

Facilitator Training: Terminology

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Types of Terms Covered

- Meteorological
 - Observations
 - Parameters
 - Instruments
 - Tools
- Metrological (measurement-related)
- Programmatic acronyms

Met. Terms: Observations

- Upper-Air: Atmosphere above the surface.
- Sounding = profile – measurement of the vertical structure of a parameter in the atmosphere
- In situ: in place, sensor is immersed in the air
- Remotely sensed: from afar, e.g., from a satellite or a ground-based or aircraft-mounted remote sensor
- Parameters, elements: physical aspects of the atmosphere to be measured

Met. Terms: Upper-Air Parameters

- Vertical Coordinate
 - Height – above ground or above sea level
 - Pressure -
 - Geopotential height
 - Others (isentropes, potential temperature)

Met. Terms: Upper-Air Parameters

- Priority 1 parameters
 - Temperature
 - Pressure: force/area due to weight of overlying air
 - Geopotential height: height of a given point in the atmosphere in units proportional to potential energy of unit mass at this height relative to sea level
 - Water Vapor: matrices use mixing ratios (g/kg), but observations may be of relative humidity, vapor pressure, specific humidity ...
 - Wind Speed and Direction
 - Ozone Concentration

Met. Terms: Upper-Air Parameters

- Priority 2 parameters
 - Aerosol properties
 - Cloud properties
 - Precipitation properties
 - Radiation properties

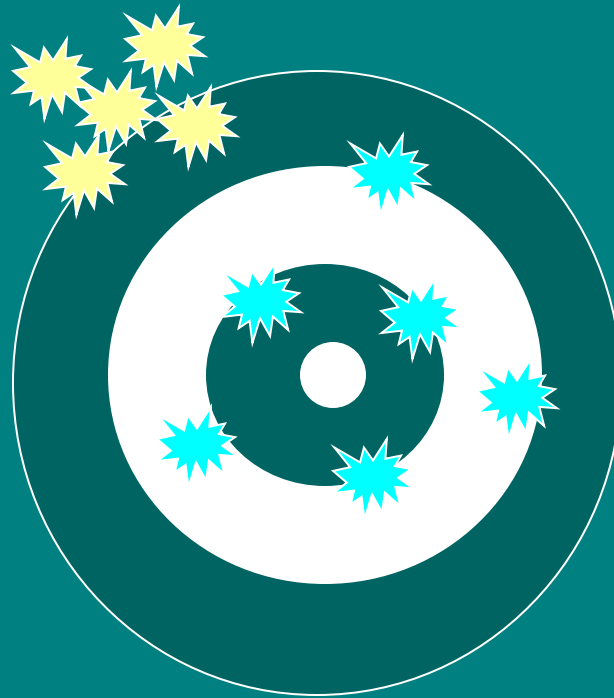
Met. Terms: Tools

- Radiative Transfer Models (RTM)
 - A physical/mathematical model of how radiation passes through the atmosphere
 - Accounts for scattering, absorption and emission
 - Relates radiances to meteorological parameters (satellite observations to in situ observations)
- Reanalysis / Ongoing Analysis
 - Climatological meteorological fields based on observations enhanced by assimilation into a weather prediction model
 - Spatially, temporally, and physically more complete than the original observations, so useful for climate studies

