

Save the Source Water Project

Chicago Conservation Corps (C3) Student Clubs
City of Chicago Department of Environment (DOE)



By participating in this Water Project, Club members will:

1. Research and discover a wide variety of methods for conserving water and improving water quality.
2. Work with administration to develop a school-wide plan addressing water issues at the school.
3. Conduct outreach for the school and/or community;
-OR-
Complete a water-related stewardship project.

Overview

During this project, Clubs will learn about a wide variety of methods used for conserving water and improving water quality. Then, they will work to achieve two different kinds of change. Clubs will:

1. Suggest **institutional** changes at the school via a meeting with or letter to the administration; and
2. Implement **behavioral/community** changes in the school or home community

The changes will focus on either water *conservation*, water *quality*, or both. This guide contains a number of ideas to start from, but the direction you decide to take at your school will depend on the challenges and opportunities you discovered during your audit.

Materials

To be provided by DOE at Water Workshop:

- 10 faucet aerators
- 10 copies of the City of Chicago “Save The Source” water conservation guide

To be provided by the Club:

- Outreach materials (paper, posters, etc.)

The online report for this project is due:

Friday, May 28th, 2010

To submit your report, log-in at
www.chicagoconservationcorps.org
(click on “C3 Teachers”)

Note: Teacher stipend check is contingent on the timely completion of this report.

If you have questions or concerns, contact:

Kristen Pratt
C3 Staff
312-744-5711

conservation@cityofchicago.org

Why should you do this project?

As you have seen over the past several weeks as you conducted your Water Audit, water plays a very important role in our day-to-day lives, from what we eat to how we wash to how we dispose of waste. It is exactly because of water’s importance in our lives that we work to conserve it and preserve its quality. It is a limited resource, and our current use of it is unsustainable. This is especially true in light of global climate change. It is anticipated, that as a result of the warming climate, the levels of the Great Lakes will drop and there will be heavier rains in winter and spring, straining our current water management infrastructure which will have an eventual impact on our ecosystems.

So, what can your school do to conserve water and improve its quality? What can YOU do? What can your friends, neighbors, and teachers do, and how can you help them?



Brainstorm and Plan Your Project (3 meetings)

(The first meeting should be combined with the last meeting of the Every Drop Counts Water Audit.)

- **Consider** your **audit** findings.
 - In what ways did you see water being wasted in the school? In your own habits?
 - In what ways did you see water being conserved in the school? In your own habits?
 - What would you like to see done differently? At school? At home? By students? Janitorial staff?
- **Brainstorm** water conservation and quality solutions.
 - What are your Club members interested in doing?
 - What do you think your audience (teachers, students, administration) might be interested in doing? What might excite them and get them involved?
 - Look at **What's It to You? (p.5-6)** and **What YOU Can Do! (p.7-8)** for additional ideas.

Part A: Institutional Change

Plan the *institutional* portion of your project. Consider following these steps:

- Conduct some **research** on what might be possible.
 - See **What's It to You? (p.5-6)** and **What YOU Can Do! (p.7-8)** and some of the additional resources for great suggestions.
- Schedule a **meeting** with your building engineer or administration to talk about current practices involving water use. Be prepared with some suggestions for what you might do (e.g., fix leaks, install faucet aerators, change landscaping practices, etc.). What specific, measurable goals could you set with your administration?
 - Get their input on: what might be possible, what they would be interested in pursuing, etc.
 - Share your **list of suggestions** specific to your school. This list will basically be a written summary of your meeting. It will hopefully serve as a checklist for your school as it moves forward in its water conservation efforts.
- Develop a way to **measure your school's progress** in reaching the goals you laid out.

Part B: Behavioral/Community Change

Plan the *behavioral/community* changes in your school or home community.

- **Decide** if your Club wants to complete an outdoor stewardship activity *or* a campaign in the school or community.
- If your Club decided to do an **outdoor stewardship activity**, work with the C3 liaisons at the Alliance for the Great Lakes or Friends of the Chicago River to set up your project.
 - See the attached **Teacher Resource Pages** (p. 9-10) for more information.
 - Consider **collaborating** with other schools. Contact C3 staff if you are interested in working with other C3 Clubs on this portion of your project.



