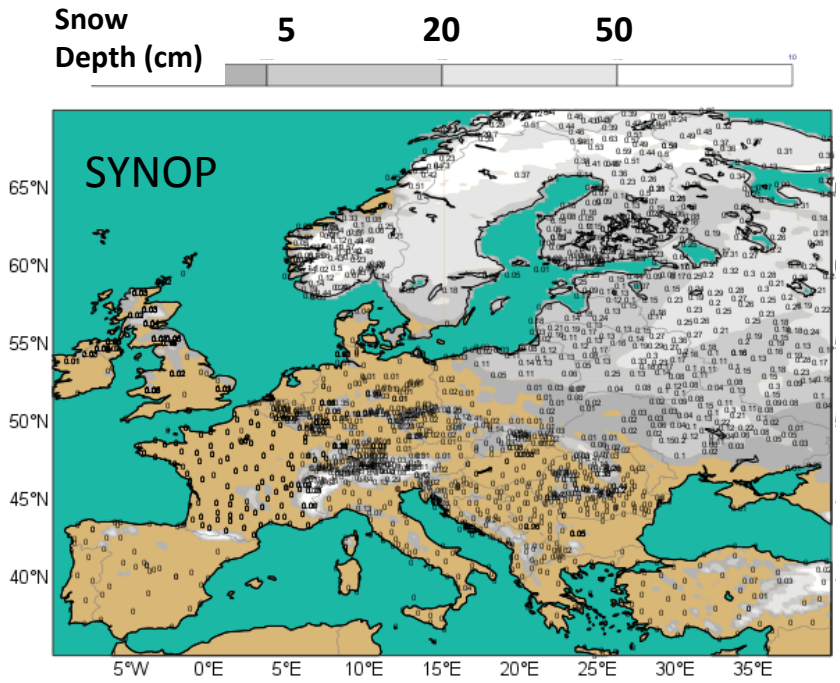
Snow Depth Reports Availability on the GTS

Patricia de Rosnay

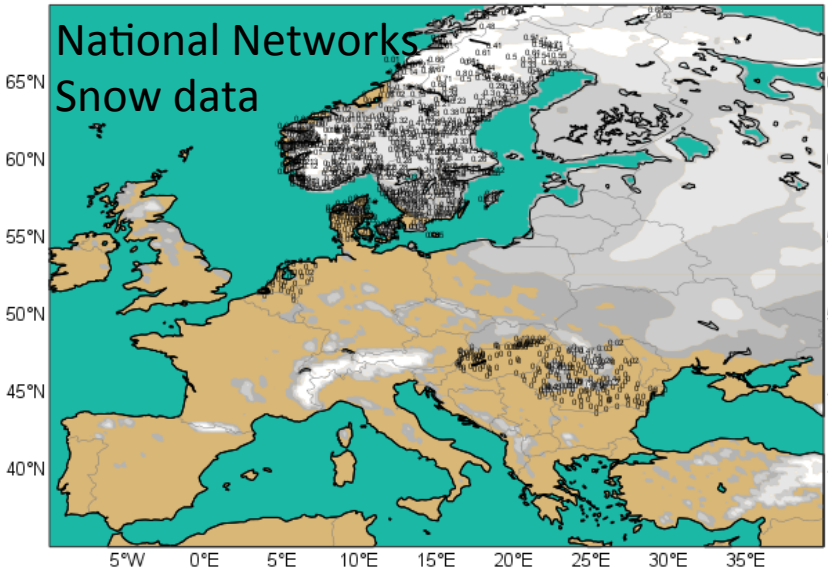
Thanks to many colleagues at ECMWF, WMO SnowWatch Team , HarmoSnow COST action and snow data providers

Snow Observations
Snow SYNOP and National Network data in Europe



Available on the GTS (Global Telecommunication System)

2016 01 15 at 06UTC



Additional data from national networks from up to 7 countries:
Sweden, Romania, The Netherlands, Denmark, Hungary, Norway, Switzerland.

