



*E-waste workers in Agbogbloshie, Ghana, burn plastic off wires to recover copper in 2010.
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Lesson: Integrating social and equity dynamics into ecological studies: the Landfill case study

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Overview:

Environmental scientists have historically favored studying systems separately from humans, which perpetuates the misconception that culture is separate from nature. In the 21st century, human impacts have become central to the study of imbalance and degradation in natural systems, but ecologists may still struggle to comprehend and incorporate insights from the social sciences and humanities into their empirical work. Part of that resistance may be methodological, as environmental scientists rely on measurement, iteration, modeling, and statistical analysis, while social scientists and humanists often approach their work with qualitative and narrative tools. But environmental research benefits tremendously in interdisciplinary scope, public interest, and integrative solutions if environmental scientists expand their worldview with the timely knowledge of social and creative spheres. This lesson uses the case study of the municipal landfill as a frame for investigating how cultural practices and social inequality lead to marginal living environments, which disproportionately affect the poor and people of color.

Assumed Prior Knowledge:

Most ideal for undergraduate and graduate natural science students with limited knowledge in sociology, anthropology, psychology, and/or the arts. It's best if students are curious about how the natural sciences are enriched by interdisciplinary framing.

Learning Objectives:

- Extend natural science epistemology by considering the human and social context in the study of a given socio-environmental system.

- Provide tools for natural scientists to approach the communities within their study systems with respect, empathy, and a solutions-based ethos.
- Link measurement and empirical analysis with creative, integrative epistemologies.
- Illuminate a specific case study of the interface between communities and their environmental conditions; in this case, the municipal landfill.

Key Terms and Concepts:

epistemology; empiricism; qualitative analysis; demography; waste culture; consumerism; point source pollution; environmental justice; globalism; remediation; urban renewal; sacrifice zones; environmental racism

The Hook (suggestions for quickly engaging students):

Where does the Amazon “river” flow?

1. Have each student pull up their purchase history on Amazon.com or their favorite shopping site. (They do not need to share this history with others.) Students spend 5 minutes making a list of the items they’ve ordered in the last month. Then, have them estimate the “use-life” time for each item: a day, a month, a year, or indefinite life. Have them factor in the packaging as part of the item.
2. Next, ask the students to guess where the item will go when it’s no longer useful. Ask them where the [nearest landfill](#) is (they probably won’t know). Research that landfill site and pull it up on a large screen on Google maps. That’s where their trash goes. Consider “reuse” and “[recycling](#)” as preferences, but hardly panaceas in reality.
3. As a full class, make a list of the 2–3 closest neighborhoods or towns to the local landfill. Divide students into groups and have a 10-minute research period to try to find out the demographics of this adjacent community (esp. race, class, income). Then, have them research whether this landfill site has ever caused controversy or sparked protest.
4. Sum up some of the [familiar socio-environmental impacts of landfill sites](#) (methane, air pollution, groundwater contamination, noise pollution from dump trucks, olfactory offense, degraded land). Then, extend the ecological concerns to consider social impacts as well, under the concept of [sacrifice zones](#).
5. Then, ask your students to list and discuss what social impacts they can deduce from the environmental and social synthesis above. How do the impacts of our personal consumerism affect others in our region more than ourselves? (This assumes nobody in the class lives in a landfill-adjacent site; if anyone does, it’s a great first-hand account.)

Teaching Assignments

Environmental Justice Profile and Slide Show

1. Give a blitz background on the field of Environmental Justice (EJ) by profiling the activism of the African-American community in Warren County, N.C. in 1982, which fought the location of a landfill to house PCB-contaminated soil in their farming community. There are many resources on EJ, but this [Washington Post article](#) sums things up with specificity and comprehensiveness.
2. Present the Landfill slide show: [Landfill slide show.pptx](#)

For each image, ask students to identify the various dynamics at play: Are they ecological, geographical, sociological, cultural, historical, political, or a blend of many disciplines? Since these

images are ecological, but also inherently deeply social, ask students to speculate how the “ecology” of the site may be impacted by other factors. Who benefits from the landfill? Who suffers? How is the site selection not only a real estate choice, but one laden with histories of racism and inequality? Besides landfills, what other industrial practices create sacrifice zones?

