MIKAS and NIKAS springs photo gallery

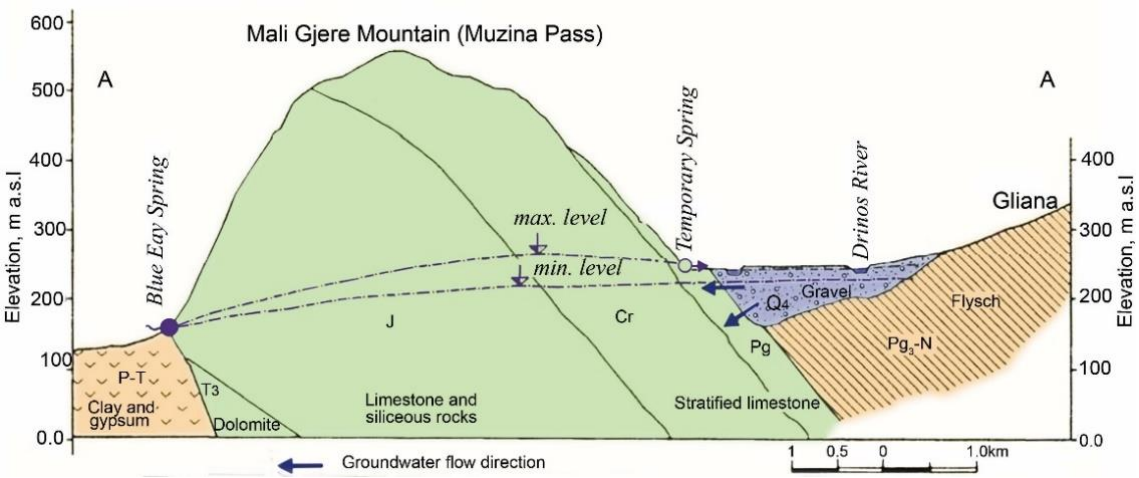
Southern and Eastern

E U R O P E

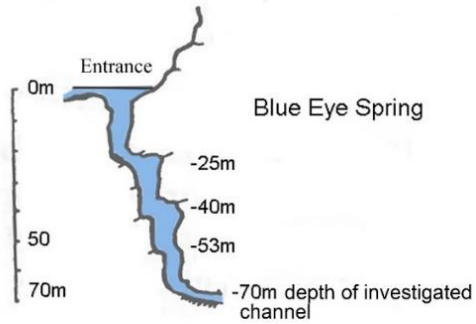
Albania, Bosnia & Herzegovina, Bulgaria, Croatia, Czech Republic, Greece, Hungary, Italy, Moldova, Montenegro, North Macedonia, Poland, Portugal, Romania, Russian Federation, Serbia, Slovakia, Slovenia, Spain

Albania

MIKAS - Blue eye (Syri i Kalter)



Cross-section through Blue Eye Spring (after Eftimi et al. 2007)

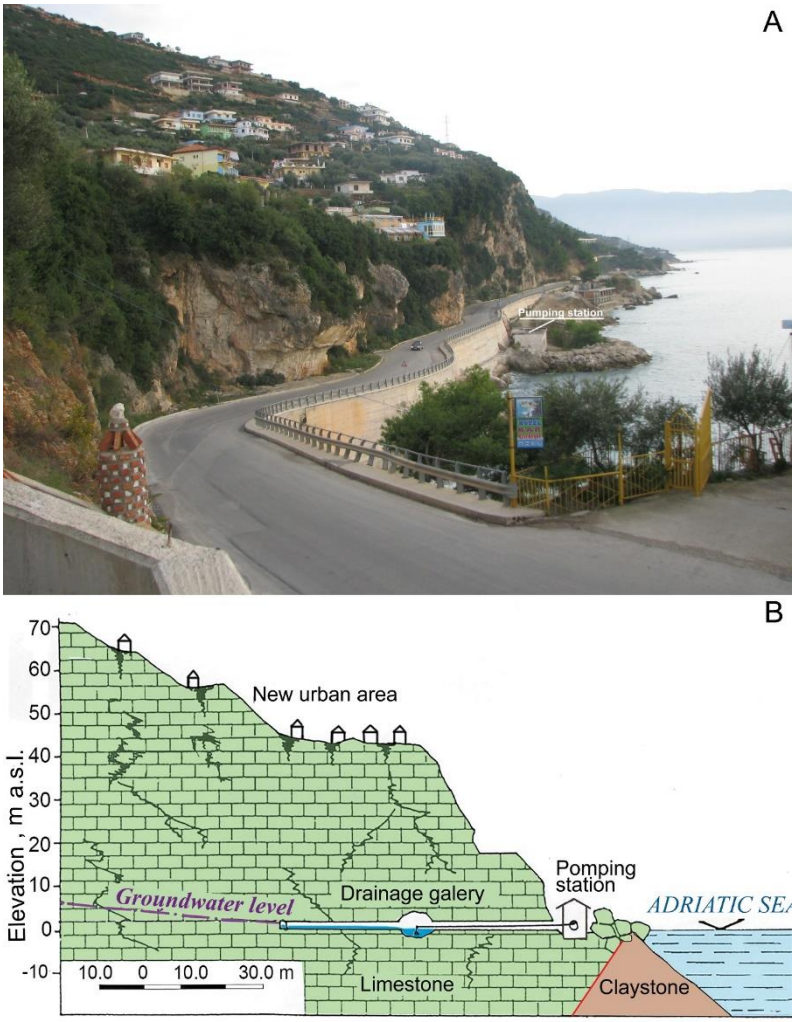


Blue Eye Spring, syphon section (Eftimi et al. 2019)



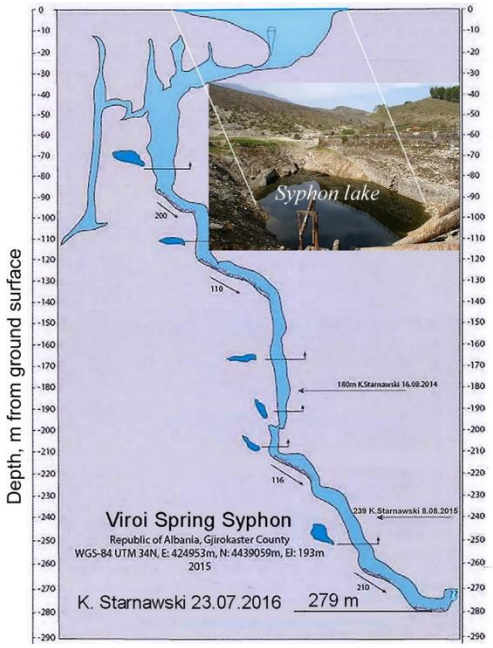
Blue Eye Spring, main issue (photo R. Eftimi)

MIKAS - Uji Ftohtë

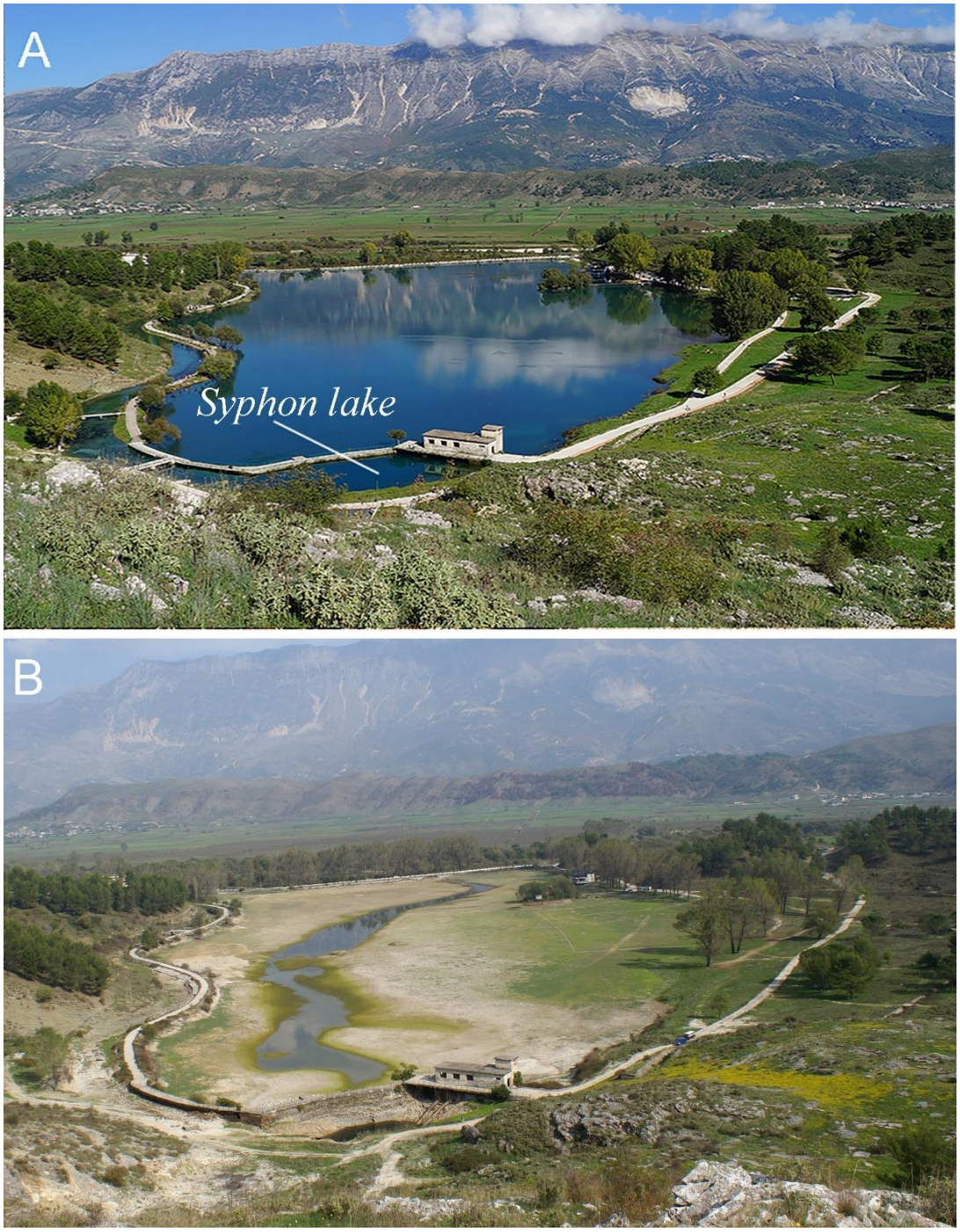


Uji Ftohte Spring; a) Location of pumping station; b) Cross-section of Uji Ftohte Spring showing also the possibility of the pollution of the spring (after Eftimi and Zojer 2015)

MIKAS – Viroi



Viroi Spring, siphon section of the main issue (after C. Touloumdjian, 2005)

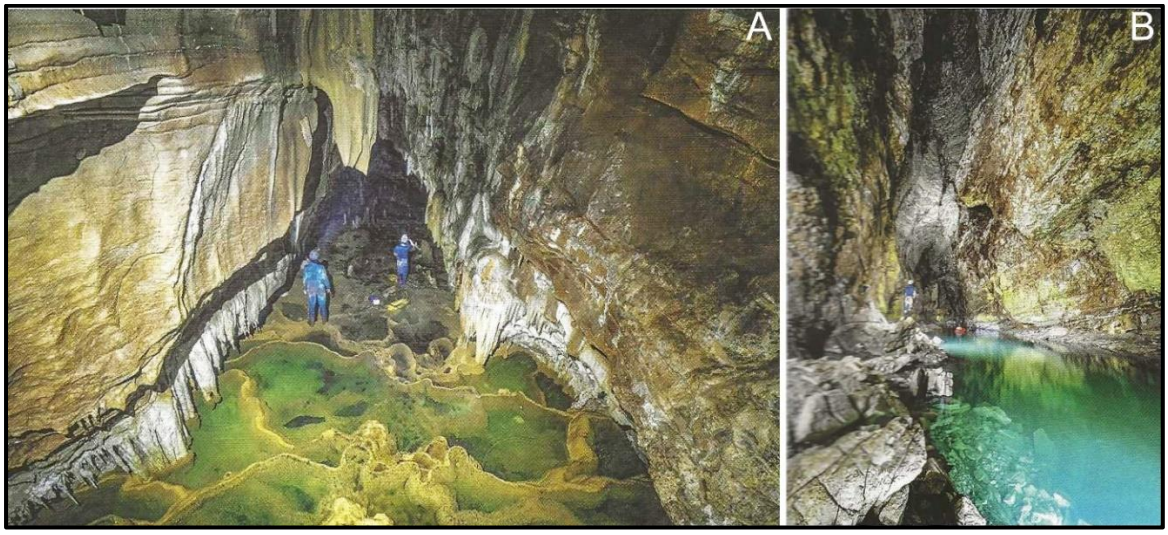


Viroi Spring: A. During the wet season, B. During the dry season (photo R. Eftimi).

MIKAS – Lengarica thermal springs



View of some thermal springs on the left bank of the Lengarica River and the Katiut Bridge (monument of the Culture).



Karst system of Lengarica. ***A:*** *One of the galleries of the Lengarica cave system,* ***B:*** *The big lake with sulfur water at a temperature of 30.4 °C (after Benasi 2023).*

NIKAS - Syri Sheganit



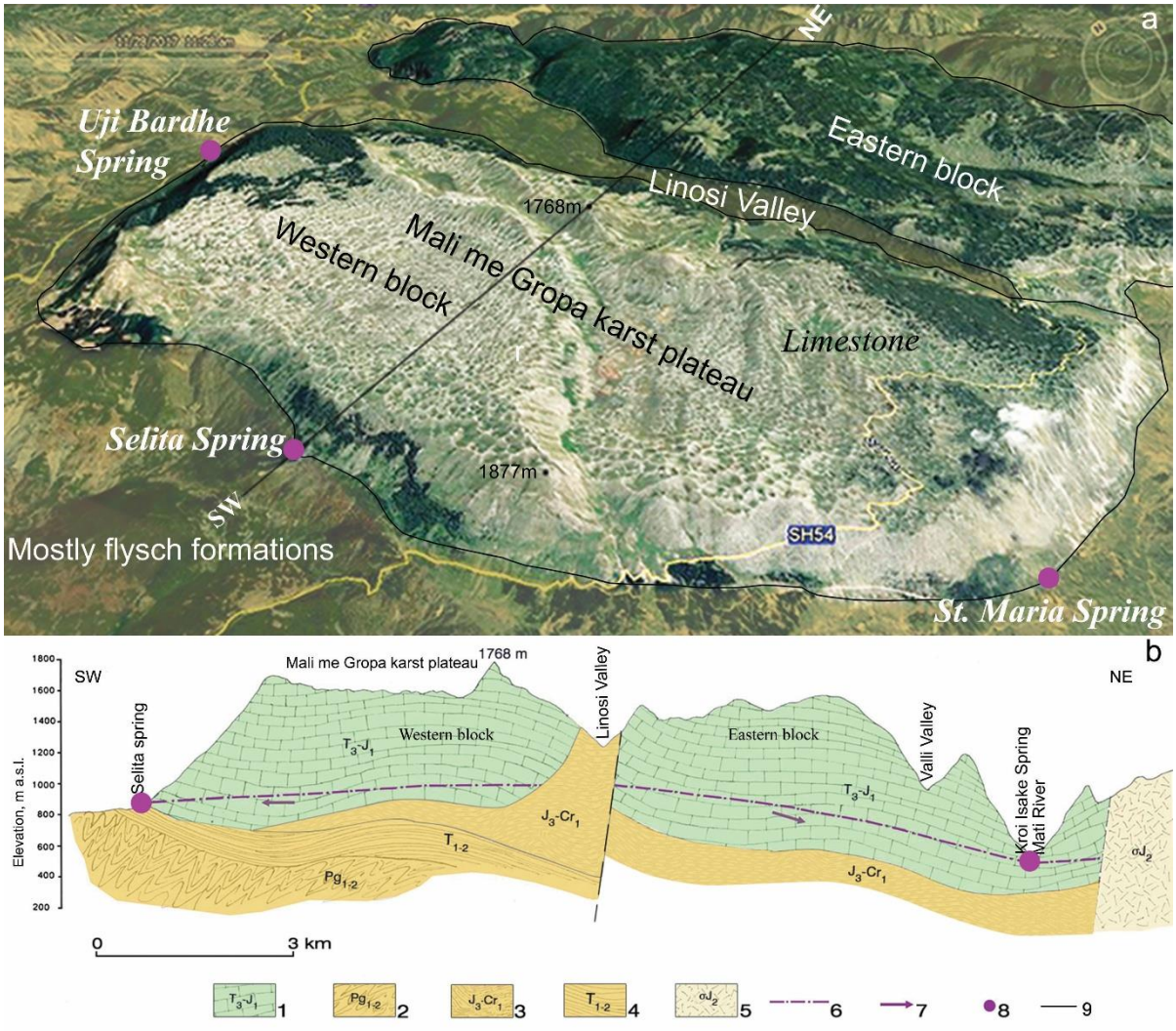
Syri Sheganit Spring, flows to Shkodra Lake (Photo R. Eftimi)

NIKAS – Valbona (Vrella Currit Spring)



Vrella Currit pumping station transmitting the water to the city of Bajram Curri.

NIKAS – Selita

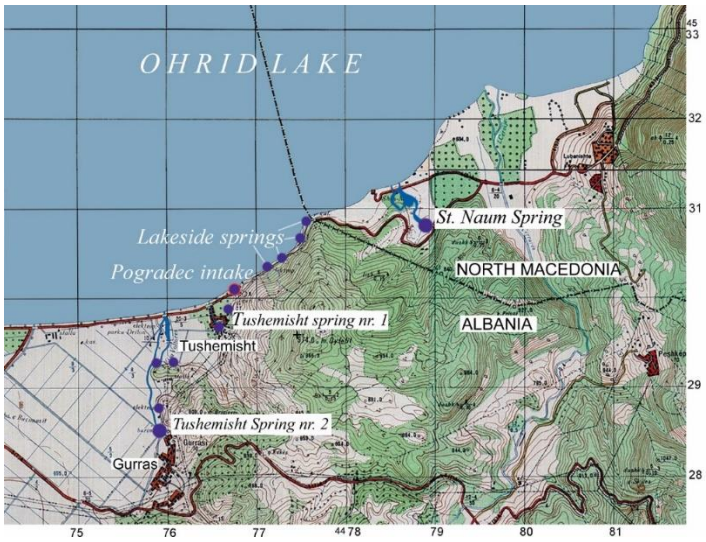


(a) Google Earth of Mali me Gropa karst massif and some geological-hydrogeological elements; (b) Hydrogeological cross-section SW-NE of the MMG:1 - High permeable karst aquifer, massive limestone; Low permeable rocks: 2 – Siltstone, shale (Krasta flysch); 3 - Ophiolitic conglomerate-breccias; 4 - Effusive-sedimentary rocks; 5 - Intrusive ultrabasic rocks; 6 – Groundwater level (supposed); 7 – Direction of groundwater flow; 8 – Big karst Springs, (modified from Eftimi et al., 2024).



*Karst phenomena of the plateaus of the Mali Me Gropa karst massif: **A** general view of the western plateau. B Cultivated doline in Central Plateau; C Uvala, length about 300 m, in Central Plateau (photos R. Eftimi).*

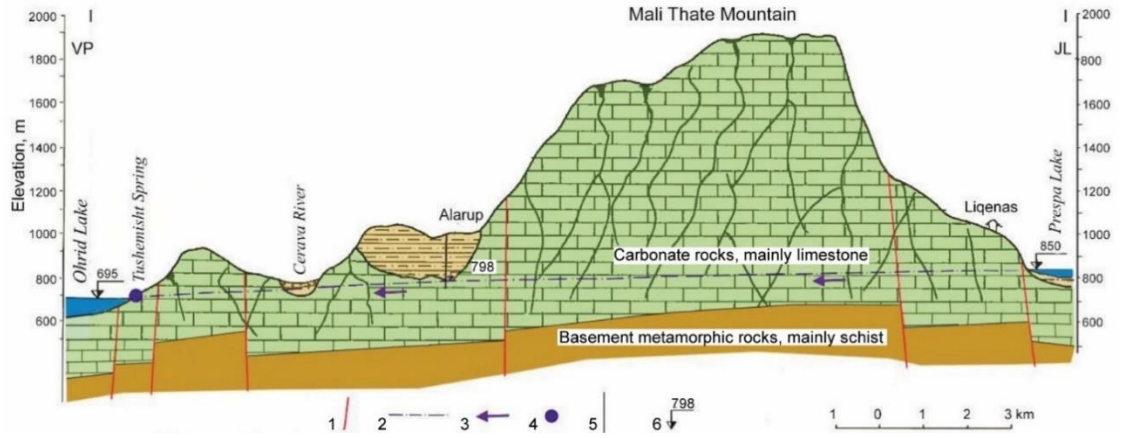
NIKAS – Tushemisht



Location Map of Tushemisht group of springs, in Albania, and St Naum Spring in North Macedonia



Tushemisht spring area



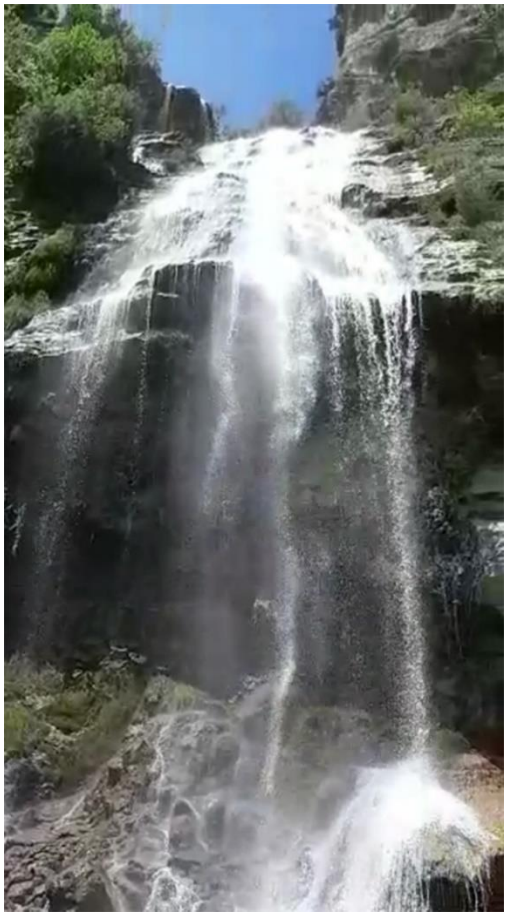
Hydrogeological cross-section between lakes Ohrid and Prespa. Legend: 1 tectonic fault; 2 groundwater level; 3 groundwater flow direction; 4 karts spring; 5 boreholes, 6. Groundwater level (m a.s.l.)

NIKAS – Tragjasi



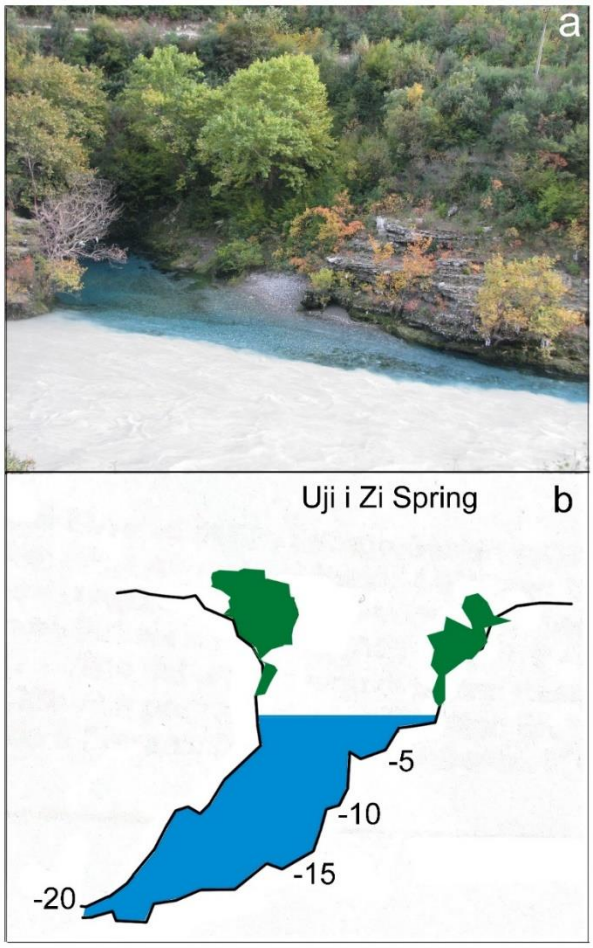
Tragjasi Spring, main issue (photo R. Eftimi).

