# Greenland meteor on 9 December 1997

**last updated 9 June 1998**

> A big meteor impact probably occurred in Southern Greenland at 61 25N, 44 26W on Tuesday, December 9th approximately 0811 UTC (05:11 am local time). The position is on the ice cap approximately 50 kilometers NE of Narsarsuaq Airport.

Since then, data surveilance equipment has confirmed a bright flash but not an impact. The event may have been further west than originally reported. Running updates on the Greenland meteorite event can be obtained at http://www.astro.ku.dk/~holger/ and at http://www.dcrs.dtu.dk.

# DOD Satellite Observations

"On 9 December 1997, sensors aboard DOD satellites detected the impact of a meteoroid at 08:15:55 UTC roughly midway between Nuuk and Qaqortoq, Greenland. The object broke into at least 4 pieces. One piece detonated at an altitude of about 46 km at 62.9 degrees North Latitude, 50.9 degrees West Longitude. The remaining 3 pieces detonated in close proximity to one another at altitudes between 28 km, at 62.9 degrees North Latitude, 50.1 degrees West Longitude and 25 km at 62.9 degrees North Latitude, 50.0 degrees West Longitude."

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USAF NEWS RELEASE

From:   Headquarters Air Force Technical Applications Center
        Office of Public Affairs
        Patrick AFB, Fl.,
        32925-3002
        (407)-494-9915

Date: June 8, 1998

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On 9 December 1997 at approximately 08:15:55.2 UT, sensors aboard a
U.S. Department of Defense satellite recorded the bright flash of
an apparent meteoroid disintegrating in the atmosphere over
Greenland. The peak radiated intensity recorded on this event
was 9.5E10 watts/sr (using a 6000K blackbody model for the
radiation). Correspondingly, the total radiated energy of the
event was 2.7E11 Joules.


        (If you have questions call MSgt Rene Uzee, Air Force Technical
Applications Center Public Affairs at, (407) 494-4403.)

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PLEASE NOTE: THIS USAF BOLIDE INFORMATION RELEASE AND ALL PREVIOUS RELEASES
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CAN BE FOUND ON THE WWW AT
http://phobos.astro.uwo.ca/~pbrown/usaf.html
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Individuals interested in obtaining graphical lightcurve information
for this event should send an email with their names, fax numbers and
a description of their intended use of this information to
peter@danlon.physics.uwo.ca
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# NOAA Satellite Observations

6 hours later, the NOAA polar-orbiting weather satellites observed a large cloud over southeastern Greenland. These AHVRR images were posted on the internet at http://www.ddorf.rhein-ruhr.de/~aknoefel/greenland .

