Super Fun Superfund: Polluted Protection Along the Gowanus Canal

Jessica Ty Miller
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SUPER FUN SUPERFUND: POLLUTED PROTECTION ALONG THE GOWANUS CANAL

by

Jessica Ty Miller

A dissertation submitted to the Graduate Faculty in Earth and Environmental Sciences in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

2015
This manuscript has been read and accepted for the Graduate Faculty in Earth and Environmental Sciences in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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Cindi Katz

Date
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Deborah Cowen

Juliana Maantay
Supervisory Committee

THE CITY UNIVERSITY OF NEW YORK
Abstract

SUPER FUN SUPERFUND: URBAN WATERFRONT REDEVELOPMENT, GENTRIFICATION, AND DISPLACEMENT ON THE GOWANUS CANAL OF BROOKLYN, NEW YORK

by
Jessica Miller

Advisor: Professor Kenneth Gould

This research reflects on the patterns of uneven development occurring in the Gowanus Canal in Brooklyn, social and physical changes taking place there, and how these elements of the canal relate to the changing purpose of urban waterways. Gowanus has mimicked the development of New York City since the 1600’s through several phases: city settlement and development, abandonment, and redevelopment. The redevelopment phase in Gowanus couples environmental clean up with gentrification and displacement. Using an urban political ecology framework, this research attempts to answer the following questions: Why, after many years of pollution, is the area being cleaned up? Will this clean up process create new opportunities for gentrification in the area, or will it merely encourage gentrification that might already be taking place in the area? Who will benefit and who will be harmed through this process? To explore these questions, I conducted semi-structured interviews, shorter door-to-door interviews, transect walks and participant observation, archival research, and geographic information systems analysis. Through this project, I found that displacement is indeed occurring in the area as it gentrifies, with the potential for this process to increase as the clean up plans move forward. Further, it posits that environmental gentrification is the result of gentrification already taking place: establishing the ability for an area to be “worth” cleaning up. This research establishes the need for a time-lapsed
approach to displacement research and builds on a growing literature on environmental
gentrification.
Acknowledgements:

I would like to take this space to thank everyone who supported me through this process, including Deb Cowen, Cindi Katz, Yahuda Klein, Melissa Checker, Juliana Maantay, Ken Gould, the late Neil Smith, and my friends and family. Special thanks to Corey Parson.
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Chapter 1: Introduction

The Gowanus Canal is a 1.8 mile-long waterway located in western Brooklyn, north of Gowanus Bay and a United States Environmental Protection Agency designated Estuary of National Significance (USEPA, 2011). The canal is located in a low elevation area between the neighborhoods of Park Slope, Gowanus, Carroll Gardens, Cobble Hill and Red Hook and was once a sprawling tidal creek surrounded by extensive wetlands that emptied into New York Bay. See Figure 1 below for the location of Gowanus within New York City.

Figure 1: Reference Map of Gowanus Neighborhood with Land Uses

Gowanus Neighborhood Map

In the mid 1800’s, the crowded Manhattan waterfront led real estate developers to fill, mold and transform the Brooklyn waterfront to suit their industrial and transportation needs,
resulting in contaminated land and water. Industrial decline and abandonment beginning in the 1960’s resulted in brownfields \(^1\) with enduring contamination and abandoned land along the canal. In response to the historic neglect and contamination in the area, residents of the surrounding neighborhoods have advocated for the clean up of the canal for many years. Aided by the federal Superfund program, clean up of the area is now imminent. Why, after many years of pollution, is the area being cleaned up? Will this clean up process create new opportunities for gentrification in the area, or will it merely encourage gentrification that might already be taking place in the area? Who will benefit from this cleaned space?

The title of this dissertation, *Superfun Superfund: Polluted Protection Along the Gowanus Canal*, refers to a dichotomy I found between two groups of people in Gowanus. “Superfun Superfund” refers to street art on the 9\(^{th}\) Street bridge, which represents a younger group of new residents, who are in mostly in favor of the canal’s clean up through the Superfund program. “Polluted protection” is a term that I have applied to understand why some people in the area do not want the canal to be cleaned up: fearing that clean up will eventually lead to changes in the neighborhood that residents do not approve of, or of residential and business displacement.

**A Brief History of the Canal:**

In 1636, Native Americans sold their lands in Gowanus to Dutch settlers, but continued to live and fish on the land. In 1679, a Dutch visitor described Native Americans who lived along the waterway, sustaining themselves on foot-long oysters caught at the mouth of Gowanus Bay. The Dutch later forced Native Americans off the land and caught, pickled and transported the

---

\(^1\) Brownfields, as defined by the US Environmental Protection Agency, are “real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a
oysters from this area out of the port in what was then known as New Amsterdam: the first export from Brooklyn (Reiss, 2000).

Following the Revolutionary War, New York developed into the nation’s largest and most active port and by the mid 18th century, the settlers controlled the land in Gowanus. Developers displaced squatters living near the remaining swampland to create new docks and housing, and used the newly filled waterfront land to build massive docks to accommodate the overflow of ships that could not dock in lower Manhattan (Osman, 2011; Reiss, 2000). In the Dutch tradition of land manipulation, new residents filled wetlands for farming, built bulkheads to hold in the landfill, created tidal powered mills and cut a canal through the wetland to transport dairy products from South Brooklyn to avoid the rough waters surrounding nearby Red Hook.

In the early 1840’s, demand for housing near the sites of the docks increased and real estate developers advertised that the area had “greater if equal attraction for public resort, as a ready, picturesque, healthy and quiet retreat” (Osman, 2011; Reiss, 2000: p. 6). German, Irish and Scandinavian immigrants replaced the Dutch, British, and French and settled in the area to work at the docks and live in the newly constructed neighborhoods. As development occurred and the population grew, the area became known for crime and conflict over space in the neighborhood, and the emergence of “gashouse gangs,” who sought to limit the competition from those seeking work in the docks by attacking arriving sailors (Reiss, 2000).

In 1848, the New York Legislature allotted funds to manipulate Gowanus Creek, widening it and transforming it into a commercial waterway, and further developing the shipping and manufacturing in the area. This transformation led to further waterfront development projects, including the expansion of the Red Hook docks into Erie Basin (completed in 1869),
connecting the Atlantic Docks to the Gowanus and providing space to accommodate more ships (New York State Legislature, 1869; Reiss, 2000).

Developers located manufacturing plants, storage, distribution and shipping facilities along the canal (New York Department of City Planning, 2011). Industrious businessmen developed manufactured gas plants, coal yards, cement and soap manufacturing plants, tanneries, paint and ink factories, and oil refineries (Osman, 2011). The water and land surrounding the canal absorbed many pollutants from these facilities. As the neighborhoods surrounding the canal grew, sewage overflow and surface water runoff also degraded the canal’s water quality, leading some residents to push for filling in the canal in the 1890’s (New York Times, 1893).

The United States Environmental Protection Agency reported that historically, contaminants have been introduced into the land and water of the canal and still remain there, including pesticides, metals, PAH’s (polycyclic aromatic hydrocarbons), PCB’s (polychlorinated biphenyls) and VOC’s (volatile organic compounds). Many of these contaminants are known carcinogens (USEPA, 2011).

In the past several decades, many of the industries have left the area and the activities near the canal have changed character. Some portions of land surrounding the canal are still industrial, but many properties are now used for commercial purposes, vacant or have been repurposed for new uses, including housing, community facilities and waterfront recreation (New York Department of City Planning, 2011 and USEPA, 2011).

To reduce pollutants in the waterway, a flushing tunnel, which extends from Buttermilk Channel in New York Harbor, underneath Degraw Street and to the Northern end of the canal, was built in 1911 (USEPA, 2011). The tunnel flushed less contaminated water from Buttermilk Channel into the canal, spreading pollution from the canal into the New York Harbor until the
1960’s, when it ceased to work due to a mechanical failure (USEPA, 2011). It has been in and out of operation since that time.

A Contested Space

In 2007, New York City suggested that the canal and surroundings should be nominated for the New York State Department of Environmental Conservation Brownfield Opportunity Area program in PlaNYC (City of New York, 2007). This program provides financial support in redeveloping New York communities “to establish effective revitalization strategies that return dormant and blighted parcels into productive, catalytic properties” (Department of State Office of Planning and Development, 2014). Since 2007, the city has worked with developers and other organizations to encourage development in the area.

In early 2009, the United States Environmental Protection Agency (EPA) proposed placing the Gowanus Canal on the National Priorities List (part of the Superfund clean up process). The identification of a site as belonging to the National Priorities List guides the EPA in: 1) determining which sites warrant further investigation to assess the nature and extent of the human health and environmental risks associated with a site; 2) identifying what Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-financed remedial actions may be appropriate; 3) notifying the public of sites EPA believes warrant further investigation; and 4) serving notice to potentially responsible parties that EPA may initiate CERCLA-financed remedial action (USEPA, 2012).

New York City created a counter proposal to clean up the canal and redevelop it quickly with its development interests ready to move in as soon as possible, which met community opposition. The debate between the ‘growth machine’ (Logan and Molotch, 1987), comprised of New York City government and its development interests, and the United States Environmental
Protection Agency delayed the listing until 2010. The EPA investigated the extent and causes of the contamination, identified potentially responsible parties for the clean up costs, and pushed forward with the feasibility study to select a remedy for the contamination found in the canal alone in 2013 (USEPA, 2013). However, city, state and community led efforts to clean up the surrounding areas are ongoing. Vision 2020, New York City’s waterfront plan, includes strategies for using waterfront areas as economic development opportunities. This plan calls for upgrades to the flushing tunnel, designing and constructing storm sewers to reduce sewage overflow into the canal, rezoning and cleaning up of “underutilized” areas near the canal, and restoration of brownfield areas along the canal (New York State Department of State, 2013 and Department of City Planning, 2011[2]). The New York State Brownfield Opportunity Area grant program is considering providing support for economic development in a 100-acre area comprised of five brownfields surrounding Gowanus (Department of State Office of Planning and Development, 2014).

For the last 30 years, aided by federal government programs created under the Comprehensive Environmental Response, Compensation and Liability Act (1980) and the Superfund Amendments and Reauthorization Act (1986), state and local programs have aimed at cleaning up contaminated brownfield sites across the country like the Gowanus Canal. Brownfields are property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant (U.S. Environmental Protection Agency, 2010). These clean up programs have remediated many contaminated sites across the country. Although researchers have assessed these projects by investigating changes in property value and other economic indicators of success after clean up, few of them have catalogued the social impacts of the redevelopment process.
Through visioning in the clean up process, brownfields and formerly industrial waterfronts take a new shape as potential uses for the land shift. As waterfronts, these sites once provided access to water-based transportation and provided an outlet for industrial pollution. Now, they can be used for creating green space and waterfront access, building housing, commercial and office space or creating tourist attractions. However, communities nearby may face challenges as a result of redevelopment, including increased housing costs and displacement pressure. But have these challenges already started to impact neighborhoods surrounding the Gowanus Canal, even though the clean up is far from finished? Does clean up occur only when wealthy or new residents will benefit from it?

Green gentrification is gentrification facilitated by the “creation or restoration of an environmental amenity” (Gould and Lewis, 2012: p. 13). An environmental amenity may be a park, a waterfront or any other type of land use that can be seen as an amenity to developers or people who the new development will attract. Few would argue that the Gowanus Canal is currently an environmental amenity due to the extensive land and water pollution left from its industrial past. The canal has a sordid past concerning environmental quality as it has been dumped in and contaminated, and until somewhat recently, was relatively abandoned. However, the notion of green or environmental gentrification can be explored by using Gowanus as a case study. What is the relationship between neighborhood change and remediation efforts? Have early indicators of gentrification inspired clean up after over a half century of neglect? Has the certainty of clean up encouraged gentrification? Why clean up the Gowanus? Why now? For whom?
**Research Questions:**

Waterfront and brownfield clean up processes are widespread, and yet the social changes that take place as a result of redevelopment and the role that the relationships between community groups, local, state and federal governments play in the redevelopment process are not well understood. An analysis of the impact these programs have in creating neighborhoods on formerly industrial waterfronts is necessary to understand the impact these clean up programs have on urban space and the people who inhabit and shape it. Because researchers have not extensively focused on the social impacts of brownfield redevelopment and green or environmental gentrification is a relatively new form of focused research, Gowanus may allow me to make a contribution to these growing research topics.

To approach this gap in understanding, my research will attempt to answer the following questions: 1) why, after many years of pollution, is the federal, state and city government cleaning up the Gowanus Canal? 2) Who will benefit from this clean up? 3) How has gentrification affected the neighborhoods near the canal up to date? 4) How are residents and other activists influential in the decision making process?, and 5) does green gentrification result from the first stages of existing gentrification combined with the clean up of a polluted area?

**Data Collection and Methods:**

To answer these questions, I propose to: 1) catalog the historic and current activism and decision making surrounding the Gowanus Canal clean up using archival research, interviews, and participant observation, 2) determine the current extent of gentrification and displacement taking place in the neighborhoods surrounding the canal by analyzing demographic, housing price and income level shifts, conducting interviews and transect walks, and 3) apply this understanding to discuss the potential for green gentrification to occur in the area.
I conducted a multi-year (from 2010-2014), mixed method observation and research project to create an account of the changing Gowanus neighborhood. I used multiple methods relying on both qualitative and quantitative data, including participant observation and archival research, GIS analysis, transect walks and semi-structured interviews. Using multiple methods allowed me to create a holistic and varied understanding of different interconnected issues related to changes taking place in Gowanus. I applied this work to discuss the potential for displacement to occur in the area and to explore the process of green gentrification.

**Participant Observation:**

Before doing any fieldwork, I conducted exploratory participant observation by attending public meetings concerning Gowanus planning. I made these observations in an attempt to identify and build relationships that I could employ for my research later on and become familiar with the actors taking part in the project, their views on the issues, and the relationships they have to one another. Being at the meetings also allowed me to piece together how the participants in these meetings were influential in the decision making process.

I attended several meetings, including New York City Community Board 6, the United States Environmental Protection Agency and the Gowanus Community Advisory Group, and New York City Green Infrastructure Plan meetings. Through these discussions, I learned about the proposed projects for the area and how community groups and government agencies negotiate these decisions. The question and answer periods at the end of each meeting were helpful in determining which community groups and individuals were involved in the decision making process, and which community groups did not take part. These meetings also gave me space to introduce myself to community groups and individuals whom I later asked for an individual interview.
Archival Research:

Attending meetings and reading current planning documents gave me an understanding of the current planning process. But in order to develop a historic perspective on the development, abandonment, and redevelopment of the canal, I used archival materials and occasionally relied on secondary data, such as the New York Times or research findings by historians. I used these materials to construct a history of development and planning initiatives in the area and allowed me to see patterns in the social and physical development of the area over time. It also assisted me in addressing why the canal is being cleaned up currently, as opposed to another time.

I used a booklet compiled by the Brooklyn Historical Society (Reiss, 2000) as a starting point to build a history of the area, but used archives to elaborate on this history. I relied on several sources to construct an understanding of the canal’s development, including pre and post European settlement, past projects and planning proposals, visions and perspectives on the canal. I looked for sources from New York City’s Department of City Planning, the City Planning bookstore, the New York Times online archive, the Brooklyn Eagle archive online, the Brooklyn Historical Society online collection, the Brooklyn Collection at the Brooklyn Public Library, the Map Division at the New York Public Library, and The National Museum of the American Indian in New York City. Proteus Gowanus, a non-profit arts and preservation organization, provided their entire archive by allowing me to copy their documents, deeds, photos and news of Gowanus history. These collections provided me with information I needed to construct a local history of Gowanus.

I used the information I obtained through this exercise to compare how the perceptions of the canal have changed through history the motivations for developing and redeveloping the
canal and surrounding area have changed through time. I also used it to construct a timeline (Figure 2 below) of historic and current activities along the canal to reflect widespread trends in historic perceptions of nature and urban development.

Figure 2: Historic Timeline of Gowanus

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1636</td>
<td>First settler land purchase in Gowanus on record</td>
</tr>
<tr>
<td>1643</td>
<td>Governor Kieft Wars</td>
</tr>
<tr>
<td>1661</td>
<td>First dredging occurs to build first tidal mills along Gowanus Creek</td>
</tr>
<tr>
<td>1679</td>
<td>First Brooklyn export: pickled foot long oysters</td>
</tr>
<tr>
<td>1776</td>
<td>Revolutionary War's Battle of Brooklyn took place along the banks of Gowanus Creek</td>
</tr>
</tbody>
</table>

**Settlement, War and Appropriation**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1825</td>
<td>The Erie Canal opened, connecting New York to the Midwest and increasing demand for docks along the waterfront</td>
</tr>
<tr>
<td>1834</td>
<td>Brooklyn becomes a city</td>
</tr>
<tr>
<td>1841</td>
<td>Atlantic Basin built by Daniel Richards in Red Hook</td>
</tr>
<tr>
<td>1847</td>
<td>First published plan for building the canal is completed by Major D.B. Douglass</td>
</tr>
<tr>
<td>1849</td>
<td>New York State Legislature authorized funds to widen Gowanus Creek into an industrial canal</td>
</tr>
<tr>
<td>1853</td>
<td>Construction begins to create the canal</td>
</tr>
<tr>
<td>1857</td>
<td>Erie Basin created by William Beard</td>
</tr>
<tr>
<td>1868</td>
<td>Private landowners along the canal build basins to connect their property to the canal</td>
</tr>
<tr>
<td>1870</td>
<td>Park Slope develops many new homes and sewers that drain into the canal</td>
</tr>
<tr>
<td>1872</td>
<td>Carroll Street Bridge is built.</td>
</tr>
<tr>
<td>1873</td>
<td>The Coignet Stone Company built its headquarters at 3rd Street and 3rd Avenue. Later, this became Edwin Litchfield's (Brooklyn Improvement Company leader) office, where he sold farmland to industrial developers.</td>
</tr>
<tr>
<td>1880</td>
<td>Additions to the sewage system are laid in the area, which ends flooding, but created public response to the stench from raw sewage and industrial waste flowing into the canal.</td>
</tr>
<tr>
<td>1888</td>
<td>Carroll Street Bridge is replaced with a retractable bridge.</td>
</tr>
</tbody>
</table>

**Development**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1903</td>
<td>Irving Bush builds the Bush Terminal Railroad to connect his industrial park.</td>
</tr>
<tr>
<td>1911</td>
<td>The flushing tunnel, a 6,280-foot long, 12-foot wide, brick conduit, was constructed to flush out the canal's polluted water.</td>
</tr>
<tr>
<td>1915</td>
<td>Burns Brothers built 18 coal pockets, which becomes the most shipped material on the canal.</td>
</tr>
<tr>
<td>Year</td>
<td>Event</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
</tr>
<tr>
<td>1920's</td>
<td>The Gowanus was one of the United States' busiest canals. The &quot;Black Hand&quot;, the beginning of the Mafia, settles on Columbia Street nearby.</td>
</tr>
<tr>
<td>1930's</td>
<td>Housing revitalization started to reduce crime related to &quot;wretched housing.&quot; The shantytown that had developed near the bath house was replaced by recreation fields and the Red Hook Houses were built.</td>
</tr>
<tr>
<td>1931</td>
<td>The 9th Street Subway viaduct is built over the canal. At the time, it was the city's tallest railroad bridge.</td>
</tr>
<tr>
<td>1940's</td>
<td>Natural gas reduces the reliance on manufactured gas plants along the canal.</td>
</tr>
<tr>
<td>1945</td>
<td>World War II generated business throughout port industries.</td>
</tr>
</tbody>
</table>

**Production Decline and Abandonment**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950's</td>
<td>New Jersey container ports drew business away from New York.</td>
</tr>
<tr>
<td>1960's-1970's</td>
<td>The former industrial land created a barrier to the waterfront. While Park Slope and Carroll Gardens gentrified, Gowanus became more deserted. Community activists worked with City to for plans to build a sewage treatment facility to prevent sewage from entering the canal. Activists advocate for the canal's clean up.</td>
</tr>
<tr>
<td>1969</td>
<td>The flushing tunnel propeller breaks.</td>
</tr>
</tbody>
</table>

**Reinvestment and Gentrification of Gowanus and Surroundings**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1983</td>
<td>The Department of Environmental Protection created a plan to fix the flushing tunnel in response to a mandate set by a court order to bring water cleanliness to a federal level.</td>
</tr>
<tr>
<td>1995</td>
<td>The Department of Environmental Protection began to fix the flushing tunnel.</td>
</tr>
<tr>
<td>1997</td>
<td>Brooklyn Center for the Urban Environment began conducting tours and holding forums focused on the Gowanus.</td>
</tr>
<tr>
<td>1998</td>
<td>City dredged the canal, pulling out over 2000 tons of contaminated sludge. Mayor Giuliani supported a plan to develop a sports center along the canal.</td>
</tr>
<tr>
<td>1999</td>
<td>The flushing tunnel began working again, after 30 years of inactivity.</td>
</tr>
<tr>
<td>2000</td>
<td>Congresswoman Nydia Val'azquez held a boat cruise press conference on the canal with members of the Army Corps of Engineers, the Department of Environmental Protection and other elected officials to promote a study of the canal.</td>
</tr>
<tr>
<td>2002</td>
<td>The Gowanus Canal Ecosystem Restoration Feasibility Study began.</td>
</tr>
<tr>
<td>2003</td>
<td>Keyspan, a local utility company, which inherited many of the gasification plant sites near the canal began a remediation study focused on the &quot;Public Place&quot; site.</td>
</tr>
<tr>
<td>2004</td>
<td>Gowanus Village development begins and included 350 condos.</td>
</tr>
<tr>
<td>2007</td>
<td>Gowanus Canal Community Development Corporation and Representative Velazquez released a plan for the Gowanus Canal area. The Gowanus Canal Conservancy formed. The New York City Department of City Planning plans rezoning for the Gowanus Canal area.</td>
</tr>
</tbody>
</table>

**Gowanus Clean Up and Development**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>United States Environmental Protection Agency nominates the Gowanus Canal for the National Priority List (known as Superfund status). Public comment period is extended to accommodate community input.</td>
</tr>
<tr>
<td>2010</td>
<td>Gowanus Canal was added to the National Priority List</td>
</tr>
<tr>
<td>2011</td>
<td>Developers backed out of plans to develop new housing along the canal.</td>
</tr>
<tr>
<td>2012</td>
<td>New developers plan new housing for the area.</td>
</tr>
</tbody>
</table>
Transect Walks:

I used the GIS maps in conjunction with transect walks through the neighborhood to devise a plan for conducting door-to-door interviews with residents of the area. By walking through the neighborhood, I saw that the areas east of the canal seemed to be changing very quickly. Walking through the neighborhood many times over the course of 5 years, I observed many new businesses opening, residential and office rehabilitations, new venues, bars, restaurants, art and office space creation and other construction projects taking place in the area.

I walked a specific route through the neighborhood each time, so that I could observe changes taking place on a local scale. I lived in the area, which allowed me to do this often. I walked from Union Street and 3rd Avenue and turned left to see where new businesses were moving in or construction taking place along this business corridor. Then, I walked down the perpendicular streets, through the residential areas of the neighborhood from Union St to 9th Street between Nevins Street and 4th Avenue. See Figure 3 below for a route map of my transect walks.
Figure 3: Transect Walk Route Map

Land Use Type
- Unknown
- 1 and 2 Family Buildings
- Multi-Family Walk-Up Buildings
- Multi-Family Elevator Buildings
- Mixed Residential and Commercial Buildings
- Commercial and Office Buildings
- Industrial and Manufacturing
- Transportation and Utility
- Public Facilities and Institutions
- Open Space and Outdoor Recreation
- Parking Facilities
- Vacant Land
- Walk Route

Compiled By Jessica T. Miller
Data Sources: NYC Department of City Planning
NYC Department of Information and Telecommunication
I used my transect walk observations further by creating exploratory GIS maps of the neighborhood, and more specifically, of the area I saw changing quickly. Comparing what I saw through my walks to spatial representations of the area, I was able to learn about how the area is changing in terms of demographic shifts, housing characteristics and zoning changes taking place. Later, I used this information to determine where I might conduct door-to-door interviews with residents and business owners. These walks also allowed me to see the changes taking place in relation to what the future of the neighborhood looks like and who will benefit from the cleaned canal.

**Geographic Information Systems (GIS) Analysis:**

To create a spatial and visual representation of how gentrification is changing the area, I created a series of maps using a Geographic Information System in ArcGIS. To visually display demographic, housing characteristics and zoning changes taking place in the area, I gathered spatial data from the United States Census Bureau, American Community Survey, New York City Housing and Vacancy Survey, New York City Planning Department and the New York City Department of Information Technology and Telecommunications.

I used US Census Bureau, American Community Survey, and New York City’s Department of Economic Development data to look at housing characteristics in the neighborhood (housing condition, housing prices). The New York City Housing and Vacancy Survey and the PLUTO data set from New York City’s Department of City Planning provided lot level data for property land use and vacancy status. This data allowed me to investigate land use changes over time at the lot level. The New York City Department of Information Technology and Telecommunications provided many data layers, including spatially represented water bodies, streets, and transit routes.
I compared demographic information at a few scales to illustrate that these changes taking place in Gowanus may indicate increased pressure for residents to leave the area. These scales included: census tract, county and city, and when appropriate, state level data. Several census tracts surround the Gowanus Canal, but my study focuses mainly on the area within census tract 119 (on the northeast side of the canal), where many changes are taking place. This tract encompasses much of the eastern side of the Gowanus neighborhood. In the coming years, the Census Bureau is likely to split the tract into several census tracts, reflecting the increased residential population in the area, as zoning restrictions change and the residential population increases. The maps I created have been useful in determining what part of the neighborhood is changing quickly, and therefore, where residents may feel the most pressure to move out.

**Interviews:**

I conducted in-depth semi-structured interviews with activists and community group members, and shorter door-to-door semi-structured interviews with residents in a specific area of the Gowanus neighborhood. I chose to conduct semi-structured interviews because this method allows flexibility in question development. Because I asked questions that allowed me to explore several topics, this flexibility became a necessity as participants brought to light new facets of a problem or issue that I had not explored before. A more structured approach did not provide the flexibility I needed. I used a cluster-sampling frame for the interviews, which involved sampling from a setting where the population I was interested could be found. This sample was not meant to be representative of the entire Gowanus area. I found activists and planning participants by attending community meetings. I found door-to-door participants by walking door-to-door in a select area within the Gowanus neighborhood and attempting to reach someone from every unit.
During my fieldwork, I interviewed two different, but sometimes overlapping groups of people: community activists and participants in the decision-making process, and residents. I found the in-depth interview participants by attending Gowanus planning meetings and through referrals from participants, although these individuals were chosen based on dimensional sampling, which allowed me to interview individuals from groups who represent the diverse interests in Gowanus. I chose the activist participants because they participated in public meetings and, according to their participation in community groups, represented varying perspectives on how to redevelop and clean up Gowanus. These interviews lasted from 30-60 minutes and took place in locations of the participant’s choosing: offices, homes or cafes. Many of the activists and community group members are also residents of the area, but most lived in the already gentrified areas of Park Slope or Carroll Gardens: not in Gowanus. Only one of the activists I spoke to lived in the area directly surrounding the canal that is changing quickly.

