



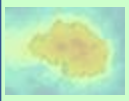
Sourcing Marine Debris in Hawaii

Jennifer Lynch, Katherine Stevens, Nakamoto, Clare Collins, Paige White, Harley Wahl, Raquel Corniuk, Andrew McWhiter, Kevin O'Brien, James Morioka, Scott McCubbins, Cynthia Welti, Barbara Wiedner, Carl Berg, Hank Lynch, Eric, Cheryl King, Megan Lamson, Sarah-Jeanne Royer, and Mafalda de Freitas


**Jennifer Lynch, Ph.D. given by
Mafalda de Freitas**


Center for Marine Debris Research


PICES JAPAN 2025 – S-MPP

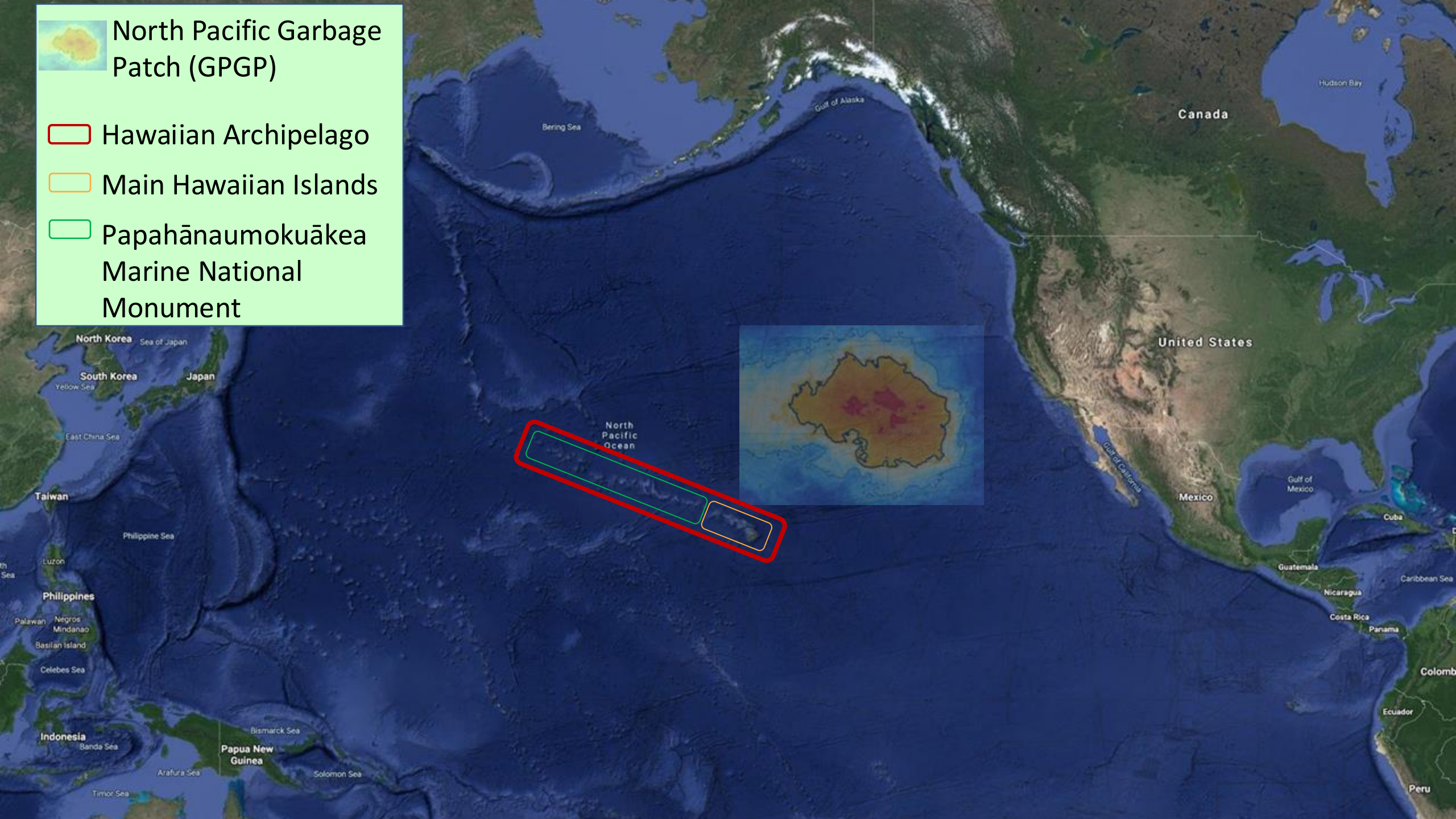


North Pacific Garbage Patch (GPGP)

