

# Follow-up Analysis of Black River Clean-up

Based on a GEO 110 Honors Project



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# What is Humanity Doing?

- Trash is being thrown anywhere, including bodies of water.
- Water pollution is being created at a very rapid pace.
- People may not believe that there is a way to reverse the current damage.
- People may also think that hurting or cleaning smaller bodies of water will make very little to no difference.



<https://hydrosphereassociation.org/wp-content/uploads/2019/01/Plastics-on-beach.jpg>

# The Problems to Address

- How does waste reach oceans from even the smallest bodies of water?
- What harm will aquatic trash do to life and the environment?
- What would happen to sources of fresh water?
- What can we do as individuals?



[https://earth911.com/wp-content/uploads/2020/11/AdobeStock\\_278282717\\_1200.jpeg](https://earth911.com/wp-content/uploads/2020/11/AdobeStock_278282717_1200.jpeg)

***The winner has a solution for every problem; the loser has a problem for every solution.***

—Shiv Khera—

[https://bukrate.com/set\\_images/images?id=1293304&author=686001&type=16](https://bukrate.com/set_images/images?id=1293304&author=686001&type=16)

# How Does Waste Reach Oceans?

- Trash that is not disposed of properly can reach other bodies of water.
- Garbage is easily transported far distances due to strong winds and heavy rainfall (How does plastic end up in the ocean?, n.d.).
- Once in the water, the trash follows the descending flow of water.
- Plastic is one of the biggest cases of this problem.

<https://149359429.v2.pressablecdn.com/wp-content/uploads/2015/08/plastic-bag-wind.jpg>



# Why Should We Care?

- Many “land surfaces” are connected to oceans (Patel, 2018)
- Every body of water is polluted by the incoming trash.
- Scientists initially believed that a piece of trash could pollute up to twenty bodies of water.
- *Science Advances* changed that number to over one thousand, especially due to "densely populated urban areas" (Parker, 2021)

<https://www.worldfinance.com/wp-content/uploads/2018/06/plasticbagpollutionintheocean.gif>



# What Harm can Aquatic Trash do to Earth's Waters?

- Plastic could trap or choke sea animals (Marine plastic pollution, 2021)
- Sea life may lose their physical stability and eventually their lives
  - Rips or tears in their flesh, infections, inefficient swimming, injuries inside their body, and malnutrition (Marine plastic pollution, 2021)
- Plastic helps direct “invasive marine species” into other aquatic habitats (Marine plastic pollution, 2021).
  - Compromises “marine biodiversity” (Marine plastic pollution, 2021).
  - Water may no longer be protected from manmade pollution.

# What Harm can Aquatic Trash do to us?

- Oceans could be home to more and more “microplastic” (Marine plastic pollution, 2021).
  - Microplastic could be found in many food and drinks.
  - Their chemical composition consists of toxic metals, which could permanently change the biological layout of cells in the human body (Toxic Chemicals used in Plastic Manufacturing and Their Safer Alternatives, n.d.).
  - Puts humans and wildlife at risk for “developmental, reproductive, neurological, and immune disorders” (Marine plastic pollution, 2021)
  - Correlates to cancer-causing chemicals that harm the endocrine system (Marine plastic pollution, 2021)

# What Would Happen to Sources of Fresh Water?

- The Great Lakes Drainage Basin
  - Provides 84% of all the fresh water in the United States and 18% in the world (Great Lakes drainage basin map, 2019)
  - Also used for public entertainment and moving goods (Great Lakes Pollution, n.d.)
- Agricultural Concerns
  - Fertilizer and pesticides introduce “agricultural runoff” (What is Agricultural Runoff?, n.d.)
  - The Great Lakes worry about “phosphorus runoff” (Graham, 2021)
    - Spreads “cyanobacteria,” an “algal bloom” that may be infectious (Graham, 2021)
    - Increases pollution due to “erosion, transporting nutrients, and heavy metals” (How To Prevent Agricultural Runoff, n.d.)

