

Annotated Bibliography

Green Infrastructure

Raju Ahmed
Elmer Merejo
Anjali Rawat
Seline Perez
Jin Huang

Raju:

Source 1: Altomonte S, & Schiavon S. (2013). Occupant Satisfaction in LEED and non-LEED certified buildings. *Building and environment*, 68, 66-76.

<http://www.sciencedirect.com/science/article/pii/S0360132313001868>

This article delves into and gauges the satisfaction of the occupants in LEED approved office buildings compared to non-LEED buildings. LEED is a voluntary, consensus program that provides a green certification to commercial buildings. Thus contributing to more sustainability and higher market value. The quality of the environment is very significant as it correlates to the self esteem, quality of work and the overall productivity of a company. For the comparison study the center for the built environment (CBE) a web based survey and online tool was used.

From the total of 144 buildings participating 65 were LEED while the remaining 79 weren't. Occupants were required to fill out a survey that takes into consideration of building size, spatial layout, distance from window. As well as the surveyor's gender, age, work hours and the such. There were a different satisfaction categories such as building maintenance, air quality and more. The results of the study showed that many employees working in a LEED certified building were satisfied in more categories.

Source 2: U.S. Green Building Council. LEED-ND backgrounder: *LEED Leadership in energy and environmental design*. Washington, DC

<https://www.usgbc.org/Docs/LEEDdocs/LEED-ND%20Backgrounder.pdf>

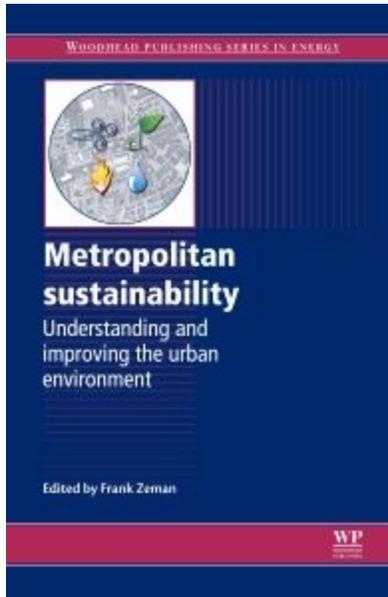
Leadership in Energy and Environmental Design also referred to as LEED, is working together with three other organizations to bring a national standard for neighborhood design. These organizations are The U.S. Green Building Council (USGBC), Congress for the New Urbanism (CNU), and Natural Resources Defense Council (NRDC). They are well known for being leaders among among developers, design professionals and within the environmental

community. Developing ways to integrate green buildings and creating smart growth of the neighborhood.

In order to accomplish this task, LEED will use their green building rating system that allows them to get a proper consensus on the impact of development sites on the neighborhoods. Even though LEED's primary focus is on green buildings practices, this partnership will bring LEED for neighborhood developments (LEED-ND). Incorporating green building practices along with signifying the importance of smart developments.

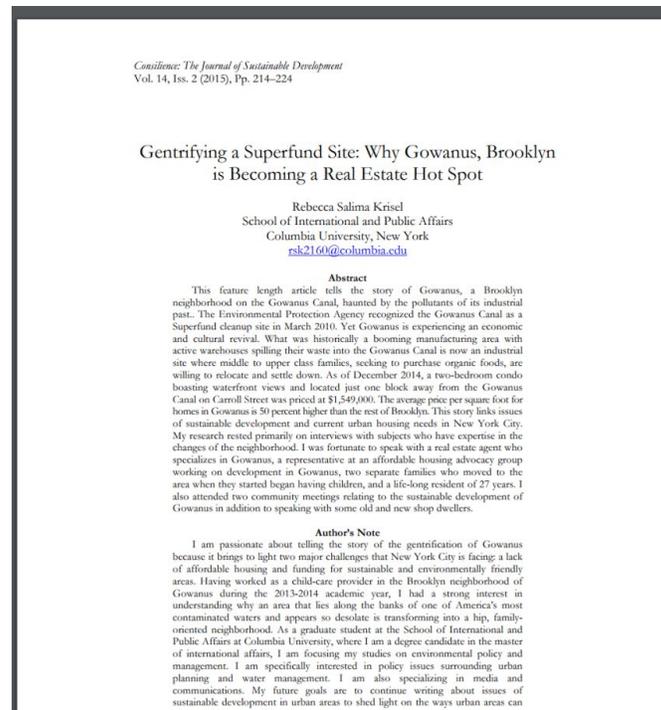
Elmer:

