



# BADGER TALKS

*“The Wreck of the Edmund Fitzgerald”*  
Steve Ackerman, Emeritus Vice Chancellor  
Research & Graduate Education



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# The Sinking of the Edmund Fitzgerald: the Ship, the Storm and the Song

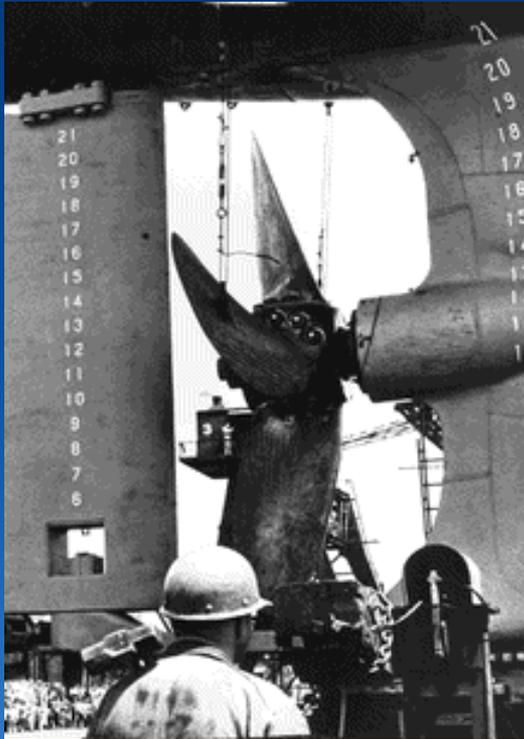
Steve Ackerman

Emeritus Prof. Atmospheric and Oceanic Science

Emeritus Vice Chancellor for Research and  
Graduate Education

Badger Talks

# The Sinking of the Edmund Fitzgerald: the Ship, the Storm and the Song



The legend of the Edmund Fitzgerald remains the most mysterious of all shipwreck tales heard around the Great Lakes.

Her story is surpassed in books, film and media only by that of the Titanic.

Canadian folksinger Gordon Lightfoot inspired popular interest in this vessel with his 1976 ballad, "The Wreck of the Edmund Fitzgerald."

# The Ship ...

On November 10, 1975 the SS Edmund Fitzgerald sank in Lake Superior.

All 29 crew members died.

It was the worst shipping disaster on the Great Lakes in 10 years.



The Fitzgerald weighed 13,632 tons; 729 feet long; 7,000 horsepower steam turbine; - 16 mph.

Launched June 7, 1958: ~15,000 people

The Fitzgerald was labeled "The Pride of the American Flag".

In 1964 it became the first ship on the Great Lakes to carry more than a million tons of ore through the Soo Locks.

Three central cargo holds were loaded through 21 watertight hatches



# ... the Storm ...

During 9–10 November 1975, an intense November Gale ravaged the upper Great Lakes with winds in excess of storm force (55-63mph) on Lake Superior.

November has produced intense storms, midlatitude cyclones, on the Great Lakes region. Other noteworthy storms

- White Hurricane of November 7 to 10, 1913.
- Armistice Day Storm of 1940 (Nov 10-11)

# ... and the Song

In 1975, Lightfoot read a Newsweek magazine article (*The Cruellest Month*) about the loss of the SS Edmund Fitzgerald. The lyrics in his song, "The Wreck of the Edmund Fitzgerald", released the following year. It reached number two on the United States Billboard chart and was a number one hit in Canada.

"The Wreck of the Edmund Fitzgerald" continues to get airplay on classic rock stations.

*Wreck of the Edmund Fitzgerald – Gordon Lightfoot*

*" The legend lives on from the Chippewa on down  
Of the big lake they call Gitche Gumee*

*The lake it is said never gives up her dead when  
the skies of November turn gloomy*

*With a load of iron ore 26,000 tons more than the  
Edmund Fitzgerald weighed empty...."*

Ojibwe call the lake gichi-gami  
meaning "be a great sea"



*"The ship was the pride of the American side  
comin' back from some mill in Wisconsin  
As the big freighters go it was bigger than most..."*

When launched on  
June 7, 1958 from  
River Rouge MI, she  
was the largest ship  
on North America's  
Great Lakes, and  
she remains the  
largest to have sunk  
there.



USCG increased Edmund Fitzgerald's load line in 1969, 1971, and 1973 to allow 3 feet 3.25 inches (997 mm) less minimum freeboard than Edmund Fitzgerald's original design allowed in 1958

*“Concluding some terms with a couple of steel firms when they left fully loaded for Cleveland”*



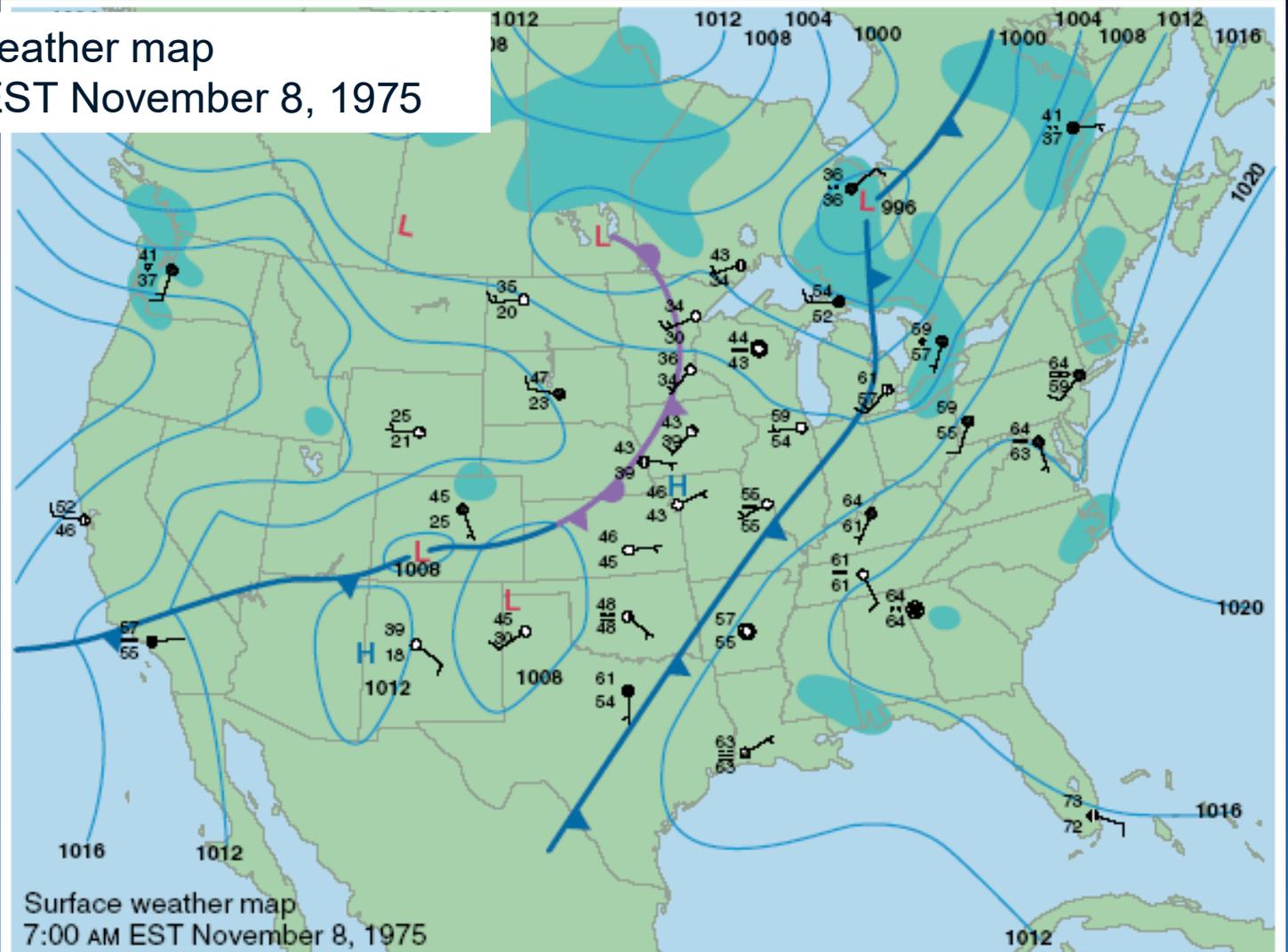
## Day One: Birth of an Extratropical Cyclone

Saturday, November 8, 1975, is a gorgeous day across much of the United States.

