

The following supplement accompanies the article

Tracking jellyfish and leatherback sea turtle seasonality through citizen science observers

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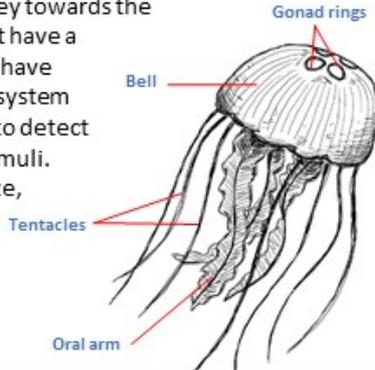
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Supplemental Material

Jellyfish in Nova Scotia:



<h3>WHAT IS A JELLYFISH?</h3> <p>Jellyfish are gelatinous, free-swimming organisms, with an umbrella shaped bell, and trailing tentacles. The tentacles are used to catch prey, and the oral arms move the prey towards the mouth. They don't have a brain, but instead have a simple nervous system that allows them to detect light and other stimuli. Jellyfish vary in size, shape, colour, tentacle length and density.</p> 	<h3>LION'S MANE (<i>Cyanea capillata</i>)</h3> <p>Characteristics: Large jellyfish, varying in colour (deep red, orange, purple and brown) depending on size and location. Has 8 clusters of long tentacles.</p> <p>Size: Up to 60 cm (can grow up to 2 m diameter, but not likely in our waters)</p> <p>Can it sting? Yes, always wear gloves, and do not touch tentacles</p> 
<h3>COMB JELLY (Ctenophore)</h3> <p>Characteristics: Not a true jellyfish, ctenophores are in a category (phylum) of their own. Transparent and spherical, with 8 rows of comb-like cilia (which help them move through the water).</p> <p>Size: Less than 3 cm</p> <p>Can it sting? No</p> 	<h3>MOON JELLY (<i>Aurelia aurita</i>)</h3> <p>Characteristics: Moon jellies have a transparent bell, with 4 petal (or moon) shaped gonads visible through the top of the bell.</p> <p>Size: Up to 25 cm bell diameter</p> <p>Can it sting? Yes, however very mild. Wear gloves as precaution.</p> 
<h3>Less common species:</h3> <div style="display: flex; justify-content: space-around;"> <div data-bbox="231 1467 486 1668">  <p>WHITE CROSS (<i>Staurophora mertensii</i>)</p> </div> <div data-bbox="550 1422 798 1668">  <p>SALP – individual or aggregated</p> </div> </div>	<h3>How to measure bell diameter:</h3>  <ol style="list-style-type: none"> 1. Wear gloves 2. Extend the tape measure so that it reaches from one edge of the bell to the other (don't include tentacles in measurement) 3. Record (cm's) on data sheet

Photograph references:

1. <https://s-media-cache-ak0.pinimg.com/236x/9d/b5/06/9db5063f001a5297ede0683cdeb1a6f.jpg>
2. Chris Harvey - Clark
3. http://img01.deviantart.net/8bbd1/f2009/215/N2/fox...s_mane_jellyfish_by_nukyppooky.jpg
4. http://3.bp.blogspot.com/_DkXyQ2R030A/1mhd7WNYtI/AAAAAAAAAAsy7uX0d0t452Q3/1600/Lion%2527s+Mane+Jellyfish2.jpg
5. http://3.bp.blogspot.com/_g5e2mc87LBA/Uo5UHT8Y0T/AAAAAAAAA0F-c/V68q5Sp6Q/s1600/jellyfish.jpg
6. <http://images.fineartamerica.com/images/artworkimages/mediumlarge/1/moon-jellyfish-aurelia-aurita-in-sea-peter-llja.jpg>
7. http://farm7.static.flickr.com/6074/6053245479_1885c4116_m.jpg
8. <http://www.gettyimages.ca/detail/photo/salps-washed-up-on-beach-amphipod-inside-royalty-free-image/549804485>
9. <http://community.joventure.com/2015/09/14/the-natural-word-salps/>

Fig. S1 – Jellyfish identification key sent to all citizen scientists. This key was used to inform citizen scientists on species of jellyfish common to Atlantic Canada, and to be used to help differentiate species during the beach surveys.

