CURRICULUM VITAE

Sofya Garipova

Russia, Moscow

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Scientific interests

Active faults, paleoseismology, seismic hazards, tectonics, structural geology, remote sensing, geoinformatics, spatial analysis, geostatistics, hydrogeology, engineering geology, numerical modelling.

Education

Bachelor's degree (with Honours): Lomonosov Moscow State University '18
Geological Faculty, Hydrogeology and Engineering geology
Average grade 4.8/5

Thesis "Analysis of hydrogeodynamical regime of Kislovodsk mineral water field"*:*
regression analysis of hydrogeological monitoring data

Master's degree (with Honours): Lomonosov Moscow State University '20
Geological Faculty, Hydrogeology
Average grade 4.8/5

Thesis "Ionakhsh fault caprock influence on hydrogeological conditions of Rogun hydropower plant area": *geostatistical study of caprock structure in Ionakhsh fault zone (Tajikistan) and numerical modeling of caprock dissolution developing its transmissivity*

Work experience

Academic

2020 – present

Geological Institute of Russian Academy of Sciences, junior researcher (100%)

provisioning of Active Faults Eurasia Database (AFEAD) – non-relational database;
assessment of paleoearthquakes magnitude and seismic hazard rate of regions;

active faults mapping, remote sensing, spatial analysis, photogrammetry,
UAV survey (DJI Phantom 4 Pro, Mini SE, Mini 2), 3D models and high-quality DEM creation (Agisoft Metashape, Pix4D), GNSS survey;
ArcGIS, QGIS (including clustering, supervised and unsupervised classification);

python (numpy, scipy, scikit-learn) for statistical data analysis, time-series analysis, spectral analysis by multitaper method;
Bayesian age-depth modelling (OxCal);

python for 3D geological modelling (gempy);
R for statistical data analysis;

field geological investigation: deposits sections description, trenching, sampling.

Non-academic

2017-2018

"HYDEC", hydrogeologist (50%)
statistical research of mineral water fields (Kislovodsk, Essentuki, Borjomi): regression analysis of hydraulic data to predict hydraulic head values in 25 years prospective, monitoring database provisioning;
analysis of pumping tests.

2018-2019

"Hydroproject" (RusHydro), junior engineer (50%)
numerical modelling of groundwater flow (Feflow – finite-element modeling software) for hydropower plant construction: Rogun HPP, Saratov HPP;
simulation of drainage projects to reduce groundwater flooding.

2022

"TINGIDIS", middle engineer (75%)
water disposal system engineering (feasibility study), drainage projects;
reports on ground and groundwater pollution elimination in chemical plant area;
numerical modelling of groundwater migration (GMS);
statistical analysis of groundwater migration, maps creation and development, spatial analysis (QGIS, ArcGIS, SAGA GIS).

Participation in grants

Previous:
1. "Active tectonics of recent mobile zones of North Eurasia" 2020-2021

Current:
2. "Active fault tectonics of Sredinny Range of Kamchatka" 2021-2022
3. "History of development and degradation of gigantic late Pleistocene lake in Kamchatka" 2021-2024
4. "Neotectonics and active tectonics of the North part of Central Asia" 2022-2025

Publications

ResearchGate profile: https://www.researchgate.net/profile/Sofya_Garipova

1. Zelenin, E., Bachmanov, D., **Garipova, S.**, Trifonov, V., and Kozhurin, A.: The Active Faults of Eurasia Database (AFEAD): the ontology and design behind the continental-scale dataset, Earth Syst. Sci. Data, 14, 4489–4503, https://doi.org/10.5194/essd-14-4489-2022, 2022.

In Russian: https://elibrary.ru/author_profile.asp?authorid=1115077

2. Zelenin, E., **Garipova, S.** Active faulting in Sredinniy Range, Kamchatka Peninsula // Bulletin of Kamchatka Regional Association «Educational-Scientific Center»: Earth Sciences. 2022. Vol. 53. No. 1. P. 104-112. DOI: 10.31431/1816-5524-2022-1-53-104-112 (in Russian).
3. Zelenin, E., Strom, A., **Garipova, S**. Active faults concept in geological data and their segmentation for seismic regionalization issues // Conference: Prospectives of engineeting survey development in Russia. Moscow, 2021. P. 420-424 (in Russian).

4. Zelenin, E., Strom, A., **Garipova, S.**, Sokolov, S.: Stochastic approach of active faults study (South Tuva example) // Conference: Study of natural hazards and geotechnical monitoring during engineering survey. Moscow, 2021. P. 161-165 (in Russian).
5. Moiseev, T., **Garipova, S.**: Landscape justification for creation of natural reserves (Bashkortostan) // Geology, Geography and Global Energy. 2021. № 1 (80). P. 94-102 (in Russian).