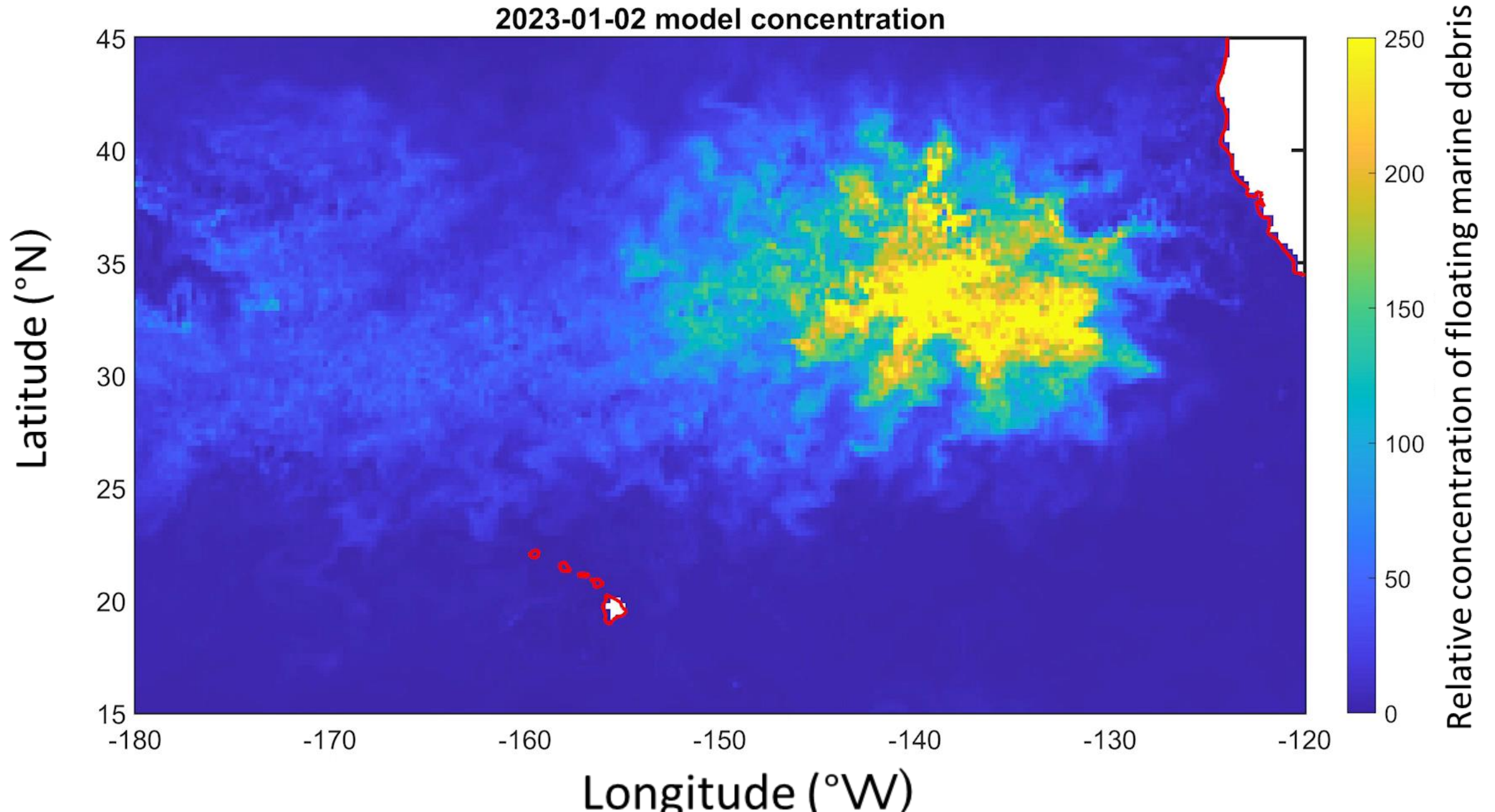
 Hawaiian Archipelago

 Main Hawaiian Islands

 Papahānaumokuākea
Marine National
Monument



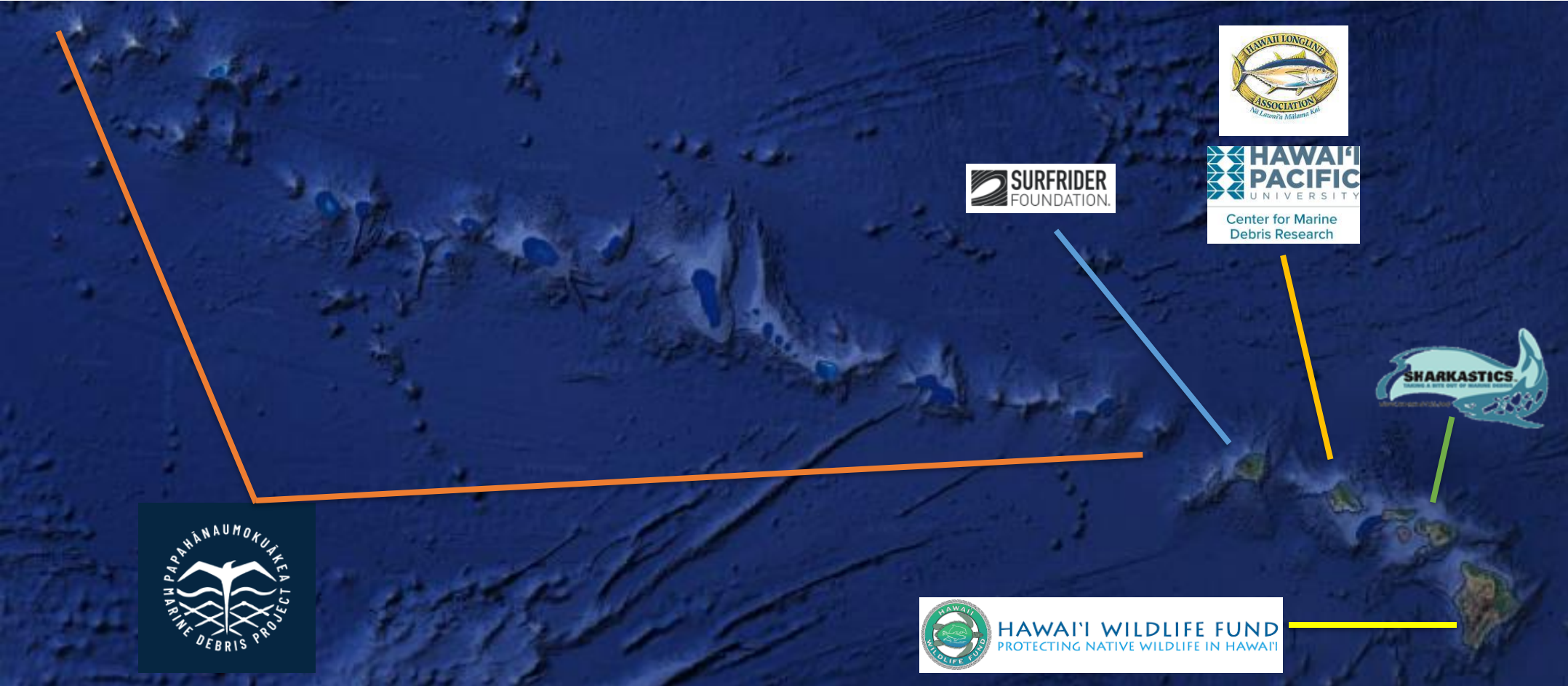
2023-01-02 model concentration



MARINE DEBRIS IN HAWAII



PARTNERS ACROSS THE ARCHIPELAGO



200 TONS A YEAR



ARRIVAL FOR SORTING