I asked interviewees about their role in the clean up and decision-making process, the role of the organization they take part in, and about their personal experiences of how the neighborhood is changing. These discussions allowed me to understand why these groups are interested in the canal and want a specific outcome from the planning process. A list of the questions I asked can be found in Appendix A. I also asked interviewees for leads to people who may have displacement concerns or been displaced near the canal.

In addition to the longer, semi-structured interviews, I completed shorter, door-to-door interviews with residents within a specified area of Gowanus. I chose these participants by knocking on doors in an area near the canal that I predicted the most displacement pressure to be happening. I based these predictions on spatial analysis and on the changes I saw taking place on the transect walks. I then asked these residents about the reasons they chose to live in the area,
what might impact their choice to leave, and how they view the changes taking place in the area. For a list of the door-to-door semi-structured interview questions, see Appendix B. These views offered insight to the extent of current gentrification and displacement in the area surrounding the Gowanus Canal.

**Conclusion:**

After developing this understanding of the area based on archival research, participant observation, interviews, and data analysis, I will be able to discuss the process of brownfield clean up and the relationship it has to displacement and green gentrification in the area. Though the clean up will be ongoing for several years, I anticipate that by conducting research in this area as it changes, I will be able to contribute to the growing understanding of how green gentrification takes place and why it occurs.
Chapter 2: Literature Review

Introduction:

The contested Gowanus is a space produced by many differing interests in housing, greening urban space, and waterfront development. To approach research on how and why this space has been and is currently being produced, I employed several types of literature. First, I will briefly review literature on waterfront redevelopment and urban political ecology and discuss a few examples of other former industrial areas that are being redeveloped currently. Then, I will review relevant theoretical work in urban political ecology. Neil Smith’s production of nature and uneven development provide grounding and a place to found this study. Environmental justice research provides another useful framework from which to analyze Gowanus. Next, I relied on research in brownfield redevelopment, displacement, gentrification, and the growing research concerning green gentrification. Each of these bodies of work point to a gap in understanding: a) brownfield redevelopment literature establishes a need for more socially inclusive assessments of brownfield cleanup programs; b) gentrification literature calls for more research focused on social impacts and displacement as a result of redevelopment and gentrification; and c) a limited amount of literature on environmental or green gentrification suggests the need for a rigorous understanding of how this process may be connected to green policies.

Waterfront Redevelopment:

Greening former industrial areas along waterfronts has become a widespread trend in urban redevelopment over the past 15 to 20 years (See Garven and Berens, 1997; Harnik, 2000; Bradshaw, 2000; Bunster-Ossa, 2001; ICMA. 2002; Burger et al., 2004; Byrne et al., 2007; Loures and Panagopoulos, 2007; Schilling and Logan, 2008; Siikama¨ki and Wernstedt 2008;
Hofmann et al., 2012; De Sousa, 2014). Several researchers across disciplinary boundaries, including urban political ecologists, focus on the transformation of these formerly industrial urban waterfronts. Bunce and Desfor (2007) argued that waterfront transformations lead to new understandings of the production of nature, patterns of social networks and political-economic relations within urban environments. Due to their physical relation to several scales of interest (including local, state, federal, and international), urban waterfronts are an environment that brings together understandings of broader transformations as well as local environmental changes (Bunce and Desfor, 2007). Swyngedouw (2004) illustrated a relationship between local, national, and international levels of government that share the decision-making responsibility in waterfront redevelopment in urban areas. He determines that urban waterways sustain urban life in capitalism by connecting these different levels of scale and urban metabolism, or the flow of resources to and from cities (2004).

In a case study of previously industrial waterfront re-development, Hagerman (2007) argued that even the most ‘progressive’ urban waterfront planning initiatives need to be critically analyzed in order to create better opportunities for more equitable urban spaces. New development on urban waterfronts needs to be re-examined in terms of industrialization, decline and post-industrial economic development as well as social transformations that come from gentrification of previously industrial waterfronts (Hagerman, 2007).

Additional Cases:

Although this is not an exhaustive list of current waterfront redevelopment projects, Newtown Creek, the Williamsburg and northern Staten Island waterfronts, Washington D.C., Portland, and European waterfront “ecodistricts” (Beretta, 2014: Brown, 2014: Seltzer et al, 2010 and 2011), and The New Orleans Urban Water Plan (Fisch, 2014), all have planned new
waterfront areas by employing a combination of “green” and economic development strategies.

Gowanus was the first active superfund in New York City, followed closely by Newtown Creek in northern Brooklyn near Queens, which became a Superfund site in 2010 (Novarro, 2010). These are two of several expensive and complicated clean up projects the EPA has acted on in the past few years around New York and New Jersey waterways (DePalma, 2012). Like Gowanus, Newtown Creek is surrounded by gentrifying neighborhoods and has a similar industrial past. Reoccurring oil spills, pesticides, heavy metals, PCB, volatile organic compounds and other contaminants pollute the waterway (EPA [7], 2014).

The City of New York and the Bloomberg administration were in favor of the EPA designation for Newtown Creek: a major difference in stance on the waterways and their potential for development. In the case of Newtown Creek, the City of New York did not come up with an alternate clean up plan, and left the clean up responsibilities to the EPA. A commissioner for the City Department of Environmental Protection said in a New York Times article, “What’s going to get the job done fastest and more efficiently? In the case of Newtown Creek, we believe the Superfund process is the way to do that” (Novarre, 2010). Similarly, the EPA Superfund program will only be responsible for clean up in the waterway, and not the surrounding contaminated land. The cost for the clean up project is more expensive than Gowanus, but it has been covered in the press significantly less. The remedial investigation is ongoing, and taking much longer to complete than the Gowanus equivalent (EPA [7], 2014).

The extent of contamination that plumes from beneath the surface land in Newtown Creek may be more extensive, and therefore, more challenging to clean up. This limitation may have indicated that the EPA is better equipped to handle the process. Conversely, New York City may not have had developers near Newtown Creek planning huge condo blocks, as in Gowanus.
This limitation to the future use of the area might have prevented the City from getting involved in the clean up process. As in Gowanus, the area is surrounding Newtown has become gentrified (DeSena, 2009). Just north of the Newtown Creek area, the similar Williamsburg waterfront has been rezoned for residential and mixed-use areas. The area was never declared a Superfund site, and the contamination there was cleaned up with private investment funds (Cardwell, 2005). Staten Island’s north waterfront is undergoing a similar process (Checker, 2014).

Washington D.C.’s southwest waterfront (Brown, 2014) and Portland’s South waterfront “ecodistricts” (Seltzer et al, 2010 and 2011) integrate sustainability design concepts into neighborhood level plans in an effort to achieve broader sustainability goals. In several other cities in the United States and abroad, formerly industrial waterfronts are becoming mixed-use, commercial, green space, and housing through infill planning. The term “ecodistrict” has been applied to several other projects taking place in Stockholm, Hamburg, and Copenhagen (Beretta, 2014), and Haiti (Brown and Ward, 2014). With this trend on the rise, it is important to understand how these plans impact neighborhoods. Researchers from diverse fields are investigating various aspects of this process. This review will present an overview of these diverse approaches.

**The Production of Nature and Uneven Development, Urban Political Ecology:**

Critiques of capitalism-driven development, neoliberalization, privatization, and deregulation have been helpful in framing this research project by providing a basis for understanding how systems of decision making impact the social use of space (See Hackworth, 2000; Logan and Molotch, 1987; Smith, 1996, 2002). These critiques gesture towards research that seeks to understand “who governs or rules” and “for what” (Logan and Molotch, 1987: p. 50). And more specifically, critiques and analysis of environmental conditions, inequality, and
perspectives on nature within this context have been helpful in framing this project (See Harvey, 1996; Heynen, 2007; Heynen and Swyngedouw, 2003; Swyngedouw, 1996, 2004, 2010; Sze, 2007).

Neil Smith’s (1984) ‘production of nature’ thesis stated that nature is produced to reflect the political purpose of space. He refuted the notion of a separation between nature and society that capitalism has upheld. Capitalism transformed the world by leaving no stone unturned or “original relation with nature unaltered (1984: p.7)” in order to continue on its path, leading to the domination of natural resources and widespread inequity. This thesis reinvigorated a discussion of the role of nature in capitalism and encouraged many scholars to reimagine their research in a historic, political and material sense. Although this concept is important in reimagining why space is produced and reproduced to create capital accumulation, the on-the-ground methods for creating capital rely upon the pattern of uneven development.

Smith’s notion of the ‘seesawing’ pattern of uneven development (1984: p.199) concluded that development or abandonment of any space follows the path of capital creation. Whether that means suburban or urban development depends on the needs of capitalism. Now that the suburbs are no longer considered amenities to many people, development in former industrial spaces provides opportunities for more people to move into cities. Smith wrote:

“The geographical decentralization of capital in the construction of the suburbs led to the underdevelopment of the inner city. Capital was attracted by the rapid increase in ground rent that accompanied suburban development, and so the inner city with already high ground-rent levels and therefore low rates of return was systematically denied capital. This led to the steady devaluation of entire areas of the inner city, whether obsolete port, commercial, and warehousing land uses or residential neighborhoods. At some point, the devaluation of capital depresses the ground-rent level sufficiently that the “rent-gap” between actual capitalized ground rent and the potential ground-rent (given a “higher” use) becomes sufficiently large that redevelopment and gentrification become possible” (1984: p.200).

This pattern of uneven development has led to widespread gentrification of urban spaces.
The combination of these concepts provide a framework from which to view what is happening in Gowanus and try to make sense of environmental gentrification. The connection between urban nature metabolization\(^2\) and capital production can be explored further by using an urban political ecology framework to design this research project.

Almost 20 years ago, Erik Swyngedouw developed the term ‘urban political ecology’ and since then, researchers have employed this framework extensively to create nuanced accounts of how connectivity between the city, society and nature produces space (See Loftus, 2012 and Heynen, 2013 for reviews of this work). Swyngedouw wrote:

“In the city, society and nature, representation and being are inseparable, integral to each other, infinitely bound-up, yet simultaneously this hybrid socio-natural ‘thing’ called the city is full of contradictions, tensions and conflicts…Only over the past few years, a rapprochement has begun to assert itself between ecological thinking, political-economy, urban studies and critical social and cultural theory. This may provide the ferment from which a new and richer urban ecology or urban political-ecology may germinate” (Swyngedouw, 1996: 65-66).

The central themes of this framework include attention to the connections between the historical, political, and social processes and how they manifest in physical space or decision making over the production of nature. Although nearly all of the central themes of this framework are relevant to this research, some deserve to be elucidated here. Some of the most relevant goals of this framework to the case of Gowanus include an analysis of “social power relations (whether material or discursive, economic, political, and/or cultural) through which metabolic circulatory processes take place,” “questions of socio-environmental sustainability are fundamentally political questions revolving around attempts to tease out who (or what) gains from and who pays for, who benefits from and who suffers (and in what ways) from particular

\(^2\) Which Heynen (2013) defines as, “a dynamic process by which new sociospatial formations, intertwinnings of materials, and collaborative enmeshing of social nature emerge and present themselves and are explicitly created through human labor and non-human processes simultaneously”
processes of metabolic circulatory change. Such politicization seeks answers to questions about “what or who needs to be sustained and how this can be maintained or achieved,” unraveling “the nature of the social relationships that unfold between individuals and social groups and how these, in turn, are mediated by and structured through processes of ecological change,” and finally, enhancing “the democratic content of socio-environmental construction by means of identifying the strategies through which a more equitable distribution of social power and a more inclusive mode of the production of nature can be achieved” (Heynen, Kaika and Swyngedouw, 2008: p. 12-13).

Researchers in urban political ecology recognize that urban areas are created to serve the interests of the elite at the expense of poor or marginalized populations (Kaika and Swyngedouw, 1999: Swyngedouw and Heynen, 2003: Heynen, 2006). This condition brings about uneven distribution of environmental harms, at the expense of marginalized communities. These areas often become a site for political action against uneven exposure to pollutants. These spaces allow elites to maintain the social power in decision-making (Swyngedouw and Heynen, 2003). Recognizing urban space as a place in need of more ‘emancipatory’ politics, Swyngedouw and Heynen (2003) suggested that an understanding of “whose nature is or becomes urbanized must be at the forefront of any radical political action (p.915).” Identifying the strategies that are required for this process, they argue is the next task at hand for creating a more inclusive urban environment. In Walker’s (2007) research, he argued that political ecology research needs to be more explicitly political, engaging in practices to encourage the use of research findings towards social and environmental change. If the aim is political, he concludes, the research needs to aim at changing politics.

These questions are packaged in Gowanus as decisions made by various government
agencies, and by visions and activities led by corporations and community groups alike. And this research attempts to tease out what the motivations are for these decisions, visions, and actions in the hopes of unveiling some sense of the impacts these social and capital desires for the production of a space lead to. What vision of sustainability will be employed to create this space, and who stands to gain from and pay for this production?

**Environmental Justice and Brownfield Redevelopment:**

The concepts of environmental justice, environmental inequity and environmental racism are woven through all of the following literatures, and therefore, a brief outline of some major concepts in this work is in order. Environmental justice, as defined by the United States Environmental Protection Agency, is the:

> “fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. EPA has this goal for all communities and persons across this Nation. It will be achieved when everyone enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work” (USEPA, 2014).

In an academic sense, environmental justice can be defined as “a local, grassroots, or “bottom up” community reaction to external threats to the health of the community, which have been shown to disproportionately affect people of color and low-income neighborhoods” (Agyeman, 2005: p.1-2).

Researchers using the environmental justice research framework illuminate and analyze strategies that seek to eliminate inequitable environmental conditions for poor communities and communities of color. These researchers do so by investigating how physical and cultural experiences of environment differ in relation to income and race (Bullard, 1994). Environmental inequality occurs when any group of people is disproportionately affected by environmental
hazards (Brulle and Pellow, 2006; Dobson, 1998). These differences in environmental experiences are based on the market economy and by institutional racism creating cycles of unequal environmental conditions (Brulle and Pellow, 2006). Pellow stressed the importance of the history of environmental inequality, social stratification, and decision-making ability impact the production of inequity. He also posited that differences in class, race, and political power can divide communities that are working towards environmental justice (Pellow, 2002).

Environmental inequities can be perpetrating by industry or government agencies, but also by community leaders and people who refer to themselves as “environmentalists” (Pellow, 2002: p. 3).

A few researchers have addressed environmental inequity by assessing government-sponsored brownfield clean up programs. The Environmental Protection Agency’s Environmental Justice Advisory Council outlined the unintended consequences of brownfield redevelopment in environmental justice communities. The Council recommended ways in which the Environmental Protection Agency can mitigate the negative consequences of redevelopment: mainly by involving community and advocacy groups throughout the redevelopment process (EJAC, 2006). Since 1994\(^3\), federal agencies have been required to implement environmental justice policies (USEPA, 2014 [3]). However, O’Neil (2007) suggested that low income and minority Superfund communities have not benefitted from the executive order. O’Neil also suggested that these communities are less likely to be considered for Superfund clean up attention since 1994. McCarthy (2009) found that brownfields that are deemed most marketable are given clean up priority. More recently, Eckerd and Keeler (2012) found that brownfield sites

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\(^3\) By executive order 12898, signed by President Bill Clinton (USEPA, 2014 [3]).
located in poor communities are cleaned up relatively quickly compared to communities with large minority populations.

Pearsall and Pierce (2010) analyzed sustainable city planning documents with environmental justice elements. The authors found that the number of city plans that include policies meant to address environmental justice concerns was on the rise; the capacity for those cities to make a measurable impact on these concerns is dwindling. They argued further that sustainability related goals, such as policy goals for climate change or establishing green space, have taken precedence in the public debate about sustainability, therefore leaving environmental justice concerns often untouched. Porter (2009) noticed this trend in properties surrounding New York State Brownfield Cleanup Program sites. He found that brownfields enrolled in the program were disproportionately located in areas with high property values, and whiter and wealthier residents.

Few researchers have assessed the results of brownfield redevelopment projects without focusing solely on the economic impacts seen in neighborhoods going through brownfield redevelopment (Greenburg and Schneider, 1995; Howland, 2003; Jenkins et al., 2006; U.S. Environmental Protection Agency, 2006; Noonan, Krupka and Baden, 2007; Paull, 2008; Chilton et al., 2009). Most of these papers developed a methodology for assessing land value and employment impacts and some attempt to validate the need for brownfield cleanup programs based on this data. Other researchers pointed to the need to understand the impacts of demographic shifts taking place at their research sites. These authors connected gentrification and brownfield redevelopment by assessing land value increases near the cleaned sites and demographic shifts that take place after redevelopment occurs.
The researchers that focus on the economic impacts of brownfield redevelopment primarily investigated the housing price and employment impacts of redevelopment. Few of them questioned the limitations of only using economic factors to discuss the impacts of brownfield redevelopment. These researchers often saw increased property value as a positive consequence of redevelopment, providing fodder for drumming up support for brownfield cleanup initiatives. This type of research may provide incentives for policy makers to support brownfield redevelopment programs without understanding the social impacts of this process. These authors agree in one respect: the distance to a site and the amount of time it takes for cleanup to occur can impact the price of land near a site.

In a methodological modeling experiment, Noonan et al. (2007) estimated the price changes in housing stock and other buildings based on the distance of each building to a Superfund site. The authors separated direct price impacts on Superfund sites from indirect changes radiating outward from the cleaned sites. They found inconsistent positive and direct price impacts on the clean sites. Direct impacts and indirect impacts are distinguished here, but not defined. However, this distinction seems relevant to this research because direct changes occur on the Superfund sites, but the impacts of this remediation radiates outward, causing indirect effects close by. The authors concluded that indirect land prices increase after National Priority List (NPL) sites have been remediated and redevelopment begins. This indicates that the remediation of a brownfield causes land value to increase surrounding the Superfund site. Chilton et al. (2009) found that after brownfield redevelopment occurred in North Carolina, land value increased close to the redeveloped site. Like Noonan (2007), the price effects diminished with distance from the site. The authors concluded that land and housing price increases have
implications for environmental justice communities changing due to brownfield redevelopment, but do not suggest what those implications may be.

A few papers have addressed land value after long-delayed clean ups have happened on Superfund sites (Messer et al., 2006; Greenstone and Gallagher, 2008). These researchers found that property prices near the sites did not increase dramatically after cleanup and suggested that this may be a result of an area being long stigmatized due to Superfund status. However, Greenstone and Gallagher (2008) found that this long-term but modest increase in land value is accompanied by demographic and population changes.

In addition to land price effects, some researchers have studied how brownfield clean up affects employment. In a review of employment effect literature, Howland (2007) found that several themes emerge. She suggests that recent clean up efforts have occurred in some of the least contaminated sites and those areas tend to have the strongest economic markets. In addition, she says that brownfield redevelopment is necessary but not sufficient alone to promote redevelopment and job creation. It is worth noting here that Gowanus has a strong economic development potential due to rising real estate prices surrounding the canal. Finally, she found that many of the most seriously contaminated sites are located in the most economically distressed neighborhoods and that the best way to avoid displacement in areas surrounding brownfield redevelopment may be to tie local job creation to the process. Paull (2008) indicates that the difficulties in assessing the job related impacts of brownfield redevelopment lie in the inadequate data on whether local residents are filling jobs, whether the jobs created are ‘new’, ‘retained’ or ‘relocated,’ and the specific type of job created (whether it pays for health care, living wage or other benefits).
The unemployment literature is limited as well, but indicates that brownfield cleanup occurs only under a particular set of conditions and not purely because a site is contaminated. Howland’s review demonstrated that the potential for economic gain and job creation gives some places clean up priority over more polluted sites in poorer neighborhoods with fewer economic advantages. Paull indicated that although the number of jobs created in the redevelopment process is known in many cases, it is unclear whether these jobs in fact benefit the community where redevelopment takes place.

Chilton et al. (2009) argued that economic changes resulting from the brownfield redevelopments are the easiest to compile due to land sales, jobs created and other economic indicators provided by government agencies, whereas the social, environmental and health impacts of brownfield redevelopment are relatively under studied. However, a few articles have addressed this gap (De Sousa, 2005; Wedding and Crawford-Brown, 2007 and Pearsall, 2009).

De Sousa (2005) collected government documentation of brownfield redevelopment activities, policy application and redevelopment outcomes for brownfield properties in Milwaukee. He conducted interviews with “key stakeholders” from the public and private sector, including members of community organizations and the legal community to gather opinions on the role government intervention plays in the success of brownfield redevelopment strategies. He found that participants believed that redevelopment measures centered on economic and employment benefits are limited. They also reflected that broader data on the social effects of redevelopment are sparse. However, participants also generally agreed that broader community goals are achieved through the brownfield clean up process.

De Sousa wrote this article to address a gap in the literature concerning the social evaluation of brownfield clean up outcomes. However, he only addressed the concerns that “key
stakeholders” perceived to be concerns of the community, which excludes other individuals who may have taken part in the process. In addition, this work does little to elucidate the community goals that his participants perceived to have been met. De Sousa’s article explains only how people from within the system of formal decision making perceive the outcomes. However, these may not be individuals who are personally impacted by the outcomes.

Wedding and Crawford-Brown (2007) built on this work by creating a survey based on 40 indicators of successful brownfield redevelopment projects and circulating this tool to academic, private and public sector professionals. Their goal was to develop a quantitative tool to calculate the relative success of a redevelopment project. These indicators may be useful for creating interview questions, however, De Sousa (2005) and Wedding and Crawford-Brown (2007) assessed only the opinions of stakeholders or leaders in the communities researched; not residents or activists in clean up areas.

Most of the literature focusing on brownfield assessment is methodological experimentation with little interest in understanding the process of redevelopment or in the interests of the communities near these sites. Though some researchers allude to the need for this type of research, few have conducted any. Tzoumis and Bennet (2009) stated that successful brownfield redevelopment requires consideration of “the site's broader social, political, and economic setting”. They add further that much of the literature concerning brownfield redevelopment neglects to put the site of redevelopment in the larger social context of the location. Pearsall (2009) conducted the only study I have found that uses interviews with residents to identify potential vulnerabilities created by brownfield redevelopment. She found that mitigating soil contamination potentially creates new hazards in neighborhoods, including increased flooding risk or air pollution related to redevelopment. She concluded that
redevelopment can expose nearby residents to new physical danger, but does not approach the social dynamic of these changes. This begs the question: who is exposed to risks, both physical and social when properties are redeveloped?

Overall, researchers in brownfield redevelopment focus on the economic, employment and physical aspects of redevelopment that might impact close by neighborhoods. However, many questions are unanswered by this body of research. How might displacement or demographic shifts impact the neighborhoods surrounding cleanup areas? How should these aspects be resolved and should they factor into perceptions of successful redevelopment strategies? This research will expand this work by contextualizing the brownfields in a neighborhood with a complex social history, and an ever-changing and diverse population with conflicting local interests.

Recently, a few researchers have begun to tackle some of the more social questions of brownfield redevelopment impacts, exposing how environmental “bads” (such as toxic sites) are being developed into environmental “goods” (such as parks and recreation facilities), and forcing low-income and people of color from formerly polluted spaces. This work has found a link between the brownfield clean up process, gentrification and displacement (EJAC, 2006; Essoka 2010; Pearsall, 2013). Essoka (2010) found in a statistical evaluation of pre-post brownfield clean up demographic shifts, that brownfield clean up resulted in widespread displacement. And Pearsall (2013) explored how people in Gowanus participated in the Superfund listing process in order to resist developer driven clean up and gentrification in the area. She suggests that this type of participation is a departure from neoliberal planning initiatives. However, Wolch et al. (2014)
determined that despite who is involved in the planning process; new green spaces in urban areas benefit predominantly White and more affluent communities.

**Gentrification and Displacement:**

Coined in 1964 by sociologist Ruth Glass, gentrification has been described as the transformation of a working-class or vacant area of the central city into middle-class residential and/or commercial use (Lees, Slater and Wyly, 2008). However there are many definitions for gentrification. Davidson and Lees (2005) developed an updated description of the gentrification process that includes these four core elements: 1) the reinvestment of capital, 2) the social upgrading of locale by incoming high-income groups, 3) landscape change and 4) direct or indirect displacement of low-income groups (Davidson and Lees, 2005). There are many opinions on what causes gentrification. The only agreement seems to be that it is a complicated process to study (Slater, 2004). However, recent literature has moved past divisions in thought on the causes of gentrification towards a multifaceted examination of several aspects of gentrification, including the political decisions that lead to it, its role in globalization and the effects it has on local economies, and most recently, an analysis of how gentrification creates ecological impacts.

In the beginning, gentrification research was split between proponents of the divisive production and consumption perspectives. Production research stems from researchers who are interested in the economics of gentrification and the relationships between the production of space and the flow of capital (Slater, 2002). Consumption research perspective comes from scholars interested in gentrifiers themselves and their characteristics and consumption behavior in relation to urban culture (Slater, 2002). From this direction, researchers developed two
separate ways of explaining why gentrification happens: the revanchist city and the emancipatory city.

The revanchist thesis expresses that gentrifiers who move into an area are doing so in an act of class revenge against the people who live there and have taken the city from them previously. The revanchist thesis posits that the loss in land value experienced by middle and upper class whites during de-industrialization in cities led to white flight and suburbanization in US cities and created a revanchist attitude towards those who moved into inner city neighborhoods and subsequently, created resentment towards the mostly lower class people who lived there (Smith, 1996). Gentrification is the process of upper and middle-class people seeking revenge upon the populations who took over neighborhoods when they left. It is a way of middle and upper class people to redefine the inner city as their own in the form of displacement and gentrification (Smith, 1996: Lees, 2000: Slater, 2002).

The emancipatory thesis serves as a stark contrast to the ideas described in the revanchist thesis. It contrasts with the revanchist city thesis by interpreting the gentrification process as a way of unifying the middle-class and creating tolerance among different types of people in the same space (Lees, 2000). This type of explanation is usually used in literature focusing on gentrifiers and their agency (Caufield, 1994). Caufield argued that gentrifiers create new conditions that encourage social activities and encourages developers, but that this interaction between new and long time residents created tolerance between different groups of people (Lees, 2000). Scholars have refuted this thesis since its inception. Lees (2000) concluded that not all people in a gentrified area may want to participate in tolerance or social interaction with newcomers and may be opposed to this type of neighborhood. This idea conceals the inherent
inequity (in agency, power, finances, etc) in the process of gentrification by presenting it as an emancipatory process.

