HAWAII'S BALLAST WATER AND BIOFOULING PROGRAM

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- Program Updates
- SCTLD Updates
- 2024 Ballast Water Data
- Recreational Vessel Biofouling Surveys

Recent Program Highlights

- Still 2.5 Staff: Biologist, Planner, part-time Data Intern
- Continuing to engage with USCG on VIDA enforcement development
- Hired the Rapid Response Coordinator to address coral disease, bleaching, AIS, & more
- Rulemaking progress for Stony Coral Tissue Loss Disease (SCTLD) preventative measures
- Funding eDNA survey development for species of concern
- Wrapping up Island-wide Recreational Vessel Hull Fouling Surveys
- Strategic Plan for Ballast Water and Biofouling Program

Stony Coral Tissue Loss Disease (SCTLD) Update

- SCTLD is now present in 33 countries and territories in Caribbean; not yet reported in Panama but may be as close as Costa Rica
- Pacific coral species have shown succeptibility to SCTLD infection during lab trials
- DAR will be partnering with researchers in Florida to test susceptibility of Hawaiian coral species to SCTLD
- Florida Sea Grant has hired a Pacific Disturbance Coordinator to coordinate any inter-jurisdictional response to SCTLD outbreak in the Pacific

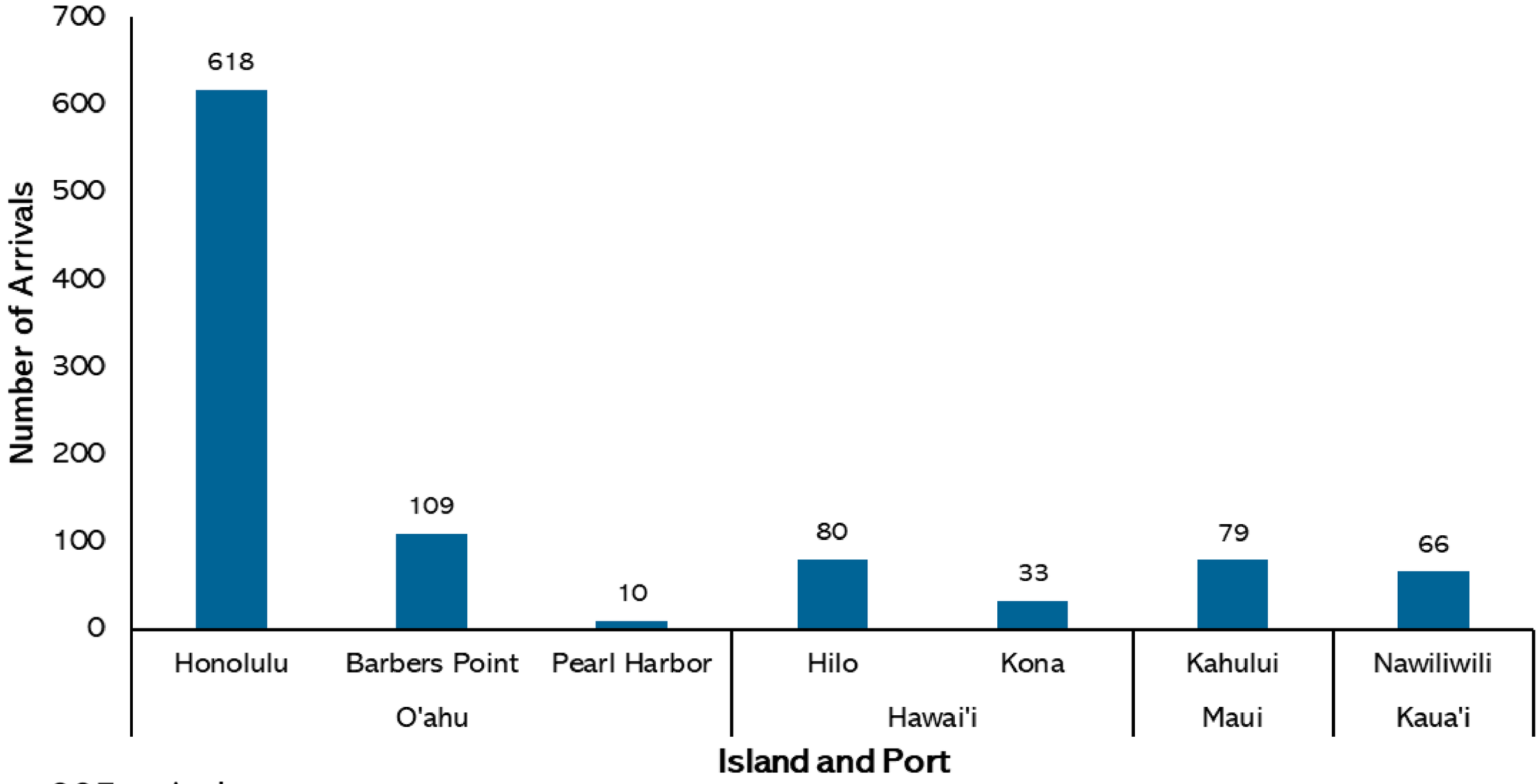
SCTLD & Ballast Water Rulemaking

- Approx. 6-8 ballast carrying commercial vessels/year travel to Hawaiʻi from SCTLD-affected ports - mostly gas tankers
- DAR is pursuing Hawaiʻi Administrative Rule-making process to add additional regulations to vessels travelling from this area
- SCTLD-risk vessels will be prohibited from discharging BW or cleaning any submerged surfaces in State waters, and must submit a notice of voyage
- DAR hopes to work within VIDA to maintain these restrictions

Ballast Water Data 2024

- 1025 vessels carrying ballast water arrived in Hawai ‘i ports in 2024 determined through BW reporting forms, NBIC and Marine Traffic
- 995 vessels submitted Ballast Water Management Reports
- 84% of vessels retained ballast water
- 50 vessels discharged ballast water

