

## 1. Overview of SeisFinder

SeisFinder is an open-source web service developed by QuakeCoRE and the University of Canterbury, focused on enabling the extraction of output data from computationally intensive earthquake resilience calculations.

Currently, SeisFinder allows users to select historical or future events and retrieve ground motion simulation outputs for requested geographical locations. This data can be used as input for other resilience calculations, such as dynamic response history analysis.

SeisFinder was developed using Django, a high-level python web framework, and uses a postgresQL database. Because our large-scale computationally-intensive numerical ground motion simulations produce big data, the actual data is stored in file systems, while the metadata is stored in the database. The basic SeisFinder architecture is shown in Figure 1.

### 1.1 Selection of Simulation Data

We have simulated a number of events and listed a subset of historical and future events in SeisFinder. All these events have been reviewed by our researchers and possess peer-reviewed publications as well as being of public interest.

### 1.2 Web Interface

Figure 2 shows the SeisFinder web interface for extraction at a single location of interest. Figure 3 shows the web interface for multiple locations of interest. Multiple location inputs can be uploaded in a CSV file. Figure 4 shows the output screen for multiple locations for a future Alpine Fault event (south to north scenario). The downloadable zip file contains the acceleration times series, intensity measures and the location metadata as shown in Figure 5.

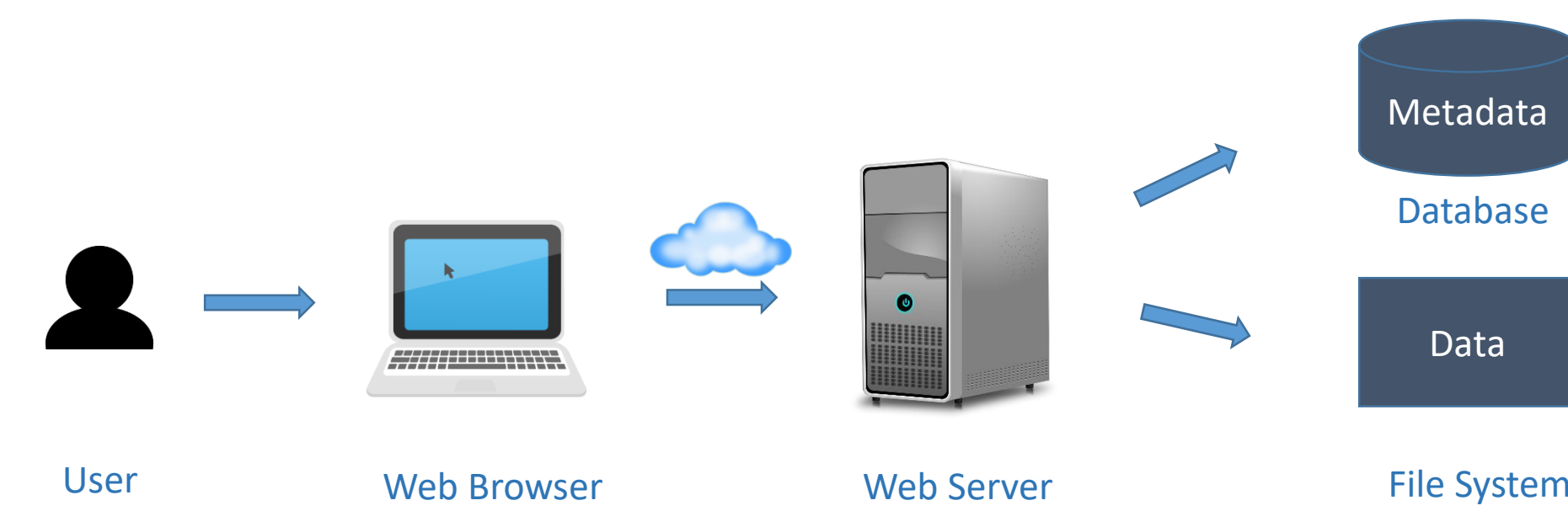


Figure 1: Basic SeisFinder architecture.

### 1.3 Usage of Downloaded Data

To facilitate usage, we have provided instructions and codes to plot and manipulate the output data (e.g. acceleration time series) using several common scripting languages such as python, MatLab and Excel, as shown in Figure 6.

We are also operating a tight feedback loop with a technical advisory group in order to improve user experience and extend from ground motion products at present to impact and risk calculations.