NIKAS – Bogova



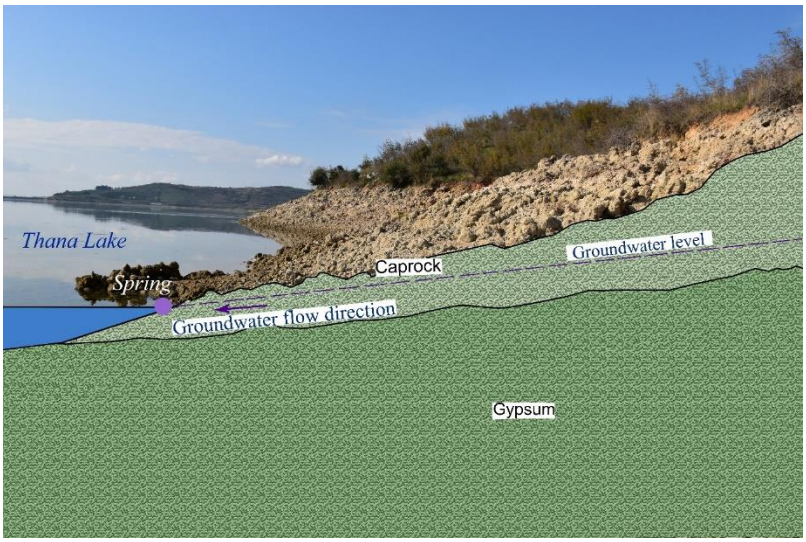
Bogova Spring flow outside the intake structure during the rainy season

NIKAS – Syri Zi



Syri Zi spring on left bank of Vjosa River

NIKAS – Dumre linear springs



Hydrogeological cross-section in the Dumre gypsum plateau (after R. Eftimi)

Bosnia and Herzegovina



MIKAS - Vrelo Bune

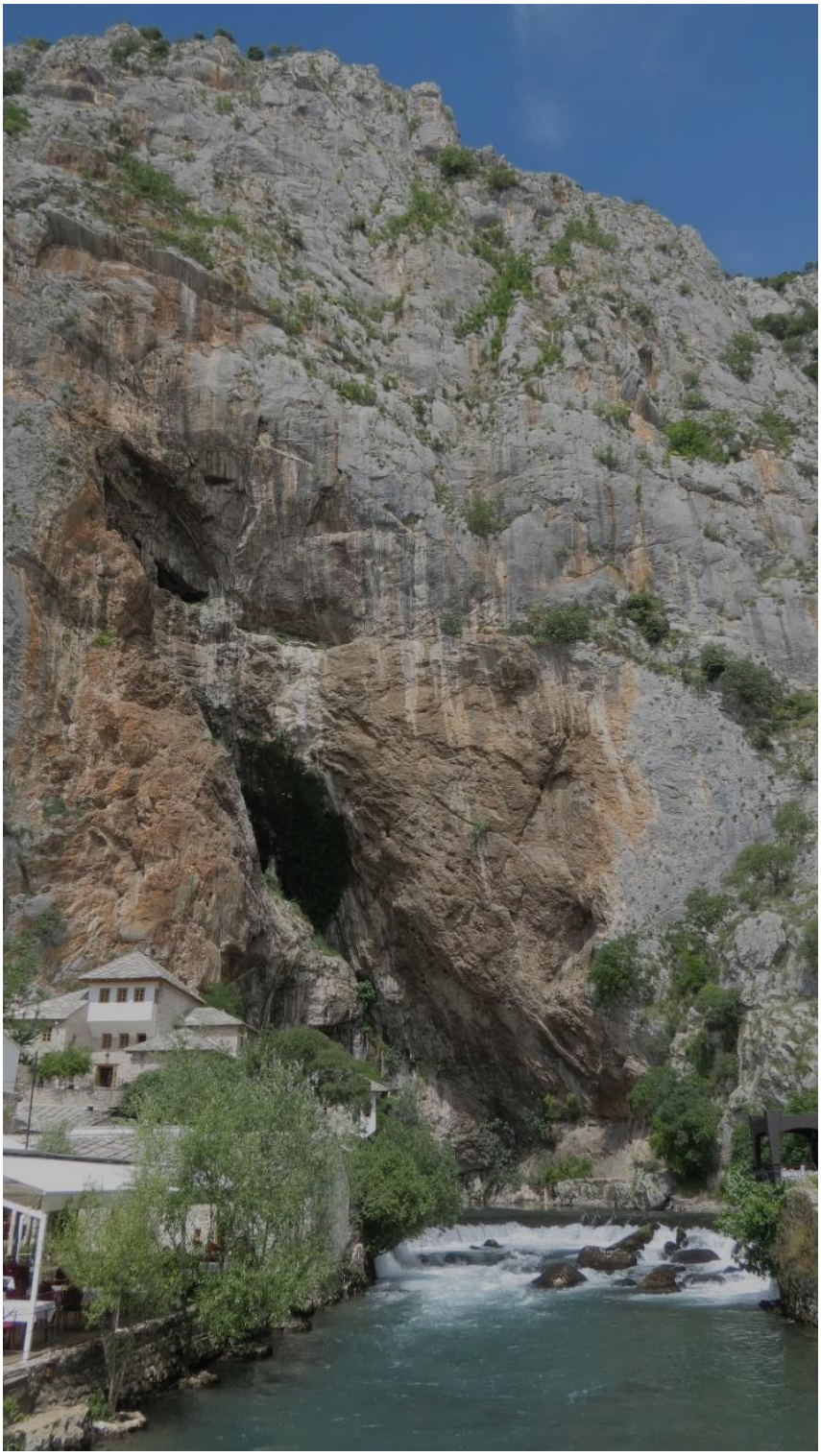




Vrelo Bune spring (summer, left and autumn, right)



Vrelo Bune, panoramic view

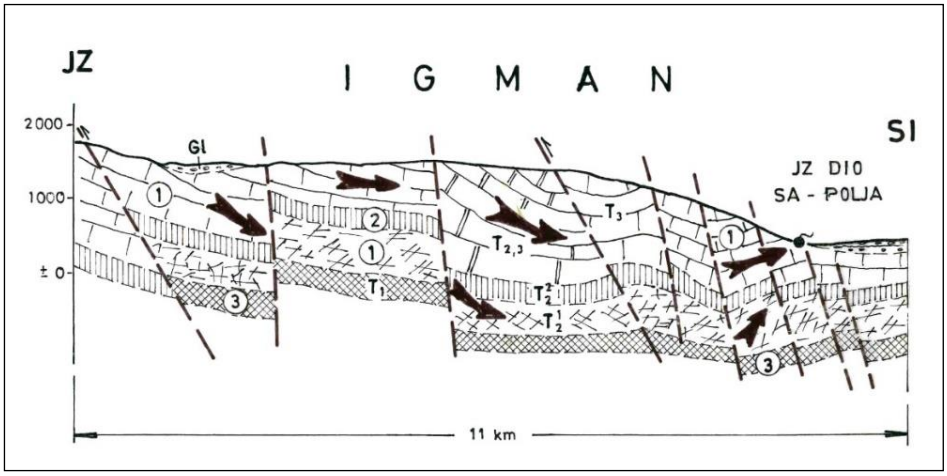


Vrelo Bune under big cliff (Photo by Z. Stevanović)

MIKAS - Vrelo Bosne



Vrelo Bosne spring and walkways in large Ilidža park

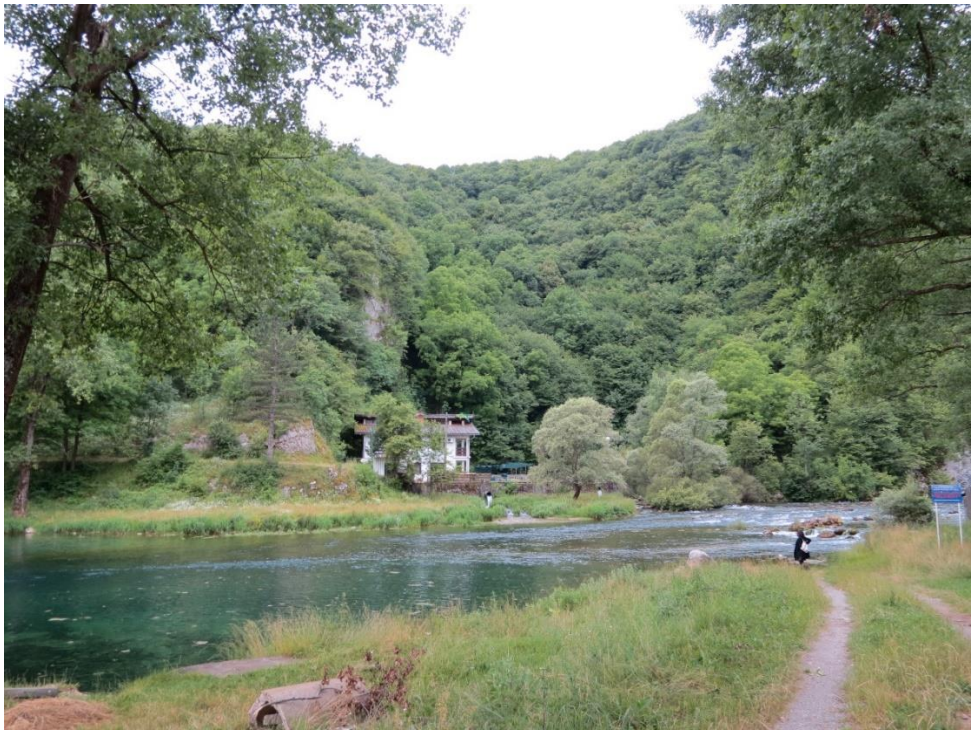


Hydrogeological cross section Vrelo Bosne spring (after Skopljak, F., 2006)

NIKAS – Klokot



Klokot spring (photo by Z. Stevanović)



Klokot River downstream of the intake (photo by Z. Stevanović)

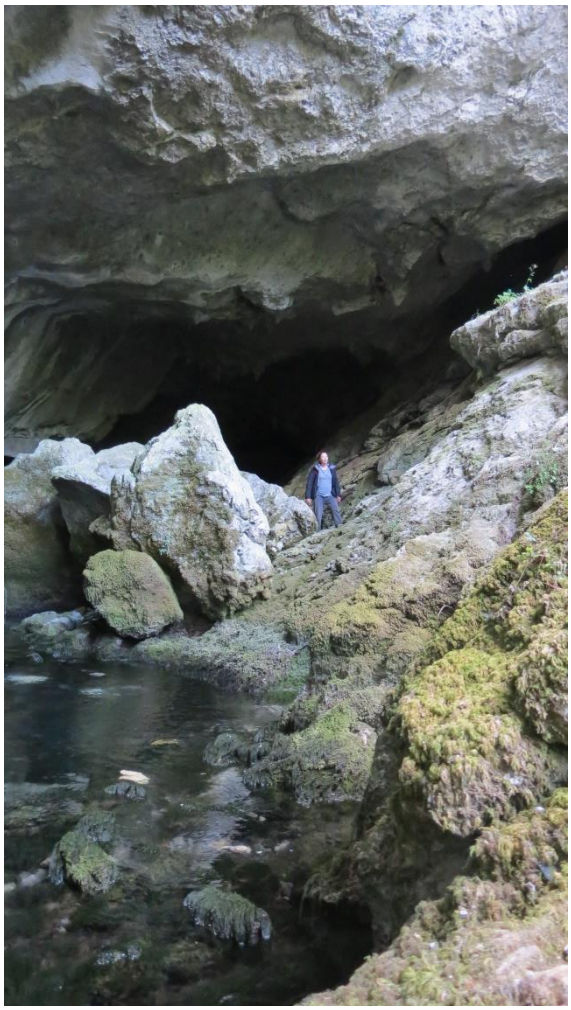
NIKAS – Vrela Sane



Left spring of Sana River



Right spring of Sana River

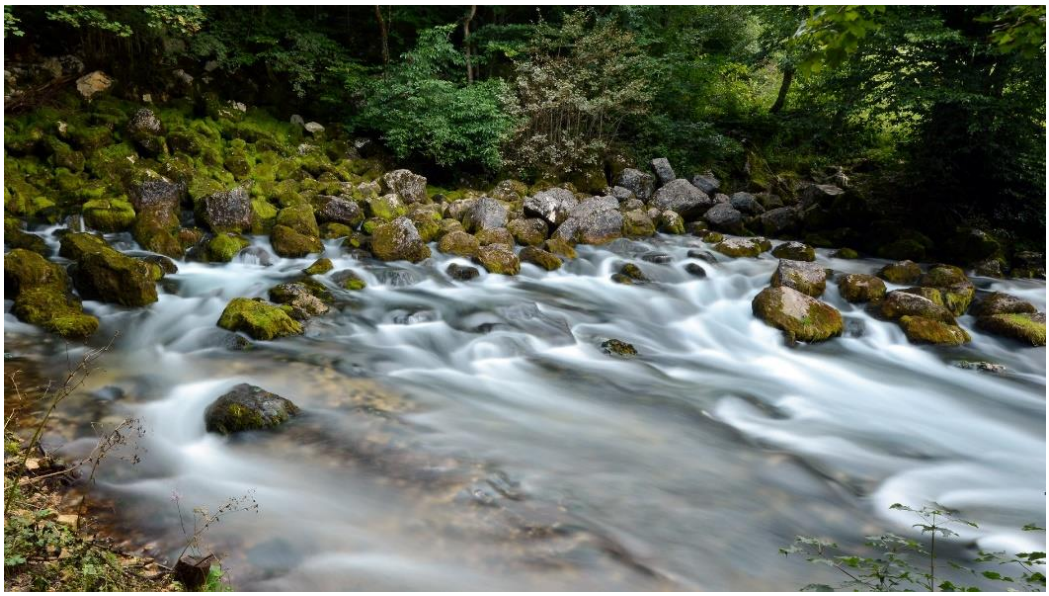


One of the Sana springs issuing from a large cave (photo Z. Stevanović)

NIKAS – Vrela Plive



Right spring of the Pliva River (photo by B. Jolović)



Left spring of the Pliva River (photo by B. Jolović)

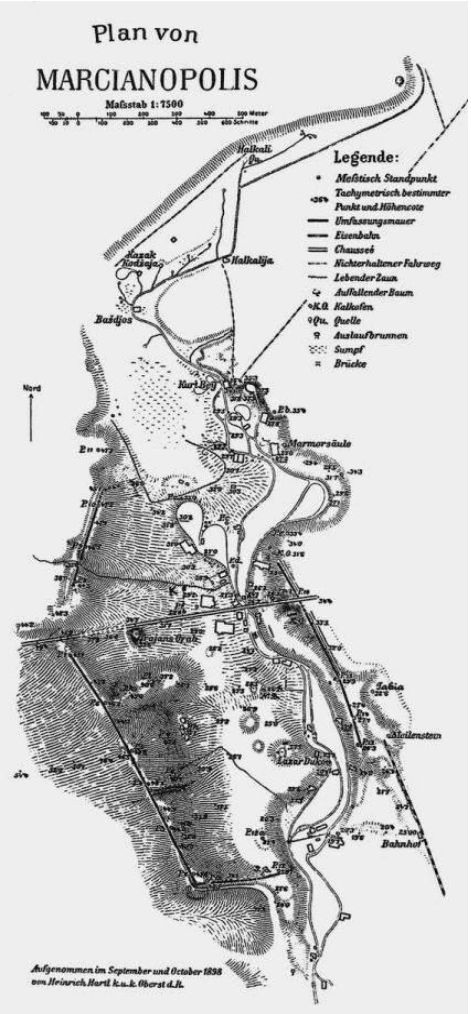
Bulgaria



MIKAS - Devnya



The Devnya's Magic spring (photo by B. Mihaylova)



Plan of Marcianopolis by Heinrich Hartl, 1898



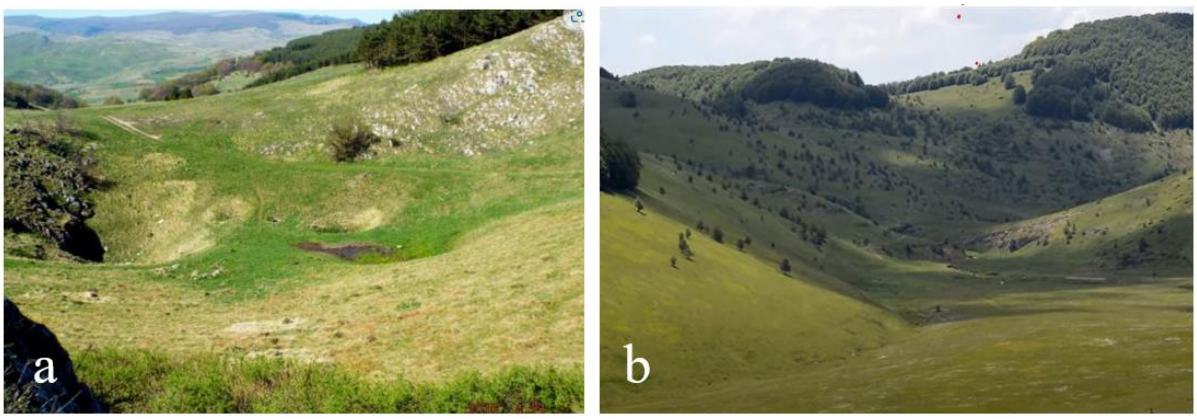


Springwater flowing into the Devnya River (photos by A. Benderev)

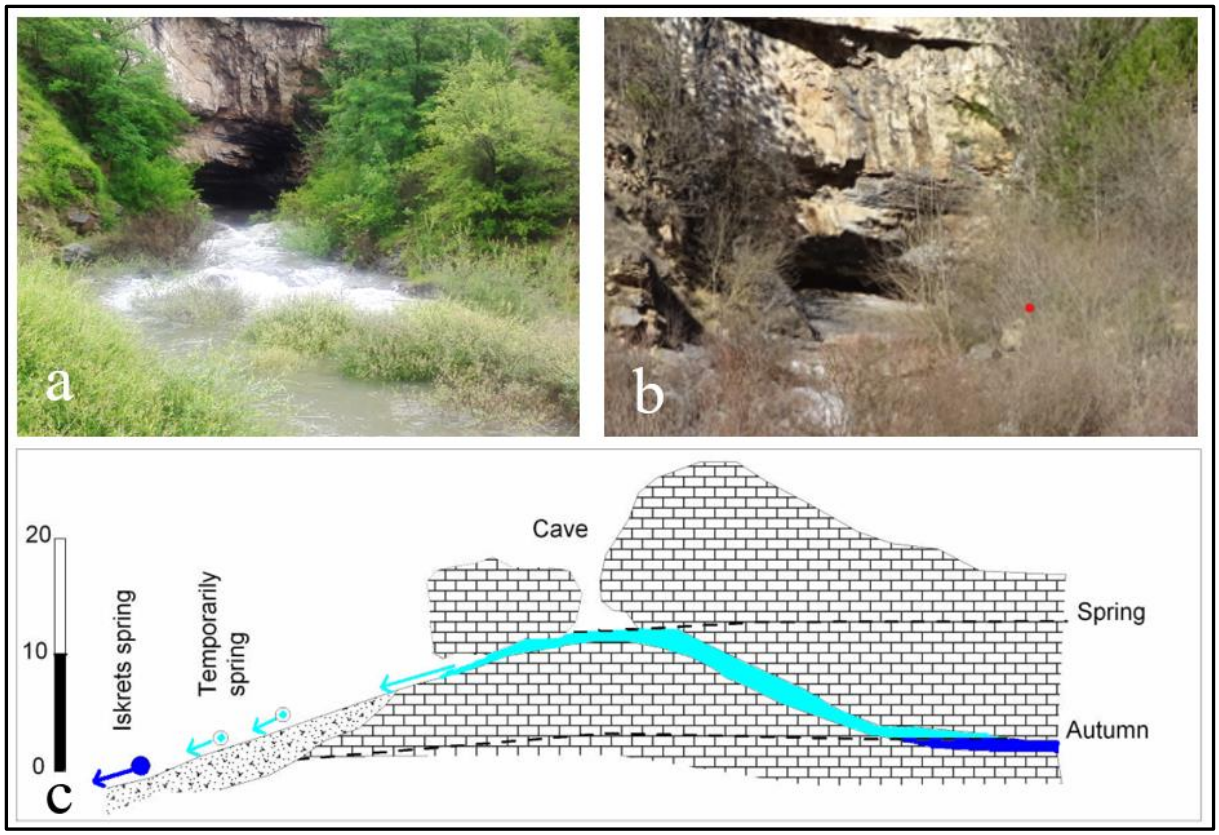
MIKAS - Iskrets (Peshta)



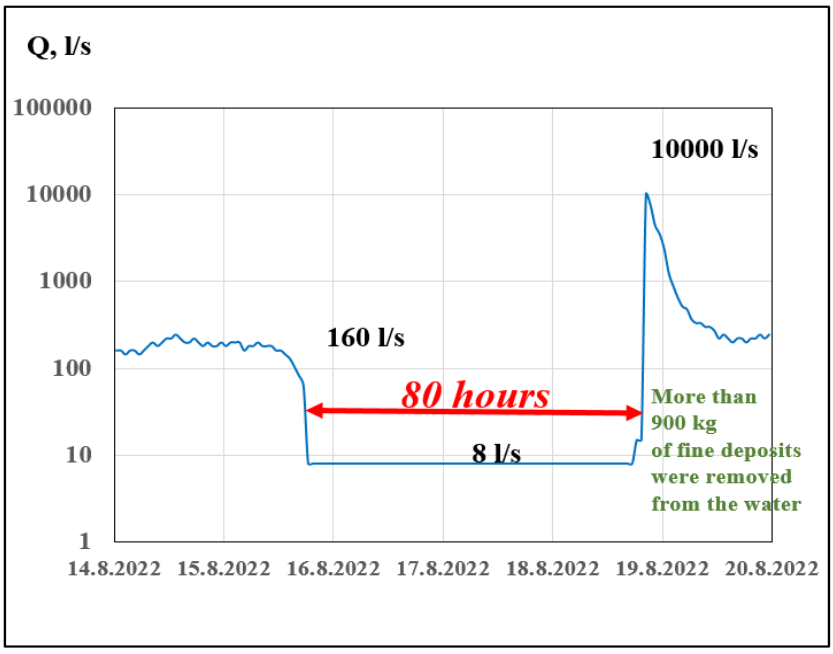
Iskrets spring general view (photo by A. Benderev)



Surface negative karst forms: a – dolines; b– blind valley in Iskrets catchment (photos by A. Benderev)



Entrance of Dusnika Cave in: a – spring; b – autumn and c - cross section of Iskrets Spring and cave with amplitude of water level (Stevanovic et al., 2015)

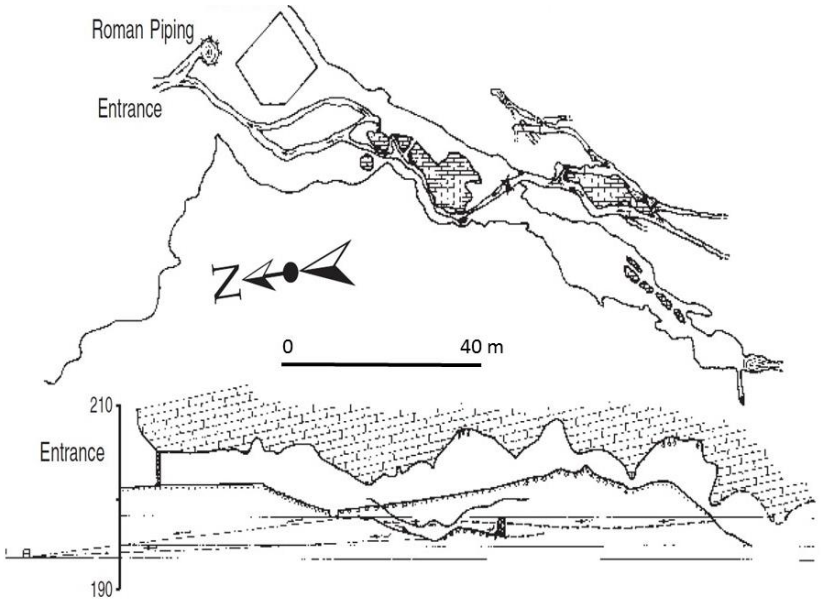


Outflow interruption at Iskrets Spring from 16 to 18/08/2022 (after Benderev et al., 2022)

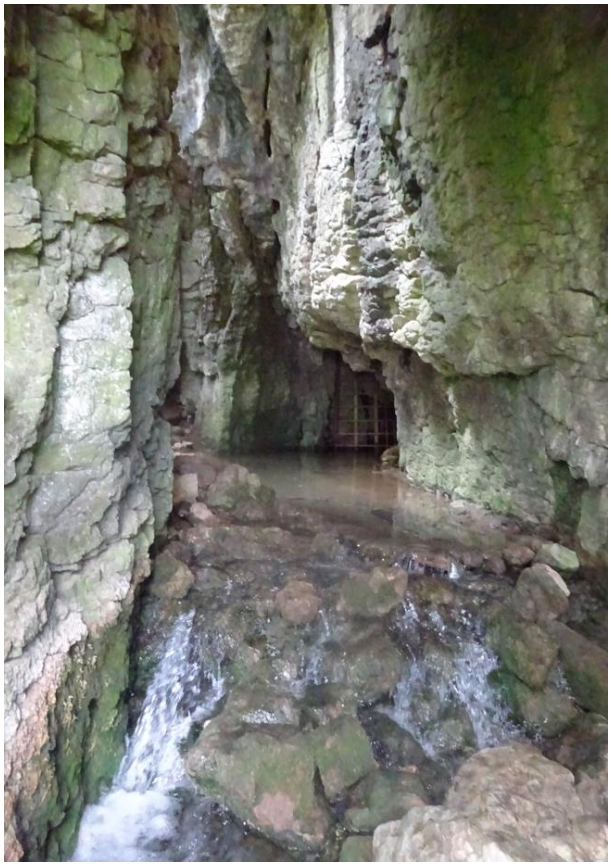
MIKAS - Musina



Aerial view of the area of the Musina spring and Musina cave (photo by Daniel Yordanov)



Map and longitudinal profile of the Musina cave up to the first siphon (after Beron et al. 2006)



The water issuing from entrance of Musina cave



Musina spring Roman capture (photo by Kalin Chakarov)

NIKAS - Zlatna Panega



The Upper Lake of Glava Panega spring



The Lower Lake of Glava Panega spring

NIKAS - Kleptuza

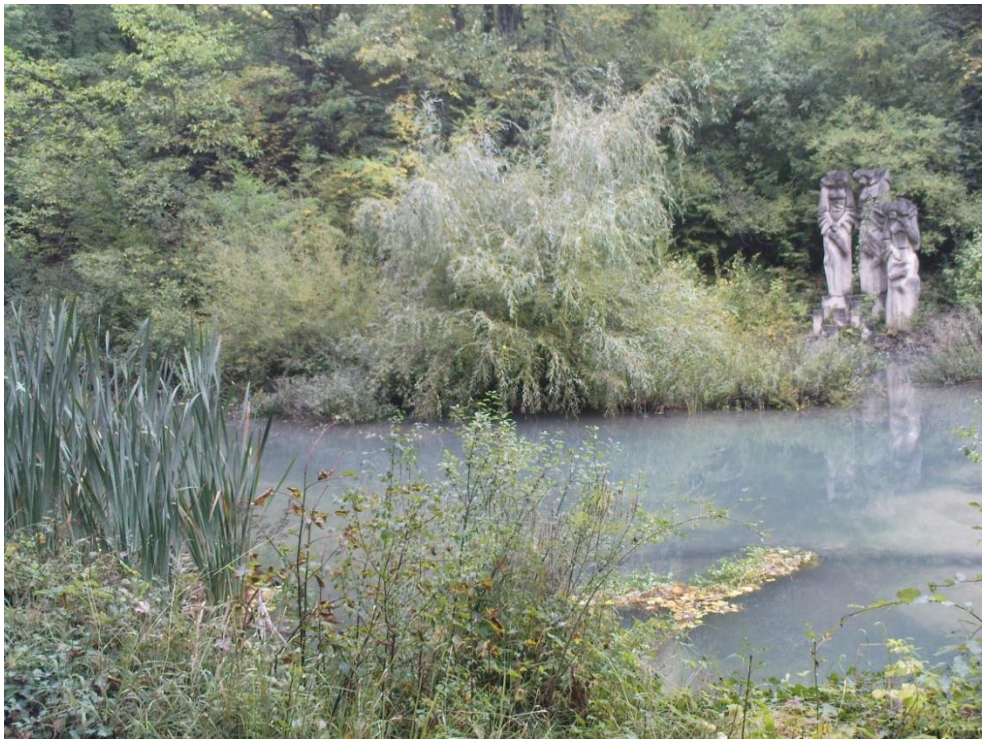


Kleptuza spring (photo by E. Damyanova)

