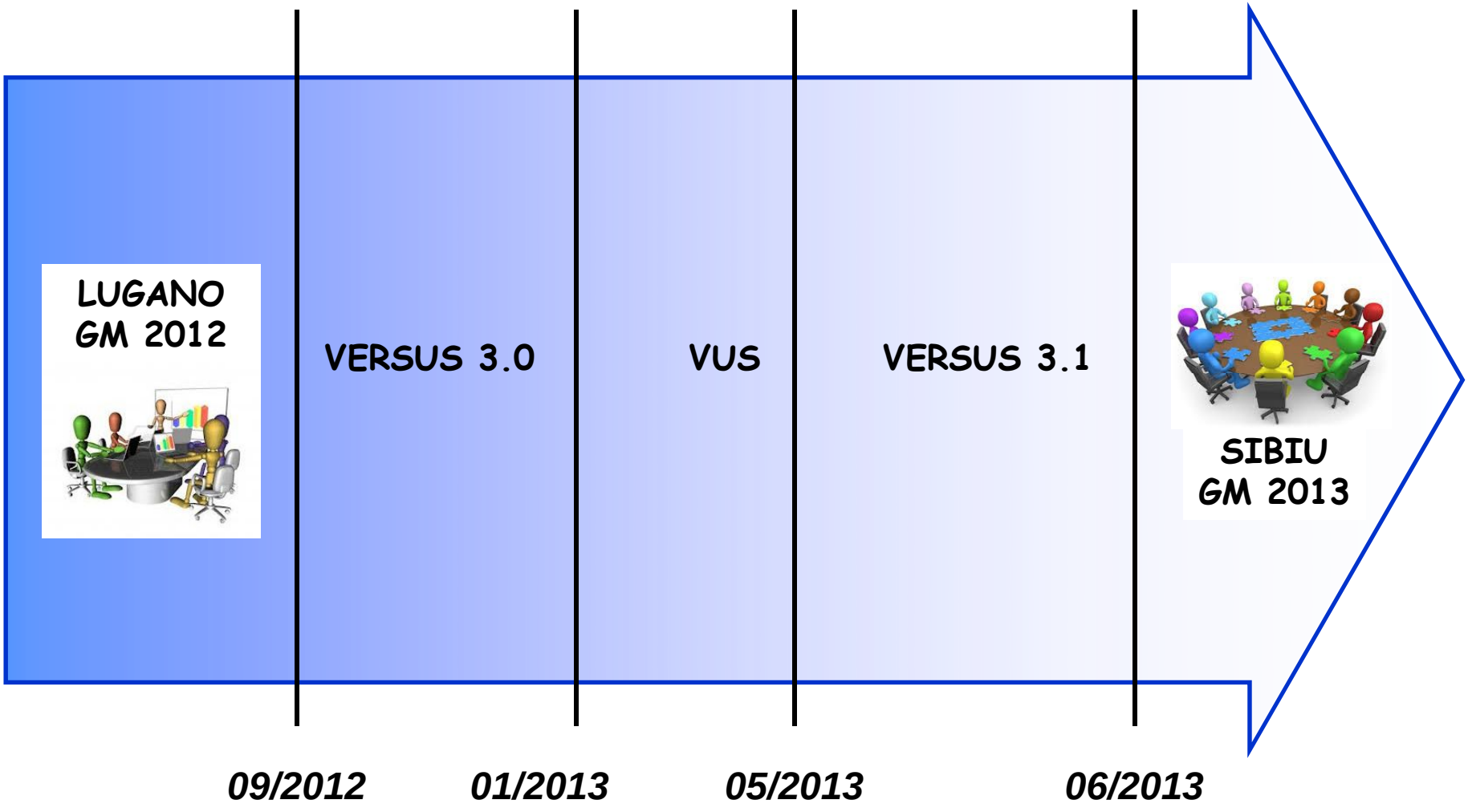
EPS VERSUS 3.0 VERSUS 3.1

Angela Celozzi

EPS VERIFICATION



EPS VERIFICATION

VERSUS 3.0 January 2013

EPS verifications and Software update

VERSUS 3.1 June 2013

EPS verification refinements

Not officially released

The VERSUS 3.1 test phase is closed

(with the HNMS collaboration)

The activity of bug fixing will be the first planned for the next COSMO year.

VERSUS EPS- PP PLAN Phase 5

Task 3: Implementation of Probabilistic Scores

This task is ongoing from the COSMO year 2012

VERSUS 3.0 is able to calculate the Following Statistical Indexes:

- ✓ Brier Score and its decomposition
- ✓ Brier Skill Score
- ✓ Ranked Probability Score and Skill Score

And the following plots:

- ✓ Rank Histogram
- ✓ ROC Curve (and ROC area)
- ✓ Reliability Diagram (with Sharpness Histogram)
- ✓ Cost/Loss Ratio

Standard Verification Surface for continuous parameters and precipitation.

