

SESAME

The SESAME project on small businesses:

Understanding flood impacts, evaluating the effects of adaptation and promoting resilience

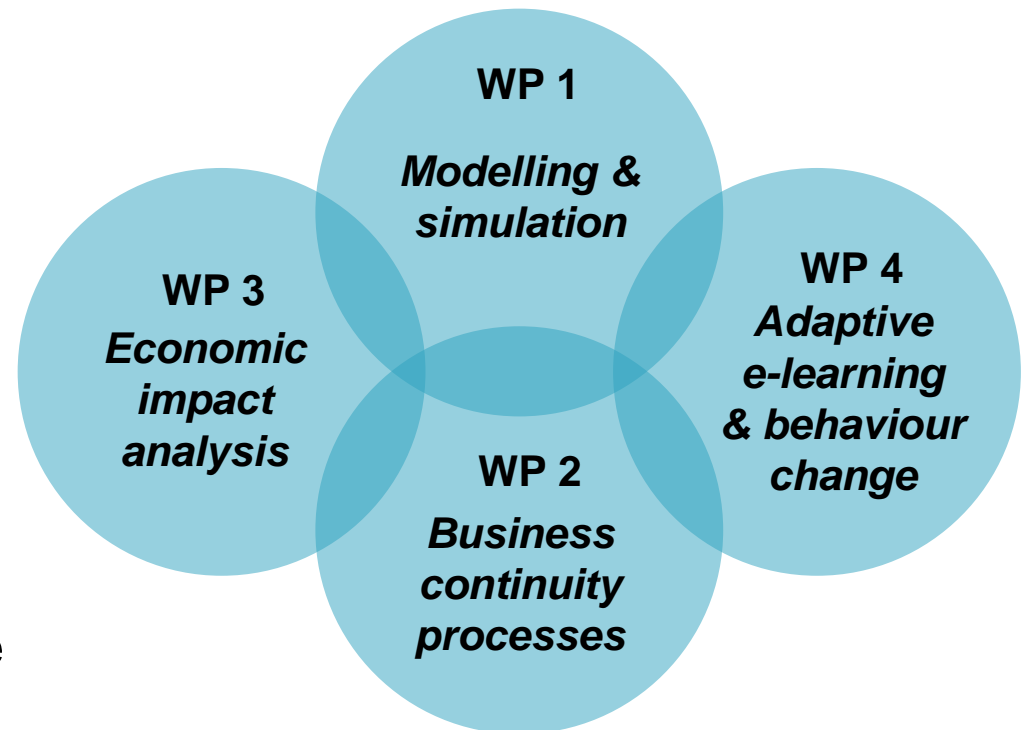
Dates: 03 Dec 2012 – 02 Jun 2016

**Investigators: Graham Coates, Dabo Guan, Tim Harries,
Lindsey McEwen, Martina McGuinness, Nigel Wright**

**Researchers: Sangaralingam Ahilan, Noel Johnson, Chunhui Li,
Amanda Wragg**

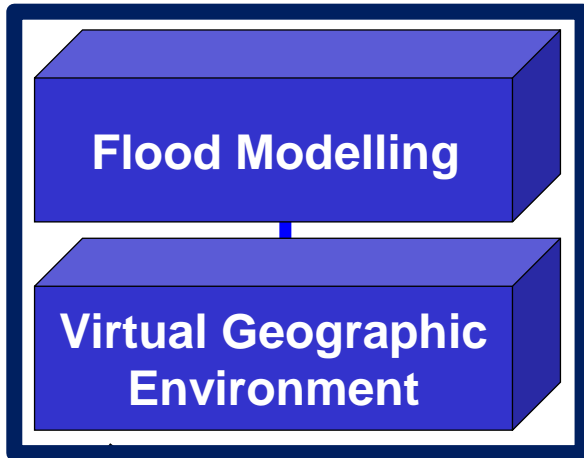
- **Cost of flooding to businesses**
- **Importance of Small and Medium Enterprises (SMEs)**
- **SESAME**

- Aims to evaluate current and potential SME flood response strategies, to identify which behaviour changes or actions will enable them to better prepare for / respond to future floods and strengthen their resilience

