

BRITISH GEOLOGICAL SURVEY

REPORT OR/11/029

Bulletin of British Earthquakes 2010

D D Galloway (Editor)

Contributors: J Bukits and G D Ford



The National Grid and other Ordnance Survey data are used with the permission of the Controller of Her Majesty's Stationery Office. Ordnance Survey licence number 100017897/2005

Bibliographical reference

GALLOWAY, D D 2011. Bulletin of British Earthquakes 2010. *British Geological Survey Internal Report, OR/11/029*

© NERC 2011

Edinburgh British Geological Survey 2011

BRITISH GEOLOGICAL SURVEY

The full range of Survey publications is available from the BGS Sales Desks at Nottingham and Edinburgh; see contact details below or shop online at www.thebgs.co.uk

The London Information Office maintains a reference collection of BGS publications including maps for consultation.

The Survey publishes an annual catalogue of its maps and other publications; this catalogue is available from any of the BGS Sales Desks.

The British Geological Survey carries out the geological survey of Great Britain and Northern Ireland (the latter as an agency service for the government of Northern Ireland), and of the surrounding continental shelf, as well as its basic research projects. It also undertakes programmes of British technical aid in geology in developing countries as arranged by the Department for International Development and other agencies.

The British Geological Survey is a component body of the Natural Environment Research Council.

Keyworth, Nottingham NG12 5GG

☎ 0115-936 3241 Fax 0115-936 3488
e-mail: sales@bgs.ac.uk
www.bgs.ac.uk
Shop online at: www.thebgs.co.uk

Murchison House, West Mains Road, Edinburgh EH9 3LA

☎ 0131-667 1000 Fax 0131-668 2683
e-mail: scotsales@bgs.ac.uk

London Information Office at the Natural History Museum (Earth Galleries), Exhibition Road, South Kensington, London SW7 2DE

☎ 020-7589 4090 Fax 020-7584 8270
☎ 020-7942 5344/45 email: bgs london@bgs.ac.uk

Forde House, Park Five Business Centre, Harrier Way, Sowton, Exeter, Devon EX2 7HU

☎ 01392-445271 Fax 01392-445371

Geological Survey of Northern Ireland, 20 College Gardens, Belfast BT9 6BS

☎ 028-9066 6595 Fax 028-9066 2835

Maclea Building, Crowmarsh Gifford, Wallingford, Oxfordshire OX10 8BB

☎ 01491-838800 Fax 01491-692345

Parent Body

Natural Environment Research Council, Polaris House, North Star Avenue, Swindon, Wiltshire SN2 1EU

☎ 01793-411500 Fax 01793-411501
www.nerc.ac.uk

Contents

Contents.....	1
1 Introduction.....	3
2 The BGS UK Seismograph Network.....	3
3 Earthquake Parameters and Their Errors.....	4
Hypocentre Location.....	4
Magnitude.....	4
Intensity.....	5
4 Summary of 2010 Seismicity.....	5
Acknowledgements.....	8
References.....	9
Figures.....	10
Tables.....	21
Appendix 1 Key to Bulletin Encoding.....	43
Appendix 2 Key to Phase Data Encoding.....	44
Appendix 3 The European Macroseismic Scale (EMS 98).....	45

FIGURES

Figure 1. Epicentre map of earthquakes in 2010 as listed in Table 1.

Figure 2. Seismograph stations operated by BGS during 2010 (red) along with station operated by other agencies in the British Isles and used for automatic detection (blue). The contours show earthquake detection capability in terms of Richter local magnitude (ML) calculated for average background noise conditions (4nm) where the detection criterion is that the signal has to exceed 4nm at 10Hz at 4 stations.

Figure 3. Epicentres of earthquakes with magnitudes of 2.5 ML and above, in the period 1979 to 2010.

Figure 4. Epicentres of earthquakes with magnitudes of 3.5 ML and above, in the period 1970 to 2010.

Figure 5. Seismograms of the ground displacement from the Coniston, Cumbria earthquake, 21 December 2010, recorded by BGS seismograph stations.

Figure 6. Focal Mechanism of the Coniston earthquake, 21 December 2010.

Figure 7. Macroseismic map of the Coniston earthquake.

Figure 8. Seismograms of the ground displacement from the Eastern North Sea earthquake, 19 February 2010, recorded by BGS seismograph stations.

Figure 9. Seismograms of the ground displacement from the Isle of Anglesey earthquake, 1 February 2010, recorded by BGS seismograph stations.

Figure 10. Focal Mechanism of the Isle of Anglesey earthquake, 1 February 2010.

Figure 11. Seismograms of the ground displacement from the Stroud, Gloucestershire earthquake, 30 July 2010, recorded by BGS seismograph stations.

Figure 12. Focal Mechanism of the Stroud earthquake, 30 July 2010.

Figure 13. Focal Mechanism of the Stroud earthquake, 9 August 2010.

TABLES

Table 1. Catalogue of events in chronological order: 2010.

Table 2. Phase data of the earthquakes in Table 1.

Table 3. Geographic coordinates and instrumentation of BGS seismograph stations.

Table 4. Depth / crustal velocity models used in earthquake locations.

1 Introduction

The British Geological Survey's (BGS) Seismic Monitoring and Information Service operate a nationwide network of seismograph stations in the United Kingdom (UK). Earthquakes in the UK and coastal waters are detected within limits dependent on the distribution of seismograph stations. Location accuracy is improved in offshore areas through data exchange with neighbouring countries. This bulletin contains locations, magnitudes and phase data for all earthquakes detected and located by the BGS during 2010, listed in Tables 1 and 2. Maps showing seismic activity in 2010 (Figure 1), and the larger magnitude events since 1979 ($ML > 2.5$) and since 1970 ($ML > 3.5$) are also included. The bulletin covers all of the UK land mass and its coastal waters including the North Sea ($-11^{\circ}W$ to $6^{\circ}E$ and $47^{\circ}N$ to $65^{\circ}N$).

All events believed to be of true tectonic origin are included. Coalfield events are also included. Acoustic disturbances, such as sonic booms from supersonic aircraft, are included when they are felt. The airborne waves are readily identified by their slow travel time across an array or by their signature on a microphone, but they are frequently mistaken as small earthquakes by the public. They are indicated by 'SONIC' in both the locality and comments column of Table 1.

Significant non-natural events, such as explosions, which received media attention or were greater than magnitude 2.5 ML or felt by local residents, are also included in Table 1. Smaller events that are known, or suspected to be of explosive origin are excluded from the bulletin where possible. These include explosions due to quarrying, mining, weapon testing or disposal, naval exercises, geophysical prospecting and civil engineering. Unfortunately, identification by record character, location and time of occurrence is not always conclusive and some man-made events may be included in the bulletin or, more rarely, a small natural event may have been excluded.

2 The BGS UK Seismograph Network

The UK seismograph network consists of almost 100 stations with broadband, short period and/or strong motion accelerometers. Thirty-three sites are equipped with broadband seismometers and twenty-four have strong motion accelerometers, fifteen of which are co-located with broadband sensors. The remaining sites are equipped with short period seismometers. Data from nearly all stations are transferred in near real-time to the BGS offices in Edinburgh for automatic processing, analysis and archival. Seismic events are detected using automatic processing algorithms, but can also be extracted manually from our archive of continuous data, then analysed to determine event types, locations and magnitudes. Operational BGS seismograph stations are shown in Figure 2.

The detection capabilities of a network depend upon station distribution, instrument sensitivity and background noise levels. Figure 2 also shows the magnitude detection thresholds for the seismograph stations operational in December 2010. The contours illustrate the lower threshold magnitude for an earthquake to significantly exceed 4 nanometres of noise (average) at 10 Hz on at least four seismographs. These detection levels hold true only if data from all stations are continuously monitored. Smaller events may go undetected unless they are felt and reported to BGS by local inhabitants, in which case detection can be strongly dependent on the population density.

The whole of the UK is covered by the seismograph network for approximately magnitude 1.5 ML, and above, at times of average ambient noise levels. Noise sources such as wind, ocean waves and traffic vary considerably with time (typically 0.5 to 15 nanometres, at 10 Hz) causing the magnitude thresholds to increase or decrease. In conditions of high noise, 0.8 ML should be added to the contour values, causing the threshold to rise to about 2.3 ML. Normally, however, an earthquake of this size would be felt, if not detected, in the areas of poorer instrumental coverage. The bulletin can, therefore, be assumed to be complete for all earthquakes of magnitude 2.3 ML and above.

Given the variability in the earthquake detection threshold, as governed by ambient noise conditions and the geometry of the observing network, the bulletin is biased towards certain localities. Figure 3 shows only earthquakes with magnitude 2.5 ML or greater, in the period 1979 to 2010. The data set is considered complete for these magnitudes in all localities onshore. Seismicity for the period 1970 to 2010 is shown in Figure 4 with a threshold magnitude of 3.5 ML. This is the period covered by BGS instrumentation that, in the early years, only consisted of the network around Edinburgh (LOWNET) and Eskdalemuir (ESK) and a station near Kyle of Lochalsh (KYL). The data set is likely to be complete for such magnitudes.

3 Earthquake Parameters and Their Errors

HYPOCENTRE LOCATION

By accurately timing the signal onsets at a minimum of three stations, a location can be found for an earthquake that satisfies the observed pattern of arrivals. Instrumental locations in the bulletin were obtained using the computer program HYPOCENTER (Lienert and Havskov 1995) that iteratively adjusts a trial hypocentre (latitude, longitude, depth, and origin time) until the observed and computed arrival times coincide closely.

The accuracy of locations is dependent on distances from the closest stations, the distribution of the stations around the epicentre, the resolution to which signal onsets can be timed from the records, and the accuracy with which the seismic wave velocities through the Earth are known.

The accurate determination of earthquake depth presents a more difficult problem, mainly because phase arrival patterns at the seismographs can still be satisfied for a large range of depths merely by adjusting the origin time to suit. Depth is usually only well constrained when there is a station very close to the epicentre.

The best depth determinations are obtained when an earthquake or earthquake series occurs almost beneath a network. For events at larger distances the depth errors can be many kilometres. Where the depth error, ERZ in Table 1, is 0.0, this indicates that the depth has been fixed in the hypocentre calculation. This is the case for explosions, which are known to occur at the surface, and for events at larger distances, where depth control is poor.

MAGNITUDE

All earthquakes in the bulletin have been assigned a local magnitude (ML) as defined by Richter (1935):

$$ML = \log_{10} (A / A_0)$$

Where A is the maximum deflection (centre to peak in mm) registered on a Wood-Anderson seismograph and A₀ is that for a 'standard' magnitude zero earthquake at the same distance. The A₀ term is thus a distance correction factor, tabulated by Richter to 200 km, and later adjusted to

include up to 600 km. Although Richter intended his method to be an approximate quantification of earthquake size and his attenuation term, A_0 , strictly only applies to California, the formula is still used worldwide today. The ML magnitudes in this bulletin have been calculated according to Richter's formula after converting the output of the BGS instruments to an equivalent Wood-Anderson deflection. Ideally, the measurements are made on two horizontal instruments and averaged but, if this is not possible, the mean of the magnitudes from a number of verticals are used. Ground motion registered at a seismograph varies with site conditions, distance and direction from the earthquake, and the nature of the ray path. Consequently, it is important to take the mean from a good distribution of stations. The resulting errors on magnitudes quoted in the bulletin will normally be less than 0.4 ML.

INTENSITY

Intensity is a measure of the effect of the shaking produced by the earthquake on people, structures and objects. It decreases with distance from a maximum value (I_{\max}) usually found close to the epicentre. The maximum felt intensity is quoted, where known, with reference to the European Macroseismic Scale (EMS), (Grünthal, 1993).

4 Summary of 2010 Seismicity

There were 98 earthquakes located by the BGS seismic monitoring network during the year, with 27 having magnitudes of 2.0 ML or greater and eight having magnitudes of 3.0 ML or greater. Nine events with a magnitude of 2.0 ML or greater were reported felt, together with a further seven smaller ones, bringing the total to sixteen felt earthquakes in 2010.

The largest onshore earthquake of the year, with a magnitude of 3.5 ML, occurred approximately 5 km northwest of Coniston, Cumbria, on 21 December at 22:59 UTC, at a depth of approximately 13 km (Figures 5, 6 & 7). The focal mechanism obtained for this event shows predominantly strike slip faulting with a small normal component with either left lateral motion on a near vertical fault striking north-northeast south-southwest or right lateral motion on an east-southeast west-northwest fault that dips slightly north-northeast. Data from some 700 questionnaires, collected online, were used to determine how widely the earthquake had been felt. The highest intensity experienced was 5 EMS (European Macroseismic Scale), which was observed over an area extending to a radius of approximately 20-25 kilometres from the epicentre. Beyond this distance, an intensity of 4 EMS was observed in towns such as Penrith (about 35 km to the northeast) and Maryport, Workington and Whitehaven (about 35-45 km to the northwest). The most credible distant reports were from towns such as Kirkcudbright, Castle Douglas, Dalbeattie and some small hamlets a few kilometres northeast of Dumfries (80-90 km) to the north; Blackpool, Lytham St. Annes and Preston (60-75 km) to the south; the Isle of Man (90 km), to the west; and to the east, the earthquake was reported as having been felt in several hamlets in the west of the county of Durham (around 90 km). This is the largest event detected in the general area since the magnitude 3.7 ML Ulverston earthquake on 28 April 2009, which was felt in the area with an intensity of at least 5 EMS. Historically, the largest earthquake to have occurred nearby was the magnitude 4.7 ML Carlisle event that occurred on 26 December 1979 and was felt throughout Scotland and northern England with a maximum intensity of 6 EMS.

The largest offshore earthquake of 2010 occurred in the eastern North Sea region on 19 February, at 21:09 UTC, with a magnitude of 4.8 ML (Figure 8). It was located approximately 570 km east of Aberdeen and was reported felt in Denmark. A further ten events occurred in the North Sea and adjacent waters during the year, with magnitudes ranging between 2.0 and 3.8 ML, including a magnitude 3.5 ML earthquake on 1 September, which was felt onboard an accommodation vessel anchored to the sea bed in the Erskine oil field. Four other offshore

earthquakes occurred, during the year, with locations in the English Channel region and with magnitudes ranging between 1.4 and 2.2 ML.

Three earthquakes occurred in County Donegal, Ireland on 7, 26 and 27 January with magnitudes of 1.6 ML, 1.5 ML and 1.7 ML, respectively. All three were felt (intensity 3 EMS) by people in Burnfoot and Bridge End who described “felt a slight tremor” and “the windows shook”. Later in the year, a magnitude 2.7 ML earthquake on 6 May in County Clare, Ireland, was felt in Ennistymon, Liscannor, Lahinch, Lisdoonvarna and Doolin with intensities of at least 3 EMS.

In Wales, two events on 1 February and 12 March, with magnitudes of 1.0 ML and 0.5 ML, respectively, occurred near the northwest coast of the Isle of Anglesey (Figure 9). They were both located within 6 km of Wylfa Power Station. The focal mechanism for the 1 February event shows strike-slip faulting with a small normal component and either left lateral motion on a west-southwest east-northeast striking fault or right lateral motion on a south-southeast north-northwest striking fault (Figure 10).

On 2 February, an earthquake with a magnitude of 1.8 ML was detected 3 km SSE of the town of Blackford, Perth and Kinross. The BGS received two reports from residents in the town, describing “felt an impact and some movement” and “the heaters and windows rattled”. An intensity of 3 EMS was assigned to the earthquake.

An earthquake with a magnitude of 2.3 ML occurred at 17:33 UTC on 7 June, approximately 4 km north of Dumfries, Dumfries and Galloway. Several reports were received from people in the town of Dumfries, describing “the house shuddered and the windows rattled”, “we heard a bang, felt a rumble then the bed shook”, “the house appeared to lift and then drop suddenly” and “we thought at first it was a lorry passing that shook the house”, indicating an intensity of at least 3 EMS. It locates approximately 2 km NNE of the magnitude 3.5 ML Dumfries earthquake of 26 December 2006 which was felt over an area of around 3,600 km² with a maximum intensity of 5 EMS.

A magnitude 2.7 ML earthquake occurred on 19 June at 10:17 UTC, approximately 7 km northeast of Gainsborough, Lincolnshire. No reports were received of anyone having felt the event. It is the largest event detected in the general area (around Lincolnshire) since the magnitude 2.9 ML Alkborough earthquake on 30 September 2009 and the magnitude 3.0 ML Goxhill earthquake on 11 April 2009, which were both felt in the area with intensities of at least 3 EMS. It is also located approximately 23 km west of the magnitude 5.2 ML Market Rasen earthquake which occurred on 27 February 2008 and was felt throughout England with a maximum intensity of 6 EMS.

In South Yorkshire, two events on 30 June and 7 September with magnitudes of 2.0 ML and 2.2 ML, respectively, occurred near Doncaster. The 2.0 ML event was felt by residents in Doncaster and the 2.2 ML event was felt by residents in Rossington, both were assigned intensities of 3 EMS. Their shallow depths and characteristics of their seismograms are similar to previous activity in the area that was associated with mining.

A magnitude 2.7 ML earthquake occurred on 30 July, at 23:39 UTC, with an epicentre 9 km east of Oldbury power station and at a depth of around 11 km (Figure 11). The BGS received two reports from residents of Stroud who described “the sofa shook, as did the building and there was a loud crack” and “we heard the rumbling approaching through the bedrock before experiencing the trembling which only lasted a few seconds”, indicating an intensity of at least 3 EMS. This is the largest earthquake detected in the region since the magnitude 2.1 ML Lydney earthquake on 20 April 1989. On 9 August, an earthquake, with a magnitude of 1.5 ML, also occurred in the area. Focal mechanisms were produced for both events and show similar though not identical faulting styles (Figures 12 & 13). The mechanism for the second event is slightly better constrained and shows strike-slip faulting with a small normal component with either left lateral motion on a north-south fault or right lateral motion on a near east-west fault.

