



The Most Wanted Features

Michal Weis

16th Workshop on Meteorological Operational Systems

ECMWF Reading, United Kingdom, 1st–3rd March 2017



We develop different software products for daily operational needs of National Meteorological Services

Moving 
Weather

Discover 
Weather

Metadata 
Monitor

Talking 
Weather

Visual 
Weather

Online 
Weather

Open 
Weather

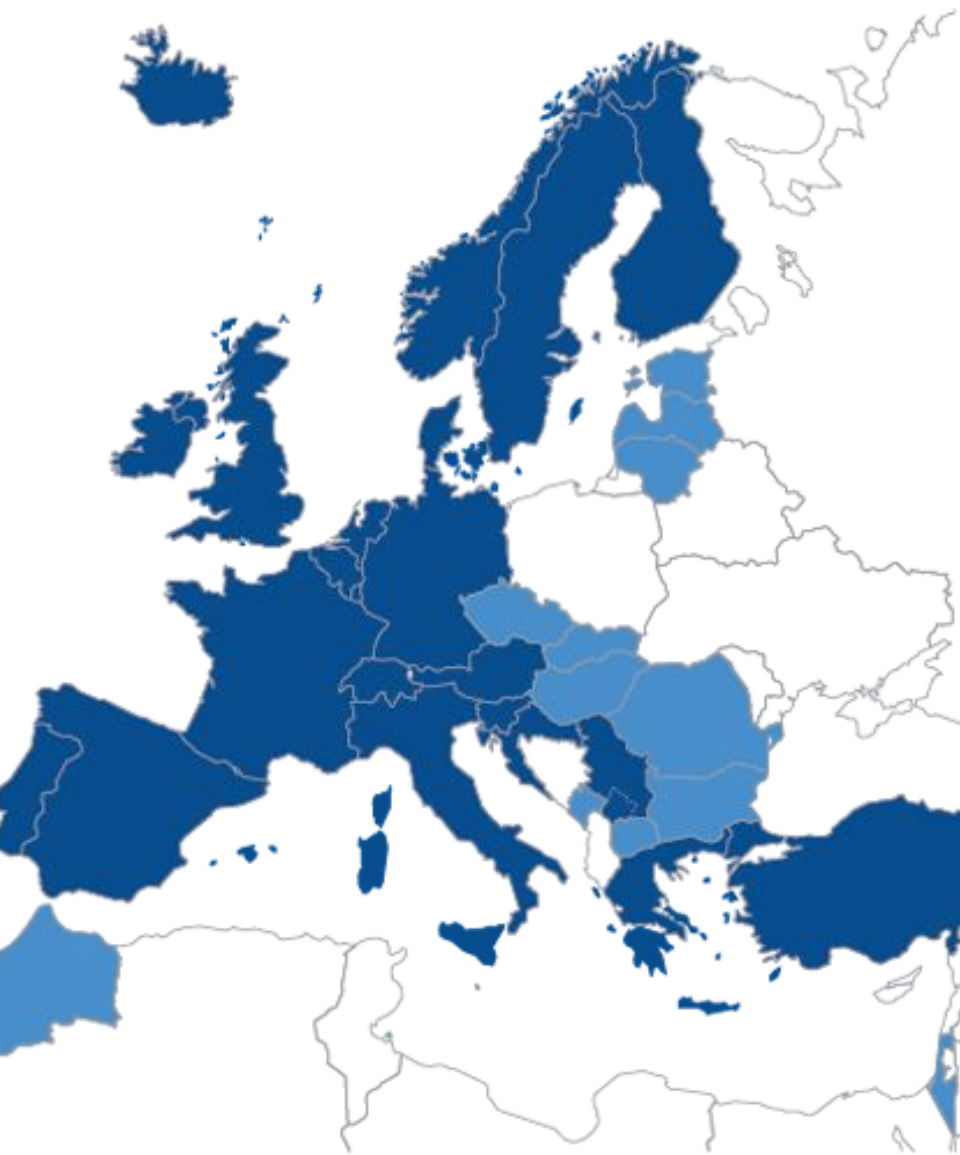
Aero 
Weather

Aero 
Weather

Climate 
Weather

Satellite 
Weather

Numeric 
Weather

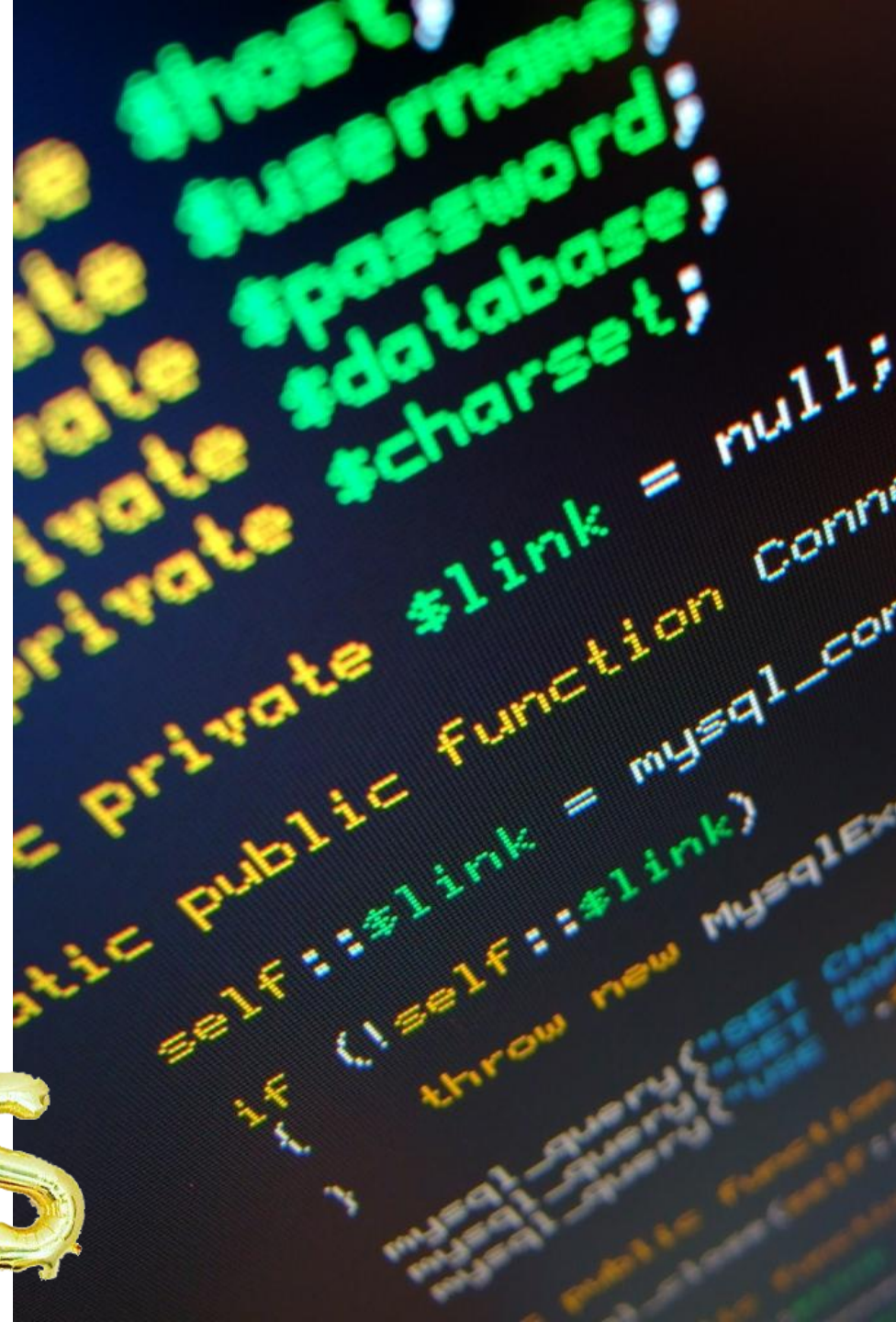


1/3rd

of ECMWF Member &
Co-operating states use
Visual Weather as
operational forecasting
platform

Visual Weather is being developed for many years, constantly updating its technology so it is very “fresh & modern”.

20
YEARS



Visual Weather
internally has modular
design, so only selected
modules are operated.
... And there is a lot of
different modules,
satisfying different
requirements.





To collect & manage requirements & ideas from user community, we annually conduct **User Group Meeting** to exchange know-how and to jointly collaborate on requirements.



Visual 
Weather

And the winners are...

Questions?



- Runway Change Briefing (and issue TREND forecast if appropriate)** [Reopen](#)
05:40Z Monitor surface and low-level winds and advise ATC Supervisor once a window of opportunity for a runway change opens. 
For further details, see [IBL Visual Weather](#).
[RECORD DETAILS IN THE LOG.](#)
- Press Forecast** [Create](#)
08:00Z Issue Press Forecast.
- Website ADMIN message** [Acknowledge](#)
08:17Z Update Website ADMIN message.
IMPORTANT : Use "Open" option in Message Editor to open previous message
- Shift Take Over** [Acknowledge](#)
09:00Z Examine all current data and developments since last duty. Read watch log, FAULT LOG, intranet updates, revised instructions, notices, etc. (Note that acknowledgement of this task is indicating that all log information and updates since the last shift have been read and understood)
Brief Observer on potential weather situation expected during shift.
Check shared e-mail folder at least once a cycle for operational
- Print Charts from Internet** [Acknowledge](#)
09:00Z

Hide successful; Groups: [AWD](#), [WRF](#), [WW3](#) a [WT](#)

