

Hurricane Florence crosses Atlantic to rock Virginia

Sentinel-3 SLSTR RBT acquired on **04 September 2018** from 12:44:48 to 12:47:48 UTC

Sentinel-3 SLSTR RBT acquired on **06 September 2018** from 01:07:31 to 01:10:31 UTC & from 13:30:26 to 13:33:26 UTC

Sentinel-1 CSAR EW acquired on **07 September 2018** from 21:32:05 to 21:33:09 UTC

...

Sentinel-1 CSAR IW acquired on **14 September 2018** from 11:15:05 to 11:15:55 UTC

Author(s): Sentinel Vision team, VisioTerra, France - svp@visioterra.fr

Keyword(s): Emergency, natural disaster, atmosphere, storm, climate change, wind, rain, cyclone, USA, United States



[3D Layerstack](#)

Fig. 1 - S3 SLSTR (04.09.2018) - S8 thermal band with colour map - The 04.09, Florence reached Hurricane status.

[2D view](#) [3D view](#)

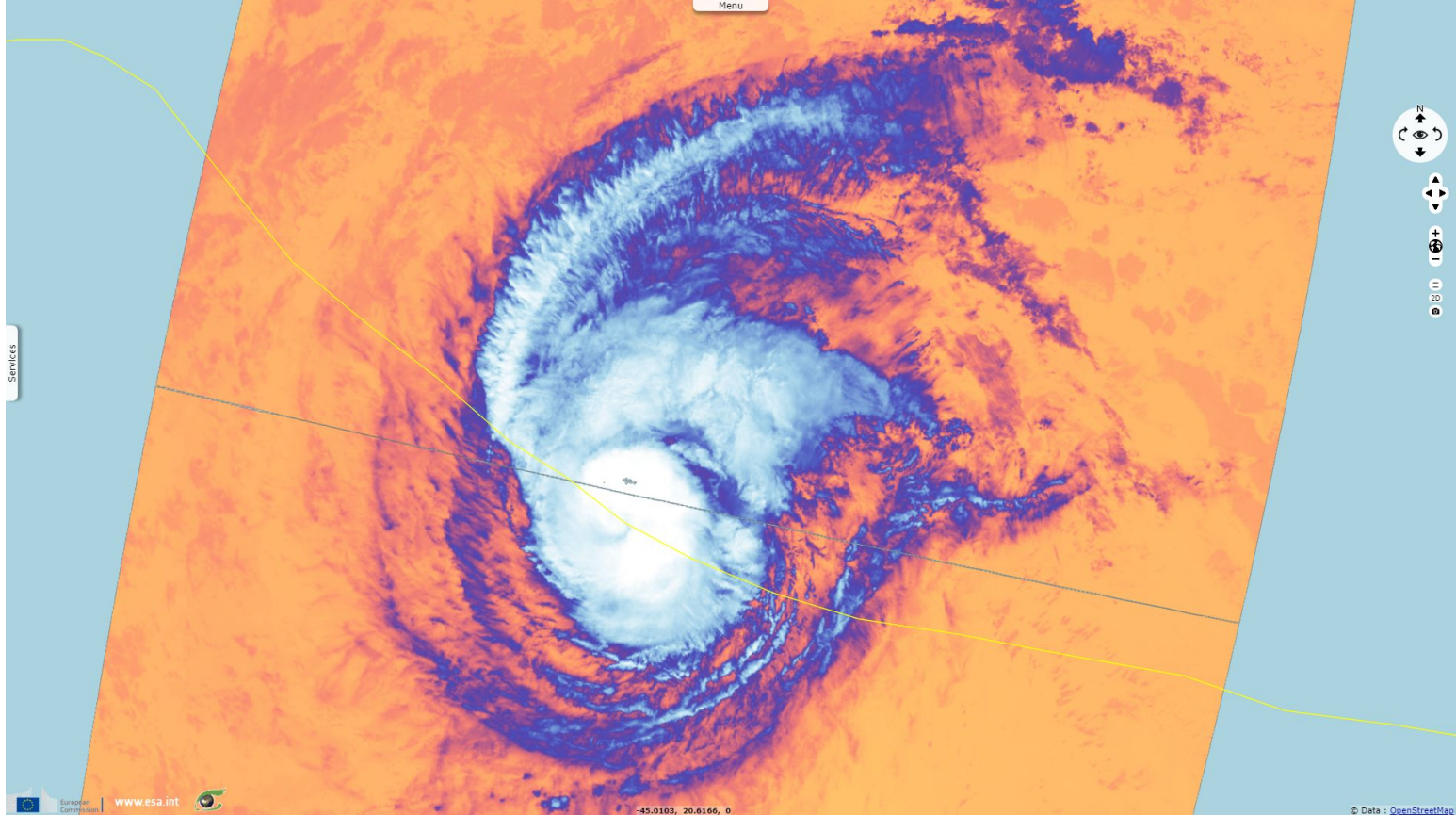


Fig. 2 - S3 SLSTR (06.09.2018 at 01:10) - Early 06.09, it was a cat.2 hurricane, down from cat.4 hours before.

[3D view](#) [2D view](#)

