Flora Fauna UROV Sprint 3 Review

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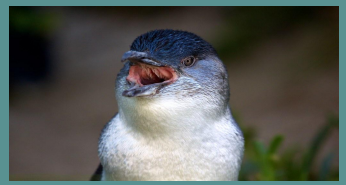


Needs Statement

We need to devise a method for the research team to utilize the provided ROV to collect Antarctic under-ice flora and fauna. This will enable them to enhance the current capabilities of the sub-zero ROV.

Retrieve samples	Suction for acquiring samples and canisters for storage
Operates from 20-30 cm above seafloor	Suction tube 30 cm in length – however will likely require modifying the UROV arm
Fit through 40cm hole	Design fits within the UROV's silhouette
Withstand water pressure	Materials chosen are commonly used in undersea applications
Integrate smoothly with UROV	Uses preexisting space and features. Have approval for the holes to be drilled in the hull

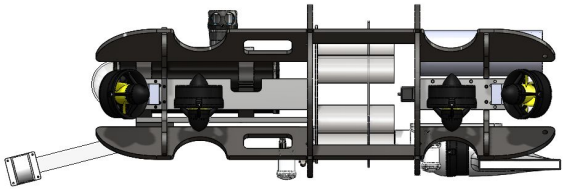
Current Design

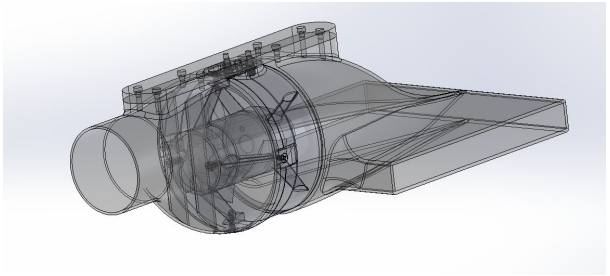
-BlueROV thruster drives a vacuum system.

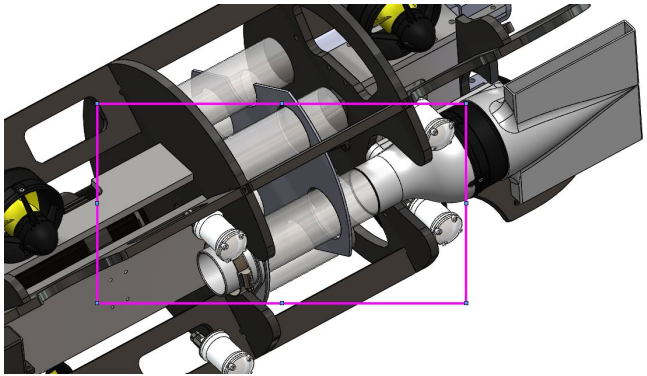
-Inlet nozzle and hose is connected to existing servo arm module and can be actuated 180°.

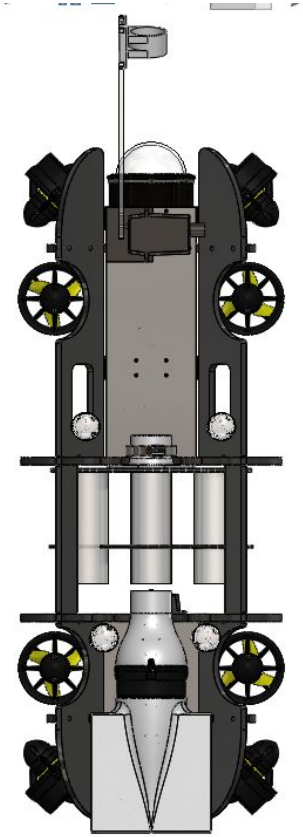
-Hose leads to sample canisters, each with a filter to collect specimens but allowing suction to be driven. Canisters rotate to allow new collection.

-Updated outlet nozzle drives neutral thrust while retaining outlet flow.