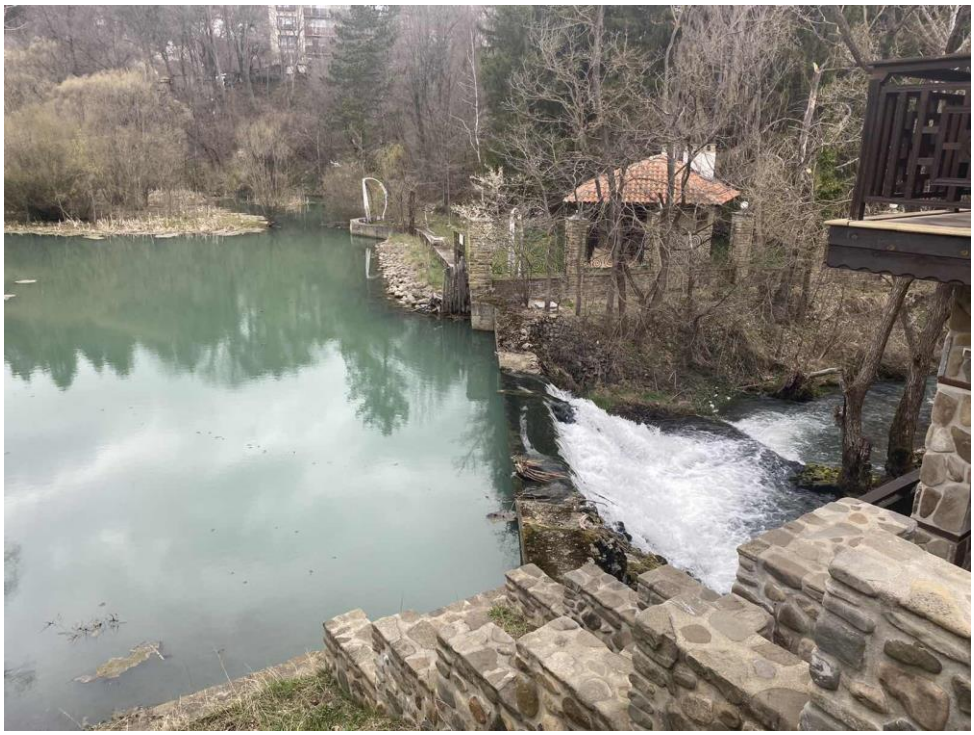


Kleptuza Park – Lower Lake (photo by E. Damyanova)

NIKAS - Kotel spring



General view of Kotel spring (photo by A. Toteva)

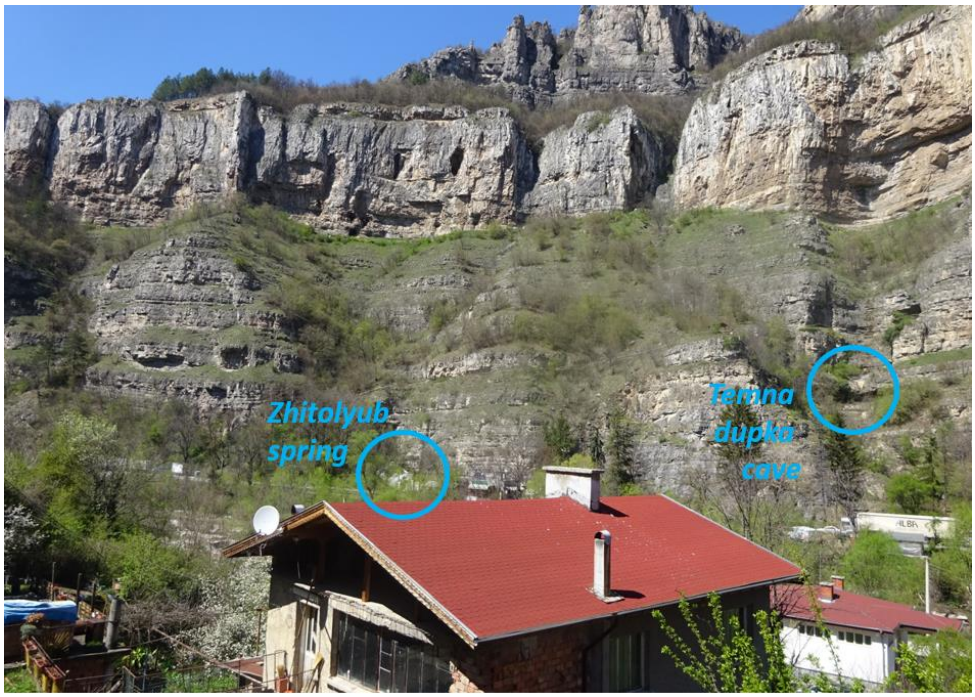


Kotel spring and the river flowing from it (photo by E. Damyanova)

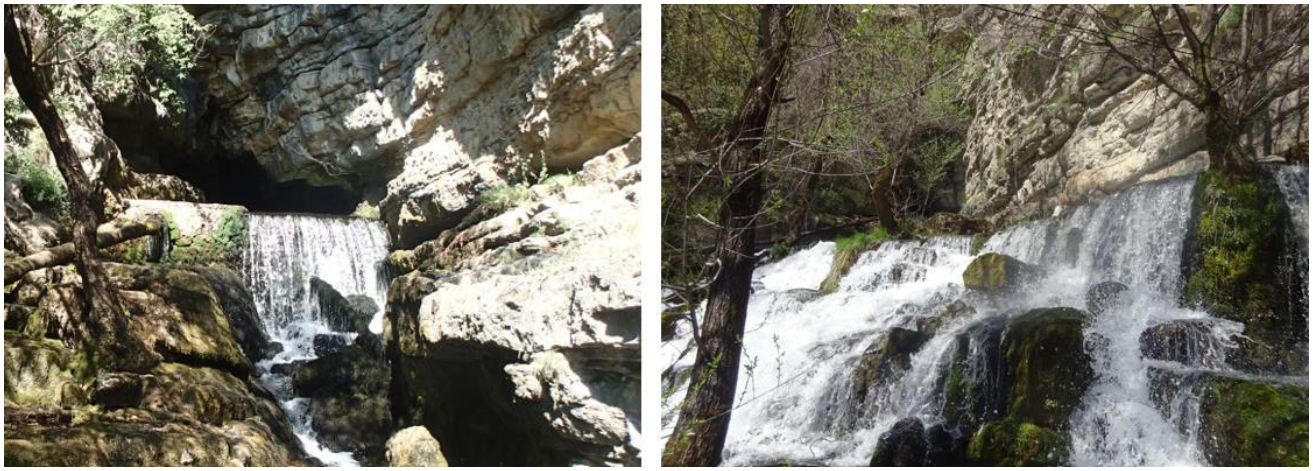


The river flows from Kotel spring (photo by E. Damyanova)

NIKAS - Zhitolyub (Lakatnik spring)



Lakatnik rocks with location of Zhytolyub spring and the entrance to Temna dupka cave (photo by A. Benderev)



Zhitolyub spring at low and high flow rates (photos by E. Damyanova)

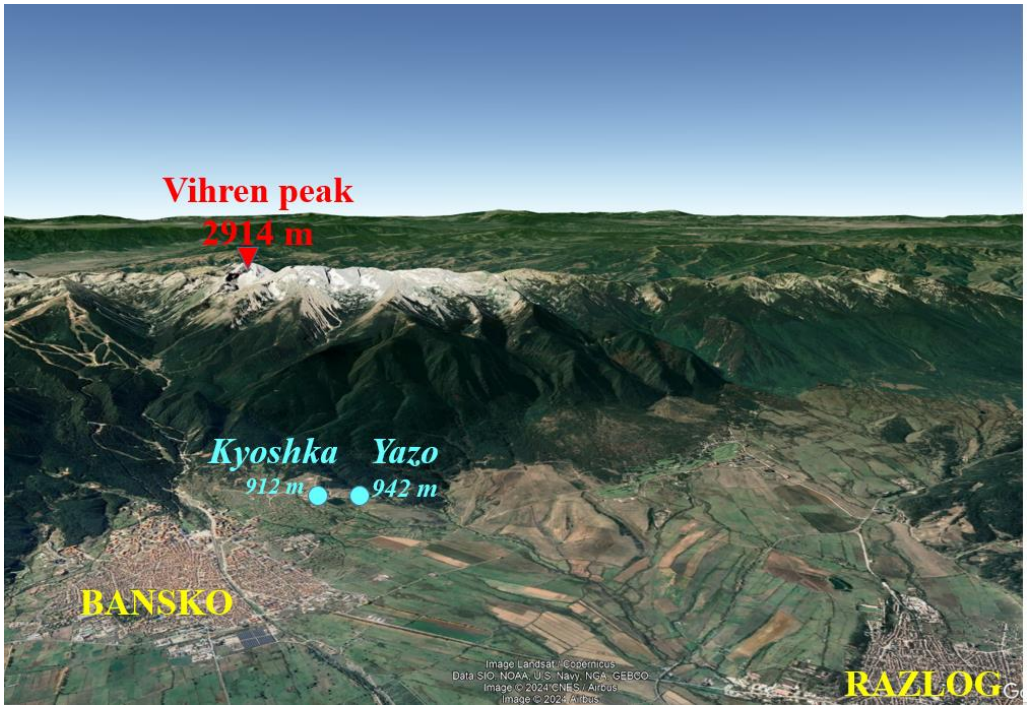


The entrance of Temna dupka cave (photo by A. Benderev)



Water flowing through the entrance of Temna dupka cave (photo courtesy by E. Damyanova, author unknown)

NIKAS - Yazo and Kyoshka springs



Google Earth view of Yazo and Kyoshka springs with Pirin Mountain



Yazo spring (photo by E. Damyanova)



Kyoshka spring (photo by E. Damyanova)



Karstified marbles at more than 2500 m a.s.l. in the catchment area of Yazo and Kyoshka springs in UNESCO Pirin National Park (photo by A. Benderev)

Croatia



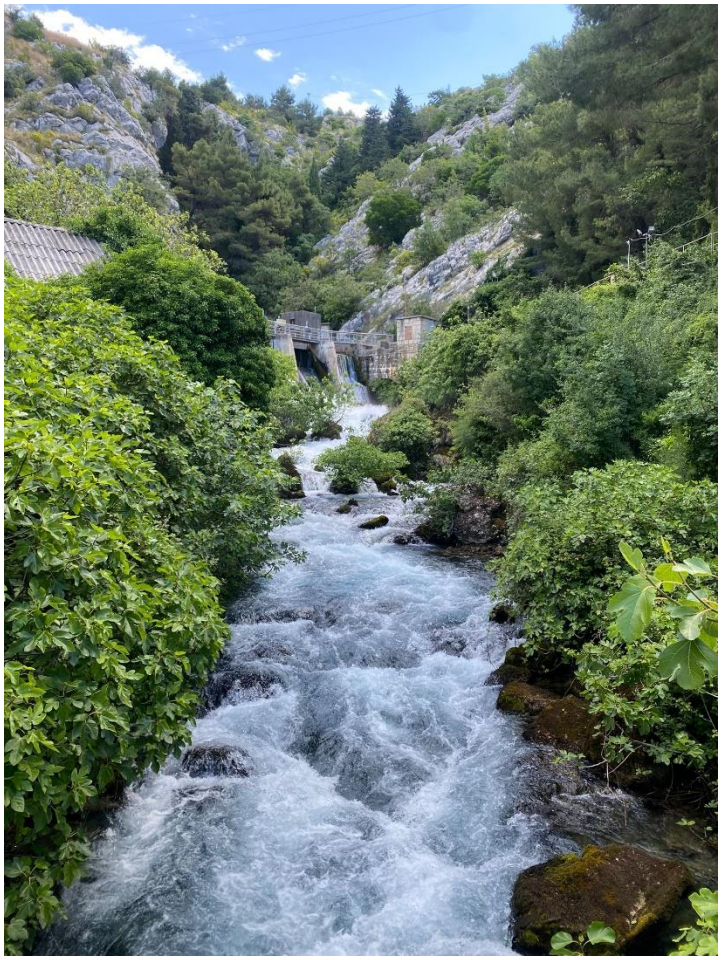
MIKAS – Jadro



Photo of Diocletian Aqueduct (https://www.petersommer.com/blog/archaeology-history/diocletians-palace-split-croatia)



The water intake structures at the Jadro River's spring (photo: M. Žabčić)



Jadro spring discharge in high water period (photo: Z. Stevanović)

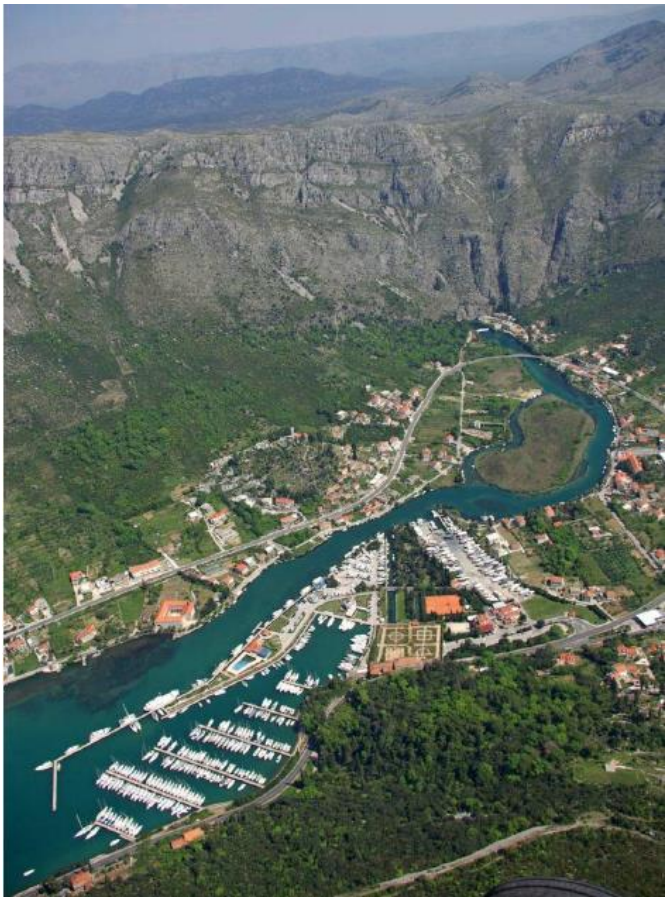
MIKAS – Ombla



Location map showing supposed catchment area of Ombla spring with locations of springs (Ombla and Zaton), Trebišnjica River, the boundary limit between Croatia and Bosnia and Herzegovina, as well as the position of existing dams, reservoirs and HEPPs (From Bonacci T. and Bonacci O., 2013)

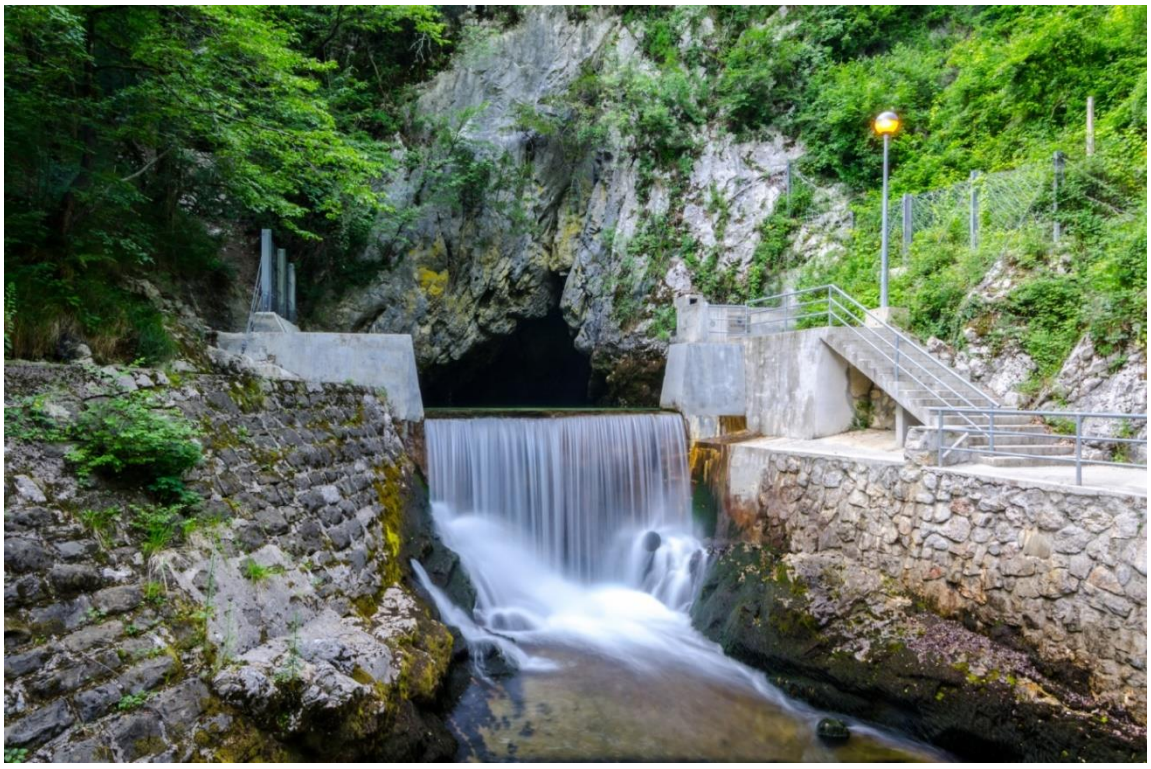


Ombla spring originates the Dubrovačka Rijeka River (Photo: Z. Stevanović)

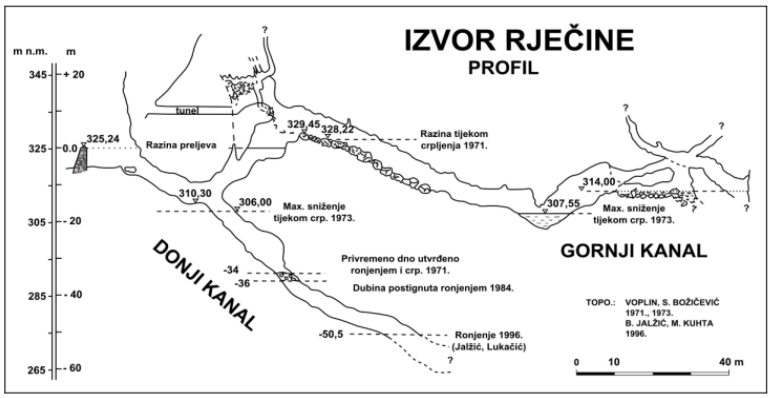


Areal photograph of the Ombla Spring and surrounding area (taken by A. Maškarić), from Bonacci T.& Bonacci O., 2013.

NIKAS – Rječina and Zvir



Rječina spring photo (source: https://bike.visitjelenje.hr/izvor-rjecine-2/)



Speleological map of Rječina spring (source: Kuhta, 1999)



Zvir spring photo (Photo: M. Oštrić)

NIKAS – Gacka



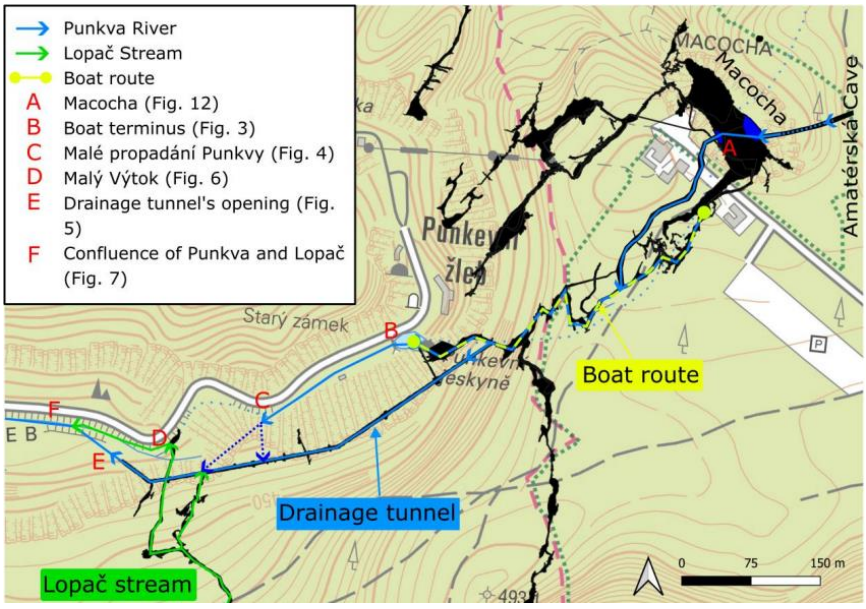
Photo of Majerovo vrilo- spring with mills (source Majerovo-vrilo-Photo-Adria-3.webp (2000×1126)



„Sinačka pučina“ – a view towards the spring zone of the Gacka River (source Rubinić et al. 2021)

Czech Republic

MIKAS – Punkva (vývěr Punkvy)



A map of the Punkva Caves system, the boat route waterway and the built regulation waterworks.



Vývěr Punkvy spring in the Moravian Karst is the point where the river Punkva leaves the Amatérská Cave system. On the left is the terminus with boats stationed after the underground trip along the Punkva River (photo by Pavel Pracný).



The drainage tunnel's terminal opening, where the Punkva River's underground flow ultimately reaches the surface (Photo by Antonín Tůma, archive of the Nature Conservation Agency of the Czech Republic).



Bottom of the Macocha Abyss from the lower viewpoint. The upper lake is visible on the left side of the photo, and the smaller Lower lake is not visible from this vantage point. In the background is the walkway that descends away from the abyss and goes towards the boat harbour (photo by Pavel Pracný).



Gauging station on the Punkva River in the Moravian Karst operating since 1923. In the background, the confluence of the Punkva River outflow from the drainage tunnel (photo by Peter Malik)

Greece

MIKAS - Almyros



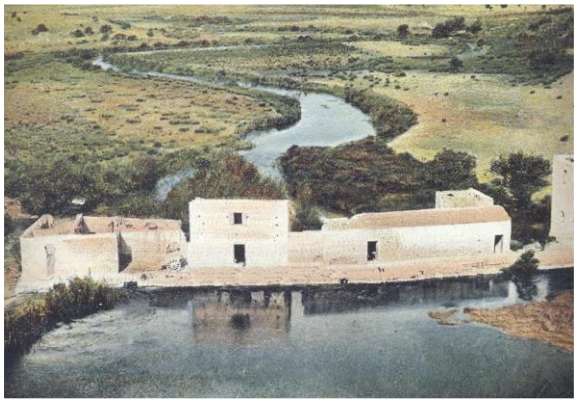
Almyros spring, Crete Island, Greece (photo by V. Perleros)



Almyros dam and informative panel (photo by Z. Stevanović)



Overview of Almyros dam, Crete Island, Greece (photo by H. Bouloukakis)



Old watermill (photo from 1957)

MIKAS - Aggitis river Springs (Maaras cave)



Photo from Aggitis River spring



Photo from the Maaras cave



Pumping system in Maaras Cave entrance / Aggitis Spring

MIKAS – Stymphalian spring front





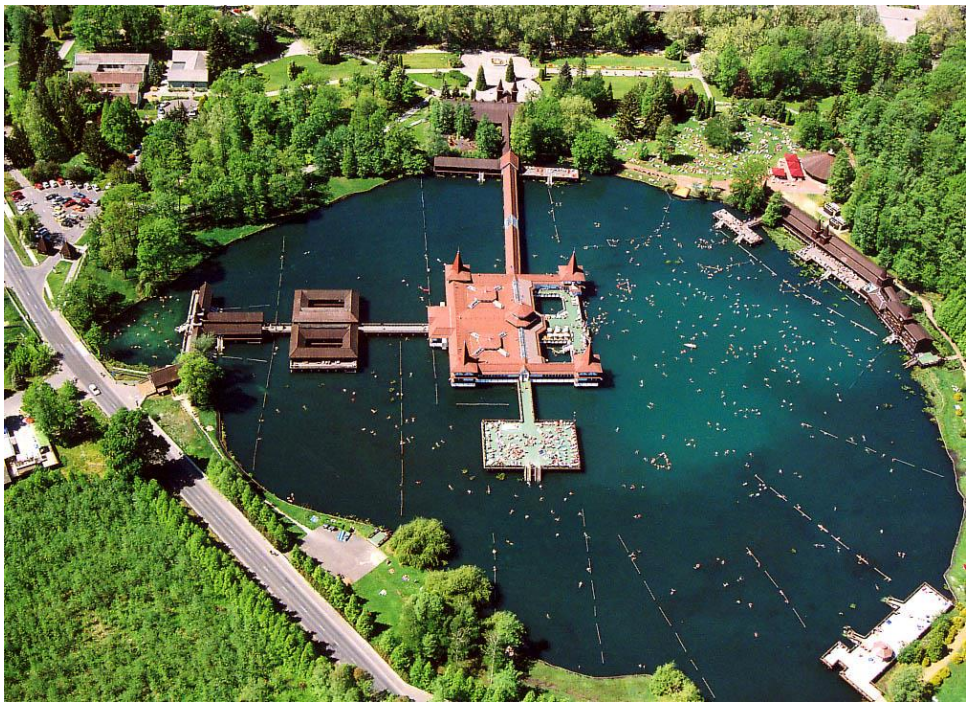
Remnants of the Hadrianic aqueduct. A bridge (top) and an underground conduit (bottom) of the aqueduct's structure in Nemea (after Lolos, 2010)



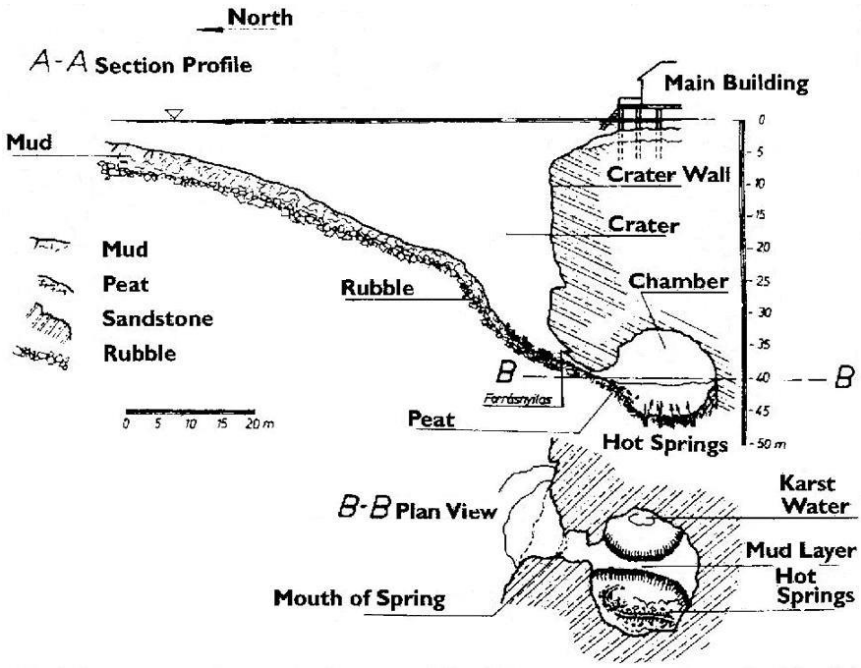
The largest spring of the Stymphalian front — Driza Spring — shown under (a, c, d, e) wet conditions and (b) dry conditions (photos by Eleni-Anna Nanou)