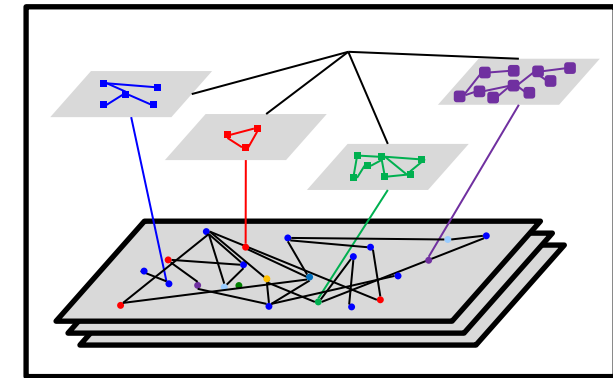
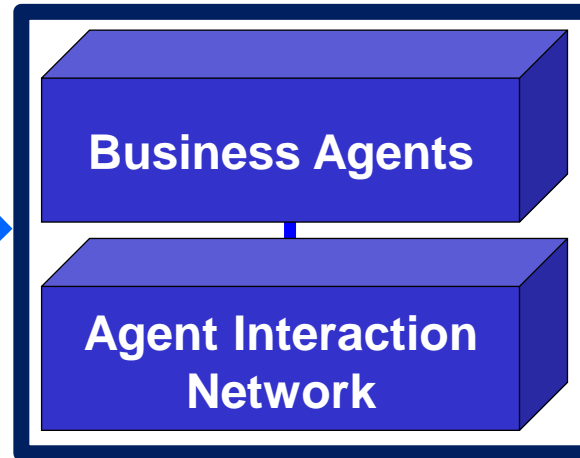


- **Aim:** To develop a modelling and simulation approach to investigate SME behaviour in the face of flood events.

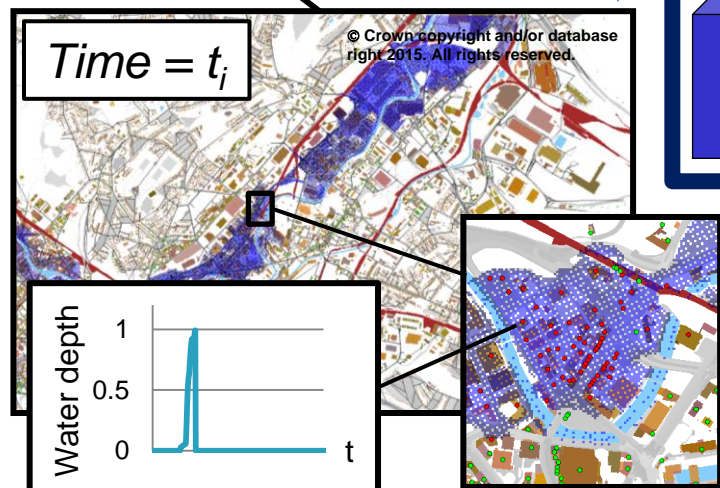
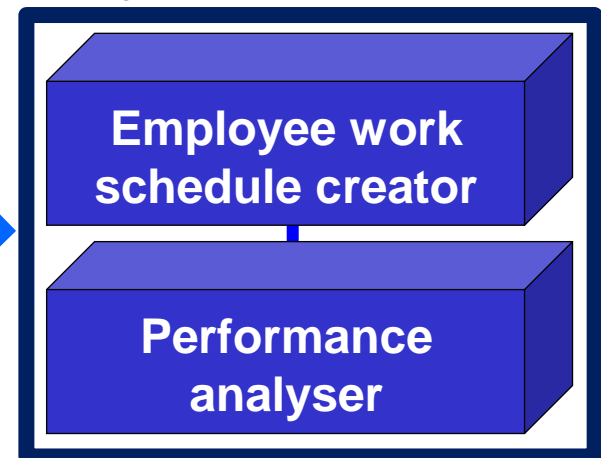
Modelling



