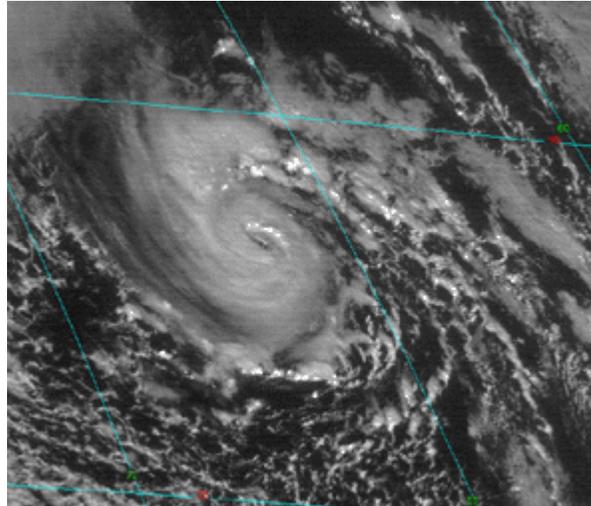


# Unnamed Hurricane

1991

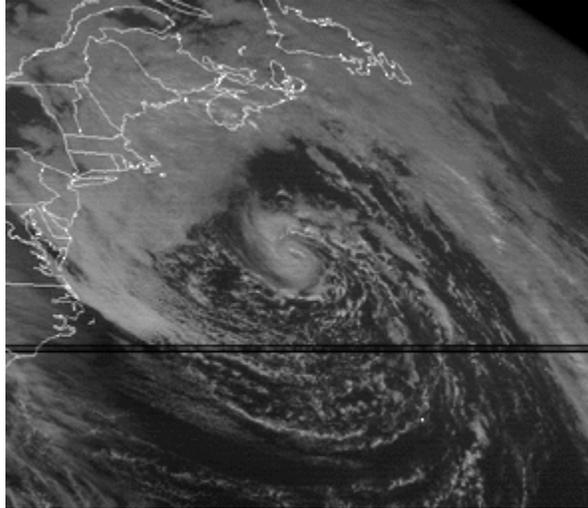


This zoomed-in visible image of an unnamed hurricane was taken at 1801 UTC November 1, 1991 when the storm was at its peak intensity (980 mb with sustained winds of 65 knots). The hurricane is embedded in the center of a much larger circulation that is the remains of the dying Halloween Storm of 1991. This storm, called the "[perfect storm](#)" by the National Weather Service, became a topic in Sebastian Junger's best-selling 1997 novel "The Perfect Storm."

| Image Information                 |                      |                               |                    |
|-----------------------------------|----------------------|-------------------------------|--------------------|
| Satellite System                  |                      | Image Specifics               |                    |
| <a href="#">Satellite Name</a>    | GOES 7               | <a href="#">Channel Band</a>  | No. 1 (Visible)    |
| Date                              | November 1, 1991     | <a href="#">Resolution</a>    | 1-km               |
| <a href="#">Julian Date</a>       | 305                  | <a href="#">Orbit No./Dir</a> | NA                 |
| <a href="#">Time</a>              | 1800 UTC<br>1300 EST | <a href="#">Entity ID</a>     | NA                 |
| <a href="#">Instrument System</a> | VAS: VISSR           | Area                          | Northwest Atlantic |
| <a href="#">Data Type</a>         | Sector               |                               |                    |