It seems both theses offer something worth examining in gentrification. The social processes underpinning gentrification are varied and depending on where these projects take place, could vary significantly based on local government policies, culture and economy. Slater (2004) looked at two cities: one in the United States and one in Canada and was able to discern both similarities and differences in both cases. Neither case indicated that either the revanchist or emancipatory perspective explained the situation.

Since these formulations and subsequent disagreements over the causes of gentrification, some scholars have updated how gentrification has changed since research in the area began over 40 years ago (Davidson and Lees, 2005; Hackworth and Smith, 2000; Lees, 2009). Some of this scholarship encourages the development of a ‘geography of gentrification’, or a way of developing a comparison of commonalities and differences found in case studies in disparate places (Lees, 2000; Slater, 2002; Slater, 2004; Wyly and Hammel, 2004). Other researchers call for unraveling the gentrification process and examining how this process is a global phenomenon that should be examined further in terms of economic and political restructuring (Hackworth and Smith, 2001; Lees, 2009; Smith, 2002). And a few researchers push for more work on displacement and the effects of gentrification (Butler, 2007; Freeman, 2008; Slater, 2006; Slater, 2008). Finally, though some writers mention the need for this type of research, only one researcher has explicitly called for an integration of urban political ecology and gentrification research (Quastel, 2009).

In the development of a ‘geography of gentrification,’ many scholars compared similarities and differences in different communities experiencing gentrification. In a study
looking at two cities in Canada and The United States, Slater (2004) argued that in order to develop a geography of gentrification, research must examine, with equal coverage, what might be ‘plausibly general’ and ‘radically different’ between two or more case studies in comparison (p.1209). He also concluded that gentrification is a complex process that “transcends” a theoretical dichotomy (Slater, 2004: p.1210). Wyly and Hammel (2004) created a case study in response to the encouragement for the development of a geography of gentrification. They compared 23 U.S. cities in terms of the effects of changing housing prices and government policy. In doing so, they found that gentrification increased class segregation and increased racial and ethnic discrimination. The authors encouraged more comparative literature in gentrification research (Wyly and Hammel, 2004). Along with Lees (2003), they suggested that more focus on how urban policy affects patterns of gentrification might yield better understandings of this process.

The gentrification research relevant for my study encompasses policy driven analysis of the gentrification process and displacement related research. These researchers analyzed why gentrification is an outcome of modern urban policy. Other researchers outlined the categories of displacement and study the role that gentrification plays in displacing people in urban spaces. This research is necessary to understand the motivations of local government for redeveloping the Gowanus Canal and the community level social impacts that decision has on the area.

Some gentrification researchers studied the process of redevelopment and the entities that encourage such development (Hackworth and Smith, 2001: Smith, 2002: Lees, 2009). Several of these scholars argued that there is a need for more sustained analysis of how government policies encourage gentrification. Hackworth and Smith (2001) reasoned that government agencies play an increasing role in redevelopment and subsequent gentrification because local governments are
now under greater pressure to enhance the tax base, making revenue generating development more of a concern than the concerns of the people affected by these policies. They also concluded that these changes allow government officials to sponsor redevelopment projects that do not consider the needs of working class people (Hackworth and Smith, 2001). Lees (2009) built on this work to conclude that local governments rely on gentrification to garner taxes from middle and ‘creative’ classes. However, she argued that due to the recession, there are now significantly more options for restructuring these policies.

Smith (2002) claimed that gentrification is now a form of urban policy. He argued that it is a result of a shift of investment from societal enhancement to sustaining capital production. Smith’s idea is applicable for understanding the motivations for brownfield redevelopment. The ramifications for brownfield redevelopment are the same: this process shows that governmental priorities have shifted from providing social needs to creating opportunities for capital production.

Referring to brownfield redevelopment as “green” development (City of New York, 2007) throws a positive light on the process and establishes it as redevelopment that meets both social and economic needs. This policy-driven take on the process may serve as a green light for gentrification. Supporters may see brownfield redevelopment strategies, such as those proposed by PlaNYC⁴ (City of New York, 2007), as actions meant to provide cleaner urban space for people to live in, but these areas are called “Brownfield Opportunity Areas” to also indicate the economic development potential of these spaces. If policy makers created brownfield redevelopment as a tool to satisfy both societal and capital needs, shouldn’t researchers focus on both the social outcomes of cleanup and redevelopment and the economic benefits of brownfield redevelopment? If the goal is sustainability, which is comprised of three pillars: Environment,

⁴ The city planning document released in 2007, developed under the Bloomberg administration.
Economy and Equity, then the relative success or failure of addressing three pillars should be investigated (USEPA, 2014 [3]). Just because a redevelopment strategy includes access to transportation, green infrastructure, ‘green’ jobs and waterfront access does not erase that it also may cause gentrification and further social inequity.

Brownfield redevelopment changes the social and economic make up of a neighborhood and may result in gentrification. One way of analyzing the social outcomes of brownfield redevelopment is through gentrification research that explores the social impacts of gentrification. Several researchers have addressed social changes that results from gentrification (Lees, 2003; Lees et al., 2007; Wyly and Hammel, 2004) and others conducted research specifically on industrial (Curran, 2004 and 2007) and residential displacement related to gentrification (Freeman, 2008; Marcuse, 1986; Newman and Wyly, 2006; Slater, 2006; 2008; 2009; Slater et al., 2004; Wyly et al., 2010). Displacement, as defined by Chester Hartman (1982: p. 3), “describes what happens when forces outside the household make living there impossible, hazardous, or unaffordable”. Slater (2006; 2008) suggested that research focusing on displacement could convince some people, who have ‘sugarcoated’ the word ‘gentrification’, that it may be a dirty word after all (Smith, 1996).

Many researchers have found displacement related to gentrification challenging to measure. Lance Freeman and Frank Braconi (2002; 2004) stated that displacement was negligible in New York City by analyzing publically available housing data for New York City. In reaction to Freeman and Braconi’s (2002; 2004) analysis, some researchers encourage displacement research that investigates how people’s lives change due to gentrification on a macro scale (Curran, 2004; 2007; Newman and Wyly, 2006; Slater, 2006). By including tenant or former tenant experiences, macro scale research on displacement shows that displacement
occurs at a higher rate than Freeman and Braconi’s analysis concluded (Newman and Wyly, 2006).

Understanding why displacement occurs and distinguishing different forms is another challenge. Peter Marcuse (1986) distinguished four types of displacement in terms of the way each type can be measured: 1) Direct last resident displacement, which can be physical (such as the landlord turning off the heat in a building) or economic (rent increases that price out tenants): 2) Direct chain displacement, which accounts for a chain of people who have been displaced in the same building over time: 3) Exclusionary displacement, which accounts for residents who cannot access housing due to gentrification or abandonment and 4) Displacement pressure, which refers to the pressure placed on residents to leave an area due to cultural or physical changes in the neighborhood. Slater (2006; 2009) suggested that distinguishing the differences between Marcuse’s categories has proven difficult because some reasons for leaving seem to overlap several of these categories.

Working from this perspective, Wyly et al. (2010) acknowledged that displacement can occur directly and indirectly as a result of gentrification, but that it is not entirely relational to gentrification. In addition, the researchers note that displacement occurs on a continuum, where most people have some ability to choose to leave or not. The blurred boundaries between these interpretations of displacement may present challenges to researchers working to understand the role gentrification plays in an individual’s decision to relocate.

**Green Gentrification:**

A growing number of researchers working in urban political ecology, gentrification and environmental justice conduct research related to green gentrification. Green gentrification is gentrification facilitated by the “creation or restoration of an environmental amenity” (Gould and
Lewis, 2012: p. 13). These researchers all contributed to understanding and defining green gentrification. In this work, researchers used several terms for the process I refer to as “green gentrification” (Gould and Lewis, 2012), including “environmental gentrification” (Eckerd, 2011; Checker, 2014) and “ecological gentrification” (Quastel, 2009). However, my rationale for using the term “green gentrification” builds on the relationship between gentrification and land use and economic development policies, such as those stated in PlaNYC (The City of New York, 2007) that aim to create social and capital unity (i.e. “green”).

Only a few researchers connect the urban political ecology and gentrification literatures; and not to sufficient depth (Quastel, 2009: Quastel, Moos and Lynch, 2012). Noah Quastel (2009) drew on planning activities in Vancouver, British Columbia to argue that political ecology can assist in understanding how government policies, ecological discourse and consumption practices relate to gentrification. He discussed the ‘greening’ of Vancouver’s image, the interest of planners and local government in using this image to sell condos, and the interests of consumers who buy into the idea of becoming green to interpret gentrification in terms of a “political ecology of gentrification”. He did this by examining how “material relations and uneven resource consumption, concepts of nature and the politics of urban environmental management affect gentrification processes” (Quastel, 2009: 694). Quastel suggested that the interaction between ecological gentrification and urban government structure needs to be analyzed to uncover how political processes impact inequality and gentrification.

This case study drew connections between the image of a city to a condo unit and green consumerism, but in the end, it does not successfully navigate through a political ecology of gentrification. This would require a lengthy and in depth discussion of the specific connections between these activities. However, connecting the image portrayed by a city to a consumer of
space within that city is worth studying as a method for gaining popular acceptance of
gentrification. Quastel, Moos and Lynch (2012) continued this work in Vancouver with an
analysis of sustainability discourse concerned with density.

Much like the term “green,” “livability” comes with a set of assumptions about how
people live or want to live that may not encompass all groups impacted by the redevelopment
process. By confronting the term “livability,” Hagerman (2007) explored the urban political
ecology of waterfront redevelopment in Portland, Oregon. He stated that other U.S. cities view
Portland’s planning initiatives as a pinnacle of progressive planning. However, he observed that
planners use the concept of “livability” without understanding how it may blind the planning
process from some social, economic and ecological concerns related to the redevelopment
process.

City planning agencies use the term “livability” to promote new plans for waterfronts.
Hagerman suggested that planners use this term to imply that previously industrial areas of cities,
such as waterfronts, were not “livable” and that it is time to reclaim them from social
fragmentation associated with industrial development. Hagerman stressed that these processes
undermine community needs to create livable spaces. The focus on “livable” spaces and not on
the community will most likely lead to gentrification because the planner based concept of
“livability” may be a white, upper middle class social construct, and not what is appropriate for
any space or population. It is a concept meant to show white, wealthy urban dwellers how they
should live or aim to live because the concept is steeped in a promise of “green” living.

There is little research that explicitly addresses the connection between brownfield
redevelopment and its impact on the social fabric of a neighborhood (Environmental Justice
Advisory Council to the United States Environmental Protection Agency, 2006; Gould and
Lewis, 2012; Maantay, 2001 and 2002; and briefly mentioned by Banzhaf and McCormick, 2007). The Environmental Protection Agency’s Environmental Justice Advisory Council (EJAC, 2006) published a report outlining the unintended consequences of brownfield redevelopment, including gentrification and displacement. EJAC also recommended the following ways in which the Environmental Protection Agency can mitigate the consequences of redevelopment:

1. EPA should support the placement of EPA staff in local redevelopment and revitalization projects through the use of Intergovernmental Personnel Agreements.
2. All stakeholders should have the opportunity for meaningful involvement in redevelopment and revitalization projects.
3. During cleanup projects, EPA should make a concerted effort to implement a coordinated approach to public outreach for settings where redevelopment and revitalization issues are complex.
4. EPA should work aggressively to address the cumulative impacts of environmental problems present in environmental justice communities.
5. When appropriate, EPA should encourage an initial neighborhood demographic assessment and a projected impact assessment regarding displacement at the earliest possible time in a redevelopment or revitalization project. A similar assessment at the project’s end should be carried out to measure changes and assess impacts. Such assessments may be facilitated as a requirement for EPA grant applications.
6. State, tribal, and federal environmental agencies should be encouraged to find creative ways to participate in local land use planning, process, and government. For example, where state and/or federal permits apply, conditional permit issuance may be encouraged (EJAC, 2006).

Maantay (2001 and 2002) connected the process of redeveloping former industrial spaces, and the impacts those changes have on outside communities, where unwanted land uses move: expulsive zoning. She concluded that unwanted land uses tend to cluster in poor and minority industrial areas due to rezoning meant to prevent these land uses in more affluent areas. This practice often includes displacement of poor and minority people, and industry from gentrifying industrial areas, and unwanted land uses moving to new poor or minority neighborhoods that are not protected by the same zoning (Maantay, 2002). Tracking this pattern
to zoning practices can assist in understanding how Gowanus, and other redeveloping central urban spaces, are changing, and why.

An increasing number of academic researchers explored the links between environmental injustice and environmental gentrification over the last few years (Curran and Hamilton, 2012; Checker, 2011; Gould and Lewis, 2012 and Pearsall and Pierce, 2010). Environmental gentrification is gentrification facilitated by the “creation or restoration of an environmental amenity” (Gould and Lewis, 2012: p. 13). The authors suggested that the redevelopment or creation of environmental amenities (such as Prospect Park in Brooklyn, in this case) lead to neighborhoods that are more “inequitable” than before the redevelopment. They argued further that this redevelopment creates neighborhoods that only the wealthy can afford, causing displacement. A central question to this research is whether gentrification spurs this redevelopment or whether redevelopment spurs gentrification.

Only a few articles specifically address green gentrification and brownfield redevelopment. Eckerd (2011) analyzed the relationship between hazardous land clean up and gentrification in Portland, Oregon from 1990 to 2000. The results of this research are somewhat contradictory. The author found that there is no relationship between gentrification, defined as economic and demographic changes, and the perceived or actual hazardous site clean up. This, he argues, exhibits a lack of ‘environmental’ gentrification in the area. However, the author explained further that there is a slight relationship between the existence of hazardous sites in 1990 and subsequent gentrification, indicating that gentrification was a slow process in this case. Sites that were contaminated in 1990 have since been cleaned and redeveloped. In addition, gentrification occurred in the areas surrounding the highest concentration of hazardous sites whether or not they were cleaned up. Eckerd proposed that in addition to an analysis that
addresses a wider timeframe than 10 years, this research warrants additional research to unravel the differences between the impacts of large scale and small-scale land clean up. The author intimated that looking at localized changes due to small scale clean up may present alternative outcomes to his own.

Pearsall (2012) investigated resilience to gentrification in three New York City neighborhoods, including the Gowanus area of Brooklyn, where she interviewed 15 people. She found that residents attempted to buy homes or find rent-stabilized apartments to become more resilient to gentrification happening in the neighborhood. With little access to rent stabilized apartments in the area, however, many residents will no doubt have to come up with other strategies for dealing with gentrification. In this article, she discussed opportunities for residents to increase housing occupancy, engage in activism to oppose gentrification, procure housing assistance from the City government and resist displacement through anti-harassment policy. However, these methods for resilience are not equally available to all residents.

Conclusion:

Research in brownfield redevelopment, environmental justice, gentrification and urban political ecology provide a base to conduct the present study. These literatures call for an exploration of the relationship between brownfield cleanup and gentrification. This research will draw together the approaches from urban political ecology, gentrification and more recently to that of green or environmental gentrification to investigate the process of brownfield redevelopment near the Gowanus Canal.

A holistic approach, drawing on diverse literatures is necessary to understand this complex issue. The policy driven gentrification research provides a way to investigate the motivations for enacting “green” policies and understanding the decision making process in
redevelopment processes. The brownfield redevelopment and gentrification literature points to a
gap in the macro scale understanding of how brownfield redevelopment and gentrification
impacts the lives of people in the areas being redeveloped. The present work will address this
gap by conducting displacement research early in the process of redevelopment. In addition, this
research will attempt to understand the connection between displacement and gentrification,
“green” urban policy and community activism. Understanding this link may provide insight into
how these aspects of redevelopment impact the social outcomes of the process.
Chapter 3: The Canal as a Mirror to Development, Decline, and Redevelopment in New York City

Introduction:

The development of Gowanus is situated in historic cycles of displacement, social and physical re-creation. By tracing pre-European history through the present, this chapter will outline these historic cycles in order to connect the current activities into the historic context of this space. The varying access and attitude to the waterfront over time has impacted the development and re-creation of Gowanus over time. Most often, this development has been capitalizing on the waterfront as a commodity and space for capital production. This development has disproportionately impacted poor communities by displacing residents near the water, which have historically been mostly poor or minority communities.

Pre-Dutch Settlement:

Before Europeans arrived in New Amsterdam and rapidly settled and transformed the landscape, the area that is now the Gowanus Canal was a sprawling, tidal creek and wetland that emptied into New York Bay. Most of Brooklyn and some of southern Manhattan were home to the Canarsee tribe. The area surrounding the canal was home to several Native American groups, including several tribes of the Algonquin Nation, who cultivated maize and fished along the tidal creek (Dodd, Mead and Company, 1928). The new settlers used the existing settlements, water sources and paths to develop the area.
Figure 4: 1639 The Dutch East India Company’s Joan Vinkeboons “Manatus” map is one of the first known illustrations of the Gowanus area. At this time, Red Hook (10 on the map) is an island (Courtesy of Library of Congress).
The new inhabitants set to work developing the area to their needs immediately. Native American residents clustered in settlements near the few sources of fresh water in the area. They developed an extensive system of well-defined, wide paths, connecting several communities nearby. They also maintained the forest underbrush to create visibility for hunting and farmed maize on the higher ground (Bolton, 1922; Thompson, 1839). These practices played a seminal role in the development and urbanization of Brooklyn, leading European settlers to develop streets based on the existing paths (Bolton, 1922). When the Dutch planned tidal mills later on, which were often residences as well as mills, the Canarsee’s water resource knowledge became important.
Not only did the European settlers use the physical groundwork laid by the Native American population to develop their settlements, but they used the names that the existing population gave to the spaces around Gowanus. The European settlers used Canarsee landmark names, including Werpos, a meadow near the head of Gowanus Kil creek named for the abundance of hares (Field, 1868: p. 87). The name Gowanus has been linked to several sources, including the name of the chieftain of Werpos (now Gowanus) named Gowane (Reiss, 2000; Bolton, 1922: p.144). Other historians trace the name to the Dutch word for bay: gouwee (Reiss, 2000).

Figure 6: GIS Map of Native American Settlements, Paths and Agriculture Near Gowanus Creek
Dutch Settlement of Brooklyn:

During the period of European settlement in Brooklyn, the new residents acquired land by “purchasing” land from Native Americans in unclear negotiations, fighting tribes in order to use the land, displacing the former inhabitants, and claiming it belonged to the new residents. In 1636, the Marechkawick, a sub-chiefdom of the Canarsee who lived in Werpos, “sold” their land to Dutch settlers, but were permitted to continue living and fishing on the land along the creek and wetlands (Bolton, 1922; Reiss, 2000). This was Brooklyn’s first non-Native American settlement (Field, 1868). Dutch settlers explored the area and established permanent communities near Gowanus Bay by displacing Native Americans from the most fertile farming land. Along Gowanus Creek, the new settlers started the first settler-run agricultural plantations in the area (Stiles, 1867, 1884; Burrows and Wallace, 1998). Two Dutch settlers, William Adriaen Bennett and Jacques Bentyne first “purchased” 936 acres of land in the Gowanus area from the Canarsee tribe in 1636. Below is the agreement of the purchase, purportedly signed by two Native Americans (from Stiles, 1867).

“In witness of the truth is the original of this with the said Indians' own hands subscribed, to wit: By Zemu Kamingh or Kaus Hansen, with this mark, ☞, and by Keurom with this mark, ☞, in the presence of Lambert Dorlant, who by request signed his name hereto as a witness. Took place at Brookland on the day and date above written.

“Compared with the original and attested to be correct.

“Michil Hainelle, Clerk.”

Bennett built the first settler home in Brooklyn at Third Avenue and 28th Street, which was later burnt down during the Governor Kieft Indian Wars of 1643 (Stiles, 1867).

In 1640, another land “purchase” stated that “a certain piece of land upon the Long Island near Marechkawingh about Werpos, reaching in breadth from the kil and the valley that come
from Gowanes N.W. by N. and from the strand on the East River S.E. by E., 1700 paces of three feet each and in length from the head of the aforesaid kil N.E. by E., and S.W. by W. to the Red Hook, under the express condition that if the savages shall voluntarily give up the maize land in the aforesaid piece, Fredrick Lubbersen shall be allowed to enter upon it in the width and extent of it” (Bolton, 1922: p. 137-8). By the middle of the 17th century, the Dutch had taken over all of Red Hook and Gowanus (Reiss, 2000). Native Americans continued to cultivate on the “Sassian’s maize-field” until 1645, when it was described as “Frederick Lubbertsen’s maize – land” (Bolton, 1922: p. 138). His home, which was built on top of a burial ground, was also built near one of the only fresh water springs in the area: a highly coveted piece of land.

More and more settlers moved in to the area, deliberately planning communities that separated Native American groups from each other and encouraging displacement. Fearing a reoccurrence of the battles taking place between settlers and several tribes just north of New Amsterdam, in Connecticut, the settlers sought to prevent collaborations between the groups living along the tidal creek (Thompson, 1839: p. 55). In one case, the settlers, including Governor Kieft, who led the initiative, influenced a feud between Iriquois tribes and the Canarsee by encouraging Canarsee groups to withhold a long standing tribute paid each year to the Iriquois. As a result, the Iriquois punished the Canarsee by killing members of the tribes each time they ran across them (Furman, 1824). These Dutch initiated conflicts became known as Governor Kieft’s Indian Wars (Stiles, 1867). The settlers continued to fear that Native Americans were “brooding over their past defeats, evidently waited only for an opportunity to avenge their losses; and jealous neighbors were secretly plotting against the Dutch rule in America” (Stiles, 1884: p. 88). As a term of peace, Kieft purchased the land along the Gowanus from Native Americans for the second time (Stiles, 1884).
Early Re-creation of the Canal:

Almost as soon as they arrived, European settlers began to change the landscape, filling in land or dredging it, to serve their transportation needs and create more land for development. Tidal mills were built as early as 1661 along the waterway, damming branches of what was then called Gowanus Kil. The first known, Denton’s Mill, was later burned during the Revolutionary War’s Battle of Brooklyn (Field, 1868: p. 106).

These settlers began dredging the waterway in 1664, when a mill owner named Adam Brouwer and several other Gowanus residents petitioned to dredge the creek of sand to make it navigable by boats carrying grain, wood or other materials. They argued in this petition that they needed to use the creek so that residents would no longer have to navigate the dangerous water surrounding Red Hook: a barrier for many to reach what is now Manhattan. At their own expense, these residents deepened the creek, which then belonged to Frederic Lubbertsen. The residents along the canal would later be responsible for widening the channel and constructing a footpath along “public place” to haul their boats in and out of the water (Stiles, 1867).

After purchasing and changing the environment to suit their needs, the new settlers devised a way to split up the land amongst them. By 1670, the town of Brooklyn had acquired most of the land surrounding the canal from Native Americans. This land remained common property in the late 1600’s, when the settlers devised a way to organize the land based on landmarks and freeholder household property, leading to the private ownership of many parcels of land in Brooklyn. The town elected land trustees as caretakers and oversight of three major divisions in the property, which were then divided among freeholders. The boundaries of land within each trustee’s jurisdiction and the use of commonly owned woods remained a source of conflict for years to come (Furman, 1824).
The private land resulting from these agreements left individuals to make decisions about their land and how to use it. Initially, several landowners used their waterfront property to create passageways through the wetlands, some of which led to public landing spots along the waterway. At a time when very few areas near water had public access, two were public along what is now Gowanus. The area now commonly known as Public Place on the west side of the canal was preserved as a public landing space for boats along the canal with a public road leading to the landing area. In 1709, commissioners laid out another public road and protected another landing site near Freeke’s Mills (Furman, 1824).

Figure 7: Freeke’s Mills (Courtesy of New York Public Library)
Initially, the European settlers found few employment opportunities in Brooklyn, which led most settlers to rely on the resources around them for monetary gain. Lack of employment opportunities came to a head when settlers in Brooklyn complained to the “Corporation of the City of New York” that they were not able to gain access to employment as a result of a restricted access to waterways. The people living in Brooklyn complained that they were not allowed to operate ferries to transport goods and travelers across the East River, giving Manhattan based ferries control over highly sought access to economic opportunities. As a result of many disagreements stemming from restricted Brooklyn waterfront access, a movement to protect public landing space along the increasingly manipulated wetland grew. In 1667, the Brooklyn dwellers were given equal rights to the waterways, and therefore, equal opportunity to create ferries and take part in trade in Manhattan. Ongoing negotiations over the use of ferries lasted until the early 1800’s. Three separate acts containing a similar provision prevented ferries from taking money from Brooklyn inhabitants in order to reduce the barriers to making money in Manhattan (Furman, 1824).

The incomers continued to rely on the waterway and the land nearby for employment opportunities for years to come. Many dwellers farmed the areas surrounding Gowanus (Stiles, 1867). The first exported product from Brooklyn to Europe, the pickled oyster, came from Gowanus. 1679, a Dutch visitor described Native Americans sustaining themselves on foot-long oysters caught at the mouth of Gowanus Bay. The Dutch later forced Native Americans off the land and took over the oyster hunt: catching, pickling and transporting the oysters from Gowanus to the port of what was then known as New Amsterdam (Reiss, 2000).

During the Revolutionary War, the Battle of Brooklyn took place near the canal at the Old Stone House, which is one of Brooklyn’s oldest buildings. It used to be a farmhouse, was
once reconstructed and now stands at 5th Avenue and 3rd Street as a historic site, in what is now Park Slope. As the British pushed U.S. troops towards the East River, many crossed what was then Gowanus Creek (Morrone, 2008). Some soldiers may have buried the dead along Gowanus (Furman, 1824).

**Development for Shipping, Manufacturing, and Industrial use:**

Following the Revolutionary War, New York developed into the nation’s largest and most active port and by the mid 18th century, the Dutch and English farmers owned most of the land in Gowanus (Reiss, 2000). And these few landowners owned the highest ratio of African American slaves in the North (Osman, 2011). Developers in the area displaced squatters living near the remaining swampland to create new docks and housing, and used the newly filled waterfront land to build massive docks to accommodate the overflow of ships that could not dock in lower Manhattan. Capitalizing on the availability of this land, the Dutch settlers filled wetlands for farming, built bulkheads to hold in the landfill, created tidal powered mills and cut a canal to transport dairy products from South Brooklyn to avoid the rough waters of Buttermilk Channel, which was named for the ability of the rough water to churn milk into buttermilk by the time it arrived to customers in Manhattan (Reiss, 2000).
The first ferry to Manhattan opened in the area in 1814, resulting in a huge population growth in Brooklyn (Osman, 2011). Gowanus began to develop significantly under mayor Thomas Goin Talmadge’s attention in the 1840’s. Talmadge lived in the area and was responsible for the rapid development along 3rd and 5th Avenues (Stiles, 1884). And with the construction of the Atlantic docks along the western side of the Brooklyn waterfront facing Manhattan, the area developed quickly, with thirty-five newly opened streets in the area in 1848 (Stiles, 1884).