3. Divide the class into six groups, each of which selects one slide to consider in-depth (30 min). Their group conversations should explore geography, demography, aesthetics, cultural values, and proleptic speculation (What will happen here in the future?).
 - Take, for example, the Freshkills site on Staten Island, N.Y. Seek a temporal journey of past, present, and future: What was the existing natural ecosystem (wetland and meadow) before dumping started in 1948? Then, compare [human demographics](#) between Staten Island and a more privileged borough, Manhattan, and discuss how this site may have been chosen over, say, Central Park. What are some human and sociological impacts of the landfill’s half-century of operation? Lastly, ask the students to imagine this site into the future, as it is planned to become New York City’s (NYC) largest park (three times larger than Central Park!). This [primer](#) provides context.
 - What cultural values and goals require the creation of landfills? How have their active-use impacts affected nearby human, animal, and botanical communities? Consider aesthetics, humor, and irony. How is it ironic and satirical that NYC’s newest park is three times larger than its most famous park, and why is it so big? How do public-facing narratives about remediation and reclamation (such as the primer above) create a triumphalist narrative on what is a signal feature of inequality in American consumer waste culture?
4. Have the group sketch out a plan for ecological remediation on that site that ignores any considerations other than what is best for its ecology. Then, complicate this eco-centric plan. What social and cultural interests and factors should be taken into consideration? Have them debate what the “best” outcome for all stakeholders would be in this situation: A wildlife refuge? A methane-recapture facility? A park with trails and recreation? A new adjacent landfill (Planners like to cluster them.)?
5. Have each group present their “eco-centric” versus “eco-cultural” plans for ushering this site into a more promising future. Conclude with a discussion of how ecologists can learn from this socio-cultural exercise in other target systems: coastal wetlands, urban industrial brown sites, mountaintop mining reclamation sites (watersheds), fragment forests and prairies with suburban, farming, or industrial encroachment.
6. Finish with the trillion-dollar-question: How can we prevent landfills in the first place? What specific actions can we take to [reduce waste](#) and close loops? Should the burden of “waste culture reform” land on consumers, producers, or the government?

Background Information for the Instructor:

1. [Gordon Plaza was sold as a dream for Black home buyers. It was a toxic nightmare.](#)
 - This *Washington Post* article describes histories of racist policies that caused a community to literally live on top of an old landfill without their knowledge.
2. [Landfill Reclamation](#) from the Environmental Protection Agency
 - This document contains a useful perspective on how the federal government hopes to remediate historic landfills, but it dates from 1997!
3. [Waste Land](#), the film
 - Vik Muniz’s documentary profiles Brazil’s largest landfill and the pickers who survive by reclaiming recyclables, as well as the art they create to celebrate their work.

Related SESYNC Content:

- Palmer, Margaret and Armstrong, A. W. (2022, April 20). *Introduction to Political Ecology*. SESYNC. <https://www.sesync.org/resources/introduction-political-ecology>
- Hoover, Fuschia-Ann. (2015). *Why STEM Needs Environmental Justice: A Call to Action*. SESYNC. <https://www.sesync.org/news-events/why-stem-needs-environmental-justice-call-action>
- Collins, Mary B., Munoz, I., and JaJa, J. (2016). Linking ‘toxic outliers’ to environmental justice communities. *Environmental Research Letters*, 11(1). <https://doi.org/10.1088/1748-9326/11/1/015004>
- SESYNC. *New Paper Finds Environmental Justice Rarely Discussed in Green Infrastructure Planning*. (2021). <https://www.sesync.org/news-events/new-paper-finds-environmental-justice-rarely-discussed-green-infrastructure-planning>
- SESYNC. (2017). *Use of Citizen Science Approaches to Understand and Address Environmental Justice and Health Issues*. <https://www.sesync.org/news-events/use-citizen-science-approaches-understand-and-address-environmental-justice-and-health>