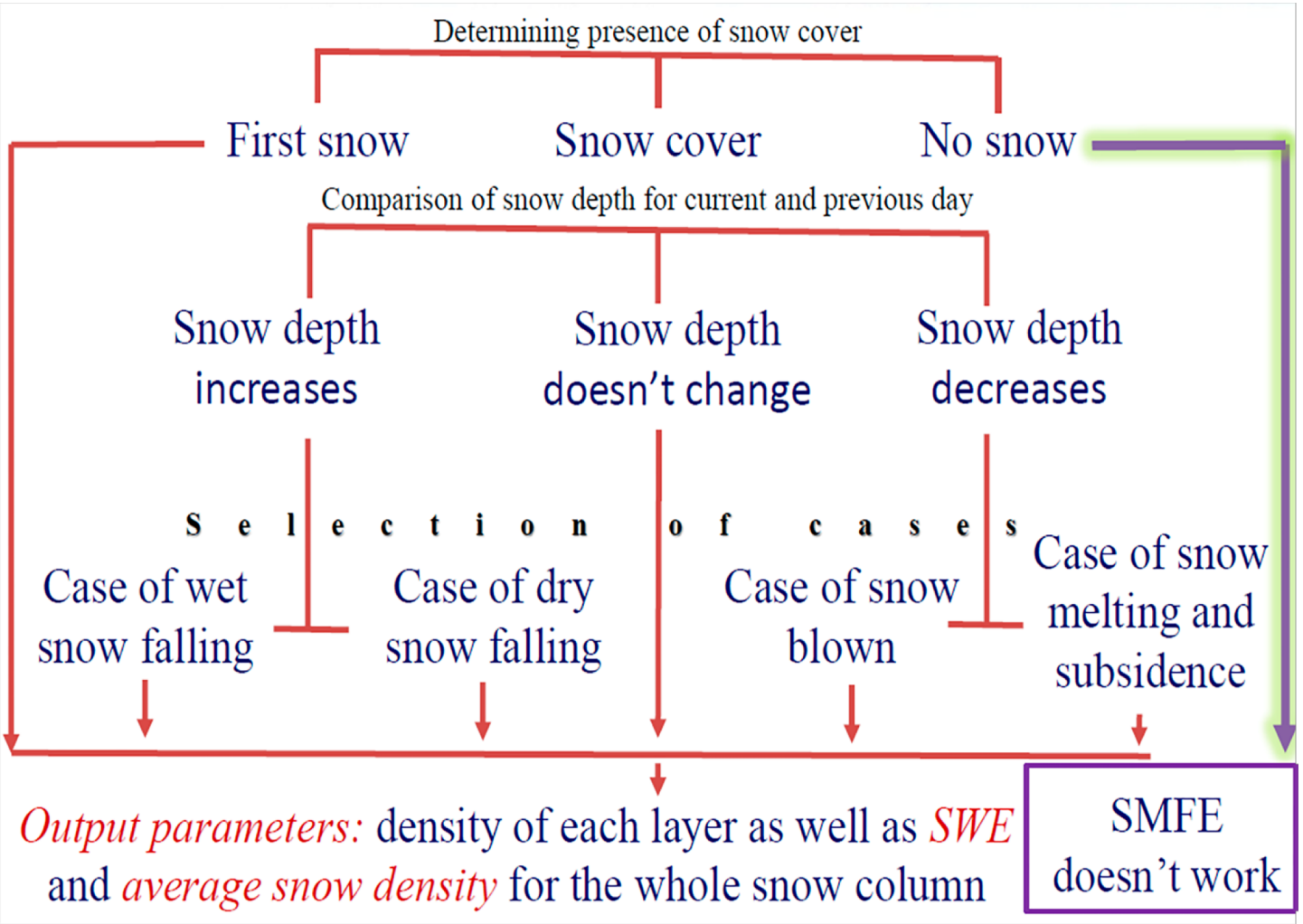
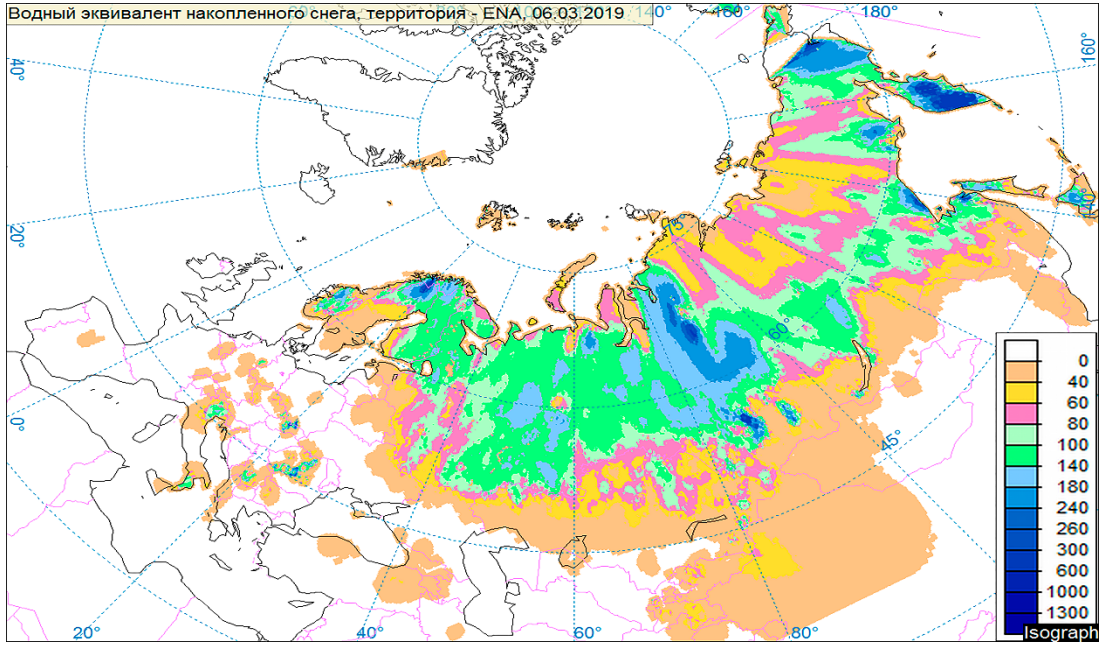
Current status of SnoWE