All of these activities and a new demand for housing left squatters with few options for living near the canal. Squatters living in the lowland along the canal were displaced to make way for Atlantic docks. Demand for housing near the docks increased and real estate developers advertised that the area had “greater if equal attraction for public resort, as a ready, picturesque,
healthy and quiet retreat” (Reiss, 2000: p. 6). However, the new housing development was often quick and cheap upslope, allowing developers to turn a profit quickly, while giving the area a false sense of grandeur with ornately detailed facade construction that later became known as “Brownstone Brooklyn,” which is now a highly coveted type of property (Osman, 2011).

While the areas of Park Slope and Gowanus changed, the areas of Red Hook and Carroll Gardens and Gowanus were not as highly developed. These neighborhoods were known to be lower quality places to live because the area was “of low ground and stagnant water, or where the filth was abundant, and were too crowded, being occupied by a population at least one-half to one-third larger than was consistent with either comfort or health (Stiles, 1884: p. 152). This left the area vulnerable to and highly impacted by the cholera epidemic of 1849. It wasn’t until 1858 that the city planned a citywide sewage system, dividing Brooklyn into four districts, one of which was known to drain into the already sewage-polluted Gowanus (Stiles, 1884: p. 593).
Figure 9: Brooklyn Neighborhood Map
Waves of immigrants seeking work displaced one another in Gowanus and Red Hook. German, Irish and Scandinavian immigrants replaced the Dutch and English and settled in the area to work at the docks and live in the newly constructed neighborhoods. As development occurred and the population grew, the area became known for crime and conflict over space in the neighborhood and the emergence of “gashouse gangs,” who sought to limit the competition from those seeking work in the docks by attacking arriving sailors (Reiss, 2000). In 1844, a riot presumed to be over access to land or work, occurred between Irish workers and Native Americans who were in the area (Stiles, 1884). Competition for employment on the docks continually resulted in violence until 1846, when developers announced that they would hire equally amongst the competing groups of German and Irish laborers. Scandinavian laborers moved into the area in the 1850’s and on. When Scandinavian immigrants moved to Bay Ridge, the Columbia Street Waterfront developed into a Little Italy (Reiss, 2000).

The first plan for creating a canal out of the already developed area evolved in 1847, when Daniel Richards, the creator or the Atlantic docks and Major D. B. Douglass created and promoted the first published plan for the canal’s manipulation. The plan outlined Douglass’ survey findings of the canal’s drainage capabilities. The canal was to be five feet deep below the low water mark and four feet above the high water mark, 100 feet wide and about a mile in length, draining nearly 1,700 acres of land. The plan included one turning basin for large ships or barges, with the assumption that private landowners would capitalize on their land by developing turning basins to accommodate depots for timber, coal, lime, cement, brick and other materials. The plan argued that the main objective was to reduce the marsh-miasma, or feverish diseases believed to result from living near marshes, but this development would also allow the land to be used for commercial and mechanical purposes (Burrows and Wallace, 1998; Stiles, 1884). The
plan introduced two similar options for the development of the canal to accommodate the new and growing population of the area (Douglass, 1847). This report was influential for the 1848 New York State Legislature’s decision to provide funds to manipulate Gowanus Creek.

This plan, approved in 1848, led to several other Gowanus Canal Improvement Acts in subsequent years, providing funds for widening, straightening, and transforming it into a commercial waterway, further developing the shipping and manufacturing industries in the area (Stiles, 1884). The development led to the expansion of the Red Hook docks into Erie Basin (completed in 1869), connecting the Atlantic Docks to the Gowanus and providing space to accommodate more ships. The series of docks allowed barges from the newly constructed Erie Canal to transfer goods in New York City. The docks were in such high demand that William Beard, an industrious Irish immigrant, expanded the dock space into the nearby Erie Basin in Red Hook without using his own money. He charged incoming ships for unloading rocks arriving as ballast from overseas when they loaded in cargo from New York to develop the docks (Reiss, 2000).
Figure 10: Atlantic Docks (New York Public Library)
Figure 11: Atlantic Docks (Brooklyn Public Library, Brooklyn Collection)

Figure 12: Downing and Lawrence Marine Railways and Ship Yard, 1878 (Stiles, 1884)
With land value increasing drastically, another developer, Edwin Litchfield, who was deeply involved in the development of the Gowanus through the Brooklyn Improvement Company, promoted the place for industrial opportunities. He bought up farmland and sold it to shippers and manufacturers at a huge profit. He and other developers undertook dredging and drained the tidal marshes to form 100 foot slips for ships to access the waterway (Morrone, 2008). Developers located manufacturing plants, storage, distribution and shipping facilities along the canal (New York Department of City Planning, 2011). Industrious businessmen developed manufactured gas plants, coal yards, cement and soap manufacturing plants, tanneries, marble and stone work factories, paint and ink factories, and oil refineries (Reiss, 2000). The River and Harbor Acts of 1880, 1881 and 1896 approved new channels to be made in the canal to accommodate more marine traffic (US Army Corps of Engineers, 2005). Other groups moved to the neighborhood to work, including African Americans and Puerto Ricans (Reiss, 2000).

In 1883, a doctor in Brooklyn describes the industrial area (Stiles, 1884: p.124):

“Below the Bridge, for a distance of about six miles, the storage warehouses predominate, with, at rare intervals, great foundries and mechanic works; and, on Gowanus Bay, Creek, and Canal, extensive lumber and coal yards. These storage warehouses number hundreds of buildings, some two-story sheds of iron, brick, or frame, but the greater part, large and massive warehouses, five or six stories in height.”
During the massive industrial development, housing and other developments were also planned. Edwin Litchfield sought to develop the area, using the Coignet Stone Company’s building at the corner of 3rd Avenue and 3rd Street as the headquarters of the Brooklyn Improvement Company (the building still exists, next to what is now Whole Foods). He bought the site of the Old Stone House, developing it into Washington Park, a baseball stadium housing a professional baseball team, the Atlantics, who later became the Brooklyn Dodgers. The Old Stone House was used as a clubhouse and the size of the building was reduced and was finally intentionally buried with landfill (Morrone, 2008).

Many new amenities were built to improve the living conditions of those who resided along the Canal and near the docks and to encourage new development in the area. In 1858, the Brooklyn sewage system was expanded, leaving Gowanus as one of four huge drainage basins in the city (Stiles, 1884). In the 1860’s, Prospect Park, one of Brooklyn’s largest parks, was
developed upslope from the Gowanus Canal to accommodate the increasing population (Prospect Park Alliance, 2013). During this time, many landowners along the Canal connected their property to the Canal by building turning basins and developers created new brownstone upslope housing, mostly in Park Slope (Reiss, 2000). Bridges were built, connecting neighborhoods on both sides of the Canal and Brooklyn to Manhattan (Osman, 2011). Along the canal, the people living in a squatter’s settlement, Darby’s Patch or sometimes referred to as “Pigtown” due to livestock found roaming the streets, were displaced in 1884 to build the new housing (Osman, 2011; New York Times, 1910).

When the homes were built in what is now Carroll Gardens, Cobble Hill and Boerum Hill, the sewage produced in these new homes went directly into the canal. Sewage was one of several pollutants entering the canal at the time, including toxic waste from the gas manufacturing, coal yards, oil depots, soap and paint factories. However, it was the most noticeable contaminant due to the smell and by 1880, the canal had a reputation for being a bottleneck for waste. The 1890’s signified the first recorded public response to the sewage and industrial waste flowing into the Canal (Reiss, 2000). In response to the public outcry, the city developed the flushing tunnel in 1911, a 12-foot wide conduit constructed to flush the polluted surface water in the Canal into New York Harbor and the Atlantic Ocean (Hewett and Johannesson, 1922).
The new development and transportation options built in the late 1800’s to the 1920’s allowed people to move from the slums of lower Manhattan and for white collar workers, who were displaced by industrial expansion of the Manhattan port, to move into Brownstone Brooklyn: a zone of the city comprised of nineteenth and early twentieth century buildings situated in Park Slope, Brooklyn Heights, Boerum Hill and Carroll Gardens. Housing developments to accommodate new residents included multifamily apartment buildings, replacing the small homes and brownstone conversions to small, low-rent apartments and rooming houses. However, at the same time, some buildings were also converted to luxury apartments, creating an area with some economic diversity. Housing towers and huge apartment buildings led to some “Manhattanization” of Brooklyn, causing some discontent. Many people
living in brownstones wanted to fend off these buildings in favor of the existing low-rise homes and “aristocratic ambiance” (Osman, 2011: p. 33). The wealthiest professionals lived in Brooklyn Heights, Cobble Hill, or Fort Greene. Row homes in Boerum Hill were less expensive, but the least paid workers moved to lower Park Slope between 3rd and 6th Avenues. Because this housing was mixed in with the industrial buildings of Gowanus, it was less desirable (Burrows and Wallace, 1998: p. 972).
Figure 15: Brownstone Areas of Brooklyn in 1980 (Courtesy of The Brooklyn Phoenix, The Brooklyn Collection-Brooklyn Public Library, Osman, 2011: p. 7).
As the areas upslope and close to downtown Brooklyn were developing into denser
eighborhoods, the conditions along the canal worsened. The admission of pollution in the water
was one of many aspects of the Gowanus neighborhood that was deteriorating quickly. Gang
violence had never ceased since the “gashouse gangs” of the 1800’s. A well-known geographic
divide between “The Pointers” for those who lived in Red Hook and “The Creekers” or those
who lived in shantytowns near Gowanus fueled many confrontations. In 1927, New York State
Crime Commission issued a report stating that Red Hook had the highest number of juvenile
delinquents to any comparably sized place in the world. The commission blamed the findings on
“wretched housing,” violence in films shown in local theatres and a lack of available activities in
the area for young men. Tin and cardboard shacks housed many people along Red Hook’s waterfront and bathhouses along the docks were in poor condition (Reiss, 2000).

Figure 17: Gowanus Squatter Settlement, 1933 (New York Public Library)
Response to this report was significant, leading to a wave of revitalization of the area in the 1930’s. Housing improvements and new recreational facilities were developed in an effort to reduce crime. Historians worked towards reconstructing the Litchfield building, which was completed in 1933. A year later, it was surrounded by what is now J. J. Byrne Park (J.J. Byrne is a deceased former Borough President), one of Park Commissioner Robert Moses’ first projects towards increasing parkland in New York City (Morrone, 2008, p. 7). Amidst the Depression, other parks and recreational facilities opened, including the Red Hook pool and bathhouse, which replaced floating bathhouses located on the docks. Ball fields and a stadium opened nearby, replacing the housing shacks along the waterfront called “Hoover City” (Reiss, 2000). This is the first time the area experienced revitalization centered on neighborhood services, rather than industrial development.

Figures 18 and 19: Revitalization led to public pool developments (Brooklyn Public Library, Brooklyn Collection), which replaced the dockside bathhouses (Brooklyn Public Library, Brooklyn Collection) and parks.
Historically, the poorest residents of New York City lived along the waterfront. When Robert Moses proposed a new waterfront plan in 1948, the plan suggested that low income housing would be located along the waterfront, partially to keep the poor where they had been living, but also because the waterfront space was plentiful for housing development (Mahler, 2012; NYDCP, 1948). Ball fields replaced the shantytown near the bathhouse. The Brooklyn Queens Expressway cut the neighborhood in half. The Red Hook Houses, the largest federally funded housing project of its time, opened without the common amenities of a housing development to house the poor of the multiethnic neighborhood. All of these developments were Robert Moses led (Caro, 1975). Although this housing was seen as an improvement to the neighborhood, some apartments lacked doors, toilet seats were not installed, and elevators didn’t operate properly due to budget cuts in the federally funded housing development (Reiss, 2000). Three other federally funded housing developments opened near the canal. Gowanus Houses,
Wykoff Houses, and 572 Warren Street opened in 1949, 1966 and 1972 respectively (New York City Housing Authority, 2010).

**Deindustrialization and Abandonment:**

World War II generated the need for many activities along the port, providing jobs for many people in Gowanus and Red Hook. The area was full of activity and development until after the war, when reliance on manufactured coal waned with the increased use of natural gas and the port declined due to changes in cargo shipping. Cargo shipping methods were evolving, and large containers took the place of burlap sacks and wooden crates. Cranes took the place of many laborers as huge containers were lifted and loaded directly onto trains or trucks. This shift necessitated parking lots, not docks, and the area was not set up to accommodate this change. With links to cross country rail lines, containerports located in Elizabeth and Newark, New Jersey gained prominence over the docks of Gowanus and Red Hook. These shifts left many longshoremen in Brooklyn without employment. The Gowanus shipping facilities that had operated for several decades moved elsewhere or shut down. By 1964, an expansive container port along the Columbia Street waterfront was planned, which would eventually lead to the total collapse of the Gowanus as a working waterway. From nearly 26,000 passages a day in 1906 to 5,000 in 1965, the post war changes ended the widespread use of the Canal as an industrial center (Reiss, 2000).
Figure 20: Laborers on the canal (Brooklyn Public Library, Brooklyn Collection)

Figure 21: Industrial Decline of the Canal (Credit: John Morrell, Brooklyn Historical Society)
Post World War II also brought social changes to the area. The areas of housing upslope from the Canal had in the 1940’s, housed mostly white, working class Irish and Italian Catholics living in the mostly nineteenth century tenements and townhomes. But in the 1950’s, many African Americans and Puerto Ricans moved in, taking the place of the many white people, mostly Irish and Italian residents, who were moving to suburbs (Osman, 2011).

Figure 22: Evangelist on 7th Avenue, Park Slope (Credit: Lucille Fornasieri-Gold, Brooklyn Historical Society)

In the 1960’s and 70’s, declining industrial centers like Red Hook and Gowanus endured the fiscal crisis without reinvestment due to “insufficient economic interest” (US Army Corps of Engineers, 1972). At the same time, nearby Brownstone Brooklyn was becoming an interest for many middle class enthusiasts. Brownstone Brooklyn, comprised of several neighborhoods, was distinct to middle class gentrifyers due to its Victorian value. The desire to rehabilitate brownstones and the search for “authenticity” drew many new residents to areas of Brooklyn with brownstones. The mixture of industrial and residential buildings not only drew people in
search of recreating Victorian era urban living, but people who wanted to find new uses for the industrial warehouses (Osman, 2011: 34). Community organizers and real estate agents of the area created many neighborhood names, including Boerum Hill, Carroll Gardens and Cobble Hill (an area that had always been flat), all located to the northwest of Gowanus Canal. New residents advised historic maps in order to piece together neighborhood descriptions and topography. They attempted to create a pre-urban, colonial and pastoral life for themselves within the city by forming new community organizations, food cooperatives and planting gardens and street trees (Osman, 2011).

Figure 23: Romantic Park Slope ‘Gas-Light Types’ (Credit: Library of Congress, Brooklyn Public Library, Brooklyn Collection)

Before and during the Brownstone Brooklyn reinvention occurring upslope in Park Slope, Carroll Gardens, Cobble Hill and Boerum Hill, the water and land surrounding the canal absorbed many pollutants from the industrial activities and housing development. After many facilities moved or went out of business (many during the 1960’s and 70’s), they left a legacy of
pollution for which the canal is now well known (USEPA, 2011). The area was not redeveloped during the brownstone Brooklyn renaissance, but residents moving into the areas upslope became more interested in the fate of the canal and the pollution that existed there. “Peering at filthy industrial waterfronts, residents reminisced about fisherman catching oysters along the Gowanus” (Osman, 2011: p. 30).

After the Flushing Tunnel broke down in the 1960’s, residents and community groups who lived nearby began to advocate for the clean up. When the City failed to respond to complaints, Salvatore “Buddy” Scotto, an activist in the neighborhood, worked with New York City Technical College to analyze the water. They found typhoid and cholera in the Canal, which was later used to advocate for a sewage treatment facility for the northwest Brooklyn sewershed. The process of building the facility involved installing sewage pipes throughout Red Hook. This was detrimental to the Columbia Street neighborhood, causing collapsed buildings, deaths and open trenches. The population of the area dropped by nearly half throughout the 1970’s as the city endured fiscal crisis (Reiss, 2000).

As the neighborhoods surrounding the canal grew, sewage overflow and surface water runoff also degraded the canal’s water quality. Contaminated land combined with the air pollution caused by the Brooklyn Queens Expressway and sewage pollution in the canal, these pollutants are known as the “terrible trio” (Reiss, 2000; p. 15). Public complaints about the environmental quality of the area began increasing in 1880, and continued until recently (Reiss, 2000).
Redevelopment:

Since the 1980’s, there have been ongoing redevelopment activities in the area. The sewage treatment plant opened in 1989, relieving the Canal of a constant flow of raw sewage. This improved the look and smell of the canal, and several community groups became more interested in promoting the canal for different uses. In the 80’s, several artist groups moved into old warehouses along the canal. In 1994, Community Board Six, which represents Red Hook and Gowanus, called for improvements along the canal, including mixed-use zoning that would allow
both residential and industrial uses. This rezoning practice would likely move the waste from the polluted areas of Gowanus to another location, a pattern that Maantay (2002) found in her research on expulsive zoning. A canoe and kayak club, The Gowanus Dredgers, formed along the canal in 2000. As of then, the area still had some manufacturing and shipping taking place along the canal, including coffee roasters, publishers, and pasta, bed linen, vacuum cleaner bag, candle and casket manufacturing (Reiss, 2000).

When the area began to gentrify in the 1980’s the industrial and manufacturing, designation of the area and the pollution from Gowanus’ industrial past were seen as barriers to redevelopment. The old buildings and warehouses that once housed shipping and manufacturing businesses were seen as a barrier to resident’s increased interest in accessing the waterfront. Red Hook and Gowanus deteriorated, while Park Slope and Carroll Gardens gentrified (Morrone, 2008: Osman, 2011, p.37). Both neighborhoods have been described as being socially, physically and economically isolated as islands. In response to the neglect of the area, members of Carroll Gardens and Park Slope community groups have become greatly involved in the redevelopment and envisioning of the canal. In the 1990’s, more people began moving into Gowanus from wealthier areas of Brooklyn and parts of Manhattan (Reiss, 2000).

When more people began moving in, a resurgence of interest in redeveloping Gowanus began. In 1998, the New York Department of Environmental Protection dredged 2,000 tons of sludge from the bottom of the canal. In 1999, the propeller was fixed in order to draw 300 gallons of cleaner water a day into the canal from Buttermilk Channel, pushing the dirty water out into Gowanus Bay (Reiss, 2000).

John Muir of the Brooklyn Center for the Urban Environment described the pollution as a “terrible trio”: the contaminated soil around the canal, the air pollution from the Brooklyn
Queens Expressway overhead and the “stinking stew” of the canal, which, in part, continues due to combined sewage overflow problems (Reiss, 2000). The United States Environmental Protection Agency recently reported that historic contaminants exist in the land and water of the canal, including pesticides, metals, PAH’s (polycyclic aromatic hydrocarbons), PCB’s (polychlorinated biphenyls) and VOC’s (volatile organic compounds). Many of these contaminants are known carcinogens (USEPA, 2011). Although a few sites along the canal have been cleaned up, the area is still polluted. Some portions of land surrounding the canal are still industrial, but many properties are now used for commercial purposes, vacant or have been repurposed for new uses, including housing, community facilities and waterfront recreation (New York Department of City Planning, 2011 and USEPA, 2011).

Many diverse groups have developed plans for a cleaned Gowanus over the years. Some envision a “Little Venice” type of development with gondola rides, using the canal for water taxis and an esplanade (Reiss, 2000). Others would like to see the canal return to a wetland. Some envision additional housing and mixed-use development, with small shops and restaurants in the ground levels of buildings.

New York City deemed the canal and surroundings a “brownfield opportunity area” in the city’s 2007 planning vision, PlaNYC (City of New York, 2007). Since the document’s release, the city has worked with developers to encourage redevelopment of the area. In April, 2009, the United States Environmental Protection Agency (EPA) proposed placing the Gowanus Canal on the National Priorities List, which would ensure a clean up. However, New York City wanted to clean up the canal and redevelop it quickly with its development interests ready to move in as soon as possible. The debate between the New York City government and its development interests delayed the listing until 2010 (which will be discussed further in the
following chapter). The EPA is investigating the extent, causes and potentially responsible parties for the clean up costs currently. A feasibility study and proposed plan for clean up options have been published to select a remedy for the contamination (USEPA, 2013).

New York City’s Department of City Planning listed several canal clean up efforts envisioned by the City of New York in Vision 2020, New York City’s waterfront plan (Department of City Planning, 2011[2]). This plan calls for upgrades to the flushing tunnel, designing and constructing storm sewers and holding tanks to reduce sewage overflow into the canal, rezoning and clean up of “underutilized” areas near the canal as well as a several other goals.

**Conclusion:**

The history of development in Gowanus illuminates several cycles and themes. From Native Americans, farmers, and several waves of dock and waterfront workers, Black, Latino and Italian American communities: displacement is commonplace. Through waves of investment, this space became polluted as people capitalized on the waterfront location. And finally, poor communities have been disproportionately been impacted by waves of displacement and development due to the historic proximity of poor and squatter communities to waterfront.
Chapter 4: Contamination and the Clean Up of the Canal

Introduction:

Once referred to as “Lavender Lake” for the purple oil sheen on the surface water from fabric dyes, the canal is currently one of the most polluted water bodies in the United States (Reiss, 2000; USEPA, 2013). The canal has been described as “an aromatic ditch” and an “aromatic avenue of steadily declining commerce” in the New York Times (Phillips, 1971). There have been several attempts to clean up the canal, but none addressed the full scope of challenges that clean up would require. Why is that kind of clean up happening now? Who will benefit from the process?

During this project, I talked to members of the community and those who are involved in community planning and advocacy. I also spoke to residents, some of who are involved in decision-making, but many who were not. I asked them several questions, which can be found in Appendix A and B. To see a demographic breakdown of whom I spoke to, see Appendix C. In this chapter, I will only focus on comments made about environmental clean up in the area and why it is taking place now.

This chapter will begin with a brief overview of the historic and current levels of contamination found in the canal followed by a description of the past and present plans for cleaning up the canal. This discussion will allow me to speculate on why, after so many years of contamination, the canal is currently being cleaned up.

Partial Plans for Clean Up:

The man-made canal with little tidal flow developed quickly from a commerce, transportation and manufacturing center to a polluted, stagnant and smelly waterway soon after it was completed in 1869. The water and land surrounding the canal endured contamination
discharged from manufactured gas plants, mills, tanneries, dye, soap and cement factories, chemical plants and other production facilities. Industrial and manufacturing pollutants, stormwater runoff and sewer outfalls from the growing residential neighborhoods upslope all convened in the canal. As early as 1889, only 20 years after the canal’s completion, residents complained of the canal’s smell, suggesting that it should be filled in (Brooklyn Eagle, 1889). In response to ongoing complaints to the sewage smell of the canal, New York City built a flushing tunnel in 1911 to replace stagnant canal water with more oxygen-rich water from Buttermilk Channel and the East River to improve water quality in the canal.

As industrial manufacturing waned in the area, it left a legacy of historic contaminants. In the 1960’s, when the flushing tunnel stopped working due to a mechanical failure, the water became stagnant and began absorbing wastewater again. The New York City Department of Environmental Protection (DEP) fixed the flushing tunnel, and it ran until the mid 1960’s, when it was neglected and ceased to operate due to the City’s fiscal crisis. Interest in cleaning up the area began with a few health hazard and dredging projects in the 1960’s and 1970’s. In 1972, the Army Corps of Engineers (USACE) declined to improve the northern portion of Gowanus Canal due to ‘lack of investment interest’. In 1979-1981, the USACE investigated dredging in the upper portion of Gowanus Bay, which was never completed due to difficulty finding a suitable space to take the contaminated dredged material from the canal (USACE, 2005).

In 1976, the City of New York Housing and Development Administration (NYCHDA) released the Gowanus Industrial Development Project Plan, calling for demolition of deteriorating non-industrial buildings and reinvestment in the area’s industrial potential. The plan outlined the reasons for enacting such a plan, including that the area had few jobs, there was developable land and the area was deemed accessible by transit and highway (New York City
Housing and Development Administration, 1976). The neighborhoods that surround Gowanus and the City’s approach to redeveloping Gowanus have changed significantly since 1976. With the increased interest in Gowanus for housing, art spaces, and entertainment, the ability to continue encouraging manufacturing has become less important. The 1976 plan remained “active” until 2008, when New York City Department of City Planning proposed rezoning the area to include mixed uses, public access to the canal and housing development (New York City Department of City Planning, 2008). Instead of re-industrializing the area, the City is now working to develop Gowanus into housing, open space, and commercial space, taking part in what Maantay (2002) refers to as expulsive zoning, which will lead to displacement in poor and minority communities.

Several planning initiatives contributed to reducing water pollution in the canal. As a result of unmet Clean Water Act (1972)\textsuperscript{5} standards, increased population upslope from the canal, and increased awareness of the problems of uncontrolled wastewater, the Red Hook wastewater treatment plant opened in 1987. It was the first facility used to collect and treat wastewater along the canal and it did little to reduce pollution and odor problems (NYCDEP, 2014 [2]). In 1994, The New York City Department of Environmental Protection (NYCDEP) began rehabilitating the flushing tunnel by dredging a portion of it to remove sediment buildup and installing a new propeller, motor and sluice gates. DEP’s work completed in 1999, nearly 40 years after it had broken, and the tunnel began to flush out the polluted water again. Since then, the tunnel has worked inconsistently, flushing out an average of 200 (up to 300) million gallons of water a day when it is operating (NYCDEP, 2014 [2]).

\textsuperscript{5} The Clean Water Act gave the US Environmental Protection Agency the authority “to set effluent limits on an industry-wide (technology-based) basis and on a water-quality basis that ensure protection of the receiving water. The CWA requires anyone who wants to discharge pollutants to first obtain an NPDES permit, or else that discharge will be considered illegal” (USEPA, 2012).
In 2009, DEP submitted an additional plan for a facility to deal with the combined sewage overflows into the canal by reconstructing the Gowanus pump station, fixing the flushing tunnel and dredging the canal (NYCDEP, 2009). In 2013, DEP made upgrades to the tunnel and to the wastewater pumping station at the northwest head of the canal, and it started pumping again in late 2013 (NYCDEP, 2014 [2]). However, DEP estimates that these changes have reduced the volume of CSO outfalls in the canal by 34% (NYCDEP, 2014).

