General Comments
With the progress in the floating turbines technology, an increasing number of offshore projects are going to be implemented in coastal deep waters; offshore areas so far disregarded, are receiving now increasing attention like the US East coast.

In this context, this paper is timely focusing on the major meteorological phenomenon in coastal areas i,e, the breezes. It presents a methodology to detect the three types of sea breezes and their characteristic features, such as the calm zone associated with pure sea breezes and coastal jets associated with corkscrew sea breezes and discuss those feature in a wind energy prospective

Response: Thank you for your positive views on our paper. We sincerely appreciate the time you spent reviewing this work. In this revision, we have revised the paper substantially based on yours and other reviewers' comments. The key changes are

- The title of the paper has changed to *Detecting and Characterizing **Simulated** Sea Breezes Over the U.S. Northeast Coast with Implication for Offshore Wind Energy*.
- An additional analysis has been conducted to examine the variability of individual sea breeze cases.

Specific Comments
This paper is well structured and written but, in my opinion, the authors, should expand the discussion of the impact of the SB from the wind energy perspective. In fact, the authors show that there are calms and divergence zone that impact on single turbine production in different breeze types (pure and corkscrew and backdoor).

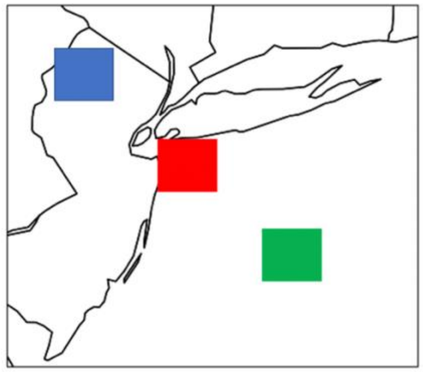
They found that "the power production associated with a 10 megawatts offshore wind turbine would produce approximately 3 to 4 times more electrical power during a corkscrew sea breeze event than the other two types of sea breezes". But there is more than this. There is the issue of finding the right layout of a wind farm or of wind farms clusters with respect to wakes; a wind farm might be split by a calm zone in at least two areas with different wind directions. In this case, the wake losses of the whole wind farm might be less and the production more.

Response: Thank you for your comment. You are right. The layout of the wind farm clusters will have a significant impact on the overall power output. However, to analyze such impact, WRF simulation with wind farm parameterization will be needed. That is beyond the scope of this study but will be serve as an interesting topic for the future work. Nevertheless, I have added a few sentences in the revised manuscript to discuss this matter.

"In addition, the layout and positioning of the wind farm might have a significant impact on the power output during a sea breeze event. For instance, a wind farm might be split by the calm zone but has more power production due to less wake loss. Therefore, finding the right layout of wind farm is also important for offshore wind energy."

@pag 10 the authors write " In addition, the location of the calm zone varies by cases, although most calm zones develop relatively close to the coastline " Here, my comment is that an analysis of the variability of the distance from the cost and the amplitude of the calm zone are variables s for sure of interest for projects developers.

Response: Thank you for your comment. We have conducted additional analysis to examine the variability of simulated sea breeze events to address your concern. Our results suggest that the temporal development of the calm zone for the pure sea breeze and the positioning of the coastal jet for the corkscrew sea breeze is rather consistent across their identified cases respectively.



To do that, we have defined three regions to quantify the variability of the identified sea breeze cases (as shown in the figure). They are located on land (blue), over the coast (red) and over the ocean (green). The size of region is about 3 % of the entire regional domain. For each sea breeze type, we calculate the standard deviation of WS10 and WD10 from the identified sea breeze events over all three regions from 08 LT to 20 LT, and the results are shown in the tables below.

Table1 : Variability of simulated pure sea breeze cases over land, coast region and ocean

Standard Deviation of WS10(m/s) for the Identified Pure Sea Breeze Cases													
	08 LT	09 LT	10 LT	11 LT	12 LT	13 LT	14 LT	15 LT	16 LT	17 LT	18 LT	19 LT	20 LT
Inland	1.4	1.3	1.2	1.1	1.2	1.3	1.4	1.3	1.1	0.9	1.0	0.8	0.8
Coast	2.3	2.0	1.8	1.6	1.5	1.4	1.3	1.4	1.4	1.4	1.3	1.2	1.4
Ocean	3.0	2.8	2.5	2.1	1.8	1.7	1.7	1.6	1.5	1.6	1.7	1.8	1.8
Standard Deviation of WD10 (degree) for the Identified Pure Sea Breeze Cases													
	08 LT	09 LT	10 LT	11 LT	12 LT	13 LT	14 LT	15 LT	16 LT	17 LT	18 LT	19 LT	20 LT
Inland	119	111	94	77	62	58	58	62	63	63	56	51	55
Coast	102	119	114	105	92	78	65	60	55	54	53	62	51
Ocean	118	129	112	108	107	116	115	110	106	97	85	78	76

