



COSMO Overview

Detlev Majewski for Dmitrii Mironov (COSMO SPM)
German Weather Service, Offenbach am Main, Germany
(detlev.majewski@dwd.de, dmitrii.mironov@dwd.de)

39th EWGLAM – 24th EUMETNET SRNWP Meeting
2 - 5 October 2017, Reading, UK

Outline

- **Looking back on the COSMO year
September 2016 – August 2017**
- **Pressing problems and challenges**
- **Outlook**

New Consortium Member Welcomed

IMS (Israel Met. Service) joined the COSMO consortium in September 2014 as an applicant member.

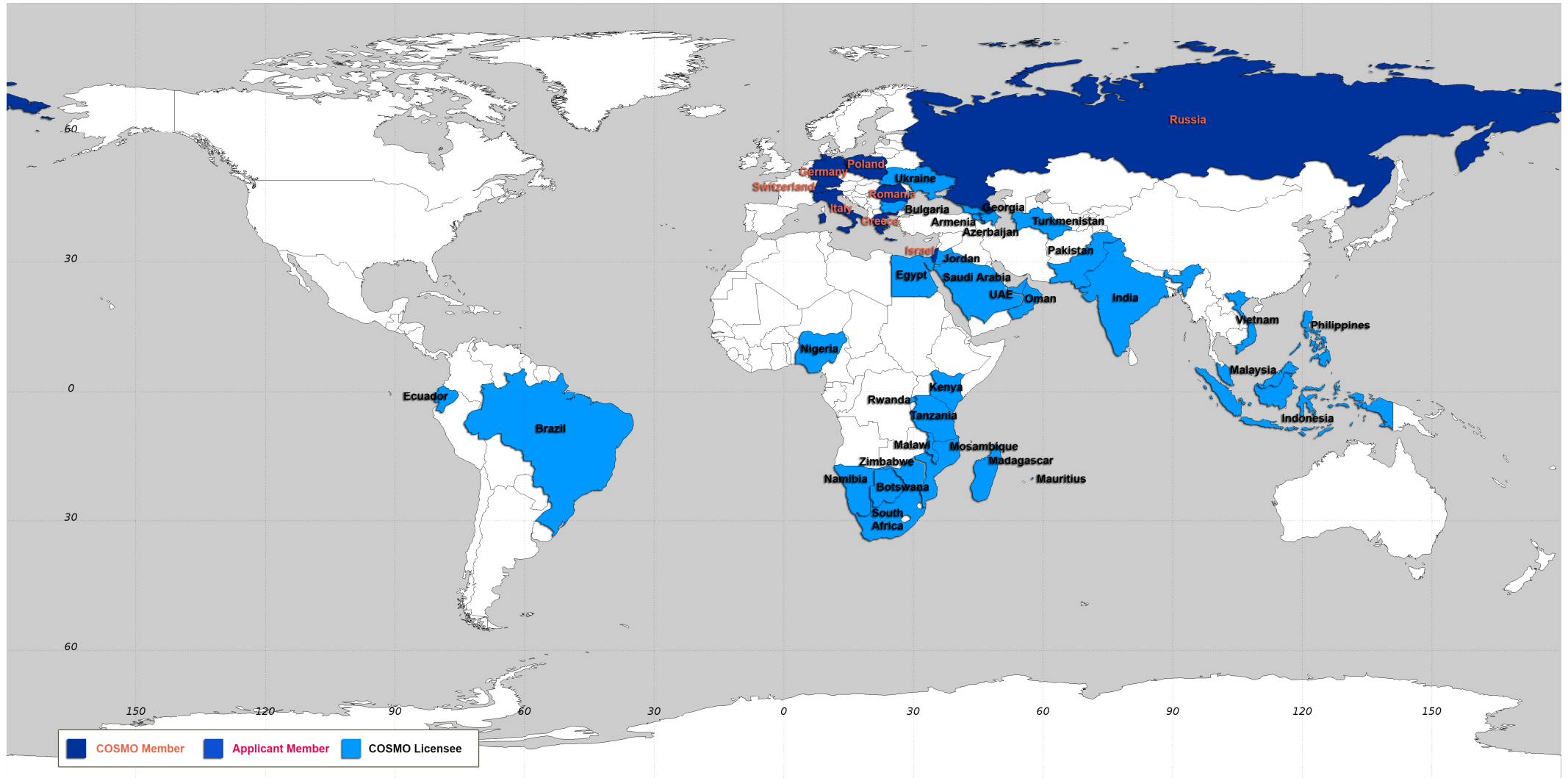
Official full COSMO membership since 1 January 2017.

Declaration of Partnership has been signed by the directors of all eight COSMO national meteorological services.

- IMS scientists are making important contributions to various COSMO activities.
- Priority Project $T^2(RC)^2$ (lead by Harel Muscatel of IMS), Priority Task TERRA Nova (lead by Yiftach Ziv), PP CALMO, to mention a few.

**We wish the IMS colleagues good luck, every success,
and much joy with(in) COSMO!**

Members and licensees of COSMO



LETKF-Based DA Goes Operational

Priority Project **KENDA** “Km-Scale Ensemble-Based Data Assimilation” (09.2007-09.2015), PP KENDA-O (09.2015-08.2020)

- **DWD, Germany: KENDA operational since March 2017** (both for ensemble and deterministic forecasts, performance OK)
- **ARPAE, Italy: KENDA operational since May 2017** (for deterministic forecast only, OK)
- **MCH, Switzerland: KENDA operational since May 2016** (for ensemble forecast, analysis less close to observations than nudging, forecast scores not improved; reasons being investigated)
- **COMET, Italy: KENDA pre-operational** (KENDA slightly worse than ‘old’ COMET system, work underway)

[Details in the talk of Christoph Schraff](#)

Development of NWP Test Suite

A truly pressing problem (recent results are contradictory, release of new COSMO-model versions delayed, etc.)