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## Event Discussion



### *Unnamed Hurricane of 1991*

#### *Conditions at the Time of the Image*

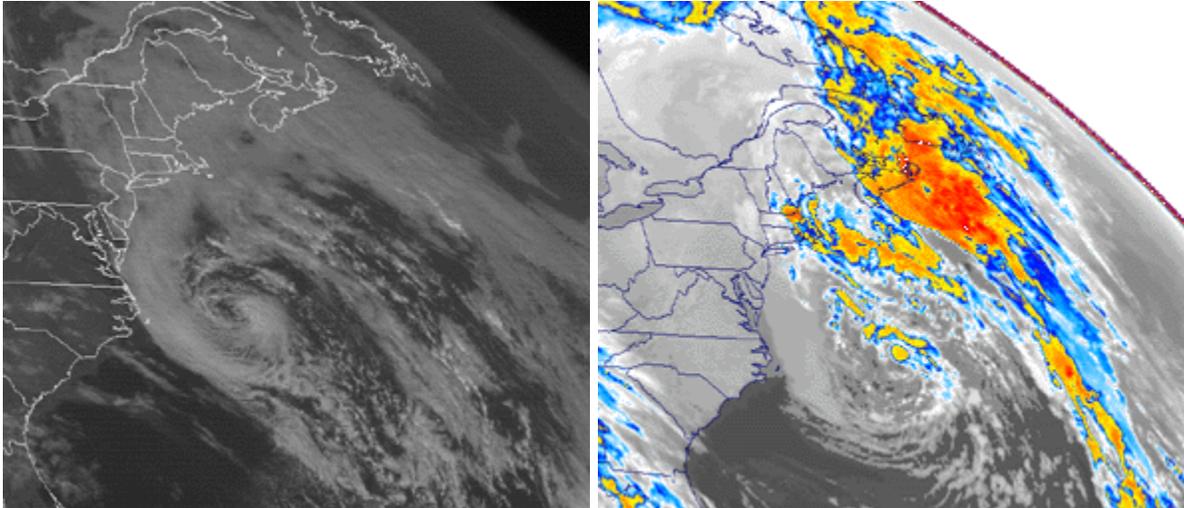
An unnamed hurricane at the center of the dying [Halloween Storm](#) of October, 1991 has reached its peak intensity in this visible GOES 7 image from 1801 UTC on November 1, 1991. The storm was packing sustained winds of 65 knots and the minimum central pressure was 980 millibars. The counterclockwise swirl of the larger cyclone is still very evident in this view of the northwest Atlantic and Eastern U.S. The storm was moving rapidly northeastward and hit Nova Scotia as a weakened tropical storm the next day. It was the eighth hurricane (and 34th tropical cyclone of either tropical storm or hurricane intensity) which remained unnamed since the official naming of Atlantic tropical cyclones began in 1950.

#### *History of the Storm*

A large and very powerful extratropical cyclone pounded the Western Atlantic in the closing days of October 1991. This storm was so severe that it became known as the Halloween Storm and was called a "perfect storm" by the National Weather Service. One of its many casualties was the sword fishing boat the Andrea Gail, which sank with all hands on board and became the basis for Sebastain Junger's novel "The Perfect Storm."

The Halloween Storm had weakened and drifted southward to near 36.7 N, 71.5 W by 18:00 UTC on October 31. (See Figure 1). At that time, the central pressure had risen to 996 mb and winds had decreased to 40 knots. With the low centered over warm waters of the Gulfstream, subtropical characteristics were acquired. By this time, there was no

longer a well-defined baroclinic zone across the area (i.e., temperatures were nearly uniform in all directions), but the center was not yet under the central dense overcast feature of tropical low pressure centers.

