



Apr 26th, 9:45 AM - 11:15 AM

Marine Monitor (M2): A new approach for measuring human activity in Haro Strait

Samantha Cope


Brendan Tougher

Virgil Zetterlind

Val Veirs

Scott Veirs

Follow this and additional works at: <https://cedar.wvu.edu/ssec>

 Part of the [Fresh Water Studies Commons](#), [Marine Biology Commons](#), and the [Natural Resources and Conservation Commons](#)

Cope, Samantha; Tougher, Brendan; Zetterlind, Virgil; Veirs, Val; and Veirs, Scott, "Marine Monitor (M2): A new approach for measuring human activity in Haro Strait" (2022). *Salish Sea Ecosystem Conference*. 319.

<https://cedar.wvu.edu/ssec/2022ssec/allsessions/319>

This Event is brought to you for free and open access by the Conferences and Events at Western CEDAR. It has been accepted for inclusion in Salish Sea Ecosystem Conference by an authorized administrator of Western CEDAR. For more information, please contact westerncedar@wwu.edu.

Marine Monitor

A new approach for measuring
human activity in Haro Strait



Samantha Cope, Brendan Tougher, Virgil Zetterlind
ProtectedSeas

Val Veirs, Scott Veirs
Beam Reach



What is M2

- Vessel monitoring platform
- Uses radar, camera, and other sensors
- Marine protected area (MPA) monitoring
- Continuous data collection
- Remote areas