The US Army Corps of Engineers (USACE) worked with the New York City Department of Environmental Protection, Congresswoman Nydia Valazquez and community members to develop a restoration feasibility study for Gowanus under the Hudson Raritan Estuary Restoration Program in 1999. Work on the project ceased after the USACE presented it to the community in 2004, local advocates for the remediation began to sort out the convoluted relationship that different branches of government have to the area. Some people blamed the City for years of stalled work, due to their agreement with the Army Corps of Engineers to conduct wetland restoration in the area. At that time, the USEPA had not considered or evaluated the canal for potential clean up through CERCLA\(^6\). New York State Department of Environmental Conservation Commissioner Peter Grannis sent a letter to the EPA asking for this consideration, which set the evaluation period into action (FROGG, 2013).

Figure 25: Infrastructure and Environmental History of Gowanus (Sources: USACE, 2004; Reiss, 2000)

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1661-1709</td>
<td>Grain mills developed along Gowanus Creek</td>
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<tr>
<td>1704</td>
<td>Gowanus Road developed to connect New Ultrecht to Gowanus Creek.</td>
</tr>
<tr>
<td>1836</td>
<td>The three mills in operation will soon begin to close due to Erie Canal development, which allowed transport of inexpensive grain from upstate New York and the Midwest.</td>
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<tr>
<td>1837</td>
<td>First proposal to use the canal for navigation created.</td>
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\(^6\) The Comprehensive Environmental Response, Compensation, and Liability Act (1980), commonly known as Superfund (USEPA, 2014 [4]).
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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<tbody>
<tr>
<td>1840-1847</td>
<td>The construction of the Atlantic Basin on the Buttermilk Channel initiates the industrialization of the Brooklyn Waterfront.</td>
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<tr>
<td>1847-1849</td>
<td>First plan for creating a canal submitted to Common Council.</td>
</tr>
<tr>
<td>1857-1865</td>
<td>Sewers and streets are laid out in the area around the canal. Additional wetlands are drained.</td>
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<tr>
<td>1858</td>
<td>First sanitary sewers empty into the canal.</td>
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<tr>
<td>1865</td>
<td>Four out of five bridges over the canal are open.</td>
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<tr>
<td>1860's</td>
<td>Manufactured gas plants begin operation along the canal.</td>
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<tr>
<td>1880</td>
<td>Additions to the sewage system are laid in the area, which ends flooding, but created public response to the stench from raw sewage and industrial waste flowing into the canal. At this point, 31 firms are operating along the canal.</td>
</tr>
<tr>
<td>1891-1899</td>
<td>The Greene Street storm sewer is connected to the head of the canal via a 17-foot wide rectangular pipe to provide sufficient fresh water to flush the canal.</td>
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<tr>
<td>1902</td>
<td>The Brooklyn Rapid Transit Corporation opens a power generating station along the canal, relying on coal delivered by water.</td>
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<tr>
<td>1900-1932</td>
<td>50 to 60 businesses used the canal: the peak of canal use.</td>
</tr>
<tr>
<td>1902-1904</td>
<td>The Greene Street sewer flushing system fails and leads to the construction of a second storm sewer outlet at DeGraw Street.</td>
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<tr>
<td>1911</td>
<td>The flushing tunnel, a 6,280-foot long, 12-foot wide, brick conduit, was constructed to flush out the canal's polluted water.</td>
</tr>
<tr>
<td>1940's</td>
<td>Natural gas reduces the reliance on manufactured gas plants along the canal, reducing the amount of coal tar sent to the canal. The Brooklyn Rapid Transit Corporation power station closes.</td>
</tr>
<tr>
<td>1955</td>
<td>Brooklyn Union Gas, a manufactured gas plant, closes.</td>
</tr>
<tr>
<td>1964</td>
<td>Brooklyn Queens Expressway opens. About 25 businesses remain along the canal.</td>
</tr>
<tr>
<td>1960's-1970's</td>
<td>The former industrial land created a barrier to the waterfront. While Park Slope and Carroll Gardens gentrified, Gowanus became more deserted. Community activists worked with City to for plans to build a sewage treatment facility to prevent sewage from entering the canal. Activists advocate for the canal's clean up.</td>
</tr>
<tr>
<td>1969</td>
<td>The flushing tunnel propeller breaks.</td>
</tr>
<tr>
<td>1978</td>
<td>About 9 businesses remain that use the canal.</td>
</tr>
<tr>
<td>1983</td>
<td>The Department of Environmental Protection created a plan to fix the flushing tunnel in response to a mandate set by a court order to bring water cleanliness to a federal level.</td>
</tr>
<tr>
<td>1995</td>
<td>The Department of Environmental Protection began to fix the flushing tunnel.</td>
</tr>
<tr>
<td>1997</td>
<td>Brooklyn Center for the Urban Environment began conducting tours and holding forums focused on the Gowanus.</td>
</tr>
<tr>
<td>1998</td>
<td>City dredged the canal, pulling out over 2000 tons of contaminated sludge. Mayor Giuliani supported a plan to develop a sports center along the canal.</td>
</tr>
<tr>
<td>1999</td>
<td>The flushing tunnel began working again, after 30 years of inactivity.</td>
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The Current Contaminants:

The USEPA conducted a remedial investigation of the Canal in 2011, including an analysis of the contamination and the ecological and human health risks posed by the contamination. The report described several phases of testing the USEPA completed to analyze the level of pollution and the potential hazards this contamination presents. The agency conducted a bathymetric survey of the Canal and a survey of outfall features, which included taking outfall water samples and tracing the origin of the outfalls. The agency also created a cultural resources survey and bulkhead study. Phase two included core sampling from the Canal’s floor.

Phase three included air, surface water and sediment analysis, fish and shellfish tissue analysis, combined sewer overflow (CSO) sediment and water sample analysis, and a hydrogeologic investigation performed by National Grid and New York City (USEPA, 2011). This study indicated that the primary sources of pollution in the Canal come from direct discharges...
from historical industrial activities, including CSOs, current CSO and stormwater discharges, discharges from other outfalls, and contaminated sites along the Canal, including moving contaminated groundwater (USEPA, 2011).

The sediment analysis separated the waterway into three layers of sediment: the surface (0-6 inch depth), soft (1-20 foot depth) and native sediment below 20 feet. The soft sediment ranges in thickness from 1 to 20 feet and is a mixture of sand, silt and clay. Beneath the soft sediments lie the native sediments, which consist of sand, silt, silty sand, sandy clay, clay and peat. The surface sediment contamination includes polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and several metals, including barium, cadmium, chromium, copper, lead, mercury, nickel and silver. Levels of these contaminants were higher in the canal than nearby reference points in Gowanus Bay and Upper New York Bay and surpassed maximum exposure levels for ecological and human health. Pesticides, PCBs and metals were found in the soft sediment as well, but found in lower concentrations in the native sediment. In the deeper soft sediment, these contaminants and VOCs and semi volatile organic compounds (SVOCs) were found in higher concentrations than surface layer sediment testing results. In the middle section of the canal, non-aqueous-phase liquid (NAPL) was found. The EPA believes that this contaminant is coal tar waste migrating to more permeable native sediments through soils or under or through the bulkheads of the waterway from the three former manufactured gas plants along the canal. This waste consists of PAHs, volatile organic compounds (VOCs), benzene, toluene, ethyl benzene and xylenes (BTEX). These contaminants are found at high concentrations in both the soft and native sediment layers.

EPA testing indicated the potential existence of pollution at 6 feet below the soft surface sediments, but stopped there due to the impossibility of proposing a remedy for deeper sediment
dredging. The levels of contamination found in the canal were much higher than in Gowanus Bay and Upper New York Bay reference points. In the ecological and human health risk assessments, the EPA found that the canal poses unacceptable risks due to exposure to contaminated sediment, surface water and prey (USEPA, 2011).

The ecological risks to wildlife were evaluated in the Baseline Ecological Risk Assessment. Risks to sediment dwelling (benthic) and water-column dwelling organisms and the wildlife that consume contaminated prey and sediment were evaluated. Benthic organisms were found to be at risk to PAH, PCB and metal contaminated sediment. Water column dwelling creatures were found to be at possible risk to lead during wet weather. Aquatic herbivores (for example, the black duck) were at risk to exposure to PAHs and avian omnivores (heron are one example) were possibly at risk from exposure to mercury. There was no risk to avian piscivores or birds that eat fish from the canal (USEPA, 2011).

Human carcinogenic and non-carcinogenic health risks were also evaluated based on EPA determined reasonable maximum exposure (RME) and central tendency exposure (CTE), which is an average exposure that most people experience to the contaminants. They evaluated how the following scenarios might impact the acceptable levels of exposure: direct contact with the surface water, ingestion of fish and crabs, direct contact with sediment and surface water that floods the area during tidal or storm surges, and inhalation of emissions from the canal. The agency found that non-carcinogenic pollutant risks for both RME and CTE situations were at or below acceptable levels. However, carcinogenic risks were above EPA’s acceptable levels in both RME and CTE. The EPA found that by recreationally using or swimming in the canal, being exposed to surface water and sediment from canal overflow, or consuming fish or crabs from the water resulted in elevated risks. The agency also found that RME air quality
surrounding the canal was above acceptable levels for carcinogenic risks. The average crab and canal fish sampled had PCB concentrations of twice the amount as the reference points, which also had higher than acceptable levels of PCBs (USEPA, 2011).

In addition to the pollution found in the canal, there are several other physical barriers that will complicate the remediation process. The bulkheads and canal support are degraded and any type of dredging that might take place during clean up activities may reduce the stability of these supports. The canal’s floor is littered with debris, including trash, sunken boats and gravel-covered sediment. The recent upgrades to the flushing tunnel increased the amount of water coming from Buttermilk Channel by up to 40 percent, which may cause further instability (USEPA, 2011).

**Current Plans for the Clean Up Process:**

The clean up plans prior to the EPA’s involvement partially addressed the challenges of cleaning up the canal, but none were successful in addressing the extent of the pollution in and around the canal. The scope of the current project is expansive, with many involved agencies and community groups. The current plan, led by the Environmental Protection Agency, New York City Department of Environmental Protection, New York State Department of Environmental Conservation and several community groups may be inclusive in terms of decision making involvement, but will it fully address the contamination in Gowanus?

Several challenges to redeveloping the area around the canal and the canal itself exist, including, but not limited to: polluted water and flooding during storm events, land and air pollution, out of date city storm water infrastructure, crumbling bulkheads, debris on the canal floor, combined sewage outfalls, and groundwater pollution. The area is flood prone and many buildings lie within the flood zone. During hurricane Sandy, many residents in Gowanus endured
contaminated floodwater on their ground floors (Harris, 2012). In addition to the physical challenges, there are divergent redevelopment interests in the canal. The negotiations over this space will stretch on for years, partially due to these non-physical challenges to the clean up process.

In 2007, New York City’s Department of City Planning released PlaNYC 2030, which placed Mayor Bloomberg in the spotlight as a forward thinking leader in favor of green policies. Some goals are particularly important for Gowanus, including:

“Develop programs to accelerate brownfield cleanup and redevelopment”

1 Increase participation in the NYC Brownfield Clean up Program by partnering with lenders and insurers
2 Increase the capacity of small businesses and small-and mid-size developers to conduct brownfield cleanup and redevelopment
3 Enable the identification, cleanup, and redevelopment of brownfields
4 Build upon existing state and federal collaborations to improve the City’s brownfield programs

Strengthen incentives for brownfield cleanup and redevelopment

5 Study the economic value of brownfield redevelopment in New York City
6 Leverage the NYC Brownfield Clean up Program to establish funding and other incentives for cleanup and redevelopment

Deepen our commitment to communities for community brownfield planning, education, and service

7 Support community-led planning efforts
8 Support local and area-wide community brownfield planning efforts
9 Increase the transparency and accessibility of brownfield clean up plans

Expand the use of green remediation

10 Promote green remediation in the NYC Brownfield Cleanup Program 11 Promote green space on remediated brownfield properties” (The City of New York, 2011).
However, PlaNYC loosely outlines the details for how the City plans to obtain these goals, including brownfield clean up. Since then, City departments have started working towards 97% of the initiatives in the plan (Progress report, 2012). However, city updates show that very few projects have reported significant progress. Some of the biggest challenges to this plan include accommodating an increasing population and the housing, transportation and other infrastructure needed to support this population increase. The plan often leaves out how the City will address conflicting policies, such as increasing housing and redeveloping brownfields, but increasing climate change resilience all the while.

In PlaNYC, the city devoted one short chapter to climate change, stating goals for reducing greenhouse emissions and some ways that the city will attempt to reach these goals. This chapter did nothing to address waterfront planning or relocating residents from flood zones, where NYC is expected to experience increased challenges in the coming years as a result of climate change. The waterfront challenges are mostly addressed in the Comprehensive Waterfront plans of 1992 and 2011. The language used in these plans goes from “reclaiming the city’s edge” in 1992 to “Vision 2020”, indicating a homage to the green policies of PlaNYC in 2012. The plans outlined in 2012 include restoring working waterfronts, improving water quality, increasing public access to the waterfront, and increasing climate resilience, among other goals. The 2011 PlaNYC updated plan included some goals that elucidate climate change concerns. These goals include:

**Reduce and track greenhouse gas emissions**

1. Release an annual inventory of greenhouse gas emissions
2. Assess opportunities to further reduce greenhouse gas emissions by 80% by 2050

**Assess vulnerabilities and risks from climate change**
3 Regularly assess climate change projections

4 Partner with the Federal Emergency Management Agency (FEMA) to update Flood Insurance Rate Maps

5 Develop tools to measure the city’s current and future climate exposure

**Increase the resilience of the city’s built and natural environments**

6 Update regulations to increase the resilience of buildings

7 Work with the insurance industry to develop strategies to encourage the use of flood protections in buildings

8 Protect New York City’s critical infrastructure

9 Identify and evaluate citywide coastal protective measures

**Protect public health from the effects of climate change**

10 Mitigate the urban heat island effect

11 Enhance our understanding of the impacts of climate change on public health

**Increase the city’s preparedness for extreme climate events**

12 Integrate climate change projections into emergency management and preparedness

**Create resilient communities though public information and outreach**

13 Work with communities to increase their climate resilience (The City of New York, 2011)

In this plan, Gowanus represented an opportunity to develop a space that addresses some of the goals outlined in PlaNYC. This is a plan to create infrastructure and encourage cooperation for creating resilience, rather than retreat from the shore for fear of climate change impacts. City level politics and the possibility of a federal agency leading the clean up efforts led to a contentious battle over the area. Known for his affinity for redeveloping “underused” spaces in New York City, Mayor Bloomberg’s government sought for the City to take control of the clean up process (USEPA, 2013[2]).

In 2007, The City of New York’s Department of City Planning released the Gowanus Canal Corridor Framework. The framework included planning guidelines for future land use
changes in the area, including limits to new building height, establishing public access to the waterfront, and a rezoning plan to include more mixed use zoning in the area and therefore, paving the way for new residential, office and commercial development in the area. This would also displace the manufacturing and production activities along the canal. It also indicated that the City was working with National Grid towards a clean up plan for specific sites along the canal, including Public Place, a large lot on Smith Street and 5th Street and the former site of a coal gasification plant, which has been abandoned for over 50 years (New York City Department of City Planning, 2007).

In August of 2008, DEP released a plan for In April of 2009, a few months before the NYCDEP’s plan for reducing CSOs in the canal was released, the EPA released a proposal to add Gowanus Canal to the National Priorities List (USEPA, 2013[2]). This decision met opposition from the City, which supported cleaning up the canal by working with developers to clean up and develop the brownfield sites along the canal. The City’s alternate approach depended on long-term funding from the US Army Corps of Engineers and the cooperation of land tenants and owners. The EPA reflected on this plan: “While the community and many elected officials supported the listing, the City of New York and some development interests did not” (USEPA, 2013: p. 1).

Although the EPA did not divulge details about the reasons New York City and it’s development interests did not support the listing, it seems the lengthy clean up process and inability for many developers to make money through new developments along the canal until the clean up is over may have impacted this interest. At the time, the City feared that, through clean up, the area would develop a stigma to development. City official said that the listing might
“jeopardize more than $500 million committed to the waterfront for two private projects involving more than 1,200 housing units” (Navarro, 2009).

Many of the community group members and residents reacted against the City’s plan. Community members who I interviewed reflected on the City’s plan for Gowanus in mostly negative ways, although a few admitted to once supporting the mayor’s development plan. One late 20’s white male resident and community organization member said that he “thought that the city’s counterproposal was not convincing or that the city had the wherewithal or interest in obtaining the same level of clean up as the EPA, especially since the City has been named a Potentially Responsible Party” (Participant #3, 4/3/2012). Another early thirties white male activist said that “It seems clear now that NYC looked at the canal and saw that they could be liable for a lot more money than they would have been without superfund and were probably trying to limit their liability” and added further that “NYC also looked around at all of the developers who were proposing to build on the canal and said ‘oh maybe we can get some public private partnerships!’” (Participant #8, 3/26/2013). A senior white woman, who was a long time activist and resident of the neighborhood said the city “just wants to plant a couple of trees and call it ‘green’” and “they’re not trustworthy” (Participant #1, 3/15/2012). A white man in his 50’s, and a long time resident and business owner in the area said “the developers said, hey let’s do it with the city because we can do it quicker and cheaper, and totally less effective, but they didn’t really care” (Participant #4, 9/22/12).

Many members of the public, the United States Environmental Protection Agency and the New York State Department of Environmental Conservation, advocated for the canal to be placed on the National Priorities List (Navarro, 2009). The community members who I spoke to about the listing process nearly all supported EPA intervention in the clean up process. Only one
of the interview participants, a white male senior activist and resident said that they had “bought into” the city’s alternate plan at the time, but quickly suggested that they no longer agreed with that plan (Participant #7, 4/22/2013).

The canal was added to the National Priorities List on March 2, 2010 (commonly known as Superfund status), which allowed the United States Environmental Protection Agency to address the contamination by finding the potentially responsible parties (PRPs) and developing a plan to reduce contamination in the waterway (USEPA, 2013). The major sources of contamination in the Canal come from direct discharges from historical industrial activities and CSOs, currently active CSO and storm water discharges, other discharges, and charges from contaminated sites along the canal, including contaminated underground water (USEPA, 2011).

Negotiations took place for several years before the EPA released the final clean up plan in 2013. The plan includes dredging contaminated materials from the bottom of the canal, sediment stabilization, and a several-layer thick cap and sand layer will be placed on the bottom of the canal. The plan also requires the City to reduce CSO contamination in the canal by creating retention tanks for storm water to prevent recontamination. And it states that working with New York State’s Department of Environmental Conservation will clean up the three manufactured gas plant sites. The city, state and federal governments are each responsible for portions of the clean up process. The federal Environmental Protection Agency is responsible for remediating the canal and for addressing the Potentially Responsible Parties to pay for the cost of the clean up. The EPA is responsible for cleaning up the waterway alone. The City and State of New York are involved in cleaning the upland brownfields and preventing CSO re-contamination (USEPA, 2013). The clean up will include the following remedies (EPA, 2013):

- Dredging contaminated sediment from the bottom of the canal
- Capping the dredged areas with a multi-layer cap consisting of
A “treatment” layer that will remove contamination that may well up from below
An “isolation” layer of sand and gravel that will ensure that underlying contaminants are not exposed
An “armor” layer or gravel and stone to prevent erosion
Clean sand will be placed on top of the others to fill in any voids between stones or gravel and to encourage the bottom of the canal as a habitat
- Installing controls to prevent CSOs from undermining the clean up
- Excavating and restoring the former 1st Street Basin and a portion of the 5th Street Basin
- Treating the dredged sediment at an off-site facility

The location for treating the dredged sediment has been a contentious question for community members (Dobkin, 2013). For a year or so, many community members protested the EPA proposal for the treatment facility to be located in Red Hook, an area close to Gowanus with a high population of low-income people of color. Many people were outraged by this proposal, and “with community input,” the EPA chose not to proceed with this proposal. The finalized location for the dredged material has not been determined yet (EPA, 2013).

The EPA is working with NY State Department of Environmental Conservation (NYDEC) and New York City Department of Environmental Protection (NYCDEP) to prevent re-contamination of the area by making improvements to uplands and preventing storm water overflow and other illegal discharges from dumping into the canal. New York City and National Grid, an energy provider, are the two major PRPs because both entities own contaminated land around the canal. Over 35 PRPs have been identified since the listing (USEPA, 2013).

New York City owns the bottom of the canal. National Grid owns the former manufactured gas plant sites and will remediate them through the State Superfund and brownfield clean up program (USEPA, 2013). To reduce CSO contamination, NYDEC will work with NYCDEP. An approximately 58% to 74% CSO reduction is needed to ensure a proper canal clean up. To do this, EPA is requiring that CSO discharges from two major outfalls in the upper
part of the canal (the most polluted) be diverted to retention tanks and other CSO control measures (EPA, 2013).

The land has to be cleaned up to State level standards in order to redevelop the land around the canal. Standards vary depending on the zoning of a parcel of land. Currently, much of the lands are still zoned as industrial and manufacturing land, meaning the level of contamination tolerated on these parcels is higher than land zoned for residential purposes. The canal is considered a class SD, impaired waterway by New York State’s Department of Environmental Conservation. This means that it is marine water with the best usage for fishing (NYDEC, 2013). Although this classification doesn’t assume the water body can support fish, the level of cleanliness that will result from clean up efforts will be determined by this waterway’s ability to support fish life. The classification of the canal determines the level to which it is cleaned up. AA and A classifications are assigned to sources that are drinking water, B can support swimming or other recreational contact, but not to be used for drinking, C is for waters that support fisheries and are suitable for non-contact activities, and D is the lowest classification for a water body, and therefore, not appealing to community advocates who want the canal to be restored or physically accessible for human and non-human uses (NYSDEC, 2014).

Because contaminants from the ground leach into the canal, the clean up responsibilities were somewhat convoluted until the EPA released their final plan. If left alone during the remediation period, the polluted outfall problems would continue to pollute the canal once the EPA’s remediation concluded. This issue caused difficulty in parsing out which entity has responsibility for which clean up activities. The unclear communication about the problem in community meetings led to frustration during question and answer periods after presentations and extended public comment periods about EPA decisions and proposals. These frustrations
have been somewhat resolved by EPA community outreach and communication in public meetings and with The Community Advisory Committee (CAG), which is the largest in history, with over 50 members and 6 committees. The EPA released a community involvement plan in 2013, which outlines how the EPA will interact with community members, which is quite different from the City plan, which did not explain the process of community involvement (USEPA, 2013).

The clean up process is expected to finish by 2020 and will cost over $500 million to complete. In the Record of Decision, the EPA outlined the methods for cleaning up the canal and why the agency had chosen such remedies. It also stated that some of the motivations for cleaning the area included that:

“Current and expected major development projects in the area will likely bring substantially more people to upland portions of the canal, adding to the number of people subject to the identified exposure pathways. NYC has previously identified such redevelopment pressures as justification for the timely implementation of a remedy” (EPA, 2013; p. 80).

The EPA clean up plan outlines the clean up process in detail, as opposed to the City plan for working with developers to remediate sites along the canal. In general, the community supported Superfund status and supports the clean up agenda.

When I asked interview participants to disclose why they think the canal is being cleaned up now, several varying opinions arose. Some interviewees commented on why the canal became a focus for clean up and development after many years of contamination had mounted. Some believe it was fortuitous that an EPA Region 2 employee lived in the area and could advocate from within the agency for a remedial investigation. This participant, an older white woman and community activist who has lived in the area since the late 1970’s, said “In 2010, the Gowanus Canal was placed on the National Priority List and done by someone who lives in the
area and works at the Federal Environmental Protection Agency and knew first hand the situation, and sought the opportunity to make it better and nominate it. It was a community effort to get it on the list with many organizations involved” (Participant #1, 3/15/2012). Some others think Superfund listing consideration moved forward because there was a longstanding community effort to get the canal cleaned. One middle aged white woman, who is an environmental educator and resident of a nearby neighborhood said "A lot of the grassroots stuff that happened back in the 70's actually helped produce the situation today in which people are actually addressing the situation” (Participant #2, 3/23/12).

Others believe that Superfund listing was related to real estate and development pressure due to Park Slope and Carroll Gardens reaching gentrification saturation. One interviewee, an middle aged environmental educator who moved to a neighborhood closeby in the 1990’s stated that "There are a lot of new people who moved to Brooklyn and the areas around it have been, for better or worse, gentrified. I think that has also put some pressure on the city to do something about the area, because it's in between Park Slope and Carroll Gardens and it's been sort of a wasteland for so long, and now that these areas are trendy, I think everyone is starting to realize, hey, that could be valuable real estate. Real estate controls everything. It's why the canal was built. It's all about real estate pressure, really” (Participant #2, 3/23/12). A mid 30’s, white male participant who works in the area, said, “There's money in it. The Brooklyn renaissance has been percolating for 10 years and the forces of real estate and Carroll Gardens finally reached a critical mass and it started to become an option. I also think the pumps working consistently was vital too” (Participant #10, 3/27/12). Another participant, who is a senior white male and long-term resident and community development advocate, added that the canal is being cleaned up because of “in the past 15-20 years, the influx of young professionals, the lack of space to
develop. Brooklyn is hot and outpacing Manhattan” (Participant #7, 4/22/13). A middle aged white male, long-term resident and developer said that, “The reason why it's getting attention now is because developers along the canal have sort of renewed focus to the canal because they all want to build luxury condos on the canal. Some of the developers, once the city and state got involved and you have to do environmental impact statements, I think it just brought attention to it and it finally caught the EPA’s attention and their efforts. Times have changed and real estate pressures bring more action than non real estate pressures. If they see they can make lots of money, it encourages that kind of cost to be spent on a proper clean up” (Participant #4, 9/22/12).

To further explain the relationship between the real estate industry and the city, a white male, mid 30’s aged lawyer and community activist said,

“When the city was talking with developers about clean up, they were only talking about pieces of land, not the canal itself. Usually, a developer will come to the state and say we know this property is contaminated we want to build on it, so we will voluntarily work with the state and then we're going to build on top of it. In exchange, there are tax breaks involved and other incentives, so that the developer fronts the cost of the clean up and gets to build on it. In this case, there are three manufactured gas plants and the liability is on national grid (on Public Place), under Lowes there was one but it wasn't fully cleaned up, so there is a lot of contamination that is floating under the parking lot at Lowes that is National Grid’s responsibility. So it's a misnomer that the city will find developers to clean it up, it's really just somebody who thinks there is enough potential for profit after paying for a clean up. None of that would have gotten at the sewage or the bottom of the canal” (Participant #8, 4/18/13).

