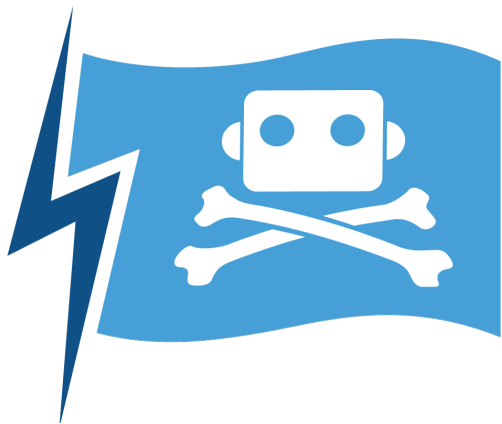




19th annual

RoboBoat 2026

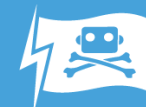
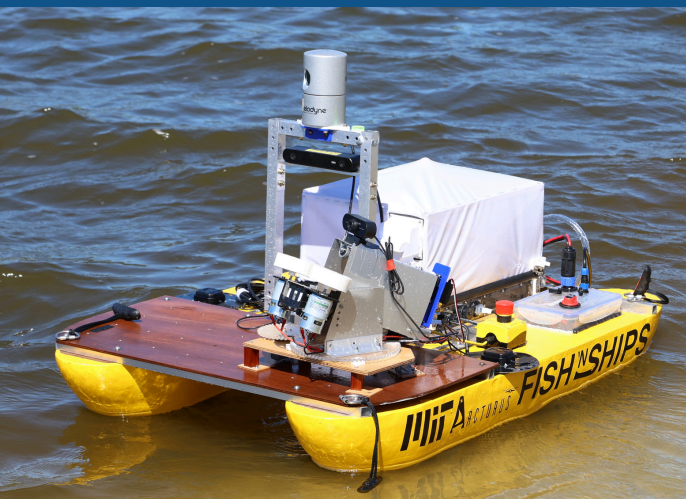
February 19-24, 2026

Nathan Benderson Park | Sarasota, FL

Primer & Task Ideas

ROBOBOAT





Why RoboBoat?

- Increase technical proficiency;
- Establish valuable professional connections; and
- Enjoy learning and collaborating while advancing the technology of ASV* systems.

The nominal winners are teams that score the most points. The real winners are participants who learn lasting lessons about working together to create an autonomous system to accomplish a challenging mission in a complex environment.

*ASV = Autonomous Surface Vehicle

19 YEARS

Surface Vessel Full Autonomy Reporting



- **Objective:** Build an international community of innovators ranging from high school to higher education, capable of making substantive contributions to the maritime field and pushing development of small-scale (X-Class) Autonomous Surface Vehicles (ASV).
- Teams must be comprised of:
 - 75% or more full-time students (college and/or high school)
 - Three (3) team members are required to travel to competition
- Participation in the RoboBoat Competition includes:
 - Building an ASV to compete, following RoboBoat's vehicle and safety requirements.
 - Providing design documentation discussing the team's technical design and competition strategy.

Find out more.

Contact RoboNation at competitions@robonation.org



Teams must build an ASV* to compete and may enter up to two vehicles in the competition.

**First-year teams are permitted to enter competition without a fully built ASV.*



Teams must be comprised of:

- 75% or more of full-time students, the majority of which are college or high school.
- 25% or less of alumni, industry, academic or government partners.



The majority of full-time student team members must be college or high school students. Teams may also include middle school students. Interdisciplinary teams are encouraged.



Minimum of three (3) team members are required for safe operations on-site at the competition.

COMPETITION



Autonomy Challenge

Build an ASV to showcase autonomous performance.



Design Documentation

Prepare documentation showcasing ASV design and competition strategy.

