



Table of contents

About the 5th conference on “Debris Flows: Disasters, Risk, Forecast, Protection”	5
<i>S.S. Chemomirets, G.V. Gavardashvili</i>	
Conference organizers, sponsors and partners	8
Organizing committee of the Conference	10
Traditions of mudflow studies in the institute of hydrometeorology of georgian technical university: evaluations, prospects	15
<i>G.I. Kherkheulidze</i>	
Analysis of debris flows by application of GIS and remote sensing: case study of western foothills of Pirin Mountains (Bulgaria)	22
<i>A. Baltakova, V. Nikolova, R. Kenderova, N. Hristova</i>	
Glaciers and debris flows in the Caucasus	33
<i>I. Bondyrev</i>	
Discussion on the characteristics and calculation method of material source for the debris flow in Tian Mo Gully	44
<i>L. Chen, J. Wang, J. Jiu, Y. Li, S. Shi</i>	
System geoinformation approach to the study of mudflow processes	54
<i>T.B. Chepurna</i>	
Geomorphological and geological analysis of Akchour landslide in Rif Mountain, Morocco	63
<i>H. Harmouzi, A. Dekayir, M. Rouai</i>	
Assessment and analysis of the freeze-thaw erosion sensitivity in Tibet, China	71
<i>J. Fan, C. An</i>	
Impact forces of torrential floods on exposed buildings	77
<i>S. Fuchs, M. Sturm, F. Keller, B. Mazzorana, M. Papathoma-Köhle, M. Aufleger, B. Gems</i>	
The mud/debris flow of the Stava (Italy) tailings dams break	87
<i>R. Genevois, P.R. Tecca</i>	
Potential danger of dammed lakes induced by the 2017 Ms6.9 Milin earthquake in the Tsangpo gorge	97
<i>K. Hu, X. Zhang, J. Tang, W. Liu</i>	
Change in water environment and aquatic ecology of Himalayan region	105
<i>M. Isaac, A.K. Pathak, R.K. Isaac, U. Sharma</i>	
Climate change and flash floods in Himalayan region	115



<i>R.K. Isaac, S. Shakti, M. Hardeep, M. Isaac</i>	
How to effectively monitor geomorphic changes in debris flow channels	123
<i>K. Keilig, A. Dietrich, M. Krautblatter</i>	
Pulse-doppler RADAR-system for Alpine mass movement monitoring	130
<i>R. Koschuch</i>	
The meteorological warning method of China geological disasters induced by precipitation	138
<i>Y. Li, W. Li, J. Di, G. Zhang, H. Bao</i>	
A monitoring barrier for investigating debris flow/structure/ground interactions	152
<i>G. Nagl, R. Kaitna, J. Hübl</i>	
Geological and geotechnical findings of the catastrophic debris flow near Tskneti, Georgia, June 2015	158
<i>P. Neumann, M. Bauer, M. Haidn, K. Keilig, Z. Menabde, D. Dumbadze</i>	
Possible impact of climate and weather condition on debris flows occurrence (on the example of Kresna gorge, Bulgaria)	166
<i>N. Nikolova, G. Rachev, R. Kenderova</i>	
Automatic detection and identification of debris flows based on seismic and infrasound signals	176
<i>A. Schimmel, J. Hübl</i>	
Reconstruction of debris floods caused by breach of the prehistoric rockslide dams in Central Asia and their parameters assessment	182
<i>A.L. Strom, A.N. Zhirkevich</i>	
Forecasting colloidal fractions value transported by floods on the example of Duruji Basin	193
<i>T. Supatashvili, Sh. Kupreishvili, P. Sichinava, M. Shavlakadze, K. Dadiani, K. Kiknadze, I. Maisaia</i>	
Multi-level flexible debris flow barriers: case study in Peru	200
<i>C. Wendeler, H. Salzmann, N. Feiger, H. Hofmann</i>	
Engineering control of debris flow in New Luding county, Hengduan Mountains, China	209
<i>H. Xie, Y. Li, S. Wang, J. Zhang, B. Yu</i>	
Conditions and mechanism for formation of glacial debris flows in Parlung Zangbo, SE Tibetan Plateau	219
<i>J.J. Zhang, J.K. Liu, Y.L. Li, J.C. Wang, L. Chen, B. Gao</i>	
Brazilian tropical residual soils as the solid phase sources of local occurring mud and debris flows due to heavy rains	230
<i>D.V. Znamensky</i>	
Mapping of multiphase catastrophic glacial events	246
<i>K.A. Aristov, O.V. Tutubalina, S.S. Chernomorets</i>	
Spatial-temporal analysis of the mudflow phenomena distribution and ways of preventing and reducing their destructive effects in mountainous and foothill areas of Kazakhstan	262



