Status of the C-SRNWP module of EUMETNET

Balázs Szintai

C-SRNWP Manager

… with contributions form many of you

EUMETNET
EUROPEAN METEOROLOGICAL SERVICES NETWORK

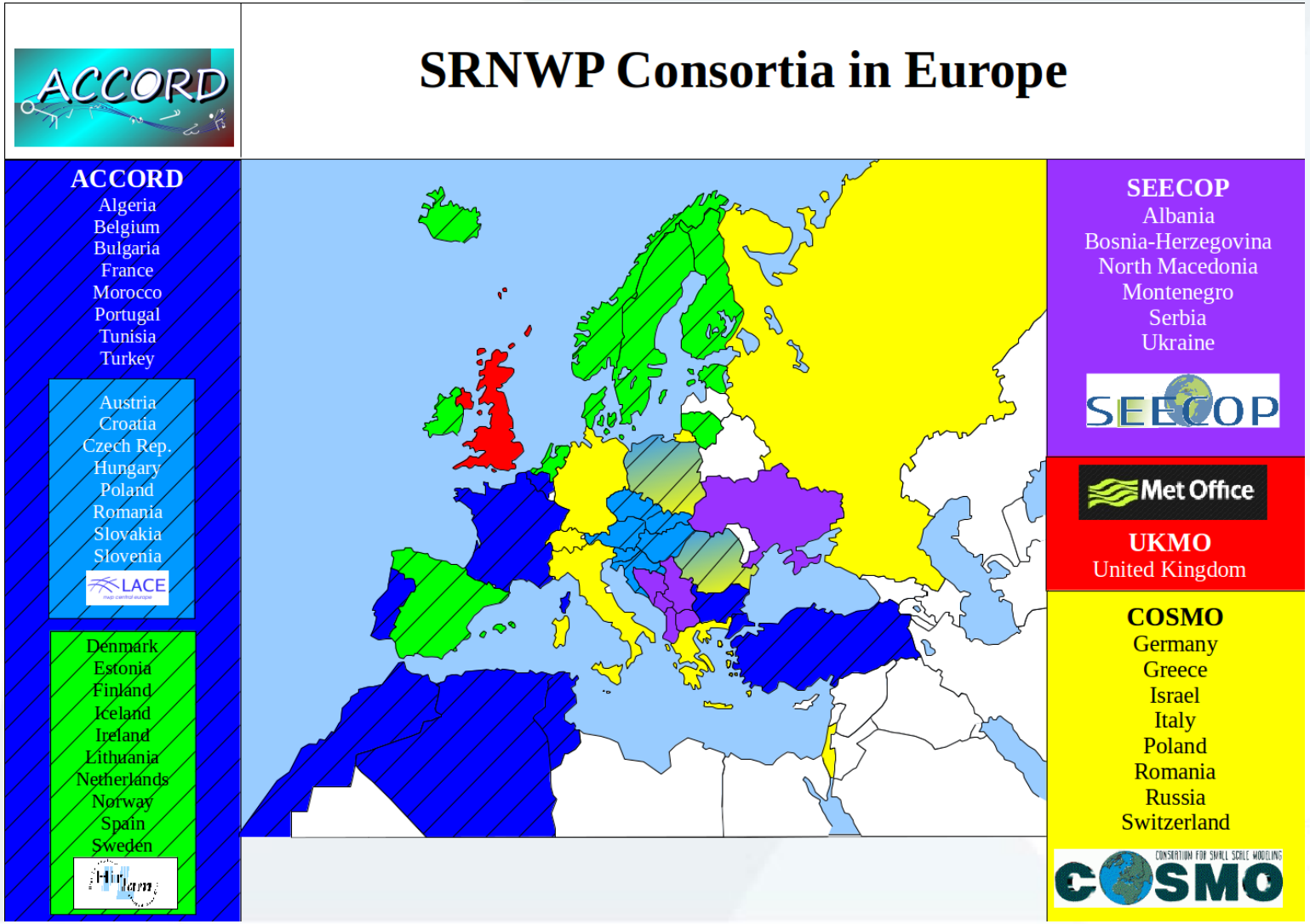
1st ACCORD All Staff Workshop

Online

12 April 2021

C-SRNWP Module of EUMETNET

- Coordination of Short Range Numerical Weather Prediction in Europe
- In the NWP Cooperation Programme
- 28 Member States,
  2 Cooperating States
- New Members: Germany, Ireland
- Module Manager: 0.3 FTE
- Coordinating Member: Hungary



