

Activation for the Charlestown Navy Yard Waterfront  
Project Proposal: Environment Science on the Water's Edge  
"e" inc. – The Environment Science Discovery & Action Museum  
May 2017

## 1.0 Organization Structure

Organization Name: "e" inc. - The Environment Science Discovery & Action Museum  
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## 2.0 Summary of Activity

**"e" inc.** is a well-established non-profit with over 14 years of experience providing science outreach and education to youth and families in the Greater Boston area. Our mission is to create engaging learning opportunities that (a) engage youth in the science that drives the planet, as well as (b) fosters a desire & ability to protect the planet and its beings. In January 2017, **"e" inc.** opened its Museum with an inaugural exhibit exploring Weather & Climate. After a 7-month stay, a new exhibit will be installed mid-year. The museum's long-term strategic plan centers on a regularly changing exhibit that will provide new activities and encourage families to return multiple times per year. While the exhibit will feature a variety of activities, all will fall under our primary theme of environment science education and increasing involvement in sustaining our planet.

**"e" inc.** is excited by the prospect of activating and developing the CNY waterfront as it provides us the opportunity to (1) create outdoor educational opportunities that extend from museum's teachable moments to the water's edge, (2) increase the scope of **"e" inc.** programming, and (3) provide engaging activities that would encourage the public's use of the waterfront and Harborwalk.

Due to its beautiful location and access to both water and green space, **"e" inc.** has a variety of ideas to activate the CNY waterfront with unique and engaging activities and installations. For the sake of proposal structure, we have grouped these ideas into four themes.

### 1. Gardens & Wildflowers

There are several green spaces surrounding Building 114 that have the potential to be used for raised beds for growing plants and creating habitat. Along the Harborwalk edge of Parcel 7 there is narrow, but long gravel section. **"e" inc.** proposes filling that space with multiple raised beds. These beds would be permanent installations and could be built from a variety of hardy materials (galvanized steel, wood, recycled plastic, etc.). Each bed would have a different

planting theme (seasonal, native vs. non-native, herbs, vegetables, etc.) and would have informational plaques so passersby would be able to read about what is growing. These gardens would be maintained by youth participating in “e” inc.’s Charlestown after school programs.

Within Parcel 7 itself, “e” inc. sees a huge opportunity for creating natural bird habitat. Every spring, without any planting, Parcel 7 comes into full bloom as a wildflower meadow and is home to a variety of bird species. We are lucky enough to see this thriving mini habitat from our office window and often wish that we could share it with others. “e” inc. proposes putting in a raised wooden boardwalk that weaves and loops through the expansive space. Along the way could be wider areas to accommodate “lookouts” or gathering spots for mini-lessons led by “e” inc. educators. Having this natural habitat would allow museum guests the opportunity to take what they learn inside our exhibit and apply it to a real-world ecosystem in their backyard. With access to this resource, “e” inc. could provide public programming, such as guided bird tours, plant ID workshops, etc. Access to the boardwalk would be gated and run in association with the museum (open during museum hours & staffed by “e” inc. educators). Additionally, the boardwalk would have railings to keep visitors on the path.



Figure 2: Raised Bed (Galvanized Steel)



Figure 1: Raised Boardwalk

## 2. Exploring Marine Ecosystems

Every year during “e” inc.’s Summer Science Discovery Program, one of our most popular activities is catching crabs in the Little Mystic Channel. During these oceanfront explorations, kids are introduced to crabs, mussels, marine plants, sea stars, plankton, and more (we even had a horseshoe crab sighting one year!). “e” inc. would like to install some year-round installations and education kiosks that provide the public with the opportunity to look below the surface. “e” inc. envisions these installations & associated programming taking place along the Harborwalk between Building 114 and the Spaulding Rehab Hospital.

“e” inc. proposes installing a structure or tool to allow for underwater views. This could be done with a transparent floating dock or underwater viewers (reverse

periscopes) along the Harborwalk that extend down into the Little Mystic. These viewers would allow the public a 180-degree view of the channel floor. To encourage marine life (and increase the chances of seeing different species), we propose creating marine habitat near the viewers. Habitat can be created by planting oyster beds or installing vertical underwater farms. Oyster beds are created by laying old oyster shells on the sea floor for oyster spat (larvae) to attach to. Vertical underwater farms (or 3D farms) are composed of kelp, oyster cages & mussel socks that hang from a floating line. The increased habitat will attract more marine life and provide more opportunities for the public to interact with this marine ecosystem. This interaction can be self-led (viewing through the open access underwater viewers), or through participation in an “e” inc. led program (scheduled for 2 or 3 groups per day) about marine ecology that uses the oyster bed or vertical farms as a teaching resource.

