



OpenGIS Web Services

Beyond web
application

www.iblsoft.com

 **ibl** weather
software
solutions

OVERVIEW

OGC Web Services

The web service modules open the visualisation and data processing capabilities of Visual Weather to all Service-Oriented Architecture (SOA) frameworks. Web services build a bridge between Visual Weather and 3rd party systems in the following key areas:

- Interfacing with other Geographical Information Systems (GIS) based on Open Geospatial Consortium (OGC) standard web service protocols
- Exposing custom data decoding, computing, post-processing functionality and visualisation to bespoke applications using Python API with XML, GeoJSON or any arbitrary output format



OPENGIS CONSORTIUM COMPLIANCE

Web Service module implements the following OGC compliant services:

- OGC Web Map Service (WMS) exposes any visualization (observations, NWP data, radar or satellite imagery, lightning, etc. Visual Weather WMS implementation is compliant with OGC Best Practice for using Web Map Services (WMS) with Time-Dependent or Elevation-Dependent Data (1.0)
- OGC Web Coverage Service (WCS) exposes satellite or radar imagery or NWP data in form of mathematical gridded "coverage" in GRIB1, GRIB2, NetCDF, CoverageJSON, KML or GeoTIFF format
- OGC Web Feature Service (WFS) exposes aviation SIGWX features (clouds, jet streams, icing areas), aviation observations, forecasts, warnings (METAR, TAF, SIGMET) and in-situ data such as observations

(weather stations, lightning etc.) in GML or GeoJSON. Clients can apply OGC filter (SQL query) to filter observations based on desired criteria

- OGC Environment Data Retrieval (EDR) service is a next generation OGC data sub-setting service which supersedes the WCS and WFS functionality



BENEFITS

Access from Anywhere

Online Weather operates over common Internet or Virtual Private Network (VPN) between Web Server and your PC, tablet or phone. This allows to provide mobile forecasting service in critical situations, sport events or other weather-sensitive occasions.

Business Continuity

In case of disasters influencing ICT operations, forecasters can use Online Weather from home or even switch to different Web Service provider in case your central office fails. Ask IBL for more information about Disaster Recovery Planning.

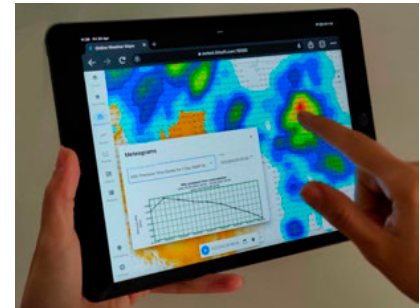
Reducing Total Cost of Ownership

Computing is performed in your data centre while user applications run in a Web Browser and do not require any installation. This reduces the costs needed to maintain the hardware and software infrastructure.

Effective Network Bandwidth Use

Big volumes of meteorological data available in your central office (en-

semble and high-resolution models, satellites) cannot be pushed to your regional offices with limited bandwidth. Online Weather users retrieve only the products they need with all the processing done on your servers.



SCALABILITY & PERFORMANCE

An important aspect of building a Service Oriented Architecture or web application is ensuring that all services scale well with client demands. IBL has a proven expertise in delivering well performing and scalable web service solutions based on:

- Source level data caching – Visual Weather uses computer memory to cache all decoded products
- Tile caching – all data is converted into image tiles which can be effectively cached and exposed using OGC Web Map Tiled Service (WMTS)
- Web service load balancing – multiple instances of Visual Weather behave like one logical cluster

