Geophysical Research Abstracts
Vol. 17, EGU2015-2346, 2015
EGU General Assembly 2015

Geosocial process and its regularities

Marina Vikulina (1), Alexander Vikulin (2), and Anna Dolgaya (3)

(1) Faculty of Geography, Lomonosov Moscow State University, Moscow, Russian Federation (masanna2003@mail.ru), (2) Institute of Volcanology and Seismology, Petropavlovsk-Kamchatsky, Russian Federation (vik@kscnet.ru), (3) Institute of Volcanology and Seismology, Petropavlovsk-Kamchatsky, Russian Federation (adolgaya@kscnet.ru)

Natural disasters and social events (wars, revolutions, genocides, epidemics, fires, etc.) accompany each other throughout human civilization, thus reflecting the close relationship of these phenomena that are seemingly of different nature. In order to study this relationship authors compiled and analyzed the list of the 2,400 natural disasters and social phenomena weighted by their magnitude that occurred during the last XXXVI centuries of our history. Statistical analysis was performed separately for each aggregate (natural disasters and social phenomena), and for particular statistically representative types of events. There was 5 + 5 = 10 types.

It is shown that the numbers of events in the list are distributed by logarithmic law: the bigger the event, the less likely it happens. For each type of events and each aggregate the existence of periodicities with periods of 280 $\pm$ 60 years was established.

Statistical analysis of the time intervals between adjacent events for both aggregates showed good agreement with Weibull-Gnedenko distribution with shape parameter less than 1, which is equivalent to the conclusion about the grouping of events at small time intervals. Modeling of statistics of time intervals with Pareto distribution allowed to identify the emergent property for all events in the aggregate. This result allowed the authors to make conclusion about interaction between natural disasters and social phenomena.

The list of events compiled by authors and first identified properties of cyclicity, grouping and interaction process reflected by this list is the basis of modeling essentially unified geosocial process at high enough statistical level. Proof of interaction between "lifeless" Nature and Society is fundamental and provided a new approach to forecasting demographic crises with taking into account both natural disasters and social phenomena.