

Sargassum and Water Quality

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What is Sargassum?

- Brown macroalgae
- 60+ benthic species
- 2 pelagic species
- Asexual fragmentation
- Christopher Columbus
- “Golden floating rain forest”
 - Refuge for migratory species
 - Breeding, nursery and forage
 - Loggerhead turtles, eels
- Ashore
 - Food source for birds
 - Shoreline stabilization
 - Nutrient source

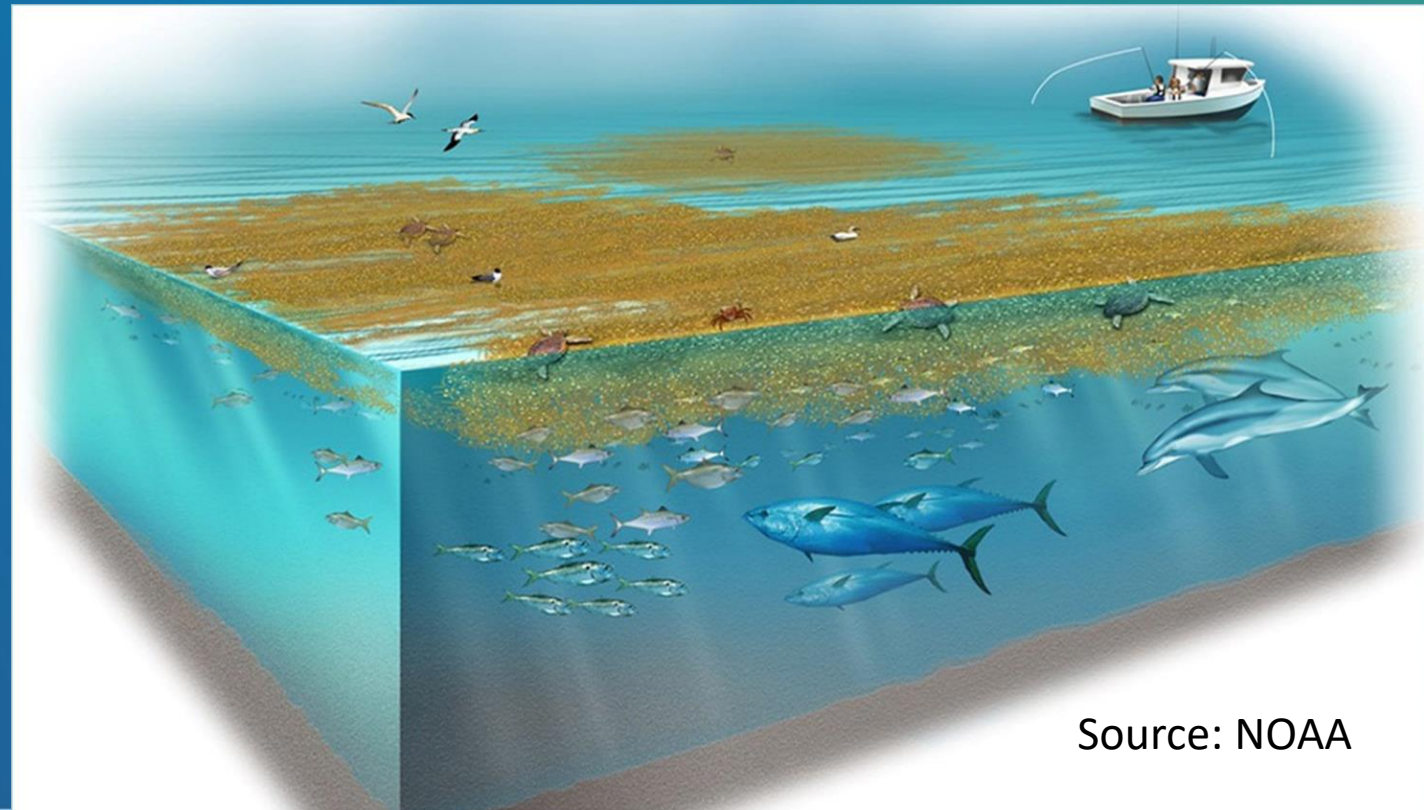


