

The logo features a white circular icon with a stylized arrow pointing left, followed by the word "GAFOR" in a bold, sans-serif font, and the word "Project" in a larger, bold, sans-serif font below it. The background is a blue sky with white clouds.

GAFOR Project

Stjepko Jančijev, CCL
Project Manager

EASA, General Aviation and Low Level Weather
Seminar
Köln, July 17th 2019.



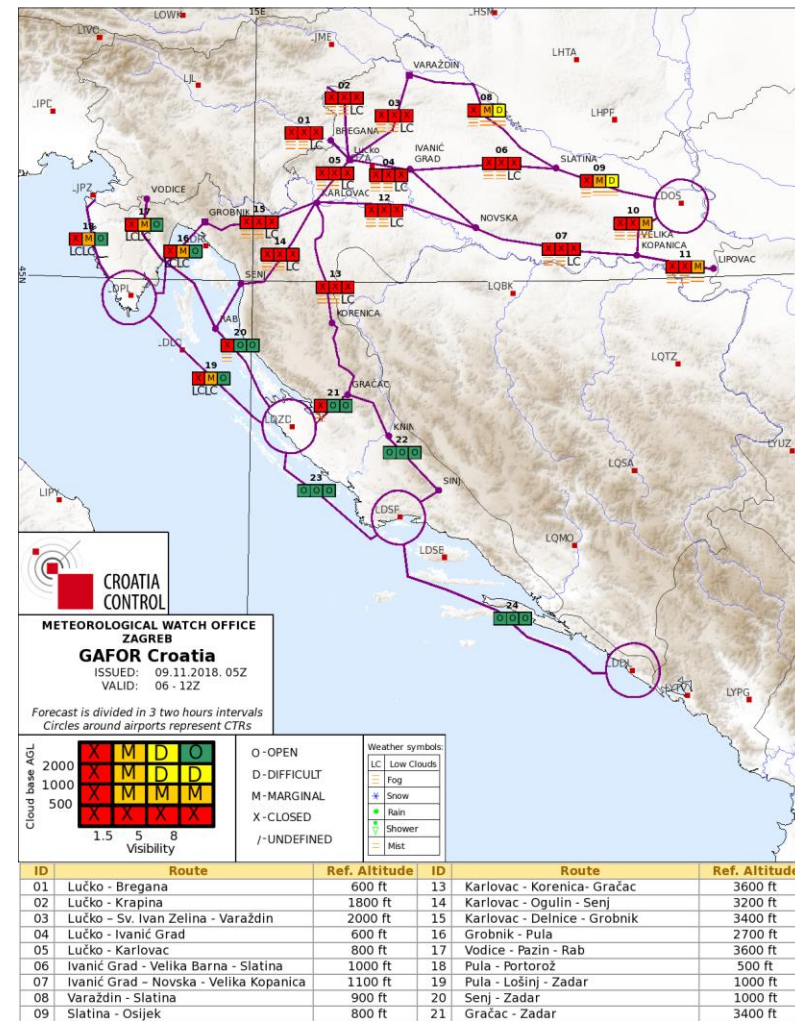
Co-financed by the European Union
Connecting Europe Facility

What is eGAFOR?

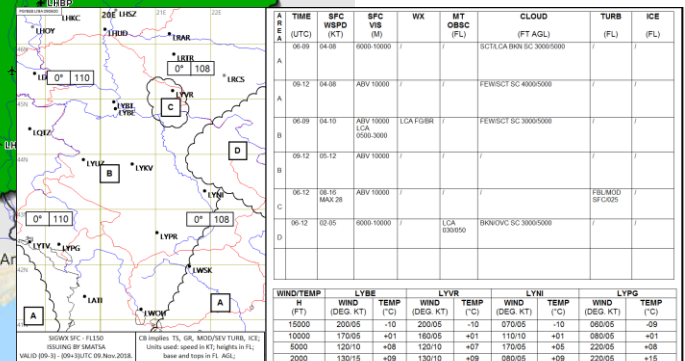
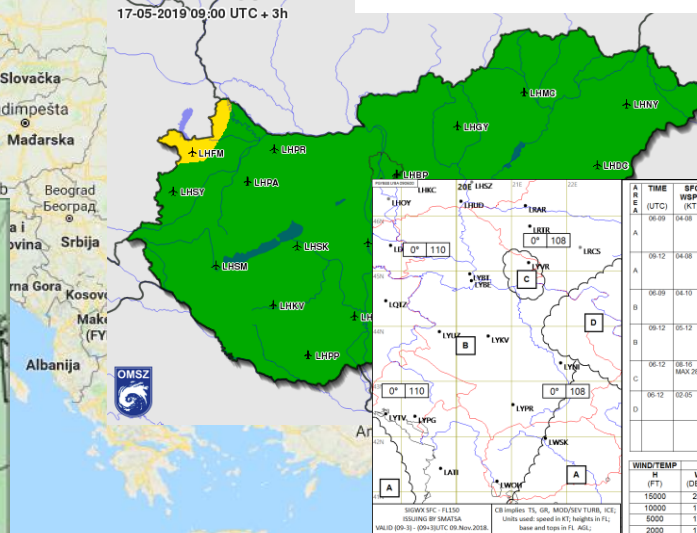
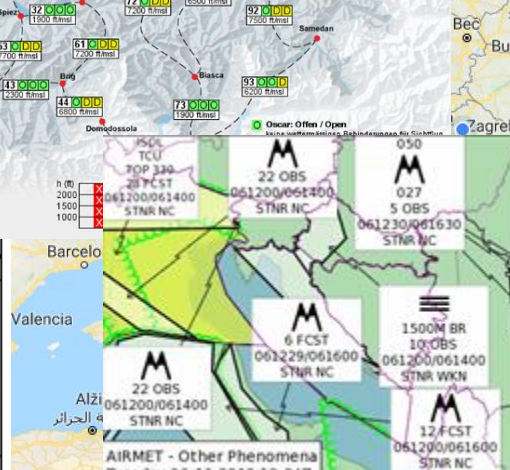
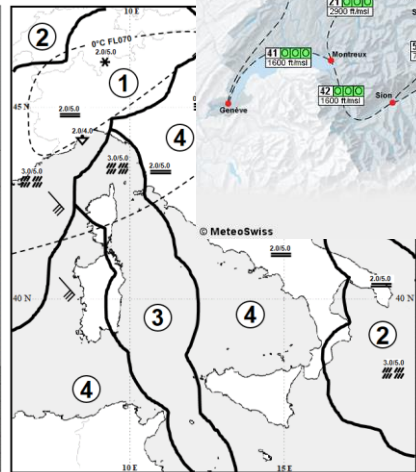
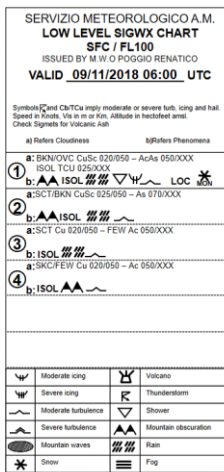
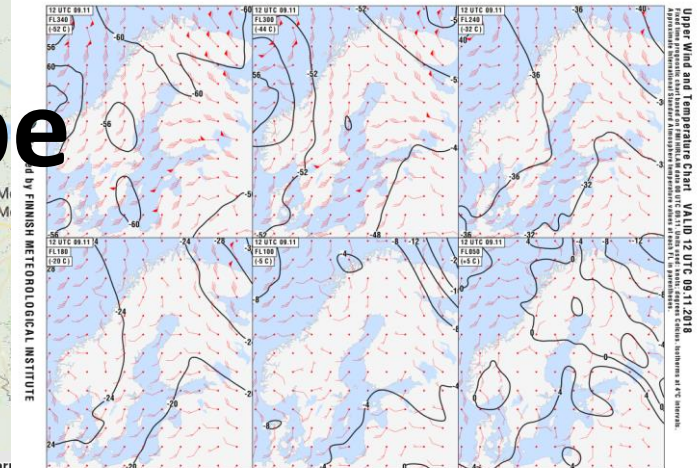
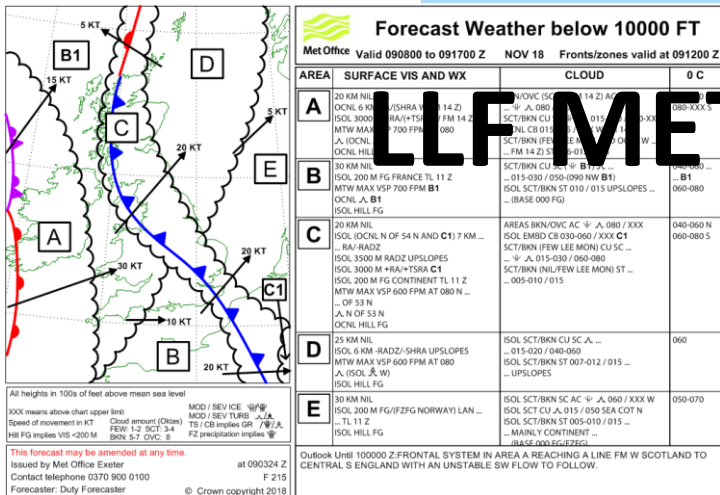
GAFOR (General Aviation FORecast) is a forecast of the state of previously defined routes for general aviation depending on horizontal visibility and low BKN/OVC cloud base.

