APPENDIX A : 1998 Survey of Proprietary Risk Assessment Systems

In its 1997 paper, the working party reported upon a survey of proprietary risk assessment systems designed for use by UK household insurers and marketed by five different systems vendors. The purpose of this survey was to obtain information regarding the scope and nature of the data underlying these systems and, in particular, the level of geographic detail to which results obtained from the systems might prove reliable for premium rating purposes. The survey has now been updated to allow for any changes to the systems that have been made since the earlier paper.

This survey is in no way intended to assist in any decisions concerning which system or systems might be appropriate for use by any individual insurance company. Pricing actuaries, and others, considering purchasing a proprietary risk assessment system should satisfy themselves of its specification by contacting the system vendor.

It should also be noted that:

- The information presented in the following tables has been provided, in its entirety, by the system vendors. No attempt has been made by the working party to validate the information obtained.

- Different vendors have chosen to place different interpretations on some of the questions posed by the working party. In particular, some responses describe the form of the model fitted to the underlying data, rather than the data itself. Where appropriate, the responses provided by the vendors have been edited to ensure consistency of response to a particular question.

- The survey results are incomplete in that one system vendor did not feel able to reply on the grounds that doing so would involve divulging commercially sensitive information. Additionally, some vendors were not able to respond in respect of every element of their system. In particular, VENTECH has requested that it be made clear that data for both residential and commercial property, together with building type, are available. In addition, the potential impact of cold weather on the subsidence risk is allowed for in their system. VENTECH also offer a windstorm model, although details of this were not provided.

Peril : Catastrophic Flood (1 of 2)	Aon Re				CARtograph
Data Description					
Data title; Series number Geographic extent	Panorama / Profile UK	Coastal Surges UK	Flair UK	Datapoint UK	Flood Loss Probability Database
Currency of Data					
Period of data collection Date of publication of data Expected Frequency of Update	1977-1997 6 months	1994-1995 Annually	1973-1995 Annually		Three years March 1996 Annual
Resolution					
Resolution of data	1:50,000 entire UK; 1:10,000 in appropriate coastal areas	20Km		Unit Postcode	Sector postcode / Full postcode
Measurement Tolerances	m - 2 m			10m	
Number of data collection points					1.6 million
Source of data					
Original source Original intended use	Ordnance Survey Cartography	Proudmans Oceanographic Library	Middlesex University	Ordnance Survey	Sea Flood Peril Datamap; Sea Defence Survey; Satellite Imaging; Thames Barrier performance data; CARtograph damage databank; Independent research. Catastrophe modelling
Catastrophes					
How do you assess the severity of different catastrophe scenarios How do you assess the frequency of these scenarios	Historical Ongoing project (Historical)				Model uses a weighted sample of 100 probabilistic events. Predicted losses for deterministic event compared with industry losses for a specific portfolio 9 classes of events, ranging from 10-10000 year return periods used to assess annual probability of each event.
Generalisation					
Has data been aggregated, simplified, smoothed, enhanced,					

Peril : Catastrophic Flood (2 of 2)	EQECAT	VENTECH	
Data Description			
Data title; Series number Geographic extent	UK Flood; Version 3.0 UK East Coast	Alluvial Soil: National Soil Map	Digital Terrain Model
Currency of Data			
Period of data collection Date of publication of data Expected Frequency of Update	1991-1996 1994 Annually	1945-1985 Not published N/A	 N/A
Resolution			
Resolution of data	Below postcode sector	100m; 1 km and 5 km	100m; 500m
Measurement Tolerances		Details available	3m
Number of data collection points		approx. 1 million	unknown
Source of data			
Original source Original intended use	Includes NRA, Halcrow Accumulation assessment and rating	Soil Survey and Land Research Centre; Macaulay Land Use Research Institute National Soil Database	Ordnance Survey National Mapping
Catastrophes			
How do you assess the severity of different catastrophe scenarios	Probabilistic model incorporating uncertainty in hazard and vulnerability	Identify all alluvial soils, giving footprint of areas that have been subjected to flooding at some stage in the last 5,000 years. Visually assessed using digital terrain model to gauge severity of flood.	N/A
How do you assess the frequency of these scenarios	Probabilistic model up to 1,000 years return period, Monte Carlo sampling	N/A	N/A
Generalisation			
Has data been aggregated, simplified, smoothed, enhanced, and if so by what methods	Hazard and vulnerability data represented as probability distributions with mean value and standard deviation.	No	Details available