At 22:10 UTC, on 1 September, an earthquake with a magnitude of 1.1 ML occurred approximately 5 km southwest of Bangor, Gwynedd, in North Wales. The BGS received several reports from residents in Bangor and Caernarfon who described “a sudden moderate rumble for about three seconds”, “nothing moved but I heard a rumbling noise” and “all the windows in the kitchen were shaking”, indicating an intensity of around 3 EMS. Historically, larger earthquakes have been known to occur in the area, the largest being a magnitude 3.5 ML earthquake that occurred in 1874 close to Caernarfon.

On 3 September, an earthquake with a magnitude of 2.4 ML occurred approximately 9 km southeast of Kendal, Cumbria. It was felt by several residents in Kendal and Staveley. Reports described the earthquake as “like a thump, followed by a perceptible shaking about a second later” and “the roof timbers creaked”, indicating an intensity of 3 EMS. A month earlier, on 4 August, a magnitude 1.7 ML earthquake with a location near Windermere, around 18 km northwest of the 3 September event, was also felt in Kendal and Staveley and with similar intensities of 3 EMS. Both these events locate in the same region (within 15 km) as the magnitude 3.0 ML Grange-over-Sands earthquake on 26 June 1993, which was felt in the region with a maximum intensity of 5 EMS.

Acknowledgements

We are indebted to the States of Jersey Meteorological Office, the Universities of East Anglia and Leeds, and many individuals who assisted with station operation.

The work was supported in part by:

British Energy (as part of EDF Energy)
Department of Communities and Local Government
Office for Nuclear Regulation (An agency of HSE)
Horizon Nuclear Power Ltd
Jersey Water
Magnox North
Magnox South
Natural Environment Research Council
Scottish & Southern Energy plc
Scottish Power
Scottish Water
Sellafield Ltd

Interchange of data with UK and European agencies, has contributed to the accuracy of location of some of these events and to the determination of their magnitudes. They include:

Atomic Weapons Establishment (Blacknest, UK)
Centre Seismologique Euro-Mediterranean (Bruyères-le-Châtel, France)
Dublin Institute for Advanced Studies (Dublin, Ireland)
GEUS (Geological Survey of Denmark and Greenland)
Institute de Physique du Globe (Paris, France)
Koninklijk Nederlands Meteorologisch Instituut (Ae de Bilt, Netherlands)
Laboratoire de Detection et de Geophysique (Bruyères-le-Châtel, France)
NORSAR (Oslo, Norway)
University of Bergen (Bergen, Norway)
University of Keele (Keele, UK)

This report is published with the approval of the Director of the British Geological Survey (NERC).

References

Grünthal, G.,(Ed) 1993. European Macroseismic scale 1992 (up-dated MSK-scale). Cahiers du Centre European de Geodynamique et de Seismologie. **Vol 7**.

Lee, W. and Lahr, J., 1975. HYPO'71 (revised). A computer program for determining hypocentre, magnitude and first motion pattern of local earthquakes, *Open File Rep. U.S. Geol. Surv.* **75**.

Lienert, B.R.E., and Havskov, J., 1995. A computer program for locating earthquakes both locally and globally, *Seis. Res. Lett.*, **66**, 26-36.

Richter, C., 1935. An instrumental earthquake magnitude scale, *Bull.Seism. Soc.Am.*,**25**, 1-32.

Snoke, J. A., J. W. Munsey, A. C. Teague, and G. A. Bollinger (1984). A program for focal mechanism determination by combined use of polarity and SV -P amplitude ratio data, *Earthquake Notes*, **55**, **3**, **15**.

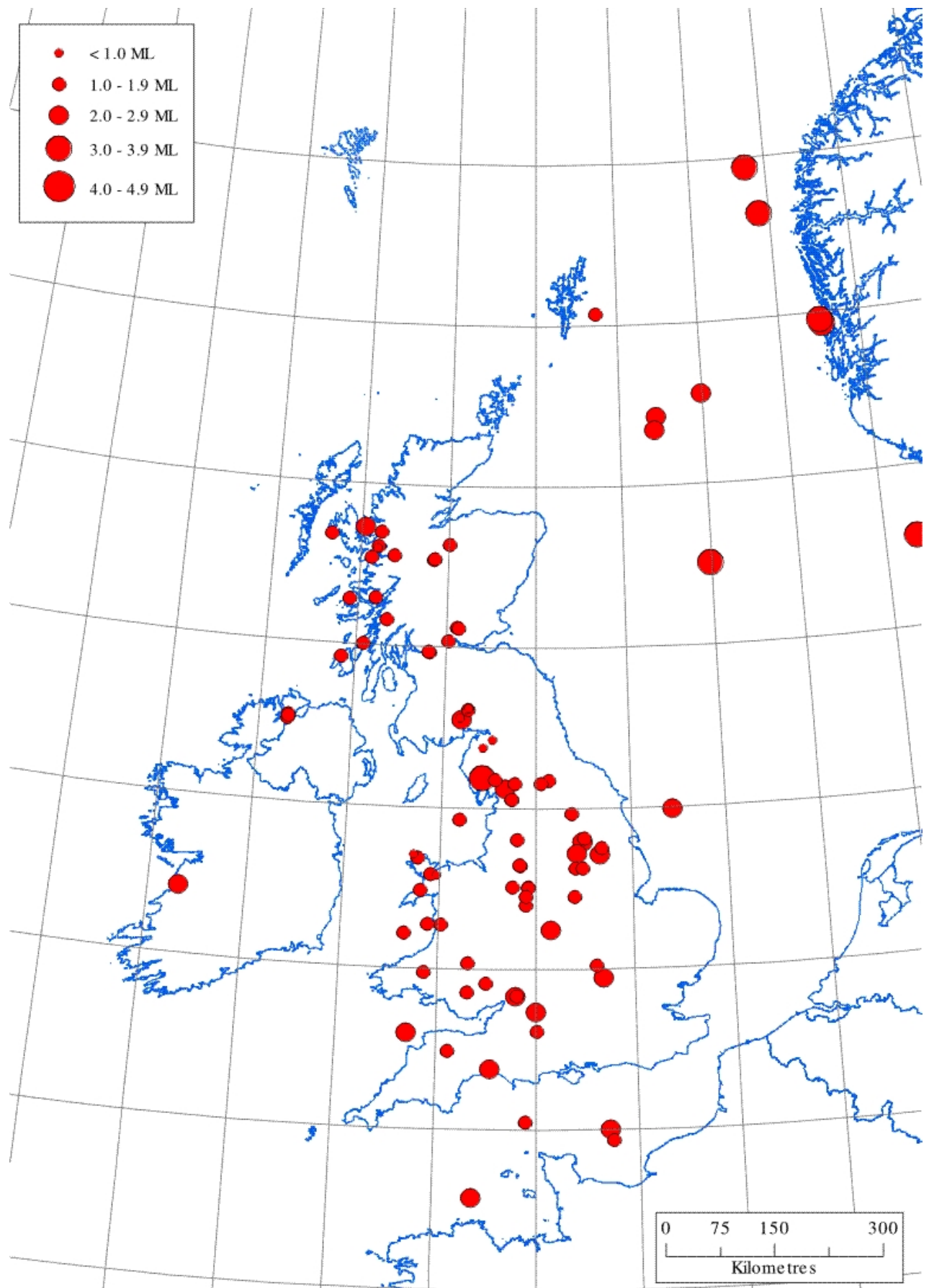


Figure 1. Epicentre map of earthquakes in 2010 as listed in Table 1.

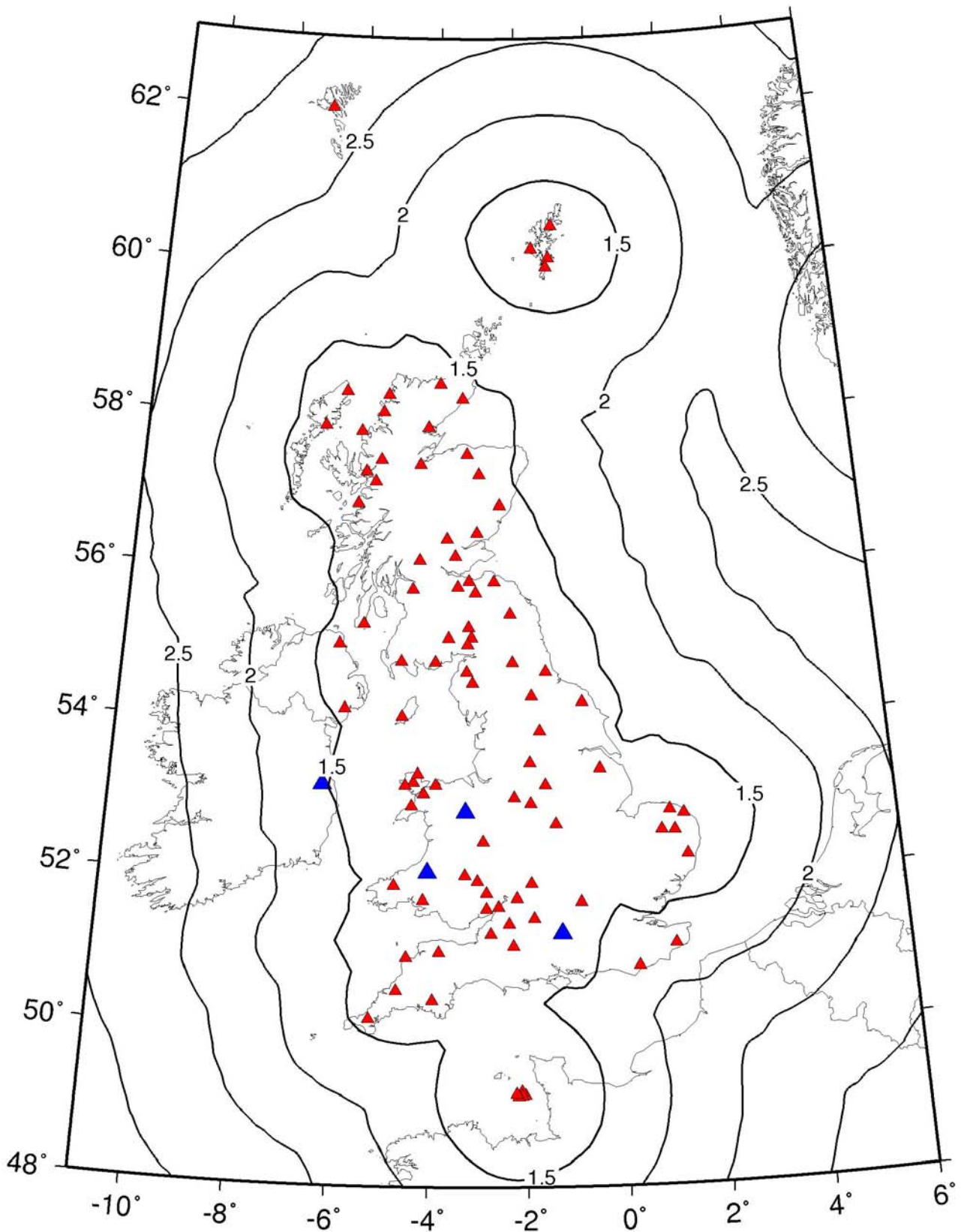


Figure 2. Seismograph stations operated by BGS during 2010 (red) along with station operated by other agencies in the British Isles and used for automatic detection (blue). The contours show earthquake detection capability in terms of Richter local magnitude (ML) calculated for average background noise conditions (4nm) where the detection criterion is that the signal has to exceed 4nm at 10Hz at 4 stations.

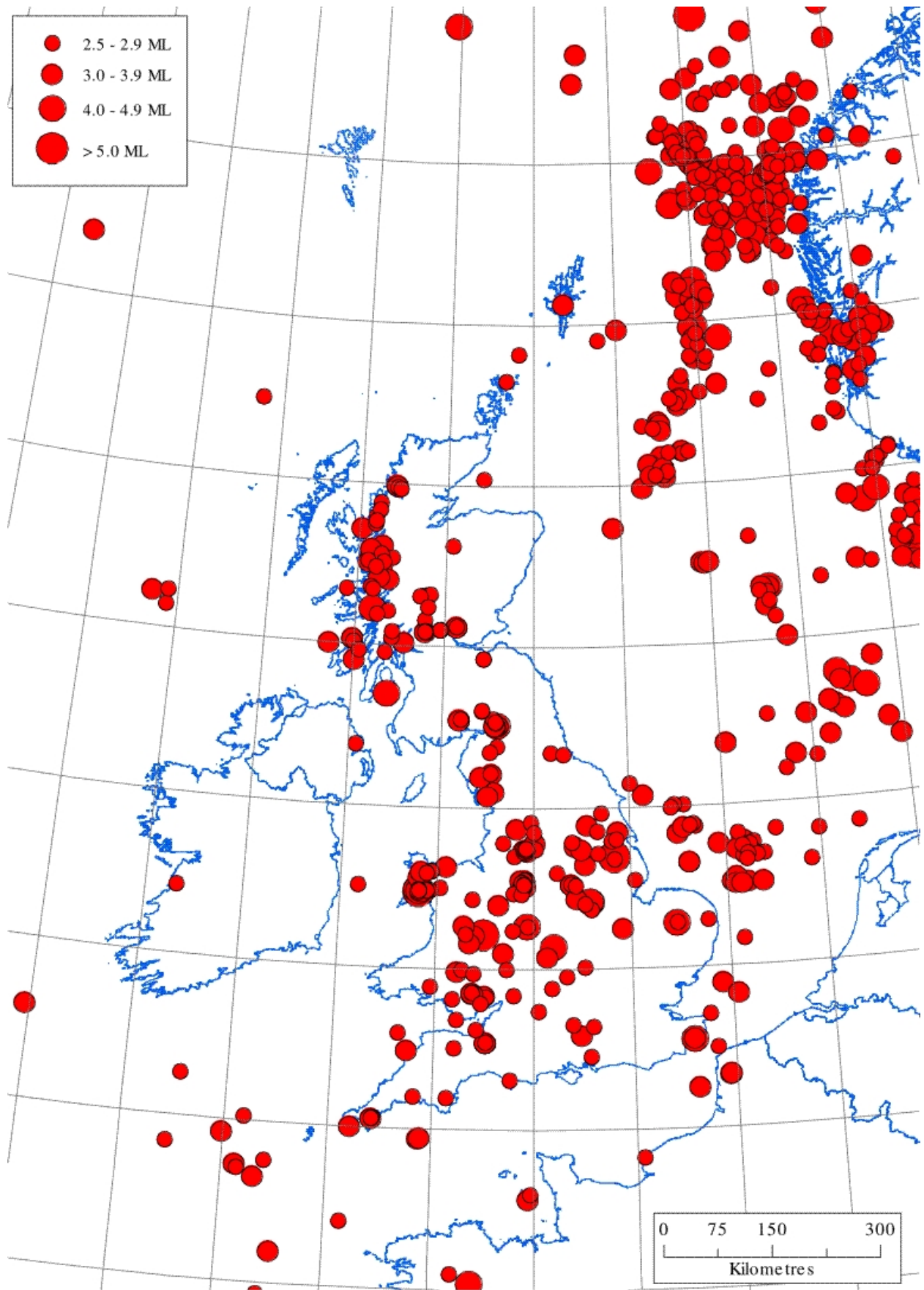


Figure 3. Epicentres of earthquakes with magnitudes of 2.5 ML and above, in the period 1979 to 2010.



Figure 4. Epicentres of earthquakes with magnitudes of 3.5 ML and above, in the period 1970 - 2010.

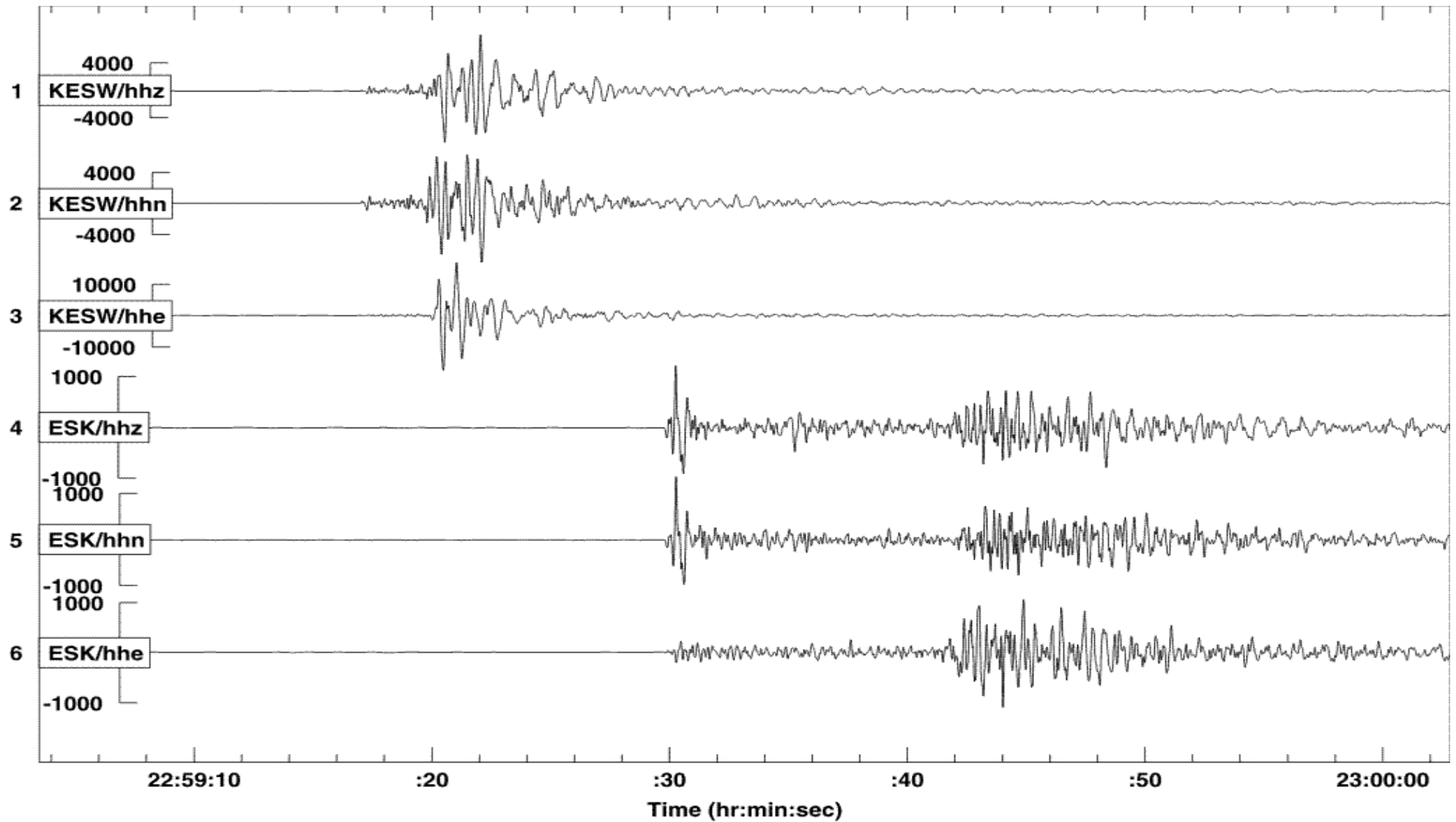


Figure 5. Seismograms of the ground displacement from the magnitude 3.5 ML Coniston earthquake, 21 December 2010, recorded by BGS seismograph stations.

