

PP INSPECT Status

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Status highlights

- The PP INSPECT is extended until August 2017 (inclusive) due to delays in many tasks, with overall FTE amount almost unchanged
- Delayed tasks in question are extended with unused FTEs shifted to later periods

Task 1: Data and Models Setup

1a. Rerun of COSMO-1 model for MesoVICT cases with more recent model versions (MCH)

Done

Reruns of COSMO-1 for ALL MesoVICT test cases are made and uploaded to <ftp.meteoam.it>

Task 1: Data and Models Setup

1c. Perform reruns of global model ECMWF-EPS to provide boundary conditions for COSMO-LEPS. Perform reruns of COSMO-LEPS and/or COSMO-E and COSMO-RU-EPS for MesoVICT test cases (ARPA-SIMC)

Ongoing, delayed, Extended until December 2016 (original date: 30.06.2016)

- ARPA-SIMC: ECMWF EPS reruns for MesoVICT cases 1 and 2
- MCH: **Probably, MCH participation in this task can be resumed with at least one COSMO-E run until the end of the year, if the initial and boundary conditions from ECMWF-EPS (IFS-ENS) are suitable for COSMO-E**
- RHM: COSMO-Ru2-EPS test rerun is made from the ECMWF EPS initial and boundary conditions (see above) for MesoVICT case 1. The complete case 1 COSMO-Ru2-EPS rerun will be put soon in WG5 repository.

Task 1: Data and Models Setup

1b. Provide high resolution deterministic and ensemble runs for the Sochi region to be used in Tasks 3 and 4 (RHM)

Done

1d. Preparation of Radar/Radar-raingauge precipitation dataset (national radar networks) for experiments (RHM, also IMGW-PIB joined this task)

RHM: **done**

IMGW-PIB: **done**

Task 2: Adaptation of statistical software and technique

2a. Policy for model output and observation data format standards before entering verification chain (preprocessing) based on existing COSMO data processing software (coordination with Fieldextra SCA)

Done

- *HNMS, RHM. IMGW-PIB*: **The policy on Additional Verification Tools (AVT) and verification data and formats** is prepared and sent to TAG for consideration.
- *RHM*: Scripts are written for the interpolation of model data prepared within task 1b using GrADS onto the radar grid of 349 lons * 481 lats with 0.00833 lat-lon step (Sochi region). The data is transferred to txt format and serves as input for SpatialVx functions. Examples are available in WG5 repository.
- *HNMS*: Research on applicability of different formats and comparative advantages and limitations of using Fieldextra and LibSIM software for preprocessing for VAST and SpatialVx.

Task 2: Adaptation of statistical software and technique

2b. Adaptation of existing free verification packages (in particular, SpatialVx and VAST) to COSMO data and development of local tools with the aim to create scripts for applying the most widely used spatial methods, that will be utilized in Tasks 3 and 4. (RHM, HNMS, ARPA-PT, IMGW-PIB)

Ongoing *Extended until December 2016*

- *RHM: A set of programs is developed (Fortran, R, GrADS languages and UNIX shell programming) for running R SpatialVx functions hoods2d (neighborhood methods) and craer (Contiguous Rain Area method). **The scripts with templates are available in WG5 repository***
- *HNMS: H-SAF data retrieval and adaptation. Description of SAL methods application in SpatialVx. **Examples are available in WG5 repository.***
- *ARPA-PT: The work is resumed from JJA2016. **It was decided to add two new developments of high priority for the project: inclusion of time dimension in VAST and the possibility to operate with other variables besides precipitation, primarily TCC, in VAST***
- *IMGW-PIB: Testing different configuration of identification of features, merging and/or matching features, analyzing features, application of MODE and CRA methods. Methodology to become available in WG5 repository.*

Task 3: Application of methods on deterministic models

3a: Test DIST methodology with the available MesoVICT data on the MesoVICT selected cases (at least in terms of total precipitation using the DIST spatial verification method based on catchment area or boxes of fixed size comparing different indices (mean, median, percentiles) (ARPA-SIMC)

Ongoing, delayed. *Extended until December 2016*

DIST method is applied to MesoVICT cases

3b: Explore the possibility to extend the DIST methodology on wind speed (in space and in time) (ARPA-SIMC)

Ongoing, delayed. *Extended until MAM2017*

(Maria Stefania's presentation tomorrow!)

Task 3: Application of methods on deterministic models

3c. Analysis of long time series of scores (in particular: FSS, Upscaling with ETS and FBI) for precipitation. Further investigation into the most informative and compact representation of scores

- DWD: **Done** See the last report. The findings will be used in task 5.
- MCH: Analysis of seasonal aggregations of neighborhood scores (FSS, ETS)

3d: Application of SAL verification methods for the core MesoVICT case

- HNMS: **Done**. Two methodologies were used to calculate SAL method, the one included in SpatialVx package and the other that was distributed from the author of SAL method. Comparison of methods was performed in a number of instances from MesoVICT cases.

Task 3: Application of methods on deterministic models

3e. Application of neighborhood (FSS, ETS) and possibly features-based (CRA) methods for deterministic models of different resolution for the Sochi region (COSMO-RU with grid spacing 1km, 2.2 km, 7km; GEM with grid spacing 2.5 km, 1 km, 0.25 km; NMMB – 1 km; HARMONIE – 1 km; INCA – 1 km) (RHM)

Ongoing, delayed, Extended until December 2016 (initially 01.2016)

The experiments are continued using different configurations of object matching functions.

