

Collaborative Analysis of Offenders' Personal and Area- based Social Exclusion

A demonstrator project for e-social science

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Sheffield Centre for Geographic
Information and Spatial Analysis



ESRC e-social science

- ⇒ ESRC aiming to harness developments for social science as well as adding to main e-science programme
- ⇒ e-Social Science Demonstrators
 - To produce a substantive research output based on the application and development of grid technologies;
 - To produce training output that can form part of a broader strategy aimed at demonstrating the application of grid technologies to the wider social science;
 - To work collaboratively with computational scientists to build an interdisciplinary community of scientists who can carry forward and develop e-science within the social sciences.

Core questions in our project

- ⇒ Are there measurable relationships between the characteristics of young people with difficulty, and the socio-economic and physical characteristics of the area they live in?
- ⇒ Are government policies addressing the multiple facets of social exclusion, including health, education, employment, and crime prevention, targeted in the areas that need them most, where young offenders live and most crimes are committed?

Research agenda

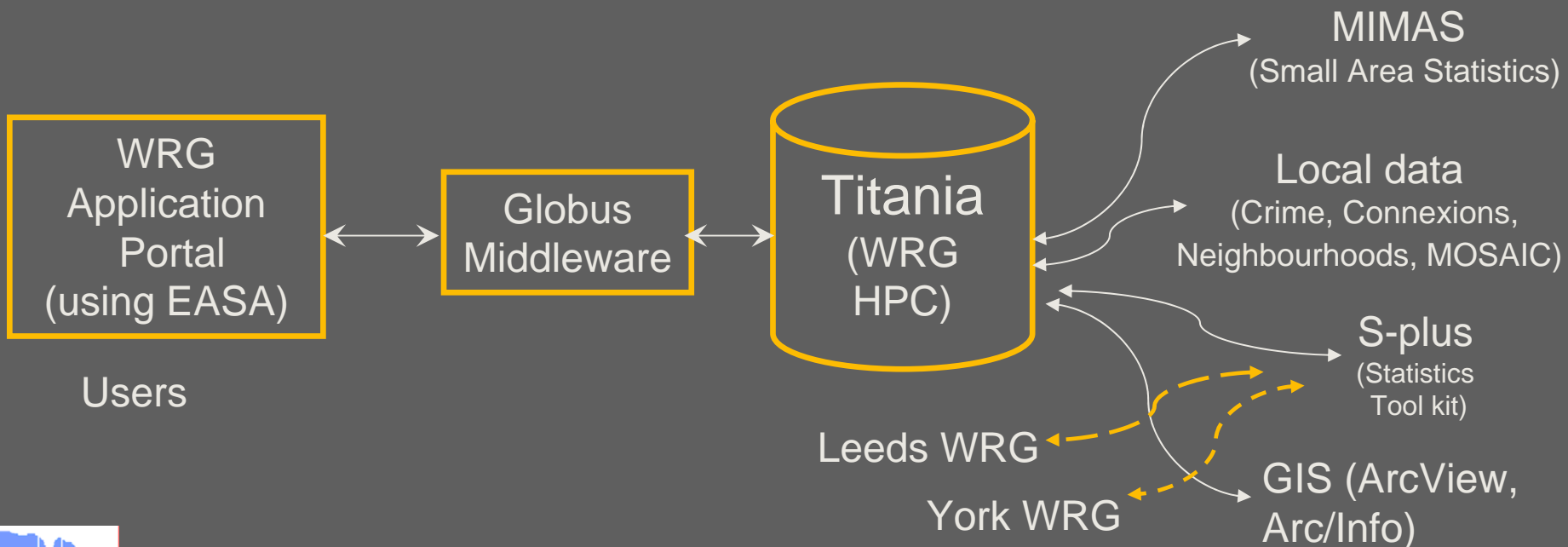
1. Theory: What do we know about the relationship between youth, offending and victimisation, and neighbourhoods?
2. Technology: Cluster of 10 High Performance Grid Suns machines at Sheffield + access to White Rose Grid facilities in Leeds and York
3. A regional level analysis of crime, social context, and young people,
 - Two case studies focusing on street crime in Sheffield, and preventative measures in Barnsley to inform the analysis
 - Modelling, synthesis and policy area analysis.
4. Analysis of the learning process: perceived benefits of Grid before and after
5. Interdisciplinary partnership among academics and between university and practice (4 local authorities, Connexion Service, South Yorkshire Police).