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		

EWGLAM/SRNWP Annual Meeting

2019:

- Paper published in Atmospheric Science Letters

2020:

- 28 September – 1 October 2020, online (BlueJeans)
- 166 registered participants from 33 countries (peak attendace ~140)
- Special topic: external databases in NWP
- Parallel sessions organized by C-SRNWP Expert Teams
- Invited experts : ECMWF, ESA, NOAA, NCAR

2021:

- 27-30 September 2021, Brussels, Belgium (or online, or hybrid…)
- Local host institute: RMI
- Special topic: Application of machine learning to actual problems in NWP
- Invited experts could be proposed by any ET

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DOI: 10.1002/asl.1031

RESEARCH ARTICLE

Atmospheric Science Letters RMetS

Crowd-sourced observations for short-range numerical weather prediction: Report from EWGLAM/SRNWP Meeting 2019

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Abstract
Crowd-sourced observations (CSO) offer great potential for numerical weather prediction (NWP). This paper offers a synthesis of progress, challenges and opportunities in this area based on a special session of the EWGLAM Meeting in 2019, concentrating on high-resolution limited-area models (LAMs). Two main application areas of CSO are described: data assimilation and verification. One part of data assimilation developments concentrates on smartphone pressure observations, which represent a large volume of data. However, special care has to be taken about data protection and the quality of observations. In this paper, two examples are presented: the SMAPS experiment from Denmark and the uWx experiment from the United States. Another data assimilation topic is citizen observations with low-cost weather sensors; here an example from Norway is presented using Netatmo stations. The other application area is the use of CSO for model verification. One novel method developed in the United Kingdom is applying social media data to detect severe weather events. This approach is especially important because one future application area of LAM NWP models is impact-oriented warnings.

KEYWORDS
citizen observations, crowd-sourcing, data assimilation, numerical weather prediction, social sensing, verification

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Cooperation with Obs CA (Obs-SET)

- **Participation at Obs-SET Meetings**
- **December 2020: web-meetings on the definition of two planned obs impact studies**
  - AMDAR vs. Mode-S
  - AMDAR-humidity
- **Spring 2021: SoWs issued**
  - AMDAR vs. Mode-S
  - Personal Weather Stations QC tools

	Description	2020 k€	2021 k€	2022 k€	2023 k€	Total k€	Status
	Budget for Action 3: Observation Impact Studies (k€)	65	100	150	150		
A3.02	MODE-S versus AMDAR impact study					60	Under review
A3.03	Impact study of VAD/VVP versus E-AMDAR wind at airports					27.1	Commited
A3.04	AMDAR humidity value for airlines					0	Paused
A3.05	Impact study of AMDAR humidity versus radiosonde at airports					-	CANCELED?
A3.06	AMDAR humidity value for LAM and forecasting service					60	Delayed
A3.13	Placeholder R&D QC Activity on Privately-owned weather stations					30	NEW
A3.07	Privately-owned Weather Station Observation impact study					90	Delayed
A3.12	Placeholder for crowdsourcing					90	Extended
A3.10	Impact study on additional GNSS products (e.g. Slant delay)					30	No change
A3.11	Impact study on MWR brightness temperature					30	No change

	New plan
	Plan approved at STAC19

- **12 January 2021: web-meeting of C-SRNWP ETDA and ETVERIF to give recommendations on the evaluation of impact studies → written recommendation at the end of January**
  - Methods for the validation of the assimilation cycle
  - Methods for the verification of forecasts
  - Design of impact studies

