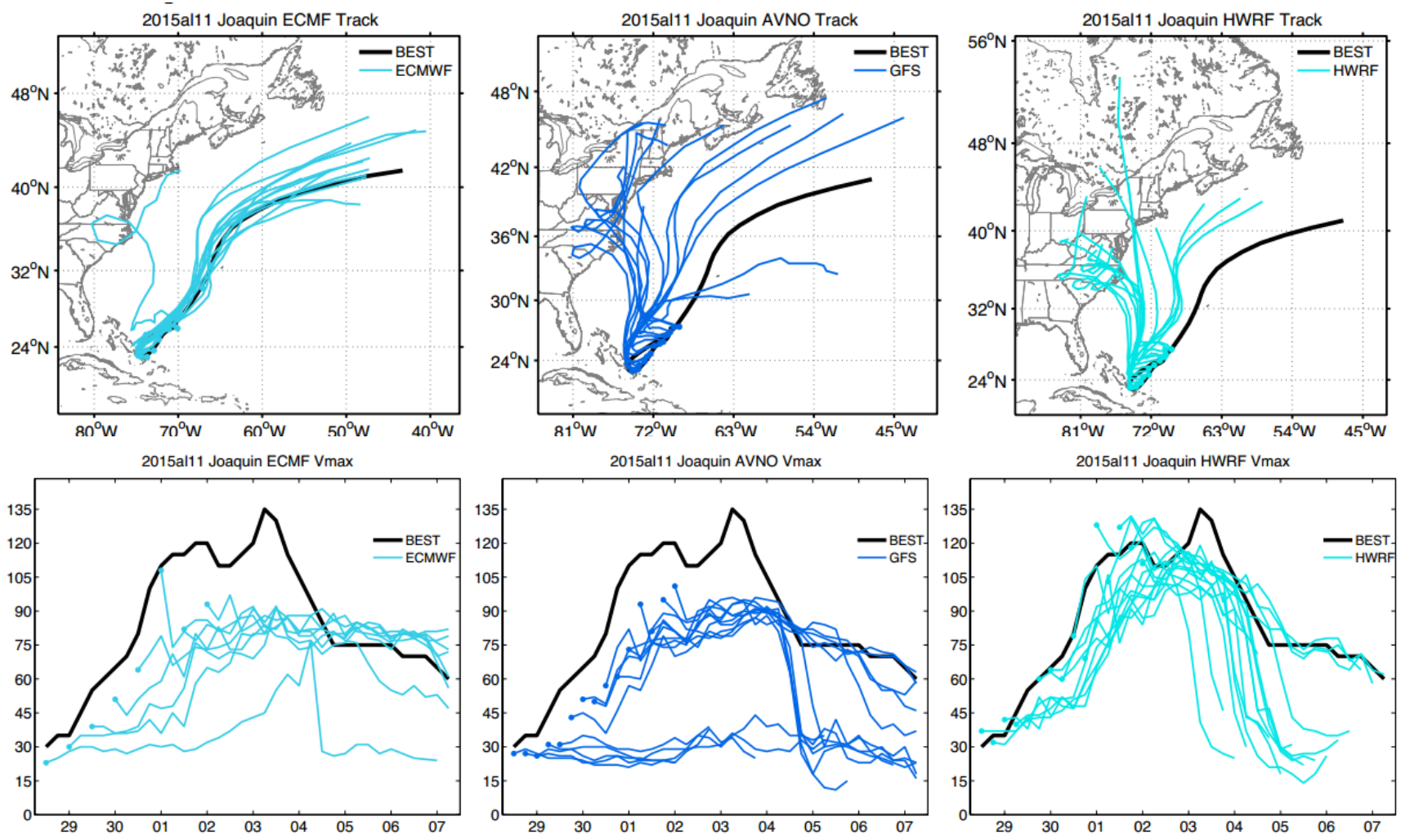
GOES-13 data assimilation with PSU-EnKF Hurricane Joaquin (2015): Track and Intensity

Lei Zhu

Operational forecasts



Satellite Obs

GOES-13 Imager:

Geostationary orbit; altitude 35786km; 75° W;

5 channels:

Visible channel: 0.65μm (0.55-0.75, 1km resolution)

Infrared channel: 3.90μm (3.80-4.00); 6.55μm (5.80-7.30, 4km, water vapor channel); 10.70μm (10.2-11.2); 13.35μm (13.0-13.7)

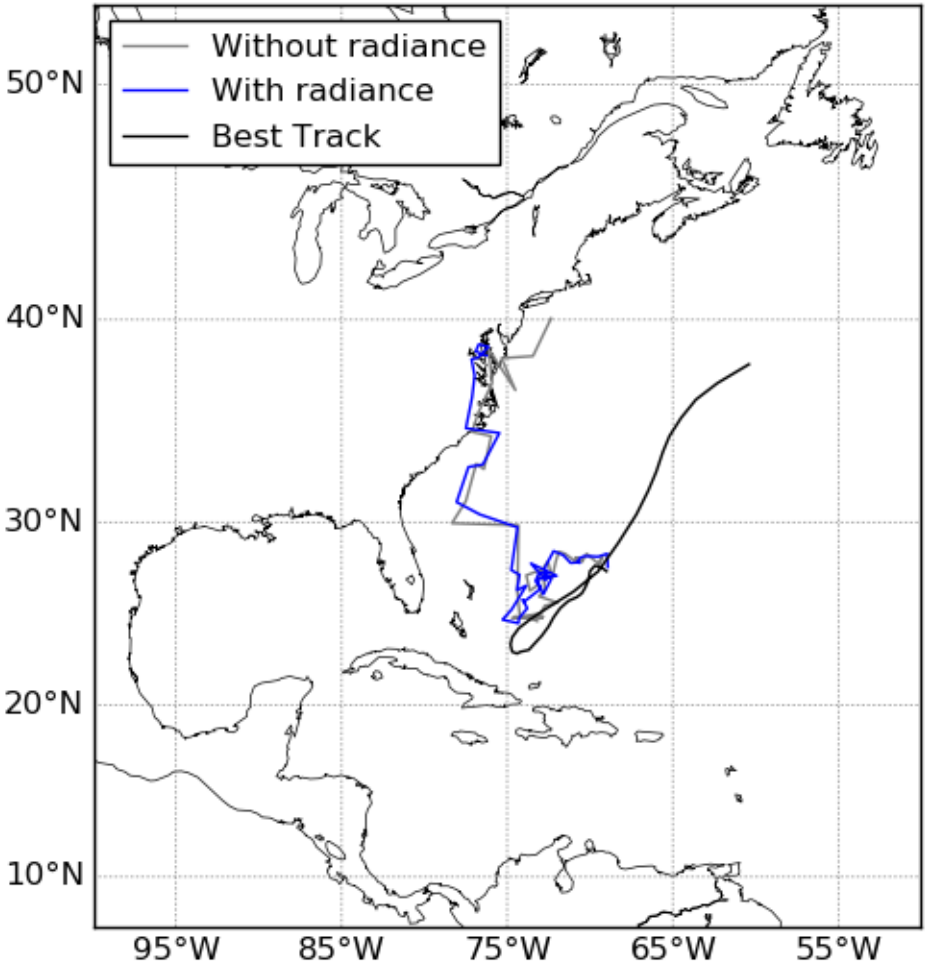
DA system:

