

TAF Initialization at Météo-France: The IniTAF Project

T. Kranitz, P. Crispel, P. Jaunet, C. Delin, and A. Drouin

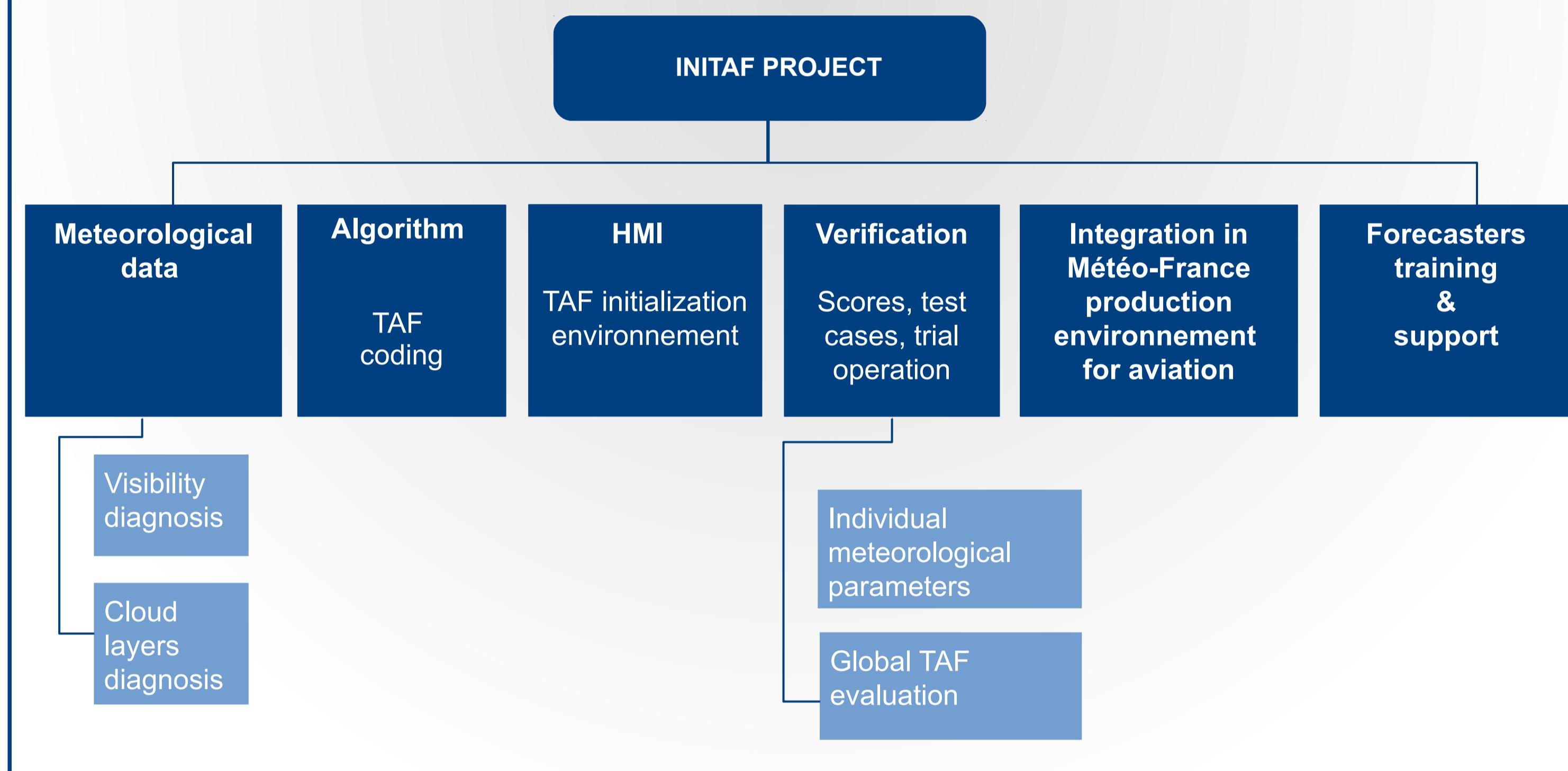
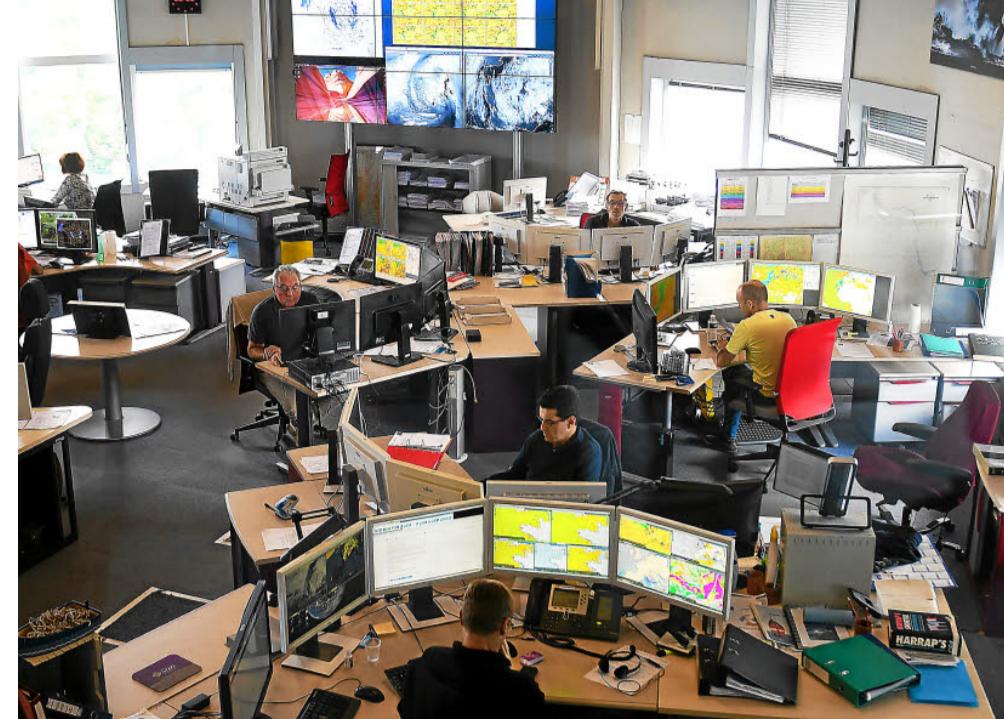
Météo-France DSM/AERO

