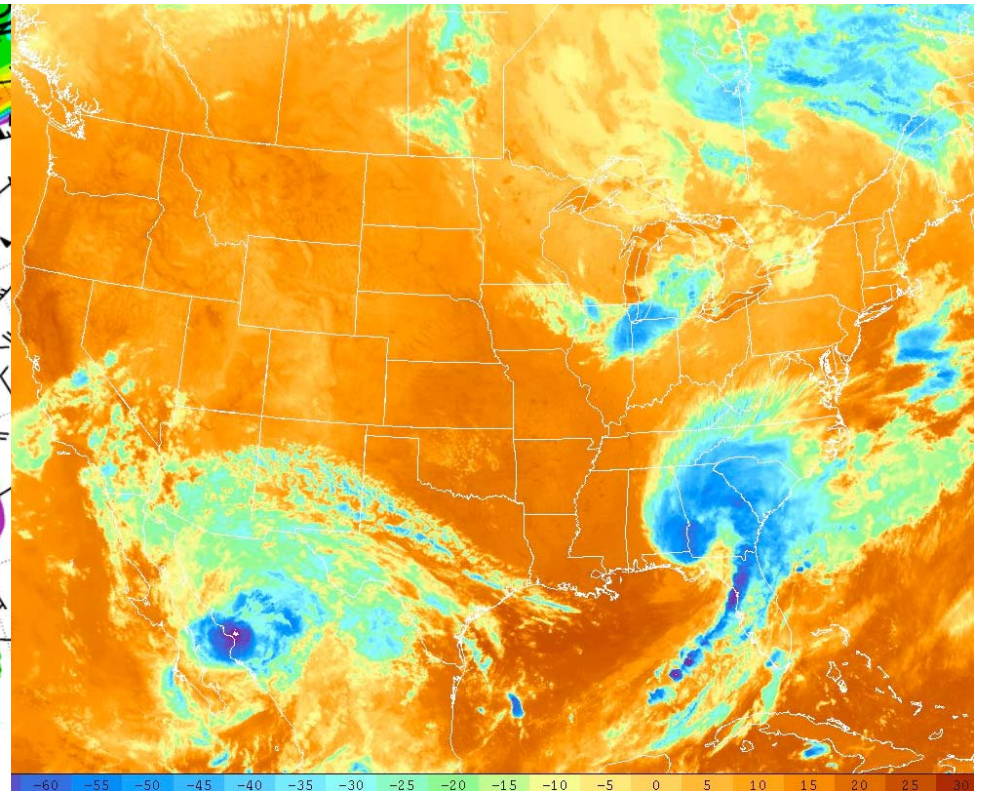


980903/1200F000 700 hPa Relative Vorticity, DT Pressure and Winds



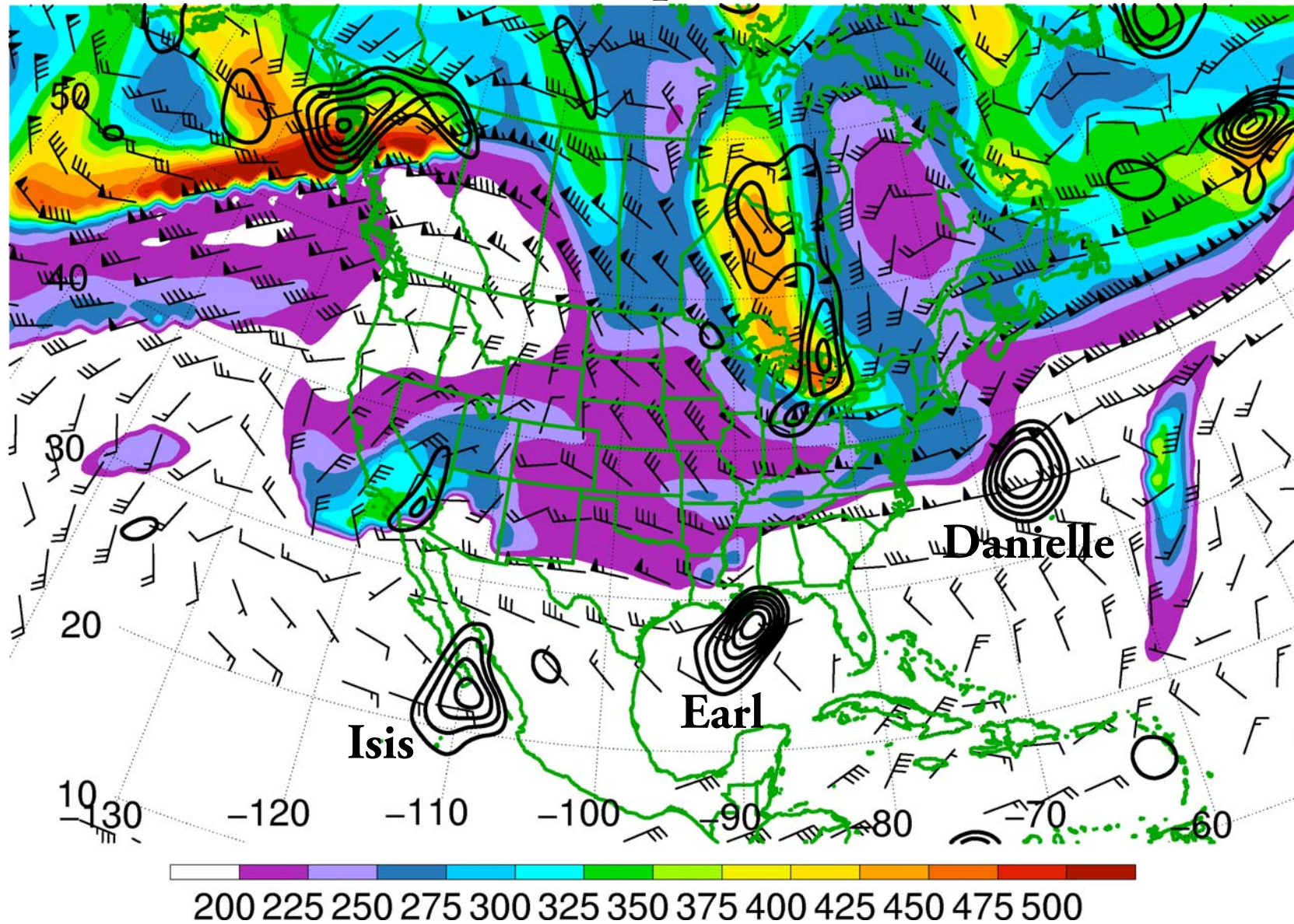
The Impact of Recurring Eastern Pacific Tropical Cyclones on the Downstream North American Flow Pattern

Kristen L. Corbosiero (UCLA)

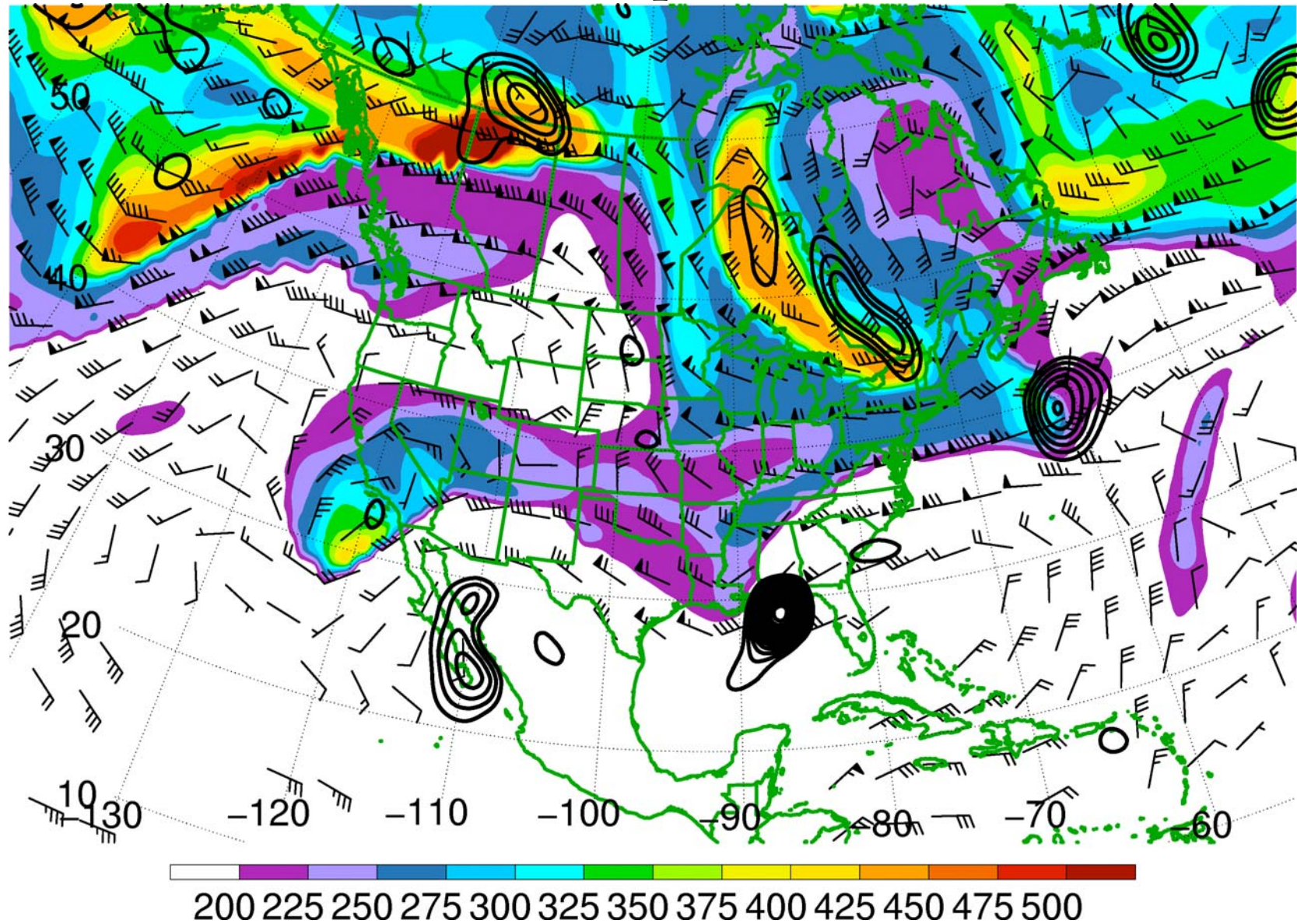
Ron McTaggart-Cowan (Environment Canada)

Lance Bosart (University at Albany)

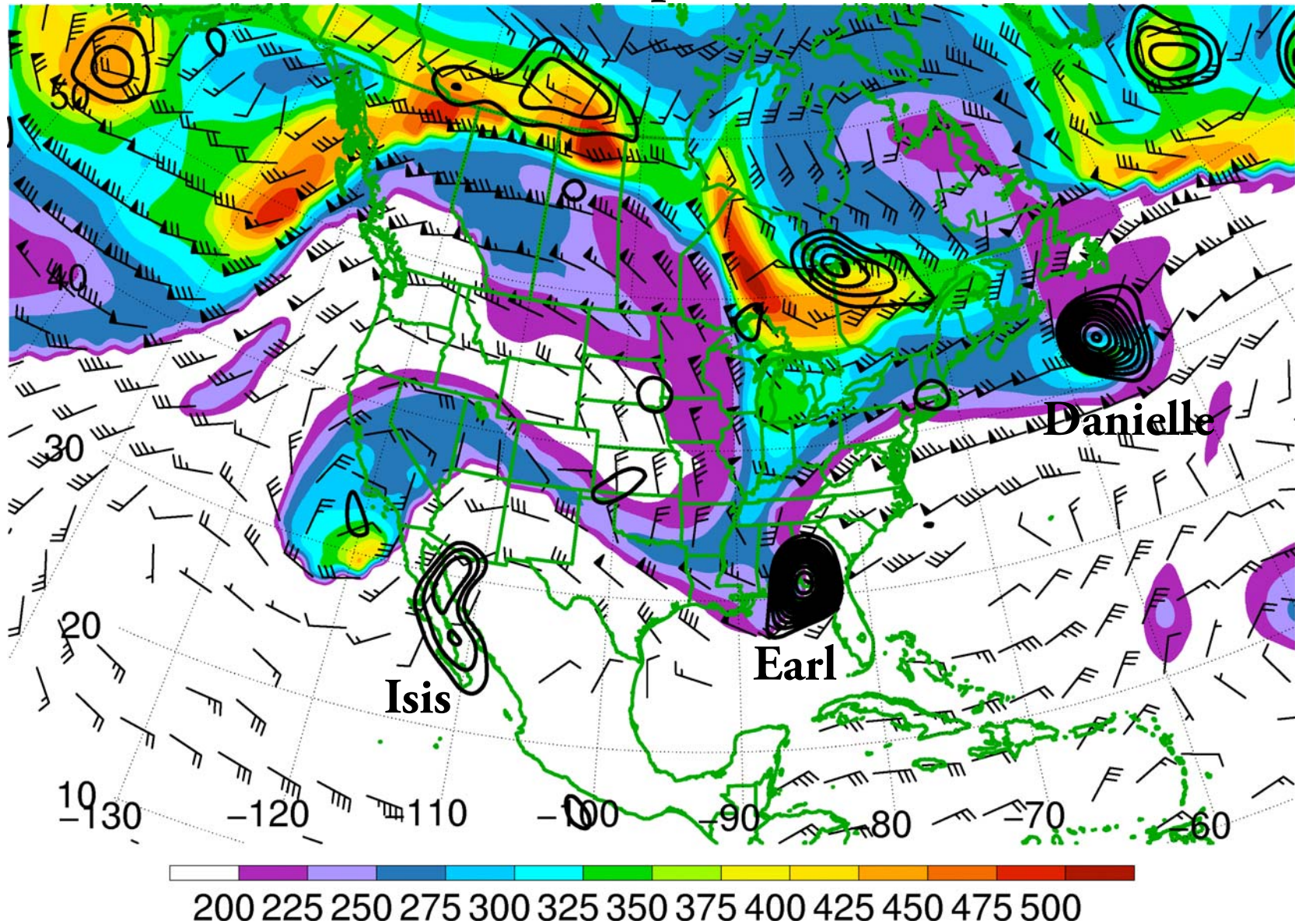
DT pressure (hPa), DT winds, & 700 hPa vorticity 12 UTC 2 September 1998



