

# The use of ECMWF IFS at MeteoSwiss

T. Jordi, A. Giordano



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

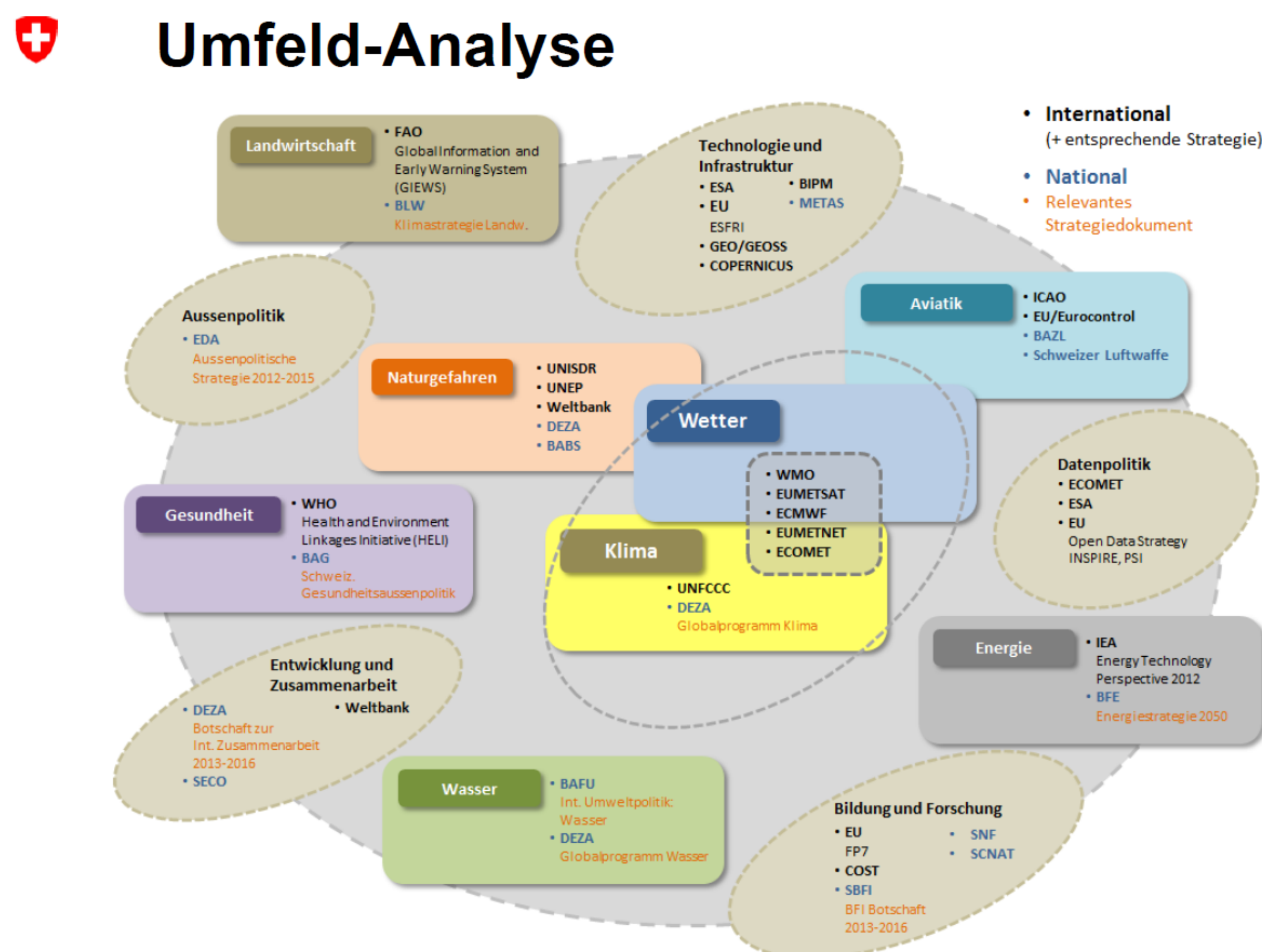
Eidgenössisches Departement des Innern EDI  
Département fédéral de l'intérieur DFI  
Dipartimento federale dell'interno DFI  
Bundesamt für Meteorologie und Klimatologie MeteoSchweiz  
Office fédéral de météorologie et de climatologie MétéoSuisse  
Ufficio federale di meteorologia e climatologia MeteoSvizzera

