Organisation des Nations Unies pour l'education, la science et la culture

Géoparcs mondiaux UNESCO

Applicant UNESCO Global Geopark

National Geopark Ries, Germany

Geographical and geological summary

Map of National Geopark Ries, showing the location of the aspiring UNESCO Global Geopark:

● Aspiring UNESCO Global Geopark

Map of the aspiring UNESCO Global Geopark indicating the boundary, cities, general geographic points.

1. Physical and human geography

The National Geopark Ries is in the middle of southern Germany at coordinates:

48°50‘07‘‘ N / 10°37‘17‘‘ E.

Driving time to nearby cities (Munich, Stuttgart, Nuremberg, Augsburg, Ulm) is 1-1.5 hours. Distance to national borders is: west, France, 4 hours; east, the Czech Republic, 4 hours; south, Austria, 2.5 hours. The Geopark encompasses the Nördlinger Ries with crater basin and rim as well as areas of the ejecta blanket still preserved today in adjacent regions of the Swabian and Franconian Alb. The major part of the total Geopark area is in Bavaria, a smaller portion in Baden-Württemberg. It comprises parts of 5 districts with 53 cities and municipalities, of which 46 communities lie in Bavaria (79 % of the total surface area) and 7 in Baden-Württemberg. The outer border of the Geopark is also the border of the respective municipality. The Nördlinger Ries, a flat, round, ca. 150m deep depression of about 25 km in diameter (“Ries basin“) forms the border between the Franconian Alb in the east and the Swabian Alb in the west. Population density is 93 residents per km². The region has one of the lowest unemployment rates (2.2 % annual average) in Germany. The Geopark area has a total of 84 schools, including: 6 secondary, 8 junior-secondary, 2 commercial secondary, 13 middle, 7 vocational, 6 special education and 42 elementary.

2. Geological features and geology of international significance

The 14.6-million-year-old meteorite crater Nördlinger Ries, situated between the Swabian and Franconian Alb in southern Germany, is considered the most intensively studied impact structure among the nearly 200 known craters worldwide. Since the 1960s much geo-scientific special impact-indicative features have been unraveled here: Typical Suevite as an impact breccia rather than a volcanic rock, containing high-temperature and high-pressure minerals (e.g., coesite, stishovite, lonsdaleite diamond), diaplectic plagioclase glasses, and mechanical planar deformation features. Most were first described from this area. Based on NASA experiments and a synopsis of lithological, petrological, mineralogical and geophysical field and laboratory data, a detailed model of the impact "story" with mainly 3 stages (contact/compression, excavation, crater modification) as the result of a progressive shock metamorphism could be acquired. Complex ejecta placement (roll-and-glide, ballistic) is still a matter of debate. The development of a post-impact soda lake in the crater depression left behind bituminous shales and lacustrine carbonates with unique fossil associations (e.g., the only known green algae reefs). With its still high interdisciplinary scientific potential (see graph), the Ries Crater can be rated as an indicative reference and challenge for further analyses of terrestrial and extraterrestrial impact structures. The Ries remains the focus of high scientific interest.