MIKAS and NIKAS springs photo gallery

Northern and Western

E U R O P E

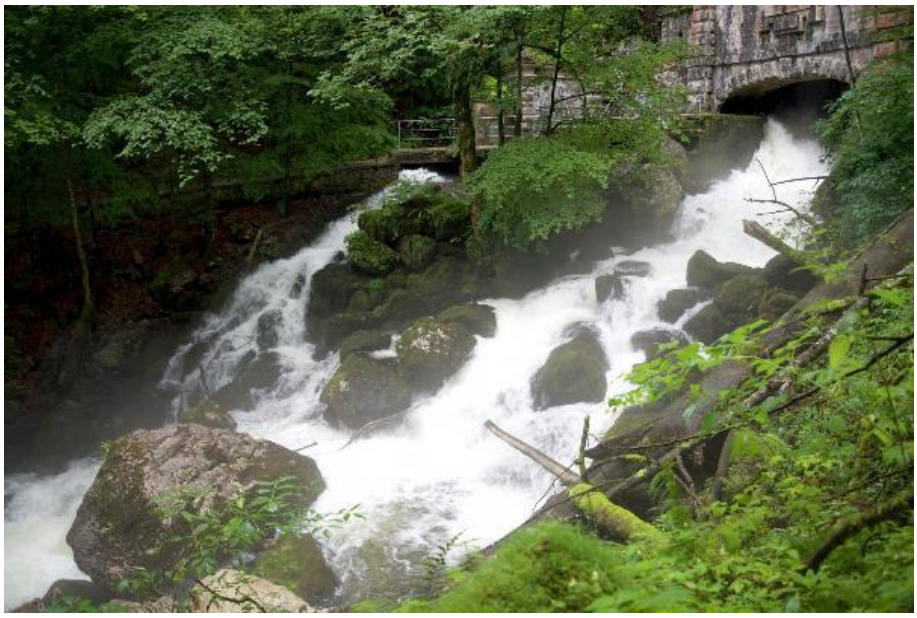
Austria, Belgium, Denmark, Estonia, France, Germany, Ireland,

Latvia, Lithuania, Norway, Switzerland, United Kingdom

Note: *The classification of springs is preliminary, the final lists will be established at the end of project.*

Austria

MIKAS - Fürstenbrunner Quelle



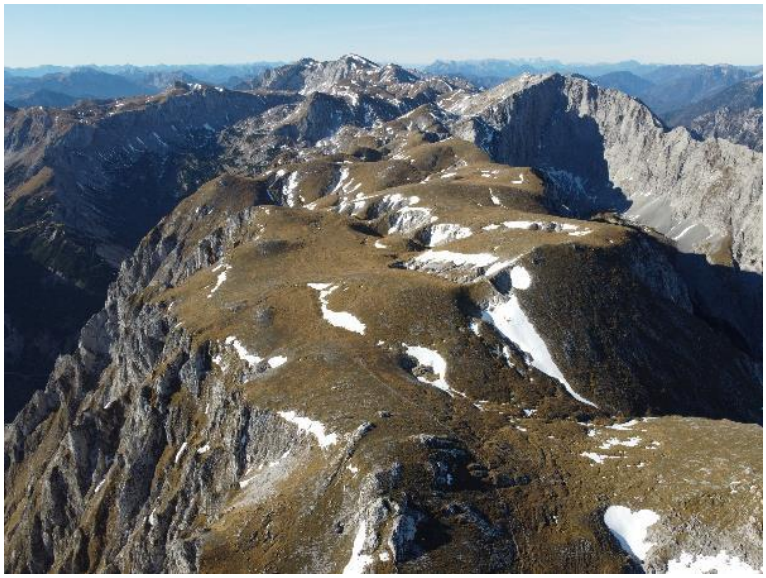
The Fürstenbrunner Quelle with parts of the tap building on July 24th, 2017 (Photo by D. Fließer)

The stream in the Fürstenbrunner Quellhöhle cave during a flood on June 1st, 2013 (Photo: Landesverein für Höhlenkunde in Salzburg)

MIKAS - Kläfferquellen (Kläffer spring)

Oblique downward view on the outlets of the Kläfferquellen on Mai 9th, 2017 with an overall discharge during snowmelt of 14 m^3/s (part of it is into the underground tapping gallery; with in the foreground 350 m; drone photo by Lukas Plan)

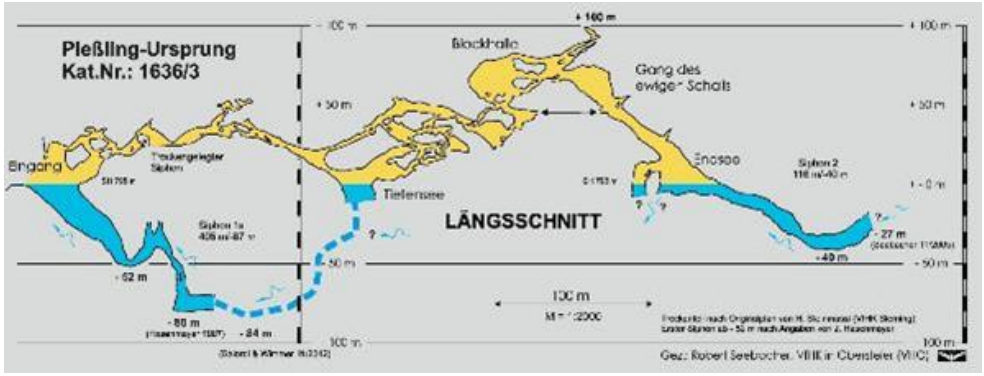
Part of the surface water during snow melt on May 24th, 2010 (Photo by Lukas Plan)



Overview of the plateau catchment area with many dolines. Aflenzer Staritzen in the foreground; Hochschwab summit (2277 m a.s.l.) in the centre (View to the west; drone photo by Lukas Plan)

MIKAS - Pießling-Ursprung

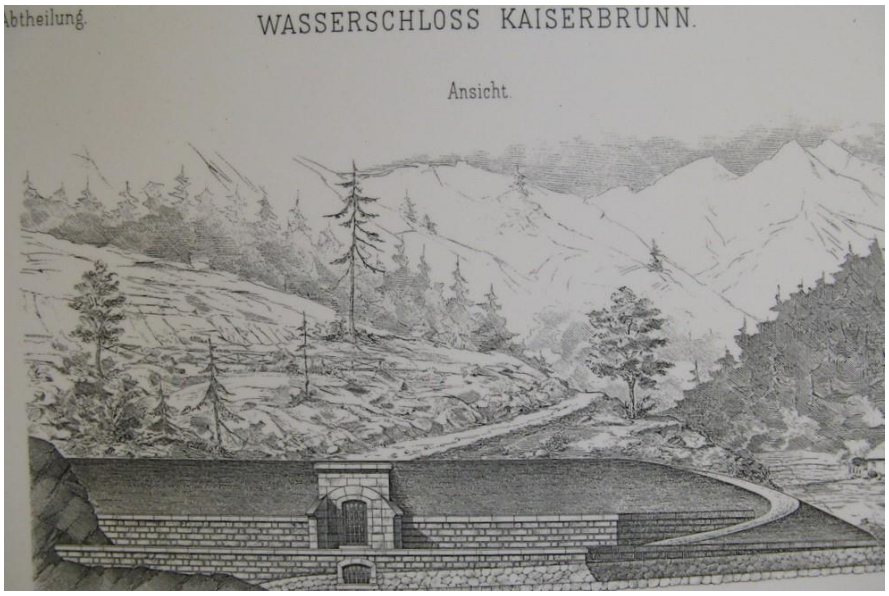
Pießling-Ursprung at medium water situation, outlet with dammed pond, in the rear access to the cave (left; Photo: R. Benischke). Spring at high water situation (right; Photo by H. Steinmaßl).



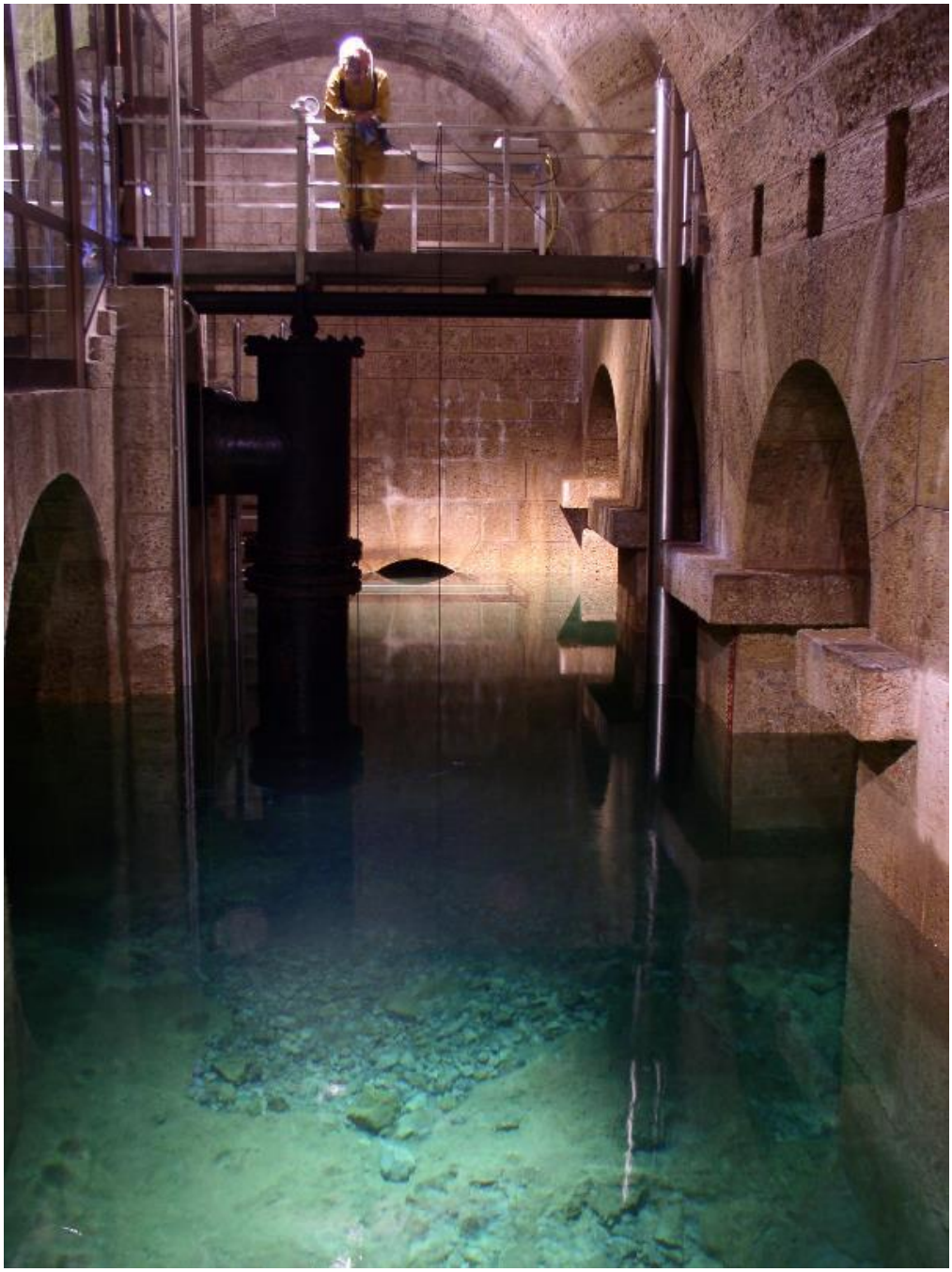
Longitudinal section of Pießling-Ursprung with siphon and overlain cave passages (drawing: R. Seebacher; cave data: H. Steinmaßl)

MIKAS - Kaiserbrunnen

Spring capture building at Kaiserbrunn (Photo by Lukas Plan)



Drawing sketch of the Kaiserbrunn intake with landscape of Rax Mt. foothills (courtesy of Kaiserbrunn museum)



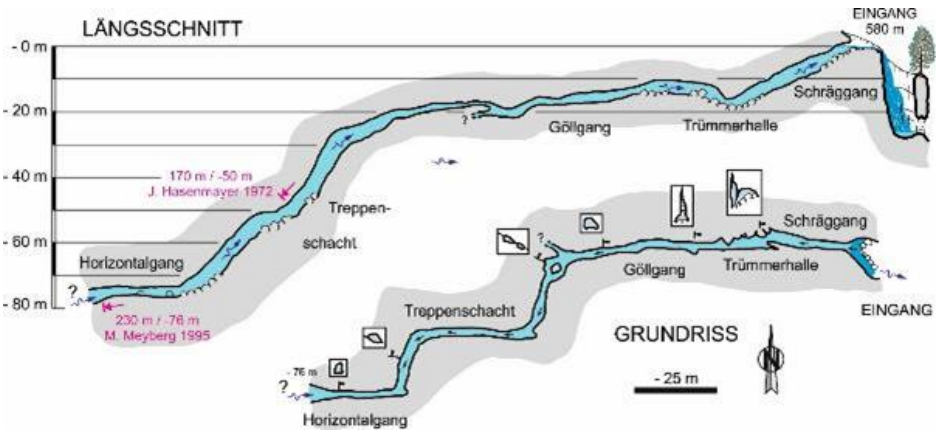
Interior the spring capture building of Kaiserbrunnen (Photo by Lukas Plan)

NIKAS - Dachserfall

Dachserfall outlets (Photo by Ralph Benischke)

NIKAS - "Gollinger Wasserfall (Schwarzbachfall)"

Gollinger Wasserfall, left: lowest step, right: middle part with water flow through a rock arch (Photo by Ralph Benischke).



Plan view (bottom) and longitudinal section (top) of Gollinger Wasserfall (Schwarzbachfall Cave) to a depth of 76 m (from Spötl et al. 2016; Sketch Meyberg & Rinne 1995, drawing R. Seebache)

NIKAS - Teufelskirche

Teufelskirche spring. Top: Outlet of spring at low water conditions with upwelling water in the centre of the pool (Photo: R. Benischke). Bottom: Outlet of the spring at high water conditions during snow melt (Photo by H. Steinmaßl)

NIKAS - Waldbach-Ursprung

Waldbach-Ursprung (overflow cave) under flood conditions (Photo by G. Völkl)

Belgium

MIKAS - Eprave spring

The entrance of the cave where spring is located with Lomme River just ahead

Diver making test of current measurement in the spring conduit.

Denmark

MIKAS – Rold Skov, Gravlev group of springs (DK1-DK7)

Gravlev kilde (DK7) – limnocrene spring considered a Holy Well before 1100 AD.

Lille Blaakilde (DK1), rheocrene spring without or very low nitrate content, EC around 490 µS/cm (July 2025)

Kovadsbaek (DK3) – helocrene spring with no or very little nitrate (July 2025)

Store Blaakilde (DK8), "big blue spring", limnocrene spring discharging from Cretaceous Chalk.

Estonia

MIKAS – Lavi spring

Lavi spring (Photo by Marko Vainu)

NIKAS - Uuemõisa Suurallikas

Spring Suurallikas, Vormsi, July 2014 (copyrights: Eesti Loodushoiu Keskus https://www.loodushoid.ee/Gallery_355-86)

NIKAS - Aravete springs

Photo of the spring (copyrights: lifar/Wikimedia Commons).

NIKAS - Imastu springs

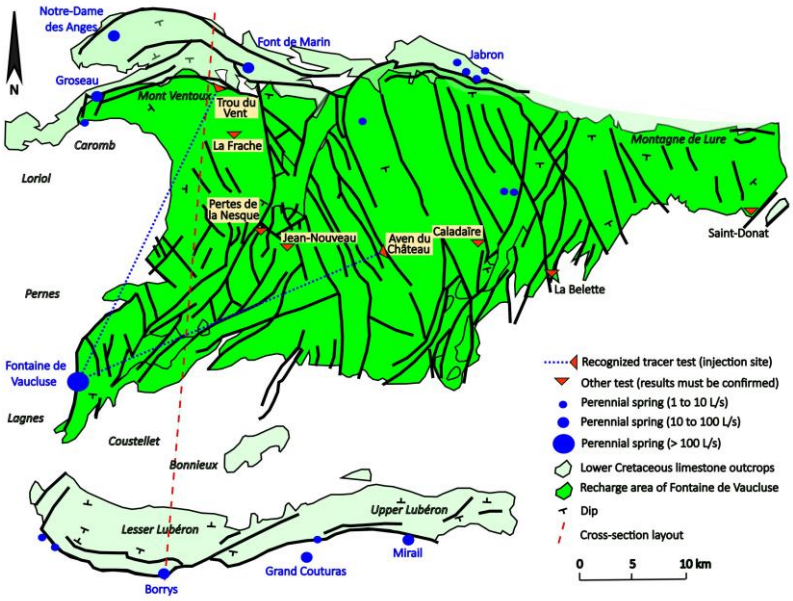
Photo of the spring (Courtesy: NOSSER/Wikimedia Commons).

