

## General comment

The UK-Flow15 dataset is a valuable addition to the large-sample hydrological datasets, where sub-daily resolutions are especially scarce. Thank you to the authors for the tedious work of collecting and controlling the 15 minute data for this large amount of gauging stations.

I think it is great that you give a usage example of the quality flags, this is very helpful to show how the comprehensive quality control measures can be useful. I think the usage example would be more illustrative and less technical, if the quality controlled data would be used for a very basic use case, e.g. about analysis of high floods.

The example also shows that the QC flags can be very useful to identify data quality issues, but in the end, time series still should be checked visually. This is not a bad thing, but the flags also have some degree of uncertainty, I think this is important to mention and highlight.

The accessibility of the dataset could be improved by giving an easier way to bulk download the entire dataset, and by giving better wget instructions (see comments in Dataset section).

## Specific (minor) comments

- title: maybe use e.g. “river flow dataset” or “streamflow dataset” instead of just “flow dataset”. At the moment, it is not clear from the title that this is a hydrological dataset.
- L14: “assessing hydrological change” → what do you mean here? For which type of changes do we need 15-minute data?  
Maybe include here that working with 15-minute data is especially necessary in small catchments, where dynamics are rapid.
- L18: state the exact number of gauging stations (instead of “over 1,300”)
- L49: I think you could cite a few more CAMELS datasets here (of your choice, I don’t usually see the one from Brazil cited as an example, so you could add one or two more)
- L52: CAMELS-GB v2 (containing hourly time series for UK) is already available (preprint paper, the dataset is already accessible)
- L66-L88: I think these two paragraphs could be merged into one / restructured, as some aspects are repeated (floods, high-intensity events, climate change), the opening of the two paragraphs are very similar (“the lack of ...”).
- L97-100: maybe add that also the comparability of results from different studies can be improved by offering a consistent data base (instead of each researcher collecting slightly different data again)

- L133-135: the numbers of the hydrometric areas don't tell me anything here, I think they don't need to be mentioned here
- L144: "the closer the fill is to real size the denser the region is" → I do not understand this sentence, what density is shown here? number of stations / km<sup>2</sup>?
- L185-L188: What did you do in cases of lower resolution, e.g. hourly / 2 hours?
- L254 (Fig. 2): When looking at the figure alone, I would get the following impressions, and I am not sure if they are correct
  - The timestamp 13:30:00 is duplicated, so you kept those? From Chapter 3.2 I think duplicated timestamps were removed
  - There is a 2 hour gap from 13:45 to 15:45, so you kept these "time jumps" in the datetime column? From the text I got the impression that all data is in 15 minute resolution, interpolating higher resolutions? What did you do in cases of lower resolution?
  - 14:45:00 has a flag of 111 → "Mismatch >5% between 15-min values and NRFA daily values" → in these cases, all 15-minute values of that day would need to have a code of 1YZ, right?
  - The value at 13:30:00 should be flagged as a negative value (Y=1)
  - The value at 13:45:00 should not be flagged as a negative value
  - So in general, I think the figure could nicely show the quality control codes, but at the moment it raises more questions than it answers. This can maybe be solved by a more extensive figure caption, explaining the details, or by changing the figure itself
- L271 (Table 2): It would be good to add details on what a relative spike, absolute spike, drop, fluctuation, truncated low and high flows actually are, i.e. how they are (mathematically) identified or what threshold values were used
- L280 (Table 3): similar to Table 2, it would be helpful to know how e.g. unrealistically high and exceptionally high events are identified / what are the thresholds? Also, Flag 4 can realistically very well occur, e.g. for small scale thunder storms / convective cells, maybe this can be mentioned in the text
- L286 (Table 4):
  - "UK national grid coordinates" → add the EPSG code to make it easier working with it
  - number of missing values → should be percentage of missing values
  - what is the "NRFA quality status", what are the "Daily", "Pooling", "Qmed" values in the csv?
  - "visual\_inspection\_anomalies\_meta" this file does not exist in the dataset, I think it is called "01\_common\_sense\_anomalies\_meta.csv" there → I would prefer "visual\_inspection\_anomalies\_meta.csv"
- L290-L293: It also provides basic metadata like the river name, and the coordinates of the gauge
- L295: see comment above, the file is named differently in the dataset
- L345 (Fig. 3):