Measurement-Related Terms

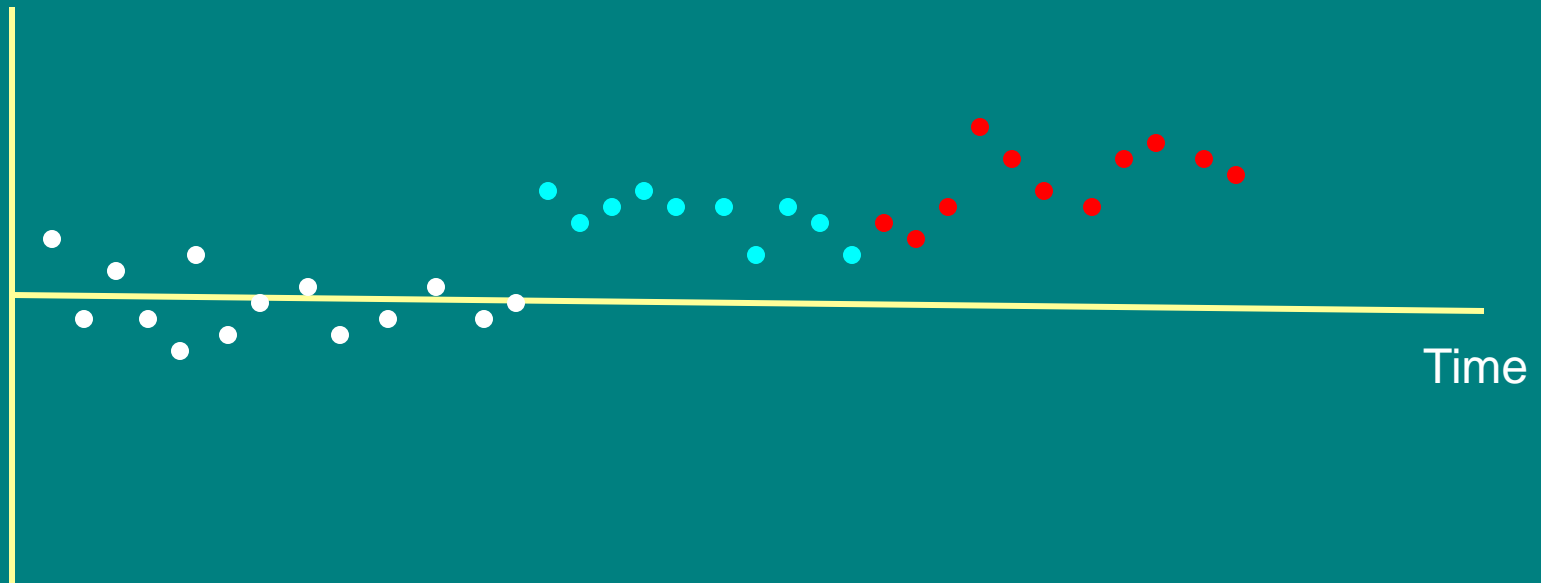
- **Measurement Accuracy:** deviation of an observation from the true value, bias error
- **Measurement Precision:** repeatability of an observation, random error
- **Measurement Range:** span from minimum to maximum value to be observed
- **Long-Term Stability:** changes in accuracy (bias) over time

