

ABSTRACT FOR REFERENCE:

New partnerships and designs over the years have brought the Educational Passages Miniboat Program to a new level. Students are now able to build and follow their very own 21st Century “Message in a Bottle,” and see the ocean like never before. In collaboration with Maker Buoy, the Miniboat-in-a-box kit now offers an easier way for students to connect to global research efforts and contribute to science themselves by outfitting their miniature sailboats (1.5m unmanned) with sensors. This is all in addition to developing crucial STEAM skills, discovering maritime careers, and building international connections that the program continues to provide. In this session, we will discuss the history of the miniboats and how the idea has evolved over the years into a unique interdisciplinary program.

AN OCEAN OF OPPORTUN

Integrating sensors on drifting miniboats to advance
education and enhance ocean science

Cassie Stymiest, Educational Passages

Wayne Pavalko, Maker Buoy

James Manning, NOAA Woods Hole



2nd Ocean Observers Workshop

Sharing international marine science educational resources

29-30 Nov & 1 Dec 2021

#OceanObserversWorkshop



2021 United Nations Decade
2030 of Ocean Science
for Sustainable Development



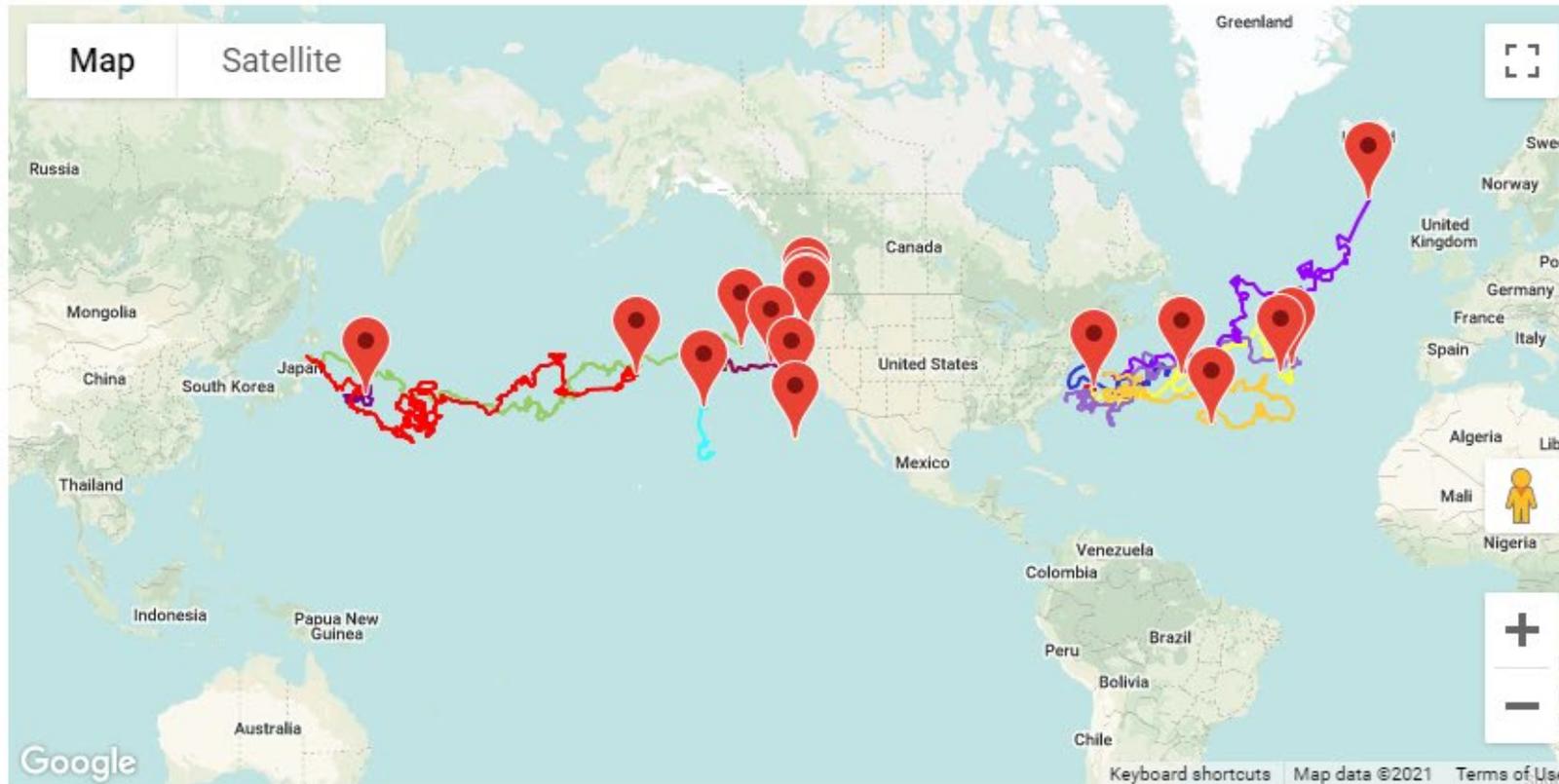
WHAT IS A MINIBOAT?