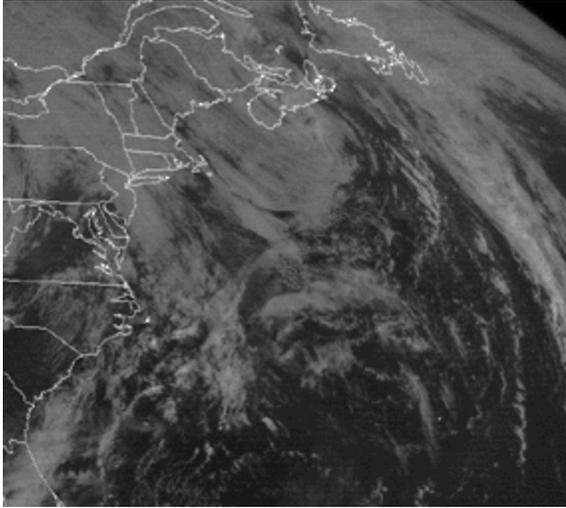


Subtropical Phase  
Visible: 18 UTC Oct 31  
Figure 1

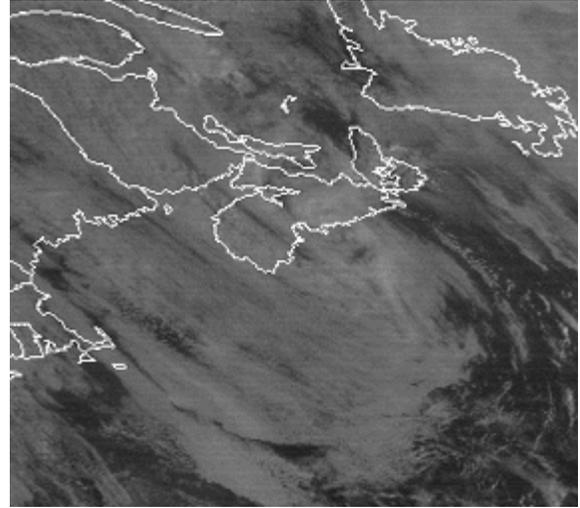
Tropical Storm  
Infrared: 06 UTC Nov 1  
Figure 2

By 0600 UTC on November 1, the storm was in the process of making a counter-clockwise loop and central convection had increased to the point where a tropical cyclone (of tropical storm intensity) could be identified at the center (See Figure 2). By nine hours later, at 1400 UTC, an eye was forming and the storm was near hurricane intensity. Maximum intensity of the storm was reached at 1800 UTC (See Main Gallery image above) when a minimum central pressure of 980 millibars with sustained winds of 65 knots was reached. An Air Force Reserve Unit aircraft investigated the hurricane around 0000 UTC on November 2 and found maximum flight level (850 mb) winds of 86 knots, a 4 degree C rise in air temperature at the center, and an estimated sea level pressure of 981 millibars. The radius of maximum winds was about 30 nautical miles. (In contrast, and typical of older massive extratropical storms, the Halloween storm had a more uniform area of gale force winds extending well over 300 n mi from its center with no clearly defined wind radius.) With the warm core finding and other data, this flight confirmed that the center of the Halloween Storm was now a hurricane!

Though the formation of a hurricane in the center of a large extratropical low is unusual, it has happened several times before. Hurricane Karl formed in the center of a deep layer non-tropical cyclone in the central Atlantic on November 25, 1980 and was of hurricane strength until November 27, 1980. By their very nature, the centers of deep layer cyclones are areas of small temperature gradients and light vertical wind shear. Given sufficient heating from the sea surface below, tropical cyclone formation within the larger low pressure center is possible.



Nova Scotia Landfall  
Visible: 1401 UTC Nov 2  
Figure 4



Zoom-in View of Landfall  
Visible: 1401 UTC Nov 2  
Figure 5

After its formation, the unnamed hurricane began speeding to the northeast. It passed over the same area where the extratropical cyclone had passed two days earlier (before the formation of the hurricane). By 0600 UTC November 2, six hours after the reconnaissance flight, the storm had weakened to tropical storm status and central pressure had risen to 988 millibars. Even so, the SFL Atlas, A Bahamian ship 110 miles southwest of the center, reported winds of 45 knots. Accelerating to the northeast, the storm made landfall near Halifax, Nova Scotia as a tropical storm around 1400 UTC (See Figures 4 and 5). The lowest reported pressure on land was 998.1 millibars at Shearwater, near Halifax, and the Canadian Coast Guard station at Chebucto Head (8 miles south of Shearwater) reported sustained winds of 40 knots with gusts to 45 knots. Radar showed curved rain bands on the western side of the system, which weakened as they approached the coast. Bedford reported only 0.27 inches and Shearwater a mere 0.23. No damage was reported from the unnamed tropical cyclone and it dissipated 10 hours after landfall.

