

Supplemental Content for Franks et al. 2016.

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Table S1. Locations and dates of reported sightings of massive pelagic *Sargassum* strandings in the tropical North Atlantic in 2011.

Location	Month	Day	Latitude N	Longitude W
Anguilla	8	1	18.224	-63.008
Antigua1	7	15	17.012	-61.733
Antigua2	8	10	17.04	-61.684
Barbados1	7	15	13.067	-59.569
Barbados2	7	15	13.33	-59.596
Barbados3	6	1	13.089	-59.456
Benin, West Africa	7	15	6.339	-2.213
Dominica1	5	30	13.896	-60.88
Dominica2	5	30	13.814	-60.896
Dominican Republic1	7	15	18.733	-68.423
Dominican Republic2	7	15	18.146	-68.577
Dominican Republic3	7	15	17.851	-71.275
Grenada1	7	15	11.947	-61.769
Grenada2	7	15	11.997	-61.152
Grenada3	5	1	12.123	
Guadeloupe	6	1	16.328	-61.268
Martinique	6	1	14.772	-60.916
Mona Island, Puerto Rico	7	25	18.076	-67.859
<i>Sargassum</i> Flight 4 Mile Line	10	22	18.578	-67.039
<i>Sargassum</i> Flight 7 Mile Line	11	26	18.632	-66.138
<i>Sargassum</i> Flight Antigua	12	23	17.105	-60.486
<i>Sargassum</i> Flight Line1	4	8	17.811	-67.083
<i>Sargassum</i> Flight Line2	9	26	17.819	-66.988
<i>Sargassum</i> Flight Line3	10	4	18.246	-67.598
<i>Sargassum</i> Flight Line4	11	17	18.609	-66.255
<i>Sargassum</i> Flight Line5	11	26	18.744	-66.18
<i>Sargassum</i> Flight Line6	12	2	18.968	-66.396
<i>Sargassum</i> Flight Line7	12	14	18.743	

Sierra Leone, West Africa	7	15	8.457	-13.279
St. Barts	7	15	17.912	-62.801
St. Croix	7	15	17.723	-64.732
St. John	7	15	17.742	-64.605
St. Kitts	7	15	17.279	-62.673
St. Lucia1	5	30	13.896	-60.88
St. Lucia2	5	30	13.814	-60.896
St. Martin	7	15	18.116	-63.021
St. Thomas	7	15	18.397	-64.857
St. Vincent	5	15	13.24	-61.097
Tobago	5	15	11.166	-60.76



Figure S1. Pelagic *Sargassum* beaching events in the tropical North Atlantic. (A) Pelagic *Sargassum* collected from Carlile Bay, Barbados, West Indies: *Sargassum natans* (left), *Sargassum fluitans* (right). (B) Mamora Bay, Antigua, West Indies, August 2011. (C) Baie de l'Embouchure, St. Martin, October 2011. (D) Lumley Beach, Sierra Leone, West Africa, July 2011. (E) Eastern coastline of Barbados, West Indies, September 2014. (F) Rutland Bay, Mustique Island, Grenadines, West Indies, July 2014. Photo credits: (A) Hazel Oxenford, (B) Max Freeling, (C) Marc Yokoyama, (D) Andrew Huckbody, (E) Hazel Oxenford, (F) Stuart Ward/Diane Wilson.

