

12.307- Weather and Climate Laboratory

<http://weatherclimatelab.mit.edu>



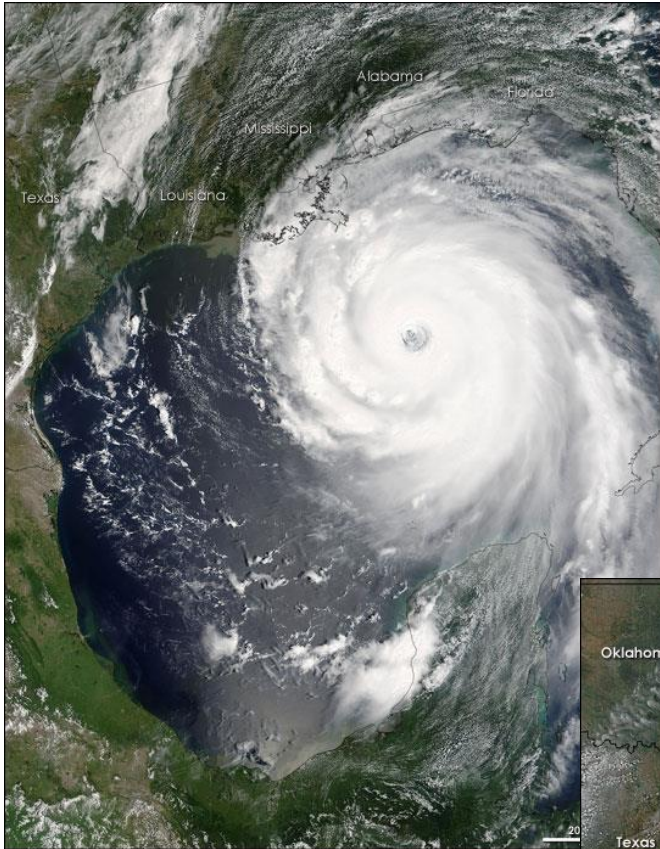
P1- Weather & Extremes



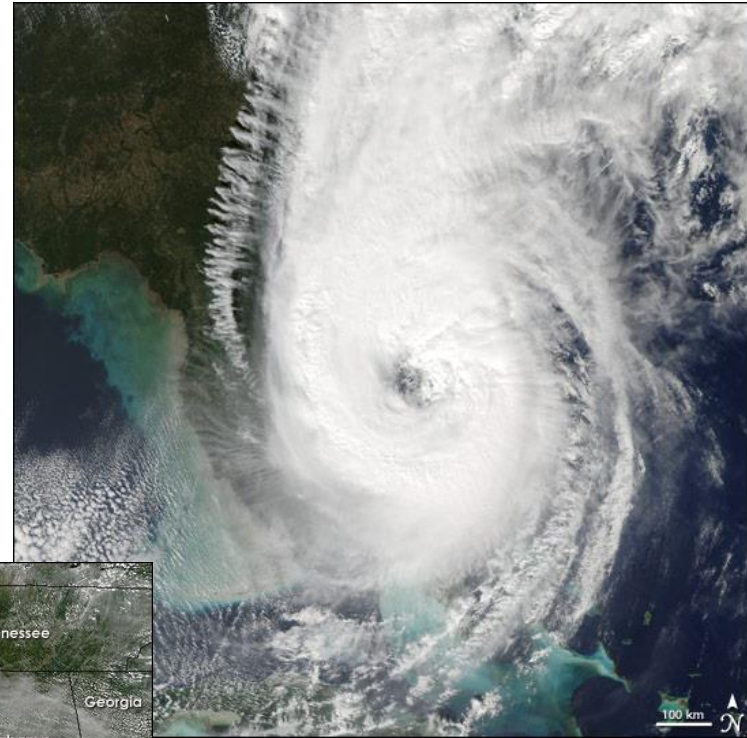
Hurricanes Maria and Jose, Sept 2017 (EO)

Hurricanes in 2005 – record year

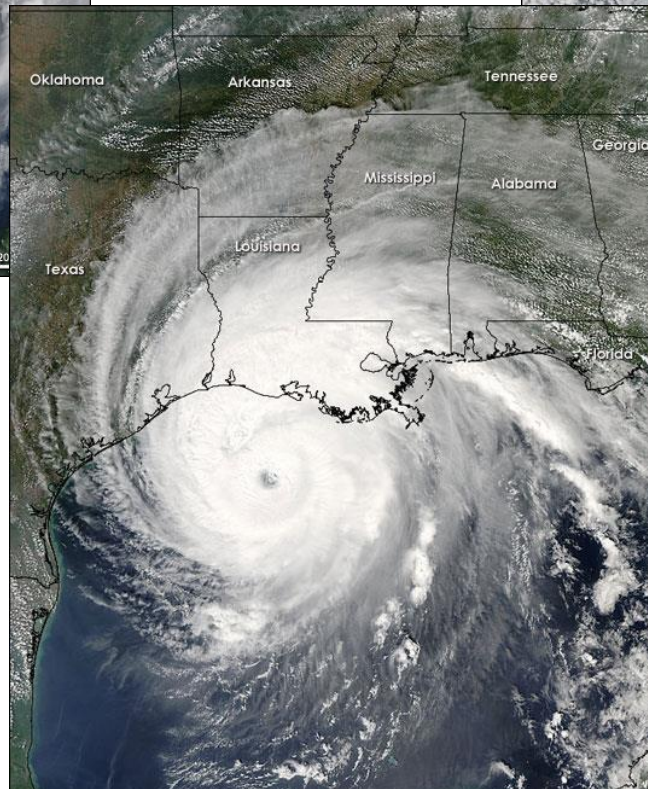
[wunderground](#)



