

nsFORECAST

making sense of your weather data

The NetSys Forecasting Tool Suite

Introduction

nsFORECAST is the **NetSys** Forecasting Tool Set seeking to address the need of forecasters to visualize and interact with meteorological data and ultimately to assist in bringing forecasts of various kinds to fruition. It covers a broad spectrum of data types and functionality commonly required by forecasting departments in their day-to-day activities.

Industry Standards

Because our customers require us to remain abreast of important developments within the industry, we ensure that the system is fully compliant to the **WMO** Manuals on the GTS 386 and Codes 306 as well as **ICAO** Annex 3 and remains up to date as Amendments are made (currently supports up to Amendment 74).



COTS Hardware

For the server and workstation platforms, NetSys elects to use Commercially Off The Shelf (COTS) hardware only, with a preference for Dell and HP equipment with hot swappable components for servers. The workstations make use of high-resolution LCD monitors and 3D accelerated graphics cards to make the forecaster's experience smooth and of high fidelity. There is also the option to connect more than one monitor to each workstation for an extended working surface.



HA Cluster

The system deploys a client-server architecture that allows multiple workstations to connect to the server-side data store. The servers can be paired in a High Availability cluster with a single IP address to provide the forecasters with uninterrupted data services. For smaller forecasting offices, the server and client can be hosted on a single workstation.

Communications Standards

The basic configuration allows for the system to be populated with data through a TCP/IP Socket connection from a WMO compliant message switch such as the NetSys nsMHS which can also be the default output medium. Numerous other possibilities are feasible by making use of I/O drivers from the NetSys nsMHS and nsWAFS offerings. EUMETCast Satellite reception is possible by incorporating components from the NetSys nsSAT offering. The system also provides the possibility to output generated products automatically to a web server by means of FTP, SCP or SMB to facilitate seamless integration with an institution's web portal.

Data Standards

The system supports the following input formats

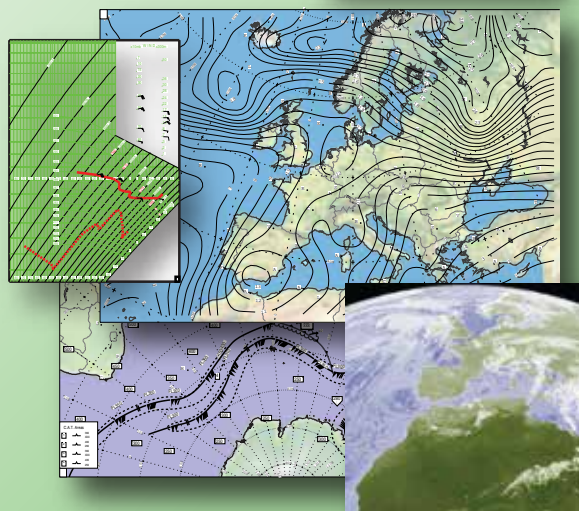
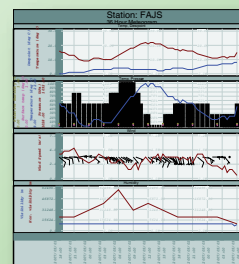
- WMO manual 306 compliant messages in TAC or TDCF format
- GRIB and GRIB2 from NWP (WAFS, ECMWF, Mesoscale, ...)
- RADAR data in European OPERA format
- Numerous raster image types are supported (PNG, BMP, JPEG etc.)
- EUMETCast satellite input
- Legacy T4 Fax

TAC and their TDCF counterparts can be decoded into the individual fields for output to CLIMAT databases, the plotting of station models, the monitoring of values against thresholds and for the construction of Meteograms.

Variety of Products

The system can create a large variety of direct or derived products in high resolution PostScript, Adobe PDF or anyone of a number of raster formats such as PNG, BMP and JPEG. The products are

- BUFR Significant Weather
- RADAR colourization
- Satellite colourization
- SYNOP Station plots
- SYNOP Contour plots
- Upper Air plots
- Tephigrams
- Meteograms
- GRIB Shaded Topography
- GRIB ISO Contours
- GRIB U/V component arrows



Specialized Products

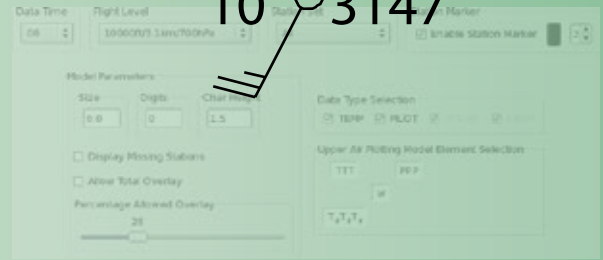
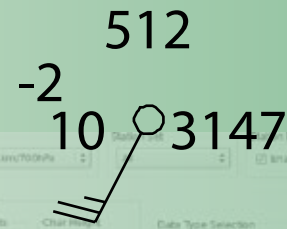
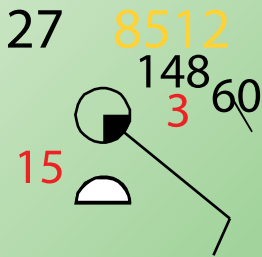
The most powerful **Meteogram Composition Tool** in the industry allows for the creation of custom Meteogram pages in a user friendly and straightforward manner.

