

# Buoyant Autonomous Microplastic Filtration Robot

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## What are Microplastics?

Broken down pieces of plastic that are smaller than 5mm.  
Microplastics are in every organism on the planet.

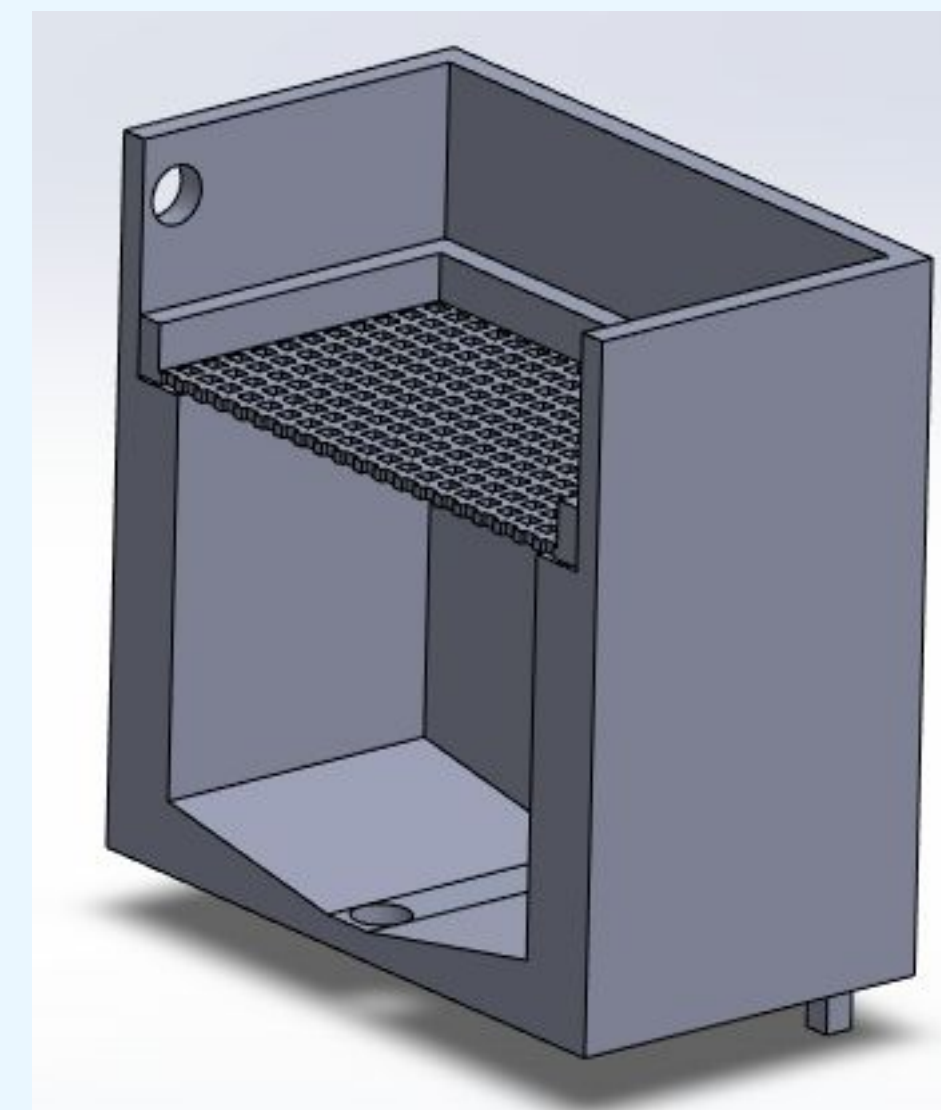
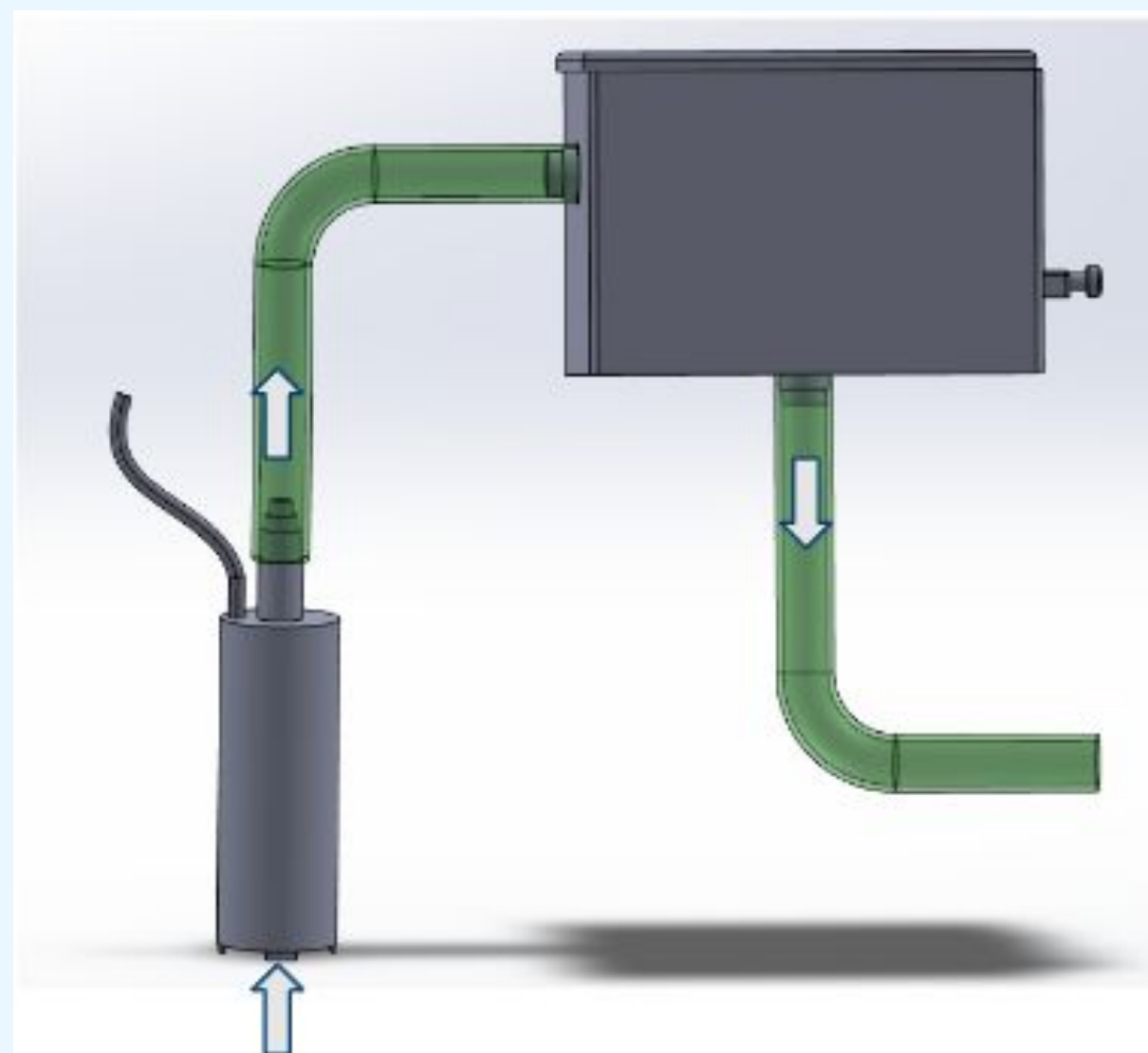


