

Early Warning of 'Invasions':

# Tracking Sargassum Seaweed via Satellite — And How Boaters Can Help

by Joan Conover

Starting primarily in 2011, massive quantities of pelagic (floating) sargassum seaweed, also known as sargasso, floated throughout the Caribbean, impacting marine resources, fisheries, shorelines, waterways, and tourism. Similar events have occurred since that time. The amount of observable weed has



By sending reports of sightings, boaters can help verify satellite imagery showing rafts of sargassum drifting through the Caribbean

lessened since the large influx of October 2015, however this process is cyclical and the coming season is projected to see a significant increase of this ocean-carried weed.

It will be during this upcoming season of 2017-18 when Caribbean governments and private citizens — including local boaters and visiting cruisers — will again need to develop procedures to address the problems that have been experienced in past "Sargasso Seasons".

The actual sargassum route and cycle are not well known, but amounts do seem to be increasing with each season's cycle; theories for this include increasing heat and/or additional nutrients introduced into the Atlantic that create or enhance massive blooms of this foliage. Recent research also suggests that Atlantic algae responds positively to increased CO<sub>2</sub> and acidity in seawater, a major change in the former theory of slower growth.

A first-hand report last month from the southern Caribbean mentions, "The smell at the moment is near intolerable; the build-up has increased massively in the last week or so, and now there is too much aggregated for the tide to remove it. Furthermore, there is so much ashore already that the new influx can only sit on and in the water. The wet sargassum rots on the shore, and sea life dies on the mass floating at the shoreline."

In cases where sargassum accumulates and decomposes in large quantities, the smell of rotten eggs can occur. This is the odor of hydrogen sulfide gas, which is given off as part of natural decomposition. The US Occupational Safety and Health Administration notes that when the smell is described as "more offensive" (three to five parts per million), prolonged exposure might cause effects such as nausea, tearing of the eyes, headaches and loss of sleep. Asthma sufferers may experience airway problems. Full details are at [www.osha.gov/SLTC/hydrogensulfide/hazards.html](http://www.osha.gov/SLTC/hydrogensulfide/hazards.html).

Sargassum also has impacts on fishing gear and motors; for example, engine cooling-water intakes get clogged and rudders get jammed. Some fishers and other boaters are coming up with devices to free rudders of weed and to deflect sargassum from propellers, and are using strainers across water intakes to prevent blockage and engine overheating. Those navigat-

ing through the islands need to be prepared to deal with gear complications plus possible loss of power or steering, and plan for the safety implications of this, especially when underway at night.

Heavy mats of sargassum along the shoreline, such as occurred on the windward coast of Barbados in 2015, can prevent hatching sea turtles from reaching the water.

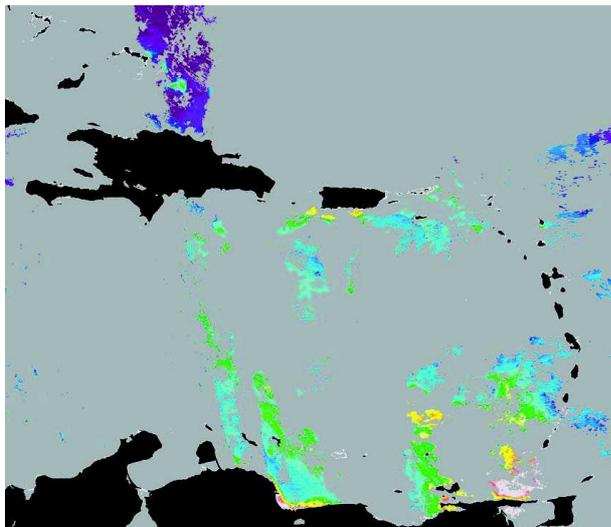
Becoming proactive and keeping informed about the location of these floating mats of seaweed will be the new reality for those in the Caribbean — islanders and sailors alike. This sargassum issue will not go away, and as one observer says, "This problem is something which will ultimately affect all of us. All of us should be working together to be proactive in this matter, rather than merely reactive or inactive."

Some Caribbean island governments, such as that in Tobago, are already looking at satellite tracking to help cope with sargassum inundations (see [www.ipnews.net/2017/07/tobago-gears-fight-sargassum-invasion-for-details](http://www.ipnews.net/2017/07/tobago-gears-fight-sargassum-invasion-for-details)).