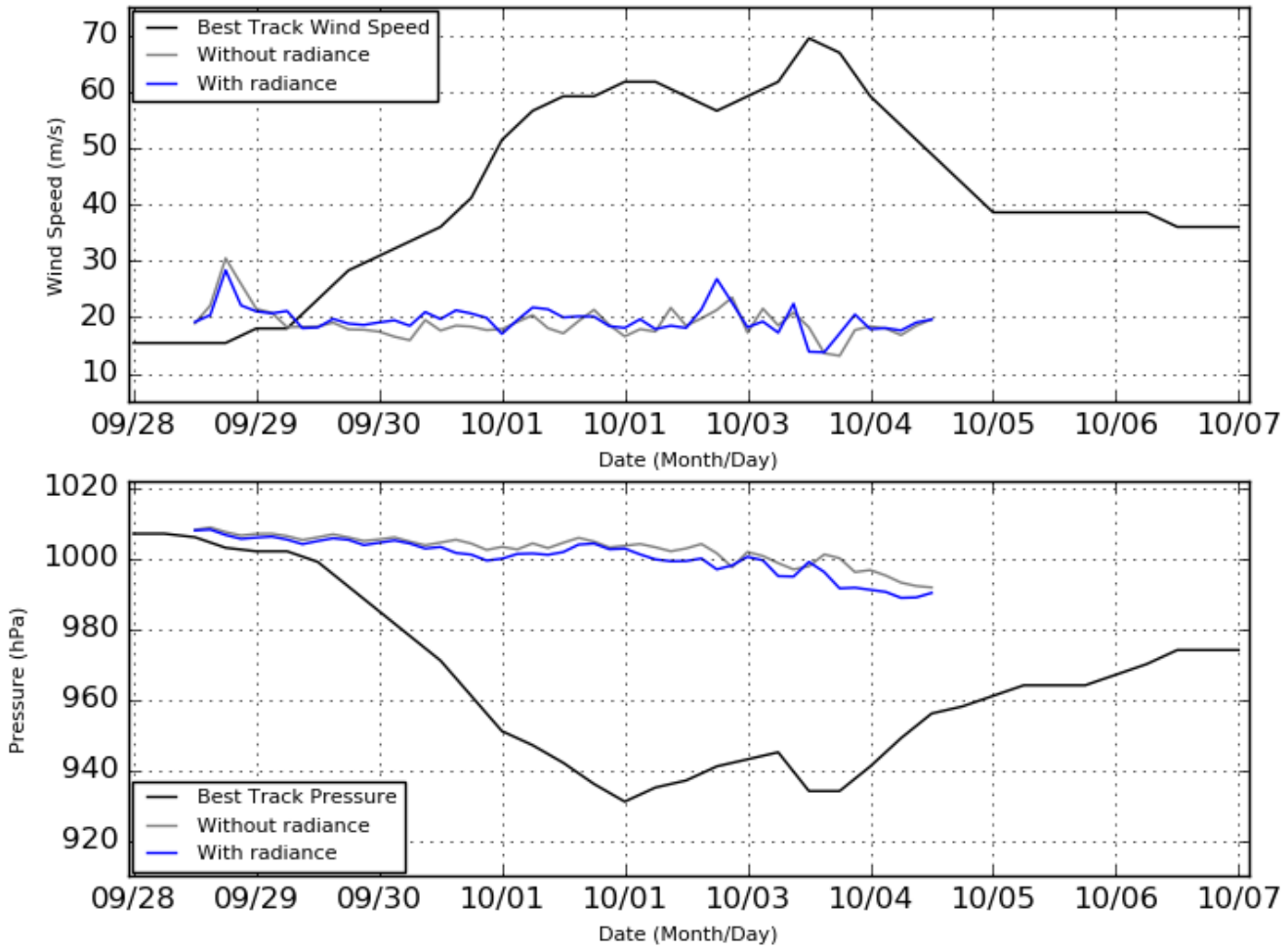
PSU realtime EnKF-WRF system

Experimental set-up

1. 12-hour free ensemble forecasts from 09/28/00/2015
2. DA initiates from 09/28/12, every 3-hour til 10/05/00 (haven’t done yet), with and without GOES-13 radiance data (Channel 3)
3. Do deterministic forecasts every 6-hour

09/28/12


Without radiance
With radiance
Best Track
50°N
40°N
30°N
20°N
10°N
95°W
85°W
75°W
65°W
55°W