- *Team Website*
- *Technical Design Report*
- *Team Intro Video*
- *Design Presentation (in-person)*
- *System Assessment (in-person)*

What's New for RoboBoat 2026

- **Vehicle Requirements** | Teams may enter up to two (2) vehicles in the competition, and have the opportunity to showcase inter-vehicle communication. Vehicles may be commercially available systems.
- **Capability Levels** | Each mission task has capabilities divided by three levels:
 - **Core Capabilities:** Fundamental competencies required for safe and effective baseline autonomous operation.
 - **Advanced Capabilities:** Competencies that reflect growth in autonomy sophistication and real-world relevance.
 - **Disruptive Capabilities:** Transformative competencies pushing the boundary of autonomous systems—enabling novel or mission-critical applications.
- **Qualification Criteria** | To qualify for Semi-Finals, the ASV must complete:
 - core capabilities of two (2) individual tasks
 - advanced capabilities of two (2) individual tasks
 - two (2) tasks in sequence autonomously
 - send heartbeat message
- **Reporting & Communications** | ASV will send short updates with location and task status to the course server. The communications protocol is being defined and will be shared with teams soon.
- **Multiple Boat Operations** | As teams advance to Semi-Finals and Finals, multiple vessels may be operating in the course.
 - *Working Concept:* Team's ASV interacts with a programmed USV "Patrol Boat," that will be operating in the mission field.



What next?

Continue reading through the **CHALLENGE** presented to RoboBoat teams this season.

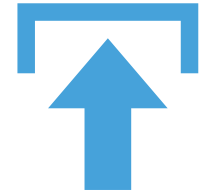
Autonomous behaviors evaluated in this year's challenge include...



Navigation



Object Avoidance



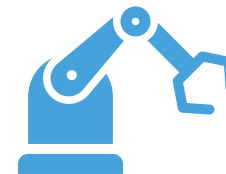
Station Keeping



Reporting & Communications



Visual/Audio Identification



Object Delivery



Two-step Behaviors

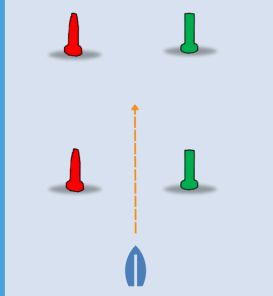
RoboBoat 2026 Tasks Overview

Communications & Reporting



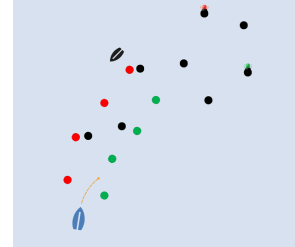
ASV reports on any given task: time stamp, lat/long locations, number or color of object.

Task 1: Evacuation Route



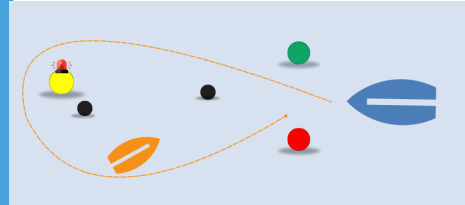
ASV safely transits through entrance and exit gates at start/end of run.

Task 2: Debris Clearance



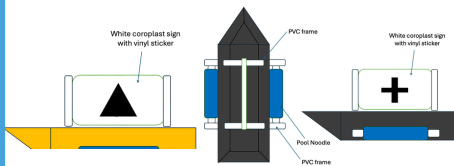
ASV navigates through channel to debris field, and scans for floating hazards.

Task 3: Emergency Response Sprint



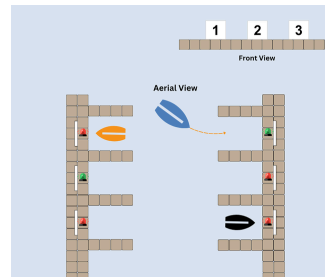
ASV sprints to the distress zone, circles the light buoy correctly, and exits back through the buoys.

Task 4: Supply Drop



ASV delivers water and racquetball supplies to stationary vessels throughout course.

Task 5: Navigate the Marina



ASV enters marina and docks in an unoccupied slip.