### **Why Was the Hurricane Unnamed?**

The National Hurricane Center (now called the Center for Tropical Prediction) began naming tropical storms and hurricanes in 1950. The hurricane which developed at the center of the dying [Halloween Storm](#) met all meteorological criteria to be designated as a hurricane, and a track for it is shown on the National Hurricane Center's 1991 "North Atlantic Hurricane Tracking Chart." So why did the storm remain unnamed?

At the time of the hurricane, news media attention was still focused on the massive damage from Maine to Florida caused by the slowly dying Halloween (or "Perfect") Storm. It was felt that naming the hurricane would cause major confusion on the part of the media, Emergency Management officials, and the public. Since the hurricane was

expected to be short-lived and primarily of concern to maritime interests, it was decided to leave the storm unnamed. All associated warnings were handled through enhanced High Seas and Offshore and Coastal Waters Forecasts. The decision was made jointly by NOAA's National Meteorological Center, selected National Weather Service Forecast Offices, the U.S. Navy, and the Maritimes Weather Center of the Atmospheric Environment Service of Canada. The unnamed hurricane brought a bizarre ending to one of the most massive Atlantic storms of record.

### *Typical Hurricane Endings*

Extensive extratropical cyclones such as the Halloween Storm usually cover larger areas than even the largest hurricanes or typhoons. Sometimes, as was the case with Hurricane Grace's interaction with the Halloween Storm, a hurricane will be absorbed by a larger extratropical storm and the hurricane's energy becomes a part of the larger storm's circulation. This sometimes leads to a dramatic energizing of the larger storm, often with disastrous consequences. Such was the case with Hurricane Hazel in October, 1954 which first struck the Carolinas as a Category 4 hurricane, and then merged with a low pressure center to become a monstrous extratropical storm which devastated Toronto, Canada causing 76 deaths. A cold front associated with the Halloween Storm overtook Grace at 1800 UTC on the 29th and the low pressure center absorbed the remnants of the hurricane. Similar absorption of hurricanes by extratropical storms is a common occurrence, and such is the end of many tropical cyclones. Still other tropical cyclones wander over land or over cooler ocean waters and slowly fade away or lose their tropical characteristics.

### *Unusual Endings to Extratropical Storms*

Though hurricanes are often absorbed by major extratropical storms, a reverse process can occur, i.e., under the right conditions, a weak extratropical cyclone can remain over warm ocean water long enough that the storm becomes "warm core" and evolves into a tropical storm, and later possibly a hurricane. If this occurs, it is often in the early part of the hurricane season. A favored place is off the Carolina or Georgia coastlines in July or early August when weak low pressure centers sometimes stall offshore and later become tropical storms or hurricanes. The process can occur at any time, however. Hurricane Grace, which was absorbed by the Halloween Storm, had similar origins in that it was initially subtropical in character and formed primarily from a mid-level low pressure center which extended down to the warm ocean surface.

An even rarer event is the conversion of the center region of a major extratropical storm into one with tropical characteristics. As with most major storms, the Halloween Storm underwent a complete occlusion process by which surface frontal boundaries underneath the spinning vortex center disappear. The central portion of such a deep-layer cyclone at this time is relatively slow moving; the surface air temperature is relatively uniform with small temperature gradients; and there is light vertical wind shear. If the center of the low is sitting over a very warm ocean water, the air in the center of the low can eventually become warm core at all levels and a tropical storm can develop. This process occurred

south of Newfoundland when the Halloween Storm drifted over the Gulfstream. Later it became a true hurricane in every sense of the word. Images of the Halloween Storm prior to its conversion to a hurricane can be found [here](#).

Citing the Article:

McCown, Sam, "Unnamed Hurricane", 1991, NOAA's National Climatic Data Center, Asheville, NC