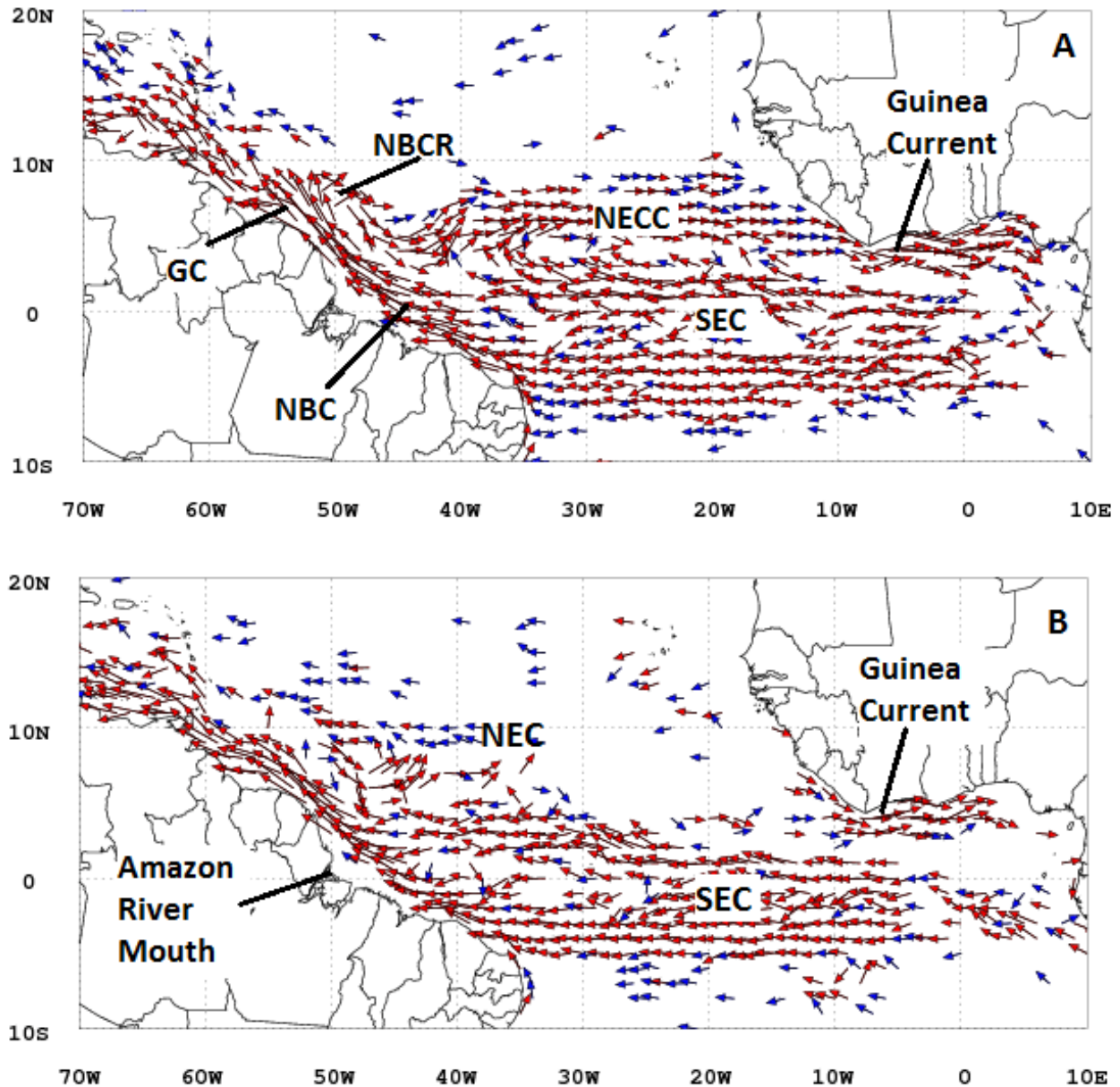


Figure S2. (A) Currents from satellite tracked mixed-layer drifters (1979-2014) averaged between June-September for all years. Vectors are plotted where the speed exceeds persistence criteria. Red vectors are plotted where averaged current speeds ≥ 0.25 m/s. Blue vectors are plotted where averaged current speeds ≥ 0.20 m/s and < 0.25 m/s. Blank spaces simply mean that observed current speeds did not meet the persistence criteria. NBC: North Brazil Current,

NBCR: North Brazil Current Retroflexion, NECC: North Equatorial Counter Current, SEC: South Equatorial Current, GC: Guiana Current. (B) Currents from satellite tracked mixed-layer drifters averaged for all years between December-March. Vectors are plotted as in Figure S2A. Note: the Guinea Current persists between summer and winter seasons. NEC: North Equatorial Current.

