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High Resolution Weather Provider
Weather professional solutions

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LRC		LRC	
Customer		Customer	

Datameteo Weather Services Index

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1) Alert Maps

We can offer very precise alert maps updated twice a day for the next 72 hours at 6 hours step with your brand.

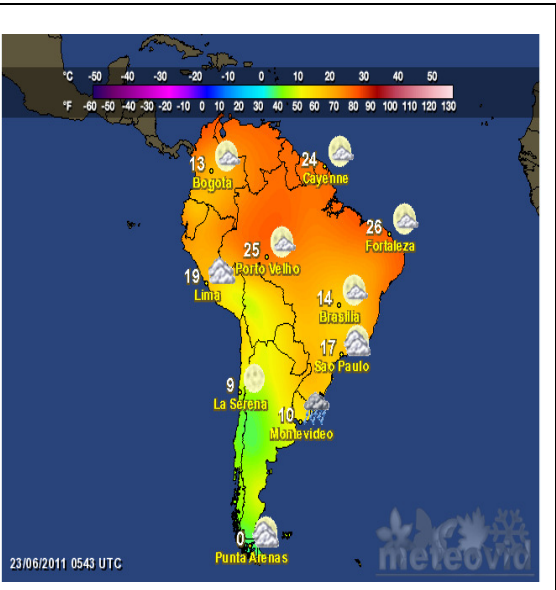**The most convenient source to have an immediate outlook**

Type	Weather Alerting Maps
Format	GIF, PNG or JPG
Weather Model:	WRF High Resolution 72 hours on 6 hours step
Availability	USA, Europe with single countries, S America, Africa (partially)
Updated	Twice a day
Demo:	http://www.datameteo.com/meteo/modello-alert_eu_center-meteovid.html

2) Weather Maps

We can offer one of the most complete superior quality weather maps dataset updated 4 times a day for the next 7 days with actual weather updated hourly and area forecast.
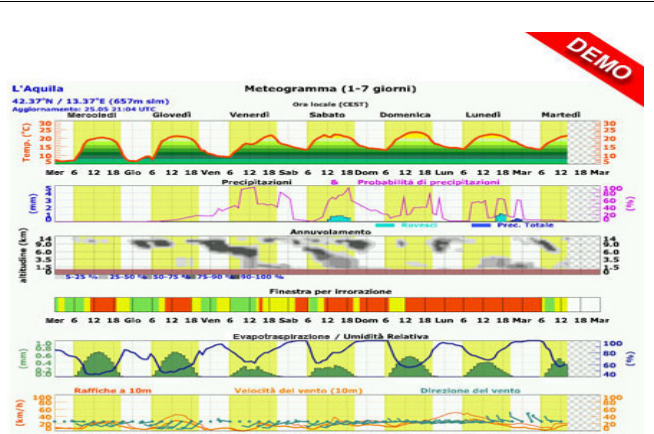
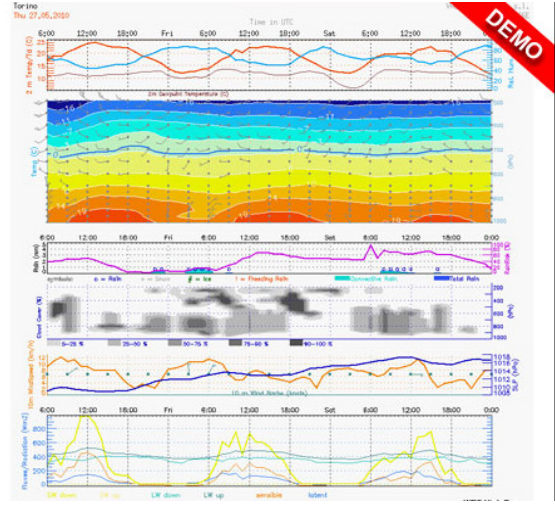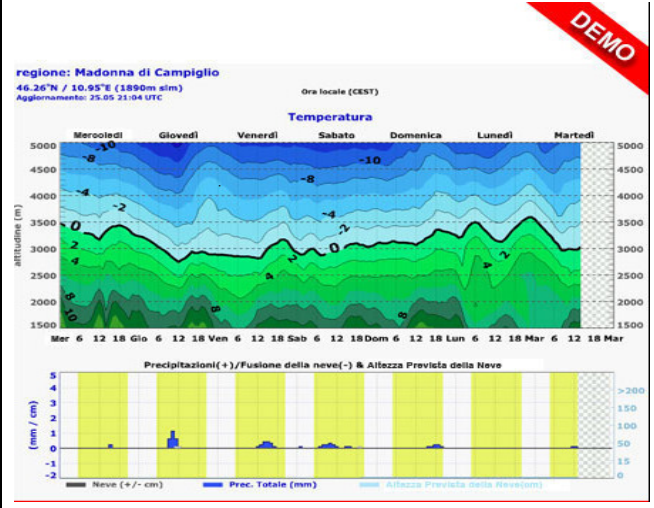**All the weather you need in a single map a the best market rate.**