Hungary

MIKAS - Heviz



Thermal Lake Hévíz (source: Civertan Grafikai Stúdió)



Section of Hévíz Lake and Amphora spring cave (Amphora Divers Group, 1976)



Spring cave (photo by Dénes Szieberth)

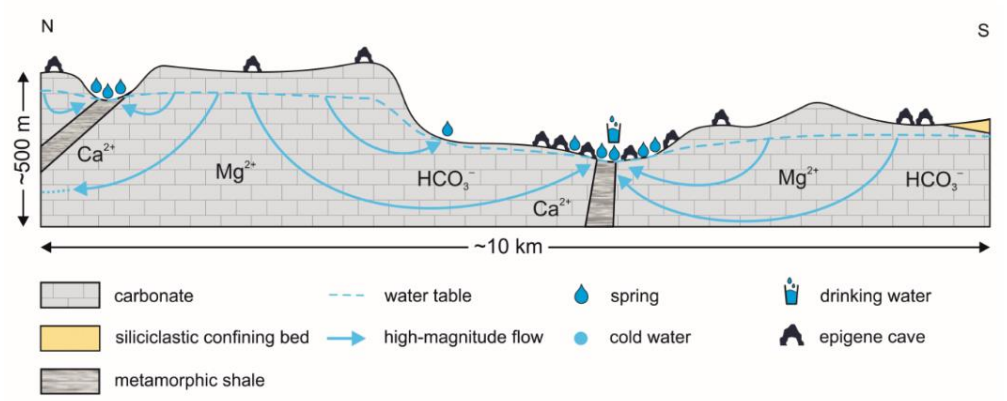
MIKAS - Jósva spring



Jósva Spring at normal flow rate (photo by Péter Gruber)

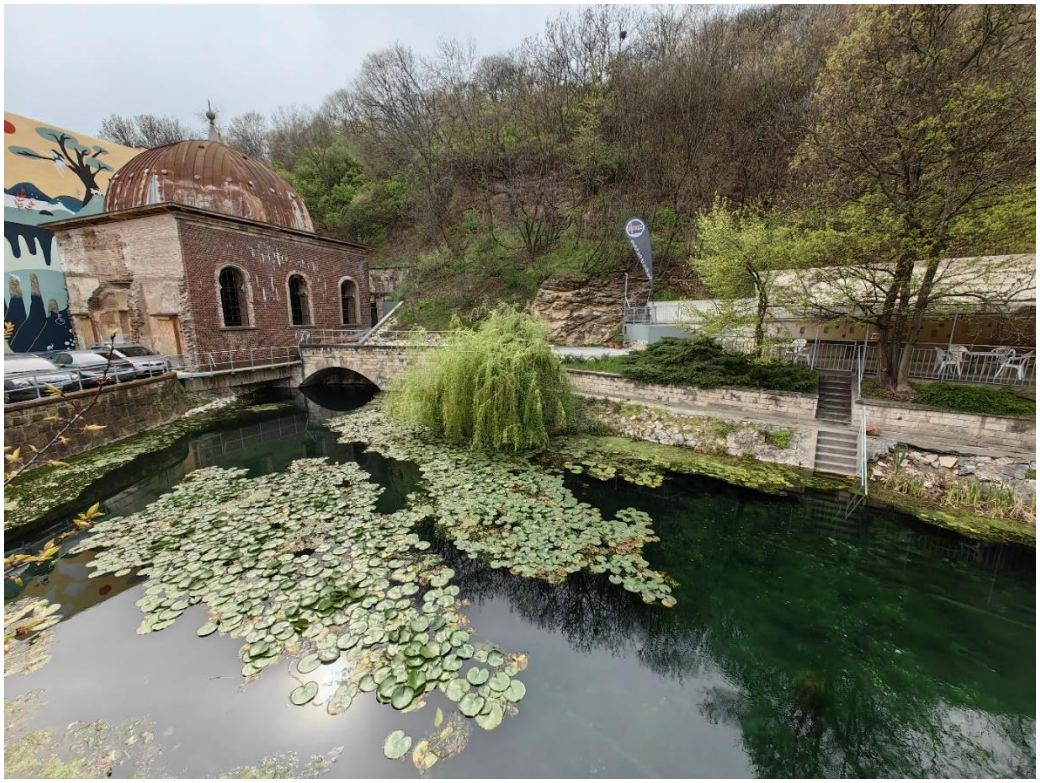


Jósva Spring in flood conditions (photo by Péter Gruber)



Generalized hydrogeological cross-section for the plateau of the Aggtelek Karst (Mádl-Szőnyi et al., 2022)

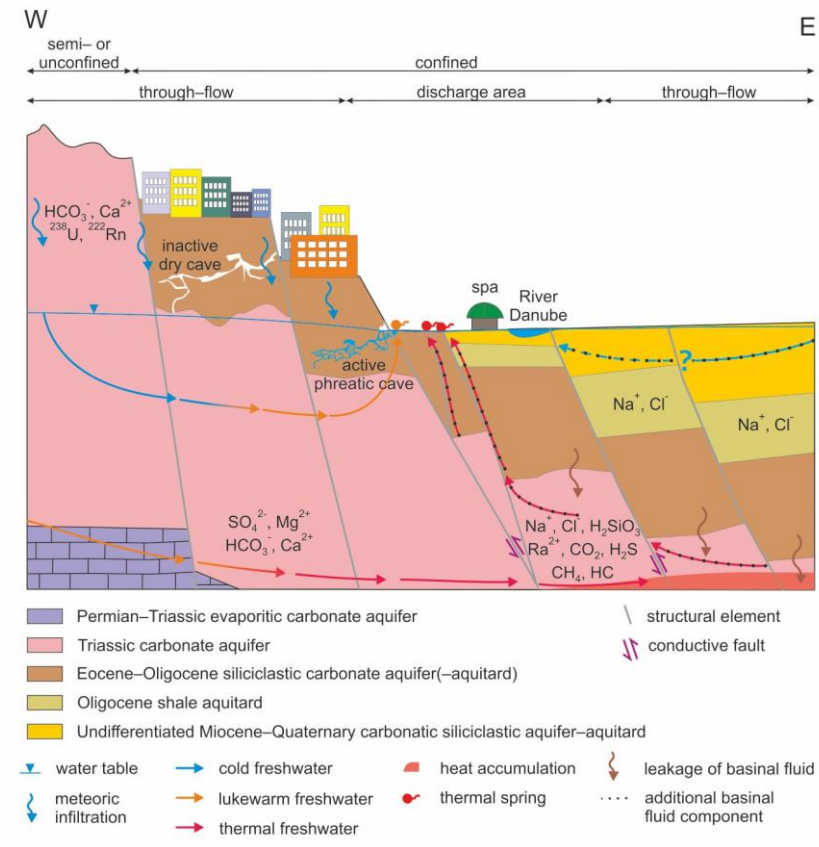
MIKAS - Boltív Spring



Boltív Spring and Malom lake (photo source: https://hu.wikipedia.org)

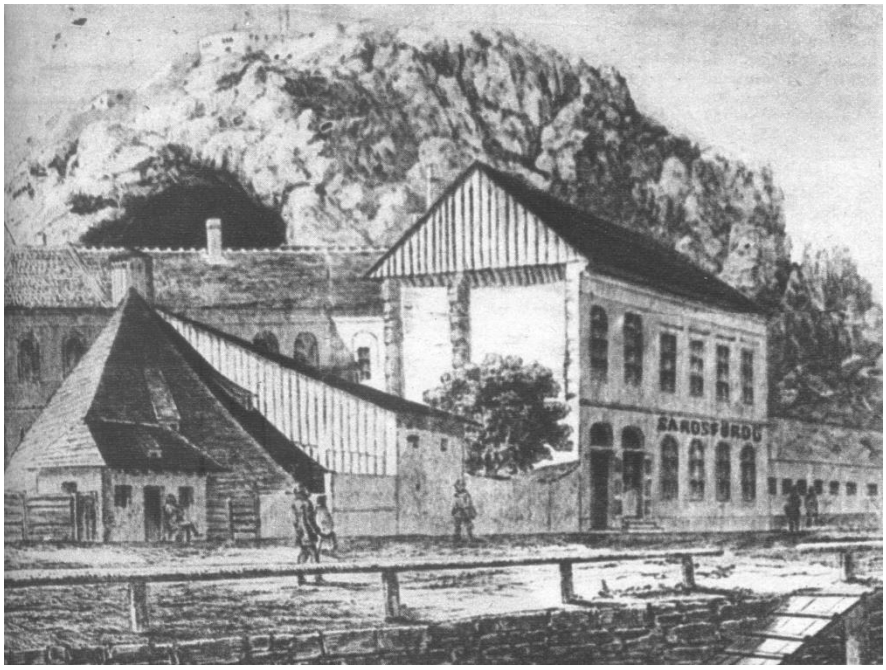


Molnár János Cave (photo by József Spanyol)

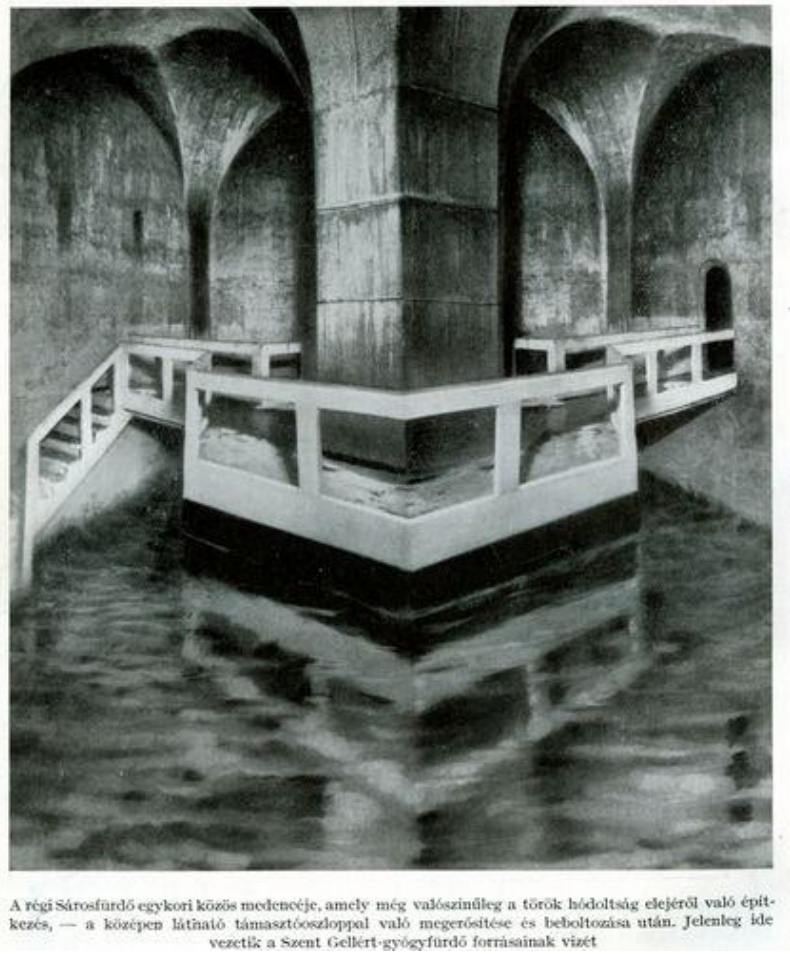


Conceptual flow model for the Rose Hill discharge area (after Erőss, 2010, modified)

MIKAS - Spring of the Gellért Spa (Ősforrás)



The so called "Muddy Bath", the ancestor of the Gellért Spa in the 19th century (from the archive of I. Dobos)



A régi Sárosfürdő egykori közös medencéje, amely még valószinűleg a török hódoltság elejéről való építkezés, — a középen látható támasztóoszloppal való megerősítése és beboltozása után. Jelenleg ide vezetik a Szent Gellért-gyógyfürdő forrásainak vizét

Sketch of the Ősforrás intake interior



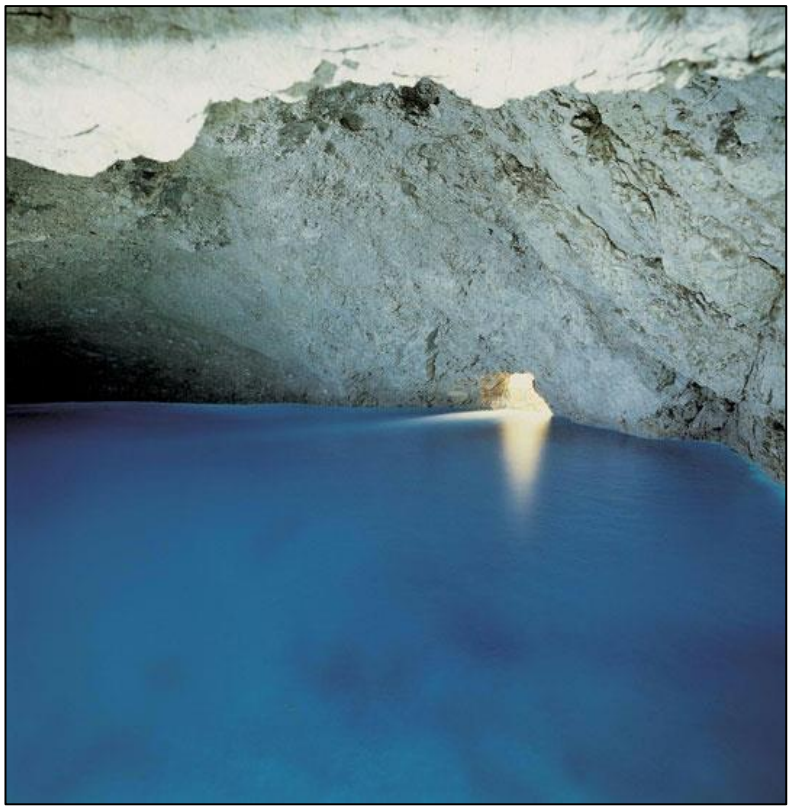
Spring of the Gellért Spa

Italy

MIKAS – Peschiera



View of the source area (Photo by Salvatore Martino).



Grotta Azzurra karst cavity within the Peschiera Spring slope (photo by University of Urbino)



Peschiera River, which originates from the Peschiera Springs (Photo by tuttorieti.com).



Present interior of tapping structure of Peschiera spring managed by ACEA-ATO2 SpA..



Overflow of the ACEA intake at the Peschiera spring (photo Z.Stevanović)

MIKAS – Sanita / Caposele

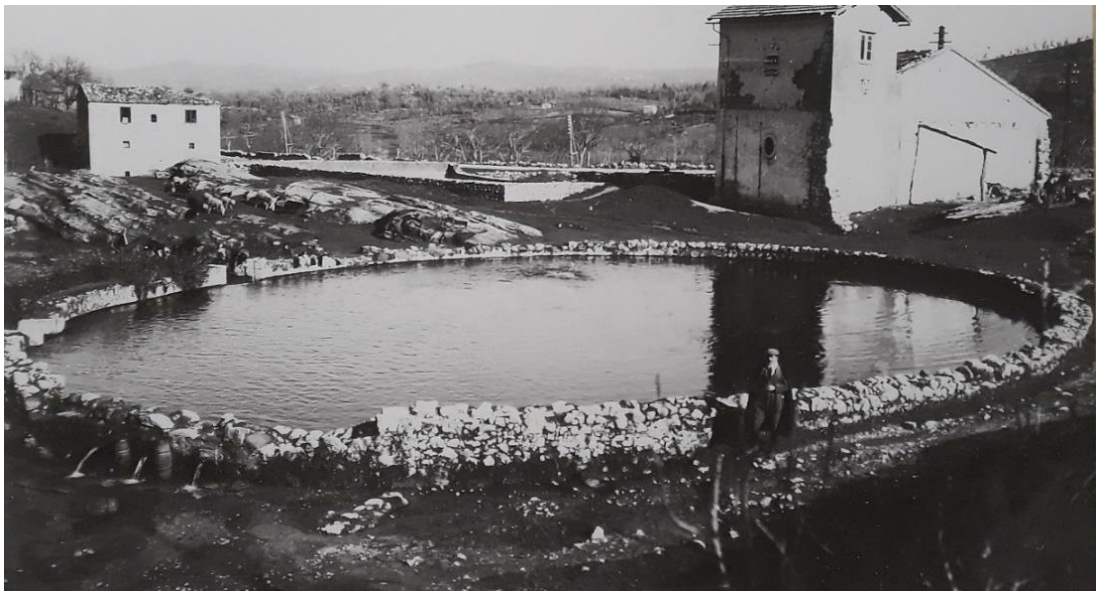


Sanità spring before tapping works (Courtesy of Acquedotto Pugliese)



Interior of tapping structure of Sanità spring (Photo by F. Fiorillo)

MIKAS – Cassano springs group



Pollentina spring before tapping works of sixties' (courtesy of Pugliese Aqueduct)



Interior of tapping structure of Pollentina spring (Photo by F. Fiorillo)



Interior of tapping structure of Peschiera spring (Photo by F. Fiorillo)

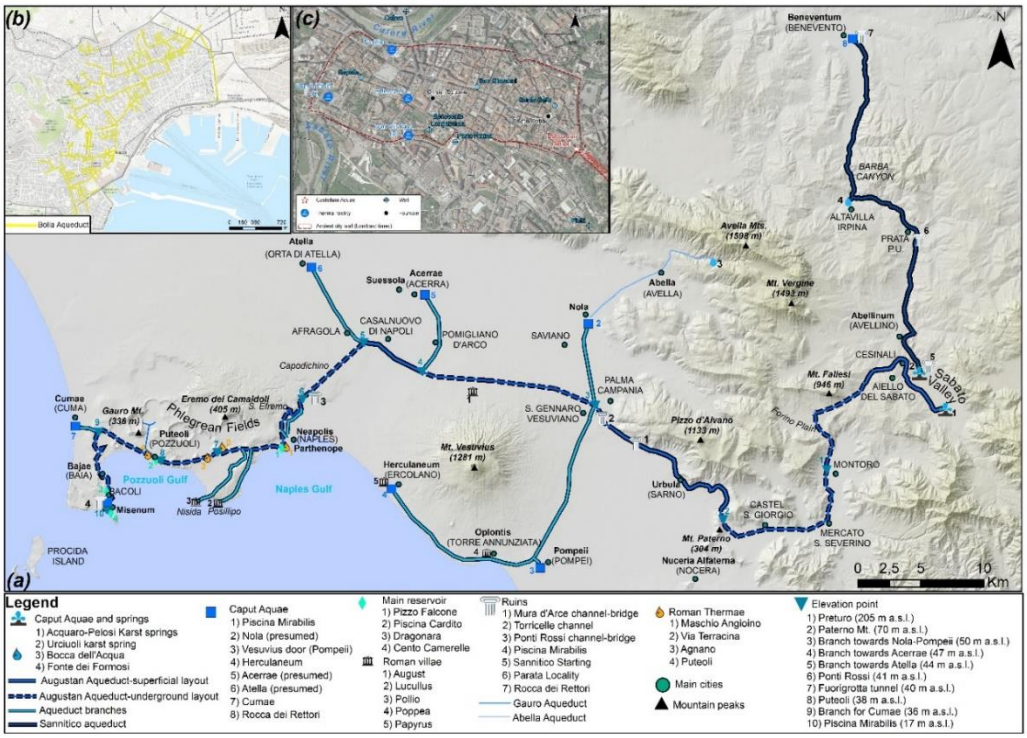


Dragone Plain polje (photo by F. Fiorillo)



Bocca del Dragone ponor, and its hydraulic channel system (photo by L. Esposito)

MIKAS – Serino springs group



Layout of Roman Aqueducts tapped Serino springs (from Esposito et al., 2025-modified)



Interior of tapping structure of Acquaro-Pelosi spring (Photo by L. Esposito)



Tapping structure of Urciuoli spring (Photo by L.Esposito)



Ruins of Roman Aqueduct near Urciuoli spring tapping structure (Photo by F. Fiorillo)

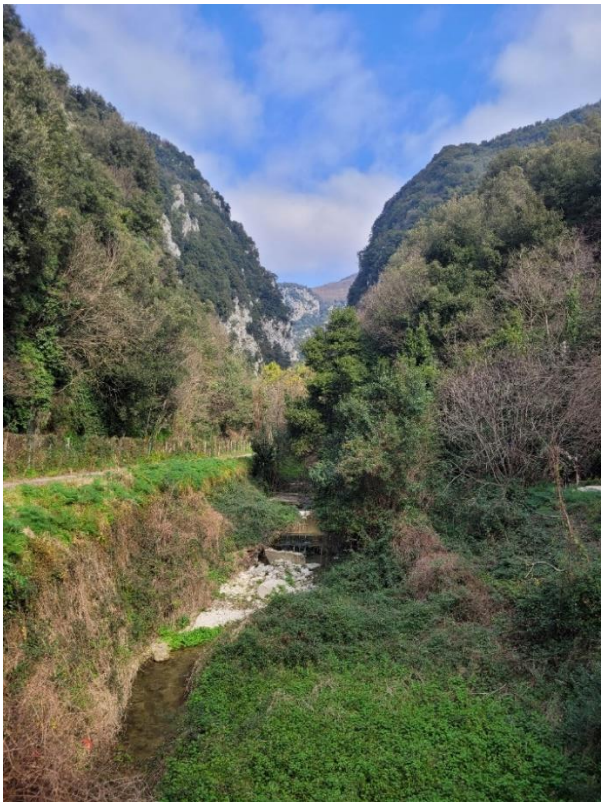
MIKAS – Torano and Maretto



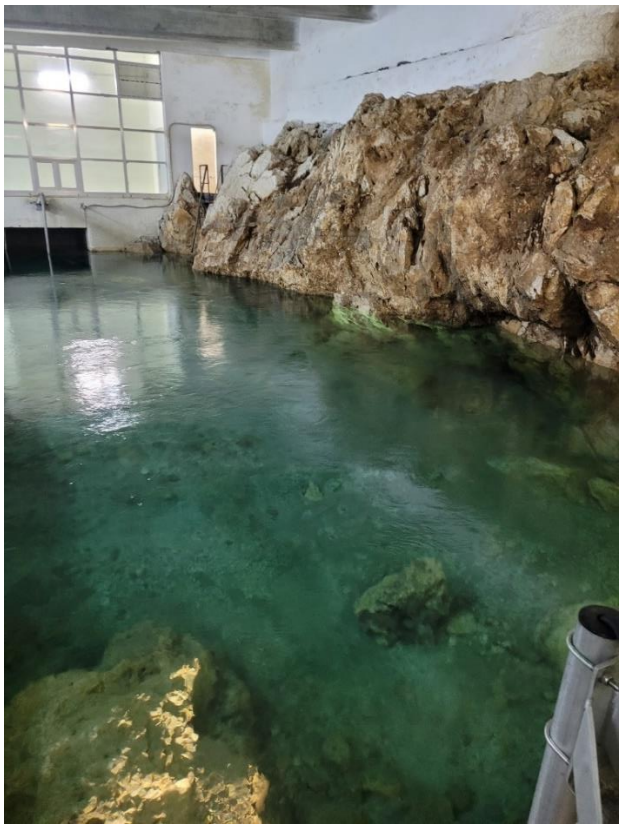
Torano spring tapping zone (photo by L. Esposito).



Natural emergence (karst conduit) of the Torano spring before its capture (photo by F.Fiorillo).



Torano karst canyon (photo by F.Fiorillo)



Maretto spring tapping zone (photo by L. Esposito).

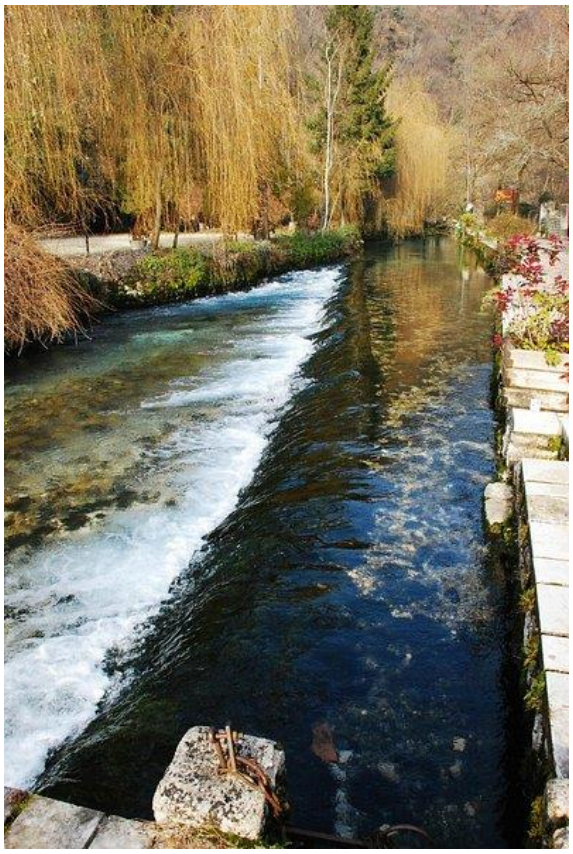


Matese Lake polje (photo by F. Fiorillo).

MIKAS – Livenza springs group (Santissima, Gorgazzo, Molinetto)



Gorgazzo spring (https://www.nordicwalkingtreviso.net/escursione/sorgenti-del-livenza-tra-natura-e-arte-domenica/)



https://www.tripadvisor.it/LocationPhotoDirectLink-g1201162-d2645715-i87368062-Sorgenti_del_Gorgazzo-Polcenigo_Province_of_Pordenone_Friuli_Venezia_Giu.html

MIKAS - Timavo

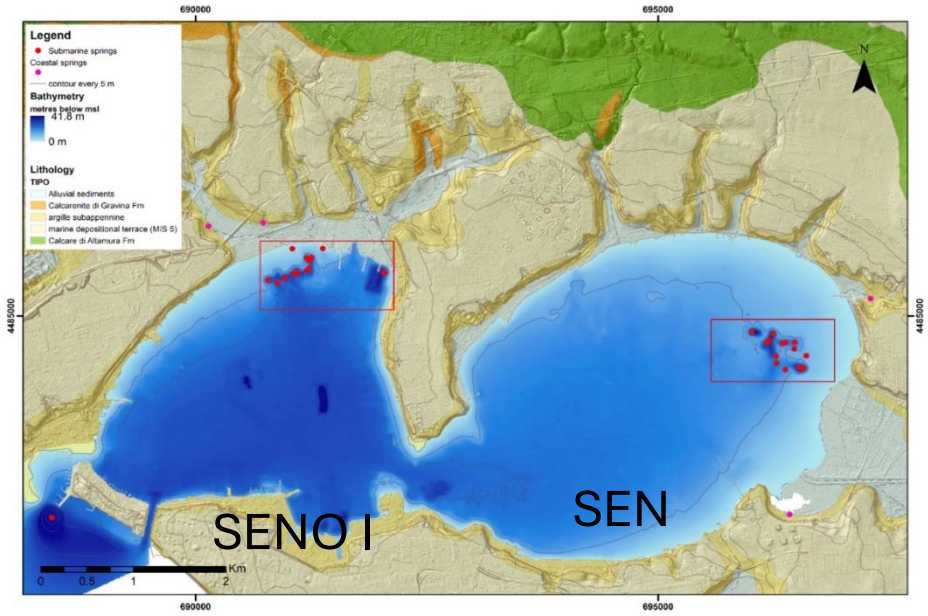


One of the outlets of Timavo springs sgroup



Timavo springs' flow

NIKAS – Citri



Red dots = location of Citri springs within the Mar Piccolo di Taranto basins. There are 34 submarine springs; 20 are in the First Inlet (SENO I) and 14 in the Second Inlet (SENO II). The most important are "Galeso" and "Citrello" in the First Inlet and "Le Copre" in the Second Inlet.