The IniTAF project

The IniTAF project is a 3 years overall project run by Météo-France which aims at providing TAF initialization for aviation weather forecasters.

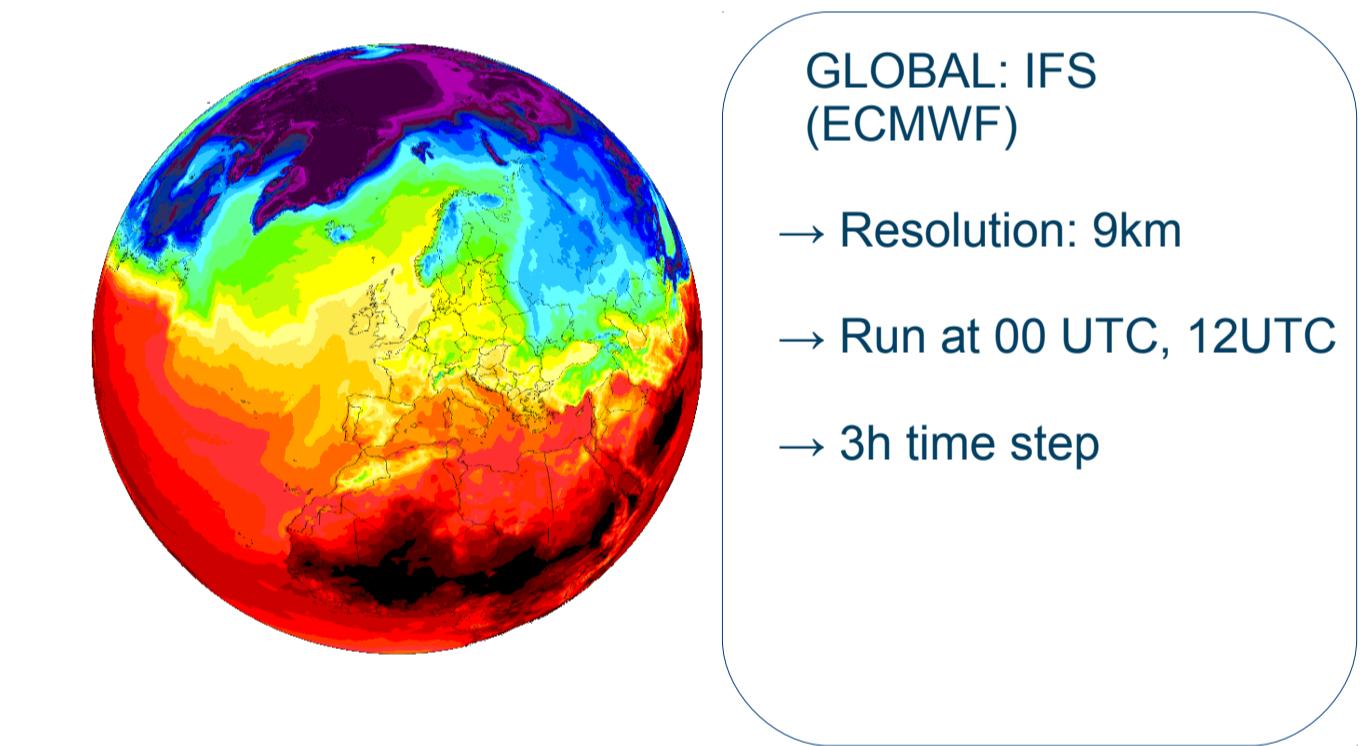
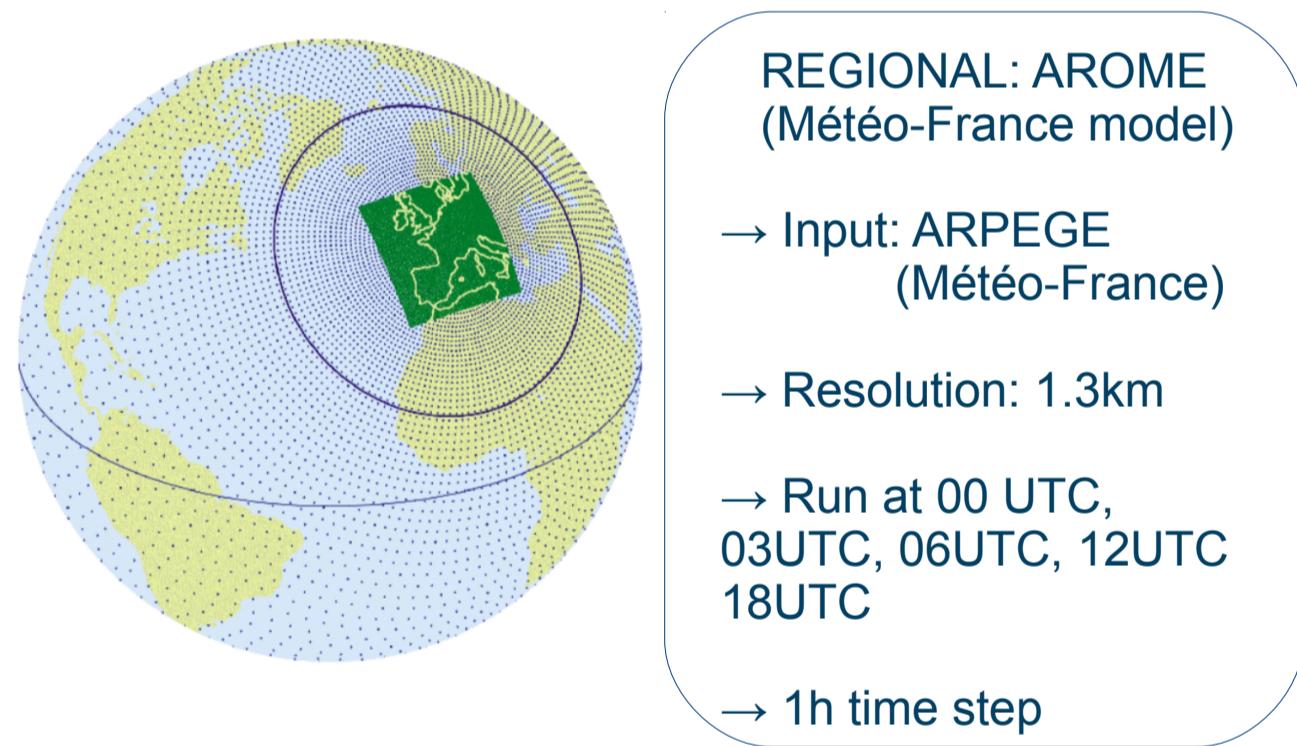
Goals

