

Building the **business case** for targeted investment in resilience planning

Summary Case Study A | **Social Housing**

March 2015

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Cover photo: Neil Moralee & Informed Infrastructure



Why are we involved?



1. It's already happening
2. More informed risk based decision making
3. 30 year business planning
4. Senior leadership buy in
5. Supporting other's



Background

Aster Group has 75,000 customers, 27,000 properties with an estimated sale value of £1bn, and an annual turnover of £133m. In 2008 Aster Group reported total costs of damages of £100,000 due to the flooding of 6 of their properties. Combined with recent flood events across the country, Aster's senior team are now concerned that these costs may increase in the future due to a changing climate. However, they lack the capacity, expertise and information required to make sound decisions under these conditions of extreme uncertainty, specifically relating to determining appropriate level of investment in addressing this issue.

In March 2014, Aster embarked on a year-long commercial feasibility study with an academic-private sector consortium led by the Global Climate Adaptation Partnership (GCAP) and Daniel Black and Associates (db+a), experts in climate adaptation and healthy urban development planning respectively, with the University of Bath and University of Manchester providing specialist technical support in economic valuation and the interplay between spatial mapping and weather risk data respectively.

The aim of the study was to test a newly integrated service model that would enable Aster to better understand its exposure to current and future extreme weather and make positive steps towards best practice adaptation planning.



Aster Group is the parent company of Aster Communities (landlord services), Synergy Housing Limited, Aster Homes Limited (new homes), Aster Living (extra care) and Aster Property Limited (asset management). It operates across the South of England.

Staff:	1,500
Total fixed assets:	£1,197m
Maintenance/annum:	£56m
Turnover:	£195m
Homes:	£27,000
Customers:	75,000
New homes/annum:	600

National **context**

The 2012 UK Climate Change Risk Assessment reports that annual damages to UK properties due to flooding from rivers and the sea currently total around £1.3 billion. For England and Wales the figure is projected to rise to somewhere between £2.3bn and £12 bn by the 2080s.

The 2013 National Adaptation Programme Economics Report notes that UK floods in 2007 were estimated to have cost businesses £740 million, with many businesses not surviving.

Global monetary losses to real estate and infrastructure from severe weather events have tripled globally during the past decade, with direct losses amounting to US \$150bn per year (Bienert, 2014).

University of Bath have extrapolated the below figures to show the national and regional (South West) picture between now and the 2050s focusing on the hazards that are of particular interest to Aster Group.

Projections suggest that, across the region as a whole, the incidence of overheating will increase most substantially, followed by flooding, with subsidence changing only a relatively small amount.

	Current	2020s	2050s
	(£ million, annual)		
Flood risk residential housing (SW Eng)	107	253	417
UK	250	1141	1881
Subsidence risk - residential (SW Eng)	8	9	10
UK	297	334	371
Summer mortality (SW Eng)	0.8	2.8	8.5
UK	8.1	29	87