View of karst submarine spring "Citrello", located in the First Inlet of Mar Piccolo di Taranto.

Moldova

MIKAS – Jeloboc



Jeloboc water pumping station near Raut riverbank (Google Maps)



Jeloboc spring (photo taken from Wikipedia, credit: Alex Prodan)

Montenegro

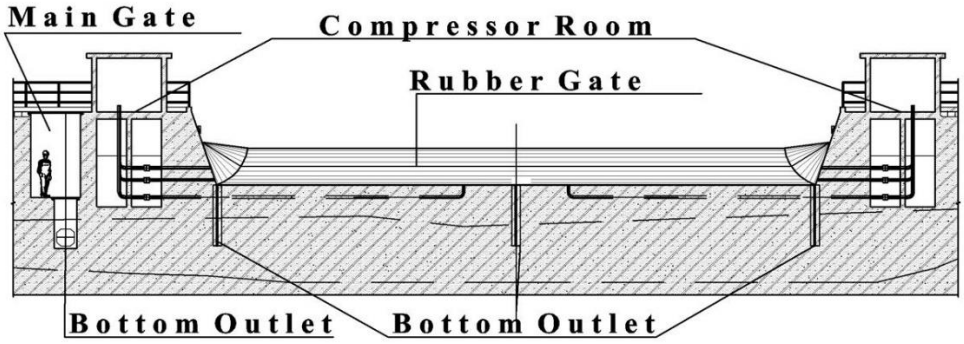
MIKAS – Bolje Sestre





Sublacustrine spring (vrulja) Bolje Sestre, before and after tapping (Photos by Z. Stevanović)



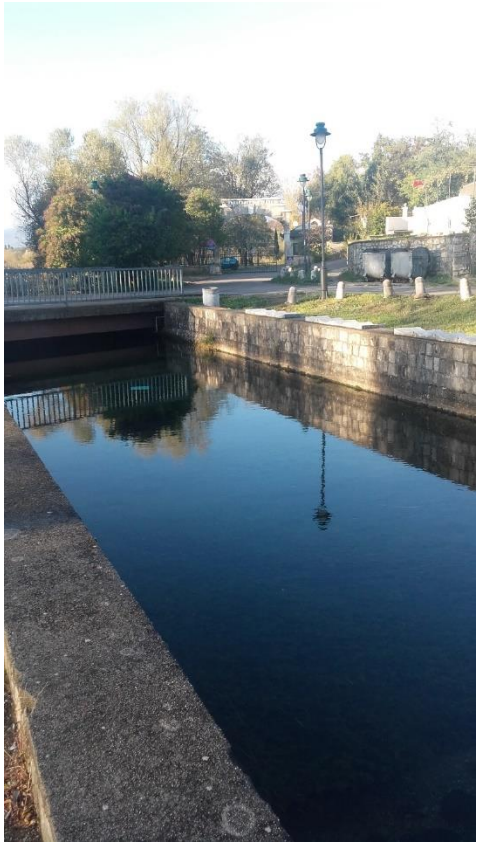


Bolje Sestre intake - Elliptical coffer dam and weir with movable rubber gate

MIKAS – Mareza



Spring site and wetland (source: Wikipedia)



Channelled overflow spring water (Photo by Z. Stevanović

NIKAS – Alipašini izvori



Alipašini springs (Photo by Z. Stevanović)

NIKAS – Bistica spring



Photo of the Bistrica Spring (courtesy of IHMS, 2019)

NIKAS – Glava Zete

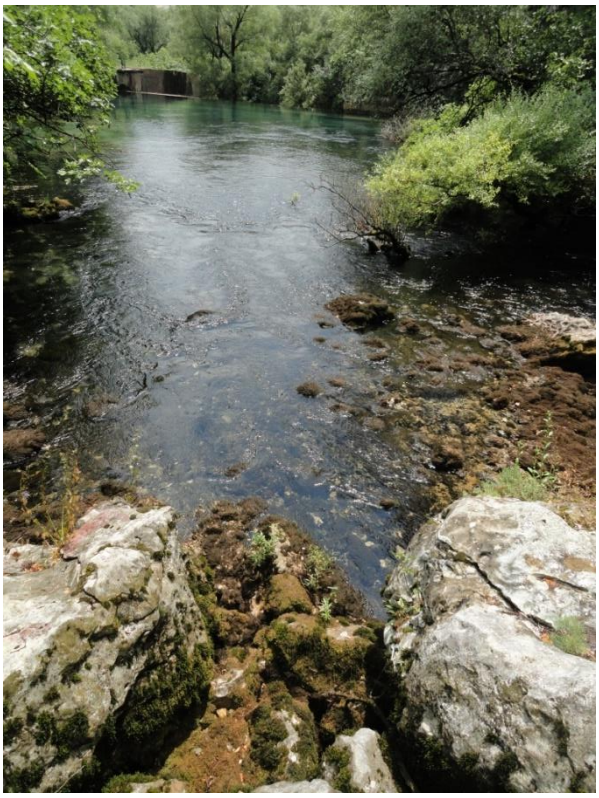


Photo of the Glava Zete Spring (Photo by Milan Radulović)

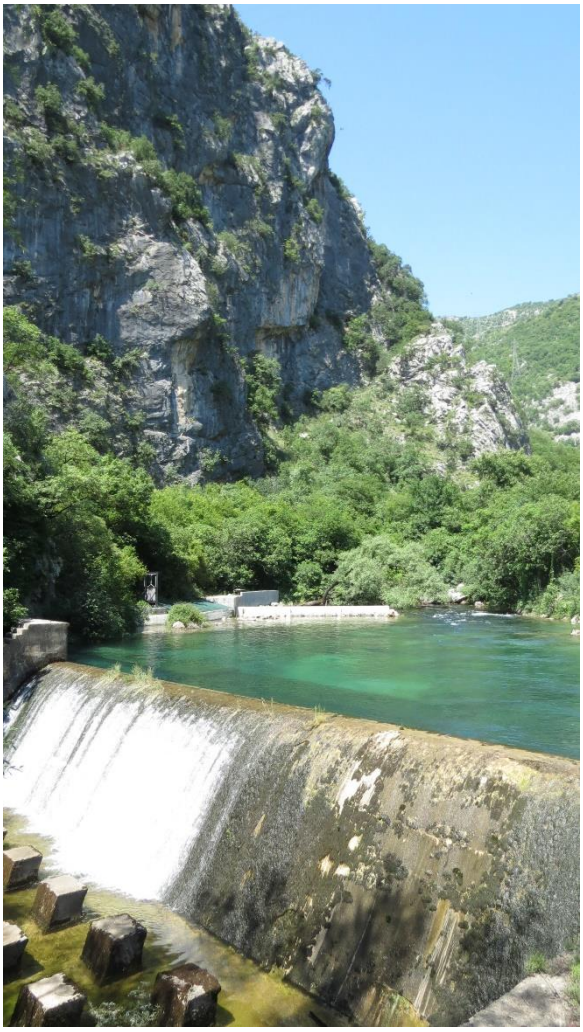


Photo of the Glava Zete Spring (Photo by Z. Stevanović)

NIKAS - Podgor spring



Photo of the Podgor Spring (Photo by Milan Radulović)

North Macedonia

MIKAS - Vrelo Rashche



The intake Rashche 1 (photo Stojan Mihailovski)

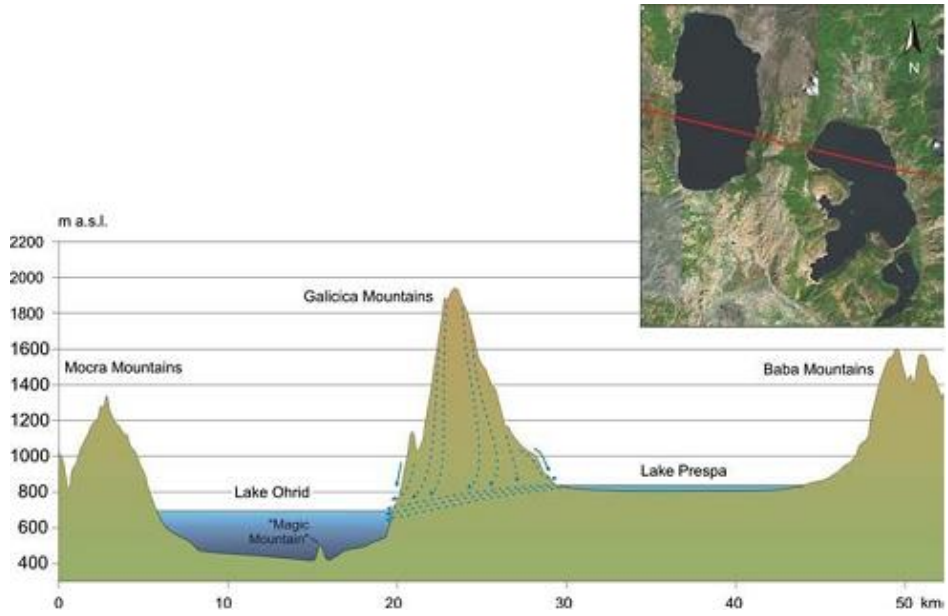


The intake Rashche 2 and a channel for diverting overflow into the nearby Vardar River

MIKAS – St. Naum spring



Outflow of the Saint Naum spring in Ohrid Lake (spring time, photo from a drone)



Schematic cross-section of the St Naum spring occurrence and its water originated from Lake Prespa



Outflow of the Saint Naum spring into the Ohrid Lake, on a bridge (Photo by Silvana Peshovska)



St. Naum spring at its mouth to Ohrid Lake (Photo by Z. Stevanović)

NIKAS - Studenchica Spring



Reinforced concrete slab above the intake structure/collection channels and the spring of Studenchica

NIKAS – Spring of Treska River



Spring of Treska River

NIKAS – Zheleznec Spring



Zheleznec spring and its immediate mouth to the Crna Reka River (autumn)

NIKAS – Belichki Spring



Belichki spring (during springtime)

Poland

MIKAS - Goryczkowe (Wywierzysko Goryczkowe)



Outflow from the Kasprowa Niżna Cave during a high water level of the massif (flood), an example of a "safety valve" type reaction for the circulatory system of *Wywierzysko Goryczkowe, 1999 (Photo by Grzegorz Barczyk)*

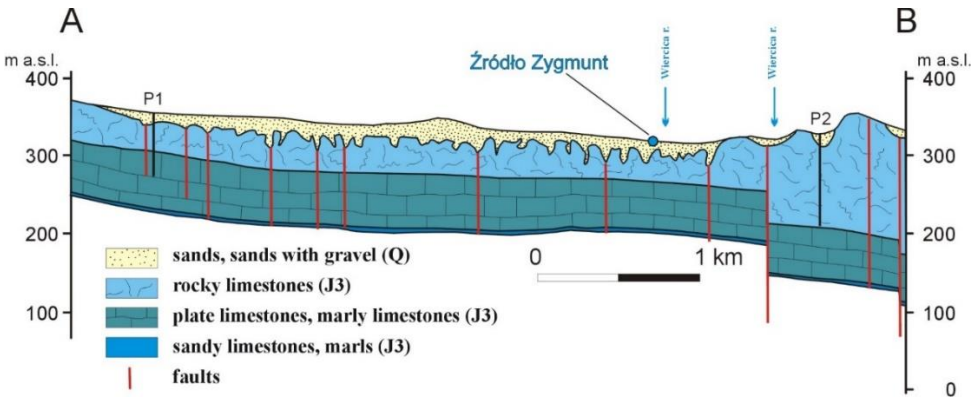
MIKAS – Zygmunt spring (Źródło Zygmunt)



Zygmunt Spring (Photo by P. Kokoszka)



Photo of the contemporary Trout House (Photo by P. Kokoszka)

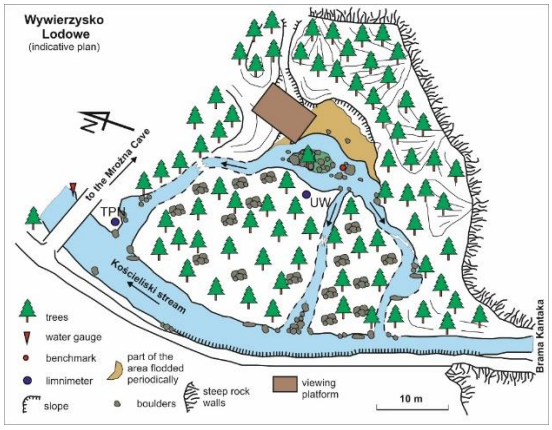


Geological cross – section with the location of the spring (after R. Więckowski, 1973)

NIKAS - Lodowe spring (Lodowe Źródło)



Lodowe Źródło (photo Grzegorz Barczyk)

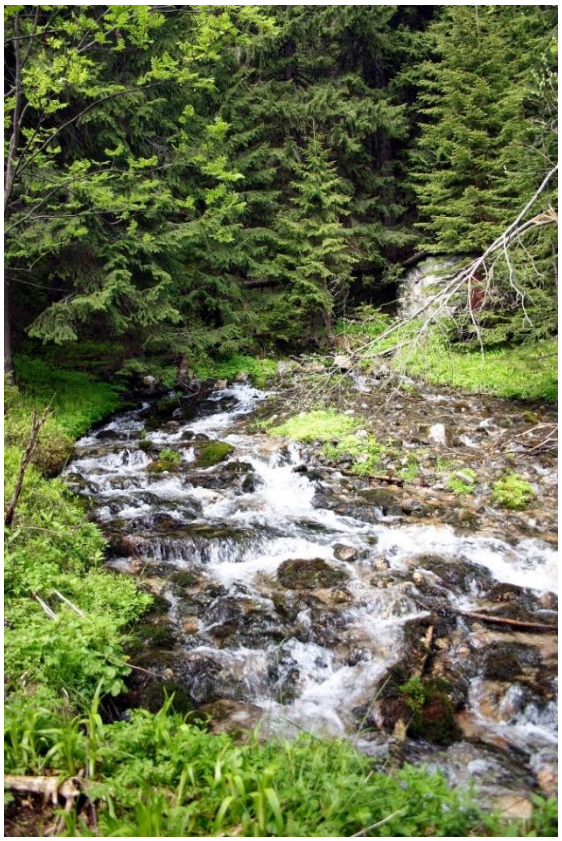


Lodowe Źródło schematic map (after Barczyk 2008)

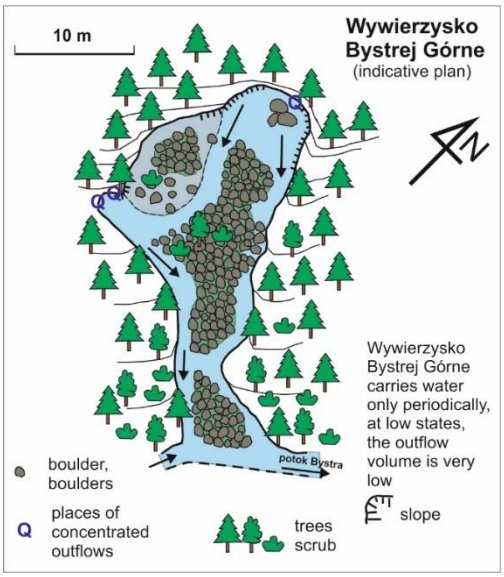


Lodowe Źródło during winter 2023 (photo Grzegorz Barczyk)

NIKAS - Wywierzysko Bystrej



Wywierzysko Bystrej Górne (photo Grzegorz Barczyk) and schematic map (after Barczyk 2008)





Orifice of Bystra Cave connected to Wywierzysko Bystrej (photo Grzegorz Barczyk)

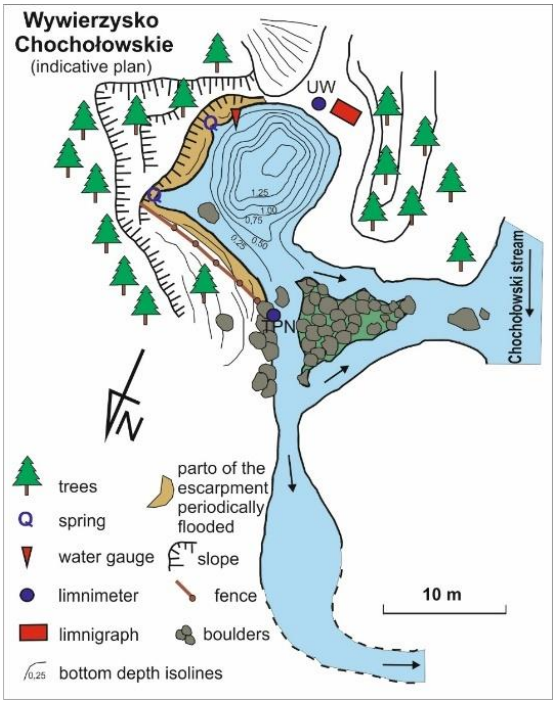
NIKAS - Chochołowskie spring (Wywierzysko Chochołowskie)



Wywierzysko Chochołowskie (photo Grzegorz Barczyk, December 2013)



Wywierzysko Chochołowskie (photo Grzegorz Barczyk, November 2019)

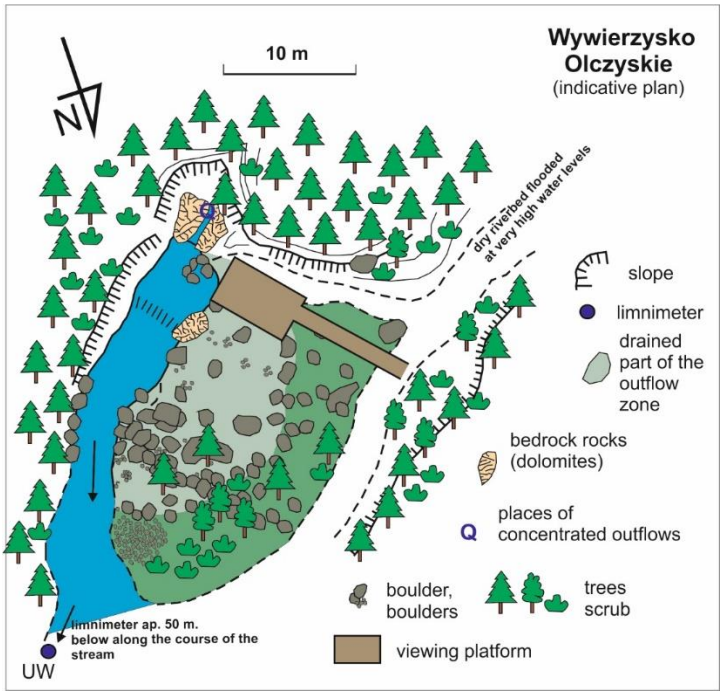


Plan of the Wywierzysko Chochołowskie (after Barczyk 2008)

NIKAS - Wywierzysko Olczyskie



Wywierzysko Olczyskie (Photo by Grzegorz Barczyk)



Plan of the Wywierzysko Olczyskie (after Barczyk 2008)

NIKAS - Błękitne Źródła



Błękitne Źródła spring (photo by P. Kokoszka)



Błękitne Źródła spring (photo by P. Kokoszka)

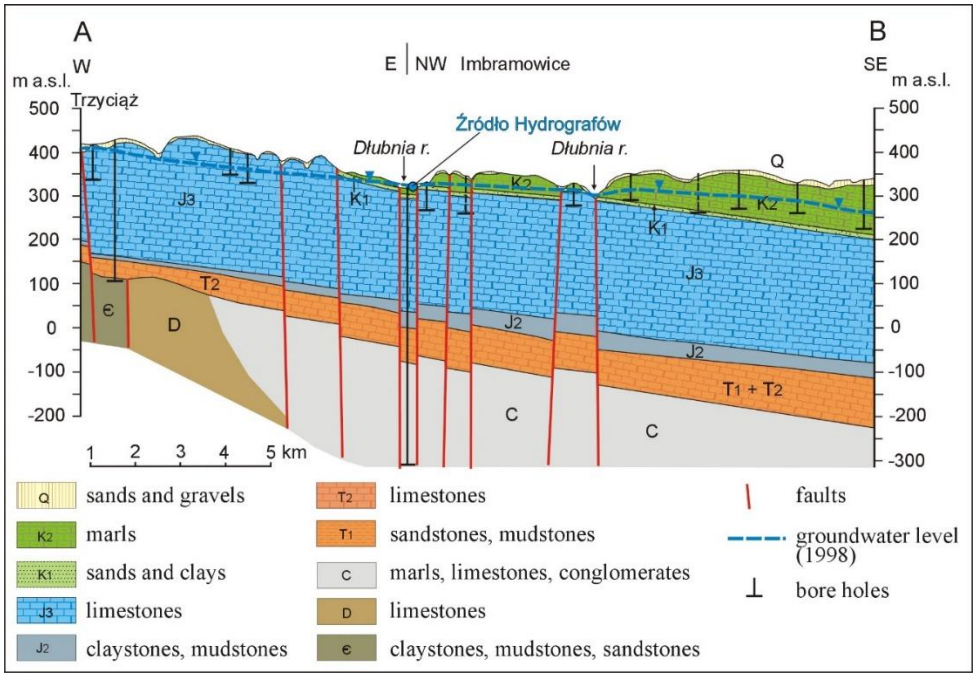
NIKAS - Źródło Hydrografów



Źródło Hydrografów (Photo by Dorota Okoń)

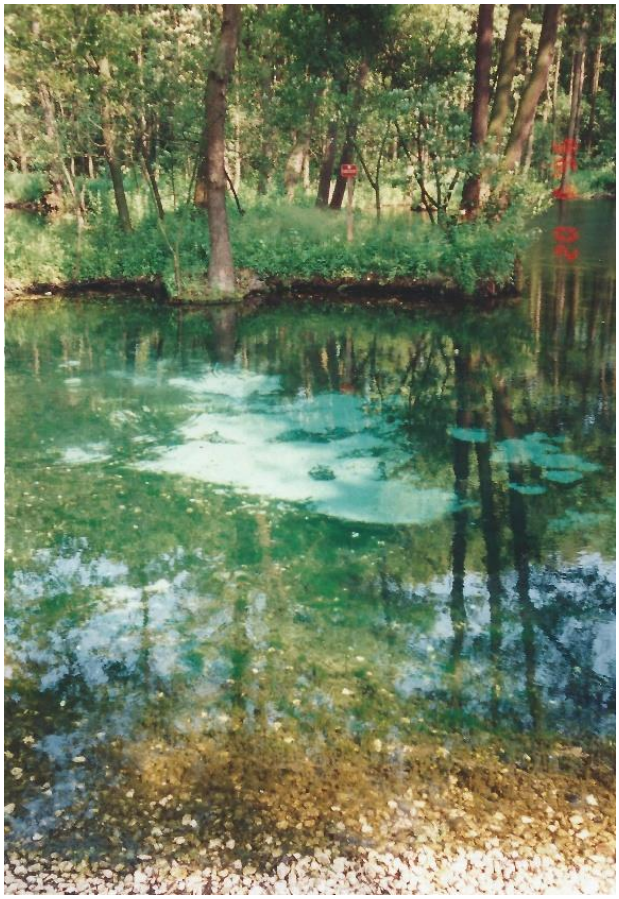


Źródło Hydrografów (Photo by Jacek Różkowski)



Geological cross-section with the location of the Źródło Hydrografów (after Lewandowski, 2004)

NIKAS – Niebieskie Źródło



Niebieskie Źródła (Photo by J. Małecki)



Niebieskie Źródła (Photo by Jacek Różkowski)

NIKAS – Winiary



Winiary spring (Photo by M. Borowiec)



Winiary spring (Photo by A. Chwalik - Borowiec)

NIKAS – Zimne Wody



Zimne Wody (photo A. Chwalik - Borowiec)



Zimne Wody (photo A. Chwalik - Borowiec)

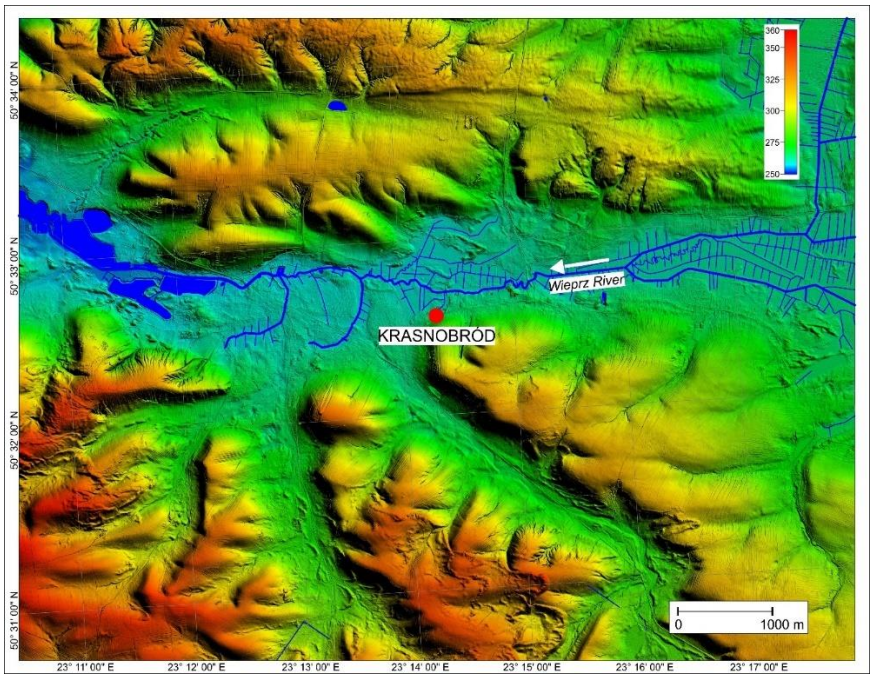
NIKAS - Krasnobród Kapliczka Podlasztor



Krasnobród spring – chapel on the water (Photo by Stanisław Chmiel)



Krasnobród spring (Photo by Stanisław Chmiel)