NIKAS - Võlingi (Võllingu) spring

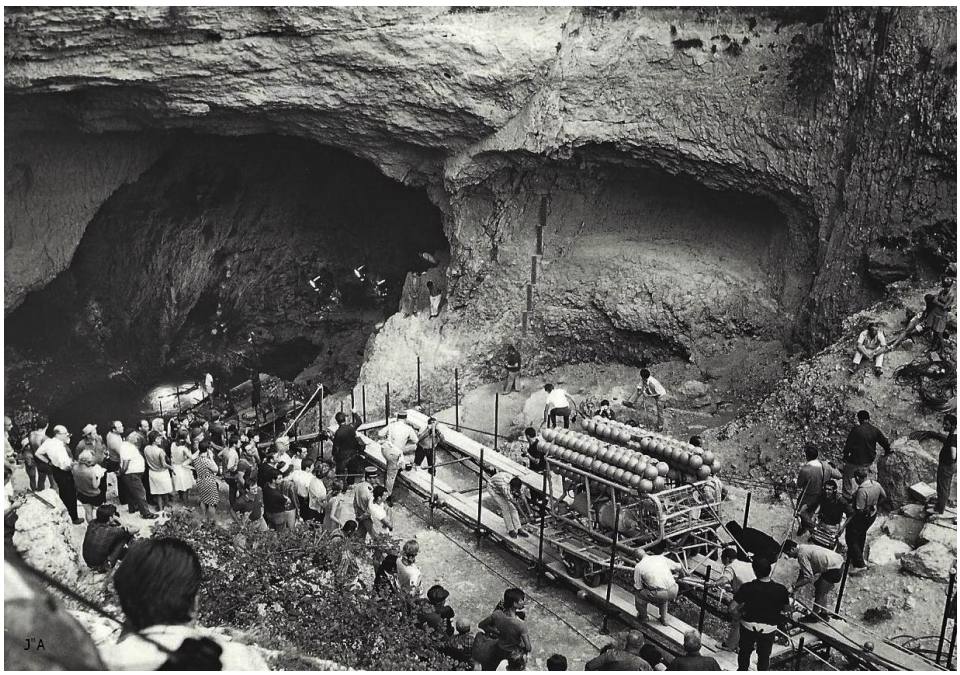
Photo of the spring (Photo by Marko Vainu)

France

MIKAS - Fontaine de Vaucluse

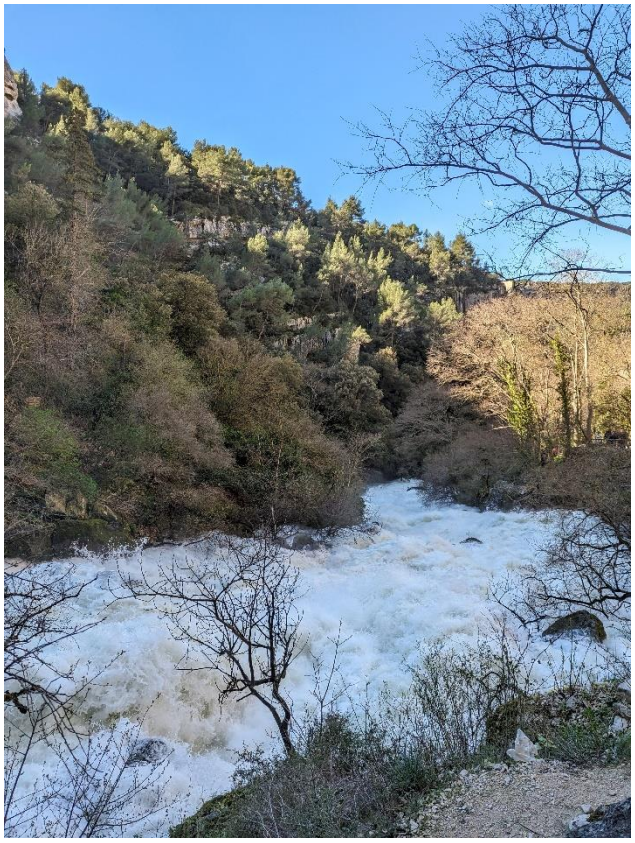


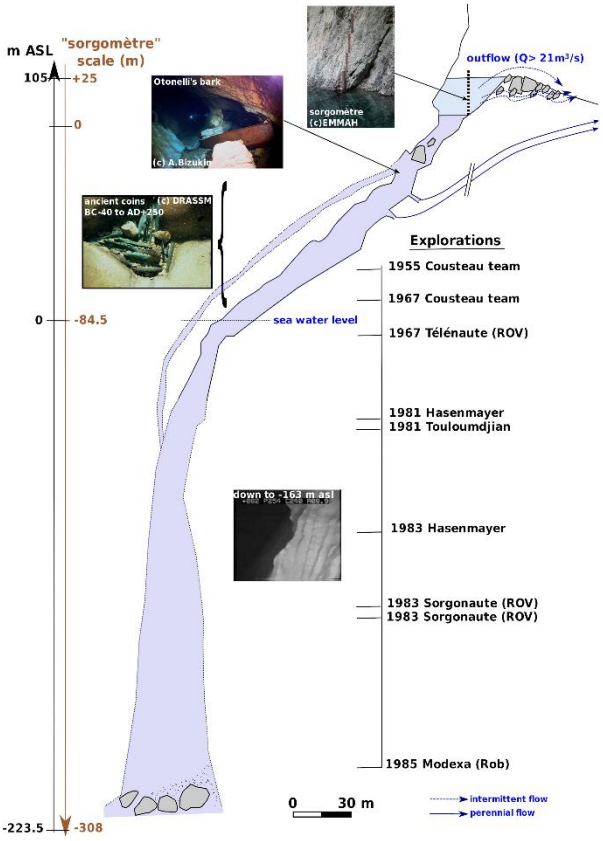
Simplified hydrogeological map - Recharge area of Fontaine de Vaucluse (from Blavoux et al., 1992, updated).



The Telenaute ROV launching, 1967. (Photo by J.Y. Cousteau. Courtesy from Syndicat Mixte du Bassin des Sorgues)

Fontaine de Vaucluse during flood (left. 58.7 m^3/s, photo C. Emblanch) and low flow stage (right). Courtesy from Syndicat Mixte du Bassin des Sorgues

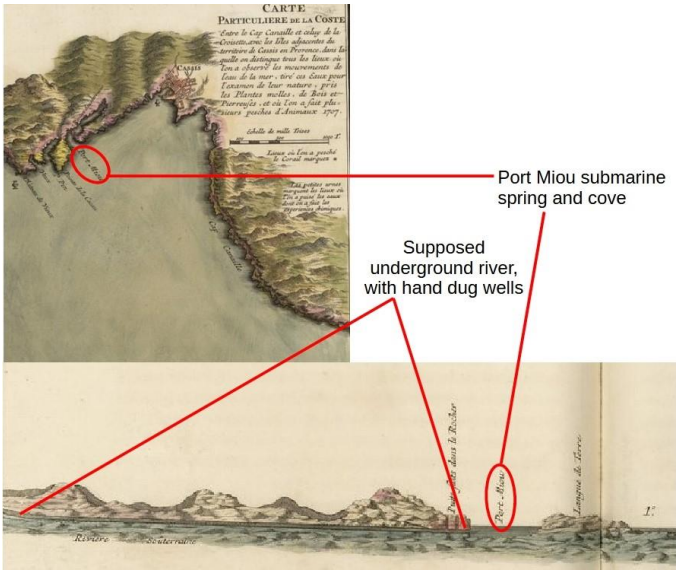




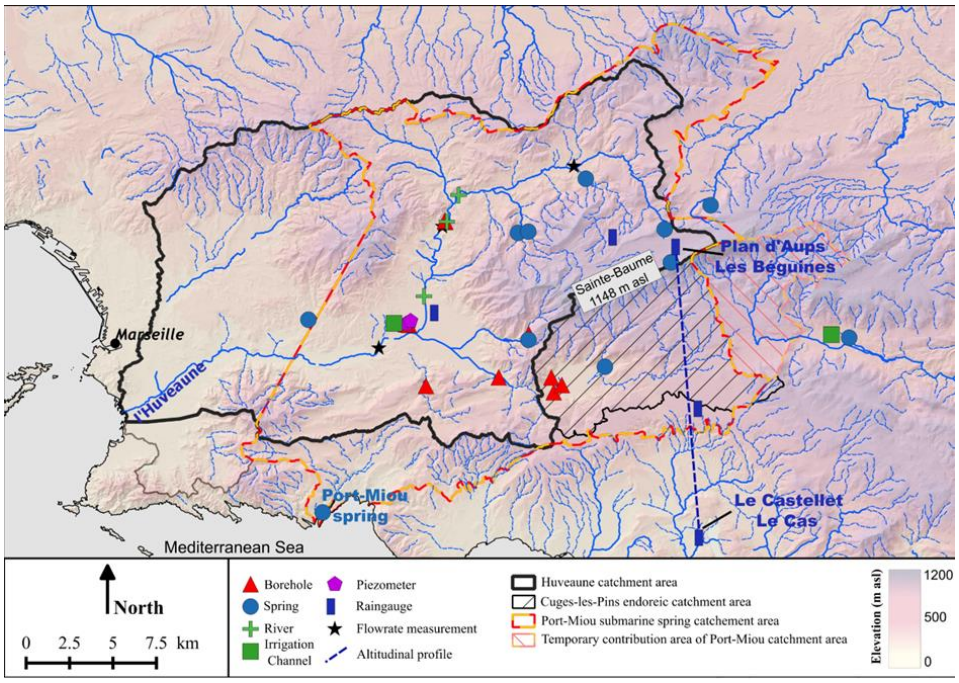
A few dozen meters down the spring, during flood (64.5 m3/s. Photo E. Simon, left);

Sketch of the Vaucluse vertical conduit, showing the progress of diving and ROV explorations (right).

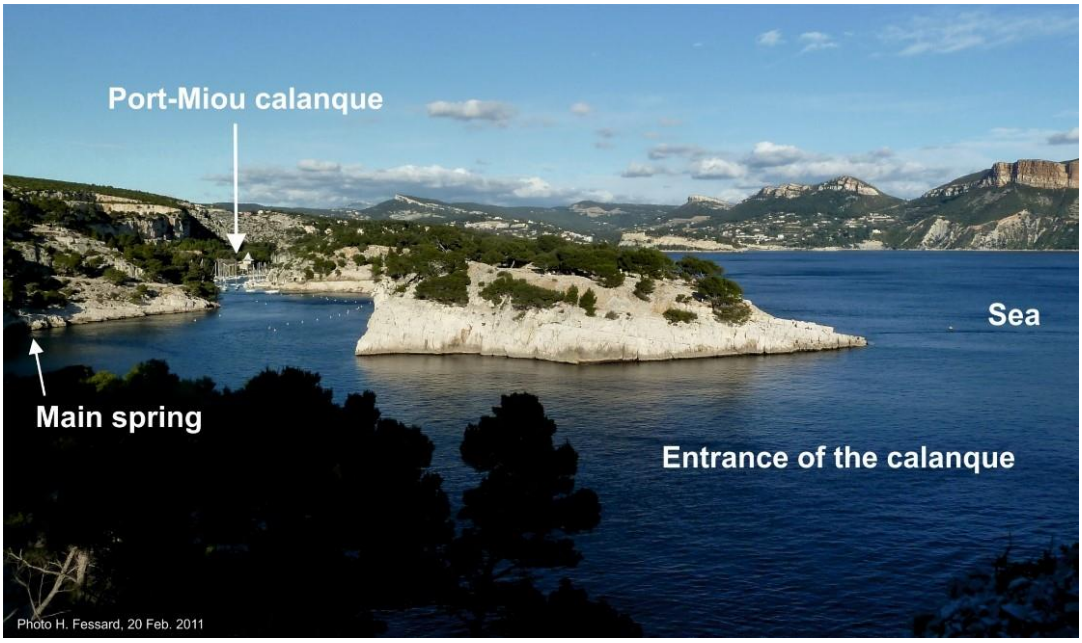
MIKAS - Port Miou



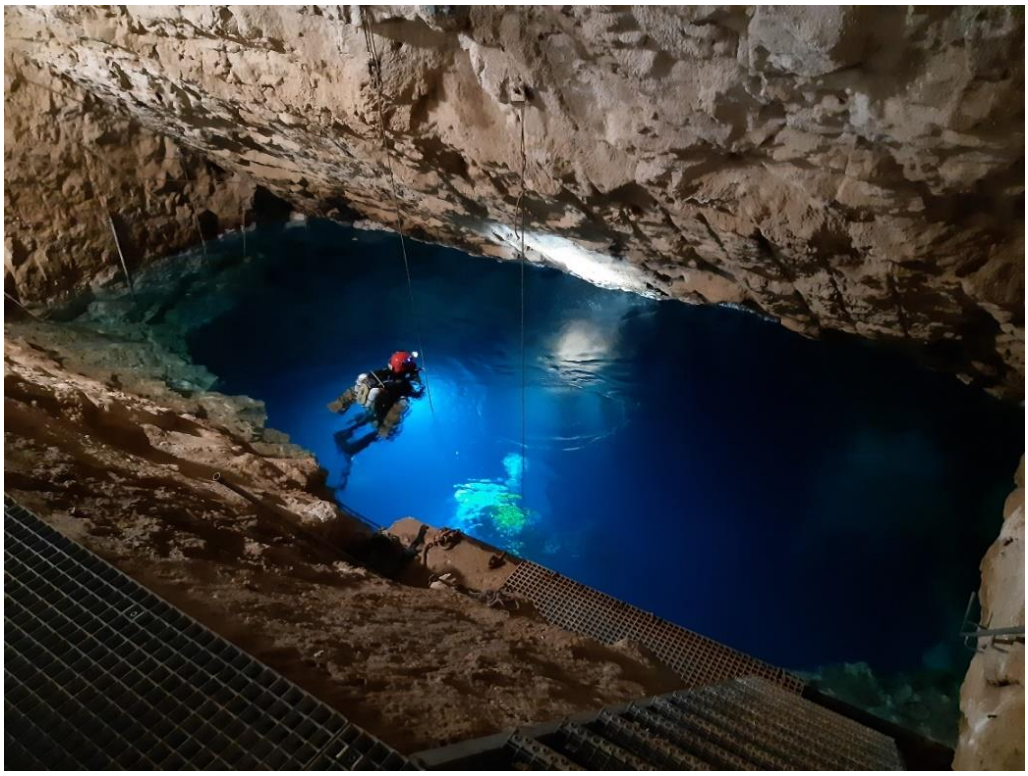
Location map and cross section of Port-Miou cove and submarine spring, according to Marsilli (1725).



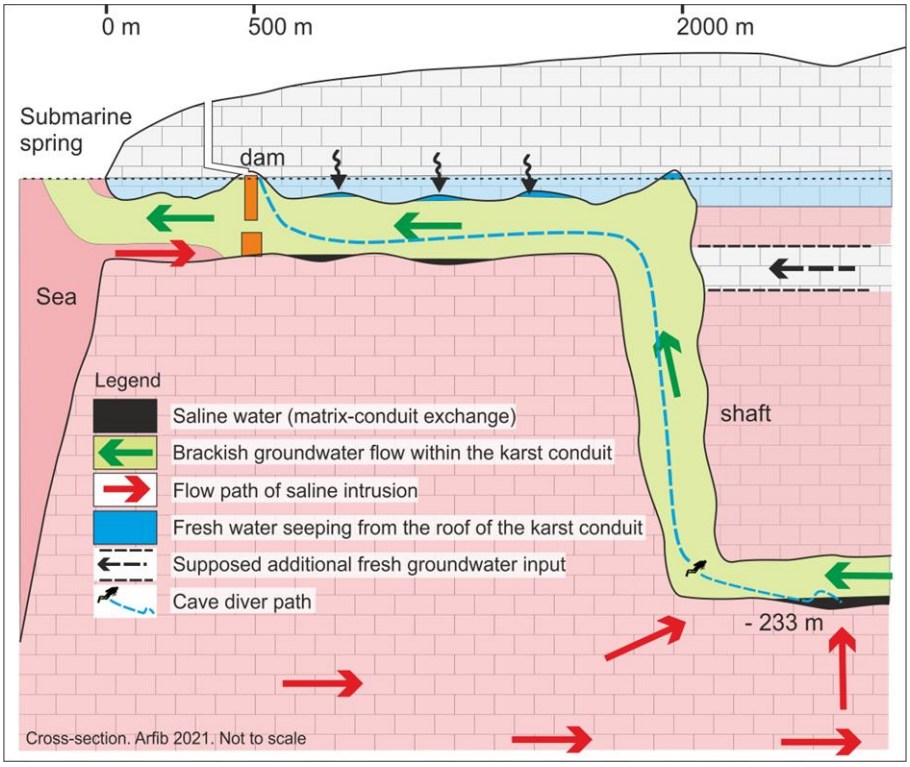
Elevation map with the contour lines of the Port-Miou recharge area and the Huveaune river watershed, and the location of regional groundwater sampling sites used by Garin, 2022.



Panoramic view of the Port-Miou calanque (Photo H. Fessard).