Why M2

Transmitting
Automatic Identification
System (AIS) data



NOT



protectedseas



Where We Work

- ★ Active
- ★ In Progress



protectedseas



Applications



Enforcement

MPA management
Compliance



Maritime Safety

Search and rescue
Emergency response



Science

Human impacts
Risk assessments



X-band
marine radar

Pan tilt camera

Remote
communication
antenna

Weather
station

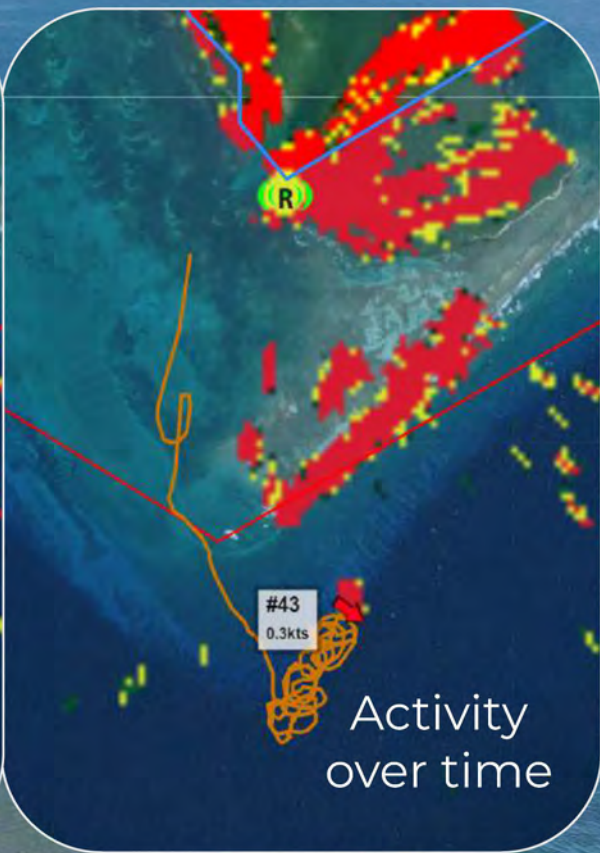
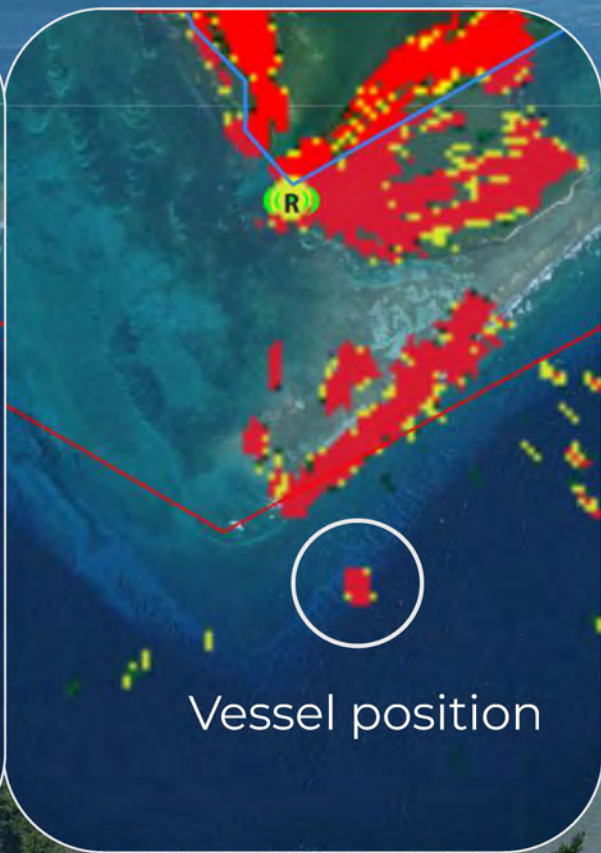
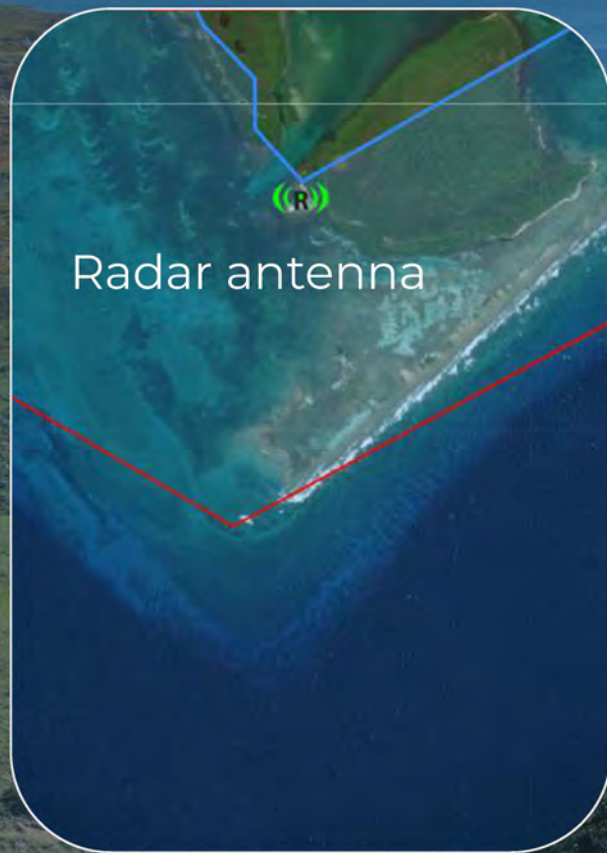
AIS

