Database for design-compatible waveforms – Deliverable: Disaggregation of the seismic hazard at return periods of 475 and 975 years – Disaggregation data

Dataset

Author(s):
Bergamo, Paolo; Panzera, Francesco (iD); Danciu, Laurentiu (iD); Fäh, Donat

Description of data structure

We provide the full suite of numerical results of the disaggregation in an electronic dataset. The data format is a set of Microsoft Excel ® tables. This document describes the content of each of these tables.

The full list of disaggregation nodes is contained in the file:

   - Disaggregation_nodes_list.xlsx

where:

Column 1 = Node ID

Column 2 = Longitude (degrees) of the node

Column 3 = Latitude (degrees) of the node

Column 4 = X coordinate (in m) of the node (CH1903 reference system)

Column 5 = Y coordinate (in m) of the node (CH1903 reference system)

Column 6 = Node's affiliation to SIA 261 zones. NA = not attributed (node outside boundaries of any zone); Z1a = zone 1a; Z1b = zone 1b; Z2 = zone 2; Z3a = zone 3a; Z3b = zone 3b

The actual disaggregation data are organized in a folder structure schematized by Table 1:

Table 1 – folder structure for the disaggregation data

Level 1	Level 2	Level 3	Level 4	Content
./RP=XXXyrs	./Disaggregation_by_nodes	./PGA		Disagg_by_node_mean_PGA_RP=XXXyrs.xlsx Disagg_by_node_median_PGA_RP=XXXyrs.xlsx Images of disaggregation 3D histograms for all nodes
		./SA(0.15s)		Disagg_by_node_mean_SA(0_15s)_RP=XXXyrs.xlsx Disagg_by_node_median_SA(0_15s)_RP=XXXyrs.xlsx Images of disaggregation 3D histograms for all nodes
		./SA(1.0s)		Disagg_by_node_mean_SA(1_0s)_RP=XXXyrs.xlsx Disagg_by_node_median_SA(1_0s)_RP=XXXyrs.xlsx Images of disaggregation 3D histograms for all nodes
		./AllIMTs		Disagg_by_node_mean_AllIMTs_RP=XXXyrs.xlsx Disagg_by_node_median_AllIMTs_RP=XXXyrs.xlsx Images of disaggregation 3D histograms for all nodes
	./Disaggregation_by_zones			Disagg_by_zone_mean_RP=XXXyrs.xlsx Disagg_by_zone_median_RP=XXXyrs.xlsx

The first-level folder subdivides the data by return periods (./RP=475yrs, ./RP=975yrs).

In each of these RP folders, data are subdivided into disaggregation results at the node level (./Disaggregagtion_by_nodes) and at the zone level (./Disaggregagtion_by_zones).

In ./Disaggregagtion_by_nodes data are further subdivided according to the considered IMT: ./PGA, ./SA(0.15s), ./SA(1.0s), ./AllIMTs (stack of the contributions to exceedance of all IMTs).

./AllIMTs is finally partitioned into two subfolders, one for the sum of the contributions to exceedance of all IMTs (./not_normalized) and one for the normalized sum of the contributions to exceedance of all IMTs (./normalized).

In the folders dedicated to the disaggregation results at the node level and to individual IMTs (./RP=XXXyrs/Disaggregagtion_by_nodes/PGA or /SA(0.15s) or SA(1.0s)), numerical data are stored into two files, named

- Disagg_by_node_mean_IMT_RP=XXXyrs.xlsx   and Disagg_by_node_median_IMT_RP=XXXyrs.xlsx

where IMT is either PGA, SA(0_15) or SA(1_0) and XXX is the relevant return period; median or mean indicates the summary statistic applied over the population of 100 random samplings of the hazard model logic tree.

The content of these two files is the following:

Rows 1 – 3 = header with statement of relevant RP, IMT and applied statistics (mean or median).

Rows 4 – 5, columns 4 – 93 = coordinates of the centers of the magnitude (M_W) – distance (R_{JB}) bins of the disaggregation.

Rows 7 – 472, columns 1 – 93 = nodes' metadata and disaggregation data. Every row refers to a disaggregation node. Column 1 = node ID number; column 2 = node longitude (deg); column 3 = node latitude (deg); column 4 – 93 = % of contribution to exceedance of the M_W – R_{JB} bin.

In the same folder hosting the files Disagg_by_node_mean/median_IMT_RP=XXXyrs.xlsx we also provide the images (.png format) of the 3D histograms of the disaggregation for all nodes and for both mean and median statistics.

In the folders dedicated to the disaggregation results at the node level and for the stack of all IMTs (./RP=XXXyrs/Disaggregagtion_by_nodes/AllIMTs), numerical data are stored into two files, named

- Disagg_by_node_mean_AllIMTs_RP=XXXyrs.xlsx   and Disagg_by_node_median_AllIMTs _RP=XXXyrs.xlsx

where median or mean indicates the summary statistic applied over the population of 100 random samplings of the hazard model logic tree (for each of the three IMTs), XXX is the relevant return period.

The content of these two files is the following:

Rows 1 – 3 = header with statement of relevant RP, IMT and applied statistics (mean or median).

Rows 4 – 5, columns 4 – 93 = coordinates of the centers of the magnitude (M_W) – distance (R_{JB}) bins of the disaggregation.

Rows 7 – 472, columns 1 – 93 = nodes' metadata and disaggregation data. Every row refers to a disaggregation node. Column 1 = node ID number; column 2 = node longitude (deg); column 3 = node latitude (deg); columns 4 – 93 = sum of contribution to exceedance (%) of the M_W – R_{JB} bins.

In the same folder hosting the files Disagg_by_node_mean/median_AllIMTs_RP=XXXyrs.xlsx we also provide the images (.png format) of the 3D histograms of the disaggregation for all nodes and for both mean and median statistics.

In the folders dedicated to the disaggregation results at the zone level (./RP=XXXyrs/Disaggregagtion_by_zones) numerical results are stored into two files, named

- Disagg_by_zone_median_RP=XXXyrs.xlsx   and
  Disagg_by_zone_mean_RP=XXXyrs.xlsx

where median or mean indicates the summary statistic applied over the population of nodes belonging to the same SIA 261 seismic zone, and XXX is the relevant return period.
The content of these two files is the following:

Rows 1 – 2 = header with statement of relevant RP and applied statistics (mean or median).

Rows 3 – 4, columns 3 – 92 = coordinates of the centres of the magnitude (M_W) – distance (R_{JB}) bins of the disaggregation.

Rows 6 – 20, columns 1 – 92 = zones' statistic metadata (for individual IMTs) and disaggregation data.
Column 1 = IMT;
Column 2 = zone;
Columns 3 – 92 = mean or median contributions to exceedance (%) of the M_W – R_{JB} bins (one for each column) over the population of nodes falling into the considered zone.

Rows 21 – 25, columns 1 – 92 = zones' statistic metadata (for the stack of all IMTs) and disaggregation data.
Column 1 = "AllIMTs, sum of contrib. (%)"
Column 2 = zone;

Columns 3 – 92 = mean or median sum of the contributions to exceedance (%) at the M_W – R_{JB} bins (one for each column) over the population of nodes falling into the considered zone.