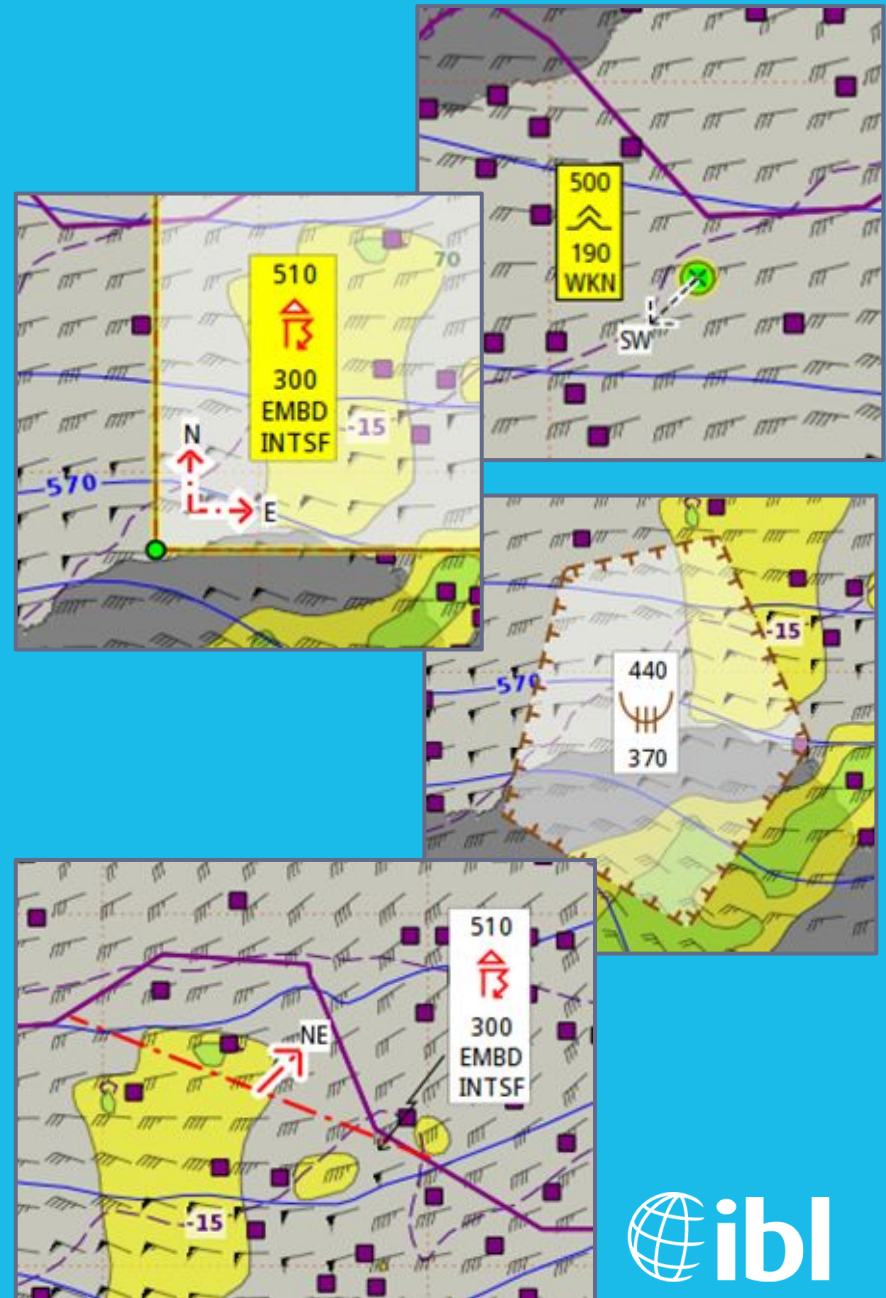
Received SPECI for EGVA (FAIRFORD) at 06.11.2015 16:23:
SPECI EGVA 061623Z AUTO 22012KT 9999 -RA OVC010 16/16 A2988 RMK AO RAB23

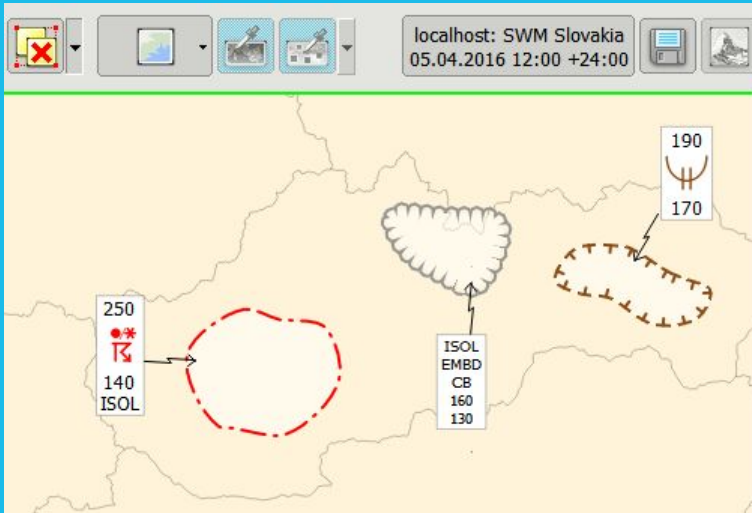
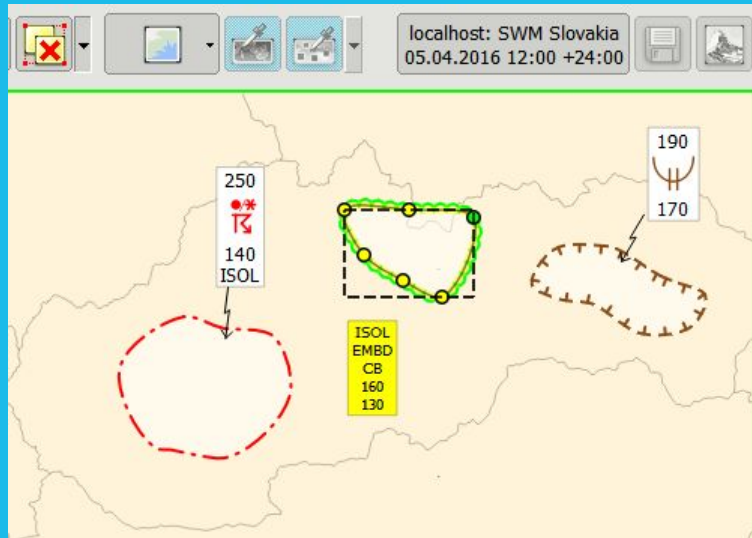
Main Panel Dashboard provides daily task list, weather monitoring and overview of situation, notifications