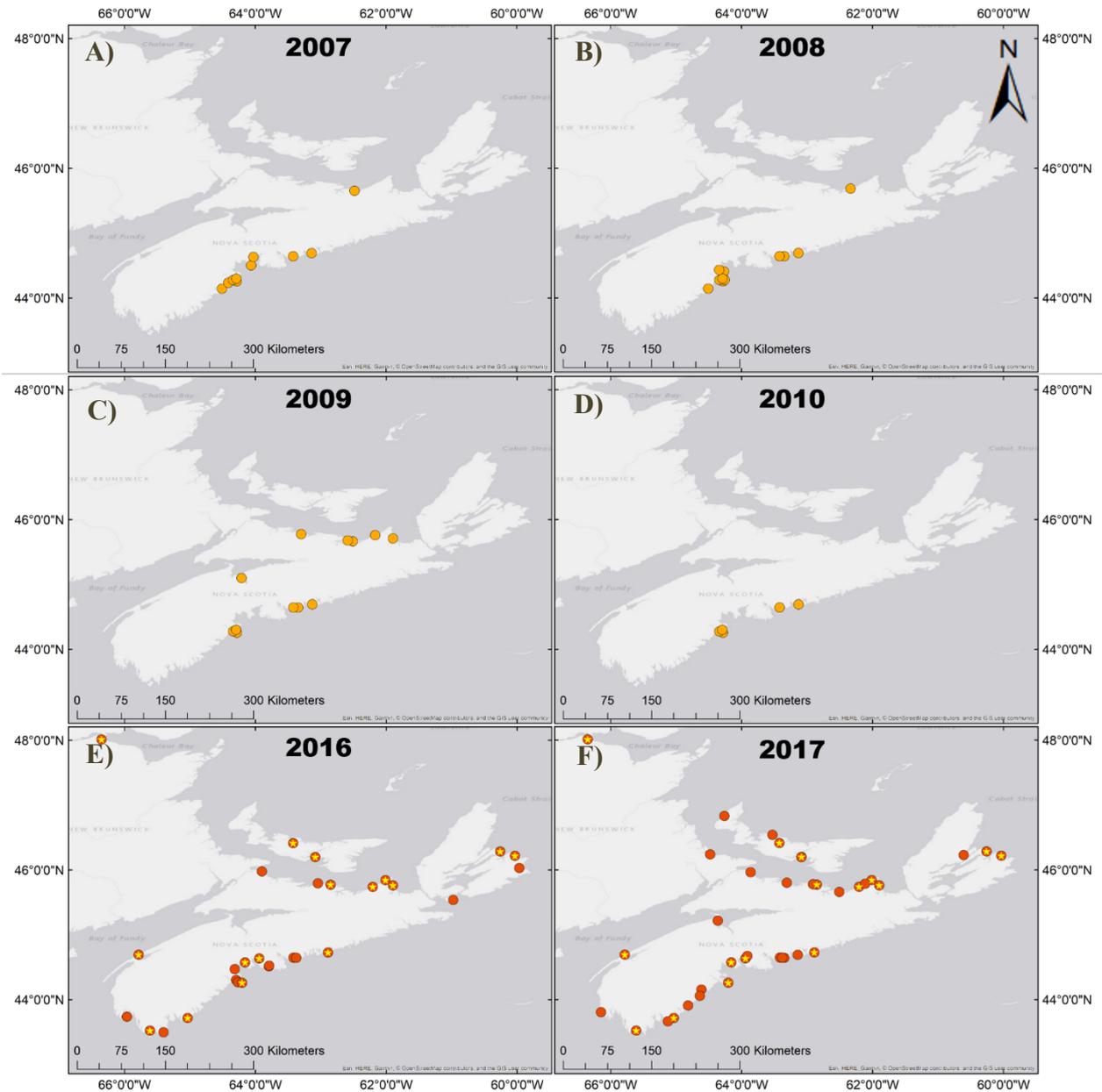


Fig. S2 - Citizen Scientist locations for all years (CSTN data and Dalhousie data), showing differences in effort and scale (number of citizen scientists involved and corresponding increase in geographic scale surveyed). A) 2007 with 10 citizen scientists; B) 2008 with 11 citizen scientists; C) 2009 with 12 citizen scientists; D) 2010 with 5 citizen scientists; E) 2016 with 29 citizen