Stevens Institute of Technology
and
Rutgers, The State University of New Jersey
Center for Ocean Observing Leadership

Request for Information (RFI) No.
2020-01

“Vessel Traffic Service Radar for Small Vessel Detection”

THIS IS A REQUEST FOR INFORMATION (RFI) issued in accordance with Federal Acquisition Regulation (FAR) 15.201(e) and solely for information and planning purposes. It does not constitute a Request For Proposal (RFP), nor a promise to issue a solicitation, RFP or Broad Agency Announcement (BAA). This RFI does not commit the United States Coast Guard (USCG) or the Maritime Security Center (MSC) to procure any supplies and/or services. The USCG or MSC is not, at this time, seeking proposals nor offers. Responders are advised that neither the USCG nor MSC will pay any cost incurred in responding to this RFI. All costs associated with responding to this RFI will be solely at the interested party’s discretion and expense. Not responding to this RFI does not preclude participation in any future solicitation, RFP or BAA. The information provided in this RFI is subject to change and is not binding upon the USCG or MSC. All submissions become the property of the USCG and MSC and will not be returned.

1. BACKGROUND AND PROGRAM DESCRIPTION

The USCG has a statutory responsibility under the Ports and Waterways Safety Act (PWSA) of 1972, Title 33 U.S. Code (U.S.C) Section 1221, to ensure the safety and environmental protection of U.S. ports and waterways. The PWSA authorizes the USCG to construct, maintain and operate Vessel Traffic Services (VTS). The US Coast Guard operates 12 Vessel Traffic Centers.

The Maritime Security Center (MSC) is a Department of Homeland Security (DHS) Science & Technology Directorate (S&T) Center of Excellence in port and maritime security that leverages the physical infrastructure and intellectual capital of its academic, industry and government partners. The MSC is led by Stevens Institute of Technology and Rutgers University is a partner organization.

The USCG is currently analyzing appropriate actions to overcome end-of-life scenarios and
obsolescence sustainment of its VTS radar systems. Ideally, solutions to these problems will come in the form of cost effective, sustainable, and state of the art technologies. MSC’s mission is to work with the United States Coast Guard (USCG) to identify radars and other sensors that can meet the USCG needs of the Ports and Waterways Safety System (PAWSS).

The PAWSS VTS is comprised of 10 USCG operated centers and 2 cooperatively run centers covering eight of the top ten US ports. In total, the 12 VTS centers provide situational awareness for 3,000 daily vessel transits and over 9,600 square miles of waterway. The VTS mission is to facilitate the safe and secure movement, growth, and distribution of commerce; reduce the risk of accidents; and protect the environment through information processing and decision support systems that provide accurate, relevant, and timely information to mariners to support their independent decision making. Timely and relevant data obtained by a VTS is provided or disseminated in user-selectable formats.

**Desired Technology Solution(s)** will augment current USCG operational concepts and capabilities by improving situational awareness of participating and nonparticipating vessels in VTS waterways. Technology solution(s) will incorporate automated detection, identification, classification, tracking, and alerting for informing and supporting decision-making by USCG and port partner personnel.

**Developed technologies** will include the following features: deployable/re-deployable; remote unattended sensors for real-time; automated; year-round detection; identification; classification and tracking. In addition, technologies will provide alerting of activities on waterways day and night and in varying weather conditions; incorporate low-power techniques that minimize energy usage and include integrated communications to provide reliable methods of sending data from remote locations; provide high probabilities of detection and alerting, low false/nuisance alarm rates and be affordable with reasonable procurement and minimal sustainment costs.

### 2. OBJECTIVE

The objective of this RFI is to collect data from the sensor supplier community to allow the USCG to evaluate the state of the art in sensor technology for small vessel detection while also meeting the VTS mission to monitor and advise vessels within the navigational waterways.

MSC requests that sensor suppliers submit a white paper describing the capabilities, maturity, safety, performance, and success metrics of each sensor meeting a majority of the Key Success Criteria (KSC) outlined below in Section 2.1. The technologies submitted under this RFI should have already undergone some development and prototyping to ensure that the technologies meet the KSC stated below.

Responses should identify particular capability options/combinations and technology readiness levels. In addition, responses to this RFI shall assess the broadly-defined costs, developmental risks and estimated timelines to achieve operational capability and the benefits of using particular technology approaches. This will enable the MSC to better understand technology portfolios and assist with planning that may be used to determine which ones to perform research, development, testing and evaluation on. The goal is to move these technologies forward in the development cycle and subsequently transition them to USCG who will directly employ them.
2.1 Key Success Criteria (KSC)

1. **Affordability** – Reasonable procurement, operations, logistics, and sustainment costs compared with the value provided and the available budget.

2. **Surveillance** - The ability to conduct continuous (year-round in all temperature and weather extremes) and systematic observation, through dependent and independent Systems, of the surface environment within the area of responsibility (AOR) to provide Maritime Domain Awareness (MDA), including vessels and activities within the AOR, and to look for and monitor known or suspected illicit activities or other activities that pose a risk to the safe and efficient use of the waterway.

3. **Detection** - The ability to autonomously sort and correlate maritime incidents, activities, and targets into groups or categories to which they may belong (collision/allision, SAR event, oil spill, fishing vessel, public vessel, etc.). Detected activities and targets are evaluated, differentiated from legitimate maritime activity and traffic, and prioritized based on their characteristics and operational mission criteria.

4. **Identification** - The ability to determine if a vessel or activity is of interest based on its unique characteristics or activities. Identification differentiates a particular vessel or activity from others in the same classification category.

