East Winston Brownfield Identification & Mapping Community-Based Project

Spatial Justice Studio at Center for Design Innovation
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Winston-Salem, NC – May 1, 2019

Introduction

This community-based pilot project was designed to **refine and expand the local brownfield database and mapping system** and to **make this information easily accessible and widely available, in support of on-going and future community-based spatial justice and brownfield revitalization initiatives within local low-income communities of color disproportionately-impacted by brownfield sites in Winston-Salem, NC.**

Brownfields are defined as any real property – the expansion, reuse or redevelopment of which – may be complicated by the presence or potential presence of environmental contamination. Recent research supports the common assumption of an unequal [*unjust*] spatial distribution and impact of brownfield sites within low income and minority communities (Eckerd, 2012).

A range of brownfield-related GIS data (see Table 1 below) for Winston-Salem is currently available from the North Carolina Department of Environmental Quality (NCDEQ). However, most of this data is highly dependent on voluntarily reporting by property owners and polluters. Therefore, it is likely this data significantly under-represents the actual number and impact of brownfield sites within the City of Winston-Salem as a whole, and particularly within its low-income and minority communities.

To address these data gaps, the project team collaborated with WSSU Professor, Dr. Russ Smith, and students in his 2019 Spring Semester course – *GEO 4342 GIS Concepts & Techniques* – to conduct an initial survey of potential brownfield sites in selected portions of East Winston. Survey data was then used to refine and expand the local brownfield database and mapping system and made available for community-based spatial justice and revitalization initiatives.

Table 1 – NCDEQ Brownfield-Related GIS Data

- BFA Sites – Location & boundaries of sites with a completed NC Brownfields Program Agreement;
- DSCA Sites – Location, address & status of certified "*Dry Cleaning Solvent Act*" Program sites;
- HW Sites – Location of sites regulated by the hazardous waste portions of the Resource Conservation and Recovery Act (RCRA);
- IH Sites – Location of hazardous waste spill and disposal sites including closed remediation sites that have land use restrictions recorded as part of the remedy ("inactive" refers to the fact that cleanup was inactive many sites at the time of program enactment);
- MGP Sites – Location of Manufactured Gas Plant (MGP) sites participating in the MGP Assessment and Remediation Program;
- Active Permitted Landfills – Locations of landfills that are permitted by the State and are actively accepting waste;
- Pre-Regulatory Landfills – Locations of non-permitted landfills that closed prior to 1983 when waste disposal permitting regulations commenced;
- RUST Incidents – Location of underground storage tank incidents and release reports listed in the Regional Underground Storage Tank (RUST) database; and
- FRB Sites – The Federal Remediation Branch and Environmental Protection Agency (EPA) work to implement the federal *Superfund Program* under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA).

Project Team & Past Experience


Nissen Wagon Works Public Design Workshop

Paul Kron has provided environmental analysis, planning and design services for hundreds of projects during his 30-year career. While serving as Regional Planning Director for the Piedmont Triad Regional Council (1993-2015), he managed two EPA Brownfield Assessment Grants, leading to the redevelopment of multiple brownfield sites, including the Lexington Home Brands Plant in Uptown Lexington and the Thomasville Furniture Plant L site in downtown Thomasville. In October 2018 PTRC received $600,000 in additional EPA assessment grant funding to focus on Phase II Assessments and Clean-Up Planning activities for several catalyst sites including the former Nissen Wagon Works Site in East Winston-Salem. This manufacturing complex was established in the historic *Waughtown Neighborhood* in 1834. By 1919, the company employed 1,500 workers and produced over 15,000 covered wagons per year - fifty per day well into the 1940s. In 1946 Western Electric moved its manufacturing operations into the factory and employed over 7,000 area residents by 1960. In 1995 Western Electric closed the plant, leaving thousands of Waughtown residents unemployed, next to a polluted site. Current residents in neighborhoods surrounding the site are 90.4% minority and suffer a 42.5% poverty rate. A community-wide strategic planning effort was recently completed in the area, involving hundreds of community members. One of the key revitalization goals of the *Waughtown/MLK Neighborhood Plan* is the **clean-up and reuse of the numerous brownfield sites in the community**. The former Nissen Wagon Works site is one of the neighborhood's top-priority catalyst sites.


