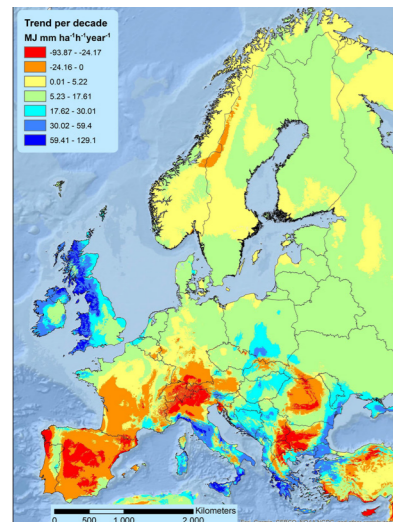


KADER / PERSONNEL

- Predstojnik
Head
prof. dr. Matjaž Mikoš
- Namestnik predstojnika
Deputy Head
doc. dr. Dušan Petrovič
- Raziskovalci
Researchers
asist. dr. Mateja Klun
Tamara Kuzmanič, MR
Mojca Likar, MR
Matej Radinja, MR
- Sodelavci
Associates
asist. dr. Nejc Bezak
prid. prof. dr. Marko Komac
asist. dr. Sašo Petan
viš. pred. dr. Jošt Sodnik
izr. prof. dr. Blaž Stres
asist. dr. Katarina Zabret



Spremembe srednjih letnih vrednosti erozivnosti padavin na desetletje, določene na osnovi rekonstruiranih letnih vrednosti erozivnosti padavin (po Bezak et al., 2020)
Changes in mean annual rainfall erosivity values per decade determined based on the reconstructed annual rainfall erosivity values (after Bezak et al., 2020)

INŠTITUT ZA GEO- IN HIDROTVEGANJA (RIGHT)

Inštitut za geo in hidro tveganja (RIGHT) so 2014 ustanovile Katedra za kartografijo, fotogrametrijo in daljinsko zaznavanje (KKFDZ), Katedra za matematično in fizikalno geodezijo ter navigacijo (KMFGN), Katedra za mehaniko tal z laboratorijem (KMTal) in Katedra za splošno hidrotehniko (KSH), da bi v njem opravljale raziskovalno delo na področju nevarnosti, tveganj in nesreč v geo- in hidrookolju.

Predstojnik inštituta je dr. Matjaž Mikoš, redni profesor za hidrologijo in redni profesor za inženirsko hidrotehniko, namestnik predstojnika je dr. Dušan Petrovič, docent za področje geodezije in geoinformatike.

Pri delu inštituta sodelujejo pedagogi ustanovnih kateder, zunanji dopolnilno zaposleni raziskovalci drugih raziskovalnih ustanov in podjetij v Sloveniji ter nekateri mladi raziskovalci, ki raziskujejo v programski skupini P2-0180 Vodarstvo in geotehnika: orodja in metode za analize in simulacije procesov ter razvoj tehnologij. Inštitut je na UL FGG samostojna raziskovalna skupina s šifro ARRS 0792-022.

UL FGG od leta 2008 redno pridobiva naziv svetovnega centra odličnosti za zmanjševanje tveganja zaradi zemeljskih plazov (WCoE – World Centre of Excellence on Landslide Risk Reduction), ki ga na rednih triennial svetovnih forumih o zemeljskih plazovih podeljuje Mednarodni program za zemeljske plazove (IPL). Inštitut je po ustanovitvi postopno prevzel večino raziskovalnega dela na UL FGG in je fakulteti tudi v obdobju 2020–2023 pridobil naziv svetovnega centra odličnosti.

Inštitut od ustanovitve redno sodeluje z Mednarodnim konzorcijem za zemeljske plazove (ICL) s sedežem v Kjotu na Japonskem. Predstojnik RIGHT je bil podpredsednik ICL v letih od 2018 do 2020 in je član uredniškega odbora revije Landslides, ki ga izdaja založba Springer Nature – gre za revijo z najvišjim faktorjem vpliva na področju inženirske geologije v bazi SCI-Expanded.

Inštitut s svojim delom in rezultati podpira delo Unescove Katedre za zmanjševanje tveganj zaradi vodnih ujm, ki jo je leta 2016 ustanovila Univerza v Ljubljani in deluje v okviru UL FGG.

Raziskovalna dejavnost

Na inštitutu so potekali različni mednarodni, bilateralni in nacionalni raziskovalni projekti, npr. raziskovalni projekt z Nemčijo »Stohastični padavinski modeli za oceno erozivnosti padavin« (2018–2019) in s Kitajsko »Vrednotenje naprednih metod rudarjenja po podatkih za napovedovanje hidroloških podatkov: uporabi primeri s Kitajske in Slovenije« (2018–2020). Nadaljevali smo sodelovanje v dveh projektih Interreg: TOUREST: Gospodarjenje z vodami v turizmu na trajnostnih obalnih območjih Jadranskega morja in DAREFFORT: Izboljšanje sodelovanja za napovedovanje poplav v porečju Donave (2018–2021). Sodelovali smo tudi na projektu COST LAND4FLOOD o naravnem zadrževanju poplav na zasebnih zemljiščih.

