DRAFT
Meeting with ECA&D

Attendance:

ECA&D: Gerard van der Schrier
Rubert Konijn
AAE: Philip Shier
Falco Valkenburg
Marianna Papamichail
Loudina Erasmus
Dirk Popielas
Matt Modisett
EIOPA: Marie Scholer (by Webex)

Date: 2019 Sep 5

1. Introductions

   An introduction was done by Mr. Valkenburg underlying the role of actuaries in the societal evolution and its aim to help establishing a European climate index as our colleagues in America and Australia have done so far.

   Mr. Shier the Chair of the EurACI WG, spoke about a practical and feasible way to get to action and produce the climate index. The EurACI group is interested in the first place on data collected and analyzed by the ECA&D Institute. We are also interested on the data interpretation and use. Mr. Popielas underlined the vast amount of capital the Germany industry involves, about 1,3 trillion Euros and the impact the EurACI needs to make on its management and investment. The participants agreed that although pension funds would be an interested party, they do not show much interest as insurance companies might do

2. Slides were presented by Dr. Schrier
3. Data available
   a. Across different regions and regulations (Turkey data are missing).
   b. Plain observations, no interpretation.
   c. Ground data, ships & ocean platforms and aeroplanes as well as independent volunteers, farmers mainly.
   d. Wind is covered less but being done in collaboration with Madrid (reference?). No gridded data set for wind yet. Is being worked on. A gridded data set for wind is expected to become available in March 2020. **Link Provided**
   e. Similar for Drought: a gridded data set is expected to become available in Summer 2020
   f. Tide and mean sea level information from Liverpool **Link Provided**
   g. Hail data is currently being developed (working together with Achmea).
   h. Hamburg organisation looking in to Sea data, difficult since ships move. But long time series since 18th century.
   i. ECA&D only has Insitu (ground) data. This is E-OBS)
   j. Non-standard data in general
      i. There exist methods to manage non-standard data **LINK PROMISED**
      ii. Some data is provided voluntarily (e.g. 80-year old retired farmers)
      iii. Other different, e.g. urban vs countryside
      iv. Dynamic measurement research **Link Provided**

        v. E.g. Temperature homogeneous but precipitation different. Difference in North vs South Europe.
    k. Data used in a variety of work, e.g. Biology of migration
    l. They have access to geographic models (elevation, urban definition, nearest sea, etc.) that can be used as indicators in a climate model
4. Use of data
    a. For non-commercial use, all grid data (derived data) is freely available.
    b. Data use comes with assistance – there is a monitored help email for which they try to have turnaround of 2 days.
    c. Under no circumstances could station data be available. The agreements with their (numerous) providers do not allow further dissemination of data. However, the ability of the download to allow custom regions allows quite refined area cover, likely providing a mitigation of the region issues the N. American index encountered.
5. Open to new data and used
    a. E.g. Cold spells could be done if useful (e.g. to study impact on diseases)
    b. Alternative measures of precipitation or temperature
    c. E.g. Snow cover they already have (fuel for glaciers).
    d. Available or easily created:
        i. Extreme precipitation
        ii. Forest fire index: combination of dry spell, dry wood rate and soil moisture
        iii. Earthquake information
6. Renewable energy → more weather dependent (e.g. wind, hours of sun shine) → opportunity for insurance products in this area?
7. The WMO state of the climate for Europe was discussed.
8. Extreme Value theory and attribution analysis in climate **Link Provided**
   Dr. Schrier informed the EurACI WG that a country with missing data is Turkey. After that he made a detailed presentation about the actions overtaken by the Institute and mentioned that a 2 meters' rising sea level by 2100 is something that the Netherlands could cope with, but above that, the situation might get serious enough. He mentioned in his presentation that the date 04.08.2003 was the hottest day in Europe. He also mentioned that the temperature is a more homogenous measure than precipitation between regions. He also mentioned that we should not necessarily confuse extreme meteorological phenomena with climate change. The former needs an extreme value statistics approach, while the later a "Climate attribution" approach. This kind of analysis is performed by best experts of the institute. He also spoke about WMO which has set standards on data collection, so after 2000 data are more comparable and bear significant quality and more credibility. As an example about data incomparability he mentioned that the time of the day that someone measures the rain gauge affects results very much and often a small deviation in the beginning of a measurement affects disproportionally the results. He mentioned that the institute have not grided data for winds. Also the Liverpool laboratory has established a sea level index, what the institute has not yet analyzed. Other measures that the institute is examining are hail, snow days, days with temperature below 0 degrees as well as cold spell days. At the question of Mr. Shier on what is the scientific definition of "ensemble" Dr. Schier replied that it is a collection of data that might appear identical on the first place but lead to completely different results because of the different initial conditions under which they are observed and collected.