Modelling and simulation



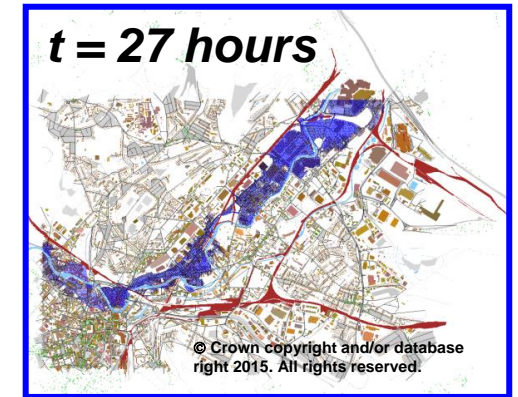
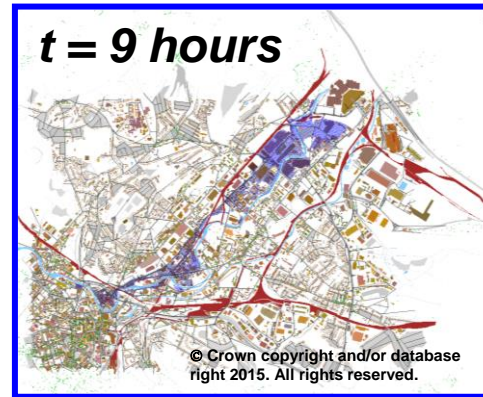
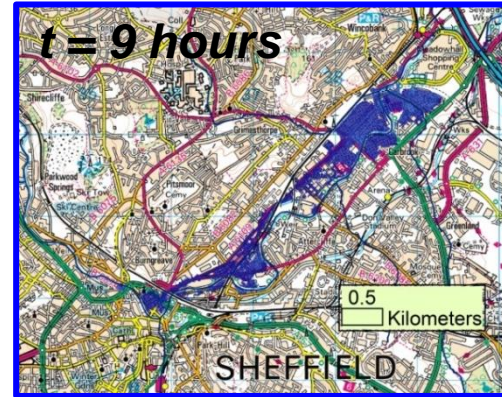
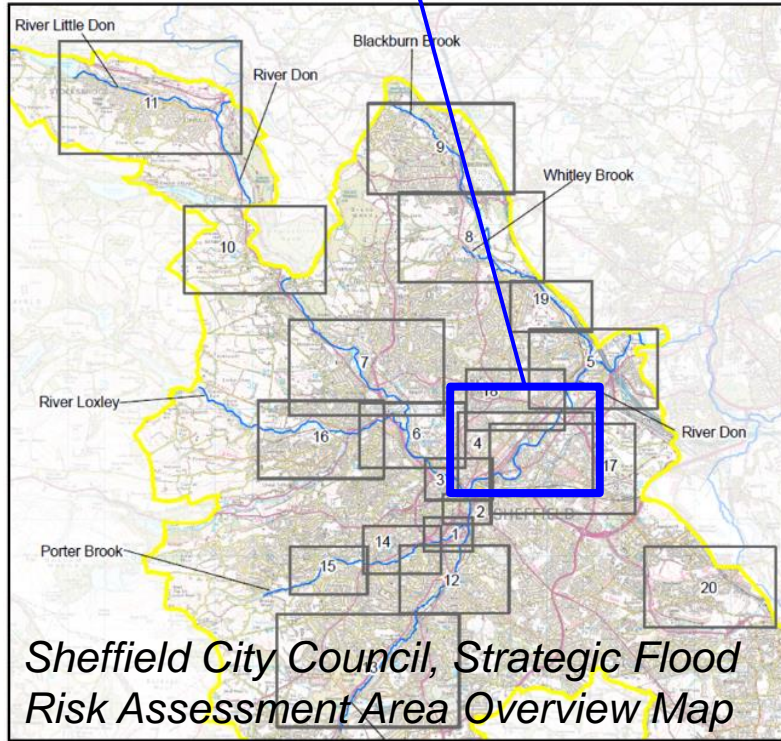
Analysis



■ **Case study**

Sheffield's Lower Don Valley

Flood modelling (1 in 1000 year event)



