

MARINE MONITOR

End-to-End Solution for Situational Awareness of the
Nearshore Marine Environment



protectedseas



What is M2

Vessel monitoring platform and software

Uses radar, camera, and other sensors

Continuous data collection

Nearshore managed areas

Remote areas



protectedseas

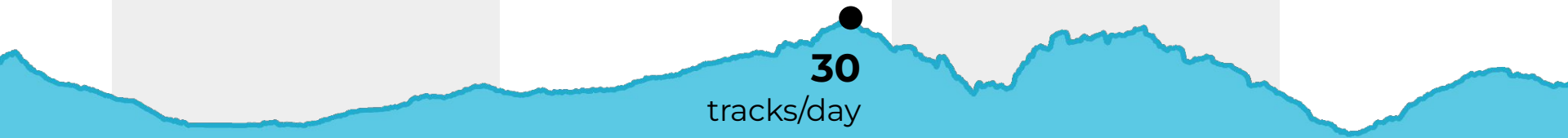


2020

2021

2022

2023



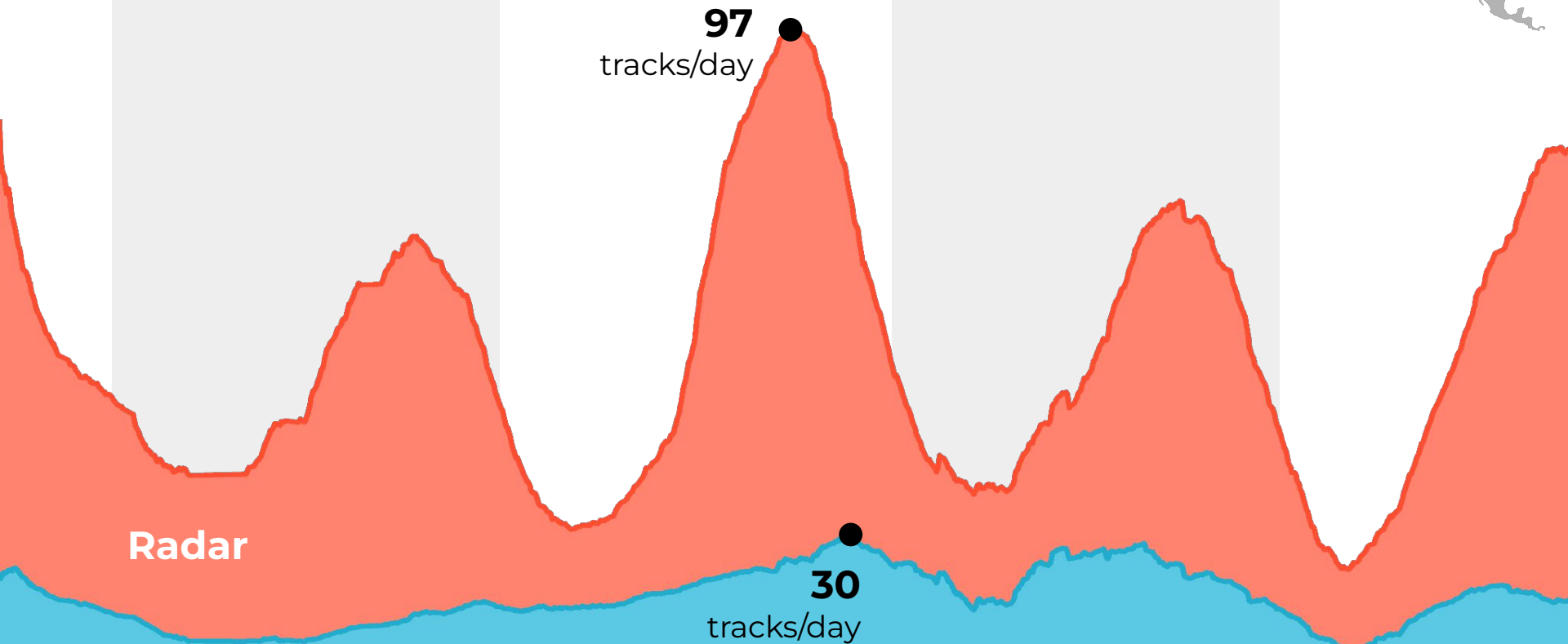
