



News CLM Community

COSMO General Meeting 2026

17 September 2026

Rome, Italy

Meetings/Events 2026 + 2027

ICON-CLM Training 2026:

23 – 25 June 2026

CLM Community Assembly 2026:

22 - 25 September 2026, Lüneburg

ICCARUS 2027:

08 - 12 March 2027, Offenbach

ICON-CLM training course 2027:

22 – 24 June 2027, Offenbach (t.b.c.)

CLM Community Assembly 2027:

20 – 24 September 2027, Caserta (t.b.c)





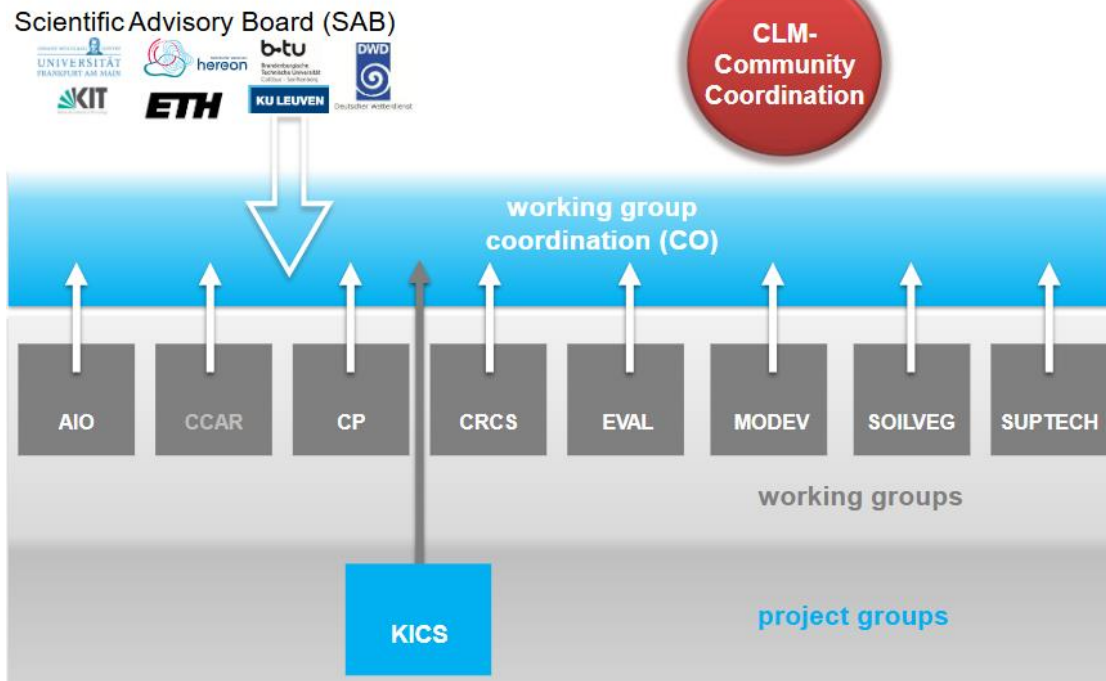
Outline

1. **Main working group activities last year**
2. ICON-CLM simulations for EURO-CORDEX



CLM Community Overview

SAB Chair: Stefan
Hagemann (Hereon)





WG AIO

→ Development coupled systems

- Upgrading RESM GCOAST-AHOIB2-1 (ICON-CLM v2026-04 + NEMO v3.6 + HD v2.5 + ECOSMO) (Ha Hagemann et al., Hereon)
- The coupling RESM IOW-ESM2 (ICON-CLM v2026-04 + MOM6) is work in progress (Sven Karsten et al., IOW)
- Regional coupled ICON-CLM + ICON-O-LAM configuration over the Mediterranean for climate applications, developed within the SPICE software (Angelo Campanale et al., CMCC)
- FESOM-1.4 coupled ocean-ice model forced by CCLM (15 km res.) over the southern Weddell Sea (Günther Heinemann et al., AWI)
- Develop the new RESM TSMP2 (ICON-CLM + eCLM + ParFlow) (Stefan Poll et al., FZJ)