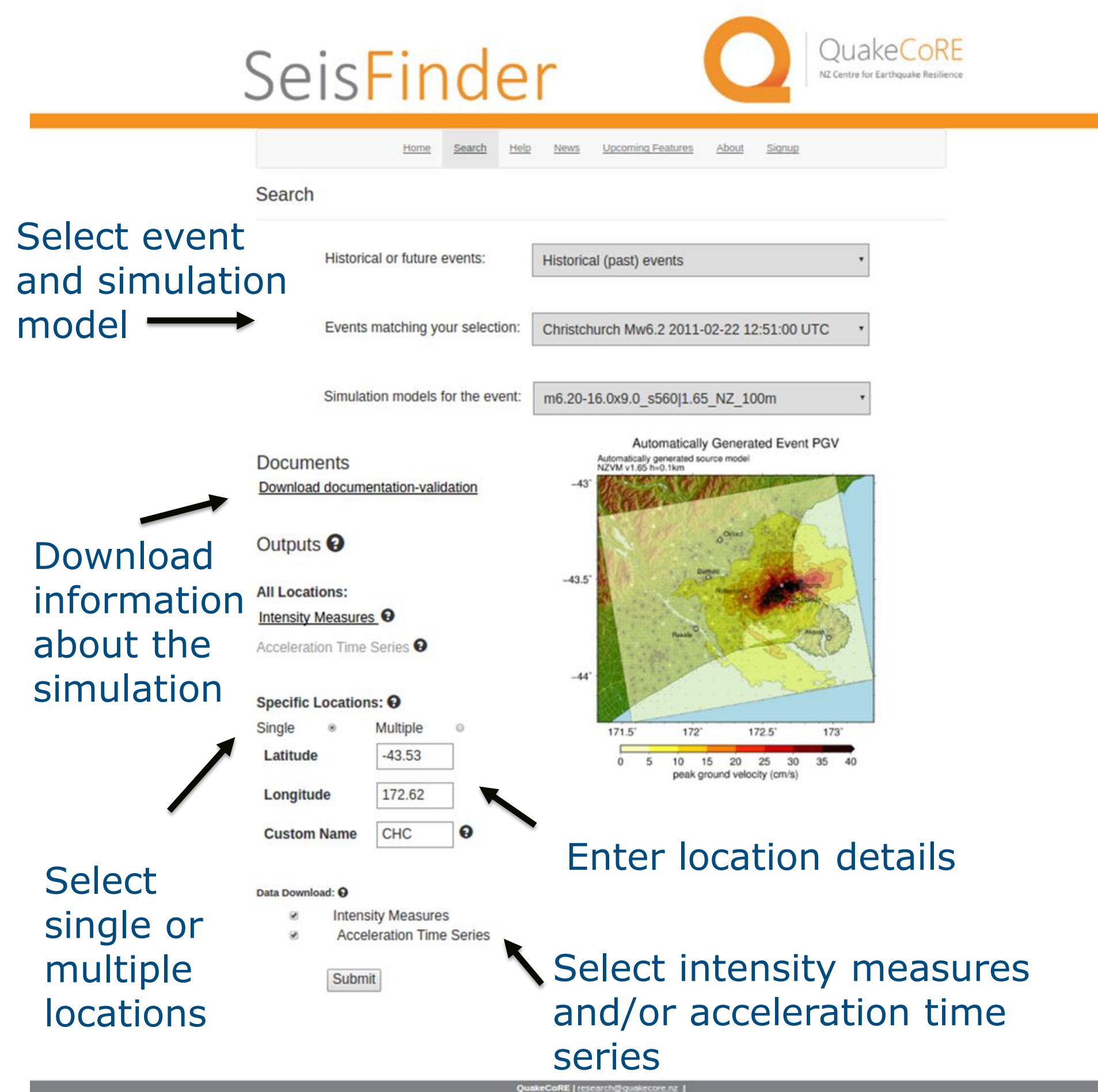


Figure 2: SeisFinder web interface for single location of interest.

