



COLLEGE OF THE DESERT
CONSERVATION OF NATURAL RESOURCES LAB
FALL SEMESTER 2018



An aerial photograph of a tropical beach. The left side shows a wide, sandy beach with many blue beach umbrellas and people. The ocean is a vibrant turquoise color. A large, dark brown and purple mass of seaweed, identified as sargassum, is floating in the water, extending from the shore into the open sea. In the background, a city skyline with various buildings is visible under a blue sky with scattered white clouds. A white sailboat is visible on the right side of the image.

WHAT IS SARGASSUM?

Presented by Vanessa Partida



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The Sargasso is a plant and is comprised of two species: Pelagic Sargassum (Fluitans) and Benthic (Natans). Pelagic is a large leafed plant and floats in the ocean. The Natans is a narrow bladed plant that is attached to the bottom. These plants sustain themselves and reproduce by vegetative fragmentation.

a. Fluitans



b. Natans





a. Fluitans

b. Natans

BROADLEAF

- Pods usually not tipped with spike
- Leaves short-stalked and broad

NARROW LEAF

- Pods usually tipped with a spike
- Leaves long-stalked and narrow

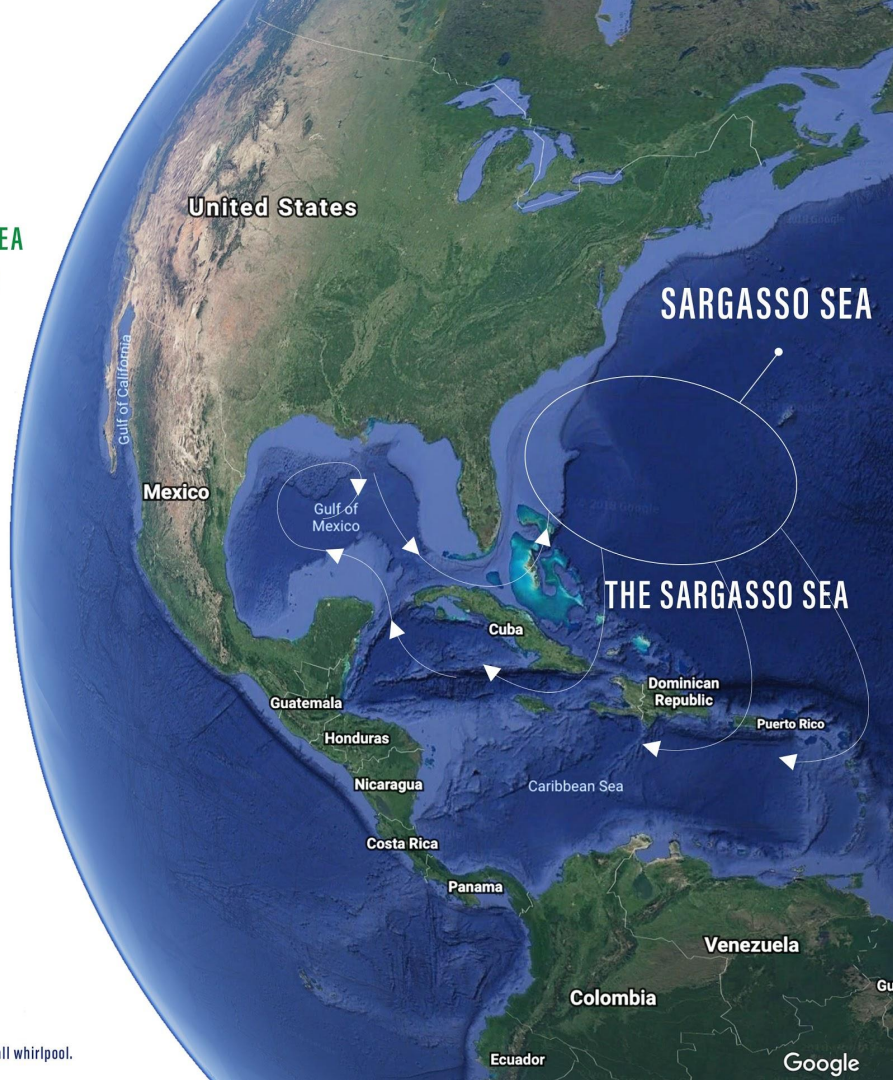
The **FIRST** scientific study of **SARGASSUM**
was conducted by **ALBERT PARR** in 1933



WHERE DOES IT COME FROM?