AIS

2020

2021

2022

2023

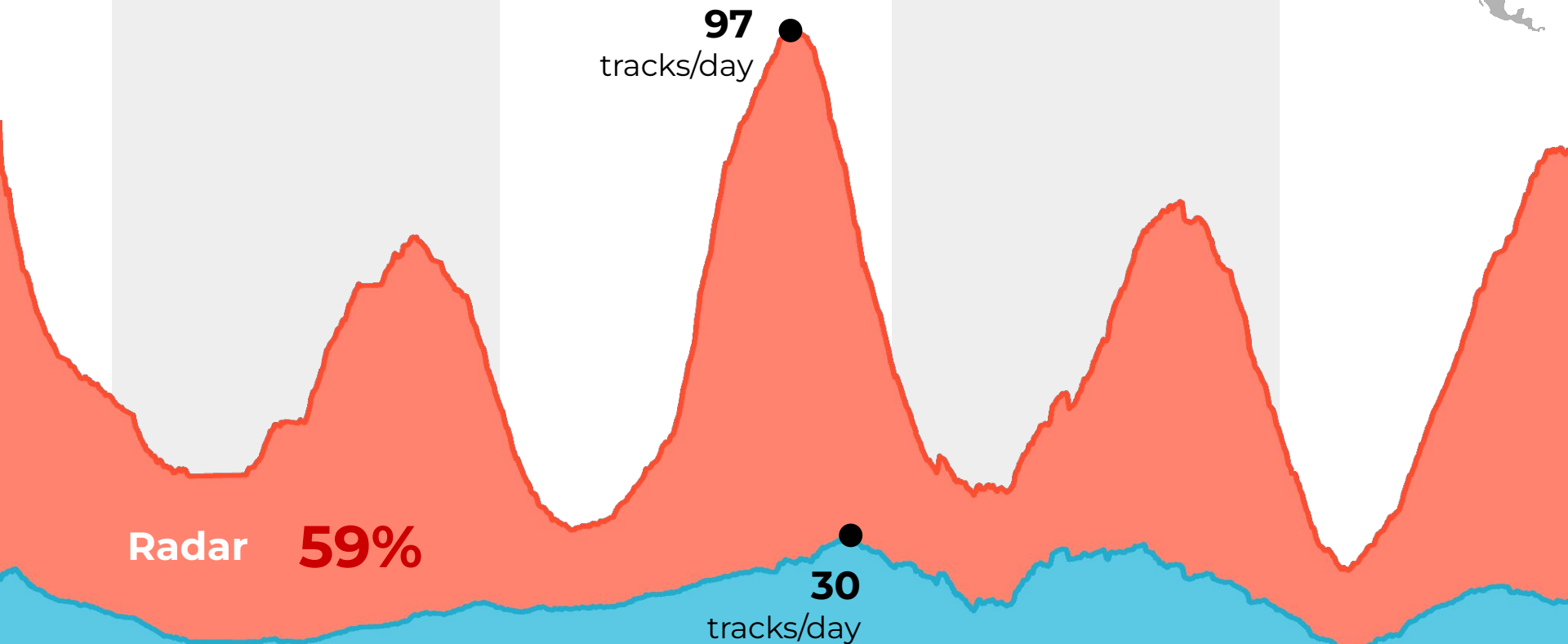


2020

2021

2022

2023



Radar **59%**

AIS **41%**

30
tracks/day

Why M2

Marine radar

- Tracks all vessels, participation not required
- Ideal for tracking small scale vessels to 5nm
- All weather, day and night
- High resolution data with low error
- Real-time vessel location and speed