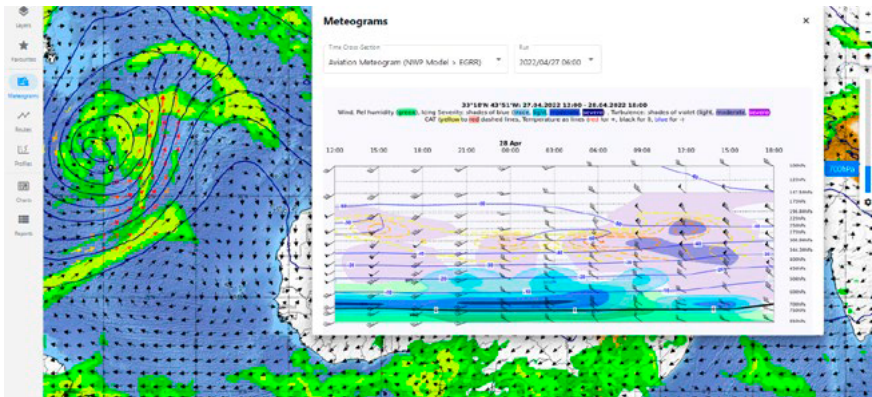
OW MAPS



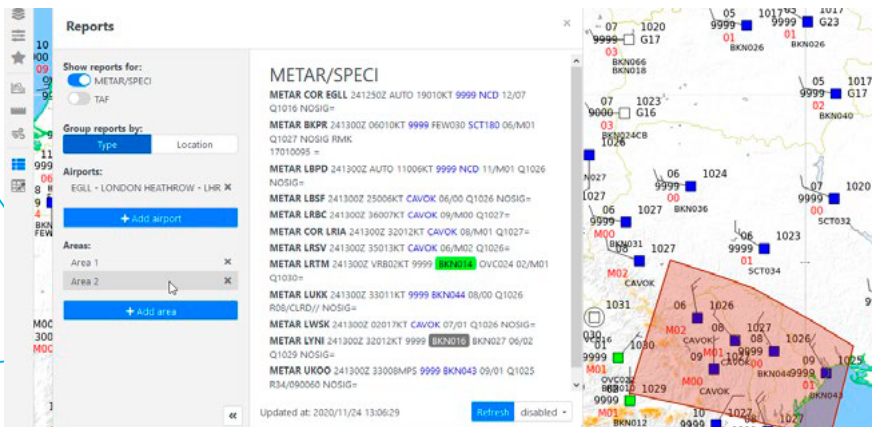
DATA VISUALISATION

Weather data and map visualization with layers, zooming and panning. Available layers include geospatial backgrounds, observations, NWP data, satellite and radar layers, lightning etc.

- Option to adjust the layer validity, height, model or styling
- Animation of displayed data with adjustable validity range and speed
- Readouts of detailed point information at the mouse position
- Interactive cross-sections and meteograms composed of both observations and NWP data for any trajectory or location



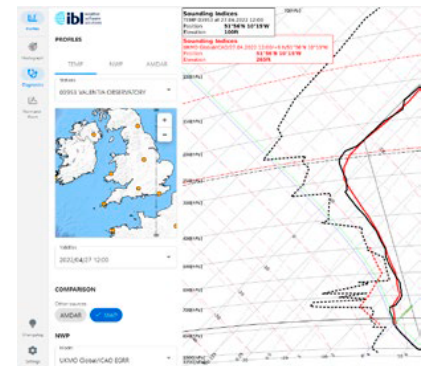
- Split-screen multi-views with different times, models or levels
- Overview of observations from selected area as text or table



PROFILES

Upper air profile from the selected data source, location and validity can be displayed. It is possible to choose which elements of the profile are shown.

- Comparison of data from multiple data sources (TEMP, NWP model, AMDAR), different locations or different validity times



- Hodograph version of data
- Tabular display of data extracted or computed from upper-air data, including stability indices

Diagnostics

Indices
Forecasted Thermodiagram IBL - NCEP/GFS 0.5 x 0.5/05.10.2020 00:00/+0 h/47°27'N 17°14'E

