Status and plans of C-SRNWP

Balázs Szintai

C-SRNWP Manager

…. with contribution from many of you
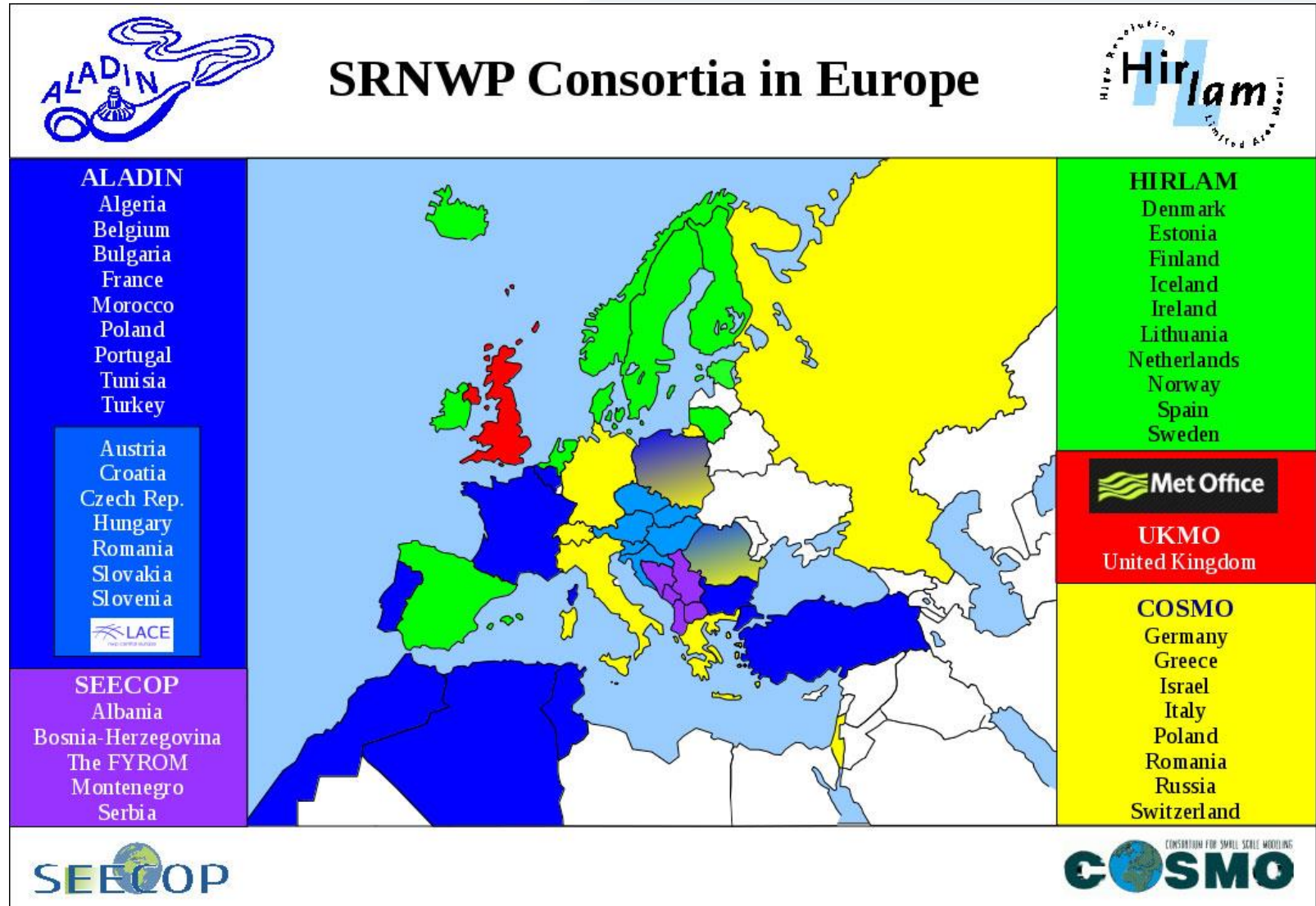
EUMETNET
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ALADIN-HIRLAM Workshop