The *Edmund Fitzgerald* glides on smooth Lake Superior waters toward its next load of iron ore at the Duluth (Minnesota)/Superior (Wisconsin) harbor.



Surface weather map  
7:00 AM EST November 8, 1975



*“That good ship and crew was a bone to be chewed  
When the gales of November came early...”*

*“When the skies of November turn gloomy.”*

Typical regions of cyclogenesis (shaded) and paths of cyclones (arrows; likeliest paths in solid lines, other possible paths in dashed lines) that affect the state of Wisconsin in fall.



## Day Two: With the *Fitz*

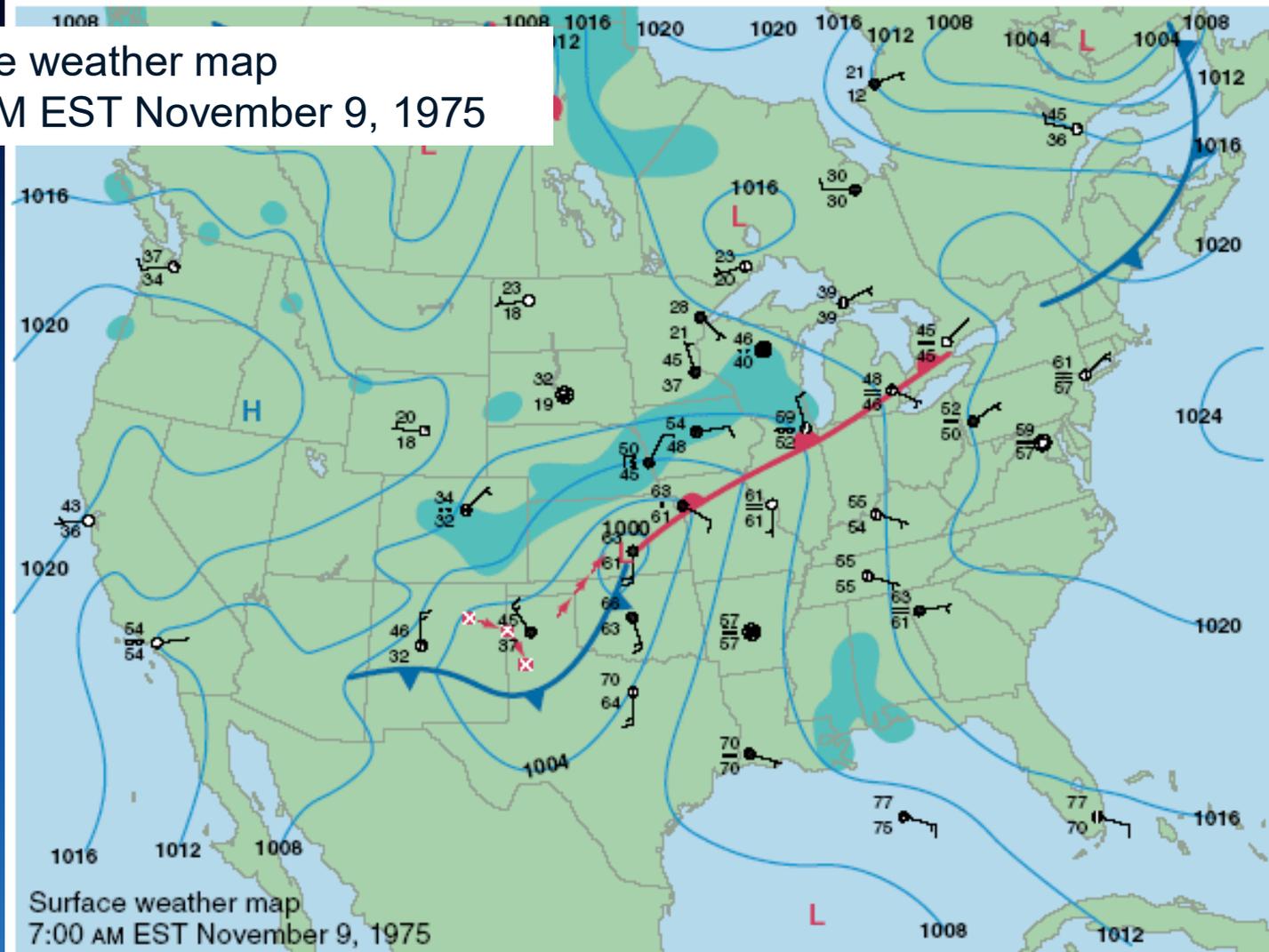
Early Sunday morning November 9th, 1975:  
Duluth/Superior docks begin the loading the *Edmund Fitzgerald*: enough iron ore to make 7500 automobiles!

The iron ore pellets slide down huge chutes like marbles into the 21 hatches in the middle of the boat. The crew then anchors each of the 6350-kilogram (7-ton) hatch covers using 68 special clamps.

Shortly before 2:00 PM, the *Fitzgerald* departs into the open waters of Lake Superior.



Surface weather map  
7:00 AM EST November 9, 1975



The storm has matured overnight. The surface weather map for Sunday morning on the 9th shows a 999-mb low over Wichita, Kansas, a pronounced cold front digging southward into Texas, and a warm front pushing north toward Iowa.

**November 9, 1975**

The *SS Arthur Anderson's* captain, “Bernie” Cooper, recalled years later that this Sunday “was one of the special days on Lake Superior—just ripples on the water, sunny and warm for November. As we departed we could see the *Edmund Fitzgerald*. . . .”

The two ships will sail together for *Fitzgerald's* last journey.



# The Forecast:

On November 9 at 7 p.m. the National Weather Service (NWS) issued a gale warning for Lake Superior. (34-40 kts. 40-46 mph)

The NWS predicted east to northeasterly winds during the night, shifting to NW to N by the afternoon of November 10.