Peril : Subsidence (1 of 2)	Aon Re				CARtograph
Data Description					
Data title; Series number Geographic extent	Subsidence Claims Data	Soil moisture deficit - Morecs; Version 2; UK	Digital postcode boundaries	British Geological Survey (BGS)	Subsidence Peril Datamap Version 3; UK
Currency of Data					
Period of data collection Date of publication of data Expected Frequency of Update	1994-1996 1994-1996 Annual	1967-1997 Continuous Weekly	Annual Annual Quarterly		Three years Feb. 95; Upgrade 96 Annual
Resolution					
Resolution of data	Postcode unit	40 km Squares	Aggregated from postcode unit	1:50,000 solid/drift maps for identification of soil types	Full postcode / sector postcode
Measurement Tolerances					
Number of data collection points	32,000 claims	190 squares			1.6 million
Source of data					
Original source Original intended use	Loss Adjusters Administration of subsidence claims	UK Met Office Environmental resource management	Geoplan Ordnance Survey Mail Delivery	House age database and house type - both from postcode unit level	Claims data; drought data; Geotechnical data; CARtograph building stock; Independent research Risk Pricing
Catastrophes					
How do you assess the severity of different catastrophe scenarios	Historical experience and climatic data				
Generalisation					
Has data been aggregated, simplified, smoothed, enhanced, and if so by what methods		Enhanced by interpolation to postcode district / sector level			

Peril : Subsidence (2 of 2)	VENTECH		
Data Description			
Data title; Series number Geographic extent	National Soil Map	Soil Shrink/Swell map	Potential Soil Moisture Deficit Map
Currency of Data			
Period of data collection Date of publication of data Expected Frequency of Update	1945-1985 1985 (small percentage - no longer available)	1965-1986 Methodology published	1961-1976 Not published
Resolution			
Resolution of data	100m 1km and 5km	100m 1km and 5km	5km
Measurement Tolerances	Details available	Details available	Details available
Number of data collection points	> 1 million	> 1 million	> 1000
Source of data			
Original source Original intended use	Soil Survey and Land Research Centre (SSLRC); Macaulay Land Use Research Institute National Soil Database	SSLRC Comprehensive measurement for the assessment of soil movement	Meteorological Office Comprehensive measurement for the assessment of soil movement
Catastrophes			
How do you assess the severity of different catastrophe scenarios How do you assess the frequency of these scenarios	Soil type is classified; capacity of soil type to shrink/swell assessed and combined with potential soil moisture deficit. Risk classification is given as one of nine categories, ranging from “extremely high” to “extremely low”. Assessment for sand, silt, peat and soft soils are carried out to provide a composite subsidence risk assessment. A range of assessments available for “standard”; 1 in 3; 1 in 6; 1 in 15; 1 in 45; 1 in 150		
Generalisation			
Has data been aggregated, simplified, smoothed, enhanced, and if so by what	No	No	Observations from field met. stations have been interpolated

methods			to create a surface.

Peril : Windstorm (1 of 2)	CARtograph		EQECAT
Data Description			
Data title; Series number	Windstorm peril data map	Windstorm loss probability database	UKWind Version 3.0
Geographic extent	(Risk Pricing) Version 3 UK	(Catastrophe Modelling) UK	UK including N Ireland
Currency of Data			
Period of data collection	Three years	Two years	1991-1996
Date of publication of data	Feb. 95; Upgrade 96	March 1996	1994
Expected Frequency of Update	Annual	Annual	Annually
Resolution			
Resolution of data	Full postcode/ Postal sector	Full postcode/ Postal sector	To be advised
Number of data collection points	1.6m		1.6m
Source of data			
Original source	Wind hazard data; Terrain data from OS; CARtograph building stock profile; Independent research	Wind hazard data; Terrain data from OS; CARtograph building stock profile; Researched Historical storms from 1509-1997; Independent research	Various
Original intended use	Risk Pricing	Catastrophe modelling	Accumulation assessment and rating for insurance and reinsurance model versions
Catastrophes			
How do you assess the severity of different catastrophe scenarios		Model uses a weighted sample of 500 probabilistic windstorms. Predicted losses for deterministic event compared with industry losses for a specific portfolio	Probabilistic model incorporating uncertainty in hazard and vulnerability
How do you assess the frequency of these scenarios		Inter-arrival time distribution of storms modelled by negative binomial and Poisson probability distribution	Probabilistic model up to 1,000 year return period; sample distributions in Monte Carlo fashion
Generalisation			
Has data been aggregated, simplified, smoothed, enhanced,			Both hazard and vulnerability data are represented as probability distributions

and if so by what methods			with mean value and standard deviation.