An older, white female artist and activist, simply stated that, “There has been a lot of development interest. Clean up does go hand in hand with development. There used to not be as much of a concern with cleaning the environment” (Participant #9, 4/18/13).

Through these comments, it seems most interviewees believe that several conditions had to be met for the canal to be considered for clean up: community activism had to have political connections to broader decision makers outside of a few surrounding neighborhoods, there had to be real estate development interest, and gentrification saturation had to occur on both sides of the
An middle aged environmental educator who moved to a neighborhood closeby in the 1990’s interviewee said, “I see gentrification driving the desire to clean it up. Not to say there wasn't an effort (to clean up) before. But property values start to increase and it creates pressure closer and closer to the canal and people are like, this property would be worth a lot if only the canal didn't smell so bad. When these houses weren't worth anything, no one would have thought to clean up the canal because what did it matter? But now, there’s this pressure” (Participant #2, 3/23/12).

However, another interviewee, who is a white middle aged woman and long-time resident of a nearby neighborhood and has taken part in activism, made a connection of the waterway being cleaned up to shifting ideas of how cities are viewing waterways. She said, “It's because people imagine that it's cheaper than the rest of the city. And people say ‘oh, well it's waterfront’” and added further that part of this desire for waterfront living was based on people in cities learning to appreciate waterways “again”. By telling a long story of the historic use of hand boats (canoes and kayaks) in the East River, the same interviewee eluded to changing interests in water and the city:

“In the 60's, everybody was running away from the city. But now, people are coming back to the city and saying oh, we love it. Let's be in the water, along the edges of marshes. Let us reclaim our love. I think it's a very honest embracing of who we have been and who we can be to want the Gowanus Canal to be a great place. The problem is that with all of that romantic passion comes along the people who come along as voyeurs. You have desire and lust. I think that desire is pure and promising as an emotion that can transform many things. I think that people who are afraid to engage in the activity, they want to sell something while people are engaging” (Participant #5, 4/18/13).

This comment about the commodification of the waterfront is very apt at describing aspects of the process of neoliberal development: cities need to be autonomous and able to meet their needs through development strategies that will allow them to garner revenue to support other services. Revenue creation through housing, commercial development, and tourism on the
waterfront may be a way to gather taxes for other purposes. However, allowing the waterfront to become physically accessible without a hint of tourism to provide city revenue would be unthinkable. It also elucidates Neil Smith’s idea of the revanchist city. All of the children of former city dwellers who grew up in the suburbs are coming to the city, hoping to make it their own in a re-envisioning and assertion of ownership of urban space.

**Conclusion:**

The past and present plans for clean up, and the conditions that led to the current plan seem to suggest that there were conditions that had to be met for Gowanus to be considered for clean up. Perhaps the best example of a similar water body Superfund site is Newtown Creek; located on the Brooklyn and Queens border. Both were industrial during the same period, have CSO problems, and are located between two gentrifying areas. However, the EPA listed Newtown Creek as a Superfund sites due to the Hazardous Ranking System rating it received during the remedial investigations (USEPA, 2012). In addition, the New York State Department of Health and Agency for Toxic Substances and Disease Registry recently released a health study for Newtown Creek, which was never completed for Gowanus.

Other formerly industrial and polluted water bodies in New York and New Jersey area, such as Newtown Creek Superfund Site and the Lower Passaic River Restoration Project include more comprehensive plans that address health or other environmental concerns concerns (USEPA, 2014[5]). The Diamond Alkalai Superfund Site (listed in 1984) project addresses the interaction between a riverfront Superfund site, and the impacts this site has had on the Hackensack River, Newark Bay and the Lower Passaic River (USEPA, 2014[6]). These broader concerns are not addressed comprehensively in the Gowanus case.
Chapter 5: Visions for the Future

Introduction:

What Gowanus looks like after the clean up process is complete depends on which visions of the canal gain approval and are implemented. Several varying concepts of the canal’s future have emerged from discussions at public meetings and plans or renderings from government agencies, real estate developers, non-profits, community groups and architecture and design firms. There are several reoccurring themes found in the visions for the canal, including an effort to develop “sustainably” or in a “green” way: the methods to achieve this changing depending on the organization using the term.

In this chapter, I will outline the many future visions of the canal in relation to the interviews I conducted with community members in order to describe how community planning efforts have been influential in the redevelopment process. I organized these ideas into three types of visions for the canal, although it is clear from the interviews that these distinctions often overlap: 1) economic, arts and culture development, 2) historic and neighborhood preservation, 3) ecological restoration and adaptation to climate change and flooding. Interspersed in these visions, I have included a discussion on how these visions could impact how the area is redeveloped and descriptions of some of the plans that are already underway.

I asked interviewees questions concerning neighborhood change, environmental clean up and whether or not they might consider leaving as a result of these changes. Many people referred to the goals for the canal clean up based on how the canal is defined by different clean up entities, broadly defined as a “produced” or “natural” water body. The various definitions of nature that community groups and residents used to create their version of the canal’s future impacted the various ways they envision it.
Because many people have long been involved in the effort to get Gowanus remediated, there are many goals and high hopes for the redevelopment of this space. Some think the area should be altered to increase waterfront access, becoming a waterfront oasis for the public to stroll through with new residential and mixed-use waterfront property surrounding it. Some would like to preserve the history of the area and create arts, entertainment, or environmental education opportunities. Some groups want the canal to become a working waterway or industrial center once again: encouraging industrial, non-polluting, creative and green businesses to move in. Some want it to be restored to a wetland to increase the ability for wetland species to survive, or restored to allow water recreation activities to take place. Others would like to showcase the area as an innovative area for green infrastructure creation. However, there are also groups of people who want the canal to remain filthy, therefore possibly buffering the area from high New York City rents.

When I asked the participants about how the neighborhood is changing and how the clean up might impact the neighborhood, most of the participants believed that the clean up would be good for the neighborhood. They anticipated that the clean up would bring jobs and recreational space. They expected the canal to support a recovering ecosystem and sometimes, that it should be clean enough for people to swim in. As discussed in the previous chapter, several of the participants suspected that one of the reasons the area is being cleaned up now is that new residents of the area are interested in the area being clean. One early 30’s white male activist and participant said, “all of these buzz words: green, organic, it’s what people are interested in today. People didn't care 30 years ago, but they care now” (Participant #8, 4/22/2013). However, several of the public meeting participants and community groups involved are comprised of mostly middle to retirement age residents. To address this dichotomy, this chapter will explore
future visions of Gowanus in an attempt to partially understand who is shaping the future of development along the canal and whom this space is being produced for.

**Economic, Arts and Culture Development:**

**Mixed Use:**

In 2008, the New York City Department of City Planning (DCP) conducted a rezoning study for approximately 25 blocks of industrial zone along the canal. DCP argued that rezoning the area for multiple purposes would maintain the industrial and commercial activities taking place, while cleaning up “underused” sites, providing opportunities for affordable housing and public access to the waterfront. The resting place for the waste from the contaminated parcels of land was not part of the conversation at that time. The agency conducted a public input period and held meetings in the area to understand community concerns about the possibility of rezoning, prepared and environmental impact statement, held meetings with the community board, borough president, city planning commission and city council (DCP, 2008).

The study outlined possible rezoning areas along both sides the north end of the canal, meant to “invigorate the pedestrian environment” (NYC Department of City Planning, 2008). Figure 26 below visualizes the rezoning plans, which includes waterfront walkways on the canal side blocks, first floor non-residential uses for upland blocks, off-street parking in the flood zone, affordable housing in development and mixed use districts in some of the area formerly zoned for industrial and manufacturing uses. The mixed uses would include residential, light industrial, commercial, community facility, retail and artist spaces. When discussing the potential for waterfront housing development, one older white man and long time resident and community advocate said, “All of the sudden it became hip to live near the water. I'm thinking to myself, excuse my French, but I don't give a shit about access to the water. I'm not a fish. I don't swim,
especially in the water around here. Access to the sewer is what they ought to call it” (Participant #6, 4/22/13). The view that the water in the canal is not an asset, but a detrimental aspect of the neighborhood is one that reoccurred through the interviews, especially amongst older residents who grew up in the neighborhood. Perhaps the idea of using the Canal seems absurd to these longtime residents because the water has historically been seen as polluted, off limits, or something to stay away from due to crime or contaminants.

Figure 26: City Planning Vision of Gowanus Through Key Words (DCP, 2008)

The plan also outlined stipulations for new development. New properties would be created to fit in with the existing typical height and building area for the surrounding buildings. Developers would be required to clean the contaminated site they plan to build on and encouraged to use storm water best management practices. Developers seeking a larger scale
development could agree to participate in the inclusionary housing program, in which 20% of all units are affordable housing as an exchange for a 33% floor area increase. These units would be available to those earning up to $61,450 for a family of four and would be permanently affordable (DCP, 2008). The remaining 80% of the units would be rented or sold at market rate and under the scrutiny of the developer who takes part in the “inclusionary” housing program. Recently, news coverage about housing developments that take advantage of this benefit has exposed that these developers sometimes create income segregation in the form of separate entrances for market and non-market rate rental units, or “poor doors” (Navarro, 2014). The implications of poor doors have stirred interest from many anti-discrimination groups and neighborhood associations. It is unclear if this practice will occur along Gowanus, but it is a way in which developers have been able to use City planning policies to eliminate the possibility of stigma buildings might gain as a result of allowing non-market rate units: allowing wealthier residents to feel separate from those who might benefit from non-market rate units. This loophole has allowed a policy aimed at creating affordable units to develop into a discriminatory housing practice.
Since 2008, few of the proposed rezoning areas in Gowanus have been adopted. The only site that has been rezoned is the Public Place brownfield site on the west side of the canal (M1-4/R7-2 below), which was approved on March 11, 2009 as a special zoning district (New York City Department of City Planning, 2013). The Department of Housing Preservation and Development announced in 2007 that it would oversee the clean up and redevelopment process of the site. Proposed future use of the site will include an eight building Hudson Companies
development called Gowanus Green, which will include a park, trail along the banks, and a rain garden (Gowanus Green, 2009).

Figure 28: Zoning Changes in Gowanus

The once industrial areas surrounding the Gowanus Canal, despite being flood prone, contaminated, and a Superfund site as of 2010, have been targeted for residential and mixed-use development as a result of the rezoning efforts. The brownfields are being cleaned up incrementally by developers who often gain tax breaks from city and state brownfield redevelopment programs for choosing to build on such sites (BOA, 2013). The area draws huge developers in search of space for new residential and mixed-use development overlooking the harbor or the skyline.
Many residents see the mixed use zoning as an end to the neighborhood as they have known it: a practice that perpetuates environmental inequity by limiting access to clean spaces within the city (See Maantay, 2002). Rather than see the area turn over parcel by parcel to developers, several interviewees mentioned that they support creating more opportunities for and maintaining the existing manufacturing in the area, since it has historically been used for production and is contaminated. One middle aged woman resident, educator, and participant supports economic development by creating space to produce goods, “I believe that making stuff is a philosophical and ideological. We should be producing stuff only when we consume stuff, and you put that together and I think you should build an economy of production, not consumption” (Participant #2, 3/23/12). And a younger, white male community member supports manufacturing as a reflection of the history of the area: not as the present condition, “The area around the canal is designated for manufacturing for a reason, and Whole Foods did not demonstrate any reasons beyond bullshit that they deserve the variance on the grounds of the laws that they were talking about. You got a mayor who acts like a king who can say well fuck it, we really do want the suburbs in the middle of Brooklyn, because there are a bunch of suburban families that live right there and this is a better use of space and money. That would have been an honest answer. I think there is a strong argument for sustainable businesses where you can live and work and make things and do stuff that is aligned with the history of this place and aligned with a sustainable future for this city for a whole range of financial demographics. Protecting manufacturing is essential for that, even if it's unrealistic this year, in 20 years, we're going to have to be making stuff again” (Participant #10, 3/27/12).

Another middle aged white woman member of a community board and participant said that support is dwindling for manufacturing and that, “The Gowanus is one of the only places left zoned M1 and M2 and I would like to see that taken seriously. The loss of manufacturing in NYC is a great tragedy” (Participant #5, 4/18/13).

A few interviewees also made reference to bringing back the maritime uses of the canal. One participant said, “There's the idea of using the canal for maritime use. It would be great to
have boat marinas, and non-motorized marinas. It would be a great place to have boat builders and boating: a full range of nautical stuff there. How much of this would be for work or pleasure depends on the oysters. If we could get oysters going, there are a lot of things to dream and imagine” (Participant #5, 2013). The notion of the canal supporting oysters, as it once did in the 1600’s, seems a romantic vision of going “back to nature”, much like the “gas-light type” notion of bringing back the history of Park Slope in the 1960’s. However, a middle aged male businessman said, “I would much rather put the resources into building factories and sewage treatment plants around the canal, not adding to it's contamination. So don't fish, swim or boat in there, but keep it a working waterway and don't waste half a billion dollars to clean it up only to bring housing. I don't think it's productive effort” (Participant #4, 9/22/12).

Lightstone Group, one of the nation’s largest real estate firms, planned and gained approval for a huge residential development on the rezoned site (MX11) next to the canal after Toll Brothers, another large developer, chose not to pursue the development, reportedly due to financial problems related to superfund status (NYT, 2012). The plan, initially developed by Toll Brothers, sought to redevelop Public Place, on Smith and 5th Streets, an area once used as a public landing site along the canal. Plans included rezoning the area from manufacturing to residential and commercial, developing a community facility and 111 underground parking spaces, a 1.2-acre public accessible waterfront park and other open space, including a publically accessible, but private rain garden. The plan included 774 market rate and an undisclosed amount of affordable housing units, although the plan said it included “up to 70 percent” affordable housing units. The plan called for “green roofs, the use of recycled and natural materials, natural ventilation, an innovative storm water management system, and high standards for indoor air
quality and energy efficiency” (New York City Department of Housing Preservation and Development, 2008: p. 2).

The Lightstone Group project met opposition in the neighborhood for several reasons. One middle aged woman participant and educator referred to the project as an example of “Real estate controls everything. It's why the canal was built. It's all about real estate pressure, really” (Participant #2, 3/23/12). Residents felt that control over development in Gowanus was handed to developers, instead of the community. Another older, white woman community member and activist said that, “The value of development is more than the value of the people” (Participant #1, 3/15/12). Several attempts to stop the Lightstone Group have delayed demolition on the site, including a potential historic site designation that threatened to stop the project. However, after a 60-day delay with no definitive decision to designate the area as a New York State historic site, demolition began in April of 2014 to prepare the sites for the future development (Kensinger, 2014).

The development of Whole Foods on 3rd Avenue and 3rd Street also met opposition from the neighborhood. The company officially broke the ground for their first Brooklyn store in 2006, but the store only recently opened in late 2013. The site is now home to a publically accessible esplanade, a greenhouse on the roof, a parking lot for 430 cars and a room available to community groups. Other store amenities include bike parking, knife sharpening, a record store, a juice bar and rooftop beer garden overlooking Gowanus. It was developed with support from the New York State Department of Environmental Conservation’s Brownfield Cleanup Program (Whole Foods, 2013). Public controversy over this project began when the plans were announced and some residents challenged it. One long time white resident and businessman said that the people:
“Who just want their Whole Foods, who couldn't give a shit about a working neighborhood, claim that it's been empty for 7 years, and is it better to have an empty lot than a productive supermarket? Well, first, the only reason that site is empty is because Whole Foods bought the property through those 5 businesses that were there, drove the businesses out and demolished the buildings. Those were productive parcels of land until they showed up. And second, there are other approaches to develop a viable real estate project that brings jobs. A project of an industrial nature could have build 370,000 square feet of new workspace, and it would have brought 900 jobs to small businesses that are local. Better than one supermarket that’s an international public company employing 250 people at service rates. Whole Foods is the beginning of the end of the neighborhood producing anything. Now the rezoning is certain to come in 2 years “ (Participant #4, 9/22/12).

Another woman in her 30’s and community advocate was skeptical of the Whole Foods development because of the larger shifts that it means for the neighborhood, “The incentives and rewards are in place to undermine the businesses that are working to allow for bigger business to replace it. And it's happening all over the city, because you (the City) want to the richer people in afterwards” (Participant #11, 3/27/12). Regardless of community support, these developments moved forward with help from city and state brownfield redevelopment programs.
The New York State Brownfield Opportunity Area Program (BOA), an economic development program, provided two interlinked organizations in the neighborhood a grant to come up with proposals for how to redevelop the brownfields surrounding the canal on the east side. Community Board 6, one of the 59 local representative and advisory bodies to the City, relays community planning activities and makes recommendations to government officials and The Friends of Community Board 6, an organization aimed at providing support to Community Board 6, gathered proposals and developed a final nomination study for the Brownfield.
Opportunity Area program. The plan calls for the clean up and redevelopment of a 131-acre area on the east side of the canal: 79 of which are potential brownfields (FCB6, 2014). The organizations chose to nominate these areas with the support of New York City’s Department of City Planning, which had previous plans for retaining manufacturing in these areas through the Gowanus Canal Corridor Framework rezoning project (Friends of Brooklyn Community Board 6 FBCB6, 2011). However, the study proposed mixed use along the two most residential areas on the east and west side of the canal (see Figure # for the study area). Community members who were involved felt that the nomination into the BOA program encouraged administrators of the grant to maintain the area’s function “as centers of industrial and commercial activity, and will work to create a compatible strategy for redevelopment” (FBCB6, 2011). The goals for the BOA Nomination Study (FBCB6 and Starr Whitehouse, 2013) include the following:

1) Support and grow industrial business presence in Gowanus
   a. Promote investment in industrial business, in both emerging and traditional sectors
   b. Encourage investment in industrial building stock
   c. Improve essential infrastructure to facilitate daily business activities
   d. Preserve built character through adaptive reuse of existing architecture where possible

2) Preserve a navigable canal for all users (commercial and recreational)
   a. Encourage property owners to make bulkhead improvements in conjunction with the EPA work
   b. Develop a waterfront access plan to ensure thoughtful integration of waterfront zoning requirements with local business needs
   c. Support environmental restoration and contextually-appropriate waterfront access

3) Integrate evolving interests in Gowanus (cultural, environmental, recreational) with existing industrial and business interests to foster a multi-faceted, productive, creative economy
   a. Encourage strategic implementation of on-street green infrastructure facilities that complement local businesses
   b. Support local efforts to develop environmental remediation and public access amenities where contextually appropriate
These goals were developed with input from several community organizations. There is no mention in the plan of housing development or preservation, or affordability, although if implemented, these goals would almost certainly impact housing access in the area.

Figure 30: Friends of CB6 BOA Nomination Study Map (Friends of CB6 and Starr Whitehouse, 2013)
NYC Department of City Planning recommended areas A and B for mixed-use zoning in 2009. The black dotted line (areas C and E) indicates the Brownfield Opportunity Area study area, and includes areas where NYC DCP “intended to remain industrial” (FCB6, 2014).

Arts Development:

Artists are not a new group of residents using Gowanus for studio space. Several artists moved into the area in the early 1980’s, using the neighborhood’s large, empty and then inexpensive spaces for studios. The number of studios is increasing. In the past 10 years, several workshops or exhibition spaces have opened in Gowanus. Proteus Gowanus, an art gallery, reading room and a space for Gowanus historic artifacts opened in 2005, although artists have
worked in the building since 1980. Arts Gowanus organizes the Gowanus Open Studios: an open studio event that has been taking place for the last 17 years. For one weekend each year, the public can enter many studios in former factories, warehouses and other buildings in Gowanus. In 2013, 150 artists opened their studios to over 3,000 members of the public (Arts Gowanus, 2014).

The Textile Arts Center opened a workshop space to teach textile related classes in 2009 (Textile Arts Center, 2014). The Old American Can Factory on 3rd Avenue and 3rd Street, was redeveloped between 2003 to 2010 and now houses nearly 300 people working in “creative industries” (XO Projects, 2013). During the same year, Brooklyn Ballroom opened an exhibition and studio space on 9th Street. Gowanus Studio Space provides space and equipment for working artists (Gowanus Studio Space, 2014). And Brooklyn Art Space opened in 2013, with 30 studios, a gallery and quiet room for writers on 3rd Avenue and 6th Street (Brooklyn Art Space, 2014).

Regardless of the new art space space development; some of the older artists, who moved in during a wave of studio space interest in the 1970s to the 1990’s, feel they are being pushed out of the area. One middle aged white woman resident and community board member said, “I have friends who have shops and studios down there and they are feeling very much under siege” (Participant #5, 4/18/13). But those who spoke about this issue failed to recognize that when they moved into the area, they may have been contributing to real estate interest in the area, and therefore, raising rents for their neighbors. Another middle aged white woman and artist romanticized about the industrial past as being a place where art inspiration could happen more readily than a redeveloped space, “A lot of the artists sort of stubbornly would like to keep it (the canal) as it is because they know that it's going to be cleaned up and that's going to promote development” and further, that “They got rid of some of the big old rock crushers and some old
equipment. Some of the things the artists really loved got taken away as a beatification measure. Some of the old artifacts disappeared and some of the graffiti has been painted over” (Participant #9, 4/18/13). This person also added that the older artists are not taking part in the redevelopment of the area, and therefore have little impact on the process, “Some of the people in the (artist) community just aren't aware of what is happening and aren't actively trying to find out what's happening, and so they kind of get left behind. You really have to be actively going to meetings all of the time if you want to have any impact” (Participant #9, 2013). Another middle aged white male resident and businessman spoke of arts development in Gowanus as a negative impact on the area and a strategy that will only bring gentrification. “You don't need arts and culture to revitalize neighborhoods, in fact, all it does is gentrify neighborhoods. I don’t think its positive” (Participant #4, 9/22/12). However, the few people who mentioned arts development in the area also supported the film industry and reuse sectors moving in to the area.

Reuse and Recycling Sector:

New York City has a growing group of organizations dedicated to reducing waste from entering landfills that are now seeking the relatively cheap, large warehouse spaces for storage. The New York City Department of Sanitation partially funds some of these organizations to help them obtain waste reduction goals (NYC Department of Sanitation, 2013). In a survey of reuse organizations in New York City, the Materials Exchange Development Program found that lack of affordable physical space is a major obstacle for reuse organizations being more successful in diverting materials from landfill. Many organizations said that finding enough physical space to keep trucks for transporting reused items and space to store items until the organization can find a new owner was a challenge (Materials Exchange Development Program (Reuse NYC), 2008).
In the past several years, several reuse and recycling organizations have located new facilities in Gowanus, using old warehouses as storage space for transportation and to store items to be reused or recycled. In 2011, Build it Green, a building material reuse and composting non-profit, opened a second facility in Gowanus. The other facility is in Astoria, Queens. In 2013, the organization diverted 2,000 tons of building materials and 300 tons of compostables from New York City’s waste stream (Build it Green, 2013). The Lower East Side Ecology Center E-waste Warehouse collects electronic waste, such as televisions, computers, cell phones, video games and many other materials for recycling and reuse. They expanded their e-waste collection from semi-annual events to a permanent drop off location with regular operating hours in Gowanus in 2009. They also opened a store in 2012 at the facility for selling refurbished items from the e-waste warehouse (Lower East Side Ecology Center, 2014). Since 2008, Film Biz Recycling has collected materials from film, television, commercial and theatre communities for resale and redistribution in the city. They have prevented nearly 450 tons of materials from the New York City waste stream (Filmbiz Recycling, 2014).

None of the community organizers mentioned the influx of reuse and recycling facilities in the area, but a few of the residents mentioned these facilities. The Lower East Side Ecology Center e-waste warehouse is located amongst the small area of residential space near the northeastern side of the canal, and several neighbors mentioned that they supported it being located there. However, they also mentioned that noise from the warehouse is distracting. The issue of noise came up several times when residents spoke of construction, trucks and manufacturing happening in the area.
Historic and Neighborhood Preservation:

Several community groups are led efforts to create historic preservation in the area around the canal. Friends and Residents of Greater Gowanus attempted to place the Gowanus Canal Corridor on the National Register of Historic Places as an Urban Industrial District. This designation would have done three things: 1) registered properties and properties determined eligible for the Registers receive a measure of protection from the effects of federal and/or state agency sponsored, licensed or assisted projects through a notice, review and consultation process, 2) owners of depreciable, certified historic properties may take a 20 percent federal income tax credit for the costs of substantial rehabilitation as provided for under the Tax Reform Act of 1986, and 3) municipal and not-for-profit owners of listed historic properties may apply for matching state historic preservation grants (New York State Department of Parks, Recreation and Historic Preservation, 2013). The proposal for creating a historic preservation near Gowanus district was denied.

In 2009, the City Department of City Planning released the Gowanus Canal Corridor Rezoning Project Cultural Resource Assessment, part of the City Environmental Quality Review process. The document identified areas that may be impacted by the rezoning project, including areas with potential archaeological and historic architectural resources or cultural resources that may be impacted by the project. The document outlines 26 projected development sites (made up of 74 individual lots) and 40 potential development sites (comprised of 68 city lots) throughout the rezoning area. Out of these lots, 16 had the potential to contain archaeological resources from the 19th century. The document also found 28 historic properties and examined whether these properties could be protected as City, State or National landmarks. Out of these sites, 7 could potentially be negatively impacted by the zoning changes.
Through the Superfund clean up, there is a Community Advisory Group sub-group dedicated to historic preservation of Gowanus artifacts. The group is concerned about the possibility of damaging historic artifacts during the clean up process and has monthly meetings devoted to discussing any new findings, and what to do with anything dredged from the bottom of the canal (EPA, 2013). One middle aged white female member of the CAG said that “a lot of these superfund sites are places that are really dirty, but they're also places where a lot of history happens, and there was a lot of human activity there. This one is unique because it was the site of a revolutionary war battle, and there aren't any others, to my knowledge, that are revolutionary battle sites as well. So it's an interesting site and you want to make sure that people are aware of that history if anything is found (through the dredging and clean up process)” (Participant #2, 3/23/12). Once dredging begins in the canal, this group will help advise the EPA on how to preserve the neighborhood history and where the artifacts will be stored.

**Ecological Restoration and Adaptation to Climate Change and Flooding:**

Although most of the planned projects and visions have a sustainability focus, only a few focus on preventing the negative impacts of building in an already low lying flood zone and former wetland. Several of the community groups and members of the Community Advisory Group are pushing for wetland restoration and habitat protection.

In the current plans, the waterway may be cleaned to a low standard due to the New York State SD classification it holds. Although no developers seem to have an opinion about this issue, a few local community groups are unhappy with this distinction. There is one non-profit group that has repeatedly asked New York State and the USEPA to reclassify the canal so that the level of water cleanliness reflects how the community uses it; for fishing and recreational
boating, they argue. Without a higher standard, this group argues that the canal will never be “clean” of pathogens, which are a product of sewage in the canal (FROGG, 2013).