3.0 Versus 3.1

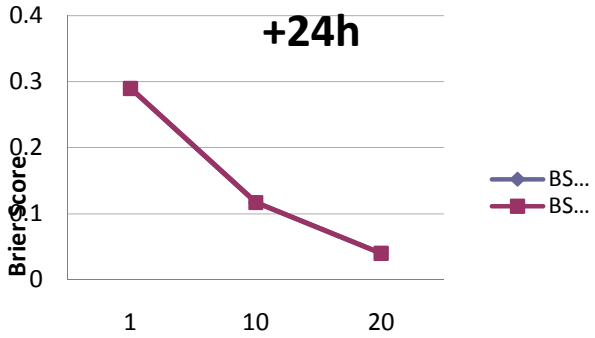
Refinements:

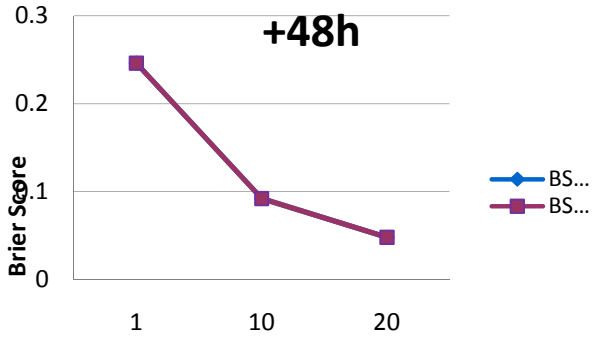
- ✓ Final Test Phase
- ✓ BS decomposition in VERSUS DB
- ✓ ROC Area Values available in txt files
- ✓ Name File structure

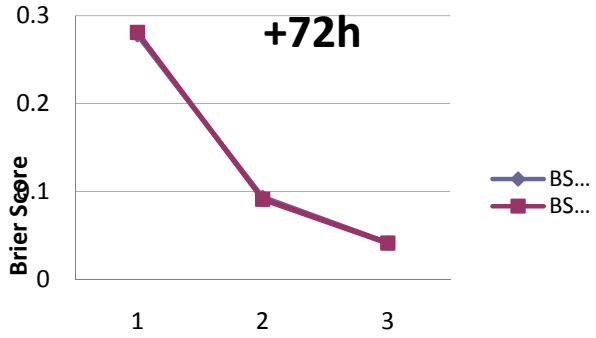
Final test phase-April 2013

- Versus and ARPA
- Model: Cosmo-Leps 16 Members
- Parameter: Precipitation
- Thresholds: 1,10,20,25
- One station: Pratica di MARE
- One Month: April 2012

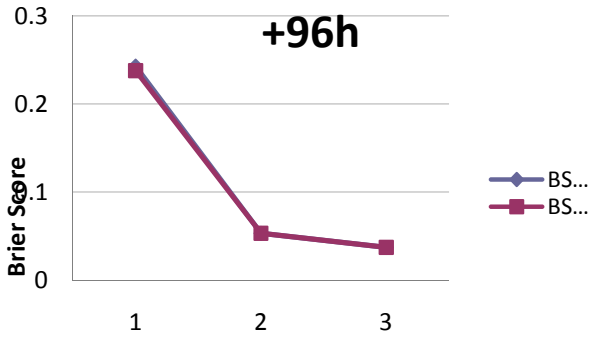
Brier Score

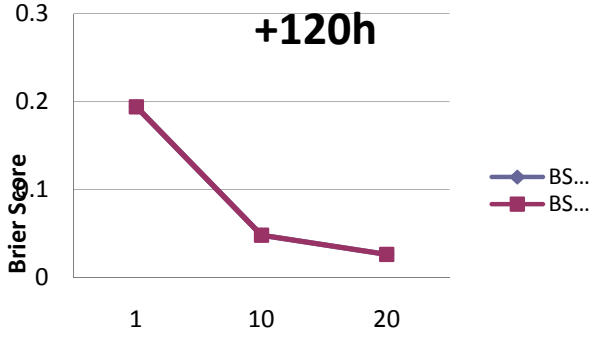






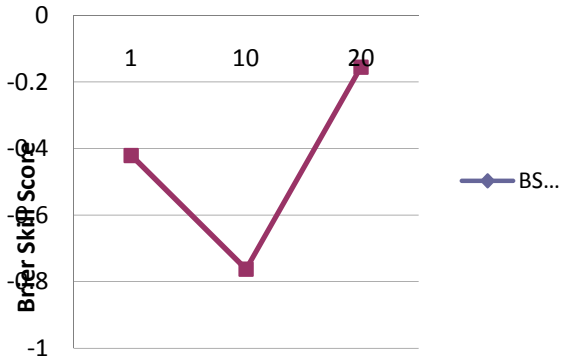
Same results!!