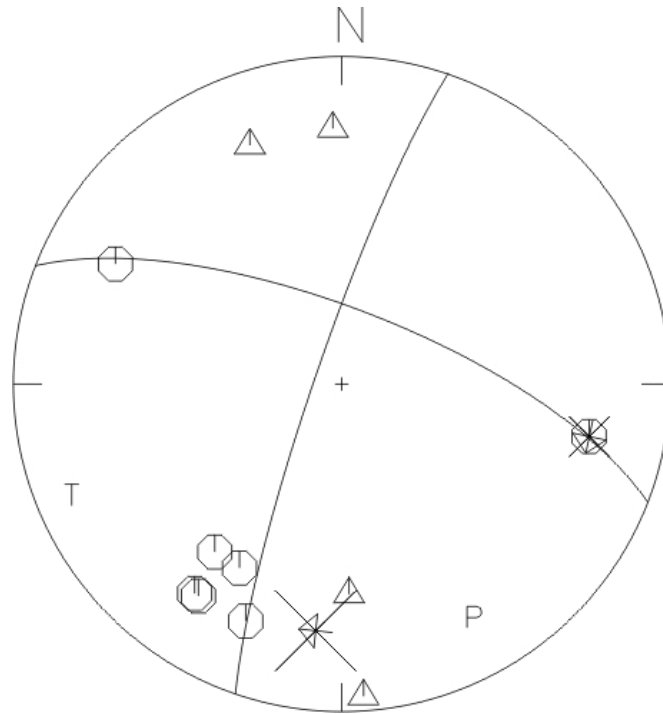


Figure 6. Equal area projection of the upper focal hemisphere for the Coniston earthquake 21 December 2010. The axes of maximum and minimum compressive stress are denoted by P and T respectively.

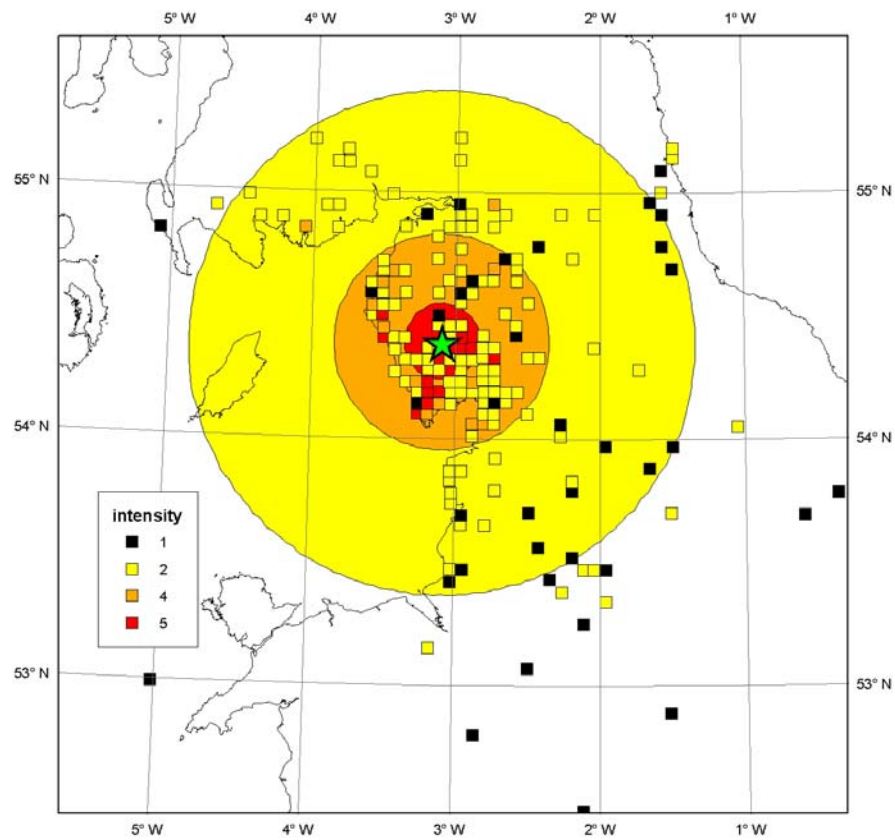


Figure 7. Macroseismic map of the Coniston earthquake, 21 December 2010.

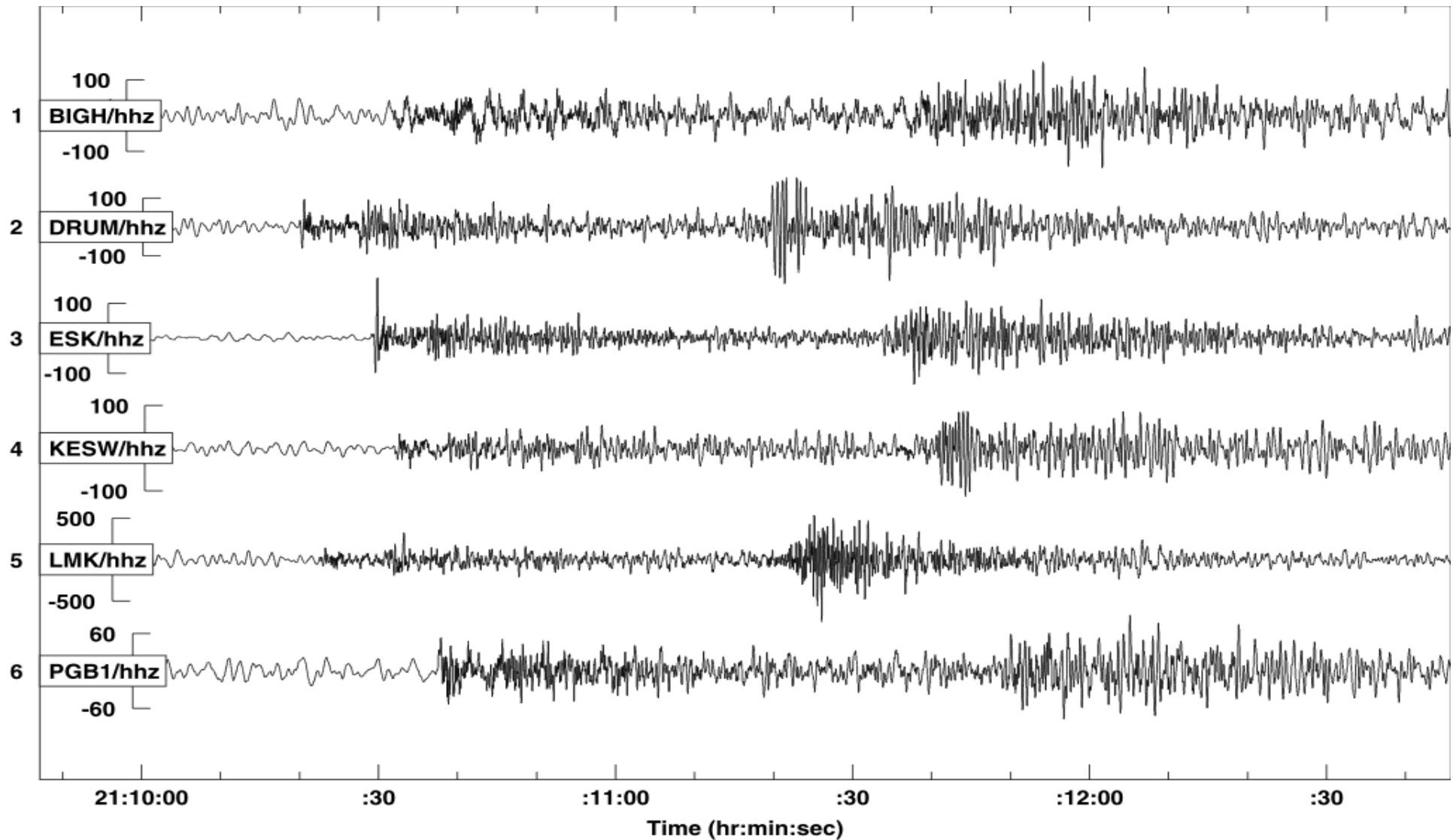


Figure 8. Seismograms of the ground displacement from the magnitude 4.8 ML Eastern North Sea earthquake, 19 February 2010, recorded by BGS seismograph stations.

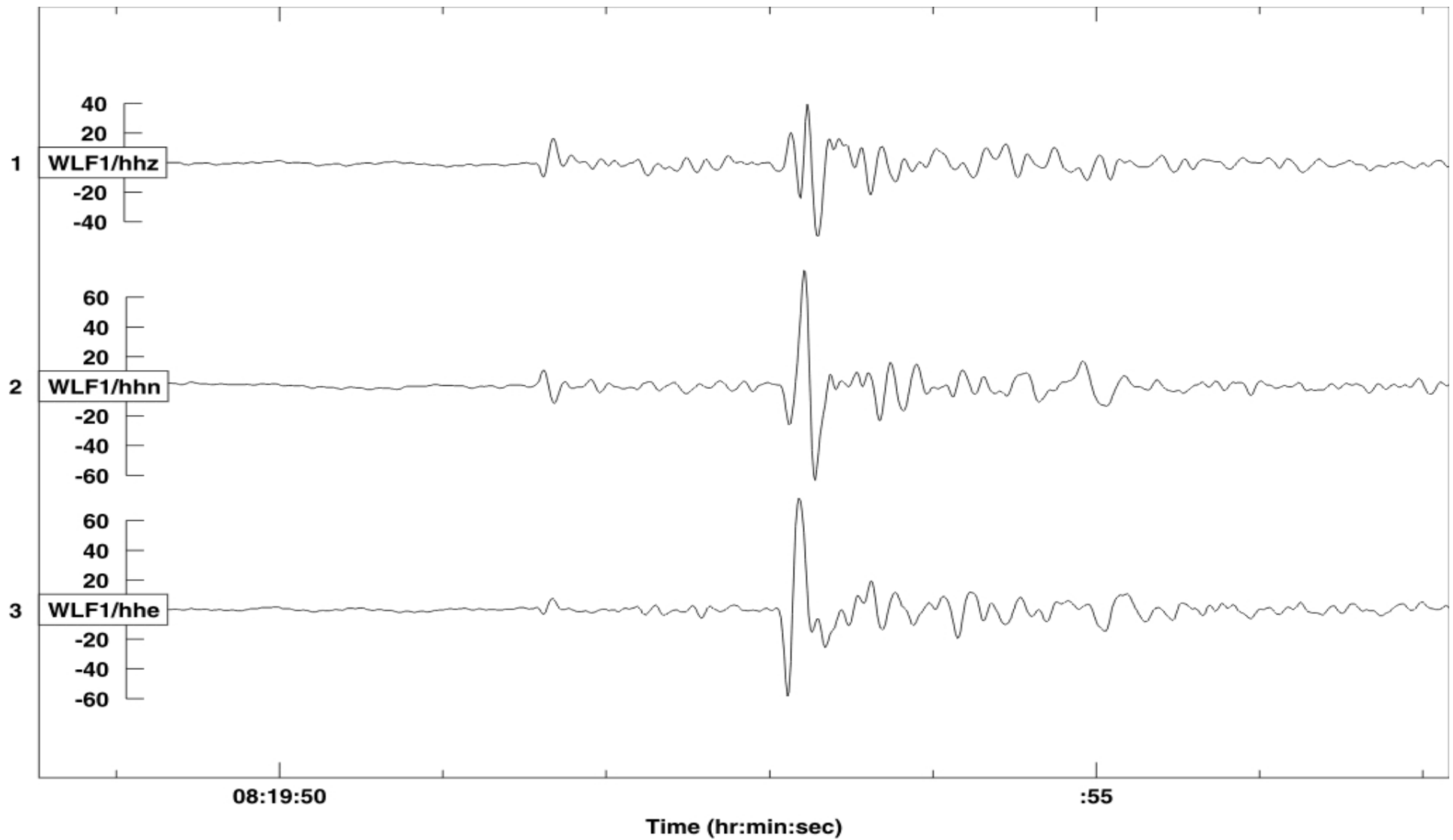


Figure 9. Seismograms of the ground displacement from the magnitude 1.0 ML Isle of Anglesey earthquake, 1 February 2010, recorded by BGS seismograph stations.

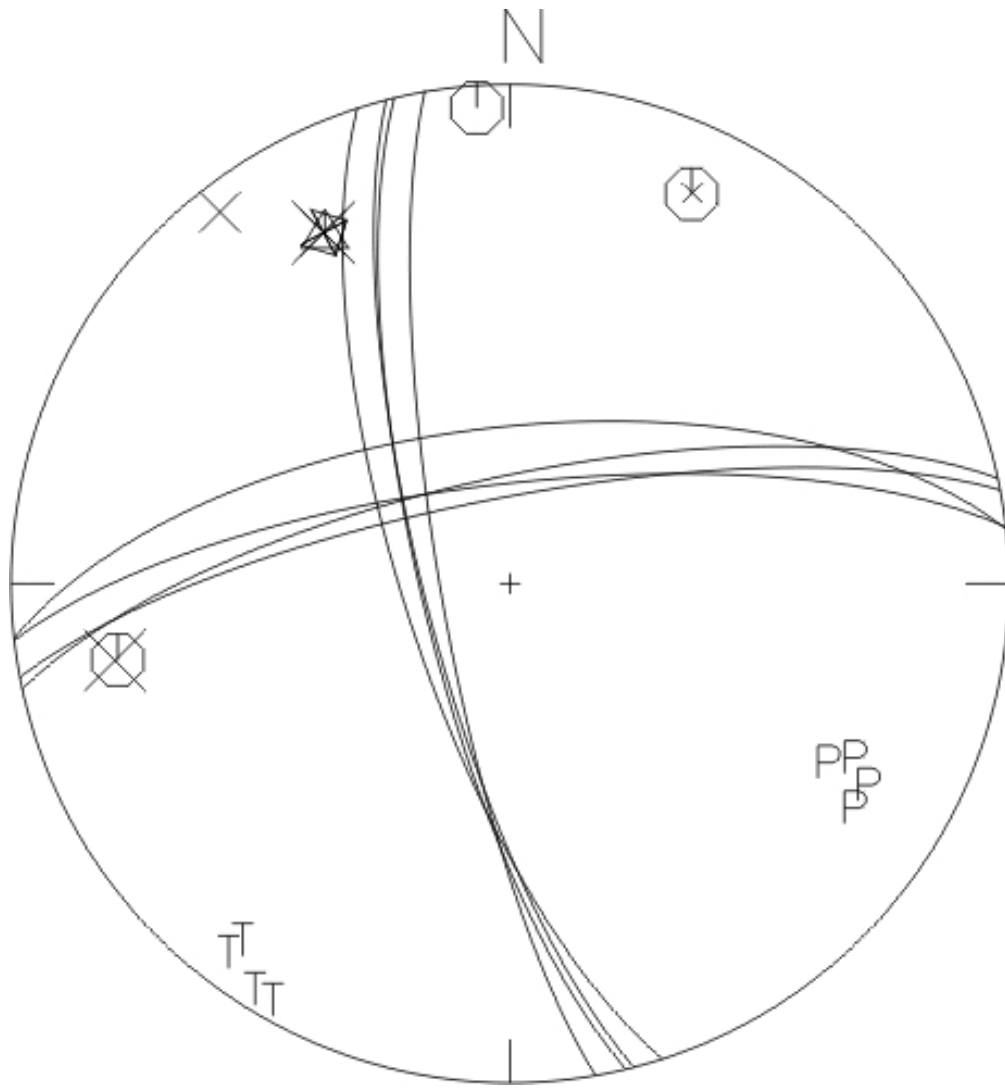


Figure 10. Equal area projection of the upper focal hemisphere for the Isle of Anglesey earthquake 1 February 2010. The axes of maximum and minimum compressive stress are denoted by P and T respectively.