- time saving for forecasters:
 - focus on most critical parameters
 - end-users support for hazardous situations on airport platform
 - multiple remote platforms handling
- also available for overseas French territories
- human in the loop approach



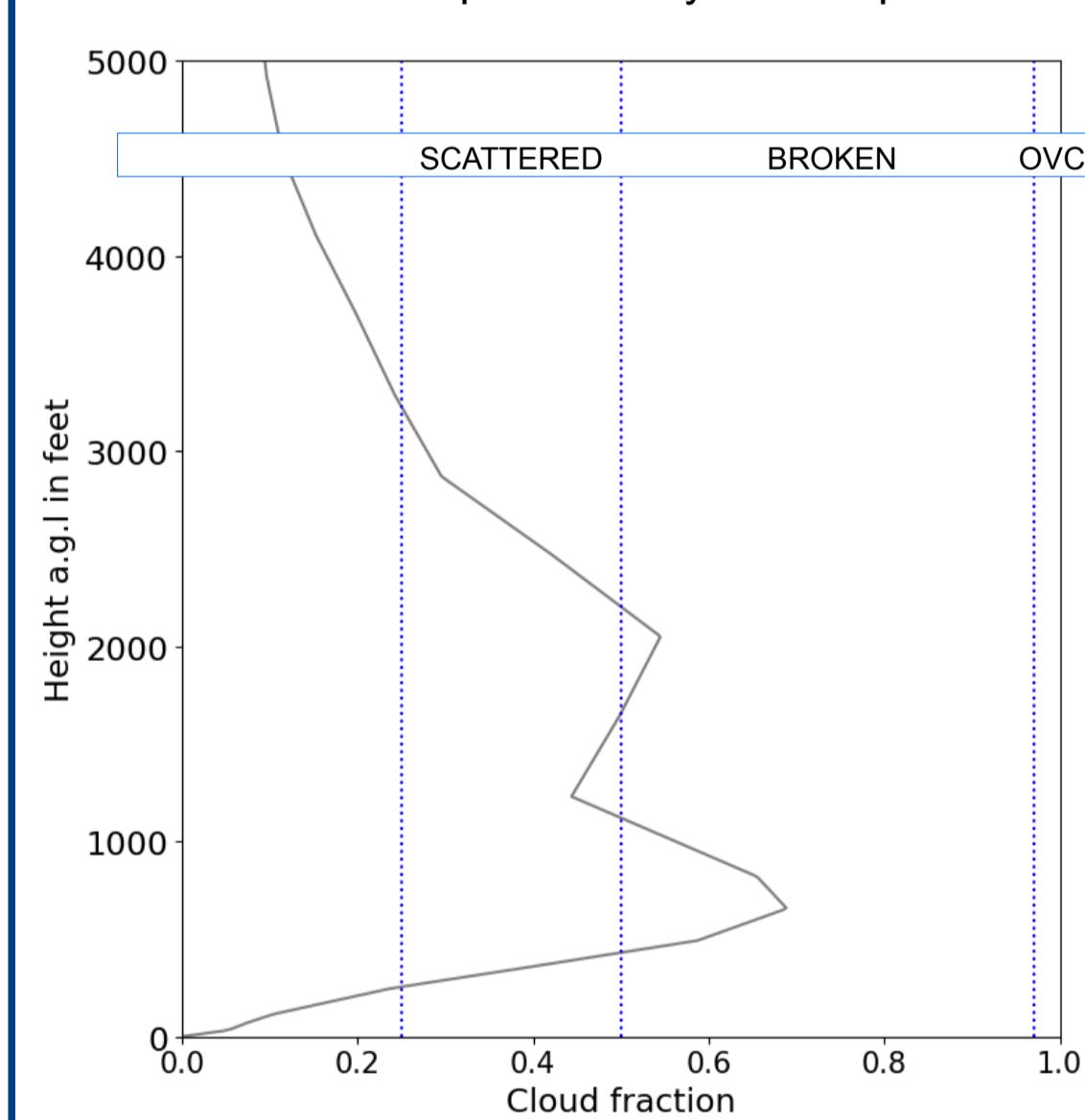
Meteorological data

NUMERICAL WEATHER PREDICTION MODELS