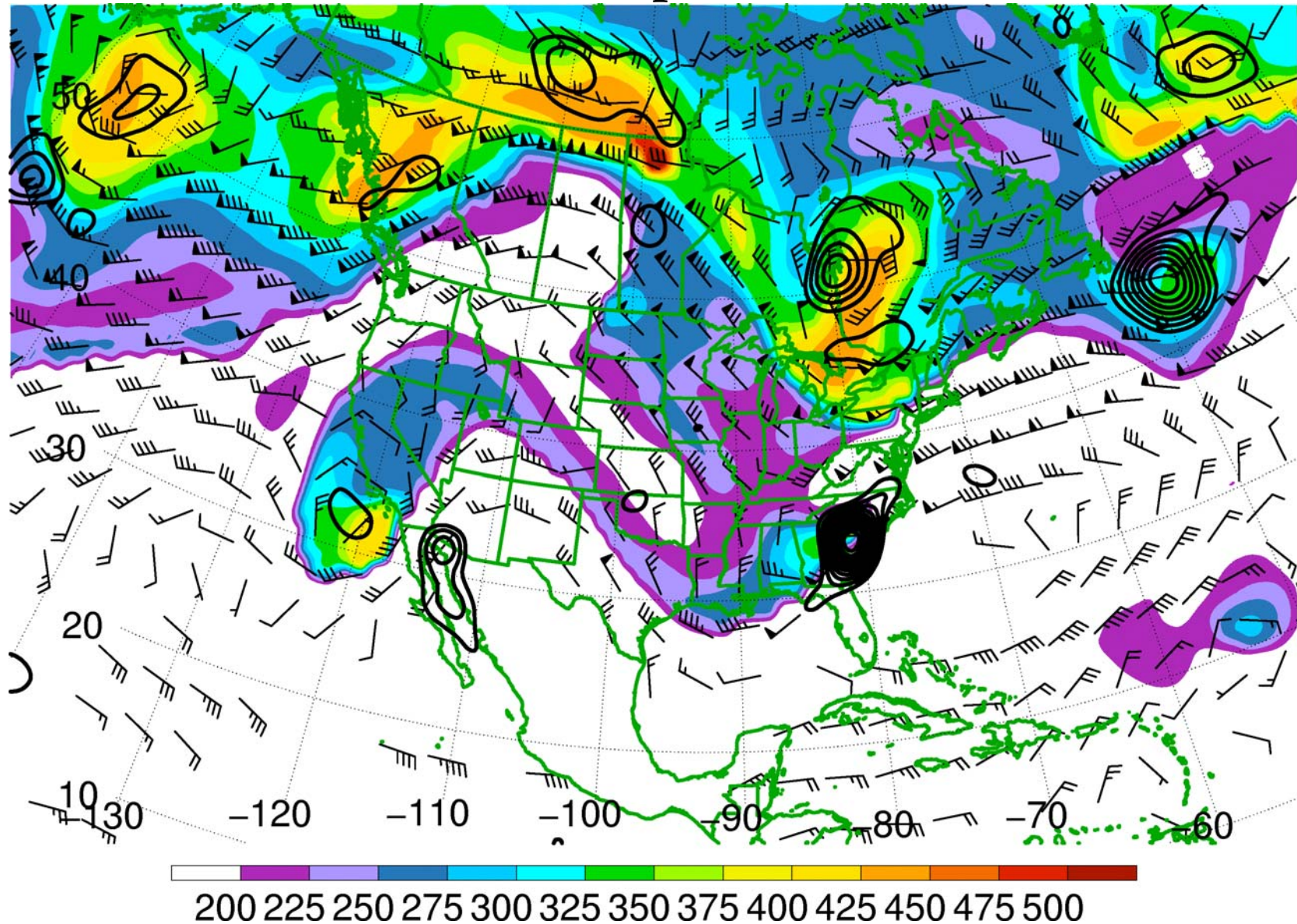
DT pressure (hPa), DT winds, & 700 hPa vorticity 00 UTC 3 September 1998



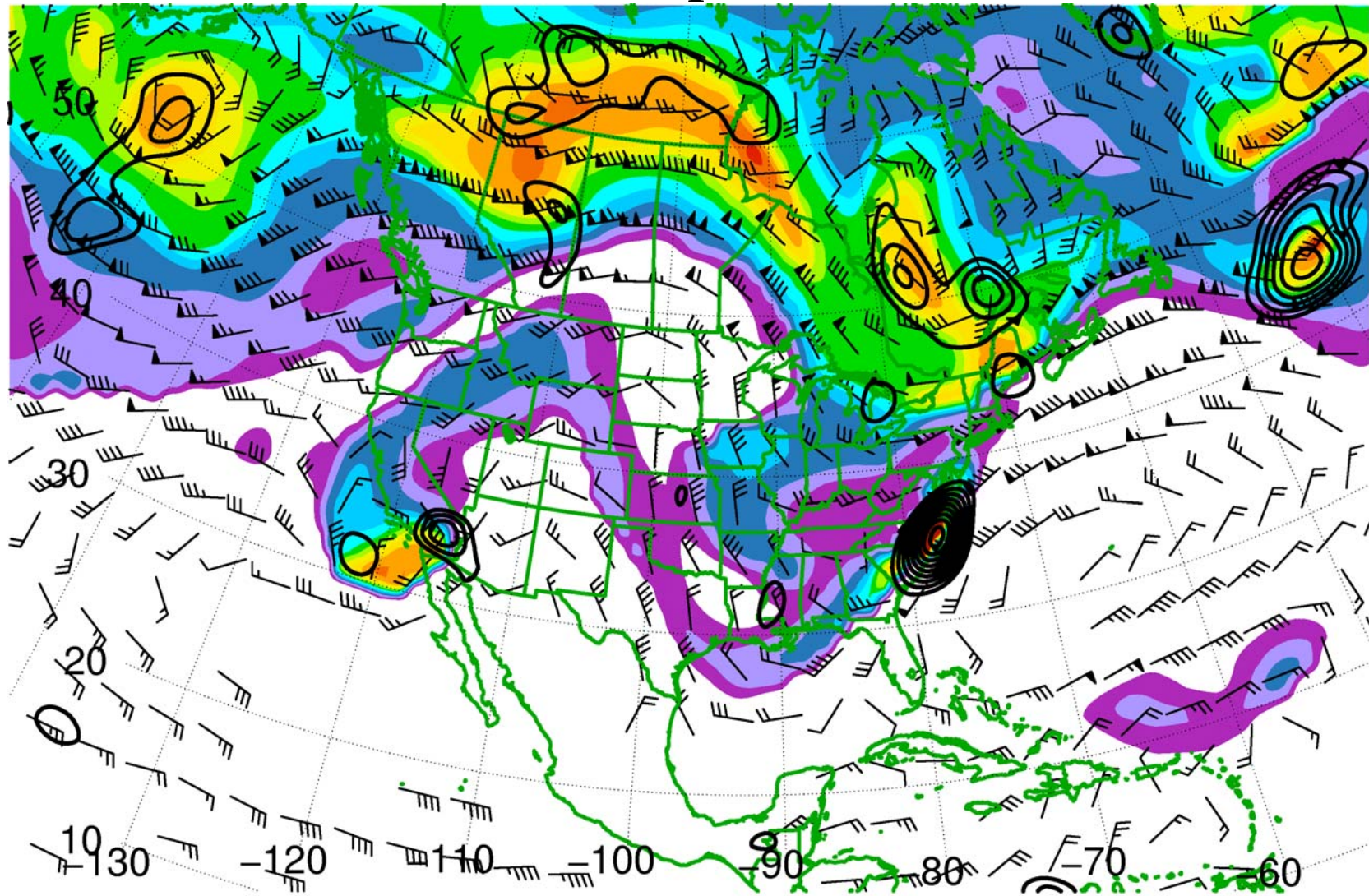
DT pressure (hPa), DT winds, & 700 hPa vorticity 12 UTC 3 September 1998



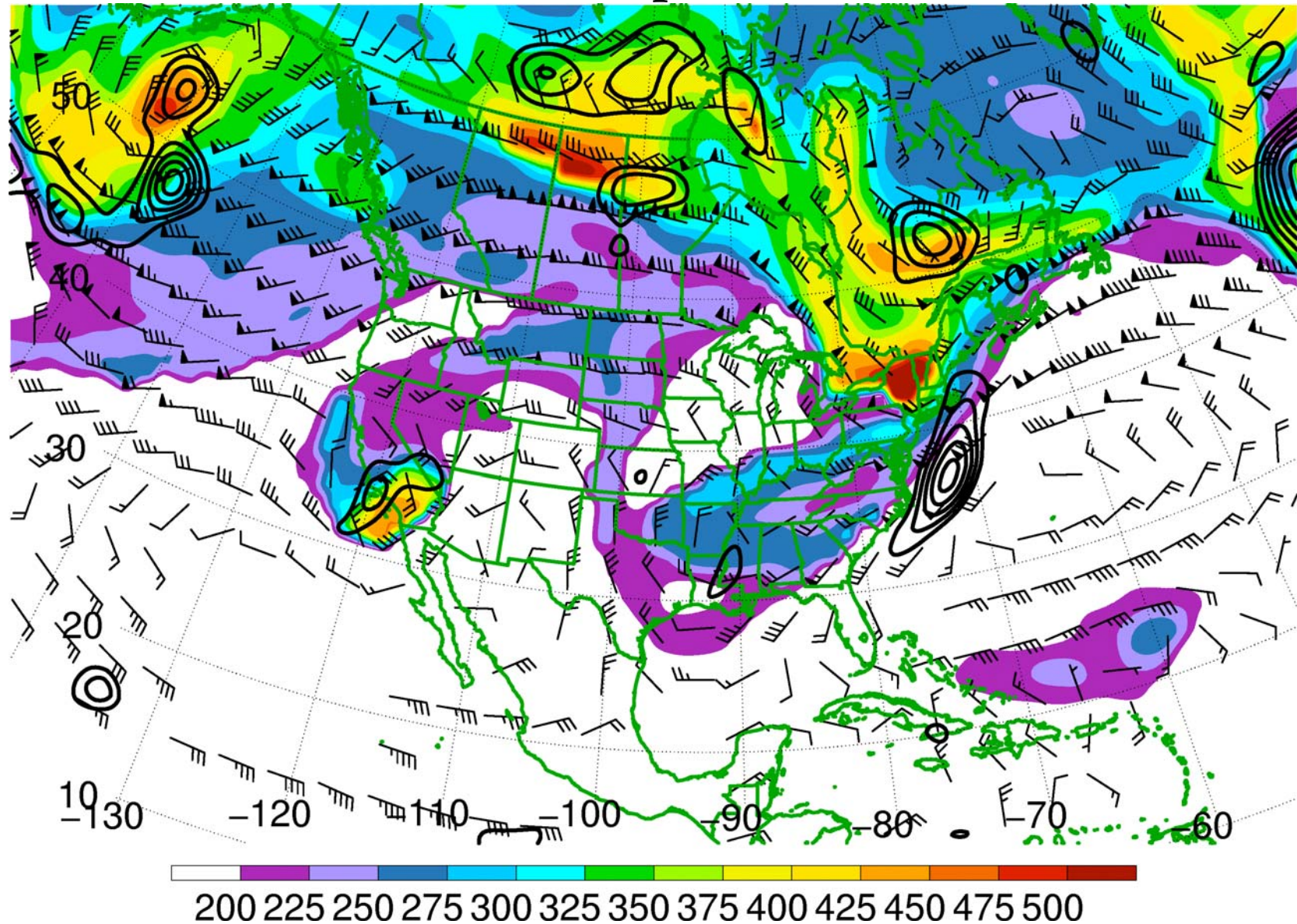
DT pressure (hPa), DT winds, & 700 hPa vorticity 00 UTC 4 September 1998