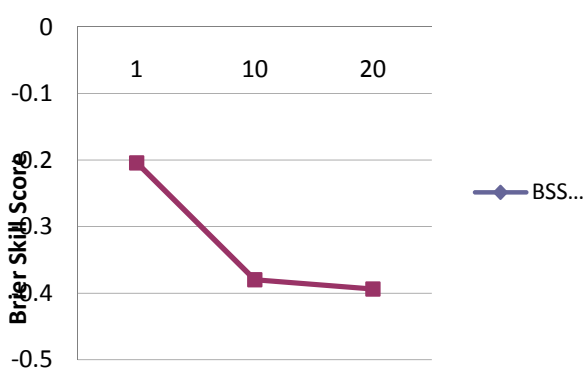


Brier Skill Score

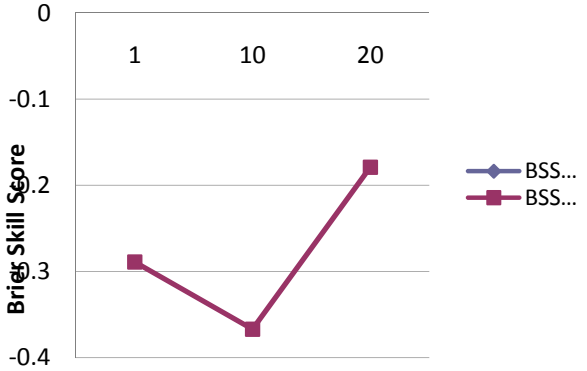
+24h



+48h

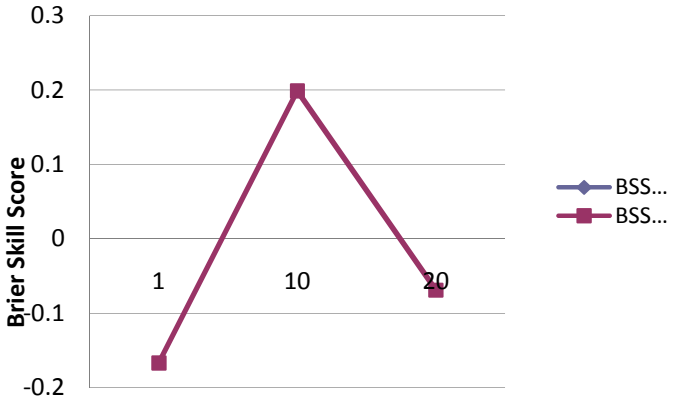


+72h

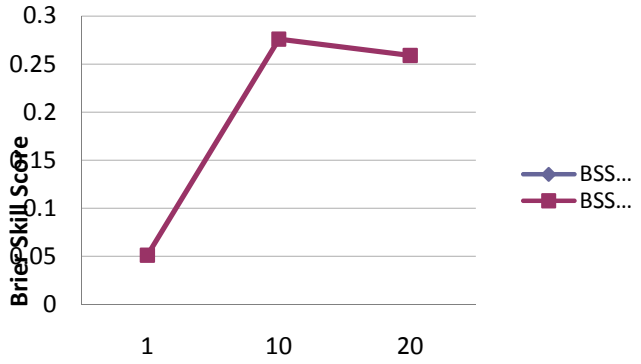


Same results!!