- unit for y-axis is missing
- Panel d: add y-axis label and unit for this row
- Panel a, b: legend label “existing timesteps” → I think this label is not ideal, maybe “regular timesteps” or “15-minute timesteps”?
- Panel c-e: the description says these are “gaps”, but in reality, the resolution of the data is > 15 minutes here, right? I think this should be changed in the figure caption
- L353-368: This comment is about entire Section 5; the usage example of the quality flags is very helpful, but I think the entire chapter would be a more exciting read and be less technical if you would formulate an exemplary research question / use case and actually make use of the quality-control high-flow data, just to tell a story. At the end of the chapter, you could compare the results of the quality controlled and the original data to make a point why the quality check is important, based on a practical example.
- L393-L401: Maybe add that one has to be cautious when removing these spikes from the data when interested in high flows (we do not want to remove flood peaks), and why your approach and QC flagging is not dangerous / cautious enough
- L430 (Fig. 6): Panel labels a-d are missing, explain what True and False in the title mean, or e.g. station kept / removed in the title
- L453: Give the exact number of stations, not “over 1300”
- L459-L466: you could also mention here that the dataset can serve as a common data source to make studies and results comparable
- L474: “stage is an important metric” → should be “ stage is an important variable”?
- L451-L481 (Conclusion):
  - Better highlight the importance of your QC methods to identify problematic streamflow data, but I think you should also add, that in the end, visual inspection of the problematic data is still key, as you have shown in your usage example
  - Are there precipitation datasets in sub-hourly resolution that could be used together with the streamflow data, e.g. for rainfall-runoff modelling? Something about this could be added to the future research section (L479-L481)

### Technical corrections

- L17: I would prefer to not use the abbreviation 15-min here, maybe change to “... flow dataset in 15 minute resolution for the UK, ...”
- L24: “QC”: even though it is a common abbreviation, I think it would be better to write it out at the first use “quality control (QC) outcomes”
- L70: whitespace after “>” and after “hours”

- L129: what is (c.38)? Is it possible to write it out?
- L140: Remove one of the full stops (“..”)
- L144: formulation “with data in a row” → maybe better something like “years with consecutive data”
- L295: Remove one of the full stops (“..”)
- L308: whitespace missing before “Additional”
- L344: “has a max a gap of 240 minutes..” → “has a maximum gap length of 240 minutes.”
- L370-L371: “The following paragraphs present examples of our approach.” Is this sentence correct here? It feels like it should be in the beginning of the Section
- L380: “differentfrom” → “different from”
- L405 (Fig. 5): The Q99 line is barely visible
- L457: “an readily” → “a readily”
- L480: “dataset” → “datasets”

## Dataset

- An option to bulk download the data without using a terminal (e.g. zip file) would improve the accessibility of the dataset
- Also, the wget option displayed when clicking Download on the UKCEH website results in an error, what worked for me was:

```
wget -r -np -nH --cut-dirs=3 -R "index.html*"
https://catalogue.ceh.ac.uk/datastore/eidchub/211710ac-f01b-4b52-807f-373babb1c368/
```

- Even though that’s probably not on your side, the wget downloaded instructions should be improved
- Would it be possible to also include the catchment geometries / shapes in the dataset? I think this could potentially be very useful to e.g. derive meteorological catchment timeseries from raster data or catchment attributes (e.g. about soils)
- 02\_uk\_products\_meta.csv: typo in column names  
“Fraction\_of\_values\_that\_are\_diffrent\_from\_daily”,  
“Fraction\_of\_values\_that\_are\_diffrent\_from\_annual\_maximas”, and  
“Fraction\_of\_values\_that\_are\_diffrent\_from\_pot\_peaks”  
→ diffrent → different
- file name visual\_inspection\_anomalies\_meta.csv (see comment above)
- Generally, the dataset is well formatted, I was able to open all .csv files without any issues. I checked all time series .csv files for duplicate datetimes and timestamp differences that are not 15 minutes, I did not find any issues.