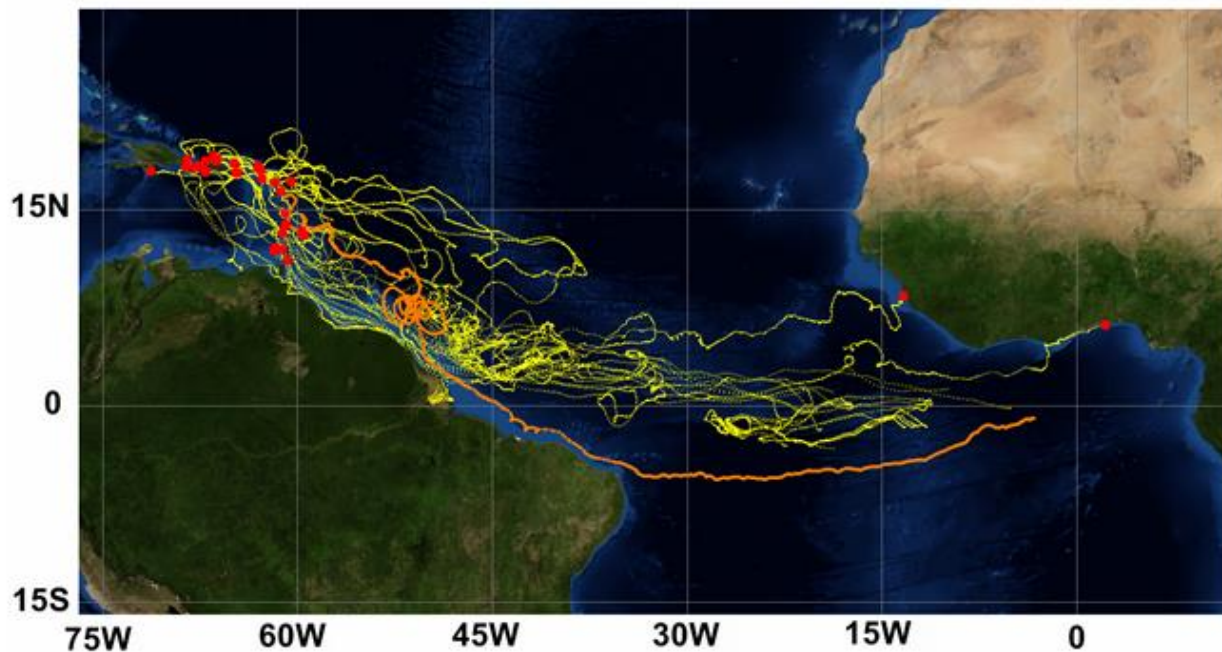


Figure S3. Model back tracks (yellow lines as dots at 6 hr intervals) from sites where pelagic *Sargassum* beaching took place in 2011 (red dots) and covering a period of one year prior to beaching date. For validation, orange line traces path of a satellite tracked drifting buoy over the same period of strandings. Note all tracks go to the equatorial region (including 2 from West Africa) with no connection northward to the Sargasso Sea.

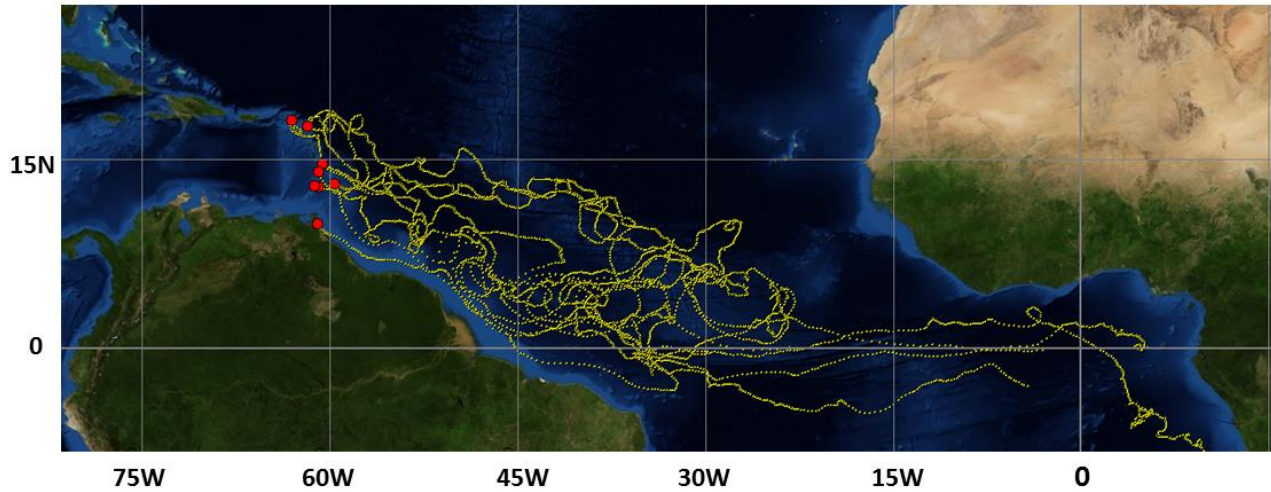


Figure S4. Model back tracks from stranding locations and dates (red dots) in the Lesser Antilles in the spring of 2014. It is noted that tracking to equatorial currents with linkage to the Gulf of Guinea is confirmed. Although one track leads back along the coast of SW Africa where pelagic *Sargassum* has never been reported, it is expected that this flow entrained pelagic *Sargassum* in the Gulf of Guinea.