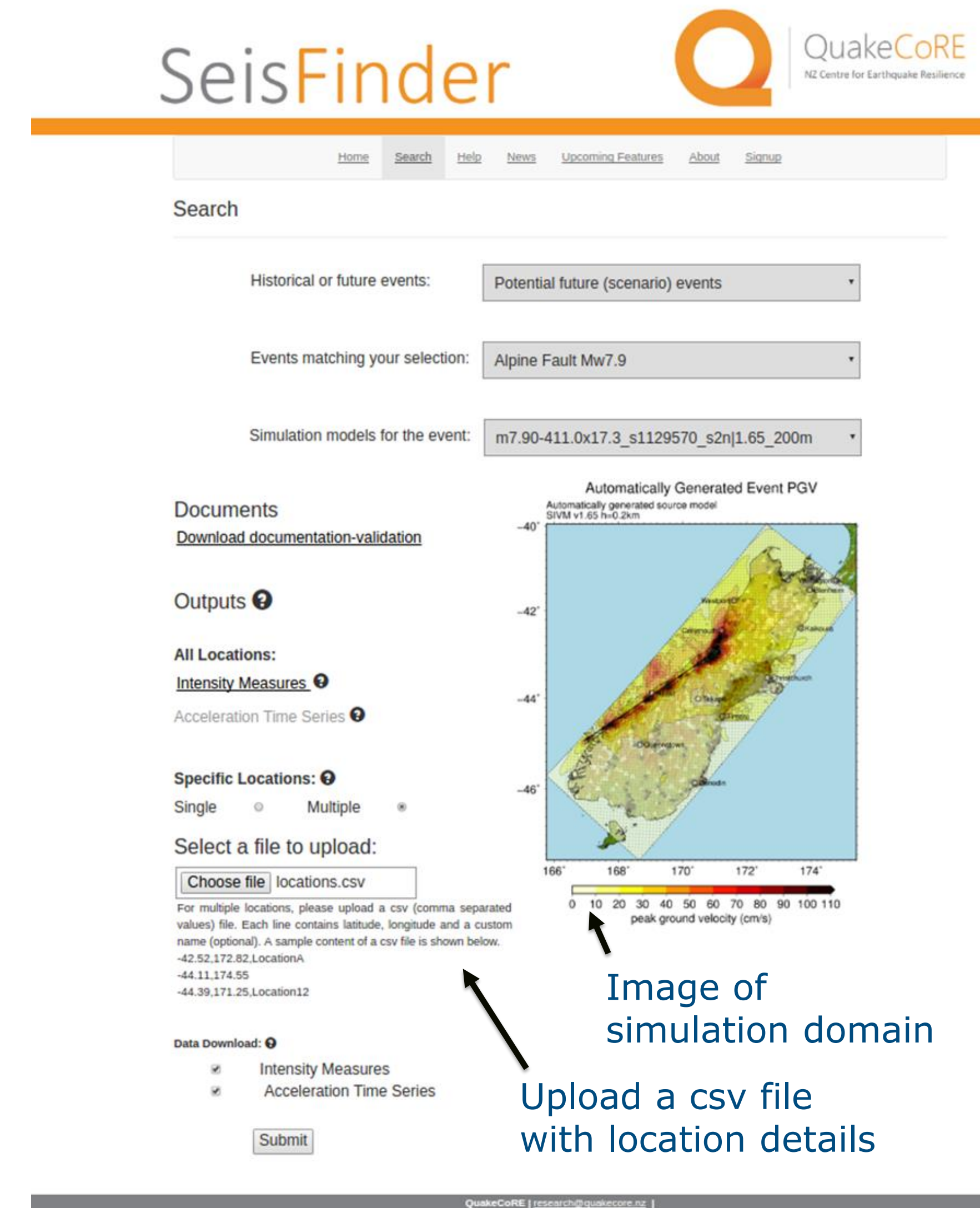


Figure 3: SeisFinder web interface for multiple locations of interest.



Figure 4: SeisFinder showing multiple locations of interest.