Sargassum natans



Sargassum fluitans

Image: A.N.S. Siuda



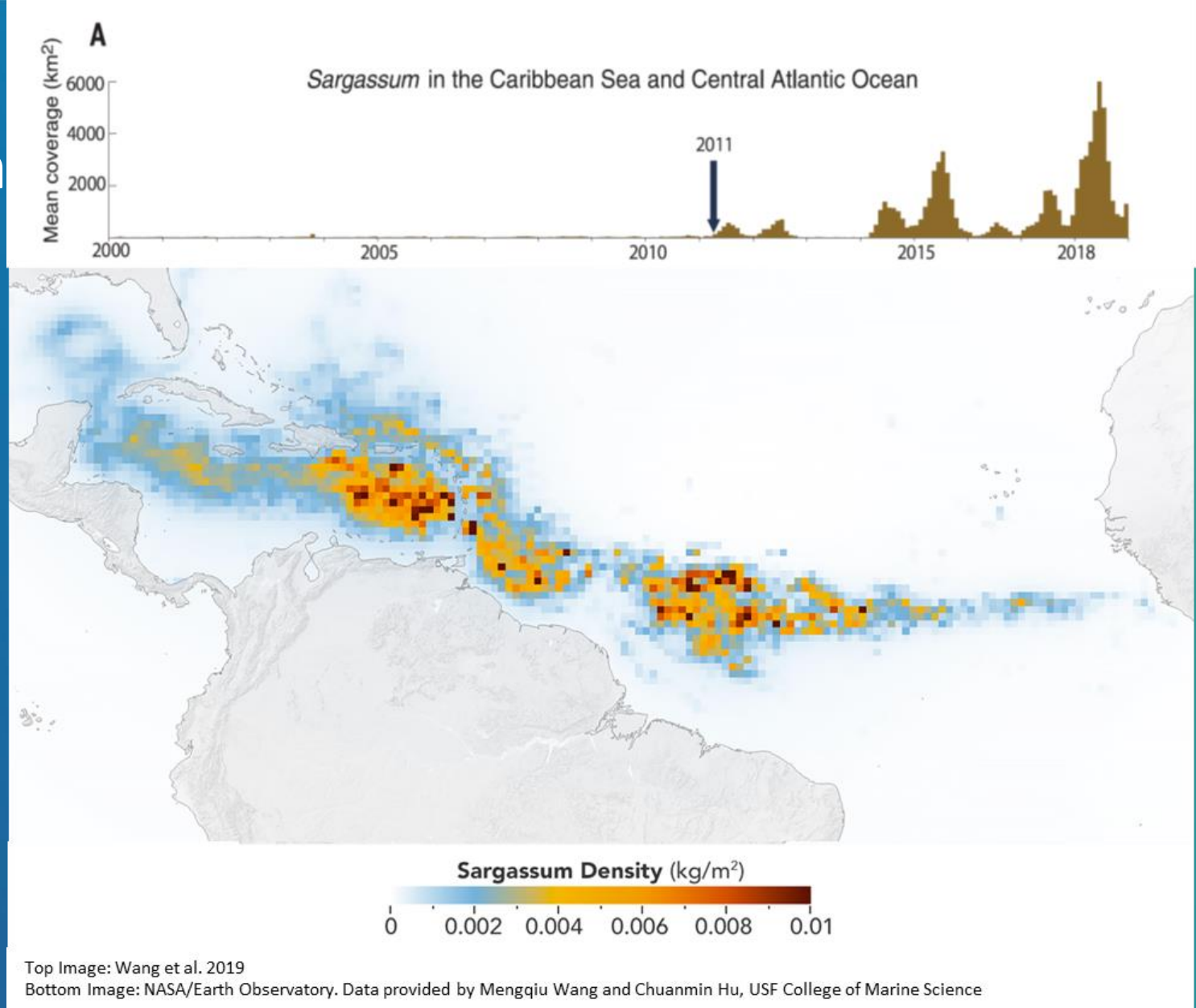
Source: NOAA

Sargasso Sea & Great Atlantic Sargassum Belt

- 2009-2010 - extreme North Atlantic Oscillation
- Winds & surface currents advect sargassum from Sargasso Sea to the east & south and created “Great Atlantic Sargassum Belt”
- Since 2011 = Exponential growth with longer growing season, warm temps, river nutrients from Congo, Amazon, & Mississippi