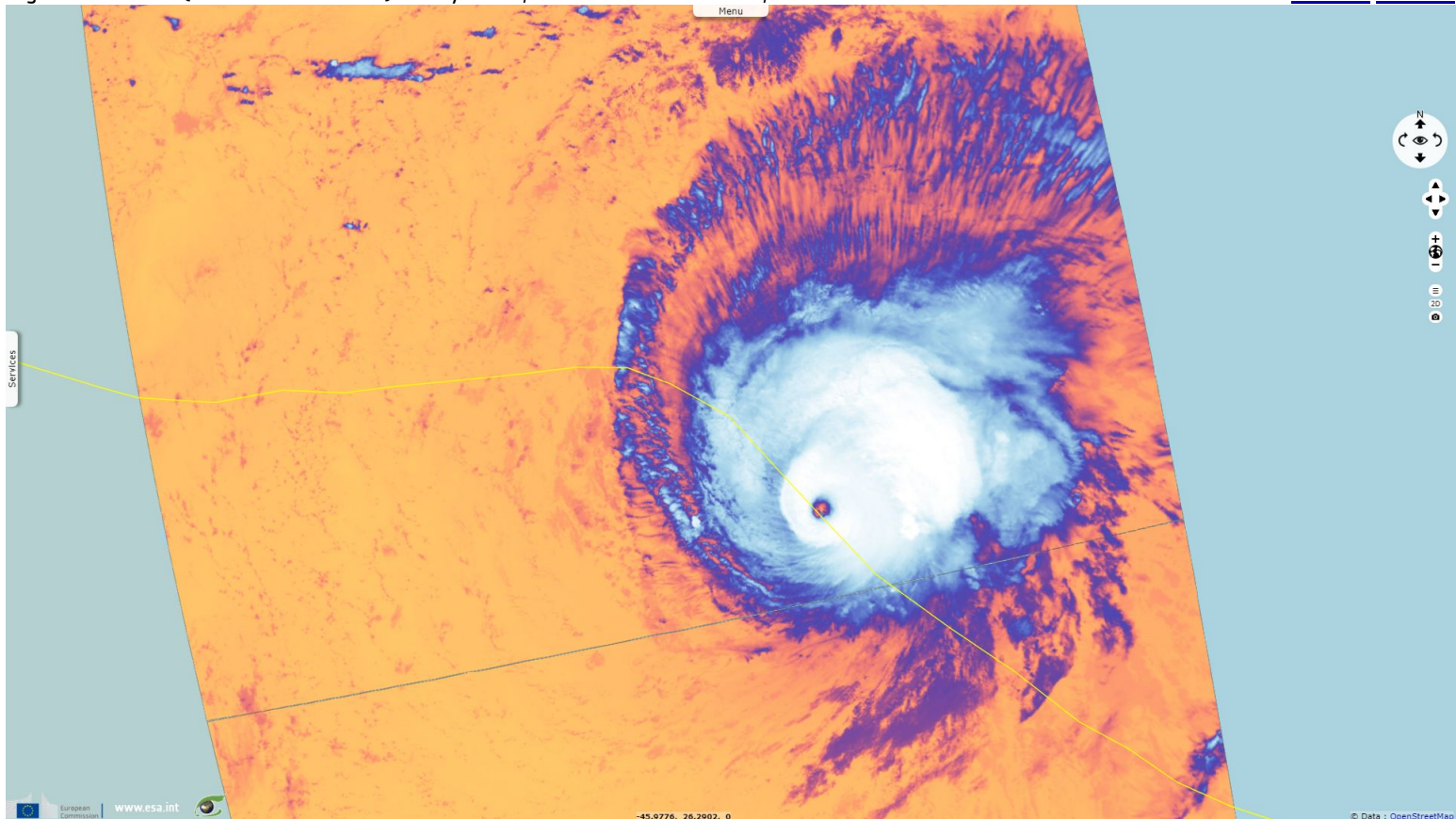


Fig. 3 - S3 SLSTR (06.09.2018 at 13:33) - The day after, it reverted to the status of tropical storm.

[3D view](#) [2D view](#)

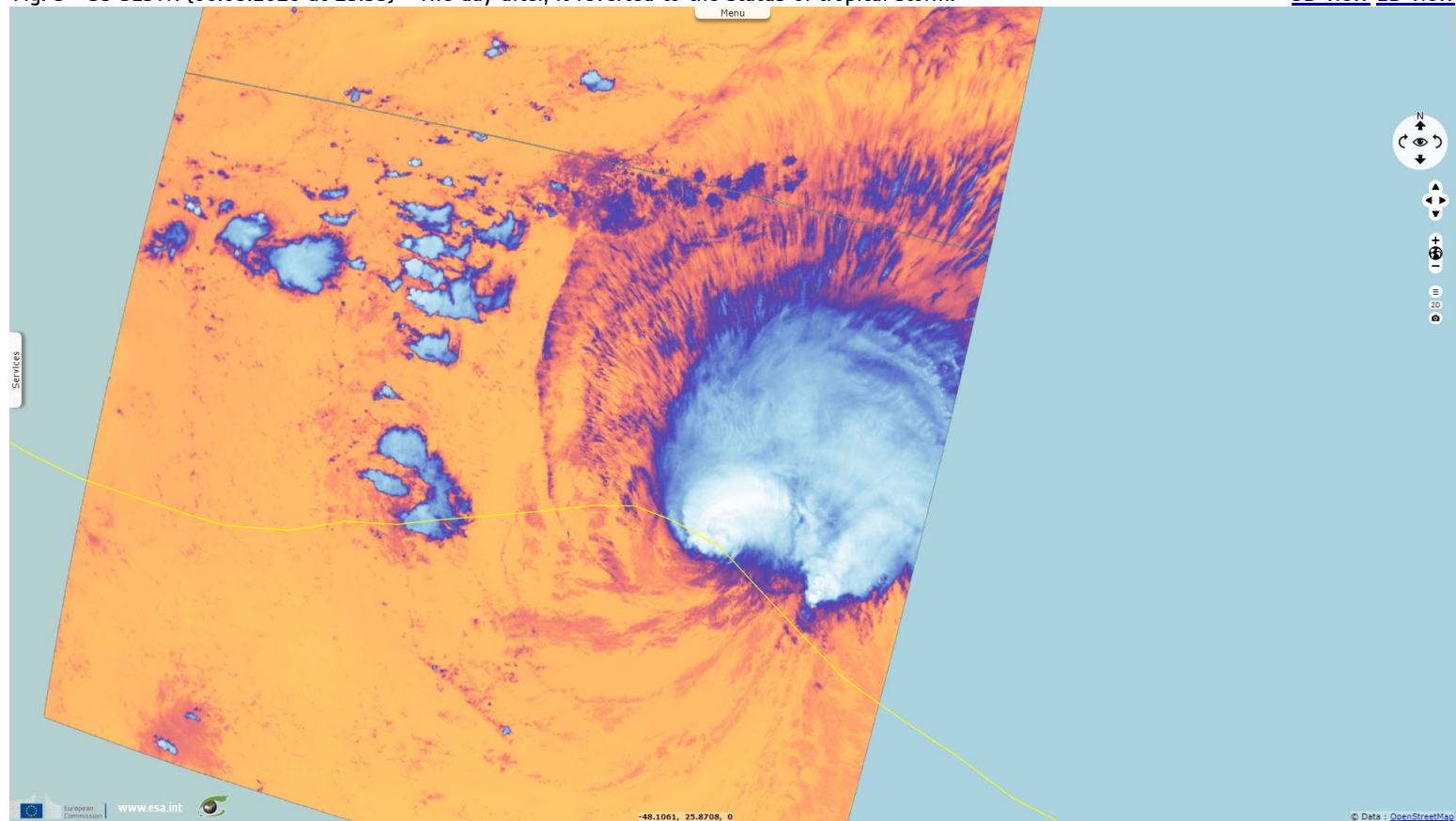


Fig. 4 - S1 EW (08.09.2018) - vv,vh,vv colour composite - Even as a tropical storm the 08.09, an eye still shows on this radar image. [2D view](#) [2D view](#)