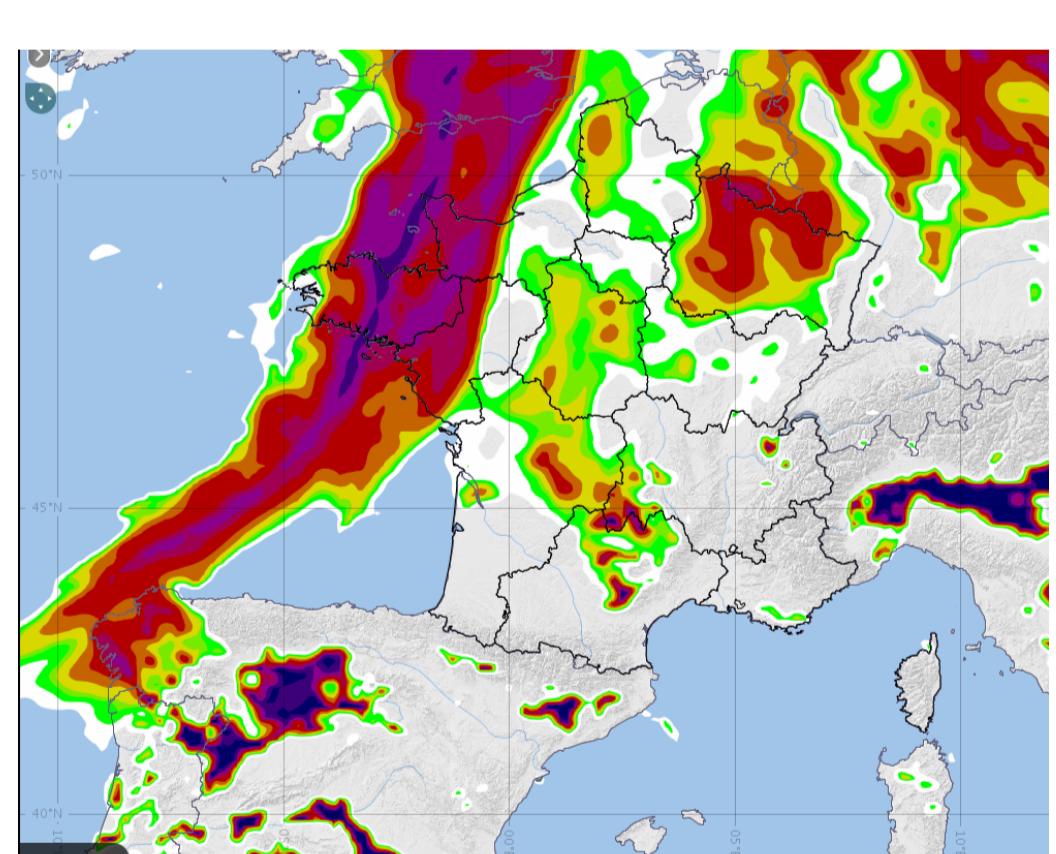
PARAMETERS

Stratified cloud layers



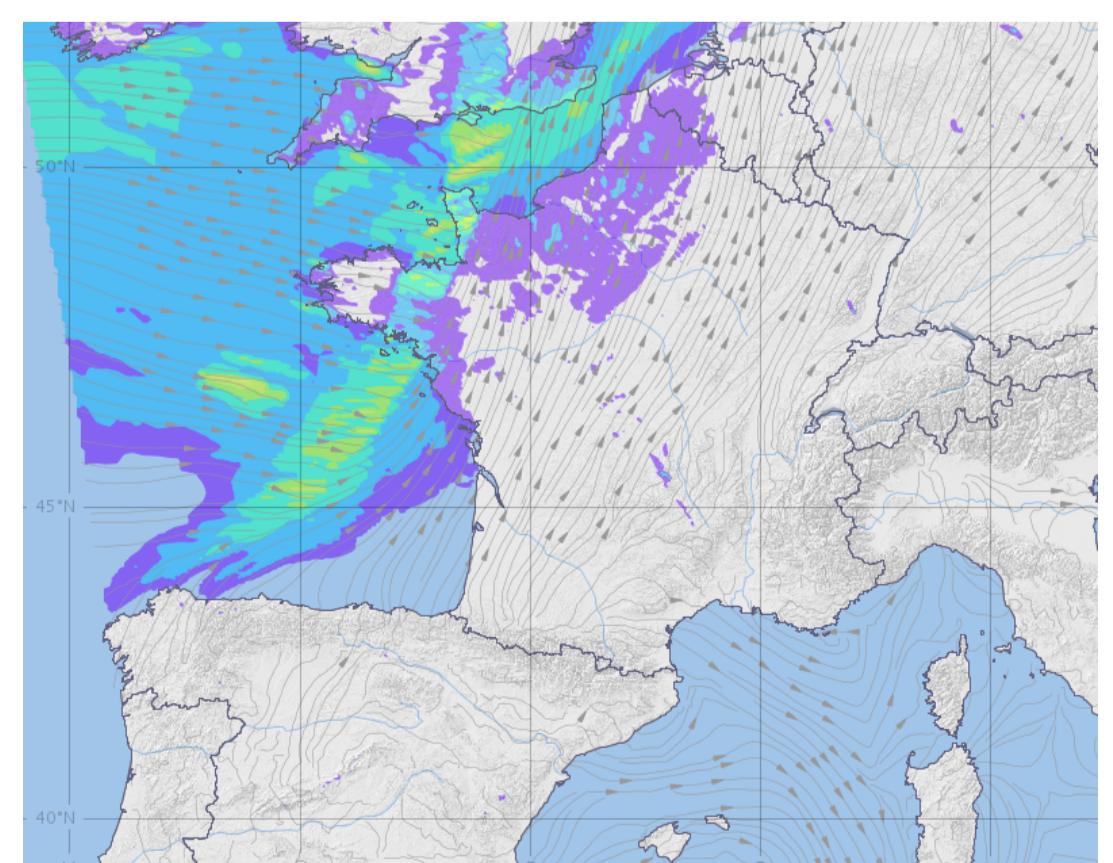
Visibility

Cloud + Hydro components
 - Cloud: Statistical model trained with visibility data from French airports (Météo-France observation network) – relies on forecasted cloud water & ice contents.
 - Hydro: snow, rain, graupel. Niemelä, 2014. Stoelinga, 1999.