DEBRIS DATA COMPILED - 2023

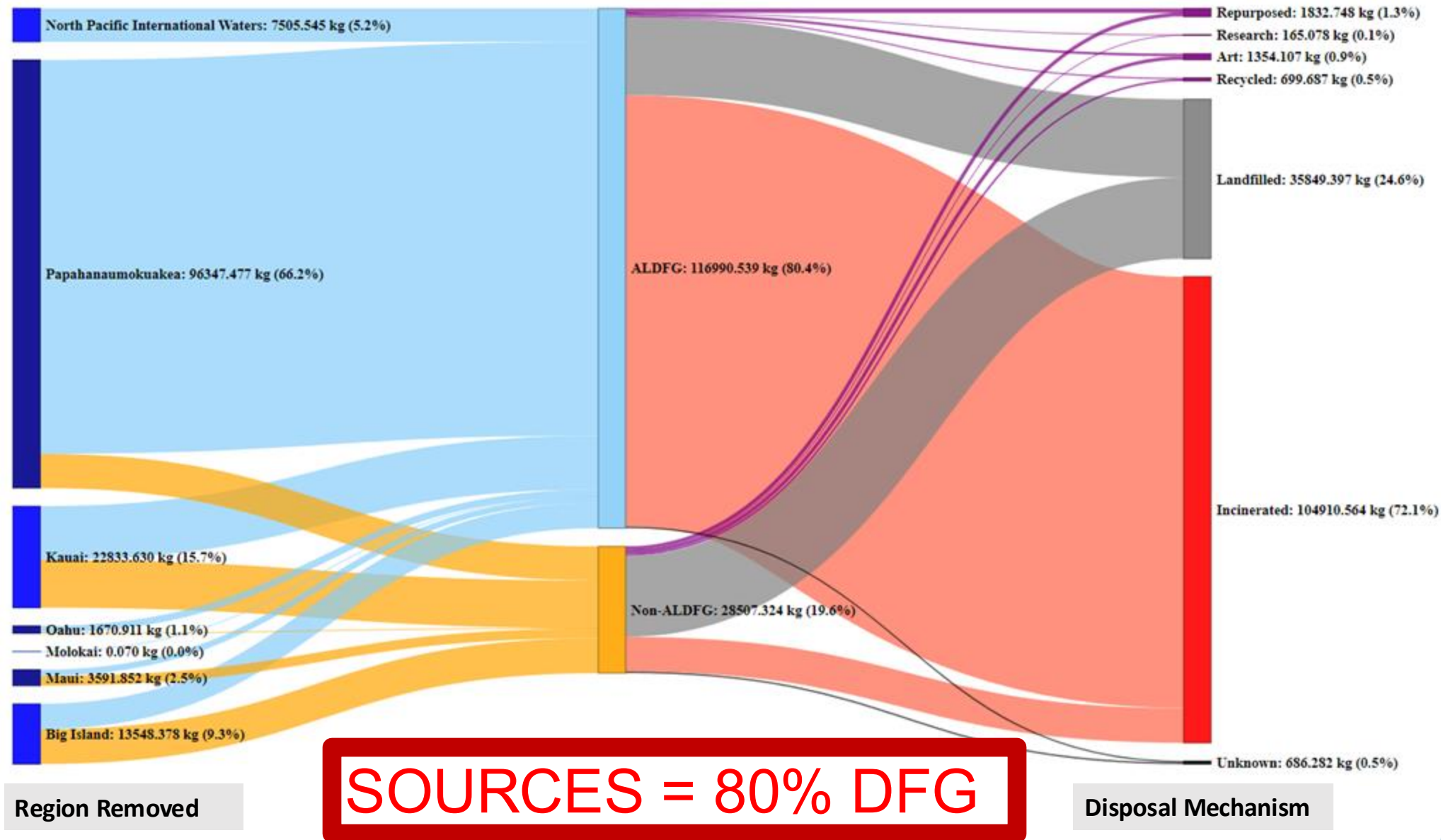


Chart made in collaboration with Dr. Win Cowger, Moore Institute for Plastic Pollution Research

SORTING

DEBRIS TYPE + POLYMER = SOURCES



+



Trawl

Net
Line
Float
Trap

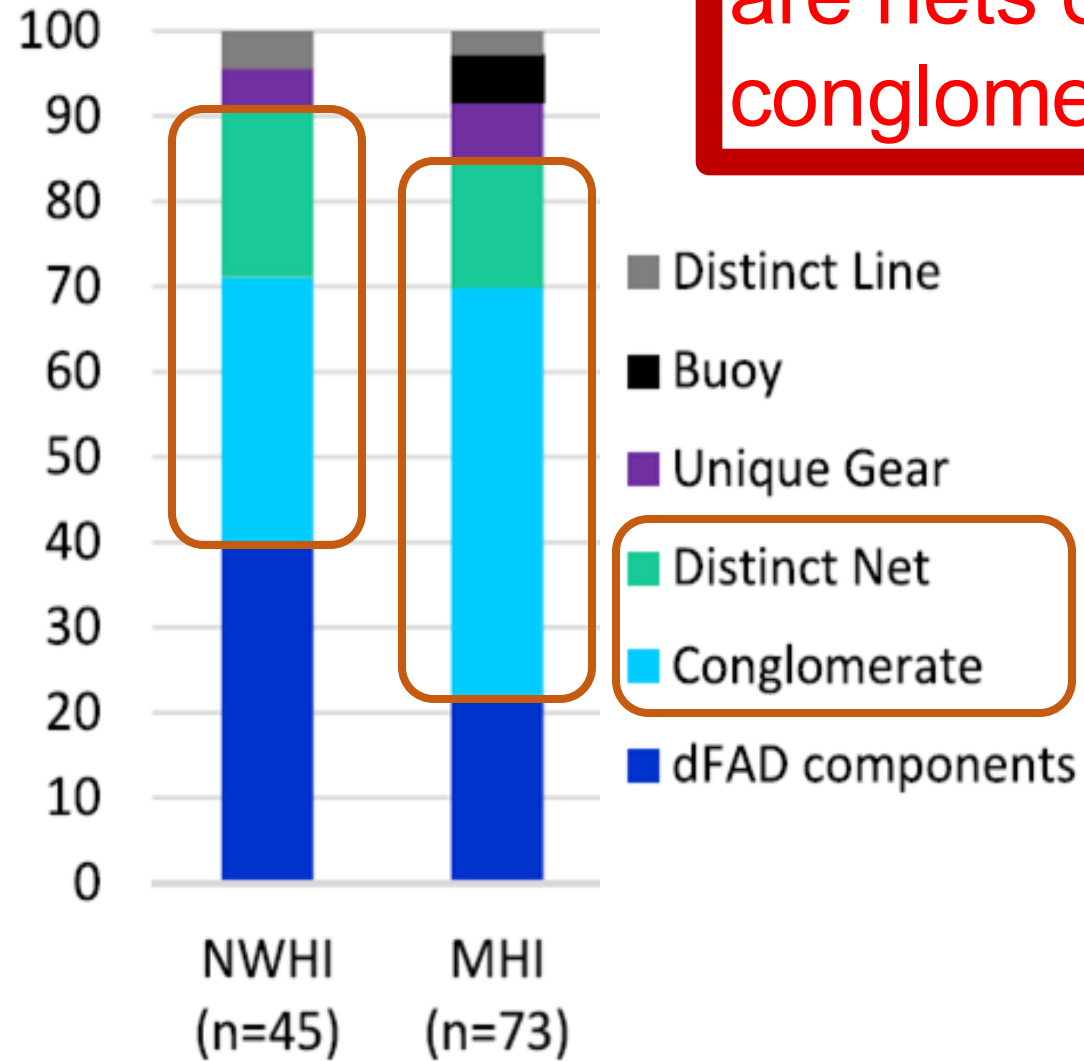
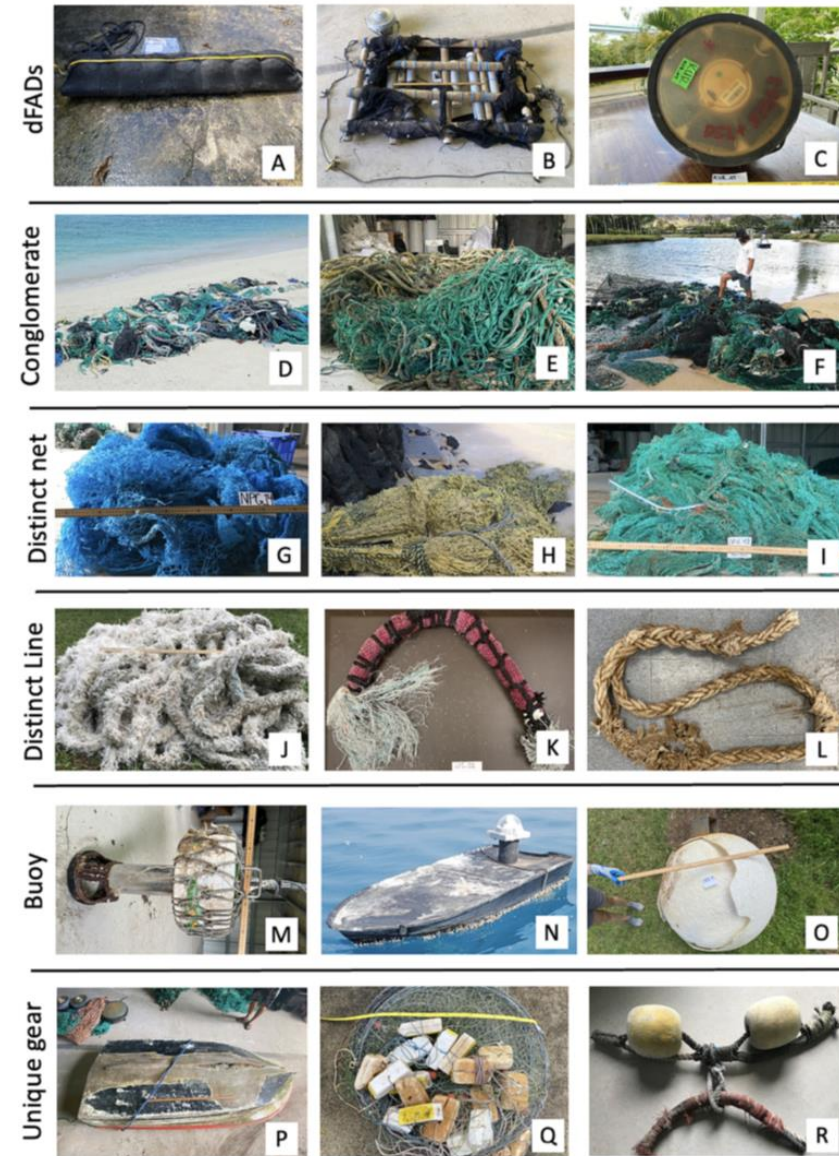
Polyethylene