CCL introduced GAFOR in 2015 on user's request. Users wanted a user-friendly graphical forecast to help them make a quick meteorological assessment.

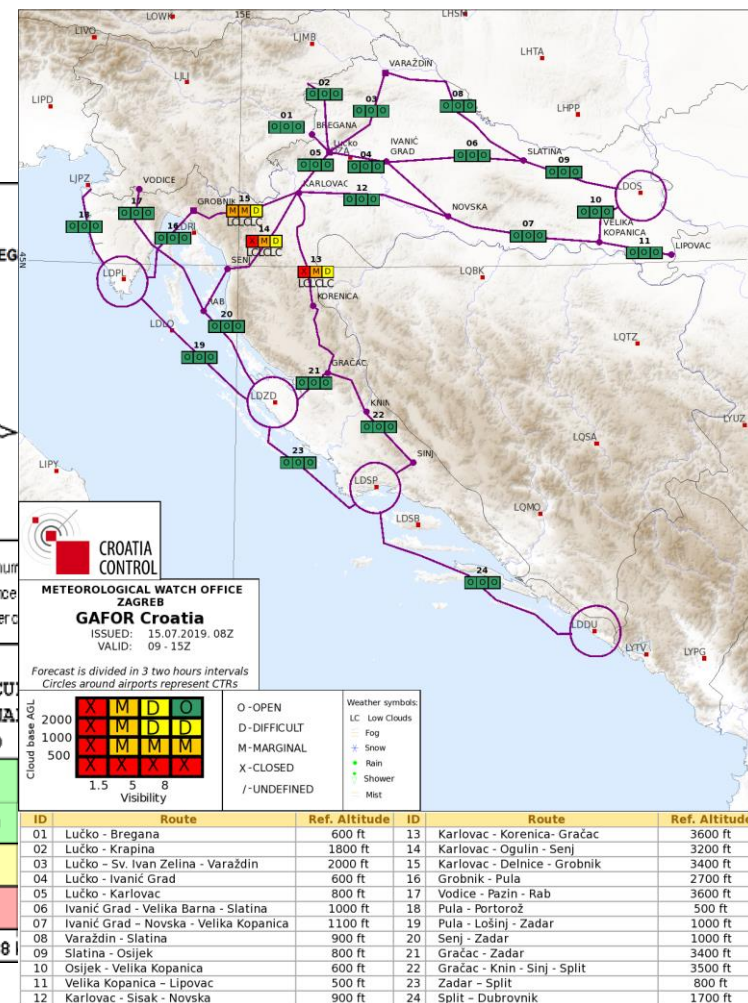
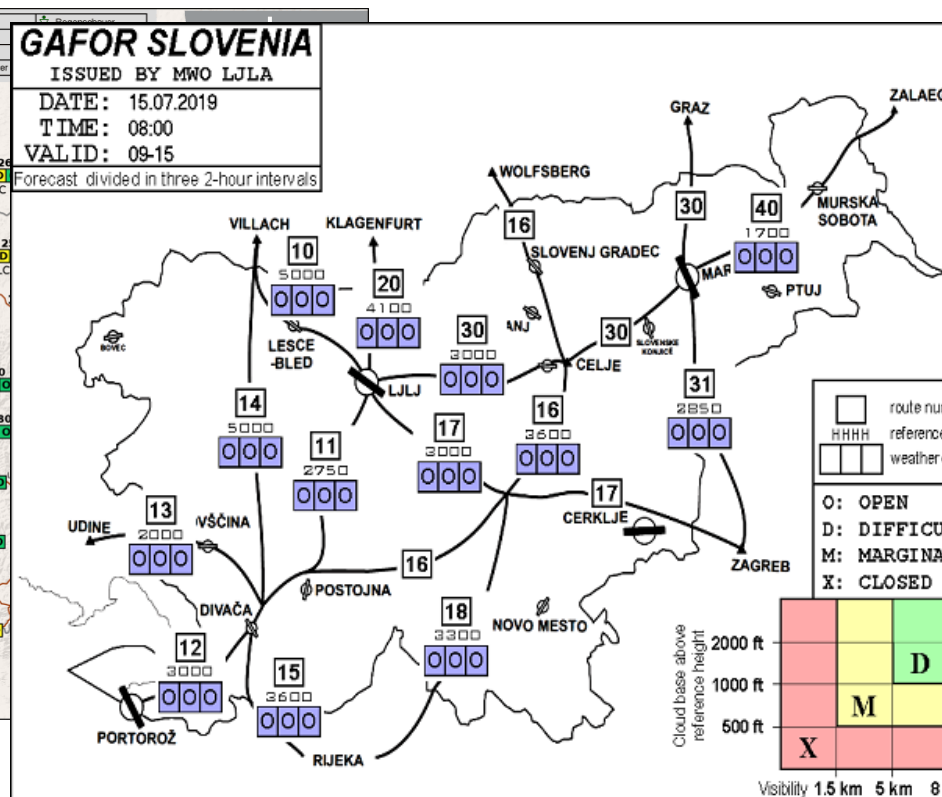
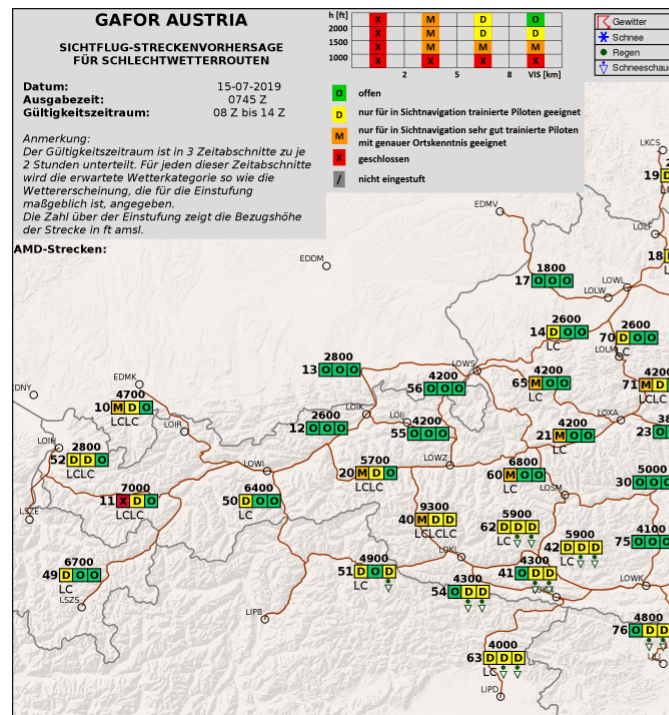
eGAFOR will be an upgraded GAFOR.



