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Temperature at the Coast, and Inlands[1]

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Abstract by Jan-Erik Solheim and Jens Olaf Pepke Pedersen

We can divide the land climate in two categories: the continental climate with warm summers and cold winters, and the maritime climate with cool summers and mild winters. This is a report of a project where we have analyzed temperature data 1900-2010 from many (thousand) meteorological stations across the world, to figure out the difference between maritime and continental stations. We have found that we can divide the stations into two types: The ocean air affected (OAA) areas and the ocean air sheltered (OAS) areas. The latter are found in valleys which are sheltered from wind from the oceans as shown in Figure 1 as blue areas.

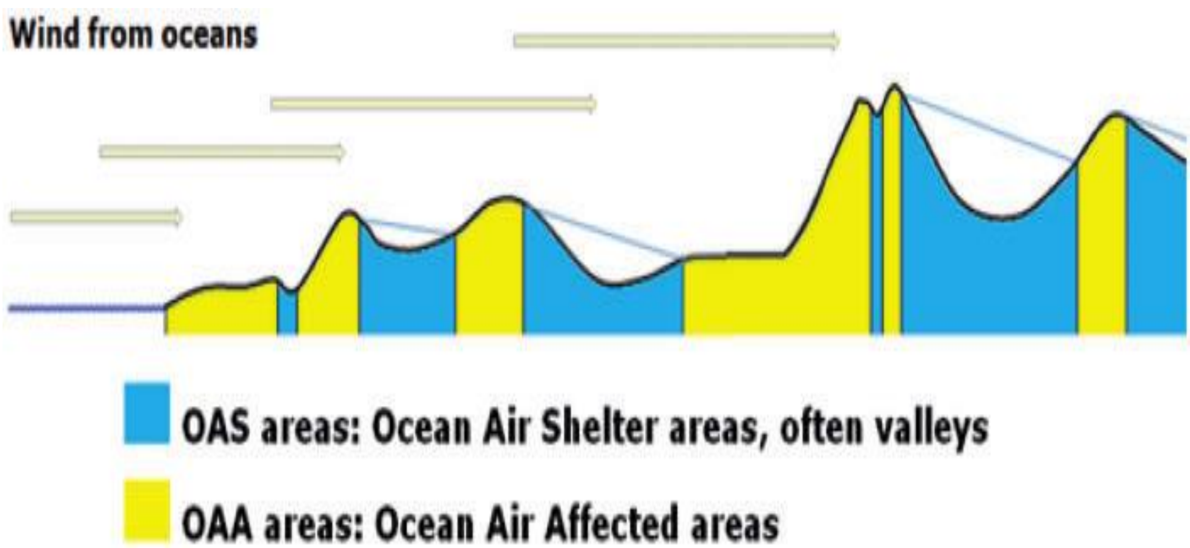

Figure 1. OAA and OAS locations with respect to dominating wind direction.

Since OAA and OAS areas often are located nearby, we have not included OAA/OAS border areas. We have also excluded areas which behave as OAS at certain wind directions, and like OAA stations at other directions. We have analyzed 16 geographical areas, and the result for 10 of those are presented in our first publication (Lansner and Pedersen 2018). The rest will be published later (Lansner and Pedersen, preprint).

All areas analyzed show the same pattern: OAS series show a sine wave with a peak heating event 1930-1950, which is not seen in the ocean data. Another heating peak appears 2000-2010 in the OAS series. This has the same or lower amplitude. The OAA data have an almost linear trend 1900-2010 and the two series follow each other closely from 1950. This is demonstrated in Figure 2.

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[1] The talk can be seen here: https://www.youtube.com/watch?v=4xb2Rr2PPkI (Recorded by Yngvar Engebretsen).

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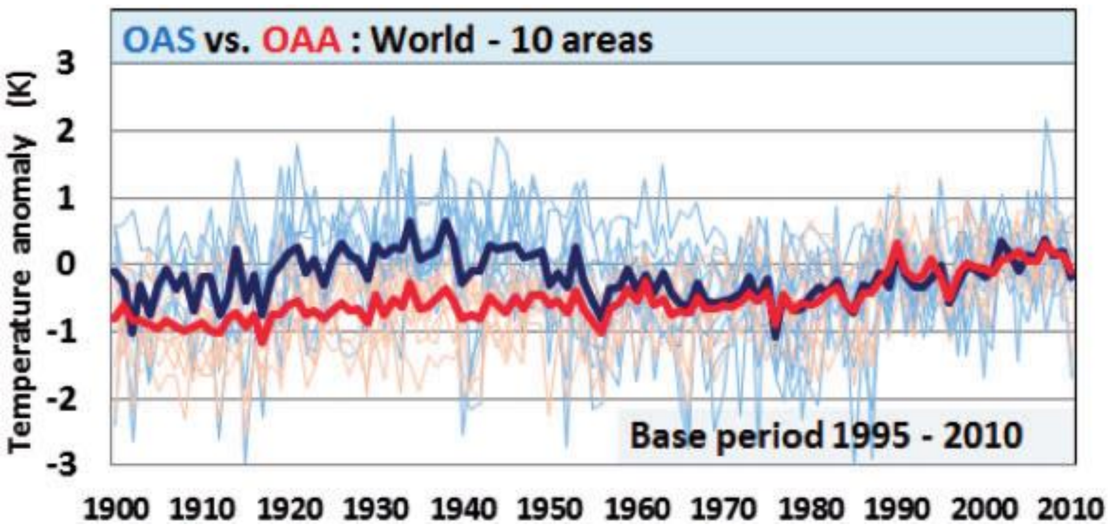

Figure 2. Global averages for OAS temperatures (blue) compared with OAA (red).