WG AIO: EURO-CORDEX downscaling (ERA5 & CMIP6)

Institute	RESM	Components	ERA5, ORAS5	MPI-ESM1-2-HR	EC-Earth-Veg3	CNRM, CMCC, MIROC6, NorESM
Hereon	GCOAST-AHOIB1-1	CCLM v6.0 + NEMO v3.6 + HD v2.5 + ECOSMO	1959-2021 (cmorised → JSC)	Historical (finished) SSP370 (running)		
DWD	ROAM-NBS	ICON v2024-10 + NEMO v4.2	1979-2021 (cmorised → JSC)	Historical (finished) SSP126 (finished) SSP370 (finished)	Historical (finished) SSP126 (finished) SSP370 (finished)	
FZJ	TSMP1-140E	CCLM v5.0 + CLM 3.5 + ParFlow	1979-2021 (cmorised → JSC)	Historical (finished) SSP126 (finished) SSP370 (finished)		
IOW	IOW-ESM1	CCLM v5.0 + MOM6 + ERGOM	1979-2021 (running)	Historical (running) SSP126 (planned) SSP370 (planned)	Historical (running) SSP126 (planned) SSP370 (planned)	Historical (planned) SSP126 (planned) SSP370 (planned)

Ensembles of Climate Projections (WG CP)

- CMIP6 Downscaling for the European Domain almost completed
 - ICON-CLM and COSMO-CLM already published in ESGF
 - Intensive analysis and publication efforts in progress
- Several (3-)Kilometre-Scale Ensemble have been created
 - UDAG – DACH Region, ICON-CLM, 3 GCMs, 2 Scenarios, transient
 - NUKLEUS – ~DACH Region, 3 RCMs, 3 GCMS, 2 GWLs
 - KIT-KLIWA – Southern Germany, 4 GCMs, COSMO-CLM, transient
 - CORDEX FPS UrbRCC – Paris and Johannesburg
- Regional Decadal Hindcast Ensemble (R2B7, R2B9) with ICON-XPP for Europe



WG Convection-Resolving Climate Sim. (WG CRCS), 2025/26

- WG CRCS-related scientific / technical activities
 - Coordinated Evaluation of Convection Permitting Climate simulations with ICON-CLM for Germany (CECPI-Ger) ongoing follow-up activities: 2-moment MP scheme testing, configuration testing for geographically distant / continental domains
 - Ongoing analyses of the UDAG km-scale simulations over Germany (e.g., precipitation extremes)
 - Technical developments by WGs EVAL, SUPTECH with “km-scale support”: COPAT3 pipeline, new EVA-Suite, new SPICE

WG Convection-Resolving Climate Sim. (WG CRCS), 2025/26

- Other activities (non-comprehensive)
 - Continued contribution to CORDEX FPSs doing km-scale ICON runs with WG CRCS members' participation (e.g. FPS-URB)
 - Contribution to CORDEX Task Force on CPRCM strategy report (<https://zenodo.org/records/20282519>) (based on this report, a paper by Sobolowski et al. for CORDEX 15th anniversary PLOS special issue under preparation)
 - WG CRCS members applied for newly to-be-established [WCRP / CORDEX Task Team Convection-Permitting Regional Climate Modelling](#)
- Born out of WG CRCS Task Group Alps discussions in mid 2025 (transferring the CECPI-Ger recommended configuration to new model domains for specific process studies):
The WG CRCS initiated during the CLMcom GA 2025 the establishment of the time-bound **Project Group Kilometer-scale ICON Continental Simulations (PG KICS)** and devoted most of its activities to this PG ever since



WG EVAL

- COPAT framework: COPAT3
- EvaSuite
 - v1.0.2 → support users
 - v2.0.0 (Nova) → new version of EvaSuite adapted for high-resolution datasets with more efficient memory consumption, new input formats (zarr + healpix) and fully automated system of tests