Best Track Wind Speed
Without radiance
With radiance
Wind Speed (m/s)
70
60
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09/28
09/29
09/30
10/01
10/01
10/03
10/04
10/05
10/06
10/07
Date (Month/Day)
Pressure (hPa)
1020
1000
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960
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Best Track Pressure
Without radiance
With radiance
09/28
09/29
09/30
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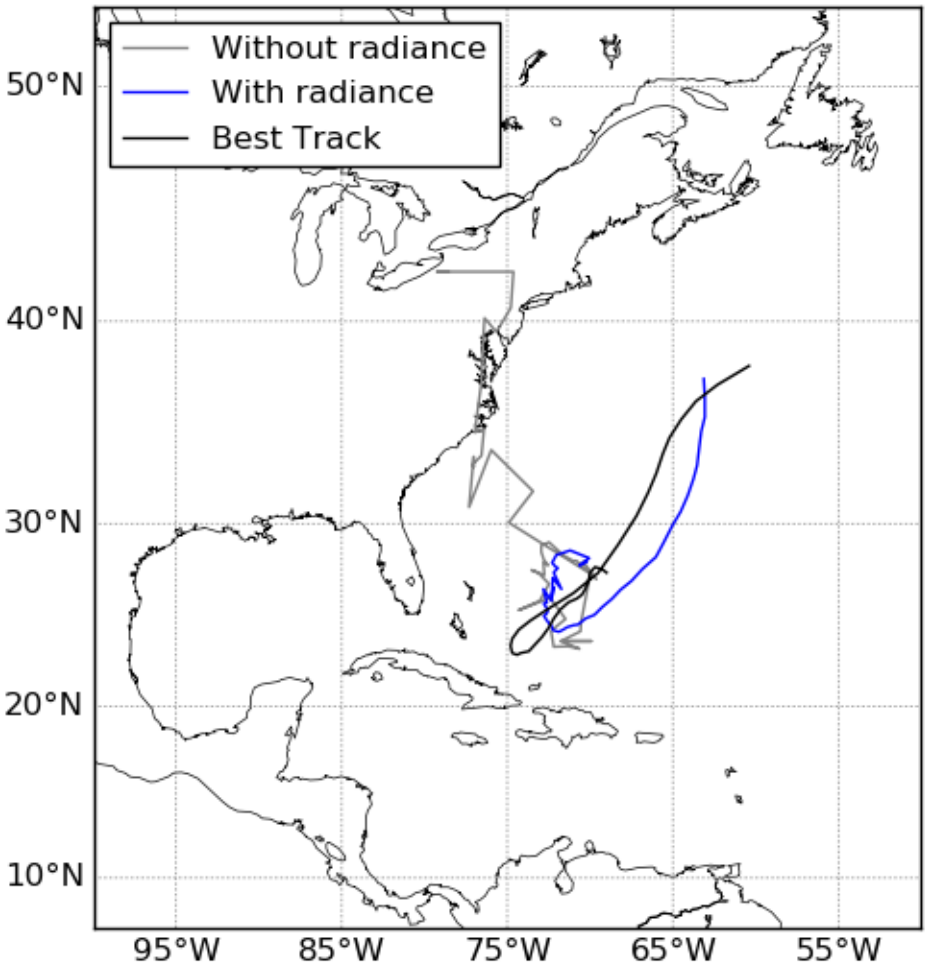
10/07
Date (Month/Day)