scientists; F) 2017 with 37 citizen scientists. Yellow stars in panel E) and F) represent repeat surveyors (those who monitored beaches in both years).

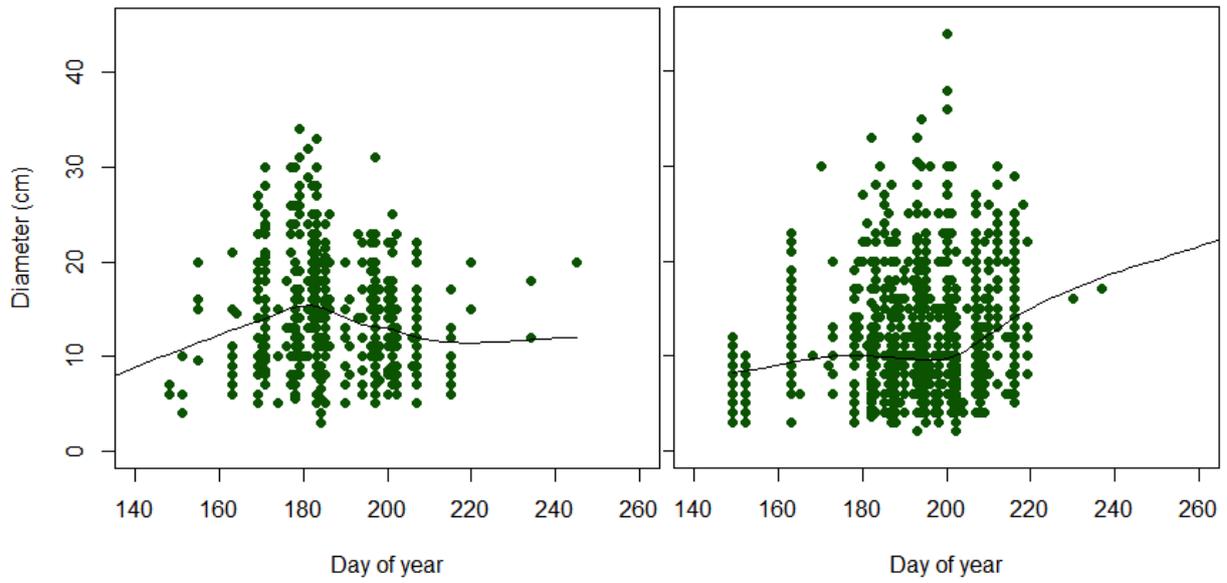


Fig. S3 - *C. capillata* diameter measurements (cm) and the day of year (2016 on the left, 2017 on the right), fit with a LOESS curve (2016: $r = -0.0919$, $n = 640$, $p = 0.0201$; 2017: $r = 0.1405$, $n = 1649$, $p < 0.0001$).

