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Iceland's early warning and information system for geologic hazards

M. J. Roberts, R. Stefánsson, S. S. Jakobsdóttir, G. B. Guðmundsson, K. S. Vogfjörð and P. Halldórsson

Physics Department, Icelandic Meteorological Office, 150 Reykjavík, Iceland (E-mail: matthew@vedur.is Fax: +354 522 6001)

To enable accurate, short- and long-term factual statements about seismic and volcanic hazards in Iceland, we have developed an early warning and information system (EWIS) for visualising geophysical data from sensor-based networks. In this presentation, we outline the design, application, and future use of EWIS. The goals of the EWIS project are (i) to produce a publicly understandable, Web-based display of past and present seismic activity in Iceland; and (ii) to produce a complementary, online databank containing scientific and public information to encourage far-sighted hazard identification and risk mitigation. For well-instrumented sites with data records spanning several episodes of tectonic unrest, anomalous changes in seismicity can be used to warn about seismic and volcanic hazards. EWIS uses the following definitions for its warning protocol. (i) Long-term warning: a forecast based on analysis of the recurrence probability of a tectonic hazard within a specified area and finite period, usually of the order of years. (ii) Intermediate-term warning: a factual statement issued when geophysical parameters depart from observed trends; likewise, intermediate warnings are applicable to a geographic area and time window ranging from months to a few years. (iii) Short-term warning: a statement about the magnitude and type of tectonic activity to be expected within a precise geographic area and time interval. Future EWIS work will focus on the development of event-probability maps that dynamically integrate real-time, multi-parameter data in a GIS. It is anticipated that such maps will serve as baseline data for emergency management of future earthquake-volcano crises.