

Mitigating Conflict in Shared Ocean Areas: A Visualization of West Coast Vessel Traffic



Leslie Nguyen, Jenna Keeton and Sunny Jardine, PhD School of Marine and Environmental Affairs, University of Washington, Seattle, WA lnguy2@uw.edu

OBJECTIVE

Visualize tug and towboat vessel usage of Crabber-Towboat transit lanes in near-shore waters off the U.S. West Coast

WEST COAST NEAR-SHORE USAGE



Tug and Tow Boats
Tug and tow boats hook up to large ocean-going vessels, helping them maneuver near-shore and into ports

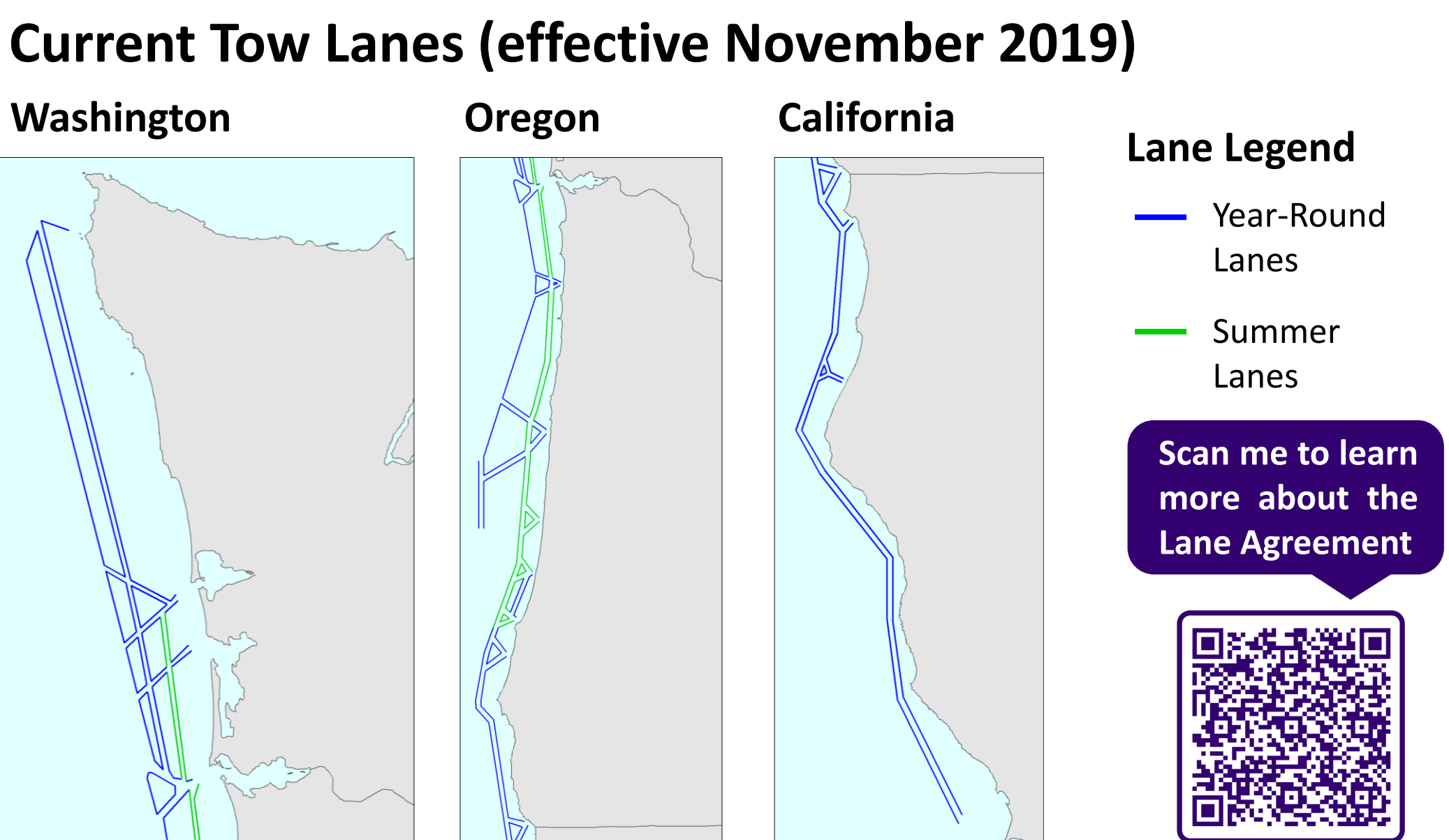


Commercial Dungeness Crab Fishery
The commercial Dungeness crab fishing fleet is most active from December - May