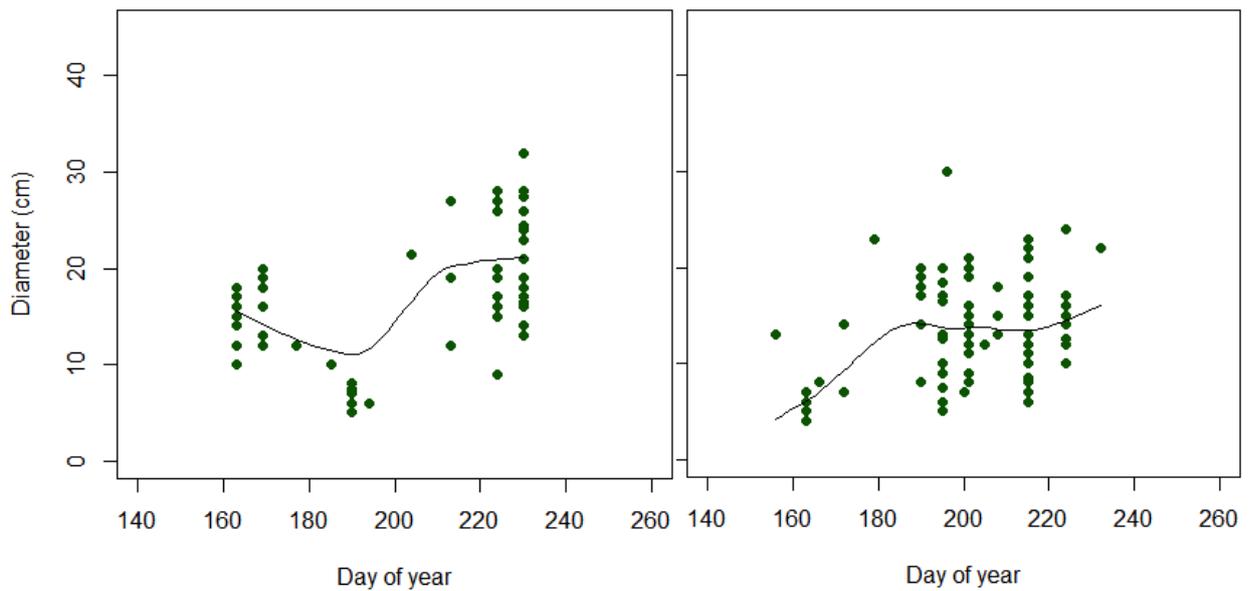


Fig. S4 - *A. aurita* diameter measurements (cm) and the day of year (2016 on the left, 2017 on the right), fit with a LOESS curve (2016: $r = 0.4965$, $n = 65$, $p < 0.0001$; 2017: $r = 0.4047$, $n = 121$, $p < 0.0001$).

Table S1- Six candidate models tested for possible linkages between jellyfish (*C. capillata*) present and environmental parameters. Model selection shown in bold. SST = sea surface temperature, Effort_wks = total survey weeks, Effort_CS = number of citizen scientists surveying.

Model	Variables	AIC	Resid. Df	Resid. Dev.	dAIC	Weight
polyS	Year, poly(SST_C,3), Chl, Region, Effort_wks, Effort_CS	123.8	108	97.8	3.2	0.06
polyS1	poly(SST_C,3), Chl, Region, Effort_wks, Effort_CS	121.8	109	97.8	1.2	0.18
polyS2	poly(SST_C,3), Chl, Region, Effort_wks	120.8	110	98.8	0.2	0.29
polyS3	poly(SST_C,3), Chl, Effort_wks	120.6	115	108.6	0.0	0.32
polyS4	poly(SST_C,3), Region, Effort_wks	123.2	111	103.2	2.5	0.09
polyS5	Year, poly(SST_C,3), Region, Effort_wks, Effort_CS	123.8	109	99.8	3.1	0.07