Type	Weather Maps
Format	GIF, PNG or JPG
Weather Model:	Current weather (wind, temperature, phenomena clouds, humidity, pressure, windchill, etc..) GFS 144 hrs on 12 hrs step (precipitation, temperature)
Availability	USA, Europe, South America, Africa , Asia, Australia
Updated	Current every hour Forecast 4 times a day
Demo:	http://www.datameteo.com/meteo/modello-carte_world-meteovid.html

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3) Meteograms: agro, air, snow

We can offer one of the most complete quality weather meteograms dataset updated twice a day for the next 7 days specially settled up for special purposes (agro, air, snow)
All the high resolution weather you need in a single meteogram.

Type	Meteograms IT, ES, EN, DE, FR	
Format	GIF, PNG or JPG	
Weather Model	WRF 3,10, 18 Km	
Availability	USA, Europe, South America, Africa (part) , Asia (part), India, NZ	
Updated	Twice a day	
Demo	http://www.datameteo.com/meteo/meteogram-agro-italy	

AGRO Meteogram ideal for agricultural purposes with*

Wind, 0-10cm temperature, cloud fraction, precipitation, evapotranspiration, spray window

AIR Meteogram ideal for :(gliding, ballooning, skydiving, etc..) with*	**SNOW Meteogram ideal for (snow alert, sky resort etc..) with ***
Wind and temperature at different altitudes, solar radiation, clouds precipitation, pressure	**Temperature at different altitudes, rain, melted snow, snow**

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4) Actual Data Report

We can offer via xml, csv actual and archived data (weather report) updated every half an hour of more than 8000 locations worldwide collected according WMO* 306 Manual.

All data are checked by a filtering system in order to prevent out of scale values or anomalies

Type	Actual Weather Data IT, ES, EN, DE, FR	
Format	XML, CSV	
Weather Model	Current weather (wind, temperature, phenomena clouds, humidity, pressure, windchill, etc..)	
Availability	17000 station worldwide	
Updated	Current every half an hour	
Demo	http://www.datameteo.com/ meteo/modules.php?name= Dati_attuali&op=Cerca_stazi oni_mondo&language=EN&c ountry=PE	**Current weather template with phenomena full associated according WMO* (World Meteorological Organization) 306 Manual**

5) Climate Data Report

We can offer via xml, csv climate data of more than 1300 locations worldwide and 80 in Italy

All data are checked every year in order to have the most updated climate archive

Type	Climate Weather Data IT, ES, EN, DE, FR
Format	XML, CSV
Weather Model	Average climate data (wind, temperature, precipitation Climate information is based on monthly averages for the 30-years period
Availability	17000 locations worldwide
Updated	every year
Demo	http://www.datameteo.com/ meteo/modules.php?name =DatiItalia&language=EN& op=Mondo=Dati_attuali&op =Cerca_stazioni_mondo&la nguage=EN&country=PE

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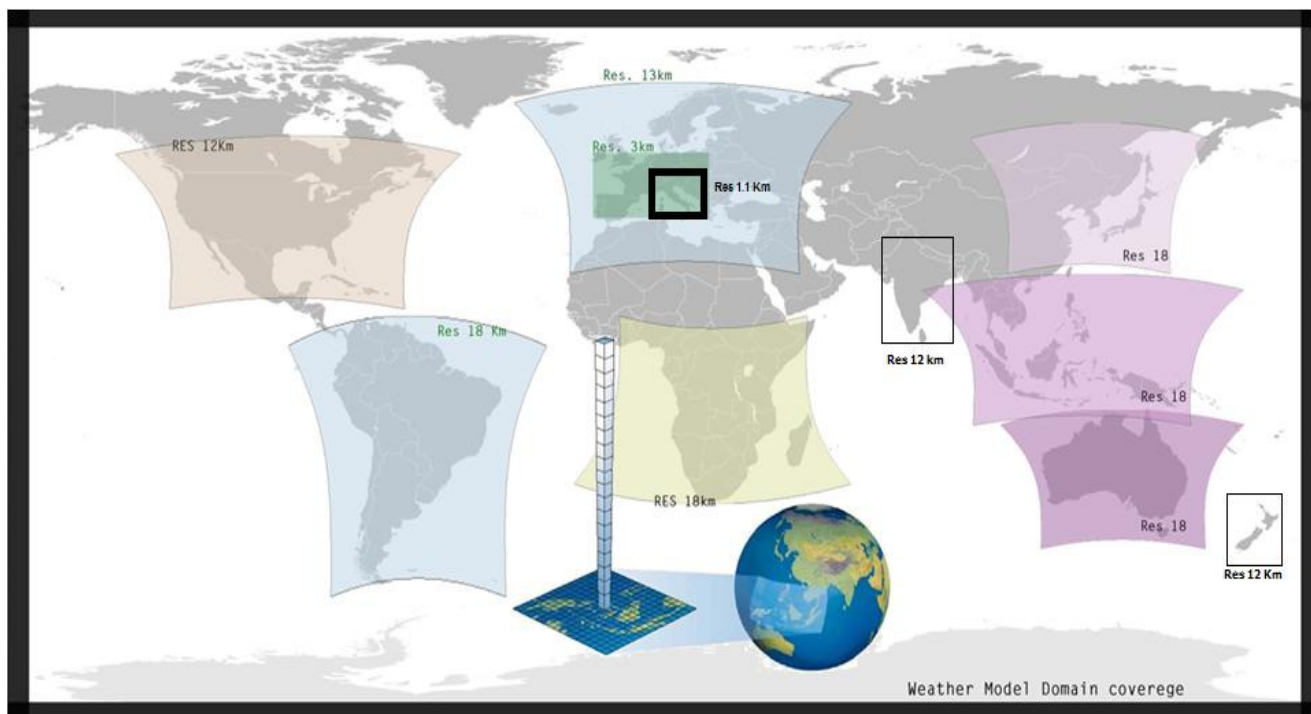
6) High Resolution Weather Model and Coverage