## Satellites Spot Sargassum

Over the past several years, several research facilities have been developing technologies based on satellite imagery to identify the location of weed masses. (See <https://eos.org/features/sargassum-watch-warns-of-incoming-seaweed>).

While this seems simple, it has required on-the-ground, or in this case sea, knowledge of where volumes of weed occur. This then allowed comparison to satellite data to develop suitable applications. For sev-



eral years, private "citizen scientists" including cruisers have reported their sargassum findings to the Gulf Coast Research Laboratory's (GCRL) sargassum research group headed by Jim Franks of the University of Southern Mississippi.

These data are used to model the movements of sargassum in the tropical North Atlantic, as well as within the Caribbean region. These data have also been used to determine the source of the massive blooms. GCRL research indicates a sargassum source region of equatorial origin, rather than connection to the Sargasso Sea. The GCRL research conducted by Franks and oceanographer colleague Dr. Don Johnson is ongoing.

Another effort to provide a satellite tracking application was being developed by Dr. Chuanmin Hu's group at the University of South Florida. We are happy to announce there is now an internet site with satellite imagery views of sargassum, which could provide early warning of where or when this seaweed will arrive or impact an area. While still in the development stages, this is a huge step forward for projecting where the weed will be and could allow countries in the impact areas time to prepare. Basically, there is an online Sargassum Watch System (SaWS) at <http://optics.marine.usf.edu/projects/saws.html>

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 Captain Gerrit Scheper, Master of Yachts and an RYA Instructor, will be providing sea instruction to complement trainees' online RYA Yachtmaster Offshore theory studies leading to practical and written examinations by RYA examiners in Grenada.



Contact schooneruth@gmail.com for information on joining the full program or program legs.

**Tall Ship to Circumnavigate for 7th Time**

Trudi Inglis reports: Starting in March 2018, the tall ship *Picton Castle* will set sail on her seventh world circumnavigation voyage under the command of Captain Daniel



Moreland. On board will be 52 crewmembers including 12 experienced, qualified staff crew and up to 40 trainees, many of whom have no sailing experience at all. "Trainees come from all over the world to sail with us," says Maggie Ostler, Voyage Coordinator. "Some have sailed before, some haven't. In either case, the experienced crew, the ship, and the sea literally teach them the ropes."

Alongside the professional crew, trainee crew stand watches. They learn to use the compass, to handle lines and sails, to steer the ship, to handle small boats, and to help with cleaning and maintenance. They will have the chance to learn sail-making, rigging, marlinspike seamanship and celestial navigation, even learning diesel engine operation for those who are inclined. While this is primarily a seafaring experience, trainees get time off in the various ports to explore ashore.

Making this particular voyage particularly special, other than being lucky number seven, is that while Captain Daniel Moreland has been in command of all of *Picton Castle's* previous voyages around the world, this will be his last. Moreland is recognized internationally as a leading authority on square-rig sailing and traditional sailing vessel rigging, and was recognized with a Lifetime Achievement Award by Tall Ships America in 2016. The upcoming voyage will be his eighth global circumnavigation personally, including seven in command of *Picton Castle*. Nobody alive today has made more around-the-world voyages in a square-rigger than Moreland.

Says Moreland, "When I started out, we used to say that there were more men alive who had walked on the moon than had sailed around the world in a square-rigger. Due to our voyages that is no longer true. But it is still true that far more folks have climbed Mount Everest than have circumnavigated the globe in such a windjammer."

Some of the ports visited on the voyage include Panama, a number of islands in the South Pacific, Bali, Mauritius, Reunion, Madagascar, South Africa, Namibia, St. Helena, Grenada and Dominica in the Eastern Caribbean, and Bermuda. The voyage both starts and ends in the UNESCO World Heritage town of Lunenburg, Nova Scotia, Canada.

Trainee applications are now being accepted. Candidates will be required to provide proof of good health and participate in an interview.

In the past 20 years, over 1,500 people of all ages and nationalities have sailed as trainees on board *Picton Castle*.

Visit [www.picton-castle.com](http://www.picton-castle.com) for more information.