Skills

GIS software:

Advanced in ArcGIS, QGIS, Agisoft Metashape, Pix4D, GS Surfer/Voxler, Photomod

Numerical modeling (hydrogeology):

Processing Modflow, Feflow, WMS Aquaveo

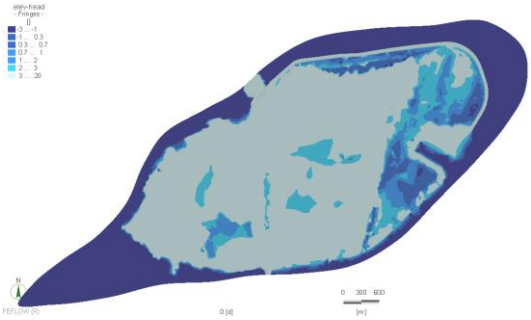
Python (numpy, scipy, scikit-learn, matplotlib, gempy, etc)

basic C++, R

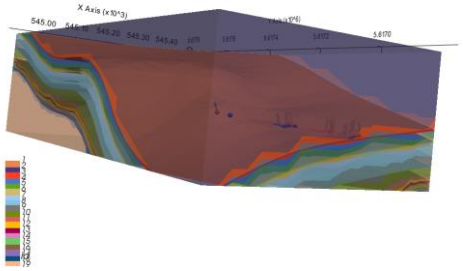
SQL

HTML5, CSS3, leaflet

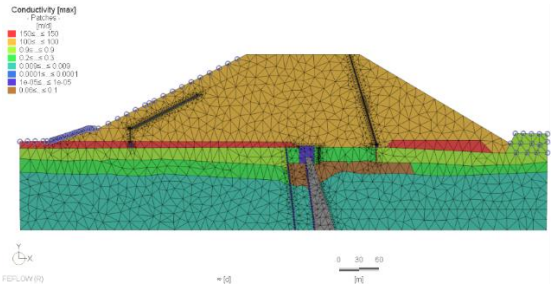
English language C1, German language A1



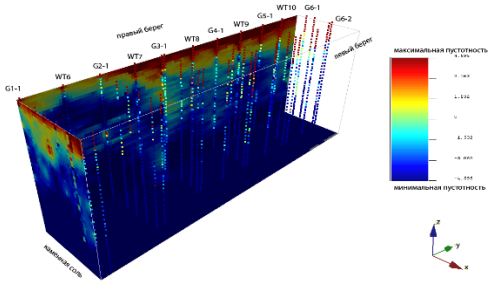
Assessment of groundwater flooding, 2D finite-element model of Saratov HPP, Russia
(Feflow Software)



3D model of Miocene deposits deformation in active fault zone, simulated by measured dip and strike,
Tuva, Russia (Gempy, python), visualization - pyvista

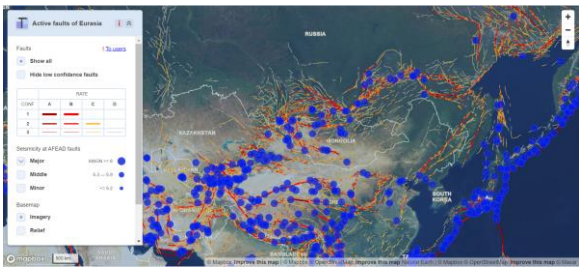


2D finite-element groundwater flow model of Rogun HPP, Tajikista
(Feflow Software)



Geostatistical model of caprock porosity by core recovery
(SGeMS Software)

2,5D model of Sayan-Tuva active fault scarp (Agisoft Metashape) on UAV data (DJI Phantom 4 Pro)



Active Faults of Eurasia Database (mapbox)

Field Experience

Tuva (Russia) – 2020, 2021 – UAV survey, seismological and geomorphological survey of Sayan-Tuva, South-Tannuola and Erzin-Agordag fault zones, Miocene-Quaternary deposits sections description, sampling for age dating, trenching.

Kamchatka Peninsula – 2021, 2022 – Sredinny Range – UAV survey, study of displaced Quaternary lava flows for K-Ar age dating;
– 2022 – Central Depression of Kamchatka – UAV survey, tephra and grainsize sampling, sections and borehole core data description, GNSS survey;
– 2022 – Shilveluch volcano region – UAV and GNSS survey.

Elbrus region – 2020 – Holocene tephra sampling at the east Elbrus slope;
– 2022 – Holocene tephra sampling at the west and north Elbrus slopes.

Ladoga lake (Leningrad region) – 2022 – young scientists field class of lake bathymetry, drilling and UAV survey.

Moscow region – 2017, 2018 – hydrogeology and geocryology field class (one month in summer and two weeks in winter) included engineering study of grounds in situ, such as
static loading plate test, pressuremeter test;
rock mechanics study and drilling;
cluster pumping test, tracer test;
vertical electrical sounding, riverbed geophysics;
snow survey, seasonal freeze depth estimation, etc.

Crimea – 2015, 2016 – structural geology field class (one month both years) included geological and tectonic mapping of the study area, samples collection, rocks age dating by paleontological method.

Additional information

Participated in scientific conferences:
- Lomonosov: Hydrogeology department (in Russian) 2015, 2018
- Study of natural hazards and geotechnical monitoring during engineering survey (in Russian) 2021
- Prospective of engineering survey development (in Russian) 2021
- Geotectonics and geodynamics of seismic regions (in Russian) 2022

Cross-country skier and long-distance runner

During 2016-2019 was a lecturer of “Popular geology” (Moscow State University) teaching class for kids.


Participated in international volunteer projects in Spain – Pirineos (2016) and Basque Mountains (2017). University volunteer (blood donation, sport events), have a first aid certificate.