+96h

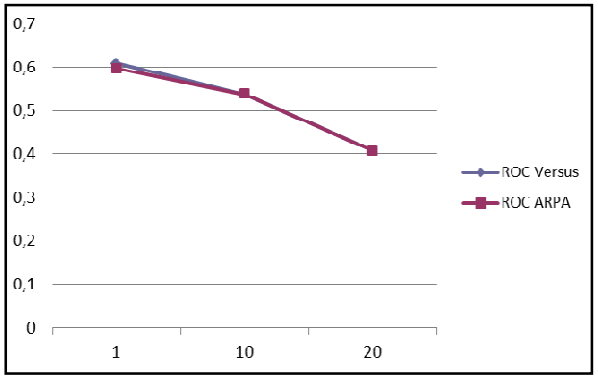


+120h

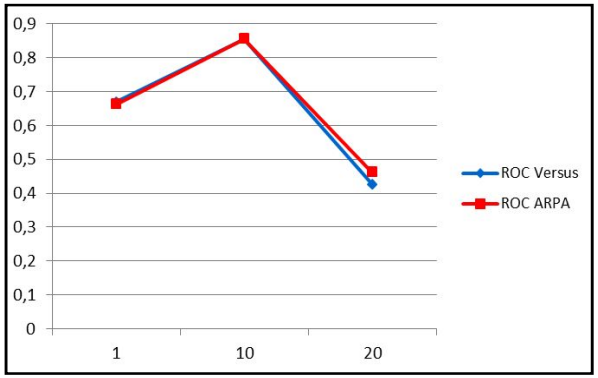


ROC Area

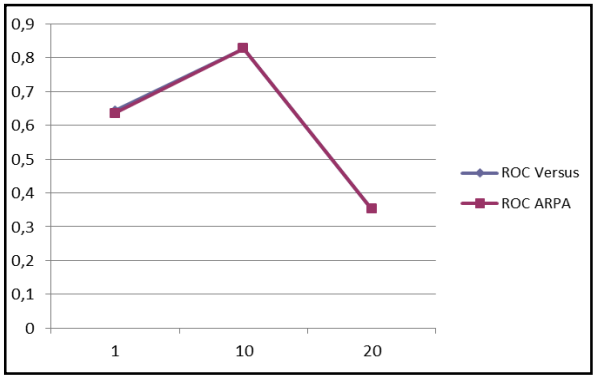
+24h



+48h

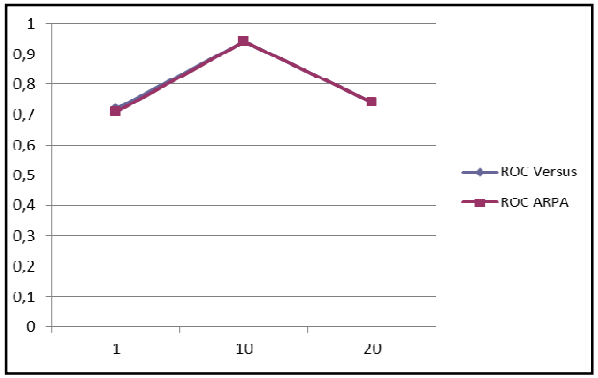


+72h

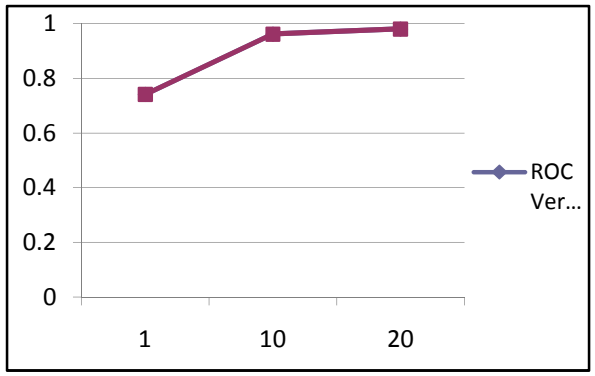


Same results!!

+96h



+120h



3.0 Versus 3.1

Refinements:

- ✓ Final Test Phase
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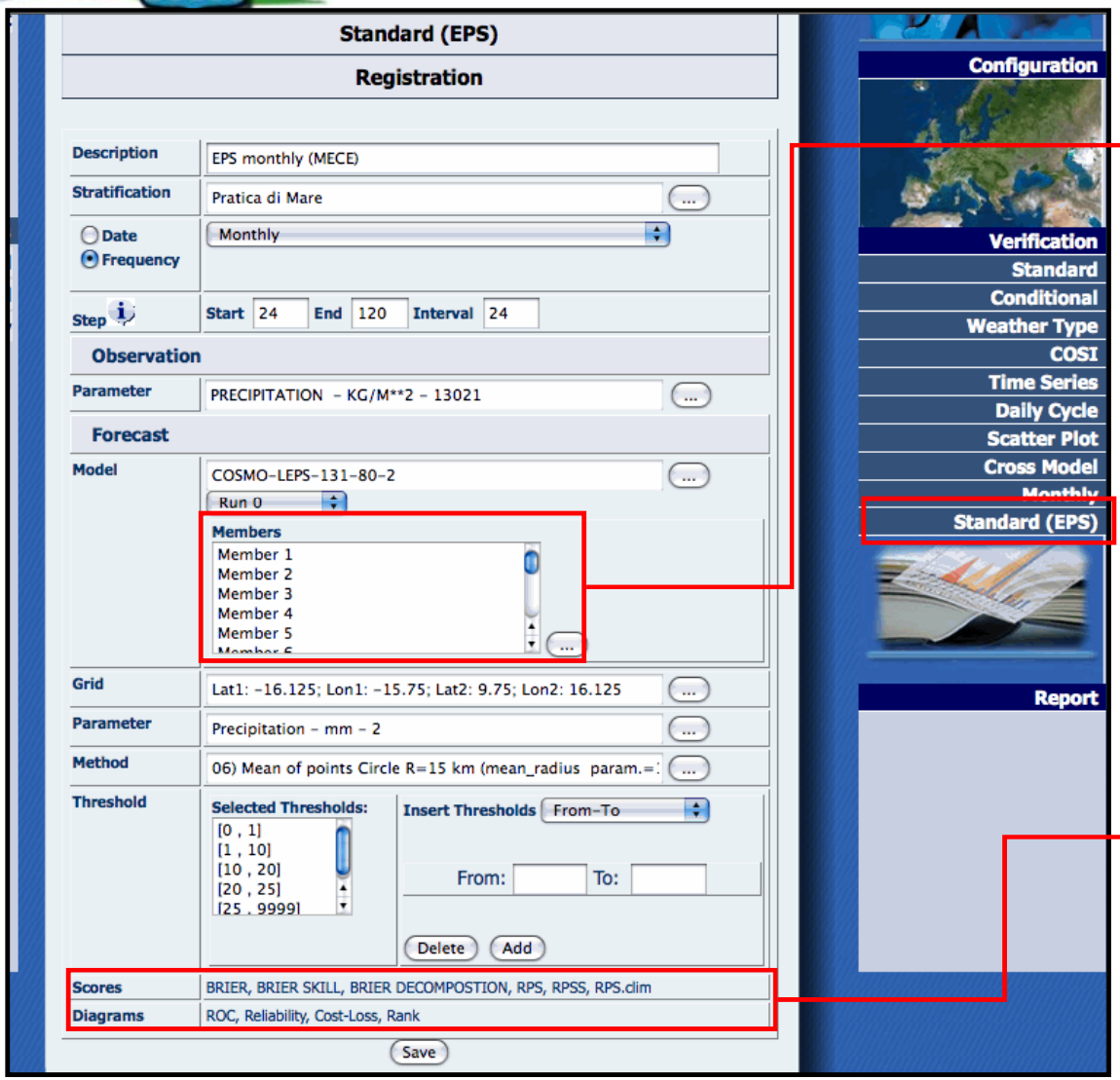
- ✓ ROC Area Values available in txt files
- ✓ Name File structure

