

Atmospheric Observations

- Lightning (ground-based, space based)
- Satellite (GEOS, POES)
 - GEOS offers continuous monitoring VIS, IR, WV, sounders (NOAA)
 - POES offers microwave sounders, altimetry, scatterometry, radars (NASA & NOAA) (research: A-Train: Aqua, Calipso, CloudSAT)
 - NASA/NOAA decadal study critical to maintaining infrastructure - critical systems are undersupported (e.g., SCAT, Altimetry)
 - Are we using the satellite data for TC forecasting sufficiently? (YES for global model, NO for regional scale models). Not a lot of DA work with satellite data in regional/mesoscale models.
 - Critical sensors for TC are on POES. Need to improve use of snapshots to extend the impact of satellite data in time by supplemental observations (Aircraft, ground, etc.).

Atmospheric Observations (2)

- What can satellites help with?:
 - Formation - GEOS key sensor, SAL index?
 - Intensity - GEOS - Dvorak, SHIPS, rapid scan (models?)
POES MI - eyewall replacement cycles, AMSU warm core
 - Structure - POES scatterometer for outer wind radii, cloud-tracked winds
 - Rapid intensification - not much help alone, but when SCAT blended with aircraft shows promise - needs work (lightning?)
 - Decay - GEOS cloud-tracked winds shear, SAL index? (moisture)

Atmospheric Observations (3)

- Doppler radars - airborne and ground based provide vertical wind profiles and reflectivity; airborne provide snapshots, ground-based provide temporal evolution
 - Formation - not much help
 - Intensity - likely most useful observations in combination with SFMR and Scatterometer
 - Structure - useful observations in combination with SFMR and Scatterometer
 - Rapid intensification - useful for initial intensity and structure, may help better understand internal dynamics and changes (Schubert's list)
 - Decay - useful observations from WSR-88D network over land

Atmospheric Observations (4)

- New Observing Systems
 - Oil Rigs observing suite (10-20 necessary): most useful for process studies
 - ET probe, Licor, profiler, radar (DOW type), spray
 - Small inexpensive (?) Doppler radars (CASA)
 - UAVs (low-slow, HALE): instrumentation suites need to be developed particularly for HALE
 - UUVs:
 - HF radars (for surface winds?)
- Use of old data sets - must mine existing data sets
 - Develop data sets for each stage of storm life cycle identified by Russ's presentation
 - AOML/HRD has GPS sonde, FL, SFMR and Doppler radar data sets available for this

Atmospheric Observations (5)

- Proposed strategy for field effort
 - Target phase of storm life cycle (intensity)
 - Pick model to use to study problem (get nature run from another model)
 - Develop observing strategy using OSSEs
 - Test observing strategy and impact of observations during field effort