This algae originates in the **SARGASSO SEA** in the Atlantic Ocean around Bermuda where it is said to have about **10 MILLION TONS.**

- Large slicks of seaweed leave the Sargasso Sea heading South
- The Sargassum enters into the Gulf of Mexico through the Yucatatan Strait.
- Sargassum can travel straight hitting Texas, go right toward Florida or get caught in an eddy.*
- Once into the Gulf Stream, the seaweed can travel quickly up north coast. East winds will push it onto Florida beaches



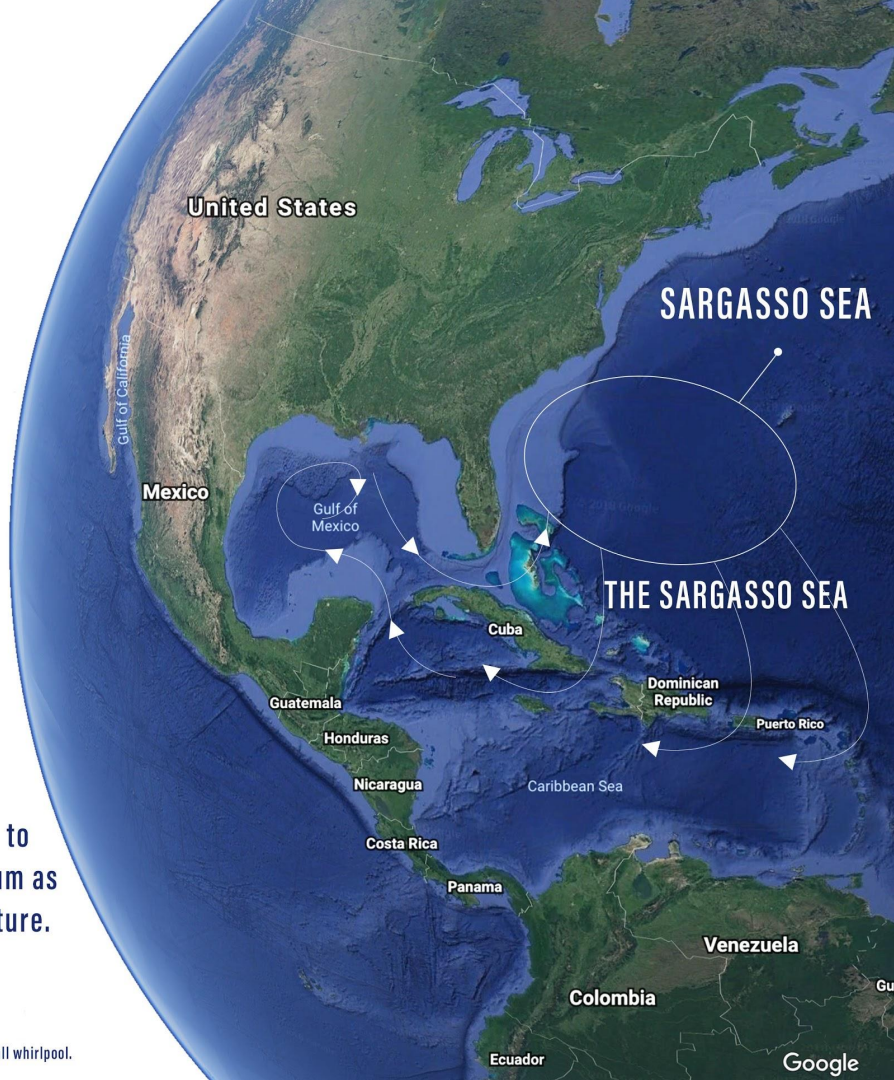
* ed-dy: a circular movement of water, counter to a main current, causing a small whirlpool.

FACTS

ABOUT...

The SARGASSO SEA

- Sargasso Sea was the clearest purest water ever studied.
- They termed it a **BIOLOGICAL DESERT** because it had very low nutrients like nitrogen phosphorus and Iron.
- It is the only "sea" without shores.
- Young Loggerhead Sea Turtles travel to the Sargasso Sea and use the Sargassum as cover from predation until they are mature.



* ed-dy: a circular movement of water, counter to a main current, causing a small whirlpool.