Uspešno smo zaključili dva temeljna projekta ARRS, in sicer J7-8273 »Prepoznavanje potencialno nevarnih hudourniških vršajev

RESEARCH INSTITUTE FOR GEO AND HYDRO THREATS (RIGHT)

Research Institute for Geo and Hydro Threats was founded by Chair of Cartography, Photogrammetry and Remote Sensing, Chair of Mathematical and Physical Geodesy and Navigation, Chair of Soil Mechanics with Laboratory, and Chair of Hydrology and Hydraulic Engineering. The purpose was to implement research work in the areas of hazards, risks and disasters in the geo and hydro environment.

The Institute is chaired by Matjaž Mikoš, PhD, full professor in hydrology and full professor in hydraulic engineering. His deputy is Dušan Petrovič, PhD, assistant professor in geodesy and geoinformation.

Teachers of the founding chairs, external partners and researchers from other research institutions and companies in Slovenia as well as some young researchers involved in the work of the core research group P2-0180 Water Science and Technology, and Geotechnical Engineering: Tools and Methods for Process Analyses and Simulations, and Development of Technologies are involved in the Institute's work. The Institute is an independent research group of UL FGG with ARRS code 0792-022.

Since 2008, UL FGG has been regularly awarded the title WCoE – World Centre of Excellence on Landslide Risk Reduction, conferred at its regular triennial World Landslide Forum by the International Programme on Landslides (IPL). Since its foundation, the Institute has gradually taken over most of the research at UL FGG, and won the title of World Centre of Excellence also for the period 2020–2023.

Since its establishment, the Institute has been regularly cooperating with the International Consortium on Landslides (ICL) with its seat in Kyoto, Japan. From 2018 to 2020, the Head of RIGHT was Vice-Chairman of ICL; he is also an Editorial Board member of the Landslides journal, published by Springer Nature – this journal has the highest impact factor in the area of engineering geology in the SCI-Expanded base.

With its work and results, the Institute supports the work of the Unesco Chair on Water-related Disaster Risk Reduction, founded in 2016 by the University of Ljubljana and hosted by UL FGG.

Research activity

Members of the Institute are involved in several international, bilateral and national research projects, e.g., a research project with Germany "Stochastic rainfall models for rainfall erosivity evaluation" (2018–2019) and with China "Evaluation of intelligent learning techniques for prediction of hydrological data: useful cases from China and Slovenia" (2018–2020). We continued collaboration within two Interreg projects: TOUREST: Tourism water management for sustainable ADRIAN coastal areas (2018–2020), and DAREFFORT: Danube River Basin Enhanced Flood Forecasting Cooperation (2018–2021). We also participated in the COST LAND4FLOOD project on Natural Flood Retention on Private Land.

We successfully completed two national basic projects: J7-8273 "Recognition of potentially hazardous torrential fans using geomorphometric methods and simulating fan formation" (2017–2020)

and J1-8153 "Studying landslide movements from source areas to zone of deposition using a deterministic approach" (2017–2020); we started research on the national basic project J1-2477 "Erosional processes on coastal flysch cliffs and their risk assessment" (2020–2023).

Educational activity

Research is the basis for quality teaching, especially in the 2nd and 3rd Bologna cycles. The Institute's research achievements are being implemented into educational content of various courses at the 2nd cycle study programs and at the doctoral study programs Built Environment and Environment Protection. High-quality research work of the Institute and supervision of young researchers are important guidelines for its activities. PhD student Mateja Klun finished her PhD thesis. Young researcher Matej Radinja continued his PhD study, while Tamara Kuzmanič and Mojca Likar started their PhD studies. The Institute was involved in the implementation of the ERASMUS+ Joint Master in Flood Risk Management. The Institute's researchers are actively involved in various UL FGG's promotional activities, particularly during technical days for secondary schools, at the Faculty's Open Day and in the Information Days for secondary schools.

Exceptional achievements

These include a scientific publication on usage of cameras for monitoring rockfalls in steep terrain:

- Kozmus Trajkovski, K., Grigillo, D., Petrovič, D. (2020). Optimization of UAV flight missions in steep terrain. Remote sensing 12(8), 1293, <https://www.mdpi.com/2072-4292/12/8/1293>.

and scientific publications concerned with investigating soil erosion:

- Bezak, N., Mikoš, M., Borrelli, P., Liakos, L., Panagos, P. (2021). An in-depth statistical analysis of the rainstorms erosivity in Europe. Catena 206, 105577, <https://doi.org/10.1016/j.catena.2021.105577>.
- Borrelli, P. et al. (2021). Soil erosion modelling: A global review and statistical analysis. Science of the Total Environment 780, 146494, <https://doi.org/10.1016/j.scitotenv.2021.146494>.
- Bezak, N., Ballabio, C., Mikoš, M., Petan, S., Borrelli, P., Panagos, P. (2020). Reconstruction of past rainfall erosivity and trend detection based on the REDES database and reanalysis rainfall. Journal of Hydrology 590, 125372, <https://doi.org/10.1016/j.jhydrol.2020.125372>.

z metodami geomorfometrije in simulacijami nastanka vršajev« (2017–2020) in J1-8153 »Preučevanje premikanja plazov od izvornih območij do mesta odlaganja z determinističnim pristopom« (2017–2020), ter začeli raziskave na temeljnem projektu ARRS J1-2477 »Erozijski procesi na obalnih flišnih klifih z oceno tveganja« (2020–2023).

