**MAEviz/mHARP**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Software Name | Peril | | License | | | | | Current Version | | | | Open Source | | Operating Systems | | | | | | | | |
| **MAEviz** | **Earthquake** | | **Single User** | | | | | **V3.1.1 Build12** | | | | Yes | | Win, Mac, Linux | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | | | | |
| **Preferred Specific Information** | | | | | | | | |  | | | |  | | |  | | | |  | |  |
| Coding Language | | Software Modules (see below in appendix for more info) | | | | | | | | | | | | | Manual | | | GUI | | | | Help |
| **Java using Eclipse RCP** | | **Many risk modules—NCSA GIS, Eclipse RCP, MAEviz** | | | | | | | | | | | | | [**YES**](https://opensource.ncsa.illinois.edu/jenkins/job/MAEviz/) | | | **YES** | | | | **YES** |
|  | | | | | | | | | | | | | | | | | | | | | | |
| **Goal of the Software** | | | |  | | | | | | |  | |  | | |  | | | | |  |  |
| Another Hazus-based application, MAEviz (Mid-America Earthquakes Visualization) was developed to perform seismic risk assessment in the middle U.S. states. At first glance, it seems specialized; however, its huge potential can be seen in the flowchart of analysis procedures (48 and counting) and its complete Hazus system, including detailed algorithms. The visually driven system uses a combination of Sakai (an open source web portal), NEESgrid (a framework of tools to allow researchers to collaborate), and SAM (Scientific Annotation Middleware) in order to allow users to add their own hazard data. It is easily extendable; the European Union (EU) project SYNER-G, for example, has added a large fragility function manager to it, in addition to other tools. | | | | | | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | | | | |
| **File Types Used** | | | |  | |  |  | | |  | | | | | | |  | |  | | | |
| Hazard | Vulnerability | | | Exposure | | **Key Hazard Metrics** | | | | | | | | | | | | | | | | |
| .txt, .csv | .xml | | | \*.shp | | Spectral ordinates are used in terms of PGA and Sa. This is calculated using GMPEs and source-site distance, source geometry, and seismicity. | | | | | | | | | | | | | | | | |
| **Description of Software Risk Outputs** | | | | | |
| Damage estimates include options for multiple mitigation strategies, testing of scientific and engineering principles, and estimating the earthquake hazard impact on lifelines and social or economic systems (based on Hazus and extra analysis).  The outputs are economic losses (direct, indirect, downtime, business interruption), social losses (social vulnerability, fatalities, injuries, homeless), and management options. A detailed list of the modules is shown in the appendix. Simple reports and data views are given. The software creates all scenario outputs (disaggregated and not). | | | | | **An overview of the MAEviz options (McLaren et al. 2008**). | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | | | | |
| **Advantages and Disadvantages** | | | | | | | | | | | | | | | | | | | | | | |
| * It is completely open source and features inbuilt GIS; the software is well formatted with the GIS user interfaces. * Is easily the best software for scenario risk assessment and decision support (mitigation, benefit-cost). * It has an outstanding array of modules that provide end analysis such as shelter needs or business interruption. * There is a developer and community, and the function codes are easy to read and improve. * Basic users find it easy to use; the large array of infrastructure types can be used for hazard and loss. * Combining detailed hazard, detailed vulnerability, and management and risk modelling, the software is easily extendable. * It is currently tuned only for deterministic analysis. | | | | | | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | | | | |
| **Recommended Improvements for Greater Utility** | | | | | | | | | | | | | | | | | | | | | | |
| mHARP will give this fantastic software an additional use. It should be integrated with Deltares or other risk software, given the common structure. It has already been integrated in HAZturk and SYNER-G. A combination with EQRM for probabilistic modelling would be useful. An InaSAFE-style command system could simplify the software even further for the most basic users, but it is currently fairly user-friendly. | | | | | | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | | | | |

Figure 2.3. Sample software package review.

*Source:* Daniell 2014.