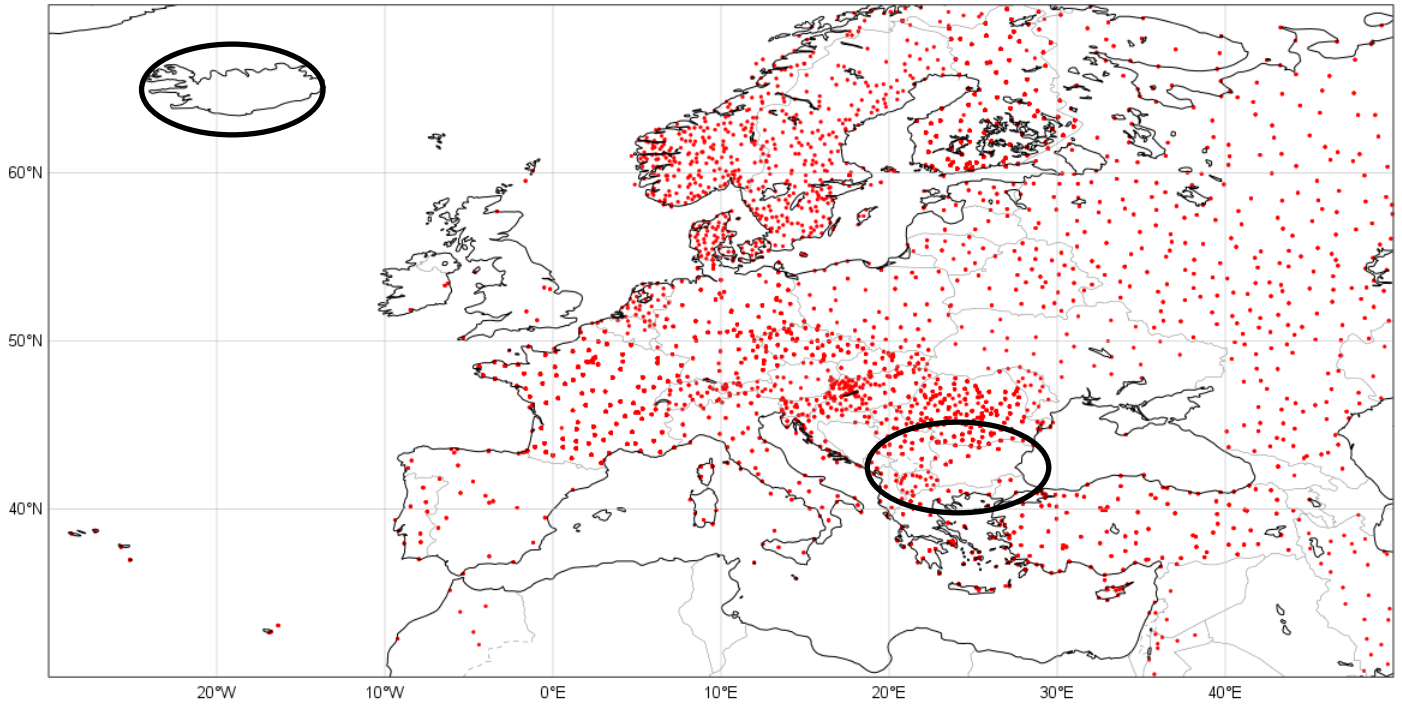
→ **Dedicated BUFR for additional national data**
(de Rosnay et al. ECMWF Res. Memo, R48.3/PdR/1139, 2011)

Snow depth observations in Europe

GTS Snow depth availability

SYNOP + national BUFR data

Status on 5 February 2017



In general, good coverage in Europe, but …

- Iceland : very few snow depth reports on the GTS (none for this date)
- Zero snow depth reporting is still an issue
- Bulgaria: more stations available but not on the GTS

Snow reports from Bulgaria

HarmoSnow COST action ES1404 →contribute to improve in situ data exchange for NWP

→ NIMH in 2016 made the data available for 39 station (BUFR format, routinely produced)

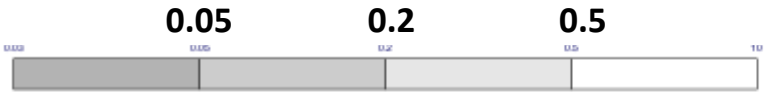
→ ECMWF data acquisition and assimilation (1 month test in oper config)