Pedagoška dejavnost

Raziskovanje je temelj kakovostnega poučevanja, predvsem na 2. in 3. bolonjski stopnji. Raziskovalni dosežki inštituta se prelivajo v pedagoške vsebine različnih predmetov na drugostopenjskih študijskih programih ter na doktorskih študijskih programih Grajeno okolje in Varstvo okolja. Kakovostno raziskovalno delo na inštitutu in mentorsko delo z mladimi raziskovalci je pomembna usmeritev dela inštituta. Z raziskovalnim delom na doktorski disertaciji je končala dr. Mateja Klun, nadaljeval ga je Matej Radinja in začeli Tamara Kuzmanič in Mojca Likar. Inštitut je sodeloval pri izvedbi skupnega magistrskega programa ERASMUS+ »Upravljanje poplavnega tveganja«. Raziskovalci inštituta aktivno sodelujejo v različnih promocijskih aktivnostih fakultete, predvsem pri tehniških dnevih za srednješolce, dnevu odprtih vrat fakultete in pri informativnih dnevih za dijake srednjih šol.

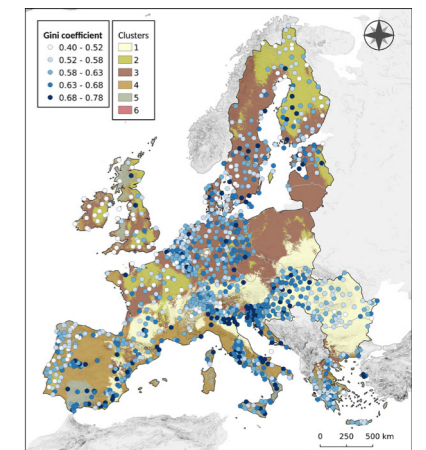
Izjemni dosežki

Mednje uvrščamo znanstveno objavo o uporabi dronov za spremljanje podrov na strmih pobočjih:

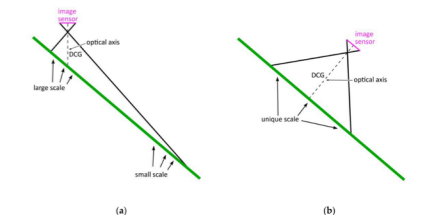
- Kozmus Trajkovski, K., Grigillo, D., Petrovič, D. (2020). Optimization of UAV flight missions in steep terrain. Remote sensing 12(8), 1293, <https://www.mdpi.com/2072-4292/12/8/1293>.

in znanstvene objave na področju raziskovanja erozije tal:

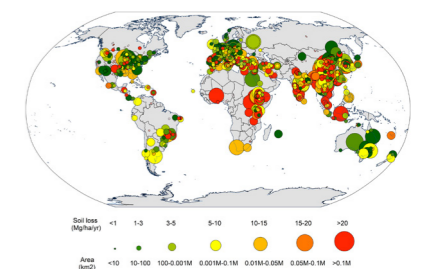
- Bezak, N., Mikoš, M., Borrelli, P., Liakos, L., Panagos, P. (2021). An in-depth statistical analysis of the rainstorms erosivity in Europe. Catena 206, 105577, <https://doi.org/10.1016/j.catena.2021.105577>.
- Borrelli, P. et al. (2021). Soil erosion modelling: A global review and statistical analysis. Science of the Total Environment 780, 146494, <https://doi.org/10.1016/j.scitotenv.2021.146494>.
- Bezak, N., Ballabio, C., Mikoš, M., Petan, S., Borrelli, P., Panagos, P. (2020). Reconstruction of past rainfall erosivity and trend detection based on the REDES database and reanalysis rainfall. Journal of Hydrology 590, 125372, <https://doi.org/10.1016/j.jhydrol.2020.125372>.



Ginijev koeficient za 1181 padavinskih postaj v Evropi ob upoštevanju vseh padavinskih erozivnih dogodkov v bazi REDES (po Bezak et al., 2021)
Gini coefficients for 1181 stations across Europe using all rainfall erosive events included in the REDES database (after Bezak et al., 2021)



Fotografiranje strmega terena z a) navpičnim slikanjem in z b) pravokotnim slikanjem (po Kozmus Trajkovski et al., 2020)
Photographing steep terrain with a) vertical imaging and b) oblique imaging (after Kozmus Trajkovski et al., 2020)



Geografska porazdelitev 1586 kvantitativnih modelnih ocen, vključno z velikostjo študijskega območja in napovedano stopnjo erozije (po Borrelli et al., 2021)
Geographical distribution of 1586 quantitative modelling estimates, including the study area size and predicted soil erosion rates (after Borrelli et al., 2021)