902 mb
Rita



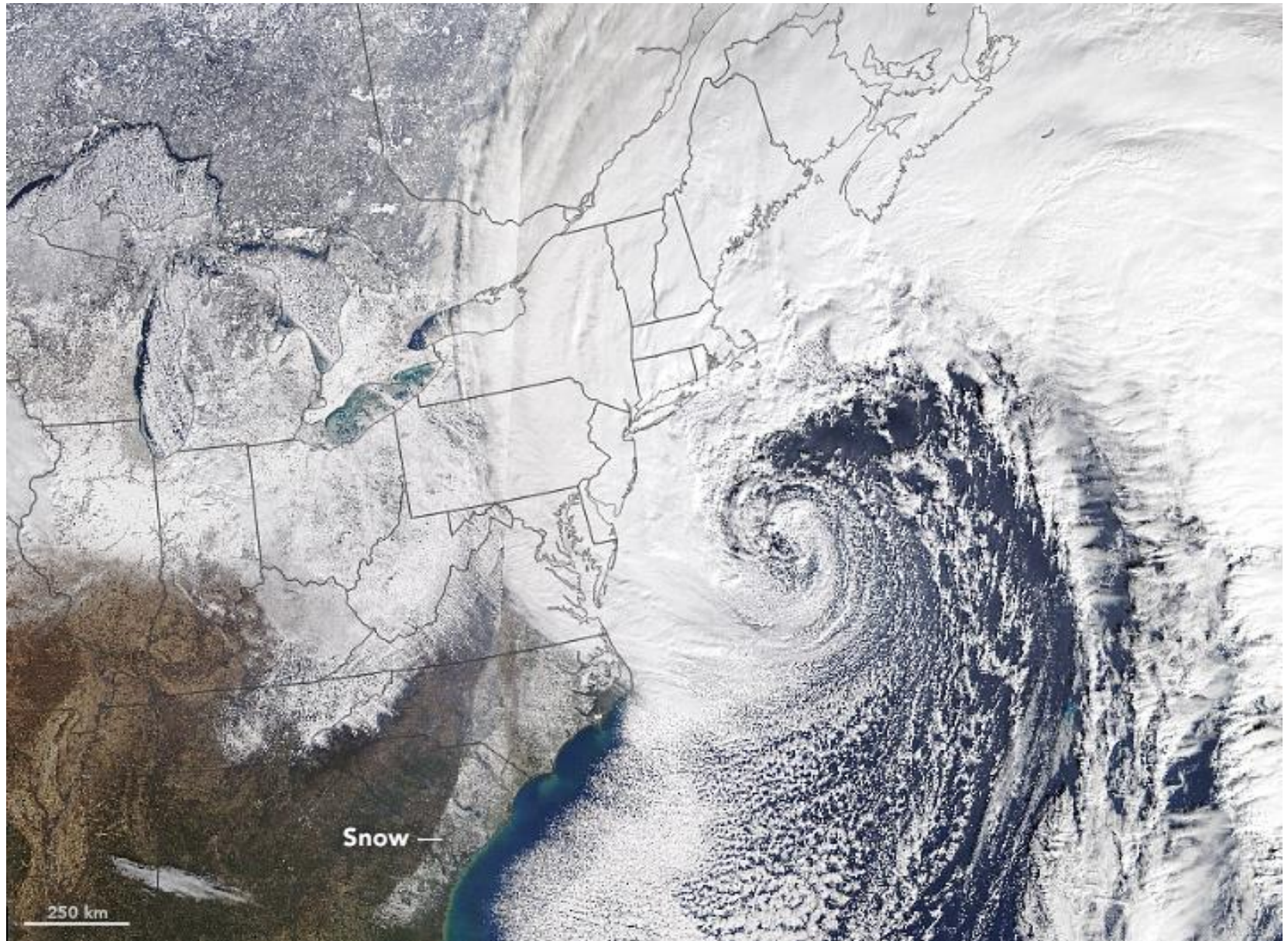
882 mb
Wilma



897 mb Katrina

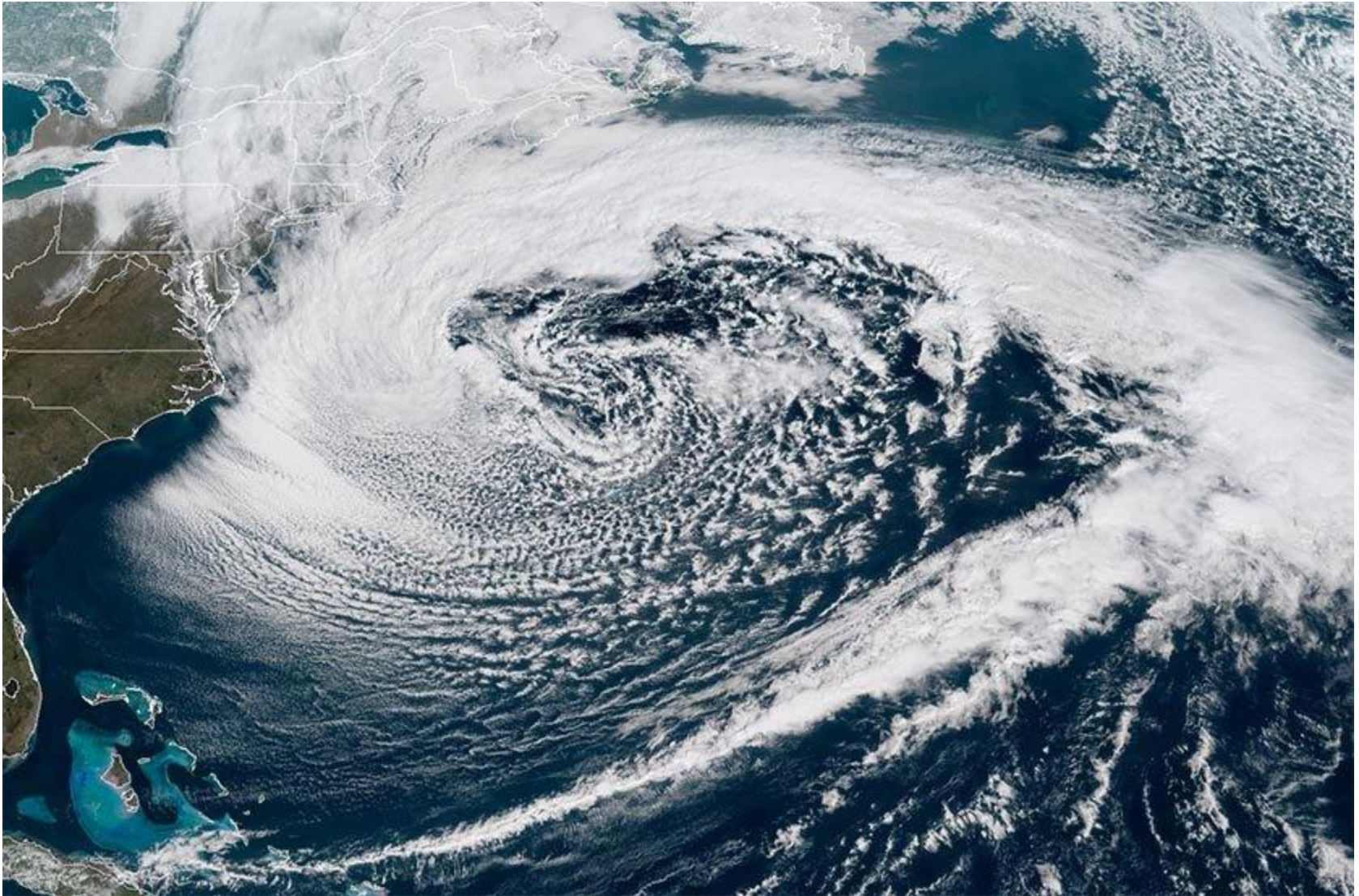
1 mb = 100 Pa (or 1 hPa)

Vortices in the real world



[Blizzard of Jan 4, 2018](#)

Vortices in the real world



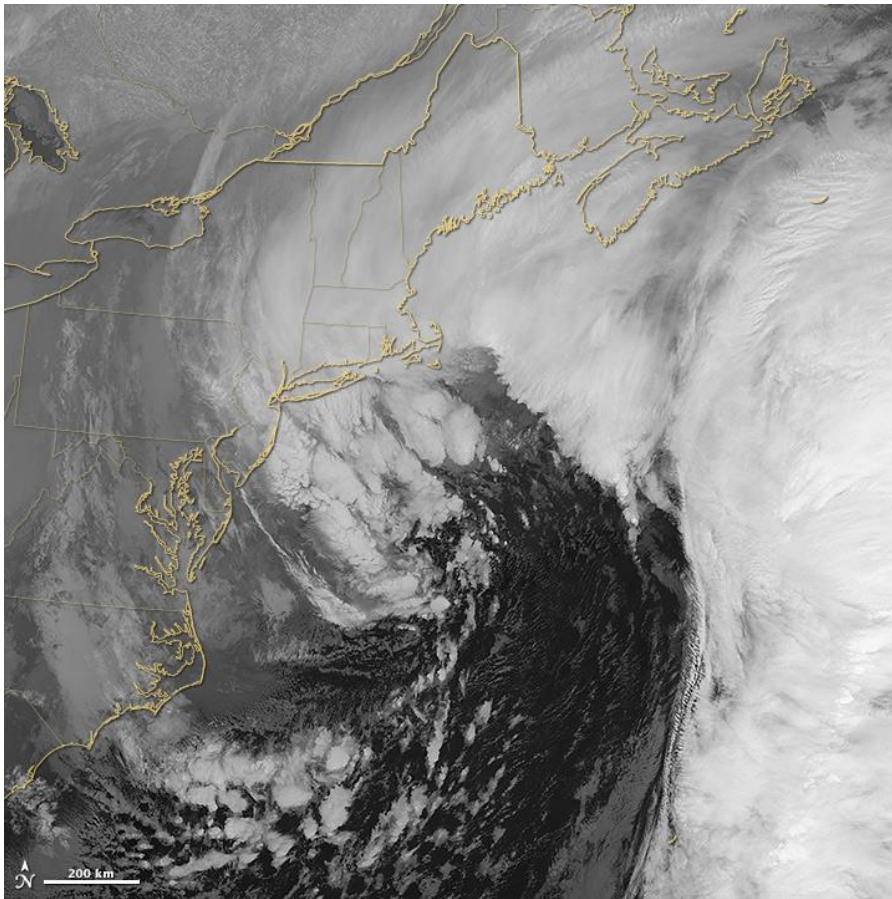
Blizzard of March 2, 2018

Blizzards in past winters

Blizzard of February 2013



Blizzard of January 2015



January and February common months
for Boston blizzards

Other vortices?

Tornado in Minneapolis, MN.