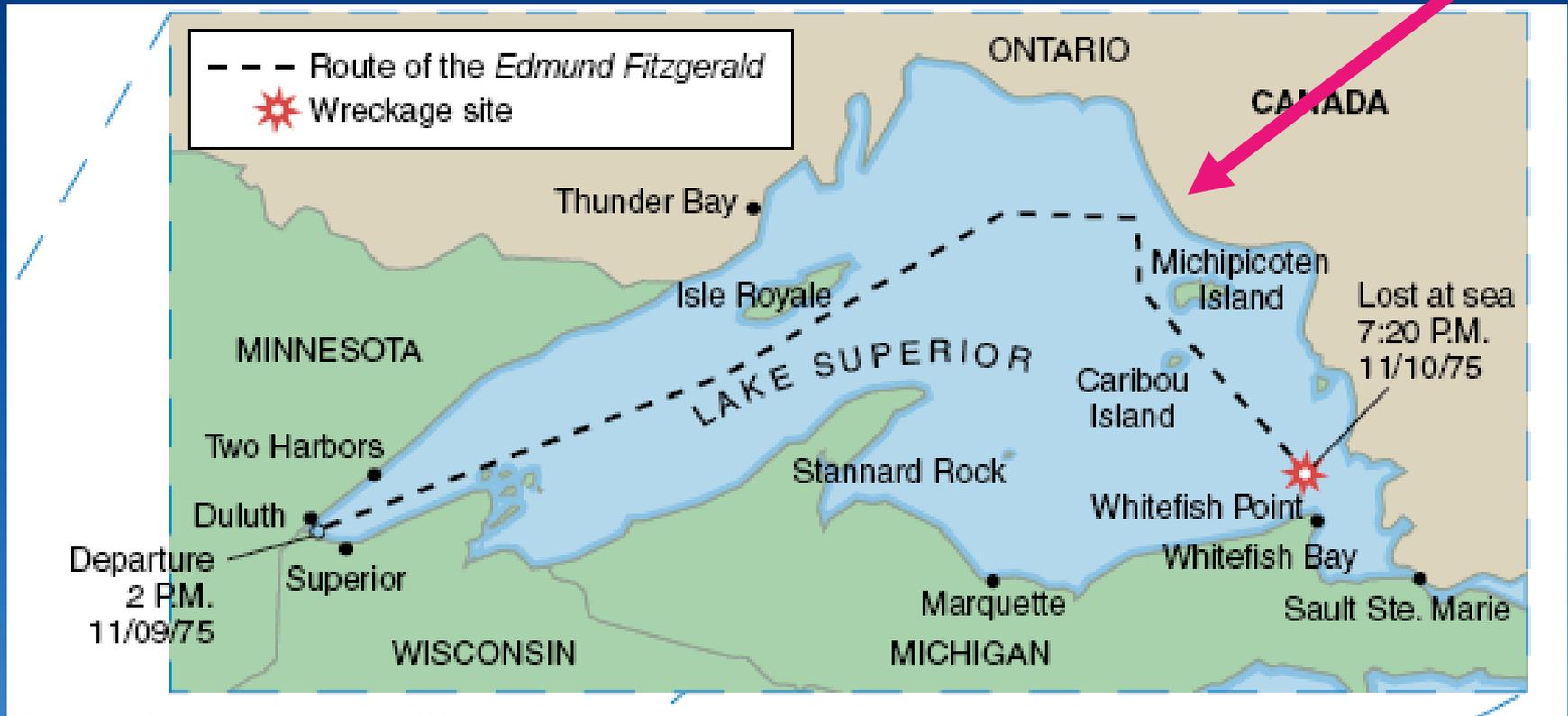


At about 2:00 am November 10 the NWS upgraded the gale warning to a storm warning with winds 48-55 knots (55 to 63 mph) with a prediction of northeast winds 35 to 50 knots (40-57 mph) becoming northwesterly 28 to 38 knots (32-44 mph), “waves 8 to 15 feet”.

Around 2 a.m. the Captains of the *Anderson* and *Fitzgerald* discussed the threatening weather and decided to change their route to a more northerly direction along Ontario’s north shore.

# Expecting Winds from the Northeast

40-57 mph

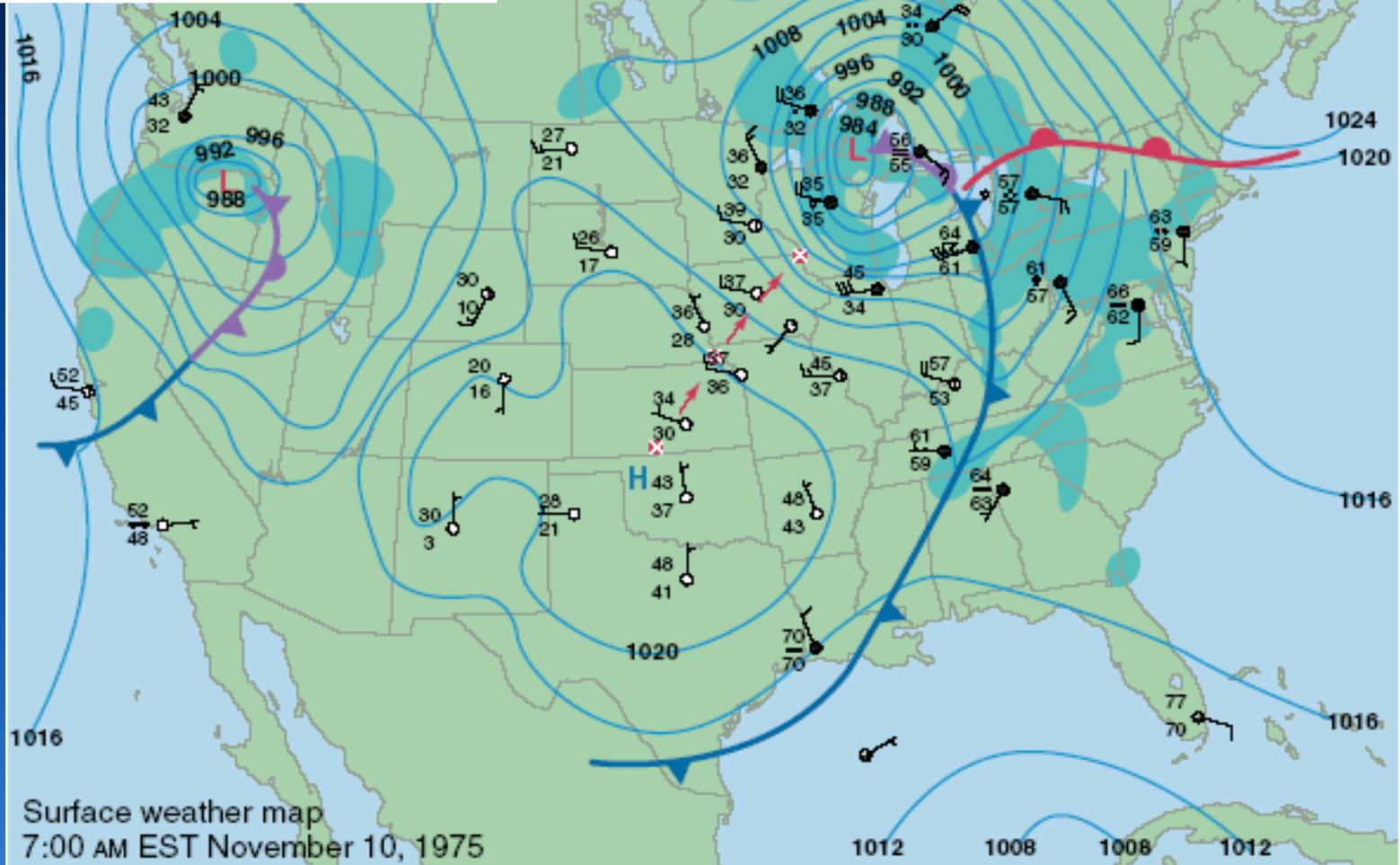


At 3 am on Nov 10<sup>th</sup>, the winds were reported as coming from the northeast at 42 knots. The *Fitzgerald* and *Anderson* proceeded together, the *Fitzgerald* ahead of the *Anderson*. They had radio contact and the *Anderson's* radar located the position of the *Fitzgerald*.

At 7 am. the storm passed over Marquette MI and started across Lake Superior.