30 March 2020

C-SRNWP Module of EUMETNET

- **Coordination of Short Range Numerical Weather Prediction in Europe**

- **28 Member States, 2 Cooperating States**

- **New Members: Germany, Ireland**

- **Module Manager: 0.3 FTE**

- **Coordinating Member: Hungary, OMSZ**

SRNWP Consortia in Europe

ALADIN
Algeria
Belgium
Bulgaria
France
Morocco
Poland
Portugal
Tunisia
Turkey

Austria
Croatia
Czech Rep.
Hungary
Romania
Slovakia
Slovenia

LACE

SEECOP
Albania
Bosnia-Herzegovina
The FYROM
Montenegro
Serbia

HIRLAM
Denmark
Estonia
Finland
Iceland
Ireland
Lithuania
Netherlands
Norway
Spain
Sweden

Met Office
UKMO
United Kingdom

COSMO
Germany
Greece
Israel
Italy
Poland
Romania
Russia
Switzerland

C-SRNWP Expert Teams

To foster communication between Limited Area NWP groups in Europe

8 C-SRNWP Topical Expert Teams (ETs)

- Data Assimilation (chair: Bruce Macpherson)
- Diagnostics and verification (chair: Marion Mittermaier)
- Dynamics and lateral boundary coupling
- Link with applications (chair: Jeanette Onvlee)
- Physical parameterisation - upper air (chair: Mike Bush)
- Predictability and EPS (chair: Chiara Marsigli)
- Surface and soil processes (chair: Patrick Samuelsson)
- System aspects

Advisory Expert Team (AET):

- Heads of NWP consortia
- C-SRNWP Topical ET Chairs
- Observers: FCAM, Post-processing MM, SRNWP-EPS MM

Core Members

	ALADIN	COSMO	HIRLAM	MetOffice	RC LACE	SEECOP	ECMWF contact
Data assimilation and use of observations	Claude Fischer	Christoph Schraff	Roger Randriamampianina	Bruce Macpherson	Benedikt Strajnar	Bojan Kasic	Lars Isaksen
Diagnostics, validation and verification	Bogdan Bochenek	Flora Gofa	Bent Hansen Sass	Marion Mittermaier	Christoph Zingerle	Angel Marcev	Dave Richardson
Dynamics and lateral boundary coupling	Piet Termonia	Michael Baldauf	Sander Tijm	Ben Shipway	Petra Smolikova		Michail Diamantakis
Link with applications	Maria Monteiro	Anastasia Bundel	Jeanette Onvlee	Simon Jackson	Benedikt Bica	Bojan Cvetkovic	
Physical parameterisation (upper air)	Yann Seity	Matthias Raschendorfer	Sander Tijm	Mike Bush	Neva Pristov		Irina Sandu
Predictability and EPS	Geert Smet	Chiara Marsigli	Inger-Lise Frogner	Aurore Porson	Martin Bellus		Martin Leutbecher
Surface and soil processes (model and data assimilation)	Patrick Le Moigne	Jean-Marie Bettems	Patrick Samuelsson	Martin Best	Alena Trojakova		Gianpaolo Balsamo Patricia de Rosnay
System aspects	Ryad El Khatib	Massimo Milelli	Daniel Santos	Richard Gilham	Oldrich Spaniel		Jenny Rourke