2024 Arrivals by Island and Port



n = 995 arrivals

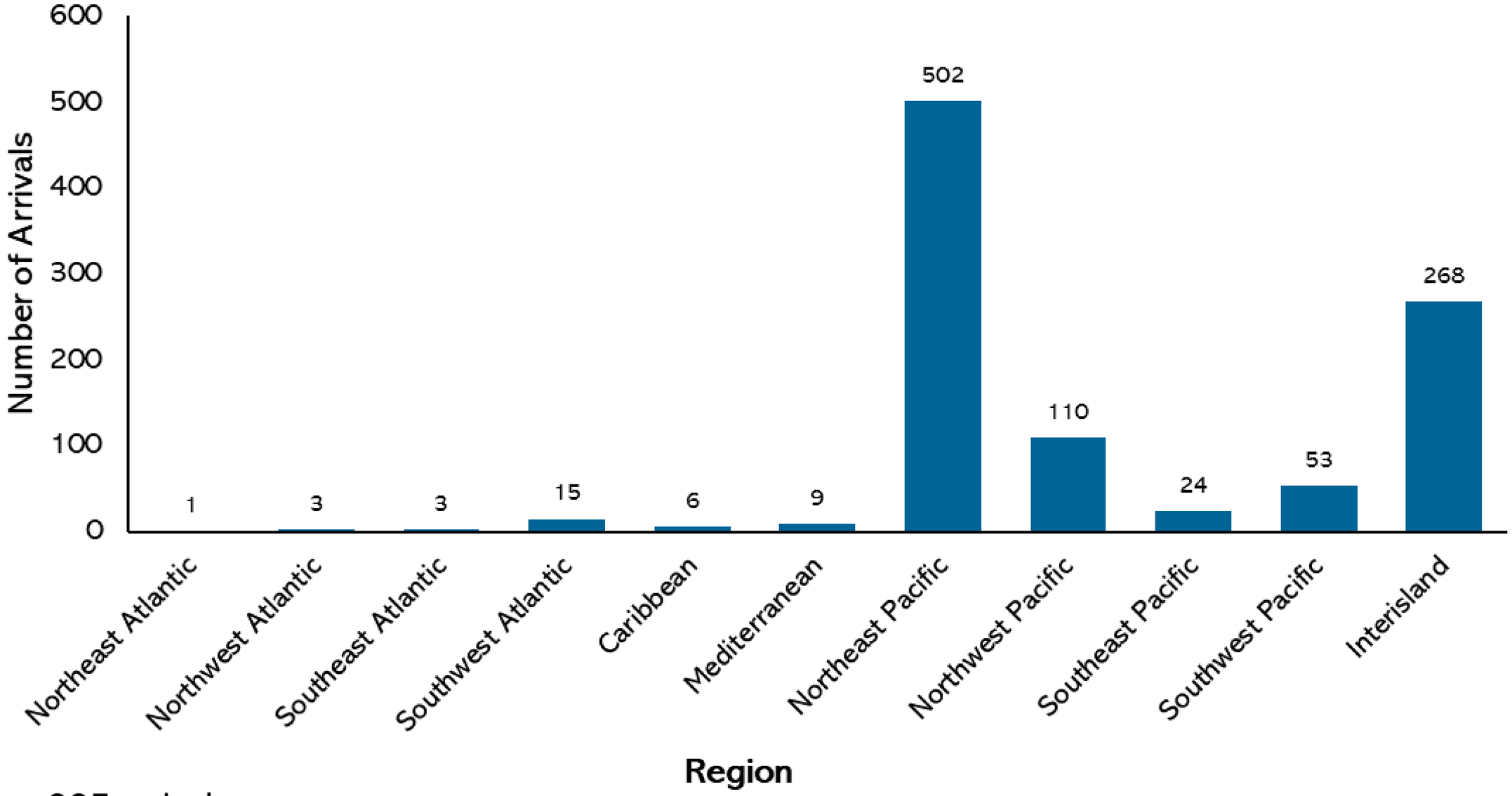
2024 Last Port of Call

Number of vessels

- 1
- 2 – 9
- 10 – 49
- 50+

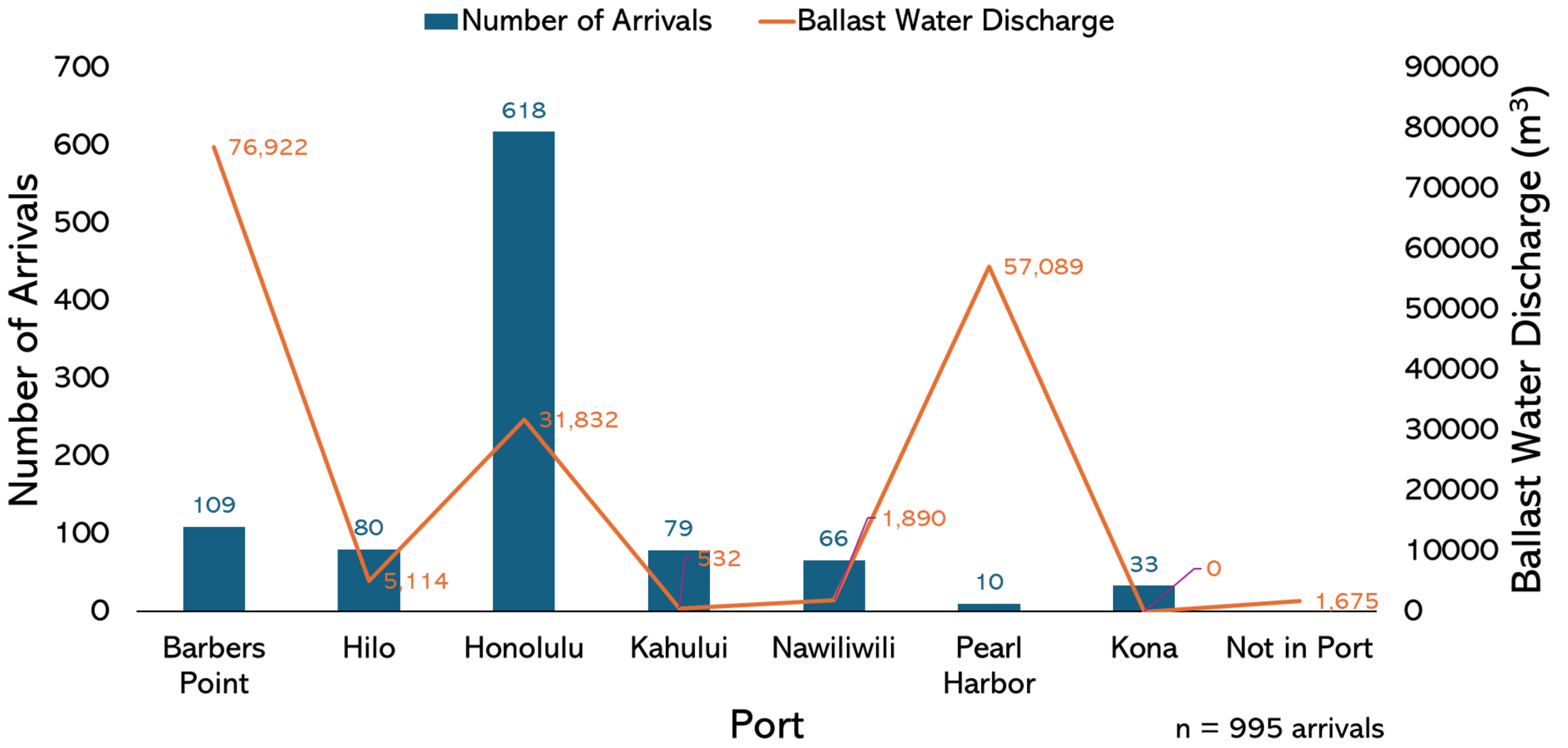
n = 995 arrivals

2024 Last Port by Region



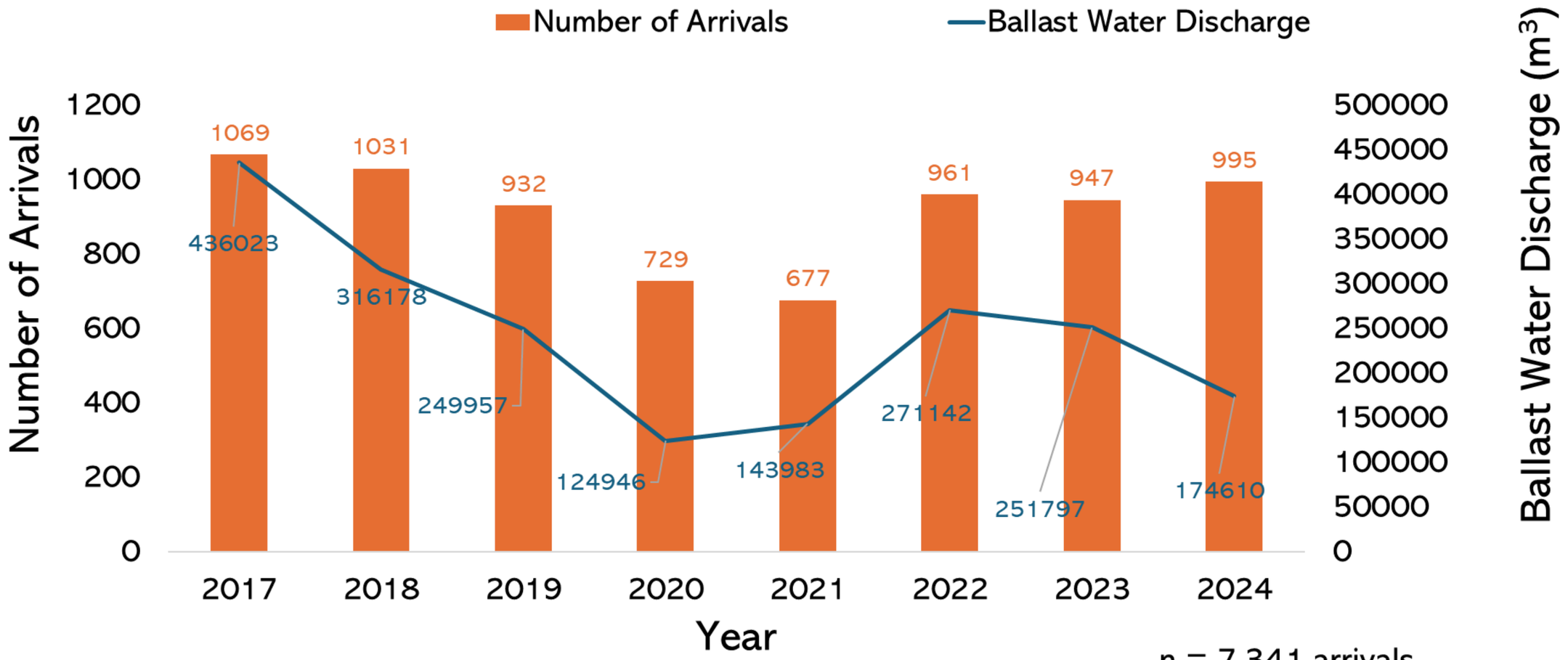
n = 995 arrivals