Federal Office of Meteorology and Climatology MeteoSwiss

## MeteoSwiss and International Collaboration

A specific statutory task of MeteoSwiss is representing the interests of Switzerland related to meteorology and climatology in the relevant international organizations, boards and interest groups. Switzerland, under the aegis of MeteoSwiss, participates in the following international organizations:

- World Meteorological Organisation (WMO)
- European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT)
- European Centre for Medium-Range Weather Forecasts (ECMWF)
- European Meteorological Network (EUMETNET)
- Economic Interest Grouping of the National Meteorological Services of the European Economic Area (ECOMET)

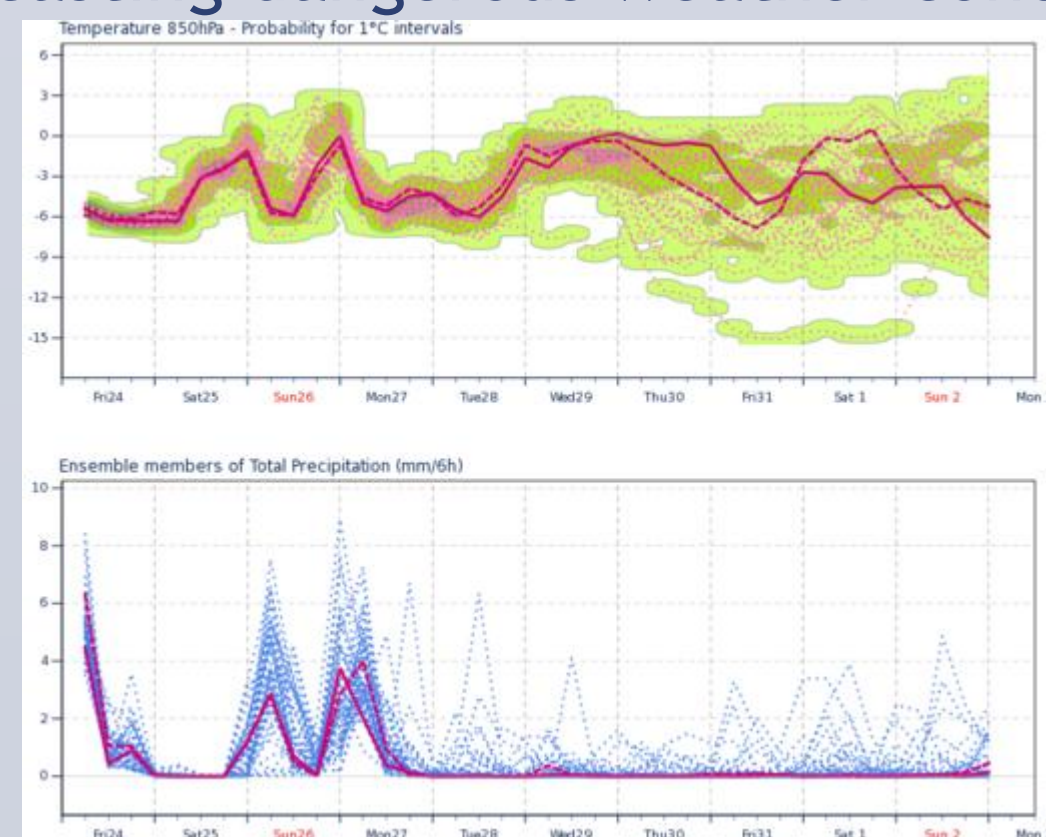
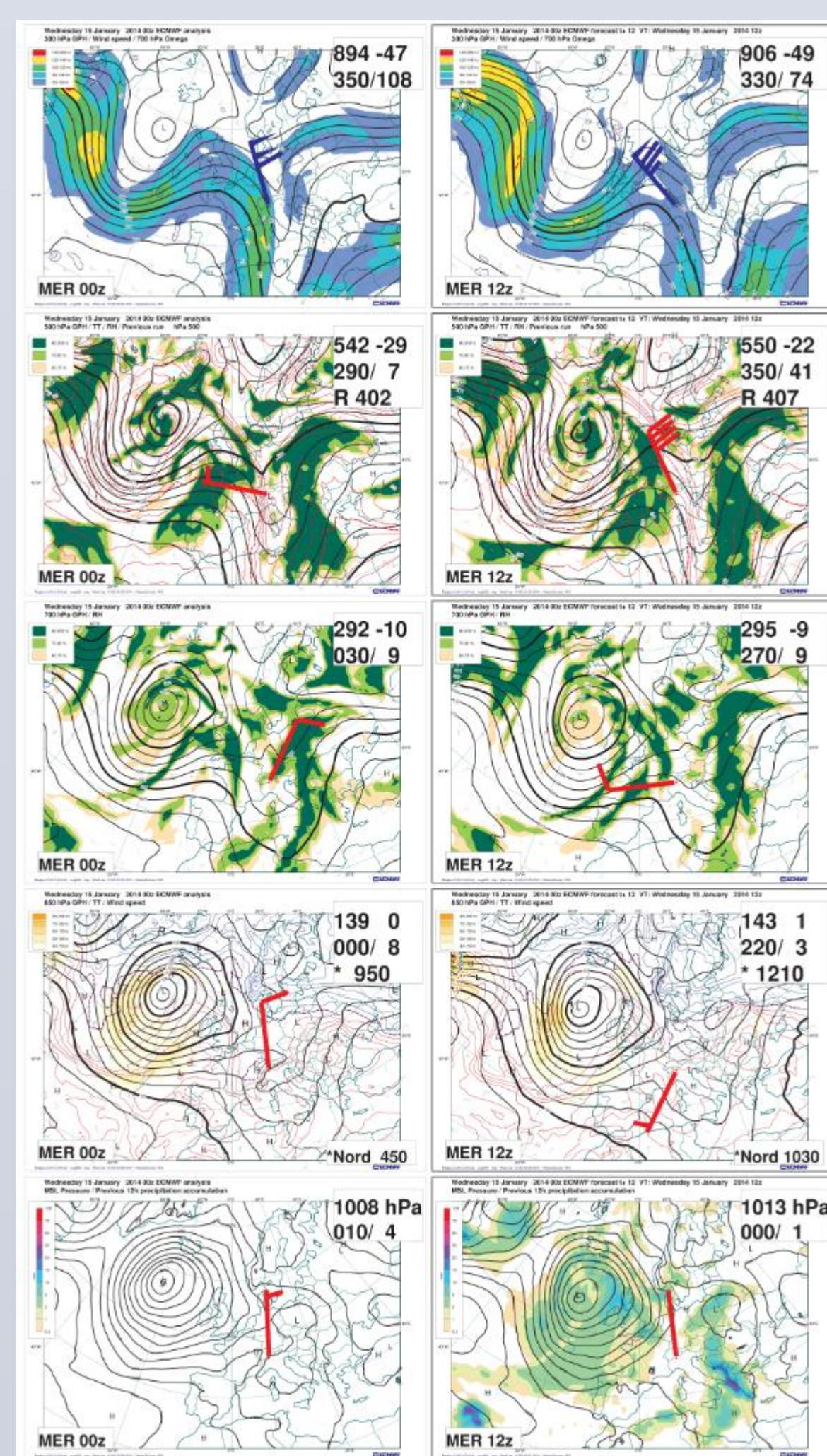