Surface weather map  
7:00 AM EST November 10, 1975



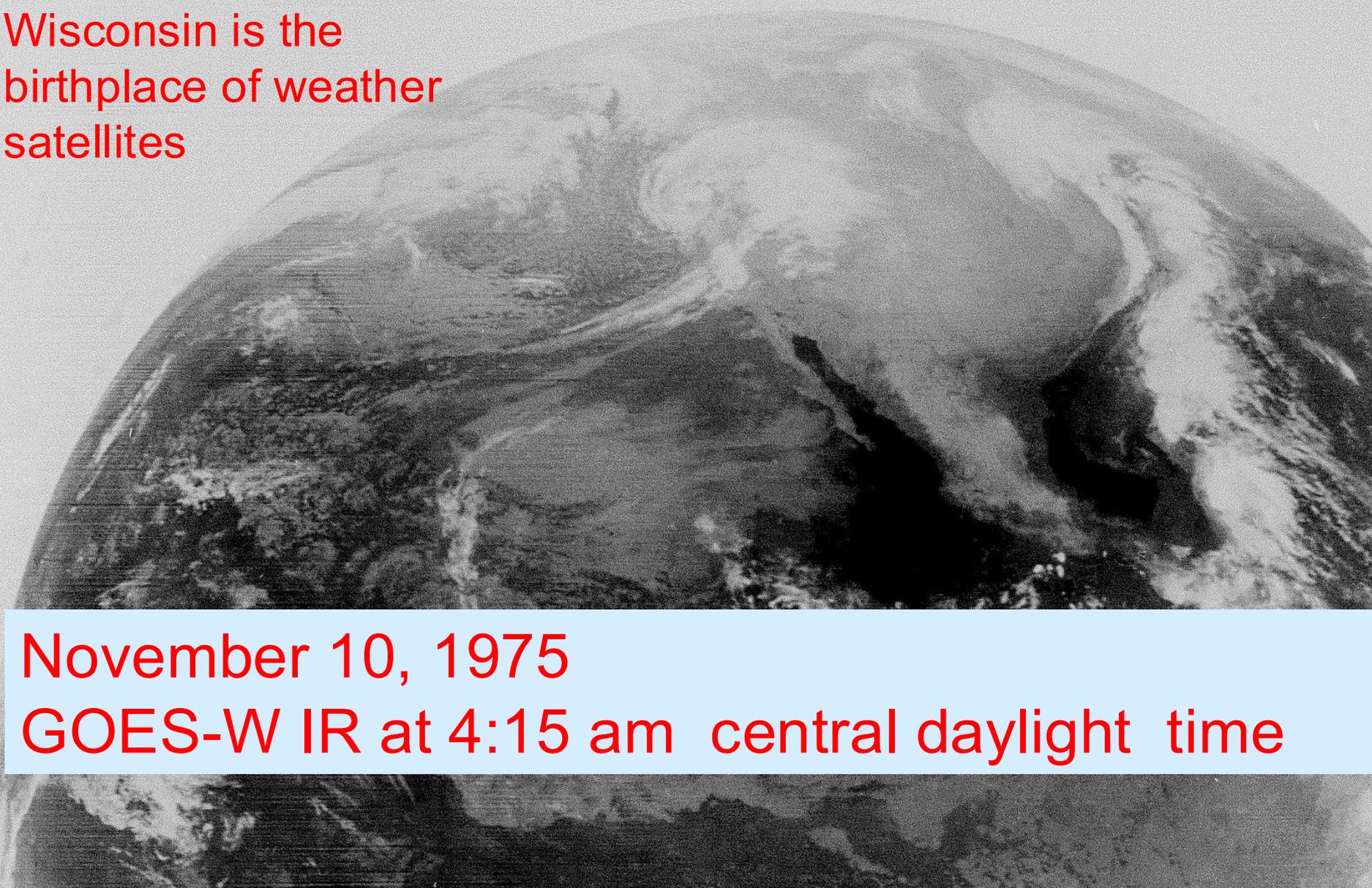
*"...and late that night when the ship' bell rang  
could it be the north wind they'd bin feelin'."*

09:15 10NOV75 32A-Z 0006-1640 FULL DISC IR

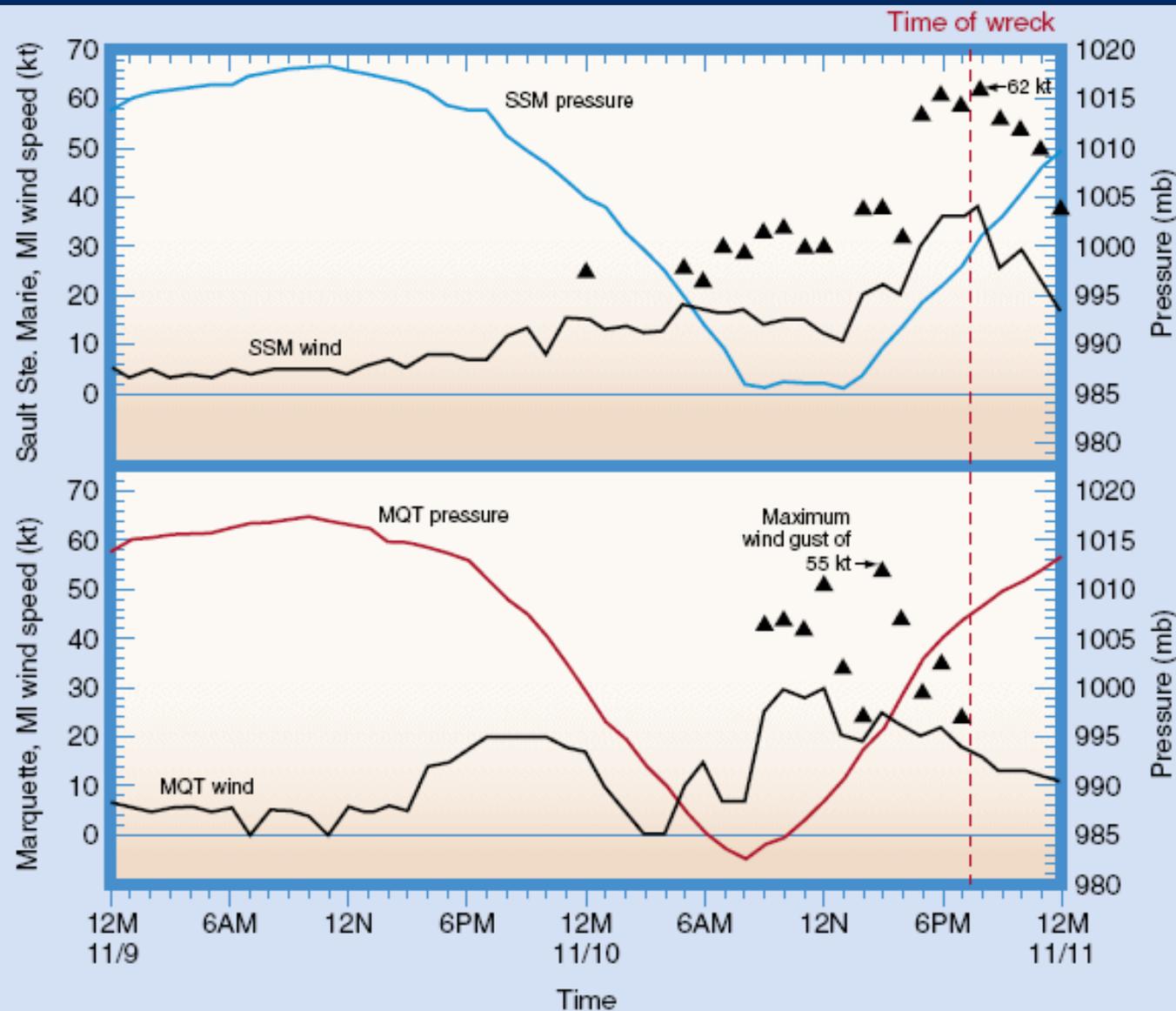
Wisconsin is the  
birthplace of weather  
satellites

November 10, 1975

GOES-W IR at 4:15 am central daylight time



*“When the gales of November came slashing  
When afternoon came it was freezing rain  
In the face of a hurricane West Wind “*



Category 1  
hurricane:  
64-82 knots  
(74 -94 mph)

*Fast rise after low  
Foretells stronger blow*

On the afternoon of November 10, a wind shift was evident.