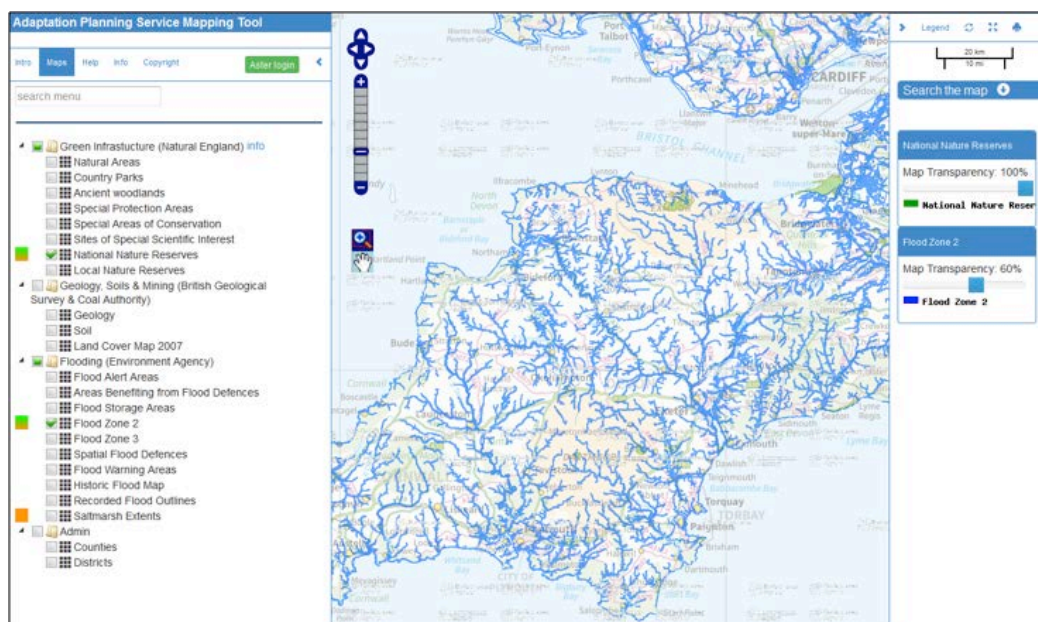
Online mapping

Some risks associated with extreme weather and climate change are spatial in nature. GIS-based mapping of data can allow finer grain analysis, limited only by the quality of the data available.

The University of Manchester's online GIS-based decision support tool is designed, not to replace GIS, but to make this powerful tool more widely accessible, and to facilitate more effective communication in spatial data analysis. It is designed bespoke for specific end-users as a user-friendly intuitive online platform that can be used by non-GIS specialists to build capacity in this area.

The focus of the prototype within this case study was on flood risk. By providing a platform to display spatial data related to flood risk, the Tool provides an opportunity to gather evidence and build understanding of this risk amongst Aster's staff and the wider community.

Illustrative datasets on the following four themes were selected to build the prototype Mapping Tool: flood hazards, exposure of buildings to flood hazards, sensitivity of residents to harm from flood hazards, and Aster's asset grading data.



Changing **climate**

The climate of South West England is changing. Records indicate that annual mean temperature increased by 1.37°C between 1961 and 2006. Precipitation levels during the autumn months have increased by 28.6% over this period.

Future climate projections for the region are included in the box opposite. These are based on the difference between the 1961-1990 recorded baseline and central (50%) projections for the 2050s.

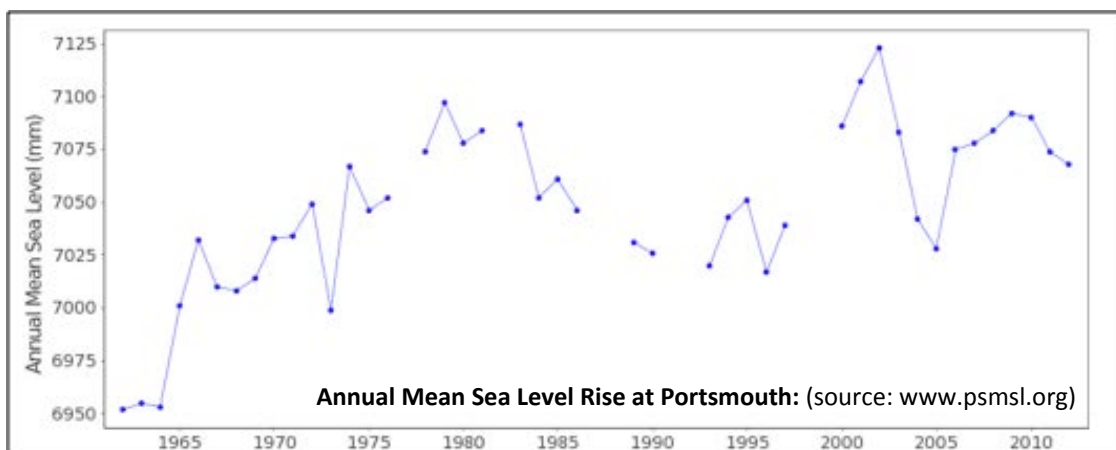
Sea level is projected to rise by around 0.5m by the end of the century, increasing at a faster rate than has been observed for the region over recent decades. This will raise the risk of flooding hitting coastal communities, particularly when associated with high tides, strong winds and storm surges.

This has implications for Aster properties in

coastal locations, for example those located in towns such as Weymouth.

- Under both the low and high greenhouse gas emissions scenarios, **considerable change is projected** for the climate of the South West, **particularly concerning temperature variables**. In many cases, the **difference between the low and high emissions scenarios is relatively small**. For example, the increase in mean temperature by the 2050s (relative to the 1961-1990 baseline) is 2.15°C under the low scenario and 2.74°C under the high scenario.
- Little change is projected in annual precipitation levels. However, this masks a **seasonal pattern of change towards drier summers** (under the central projection) and **wetter winters**. Precipitation levels on the wettest winter day are projected to increase by 10-15%.

Taken from University of Manchester Project Report; see page 12 for contact information to request a copy.