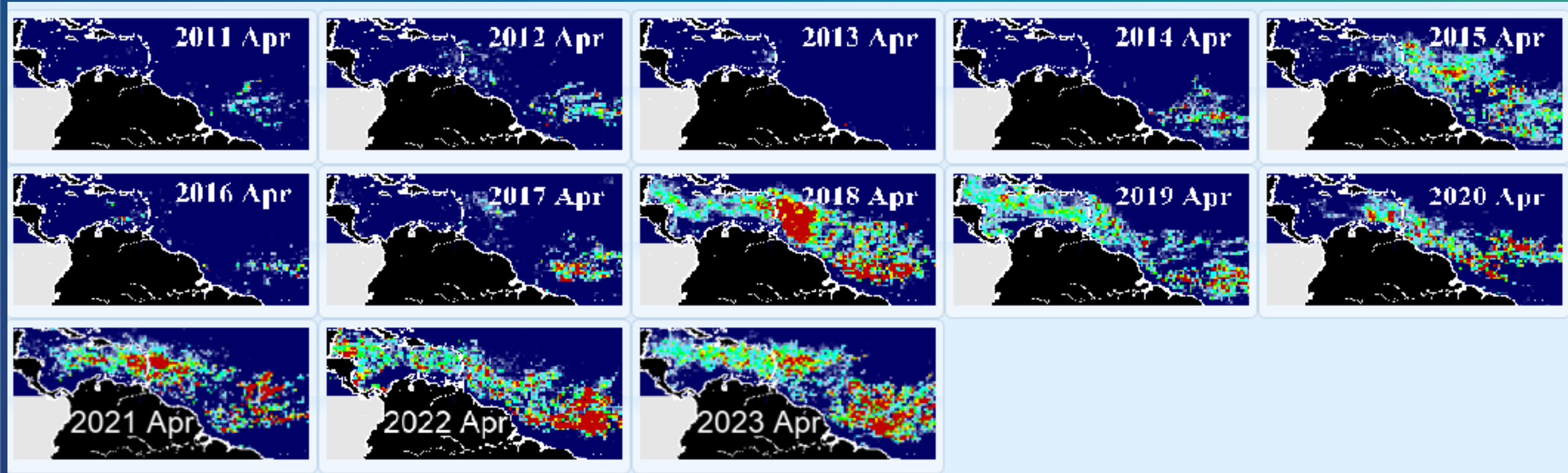


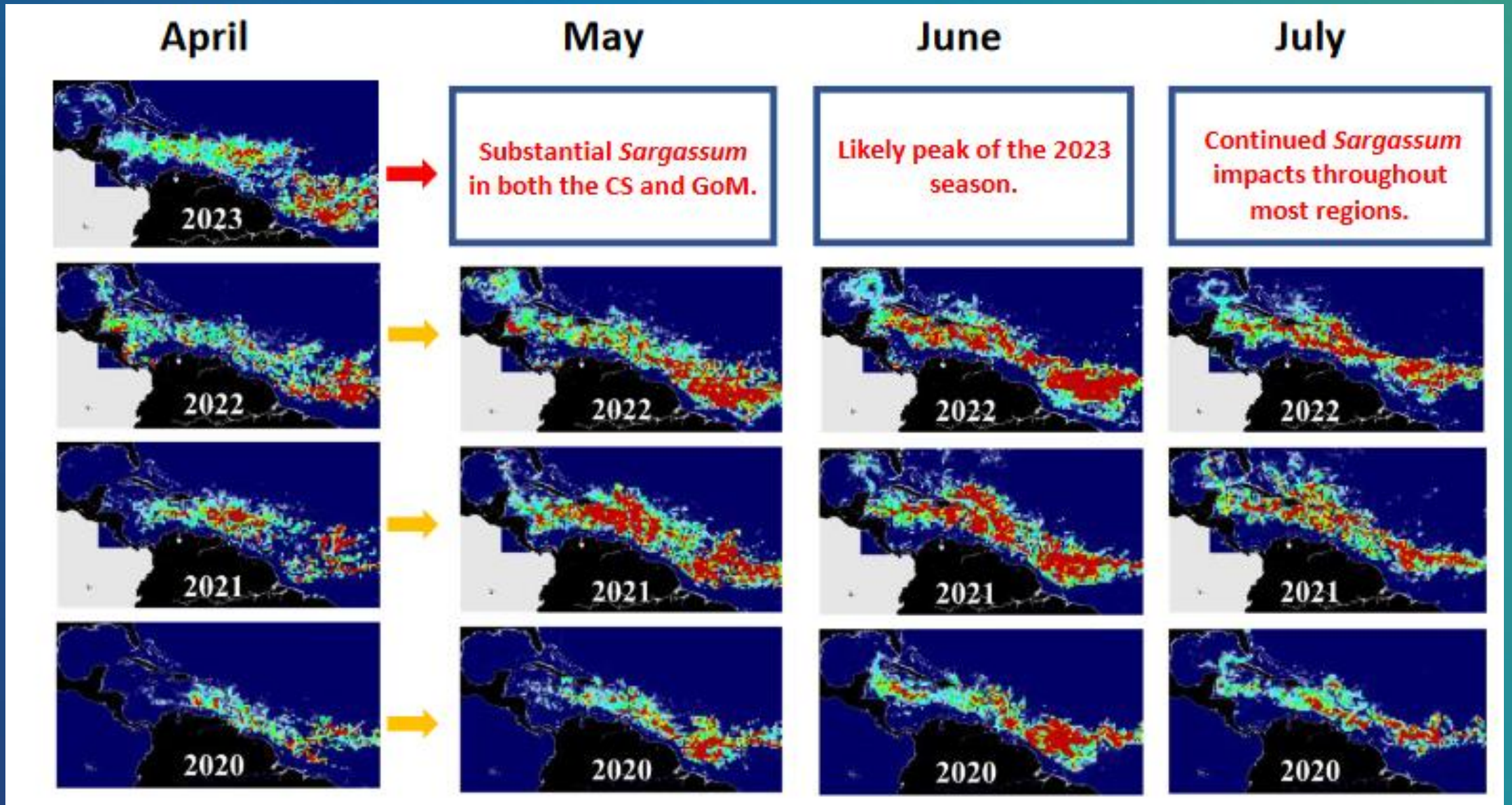
- Largest macroalgae bloom in the world!
- Since 2011 - seasonal influxes Caribbean, TX, FL