SARGASSO

A Floating Jungle

Sargassum provides a **FOOD SOURCE, HOME, and SHELTER** to an amazing **VARIETY OF MARINE SPECIES** including the threatened and endangered species.

127 Species of Fish



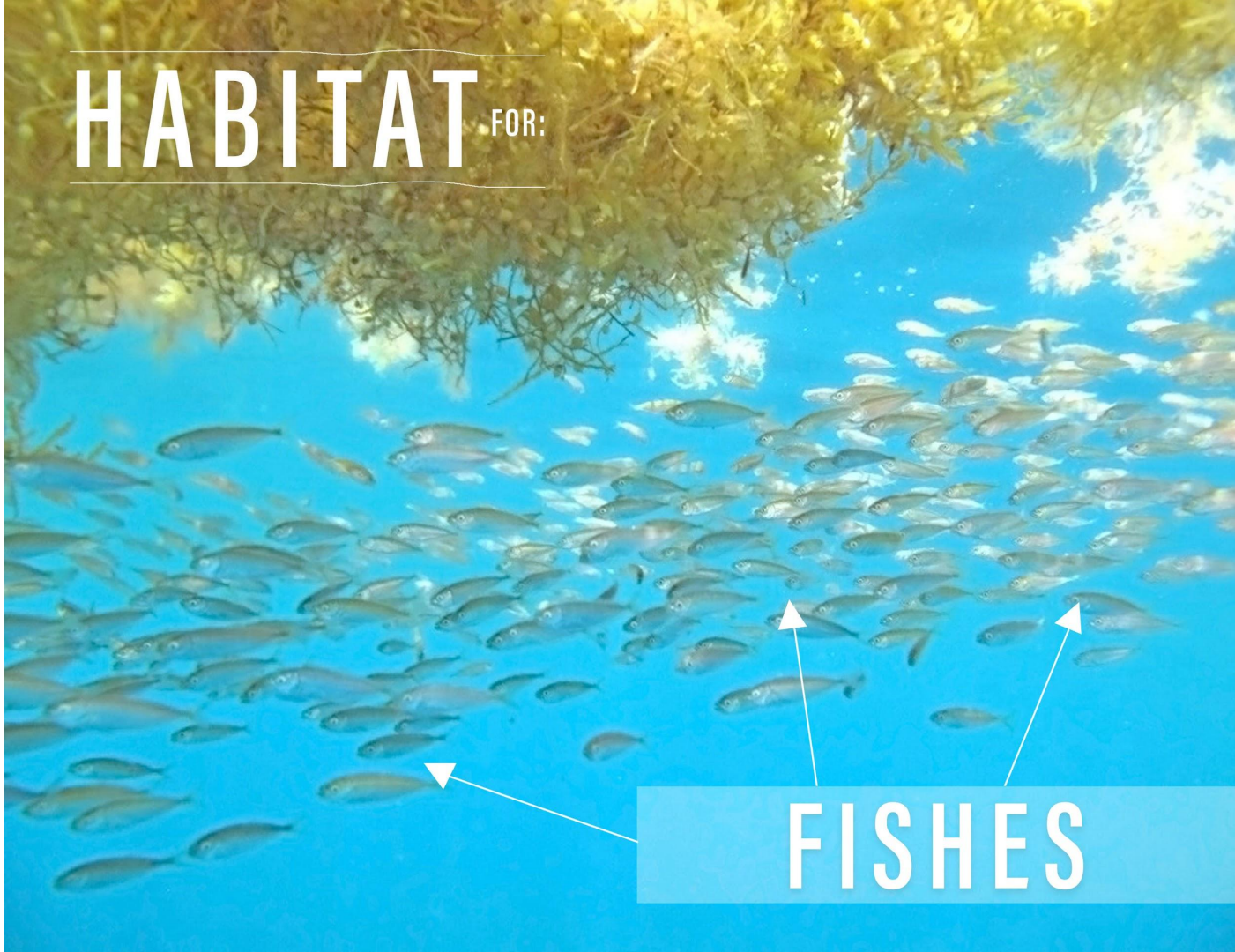
145 Invertebrate
Species



10 Endemic Species



HABITAT FOR:



FISHES

A photograph of two sea turtles swimming in the water, surrounded by a dense layer of yellow seaweed. The turtles have dark, patterned shells and are seen from above. The water is clear, and the seaweed is vibrant yellow. A semi-transparent white box with the text "SEA TURTLES" is centered over the image.