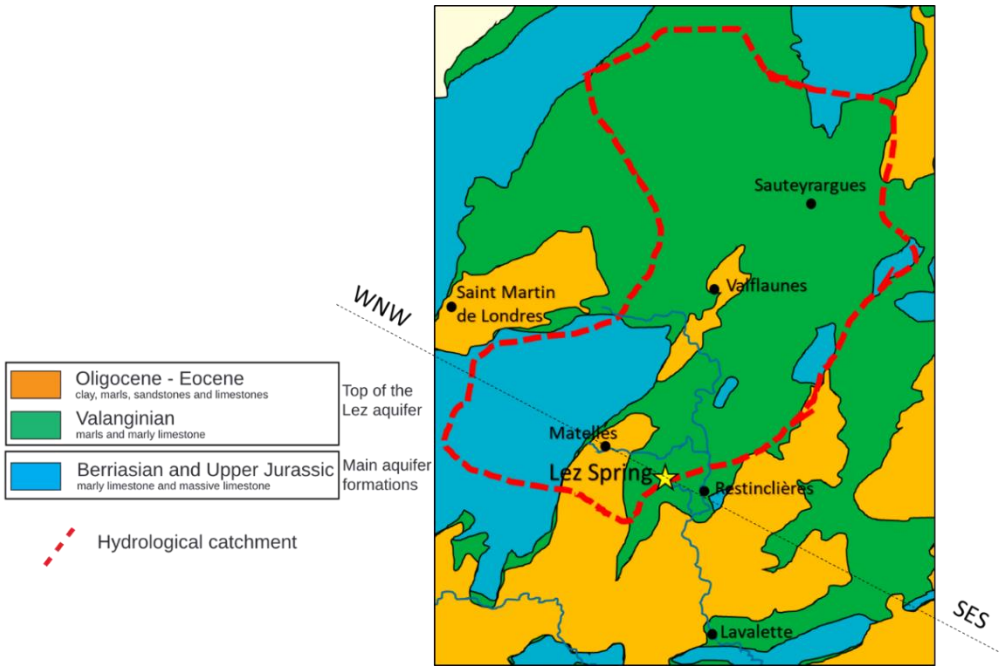


Cave divers at the Port-Miou submarine and underground dam (Photo B. Arfib).

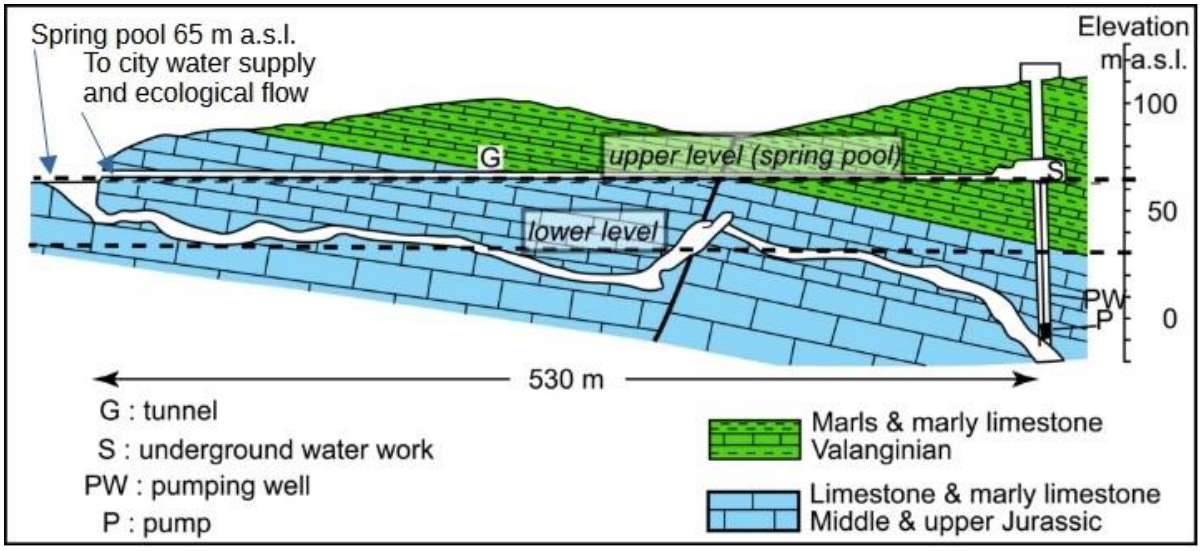


Schematic cross section of Port-Miou submarine karstic spring, explored by cave-diving up to 2000 m from the sea and 233 m below sea level. The underground submarine dam is located 500 m inland from the sea. Deep saline intrusion was revealed by continuous EC measurements at the dam and during the diving explorations (from Arfib & Mocochain, 2022).

MIKAS - Lez



2D simplified geological map of Lez Aquifer and hydrogeological basin of the Lez spring (modified after Dausse et al., 2019 and Leonardi et al., 2013)



Cross section showing the pumping station of the Lez Spring (from Bakalowicz, 2011).

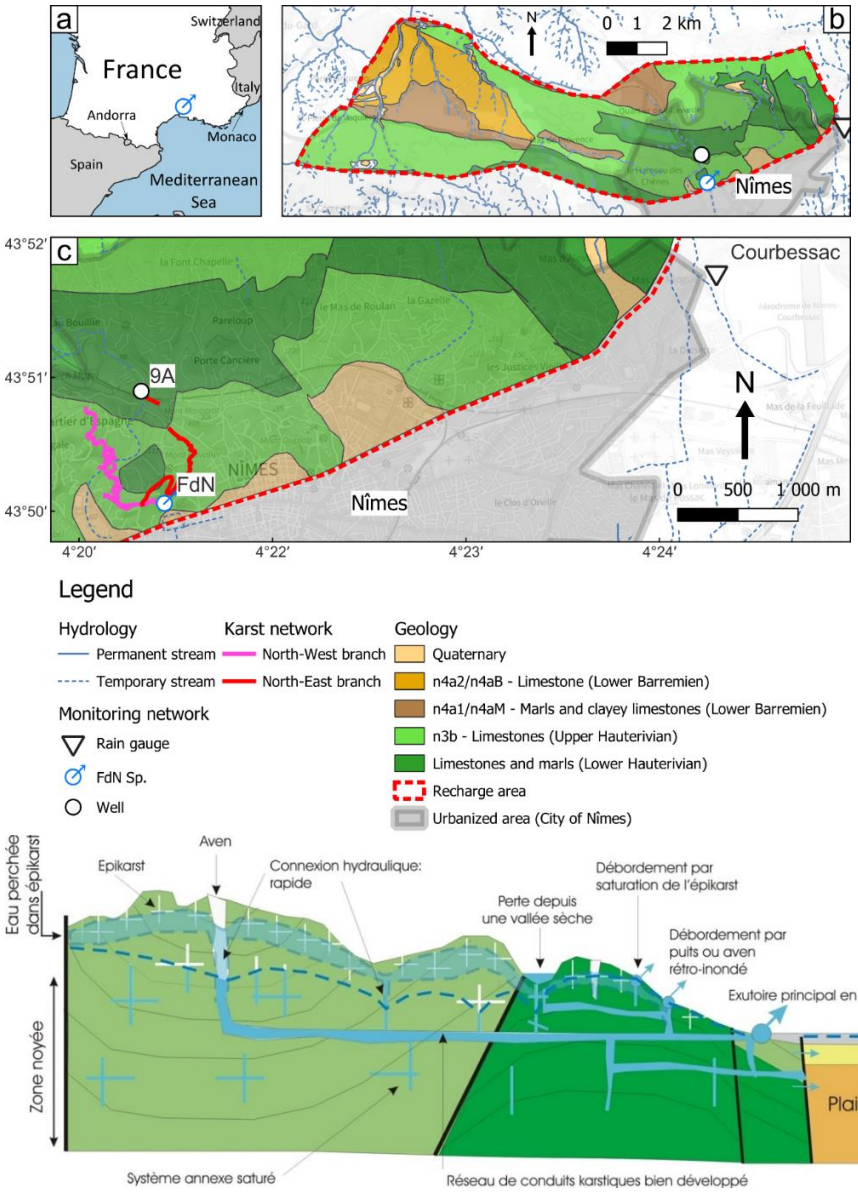
Entrance to the Lez spring pumping station, in honor of J. V. Avias, professor of geology at Montpellier University and former vice-president of A.I.H. (photo M. Bakalowicz)

Lez Spring under normal flow conditions (photo H. Jourde).

Lez Spring when the pumping flow rate at the spring exceeds the discharge rate (photo H. Jourde).

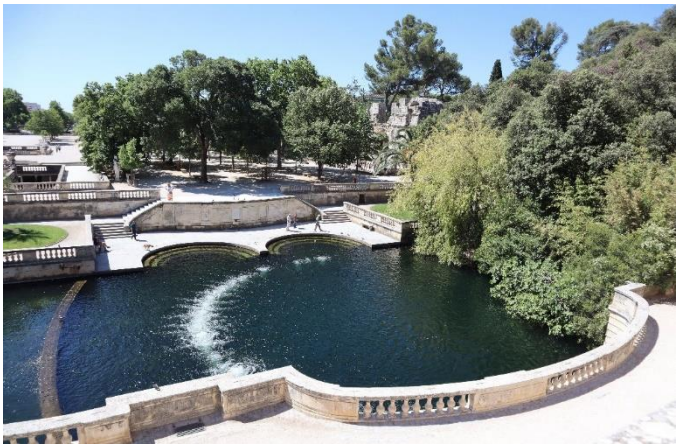
Ecological flow diverted towards the Lez river when the natural discharge becomes insufficient (photo H. Jourde).

MIKAS – Fontaine de Nîmes

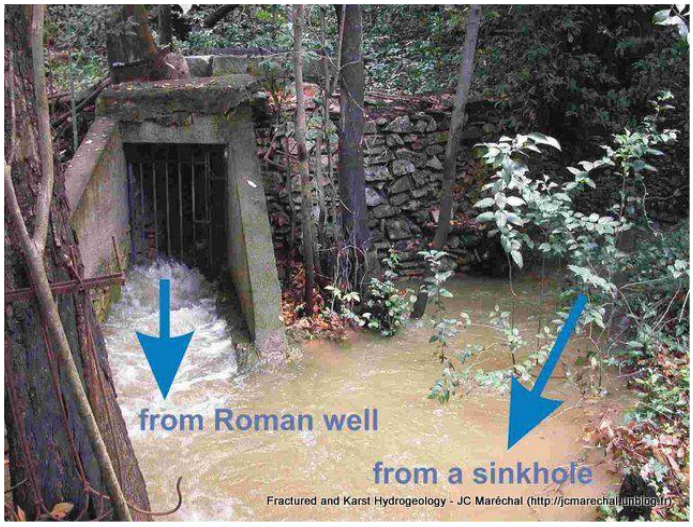


Recharge area of Fontaine de Nîmes. a): general location. b): hydrogeological context. c) urban part with the two explored branches (Bailly-Comte et al., 2023).

Hydrogeological conceptual model of Fontaine de Nîmes karst system during flood events (Maréchal et al., 2005).



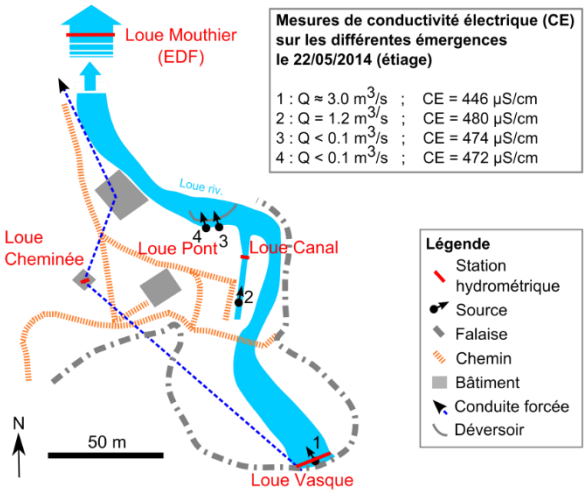
Fontaine de Nîmes during low flow stage (photo BRGM).



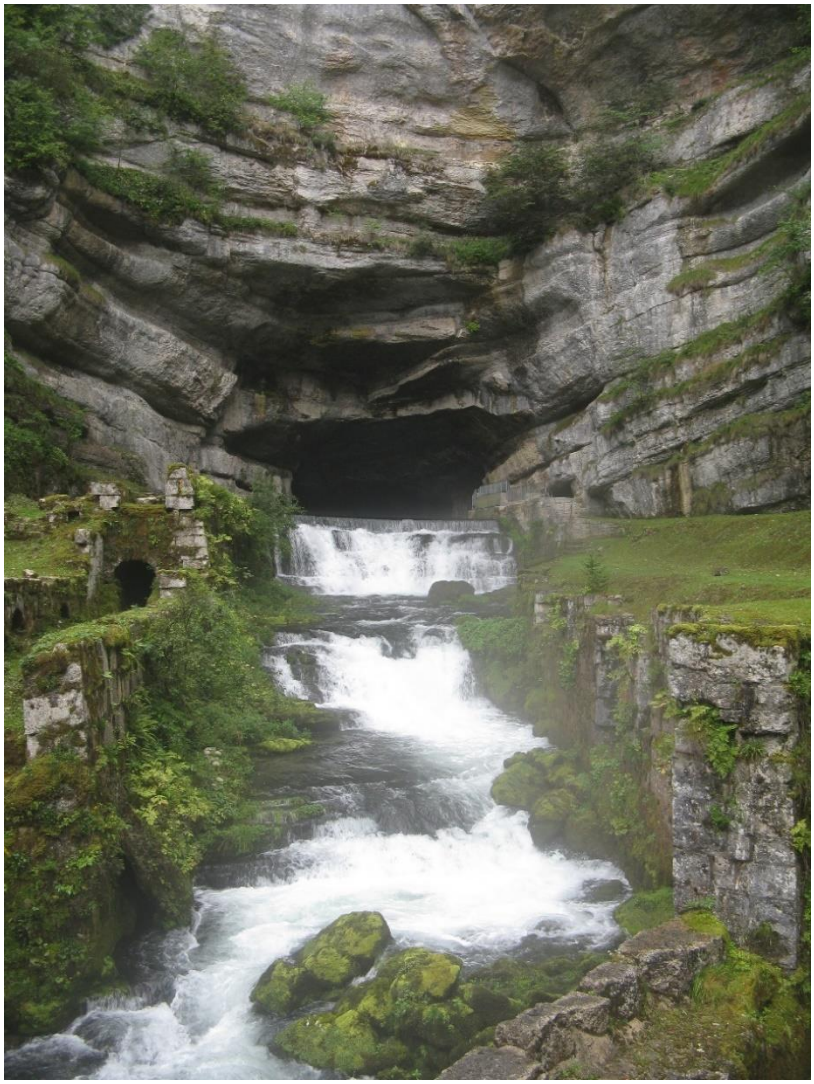
Gaffone Roman well overflowing during the 9 Sept. 2005 flood (photo G. Jouannen)

Fontaine de Nîmes during a flood (photo BRGM).

MIKAS – La Loue



Location of the 4 springs and 3 gauging stations at the Loue River Spring site (Charlier et al., 2014).

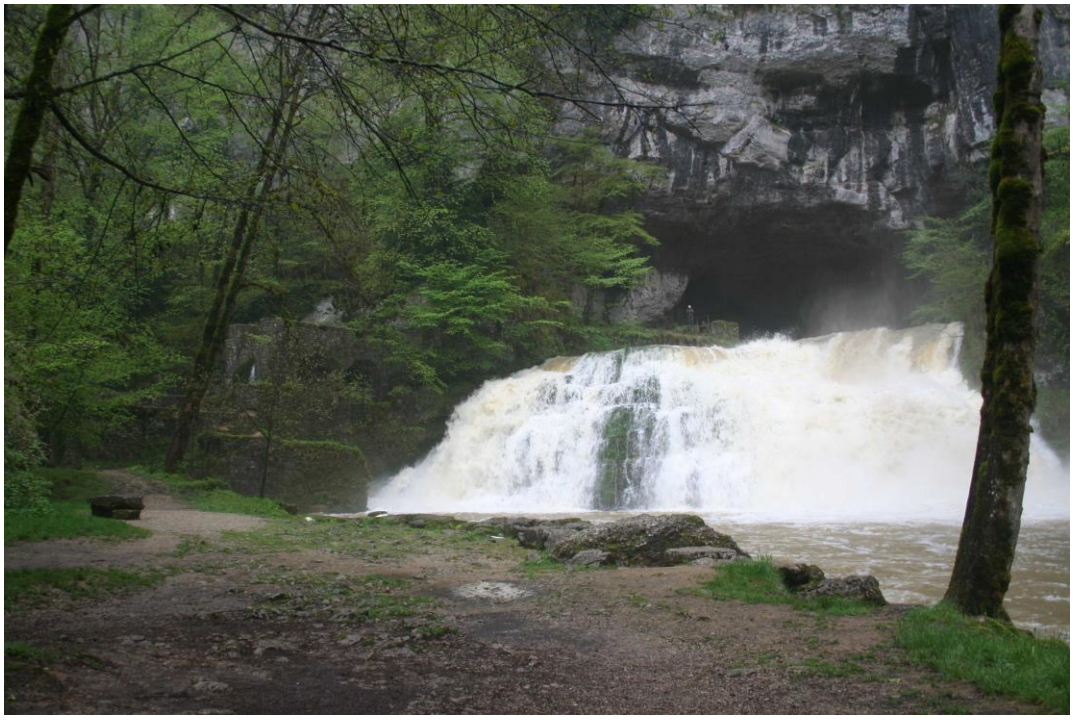


The Loue River Spring issuing from Upper Jurassic limestones during low flow period. Photo used for front page of Neven Kresic's book "Water in Karst: Vulnerability, Management and Restoration", McGraw Hill, (photo Z. Stevanović).