VGE

SME database

- 5570 organisations
- Manufacturing SMEs

Org ID	Name	Address	Postcode	Industry	Company Type	Region	Country	Year
10000010048177	LLOYDS PHARMACY	CHESTERTON	CS	U991	249			
10000010181576	TECHNOPIRIA	GENERAL COMMERCIAL	ML	U102	-1			
10000010048187	CRECILELL CORNER	GENERAL COMMERCIAL	U994	-1				
10000010046158	PEOPLE UNITED AGAINST CRIME	GENERAL COMMERCIAL	U102	-1				
10000010046410	WALES SMITH	GENERAL COMMERCIAL	U102	-1				
10000010151321	BEERY CONSULTANTS UK LTD	GENERAL COMMERCIAL	U981	-1				
10000010046451	FAMILY PLACEMENT	GENERAL COMMERCIAL	U984	-1				
10000010144656	RESEARCH FLOW TECHNOLOGIES LTD	FACTORY	U981	96				
10000010144693	EYES OPEN CREATIVE LTD	GENERAL COMMERCIAL	U983	-1				
10000010046481	SCIENCEWEST	GENERAL COMMERCIAL	U981	-1				
10000010047027	CASTLE MARKET SERVICES	OFFICE	ML	U992	203			
10000010011282	BROOKH LTD	GENERAL COMMERCIAL	U102	-1				
10000010011521	ROCKET SCIENCE SOLUTIONS LTD	GENERAL COMMERCIAL	U102	-1				
10000010012921	AVIVA UK	GENERAL COMMERCIAL	U982	-1				
10000010738411	BANK PARK	PO BOX	U982	-1				
10000010738474	T W PUBLICATIONS (SHEFFIELD)	GENERAL COMMERCIAL	U982	-1				
100000100115482	SUPREME BEING	GENERAL COMMERCIAL	U981	-1				
10000010049844	ISPECT HEALTH UK LTD	GENERAL COMMERCIAL	CS	U991	249			
100000100115449	SHEFFIELD ROYAL SOCIETY FOR THE BLIND	GENERAL COMMERCIAL	U984	-1				
100000100115516	KEIF FIBRE	GENERAL COMMERCIAL	U981	96				
100000100115489	A FINCH LTD	GENERAL COMMERCIAL	U981	96				
100000100115489	THE ENGLISH SHAVING CO	GENERAL COMMERCIAL	ML	U992	289			
100000100115313	BOWS GARAGE	GENERAL COMMERCIAL	CGL	U991	289			
100000100115354	SHEFFIELD CITY COUNCIL	LOCAL GOVERNMENT OFFICE	ML	U992	289			
100000100115382	HODGSON & OLDFIELD	GENERAL COMMERCIAL	U982	-1				
100000100115579	Y J C & PAINT MERCHANTS	GENERAL COMMERCIAL	U981	249				
100000100115549	ADDECO UK LTD	EMPLOYMENT AGENCY	ML	U992	203			
10000010738620	K & D SHARPLEY LTD	SHIPPING	CS	U991	249			
100000100115538	UK BOOBANK LTD	GENERAL COMMERCIAL	U981	203				
10000100115557	A & S SHARPLEY LTD	GENERAL COMMERCIAL	U981	203				
100000100115514	KERIX GLOBAL SERVICES	OFFICE	ML	U992	203			
100000100115613	A & W HODGSON LTD	GENERAL COMMERCIAL	U981	-1				
100000100115610	THE HOSPITAL GROUP	GENERAL COMMERCIAL	U981	-1				
10000010738624	COLLECTIVE DEVELOPMENTS LTD	GENERAL COMMERCIAL	U102	-1				
100000100115588	UNIVERSAL ALLOYS & METALS LTD	GENERAL COMMERCIAL	U981	-1				
100000100115588	BROWNS	GENERAL COMMERCIAL	U983	-1				