Graphical SIGMET

Editing - polygon based editing with graphical depiction and consistent automatic encoding

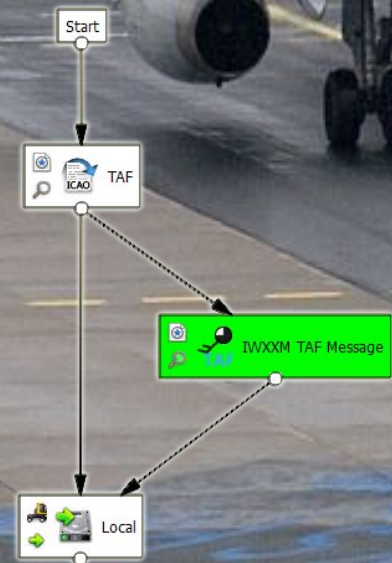




Collaborative Feature
Editing - to jointly
create consistent
forecast depiction
over larger region
by multiple
meteorologists

```
Taxi to runway <?xml
version="1.0"?><runway>02
</runway>
```

Native IWXXM 2.0 integration and ICAO Annex 3 Amendment 77 support



TAF body
 Station: LZIB
 Validity: 0813/0913 Wind: 12050 Visibility: 5000 Weather: TSGR Clouds:
 BECMG Validity: 0815/0818 Wind: 1501 Visibility: 3500
 BECMG Validity: Warnings:

Guidance
 Latest METAR:
 METAR LZIB 081100Z 32006KT 280V030 9999 NOSIG
 NWP model: KWBC Model run: 2010-02-08T06:00:
 Time 12:00 15:00
 Wind
 Temp/RH

WEATHER BU
 Issued: 12:00 GMT, 19/09/2008
 Sent: 13:03 GMT, 19/09/2008
 Valid: 12:30 GMT, 19/09/2008 - 12:

Forecast text: Overallly nice and hot during the next few days. WIND: 5-10KT northwesterly.

WEATHER IN UAE

Station	Temp. °C		Humidity %	
	Min.	Max.	Min.	Max.
AL-DHAFRA	26	37	50	80
DELMA	28	35	40	90
SIR ABU NAIR	26	33	50	80
AL-HAMBRA	27	30	60	90
AL-MINHAD	26	39	50	80
AL-BATEEN	26	36	50	80
ABU DHABI	27	37	60	90
DUBAI	26	35	50	100
SHARJAH	24	37	30	80
R. A. KHAIMAH	26	33	50	70
FUJAIRAH	27	34	60	90
AL-AIN	26	37	50	80

OUTLOOK FOR NEXT 4 DAYS

Region	Saturday		Sunday		Monday		Tuesday	
	Temp. °C	Weather	Temp. °C	Weather	Temp. °C	Weather	Temp. °C	Weather
EAST	22-41	NICE	19-38	NICE	21-38	NICE	21-39	-RA
WEST	20-39	FG	21-40	HZ	25-36	-SHRA	25-40	SHRA
MID	18-36	NICE	18-38	RA	22-37	+HZ	21-39	HZ
NORTH	20-41	RA	17-38	SHRA	24-36	SHRA	23-37	NICE
SOUTH	21-35	-RA	19-38	+RA	21-35	NICE	24-40	NICE

Station	Sunrise		Sunset		Moon set		Twilight	
	Saturday	Friday	Saturday	Friday	Saturday	Saturday	Friday	Friday
ABU DHABI	06:02 LT	18:35 LT	01:34 LT	05:09 LT	05:09 LT	20:32 LT		
DUBAI	06:03 LT	18:36 LT						
R. A. KHAIMAH	06:01 LT	18:34 LT						
AL-AIN	06:07 LT	18:39 LT						

CAST TAKE-OFF CONDITIONS

TEMP (deg C)	QNH (hPa)	COMMENTS
42	999	ACTUAL DATA
41	999	TAKE OFF DATA
41	998	TAKE OFF DATA
40	999	TAKE OFF DATA
38	999	PROVISIONAL DATA FOR FLIGHT PLANNING INFORMATION ONLY
36	999	PROVISIONAL DATA FOR FLIGHT PLANNING INFORMATION ONLY
35	1000	PROVISIONAL DATA FOR FLIGHT PLANNING INFORMATION ONLY
34	1000	PROVISIONAL DATA FOR FLIGHT PLANNING INFORMATION ONLY
33	1000	PROVISIONAL DATA FOR FLIGHT PLANNING INFORMATION ONLY

Map of Bahrain with temperature and wind indicators. Includes text: "به عام يتحول إلى عالم جزئياً" and "بينة من 8 إلى 13 عقده، تتحول ت شرقية غدا وتصل من 13 إلى جزئياً".

Weather icons and temperature ranges for different times of day: الأربعماء (23° 16°), المساء (22° 16°), الإثنين (25° 17°).