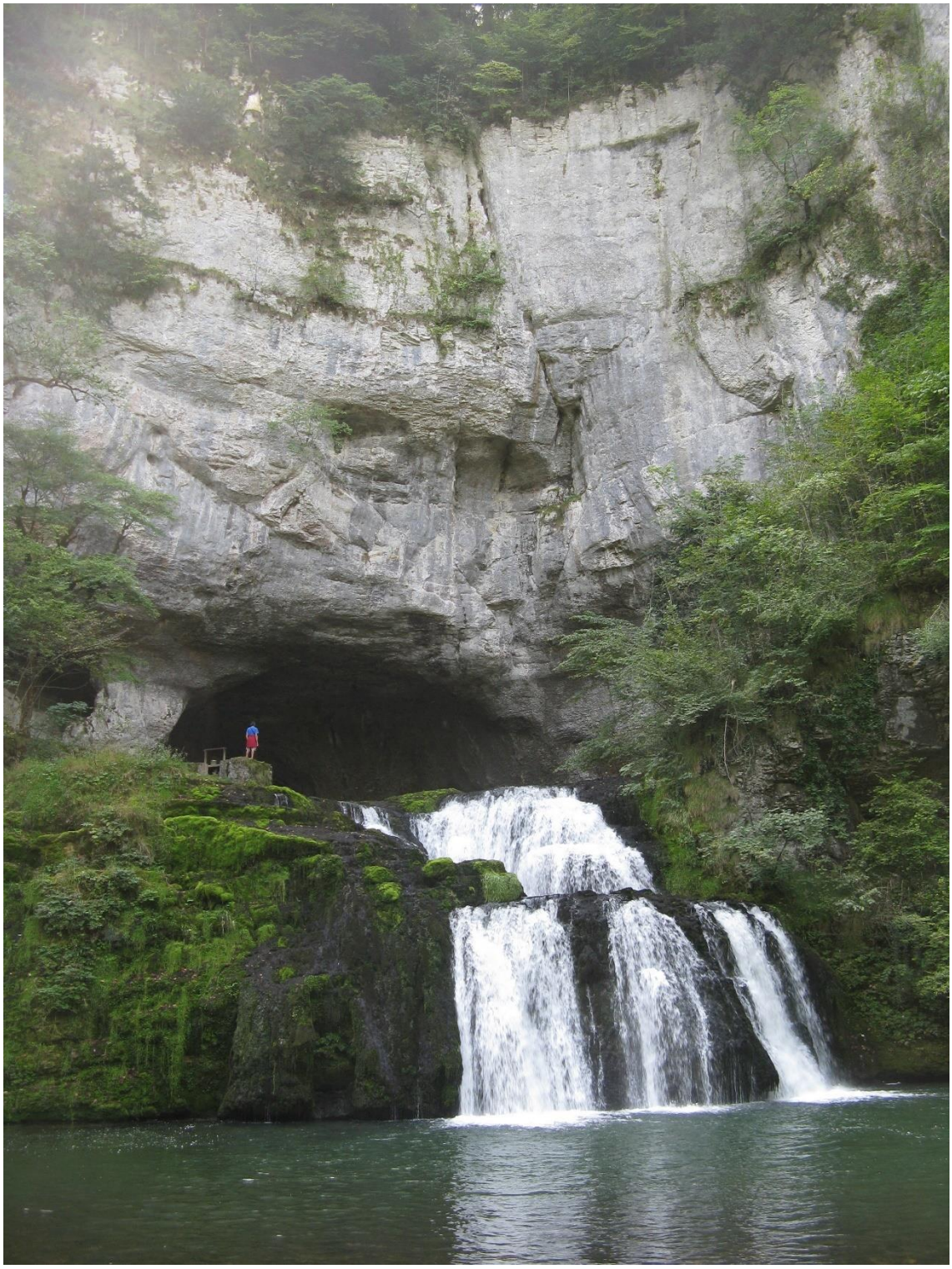
The Loue River Spring during flood event season (photo J.-B. Charlier).

The Loue River Spring, by the famous French painter Gustave Courbet (1864), Metropolitan Museum of Art, New-York

MIKAS – Lison spring

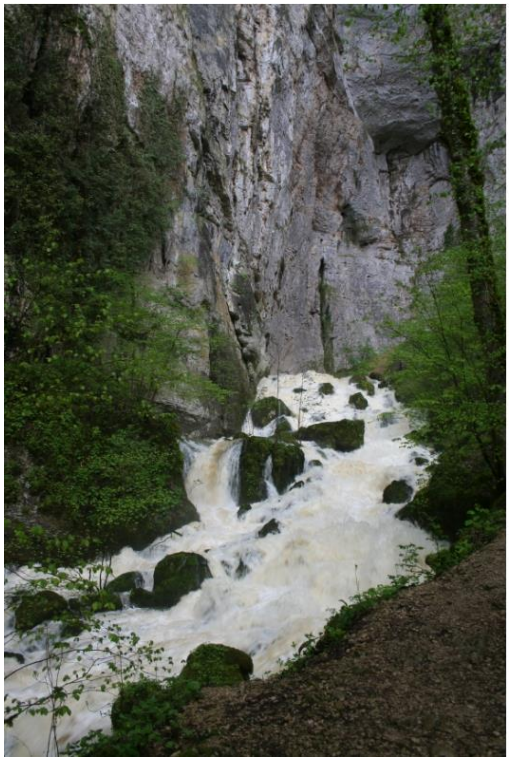


Lison Spring during high flow (photos J. Mudry).



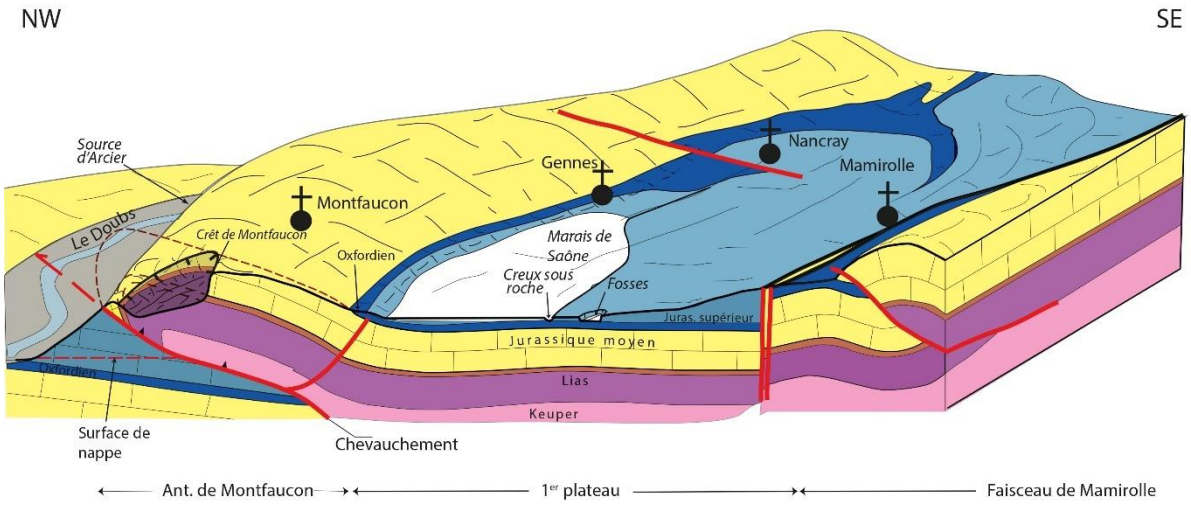
Impressive cave orifice from which is issuing Lison Spring water. Photo used for front page of "Karst: Environment, Management of the Aquifers" of Stevanović et al., GW Project (photo by Z. Stevanović)

Lison Spring during low flow (photos J. Mudry).



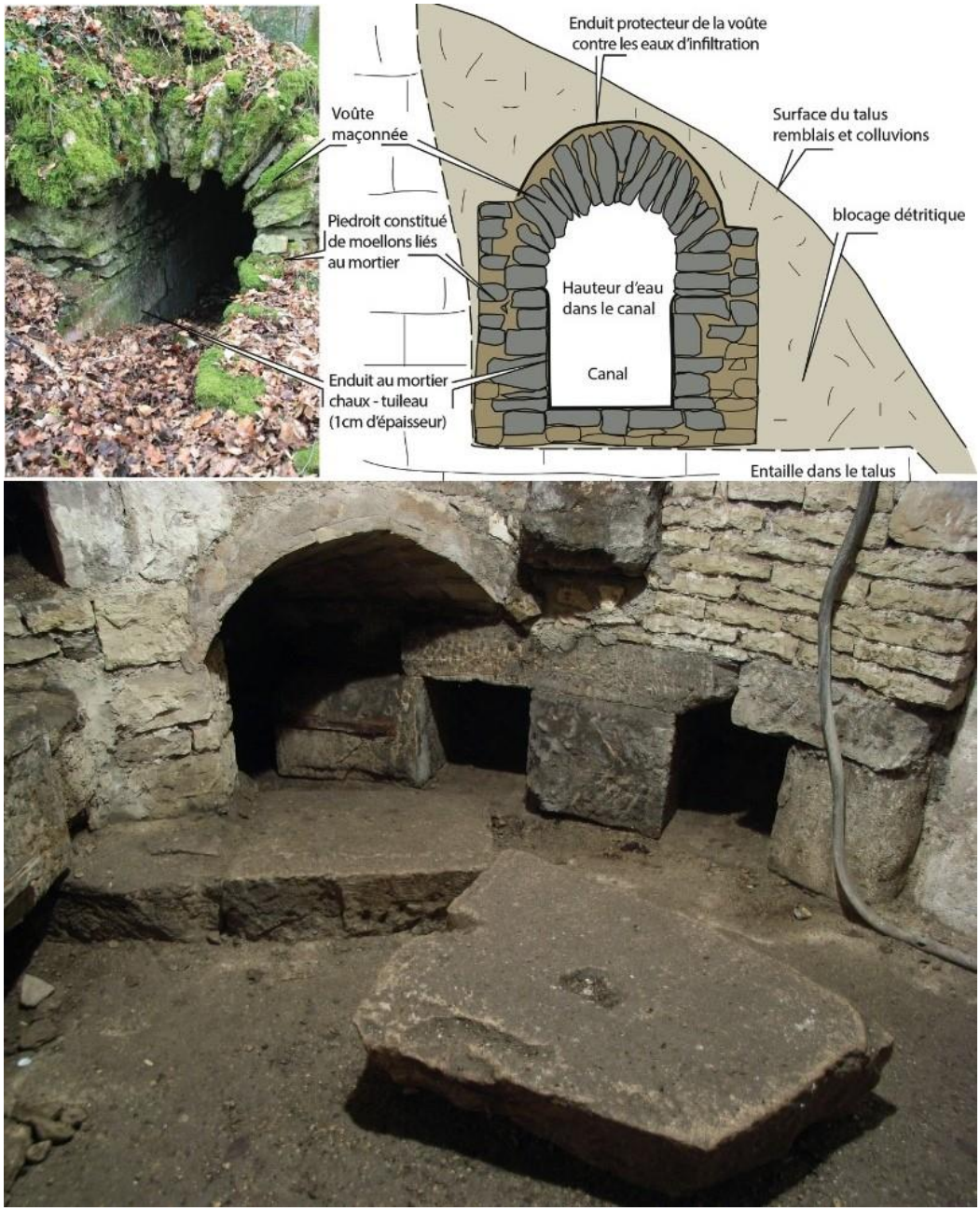
Lison Drainage area: Sarrasine overflow spring(left), Creux Billard (right) (photos J. Mudry).

MIKAS – Arcier spring



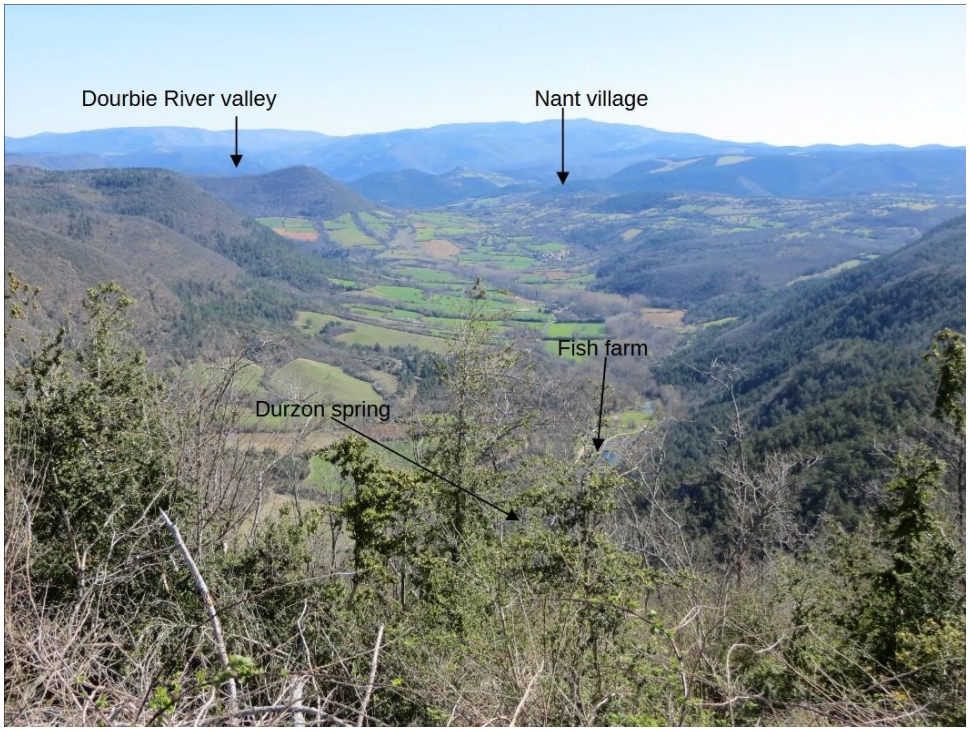
3D geological scheme of the Marais de Saône polje, in the recharge area of Arcier Spring (Chauve & Mudry, 2024).

Overflow of Arcier Spring (photo P. Chauve).



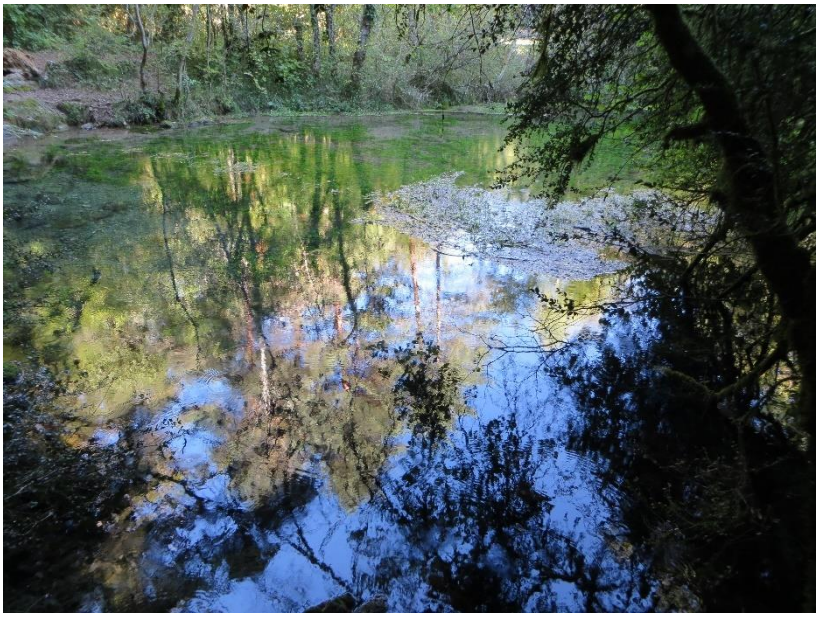
Roman tapping of Arcier spring (2nd Century CE). Up: Remains of the Roman aqueduct (Chauve & Rolin, 2015). Down: Distribution basin in the city center of Besançon (photo J.-C. Barçon).

MIKAS – Durzon spring



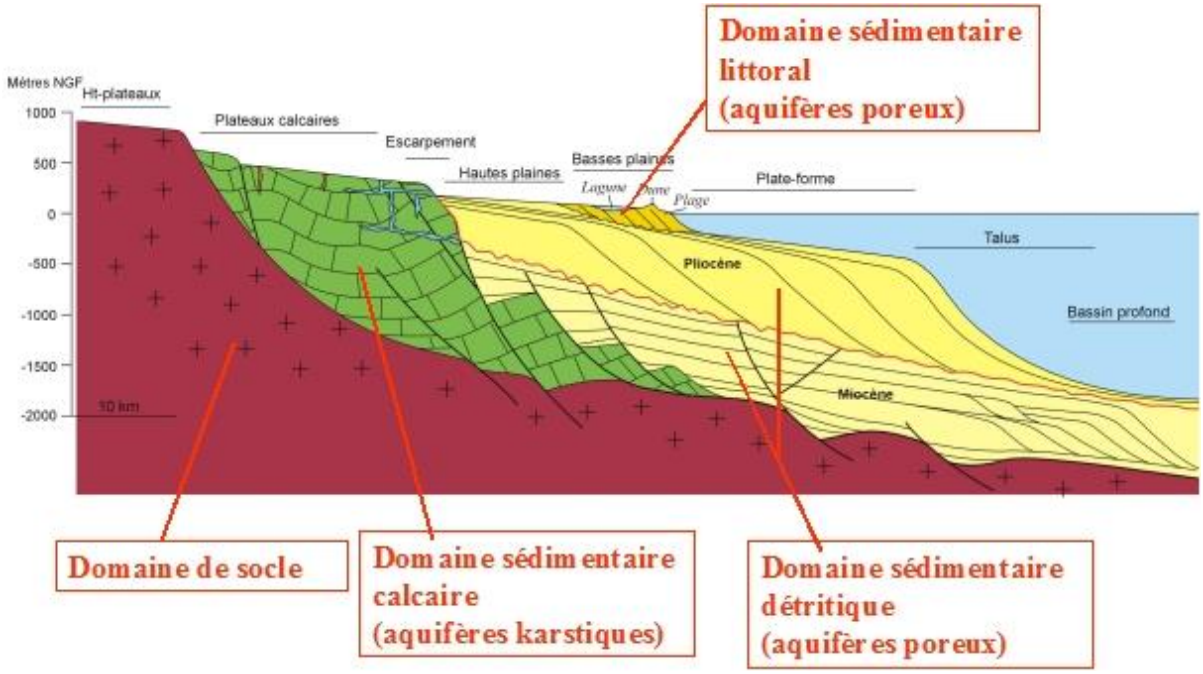
Valley of the Durzon River (Photo M. Bakalowicz)

The Durzon spring in winter, looking upstream (photo L. Danneville).