For the pure sea breeze cases (Table1), the variability of WS10 is largest during the morning hours and decreases after that. Overall, the variable of WS10 is greater over the ocean than that on land. As for WD10, the variability is large during the morning hours. Note that, based on our methodology and the shape of the coastline, the pure sea breeze is identified from potential days of three different wind regimes (Northwesterly, Northly and Westly). Therefore, it is not a surprise that variability of WD10 is large during the morning hour. However, variability of WD10 drastically decreases after the morning hour due to the influence of sea breeze development. Note that the standard deviation of WD10 over the ocean is relatively large until late afternoon. This is mainly due to the development of the calm zone (Figure 6 of the manuscript). After the calm zone moved away from the coast, standard deviation of WD10 reduces significantly (16 LT to 20 LT).

Table2 : Variability of simulated corkscrew sea breeze cases over land, coast region and ocean

Standard Deviation of WS10(m/s) for the Identified Pure Sea Breeze Cases													
	08 LT	09 LT	10 LT	11 LT	12 LT	13 LT	14 LT	15 LT	16 LT	17 LT	18 LT	19 LT	20 LT
Inland	1.1	1.0	1.1	1.1	1.1	1.0	0.9	0.8	0.6	0.8	1.0	0.6	0.7
Coast	1.8	1.7	1.6	1.7	1.9	1.7	1.8	1.7	1.8	1.8	1.7	1.6	1.8
Ocean	2.4	2.3	2.1	1.9	1.8	1.9	2.1	2.2	2.3	2.5	2.4	2.4	2.2
Standard Deviation of WD10 (degree) for the Identified Pure Sea Breeze Cases													
	08 LT	09 LT	10 LT	11 LT	12 LT	13 LT	14 LT	15 LT	16 LT	17 LT	18 LT	19 LT	20 LT
Inland	68	67	58	48	42	43	44	43	43	44	40	46	40
Coast	79	80	69	55	45	36	32	35	28	28	28	35	31
Ocean	67	78	85	75	75	78	66	62	60	57	48	36	31

Table 2 shows the results from the corkscrew sea breezes. In general, the characteristics are similar to that from the pure sea breeze cases. One important aspect is that the small variability of WD10 over the coastal region during the late afternoon hours. This suggests that the position of the simulated jet core (Figure 7 of the manuscript) over this region is rather stable, which would have significant offshore wind energy implication in terms of wind turbine positioning.

Table3 : Variability of simulated backdoor sea breeze cases over land, coast region and ocean

Standard Deviation of WS10(m/s) for the Identified Pure Sea Breeze Cases													
	08 LT	09 LT	10 LT	11 LT	12 LT	13 LT	14 LT	15 LT	16 LT	17 LT	18 LT	19 LT	20 LT
Inland	0.9	1.1	1.6	1.7	1.6	1.7	1.7	1.7	1.8	1.4	0.8	0.4	0.3
Coast	2.4	2.3	2.2	2.4	2.5	2.4	2.3	2.3	2.3	2.3	2.2	2.3	2.4
Ocean	3.5	3.7	3.6	3.5	3.4	3.0	2.9	3.0	3.0	3.0	2.9	2.8	2.7
Standard Deviation of WD10 (degree) for the Identified Pure Sea Breeze Cases													
	08 LT	09 LT	10 LT	11 LT	12 LT	13 LT	14 LT	15 LT	16 LT	17 LT	18 LT	19 LT	20 LT
Inland	16	17	20	29	34	37	35	31	31	27	27	29	31
Coast	13	14	17	18	16	16	17	16	18	22	22	28	26
Ocean	107	94	42	37	58	65	78	62	36	24	17	22	29

Table 3 shows the results from the backdoor sea breezes. Because of low occurrence rate, It has the smallest variability, which also indicates that the development of the individual backdoor sea breeze does not differ much from the mean condition (Figure 8 of the manuscript).

Corresponding texts and tables have been added to the manuscript. Note that we did change the alignment of three regions in other attempts, such as horizontal and vertical. However, that does not have a significant impact on the results.