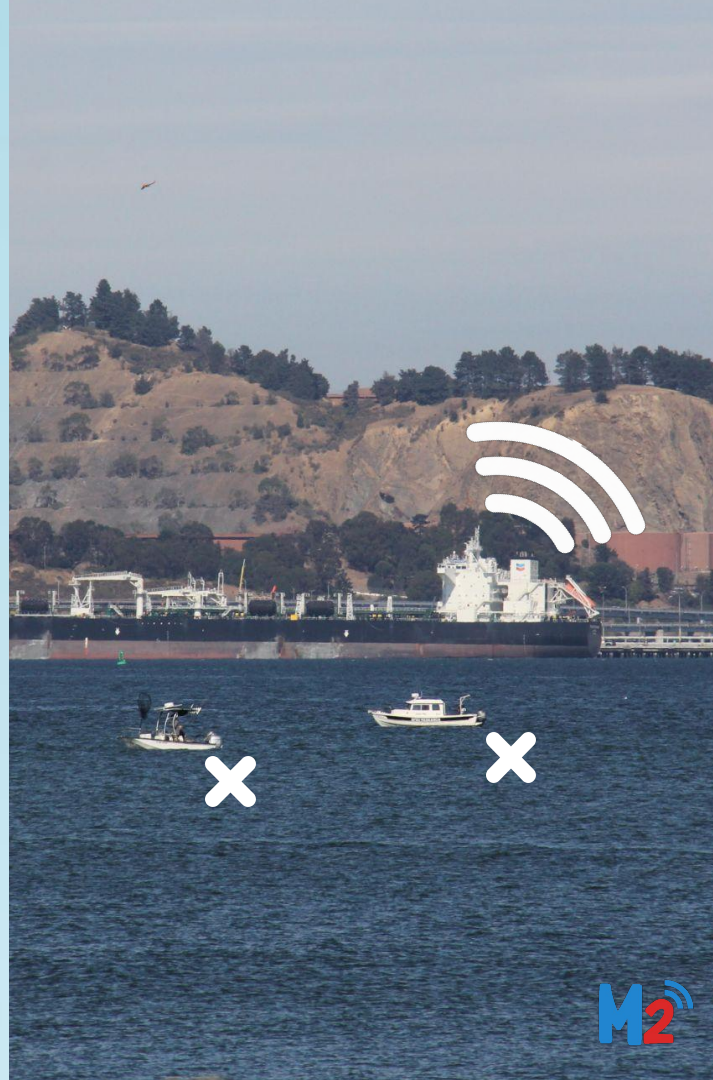
Camera

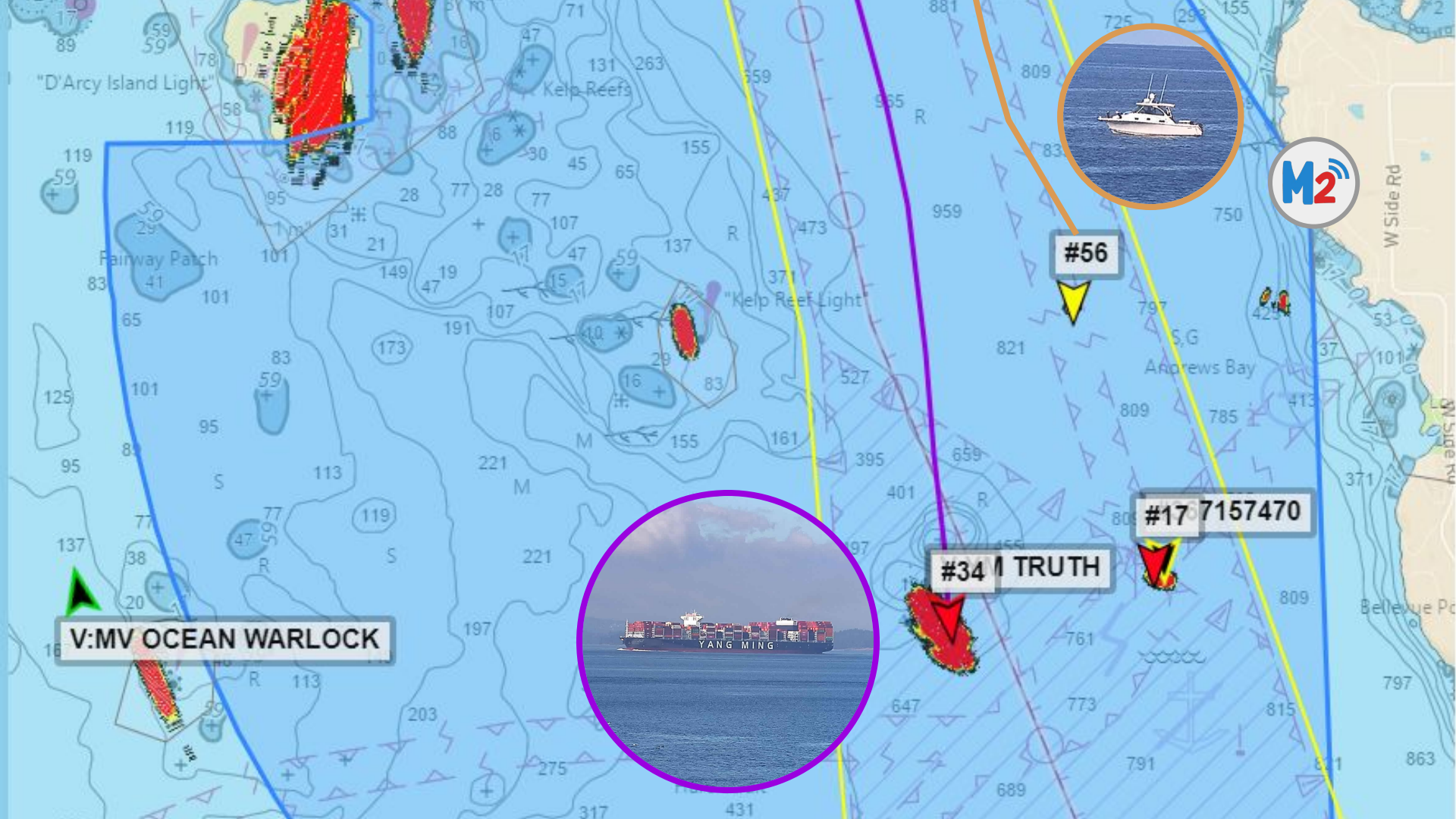
- Autonomous image capture
- Images tagged with vessel location