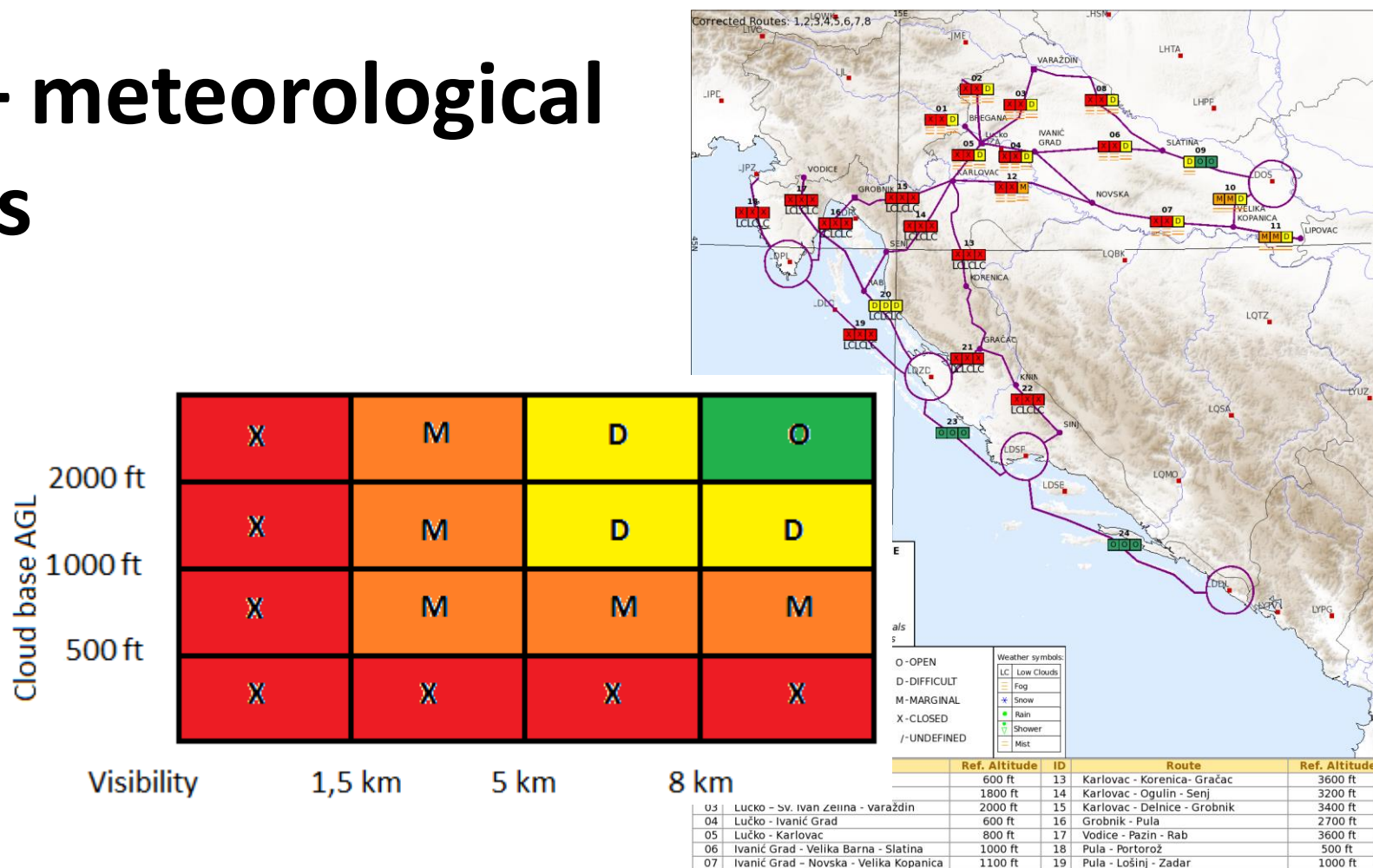
LLF MET products in Europe



User perspective



GAFOR – meteorological problems



Initial idea

- Users like GAFOR – to offer them a similar, but upgraded product
- To create a single product for multiple countries, but with expertise of local forecasters included
- To harmonize forecasting criteria and forecasting in general over a larger area
- To operationally harmonize collaborative forecasting between different METSPs
- To introduce probability forecasts to the product
- To use the obtained information for other products in the future

The Project

- Project idea reported to INEA through CEF Transport Call 2016
- The Project is approved and co-financed with 85% of the EU
- The Project started on 03.07.2017 and will end on 31.12.2020

The Partners

CCL (Croatia) - initiator and lead partner

ARSO (Slovenia)

BHANSA (Bosnia and Herzegovina)

OMSZ (Hungary)

ROMATSA (Romania)

SHMU (Slovakia)

SMATSA (Serbia and Montenegro)

IBL (Slovakia) - industrial partner



MET phenomena in eGAFOR

It was decided that the following weather phenomena hazardous for aviation would be forecast in eGAFOR:

- Low BKN/OVC ($\geq \frac{5}{8}$) cloudiness
- Visibility
- Turbulence
- CB cloudiness
- Freezing precipitation

Traditional GAFOR

NEW

Meteorological vs. Impact forecasting

In traditional GAFOR, forecasters forecast impact on users, based on meteorological parameters (LC and VIS).