Verification Registration 3.0



It' possible to choose the members for the Verification

Pay attention to the control run

Scores and Diagrams are fixed

Verification Report

VERSUS 3.0

The verification has been created.
To create a new verification click on 'Continue'

Standard Verification Report[EPS]

Id	2695
Name	EPS monthly (MECE)
Criteria Type	Surface
Dichotomic	No
Run	0
Frequency	Monthly
Period Based	Forecast
Steps	START: 24 END: 120 INTERVAL: 24
Stratification	Pratica di Mare
Geographical Distribution	No
OBS	
Parameter	TOTAL PRECIPITATION - KG/M**2 - 13021
Suspect Value	No
FCS	
Model	COSMO-LEPS
Grid	Lat first:-16.125; Lon first:-15.75; Lat last:9.75; Lon last:16.125
Parameter	Precipitation - mm - 2
EPS Diagramm	ROC, Reliability, Cost-Loss, Rank
Scores	BRIER BRIER-SD BRIER-SKILL RPS RPSS RPS.clim
Thresholds	[0 , 1] [1 , 10] [10 , 20]

VERSUS 3.1

Report Verification

Standard Verification Report[EPS]

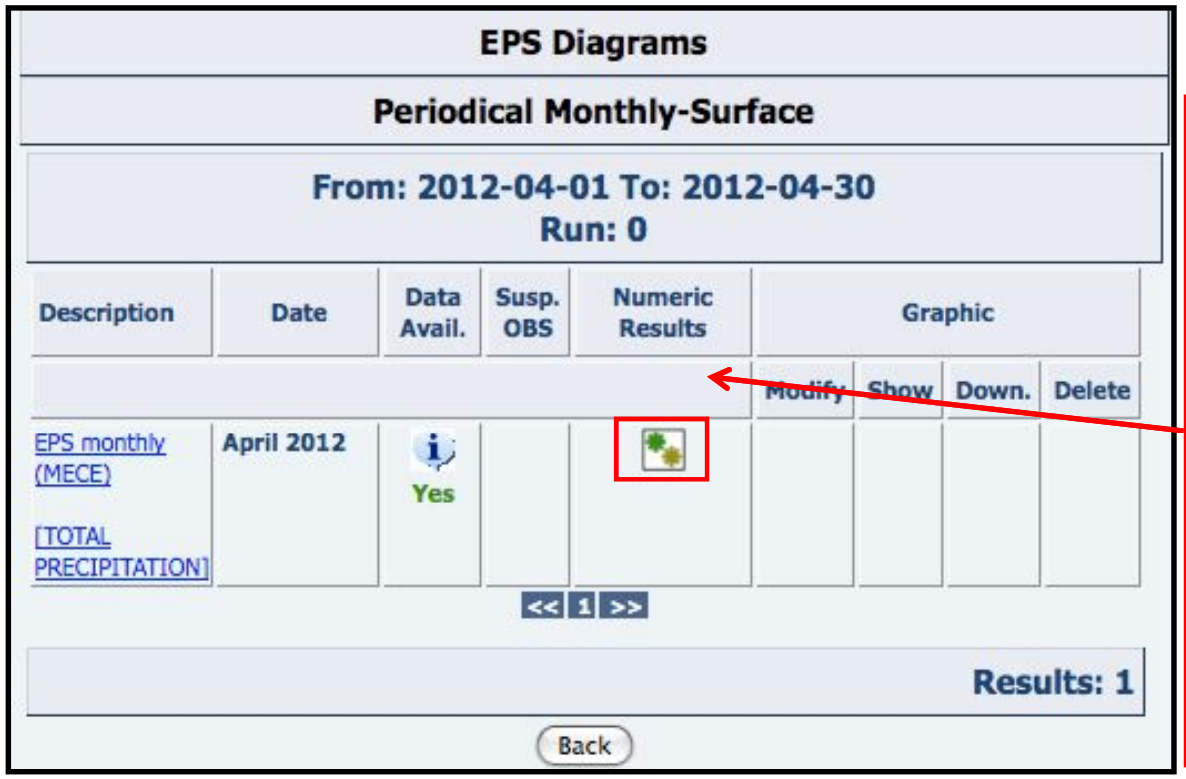
Id	2246
Name	M-CLEPS All Italian Stations (MECE) -D
Criteria Type	Surface
Dichotomic	No
Run	0
Frequency	Seasonal
Period Based	Forecast
Steps	START: 24 END: 120 INTERVAL: 24
Stratification	All Italian Stations
Geographical Distribution	No
OBS	
Parameter	TOTAL PRECIPITATION - KG/M**2 - 13021
Suspect Value	No
FCS	
Model	COSMO-LEPS
Grid	Lat first:-16.125; Lon first:-15.75; Lat last:9.75; Lon last:16.125
Parameter	Precipitation - mm - 2
EPS Diagrams	ROC, Reliability, Cost-Loss, Rank
Scores	BRIER BRIER-reliabily BRIER-resolution BRIER-SKILL BRIER-uncer RPS RPS.clim RPSS
Thresholds	[0 , 1] [1 , 10] [10 , 20] [20 , 25] [25 , 9999]

3.0 Versus 3.1

Refinements:

