EASTON CLIMATE ACTION PLAN: EDUCATION

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Hope Maguire, Louisa Rose, Heather Aikman

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Introduction

Climate change will continue to be a direct threat to our everyday life as we know it until cycles of change are created. One direct adaptation that could be made to lessen the impacts, effects, and even the presence of climate change is education surrounding this issue. Climate change education is lacking in the education system of not just Easton, Pennsylvania, but regrettably in the education system across the United States, and some could even argue worldwide. For this project, we worked with a community partner on the Easton Climate Action Plan. In doing so, we are hopeful in trying to mitigate this issue and prove some success.

Knowledge of this topic may not be as widely available to most of our populations as we may have tended to think, which means that solutions to climate change topics and issues, as well as general awareness over this topic overall are directly being offered as a result. However, there have been recent updates in Pennsylvania's Standard of Science Education that requires climate change be incorporated into the curricula statewide. Even with this update having been implemented, teachers statewide are still adjusting to this recent change and how to incorporate it into their teachings. It has come to the attention that the "standard" ways to go about teaching science and global wellbeing are obsolete, which is why organizations such as the Nurture Nature Center are so important during this transitional period. The Nurture Nature Center is a nonprofit organization located in Easton and was created in 2007 with the intention to focus on science education and community engagement through the aid of artistic expression.

Recently, Easton has updated their Climate Action Plan to allot funding for climate change education and further this continuation within the public school systems of the Easton community. With this recent source of financial support from the Easton Climate Action Plan, it is important to note that rather than creating a new technology, our project will be working in collaboration with Easton's Climate Action Plan and as previously mentioned, this project will be working in close collaboration with a contributor to the Climate Action Plan, the Nurture Nature Center. By working together, it can further create a relationship between both the Nurture Nature Center and Lafayette College as both these contributors value sustainable solutions and wish to share these practices with the community of Easton.

The studies behind climate change education within youth help express the idea that while students are familiar with climate change, they lack the knowledge when it comes towards solutions, they can implement into their daily lives in addition to their individual role within climate change mitigation. Moreover, in a study conducted through Brookings, it was concluded that if only 16% of high school students were given adequate education in regards to climate change and climate change solutions, that alone would result in a reduction of carbon emissions of 19 gigatons by 2050 (Kwauk & Winthrop, 2021). To better frame this perspective, on average, humans emit around 10 gigatons of carbon dioxide emissions per year, however in as recent as 2021 we had 36.8 gigatons of carbon into the atmosphere (Bressan, n.d.). If only 16% of high school students can cause a 19 gigaton reduction of carbon emissions, just imagine how many gigatons of carbon can be reduced if climate change education was open to a broader

stream of the public and education surrounding climate change was more available, especially in the entirety of the schooling systems. This statistic, while insanely staggering, is motivation in the efforts needed when combating climate change and implementing technology that can be used to bring forth climate change education.

Moreover, as seen throughout the workings of the Nature Nurture Center, it takes a community to make a change on the effects that climate can have on not only their community, but the rest of the world. Allen and Crowley (2017) argue that climate change education alone is not enough to make the difference that our world so desperately needs. However, by coming together and working as a community, alongside the assistance of higher powers or even governance or sorts, distinguishable impacts can be made to this endeavor. They noted that this idea is called *collective efficiency,* and it allows for the engagement, participation, and involvement of the community at a larger scale. Though climate change education may not seem like the most glamorous and advertised way to go about combating climate change, it is our hope that bringing forth knowledge of the change it could bring to our daily lives to younger generations could inspire them to act.

Our project will specifically be working with the Nurture Nature Center to create the framework for their annual symposium, which will be an event that, while it has already taken place in the past, will continue in the future with this new partnership between Lafayette College and the Nurture Nature Center. The framework of the symposium will allow for future iterations of this project to be completed in addition to

ensuring the longevity of this event and the ongoing success that it will instill within those in the community of Easton who participate.

Social Context & Public Policy Analysis

Through the efforts of the United Nations (UN), the Intergovernmental Panel on Climate Change (IPCC), Environmental Protection Agency (EPA), and other international organizations, huge strides have been made in terms of bringing awareness to the dangers of climate change; however, a lot of the focus is on the technical solutions instead of social solutions. (Dahl, 2020) Rather than focus on the financial implications on how to fund these new technologies and implement them in a larger capacity, the focus should also include climate change education, and raising the next generation with the tools to address climate change at its root cause: our own activities such as overfishing, deforestation, and burning fossil fuels.

There still exists a large gap between scientific knowledge and technologies and societal understanding of the issue. “Education is needed because, in the case of climate change, learning from experience is learning too late. The delay between decisions that cause climate change, and their full societal impact can range from decades to millennia” (Ledley et al., 2017). Rather than focusing our energy on just the technological solutions and advancements we have made in the fight against climate change, more of a social, systematic change must take place to make enough progress (Ledley et al., 2017).

This is a message embraced by the United Nations, particularly the Education for Sustainable Development (ESD) sector of United Nations Educational, Scientific and

Cultural Organization (UNESCO). ESD has made a framework that outlines what exactly needs to be done to reach climate change mitigation goals as it relates to education by 2030. In the ESD for 2030 Framework, specific plans on building confidence/climate literacy in educators, enacting policy change, and even how to monitor progress are all outlined and discussed. (*Education for Sustainable Development: A Roadmap - UNESCO Digital Library*, n.d.) However, a study done by UNESCO in 2021 found that more than half of the curricular plans of the countries analyzed in their study made no references to climate change, and only 19% even mentioned biodiversity. (*UNESCO Declares Environmental Education Must Be a Core Curriculum Component by 2025 | UNESCO*, n.d.) In addition, only a few countries have actually mandated climate change education in their public schooling systems, despite almost 200 countries being signatories of the education objective of the Paris Agreement. (Ellerbeck, 2022)

The Paris Agreement which is an international treaty on climate change which puts particular attention on lowering the temperature over the long term by limiting activities that release carbon dioxide. However, in 2020 the Trump administration infamously withdrew the United States from the agreement. Though rejoining the Paris Agreement was among the first actions taken by the Biden Administration, the uncertainty during the years the United States was planning on leaving and was absent from the treaty caused local governments to take matters into their own hands. One such municipality, the City of Easton, joined the global Covenant of Mayors (GCoM) for climate and energy in 2016 in an effort to continue making progress locally. The GCoM includes tens of thousands of cities worldwide and enables cities to collaborate and

engage with international organizations, and each other. Easton's membership in the GCoM is not where their participation in climate change mitigation ends, however. (*Easton, PA Is Taking Action on Climate Change*, n.d.)