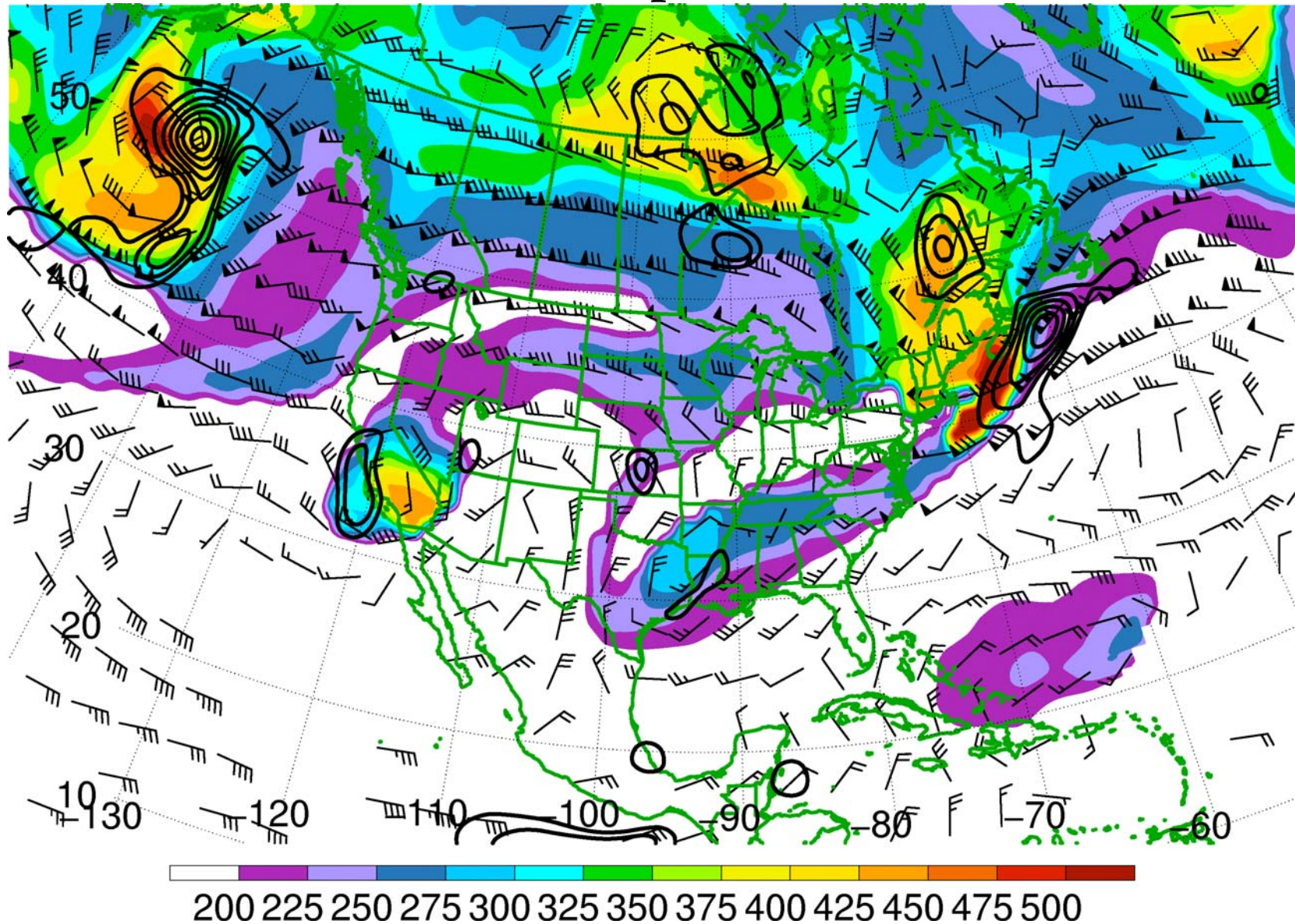
DT pressure (hPa), DT winds, & 700 hPa vorticity 12 UTC 4 September 1998



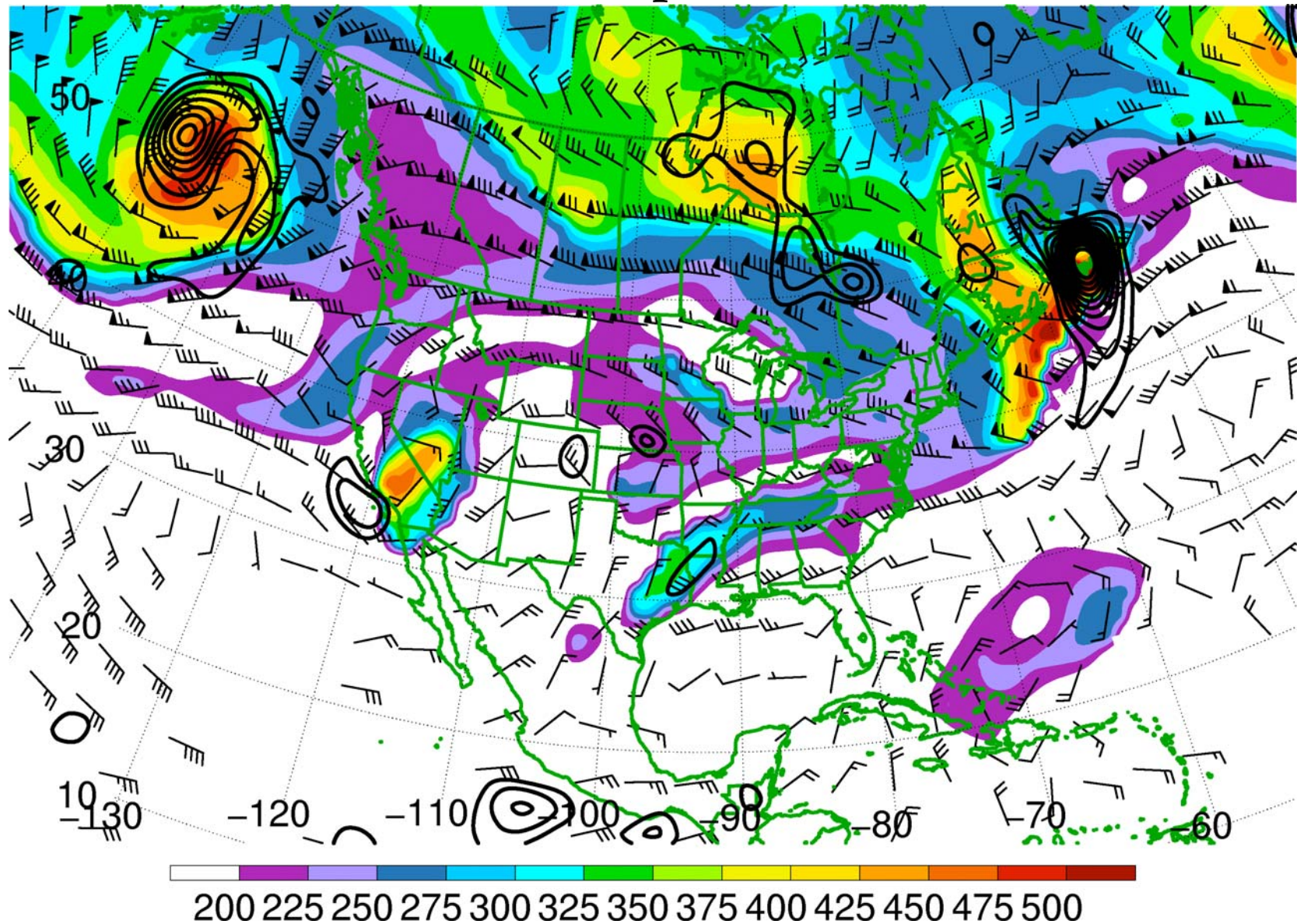
DT pressure (hPa), DT winds, & 700 hPa vorticity 00 UTC 5 September 1998



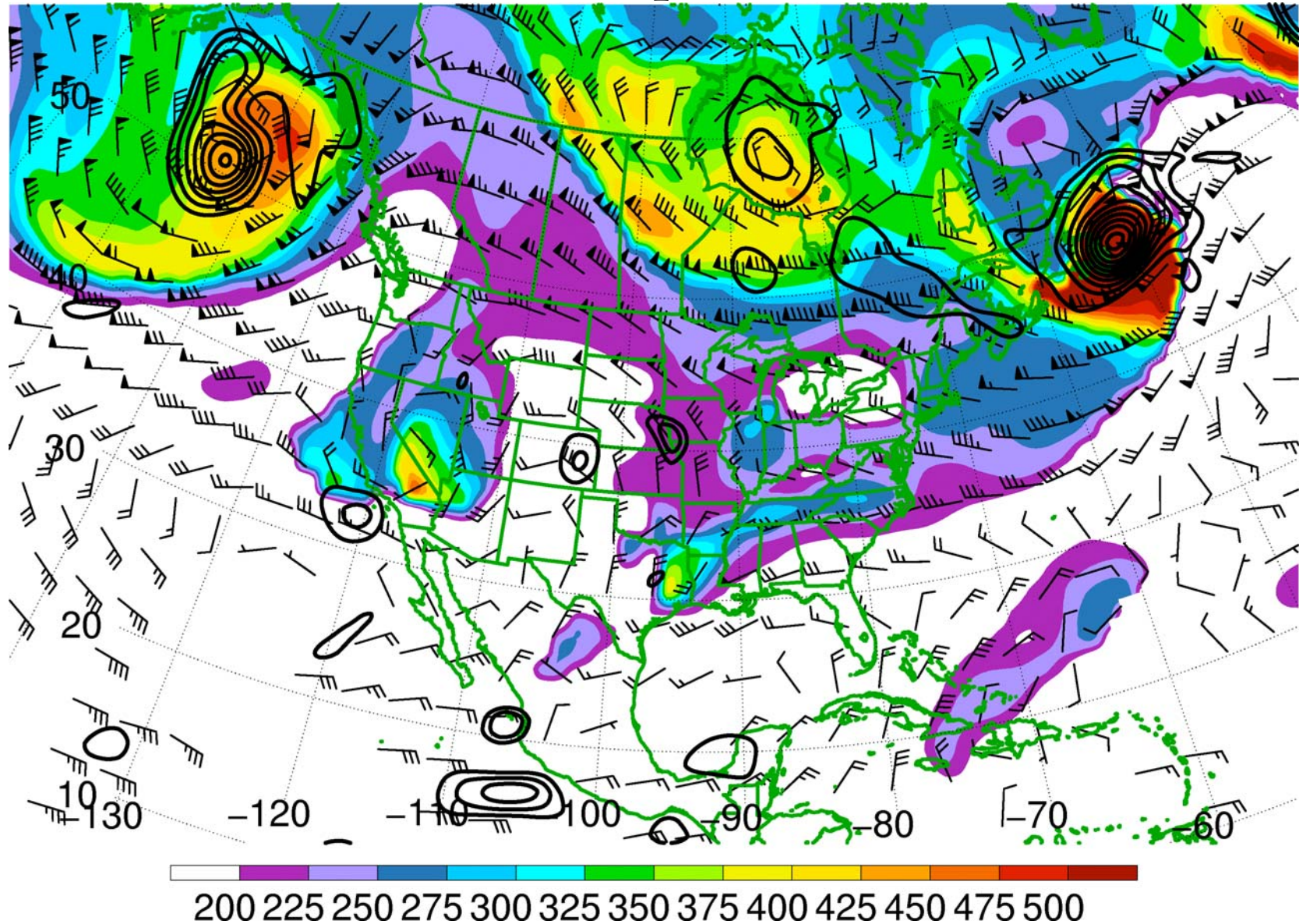
DT pressure (hPa), DT winds, & 700 hPa vorticity 12 UTC 5 September 1998