- ✓ Final Test Phase
- ✓ BS decomposition in VERSUS DB
- ✓ ROC Area Values available in txt files
- ✓ Name File structure

VERSUS EPS- Results of searching



EPS Diagrams

Periodical Monthly-Surface

From: 2012-04-01 To: 2012-04-30
Run: 0

Description	Date	Data Avail.	Susp. OBS	Numeric Results	Graphic			
					Modify	Show	Down.	Delete
EPS monthly (MECE) [TOTAL PRECIPITATION]	April 2012	Yes						

<< 1 >>

Results: 1

Back

Running a verification on EPS means to calculate the Probability of distribution, the scores and the graphs. Probabilities are carried out by means of php and saved as files that can be inspected after the execution.
Scores and graphs are calculated with R package

VERSUS EPS- Results of searching

Periodical Monthly-Surface

From: 2012-04-01 To: 2012-04-30
Run: 0

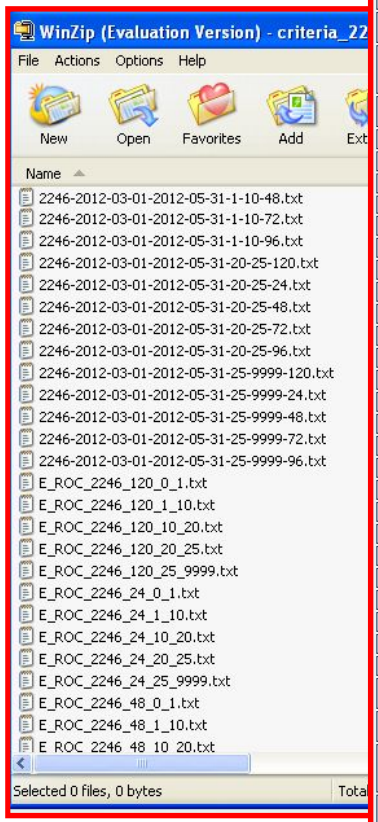
Description	Date	Data Avail.	Susp. OBS	Numeric Results	Graphic			
					Modify	Show	Down.	Delete

Criteria: M-CLEPS All Italian Stations (MECE) -D

Index: BRIER

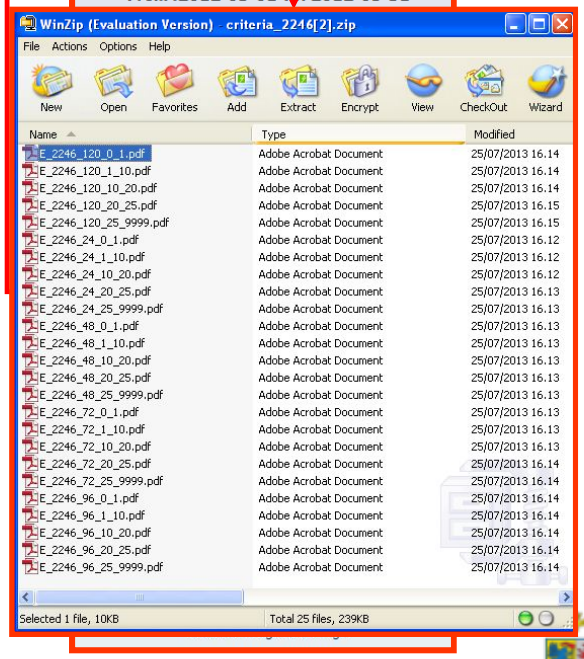
Frequency: Seasonal - From: 2012-03-01 To: 2012-05-31

Step	Index Value	Number Value	Start Threshold	End Threshold
From: 2012-03-01 To: 2012-05-31				
24	0.141314	9918	0	1
24	0.149252	9918	1	10
24	0.0432157	9918	10	20
24	0.0087416	9918	20	25
24	0.0167101	9918	25	9999
48	0.130848	10013	0	1
48	0.14033	10013	1	10
48	0.0410033	10013	10	20
48	0.00834111	10013	20	25
48	0.0165621	10013	25	9999
72	0.119918	9999	0	1
72	0.128471	9999	1	10
72	0.0387031	9999	10	20
72	0.00838092	9999	20	25
72	0.0151961	9999	25	9999
96	0.115945	9987	0	1
96	0.122877	9987	1	10
96	0.0368866	9987	10	20
96	0.00806674	9987	20	25
96	0.0138594	9987	25	9999
120	0.112381	9975	0	1
120	0.116425	9975	1	10
120	0.0360636	9975	10	20
120	0.00807292	9975	20	25
120	0.0137128	9975	25	9999
Index: BRIER-reliabily				
Frequency: Seasonal - From: 2012-03-01 To: 2012-05-31				
Step	**Index Value**	**Number Value**	**Start Threshold**	**End Threshold**
From: 2012-03-01 To: 2012-05-31				
24	0.00845488	9918	0	1



Graphic Viewer

From :2012-03-01 To: 2012-05-31



3.0 Versus 3.1

Refinements:

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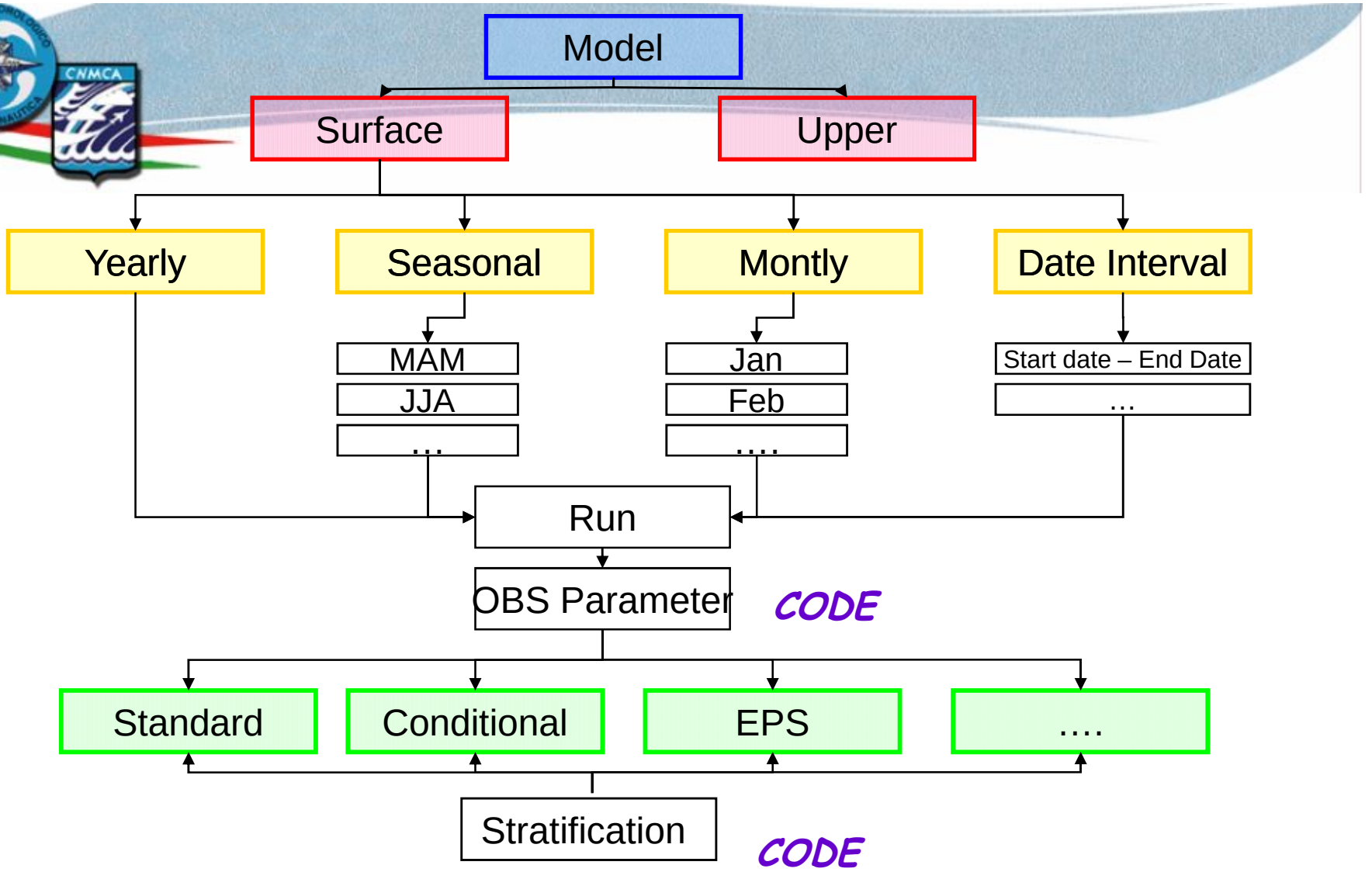
VERSUS 3.1 – Plots Identification

The goal of this task is to create a standard/tree structure in which the VERSUS plots get saved

This structure will allow an easier identification of the graphs

Crucial points: 1) coexistence old and new logic
2) verification against the analysis
(obs code isn't available)

It is not dynamic and it follows this SCHEMA



FILE NAME _ Verification_ID

File Name Schema

Dicotomic

D_ (ID VERIFICATION)_STEP_G/T/S_ScoreName.jpg

G = Geographical map
S = Plot for Step
T = Plot for Trhesholds

Step is only for the SCATTER PLOT/Geographical Distribuction

D_ (ID VERIFICATION)_P_Startth_Endth.jpg

P= Performance Diagrams

Continuous

C_(ID VERIFICATION)_STEP_G.jpg
Step is optional only for the SCATTER PLOT/ Geographical Distribution
G only for Geographical Distribution