General information about SnoWE

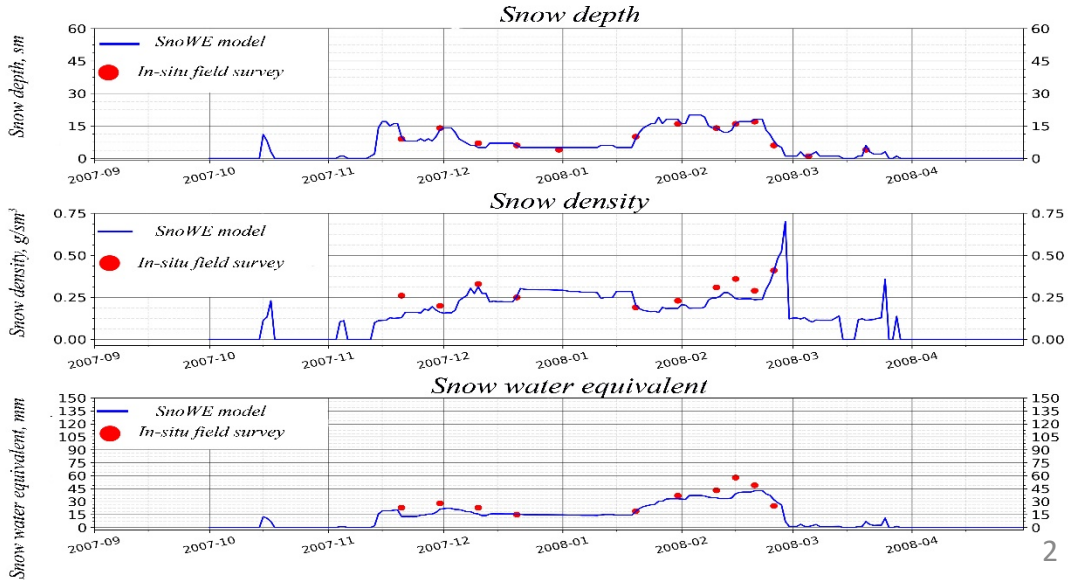
Algorithm of calculations snow in SnoWE



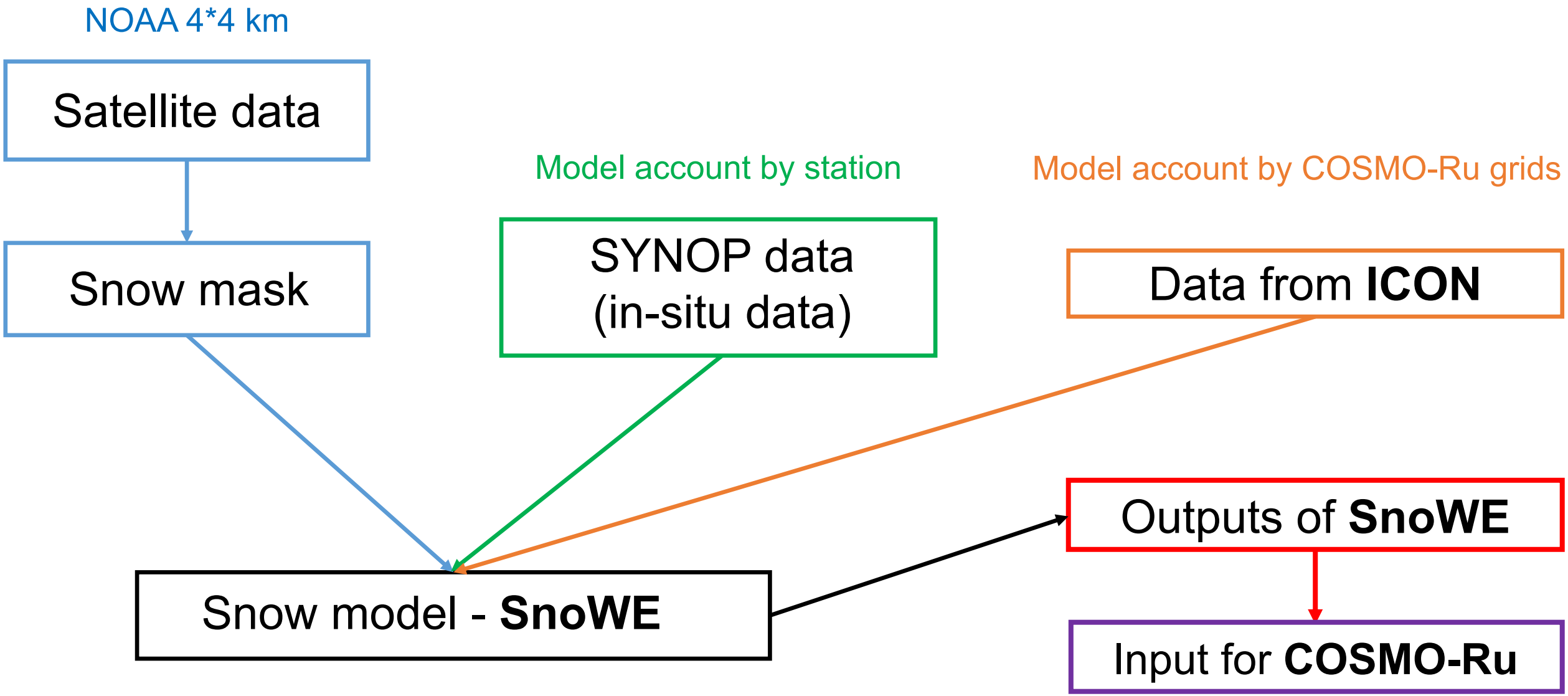
SWE maps



Time series



General information about SnoWE

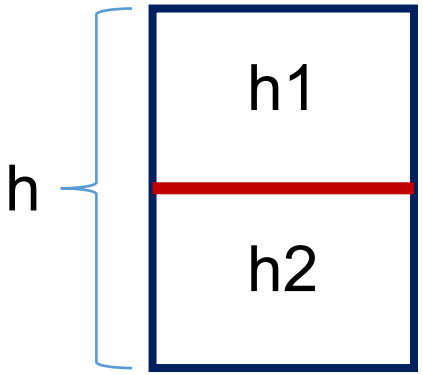


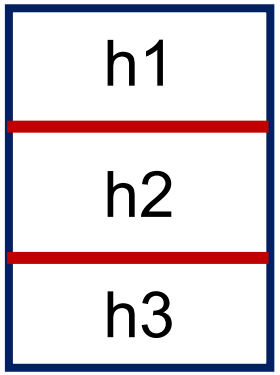
Outputs of SnoWE

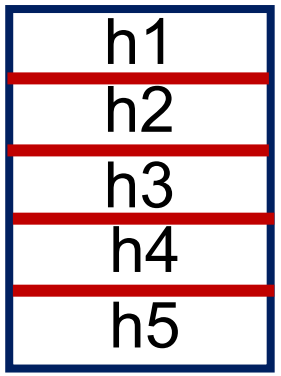
Products (daily): in-situ, cosmo, combination

1. Snow water equivalent maps

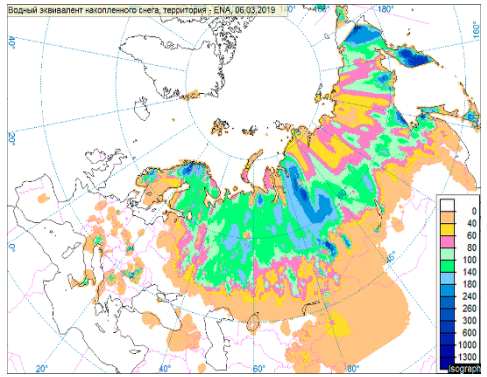
(total SWE and SD; SWE and SD by layers)







