**BACKGROUND**

**Scatterometer**
- Gale-force
- Storm-force
- Hurricane-force

**Radiometer**
- Scanning Radiometer (AMSR-2) e.g. Advanced Microwave Scanning Radiometer
- Orbits of AMSR-2: Polar, near-polar, and polar orbit (wet troposphere)

**Peak response at ~350 mb**
- 6.2 µm channel

**Ocean Prediction Center (OPC)** – “mariner’s weather lifeline”
- Ocean data is sparse

**Himawari-8 Water Vapor**
- Used to help quantify Airmass RGB
- Total Column Ozone & Ozone Anomaly

**Importance to weather systems**
- Exchanges of air between stratosphere and troposphere
- AKA: tropopause folds, stratosphere-troposphere exchange (STE), dry intrusion

**Research Question**
- How can integrating satellite data imagery and derived products help forecasters improve prognosis of rapid cyclogenesis and hurricane-force wind events?

**Phase I** - Identifying stratospheric air intrusions

**DATA & METHODS**

**Himawari-8 Airmass RGB**
- Each color band represents a wavelength (difference)
- Different wavelengths capture different layers of atmosphere

- Red: 6.2 µm inverted, representing moisture between 300-700 mb
- Green: 9.6 µm minus 10.3 µm, representing thermal response & tropopause height
- Blue: 6.2 µm inverted, representing moisture between 200-400 mb

**Total Column Ozone & Ozone Anomaly**
- Used to help quantify Airmass RGB

**Examples of instruments**
- 1. Aqua’s Atmospheric Infrared Sounder (AIRS)
- 2. NPP’s Cross-track Infrared Sounder/Advanced Technology Microwave Sounder (CrIS/ATMS)
- 3. Metop-B’s Infrared Atmospheric Sounding Interferometer (IASI)

**Himawari-8 Water Vapor**
- Upper-layer: 6.2 µm channel, Peak response at ~350 mb
- Middle-layer: 6.9 µm channel, Peak response at ~450 mb
- Lower-layer: 7.3 µm channel, Peak response at ~650 mb

**Scatterometer & Microwave Radiometer**
- Used to verify hurricane-force Scatterometer
- Measures backscatter of radar signal for wind speed & direction
- Advanced SCATtermeter (A/B)

**Microwave Radiometer**
- Measures microwave signal response for only wind speed

**REFERENCE**