

# Instructions for Using the GEODE Portal, edition 0.3

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# 1. Introduction to the GEODE project occupational information resources

## *Background*

In the GEODE project we have attempted to provide an online data index service which stores and supplies occupational information resources for the benefit of social scientists who work with occupational data. The service is accessed by logging into the ‘GEODE portal’, either with personalised details or as a guest (see section 2).

GEODE stands for “Grid Enabled Occupational Data Environment”. The GEODE project involves exploiting the computing technologies associated with the ‘Grid’, (also known as ‘e-Science’ and ‘e-Social Science’). A full text introduction to the GEODE project is given in Lambert et al (2006a). Tan et al (2006) adds further technical details to the description of the service. The project web-pages [www.geode.stir.ac.uk](http://www.geode.stir.ac.uk) also contain information on the GEODE project and its participants.

The GEODE project primarily deals with ‘aggregate occupational information resources’. These are electronic data files which contain some descriptive information on a number of different occupational positions. Typical examples of this descriptive information include social class classification schemes (data on which social class particular occupational positions should be placed in); and statistics on occupational circumstances (such as statistics on gender segregation – the proportion of women within any particular occupational position).

Broadly, usage of the GEODE service falls into two categories:

### **i) Accessing occupational information files (and linking them with other data)**

Most users of GEODE are people who wish to access the wide range of occupational data resources indexed under GEODE.

Users may search across the occupational information resources stored in GEODE (see section 3). They can choose to immediately download relevant occupational information (section 3). However most often they will also wish to use the GEODE ‘matching’ service which automates the matching process linking the GEODE data resources to the user’s own data files (see section 4).

Scenarios 1, 2 and 3 below illustrate typical applications in accessing occupational information.

The operations of searching, accessing and matching occupational information can be achieved by entering the GEODE portal as a ‘guest’ (see section 2).

### **ii) Depositing occupational information resources**

Smaller numbers of users may use GEODE in order to distribute their own occupational information resources to other researchers (see section 5). This exercise is usually undertaken by social scientists with a specialist interest in occupational data analysis.

Scenarios 4 and 5 below illustrate typical applications in depositing occupational information.

Depositing occupational information resources on GEODE requires logging into the GEODE portal with a personalised account (see section 2).

For information, in the social sciences this task has previously been achieved by supplying occupational data through dedicated webpages, for example:

Harry Ganzeboom's conversion tools: <http://home.fsw.vu.nl/~ganzeboom/pisa/>

CAMSIS project: <http://www.camsis.stir.ac.uk/>

**Table 1: Selected scenarios in using GEODE**

**Usage 1: Access SOC-90 value labels**

Scenario:	A researcher (using SPSS) has obtained a survey dataset where occupations have been coded to the numeric values of the UK SOC-90 occupational unit group scheme. They wish to attach the textual descriptions for the relevant occupations to their data file.
Expert view:	There is an SPSS file called 'UK1990socsbgpsandlabels.v1.sps', which is free to download from <a href="http://www.camsis.stir.ac.uk/occunits/distribution.html#UK">http://www.camsis.stir.ac.uk/occunits/distribution.html#UK</a> that gives text value labels for all SOC-90 3-digit units. The user needs to download this file.
GEODE contribution:	Login to GEODE as a named user or guest. Use the search engine to search for resources which cover the UK SOC-90 file. The search should reveal the SPSS file 'UK1990socsbgpsandlabels.v1.sps'. The user can immediately download the file from GEODE, and/or may visit the distributing website.

**Usage 2: Translate SOC-90 to CASMIN social class scheme**

Scenario:	A researcher (using SPSS) has obtained a survey dataset where occupations have been coded to the numeric values of the UK SOC-90 occupational unit group scheme. They wish to attach CASMIN (aka. Goldthorpe) class scheme values to the relevant occupations to their data file.
Expert view:	There is an SPSS file called 'gb91soc90.sav' which is free to download from <a href="http://www.camsis.stir.ac.uk/Data/Britain91.html">http://www.camsis.stir.ac.uk/Data/Britain91.html</a> that links SOC-90 3-digit units, in combination with a 1-digit definition of employment status, to the CASMIN class scheme. The user should calculate employment status measures (if they can), and then process the SPSS file either themselves, or by using GEODE.
GEODE contribution:	(Once the employment status data is prepared), login to GEODE as a named user or guest. Use the search engine to search for resources which cover the UK SOC-90 file. The search should reveal the SPSS file 'gb91soc90.sav'. The user now has two choices: <ul style="list-style-type: none"> <li>i) Immediately download the file from GEODE, and/or may visit the distributing website, and follow its own instructions for linking the data in SPSS with their own records.</li> <li>ii) Use the GEODE occupational matching programme to process the linkage between their own data files and the GEODE indexed data file [<i>the programme on GEODE to do this is called 'gbsocukempst'</i>]</li> </ul>