Peril : Windstorm (2 of 2)	Aon Re	
Data Description		
Data title; Series number	Wind Parametres	Global Surface Summary of the day
Geographic extent	UK	UK
Currency of Data		
Period of data collection	1973 - 1998	1973 - 1998
Date of publication of data	Monthly	Monthly
Expected Frequency of Update		Monthly
Resolution		
Resolution of data	Weather Stations interpolated to postcode district level	Weather Stations interpolated to postcode district level
Number of data collection points	130	200 - 300
Source of data		
Original source	UK Met Office	World Met Office
Original intended use	Weather Monitoring	Climate Forecasting
Other known uses	None	None
Catastrophes		
How do you assess the severity of different catastrophe scenarios	Historical	
How do you assess the frequency of these scenarios	Historical	
Generalisation		
Has data been aggregated, simplified, smoothed, enhanced, and if so by what methods	Interpolated to postcode district level	

Peril : Freeze	Aon Re	CARtograph	EQECAT
Data Description			
Data title	Global surface summary of the day	Freeze Peril Data Map	UK Freeze
Series number (if appropriate)		3.00	Version 1.0
Geographic extent of data	World-wide	UK	UK
Currency of Data			
Period of data collection	1973-97	3 years	1993
Date of publication of data	Ongoing	Feb. 95; Updated 96	1997
Frequency with which you would expect to update data	Monthly	Annual	Yearly
Resolution			
Resolution of data		Postcode sector	TO BE ADVISED
Number of data collection points (if appropriate)	200 - 300	9,600	
Source of data			
Original source	World Meteorological Organisation	CARtograph building stock profile; Weather and Climate Research from published sources; Claims data	
Original intended use	Monitoring Climate Change	Risk Pricing	
Catastrophes			
How do you assess the severity of different catastrophe scenarios	Use correlation of degree-days with number of claims to estimate total loss for a given scenario		
How do you assess the frequency of these scenarios	Analyse frequency of severe winters in each part of the country		
Generalisation			
Has data been aggregated, simplified, smoothed, enhanced, and if so by what methods	Calculate 7-day degree-day totals for each station and interpolated to obtain postcode district summaries		

Peril : Theft	Aon Re		EQECAT	CARtograph
Data Description				
Data title / Series number	Police Statistics	Census Data	UK Theft Version 2.0	Theft Peril Datamap 3.0
Geographic extent of data	UK	UK	England, Scotland, Wales, Northern Ireland	UK
Currency of Data				
Period of data collection	1997	1991	Three years	Three Years
Date of publication of data			1998	Feb. 1995; Upgrade 96
Frequency with which you would expect to update data	Annually	10 years (unemployment - monthly)	Yearly	Annual
Resolution				
Resolution of data	Range from beat level to whole police force	Postcode sector	Source data (crime) and ; Insurance claims:- full postcode	Full postcode / Sector postcode
Measurement tolerances				
Number of data collection points (if appropriate)			All major conurbations	1.6 million
Source of data				
Original source	Home office; Scottish office; Police forces; N Ireland Office	CAPSCAN	Crime data - police constabularies; Claims - insurance companies; Penetration of contents insurance - surveys; Housing and demographic data - various.	British crime survey; Home office crime statistics; Police crime statistics; Insurance loss aggregates; Claims; CARtograph building stock profile; Census
Original intended use	Crime monitoring Police performance	Varied		
Generalisation				
Has data been aggregated, simplified, smoothed, enhanced, and if so by what methods	Model relating official crime statistics to socio-economic variables built. Enables estimate of burglary rate at sector level. Police divisional/section boundaries were digitised for use within a GIS system.		Statistical techniques used to produce a model based on the full picture of theft in a postcode	

Peril : Earthquake	CARtograph
Data Description	
Data title	Earthquake Peril Datamap
Series number (if appropriate)	3.00
Geographic extent of data	UK
Currency of Data	
Period of data collection	Three Years
Date of publication of data	Feb. 1995; Upgrade 96
Frequency with which you would expect to update data	Annual
Resolution	
Resolution of data	Postcode sector
Measurement tolerances	
Number of data collection points (if appropriate)	9,600
Source of data	
Original source	CARtograph building stock Profile; DOE study data; CARtograph research
Original intended use	Risk Pricing
Other known uses	