5. **Mission Enablers** - Functions that facilitate, enable, and otherwise provide the foundation for successful mission performance. Mission Enablers encompass Command and Control (C2), Intelligence, and Operational Logistics (OL) activities.

6. **Operation** – Ease of transporting, planning installations, setting-up and testing/validating. Ease of operational use, technician training and logistics and sustainment support; and graphical operator/user interface.

7. **Connectivity and Software** – Real-time or near real-time, secure communications with both local operator/user mobile devices and remote command center facilities; remote data collection, administration, diagnostics and health and status (H&S) reporting for system. Maximizes use of an open architecture and data sharing: ease in adding, upgrading, and swapping system components; use of and compliance with published, publicly available and widely-accepted architecture and data standards and specifications.

8. **System Performance** – Capabilities to autonomously detect, identify, classify, track, and alert on targets of interest (ToIs): high probabilities of detection and alerting with low false/nuisance alarm rates and capabilities to provide ToI location, range, bearing, and speed. High level of independent unattended, remote operations; low extent of operator/user and maintenance and repair (M&R) technician involvement.

9. **Security** – Provides security measures preventing unauthorized control/communications or access (either local or remotely); notifies the operator of any breaches to the system and remains quiet while operational.

10. **Scalability** – Ability to scale from small to large system installations, from low to high rates of ToI detections and to support associated processing and communications.

### 3. RESPONSES SUBMITTED UNDER THIS RFI

Suppliers of sensors and associated technologies that are able to satisfy the majority of the above KSC are invited to submit information describing their system(s). Suppliers may submit
information on more than one sensor system.

White Paper submissions shall provide the following information:

**Cover page** (maximum 1 page)

- Contact and Company Information
  - Company Point of Contact (POC)
    - Name
    - Title
    - Location
    - Mailing address
    - Phone number
    - Email address
  - Company Information
    - Company Name
    - Website
    - Date of incorporation
    - Brief overview of company history
    - Fiscal Year (FY)14 through FY19 history
    - Number of employees
  - Note that RFI respondents shall designate a single POC for receipt of all information pursuant to this RFI

- Name/type of technology or model
- Technology Maturity: Existing technology or technology concept; Technology Readiness Level\(^1\) (TRL) must be 9

**Body of White Paper** (maximum 3 pages per system)

Provide a technical description to include existing or expected performance characteristics/capabilities for key components of the technology/concept offered for assessment.

The body narrative should include:

- Platform description(s) (size, weight, and power [SWAP], endurance, etc.)
- Sensor description(s) (capabilities, etc.)
- Ability to meet KSC and requirements (Section 2.1)
- Operational use of platform(s) and sensors along with any available performance metrics
- Ability of the platform(sensor) to withstand environmental effects (including, but not limited to: temperature, humidity, ice, rain, moisture, electromagnetic radiation, salt, fungus,

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\(^1\) As described in section 2.5 of the “DoD Technology Readiness Assessment (TRA) Guidance,” April 2011 (revised)
sand/dust, vibration, and shock) in operation and storage

• Ability to process, evaluate, and disseminate sensor information (format, support equipment, etc.)
• Training requirements
• Brief overview of operator’s and logistical plans (maintenance, software/firmware upgrades, etc.)
• Identified hazards and safety features of the platform
• U. S. and International standards the platform and sensors meet
• System per unit cost and one-year logistic support
• Security features and potential risks (susceptibility to jamming, hacking, or locating the system)

White Papers shall be submitted in Times New Roman 12-point font with single line spacing. All proprietary information, performance capabilities, and/or future modification(s) should be clearly identified and marked.

Method of Submission: One electronic submission per system in MS Word format. The electronic submission shall not be locked to prevent copying and mark-up of information.

Responses to this RFI are to be submitted electronically to MSC at: hroarty@marine.rutgers.edu with a carbon copy to: MSC@stevens.edu. Your submission should include the RFI Number (2020-01) and RFI Title in the subject line of your email response. Submissions should be received no later than 3:00 pm, U.S. Eastern Time, August 28, 2020.

MSC reserves the right to review late submissions, but makes no guarantee to the order of, or possibility for, review of late submissions. Respondents are solely responsible for any and all expenses incurred in responding to this RFI. Responses to the RFI may be used to develop other government documentation. Unsolicited proposals in response to this RFI will not be considered.

White Paper Assessment Criteria

The responses received under this RFI will be reviewed against the KSC stated above under Section 2.1.

4. MSC PLANS

This RFI is issued solely for market research, planning, and informational purposes and is not to be construed as a commitment by the government to issue a subsequent solicitation (Broad Agency Announcement, Request for Proposal, etc.). Feedback may not be provided to RFI respondents. This is not a formal source selection process; and therefore, details as to the selection of any systems for additional informational requests or testing should not be expected to be provided to other respondents.

5. CLASSIFIED SUBMISSION
Submission will be accepted for unclassified systems only. Any classified information regarding any submitted system shall be omitted from the white paper. You must limit white paper responses under this RFI to company proprietary or unrestricted information only, and mark submissions accordingly.

6. QUESTIONS AND REQUESTS FOR ADDITIONAL INFORMATION

Questions and requests for additional information can be sent to Dr. Hugh Roarty, email: hroarty@marine.rutgers.edu or phone 908-208-2970

7. ACKNOWLEDGEMENTS

This RFI is based upon U.S. Department of Homeland Security RFI 70RSAT20RFI000004 “Unattended Sensor Technologies for Monitoring Riverine and Littoral Zone Vessel Traffic”. We thank Ms. Brenda Long, Science and Technology Directorate, Department of Homeland Security for providing the RFI. Much of the language in the Key Success Criteria is drawn from USCG “Capability Analysis Report for Vessel Traffic Service” Version 1.