Our WRF's numerical weather forecasts cover168 hours from the moment of initialization to the end, updated 2 times a day, every 12 hours. This means that a forecast for a specific time step is calculated 12 times ranging from the first model run (168 hours in advance) till the closer one (12 hours in advance) which is stored in the archive. This enhances the value of the archived data by a factor 2,5 because there are much more "potential solutions" for that parameter at the selected time step. 4,5 Years of archived data, with 12 different deterministic solutions for each value, are in point of fact similar to more than 10 years of continues data series. Numerical models cover the entire world and enable the production of weather forecast for any place on Earth, irrespective of whether a meteorological recording station exists or not.

Through the high spatial resolution, which calculates forecast for every 10-18 km, we produce local forecasts which include the effects of local climate, topography and soil cover.

Examples of the capabilities of numerical high resolution forecast are:

1. Distinction between valley, slope and summit temperatures in mountain areas.
2. Detection of weather barriers (e.g. Alps, Andes), with distinction of rain, wind, etc.
3. Display of local thermal phenomena, such as winds (e.g. Föehn, Tramontana, Chinook), thunderstorm activity, etc.

Our high resolution forecast are "live corrected, when applicable, with validated satellite feed observations

Below you can see the operational areas covered by our high resolution weather models and the grid resolution applied. Weather model resolution applied depends on the area topography complexity.

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7) Basic Weather Forecast 8-16 days

We can offer general weather forecast based on our post processed 20 Km grid GFS weather model updated 4 times a day on 3 hours step for the first 192 hours or 6 hours step from 192 to 384 hours
Quality worldwide weather forecasts at interesting rates

Type	Data	Available Parameters
Language	IT, ES, GB, DE, FR	both in English and metric units
Format	Include Url Html, API, xml, csv	-Weather forecast and icon
Weather Model	Postprocessed GFS 20 Km gridded resolution for first 192 hours forecast Postprocessed GFS 60 Km gridded resolution for 192-384 hours forecast	-10 m Wind direction , speed and gust -2 m Temperature, High, Lows, -Precipitation amount, probability
Availability	Worldwide unlimited locations Italy 8103 locations	-Humidity,
Updated	4 times a day 3 hours step first 192 hours 6 hours step 192-384 hours	-Windchill, -Visibility, -Pressure, -Freezing Level,
Demo	http://www.datameteo.com/meteo/weather_WORLD_0_0	-UV index Other parameters on request

Forecast details based on 3 hours step	8-16 Days Weather summary forecast

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8) High Resolution Weather Forecast

We can offer high resolution validated weather 168 hours forecast on hourly step based on our WRF 3-12 Km models available for Europe, USA, South America and part of Africa and Asia. Every place cover by the models is simply available via latitude and longitude.

Validated top quality worldwide high resolution weather forecast at interesting rates

Type	Data	Available Parameters
Language	IT, ES, GB, DE, FR	both in English and metric units
Format	Include Url Html, API, xml, csv	-Weather forecast and icon
Weather Model	WRF 3, 12,18 Km	--Wind direction , speed and gust at diff altitudes,
Availability	Europe, USASouth America, Africa (part), Asia (part), NZ, India

More than 8.000.000 of locations available simply digiting latitude and longitude. Others available on request, adding the desired latitude and longitude. | -Temperature at different altitudes, High, Lows,

-Precipitation amount, type, probability, Humidity,

-Windchill, Visibility, pressure, Freezing Level, UV

Special Parameters for selected services

-Air: Wind, Temperature, Cloud fraction at different altitudes |
| Updated | Twice a day

1 hours step till 168 hours | -Agro: 0-10 cm Temperature, Evapotranspiration, Leaf wetness Index, soil moisture

