

<b>Institution:</b> The University of Manchester		
<b>Unit of Assessment:</b> 14 (Geography and Environmental Studies)		
<b>Title of case study:</b> Climate Just: shaping more socially-aware responses to climate change		
<b>Period when the underpinning research was undertaken:</b> 2003 – 2015		
<b>Details of staff conducting the underpinning research from the submitting unit:</b>		
<b>Name(s):</b>	<b>Role(s) (e.g. job title):</b>	<b>Period(s) employed by submitting HEI:</b>
Sarah Lindley	Professor of Geography	2001 – present
Joseph Kandeh	Post-doctoral Researcher	2010 – 2011
Alexandra Kazmierczak	Post-doctoral Researcher	2009 – 2014
Angela Connelly	Post-doctoral Researcher	2011 – 2020
Nigel Lawson	Honorary Fellow; and Research Associate	2013 – present, 2009 – 2012; 2010 – 2013
<b>Period when the claimed impact occurred:</b> 2010 – 2020		
<b>Is this case study continued from a case study submitted in 2014?</b> Yes		
<p><b>1. Summary of the impact</b></p> <p>Decisions about how to adapt to the impacts of climate-related events like floods and heat-waves have often relied on understanding only the physical exposure of people and places. University of Manchester research brought decision-makers fresh perspectives and new insights from map-based evidence. The research and its resources (<a href="http://www.climatejust.org.uk">www.climatejust.org.uk</a>) have benefitted many socially vulnerable and climate disadvantaged communities by:</p> <ul style="list-style-type: none"> <li>• Bringing a stronger social emphasis into UK climate change risk assessments and national adaptation plans;</li> <li>• Underpinning practitioner guidance, e.g. from the European Environment Agency and UK professional planning bodies; and</li> <li>• Transforming thinking so that actions now account for personal, social and environmental contexts, e.g. in the NHS, and in UK and European local authorities.</li> </ul>		
<p><b>2. Underpinning research</b></p> <p>The EPSRC-funded Adaptation Strategies for Climate Change in the Built Environment project [1,2] stimulated Lindley to reassess how to map social vulnerability for improved climate-related decision-making [1,2,3]. She further developed her ideas as part of a Manchester-led multi-disciplinary Joseph Rowntree Foundation (JRF) project in 2010-11 [4], and then in collaborative research commissioned by the Scottish Government [5,6]. After considerable interest from research users, JRF and the Environment Agency funded multiple knowledge-exchange projects (2012-19). A key deliverable was the 2015 Climate Just resource.</p> <p>In the original JRF project, Lindley (with O'Neill (Philosophy)) developed a new, inter-disciplinary perspective on social vulnerability and climate disadvantage and carried out an analysis of map-based evidence. <b>The research focused on the human dimensions of uneven impacts - as distributional injustices</b> - and brought together concepts from climate change adaptation and disaster risk reduction with a capabilities approach to understanding wellbeing and social justice. <b>The resulting ethically and empirically grounded framework was applied to the case of UK flooding and heat-related events</b> using comprehensive data and a range of spatial and other analysis techniques [4]. Individual indicator and composite maps (Fig. 1) showed geographical distributions of:</p> <ul style="list-style-type: none"> <li>• Sensitivity – personal biophysical characteristics influencing how heat-waves or floods might lead to differential negative welfare impacts, e.g. older age groups and people with pre-existing ill-health;</li> <li>• Enhanced exposure – aspects of the local physical environment tending to accentuate or offset the severity of heat-waves or floods, e.g. the amount of greenspace or specific housing characteristics;</li> <li>• Ability to prepare – factors suggesting how well people can prepare for heat-waves or floods, e.g. insurance, income and local knowledge;</li> <li>• Ability to respond – factors suggesting how well people can immediately respond to heat-waves or floods, e.g. income, personal mobility and community networks; and</li> <li>• Ability to recover – factors suggesting how well people can recover from heat-waves or</li> </ul>		

floods, e.g. income, insurance, housing mobility, and health service availability.

The maps were combined with data showing hazard-exposure (e.g. river and coastal flooding) to **identify the potential for more/less extreme impacts** (Fig. 1). Data were also analysed to reveal **distinct socially-vulnerable groups and their geographical distributions** [4].