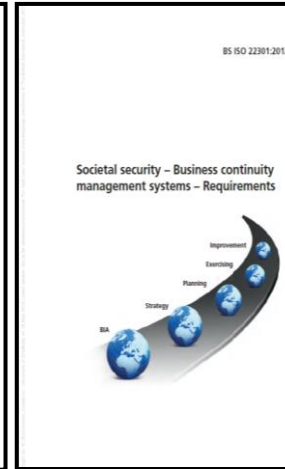
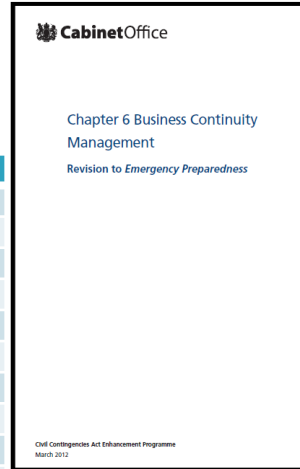
Org ID	Name	Address	Postcode	Industry	Company Type	Region	Country	Year
10000010048177	LLOYDS PHARMACY	CHESTERTON	CS	U991	249			
10000010181576	TECHNOPIRIA	GENERAL COMMERCIAL	ML	U102	-1			
10000010048187	CRECILELL CORNER	GENERAL COMMERCIAL	U994	-1				
10000010046158	PEOPLE UNITED AGAINST CRIME	GENERAL COMMERCIAL	U102	-1				
10000010046410	WALES SMITH	GENERAL COMMERCIAL	U102	-1				
10000010151321	BEERY CONSULTANTS UK LTD	GENERAL COMMERCIAL	U981	-1				
10000010046451	FAMILY PLACEMENT	GENERAL COMMERCIAL	U984	-1				
10000010144656	RESEARCH FLOW TECHNOLOGIES LTD	FACTORY	U981	96				
10000010144693	EYES OPEN CREATIVE LTD	GENERAL COMMERCIAL	U983	-1				
10000010046481	SCIENCEWEST	GENERAL COMMERCIAL	U981	-1				
10000010047027	CASTLE MARKET SERVICES	OFFICE	ML	U992	203			
10000010011282	BROOKH LTD	GENERAL COMMERCIAL	U102	-1				
10000010011521	ROCKET SCIENCE SOLUTIONS LTD	GENERAL COMMERCIAL	U102	-1				
10000010012921	AVIVA UK	GENERAL COMMERCIAL	U982	-1				
10000010738411	BANK PARK	PO BOX	U982	-1				
10000010738474	T W PUBLICATIONS (SHEFFIELD)	GENERAL COMMERCIAL	U982	-1				
100000100115482	SUPREME BEING	GENERAL COMMERCIAL	U981	-1				
10000010049844	ISPECT HEALTH UK LTD	GENERAL COMMERCIAL	CS	U991	249			
100000100115449	SHEFFIELD ROYAL SOCIETY FOR THE BLIND	GENERAL COMMERCIAL	U984	-1				
100000100115516	KEIF FIBRE	GENERAL COMMERCIAL	U981	96				
100000100115489	A FINCH LTD	GENERAL COMMERCIAL	U981	96				
100000100115489	THE ENGLISH SHAVING CO	GENERAL COMMERCIAL	ML	U992	289			
100000100115313	BOWS GARAGE	GENERAL COMMERCIAL	CGL	U991	289			
100000100115354	SHEFFIELD CITY COUNCIL	LOCAL GOVERNMENT OFFICE	ML	U992	289			
100000100115382	HODGSON & OLDFIELD	GENERAL COMMERCIAL	U982	-1				
100000100115579	Y J C & PAINT MERCHANTS	GENERAL COMMERCIAL	U981	249				
100000100115549	ADDECO UK LTD	EMPLOYMENT AGENCY	ML	U992	203			
10000010738620	K & D SHARPLEY LTD	SHIPPING	CS	U991	249			
100000100115538	UK BOOBANK LTD	GENERAL COMMERCIAL	U981	203				
10000100115557	A & S SHARPLEY LTD	GENERAL COMMERCIAL	U981	203				
100000100115514	KERIX GLOBAL SERVICES	OFFICE	ML	U992	203			
100000100115613	A & W HODGSON LTD	GENERAL COMMERCIAL	U981	-1				
100000100115610	THE HOSPITAL GROUP	GENERAL COMMERCIAL	U981	-1				
10000010738624	COLLECTIVE DEVELOPMENTS LTD	GENERAL COMMERCIAL	U102	-1				
100000100115588	UNIVERSAL ALLOYS & METALS LTD	GENERAL COMMERCIAL	U981	-1				
100000100115588	BROWNS	GENERAL COMMERCIAL	U983	-1				

