Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Home Affairs FDHA
Federal Office of Meteorology and Climatology MeteoSwiss

News from the consortium

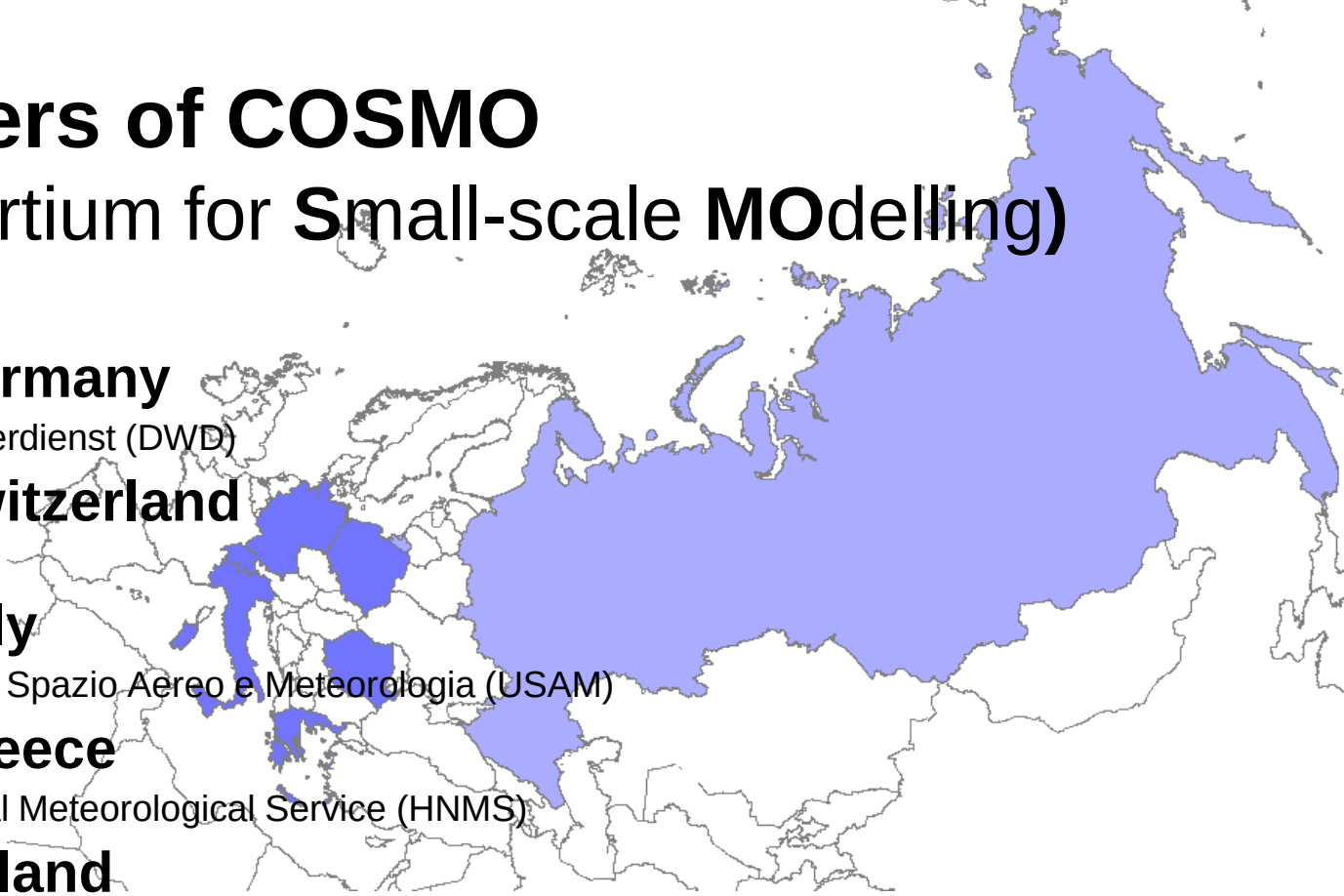
CONSORTIUM FOR SMALL SCALE MODELING

COSMO

Swiss COSMO User Workshop

17th January 2012

Members of COSMO
(**CO**nsortium for **S**mall-scale **MO**delling)



Germany
Deutscher Wetterdienst (DWD)

Switzerland
MeteoSwiss

Italy
Ufficio Generale Spazio Aereo e Meteorologia (USAM)

Greece
Hellenic National Meteorological Service (HNMS)