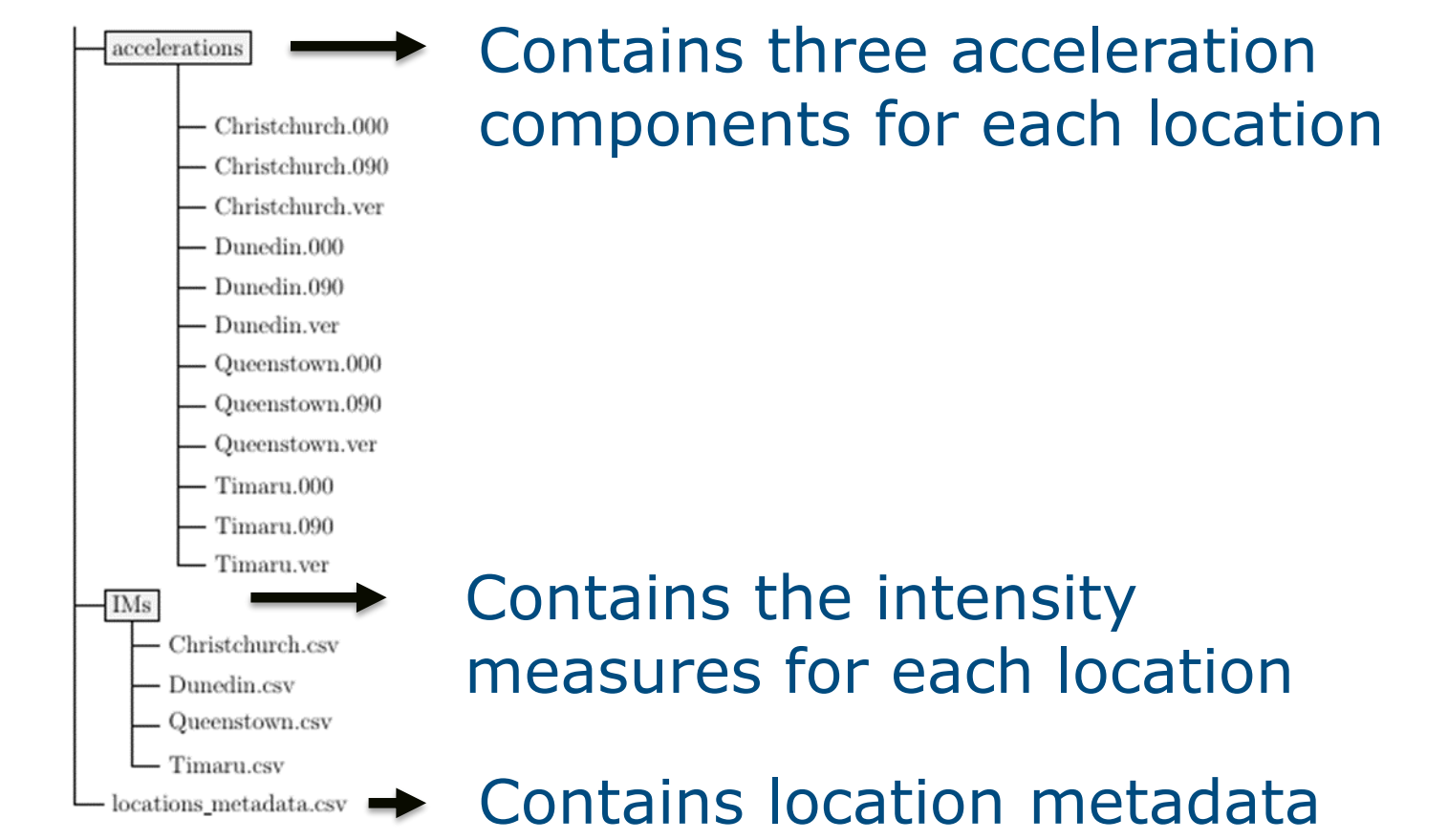


Figure 5: Contents of the downloaded zip file.

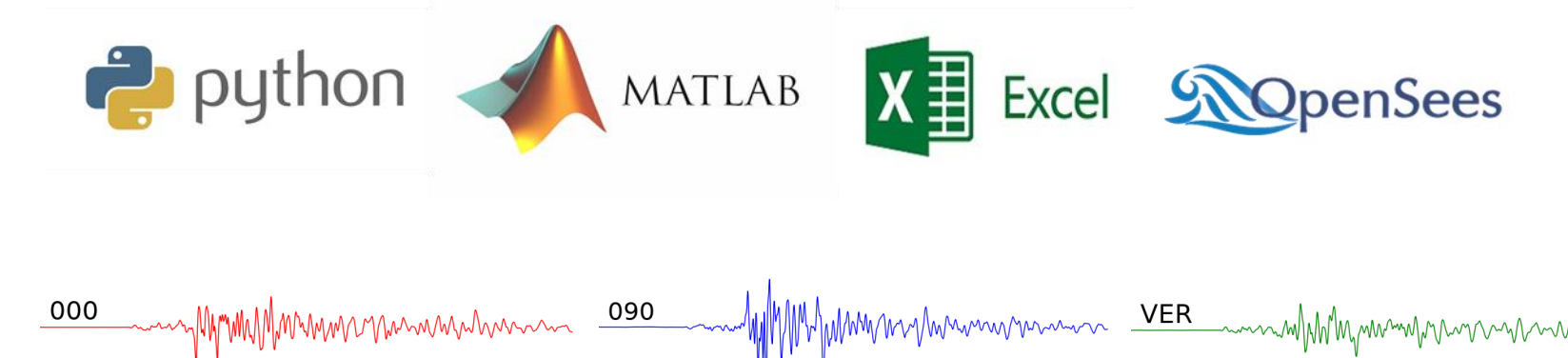


Figure 6: Acceleration time series of the three components and languages of example scripts.