The Pennsylvania Climate Change Act was passed in 2008 which requires that the Department of Environmental Protection adheres to a schedule of risk assessments, creates an advisory committee, and provides a greenhouse gas inventory annually. In congruence with the statewide plan, with the help of the Nurture Nature Center, as well as some Lafayette College students and staff, Easton's Climate Action Plan (CAP) was born in 2019 and later officially adopted in October 2021. (*The City of Easton's Climate Action Plan | Nurture Nature Foundation*, n.d.) The CAP was also in part informed by a Vulnerability Assessment produced by an engineering studies class, "Sustainable Solutions" taught by Professors Nicodemus and Cohen at Lafayette College. (*Students in Sustainable Solutions Course Contribute to Easton Climate Action Plan · Engineering · Lafayette College*, n.d.)

Initially, the Nurture Nature Center started as a hub for the city's flood education and outreach efforts and has since broadened its scope. The center is now working in collaboration with the city of Easton to spearhead community building events, organize cleanup events and help to contextualize Easton's climate action plans to the community. Furthermore, by placing a heavier emphasis on the creation and visualization of art, the Nurture Nature Center is allowing younger generations to start participating in this process. By allowing for the Easton community to not only share their sense of creativity through various different forms of art, but the Nurture Nature Center is also providing a

direct path work for the community as well as this foundation to work together and share their knowledge with one another on the city they all call their home. More importantly, the Nurture Nature Center also hosts a variety of different programs, series, and events, all of which target different age groups and are inclusive towards the city and those surrounding it. These events are categorized into three groups, of which they place a heavier focus of different topics on. More of their science heavy events that take place throughout the year are “Science on a Sphere” which is used as an educational tool to exemplify and demonstrate the works of science behind the earth and is done so in a way which allows different age groups to further gain deeper understanding for this topic. By using this educational tool, Nurture Nature Center is able to simulate flooding events, changing weather patterns and other phenomena, including depicting climate change’s impending toll on everyday life.

Another education tool used by the Nurture Nature Center is their four art galleries and exhibition spaces. One of the more well-known exhibitions, “Perspectives", allows exploration of environmental issues through the use of and work of art, which allows for the viewers to become further engaged, passionate and well versed in this ongoing event, which has gone on to enter its sixth year of existence. Lastly, the Nurture Nature Center hosts events for the community which highlight and show an overlap in both scientific and artistic approaches. Right on the premises, the Nurture Nature Center has an urban recycle garden, which recycles everyday material used by the community as a way of planting fresh food and flowers. While the garden functions as a space for decoration, its main impact is in the way that it illustrates the way in which low cost

gardening and growing techniques can be applied, and hosts workshops that are open to the community that further delve further into this aspect (*Climate Series and Earth as Art | Nurture Nature Foundation*, n.d.). Overall, the Nurture Nature Center serves as a wonderful bridge between its community members, science education, and artistic expression. Its unique situation at the crossroads of these ideals makes it a prime organization for collaboration with sustainability efforts, volunteers, and the general student body of Lafayette College.

For the past few years, the Nurture Nature Center has planned and carried out a yearly event called the Climate Symposium, which is specifically targeting K-12 students. Last year's event featured a "TED Talk" themed speaker who spoke on their research and ended with the kids producing book covers as an artistic deliverable to reflect on what they had learned during the event. Through this symposium, the Nurture Nature Center seeks to engage a wide range of students and kids in general and inspire them/impassion them about climate change. This is indicative of Nurture Nature Center's passion to work with the Easton Community and further provide links and connections as a direct pathway into climate change education. After a preliminary conversation with Kate Semmens, the Science Director at the Nurture Nature Center who has played a large role in the creation and progress of the Climate symposium, in addition to looking at the data from multiple studies about students and climate change, we have found that students in the middle and high school age range know what climate change is and are more interested in hands-on activities and learning; Kate herself said that "they are tired of sitting around listening to what is happening and want to take action" (K. Semmens,

Personal Communication, 24 October 2022). These students are seeking knowledge in solutions to lessen their own contributions to climate change. In addition to educating about the technical aspects of climate change, it is important to recognize the impact even just one person can have on the environment. This approach is what gives credibility to using community outreach and education as additional methods to help mitigate the impacts of climate change.

The Nurture Nature Center's role in the city has evolved over the years, as they took on the role of stewards of the Climate Action Plan and are making significant contributions to the city as a whole; running the climate symposium is certainly something they have done on their own in the past, but this is a wonderful opportunity for the sustainability efforts on Lafayette College's campus to get involved and engage with the Easton Community.

Symposium Framework

Now that the social and political contexts surrounding the need for a climate symposium have been established, understanding the background and details of the climate symposium blueprint will be helpful for those who are looking to use the blueprint as a guide to running the proposed climate symposium. Within this technical context, we will describe the steps taken to create the blueprint, establish the importance of the creation of a blueprint and give context and explain the ideas within the blueprint itself. These factors were explored via peer-reviewed research, as well as through conversations within the Lafayette community, and in conjunction with the Nurture Nature Center. This blueprint is meant to provide a frame of reference and starting point

for the planning of the symposium. Our mission is to aid the Nurture Nature Center in meeting the goals laid out by the Easton Climate Action Plan and provide a framework for an event that could be scalable. The symposium would be made up of two main components: a keynote speaker and an interactive portion, similar to an activities fair, with activities and participation from local organizations and vendors.

