Building Fragility Mapping

Overview

This page will build upon the example presented that is presented in the Building Fragility page. Now that we have a building fragility curve ingested into Ergo, we need to tell Ergo how to map that fragility curve to buildings. What we will learn in this section is:

1. How to create a building fragility mapping file
2. How to ingets a building fragility mapping file

Create Fragility Mapping

This section will require a very basic understanding of XML and is something that we can help the user with putting together if you contact us by email. The basic concept behind the fragility mapping is to tell Ergo which fragilities should be used with which "objects". In the case of a building dataset, which fragilities should be mapped to which buildings. The mapping file allows you to use a specific set of rules to map fragilities to buildings (e.g. if a building has a structure type S1 and has 6 stories, use fragility curve with ID **SF_S1_1**).

Using the example below, we'll go through the various parts of the fragility mapping.

```
<match-filter-map>
  <property-match>
    <success-value>
      <map>
        <entry key="Non-Retrofit Fragility ID Code" value="SF_S1_1"/>
      </map>
    </success-value>
    <filter>
      <statement>
        <rule>int no_stories GE 4</rule>
        <rule>int no_stories LE 7</rule>
        <rule>String struct_typ EQUALS S1</rule>
      </statement>
    </filter>
  </property-match>
</match-filter-map>
```

In the section that says <map> </map> is where the fragility identifier is specified. Where it says **key** is for Ergo internal use and that must match exactly because the "Non-Retrofit Fragility ID Code" tells Ergo this is the as-built fragility. The second part where it says **value** is a fragility ID in your fragility dataset (e.g. **SF_S1_1**), this must match match a fragility in your fragility dataset.

In the next section of the example above you will see some <rule> </rule> tags between <statement> </statement> tags. These are the rules to determine if **SF_S1_1** fragility should be used for a particular building. If you look at the first rule where it says:

<rule>int no_stories GE 4</rule>

The first part that says **int** tells Ergo what type of data to look for. The second part where it says **no_stories** tells Ergo which column to look at, so in this case, there should be a column in the building dataset called **no_stories**. For reference, if you look in the previous section it was specified that the column **no_stories** should be of type**integer**. Now, the third part tells Ergo what type of comparison to perform. In this case, we are looking for something that is greater than or equal to (GE) 4. For a building to pass this first rule, it must have a **no_stories** column with a value greater than or equal to 4. If it matches, Ergo will check the next rule. Looking at the next rule, it states that there must be a column called **no_stories** that is of type integer, with a value Less Than or Equal to 7 (LE). In order to use this set of fragilities a building must match all of the rules between <statement> </statement> tags. If any fail, Ergo will move onto the next <property-match> </property-match> tags set that contain the next fragility curve and its rules.

You can make these rules as complex or as simple as you want. You could simply have a single rule:

<rule>String STRUCT_TYP EQUALS S1</rule>

In this case, we are looking at a column called **STRUCT_TYP** (structure type) with a value of S1. If it matches, then use the fragility we specified.

If you need to create a fragility mapping file that maps your fragilities to your building dataset, you just need to come up with a list of rules that maps a fragilities to buildings and save them to an XML file. After creating the file, you need to ingest it into Ergo. Ingesting data into Ergo will be detailed in the next sections.
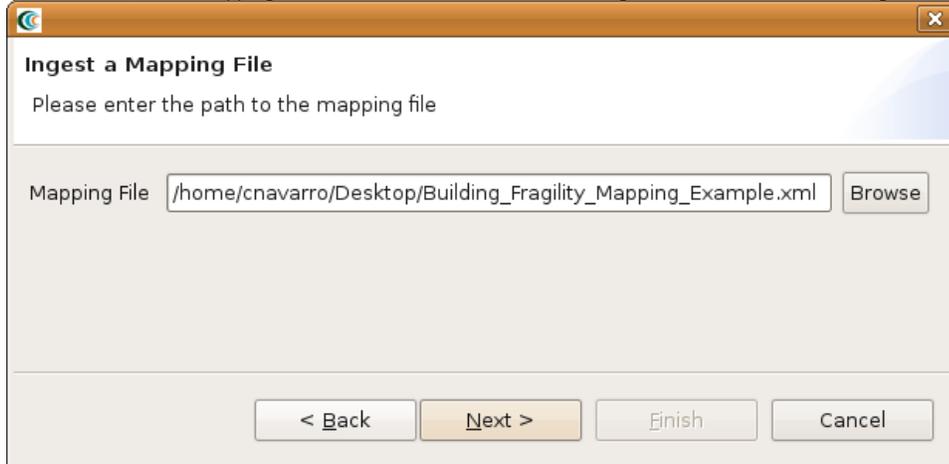
Ingest Fragility Mapping