EDUCATIONAL PASSAGES MINIBOAT PROGRAM

CONNECTING PEOPLE AROUND THE WORLD
TO THE OCEAN AND EACH OTHER, INSPIRING
OCEAN STEWARDSHIP THROUGH UNIQUE
GLOBAL EXPERIENCES



At Sea



Boats:

- [HVES Cruiser](#)

- [Kimura-sensei](#)

- [Fledgling Freddy](#)

- [Nate the Great](#)

- [Square Mile](#)

- [Neptune](#)

- [Great Northern](#)

- [Crimson Storm](#)

- [Blue Heron](#)

- [Rye Riptides](#)

- [Sojourner's Truth](#)

- [KIZUNA GOU](#)

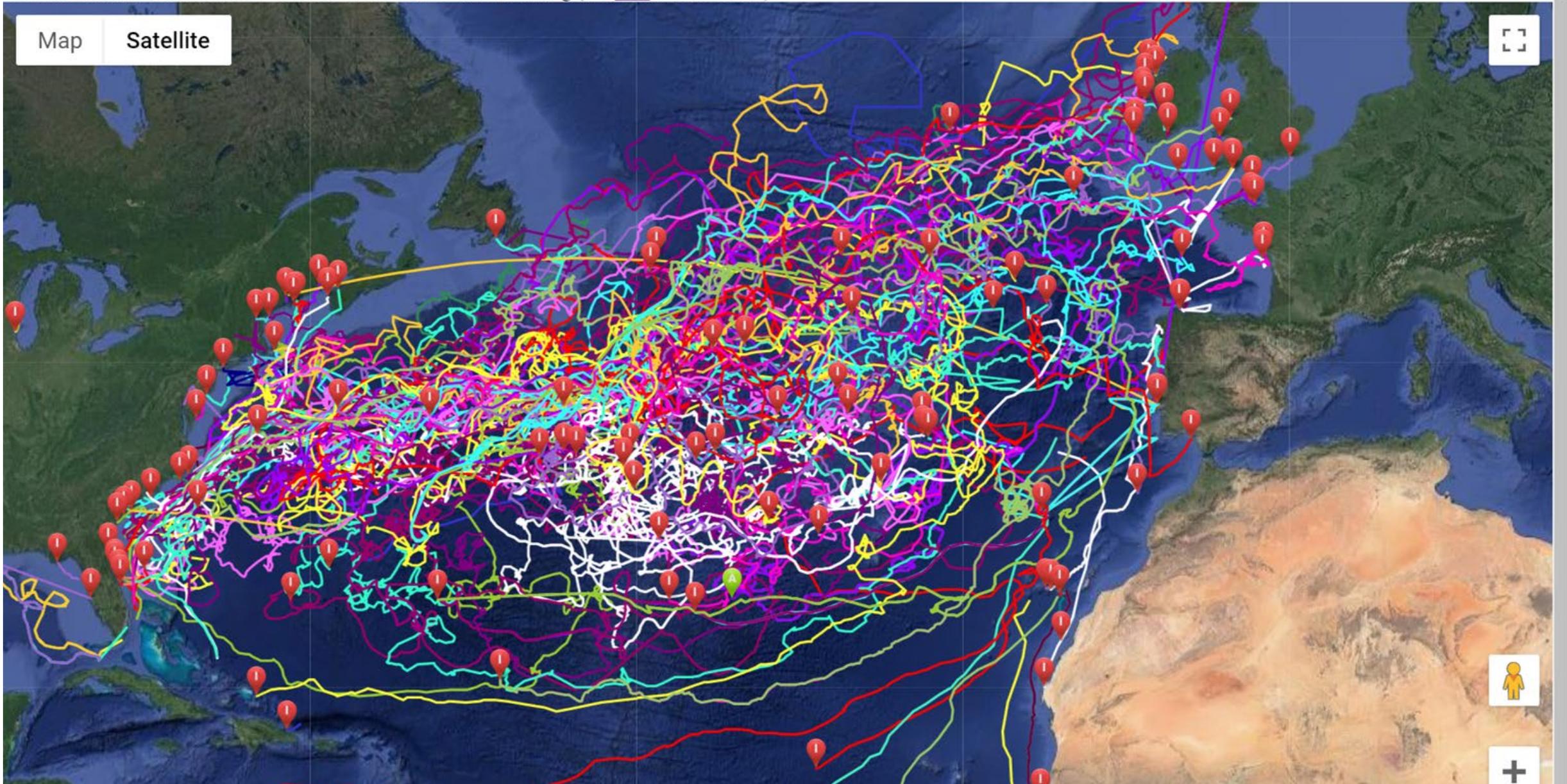
- [GO! GO! 大久喜号 \(GO! GO! Okuki Go\)](#)