<i>T.A. Baimoldayev, M.K. Kassenov, A.K. Mussina, Zh.T. Raimbekova</i>	
Design and construction of mud protection facilities in Kazakhstan. The present stage 2008-2018	271
<i>T.V. Bakarassova, Y.N. Zinevich., Y.K. Khozhanazarov</i>	
The prediction of surface position of sediments in the upper bay of mudflow protection structures	283
<i>P.O. Baljyan, V.O. Tokmajyan, V.P. Baljyan, A.V. Bayunts</i>	
Debris flow check constructions situated near the mouth of a debris flow rivers of the Sakhalin Island	289
<i>D.A. Bobrova, E.N. Kazakova</i>	
The motion of the solid phase in a turbulent debris flow	294
<i>K.V. Verkhovov, S.V. Rybalchenko</i>	
Relationship between seismic and debris flow manifestations in Khibiny low mountains, Kola peninsula, Russia	299
<i>E.V. Garankina, A.A. Lukashov</i>	
The analysis of existing methods of determining the mudflow velocity	308
<i>K.A. Gegiev, F.Kh. Sherkhov, Z.J. Gergokova</i>	
The effect of subsurface runoff in the formation of river flood and debris flow on the watercourses of the taiga zone	314
<i>Y.V. Gensiorovskiy, G.V. Pryakhina, N.A. Kazakov</i>	
Debris flows 14 and 15 august 2017 in the basin of Gerhozhan-Su river (Central Caucasus): conditions and causes of formation, dynamics, consequences	317
<i>M.D. Dokukin, M.A. Anaev, M.Yu. Bekkiev, E.M. Bogachenko, E.V. Zaporozhchenko, R.Kh. Kalov, E.A. Savernyuk, S.S. Chernomorets, M.M. Khadjiev, A.V. Khatkutov</i>	
Actions for protection of infrastructure against mudflows of Western Caucasus (in the Lagonaki Highlands)	331
<i>Yu.V. Efremov, D.Yu. Shulyakov</i>	
Water-ice flows on the rivers of the Almaty region	338
<i>V.V. Zhdanov</i>	
Prerequisite for enhanced mudflow activity in West Sayan mountains	345
<i>E.S. Zelepukina, S.A. Gavrilkina, G.V. Pryakhina</i>	
Debris flow protection on Sakhalin Island	351
<i>E.N. Kazakova, N.A. Kazakov, Y.V. Gensiorovskiy</i>	
Glacial Lakes in the Ile (Zailiiskiy) Alatau: Current state, observed changes and potential risks	357
<i>V. Kapitsa, M. Shahgedanova, Z. Usmanova, I. Severskiy, V. Blagovechshenskiy, N. Kasatkin, V. Mishenin, Yu. Rebrov, A. Golenko</i>	
Modelling of the 1st September 2017 Bashkara lakes outburst	367
<i>V.M. Kidyayeva, D.A. Petrakov, S.S. Chernomorets, I.N. Krylenko, A.A. Aleynikov, M. Stoffel, C. Graf</i>	



Comparative assessment of mudflow activity in the geographical regions of the North Caucasus (from east to west and from north to south) by type, origin and volume of mudflow deposits	378
<i>N.V. Kondratieva, A.Kh. Adzhiev, V.V. Razumov, M.Yu. Bekkiev</i>	
Formation and distribution of mudflows in North Ossetia–Alania	383
<i>N.V. Kondratieva, V.Kh. Kesaonov, L.V. Khuchunaeva</i>	
The 4 September 2017 mudflows in river basins Kuz'minka and Matrosskaya, Paramushir Island, the Kuril Islands	389
<i>T.A. Kotenko, L.V. Kotenko</i>	
Rivers of Kamchatka volcanic territories and their lahar danger	400
<i>L.V. Kuksina, Ya.D. Muravyev</i>	
Modeling of flash floods on the example of the Shirokii Channel	411
<i>V.A. Kurovskaia, T.A. Vinogradova</i>	
Environmental risk for the pollution of lake Baikal by the waste of the Baikal Pulp and Paper Mill	419
<i>V.K. Laperdin</i>	
Factors of forming mudflows Baikal rift zone and the protection cluster avtoturistic «Tunka Valley»	433
<i>Lekhatinov A.M., Lekhatinova E.B.</i>	
Natural distribution and activity indicators manifestations of mudflow	438
<i>Lekhatinov A.M.</i>	
Mountain ecosystems of Zhupanovsky Volcano (Kamchatka Peninsula, Russia) and their transformation under the influence of eruptions in 2013-2017	443
<i>M.A. Makarova, V.G. Dirksen, N.A. Vladimirova, O.V. Dirksen</i>	
Modeling of catastrophic floods in the basin of the river Tuapse	450
<i>O.M. Makarieva, T.A. Vinogradova, N.V. Nesterova, A.Yu. Vinogradov, I.N. Beldiman, A.D. Kolypaeva</i>	
Use of space weather indicators for operational forecast of mudflows	464
<i>I.V. Malneva, A.A. Cherkesov</i>	
Modern problems of forecasting mudslides in Georgia and in adjacent territories	471
<i>I.V. Malneva, N.K. Kononova</i>	
About the methodology of assessment of damage caused by mudflow action	476
<i>A.Kh. Markosyan, O.V. Tokmajyan, V.G. Hayrapetyan, G.A. Ivanyan</i>	
Mudflow-processes monitoring recommendations on motorways, by the example of the road section from the Sulimovsky stream to the border point (Esto-Sadok village)	483
<i>S.I. Matsiy, L.A. Sukhlyayeva, V.A. Lesnoy</i>	
Conception monitoring of the mudflow hazard in Ile Alatau	492
<i>A.R. Medeu, M.A. Askarova, V.P. Blagovechshenskiy, S.U. Ranova, B.S. Stepanov</i>	