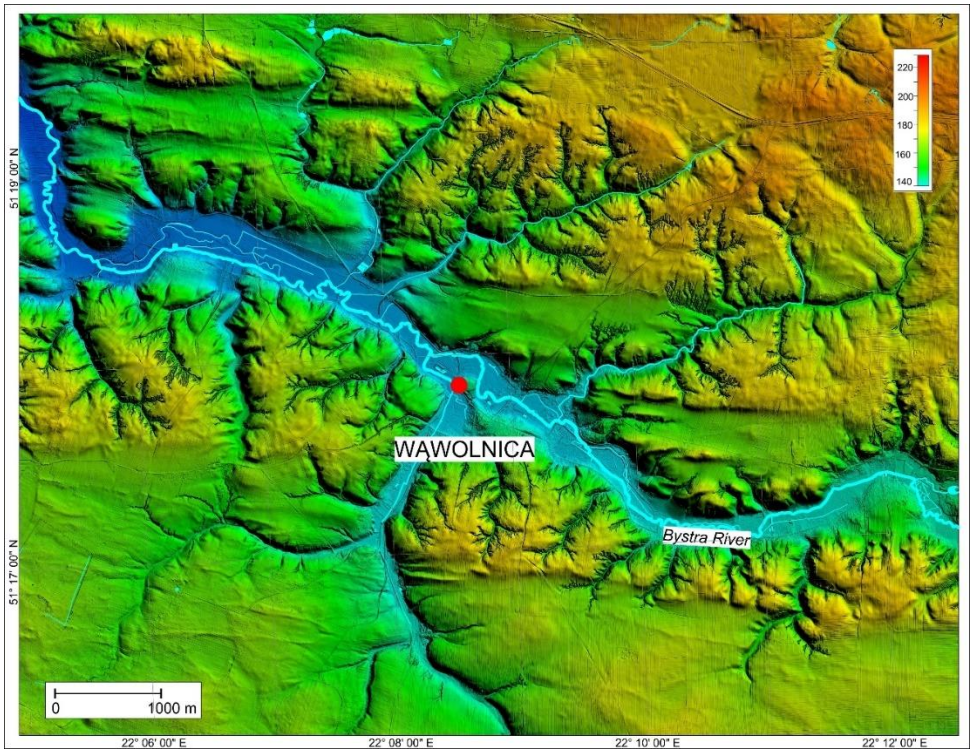


Surface relief of the Krasnobród spring area

NIKAS – Wąwolnica



Wawolnica spring (Photo by K. Stępniewski)

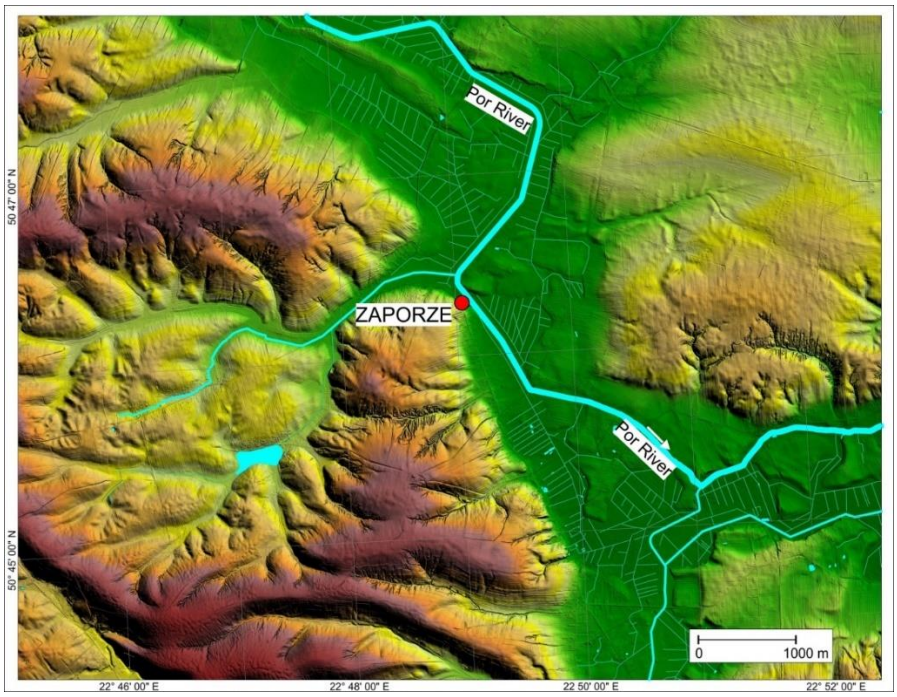


Surface relief of the Wawolnica spring area

NIKAS – Zaporze



Zaporze spring (Photo by Stanisław Chmiel)

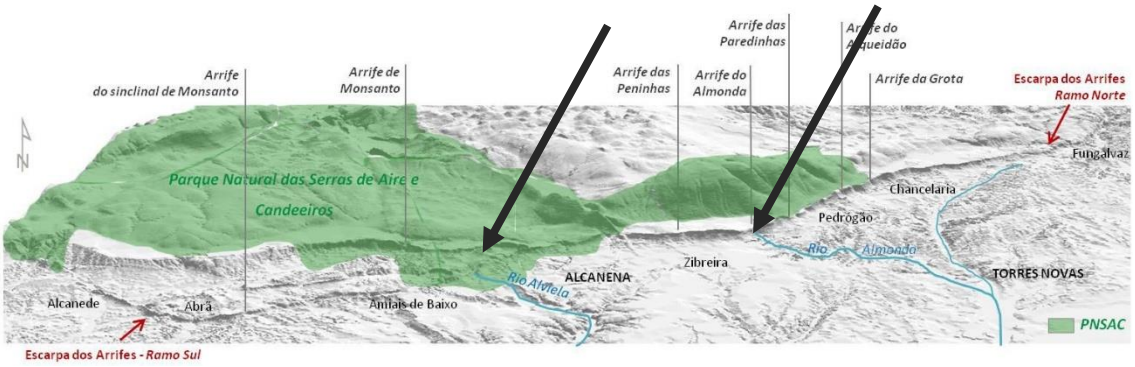


Surface relief of the Zaporze spring area

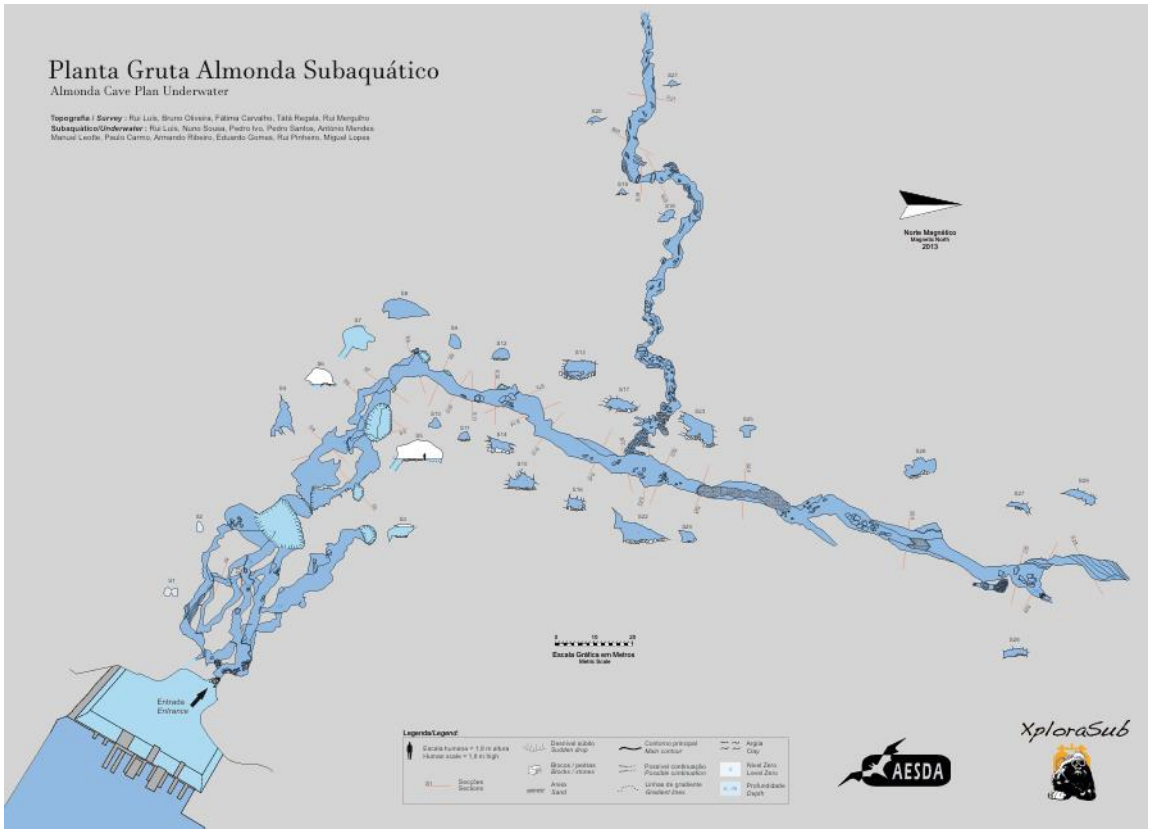
Portugal



MIKAS – Almonda



Almonda and Alviela Locations - 3D model of Escarpa dos Arrifes and its integration in the Natural Park of Serras de Aire e Candeeiros (PNSAC) (Leal, C. 2014).



Sketch map of surveyed cave channels (courtesy of Rui Luis)





Almonda spring in high and low water period (photos by Rui Luis)

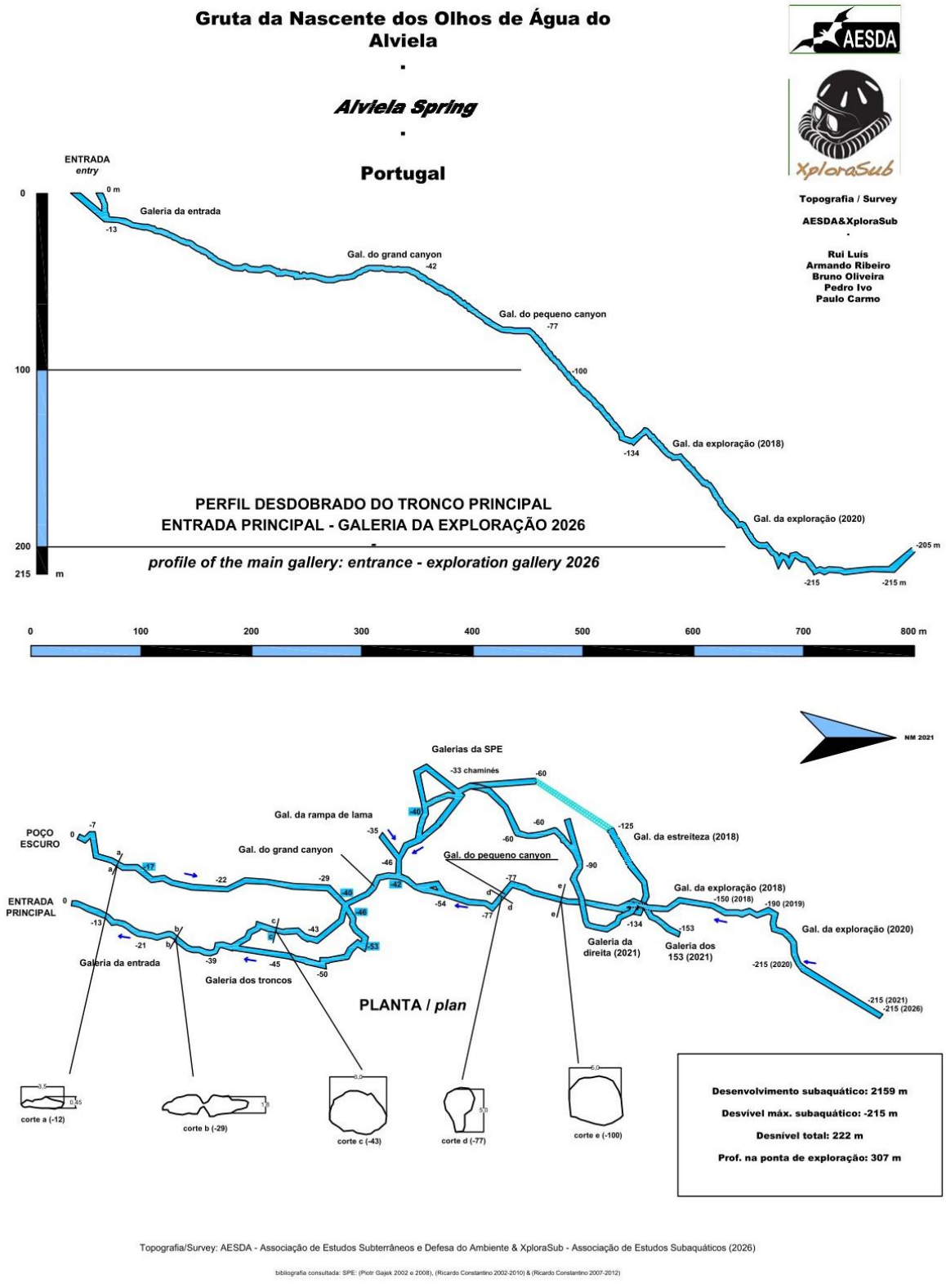






Underwater cave diving (photos by Rui Luis)

MIKAS – Alviela



Profile and sketch map of underwater channels of Alviela (courtesy of Rui Luis)



Alviela spring (photo by Rui Luis)



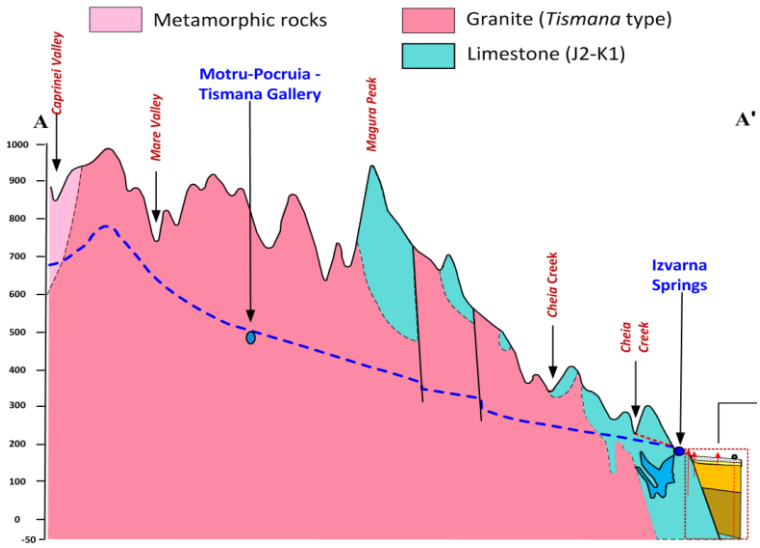


Alviela underwater channels (photos by Rui Luis)

Romania

MIKAS – Izvarna group of springs

Schematic cross-section of Izvarna group of springs – binary system of coupled karstic-granitic aquifer





Main building of Izvarna intake structure (photo by Carlan Constantin)



Intake basins for Group 1 – Costeni (photo by Carlan Constantin)



Old mill at Izvarna spring course (www.alpinet.org)

Russian Federation



MIKAS – Arsenovsky spring



View of the Kungur River valley and Arsenovsky spring (photo: N.G. Maksimovich).

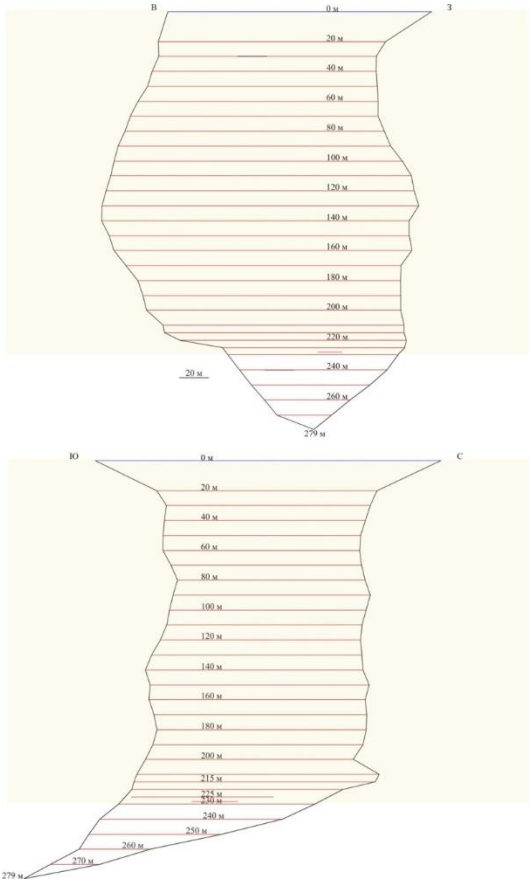


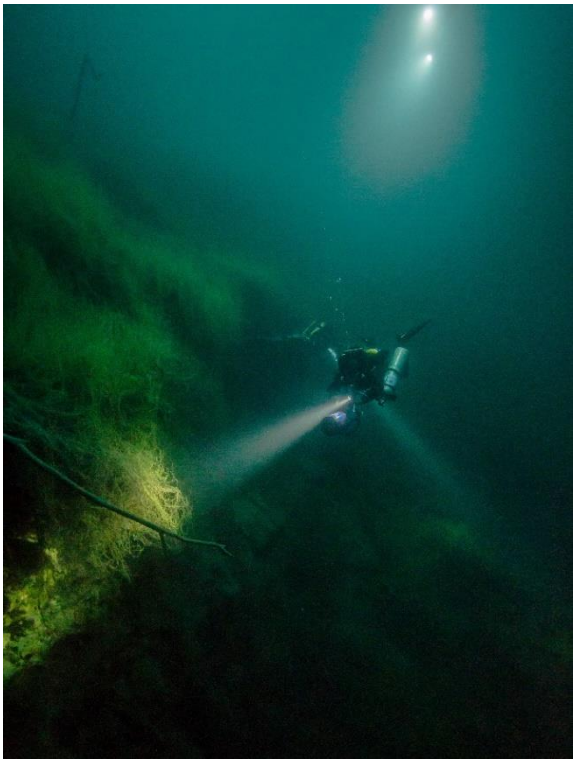
Diving in reservoir filled by Arsenovsky spring water (https://tritonural.ru/arsenovskiy-istochnik-udivitelnoe-ryadom/).

MIKAS – Cerik Kel (Blue Lake)



Aerial view on Cerik Kel spring and lake (siphon) sections





Underwater space (photo by Underwater Research Center of the Russian Geographical society)

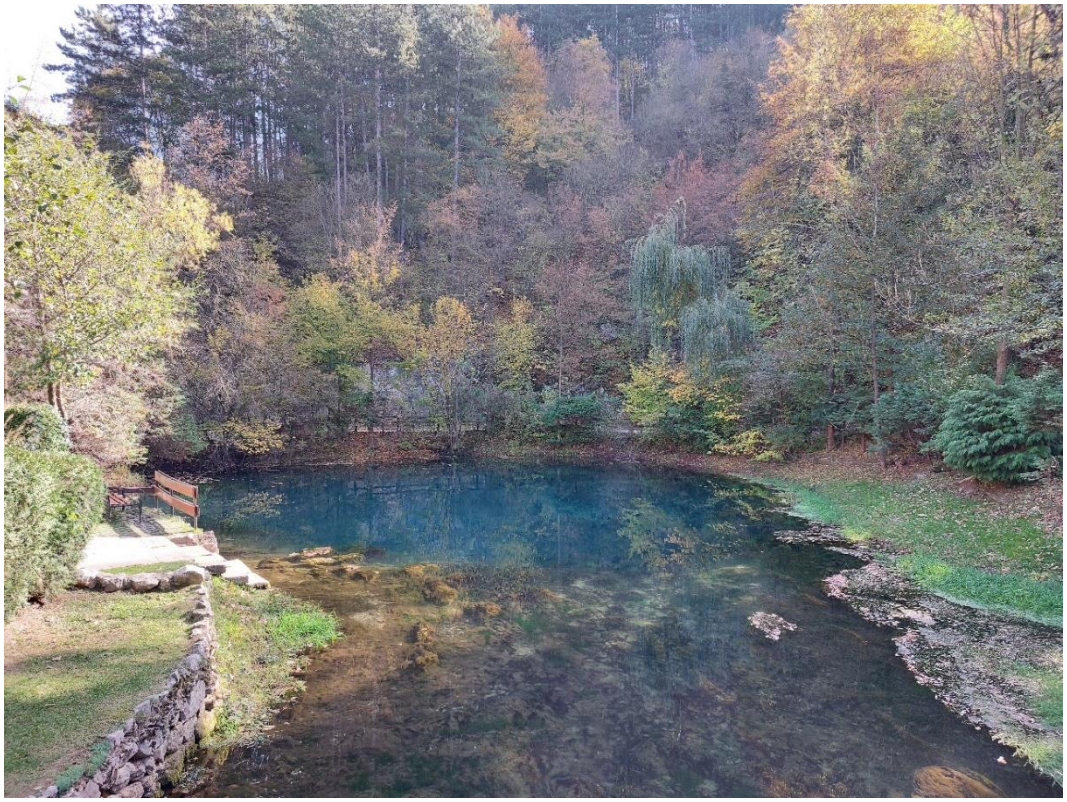


Cerik-Kel Blue lake (photo by N.G. Maksimovich)

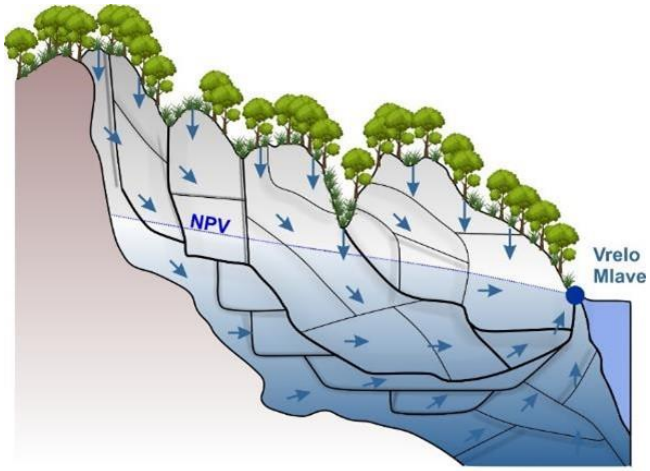
Serbia

MIKAS - Vrelo Mlave

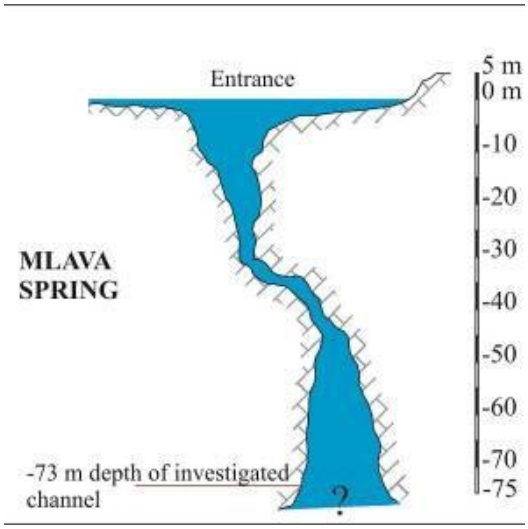
Photos by Zoran Stevanović



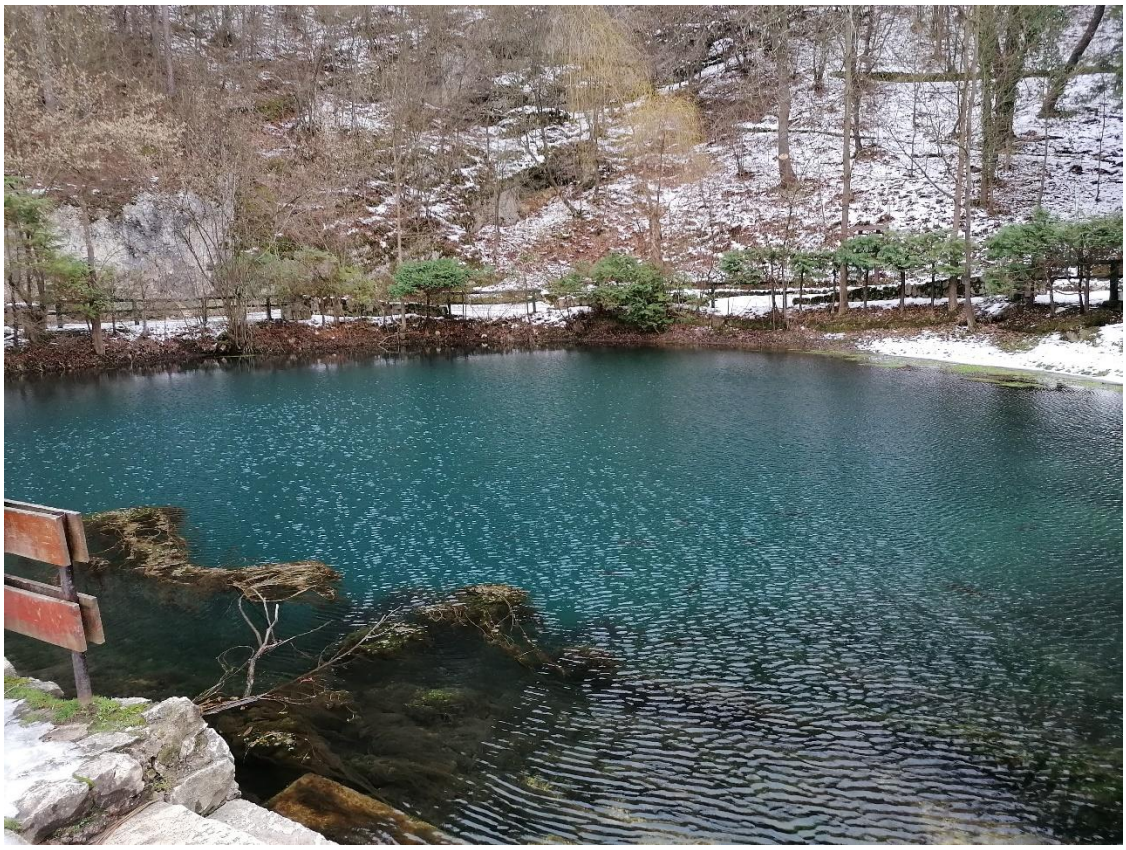
Vrelo Mlave spring (summer)



Schematic cross section (after Vasić, 2017)



Vrelo Mlave, siphon section (Milanović, 2010)



Vrelo Mlave spring (winter)