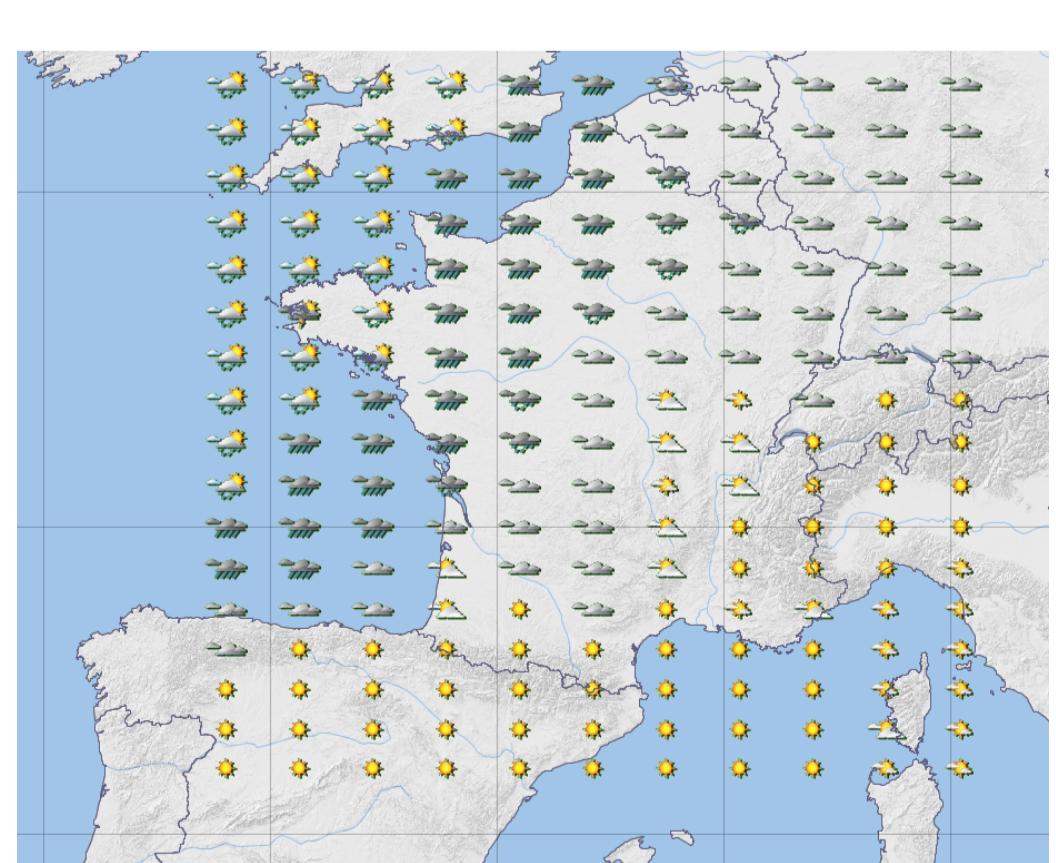
Wind

- Direct model outputs
- Wind mean speed and direction
- Wind gusts

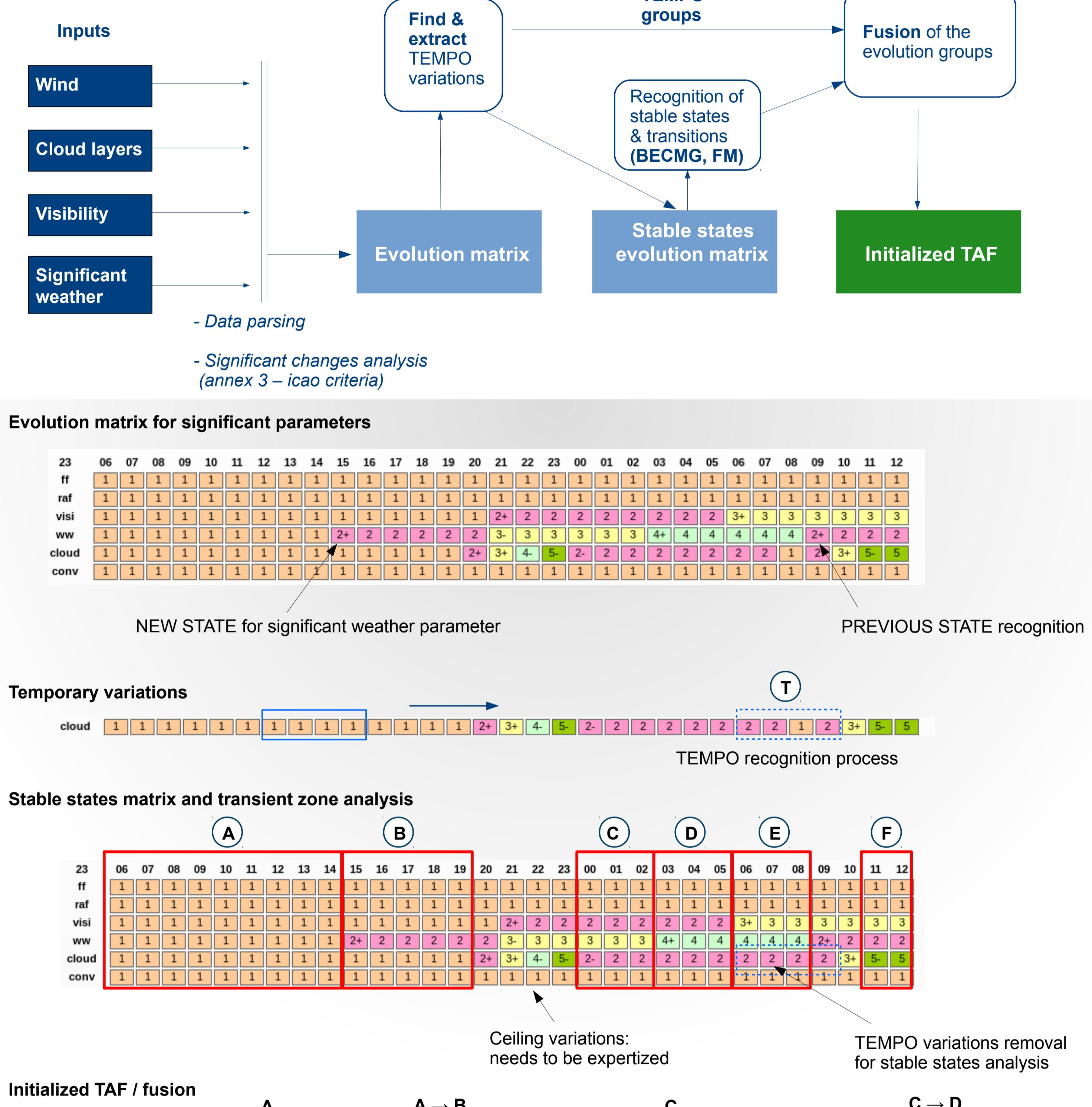


Aviation significant weather / convection