Solar array

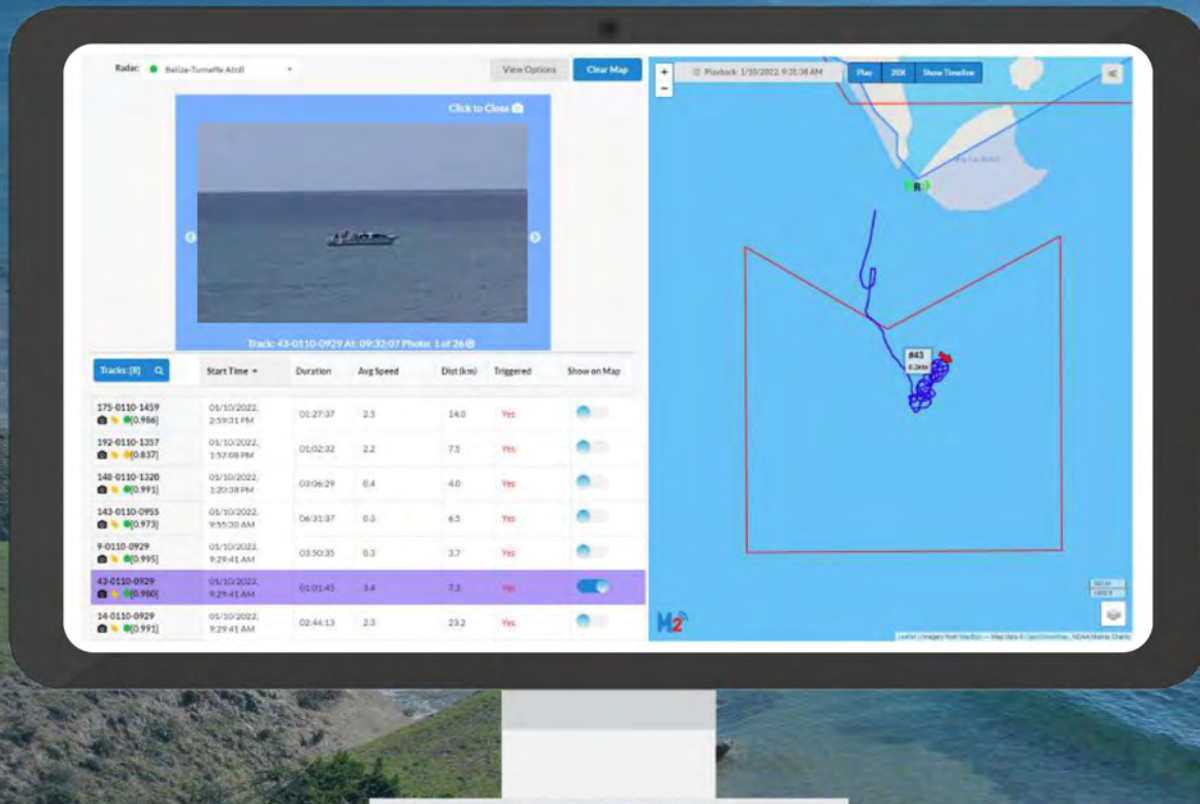
Standard box
trailer



M2 Software



M2 Viewer



M2 in Haro Strait

- Deployed in 2019, currently active
- Integrated with power and internet
- Orcasound network hydrophone
- Over 700 days of data collection



protectedseas



Beam Reach
Marine Science and
Sustainability School


ORCASOUND







((R)) Radar location

 Radar range



((R))

10

km



Radar

- (R)** Radar location
-  Radar range
-  Radar imagery

(R)