### Usage 3: Access gender segregation statistics for SOC-90 unit groups

Scenario:	A researcher (using SPSS) has obtained a survey dataset where occupations have been coded to the numeric values of the UK SOC-90 occupational unit group scheme. They wish to attach data on gender segregation (the proportion of women nationally within each occupational unit group) to each occupational unit in their data file.
Expert view:	There are several sources of gender segregation statistics. One publication (Hakim, 1998) uses data on UK 1991 census to present gender segregation values for each SOC-90 unit. This data has been transcribed into SPSS format and stored at GEODE.
GEODE contribution:	Login to GEODE as a named user or guest. Use the search engine to search for resources which cover the UK SOC-90 file. The search should reveal the SPSS file 'soc90seg_hakim1998.sps'. The user can immediately download the file from GEODE. The could also is wanted to use the GEODE portal to undertaking a file matching exercise which links their own data with these statistics [ <i>the programme on GEODE to do this is called 'hakimsoc'</i> ]

### Usage 4: Supply a data file on occupational positions to GEODE

Scenario:	A researcher has prepared some descriptive data on the average income levels held by women in different occupations in the United States in 2004, using the US SOC-2000 occupational unit group scheme. They would like to make this data available to other researchers so that they may attach this information to their records in SOC-2000 units.
Expert view:	The file could be deposited to GEODE by uploading it into the index service whilst filling out a small number of questions on the origins of the resource. Once deposited it will be registered with the search engine on GEODE and will then be available to other users of GEODE for download from there. Members of the GEODE project may subsequently enhance its accessibility by extending the data curation process (cf. usage 5).
GEODE contribution:	Login to GEODE as a named user (this will require email registration with the GEODE project contacts). Use the 'deposit data' tab to upload the data file or files, providing information on the name of the data producer and a short description of the files. GEODE project members will further curate the data after it has been uploaded to GEODE.

### Usage 5: Prepare enhanced meta-data on an occupational information file supplied to GEODE

Scenario:	[This process would ordinarily be undertaken by members of the GEODE project]. A data resource has been supplied to GEODE but is currently only available for download by other users in its original format. There is a desire that the data should also be available via the GEODE matching service.
Expert view:	The data will only be available for file matching processes after it has been fully curated to the GEODE-M metadata standard. This is a short manual operation which can be undertaken by the data depositor or members of the GEODE project (usually the latter). This operation involves making edits to an xml format data file which contains information on the occupational data file.
GEODE contribution:	Login to GEODE as a named user (this will require email registration with the GEODE project contacts). Use the 'deposit data' tab links to edit the metadata file associated with an existing resource. [ <i>This service became available to public users on 8.1.07. Instructions on this are in section 5</i> ]

### *Further orienting issues:*

#### Occupational index schemes

The GEODE service organises aggregate occupational information data files according to the occupational 'index scheme' to which each file refers. Index schemes include published dictionary style definitions of different occupational titles, known as 'occupational unit group' schemes (OUGs). Also, other index schemes exist to record the occupational position, such as index measures of 'employment status'. When social scientists collect data on the occupational positions of their subjects (for example - the occupations of those who completed a survey questionnaire), the data is usually recorded as a location in such an 'index scheme'. There is a further discussion of index schemes, including a listing of all known occupational index schemes used in GEODE, on the GEODE webpages at: <http://www.geode.stir.ac.uk/ougs.html>.

#### Occupational information meta-data

The indexing facilities associated with the GEODE service hinge upon exploiting appropriate meta-data about the relevant occupational information resources (meta-data is data describing the data resources themselves, such as the author(s) of the resource and the date it was produced). The GEODE service looks for specific metadata entries which are organised in terms of an internationally standardised metadata protocol, the Data Documentation Initiative (<http://www.icpsr.umich.edu/DDI/>). The GEODE component of this protocol is known as the 'GOEDE-M' metadata standard. Meta-data issues GEODE are also described in Lambert et al (2006b), and on our webpage [http://www.geode.stir.ac.uk/geode\\_m\\_curation.html](http://www.geode.stir.ac.uk/geode_m_curation.html). We refer to the process of adding appropriate meta-data to an occupational information resource as the process of 'data curation'.

