



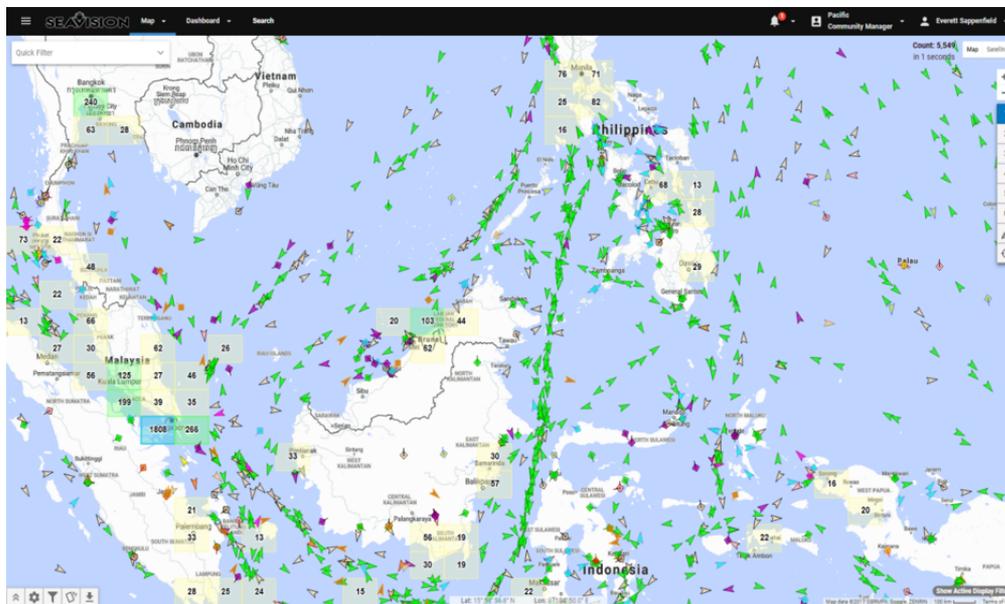
SeaVision

The US Navy's premier tool for unclassified
interagency and coalition maritime data sharing

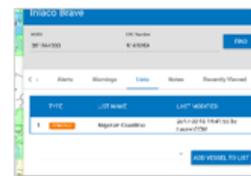
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Overview

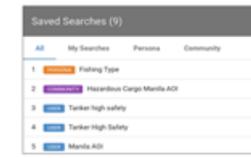
- Unclassified, non-PKI, web-based Maritime Domain Awareness Tool
- Enables users to view and share a broad array of maritime information, i.e. vessel movements, vessel details, and vessel history
- Provides user-defined, rules-based analytics to evaluate and notify the user of maritime activities or events



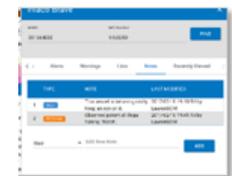
Vessel Lists



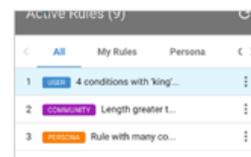
Searches



Vessel Notes



Rules



Shapes



Alerts

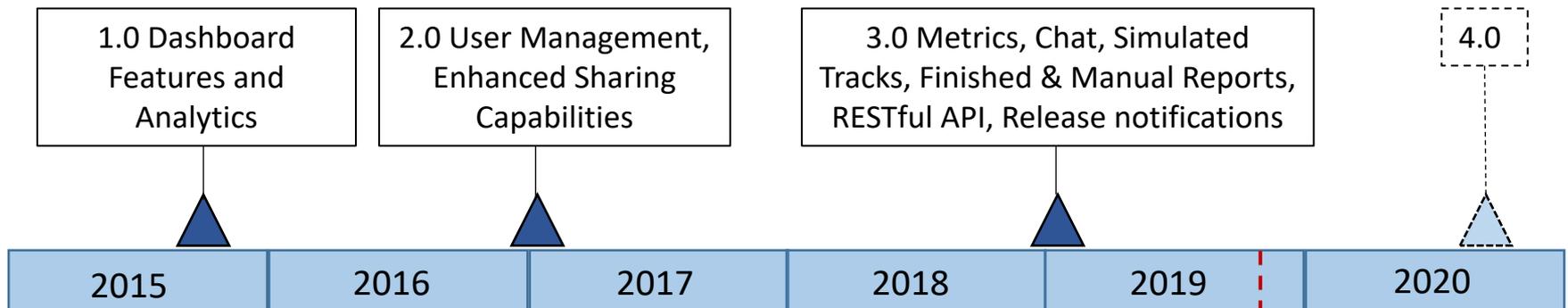


Background

- Developed in 2010 to meet a U.S. Naval Forces Europe/Africa theater Security Cooperation (SC) requirement
 - Browser-based viewer of Maritime Safety and Security Information System (MSSIS) data
 - Initially developed by the DoT's Volpe Center
 - Provided a regional maritime picture, allowing African navies to monitor their EEZ and fully participate in maritime exercises
- In 2014 US Fleet Forces Command issued an unclassified MDA requirements memo stating the need for “...*Enterprise access to maritime data, automated analytics and information sharing capabilities to support operational level MDA...*”
 - USFFC selected SeaVision to provide the solution
 - SeaVision continues to support USN 6th Fleet (Europe/Africa) partnership building capabilities and future Navy partnership programs