2. Snow density maps

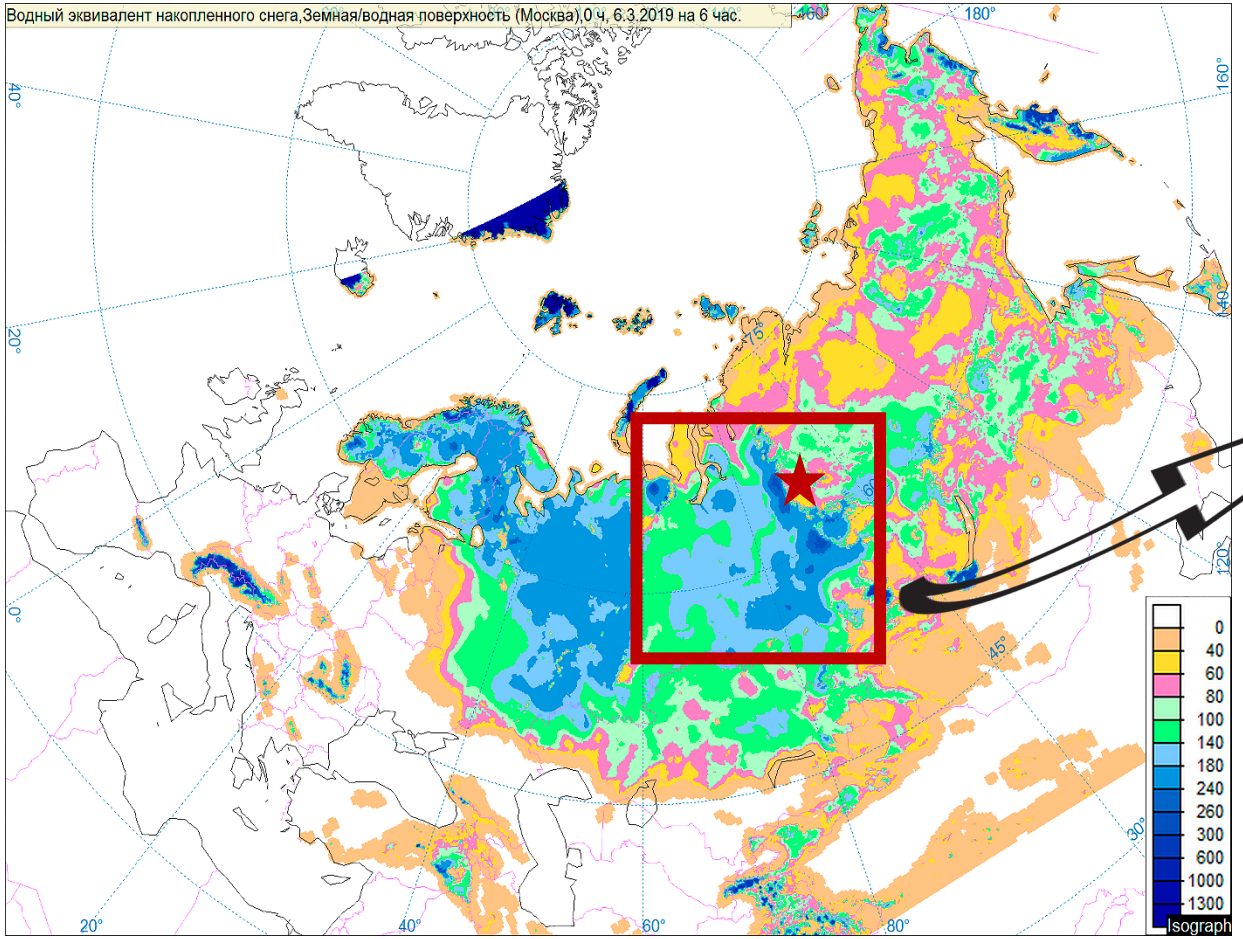


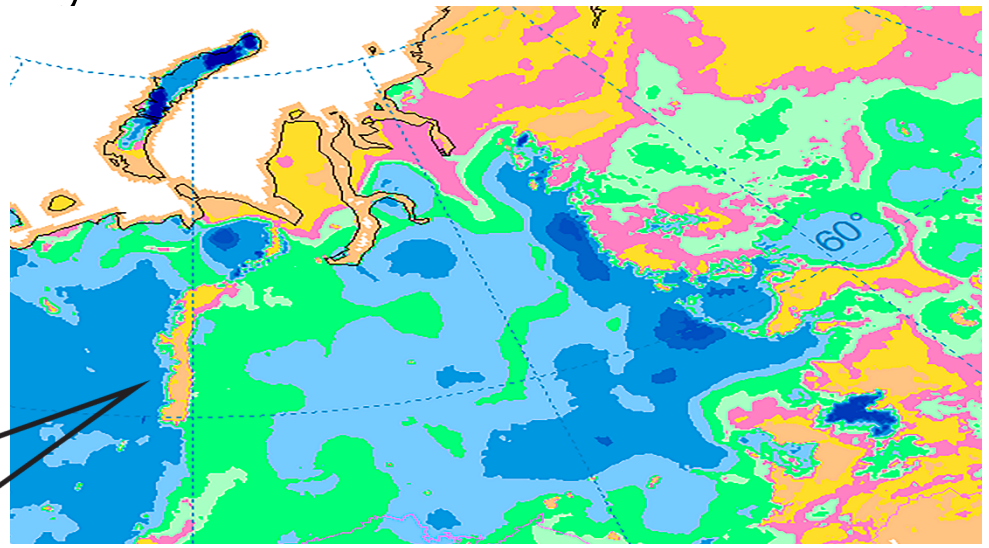
3. Snow time series
(Algorithm of calculation, aveT2m, maxT2m, SD, SWE, RHO(SD), lat, lon)