Fort Pierce Beach. Source: Treasure Coast Palm News, 2019

University of South Florida Satellite-based Sargassum Watch System (SaWS) APRIL 2011 to 2023





Source: Outlook of 2023 Sargassum blooms in the Caribbean Sea and Gulf of Mexico April 30, 2023, by University of South Florida Optical Oceanography Lab (bbarnes4@usf.edu, yuyuan@usf.edu, huc@usf.edu)

Economic Impacts

- Too much of a good thing!
- Impacts beach tourism
- Can cover and smother
 - Sea turtle nests
 - Seagrasses
 - Patch coral reefs
- Fish kills
- Decomposing *Sargassum*= hydrogen sulfide and ammonia
- Costs of Beach Cleanup



Image: Barbados Government Information Service

Mechanical Removal from Beaches

- Miami:
 - 2019: 4 targeted beaches \$3.8M
 - 2023: anticipating \$6M
 - Est: ALL beaches >\$45M
- Florida Keys
 - ~\$150K annually
 - Trucked to C&D landfill
- Mexico 2018: \$17.2M



Miami Beach, Florida. Source: Vincent Encomio, Florida Sea Grant

Pilot Study to Evaluate Sargassum Composting for Soil Amendment in Municipal Landscaping at Key West Botanical Garden, June to September 2021



