

# MISSION:

ISSUE 9

# water



## Antarctica

A look into Earth's past and a preview of life on Mars



## Meltdown

The Colorado River's challenges begin in the mountains



## Maritime Disaster

The sinking of the MS Estonia is shrouded in mystery

## Journey Down the Danube

Dr. Andreas Fath shines a light on pollution in Europe's second-longest river.





**Tahkuna Peninsula, Estonia**

A memorial to victims of the MS *Estonia* tragedy, one of the worst maritime disasters of the 20th century. The bronze bell rings during strong wind.

# MYSTERY at the BOTTOM of the BALTIC SEA

## Searching for answers to explain the 1994 sinking of the MS *Estonia*



Written by  
Courtney Leeper Girgis

Beneath the crashing, cold waves of the Baltic Sea lies a shipwreck that has been shrouded in mystery and controversy for more than 25 years.



**The sinking of the MS *Estonia* in September 1994 resulted in the loss of 852 lives.** Photo: Estonian World

The official accident report prepared by the Joint Accident Investigation Commission (JAIC) stated the ship ultimately sank due to a failure onboard. However, many were skeptical of the report's findings, including survivors traveling on the MS *Estonia*. In recent years, discoveries at the wreckage site have also called into question what really happened on that early autumn voyage.



On the evening of September 27, 1994, the cruise ferry MS *Estonia* left port in Tallinn, the capital of Estonia, for Stockholm. There were 989 passengers and crew members on board what was to be a typical overnight trip. Professionals, students, and families traveled for work and for fun, many of them settling in to enjoy the ship's swimming pool, shops, and pub before returning home from business or visits with loved ones.

But the *Estonia* never made it to Sweden that autumn voyage. In the early hours of September 28, about 22 nautical miles from the Finnish island Utö, the ship sank. With it, 852 people died, many of them trapped inside the ship, which went down in less than an hour.

The official report released in 1997 by the Joint Accident Investigation Commission (JAIC) concluded the ship sank after the bow visor—the ferry's front-end cover that opens upward to allow vehicles to drive onto the ship—fell into the sea due to a wave-induced failure of its locks.<sup>1</sup> According to the report, the ship "capsized due to large amounts of water entering the car deck, loss of stability, and subsequent flooding of the accommodation decks."

However, the report and handling of the incident quickly came under criticism by many of the survivors and families of those who died—mostly Swedes (552) and Estonians (347)—who felt they never got transparent answers as to what really happened that night.

### The Initial Response

In the days immediately following the disaster, it seemed government officials, including both the outgoing and incoming Swedish prime ministers, supported the recovery of the ship and bodies. Ingvar Carlsson, who would take office on October 7<sup>th</sup>, told television news crews that "every effort must be made to salvage the vessel."<sup>2</sup>

JAIC was formed the day after the incident at the agreement of Sweden, Estonia, and Finland. However, weeks passed with no clear salvaging plan. Soon the question was not "when" but "if" such a mission would be made. Ultimately, on December 15<sup>th</sup>, the Swedish government decided against one based on ethical considerations.

The *Estonia* and its deceased would remain in the ocean, and the site would be considered a sacred burial ground. It would also be covered by gravel to prevent grave plundering.

The response outraged many families of those who had died. Their protests halted the entombment after it began in April 1996.

By that point, the JAIC had received its full extent of information from the wreckage site, based on a diving survey commissioned and overseen by the Swedish National Maritime Administration in late November 1994.<sup>3</sup>

All other dives to the site for any purpose were illegal.

## The Controversy

Up until recently, the governments involved have always been confident in the JAIC's 1997 conclusion of how the *Estonia* sank. However, many people, including survivors, have not.

Some survivors claim the ship started listing—or taking on water and tilting to one side (in this case, the starboard, or right side when facing the bow)—earlier than the report states. They describe loud bangs and the impression that the ship had hit something, as well as seeing water in places on the ship at times and places contradictory to the report's descriptions.

Some critics of the official report say, based on the presented scenario, the ship should have flipped upside down and floated on trapped air from watertight areas below the car deck. The process should have taken hours, not minutes, they contend.