→ Suitable for operational use

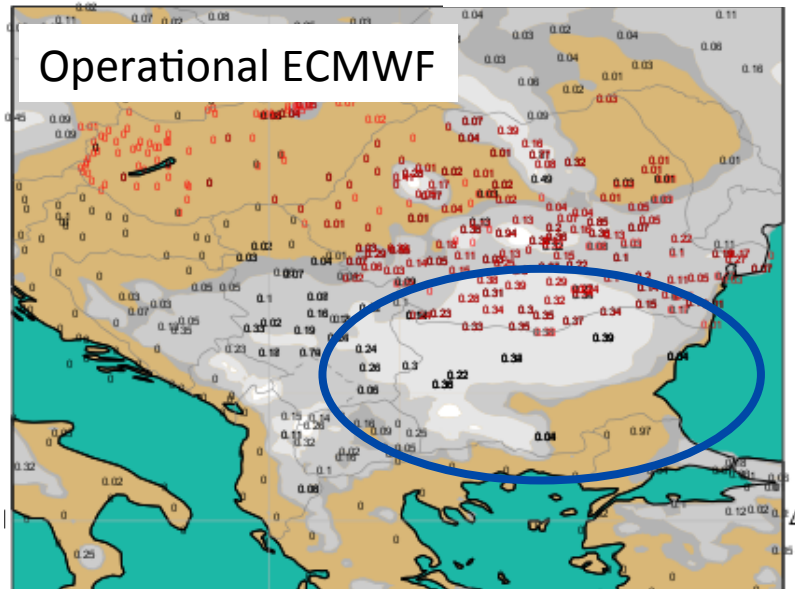
→ Recommendation to NIMH to make the data available on the GTS