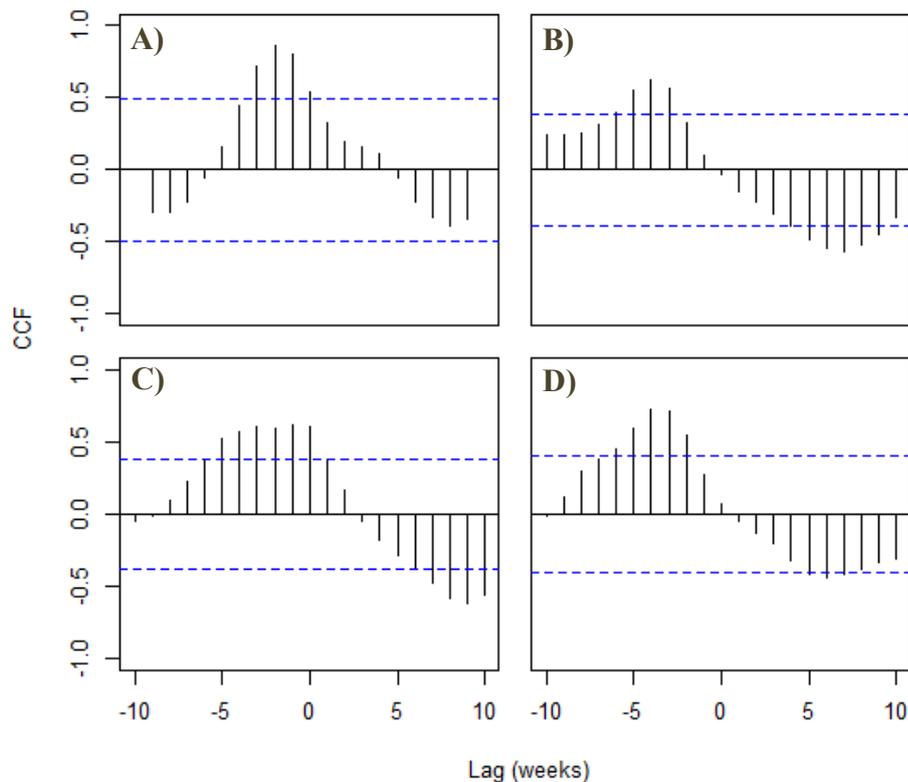


Fig. S5- Cross correlation function for leatherback residency and Scotian Shelf jellyfish sources for all years. A) DFO gfs jellyfish bycatch (significant correlations from week -3 to 0; with the highest correlation at week -2 (ACF = 0.859); B) Dalhousie citizen science jellyfish network (significant correlations from week -6 to -3; with the highest correlation at week -4 (ACF = 0.625); C) CSTN citizen science jellyfish network (significant correlations from week -5 to 0; with the highest

correlation at week -1 (ACF = 0.624); D) opportunistic email jellyfish sightings (significant correlations from week -6 to -2; with the highest correlation at week -4 (ACF = 0.724).