#### Data file formats

The GEODE data resources are available either for direct download in their original format, or else, after being fully curated, in the form of a plain text data file which can be processed automatically during the file matching operation. In the former case, resources are often supplied the formats of proprietary packages such as SPSS or Stata (they are simply supplied in whatever formats their original creator developed them in). In the latter case, of file matching, users will need to prepare their own data in plain text format. This is usually a simple process of saving out the data file from the package of choice, but choosing a specialist option in order to save it out into plain text format (which may also easily be read by the programme). Instructions on undertaking these linkages are posted on our webpage [http://www.geode.stir.ac.uk/file\\_convert\\_info.html](http://www.geode.stir.ac.uk/file_convert_info.html).

## 2. Entering the GEODE portal

You may enter the GEODE portal by logging in from the entry page (linked from [www.geode.stir.ac.uk](http://www.geode.stir.ac.uk)).

Help on working with the GEODE portal is available from several sources:

- this technical paper (<http://www.geode.stir.ac.uk/publications.html>)
- the links available from the portal front page
- textual description entries within the portal

You can login to the GEODE portal either as a named user or as a guest.

### Named users can:

- Search data
- Download data
- Use the GEODE data matching service
- Deposit data
- Manage those data resources that have been deposited previously
- Edit personal account space settings (e.g. display language and password)
  
- Named user access requires a personalised account: email Paul Lambert ([paul.lambert@stirling.ac.uk](mailto:paul.lambert@stirling.ac.uk)) requesting a GEODE account, and login details will be manually created and sent to you at the earliest opportunity.

### Guest users can:

- Search data
- Download data
- Use the GEODE data matching service
  
- Guest user access requires logging in with generic login details (username: guest; password: geode).

The GEODE portal runs in a 'Grid middleware' (i.e. software) environment known as 'Gridsphere'. The resources which you will see after logging in are dependent on which account you logged in with.

Gridsphere arranges resources under a series of tabs and sub-tabs known as 'portlets'. Each portlet within the GEODE portal allows a user to undertake a different operation with the GEODE project's occupational information resources. A site map of the portlets is given below.

*Users should beware that using the 'back' key on an internet browser is not a reliable way to navigate through Gridsphere – it is better practice to follow specific links when moving through the site.*

### **Logging out:**

- It is preferable to log out manually when leaving the GEODE portal.
- An automatic logout from the GEODE portal occurs after 30 minutes of inactivity.

**Table 2: GEODE Portal: Portlet site map**

\* = not available to guest users

<p>Welcome          -&gt; Welcome statment          -&gt; Settings*          -&gt; Layout*          -&gt; Help          -&gt; FAQ</p>	<p>Textual description of the portal          Allows changes to settings, e.g. password, time zone (may only be edited by named users)          Allows changes to visual layout (may only be edited by named users)          Further resources offering help with the GEODE service          Further help resources: users' frequently asked questions</p>
<p>-Feedback</p>	<p>Opportunity to convey feedback on the GEODE service</p>
<p>GEODE Search          -&gt; Search data          GEODE Browse          -&gt; Browse data</p>	<p>Allows searching of GEODE resources (see section 3)          Allows browsing of GEODE resources (see section 3)</p>
<p>Deposit data*          -&gt; Manage my data resources*          -&gt; Manage my G1 data resources*</p>	<p>Allows upload of new resources (see section 4) and management of resources previously uploaded (see section 5)          Allows curation of data which has already been deposited to GEODE – requires xml files to be specified, giving metadata on the occupational information, and subsequently allowing file matching linkages to be deployed</p>
<p>Link Data Resources:          -&gt; Manage my occ resources</p>	<p>Allows implementation of file matching exercises</p>



### 3. Searching the GEODE data index service

Guest and named users may use the GEODE portal to search those occupational information resources which have been indexed under GEODE.