Tornado in Iowa - July 19, 2018



Monster tornado

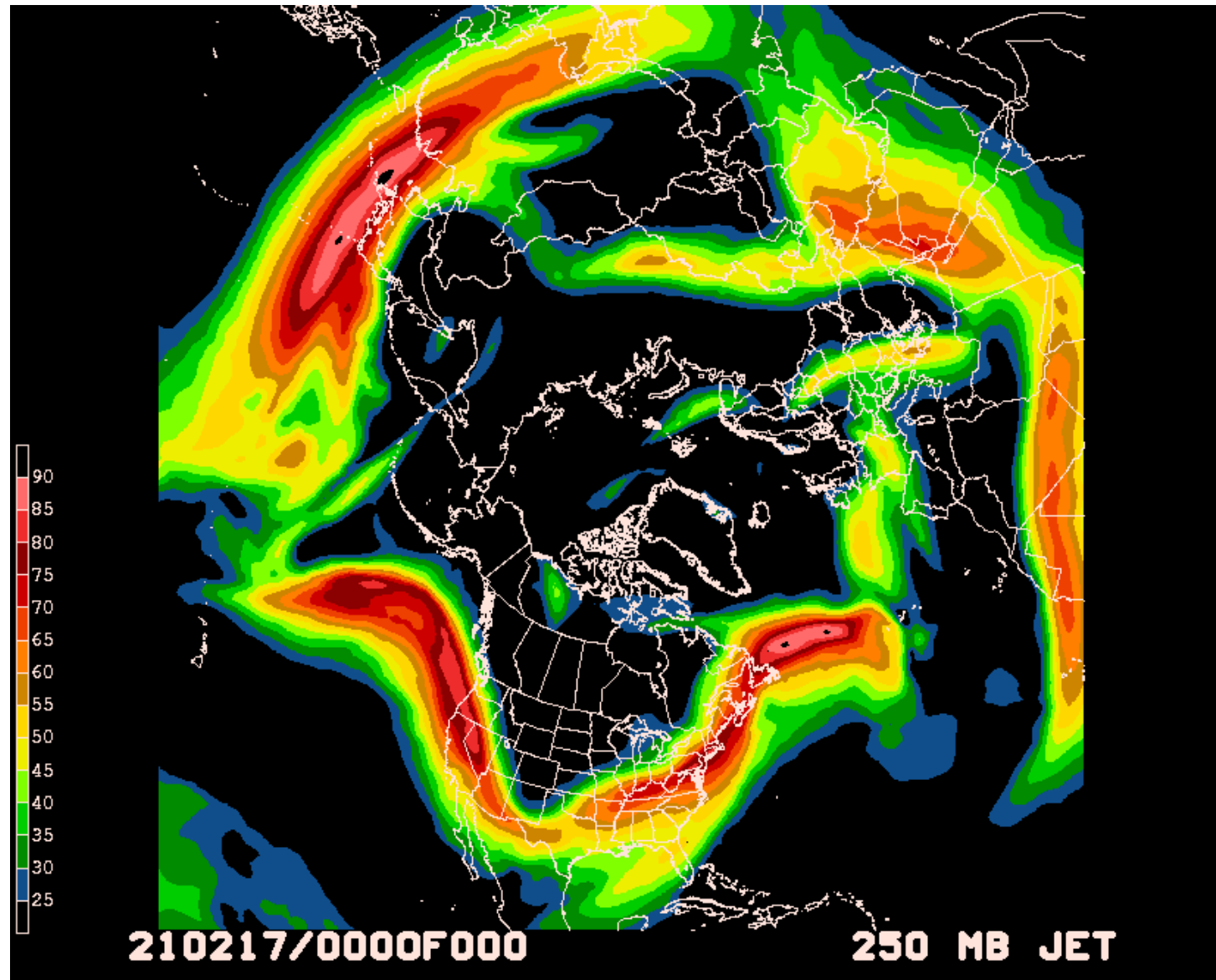


Waterspout
Florida,
09/03/17



Where is the “largest” vortex on earth ?