- Before your volunteer activities, consider the following questions:
 - What environmental impact would your Club have by taking part in this activity?
 - What can you learn about ecology from this activity?
- If your Club decided to do a **campaign** in the school or community, plan your campaign. Consider following these steps:
 - Conduct some **research** based on the findings from your audit, your Club members' interests, and the **What's it to You?** and **What YOU Can Do!** Resource Sheets.
 - Consider the **audience** to whom you will be presenting, and tailor your campaign to that audience specifically. With whom will you be sharing information? Teachers? Students? Parents?
 - Plan the **theme** of your outreach. What would you want the take-home message to be? Make sure that it suits your audience and then use this as the basis for your outreach planning.
 - Determine your **outreach method**. Will you be presenting the information verbally? Through pictures? In writing? Here are some ideas:
 - Make **posters**. Consider including:
 - Facts specific to your school (such as information from your audit);
 - Pictures of people in your school/community conserving water; and/or
 - Suggestions or tips for conserving water.
 - Lead a **hands-on activity** for your audience. For example, teach people how to:
 - Conduct audits of their own homes/habits;
 - Install a faucet aerator; or
 - Use a rain barrel.

People are more likely to adopt behaviors if they are confident they can do so successfully. So, help them practice and see what a difference they could make!
 - Find a way to **relate** your outreach to everyone in your audience by appealing to something with which they are familiar.
 - For example, assign "homework" for a class. Have everyone go home and keep track of how long (how many minutes/seconds) they spend brushing their teeth with the water on. Then, do the math the next day to find out how many gallons of water were used! Share your findings with your research participants.
 - Present at a **school assembly!**
 - **Set goals** related to whichever means of outreach you chose.
 - Make sure that these goals are measurable (e.g., number of people involved, gallons of water conserved, etc.) within the time constraints of your project.
 - Involve as many people as possible!

Implement (2-3 meetings)



Follow your plans for both **Part A: Institutional Change** and **Part B: Behavioral/Community Change!** Don't forget to **measure your school's progress** as you put your ideas into action.



Analysis and Follow Up

1. Look back at the goals you set during your planning process for both the behavioral and institutional portions of your project. Did you reach those goals?
 - For your specific measurable goals, estimate/determine values. For example:
 - How much water was conserved as a result of your efforts?
 - How many people were included in your outreach?
 - How many pounds/bags of trash were collected at your site (for the Friends of the Chicago River or Alliance for the Great Lakes activities)?
 - How many leaks were repaired?
 - How many faucet aerators were installed?
 - How did your Club's efforts impact water quality?
2. What did your Club learn from these activities?
3. What were some of your greatest successes?
4. What were some of your greatest challenges and how did you address them? Would you address these issues differently in the future?
5. What more could your Club do to assist your school and community in their water conservation efforts? In improving water quality? This year? Next year? In future years?
6. Fill out the online report for this audit, due on **Friday, May 28th** (see page 1 for instructions).

Additional Resources

Chicago Department of Environment: <http://www.cityofchicago.org/Environment>

Under "Initiatives and Programs" on the left side, click on "Water" to learn what Chicago is doing for water quality and conservation.

Chicago Climate Action Plan: www.chicagoclimataction.org

Under "How Climate Change Affects Chicago," look at some of the information about increased precipitation and plans for improved stormwater management.

Alliance for Water Efficiency: <http://www.allianceforwaterefficiency.org/>

This Chicago-based non-profit organization is dedicated to the efficient and sustainable use of water.

**Pennsylvania Department of Environmental Protection's
"Water Conservation Ideas for Schools and Colleges":**

To access this document, visit www.edfacilities.org/rl/water.cfm and click on the 7th link from the top with this title.