Economic valuation

Credit: Informed Infrastructure



Using a combination of client-specific data and tested assumptions the University of Bath calculated the current and future (2040) costs associated with flood risk, subsidence and overheating, considering projected expansions in the Aster property stock and climate change.

Results suggest that Aster's current level of exposure is manageable, from their perspective. However, with potential increases in exposure of varying magnitude going forward there may need to be significantly greater resources committed. For example, under the medium climate change scenario there may be a 60% increase in flood risk costs due to stock expansion, and a further 60% when factoring in climate change. Of note is the fact that results for the high-end climate

scenario is almost three times larger than in the medium scenario, whilst the low-end results are less than half those in the medium scenario. For subsidence, the figures are 30% and 18% respectively in the mid-point analysis though it should be noted that subsidence incidence is projected to decrease in a high-end climate scenario, relative to a low-end scenario, reflecting the fact that the increased winter rainfall in the high scenario more than cancels out the effects of drier summers on subsidence. For overheating, a 13% increase in heat-related health costs as a result of stock expansion, and a doubling of costs as a result of climate change in 2040, is judged to be possible, with uncertainty ranges around these figures similar to those for flooding.

In the case of heat-related health costs, all mortality costs, and the majority of morbidity costs, are non-market costs, measured by surveying people's willingness to pay to avoid these health risks. Consequently, Aster would not expect to bear direct financial costs, yet indirect costs may be an important consideration (e.g. the importance of reputation particularly in light of Aster's strong ethical position).

Managing **climate risks**

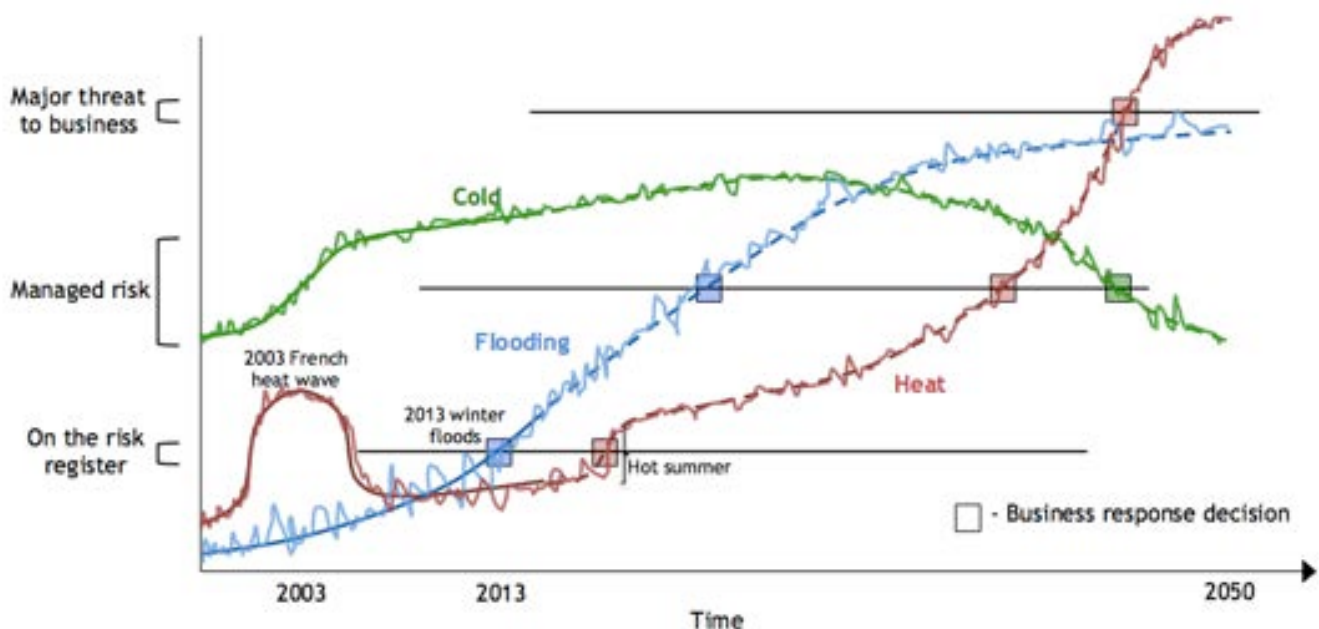
The Global Climate Adaptation Partnership developed a suite of tools for understanding climate risks to specific business processes. Risks beyond 2050, as commonly represented by global climate model scenarios, are of little concern to most businesses.

This figure illustrates how weather-related risks are brought into business processes. While only illustrative, it is based on discussions with Aster's managers and has the potential to contribute to their Risk Register.

