# New carbon flux towers reveal UK saltmarshes as vital but vulnerable carbon sinks



Recent research underscores the critical importance of saltmarshes as significant carbon stores, particularly in the context of rising sea levels and climate change. A collaborative report from the conservation charity WWF, in partnership with insurance giant Aviva, highlights these coastal ecosystems’ vital role in reducing greenhouse gases and safeguarding coastal communities.

Utilising a solar-powered “carbon flux tower” on the Ribble Estuary in Lancashire, the research measures the exchange of carbon dioxide—one of the key greenhouse gases—between the air and the saltmarshes. This technique, already employed in forests and peatlands, marks a novel application in saltmarshes, providing the first insights from a newly established network of measurement towers across the UK. Findings indicate that, despite seasonal fluctuations, saltmarshes generally act as a net sink for carbon dioxide, absorbing more carbon in warmer months than they release in winter.

The WWF and Aviva are advocating for the inclusion of saltmarshes in the UK’s official greenhouse gas inventory. They posit that recognising the carbon sequestration capabilities of these habitats could enhance national reporting, thereby unlocking crucial funding and policy initiatives dedicated to their protection and restoration. Currently, a staggering 85% of the UK’s saltmarshes have been lost since the mid-19th century, diminishing both their ecological and protective benefits. The remaining saltmarshes are vital for shielding over £200 billion in assets across England and Wales from the threats posed by rising sea levels and storm surges.

In response to the pressing issue of climate change, the research also involved a network of surface elevation tables across six UK saltmarshes to track changes in their height relative to rising sea levels. Results suggest that while many saltmarshes are managing to gain height—particularly in areas like Chichester and The Wash—some regions, including North Norfolk and parts of the Ribble Estuary, are exhibiting signs of distress.

Tom Brook, ocean conservation specialist at WWF, emphasised the urgency of the situation: “The results are in, and mud matters. Saltmarshes are powerful natural allies in the fight against climate change—storing carbon, protecting our coasts, and supporting rich biodiversity. As extreme weather and rising sea levels put more people and places at risk, the case for protecting and restoring these habitats has never been stronger.”

Saltmarshes not only sequester carbon through the process of photosynthesis and storing it in biomass, but they also play a crucial role in coastal protection by dissipating wave energy and reducing erosion. Studies indicate that a single hectare of saltmarsh can sequester approximately two tonnes of carbon annually, with undisturbed marshes capable of retaining these carbon stores for centuries.

However, threats loom large as nearly 100 hectares of saltmarsh are lost each year due to drainage, coastal development, and the pressures of climate change. Additionally, while it’s been shown that rising sea levels can enhance the carbon storage capacity of coastal wetlands through sediment capture and the thickening of root materials, there is still a considerable need for protective measures to maintain these vital ecosystems.

Investments are starting to emerge, with the UK Centre for Ecology and Hydrology leading a partnership that aims to secure £1 billion for restoring degraded saltmarshes across England. Such restoration projects involve reintroducing tidal flows to previously reclaimed lands to reinstate natural processes and functions vital for these habitats’ sustainability.

With current research estimating that UK saltmarshes store an impressive 5.2 million tonnes of carbon, the emphasis on protecting these ecosystems becomes increasingly significant. As studies reveal that new carbon accumulation rates may be slower than anticipated, comparable to those found in UK forests, it becomes clear that immediate action is essential to safeguard these reserves and their contributions to climate change mitigation.

In light of these findings, the push for greater recognition of saltmarshes in carbon accounting frameworks and increased investment in their restoration could pave the way for both ecological resilience and enhanced climate action, aligning with broader efforts toward a sustainable, net-zero future.