AIS/VMS integration

- Collect additional vessel data
- Identify non-participating vessels
- AIS Class A and Class B

Radar is an established, reliable technology





"D'Arcy Island Light"

Kelp Reefs

"Kelp Reef Light"

Andrews Bay

Bellevue Pt

V: MV OCEAN WARLOCK

#34 TRUTH

#17 7157470

#56



Who Uses M2

Government agencies

MPA managers

Enforcement personnel

NGOs

Research institutions



Where We Work

- ★ Active
- ★ In Progress



protectedseas



Radar + Camera



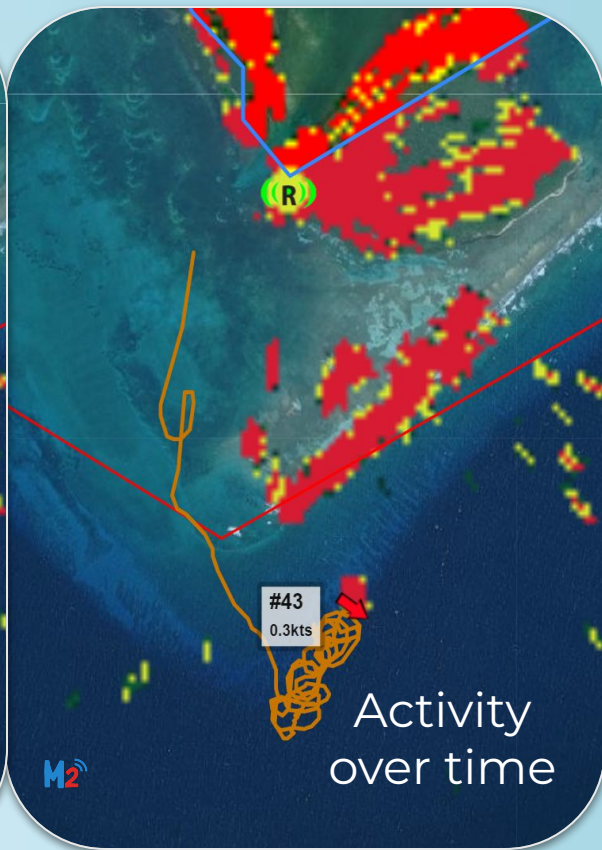
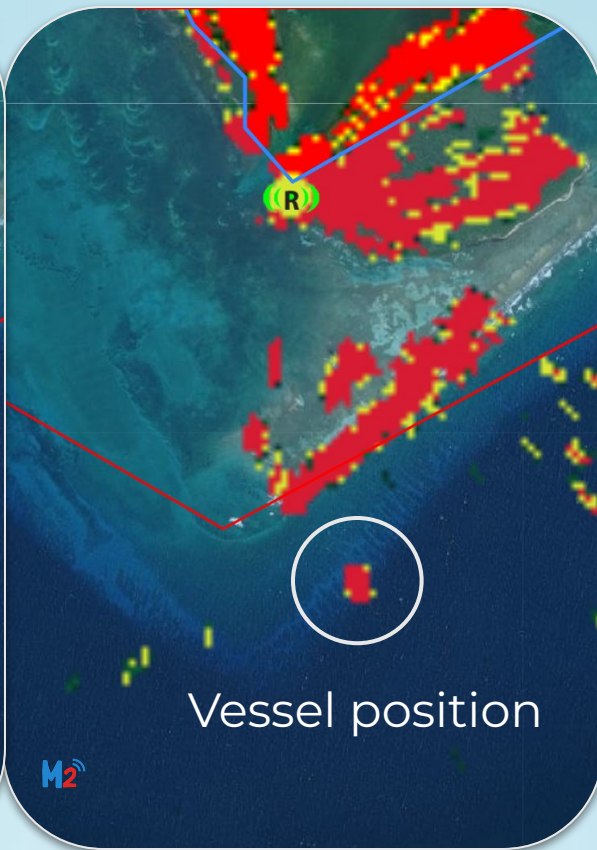
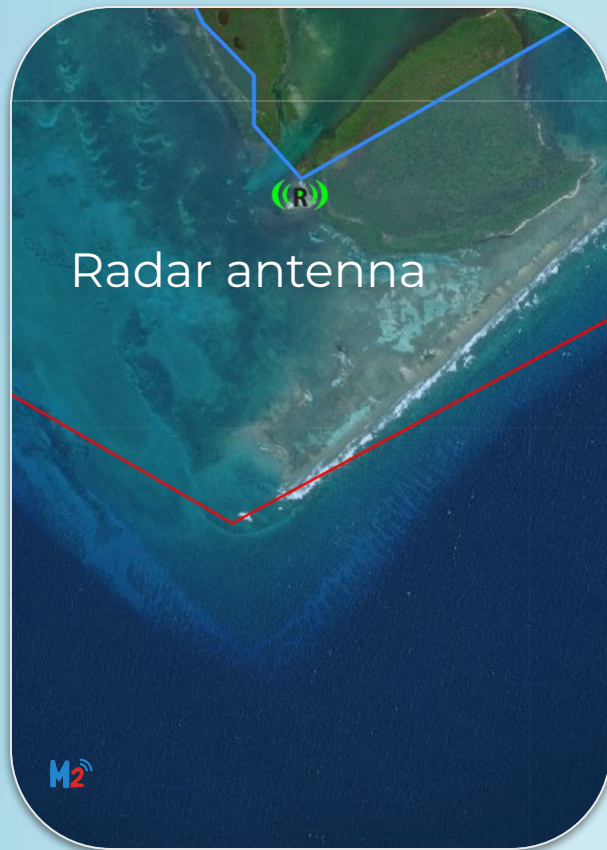
M2 Control Center