Data Issues

- ⇒ Five years worth of offenders characteristics and addresses, offences, and victims in South Yorkshire (SYP), data for 13-19 year old not in education, employment or training, (Connexions) + data from local authorities at 1 meter or 10 meter resolution
- ⇒ Unique and highly confidential set of data
- ⇒ Problematic ownership and context that need to be understood in establishing relationships between different sets of data
- ⇒ Aim to develop our understanding, and a model based on nationally available data (census) that expresses the relationships in the unique regional data collection.

Grid architecture

- ➔ Using White Rose Grid High performance computing for Distributed access and data processing
- ➔ Open-GIS architecture for data handling platform



EASA - Microsoft Internet Explorer

File Edit View Favorites Tools Help









Address <http://gaps.shef.ac.uk:8080/easa/servlet/stow.Applications?stowId=106422110&mode=user&pg=Applications&pgid=10>

Table View Gallery View

Category Selection

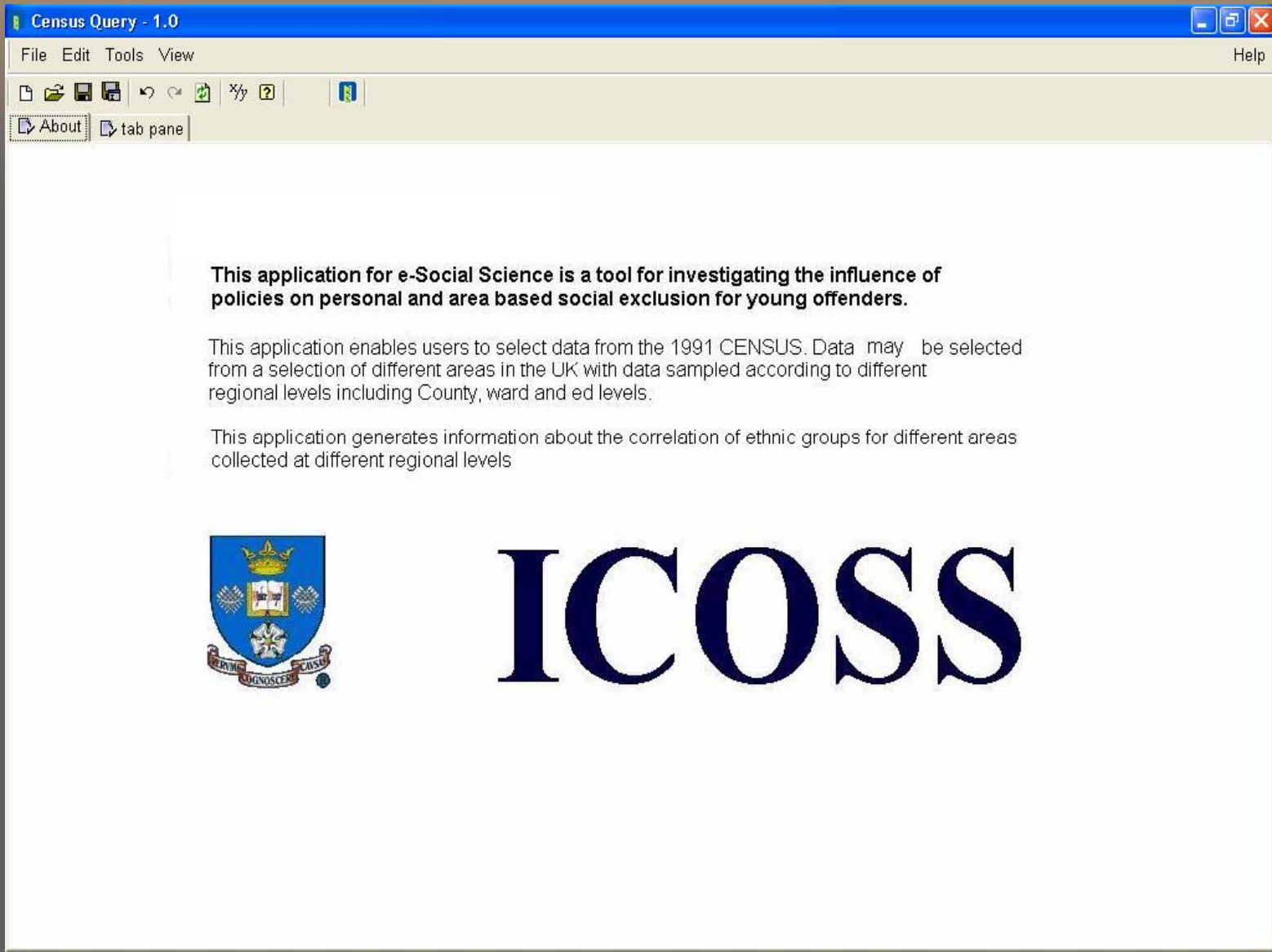
Display applications in category: All Applications