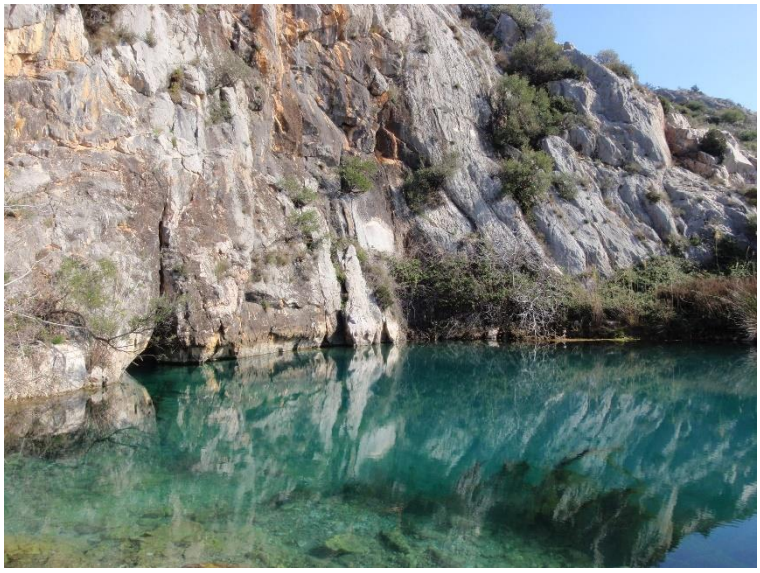


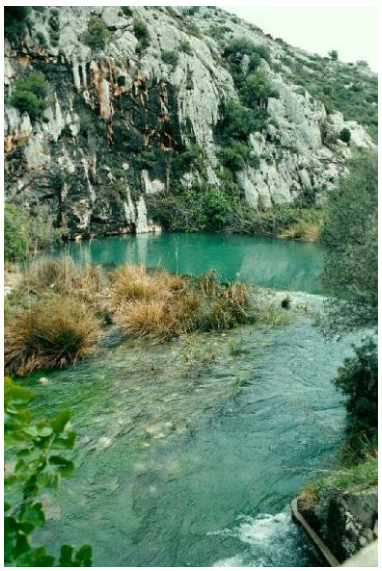
The Durzon spring, looking downstream (photo M. Bakalowicz).

MIKAS – Font Estramar spring



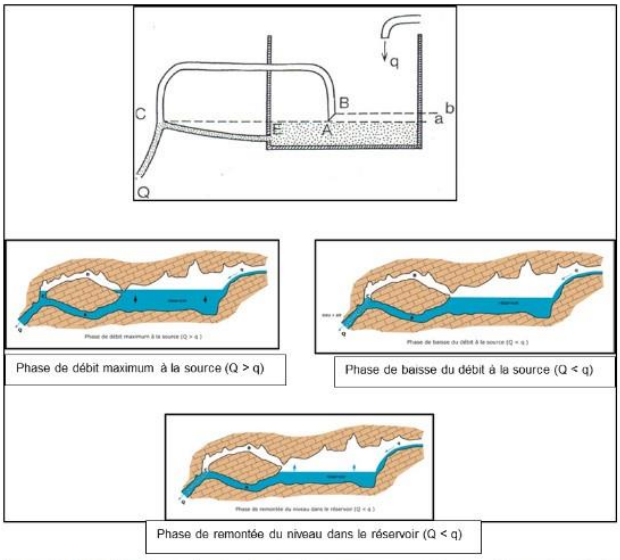
Schematic cross section of the carbonate massif with karst development at depth during the Messinian Salinity Crisis (from BRGM Report).



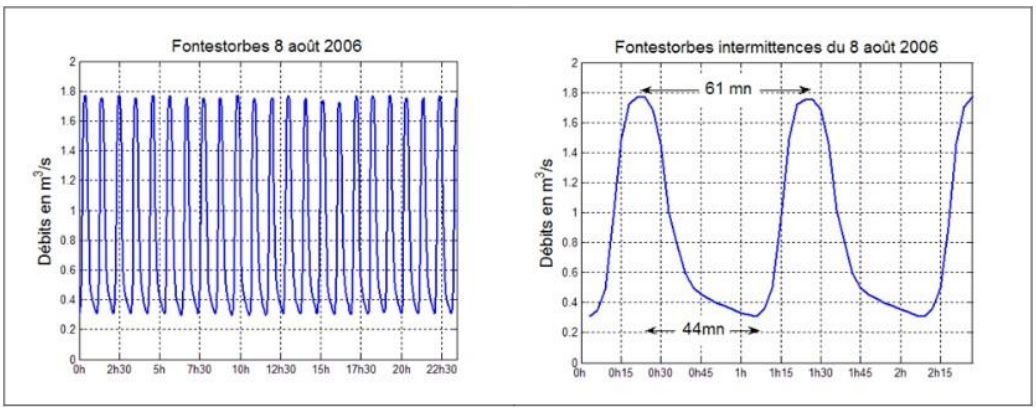


Font Estramar spring (photos, left: P. Fleury; right: BRGM).

MIKAS – Fontestorbes



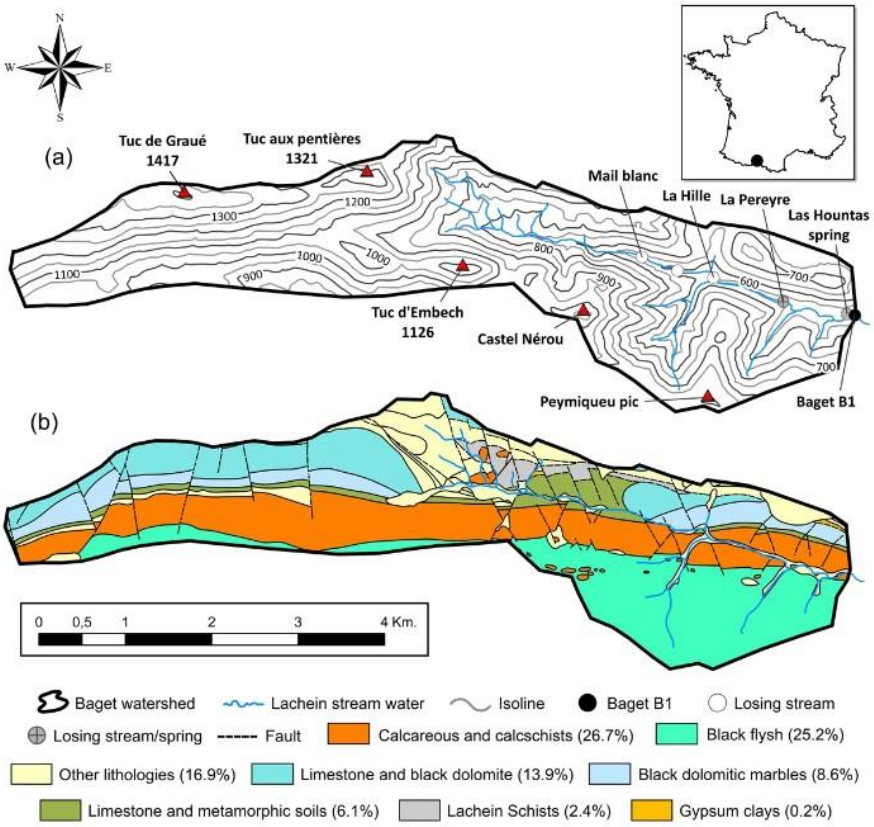
Hydrogeological system producing the periodic flow, according to Mangin (1973) (from BRGM Report 2015 RP-64209-FR).



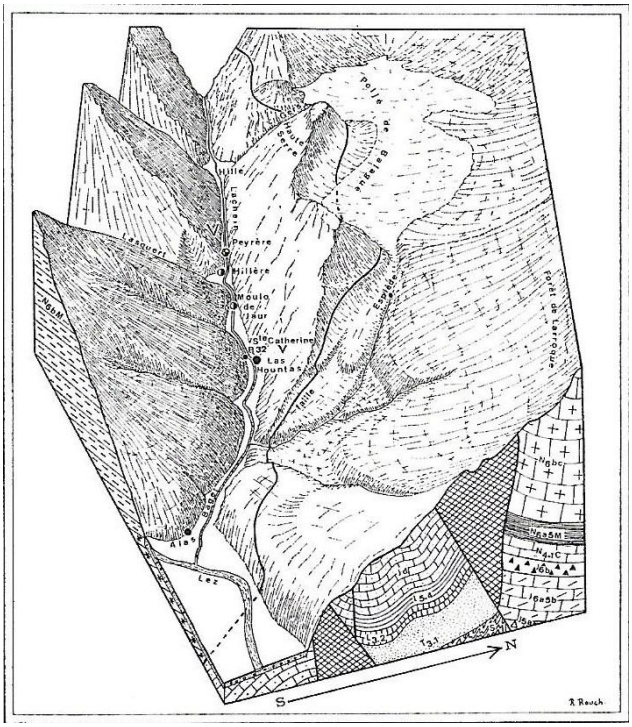
Example of spring hydrograph during intermittencies (from BRGM Report 2015 RP-64209-FR).

Fontestorbes spring, during low flow (photo BRGM).

MIKAS - Bates (Las Hountas)



Topographic and geological map of Baget system (Ulloa-Cedamanos et al., 2020)

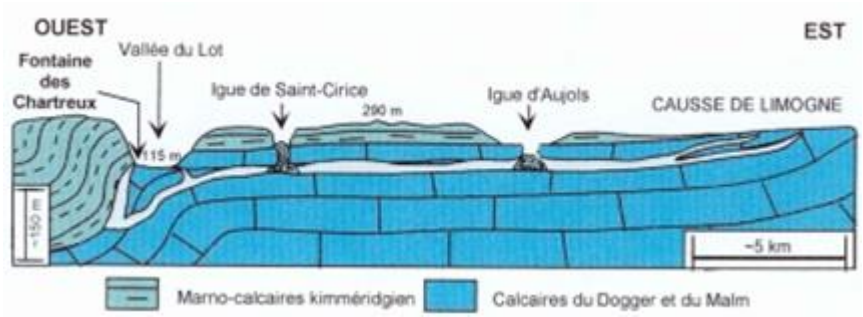


Geological 3D representation of the Baget karst system (from Mangin, 1976).

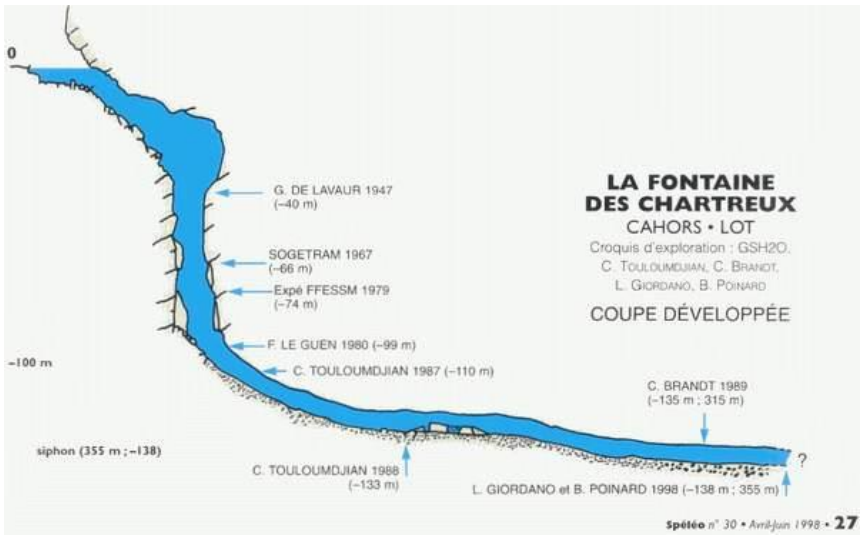
Las Hountas and the field lab, during a winter flood (photo D. Labat).

The main hydrometric station, downstream Las Hountas, controlling the total flow from the main spring and the overflow springs (photo D. Labat).

MIKAS - Fontaine des Chartreux



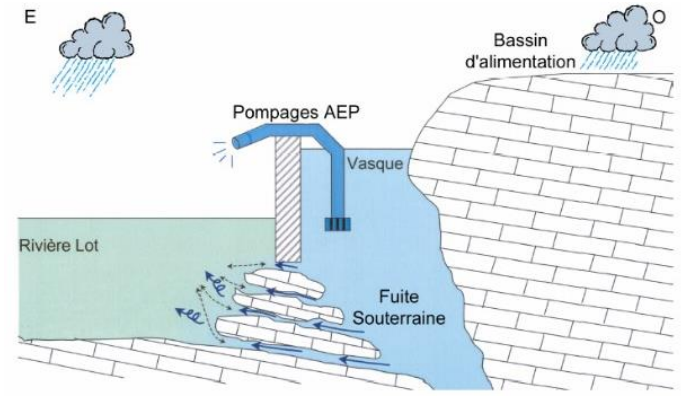
Hydrogeological cross section of Fontaine des Chartreux recharge area, with the assumed main conduit (from Astruc & Soulé, 1977).



Cross section showing the Fontaine des Chartreux conduit explored by divers (from Giordano & Poinard, 1998).

General view of the Fontaine des Chartreux, on the left bank of the Lot, with the famous Valentré bridge (14th century) in Cahors (photo C. Kupiec).

The Fontaine des Chartreux flowing into the River Lot (photo C. Kupiec).

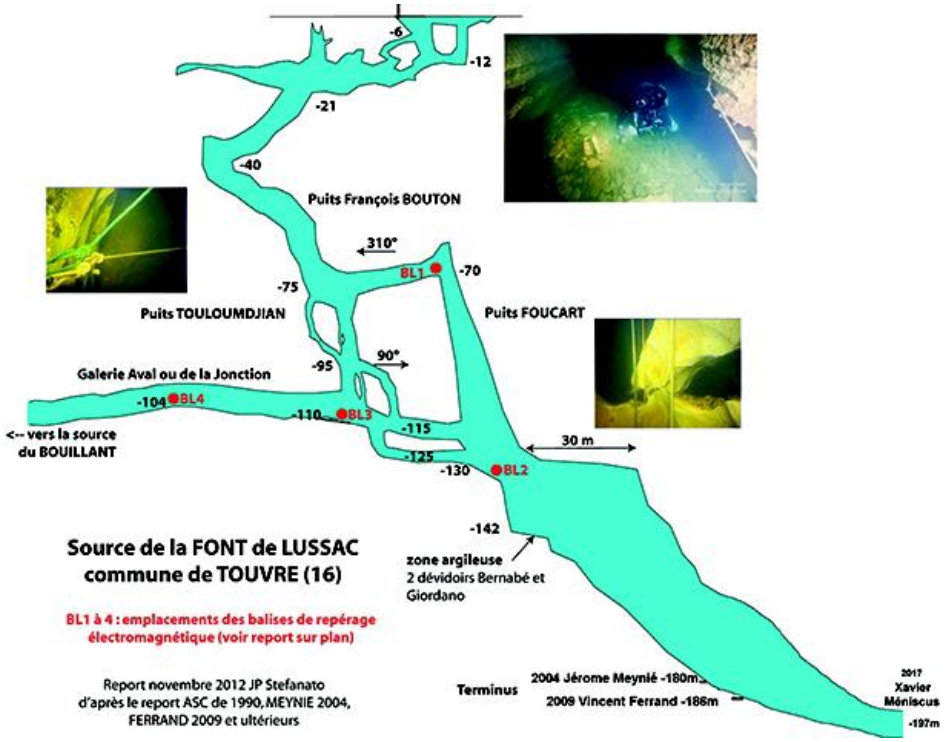


Simplified representation of Fontaine des Chartreux's functioning (Hoareau, 2005). Direct leakage into the river Lot demonstrates the difficulty of estimating flow rates using hydraulic models.

