*NWWN internship opportunity: research to advance the resilience of commercial fishing communities.*

*Applicants must submit a single-spaced, two-page research project proposal (in size 11 font or larger)*

1. The contact information (names, titles, affiliations, email addresses, phone numbers, and mailing addresses) for the lead academic partner and the lead community/industry partner

Dr. Sunny Jardine, Associate Professor, School of Marine and Environmental Affairs, University of Washington, [jardine@uw.edu](mailto:jardine@uw.edu), 206-616-4952, 3707 Brooklyn Ave NE, Seattle, WA 98105

Jenna Keeton, Fisheries Specialist and Crabber-Towlane Agreement Coordinator, Washington Sea Grant, [keetonj@uw.edu](mailto:keetonj@uw.edu), 206-734-5566, 3710 Brooklyn Ave NE, Seattle, WA 98105

1. An explanation of the significance of the proposed research question, specifically addressing how this research question will promote the resilience of commercial fishing communities in the context of working waterfronts.

The coastal waters off the U.S West Coast provide many opportunities for commercial and industrial use including marine vessel traffic. In particular, the coastal commercial Dungeness crab fishery and the tug/towboat industries occupy similar areas of coastal waters for daily and seasonal uses. Because of this overlap in shared space, conflicts have arisen as tug/towboats occasionally run over and decimate set crab pots. Not only does this incident result in lost commercial catch for crab fishers, but the tug/towboat industries must also pay workers to clear affected boat props of crab gear. To mitigate this conflict and potential financial loss for both industries, the Crabber-Towlane agreement was created in 1971 as an informal, non-regulatory agreement between the commercial Dungeness crab fishery and the tug/towboat industry. The agreement designates summer, advisory, and year-round towlanes in which tug/towboats must travel within and in return, crab fishers agree to set pots outside of these lanes. The agreement is re-evaluated twice annually by representatives from the crab fishery, tug/towboat industry, state and federal natural resource agencies, among other partners. Meetings and lane agreement management is coordinated by Washington Sea Grant.

With good compliance, the Crabber-Towlane agreement is an example of outstanding, efficient, and progressive cooperation to increase the resiliency of the commercial crab fishery and tug/towboat industry. However, compliance with the agreement has yet to be evaluated. Our research question revolves around understanding compliance rates and, thus, the success of agreement. To explore the success of the agreement we will synthesize large geospatial datasets on vessel traffic along with lane boundaries over time to create an interactive map whereby fishing traffic (crab, tuna, salmon, etc.), tug/towboat traffic, and towlanes are visible simultaneously. This information will be vital to showing the success of the lane agreement to West Coast Ocean users and promote the collaborative nature of fishing communities and working waterfronts.

<https://wsg.washington.edu/community-outreach/outreach-detail-pages/crabbertowboat-lane-agreements-download-charts-data-and-meetings/>

1. A description of the research methodology and timeline

The research methodology is comprised of three steps. First, the daily geospatial datasets on vessel traffic data from MarineCadastre.gov will be aggregated to create a single annual summary of vessel traffic density both in and out of the tow lane boundaries for multiple years of interest (e.g., years before and after a tow lane boundary change). Second, the traffic density datasets will be coupled with a geospatial dataset on lane boundaries in an interactive map. Third, additional features such as the coastline and major ports will be added to the map. The final deliverable will be a map that demonstrates the effectiveness of cross industry collaboration and allows users to interact with the product, e.g., by zooming in to areas of interest, by selecting which year of traffic density and tow lane boundaries to display.

The graduate student intern will be enrolled in Dr. Jardine’s course entitled “Introduction to Spatial Data Manipulation and Visualization”, which is a project-based course focusing on the technologies to create reproducible geospatial products using the R software package. The course begins on March 28th, 2022, and ends on June 10th, 2022. Students in the course get iterative feedback and personalized instruction on class projects. The graduate student intern will agree to take on the method described herein as a class project, completing the analysis by the class end date. Before the class begins, the student will work with [our industry partner] to learn about the institutional history behind the tow lane agreements.

1. A description of the final deliverable(s) and how it/they will be shared

The interactive map will portray marine vessel traffic (<https://marinecadastre.gov/ais/>) and towlanes and will contribute to existing knowledge including the Washington Marine Spatial Planning map. Additionally, this information will be made available to the Washington Coast Marine Advisory Committee, the Pacific County Marine Resource Committee, and the Grays Harbor County Marine Resource Committee to further their coastal planning efforts and to help them prepare to respond to future marine development proposals. Washington Sea Grant will coordinate information sharing among partners.

1. A description of how the academic partner and the community/industry partner will work together to support the graduate student, identifying who will act as the mentor and who will act as the supervisor, including details of how each will assist the graduate student.

Dr. Sunny Jardine (UW School of Marine and Environmental Affairs) will be the primary mentor to the graduate student intern.

Jenna Keeton (Washington Sea Grant) will coordinate and facilitate a student intern presentation at the April 2022 Crabber-Towlane Agreement meeting where the student intern will communicate with crabbers, tug/towboat operators, and state/federal natural resource agencies on the interactive vessel traffic map.

1. Resumes, not exceeding two-pages, of the lead academic partner and the lead community/industry partner (not counted toward the two-page page limit of the proposal). If the graduate student has already been identified, please include that person’s contact information and resume as well.