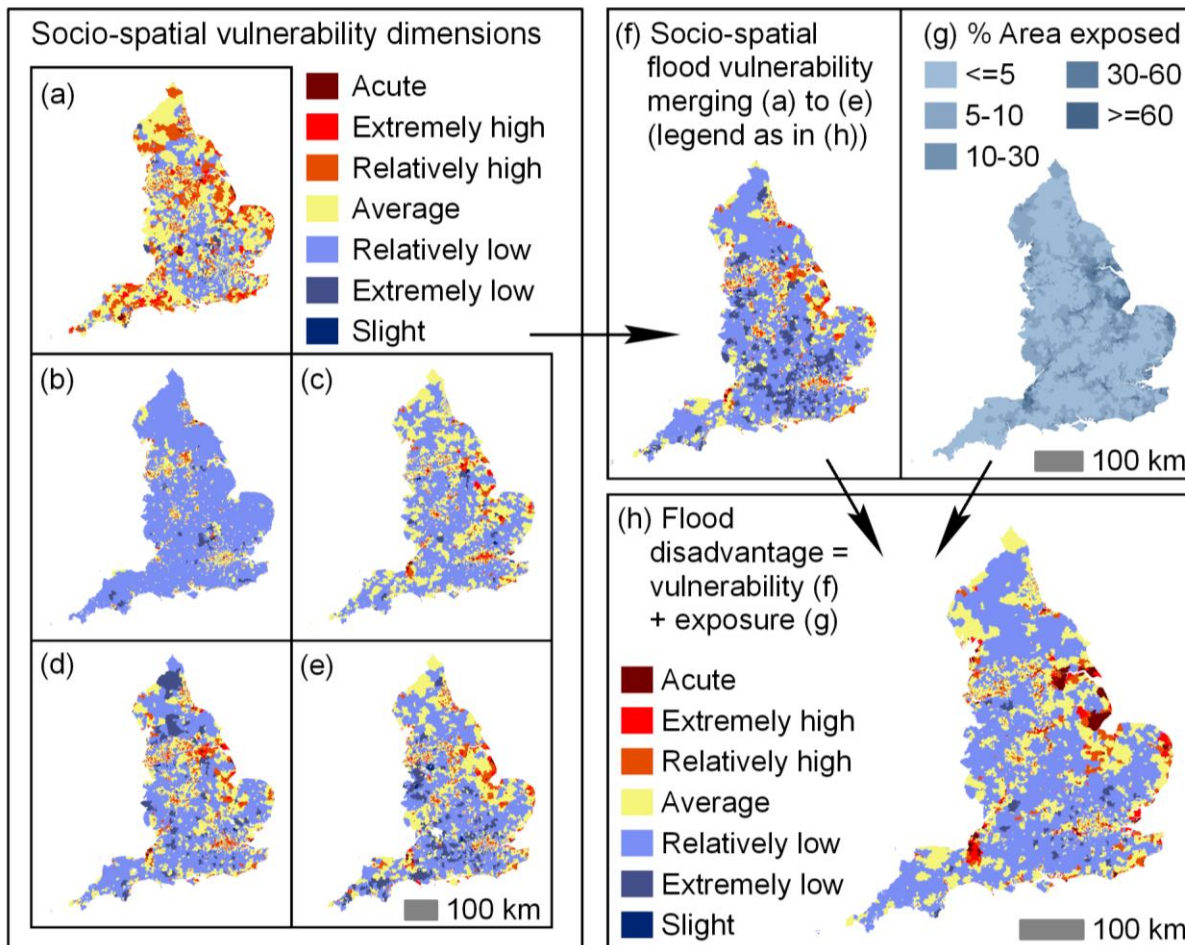


Fig. 1: Examples of original flood-related data for England based on [4], 2011 update. Notes: (a) Sensitivity (b) Enhanced Exposure (c) Inability to Prepare (d) Inability to Respond (e) Inability to Recover (g) Environment Agency moderate or significant flood zones. Contains Ordnance Survey and Office for National Statistics data under the Open Government Licence © Crown copyright and database right 2012 and Environment Agency data [4].

The research identified **severe regional and other geographical imbalances in social vulnerability and climate disadvantage across the UK** [4,5,6]. At the time, mainstream risk assessments largely focussed on assessing the likelihood, location and severity of hazards, and the extent of physical exposures. There was far less consideration of social vulnerabilities and their geographical distributions. Consequently, decision-making across a wide range of sectors and scales took little account of how individual, social and environmental factors might influence actual experiences, real outcomes, and specific local needs. If there was any consideration of social dimensions at all, it tended to be qualitative, or use basic vulnerability or social deprivation indices [4]. The substantive results of the underpinning research were important. However, it was the gaps they revealed in overall awareness that were foundational to the impact reported in section 4. These gaps were addressed by **providing a comprehensive, quantitative, and accessible evidence base to support more socially-just decision-making**. The research supports the combined use of quantitative and qualitative information, and aids the development of more holistic local assessments and responses [4].