Even some "stability experts in the commission grew less certain about their conclusion over time," according to a January 2003 article from *The Washington Times* featuring Bengt Schager, a Swedish marine psychologist who resigned from the JAIC.

**"We did not understand how a ship could sink in about 35 minutes," the article quotes Schager as saying. "That was mysterious for everyone, and it's still unexplained."**

Survivors and next-of-kin called for new investigations, but no official ones were opened. An unauthorized dive was made in 2000 by U.S. businessman Gregg Bemis and German journalist Jutta Rabe. They claimed to have found a hole in the starboard side of the ship and believed explosives to be involved but were largely dismissed.<sup>4</sup>

The lack of governmental response only fueled conspiracy theories and, in the eyes of some, further called into question the investigation's integrity.

## A Cover Up?

One of many popular alternative stories that tried to explain how the ship sank surrounded the idea of secret military operations. *Estonia* had gained independence from the Soviet Union in 1991, just three years before the incident, and the last Russian army units left the country at the end of August 1994.<sup>5</sup>

The idea was regarded as speculation only until a retired Swedish customs official stepped forward in 2004 with information saying the ferry may have been used for transferring military equipment from Estonia to Sweden.<sup>5</sup> An investigation was launched, and the Swedish government confirmed the ship was used to transport military equipment, not of an explosive nature, on September 14 and 20, 1994—within two weeks of the incident.<sup>6</sup>

While officials maintained there was no reason to believe military cargo was on board the night the *Estonia* sank, survivor Sara Hedrenius claims she saw at least one military vehicle escorted onto the ship when she went on deck to wave goodbye to her father.<sup>2</sup>

Journalist Stephen Davis believes, based on information from a source at MI6 (the United Kingdom's Secret Intelligence Service), that the *MS Estonia* was used to move electronics related to the ballistic missiles program from Russia to the West. He further claims that the Brits, Swedes, and Estonians were involved and that the Russian government had issued two warnings to stop the operations—the last directly to MI6 one month before the disaster.<sup>7</sup>

The assertion brings up a new theory: **Could a Russian submarine have hit the *MS Estonia*, creating a hole and contributing to its sinking?**

Survivor Carl Eric Reintamm says he saw a large object in the water early in the incident that might have been a submarine.<sup>2</sup>

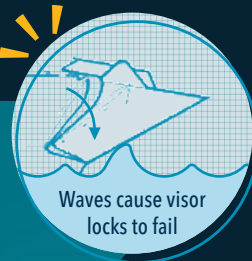
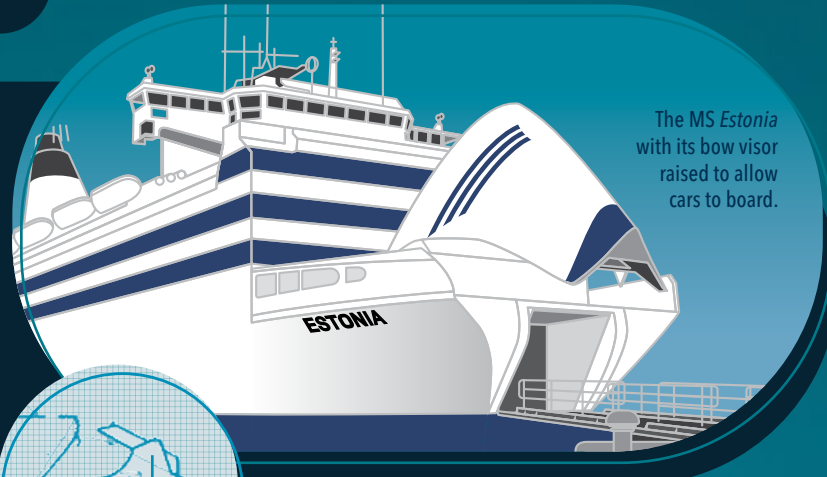
There was no officially recognized evidence for a hole in the ship's hull, though, until 2020, when a Discovery Network documentary directed by Swedish journalist Henrik Evertsson revealed new footage from his team's unauthorized dive in November 2019. They had filmed a 4-meter-high, 1.2-meter-wide hole in the ship's starboard side.<sup>2</sup>