Development and Release Approach

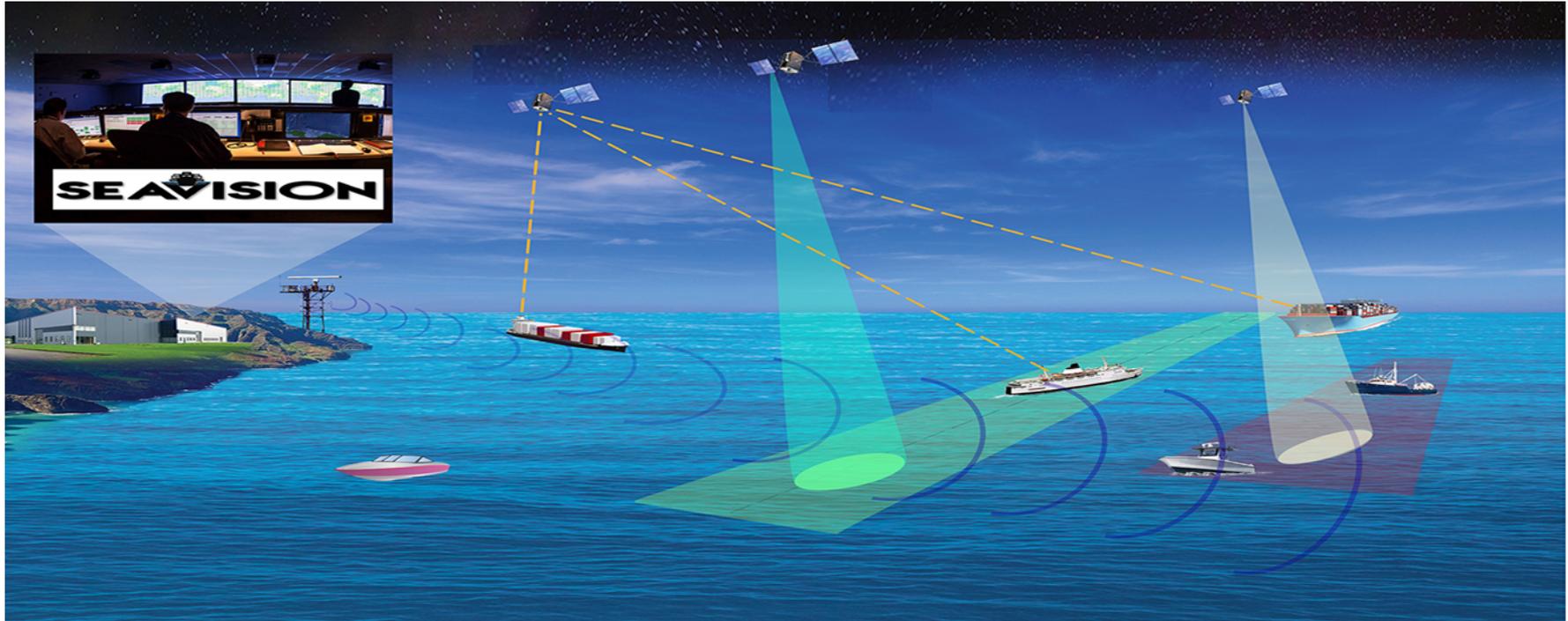
- Utilize Agile Development & DevOps practices while leveraging commercial cloud services to increase flexibility, incorporate new data and technologies to meet user requirements
 - Major releases every 18-24 months
 - Incremental releases (every 60-90 days) to keep pace with emerging requirements
 - Emphasize user engagement and continuous feedback throughout the development/release process



Keys to Success

- Simplicity and ease of use for maritime partners promotes MDA information sharing and interoperability
 - Minimal training to get users on the system
 - User Interface utilizes Google Material Design
 - Optimized to support low-bandwidth users
- Displays publicly available and commercial data to create a level, open playing field benefitting all
 - Combatant Commanders purchase commercial data to give to partner nations via SeaVision
 - Commercial Data Contracts limit the ability to share data based on license counts
- Minimal administrative burden placed on users and community managers ensures SeaVision continued success
- Consistent User engagement

Deployment Operational View



Safety

Search and Rescue ♦ Accidents at Sea
Navies ♦ Coast Guard ♦ Port Authority

Economic

IUU fishing ♦ Oil Spills
Customs ♦ Fisheries

Security

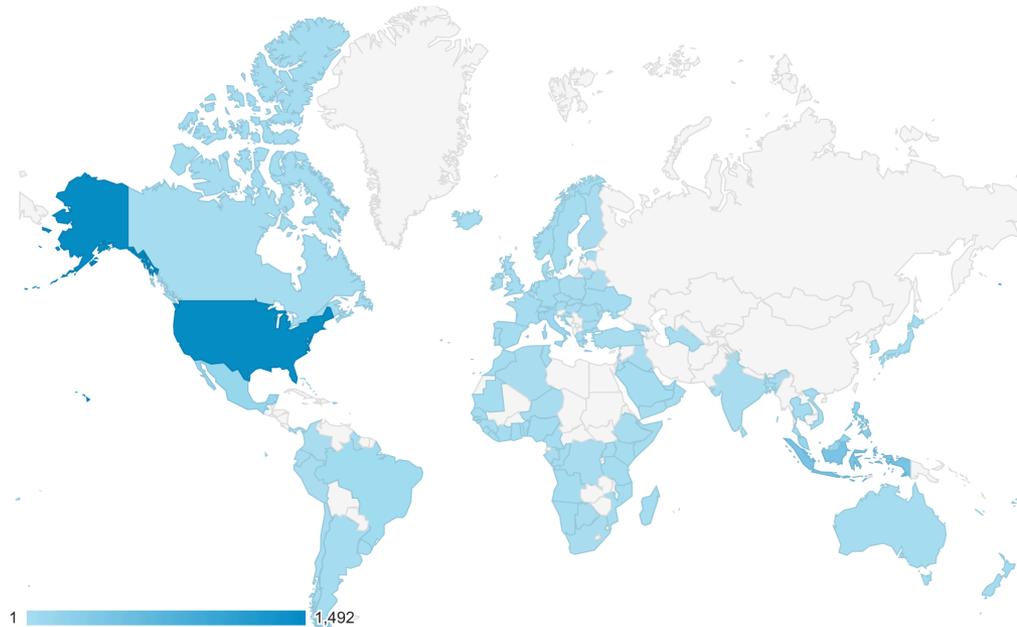
Terrorism ♦ Robbery ♦ Piracy ♦ Human Trafficking ♦ Illegal cargo
Coast Guard ♦ Port Authority ♦ Maritime Police