For SYNOP and Upper Air models, a variety of parameters can be fine-tuned on an interactive Graphical User Interface to control exactly which information should be depicted in the models. **Irregular grid** contours can also be generated from SYNOP elements.

The **GRIB Laboratory** enables the forecaster to create derived products by combining different GRIB components into a new data type by means of a powerful mathematical interpretation engine. Apart from the coarse grained WAFC NWP GRIB, it can be applied to mesoscale model output as well which makes it an attractive feature for **any** meteorological office.

The product definitions are always saved with relative time definitions which means they can be **reused** at any time in future without having to perform the setup all over again.

All these functions strive to assist the forecaster in producing products of relevance to specific user communities such as aviation, agriculture, shipping, environmental protection, etc.



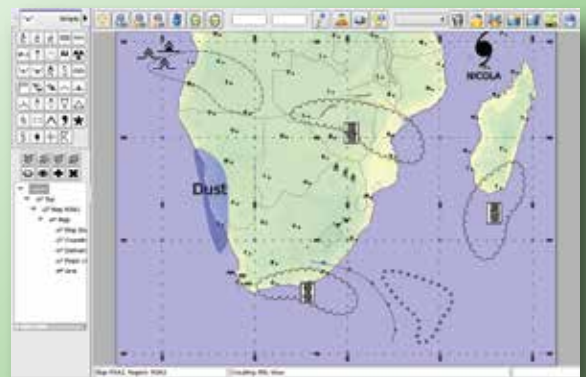
Automatic Creation of Products

Configured products as mentioned in the previous section can be scheduled for generation in a number of ways. Regular production at specific times on **weekdays** is a commonly used option. Scheduling for a **specific time and date** is useful for setting up product generation in advance for once-off events. Likewise, product generation can be **suppressed** for time periods such as public holidays or the like.

Events can also serve as **triggers** for the generation of products, the most common example is the completion of a GRIB reception run to generate a set of charts. Other examples are the sampling of values from observations below a certain configured threshold or the arrival of a specific data type in a geographical region such as a SPECI arriving for any station inside a specific FIR.

Chart Composition and Overlays

The package contains a very powerful graphical forecasting editor to compose regional charts such as **low-level forecasts** for aviation. Compatible elements from the products already mentioned can be combined at will; a complete palette of standard and custom weather symbols with which to enhance these overlays, are available. The end product can once again be saved in high resolution PostScript/Adobe PDF, exported to one of a number of raster formats or submitted to a message switching system.



$$wind_{45}(t) = \sqrt{U_{45}(t, 17)^2 + V_{45}(t, 17)^2}$$

$$wind_{13}(t) = \sqrt{U_{13}(t, 15)^2 + V_{13}(t, 15)^2}$$

$$\Delta_{wind}(t) = wind_{45}(t) - wind_{13}(t)$$

$$Y(t) = \begin{cases} 0 & |\Delta_{wind}(t)| < 3 \\ 1 & |\Delta_{wind}(t)| \geq 3 \end{cases}$$

User Interface

All features are accessible through a **user-friendly** graphical interface running under the Linux operating system. The client-server architecture implies that the client workstations can be geographically separated from the servers to integrate into environments with dedicated server facilities and forecaster offices.

The software is **access controlled** through user name and passwords and a fine grained user role mechanism ensures that the administrator can control the use of features as dictated by institution policy.

Context sensitive help is available on all aspects of the interface through popup tooltips. The package also comes with a complete set of manuals and **NetSys** provides training upon commissioning of the system covering every aspect to ensure the users are well versed to make full use of the rich feature set.

Conclusion

The **nsFORECAST** solution is a powerful and user-friendly product to serve the needs of forecasting offices at meteorological or aviation institutions. It is ever expanding as advances are made in weather forecasting and **NetSys** is always willing to tailor-make it to the specific needs of customers to integrate well into their environments and work processes. **NetSys** is an **ISO9001:2000** certified organization that have a Quality Management System in place ensuring that your experience of our products and customer service remains predictable and professional at all times.

