Welcome to the RiskScape tutorial: Introduction to the RiskScape tool. This tutorial is designed to quickly familiarise you with RiskScape’s Graphical User Interface (GUI), Model Run Sequence and Data Aggregation options. This should be one of the first RiskScape tutorials you complete as it covers all the basic steps required to run an impact or risk model then view and export the results. For the purpose of this tutorial we will create an impact model run for a Stopbank breach flood affecting buildings in Hawke’s Bay, New Zealand.

START TUTORIAL

Step 1: Load RiskScape

Step 2: RiskScape GUI

Once RiskScape has loaded, maximise the screen. This screen is referred to as the Graphical User Interface (GUI). The GUI is where you will make all your decisions when creating an impact or risk model run and exporting the model run results.

Three boxes are present near the top of the screen. This is where you may choose to model the Impacts to Assets from Hazards.
**Step 3: Tools and Help**

Near the top of the GUI you will see a number of icons (see opposite) available for user support. These are:

1. **RiskScape configuration**: Internet access and coordinate system settings.
2. **Module manager**: Add or remove modules.
3. **Filter manager**: Delete asset types.
4. **Help**: View information about features.

**Step 4: Downloading modules**

Before you begin, you must download the modules you need to run the analysis. You can do this using the module manager (Step 3, (2) above). To create an impact model run for a flood event in Hawke’s Bay event affecting buildings and people, you will need to download the following:

- **Asset module**: ‘Hawke’s Bay Buildings’.
- **Hazard modules**: ‘Tutaikuri Meanee Breach Flood’.
- **Fragility functions**: Flood Impacts: ‘Depth Only Model’ and ‘Depth and Velocity Model’.
- **Aggregation module**: ‘Suburbs 2010” “Grid 1km x 1km) NZMG’ and Meshblocks 2014 (NZMG)’

To do this click on the module manager icon on the toolbar. Select all of the modules above (you can use the shift key to select multiple modules) and select File, Download.

Once complete, Hawke’s Bay buildings, Flood hazard and all of the available impacts for this scenario will appear in the boxes on the GUI home screen.
Step 5: Model Selection

For our model run select **Hawke’s Bay Buildings** under List in the Assets box. Then select **Flood** in the Hazards box. Finally under Impacts, select all available impacts.

While these impacts are available for flood hazards they might not be for other hazards. When not available, the impact option will be Greyed.

Click **Add to library** to continue.

Step 6: Add Analysis to Library

Before we can add this run to the library, we need to further refine our model run by making a few decisions on how to treat our asset data, what unit to aggregate our models results to, the hazard event, its time of occurrence and degree of warning to the exposed assets. These will be covered in Steps 7 to 13.

Click **Next** to continue.

Step 7: Refine Asset Data

For our model run we will select **use complete dataset** for Hawke’s Bay buildings. For other model runs you may choose to use a subset of building attributes to examine the influence of a building attribute on building impacts or risk. For example, you may only examine impacts to timber-weatherboard buildings as these are considered highly vulnerable to flood damage.

Click **Next** to continue.
### Step 8: Choose Data Aggregation

As Hawke’s Bay contains two medium sized cities, choosing the **Suburbs** aggregation unit will provide a good spatial overview of impacts. For more detailed analysis a meshblock or 1km x 1km aggregation may be more useful. By choosing the suburbs option, this means the model run impact results will be summed for all buildings in each suburb.

Click **Next** to continue.

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### Step 9: Choose Hazard Model

One or a number of hazard models could be available for an asset type in the area of interest. In this case, Hawke’s Bay has several flood models available but we have only downloaded one, a breach of the Tutaikuri Meanee stopbank.

Select **Tutaikuri Meanee Breach Flood**

Click **Next** to continue.

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### Step 10: Choose Hazard Parameters

For each hazard model option there may be a number of parameters to choose from when selecting a hazard event. For the current conditions. For this flood scenario we have only a 50 year ARI event available have only the

Select the **50 year ARI flood event** and click **Next** to continue.
**Step 11: Choose Impact Model(s)**

Flood impacts to buildings can be determined in RiskScape from a vulnerability model that uses a relationship between building impacts and either a flood-depth and velocity or flood-depth. While flood flow velocity can have an important influence on the levels of building damage experienced, we will use the Depth and Velocity Model vulnerability model for all impacts.

Select depth and velocity for all and click Next to continue.

**Step 12: Choose time of impact occurrence**

Time of occurrence can be an important influence on flood damage to buildings and their contents as people present can take precautions to reduce damage e.g. storing possessions above flood water levels. Building occupancy reduces during daytime as people leave for work, school etc. Select Daytime for the model run to maximise the potential building and contents impacts and click Next to continue.

**Step 13: Choose a mitigation factor**

Similar to Step 12, none or a short warning prior to flooding will potentially result in greater building and content damage from an event as people have less time to take precautions that reduce damage. To further maximise the potential building and contents impacts for the 250 year ARI event select No flood warning and short lead time.

Click Next to continue.
### Step 14: Name model run

Now that all model run selections have been made you need to name the model run so it can be identified in the RiskScape **Library** e.g. ‘Tutaikuri Meanee Breach Flood’.