At 2:45 p.m. the winds had backed to NW and were 42 knots. Steady winds at 43 knots (49 mph) and waves of up to 12 and 16 feet were reported by the *Anderson*.

At around 3:30 pm the *Fitzgerald* contacted the *Anderson* and reported "a fence rail down, two vents lost or damaged and a list".

Also, around this time, the storm's fury had closed the Sault Ste. Marie locks.

*"The wind in the wires made a tattle tale sound and a wave broke over the railing...."*



A shift of winds to the W and NW is very important, as this increased the fetch, allowing large waves to build.

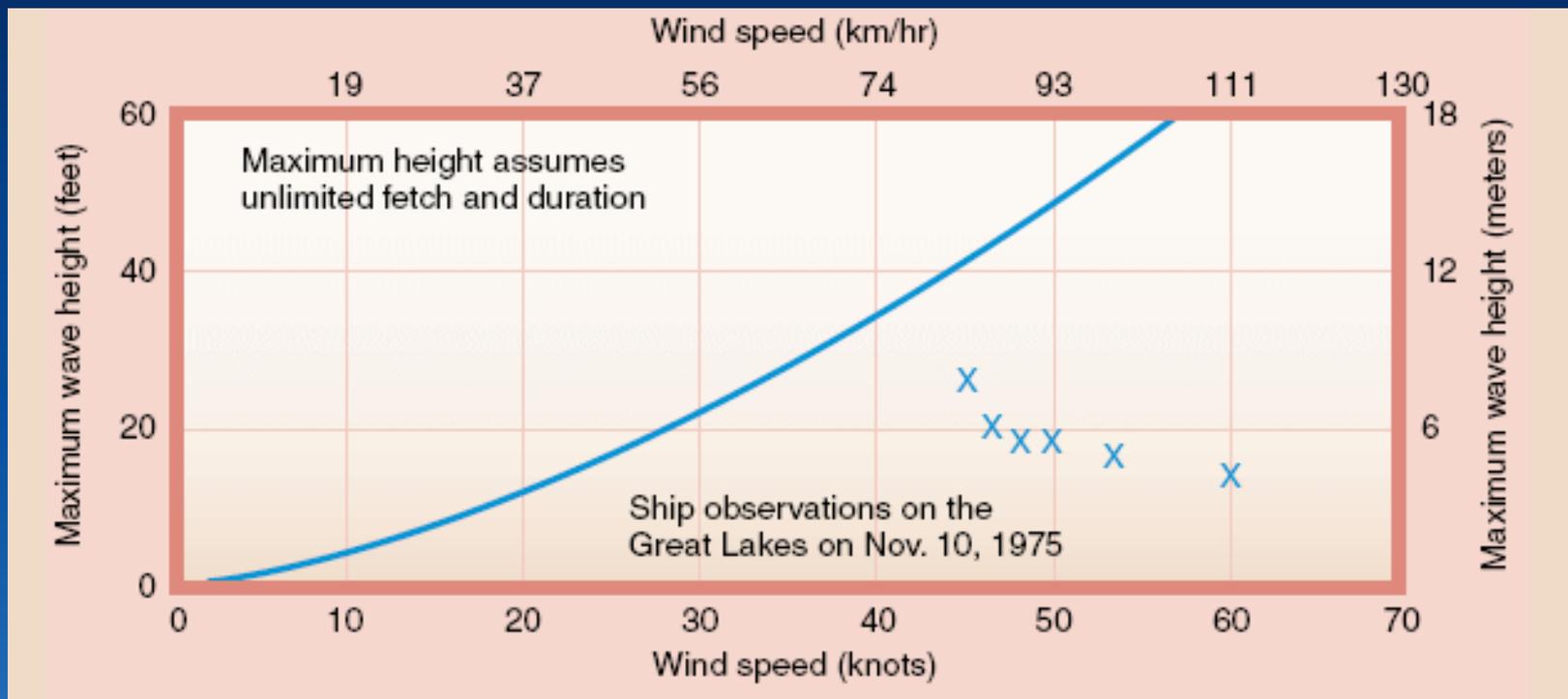
49 mph



The size of a wind-generated wave depends on:

1. *The wind speed*: The stronger the winds, the larger the force, and thus the bigger the wave. The wind must also be constant, not just a wind gust here or there.
2. *The duration of the winds*: The longer the wind blows over the open water, the larger the waves.
3. *The fetch*: This is the distance of open water over which the wind blows. The longer the fetch, the larger the waves.
4. *The water depth*: Shallow water limits large waves.

*“When supper time came the old cook came on deck  
Saying fellas it's too rough to feed ya...”*



A 2006 weather model simulation of the 1975 storm indicated wind generated waves of 25 feet and winds of 57.5 mph. which moved from west to east across southeast Lake Superior, nearly perpendicular to the track of the Edmund Fitzgerald

In the middle of the howling winds, snow, sea, and spray, something goes wrong.

Around 3:20 PM, McSorley calls Cooper on the radio:

“*Anderson*, this is the *Fitzgerald*. I have sustained some topside damage. I have a fence rail laid down, two vents lost or damaged, and a list. I’m checking [slowing] down . . . Will you stay by me ’til I get to Whitefish [Bay]?”

“Charlie on that *Fitzgerald*. Do you have your pumps going?”

“Yes, both of them.”

Something has damaged the *Fitzgerald*



The windstorm intensifies. Around 4:10 PM gusts blow away the *Fitzgerald's* radar antenna, knock out power to the remote navigation station at Whitefish Bay. At 5:00 PM the lighthouse at Stannard Rock north of Marquette, the closest observing station to the *Fitzgerald* at that moment, records a gust of 66 knots (76 mph). Cooper, on board the *Anderson*, estimated wind gusts of more than 100 mph.

Before 6:00 PM, McSorley tells another ship captain (Swedish vessel *Avafors*) via radio the following:

“I have a bad list, lost both radars. And am taking heavy seas over the deck. One of the worst seas I’ve ever been in.”

*Anderson* 10 miles behind her.



*"...At seven p.m. a main hatchway caved in he said  
'fellas it's bin good to know ya'*

*The captain wired in he had water comin' in and the  
good ship and crew was in peril*

*and later that night when 'is lights went out of sight  
came the wreck of the Edmund Fitzgerald"*

This phrase of the song, while romantic, makes it sound as if the crew knew they were doomed. In reality the sinking of the Fitzgerald was very rapid and it is likely they did not know the seriousness of their condition.



*"...At seven p.m. a main hatchway caved in he said  
'fellas it's bin good to know ya'*

*"...At seven p.m., it grew dark, it was then he said  
'fellas it's bin good to know ya'*

2010 Version, sung in live performances



At 7:10 PM the *Anderson* gives navigation instructions to the radar-less *Fitzgerald* up ahead of it. *Anderson*'s first mate asks, "Oh, and by the way, how are you making out with your problems?" The *Fitzgerald* replies, "We are holding our own."