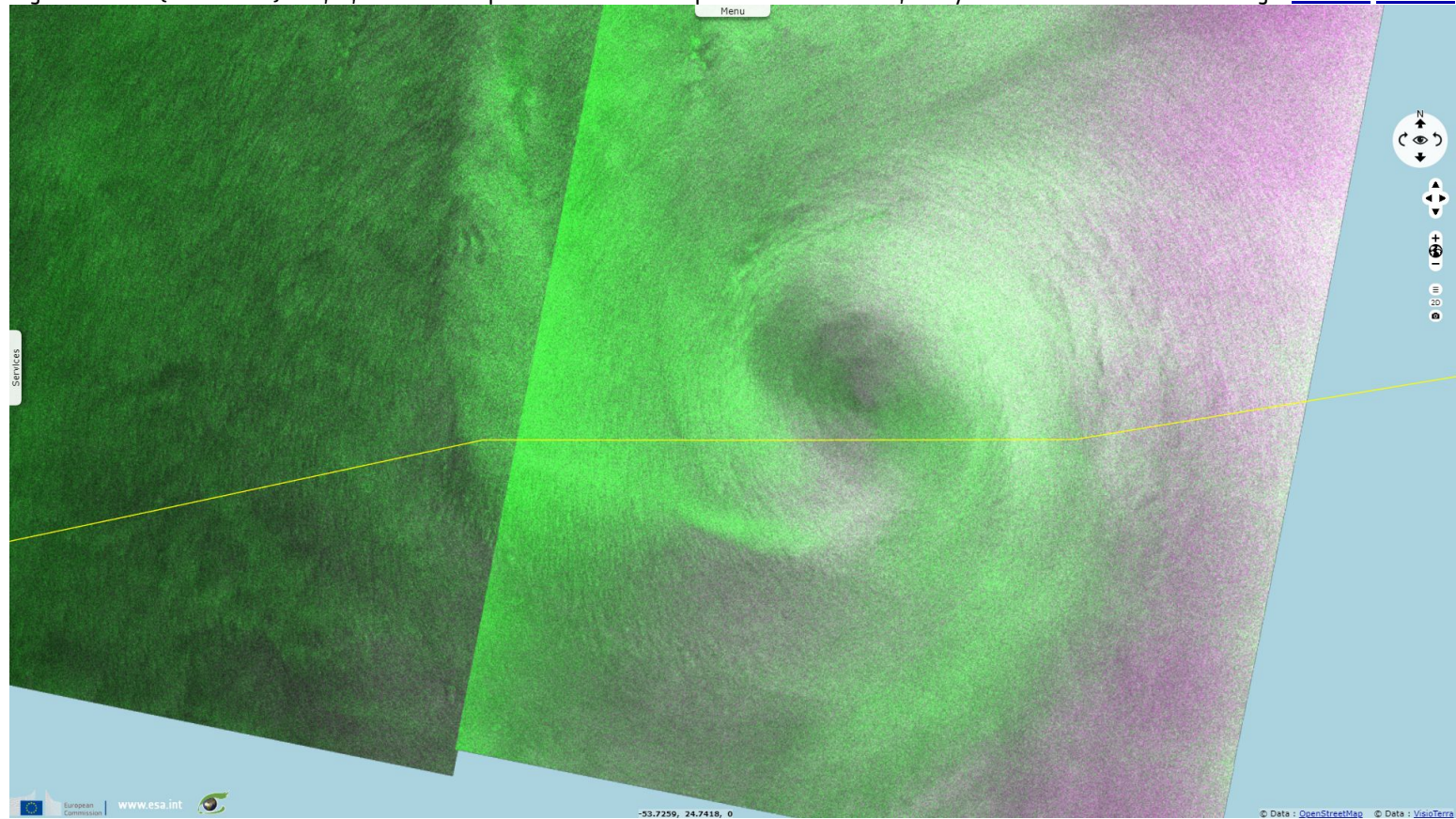


Fig. 5 - S3 SLSTR (09.09.2018) - Bolstered by the Gulf Stream, Florence recovered strength the following day.

[3D view](#) [2D view](#)