Nissen Wagon Works Master Plan

Local NC A&T University Landscape Architecture students recently facilitated a public design workshop in which community members identified a wide range of preferred uses on the site, including a library, community health center, youth center, museum, retail and office space, and affordable workforce housing to avoid displacement of existing residents in the. A Phase I assessment identified several Recognized Environmental Conditions (RECs), including PCBs; asbestos and ACMs. EPA funding will now enable the neighborhood to conduct a **Phase II assessment and clean up planning** to identify and address potential contaminants and pursue redevelopment of the site.

Dr. Joseph Sloop has supported numerous community-based projects while serving as the Forsyth County Geographic Information Officer for the past 7 years. He and his staff provided invaluable GIS data and mapping services in support of the *Waughtown/MLK Neighborhood Plan* outlined above. Dr. Sloop has a keen interest in spatial justice issues and the expertise, local staff relationships and technical skills necessary to accomplish the goals and desired outcomes of the project.

Process & Timeline

Brownfield-related GIS data for Winston-Salem and Forsyth County currently available from NCDEQ is heavily dependent on voluntarily reporting. It is therefore suspected to significantly under-represent the actual number and impact of brownfield sites – particularly within low-income and minority communities. To test and address these likely data gaps, project members used the following process and timeline:

- October 15, 2018 – Confer with Dr. Smith, SJS@CDI Director, to refine the project proposal;
- October 15 – November 15, 2018 – Collect, analyze and map additional GIS data sets from other local, state and federal sources as available;
- November 15 – December 15, 2018 – Identify an initial set of likely brownfield sites in Winston-Salem *not* currently included in the NCDEQ Brownfield database;
- November 15 – December 1, 2018 – Confer with Dr. Smith and other recommended WSSU Professors, to establish and organize course projects & assignments in support of the proposed ground-truthing element of the project;
- December 1 – 15, 2018 – Draft 1st Report for filing with SJS@CDI Director;
- December 15, 2018 – File 1st report outlining progress & plans for Spring Semester, 2019;
- December 15, 2018 – January 15, 2019 – Confer with Dr. Smith and other interested WSSU Professors, to refine and finalize course projects & assignments in support of the proposed ground-truthing element of the project;
- January 15 – March 1, 2019 – Collaborate with WSSU professors and students to design and implement a ground-truthing protocol to test the accuracy of our initial GIS findings. Initial ground-truthing protocols for this pilot project include WSSU students conducting qualitative site assessments, taking photos, and collecting GPS data points through windshield (driving) and/or walking surveys – focusing their efforts in low-income and minority communities in Winston-Salem;
- March 1 – 22, 2019 – Map and analyze ground-truthing survey data to refine and expand the local brownfield database & mapping system;
- March 23 – March 31, 2019 – Draft 2nd Report for filing with SJS@CDI Director;
- April 1, 2019 – File 2nd report outlining progress and activities to date;
- April 1 – 19, 2019 – Finalize refinement and expansion of the local brownfield database & mapping system and develop an on-line GIS database and mapping interface to make the Project's improved information and maps easily accessible and widely available, in support of on-going and future community-based spatial justice and brownfield revitalization initiatives within local low-income communities of color disproportionately-impacted by brownfield sites in Winston-Salem, NC.
- April 19 – 31, 2019 – Produce a Report & Presentation summarizing project results;
- May 2019 – Present final research and project results in a report.

Project Activities – 2018 Fall Semester

During the 2018 Fall Semester project team members collected, analyzed and mapped NCDEQ brownfield data. Additional GIS data sets from other local, state and federal sources was assembled and mapped to create an initial set of likely brownfield sites in Winston-Salem *not* currently included in the NCDEQ Brownfield database. Project members also conferred with Dr. Smith, WSSU Professor and Spatial Justice Studio Director, to establish and organize course projects & assignments in support of the proposed ground-truthing element of the project.