4. Snow history (each layer info)
(Algorithm of calculation, aveT2m, maxT2m, SD, SWE, RHO(SD), lat, lon)

E. Churiulin, V. Kopeykin, I. Rozinkina

1. Pre-operational runs of atmospheric model COSMO-Ru with initial snow data from 1D multilayer snow model SnoWE



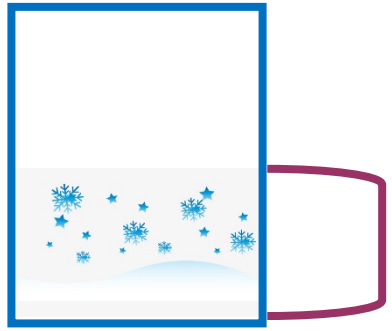


SWE map for 06.03.2018 ICON Data

Snow depth on ★

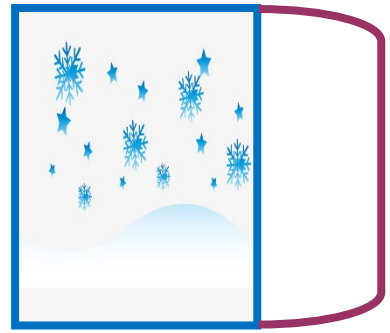
ICON Data

45 sm

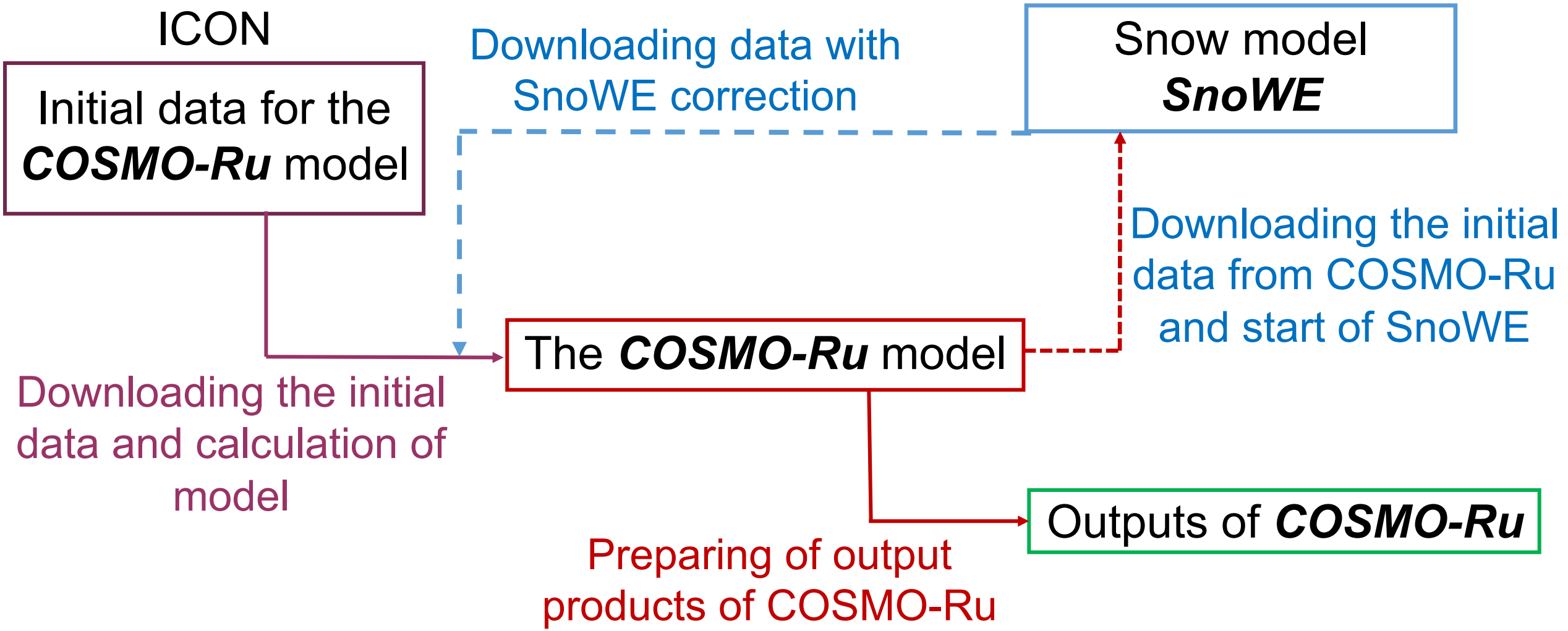


In-situ data

85 sm



Role of the SnoWE model in the COSMO-Ru model



Observations: Hsnow, T2m, Td2m, Prec, Wind 10m

SnoWE: calculation of SWE and snow density values at stations

users

First guess of SWE and snow density for COSMO-Ru

Finding of proportions between ICON FG and calculated fields at stations and interpolation of relations to grid-points of COSMO-Ru

Satellite data
(snow boundary)