Is their business model viable in the future (the upper line)? Major threats and opportunities are unlikely to be extreme

weather events on their own. However, there are situations where future climate change is part of several risks that would threaten a business. Cold stress is a risk that Aster monitors closely. Flooding came onto their radar screen in 2013. Heat stress could well be a serious threat in the future.

Businesses manage risk in several processes. As a risk becomes salient (the lower boundary of the risk-management pathway), businesses invest in knowledge and procedures. Aster have acted initially on flooding, and are now starting to explore over-heating as a potential risk.



Achieving **resilience**

This project has demonstrated that it is possible for corporate entities to start transforming their capacity to engage in resilience planning. Not a simple undertaking, three key factors that made this possible were: 1) committed support from Aster’s experienced and capable sustainability team with project buy-in at Board-level; 2) Aster’s relatively long-term view based on asset management and maintenance programmes; 3) the unusual breadth and depth of experience of the project team to navigate this complex area.

A challenge for this type of approach were those impacts outside of Aster’s direct remit (e.g. heat-related health impacts) which nonetheless may have a substantial effect across multiple private and public

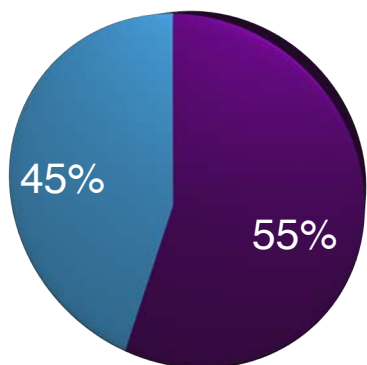
agencies. db+a is now progressing an opportunity for a new feasibility study exploring this complex area.

To sense-check the preparedness of the UK’s social housing sector for extreme weather events, db+a has set up a pilot survey with the support of Aster Group and the National Housing Federation. We encourage UK-based RSLs to complete this survey. If there are other sectors interested in exploring this area, please get in touch.

www.surveymonkey.com/s/VHP5YFN

Results so far suggest:

- A third have been impacted by flooding and storm damage; 1 in 10 from heat stress; a third consider these impacts significant
- A third consider *current* extreme weather to be a threat to the business at strategic/ Board level, while **half considered future extreme weather to be a threat to the business.**
- Half do not have in-house GIS resource; just under half felt that their database was up to date and consolidated
- Half have formally adopted climate change adaptation into their corporate strategies; three quarters have started work in this area.



- Climate adaptation in RSL's corporate strategy
- Climate adaptation not in RSL's corporate strategy

Thank you

In addition to all the stakeholders who took the time to attend and contribute at our events, we'd also like to thank those who gave their time and resource to help make this project a success:

- **National Housing Federation** Bristol Office for hosting our team meetings throughout the year.
- Debbie Hobbs and Jessica Allen at **Legal & General Property** for so generously hosting our final event at their London HQ.
- **Dr David Stainforth**, Grantham Institute of Climate Change, London School of Economics, for somehow making the complexity of climate and weather predictions not only clear and informative, but also enjoyable.
- **Professor Bill Gething**, Sustainability + Architecture and University West of England, for bringing his invaluable expertise in designing buildings for climate change.
- **Caroline Duckworth** and Jim Hodgson from the EA's **Climate Ready** team for all their support.
- **Mark Leach** and Bristol City Council for hosting our Autumn team meeting.



Project team

Daniel Black, db+a	Project concept/coordination and urban planning specialist
Jeremy Carter, University of Manchester	Current climate and projections - spatial analysis
Tom Downing, GCAP	Lead partner and climate adaptation specialist
Adam Hackett, Aster Group	Sustainability, end user research partner
Alistair Hunt, University of Bath	Economic valuation
Richard Kingston, University of Manchester	Online spatial data mapping
Alex Roberts, Aster Group	Sustainability, end user research partner
Paul Watkiss, PWA/GCAP	Advisor, climate risk and economic valuation



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Daniel Black & Associates (**db+a**) is an urban planning and research consultancy. We specialise in the development and delivery of transformative and catalytic real world services that integrate health, sustainability and resilience across multiple stakeholder interests, public and private, to substantially improve current decision making for long-term quality of life.
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GCAP is a leading climate change adaptation consultancy. GCAP's technical services support fund managers with over \$2 billion in project finance. The Adaptation Academy at the University of Oxford inspires and empowers leadership in a rapidly changing area. Principal areas of expertise include national adaptation strategies and action plans, economics, business resilience, screening for climate risks and adaptation opportunities and custom-made knowledge services.
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