THERMODYNAMIC INDICES

Index	Value	Moderate	Severe
Showalter	7.1	4.0	-4.0
Lifted	7.4	-3.0	-5.0
Modified Lifted	2.6	-3.0	-5.0
Surface Lifted	9.8	-3.0	-5.0
K Index	15.4	20.0	
Thomson	8.0	30.0	35.0
Jefferson	21.8	27.0	28.0
KO Index	4.1	6.0	2.0
S Index	30.5	40.0	46.0
Total Totals	40.6	45.0	55.0
SWEAT	110	300	400
BOYDEN	96.0	94.0	95.0
CAPE (J/kg)	0	1001	2001

PROTECTING YOUR ASSETS



OVERVIEW

Protect your assets and ensure safe operation by evaluating the impact of weather on a range of military, aviation and marine vehicles and other assets performing specific tasks. An instant view of the Impact Matrix (RAG) forecasts helps operators to easily determine ahead of time if tasks can be carried out safely.

- Minimal initial download and fast response times ensures that the tool can be deployed instantly
- An intuitive and user-friendly interface ensures that the tool can be used by forecasters without special training or expert
- Knowledge Assets, tasks and thresholds can be saved so that any user can immediately assess the risk



THRESHOLD

- The impacts are evaluated based on the selected model data, which can include atmospheric, oceanographic parameters from either deterministic or ensemble models



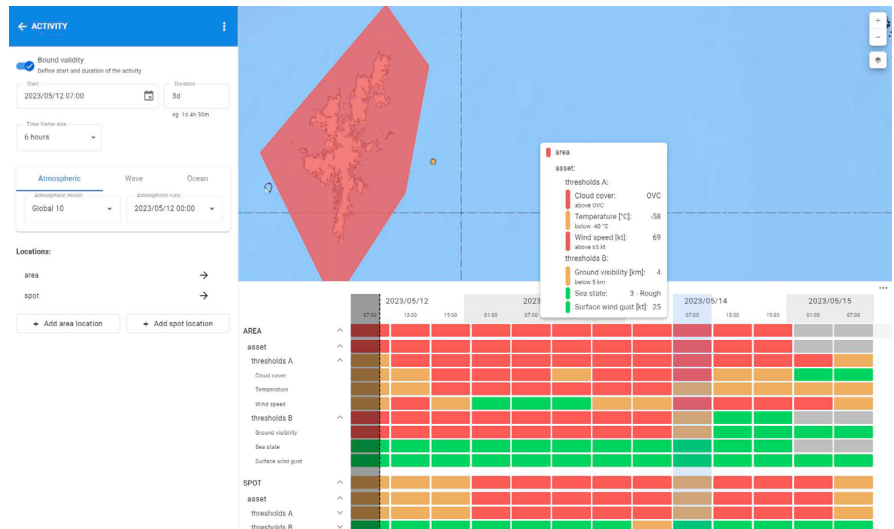
IMPACT MATRIX

- An user-friendly display in which the RAG impact matrix clearly displays the chance of a weather or oceanographic parameter having a safety impact on the task being planned
- In case of multiple weather parameters, the locations or areas are highlighted by the colour coding representing the worst-case scenario



LOCATIONS

- Select any location by clicking a spot on a zoomed world map or entering the ICAO identifier, name or coordinates
- Define an area by drawing or by specifying coordinates
- Specify RAG thresholds for the selected asset type (aircraft, ship, vehicle etc): the location or area will be evaluated for each asset in the location or area