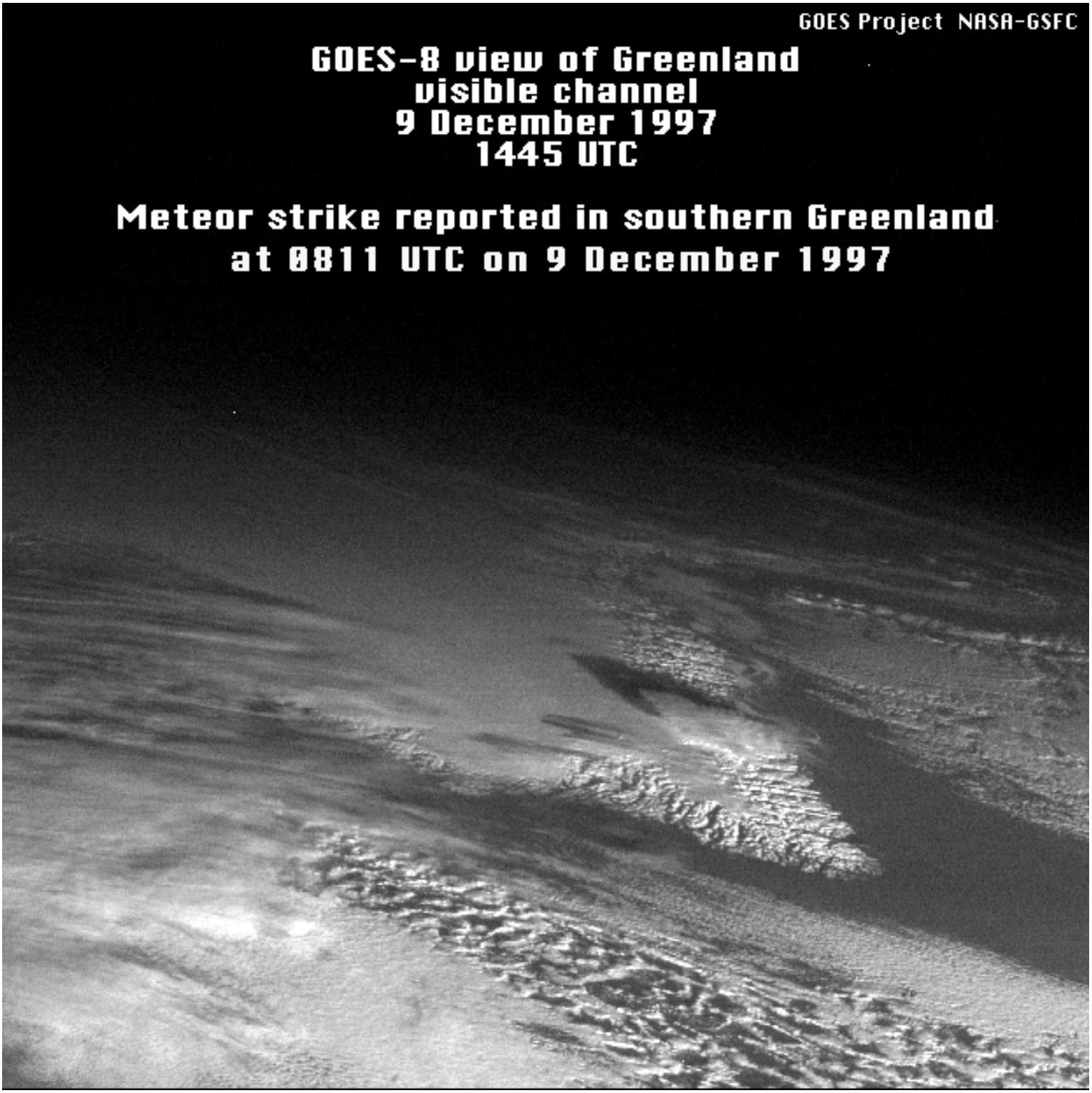
There was speculation that the cloud was related to the meteor because of its unusually high, crisp appearance.