### 3. References to the research

1. **Lindley, S. J.**, Handley, J. F., Theuray, N. Peet, E. & McEvoy, D. (2006) Adaptation Strategies for Climate Change in the Urban Environment: Assessing Climate Change Related Risk in UK Urban Areas, *Journal of Risk Research*, 9:5, 543-568. DOI:

- [10.1080/13669870600798020](https://doi.org/10.1080/13669870600798020). 55 citations in WoS (December 2020)
- Lindley, S.J.**, Handley, J.F., McEvoy, D., Peet, E. and Theuray, N. (2007) The Role of Spatial Risk Assessment in the Context of Planning for Adaptation in UK Urban Areas *Built Environment*. 33:1 46-69. DOI: [10.2148/benv.33.1.46](https://doi.org/10.2148/benv.33.1.46). Not in WoS, 51 GS citations (December 2020).
  - McEvoy D., **Lindley S.** and Handley J. (2006) Adaptation and mitigation in urban areas: synergies and conflicts. *Proceedings of the Institution of Civil Engineers, Municipal Engineer*, 2006, 159, No. 4, 185-191. DOI: [10.1680/muen.2006.159.4.185](https://doi.org/10.1680/muen.2006.159.4.185). 77 citations in WoS (December 2020)
  - Lindley, S. J.**, O'Neill, J., **Kandeh, J.**, **Lawson, N.**, Christian, R. & O'Neill M. (2011) *Climate change, justice and vulnerability*, Joseph Rowntree Foundation, York. Not in WoS, 89 GS citations (December, 2020). <http://bit.ly/2MSdQH4>
  - Lindley, S.**, & O'Neill, J. (2013). Flood disadvantage in Scotland: mapping the potential losses in well-being. Scottish Government. <https://bit.ly/3d2sdDH>
  - Kazmierczak, A.**, Cavan, G., **Lindley, S.** & **Connelly, A.** (2015) Mapping Flood Disadvantage in Scotland. Edinburgh: The Scottish Government. <http://bit.ly/2OdUAUQ>

#### 4. Details of the impact

**The resource:** The free-to-use Climate Just resource ([www.climatejust.org.uk](http://www.climatejust.org.uk)) provides evidence, guidance and case studies supporting the development of more socially-aware responses to climate change. Its datasets and interactive maps facilitate in-depth assessments of social vulnerability and climate disadvantage, which go well beyond traditional exposure-based analyses.

**Beneficiaries:** From its February 2015 launch to May 2018, Climate Just had attracted >38,000 users [A]. Most (62%) actively searched for the resource prior to landing on the site and 25% were returning visitors. Around 20% of the 51,000 sessions were >3 minutes long.

Some 600 people have been directly engaged through 30 face-to-face events [A]. The National Flood Forum, and the Town & Country Planning Association and Royal Town Planning Institute (TCPA/RTPI) ran additional events due to their independent professional interests [B]. Following the 2018 re-launch, Adaptation Scotland funded a second workshop due to heavy demand, and a new map-portal registration system has now collected 1432 registrations (Fig. 2a). The intended audience was primarily local public-sector practitioners, and voluntary and community organisations with a role in supporting UK climate adaptation. However, the reach of the work has proved far wider (Fig. 2b). Impacts stem from (i) top-down activities by external agencies with ideas cascading through policy and practice networks and (ii) bottom-up activities due to independent engagement by individuals and organisations.