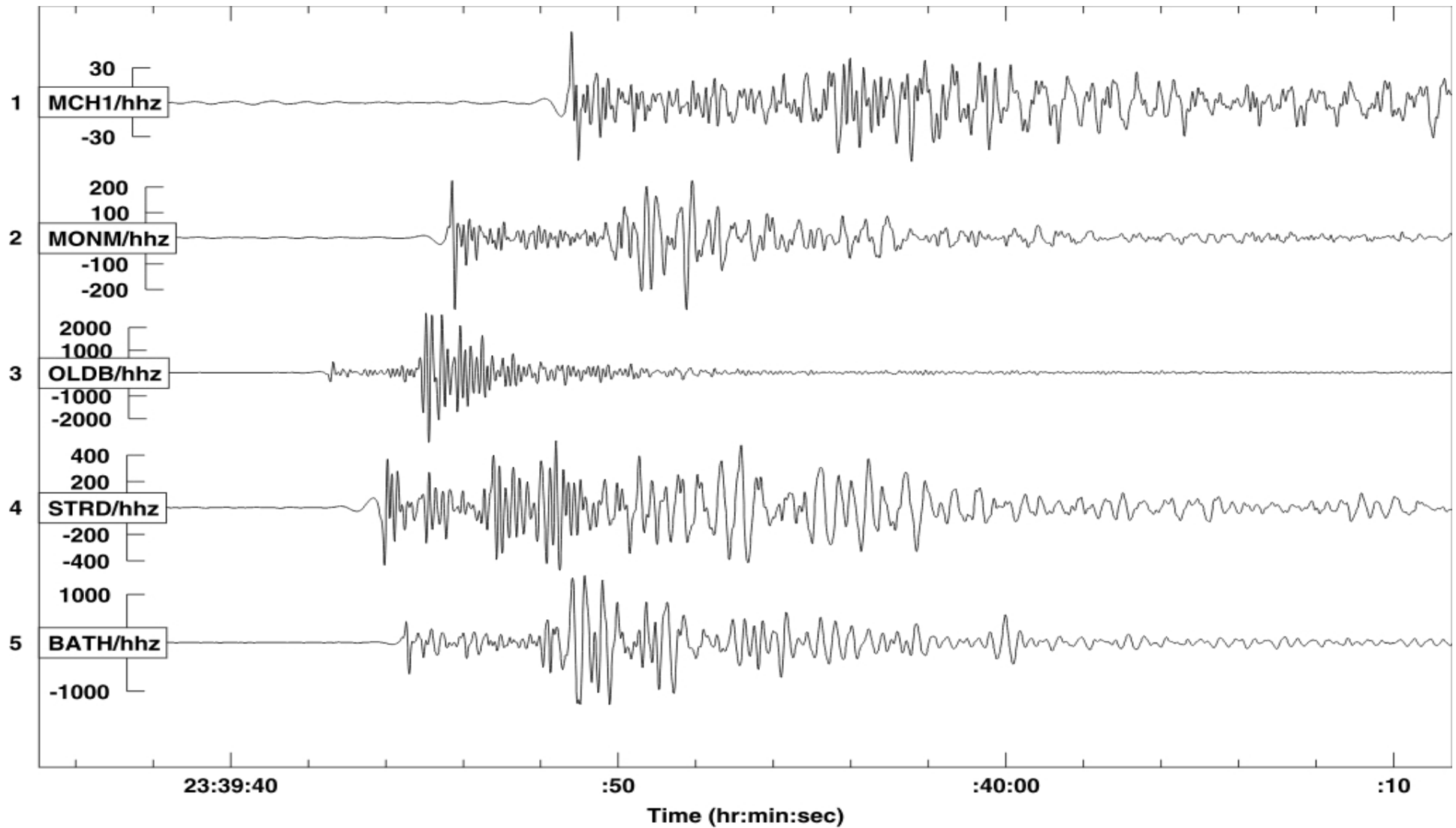


Figure 11. Seismograms of the ground displacement from the magnitude 2.7 ML Stroud, Gloucestershire earthquake, 30 July 2010, recorded by BGS seismograph stations.

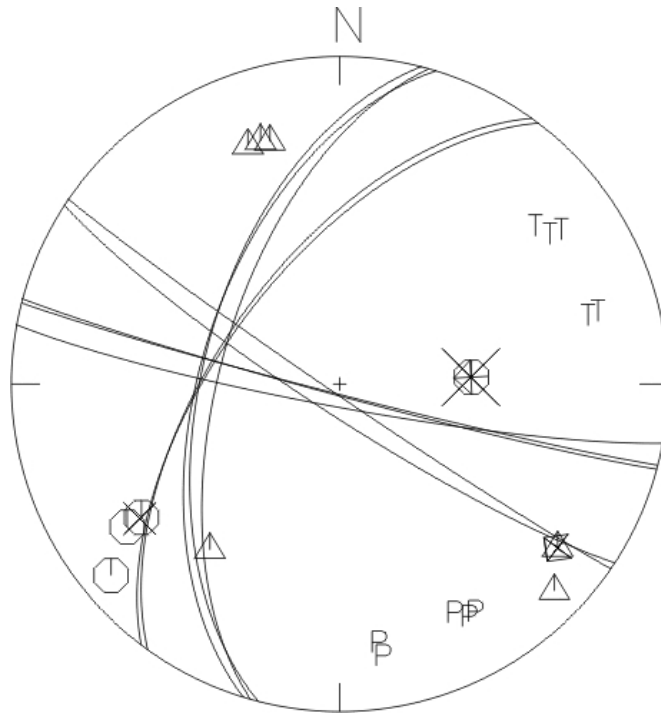


Figure 12. Equal area projection of the upper focal hemisphere for the Stroud, Gloucestershire earthquake 30 July 2010. The axes of maximum and minimum compressive stress are denoted by P and T respectively.

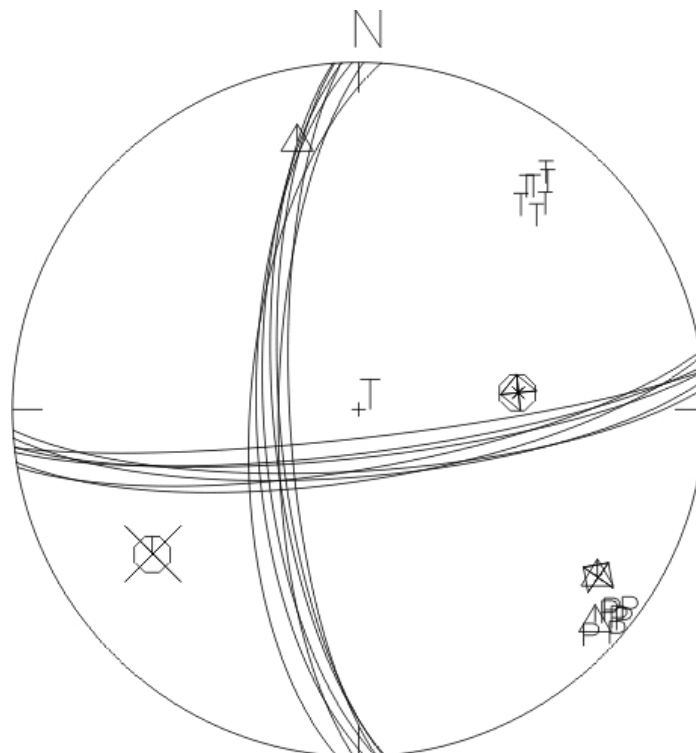


Figure 13. Equal area projection of the upper focal hemisphere for the Stroud, Gloucestershire earthquake 9 August 2010. The axes of maximum and minimum compressive stress are denoted by P and T respectively.

TABLE 1 : CATALOGUE OF EVENTS : 2010

YearMoDy	HrMnSecs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No Gap	RMS	ERH	ERZ	Comments
20100107	193014.4	55.03	-7.40	55.2	584.3	9.6	1.6	COUNTY DONEGAL, IRELAND	3	5 290	0.60	1.64	2.40	FELT COUNTY DONEGAL
20100108	211914.0	55.23	-3.50	304.7	594.3	2.6	0.9	JOHNSTONEBRIDGE, D & G		9 76	0.40	4.25	7.30	
20100108	221840.9	55.26	-3.49	305.2	596.7	3.2	0.5	JOHNSTONEBRIDGE, D & G		5 188	0.20	4.00	4.60	
20100120	133702.2	52.55	-3.96	267.3	296.4	5.0	1.4	FURNACE, CEREDIGION		7 138	0.30	3.98	1.80	
20100120	161827.5	56.01	-5.84	160.5	686.1	5.8	1.9	JURA, ARGYLL & BUTE		8 214	0.40	0.09	8.90	
20100126	204751.4	55.08	-7.39	56.3	589.2	10.7	1.5	COUNTY DONEGAL, IRELAND	3	4 291	0.40	4.12	1.20	FELT COUNTY DONEGAL
20100127	004212.2	53.02	-2.18	387.9	347.3	1.3	1.8	STOKE-ON-TRENT, STAFFS		15 120	0.40	4.61	2.70	
20100127	075121.7	55.06	-7.39	55.8	586.8	9.2	1.7	COUNTY DONEGAL, IRELAND	3	3 328	0.60	2.05	0.00	FELT COUNTY DONEGAL
20100128	061754.7	53.02	-2.17	388.9	346.6	1.4	1.8	STOKE-ON-TRENT, STAFFS		11 141	0.50	5.73	3.50	
20100131	190857.8	53.03	-2.50	366.3	348.1	7.0	1.3	NANTWICH, CHESHIRE		11 105	0.40	3.85	7.80	
20100201	081949.4	53.38	-4.47	235.4	389.6	5.2	1.0	ISLE OF ANGLESEY		9 175	0.10	1.64	2.00	
20100202	083230.9	56.24	-3.77	290.3	706.7	1.8	1.8	BLACKFORD, PERTH/KINROSS	3	12 94	0.40	4.12	3.30	FELT BLACKFORD
20100202	152251.7	56.24	-3.73	292.7	706.3	2.3	1.6	BLACKFORD, PERTH/KINROSS		13 96	0.40	4.79	3.90	
20100204	133211.6	51.20	-4.58	219.6	147.4	18.9	2.2	BRISTOL CHANNEL		11 193	0.30	5.07	2.30	10KM EAST OF LUNDY
20100207	131747.6	51.96	-4.28	243.3	231.1	7.9	1.2	RHOS, CARMARTHENSHIRE		8 165	0.30	4.12	4.00	7KM SE OF RHOS
20100210	052334.9	50.76	-2.92	335.0	95.8	9.2	2.2	LYME REGIS, DORSET		13 182	0.40	5.17	5.60	
20100210	070952.8	58.85	0.86	565.1	999.8	15.6	2.0	NORTHERN NORTH SEA		6 273	0.50	5.26	0.00	200KM EAST OF ORKNEY
20100219	210901.0	56.88	7.42	973.0	816.5	26.8	4.8	EASTERN NORTH SEA	4	43 194	0.70	6.86	9.30	FELT DENMARK
20100224	123008.9	51.48	-2.01	399.4	175.3	22.9	2.0	CHIPPENHAM, WILTSHIRE		11 122	0.30	3.00	2.00	
20100301	214406.5	50.98	-3.76	276.3	121.8	12.5	1.4	SOUTH MOLTON, DEVON		9 129	0.20	2.86	2.10	
20100304	032940.9	57.27	-3.99	280.2	821.9	2.7	1.6	CARRBRIDGE, HIGHLAND		14 76	0.30	3.30	3.40	
20100312	060229.0	53.42	-4.56	230.1	395.1	10.1	0.5	ISLE OF ANGLESEY		6 277	0.20	7.19	5.60	OFFSHORE LOCATION
20100321	014521.7	53.86	-3.62	293.8	441.8	4.1	1.7	IRISH SEA		20 104	0.40	4.14	6.20	40KM WNW OF BLACKPOOL
20100323	083849.0	49.16	-3.25	308.9	-81.9	8.2	2.2	ENGLISH CHANNEL		7 223	0.40	1.53	5.10	70KM WEST OF JERSEY
20100401	101438.5	61.88	3.49	688.2	1345.7	10.0	3.3	NORTHERN NORTH SEA		4 340	0.60	8.95	0.00	300KM NE OF LERWICK
20100415	054756.2	57.35	-6.70	117.4	839.0	2.7	1.3	ISLE OF SKYE		7 259	0.30	6.73	5.40	
20100420	043643.5	52.80	-2.22	385.2	322.9	3.1	1.4	GNOSALL, STAFFORDSHIRE		9 176	0.50	7.91	2.90	
20100421	060852.5	53.26	-1.20	453.7	373.4	1.1	1.7	WORKSOP, NOTTS	3	5 250	0.30	5.22	5.30	FELT EDWINSTOWE
20100425	015832.8	52.91	-2.23	384.7	334.6	5.8	1.3	STONE, STAFFORDSHIRE		11 148	0.30	3.98	4.60	6KM WEST OF STONE
20100501	200157.1	54.32	-2.46	369.9	491.4	7.7	1.9	SEDBERGH, CUMBRIA		14 72	0.40	4.03	5.20	
20100503	230723.0	54.11	-2.52	365.7	468.5	8.9	1.8	BENTHAM, N YORKSHIRE		13 66	0.30	3.89	6.90	
20100506	222400.6	52.85	-9.36	-95.5	353.2	4.7	2.7	COUNTY CLARE, IRELAND	3	14 186	1.20	2.33	0.00	FELT COUNTY CLARE
20100507	001507.0	54.35	-1.73	417.4	495.1	7.2	1.8	RICHMOND, N YORKSHIRE		10 150	0.20	3.51	6.10	
20100520	235317.3	56.32	-5.35	193.1	719.0	15.5	1.2	OBAN, ARGYLL & BUTE		8 185	0.30	7.75	3.70	12KM SE OF OBAN
20100523	134619.4	55.93	-4.37	251.9	672.9	2.2	1.5	CLYDEBANK, STRATHCLYDE		12 155	0.40	3.69	9.50	
20100529	023725.1	57.41	-5.56	186.2	840.9	3.4	1.0	LOHCARRON, HIGHLAND		5 201	0.30	5.61	0.00	
20100529	165016.5	55.94	-4.39	250.8	674.1	4.2	1.9	CLYDEBANK, STRATHCLYDE		10 131	0.30	7.20	6.90	
20100607	160632.8	59.12	1.98	627.7	1033.2	18.2	2.7	NORTHERN NORTH SEA		10 177	0.30	6.89	7.50	
20100607	173319.5	55.11	-3.62	296.7	580.3	4.7	2.3	DUMFRIES, D & G	3	13 100	0.50	5.05	7.00	FELT DUMFRIES...
20100607	173459.4	55.13	-3.65	294.5	582.7	6.8	0.8	DUMFRIES, D & G		6 113	0.20	3.08	5.20	
20100619	101743.8	53.43	-0.67	488.1	393.6	8.8	2.7	GAINSBOROUGH, LINCS		9 125	0.30	5.45	7.50	7KM NE OF GAINSBOROUGH
20100621	050254.3	52.49	-1.70	420.1	288.5	10.3	2.3	BIRMINGHAM, W MIDLANDS		13 125	0.20	2.02	2.50	
20100625	195534.5	51.23	-2.00	400.1	147.7	2.7	1.5	WARMINSTER, WILTSHIRE		10 214	0.40	6.66	3.80	15KM EAST OF WARMINSTER
20100628	203454.8	53.51	-0.64	490.4	402.7	9.3	1.9	SCUNTHORPE, NORTH LINCS		6 159	0.40	9.76	3.90	7KM SOUTH OF SCUNTHORPE
20100630	003532.2	53.58	-1.06	462.2	410.1	1.5	2.0	DONCASTER, S YORKSHIRE	4	10 118	0.40	2.70	3.10	C/F, FELT DONCASTER
20100630	005110.9	52.98	-4.41	238.3	344.8	4.6	1.1	LLEYN PENINSULA		4 290	0.20	4.97	4.40	
20100703	113306.2	56.58	-5.62	177.8	749.3	7.6	1.5	LOCHALINE, HIGHLAND		7 218	0.20	3.49	0.00	9KM ENE OF LOCHALINE
20100712	174523.6	52.44	-4.71	216.1	285.8	4.7	1.2	CARDIGAN BAY		11 191	0.30	9.58	7.80	40KM WEST OF ABERYSTWYTH