WG SOILVEG

- **WG Coordinator / Deputy**

Jan-Peter Schulz (DWD, CMCC) / Mario Raffa (CMCC)

- **Key research topics: Soil hydrology**

- Jane Roque (Uni Bonn): Decadal convection-permitting irrigation impact across the European continent
- Morgane Lalonde (ETHZ): Lateral soil water transport
- Gennaro Sequino (CMCC): Soil hydraulic properties based on measurements
- Mittal Parmar (GUF): Frozen soil water for seasonal prediction



WG SOILVEG

- **Key research topics: Urban modelling**
 - Angelo Campanale (CMCC): Urban test case Bologna
 - May Bohmann (KIT): Urban climate applications with ICON-CLM at KIT
 - Kutay Dönmez (EMPA): Evaluating the role of Urban Canopy Parameters in ICON TERRA_URB
 - Nicole van Lipzig (KUL): "Roman cement" with high albedo
 - Fien Serras (KUL): Urban climate adaptations in Belgium

Topics WG SUPTECH (1)

- **User Management and gitlab:** connection between gitlab and webpage established; working groups and repositories in place and now used more actively; also some public repositories (e.g. SPICE)
- **SPICE** updated to version 2.4 (new recommended settings; technical updates, new documentation directly in gitlab, ...)

Topics WG SUPTECH (1)

- **COPAT-Framework** for testing new model versions established
- **ICON-CLM Training course** in June with 31 participants



Topics WG SUPTECH (3)

- **Zonda** updated to version 2.2 (e.g.,
editable JSON Config and new datasets for EXTPAR)

```
JSON CONFIG Paste a full JSON config or edit values directly.

1 {
2   "zonda": {
3     "request_name": "my_request",
4     "backend_tag": "v2.2",
5     "icontools_tag": "latest",
6     "extpar_tag": "latest"
7   },
8   "globals": {
9     "keep_basegrid_files": false,
10    "grid_root": 13,
11    "grid_level": 5,
12    "icorotation": 0,
13    "icopole_lat": 90,
14    "icopole_lon": 0,
15    "centre": 215,
16    "subcentre": 0
17  },
18  "domains": [
19  ]
20 }
```

EXTPAR PARAMETERS — DOMAIN 1

flu_type	laib_type	isoi_type
Globcover2009	total albedo	FAO
itopo_type	lit_cl_type	lera_type
GLOBE	Aggregate only fine data over land	ERA5
lemiss_type	laot_type	lookup_table_lu
full-range (3.6 & 14.3 micron)	Tegen	operational settings (Asensio, 2011)
enable_cdnc	icdnc_type	enable_edgar
false ☒	MODIS Q06	false ☒
enable_art	enable_gfascim	l_use_corine
false ☒	false ☒	false ☒
infill_corine	iradtopo	radtopo_radius
false ☒	false ☒	40000
nhori		
24		