Applications

Image	Title	Category	Description	Information
	Census Query	New Easap		
	DMDecisionTreeApp	training		
	ess Custom Mimas Query	New Easap		
	ess Mimas Query	New Easap		
	Rectangular Plate Loading Analysis	Training	This application computes plate stresses and displacement due to user specified loads.	
	Rectangular Plate Loading Analysis - 2D	Training	This application computes plate stresses and displacement due to user specified loads.	

Pages: 1 2

Done Internet



Census Query - 1.0

File Edit Tools View Help

About tab pane

Jobname:

Output Filename:

Region:

Input System Filename:

Census Code:

Statistics:

Census Query - 1.0

File Edit Tools View

File Edit Tools View

About tab pane

Jobname: mimas-cen91

Output Filename: output


Region: South Yorkshire
West Yorkshire

Input System Filename: County
Ward

Census Code: s060001,s060002,s060003,s0

Statistics: Correlation

Information

 The submission has been added successfully.
Please go to My Results to see your results.

OK

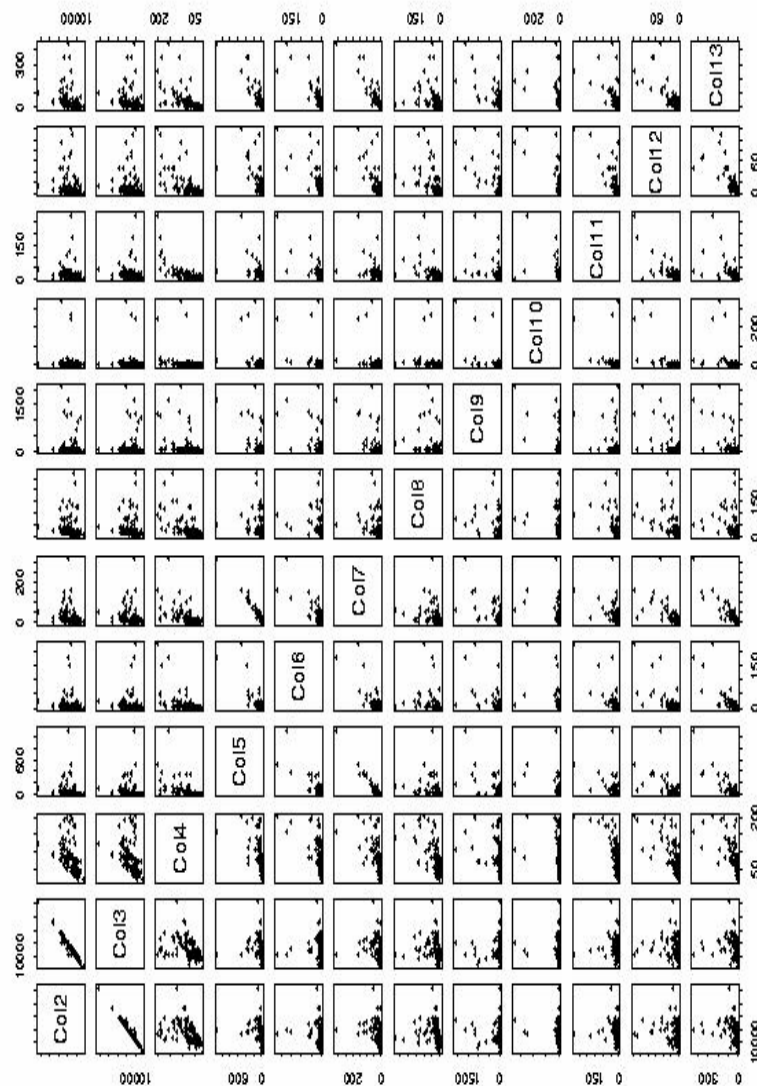
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84	'CGFU'	15161	13200	196	230	47	72	126	1168	33	105	35	145
85	'CGFW'	15943	15629	137	67	4	28	18	70	1	30	8	88
86	'CGFX'	14015	12697	188	387	152	118	37	71	11	123	69	350
87	'CGFY'	15486	15272	84	44	3	42	24	21	7	7	7	59
88	'CGFZ'	15902	15636	75	85	6	50	26	4	9	26	8	52
89	'CGGA'	15683	15235	109	154	17	76	17	28	1	34	28	93
90	'CGGB'	13513	10422	204	526	226	164	97	1184	243	282	119	250
91	'CGGC'	15516	15305	70	51	6	51	18	1	0	13	7	64
92	'CGGD'	22874	22760	91	10	13	2	26	11	6	4	6	36
93	'CGGE'	13613	13501	90	12	10	6	30	9	0	12	5	28
94	'CGGF'	16739	16366	105	93	28	48	30	23	3	43	28	77