SEA TURTLES

A photograph of a Laughing Gull standing on a nest made of seaweed. The bird has a black head and neck, a white breast, and grey wings. It is holding a small crab in its beak. The background is a blurred, brownish landscape.

Laughing Gull

BIRDS



Sargassum
SWIMMING CRAB



Sargassum

NUDIBRANCH



Sargassum

ANGLER FISH





BROWN GLASS SHRIMP



PLANEHEAD FILEFISH



LINED SEAHORSE

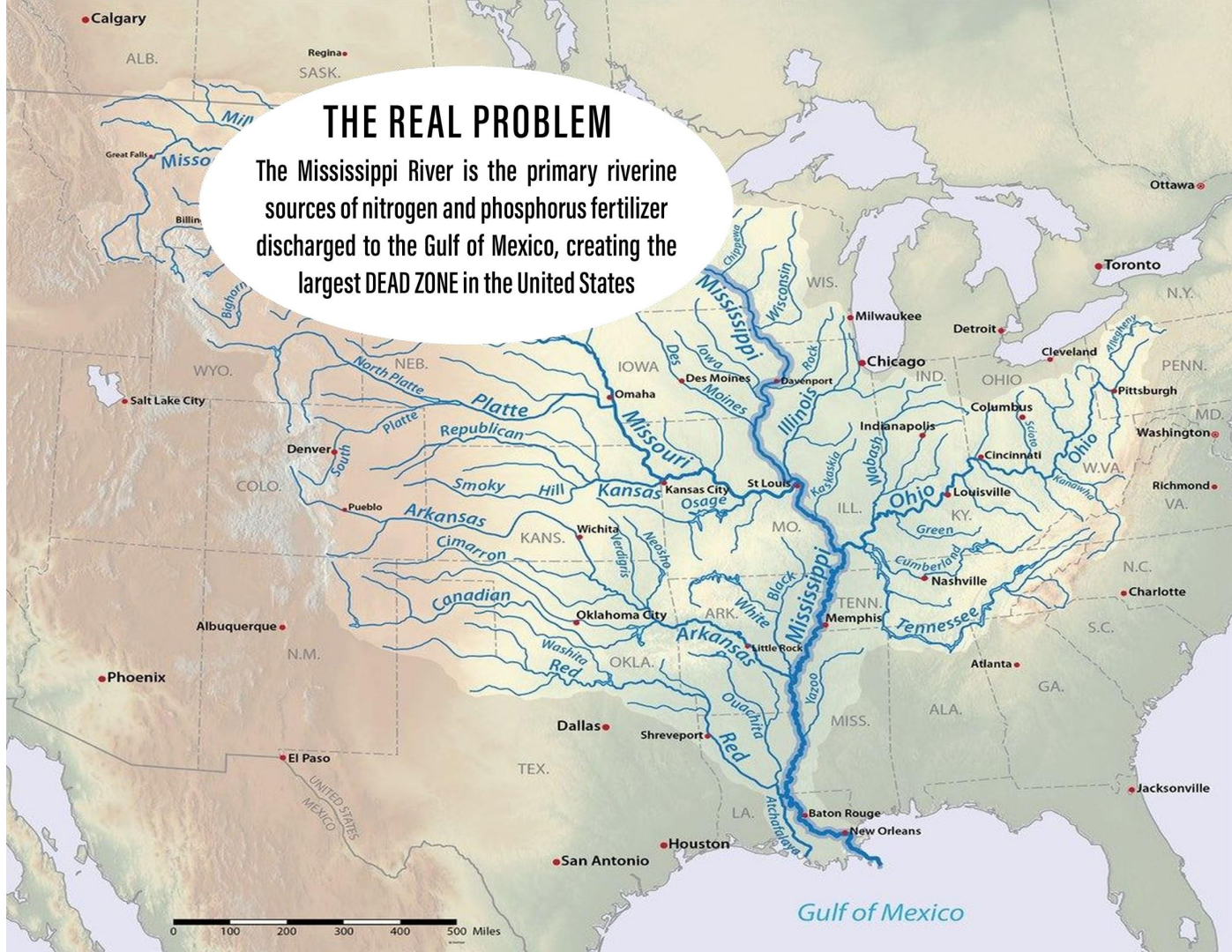


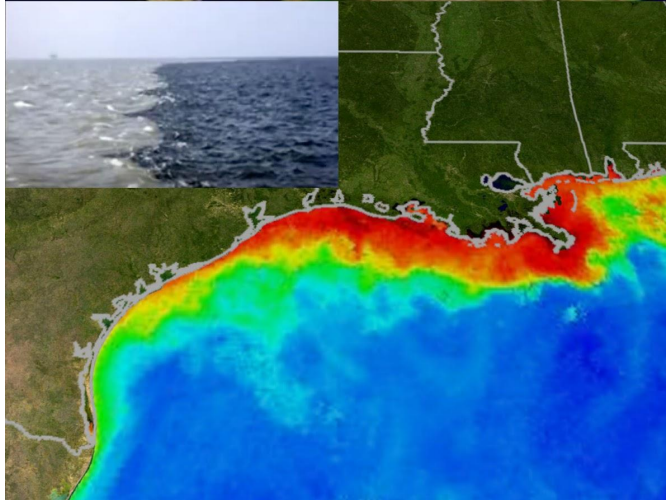
