Common Misconceptions About Weather Observations

We believe it is important to understand the intricacies of weather observations. The outcome of financial transactions increasingly depends upon the weather. We frequently find that assumptions are being made that are incorrect. These may result in erroneous research results leading to sub-optimal trading strategies. In businesses where weather is the "commodity" (pure weather risk trading) or where it often drives the underlying commodity (agriculture / energy consumption) it makes sense to know as much as possible about such a fundamental measure. This series of educational papers (yes, there will be more!) aims to provide a basic education on weather topics.

1. Observation Convention
All data is observed from midnight to midnight (the calendar day)   [FALSE]

In reality, observation convention varies from country to country and network to network. In general it can be assumed that the observation of a given variable (such as daily maximum temperature) will be consistent across an entire network. The convention is set by the network owner. When asked, data vendors should be able to describe the observation convention for all datasets.

Why is this important?
- When comparing / merging datasets, it is important to compare like with like.
- When verifying forecasts, make sure the observation convention matches the forecast day convention.
- For weather risk contracts, reporting conventions can have a material impact on settlement values.

Did You Know?

In the UK and France Climate TMax & TMin are observed over different 24hr periods!

Many US COOP obs are taken at 7am because that is when observers wake!

2. Daily Observations
All "daily" observations represent a full day (24 hour period)   [FALSE]

The truth is that "Daily" data, especially those derived from the SYNOP network sometimes only represents a partial day. A nighttime TMin or daytime TMax is common practice. When asked, a data vendor should be able to explain the convention used.

London Heathrow 3rd & 4th January 2010 — SYNOP TMIN / Missed Daily TMin
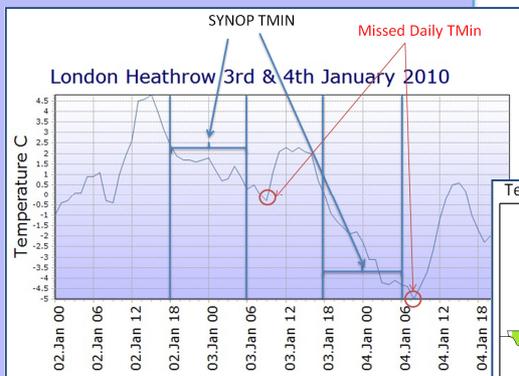
Why is this important?
- Some examples
  - people consume electricity 24 hours a day
  - frost events damage plants at all hours
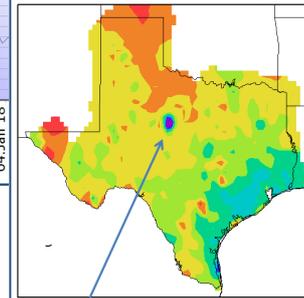 - crops don't care when it rains as long as it rains

3. Data Quality
Missing and erroneous observations are uncommon   [FALSE]

The truth is that missing values and erroneous values are common. The best solution is to only use CLEANED data. This is data where missing and erroneous values are filled and replaced.

Temperature (Tmax) Contour July 1, 2012
Erroneous Observation: Abilene, TX Max/Min swap (reported as 69F should be 100F)
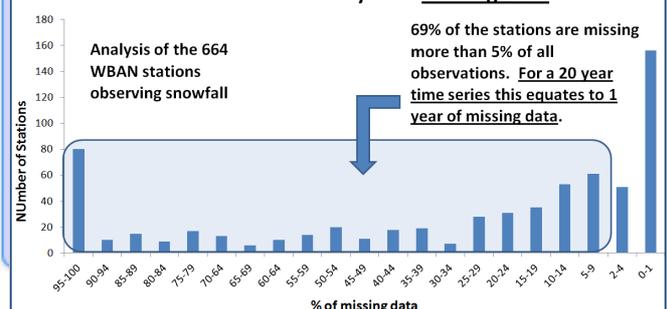
Why is this important?
- Missing values make an analysis difficult if not impossible. You cannot ignore missing values.
- An erroneous 100mm of rain can make the difference between drought and flood.

About Speedwell...

Founded in 1999 and with offices in the USA and UK, Speedwell Weather supplies historical and real-time weather data for thousands of weather reference sites around the world. Speedwell has direct data supply agreements with a wide range of national meteorological services and provides a single-point of contact for the provision of high quality weather data and forecasts to the energy, agriculture, banking, insurance and weather risk management sectors. Speedwell provides the market leading weather trading system (SWS) and are the preeminent settlement agent for OTC and CME weather contracts.

U.S. WBAN Snowfall Stations Analysis of Missing Data

Analysis of the 664 WBAN stations observing snowfall

69% of the stations are missing more than 5% of all observations. For a 20 year time series this equates to 1 year of missing data.

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