Source 1: Ackerman, K. (2012). Urban agriculture: Opportunities and constraints-7. In *Metropolitan sustainability* (pp. 118-146).



In the chapter about urban agriculture, the book goes in depth about how a city should be changing to become more sustainable in terms of food and water. One argument they try to make is that by adding many more green roofs to cities, they would be more sustainable and it would improve their urban environment such as by reducing the CSO(Combined Sewage Overflow). They even talk about case studies done in various cities around the United States. One case study that they talk about is right in the gowanus: “It should be noted that green roofs alone will not solve the CSO issue--a study focusing on the Gowanus Canal Watershed in Brooklyn estimated that covering 100% of suitable buildings in that area with green roofs would result in 26% reduction in CSO volume”. Developers would use this knowledge to say that even if they added green infrastructure such as green roofs, they still would not make as big of an impact to environmental issues as the common people may be lead to believe.

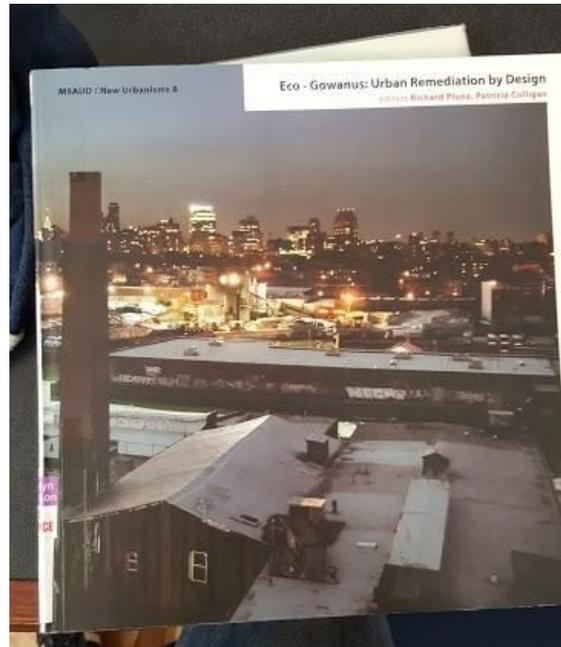
Source 2: Krisel, R. S. (2015). Gentrifying a Superfund Site: Why Gowanus, Brooklyn is Becoming a Real Estate Hot Spot. *Consilience: The Journal of Sustainable Development*, 14(2), 214-224.



This source looks into the Gowanus and why is it becoming gentrified today, and Brooklyn in general becoming a real estate hotspot. It starts out with an extremely brief history of the Gowanus, and then goes into the housing market and how the market in Brooklyn is going up significantly. The author then explains how Brooklyn is going into what they call “super gentrification” which is having extra gentrification waves after the first wave of gentrification. That leads into why the Gowanus real estate is going up. Because the surrounding neighborhoods around the Gowanus, Carroll Gardens and Park Slope, are already super gentrified areas, it was only a matter of time for Gowanus to do the same. And this is what many developers will argue about it too and now that Gowanus is getting rezoned, favoring residential zones, developers are going to definitely come in and try to make the best buck. How I plan to use this is to make the case that someone who understands the Gowanus and what is happening in the area is more equipped to help with environmental issues and other similar issues than someone who is just there to make money.