Project Activities – 2019 Spring Semester

In collaboration with Dr. Smith, team members worked to refine and finalize course assignments and ground-truthing protocols. In mid-February the team met with Dr. Smith and members of his *GEO 4342 GIS Concepts & Techniques* course to introduce the project, provide a contextual overview of the importance of identifying and addressing brownfield sites within low-income communities of color, and to introduce students to their first assignment. For their first assignment (see *Activity A Instructions* below), students were given detailed instructions to conduct a "Virtual Survey" of potential brownfield sites using Google Maps Street View on their computers. Students organized themselves into work groups and each group selected one of the study areas pre-identified by the project team. By mid-March, all teams completed and submitted data from their initial virtual survey. This initial data was then used to create a GIS iPad application to help students with their second assignment (see *Activity B Instructions* below) – to conduct an on-site survey to verify their initial findings. Using iPads, each team conducted qualitative site assessments, taking photos, collecting GPS data points and "ground-truth" their initial identification of potential brownfield sites in selected low-income and minority communities in Winston-Salem.

Course assignments in support of the project also included research papers and presentations on brownfield-related spatial justice issues. Initial student research then culminated in their real-world participation in the collection of brownfield data in neighborhoods surrounding the WSSU campus and their contribution to the development of a key revitalization resource for these neighborhoods.

After receiving final data from each of the student groups the project team refined and mapped the verified "Local Brownfield Inventory Data" and created an on-line GIS map portal to help make the data easily accessible and widely available, to encourage and support community-based spatial justice and brownfield revitalization initiatives.

Brownfield Activity A
WSSU GEO4342/JUS 4342: GIS Concepts and Techniques

Virtual Local Brownfield Inventory Verification Using Google Maps Street View

Start Date: Thursday, February 7, 2019
Due Date: Thursday, February 21, 2019

The purpose of Brownfield Activity #A is to use Google Maps Street View to virtually test or verify the validity and accuracy of "Local Brownfield Inventory Data" (provided by City, County and non-governmental organizations) within your team's study area. Please use the following steps to complete this activity:

1. Select (or be assigned) an activity partner;
2. Select (or be assigned) an activity study area
3. Review the map and Excel Spreadsheet Listing of potential brownfield redevelopment sites in your study area
4. Identify main streets, logical routes and good places to stop and start the virtual tour of your study area using Google Maps Street View
5. Sign in to *Google Maps Street View* (https://mapstreetview.com/)
6. Type in the street address of the first potential brownfield property on your selected route
7. Make a visual assessment of the site to determine answers to the following questions:
   a. Does the site appear to be abandoned, vacant or under-utilized? Yes or No
   b. What is the site's current land use? (i.e. Commercial; Industrial; Office; Residential, Park or Open Space; Vacant; Other:_____)
   c. How may this site have been used in the past and what visual evidence do you see that might indicate the possibility of environmental contamination on the site (e.g. old gas pump islands indicate it was a gas station; old sign indicates it was a dry cleaning store; large 3-story brick building with multiple broken windows indicates it was a factory; old electrical transformers indicate the possibility of PCB leakage; old barrels or storage tanks indicate possible storage of petroleum products, gas, paint or solvents; none)
   d. What level of positive impact might the site's remediation and redevelopment have on surrounding properties? (Very Low; Low; Moderate; High; Very High)
8. Enter your answers to Questions 7a.-7d. in your Excel Spreadsheet Listing
9. Proceed to the next potential brownfield site listed on this street, or type in the next address listed, and conduct your visual assessment of the site as outlined in Step 7 above;
10. As you conduct visual assessments of sites listed in the Local Brownfield Inventory, look for additional sites NOT listed, and conduct a visual assessment if you suspect they should be added to the inventory;
11. After completing your verification of listed sites and the addition of new potential brownfield sites within your study area, save your Excel Spreadsheet.
12. E-mail your completed Excel Spreadsheet by 2:00 PM on Thursday February 21, 2019 (Joseph Sloop sloopjb@forsyth.cc; Paul Kron paul@foothillsdesign.us; Russell M. Smith smithrm@wssu.edu).

Excel Spreadsheet Data collected during Activity A will be used to refine the Local Brownfield Inventory Data in preparation for Activity B – the on-site verification and refinement of data.