Col2	Col3	Col4	Col5
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Mean:13432	Mean:13048	Mean: 82.99	Mean: 64.01
3rd Qu.:15847	3rd Qu.:15305	3rd Qu.:103.80	3rd Qu.: 60.50
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Mean: 14.46	Mean: 27.37	Mean: 37.52	Mean: 140.40
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Col2	Col3	Col4	Col5	Col6	Col7
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Col4 0.46991956	0.379814718	1.0000000	0.49055032	0.551797266	0.5168108
Col5 0.20734258	0.061821688	0.4905503	1.00000000	0.817311084	0.9753568
Col6 0.12413805	-0.009945995	0.5517973	0.81731108	1.000000000	0.7914869
Col7 0.26927723	0.122997942	0.5168108	0.97535677	0.791486856	1.0000000



ess Custom Mimas Query - 4.0

File Edit Tools View

about queryinput_tab Sample queries

jobname

Region

Level

varname

query

Size

ess Mimas Query - 2.0

File Edit Tools View

about queryinput_tab

jobname

Region

Level

Query

Size

ess Custom Mimas Query - 4.0

File Edit Tools View Help

about queryinput_tab Sample queries

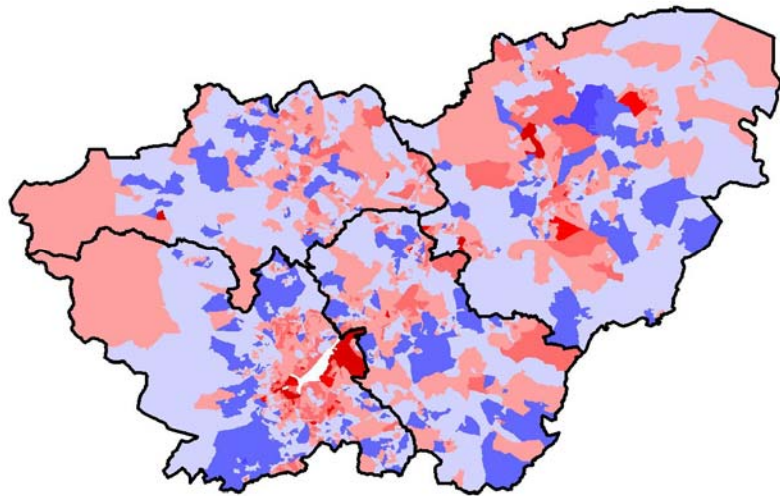
Mimas CENSUS 1991 Query

This application for e-Social Science is a tool for investigating the influence of policies on personal and area based social exclusion for young offenders.

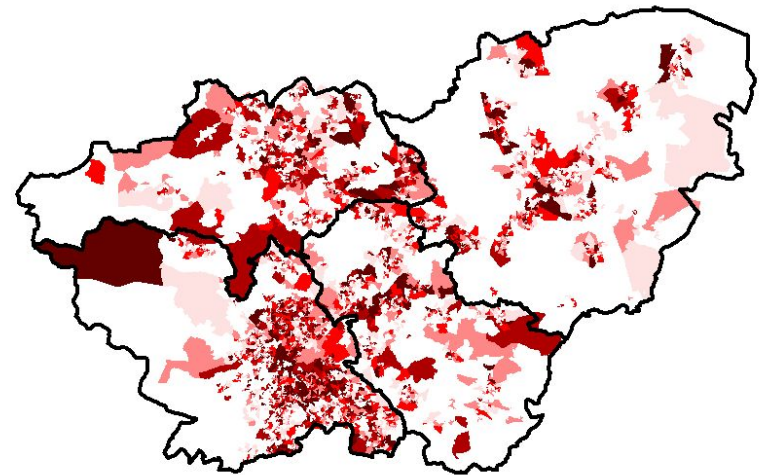
The saspac application is used to query the mimas database. The text below illustrates some of the queries that can be made.