## TWO Theories

### Murky Speculations of Foul Play

1

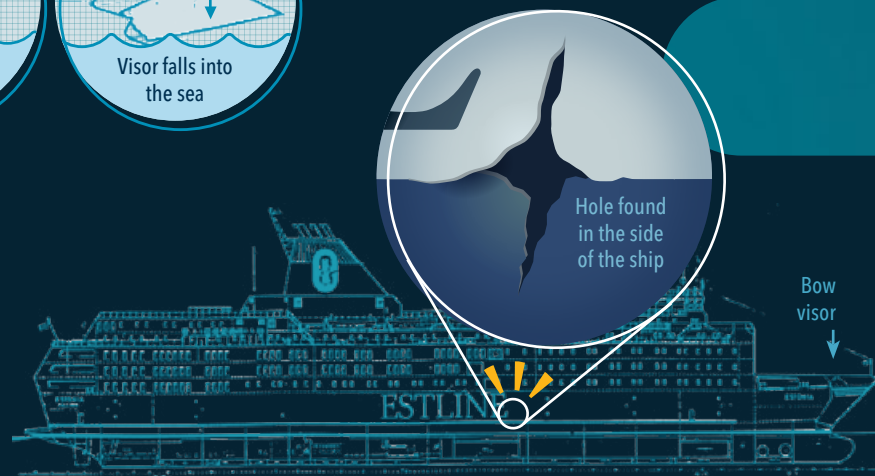
The JAIC's final report concluded the ship sank after the bow visor—the ferry's front-end cover that opens upward to allow vehicles to drive onto the ship—fell into the sea due to a wave-induced failure of its locks.<sup>1</sup>



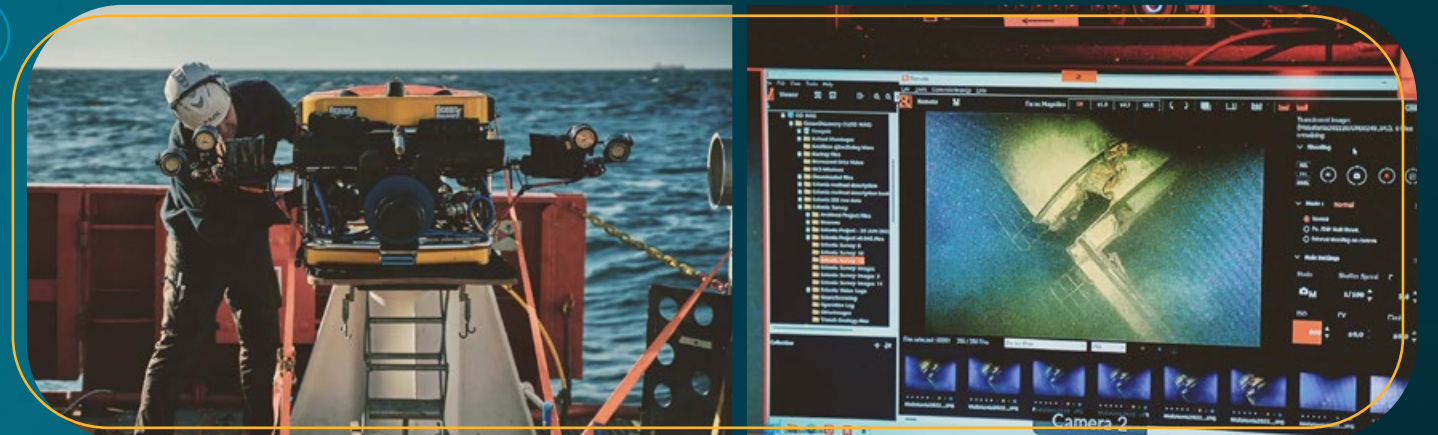
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In 2020, a Discovery Network documentary revealed a 4-meter-high, 1.2-meter-wide hole in the ship's starboard side.<sup>2</sup>

This new discovery—coupled with what those onboard felt and saw—led many to question the JAIC's conclusions. Did something hit the ship, such as a submarine? Were explosives involved?