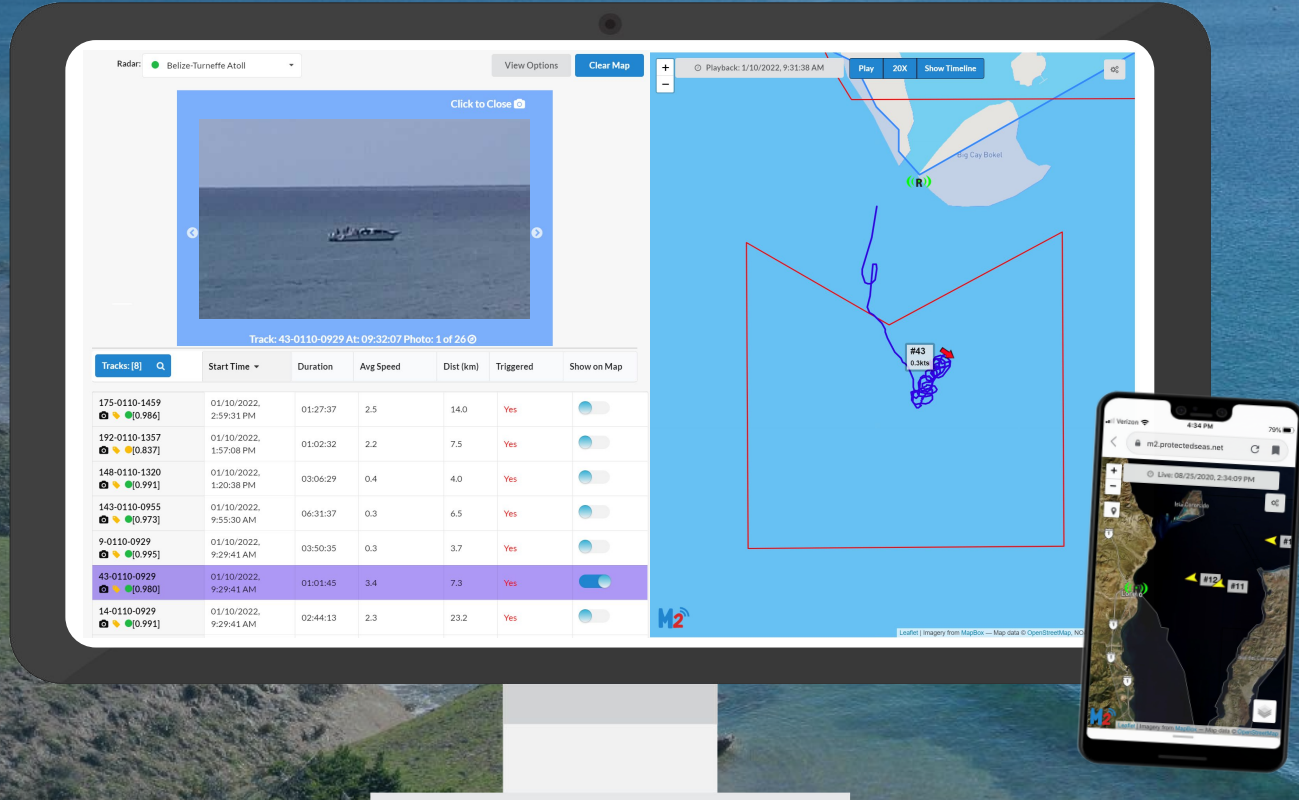
M2 Viewer



Radar



M2 Viewer




M2 Viewer

Radar: Belize-Turneffe Atoll

View Options

Clear Map

Click to Close



Track: 43-0110-0929 At: 09:32:07 Photo: 1 of 26

Tracks: [8]

	Start Time	Duration	Avg Speed	Dist (km)	Triggered	Show on Map
175-0110-1459 [0.986]	01/10/2022, 2:59:31 PM	01:27:37	2.5	14.0	Yes	<input type="checkbox"/>
192-0110-1357 [0.837]	01/10/2022, 1:57:08 PM	01:02:32	2.2	7.5	Yes	<input type="checkbox"/>
148-0110-1320 [0.991]	01/10/2022, 1:20:38 PM	03:06:29	0.4	4.0	Yes	<input type="checkbox"/>
143-0110-0955 [0.973]	01/10/2022, 9:55:30 AM	06:31:37	0.3	6.5	Yes	<input type="checkbox"/>
9-0110-0929 [0.995]	01/10/2022, 9:29:41 AM	03:50:35	0.3	3.7	Yes	<input type="checkbox"/>
43-0110-0929 [0.980]	01/10/2022, 9:29:41 AM	01:01:45	3.4	7.3	Yes	<input checked="" type="checkbox"/>
14-0110-0929 [0.991]	01/10/2022, 9:29:41 AM	02:44:13	2.3	23.2	Yes	<input type="checkbox"/>

Playback: 1/10/2022, 9:31:38 AM

Play

20X

Show Timeline

QC

Caye Bokel Spawning Aggregation Alarm Zone

Speed < 5 knots
Time > 10 minutes
Active 24 hours

Subscribe to Alerts:

From

To

☐ Email 00:00 23:59

☐ SMS 00:00 23:59

☐ Receive for AIS Only

Email and SMS Alerts are not sent for Low Confidence targets.

Verify your Email and Phone Settings to Ensure Delivery

M2

Leaflet | Imagery from Mapbox — Map data © OpenStreetMap contributors

Verizon 4:34 PM 79%

m2.protectedseas.net

Live! 08/25/2020, 2:34:09 PM



M2

Camera

Range (approximate)

1 nautical mile (1.9 km)

- Identify **vessel**

3 nautical miles (5.6 km)

- Identify **vessel type**

5 nautical miles (9.3 km)