09/29/00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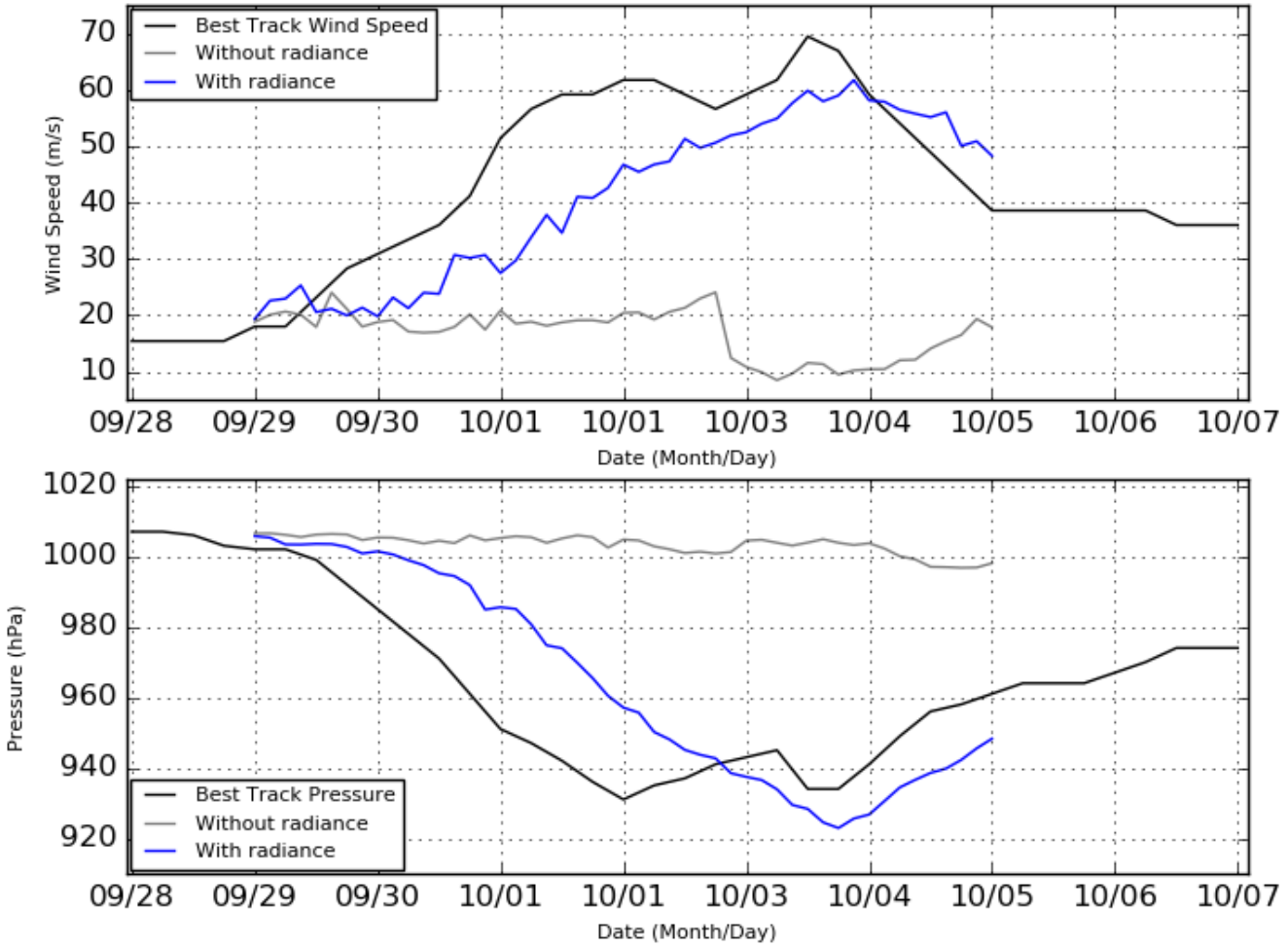
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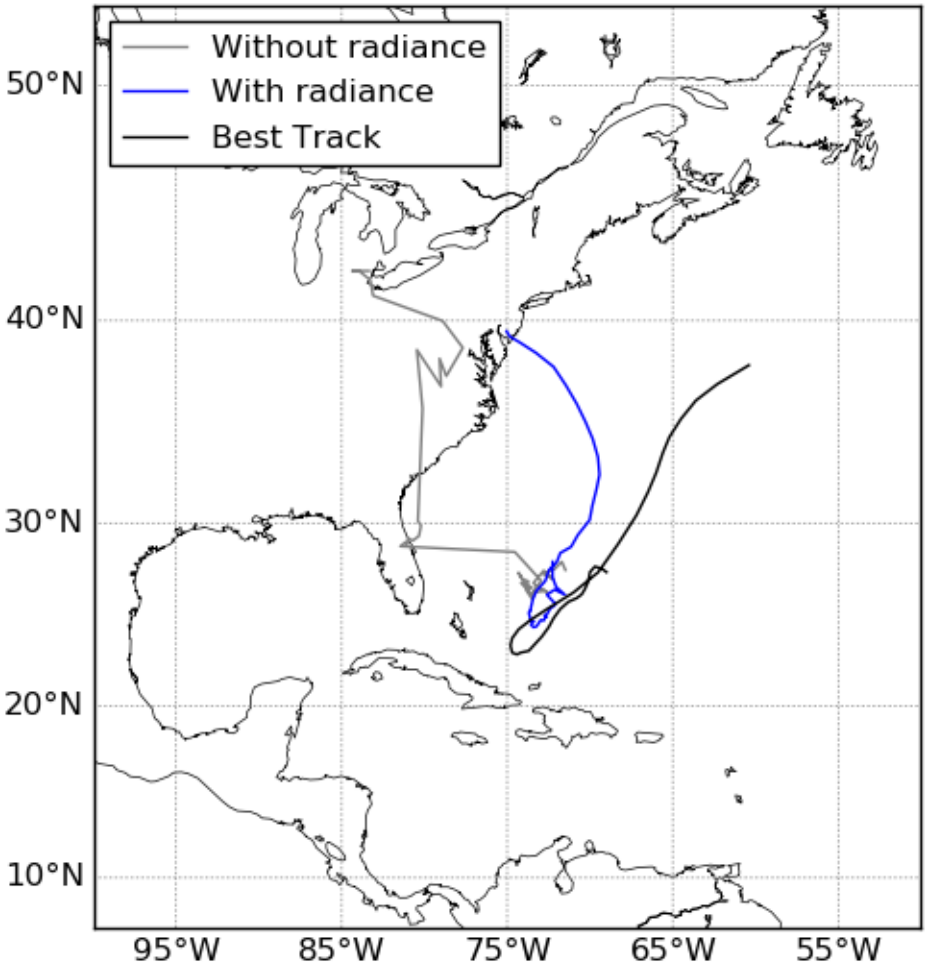
09/29/12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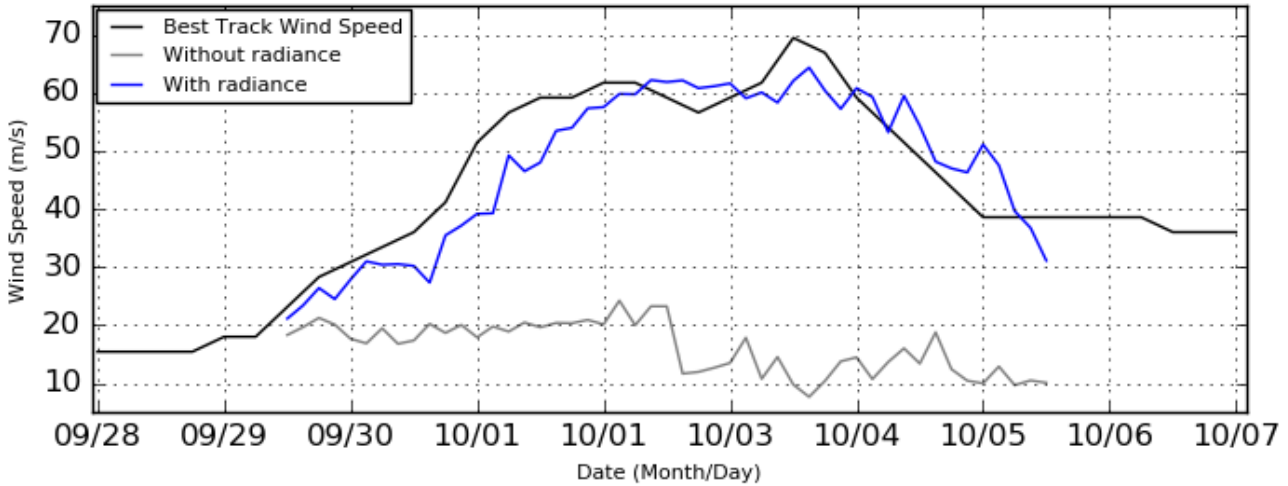