New tools will be used to study *MS Estonia* and create its digital twin



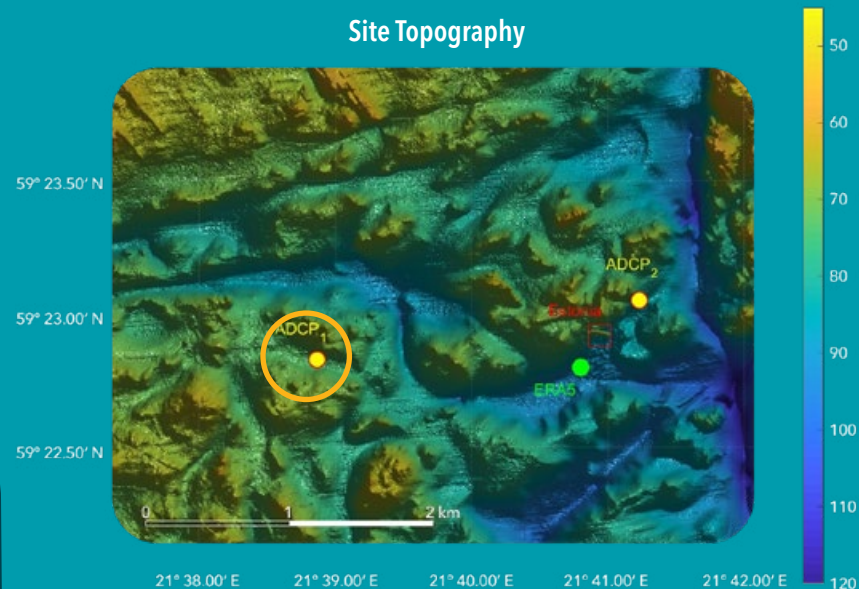
Advanced technology has given investigators a leg up in their quest to determine what happened to the *MS Estonia*. One such tool is a specialized underwater robot that can closely examine a hole in the ship's starboard side.<sup>11</sup> Photo: Andi Kokk

Investigators will use a wealth of information—including over 40,000 images from a submersible photogrammetric survey—to create a digital twin of the *MS Estonia*. Building this model will begin in the autumn of 2022.<sup>11</sup> Photo: Andi Kokk



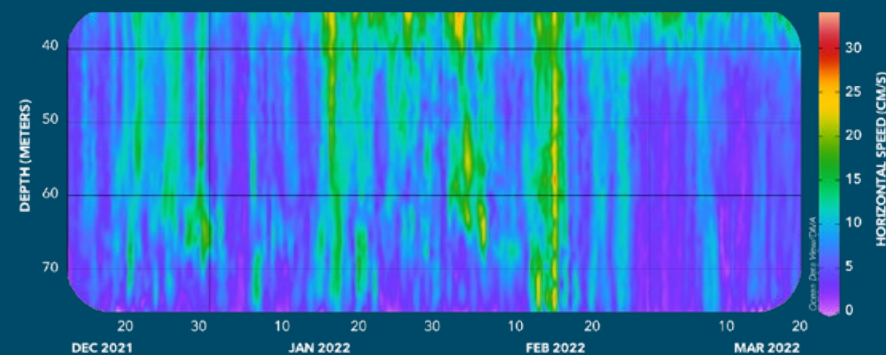
The buoy station configuration used by Dr. Lips and his team featured an Aanderaa SeaGuard II platform with an acoustic current profiler and oxygen, temperature, and conductivity sensors.

### Site Topography



Detailed topography of the wreck area (red square). Locations where meteorological data were collected (green circle) and where the Aanderaa instruments were deployed (ADCP1 and ADCP2) are also shown.

### Current Speed at the Wreckage Site



In order to build this model, the investigators first needed information related to water characteristics and dynamics at the wreckage site.

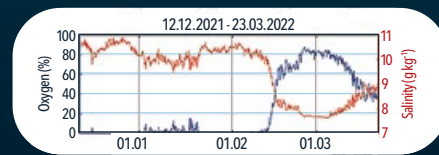
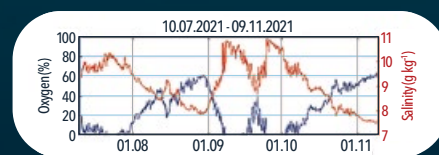
Dr. Urmas Lips of Tallinn University of Technology in Estonia is part of the research team. He uses an [Aanderaa current profiler](#), an instrument that sends out acoustic signals into the water to measure the speed of currents, to help him collect data that describes how water moves around the ship.

