

Soak It Up!

GREEN ROOF

A BUILDING ROOF COVERED WITH PLANTS

“

Unlike cement that does not hold in water, green space can absorb water. Green roofs are more porous—like a sponge—and can trap in the polluted water.

—
GRAEME DAUBERT
GOWANUS CANAL CONSERVANCY

”



How do green roofs work?

1.

Green roof water comes from rain or irrigation, like sprinklers.

2. Soil and plant roots absorb the water.

3.

Some of the water can evaporate.

4.

If there is more water than the soil or roots can absorb, it travels through the soil and plant layer to a drainage layer, like rocks, where it can drain away.

5.

As the water travels through the different layers, pollution may be filtered out of the water.

filters

absorbs

HISTORICAL CONNECTIONS:

Ancient Mesopotamians and Romans used green roofs to help keep buildings warm or cool. A green roof can be extensive, meaning the soil is only 3-6 inches deep, or intensive, with soil over 6 inches deep! Extensive roofs, such as at BLDG 92 at the Brooklyn Navy Yard, are lighter, use less soil, and need less care than intensive green roofs.

Soak It Up!

RAIN BARREL

A CONTAINER BUILT TO CATCH AND HOLD RAINWATER

“

If you have a way of collecting rain water, you can trap it and use it for your own purpose, like farming, and can stop it from becoming runoff that may pollute the waterways.

GRAEME DAUBERT
GOWANUS CANAL CONSERVANCY

”



How do rain barrels work?



HISTORICAL CONNECTIONS:

Ancient Mesopotamians, Greeks, and Romans all collected rainwater using similar methods.

Soak It Up!

BIOSWALE

A WATER COURSE THAT STORES AND FILTERS STORMWATER RUNOFF

“

All the dirty water in the street, called surface runoff, now is filtered through the bioswale instead of easily flowing down the slope of the street into our waterways.

GRAEME DAUBERT
GOWANUS CANAL CONSERVANCY

”



How do bioswales work?

1.

Water from rain, streets, and sidewalks flows into the bioswale and travels through multiple sections.



2.

Depending on how much water there is, the water may be absorbed or stored in the soil and plant roots.



3.

Rocks and soil filter the water.



4.

Cleaner water that is not absorbed slowly flows back onto the street.

filters

absorbs

stores

HISTORICAL CONNECTIONS:

Bioswales developed much later in history because ancient civilizations had not yet invented automobiles or factories that add pollution to our streets and waterways. Similar to the design of a bioswale, the Incas took advantage of the movement of water down a slope to water their farms planted on the steps of a hill, known as terrace farming.

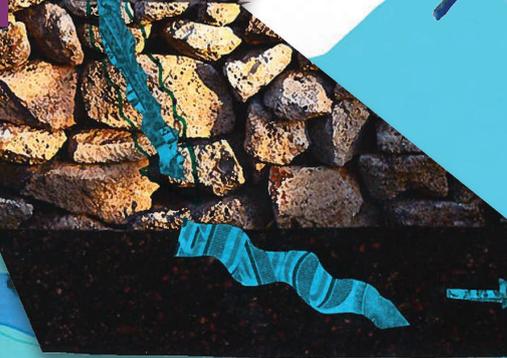
Soak It Up!

PERMEABLE PAVEMENT

A PAVED SURFACE THAT IS POROUS LIKE A SPONGE TO ALLOW STORMWATER TO MOVE THROUGH IT

“Puddles in the streets here can contain oil. When you have a puddle of oil and then it rains, that oil is flushed into our waterways. The purpose of permeable pavement is to trap that oil, let it sink through the cracks in the pavement, where it can stay and be filtered.”

GRAEME DAUBERT
GOWANUS CANAL CONSERVANCY



How do permeable pavements work?

1.

Water from rain, streets, and sidewalks flows onto the pavement.



2. Permeable pavement absorbs the water.

absorbs



3.

As the water travels from the pavement layer to the soil below, pollution may be filtered out of the water.

filters

HISTORICAL CONNECTIONS:

The first cities in the Indus Valley created drains under the streets for wastewater. The ancient Romans developed special drains and square pavement stones out of concrete to collect water.

Soak It Up!

CONSTRUCTED WETLAND

A MAN-MADE AREA DESIGNED TO TREAT WASTEWATER USING PLANTS AND SOIL

For new construction along our waterways there needs to be 40 feet between the waterway and the new building. Green space can fill up those 40 feet to help filter the runoff water before it enters our waterways.

GRAEME DAUBERT
GOWANUS CANAL CONSERVANCY



How do constructed wetlands work?



HISTORICAL CONNECTIONS:

The Mayas and Aztecs used constructed wetlands outside of their capital Tenochtitlan, known today as Mexico City. These wetlands were used for farming, not wastewater, and fed over half of the people there.

SOAK IT UP!

NEW YORK CITY CURRENTLY HAS A GREEN INFRASTRUCTURE PLAN TO IMPROVE THE CITY'S WATER QUALITY. | WHAT ARE GREEN INFRASTRUCTURES? | WHY IS THE WATER POLLUTED? | HOW WILL THE GREEN INFRASTRUCTURE PLAN CLEAN THE WATER?