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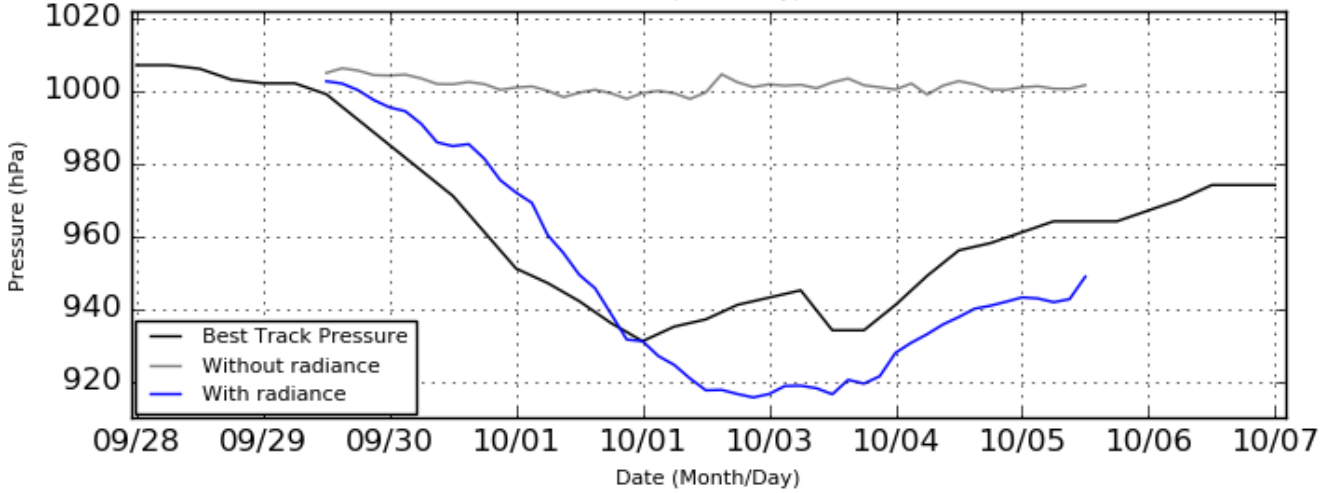
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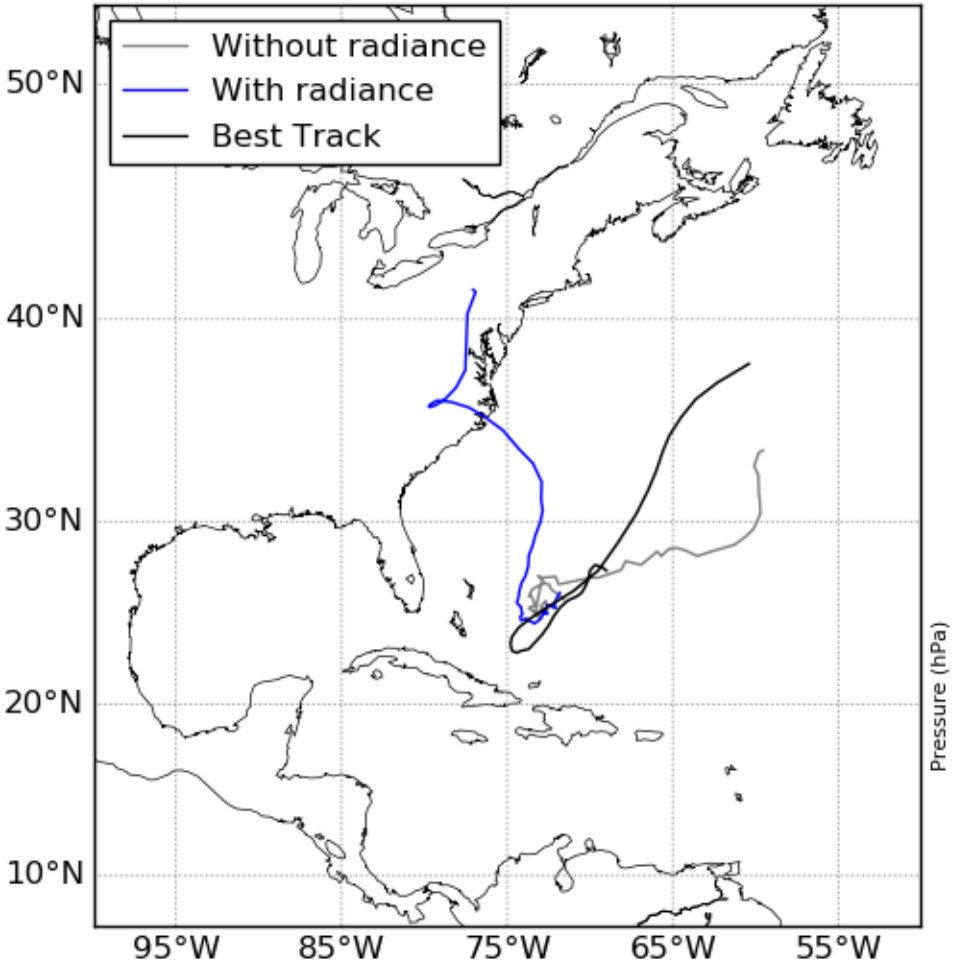
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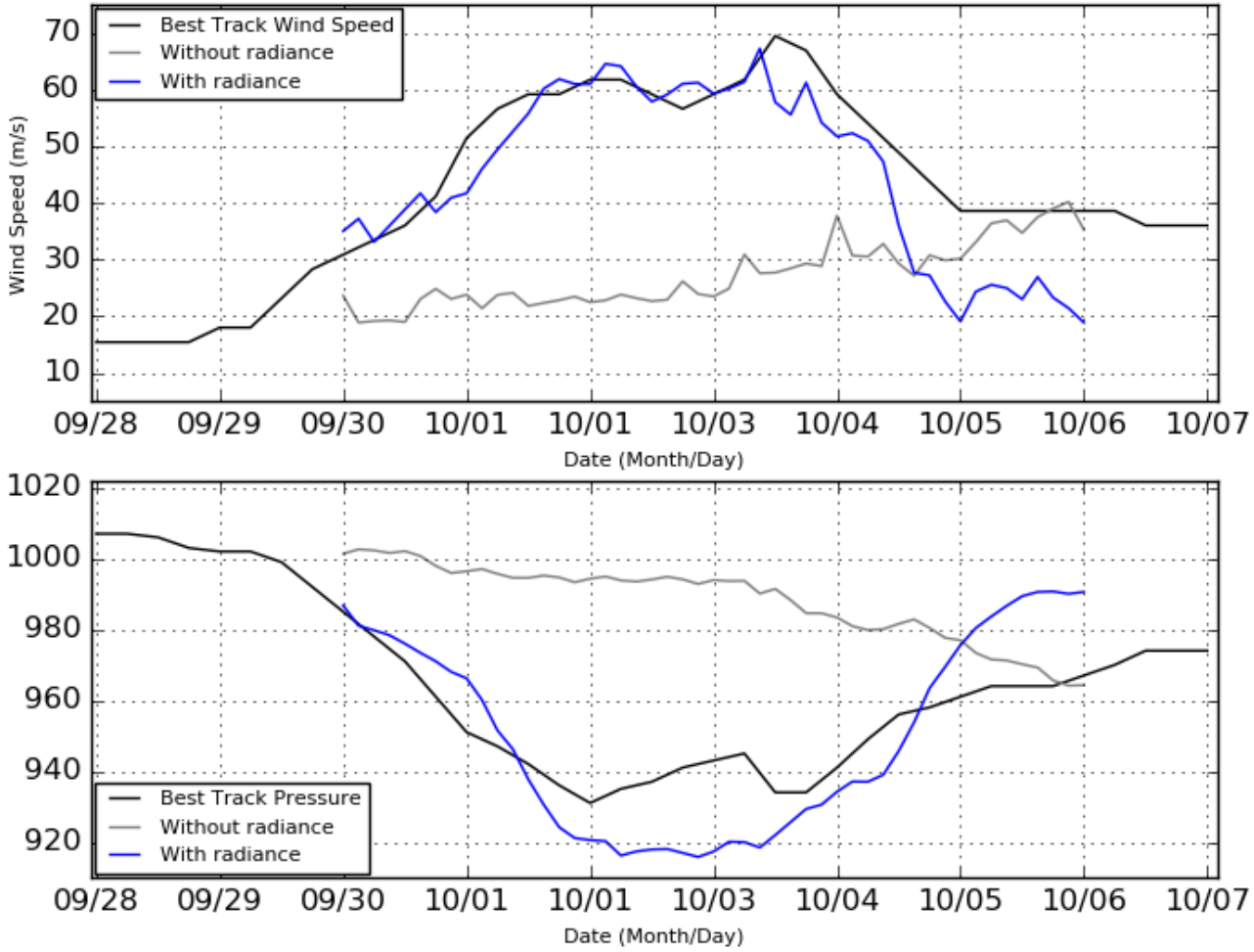