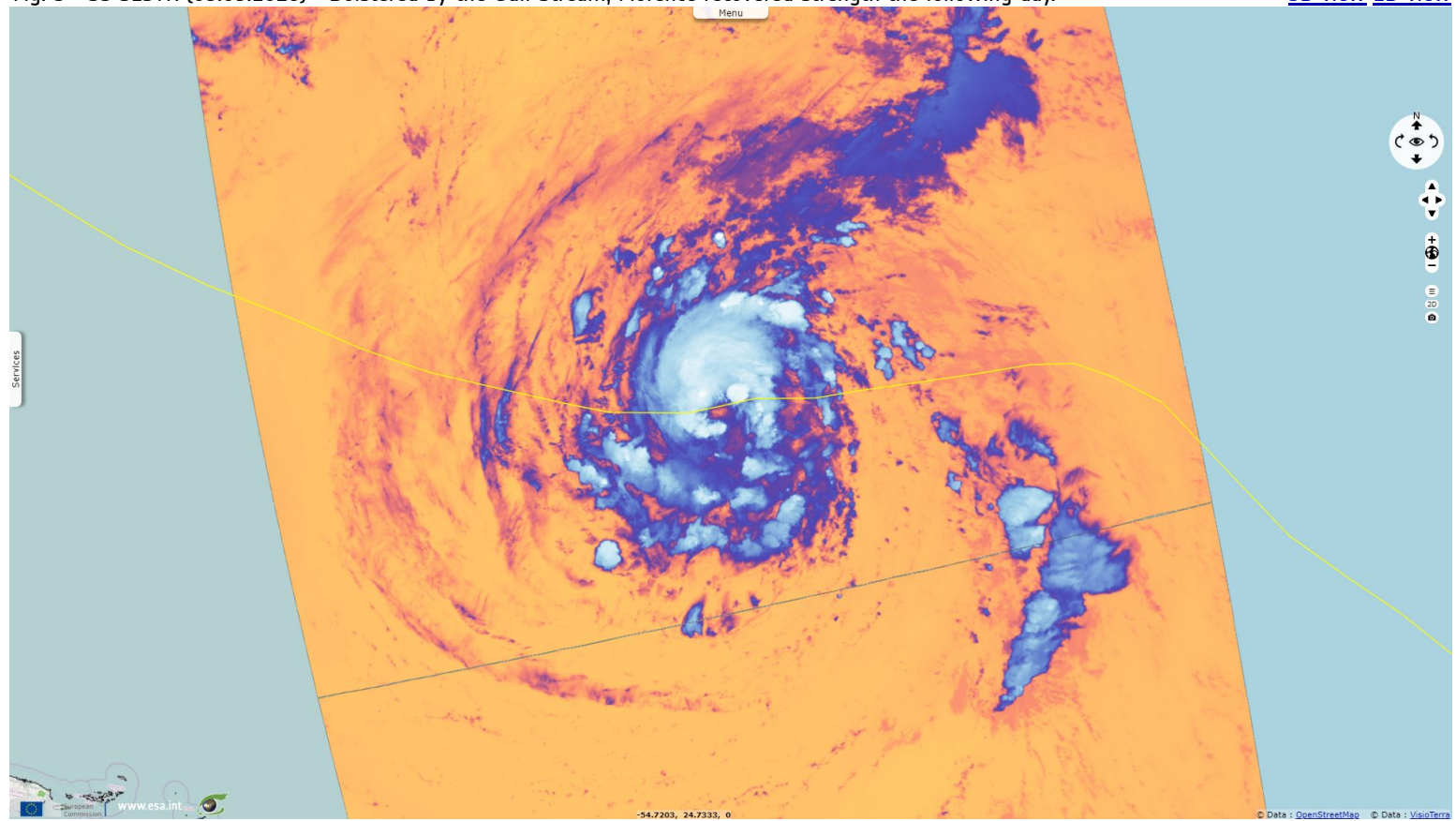
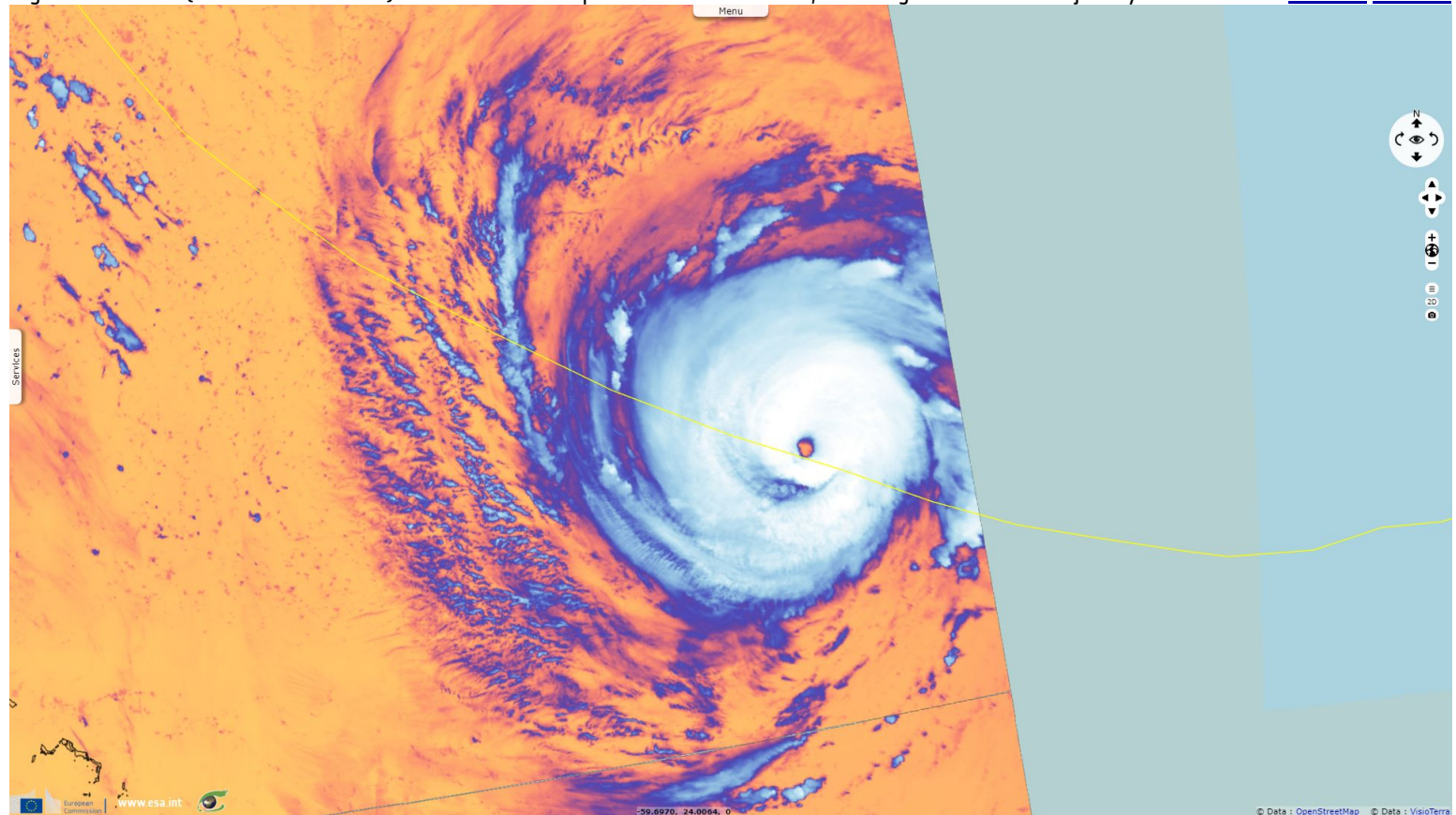
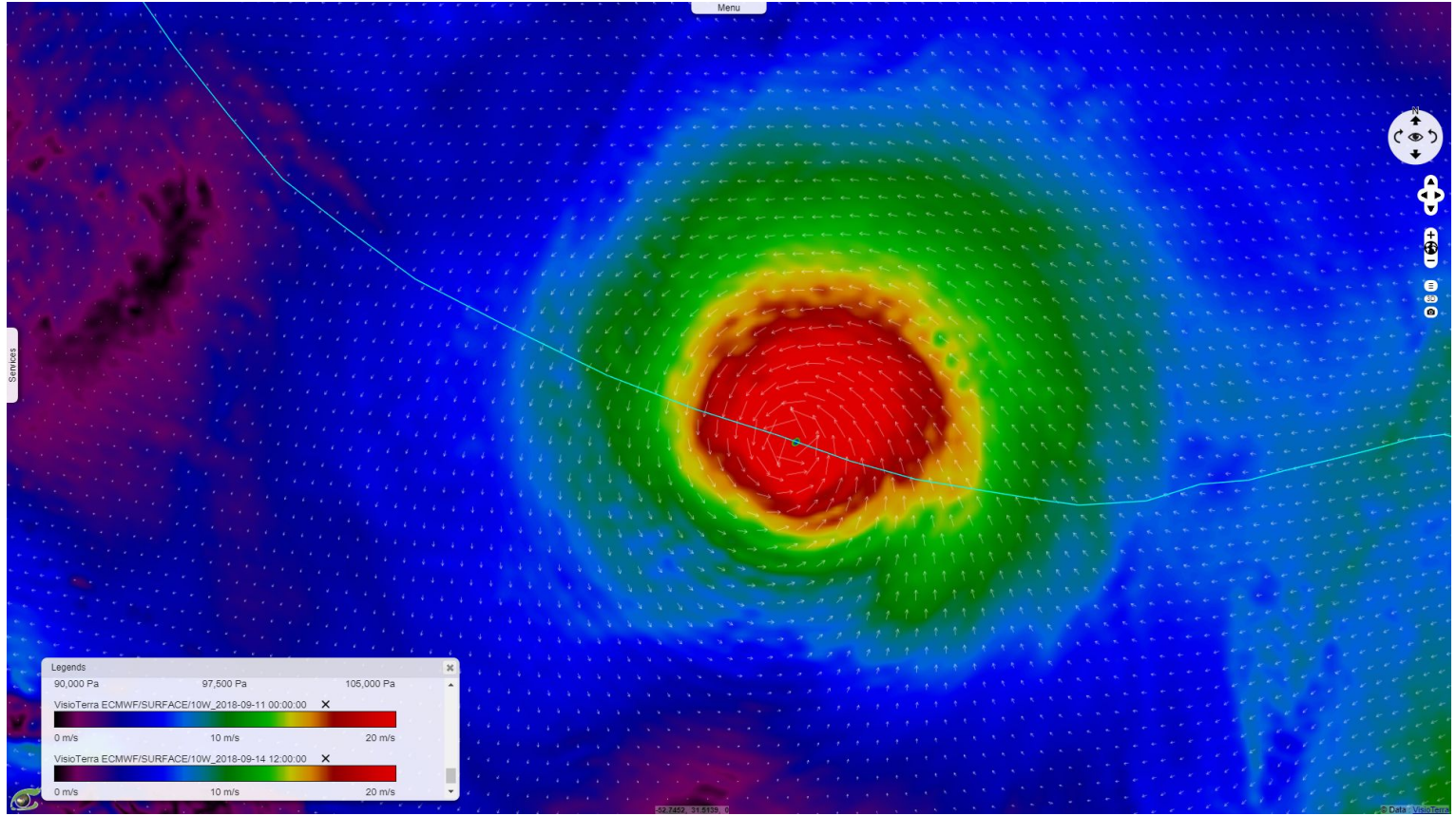


Fig. 6 - S3 SLSTR (11.09.2018 at 02:21) - It is here at its apex as a cat.4 hurricane, following a north-west trajectory.

