



WEB-based System for Aftershock Hazard Assessment

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The first version of web-based system for automatic aftershock hazard assessment is available at <http://afcast.org/afcast>. The system software downloads earthquake data every 2 hours from ANSS Comprehensive Earthquake Catalog (ComCat, <http://earthquake.usgs.gov/data/comcat/>) provided on-line by USGS. Currently the system is aimed to assess hazard of aftershocks of M5.5+ after earthquakes of M6.5+. The access to the system is unlimited to the registered users only. First, the system estimates in quasi real time mode an area where strong aftershocks are expected. This area is modeled by an ellipse and stadium (the locus of distances from a line segment not exceeding a given value), both centered and oriented according to the main shock rupture, estimated using epicenters of the first 12 hours aftershocks. The sizes of the areas are controlled by q part of earthquakes for 12 hours after the mainshock from the enclosed circle with radius of $0.03 \times 10M/2$. The chosen q -values are based on retrospective (1980-2015) analysis of the error diagram and imply three forecasting strategies: “soft”, “neutral” and “hard”. The “soft” strategy minimizes false alarms at a reasonable rate of failures to predict. The “hard” strategy, in contrary, minimizes the rate of failures to predict at a reasonable area of alarms. The “neutral” strategy equalizes errors of two types. Three concentric ellipses or stadiums may serve as benchmarks for the choice corresponding to specific hazard reduction measures between the three strategies. Next, the system will estimate the period and magnitude of the strongest aftershock expected inside the alarm area. This research was carried out at the expense of the Russian Science Foundation (Project No. 16-17-00093).