# GOES Satellite Observations

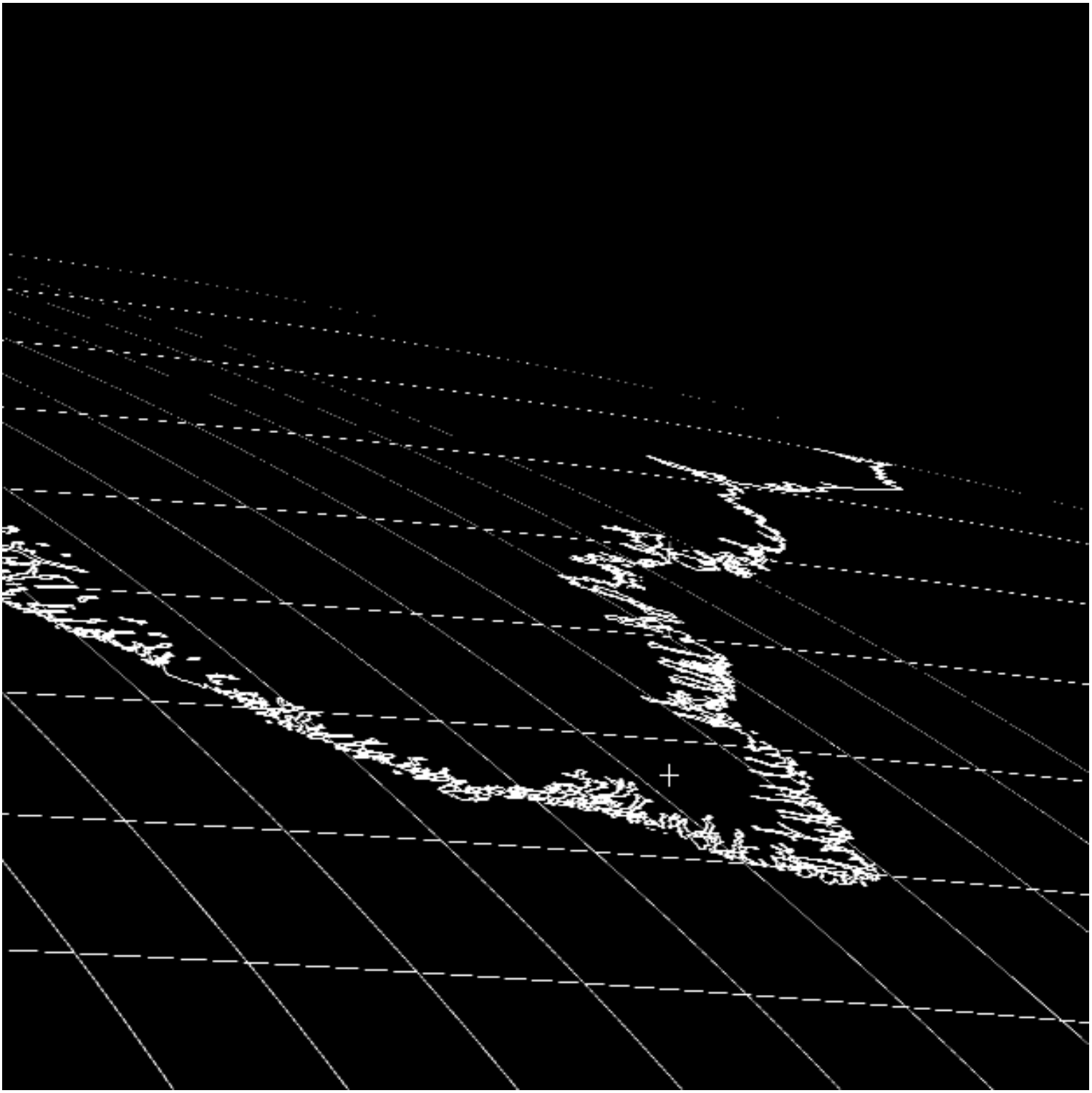
NASA's Laboratory for Atmospheres collects and posts real time images from the GOES weather satellite. These were used to examine the time-series of Greenland images gleaned from the full-disk scans taken by GOES-8 once every three hours in the second week of December.

## GOES-8 visible image on 9 December 1997

The GOES-EAST visible image at 1445 UTC gives a nice view of a distinct high cloud over southern Greenland near local noon:




corresponding coastline map:

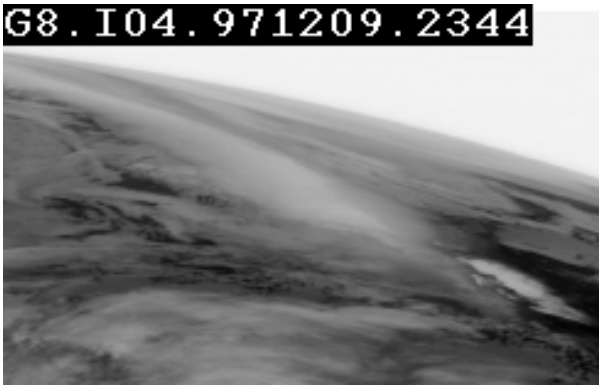


The "+" marks the reported impact point at 61.4N, 44.4W. Latitude and longitude lines are sketched at 2 degree intervals, based on the reported GOES earth-navigation. At this time, the navigated map's coastlines fall 3 pixels south and one pixel west of the observed coastlines, within the GOES earth-navigation error tolerances of 4 visible pixels.