Task 6: Harbor Alert



ASV responds to emergency audio signal.



navigation
channel

object
delivery

speed
challenge

entry/exit
gate

docking



COURSE LAYOUT

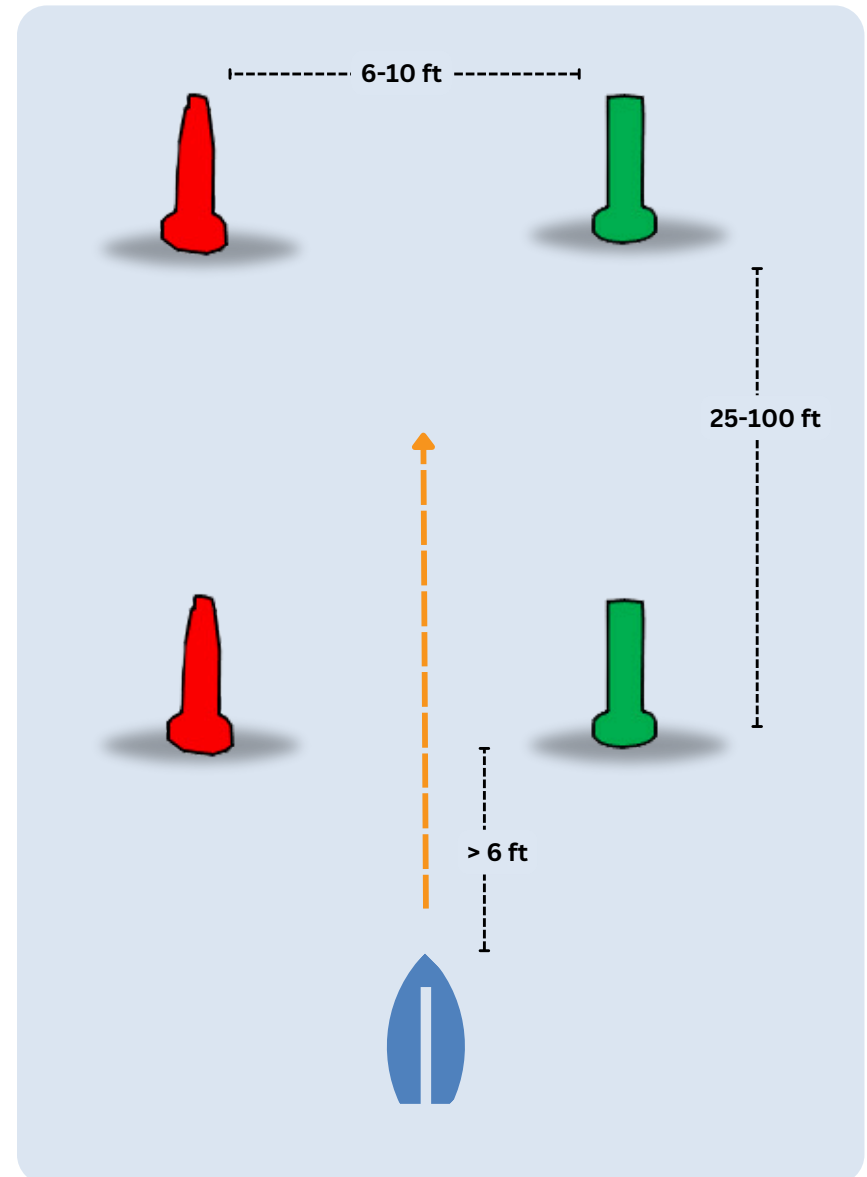
Task 1: Evacuation Route & Return

Entry & Exit Gates

- ASV passes through two sets of gates.
 - Gate: pair of red and green buoys
 - ASV starts autonomous navigation at a minimum of 6 ft. before the set of gates.
- Reporting: ASV reports on any given task: time stamp, lat/long locations, number or color of object.