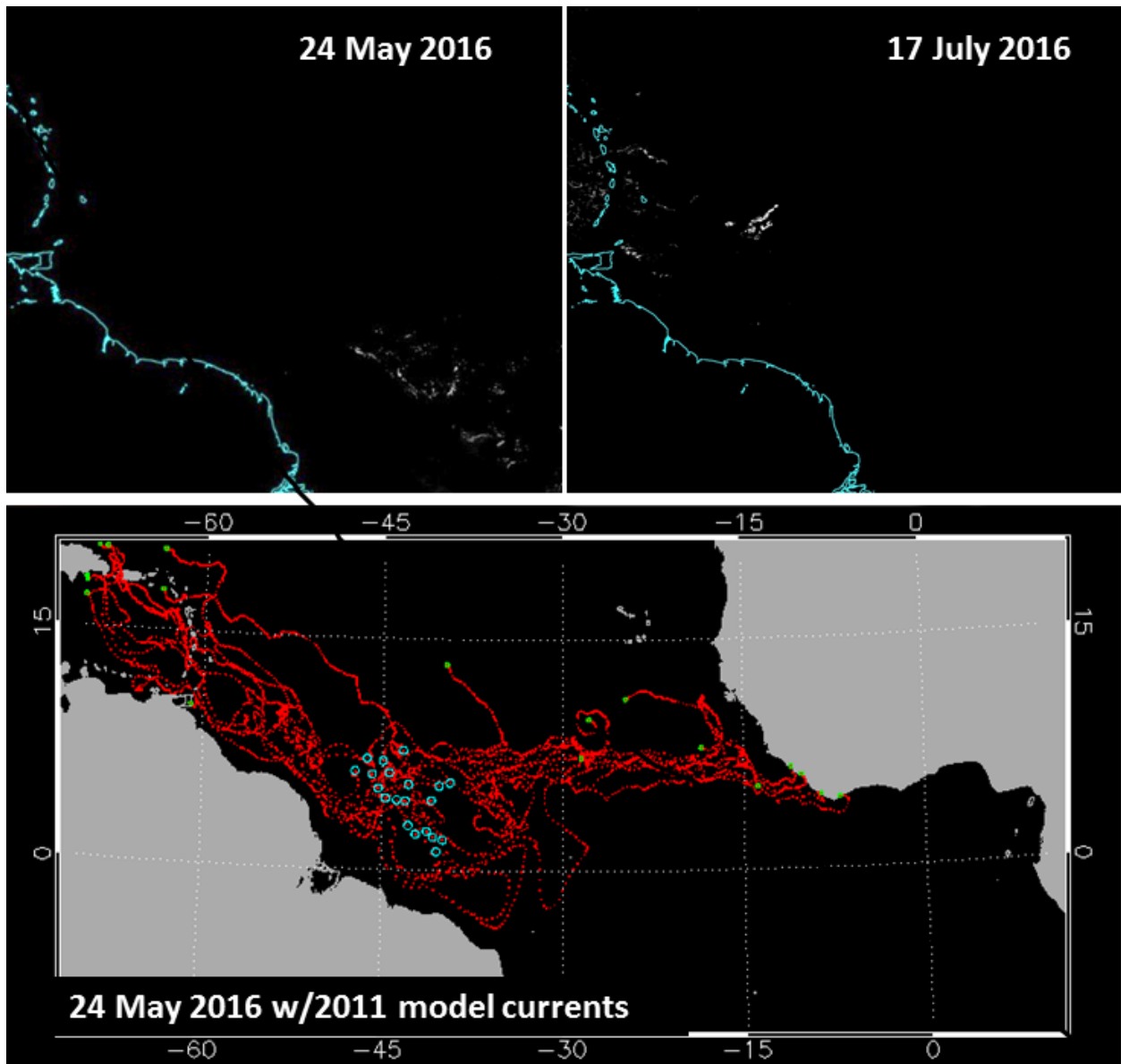


Figure S5. Efforts at predicting arrival of *Sargassum* in the Lesser Antilles in spring 2016.

Upper left: Satellite image of *Sargassum* (<http://optics.marine.usf.edu/>; Hu 2009, Hu et al.

2015) off the NE coast of Brazil on 24 May 2016 in the area of the NBCR (white pixels). **Upper**

right: Satellite image on 17 July 2016 showing arrival in the Lesser Antilles. **Lower:** Forward

tracking (red dots) from selected *Sargassum* locations (blue circles) in the 24 May image using

HYCOM model currents from 2011. Back tracking (not shown) from these locations showed several tracks cycling for over a year in the NBCR and other tracks to the Gulf of Guinea.