- Confirm **presence**



1nm



3nm



Applications



Enforcement

MPA management
Compliance



Science

Human impacts
Risk assessments



Maritime Safety

Search and rescue
Emergency response



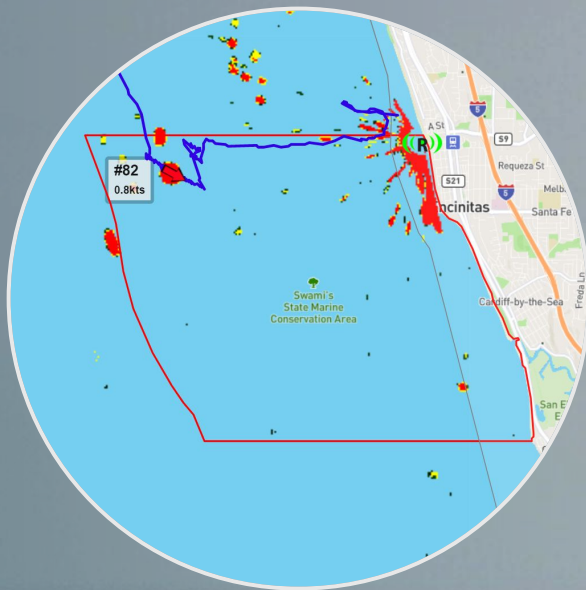
protectedseas

M2

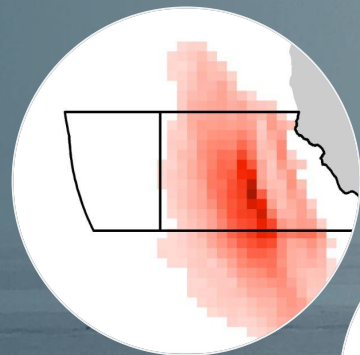


Managed Area Activity

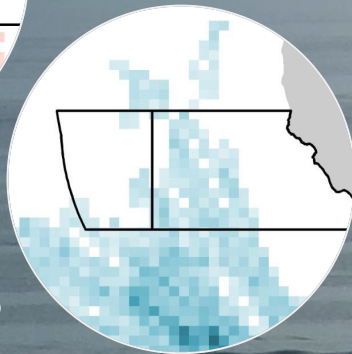
San Diego Area, California



[Press release](#)



Radar



AIS

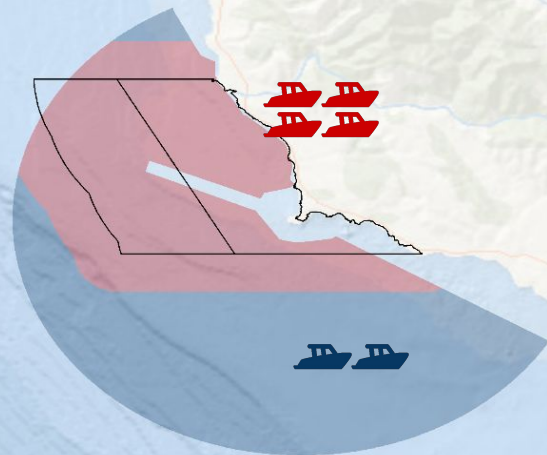
[Publication](#)



Piedras Blancas

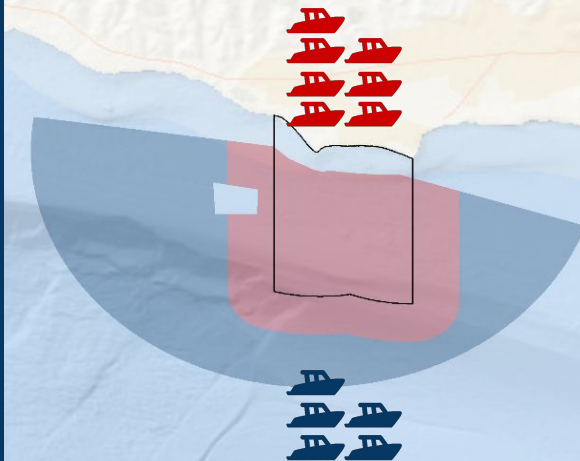
50 km

1x vessel per day



Campus Point

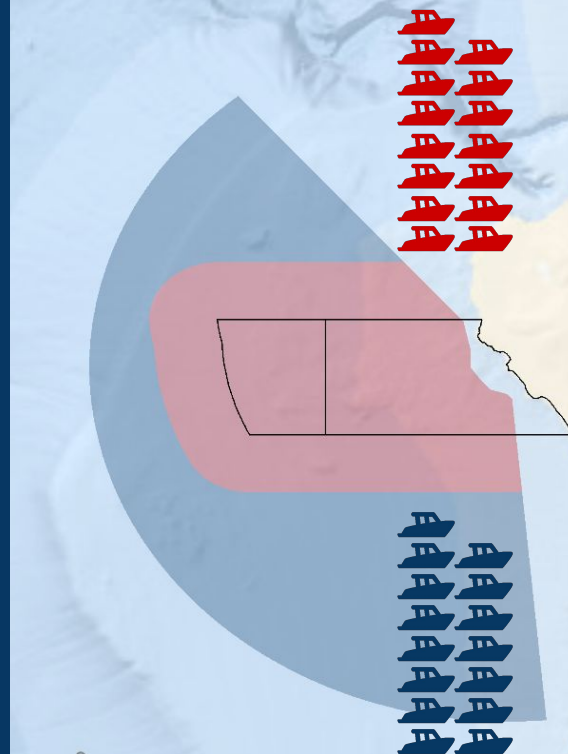
15 km



[Publication](#)