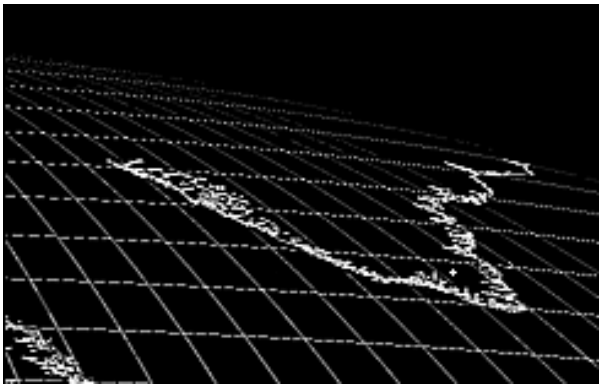
Unfortunately, Greenland is too dark in December to provide visible images during the other GOES-8 observation times, such as 1145 and 1745 UTC.

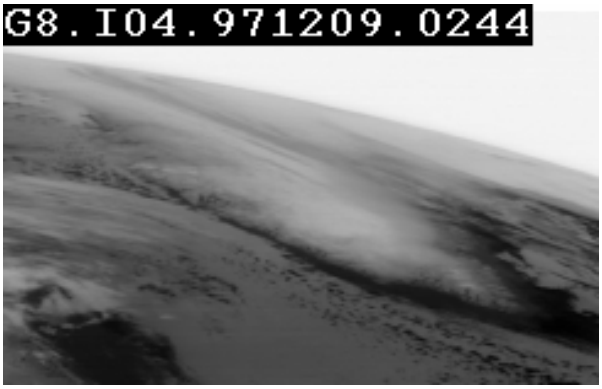
## GOES-8 infrared images on 9 December 1997

Fortunately, Greenland can be seen every three hours in the GOES-8 thermal infrared channel ("I04", or Imager channel 4 at 11 microns) with lower resolution:

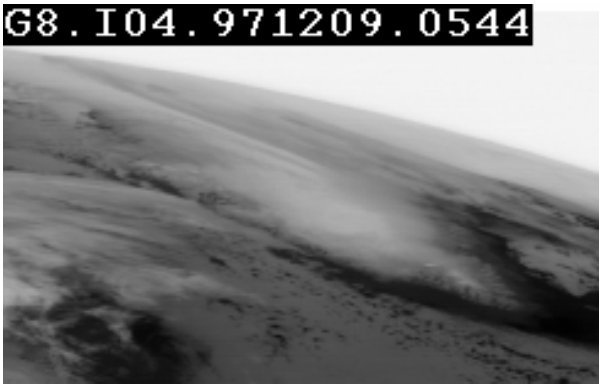


GIF animation

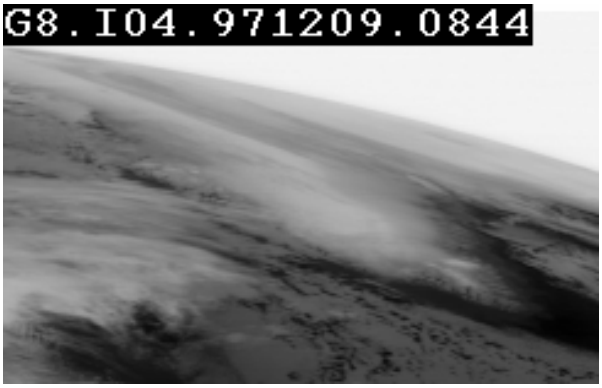

coastline map ("+" marks impact point)



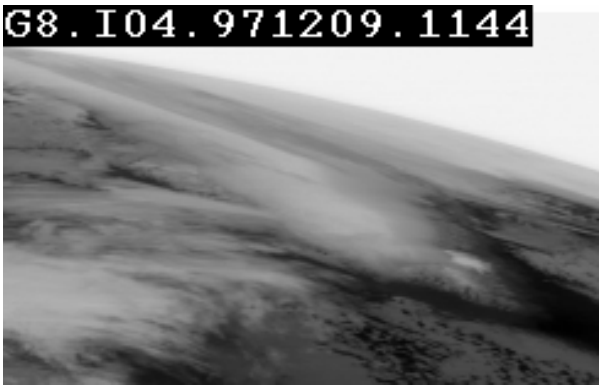
0245 UTC (local midnight)



