Review ESSD-2019-0, Rescue daily climate data

Regardless of its political wrappings (GFCS, WMO, etc.) does this data product add substantial reliable value to European climate data? If so, how can users verify? What have the authors accomplished by their efforts that make this data rescue effort notable and that qualifies this product for publication in ESSD? Clear answers do not emerge from the present manuscript.

Page 5 line 100: Authors introduce the acronym “DARE” which this reviewer understands as shorthand for DAta REscue but we get no definition. The authors use this term several times throughout the manuscript so we need a definition.

Figure 1 highlights two potential data deficiencies: absence of stations/data (beige background color) and existence of stations but data not downloadable (red dot). But the narrative talks about spatial data coverage and temporal data gaps, while the rescue products refer to undigitized data. In fact Spain - with relatively weak spatial distribution at least according to Fig 1 - and even France have substantial spatial data coverage problems but apparently nothing to rescue? But didn’t France already address their data coverage issues through their SCOPE climate project, e.g. https://doi.org/10.5194/essd-11-241-2019? So if this study then focused on the red dot regions, e.g. where data exist but either not downloadable (according to caption in Figure 1) or not digitized (according to narrative) - and the reader gets no overt explanation of difference if any between not downloadable and not digitized - then northern Europe particularly Poland and Czechia seem most ‘red’. If the Balkans represent a “a key region for data rescue missions” (page 5 line 113) that designation must include additional factors such as relative ease of access to non-digital data? Saying nothing about the quality of the digitization effort, the authors have neither justified nor clarified, at least according to Figure 1, their choice of stations to rescue!

Apparently most of the data came from the NOAA site. And most of the remainder from the Croatian DHMZ? In the end, most rescued data came from Czech Republic (40%) and much fewer from other Balkan countries? Table 1 not helpful, need it in English s.v.p! By stations: 11 in Czechia, 5 in Slovakia, 3 in Serbia, 2 in Boznia and 1 or none in other Balkan countries. I make this point because after the authors claimed to have chosen stations for data rescue based on spatial/temporal analysis, it seems that in fact they rescued data primarily according to convenience of access. I do not criticize here, any other data rescue project would confront the same issues? I think however the authors have claimed an analytical approach but proceeded on much more an availability approach. If true, they should clearly inform readers! Nothing from the ‘red’ areas of Poland, Italy, Portugal?

Page 6 line 133 “INDECIS project represented a great opportunity to rescue all this amount 134 of non-digitized daily data by using the same data sources already scanned.” So this effort only involved digitization of data sheets already scanned. Good, valuable if well done, but misleading to claim full data rescue? This team digitized data, but data that others had arleady scanned, e.g. partially rescued?

Page 6 line 139 “secondary data sources are more prominent to keep transcription errors than original data sources”. So the NOAA data were already transcribed? Transcribed but not digitized? Very confusing here, a reader can not determine at what level this work started from nor subsequent levels of digitization, cross-checking, validation, etc. Does their use of the word ‘keep’ here imply that prior transcriptions from the scanned data sheets had already induced errors, or that the scanned sheets somehow have a higher possibility to induce subsequent transcription errors? Reader does not understand what the authors intend.

Page 6 line 146 “an inventory of candidate climate series to be rescued was created prioritizing those stations not included in ECA&D” So the data rescue effort focused on existing WMO-

labelled stations that had data in the NOAA or DHMZ archives but had not yet found their way into the ECA%D archive. Not a criticism, but very far from from the analytical approach (identify spatial and temporal gaps in key regions) hinted at earlier. This is the hard reality of data rescue efforts, the authors should admit it up front.

Page 6 line 153: Here the authors claim 50-year digitization periods for most of their data rescue efforts but in their examples (Figures 11 to 13) for WMO station 13274 (Belgrade - and do they designate that as central European or Balkan?) they only demonstrate a 15-year backward extension tail (1920-1935) on an already-available 80-year record (1936 to 2017). Not a good visual or quantitative demonstration of the impact of this effort. No validation against other stations or other sources.

Page 7 line 194: “a second and more sophisticate (sic) layer of quality control routines must be run to detect non-systematic errors hidden in climate data for future climate analysis” Who will do this subsequent necessary step? The data as rescued here remain of limited value without subsequent QA steps?

A large number of transcription error detection and validation schemes exist, several of them described and applied to other ESSD data sets. The ‘key as you see’ and WMO protocols cited here do not cover all the identified source and transcription errors. This reader wishes the authors had evaluated their particular source materials more carefully, referenced other transcription methodologies (including novice/expert or two-reader techniques), and done more than simply follow WMO recipes. Or, tell us why not?

For reasons already mentioned, this reader did not find the 15-year data assessments for the Belgrade station particularly useful or convincing. As larger issue, we find very limited quality control - mostly related to transcription rather than climatology or metrology - and almost no validation. Does the ECA&D data product, as amended with these newly-rescued data, now produce better records of extremes (flood or drought) across Europe? Does ECA&D now offer a better fit to re-analyses? This reader did not find evidence, beyond number of daily staton data digitized or efforts spent in digitization, that these data made any useful contribution. One presumes the authors intended such a contribution, but they have largely failed to convince readers and future users.