

State of **the Planet**

EDUCATION

Real-World Lessons From the Spring 2020 Environmental Science and Policy Workshop

BY GREG HOPPER | JUNE 4, 2020

In the final semester of Columbia University's [Masters of Public Administration in Environmental Science and Policy](#) (MSP-ESP) program, students are enrolled in the Workshop in Applied Earth Systems Policy Analysis, in which they analyze projects for real-world clients in government and nonprofit agencies. These projects were introduced in a State of the Planet post in January, [here](#).

We caught up with a few of the students who worked on these projects to learn more about their projects, their challenges, and what they've gained from these experiences. Read the Q&As below. You can also watch the recording of the students' final briefings [here](#).





The MPA in Environmental Science and Policy cohort

Project: Opportunities and Challenges for Water Reuse Policy in New York City: Applying Lessons Learned from the US and Beyond

Faculty Advisor: [Nancy Degnan](#)

Greg Hopper: The goal of this project is to identify challenges and opportunities that lie ahead for water reuse policy in New York City as it relates to the U.S. Environmental Protection Agency's September 2019 draft of the National Water Reuse Action Plan (WRAP). Are there any challenges you can share that are posed by WRAP for the City of New York? What kind of solutions are available for those challenges?

Daniella Simari: Some of the challenges that New York City faces, especially in light of WRAP, is that our city is water-rich, meaning it already has abundant water resources with the infrastructure to deliver clean, high quality water. There are practically no financial incentives for reuse systems in New York City unless these systems are large enough to accommodate many, many buildings, which then lowers the cost of water for those consumers. The capital costs to build a municipal-level centralized system are too high to be thought of as feasible, and having a potable (drinkable) water system is totally out of the question, according to the NYC Department of Health. New York City is also unique in that most of the infrastructure in the city

is already built up, and there is more need for retrofitting/infrastructure maintenance than there is for completely new construction. Thus, finding the space for these systems, especially at a centralized scale that would accommodate lots of buildings, is incredibly difficult. Our team thought that a way around that would be to provide a self-updating map for the Department of Environmental Protection regarding all new construction projects throughout NYC, so that they would be able to approach those developers and explain the feasibility of a reuse system to be part of their construction.

Unfortunately, reuse systems aren't highly visible to the general public yet, and there could be a lot of doubt and fear about drinking/using recycled water. The NYC DEP already has a [grant system](#) in place for developers who wish to build reuse systems, but we believe that the education side of this grant system may be lacking. If the city were to begin a municipal-level reuse strategy, there would need to be a public outreach campaign to build a groundswell of support. Orange County Public Works in California is a really great example of this, and they have a potable groundwater recharging system. San Francisco also has excellent educational tools, and their municipal-level reuse system is thought of as the "gold standard" among reuse strategies. Again, these two regions are in water-scarce areas, so more residents were willing to get on board.

That being said, New York City has other drivers that warrant reuse, which include the aging infrastructure of the water systems, problems with combined sewer overflows from frequent storms, and greenhouse gas emissions from NYC's wastewater treatment plants. If NYC were to invest in municipal-level reuse strategy, officials would be able to mitigate these issues. Wastewater treatment plants actually emit 16 percent of the New York City government's total emissions, and there are 14 of these plants across the five boroughs. Also, the Delaware Aqueduct that feeds water from the Catskills into NYC residents' taps is planned to be shut down in 2020 to undertake a massive restructuring and repair. It's currently leaking between 15-20 million gallons per day. While the leak isn't significantly impacting our water supply, officials are beginning to think about how they can be proactive, rather than reactive, with water conservation strategies. These strategies become even more necessary with the unpredictability that climate change brings to the region. Our Columbia research team is very focused on helping the DEP make water reuse a part of these proactive strategies.

GH: What is your role in the this project and how has the ESP program prepared you for that role?

DS: My two roles within our capstone project were: being part of the expert interview team, as well as the group's editor. Our interview team collects experts to be vetted by our client, the DEP, and takes care of all correspondence, including the interviews with subject-matter specialists in the field of reuse. We've contacted 12 people so far, and hope to have at least 15 interviews under our belts for the final report.

As an editor, I look over the memos that are sent to the client, with the most important being our final report sent out toward the end of the semester.

ESP has prepared me for a role with our expert interview team because our previous workshop warranted contacting individuals from New York City's agencies to collect information that better informed our final report. I've personally been contacting ESP alumni for informational interviews throughout the fall semester, so I generally feel comfortable talking to people over the phone and come prepared with questions to guide the conversation. I was also a deputy manager for our workshop in the fall, and this role required a lot of editing each week for the weekly outputs that our team was required to submit and present. I've always just generally enjoyed the editing process, too.