This assumes that:

- all users have the same or similar impact
- forecasters are familiar with the impact on users

In eGAFOR we have decided that forecasters shall forecast meteorological phenomena, and the system shall translate it to impact.

MET phenomenon -> Impact

To make a forecast understandable to the pilots, it must be adjusted to them.

That means, the meteorological forecast will be translated into the impact (state of the route) shown in **standardised colours** („traffic-light-like”):

RED	Closed
ORANGE	Only for pilots well trained in visual navigation with a precise knowledge of the area
YELLOW	Only for pilots trained in visual navigation
GREEN	Open

For every two-hour time interval of the forecast, impact will be calculated on every eGAFOR route for each MET element (phenomenon).

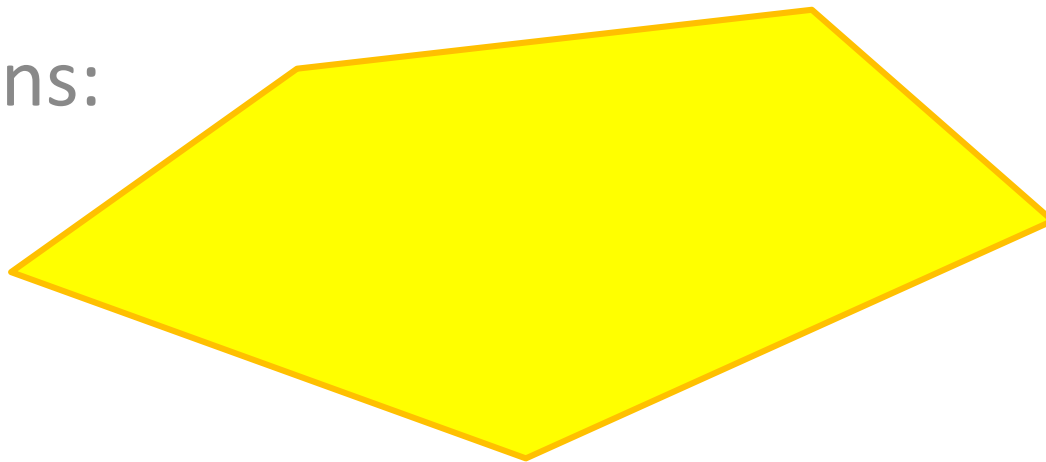
		Severity of phenomenon		
		More severe	Severe	Less severe
Probability of occurrence	Low			
	Medium			
	High			

The highest impact of this impacts will be final impact of the route for the time interval.

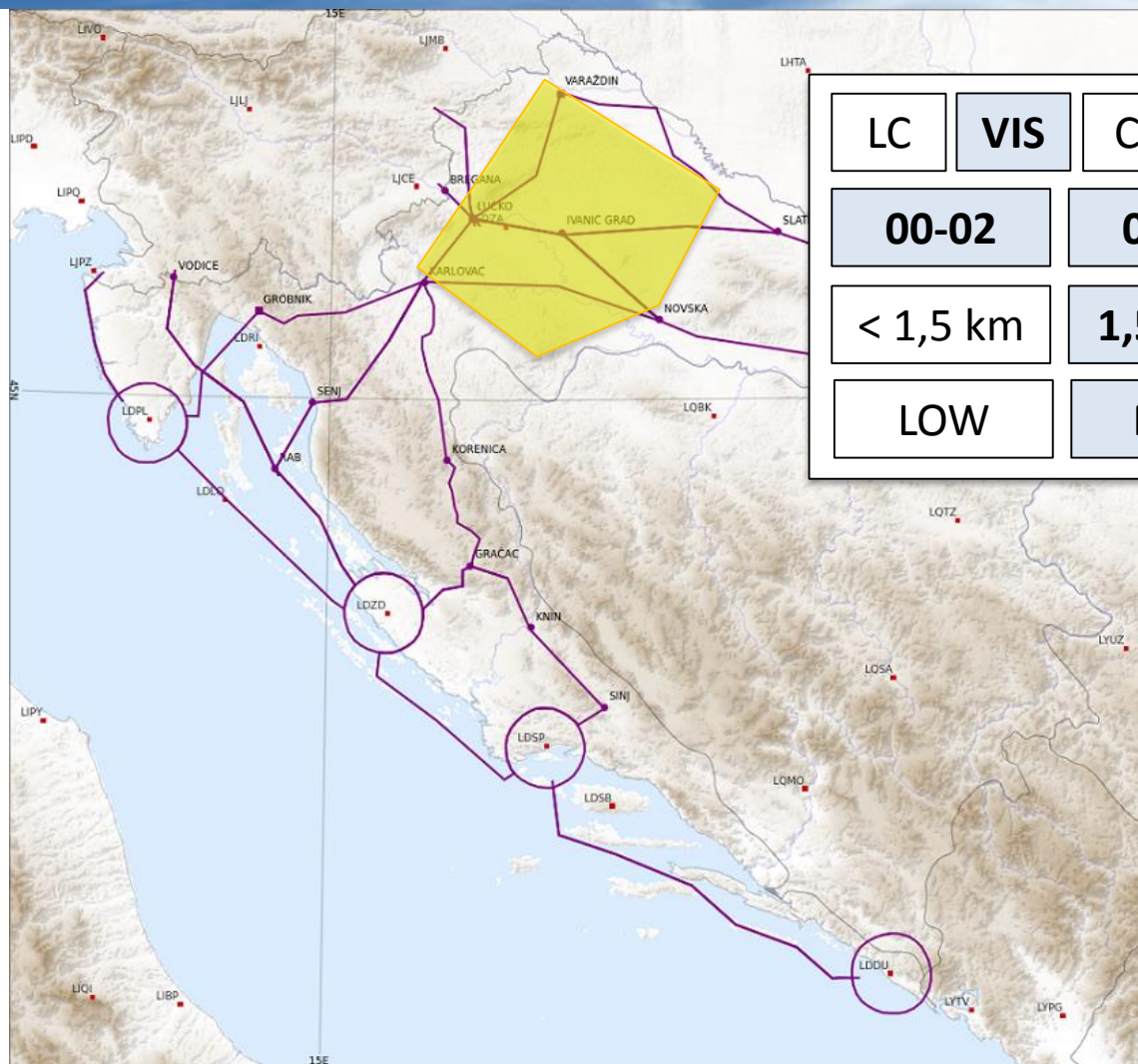
Object forecasting

One of the first questions which have arisen, was how shall forecasters input a substantial amount of data into the system?