Precision and Accuracy

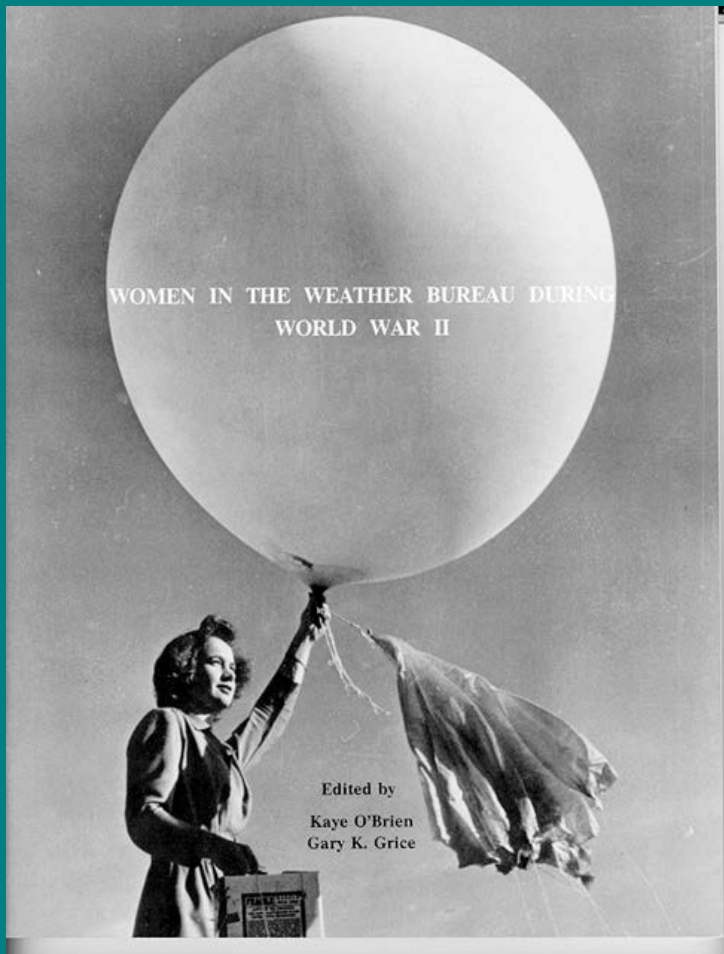


Long-Term Measurement Stability

Parameter



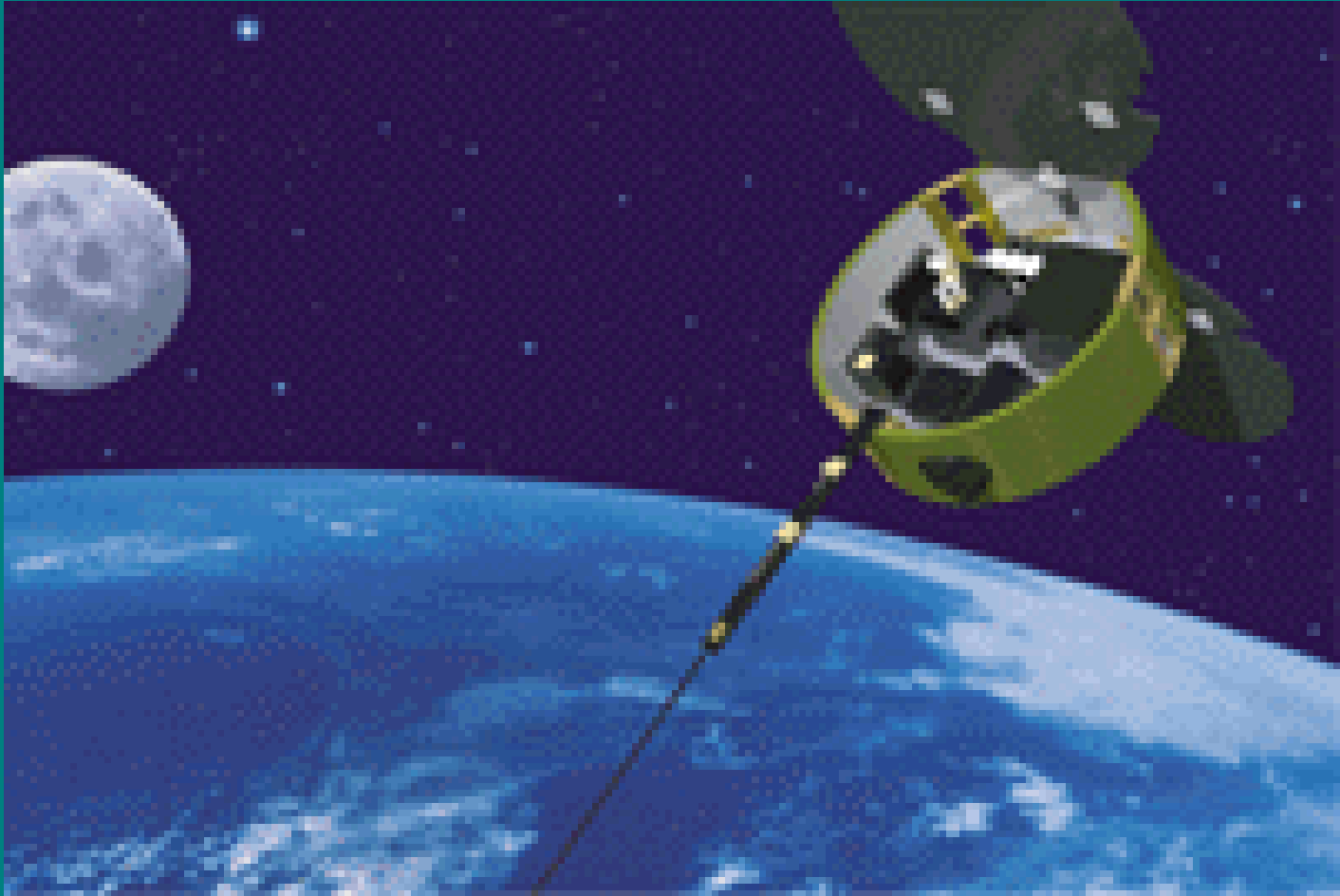
Instruments: Radiosonde



Instruments: Ozonesonde



Instruments: GPS



Instruments: UAV



Instruments: Other terms

- Reference Radiosonde – a more highly calibrated radiosonde
- Lidar – remote sensor operating on the same principles as radar, but using light, not radio, waves
- Satellite orbits: geostationary vs polar orbiting

Acronyms

- GCOS – Global Climate Observing System
- GUAN – GCOS Upper Air Network
- AOPC – Atmospheric Observation Panel for Climate
- GEOS – Group on Earth Observing System
- WMO – World Meteorological Organization
- NDSC – Network for the Detection of Stratospheric Change
- UNFCCC – UN Framework Convention on Climate Change
- Myriad of satellite sensor acronyms
- GPS – Global Positioning System; GPSMet