## Project scope

The Scope of our project is to create an autonomous microplastic filtering system that is sustainable. While creating a prototype within the designated budget of time and resources with goals to improve upon the design in the future. The design should not interfere with water travel for boats in the great lakes. Automation is essential for our design due to the meticulous nature of collecting microplastics by hand.

## Function

When launched, the robot will make its way autonomously to the predetermined area.  
Once in the geofence, the pump will turn on with a flowrate of 725 liters per hour.  
When the filter is full, or the battery is fully drained, The BAMF bot will return to shore for pickup where the collected microplastics will be recycled.



## Design

### Housing/Hull

- One-piece, Fiberglass hull designed to mount onto channel marker buoys

### Gps/Circuit

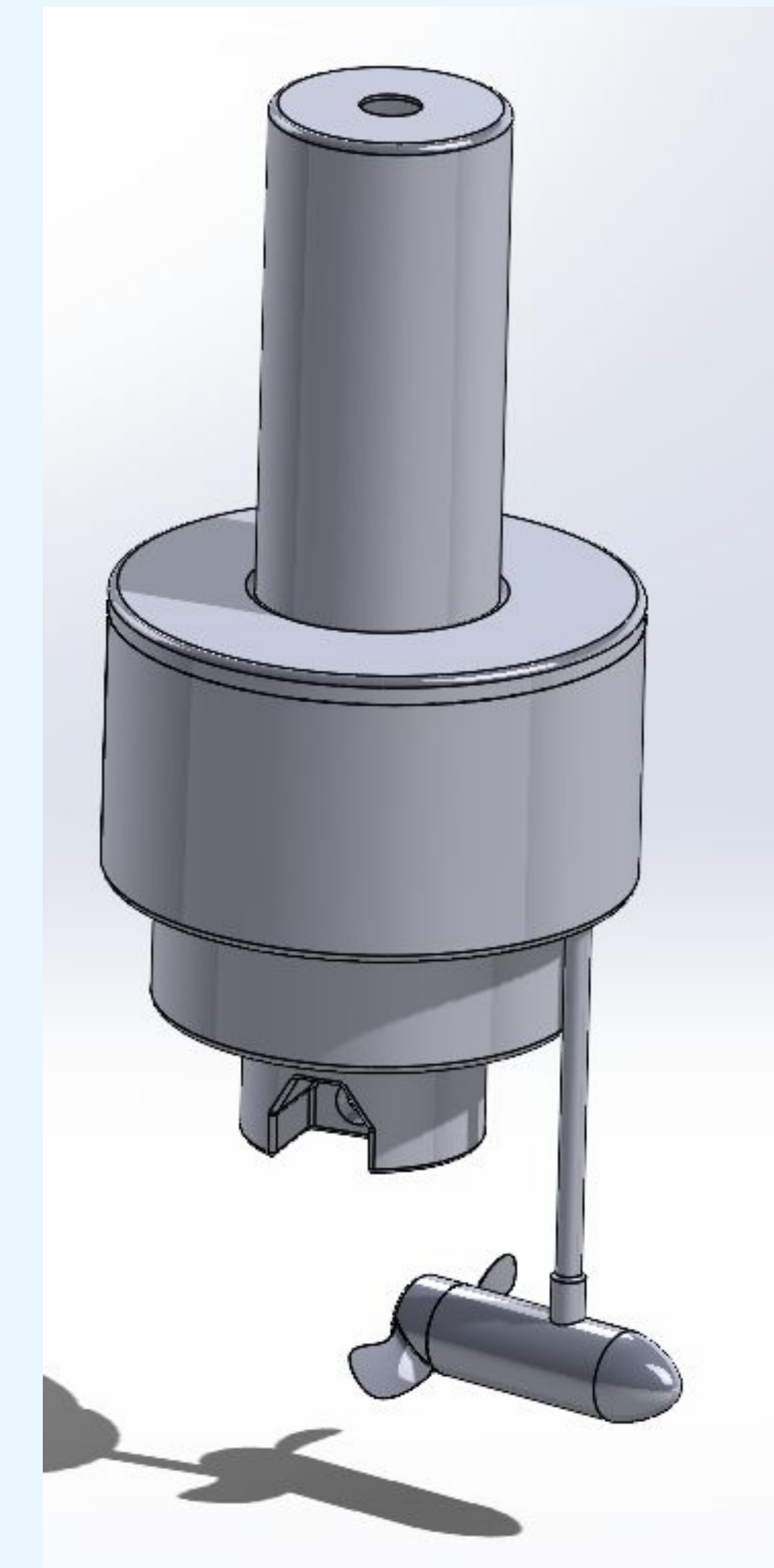
- Arduino Uno Rev3 Microcontroller
- NEO-6M GPS
- 12V, 5A Lithium Polymer Battery

### Filtration

- 12V Submersible Pump
- 3D Printed Filtration Box with 500µm Mesh Size

### Steering/Propulsion

- 12V Greenworks Trolling Motor with 38 lbs of Thrust
- 25 Kg High Torque Servo with 180° of Rotation
- 3D Printed Adapter Connecting the Motor and Pump



### Future Improvements

- Solar energy collection for longer battery life and less time recharging.
- Repurposed Plastic for Hull further reinforcing our environmentally friendly message
- Volumetric and Collection sensors to alert if pump is clogged or filter is full
- Fleet of BAMF will clean microplastics from a variety of depths in bodies of water. Introducing a barge for the fleet would increase efficiency on open water.