Environment

Oil Spill ♦ Illegal Dumping
Environmental Agencies

Primary Users

- **U.S. Navy Maritime Operations Centers (MOCs)**
 - Designated as the Navy MOC Unclassified/Non-PKI Information Sharing Tool
- **AFRICOM & U.S. 6th Fleet**
 - Deployed to African Nations as part of the Gulf of Guinea Info Sharing Framework
 - Radar and AIS installations in AFRICOM for Counter-Narcotics, integrated into SeaVision/MSSIS
- **Maritime Security Initiative (MSI) – Southeast Asia**
 - Utilized by 5 ASEAN Nations + more to be added
 - NIWC Pacific is funded to provide data integration and training
- **20+ U.S. Government Agencies**
 - DHS, USCG, CBP, NOAA
- **2200+ Users from 85 Countries**





SeaVision Walkthrough



Key Features

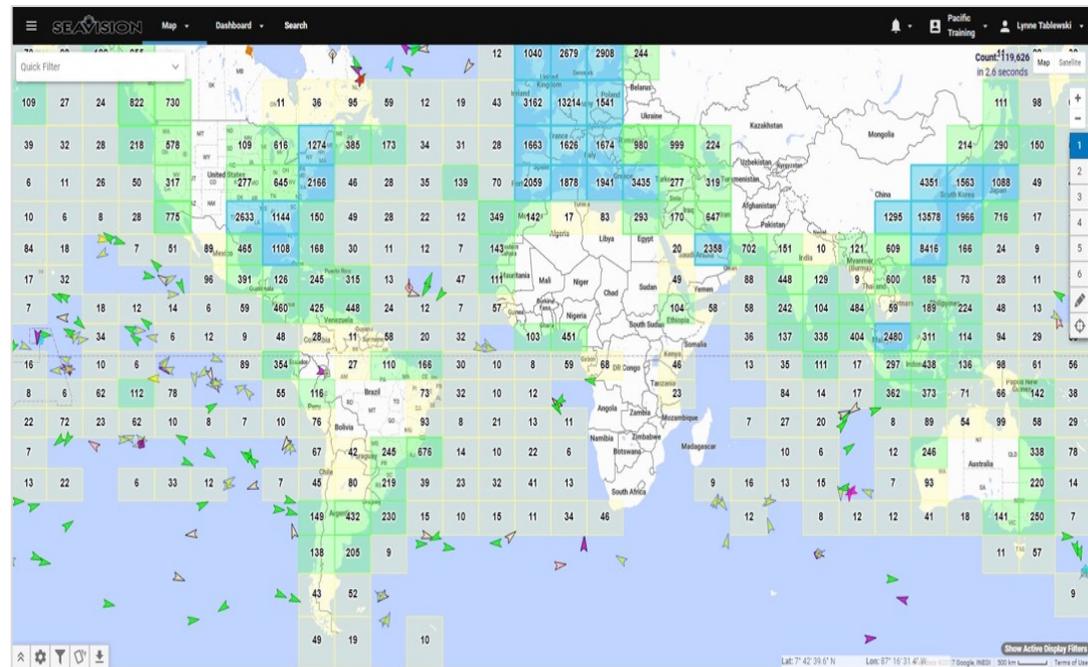
- Visualize vessel positions and tracks on a map
 - Sources include terrestrial AIS, satellite AIS, coastal RADAR, and satellite imagery based positions
- View vessel details (i.e. owner, operator, port visit history)
- Filter vessels based on wide range of parameters
- Collaborate in a community/persona by sharing shapes, rules, alerts, searches, warnings, vessel lists and user notes
- Perform and view the results of automated analysis including:
 - Complex searches with multiple criteria
 - Automated real time alerts
 - User defined rules to quickly identify high priority vessels
 - Vessel risk scores
 - Automated correlation of multiple data sources

SeaVision Map

The **SeaVision Map** provides users with the ability to view & track information about vessels in both near real-time & historical contexts, with advanced filtering & search capabilities

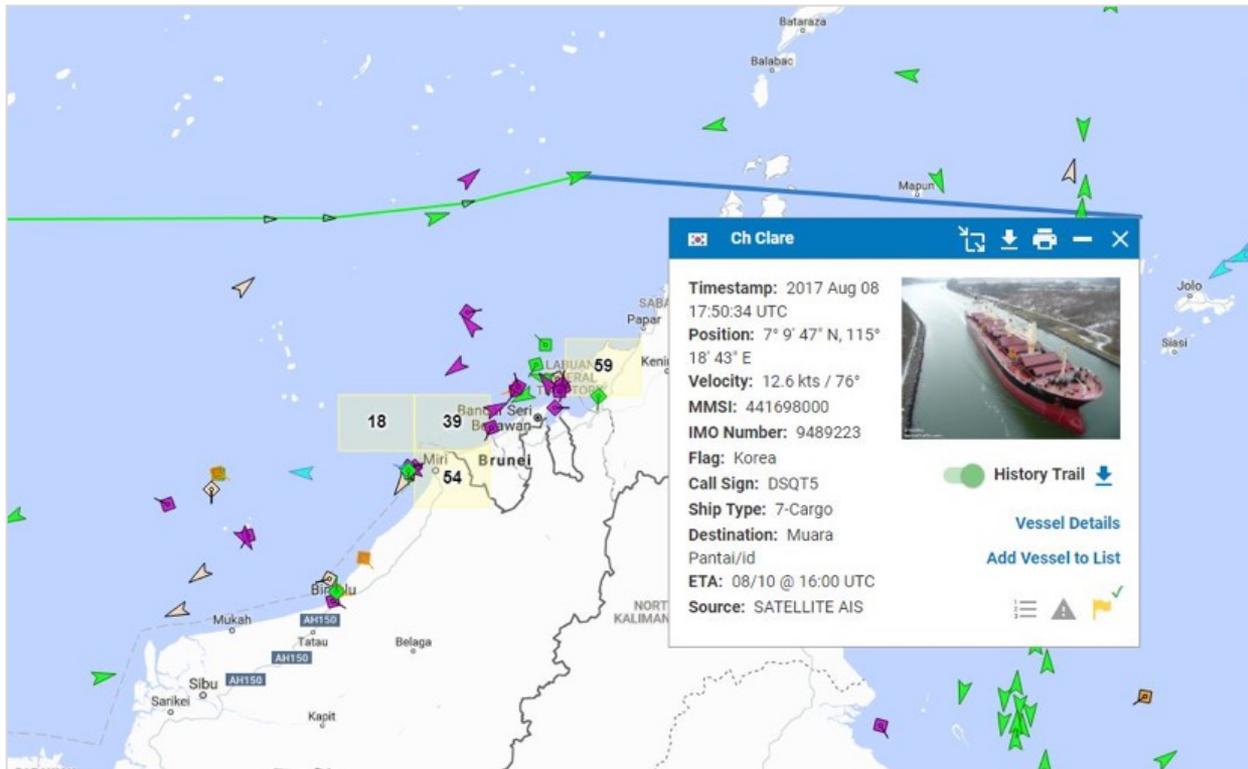
Easily filter map data based on:

- Vessel Type
- MMSI, IMO Number, Vessel Name & Destination
- Alert status (view vessels which match user defined alerts)
- User defined rule status (view vessels which match user defined rules)
- Custom vessel (filter/view vessels on a vessel list)



Viewing Vessel History Trails

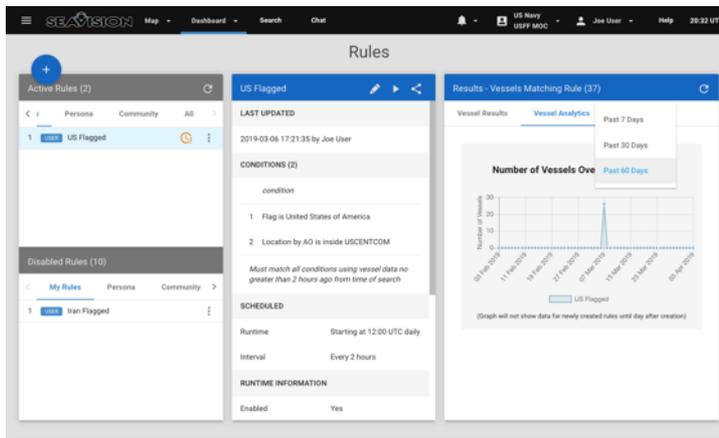
- SeaVision allows visualization of a vessels history trails up to 90 days
- Can view multiple history trails simultaneously and export them for additional analysis
- Individual position reports in history trail are available and shown as triangles
 - Each position marker has date/time stamp



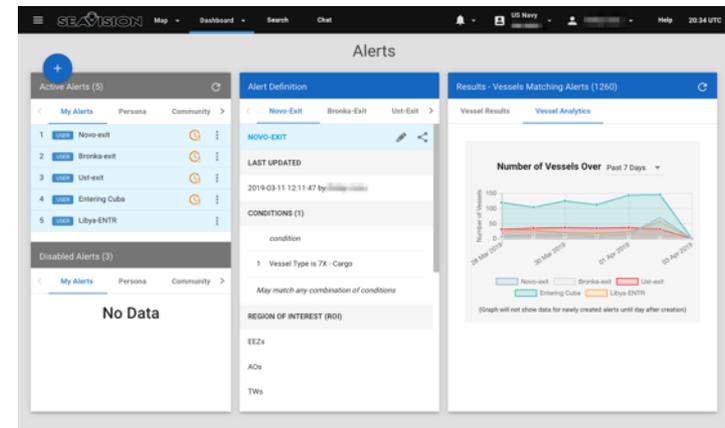
SeaVision Dashboard

The **SeaVision Dashboard** enables users to create and/or view:

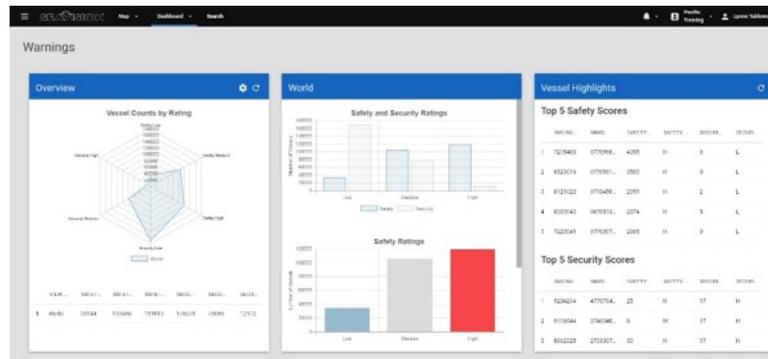
User-defined Rules



Real-time Alerts



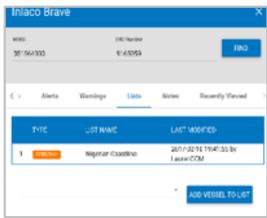
Safety/Security Warnings



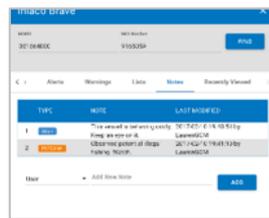
Information Sharing and Collaboration

Users can share resources and collaborate over chat with other **users** in their **persona** and/or **community**