Additional Members

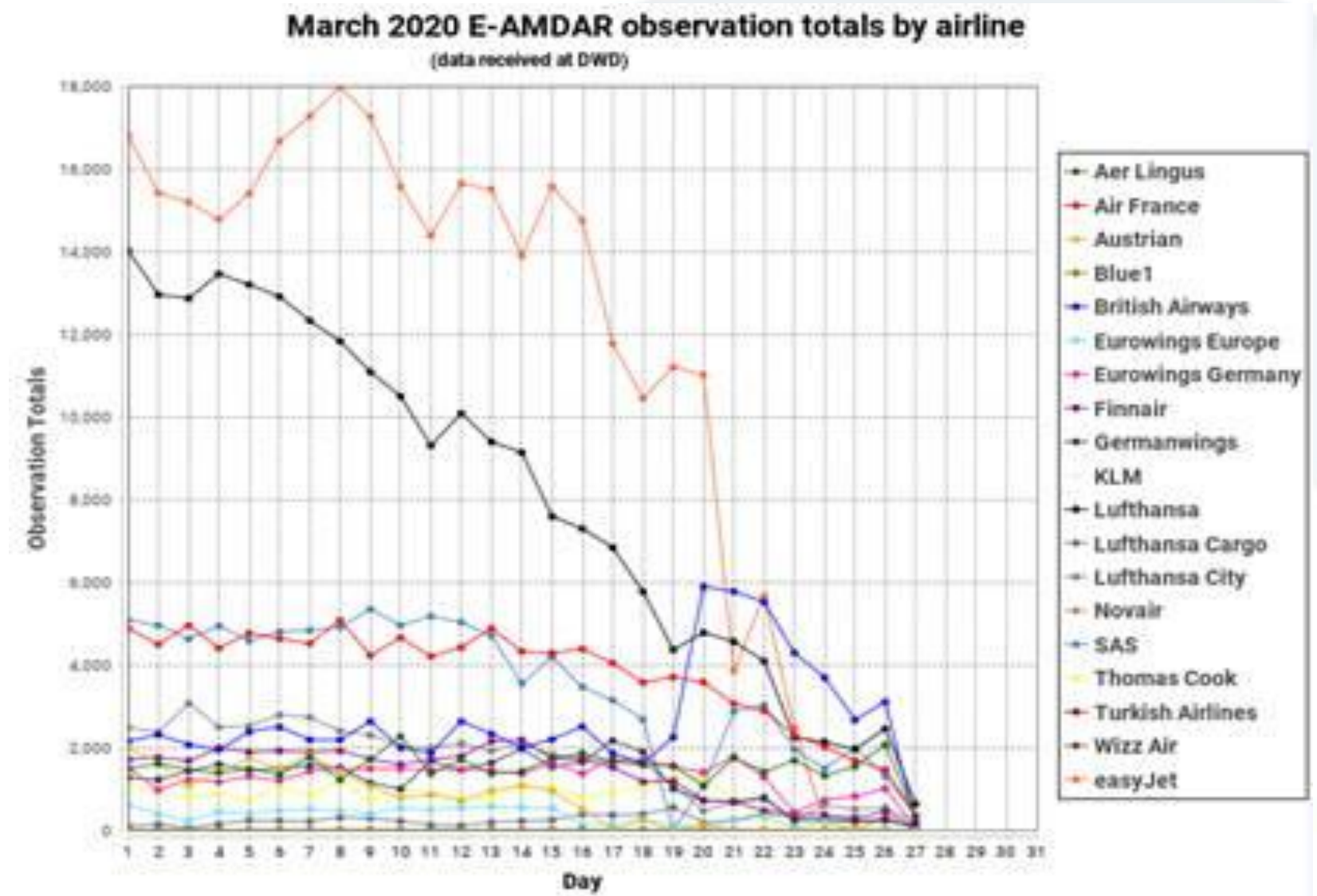|	ALADIN	COSMO	HIRLAM	MetOffice	RC LACE	SRNWP-EPS Activity	Post-Processing Activity
Data assimilation and use of observations	Loik Berre, Maria Monteiro	Mihail Tsyrulnikov	Magnus Lindskog	David Simonin Lee Hawkness-Smith	Florian Meier, Michal Nestiak		
Diagnostics, validation and verification	Marek Jerczynski, Alexander Kann	Joanna Linkowska	Xiaohua Yang, Ulf Andrae, Carl Fortelius	Nigel Roberts	Christoph Wittmann		
Dynamics and lateral boundary coupling					Jozef Vivoda		
Link with applications		Flora Gofa	Per Unden	Mike Bush	Martina Tudor		Stéphane Vannitsem
Physical parameterisation (upper air)		Dmitrii Mironov Frederico Grazzini	Bent Hansen Sass		Jan Masek		
Predictability and EPS	Francois Bouttier, Alain Joly	André Walser, Christoph Gebhardt	Jan Barkmeijer	Anne Mccabe	Mihály Szücs	Alfons Callado Pallarés	
Surface and soil processes (model and data assimilation)	Rafiq Hamdi	Jürgen Helmert, Jan-Peter Schulz	Ekaterina Kurzeneva	Breogan Gomez	Jure Cedilnik, Balázs Szintai		
System aspects	Andrey Bogatchev	Uli Schaettler	Ulf Andrae, Xiaohua Yang		Martina Tudor		

Cooperation with Obs CA (Obs-SET)