Potential conflict arise due to the overlap in shared space: tug and towboats may occasionally run over and decimate set crab pots. This can cause financial losses for both industries through damaged tugging/towing equipment and loss of commercial catch for crab fishers.

CRABBER-TOWBOAT LANE AGREEMENT

WHAT	an informal, non-regulatory agreement since 1971 to mitigate conflict and financial loss
WHO	commercial Dungeness crab fishing industry and tug/towboat industry
WHERE	near-shore coastal waters off the US West Coast (Washington, Oregon, and California)
WHEN	year-round lanes are active all year; summer lanes are active from April 15 – November 24
WHY	to mitigate gear damage and financial stress - tugs and tows transit within designated lanes and crab fishermen agree to not place crab pots within these lanes
HOW	members of both industries meet twice a year to discuss the agreement; lane designations may be revised, as industry conditions change

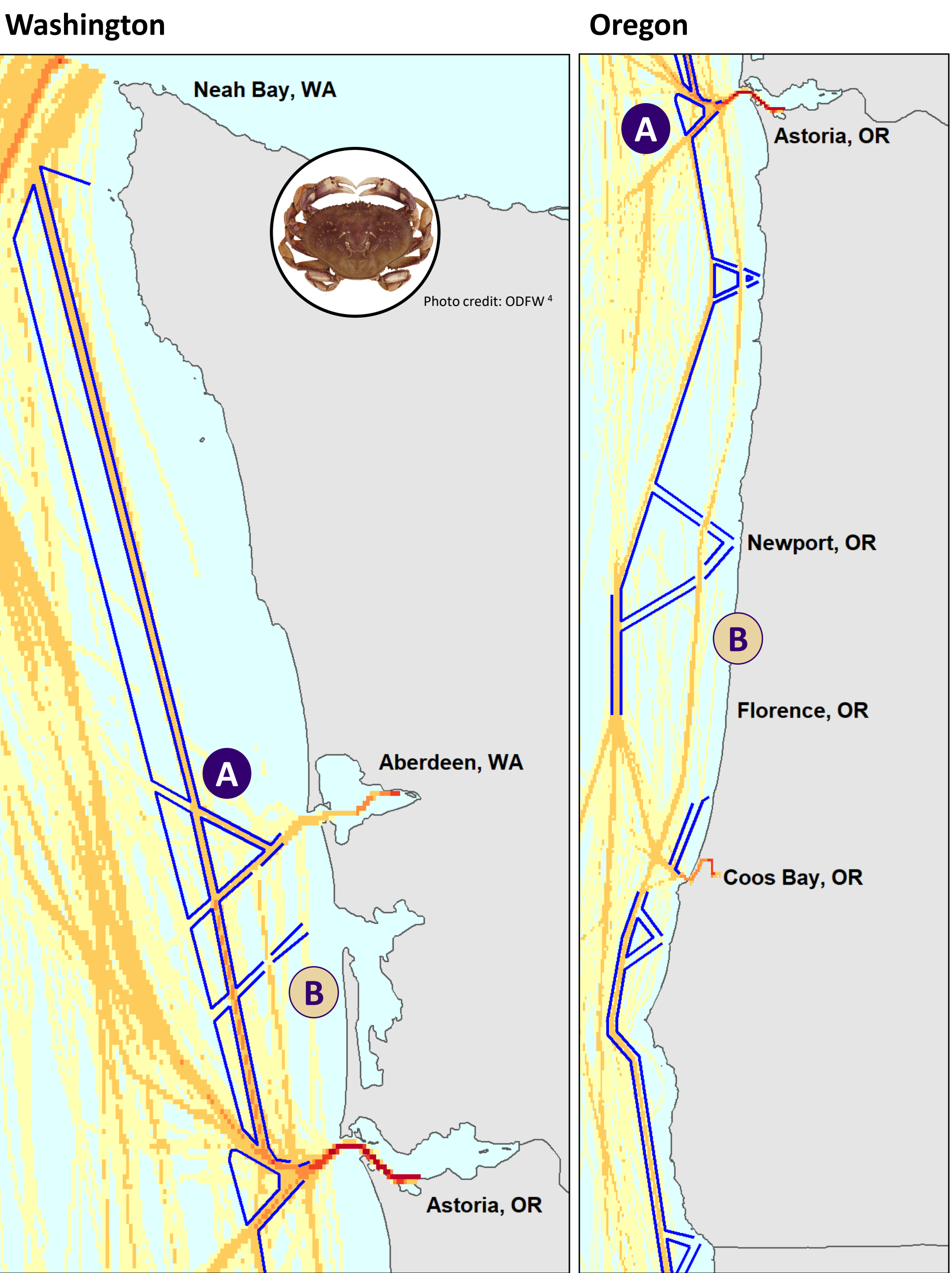


SUPPORTING RESILIENT AND SUSTAINABLE FISHERIES

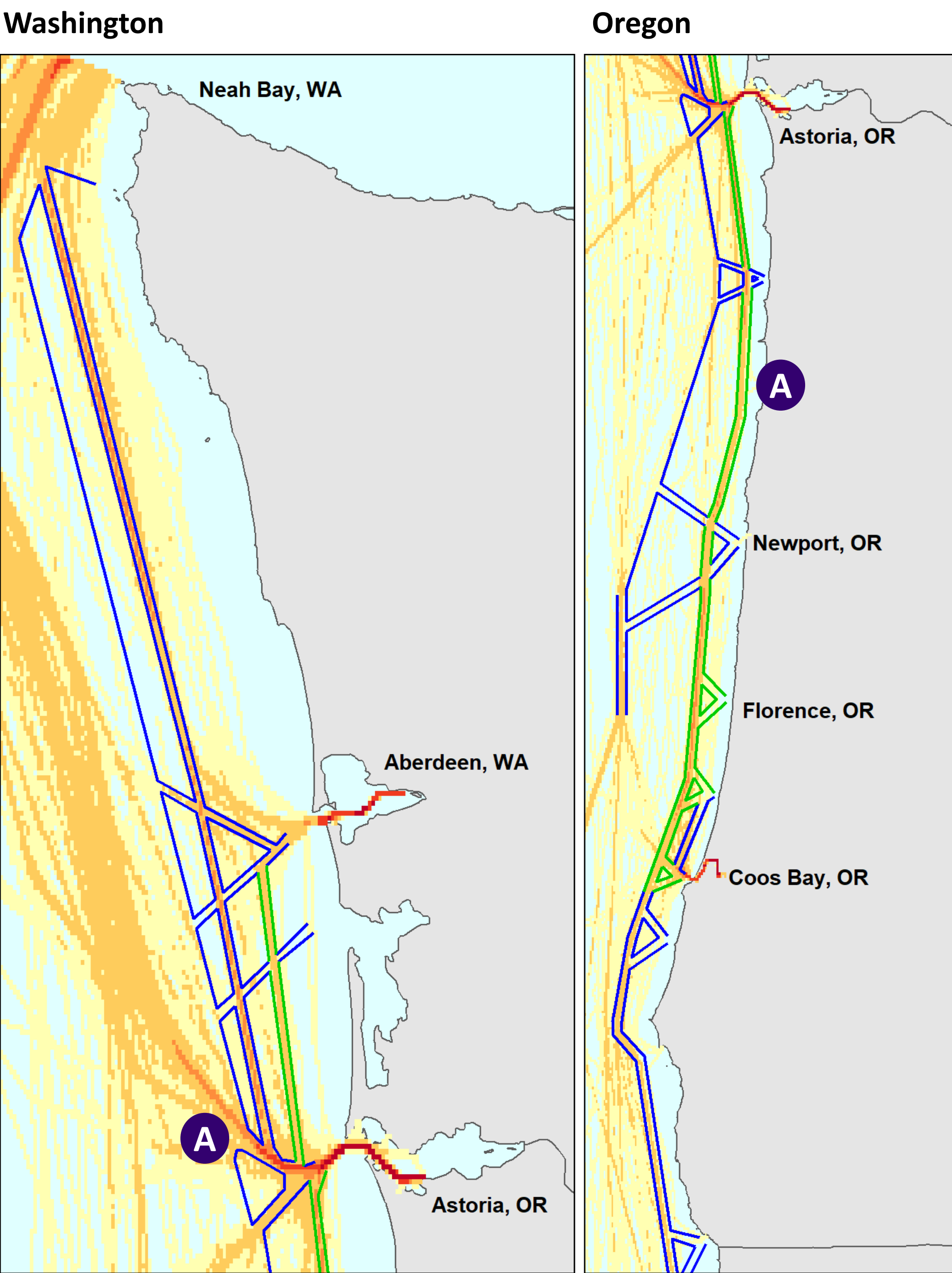
The Crabber-Towboat Lane Agreement was created in 1971, increasing the resiliency of both the commercial crab fishery and tug/towboat industry. This cross-industry agreement allows for the sustainability and persistence of the Dungeness crab fishery, despite co-existing ocean usages. Without this agreement in place, tow vessel and crab gear interactions may cost each industry millions of dollars each year in vessel repairs and profit loss.