Before we delve into the symposium blueprint, we want to begin by elaborating on three of our prior ideas that led to the creation of the blueprint. Our first proposal centered around a workshop focusing on Climate Change education for local K-12 teachers in the Easton Area. After looking at two studies (Ledly et al., Plutzer et al.), we concluded that teachers are not properly equipped with knowledge about climate change, and therefore cannot adequately teach on the topic. Currently, the Nurture Nature Center has workshops for teachers about data science education and we thought we could use the pre-existing template for workshops and apply Climate Change information to said templates to create new educational opportunities. The pitfall of this idea centers on not wanting to add additional work to educator's already large amount of responsibilities. In addition, we believe that the same outcomes could be achieved outside of the classroom.

Our second idea was implementing a field trip series for students in the Easton Area School District. Parkinson et al (2003) studied how hands-on learning is an effective way to foster interest in students and can show long-term passion for a topic. Field trips are a great way to implement hands-on learning opportunities, as well as create a memorable outside-the-classroom experience. These field trips would be used to demonstrate local sustainability practices and climate change mitigation techniques that are being used in the Easton Area. Different locations could be used for different age

groups due to the various levels of conceptualization. Some ideas of locations included the Allan P. Kirby Sports Center Solar Array, located at Lafayette College, the Nurture Nature Center's Urban Garden, and LaFarm. The issue with a field trip series came with finding the time to take students to these locations, COVID concerns, as well as cost impacts, not only on the school and the district, but on the students and their families. We believe that learning about climate change and mitigation techniques should be available to everyone, regardless of socioeconomic status. In addition, finding a time to visit these locations would require the planning and cooperation of a number of groups, and overall, the field trips may not end in a productive experience for the students and faculty that escort them.

The third idea we had was to establish a sustainability club. The goal of the club would be to address projects that are student led to help the school become more sustainable. The downfalls with this idea is that it would require extra hours from both students as well as the faculty advisor for the club, and could potentially fizzle if there was a lack of student interest. In addition, funding would likely need to come from the school district, and this could pose an issue if there is a lack of funding, or too many clubs who require school funding. There could also be a partnership with Lafayette College's student groups that focus on sustainability, but similar to the issue with high school students and interest, the same could apply at Lafayette. In addition, clubs are typically student driven at schools, and it would not make sense to place a faculty member at the helm. Similar to our first proposal, faculty members and teachers already have numerous responsibilities, which could mean the club may not get the attention due to the teacher being overworked.

The Climate Symposium combines the best aspects of the prior three ideas without adding extra work to teachers, requiring funding through the School District, and finding time within the school day to teach about climate change. The Climate Change Symposium would be organized by the Nurture Nature Center, in conjunction with different groups at Lafayette College, which removes the burden from the Easton Area School District, would take place on a weekend, which removes the constraint of finding class time to educate students on climate change, and would contain both speakers and interactive activities to create learning opportunities for students.

The Easton Climate Action Plan is taking a three-pronged approach to educating the community about climate change. These are sharing information "about new and expanded initiatives, public education campaigns, and important city actions with regard to the CAP", "developing civic and environmental literacy in K-12 students", and "continued transparency around the progress of the Climate Action Plan" (*The City of Easton's Climate Action Plan | Nurture Nature Foundation*, n.d.). The symposium would fulfill the "developing civic and environmental literacy in K-12 students" and has the potential to fulfill the other two prongs of the initiative.

In April 2022, the Nurture Nature Center hosted their first Climate Symposium, and our goal with this blueprint is twofold: to ensure the longevity of the symposium and its intention to meet the Easton CAP goals, and to ensure a lasting partnership between Lafayette and the Nurture Nature Center. This symposium is something that can not be done alone; collaboration between the Nurture Nature Center and Lafayette is crucial for continued implementation and success. As stated at the top of the blueprint, the desired educational outcome for the climate symposium is to inspire the next generation of

students to combat climate change through increased education on the topic. In order to achieve this goal, it is important to have a strong organizational committee that represents the different stakeholders.

Organization Committee

- Kate Semmens from NNC
- Madeline Squarcia from NNC
- Dr. Benjamin Cohen from Lafayette College
  - cohenb@lafayette.edu
- Office of Sustainability from Lafayette College
  - sustainability@lafayette.edu
- Landis Center of Community Engagement
  - Chelsea Morrese: cefaluc@lafayette.edu

The proposed Organization Committee is composed of the key stakeholders for the Climate Symposium. Kate Semmens and Madeline Squarcia from the Nurture Nature Center will likely be leading the committee and directing the organizational process. Dr. Cohen's participation in the organizational committee is two-fold, first as the chair of the Engineering Studies Department and as the professor for EGRS 451, and second as a member of the Task Force. The Office of Sustainability is responsible for overseeing the Lafayette College Climate Action Plan as well as leading and implementing sustainability efforts at Lafayette. Their participation on the organization committee would be beneficial because they can provide insight into Lafayette initiatives as well as provide support to the Nurture Nature Center in the symposium. The Landis Center for Community Engagement at Lafayette can provide resources and aid to the planning process of the symposium. The Landis Center has a vast network that can aid in getting the word out about the symposium, utilize their community partners to help the symposium become a successful event, and help to get student volunteers from Lafayette College and the Easton Area School District. The proposed location for the symposium

would be at the Nurture Nature Center, located in Downtown Easton. This location is easy to get to for Easton residents and has enough space for the keynote speaker, various booths, and other activities.

For the keynote speaker, we wanted a local individual from Lafayette College who is focused on some aspect of technology or system that relates to climate change. The motivation behind bringing in a local speaker is three-fold: to showcase climate change and how it relates to Easton specifically, to bridge the Easton Community and the Lafayette Community, and to minimize travel costs and emissions for a speaker.

Keynote Speakers

- ***Professor Cohen (Engineering Studies Department)***
  - currently working with students towards sustainable solutions
- ***Dr. Lawrence (Geology Department)***
  - currently working on the wind initiative in NJ
- ***Dr. Gordon (Chemical Engineering Department)***
  - has a diverse knowledge in polymer plastics in addition to biodegradable education.