-Snow: melted snow, snow fraction |
| Demo | http://www.datameteo.com/meteo/weather_WORLD_0_0 | -Wind Power: mean wind speed, gust, air density, icing at different heights (0-140 m)

-Solar Power: mean solar radiation value |

Forecast details based on hourly hours step	7 Days Weather summary forecast

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9) Sea Forecast

We can offer the most reliable high resolution wave model forecast use for oil spill drifting operation, navigation planning, sailing etc..Your precise sea point forecast in a click

Type Language	Data , Maps IT, ES, GB, DE, FR
Format	**Data: Include Url Html, xml, csv Maps:JPG, PNG, GIF**
Weather Model:	**WW3+WAM4+Hycom+ SWAN (Simulating WAve Nearshore)**
Availability	**Mediterranean 0.01°, Oceans 0.25°, Global 0.5°**
Updated	**4 times a day 0-240 hours (Mediterranean hourly updated till 180 hours) Other updated on 3 hours step till 180 hours on 6 hours step till 240 hours**
Demo	**http://www.datameteo.com/meteo/modello-carte_mare-meteovid.html**
Parameter	**Unit**
Wind Direction and speed	**°, KTS**
Pressure	**Ectopascal**
Peak Direction	**°**
Superficial current	**KTS**
Mean wave direction	**°**
Primary wave direction	**°**
Primary wave period	**sec**
Peak Peruiod	**sec**
Wave height	**m**
Wave lenght	**m**
Swell Direction	**°**
Swell height	**m**
Swell period	**sec**
Wind sea direction	**°**
Wind sea height	**m**
Wind sea period	**sec**

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Details of a 180 hours high resolution sea point forecast on hourly basis

Data	Dir. °	Wave Wind KTS	10m Wind KTS	Wave Height (Swell)	Wave Lenght m	Direction Spread °	Mean Dir °	Mean Period sec.	Peak Dir °	Peak Period sec	Wind Sea Dir °	Wind Sea Period sec.
02-07-2011 00:00	000	04	05	Poco mosso (con piccole onde) 0.2 m	11.8	0	300	3	260	2	000	0
02-07-2011 01:00	350	04	05	Calmo (con increspature) 0.1 m	12	0	310	3	330	4	000	0
02-07-2011 02:00	360	04	05	Calmo (con increspature) 0.1 m	12.4	0	330	3	330	4	000	0
02-07-2011 03:00	020	04	05	Calmo (con increspature) 0.1 m	12.5	0	340	3	330	3	000	0
02-07-2011 04:00	000	04	05	Calmo (con increspature) 0.1 m	12.3	0	340	3	330	3	000	0
02-07-2011 05:00	360	04	05	Calmo (con increspature) 0.1 m	11.8	0	340	3	340	3	000	0

Seapoint Forecast Marina di Campo - Mar Tirreno Settentrionale / Northern Tyrrhenian
Updated 2011-07-02 21:07:06 UTC
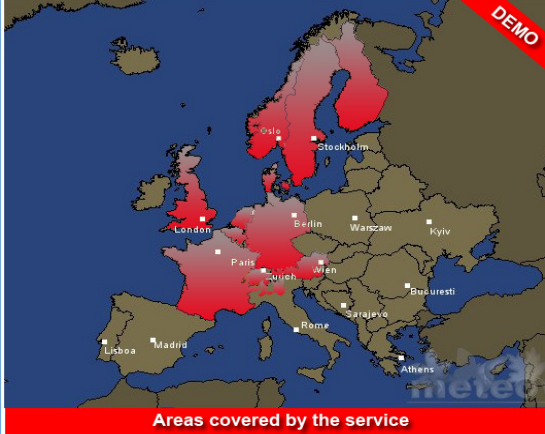
Details of an high resolution wave model map forecast