2024 Arrivals and Discharge by Port



n = 995 arrivals
total discharge = 175,054 m³

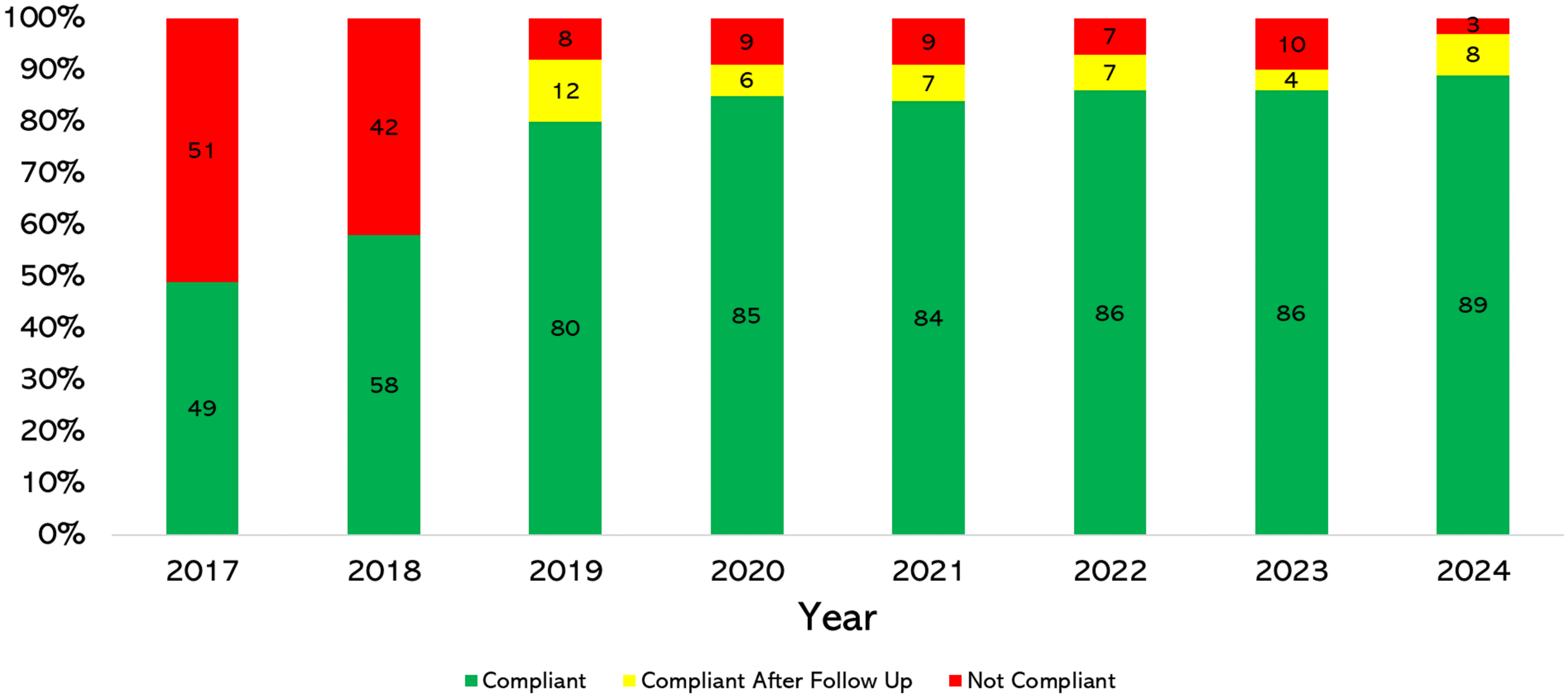
Vessel Arrivals and Total Ballast Water Discharge Over Time (2017 - 2024)



n = 7,341 arrivals

Total discharge = 1,968,636 m³

Percentage of Vessels in Compliance Over Time (2017 - 2024)



Recreational Vessel Hull Fouling Surveys

Vessel biofouling has been the most significant vector of aquatic invasive species introductions to Hawaiʻi . While much research focuses on biofouling on large commercial vehicles, recreational vessel travel can also pose a biosecurity risk. Hawaiʻi has approximately 15,000 registered recreational vessels that travel interisland, domestically, and internationally. Limited information exists on the extent of recreational vessel hull fouling, hull fouling management practices, and general public knowledge of its potential impacts in the State of Hawaiʻi.