Anjali:

Source 1: Plunz, R., Culligan, P. J., & Columbia University. (2007). *Eco-Gowanus: Urban remediation by design*. New York: Columbia University Urban Design Program.

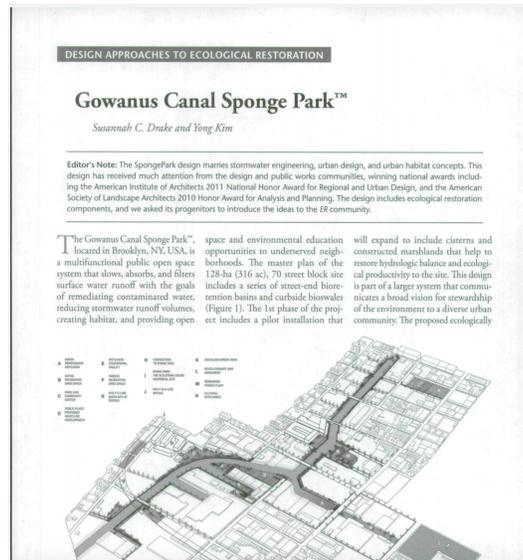


- Lead is a highly toxic substance that's found in public sites. It can lead to illness such as learning disabilities, kidney damage, fertility problems and most heinously/possibly, death. Other substances are, benzene, benzopyrene and any exposure to these subs can put your health in high risk. This should be a driving factor for the remediation of this site.

- Four types of contaminants in GC:

1. Heavy metals - byproducts of industry associated with storage, processing, Ex: MGP , material processing causes concentrated metal contamination in waters.
2. Light non - aqueous phase liquids- LNAPLs- byproduct of any industry using processed oil such as gasoline, 20th centuries sky rocked use of gasoline so there's spillage and contamination in and around G.Canal.
3. Dense non aqueous liquids phase liquids - DNAPLs- byproduct of industries that has incomplete burning of coal, garage or gas.
4. Dissolved Contaminants - by products of food industries production and storage such as fertilizer, pesticides, insecticides.

Source 2: Drake, S., & Kim, Y. (2011). Gowanus Canal Sponge Park™. *Ecological Restoration*, 29(4), 392-400.



- This article discusses the function of the sponge park.
- It's an open space system, that's easily accessed to the public and also has many functions.
- It collects rainwater and water runoff, as well as filters.
- The long term plan for the Sponge Park is to expand and expand it to 70 blocks.
- This site will include sidewalk bio swales and bioretention
- 1st phase = A pilot, has cisterns and marshlands, helps restore balance and ecological productivity.
- Involves multiple collaborations with private and public constitutions
- Goals= reducing the runoff water and decreasing pollutants, limiting the amount of pressure on the sewer systems w/ Low Impact Development (LID)
- Gowanus canal is a water channel within the industrial zone w/ the shipping commercial goods and barges. All pollution from industries went into the river through the sewers and also from homes.
- Park Slope, Boerum Hill, Red Hook, Carroll Gardens,
- CSOs is the greatest updated source of pathogens in the GC
- Streets & sidewalks and other paved surfaces make up 32 percent of GC CSO shed so it's very critical to implement green infrastructure on that very land surface.
- Sponge park = helps alleviate contamination by reducing runoff contamination from CSO contaminants