Overall, the ESP program prepares you very well by simulating what you'll be doing in the final semester for a client throughout the first two semesters of the program. We are tasked with working in groups from the very beginning, and through that process find that we must play to the strengths of our team members to deliver outputs that inform the final report each semester. It's been a really fun journey and I've learned a lot about myself and my teammates.

GH: Do you have any recommendations for city dwellers in how they can reduce and/or reuse water?

DS: There are lots of ways for city dwellers to reduce their overall water consumption, and they include the basics: turn off taps when not absolutely necessary, and don't shower or run the dishwasher or laundry machine during rainstorms. This prevents more water from entering combined sewers and ending up in NYC's waterways, which causes eutrophication and the death of many essential organisms that live in these habitats. I would also recommend fixing leaks as soon as residents spot them, and considering retrofitting low flush toilets in their homes.

The NYC DEP's website has a slew of information for residents to take a look at, and I highly recommend **making an account with them** to track water usage, pay bills online, and sign up for online leak notifications.

I also recommend that if residents know about building construction going on near them, they should try to contact the developers of the project to ask if they can look into including a reuse system, and plug the DEP's grants. Also, if residents can afford the retrofits for reuse themselves and are extremely passionate about water conservation, then by all means they should look into it themselves!

Project: Regional Energy Independence in Northern California and Alternative Energy Analysis

Faculty Advisor: [Adrian Hill](#)

Greg Hopper: What is your role in this project and how has the ESP program prepared you for its challenges?

Claire Desser: I'm the manager, but Maya Fuller (deputy manager) and I communicate with the client weekly. We create a weekly update that we deliver to her every Friday, outlining what we're working on, who we're interviewing, and next steps. I primarily arrange the call and summarize what people are doing and cue in people to help me with that on occasion. I also lead the meetings every week, facilitating discussions or acts, and establishing what our goals for the week are.

Prior to the program I worked in consulting, so that prepared me quite a bit, but I've also taken a course [here at Columbia] where we had a real-life client in which we wrote a corporate sustainability report for them. It was a great experience. It helped me understand how to meet the client's needs, and sometimes prioritizing those needs over your personal opinion on things.

So, that kind of leads me into the topic of our project. Our main goal is to look into the feasibility of transitioning to biomass burning in Northern California for off-the-grid energy production. The reason we're looking at biomass is because there's been these catastrophic fires in California [and biomass, such as small-diameter wood material, increases the risk of fire]. A transition is really one of the only solutions to getting the small woody biomass in the bottom of the forests out. We've determined that it needs to come out, there's really no question about that, that's what the science says. The question is how to get it out. Right now, they're doing prescribed burns and some in the timber industry are sending the biomass to landfills. Very small woody mass doesn't have many commercial uses, so you can't make typical paper products out of it, which is why we're looking at biomass [burning] as a solution.

GH: The end goal of the project is to determine the feasibility of a transition to off-the-grid energy generation for nine Northern California counties. What is your research saying about biomass as a solution?

CD: We've determined that transitioning off-the-grid is highly costly. It would be a horrible cost burden to use a different transmission and distribution infrastructure system rather than using the existing system that PG&E and other utilities are using, in addition to the very expensive facilities. We've outlined a few scenarios of how the region can integrate with the current grid instead, which means that the region can utilize that grid rather than having to go off-grid and build all of its own power lines. We didn't end up making a recommendation in the end, but rather laid out different options and the pros/cons.

GH: What is it about biomass that's heavily pollutive?

CD: The pollution comes from a lot of parts in the process. We were initially exploring this because, of course, wildfires are causing a lot of particulate matter to be emitted, harming local and global air quality. The idea was maybe we should be using that wood (biomass) for a purpose, but still taking the wood out of the forest requires a lot of transporting of the material – truck emissions are especially bad for the local communities. It's also more pollutive than coal, which is already horrible. Biomass is technically considered a renewable, but it's not clean. Technologies, such as carbon capture, can help offset the emissions, but it's so expensive – and this is already an expensive option – making it difficult to rationalize as an alternative energy source for the region. Unfortunately, the region doesn't have a better option at this point.

GH: What's one of the biggest takeaways you've learned about off-the-grid energy?

CD: When we started the project, we thought "Oh, that would be great to transition this region off-the-grid." But as we've done research, we've found that it's not possible. We need to work with the utilities. There are a lot of complexities and understanding of the energy grid, and none of us are necessarily experts on that, so we ended up adding a whole section talking about grid utilization and how that works.

Project: Analysis and Assessment of Iceland's Climate Action Plan for 2040

Faculty Advisor: [Eileen McGinnis](#)

Greg Hopper: As a leader in the Analysis and Assessment of Iceland's Climate Action Plan (CAP) for 2040 project, what have you learned about managing goals during a crisis?