■ Business agents

- Model **existing** and **potential** 'behaviours' and 'attributes'

WP2 & WP4 semi-structured interviews

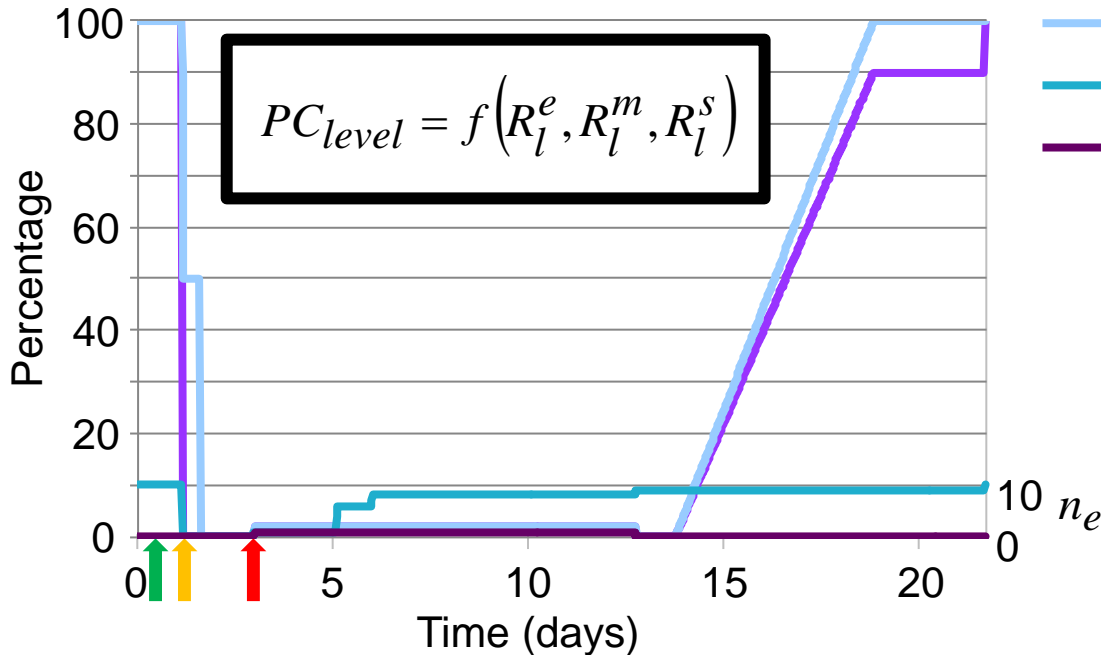
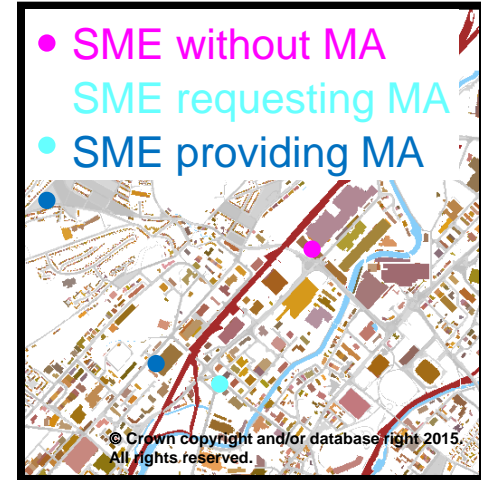
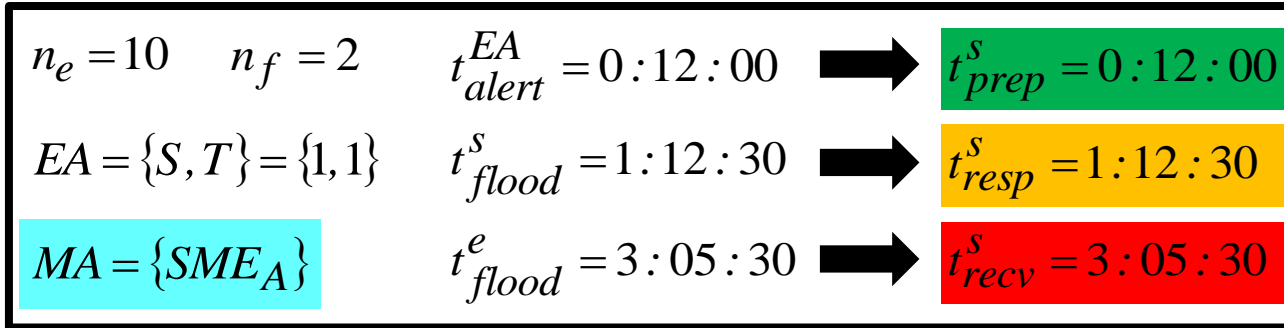
Interview	Sector	ISIC code	Employees	
			2013	2007
1	Engineering	C28	45	
2	Engineering	C28	380	
3	Engineering	C28	24	24
4	Training/support	N78	45	
5	Insurance	K65	30	
6	Printing	C18	16	18
7	Trade/retail	G46/47	7	11
8	Recruitment	N78	10	12
9	Engineering	C28	25	
10	Haulage	H52/53	45	35
11	Engineering	C28	7	8
12	Prop maintenance	N81	98	
13	Manufacturing/Eng	C28	200	100
14	Property Agent	L68	4	4
15	Events	R93	35	
16	Domiciliary care	Q86	106	
17	Engineering	C28	48	
18	Manufacturing/Eng	C28	20	26
19	Engineering	C28	34	16
20	Manufacturing/Eng	C28	14	30
21	Engineering	C28	49	65
22	Engineering	C28	180	146



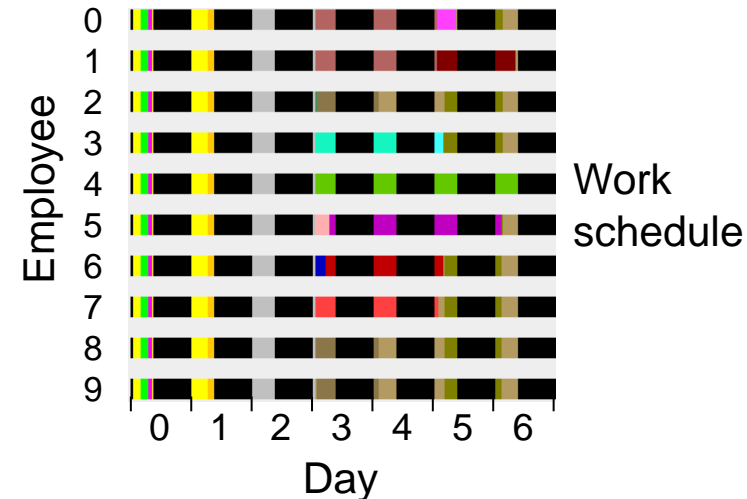
Physical & social changes



Simulation: Example of SME **with** mutual aid



- Production capacity level (%)
- Total available machines (%)
- No. of available employees (own site)
- No. of available employees (aid site)