MAP: Seasonal Tug and Towboat Traffic

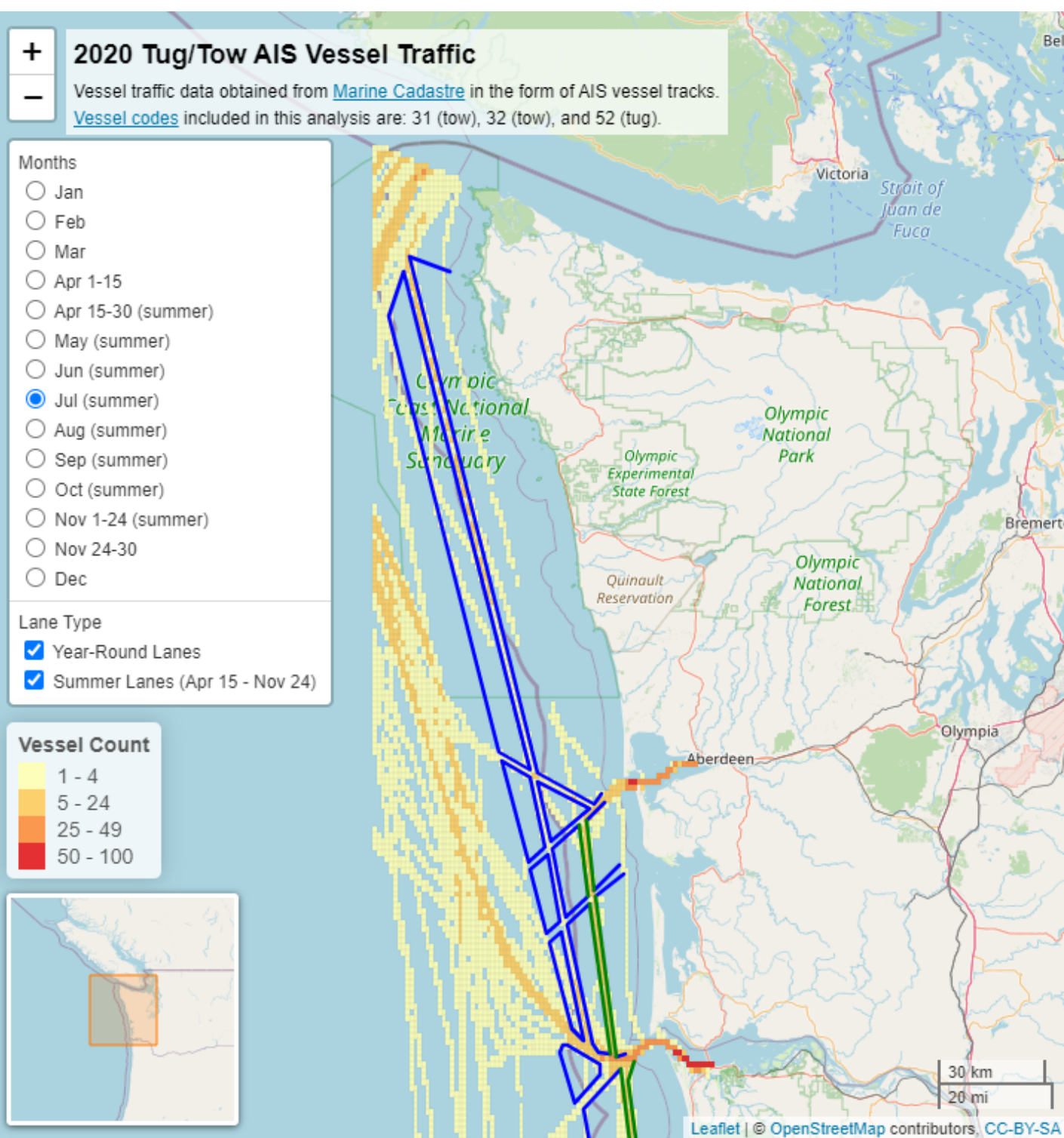
Only Year-Round Lanes Active: Peak Crab Fishing Season
(January 1 – April 14 & November 25 – December 31)