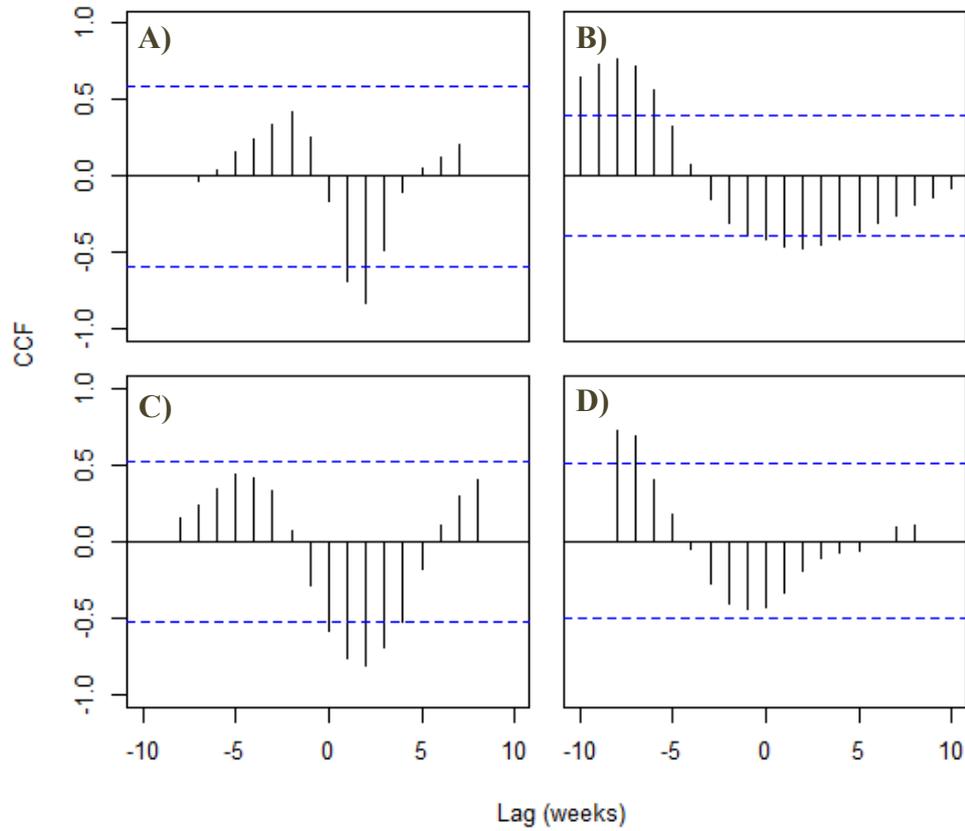


Fig. S6 - Cross correlation function for leatherback residency and Gulf of St. Lawrence jellyfish sources for all years. There was no clear pattern of cross correlation, with lags ranging from week -10 to 3. A) DFO gfs jellyfish bycatch; B) Dalhousie citizen science jellyfish network; C) CSTN citizen science jellyfish network; D) opportunistic email jellyfish sightings.