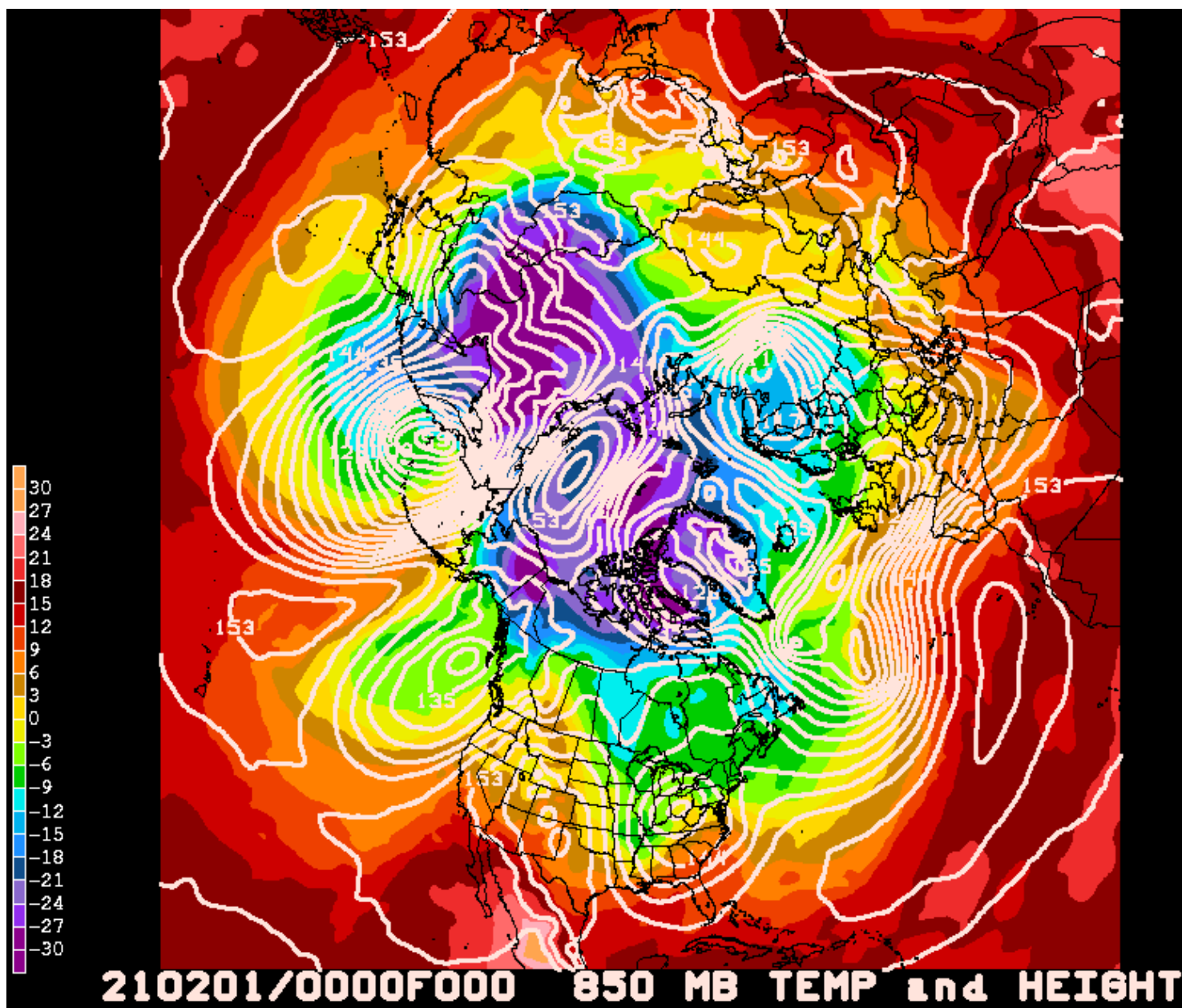
Today's wind
at a height of 10 km



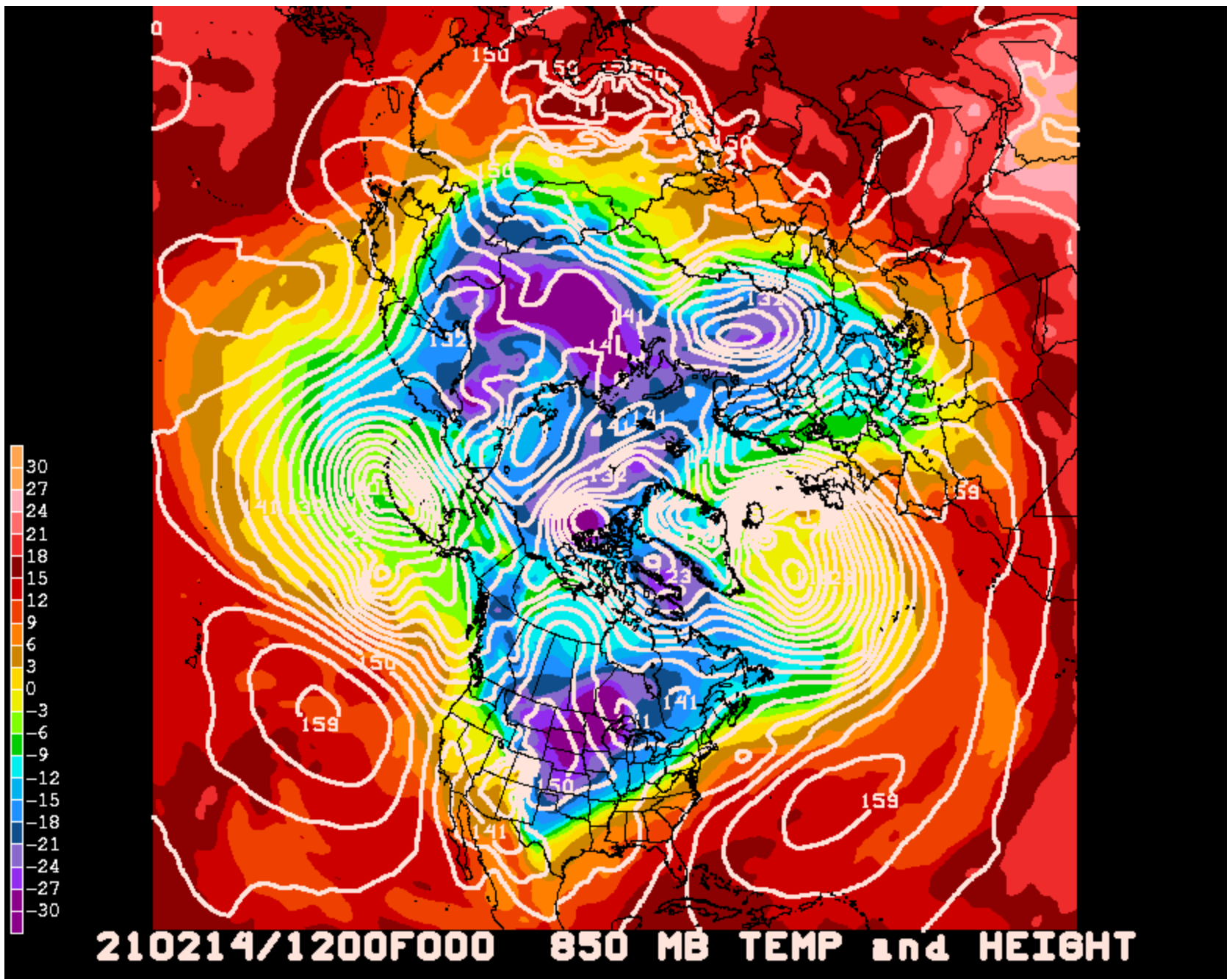
[last week loop](#)

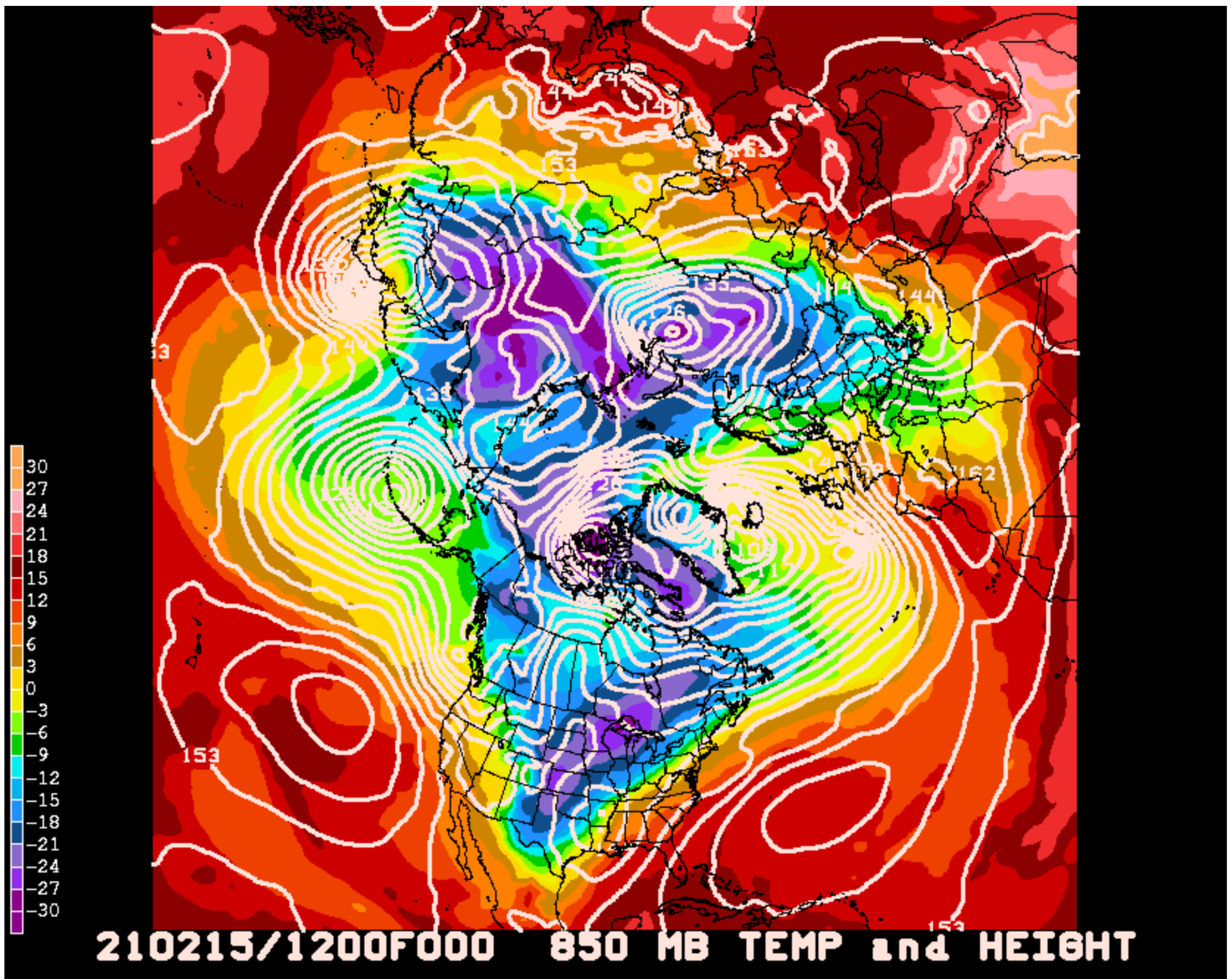
850 mb Temperature and height on Feb 1, 2021 at 00 GM.

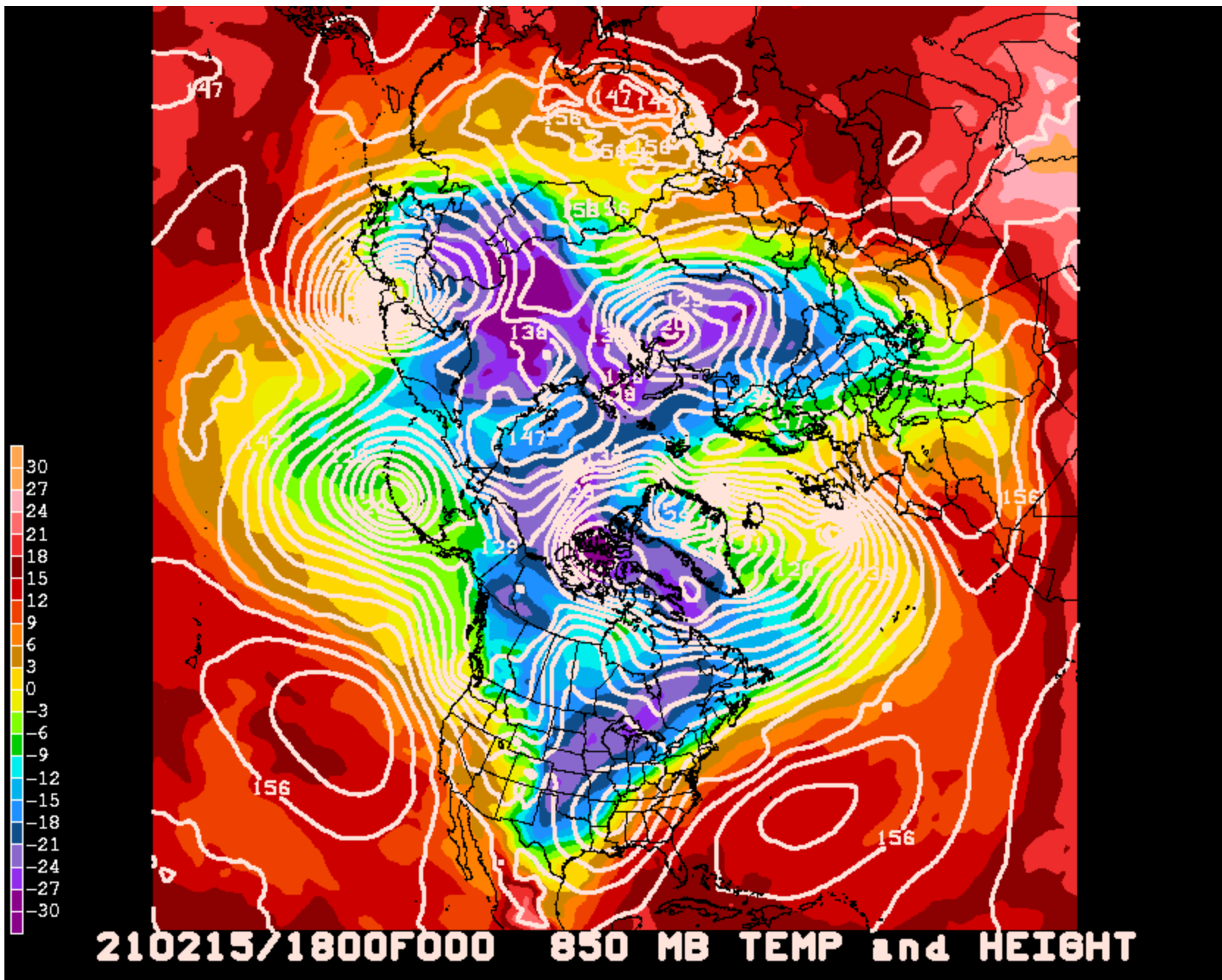
Note the very cold air confined to the North Pole and Siberia: typical for winter.