NOCAR = (S200010 / S200001) * 100
 OVERCROW = ((S230003+S230004)/S230001)*100
 NONOWNER = (S200001-S200002-S200003)/S200001 * 100
 UNEMP = (S080078+S080232-S080240-S080241-S080087)
 ECACTIVE = (S080012+S080166-S080174-S080175-S080021)
 UNEMPLOY = UNEMP/ECACTIVE*100
 HOUSEHOL = S200001

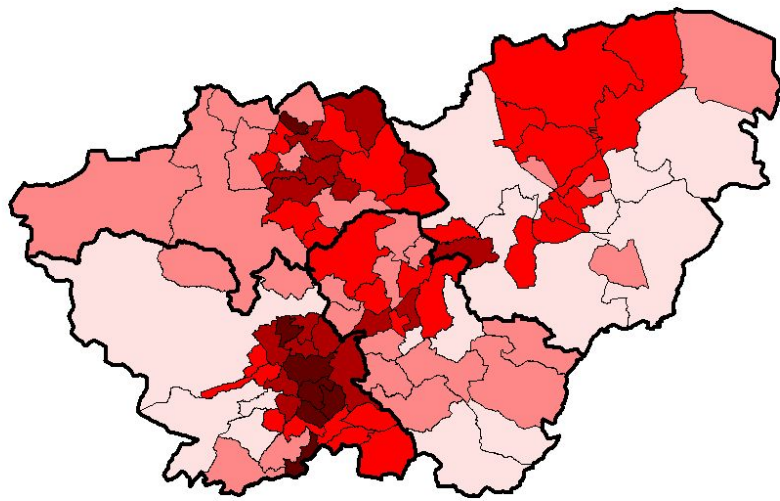




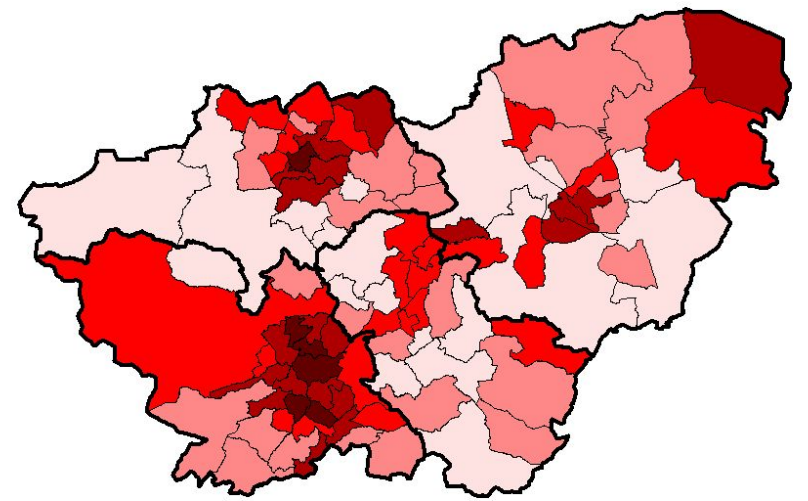
Deprivation - EDs



Neet rate - ED



Neet rate - Ward



crime - Ward

Social Science as a distinct Grid application

- ⇒ The distinctive characteristics of the social sciences - exploring aspects of the social world & engaging with people
- ⇒ Different social science disciplines, different theoretical and methodological approaches
- ⇒ The concept of Social Exclusion in the social sciences - multi-dimensional and dynamic

Developing new practice

- ⇒ Social scientists talking to each other & technologists and social scientists talking to each other
- ⇒ Understanding what each other's data means: theory, methodology, methods, representation, asking (new) research questions
- ⇒ The process of identifying existing and new data-sets, negotiating access to data-sets - ethics and confidentiality
- ⇒ Technological work and social science work - workshops and learning new techniques

Expected outcomes

- ⇒ Better understanding of social exclusion, youth, and offending
- ⇒ Better methods for harnessing grid computing for social science e.g. through known software tools such as S+ and ArcView + bespoke scripting
- ⇒ Interoperability framework for data sharing in the region
- ⇒ Better understanding of the social construction of the grid across academic and practitioners communities
- ⇒ Training material.

Conclusions

- ⇒ User driven application
- ⇒ Process of learning and negotiating access to technology and data in a controlled and secure environment (from paper protocols to secure portals)
- ⇒ Opening up new opportunities for social scientist to understand highly complex interactions and relationships in terms of processing power but also collaborative working as no single agency or discipline can address such complexity alone

Way forward

- ⇒ Grid offers opportunities to share not just documents and data but sharing workflows
- ⇒ We as users taking ownership of the technology, data, and collective analysis, documenting the process, and sharing it with others