Toggle Boats: [HVES Cruiser](#) [HVES Cruiser](#) [Kimura-sensei](#) [Fledgling Freddy](#) [Nate the Great](#)

[Nate the Great](#) [Square Mile](#) [Neptune](#) [Great Northern](#) [Great Northern](#) [Great Northern](#)

Googlemap of all North Atlantic Miniboat Tracks 2008 to 2020

All miniboat tracks should show here after several seconds of loading (see [here](#) for more info)



SENSORS ON MINIBOATS

- Version 1 - **Raspberry Pi + AP3**
 - Rockstar (A)
 - Sojourner's Truth
- Version 2 - **Arduino + AP3**
 - Ginger Judge
 - Jamestown Drifter
 - Spirit of Ashley Hall (B)
 - The Perry
 - Maverick Jr
 - Despaseato
 - Nate the Great
- Version 3 - **Arduino (Maker Buoy) + Rockblock**
 - Neptune (C)
 - Square Mle (D)
 - Fledgling Freddy

2018

2017

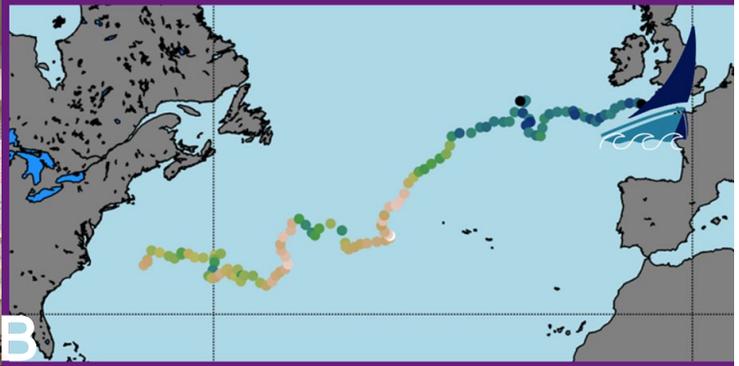
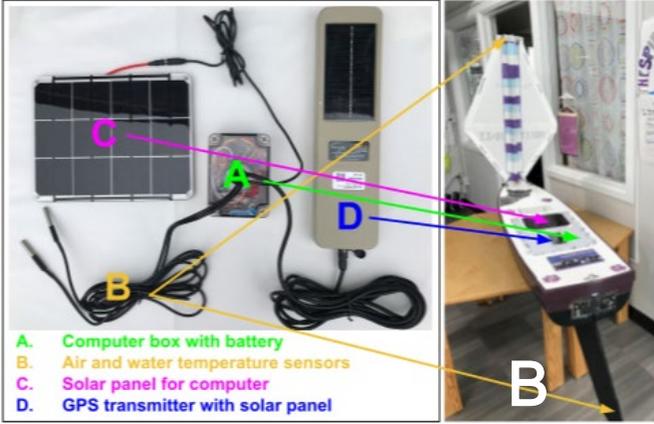
2019

2019

2021

2021

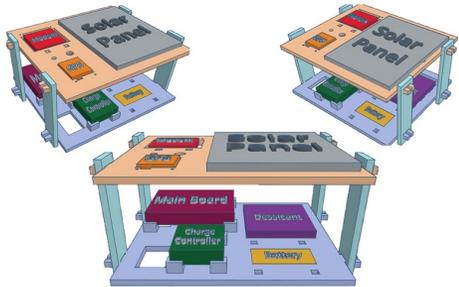
2021



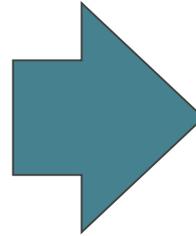
“Maker Buoy” Open Source Drifting Buoy Project

2016-18

“Build an Inexpensive, Open Source Drifting Buoy”



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Today

“Making Ocean Sensing Easy and Affordable”

Drifting Buoys



Sensor Packages
e.g. for Mini Boats



Open Source Hardware

- Printed Circuit Board
- 3-D Printed Internal Frame
- Commercial Case

Open Source Software

- Github Maker Buoy Repo
- Arduino Libraries

Produced over 200 custom buoys for researchers, educators and maritime industry

JOIN THE JOURNEY!

- Each boat has their own webpage which is publicly available
- Maker Buoy sensor package data are embedded in maps on these boat pages
- Data download directly to educators to explore further
- Connect to data collected on research expeditions, from nearby buoys and floats, and satellite data. Contrast!
- Workshops, resources, etc.
- Interested in building your own boat or drifter? Contact us:

EDUCATIONALPASSAGES.ORG/ATSEA

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