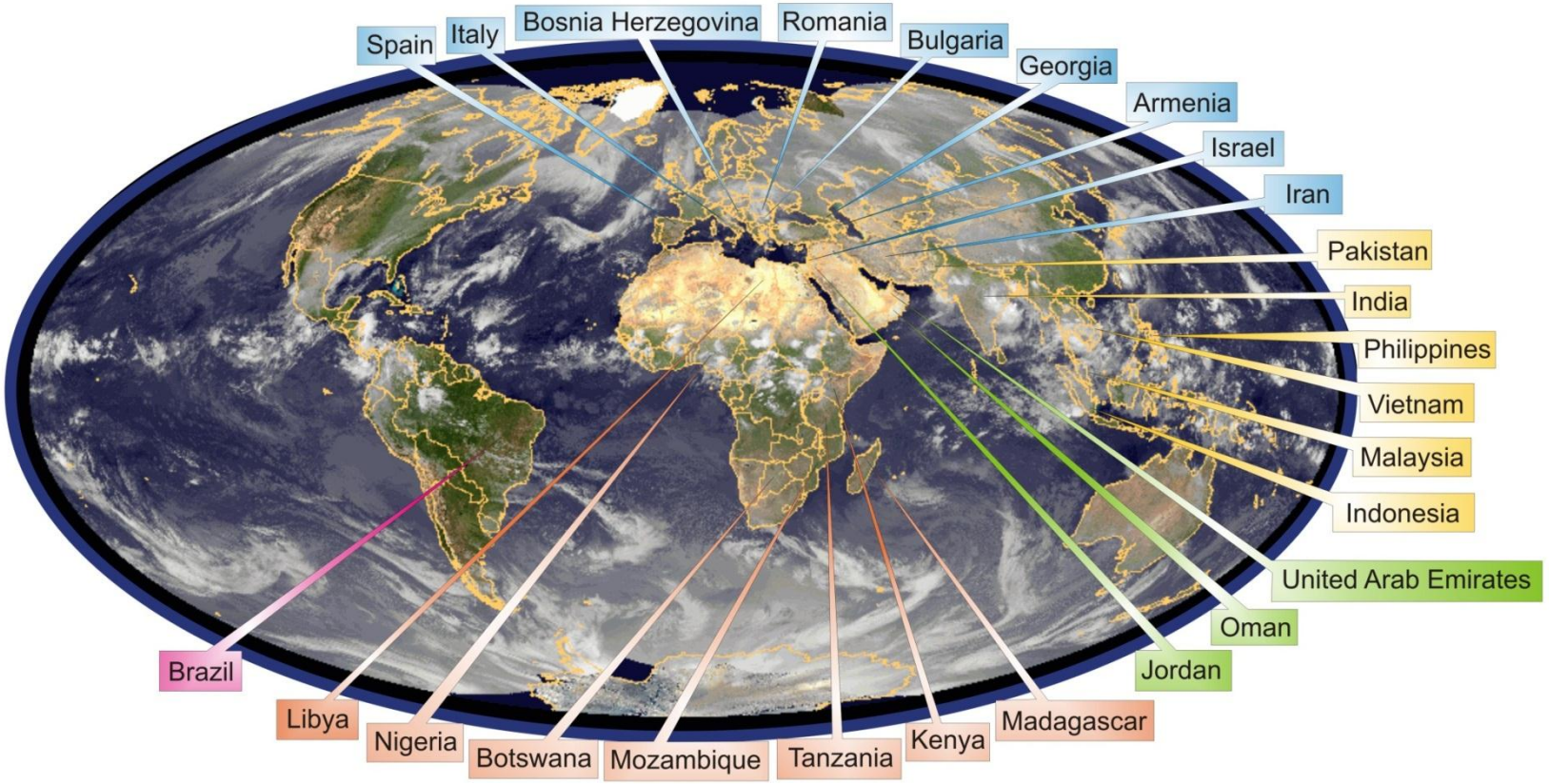
Poland
Institute for Meteorology and Water Management (IMGW)

Romania
National Meteorological Administration (NMA)