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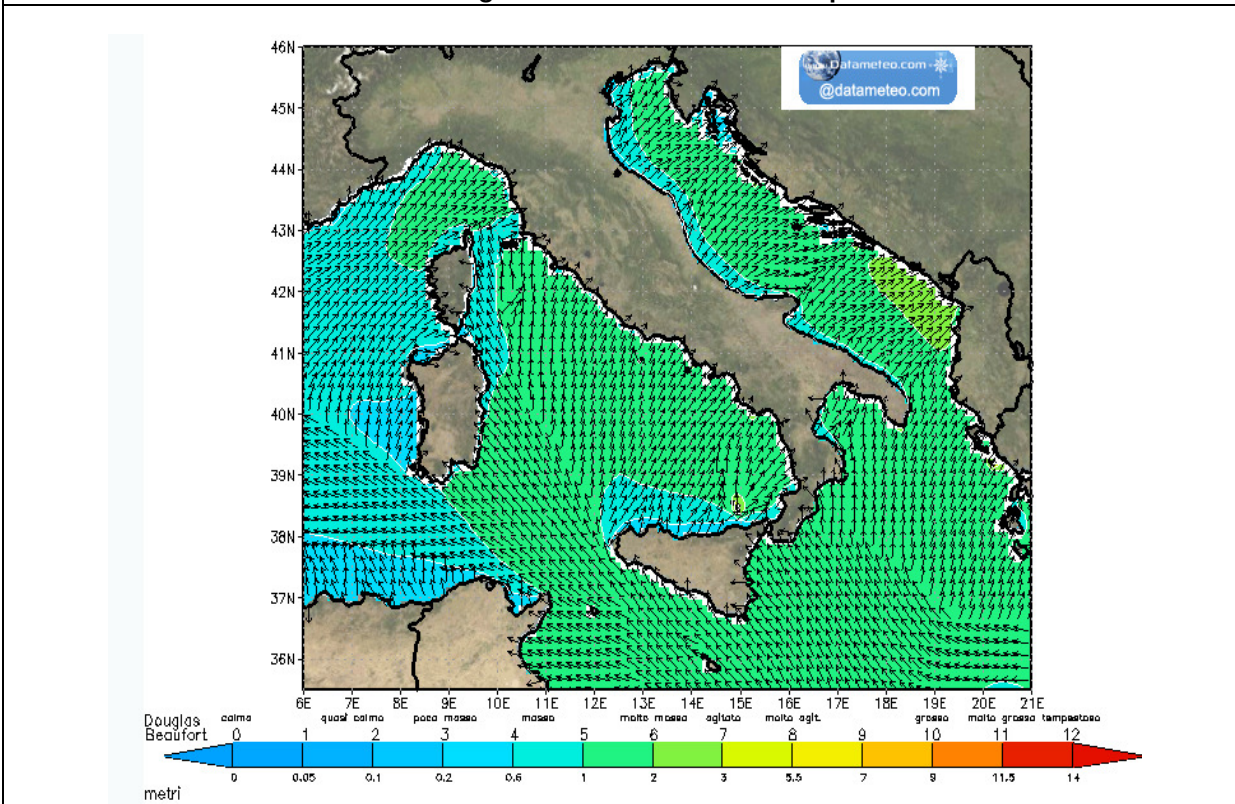
10) Radar Forecast

We offer Radar Precip the latest frontier for nowcasting-short term weather forecasting service showing the precipitation amount by the weather radar for a selected location. he precipitation shown is the rate in mm in the area surrounding the selected location, displayed as forecast for the next 2 hours and data for the past 12.
The best added value weather service at your disposal

Area Covered by the service	Demo: http://www.datameteo.com/meteo/radar_precip-Italy
Areas covered by the service	

11) Satellite Images and Forecast

We can offer this new forecast source derived by a combination of different satellite channels comparison like IR, Visibile, Water Vapour etc..Satellite feeds are constantly quality checked by comparation with ground measure or other forecast sources.

Type Images PNG, JPG	Type Data	Demo: http://www.datameteo.com/meteo/modules.php?name=Gallery
Data available **-Fire Index** **-Radiation data** **-Clouds coverage** **-Temperatures** **Etc..**		Weather satellites are used to get a space-bird's eye view of Earth's atmosphere. There are two main types of weather satellites: **polar orbiting** and **geostationary**. Both monitor the following: Day and night cloud images and low-level cloud and fog images. Images showing the amounts of water vapor at various altitudes in the lower atmosphere, land temperatures and sea surface temperatures. Winds are calculated by measuring cloud motion. Other data are: the amounts of solar energy being reflected by various parts of the Earth Infrared, or heat, energy leaving the earth locations of forest fires and the estimates of precipitation amounts and the total amounts of ozone above different locations.

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Details of our interactive GIS 3D Platform Meteobrowser with fire index display overlayed at a weather maps combined with an RGB satellite image
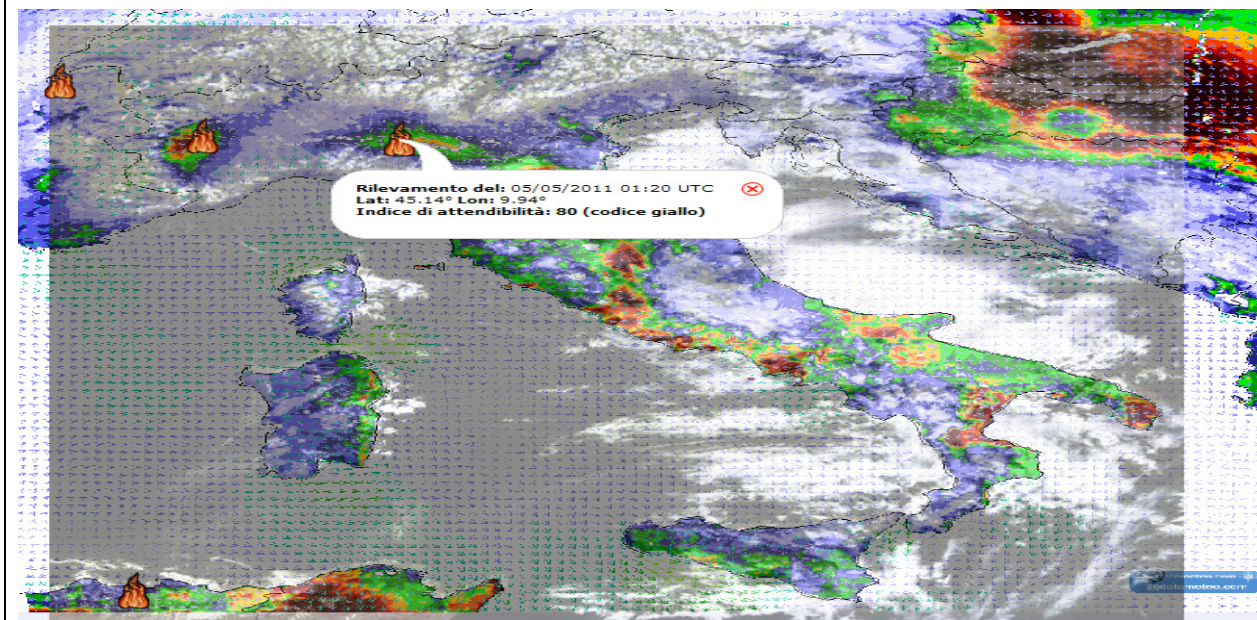
12) Archived Weather Forecast