- Remedial measures are proposed (proposal prepared by Flora Gofa and a few other colleagues)
- **Set-up of test suite:** Series of forecast, each being re-initialized with IFS fields **or** one continuous hindcast run **or** series of forecasts, where the soil variables run freely.
- **Verification software** (VERSUS, modified VERSUS, MEC + Feedback Files)
- Proposal has been considered by the COSMO Steering Committee (STC) and the Scientific Management Committee
- **The implementation plan is prepared,**
- **Priority Project (Task) will be launched** (c/o F. Gofa, A. Montani, M. Milelli, R. Dumitrache, A. Iriza, U. Schättler)

Fresh Wind is Blowing in WG4

Pierre Eckert (Switzerland) has been the coordinator of the COSMO Working Group 4 “Interpretation and Applications” for many years (Pierre steps down in 2017).

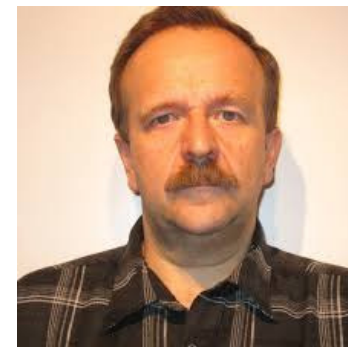
Great thanks, Pierre!



Fresh Wind is Blowing in WG4 (cont'd)

- The scope of the WG4 work has been shrinking over years, as the group experienced a number of problems...
- Based on the proposal (position paper) prepared by Pierre, the COSMO STC decided to keep WG4 and have delegated their representatives to form the new WG4 team.
- A new coordinator is nominated by the STC, Anastasia Bundel (Russia), Andrzej Mazur (Poland) is the deputy.

**Congratulations,
Anastasia and Andrzej!**



Hit the road, the WG4 revival team!

High-Resolution Challenge

With increasing spatial resolution we have entered the “convection-permitting” range of scales

- Deep cumulus convection scheme is switched off (not a bad idea)
- No general consensus about the treatment of shallow convection (though COSMO researchers have promising ideas!)
- Sophisticated interplay of radiation, turbulence, microphysics (expensive solutions exist, but how to make things cheap?)
- The interaction of SGS and resolved scales is not well understood.
- Frankly speaking, we do not really understand what our models actually do.

**We know that something is happening here
But we don't know what it is
Do you? (Bob Dylan, Ballad Of A Thin Man)**

Outlook

Within COSMO, much effort will (likely) go into

- development of dycores with improved conservation properties,
- more intimate coupling of turbulence, microphysics, radiation and soil (including ocean and lakes) parameterization schemes,
- model calibration,
- development and efficient use of spatial verification methods for ensemble and deterministic forecasts,
- representation of model uncertainties and development of perturbation methods for the ensemble prediction systems,
- performance on massively parallel hybrid computer architectures,
- (not the least) software maintenance.

Given limited resources, priorities should be carefully set!

Outlook (cont'd)

The SPM would like to encourage the COSMO folks

- To think more and perform deeper analyses, not just run the model and produce nice plots. Thinking is not a waste of time, it often helps to make progress!
- To strengthen co-operation between COSMO WGs [cf. a long WG3ab(physics)-WG5(verification) co-operation story, not really a success story so far] and, importantly, with other NWP consortia!
- To write and update the model documentation (oh, how many times did we talk about this?)!
- To try out ICON-LAM. **It is tasty!**

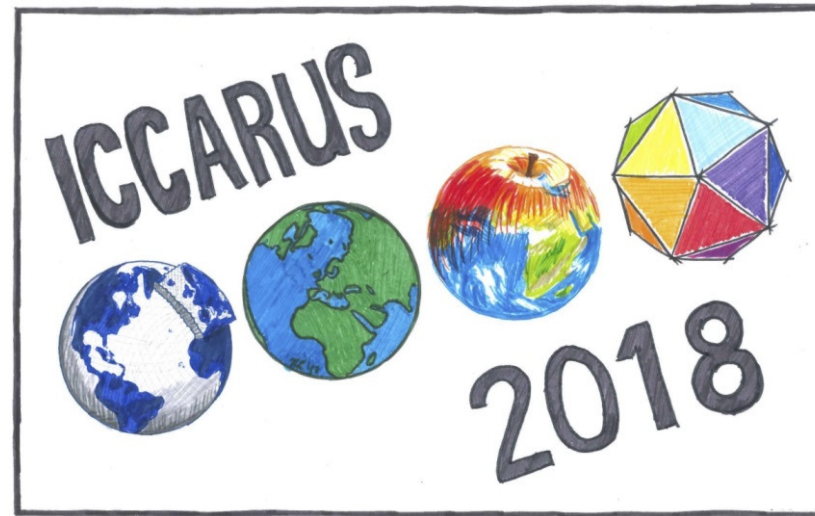
We feel we are on a good track,

but there is still a lot to improve!



Thank you!

**39th EWGLAM – 24th EUMETNET SRNWP Meeting
2 - 5 October 2017, Reading, UK**



- The next **ICCARUS** (ICON-COSMO-CLM-ART User Seminar) will be held in Offenbach, Germany, 26 - 28 February 2018; WG meetings 1 - 2 March 2018.
- http://www.dwd.de/SharedDocs/termine/EN/research/termin_iccarus_en_2018.html
- You are very welcome to participate in ICCARUS!