## MeteoSwiss legal duties

- to collect meteorological and climatological data on Swiss territory, permanently and comprehensively
- to take part in the recording, exchange and analysis of meteorological and climatological data on an international scale
- to warn of dangerous weather conditions
- to provide meteorological information for aviation and aviation security on Swiss territory
- to provide climate information and implement measures as a contribution to ensuring a healthy environment in the long term
- to guarantee the monitoring of radioactivity in the atmosphere and to provide the meteorological basis for the calculation of the spread of air pollutants
- to further theoretical meteorology and climatology and to carry out applied research and development projects
- to provide further meteorological and climatological services for the benefit of the general public

## Use of ECMWF-Products (HRES, ENS)

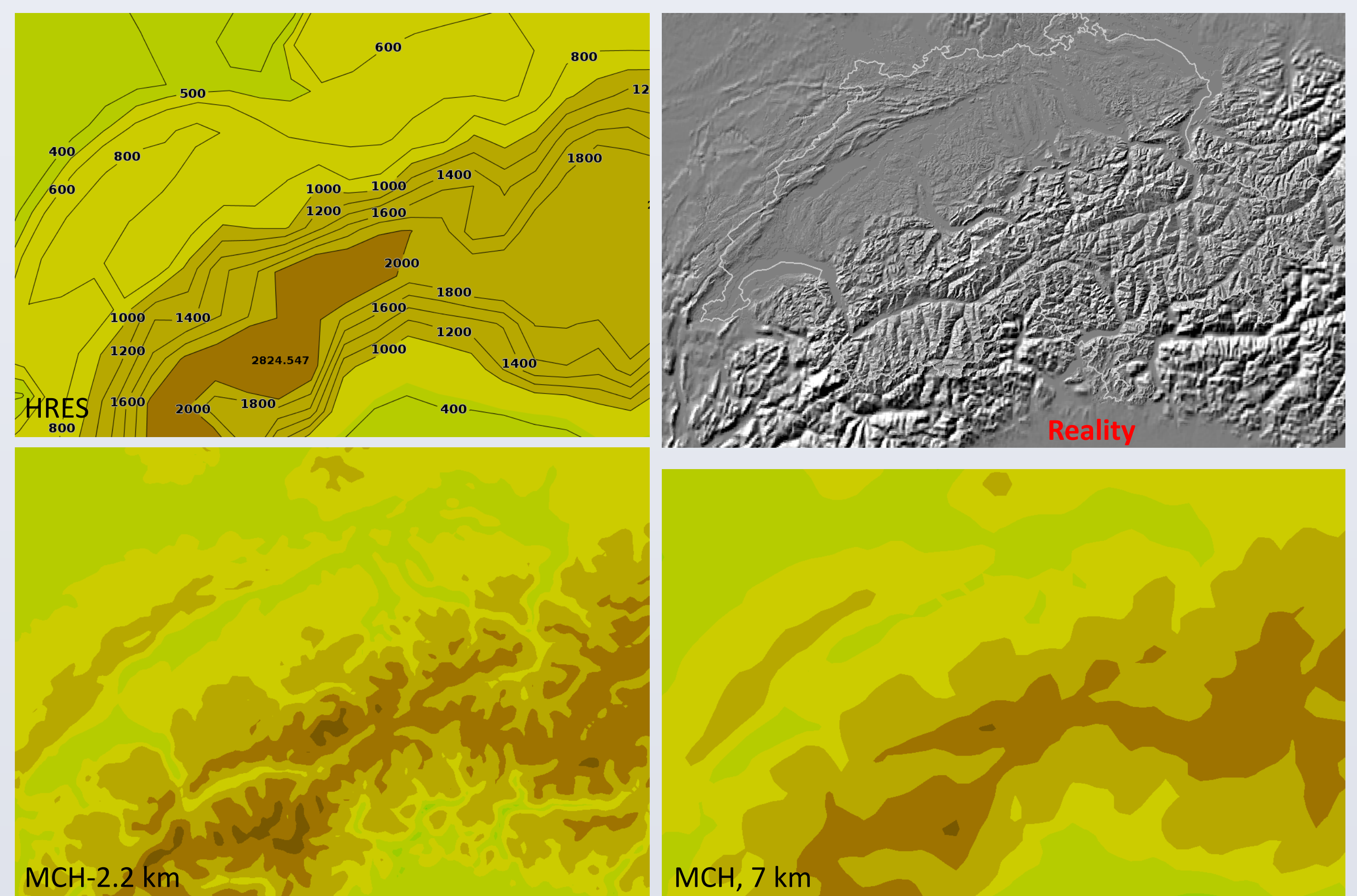
- HRES is used to create the short and medium range weather forecast.
- ENS is used to create the medium range weather forecast and to give a trend up to 10 days.
- ENS is currently being implemented to do a more probabilistic approach even in the short term. Main focus in this task is warning of dangerous weather conditions.
- EFI is sometimes used in forecasting dangerous weather conditions. We could improve there.
- 4DVAR analysis are used to drive the MeteoSwiss model chain of COSMO (7, 2, ..)
- COSMO-LEPS is run at ECMWF. It is mainly used in forecasting dangerous weather conditions.