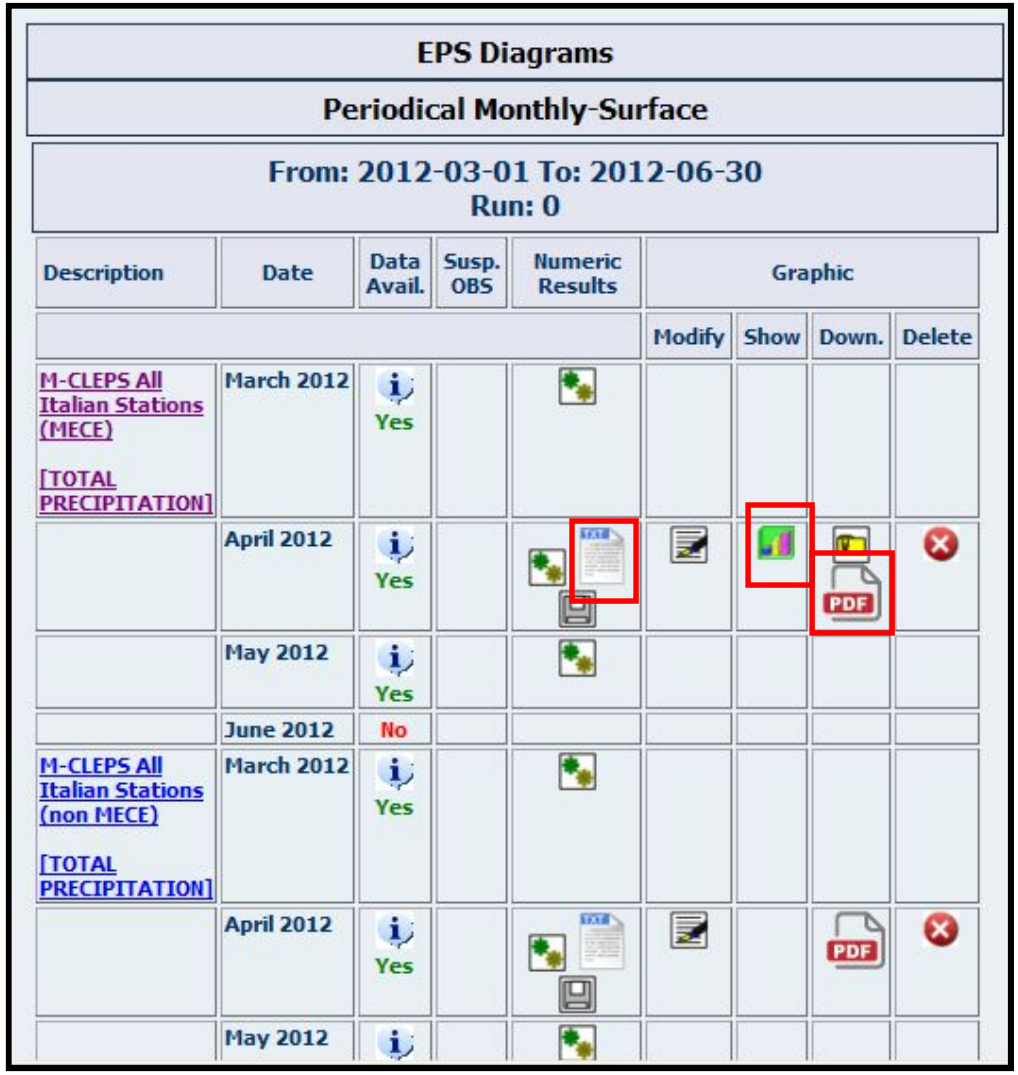
Upper

U_(ID VERIFICATION)_STEP.png for the single plots
U_(ID VERIFICATION)_unic.png for the unic plot

File Name Schema - EPS

Each EPS Verification produces different kind of files:

- ✓ Prob of Prec - txt files
- ✓ Scores Plots - png files
- ✓ Diagrams - pdf files



EPS Diagrams

Periodical Monthly-Surface

From: 2012-03-01 To: 2012-06-30
Run: 0

Description	Date	Data Avail.	Susp. OBS	Numeric Results	Graphic			
					Modify	Show	Down.	Delete
M-CLEPS All Italian Stations (MECE) [TOTAL PRECIPITATION]	March 2012	Yes						
	April 2012	Yes						
	May 2012	Yes						
	June 2012	No						
M-CLEPS All Italian Stations (non MECE) [TOTAL PRECIPITATION]	March 2012	Yes						
	April 2012	Yes						
	May 2012							

File Name Schema - EPS

For the scores plots (png files) we use the same logic for the other ones.

For the diagrams file (pdf format):

E_ID Verification_STEP_startth_endth.pdf

All the POP files are stored in a new folder named:

ID verification_txt

The name of the txt files are the same of the existing ones

Conclusion - Crucial Point

After the loader of EPS grib and bufr, the system organizes the data, calculates the Probability and the statistical index using R software.

R desn't work fine in multi-user sessions !!!

We have to detect where acting : R Project or VERSUS code

The goal for next year is to use the system in order to find out whether it responds correctly to every Met Service necessity.

CRUCIAL: we need to optimize the developments!!!

Conclusion - Crucial Point

The best test is the use of the system!!!

Only diversified use of the software gives the possibility to recognize crucial behaviors.

Versus PP Phase6

Task 4: Enhance flexibility of EPS verification

During the last VUS the WG7 required the implementation of further probabilistic indices and graphs, some of them are available in R package.

At the moment the calculation of EPS indexes it is included in the code (hardcoded) and updates or additions of a new index available in R package need a change in the code itself. The purpose of this task is to develop a dynamic method where it is possible to add new indexes or modify the old. In this way the choice, the update and the addition of new indexes will be possible and flexible and calculated in the same way that is done for deterministic models.

Main Activities:

- ✓ DB variation
- ✓ Update Versus Code
- ✓ Score Creation
- ✓ Gui Adjustment

Thanks
for your
Attention !!!