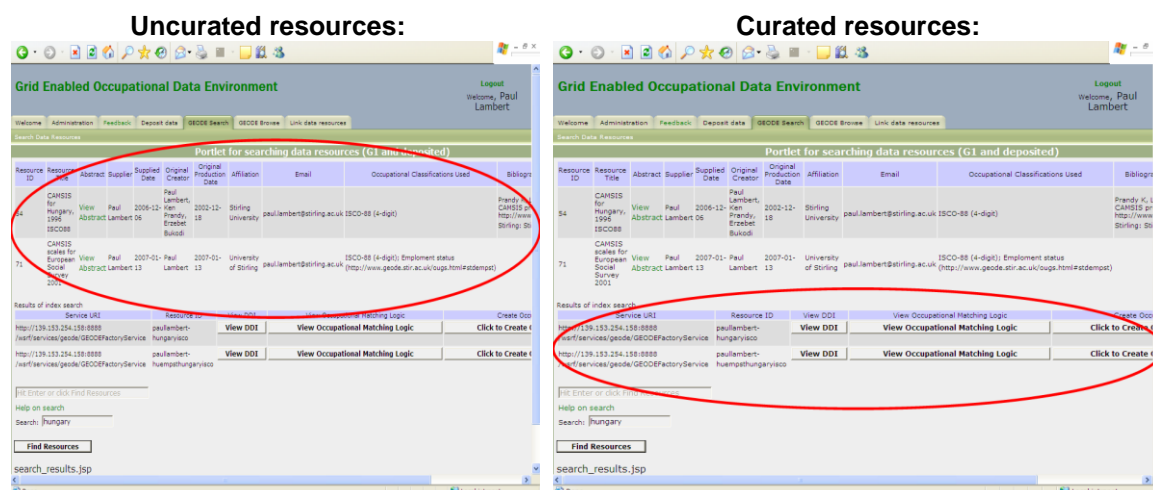
This requires use of the 'search' portlet and/or the 'browse' portlet.

[We are currently still working on improving the usability of the search engine and browse facilities, 14.1.07].

#### Search Portlet:

The search portlet accepts any terms, but its usage requires some consideration:

- (A) There are two groups of resources which your search may uncover. These are (1) 'uncurated' resources, which are data files, or links to data files, in any format, which have been notified to the GEODE portal, but haven't been subjected to any further treatment (curation). They are available for other users to access in their original format (e.g. to download), but are not fully integrated into GEODE. There are also (2) 'curated' resources, which have been integrated into the GEODE file matching process. These are the links that appear towards the end of the file searching linkage. These resources, which connect to data files available from corresponding 'uncurated' resources, are data files which have had sufficient metadata added to them that they can be used to run the GEODE portal file matching procedure on them.



- (B) The rules which generate search results operate differently for the curated and uncurated resources [Jan 07: this situation is likely to be revised in the coming months]. At present, uncurated resources are searched using an array of search logic terms which are described on the portal link 'help for search'. Curated resources however are searched only for exact matches of terms.

### **Browse Portlet**

The 'browse' function provides an alternative means to 'search' to locate occupational information resources which have been indexed at GEODE.

It organises occupational information resources in groups according to the country, time period, and type of occupational index unit (and combinations thereof).

[At time of writing [13.1.07], the 'browse' facility in GEODE is partially functional. It currently only refers to 'uncurated' occupational information resources, and only to those examples of uncurated information for which the appropriate 'browse' categorisations were specifically declared by the data depositor].

#### **4. Linking occupational data resources**

The GEODE portal portlet 'Link data resources' allows for automated merging of a user's original data (e.g. social survey micro-data) with relevant occupational information resources on GEODE.

This linkage service is a core provision of GEODE. It is felt that a leading reason for the under-exploitation of existing occupational information resources has been that non-specialist users find it difficult to undertake the data management tasks involved in linking their own data with occupational data resources.

Procedures for implementing the linking process, which involves deploying a JAVA application, are documented on our webpage:

[http://www.geode.stir.ac.uk/matching\\_occupational\\_data.html](http://www.geode.stir.ac.uk/matching_occupational_data.html)

[At time of writing, 14 Jan 2007, we are still working on improving the usability of the GEODE occupational matching data service].

## 5. Depositing occupational data with GEODE

The GEODE portal is improved on every occasion that users index additional occupational information resources with it. The GEODE index service offers coordinated access to occupational information resources from a wide range of countries and time periods, and from a number of different analytical perspectives. Members of the GEODE project themselves actively index all occupational data which they have access to, but other users are keenly invited to index further data files.