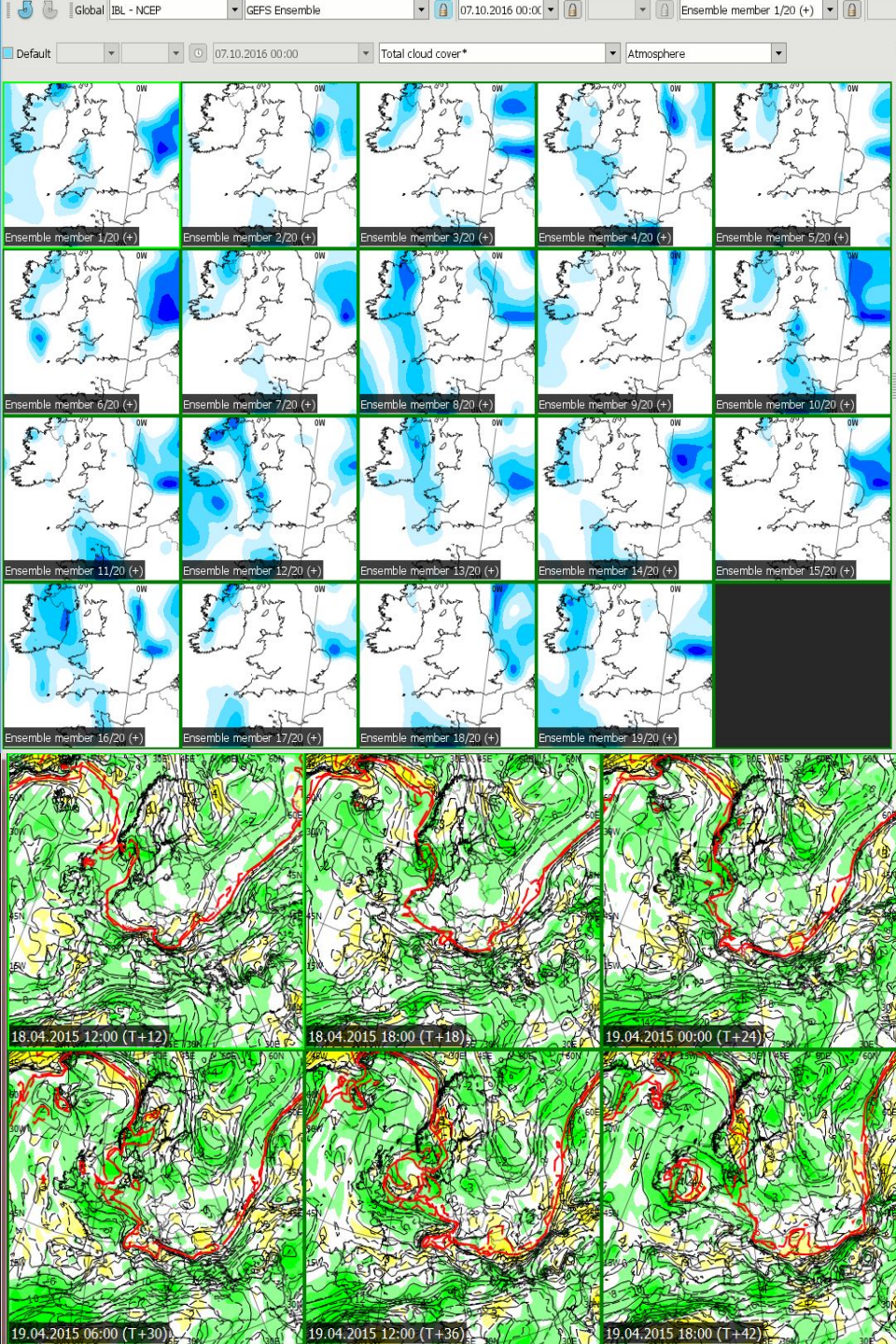
5Day Forecast - Wind speed in km/h
 Map of Bahrain showing wind speed and direction. Includes a grid of weather icons for each hour.

TEHRAN 19 35 FG

Meteorological Services

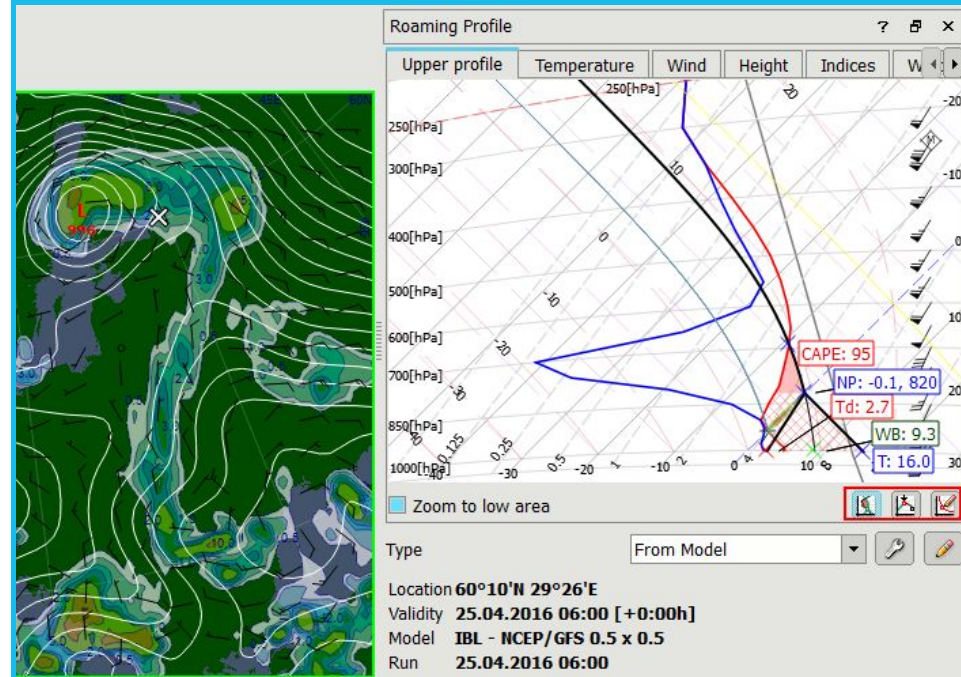
Forecast production platform - authoring of forecast and generating multiple outputs