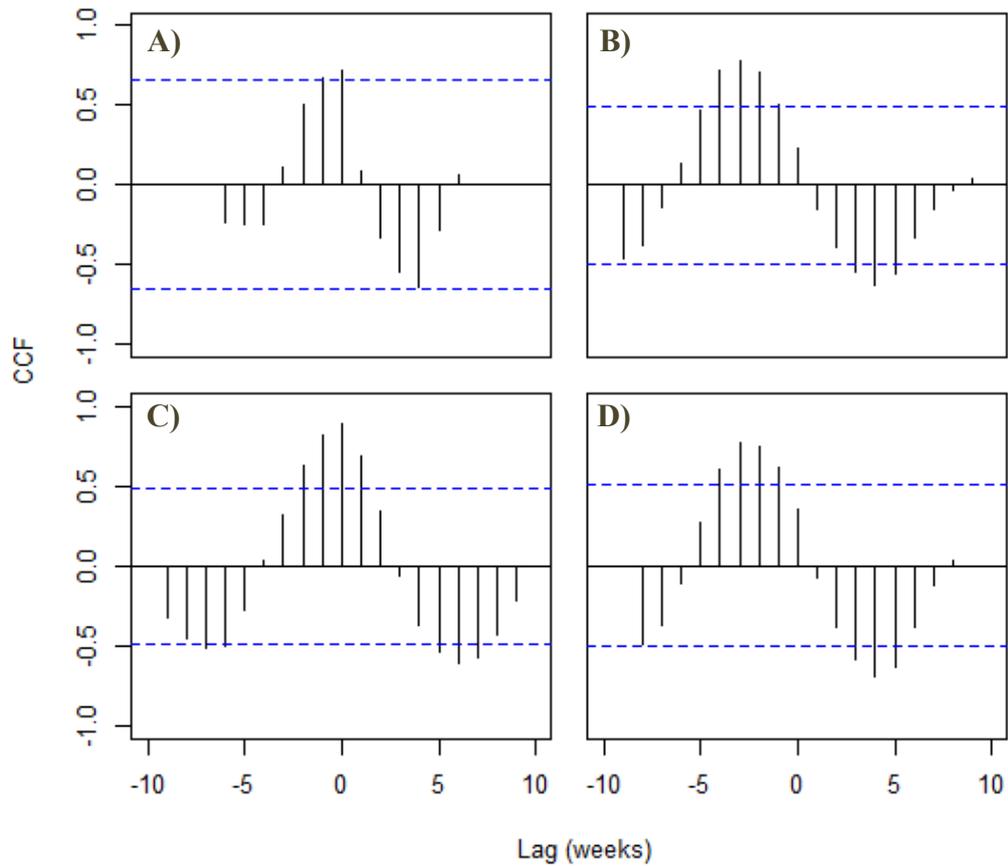


Fig. S7 - Cross correlation function for CSTN leatherback sightings and Scotian Shelf jellyfish sources for all years. A) DFO gfs jellyfish bycatch (significant correlations from week -1 to 0; with the highest correlation at week 0 (ACF = 0.715); B) Dalhousie citizen science jellyfish network (significant correlations from week -4 to -1; with the highest correlation at week -3 (ACF = 0.781); C) CSTN citizen science jellyfish network (significant correlations from week -2 to 1; with the highest correlation at week 0 (ACF = 0.897); D) opportunistic email jellyfish sightings (significant correlations from week -4 to -1; with the highest correlation at week -3 (ACF = 0.768).

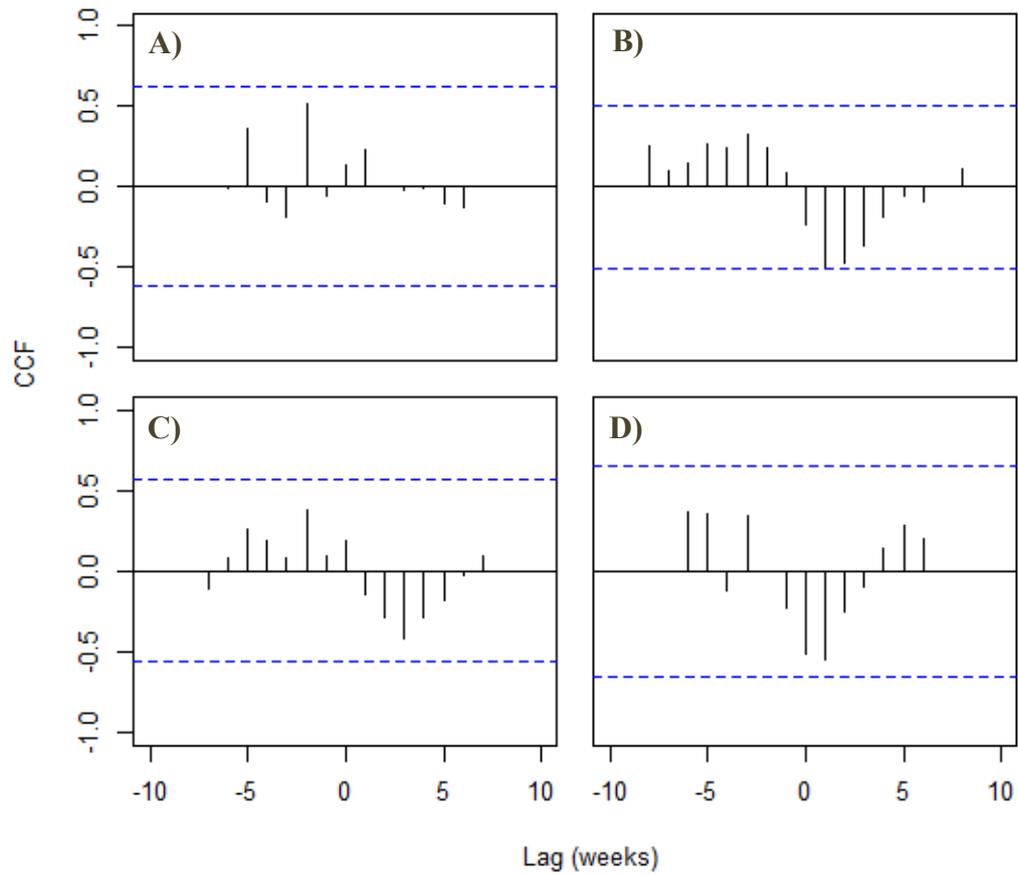


Fig. S8 - Cross correlation function for CSTN leatherback sightings and Gulf of St. Lawrence jellyfish sources for all years, showing no clear pattern of cross correlation, and no statistically significant correlations. A) DFO gfs jellyfish bycatch; B) Dalhousie citizen science jellyfish network; C) CSTN citizen science jellyfish network; D) opportunistic email jellyfish sightings.