

MARYLAND REGIONAL SEAPERCH CHALLENGE

For Middle/High Schools

APRIL 6, 2019

United States Naval Academy

Hosted by the United States Naval Academy,
Sponsored by the Office of Naval Research

Please join us for the SeaPerch ROV Challenge at USNA. Teams will build their kits at their schools and then come together for these SeaTrials with schools from across Maryland.

REGISTRATION BEGINS 8am – you must pre-register by March 11 online at <http://www.usna.edu/stem> Additional info on schedule and logistics will be provided by email.

PRELIMINARY COMPETITION 9am-12pm

TEAMS WILL BE EVALUATED ON THE FOLLOWING:

- **DESIGN, CONCEPTS AND TEAMWORK** – teams will be asked a series of questions to determine the level of effort and understanding in these areas
- **CREATIVITY AND ENGINEERING APPLICATIONS** - SeaPerch will be judged on aesthetics, robustness, creativity of modifications to accomplish mission
- **BASIC LAUNCH**
 - **Speed** (average of time for 2 trials for a standard distance)
 - **Maneuverability** Speed to complete a submerged obstacle course that involves large rings (22" minimum diameter), oriented in any direction, through which the vehicles must travel. A possible course includes three to five -22" diameter hoops.
Ring Challenge Retrieve weighted underwater ring, time stops when ring is delivered to surface at tank wall.
- **MATH CHALLENGE** - teams will solve analytical problems related to building the SeaPerch.

THERE IS NO POSTER OR FORMAL PRESENTATION SESSION! NO DESIGN NOTEBOOKS WILL BE COLLECTED OR REVIEWED. HOWEVER DESIGN NOTEBOOKS ARE NEEDED FOR THE NATIONAL COMPETITION.

BASED ON RESULTS OF PRELIMINARY ROUNDS, FINALISTS WILL PROGRESS TO THE FINAL ROUND.

General Rules and Information

- Only team members are allowed in the test lanes during competition.
- All team members must wear close toed shoes with rubber soles to the competition.
- Nothing other than the SeaPerch ROV may be put into the tanks.
- Each SeaPerch ROV will perform a dry compliance check during the qualifying round and be inspected by an official prior to competition.
- There will be a triage area for repairs as required.
- Teams have a budget of \$25.00 to modify the SeaPerch. It is the actual value of the modifications that must be \$25 or less. Donated material will be assessed at what the cost would be to procure the material. The \$25 limit is for costs of the materials utilized on the final competition vehicle. Reasonable spare parts are not included in this budget. 3D printed parts will be costed out at \$0.025 per gram. Proof of budget compliance should be made available upon request.
- Hooks and attachments MAY NOT be added/removed depending on the competition round. Adjustments to buoyancy can be made during competition but timer will not be paused.
- Additional motors may be utilized for actuation or other non-propulsion uses.

- Teams may only utilize stock SeaPerch motors in thruster. Teams may not add additional thrusters to the SeaPerch. A thruster is defined as a means of propulsion for the SeaPerch, normally but not limited to a motor and propeller assembly.
- ROV thruster controls shall use simple switches only, no power conditioning or pulse-width modulation (PWM) controls are allowed. Use of a fixed or variable resistor to reduce voltage is acceptable.
- All motors must be waterproofed.
- Teams will design for and utilize a 12-volt power source as provided in the SeaPerch kit. Over charging or stacking batteries is not allowed. Be sure to have your 12V battery fully charged and with you.
- The vehicle may be worked upon by the teams during the competition.
- The vehicle cannot be dragged via the tether.
- ROV shall fit through an 18" hoop.

FINAL COMPETITION

The final challenge will be similar to the one described for the 2019 SeaPerch National Competition at <https://www.seaperch.org/challenge>. Challenge and rules may be modified and will be announced.