Vessel Lists



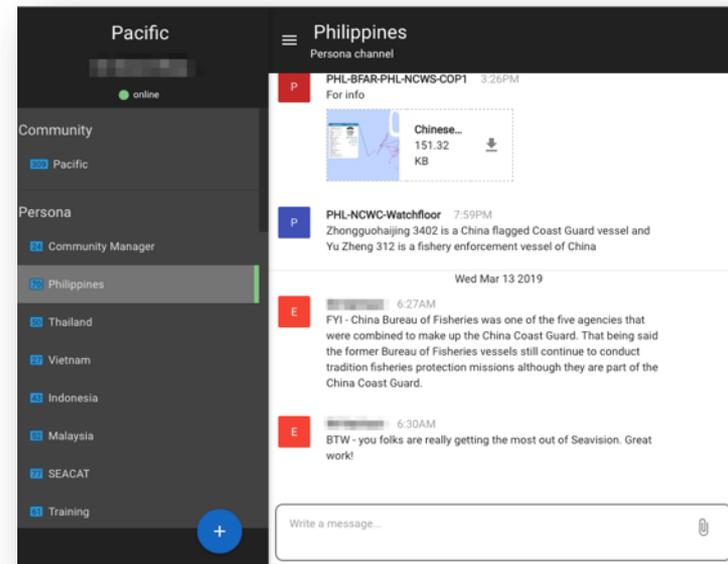
Vessel Notes



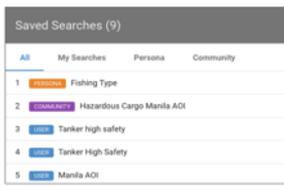
Shapes



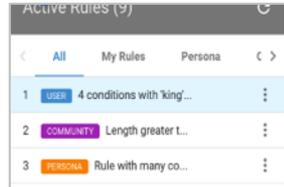
Chat



Searches



Rules



Alerts



SeaVision Search

- SeaVision provides ability to conduct complex searches with multiple criteria
- Search results can be displayed or exported as JSON, CSV, XML
- Searches can be shared at the **PERSONA** and **COMMUNITY** level

The screenshot displays the SeaVision Search interface. At the top, a blue header contains the word "SEARCH" and a close button (X). Below the header, the interface is divided into two main sections: "Set Up Your Conditions" and "Choose The Time Period To Evaluate".

Set Up Your Conditions: This section contains three search criteria, each in a rounded rectangular box. The first box is labeled "Location by EEZ" and contains the text "is inside" followed by a dropdown menu showing "Indonesia" and a close button (X). The second box is labeled "Flag" and contains the text "is" followed by a dropdown menu showing "Iran" and a close button (X). The third box is labeled "Classification" and contains the text "is" followed by a dropdown menu showing "Bulk Carriers" and a close button (X). Below the "Classification" dropdown, there are two more options: "Bulk Dry/Liquid" and "Bulk/Liquid Carrier". The criteria are connected by "AND" operators. A blue button labeled "ADD CONDITION" is located at the bottom right of this section.

Choose The Time Period To Evaluate: This section contains a slider for "Vessel Age". The slider is currently set to "6 hrs" and has a range from 0 to "30 days".

On the right side of the interface, there is a world map showing the continents and oceans. The map is labeled with "NORTH AMERICA", "SOUTH AMERICA", "EUROPE", "AFRICA", "ASIA", and "OCEANIA". The oceans are labeled "Pacific Ocean", "Atlantic Ocean", and "Indian Ocean". The Google logo is visible in the bottom left corner of the map, and "Map data ©2017 Terms of Use" is visible in the bottom right corner.

SeaVision User Defined Rules

Allows user to define the evaluation time and interval when the individual rules are run

- Each rule has weight/score defined by user which represents it's importance
- Multiple conditions can be set

Create a New Rule [X]

✓ **Name Your Rule**
Flag Russia or China

✓ **Choose How To Evaluate Your Conditions**
 Vessels must meet all conditions
 Vessels can meet any condition and will accumulate a score associated with the condition

✓ **Set Up Your Conditions**

Flag	is	China	Weight: 3	X
		OR		
Flag	is	Russia	Weight: 1	X

ADD CONDITION

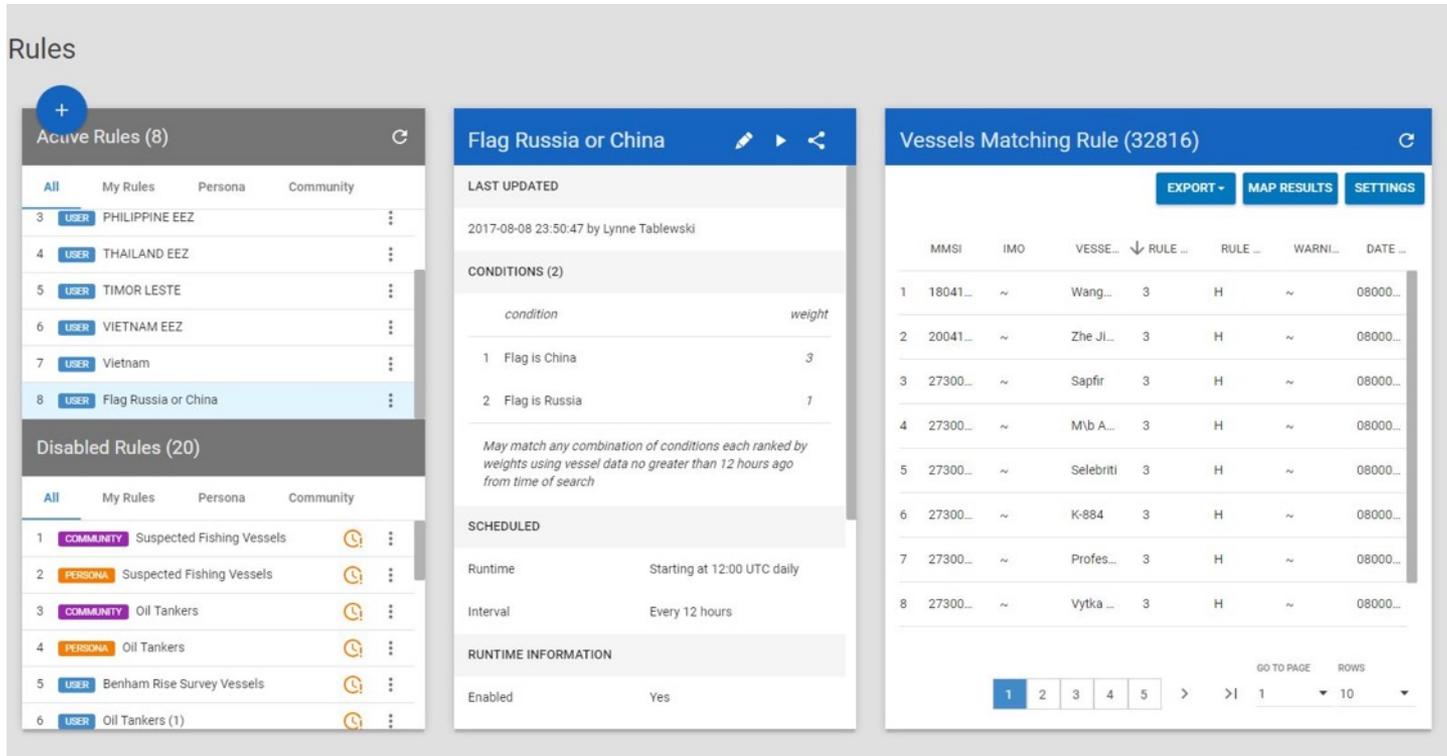
Set Score Thresholds for the Low/Medium boundary: 1 [Slider]

