

5.3 Accuracy

The accuracy of a measurement is the degree of closeness of the measurement to the actual (true) value. Accuracy is also referred to as the measurement error. Although this may seem like a simple concept, the accuracy of sensors can be very hard to determine. This typically requires a 'standard', in the case of a scale, that would be an item of a known weight. For many other sensors, it is difficult for users to get a reliable standard to determine accuracy.

Manufacturers typically have calibration procedures, using standards that are traceable to the National Institute of Standards and Technology (NIST). That allows the manufacturers to determine accuracy information in their specifications.

The ideal sensor would have good accuracy and good precision. Note that accuracy can be improved through proper calibration, while precision normally cannot. In some cases, sensors with good precision, but not good accuracy, may still be able to fulfill their intended purpose. For example, for irrigation control based on soil moisture sensors, it may be good enough to be able to precisely measure changes in soil water content (which a sensor with good precision can do), even if the accuracy is not good (all measured soil water contents would be higher or lower than the true water content).



Figure 6. An example of good accuracy, but poor precision. On average, the data are close to the bull's eye, but there individual measurements vary widely.

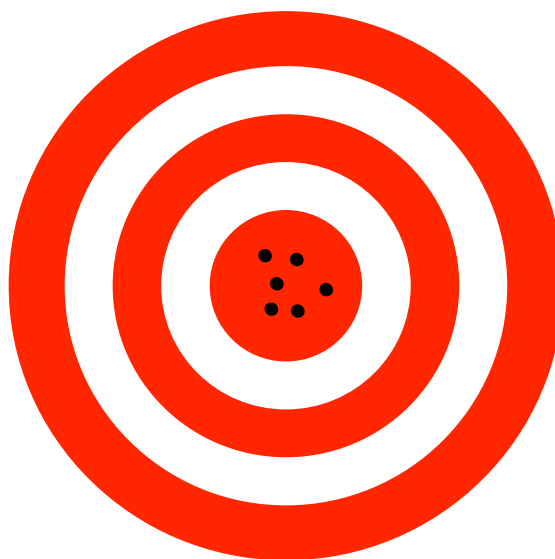


Figure 7. An example of both accuracy and precision: all measurement data are close to the bull's eye.