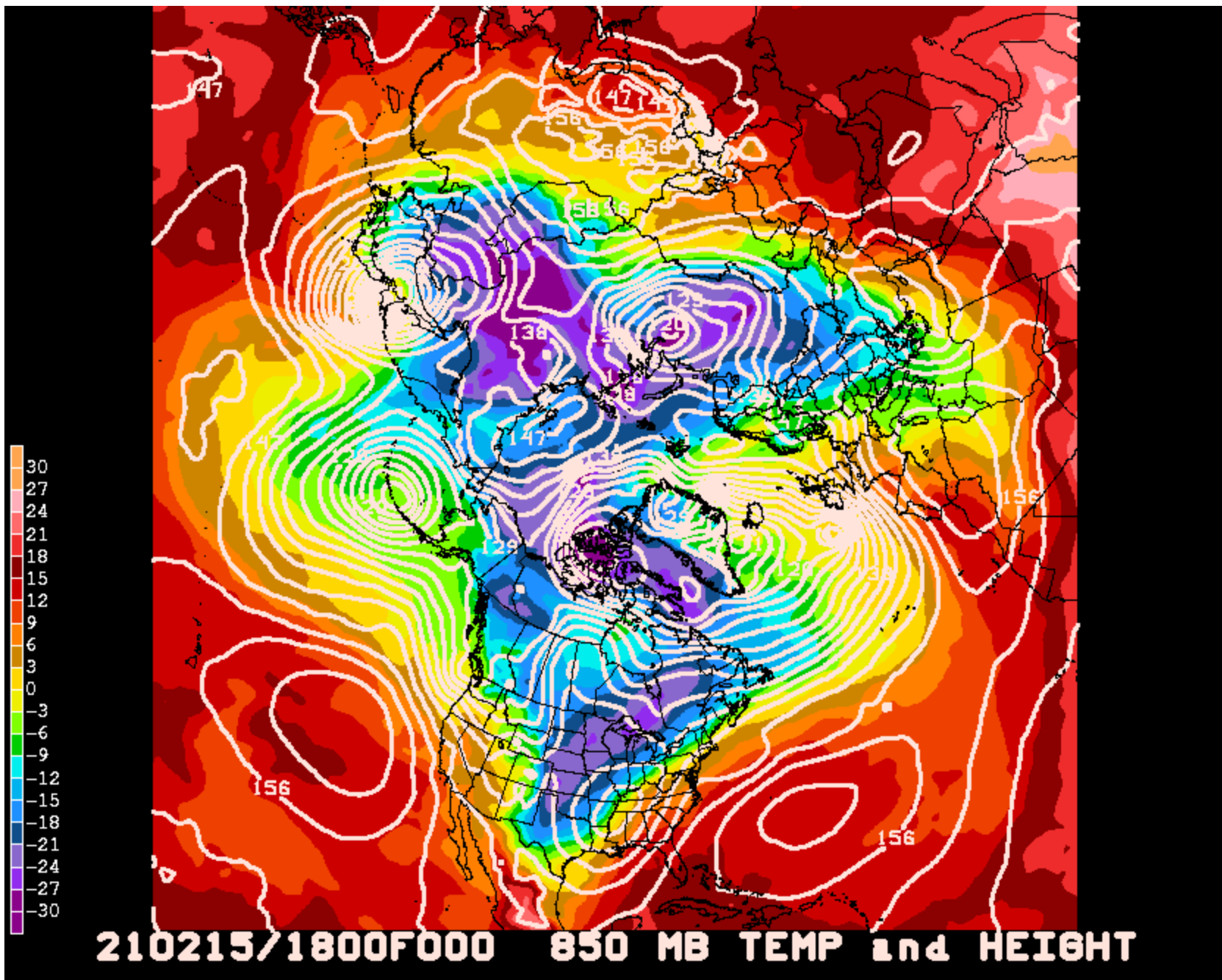


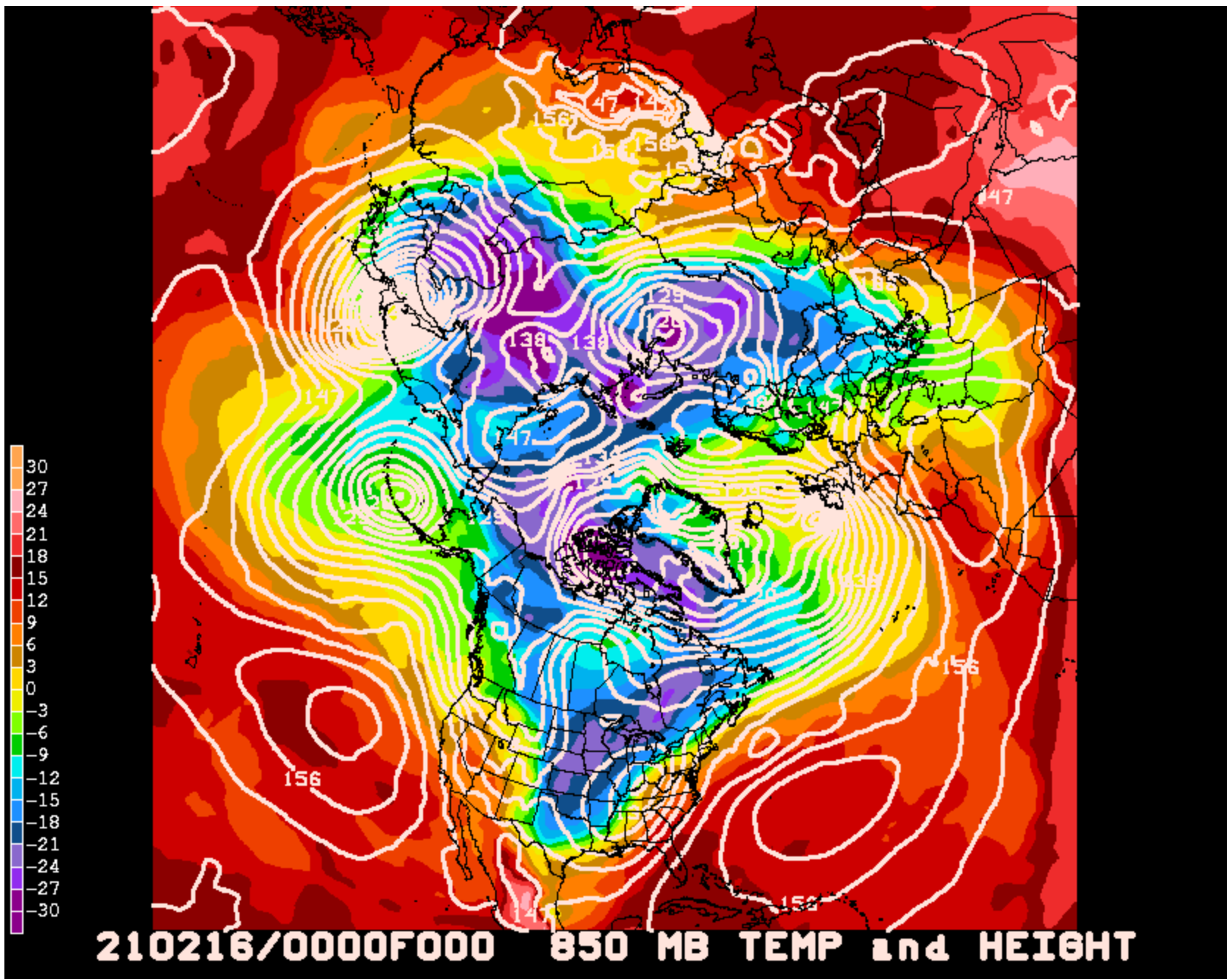
In the following two weeks, through the action of several storms, the cold air is advected south over Oklahoma and Texas: see the sequence of maps from Feb 14 to 17, 2021.