- **New Obs CA Management has conducted a series of information exchange events to shape the five year plan of the R&D Studies Programme**

- **June 2019: 1 day web-meeting to discuss the needs of SRNWP**
  - All limited area modelling consortia represented (with the involvement of the C-SRNWP DA Expert Team)
  - Important weather phenomena and associated observation requirements identified
  - Fog → participate/support measurement campaigns
  - Deep convection → temperature, wind and humidity profiles (Mode-S, AMDAR-q, radiosonde descent data)

- **17 January 2020: web meeting within ET Data Assimilation of C-SRNWP**
  - To refine the list of proposed impact studies:
    - Mode-S (as compared to AMDAR)
    - AMDAR-humidity (if there is a wide enough coverage)
    - GNSS Slant Total Delay (STD)
    - Others (crowd-sourced obs, radiometers, RaSo descent)

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Aircraft-based observations Workshop (12-13 Feb 2020)

- **To give an overview of current ABO types, coverage, etc.. and future developments**

- **Bring together observation providers and users**

- **Presentation on AMDAR-humidity usage in LAMs**

- **Two new developments presented by Siebren de Haan:**

  - Correction of Mode-S EHS temperature

    - exploiting indicated airspeed measurements

    - standard deviation Mode-S EHS similar to AMDAR (when compared to NWP)

  - Correction of AMDAR temperature BIAS

    - combining true airspeed and Mach from Mode-S EHS

    - bias reduced to zero and improved standard deviation when compared to radiosonde temperatures

Decrease in aircraft based observations

- Due to COVID-19 situation, there was a reduction of 65% in AMDAR reports over Europe (as of 27/03)

- Further reductions might come

- All AMDAR-humidity aircrafts are already grounded

- Coordinated effort is planned by EUMETNET to increase radiosoundings (at 06 and 18 UTC) → to be discussed at EUMETNET STAC Meeting on 31 March

March 2020 E-AMDAR observation totals by airline
(data received at DWD)

Legend: Aer Lingus, Air France, Austrian, Blue1, British Airways, Eurowings Europe, Eurowings Germany, Finnair, Germanwings, KLM, Lufthansa, Lufthansa Cargo, Lufthansa City, Novair, SAS, Thomas Cook, Turkish Airlines, Wizz Air, easyJet

Short Term Scientific Missions

- **New element in the C-SRNWP module**

- **NWP consortia have the funds to support internal exchange, however, this is usually not applicable for travel outside the consortia**

- **Yearly 1-2 missions (2000 EUR/year) will be funded to deal with cross-consortia issues (either technical or scientific).**

- **A typical stay would last 1-2 weeks and participation of young scientist is encouraged.**

- **Shared funding (EUMETNET/sending-host institute) is very welcome.**

- **Application form have been prepared and sent to Contact Points and consortia PMs**

- **Two collection dates per year: 1st March, 1st September**

- **Decision to be taken by AET**

- **2019 autumn: Martin Imrisek (SHMU) work on GNSS STD assimilation (ALADIN-LACE-HIRLAM) at KNMI for four weeks (shared funding with LACE)**

GNSS slant total delays in the ALADIN NWP system

- Martin Imrisek
- Supervisor: Siebren de Haan
- KNMI 11/2019
- Phased from cy40h1 to cy43t2bf10