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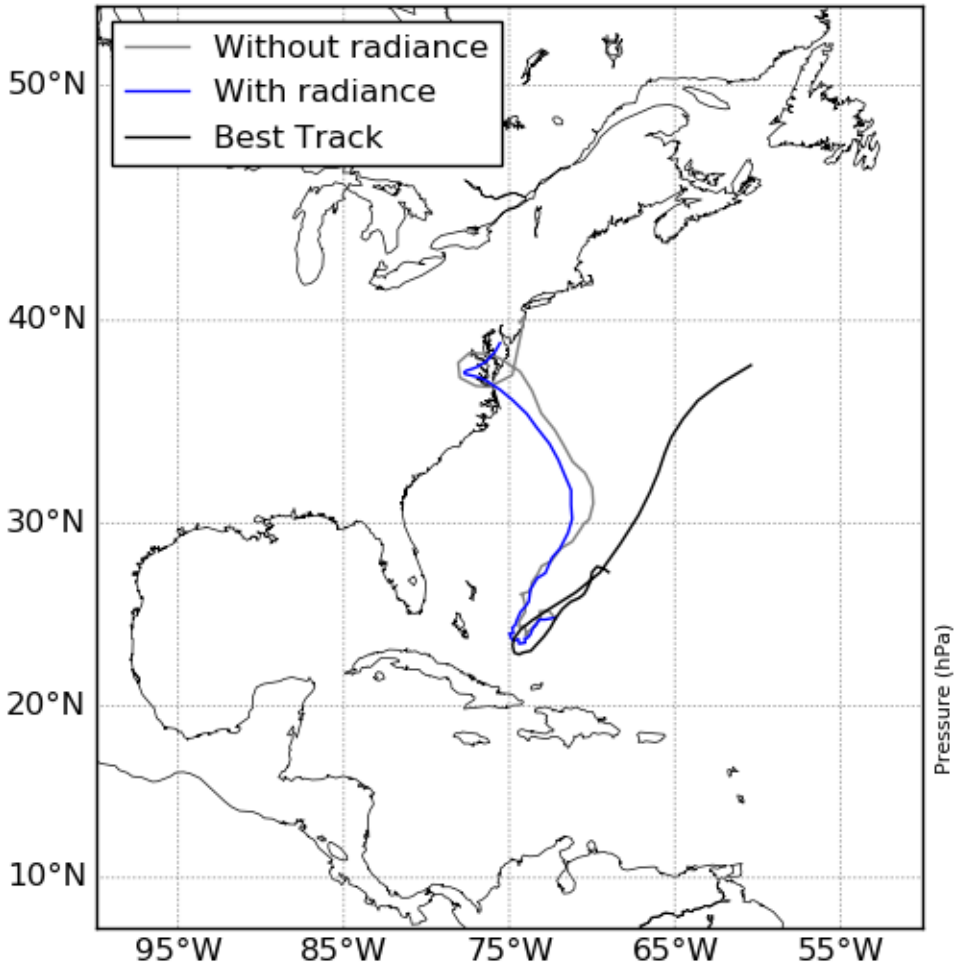
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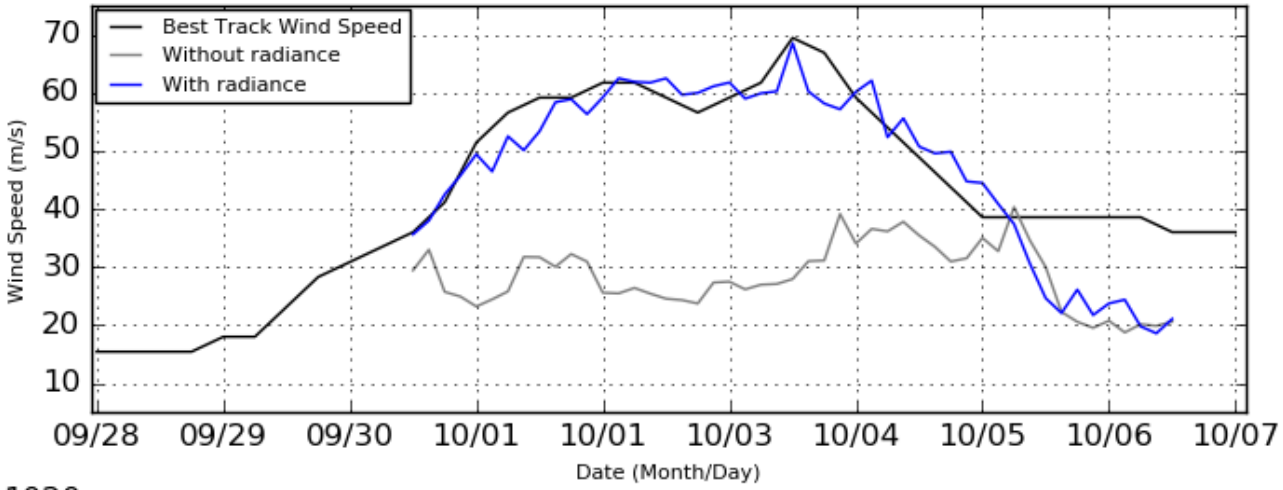
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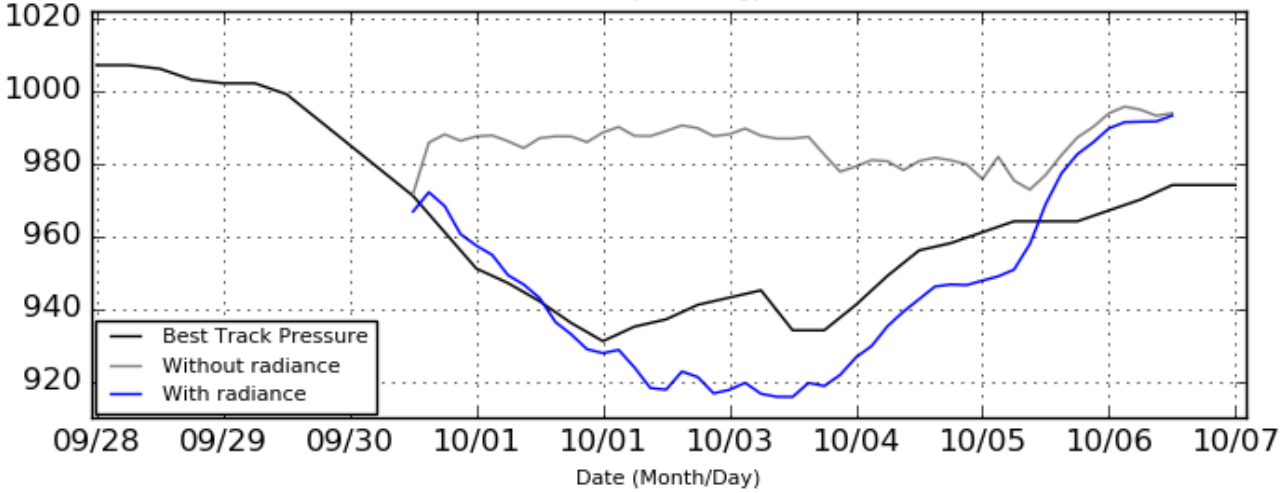