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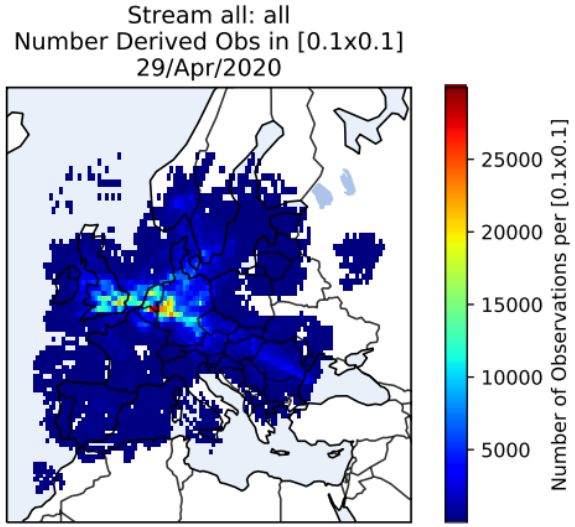
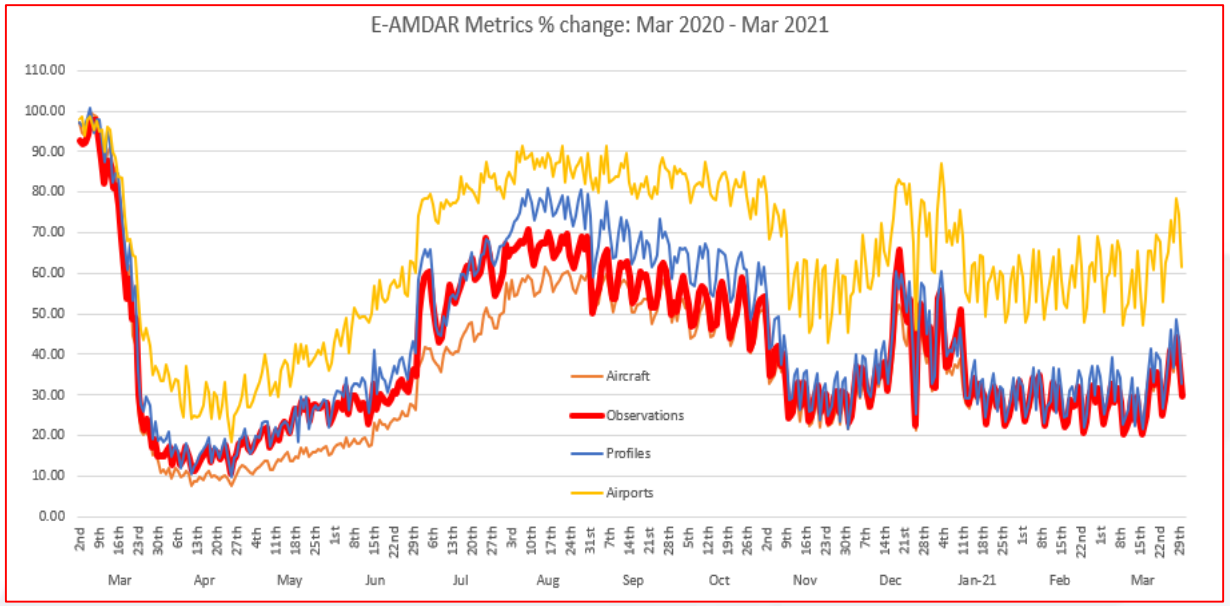
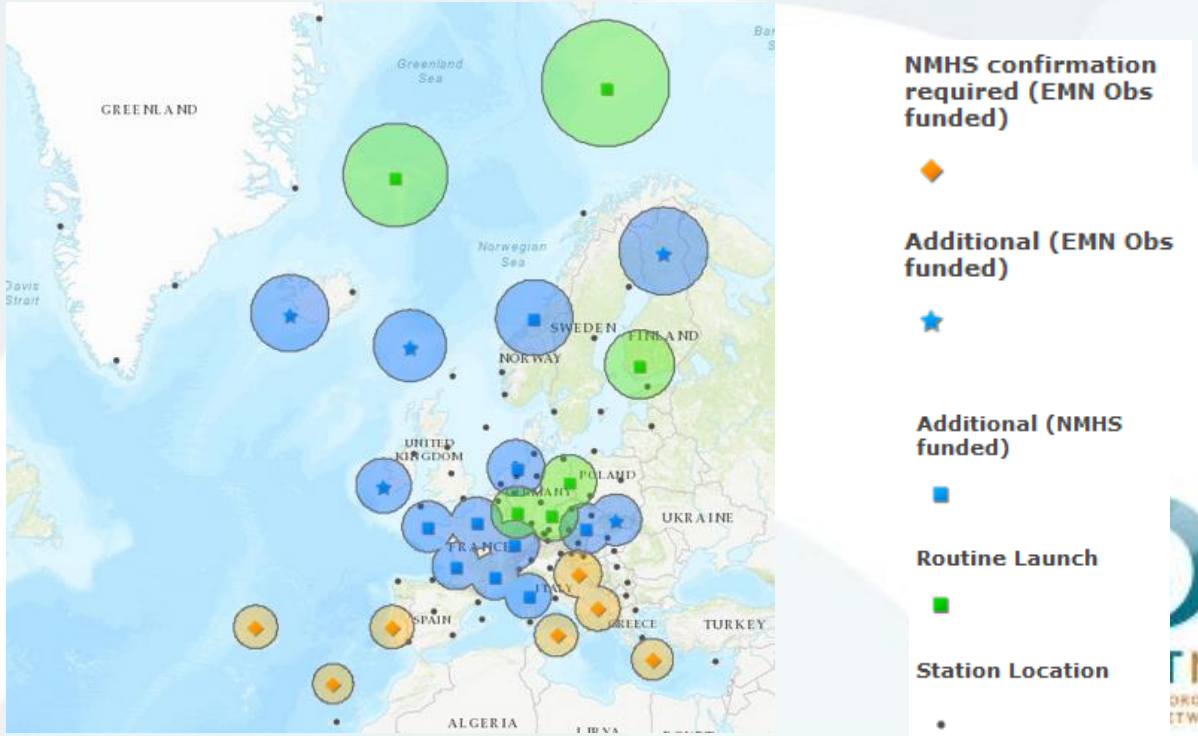
Decrease in aircraft based obs.

