Surface Observation Operators @ NRL

- SSMIS wind speed
  - Adjusts from 19.5 meters (retrieval height) to 10 meters in prep routines
  - Computes background winds at 10 meters to generate wind innovations at 10 meters. Corrects the lowest model level to 10m (no vertical interpolation). Uses PBL similarity theory.
  - The corner points are interpolated to the observation location (bicubic interpolation) for u and v, and then converted to wind speed. Monotonic criteria is used.
  - Winds are superobbed @ 2 degrees
- Scatterometer and WindSat wind vectors
  - Wind retrievals are retrieved at 10m
  - Innovations are computed at 10m
  - Winds are superobbed rather than thinned. (1.5 degrees; 50 km product for ASCAT)
  - The corner points are interpolated to the observation location (bicubic interpolation) in u and v.
- CMAN stations
  - Data are available every 6min, so time thinning should be used
  - These are coastal stations—issues with representativeness

Surface Observation Operators @ NRL

- Buoys, fixed and drifting
  - surface pressure converted to terrain pressure
  - We currently don't use buoy winds that don't report pressures, but have that as a priority item
  - We have a partial list of buoy anemometer heights that we could use instead
  - All buoy types use the same ob errors, regardless of instrumentation

- Surface land
  - Check for a mismatch between observation height and model height
  - Currently use SYNOP data, some of which is 6-hourly or 3-hourly
  - Would like to use selected METAR data instead, especially for the US and Canada where SYNOPs are converted from METARS. The conversion process (from METAR to SYNOP) is a source of error that is difficult to get corrected at the source. We do not know what elevation is used with the conversion. There are known errors with this conversion process.
  - METARS report altimeter settings, not surface pressure. This requires knowing the elevation/station height accurately, and converting (if necessary) to surface pressure. Using METAR gets around the error mentioned in the previous bullet, plus gives us hourly (at least) observations.

- Ship Observations
  - Many observation types can fit into this category
  - Largely unknown height of observations, although if SLP and station pressure are reported, the height can be estimated.
  - Ship location/track checking is important.