Wisconsin Green Schools Program Water Resources:

<http://www.dnr.state.wi.us/org/caer/ce/greenSchools/resourcesWater.htm>

EPA New England region's Water Conservation Tips for Schools:

http://www.epa.gov/region01/eco/drinkwater/water_conservation_schools.html

EPA's water page for high school students: <http://www.epa.gov/highschool/water.htm>





What's It to You? Why Water Conservation and Quality Matter in YOUR Life

Chicago Conservation Corps (C3) Student Clubs
City of Chicago Department of Environment (DOE)



Water Use in Chicago:

- ◆ Between 5 million people and the industrial equivalent of another 4.5 million, the Chicago region uses **~2.1 billion gallons of water a day**. This is enough water to fill more than 3,000 Olympic sized swimming pools! All of our water comes from Lake Michigan.
- ◆ The City of Chicago was originally part of Lake Michigan's watershed, meaning that when Chicagoans drew water from the lake and then disposed of it in the Chicago River, the water returned to the lake. However, the practice of returning dirty water (before it was treated like it is today) to Chicago's water source caused outbreaks of cholera, dysentery, typhoid fever, and other water-borne diseases in the city. In order to reduce disease outbreaks, the city built the Sanitary & Ship Canal that **reversed the flow of the river**. The Canal was completed in 1900.
- ◆ Because Chicago reversed its river, we are no longer part of the Lake Michigan watershed. In other words, we draw water from the lake, but instead of sending it back in when we're done with it, we send the water down the Chicago River. Eventually, that water flows into the Gulf of Mexico. That means we're slowly draining Lake Michigan! **Less than 1% of the water we use makes it back into Lake Michigan**. With potential drops in the level of the Great Lakes due to impacts from global climate change, this becomes a matter of ever-increasing importance.
- ◆ When our water (and whatever is mixed with it) goes down the toilet or drain, it flows into our sewers. Chicago has a combined sewer system, meaning that our rain water and wastewater go into the same sewers. When we have big storms, the reservoirs that hold water before it is treated sometimes reach their capacity and cannot hold all of the water from the sewers. When this occurs, the **excess untreated sewer water** is dumped into the Chicago River – this is called a combined sewer overflow (CSO). This sewer water can have a negative impact on the health of the Chicago River.
- ◆ If sewer and rain water are dumped into the Chicago River and the *river* begins to flood, we sometimes, in very special circumstances, must open the locks on the dam that was built to reverse the flow of the river. This means that river water (mixed with sewer water) flows back into Lake Michigan (like it once did). This happened **three times in 2009** during really big storms.

Your Water Use:

Did you know?

- ◆ The average Chicagoan uses 200 gallons of water per day. Nationwide, the average American uses 100 gallons of water per day.
- ◆ Water use requires energy use. Pumping, pre-treatment, heating, and post-treatment of water are all energy intensive processes. It is estimated that, on average, 1.65 pounds of carbon are emitted by coal-fired power plants for every gallon of water that you use (0.44 pounds per liter).
- ◆ Watering athletic fields and other landscaping can account for 47% of a school's water use during the hot summer months. It can account for 40-65% of the average homeowner's water use. About 50% of the water used for landscaping purposes is lost through evaporation.

Flip over this page to learn more about how you can investigate **YOUR** water use.



To learn more about some of your water uses, try some of these activities:

- ◆ **Toilets (with accessible tanks):** New toilets are supposed to meet the standard of 1.6 gallons/flush. Often times, the flush rate is written inside of the tank. If it isn't, you can figure out how many gallons of water your toilet uses per flush by following these directions.
 - ◆ Carefully shut off the valve in the toilet tank supply line (DO NOT FORCE).
 - ◆ Mark the level of the water in the tank reservoir. For example, put a piece of tape at the edge of where the water is.
 - ◆ Flush the toilet.
 - ◆ Refill the tank reservoir with fresh water using a graduated container (such as the C3 water bottle) to determine how much water is needed to flush the toilet.
 - ◆ Don't forget to open the valve when you're done.

- ◆ **Toilets (with accessible tanks):** You can find "silent leaks" in your toilet by following these directions.
 - ◆ Put enough food dye in the tank to noticeably color the water.
 - ◆ Wait 15 minutes.
 - ◆ Look for food dye in the toilet bowl at the end of 15 minutes. If you see color, then you have a leak you can report to a plumber.

