ESSD-2023-99, IWIN

Interesting system. I applaud authors intent and efforts to make (and, keep) data free and open. Also, as hinted, IWIN effort might encourage replication in other settings; without these kinds of additional deployments observational meteorological networks will increasingly fail to keep up with model (and data assimilation) resolution.

Unfortunately, description as presented here seems not quite ready for publication in ESSD. Please can authors read ESSD guidelines (short) at: https://www.earth-syst-sci-data.net/10/2275/2018/. Authors can of course withdraw manuscript to try a different journal. If they prefer to stay with ESSD, I request several changes.

1) Data access via THREDDS server (often-used standard for met data) and then OpenDAP (or proprietary software such as MATLAB or IDL) works for people already familiar with met data but does not meet needs of majority of ESSD readers. Because authors will want to preserve up-to-date access via MetNo servers, please may I suggest following strategy: capture a fixed-location fixed-time-period snapshot, as netCDF or even .csv, specific to this particular description, and provide same as a single download from MetNo or third-party repository (e.g. Zenodo or authors' preference). Do not make readers select coordinates or time periods; give us your best defined product. Data access 'statement' would then say something like: get data product described here at DOIxxx, while interested users can find most-recent and future data at DOIyyy (as for current IWIN data). Many ESSD papers use this distinction: snapshot here, real-time updates and future products at this other location. (To keep a two-year snapshot to reasonable download size, authors may need to revise time resolution, e.g. 10 min rather than 1 minute. Authors failed to justify either temporal resolution so choice should prove relatively easy.)
2) Uncertainties section seems incomplete. As authors imply, full uncertainty starts from sensors, includes deployment logistics, must accommodate failures in power or communication, and - finally - must exist within comprehensive metadata system (what sensor, where, for what purposes, on what platform, with what performance, what biases or drifts, what possible outliers, etc.). Authors make small effort (replaying info from manufacturer's data sheets) at sensor level but seem to then relax to standard MetNo procedures. Even where they correctly list some of these factors (e.g. ship plumes while - apparently - ignoring ship- or land-based elevation factors) they fail to prove understanding of relevant factors. Substantial literature exists, for example, on both ship-based and land-based deployment, footprint, and interference factors. Authors show no evidence that they recognize those factors. An unpublished MS thesis report does not substitute for careful thoughtful analyses. Because neither Campbell nor Gill manufacture their own temperature or RH sensors (do they use identical sensors?, doubtful), readers will have no basis to credit values cited in Table 3. I doubt that standard MetNo temperature sensors achieve resolution of 0.1K. Accuracy of 0.3K at 20C seems reasonable for laboratory, but not for median Svalbard temperatures. This reader suspects 20C represents almost absolute max for Longyearbyen. MetNo data show averaged daily means above 0C only for three or four summer months with annual average (even if rapidly warming) substantially below 0C. Many temperature and RH sensors perform poorly at -20C and fail at -40C. Why do authors then quote uncertainties based around +20C? As presented, this reader confronts a lack of useful comprehensive uncertainty quantification that would allow confidence in IWIN data.
3) Validation, absent. Authors refer to IWIN data as validation for, e.g., forecast models, or as an element of future improvements, but provide no validation of current IWIN data. If they intend their four examples as validation examples, they have missed for this reader. What ranges of T or RH in what wind speeds and directions? Reader finds no inter-comparisons with e.g. the four MetNo stations on southern shores of the fjord. MetNo has - in some cases - many decades of data from those stations; why does reader never see how IWIN data compare. Show how IWIN data fit within current MetNo or ECMWF forecasts? When

validating against openly-accessible (e.g. MetNo, ECMWF) data, include those data or a link to those data? Norwegian search and rescue already operates a local water temperature and wind product; how do IWIN data fit or not fit? Authors allude to inner fjord vs more exposed locations: show us how IWIN locations respond to cold meltwaters along a glacial front or to open warmer Atlantic water currents. Fundamentally, user needs abundant validation to develop trust in IWIN data. In current manuscript, they get none. For this reader, rather than four different map-based examples, I would rather see (and use, and learn to trust) two well-documented careful data inter-comparisons, one inshore and one offshore.

Potentially a useful ESSD product. Needs work, however. Authors to decide magnitude of the effort and their best options.