

AWARE
Appraisal of
"Challenging
WeAther"
(CW) FoREcasts

TASK 1
Challenges in
observing CW

TASK 2
Overview of
verification
measures

TASK 3
CW Verification
applications
based on spatial
methods

TASK 4
Overview of CW
forecast methods,
representation
and user-oriented
products

Observation
issues

Verification
approaches

Forecast
methods &
representation

PP-AWARE
(end Aug21)



Short extension
and new PP
(to start in Sept 2021)

- Common Verification framework
- Exploitation of spatial verification techniques
- Severe and High Impact Weather
- Utilization of non conventional observational datasets
- Evaluation of convection permitting EPS performance

Questions (Un)raised

PP-AWARE
(2019-2021)

HIW phenomena: visibility range (fog), thunderstorms (w. lightning), intense precipitation, discrimination between severe and non-severe convection, extreme temperatures and winds,.

Obs Types: application of non-conventional observations

Methodologies: Multivariate verification statistics (several gridpoints-leadtimes-variables in all possible combinations with respect to obs), further study on obs uncertainty with application to scores, Impact-based warnings issuing and evaluation

Models: application on convection permitting ENS, ICON-LAMs

ideas for PP-AWARE continuation

I. Stressing of observations role in HIW

- ✓ **new obs types use in the evaluation of forecasted phenomena (severe convection, fog).**

Obs Types:

- *Remote sensing derived non-conventional observations.* Use of satellite products (e.g. cloud optical thickness, brightness temp, LWR, SWR) to evaluate characteristics of convection, NWC-SAF products for fog verification
 - *Crowd-sourced data:* third party and citizen met stations, smart phones, web & social media etc. usefulness for NWP predictions and evaluation
- ✓ **observation uncertainty and impact on scores**

II. Verification scheme for convection permitting ensemble forecasts

- ✓ **object-based approaches:** methodology and criteria for reduction/summarizing of object information, metrics for performance evaluation, visualisation
- ✓ **build of a robust common verification framework for sensitivity tests**

III. Impact-based warnings issuing and evaluation

IV.

Ensemble verification with spatial methods

- FSS well established for an operational usage
- Object-based verifications: several methods and scores exist; the choice of the method depends also on the phenomenon to be verified. Still difficult to know how to use operationally in particular for ensembles.
- Proposal: focus on one (few) method and address how to use it for a probabilistic forecast (independently on the object-identification method and on the score, focus on how to use the method for ensemble verification):
 - CRA or MMI or ...
 - use of pseudo-member (pres. by Gregor Pante)
 - Introduce a probabilistic pseudo-member (using lower probabilities for the same object, yesterday in the questions)
 - quantify the impact of the parameters of the object identification (e.g. radius) and build a scale-dependent object-based score
 - build probability objects
 - ...

PP-AWARE continuation?

Project format: PP-AWARE phase II (HiWeather, WMO)

Duration: 1 ½ - 2 years t.b.d.

- Preparation of a summary for the motivation for project continuation
- Dissemination to **wg5-wg7-wg4** for tentative contributions in the task work: **only DWD (SINFONY), RHM (CRA, MET software)**
- ~~Final proposal to be submitted to the SMC by early June~~