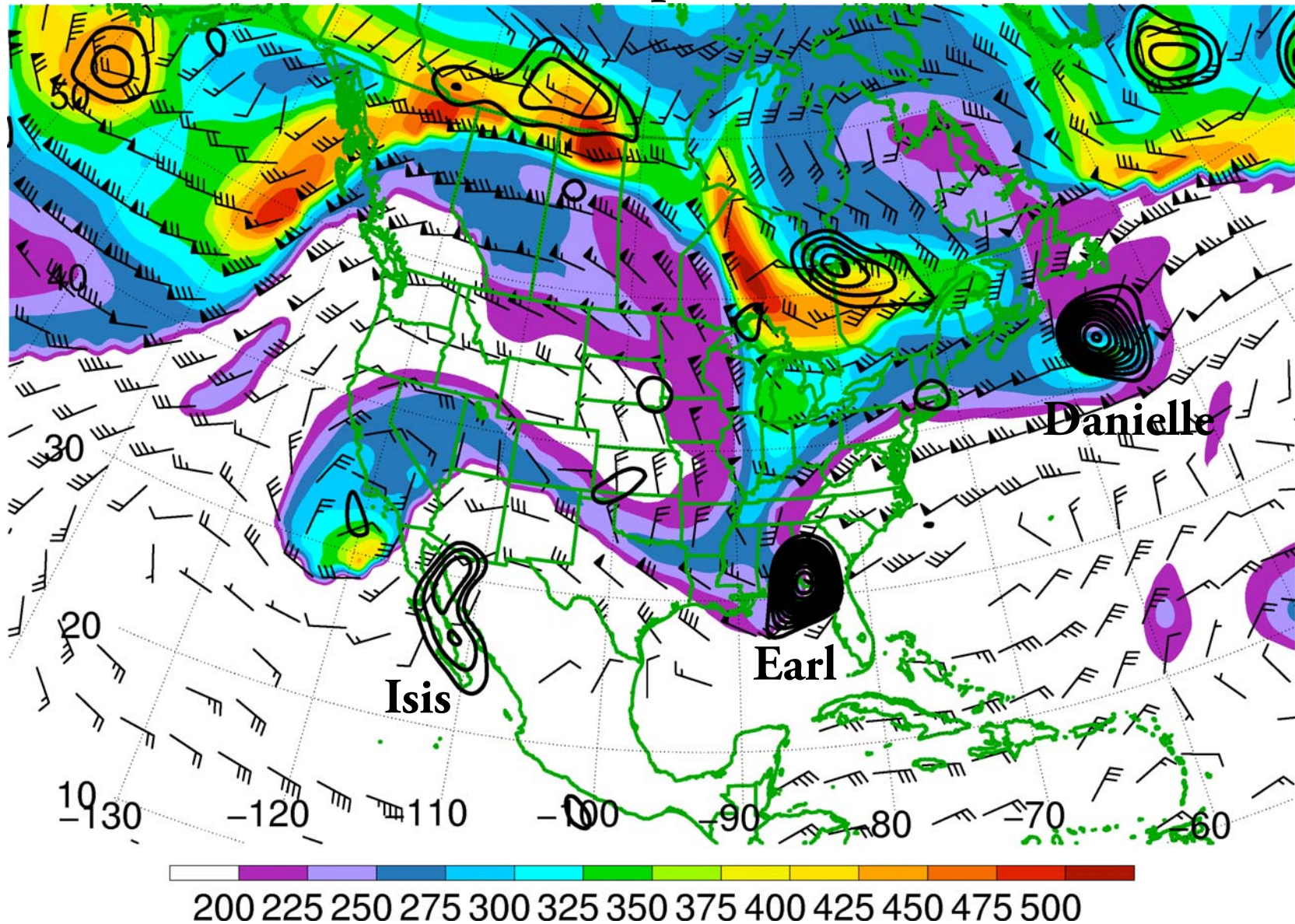
DT pressure (hPa), DT winds, & 700 hPa vorticity 00 UTC 6 September 1998



DT pressure (hPa), DT winds, & 700 hPa vorticity 12 UTC 6 September 1998

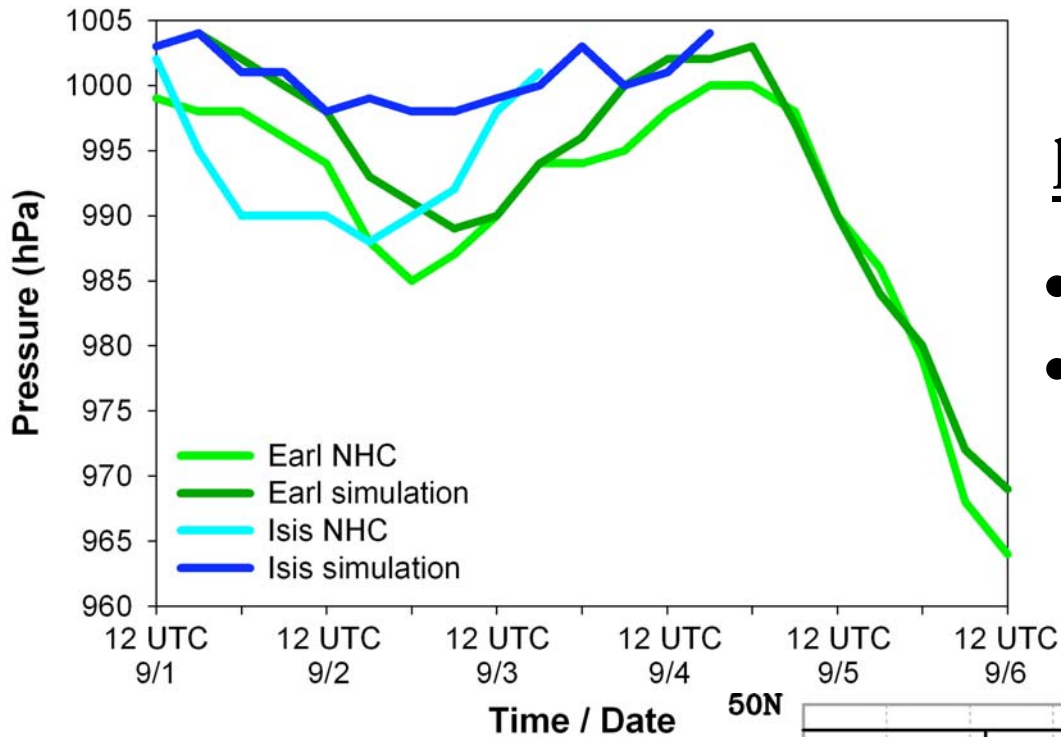


DT pressure (hPa), DT winds, & 700 hPa vorticity 12 UTC 3 September 1998

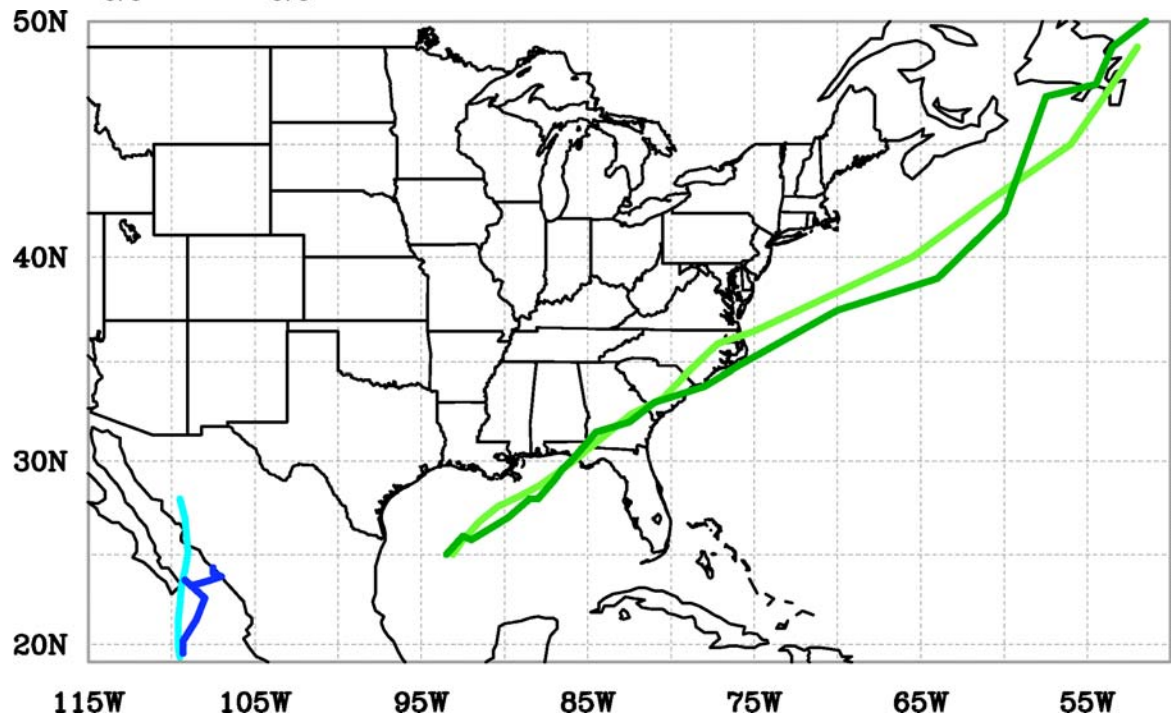


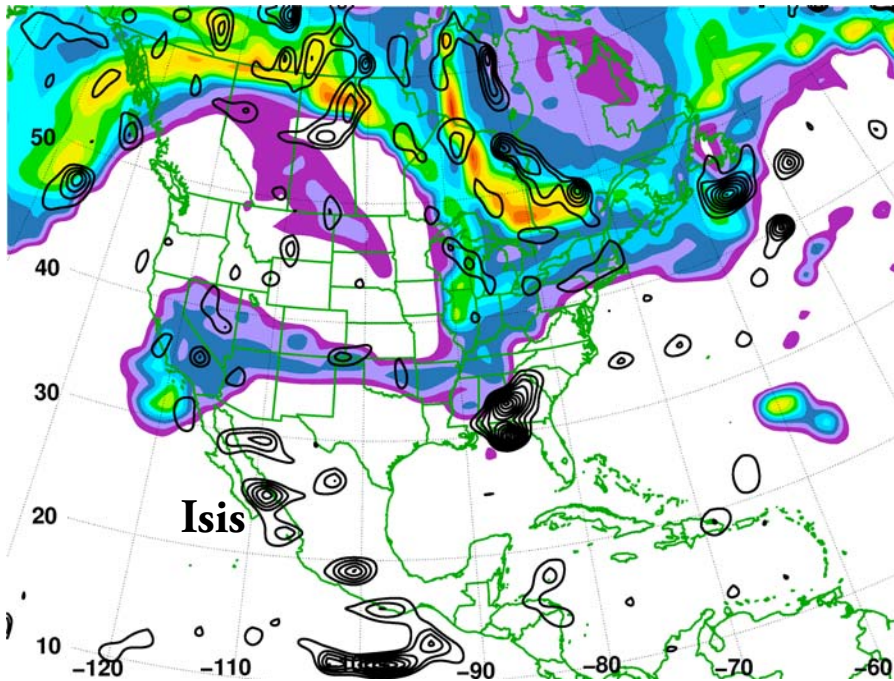
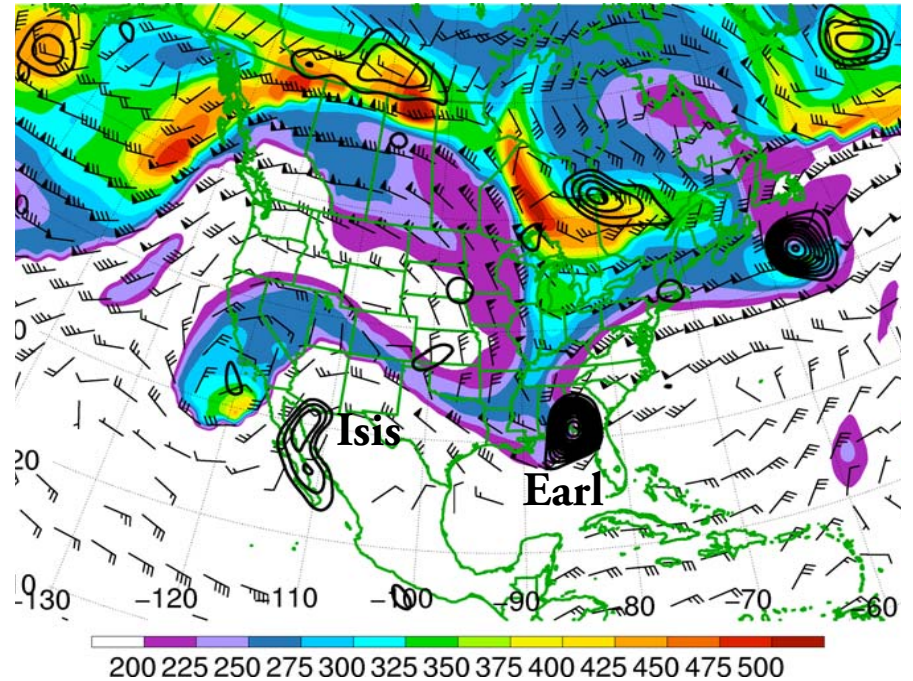
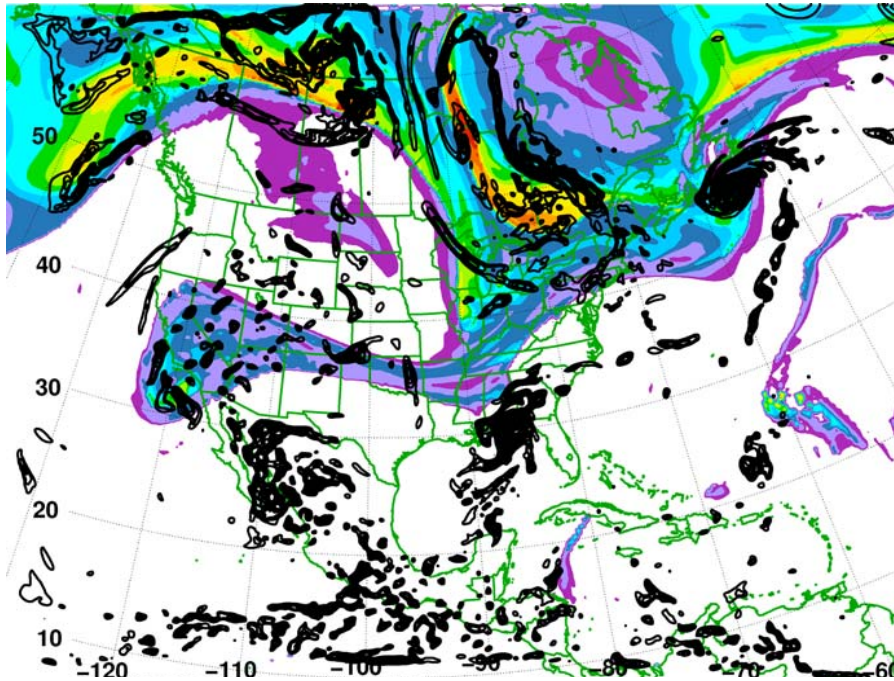
Track and minimum sea level pressure: Earl and Isis