Immediately after this conversation, a severe snow squall enshrouds the two boats. The *Fitzgerald* is hidden from the radar beam of the *Anderson*, lost in a chaos of snow and sea. Just as suddenly, around 7:30 PM, the snow ends. For the first time in many hours, visibility is excellent. Lights from ships coming north from Sault Ste. But the *Fitzgerald* is nowhere to be found: no lights, no radar blip, no radio contact.



Captain Cooper searches for the *Fitzgerald*. How can you lose a 729-foot ore freighter in the middle of a lake?

Cooper calls U.S. Coast Guard in Sault Ste. Marie with his worst fears:

“This is the *Anderson*. I am very concerned with the welfare of the steamer *Edmund Fitzgerald*.

... I can see no lights as before, and I don't have him on radar. I just hope he didn't take a nosedive.”

The *Fitzgerald* is gone.



After the wreck a severely damaged lifeboat was found, and only part of the second.

The conditions of recovered lifeboats suggest that no attempts were made to leave the ship.

No distress signals were ever issued.



*" Does anyone know where the love of God goes  
when the waves turn the minutes to hours*

*The searchers all say they'd have made Whitefish  
Bay*

*If they'd put fifteen more miles behind 'em*

*They might have split up or they might have  
capsized*

*they may have broke deep and took water...."*

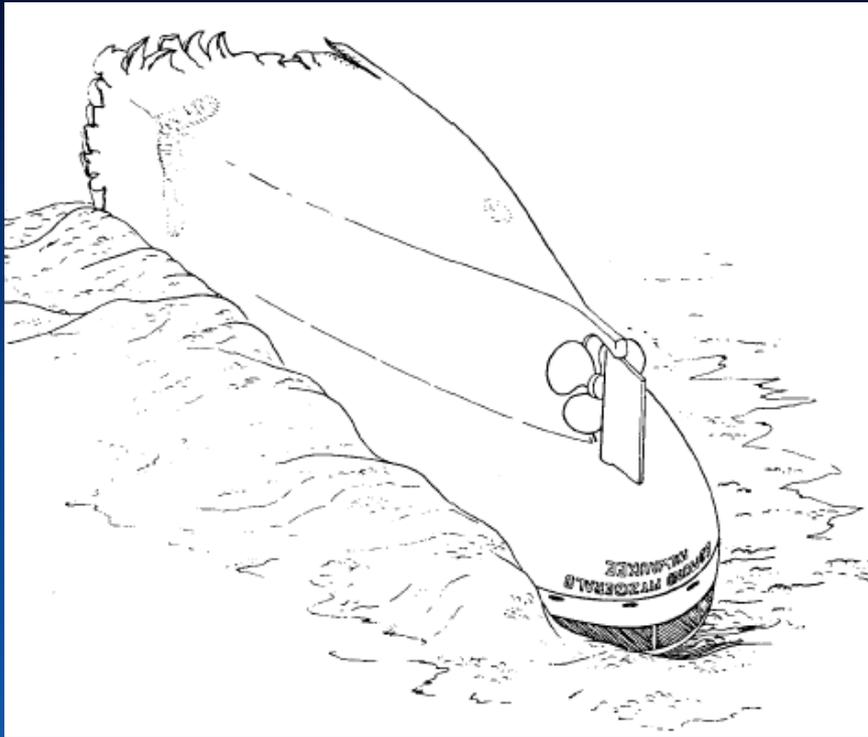
So what happened?



There are a couple of theories cited in the "Marine Casualty Report" by the US. Coast Guard Marine Board of Investigation Report. Since there were no survivors nor witnesses, their report is based on testimonies and an underwater survey of the wreck.

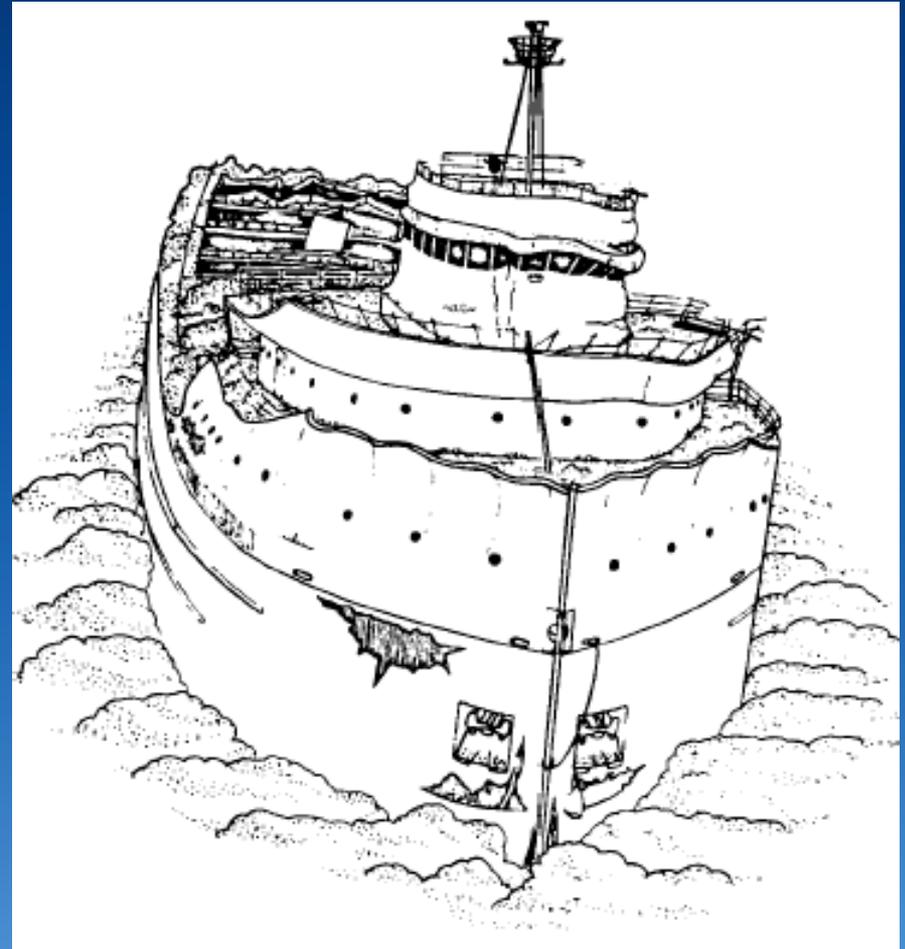
This report suggests that the *Fitzgerald* was taking on water due to earlier damage from the storm and that around 7:15 p.m. it plunged headfirst into a large wave and sank abruptly.

... the loss of buoyance and stability which results from massive flooding....