## Special forecasting conditions in Switzerland

Because of its specific topography, there are quite some issues to think about while forecasting the weather:

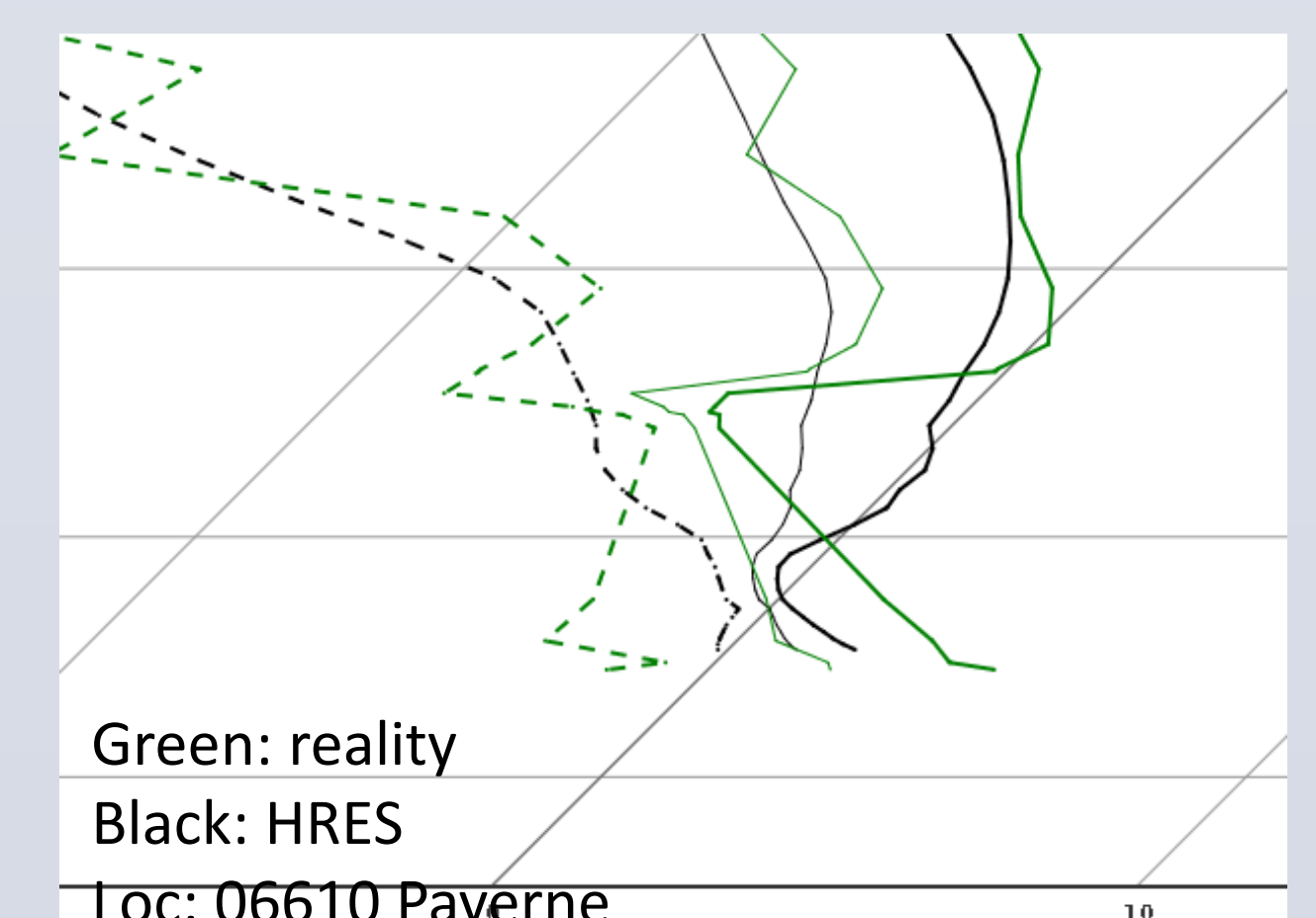
- Switzerland has quite high mountains (~4500 m) Therefore the flow gets disturbed. Mostly the air has to move around the Alps, inducing a specific flow regime, or it has to go above, which leads to orographic lifting. Most common is lee-cyclogenesis, which not only affects northern Italy but Switzerland as well.
- The topography is too fragmented for models, this leads to wrong DMO.
- The Swiss plateau, where most of the people live, has A LOT of stratus during the winter half year. The models are very poorly in forecasting this boundary layer problems, especially in this area (resolution and parameterization problems)
- As the alps block the flow, fronts are slowed down and total precipitation is increased due to orographic lifting and ongoing moist advection.
- As fronts cross quite quickly over Reading, they tend to stay a while in Switzerland
- During summer, thunderstorms are very frequent (mountainous terrain). Models again have low skill when forecasting these events, especially in the space-time-continuum. One has to rely on other parameters like humidity, CAPE, vorticity advection, etc. Most important is nowcasting.