The ocean data does not show the heating waves, just slowly increasing temperature of the surface layer. This is demonstrated in Figure 3, where the OAA series (red) is compared with the HadCRUT sea-surface temperature (HADNMAT2(black)). The linear trend for the HADMAT2 series 1900-2010 is 0.71K/century, while we find for the OAA set a slope of 0.78K/century. Therefore, they are close.

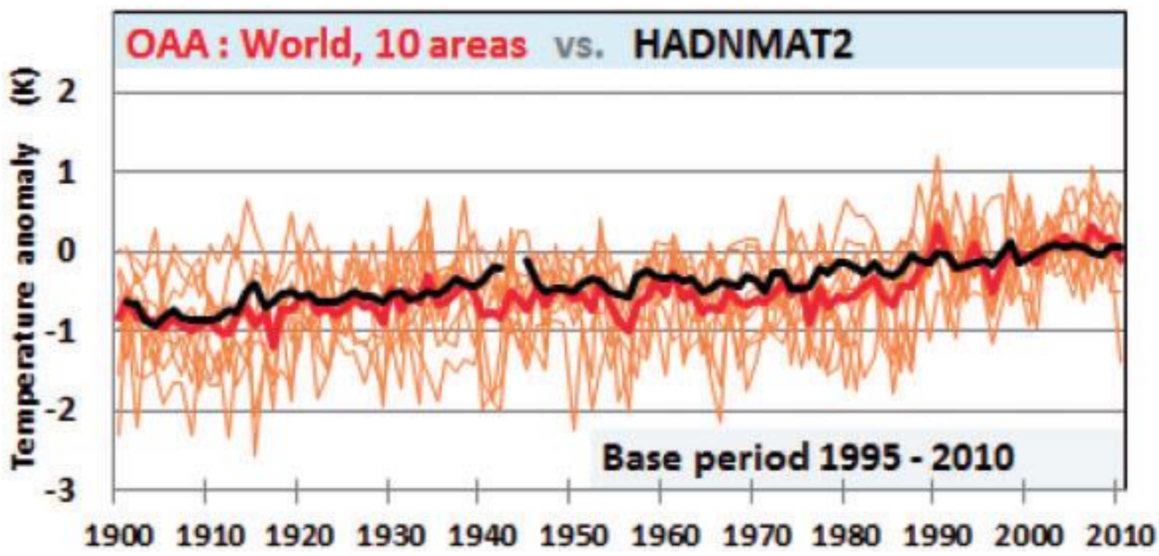

Figure 3. Sea surface temperature (HADMAT2) compared with OAA.

Comparing OAS areas, we see larger variations in areas closer to the Arctic, but the same trend as in other areas. The same with the OAA data. This is a result of the Arctic amplification. For the North, Central and South Americas, the trends are the same, but in the OAS data, the 1930-ties are considerably warmer than the peak at the end of the century.

The OAS and OAA data from an area are always from the same source, so the differences we find are not due to different sources. The sources of data used are Meteorological Yearbooks (Europe), NOAH GHCN v2.raw, National Archives, Nordclim, Tutiempo, World weather records and statistical yearbooks.

We have also compared our results with "corrected" data series and find that they assume a trend and correct the data to fit the expected trend. The BEST collaboration even states this clearly: They adjust the data to follow the "expected trend". This is clearly wrong. All land areas have two correct temperature trends. Temperature corrections fails by ignoring this.

Examples can be found in the Alps, where OAS data are ignored, and only one trend is assumed to exist. Data from mountain peaks are accepted. They look like OAA data and are not changed. The same happens for Scandinavia. Comparing the original data sets with the European Center data sets, we found that data before 1950 were missing. The same with continental Europe data.

The result is that the warm peak in the 1930-ties is only seen in the original data. Extreme examples are from Hungary where most stations have a temperature drop of 1.5K in the period 1934-1980 which is not seen in the adjusted data sets.

Conclusion

Any land area has two different, but correct, temperature trends (+ intermediate trends). In contrast, all official institutions are adjusting or homogenizing the data expecting one trend, not two. To decide on the amount of warming due to CO_2, one should compare with OAS stations, which show little or no warming after 1950, just the same or a smaller cycle than in the 1930ies.

Why do we need a large extra CO_2 heating after 1950 to explain "no extra heating after 1950?". The CO_2 emissions, exploding after 1950, seem to have no effect on the temperature when we delete the ocean noise.

Reference

Lansner, F. and Pedersen, J.O.P. 2018, **Temperature trends with reduced impact of ocean air temperature**, Energy and Environment, 29, 613-632. https://doi.org/10.1177/0958305X18756670