General Comments

The authors present an interesting study of impact of tropical cyclone track change on the air quality in Hong Kong. While the paper has good potential, more rigorous scientific analysis and improved presentation in writing structure need to be conducted for this manuscript to be appropriate for publication in *Science of the Total Environment*. I recommend major revisions to address the following comments.

Specific comments

1. The analyses presented in this study were focused on the summer months (from May to August). However, the tropical cyclones affected Hong Kong most in July, August, and September (Page 41, <http://www.weather.gov.hk/publica/tc/TC2014.pdf>) and the concentrations of RSP and O3 are generally lower in summer than autumn (Page 17, <http://www.aqhi.gov.hk/api_history/english/report/files/AQR2015e_final.pdf>). Why September and October were not included in the analysis? It should be more meaningful to include September and October rather than May and Jun for the analyses.
2. The study presents statistical analyses between the concentrations of different air pollutants (i.e., RSP, O3) and the locations of tropical cyclones, and highlights the importance of the tropical cyclone track change to the air quality in HK. However, more deep analyses are needed for better understanding of the processes and factors behind these statistical analyses. A case study perhaps is helpful to show the details.
3. There are too many grammar errors throughout the manuscript. Many sentences need to be improved. A professional language edit is needed.
4. Why does the study present the analysis on RSP rather than PM2.5 since PM2.5 has larger impact on human health than PM10?
5. As presented by the study, the increases in daily average RSP, daily average SO2, and daily maximum 8hr-avege O3 were closely associated with the tropical cycles that traveled near Taiwan. How can you know the impact was dependent on the occurrence frequency of tropical cyclones in Region 2 only? What about the impact of other factors such as intensity of the TCs, anthropogenic emissions?
6. Line 19: Please define RSP.
7. Lines 19-22: What time periods were these comparisons conducted? Should the comparisons be made for the days with TC occurrences in Region 2 between 1991-2000 and 2001-2010? The same question is for the comparison described in Lines 24-27.
8. Lines 30-31. It is better to delete “; as Hong Kong (HK) is situated at the mouth of the Pearl River estuary”.
9. Lines 35 and 37: “effects” should be “impacts”?
10. Line 36: Delete “prevail into”.
11. Line 44-45: Is it necessary to keep this sentence?
12. Line 46-47: Move “In the last two decades” to the end of this sentence and change to “over the past several decades”.
13. Line 47: Do these represent summer episodes? If that is the case, the statement may be not true. As pointed out by the HKEPD monitoring reports, the concentrations of O3 and the number of episodes are in general lower in summer than in autumn (<http://www.aqhi.gov.hk/api_history/english/report/files/AQR2015e_final.pdf>).
14. Line 49: Intense sunlight and high temperature are favorable for the formation of O3. The subsidence is not in favor of dispersion of air pollutants.
15. Line 50: change “;” to “.”. I do not think it is necessary to use “;” to link two sentences together. The same issue was found in other several places.
16. Lines 67-68: could be important too for the episodes in autumn.
17. Line 68: effect 🡪 impact ？
18. Line 71-72: with respect to?
19. Line 73: Again why can not be the episodes” in autumn ?
20. Line 79: A reference is needed for “the IPCC AR4 scenario”.
21. Lines 81-82: Some details about the tropical cyclone and air quality are needed.
22. Line 87: It should be “categories”, not “types”
23. Line 89: Delete “that happened in a particular year”.
24. Line 91: How to define TC track density?
25. L96: epoch or period or phase?
26. Figure 1: The three regions were not defined clearly.
27. Line2 114-115: Using a new independent sentence.
28. Lines 115-116: Please provide accurate definition of PM10 and PM2.5. The whole sentence needs to be rewritten.
29. Lines 118-121: Please be careful to use parallel sentences if they are not necessary. Please check this issue throughout the manuscript.
30. L127: change “in recent years, as shown in Fig. 2 a” to “(Fig.2a)”.
31. L135-136: grammar error, “wind” with “are”? Similar errors were found in several other places. Please correct them throughout the text.
32. Line 137: Does “prevailing circulation of southwesterly monsoon” use standard terminologies?
33. Lines 143-144: “ … a sinking airflow (shown in red)”. However, red color represents positive vertical velocity in Fig.3d-3f. Positive or negative vertical velocity represents subsidence airflow?
34. Line 154-156: grammar error. “the cumulative distribution function (CDF) … are …” ?
35. Lines 159-160: Please check grammar errors.
36. Lines 166-167: “the average mean”? “..concentrations …is…” ?
37. Line 168: “is” or “are”?
38. Line 168-170: A reference is needed here. Why not use the Hong Kong Air Quality Objectives for a comparison in this study?
39. Line 177: “))” ?
40. Line 178-181: The sentence structure is very confused. Please rewrite it.
41. Line 185: What does “which” represent?
42. Line 188-189: effect 🡪 impact? The intensity of tropical cyclone could exert an important impact on air quality in Hong Kong. It deserves further analysis on the impact of intensity of TC on air quality in Hong Kong.
43. Line 192: report 🡪 represent or a more appropriate verb?
44. L195: grammar error. “the CDF … are”?
45. L201: discourage 🡪 inhibit, encourage 🡪 are conducive to
46. L205: “are” is a grammar error. Too many grammar errors.
47. Lines 207-209: It is very messy sentence structure and needs to be rewritten.
48. Lines 212-215: need rewrite.
49. Line 217: WHO has been defined.
50. Lines 223-224: lower than that in KC?
51. Line 229: “when TCs in R2” is not a complete subordinate clause.
52. Line 245: Effect 🡪 Impact? The first … and the second …?
53. Line 249: concentrations?
54. Lines 250-251: “while … “ is not a complete sentence.
55. Lines 256-257: The sentence needs to be rewritten.
56. Line 258: attributed by 🡪 attributed to ?
57. Line 259: greater than that in … ?
58. Lines 259-261: “As China SO2 …. Fig. A1)” is meaningless.
59. Line 264: The caption deeds more details about Figure 6.
60. Line 265: delete “in terms of ozone”.
61. Line 266: The sentence is confused and has grammar errors.
62. Line 269-273: It has grammar errors. Again, please do not use long sentence structure if you cannot use it correctly. Please rewrite it.
63. Lines 276-279: Are there any evidences to show the impact of urban heat island?
64. Lines 279-282: Please rewrite the sentence.
65. Line 286-287: Very confused. The sentence needs to be rewritten.
66. Line 299: need “,” before respectively. Correct the same error in other places of the manuscript. What is “the observation”?
67. Lines 301-303: It is difficult to link these very local differences (among regions R1, R2, and R3 discussed in this study) with the global SST change.
68. Lines 309-311: Again the sentence needs to be rewritten. In addition, how can you determine the exceedance of AQ standards is only caused by the occurrence of TCs in region R2? Could it be caused by increase in the anthropogenic emissions transported from the PRD region?
69. Lines 326-328: It is true but you did not present any analysis on the change in O3 precursors (e.g., NOxand VOCs) in the section 3.
70. Line 334-337: There is no doubt that the O3 concentrations on the days with TCs occurring in region R2 (typically causing O3 episodes) were higher than the average concentrations in summer. This sentence is meaningless too.
71. Lines 337-339. The sentence needs to rewritten.