Set Score Thresholds for the Medium/High boundary: 2 [Slider]

✓ **Choose The Evaluation Time And Interval**

SeaVision User Defined Rules

- Results provide a prioritized list and score for vessel matching user rules
 - Vessels with highest scores matched the most rules
- Results can be exported as JSON, CSV, XML or KML and viewed on the map
- Rules can be copied and/or shared at the **PERSONA** and **COMMUNITY** levels



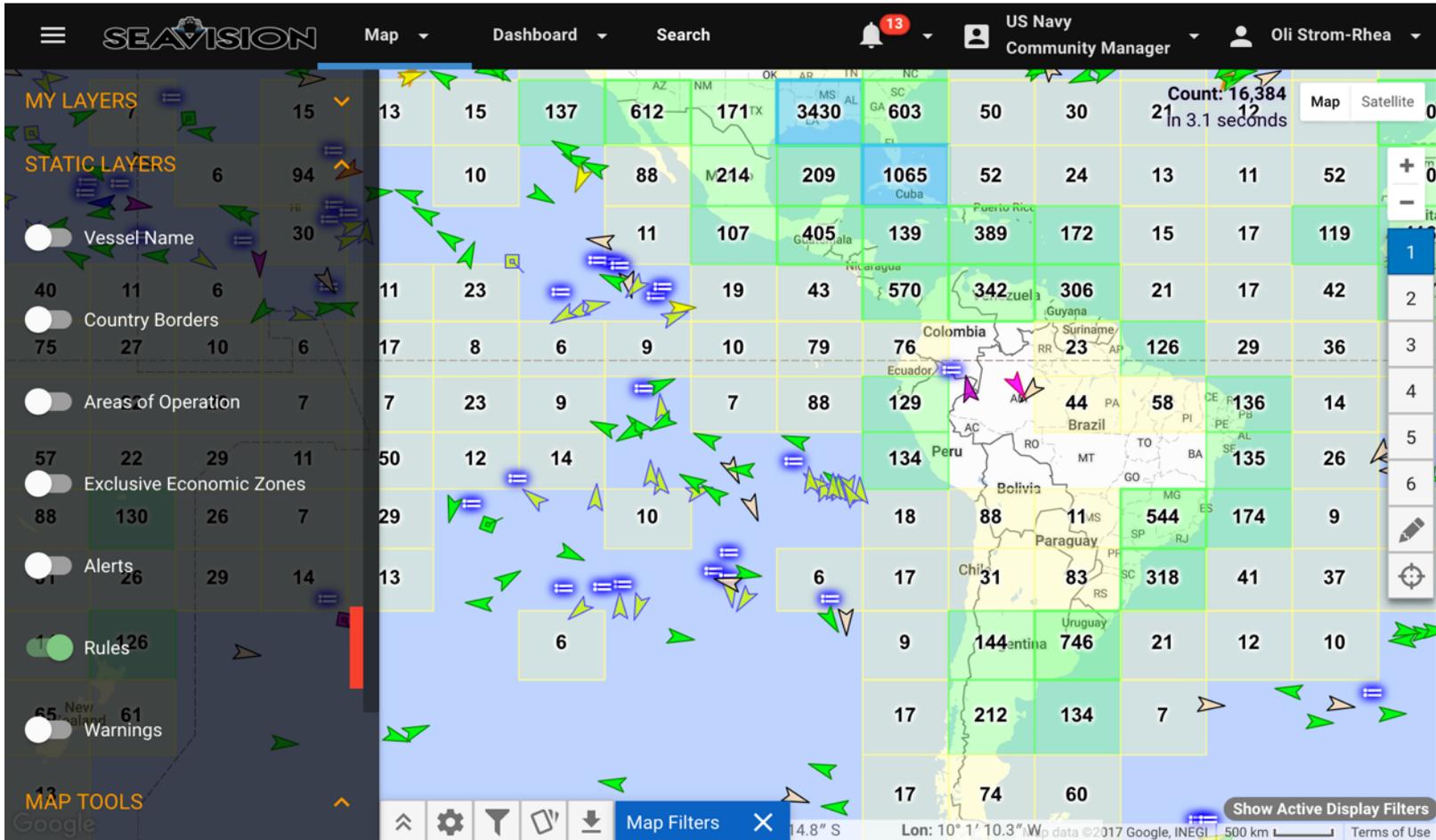
The screenshot displays the 'Rules' management interface in SeaVision. It is divided into three main sections:

- Rules List:** Shows 'Active Rules (8)' and 'Disabled Rules (20)'. The active rules list includes:
 - 3 PHILIPPINE EEZ (USER)
 - 4 THAILAND EEZ (USER)
 - 5 TIMOR LESTE (USER)
 - 6 VIETNAM EEZ (USER)
 - 7 Vietnam (USER)
 - 8 Flag Russia or China (USER) - This rule is selected.
- Flag Russia or China Rule Detail:** Shows the rule's metadata and conditions.
 - LAST UPDATED: 2017-08-08 23:50:47 by Lynne Tablewski
 - CONDITIONS (2):

condition	weight
1 Flag is China	3
2 Flag is Russia	1
 - SCHEDULED: Runtime (Starting at 12:00 UTC daily), Interval (Every 12 hours)
 - RUNTIME INFORMATION: Enabled (Yes)
- Vessels Matching Rule (32816):** A table showing the results of the selected rule.