Brownfield Activity B
WSSU GEO4342/JUS 4342: GIS Concepts and Techniques

On-Site Local Brownfield Inventory Verification & Data Refinement

Start Date: Thursday, February 21, 2019
Due Date: Tuesday, March 19, 2019

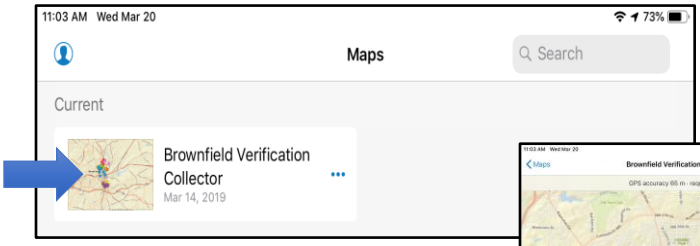
The purpose of Brownfield Activity #2 is to conduct an on-site survey to verify the validity and accuracy of your *Brownfield Activity #1 – Virtual Local Brownfield Inventory Verification Using Google Maps Street View*. To facilitate your completion of Activity B, Map Forsyth staff have created a digital iPad tool to help you verify and up-date your Activity A data. Please use the following steps to complete this activity:

STEP 1

- Open & unlock iPad.
- Click on the "Collector" app

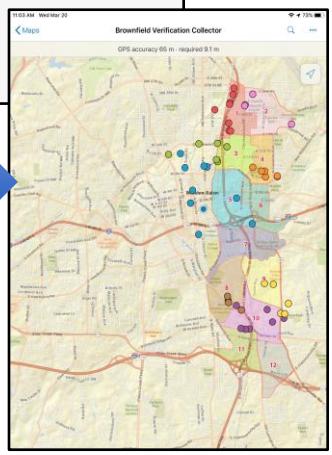
STEP 2

- Click on the "Brownfield Verification Collector"



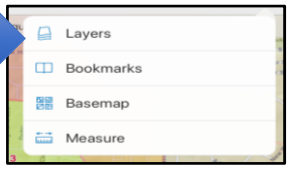
STEP 3

- The map will open and you should see the following map.
- Click in the three blue dots in the top right-hand corner.



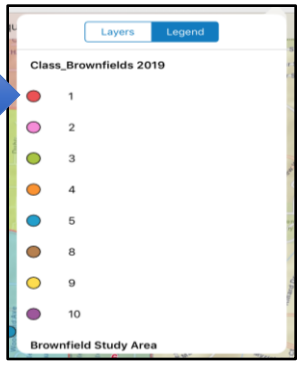
STEP 4

- Click on "Layers"



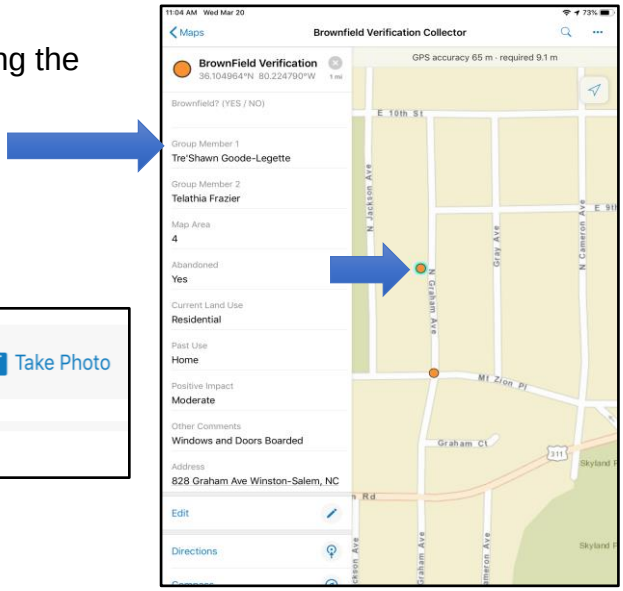
STEP 5

- Identify your Brownfield Study Area # & Color
- Only edit your area (so remember your color).
- Click anywhere on the screen to remove the legend.