- Due to COVID-19 situation, there was a reduction of 80% in AMDAR reports over Europe in April 2020
- Coordinated effort was made by EUMETNET Members to increase radiosoundings (at 06 and 18 UTC) in summer 2020
- New Mode-S data was quickly made available by EMADDC







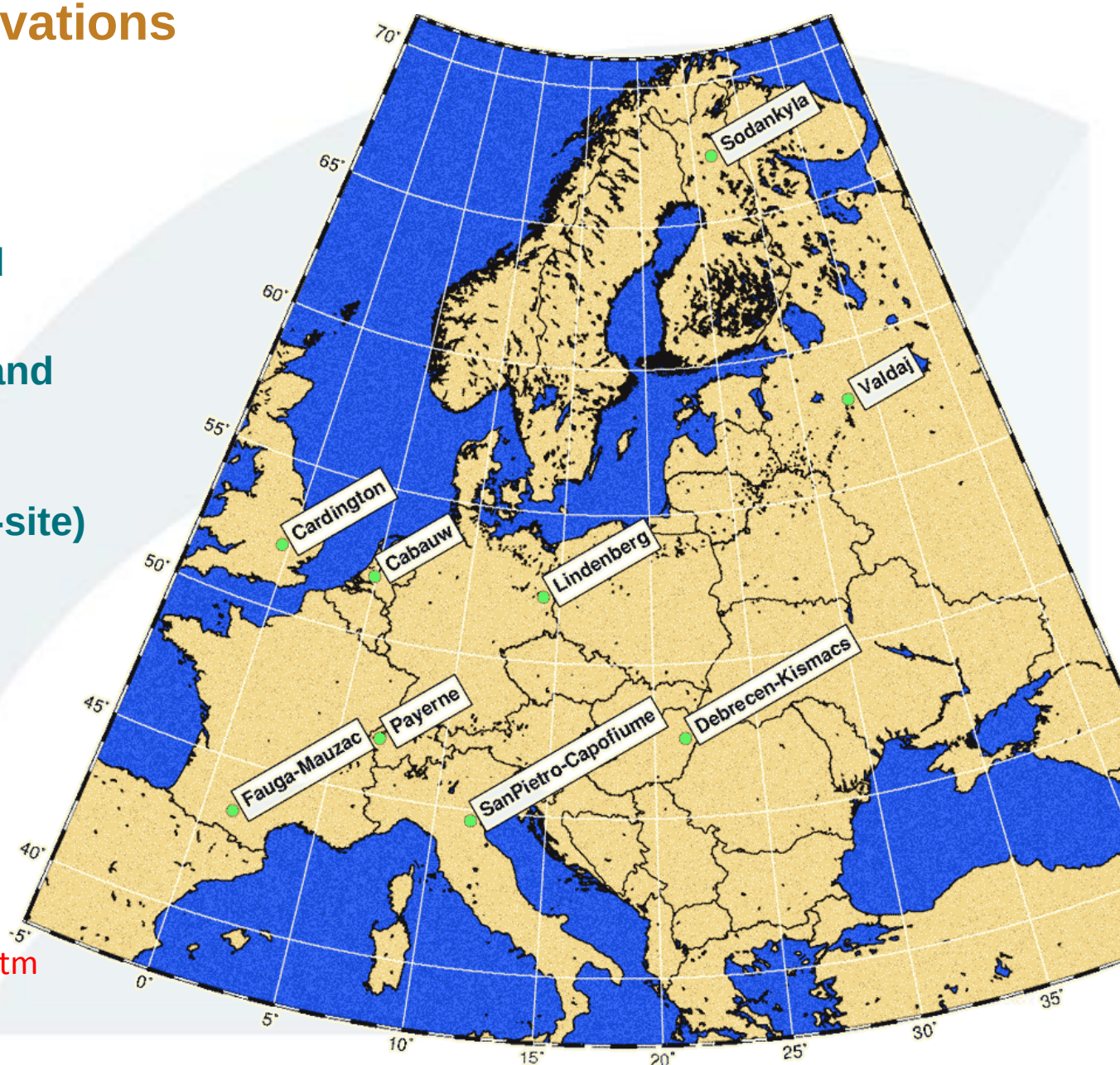
European Radiosonde Coverage / Potential Coverage 18Z

