

Submission of evidence made in response to the Environmental Audit Committee's inquiry into HM Treasury and the economics of climate and nature (April/May 2026)

About us

1. This submission is made on behalf of FloodMind, a collaboration of researchers from the University of Hertfordshire, Middlesex University, the University of Birmingham, Emirates Aviation University and the UK Health Security Agency, working with Orbital Applied Economics, Ocean Oculus and the National Flood Forum. The collaboration brought together expertise in public health, health economics, systems modelling, statistical modelling, flood risk, community engagement, and communications.
2. We are providing responses to Questions 3, 4(a), 5 and 8 of the Committee's call for evidence.
3. For further information or any questions, please contact Amin Hosseinian-Far, Professor of Systems Thinking at Hertfordshire Business School, University of Hertfordshire:

Why this evidence is relevant

4. Flooding is still too often assessed mainly in terms of damage to property, land, and infrastructure. The below evidence is relevant to this inquiry because the mental health consequences of flooding can also be significant, persistent, and costly, yet are at risk of being under-measured and therefore under-valued in Treasury-led appraisal, spending, and resilience decisions.

Our research

5. FloodMind is the first phase of a UK research initiative examining the mental health impacts of groundwater flooding and what those impacts mean for policy, funding and community support. A key focus of the project was groundwater flooding, an often overlooked but increasingly important disaster in certain regions in the UK, while drawing on the wider evidence base on flooding and mental health.
6. Phase One work included the examination of:
 - 6 (a) the prevalence and nature of flood-related mental health harms through a systematic review and meta-analysis of the evidence
 - 6 (b) how mental health impacts, service use, costs and outcomes can be mapped and consolidated into a decision-relevant framework
 - 6 (c) the economic implications of these harms for individuals, services, and wider society
 - 6 (d) a health-economic framework using probabilistic Bayesian modelling, designed to support decision-making under uncertainty
7. FloodMind was funded by/is managed by Project Groundwater Greater Lincolnshire and Project Groundwater Chiltern Hills and Berkshire Downs. These projects are funded by Defra as part of the £200 million Flood and Coastal Innovation Programmes which is managed by the Environment Agency. The programmes will drive innovation in flood and coastal resilience and adaptation to a changing climate.

Summary for the Committee

8. Our contribution is that HM Treasury's approach to climate adaptation, resilience and environmental decision-making should better reflect the full long-term costs of flooding, including mental health outcomes. Treasury decisions influence whether these costs are recognised early and reduced through prevention and adaptation, or instead allowed to materialise later across the NHS, local government, employers, households, and affected communities.

Key Findings

9. Key findings from Phase One of our project are outlined below:
 - 9 (a) Flooding can have important and sometimes long-lasting mental health consequences, including increased risks of Post-Traumatic Stress Disorder (PTSD), depression and anxiety, alongside physical and economic disruption.
 - 9 (b) The mental health impacts create economically relevant costs, such as increased demand for health and support services, lost productivity, reduced wellbeing, and wider social harm.
 - 9 (c) Because many of these costs arise over time and fall across multiple organisations and budgets, they can be missed or underweighted in conventional appraisal and spending decisions. The human costs of mental health impacts, monetised using Willingness to Pay (WTP)-based valuations, are almost always overlooked in economic appraisals of the costs of flooding but have the potential to be substantial.
 - 9 (d) Where mental health harms are omitted or treated as secondary, the case for early adaptation and resilience investment is likely to be understated.
 - 9 (e) Evidence-based, uncertainty-aware health-economic and systems approaches can help government make better decisions where climate impacts are complex, long-term, and distributed across sectors.

Question 3. How do fiscal rules, taxation, and spending constraints affect climate and environmental investment, and how does HM Treasury ensure that decisions do not increase economic vulnerability by delaying or underfunding early action?

10. *What we did:* FloodMind examined the mental health consequences of flooding through systematic evidence synthesis, economic analysis, and the development of a health-economic framework. This work was designed to test whether impacts that are often treated as indirect or secondary are nevertheless material to public decision-making.
11. *What we learned:* Household flood exposure is associated with substantially higher odds of PTSD, depression, and anxiety. Drawing on wider literature not specific to the flooding context, a one-year episode of anxiety, depression, and PTSD is associated with Quality Adjusted Life Year (QALY) losses of about 0.07, 0.159, and 0.25, respectively. A QALY measures the loss of healthy life expectancy associated with a health problem, combining both length of life and quality of life. Thus, this is equivalent to losing circa 0.8 months, 1.9 months, and 3 months of life expectancy in perfect health for the respective mental health outcomes. Using HM Treasury's £70,000 WTP-QALY value, this represents sizeable welfare losses even before direct

service costs and productivity losses are added. Flood-related mental health harms can persist well beyond the immediate event and can generate avoidable future costs for health services, local authorities, employers, and households. These are economically relevant consequences of climate risk, even when they are less visible than damage to property or infrastructure.