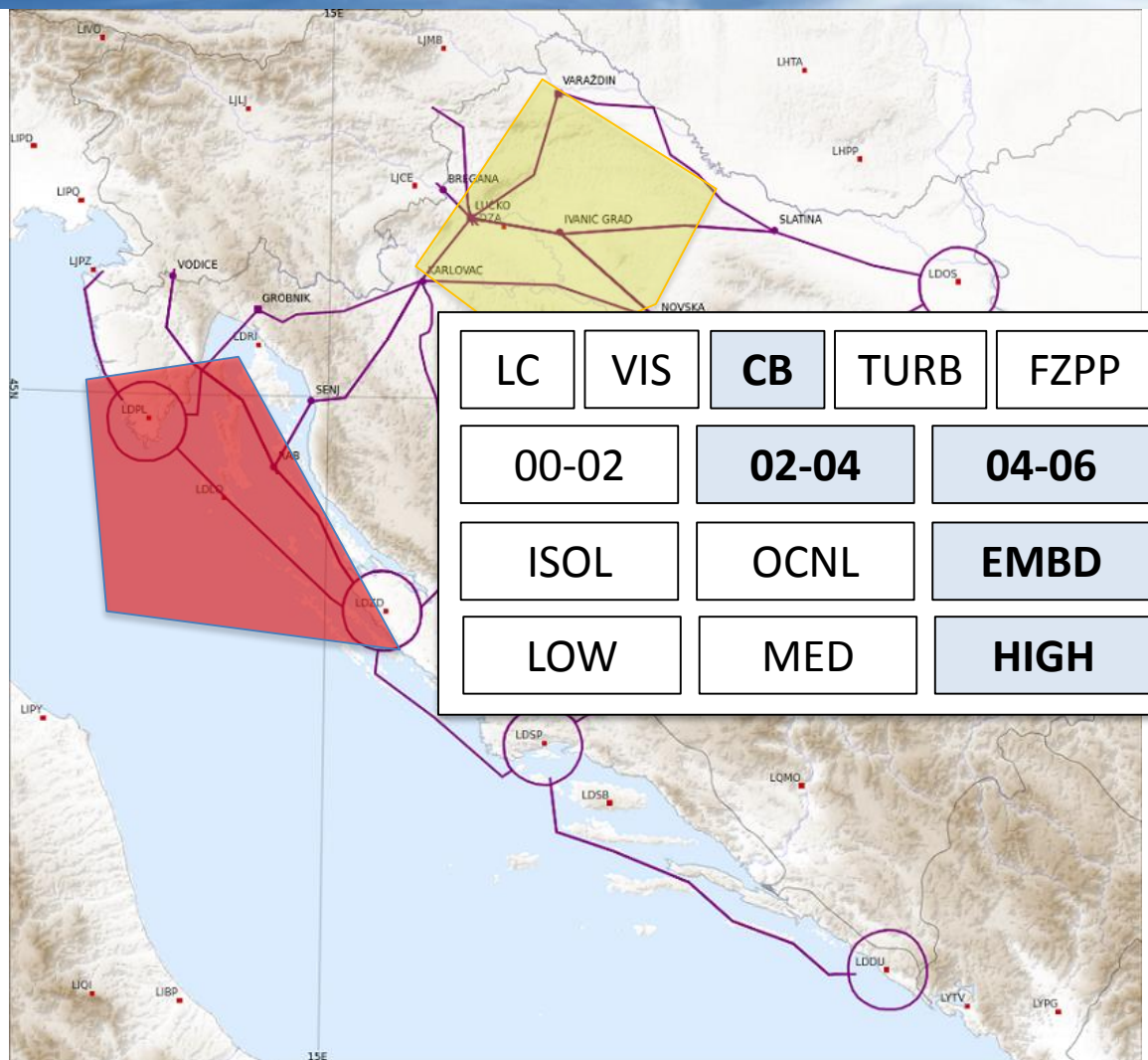
Polygons:

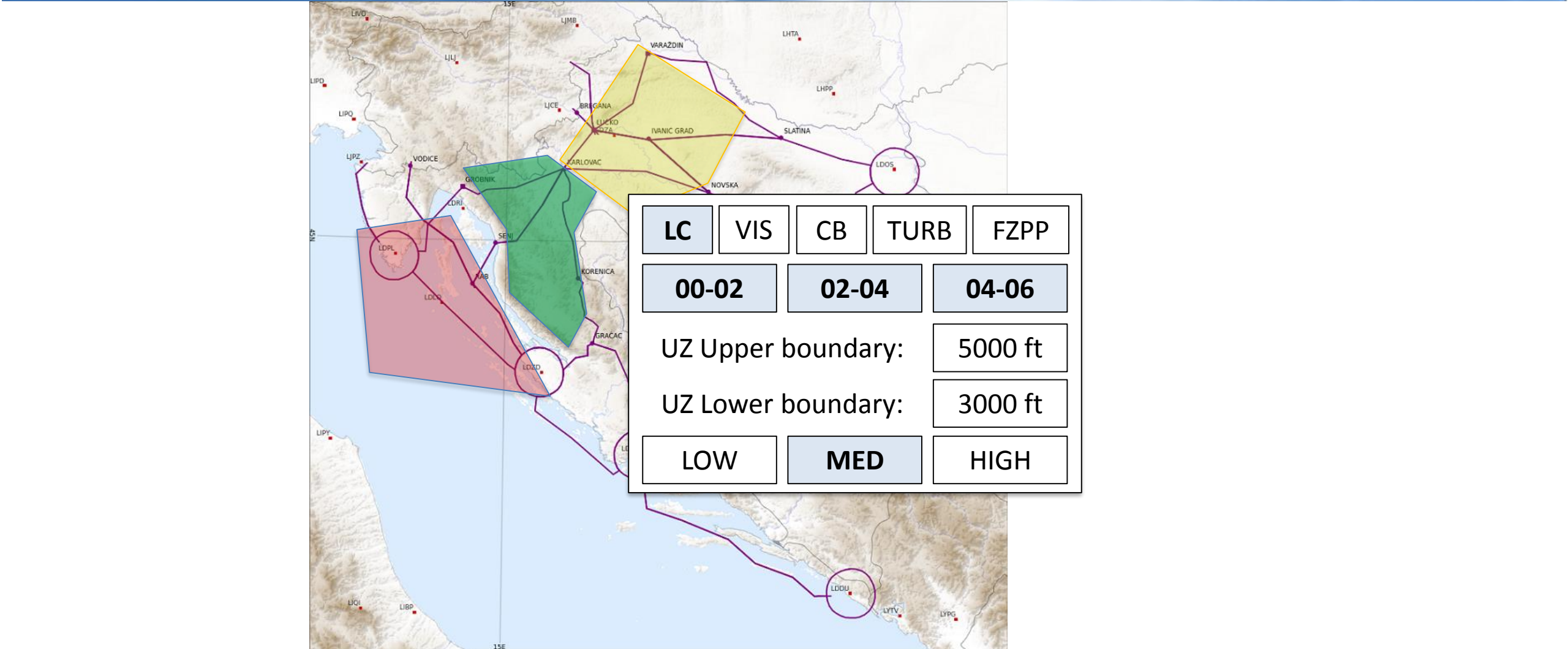


LC	VIS	CB	TURB	FZPP
00-02	02-04	04-06		
< 1,5 km	1,5-5km	5-8 km		
LOW	MED	HIGH		



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< 1,5 km	1,5-5km	5-8 km		
LOW	MED	HIGH		







Collaborative forecasting

One of the main advantages of the project is inclusion of local MET expertise in the product. At the same time, forecast needs to be:

- Simultaneous
- Harmonized
- Seamless on borders

In order to achieve that, collaborative forecasting procedures are being set, and during 2020 all partners will conduct trainings for forecasters on national level.