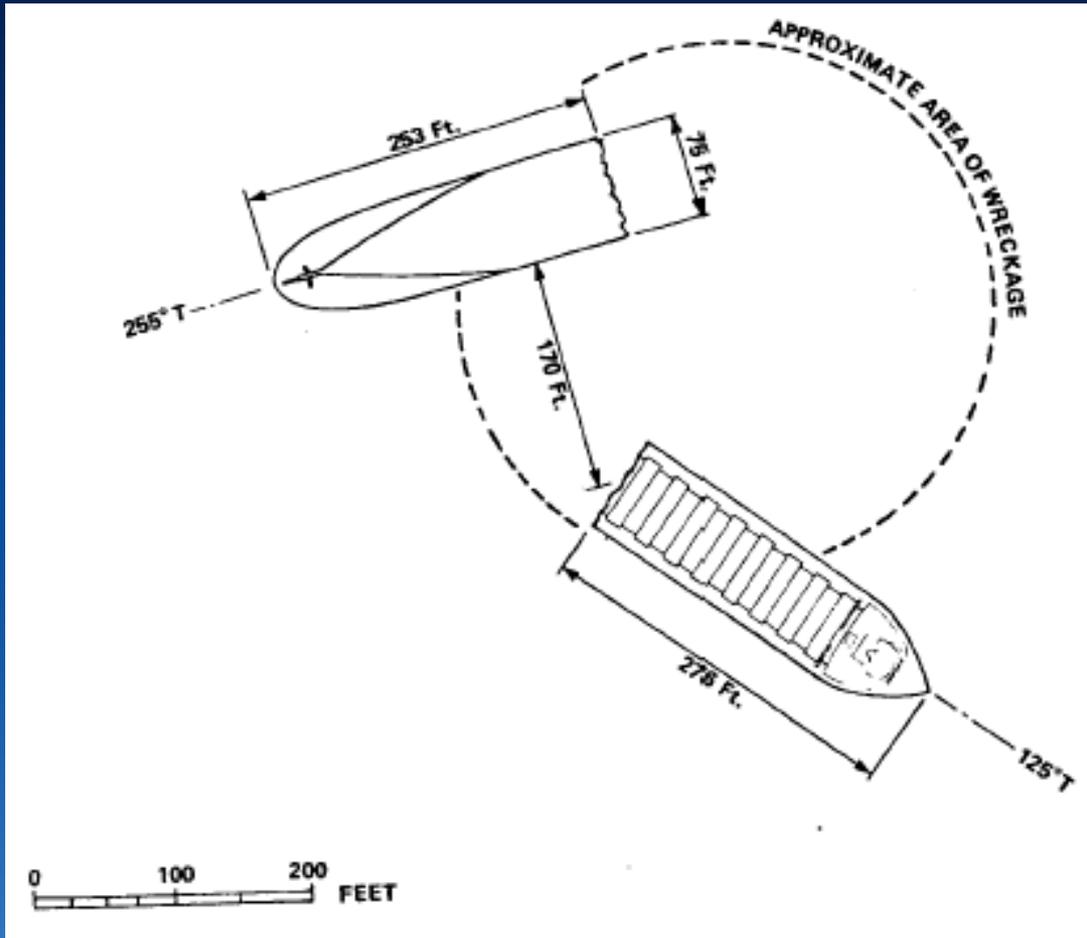


530 feet (160 m) of water

Sketch of the Edmund Fitzgerald shipwreck site from the 1977 U.S. Coast Guard marine casualty report.



# Expeditions



**May 1976** - U.S. Coast Guard Expedition

**September 1980** - Calypso Expedition

**August 1989** - ROV Expedition Pilot door open

**July 1994** - MacInnis Expedition: Stern lies roughly parallel to the bow; debris aft pilot house, pellets scattered

**Shannon Expedition – 1994:** body in cork life jacket, open door

1995 - Bell Recovery displayed in the Great Lakes Shipwreck Museum in Whitefish Point Michigan.

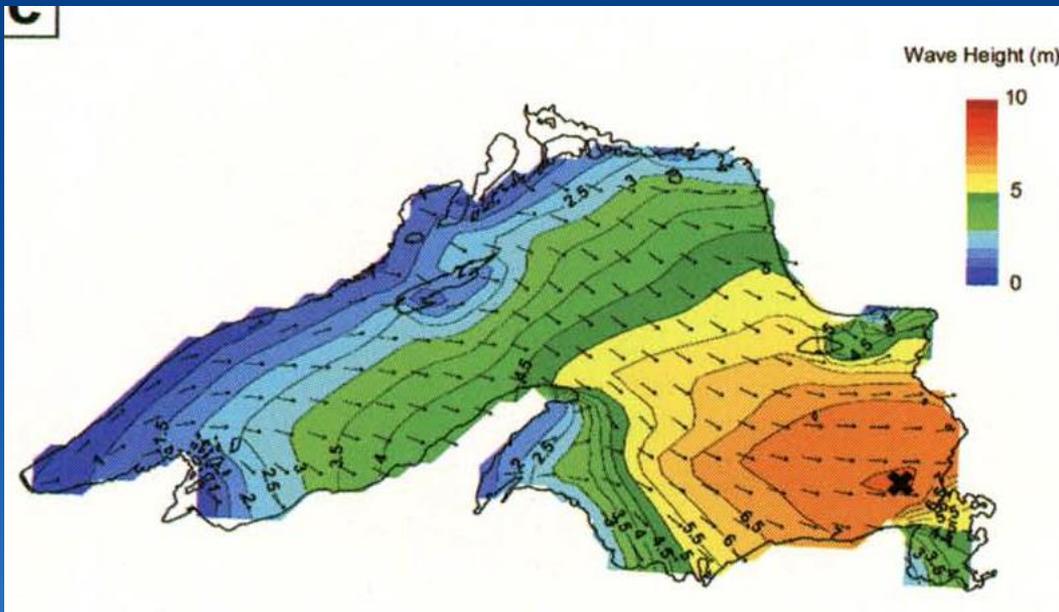
1. Problem with hatch covers.
2. Bottoming out/grounding. This could have happened near Six Fathom Shoal.
3. Stress fractures/structures
4. Rogue wave

The weather: Sinking was coincident in both time and location with the most severe simulated and observed conditions



# Reexamination of the 9-10 November 1975 "Edmund Fitzgerald" Storm Using Today's Technology

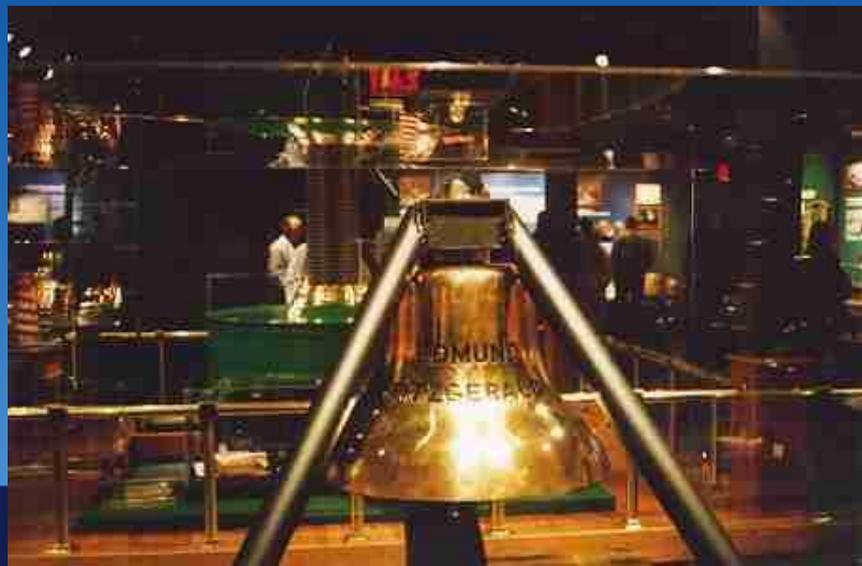
T R Hultquist, M. R. Dutter and D. J. Schwab (2005)



Wave height larger than 25 feet at time and location of the sinking of Edmund Fitzgerald.