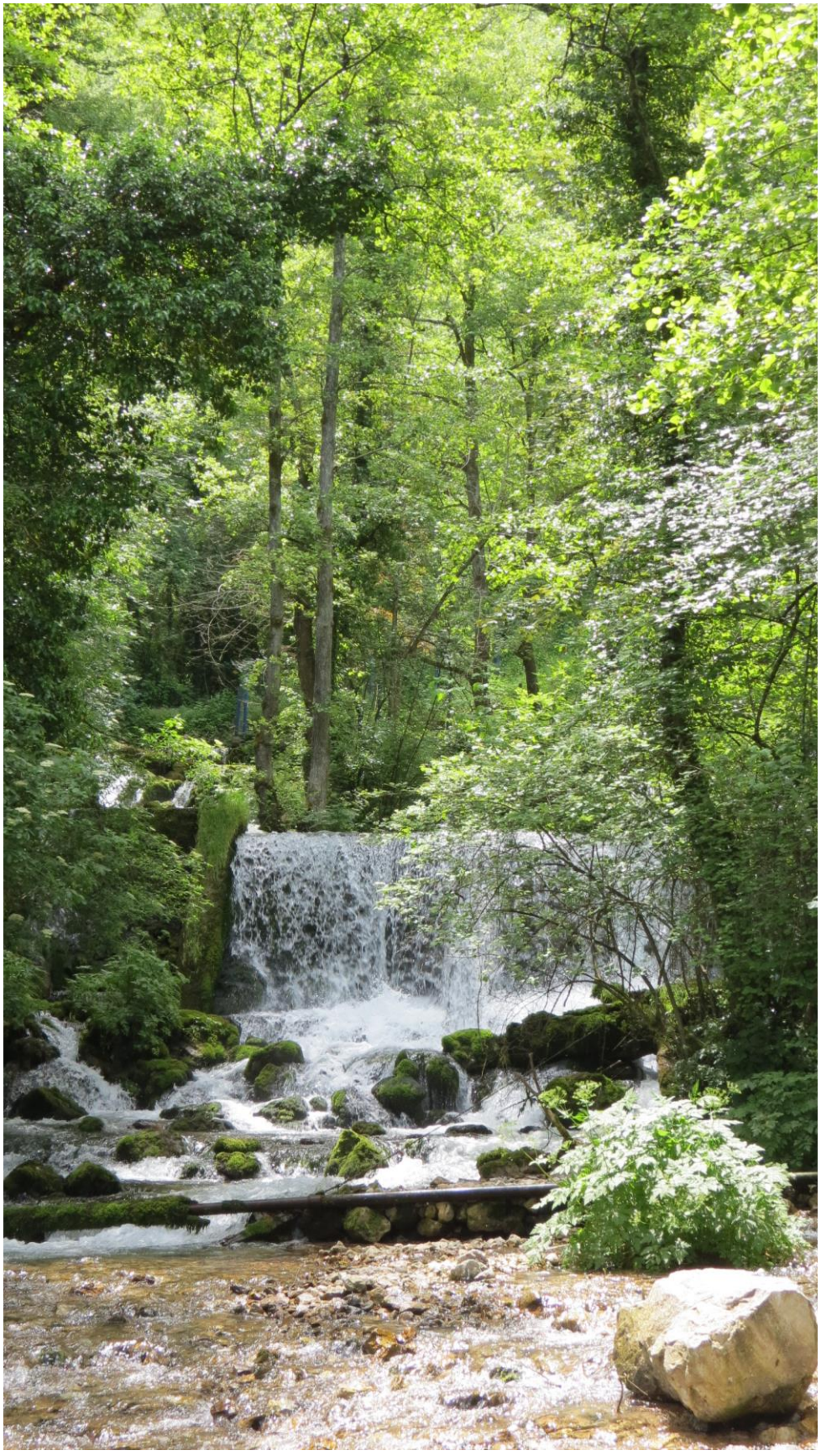


Vrelo Mlave, panoramic view

MIKAS - Perućac (Perućačko vrelo)



Perućac spring waterfall at the mouth to Drina River (https://tara.rs/sr/perucac-odmor-pored-jezera-i-reke-drine/)

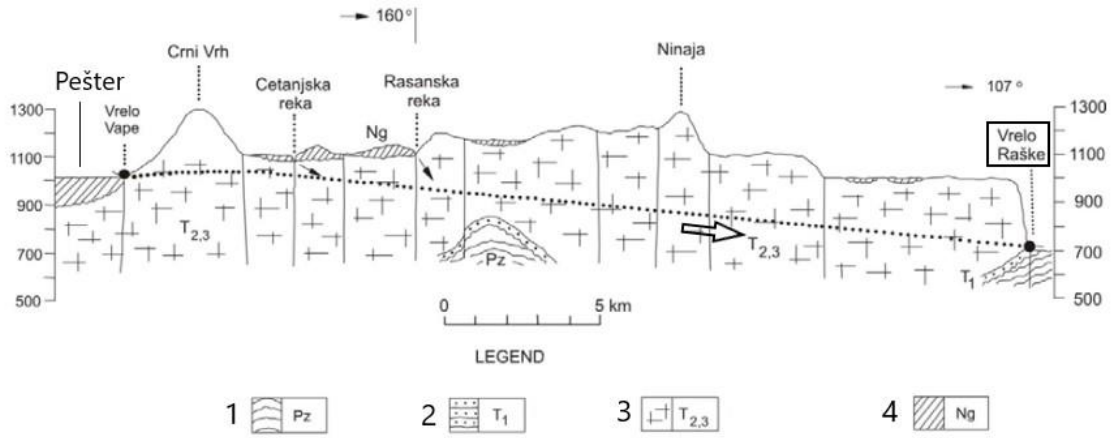


Perućac karst spring (photo by Z. Stevanović)

MIKAS - Vrelo Raške



Intake and overflow of the Vrelo Raške (Photo Z. Stevanović)



Schematic cross-section Pešter – Vrelo Raške. Legend: 1. Paleozoic schists, 2. Clastic rocks of Lower Triassic age, 3. Middle and Upper Triassic limestones, karst aquifer, 4. Neogene deposits (after Ristic Vakanjac et al. 2014)



Entrance of the cave with upper flow of Vrelo Raške (Photo Z. Stevanović)



Ponor Boroštice – one of several ponors (swallow holes) at the Pešter karst polje (Photo Z. Stevanović)

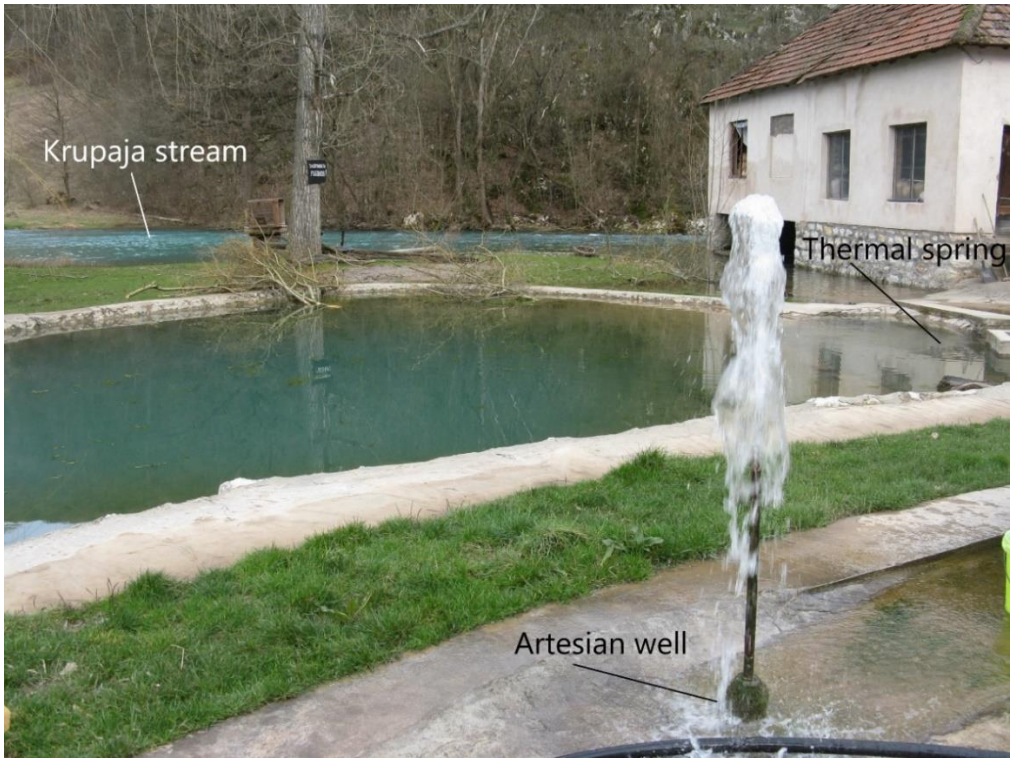
NIKAS – Krupajsko vrelo



Krupajsko vrelo spring – drainage from cave and overflow over small weir (Photo Z. Stevanović)

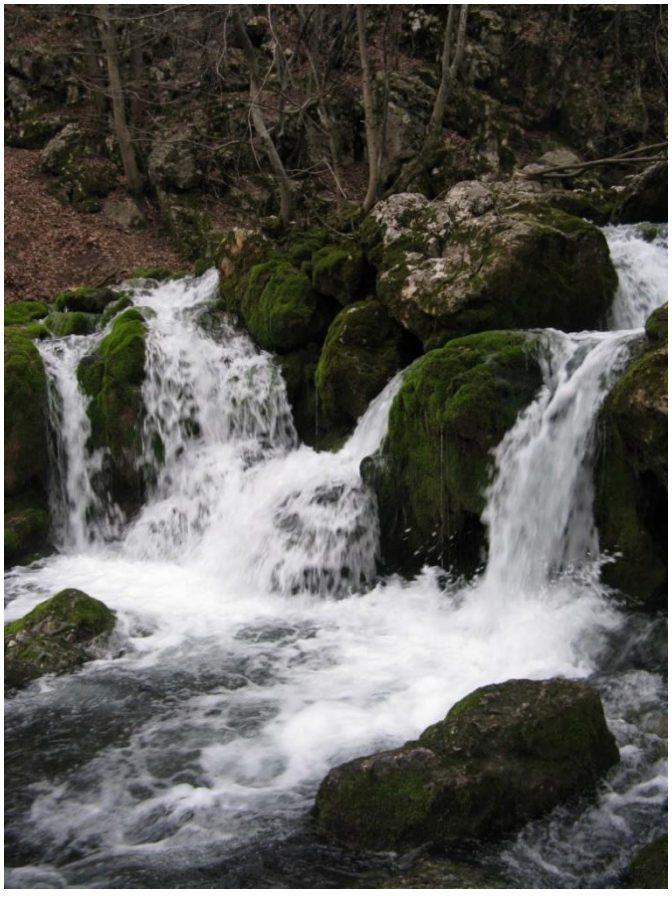


Krupajsko vrelo spring (Photo Z. Stevanović)



Krupaja stream, thermal spring and artesian well (Photo Z. Stevanović)

NIKAS – Veliko vrelo



Veliko vrelo gravity flow issuing from big blocks (Photo by Z. Stevanović)



Veliko vrelo spring at Veliki buk waterfall in Lisine – minimal and maximal discharge (Photos by Z. Stevanović)

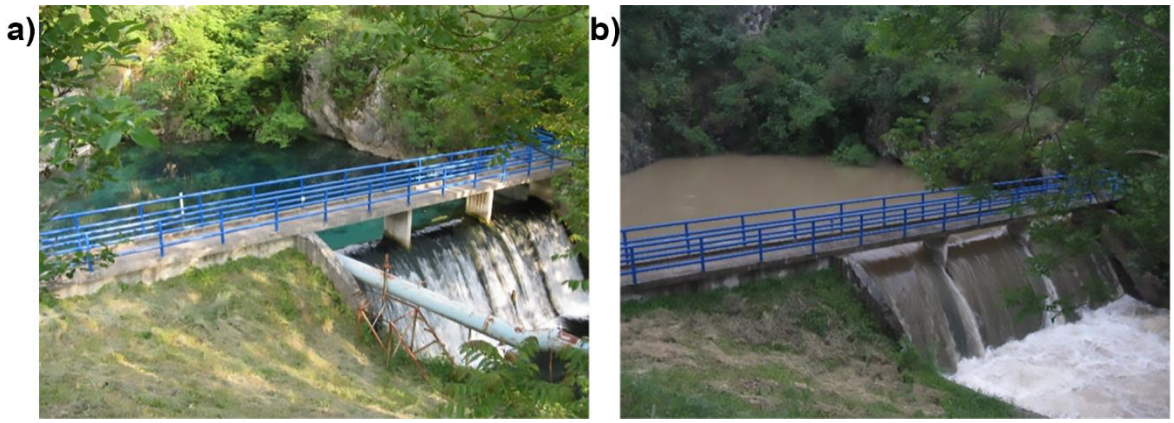
NIKAS – Krupac – Modro oko



Google Earth with pinned spring in the foothills of Svrljiške Mts.



Krupac – Modro oko vauclusian spring during low water season



Krupac – Modro oko during periods of low water (a), and high water (b), when there is a substantial increase in turbidity as a result of the collapse of sinkholes in the catchment and flushing of sediment from underground storage (Photos of Z. Stevanović)

NIKAS – Sopotnica



Sopotnica waterfalls over thick tufa cascades (Photo by Z. Stevanović)





Sopotnica (Photos by Z. Stevanović)

Slovakia

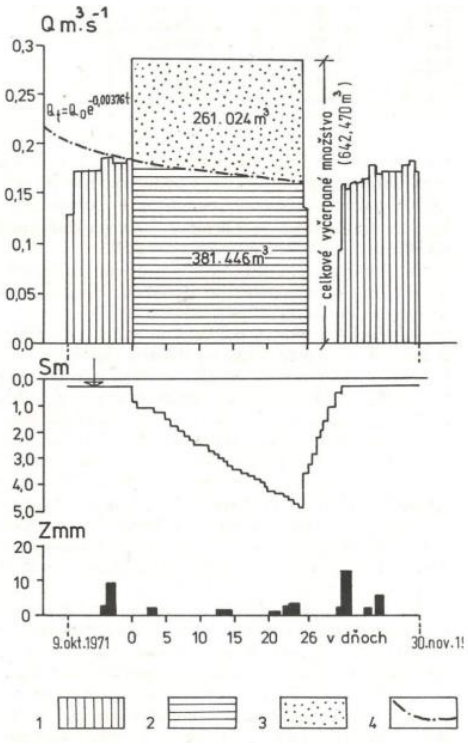
MIKAS – Jergaly spring



The building of the Jergaly spring waterworks intake facility (Photo: Iveta Zvarová)



The interior of the Jergaly spring waterworks intake facility (Photo: Anton Auxt)



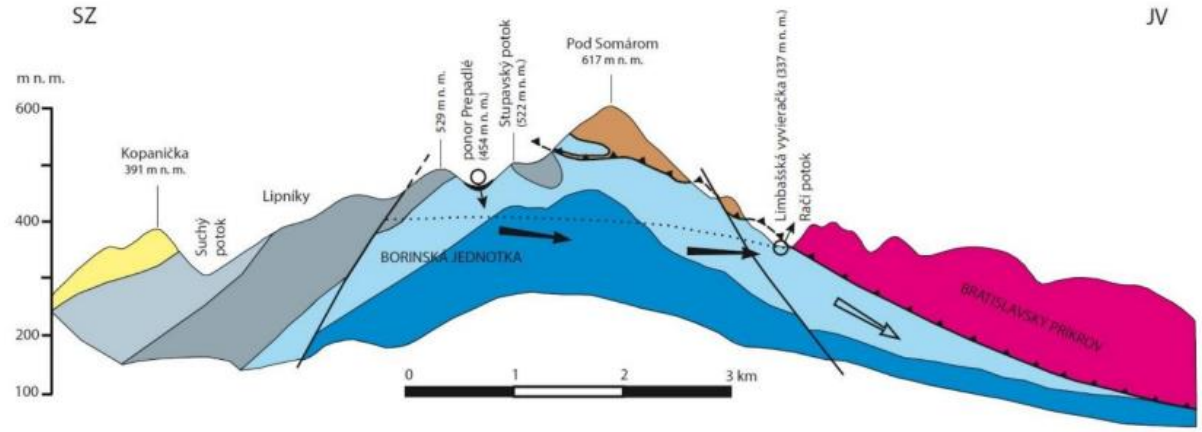
The principle of combined exploitation of static and dynamic groundwater sources of the Jergaly spring and their separation using the recession curve during pumping test in 1971. Source: Eugen Kullman (1990). Legend: 1. Spring yield, 2. Pumped amount corresponding to natural discharge, 3. Pumped amount corresponding with static water reserves, 4. Groundwater depletion curve



Ecological outflow of karst waters of the Jergaly spring not used for water purposes. Photo: Anton Auxt

MIKAS – Limbašská vyvieračka





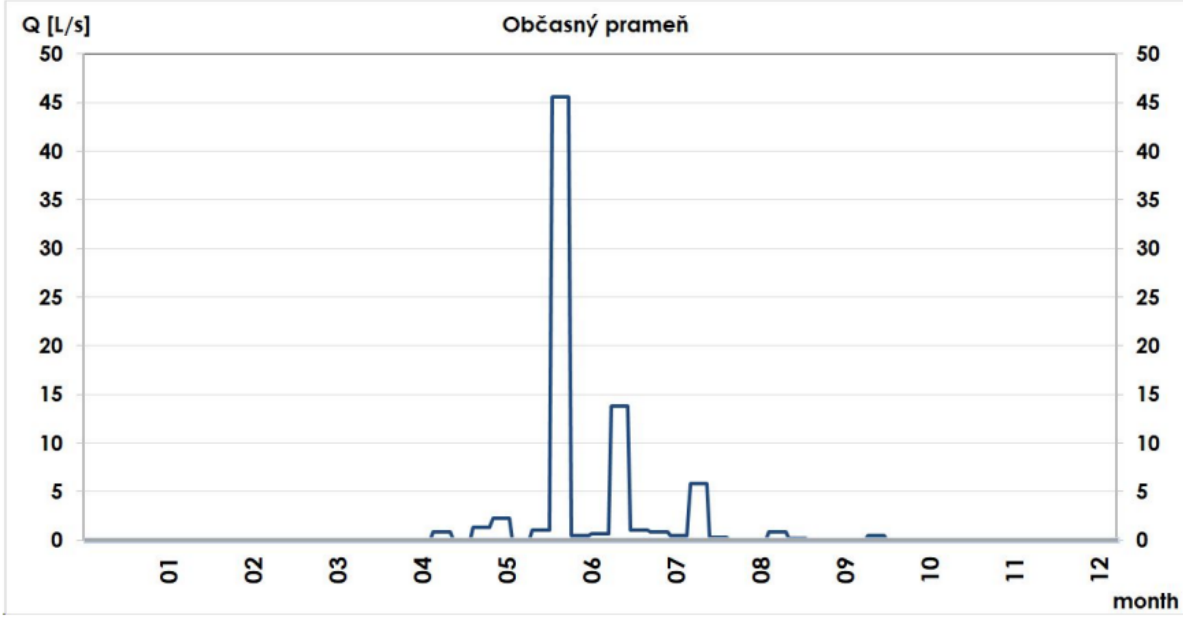
Schematic cross section between Prepadle ponor (swallow hole) and Limbašská vyvieračka. The carbonate rocks units are in grey and blue colors (Courtesy of State Geol. Inst. "Dyoniza Štura"of Slovak Republic – Manuscript material)





Prepadlé swallow hole in the upper part of the Stupavský potok (left) and Limbašská vyvieračka in high water period (Photos: www.mapy.cz (left), and Eva Malíková (right))

MIKAS - Občasný prameň



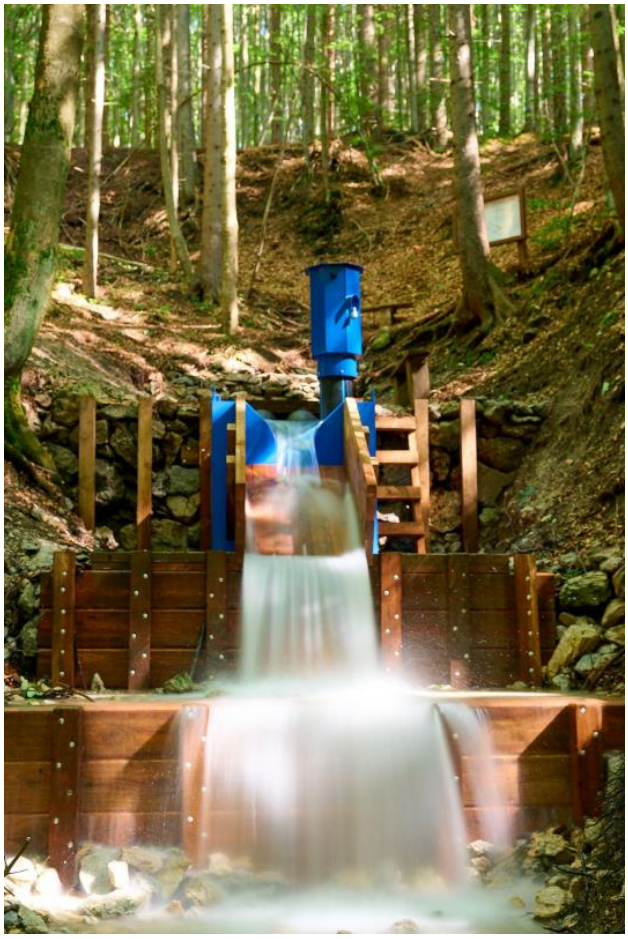
Summarized average yields of the Občasný prameň spring under the Havrania skala Mt. during individual weeks during the hydrological year 1995, normal scale, based on SHMI data. Author: Peter Malík



Občasný prameň spring under the Havrania skala Mt. with an old Slovak Hidromet. Service (SHMÚ) gauging object - detail. Photo: Marcel Wolf / www.mapy.cz

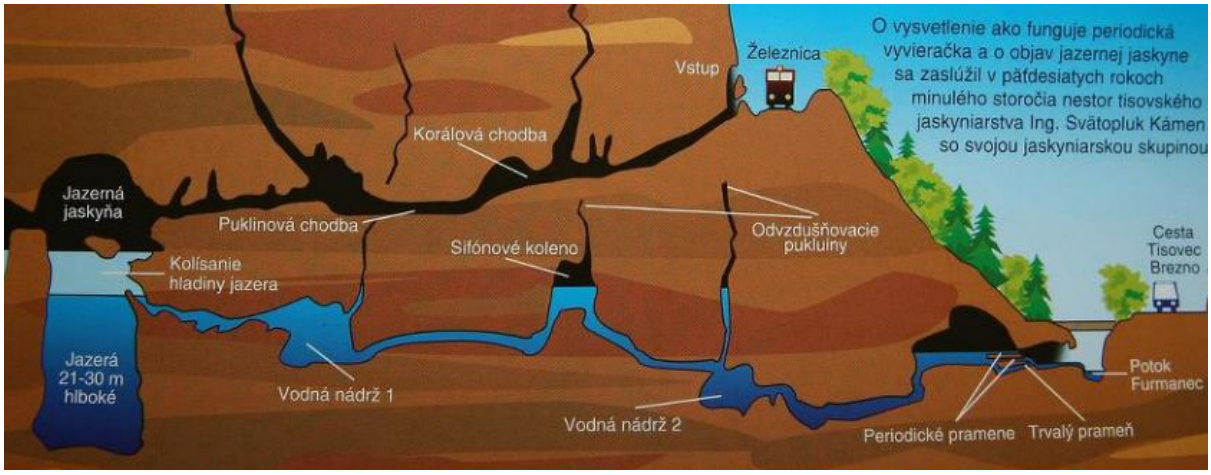


Občasný prameň spring under the Havrania skala Mt. after the reconstruction of gauging object in June 2023. Photo: Ján Gavurník



Občasný prameň spring under the Havrania skala Mt. during active outflow outburst. Photo: Ján Griglák / www.mapy.cz

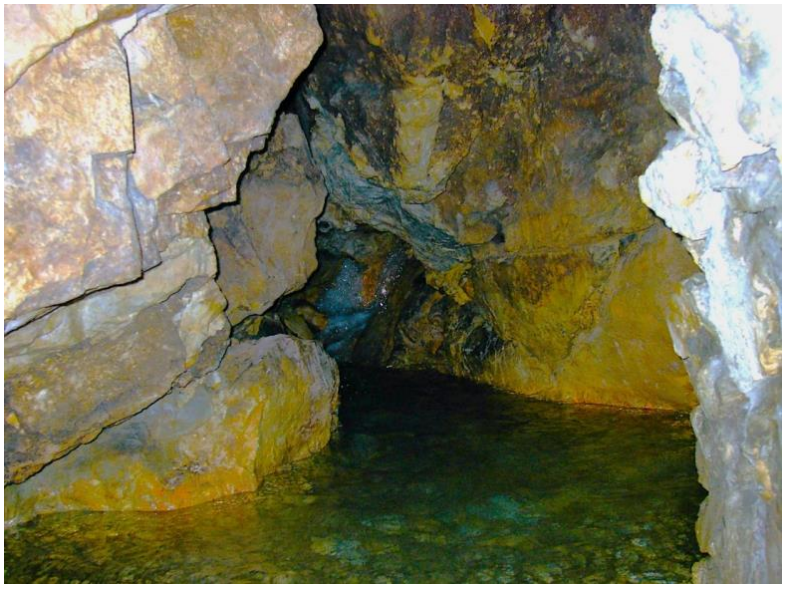
MIKAS - Periodická vyvieračka spring



Traditional hydrodynamic scheme diagram of the Periodická vyvieračka spring near Tisovec compiled according to the concept of S. Kámen.



The building of the waterworks intake facility of the Periodická vyvieračka spring near Tisovec. Photo:Jozef Fabo.

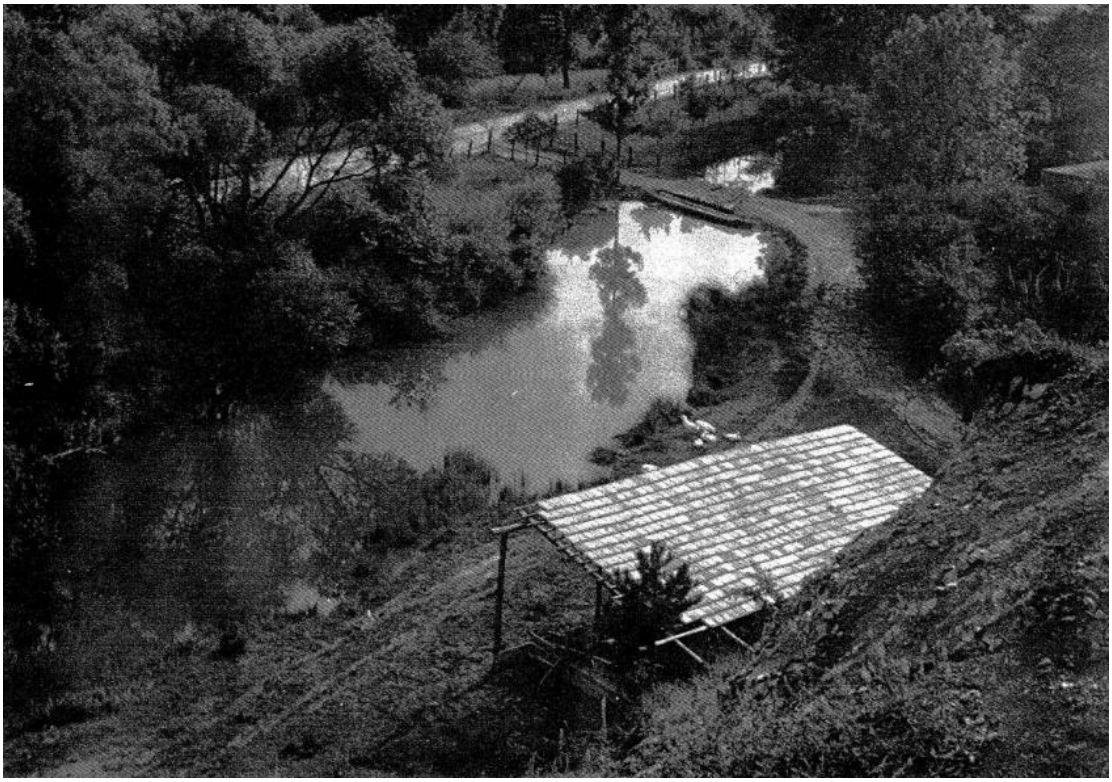


Outlet with the basic discharge of the Periodická vyvieračka near Tisovec. Photo: Peter Malík.