Polypropylene

Nylon

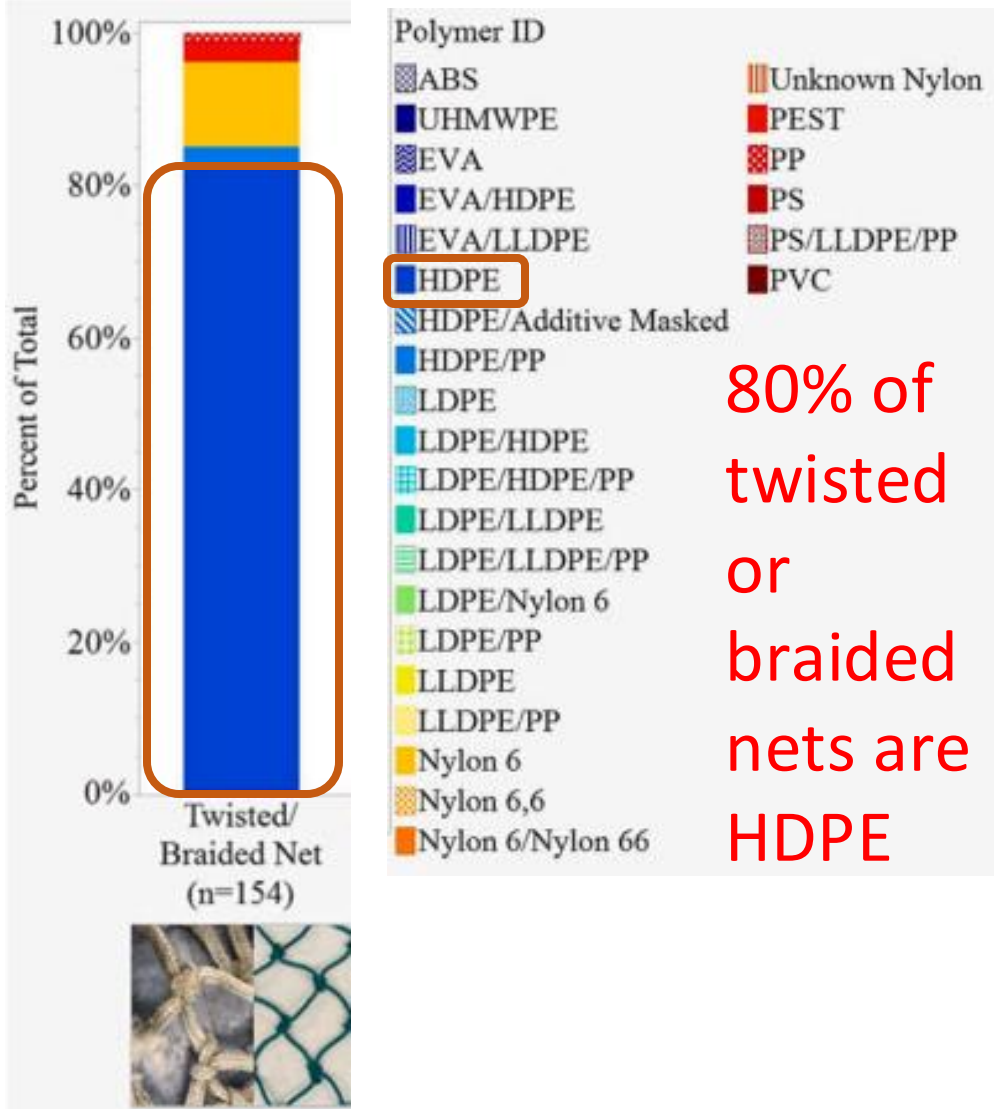
Purse Seine
Gillnet

DFG TYPES



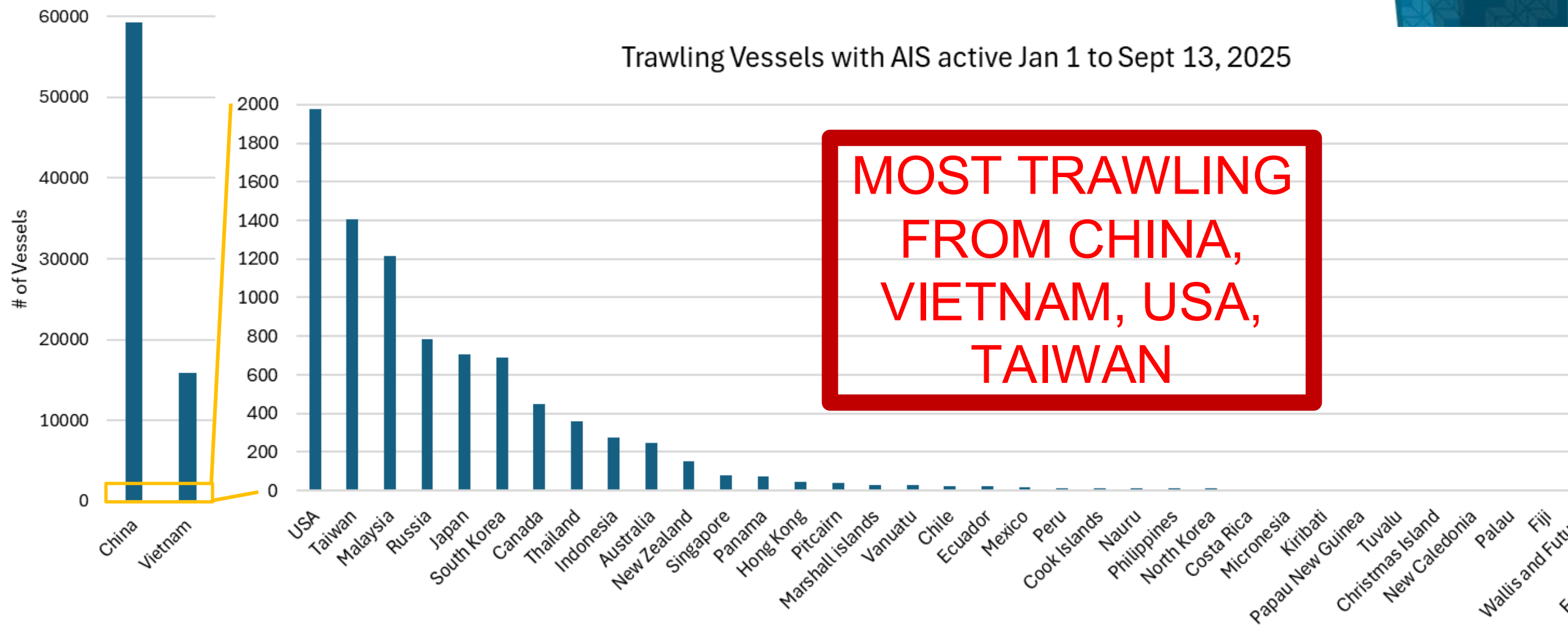
60% of DFG are nets or conglomerates

DFG POLYMER IDENTIFICATION



20% of marine
debris mass in
Hawaii is foreign
TRAWL nets

TRAWL FLEETS FLAGGED TO PACIFIC COUNTRIES



ASIAN VS. AMERICAN TRAWLING

Twisted
knotted
nets

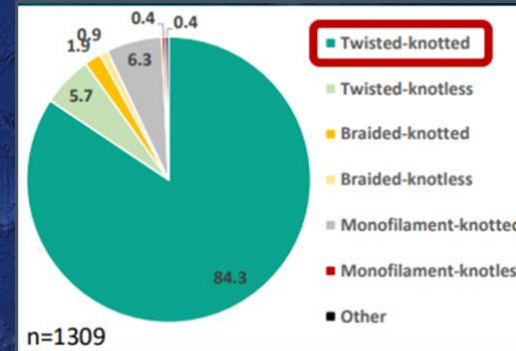
Black
floats

74-84% debris
matches Asian
trawl gear

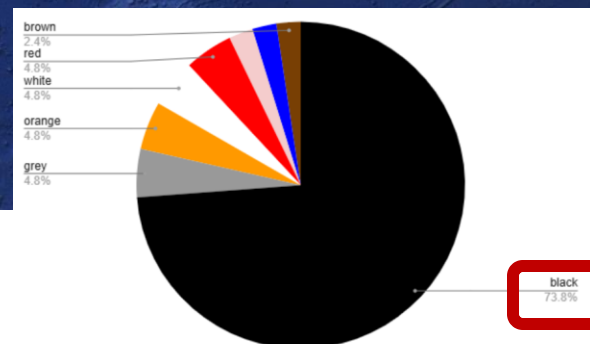