*“In a musty old hall in Detroit they prayed  
In the maritime sailors’ cathedral  
The church bell chimed ‘til it rang 29 times  
For each man on the Edmund Fitzgerald  
The legend lives on from the Chippewa on down  
Of the big lake they called Gitche Gumee  
Superior they said never gives up her dead  
When the gales of November come early.”*

The ship’s bell was recovered from the wreck on July 4, 1995. A replica engraved with the names of the 29 sailors who died replaced the original on the wreck



## LOST AT SEA

There will always be another extratropical cyclone, and there will be Great Lakes freighters.

But people are unique and irreplaceable, and their loss is felt forever.

Ernest M. McSorley, 63, Captain, Toledo, Ohio  
John H. McCarthy, 62, first mate, Bay Village, Ohio  
James A. Pratt, 44, second mate, Lakewood, Ohio  
Michael E. Armagost, 37, third mate, Iron River, Wisconsin  
George J. Holl, 60, chief engineer, Cabot, Pennsylvania  
Edward F. Bindon, 47, first assistant engineer, Fairport Harbor, Ohio  
Thomas E. Edwards, 50, second assistant engineer, Oregon, Ohio  
Russell G. Haskell, 40, second assistant engineer, Millbury, Ohio  
Oliver J. Champeau, 41, third assistant engineer, Milwaukee, Wisconsin  
Frederick J. Beetcher, 56, porter, Superior, Wisconsin  
Thomas Bentsen, 23, oiler, St. Joseph, Michigan  
Thomas D. Borgeson, 41, able-bodied maintenance man, Duluth, Minnesota  
Nolan F. Church, 55, porter, Silver Bay, Minnesota  
Ransom E. Cundy, 53, watchman, Superior, Wisconsin  
Bruce L. Hudson, 22, deckhand, North Olmsted, Ohio  
Allen G. Kalmon, 43, second cook, Washburn, Wisconsin  
Gordon F. MacLellan, 30, wiper, Clearwater, Florida  
Joseph W. Mazes, 59, special maintenance man, Ashland, Wisconsin  
Eugene W. O'Brien, 50, wheelsman, Perrysburg Township, Ohio  
Karl A. Peckol, 20, watchman, Ashtabula, Ohio  
John J. Poviach, 59, wheelsman, Bradenton, Florida  
Robert C. Rafferty, 62, temporary steward (first cook), Toledo, Ohio  
Paul M. Riippa, 22, deckhand, Ashtabula, Ohio  
John D. Simmons, 60, wheelsman, Ashland, Wisconsin  
William J. Spengler, 59, watchman, Toledo, Ohio  
Mark A. Thomas, 21, deckhand, Richmond Heights, Ohio  
Ralph G. Walton, 58, oiler, Fremont, Ohio  
David E. Weiss, 22, cadet (deck), Agoura, California  
Blaine H. Wilhelm, 52, oiler, Moquah, Wisconsin



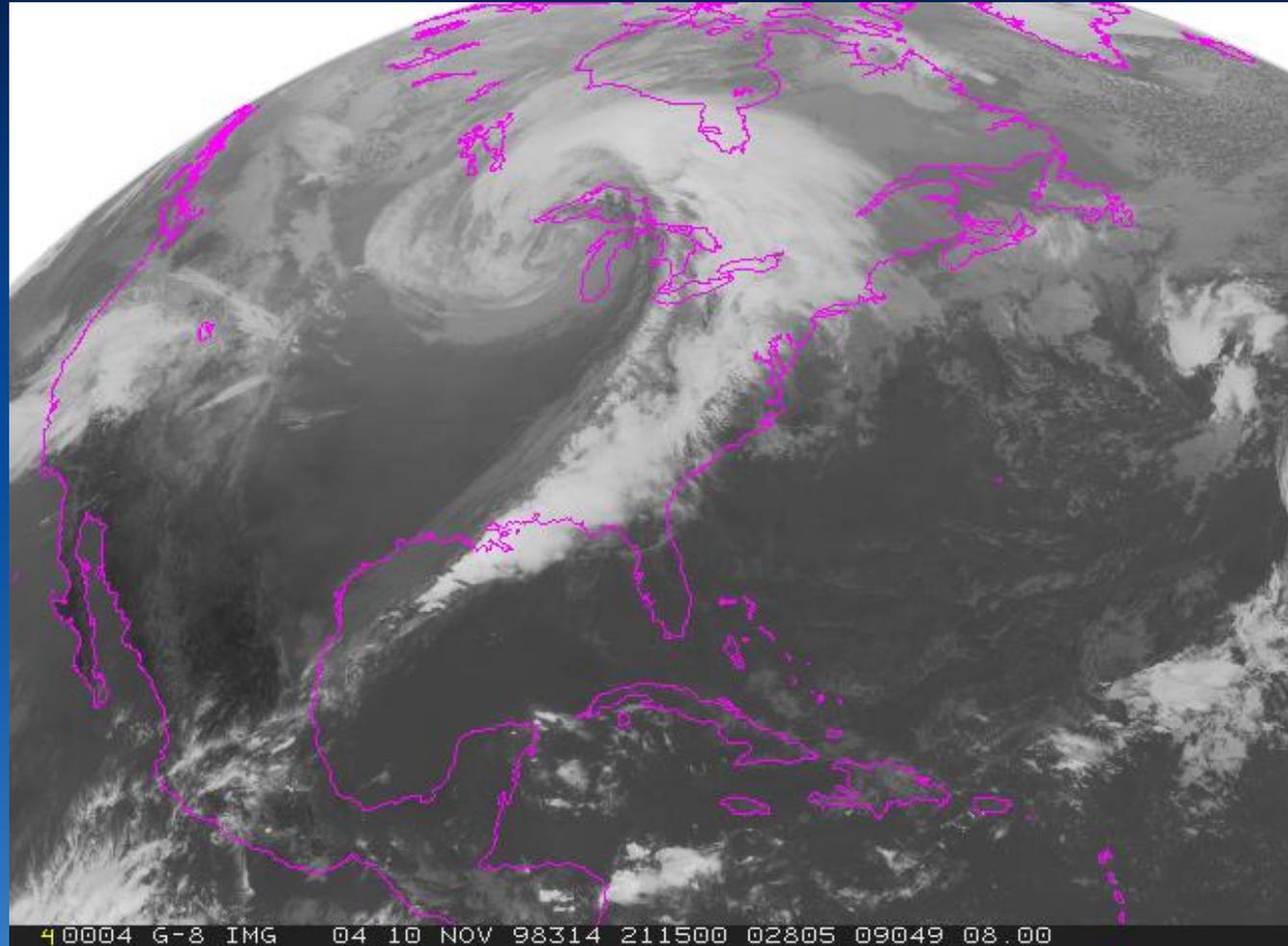
# Changes

The sinking led to changes in Great Lakes shipping regulations and practices that included mandatory survival suits, depth finders, positioning systems, increased freeboard, and more frequent inspection of vessels.

NOAA revised its method for predicting wave heights

# Changes

Weather forecasting has improved significantly, due to better computer models and data collection.



- The storm of November 9-11 1998

# Thank You

*” The legend lives on...”*

*Wreck of the Edmund Fitzgerald – Gordon Lightfoot*



Details of the *Edmund Fitzgerald's* last voyage and weather on that day used in this presentation are primarily derived from the following:

- *The Wreck of the Edmund Fitzgerald* by Frederick Stonehouse (Avery Color Studios, Marquette, Michigan),
- *Gales of November* by Robert J. Hemming (Thunder Bay Press, Holt, Michigan),
- *The Night the Fitz Went Down* by Hugh E. Bishop (Lake Superior, Port Cities, Inc., 2000).
- *Meteorology: Understanding the Atmosphere* by S. A. Ackerman and J. Knox (4<sup>th</sup> edition Jones & Bartlett Learning)