de Rosnay et al., ECMWF Res Memo RD16-178, June 2016

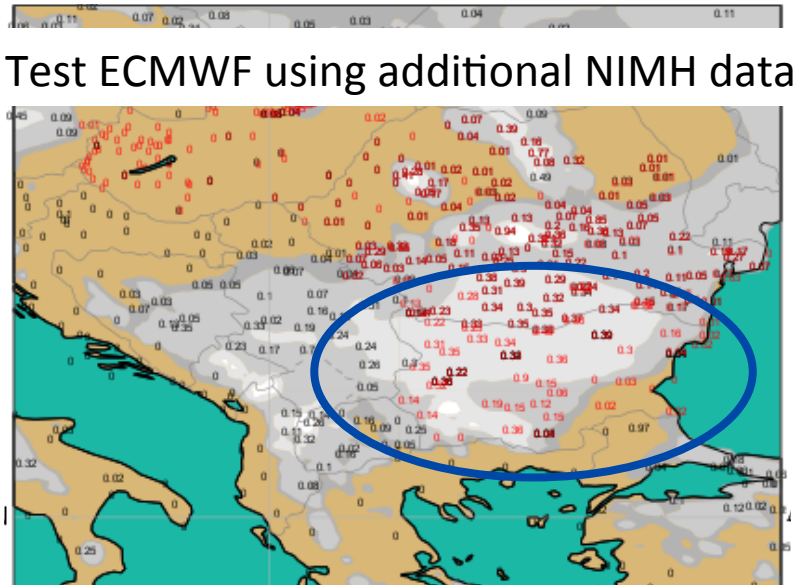
19 January 2016
Snow depth in m



Operational ECMWF



Test ECMWF using additional NIMH data



Lack of observations in Bulgaria

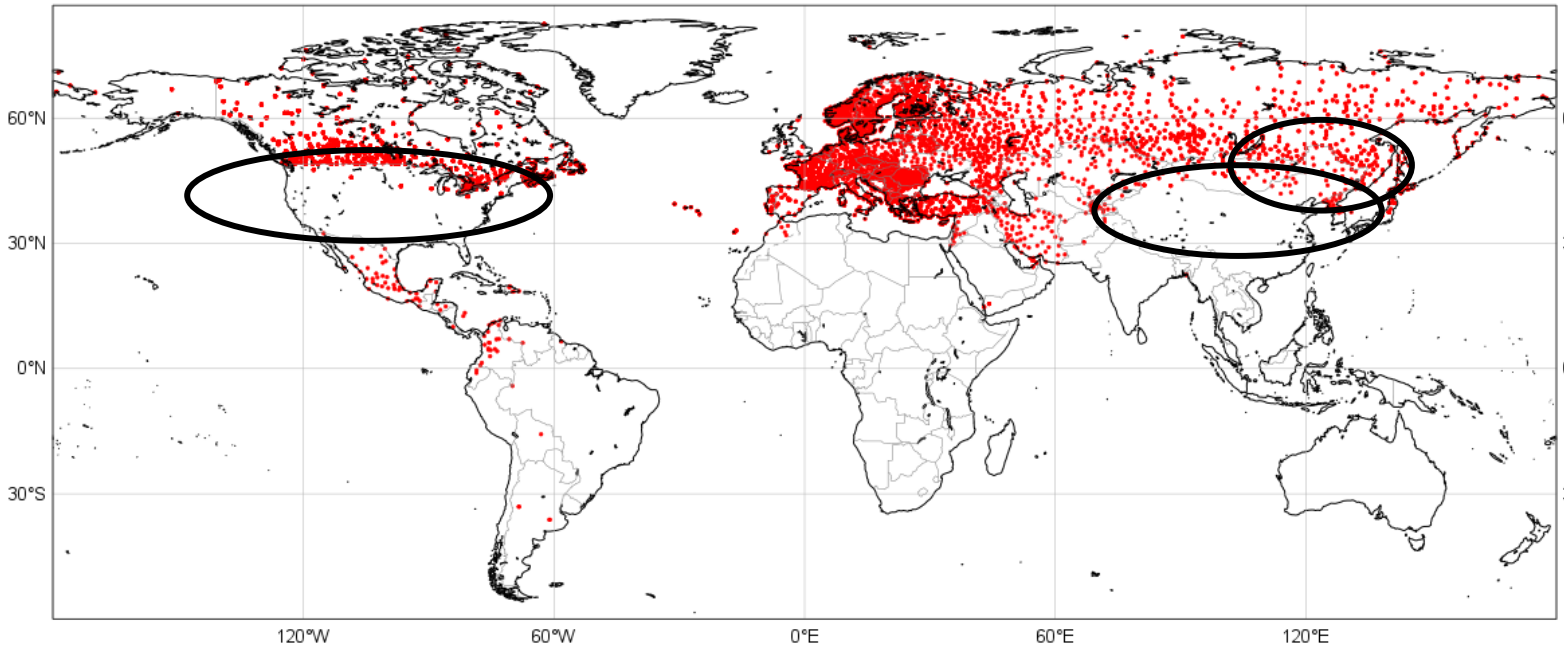
39 more stations provided by NIMH

Technical aspects (data format, acquisition, assimilation) solved.
Still in discussion to make the data effectively available for NWP

Snow depth observations

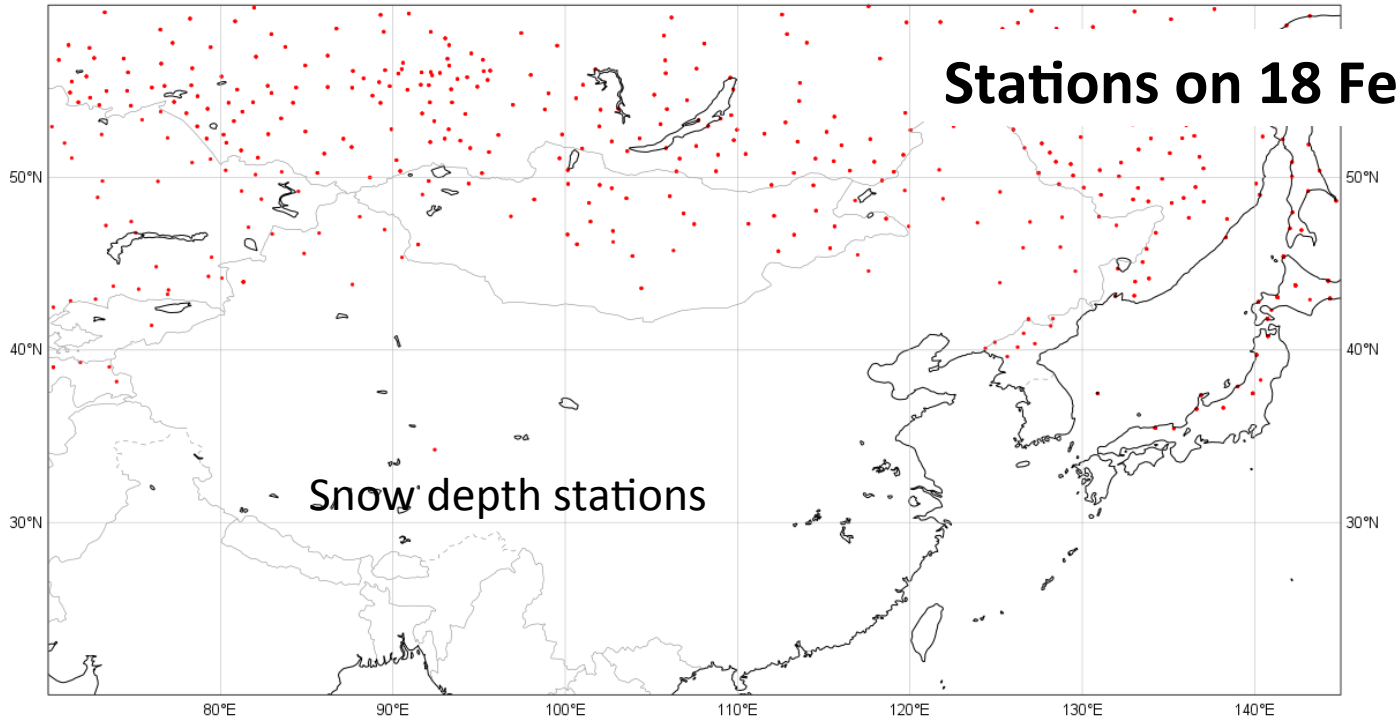
SYNOP TAC + SYNOP BUFR + national BUFR data