<https://geology.com/maps/lakes/great-lakes/great-lakes.jpg>



# What Would Happen to Sources of Fresh Water? (Continued)

- Plastic waste contamination
  - Lowers the quality and health of the Great Lakes (Graham, 2021)
  - May ruin several foods and beverages because of microplastic
- Either way, these lakes will become less and less reliable for transportation and public health.
- Newly created toxic compounds could form that attack habitats and sea life (Graham, 2021)

[https://media-cldnry.s-nbcnews.com/image/upload/t\\_fit-760w,f\\_auto,q\\_auto:best/rockcms/2022-04/220407-microplastics-stock-ac-756p-83361f.jpg](https://media-cldnry.s-nbcnews.com/image/upload/t_fit-760w,f_auto,q_auto:best/rockcms/2022-04/220407-microplastics-stock-ac-756p-83361f.jpg)



# Finally... What Can We Do?

- For starters
  - Avoid the habit of throwing trash literally anywhere... personal and public garbage cans exist for a reason.
  - Reduce, reuse, and recycle appropriate items like paper and plastic.
  - Keep filled recycle bins, garbage bags, and garbage cans indoors until they need to be dumped out.
  - Educate others about the problem and solutions.

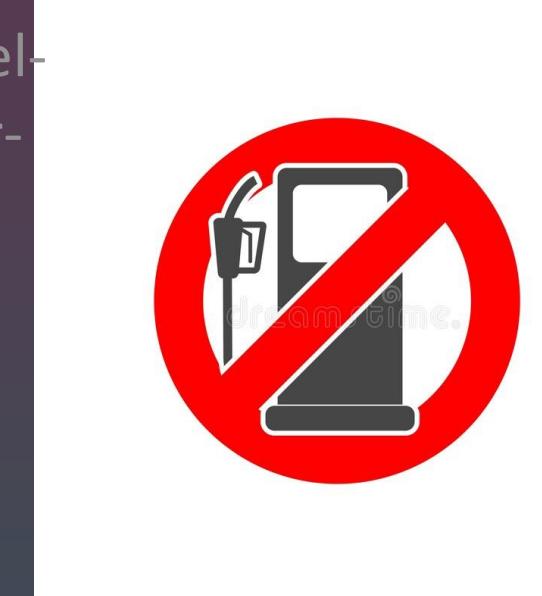
<http://bwcsa.co.za/wp-content/uploads/2017/05/educate-others.jpg>



# More Solutions at the Individual Level



- At home
  - Limit water usage, pollutants, and waste disposal (How can you help our ocean?, n.d.)  
[https://sustain.princeton.edu/sites/g/files/toruqf176/files/styles/freeform\\_1440w/public/2019-12/icon-water-usage.png?itok=BgJIXI9i](https://sustain.princeton.edu/sites/g/files/toruqf176/files/styles/freeform_1440w/public/2019-12/icon-water-usage.png?itok=BgJIXI9i)
- While going out
  - Use “reusable bags” (How can you help our ocean?, n.d.)
  - Travel using as little fuel as possible (How can you help our ocean?, n.d.)  
<https://thumbs.dreamstime.com/b/no-gas-sign-no-fuel-warning-sign-no-gas-sign-no-fuel-warning-sign-vector-icon-172277977.jpg>
  - Consider purchasing “energy efficient lightbulbs” (How can you help our ocean?, n.d.)
- When boating
  - Fish through the “catch and release method” (How can you help our ocean?, n.d.)
  - Avoid stopping near “coral and seagrass” (How can you help our ocean?, n.d.)
  - Find other ways to give love and care to the aquatic habitat (How can you help our ocean?, n.d.)



# What I Did!

- Initiated a local river cleanup on April 21st, 2022
- Received help from nearly thirty volunteers
- Removed pounds of trash at the trail behind campus that leads to the Black River



**BLACK RIVER CLEAN-UP**  
Jefferson Community College

**When:**  
April 21, 2022  
12:30 p.m. - 2:00 p.m.

**Where:**  
Meet in front of Res Hall  
at JCC

Join JCC Honors Student, Justyce Countryman, who is on a mission to protect the environment. All are welcome to lend a helping hand in cleaning up the Black River.

**Register: [bit.ly/blackriver2](http://bit.ly/blackriver2)**

Students can contact Dr. Chris Ebey about extra credit for participating in this event.



In collaboration with Student Activities & Inclusion.  
This initiative is an Honors Program capstone project and a community service project for Phi Theta Kappa Honor Society.

