# UK report reveals saltmarshes’ untapped potential for carbon capture and flood defence



A new report underscores the critical importance of the UK’s saltmarshes in the fight against climate change, highlighting their dual capabilities in carbon storage and coastal protection. This comprehensive study was produced through a collaboration involving the World Wildlife Fund (WWF), Aviva, the UK Centre for Ecology and Hydrology (UKCEH), and the Royal Society for the Protection of Birds (RSPB). Central to the report is data collected from the nation’s very first carbon monitoring tower, which was installed on the Ribble Estuary in Lancashire.

Saltmarshes, characterised by their unique salt-tolerant vegetation and regular tidal inundation, play a pivotal role in natural flood defence and support rich biodiversity. Alarmingly, the UK has witnessed a dramatic loss of over 85% of its saltmarshes due to factors such as urban development, pollution, and various environmental pressures linked to climate change. This loss prompts a pressing need for enhanced conservation measures and greater recognition of saltmarshes in environmental policy.

The report advocates for the inclusion of saltmarsh habitats in the UK’s Greenhouse Gas Inventory—the official record that tracks the nation’s emissions and removals—in order to better gauge their contributions to achieving net zero emissions. Initial findings from the carbon flux tower indicate that these ecosystems are effective carbon sinks, with absorption rates peaking during the spring and summer months, while emissions rise in the autumn and winter. This nuanced understanding of seasonal carbon dynamics is crucial, especially as similar monitoring has been primarily focused on terrestrial ecosystems like woodlands and peatlands.

In addition to their carbon storage benefits, saltmarshes serve as natural flood barriers, providing an estimated £1 billion in annual protection to UK homes. Furthermore, their role in enhancing biodiversity cannot be overstated, as they harbour a wide variety of plant and animal species. They also contribute to water purification by filtering out pollutants and sediments, thereby fostering healthier aquatic environments.

Recent projections from various studies indicate that the number of properties at risk of flooding in England could escalate from 6.3 million to as many as 8 million by mid-century due to rising sea levels. This stark reality necessitates an urgent approach to safeguard and restore saltmarsh habitats, and the current research exemplifies the need for recognising these ecosystems not just as ecological treasures, but as essential components of climate adaptation and mitigation strategies.

Tom Brook, WWF’s ocean conservation specialist, remarked, "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." His sentiments were echoed by Claudine Blamey, sustainability director at Aviva, who acknowledged the report as a “science-based contribution” to the understanding of saltmarshes’ value in climate mitigation efforts.

Moreover, the study leverages early data from 48 Surface Elevation Tables across six UK saltmarsh sites to evaluate their resilience against sea-level rise. While some areas exhibit promising adaptive behaviours, others, particularly in North Norfolk and the Ribble Estuary, show signs of distress, signalling immediate restoration needs.

The collaborative efforts between scientists and policymakers aim to facilitate a financial infusion of £1 billion into restoring England's degraded saltmarshes. These efforts focus on enhancing the ecosystems' natural carbon sequestration capabilities, thereby unlocking pathways for investment through voluntary carbon markets. With an ambitious aim to create a UK Saltmarsh Carbon Code, similar to existing frameworks for peatland and woodland conservation, the project hopes to attract private investment while addressing climate change comprehensively.

In light of these findings, protecting existing saltmarshes and exploring opportunities for habitat restoration have become not just environmental imperatives but also crucial economic strategies for safeguarding communities against the increasing threats posed by climate change. The case for saltmarsh protection and restoration has never been more compelling, underscoring the urgent need for a coordinated response to preserve these invaluable ecosystems.

### 📌 Reference Map:

* Paragraph 1 – [[1]](https://www.newcivilengineer.com/latest/uk-saltmarshes-role-in-absorbing-emissions-and-flood-defence-outlined-in-new-report-02-06-2025/), [[4]](https://www.ceh.ac.uk/news-and-media/news/unlocking-billion-pound-investment-restoration-saltmarshes)
* Paragraph 2 – [[1]](https://www.newcivilengineer.com/latest/uk-saltmarshes-role-in-absorbing-emissions-and-flood-defence-outlined-in-new-report-02-06-2025/), [[2]](https://www.ceh.ac.uk/press/new-monitoring-assess-ability-uk-saltmarshes-suck-co2), [[5]](https://www.wildlifetrusts.org/natural-solutions-climate-change/saltmarshes)
* Paragraph 3 – [[3]](https://www.wwt.org.uk/news-and-stories/news/salt-marshes-the-most-effective-carbon-sinks-on-earth/), [[6]](https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/saltmarshfloodmitigationinenglandandwalesnaturalcapital/2022)
* Paragraph 4 – [[7]](https://www.ceh.ac.uk/our-science/projects/uk-saltmarsh-code/saltmarsh-blue-carbon)

