
HazImp Documentation

Release 0.2

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CONTENTS

1	User Guide	3
1.1	Introduction	3
1.2	Quick how-to	3
1.3	Templates	3
1.4	Wind Template	3

HazImp is a tool for determining the impact due to natural hazards. It can be used to calculate damage to sites, given exposure and hazard information. It is command line based and can be executed in parallel.

USER GUIDE

1.1 Introduction

HazImp is used to simulate the loss of value to structures from natural hazards using vulnerability curves. Generally the input information is hazard, such as a wind speed raster and exposure. The exposure information is currently supplied as a csv file, with structure locations given in latitude and longitude. This is combined with vulnerability curve information, described in an xml file. There is an example of a vulnerability curve, showing a hazard value of the x-axis and the loss associated with that hazard on the y-axis;

1.2 Quick how-to

A configuration file can be used to define a HazImp simulation. The configuration file is described using yaml, a data serialisation format. HazImp can also be used by another Python application, by passing the configuration information in as a dictionary. To run HazImp from a configuration file do::

```
python hazimp.py -c wind_v1.yaml
```

Use -c to specify the configuration file.

HazImp can also be ran in parallel, using mpirun. For example::

```
mpirun -np 4 python hazimp.py -c wind_v1.yaml
```

To run a wind example do::

```
cd examples/wind
python ../../core_hazimp/hazimp.py -c wind_v1.yaml
```

1.3 Templates

The simplest way to use HazImp is with a template. Currently the only template is for wind hazards.

1.4 Wind Template

Given gust information from TCRM and point exposure data the loss associated with each site is calculated using the wind template. The wind vulnerability functions That are used are built-in to HazImp. They are defined in the GA internal report

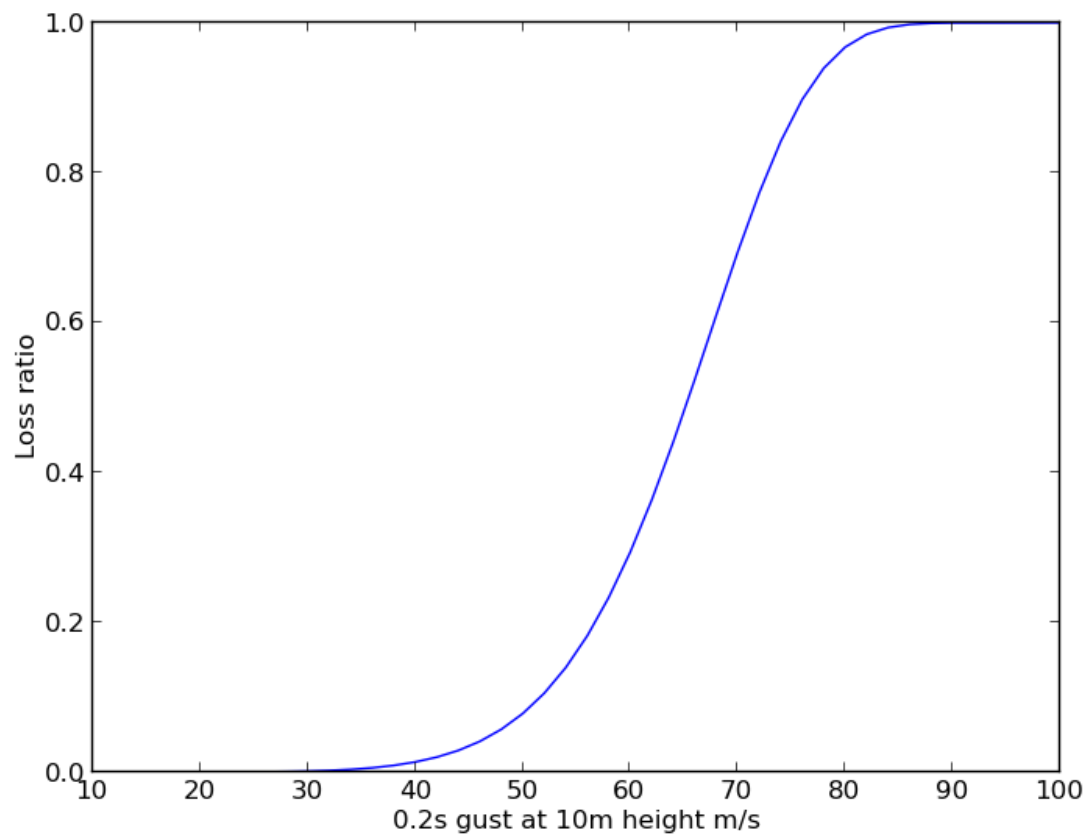


Figure 1.1: *An example vulnerability curve.*

Here is an example wind configuration file, which uses the wind template.:

```
# python hazimp.py -c wind_v1.yaml
template: windv1
load_exposure:
  file_name: WA_Wind_Exposure_2013_Test_only.csv
  exposure_latitude: LATITUDE
  exposure_longitude: LONGITUDE
load_wind_ascii: [gust01.txt, gust02.tx]
save: wind_impact.csv
```

The first line is a comment, so this is ignored. The rest of the file can be understood by the following key value pairs;

template The type of template to use. This example describes the *windv1* template.

load_exposure This describes how to load the exposure data *load_exposure* has key values pairs of;

file_name The name of the file to load. Currently only csv files are supported. The first row of the csv file must be the title row.

exposure_latitude The title of the csv column with latitude values.

exposure_longitude The title of the csv column with longitude values.

load_wind_ascii A list of ascii grid wind hazard files to load or a single file. The file format is grid ascii. The values is the file must be *0.2s gust at 10m height m/s*.

save The file where the results will be saved. All the results to calculate the damage due to the wind hazard are saved to file. The above example saves to a csv file, since the file name ends in *.csv*. This has the disadvantage of averaging data from multiple wind hazards. The information can also be saved as numpy arrays. This can be done by not using the *.npz* extension.