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User Workshop on Observations for Reanalysis

ERA-CLIM2 User Workshop on Observations for Reanalyses 21 June 2016

9th ACRE Workshop and Historical Weather and Climate Data Forum

University of Maynooth, Ireland, 20-24 June 2016

Introduction

ERA-CLIM2 co-organized the 9th Atmospheric Circulation Reconstructions over the Earth (ACRE) Workshop at University of Maynooth, Ireland, 20-24 June 2016 and, within that umbrella, held a User Workshop on Observations for Reanalysis on 21 June 2016. Many ERA-CLIM2 project members attended both workshops and presented ERA-CLIM2 related work.

The ACRE community deals with rescuing and analysing historical weather observations and their impacts. The community is thus both a provider of observations for reanalysis and an important user of (mainly historical) reanalysis products for their analysis. There is thus a two-way interaction between the communities. Several members of the „Twentieth Century Reanalysis Project“, including Gil Compo, also attended the workshop which provided a good opportunity to discuss reanalysis efforts.

9th ACRE Workshop and Historical Weather and Climate Data Forum

At the 9th ACRE workshop, four presentations introduced the work of ERA-CLIM2 (by ERA-CLIM2 members). The presentations were focusing on the recovery of historical observations for reanalysis, inventorising, and building a web-based global registry for metadata and for information on data rescue. Also, analyses of historical data retrieved within ERA-CLIM2 were shown. ERA-CLIM2 was thus featured prominently in the workshop. Furthermore, it was interesting to see that the ERA-CLIM reanalysis ERA-20C has become a widely used products that also appeared in many other presentations.

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The specific ERA-CLIM2 user workshop was physically attended by 44 person, three persons the joined the conference remotely via a video link and asked questions to the speakers.

The workshop was organised as a session within the 9th ACRE Workshop. It comprised 3 presentations (Leo Haimberger, Stefan Brönnimann, Elke Rustemeier) and 1 poster (Elke Rustemeier). These presentations were more strongly focusing on the link between reanalyses and historical observations.

In the first presentation, Leo Haimberger introduced the ERA-CLIM reanalysis products and ten focused on the upper-air temperature. He showed how, on the one hand, reanalyses can be used to detect quality issues and homogenize upper-air temperature by making use of

background departure statistics, on the other hand he showed how reanalyses can profit from assimilating upper-air data. However, there are still important issues. For instance, the uneven coverage of upper-air data in the early decades leads to unphysical interhemispheric differences.

The presentation by Stefan Brönnimann then briefly introduced the data rescue work of ERA-CLIM2 and showed how these data were used in ERA-CLIM2. Specifically, he showed several comparisons between ERA-20C and other reanalysis with historical observations. Comparisons were shown for storms, upper-level winds, and historical column ozone data. The later analysis specifically showed the value of assimilating historical upper-air data in that the experimental ERA-PreSAT analysis that assimilates upper-air data performed clearly better than the other ones.

In her presentation, Elke Rustemeier compared trends in precipitation in ERA-20C and in observation-based products, highlighting the agreement and differences with respect to climatology and trends. Aspects of data quality and homogenization of the same work was then presented in a poster.

Lessons learned

The workshop led to important exchange between reanalysis and observational communities. Knowing the status of global data rescue activities is important for reanalyses, as is the expertise on data issues by the ACRE communities. Conversely, the latest reanalyses with expertise on their generation is important for the ACRE community.

- An important mutual concern was the Quality Control (QC) and homogenization of historical observations.
- The workshop demonstrated the importance of historical observations from the Southern Midlatitudes for global reanalysis efforts.
- Several results pointed to benefits of assimilating marine winds (which is done in ERA-20C but not for instance in 20CR), but this should be further improved
- Results very clearly demonstrated the benefits of assimilating historical upper-level data.