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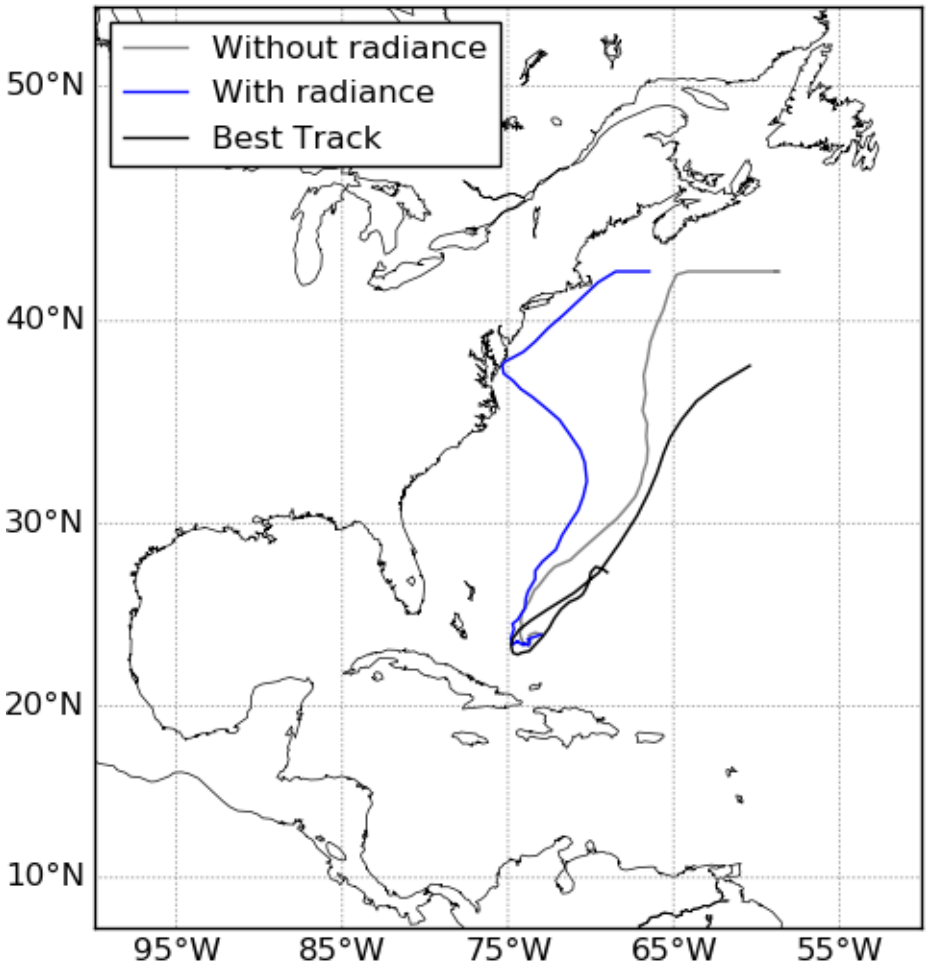
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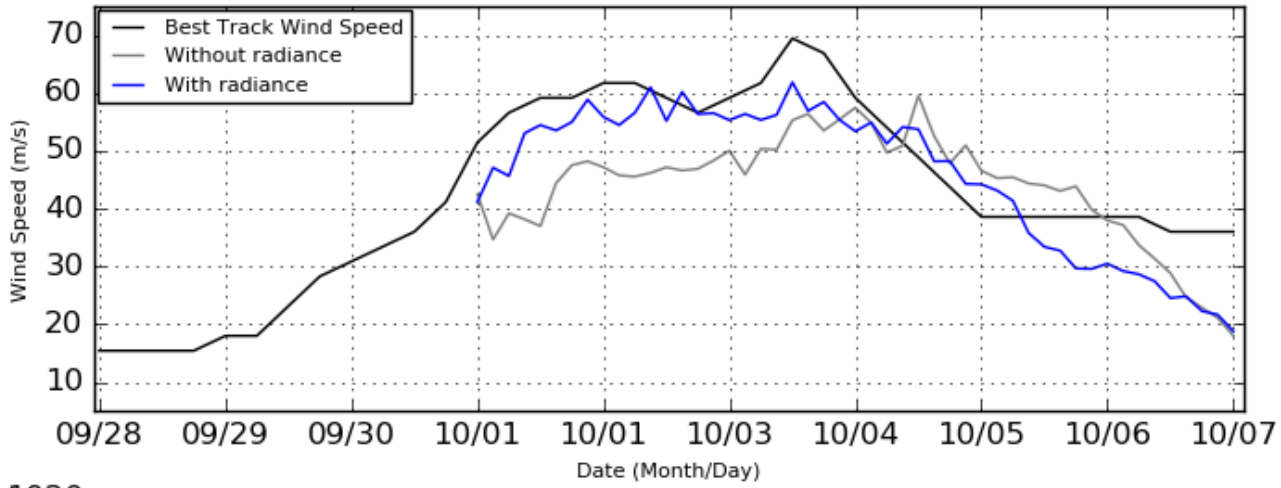
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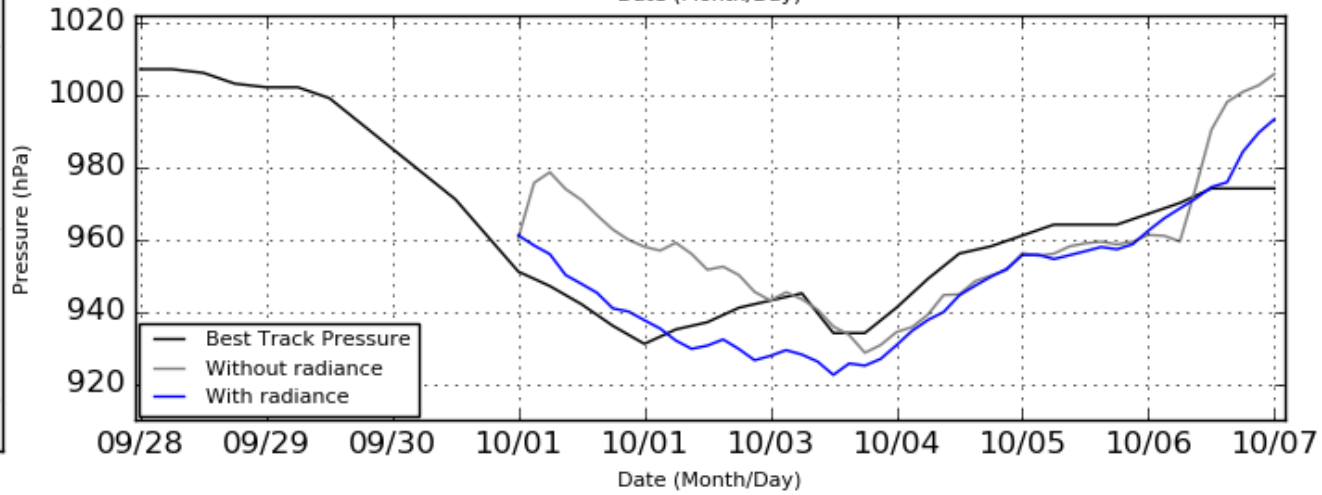