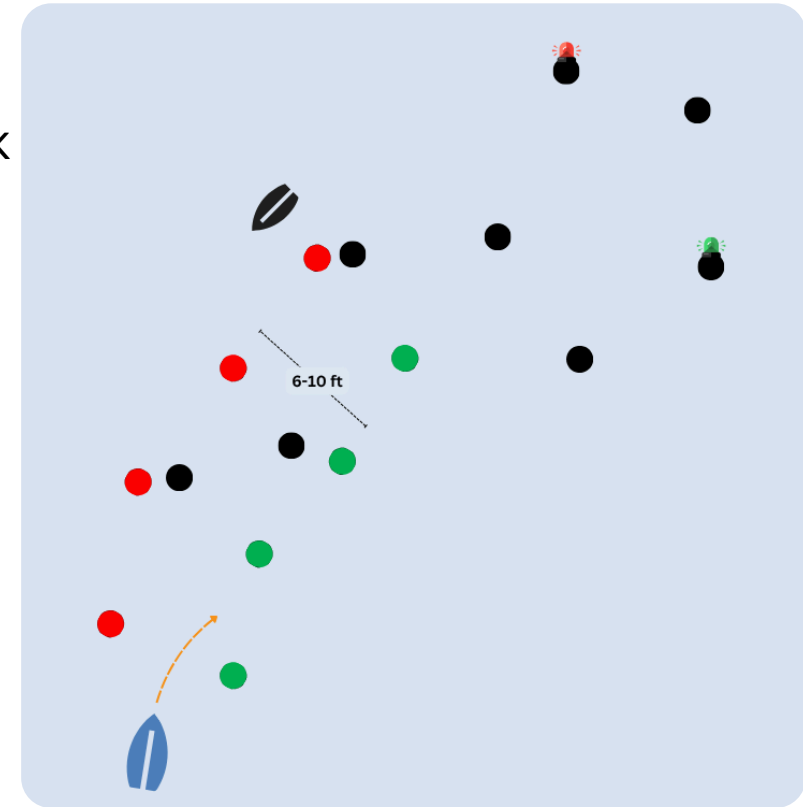
Capability Levels:

- **Core:** Navigate and exit through two pairs of gates



Task 2: Debris Clearance Navigation Channel

- ASV navigates through pathway of multiple gates, avoiding intermittent black obstacle buoys.
- ASV enters debris field and scans for:
 - Red light beacon = hazard to avoid and report location
 - Green light beacon = survivor to rescue, circle, and report
- Light beacons are bright LED lights inside clear or translucent tubes. This single colored light is visible 360° radially on a horizontal plane only.



Capability Levels:

- **Core:** Transit channel, enter debris field, avoid debris, and return through channel.
- **Advanced:** Detect and interact correctly with red or green debris.
- **Disruptive:** Reports location (lat/long) of all debris (lighted and non-lighted buoys).

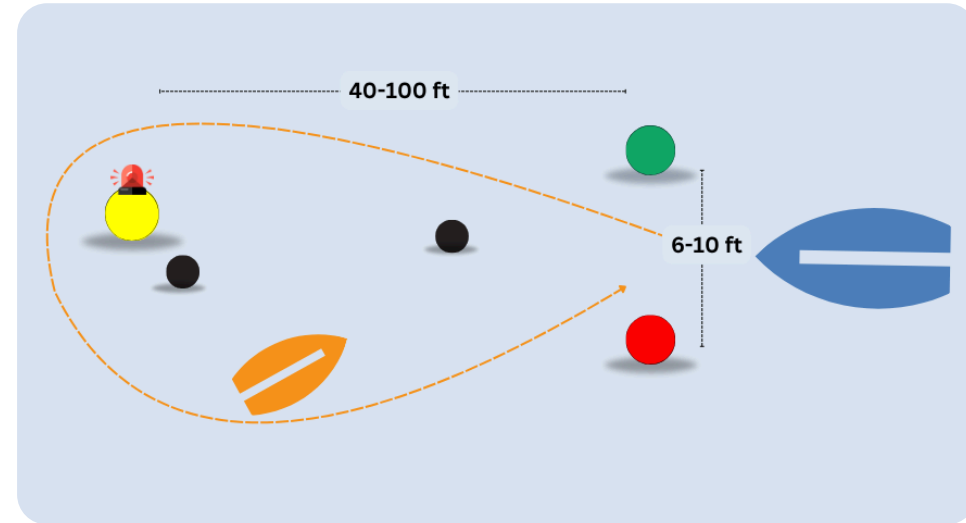


- Reporting: ASV reports on any given task: time stamp, lat/long locations, number or color of object.