Peril : Fluvial Flood	Aon Re		CARtograph
Data Description			
Data title	Flood risk map for	Datapoint	Flood Peril Datamap (Includes coastal)
Geographic extent of data	England and Wales	UK	UK
Series number (if appropriate)	Report number 130		3.0
Currency of Data			
Period of data collection	Rainfall data (1941-1970)		Three years
Date of publication of data	Oct. 96/ Mar. 97		Feb. 95; Upgrade 96
Expected frequency of Update			Annual
Resolution			
Resolution of data	50m square grid		Full postcode / sector postcode
Number of data collection points			
Source of data			
Original source	Institute of Hydrology	Ordnance Survey	Environmental agency; Claims data; CARtograph building stock profile; Ordnance Survey; Independent research
Original intended use	Analysis of how much land in built up area is at risk to river flooding		Risk Pricing
Catastrophes			
How do you assess the severity of different catastrophe scenarios	Data supplied for 1 in 100 year return period. Data point used to assess depth of flooding in each postcode unit.		
Generalisation			
Has data been aggregated, simplified, smoothed, enhanced, and if so by what methods	Overlay property location (data point) with flood map to identify property at risk		

Peril : Fire	EQECAT
Data Description	
Data title	Residata Fire
Series number (if appropriate)	Version 1.0
Geographic extent of data	UK
Currency of Data	
Period of data collection	1996
Date of publication of data	
Frequency with which you would expect to update data	Yearly
Resolution	
Resolution of data	Postcode sector
Measurement tolerances	
Number of data collection points (if appropriate)	20,000 fire claims Database of smokers (full postcode)
Source of data	
Original source	Insurance companies, surveys, fire station incident data
Original intended use	
Other known uses	
Catastrophes	
How do you assess the severity of different catastrophe scenarios	
How do you assess the frequency of these scenarios	
Generalisation	
Has data been aggregated, simplified, smoothed, enhanced, and if so by what methods	Model estimates likelihood of fire claim based on incident data and estimate of penetration of smokers

Data : Competitor Information	EQECAT
Data Description	
Data title	Estimate of net rate by postcode sector
Series number (if appropriate)	Version 2.0
Geographic extent of data	UK
Currency of Data	
Period of data collection	Monthly
Date of publication of data	1997
Frequency with which you would expect to update data	Quarterly
Resolution	
Resolution of data	Postcode Sector
Measurement tolerances	
Number of data collection points (if appropriate)	
Source of data	
Original source	"Average" profile in each postcode sector derived from demographics run through "What If?" product
Original intended use	Database
Other known uses	

Data : Geodemographic	Aon Re	EQECAT
Data Description		
Data title	Mosaic	Residata Lifetype
Series number (if appropriate)		Version 1.0
Geographic extent of data	UK	UK Northern Ireland
Currency of Data		
Period of data collection	Continuous since 1980	
Date of publication of data		1997
Frequency with which you would expect to update data	Annually	Yearly
Resolution		
Resolution of data	Postcode Unit	Postcode unit (some census data at ED level)
Measurement tolerances		
Number of data collection points (if appropriate)	1.7 million	
Source of data		
Original source	CCN	Census; Property value by postcode; Residata building stock; county court judgements; directors; commercial data; spatial data
Original intended use	Classification of each postcode	

Data: Building Stock	EQECAT	CARtograph
Data Description		
Data title	Residata Housetypes	Residential Building Stock Profile
Series number (if appropriate)	Version 2.0	3.0
Geographic extent of data	UK Northern Ireland	UK
Currency of Data		
Period of data collection	Three years	Five years
Date of publication of data	1997	Feb. 1995; Upgrade 1996
Frequency with which you would expect to update data	Yearly	Annual
Resolution		
Resolution of data	Full postcode (1.6 million records)	Full postcode / Sector postcode
Number of data collection points (if appropriate)	14 million records	1.6 million
Source of data		
Original source	Building surveyors reports, various marketing surveys (for checking)	CARtograph research; Census; Historical mapping; Aerial photography; Local authority land use/Development plans; Building costs RICS; Independent Research and Survey.
Original intended use	Analysis of local authority building stock	Buildings Distribution; Risk pricing in CARtograph
Generalisation		
Has data been aggregated, simplified, smoothed, enhanced, and if so by what methods	A distribution for each postcode was produced and the dominant housing type determined.	