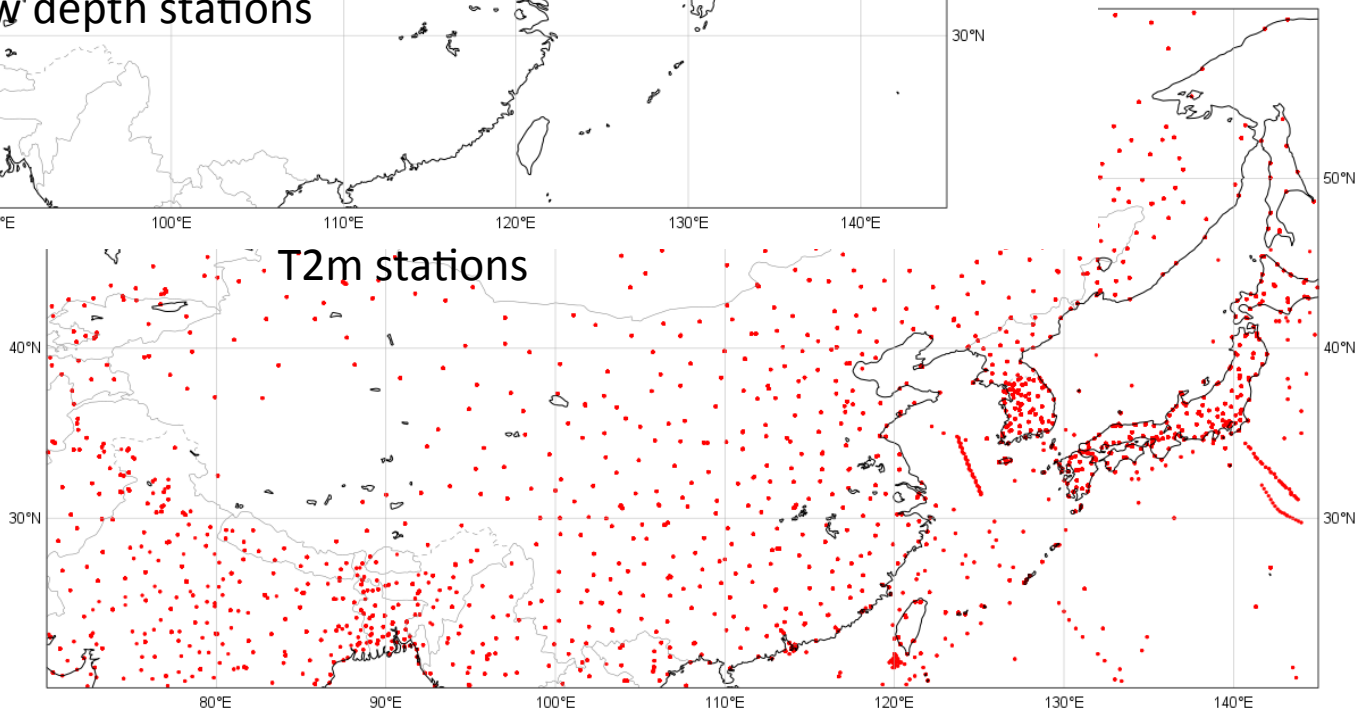
Status on 5 February 2017



- Gaps in USA, China and southern hemisphere
- NRT data exist and is available (more than 20000 station in the USA), but it is not on the GTS for NWP applications.
- However, we note an improvement in China (since status in de Rosnay et al, ECMWF NL article 143, 2015)