[3D view](#) [2D view](#)

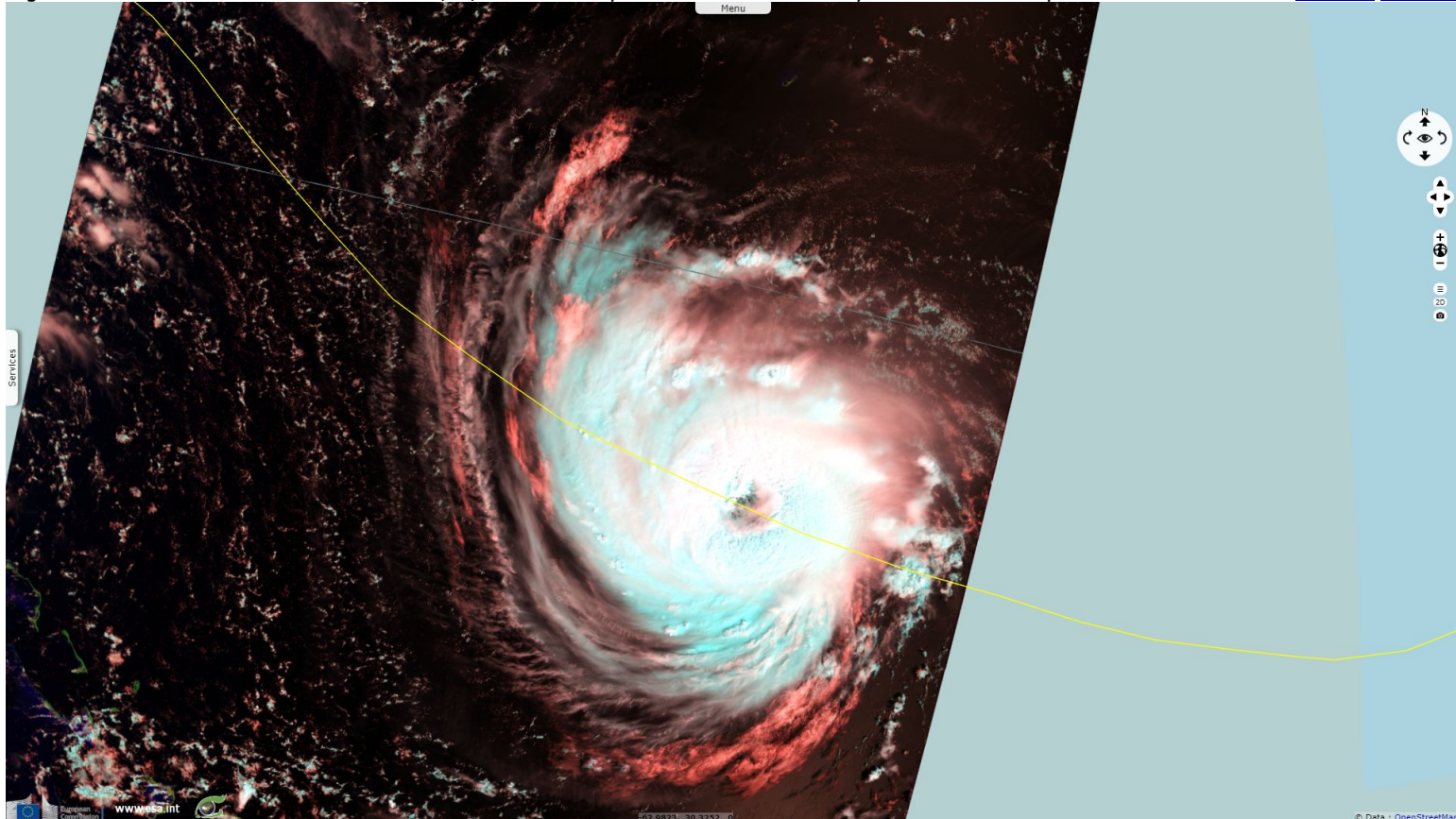




10-metre wind 11.09.2018 at 00:00 by ECMWF when Hurricane Florence was at its strongest [3D view in VtWeb](#)

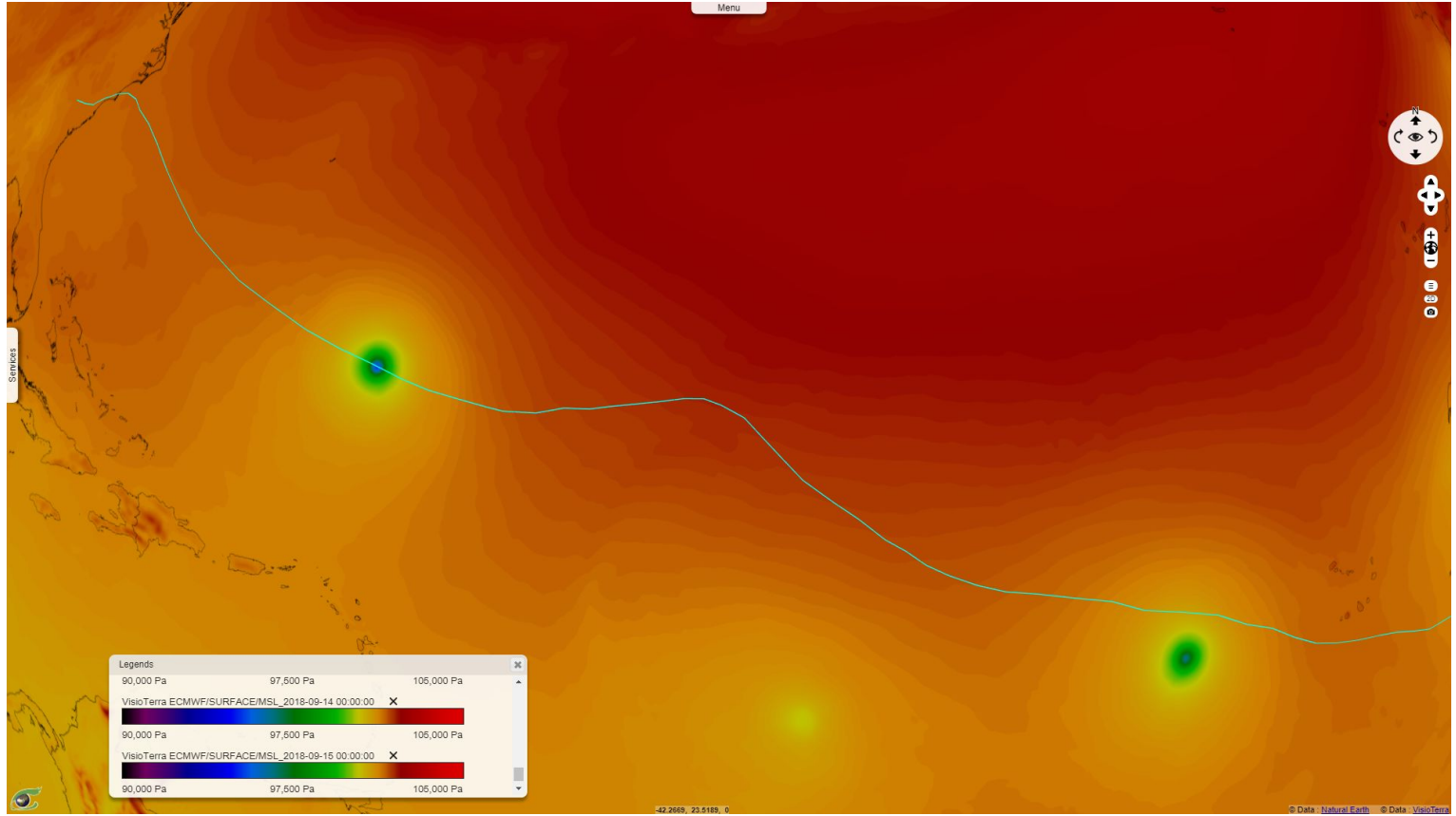
Fig. 7 - S3 SLSTR (11.09.2018 at 14:44) - S6,S3,S1 colour composite - Different cloud layers show on this optical view.