MIKAS - Touvre

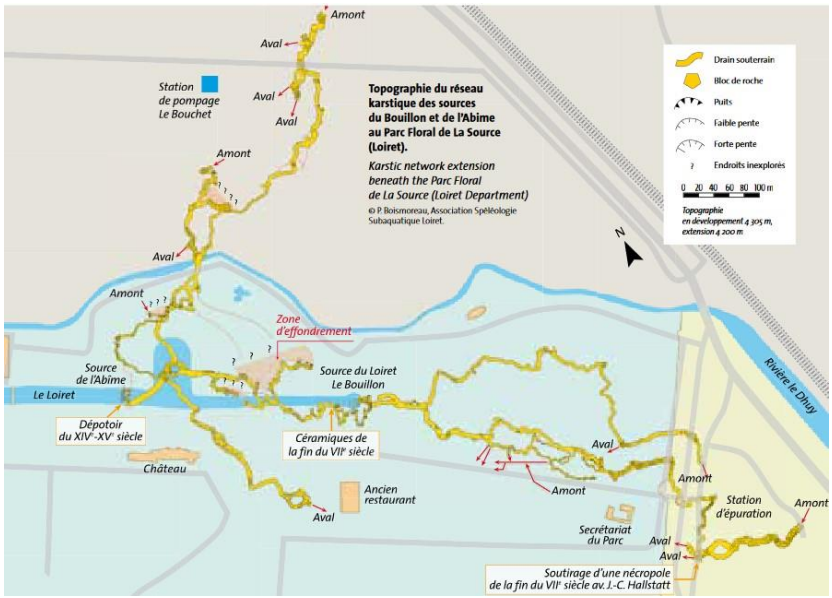
Le Bouillant, the main spring of the Touvre River (photo J. Mudry)

Le Bouillant spring, Touvre River and pumping station (https://www.charentelibre.fr/charente/ruelle-sur-touvre/source-de-la-touvre-un-mystere-leve-a-120-m-de-fond-6427154.php)

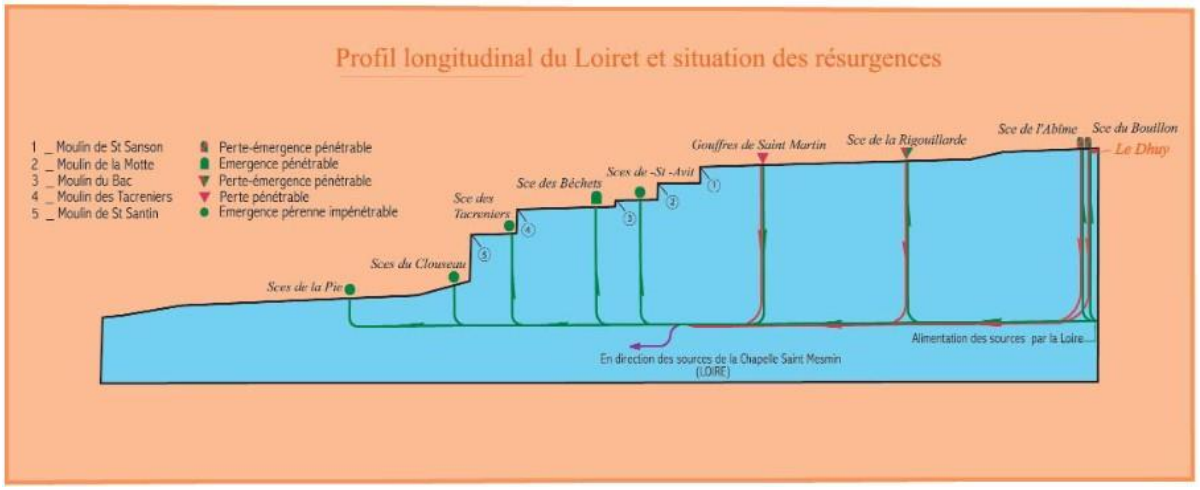


Cross-section of the Font de Lussac, one of the Touvre springs (https://subaqua.ffessm.fr/article/les-sources-de-la-touvre)

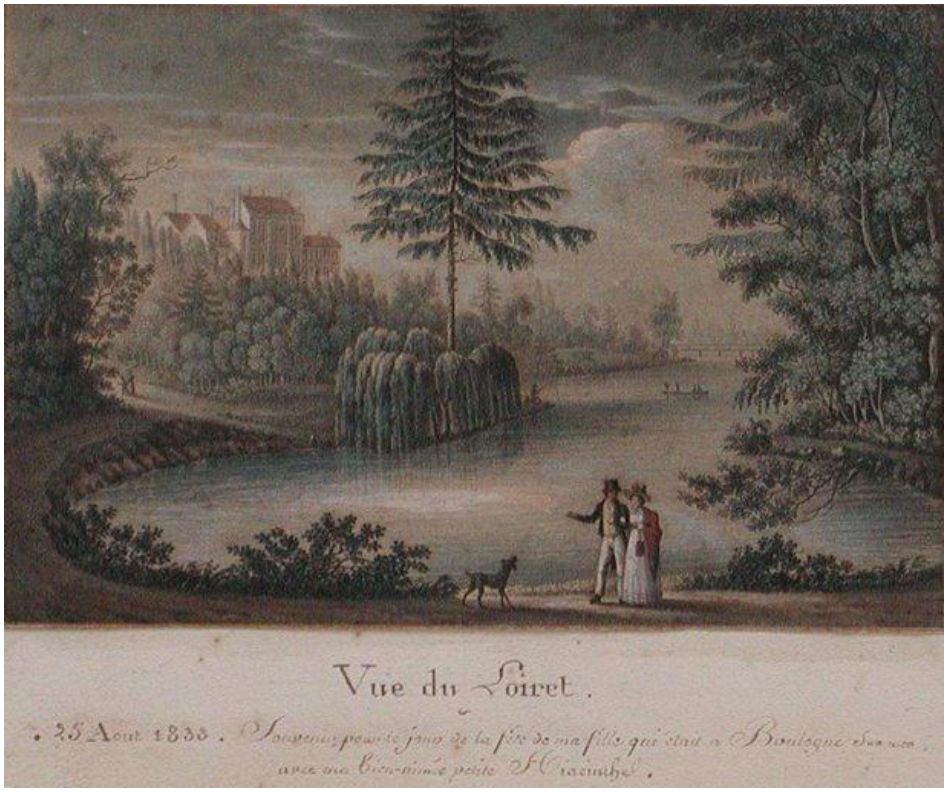
MIKAS - Le Bouillon (Source of Loiret River)



Map of the karstic conduits explored by divers from Le Bouillon, Loiret River Spring (Gutierrez and Binet, 2010).



Schematic cross section showing the resurgences downstream Le Bouillon. Green arrows show upward flow; read arrows show downward flow, or inversac (extract from https://www.assises-riviere-loiret.fr/images/DIAGNOSTIC/Fiche_alimentation.pdf, based on Lepiller, 2006).

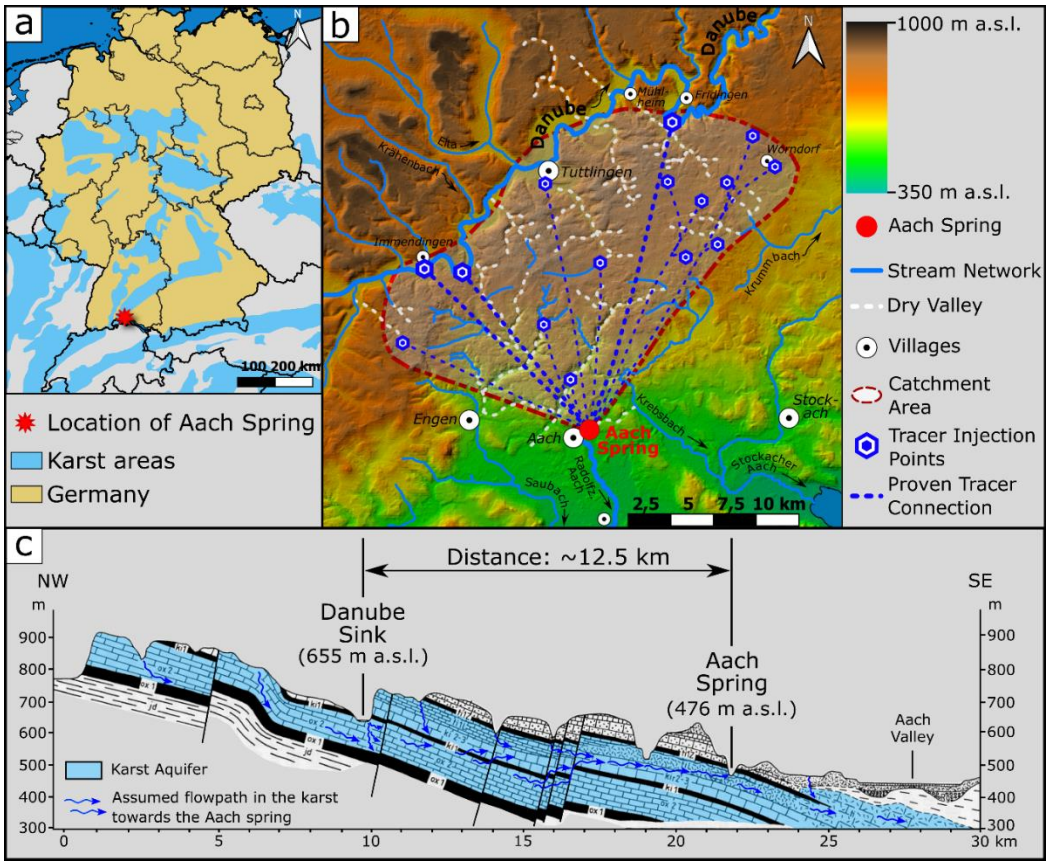


View of Loiret Spring (19th century print, https://www.wikiwand.com/fr/Fichier:La_source_du_Loiret,_estampe_1.jpg)

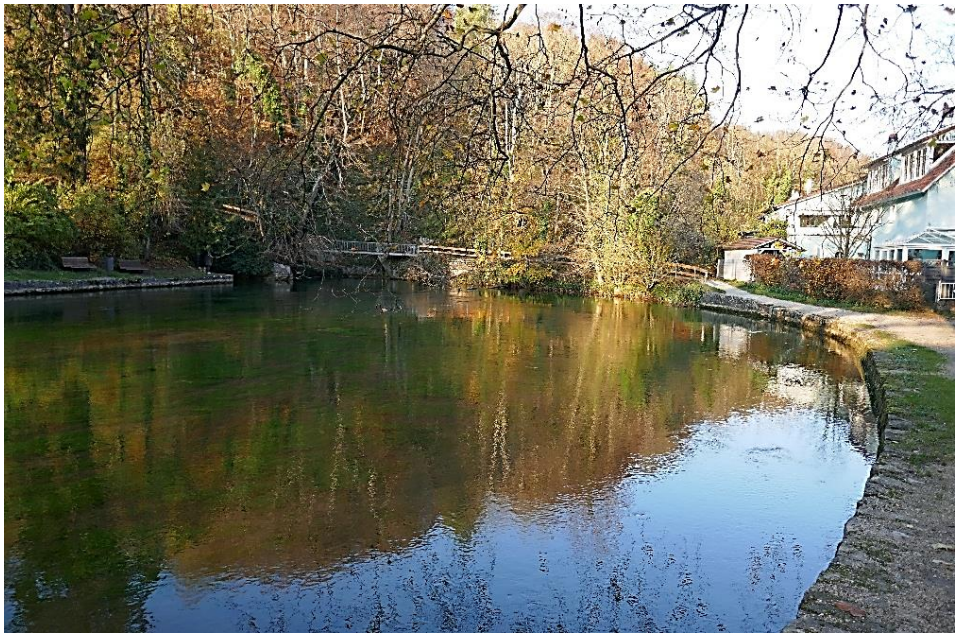
Le Bouillon, spring of Loiret River (https://www.parcfloraldelasource.com/les-jardins/la-source/

Germany

MIKAS – Aach spring



a) Location of the Aach spring in Southern Germany, shown on the World Karst Aquifer Map; b) Schematic illustration of the Danube-Aach system with the major sink points and tracer connections; c) Hydrogeologic cross-section from the principal sink of the Danube at 655 m asl to the Aach spring in 12.5 km distance at 476 m asl, resulting in a hydraulic gradient of 1.44% (graphics: Leon Seehrich, modified after Hötzl 1996).

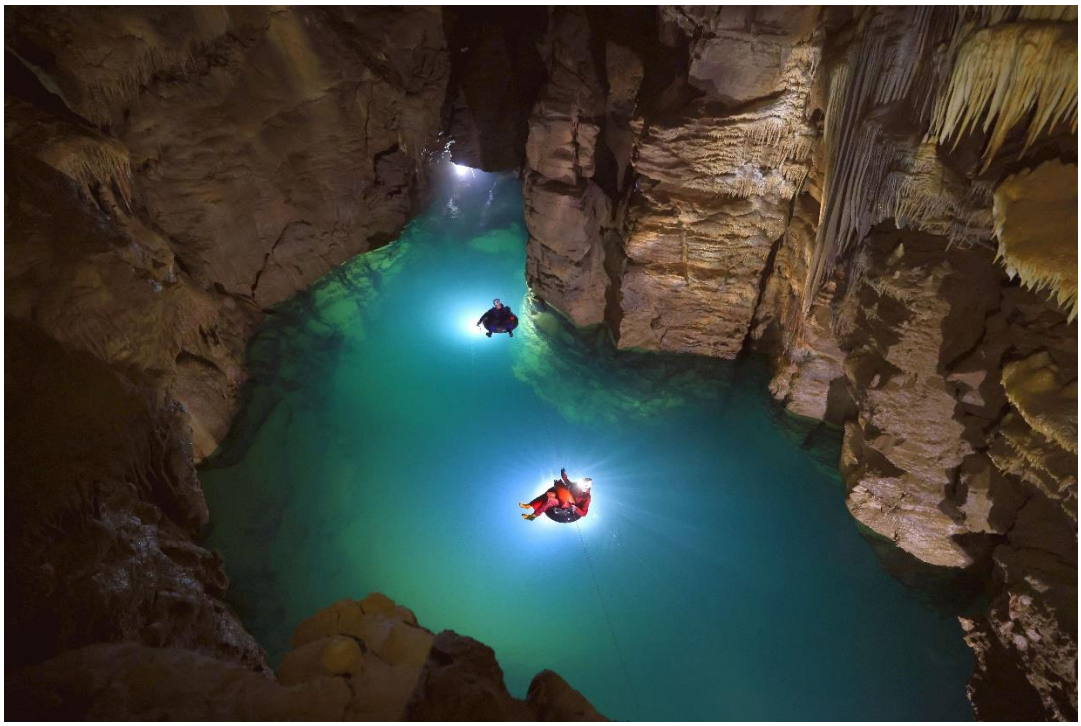


The Aach spring outlet (photo: N. Goldscheider).

Principal sink of the Danube near Immendingen, where the river sinks partly or completely underground, during conditions of complete sinking that occur about 155 days per year (photo: N. Goldscheider).

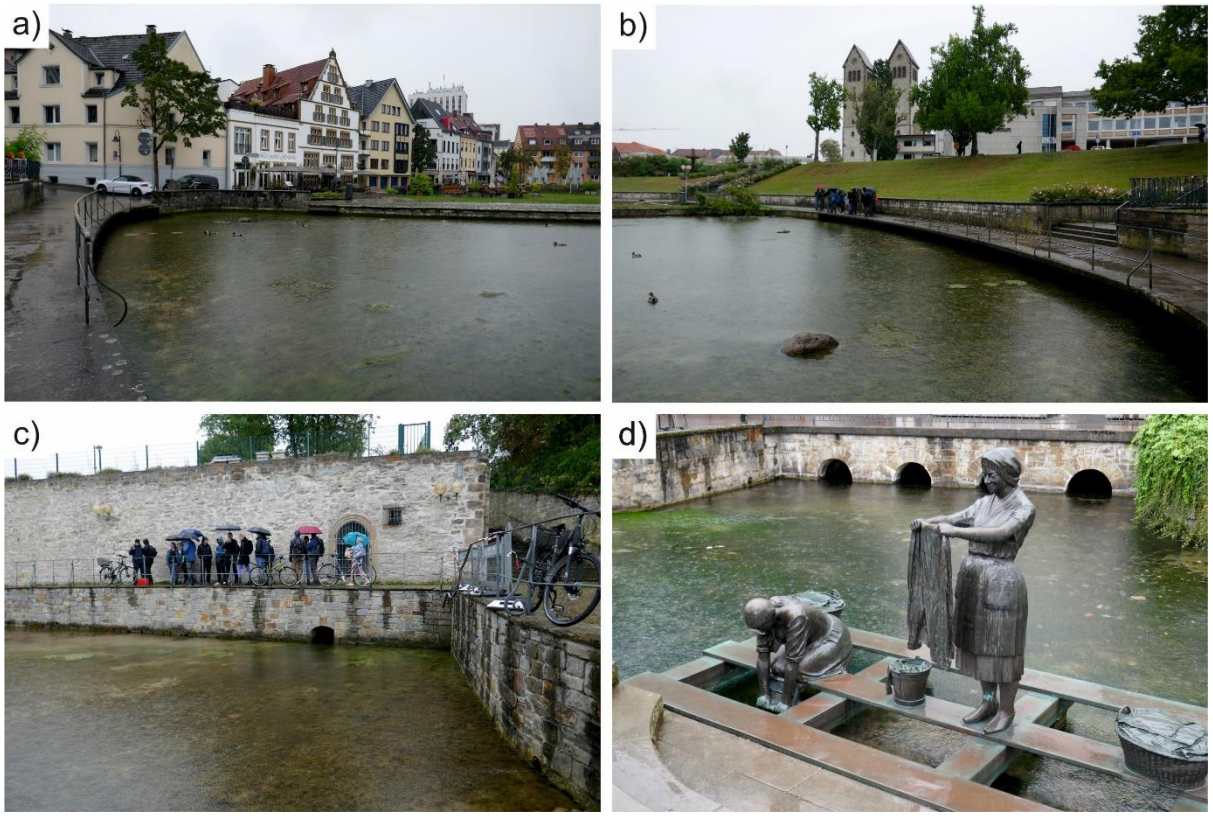
MIKAS – Blautopf

The Blautopf (= Blue Pot) spring, which is famous for its deep water, blue colour and beauty (photo: N. Goldscheider).