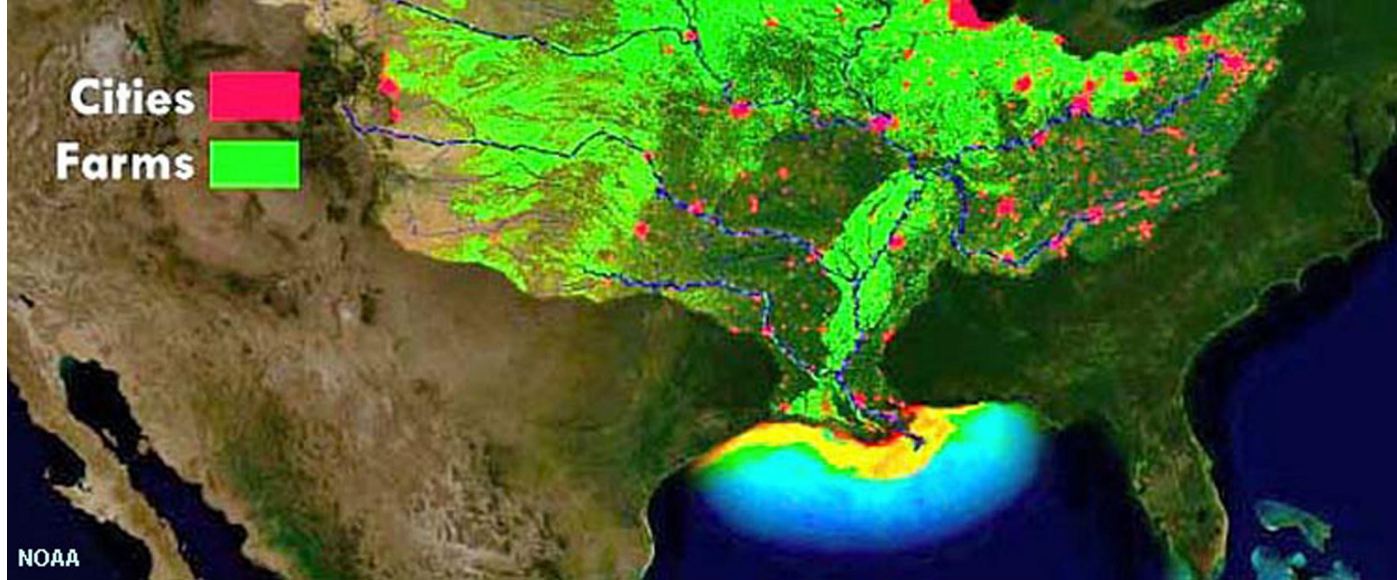
WHY SO MUCH SARGASSUM?

In order for the Sargassum plant to grow and reproduce, they need NUTRIENTS. BRIAN LAPOINTE, a biologist, discovered that COASTAL WATER, which carry nutrients from run offs, spin off into the Sargassum Sea. This helps the Sargassum Seaweed not only to SUSTAIN and ENRICH themselves but it also helps these plants GROW FASTER and be more productive. They grow faster in the near shore compared to those in the open ocean.