Task 3: Emergency Response Sprint

Speed Challenge

- ASV passes through the gate buoys, maneuvers around the red or green light buoy (on yellow buoy), and exits through the same gate buoys, as quickly as possible.
 - Red light beacon = circle the buoy from the right
 - Green light beacon = circle the buoy from the left
- Light beacons are bright LED lights inside clear or translucent tubes. This single colored light is visible 360° radially on a horizontal plane only.



- Reporting: ASV reports on any given task: time stamp, lat/long locations, number or color of object.

Capability Levels:

- Core:** Pass through gate, circle light buoy, and exit through gate.
- Advanced:** Circle light beacon in correct direction indicated by color.
- Disruptive:** Report color of light beacon and time of response.

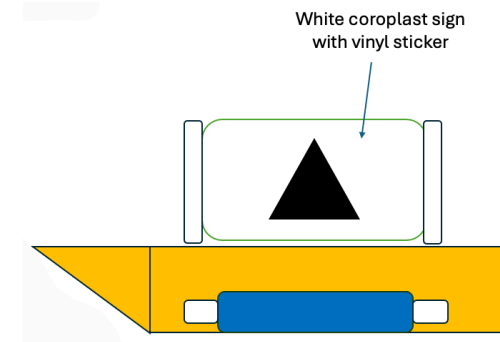
Task 4: Supply Drop

Object Delivery

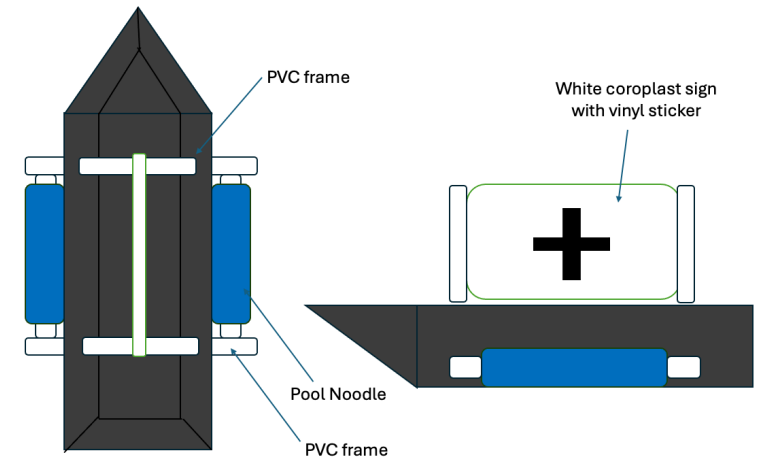
- ASV detects up to 3 orange boats that are anchored throughout the course, with a black triangle shape fixed to both sides of the boat. ASV delivers water on the triangle.
- ASV detects up to 3 black boats that are anchored throughout the course, with a black plus shape fixed to both sides of the boat. ASV delivers racquetball(s) to the boat.

Capability Levels:

- **Core:** Deliver water to orange vessel or ball to black vessel.
- **Advanced:** Deliver water to orange vessel and ball to black vessel.



Example Water Delivery Boat



-  Reporting: ASV reports on any given task: time stamp, lat/long locations, number or color of object.