MMSI	IMO	VESSE...	RULE ...	RULE ...	WARNI...	DATE ...
1 18041...	~	Wang...	3	H	~	08000...
2 20041...	~	Zhe Ji...	3	H	~	08000...
3 27300...	~	Sapfir	3	H	~	08000...
4 27300...	~	Mvb A...	3	H	~	08000...
5 27300...	~	Selebriti	3	H	~	08000...
6 27300...	~	K-884	3	H	~	08000...
7 27300...	~	Profes...	3	H	~	08000...
8 27300...	~	Vytka ...	3	H	~	08000...

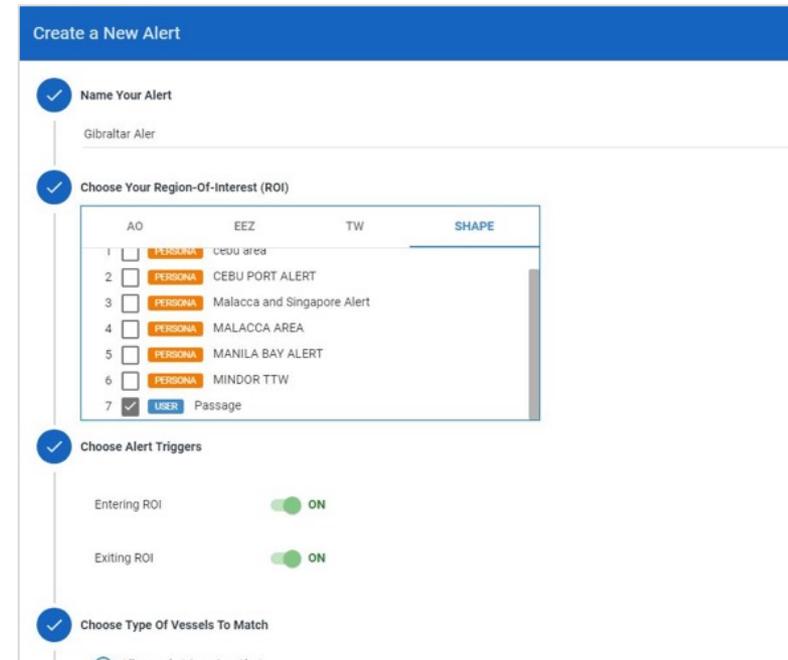
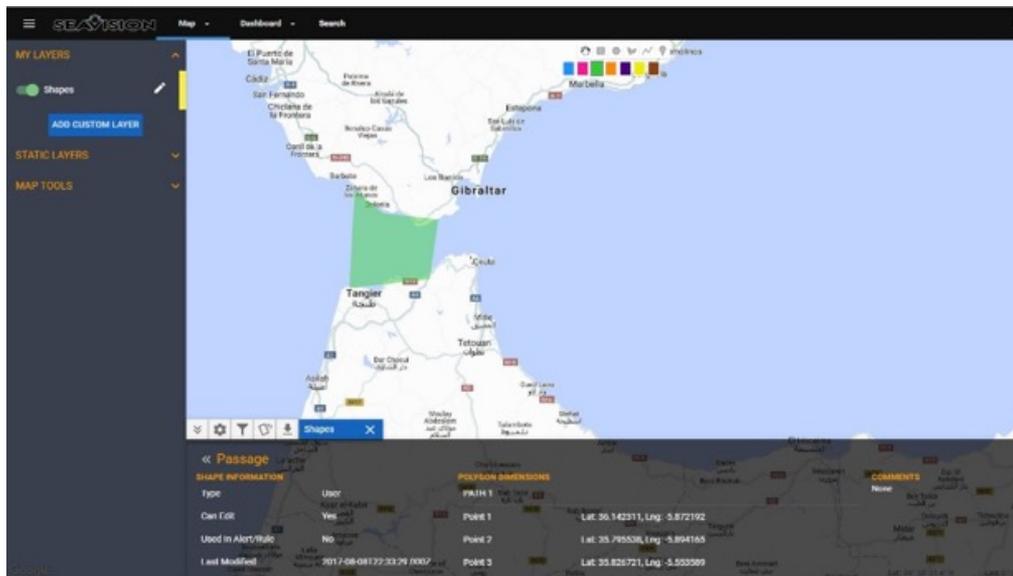
SeaVision User Defined Rules