[3D view](#) [2D view](#)



US National Oceanic and Atmospheric Administration (NOAA) Satellite and Information Service [published](#): "At 2 p.m. September 12, Florence was located about 435 miles southeast of Wilmington, North Carolina and moving northwest at around 16 mph. Hurricane-force winds extend up to 70 miles from the center of the storm, and will begin reaching the coast of the Carolinas by Thursday morning. Hurricane warnings are in effect across the entire North Carolina coast and parts of northern South Carolina, while flash flood watches extend inland away from the coast in both states.

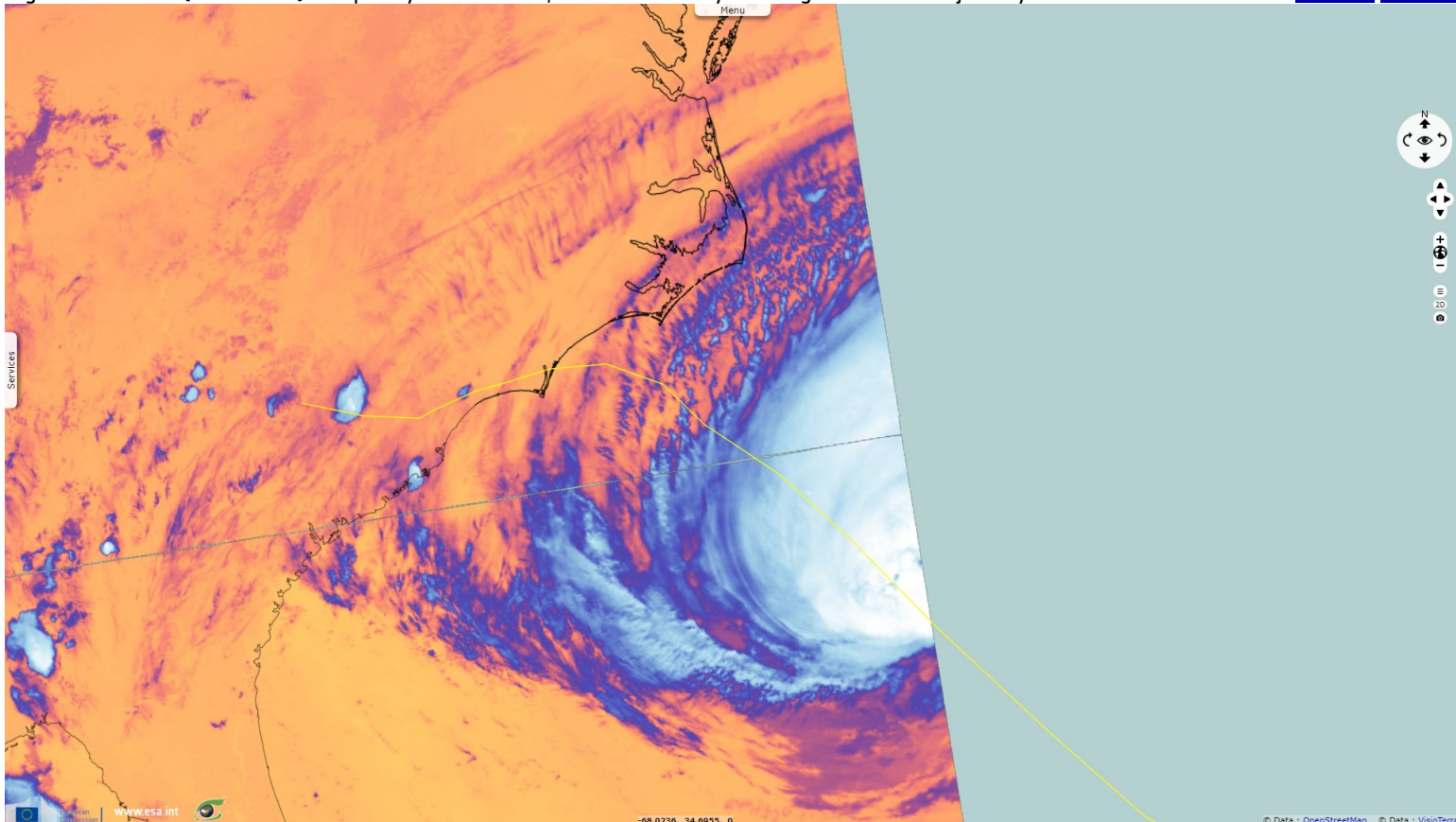
The National Hurricane Center warns that Florence may slow down considerably late Thursday into Friday as it makes landfall, elevating the risk of "life-threatening storm surge" along the coast and high potential for catastrophic flooding as the storm dumps "heavy and excessive rainfall" across the Carolinas."



Mean sea level pressure 11.09.2018 at 00:00 by ECMWF when Hurricane Florence was at its strongest [3D animation in VtWeb](#) [3D view in VtWeb](#)

Fig. 8 - S3 SLSTR (13.09.2018) - Hopefully back to cat.2, Florence is finally reaching the end of its journey.

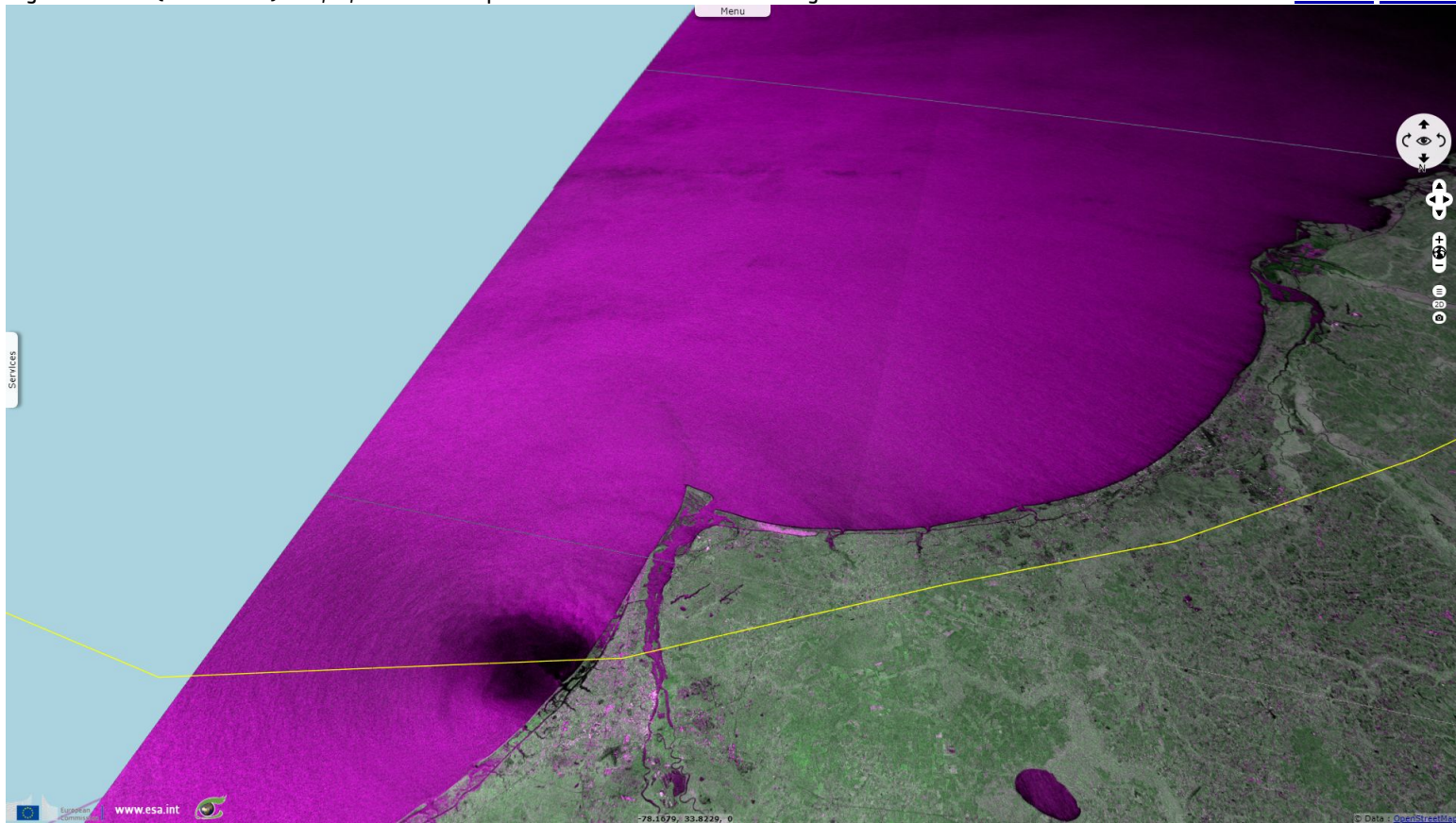
[3D view](#) [2D view](#)