**JEFFERSON**  
STATE UNIVERSITY OF NEW YORK  
There's more here.

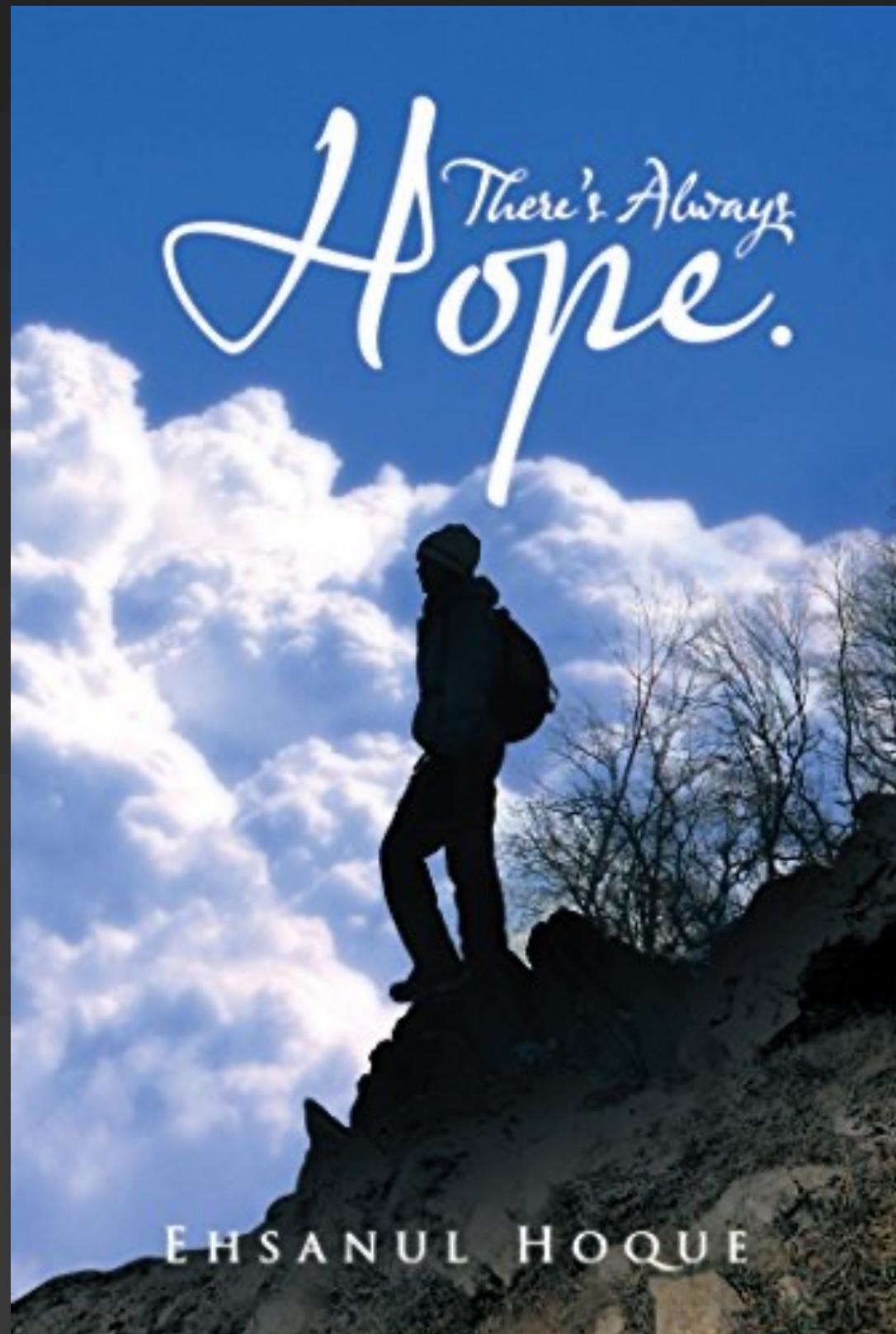
# What Benefits Did the Clean-Up Accomplish?

- All participants were able to take note of the significant amount of garbage left over in our area.
- They were able to do their part in reversing the manmade damage.
- Sea life is more likely to be saved and their habitats will be suitable for living and finding food (Benefits of River Protection, n.d.).
- Bodies of water will be more safe from contamination and natural disasters (Benefits of River Protection, n.d.).



Technology and individual contributions  
could help oceans return to their former  
glory by 2050.

(McGrath, 2020)



[https://m.media-  
amazon.com/images/I/51VytIYDMgLj.jpg](https://m.media-amazon.com/images/I/51VytIYDMgLj.jpg)

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# Thank You!!!



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