12. *Why this matters for the Committee's question:* Spending constraints and short-term fiscal pressures can bias decisions against early adaptation where benefits are realised over longer periods, across several sectors, and through avoided harm rather than immediate monetary gains. If appraisal does not capture avoided future health and social costs, delaying action can look cheaper than it really is.
13. *Implication:* Treasury decisions should distinguish more clearly between short-term affordability and long-term value. In flood resilience, early action may reduce future liabilities and improve resilience precisely because it prevents harms that would otherwise fall on other parts of the public sector and on communities.
14. *Recommendation:* HM Treasury should treat adaptation and resilience spending more explicitly as preventative investment and should expect business cases to show the likely avoided future costs of flood-related health and wellbeing harms where credible evidence is available. Flood resilience business cases should include a preventative-health appraisal component, using QALYs, service costs, absenteeism costs, and uncertainty analysis.

Question 4a. How are departments required to demonstrate the contribution of spending and investment proposals to climate and environmental objectives, including adaptation and resilience, and how are these assessments scrutinised and used in final funding decisions, and reflected in outcomes for climate and the environment, including any direct and indirect impacts of these decisions?

15. *What we did:* FloodMind mapped the pathways through which flooding can affect mental health and identified how these impacts translate into demands on services, costs to households, and wider social and economic consequences. Our wider project work also considered how such evidence could be brought into appraisal using Green Book principles and relevant economic-evaluation concepts.
16. *What we learned:* The consequences of flooding are not confined to the department sponsoring a resilience intervention. Mental health impacts can create costs for the NHS, local government, employers, voluntary organisations and affected households. This includes costs for diagnosis and treatment, recovery support, absenteeism, reduced wellbeing, and disrupted recovery. They can also worsen inequalities, because vulnerable populations may face the greatest and longest-lasting effects.
17. *Why this matters for the Committee's question:* If departments are asked mainly to demonstrate immediate or direct benefits within their own remit, important indirect and cross-government benefits may be under-represented in spending proposals. That makes it more challenging for adaptation and resilience measures to compete fairly in funding decisions.
18. *Implication:* Departments should be expected to identify both direct and indirect impacts of climate risks and climate-resilience interventions, including health,

wellbeing and service-cost implications. Scrutiny should test whether impacts falling outside the sponsoring department's budget have been properly considered.

19. *Recommendation:* HM Treasury should require stronger cross-departmental assessment of the long-term health, wellbeing and service-cost implications of climate risks, and should make clear that these wider effects are relevant to decisions on adaptation and resilience funding e.g. require departments to submit a cross-government impact table for major flood resilience proposals, identifying which avoided costs fall to the NHS, local government, DWP, employers, households, and affected communities. This assessment should also consider how public adaptation and resilience funding can unlock non-public investment, support wider economic growth, and enable benefits beyond the direct return on public expenditure.

Question 5. How effectively do HM Treasury's appraisal frameworks, including the Green Book, incorporate climate and environmental risks and benefits in policy and investment decisions?

20. *What we did:* Although the project's published flood mental health paper did not itself apply Green Book or NICE frameworks directly, FloodMind's wider project work has used those frameworks to interpret the policy significance of the evidence. We have considered the relevance of systematic evidence, explicit perspectives on costs and outcomes, appropriate time horizons, and uncertainty in modelling.
21. *What we learned:* In principle, appraisal frameworks can accommodate long-term and indirect impacts. In practice, however, impacts that are more difficult to measure, monetise or assign to one budget line risk being omitted or treated as peripheral. Mental health harms are especially vulnerable to this problem. Also, FloodMind's valuation work identifies a practical route for appraisal: use QALYs as the main welfare metric, apply EQ-5D-based utility losses where available, monetise QALYs using Treasury's WTP-QALY value, include cost-of-illness and absenteeism estimates, and apply conservative comorbidity adjustment to avoid double counting.
22. *Why this matters for the Committee's question:* If mental health effects are left outside the appraisal frame, the benefits of adaptation and resilience are likely to be understated. This creates a systematic risk that proposals delivering real long-term public value will appear less cost-effective than they are.
23. *Implication:* The issue may be less a lack of formal appraisal tools than a lack of consistent expectation, guidance and evidence standards for using them to capture climate-related health and wellbeing impacts. Treasury therefore has an important role in signalling that these impacts should be identified and valued wherever proportionate and evidence-based.
24. *Recommendation:* HM Treasury should update appraisal practice, guidance and expectations so that climate- and flood-related business cases more consistently identify, value and appropriately discount mental health impacts alongside physical damage, property losses, and infrastructure losses. This should include clearer expectations on the use of health-related and intergenerational discount rates, so that long-term mental health consequences and preventive investments are not undervalued in appraisal.

Question 8. How does HM Treasury assess and manage long term fiscal and economic risks associated with the costs of climate change and environmental degradation, and what influence does this have on Treasury decisions?