Filling in information gaps through surveys of recreational boat harbors on the island of Oʻahu

Gather baseline information

Assess the importance of and look into management options for recreational vessels as a vector for aquatic invasive species in Hawaii

Visual Fouling Surveys

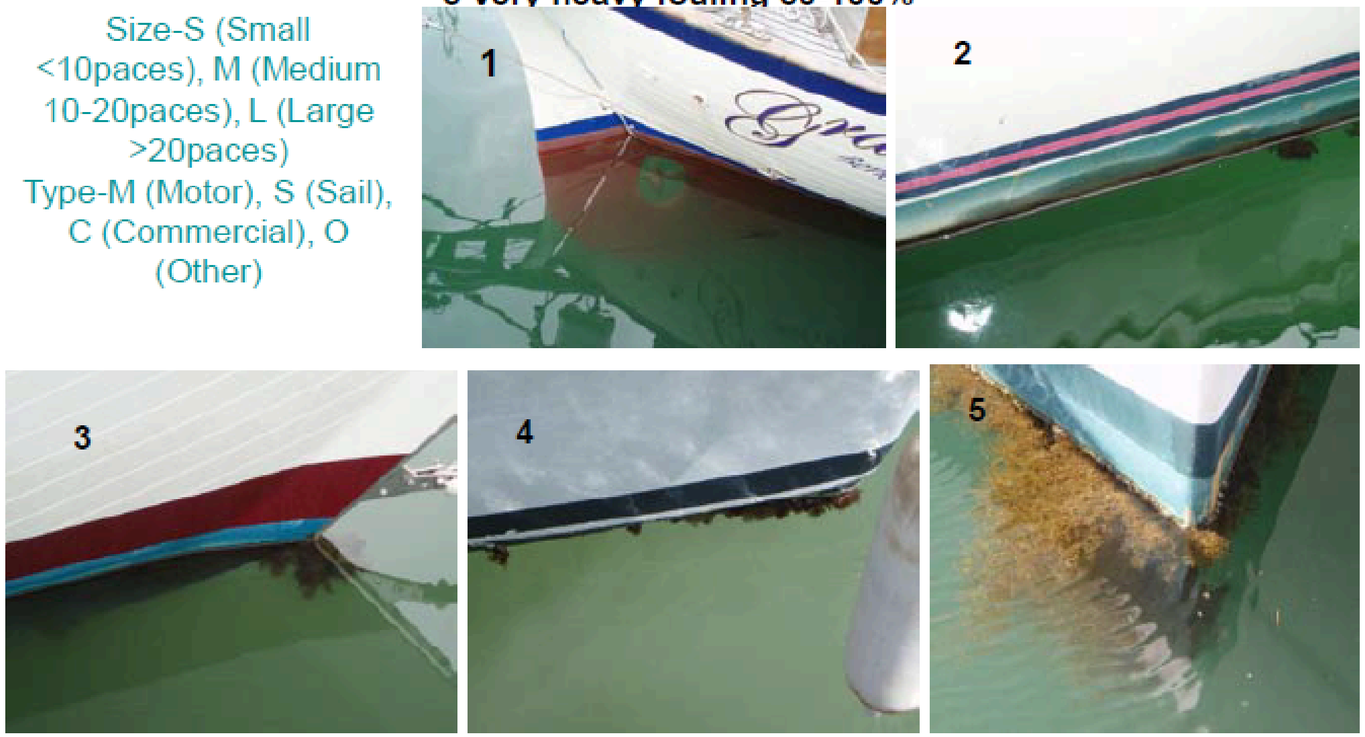
Level of Fouling (LoF) rank was conducted by walking or navigating a small vessel through marinas and harbors categorizing vessels by a modified form of grading developed by Floerl et al. (2005).