The indexing of occupational information files is a two stage process (also described at [http://www.geode.stir.ac.uk/geode\\_m\\_curation.html](http://www.geode.stir.ac.uk/geode_m_curation.html)).

- Stage 1: Initial supply of only the most crucial data necessary to define occupational information resource
- Stage 2: Further updates to the xml files of any further available metadata

The data required at **stage 1** is quite limited, covering the name of the data file, details on the supplier and context of the study (such as which country and time period it applies to).

To make an initial supply of data, portal users should:

- Login to the portal as a named user
- Enter the 'deposit data' portlet
- Fill out the entries on the data entry form, detailing the website location of the resource, and/or uploading the data resource from the relevant location.

(Note that the data supply process makes a distinction between the supplier of the data to GEODE, and the originator of the data resource, who may or may not be the same people).

After a user has supplied data in this way, the data is listed on their GEODE account, and they may edit the content of the online record at a later time.

After the data has been exposed, it is now eligible to be curated in **stage 2** of the data supply process. The addition of a fuller set of metadata to the resource is a complex process as there is a great deal of data which may be entered. Illustrations of the relevant metadata are published at [http://www.geode.stir.ac.uk/geode\\_m\\_curation.html](http://www.geode.stir.ac.uk/geode_m_curation.html) . Reflecting the complex data, the stage 2 data curation is usually only undertaken by members of the GEODE team.

### **Illustration: Stage 2 data curation**

In the following paragraphs we describe the processes of curating occupational information at GEODE in terms of a simple example file.

*The example we use is a simple tabular data file which describes how the 10 major groups of the ISCO-88 occupational units can be assigned to skill levels. This resource has been deposited to GEODE in an 'uncurated' form in the substance of a single Microsoft Excel file called 'isco88\_majorgroups\_skill.xls':*

	A	B	C	D	E
2					
3		Major groups	Elias 1997 Skill level		
4	0	Armed forces	-999		
5	1	Legislators, senior officials and managers	-999		
6	2	Professionals	4		
7	3	Technicians and associate professionals	3		
8	4	Clerks	2		
9	5	Service workers and shop and market sales workers	2		
10	6	Skilled agricultural and fishery workers	2		
11	7	Craft and related workers	2		
12	8	Plant and machine operators and assemblers	2		
13	9	Elementary occupations	1		
14					
15					
16		Refs:			
17		Elias, P. 1997. Occupational Classification ISCO-88 : Concepts, Methods, Reliability, Validity and			
18		<a href="http://www.warwick.ac.uk/ier/isco/frm-is88.html">http://www.warwick.ac.uk/ier/isco/frm-is88.html</a>			
19					

In order for a data resource to be fully curated, to the extent that it may be used in the GEODE occupational matching programme, **it is necessary to create a second (curated) resource associated with the data on the GEODE portal, and to curate three new files associated with the resource.**

The first step involves creating a simple format tab delimited data file representing the data. Instructions on deriving such files are on [http://www.geode.stir.ac.uk/file\\_convert\\_info.html](http://www.geode.stir.ac.uk/file_convert_info.html) . This file must be posted on an open access webpage (at any location). For instance, the file associated with the above resource is shown below:

```

isco88_1 skill14
0 -999
1 -999
2 4
3 3
4 2
5 2
6 2
7 2
8 2
9 1

```

Once the plain text file has been posted in an appropriate location, it is necessary to create, within GEODE, a resource which describes the location of this new file, and makes the linkage with its metadata documentation. The creation of this resource is done by:

- Clicking on the ‘deposit data tab’
- Clicking on ‘list resources’
- Clicking ‘add new text data resource’
- Filling out the online form, giving a name for the resource and identifying a unique uri at which the resource file in plain text format is located.
- Saving the resource with ‘Add data resource’

An image of the online form for the above resource, ready to be added, is shown below:

The screenshot shows a web browser window titled 'GridSphere Portal - Microsoft Internet Explorer provided by University of Stirling'. The address bar shows 'http://geode.cs.stir.ac.uk:8080/gridsphere/gridsphere?cid=107'. The page content includes a navigation menu with 'Deposit data' selected. The main form is titled 'Manage G1 Data Resources (Title)'. It contains the following fields and values:

- Add to G1 Data Service (URI):
- Resource ID (G1 Factory Resource ID):
- Data Resource Name:
- Product of Data Resource:
- Product Version:
- Vendor of Data Resource:
- Type of Data:
- URI to access Data Resource:
- File(s):

Buttons at the bottom of the form include 'Cancel', 'Add Data Resource', and 'More Files'. The page footer shows 'AddTxtDataResource.jsp'.

