

# Investigating Water Quality in Philadelphia Rivers: What are we Drinking?

## STEM-UP SeaPerch Program

Temple University Philadelphia, PA, USA

### Abstract

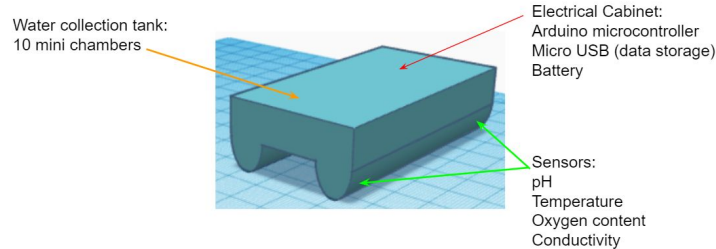
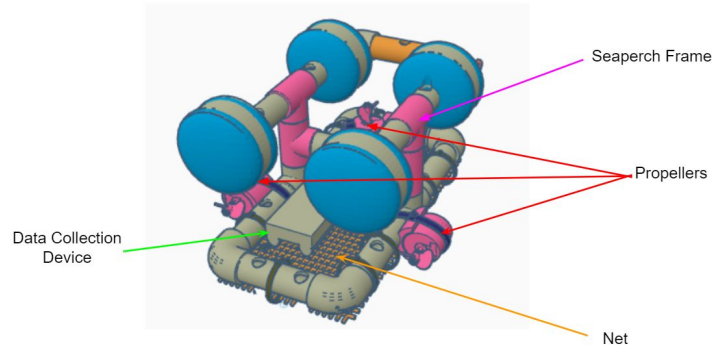
- Philadelphia is dependent on the Delaware and Schuylkill Rivers for drinking water, seafood, commerce, industry, nature, and recreational activities
- The STEM-UP SeaPerch Team will assess the health and water quality of the rivers by modifying the SeaPerch to measure temperature, pH, oxygen content, and conductivity and to collect water samples for further composition testing.
- Given the years of pollution accumulation from the city, the water samples are hypothesized to be warmer, more acidic, have a lower dissolved oxygen level, and decreased conductivity.
- To obtain these measurements, the SeaPerch will be equipped with various probes for each measurement
- It will be first tested in a pool before being placed in the rivers
- The measurements will be taken longitudinally by an Arduino microcontroller to monitor the water quality changes over time

### Background & Motivation

- Both rivers hold a reputation of being heavily polluted, despite being important natural resources for Philadelphia
- Adam Garber, the field director for Penn Environment, estimated that polluters dumped **10 million pounds of toxic waste** into Pennsylvania waters every year
- As the rivers' health is closely tied to the health of Philadelphians and the wildlife, the SeaPerch challenge was the perfect opportunity to gain a concrete picture of a pertinent issue impacting society and gain the necessary knowledge to begin acting towards a solution.

### Methodology

- Conduct a literature review to identify the parameters to measure and the effects of pollution on them
- Reconsider the SeaPerch design and modify it to accompany the measured parameters
- Create a model for the new design
- Test the model in the pool for functionality



### Results & Discussion

- Identify a need in to monitor quality in Philadelphia's Delaware and Schuylkill river
- Established the key parameter that needs observation
- Completed a CAD model of the data collection device
- Created and strategize Plan to develop a real life model
- Started a social media pages to draw attention to the cause and engage the community

### Conclusion

- Successfully identified a need to investigate the pollution levels of the two key rivers in Philadelphia
- Determined the effects of long term pollution on key parameters

### Next Steps

- Test the seaperch in the data collection in the pool
- Test in the River
- Launch model for longitudinal studies
- Test microbial content of water

### Acknowledgements

«Bright Light Blue Ripple Surface Texture of Swimming Pool with Sun Reflect View from Top. Premium Photo. use717655b. 2019. [www.freepik.com/foremum-photo/bright-light-blue-ripples-surface-texture-swimming-pool-vg-hsun-reflect-view-from-top\\_5214734.htm](http://www.freepik.com/foremum-photo/bright-light-blue-ripples-surface-texture-swimming-pool-vg-hsun-reflect-view-from-top_5214734.htm)

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