- Observation type (19) and observation (129) were added.
- Nonlinear, TL, AD observation operators were developed.
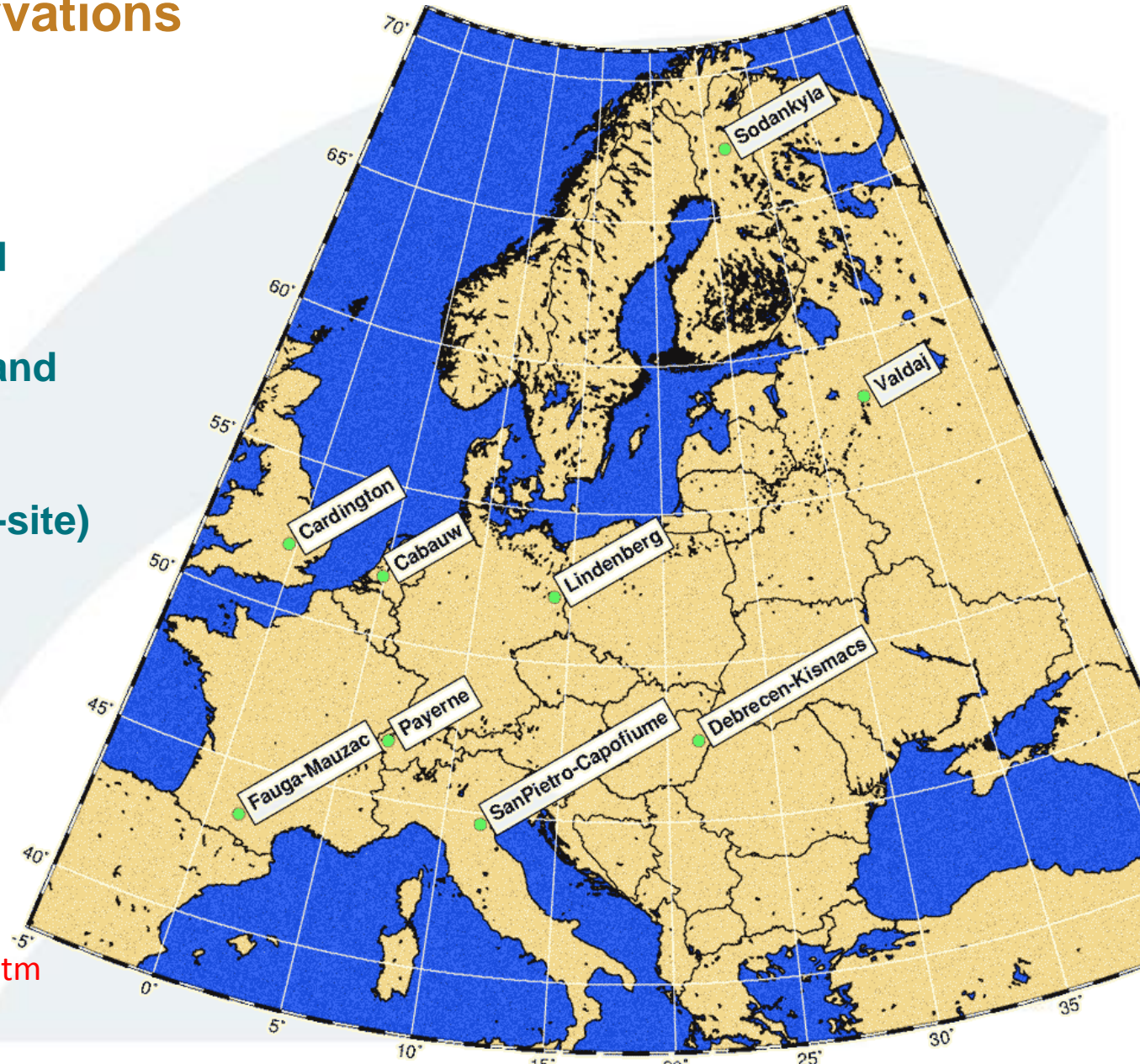- Preliminary assimilation tests were performed.
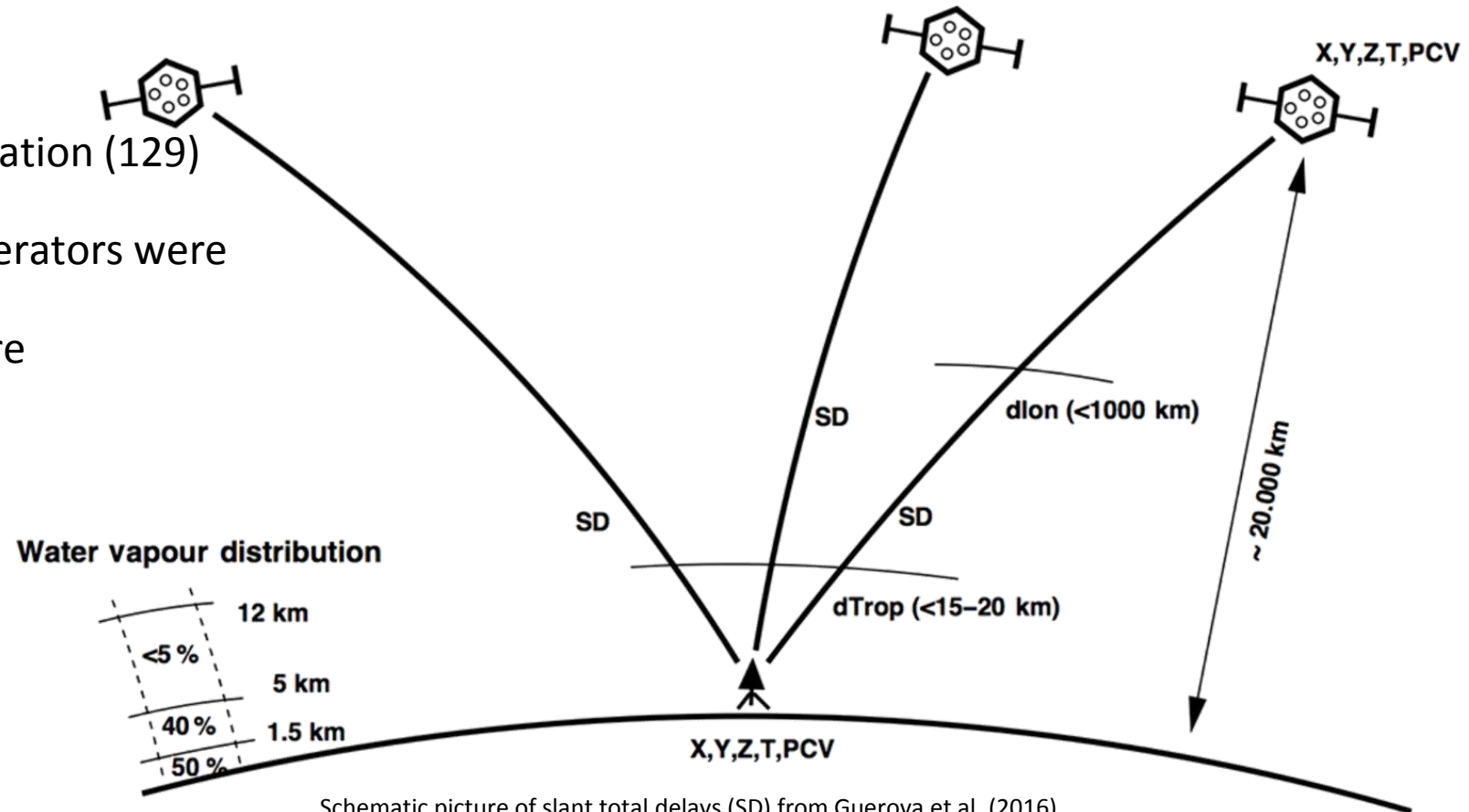
Schematic picture of slant total delays (SD) from Guerova et al. (2016).