“Multi view” -
 interactive display of
 multiple synchronized
 windows differing by
 time, elevation,
 model, ensemble or
 parameter

Roaming profile - tool
to explore the
atmosphere profile,
its stability and other
characteristics





13:50:58

Training Server -
simulation of real-life
cases for training
purposes,
competence
assessment tool

Internal math kernel,
functional data
processing by user
equations

Layer Options

Template: Default

Colour model: Colour

Source: Tracing Render, Advanced Tracing, Extremes Render, Labels Render

Global Run Filter: $((GRB \text{ Relative humidity pt above} > 96 [\%]) \text{ and } ((wind \text{ in } 850 < 30 [kt]) \text{ and } (GRB \text{ Relative humidity pt above in } 3300 > 94 [\%])) \text{ and } ((wind \text{ in aof} < 7 [kt]) \text{ and } (dewpoint \text{ temperature} < 6 [^{\circ}C]))$

Global Level Filter:

Logged Messages:

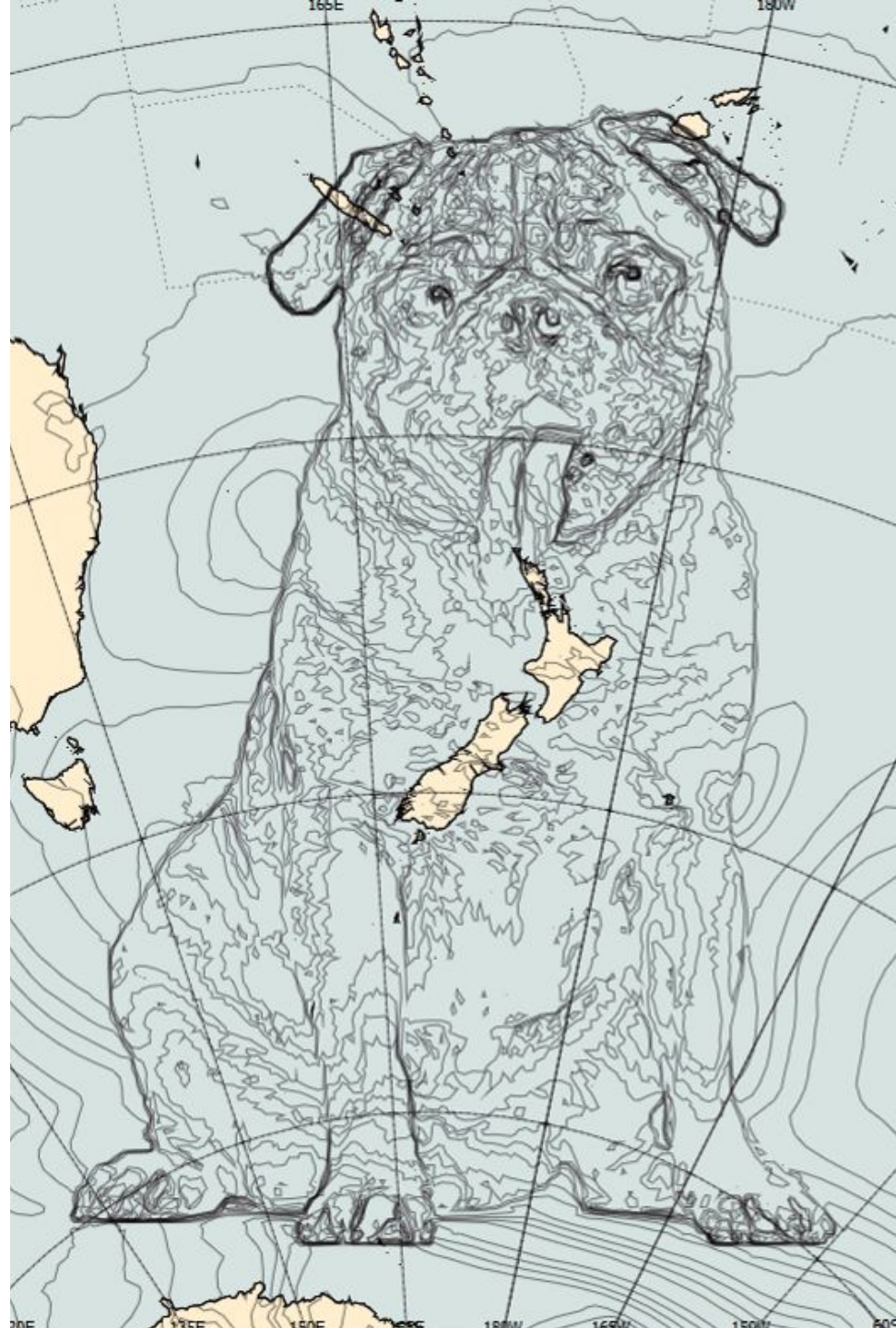
Equation Editor