- NHC best track (light)
- 15 km GEM simulation with CMC initial and boundary conditions simulation (dark)



The intensity, track and timing of Earl are all well handled by the **model**, while Isis does not intensify nor does it propagate north of 25° N.

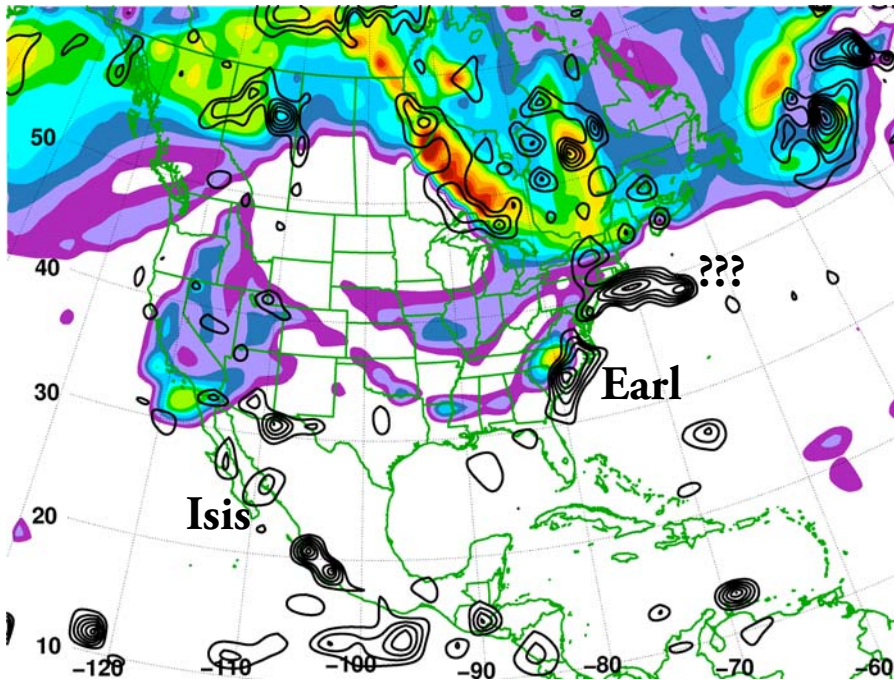
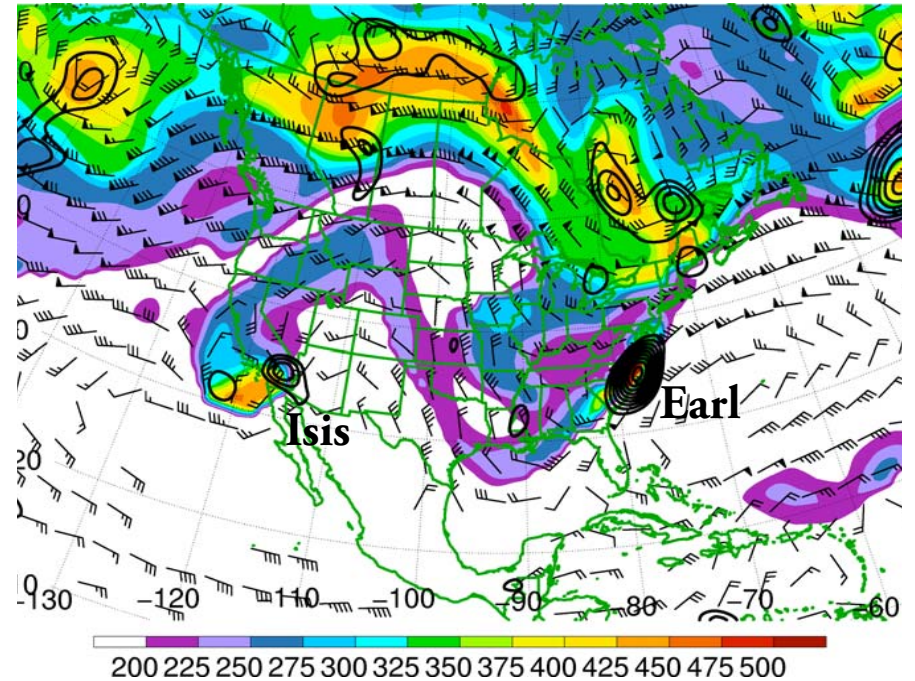
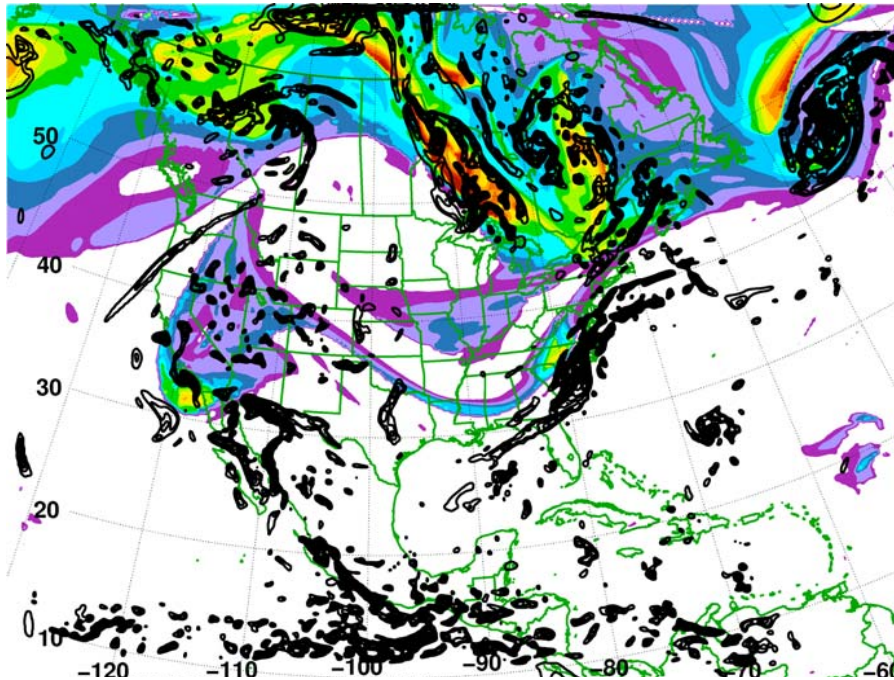




12 UTC 3 September 1998

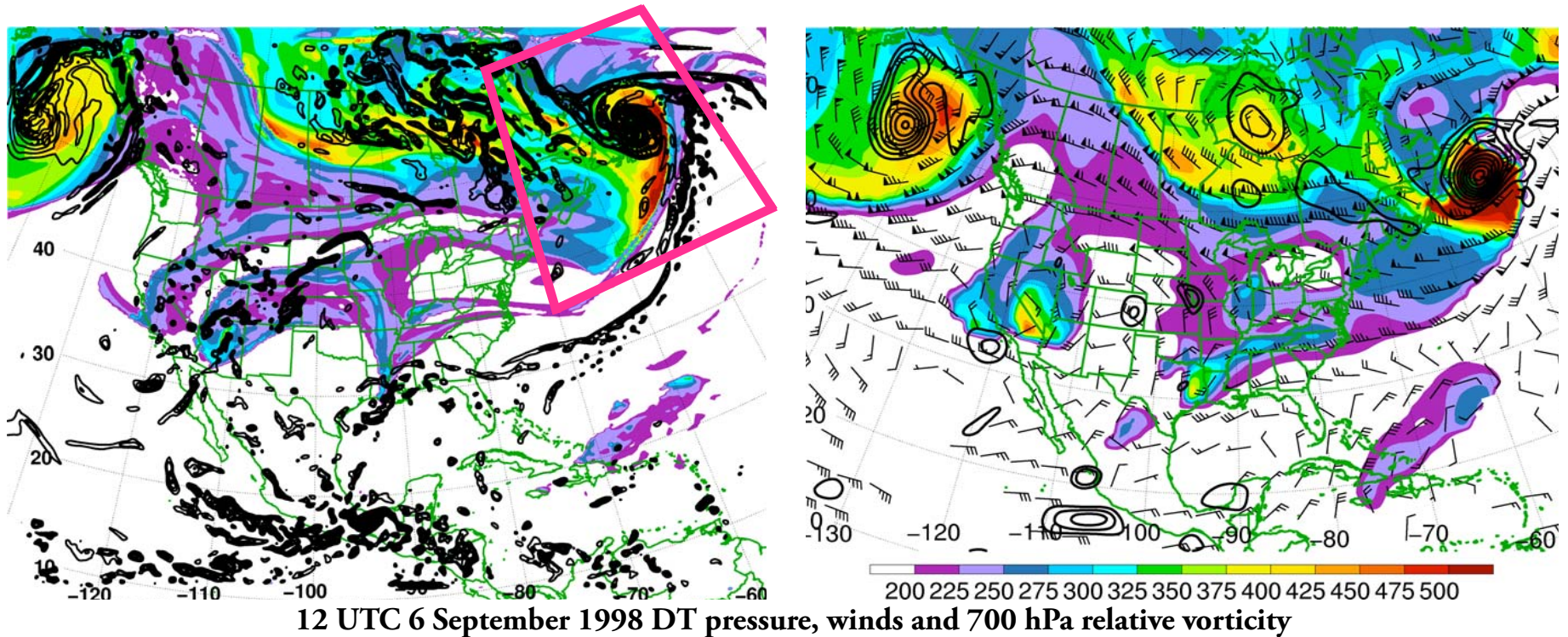
DT pressure, winds and
700 hPa relative vorticity:

- ERA-40 (upper right)
- GEM full resolution (upper left)
- GEM 6 pt smoothed (lower left)



