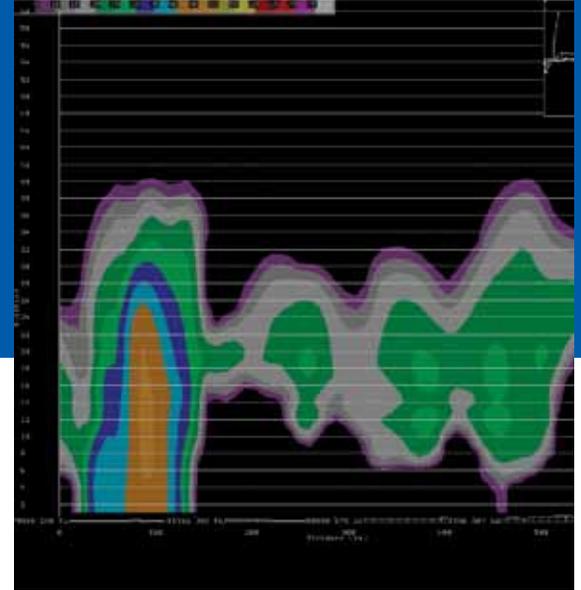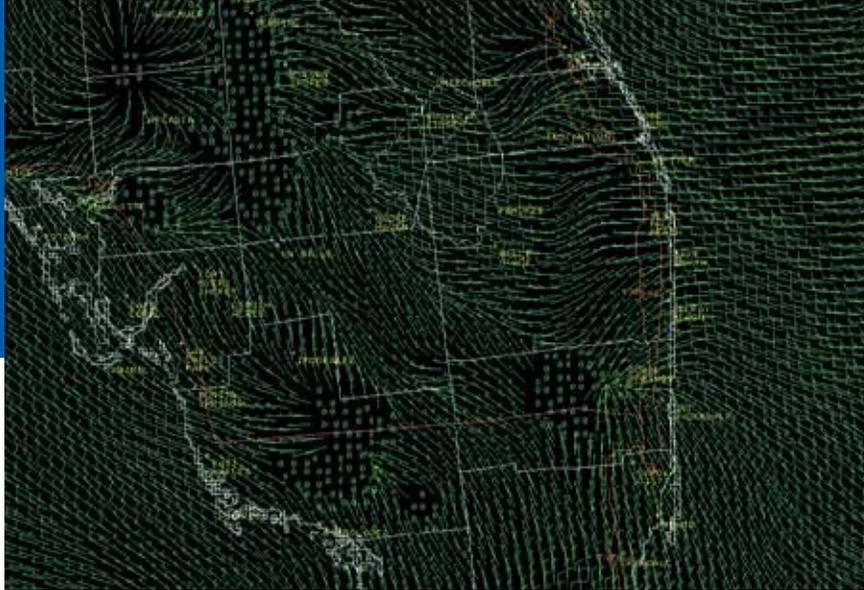# MetWise® Predict

MetWise® Predict employs a high-resolution numerical weather prediction model that is run on an ENSCO multi-node computer platform, producing forecasts for any location in the United States. This modeling capability delivers products to users via MetWise Enterprise, MetWise Net, MetWise Collaborate, or MetWise Live.

The high-resolution model predicts weather parameters from the surface of the Earth to an altitude of about 40,000 feet at grid points about every 7.5 miles across the continental U.S. MetWise Predict will provide a forecast of temperature, humidity, winds, cloud cover, radar reflectivity, precipitation amounts, and other parameters that could affect operations.

The High-resolution Mesoscale Model

MetWise Predict incorporates a high-resolution (small grid spacing) mesoscale numerical weather prediction (NWP) model. The MetWise Predict NWP model is considered a meso-gamma (γ) scale model. Global or national NWP models produce forecasts pertaining to large scale processes, such as fronts, highs and lows that normally persist for days to weeks and have horizontal grid spacing of 40 to 80 km or more (meso-beta (β) scale to global scale). Mesoscale features range from near synoptic scales (meso-alpha (α) scale) down to individual cloud cells with dimensions of 1 X 20 km and life spans less than one hour (meso-gamma scale). The chart below describes typical mesoscale parameters.

The goal of MetWise Predict is to focus on weather phenomena that are too small for most national models to forecast, yet very important for many types of weather sensitive operations. Some of the MetWise Predict weather phenomena includes thunderstorm forecasting, local heavy rainfall, sea breezes, land breezes, mountain and valley breezes, and turbulence and icing. High-resolution wind fields and precipitation amounts associated with tropical systems can also be forecast with MetWise Predict.

Zero to 12-hour strategic high-resolution numerical modeling system that assimilates data from NEXRAD and other critical sources

Photo left: MetWise Predict can display very high resolution numerical weather prediction model images. Shown here are forecast surface winds over south Florida at 4 km grid spacing produced by the modeling component of MetWise Predict.

Photo right: Besides looking at data in a plane (horizontal) view, vertical cross-sections of gridded data, such as model forecast data, can be constructed for any location or along any flight path. Cross-sections are extremely useful, enabling forecasters to analyze data in both space and time simultaneously. This cross-section shows precipitation along a flight path.

Specialized aviation algorithms

MetWise Predict features specialized algorithms for analyzing and forecasting low-level mechanical turbulence, high-level clear air turbulence, and aircraft icing hazards. These algorithms can help aviation customers plan and avoid areas of potentially dangerous weather for helicopter flights across town or aircraft flights across the country.

Applications

Road weather and construction weather

When the conditions on or near the ground make a difference, customers in the construction industry or roadway transportation find the high-resolution forecasts very useful. Construction operations, such as road paving, find forecasts of radar reflectivity and precipitation amounts extremely valuable. Industries that rely on roadway surface transportation can use MetWise Predict to indicate locations of potential ice and snow problems, as well as plan trips to maximize fuel economy based on wind speed and direction forecasts.

Boat/sailing weather

High-resolution forecasts of wind speed and direction as well as convective weather can give sailors an advantage over other forecast sources. Whether in a racing event or boating for pleasure, the capabilities of MetWise Predict can assist with planning a day on the water.

Railroad weather

The MetWise Predict skin temperature product and associated algorithms can alert railroads to dangerous situations when track buckling may occur due to extremely high temperatures with maximum amounts of sunshine reaching the tracks.

Custom Models

Customized high-resolution models can be run specifically to meet a customer's needs. In addition to the 12 km domestic model, the grid spacing can be decreased to as little as 1 km.

MetWise® Predict Features

- State-of-the-art tested and verified meteorological model
- High spatial resolution — 12 km horizontal grid spacing
- High temporal resolution — forecasts valid every 30 minutes for 12 hours
- Reruns the model every three hours, producing a brand new 12 hour forecast
- Algorithms for analyzing and forecasting aircraft hazards

ENSCO®