25. *What we did:* FloodMind developed a health-economic framework using probabilistic Bayesian modelling to support analysis where climate impacts are uncertain, long-term and spread across multiple outcomes. This approach was intended to help move from general recognition of harm to a more decision-relevant assessment of costs, benefits and uncertainty.
26. *What we learned:* Current approaches likely underestimate the full societal cost of flood-related mental health impacts, particularly because human costs, presenteeism, community support needs, and comorbidity are not consistently monetised. Long-term fiscal risk is not limited to insured losses, asset damage or emergency response costs. Flood-related mental health harms can generate future liabilities through increased service demand, lost productivity, and cumulative pressures on local communities. The associated human costs are also likely to be substantial. Uncertainty does not make these risks irrelevant; it strengthens the case for better modelling and more transparent assumptions.
27. *Why this matters for the Committee's question:* If Treasury approaches to risk management focus too narrowly on short-term or easily observed losses, they may understate the fiscal and economic consequences of climate change. This can weaken incentives for early resilience investment and leave future costs to be absorbed elsewhere in the system.
28. *Implication:* A more complete approach to long-term climate risk would include people-centred and service-related harms, not just capital losses. It would also recognise the distributional dimension: the burdens of delayed action are not evenly shared across places or populations.
29. *Recommendation:* HM Treasury should support the use of evidence-based, uncertainty-aware health-economic and systems approaches where climate impacts are complex, long-term and distributed across multiple outcomes and institutions.

Conclusion

30. Flooding is not only an infrastructure and property issue. It is also a public health, economic resilience, and fairness issue. If HM Treasury wishes to support a climate-resilient and nature-positive economy, its appraisal and spending practices should more consistently account for flood-related mental health impacts. This could include requiring departments to identify exposed populations, estimate additional cases of PTSD/depression/anxiety, value QALY losses using the Treasury WTP-QALY value, add service and productivity costs where evidence is available, and test uncertainty through probabilistic sensitivity analysis.

Key Supporting References

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- McDonald R and Georges M, Systematic review of the economic impacts of anxiety, depression and Post Traumatic Stress Disorder in the UK. FloodMind, February 2026. Available via FloodMind: “[New FloodMind reports highlight the economic cost of flood-related mental health impacts](#)” (accessed 30 Apr 2026).
- McDonald R and Georges M, Recommendation report – metrics for mental health valuation in the UK. FloodMind, February 2026. Available via FloodMind: “[New FloodMind reports highlight the economic cost of flood-related mental health impacts](#)” (accessed 30 Apr 2026)
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- Yakubu S et al., Flooding and the risk of PTSD, depression, and anxiety. Environmental Research (2026). <https://doi.org/10.1016/j.envres.2026.124063>

Appendix 1: Illustrative appraisal implication

31. Using FloodMind's recommended values, one additional one-year case of anxiety could imply approximately £4,900 in monetised QALY loss, plus around £1,104 in service costs and £1,036 in absenteeism costs. Equivalent figures are approximately £11,130, £2,085 and £2,188 for depression, and £17,500, £1,118 and £1,176 for PTSD. These figures suggest that even modest reductions in flood-attributable mental health harms could materially affect the benefit-cost case for early adaptation.

32. Note: These values should be used proportionately and transparently. Some cost inputs are drawn from wider UK mental health economics rather than flood-specific studies. For this reason, FloodMind recommends conservative assumptions, comorbidity adjustment, and probabilistic sensitivity analysis.

Appendix 2: Summary table of evidence

Table 1: FloodMind's evidence area, and potential utility for Treasury

Evidence area	FloodMind finding	Why it matters for Treasury
Flood exposure and PTSD	Pooled Odds Ratio* (OR) around 3.01	Flooding has measurable long-term mental health consequences, not just property impacts.
Flood exposure and depression	Pooled OR around 2.38	Adaptation benefits include avoided health and wellbeing losses.
Flood exposure and anxiety	Pooled OR around 2.84	Appraisals should include mental health risk pathways.
Service disruption	Associated with higher odds of PTSD, depression and anxiety	Resilience investment should include continuity of utilities, transport, health and local support.
Economic disruption	Associated with higher odds of depression	Household and business recovery support has mental health as well as financial value.
QALY loss per one-year episode	Anxiety 0.07 , depression 0.159 , PTSD 0.25	These can be monetised in Green Book-style appraisal.
Suggested QALY value	HM Treasury value: £70,000 per QALY , 2020/21 prices	Gives Treasury a directly usable valuation method.
Annual service costs per person	Anxiety £1,104 , depression £2,085 , PTSD £1,118	Shows direct pressure on health and support services.
Annual absenteeism costs per person	Anxiety £1,036 , depression £2,188 , PTSD £1,176	Shows costs beyond the NHS and local government.

**An odds ratio is a measure of how strongly an exposure or characteristic is associated with an outcome by comparing the odds of that outcome between two groups.*