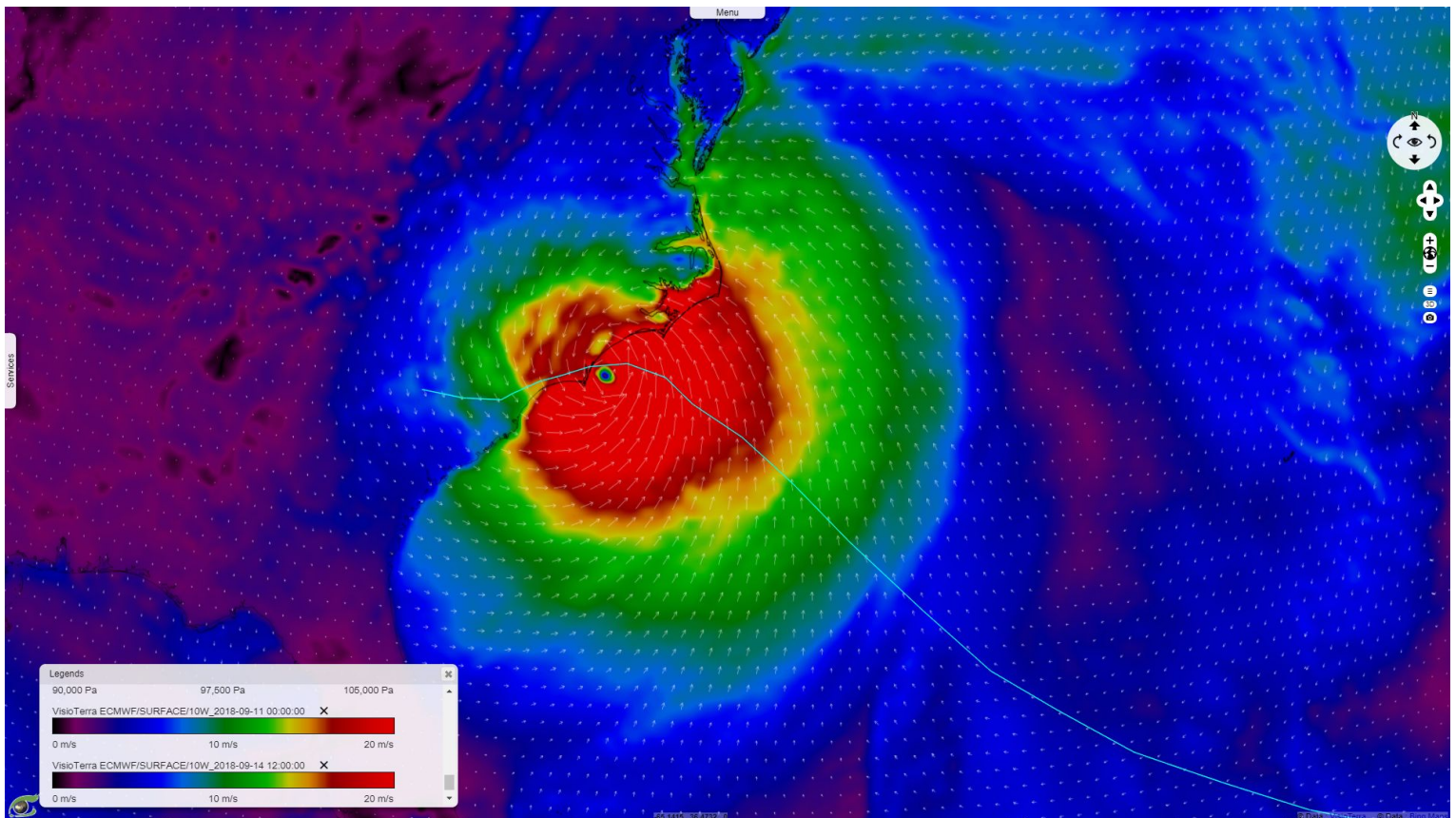
Before Florece reached the US coast, Disaster Charter [wrote](#): "Florence is the most powerful storm to threaten the Carolinas in almost thirty years with current sustained wind speeds of over 140mph. The region could be without power for several days. Storm surge is also predicted to flood large areas. A state of emergency has already been declared in Virginia, Maryland, Washington DC as well as North and South Carolina. Officials have already asked residents in low-lying coastal areas to leave their homes with a million people expected to evacuate."

Fig. 9 - S1 IW (14.09.2018) - vv,vh,vv colour composite - Florence as it was making landfall on North Carolina coast.

