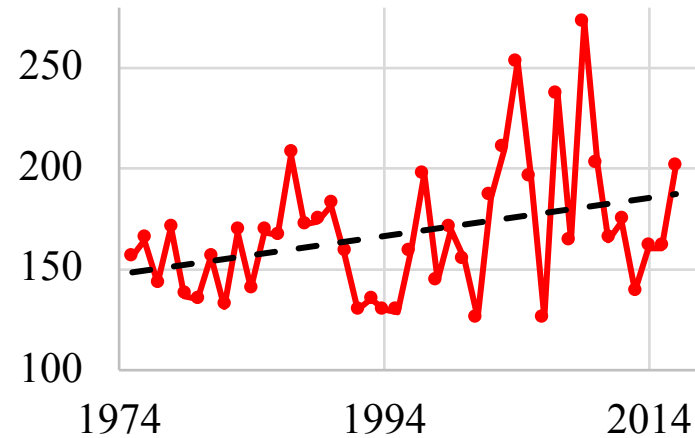# Forecasting convective high-impact weather events in Armenia using the WRF model and WRF Data Assimilation system

Hazardous weather events are increasing in Armenia!

Observed number of severe weather events in Armenia (strong frosts+hailstorms+winds+heavy rains) from 1975 to 2016

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Purpose of the project

- Very high-resolution simulations (500 m – 1 km spatial spacing) using Weather Research and Forecasting model (WRF), not done before due to limitations of computing resources.
- Perform sensitivity experiments with WRF model, i.e. testing various physical parametrization of the model, various global forcing datasets, etc.
- Assimilation of high density local observations (e.g. from local weather stations and radars not included in models) when simulating convective storms. Data assimilation may further improve the modeling and forecasting of location, timing and magnitude of hazardous weather events in Armenia.

EYR Support from ASNET-AM

- HPC resources - hundreds of CPU cores and work with huge amount of data (up to 3 Terabytes).
- Technical support – e.g. related to properly compiling the WRF model and necessary libraries, etc.
- Open Access Publication of research results in a peer-reviewed journal

Importance of the project

- Hundreds of millions of dollars of damage from extreme weather in Armenia (3rd National Communication on Climate Change in Armenia, 2015). Agricultural damage caused by hailstorms, heavy rainfall, severe flash floods in mountain river basins.
- Armenia still considered as little-studied. High resolution modelling research will improve our understanding of physics of initiation of local and mesoscale convective storms, their dynamics and microphysical structures over mountain terrain.
- Main goal - research outcomes to be introduced in the operational practice of Hydromet Service of Armenia to improve short-term forecasts of dangerous weather events → early warning system.