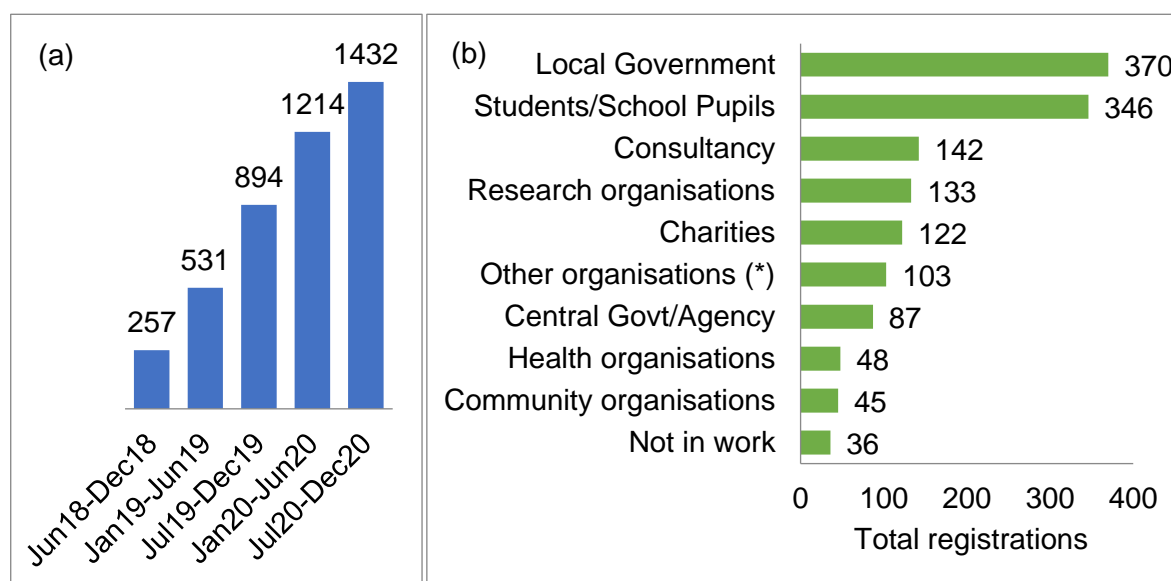


Fig. 2: (a) Cumulative map tool registrations (b) User-breakdown of map tool registrations (Jun18–Dec20) \*Other includes: businesses, international and advisory bodies, and the media.



**Evolving pathways-to-impact:** In 2015, Scottish Government commissioned data updates, including the co-development of new indicators [5,6]. Paul Sayers Consulting's Social Flood Risk and Neighbourhood Flood Vulnerability Indices [C] were developed from the underpinning research [4,6] and used in the 2018 re-launch. Most recently, the East London Business Alliance (<https://elba-1.org.uk/>) has helped bring evidence from Climate Just to its large corporate members, e.g. presentation by Lindley to Aviva plc in December 2020.

**Local impacts in the UK:** Positive impacts on local planning, design and community action have occurred across a diverse user community, including local and combined authorities, emergency services, charities and agencies [A]. Indicative examples include:

- **Hull City Council (HCC):** HCC's Environment and Climate Change Strategic Advisor states *"We were able to use the Climate Just maps and resources in our internal discussions with different services as part of our strategy development to help identify vulnerable communities and consider service responses"* [D]. Materials also informed discussions within the local Health and Wellbeing Board bringing wider perspectives on overheating risks and engaging the social care sector, *"This helped to inform plans for a new care home scheme in the city including ensuring design was future proofed as well as increasing the Extra Care provider's understanding of the impacts of climate change on vulnerable groups and the wider community resource the centre could provide in extreme weather events."* [D].
- **Royal Liverpool and Broadgreen University Hospitals NHS Trust:** Climate Just was used to develop materials and commitments on patient guidance, changes to estate, and local community working. The RLBH's Head of Sustainability notes the *"Climate Just website was used in the Trust's Sustainability Plan 2016-17 to engage and influence staff and partners, including senior management and clinical staff within the hospitals and also our partners in Liverpool's Knowledge Quarter and across the wider NHS"*. Furthermore *"the maps of the Liverpool area surrounding the hospital highlighting social vulnerability and flood disadvantage in relation to surface water flooding were really valuable to us for demonstrating visually where the social impacts may be felt the most"* [E]. Their Plan received the highest quality rating of any English NHS organisation in 2017. Indeed, RLBH's engagement with Climate Just was also highlighted as a best-practice case by the Liverpool City-Region Brussels Office [E].
- **Staffordshire County Council (SCC):** The Manager for Sustainability and Waste Strategy combined Climate Just maps with internal datasets to identify places to focus resources and engage multiple stakeholders. She notes that *"This activity added the social disadvantage element not captured by our original risk assessment on flooding"* [F]. One of the areas (Rolleston village) has since received an additional £30,000 to help with property protection (2018) [F].