In the autumn 2020 a joint workshop for all forecasters will be held. During the joint workshop, beta testing of eGAFOR will be conducted in cooperation with selected GA pilots.

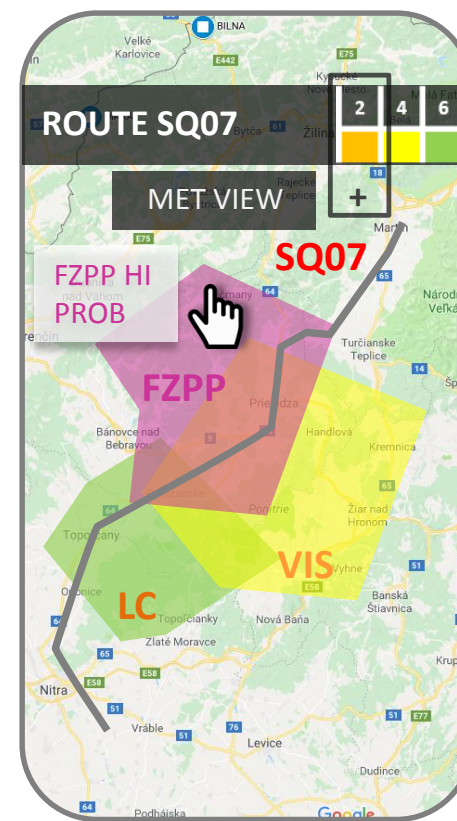
eGAFOR for end users

- eGAFOR product for end users will be web based product intended primarily for use on mobile devices.
- It will be updated regularly and if needed – the **latest information** will always be available.
- **Training for end users** shall be conducted prior to eGAFOR launch.

eGAFOR User Interface

Interactive and intuitive display with two views:

- Route view – routes coloured according impact
- MET view – weather polygons



Why stop here?

GAFOR with weather (2019-05-30 05:30, revision 0) - Message Editor <@ZAOAVWAIASV>

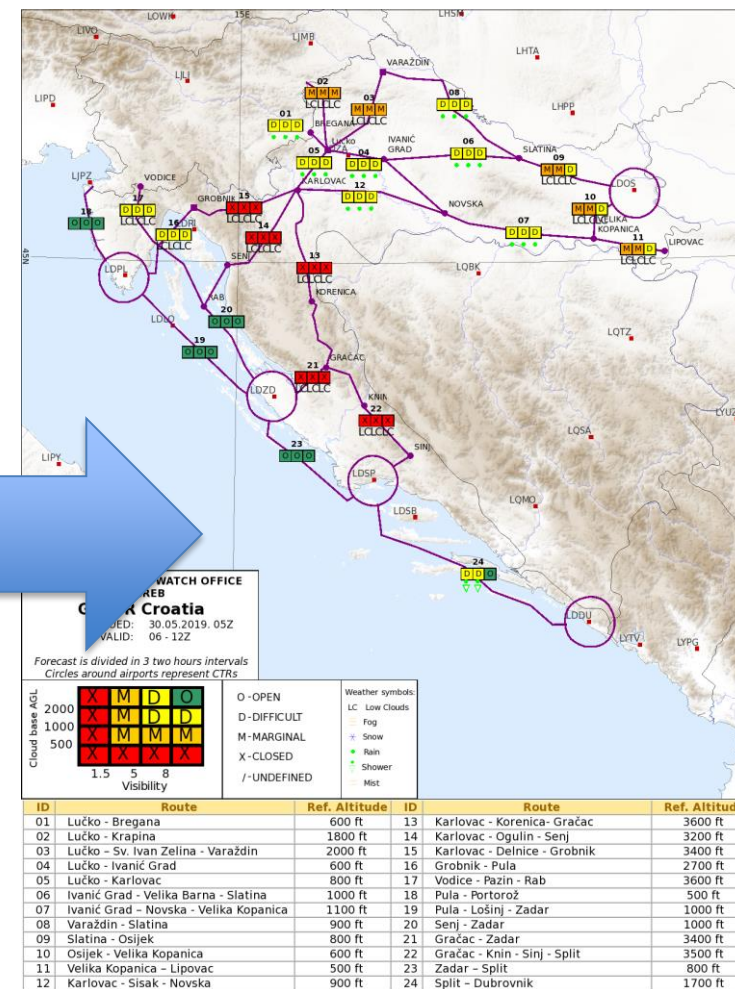
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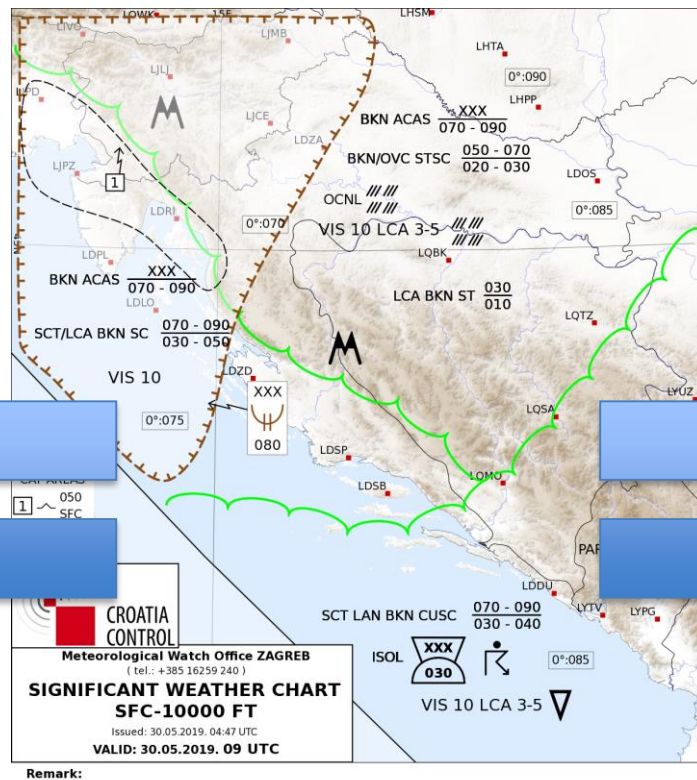
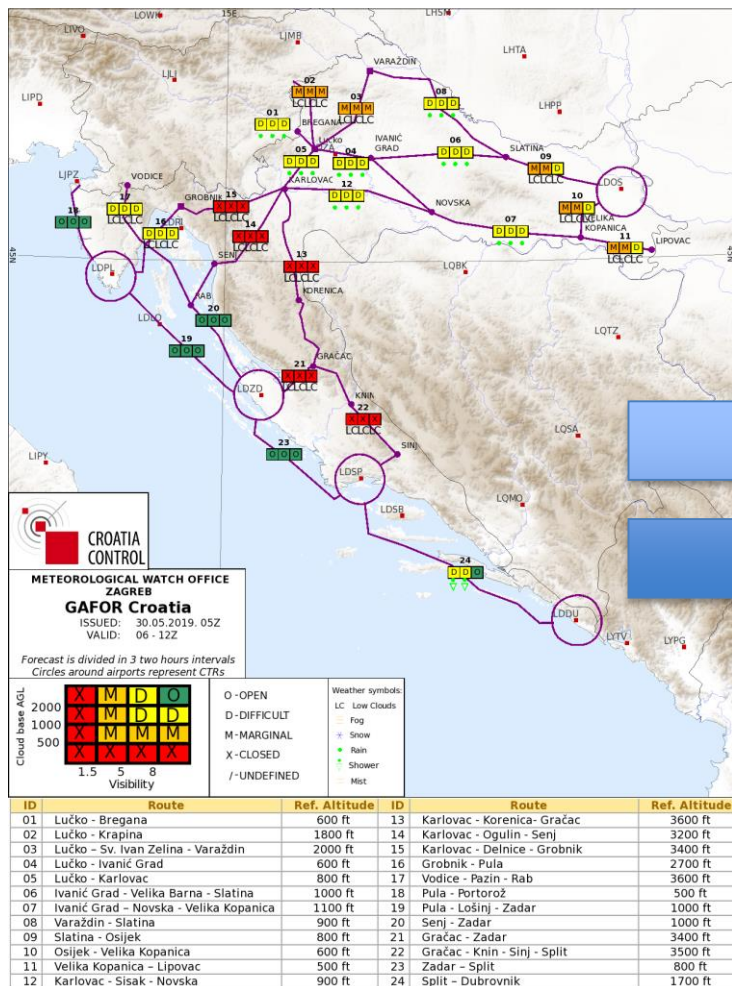
GAFOR.png 19 / 19