TABLE 1 : CATALOGUE OF EVENTS : 2010

YearMoDy	HrMnSecs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No Gap	RMS	ERH	ERZ	Comments
20100714	100942.2	57.09	-5.77	171.7	805.8	3.7	1.3	KNOYDART, HIGHLAND		7 305	0.30	7.34	7.70	
20100715	102239.7	51.90	-0.64	493.6	222.9	14.3	2.0	DUNSTABLE, BEDFORDSHIRE		7 307	0.30	2.57	2.50	8KM WEST OF DUNSTABLE
20100720	193548.1	50.09	-2.23	383.8	21.8	5.0	1.4	ENGLISH CHANNEL		6 229	0.60	7.13	0.00	60KM SSE OF WEYMOUTH
20100727	015616.9	53.61	-2.41	372.7	412.9	12.3	1.9	BOLTON, LANCASHIRE		15 82	0.30	2.91	3.80	
20100730	211710.5	57.12	-5.24	203.8	807.3	6.2	1.5	GLEN SHEIL, HIGHLAND		11 163	0.30	4.78	4.60	
20100730	233939.9	51.67	-2.42	370.8	196.9	11.4	2.7	STROUD, GLOUCESTERSHIRE	3	20 55	0.40	2.61	2.40	FELT STROUD
20100804	000250.8	54.36	-2.88	342.8	496.3	3.5	1.7	WINDERMERE, CUMBRIA	3	19 73	0.40	6.71	2.10	FELT STAVELEY, KENDAL
20100806	033901.7	54.11	-2.53	365.4	468.6	8.1	1.5	BENTHAM, N YORKSHIRE		14 65	0.40	4.38	7.50	
20100809	112635.3	51.67	-2.41	371.6	196.9	14.2	1.5	STROUD, GLOUCESTERSHIRE		7 97	0.20	2.30	2.90	
20100822	185124.5	52.56	-4.23	248.6	298.0	7.4	1.7	CARDIGAN BAY, WALES		13 174	0.20	2.66	3.20	
20100826	070135.9	57.08	-4.34	258.1	801.6	7.4	1.8	KINGUSSIE, HIGHLAND		8 184	0.30	3.61	9.10	16KM WEST OF KINGUSSIE
20100827	131653.7	57.22	-5.61	182.1	820.3	4.2	1.2	GLENELG, HIGHLAND		10 224	0.30	7.74	3.40	
20100828	161258.9	53.94	-1.25	449.1	449.6	6.1	1.6	TADCASTER, N YORKSHIRE		6 191	0.20	3.92	3.10	6KM NORTH OF TADCASTER
20100831	092028.6	54.31	-1.90	406.2	490.5	8.8	1.6	LEYBURN, N YORKSHIRE		7 125	0.20	2.59	4.90	
20100901	054555.7	57.02	1.97	641.2	798.7	15.0	3.5	CENTRAL NORTH SEA	3	27 228	0.50	0.47	0.00	FELT ONBOARD VESSEL
20100901	221035.8	53.18	-4.19	253.5	366.6	15.2	1.1	BANGOR, GWYNEDD	3	7 112	0.50	6.94	5.90	FELT BANGOR, CAERNARFON...
20100903	081350.7	54.25	-2.66	356.9	484.0	9.7	2.4	KENDAL, CUMBRIA	3	24 113	0.50	6.40	7.80	FELT STAVELEY, KENDAL
20100907	002825.1	54.86	-2.95	339.1	552.0	7.8	0.8	CARLISLE, CUMBRIA		6 216	0.20	7.48	1.90	
20100907	232141.7	53.45	-1.15	456.3	394.9	1.1	2.2	DONCASTER, S YORKSHIRE	3	12 117	0.30	2.95	2.60	C/F, FELT ROSSINGTON
20100910	120525.0	51.83	-3.02	329.6	214.7	25.6	1.6	ABERGAVENNY, GWENT		10 82	0.20	3.33	2.60	
20100912	051456.1	51.71	-3.40	303.5	202.3	9.8	1.3	ABERDARE, MID GLAMORGAN		6 180	0.10	1.92	1.50	
20100913	103118.7	58.69	0.82	563.7	981.4	10.3	2.5	NORTHERN NORTH SEA		16 241	0.30	3.05	8.40	200KM SSE OF LERWICK
20100919	082924.0	56.07	-3.96	278.2	688.4	8.6	1.2	DENNY, FALKIRK		8 105	0.30	3.89	7.50	7KM NNW OF DENNY
20100925	231725.8	57.09	-4.33	259.1	801.8	7.1	1.7	NEWTONMORE, HIGHLAND		9 102	0.20	3.42	0.50	12KM WEST OF NEWTONMORE
20100927	053216.9	52.05	-0.79	483.1	239.9	4.4	1.9	MILTON KEYNES, BUCKS		11 149	0.30	4.62	6.40	
20100928	033203.1	60.15	-0.53	481.5	1140.2	3.5	1.3	SHETLAND ISLANDS		3 328	0.10	3.11	5.60	35KM EAST OF LERWICK
20101015	054953.4	53.26	-1.04	464.2	373.7	6.1	1.7	WORKSOP, NOTTS		6 244	0.30	1.21	9.60	
20101017	071747.6	57.20	-5.62	181.4	818.5	2.7	0.6	GLENELG, HIGHLAND		4 265	0.10	7.18	2.50	
20101021	223004.2	52.91	-1.21	453.4	334.8	6.8	1.9	BEESTON, NOTTS		10 156	0.20	2.75	3.50	
20101022	012249.2	53.30	-2.34	377.1	377.6	17.2	1.2	KNUTSFORD, CHESHIRE		7 160	0.20	3.09	2.10	
20101023	085801.1	53.30	-2.35	376.8	378.8	16.7	1.2	KNUTSFORD, CHESHIRE		6 162	0.20	2.59	1.90	
20101025	041223.7	53.63	-1.01	465.7	415.9	1.4	1.8	THORNE, S YORKSHIRE		7 162	0.40	4.24	4.20	C/F
20101025	230933.1	56.56	-6.20	141.8	748.7	8.0	1.4	MULL, ARGYLL & BUTE		6 254	0.20	8.36	2.10	
20101104	074747.8	61.30	3.75	707.7	1282.0	15.0	3.0	NORWEGIAN SEA		11 158	1.00	6.48	4.80	
20101118	140453.7	53.16	-4.08	261.2	365.1	4.3	0.7	BETHESDA, GWYNEDD		7 112	0.10	1.28	1.30	
20101126	075034.8	55.25	-3.48	306.2	595.8	5.1	0.8	JOHNSTONEBRIDGE, D & G		4 183	0.20	2.61	4.50	
20101126	175709.2	55.23	-3.49	305.5	593.8	4.6	1.4	JOHNSTONEBRIDGE, D & G		7 110	0.30	3.34	5.30	
20101126	181927.6	55.25	-3.48	306.2	595.6	4.3	0.2	JOHNSTONEBRIDGE, D & G		4 183	0.10	2.02	6.80	
20101201	024849.4	55.83	-6.32	129.6	668.5	9.3	1.4	ISLAY, ARGYLL & BUTE		5 238	0.50	5.18	3.70	
20101204	015328.2	53.98	0.87	588.2	457.8	14.8	2.6	SOUTHERN NORTH SEA		15 252	0.20	7.77	4.20	
20101207	082728.8	55.25	-3.48	306.2	596.0	5.3	0.7	JOHNSTONEBRIDGE, D & G		4 184	0.20	3.33	5.70	
20101214	123435.3	52.08	-3.40	304.3	242.8	4.3	1.0	BULLTH WELLS, POWYS		6 153	0.10	1.14	3.20	
20101214	185215.9	54.76	-3.15	325.9	541.0	4.2	0.6	WIGTON, CUMBRIA		6 174	0.30	3.83	3.10	
20101215	102725.2	50.01	-0.56	503.4	12.9	5.0	2.2	ENGLISH CHANNEL		6 188	0.60	0.21	0.00	95KM SSW OF BRIGHTON
20101215	140945.1	49.87	-0.50	507.9	-2.0	5.0	1.5	ENGLISH CHANNEL		4 311	0.40	1.31	0.00	105KM SSW OF BRIGHTON
20101218	061909.0	57.46	-5.94	164.0	848.1	3.7	2.2	APPLECROSS, HIGHLAND		16 165	0.50	8.95	6.60	8KM NW OF APPLECROSS
20101220	004325.0	59.87	5.07	795.2	1130.6	10.0	3.4	NORWEGIAN COAST		14 304	0.40	7.68	0.00	
20101220	123013.6	59.91	5.01	791.5	1135.0	10.0	3.8	NORWEGIAN COAST		17 303	0.50	7.90	0.00	

TABLE 1 : CATALOGUE OF EVENTS : 2010

YearMoDy	HrMnSecs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	Gap	RMS	ERH	ERZ	Comments
20101221	225912.7	54.39	-3.15	325.6	500.0	12.6	3.5	CONISTON,CUMBRIA	5	30	174	0.60	7.98	4.90	FELT CUMBRIA ...
20101222	051310.5	57.12	6.73	927.6	836.9	23.6	3.5	EASTERN NORTH SEA		13	307	0.30	7.79	6.70	530KM EAST OF ABERDEEN
20090101	145420.8	55.07	-3.63	296.0	575.9	3.1	1.1	DUMFRIES,D & G		9	149	0.40	3.91	0.80	

TABLE 2 : PHASE DATA

May 3 2010 Time: 23:07 23.0 UTC Magnitude: 1.8 ML Lat: 54.111N Lon: -2.525W Depth: 8.9 km Grid Ref: 365.68 kmE 468.49 kmN RMS: 0.30 secs Locality: BENTHAM,N YORKSHIRE Velocity model: Lownet Xnear: 100.0 Xfar: 200.0										
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI	RES
WLF1	HE	171.0	AML			20:02	46.97	6	0.26	
WLF1	HN	171.0	AML			20:02	47.85	9	0.26	
ESY	EZ	178.0	EP			20:02	26.55			1.77
YRC	EZ	183.0	EP			20:02	24.66			-0.60
HLM1	HZ	202.0	EP			20:02	27.60			-0.15
STNC	HE	144.0	AML							00:15 53.96 28 0.36
FOEL	HZ	189.0	EP							00:15 35.16 -1.01
FOEL	HE	189.0	AML							00:16 02.00 6 0.46
FOEL	HN	189.0	AML							00:16 02.46 14 0.40
GALL	HZ	201.0	EP							00:15 38.20 0.67
GALL	HN	201.0	ES							00:16 00.55 0.77
GALL	HN	201.0	AML							00:16 04.40 7 0.22
GALL	HE	201.0	AML							00:16 06.09 5 0.38
HLM1	HZ	218.0	EP							00:15 39.08 -0.63
HLM1	HN	218.0	AML							00:16 09.87 5 0.40
HLM1	HE	218.0	AML							00:16 10.23 7 0.26
May 20 2010 Time: 23:53 17.3 UTC Magnitude: 1.2 ML Lat: 56.318N Lon: -5.346W Depth: 15.5 km Grid Ref: 193.10 kmE 718.98 kmN RMS: 0.30 secs Locality: OBAN,ARGYLL & BUTE Velocity model: Lownet Xnear: 100.0 Xfar: 200.0 Comment: 12KM SE OF OBAN										
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI	RES
EAB	EZ	64.1	EP			23:53	28.23			0.00
PGB1	HZ	77.9	EP			23:53	30.24			-0.08
PGB1	HN	77.9	ES			23:53	39.94			0.11
PGB1	HN	77.9	AML			23:53	42.34	10	0.22	
PGB1	HE	77.9	AML			23:53	42.51	7	0.22	
KPL	HZ	115.0	EP			23:53	35.67			0.06
KPL	HE	115.0	ES			23:53	49.03			0.04
KPL	HN	115.0	AML			23:53	51.55	5	0.32	
KPL	HE	115.0	AML			23:53	52.37	4	0.22	
KAC	EZ	131.0	EP			23:53	37.76			-0.22
EDI	HZ	141.0	EP	9		23:53	23.64			-15.70
EDI	HN	141.0	ES			23:53	39.23			-0.52
EDI	HE	141.0	AML			23:53	42.12	4	0.42	
EDI	HN	141.0	AML			23:53	42.31	4	0.30	
GALL	HZ	167.0	EP			23:53	42.06			-0.66
GALL	HN	167.0	ES			23:54	01.11			-0.17
GALL	HN	167.0	AML			23:54	04.20	3	0.28	
GALL	HE	167.0	AML			23:54	05.01	4	0.36	
ESK	HZ	174.0	EP			23:53	44.55			0.81
ESK	HN	174.0	ES			23:54	03.58			0.53
ESK	HN	174.0	AML			23:54	07.91	2	0.42	
ESK	HE	174.0	AML			23:54	08.46	3	0.22	
DRUM	HZ	188.0	EP			23:53	45.70			0.33
DRUM	HN	188.0	AML			23:54	15.15	8	0.52	
DRUM	HE	188.0	AML			23:54	15.24	2	0.16	
May 23 2010 Time: 13:46 19.4 UTC Magnitude: 1.5 ML Lat: 55.926N Lon: -4.370W Depth: 2.2 km Grid Ref: 251.94 kmE 672.86 kmN RMS: 0.40 secs Locality: CLYDEBANK, STRATHCLYDE Velocity model: Lownet Xnear: 75.0 Xfar: 150.0										
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI	RES
PGB1	HZ	14.6	IP		C	13:46	22.33			-0.08
PGB1	HE	14.6	ES			13:46	24.43			-0.20
PGB1	HN	14.6	AML			13:46	24.70	93	0.15	
PGB1	HE	14.6	AML			13:46	24.74	278	0.21	
EAB	EZ	29.3	EP			13:46	24.57			-0.34
EAB	EZ	29.3	ES			13:46	28.64			-0.31
ELO	EZ	73.1	EP			13:46	32.46			0.41
EDI	HZ	73.9	EP	9		13:46	14.63			-17.50
EDI	HN	73.9	ES			13:46	22.15			-1.77
EDI	HN	73.9	AML			13:46	26.85	9	0.20	
EDI	HE	73.9	AML			13:46	26.94	11	0.44	
EBL	EZ	84.8	EP			13:46	33.83			-0.02
ESK	HZ	100.0	EP			13:46	36.27			0.10
ESY	EZ	110.0	EP			13:46	39.08			1.38
ECK	EZ	114.0	EP			13:46	38.71			0.34
GALL	HZ	120.0	EP			13:46	39.65			0.41
GALL	HN	120.0	ES			13:46	53.44			-0.30
GALL	HN	120.0	AML			13:46	55.00	14	0.30	
GALL	HE	120.0	AML			13:46	55.19	28	0.32	
DRUM	HZ	160.0	EP			13:46	45.29			0.17
DRUM	HE	160.0	AML			13:47	06.42	10	0.24	
DRUM	HN	160.0	AML			13:47	07.49	8	0.12	
KESW	HZ	169.0	EP			13:46	47.25			0.78
KPL	HZ	176.0	EP			13:46	47.60			0.28
KPL	HN	176.0	AML			13:47	09.46	4	0.24	
KPL	HE	176.0	AML			13:47	09.51	7	0.18	
May 29 2010 Time: 02:37 25.1 UTC Magnitude: 1.0 ML Lat: 57.408N Lon: -5.560W Depth: 3.4 km Grid Ref: 186.19 kmE 840.87 kmN RMS: 0.30 secs Locality: LOCHCARRON,HIGHLAND Velocity model: Lownet Xnear: 50.0 Xfar: 200.0										
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI	RES
KPL	HZ	9.5	IP		C	02:37	27.14			-0.02
KPL	HE	9.5	ES			02:37	28.79			0.11
KPL	HN	9.5	AML			02:37	28.90	45	0.14	
KPL	HE	9.5	AML			02:37	28.94	40	0.10	
KAC	EZ	18.6	EP			02:37	28.65			-0.09
KSB	EZ	23.6	EP			02:37	29.47			-0.16
MDO	EZ	72.0	EP			02:37	37.34			-0.10
MCD	EZ	140.0	EP			02:37	48.25			0.45
MCD	EE	140.0	ES			02:38	05.42			1.03
MCD	EE	140.0	AML			02:38	06.23	7	0.26	
MCD	EN	140.0	AML			02:38	06.47	4	0.19	
May 29 2010 Time: 16:50 16.5 UTC Magnitude: 1.9 ML Lat: 55.937N Lon: -4.389W Depth: 4.2 km Grid Ref: 250.79 kmE 674.12 kmN RMS: 0.30 secs Locality: CLYDEBANK, STRATHCLYDE Velocity model: Lownet Xnear: 100.0 Xfar: 200.0										
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI	RES
PGB1	HZ	15.1	IP		C	16:50	19.55			-0.01
PGB1	HE	15.1	ES			16:50	21.57			-0.24
PGB1	HE	15.1	AML			16:50	21.96	587	0.21	
PGB1	HN	15.1	AML			16:50	22.20	248	0.19	
EAB	EZ	28.2	EP			16:50	21.73			-0.06