12 UTC 4 September 1998
DT pressure, winds and
700 hPa relative vorticity:

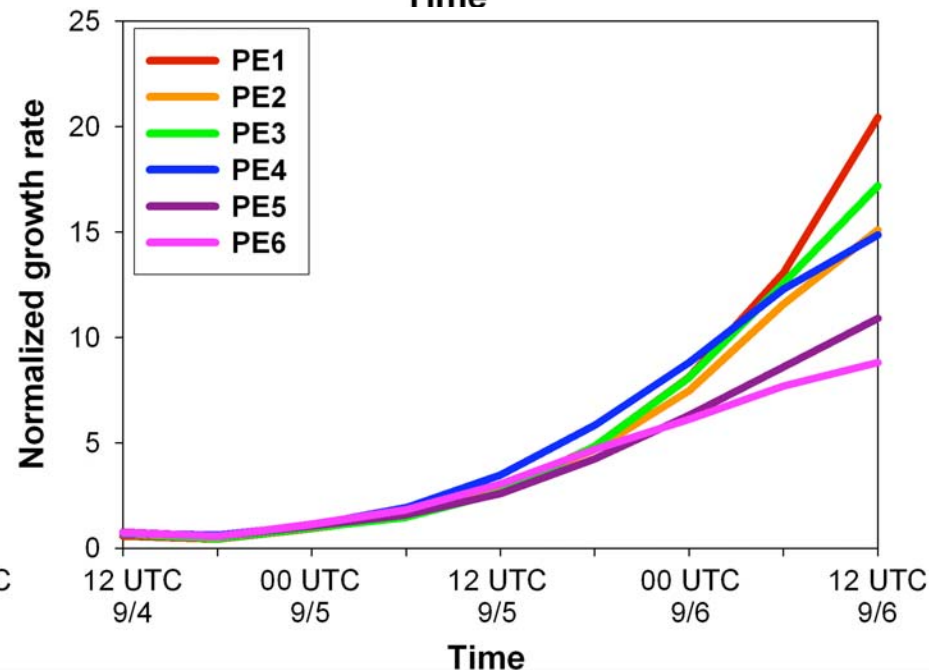
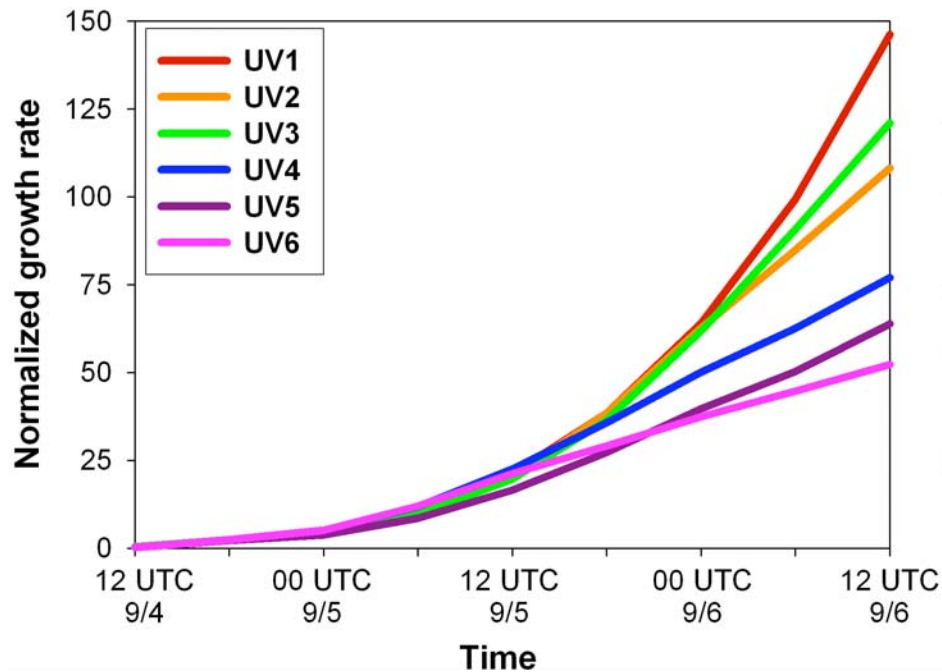
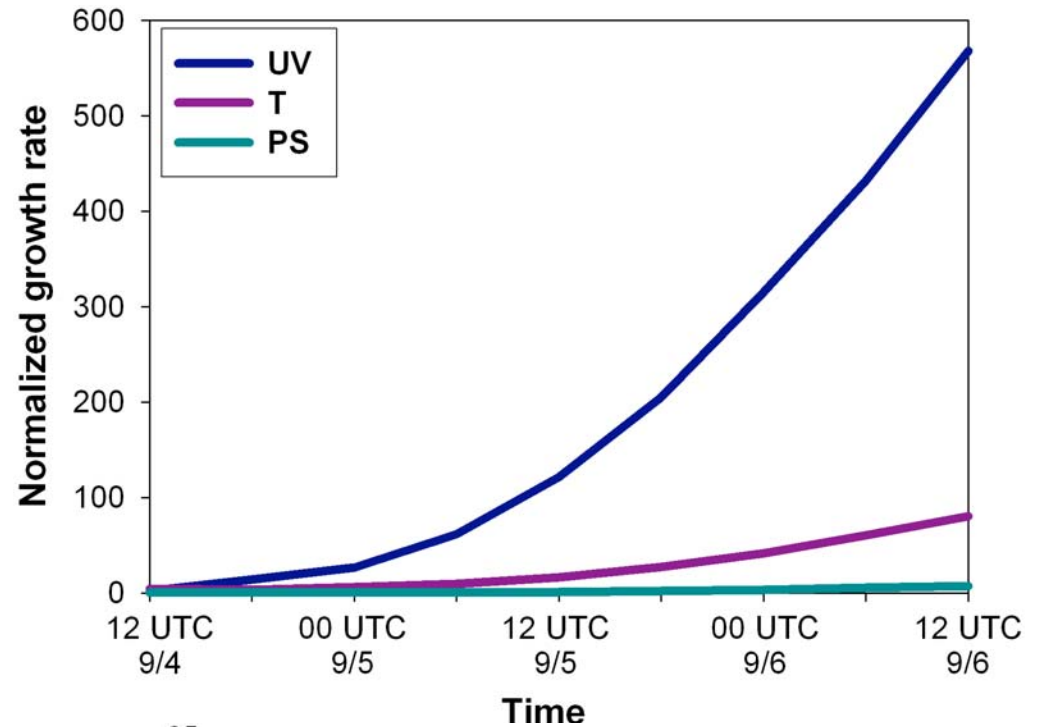
- The shape of the PV streamer connecting Isis to Earl
- The multiple vorticity centers along the eastern seaboard



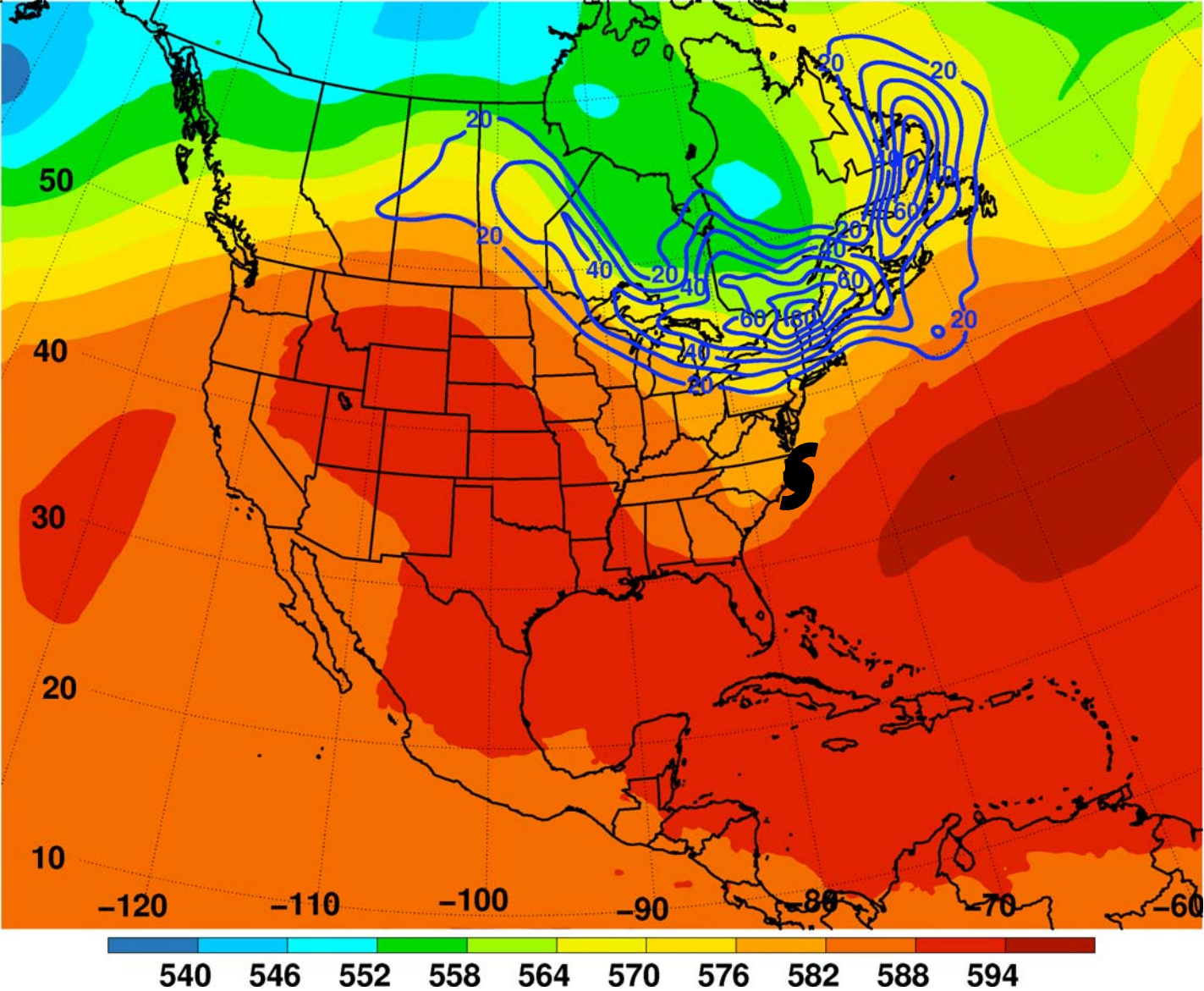
- To examine the sensitivity of Earl's re-intensification, we employ singular vectors: perturbations to the initial state with the largest linear growth rate over a specified time interval and area
- Balanced perturbations to surface pressure, and temperature, winds and humidity at all levels, are calculated over a 48 h period ending at 12 UTC 9/6 (above) and target the final location of Earl (pink trapezoid)

Kinetic Energy (UV) and
Potential Energy (T, PS)
Normalized Growth Rates:

Strong baroclinic conversion
as kinetic energy
increases 6x faster than
potential energy

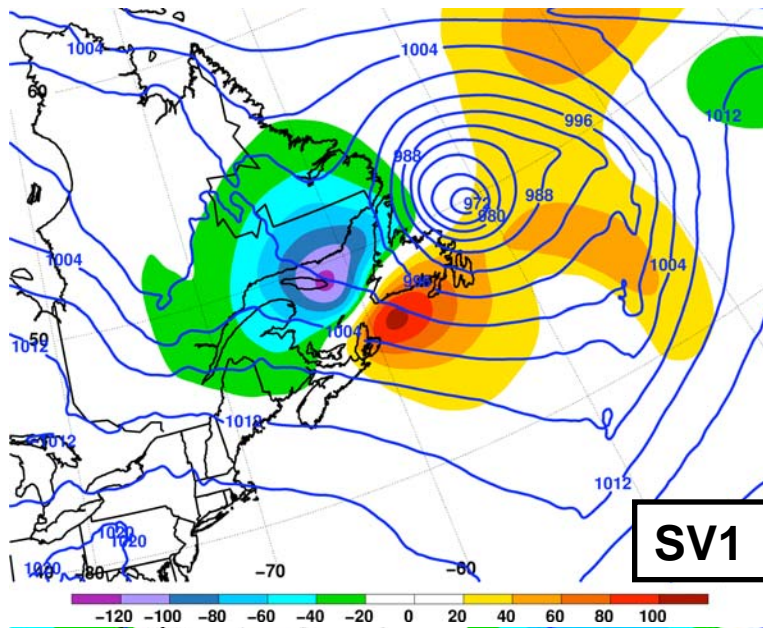


500 hPa height and Total Energy Sensitivity at Initial Time 12 UTC 4 September



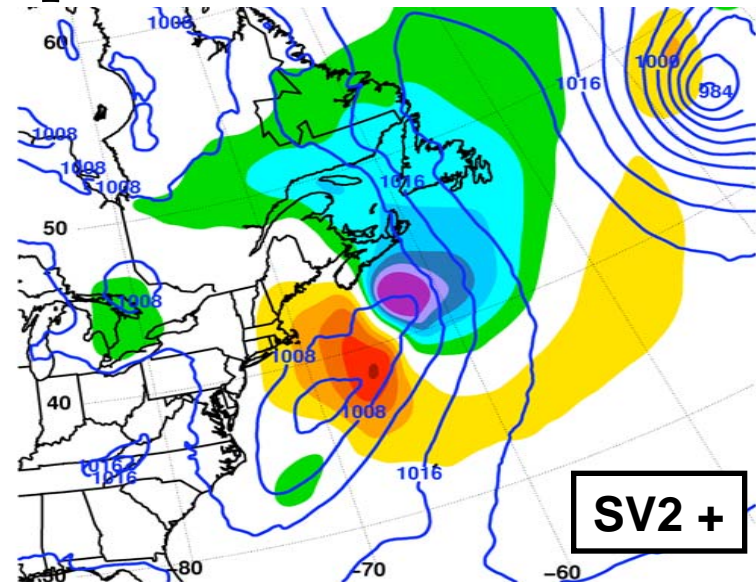
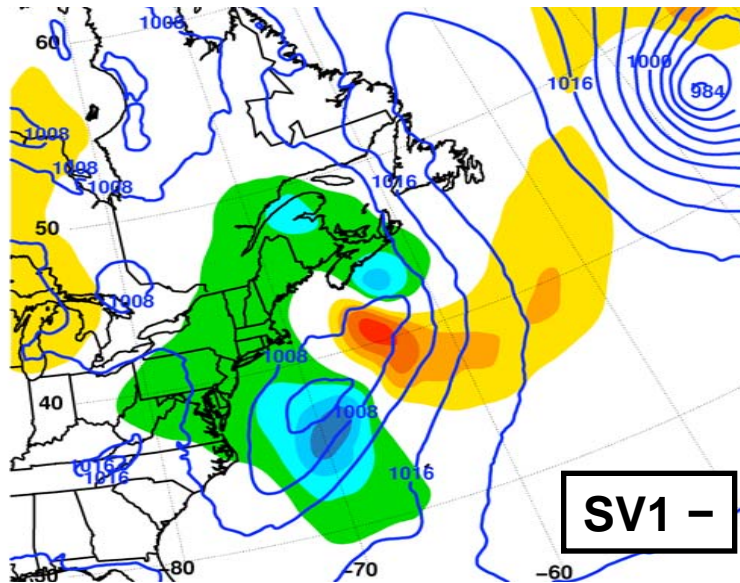
Sea Level Pressure (contours) and Sensitivity (shaded)