South La Jolla

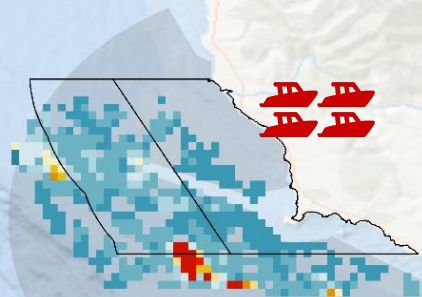
4 km



Piedras Blancas

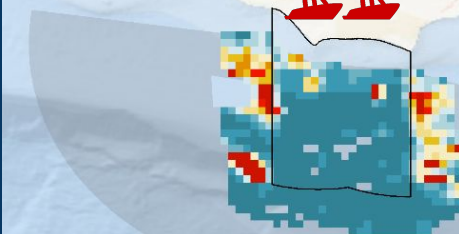
50 km

1x vessel per day



Campus Point

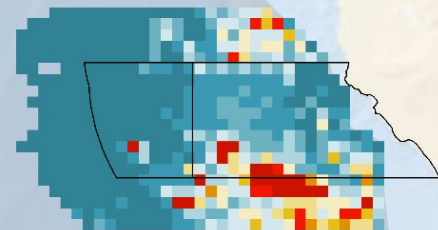
15 km



[Publication](#)

South La Jolla

4 km

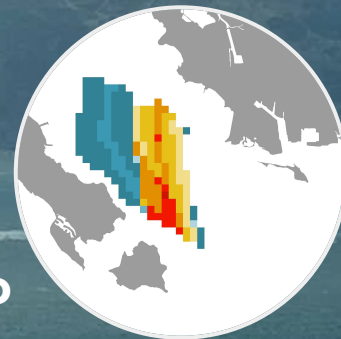


Vessel Speed and Noise

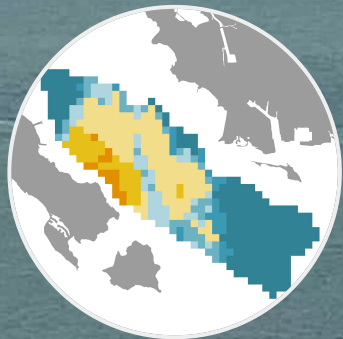
San Francisco Bay Area, California



Cargo



Recreational



[Publication](#)

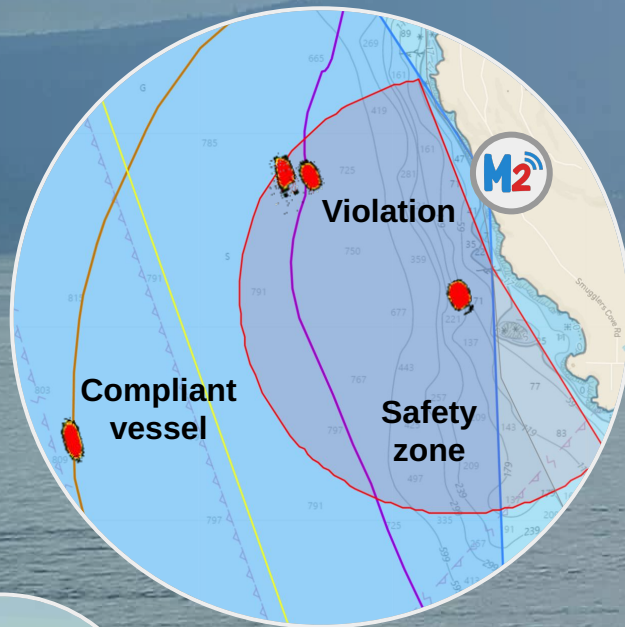
[NOAA Article](#)





Safety

San Juan Island, Washington



Media Coverage



Benefits

Autonomous data collection **24/7**

Integration of **small vessel** information

In-use today by managers

Reliable, established technologies

Monitoring in **remote areas**

Integration of other sensors

Platform for **collaboration** and **partnerships**



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