



A new approach to climate proof insurance industry

Vyacheslav Lyubchich*

University of Maryland Center for Environmental Science, Solomons, MD, USA - lyubchic@cbl.umces.edu

Yulia R. Gel

University of Texas at Dallas, Richardson, TX, USA - ygl@utdallas.edu

Sylvia Esterby

University of British Columbia, Okanagan, Kelowna, BC, Canada - sylvia.esterby@ubc.ca

The adverse effects of climate change bring increasingly more alterations into all aspects of human life and welfare, and one of the sectors that is particularly affected is insurance industry. Indeed, the year 2013 brought a record amount of claims and losses due to weather related damages, which in the USA and Canada alone cost to insurers more than \$3 billion. We aim to provide a statistical data-driven insight into (non)linear relationship between weather-related house insurance claims and atmospheric variables, and to predict future claim dynamics accounting for changes in extreme weather. We propose to employ a flexible Generalized Autoregressive Moving Average (GARMA) model for count time series of insurance claims, develop a new method to compare tails of the observed and projected extreme precipitation and evaluate its impact on number of claims in the GARMA framework.

Keywords: weather extreme; insurance claim; GARMA; distribution tail comparison.