- ◆ **Dishwashers, toilets with inaccessible tanks, etc.:** If you can't determine water use or leaks with the above methods, try some of these:
 - ◆ Consult maintenance staff, owner's manuals, or manufacturer's website.
 - ◆ Check out the water use figures listed on the Niagara Conservation Water Wheel (provided by C3), or on the website <http://www.h2ouse.org>. This website gives average water uses, in some cases by the year of installation.
 - ◆ Once you find out how many gallons of water an appliance uses per use, calculate how many gallons the appliance uses per day with the following equation:
$$\text{daily water consumption} = \text{gallons per use} \times \text{uses per day}$$

- ◆ **Personal Water Use per Day:** Visit this website to calculate an estimate for your water use per day.
 - ◆ http://www.tampagov.net/dept_Water/information_resources/Saving_water/Water_use_calculator.asp

For more information on water use and how it relates to you:

H2ouse, the Water Saver House: <http://www.h2ouse.org>

Visit this site to take a virtual tour of a water efficient house. Learn how much water is used, on average, in different parts of the home.

Chicago Climate Action Plan, \$800 Challenge:

http://www.chicagoclimateaction.org/pages/take_the_700_challenge/59.php

See how much money you could save (and the carbon emissions you could reduce) by simple practices in your home, including some related to water use.





What YOU Can Do! How You Can Conserve Water Everyday

Chicago Conservation Corps (C3) Student Clubs
City of Chicago Department of Environment (DOE)



Indoors:

Many of these tips can be applied at home or at school.

- ◆ Turn the water off **while brushing your teeth or shaving**.
- ◆ Fix leaky **faucets and toilets**.
- ◆ Put food coloring in your **toilet tank**. If it seeps into the toilet bowl, you have a leak that should be repaired.
- ◆ Make sure the **toilet flapper** does not stick open after flushing.
- ◆ Install **low-volume toilets**. Or, if your toilet was installed prior to 1980, place a bottle filled with water in your toilet tank.
- ◆ Keep your **shower under five minutes** long. Need help timing yourself? Try using music! For example, set yourself a limit of two songs.
- ◆ Install a **low-flow showerhead**.
- ◆ **Suggest to the administration that your school purchase low-flow fixtures** when the old ones wear out. Research the costs and benefits of water-saving devices like low-flow showerheads and faucets and new low-water toilets. Compare the costs and benefits of low-flow fixtures to conventional fixtures. Present your findings to the administration.
 - C3 will provide each Club with **10 faucet aerators**, which reduce a faucet's water use to 1.5 gallons per minute. How much water does this save? The typical faucet uses 3 gallons per minute. Therefore, these aerators save 1.5 gallons/minute. By installing all 10 faucet aerators, your school can save:
 - 10 faucets x 1.5 gallons/minute = **15 gallons per minute**
 - NOTE: If these aerators won't fit on any of the faucets in your school, feel free to **distribute them among C3 students** to take home.
- ◆ Use creative means for **watering houseplants** (or perhaps even filling pets' water bowls). For example, you could use leftover drinking water, water collected in the bathtub while you're waiting for the water to get warm, water collected as you wash your fruits and veggies, or a bucket under your air conditioning unit that collects condensation.
- ◆ Run your **washing machine and dishwasher** only when full.
- ◆ Rinse **dishes in a sink full of water** instead of with the tap. Use a dishwasher if you have one, which actually uses less water than washing dishes by hand.
- ◆ Visit <http://www.h2ouse.org> for more ideas about conserving water indoors.
- ◆ For even **MORE ideas**, visit <http://www.wateruseitwisely.com/100-ways-to-conserve/index.php>. They have a list of over 100 tips like these!

Please turn the page for Outdoor Tips.



Outdoors:

Many of these tips can be applied at home or at school.

