Consider, for example, the case of aggregates (crushed stone, sand and gravel), which are crucial for infrastructure and construction. Their importance and role in the societies has evolved over time, and last few decades have seen dynamic changes. In parallel to these changes, the role of aggregates resource geologists has also changed, due to the requirements for data and information related to resources. In the increasingly complex world that we face more and more diverse geological information is required, not only information on deposit quantity and quality, but also other geo-oriented information that supports the economic, environmental and social aspects of deposit, quarry development, and the whole mine life cycle.

Many countries are rich in aggregates, but supply is not coordinated, which is the case within South East Europe. Among many challenges are illegal and damaging quarries, unreclaimed sites, limited recycling, and community opposition. Primary aggregates can only be extracted where they occur, but quarrying has had environmental and social impacts, including inefficient usage of water and energy, air pollution, and community disruption. These have given the industry a negative image, intensified by illegal quarrying, limited recycling of construction and demolition (C&D) wastes, and minimal use of quarry and industrial by-products.

Geologists form a major part of the project team of the South East Europe project entitled “Sustainable Aggregates Resource Management”. Main objectives of the project are to develop a common approach to sustainable aggregate resource management (SARM) and sustainable supply mix (SSM) planning, at three scales, to ensure efficient and secure supply in South East Europe. Efficient, low socio-environmental impact, quarrying and waste management is SARM. SSM promotes the use of multiple sources of aggregates, including recycled wastes and industrial by-products (slag) that together maximize net benefits of aggregate supply across generations. At the site level, the issues are high environmental impacts, limited recycling, the need for stakeholder consultation and capacity building, and lack of social license to operate. At the regional/national level, the issues are policies and regulations affecting aggregates that: do not address resource and energy efficiency or EU guidelines, preclude the use of recycled materials and industrial by-products, and fail to address aggregate consumption in long-term sustainable development and spatial planning. The transnational issues are lack of capacity and lack of coordination on aggregates production and transport among nations.

The project partnership has the requisite expertise for implementing the project, achieving the objectives and producing the planned outputs. These include: Recommendations on environmentally and socially acceptable quarrying, prevention of illegal quarrying, quarry waste management and opportunities for increasing the rate of recycling of quarry waste and construction and demolition waste, implementation of relevant EU legislation, and aggregates policy and management; manuals on SARM and SSM at the regional, national and transnational spatial scales, and methodology of life cycle assessments in the primary and secondary aggregates sectors.

The impact of fault zone and fractures on the discharge rate of Sasan Spring, Kazerun, Southern Iran

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Carbonate aquifers typically exhibit complex groundwater flow patterns, mainly due to depositional heterogeneities, faulting, fracturing and karstification. Sasan spring is a significant karst groundwater discharge point in the Kazerun area, one the most important karstic region of the southern Zagros in southern Iran. The annual precipitation, recharge coefficient and apparent catchment area of the Sasan spring are 524 mm, 37%, and 36.2 km², respectively. On this basis, the annual discharge of the spring is expected to be 7 MCM. However, the actual measured annual discharge of the spring is 91.4 MCM, some thirteen times larger than 7 MCM. It therefore seems that a major part of the recharge source to the spring is supplied form the adjoining watershed through a fault zone and the associated

fractures. To find the source of this extra water, the geometrical properties and the permeability of the associated fault zone of the local Amui fault have been analyzed. The results show that the overall setting of this fault is a conduit-barrier fluid flow system with a uniform structure. The mentioned extra recharge occurs through the carbonate rocks in the eastern part of local Salbiz and Ghandil anticlines along the Kazerun fault zone. It then reaches the Sasan spring by the Amui fault and associated fractures.

A climatic investigation of precipitation amount associated with 500-hpa cyclones which are affecting the Greek territory during warm period of the year

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An objective analysis of 500-hPa cyclones (500-hPa lows) is performed during the warm period (15 Apr-15 Oct) of the year for central and east Mediterranean regions. A 40-year (1958-1997) data basis of geopotential height values with a detailed (2.5°X2.5°) spatial and temporal (00, 06, 12, 18 UTC) resolution is used in the study. Lows are determined as local minima in each 3X3 matrix of geopotential height values for every grid point in the area of study. A gradient criterion between the central point and the surroundings is additionally applied to exclude weak lows, which probably originate from the assimilation procedure. A sub-area which consists of 36 grid points and includes the Greek peninsula is selected for the investigation of relationship between cyclone occurrence and precipitation amount. Cyclone occurrence is classified in nine groups consisting of four (4) grid points each. During the domination of these cyclones, daily precipitation amounts where determined from precipitation data collected at a 20-station network, which was operational during the same time period. In cases of multiple cyclone occurrences per day, the location of the deepest cyclone was selected. The spatial distribution of average precipitation amount in each of the nine cyclone groups is plotted and discussed. The comparison of these nine distributions revealed three major factors affecting the location of frequency maxima and minima. The first is low-level instability, the second is orography and the third is positive vorticity advection associated with 500-hPa cyclones.

Cretaceous alkali basalts from the Pieniny Klippen Belt

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Occurrences of mafic alkaline volcanics are scattered all around Europe, being mostly related to anorogenic, extensional tectonic environments. While the widespread Cenozoic alkaline basalts have been intensively studied and are rather well known, their Cretaceous precursors are often involved in the Alpine-Carpathian orogenic zones, therefore their genesis and geodynamic setting are partially obscured by superimposed deformation and alteration. We describe a newly discovered body of alkaline basalts in the central part of the Pieniny Klippen Belt – Vršatec, then, farther to the east, dike bodies of Hanigovce and in the Ukrainian part of the klippen belt, alkaline basalts of Velikij Kamenec. The basalt at Vršatec is lying within the mid-Cretaceous deep-marine pelagic sediments of the Pieniny Klippen Belt in western Slovakia. The body consists of hyaloclastic lavas of basanitic composition. There is not revealed any direct contact of the Hanigovce bodies with the surrounding sediments; however, due to missing signs of contact metamorphosis in their close environment –