Community comment

The author addresses an interesting topic in the insurance world. (Extratropical cyclone) Storm losses in Europe have been relatively low in the last two decades compared to the stormy 80s or 90s. Although standard atmospheric indices such as the NAO or AO, whose positive phase is associated with increased storm activity over the North Atlantic and over Europe in general, have tended to increase again in recent years, recorded storm losses (insured) seem to be below average. The author introduces a new class of hemispheric indices which, on the decadal time scale, provide an interesting explanation for the weak storm damage signal in Europe in recent years.

On first reading of the article, I found the writing style, findings and conclusions reasonable, but on second reading I got the impression that there are still some statistical weaknesses in the manuscript. In my opinion, these weaknesses should be corrected before a decision can be made about a publication.

- The author thanks Dr. Klawa for reading the manuscript and giving his time to provide feedback on important aspects of storm climate. The author appreciates the opportunity to discuss these topics.
- The revised manuscript is improved by answering the questions raised by Dr. Klawa.
- Referee 1 made specific recommendations about statistical weaknesses and these are addressed in the revised manuscript.

The author compares a storm loss signal with hemispheric indices on decadal scales. If we regard the loss history in Fig. 1, we can easily see the dominant storm loss of the year 1990, which was caused by a remarkable storm series within just 6 weeks (Daria, Vivian, Wiebke etc.). This single dominant year is probably the main reason why the shape of the loss curve in Fig 4 or 5 (11 year running mean) increases drastically after 1985 and drops down after 1996. I wonder, if we would discuss the findings of the author differently, if we remove the very specific year 1990, or replace the storm loss of that year by an average storm loss. I am afraid that we are discussing a random signal here: If we consider storm losses we should be aware, that the exact position of a storm footprint has an huge impact on the loss amount. If the storm does not cover the densly populated areas of Europe even a severe storm produces a small loss. Perhaps, the author could use number of events above a loss threshold instead of loss amounts.

- The revised manuscript contains new material on how to interpret 1989/90 in the context of the European windstorm loss history
- Specifically, the third paragraph of the new Section 4.4 addresses this issue, by analysing the new loss dataset, and a new Figure 9 is included too
- In brief, the population weighting was removed from the model loss equation to form a Storm Severity Index (SSI) reflecting storm hazard strength, and the SSI timeseries indicates the period 1980-99 was much stormier than other periods, including the 21st century
- The new analysis also finds the SSI and loss timeseries are highly correlated
- Dr. Klawa has correctly anticipated that 1989/90 is less extreme in terms of SSI, than losses. However, other seasons in that period are more anomalous in terms of SSI. In particular, the profoundly stormy January 1993 in Scotland (especially northern parts with low exposure) has more anomalous SSI than loss. It was found that the average SSI in the 1980s and 1990s are as anomalous as the losses. The SSI suggests the 1980-1999 period was much stormier as a whole, which would raise the chance of a very extreme loss year like 1989/90.

I would be more comfortable with the new HGIs if the author could show us scatterplots with HGI vs. loss (on a yearly basis, not decadal). Do these yearly HGIs perform similair compared to NAO or AO? Otherwise

the impression could be given that these HGIs do work only on decadal scales and that they are just a result of a random hit, which produced the correct up and downs in the graphs.

- The proposed new index, intended to explain recent low losses, is removed from the revised manuscript.
- The original manuscript had a roughly 50:50 weight on developing a loss dataset, then comparing it to some climate indices, including the proposed HGI. The revised manuscript is now more dedicated to describing the data and methods of the loss dataset, and its validation. The development of a new climate index, specifically to explain the low level of recent losses, is suggested as potential future work in the revised manuscript.

Specific comments

Ln 27: Which are the storms exceeding 20 bn USD?

- Figure 2 of Barredo (2010) gives storm losses in USD indexed to 2008, and when trending these to 2022 using 5% p.a. (from Klawa and Ulbrich, 2003), then Capella (1976), 87J (1987), Daria (1990) and Lothar (1999) would have losses above 20 bn USD. (Note Barredo investigates economic, rather than insured losses.)
- These storm names are added in the revised manuscript.
- The trending of losses in the 21st century is reviewed later in the new manuscript, and a growth of 3.5% p.a. is suggested, slightly lower than the Klawa and Ulbrich (2003) value of 5%. Note that these four named storms would have economic losses above 20 bn USD if trended using 3.5% p.a. from 2008 to 2022.

Section 3.1: Maybe I read it over, but does the loss estimation include the whole of Europe? The losses are compared to the PERILS Data. The PERILS losses cover only selected countries.

- The domain of the new loss dataset covers the same 12 countries included in PERILS loss estimates, which together represent the vast majority of insured losses in Europe.
- The domain of study, and PERILS losses, is shown in the new Figure 1 of revised manuscript.

Section 3.2: The author recalibrates the loss estimation for recent years, because there seems to be an overestimation of winds in the ERA5 data. Is this a known issue for ECMWF (https://confluence.ecmwf.int/display/CKB/ERA5%3A+data+documentation#heading-Knownissues) or is there any personal communication with ECMWF?

- This is not in the list of known issues, and the author has not discussed it with ECMWF, to date.
- More generally, the potential for non-meteorological trends in ERA5 quantities is discussed in the manuscript, in the fourth paragraph of section 4.2, and first paragraph of section 4.4.
- Further, the revised manuscript contains an investigation of how ERA5 winds have a different multidecadal trend than observed gusts from the Global Summary Of the Day (GSOD) dataset.
    - A minor point: the key issue is how ERA5 event-max winds have a flatter trend from the late 20th to 21st centuries, rather than "*overestimation of winds*". (ERA5 winds are almost always lower than station point observations, due to the former's reduced spatiotemporal resolution.)
- This topic is also mentioned as a candidate for further work in the revised manuscript: to explore the potential to improve ERA5 gusts with information from observed gusts.