☒ Include topography plot in output

PG Kilometer-scale ICON Continental Simulations, 2025/26

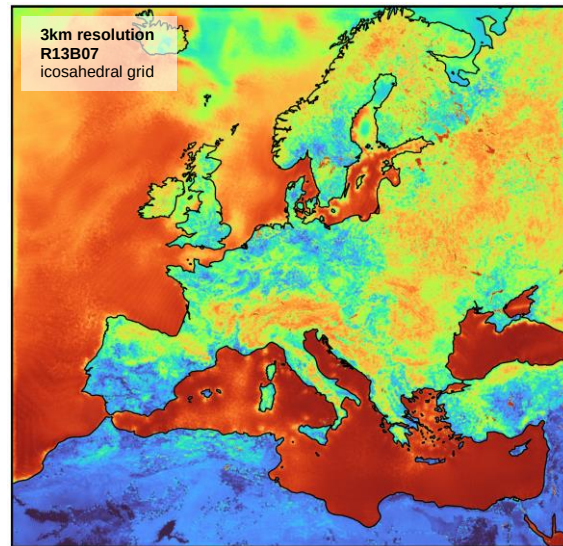
- Assembly 2025: **Startup and establishment of PG KICS**
 - “The goal of the Project Group is the preparation, conduction, and analysis of km-scale continental ICON climate simulations by 2030. This encompasses all aspects of regional climate modelling. The PG thus aims at enabling the CLM-Community to perform such simulations, similar to 12 km simulations nowadays, 2025.”
- GitLab-based FAIR / RAIR4RS work organisation, information management, communication, sprint-like simulation experiment development and maintenance; **monthly jour-fixe** and **intermediate meetings**
- Two primary simulation experiments ongoing / under preparation (pan-European 3km model domain)
 - “*pg-kics_cycle-2026_initial-tests*” (preparation of setup, use of multiple HPC systems, internal variability, additional sensitivity study runs), seven simulation groups / HPC systems; 1SYPD can already be reached (on CSCS Alps by ETH)
 - “*pg-kics_cycle-2026_baseline*” (production of 2026 1st 10-year evaluation baseline, **continued technical improvements** (data handling, performance, in-situ analysis, workflows, parallelism, use of heterogeneous HPC, etc.); enhanced setups and configurations; **basis for extensive community analyses and process studies through community Task Groups**)
- Since May 2026, own CLMcom compute time project on JSC/JUPITER exascale HPC system for km-scale runs



PG Kilometer-scale ICON Continental Simulations, 2025/26

pg-kics_cycle-2026_initial-tests setup

- ICON release-2026.04-public
- Configuration: CEI19[3,5]c
- Grid: R12B07, EUR-12 extent
- extpar: Zonda
- One-way single nest, no nudging
- LBC / IC: ERA5
- 2001-12 spinup, 2002-01 to 12
- Workflow engine: SPICE 2.4 modified
- VL: towards CORE and Tier 1 from CORDEX
- HPC: IMWM, GUF, DWD, DKRZ, CSCS, JSC (x2)



Example of
preparatory
ICON 3km
test runs

0.0 0.2 0.4 0.6 0.8 1.0
Evaporative fraction [-], $EF = Q_e / (Q_e + Q_h)$, mean: 2018-07, 6-18UTC



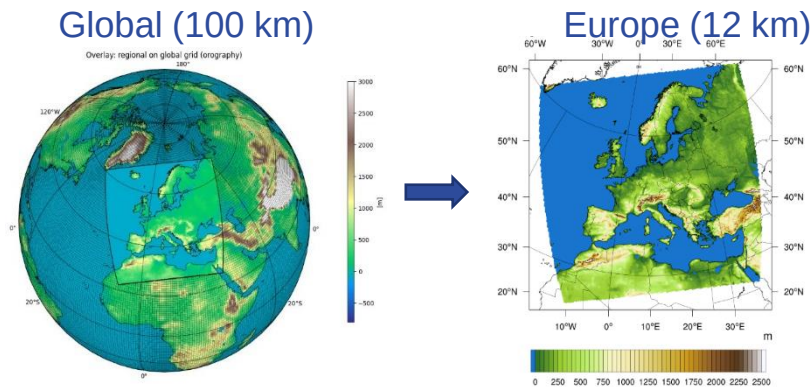
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UDAG – 12 km simulations

- Provide regional climate projections based on current global climate models (CMIP6)
- “Dynamical Downscaling”
 - ICON-CLM
 - 4 global models as driving models
 - Scenarios: SSP1-2.6, SSP2-4.5
SSP3-7.0 and SSP5-8.5