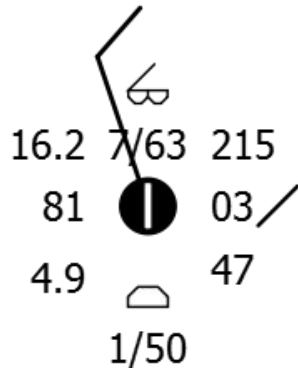
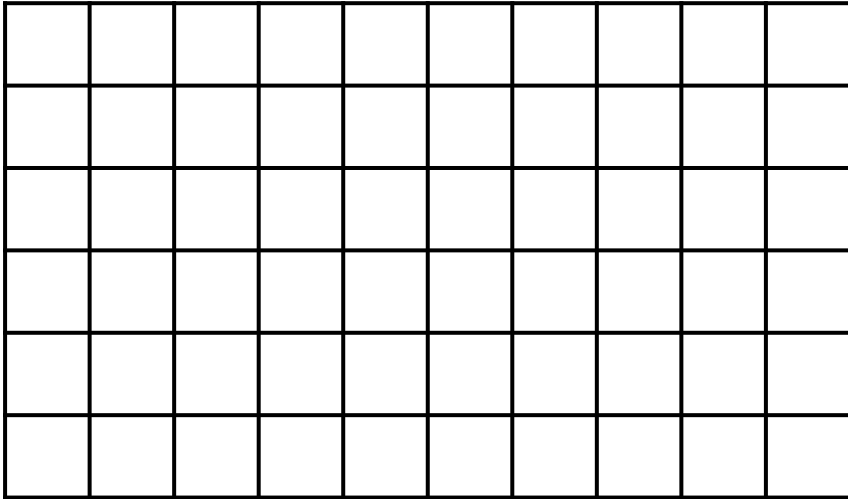
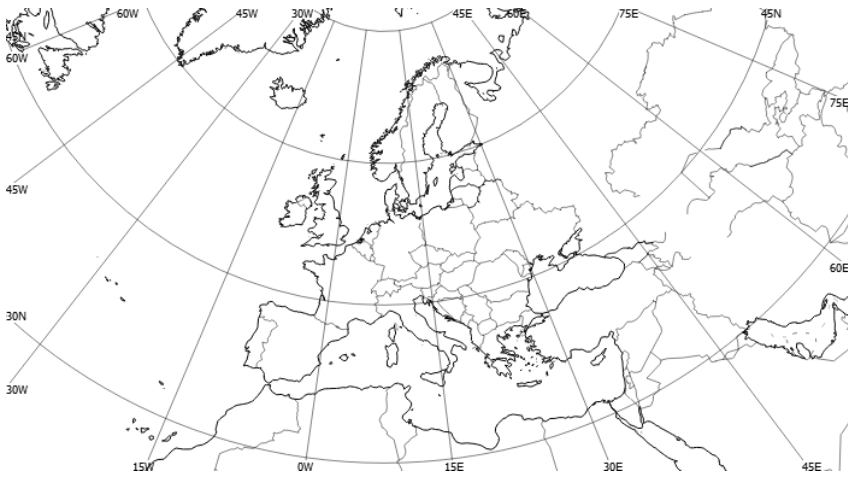
Equation: $(GRB \text{ Temperature} [] - dewpoint \text{ temperature} []) > GRB \text{ Relative humidity pt above} [\%] < 8.4 []$

Equation Editor

Equation:
$$\frac{\left(1 [] - 0.19025 [] \cdot \ln \left(\frac{\text{Default: Models/ALARO *26.09.2016 06:00 Surface Pressure ground* / +0h} []}{101323.15 []} \right) \right) \cdot \left(\text{Default: Models/ALARO *26.09.2016 06:00 Geopotential height* ground* / +0h} [gpm] \right) + 0.03416 []}{100 [] \cdot \left(288.2 [] + 0.00325 [] \cdot \text{Default: Models/ALARO *26.09.2016 06:00 Geopotential height* ground* / +0h} [gpm] [] \right)}$$

Expandability of
Python API - custom
functions, algorithms,
integrations,
processing





OpenGIS Web Services
 Web Map Service 1.3.0
 (Time & Elevation BP)

Web Coverage Service
 2.1 (MetOcean
 Application Profile)