Related programming can include Fishing Clinics during which the public is invited to spend a few hours fishing on the Harborwalk. Throughout the event, “e” inc. will provide mini-lessons that address harbor health, flora & fauna, pollution sources & prevention, sea level rise and the role of humans in protecting our oceans. “e” inc. can also run recurring water-testing workshops that encourage local residents to visit the channel, collect data and contribute to a citizen science database.

In addition to attracting marine life as a teaching tool, the creation of new habitat has climate resiliency benefits as well (see Climate Resiliency section).

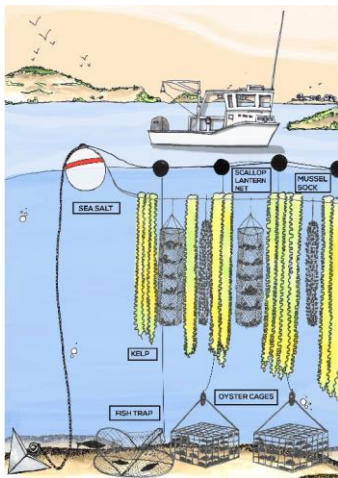


Figure 3: Vertical Underwater Farm

### 3. Weather Tracking

“e” inc. is very interested in the idea of teaching what drives weather, how weather changes and the difference between weather and climate. With our current museum exhibit on Weather & Climate, students are tasked with making basic weather observations at different points throughout the day. Students leave understanding that weather depends on many different factors (temp, cloud cover, precipitation,

wind, etc.) and that it is dynamic and can change quickly. We believe that, even after the Weather & Climate exhibit leaves, teaching youth how to observe and think about weather conditions and weather systems is a key component of environment and climate science. **“e” inc.** proposes the installation of weather measuring tools along the Harborwalk. Non-digital measuring tools, such as thermometers, weather vanes, anemometers, barometers and rain gauges, will track weather in real-time and will allow visitors the opportunity to see how the tool works, and read the current weather data. While these tools will be publicly displayed and open to all passersby, visitors to the museum will receive data sheets that allow them to record their weather findings. Then, back in the museum resource area, visitors will have access to historical climate data for comparison.

#### 4. Climate Resiliency

Climate Change and climate resiliency are topics very much entwined with **“e” inc.**'s mission. Many of the abovementioned proposals include a resiliency component, especially the creation of marine habitat by seeding oyster beds or planting vertical farms. The addition of specialized species can bring benefits such as, oysters filtering water (a single oyster can filter 40 gallons per day); kelp absorbing CO<sub>2</sub> (over five times more absorption than land plants); and mussels adding calcium carbonate, a buffer to ocean acidification. Secondly, the physical structure of an oyster bed or vertical farm provides protection from wave energy and storm surges. These techniques have been implemented successfully in places like New York Harbor, the Chesapeake Bay and the coast of Connecticut. While the scale of oyster beds and vertical farming can be sized down to fit the channel, these systems will create many teaching opportunities that help the Channel's water quality and allow public demonstrations of how to create resiliency.

Another component to climate preparedness and resiliency is the acceptance and normalization of renewable energy. As a form of public education, **“e” inc.** proposes displaying a blade from a wind turbine along the side of the Harborwalk. Due to the sheer size of the blade, it will undoubtedly be a stunning and eye-catching installation. Learners of all ages will be able to measure themselves against the blade height, peer (or even climb) inside the blade to see its hollow interior, and walk along the length of the blade to see its aerodynamic shape. It can be used as a teaching tool in a variety of ways – having students measure and calculate size of a full turbine, calculate spin speed, serve as a conversation starter about renewable energy, etc. Last month, **“e” inc.** was invited to take a tour of the Wind Technology Testing Center on Terminal Street and through conversation with their staff, learned that they often have old test blades (or partial blades) that they can give to educational institutions and we requested one. We believe this is a great way to provide public education about climate change and renewable energy, as well as inform people about the unique, role that Charlestown is playing in wind energy technology.