We can offer 9 standard parameters supplied for the surface level. Atmosphere data are not archived. Other data can be generated on request

Validated top quality worldwide high resolution weather archived forecast

Type	Data	Available Parameters
Availability	**Europe, USA, S America, Africa and Asia (part), NZ, India**	**In metric units**
Format	**Xml, csv** Standard format for forecast data archive includes forecast. Other formats require separate agreement. The model forecasts are statistically most accurate between forecast hours 12 and 36. **Archives start from 2007 expect for Asia starting in Febrary 2008**	- **2m Air Temperature in ℃** - **Dew Point in ℃** - **10 m Wind u, v component in m/s** - **Total Precipitation in mm** - **Total Convective Precipitation in mm** - **Solar Radiation in w/m2** - **Pressure in hPa**

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13) Delivering platform and support

All data are quality checked, <u>very accurate weather phenomena are shown, particularly in actual weather (214 reported weather associations possible).</u> Our feed comes with an icon set, associated phenomena details database and are downloadable via secure http download url protected by declared download Ips and personal customer code. Support available via mail or skype during business days and hours. On request, other special <u>Service Level Agreement are quoted separately.</u>

14) CSV - XML Feed example

189|23062011|05:00|4.5|WSW|4 |Sereno|pcloudy.gif |0|

189	23/06/2011	|05:00	|4.5	|WSW	|4	|Sereno	|pcloudy.gif	|0	|etc
Location id	Date	Time step	Temp ℃	Wind Dir ℃	WindSpeed Km/h	Weather	Icon	Precip mm	Other

This in only an example. Complete feed flow chart will be available upon subcription

15) Icon Dataset

You can choose our icon set or you can build your own, based on our phemomena reference.

