Observations and Observing Strategies

NOAA HFIP meeting
November 9, 2017

Applications of Observing Technologies

- Forecaster analysis and situational awareness

- Model initialization (through DA and forecaster input)

- Model evaluation

- Best tracks

- OSEs and OSSEs

- Process studies

Observational Capabilities

Current capabilities

- Airborne
  - Manned aircraft: AF C-130, NOAA WP-3D, NOAA G-IV
- Satellite
  - Geostationary: GOES-16
  - Low-earth orbiting: imagers (e.g.,GMI, AMSR-2), sounders (e.g.,AMSU, ATMS)
  - Scatterometers (e.g., ASCAT)
  - Altimeters (e.g., JASON)
- Surface-based
  - ASOS
  - Buoys and ships
  - WSR-88D
  - Water-level sensors
  - Mobile platforms

Observational Capabilities

Emerging technologies

- Unmanned technologies
  - Global Hawk
  - Coyote
  - Glider
- New instrumentation
  - Doppler Wind Lidar
  - APAR
- Satellite constellations/microsats
  - GPSRO
  - CYGNSS
  - TROPICS

Key Observations

- Surface wind field (i.e., radius of maximum wind, 34-kt winds)
  - Scatterometers, SFMR, dropsondes, buoys
  - Improved structural analysis
  - Better surge forecasts
  - Timing of onset of tropical-storm-force winds
- Vertical shear
  - Cloud track winds, deep layer (G-IV, Global Hawk) dropsondes, airborne Doppler
  - Structure and intensity response of TC
- Boundary layer moisture, ocean structure
  - Dropsondes, AXBTs/CPs, Coyote
  - Air-sea fluxes
- Mid-level humidity
  - Deep layer dropsondes, microwave sounders
  - Intensity and longevity of convection
- Uncertainty and error characteristics of all observations
  - TC analyses from data assimilation
  - Targeting of supplemental observations