## Reference Map:

* Paragraph 1 – [[1]](https://www.irishnews.com/news/uk/mud-matters-research-shows-saltmarshes-are-significant-carbon-store-FLRVD426IJK5DJSNN4FU5T4WWI/), [[6]](https://www.york.ac.uk/news-and-events/news/2024/research/saltmarshes-climate-mitigation/)
* Paragraph 2 – [[1]](https://www.irishnews.com/news/uk/mud-matters-research-shows-saltmarshes-are-significant-carbon-store-FLRVD426IJK5DJSNN4FU5T4WWI/), [[2]](https://www.wildlifetrusts.org/natural-solutions-climate-change/saltmarshes), [[5]](https://www.ceh.ac.uk/news-and-media/news/unlocking-billion-pound-investment-restoration-saltmarshes)
* Paragraph 3 – [[3]](https://www.wwt.org.uk/news-and-stories/news/salt-marshes-the-most-effective-carbon-sinks-on-earth/), [[4]](https://www.uow.edu.au/media/2019/rising-seas-allow-coastal-wetlands-to-store-more-carbon.php)
* Paragraph 4 – [[2]](https://www.wildlifetrusts.org/natural-solutions-climate-change/saltmarshes), [[5]](https://www.ceh.ac.uk/news-and-media/news/unlocking-billion-pound-investment-restoration-saltmarshes)
* Paragraph 5 – [[1]](https://www.irishnews.com/news/uk/mud-matters-research-shows-saltmarshes-are-significant-carbon-store-FLRVD426IJK5DJSNN4FU5T4WWI/), [[6]](https://www.york.ac.uk/news-and-events/news/2024/research/saltmarshes-climate-mitigation/)

Source: [Noah Wire Services](https://www.noahwire.com)

## Bibliography

1. <https://www.irishnews.com/news/uk/mud-matters-research-shows-saltmarshes-are-significant-carbon-store-FLRVD426IJK5DJSNN4FU5T4WWI/> - Please view link - unable to able to access data
2. <https://www.wildlifetrusts.org/natural-solutions-climate-change/saltmarshes> - Saltmarshes are vital in combating climate change by capturing carbon dioxide through photosynthesis and storing it in both plant biomass and underlying sediments. A hectare of saltmarsh can sequester two tonnes of carbon annually, with undisturbed marshes locking it away for centuries. However, threats like drainage, development, and rising sea levels are causing the loss of nearly 100 hectares of saltmarsh each year. Protecting and restoring these habitats is crucial for carbon storage and coastal protection.
3. <https://www.wwt.org.uk/news-and-stories/news/salt-marshes-the-most-effective-carbon-sinks-on-earth/> - Saltmarshes and mudflats are highly effective carbon sinks, capturing and storing more carbon per hectare than many other habitats. When saltmarsh plants die, their carbon-rich material becomes buried in the mud, preventing decomposition and release of carbon into the atmosphere. This process helps mitigate climate change. Additionally, saltmarshes provide essential coastal protection by reducing wave energy and protecting shorelines from storms and erosion.
4. <https://www.uow.edu.au/media/2019/rising-seas-allow-coastal-wetlands-to-store-more-carbon.php> - Research indicates that rising sea levels enhance the carbon storage capacity of coastal wetlands, including saltmarshes. As sea levels rise, these wetlands adapt by increasing soil height, capturing more mineral sediment, and accumulating dense root material, much of which is carbon-rich. This adaptation allows them to sequester more carbon, thereby aiding in climate change mitigation. The study underscores the importance of preserving these habitats to maintain their carbon sequestration potential.
5. <https://www.ceh.ac.uk/news-and-media/news/unlocking-billion-pound-investment-restoration-saltmarshes> - A partnership led by the UK Centre for Ecology & Hydrology aims to secure £1 billion for restoring England's degraded saltmarshes. These coastal wetlands are crucial for carbon sequestration, biodiversity support, and flood risk reduction. Restoration efforts involve re-establishing tidal flows to reflood previously reclaimed land, thereby reconnecting saltmarshes to the sea and enhancing their natural functions. This initiative highlights the economic and environmental benefits of saltmarsh restoration.
6. <https://www.york.ac.uk/news-and-events/news/2024/research/saltmarshes-climate-mitigation/> - A study by the University of York found that UK saltmarshes store 5.2 million tonnes of carbon. However, the rate of new carbon accumulation is slower than expected, similar to sequestration rates in UK forests. This underscores the value of these carbon reserves and the need to protect them from climate change, sea-level rise, and human disturbances. The research highlights the critical role of saltmarshes in long-term carbon storage and climate change mitigation.
7. <https://www.ceh.ac.uk/our-science/projects/salt-marshes> - Saltmarshes are globally significant for their capacity to capture and store carbon. They can sequester carbon at rapid rates and store it for long periods. However, habitat loss due to human activities threatens their carbon storage potential. Research by the UK Centre for Ecology & Hydrology indicates that maintaining current coastal habitats could capture carbon worth approximately £1 billion over the period 2000–2060. Protecting and restoring these habitats is essential for climate change mitigation.