Summer Lanes and Year-Round Lanes Active
(April 15 – November 24)



MAP: Interactive Monthly Vessel Traffic



INTERPRETATION OF MAPS

- A** A high density of tug and tow vessels do appear to transit within designated lanes.
- B** Tug and tow vessels appear to utilize summer lanes during fall, winter, and spring.
 - Increases risk of vessel collisions and gear entanglements
 - Presents potential safety concerns
 - May lead to negative financial consequences

The summer lanes provide routes for tug and towboats that are closer to the shore, resulting in fuel savings for vessel operators. These lanes represent a compromise with the commercial crab fisheries, as crab fishing is less active during summer months.

DATA SOURCE

- Automatic Identification System (AIS) Vessel Tracks**³
- Calendar year 2020
 - Vessel “tracks” are individual vessel AIS location pings translated into travel pathways
 - Analyzed vessel codes 31, 32, and 52 for tugs and tows

APPLICATIONS OF RESEARCH

- Maps of annual tug and tow vessel transits can be used to revise towlane designations in future iterations of the agreement
- Visualization of tug and tow vessel traffic can inform marine spatial planning for other ocean uses, such as offshore wind developments
- Interactive map will be publicly available online for use by researchers, planners, and ocean users

LIMITATIONS

The current iteration of towlanes became effective November 2019. At the time the analysis was conducted, the most recently available AIS vessel tracks dataset was for calendar year 2020. However, activity during this calendar year may not be representative of tug and towboat traffic for a typical year, due to the COVID-19 pandemic.

FUTURE WORK

- Conduct similar analyses for 2021 and subsequent years to better understand tug and tow vessel traffic and lane usage patterns
- Incorporate crab fishing data to visualize commercial Dungeness crab fishery usage of West Coast near-shore area
- Quantitative analysis of vessel transit routes to determine a “compliance rate” for vessels transiting within vs. outside of lanes

ACKNOWLEDGEMENTS

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REFERENCES

1. Frans Schouwenburg, shared under Creative Commons License CC BY-NC 2.0. 2. Julie Gentry, available in the public domain 3. Bureau of Ocean Energy Management (BOEM) and National Oceanic and Atmospheric Administration (NOAA). MarineCadastr.gov. AIS Vessel Tracks 2020. Retrieved April 2, 2022 from marinedastre.gov/data. 4. Oregon Department of Fish and Wildlife