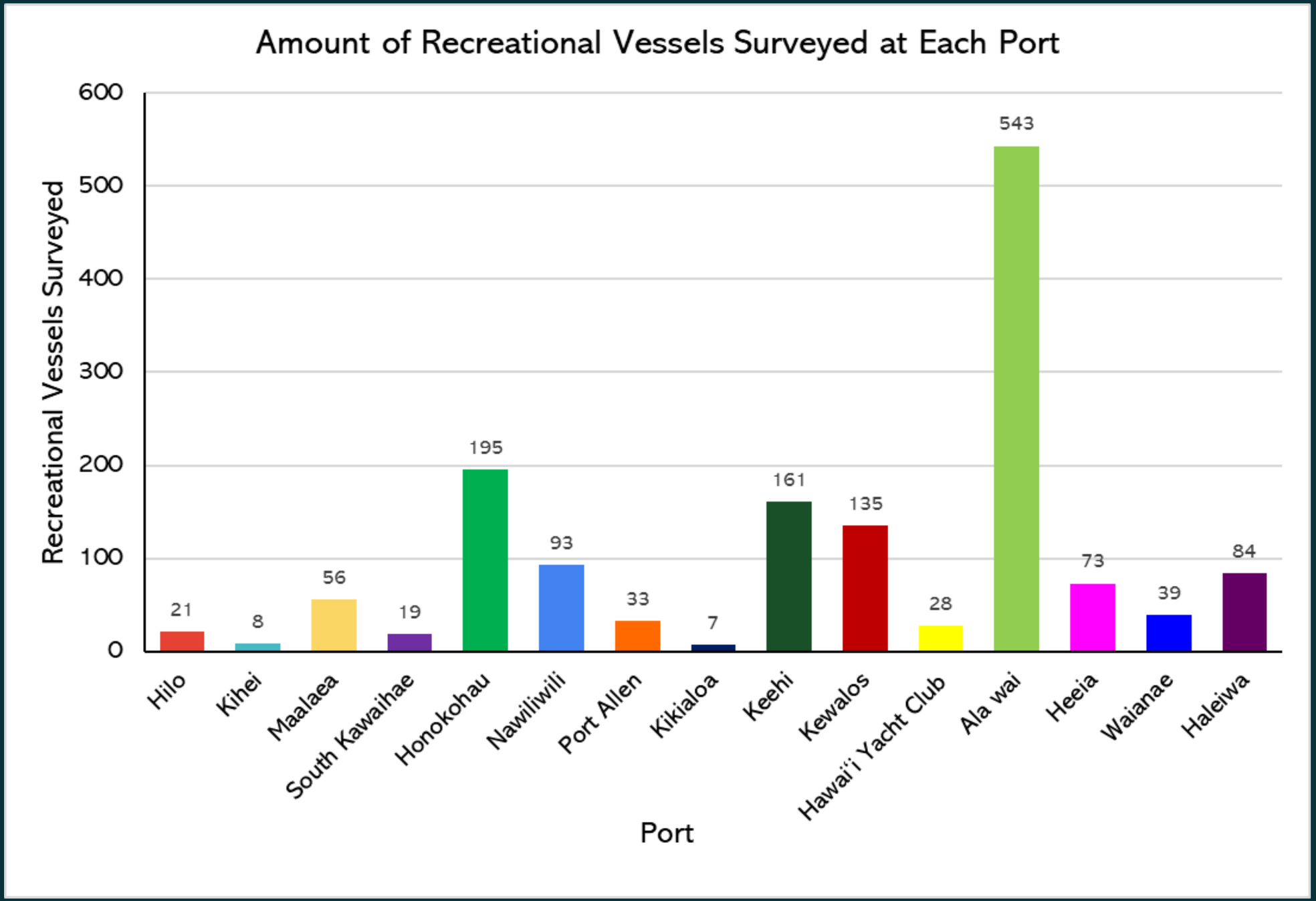
The LoF was observed by visibly looking across the whole length of one side of a vessels water line and applying a rank from zero (clean) to five (heavily fouled)