SeaVision Rules results displayed on the map

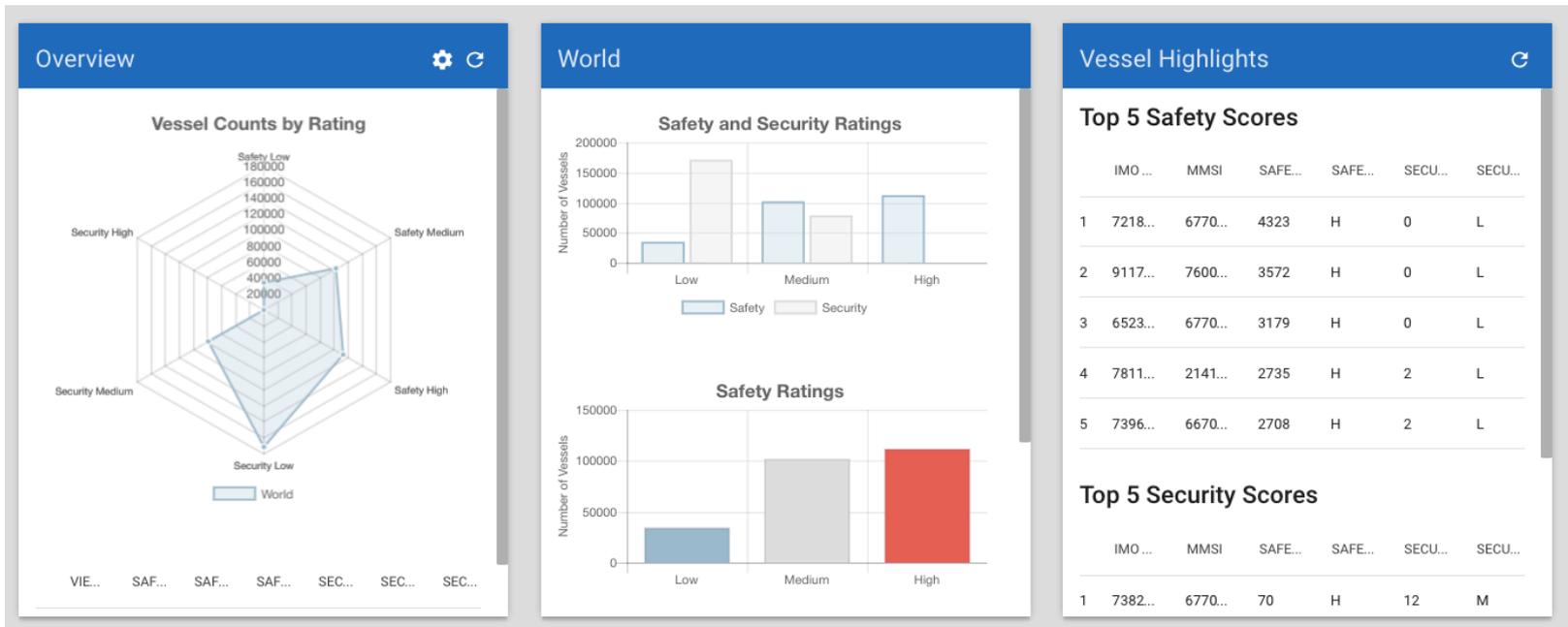
SeaVision Automated Alerts

- SeaVision provides the ability to set up automated real time alerts.
- Allows users to specify area of interest and constraints
 - Can add as many AIS constraints as desired
- Users can receive automated email alerts when vessels match conditions
- Users can copy and/or share Alerts at the **PERSONA** and **COMMUNITY** levels



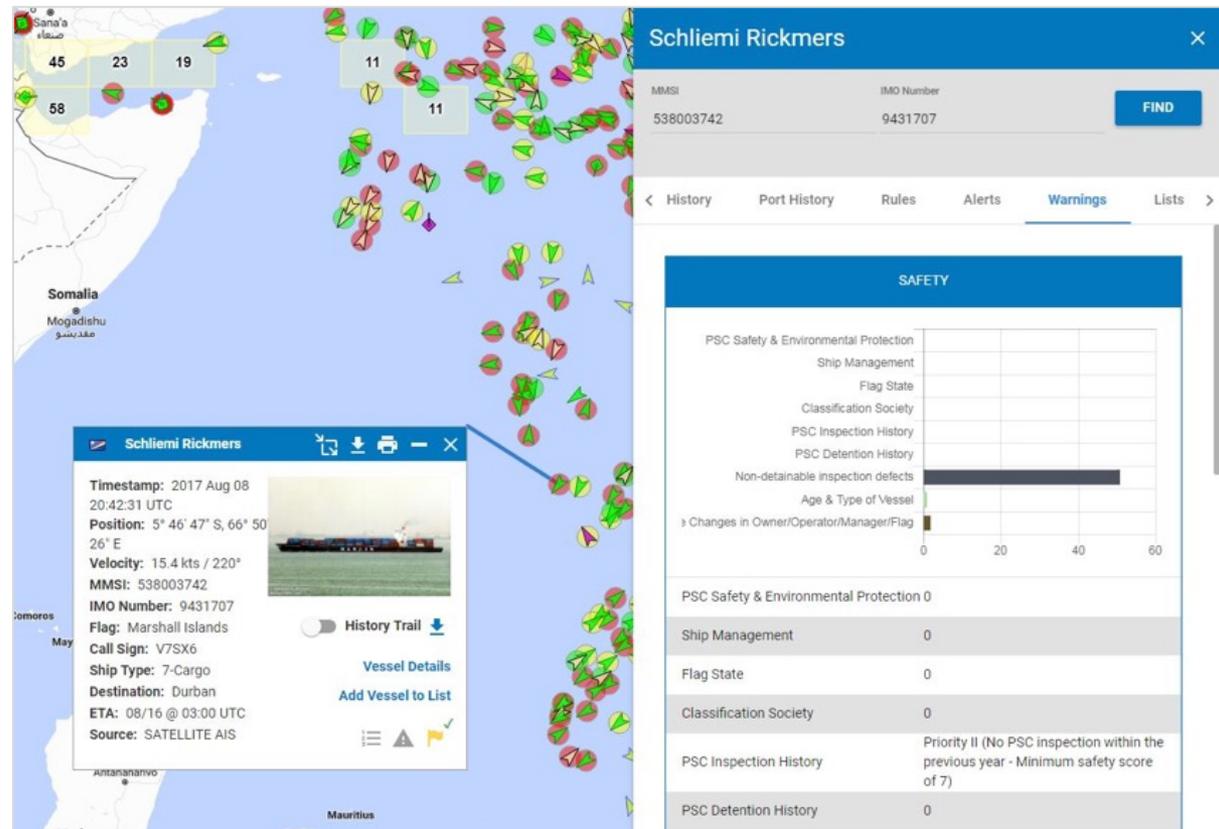
Warnings – Risk Scores

- Warnings Settings are derived from the US Coast Guard’s Port Security Matrix
- Warning Settings are configured by the Community Manager for each persona and displayed to the users



Warning Scores

- Color coded based on scores for simple visualization
 - Red: High
 - Yellow: Medium
 - Green: Low
- Warnings Overview link (flag icon) provides detailed break down of warning scores



Automated Correlation

- Ability to integrate, correlate, and display RADAR tracked targets
- Automatically correlates RADAR to AIS or Satellite SAR to AIS

The screenshot shows the SEAVISION interface with a map of the Pacific region. A pop-up window displays details for a specific contact (ID 1002315578):

- Source: SAT-SAR
- Time: 2019 Apr 15 21:44:01 UTC
- Age: 18h 19m 6s ago
- Position: 5° 34' 41" N, 121° 56' 13" E
- Speed: — kts
- Heading: 191°
- Length: 264.2 m
- Width: 44.9 m
- Sensor: TSX1

Annotations on the map highlight:

- Correlated Satellite SAR imagery contact** (orange box)
- Uncorrelated Satellite SAR imagery contact** (green box)
- Satellite SAR image chip** (orange box)

At the bottom, a green banner states: **Enables the user to quickly identify uncorrelated targets**