LDZA 30/05/2019 06:00 30/05/2019 12:00

Route ID	Reference Height	1.Cat.	1.Phen.	2.Cat.	2.Phen.	3.Cat.	3.Phen.	Route
1	600	D - Difficult	RA - Rain	D - Difficult	RA - Rain	D - Difficult	RA - Rain	Lučko - Bregana
2	1800	M - Marginal	LC - Low Clouds	M - Marginal	LC - Low Clouds	M - Marginal	LC - Low Clouds	Lučko - Krapina
3	2000	M - Marginal	LC - Low Clouds	M - Marginal	LC - Low Clouds	M - Marginal	LC - Low Clouds	Lučko - Sv. Iv...
4	600	D - Difficult	RA - Rain	D - Difficult	RA - Rain	D - Difficult	RA - Rain	Lučko - Ivanič...
5	800	D - Difficult	RA - Rain	D - Difficult	RA - Rain	D - Difficult	RA - Rain	Lučko - Karlov...
6	1000	D - Difficult	RA - Rain	D - Difficult	RA - Rain	D - Difficult	RA - Rain	Ivanič Grad - ...
7	1100	D - Difficult	RA - Rain	D - Difficult	RA - Rain	D - Difficult	RA - Rain	Ivanič Grad - ...
8	900	D - Difficult	RA - Rain	D - Difficult	RA - Rain	D - Difficult	RA - Rain	
9	800	M - Marginal	LC - Low Clouds	M - Marginal	LC - Low Clouds	D - Difficult	LC - Low Clo	
10	600	M - Marginal	LC - Low Clouds	M - Marginal	LC - Low Clouds	D - Difficult	LC - Low Clo	
11	500	M - Marginal	LC - Low Clouds	M - Marginal	LC - Low Clouds	D - Difficult	LC - Low Clo	
12	900	D - Difficult	RA - Rain	D - Difficult	RA - Rain	D - Difficult	RA - Rain	Karlovac - Sis...
13	3600	X - Closed	LC - Low Clouds	X - Closed	LC - Low Clouds	X - Closed	LC - Low Clouds	Karlovac - Kor...
14	3200	X - Closed	LC - Low Clouds	X - Closed	LC - Low Clouds	X - Closed	LC - Low Clouds	Karlovac - Ogu...
15	3400	X - Closed	LC - Low Clouds	X - Closed	LC - Low Clouds	X - Closed	LC - Low Clouds	Karlovac - Del...
16	2700	D - Difficult	LC - Low Clouds	D - Difficult	LC - Low Clouds	D - Difficult	LC - Low Clouds	Grobnik - Pula
17	3600	D - Difficult	LC - Low Clouds	D - Difficult	LC - Low Clouds	D - Difficult	LC - Low Clouds	Vodice - Pazin...
18	500	O - Open		O - Open		O - Open		Pula - Portorož
19	1000	O - Open		O - Open		O - Open		Pula - Lošinj ...
20	1000	O - Open		O - Open		O - Open		Senj - Zadar
21	3400	X - Closed	LC - Low Clouds	X - Closed	LC - Low Clouds	X - Closed	LC - Low Clouds	Gračac - Zadar
22	3500	X - Closed	LC - Low Clouds	X - Closed	LC - Low Clouds	X - Closed	LC - Low Clouds	Gračac - Knin ...
23	800	O - Open		O - Open		O - Open		Zadar - Split
24	1700	D - Difficult	SHRA - Showers...	D - Difficult	SHRA - Showers...	O - Open		Split - Dubrov...