Additional simulations from partners

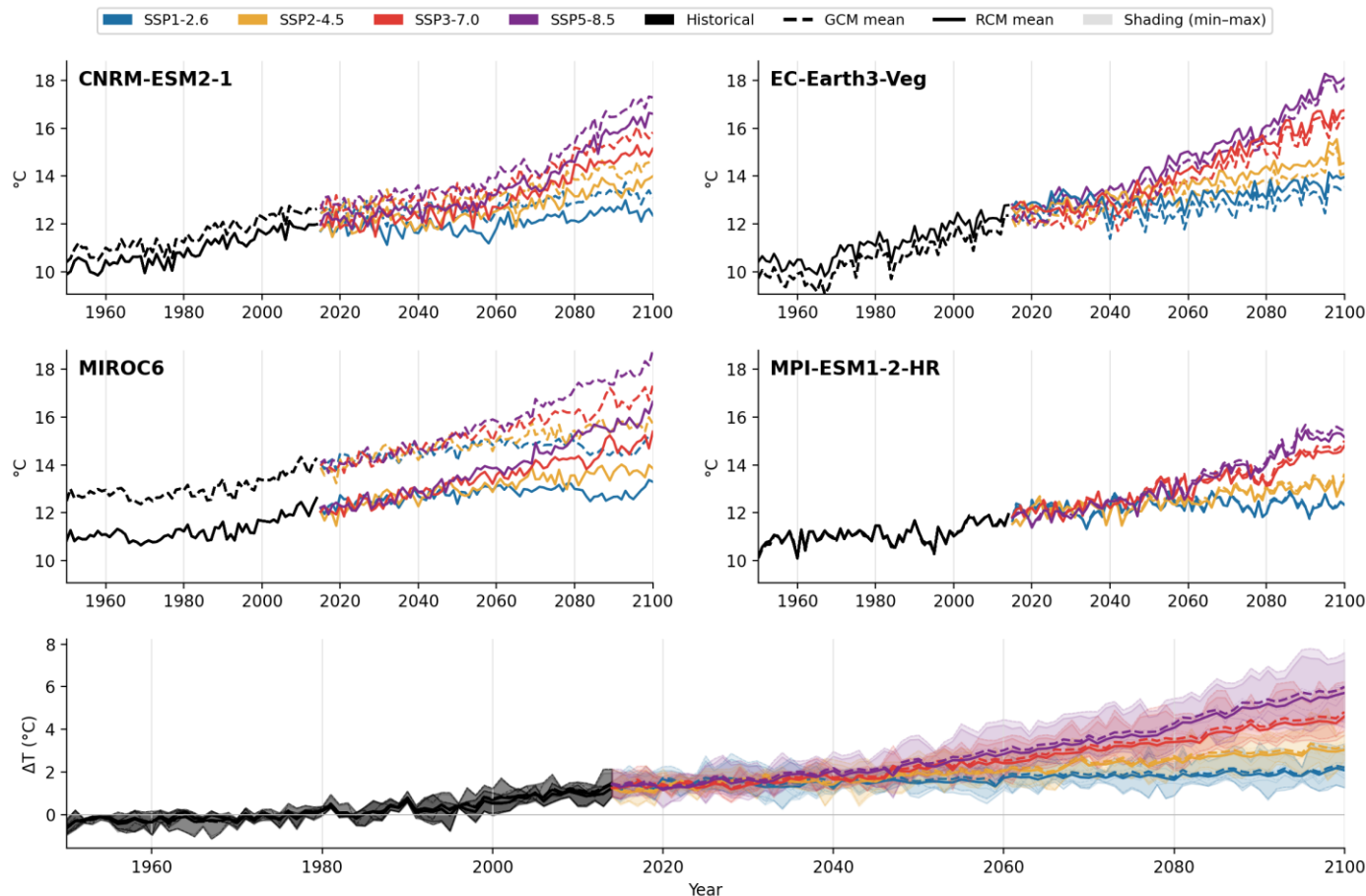




UDAG 12 km

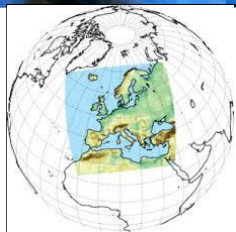
2m temperature
Europe in historical
and different
scenarios in GCMs
and RCMs

