

Field study tour #1 – Vipava valley

All stops lie in the Vipava valley, SW Slovenia, whose northern flank consists of fold and thrust structure of the External Dinarides composed of a series of nappes of Mesozoic carbonates thrust over Palaeogene flysch. Such geological setting and steep slope morphology led to a number of various mass movements, which will be visited during the excursion.



STOP 1. First stop will be **Stogovce** landslide near the town of Ajdovščina. Landslide was triggered during an extreme precipitation event (300–520 mm) during the September 16th and 20th in year 2010. Material comprises debris of fractured Upper Triassic limestone and dolomite and weathered flysch, and due to its measured movements, is still capable of being transformed into a debris flow. Present movements (2012–mid 2015 period) are in range of several cm/month, with cumulative movement of 45 cm in this period., and depth to the slip surface was detected from 13 m to 25 m. From this stop, several huge carbonate blocks will also be visible on the slopes of Čaven mountain, which have detached from the high carbonate plateau and rotated during the transport. Transport ranges from 80 m to about 2 km, and block areas range from 7.5–175 ha.

STOP 2. We will continue to the nearby **Slano blato** landslide above the village Lokavec, one of the biggest mass movements in Slovenia. During the period of heavy rain on 17–19 November 2000, the landslide was reactivated as mudflow with velocities up to 60–100 m/day. The landslide is currently 1.4 km in length and boasts a volume of more than 1 mio m³. Several mitigation methods were

constructed, including a small rockfill dam, deep concrete shafts in the upper part, and two 2 m and 13 m high concrete dams. Present activity is constrained to the main scarp only.

STOP 3. We will stop at the **Hubelj spring**, among one of the largest water supply karstic springs in the Vipava valley. Spring emerges on the contact of Upper Triassic and Jurassic limestones, overthrust on Eocene flysch. The spring mean discharge is 3 m³/s, with minimum and maximum values from 0.2 m³/s to 59 m³/s. Apart from being the drinking water source for the town of Ajdovščina and surroundings, spring is important for the evolution of recent landslide morphology. Hubelj spring has eroded a large volume of a huge fossil rock avalanche deposits of nearby **Gradiška gmajna**, with thickness of carbonate gravel sediments up to 50 m. Estimated volume before the erosion is 19 mio m³, and present volume about 10 mio m³. Age of the event is not known.

STOP 4. Final stop will be in the **Rebrnice** region, a SW-facing slope that borders the Vipava Valley and the NE-lying Nanos Plateau in SW Slovenia. Several fossil and recent complex landslides appear in this region, with total volumes about 2.8 mio km³. We will visit the Podboršt landslide, one of the many landslides with open active deep fractures and mitigation measures (pile walls) close to the constructed highway, which transects the landslide body. Sediments mostly comprise the debris, carbonate gravel, and weathered flysch.

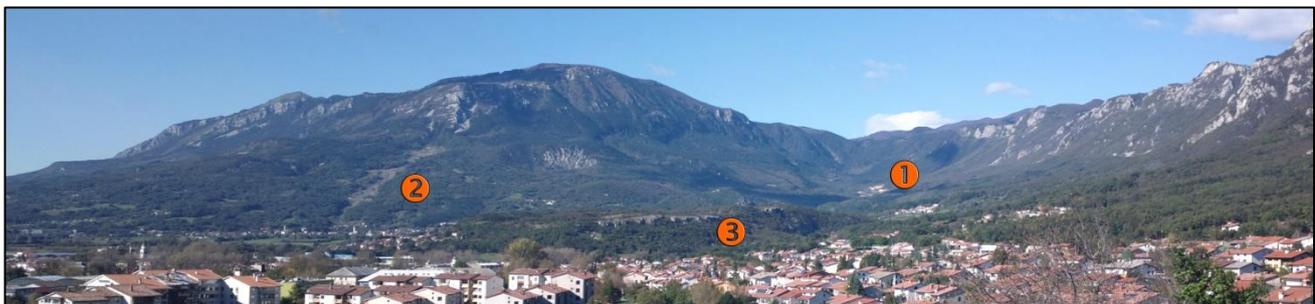


Fig 1. Landslides Stogovce (1), Slano blato (2) and Gradiška gmajna (3).



Fig 2. Landslide Podboršt (4).