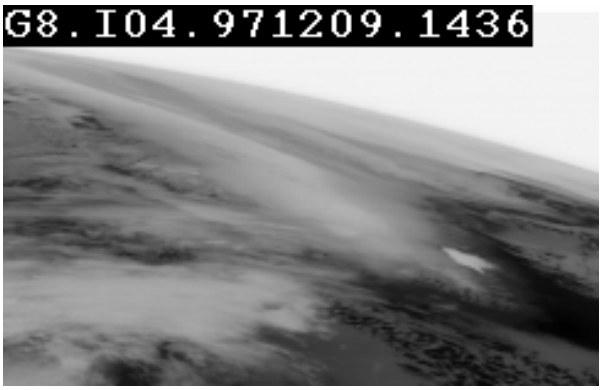
0545 UTC



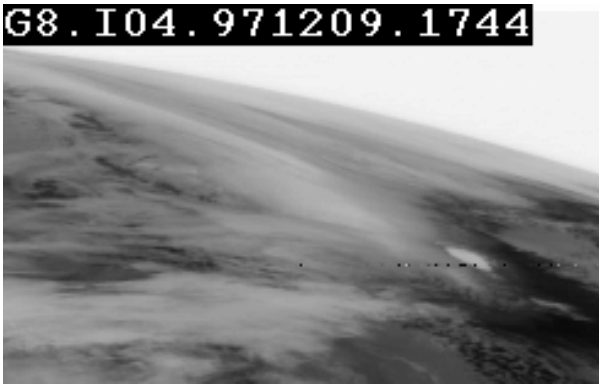
0845 UTC (30 minutes after impact)



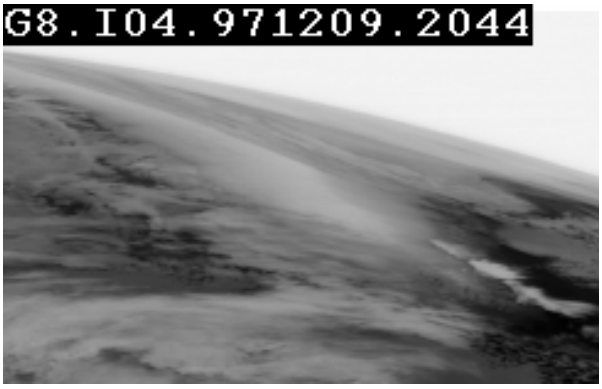
1145 UTC



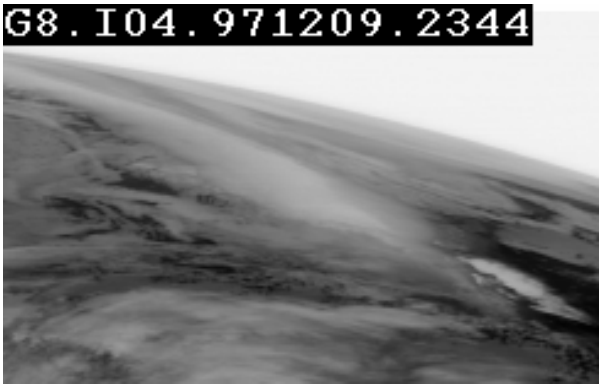
1445 UTC (local noon)



1745 UTC



2045 UTC



2345 UTC

A cold, high cloud appears over southeastern Greenland at 0845 UTC, 30 minutes after the reported impact, with faint hints of cloud formation along the center ridge of the southern Greenland ice cap at 0545 UTC.

This cloud formation appears to be part of a normal storm development in the lee of the ice cap.

## GOES-8 infrared movies for 8 to 12 December 1997

One can see the normal cycle of storm cloud development during the week in this region by viewing the GOES-8 infrared images of Greenland starting from the day before the meteor impact, and ending three days later:

- 8-to-12 December 1997, as a GIF movie (1.1 MBytes)
- 8-to-12 December 1997, as a QuickTime movie (Cinepak format, 0.5 MBytes)

## Conclusion, based on GOES-8 Images

The cloud formation and development over southeastern Greenland on 9 December 1997 looks like a normal storm, similar to the storm on 12 December.

It does not look like a single ejection cloud, nor a long contrail.

Nevertheless, the time-of-formation is a remarkable coincidence with the reported meteor impact.

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