- EPA & NY state dep. Environmental Conservation thru a grant from N. England Interstate Water Pollution Control Commission, 1st pilot S. Park in 2012, 2d st, west gowanus
- Designed to capture absolute drainage from Bond st to GC.
- Need permission from NYCDEP, planning on directing stormwater intersection of 2nd st from Hoyt to GC into curbside bioswales & bioretention basins.
- Runoff filtered through catch basins that are pretreated to trap easily obtained items such as garbage and other sediments and debris.
- Discussing on making these more visually appealing and the wildlife easy to maintain.
- Want to implement street end end bioretention basins, will have horizontal plant basins, will incorporate organic plants to remediate the contaminants, along side will also have a sand filter, to help clean surface water.
- Phytoremediation - reduces and will try to eliminate pollutants in water and soil. Implemented plants will absorb and metabolize plants through roots, 1st pollutants in contact= plants filter. Oil and other organic pollutants broken down by microbes and natural plantation to non-contaminants that are simplified.
- Curbside Bioswales- infiltration system, phytoremediation processes in plants and microbes that slowly absorb & filter surface water runoff similar to Green Infrastructure pilot swales and tree pits installed by NYCDEP.

((Change to own words>))Desired Outcomes With this design, we aim to achieve the following goals: 1. reduce the quantity of stormwater entering the combined sewer system by promoting the infiltration of stormwater through soil media and increasing the retention and detention capacity of the Gowanus Canal watershed; 2. reduce contaminated stormwater (first flush) entering the Gowanus Canal through direct drainage; 3. minimize floatable debris entering Gowanus Canal; 4. directly remove pollutants through phytoremediation processes; 5. develop a Quality Assurance Project Plan (QAPP) with NEIWPCC and EPA to measure the performance of the Sponge Park™ system by monitoring stormwater volume and pollutant load. This study will be accessible to the public as a resource to promote and improve future green infrastructure projects; 6. reduce pressure on expensive sewer infrastructure; 7. promote ecological stewardship through active community engagement, and promote environmental awareness in the community; 8. develop a stormwater management facility design innovation that will result in universal applicability and reduce a future green infrastructure implementation cost, as shown in the 2009 Boston Society of Architects 2009 Urban Regeneration Award in Unbuilt Architectural Design Award Category (Boston Society of Architects 2009); 9. utilize the street-end bioretention and curbside bioswales as an educational opportunity for local residents and students engaged by the Center for Urban Pedagogy and Manhattan

Source 3: Citation: Rice, A. (2009, October 25). ON THE WATERFRONT. *The New York Times Magazine*, 64(L). Retrieved from

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ON THE WATERFRONT

Andrew Rice
The New York Times Magazine, (Oct. 25, 2009); Lifestyle; p64(L). From *Literature Resource Center*.
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Full Text:

THE GOWANUS CANAL runs one and a half miles through brownstone Brooklyn, cutting a disreputable gash between two of the most desirable residential neighborhoods in New York City. Sunken below street level, no more than 100 feet across at most points, the canal does not really flow -- it skulks. On sunny days, its waters take a greenish hue and are clear enough to afford glimpses of rotting bulkhead timbers, mud-caked tires and other submerged detritus. When it's overcast, the water turns an inert gray. In the lawless old days, industries along the canal's banks fouled it with all kinds of pollution. Today, the canal is mostly disused, a corridor of warehouses and razor wire, and the most enduring reminders of its colorful past emanate from several underground deposits of coal tar, which belch up oily bubbles. The residue forms a prismatic sheen on the canal's surface, reflecting shimmering visions of the landscape.

Created in the mid-19th century out of a tidal creek named for an Indian headman, the Gowanus long resisted attempts at reformation, in sluggish defiance of generations of city planners, civic dogooders, editorialists and speculators. But over the past decade, the government has cleaned up the water a bit, allowing the canal to be recolonized by some hardier forms of natural life -- shore crabs and cormorants, silvery bait fish -- along with enterprising humans. First came the artists for the cheap studio space, then the hipsters for the decayed authenticity, and finally, in the inevitable progression, residential developers arrived.