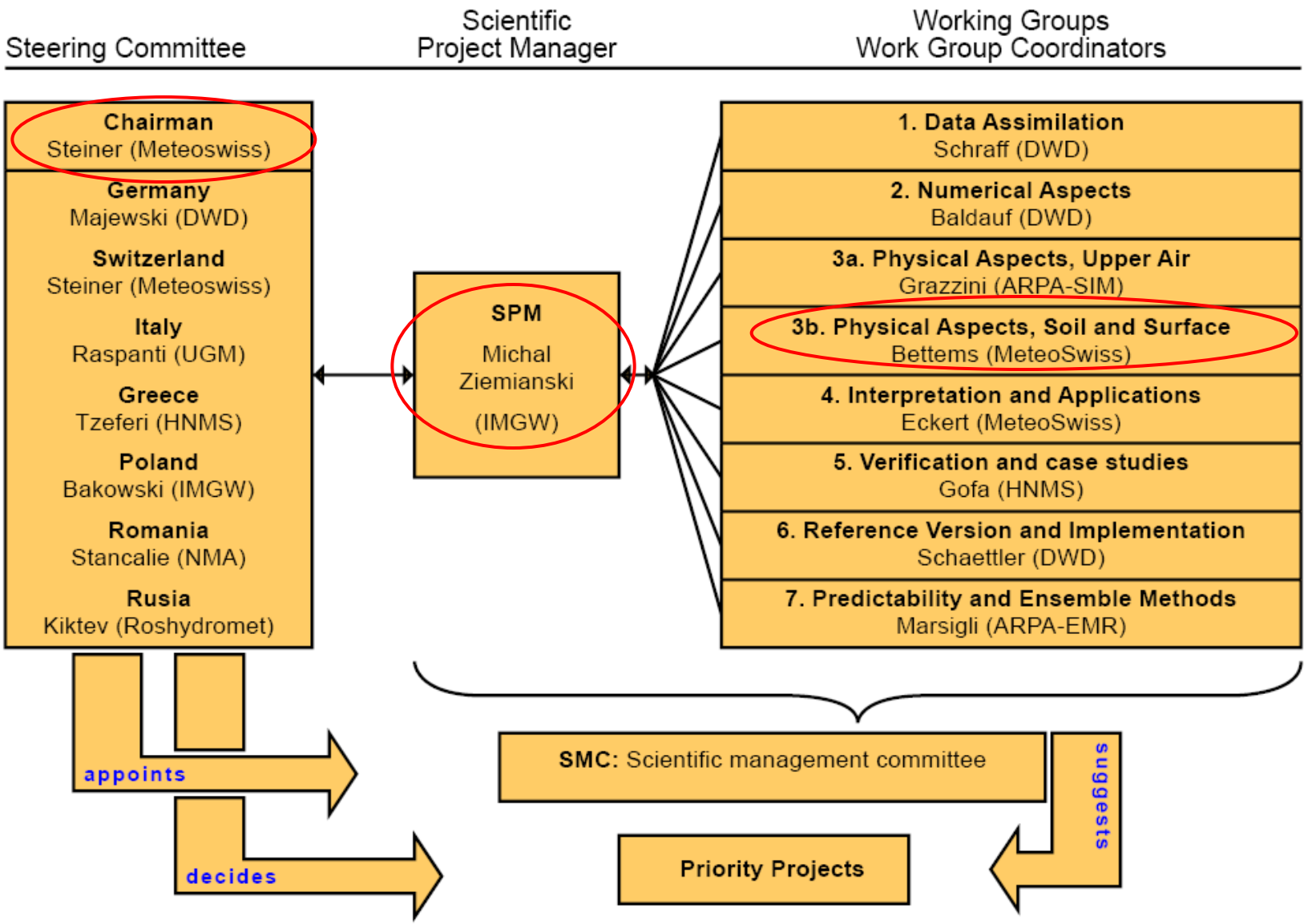
Russia
Federal Service for Hydrometeorology and Environmental Monitoring (Roshydromet)

Weather services with COSMO licenses

- 4 weather services used COSMO under license in 2011
- COSMO proposed to the current operational HRM users:
  15 test licences installed end of 2011



COSMO Organisation



Priority Projects & PP Leaders

- **Conservative dynamical core (CDC)**
  Michael Baldauf (michael.baldauf [at] dwd.de)
- **Performance On Massively Parallel Architectures (POMPA)**
  Oliver Fuhrer (oliver.fuhrer [at] meteoswiss.ch)
- **Km-Scale Ensemble-Based Data Assimilation (KENDA)**
  Christoph Schraff (christoph.schraff [at] dwd.de)
- **Towards Unified Turbulence-Shallow Convection Scheme (UTCS)**
  Dmitrii Mironov (dmitrii.mironov [at] dwd.de)
- **Verification System Unified Survey (VERSUS 2)**
  Angela Celozzi (celozzi [at] meteoam.it)

In the last steps of approval:

- **Consolidation of Operations and Research results for the Sochi Olympic Games (CORSO)**
  Gdaly Rivin & Inna Rosinkina (gdaly.rivin, inna.rosinkina [at] mecom.ru)

1st Priority Project finished in 2011 (1)

Consolidation of Lower Boundary Conditions (COLOBOC)

Jean-Marie Bettems (jean-marie.bettems [at] meteoswiss.ch)

- **Observation sets for model validation and development**
  > SRNWP data pool with 9 sites created, long term coordination
- **Externalized TERRA module**
  > package consolidated and documented, but **no support in COSMO**
- **Software for generation of external parameters**
  > software EXTPAR consolidated and documented
  > accessible via **web portal**
- **External parameters**
  > available data sets documented & consolidated (15 new parameters)
- **TERRA improvements**
  > Implementation of more realistic physics in TERRA but neutral impact

Final status (ok, delayed, not all goals reached)

1st Priority Project finished in 2011 (2)

Consolidation of Lower Boundary Conditions (COLOBOC)

Jean-Marie Bettems (jean-marie.bettems [at] meteoswiss.ch)

- **Improved snow model**
  > revised parameterizations of **snow albedo** and **partial snow cover**
  > **multi-layers snow model** (stability issues, solution till Q2 2012)
- **Snow analysis**
  > snow analysis software unified, but not all features merged
  > (e.g. altitudinal interpolation)
- **Urban module BEP (Building Effect Parameterisation)**
  > code ported and documented, but **no support in COSMO**
- **Parameterization of surface heterogeneities**
  > **tile** and **mosaic** approach implemented, to be releases till Q2 2012

Final status (ok, delayed, not all goals reached)

2nd Priority Project finished in 2011

Consolidation of COSMO Ensemble (CONSENS)

Chiara Marsigli (cmarsigli [at] arpa.emr.it)

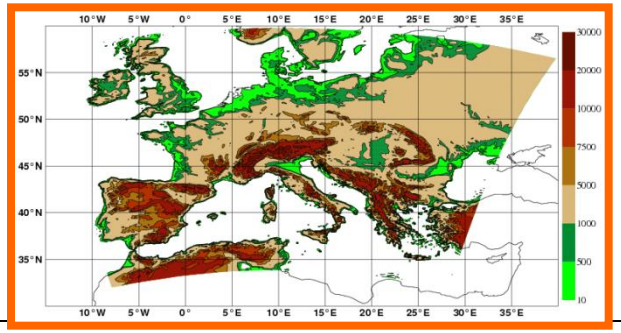
- Compare COSMO-SREPS with COSMO-LEPS for the short-range prediction of precipitation
- Decide if and how merge the two ensemble systems
- Assess the validity of the multi-model approach to provide initial and boundary conditions with respect to using a single model ensemble (EPS)

COSMO-SREPS vs. COSMO-LEPS

- **Multi-analysis** multi-boundary approach
- IC and BC provided by 3 deterministic global models (IFS, GME, GFS)
- Perturbations of the model physics applied
- Regular runs for testing, last set-up in Nov. 2010

- **Downscaling** of selected members of the ECMWF EPS with COSMO
- Selection with Cluster Analysis and Representative Member selection technique
- Perturbations of the model physics applied
- Operational since Nov. 2002