Once you have named the model run click **Finish** and you will see it appear in the library in the bottom half of the GUI.

![Name model run](image)

### Step 15: Add model run to library and run analysis

Select your model run in the **Library** and click on the “Play” button to perform the analysis. It might take a minute has the impacts for the run are being calculated. You will notice that some icons are greyed. These cannot be used during the analysis but will appear when the analysis is completed and will be used to view or export the model run results (see **Step 16**).

![Add model run to library](image)

### Step 16: User options to analyse model results

1. **Run:** Run the analysis.
2. **Identify:** View analysis parameters (e.g. choices of Steps 7 to 13).
3. **Clone:** Create another model run based on the current analysis parameters selected.
4. **View Assets:** View assets used in the model run and their attributes on a map.
5. **View Hazard:** View the hazard model on a map.
6. **View Results:** View the impacts on a map (asset-by-asset).
7. **View/Export Aggregated Results:** View aggregated unit results on a map or export, e.g. to Google Earth.
8. **Delete:** Delete model run.

![User options to analyse model results](image)
**Step 17: View Assets**

Asset attributes in the model run are viewed by clicking the ‘house/magnify glass’ icon (see Step 16 (4.)).

The Legend displays a single building attribute (e.g. building floor area) and value range (e.g. m²) represented by the coloured dots on the map. These dots represent the geo-referenced locations of individual assets used in the model run e.g. Hawke’s Bay buildings. Different attributes and their values can be identified spatially by right clicking on the legend scale to open the Symbology box and changing the attribute type and/or value range (see Step 19).

You can also zoom in using the zoom tools, and turn off the background map; if preferred (see Step 18), in order to get a clearer view of the individual assets, Hawke’s Bay buildings.
**Step 18: Navigate map view**

1. **Zoom in**: Reduce map extent.
2. **Zoom out**: Increase map extent.
3. **Pan**: Drag map across screen.
4. **Select**: Select objects on toolbar or legend.
5. **Identify**: Click on asset to see details.
6. **Full extent**: Zoom to full map extent.
7. **Extents**: Go to previous extent.
8. **Maps**: Choose background maps/ no background.

**Step 19: Change Symbology**

The Symbology box provides users with the means to change the attribute, value range and colour scale for asset, hazard or impact types viewed. Any changes made will automatically appear on the map view. This enables users to identify the spatial distribution of asset attributes, hazard exposure and impact intensity across the model run area.

The Symbology box can be accessed by right clicking on Legend scale, scrolling down and clicking Symbology (see opposite).

1. **Legend**: For the map view.
2. **Legend options box**: Right click on legend scale to open the options box.
3. **Symbology**: Right click on Symbology to open the Symbology box.
4. **Attribute type**: Asset, hazard or impact value types.
5. **Value Range**: Asset, hazard or impact value range.
6. **Fill**: Legend colour scale.
7. **Opacity**: Transparency of the colour fill on the map.
Step 20: View Hazard

Hazard exposure from the model run is viewed by clicking the ‘exclamation/magnify glass’ icon (see Step 16 (5.)).

The Legend displays a single hazard exposure attribute (e.g. flood depth) and value range (e.g. meters) represented spatially on the map by the colour fill (see opposite). The type and value range of hazard exposure can be changed in the Symbology box (see Step 19).

Leave the hazard exposure map open for use in Step 21.

Step 21: View results of the model run

Impacts to buildings calculated in the model run can viewed on a map by clicking the ‘broken building/magnify glass’ icon (see Step 16 (6.)).

Select Damage State and click Finish to view the results. The damage states for individual building locations will now be overlaid on the hazard exposure map created in Step 20. By expanding the legend, you can view the impact states calculated (e.g. Light, Moderate etc.) – each state is represented by a different colour on the map. The colour range can be changed in Symbology (see Step 19).

Now close the map and move onto Step 22.
**Step 22: Export aggregated model results**

Impact results aggregated for the Hawke’s Bay suburbs areas can be viewed or exported by clicking the ‘RiskScape logo/magnify glass’ icon (see Step 16 (7.)).

For this step we will choose to aggregate **Reinstatement Costs** from the model run then export the aggregated results as a CSV (spreadsheet).

Click **Finish** after Step 4 (opposite) to open the results in Excel or similar software.

The new spreadsheet will be available as a tab at the bottom of your computer screen.

You can hide columns with no data, sum the total losses and change the format of how the results are displayed.
Step 23: View aggregated model results in Google Earth

There are other options for viewing aggregated results. If you choose to view the result in Google Earth select Type: Centroid, so result columns are geo-spatially placed in the centre of each suburb areas.

You can now view the aggregated model run results for Asset Repair Costs in Google Earth. To get a better view of the aggregated cost columns for each suburb in Hawke’s Bay, on your keyboard hold down the Ctrl key and user the mouse roller to rotate the screen around 360° and/or hold down the Shift key and user the mouse roller to tilt the screen, enabling a horizontal view of the columns (see opposite). This will provide you with a perspective of the potential building repair costs across the Hawke’s Bay region from a stopbank breach flood event under current conditions.

For more detailed results you can re-run the flood using meshblock as your aggregation unit. See Step 16 (3) for creating a new analysis but making wizard changes.

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