The list of proposed Lafayette College faculty each do research or work with students to mitigate climate change. All three of these professors fulfill this within different areas of scholarship, whether that be via a more technical route, such as polymer research, or a more sociotechnical route, such as education. By having a member of the Lafayette community speak at an event catered to the Easton community, it can create a new space of transparency between the two communities, and foster further communication in the future. Another reason for proposing a Lafayette College faculty member as the keynote speaker of the event is the benefit that it will have for Lafayette. It will not only provide positive press for the college and the department that houses the faculty member, but it also acts as a way to volunteer sustainably.

Continuing with the theme of integrating the Easton Community, we are also proposing a list of Easton Partners who could play a role in the event, whether that be through sponsorship or by having a booth at the interactive portion of the symposium.

Easton Partners

- **Lehigh Valley Greenways**
- **Karl Stirner Arts trail**
- **Public Market**

These potential partners embody different values that are important to the success of the Nurture Nature Center and/or are working to combat climate change. For example, Lehigh Valley Greenways is working through partnership to connect and conserve ribbons of green to enhance quality of life for those who live, work, and recreate in the Lehigh Valley. The United Nations has stated that "the number and quality of green spaces has the potential to mitigate short-lived climate pollutants that produce a strong global warming effect and contribute significantly to more than 7 million premature air-pollution related deaths annually" (Röbbel, n.d.). In addition to helping with climate change mitigation, greenspaces also increase the quality of life for those who benefit from them. The Karl Stirner Arts Trail states that "environmental sustainability and public stewardship of an urban infrastructure are defining factors in their philosophy" (*Art and Nature Converge*, n.d.). The arts trail aims to connect art and the urban environment with nature to promote a holistic view of the shared human experience. The KSAT is a unique area of Easton and uses a creative method to encourage the intersection of urbanism with nature, set in a unique location along the Bushkill Creek. The Easton Public Market is an initiative of the Greater Easton Development Project, an organization that strives towards making Easton "a national model of a livable and welcoming small city" (*The Greater Easton Development Partnership » Mission, Vision, and Values*, n.d.).

Over the past two years the Easton Public Market has looked to become more sustainable, and has outlined some of their initiatives on their website, including adding solar panels to the roof. They outline what different vendors have been doing to become more sustainable and to be better stewards of the earth. We feel that these three groups would make excellent additions to the symposium and could contribute more perspectives about climate change as well as what steps they have taken to become more sustainable.

We have discussed the participation of a keynote speaker from Lafayette College, but we also wanted to ensure the participation of students at Lafayette. Below is a list of student organizations who we think would have a positive output for those attending the symposium, whether that be through tabling or a demonstration.

Lafayette Clubs/Organizations

- **LEAP**
  - Attend the event and hand out flyers or pamphlets about their research.
    - Contact: *Alexa Gatti (President)* - **gattia@lafayette.edu**
- **Pard Paper:**
  - Provide recycled paper pamphlets to print out information to advertise the symposium to the Lafayette Campus.
  - Attend the event and have a write up of any concluding remarks and overall thoughts of the event.
    - Contact: *Melissa Glenn (President)* - **glennm@lafayette.edu**
- **The Office of Sustainability**:
  - Encourage and advertise attendance from the Lafayette Student Body in its usual programming.
  - Attend the event and have a table where other people can receive more information on the sustainability efforts at Lafayette College.
    - **Contact: Sustainability@lafayette.edu**
- **APO**
  - Can help with the organization of volunteers to help with the setting up and execution of this event.
    - Contact: Anna DiFelice: **difelica@lafayette.edu**
- **Lafarm**
  - Contact: Josh Parr, Farmer: **parrj@lafayette.edu**

Other potential students who could make an impact within the activity fair would be students who are either in classes focused on sustainability or students doing research that has a sustainability component or focus. The class that immediately jumped to mind

as a group that could aid in the symposium are the students in the EGRS 480: Sustainable Solutions class since, as part of the class, they undertake a project that aims to create a solution to a complex problem that has no defined solution. The symposium could be an excellent place for them to focus their time or for them to present the work they have done during the semester to a new audience.

Possible Student Involvement

- **EGRS 480 - Sustainable Solutions**
  - Contact: *Mary Wilford Hunt:* **wilfordm@lafayette.edu**
  - Julia Nicodemus: **nicodemj@lafayette.edu**
- **Student research**
  - *Najjar* (doing plastics research)
  - *Huba* (doing research on the contamination of Bushkill Creek)

Professor involvement

- *Prof. Cohen* - cohenb@lafayette.edu
- *Prof. Sanford* -sanfordk@lafayette.edu
- *Prof. Nicodemus* - nicodemusj@lafayette.edu
- *Dr. Sunderland* - sunderlandd@lafayette.edu

In addition, the aforementioned professors would all be good contacts. The three professors to mention specifically are those who work within the Engineering Studies department at Lafayette: Professors Cohen, Nicodemus, and Sanford, since they have direct access to the Engineering Studies students and community.

When looking at who would work the event, we envision Alpha Phi Omega (APO) to promote the event and to provide volunteers for the symposium. APO is the service fraternity at Lafayette College, and after a conversation with President Anna DiFelice, they could provide volunteers for the event. Another source of volunteers, and one that would fulfill a CAP goal, is providing volunteer opportunities within the event to students within the Easton Area School District. Action item PE-2C in the Easton CAP states that there should be “volunteer opportunities for required community service hours and incentivize students to participate by getting a day off school or special honor at

graduation" (*The City of Easton's Climate Action Plan | Nurture Nature Foundation*, n.d.). By allowing Easton Area School District students the opportunity to volunteer, it will allow the Easton CAP to be one step closer to meeting its goals.