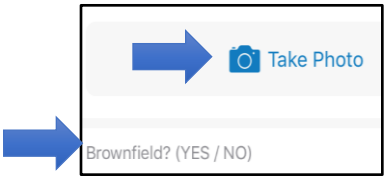
STEP 6

- Zoom into your area and select a point by touching the point with your finger.
- A side panel will open up on the left-hand side.
- Near the bottom of this panel, click on “Edit”



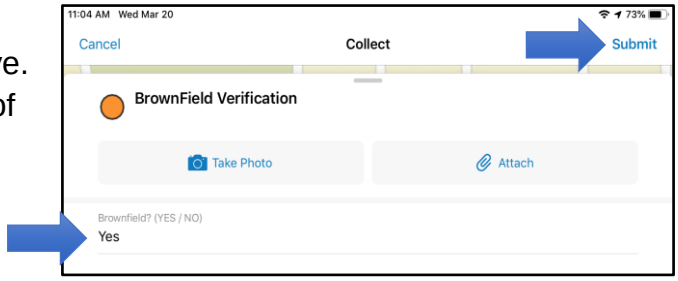
STEP 7

- Click on in the area that says “Brownfield? (YES/ NO).



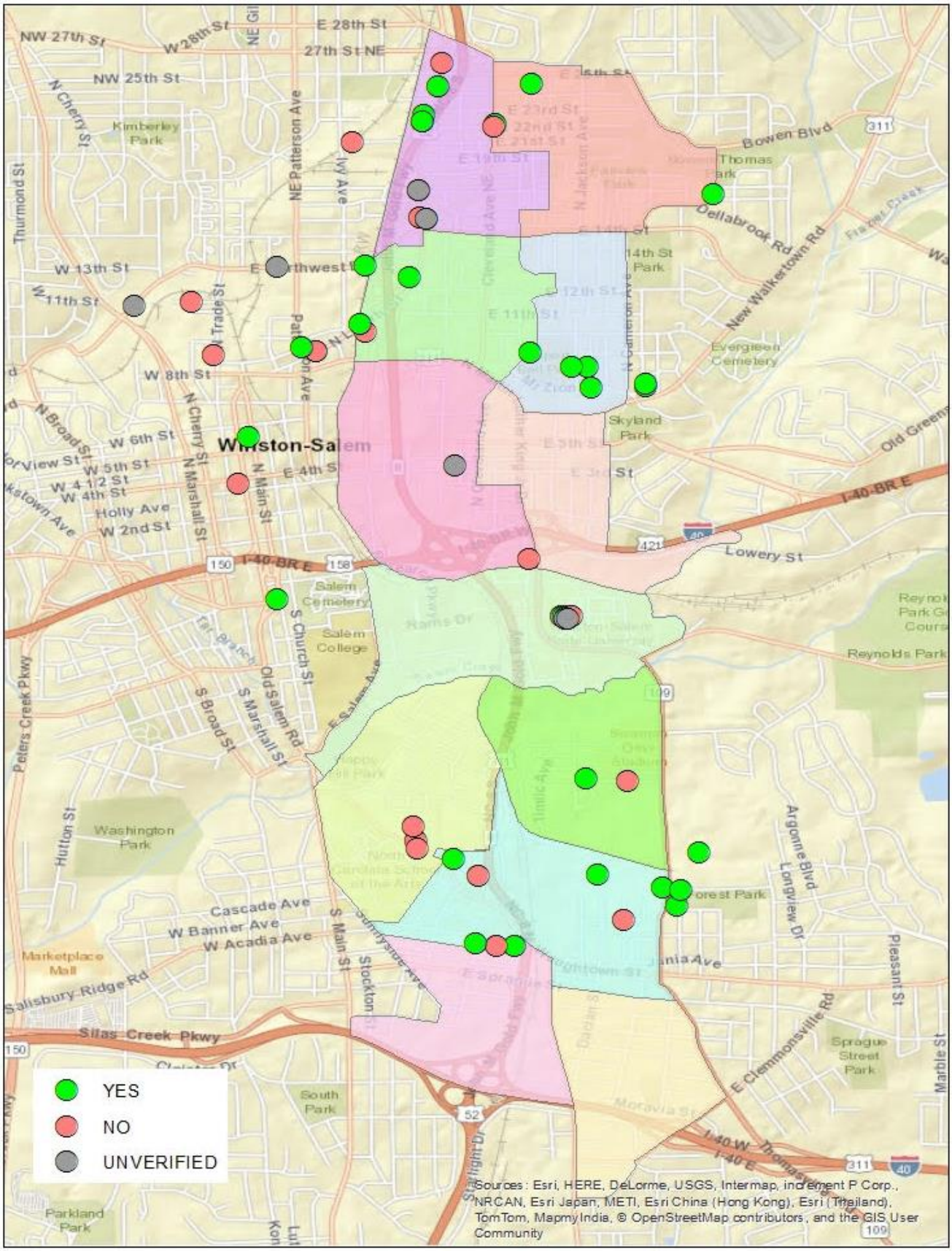
STEP 8

- Type in ‘YES’ or ‘NO’.
- Click “Take a Photo” and take a photo.
- Click “ATTACH” to save the photo.
- Click “Submit” in upper right-hand corner to save.
- Repeat the process from STEP 6 to review all of the points in your area.



East Winston Brownfield Map

Using Data Collected & Verified by WSSU Students – Spring 2019



East Winston Brownfield Data Collected & Verified by WSSU Students – Spring 2019

Positive Impact site redevelopment would have on surrounding properties	Observations & Comments	Address	Latitude	Longitude	Considered a brownfield site
Moderate	The building is falling down	430 Haled St	36.071	-80.229	Yes
High			36.075	-80.224	Yes
Moderate		750 Allen St	36.073	-80.223	No
High		415 Julia Ave	36.071	-80.23	No
Moderate		1824 Francis St	36.073	-80.22	Yes
High		309 Fayetteville St	36.076	-80.233	Yes
Moderate		2031 Vargraves St	36.071	-80.231	Yes
Very Low		792 21st E	36.118	-80.239	No
Low		2208 N Liberty St	36.119	-80.234	Yes
Low		2308 N Liberty St	36.12	-80.234	Yes
Low		2420 N Liberty St	36.121	-80.234	Yes
Low		2600 N Liberty St	36.123	-80.233	No
Low	Just taking up space	1700 N Liberty St	36.115	-80.235	no
Moderate		1420 N Liberty St	36.114	-80.235	No
Moderate		1417 N Liberty St	36.114	-80.234	Yes
High	Building still standing just vacant	1234 N Liberty St	36.11	-80.235	Yes
Low		2208 N Liberty St	36.119	-80.234	Yes