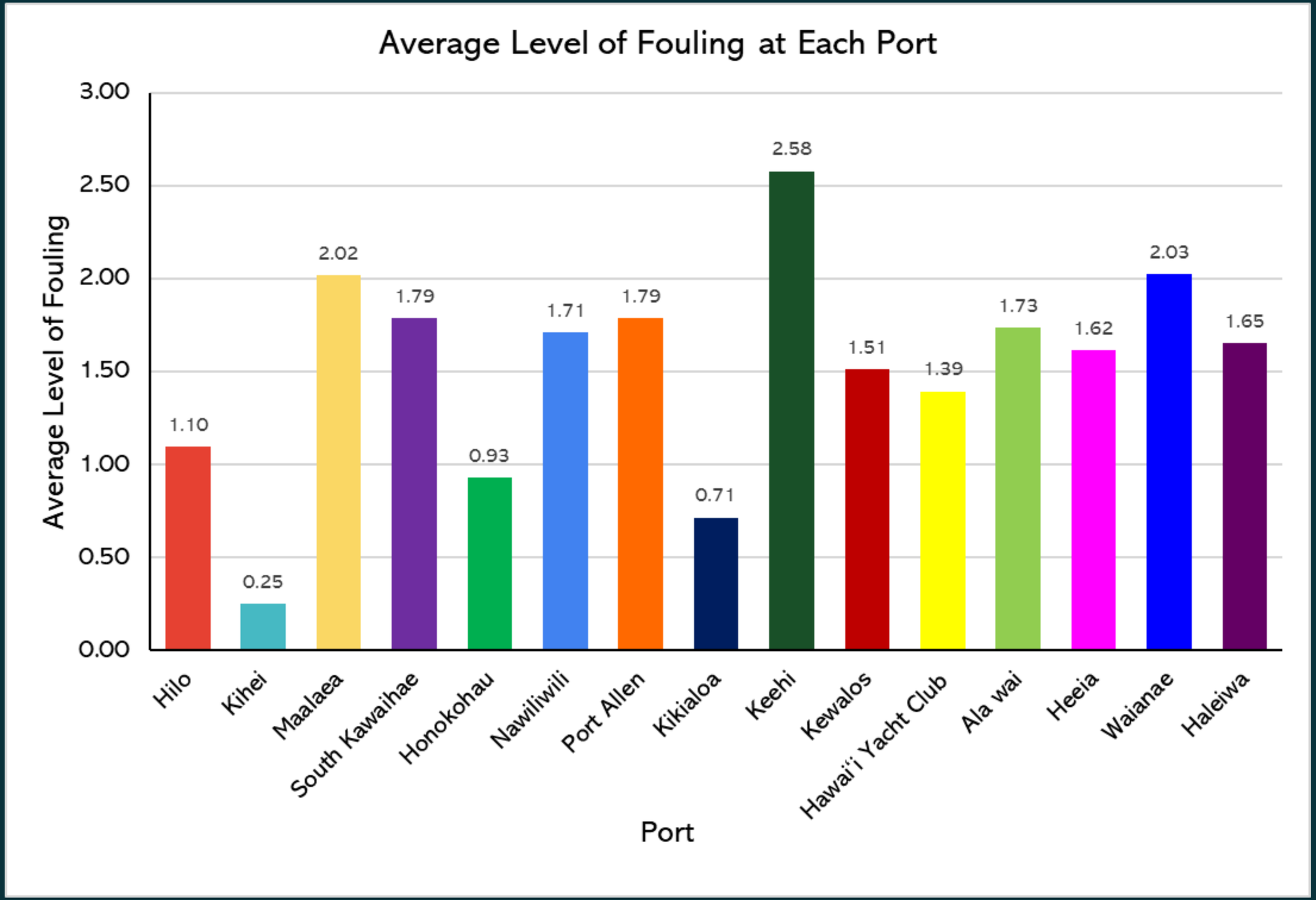
LoF- Level of Fouling Ranks

0 No visible Fouling
1 Hull partially or completely covered in slime fouling, no macro fouling.
2 Light fouling 1-5%
3 Considerable fouling 6- 24%
4 Extensive fouling 25-49%
5 Very heavy fouling 50-100%

Size-S (Small <10paces), M (Medium 10-20paces), L (Large >20paces)
Type-M (Motor), S (Sail), C (Commercial), O (Other)




Amount of Recreational Vessels Surveyed at Each Port
Recreational Vessels Surveyed
600
500
400
300
200
100
0
21
8
56
19
195
93
33
7
161
135
28
543
73
39
84
Hilo
Kihei
Maalaea
South Kawaihae
Honokohau
Nawiliwili
Port Allen
Kikialoa
Keehi
Kewalos
Hawai'i Yacht Club
Ala wai
Heeia
Waianae
Haleiwa
Port


Average Level of Fouling at Each Port
Average Level of Fouling
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1.10
0.25
2.02
1.79
0.93
1.71
1.79
0.71
2.58
1.51
1.39
1.73
1.62
2.03
1.65
Hilo
Kihei
Maalaea
South Kawaihae
Honokohau
Nawiliwili
Port Allen
Kikialoa
Keehi
Kewalos
Hawai'i Yacht Club
Ala wai
Heeia
Waianae
Haleiwa
Port

Preliminary Conclusions

- Kihei had the lowest average LoF because all the vessels are stored out of water
- Harbors on Hawai‘i Island (Honokohau, Kikialoa and Hilo) had relatively low LoF, likely due to the significant flush of freshwater through the harbors (Davidson et al. 2008)
- Many were hesitant to take the written surveys until we shared the goal of our study
- Majority of the vessel owners and harbor agents did not know what biofouling was or how to manage it
- The study was a good way to do additional outreach around harbors

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