TABLE 2 : PHASE DATA

MONM HZ 88.0 EP	19:55	49.78	0.04	Velocity model: Lownet	Xnear: 100.0	Xfar: 200.0	
MONM HE 88.0 ES	19:56	01.20	0.36	Comment: 9KM ENE OF LOCHALINE			
MONM HN 88.0 AML	19:56	01.63	9 0.76	STAT CO DIST PHAS WT P HrMn SECS AMPL PERI RES			
MONM HE 88.0 AML	19:56	06.54	9 0.32	KSB EZ 70.8 EP	11:33	17.69	-0.42
SKP EZ 99.2 EP	19:56	11.99	20.50	KPL HZ 84.2 EP	11:33	20.20	0.09
MCH1 HZ 110.0 EP	19:55	53.44	0.26	KPL HE 84.2 ES	11:33	30.30	0.05
MCH1 HE 110.0 ES	19:56	06.72	-0.07	KPL HE 84.2 AML	11:33	34.01	48 0.16
MCH1 HE 110.0 AML	19:56	09.07	6 0.26	KPL HN 84.2 AML	11:33	34.03	31 0.22
MCH1 HN 110.0 AML	19:56	10.06	8 0.50	KAC EZ 104.0 EP	11:33	23.39	0.21
HLM1 HZ 156.0 EP	19:56	00.17	0.11	PGB1 HZ 111.0 EP	11:33	24.33	0.02
HLM1 HN 156.0 ES	19:56	17.95	-0.74	PGB1 HN 111.0 ES	11:33	37.51	-0.01
HLM1 HN 156.0 AML	19:56	20.30	15 0.28	PGB1 HN 111.0 AML	11:33	38.74	15 0.24
HLM1 HE 156.0 AML	19:56	20.43	22 0.38	PGB1 HE 111.0 AML	11:33	39.07	15 0.52
DYA HZ 162.0 EP	19:56	00.20	-0.73	MDO EZ 122.0 EP	11:33	26.10	0.04
DYA HE 162.0 ES	19:56	20.43	0.24	MVH1 EZ 173.0 EP	11:33	33.89	0.78
DYA HE 162.0 AML	19:56	21.67	6 0.16	ESK HZ 206.0 EP	11:33	36.57	-0.76
DYA HN 162.0 AML	19:56	26.79	5 0.28	ESK HN 206.0 AML	11:34	04.24	4 0.18
LPW BZ 174.0 EP	19:56	03.10	0.56	ESK HE 206.0 AML	11:34	06.71	6 0.48
LPW BE 174.0 ES	19:56	23.14	0.15				
LPW BE 174.0 AML	19:56	25.20	8 0.25	July 12 2010	Time: 17:45 23.6	UTC	Magnitude: 1.2 ML
LPW BN 174.0 AML	19:56	25.83	6 0.10	Lat: 52.439N	Lon: -4.706W		Depth: 4.7 km
HTL HZ 176.0 EP	19:56	02.41	-0.42	Grid Ref: 216.09 kmE	285.82 kmN		RMS: 0.30 secs
HTL HE 176.0 ES	19:56	23.87	0.39	Locality: CARDIGAN BAY			
HTL HE 176.0 AML	19:56	26.01	11 0.56	Velocity model: Lownet	Xnear: 100.0	Xfar: 200.0	
HTL HN 176.0 AML	19:56	26.88	12 0.58	Comment: 40KM W OF ABERYSTWYTH			
June 28 2010	Time: 20:34 54.8	UTC	Magnitude: 1.9 ML	STAT CO DIST PHAS WT P HrMn SECS AMPL PERI RES			
Lat: 53.513N	Lon: -0.636W		Depth: 9.3 km	LPW BZ 56.6 EP	17:45	33.17	-0.24
Grid Ref: 490.44 kmE	402.71 kmN		RMS: 0.40 secs	LPW BE 56.6 ES	17:45	40.22	-0.36
Locality: SCUNTHORPE,NORTH LINC'S				LPW BN 56.6 AML	17:45	34.14	17 0.30
Velocity model: Lownet	Xnear: 150.0	Xfar: 300.0		LPW BE 56.6 AML	17:45	40.56	18 0.25
Comment: 7KM S OF SCUNTHORPE				YRE EZ 63.3 EP	17:45	34.34	-0.13
				YLL EZ 86.0 EP	17:45	38.00	0.01
				YRC EZ 90.8 EP	17:45	38.70	-0.01
				WPML EZ 106.0 EP	17:45	41.16	0.04
				WME EZ 110.0 EP	17:45	41.51	-0.19
				FOEL HZ 114.0 EP	17:45	42.74	0.42
				FOEL HN 114.0 AML	17:46	07.27	8 0.70
				FOEL HE 114.0 AML	17:46	07.75	3 0.40
				HLM1 HZ 124.0 EP	17:45	44.41	0.43
				HLM1 HE 124.0 AML	17:45	52.71	8 0.18
				HLM1 HN 124.0 AML	17:46	09.51	6 0.52
				MCH1 HZ 127.0 EP	17:45	44.54	0.24
				MCH1 HE 127.0 AML	17:46	06.21	4 0.30
				MCH1 HN 127.0 AML	17:46	10.32	4 0.40
				HTL HZ 161.0 EP	17:45	50.08	0.81
				HEX EZ 165.0 EP	17:45	50.18	0.38
June 30 2010	Time: 00:35 32.2	UTC	Magnitude: 2.0 ML	July 14 2010	Time: 10:09 42.2	UTC	Magnitude: 1.3 ML
Lat: 53.584N	Lon: -1.060W		Depth: 1.5 km	Lat: 57.087N	Lon: -5.678W		Depth: 3.7 km
Grid Ref: 462.22 kmE	410.15 kmN		RMS: 0.40 secs	Grid Ref: 171.73 kmE	805.84 kmN		RMS: 0.30 secs
Locality: DONCASTER,S YORKSHIRE				Locality: KNOYDART,HIGHLAND			
Velocity model: Lownet	Xnear: 100.0	Xfar: 300.0		Velocity model: Lownet	Xnear: 75.0	Xfar: 200.0	
Comment: C/F,FELT DONCASTER			Intensity: 4	STAT CO DIST PHAS WT P HrMn SECS AMPL PERI RES			
				KSB EZ 25.0 EP	10:09	47.19	-0.24
				KPL HZ 28.9 EP	10:09	47.74	-0.28
				KPL HN 28.9 ES	10:09	52.25	-0.03
				KPL HN 28.9 AML	10:09	53.16	19 0.14
				KPL HE 28.9 AML	10:09	54.48	20 0.24
				KAC EZ 53.9 EP	10:09	52.77	0.51
				MDO EZ 93.4 EP	10:09	58.35	-0.08
				MVH1 EZ 133.0 EP	10:10	04.76	0.21
				MCD EN 161.0 ES	10:10	28.14	0.30
				PGB1 HE 163.0 AML	10:10	48.82	11 0.16
				PGB1 HN 163.0 AML	10:10	48.93	12 0.16
June 30 2010	Time: 10:22 39.7	UTC	Magnitude: 2.0 ML	July 15 2010	Time: 10:22 39.7	UTC	Magnitude: 2.0 ML
Lat: 51.896N	Lon: -0.639W		Depth: 14.3 km	Lat: 51.896N	Lon: -0.639W		Depth: 14.3 km
Grid Ref: 493.64 kmE	222.86 kmN		RMS: 0.30 secs	Grid Ref: 493.64 kmE	222.86 kmN		RMS: 0.30 secs
Locality: DUNSTABLE,BEDFORDSHIRE				Locality: DUNSTABLE,BEDFORDSHIRE			
Velocity model: Lownet	Xnear: 125.0	Xfar: 250.0		Velocity model: Lownet	Xnear: 125.0	Xfar: 250.0	
Comment: 8KM W OF DUNSTABLE				STAT CO DIST PHAS WT P HrMn SECS AMPL PERI RES			
				SWN1 HZ 90.9 EP	10:22	54.20	-0.31
				SWN1 HN 90.9 ES	10:23	05.61	0.28
				SWN1 HN 90.9 AML	10:23	06.14	149 0.38
				SWN1 HE 90.9 AML	10:23	06.19	97 0.14
				STRD HZ 106.0 EP	10:22	56.81	0.17
				STRD HE 106.0 ES	10:23	08.93	-0.11
				STRD HN 106.0 AML	10:23	10.95	73 0.44
				STRD HE 106.0 AML	10:23	11.69	72 0.38
				BATH HZ 127.0 EP	10:23	00.16	0.47
				BATH HN 127.0 ES	10:23	13.85	-0.45
				OLDB HN 134.0 ES	10:23	16.17	0.13
				MONM HZ 149.0 EP	10:23	02.85	0.02
				MONM HN 149.0 ES	10:23	19.69	-0.05
				MONM HN 149.0 AML	10:23	20.99	45 0.18
				MONM HE 149.0 AML	10:23	21.47	27 0.26
				MCH1 HZ 163.0 EP	10:23	04.01	-0.54
				MCH1 HN 163.0 ES	10:23	23.05	0.34
				MCH1 HE 163.0 ES	10:23	23.08	
				MCH1 HE 163.0 AML	10:23	24.15	28 0.18
				MCH1 HN 163.0 AML	10:23	24.68	18 0.24
				HLM1 HZ 168.0 EP	10:23	05.15	-0.14
				HLM1 HN 168.0 ES	10:23	24.04	0.05
				HLM1 HE 168.0 AML	10:23	24.81	10 0.26
				HLM1 HN 168.0 AML	10:23	26.45	11 0.16
July 20 2010	Time: 19:35 48.1	UTC	Magnitude: 1.4 ML	July 20 2010	Time: 19:35 48.1	UTC	Magnitude: 1.4 ML
Lat: 50.095N	Lon: -2.226W		Depth: 5.0 km	Lat: 50.095N	Lon: -2.226W		Depth: 5.0 km
Grid Ref: 383.84 kmE	21.75 kmN		RMS: 0.60 secs	Grid Ref: 383.84 kmE	21.75 kmN		RMS: 0.60 secs
Locality: ENGLISH CHANNEL				Locality: ENGLISH CHANNEL			
Velocity model: Lownet	Xnear: 150.0	Xfar: 300.0		Velocity model: Lownet	Xnear: 150.0	Xfar: 300.0	
Comment: 60KM SSE OF WEYMOUTH				STAT CO DIST PHAS WT P HrMn SECS AMPL PERI RES			
				JLP EZ 94.5 EP	19:36	03.46	-0.34
				JQE EZ 100.0 EP	19:36	04.39	-0.32
				JSA HZ 101.0 EP	19:36	04.40	-0.38
July 3 2010	Time: 11:33 06.2	UTC	Magnitude: 1.5 ML	July 3 2010	Time: 11:33 06.2	UTC	Magnitude: 1.5 ML
Lat: 56.583N	Lon: -5.618W		Depth: 7.6 km	Lat: 56.583N	Lon: -5.618W		Depth: 7.6 km
Grid Ref: 177.84 kmE	749.30 kmN		RMS: 0.20 secs	Grid Ref: 177.84 kmE	749.30 kmN		RMS: 0.20 secs
Locality: LOCHALINE,HIGHLAND				Locality: LOCHALINE,HIGHLAND			

TABLE 2 : PHASE DATA

ESK HE 18.8 AML 07:50 41.39 16 0.10	MONM HZ 343.0 EP 01:54 15.04 0.09
ESK HN 18.8 AML 07:50 42.39 17 0.22	GALL HZ 375.0 EP 01:54 18.52 -0.40
BHH SZ 23.7 EP 07:50 39.60 0.23	DRUM HZ 389.0 EP 01:54 20.65 0.00
BHH SN 23.7 ES 07:50 42.60 -0.11	EAB EZ 413.0 EP 01:54 23.75 0.10
BHH SE 23.7 AML 07:50 42.73 40 0.18	GMM EZ 447.0 EP 01:54 27.86 0.06
BHH SN 23.7 AML 07:50 42.74 44 0.16	
GALL HZ 89.6 EP 07:50 49.77 0.11	December 7 2010 Time: 08:27 28.8 UTC Magnitude: 0.7 ML
GALL HN 89.6 ES 07:51 00.27 -0.24	Lat: 55.249N Lon: -3.475W
GALL HN 89.6 AML 07:51 01.00 3 0.30	Grid Ref: 306.24 kmE 595.98 kmN
GALL HE 89.6 AML 07:51 01.75 2 0.50	Locality: JOHNSTONEBRIDGE,D & G
	Velocity model: Lownet Xnear: 80.0 Xfar: 100.0
November 26 2010 Time: 17:57 09.2 UTC Magnitude: 1.4 ML	STAT CO DIST PHAS WT P HrMn SECS AMPL PERI RES
Lat: 55.229N Lon: -3.486W	BWH SZ 14.0 EP 08:27 31.78 -0.04
Grid Ref: 305.50 kmE 593.77 kmN	ESK HZ 18.7 IP C 08:27 32.79 0.20
Locality: JOHNSTONEBRIDGE,D & G	ESK HN 18.7 ES 08:27 35.10 -0.23
Velocity model: Lownet Xnear: 80.0 Xfar: 100.0	ESK HE 18.7 AML 08:27 35.51 17 0.12
STAT CO DIST PHAS WT P HrMn SECS AMPL PERI RES	ESK HN 18.7 AML 08:27 36.45 16 0.22
BWH SZ 12.3 EP 17:57 12.03 0.18	BHH SZ 23.8 EP 08:27 33.70 0.28
BWH SZ 12.3 ES 17:57 13.73 -0.04	BHH SE 23.8 ES 08:27 36.61 -0.17
ESK HZ 20.3 IP C 17:57 13.10 -0.09	BHH SE 23.8 AML 08:27 36.83 38 0.18
ESK HE 20.3 ES 17:57 15.56 -0.53	BHH SN 23.8 AML 08:27 36.84 48 0.16
ESK HE 20.3 AML 17:57 15.80 86 0.10	GALL HZ 89.7 EP 08:27 43.82 0.13
ESK HN 20.3 AML 17:57 16.86 82 0.22	GALL HN 89.7 ES 08:27 54.23 -0.31
BHH SZ 22.8 EP 17:57 13.98 0.38	GALL HE 89.7 AML 08:27 55.02 1 0.28
BHH SE 22.8 ES 17:57 16.98 0.18	GALL HN 89.7 AML 08:27 55.08 2 0.24
BHH SE 22.8 AML 17:57 17.17 154 0.10	
BHH SN 22.8 AML 17:57 17.18 175 0.13	December 14 2010 Time: 12:34 35.3 UTC Magnitude: 1.0 ML
EDI HZ 79.5 EP 17:57 22.77 0.16	Lat: 52.075N Lon: -3.397W
EDI HE 79.5 ES 17:57 32.38 -0.01	Grid Ref: 304.27 kmE 242.82 kmN
EDI HE 79.5 AML 17:57 33.60 17 0.19	Locality: BUILTH WELLS,POWYS
EDI HN 79.5 AML 17:57 33.74 31 0.29	Velocity model: Mid Wales Xnear: 80.0 Xfar: 200.0
GALL HZ 88.1 IP C 17:57 23.70 -0.24	STAT CO DIST PHAS WT P HrMn SECS AMPL PERI RES
GALL HN 88.1 ES 17:57 33.83 -0.87	MCH1 HZ 28.7 EP 12:34 40.30 -0.04
GALL HE 88.1 AML 17:57 35.19 5 0.19	MCH1 HE 28.7 ES 12:34 44.12 0.12
GALL HN 88.1 AML 17:57 35.51 11 0.27	MCH1 HN 28.7 AML 12:34 44.22 48 0.10
PGB1 HZ 90.4 EP 17:57 24.86 0.55	MCH1 HE 28.7 AML 12:34 44.25 52 0.16
PGB1 HE 90.4 ES 17:57 35.28 -0.05	LPW BZ 46.2 EP 12:34 43.27 0.04
PGB1 HN 90.4 AML 17:57 38.16 15 0.18	LPW BN 46.2 ES 12:34 48.87 -0.09
PGB1 HE 90.4 AML 17:57 38.19 24 0.21	LPW BE 46.2 AML 12:34 49.08 25 0.10
ESY EZ 94.3 EP 17:57 25.31 0.37	LPW BN 46.2 AML 12:34 49.09 32 0.15
	MONM HZ 48.5 EP 12:34 43.55 -0.06
November 26 2010 Time: 18:19 27.6 UTC Magnitude: 0.2 ML	MONM HN 48.5 ES 12:34 49.58 -0.03
Lat: 55.246N Lon: -3.475W	MONM HE 48.5 AML 12:34 49.77 7 0.28
Grid Ref: 306.24 kmE 595.64 kmN	MONM HN 48.5 AML 12:34 52.25 6 0.54
Locality: JOHNSTONEBRIDGE,D & G	HLM1 HZ 60.6 EP 12:34 45.75 0.12
Velocity model: Lownet Xnear: 80.0 Xfar: 100.0	HLM1 HE 60.6 ES 12:34 52.86 -0.24
STAT CO DIST PHAS WT P HrMn SECS AMPL PERI RES	HLM1 HN 60.6 AML 12:34 53.40 3 0.18
BWH SZ 13.8 EP 18:19 30.46 -0.05	HLM1 HE 60.6 AML 12:34 53.64 6 0.18
ESK HZ 18.9 IP C 18:19 31.46 0.10	STRD HZ 91.2 EP 12:34 50.68 0.00
ESK HE 18.9 ES 18:19 33.98 -0.11	FOEL HZ 91.6 EP 12:34 50.92 0.16
ESK HE 18.9 AML 18:19 34.17 4 0.11	FOEL HN 91.6 ES 12:35 01.98 0.06
ESK HN 18.9 AML 18:19 35.20 4 0.18	FOEL HE 91.6 AML 12:35 02.09 3 0.24
BHH SZ 23.6 EP 18:19 32.36 0.21	FOEL HN 91.6 AML 12:35 03.26 6 0.50
BHH SE 23.6 ES 18:19 35.34 -0.11	
BHH SE 23.6 AML 18:19 35.47 8 0.18	December 14 2010 Time: 18:52 15.9 UTC Magnitude: 0.6 ML
BHH SN 23.6 AML 18:19 35.48 12 0.18	Lat: 54.758N Lon: -3.151W
GALL HZ 89.6 EP 18:19 42.49 -0.11	Grid Ref: 325.94 kmE 540.96 kmN
	Locality: WIGTON,CUMBRIA
December 1 2010 Time: 02:48 49.4 UTC Magnitude: 1.4 ML	Velocity model: Borders Xnear: 100.0 Xfar: 200.0
Lat: 55.834N Lon: -6.319W	STAT CO DIST PHAS WT P HrMn SECS AMPL PERI RES
Grid Ref: 129.60 kmE 668.52 kmN	KESW HZ 19.1 IP D 18:52 19.68 -0.04
Locality: ISLAY,ARGYLL & BUTE	KESW HN 19.1 ES 18:52 22.18 -0.23
Velocity model: Lownet Xnear: 150.0 Xfar: 300.0	KESW HN 19.1 AML 18:52 22.60 11 0.10
STAT CO DIST PHAS WT P HrMn SECS AMPL PERI RES	KESW HE 19.1 AML 18:52 22.63 26 0.15
PGB1 HZ 115.0 EP 02:49 08.18 0.11	BHH SZ 37.5 EP 18:52 23.01 0.31
PGB1 HE 115.0 ES 02:49 22.03 0.30	BHH SE 37.5 ES 18:52 27.81 0.31
PGB1 HN 115.0 AML 02:49 22.86 20 0.24	BHH SE 37.5 AML 18:52 28.04 14 0.40
PGB1 HE 115.0 AML 02:49 23.76 14 0.22	BHH SN 37.5 AML 18:52 28.42 11 0.24
EAB EZ 130.0 EP 02:49 09.55 -0.63	SLPK EZ 42.2 EP 18:52 23.51 0.08
GALL HZ 148.0 EP 02:49 13.23 0.42	SLPK HE 42.2 ES 18:52 28.83 0.07
GALL HE 148.0 ES 02:49 29.42 -0.51	ESK HZ 62.2 EP 18:52 26.71 -0.01
GALL HN 148.0 AML 02:49 31.74 4 0.18	ESK HN 62.2 ES 18:52 33.87 -0.52
GALL HE 148.0 AML 02:49 31.92 5 0.17	ESK HE 62.2 AML 18:52 34.76 4 0.08
KPL HZ 172.0 EP 02:49 16.01 -0.06	ESK HN 62.2 AML 18:52 34.79 4 0.18
KPL HE 172.0 AML 02:49 39.07 5 0.44	GALL HZ 101.0 EP 18:52 33.08 0.07
KPL HN 172.0 AML 02:49 44.44 3 0.82	GALL HN 101.0 ES 18:52 44.88 -0.25
ESK HZ 205.0 EP 02:49 21.02 0.87	GALL HN 101.0 AML 18:52 45.87 2 0.17
ESK HN 205.0 AML 02:49 47.28 4 0.36	GALL HE 101.0 AML 18:52 46.97 1 0.19
ESK HE 205.0 AML 02:49 50.72 3 0.32	WIM EZ 120.0 EP 18:52 36.44 0.31
December 4 2010 Time: 01:53 28.2 UTC Magnitude: 2.6 ML	December 15 2010 Time: 10:27 25.2 UTC Magnitude: 2.2 ML
Lat: 53.982N Lon: 0.871W	Lat: 50.007N Lon: -0.557W
Grid Ref: 588.23 kmE 457.83 kmN	Grid Ref: 503.39 kmE 12.94 kmN
Locality: SOUTHERN NORTH SEA	Locality: ENGLISH CHANNEL
Velocity model: North Sea Xnear: 400.0 Xfar: 600.0	Velocity model: Lownet Xnear: 500.0 Xfar: 1000.0
STAT CO DIST PHAS WT P HrMn SECS AMPL PERI RES	Comment: 95KM SSW OF BRIGHTON
LMK HZ 98.3 EP 01:53 43.98 0.02	STAT CO DIST PHAS WT P HrMn SECS AMPL PERI RES
LMK HN 98.3 AML 01:53 59.04 371 0.30	JDG EZ 141.0 EP 10:27 47.58 -0.29
LMK HE 98.3 AML 01:53 59.36 620 0.26	JDG EN 141.0 ES 10:28 04.68 0.27
CWF HZ 200.0 EP 01:53 57.08 -0.12	JDC EZ 141.0 EP 10:27 47.40 -0.48
CWF HN 200.0 AML 01:54 24.93 23 0.28	JDC EN 141.0 ES 10:28 04.68 0.26
CWF HE 200.0 AML 01:54 25.40 36 0.26	JSA HZ 148.0 EP 10:27 48.80 -0.15
SSW EZ 289.0 EP 01:54 08.31 0.07	JSA HN 148.0 ES 10:28 06.94 0.66
FOEL HZ 297.0 EP 01:54 09.42 0.26	JSA HE 148.0 AML 10:28 08.49 38 0.40
FOEL HN 297.0 AML 01:54 55.11 46 0.40	JSA HN 148.0 AML 10:28 08.65 39 0.22
FOEL HE 297.0 AML 01:54 56.44 16 0.60	ELSH HZ 175.0 EP 10:27 52.96 0.30
HLM1 HZ 299.0 EP 01:54 09.60 0.18	ELSH HE 175.0 ES 10:28 13.11 0.41
HLM1 HN 299.0 AML 01:54 57.20 27 0.46	ELSH HN 175.0 AML 10:28 17.20 23 0.98
HLM1 HE 299.0 AML 01:54 57.53 27 0.94	ELSH HE 175.0 AML 10:28 19.87 20 0.18
ESK HZ 302.0 EP 01:54 09.60 -0.23	DYA HZ 245.0 EP 10:28 00.65 -0.91
ESK HN 302.0 ES 01:54 40.22 0.03	DYA HE 245.0 ES 10:28 28.99 0.90
ESK HN 302.0 AML 01:54 54.72 8 0.22	DYA HN 245.0 AML 10:28 35.44 21 0.20
ESK HE 302.0 AML 01:54 55.92 9 0.50	DYA HE 245.0 AML 10:28 36.99 15 0.40
ESY EZ 310.0 EP 01:54 10.93 0.08	CCA1 HZ 335.0 EP 10:28 11.73 -0.97
STRD HZ 319.0 EP 01:54 11.78 -0.18	
EDI HZ 338.0 EP 01:54 14.47 0.19	December 15 2010 Time: 14:09 45.1 UTC Magnitude: 1.5 ML
MCH1 HZ 341.0 EP 01:54 14.53 -0.12	Lat: 49.872N Lon: -0.498W
	Depth: 5.0 km