Hydraulic calculation of anti-mudflow structure with a bottom grating to extinguish the kinetic energy of noncohesive debris flow to transform it into an ordinary silt-carrying flow	499
<i>O.G. Natishvili, G.V. Gavardashvili</i>	
Debris flows in mountain framing of the Boguty depression, South-West Altai: analysis of the landscape climatic factors and triggers	505
<i>R.K. Nepoch, A.R. Agatova</i>	
Outbursts of glacial and subglacial lakes at the area of the Progress station, East Antarctica, in 2017-2018	512
<i>S.V. Popov, A.S. Boronina, G.V. Pryakhina, S.D. Grigoreva, A.A. Sukhanova, S.V. Tyurin</i>	
Debris flows on the islands and coasts of the Arctic seas	521
<i>F.A. Romanenko</i>	
Debris flow phenomena in the Lovozerskiye Tundry	529
<i>A.I. Rudinskaya, Yu.R. Belyaev, A.L. Gurinov, E.V. Garankina</i>	
An integrated approach to the creation of the engineering protection against debris flow processes on marine terraces of the Sakhalin island	538
<i>S.V. Rybalchenko, K.V. Verkhovov</i>	
The difference of slope debris flows from other exogenous processes	544
<i>S.V. Rybalchenko, K.V. Verkhovov</i>	
Formation conditions and hazard analysis of debris flows in the Tunka ridge, Siberia, Russia	550
<i>A.A. Rybchenko, A.V. Kadetova, E.A. Kozireva</i>	
The strong hail and mudflow events occurred in the territory of Gobustan district of Azerbaijan Republic on June 1, 2017	559
<i>S.H. Safarov, ¹T. Bayramova, E.S. Safarov</i>	
Methodology for the debris flows forecast in the Central Caucasus region and its approbation	564
<i>I.B. Seinova, Y.B. Andreev, I.N. Krylenko, E.M. Bogachenko, I.G. Feoktistova</i>	
Remote sensing techniques and numerical simulation of debris flows in the Akhangaran and Tegermech Rivers basins, using RAMMS software	571
<i>E. Semakova, Yo. Alimov, L. Sichugova, D. Semakov, C. Graf</i>	
Assessment of dynamic characteristics of debris flow	576
<i>D.P. Sokolova, T.A. Vinogradova, A.A. Ostashov</i>	
Principles of morphodynamic analysis and mapping of mudflow hazard of the mountains of southern Siberia	587
<i>V.P. Stupin, L.A. Plastinin, B.N. Olzoev</i>	
Climatology of debris-flow forming precipitation in Caucasus: hypotheses and facts	595
<i>Ye.A. Talanov</i>	



New verification of the groundwater and tectonic processes possible impact on a series of recent catastrophic floods and debris flows (2011-2017)	606
<i>T.A. Trifonova, D.V. Trifonov, S.I. Abrakhin, V.N. Koneshov, A.V. Nikolaev, S.M. Arakelian</i>	
The debris flows hazard of the river Varzob basin (Tajikistan)	619
<i>A.R. Fazilov, J.B. Niyazov, M.S. Saidov, Ye.A. Talanov</i>	
Slushflow release forecasting	624
<i>P.A. Chernous, A.V. Volkov, D.P. Sokolova</i>	
Analysis of the state of outburst lakes along the Gunt River valley in the South-Western Pamirs	631
<i>G.V. Shafiev</i>	
Origin and classification of debris flows	639
<i>M.G. Nanitashvili, D.R. Gurgenidze, I.D. Inashvili</i>	
Debris flow channel processes and determination of the lateral compression ratio	643
<i>I. Kruashvili, W. Loiscandl, I. Inashvili, K. Bziava, M. Himmelbauer</i>	
List of authors	650
Table of contents	660