SRNWP Data Pool of surface observations

- **Database of surface and boundary layer observations → validation of PBL and land surface models**

- **Freely available for EUMETNET Members and collaborating universities**

- **Important in-kind contribution from DWD (collecting the data) and HNMS (web-site)**

Statistics for Sept 2018 – Aug 2019:

- **5 new users**

- **440 monthly files downloaded**

Website: http://srnwp.cosmo-model.org/content/default.htm
Account request: http://srnwp.cosmo-model.org/content/register.htm

9

Global Lake Database (GLDB)

- **Database of lake location and depth**

- **Important input for NWP models running a lake parameterization**

- **In the past ~10 years: work financed by different LAM consortia**

- **Financial support of EUMETNET since 2017: 8500 EUR/year (for maintenance and development) → since 2019 included in the C-SRNWP budget**

- **Work coordinated by FMI (Ekaterina Kurzeneva), persons involved: Margarita Choulga (ECMWF) and Georgy Kurzenev**

Ongoing work / Plans:

- **Goal: produce new version of GLDB at 330 m resolution**

- **Steps:**

  - Preparation of the land-sea-lake map from the GSWE data (Global Surface Water Explorer, 30 m res., produced by JRC) → ongoing

  - Projection of lakes onto this map → starting in May

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EWGLAM/SRNWP Annual Meeting

2019:

- **30 September – 3 October 2019, Sofia, Bulgaria**
- **87 participants from 31 countries**
- **Local host institute: Bulgarian Met Service**
- **EUMETNET support (6000 EUR)**
- **Special topic: crowdsourced observations in NWP**
- **Parallel sessions, side meetings**
  - Use of EUMETNET observations (E-ABO, OPERA) in LAM NWP models
  - External parameters for land surface models ⟶

STAC paper planned ⟶ to request funding for common work on physiography databases

- **Invited experts (4000 EUR/year) ⟶ proposed by ETs (in 2019: DA, APP, VERIF ET)**
- **Support for meeting participation (2000 EUR/year) ⟶ no applicant in 2019**

2020:

- **28 September – 1 October 2020, Brussels, Belgium**
- **Local host institute: RMI**
- **Special topic: external databases**
- **Invited experts (possibly one from ESA, one from US) ⟶ proposed by ET-SURF and ET-PHYS**

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Evaluation and updates of ESA-CCI global land cover map for NWP needs

European Space Agency Climate Change Initiative (ESA-CCI) land cover product developed in the framework of the Copernicus Climate Change Service (C3S). ESA-CCI land cover product describes the land surface into 22 classes, or covers, at a spatial global resolution of ~300m.

Why this proposal now? Land-cover products is nothing new!

This is the first time when most European NWP agencies consider the same product for their NWP systems.

By experience we know that all new products suffer from deficiencies but until now it has been no meaning to share information about such deficiencies and do something about them in a common effort.

Patrick Samuelsson, SMHI

Evaluation and updates of ESA-CCI global land cover map for NWP needs

Concrete examples from recently published ALADIN-HIRLAM Newsletter no 14 (January 2020) where Ekaterina Kurzeneva (FMI) documents deficiencies identified in the ESA-CCI land cover product:

Small islands disappeared: Amsterdam (77.555, -37.848) and Saint-Paul (77.521, -38.728); Fatu Hiva (around -135.0, -15.0, the surface area is 84 km2);…

Along Chile coast, many false small lakes appeared.

In Greenland, many false lakes appeared.

But, there is currently no organisation within HIRLAM where these deficiencies identified by Ekaterina can be further processed by GIS experts, and if there was, an action would not necessarily benefit other organisation outside HIRLAM due to non-common technical details…

So, we suggest to coordinate this on a European level for the benefit of all!

Patrick Samuelsson, SMHI

EMS Annual Meeting

2019:

9-13 September 2019, Copenhagen

- OSA Session: Challenges in High Resolution Short Range NWP at European level including forecaster-developer cooperation
- Conveners: Balázs Szintai, Chiara Marsigli, Emily Gleeson
- Session about EUMETNET, C-SRNWP and related activities
- 8 oral, 5 poster presentations

2020:

7-11 September 2020, Bratislava

- Session was merged with the verification and physics-dynamics sessions (only for 2020, later might be different)
- Conveners: Estíbaliz Gascón, Daniel Reinert, Balázs Szintai
- OSA Session: Challenges in Weather and Climate Modelling: from model development via verification to operational perspectives
- Call for abstracts open and extended until mid-May
- Decision on the conference (e.g. online conference or possible cancellation) will be made in the coming weeks

14

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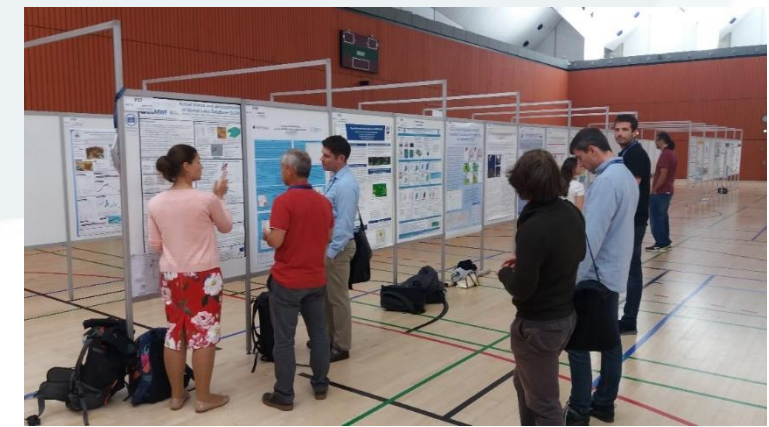
Thank you for your attention!

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