10

km

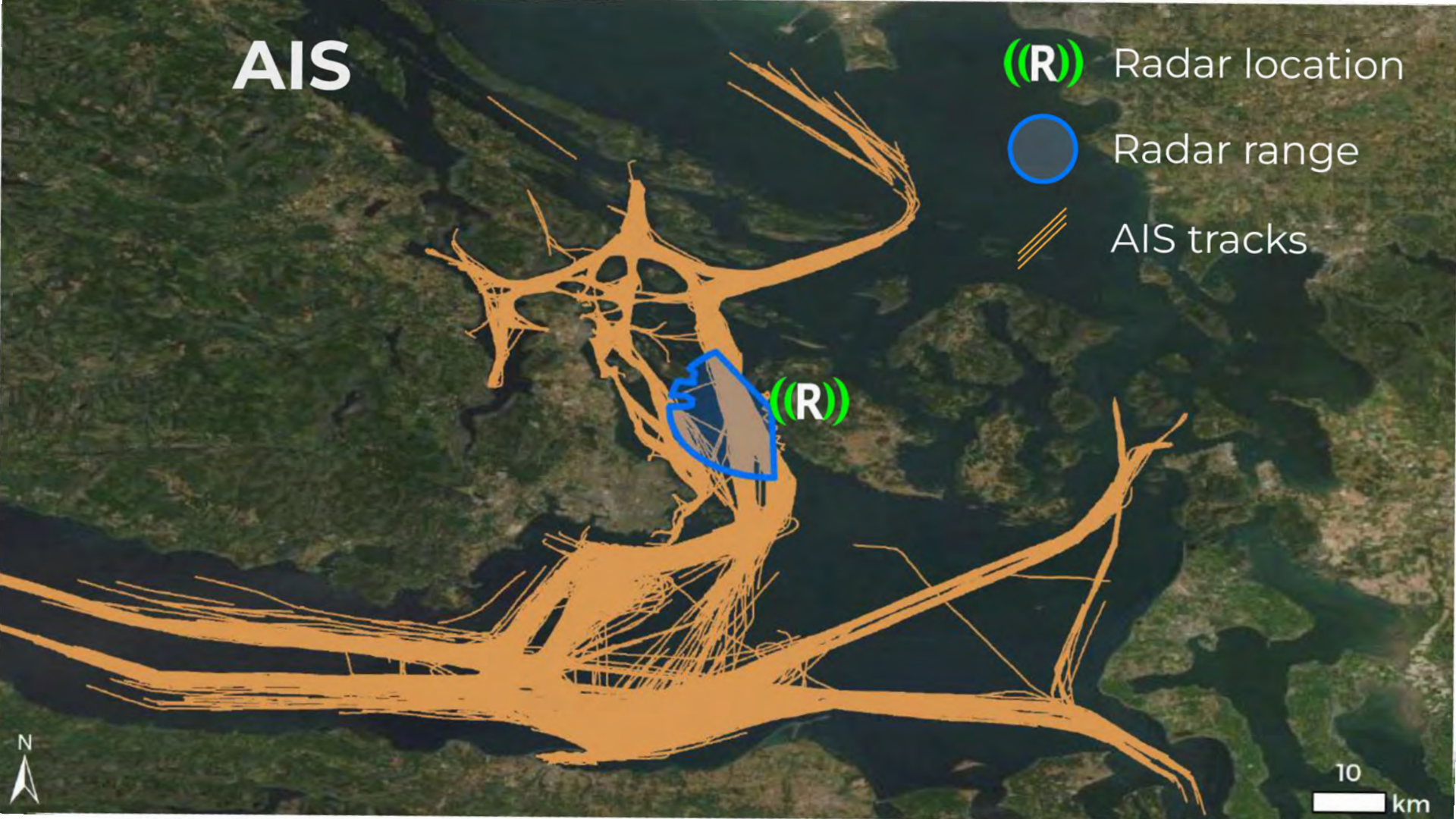


AIS

((R)) Radar location

 Radar range

 AIS tracks



10
km

Commercial fishing

- Document non-AIS vessels
- Fine-scale activity
- Details in photos



((R))