9. AAE needs
    a. Information about how station data is refined into derived data. **Link Provided**.

10. Financing
    a. Climate Change Service financing comes in part from Copernicus (European Commission).
    b. Other contributors are The Netherlands ministry, the EU, Schiphol Airport and others.
    c. Though they have occasionally sold some products to companies (Swiss Re had a nominal charge) this is not their general source of financing.
11. Initial advice on EUR ACI
    a. Use gridded data (freely available) but with more detailed regions that N. Americans have done. In fact, do not define regions upfront, but use the software's ability to custom define regions. Relevant regions will also differ depending on what data is looked at.
    b. Station data is generally not free and would require contracts with various different meteorological measurement organisations in various jurisdictions.
12. Where could the Actuarial Profession help them?
    a. They mentioned assistance with Attribution, i.e. attribution of risks to climate effects. Only 5-6 people in the world do this in climate though it is common in insurance.
    b. Act as a user in Copernicus projects

Finally Dr. Schrier encouraged the AAE team to be officially registered as user to the ECA site

Comments I have noted down:

Gerard was very clear and giving us advice that we should **not split Europe into subregions** like North America or Australia did. He was mentioning that we should use a flexible way of showing and building various indices. Temperature is pretty homogeneous, but other parameters like wind or precipitation might not.

Additional great parameters to watch and include could be:

- Snow cover
- Cold spells
- Ground moisture
- Hail-

In addition, Gerard and Rubert recommended to work with maps and visualize as much as possible. Pattern become much clearer instead of using regional data sets only.

Gerard asked for any support with regards to climate attribution work that is done at the moment only by 5 or so scientists worldwide.

EAC&D is open for any suggestion of additional parameters or analysis to be useful to us (may be for a second step).

Work on a European Project for (open minded), but not wait for global project to be happen in the first place).

As a follow up, Gerard provided the following links:

* A document which gives some guidance to the National Meteorological Services on how to make measurements and how a measuring station should look like (the standardization) is the so-called CIMO-guide. It can be downloaded from the website of the World Meteorological Organization at: https://library.wmo.int/index.php?lvl=notice_display&id=12407#.XXI1E_zLdhF
* The Climate Attribution work is pioneered by our colleague Geert Jan van Oldenborgh and his colleagues of the World Weather Attribution: https://www.worldweatherattribution.org/. The attributed events usually end-up as an article in the peer-reviewed literature, like the study on Harvey: https://iopscience.iop.org/article/10.1088/1748-9326/aa9ef2. A more introductory piece appeared some time ago in Nature Climate Change: https://www.nature.com/articles/nclimate3089
* The Permanent Service for Mean Sea Level (https://www.psmsl.org/) is the place to access tide gauges (I thought it was based in Plymouth - it's Liverpool)
* The work we are doing to construct interpolated maps for wind speed is done with dr. Fidel Gonzalez Rouco from the Universidad Complutense de Madrid (https://www.ucm.es/directorio?id=9828). He is involved in the NEWA project (http://www.neweuropeanwindatlas.eu/)