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## Bibliography

1. <https://www.newcivilengineer.com/latest/uk-saltmarshes-role-in-absorbing-emissions-and-flood-defence-outlined-in-new-report-02-06-2025/> - Please view link - unable to able to access data
2. <https://www.ceh.ac.uk/press/new-monitoring-assess-ability-uk-saltmarshes-suck-co2> - Scientists are establishing the first network of greenhouse gas monitoring stations on saltmarshes around the UK coast to support national efforts to mitigate climate change. The UK Centre for Ecology & Hydrology (UKCEH) has installed two flux systems in the Ribble Estuary, with plans for others in Essex Marshes and The Wash. These flux towers will measure how much carbon dioxide is captured from the atmosphere and stored as carbon within the saltmarsh ecosystem, providing evidence to help unlock investment in restoration schemes of these important coastal wetlands. Since the mid-19th century, 85% of UK saltmarshes have been lost due to land reclamation, pollution, and erosion. Saltmarshes act as natural flood defences by dissipating wave energy during storms, thereby protecting coastal communities and infrastructure. The new monitoring will provide much-needed evidence on how much greenhouse gas is currently being absorbed from the atmosphere by UK saltmarshes, and what could be removed if more sites were restored. This will then help pave the way for private investment in restoration projects through the voluntary carbon market.
3. <https://www.wwt.org.uk/news-and-stories/news/salt-marshes-the-most-effective-carbon-sinks-on-earth/> - Saltmarshes and mudflats are tidal wetlands that are intermittently submerged with water, forming in sheltered coastal areas. They have a huge amount of biodiversity and are valuable to humans as efficient 'carbon sinks' and flood protection. Saltmarshes can significantly help address climate change by being the most effective form of storing carbon per hectare than many other habitats – acting as giant ‘carbon sinks’. When saltmarsh plants die, rather than decomposing and releasing their carbon into the atmosphere, they become buried in the mud. As sea levels rise, more sediment layers get buried and more carbon gets locked beneath the mud. Saltmarshes also act like huge sponges, absorbing and cleaning farming runoff, by filtering out herbicides, pesticides, and heavy metals, as well as excess sediments and nutrients. In times of heavy storms, hurricanes or high tides, they provide a buffer, reducing the strength and destruction of the incoming water and protecting the worst of the storm hitting populated areas further inland. Estimates show that we have lost over a third of our wetlands, of which salt marshes are an important constituent, in the last 50 years.
4. <https://www.ceh.ac.uk/news-and-media/news/unlocking-billion-pound-investment-restoration-saltmarshes> - A new project is set to pave the way for £1 billion investment in restoring England’s degraded saltmarshes, in order to mitigate climate change, support wildlife and reduce flood risk. In a natural state, these important coastal wetland habitats – through build-up of sediment and vegetation – trap and bury carbon at a greater rate, per area, than terrestrial habitats such as forests or peatlands. However, since the 1800s, large areas of saltmarsh have been drained, to reclaim land from the sea for agriculture, development or coastal flood defences – resulting in loss of habitat and biodiversity. A partnership of scientists, charities and financial experts, led by the UK Centre for Ecology & Hydrology (UKCEH), has secured a £100,000 grant from the Government’s new Natural Environment Investment Readiness Fund. They will develop scientific and revenue models plus a certification scheme for UK projects wanting to attract private investment by selling companies the carbon benefits that will result from restoring saltmarshes. There is growing interest in carbon credits by companies seeking to voluntarily offset their emissions of carbon dioxide (CO2) and motivated by corporate social responsibility. The planned UK Saltmarsh Carbon Code will operate on a similar basis to the Peatland Code and Woodland Code, and it is hoped the scheme will pave the way for at least £1 billion of private investment in restoration projects over 25 years, covering 22,000 hectares of habitat.