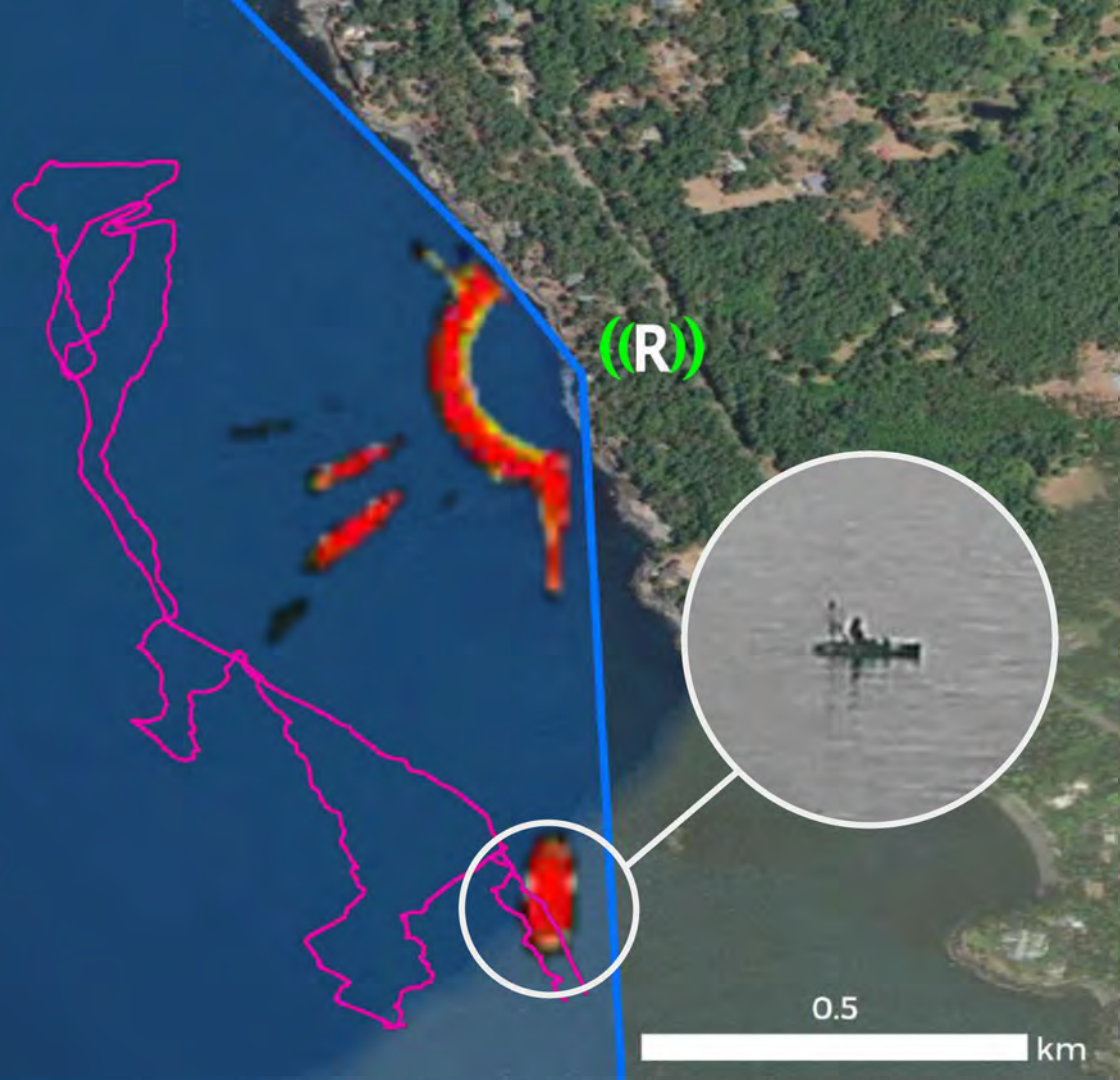
1

km



Recreational fishing

- Lack of data
- Photo identification
- Integrate with other data



Monitoring compliance

- Vessel speed
- Small vessels
- Overlap with species habitat
- Real-time hydrophone

Listen
ORCASOUND
live.orcasound.net



(R)

2

km





((R))