Creating a partnership between Lafayette College and the Nurture Nature Center for the symposium makes sense for a variety of reasons. First, as stated before, this is a large undertaking and would only be made stronger with a partnership. In addition, the Nurture Nature Center already has tools and programs in place, such as a science division and an art division, and Lafayette has resources and different perspectives that lend well to the symposium. Also since this symposium is for the community of Easton, it makes sense to partner with an organization who is already recognized by the community. The Nurture Nature Center is known throughout the community and is respected for their work around climate change and flooding. The Nurture Nature Center does not currently have the staff to dedicate exclusively to creating a blueprint for the symposium, which is where the partnership between Lafayette and the Nurture Nature Center becomes beneficial. The desired outcome of creating a blueprint for the symposium is two-fold: lessening the work for the Nurture Nature Center and creating longevity for the symposium. As previously stated, the Nurture Nature Center is understaffed and would greatly benefit from someone else doing the legwork to get the symposium up and running.

The methods in which our group was able to finalize the symposium framework through a multidisciplinary and collaborative approach is indicative of the way climate change must be addressed. By using a collaborative approach and allowing students to put their mark on the problem, it creates new learning opportunities and can create a

newfound passion within students. These students, who the symposium is targeting, are the future leaders and changemakers of the world, and it is our responsibility to give them the tools to succeed. This climate symposium is not the only way to educate students and their families about climate change, but it is a method that can be effective without burdening the school system or teachers. It also allows for more interaction and community building between Lafayette and Easton. This partnership can demonstrate to students a path forward in fighting climate change, as well as demonstrate to the greater Easton community some of the work surrounding sustainability that goes on at Lafayette. Furthermore, this symposium can demonstrate to students that they too can have an impact in their lives in fighting climate change, since, after our conversation with Kate Semmens, students understand climate change, they just do not know how they can help in finding a solution.

Due to the increase in discussions surrounding climate change and with the recent creation of the Easton Climate Action Plan, it is important to look at the different ways to reduce the impact of climate change within Easton. By involving the community and educating them on not only climate change technologies, but also on how climate change will impact Easton, we are confident that it will inspire passion in the students who will become our future leaders. In addition, the work the Nurture Nature Center does is paramount to the success of the community becoming educated on climate change.

Economic Analysis

The implementation of climate change solutions is very costly, but the effects of not acting and letting climate change progress, is even more costly. The United States Government has allocated a large portion of funds to be allocated towards Climate

Change. Moreover, the Biden Administration has created a Budget for the Fiscal Year of 2023 that heavily focuses on and is forcefully pushing for the reduction of energy costs as well as further actions towards combating the climate crisis. President Biden, has implemented a Bipartisan Infrastructure Law (BIL) which has already influenced hundreds of projects across the country and many of those have increased resilience towards climate change amongst other factors and topics (President Biden's Bipartisan Infrastructure Law, n.d.). By the implementation of this new law, Biden is able to emphasize the larger scope of this issue which signifies the importance of climate change topics and education at a federal level.

President Biden, as stated during his State of the Union address, has many priorities focused on climate change, but more specifically, Biden has focused on reducing energy costs for families by not only combating climate change but also growing an economy which is focused on clean energy. This budget has invested 44.9 billion dollars, which was an increase from the 2021 budget by 60% or 16.7 billion dollars, which was allotted with the expectation of being used to tackle climate change (President Biden's FY 2023 Budget Reduces Energy Costs, Combats the Climate Crisis, and Advances Environmental Justice | OMB, n.d.). The increase in these fiscal year budgets alone highlights the importance of the furthering need of resources towards combating climate change and education and will be further broken down and described further below.

Working in coordination with NASA, The Biden administration has provided research that will help improve our current understanding of climate change. The Biden administration has allocated 2.4 billion dollars for NASA Earth-observing satellites and

(President Biden's FY 2023 Budget Reduces Energy Costs, Combats the Climate Crisis, and Advances Environmental Justice | OMB, n.d.). These new satellites will provide a more holistic view of the Earth, which will be beneficial to solidifying our understanding of not only climate change, but natural hazards as well. Also, this section of the budget will allow for the collaboration with other agencies and partners to create prototypes with different capabilities of greenhouse gas monitoring and different informational systems that will be able to integrate data from a variety of different sources that will consequently allow for this information to become more available at the federal, state and local governments in addition to researchers and other users who will be working alongside the EPA in these creations.

The NOAA (National Oceanic and Atmospheric Administration) will also be working on new satellites in hopes of preparing those who are the most vulnerable and susceptible to further damage to their communities. Moreover, 2.3 billion dollars has been allotted to NOAA that will cover these next generation of weather satellites, which will be able to provide weather detection capabilities that will allow for the planning of extreme weather events (President Biden's FY 2023 Budget Reduces Energy Costs, Combats the Climate Crisis, and Advances Environmental Justice | OMB, n.d.).By implementing this, it shows that the government is taking all possible steps in not only the further research and understanding of climate change, but also the development of strategic back up plans in case the journey to mitigating climate change is not fulfilled.

The Department of the Interior, or the DOI, which focuses a large portion of their time and resources into land conservation and upkeep is also participation within these new budget allocations. 375 million dollars has gone towards the DOI to advance and

further provide research that will help in the understanding of the impacts of climate change (President Biden's FY 2023 Budget Reduces Energy Costs, Combats the Climate Crisis, and Advances Environmental Justice | OMB, n.d.). Through this work, new opportunities are expected to arise which will allow for the reduction of climate change risk through different mitigation and adaptation efforts. Part of this section of the budget will allow for conservation of different lands and will ensure coastal, fire-prone, and even other vulnerable communities to have access to information that will permit them to better respond and be better prepared towards these climate crises. By providing this, it is with great hopes that greater resilience will be created throughout these different communities.

The United States Department of Agriculture (USDA) is responsible for the development and implementation of any federal laws in regard to agriculture and forestry. With the help of the 24 million dollars which has been allocated by the Biden Administration, the USDA has created climate hubs, which are multi-agency undertakings that are used to leverage climate science and knowledge and increase awareness and engagement in combating climate change, especially towards those people who are in locations that are the most vulnerable to feeling the impacts of climate change(President Biden's FY 2023 Budget Reduces Energy Costs, Combats the Climate Crisis, and Advances Environmental Justice | OMB, n.d.). In addition, this budget has also increased its funding priority for climate research at USDA by 148 million dollars over the fiscal year 2021 and continues to provide an increase of 103 million dollars for different innovative methods and mechanisms which serve as incentives for climate-smart agricultural practices (President Biden's FY 2023 Budget Reduces Energy Costs,

Combats the Climate Crisis, and Advances Environmental Justice | OMB, n.d.). This source of funding allows for a systematic change within the ways many farmers in the United States go about their agricultural practices and allows for safer practices in regard to the earth.