- **Aims** to gain an understanding of the behaviours of SMEs when responding to flood events based on their experiences
- **Small and medium-sized businesses**
 - Less likely to be prepared for flooding than their larger counterparts
 - Resources: Limited (time-cash-human), fewer to mobilise in response
 - Less bureaucracy, rapid decision-making, flexibility, adaptability

Research design



Case studies



Findings

ISO 22301 BCM used as basis for exploring flood response behaviours in SMEs

Sheffield

Tewkesbury

Limited evidence of formal BC processes/structures

Key question:

What enabled SME resilience?

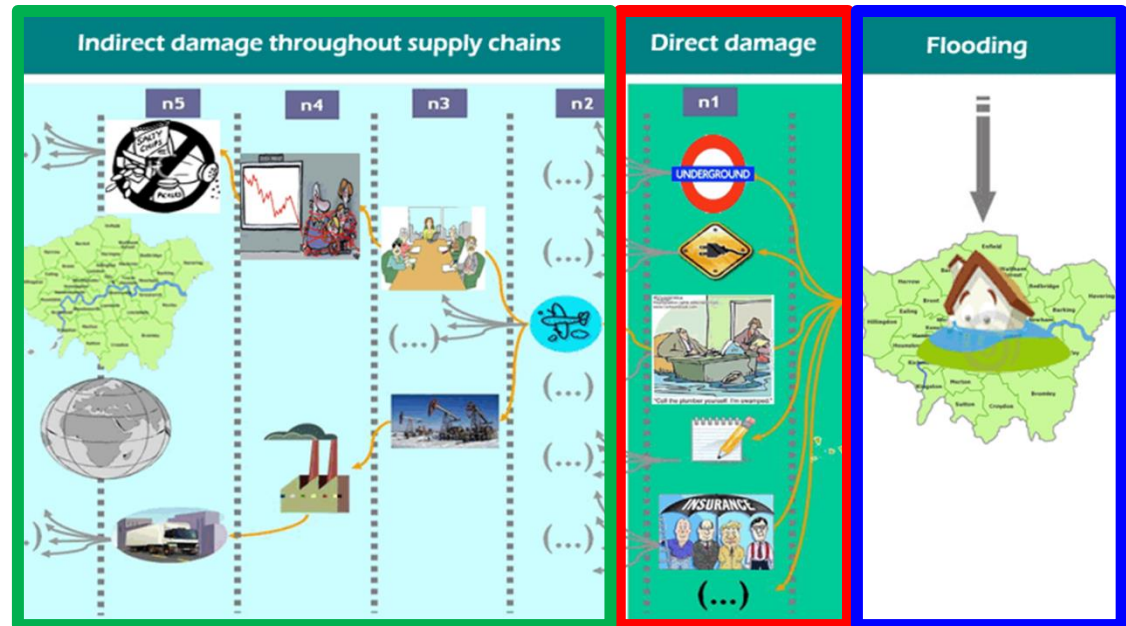
- **Social capital**
- **Path dependence**
- **Bricolage**

- Flooding in one location can impact the whole UK economy.
- Neglecting knock-on costs means we may be ignoring economic benefits of flood risk management interventions.
- WP 3 sets out to gain an improved understanding of the:
 - economic impacts of floods on SMEs,
 - knock-on effects to the wider economy.