- significant weather predictions assessed by Météo-France forecasters



Algorithm: TAF coding

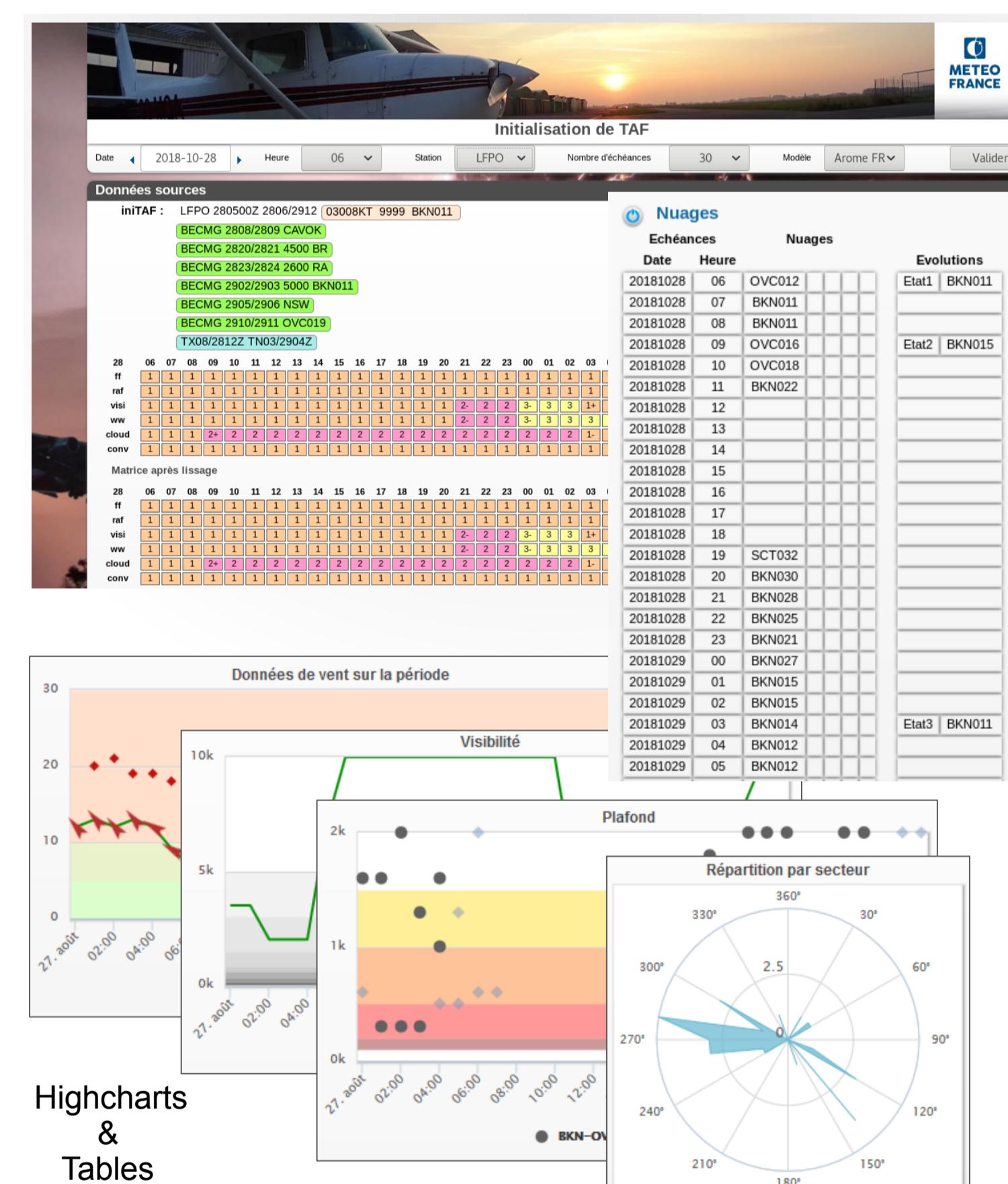


Initialized TAF / fusion

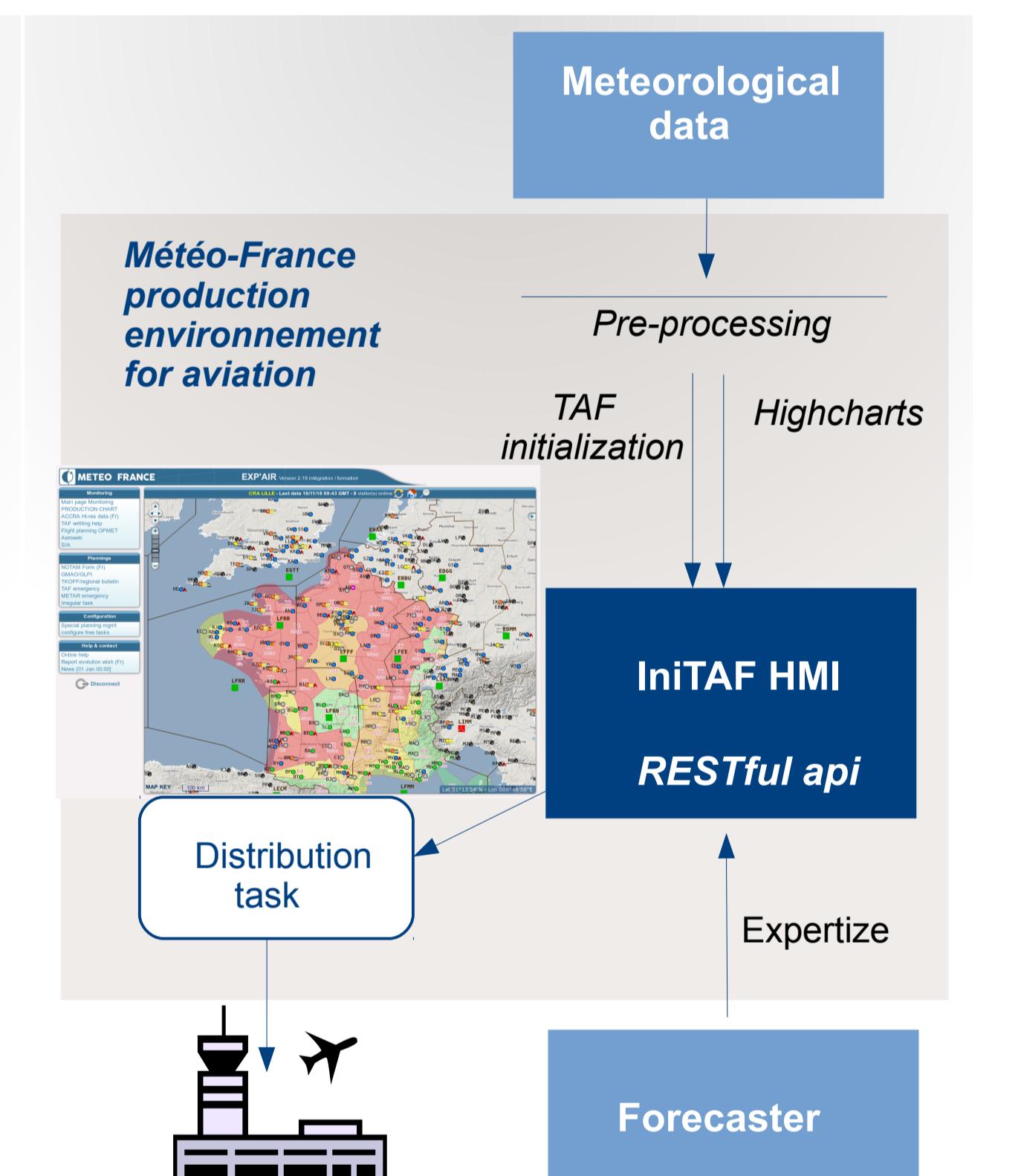
LFGC 230500Z 2306/2412 1000K 900 BCFG OVC000 BECMG 2314/2315 NSW FM 232300 1000K 1700 RA BKN05 OVC035 BECMG 2405/2406 6000 TEMPO 2408/2409 BKN000 OVC004 BECMG 2409/2411 NSW BKN006