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)

<u>Statistics for Sept 2019 – Aug 2020:</u>

- 2 new users
- 15 monthly files downloaded



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

Global Lake Database

- **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), person involved: Georgy Kurzenev**
- **Currently ongoing work:**
  - Two land-water datasets are currently under processing for the new fine resolution version of GLDB: (i) ECOCLIMAP SG as a preliminary map and (ii) the new map based on Joint Research Centre (JRC) Global Surface Water (GSW) dataset as a final map.
  - Both ECOCLIMAP SG and JRC GSW - based dataset contain errors of mis-classification between inland water and sea water (river estuaries, coastal lagoons, etc.). The algorithm to treat these errors exists (see e.g. C. Fortelius et al., 2020, p. 47), but it should be adapted for the specific task, for a specific map resolution and applied globally. Georgy Kurzenev is currently working on that, using ECOCLIMAP SG as a prototype.
  - Finally, after correcting all mis-classification errors, the lake depth will be mapped on the JRC GSW - based dataset by Georgy.

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Physiography related work

- **Goal: checking and correction of ESA-CCI land cover map for NWP purposes**
- **Budget: 27.000 EUR for three years: 2021-2023 (money not spent in other C-SRNWP tasks)**

- **Supervisory team defined on 24 February:**
  - C-SRNWP Surface ET Chair: Patrick Samuelsson (SMHI)
  - NWP expert: Ekaterina Kurzeneva (FMI)
  - GIS expert: Bolli Pálmason (IMO)

- **Successful application: Sandro Oswald (ZAMG) on 24 March**

- **Kick-off meeting planned (within Surface ET) in near future**

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EMS Annual Meeting

- 6-10 September 2021, online event

- OSA Session: Challenges in Weather and Climate Modelling: from model development via verification to operational perspectives
- Conveners: Estíbaliz Gascón, Daniel Reinert, Balázs Szintai
- Co-conveners: Emily Gleeson, Chiara Marsigli, Guy de Morsier, Manfred Dorninger
- Sub-session about EUMETNET, C-SRNWP and related activities

- Abstract submission deadline: 16 April

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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)

- 2020: no travels due to COVID, funds carried forward to 2021

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Thank you for your attention!

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