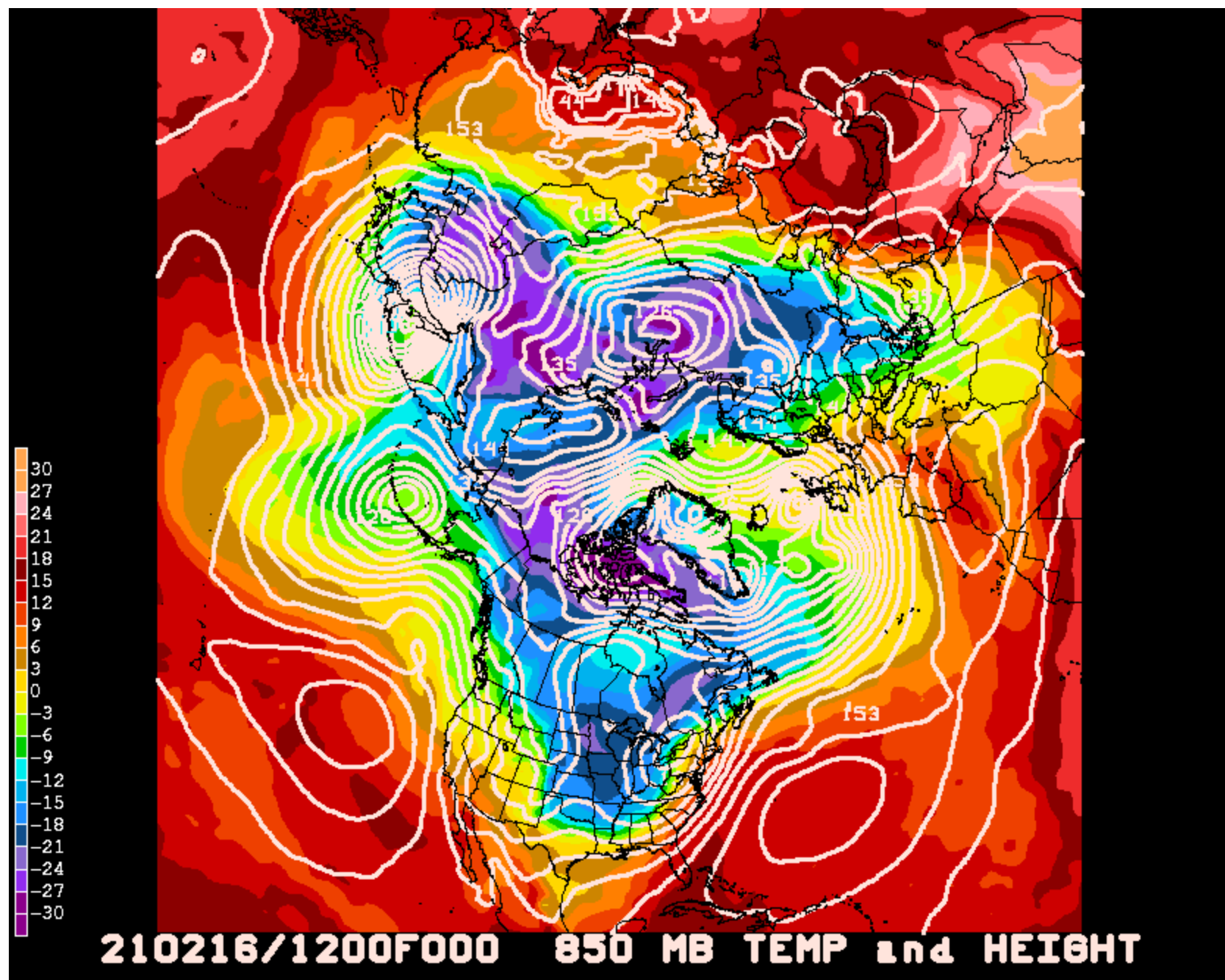


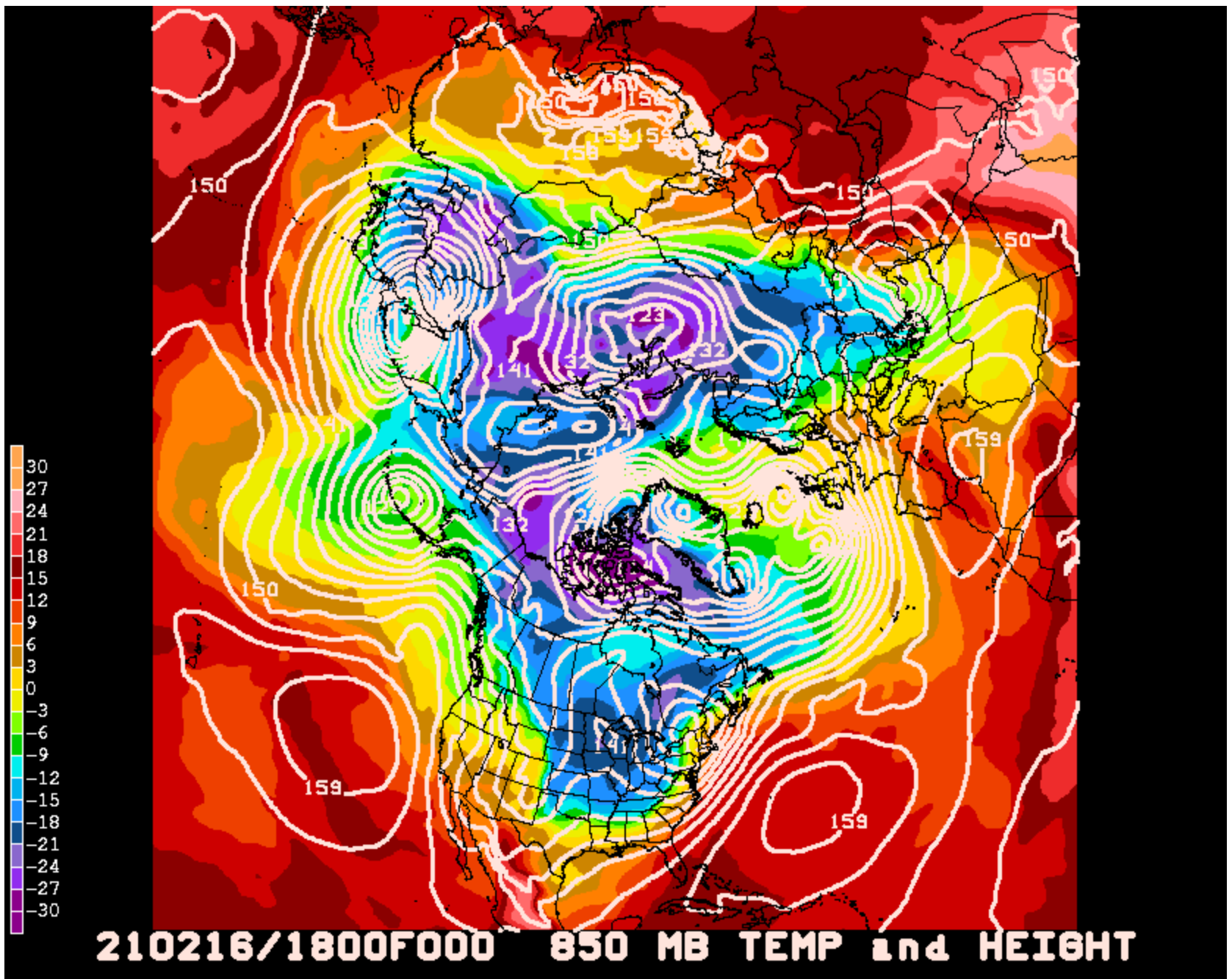


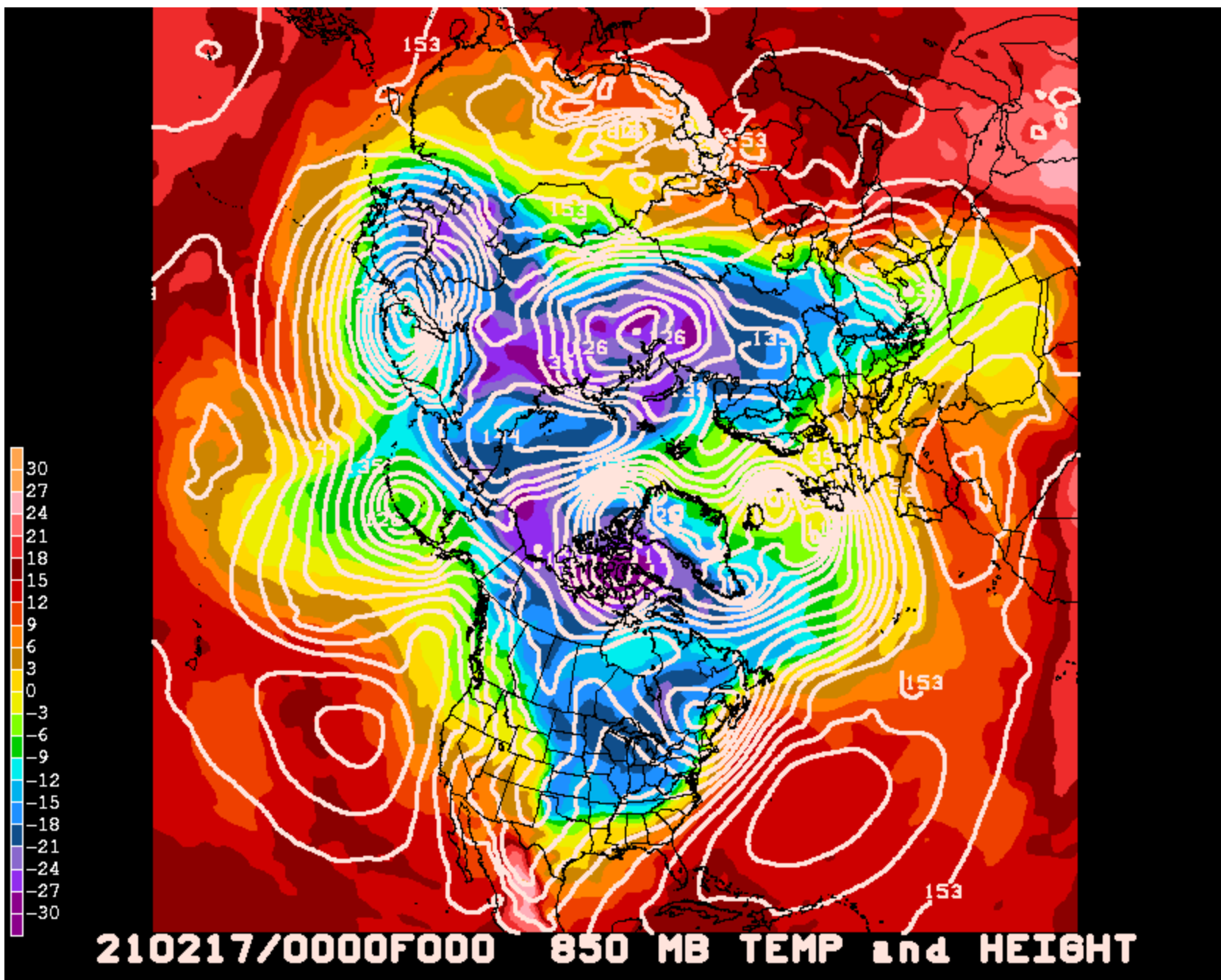


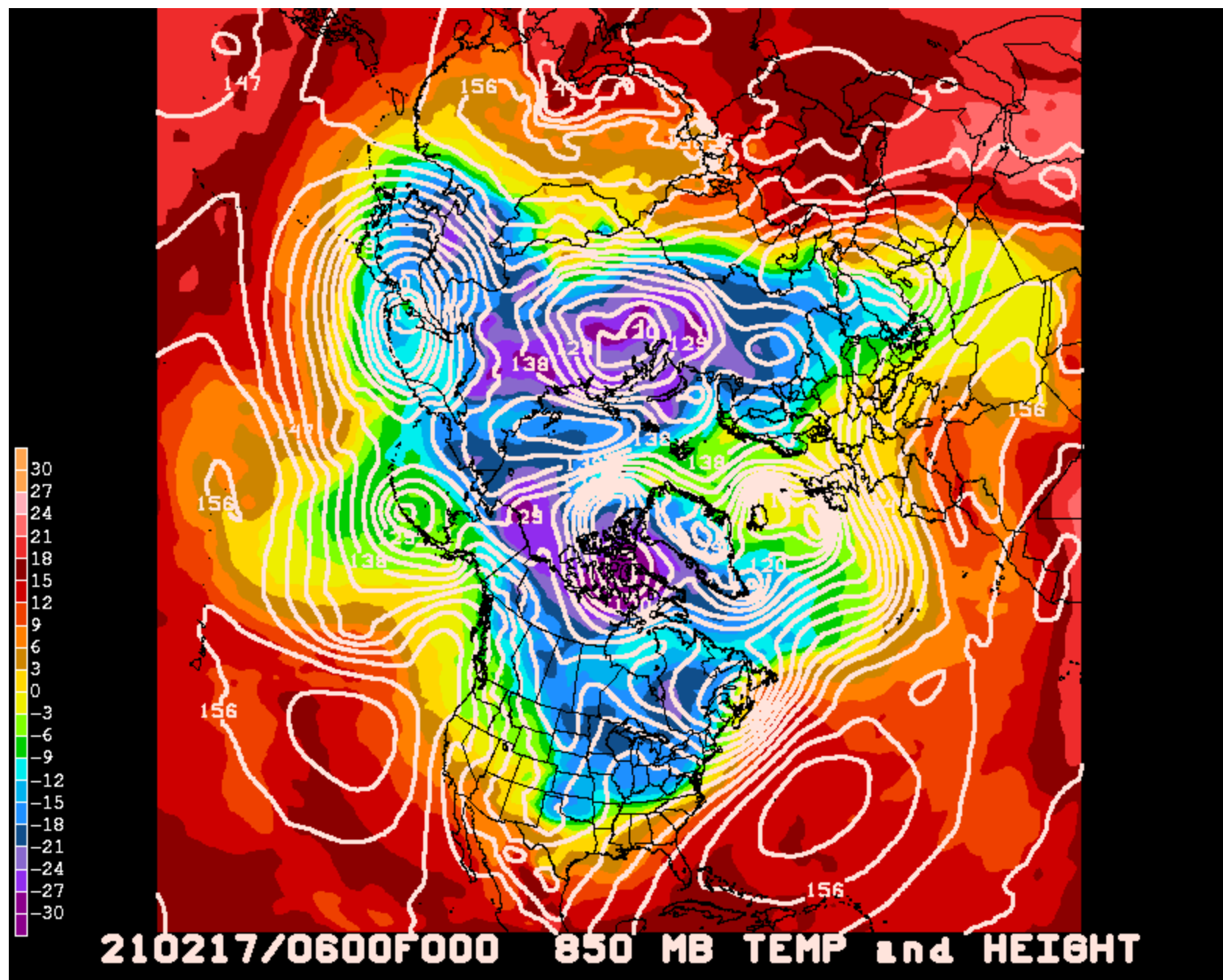


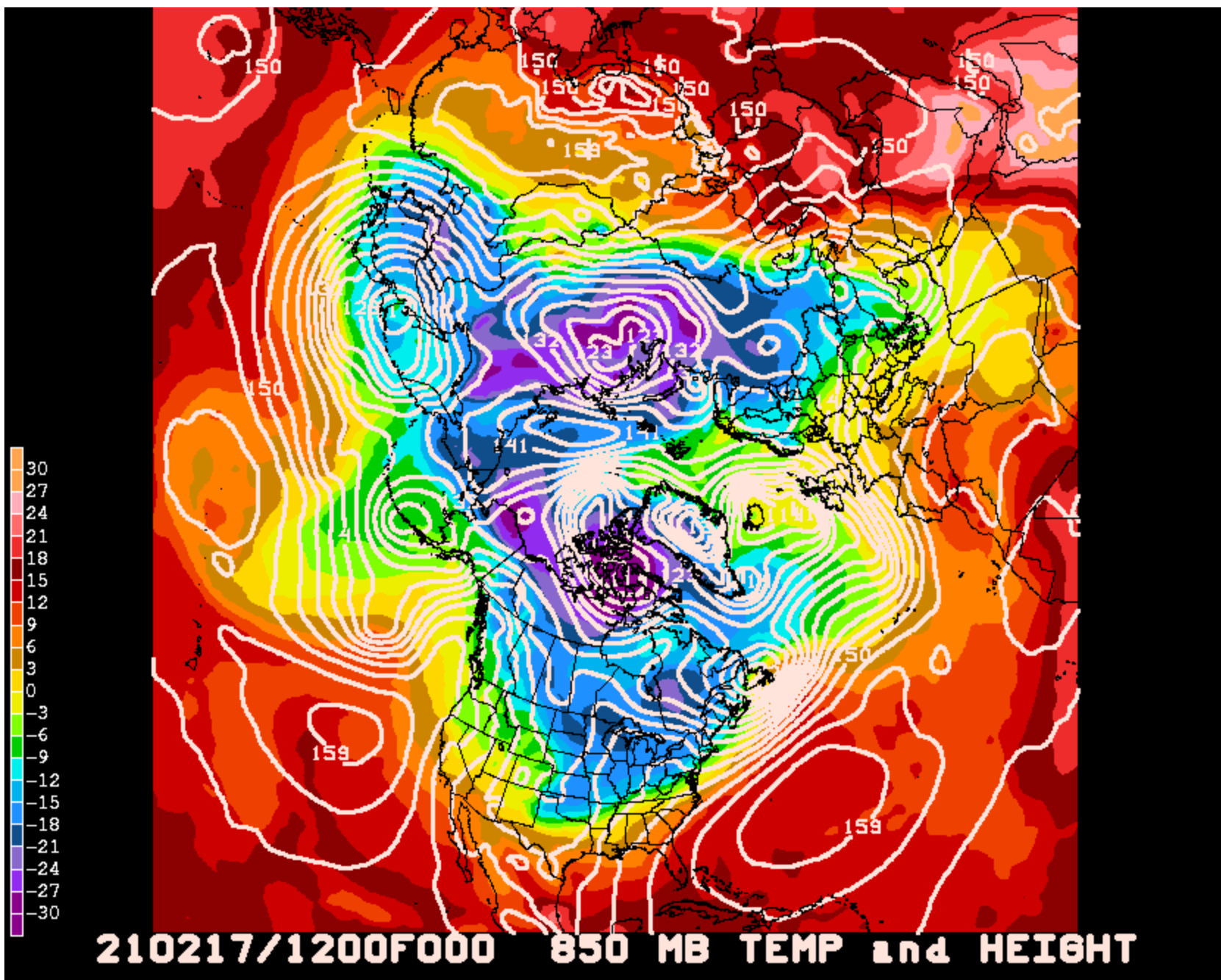


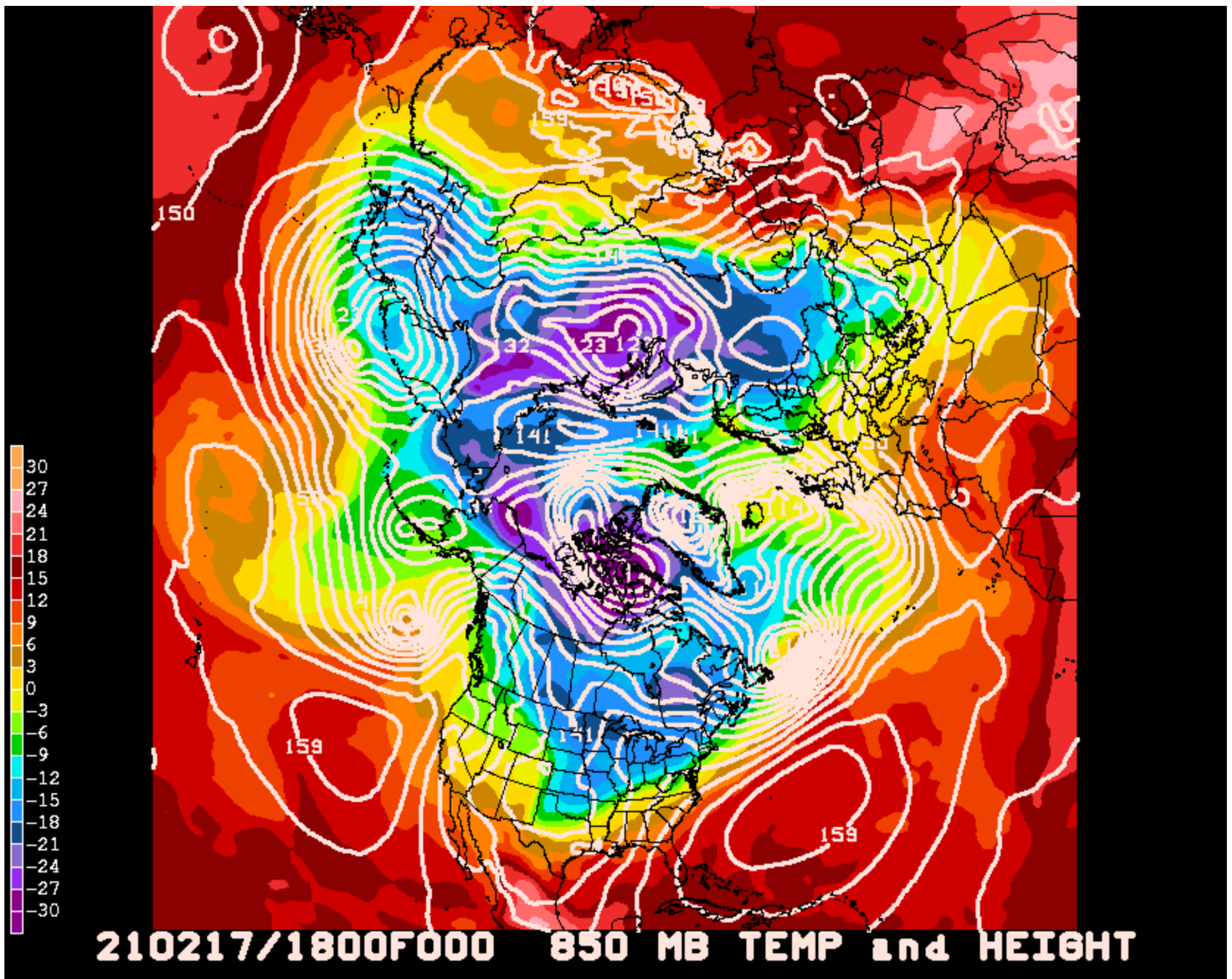












Amarillo has seen high temperature of just 2F (-17C), breaking the city's previous record