5. <https://www.wildlifetrusts.org/natural-solutions-climate-change/saltmarshes> - Carbon is captured by plants growing in the saltmarsh through photosynthesis and is stored both in the plant and the sediment beneath, which can extend several metres deep. A hectare of saltmarsh can capture two tonnes of carbon a year and lock it into sediments for centuries. If the saltmarsh remains undisturbed, the carbon in the soil can be stored for millennia. Saltmarshes provide a range of ecosystem services, including climate change mitigation through carbon sequestration, biodiversity support, and flood protection. However, threats such as drainage, development, and rising sea levels result in the loss and damage to coastal wetlands and saltmarshes, releasing CO₂ into the atmosphere. The protection of remaining saltmarsh is a matter of urgency; but there is also potential to restore and create new habitat. ‘Managed realignment’ is one way of creating new habitat and is achieved by purposefully removing coastal defences or moving them further back inland. Plans to realign 10% of England’s coastal zone by 2030 would create 6,200 ha of habitat and increase carbon storage, as well as reduce risks of flooding and coastal erosion.
6. <https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/saltmarshfloodmitigationinenglandandwalesnaturalcapital/2022> - This data estimates the impact saltmarsh has on reducing flood risk in coastal areas in England and Wales. The estimated value of flood mitigation by saltmarsh in 2019 was £62 million in England and £9 million in Wales. The total value of assets benefitting from saltmarsh flood mitigation is £1.79 billion for England and £0.26 billion for Wales. 1.8% of urban landcover and more than 87,000 properties in England benefit from some level of flood protection from saltmarsh; in Wales, 1.4% of urban landcover and more than 6,000 properties benefit from saltmarsh protection. Suburban land cover receives the highest flood mitigation service per hectare in both Wales and England, just over £18,000 and almost £9,500, respectively. Saltmarshes provide a range of ecosystem services, including climate change mitigation through carbon sequestration, biodiversity support, and flood protection. However, threats such as drainage, development, and rising sea levels result in the loss and damage to coastal wetlands and saltmarshes, releasing CO₂ into the atmosphere. The protection of remaining saltmarsh is a matter of urgency; but there is also potential to restore and create new habitat. ‘Managed realignment’ is one way of creating new habitat and is achieved by purposefully removing coastal defences or moving them further back inland. Plans to realign 10% of England’s coastal zone by 2030 would create 6,200 ha of habitat and increase carbon storage, as well as reduce risks of flooding and coastal erosion.
7. <https://www.ceh.ac.uk/our-science/projects/uk-saltmarsh-code/saltmarsh-blue-carbon> - Saltmarsh degradation results in biodiversity loss and the release of carbon and greenhouse gases stored in the sediment. As the UK aims for net zero by 2050, the restoration of coastal habitats has never been more important. Fortunately, there is potential for restoration, with past findings and current research paving the way for habitat protection, carbon storage, and adaptation to climate change. Saltmarsh habitats make up approximately 36,000 ha of English coastline, 7,000 ha of the Welsh coastline, and 6,000 ha of Scottish coastline, collectively an area roughly the size of West Yorkshire. Saltmarsh provides habitat for land and marine creatures, nutritious grazing for livestock, and popular spots for fishing and birdwatching. Saltmarshes have featured in popular fiction and folk stories as remote landscapes haunted by dangerous people and strange creatures. The fast incoming tides which for centuries evoked fear of stranding are rising with sea levels, and washing away this intertidal fringe of the UK, of which 85% has been lost since the mid-1800s. Political and scientific interests focus on issues of land reclamation for agriculture and development, sea level rise, indirect effects of industrial fishing on associated habitats like seagrass and oyster reefs which provide protection from wave erosion, health and well-being benefits, and now carbon sequestration, nutrient remediation, and co-restoration of coastal seascapes. More than 500,000 homes and businesses in England alone are located in areas at risk of damage from coastal flooding. By the 2080s, this could increase to up to 1.5 million properties. Damages from coastal flooding and erosion are currently estimated at over £260 million on average each year. To avoid this risk getting worse, the Environment Agency has estimated an average spend of over £1 billion a year in flood and coastal protection over the next 50 years. Saltmarshes are widely recognised for their contributions towards coastal protection by dampening waves, reducing storm surges, and minimising coastal erosion, encouraging investment in them as a nature-based solution for coastal protection. Sediments and organic detritus deposited up the tidal channels and among the roots of saltmarsh plants trap carbon and vertically build up the marsh, giving saltmarshes the title of a ‘blue carbon’ storing habitat. As the UK works towards Net Zero by 2050, carbon storing habitats are becoming increasingly important for offsetting emissions of CO₂.