The level of one of the lakes of the Jazerná jaskyňa Cave connected to the Periodická vyvieračka spring near Tisovec. Photo: Dušan Hutka.

MIKAS – Vrchovište



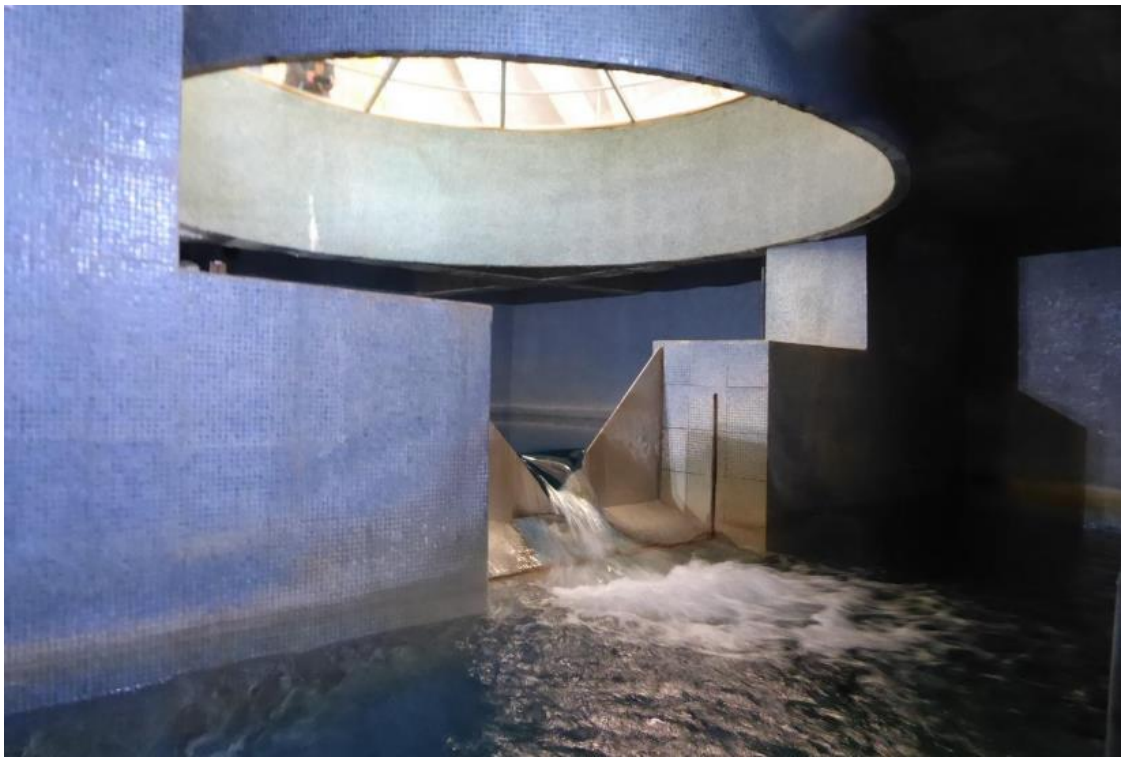
The surroundings of the karst spring Vrchovište in Slatinka nad Bebravou before building up its waterworks intake facility, circa 1960. Photo: archive of Západoslovenská vodárenská spoločnosť, a.s. waterworks.



General view of the Vrchovište spring waterworks intake facility in Slatinka nad Bebravou. Photo: archive of Západoslovenská vodárenská spoločnosť, a.s. waterworks.



Interior of the hall of the Vrchovište spring waterworks intake facility in Slatinka nad Bebravou. Photo: Peter Malík.



Thomson's culvert gauge in the Vrchovište spring waterworks intake facility (SHMÚ object no. 1095). Photo: Peter Malík.

NIKAS – Bobrovec (Bobrovecká dolina)



Entrance portal of the waterworks facility of the Bobrovecká dolina spring, managed by the Orava Water Company. Photo: Peter Malík.

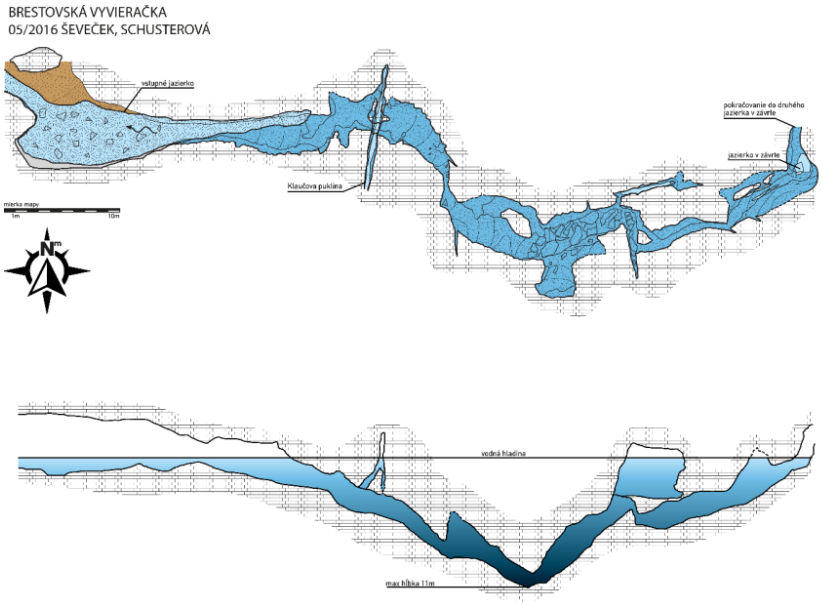


Groundwater discharging from fissures of scratched carbonates in the waterworks facility of the Bobrovec (Bobrovecká dolina) spring. Photo: Alexandra Vasilenková.



Groundwater discharging from fissures of scratched carbonates in the waterworks facility of the Bobrovec (Bobrovecká dolina) spring. Photo: Peter Malík.

NIKAS - Brestovská vyvieračka



Cave map of the Brestovská vvyvieračka spring.



Brestovská vyvieračka spring. Photo: Pavol Staník.



Brestovská vyvieračka spring during high flow. Photo: Dagmar Haviarová.

NIKAS - Buzgó



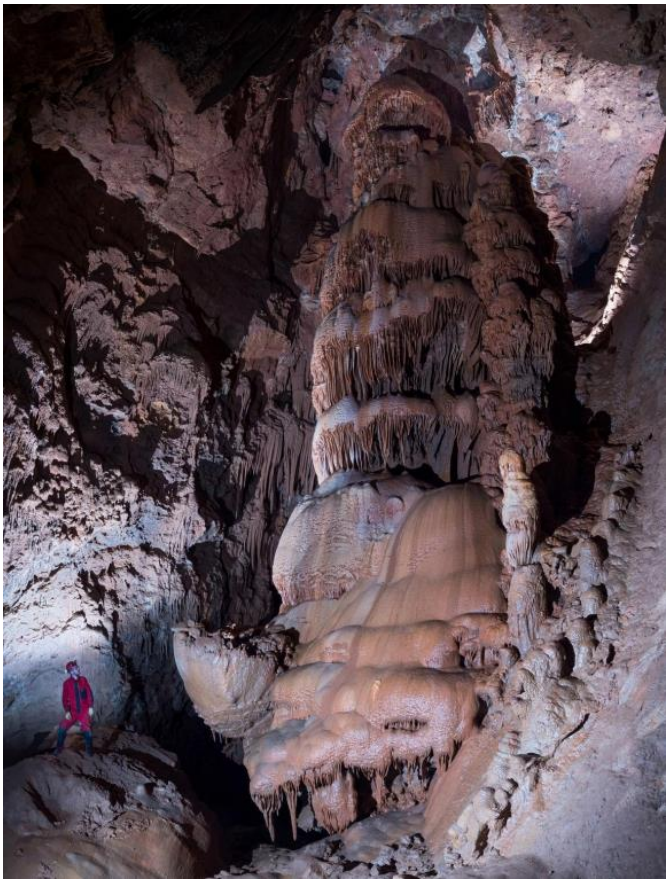
Buzgó spring during low water stage. Photo: Erika Kováčová.



Buzgó spring at high water stage. In the back the entrance to the Krásnohorská jaskyňa Cave, in the front the old gauging object of SHMI. Photo: Dagmar Haviarová.



Marikino jazero Lake, orifice of the rear siphon inside the Krásnohorská jaskyňa Cave. From here the underground stream can be easily followed up to the Buzgó spring. Photo: Pavol Staník.



Speleothem of Rožňava Cavers – gigantic speleothem inside the Krásnohorská jaskyňa Cave behind the Buzgó spring, with its height of 34,0 m once supposed in the time of its discovery (1964) to be the highest in the (contemporary) world. Photo: Pavol Staník.

NIKAS – Čertova skala



Čertova skala spring - outflow from the fissure. Photo: Kamila Rehorovská.



Čertova skala spring - access path along the drainage gallery / adit. Photo: Kamila Rehorovská.

NIKAS – Čierna vyvieračka



Čierna vyvieračka spring - SHMI gauging object No. 1869. Photo: Peter Malík.



Speleothem Decoration of Gombasecká Cave - typical long straws. Photo: wikipedia.

NIKAS – Čierno II



The inner part of the waterworks catchment facility of the Čierno II karst spring. Photo: Iveta Zvarová

NIKAS - Dechtické pramenisko



Discharge measurements at the surface stream Horná Blava below the Dechtické pramenisko linear spring. Photo: Peter Malík



Hydrogeological borehole De-10 - one of the waterworks intake facilities of the Dechtické pramenisko linear spring. Photo: Peter Malík

NIKAS – Drienovecká vyvieračka



Underground flow in Drienovecká jaskyňa Cave. Photo: Peter Malík

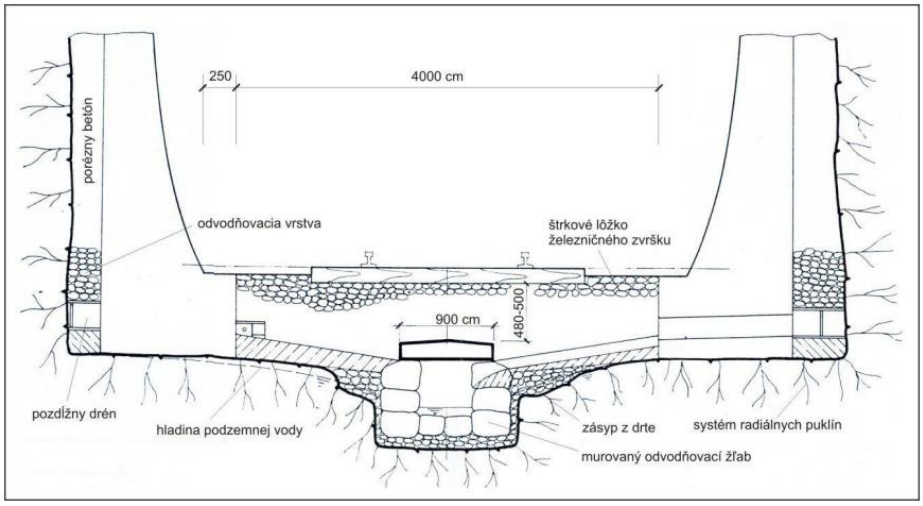


Drienovecká vyvieračka spring - direct view of the spring. Photo: Peter Malík.

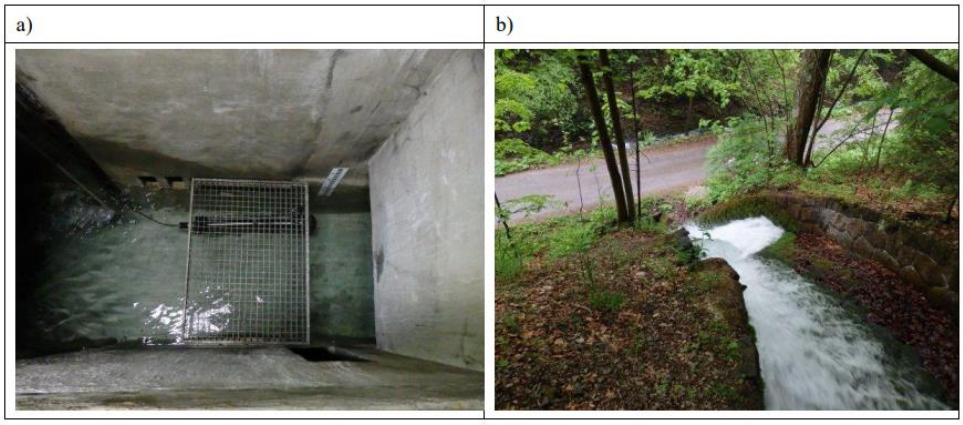
NIKAS – Harmanecký Veľký tunel



Eastern portal of the Čremošný tunnel, in the background the Harmanecký Veľký tunnel water intake. Photo: Peter Malík.



Technical solution of drainage and method of groundwater intake and its isolation from the operational part of the Harmanecký Veľký tunnel. Kiszling (1993) in Dzúrik et al. (2016).



Water drained by the the Harmanecký Veľký tunnel: a) diverted to water pipeline; b) left as ecological outflow.

NIKAS – Hlavný prameň



Entrance to the Hlavný spring area - the first degree protection zone (Vyšný Slavkov). Photo: Ingrid Mydlová.



The Hlavný spring (Vyšný Slavkov) - a view of the collection well. Photo: Ingrid Mydlová.

NIKAS – Hlbokô



Hlbokô spring. Photo: P. Staník

NIKAS – Kráter



View of the Travertine Lake "Kráter" in the summer period (https://www.ruzbachy.sk/galeria/krater)



Aerial view of the Travertine Lake "Kráter" (https://www.ruzbachy.sk/galeria/krater).

NIKAS – Lazce

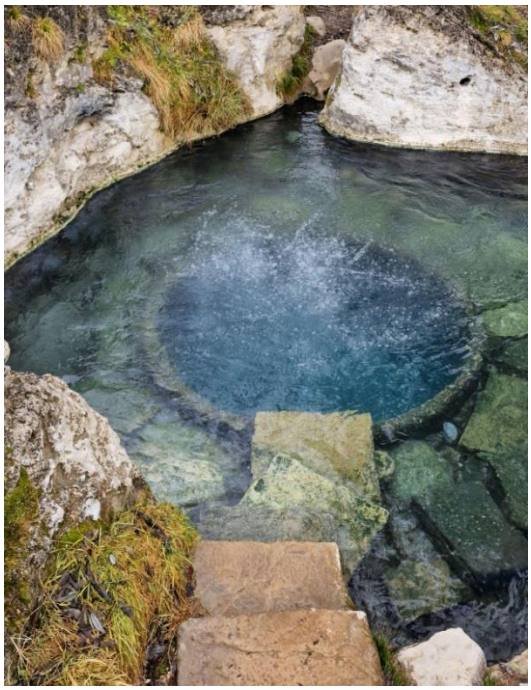


The apse at the upper end of the Lazce spring collection gallery in the Necpalská valley with exposed Middle Triassic massive dolomites. Photo: Peter Bajtoš



The flow measurement device (Poncelet's weir) at the end of the Lazce spring collection gallery. Photo: Peter Bajtoš.

NIKAS – Malý krater



Detail of the mineral spring outlet of Malý kráter / Kaďa / Kúpeľný in Liptovský Ján. Photo: Gustáv Varga / www.mapy.cz.



Mineral spring Malý kráter / Kaďa / Kúpeľný in Liptovský Ján - bathing visitors. Photo: Josef Tomek / www.mapy.cz.

NIKAS – Podhrad



Slovak Hydromet Institute (SHMI) gauging object under the waterworks intake facility object of the Podhrad spring in Muráň at average water stages. Photo: SHMI, taken from www.shmu.sk.



General view of the waterworks intake facility object of the Podhrad spring in Muráň. Photo: Peter Malík.

NIKAS – Vyvieračka v Prosieckej doline





Vyvieračka v Prosieckej doline spring during low water stage. Photo: Gustáv Varga / www.mapy.cz (left); The spring during high water stage on 19. 05. 2010. Photo: Juraj Szunyog



Vyvieračka v Prosieckej doline spring during high water stage on 19. 05. 2010 - general view. Photo: Juraj Szunyog

NIKAS – Vyvieranie



Gauging object for discharge monitoring at the Vyvieranie spring, photo: František Bottlik



Underground stream Demänovka in the Demänovská jaskyňa Slobody Cave. Photo:

Slovenia

MIKAS – Hubelj



The Hubelj spring at low waters



Panoramic view of the Hubelj spring at high waters (https://www.vipavskadolina.si/si/odkrivaj/dediscina/narava/reke/reka-hubelj)

MIKAS – Unica



Pivka River sinking into Postojnska Jama.



Rak River sinking at Rakov Škocjan



The Malenščica spring



The Unica spring

NIKAS – Dobličica



The Dobličica spring (https://natura2000.gov.si/narava/obmocja/SI3000048/)

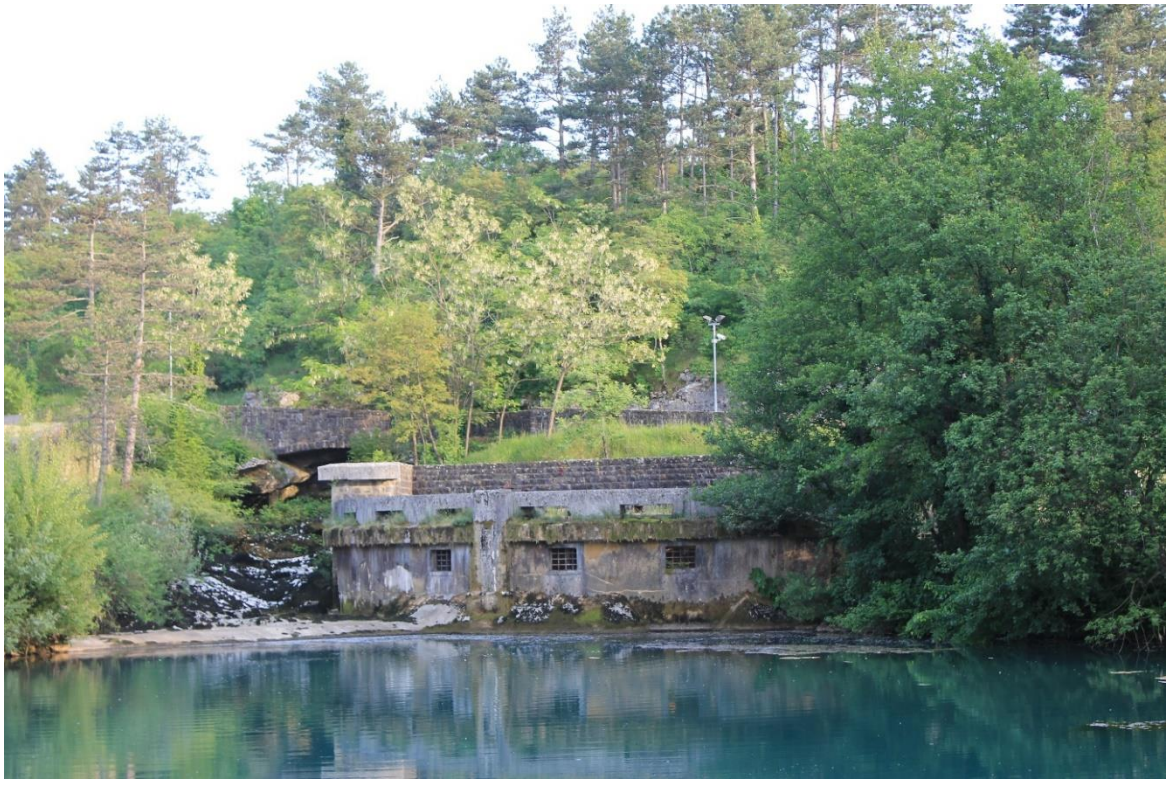


Discovery of the first black Proteus in the Dobličica spring (Photo by Andrej Mihevc)



Pumping station at the Dobličica spring (https://www.radio-odeon.com/novice/crpalisce-v-doblicah/)

NIKAS - Rižana



The Rižana karst spring

Spain



MIKAS - Gato Cave spring



Oil on canvas to Manuel Barrón y Carrillo (1869) (Retrieved from https://www.carmenthyssenmalaga.org/obra/emboscada-a-unosbandoleros-en-la-cueva-del-gato)



Gato Cave waterfall (Retrieved from https://www.tripadvisor.es/Attraction_Review-g265784-d10236448-Reviews-Cueva_del_Gato-Ronda_Costa_del_Sol_Province_of_Malaga_Andalucia.html)

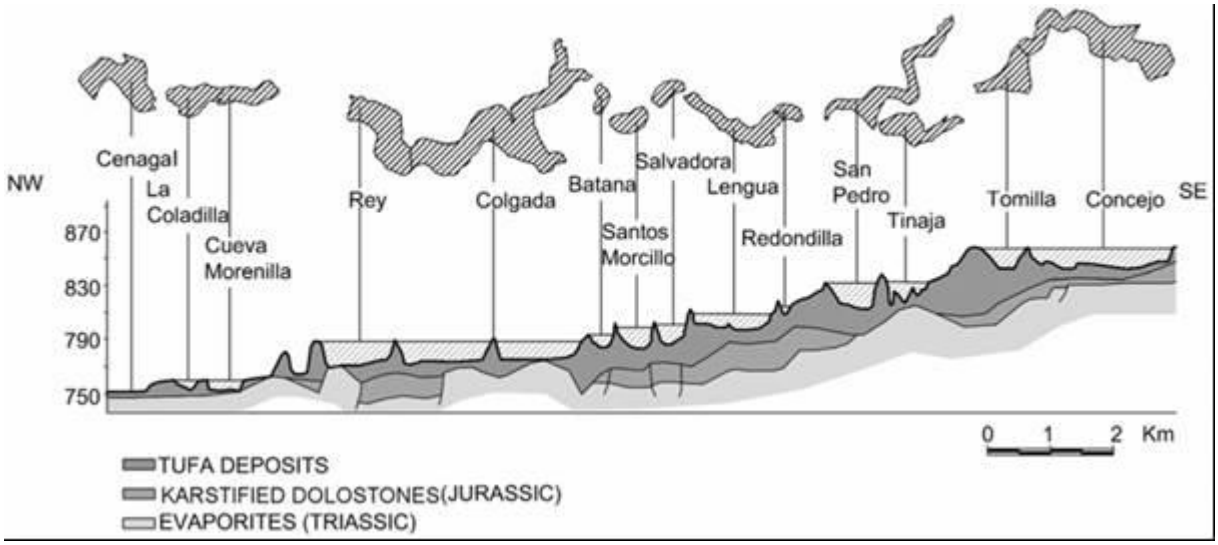
MIKAS - Lagunas de Ruidera



Retrieved from http://www.turismocastillalamancha.es/naturaleza/parquenatural-de-lagunas-de-ruidera-en-albacete-58272/descripcion/



Retrieved from https://www.viajesporcastillalamancha.es/rutas/id121-las-8-sendas-de-las-lagunas-de-ruidera.html



Cross section of lagunas Ruidera (Moya et al., 2018).

MIKAS - Nacedero de Arteta





Artazul waterfall (Retrieved from https://ca.wikiloc.com/rutessenderisme/ulzurrun-cascada-de-artazul-nacedero-de-arteta-66904099/photo-44160813) (left); Arteta Spring (from Alegría-Suescun, 2011) (Right)

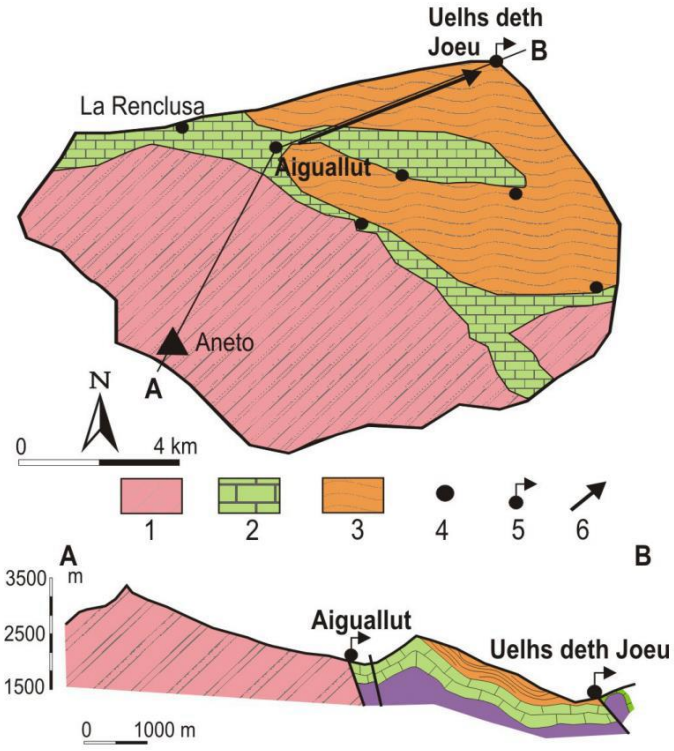


Arteta Springflow

MIKAS - Uelhs deth Joèu



Photo of the Uelhs deth Joeu spring taken from the downstream perspective (taken from Andreu et al., 2016).



Hydrogeological section of the Aiguallut (swallet)-Uelhs deth Joeu (spring) system. Lithologies: 1) Hercinian granites, 2) Devonian limestones and 3) Carboniferous metapelites. Symbols: 4) swallet, 5) karst spring and 6) preferential groundwater flows (modified from Freixes, 2014).

MIKAS - Mundo River spring



Low-front views of the Mundo River spring during low flow (left) and flood (right) conditions (taken from García and Rodríguez-Estrella, 2003).



Close-up photography of the Mundo River spring in the summer season (taken from García and Rodríguez-Estrella, 2003).



Cave room with a wide variety of speleothems within Los Chorros cave system (taken from García and Rodríguez-Estrella, 2003).