The Bloomberg administration, sensing a chance for revitalization, rushed to rezone 25 blocks of the Gowanus area for nonindustrial uses, identifying more than 60 development sites with a potential to generate at least \$500 million in tax revenue. It didn't appear to be a deterrent that the canal was, quite literally, still something of a cesspool. New York is, after all, a city where people have proved themselves willing to live almost anywhere, where no location, be it smelly or notorious (think the meatpacking district or Hell's Kitchen or Brooklyn's Myrtle Avenue, formerly known as Murder Avenue), seems to be beyond the reach of gentrification. But the case of the Gowanus Canal has

Seline:

Source 1: Brooklyn Historical Society.(2000). Red Hook, Gowanus Neighborhood History Guide. Brooklyn Public Library.

Annotation:

- This book could be found in the Brooklyn Public Library and the book talks about the history of the Gowanus and Red Hook. It starts to talk about the Native American that were in the Gowanus Area in 1636 and how they fish in the water. Then, the book goes on to tell you the different time periods when the Gowanus Area underwent different changes and what those changes did to the people around the area. The book even talks about the Gowanus turning from a creek into a canal in order for business around the area to run and bring in a lot of income and bring people into the area. The book also talks about the various points in time when the canal was undergoing change and how every time it changed it seem to have been to the worse. The book also described how the ecosystem in the Gowanus area kept undergoing changes with the different people that kept on arriving and living.

Source 2: Edward Lewine. (1998). The Gowanus Canal: An Appreciation, New York Times. Retrieved from <http://www.nytimes.com/1998/08/30/nyregion/the-gowanus-canal-an-appreciation.html>

Annotation:

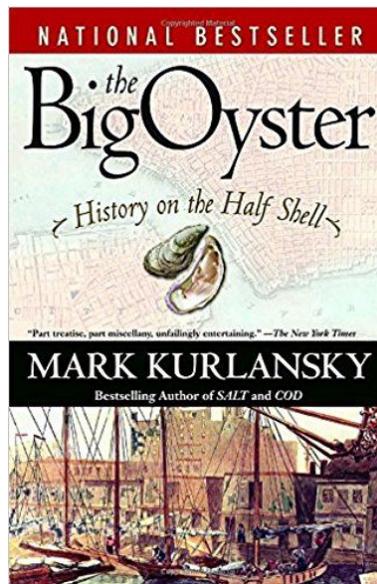
- The article is set back in 1998 and it starts off by talking about a man that bought about half an acre of land right beside the canal. The man was very optimistic on what he feels the Canal could turn into in the future. The article then moves along to talk about the horrible eco-system of the Gowanus Canal is itself and as well how bad this surrounding area is as well. The article's main purpose is to talk about the surrounding area of the Canal overtime. Then the rest of the article continues with when the Canal was paved and turned into the Gowanus Canal we know now. Then, there were different time periods in the article that described how the Canal underwent a dramatic change or a simple change that now can be noticed.

Jin:

Source 1: "Environmental Education and Restoration Merge in a New York Harbor Oyster Revival." *The New York Times*, The New York Times, mobile.nytimes.com/blogs/dotearth/2015/10/26/environmental-education-and-restoration-merge-in-a-new-york-harbor-oyster-revival/?referer=. <https://mobile.nytimes.com/blogs/dotearth/2015/10/26/environmental-education-and-restoration-merge-in-a-new-york-harbor-oyster-revival/?referer=>

Oysters were nursed for 2 years in brooklyn navy yard which accumulated around 100000 oysters in hopes of restoring the waters near the mouth of the bronx river. Regardless of location, oysters were known in new york for their size many centuries ago. Oysters were known for their foot long dimensions and people consumed more oyster meat than any other meat in new york. The oysters were part of the stem research by scholars who are interested in restoring New York's water.

Source 2: Kurlansky, M. (2006). *The big oyster: History on the half shell*. New York: Ballantine Books.



One of the most informative books about New York oysters and Oysters in general. The book gives you insights of how oysters were like in historical context which vividly shows the reader how oysters came to be and how its life cycle was destroyed by the new innovations of New York City. While researching, stumbling upon this book was a great addition for my research

since it contains a lot of the necessary information which I required since I'm taking the role as the "Oyster Specialist."