**Happy Anniversary, Cruising Life!**

Four years ago, the e-book *Cruising Life: The Best Stories from Caribbean Compass* was published, and it became an instant hit! Here are just a couple of the reviews it garnered:

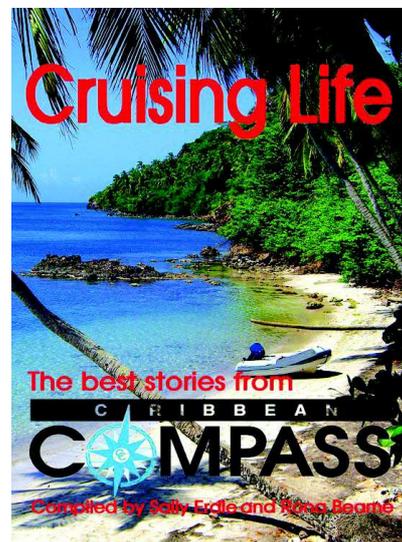
"This is a great collection of stories and articles from the Caribbean, and the first story will have you on the edge of your seat!"

— Betty Karl, author of *Island Fever*

"*Cruising Life* is packed with more first-hand knowledge of what you will find once you arrive in the Caribbean than any cruising guide or travel book. This book is a 'must have' for anyone who has visited or plans to visit the beautiful islands of the Caribbean."

— Bob Bitchin, *Cruising Outpost* magazine, [www.cruisingoutpost.com](http://www.cruisingoutpost.com)

*Cruising Life* is available from Amazon.com. See ad on page 36 for more information.



—Continued from page 13 ...Tracking Sargassum

It distributes daily images with surface currents so others can visually estimate sargassum aggregation and movement directions.

Thanks to this information, along with the work of Jim Franks, the migration paths and patterns of sargassum weed are becoming better known; ongoing research will allow better understanding of variation and aggregation patterns.

According to Dr. Hu, "...if there is a large sargassum aggregation in a 'hotspot' in the Atlantic in February, we can predict that there would be major blooms in the Eastern Caribbean in spring and summer. So this prediction gives at least two months of lead-time to respond to beaching events. For example, back in February this year we predicted that this will be another sargassum year for the Caribbean, and this turned out to be true.

"Longer-term prediction (e.g. next year or future years) is currently not possible because we don't know what caused inter-annual variations in the past, although in general we believe that future years will also have similar events."

**How Can Boaters Help?**

What can cruisers and other boaters do to assist in the development of this early warning system for the sargassum? Get the word out to other concerned people, and continue to report when and where you see the weed! This is especially important as now there is a working prototype for the early warning system, and more testing and validation are critical.

More data points mean more accurate prediction models, and there are still other parts of the tropical Atlantic to be added. This is especially critical for the equatorial cruising regions from West Africa to South America and the Caribbean, where transatlantic sailors, such as those in the Atlantic Rally for Cruisers (ARC), can face serious impacts. (Solo sailor Donna Lange, during her 2015-2016 circumnavigation, was trapped in sargassum weed off Africa; she had to use a machete to cut her boat free from a vast solid mat of weed more than a foot deep.)

By reporting data, cruisers will allow Dr. Hu's team to fine-tune the processing tools. GCRL's Senior Scientist, Jim Franks, asks cruisers to input their observations and data including latitude and longitude, photographs if possible (Jim will provide contact information in direct response to your report), and comments, to a website designed for reporting pelagic sargassum observations in the Caribbean and tropical North Atlantic. Data provided to this site will continue to be used by GCRL scientists and colleagues throughout the region to identify the source and

examine the movements and causes of extraordinary sargassum events.

Please file your report on the form at <http://gcrl.usm.edu/sargassum/sargassum.observation.form.php>



It's easy to use this site to report sargassum sightings

Likewise, Seakeepers.org and the Sargasso Sea Commission have also developed a reporting system where detailed information can be filled in a reporting card and e-mailed to PhD student Mengqiu Wang at [mengqiu@mail.usf.edu](mailto:mengqiu@mail.usf.edu) for validation of satellite observations.

In support of this data-collection effort, the international Seven Seas Cruising Association — the world's largest association of cruising sailors — is actively notifying their network of members via website and publications. We suggest other organizations do the same.