THE REAL PROBLEM

The Mississippi River is the primary riverine sources of nitrogen and phosphorus fertilizer discharged to the Gulf of Mexico, creating the largest DEAD ZONE in the United States



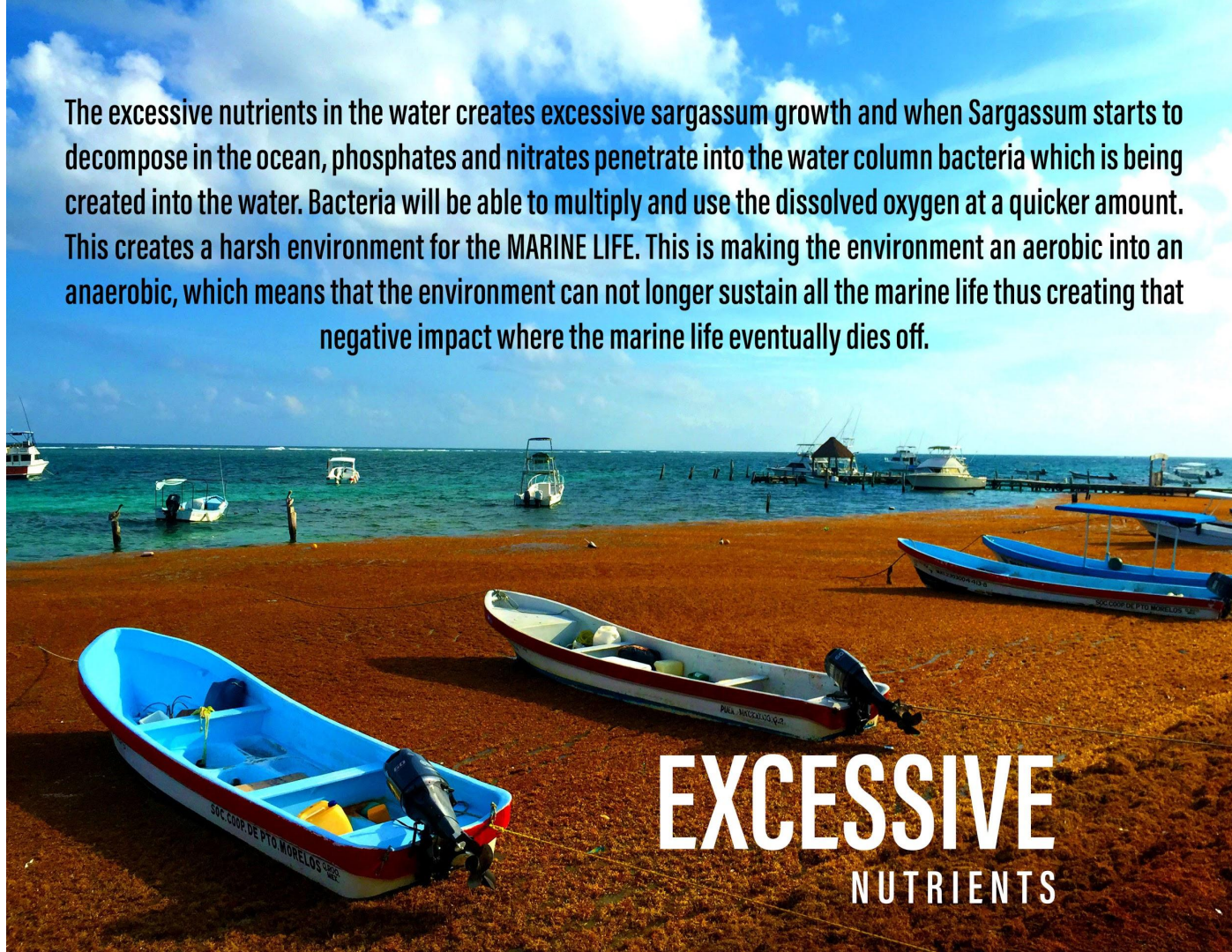


THE DEAD ZONE

The largest dead zone ever recorded in the Gulf of Mexico was reported by National Geographic News in August 2017

It cover up to 6,000-7,000 square miles.

The excessive nutrients in the water creates excessive sargassum growth and when Sargassum starts to decompose in the ocean, phosphates and nitrates penetrate into the water column bacteria which is being created into the water. Bacteria will be able to multiply and use the dissolved oxygen at a quicker amount. This creates a harsh environment for the MARINE LIFE. This is making the environment an aerobic into an anaerobic, which means that the environment can not longer sustain all the marine life thus creating that negative impact where the marine life eventually dies off.