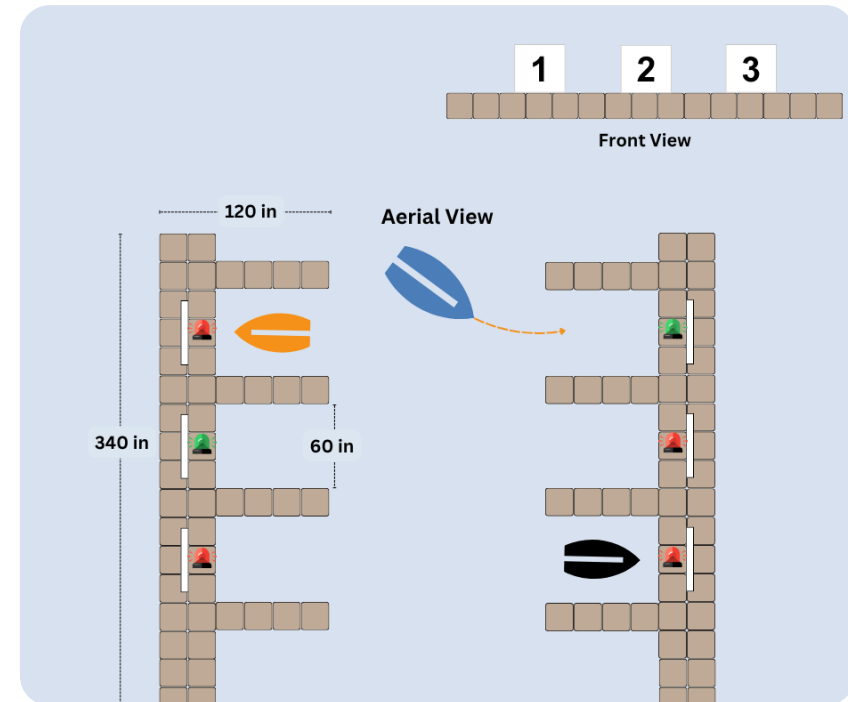
Task 5: Navigate the Marina

Docking

- ASV enters marina with three finger pier docks, docks in an available slip (indicated by green light beacon).
- ASV docks in the most desirable open dock, indicated by lowest number sign available.
- Light beacons are bright LED lights inside clear or translucent tubes. This single colored light is visible 360° radially on a horizontal plane only.

Capability Levels:

- **Core:** Dock in any unoccupied bay.
- **Advanced:** Dock in slip with green light beacon, signaling an available bay.
- **Disruptive:** Dock in slip with green light beacon and the lowest number sign, signaling an available bay.



-  Reporting: ASV reports on any given task: time stamp, lat/long locations, number or color of object.

Task 6: Harbor Alert Sound Signal

International Regulations for Preventing Collisions at Sea (COLREGs) list rules for using audible (whistle and horn) signals and lights for communicating their intentions with other vessels. There are no rules specifically for Maritime Autonomous Surface Ships (MASS), however these ships must comply with COLREGs.

- ASV detects audible signal and immediately abandons current task and:
 - One-blast signal = navigate to emergency response zone (Task 3)
 - Two-blast signal = return to marina dock (Task 5)
- Sound signal can alert at any point during the mission.
- Signals will vary by course, which could be 600Hz, 800Hz, 1000Hz, or 1200HZ ($\pm 5\%$)

Capability Levels:

- **Core:** Detect and classify audible signal (1 vs 2 blasts) and immediately abandon task, override behavior, and navigate safely to assigned zone/task.
- **Advanced:** Report confirmation of signal and execute optimized routing and collision avoidance to assigned zone/task.
- **Disruptive:** Coordinate response with another boat, report real-time status confirmation.

Reporting:

- ASV reports confirmation of sound signal
- ASV reports real-time status of response time and assigned zone

Preliminary Schedule

JAN 2026	FEB 19 THU	FEB 20 FRI	FEB 21 SAT	FEB 22 SUN	FEB 23 MON	FEB 24 TUE
Pre-Competition Submission Deadlines	Team Orientation <i>(mandatory)</i>	Practice & Qualifications		Semi-Finals		Third-Chance & Finals
	Design Presentations / System Assessments					
	Overnight Pool Testing (@ Event Hotel)					Awards

Stay Updated

ALL THINGS ROBOBOAT

For all the latest information and updates for the competitions season, visit the RoboBoat website!



roboboat.org

DISCORD

Stay connected and updated with the RoboBoat Discord. Scan the QR code to get started!



robonation.org/discord

JOIN TODAY!

- Scan the QR code
- Select the RoboBoat role
- Turn on notifications!



robonation



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RoboNation is a 501c3 nonprofit organization whose mission is to provide a pathway of hands-on educational experiences that empower students to find innovative solutions to global challenges. Working together with the industry, research and educators, we have grown to include over nine student competitions and programs and engage more than 250,000 students per year.

For more information contact competitions@robonation.org