The instrument is deployed to 3 to 4 meters from the seabed and measures nearly all the way up to the surface. It also has sensors that measure oxygen content, salinity, and temperature.

Dr. Lips and his team use the combination of these parameters to understand potential impacts on the vessel throughout the years and to inform the next stage of research. Together, they seek answers to questions like:

- Could sediments have covered the hole in the initial investigation?
- Could currents have moved pieces of the vessel (the bow ramp's hinges are broken, and the ramp is detached from the boat?)
- What role could corrosion (influenced by oxygen and salinity) have played in making and/or exasperating damage?

### Oxygen and Salinity Levels



Temporal changes of salinity and oxygen content near the MS Estonia wreckage. These highly-variable data are being compared to the output of computer models that attempt to replicate environmental conditions at the site.

## Preliminary Findings

During deployments to the site in 2021 and 2022, Dr. Lips and his research team discovered surprisingly strong currents near the ocean's surface and the seafloor. The MS Estonia is situated perpendicular to a channel, and prevailing currents aligned with topography flow through the channel, pushing on the vessel as it rests on the bottom of the Baltic Sea.

Using oxygen data from the Aanderaa current profiler, the team determined the variability of corrosion on the Estonia throughout the years. During periods of high current, there were changes in oxygen saturation—from 80% to anoxic within a few days. Salinity measurements from the instrument showed high variability with water movement and vertical mixing influences.

The data collected are now being used to determine the accuracy of previously-created models of the area. This critical part of the investigation is challenging, primarily due to the high variability of water current, oxygen, and conductivity observed by Dr. Lips and team.

If the measured data align well with the model, researchers will be looking to draw several conclusions: 1) whether the currents were strong enough to move the vessel, and 2) the corrosion that could be expected with the oxygen and salinity in the area. Combining this with the geological makeup of the seabed, modelers will have a more accurate representation of the environmental conditions to which the MS Estonia has been exposed for nearly three decades.

The hope is that the 3D models of the sunken ship, and how it came to rest on the ocean floor, can help clear up the murkiness surrounding the MS Estonia—and provide peace to survivors and the families of those lost at sea.

**"If we want exhaustive and objective answers to what has caused the damage, we must focus on the quality of the research."**

**Rene Arikas**, head of the Estonian Safety Investigation Bureau (ESIB)

## Dive Deeper

Find the latest reports from the new, government-sponsored investigation at [www.estonia1994.ee](http://www.estonia1994.ee).

The families of victims have also initiated a private investigation since the Discovery documentary. A legal amendment allowing for diving and other underwater activity for the purpose of examining causes for the sinking came into effect July 1, 2021.



Located in Tallinn, Estonia's capital, the "Broken Line" monument commemorates the enormous loss of life in the MS Estonia tragedy. Photo: Jan Pohunek/Creative Commons

### SOURCES

- 1 **JAIC**, 1997 Report
- 2 **Discovery Plus**, Estonia
- 3 **Rockwater**, Survey Report
- 4 **The Washington Times**, Suspicions surround sunken ferry
- 5 **The Baltic Times**, Sweden to investigate 'military cargo' theory of tragic accident
- 6 **The Baltic Times**, Sweden to conduct new probe into ferry tragedy
- 7 **Postimees**, New Zealand journalist: Estonian intelligence knew MS Estonia was carrying weapons systems
- 8 **Estonia Safety Investigation Bureau**, Preliminary assessment
- 9 **Estonian World**, New discoveries place a question mark on the official MS Estonia disaster report
- 10 **Estonian World**, MS Estonia's damage much greater than previously thought
- 11 **ERR News**, New tools will be used to study MS Estonia and create its digital twin

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- 1) The tissue in plants that brings water upward from the roots;
- 2) a leading global water technology company.

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- +47.55.60.48.00
- aanderaa.info@xylem.com
- Aanderaa.com



- +1.979.690.1711
- oi-info@xylem.com
- OICO.com



- +1.858.546.8327
- inquiry@sontek.com
- SonTek.com



- +49.881.183-0
- Info.WTW@xylem.com
- WTW.com



- +1.937.767.7241
- info@ysi.com
- YSI.com



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