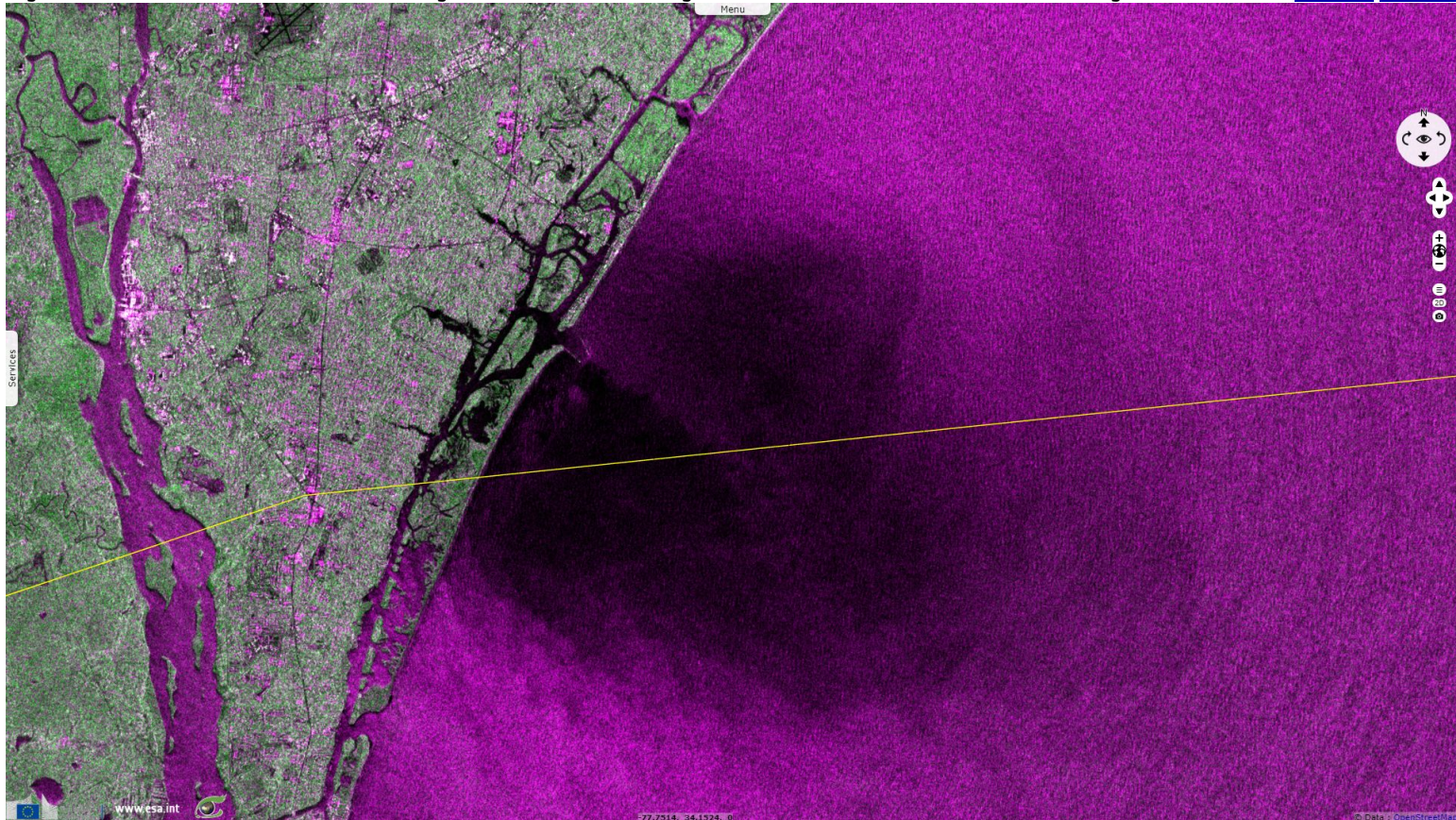
[3D view](#) [2D view](#)



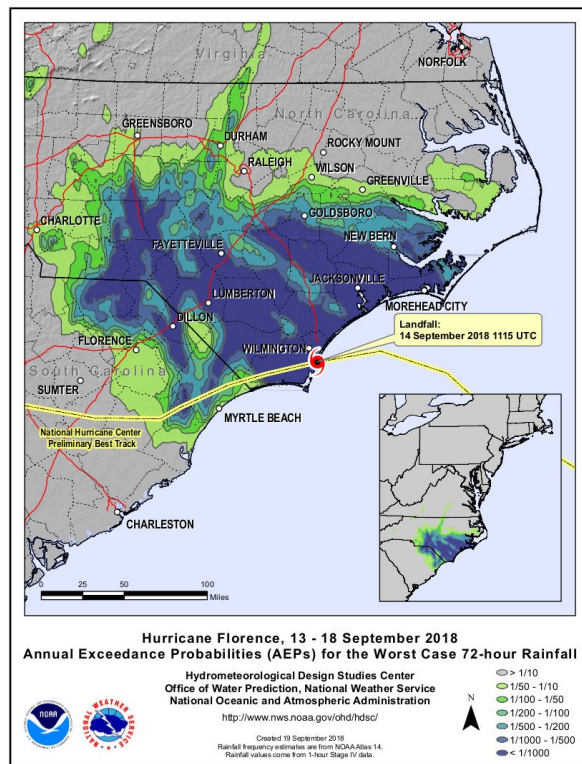
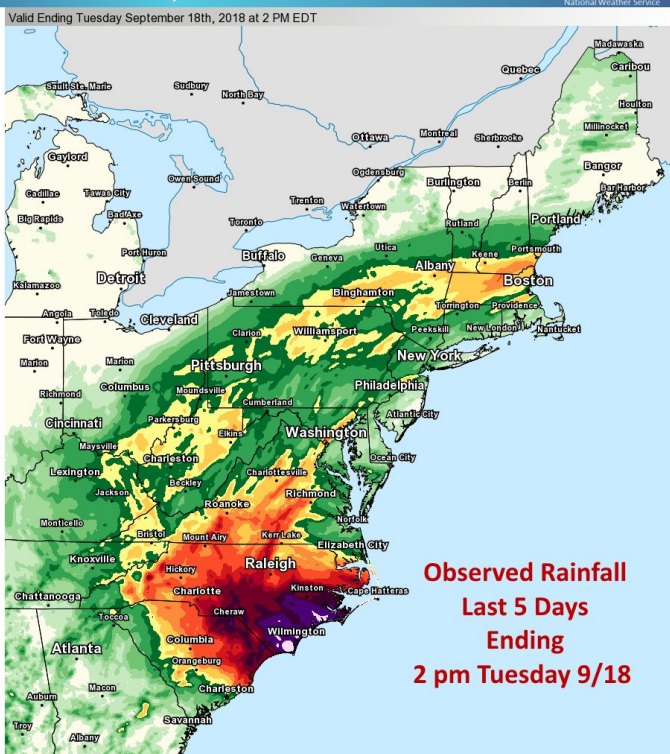
One can see how sea surface waves caused by Florence wind only weaken far away from the eye. Important storm surge was observed on the south-east coast of USA. At least 45 people were killed directly or indirectly by Florence, the economic toll should exceed one billion dollars of damage.



10-metre wind 14.09.2018 at 12:00 by ECMWF when Hurricane Florence was about to hit North Carolina, notice how even friction with even low lying land reduces wind speed [3D view in VtWeb](#)



Observed Precipitation



Left: Here is the latest observed rainfall map from Florence. Totals are from the last 5 days ending 2 pm this afternoon (Tuesday September 18th) - source: [National Weather Service Eastern Region](#).

Right: The NOAA/NWS Hydrometeorological Design Studies Center analysis of the 3-day rainfall totals from Florence confirms that a large area exceeded the 0.1% probability event expected in given year, or "1000-year" event - source: [National Weather Service Eastern Region](#).

The views expressed herein can in no way be taken to reflect the official opinion of the European Space Agency or the European Union.

More on European Commission space:

More on ESA: [S-1 website](#) [S-2 website](#) [S-3 website](#)

More on Copernicus program: [Scihub_portal](#) [Cophub_portal](#) [Inthub_portal](#) [Colhub_portal](#)

More on VisioTerra: [Sentinel Vision Portal](#) [Envisat+ERS_portal](#) [Swarm+GOCE_portal](#) [CryoSat_portal](#) Proba-V portal