WORLD METEOROLOGICAL ORGANIZATION

COMMISSION FOR BASIC SYSTEMS
OPEN PROGRAMME AREA GROUP ON INTEGRATED OBSERVING SYSTEMS

EXPERT TEAM ON REQUIREMENTS AND IMPLEMENTATION AWS PLATFORMS (ET-AWS)
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Advances in AWS Technology

Some additional ideas

Submitted by Michel Leroy (France)

Summary and Purpose of Document

This document provides information about recent trends in AWS network characteristics and recall limitations of automation of visual observations

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ACTION PROPOSED

The meeting is invited to take into account this information when discussing individual agenda items.

1. Recent trends in AWS network characteristics

With the advance of telecommunication and the lowering of their price, many AWS network are evolving towards a centralization of raw data (e.g. 1 minute data) from the AWS. Centrally, data is further controlled and processed. Messages (e.g. BUFR messages for GTS dissemination) are also generated centrally.

With this scheme, the central system receives what we can call “raw” data and transforms them into “operational” data.

At the AWS level, quality control and data processing may be limited to what needs data samples at a higher frequency than 1 per minute. This allows keeping the AWS software as simple as possible, the AWS being a simple data logger.

More sophisticated controls are then applied at the central level. By this way, the algorithms applied are homogeneous and easier to upgrade (rather than to distribute them in the field). Influence of a change in an algorithm may also be well documented by recording both the results before and after the change.

Both the raw data (original data) and the operational data (including nominal values) can be archived, for possible further re-processing.

2. Automation of Visual Observation

Due to the reduction of staff costs, the human observation is decreasing and more and more replaced (or not!) by automation.

Automation of visual observations has a characteristic, less frequently encountered with “classic” parameters (e.g. wind, temperature): It may be good but it is not excellent and probably will never be. False reports of present weather exist, even if the UP code (Undefined Precipitation) exits to limit them. Efforts are made to limit the errors, but the reliability of automatic calculation of present weather is far from the reliability of “classic” sensors (except in harsh conditions).

This may cause a problem to the users, who currently consider the human observation as unquestionable. The automatic observation of visual parameters is questionable and will be still for a long period of time. This doesn’t remove the interest of the automatic observation, but it is a specific characteristic of the observation, compared to the more “classic” parameters (except when measured in special harsh conditions).

Therefore, the users have to be aware of this characteristic. And automatic products, such as automatic nowcasting products, intensively using observations, should consider this characteristic in their internal design. Numerical models have been for a long time aware of the quality of observations and many controls are made before injecting an observation in the analysis (but numerical models currently don’t use visual observations). A forecaster is also aware of the consistency of the observations. But automatic processes for nowcasting products may not and this may cause a problem: an error in an automatic observation may be directly forwarded in a product automatic delivered to the users.

A way to mitigate this danger could be to deliver a confidence parameter, if it is possible to calculate one within the observing system. There exists a BUFR descriptor (0 33 020) to indicate if a parameter is good, inconsistent, doubtful, erroneous or missing. The two values, “inconsistent” and “doubtful” could be used to give a level of confidence, but perhaps some probability value (%) could be also used?