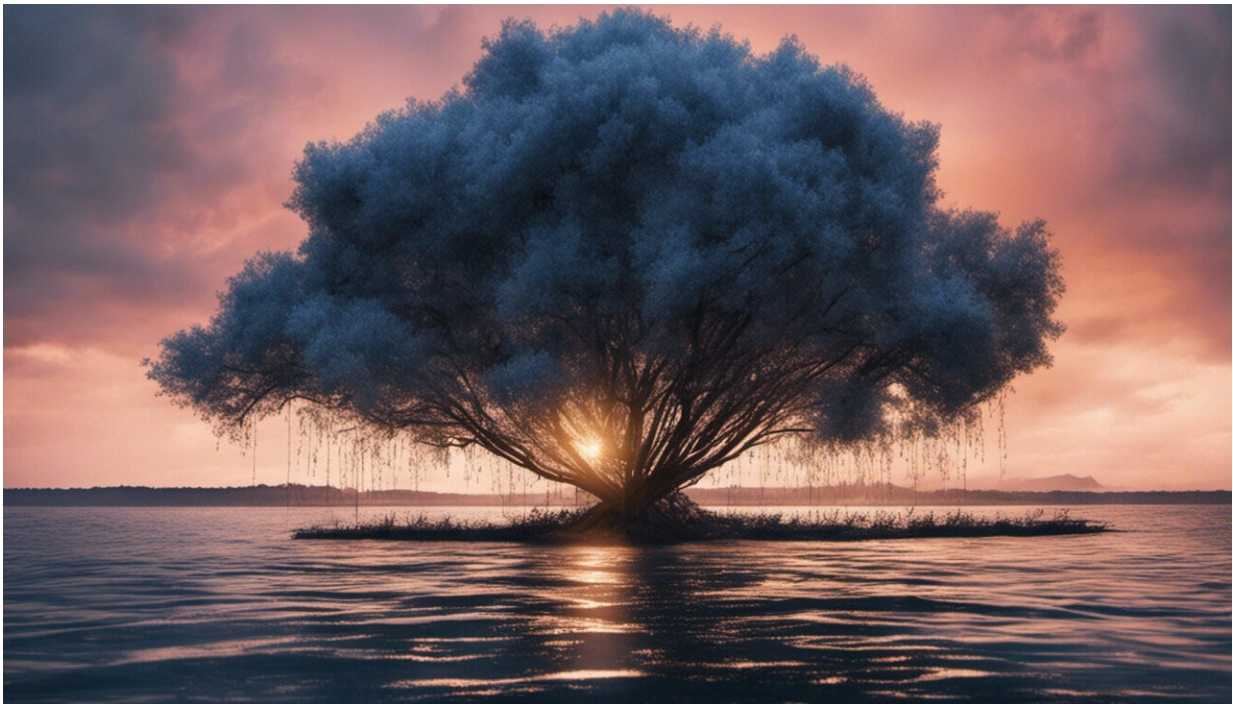


Climate change intensifies night-time storms over Lake Victoria

September 23 2016, by Roy Meijer



Credit: AI-generated image ([disclaimer](#))

Lake Victoria in East Africa will become a hotspot for hazardous thunderstorms due to climate change. This is shown by an international study published in *Nature Communications* on the 23rd of September. Stef Lhermitte (TU Delft) analysed the differences between storms during the day (which occur mainly over land) and during the night

(occur mainly over the lake).

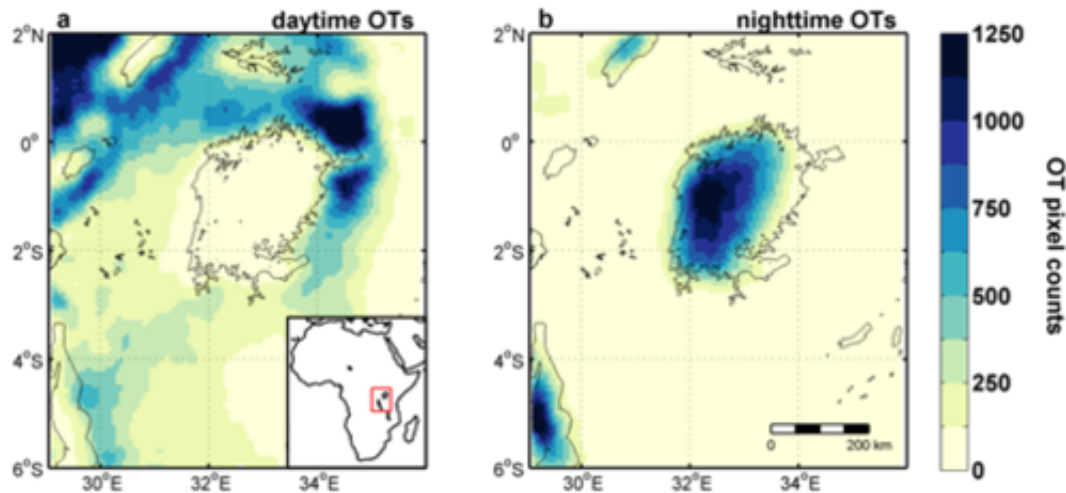
Lake Victoria is divided among Uganda, Kenya, and Tanzania. With a surface close to 70,000 km², it is the biggest lake in Africa. The lake is also a notoriously dangerous place for the 200,000 people who go fishing there at night. The International Red Cross estimates that between 3,000 and 5,000 fishermen per year lose their lives in violent storms on the lake.

Difference between day and night

That Lake Victoria can be so stormy at night is related to the circulation in the atmosphere above the enormous water surface, explains Lhermitte, who was working for KU Leuven (Belgium) during the time of the research. During the day, a breeze develops that flows from the cool water towards the warm land. At night, the opposite occurs: the land breeze flows away from the cooling land towards the warmer lake. As the lake is shaped like a circle, these land breezes from all directions converge above the lake. Add evaporation to this cocktail and you get a lot of storms, rain, wind, and waves.

Satellite observations

The scientists were able to provide scientific evidence for this pattern in collaboration with American space agency NASA. Thanks to new NASA satellite products they were able to map the number of hazardous thunderstorms and their locations in East Africa – every 15 minutes for a period ranging from 2005 to 2013. During the day, most storms rage over the surrounding land, especially the typical afternoon thunderstorms that are caused by local upsurges of warm air. At night, these storms concentrate over Lake Victoria.



The new NASA satellite observations clearly show the day-and-night rhythm of the climate above and around Lake Victoria (day image on the left, night image on the right). The darker the image, the more storms were counted there between 2005 and 2013. Credit: Delft University of Technology

Hotspot for night-time storms

To predict the impact of climate change on this process, the team, led by Wim Thiery (KU Leuven and ETH Zurich) also ran climate simulations using an advanced computer model: "If we start from a business-as-usual scenario, whereby the emission of greenhouse gases continues to increase, the extreme amounts of rainfall over Lake Victoria will increase by twice as much as the rainfall over the surrounding land. As a result, the lake will become a hotspot for night-time storms. Superstorms that only occur once every 15 years today will occur almost every year by the end of the century."

Warning system

The scientists plan to do further research to optimize existing warning

systems for local fishermen. The results make it possible to better predict extreme storms over the lake and to reduce the vulnerability of the local fishermen. In the meantime, a prototype of a new warning system has been developed.

More information: Wim Thiery et al. Hazardous thunderstorm intensification over Lake Victoria, *Nature Communications* (2016). [DOI: 10.1038/ncomms12786](https://doi.org/10.1038/ncomms12786)

Provided by Delft University of Technology

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