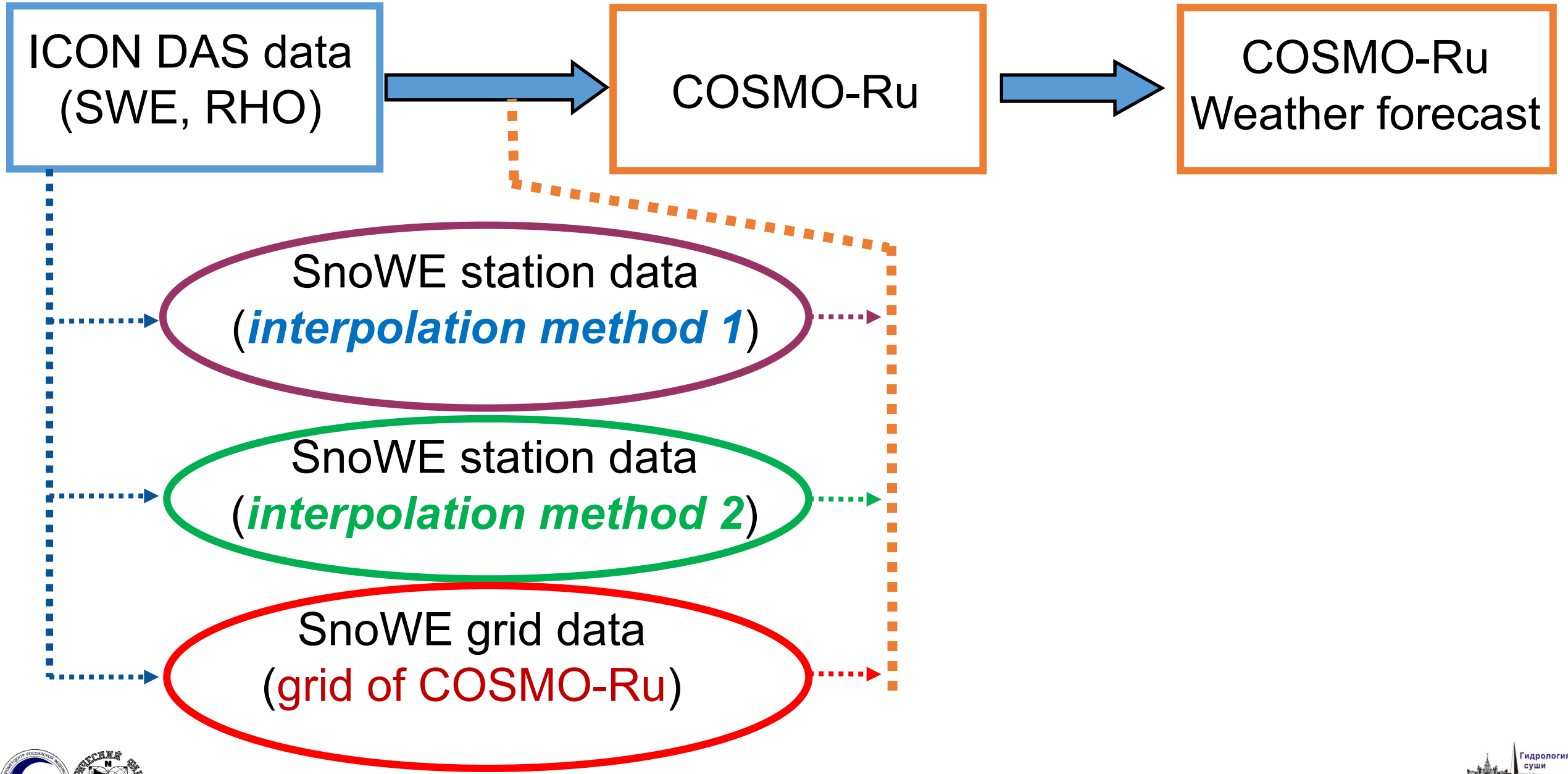
FG changing

Replacement of FG fields of SWE and snow density by modified fields

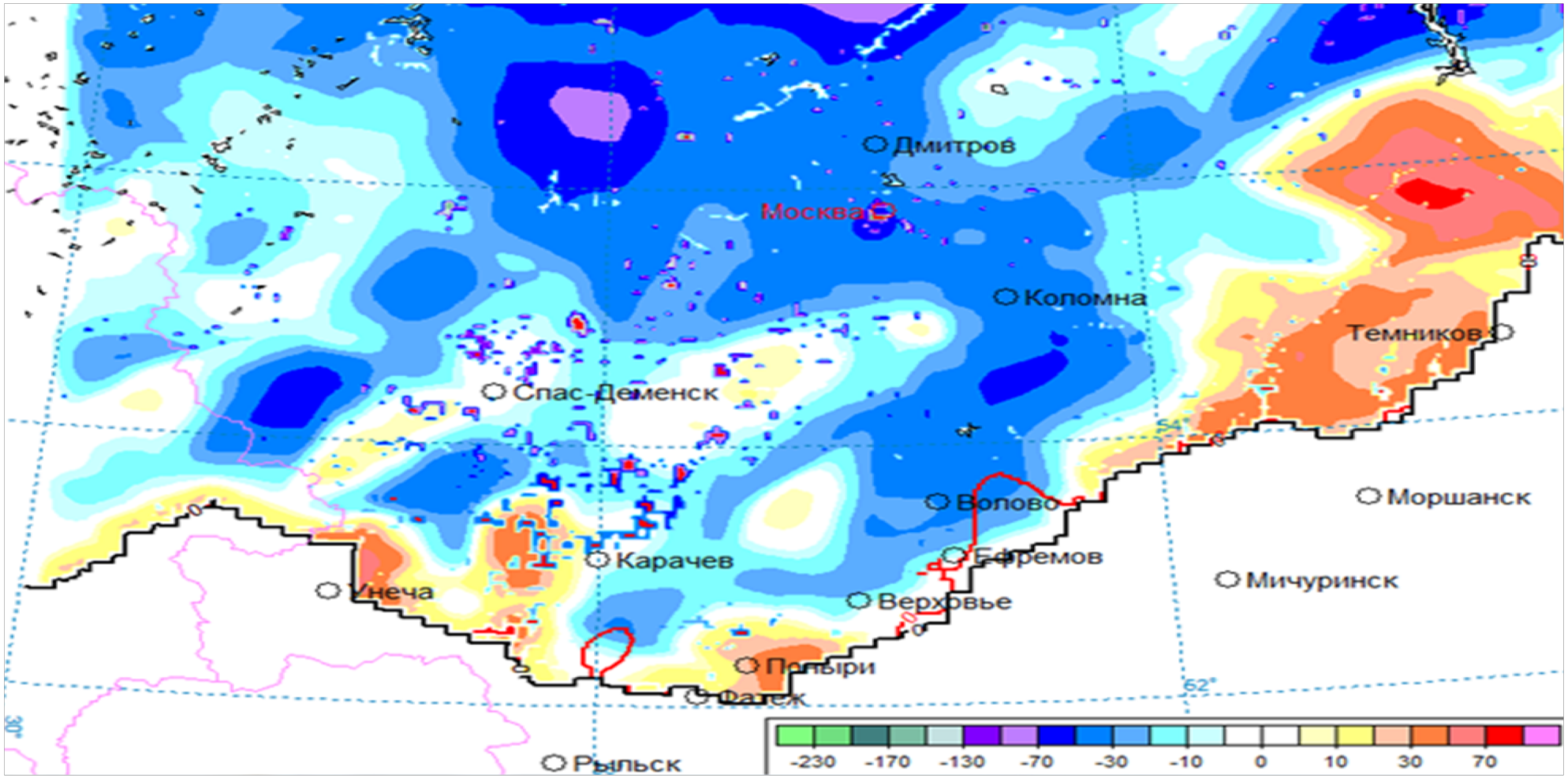
users

Runs of COSMO-Ru with initial data from SnoWE

Experiments with replacement of original fields in COSMO-Ru



Modelling of snow cover boundaries

