Salish Sea Ecosystem Conference

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Mapping whale-watching effort using AIS data in the Salish Sea

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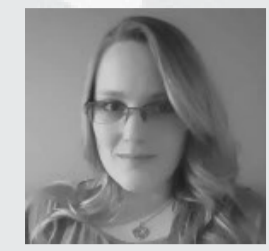
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Background

To achieve a sustainable commercial whale watching industry in the Salish Sea, it is important to gain a good understanding of the footprint that this activity has on the marine environment. We use AIS data to obtain a temporal picture of commercial whale watching activities in two conservation areas of the Salish Sea. AIS stands for Automatic Identification System and provides real-time vessel information and tracking data.

Data and Analysis

To conduct our analysis we used terrestrial-based AIS data from 2018 to 2021, provided by the Canadian Coast Guard via Ocean Networks Canada.

Whale watching trips were derived from known commercial whale watching vessels equipped with AIS transponders, with a start and end point at a home port and a duration of 2 to 5.5 hours. The poster background map (Fig 1) shows the distribution of whale watching trips for 2019.

Fig 2 and 3 show the results of analyzing whale watching trips within the boundary of the Interim Sanctuary Zone (ISZ) on Saturna Island and the XwaYen (Race Rocks) Ecological Reserve respectively. Vessels are not allowed within the ISZ while in effect[2]. The marine area of the ecological reserve is also designated as an MPA under the Oceans Act[3].

Results only represent minimum estimates since only a portion of the actual whale watching fleet was fitted with AIS or transmitting their AIS positions at all times (Fig 4).

Fig 4. Number of commercial whale watching vessels transmitting AIS (total and by country) and total active fleet[1] operating in the Salish Sea. There has been an uptake in the number of commercial whale watching vessels being fitted with AIS, particularly by Canadian vessels
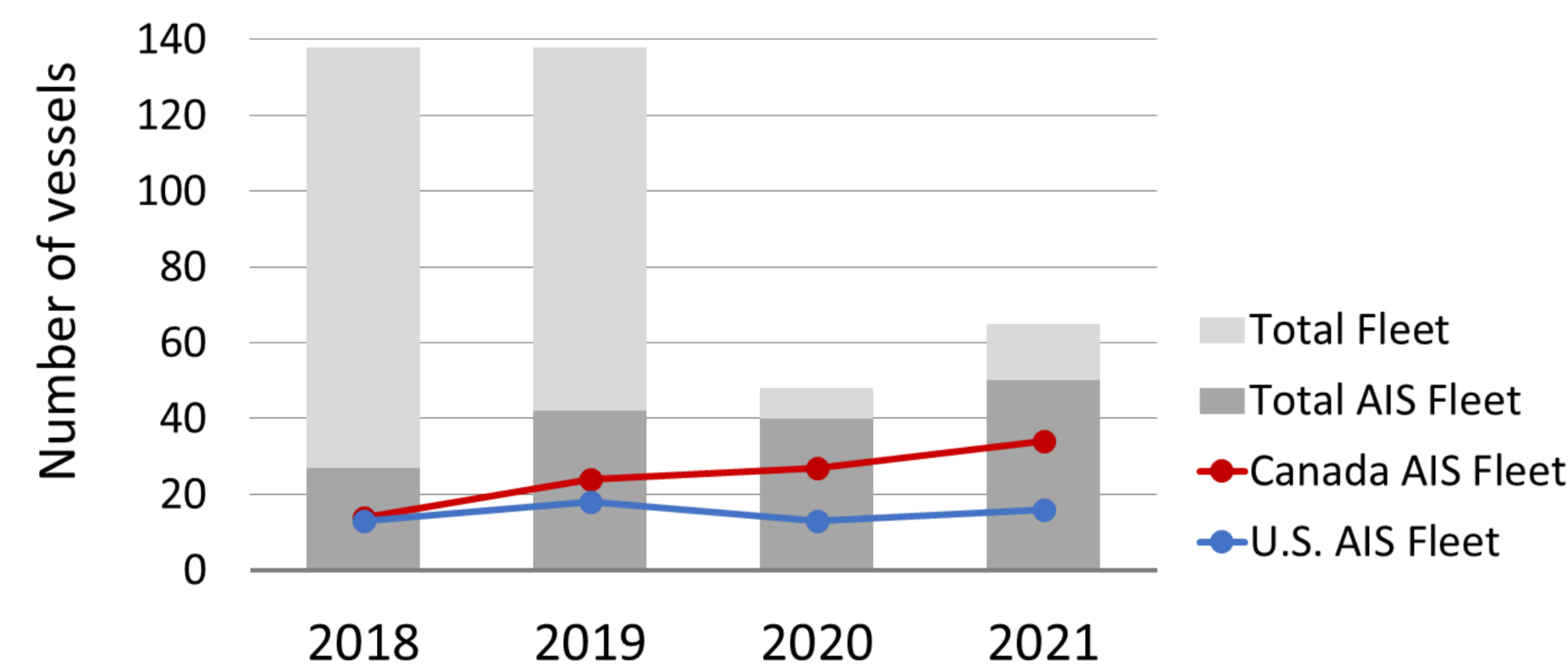
Conclusion