of 12F (-11C) that was set in 1895, a forecaster from the service's Weather Prediction Centre, Marc Chenard, told Reuters news agency.

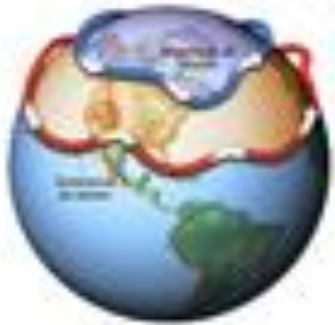
The temperature in Dallas has been colder than in Anchorage, Alaska, CBS News reports.

Temperatures in the city of Dallas for example will reach a high of 14F (-10C) on Monday when it should be more like 59F (15C) at this time of year.

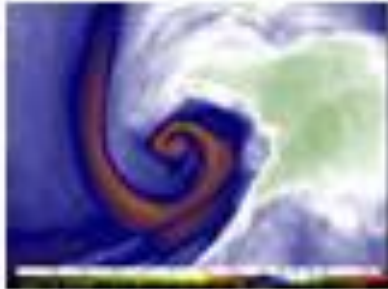
<https://cimss.ssec.wisc.edu/satellite-blog/archives/39941>

<https://www.bbc.com/news/world-56085733>

Vortices in the atmosphere



jet stream



blizzard



hurricane



tornado

Let's create a vortex in the laboratory

See the [balanced vortex experiment](#)