EXCESSIVE
NUTRIENTS

THE OIL SPILL



Another marine life impact was due to the OIL SPILL. The Sargasso affected by the Oil Spill not only killed its biomass but it also cause the Sargasso to sink causing depletion of oxygen for MARINE LIFE.

Is Sargassum hazardous to our health?



When Sargassum plant starts to decompose into the coast area, it releases hydrogen sulfide which in certain concentrations can be toxic. This gas smells like rotten eggs and it is an unpleasant smell.

People who may have respiratory illness such as asthma, bronchitis, chronic obstructive pulmonary disease such as emphysema may be a lot more sensitive to this smell.

Responding to a sargassum influx

If sargassum appears on your beach, what you do next can be good or bad for the beach and business. Important lessons have been learned so far.

Here's what you need to know

Sargassum is a *natural* seaweed that floats in the Atlantic Ocean.

It's an *important home* for marine life, like fish and sea turtles.

It's a problem only when it comes ashore in *massive amounts*.

A complaint is the smell of *rotten egg gas* as wet sargassum decomposes. There are potential health risks at *high gas concentrations*.



What should you do?

Communication is key!

Inform beach users about sargassum - manage their expectations.

Direct beach users to unaffected or clean beaches.

Agree how much sargassum justifies cleaning.

Determine which beaches will be cleaned.

Join with partners and share the job.

Organise wildlife patrollers to inspect for stranded sea creatures like sea turtle hatchlings, collect and release them with some sargassum into offshore currents.

Leave some sargassum for beach nourishment.

Keep in touch with local environmental agencies as forecasting models are in development.



Take care!

These actions cause serious harm to the beach.

- 1 Constant beach grooming
- 2 Removing sand from the beach or dunes
- 3 Heavy machinery used carelessly
- 4 Clearing or trampling beach vegetation
- 5 Driving above the high water mark and through sand dunes
- 6 Driving over sea turtle nests
- 7 Cleaning before patrollers - Let them check for signs of wildlife before you start cleaning!

If my beach looks like this...

No action

required on this beach



Leave the sargassum alone - let nature run its course. Be patient - it will wash away or get buried. Rest assured - it will benefit your beach and save you money and effort.

Taking action?

Manual raking is the approach to take



It's simple, low cost and environmentally friendly. Get communities involved in these beach clean-ups. Run educational scavenger hunts for sea creatures in sargassum.

Separate plastic pollution from sargassum for disposal. Transport using wheelbarrows, bags or tarpaulins and take to designated disposal areas.

Work with partners

and plan a mechanical response



Take a multi-stage approach - remove upper layers of sargassum with machinery, without touching the sand, then rake manually or run mechanical beach raking equipment.

Clean high usage areas first and leave other beaches for nature to clean.

Remove the sargassum as soon as possible after arrival to avoid vast accumulation.

Do's & Don'ts



Clean in daylight

✓ Use same route on and off the beach

✓ Consider public safety
Avoid mechanical cleaning around fishers and beach goers

what about... REMOVAL from shallow water?

! Sargassum is heavy when wet.

Removal from close to shore may prevent sargassum from rotting in the water.

Consider a horse-drawn trap to collect sargassum in suitable sea conditions as an environmentally friendly removal option.

Different methods have been tried but are labour intensive and costly (eg. booms, barges, vacuums). Results are mixed – stability problems, unloading issues and unwanted by-catch of marine life.

✗ If using a bucket, don't gouge sand

✗ Never use tractor or belted equipment

✗ Don't clean near dunes

✓ Use machines with large soft tires

✓ Supervise use of machinery

✓ Machines with a claw or rake are preferable

✓ Manual cleaning is preferred

✓ Clean at low tide

✓ Keep equipment on damp sand in the tidal zone

✓ Consider a horse-drawn trap

- Designate sites for the disposal of sargassum.
- Use sunny locations for drying and decomposition.
- Re-distribute sargassum to fill eroded beaches.
- For sea turtle nesting beaches, transport sargassum off-site, don't dump on dunes or nests.

- Use as mulch or compost – wash out salt first.
- New uses are being developed – like bio-stimulant and bio-fuel.
- Sargassum is not suitable for human consumption.

how do we DISPOSE of sargassum?

✗ NO-GO Areas: turtle and bird nests
Do not enter with cleaning equipment

✓ Observe
Patrol the beach searching for wildlife

✓ Use mechanical beach raking equipment with perforated conveyor belt