The National Science Foundation (NSF), whose goal within its mission is to advance the progress and development of science. Within this budget, NSF has received 913 million dollars

for research and better understanding of climate change and the ways in which its adverse impacts will be felt worldwide (President Biden's FY 2023 Budget Reduces Energy Costs, Combats the Climate Crisis, and Advances Environmental Justice | OMB, n.d.). This budget is continually increasing and prioritizing its efforts not only towards climate change, but also towards research which will help us better understand, have greater knowledge and be more educated with our current as well as future standings in regards to climate change.

As of this January, Deloitte Economic Institute has done research on the cost of our inaction towards climate change and was fixated over the next 50 years. If we venture down the path of inaction towards climate change, we will be costing the United States Economy 14.5 trillion dollars. To put this into more of a generalized perspective, this is the equivalent of the continuous loss of 900,000 jobs per year for the next 50 years, well into the year 2070 (Deloitte Report, n.d.). Scott Corwin, most commonly known for his role as the managing director in Deloitte's United States ESG Strategic Growth Offering, gives insight of how every region of the country would actually be able to benefit economically if they had participated in practices that would mitigate climate change,

especially by placing a large focus on decarbonization. He was fairly confident that the net economic gains of this progress would be seen by 2048. Specifically, the United States Economy could gain 3 trillion dollars, and this is seen as a once in a generation opportunity, as it will be directly tied to adding nearly 1 million jobs into the economy by 2070 (Deloitte Report, n.d.). Moreover, from a strictly economic standpoint, holding all moral and conscious efforts aside, these numbers should be reason enough to incentivize people to make efforts in climate change mitigation, or simply even raising awareness towards this issue.

In the past, the Nurture Nature Center has hosted their symposium, each time being held differently, and a unique structure has been applied to each circumstance. In the beginning stages of their journey with the symposium, simply due to the nature of Covid during that time, these symposiums were held virtually, however they have begun to change to more of a hybrid structure, which they would hope to continue in the future as it allows for a wider range of audience members, especially those from outside of the Easton and Lehigh Valley communities (K. Semmens, Personal Communication, 24 October 2022). Because of this, there is no clear economic pattern or consistencies that can be tracked or correlated with the symposium.

However, the Nurture Nature Center has access to multiple grants that have been offered, awarded, and used in the past not only towards the symposium, but also towards other climate change programs they successfully share with the community. In a second meeting with Kate Semmens and Madeline Squarcia, we were able to gain more insight regarding the inner workings of the symposium from their end. From this meeting, they shared that the only thing that the Nurture Nature Center pays for in regard to the

symposium, is the workers that help out during the event, while the speakers were not paid for the participation in this event, the Nurture Nature Center is looking to change this as this symposium becomes more popular and widely held and participated in.

The Nurture Nature Center, with help of well-known and influential grants, was able to proceed with their plans for their annual symposium. Mainly, three grants helped with this symposium and supplied aid and funds to see through the success of this event. One of the grants that was used, especially as a source of relief for the first symposium held, in addition to other events that the Nurture Nature Center hosts, was a grant from NOAA. This federal grant, coming from their Environmental Literacy Program, is granted with the purpose of supporting projects of which create inspiration and are able to further educate people on Earth science and the systematic boundaries and abilities that can be used to create resilience to climate change and other environmental harms (NOAA's Community Resilience Education Theory of Change, n.d.). This grant typically lasts as long as four years and has a limit of 500,000 dollars. The main audience of this grant are those who support resilience efforts, practices and even other philanthropic organizations who share these ideals as well. Moreover, these grants are allocated towards those who see education as being a critical key player in the successful integration of this component (NOAA's Community Resilience Education Theory of Change, n.d.). Further, those in the education industry or profession as well as non-governmental environmental organizations, such as the Nurture Nature Center, find grants from this program to be applicable to the contribution of their own efforts regarding climate change and community outreach and further development of climate change education and awareness. By using the grant supplied by NOAA, these recipients

will be able to further advance their local efforts into a broader, and hopefully even national effort in creating further awareness and creating more knowledge regarding climate change. The Nurture Nature Center, as proof of receiving this grant multiple times already in the past, is a perfect candidate for this source of funding, as they share similar goals and mindsets as those mentioned in the ideal recipient explanation.

Additionally, another grant that the Nurture Nature Center received came from the Pennsylvania Department of Environmental Protection. More specifically, this environmental educational grant is smaller than the federal grant received from NOAA. While this grant only lasts for one year, and the Nurture Nature Center will not be able to apply this grant towards the symposium for this year, as the grant application begins to open in July and the Nurture Nature Center would ideally like to hold this event in April to be representative of Earth Day. Furthermore, this grant also has a smaller amount of funding that it allocates to recipients of this grant, but interestingly enough, they have increased this amount from 20,000 dollars to now being 30,000 dollars (2023 EE Grants Program Manual, n.d.). In order for this grant to be applicable to not only the Nurture Nature Center, but to the events and programs that they hold and run, the symposium - in addition to other similar events- would have to be regional and can be applied to two different scaling factors. An increased scaling factor would consider more large-scale environmental projects, of those which would include multiple communities, counties and even school districts. A larger scale project would then receive a larger portion of funding, and the symposium would fall under this category since it not only is available to those students in the Easton School Districts, but in the past, they have opened this event up to the Lehigh Valley Communities and their surrounding school districts. On the

other hand, those programs that are smaller scale, have more of a local focus and impact and therefore have a smaller funding cap which is 5,000 dollars. For the 2023 Pennsylvania DEP application, their main priority and the topic that will be held to the highest focus is climate change (2023 EE Grants Program Manual, n.d.). This is not only indicative of Pennsylvania's efforts in mitigating climate change, but it is also indicative in their ongoing willingness to combat climate change.