Braided
knotless
nets

Orange
floats

Net construction



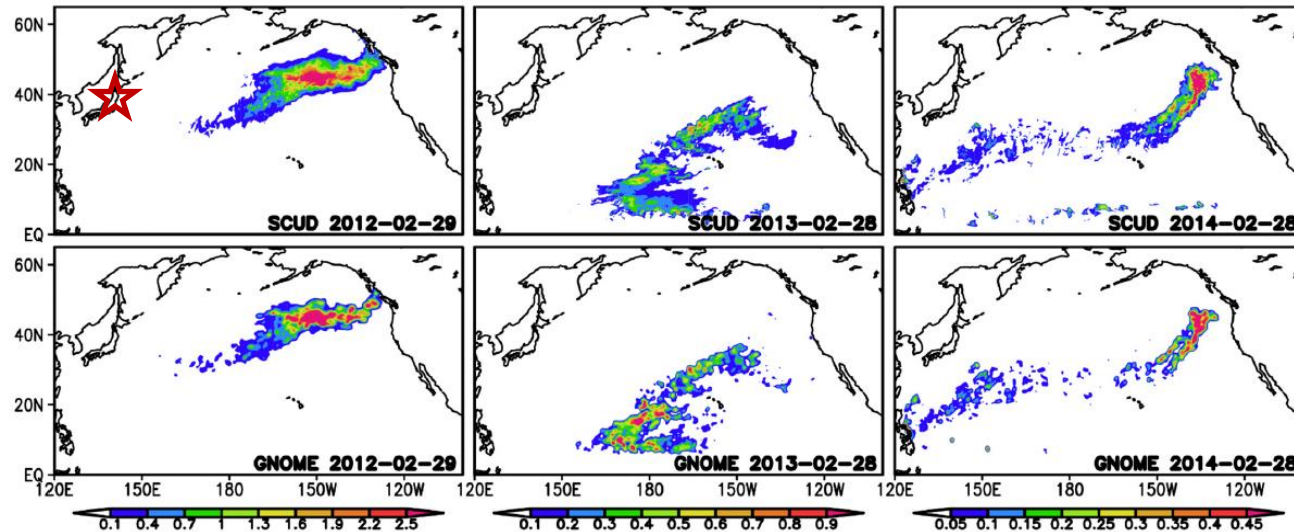
Trawl float color



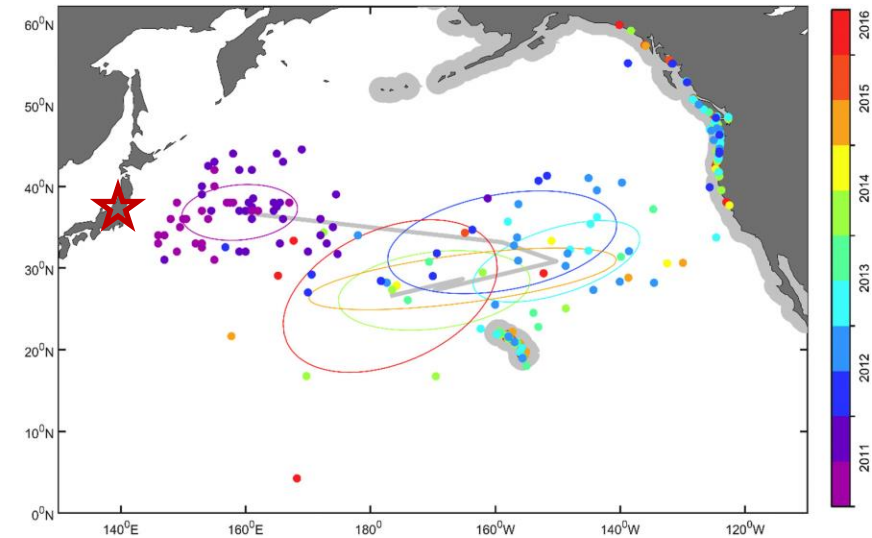
PROVEN TRANSPORT of ASIAN DEBRIS



Modeled Japanese Tsunami debris transport
across Pacific from 2011 to 2014



327 Japanese tsunami boats located



Marine Pollution Bulletin 132 (2018) 5–25



Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Marine Pollution Bulletin

journal homepage: www.elsevier.com/locate/marpolbul