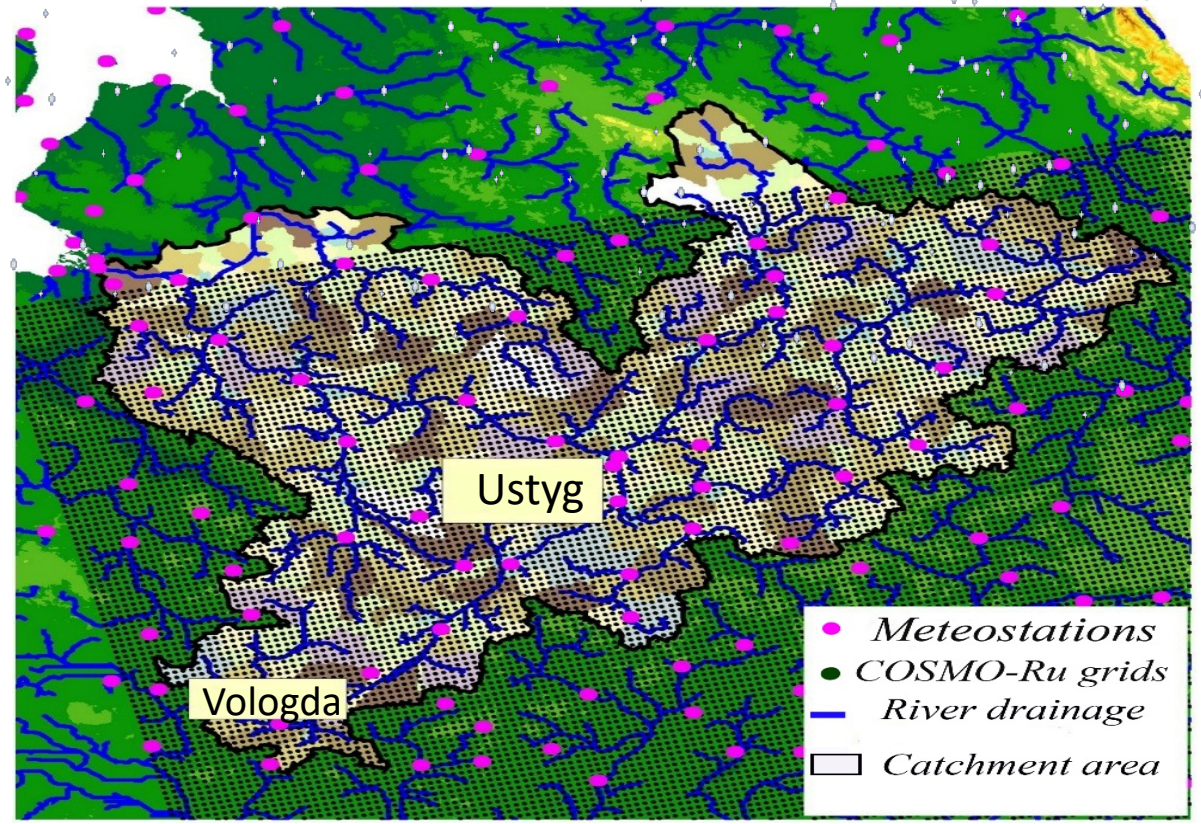


Black line is operational version COSMO-Ru

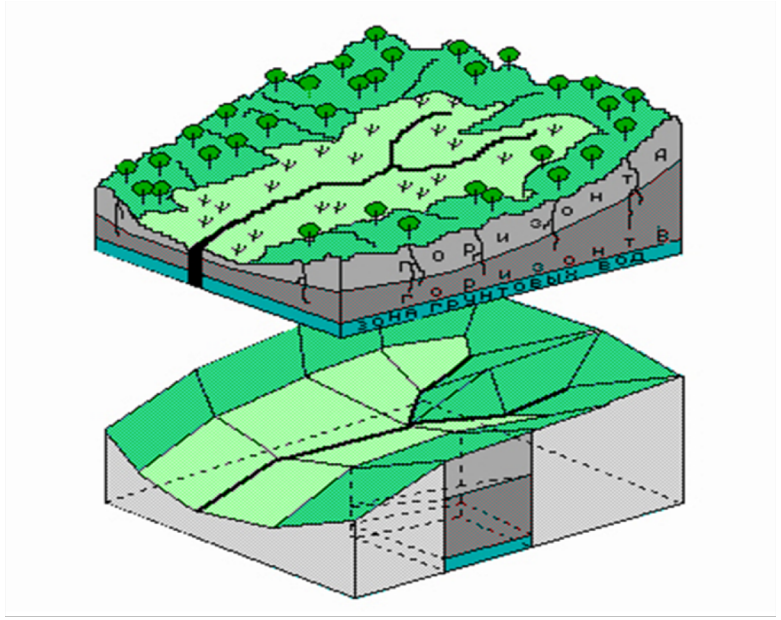
Red line is experimental version COSMO-Ru

E. Churiulin, I. Krylenko, N. Frolova, V. Kopeykin

2. Modelling of flood characteristics by the runoff formation model ECOMAG applying atmospheric model COSMO-Ru and snow model SnoWE

