Commodity Weather Group, LLC

Reference Notebook

Weather Model Basics

Technical Definition: Weather models are comprised of a certain number of mathematical equations that represent the behavior of a physical system, such as the atmosphere, and are used to predict the weather using current oceanic and atmospheric weather conditions as its base.

Different Types of models: There are many weather models available. The most common weather models used are the NAM model, GFS model (also known as the American model), the EMCWF model (also known as the European model), the CMC model (also known as the Canadian model). The main GFS model, EMCWF model, and CMC model are also known as their operational models. In addition, there are ensembles. The ensembles use slightly different initial conditions and run multiple times to produce different weather pattern scenarios in the future. The ensemble mean takes all these model runs and averages them together.

NAM model: A short range model which goes out 84 hours. Updated four times a day. A digital output (called Model Output Statistics or MOS for short) is also available.

GFS model: A short, medium, and longer range model. Both the operational and ensembles go out 16 days. Updated four times a day. MOS data are available.

EMCWF model: A short and medium range model. The operational model goes out 10 days and the ensembles go out 16 days. Updated twice a day. MOS data for temperatures are also available.

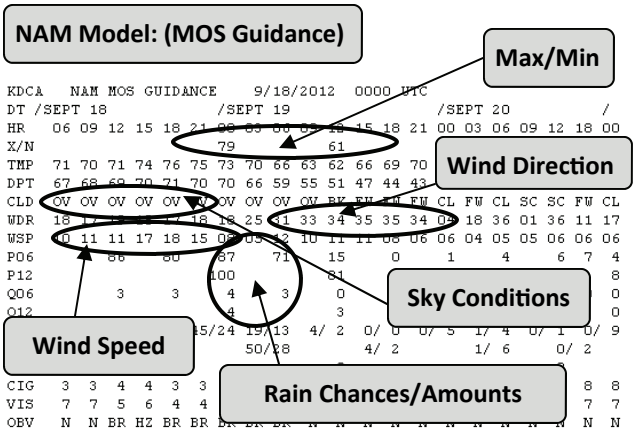
CMC model: A short and medium range model. The operational model goes out 10 days and the ensembles go out 16 days. Updated twice a day.

How CWG Incorporates the Models into a forecast:

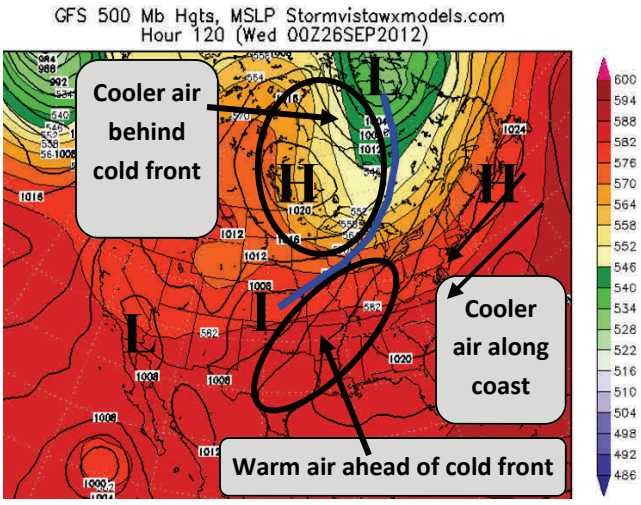
CWG uses the weather models as guides when making a forecast. Forecasts are constructed using multiple techniques with guidance from the models at different levels of the atmosphere. Some techniques used are knowing weather model biases, familiarity with certain weather patterns, and particular model performances under certain weather patterns and circumstances. Knowing these factors, CWG is then able to make temperature forecasts, precipitation forecasts, hurricane forecast, wind generation forecasts, severe weather outlooks, and more.

Samples of weather models at different layers of the atmosphere and their MOS guidance.

NAM Model: (MOS Guidance)



GFS Model depiction at 500mb five days out



Helpful Links

Stormvista (CWG partner for weather data/model information)

MOS Forecast Products (NOAA)