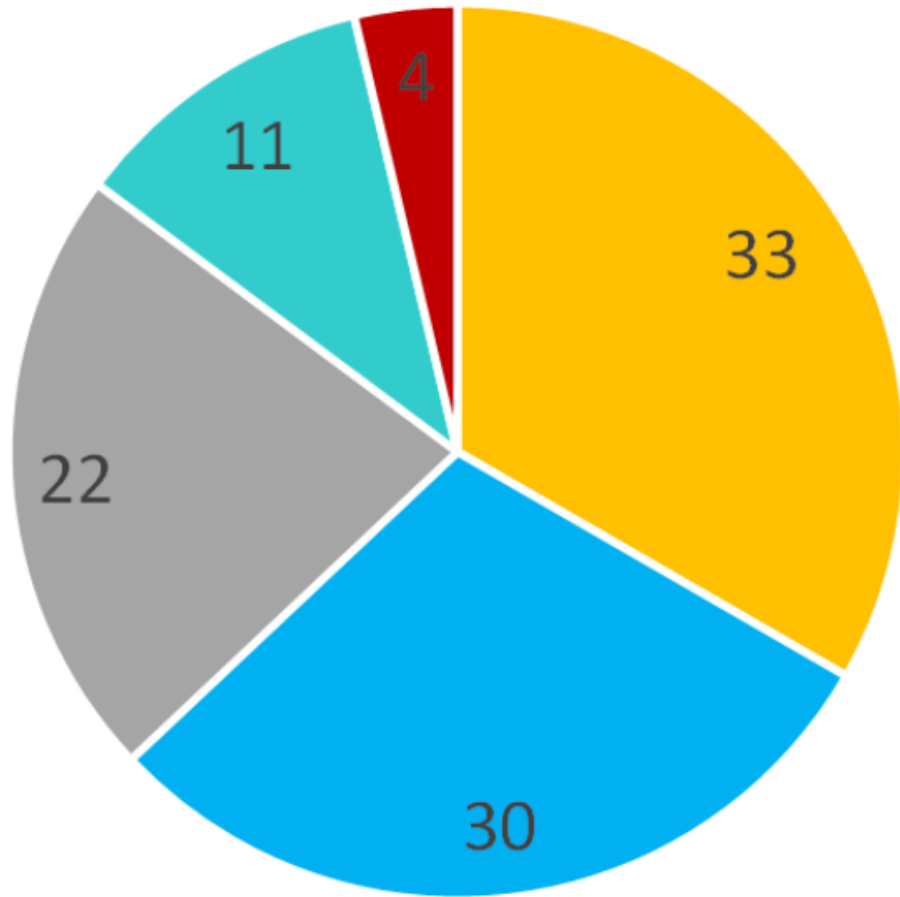
Numerical simulations of debris drift from the Great Japan Tsunami of 2011
and their verification with observational reports[☆]

Nikolai Maximenko^{a,*}, Jan Hafner^a, Masafumi Kamachi^b, Amy MacFadyen^c

HAWAII
PACIFIC
UNIVERSITY



LANGUAGES ON DEBRIS



- English
- Chinese
- Japanese
- Korean
- Thai

**67% debris
with Asian
languages**

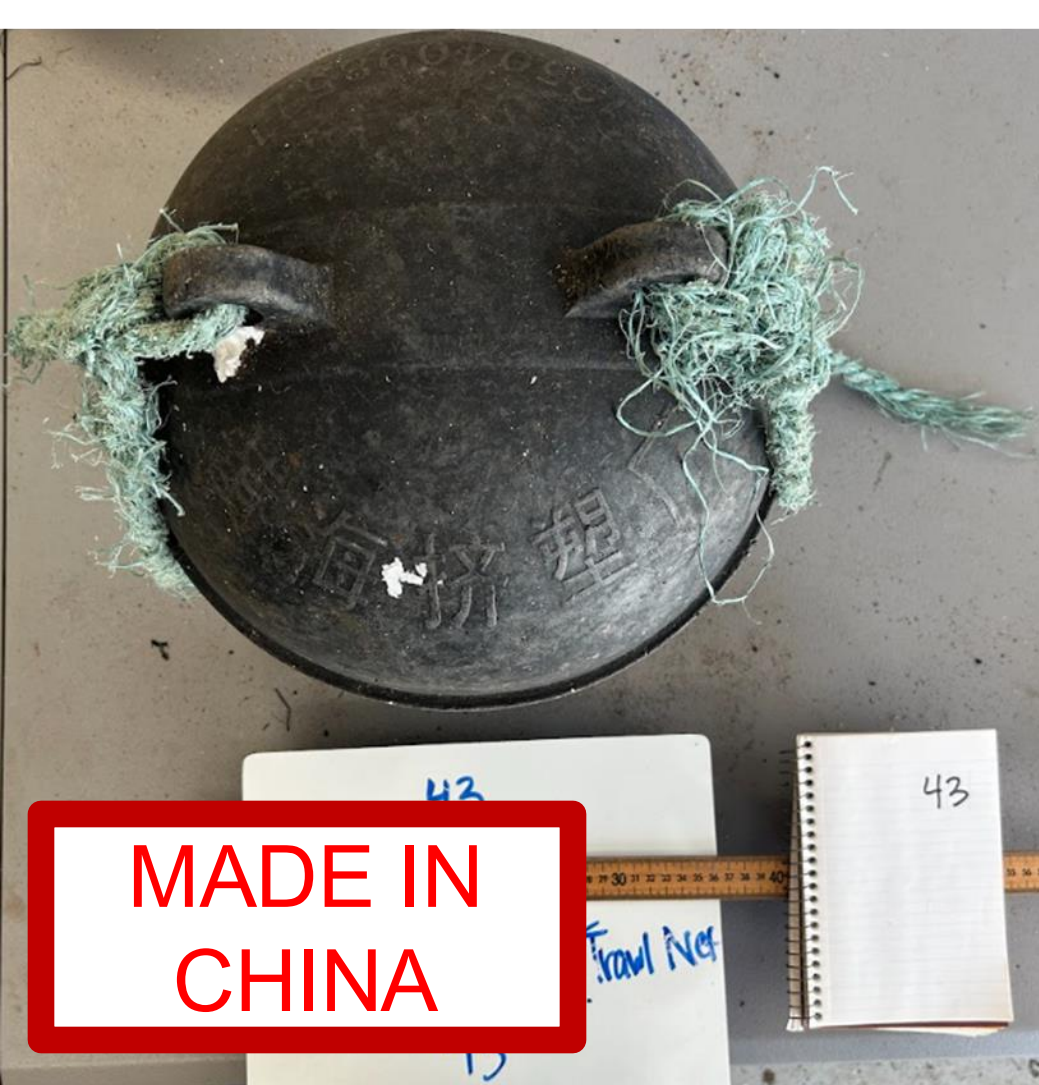
Float brands point to East Asian gear manufacturers