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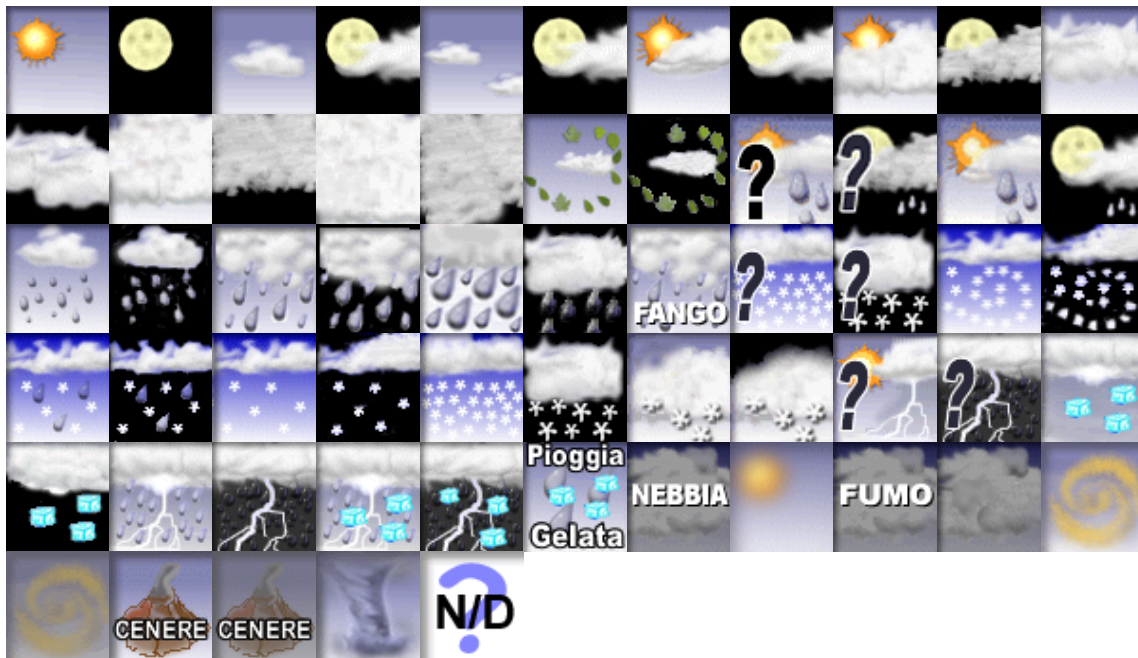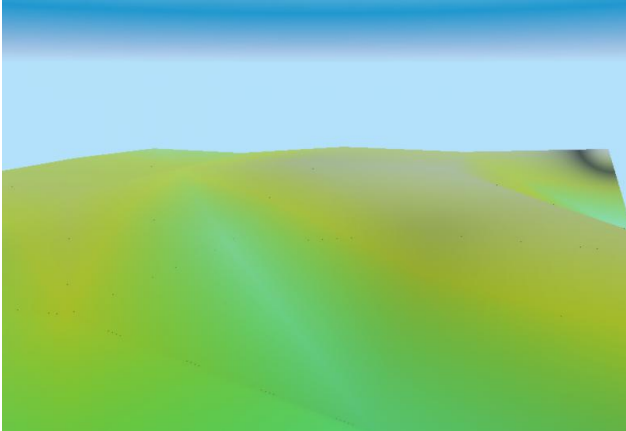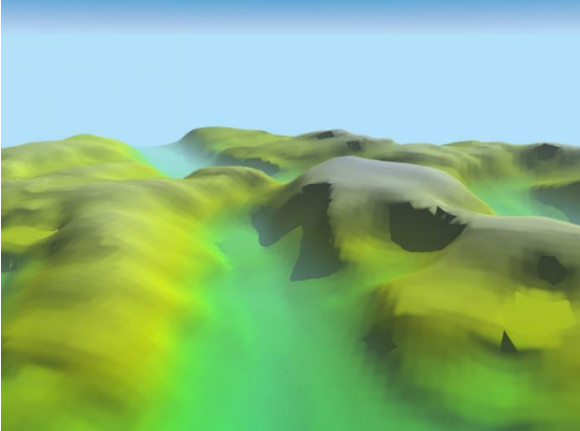
16) Model Data Validation and Comparison

Datameteo numerical models cover the entire world and enable the production of weather forecast for any place on Earth, irrespective of whether a meteorological recording station exists or not. Through the high spatial resolution, which calculates forecast for every 1.- 3-18 km, datameteo produces local forecasts which include the effects of local climate, topography and soil cover.

We conduct regular verification of our forecast, comparing them to actual observation data (2800 stations).

Thereby, we make sure that our services are delivering verified quality forecasts, and continuously improving

Statistics vs. High Resolution Modelling Forecast	
Statistics	**Modelling**
Needs weather stations (past data)-depends on station density	Forecast for every location: NA, EU, LATAM, Africa, LATAM, Africa, Australia, (and Asia on request)
good in NAFTA, W-EU,	Quality consistent through entire domain: NA=EU=AF=LA=AU
less in LATAM, Africa, Australia, Asia	Can predict extremes even if they have not yet occured (pyhsics)
Quality highly dependent on intensity of observation data : good in NAFTA, W-EU	Can include local observations if needed: local adjustment
forecast extremes only if extremes already occured (statistics).	
+ can be better in microscale topography (less then 3 km)	
Low resolution landscape seen by the model	**High resolution landscape seen by the model**
Quality weather station dependant	**Quality forecast everywhere**

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Temperatures

Our weather models predicts more than **70%** of all temperatures with less than **2°C** difference to the reality - **3 days (72 hours) in advance**. For 12 hours ahead, more than 80% of all temperature forecasts are less than 2°C different from measurement - on an hourly basis. The RMSE (Root Mean Square Error) of the hourly forecast is less than 2.5°C for up to 3 day forecasts, and around 2°C for 1 day forecast (these data are valid for Europe and North America).

Winds

The datameteo wind forecast for the period of **12-48 hours** ahead reaches **70-80%** agreement (Correlation r²) with measured values. Knowing that wind can vary substantially within a 200 meters distance, this is a very high correlation.

Precipitations

Datameteo can forecast more than **75% or 85% of all precipitation events with more than 2 or 5 millimeters (mm) correctly 3 days in advance**. This includes forecasting the days on which such events will not occur. Looking at precipitation events of 2 mm, datameteo can forecast **50%** of those **6 days** in advance, and more than **60% one day** in advance.