In 2010, The Department of Environmental Protection listed the Gowanus Canal watershed as a priority area for storm water management through green infrastructure. The department estimated that 61% of the acreage surrounding the canal could be used to prevent storm water runoff into the canal through green infrastructure. The Green Infrastructure Plan presented several options for reducing runoff by as much as 10% to the canal by constructing green roofs, bioswales, rain barrels and residential retrofits in the area (Department of Environmental Protection, Green Infrastructure Plan, 2010).

So far, bioswale creation has been a priority. Bioswales are similar to tree pits, but are built within sidewalks and contain a catchment basin for runoff water from the streets or sidewalks. The bottom of the catchment basin contains layers of soil and gravel to allow water to permeate soil underneath. Since the plan was released, four of these 20 by 5 foot bioswales have been installed in the Gowanus sewershed. The New York Restoration Project was awarded a grant to install a bioswale in Gowanus that will manage approximately 130,000 gallons of stormwater a year. The project also funded the development of a small education station with a weather monitoring station and an outdoor classroom (Department of Environmental Protection, Green Infrastructure Plan Annual report 2011). Construction of new storm water management infrastructure began in the fall of 2013, and as of the 2013 annual summary, 2% of the land around the Gowanus Canal is currently managed by use of green infrastructure, with construction to increase in 2014. (Department of Environmental Protection, Green Infrastructure Plan Annual report, 2013).
In 2009, the Hudson-Raritan Estuary Comprehensive Restoration Plan indicated that Gowanus Canal Sponge Park, designed by dlandstudio working with Gowanus Canal Conservancy, might be one tactic for starting the process of restoration in the area. This plan included open space aiming to slow, absorb and filter surface runoff, preventing runoff from reaching the water in the canal. The plan includes retention areas for stormwater runoff and relies on plants to filter runoff water and release it into the canal. The plan also indicated that contaminate removal, improving water circulation, and habitat restoration should be a goal for Gowanus (US Army Corps of Engineers et al., 2009).

The Gowanus Canal Conservancy formed in 2006 from former members of the Gowanus Canal Community Development Corporation’s (GCCDC) Environmental Committee. The Conservancy worked with a design firm and New York State Council on the Arts to develop plans for Sponge Park. This plan called for increased recreational space along the canal with an esplanade and pavilion, a boat launch and a wetlands educational facility, which the GCCDC is a supporter of. The new green space would take shape by creating new wetland-like esplanade with walkways along most of the length of the canal. It would also connect the newly formed green space with JJ Byrne Park, upslope on 4th Avenue and 3rd Street.

The Sponge Park plan would include storm water diversion and vegetated walkways would serve as catchment and filtering surfaces for runoff. Although, because the paper focuses on the Sponge Park conceptual plan, the amount of runoff prevented from reaching the waterway or filtered by vegetation is not included in the document (Gowanus Canal Conservancy, 2012). See Figure 32 below for a rendering of this project.
The NYC Department of Environmental Protection awarded the Conservancy money to build seven bioswales along 6th Street and 2nd Avenue. These swales are projected to capture
40% of the runoff within the “seven-swale area” of 45,000 square feet of streets and sidewalks (NYC Department of Environmental Protection, 2014).

**Climate Change and Flooding:**

The extreme storm events over the last few years, including Superstorm Sandy most recently, brought the issue of climate change to the forefront of planning in New York City and the state of New York. During Superstorm Sandy, many Gowanus residents were fearful of contaminated materials left by floodwaters in their basements, garages and first floor apartments (Harris, 2012). During this time, the Environmental Protection Agency sent testers to the area to conduct limited floodwater testing in two homes along the canal. They found that the water was highly contaminated with bacteria, and suggested that people cleaning up after the storm properly protect themselves. Other pollutants were found to be at “below levels of concern” (EPA, 2012). However, the threat of flooding did not disappear with the receding floodwater.
In January of 2013, only a few months after Superstorm Sandy, the State of New York announced a “retreat from the shore” plan (New York State Office of the Governor, 2013) for buying and demolishing coastline property damaged during Sandy to prevent redevelopment from occurring along areas likely to flood again in the future. As of now, this program will only address homes along the Atlantic coastline: the areas hit worst during Sandy (Kaplan, 2013).
However, many areas near the harbor and along the waterfront, including Gowanus, sustained significant flood damage and will also experience increased flooding in the future.

FEMA has redrawn flooding maps and the city is working on updating building codes to address the problems of building in flood zones. FEMA’s updated flood zone maps include twice as many building structures as the last update, which was completed in 1986 (Buckley, 2013). However, these maps do not reflect anticipated sea level rise. They also reflect a much smaller area than the total area of land impacted by Sandy, indicating they may be very conservative estimates of future flooding risks (Climate Law Center, 2013).

City plans have been slow moving in the past to adjust to increased flooding, and in favor of economic development over climate change responsive development. However, updated city zoning regulations may be able to shape the outcome of Gowanus in a way that might not have been considered pre-Sandy. In response to the storm, New York City released a plan, *A Stronger, More Resilient New York* in 2013, which outlines planning and coordination strategies for increasing resilience to future storms.

One older white male participant and community advocate told me that the planning visions for the neighborhood post-Sandy reflect that planners are starting to have “A realization that you have to be more in balance with nature” (Participant #6, 4/22/13). If Gowanus stands as a reflection of citywide development, the large scale (mostly market rate housing with retail on the ground floor) complexes will be permitted to build in flood zones, adding additional runoff into an already difficult to manage waterway in favor of economic development. Another older white male advocate and participant said that, "All of the sudden, people have to have access to the water…until they're under water" (Participant #6, 4/22/13).
One older Hispanic woman I spoke to when walking door-to-door told me that her home had been flooded during Sandy, and was finishing up a remodel in April of 2013 after the damage. Unlike some of her neighbors, her home is only two levels, with the kitchen and bathroom on the lower floor, making moving up a floor to avoid flooding in the future more difficult and cramped. She said that she “Can't afford to remodel again if it floods again” (Participant #12, 2013). She also said that after the storm, she could no longer afford to buy flood insurance due to the increased price of premiums, indicating that she would have to leave the area if another storm destroys her home. This story points to the limited ability for lower income people to develop resilience to climate change impacts, and therefore, to resist displacement as a result of flooding. As in the see-sawing pattern of uneven development, where the development of a space follows capital creation: developers of new commercial and residential space will be able to integrate plans for new buildings to withstand damage from future storms by building higher or integrating parking onto the first floor of a building or in other most likely to flood areas, but residents of smaller buildings may not be able to do so.

Conclusions:

There are many interests in Gowanus, and many participants contributing to the canal’s envisioning. Even though the clean up process has just begun, changes are underway in the neighborhood, and the ability to shape the outcome is becoming more and more convoluted. Plans for the area continue building up and layering on top of each other, making it more and more difficult to parse out whom is impacting these changes. One older white male advocate and respondent reflected on the planned and future development of the area as being out of control and as the death of the neighborhood: “Williamsburg looks like Miami. It will happen. It's inevitable” (Participant #7, 4/22/13).
Most of the interviewees felt that Gowanus has experienced very little stigma and that the clean up process has done little to slow down the development of the area. Several residents pointed out that properties nearby have been bought and sold along the canal recently; an effort for new owners to pay as little as possible for property that will one day, after clean up, be worth much more than they are now. One participant reflected on this pattern as a negative community development practice: “Land owners would rather buy up property and sit on it for a few years than rent it to a business or manufacturer because if (the mixed use rezoning is) approved, residential will make them a lot more money at increased land use density. This is the end of the ability for manufacturers to obtain leases.” Another older white male resident said that when it comes to new landowners and residents, “I think the stigma exists, but it’s not powerful enough to drive people away” (Participant #7, 4/22/12).

The ideas that several community members and organizations have for rehabilitating the canal to support oysters or edible fish, or clean enough to swim in seem to envision that the canal can once again be similar to the tidal wetland it once was. When the area was a tidal wetland, in the 1600’s, it may have supported some of these uses, but since then, it has been transformed several times to reflect the changing infrastructural and economic needs of different time periods. Although the housing and green space planning projects suggest that living along the water is an amenity many would like to have, this new vision of urban nature reflects something other than re-creating a tidal wetland. Rather, it reflects the developer interests in profiting from the perceived desire people may have to be close to an approachable, sanitized version of urban nature. This version may include waterfront parks and walkways, but makes no promises to create opportunities for direct contact with the water, the rehabilitation of once thriving
ecosystems, or the creation of a productive waterfront of any sort. It relies heavily on the idea that amenities will sell space, and in this case, that amenity is the canal.
Chapter 6: “Life never stays the same.” Gentrification and Displacement

An Overview of Change:

Following the pattern of nearby Carroll Gardens and Park Slope, Gowanus is gentrifying. New residents of these neighborhoods in the 1970’s and 80’s came from Manhattan and elsewhere, seeking a cheap place to buy property (Reiss, 2000; Osman, 2011). Until relatively recently, the area was somewhat stagnant. Now that the neighborhoods surrounding Gowanus have gentrified beyond affordability for most, and some barriers to development have been broken; Gowanus has been targeted for development. Gentrification began before remediation started in the area, and will likely continue.

Home value and rent prices have increased, and businesses continue to move into the area, including restaurants, bars, and coffee shops. Gowanus continues to change as rent prices, home value and resident income rise. This chapter will outline these changes and discuss how these changes relate to interviewee comments and perceptions. The discussion of responses in this chapter will be organized in the following order: 1) physical changes to the neighborhood; 2) demographic shifts in the neighborhood; 3) housing cost changes; and 4) displacement occurring or expected in the neighborhood.

Interviews:

I spoke to people who were either involved in community development or community groups, or lived within an approximately 1 square mile area with the most potential for drastic change in the years to come. These two groups discussed several ways the area has already changed and gentrified, and the opportunities for shaping the future of the area. I used two methods for determining where to conduct the door-to-door interviews: 1) I conducted spatial and demographic data analysis in GIS, and 2) I performed transect walks to perceive physical
changes I saw happening in the neighborhood. I also attended several public meetings concerning Gowanus to hear about resident and community activist concerns.

I conducted door-to-door interviews in a small cluster of residential units in Gowanus. The area surrounding the canal is zoned mostly for manufacturing and industrial purposes; therefore majority residential zones are limited. The area I planned for door-to-door interviews is changing quickly as a result of large-scale development plans, public infrastructure investment, and the possibility for mixed use zoning to be enacted there. There are several building permits and construction zones in the area, new businesses moving in, condo development, and demographic shifts taking place there as a result of rezoning. Because of these changes, it seemed likely that residents living there might be feeling pressure to leave. The area that was also extensively flooded during Sandy. I walked door-to-door, interviewing anyone who would speak to me within a predetermined cluster of housing on the eastern side of the canal, asking him or her a series of questions aimed at determining whether displacement pressure was occurring. These discussions lasted from just a few minutes to up to an hour. See Figure 35 below for a map of the interview area.
Figure 35: Door-to-Door Interview Area
I attempted to contact people living in 57 buildings on these blocks consisting of mostly one and two unit buildings. The largest building had 16 units. I spoke to people at 28 out of the 38 (73.6%) housing units that I made contact with verbally. These interviews consisted of six structured questions, which often led to several others. See Appendix A for question details. I first asked how long residents have lived in the area and whether they own or rent their homes. Then I asked if residents felt any need to leave the area and if so, why. I also asked if the residents knew anyone who had already left the area and if so, why these residents left. Although several expressed interest in doing so, none of the residents who I spoke to door-to-door had any part in community planning or decision making.

In order to speak to people more directly involved in decisions surrounding clean up and redevelopment activities, I spoke to 11 developers and business owners, people who belong to community groups, non-profits, or government agencies. Most of those individuals lived in either Park Slope or Carroll Gardens and own their homes. I spoke to 6 men and 5 women. They were also mostly between 45 and 65 years of age, and four participants were between 30 and 40. All of the older participants owned their homes, and all of the younger participants rented. These longer, more in-depth interviews took place at the location of the interviewee’s choosing: often in offices, homes and coffee shops. I found subjects to interview by going to community planning meetings and asking interviewees for referrals to others who might be willing to speak to me: a form of snowball sampling. Figures 36 and 37 below outline how long all of the participants have lived in the area, and how many rent or own their homes. Compared to Brooklyn, the home ownership rate is significantly higher in this group.
I asked the interviewees what types of changes they have perceived to date, and what aspects of the canal interest them. A few of the interviewees commented on the increased access
to neighborhood amenities. A late 20’s white male community advocate said, “I have more opportunities for doing business around the canal, more opportunities for entertainment, food and more jobs. And my young, hipster demographic is very well served by the changes that are happening around the canal (Participant #3, 4/3/12).” And added that, “Red hook is changing quickly, 3rd and 4th avenues are changing, the Park Slope side of Gowanus is changing noticeably into arts, crafts, and entertainment. There are new woodshops and a bunch of new venues. It's become a lot more hip and interesting in the last five years (Participant #3, 2012).”

Another younger white male said, “It's nice that it's still a little bit sleepy over here. But it's nice that I can have a meeting with a client in a coffee shop now too (Participant #10, 3/27/12).”

Regardless of how the neighborhood has changed to date, several interviewees noted that because the area has not entirely gentrified, there is room to take part in how the area is fashioned. A middle aged, long time white male resident said there is still room for influencing what Gowanus becomes in the future; “It’s still an important place to focus on, because the changes can still be shaped, as opposed to other parts of the city, that have had this sort of wave (Participant #4, 9/22/12).” A younger white woman in her 30’s interviewee and community advocate said that the area is, “Not currently just for people who live in million dollar condos and the people who clean their homes. There are actually people who live and work for themselves and scale their lives that way” (Participant #11, 3/27/12).

**Physical Changes in the Neighborhood:**

When I asked the interviewees how the canal itself has changed since they moved to the area, few cited any substantial changes to the physical environment of the canal. Some cited that seeing wildlife in the canal, or changes to the level of stench in the canal have indicated some positive change to the water quality. One younger white male resident and community advocate
stated that the physical environment of the “canal has not changed, but in the realm of public understanding, there's been a tremendous increase in awareness of the environmental challenges the Gowanus Canal faces and it's social value and its quirky beauty (Participant #3, 4/3/12)."

Some participants cited a reduction in crime in the area, fewer trucks, manufacturing and noise, but reluctantly referred to these changes as positive. A middle aged white male businessman and long time resident said, “I miss that bit of texture, so I think there is just less life and less working people (Participant #4, 9/22/12).”

**Land Use Changes:**

Several physical changes have taken place in the neighborhood, including new curb cuts and improved sidewalks, tree plantings and other green infrastructure, bike lane improvements, zoning changes, new buildings, and building alterations. Most of these changes can be seen along the canal, but spatial data reflecting many of these changes is not available.
Figure 38: Physical Changes in the Neighborhood
In the past several years, as I have walked through the area, I have seen many construction sites and residences being altered for some new use. Figure 39 below shows the residential area that I conducted door-to-door interviews with residents. It also shows the year the building was last altered. Again, the most recent data available does not display every alteration to date, but until 2012.

Figure 39: Residential Unit Density and Year Buildings were Last Altered

Zoning Changes:

The area surrounding the canal is currently zoned as a manufacturing district and therefore has little housing supply. A proposed zoning change may in the future permit residential development in the form of mixed-use buildings along the canal borders. One
younger, white male resident and community advocate said, “Rezoning probably will go through. I think it will have a big impact of the number of residential units that can be built there and I think that whatever is allowable will be maximized around the Gowanus. I'm sure there is going to be as much residential development as people can possibly build in the next 20 years (Participant #3, 4/3/12).” This may increase the amount of residential units in the area. Below is a map of the proposed zoning changes, which have not been approved yet with the exception of the Lightstone Group site on the west side of the canal at Carroll Street to 2nd Street on the west side of the canal (NYCDCP, 2014). See Figure 40 below for a map of the proposed rezoning plan.

Figure 40: Proposed zoning changes
Transportation, Streetscape and Green Infrastructure Changes:

Several people who I spoke to brought up the level of transportation access in the neighborhood as either a problem that needs to be addressed or as an amenity the neighborhood offers to people moving to the area. An older white woman resident and community activist said, “We’ve got decent subways and well, no more buses. I miss the Union Street bus. I walk to the library now (Participant #1, 3/15/12).” However, one older white male interviewee and community advocate suggested that people used to be able to live and work in the area, and the loss of that ability is partially related to the transportation infrastructure: “It is important that if people can’t afford to live in a neighborhood, they can at least get there to work, or to work somewhere else. You have to have better transportation, so that people who live close by can come in to a neighborhood to make it evolve into a healthy community (Participant #6, 4/22/13).” Another older white male advocate added that, “Transportation is one of the most vital things to provide if you’re going to redevelop. Use Yankee stadium as example. The G line is not keeping up with growth (Participant #7, 4/22/13).” The Metropolitan Transportation Authority (MTA) service cuts in 2010 eliminated the only bus crossing the Gowanus, the B37. MTA partially restored the route in the summer of 2014. In 2009, the MTA also extended the G subway line to pass through Gowanus: an extension that may remain permanent (MTA, 2014).

The Department of Transportation also planned bicycle lane improvements to Degraw, Nevins, Union and Sackett Streets to increase access to the area. These improvements allow bicycle connections to the Brooklyn Greenway and two-way biking across Union Street: one of the major thoroughfares in the neighborhood (DOT, 2013). One younger, white male community member mentioned the influx of people commuting to the area via bicycle, “I don't think there
are a lot of people commuting here to work on things other than bicycles. People are not driving here from suburban homes (Participant #10, 3/27/12).”

Some interviewees discussed transportation as being vital to the neighborhood in terms of creating a space that will entice people who live in suburbs to give up their cars and potentially move back to the city. A middle-aged white woman community member said, “Now, people are coming back to the city and saying oh, we love it (Participant #5, 4/18/13)!” Several mentioned people they knew who moved away and would like to move back: contributing to the influx of people moving in currently. “The thing was to go buy a place in the suburbs and be able to drive back and forth. But if you drive on the LIE, there's traffic all the time. It's not viable (Participant #6, 4/22/13).” Another added that he “had been asked why I'm staying in the city. Everyone I knew (in 1970) was either out on Long Island or in Jersey (Participant #7, 4/22/13).” Participant 6 added that the people who are moving back to the area might be returning to the city from suburban living. He suggested that the area is ideal to address the needs of these people, because it can, “blend the needs you might find in a traditional small town, with recreation space, employment opportunities, education and a reasonable form of transportation (Participant #6, 2013).”

The interviewees noticed that some barriers to developing the area are dwindling. These social barriers included crime, prostitution, and a fear of abandoned spaces. An early thirties white male community member said, “Because people weren’t looking, more illegal activity would happen and it would get more disgusting, and it got to the point that people wouldn't walk over the canal because it was disgusting and the only people who were there were...you know (prostitutes or drug dealers) (Participant #10, 3/27/12).” A middle-aged white woman member of the Community Advisory Group said, “There used to be prostitution over there. But I haven’t
seen evidence of that in a long time (Participant #2, 3/23/12).” But now, the neighborhood is "less foreboding" than it used to be. “It feels a lot safer and there's a lot more activity over there. It doesn't feel as dangerous as it did (Participant #2, 3/23/12).”

**Demographic and Housing Price Changes:**

Gowanus has changed significantly from the majority abandoned or industrial space neighborhood it once was. It has become a neighborhood that costs more to live in and one where the population have higher incomes are moving. Some see these changes as a sign that gentrification will change the neighborhood in ways they might not rather see. Some interviewees reflected about neighborhood changes, citing the loss in neighborhood income diversity as an inevitability of gentrification. An older white male community development advocate said, "In every neighborhood, you have to have a variety of people to perform a variety of services, and if you can't have the people who cook your food or do other services, and they can't afford it, than what the hell can you have (Participant #6, 4/22/13)?”

Figure 41: Neighborhood Change Overview

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Population</td>
<td>1,635.00</td>
<td>1,789.00</td>
<td>9%</td>
</tr>
<tr>
<td>Income</td>
<td>$55,156.00</td>
<td>$72,109.00</td>
<td>30.70%</td>
</tr>
<tr>
<td>Median Home Value</td>
<td>$382,600.00</td>
<td>$658,000.00</td>
<td>71.10%</td>
</tr>
<tr>
<td>Median Rent Paid</td>
<td>$1,158.00</td>
<td>$1,458.00</td>
<td>25.90%</td>
</tr>
<tr>
<td>Housing Units</td>
<td>677</td>
<td>774</td>
<td>14.30%</td>
</tr>
</tbody>
</table>

According to the United States Census data, the population in Gowanus from 2000 to 2013 did not change significantly. However, American Community Survey data suggests higher population increase estimates. The population of the area may not have increase much yet, due to
the limited available residential buildings, mostly industrial and manufacturing zoning restrictions, and many sites in transition.

Figure 42: Population Change from 2000-2013
The people moving to Gowanus have higher educational attainment than the older residents in the area. The percentage of people with a bachelor’s degree or higher in Gowanus has grown by over 100% since 2000. Compared to the surrounding census tracts, this is a dramatic increase. This could mean that more educated people are moving in to work at the non-profits, offices and art spaces. But Gowanus has a history of squatters, and this could mean that art spaces are also residences. It could potentially mean that several people have moved in and are living in buildings zoned for manufacturing.

Figure 43: Educational Attainment Change from 2000-2013
As in many of the surrounding census tracts, the study area in Census Tract 119 became whiter since 2000 (13.4% more white identified people). There are also fewer people in the area who were born in another country. The loss of 41.8% of the Hispanic population and 27.1% of the Black population is significantly above average for the surrounding census tracts. See Figures 44, 45, 46, and 47 below for more detail.

Figure 44: Foreign Born Population Change from 2000-2013
Figure 45: White Population Increase by Census Tract and Brooklyn Average from 2000-2013

Figure 46: Loss in Hispanic Population by Census Tract and Brooklyn Average from 2000-2013
The median income of the Gowanus area has gone up substantially since 2000 (131% of 2000 median income). Census Tract 119 median income percent change was only slightly above the median income percent change from 2000 to 2013.
Figure 48: Household Median Income Change

Median Income Change from 2000-2012
**Housing Costs:**

Rent prices in the area have nearly doubled since 2000, causing some people to re-evaluate their lives there. A middle aged white woman who is a member of the Community Advisory Group said, “I was talking to a friend the other day who told me, you know, for what we're paying for our tiny apartment here, we could have an entire house. He's seriously thinking about moving down there because his kids could have a yard. It's quality of life (Participant #2, 3/23/12).” The residents of Gowanus pay substantially more in rent if they moved in after 2005 than other residents of the neighborhood who moved in before them. Figure 50 below shows the different amounts each group of residents paid in rent in 2012 based on the range of years they moved to the neighborhood.
Figure 50: Year Moved in, Average Rent Paid

Note, data for residents moving in between the years 1970-1979 was unavailable.

<table>
<thead>
<tr>
<th>Year Moved to the Neighborhood</th>
<th>Average Rent Paid</th>
<th>Margin of Error in ACS Estimates for 2008-2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moved in 2005 or later</td>
<td>$1,613.00</td>
<td>+/-173</td>
</tr>
<tr>
<td>Moved in 2000 to 2004</td>
<td>$991.00</td>
<td>+/-374</td>
</tr>
<tr>
<td>Moved in 1990 to 1999</td>
<td>$1,149.00</td>
<td>+/-166</td>
</tr>
<tr>
<td>Moved in 1980 to 1989</td>
<td>$1,074.00</td>
<td>+/-129</td>
</tr>
<tr>
<td>Moved in 1969 or earlier</td>
<td>$825.00</td>
<td>+/-5</td>
</tr>
<tr>
<td>Total Average Rent Paid</td>
<td>$1,309.00</td>
<td>+/-312</td>
</tr>
</tbody>
</table>

Figure 51: Median Rent Price and Housing Value Changes from 2000-2013
The residents I spoke to fell into two groups: those who moved in recently (since 2005) and those who have lived in the neighborhood for 30 or more years. The older residents mostly owned their homes or additional property in the neighborhood. A few residents I spoke to were middle aged and had bought property recently, but the most recent group of younger residents mostly rented their apartments.
Figure 53: Resident Age by Year Moved In
The people who I spoke to when I walked door-to-door differed from these census averages in a few ways. Most of the people who I spoke to when I walked door-to-door owned their homes in Gowanus and many had lived in the area for a long time (average, 17.3 years).
Home Value:

Home value has also increased significantly since 2000. Measured by Property Shark’s price per square foot of occupancy space, the neighborhood was in a New York Times list of the 25 most quickly gentrifying neighborhoods in the country (NYT, 2014). One participant, who is an older white male advocate for an community development organization, said that in 1978, he was joking with a friend and told this friend, “do you think the houses here will ever go for $150,000?” and his friend replied, “you’ll live to see them go for a million. You could walk to Wall Street (from here) (Participant #8, 4/18/13).” A middle aged white woman Community Advisory Group member said, “Yeah I see gentrification driving the desire to clean it up. Not to say there wasn't an effort before. But property values start to increase and it creates pressure closer and closer to the canal and people are like, this property would be worth a lot if only the canal didn't smell so bad. When these houses weren't worth anything, no one would have thought to cleanup the canal because what did it matter, but now, there’s this pressure (Participant #2, 3/23/12).”
Figure 56: Property Shark’s map of Home Price Change in Brooklyn (propertyshark.com)
Residential Displacement:

Several respondents told me that they knew of people who had moved from the neighborhood. In some cases, they felt they were “the only ones left” out of the “original” people in the neighborhood. Peter Marcuse (1985) said that displacement “occurs when any household is forced to move from its residence by conditions that affect the dwelling or its immediate surroundings, and that: 1) are beyond the household’s reasonable ability to control or prevent; 2) occur despite the household’s having met all previously imposed conditions of occupancy; and 3) make continued occupancy by that household impossible, hazardous, or unaffordable”. He devised several ways to parse out the differences in experiencing displacement. He argued that “displacement pressure” is one of the ways a resident may experience displacement, even though they are not yet displaced. For this research, displacement pressure was the most common type of displacement that I found. However, several participants told me that they knew of people who left the area already.
I found few people who said outright that they felt pressure to leave, but as I asked them to elaborate, they worried about property tax increases, others moving out and the neighborhood becoming more expensive, new housing and retail development pushing them out, and real estate agents contacting them (and in some cases harassing them) to sell their property. When I asked the interviewees if they felt pressure to leave the area, or had known anyone who left already, I received mixed responses. Out of the people who I interviewed, only 14% of them immediately said they felt pressure to leave, although several more mentioned people they knew who had already left.

Figures 58 and 59: Percent of Door-to-door respondents who indicated either that they felt pressure to leave, or knew of someone who had left.