Once this resource has been created – here the resource has been called ‘iscomskill’ – it is next necessary to populate the resource with data on the occupational information itself. This is done by supplying two xml format information files. In practice it is therefore necessary to create two new files associated with the resource:

#### 1) An xml format file containing metadata on the document

This is the DDI format metadata described above. Instructions with examples on creating DDI metadata are published on [http://www.geode.stir.ac.uk/geode\\_m\\_curation.html](http://www.geode.stir.ac.uk/geode_m_curation.html) .

Most of those instructions are directed to relatively complex data resources, and, subsequently, the DDI metadata files given as examples tend to be quite long. However, many resources do not need such extensive curation. An example of xml format DDI metadata which would be suitable for the resource described above is downloadable from:

[http://www.geode.stir.ac.uk/data/73/ddi\\_isco88\\_1\\_skill.xml](http://www.geode.stir.ac.uk/data/73/ddi_isco88_1_skill.xml)

## 2) An xml format file containing the ‘occupational matching logic’

This ‘logic’ is used to link together the index file with the local (micro-social) data. The content required for the ‘logic’ file can be derived on the basis of information from the DDI metadata. The ‘logic’ file constitutes a short xml file requiring statements which identify the ‘input’ and ‘output’ variable(s) (corresponding to the occupational index unit(s) and the social classification information).

It is possible for GEODE users to view examples of existing ‘occupational matching logic’ xml files by searching ‘G1’ resources and clicking the ‘View occupational logic’ tab. For information, the simple logic required for the above file is as follows:

```
<?xml version="1.0" encoding="UTF-8"?>
<geodeOccMatchLogic targetNamespace="http://www.geode.stir.ac.uk/wsrf/applications/occ_match_logic.xsd"
xmlns="http://www.geode.stir.ac.uk/wsrf/applications/occ_match_logic.xsd">
  <inputs>
    <var required="true">
      <alias>tar_isco88_1</alias>
      <category>http://www.geode.stir.ac.uk/ougs.html#isco88_1</category>
      <valueType>integer</valueType>
      <defaultValue>0000</defaultValue>
      <req_format>9999</req_format>
      <remedy formula="TRAIL_PAD" value="0"/>
    </var>
  </inputs>

  <matches indexFileTable="isco88_maj_skill.dat">
    <match>
      <varInput>
        <var>
          <alias>tar_isco88_1</alias>
        </var>
      </varInput>
      <varIndex>
        <var>
          <name>isco88_1</name>
        </var>
      </varIndex>
    </match>
  </matches>

  <outputs>
    <varOutput>
      <name>skill4</name>
    </varOutput>
  </outputs>
</geodeOccMatchLogic>
```

The curation of the resource therefore requires the uploading of these two XML files (the DDI documentation, and the occupational matching logic). This is achieved by clicking the links under ‘deposit data’, and the subsequent links ‘Modify DDI’ and ‘Modify Occupational Matching Logic’ which are available under the ‘Manage G1 Data Resources’ portlet.

*Once these files are in place, it is possible for users to individually create the linkages which allows for the processing of occupational matching exercises (see section 4 which refers to the webpage instructions [http://www.geode.stir.ac.uk/matching\\_occupational\\_data.html](http://www.geode.stir.ac.uk/matching_occupational_data.html) ).*

## 6. Further resources

Readers are encouraged to consult the GEODE webpages for further information:

- Front page: <http://www.geode.stir.ac.uk/>
- Publications: <http://www.geode.stir.ac.uk/publications.html> (includes links to text of conference papers authored by GEODE project members)
- File matching notes: [http://www.geode.stir.ac.uk/matching\\_occupational\\_data.html](http://www.geode.stir.ac.uk/matching_occupational_data.html)
- Data curation notes: [http://www.geode.stir.ac.uk/geode\\_m\\_curation.html](http://www.geode.stir.ac.uk/geode_m_curation.html)
- Listing of occupational index schemes: <http://www.geode.stir.ac.uk/ougs.html>
- File format conversion notes: [http://www.geode.stir.ac.uk/file\\_convert\\_info.html](http://www.geode.stir.ac.uk/file_convert_info.html)

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