Isabelle Branco-Ló: Because of COVID-19, we were unable to travel to Iceland in mid-March, which is where a majority of our team had planned to interview several key stakeholders at the Ministry of Natural Resources and Environment, the University of Iceland, and elsewhere in Reykjavik. In order to get these interviews completed, we had to quickly pivot to phone interviews. In addition, two weeks of lost instruction from the University delayed this process, so we had to rearrange our work plan. In the end, the team was flexible and adapted to the changes quickly. As a manager, I learned that timelines can and must be flexible in times of crisis, and goals must be adjusted accordingly.

GH: Iceland is notably progressive for its climate consciousness. How effective are the carbon reduction strategies set out in the CAP?

IEL: Iceland has already made significant carbon emissions reductions due to its progressive political climate and natural renewable energy resources. Nearly all of Iceland's electricity comes from hydropower and geothermal power, and about 90 percent of its residential heating needs are met by the use of geothermal heat. Due to this low-carbon energy mix, the CAP

focuses on phasing out fossil fuels in the transport sector, as well as increasing carbon sequestration through reforestation, revegetation, and restoration of wetlands. To fund these ambitions, an increase in funding for climate mitigation measures will happen over a five-year period, and the existing carbon tax will increase. Our team has identified that the existing actions outlined in the CAP need more rapid implementation to meet the 2030 goal of 29 percent reduction in emissions. Transport electrification, reforestation, revegetation, and restoration all take time to become effective, and the projected emissions reductions by 2030 will miss this goal by about 10 percent. The 2040 goal to reach carbon neutrality, however, is more likely to be achieved due to the extended timeframe.

GH: What are some key takeaways that U.S. policymakers can garner from Iceland's CAP?

IBL: Iceland's geological features and geographical location make it uniquely attuned to the climate crisis, which informs a lot of its progressive climate policies. Although the United States stands on fundamentally different ground, what policymakers can mimic is the widespread acceptance of climate change science and an understanding that all sectors must collaborate to reach national and global climate goals. No industry or corporation should be exempt from action, and the federal government's role should be visible to accelerate implementation. Without the Icelandic government's support for clean energy infrastructure, carbon taxes and financial incentives, protections of wetlands and climate mitigation strategies, Iceland would not be able to make such significant progress. Policy makers in the United States must treat the anthropogenic warming of our planet as the emergency it is.

Project: Agroforestry Policy

Faculty Advisory: [Louise Rosen](#)

Greg Hopper: This semester you are the manager of the Agroforestry project. What is agroforestry and why did you choose this workshop?

Louise Efthimiou: Agroforestry is a land-use practice that combines trees, agricultural crops, and/or livestock in the same area. All over the world, people have been engaged in "agroforestry" for millennia to sustain their livelihoods. It is only recently that the practice became formalized in agricultural/forestry studies as well as development policy. The main goals of agroforestry are to plant trees to support food production for subsistence and income, as well as preserve other ecosystem services.

I chose to work on agroforestry because I was very inspired by its potential to achieve social, economic and environmental goals. Wanting to build an international career after this program, I was also drawn by the fact that we are working with the World Resources Institute country offices in Brazil, India and Mexico.

GH: How has the ESP program prepared you for the challenges of being a manager during a crisis?

LE: During the previous workshop sessions, we learned about the importance of creating timelines for larger projects like this one. This has definitely proven helpful to manage the team throughout the semester. However, in times of crisis like the one we are in now, it was important to take a step back from the current timeline and see what we can adjust. Ultimately, projects will not fit perfectly inside the timeline you build, and I believe being flexible and quick to re-work things is key for navigating through big changes.

GH: Can you provide some insight into how the global crisis may impact, for better or worse, the use of agroforestry in your study areas?

LE: Similar to our work on agroforestry, the COVID-19 crisis is showing how intimately connected our social and ecological systems are. Based on articles I've read by the CGIAR [Consultative Group on International Agricultural Research], the crisis will disproportionately impact the poor. For instance, a COVID lockdown will jeopardize the livelihoods of those who rely on physical labor like farming for their main source of income. This is very relevant to the small, often poor, rural communities we are focusing on for agroforestry projects. On a broader level, the **disruption of food systems** from lockdowns and social distancing could impact access to agroforestry-related inputs and market exchanges, further slowing down the flows necessary for sustaining an integrated agroforestry system.

GH: What is your biggest takeaway from having participated in the workshop this semester?

LE: Having recently graduated from my B.A. at McGill University, the manager role has definitely been something new and challenging for me. My biggest takeaway has to be learning how to take things one step at a time, knowing that there are many mini goals to complete before reaching the final product of a larger project. Learning how to be comfortable with uncertainty at times was also important. Lastly, I definitely practiced how to be a better communicator, having served as a link between my team, faculty advisor and the client.

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