

**Note of a call between the EurACI WG and representatives from the (North American) ACI on Monday 1<sup>st</sup> July 2019**

Present

EurACI WG:

Philip Shier (Host) (PS)

Marcin Zwara

Philip Gruber

Matt Modisett (MM)

Dirk Popielas

Marianna Papamichail (MP)

Svilena Dimitrova

Fabian.Qazimi

David Bogataj

Anna Edwards

Tom Hoedemakers

Edmond

Matthias Pillaudin

Falco Valkenburg (FV)

North America:

Doug Collins (DC)

Steve Jackson (SJ)

Patrick Wiese (PW)

Rob Montgomery

PS opened the call by welcoming four colleagues from North America who had very kindly agreed to take the time to give us some background to the development of the ACI and address queries which we had.

DC gave a brief overview of the history which began about 10 years ago when Solterra Solutions were engaged to work on the development of a climate index; the work was then taken over by the four sponsoring associations and maintenance of the data and production of the index is currently managed within the SOA (headed by PW). The first index was published in November 2016 and there are quarterly updates.

DC commented that there were issues in relation to some of the 6 components of the index such as:

- The wind component is an average rather than an extreme
- Rainfall (Rx5) doesn't capture the dynamics of heavy rain over a long period
- Maximum dry days is an interpolation of annual figures, which doesn't for instance capture a situation where there are a number of dry periods separated by one rain day.
- Sea level not available for all coasts and measured relative to ocean floor which may also be changing

There was also a concern that the regions (12) and grids were too large, particularly as ACRI would need more granular data.

To address these and other issues, the organisations were actively considering the development of a Version 2.0. It was generally agreed that ideally this would have a global remit, with all of the existing/proposed indices being dealt with consistently; perhaps this could be done through the IAA? There would of course be issues of resources/cost to be addressed.

PW pointed out that using gridded data means that they have to take what is provided by the bodies who do the gridding, so that they may not be able to use the preferred metrics if these are not gridded. Gridding avoids the problems of individual stations not having all the data but there can still be holes in the gridded data. He noted that in the most recent release, there was a Data Disclosure which addressed the removal of some grids due to a lack of consistent data. They now only used grids with 90% persistency in each decade. It was also noted that data is only provided if the centre point of the grid is over land rather than water. There are about 500 grids and 5,000 stations with sufficient history (from 1961). In the northern less populated regions, there are big gaps between stations; one possible way of dealing with this would be to use satellite data.

PS queried why it was necessary to go back to 1961. SJ advised that the meteorological definition of climate is 30 years with anything shorter than that being variations in weather. DC said that it was decided to use 1961 to 1990 as the reference period; ideally they might have used 1951-1980 as 1980 coincided with the beginning of the increase in volatility in weather events, but 1961-1990 was chosen. However, if the data isn't available, then a shorter period would have to be used.

MP asked about correlation of the components. PW advised that T90 and T10 are correlated as one might expect, but otherwise there was nothing significant. DC commented that there was negative correlation locally between heavy rainfall and drought but this tended to be averaged out over the grids. SJ, who is involved in the development of the ACRI, noted that if you look at the components more granularly, it is possible to see some correlations in specific months within regions, which could be important from the ACRI perspective.

There was further discussion on how to deal with holes in the data; DC said that this was initially addressed by putting text in the release pointing out the potential shortcomings but that over time, as the holes increased, it was felt that this was insufficient so the approach of removing the grids with data holes was adopted.

FV asked if there was any documentation available on Version 2.0 as it would seem sensible for us to start from this, but DC advised that this was still in the early stages and was unlikely to go live for perhaps 3-4 years.

PW advised that once the system is up and running, producing the update is not time consuming; these are produced and reviewed before issue by the volunteers. The history is recalculated each time (the previous figures are stored) even if there has been no change in the methodology as data

is often updated or amended by the data providers. The Index history was recalculated for the most recent disclosure with some of the data removed but there had not been a huge change.

MM noted that he hadn't been aware that Version 2.0 was proposed and agreed that we should try to work on this together; it was noted that this becomes more complicated if Australia is also included due to the time differences. MM asked how long the Version 2.0 project might take; DC felt that there were 2-3 years' work to do on the technical side, but there would also be a need to look at legal issues such as ownership.

MM also queried whether averaging the data over the regions was the best way to collate the available information and PW confirmed that Version 2.0 would look at other ways of summarising data which would better preserve the detail of local events. He mentioned that the NOAA website has details on severe events.

[PW subsequently emailed as follows

Below is a link to NOAA's Climate Extremes Index. NOAA's index uses a different approach (relative to the ACI) for summarizing weather extremes across large geographic regions.

<https://www.ncdc.noaa.gov/extremes/cei/>

Also, below is a link to a paper that provides information about the GHCNDEX gridded dataset that we in our T90, T10, Rx5day and CDD calculations.

<https://journals.ametsoc.org/doi/full/10.1175/BAMS-D-12-00109.1>

I can't recall how deeply this paper delves into the issues of the underlying quality of the station data from which the gridded data is derived. But I think the paper at least touches on the issue.]

FV asked about the original objectives of developing the ACI, and how it was received. DC said that the original objective had been primarily to develop the profile of the profession but also to provide useful data for insurers. Whilst there had been success in relation to the latter objective, with good coverage in the trade press, and lots of data downloads, it hadn't been picked up by the national press.

MM noted that we shouldn't just project history but should make recommendations for the future in the public interest. DC noted that this had been discussed but the focus of the sponsors at this stage was to provide retrospective information and not endeavour to predict the future. PS commented that while predicting the future might not be wise, we could attempt to model the sensitivity of future outcomes in possible future scenarios, but in any event this was beyond the scope of the current project.

PS thanked our North American colleagues for their time and helpful comments, and said that we would probably need to come back to them in future; DC and PW said that they would be happy to assist.

**Philip Shier**

**16 July 2019**