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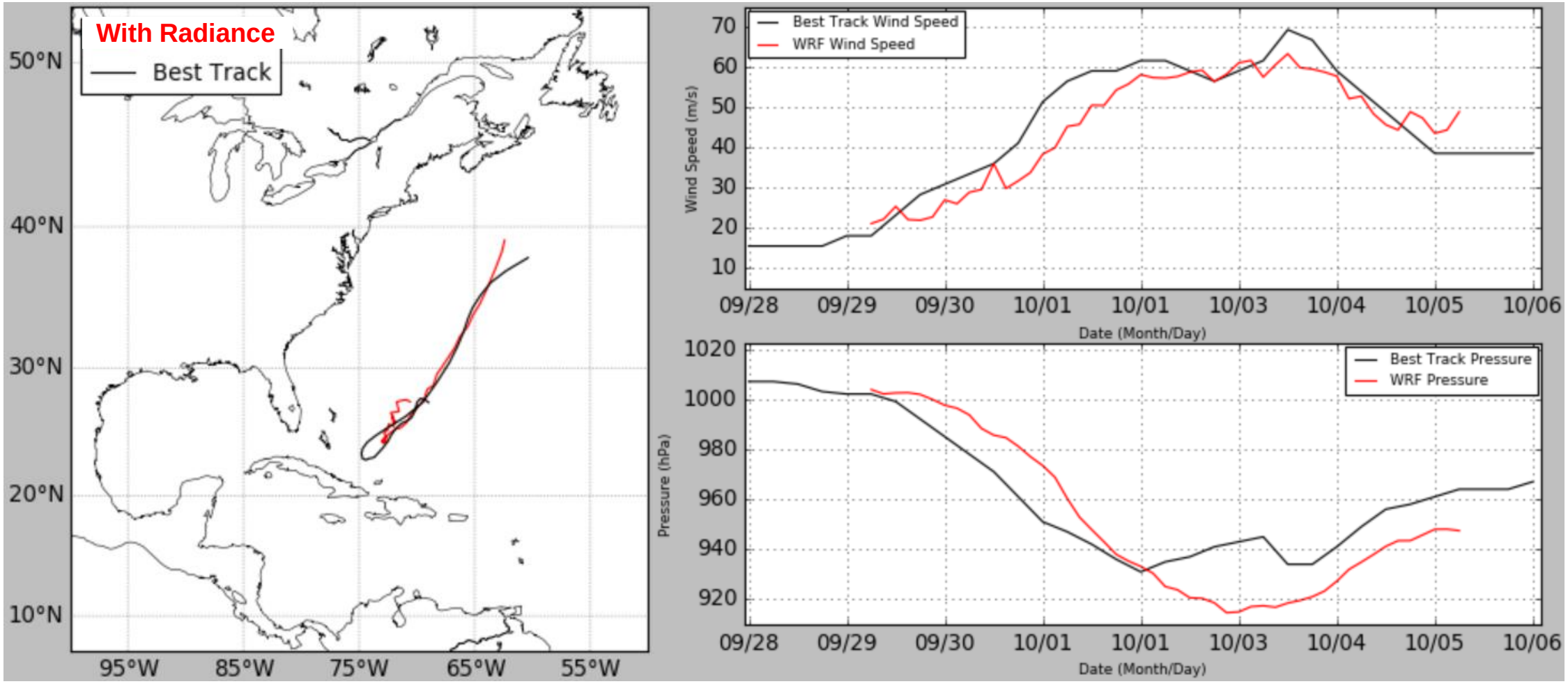
Conclusion

1. After the satellite data (GOES-13 channel 3) been digested into the initial conditions, quite a lot improvement can be obtained on the intensity forecasts while not too distinct on the track forecasts.

Initiated at 09/29/06