1. Go to the *File* menu near the top of the application and select *Import*. This should bring up the dialog seen below.
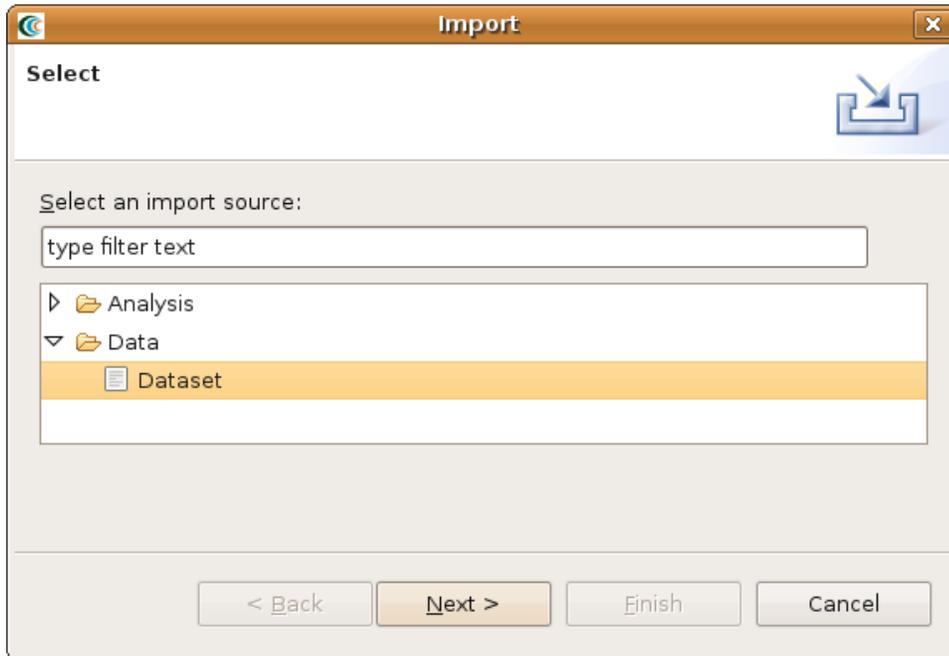
2. From the dialog box, expand the *Data* selection and select *Dataset* and click *Next*. You should see something similar to the image below.
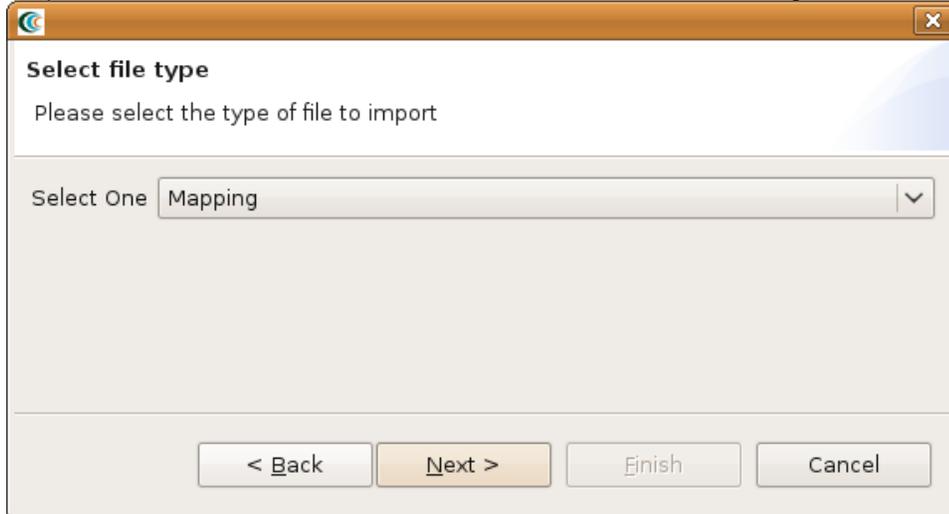
3. From the dialog drop down menu, select *Mapping* and click *Next*. You should see a dialog similar to the one in the image below.

4. From the dialog, click the *Browse* button and select the building fragility mapping you want to ingest and click the *Next* button. You should see a dialog similar to the one below.

5. From the dialog drop down menu, select *Building Fragility Mapping* and click *Next*. You should see a dialog similar to the one below.

6. From this dialog you can select the repository to ingest the dataset to, provide a descriptive name for the dataset (e.g. Example Building Fragility Mapping), and a version number. After entering the required information, click the *Finish* button.