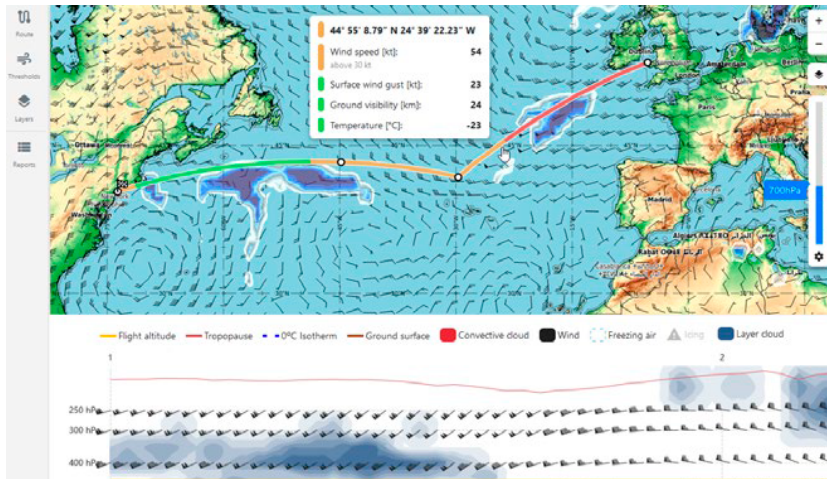


TAILORED APPLICATIONS



OW ROUTES

- Display of flight or marine cross-section for the interactively specified route. It is possible to interactively select the specific parameters that will be displayed in the cross-section
- Map display where routes are specified supports the display of weather data (observations, NWP model data, SIGMETs, etc)
- Tooltip display, zooming and panning are supported in both map display and in cross-section
- Thresholds for visual warnings allow users to see if various weather parameters might be exceeding operational limits. The route segments where the condition exceeds the moderate or severe threshold are indicated in amber or red



WEB COMPONENTS FOR PUBLIC

If you want to build your public weather web site or local Intranet portal or perform forecasting over the Web, Online Weather is the right product for you, containing:

- Web Portal with Content Management System where you can publish all your weather products created in Visual Weather and author your custom text content or layout
- Interactive forecasting tools implemented as web applications to shift forecasting from traditional workstation to lightweight web browser

We provide HTML5 + JavaScript components that you can build into your own public website to display of the weather forecast and warnings on an interactive map background (provided by Open Street Map).



TECHNOLOGIES

- HTML 5
- JavaScript (TypeScript, Angular)
- Leaflet JS for Open Street Map background with zooming & panning
- WebSockets protocol for real-time collaborative editing
- IBL Visual Weather with web services, pipelines, maps, Message Editor and Alert Editor and Python API:

- provides NWP guidance (using a Python web service on top of Grid Processor)
- production capabilities leveraging Message Editor and Pipeline Editor (in automatic mode)
- Storage of drawing session events in Visual Weather's notification queue

Interoperability

Online Weather is powered by OGC Web Services, and therefore, it can be connected to any standard OGC service provider. Major centers such as ECMWF are already exposing their products using OGC services, allowing Online Weather to visualize their products online. The highest synergy is achieved when Online Weather connects to Visual Weather OGC Web Services, bringing Visual Weather's visualization and data analysis powers into your Web Browser.



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IBL Software Engineering builds its reputation on 45 years of tradition in the field of Meteorological IT development. Dating from its first Automated Meteorological Message Switching Systems, the branch in Frankfurt, Germany, was established in 1988, while the branch in Bratislava, Slovakia was opened in 1997. IBL Software Engineering is employing IT specialists working exclusively in the Meteorological IT Environment with a high level of professional expertise.

IBL Software Engineering is ISO 9001:2015, ISO 27001:2013, and ISO 14001:2015 certified in the scope of development, supplying, installation, and maintenance of software for meteorological information systems. As a representative of Hydro-Meteorological Equipment Industry it is recognized by WMO and IBL's experts are participating in the number of WMO Expert Teams. IBL pays close attention to the advancements in BUFR, IWXXM, Amendment 81, GRIB3, etc. and its products fully comply to the following standards:

- WMO Manuals on Codes 306, on Global Telecommunication System 386, on Global Data Processing System 485
- ICAO Annex 3 up to Amendment 81 and ICAO Regional SIGMET Guides as of 2023
- SADIS workstation requirements 1.1 April 2021

PRODUCT PORTFOLIO

If the integration of all meteorological data processing systems is the key factor for the effective operation of your business, then with the IBL product portfolio your integration efforts are minimized, because IBL systems are designed to closely cooperate to provide the desired synergy.

