	Species	Inner Ring	Outer Ring	Waney[1]	Correlation[2]	T-stat
RS2	*P. strobus*	1599	1785	-BE	0.32	4.5

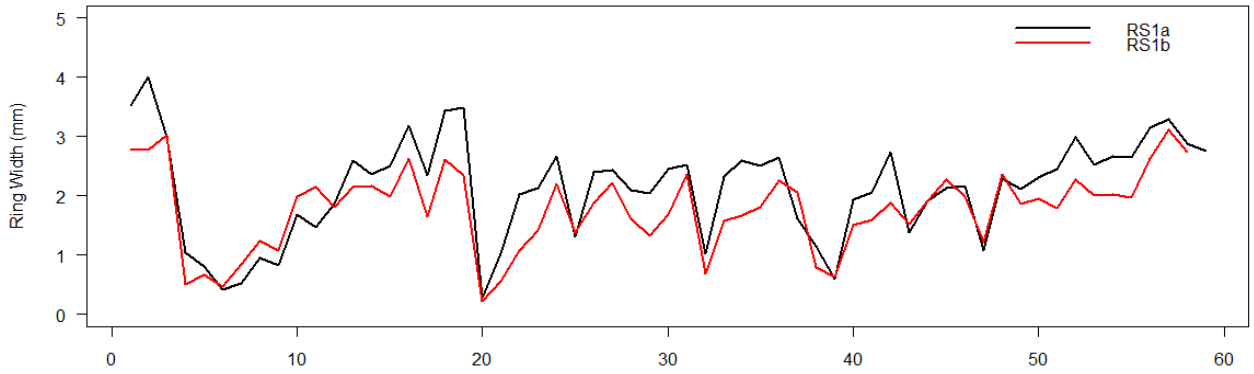


Figure 1 (above): Two measured radii (RS1a and RS1b) from the *P. rigida* sample, which illustrate strong crossdating within the sample. Because this sample was not successfully dated, the x-axis values (0-60) do not represent particular years.

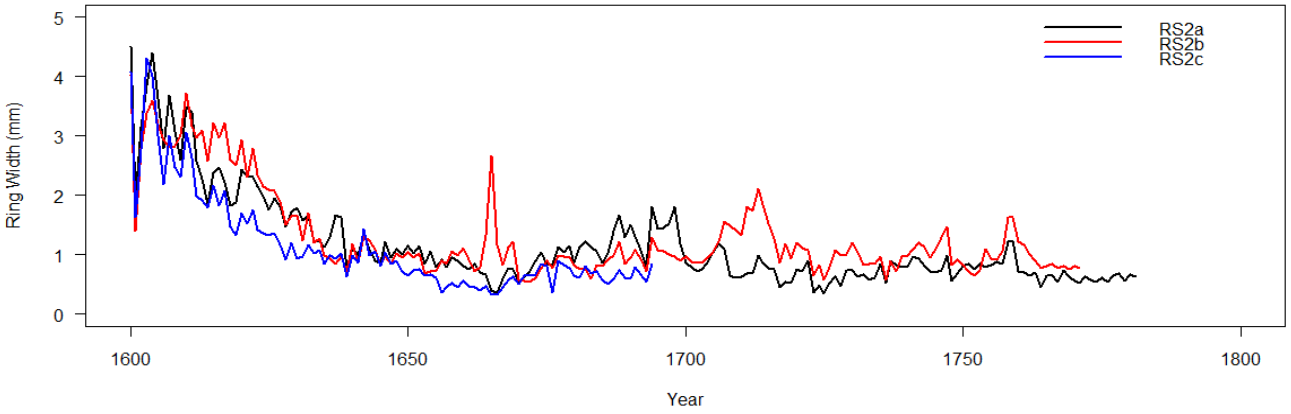


Figure 2 (above): Three measured radii (RS2a, RS2b, and RS2c) from the *P. strobus* sample. Despite some noisiness in individual series, this figure illustrates successful crossdating within the sample.

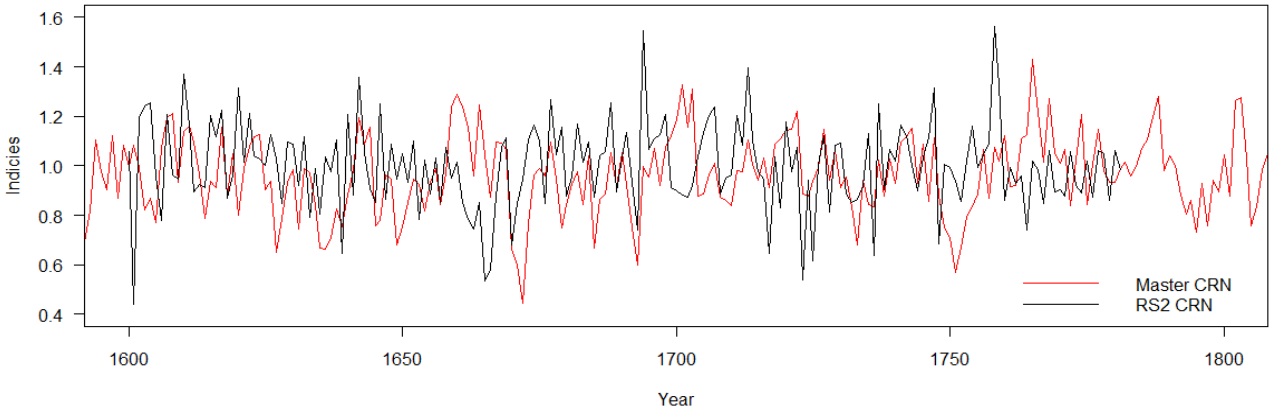


Figure 3 (above): The *P. strobus* sample (dark blue) compared against the NYC master chronology (red) through time.

References:

Cook, E.R.,1985. *A time-series analysis approach to tree-ring standardization*. PhD dissertation, The University of Arizona Press, Tucson, 171 pp.

Cook, E. R., Krusic, P.J., 2011. Software. *Tree Ring Laboratory of Lamont-Doherty Earth Observatory*. http://www.ldeo.columbia.edu/tree-ring-laboratory/resources/software (Accessed July 10, 2011).

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