**MADE IN
TAIWAN**



Float brands point to East Asian gear manufacturers



Yellow Sea Extrusion Factory, China



**MADE IN
CHINA**

Float brands point to East Asian gear manufacturers



**MADE IN
KOREA**



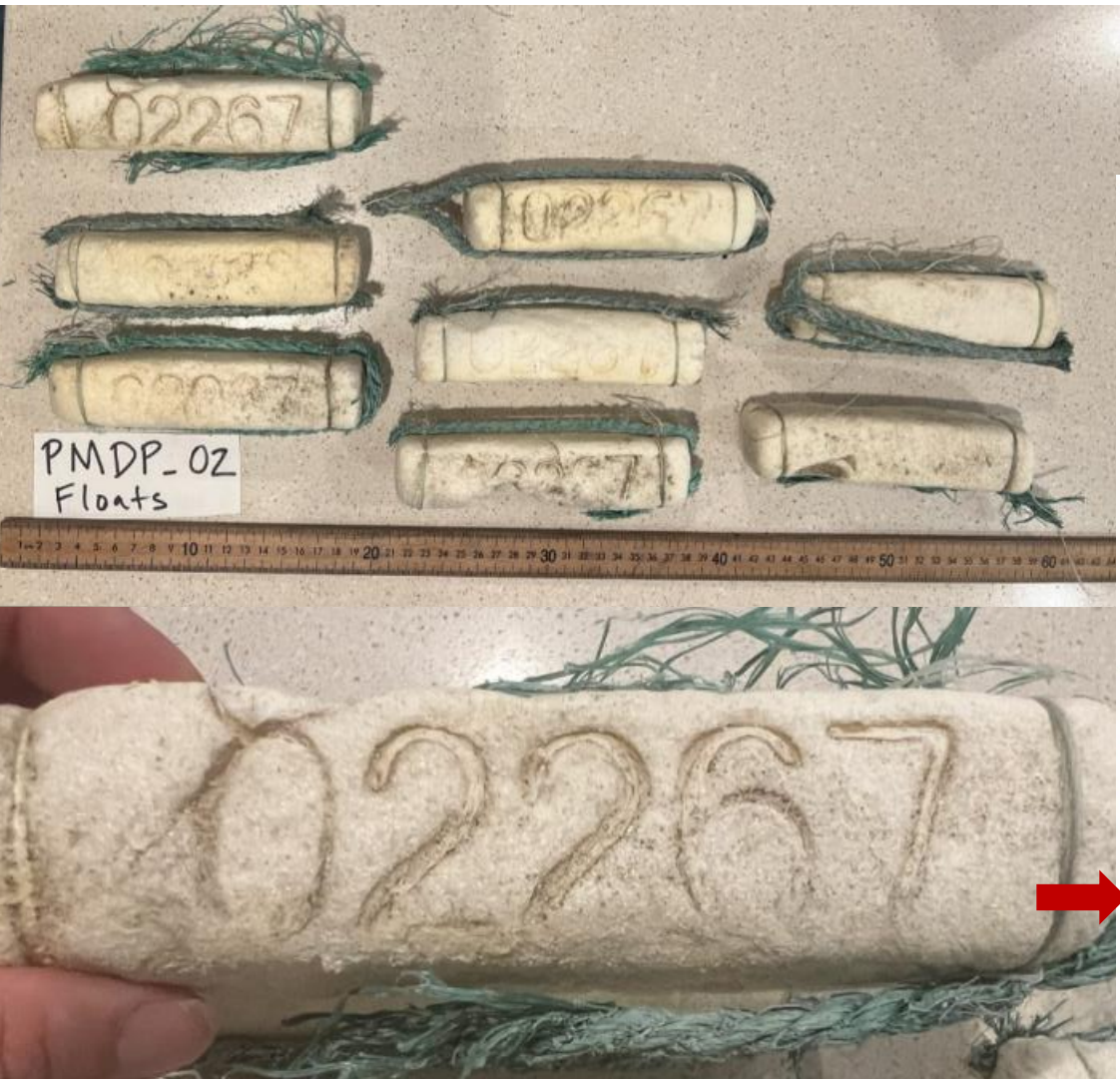
"...Daily Chemistry" in Korean

Float brands point to East Asian gear manufacturers



**MADE IN
JAPAN**




GEAR MARKINGS ON FLOATS



2021

西 海岸漁業廢棄物圖鑑
Fishery debris handbook of West Taiwan

No.2 | Sushi Rice Float | Gillnet



"Sushi rice" is a foam float used by Chinese gillnetters. Some are printed with a five-digit code; some are not. This five digit number is the code of a Chinese fishing boat. For example, "07188" in the picture on the upper right corresponds to the fishing boat "Minshi Fishing 07188" in Shinshi City, Fujian. If you enter a five-digit number into a ship tracking platform such as "FleetMon" or "Marine Traffic", you can track the ship's location.

Most sushi rice is rectangular in white, with a few in special colors such as pink. "Code sushi rice" often appears tangled with transparent nylon rope and monofilament nylon gillnet.

Common Colors

Size Specifications

35cm以下 35-50cm 50-100cm 1米以上

Negative Impacts

Entanglement Ingestion Navigation

Possible Source

China

Indigo Waters, Ning Yen

Global Fishing Watch

Suganyu02267

REGISTRY

DATES

Aug 2, 2014 - Nov 5, 2015

NAME

Suganyu02267

FLAG

China

MMSI

412302267

IMO

GFW VESSEL TYPE

Fishing (2015)

Fishing (2014)

GFW GEAR TYPE

Set gillnet (2015)

Set gillnet (2014)