A mini grant, offered by the Lehigh Valley Greenways Conservation Landscape, is the third grant application and funding the Nurture Nature Center uses to help provide funding for their ongoing and future projects. For the Nurture Nature Center, and their experience with this grant, there was no real limit that is allocated towards programs, however, they have received anywhere from 1,000 to 10,000 in the past ("About Lehigh Valley Greenways," n.d.). Further, this grant lasts for usually a year and a half similarly to the other grants previously discussed, it also has a focus on education and conservation, but a larger part of the conservation in this grant is related to the Lehigh Valley.

The Greenways, created in 2004, places a large portion of their funds and focus on proactive partnerships in both the Lehigh and Northampton counties. Further, by collaborating with these two counties, The Greenways is able to diversify their surrounding work groups as well as be able to gain the ability to enrich the quality of knowledge and ways of living for those in these communities, especially by emphasizing the importance of trails and greenway corridors. The Greenways has a unique vision that will allow them to enhance the relationship of the communities within the advocacy of this program and further outdoor experiences in addition to placing a heavy emphasis and

iteration on the rebuilding of these spaces with natural resources, green infrastructure and improved public health kept in mind ("About Lehigh Valley Greenways," n.d.). This mission that is centered within the philosophy of The Greenways allows for community participation in the conservation of their own home, which is something that is very parallel to that of the Nurture Nature Center.

Further, Greenways has implemented an action plan for the year of 2022, that gives a broad overview of specific items and topics they want to place a heavier focus on and find a greater importance about. Through this action plan, they have created four goals: Land Conservation & Restoration, Outdoor Recreation & Trail Connection, Trail Revitalization and Local Education & Outreach. With their fourth goal focusing on Education and Engagement, the Greenways is trying to create and involve a more inclusive audience and promote environmental education. Some ways they have outlined that they are planning or have planned going about this includes but are not limited to the following which incorporates reaching out to new potential partners, that will allow for them to create a more diverse, equal and inclusive group, work with more organizations that share similar ideals and ideologies that they are not already involved in a partnership with as well as the execution of programs in public school district, especially in the Eastern Pennsylvania sector that focuses on Cultural Ecology of this region ("About Lehigh Valley Greenways," n.d.). Moreover, the engagement and pivot towards education in these grants, serves as an indicator and sign that education is beginning to take precedence in climate change mitigation and actions.

The Nurture Nature Center is hopeful for the continuation of their partnerships and relationships with these grant agencies and is looking to further expand their network

and hopefully begin to hone in on more local sponsorship opportunities. They would be looking to work with different organizations, corporations, and local businesses to see if they would be willing to donate a certain or any amount as it would be the most beneficial for them to gain additional outside sources of funding ((K. Semmens, Personal Communication, 24 October 2022). While this is something that the Nurture Nature Center has not integrated into any of their programming yet, they have had people reach out to them in the past and offer various amounts of funding and other opportunities as a form of their sponsorship, this could mean the inclusion of their logo, a mentioning, or a promotional incentive.

In the past, Nurture Nature Center has worked closely on a project: Buy Fresh, Buy Local (BFBL). Within this project, the Nurture Nature Center had different sponsorships, as explained by Madeline Squarcia, in which people have reached out to them about going to get their brand out there while also additionally supporting the mission of Buying Fresh and Buying Local (Madeline Squarcia, NNC). Another technique the Nurture Nature Center was looking to put into their financial counterparts of their programs includes kickstarting. The Nurture Nature Center has used this approach with the creation of their urban recycle garden. For the sponsors who had helped the Nurture Nature Center with this, they were promised a garden party in which food and giveaways would be provided. Using kickstarting, Nurture Nature Center was able to crowd sourced funding as well as have the event be publicly advertised. Further both the Rotary Club and Kiwanis Club had provided donations which were able to be used to help redo the urban garden. Further, for the symposium, if we were to use or mix in the kickstart method, it would be the most impactful to provide food that is locally

sourced as it would further push the importance of the relationship between climate change and the Easton Community.

Conclusion

Unfortunately, not all cities that are of a similar size and social composition to Easton are fortunate enough to have an organization like the Nurture Nature Center. Therefore, the possibility of repeating this project in other cities is largely dependent on the pre-existing structures at play within a city, and the same can be said of the presence of an institution with a lot of people willing to volunteer to help run events, such as Lafayette College. That also puts us at an advantageous position because acting as a bridge for the two institutions puts both organizations in better standing than if they needed to completely build a new framework. An additional piece of information we learned about Lafayette's role in the Nurture Nature Center's events is that Lehigh University is already a big participant in their Climate Summit, which is a different event which targets a similar issue. Lafayette has potential to join with Lehigh to make this event more impactful and can create an opportunity for more collaboration in the future.

There were a multitude of different ways we could have interpreted the given prompt, especially as we are the first group to tackle this particular problem in the history of this capstone. Not only can the framework itself be changed, expanded, and improved upon, but continuing to find additional ways to diversify the audience and to find ways to institutionalize Lafayette's participation annually would all be great ways to continue this effort. Something that we learned further into the project is what a big undertaking instituting a LANDIS center project would be for three senior students and creating something where Lafayette students volunteer to present different climate change topics

and ideas regularly within the Easton Area Public Schools could be a potential next step for this project in future years. For now, our sincerest hope is that the framework is able to put the Nurture Nature Center into contact with prominent, environmentally focused organizations both on and off campus.