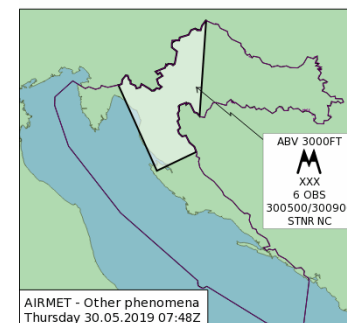
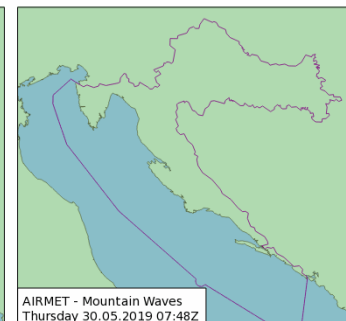
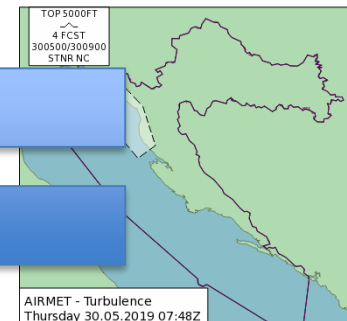
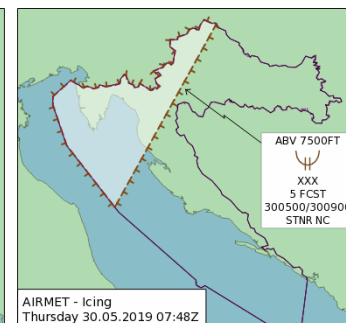
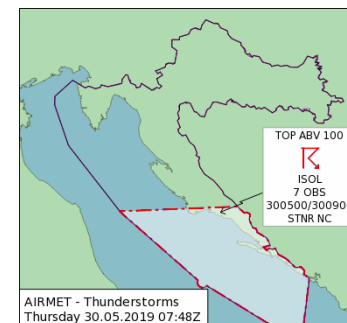
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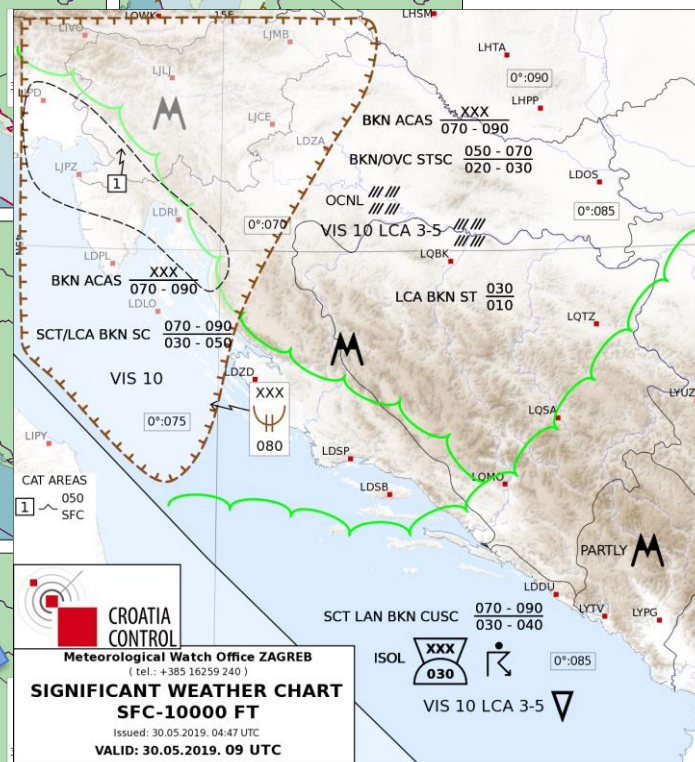
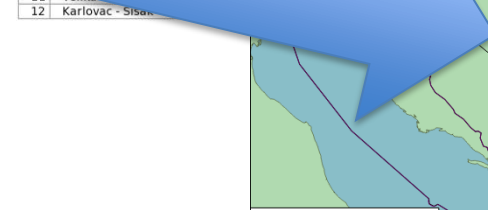
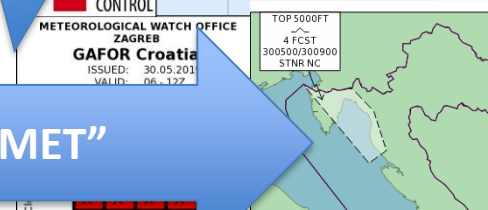
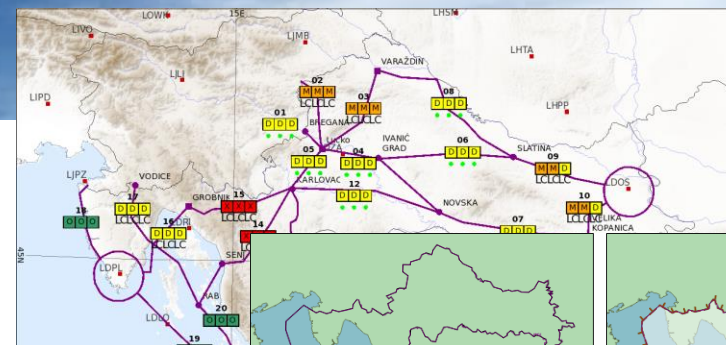
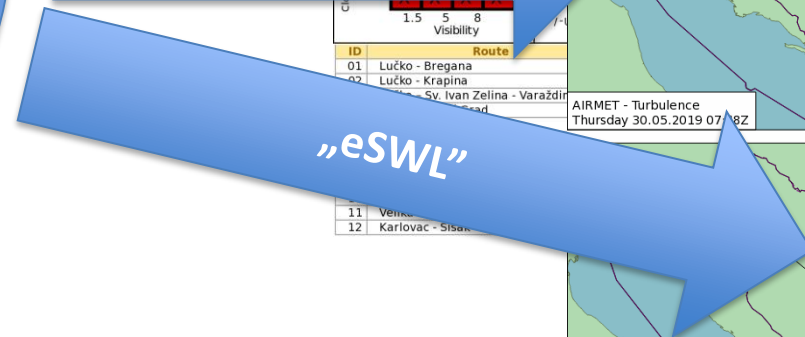
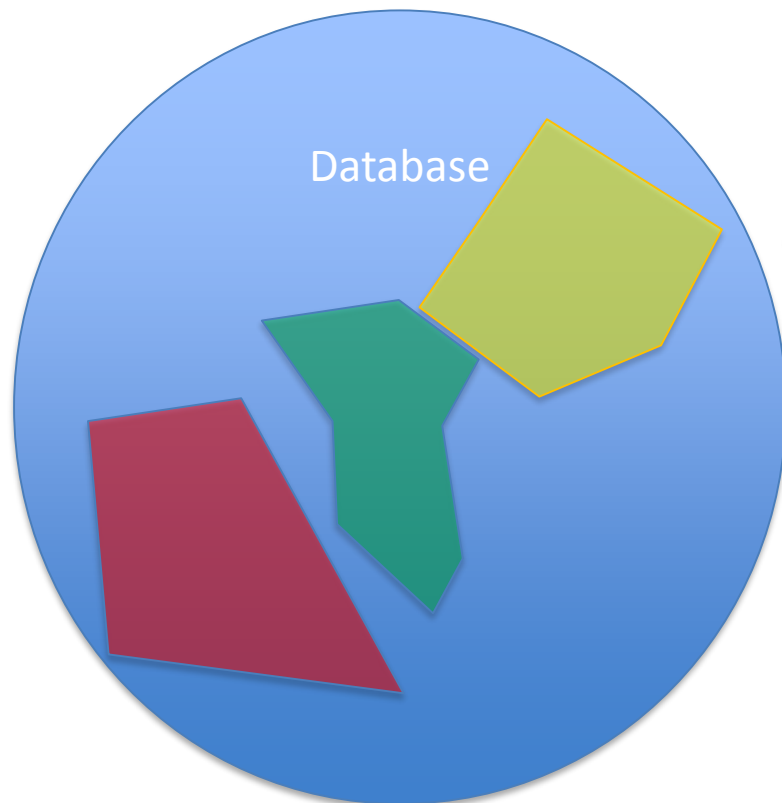
























	FREEZING PRECIPITATION		SNOW		WIDESPREAD STRONG SURFACE WIND		WIDESPREAD MIST		MODERATE TURBULENCE
	DRIZZLE		THUNDERSTORM		MODERATE AIRCRAFT ICING		WIDESPREAD FOG		SEVERE TURBULENCE
	RAIN		MOUNTAIN OBSCURATION		SEVERE AIRCRAFT ICING		WIDESPREAD HAZE		CUMULONIMBUS
	SHOWER		MOUNTAIN WAVES		WIDESPREAD BLOWING SNOW		WIDESPREAD SMOKE		TOWERING CUMULUS

CB implies thunderstorm, moderate or severe turbulence, icing and hail.
 Units used: speed in knots, visibility in kilometers, altitude in hectofeet above sea level.





Remark:

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Please find more information about the Project on www.egafor.eu

Thank you for your attention