- 00 and 12 UTC
- 7 km, 40 levels
- 16 members
- **48 h** forecasts

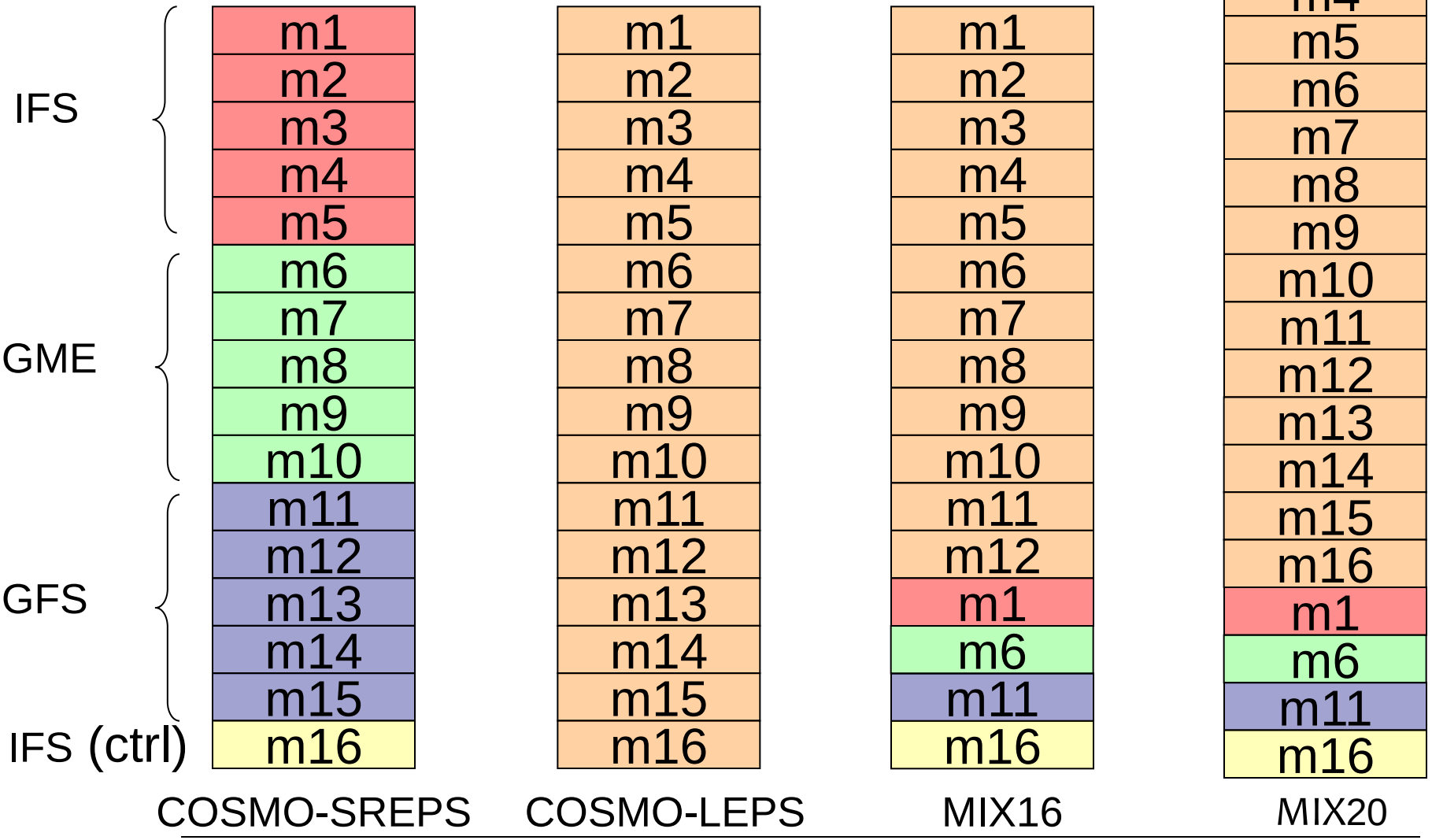


- 12 UTC *(new 00 UTC)*
- 7 km, 40 levels
- 16 members
- **132 h** forecasts

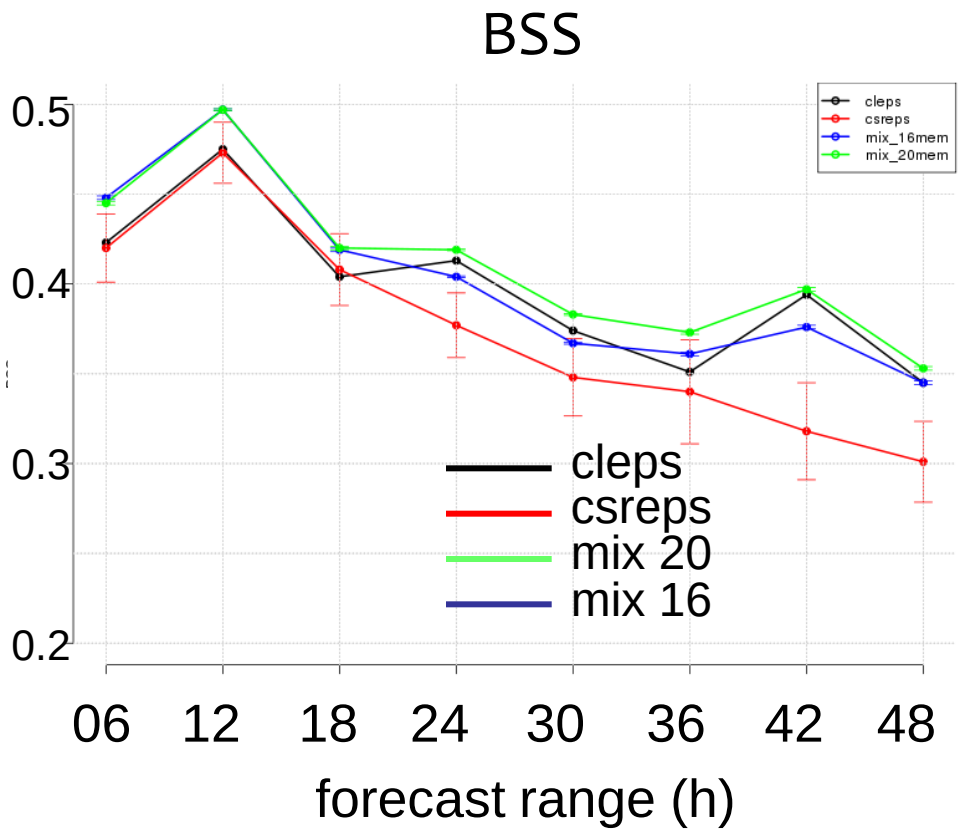
philippe.steiner@meteoswiss.ch

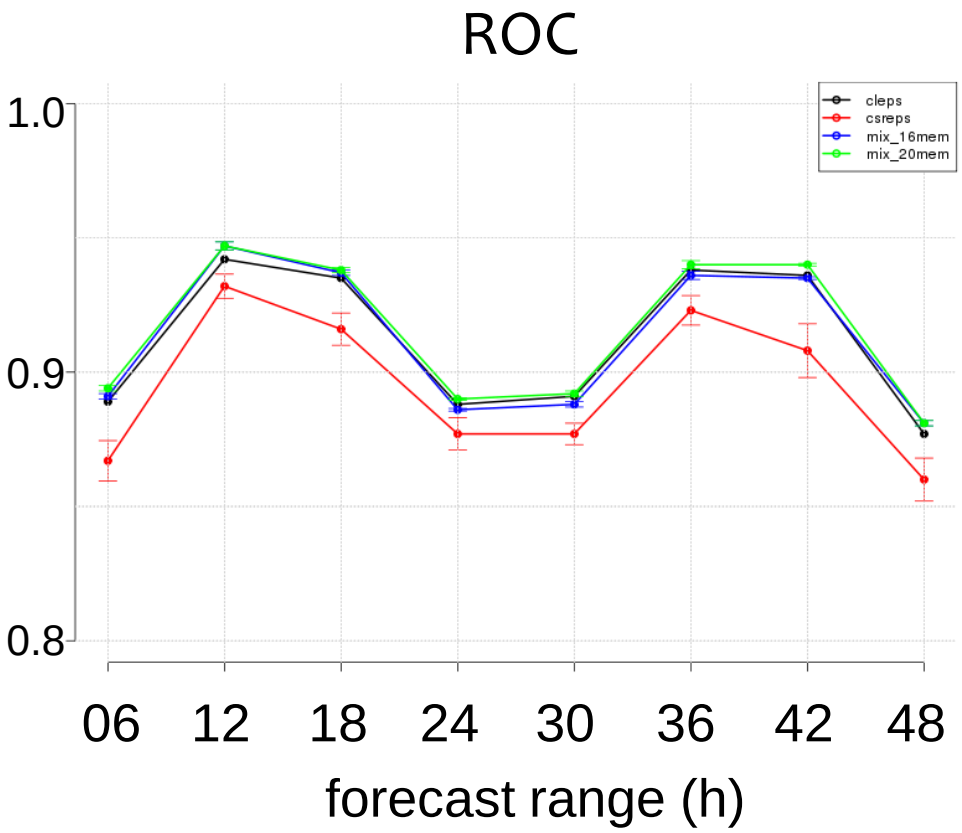
Chiara Marsigli

Test of Ensemble mixing



Example of comparison: precipitation





Average precipitation on 0.5 x 0.5 deg boxes (Northern Italy) > 1mm/6h

Conclusions of CONSENS

- Generally **COSMO-LEPS outperforms** COSMO-SREPS
- **Multi-model** approach for i.c. and b.c. proves **valuable** even if model with different qualities are used
- Several models are needed in the multi-model approach, to get a performance similar (or better) to a downscaling from a well constructed ensemble (like EPS)
- With only **3 global models** for initial and boundary conditions, very limited scores increase after **8 members**
- For the approach of EPS downscaling we are in the short-range at the maximum attainable skill with **16 members**
- The scores of both ensemble approaches saturate around ensemble size 13-14