TABLE 2 : PHASE DATA

Grid Ref: 507.92 kmE -1.98 kmN RMS: 0.40 secs Locality: ENGLISH CHANNEL Velocity model: Lownet Xnear: 500.0 Xfar: 1000.0 Comment: 105KM SSW OF BRIGHTON										MCD EZ 544.0 EP 12:31 25.30 -0.38 MCD EE 544.0 AML 12:32 37.79 41 0.36 MCD EN 544.0 AML 12:32 38.22 34 0.52 MM1L EZ 546.0 EP 12:31 26.04 0.09 DRUM HZ 551.0 EP 12:31 26.73 0.22 DRUM HN 551.0 ES 12:32 20.01 0.28 DRUM HE 551.0 AML 12:32 28.07 66 0.50 DRUM HN 551.0 AML 12:32 28.31 58 0.56 MVH1 EZ 573.0 EP 12:31 28.73 -0.61 EDU EZ 601.0 EP 12:31 32.89 0.04 MDO EZ 609.0 EP 12:31 33.02 -0.74 ESY EZ 634.0 EP 12:31 36.45 -0.37 EDI HN 658.0 ES 12:32 42.89 0.18 EDI HE 658.0 AML 12:32 49.68 47 0.56 EDI HN 658.0 AML 12:32 51.18 68 0.62 KSB EZ 677.0 EP 12:31 41.32 -0.88 KPL HE 682.0 AML 12:32 54.28 16 0.54 KPL HN 682.0 AML 12:32 59.35 13 0.88 EAB EZ 689.0 EP 12:31 44.44 0.68 ESK HZ 708.0 EP 12:31 46.55 0.44 ESK HE 708.0 ES 12:32 53.97 0.32 ESK HN 708.0 ES 12:32 55.33 ESK HN 708.0 AML 12:33 02.46 23 0.48 ESK HE 708.0 AML 12:33 06.87 26 0.60									
December 18 2010 Time: 06:19 09.0 UTC Magnitude: 2.2 ML Lat: 57.462N Lon: -5.936W Depth: 3.7 km Grid Ref: 163.97 kmE 848.12 kmN RMS: 0.50 secs Locality: APPLECROSS, HIGHLAND Velocity model: Lownet Xnear: 100.0 Xfar: 300.0 Comment: 8KM NW OF APPLECROSS										December 21 2010 Time: 22:59 12.7 UTC Magnitude: 3.5 ML Lat: 54.390N Lon: -3.146W Depth: 12.6 km Grid Ref: 325.59 kmE 500.01 kmN RMS: 0.60 secs Locality: CONISTON, CUMBRIA Velocity model: Lownet Xnear: 100.0 Xfar: 200.0 Comment: FELT CUMBRIA ... Intensity: 5									
STAT CO DIST PHAS WT P HrMn SECS AMPL PERI RES KPL HZ 21.8 IP C 06:19 13.25 0.07 KPL HN 21.8 ES 06:19 15.60 -0.62 KPL HE 21.8 AML 06:19 15.64 121 0.46 KPL HN 21.8 AML 06:19 16.32 111 0.24 KAC EZ 38.4 IP C 06:19 16.25 0.22 KAC EZ 38.4 ES 06:19 20.79 -0.37 KSB EZ 41.8 IP C 06:19 16.55 -0.09 RRR SZ 44.8 EP 06:19 16.91 -0.17 RRR SN 44.8 ES 06:19 22.42 -0.54 RRR SE 44.8 AML 06:19 22.60 203 0.26 RRR SN 44.8 AML 06:19 22.77 114 0.10 RRR SZ 67.9 EP 06:19 20.17 -0.58 MDO EZ 94.4 EP 06:19 25.11 0.19 MDO EZ 94.4 ES 06:19 36.09 -0.45 RSC SZ 109.0 EP 06:19 27.74 0.67 MVH1 EZ 117.0 IP D 06:19 28.55 0.24 MCD EZ 161.0 EP 06:19 36.02 1.11 MCD EE 161.0 AML 06:19 56.34 121 0.20 MCD EN 161.0 AML 06:19 56.37 68 0.20 BIGH HZ 166.0 EP 06:19 36.78 1.24 BIGH HN 166.0 AML 06:19 57.09 158 0.14 BIGH HE 166.0 AML 06:19 57.11 99 0.10 EAB EZ 172.0 EP 06:19 36.75 0.29 MM1L EZ 179.0 EP 06:19 37.69 0.26 PGB1 HZ 204.0 EP 06:19 40.67 0.20 PGB1 HE 204.0 AML 06:20 10.55 24 0.64 PGB1 HN 204.0 AML 06:20 11.04 24 0.68 EDU EZ 205.0 EP 06:19 41.16 0.57 DRUM HZ 217.0 EP 06:19 42.45 0.34 DRUM HN 217.0 AML 06:20 16.62 25 0.36 DRUM HE 217.0 AML 06:20 17.51 23 0.36 ESK HZ 292.0 EP 06:19 51.57 0.07 ESK HN 292.0 AML 06:20 34.95 7 0.58 ESK HE 292.0 AML 06:20 35.36 7 0.72										STAT CO DIST PHAS WT P HrMn SECS AMPL PERI RES KESW HZ 22.3 EP 22:59 16.96 -0.31 KESW HZ 22.3 AMPG 22:59 17.01 177 0.06 KESW HN 22.3 ES 22:59 19.76 -0.81 KESW HZ 22.3 AMSG 22:59 20.32 4786 0.34 KESW HT 22.3 AMSG 22:59 20.33 14800 0.28 KESW HR 22.3 AMSG 22:59 20.38 5731 0.30 KESW HE 22.3 AML 22:59 20.40 14244 0.32 KESW HN 22.3 AML 22:59 20.50 7450 0.30 SLPK EZ 22.8 IP C 22:59 17.23 -0.06 SLPK EZ 22.8 AMPG 22:59 17.31 4956 0.09 SLPK EN 22.8 ES 22:59 20.37 -0.24 SLPK ER 22.8 AMSG 22:59 20.67 15212 0.13 SLPK ET 22.8 AMSG 22:59 20.74 29605 0.18 SLPK EZ 22.8 AMSG 22:59 20.78 8363 0.14 SLPK EE 22.8 AML 22:59 20.81 20398 0.15 SLPK EN 22.8 AML 22:59 20.89 22394 0.14 BCC EZ 69.8 EP 22:59 25.06 0.59 BCC EN 69.8 ES 22:59 32.91 -0.11 BCC EE 69.8 AML 22:59 34.08 4413 0.28 BCC EN 69.8 AML 22:59 35.70 1255 0.22 BHH SZ 78.4 IP D 22:59 26.21 0.39 BHH SN 78.4 ES 22:59 35.71 0.35 BHH SN 78.4 AML 22:59 36.39 3056 0.46 BHH SE 78.4 AML 22:59 39.05 2453 0.32 BWH SZ 93.4 IP D 22:59 28.69 0.54 WIM EZ 103.0 EP 22:59 30.13 0.53 ESK HZ 103.0 IP D 22:59 29.75 0.17 ESK HE 103.0 ES 22:59 41.38 -0.49 ESK HN 103.0 AML 22:59 43.67 659 0.07 ESK HE 103.0 AML 22:59 44.93 937 0.24 GAL1 HZ 114.0 EP C 22:59 31.20 0.08 GAL1 HN 114.0 ES 22:59 44.33 -0.20 GAL1 HE 114.0 AML 22:59 44.94 707 0.38 GAL1 HN 114.0 AML 22:59 45.92 1200 0.26 WME EZ 134.0 EP C 22:59 34.65 0.67 WPM1 EZ 136.0 IP C 22:59 35.04 0.82 WLF1 HZ 148.0 EP C 22:59 34.60 -1.28 WLF1 HE 148.0 ES 22:59 51.21 -1.56 WLF1 HE 148.0 AML 22:59 54.73 721 0.23 WLF1 HN 148.0 AML 22:59 56.89 522 0.22 YRC EZ 158.0 EP C 22:59 37.69 0.35 FOEL HZ 167.0 EP 22:59 37.57 -1.01 FOEL HE 167.0 ES 22:59 55.52 -1.91 FOEL HE 167.0 AML 23:00 02.84 726 0.66 FOEL HN 167.0 AML 23:00 03.14 1114 0.64 EDI HZ 171.0 EP 22:59 38.44 -0.53 EDI HN 171.0 AML 23:00 02.70 538 0.31 EDI HE 171.0 AML 23:00 02.74 635 0.32 YRE EZ 178.0 IP C 22:59 40.56 0.65 PGB1 HZ 180.0 EP 22:59 39.40 -0.72 PGB1 HE 180.0 AML 23:00 02.77 449 0.52 PGB1 HN 180.0 AML 23:00 09.61 440 0.40 HLM1 HZ 209.0 EP 22:59 43.00 -0.82 HLM1 HE 209.0 ES 23:00 04.90 -1.61 HLM1 HN 209.0 AML 23:00 11.43 325 0.58 HLM1 HE 209.0 AML 23:00 13.03 450 0.32 EAB EZ 214.0 EP 22:59 43.50 -0.92 CWF HZ 220.0 EP 22:59 44.69 -0.51 CWF HN 220.0 AML 23:00 16.58 155 0.22 CWF HE 220.0 AML 23:00 18.67 207 0.46 LPW BZ 261.0 EP 22:59 49.39 -0.81 LPW BN 261.0 AML 23:00 25.06 335 0.30 LPW BE 261.0 AML 23:00 26.63 340 0.24 MCH1 HZ 266.0 IP D 22:59 50.64 -0.31 MCH1 HE 266.0 ES 23:00 17.87 -0.97 MCH1 HN 266.0 AML 23:00 27.42 227 0.42 MCH1 HE 266.0 AML 23:00 36.19 228 0.50 MONM HZ 285.0 EP 22:59 52.95 -0.28 STRD HZ 298.0 EP 22:59 54.82 -0.11 OLDB HZ 306.0 EP 22:59 55.67 -0.22 BATH HZ 333.0 EP 22:59 59.20 0.00 SWN1 HZ 333.0 EP 22:59 59.57 0.35 SWN1 HE 333.0 AML 23:00 56.21 248 0.54 SWN1 HN 333.0 AML 23:00 57.86 258 0.56 MDO EZ 348.0 EP 23:00 00.35 -0.85									
December 20 2010 Time: 00:43 25.0 UTC Magnitude: 3.4 ML Lat: 59.871N Lon: 5.067W Depth: 10.0 km Grid Ref: 795.18 kmE 1130.60 kmN RMS: 0.40 secs Locality: NORWEGIAN COAST Velocity model: North Sea Xnear: 750.0 Xfar: 1500.0										STAT CO DIST PHAS WT P HrMn SECS AMPL PERI RES YEL1 EZ 349.0 EP 00:44 12.69 -0.21 LRW HZ 350.0 EP 00:44 13.35 0.41 LRW HN 350.0 AML 00:45 11.74 23 0.44 LRW HE 350.0 AML 00:45 13.27 24 0.62 SAN1 EZ 353.0 EP 00:44 13.32 -0.02 WALL EZ 375.0 EP 00:44 16.04 -0.01 BIGH HZ 535.0 EP 00:44 35.53 -0.47 BIGH HN 535.0 ES 00:45 28.04 0.22 BIGH HN 535.0 AML 00:45 34.28 48 0.46 BIGH HE 535.0 AML 00:45 35.06 41 0.72 MCD EZ 545.0 EP 00:44 37.64 0.44 MCD EE 545.0 AML 00:45 38.51 26 0.46 MCD EN 545.0 AML 00:45 41.56 27 0.58 MM1L EZ 546.0 EP 00:44 37.46 0.02 DRUM HZ 551.0 EP 00:44 37.97 0.05 DRUM HN 551.0 AML 00:45 43.18 30 0.36 DRUM HE 551.0 AML 00:45 51.51 41 0.52 MVH1 EZ 575.0 EP 00:44 40.18 -0.77 EDU EZ 601.0 EP 00:44 44.02 -0.24 ESY EZ 633.0 EP 00:44 48.04 -0.11 EDI HN 657.0 ES 00:45 53.80 -0.23 EDI HE 657.0 AML 00:45 59.35 20 0.42 EDI HN 657.0 AML 00:46 02.35 39 0.48 EAB EZ 690.0 EP 00:44 56.10 0.91 ESK HZ 707.0 AML 00:46 12.52 9 0.38 ESK HN 707.0 AML 00:46 13.85 17 0.52									
December 20 2010 Time: 12:30 13.6 UTC Magnitude: 3.8 ML Lat: 59.914N Lon: 5.010W Depth: 10.0 km Grid Ref: 791.49 kmE 1135.03 kmN RMS: 0.50 secs Locality: NORWEGIAN COAST Velocity model: North Sea Xnear: 750.0 Xfar: 1500.0										STAT CO DIST PHAS WT P HrMn SECS AMPL PERI RES YEL1 EZ 345.0 EP 12:31 01.18 0.23 LRW HZ 346.0 EP 12:31 01.77 0.71 SAN1 EZ 349.0 EP 12:31 01.69 0.21 WALL EZ 371.0 EP 12:31 04.56 0.40 BIGH HZ 533.0 EP 12:31 23.91 -0.42 BIGH HN 533.0 ES 12:32 15.59 -0.38 BIGH HN 533.0 AML 12:32 23.59 101 0.58 BIGH HE 533.0 AML 12:32 23.64 88 0.48									

TABLE 2 : PHASE DATA

MCD	EZ	356.0	EP	23:00	01.09				-1.02	MCD	EE	603.0	AML	05:15	29.57	21	0.56		
MCD	EN	356.0	AML	23:00	55.62	165	0.36			MCD	EN	603.0	AML	05:15	30.48	13	0.32		
MCD	EE	356.0	AML	23:00	58.12	140	0.78			EDI	HZ	624.0	EP	05:14	31.48				0.21
HTL	HZ	389.0	EP	23:00	05.73				-0.45	EDI	HN	624.0	ES	05:15	30.40				0.16
MVH1	EZ	399.0	EP	23:00	06.01				-1.49	EDI	HE	624.0	AML	05:15	39.40	14	0.42		
										EDI	HN	624.0	AML	05:15	40.03	28	0.42		
December 22 2010	Time:	05:13	10.5	UTC				Magnitude:	3.5	ML	ESK	HZ	647.0	EP	05:14	33.63			-0.55
Lat:	57.119N	Lon:	6.727W					Depth:	23.6	km	ESK	HN	647.0	ES	05:15	34.98			-0.30
Grid Ref:	927.56	kmE	836.93	kmN				RMS:	0.30	secs	ESK	HN	647.0	AML	05:15	39.12	19	0.22	
Locality:	EASTERN NORTH SEA										ESK	HE	647.0	AML	05:15	39.71	33	0.38	
Velocity model:	North Sea			Xnear:	750.0	Xfar:	1500.0				BIGH	HZ	650.0	EP	05:14	34.19			-0.29
Comment:	530KM EAST OF ABERDEEN										BIGH	HE	650.0	ES	05:15	36.13			0.32
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI	RES	BIGH	HE	650.0	AML	05:15	41.16	27	0.34	
DRUM	HZ	560.0	EP			05:14	23.42			0.13	BIGH	HN	650.0	AML	05:15	42.20	21	0.36	
DRUM	HN	560.0	ES			05:15	16.61			0.16	MDO	EZ	669.0	EP	05:14	37.01			0.10
DRUM	HN	560.0	AML			05:15	21.47	74	0.68		EAB	EZ	686.0	EP	05:14	39.13			0.18
DRUM	HE	560.0	AML			05:15	21.54	47	0.62		PGB1	HZ	705.0	EP	05:14	41.65			0.27
LRW	HZ	569.0	EP			05:14	24.81			0.44	PGB1	HE	705.0	ES	05:15	48.08			0.35
LRW	HE	569.0	ES			05:15	18.11			-0.20	PGB1	HN	705.0	AML	05:15	52.53	21	0.24	
LRW	HE	569.0	AML			05:15	25.62	6	0.44		PGB1	HE	705.0	AML	05:15	53.74	37	0.52	
LRW	HN	569.0	AML			05:15	33.57	6	0.38		KSB	EZ	734.0	EP	05:14	44.73			-0.25
ESY	EZ	590.0	EP			05:14	27.10			0.05	KPL	HZ	747.0	EP	05:14	46.34			-0.21
EDU	EZ	597.0	EP			05:14	28.11			0.13	KPL	HE	747.0	AML	05:16	00.94	7	0.38	
MCD	EZ	603.0	EP			05:14	28.41			-0.21	KPL	HE	747.0	AML	05:16	05.80	7	0.54	
MCD	EN	603.0	ES			05:15	25.17			-0.49									