Lastly, **“e” inc.** proposes an art installation that draws attention to the ways in which sea level rise might impact Charlestown. This message could come in a

variety of forms, for example, a vertical piece that shows how the landscape changes with the different sea level rise scenarios. In researching successful projects in other waterfront areas, “e” inc. became familiar with an installation in NYC called Sea Song. Sea Song was created to bring the community together after Hurricane Sandy and was a collaborative art piece between artists and local residents. Artists built a 16 foot high tree-like structure from salvaged and hand-made materials. Residents contributed by writing messages of hope for the future on small fabric strips that were then tied to the tree. “e” inc. believes that a similar project could be impactful for the waterfront and be a way to bring public attention to climate change.



Figure 5: Sea Song sketch



Figure 4: Wind Turbine Blade Display

While the abovementioned proposals cover a range of topics and incorporate a variety of activation strategies, all achieve the goals of the RFI, as well as help grow “e” inc.’s own mission.

- Proposed installations all have some component open to the public, as well as the opportunity for more in-depth usage and teaching with “e” inc.’s presence.
- Installations would be permanent and educational programming would be recurring throughout the year, with themes varying depending on the season.
- Any actualization of these proposed ideas would complement “e” inc.’s current efforts to attract visitors to the Harborwalk by extending public education opportunities beyond its exhibit to an outdoor learning space.
- All of the proposed activities are rooted in increasing the public’s exposure to environment and climate science ideas. Whether its through physical enhancements of climate resiliency (vertical farms) or building public

awareness (wind turbine blade display), climate change impacts and resiliency issues are addressed.

### **3.0 Financial Viability & Capability**

Since its incorporation in 2002, **“e” inc.** has always used a mix of funding grants, contract fees and sponsorships to grow its business. From a one-person organization we have grown to have 8 educators in communities around Greater Boston and a new museum. **“e” inc.** has always found the monies to create new ventures, and adding this outside space is just like other aspects of our work.

Currently, **“e” inc.** does not possess the funds to support these projects, but if approved, **“e” inc.** will work to raise the necessary amount via corporate sponsors, fundraising events and/or grant requests to foundations.

### **4.0 Organization Programming & Service Delivery**

**“e” inc.** is a non-profit whose mission is to create scientifically literate citizens committed to understanding and protecting the Earth. Many Boston students have science only once or twice per week and lack basic understanding about how the planet works. **“e” inc.** takes a two-pronged approach to addressing this need and achieving its mission: (1) use hands-on investigation activities to teach children science concepts; (2) help children convert their new science knowledge and interests into concrete action projects they can do at home or in the community to create positive change for the planet. This coupling of academics with civic engagement helps our children make not just intellectual gains, but social growth, as well.

Since our beginnings in 2002 as an after school program in a public housing site, we have experienced yearly growth and have expanded our program offerings. Some of **“e” inc.’s** programs include: Planet Protectors (after school & summer residency programs that employ “e” inc. curricula, dynamic teaching tools and supported action projects); ChangeMakers Club (year-long after school science, leadership & civic action for teens); Kids Green Their School (classroom science residencies in schools that move these sites toward sustainable use of their resources) and Explorations in the City (free summer field trip opportunities that bring students from a plethora of urban summer camps into either Allandale Woods or the Fort Point Channel for the day).

New this year, **“e” inc.** opened it’s Science Discovery & Action Museum. Monday thru Friday we host one classroom per day for a four-hour, fully-guided, interactive field trip. Students spend the day as climate scientists, taking data, conducting experiments and exploring the ways in which climate is changing and the impacts it will have on our planet. The museum is open to the public on Saturdays. There is also a small gift shop in the museum that sells science kits and books for kids.

In FY 15-16, "e" inc. saw over 7,000 children and teens from low-income areas at over 27 partner sites (schools, community centers and other community institutions in the Greater Boston area).

The proposed activities help "e" inc. expand its educational reach to more children and families as an extended learning space for our museum. The additional resources would also allow "e" inc. to offer a new variety of educational programs (fishing clinics, bird tours, water testing workshops, etc.). "e" inc. anticipates that offering these programs would draw more families to its museum and to the Harborwalk.

## **5.0 Collaboration Opportunities**

There are many opportunities for collaboration in the proposed activities, including the Wind Technology Testing Center, Partners Healthcare, Massachusetts Oyster Project, local meteorologists and climate scientists.