Lake in "Mörikedom", named after the German poet Eduard Mörike (1804-1875) and located in the heart of Blauhöhle (Blue Cave) (photo: Andreas Kücha, ARGE Blautopf).

MIKAS – Pader springs



Impressions of the Pader Springs (on a rainy day): a) Börnepader, b) Börnepader with Cathedral in the background, c) Rothobornpader with spring orifice emerging from the cellar of the ancient imperial palace, d) Warme Pader, with sculpture illustrating the former utilization of this warm spring (photos: N. Goldscheider).

Ireland

MIKAS – Cong spring

Drone image that showing the spring complex. The blue star shows the Hatchery Spring branch (Photo by David Drew)

Cong Hatchery Spring (the largest) (Photo by John Gunn)

MIKAS - Shannon Pot

Shannon Pot looking towards outlet channel (photo by John Gunn)

NIKAS - Ogulla Spring

Ogulla holly well (spring) (source: https://pilgrimagemedievalireland.com/2012/06/23/ogulla-holy-well/)

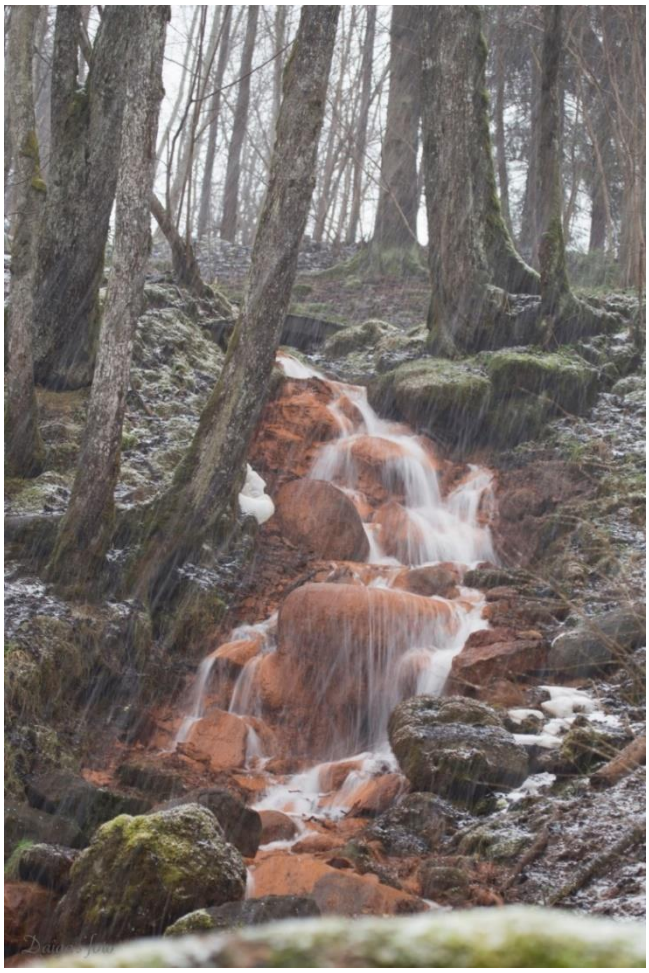
Latvia

MIKAS - Bārbeles sulfur spring

Bārbeles spring (June 2020; Photo by Jānis Bikše)

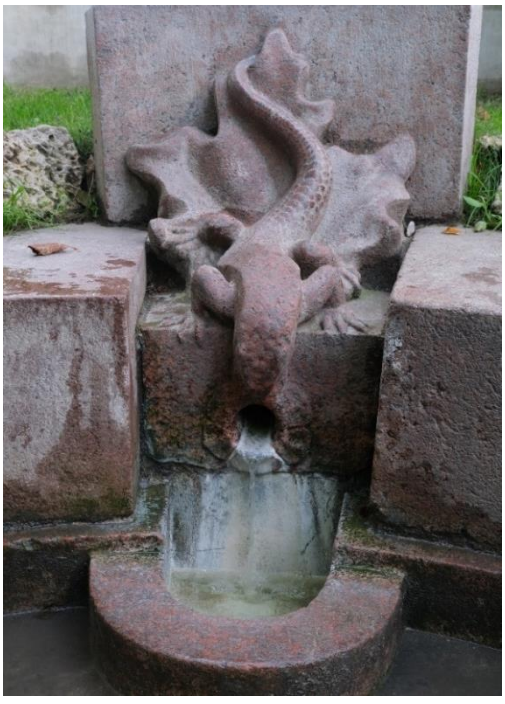
Bārbeles spring, downstream view (January 2024; Photo by Jānis Bikše)

NIKAS – Dāvida mill springs (Dāvida dzirnavu avoti)



Dāvida mill springs (February 2016; Photo by Zigmunds Kazanovskis)

NIKAS – Ķemeri sulfur spring “Ķirzaciņa” (“Little Lizard”) (Ķemeru sēravots “Ķirzaciņa”)



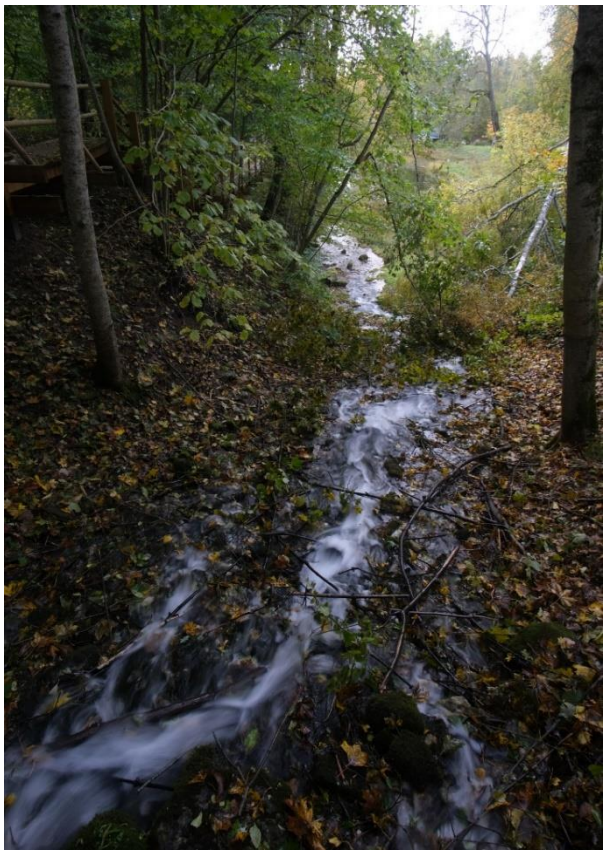
Ķemeri sulfur spring “Ķirzaciņa” (September 2021; Photo by Jānis Bikše)

Pavilion of the Ķemeri sulfur spring "Ķirzaciņa" (September 2021; Photo by Jānis Bikše)

NIKAS – Kulšēnu sulfur spring (Kulšēnu sēravots)

Kulšēnu sulfur spring (September 2021; Photo by Jānis Bikše)

NIKAS – Mežmuižas springs (Mežmuižas avoti)

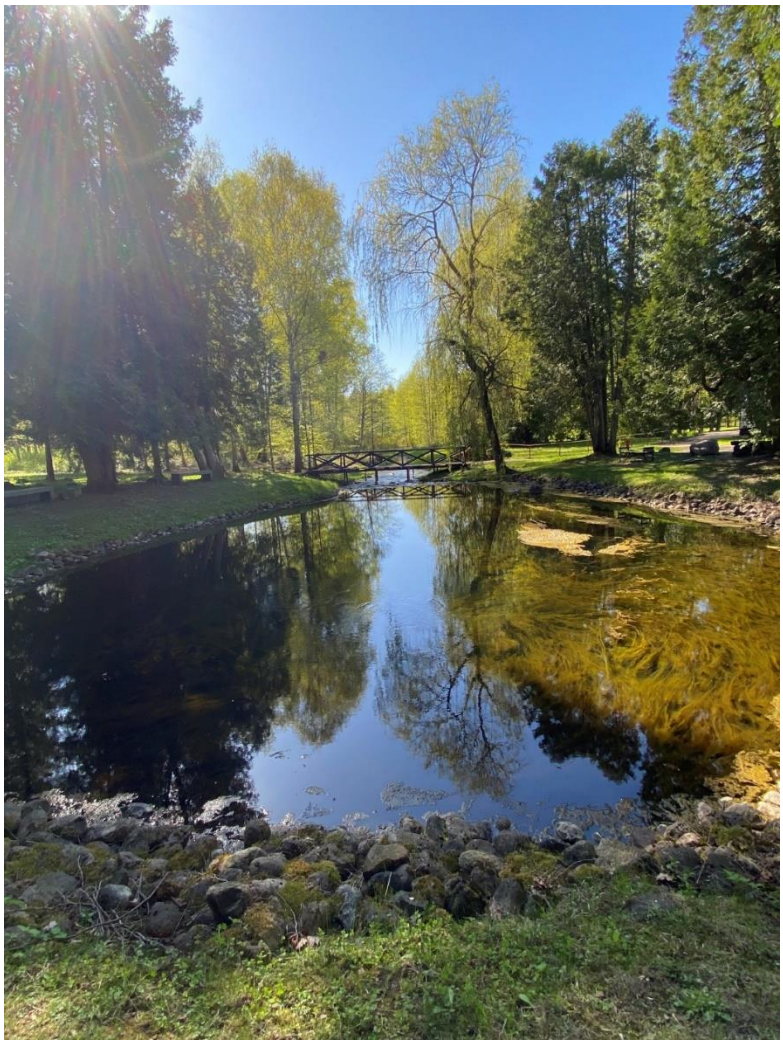


A spring stream connecting spring outflow to the pond (October 2023; Photo by Jānis Bikše)

A pond where spring water is collected (October 2023; Photo by Jānis Bikše)

Lithuania

MIKAS – Smardonės



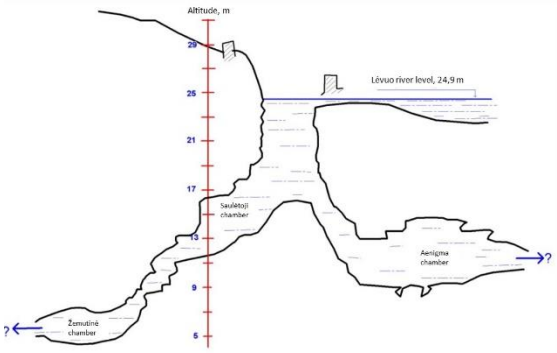
Spring at the river bank (late spring) (Photo by Vytautas Samalvičius, 07/05/2023).

Spring name tablet, info dashboard, and the memorial for Theodor Grottuss, a world-famous chemist who was the first to analyze and study Smardonės spring water

NIKAS – Žalsvasis

Spring at the river bank (late summer – early fall)

https://www.pamatyklietuvoje.lt/details/zalsvasis-saltinis/3838 .



Spring cross section. Data is obtained during the technical diving expeditions. Three known chambers are observed below the spring and Lėvuo river.

Spring name tablet, info dashboard, and carved wood statue at the entrance

Norway

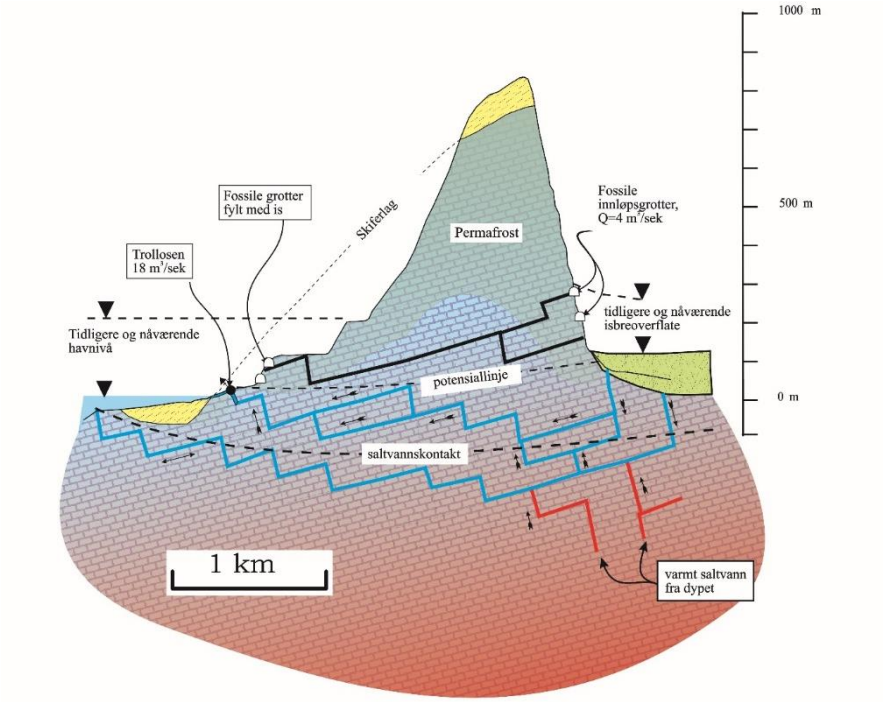
MIKAS – Jordtulla spring and Juta spring

Jordtulla spring

Juta spring

MIKAS – Trollosen

Trollosen at south Spitsbergen. View from the shoreline towards the 800 m a.s.l. Hilmafjellet mountain. The outlet is at a tectonic contact between Triassic shales (left) and Caledonian marbles (right). Discharge about 10 000 l/s. Person for scale. Photo: SE Lauritzen



Subpermafrost karst drainage through Hilmarfjellet, south Spitsbergen (Lauritzen, 1991, 1998, Lauritzen and Bottrell, 1994). Glacial meltwater mixed with hot brine emerges at a large karst spring at sea level. Drainage fra the nearby glacier is pirated to the spring. Dye transit time between glacier and spring is more than 30 hours. (Figure and text from Lauritzen and Skoglund, 2013.)