GTS stations availability





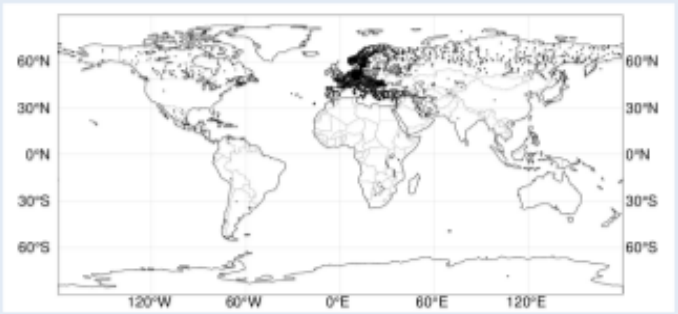
Initiatives relevant to address snow observations availability on the GTS

WMO GCW Snow Watch Activity

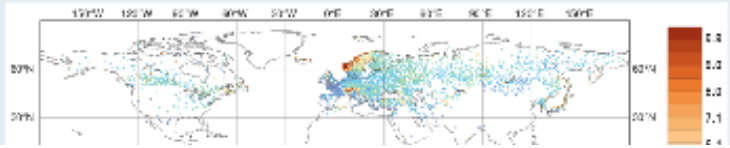
World Meteorological Organization
Global Cryosphere Watch

Snow Reporting

A GCW Snow Watch Activity



Spatial distribution of in situ station reporting snow depth on the GTS (on 20 January 2015).



http://globalcryospherewatch.org/reference/documents/

Snow Watch reporting Handout 2015 (ECMWF/UKMO)

Initiatives relevant to address snow observations availability on the GTS

GCW Snow Watch Activity

Snow Watch reporting Handout 2015 (ECMWF/UKMO)

http://globalcryospherewatch.org/reference/documents/

COST action on Snow: HarmoSnow

"A European network for a harmonised monitoring of snow for the benefit of climate change scenarios, hydrology and numerical weather prediction".

http://www.cost.eu/COST_Actions/essem/Actions/ES1404

http://costsnow.fmi.fi/

NAEDEX (North America Europe data exchange)

Meeting Oct 2015 -> discussion NOAA/ NCEP to improve availability of snow depth on the GTS – status ?

OSCAR

Observing Systems Capability Analysis and Review Tool

- New section for in situ surface data
- Would be relevant to use it to monitor snow depth data availibity

For discussion on NRT observations availability

- Snow Data Assimilation (DA) crucial for NWP
- In the absence of dedicated satellite mission, in situ snow depth is by far the most relevant information for snow DA

Gaps: in snow reports availability on the GTS:

- Areas with sparse reports: USA, China, Southern Hemisphere and some countries in Europe (Bulgaria, Iceland)
- Areas with seasonal reporting (Ukraine) because only report in snow covered

Issues:

- For some countries the data exist in NRT and is freely available

→ need to put the data on the GTS in BUFR (e.g. USA); the issue is related to decision and resources

- For other countries, data policy issue (SYKE data in Finland ?)
- For all areas with gaps Awareness is crucial (e.g. Bulgaria)

For discussion on NRT observations availability

Priorities:

For many areas with gaps, data exist, the issues are due to lack of awareness, resources, decision, data policy, ...

→ Improve snow depth report availability on the GTS by addressing these issues

Contributions:

- Snow Watch, approved ECMWF BUFR Template
- ECMWF: help provided to each MS with the dedicated BUFR template (last one ongoing Bulgaria)
- Link between Snow Watch, NAEDX and COST action HarmoSnow
- Link to OSCAR data base. It needs to be populated with snow depth reports for monitoring availability
- Contribution from ISSI-BJ team on Snow in HTP would be highly relevant for operational NWP