Earthquake and ground motion database

The NZ earthquake and ground motion database includes important earthquake data, such as hypocenter locations, corrected local magnitudes, and ground motion intensity measures. This database has been designed to be easily expanded. These pages will break down each catalogue that make up the database, and will outline procedures used to generate the catalogues.

The below section outlines current, future, and past version information. This is a living document and these plans are subject to change with priorities.

Current Version Implementations:

- v 0.6 - This version comes with lots of big changes! Here is a list, apologies if I forgot any:
    - M 6 + GM IM data has been completely redone. These data now include rotd50 and rotd100 values. pSA periods have been updated to include the following: 0.01 0.015 0.02 0.03 0.04 0.05 0.07 0.1 0.15 0.2 0.3 0.4 0.5 0.7 1.0 1.5 2.0 3.0 4.0 5.0 7.0 10.0.
    - The update to the IM tables has not been applied to lower magnitude data; this is part of our ongoing efforts.
    - cMl values have been completely revised and should be considered more reliable. When given enough stations, cMl values are the preferred results. In some cases, particularly for older events, waveform data is not available to properly measure peak amplitudes.
    - The earthquake source table has been updated to include two new columns; domain_no and domain_type, which correspond to the tectonic domain number and the type of rupture associated with that domain.
    - The site table has been slightly reworked to convey which Vs30 model is preferred and the exact value. Columns have been renamed accordingly.

Future Implementation Plans:

- v 1.0 - M>= 3.5 GM IM data added. Add RotD50 and RotD100 data. Revise GM IM catalogue organization to be five different tables (000, 090, ver, RotD50, RotD100). Ground motion classifications are performed on rotation-corrected data, as opposed to raw data.
- v 1.1 - Addition of further site response data (more stations, etc.)
- v 1.? - GM data will be downloaded and processed using magnitude-distance parameters. This will expand the catalogue to include data not 'picked' in the GeoNet catalogue and may result in a higher percentage of high-quality data.
- v 2.0 - Inclusion of automated earthquake solutions.

Previous Version Information:

- v 0.5
    - GM IM tables have been subdivided into flat-files, containing much of the data from the other tables, and tables simply focused on providing the GM IM data. Additional columns have been added to the site table. These include Vs30 data from Foster et al. (2019) and Z1.0 and Z2.5 from the NZVM.
    - A TVZ category has been added to the site table (and GM IM flat files). This category indicates whether or not a site is within the Taupo volcanic zone with 1 being 'yes' and 0 being 'no'.
- v 0.4.2 - Updated the column order presented in the GM IM tables and retitled the csv files to be simpler and more clear.
- v 0.4 - The zip file has been organized to have two folders, Figures and Tables. Additional columns have been added to the GM IM table. These include: 'ev_lat', 'ev_lon', 'ev_depth', 'mag', 'tect_type', 'reloc', 'sta_lat', 'sta_lon', 'Vs30', 'Tsite', 'Z1.0', 'Z2.5', 'rrup', 'rjb', and 'Ztor'. Please note that rrup, rjb, and Ztor are currently duplicates of r_epi, r_hyp from the propagation path table, and event depth.
- v 0.3 - Accompanying figures have been added to the ESGMIM package in .png format.
- v 0.2 - The GM IM catalogue has been divided into three separate documents for 000, 090, and vertical components. The site table contains additional site response data.
- v 0.1 - Includes complete subset catalogue with GM IM and relocation data for M >= 4 GM IM data. As includes tectonic class measurements.
- v 0.0 - First version. Incomplete and without the addition of relocated data.