Low		920 N Liberty St	36.106	-80.241	
Low	Joint Building.	941 A Brenner St	36.107	-80.238	No
Low	Spray Paint on building. Boards up.	998 N Liberty St	36.107	-80.238	Yes
		1417 N Liberty St	36.114	-80.234	
High		1700 N Liberty St	36.115	-80.235	
Low		599 E Northwest Blvd	36.111	-80.238	Yes
Low	High area of homeless hangout	215 Northwest Blvd	36.111	-80.243	
High	Hispanics community	572 Northwest Blvd	36.109	-80.251	
High	Building falling down	191 Fayetteville St	36.077	-80.235	No
Moderate	Old truck parts and storage	498 Fayetteville St	36.075	-80.231	No
Moderate	Old paint building falling apart	198 Fayetteville St	36.077	-80.235	No
Moderate	Old building	187 Fayetteville St	36.078	-80.235	No
Moderate	Building looks vacant, car parts nearby	1665 S MLK Jr Dr	36.077	-80.218	Yes
Moderate	Building is small but has parking lot with it.	1776 S MLK Jr Dr	36.074	-80.22	Yes
Moderate (for Neighborhood)	Nothing there - just vacant land across from 1508 Williamson St	1508 Williamson St	36.081	-80.225	Yes
High	2 huge parking lots side by side	1601 Williamson St	36.081	-80.222	No
Moderate (for Neighborhood)	Vacant building in neighborhood with graffiti	1000 Tower St	36.074	-80.219	Yes
Moderate	Windows and Doors Boarded	11105 File St	36.106	-80.228	Yes
Moderate	Windows and Doors Boarded	1600 Mt Zion Pl	36.104	-80.225	Yes
Moderate	Windows and Doors Boarded	809 Rich Ave	36.104	-80.221	Yes
Moderate	Windows and Doors Boarded	811 Rich Ave	36.104	-80.221	Yes
Moderate	Windows and Doors Boarded	828 Graham Ave	36.105	-80.225	Yes
Moderate	Windows and Doors Boarded	822 Jackson Ave	36.105	-80.226	Yes
Moderate	No home, empty lot	1201 NE 22nd St	36.119	-80.23	Yes
Very High	No home, empty lot	2419 Claremont Ave	36.121	-80.228	Yes