12 UTC 6 September

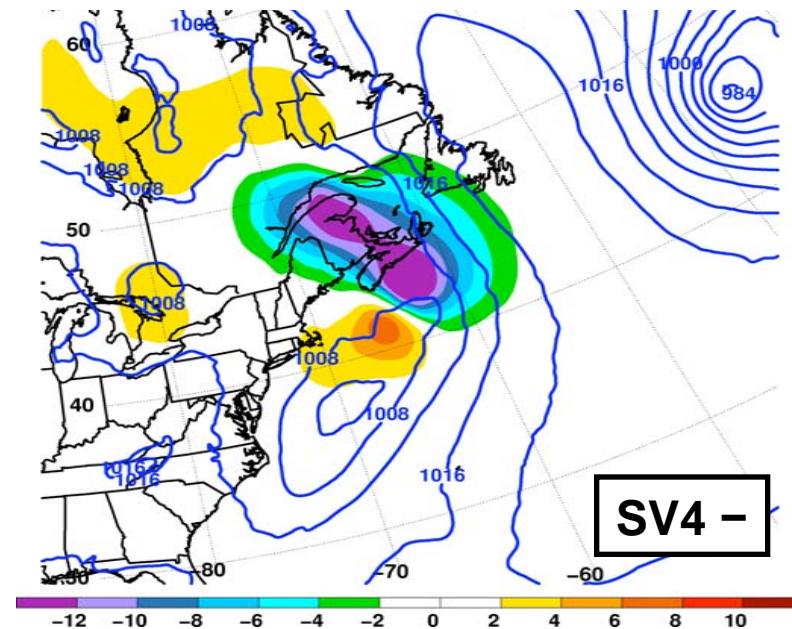


Sea Level Pressure (contours) and Sensitivity (shaded)

00 UTC 5 September

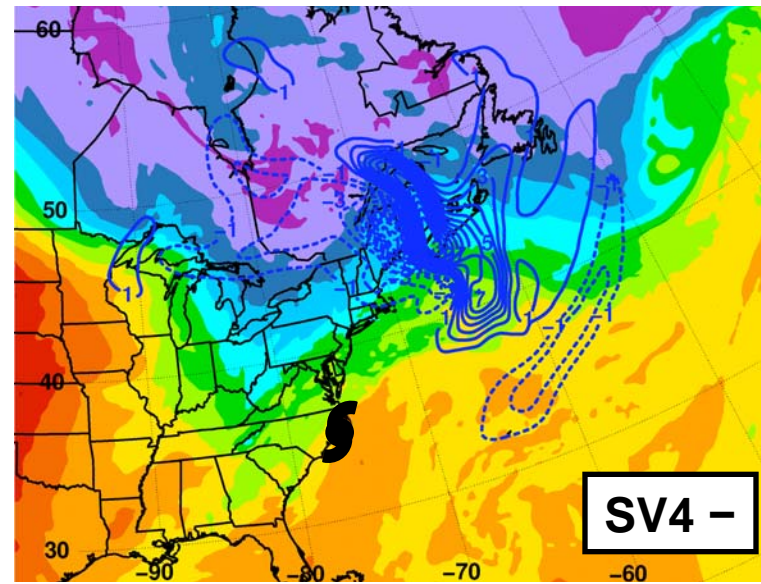
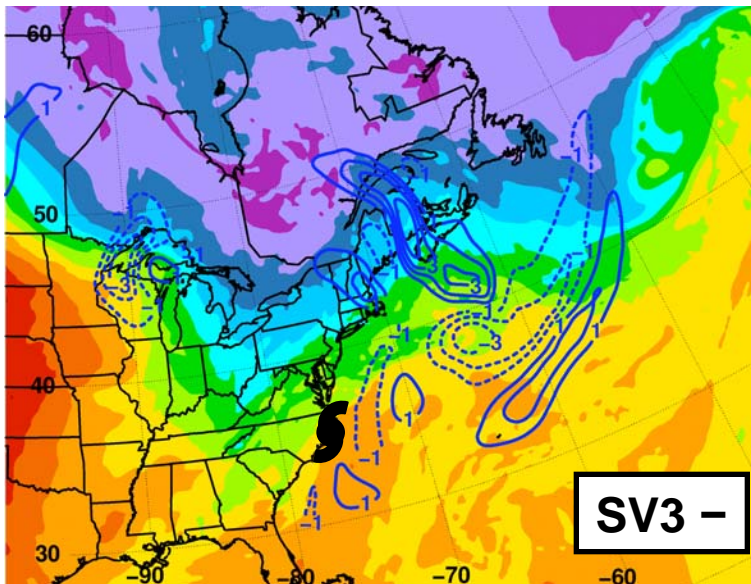
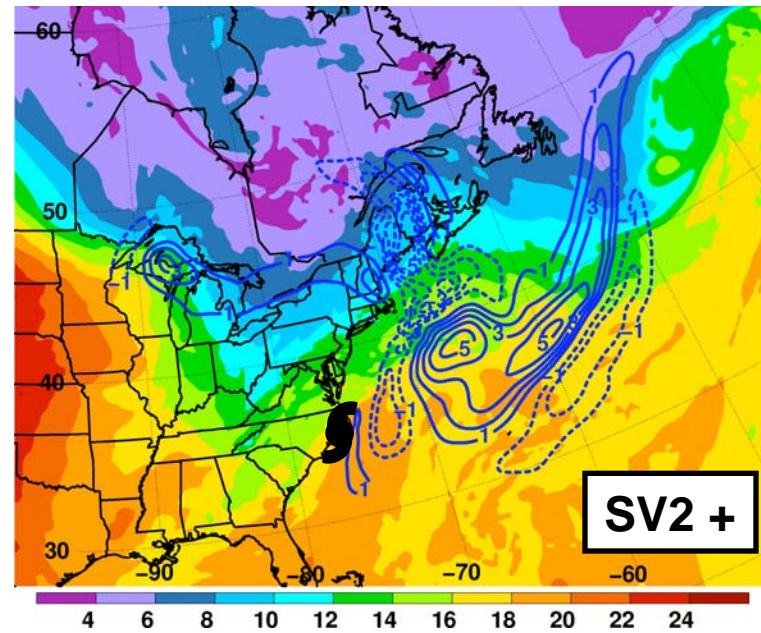
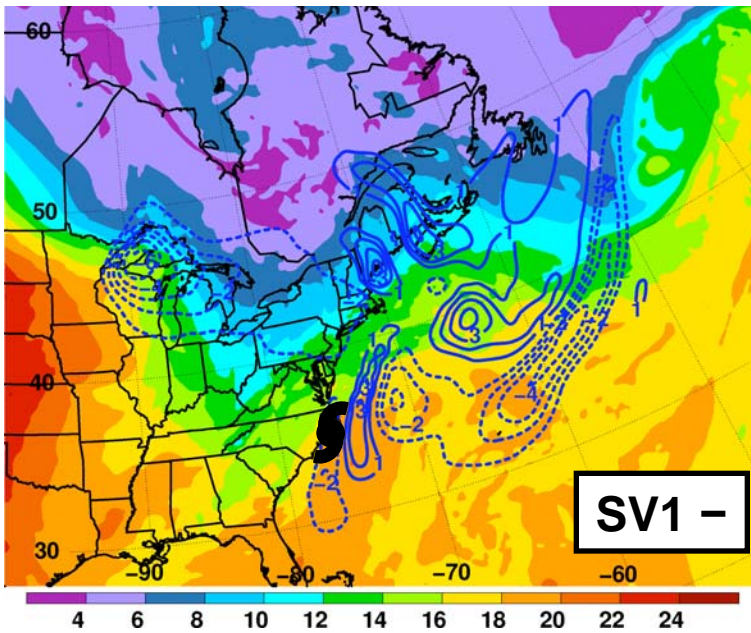


The leading singular vectors indicate that weakening the surface pressure perturbation of Earl increases the final time intensity of the merged cyclone.

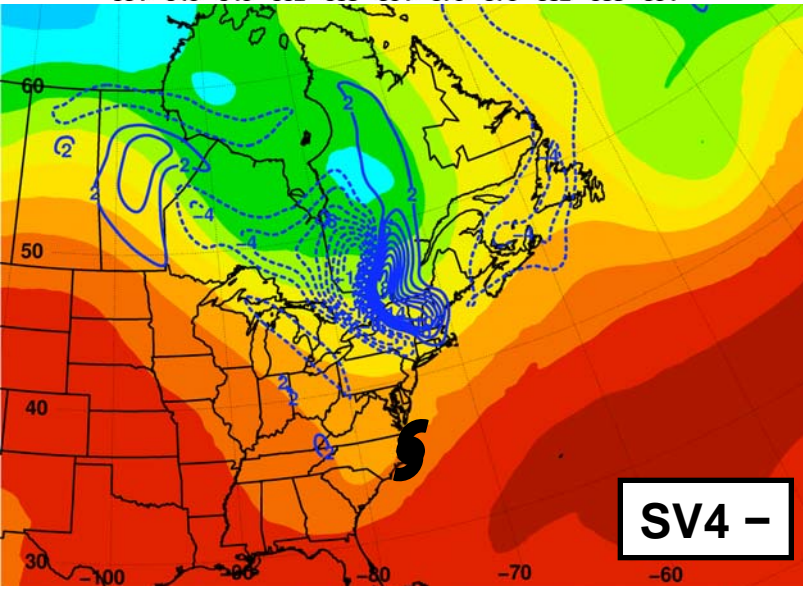
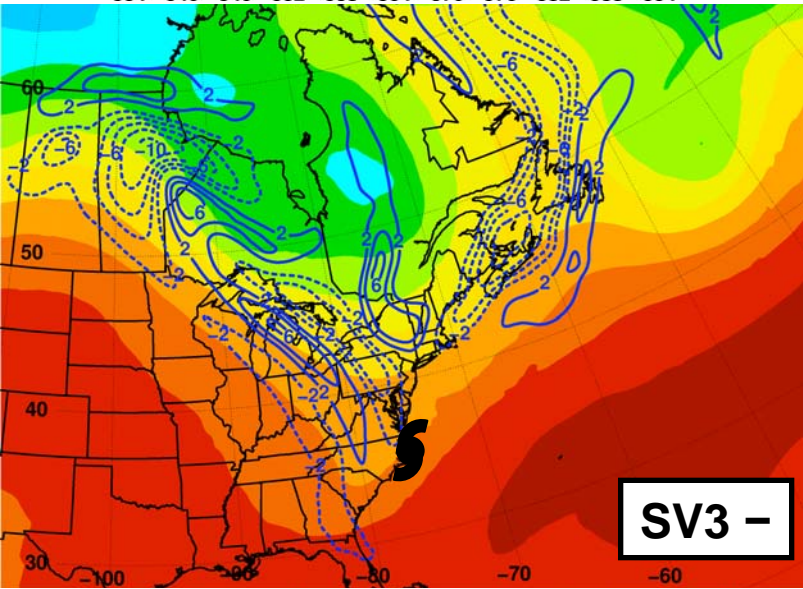
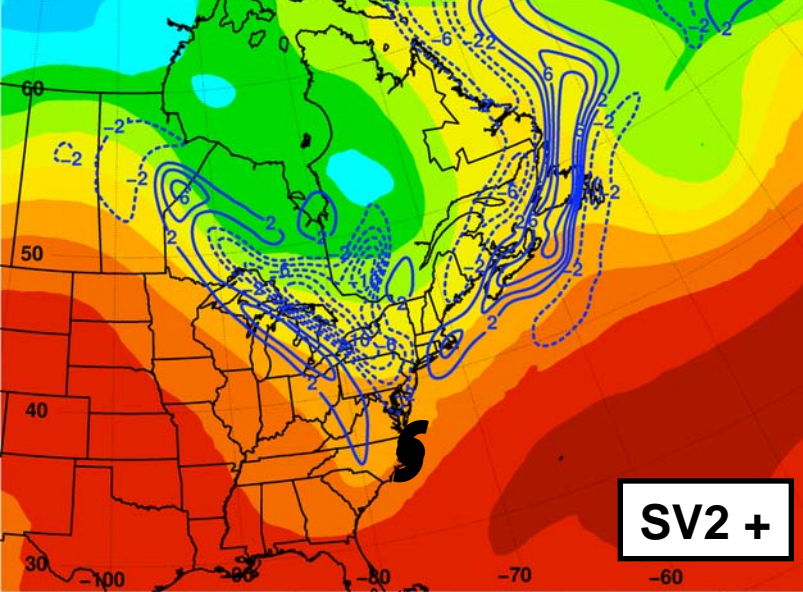
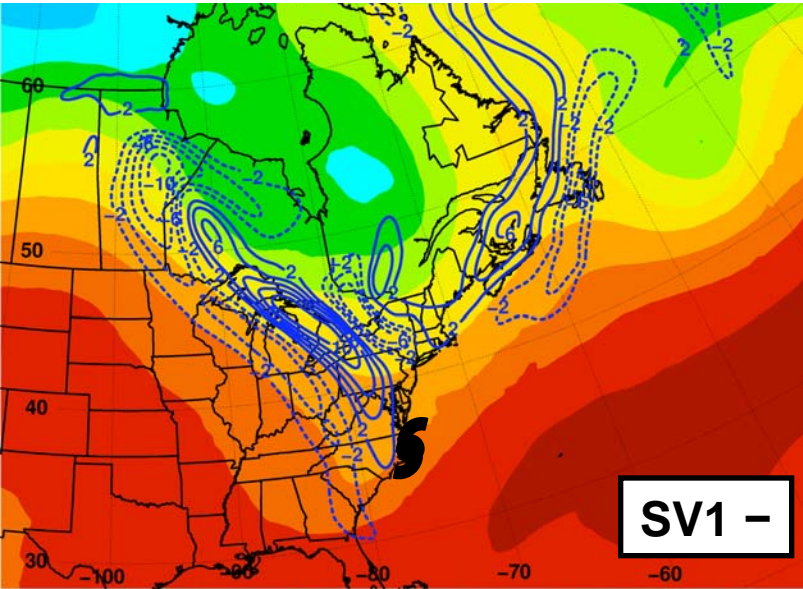