AIS data is a powerful monitoring tool to assess the level of compliance and success of conservation measures, and to evaluate the intensity of commercial whale watching activities within ecological important areas.

For more information about our research on the commercial whale watching industry in British Columbia visit our project website at https://waveproject.ca/

References

1. 2021 Soundwatch Program Annual Contract Report
2. 2021 Management measures to protect SRWK
3. Race Rocks Ecological Reserve - BC Parks

Vessel tracking data facilitates the analysis of commercial whale watching operations in sensitive areas of the Salish Sea.

Fig.1. Density of commercial whale watching trips in 2019 from vessels transmitting AIS

Number of trips (2019 data)
- 1
- 2 - 10
- 11 - 25
- 26 - 50
- 51 - 75
- 76 - 100
- 101 - 250
- 251 - 500
- > 500

Fig 2. Noticeable decrease in the number visits per month by commercial whale watching vessels transmitting AIS inside the **Saturna Island Interim Sanctuary Zone** since its implementation in June 2019.
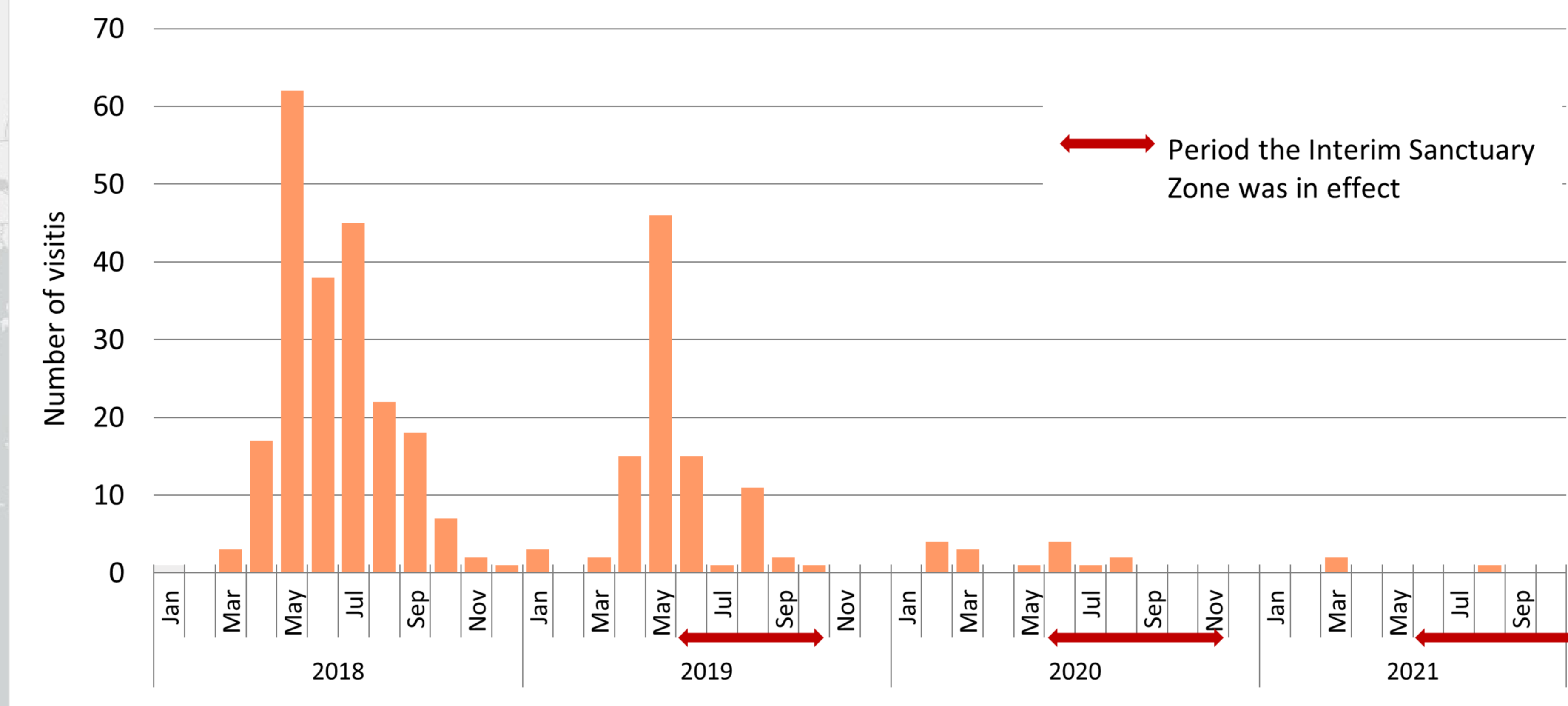
Fig 3. Number of visits to **XwaYen (Race Rocks) Ecological Reserve** by commercial whale watching vessels transmitting AIS quadrupled in 2019 compared to 2018. In 2019, the maximum number of unique vessels per day decreased from 20 to 10 vessels per day during the summer months. COVID-19 restrictions cause a decrease in number of visits in 2020. Levels recov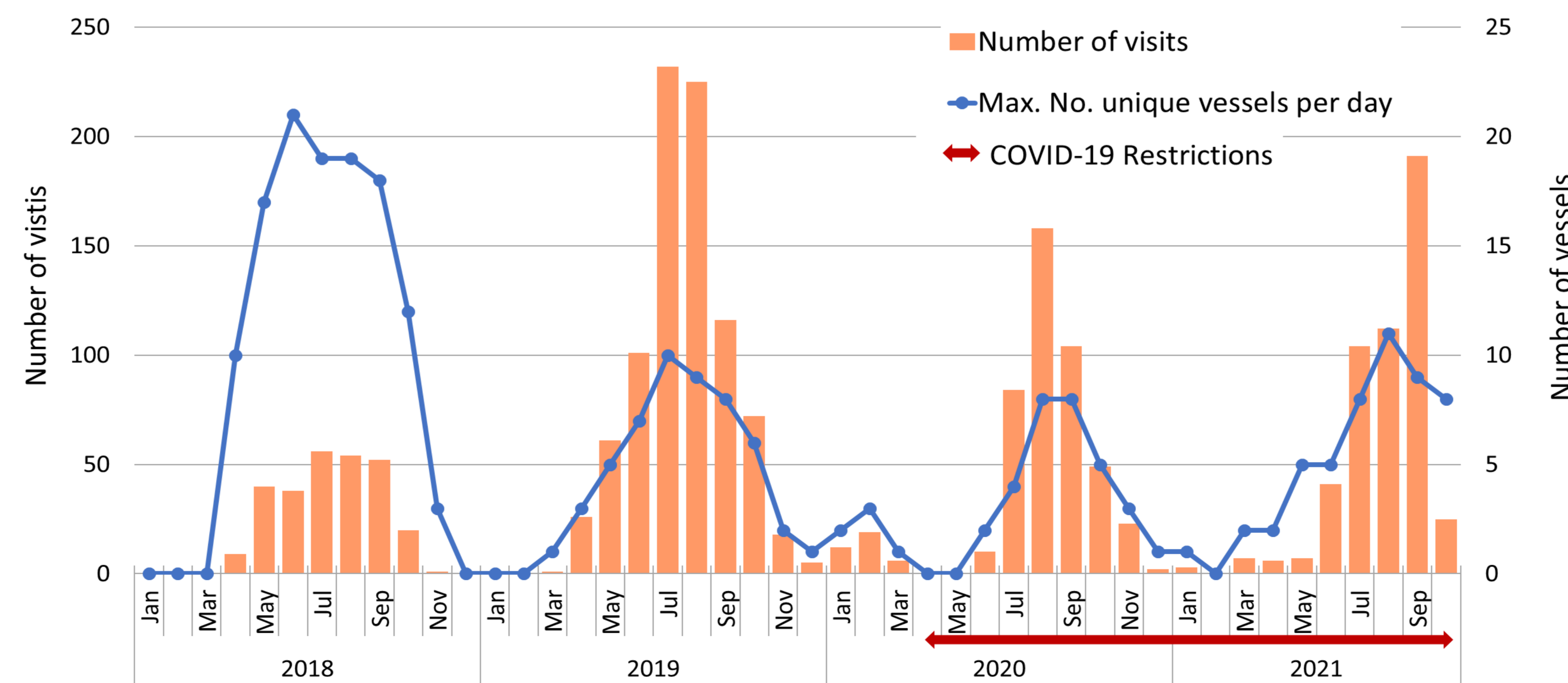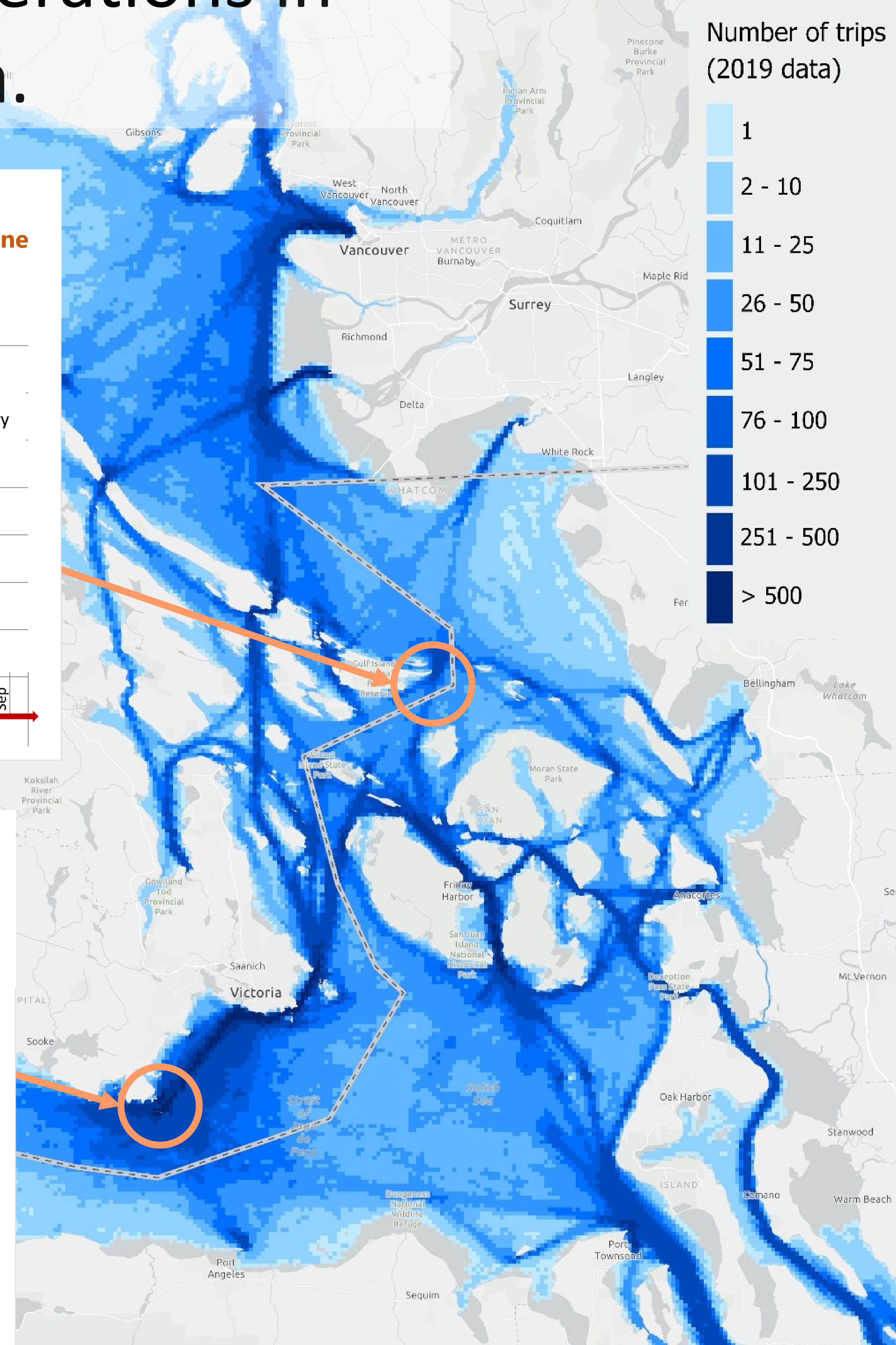ered to those similar to 2019 at the end of 2021.