A → B C → D
 B → E T in E
 D → E E → F

IniTAF HMI



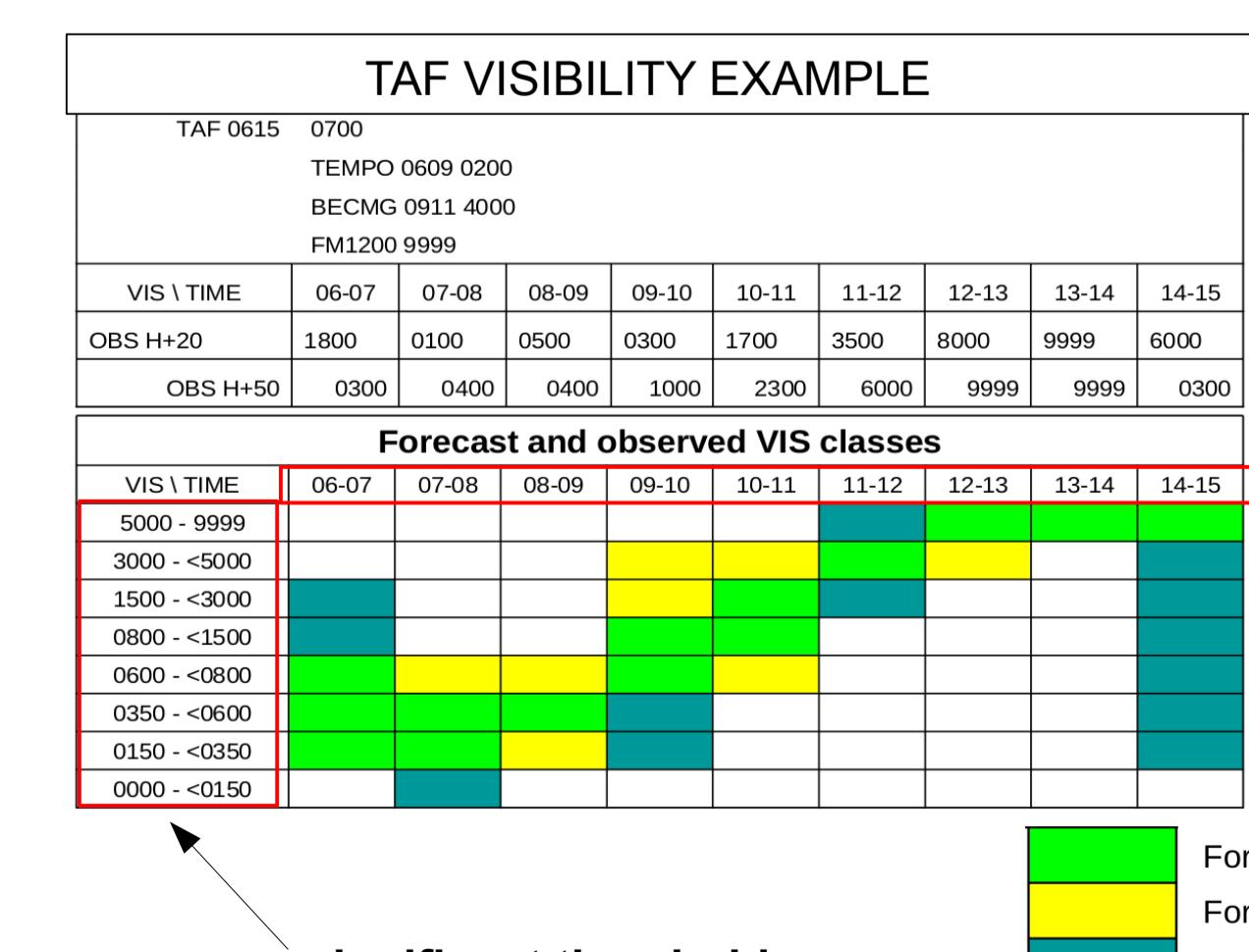
Production



IniTAF scoring methodology

Metalliance methodology (Mahringer et al. 2008)

- Initialized TAF are transformed to hourly predictions for each parameter
- Comparison is achieved with METARS at French airports (Météo-France observation network)



metalliance

Binary classification scores for each significant thresholds

- Hits
- False alarms
- Bias
- PSS, HSS, etc ...

Global score : Key Performance Index

$$KPI = \frac{\text{mean(PSS)} + \text{mean(HSS)}}{2}$$

TAF - statistics

e.g. Number of evolution groups