850 hPa Temperature (shaded) and Sensitivity (contours)

12 UTC 4 September

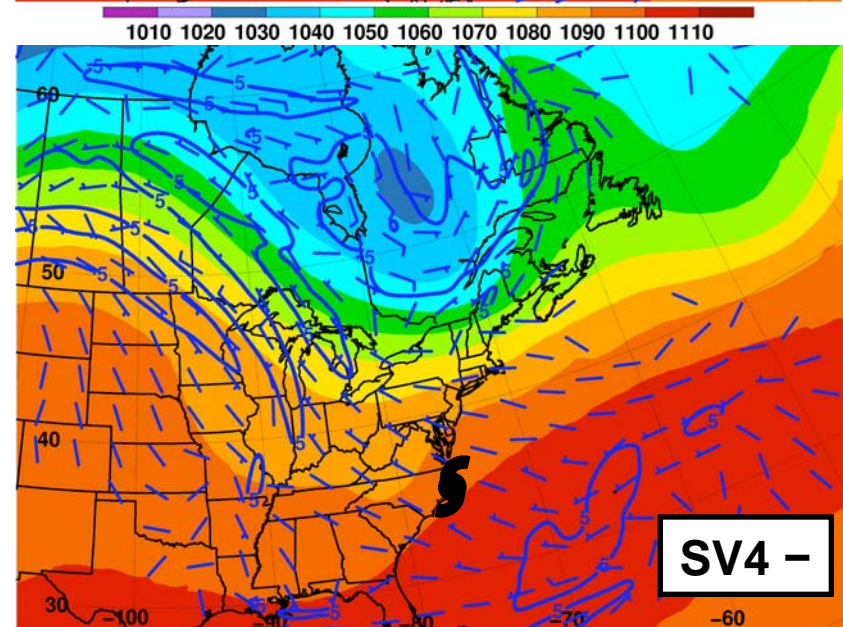
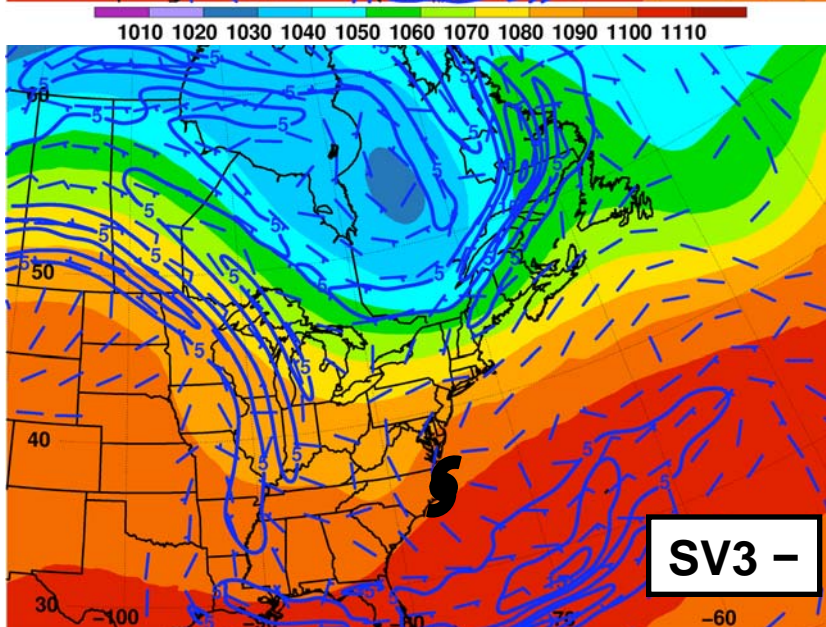
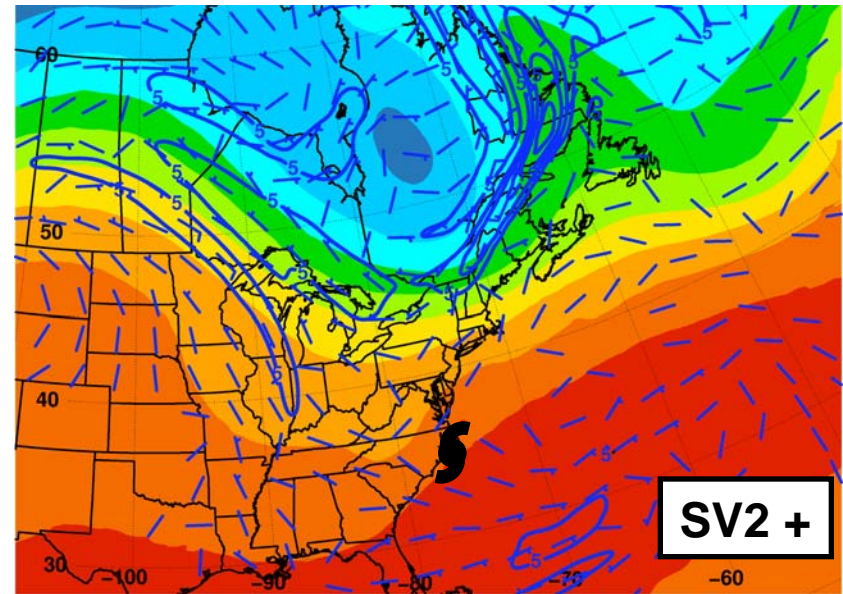
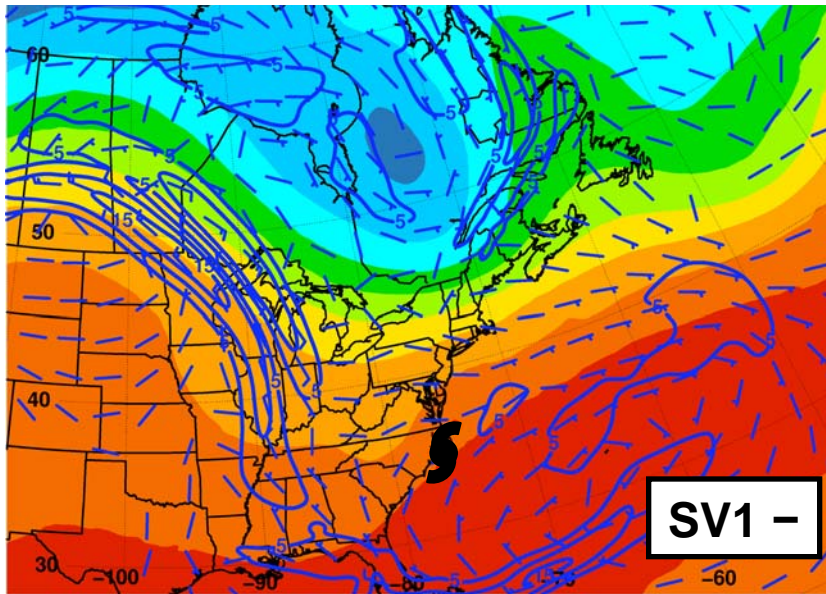


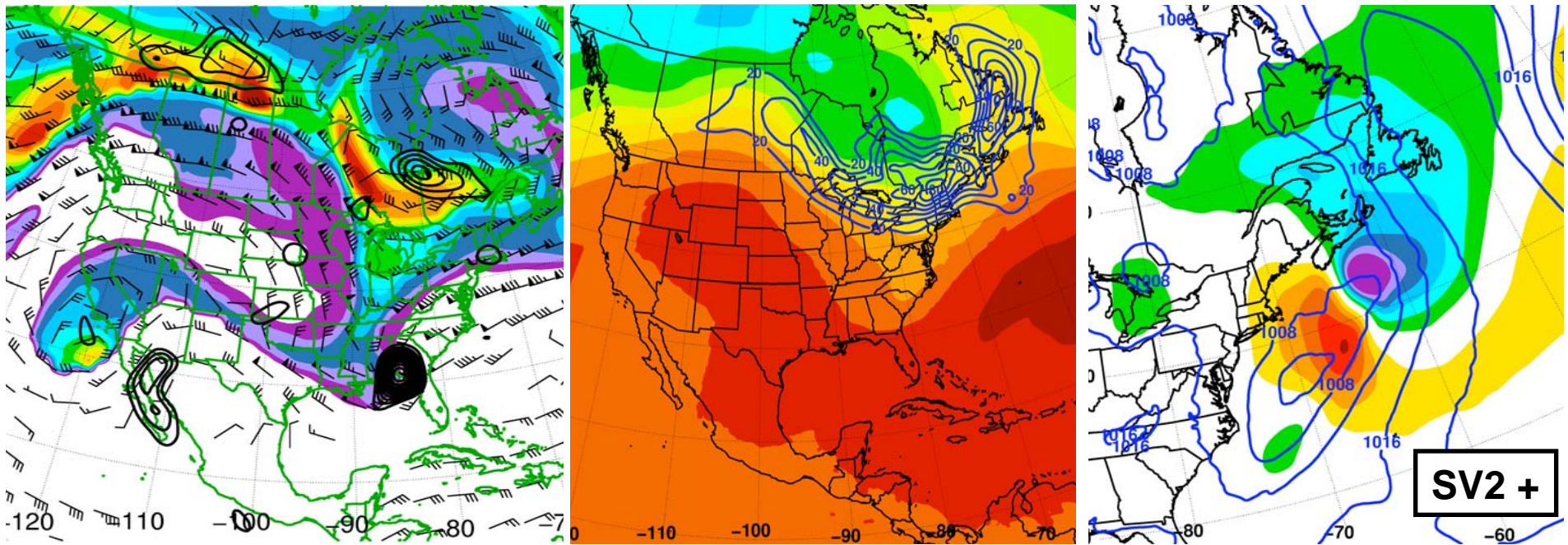
500 hPa Height (shaded) and Temperature Sensitivity (contours) 12 UTC 4 September



250 hPa Height (shaded) and Wind Sensitivity (contours and barbs)

12 UTC 4 September





Summary and Future Work

- A sensitivity analysis of the synoptic scale flow pattern associated with the re-intensification of Earl shows there was no influence of Isis and little influence from Earl itself (over the time period considered)
- Generate new initial states from the leading SVs and examine the evolution of the perturbed atmosphere in the full model