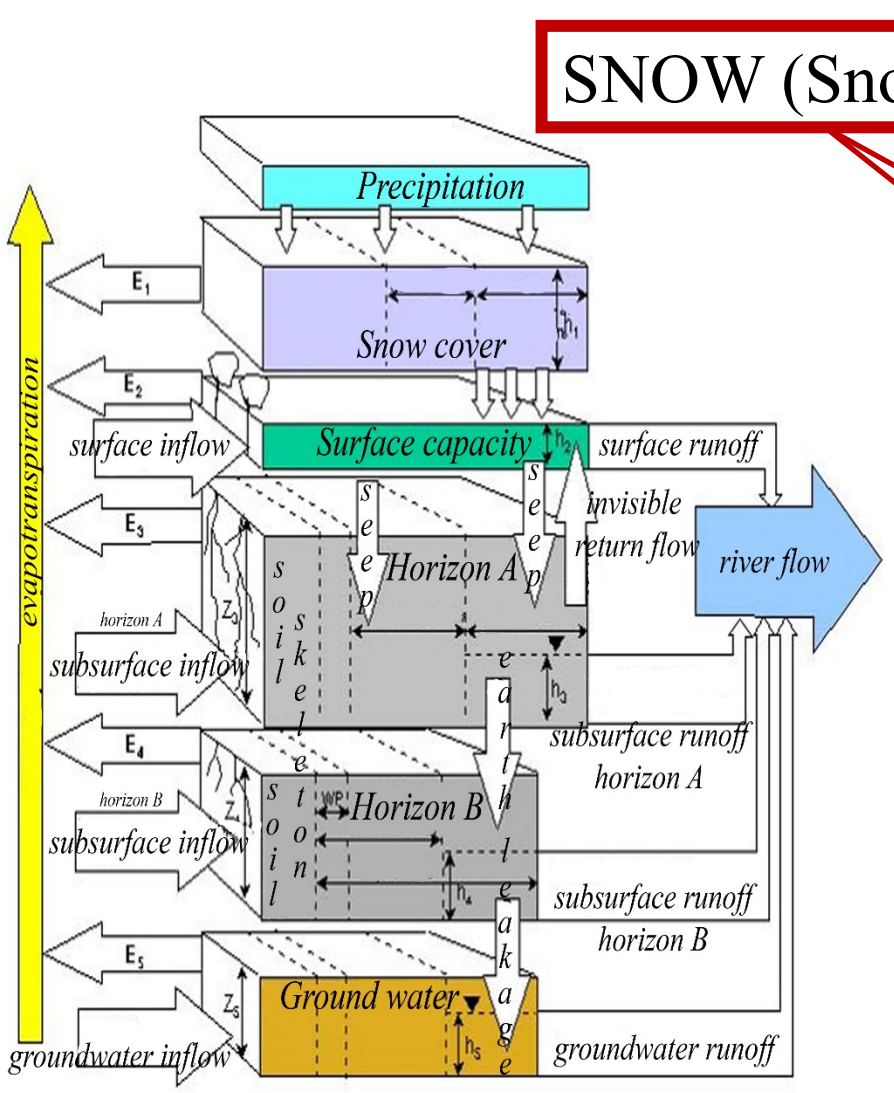


Catchment area of the North Dvina river



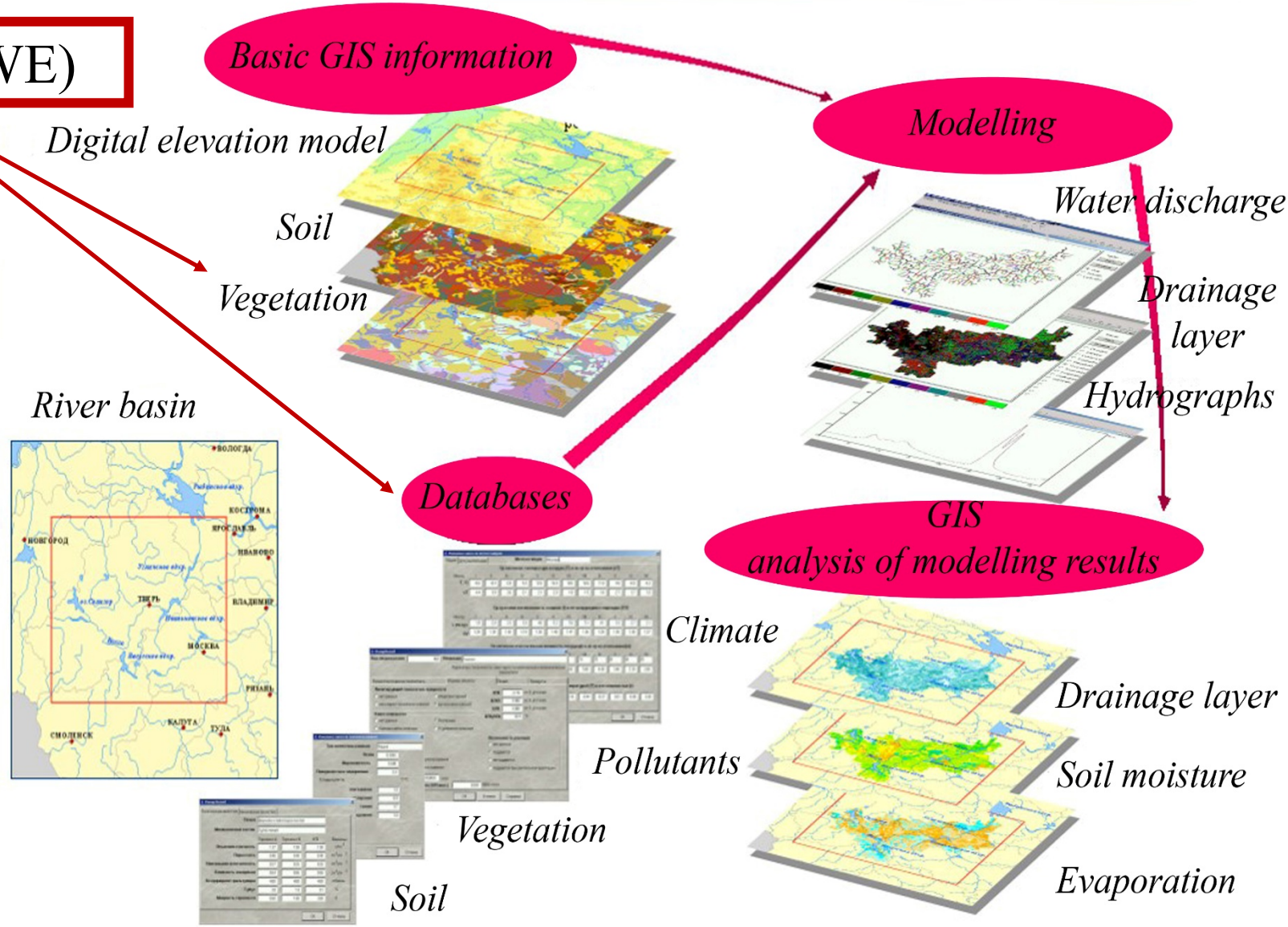
River basin schematization and hydrological model structure for an elementary site