Web Feature Service
 +Transactional



```

Kernel as Kernel
L.DB.Parameters as Parameters
tetime

ieveValueAtStationWithInterpolation():
ion = Geo.StationId.fromICAO('LZIB')
t = station.getPosition()
queries = [ Kernel.QueryItem.mkPointQuery(point) ]
cessor = Kernel.GridProcessor(units = Kernel.u.T_CELS,
viMode = Kernel.gdvim.INTERPOLATE,
viSource = Kernel.gdvis.ISOBARIC,
tiMode = Kernel.gptim.INTERPOLATE_AFTER_QUERY)
recast = 4 * 3600
level = Geo.GridLevel.fromString('382m')
result = processor.decodeAndInterpolate(g_model, g_run, g_paramet
level, g_dataset, l_queries)
print 'Value at %s (%s), level: %s, forecast: %dh' % (station, po
forecast / 3600)
print result[0].value, result[0].unit

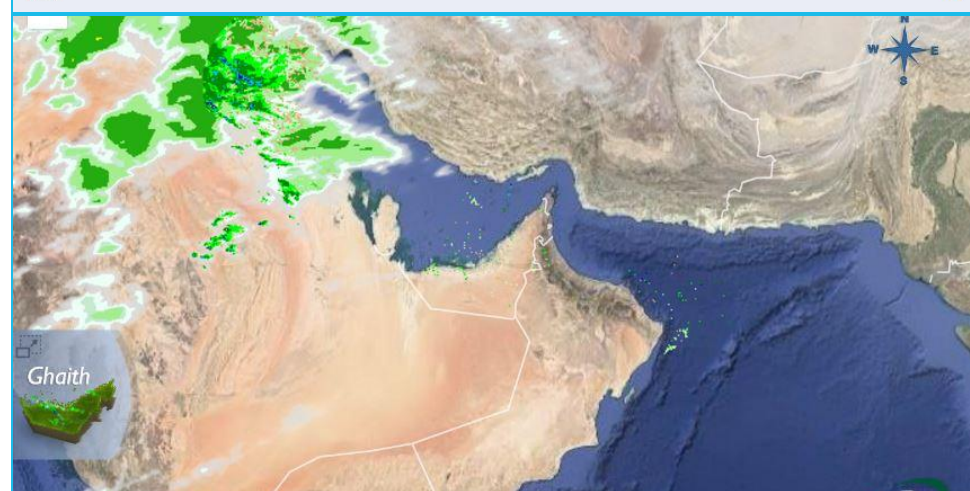
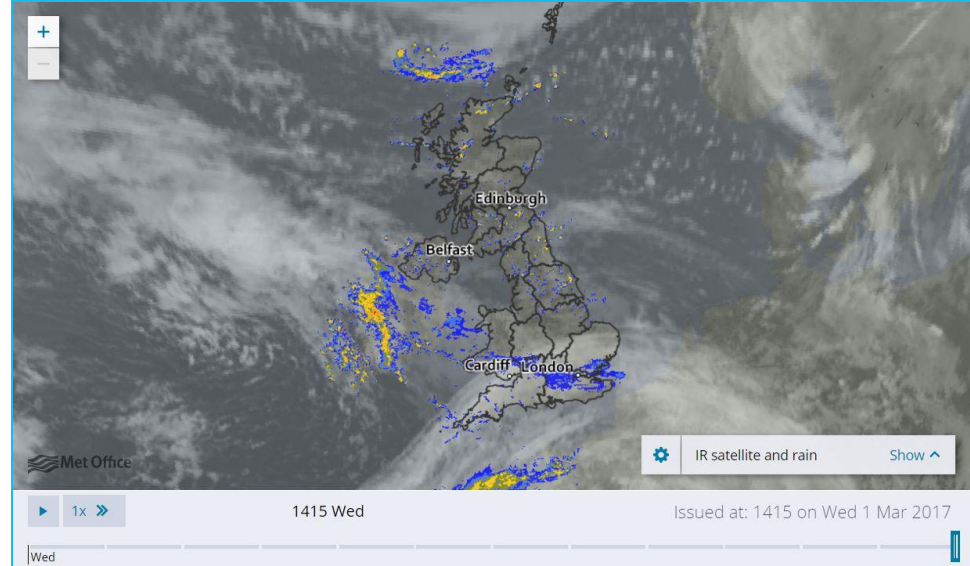
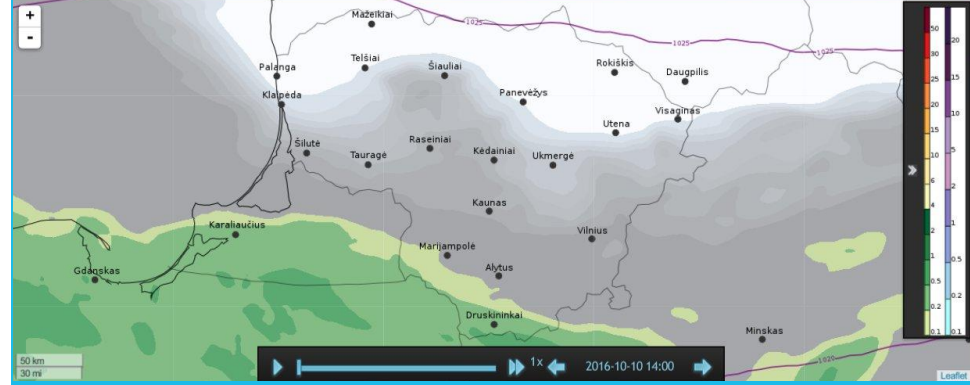
calculateStatisticsOverArea():
polygon = Kernel.Area()
polygon.append(Kernel.mkStation(Geo.StationId.fromICAO('LZIB')))
polygon.append(Kernel.mkStation(Geo.StationId.fromICAO('LKPR')))
polygon.append(Kernel.mkStation(Geo.StationId.fromICAO('LJLJ')))
# first parameter is the polygon, second list of percentiles requ
# and 3rd count of histogram bins
l_queries = [ Kernel.QueryItem.mkStatsQuery(polygon, [5, 10, 50, 9
processor = Kernel.GridProcessor()
result = processor.decodeAndInterpolate(g_model, g_run, g_paramete
g_level, g_dataset, l_queries)
statistics over area', polygon.getLaLoPoints()
result[0].count
result[0].minimum
result[0].maximum

```

OpenGIS Web Processing Service - custom server-side value-added computations



Interactive map
widgets for web pages
& mobile, alongside
with underlying
dynamic Tiles (WMS)





Questions?

Michal.Weis@iblsoft.com • www.iblsoft.com