<table>
<thead>
<tr>
<th>Felt Pressure to Leave</th>
<th>Others Have Left</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes 14%</td>
<td>Yes 36%</td>
</tr>
<tr>
<td>No 86%</td>
<td>No 64%</td>
</tr>
</tbody>
</table>

Who feels pressure to leave?

In the small number of interviews I conducted, three groups of people are most likely to feel pressure to leave: people who rent, seniors who own their homes, and owners who feel the neighborhood is changing for the worse. An older white woman who is a community activist said,

“But we would not be getting the benefit (from new large-scale condo development) and people would be displaced. The lower income people would not be able to afford to stay here, because once condos, co-ops, Whole Foods comes in here, they can't afford to live
and shop in the same neighborhood and they can't afford to pay the extra money in rent, housing, or basic necessities. Those people will move and become displaced. So I don't see how this type of development will benefit the neighborhood, because you're not investing in the people. You're invested in an unreal, something or other, that the value of development is more important than the development of people. It's not healthy, clean or honest (Participant #1, 3/15/12).”

With rents increasing in the area, it is understandable that renters may feel less apt to deal with this change. Since rental agreements are typically renewed every year, and even landlords of rent-subsidized units are allowed to increase rent by a citywide agreed percentage (NYCRGB, 2014), there is little financial stability in being a renter. A middle-aged woman who is a Community Advisory Group member said, “A lot of people who moved here since (the late 1990s), tend to be renters. They tend to wish they could afford to be owners in this neighborhood. But they continue to rent but they may leave because as they have more kids, and since they haven't been able to buy a place, they may be pressured out (Participant #2, 3/23/12).”

Some of the ways people are resisting this change lies in the power of the few landlords who reside in the buildings they own. The few I spoke to several were mostly elderly, and had lived in the area for many years. They were Hispanic, Black, and White. The few who I spoke to in door-to-door suggested that they are maintaining power over the space by not increasing rents in order to keep tenants and “stability” in the area. An elderly black man I spoke to said that in all three floors of rental units, he had only increased the rent once in the last 10 years. I also spoke to one of his tenants, who was a younger white man and said that this was true. However, when questioned further, one older Hispanic landlord said that he would keep rents stable for as long as possible, until he can no longer afford to maintain this practice as a result of property tax increases.
Seniors were more susceptible to displacement pressure. Participants gave several reasons for this, including increased property taxes, shrinking parking opportunities, and unaffordability due to fixed incomes. An older white male community development advocate said, “The people leaving are those who have been priced out, mostly older people on fixed incomes (Participant #7, 4/22/13).” Being invested in the changes to come seems to be important in keeping people in their homes. An older white woman and longtime community activist said, “I think we all feel that (pressure to leave), but I guess the people I know who are real die-hards, who care enough about where we live not to cave in, give up and to fight for where we live (Participant #1, 3/15/12).”

People who dislike the changes taking place, or can envision themselves somewhere else with more space may also be more likely to feel pressure to leave. An older white woman artist said, “I think when change happens, people just want to cash in and that's why they leave. I think as people see things are progressing along Gowanus, they will sell (Participant #9, 4/18/13). People in this group also own property, however, affordability may be more subtly impacting them through property tax increases. But due to their status as landowners, they have the flexibility to sell if they would like to move away from the area.

Several of the respondents, including several who earlier stated that they didn’t feel pressure to leave the area, in various ways said they were unhappy with how conditions are changing in their neighborhood. Reasons for this unhappiness included:

1) Increasing problems finding street parking due to new businesses and people moving to the area (map of vehicles per household, new businesses)
2) Problems with the new restaurants and bars catering to the new, younger and wealthier group of residents instead of businesses that the community wants, such as an affordable grocery store (NOT Whole Foods), drug store or other neighborhood resource
3) Fear of how new, large scale approved development will impact their neighborhood
4) Fear that increased property taxes will render property unaffordable to current residents (and older residents on fixed incomes)
Several people suggested that not cleaning up the canal is a way to preserve the neighborhood as it is. These people tended to be residents who moved in before some of the current changes in the neighborhood were taking place. Some comments suggested that the area would lose authenticity through redevelopment and further gentrification. An older white male community development advocate said,

"I would much rather the canal not be cleaned up and that there be jobs around it, than if it is cleaned up and people start living around it. There is no benefit to society having housing along the canal after a 500 million clean up that is not good for NYC's waterways. I would much rather put the resources into building factories and sewage treatment plants around the canal, not adding to it's contamination. So don't fish, swim or boat in there, but keep it a working waterway and don't waste half a billion dollars to clean it up only to bring housing. I don't think it's productive effort (Participant #7, 4/22/13)."

This opinion may also be related to several residents stating that they have experienced displacement pressure due to all of the changes taking place in the neighborhood.

Finally, only one person said they knew of someone who left because Superstorm Sandy had destroyed his or her living space. This middle-aged white woman, who has been involved in community decision making for many years said, “People left because of Sandy. A friend left because of Sandy and moved to Seattle. I haven't heard of anyone being forced out. The people who had the barge, they left (Participant #5, 4/18/13).” The others who mentioned the storm were also seniors, and feared that they could not afford to rehabilitate their property again if another storm causes flooding in their homes. One middle aged white woman, who is a Community Advisory Group member and resident said, “In the 70's, people were leaving because of crime and danger and they were fleeing to the suburbs and it seems like most of the people who have left in my time here have left more reluctantly. I know some people are happy to move back to the country, but generally, people move because they have to and not because they want to (Participant #2, 3/23/12)."
Business Displacement:

Several interviewees were interested in maintaining and increasing the burgeoning non-polluting and creative industries along the canal. When addressing why businesses locate in Gowanus, one older white woman community activist said, “Because they've gotten the boot from DUMBO, Williamsburg, Greenpoint or wherever they were. Those neighborhoods probably are changing faster than Gowanus, in terms of the growth rate or the zoning and land use rules. So they've come here and found a new home and they're happy to be here, and it's exciting. We've got special effects, arts and galleries and writing workshops and people make candles and pottery (Participant #1, 3/15/12).”

One person supported both manufacturing and maintaining art studios. This middle aged white woman and community board member said, “MAN-unfacturing, light industry. I don't see any of that. I have friends who have shops and studios down there and they are feeling very much under siege. Constantly encroaching, you know (Participant #5, 4/18/12)” and added that, “We need to get the developers to put their tongues back in their mouths. We need another 5-10 year moratorium on development to get the developers the fuck out and let people to really imagine and make things happen. And to have long enough time to get businesses going, they need 7-10 yrs. They need to know that they have another 15 years to really take hold and the real estate industry are such slathering dogs (Participant #5, 4/18/12).”

Several people felt disillusioned with the redevelopment projects that have been approved in the area. An early thirties white male business owner said, “Displacing everybody here by putting in a Whole Foods over there is not going to help the local economy in the long-term. It's not going to help people who live here unless they want to flip their shit (houses) and get out. Maybe that's the history of NYC in a way, but it's not a happy story (Participant #10, 3/27/12).”
Another feared that the community doesn’t support the canal serving industrial purposes. This middle-aged white woman and community board member said, “The Gowanus is one of the only places left zoned M1 and M2 and I would like to see that taken seriously. I don't have a sense that anyone on the community board is really excited about maintaining the area for manufacturing (Participant #5, 4/18/12).”

Several people are worried that with increased real estate interest and rezoning potential, the area is susceptible to losing its long-term industrial character, an outcome of what Maantay refers to as “expulsive” zoning (2001 and 2002). An older white male business owner and long-term resident said, “There were a lot more larger businesses in Gowanus 21 years ago than there are today, because many of those companies have been displaced because of real estate speculation along the canal. Those were either manufacturing or warehousing. So where Whole Foods is now, there were 4 businesses before. There are many fewer trucks in the area. The biggest change is the number of businesses operating on or around the canal. But people who would want to live here, would consider that a positive impact. I don't (Participant #4, 9/22/12).”

**Conclusion:**

Even though the area has become more expensive to live in, I found only a limited amount of people are willing to admit that they feel pressure to leave immediately. As the area gentrifies, residents in the area are feeling the changes in both positive and negative ways. Many of the people I spoke with told me that they approve of some of the changes, because the area feels safer than it used to: siting more foot traffic and street activity or fewer prostitutes and drug dealers as proof of this change.

Many more residents would discuss the pressure they feel to leave in other ways, such as their unhappiness towards the rapidly increasing unaffordability of the area or other changes in
the neighborhood, such as access to transit or parking. But the older residents and residents who have lived there for several years want to stay put for as long as they can and resist change by maintaining stable rents in their rental units. This may be considered a critical social practice: “efforts by human beings to resist institutionalized patterns of dominance and suppressed by possibility and create new conditions for their social activities”, to use Marcel Rioux’ words in Jon Caulfield’s context (1994, p.xiii). However, this practice is critical of gentrification (the opposite is true in Caulfield’s context) and to pressure to move to the suburbs and sell their homes. They would like to maintain the lives they have had in Gowanus for years. This furthers Loretta Lees’ observation that Caulfield “obscures the fact that anti-gentrification groups, often largely composed of working class and/or ethnic minorities, do not always share the same desires as gentrifiers (Lees, 2000: p.393). Proof that stability or the notion of it comes in several forms, depending on the needs and desires of particular groups. Smith and Hackworth wrote in 2001 that opposition to gentrification was dwindling. However, this example suggests that opposition to gentrification may be taking place on a much smaller scale than a demonstration and instead, happening inside individual homes.

Many of the people who are involved in the decision making process are not only owners, which may give them an advantage in terms of stability, but they are actively involved in community planning, which may help ground them in the changes that are taking place. Therefore, these changes may not come as much of a shock to them as perhaps an uninvolved resident may experience. Regardless of why they feel pressure, many don’t see the changes as immediate threats to living in the area, and many can foresee living in the area for years to come.
Chapter 7: Discussion and Conclusion

Introduction:

Since the tidal mill development in the 1600’s, Gowanus has never been a place with many residences. It has been an area mostly devoted to manufacturing and material production, with small segments of residential and commercial development. More recently, the area has been through phases of abandonment and then redevelopment through art studio space development, residential development, venues, bars and restaurants. The production of this space in all of its iterations has been a reflection of uneven development. Land is a commodity in New York City, and Gowanus is no different. Once the tide shifted towards redeveloping the area due to rapid gentrification along the periphery, the identity of the area shifted from one of production to one of consumption quickly by those seeking to develop the area with waterfront property.

My questions at the beginning of this project were: Why, after many years of pollution, is the area being cleaned up? Will this clean up process create new opportunities for gentrification in the area, or will it merely encourage gentrification that might already be taking place in the area? Who will benefit from this cleaned space? This chapter will address how this research has moved towards answering these questions. I will also discuss this work in relation to the theoretical work I have relied on and the applications of this research.

Research Questions:

Creating a historic narrative of the many changes Gowanus has been through allowed me to see how political and social shifts have influenced development along the canal. Several groups in the neighborhood advocated for the canals clean up for many years before the current, large-scale clean up plan was created. However, the recent interest in doing so was led by two powerful actors: the United States Environmental Protection Agency and the City of New York.
EPA involvement pushed the City of New York to act quickly to develop an alternate clean up plan for the area. The reason this area became so important to redevelop is debatable, but from this work, I found that these entities became involved for different reasons: the EPA became involved to clean up a highly contaminated space, and New York City: to develop that space.

This area has become an important intersection of services that people who want to move there might perceive as amenities. The area is close to several gentrified areas of “brownstone” Brooklyn, public transportation, grocery stores, and many other amenities one might seek when moving to a neighborhood, and those amenities have increased since I started this project. The planned new developments will build upon growing gentrification in the area, and meld together an even larger portion of Brooklyn where wealthier, whiter residents reside and be decreasingly available to renters, elderly residents or those living on a fixed income, and to artists who rent out space along the canal.

Why is the canal being cleaned up now? The confluence of green policies championed by the Michael Bloomberg administration, and continued by the de Blasio administration (such as those stated in PlaNYC and the Green Infrastructure Plan) and interest in real estate development along waterfronts in New York City have provided ample support for cleaning up and redeveloping the Gowanus Canal. Without these interests, the area might continue to be used for the various land uses that have relied on the low value of the land surrounding the canal for many years. Gowanus has potential to provide space to develop housing, garner property taxes from new and redeveloped properties, and enact some of the city’s “green” policies, such as brownfield clean up and green infrastructure development. The “green” image of the space, led partially by existence of the reuse sector, the canoe club, environmentally sensitive art and conservation efforts, and other aspects of the neighborhood, give the area a “green” identity,
which New York City policy goals make a priority in an effort to become known as a green global city.

Creating connections between gentrified areas of the city through real estate development, and accomplishing other policy goals, such as brownfield and “underutilized” site redevelopment and housing creation, improvements to water quality, street infrastructure, jobs, and access to transportation, retail, and healthy food options, make this area a perfect showcase of all that PlaNYC has to offer: green space and sustainability for some New Yorkers. Recent investments in reducing sewage overflow in the canal and improvements to the streetscape, such as curb cuts and sidewalk improvements, new tree plantings, bioswale development, and increased public access to gardens and walkways along the water’s edge make this area desirable for real estate development. Once these amenities are in place, property values will increase.

Non-polluting economic development, such as the reuse sector development, the preservation of creative start up and artist’s space in former warehouses, or the Whole Foods store, has been burgeoning in Gowanus for several years. All of these land uses support the goals of PlaNYC, but do not support the local residents who reside near the canal. With new amenities, people with higher incomes and more education are moving to the area. As of 2014, 69% of redeveloped brownfields are planned for housing, with only 19% of that being affordable (The City of New York, 2014). This cleaned space will provide ample housing, food and retail availability for those who can afford it.

**Theoretical Considerations: Urban Nature**

Smith’s analysis of the commodification of nature (1996) can be applied to land and water in Gowanus. As the area is cleaned, waterfront access will be supplied to the new residents along the canal. However, access to the water will be reserved for the increasingly wealthy
residents, due to the massive, mostly market rate condo developments planned for the area. As Smith pointed out that, “access to nature, and cultural constructions of nature, are centrally questions of class, and race as well as gender and other dimensions of social difference” (1996: p. 43). In this case, it is not only wealthier residents who will have access to the waterfront, but a whiter group of people as well if the demographic changes continue.

Some landowners, former gentrifiers, real estate and economic development stand to gain significantly from the clean up process. However, not all of these groups want the canal cleaned because they do not have the same desired outcome. Perhaps knowing that the Gowanus has become a pawn to toss back and forth to obtain some monetary goal, some individuals have chosen to continue living in the area without getting involved in the decision making process. Conversely, people who live in the wealthier neighborhoods surrounding the canal have more interest or ability to participate in the planning process due to their incomes, schedules or ability to find childcare to attend meetings. Renters and elderly residents are the most at risk for displacement in the coming years. When rents rise, and property taxes increase, the ability for these groups to adjust may be challenged, creating additional displacement pressure.

In Gowanus, redevelopment reflects the interest many people now have in becoming consumers of nature. Instead of using every local spatial resource for production of material goods as it once was, the space around the canal is reproduced to reflect that, like tourists, urban consumption of nature can only be appreciated from a well-manicured path. This separation maintains Smith’s notion that capitalism reinforces and is reinforced by the separation of society and nature. In this case, the new purpose of nature is that of a capital-creating (in the form of landscape consumption by the real estate industry, retail, etc) amenity. Human needs or desires
are at the center of this uneven development, although the condo advertisements might convince consumers otherwise.

Many of the community groups and activists seem to envision a Gowanus that is ‘socially determined,’ to use Smith’s words (1984: p. 211). They take part in the redevelopment process for several reasons, including the possibility of monetary gain through redevelopment and higher ground rents. But they also envision a space that is no longer inaccessible to people and one that reflects the historic use of “Public Place” as a space open to hand powered boats, bridging public water and land use. The Community Advisory Group for the Environmental Protection Agency is the largest in history, indicating that many feel there is much at stake for accepting the plans from local, state, and federal agencies and their development partners. However, the ability for residents to shape the outcome of the area is limited by the larger political and development interests in the area.

This pattern also exemplifies Smith’s notion of the ‘seesawing’ pattern of uneven development (1984: p.199), where development or abandonment follow the path of capital creation. Now that the suburbs are no longer considered amenities to many people who want to interact with cities, development in this formerly industrial space will provide access to a conception of urban nature that appeases the gentrified neighborhoods surrounding Gowanus. Several residents of the area said that many of the people who grew up in the area and moved away are “kicking themselves” for not investing in real estate in the area, and now they can’t afford to come back.

In cooperation with local government agencies, the power of real estate development will be a great influence on the reproduction of this space via the exploitation of expulsive rezoning practices. The large-scale condo developments that are already approved will no doubt change
the demographics of the area. It may further displace people living there now and create opportunities for only wealthy people to access this manufactured waterfront. Some of the ways people are resisting this change lies in the power of the few (older) landlords who reside in the buildings they own. Several landlords suggested that they are attempting to maintain stability in their buildings by not raising rents for long-term tenants. Although I only spoke to some of their tenants, those who I spoke to felt that this was true, and they have positive relationships with the landlord of their building. How long these landlords can afford to do this without increasing rents, remains to be seen.

In Gowanus, gentrification has led to the re-envisioning of urban nature in an often post-production sense because the goals to obtain capital through material production are a desire for few gentrifyers. Many residents want an urban oasis to gravitate to, and the visions for Gowanus reflect that. However, some residents would like to see Gowanus produce physical goods again, and support an alternate, non-polluting re-industrialization of the area. With the central goals of ecological restoration and canal clean up, these plans also encourage the development of an amenity: a recreationally focused waterfront access space. This goal is prevalent in other development plans (including the opposed Whole Foods and Lightstone Group projects) to increase access to the waterfront in conjunction with new waterfront housing development (See NYC Waterfront Plan). This notion is bound with the idea of sustainability in all of its problematic variations (Keil and Swyngedouw, 2007).

Challenges of Displacement Research:

Through my interviews in Gowanus, it is clear that displacement is a concern for residents living there. This may not come in the form of forced displacement in Gowanus, but interviewees indicated that some of Marcuse’s (1986) more subtle forms of displacement are
occurring: Direct last resident displacement, which can be physical (such as the landlord turning off the heat in a building) or economic (rent increases that price out tenants): Exclusionary displacement, which accounts for residents who cannot access housing due to gentrification or abandonment, and; Displacement pressure, which refers to the pressure placed on residents to leave an area due to cultural or physical changes in the neighborhood.

Some residents mentioned that several years ago, there were many families living in the area. Those families had to leave due to increased rents: a form of direct last resident displacement. Others mentioned that they knew of people who have left the area for New Jersey, Staten Island, and other parts of Long Island. Some people also mentioned that those who had left now wish they could return to the area, but can no longer afford to do so: a form of exclusionary displacement. Hamnett (2003) discussed a related topic, “replacement”, which occurs as working class homeowners sell their property and relocate to other areas and are replaced by a new group of people moving into those properties. Once a new group has replaced the other, the area can change to meet the needs of the new group.

Displacement pressure was the most common form of displacement that I found in Gowanus. Some mentioned that flooding in the area might increase in the coming years, or that the planned housing developments and rezoning would make the neighborhood a “zoo”. Others mentioned the loss of the neighborhood, as they know it: one filled with “industrial charm” or affordable art studio space. Others mentioned that their landlords had asked them to leave rent-stabilized apartments, so that they could be rented at market rate. Some were offered large sums of money to leave their apartments, but chose to stay put. Although these residents feared that the landlords might retaliate by not maintaining or repairing their apartments, they felt it was worthwhile to stay where they lived and perhaps make repairs to the apartment themselves. This
situation resembles direct last resident displacement, but the way these residents viewed their situation, it was only a consequence of maintaining housing stability.

Slater (2006; 2009) suggested that distinguishing the differences between Marcuse’s categories has proven difficult because some reasons for leaving seem to overlap several of these categories. While this seems to be an apt observation about Marcuse’s categories, the forms of displacement are not always exclusive. These distinctions can, however, be helpful for forming pathways to understanding how displacement occurs, and therefore, create opportunities for further displacement research and prevention. A resident might feel pressure to leave, pursue it, and then try to move back in. The severity of pressure and the ability for a person to return to an area they once lived in could be a focus for displacement research due to the conditions people may be subjected to before finally deciding to leave an apartment or house. However, the reasons that person chose to leave in the first place can often be obscured by conditions within a person’s ability to decide to stay.

Slater (2006; 2009) deemed displacement research challenging due to the difficulty in locating displaced individuals. I interviewed residents who felt pressure to leave the area: not those who had already been displaced, although some interviewees mentioned that they knew of people who had already left the neighborhood. This allowed me to gauge displacement pressure during a time when some may be displaced, but many residents are feeling displacement pressure, due to the many real estate and construction activities taking place around them. From this experience, I can suggest to those seeking to determine how displacement impacts a place, that a time-lapsed approach to displacement may be a key way of gauging the extent of displacement in an area. Time is a sensitive actor in the process of displacement, and spreading this research out to encompass a before and after type of scenario may yield a better
understanding of how displacement impacts a space. I intend to re-visit Gowanus after the clean up process is complete to do just that.

**Directions in Environmental Gentrification:**

In Gowanus, gentrification began long before the area will be a clean environment. However, it seems that this initial wave of gentrification has been partially led by the promise that the area will be clean in the future, or at the very least, a sense that the contamination doesn’t matter. However, historically, that contamination has mattered, and kept people from moving heavily to the area.

Through this project, I have found that the gentrification happening there began to draw people in, and the promise of a clean environment might weigh in the decision for families to move to the area, and people who might buy high end condos. Many of the long-term residents and homeowners would like to see the area cleaned up, but new residents don’t mind the contamination as much, since they see it as a barrier to complete gentrification and potential displacement. These two mindsets surrounding the canal might be related to the relative stability that each group seeks by living in Gowanus: older residents who own would like to be able to stay in the area, with the benefit of a clean canal. Younger residents who rent would like to be able to live in the area for several years may not see the benefit of cleaning up the area, since to them, it might mean higher rents or a neighborhood character change.

Gould and Lewis (2012) argue that environmental gentrification creates neighborhoods that only the wealthy can afford, causing displacement. A central question to this research is whether gentrification spurs this redevelopment or whether redevelopment spurs gentrification. In the case of Gowanus, the answer is both scenarios. Gentrification surrounding Gowanus spurred further gentrification, and it will only increase after the clean up process is complete. It
also created a reason for government agencies to support clean up. This research concludes that this space will become an area where wealthier people will be able to access environmental “amenities”, but also to reinforce that displacement is a result of gentrification that needs more investigation. One way of doing this effectively is to conduct a multi-year assessment of change in the area. Until researchers can obtain evidence of displacement that convinces government agencies to act upon this problem, it will likely continue to be ignored.

Conclusions and Further Research:

Through this project, I have applied urban political ecology and displacement theory in Gowanus, and contributed to a growing literature on environmental gentrification. Who has access to water and green space in cities, or anywhere, is a social and political question (See Wolch et al, 2014). By dissecting this space using an urban political ecology framework, I was able to begin to understand how this waterway is produced, for whom, and what it might become. And learning from lessons of previous displacement researchers, I found a way to begin the process of tracking displacement. The value in this research may not be clear until I can return to the area after the clean up is complete, to gauge how the area has changed, who has moved out, and who remains in place.

The limitations of doing urban political ecology seem to be a lack of time or devotion to unfolding every layer of a problem. Although this research revealed several layers of influences that create the space around Gowanus, there are many more to uncover in future research projects. One of the potential layers to explore is the impact of changing infrastructure in post-industrial spaces, and the political and economic reasons for these shifts. Because infrastructure has played an influential role in how Gowanus and other post-industrial spaces are envisioned. Attention to the historic development of infrastructure, the social history of a space, and physical
structure changes in a space may illuminate the activities in Gowanus and other places like it further. Because this “ecodistrict” view of planning is ongoing, there are ample opportunities to improve upon this work.
Appendix A: Semi-Structured Interview Questions

1) What is your occupation?
2) Are you single, married, have children?
3) How old are you?
4) Do you own or rent your home?
5) How long have you owned your home?
6) How long have you lived in the Gowanus Canal area?
7) Has the Canal changed since you moved here? How?
8) Did you agree or disagree with the superfund status being given to the Canal?
   Why? Why not?
9) The canal has been polluted since the 1800’s. Why do you think the clean up is happening now?
10) Have you gone to any public meetings about the clean up?
11) Did they help you understand what is going on in the neighborhood better?
12) Are there any barriers to you taking part in community meetings or groups about the clean-up process? What are they?
13) Have you been involved in any community groups or government agencies that focus on the Canal clean-up?
14) What is the mission for the community group or agency you are involved in?
15) According to your experience, what are the major interests in the canal and surrounding areas? Are there specific groups or agencies who want particular outcomes?
Housing development? Restoration of the canal as a green space? Retail, office development? Transportation oriented development? Something else?

16) Is there an overarching vision for the canal? What does your group want this canal to develop into?

17) Do you think the public meetings and community group meetings integrate perspectives from all interested groups in the community?

18) Do you think any part of the community is left out of the clean-up and redevelopment discussion? Which groups/people? Why?

19) Since you moved here until now, have you noticed any big changes in the neighborhood?
   Are these positive or negative changes?
   Why are they positive/negative?

20) Has the brownfield redevelopment and superfund clean-up projects along the Canal been accompanied by other physical or demographic changes in your neighborhood? How do these changes affect your daily life?

21) Have the people who live around here changed since you’ve lived here? How?

22) Is it harder/easier/the same now to find an apartment in the area than when you moved here? Why is it harder/easier/the same?

23) As a resident of the area, have you felt the need to move away from the neighborhood?
   When? Why?

24) Have you ever felt pressure from your landlord to move out? How has the landlord pressured you?

25) Has the cost of living in the neighborhood increased recently?

26) Do any neighborhood changes make you want to leave the area? Which ones? Why?
How do they impact you?

27) Are there any other reasons you might have for wanting to move away from the neighborhood?

28) Where would you move if you left: another neighborhood in Brooklyn/another borough/outside of New York City/outside of the country/another place?

   What would draw you to this area?

29) Do you know anyone who has already moved from the neighborhood recently? When?

   Why did this person move?

30) Did they go to another neighborhood in Brooklyn/another borough/outside of New York City/outside of the country/another place?

31) Are there any additional comments you’d like to make about the canal, your life here, the clean-up process or anything else we’ve discussed?
Appendix B: Door-to-Door Semi-Structured Interview Questions

1) How long have you lived here?
2) Do you own or rent your home?
3) Have you ever felt pressure to leave your home?
4) How have you experienced pressure to leave your home?
5) Have you known of anyone who has left the area?
6) Why did they leave?
7) What kind of changes have you noticed in the neighborhood since you have lived in the area?
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