**Regional and national impacts:** The research has influenced strategic responses, including in the Environment Agency; Regional Flood & Coastal Committees; NHS Scotland; and the TCPA/RTPI [A B]. Indicative examples include:

- **TCPA/RTPI National Planning Policy Framework guidance:** TCPA/RTPI's 2018 guidance states *"Fairness and justice should be at the heart of planning for climate change"* and continues *"The Climate Just resource provides a powerful way of mapping the relationship between social exclusion and the impacts of climate change, offering the opportunity to tailor policy to meet the needs of those likely to be most vulnerable to climate change"* [B, p6].
- **Friends of the Earth's analysis of climate-friendly areas:** FoE's 2019 use of Climate Just data is helping develop Climate Action Groups, local Climate Action Plans and *"tangible solutions"* [G].
- **Activities required under the Climate Change Act 2008, and its devolved equivalents:** The 2017 UK Climate Change Risk Assessment (CCRA) Evidence Report included maps from the research [H], and further social disadvantage analyses have been delivered for the 2022 CCRA [H]. The Second Scottish Climate Change Adaptation Programme (2019-2024) explicitly references the research [5,6] for Outcome 2, which will ensure that: *"The people in Scotland who are most vulnerable to climate change are able to adapt and climate justice is embedded in climate change adaptation policy"* [I].

***International impacts:*** Climate Just was identified as a good practice example at the 2015 European Climate Change Adaptation Conference, and the European Environment Agency (EEA) recognises it as “***the most comprehensive and detailed tool currently existing in Europe for the planning and implementation of socially just urban adaptation***” [J]. Hitherto, the EEA and European LAs had typically taken a physically-informed approach, like the UK. Now, the research is stimulating more socially-aware responses across Europe. For instance, on learning about the mapping work, a City of Helsinki representative notes “[we] were all very excited because that was something which we were lacking in our adaptation analysis... Prior to our use of Climate Just in 2015, when the first vulnerability mapping was done for Helsinki, the issues of climate disadvantage and social vulnerability to climate change had not been considered” [K]. Through replication of the methodology, Helsinki authorities have discovered how their existing coastal flood adaptation responses were unconsciously favouring the wealthy, and are now rebalancing their activities accordingly [K].

#### 5. Sources to corroborate the impact

- A. Knox, K. (2018) *Climate Just Impact and Legacy Report*. Simon Industrial and Professional Fellowship report.
- B. RTPI/TCPA (2018) *Rising to the Climate Crisis A Guide for Local Authorities on Planning for Climate Change*. <https://bit.ly/3rDa7Mi>
- C. Sayers *et al.* (2018) Flood vulnerability, risk, and social disadvantage: current and future patterns in the UK. *Reg. Environ Change* 18, 339–352. DOI: [10.1007/s10113-017-1252-z](https://doi.org/10.1007/s10113-017-1252-z)
- D. Testimonial and case study from the Environment and Climate Change Strategic Advisor, Hull City Council. Received February 2019.
- E. Testimonial and case study from the Head of Sustainability, Royal Liverpool and Broadgreen University Hospitals NHS Trust. Received February 2019.
- F. Testimonial and case study from the Manager for Sustainability and Waste Strategy, Staffordshire County Council. Received November 2020.
- G. Methodology and datasets used in Friends of the Earth’s analysis of climate-friendly areas. <http://bit.ly/3p1XVTH>
- H. Combined Climate Change Risk Assessment reports: (a) Street *et al.* (2016) UK Climate Change Risk Assessment Evidence Report: Chapter 8, Cross-cutting Issues. Report prepared for the Adaptation Sub-Committee of the Committee on Climate Change, London. <https://bit.ly/3a3Sfob>; and (b) Sayers *et al.* (2020) Third UK Climate Change Risk Assessment (CCRA3): Future flood risk. Research undertaken by Sayers and Partners for the Committee on Climate Change. <https://bit.ly/3cXJf5l>
- I. Climate Ready Scotland: Second Scottish Climate Change Adaptation Programme 2019-2024. Laid before the Scottish Parliament by the Scottish Ministers under Section 53 of the Climate Change (Scotland) Act 2009, Scottish Government SG/2019/150 Sept 2019 (p.67). <https://bit.ly/2Z1NDbC>
- J. Breil *et al.* (2018) *Social vulnerability to climate change in European cities – state of play in policy and practice*. European Topic Centre on Climate Change Impacts, Vulnerability and Adaptation (p.34). DOI: [10.25424/CMCC/SOCVUL\\_EUROPCITIES](https://doi.org/10.25424/CMCC/SOCVUL_EUROPCITIES)
- K. Evidence of impact in Helsinki: (a) Testimonial from Susanna Kankaanpää, Climate Adaptation Expert, Urban Environment Division, City of Helsinki. Received January 2021; and (b) Kazmierczak, A. (2015) *Analysis of social vulnerability to climate change in the Helsinki Metropolitan Area*. A report for the Helsinki Region Environmental Services Authority. <https://bit.ly/3ba2MOW>