4. Results of SnoWE for hydrology modelling

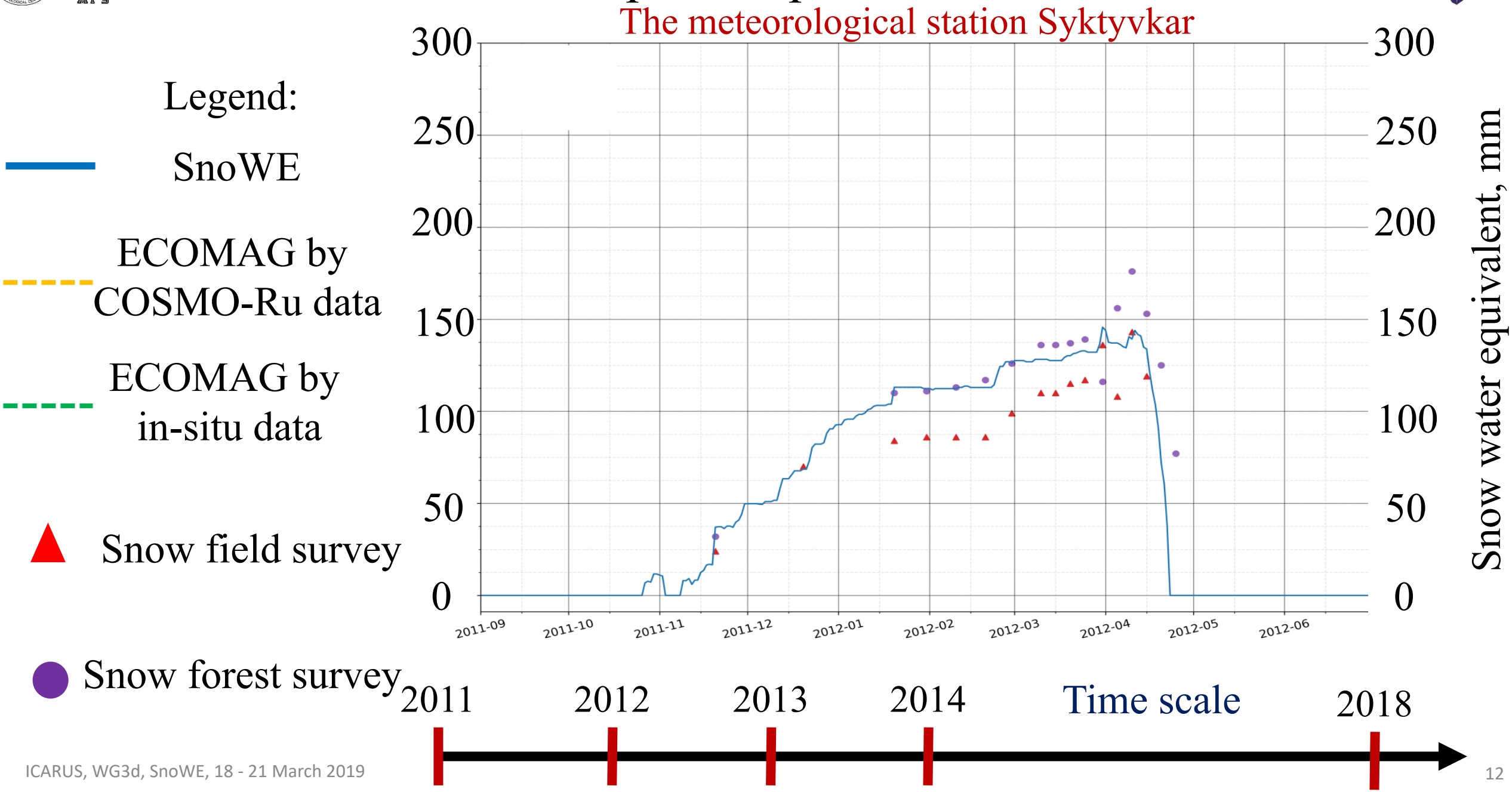


Scheme of the ECOMAG

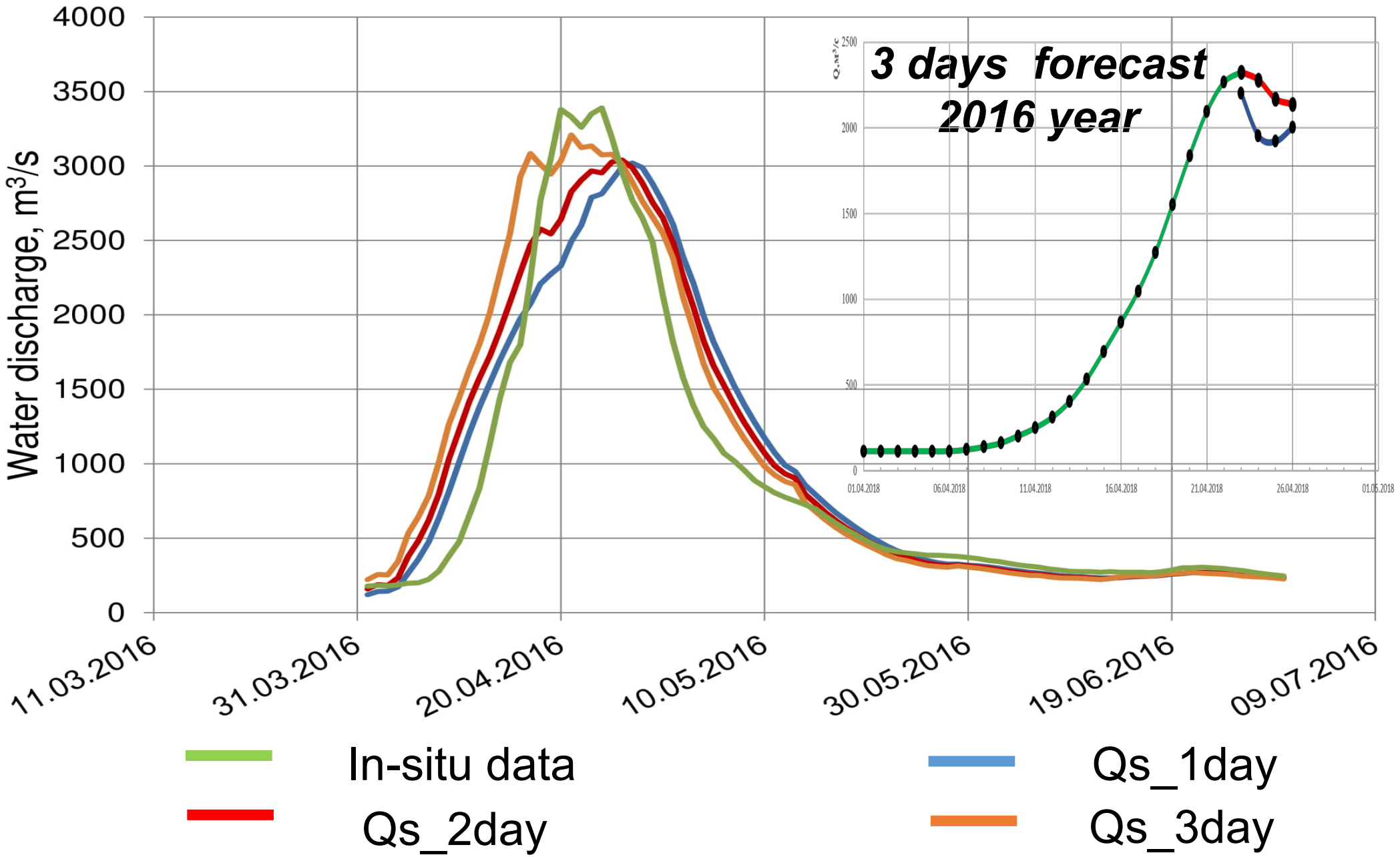
SNOW (SnoWE)



4. Comparison plots of SWE



Comparison of water discharges of the Sukhona river - Kalikino



Conclusions

1. The ***SnoWE*** (snow 1-D model) generate daily SWE and snow density maps and time series based on SYNOP or ***ICON*** data

2. Daily ***SnoWE*** data apply as an initial data for the test version ***COSMO-Ru*** and as resource of initial data for hydrological models

3. Thanks to data from the ***SnoWE*** model we have opportunity to correct snow FG ICON data for the territory of the Russian Federation

4. The combined use of **COSMO-Ru**, **SnoWE** and **ECOMAG** allows to carry out a quantitative assessment of the flood characteristics with a lack time of data from hydrometeorological observations and to solve problems related to the study of the water regime of river basins as well as hydrological safety of the territory

My contacts:

Phone: +79817607640

email: evgenychur@gmail.com

Best regards, Churiulin E.

Outputs of SnoWE

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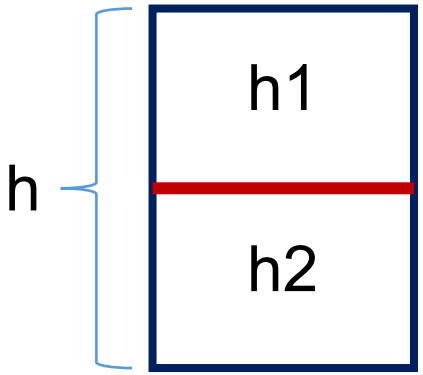
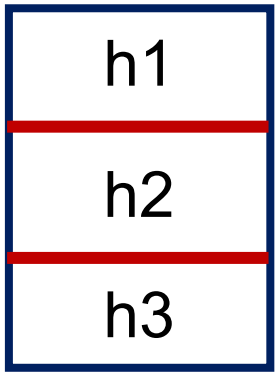
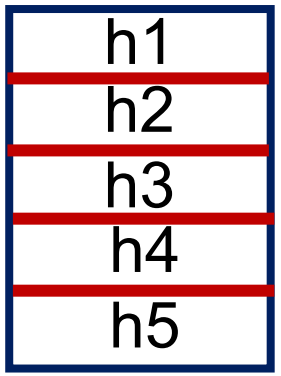
(total SWE and SD; SWE and SD by layers)







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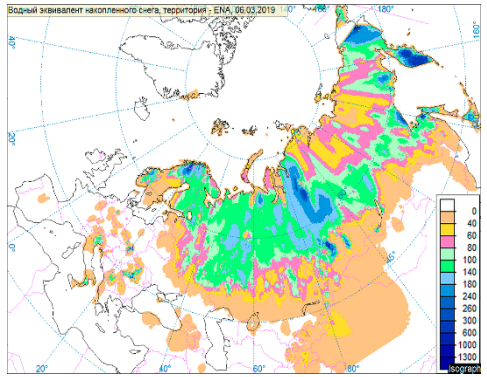

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