Canister

-Discovered no easy way to remove canisters-> cut off the sides

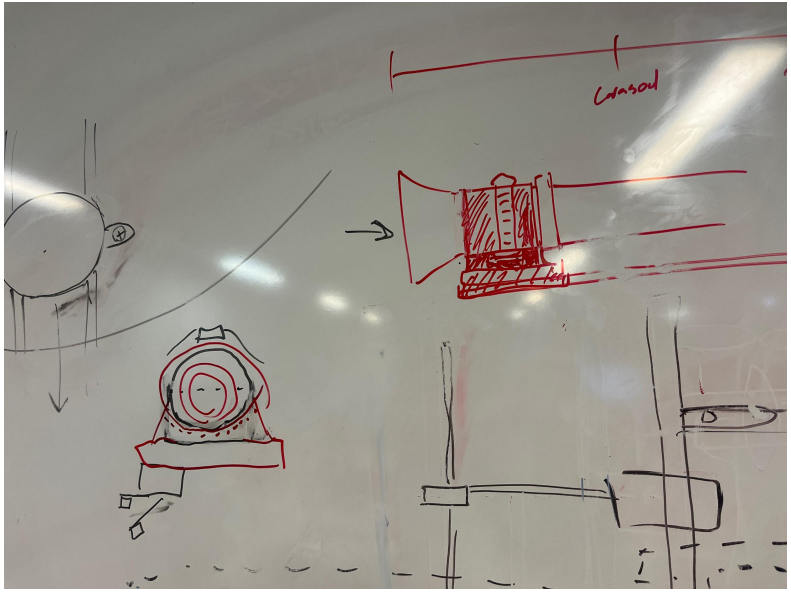
- Now has clearance to be removed out the side

- Redesigned servo mount

Arm

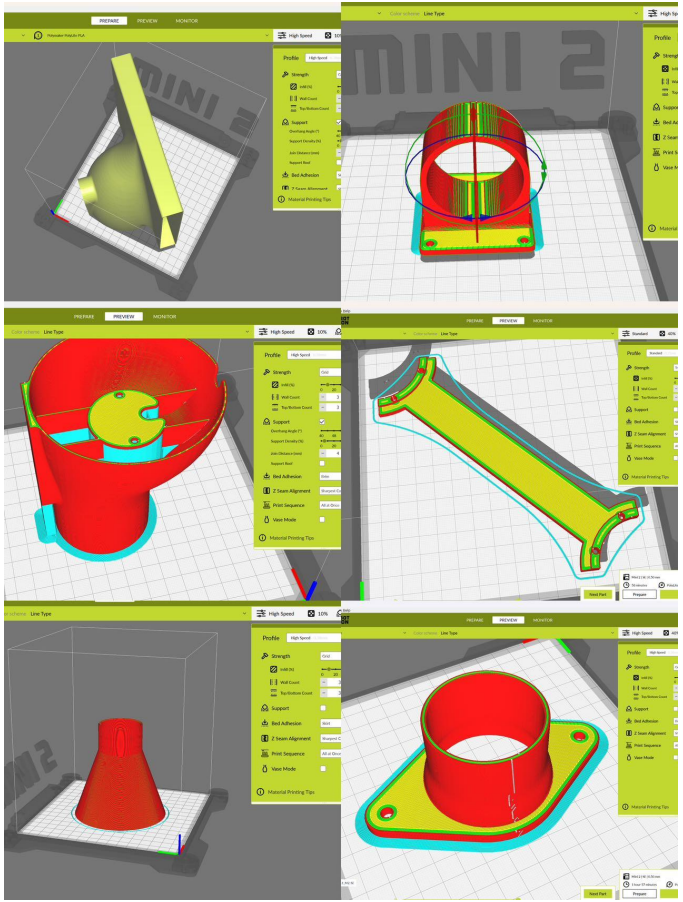
-Still using hose tubing and hose clamps for now

-Redesigning base arm out of 6mm acrylic



Miscellaneous Updates

- Printing out the testing required components
- Will switch the UROV arm with a lighter weight custom piece in next test.
- Designed suction tube & robot arm attachment



Prototype Testing: Suction

Tested parts: Inlet funnel, pool tube, storage (with filter) and motor assembly

Key takeaways:

- Suction works!
- Sand + smaller debris doesn't clog filter or impact motor
- Redesign outlet and motor attachment

Final Sprint Plans

Deliverable: Proof of concept for a suction approach

- **Time constraints -> Sub systems testing**
  - Suction test with anticipated gaps between components
    - Attach everything to a rigid plate to test that the space between our moving parts does not significantly dampen suction power
  - Arm storage and an articulation test
    - Does our arm retract properly, move with accuracy, and stay in the field of vision
    - How well does the suction tube bend? Can it be stored within the UROV?
  - Servo rotation of canisters test
    - Does our attachment point distribute force properly and keep everything in place.
- **Confirm everything fits within given space**

Questions and Feedback

- Is there anything else we should prioritize next week?
- Is there anything that has escaped our proposed testing?
- Do you have any concerns about how specific parts of the design will function in the arctic? (assembly process, etc.)
- Can we get access to look at the servo mount?
- What's the final expectation on the whole assembly? Should we include any servo or motor coding?
- How can we cut a new base plate/cut into the existing one?


THANK
YOU!