- ◆ Never discard **chemicals, pharmaceuticals, litter, or motor oil** down any drain or sewer.
- ◆ **Fix leaks** in the irrigation system.
- ◆ **Water landscaping at night.** The ideal time to water is between midnight and 4 a.m. Watering during this time period keeps evaporation to a minimum and reduces pressure on the municipal water system during peak water-use hours. If possible, change the automatic irrigation timer to go off between these hours. However, if staff members need to be present when the sprinklers are operating, suggest turning the sprinklers on first thing in the morning or right before staff goes home in the evening.
- ◆ **Reduce the number of times** you water per week, and **increase the length of time.** Watering fewer days per week for longer periods helps grass develop longer roots, so it can survive droughts. During dry periods, it's ok to let the lawn go brown – brown grass isn't dead, it's just dormant.
- ◆ If you have an **automatic irrigation timer**, adjust it monthly in accordance with the weather. You also might encourage your school to install an automatic rain shutoff device. If sprinkling is controlled by hand, encourage the maintenance staff to avoid watering on rainy days.
- ◆ **Set lawn mower blades** to 2-3 inches high. Longer grass shades the soil and takes in more sunlight, improving moisture retention and allowing the grass to grow thicker and develop a deeper root system. This helps grass survive drought, tolerate insect damage and fend off disease.
- ◆ Apply **mulch** around shrubs and flowerbeds. This helps reduce evaporation.
- ◆ Reduce or eliminate the use of **fertilizers, pesticides and herbicides** on the school lawn or garden.
- ◆ Use **native plants** in your landscaping. Plants that are indigenous to Illinois (i.e., occur naturally in this habitat) have longer roots than non-native species, so they absorb more stormwater runoff and can better survive droughts. They also require a lot less watering, which conserves water! Not only will native plants conserve water, but they also protect water quality because they require fewer pesticides and fertilizers.
- ◆ **Use a broom** instead of a hose to clean walkways, driveways and entrances.
- ◆ **Install a rain barrel** to catch some of the rainwater that falls on the roof. This water can then be used in the garden instead of flowing into the sewer system. Rain barrels are **ideal for use at most homes**, however, the Chicago Department of Environment may be able to provide your Club with a 55-gallon rain barrel if you have a shed or other small outbuilding at your school. **Installing a rain barrel may be appropriate at your school if:**
 - There is an appropriate location that drains a small amount of roof, such as a shed, where an external downspout can be disconnected, and directed into the rain barrel.
 - The water collected in the rain barrel could be used on a regular basis for watering landscaping or other outdoor (non-potable) uses.
 - You have approval from appropriate administration.
 - Find information on how to make, install and maintain a rain barrel on your CD. If you are interested or would like more information, please e-mail us at conservation@cityofchicago.org.
- ◆ Visit <http://www.h2ouse.org> for more ideas about conserving water on landscaping.





Adopt-a-Beach Volunteer Opportunity with C3 Partner Organization: Alliance for the Great Lakes ~ Teacher Resource Sheet ~

Qualifies for "Behavioral/Community Change" component of Water Campaign



The Alliance for the Great Lakes is the oldest membership-based, non-partisan education and advocacy voice for the Great Lakes. For this component of your project, you'll work with a representative from Alliance for the Great Lakes to adopt a site along Lake Michigan.

The Year-Round Adopt-a-Beach program invites groups and individuals to commit to between 2-5 visits. At each visit, you and your students will collect and record the litter you find, and test the water for *E. coli* levels using materials provided by the Alliance. In addition, adopters conduct a general assessment of beach conditions. Adopters then enter their data onto the Alliance's online database, combining their data with volunteers from all over the Great Lakes region.

You and your students can also elect to participate in the Alliance for the Great Lakes' annual beach cleanup next September. The cleanup is part of a worldwide event and is important in raising awareness about beach health for the Great Lakes and other waters around the world.