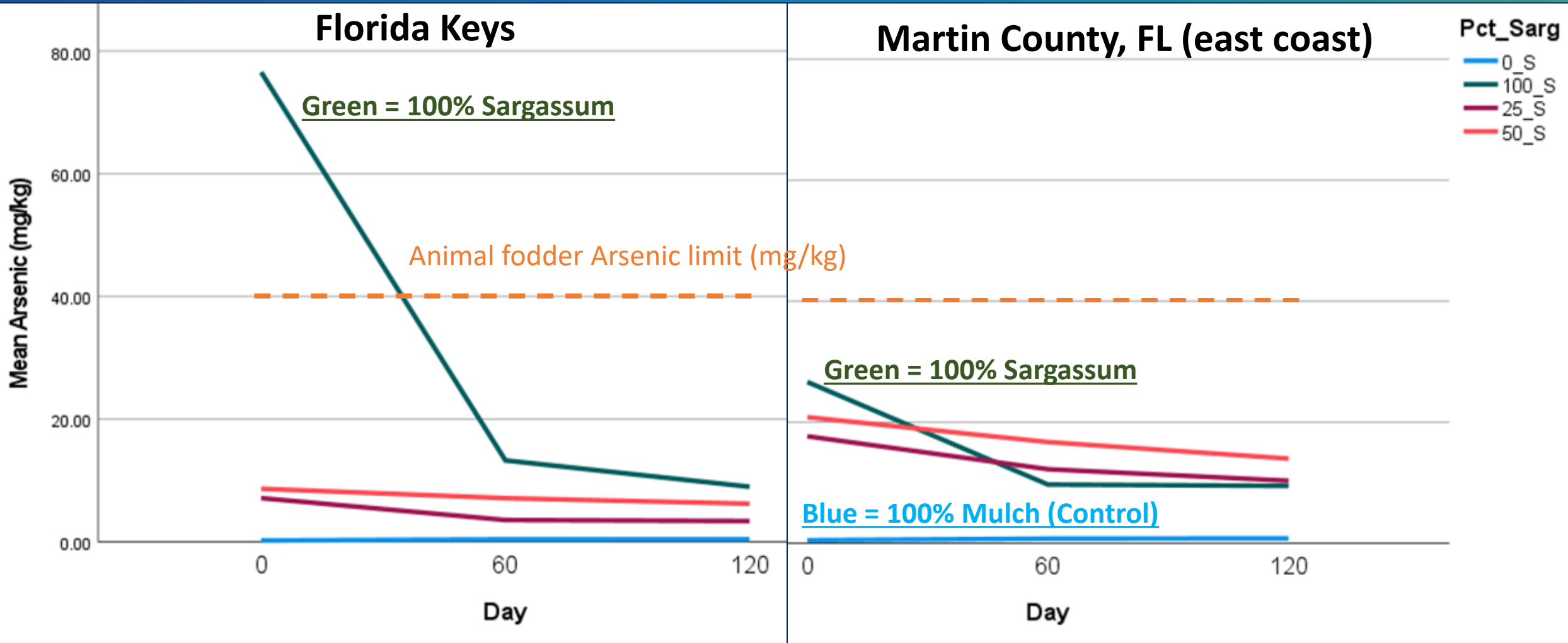
Sargassum Composting for Soil Amendment Applications in Municipal Landscaping

Treatment I (A,B,C)	Treatment II (A,B,C)	Treatment III (A,B,C)	Control (A,B,C)
100% sargassum	50% sargassum/ 50% wood chips	25% sargassum/ 75% wood chips	100% wood chips

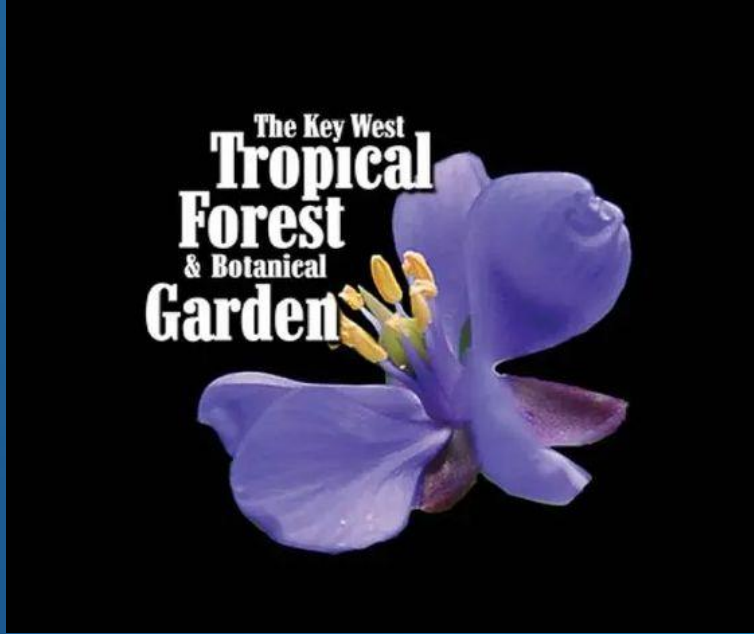
- Pilot study = 120 days in Monroe and Martin counties
- Tested every 60 days for TN, TP, K, C, NH₃-N, and Arsenic



Total Arsenic by treatment (mg/kg)



Partnerships



Questions?



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