## 2. Future work

We currently operate both public and development websites of SeisFinder for validated and early-adopter content. The major addition over the next quarter will be the inclusion of simulated ground motions for all (~540) sources in the NZ National Seismic Hazard model that have been undertaken within the Cybershake NZ project (Figure 7).

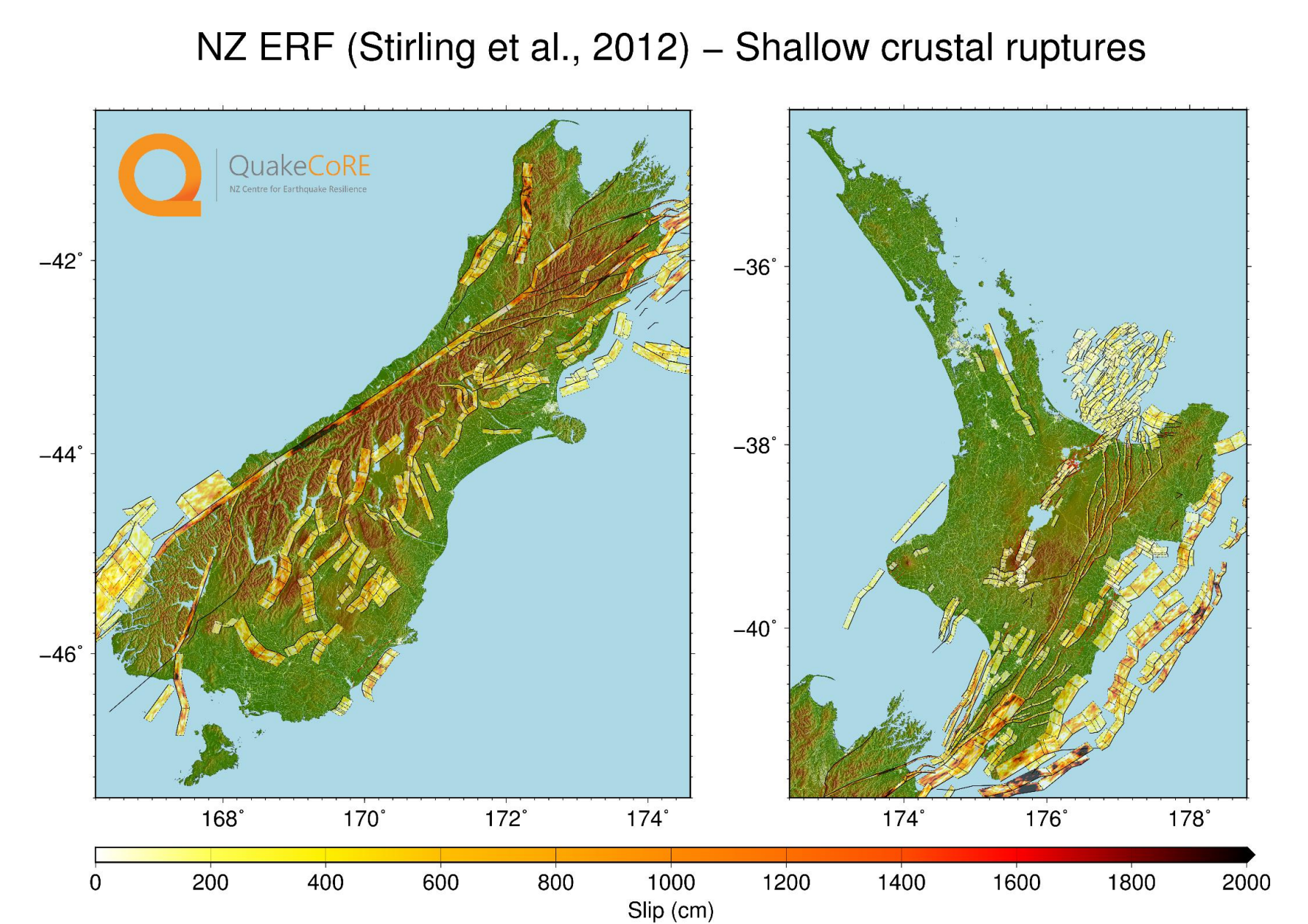


Figure 7: Shallow crustal sources in NZ.