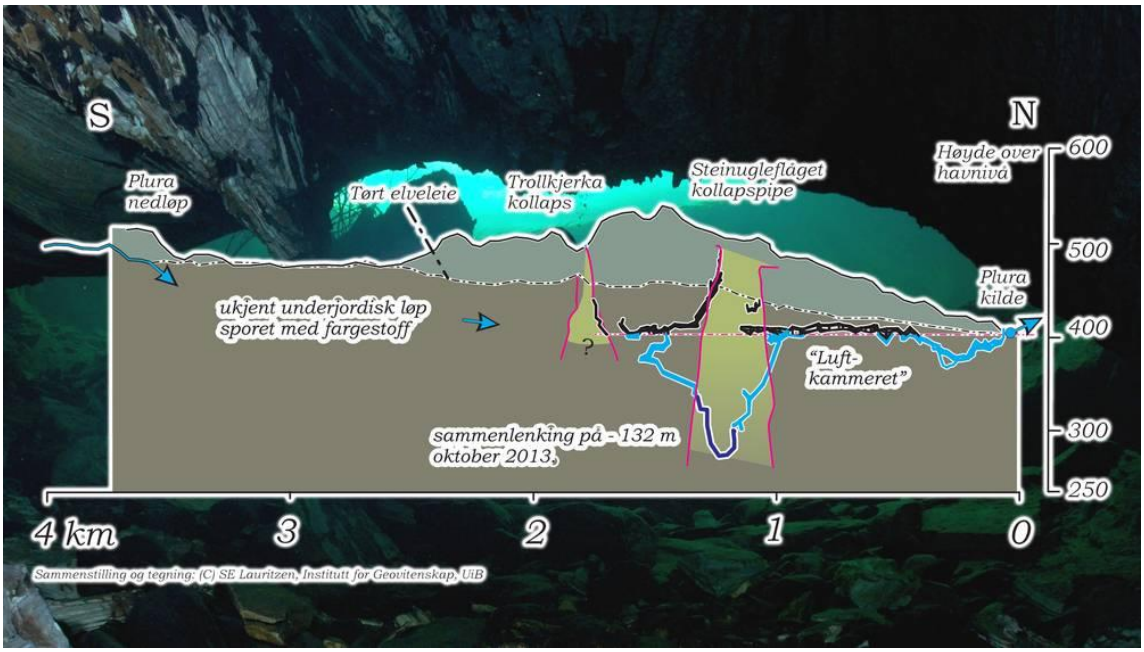
NIKAS – Bubbelen

Bubbelen spring

NIKAS - Møsabekken spring

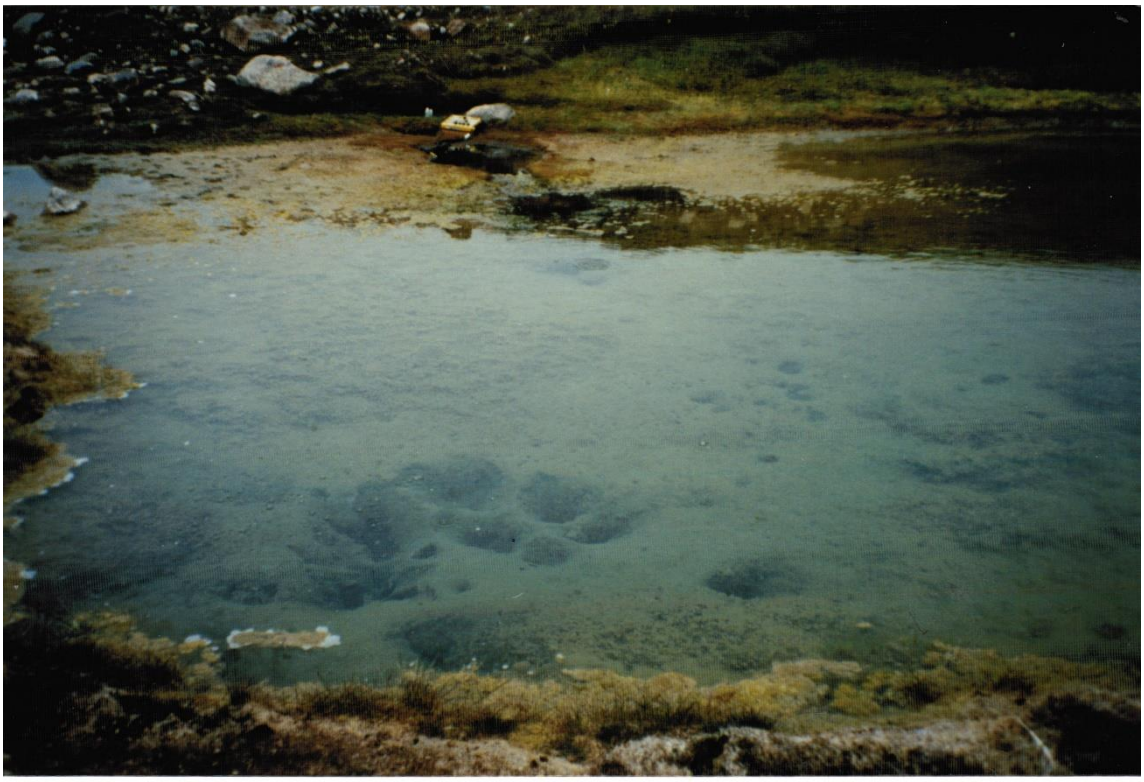
Møsabekken spring

NIKAS – Plura spring

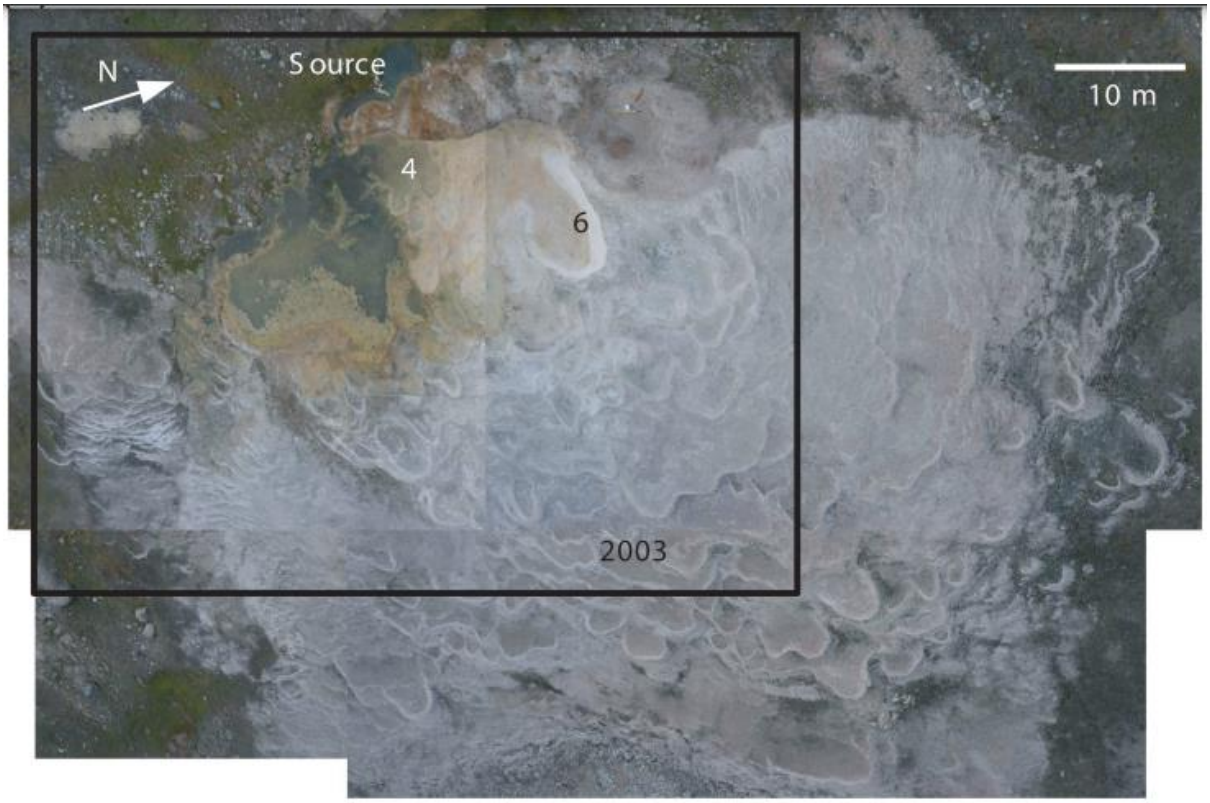


Map of Plura cave system by SE Lauritzen, and photo be Heidi Marie Nordahl

NIKAS – Troll and Jotun springs



Hot spring 2A4ii (2A4i in background), Trollkjeldene, Bockfjord, July 1996



(b)

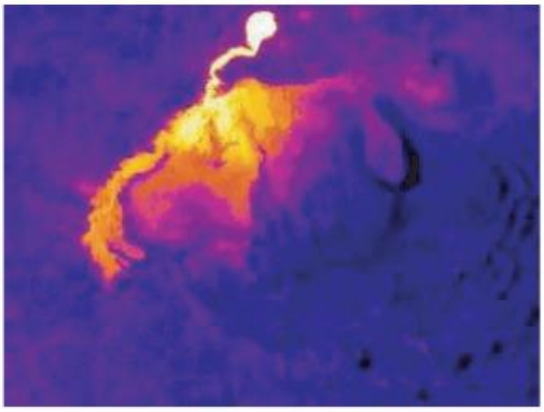
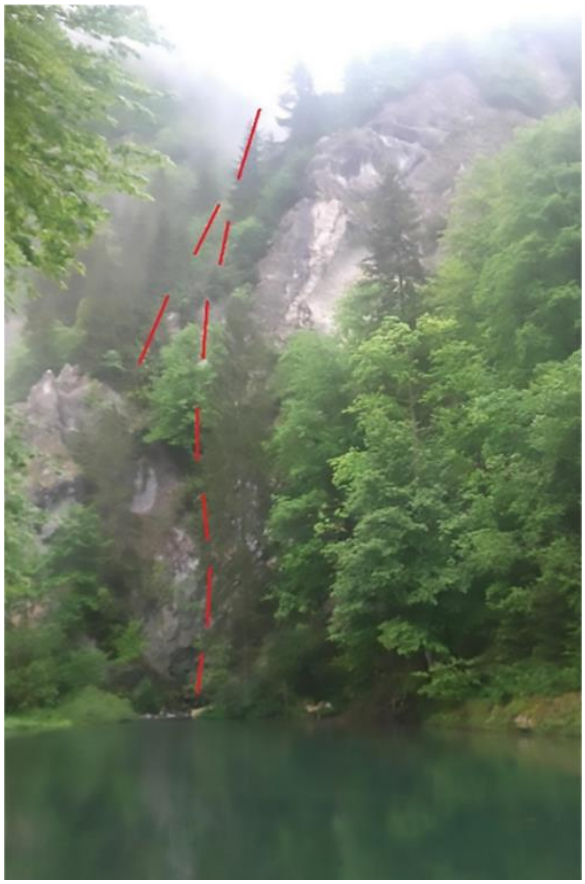


Fig.2: a) Overview images of the main Troll spring with associated travertine terraces taken from helicopter using a Nikon D100 SLR camera with 2000x3000 pixels The spring source is near the upper edge of the picture. Flooded regions around the spring source are seen as green or brown areas. The colors are produced by bacterial growth in wet regions. Field of view: 100 m. b) Infrared image of the flooded region around the spring source taken with an FLIR S40 infrared camera with 320x240 pixels on a microbolometer focal plane array with sensitivity better than 0.1°C. The temperature ranges from 5°C (dark blue) to 25°C (bright yellow). The temperatures were confirmed by ground readings using a resistance thermometer.

Switzerland

MIKAS - Source de l'Areuse

Areuse spring in high-water conditions



Fault over the Source de l'Areuse, the vauclusian type spring (courtesy of Z. Stevanović)

One of the sumps (left) and one cave passage (right) in the Rutelins cave

MIKAS - Source de l'Orbe

Picture of the Orbe resurgence. © Rémy Wenger, ISSKA.

The Orbe resurgence; the end of the river's underground journey. © Rémy Wenger, ISSKA.

The subterranean Orbe river. © Rémy Wenger, ISSKA.

United Kingdom

MIKAS – Bath Hot Springs

The Cross Bath Spring (photo provided by Thermae Bath Spa)

One of the Bath hot springs

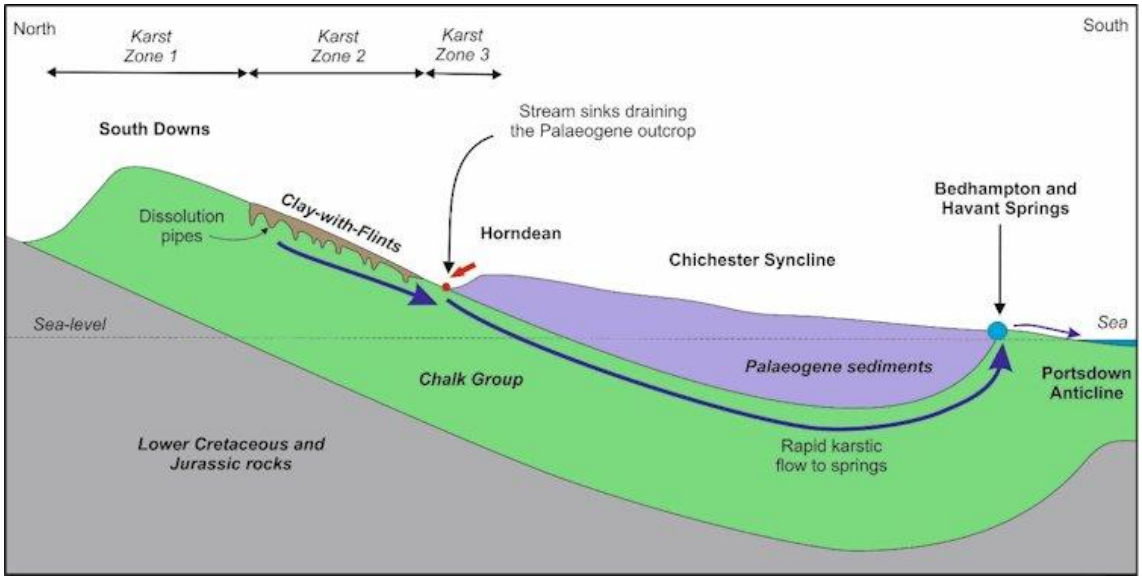
(photo copyright Alan Gray)

The old thermal baths fed by hot springs (photo copyright Alan Gray)

MIKAS – Bedhampton and Havant

Spring overflow following public supply abstraction (Photo copyright Portsmouth Water)

Spring upwelling hatch at the Public Water supply site (Photo copyright Portsmouth Water)

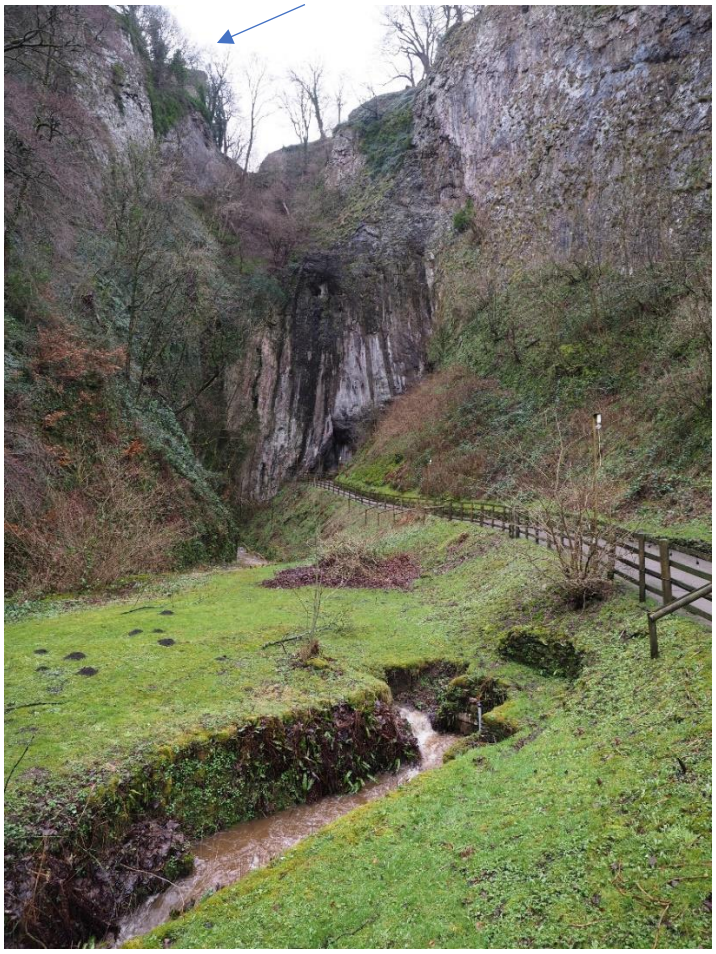


Schematic cross section showing flow to Bedhampton and Havant springs under the Chichester syncline, in karstic networks in the Chalk beneath the Palaeogene sediment cover. Geological material © NERC. All rights reserved. Topography © Crown Copyright reserved.

MIKAS – Castleton spring group

Photos of springs during high flow, 6 February 2022. All photos by John Gunn

Russett Well (note the pressure dome)

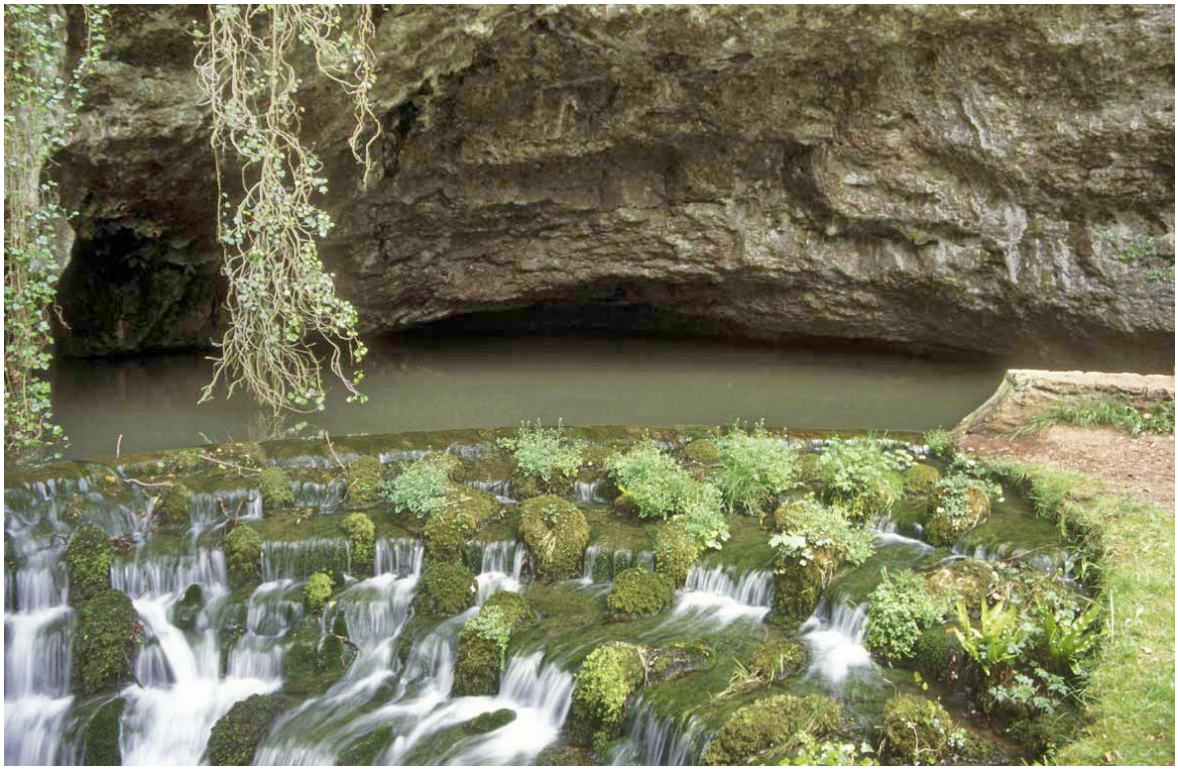


Peak Cavern Gorge. Slop Moll is in bottom right. Path on right leads to entrance of tourist cave "The Devil's Arse". Peak Cavern Rising is mid-left and is shown in detail on lower photo.

The arrow is pointing to the ruins of Peveril Castle

MIKAS – Wookey Hole spring

Wookey Hole Resurgence in context (photo by Andrew Farrant)



Wookey Hole Resurgence in detail (photo by Chris Howes)

Penelope Powell and Graham Balcombe kitted up in Wookey Hole Cave for the first ever cave dive in 1935. Historical photo courtesy of Mendip Cave Registry and Archive Cave Diving Group: Image and caption from: https://xray-mag.com/content/diving-then-and-now-wookey-hole-caves-birthplace-cave-diving