3f: Application of traditional categorical scores and spatial verification methods to analyze extreme precipitation events based on MesoVICT cases

Ongoing, Extended until DJF 2016 (initially 01.2016)

- *HNMS: Application of filtering methods and neighborhood methods for MesoVICT core case and comparison with traditional scores. Evaluation of SEEPS score usability.*
- *RHM: Routines developed in Tasks 2a and 2b are adapted for the MesoVICT data. The optimal smoothing parameters for 1h precipitation fields and the minimum object size to be included in matching are identified.*
- *IMGW-PIB: Adjustment of MesoVICT data to R verification packages. Calculation of traditional scores for extreme events (SEDS, SEDI)*

Task 4: Overview of spatial methods on EPS systems

Open Issues: This Task is of highest priority according to the COSMO strategy and one of the main goals of the project

4a. Verification study of COSMO-LEPS against ECMWF ENS in terms of total precipitation using the same methods (DIST method) for MesoVICT cases (ARPA-SIMC)

- **Ongoing, delayed, Extended until Dec 2016 (initially 07.2016)**
- **Sensitivity of COSMO-LEPS forecast skill to the verification network is studied as applied to MesoVICT cases (*Andrea's presentation tomorrow!*)**

Task 4: Overview of spatial methods on EPS systems

4b Verification study of COSMO-Ru-EPS (2.2 km) ensemble for MesoVICT cases (RHM)

Delayed, *Extended until Dec 2016*

The existing spatial methods for ensembles are revised. The routines for deterministic spatial methods developed in tasks 2a and 2b are being adapted for particular ensemble members and probabilities. Results not available yet

4c: A study on applicability of spatial methods to ensemble systems of different resolution for the Sochi region (for individual members, probabilities, ensembles of attributes). The EPS models utilized will be: COSMO-S14-EPS (7km), Aladin LAEF (11km), GLAMEPS (11km), NNMB-EPS (7km), COSMO-RU2-EPS (2.2km), HARMON-EPS (2.5km), for the period of Sochi Olympics (RHM)

Delayed, *Extended until DJF 2016 (initially 08.2016)*

Task 4: Overview of spatial methods on EPS systems

4d. SAL application to COSMO-LEPS data for MesoVICT cases (HNMS)

Ongoing, *New task, Start 2016-03-01 – End 2017-02-28*

- *HNMS*: SAL method is applied to individual members of LEPS forecasts over MesoVICT cases and summary plots are used to extract information on the overall performance of precipitation pattern and intensity forecasts

Task 5: Guidelines for relative usefulness of various spatial methods in decision-making

5a. Follow-up of the outcomes from the Tasks of INSPECT and the work accomplished in MesoVICT test cases by the international community: classification of the analysis into categories (e.g. filtering, displacement methods) followed by an intercomparison of the outcomes for each category (assessment of differences/resemblances to the MesoVICT cases applications) (HNMS, RHM)

Ongoing. MCH participation is cancelled

- RHM: Overview of MesoVICT activities was prepared and sent to INSPECT mail list. Participation in MesoVICT web-conference, participation in the MesoVICT group created on LinkedIn.
- HNMS: A paper is written about the Neighborhood method application on MesoVICT case. Participation in MesoVICT web-conference, participation in the MesoVICT group created on LinkedIn.
- **ARPA-SIMC was included** in this task because of the organization of the **2nd MesoVICT international meeting to be held in Bologna, Italy, in September 2016**. During the same period, the INSPECT meeting will also take place

Task 5: Guidelines for relative usefulness of various spatial methods in decision-making

5b: Analysis of the usefulness of various spatial methods (precipitation and possible wind). Overview of their characteristics with respect to: efficiency in calculation time, ability to deal with different density of observations, stability against observation errors, proving added value of high-resolution models, ability to address specific issues of interest (e.g. location errors, intensity errors, performance at different scales) etc. Pros and cons of various methods in terms of each verification questions imposed by the user

Delayed (start in 10.2016, initially 07.2016)

5c: Guidelines for using spatial methods, leading to an updated strategy for decision-making. This will also include information on the tools that can be utilized and a complete set of tools to perform all the statistical methods that were proved to be more informative during the assessment of Task 5b (link to the outcome of Task 2)

Starts in October

5d: Guidelines for applying spatial methods on convection permitting ensemble systems

Starts in October

Due to delays of the tasks 5a, 5b, an extension of subtasks 5c and 5d is requested until September 2017.

Task 5: Guidelines for relative usefulness of various spatial methods in decision-making

Open issues (Task5 and more) – ALMOST UNCHANGED since the last meeting at the CUS2016!

- To simplify the preparation of the Task 5 deliverables, for each method tested in Tasks3,4 a paper needs to be prepared by the participants that will reflect the experience gained and will provide feedback in the questions that are addressed (see Task 5b, 5d description). Deadline for this individual reporting?
- Increased collaboration and communication among project participants in the final stage of the project is necessary!
- Questions and experience exchange through the mailing list are welcome!