AIS

- Enrich, verify traditional data
- Photo analysis
- Ship draft

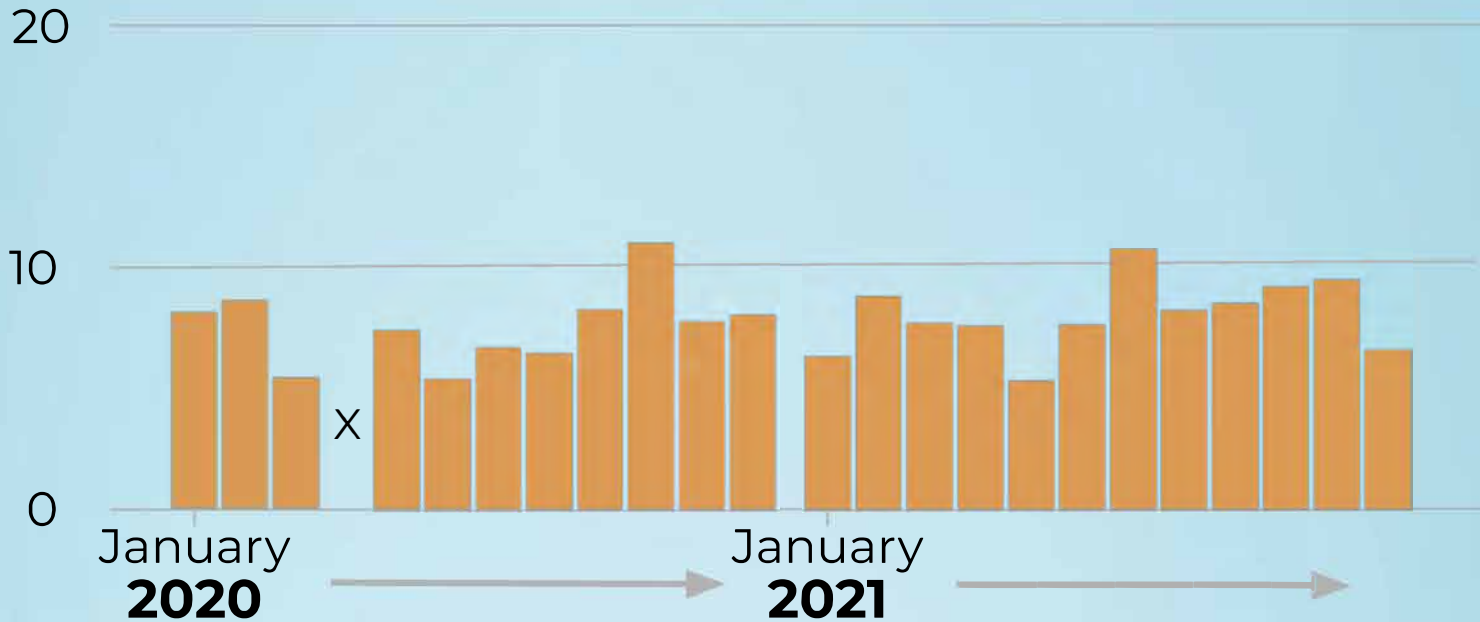
3

km



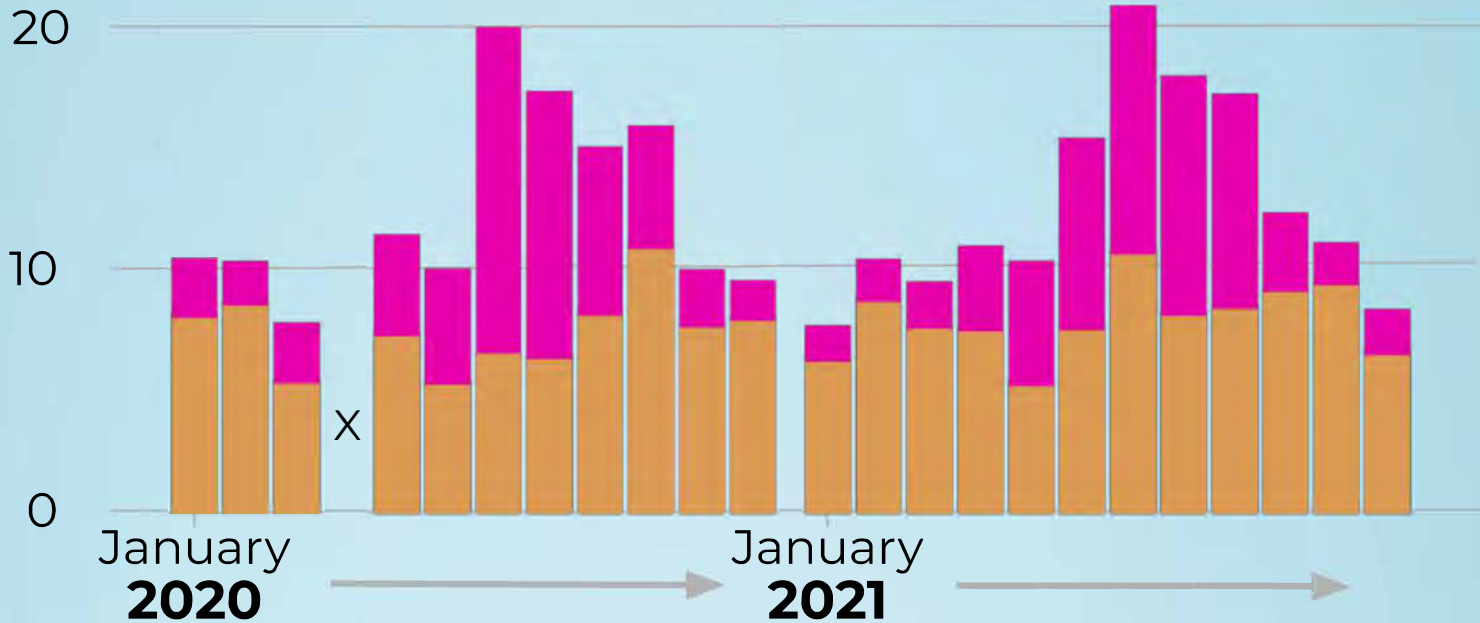
Tracks per day

■ AIS



Tracks per day

AIS Radar



M2 in the Salish Sea

- Ideal conditions for monitoring using radar
- Need for vessel data beyond AIS has been identified
- Potential for science-based research collaborations
- Future work
 - VMS systems
 - Image analysis
 - New integrated app

web | protectedseas.net
email | M2@protectedseas.net



protectedseas