2009 Facts and Figures

- **200+** beach sites were cleaned up
- **7,000** volunteers participated
- **30,468** pounds of trash were removed from Great Lakes beaches by Adopt-a-Beach volunteers
- **Five** states had Adopt-a-Beach programs

Source: 2009 Adopt-a-Beach newsletter

Getting Started

The first step is getting in touch with Frances Canonizado, outreach coordinator at the Alliance for the Great Lakes, to let her know you're interested in adopting a beach with your C3 Club. Frances will set you up as an adopter and help you choose a site. She will also make sure you have the right materials for your site visit including a training CD, water quality testing supplies, sample forms, and a username and password for entering data online.

Frances Canonizado, 312-939-0838 x227, fcanonizado@greatlakes.org

We recommend working with other schools on this project. Don't forget that as a C3 club, you are a part of an extensive network of schools throughout Chicago! Once you've contacted Frances, if you are interested in getting in touch with other teachers, send us an e-mail at conservation@cityofchicago.org with your contact information, which beach site you're thinking about, and a few proposed dates. We will circulate your ideas among all of our participating teachers.

For More Information

- Alliance for the Great Lakes: <http://www.greatlakes.org/>. In addition to running the Adopt-a-Beach program, the Alliance works to protect the Great Lakes with policy, education, and other efforts. Check out their website for fact sheets and news releases on environmental issues related to the Lakes.
- The EPA's *The Great Lakes: An Environmental Atlas and Resource Book*. Available at <http://www.epa.gov/glnpo/atlas/>.
- Great Lakes Regional Collaboration: <http://www.glrc.us/>. The Great Lakes Regional Collaboration (GLRC) is a wide-ranging, cooperative effort to design and implement a strategy for the restoration, protection and sustainable use of the Great Lakes.
- Healing Our Waters: <http://www.healingourwaters.org/>. The Healing Our Waters agenda calls upon the U.S. federal government to take the lead role in coordinating Great Lakes protection, especially in restoring water quality, preventing and controlling non-native aquatic invasive species, and cleaning-up areas of concentrated toxic pollution.





Chicago River Day Volunteer Opportunity with C3 Partner Organization: Friends of the Chicago River ~ Teacher Resource Sheet ~



Qualifies for "Behavioral/Community Change" component of Water Campaign

Friends of the Chicago River is the only organization solely dedicated to the Chicago River. Founded in 1979, Friends' work now spans the entire 156-mile river system and its surrounding watershed, focusing on: a greener river with healthy habitat; an accessible river that people can use and enjoy; and a river cared for by a broad group of supporters. Friends believes that a broad base of popular support for the Chicago River is essential to the long-term success of efforts to improve it.

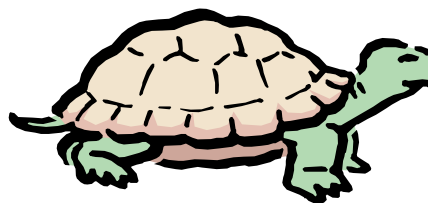
For this portion of your project, you'll participate in the annual Chicago River Day. Your students will be working with over 4,100 other volunteers on improvement and restoration projects that will take place along 100 miles of sites on the Chicago River.

Date: Saturday, May 8, 2010

Workday (9a.m. – noon)

Activities Include:

- ◆ Collecting garbage and recycling
- ◆ Removing invasive vegetation
- ◆ Sprucing up river-edge trails
- ◆ Planting native seedlings
- ◆ Creating river-inspired art
- ◆ Exploring the Chicago River
- ◆ Free t-shirts provided to volunteers!



Getting Started

Visit the www.chicagoriver.org for details about the event, including participating sites. To register your Club, contact Cynthia Fox at Friends of the Chicago River:

Cynthia Fox
(312) 939-0490 x13
cfox@chicagoriver.org

Additional Resources

- **Friends of the Chicago River:** www.chicagoriver.org
The mission of Friends of the Chicago River is to preserve, protect, and foster the vitality of the Chicago River for the human, plant, and animal communities within its watershed.
- **Chicago Public Library's** history of how the Chicago River was reversed:
<http://www.chipublib.org/004chicago/timeline/riverstrght.html>
- Complete history of the Chicago River from the online *Encyclopedia of Chicago*:
<http://www.encyclopedia.chicagohistory.org/pages/263.html>

