

Interactive comment on “40 years High Arctic climatological dataset of the Polish Polar Station Hornsund (SW Spitsbergen, Svalbard)” by Tomasz Wawrzyniak and Marzena Osuch

Anonymous Referee #1

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In this paper, authors presented a unique meteorological dataset from an Arctic weather station in the Svalbard Archipelago for the period of 1979-2018. The paper is very well-organized and the dataset presented is a very useful contribution to the monitoring of remote northern regions that can be used for testing and evaluating hydrology, weather, and climate models and to validate remote sensing products. I recommend publishing the paper after a minor revision and addressing the following comments.

General comments:

1. I am wondering if the authors can provide information about snow depth and snow water equivalent, which are key elements for the Arctic environment. How about soil

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temperature and moisture and permafrost information?

Specific comments:

1. Title: Replace "40" with "Forty"
2. Line 7: Replace "SW part" with "southwest".
3. Line 9-10: Start as a new sentence and rephrase it as "Therefore, the described time series of observations in this paper are of unique value."
4. Line 11 (also line 58): I would remove ", systematic," as we use "systematic" for errors and not observations. Also, add "and compare" after "analyse" in the line above and remove "and comparing the corresponding data". Change "rely" to "relying".
5. Line 16: Spell out "PANGAEA" or introduce it.
6. Line 19-20: Rephrase the sentence and remove the "if condition".
7. Line 23-24: Add references for this claims: "The climatic characteristics are primarily determined by astronomical factors, but there are differences in the mechanisms that cause a regional warming trend and determine their magnitude."
8. Line 26: Replace "ocean and atmospheric" with "oceanic and atmospheric" to be consistent.
9. Line 37: Change to read as "There are evidences for anomalies and changes in the recent years in western Spitsbergen, including higher are temperature ...".
10. Fig 1 caption: Add "in the Svalbard Archipelago" to the end of the caption
11. Line 46: Replace "became" with "has become".
12. Line 51: Use lower case for "Station" here and anywhere else (e.g., in line 53) that does not follow a name. Use short sentences with clear "subject" and "verb" in each sentence. Verbs like "covered, raised, and covered" need a subject. For instance, it can be used as "it is covered/raised".

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13. Figure 2 and other figures if relevant: I am wondering if you can add the significant trend values on the figures.
14. Line 121: Check the grammar here and throughout the manuscript. Here, add "are" before "not considered".
15. Table 2: Are the numbers with a star sign statistically significant? The caption is confusing. You should assign the symbols for those that are statistically significant not the opposite. Define variable indices in the caption, e.g., What is VV? I suggest removing RH and maybe WS columns as they seem not statistically significant.
16. I suggest removing Figure 3 for relative humidity, because it is somehow presented later in Figure 5 in the form of atmospheric vapour pressure and it does not show any significant trends, not monthly nor annually.
17. Line 141 and throughout the paper: Replace "a lack of a statistically significant trend" with "a statistically insignificant trend".
18. Line 156: Rewrite as: "...creates a relatively moist climate in SW Spitsbergen region, which ...
19. Figure 7: Remove the trend line if it is insignificant (e.g., line 197). Same goes to Figure 8.
20. Figure 9 can be easily merged to Figures 8 and 10.

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