Below and example of comparison between a global model and an high resolution model

www.climatempo.com.br
• Little differentiation in less populated areas
• Only GFS output (100 km)

www.datameteo.com
• Forecast quality same everywhere
• Fronts are visible (time resolution)

Example:: rainfall maps

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## 17) Technologies (MOS-Neural Network) to refine weather forecast

Model output statistic, Kalman filter and neural network technologies are a scientific method for developing a comprehensive record of how weather and climate are changing over time in a limited area or over a specified point. In it, observations and a numerical model that simulates one or more aspects of the Earth system are combined objectively to generate a synthesized estimate of the state of the system.
These techniques cam combines observational datasets from surface stations and satellites with a comprehensive Numerical Weather Prediction (NWP) model. Using modern data assimilation methods, a complete estimate of the atmospheric state, for every location without the aid of ground measures, is computed that is both dynamically consistent and optimally close to the observations.

Correlating h data and forecast we can refine in a very accurate way forecast for a specified location or area
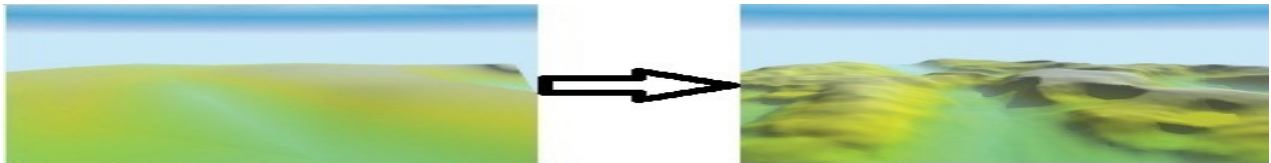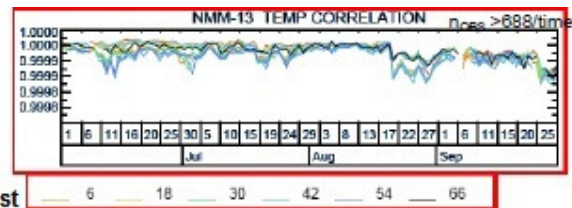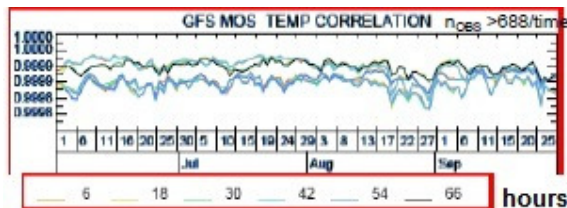

-Resolution defines _how_ the model see

-Parametrization defines _what_ the model see
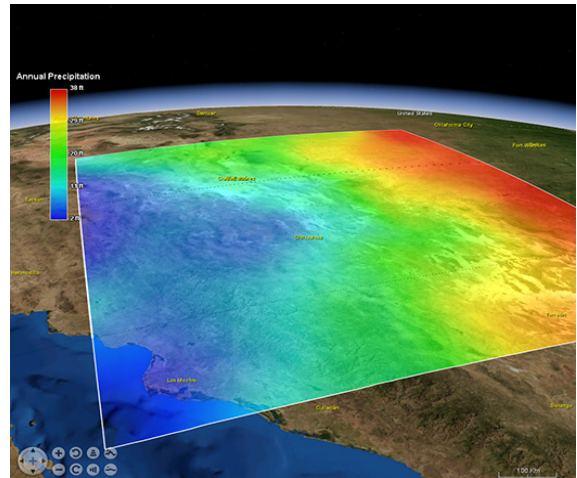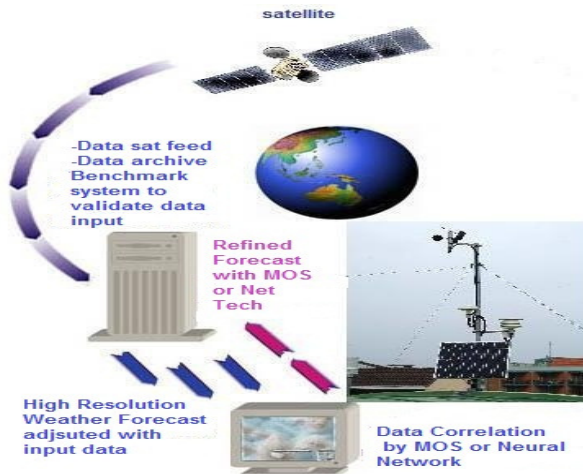
Below a correlation example of a **global GFS weather model** with MOS technology applied at the air temperature field show an RMSE score of **0.9996-.9999 RMSE** while the WRF **high resolution weather model** reaches a RSME **>of 0.09998,** with MOS technology applied

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18) References

Datameteo offers an **increasing products range** for different businesses. For individual industries, we offer specialized services. These include wind and solar energy forecasts, weather services for the building management, special data supply and warning services.

These **high value outputs** are the cornerstone for all our market tailored services, being integrated into specific packages and distribution tools. As a key player in the Italian fast growing meteorological market.

Datameteo continuously develops **new services** through **scientific** and **commercia**l collaborations which can add value to our operational forecast.

...more