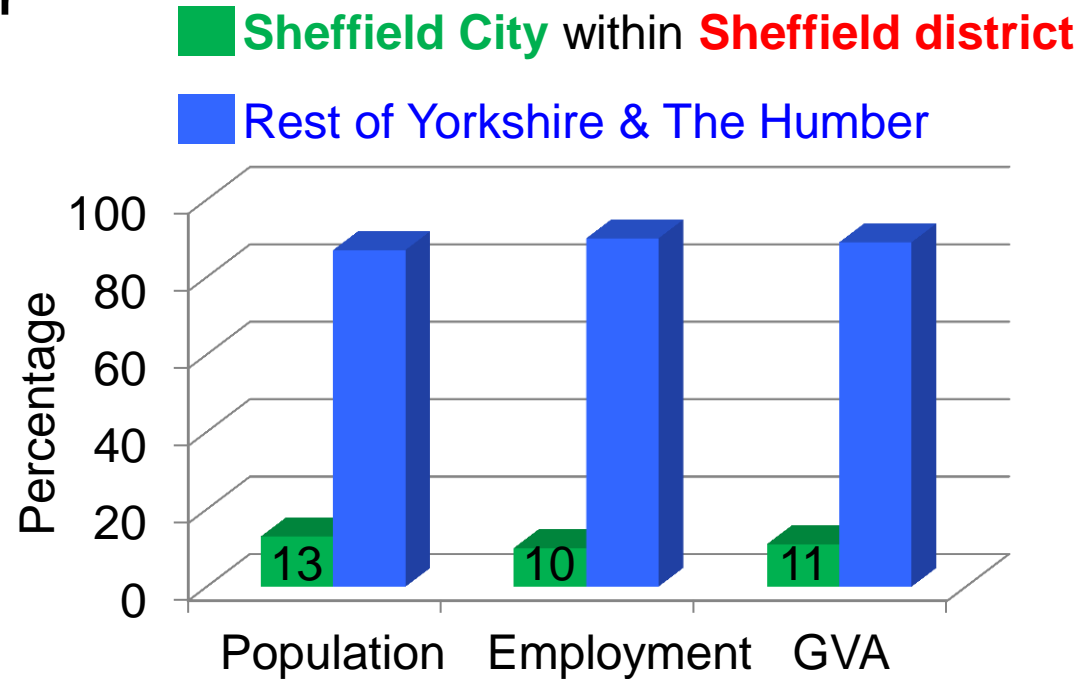
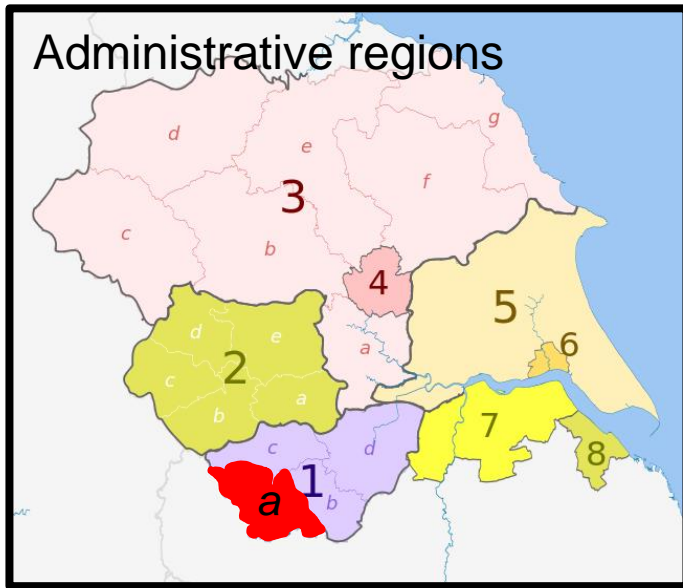


} **Flood footprint**

- **Flood footprint** is a measure of the total **direct** and **indirect** socio-economic impacts caused by a flood to the flooded region and to wider economic systems.



■ Yorkshire and The Humber



■ Sheffield City level 'Input-Output model' analysis of 2007 flood

- **Direct damage** ≈ £282M (≈3.4% of Sheffield City GVA)
- **Indirect damage** ≈ £172M (≈2.1% of Sheffield City GVA)
- **Flood footprint** ≈ £454M (≈5.5% of Sheffield City GVA)
- Approximately 16 months for economic recovery to pre-flood level

- **Some businesses survive floods...**
 - and adapt successfully
- **But many are unprepared or underprepared, with no:**
 - Flood protection
 - Flood / emergency plans
 - Emergency financial reserves
 - Data back-ups
 - Local support networks
 - Strategies for protecting customer relationships
- **Interviews with flooded businesses suggest possible reasons for this**



- ➔ Hands-on
- ➔ Focus on here-and-now
- ➔ Rely on familiar methods

■ Two contrasting case studies

Building centre

- ❑ Owner/manager of a single business
- ❑ Little confidence in experts' advice
- ❑ Adaptation viewed as abstract
- ❑ Incremental protection based on experience of multiple floods



***Owner 'hands-on',
less strategic***

Tyre fitter

- ❑ Owner of several businesses
- ❑ Resources used from other businesses to make 'at-risk' building more resilient
- ❑ Personal relationship with insurance broker
- ❑ Systematic adaptation



***Owner not hands-on,
more strategic role***

- **Digital tool to promote long-term adaptation and resilience**
 - Learning from the literature, interviews with 40 flooded businesses and from our business/stakeholder researcher partners
 - Developing a tool that will:
 - be interactive
 - facilitate business-to-business discussion
 - include numerous “voices” and perspectives
 - include/invite contributions from businesses
 - include films in which business people
 - interview flooding experts
 - tell their own resilience stories