Engineering Studies Outcomes

Throughout the process of grounding ourselves with readings and familiarizing ourselves with sociotechnical thinking at the introduction of this course, it seemed nonsensical to approach problems with a solution first attitude. We saw this type of thinking in a number of case studies all around the world involving foreign engineers; where using very minimal, often external sources, and research engineers justify producing prototypes and other products for communities without even knowing them. Engineering Studies students are taught community centered design tactics, which urges them to consider factors, such as the community's history, current standing, marginalized groups within the community, environmental factors, religious beliefs, and existing hierarchies, before considering how they as students and engineers fit into the solution. Oftentimes, groups entering the community would discover that their "help" was not needed and/or wanted, or their efforts were targeted at something that the community did not value as a problem at all, rather something they assumed would be based on their own biases. A lot of our class discussions revolved around the engineers themselves: how they approach problems, where they fit into society, how their education has taught them these habits and how it impacts their socio-technical projects. As a group of Engineering Studies majors, we thought there was no way we could fall into the same problematic

thinking because of our coursework, the fact that none of us are “technical engineers”, as well as the flexibility and creativity we have in approaching the broad problem of climate education in Easton.

Despite all of the class discussion, lectures, examples, and readings, our group fell into a very similar pattern in the very beginning. We did our due diligence in researching climate change education across the U.S., in Easton, what climate change education looks like outside the U.S., how U.S. teachers feel about teaching climate change, what the demographics of the city are, as well as what the added benefit of implementing a more robust climate education program would be beyond Easton. At this point we felt we had done enough research and began brainstorming solutions without even having spoken to community partners, teachers or other organizations involved in the climate action plan. We had known that approaching and actually implementing something curricular in public schools would be difficult, due to inherent and warranted bureaucratic and legislative protections, and focused our attention on teachers, since we read that a lot do not feel qualified to teach the subject properly. This was in part inspired by the Nurture Nature Center’s Data Science education initiative that features after school sessions for teachers to learn more about the subject to integrate into their teachings. We also had a few other ideas on how Lafayette with its many environmental organizations could get involved with education in public schools as well.

At that point, after having drafted a few possible courses of action and speaking to our peers about other solutions, we decided to bring our ideas to the Science Director of the Nurture Nature Center, who put things into perspective. Something that quickly became apparent throughout our conversation is that climate change education is already

present in Easton, and the Nurture Nature Center handles the majority of said education: especially as they are the only recipients of the grant from the climate action plan. Another surprising outcome of our research was that kids of the age group we are targeting for this initiative are very much aware of climate change, but want to know what they can do about it. Throughout our research, we were under the impression that there was a severe lack of awareness of the topic, however it was astonishing to us that we were able to construct basically an entire game plan with multiple alternatives based on information we did not even confirm with the community we are trying to serve. We never thought we would play the part of the misinformed engineer trying to "educate others", but we certainly were following the typical route for a brief time at the start of the idea generation process.

Working through the pivot towards the Climate Symposium work was uncertain at times, however throughout our conversations with not only the Science Director but also the Coordinator of Local Foods, the need for the institutionalization of Lafayette's role in the symposium in order to expand and support it only became more apparent. Though this is quite the digression from our original, grandiose plan of fundamentally changing the American public school curriculum, we think this is an impactful, tangible way to improve on a pre-existing method of spreading climate change education in Easton and getting Lafayette College more engaged with the community.

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Appendix A: Symposium Blueprint

Climate Symposium April 2022

Goal of the symposium

- To inspire K-12 students through education and engagement to combat climate change

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Methods

- Provide a blueprint for a one-day symposium that will have in person and virtual aspects
- Connect the Lafayette Community with the Easton community about climate change

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Organization Committee

- Kate Semmens from NNC
- Madeline Squarcia from NNC
- Dr. Benjamin Cohen from Lafayette College
  - cohenb@lafayette.edu
- Office of Sustainability from Lafayette College
  - sustainability@lafayette.edu
- Landis Center of Community Engagement
  - Chelsea Morrese: cefaluc@lafayette.edu

Venue for Symposium

- Located at the Nurture Nature Center

Keynote Speakers

- ***Professor Cohen (Engineering Studies Department)*****:** cohenb@lafayette.edu
  - currently working with students towards sustainable solutions
- ***Dr. Lawrence (Geology Department)*****:** lawrenck@lafayette.edu
  - currently working on the wind initiative in NJ
- ***Dr. Gordon (Chemical Engineering Department)*****:** gordonm@lafayette.edu
  - has a diverse knowledge in polymer plastics in addition to biodegradable education.

Activities at the symposium

- Art activity
  - Run through NNC
- Poster session of Lafayette college students doing sustainability work
- Workshops/tables
  - How to live a sustainable lifestyle
  - What's the impact of my food
  - Remy's bus
  - Pard paper

- Adaptive reuse and the history of the buildings of easton

Easton Partners

- Lehigh Greenways
- Karl Stirner Arts trail
- Public Market/Greater Easton Development Project

Lafayette Clubs/Organizations

- **LEAP**
  - Attend the event and hand out flyers or pamphlets about their research.
    - Contact: *Alexa Gatti (President)* - **gattia@lafayette.edu**
- **Pard Paper:**
  - Provide recycled paper pamphlets to print out information to advertise the symposium to the Lafayette Campus.
  - Attend the event and have a write up of any concluding remarks and overall thoughts of the event.
    - Contact: *Melissa Glenn (President)* - **glennm@lafayette.edu**
- **The Office of Sustainability**:
  - Encourage and advertise attendance from the Lafayette Student Body in its usual programming.
  - Attend the event and have a table where other people can receive more information on the sustainability efforts at Lafayette College.
    - **Contact: Sustainability@lafayette.edu**
- **APO**
  - Can help with the organization of volunteers to help with the setting up and execution of this event.
    - Contact: Anna DiFelice: difelica@lafayette.edu
- **Lafarm**
  - Contact: Josh Parr, Farmer: parrj@lafayette.edu

Possible Student Involvement

- **EGRS 480 - Sustainable Solutions**
  - Contact: *Mary Wilford Hunt:* wilfordm@lafayette.edu

Professor involvement

- *Prof. Cohen* - cohenb@lafayette.edu
- *Prof. Sanford* -sanfordk@lafayette.edu
- *Prof. Nicodemus* - nicodemusj@lafayette.edu
- *Dr. Sunderland* - sunderlandd@lafayette.edu