In the Winter of 2016, CUP collaborated with teaching artist Elma Relihan and Erin Fleischauer's History classes at Brooklyn International High School to find out how green infrastructures work.

To investigate, students shared their personal experiences with water, explored green infrastructures along the Gowanus Canal, and interviewed Graeme Daubert of the Gowanus Canal Conservancy to learn more about the history of the city's water.

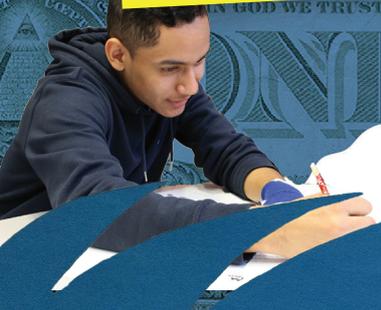
Students collaborated on this set of 6 postcards to teach others how green infrastructures make the city like a sponge.

THE SOAK IT UP! CARD SET:

- GREEN ROOF
- CONSTRUCTED WETLAND
- PERMEABLE PAVEMENT
- RAIN BARREL
- BIOSWALE



Where would you add green infrastructures?



GREEN INFRASTRUCTURE

WATER MANAGEMENT THAT COLLECTS AND DIRECTS WATER TO BE ABSORBED, FILTERED, OR STORED

Student Collaborators:

Abdoulaye Guendeba, Adalberto Brito, Aminata Bathily, Anunna Meem, Abdoulaye Guendeba, Adalberto Brito, Aminata Bathily, Anunna Meem, Anvar Suvonov, Baker Albaadani, Ehab Nagi, Elismel Diaz, Elizabeth Alcantara, Jeiffrey Garcia, Karen Mendez, Kazi Islam, Lesly Portillo, Lisbeiry Veloz Gonzalez, Mariam Sangare, Mohamed Almohamadi, Noor Gachi, Omar Faruk, Sana Quddus, Sayed Rahman, Shwei Thein, Steven Frias, Williams Medina, Yimelly Giraldo, Yuliana Pulagrin, Abdoulaye Ly, Adil Mahmood, Amena Begum, Delia Garcia, Eidy Almonte, Estefany Reyes, Heber Murillo, Huda Muthana, Ibrahim Diallo, Kevin Hernandez-Suarez, Lester Garcia, Moises Santos, Nazmul Tutul, Nelson Salinas, Rosibel Lopez, Saidou Ly, Samh Alshaif, Sharley Fernandez, Sheng Zheng, Souleymane Ba, Tahirou Sow, Yasilis Alcantara, Yina Sanchez, Yuleisi Guzman, Anderson Solis, Elenny Rodriguez, Elhadji Ndiaye, Elia Drozdovska, Fatema Fnu, Fatou Bintou Diop, Hui Lan Lin, Ibrahim Sow, Drozdovska, Fatema Fnu, Fatou Bintou Diop, Hui Lan Lin, Ibrahim Sow, Jing Qiu, Jonathan Russell Luna, Jorge Esquivel, Kenia Soberanis, Luz Urena Cruz, Mariama Diop, Misael Medina, Nene Camara, Nora Kaid, Sandra Torres, Santiago Moscoso, Sheima Alghazaly, Silvia Orellena, Yng Zhang, Zedah Islam, Amir Soliev, Cesar Menjivar, Charina Pena, Diogenes Asencio, Dioneysis Bautista, Fatima Rahman, Ferlando Andre, Jaen Wyatt Hurtado, James Celidon Faudel, Jian Ming Chen, Jonnathan Burgos, Julie Duchaine, Karina Diaz, Marco Isidro, Melisa Rodriguez Santos, Mohamed Shimul, Momotaj Begum, Orzimurod Kholdorov, Rofiqui Mowla, Tamim Feroz, Widmia Petit Homme, Xizhan Chen Cen

- ✓ To learn more about the NYC Green Infrastructure Plan, visit www.nyc.gov/greeninfrastructure
- ✓ To get involved in the NYC Green Infrastructure Program, email GIOutreach@dep.nyc.gov
- ✓ To learn how to build green infrastructures, visit www.grownyc.org/gardens/green-infrastructure-toolkit

The Center for Urban Pedagogy (CUP) is a nonprofit organization that uses the power of design and art to increase meaningful civic engagement, particularly among historically underrepresented communities.

To learn more about CUP, visit welcometoCUP.org. City Studies are CUP's project-based in-class and afterschool programs that use design and art as tools to research the city.

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Project Support: Christy Herbes
BIHS Classroom Teacher: Erin Fleischauer

The Brooklyn International High School (BIHS) helps English Language Learners develop their language, intellectual, cultural, and collaborative abilities so that they may become active participants in today's interdependent world. BIHS strives to help every student reach his or her potential by fostering academic growth, personal growth, and tolerance.

To learn more, visit mybihs.org.

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