Ensemble mean





CMIP6 - EURO-CORDEX “balanced” matrix

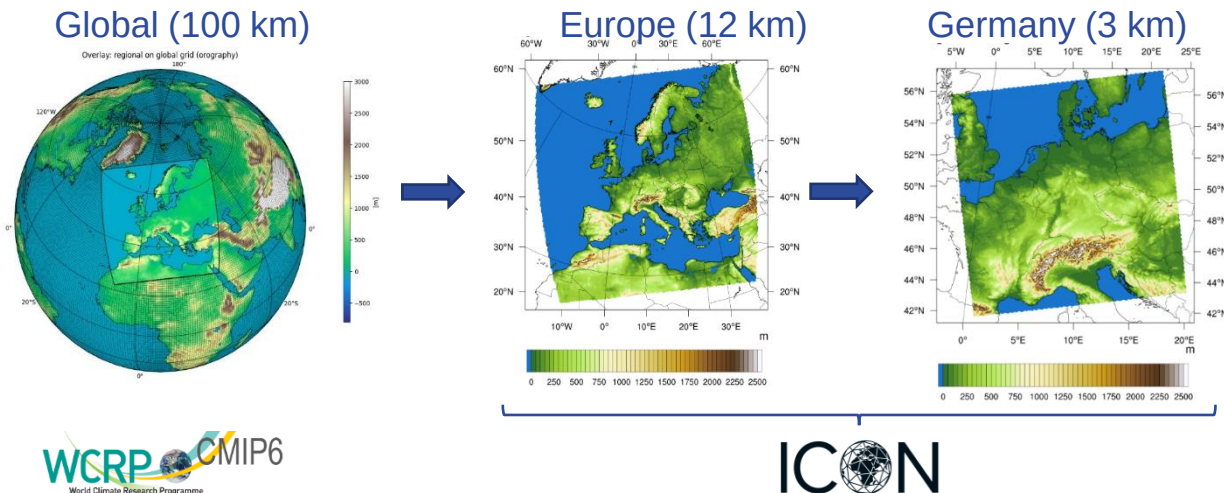


	Institution	CNRM-MF	Hclimcom-SMHI	CLMcom – ICON-CLM	CLMcom – COSMO-CLM	KNMI	GERICS	CNR-ISAC, CUNI, ICTP	AUTH, BCC- UCAN, IDL- FCUL, TASK- IMWM
	RCM	CNRM- ALADIN64E1	HCLIM43- ALADIN	ICON-CLM- 202407-1-1	CCLM6-0-1	RACMO23E	REMO2020- 2-2	RegCM5-0	WRF451Q
GCM	realization								
CMCC-CM2-SR5	r1i1p1f1	hist, ssp126, ssp370		hist, ssp126, ssp370	hist, ssp126, ssp370				hist, ssp126, ssp370
CNRM-ESM2-1	r1i1p1f1	hist, ssp126, ssp370	hist, ssp126, ssp370			hist, ssp126, ssp370		hist, ssp126, ssp370	
EC-Earth3-Veg	r1i1p1f1		hist, ssp126, ssp370	hist, ssp126, ssp370		hist, ssp126, ssp370	hist, ssp126, ssp370		
MIROC6	r1i1p1f1		hist, ssp126, ssp370	hist, ssp126, ssp370	hist, ssp126, ssp370		hist, ssp126, ssp370		
MPI-ESM1-2-HR	r1i1p1f1				hist, ssp126, ssp370		hist, ssp126, ssp370	hist, ssp126, ssp370	hist, ssp126, ssp370
NorESM2-MM	r1i1p1f1	hist, ssp126, ssp370				hist, ssp126, ssp370		hist, ssp126, ssp370	hist, ssp126, ssp370



UDAG – 3 km simulations

- ➔ High-resolution simulations (3 km) for „Hydrological D-A-CH Region”:
Refinement of EUR-12 Simulations to a convection-permitting scale (3 km)



MIROC6
MPI-ESM1-2-HR
EC-Earth3-Veg

SSP1-2.6 and
SSP3-7.0



Questions?