- Most weather is modified by terrain, being it flooding or storms. This is indicated in the models, but there is a lot to improve for the forecaster.
- We are looking forward to the planned increase of the horizontal grid resolution.
- Despite Alinghi won two times the America's Cup, we do not use the wave model, due to severe lack of oceans.

## Reflections

- Even after like 1000 fog forecasts one of the most reliable forecasting tool is climatology and simple rules of thumb
- Models fail to forecast very steep gradients, associated with mountains, inversions etc.
- We do need to work more with probabilistic forecasts. They are, however, quite difficult to communicate to the unskilled public. [It cannot rain 60%...]

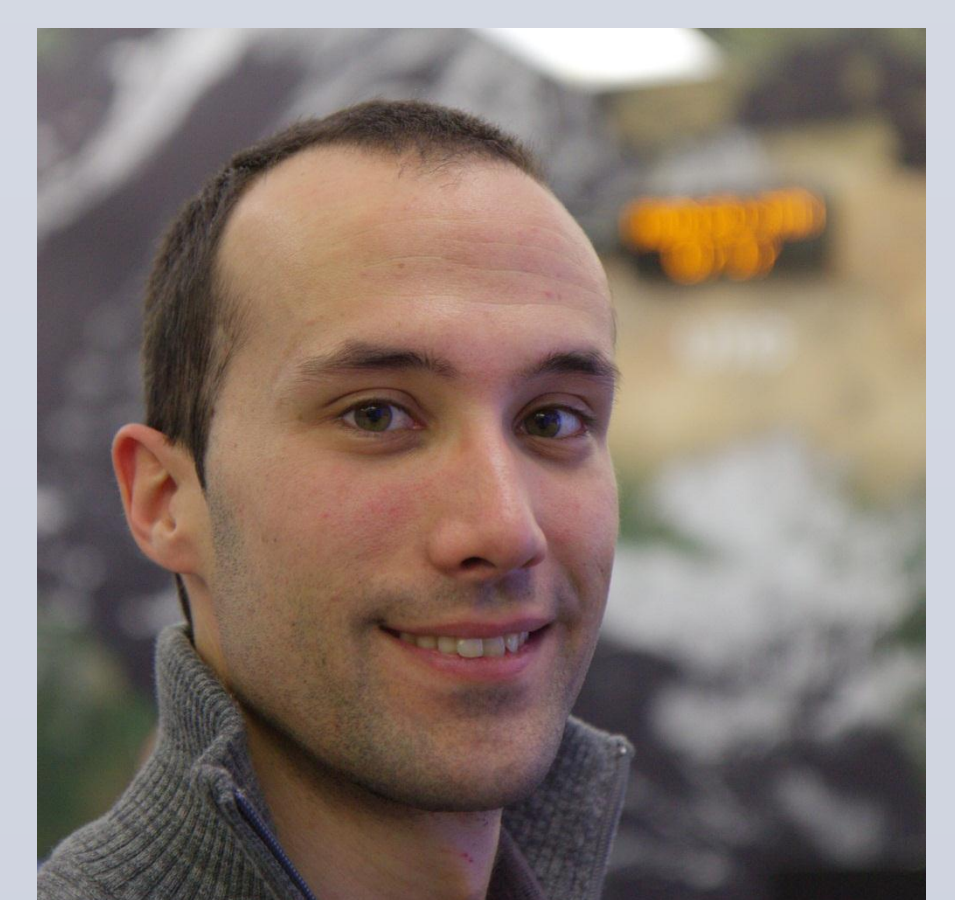


## Acknowledgements and contact details

- We'd like to thank the people of ECMWF for the development of HRES, which is a great tool to work with.



thomas.jordi@meteoswiss.ch



alexander.giordano@meteoswiss.ch

- This poster was made after an early shift, so sorry for any typos.
- Live long and prosper. So long, and thanks for all the fish.