TABLE 3

GEOGRAPHIC COORDINATES OF SEISMOGRAPH STATIONS, 2010

Code	Name	Lat	Lon	E (km)	N (km)	Ht (m)	Comp
ABA1	BACONSTHORPE	52.8884	1.1453	611.58	337.00	74	1R
AEA	EAST ANGLIA UNIV	52.6208	1.2403	619.30	307.53	45	3M
AEU	EAST ANGLIA	52.6202	1.2347	618.93	307.45	28	SMR
APAE	PACKWAY	52.3006	1.4782	637.12	272.68	58	1R
AWH	WHINBURGH	52.6297	0.9507	599.67	307.68	64	1R
AWI1	WITTON	52.8319	1.4471	632.17	331.65	46	1R
BATH	BATH	51.4429	-2.3292	377.22	171.60	131	BBR
BBH	BRUNTSHEIL	55.1333	-2.9299	340.72	582.50	216	1R
BBO1	BOTHEL	54.7367	-3.2464	319.76	538.69	209	3R
BCC1	CHAPELCROSS	55.0153	-3.2201	321.99	569.66	138	1SMR
BDL	DOBCROSS HALL	54.8030	-2.9385	339.68	545.76	157	1R
BHH	HOWATS HILL	55.0931	-3.2181	322.27	578.31	216	3R
BIGH	UPPER BIGHOUSE	58.4932	-3.9102	288.75	957.69	70	BBR
BTA	TALKIN	54.9057	-2.6844	356.12	557.00	279	3R
BWH	WARDLAW	55.1758	-3.6549	294.62	588.09	269	1R
CCA1	CARNMENELLIS	50.1866	-5.2277	169.62	36.90	210	BBR
CWF	CHARNWOOD FST	52.7385	-1.3076	446.74	315.91	203	BBR
DRUM	DRUMTOCHTY	56.9123	-2.4865	370.48	780.23	208	BBR
DYA	YADSWORTHY	50.4353	-3.9310	262.88	61.34	292	BBR
EAB	ABERFOYLE	56.1887	-4.3373	254.97	702.02	279	1R
EAU	AUCHINOON	55.8454	-3.4474	309.38	662.30	359	1R
EBH	BLACK HILL	56.2476	-3.5084	306.54	707.13	375	1R
EBL	BROAD LAW	55.7723	-3.0445	334.48	653.71	436	1R
ECK	CAULDKAINE HILL	55.1810	-3.1292	328.10	588.00	351	1R
EDI	EDINBURGH	55.9233	-3.1875	325.80	670.66	125	BBR
EDU	DUNDEE	56.5477	-3.0110	337.85	739.97	421	1R
ELO	LOGIEALMOND	56.4703	-3.7112	294.59	732.21	523	1R
ELSH	ELHAM	51.1482	1.1345	619.32	143.44	126	BBR
ESK	ESKDALEMUIR	55.3165	-3.2052	323.52	603.16	261	3MLGBBR
ESY	STONEYPATH	55.9175	-2.6141	361.62	669.55	337	1R
FOEL	FOEL WYLFA	52.8898	-3.2012	319.27	333.15	449	BBR
GAL1	GALLOWAY	54.8664	-4.7114	226.02	555.78	117	3MLGBBR
GCD	CASTLE DOUGLAS	54.8630	-3.9403	275.48	553.76	184	1R
GCL	CUSHENDALL	55.0783	-6.1264	136.66	583.77	278	1R
GMK	MULL OF KINTYRE	55.3458	-5.5934	172.19	611.64	164	1R
GMM	MTNS OF MOURNE	54.2377	-5.9498	142.66	489.67	155	1R
HEX	EXMOOR	51.0664	-3.8026	273.71	131.28	230	1R
HGH	GRAY HILL	51.6379	-2.8057	344.25	193.59	223	1R
HLM1	LONG MYND	52.5184	-2.8807	340.25	291.57	429	BBR
HMNX	HERSTMONCEUX	50.8674	0.3363	564.49	110.15	26	BBR
HPE	PEMBROKE	51.9372	-4.7746	209.29	230.21	349	1R
HPK	HAVERAH PARK	53.9581	-1.6241	424.66	451.42	233	BBR
HSA	SWANSEA	51.7500	-4.1532	251.38	207.94	293	1R
HTL	HARTLAND	50.9943	-4.4849	225.64	124.66	86	3MLGSMBBR
HTR	TREWERN HILL	52.0785	-3.2679	313.12	243.04	337	1R
INVG	INVERGELDIE	56.4273	-4.0452	273.96	727.99	279	BBR
JDC	DAM (CREST)	49.1947	-2.0469			39	SMR
JDG	DAM (GALLERY)	49.1947	-2.0469			7	SMR
JLP	LES PLATONS	49.2486	-2.1039			129	1R
JQE	QUEENS EAST	49.2000	-2.0383			58	1R
JRS	MAISON ST LOUIS	49.1922	-2.0922			56	3LGR
JSA	ST AUBINS	49.1878	-2.1717			39	BBR
JVM	VALLE D.L.MARE	49.2169	-2.2067			64	1R
KAC	ACHNASHSELLACH	57.4989	-5.2988	202.36	850.19	206	1R
KB1	BIRLEY GRANGE	53.2543	-1.5279	431.49	373.17	272	1R
KESW	KESWICK	54.5886	-3.1048	328.70	522.05	282	BBR
KEY2	KEYWORTH	52.8790	-1.0770	462.13	331.73	76	SMR
KPL	PLOCKTON	57.3391	-5.6527	180.21	833.50	13	3LGSMBBR
KSB	SHIEL BRIDGE	57.2099	-5.4214	193.40	818.40	417	1R

TABLE 3

GEOGRAPHIC COORDINATES OF SEISMOGRAPH STATIONS, 2010

Code	Name	Lat	Lon	E (km)	N (km)	Ht (m)	Comp
KSY	SYSTON	52.9642	-0.5872	494.88	341.73	121	1R
KTG1	TILBROOK GRNGE	52.3264	-0.4019	508.90	271.06	83	1R
KUF	UFFORD	52.6170	-0.3907	508.94	303.39	38	1R
KWE	WEAVER FARM	53.0164	-1.8412	410.65	346.61	328	1R
LCP	CASSOP	54.7370	-1.4744	433.84	538.14	185	1R
LHO	HOLMEFIRTH	53.5453	-1.8548	409.62	405.44	462	1R
LMK1	MARKET RASEN	53.4573	-0.3274	511.15	396.92	133	BBR
LRN	RICHMOND	54.4165	-1.8007	412.93	502.37	313	1R
LRW	LERWICK	60.1360	-1.1779	445.66	1139.27	98	3MLGBBR
LWH	WHINNY NAB	54.3338	-0.6717	486.36	493.97	277	1R
MCD	COLEBURN DISTIL	57.5828	-3.2541	325.02	855.42	293	3MLGSMR
MCH1	MICHAELCHURCH	51.9974	-2.9983	331.47	233.74	219	SMBBR
MDO	DOCHFOUR	57.4409	-4.3633	258.17	841.39	415	1R
MLA1	LATHERON	58.3055	-3.3627	320.15	935.98	188	1R
MME1	MEIKLE CAIRN	57.3149	-2.9647	341.90	825.32	475	1R
MONM	MONMOUTH	51.8396	-2.8054	344.61	215.98	145	BBR
MVH1	ACHVAICH	57.9250	-4.1825	270.75	894.90	185	1R
OLDB	OLDBURY	51.6609	-2.5514	361.95	195.94	6	BBR
PCO1	CORRIE	55.9880	-4.1002	269.00	679.21	267	1R
PGB1	GLENIFFERBRAES	55.8115	-4.4837	244.38	660.37	199	BBR
PMS1	MUIRSHIEL	55.8459	-4.7452	228.15	664.82	351	1R
POB1	OBSERVATORY	55.8458	-44299	247.88	664.06	34	MLGR
REB	EISG-BRACHAIDH	58.1194	-5.2802	206.82	919.16	100	1R
RRH	RHENIGDALE	57.9197	-6.6881	122.43	901.86	103	1R
RRR	RUBHA REIDH	57.8577	-5.8067	174.19	891.68	61	3MLGSMR
RSC	SCOURIE	58.3485	-5.1683	214.61	944.33	60	1R
RTO	TOLSTA	58.3778	-6.2092	153.95	950.93	74	1R
SAN1	SANDWICK	60.0179	-1.2392	442.41	1126.08	150	1R
SKP1	KOPHILL	51.7218	-0.8096	482.22	203.29	212	1R
SMD	MENDIPS	51.3083	-2.7170	350.03	156.88	310	1R
SOFL	SORNFELLI	62.0689	-6.9658			721	BBR
SSW	STOW-ON-WOLD	51.9667	-1.8499	410.31	229.86	291	1R
STNC	STOKE	53.0913	-2.2062	354.95	386.19	234	BBR
STRD	STROUD	51.7763	-2.1643	388.77	208.64	200	BBR
SWK	WARMINSTER	51.1483	-2.2471	382.72	138.87	266	1R
SWN1	SWINDON	51.5137	-1.8007	413.83	179.49	192	3MLGSMBBR
WAL1	WALLS	60.2564	-1.6173	421.18	1152.46	167	1R
WIM	ISLE OF MAN (South)	54.1475	-4.6738	225.39	475.73	386	1R
WLF1	LLYNFAES	53.2894	-4.3966	240.27	379.65	58	BBR
WME	MYNDD EILIAN	53.3969	-4.3032	246.88	391.40	129	1R
WPM1	PENMAENMAWR	53.2581	-3.9048	272.95	375.18	353	1R
XAL	ALLENDALE	54.8617	-2.2147	386.22	551.91	458	1R
XSO	SOURHOPE	55.4924	-2.2510	384.14	622.10	516	1R
YEL1	YELL	60.5509	-1.0830	450.29	1185.55	203	1R
YLL	LLANBERIS	53.1402	-4.1704	254.84	362.57	159	1R
YRC	RHOSCOLYN	53.2508	-4.5753	228.21	375.77	22	1R
YRE	YR EIFL	52.9810	-4.4254	237.19	345.42	197	1R

Component Codes:

- 1 Single vertical seismometer
- 3 Orthogonal set of 3 seismometers
- M Low-frequency microphone
- LG Single low-gain vertical seismometer
- SM Strong motion seismometers
- BB Broadband Instrument
- R Station coordinates registered with the International Seismological Centre (ISC), England and the National Earthquake Information Centre (NEIC), USA

TABLE 4**Depth / crustal velocity models used in earthquake locations**

Structural area	Depth to top of layer (km)	P-wave velocity (km/sec)	Vp/Vs
North Sea	0.00	6.20	1.73
	12.00	6.50	
	23.00	7.10	
	31.00	8.05	
Lownet and general UK	0.00	4.00	1.73
	2.52	5.90	
	7.55	6.45	
	18.87	7.00	
	34.15	8.00	
Borders	0.00	4.10	1.71
	3.00	5.60	
	4.10	6.15	
	17.00	6.60	
	30.00	8.00	
North Wales (Lleyn)	0.00	5.40	1.68
	2.00	6.05	
	13.00	6.50	
	25.00	6.80	
	34.00	8.00	
Mid Wales	0.00	5.40	1.72
	3.80	6.05	
	15.50	6.65	
	34.30	8.00	
Cornwall	0.00	5.50	1.77
	0.30	5.76	
	15.00	6.90	
	30.00	8.00	

Appendix 1 Key to Bulletin Encoding

YearMoDy	Year, month and day of event.
HrMn Secs	Time of occurrence of event in hours, mins and secs, (UTC).
Lat	Latitude of the event, positive latitude indicates north.
Lon	Longitude of the event, positive longitude indicates east.
kmE	UK National Grid Reference in kilometres east of grid origin.
kmN	UK National Grid Reference in kilometres north of grid origin.
Dep	Depth of the hypocentre in kilometres.
Mag	Richter local magnitude of the event.
Locality	A geographical indication of the epicentral area, usually the nearest town followed by the region. A key to the abbreviations used in the locality column are given below.
Int	Maximum EMS intensity. 2+ indicates felt, no macroseismic details. 3+, 4+ etc indicates felt at 3 or 4, but no survey carried out. 3, 4, 5 etc describes the maximum EMS intensity produced by the event.
Comments	Additional comments about the event eg: C/F, see below under comments abbreviations.

The following abbreviations are extracted from the output of the location program HYPO71 (Lee and Lahr,1975)

No	Total number of P and S readings used in the event location.
Gap	Largest azimuthal separation in degrees between stations.
RMS	Root Mean Square of the travel time residuals in seconds.
ERH	Standard error of the epicentre in kilometres. When this column is blank, the error is large and indeterminate.
ERZ	Standard error of the focal depth in kilometres. When this column is blank, the error is large and indeterminate.

Locality abbreviations

Sonic	Sonic boom
Bucks	Buckinghamshire
D & G	Dumfries and Galloway
Lincs	Lincolnshire
Notts	Nottinghamshire
Staffs	Staffordshire

Comments abbreviations

...	and felt elsewhere
N,S,E,W	North, South, East, West

Appendix 2 Key to Phase Data Encoding

Time	Time of occurrence of event in hours, mins and secs, (UTC).
Lat	Latitude of the event, N indicates North.
Lon	Longitude of the event, W indicates West, E indicates East.
Depth	Depth of the hypocentre in kilometres.
Grid Ref	UK National Grid Reference in kilometres east (kmE) and kilometres north (kmN) of grid origin.
RMS	Root Mean Square of the travel time residuals in seconds.
Velocity Model	Velocity model used in location.
Magnitude	Richter local magnitude of the event.
Locality	A geographical indication of the epicentral area, usually the nearest town followed by the region.
Intensity	Maximum EMS intensity. 2+ indicates felt, no macroseismic details. 3+, 4+ etc indicates felt at 3 or 4, but no survey carried out. 3, 4, 5 etc describes the maximum EMS intensity produced by the event.
Comments	Additional comments about the event eg: C/F see list of comments abbreviations below.
STAT	Station name
CO	Station component S=short period Z=vertical N=north south E=east west
DIST	Distance from earthquake to station (km)
PHAS	Phase identifier; the first letter characterizes onset E=emergent I=impulsive, the second indicates the phase eg P, S, PG and PN. AML
WT	Hypo weighting factor to arrival. 0 or blank=full weighting to 4=zero weighting (ignore). 9=use P S interval only for this line.
P	Polarity C=Compression/up D=Dilatation/down
HrMn	Hour, Minute of event
SECS	Seconds of event
AMPL	Amplitude centre to peak in nanometres (nm)
PERI	Period in seconds
RES	Station residual

Appendix 3 The European Macroseismic Scale (EMS 98)

1 - **Not felt**

Not felt, even under the most favourable circumstances.

2 - **Scarcely felt**

Vibration is felt only by individual people at rest in houses, especially on upper floors of buildings.

3 - **Weak**

The vibration is weak and is felt indoors by a few people. People at rest feel a swaying or light trembling.

4 - **Largely observed**

The earthquake is felt indoors by many people, outdoors by very few. A few people are awakened. The level of vibration is not frightening. Windows, doors and dishes rattle. Hanging objects swing.

5 - **Strong**

The earthquake is felt indoors by most, outdoors by few. Many sleeping people awake. A few run outdoors. Buildings tremble throughout. Hanging objects swing considerably. China and glasses clatter together. The vibration is strong. Top heavy objects topple over. Doors and windows swing open or shut.

6 - **Slightly damaging**

Felt by most indoors and by many outdoors. Many people in buildings are frightened and run outdoors. Small objects fall. Slight damage to many ordinary buildings eg; fine cracks in plaster and small pieces of plaster fall.

7 - **Damaging**

Most people are frightened and run outdoors. Furniture is shifted and objects fall from shelves in large numbers. Many ordinary buildings suffer moderate damage: small cracks in walls; partial collapse of chimneys.

8 - **Heavily damaging**

Furniture may be overturned. Many ordinary buildings suffer damage: chimneys fall; large cracks appear in walls and a few buildings may partially collapse.

9 - **Destructive**

Monuments and columns fall or are twisted. Many ordinary buildings partially collapse and a few collapse completely.

10 - **Very destructive**

Many ordinary buildings collapse.

11 - **Devastating**

Most ordinary buildings collapse.

12 - **Completely devastating**

Practically all structures above and below ground are heavily damaged or destroyed.

-----****-----

A complete description of the EMS-98 scale is given in: Grunthal, G., (Ed) 1998. European Macroseismic scale 1998. Cahiers du Centre European de Geodynamique et de Seismologie. Vol 15.