Positive Impact site redevelopment would have on surrounding properties	Observations & Comments	Address	Latitude	Longitude	Considered a brownfield site
Low	Empty field	1511 Attucks St	36.115	-80.217	Yes
High	No home, empty field	2198 N. Cleveland Ave	36.119	-80.23	No
High	Building falling down	310 NE Woodland Ave	36.099	-80.233	
High		332 S Main St	36.091	-80.243	Yes
Moderate		920 N Liberty St	36.106	-80.241	No
Very low		920 Patterson Ave	36.106	-80.242	Yes
High		300 S MLK Jr Dr	36.094	-80.228	No
Low	A cluster of five buildings unused and boarded up	526 N Main St	36.101	-80.245	Yes
Moderate	Poor windows, boarded up	104 4th St	36.098	-80.245	No
Moderate	Fair condition, no windows, no vandalism	860 Trade St	36.106	-80.247	No
Low	Connected to another part. Other part looks updated. Rusted, windows covered	299 12th St	36.109	-80.248	No

Project Outputs

- A refined, expanded and verified GIS database and mapping interface of brownfield sites in selected areas of East Winston-Salem.
- A more accurate and accessible set of brownfield-related data to support on-going and future community-based spatial justice and brownfield revitalization initiatives within selected local low-income communities of color disproportionately-impacted by brownfield sites in Winston-Salem, NC.
- Increased community awareness of brownfield locations and impacts in low-income and minority neighborhoods.
- Increased communication and collaboration among County GIS staff, WSSU faculty and students, and community-based organizations and non-profits.
- Identification of potential brownfield assessment, clean-up and redevelopment opportunities for the Piedmont Triad Regional Council Brownfields Program and the City of Winston-Salem, as recent recipients of a $600,000 EPA Brownfield Assessment Coalition Grant (October 1, 2018 – September 30, 2021);
- Valuable hands-on spatial justice learning and community-service experience for WSSU students and faculty.

Lessons Learned

- Value would be added to the process by collaborating with City of Winston-Salem and Forsyth County Planning, Community & Economic Development, and Environmental Quality staff to discuss and identify internal documents and databases deemed relevant and helpful to identifying potential or likely brownfield sites in Winston-Salem *not* currently included in the NCDEQ Brownfield database.
- Assignment A – Have students/community volunteers capture the X/Y coordinates instead of addresses when using Google Earth to collect potential brownfield site information.
- Assignment A – Require each work group to identify a minimum number of potential brownfield sites (e.g. 10) to ensure all groups have a similar level of involvement in the project.
- Assignment B – Emphasize the importance of students/community volunteers editing the map layer attribute for every potential brownfield site they are verifying and entering YES or No to the question of whether each site is indeed a potential brownfield. If they do not use this edit function, the point shows up as "other" which is not helpful for identifying potential brownfields. For example, several student groups took photos of the sites, but did not update the map layer attributes to indicate whether the site should be considered a potential brownfield or not.

Alternative Approaches for Future Projects

- Create a public web application built on an *ArcGIS Online* platform similar to the iPad application built for the pilot project with the students, but open to anyone in the community on any device with internet access (i.e. crowd-sourced). Skip the Google Maps search and add the following data to help users identify the NCDEQ Brownfield data; Forsyth County tax parcel data (e.g. address, owner, acreage, existing use, zoning, assessed value); parks, roads & road names, etc.
- Collaborate with WSSU students, non-profits and/or neighborhood associations to verify crowd-sourced data points added to the Local Brownfield Data and Map.