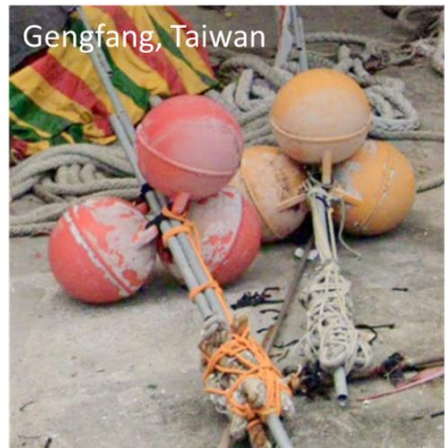
HAWAII PACIFIC UNIVERSITY

CMDR

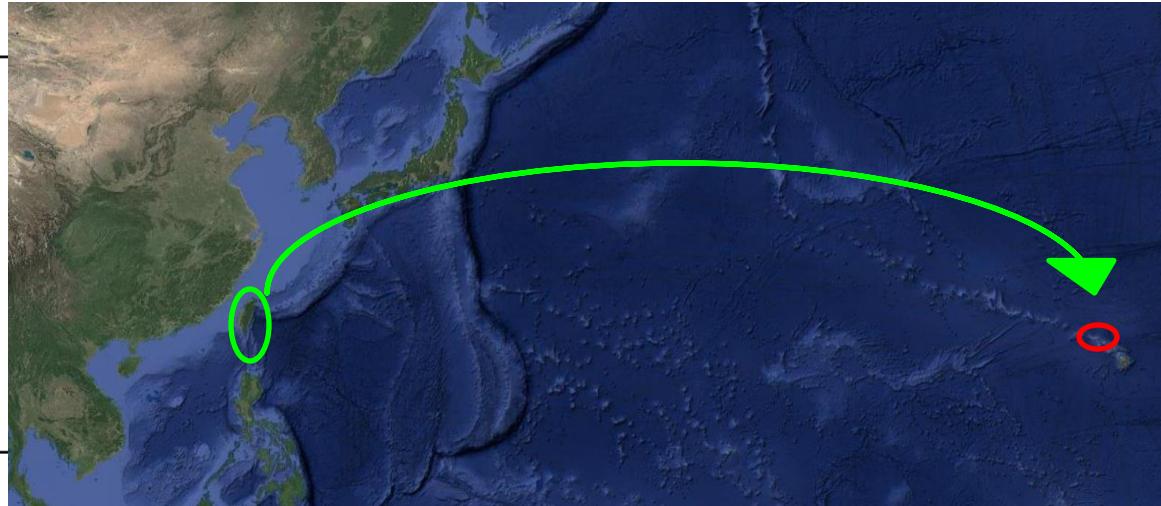
Matched to Asian Google StreetView



Chenggong Fishing Pier/Zingang Fishing Pier, Taiwan



GOOGLE STREETVIEW CONNECTS TAIWAN



Unfamiliar DFG removed in Hawai'i



HAWAII
PACIFIC
UNIVERSITY



Matched to Asian Google StreetView



Takaoka Fishing Port, Japan

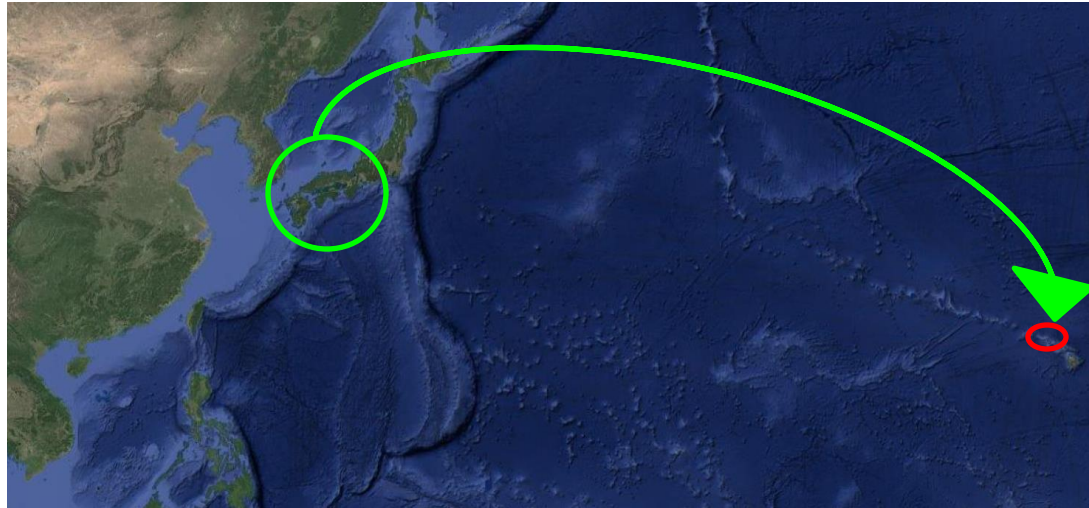


Takaoka Fishing Port, Japan

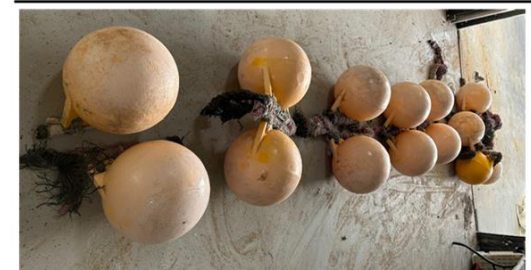
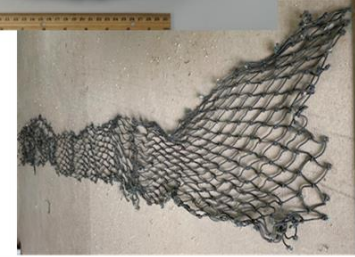


Orikasa, Japan

GOOGLE STREETVIEW CONNECTS JAPAN



Unfamiliar DFG removed in Hawai'i



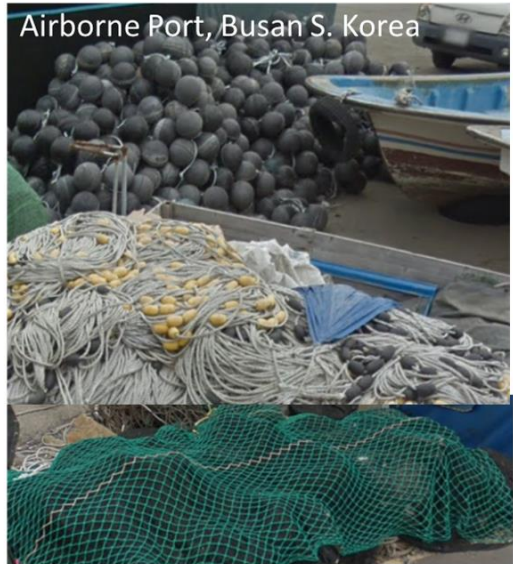
Matched to Asian Google StreetView



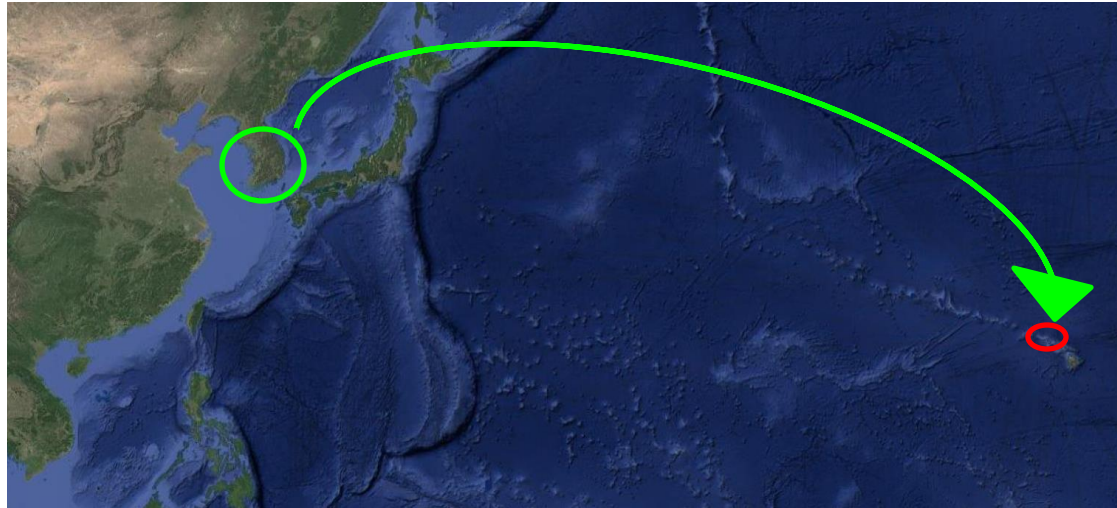
Daebyeon Port, S. Korea



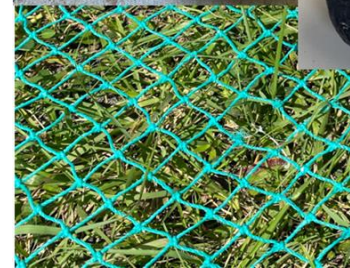
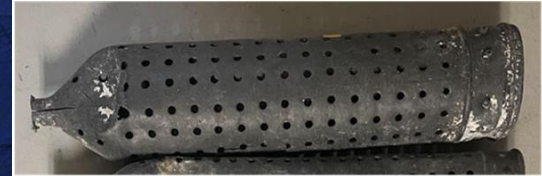
Airborne Port, Busan S. Korea



GOOGLE STREETVIEW CONNECTS KOREA



Unfamiliar DFG removed in Hawai'i



KEY TAKE-AWAYS



Hawaii is severely impacted by plastic pollution



Hawaii needs international cooperation to prevent gear loss and support removal efforts



Hawaii needs international discussions to prevent future marine debris inputs.



SPIDER TIE
CONCRETE FORMING SYSTEM



NIST National Institute of Standards and Technology
U.S. Department of Commerce



Making Hawai'i a Great Place to Live!
Department of Land and Natural Resources
Ka 'Oihana Kumuwaiwai 'Āina



UNIVERSITY of HAWAII
HILO

Ke Kulanui o Hawai'i ma Hilo



Center for Marine Debris Research



MOORE INSTITUTE
for Plastic Pollution Research



Mahalo for your
attention!



THANK YOU

Learn More



Visit our website:

<https://www.hpu.edu/cncs/cmdr/index.html>

Email:

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Jmlynch@hpu.edu



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