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Geo-biodiversity and cultural environment of Nisyros volcano

V. Antoniou[1], P. Nomikou[1], E. Zafeirakopoulou[1], P. Bardouli[1], T. Ioannou[1]

(1) Department of Geology and Geoenvironment, National and Kapodistrian University of Athens, Panepistimioupoli Zografou, 15784 Athens, Greece

Story maps are widespread as an interactive tool used for science and spatial data communication, information and dissemination. A web-based application using story mapping technology is here presented to show the walking paths and routes of Nisyros volcano, Dodecanese, Greece (Figure 1). A tailored story map that combines thematic webmaps, scenes (3D webmaps), narrative text and multimedia content was created to highlight the geological and cultural environment of Nisyros. The webmaps and scenes were entirely created by a Geographic Information System (GIS) having a great impact on web-based visual presentations.
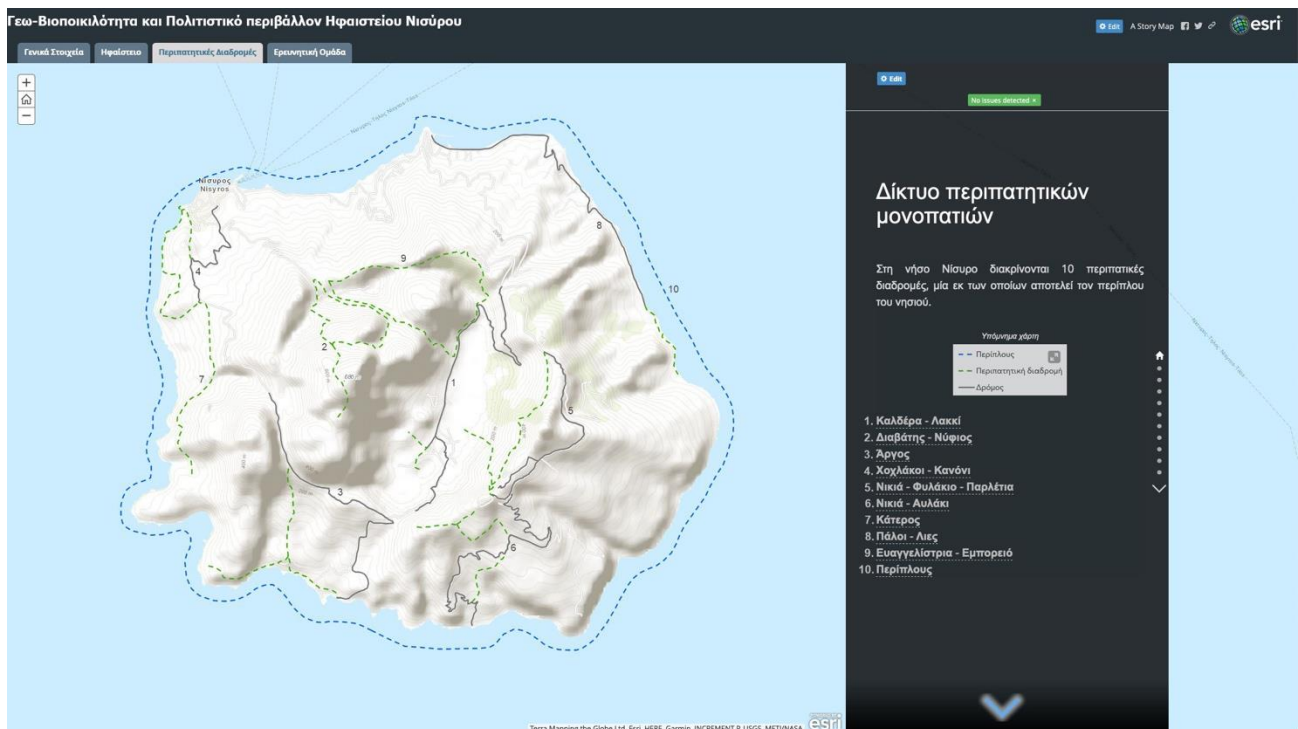

Figure 1. Walking paths and routes of Nisyros Volcanic Island (1. Kaldera - Laki, 2. Diavatis - Nifios, 3. Argos, 4. Hohlaki - Kanoni, 5. Nikia – Filakio - Parletia, 6. Nikia-Avlaki, 7. Kateros, 8. Pali-Lies, 9. Emporios – Laki - Evagelistria, 10. Circumnavigation, ---- path, — road)

The island of Nisyros was selected as it presents unique characteristics. It is one of the smaller islands of Dodecanese islands in the eastern Aegean Sea covering an area of 42 km2 and having an almost circular shape with a total width of 8.5 km and a coastal circumpherence of about 25 km,. It is composed of Quaternary volcanic rocks with a central caldera diameter of approximately 2.8 km surrounded by volcanic domes and thick lavas averaging about 550 m height with Profitis Ilias mountain having the maximum altitude of 698 m (Nomikou & Papanikolaou, 2011).

The history of Nisyros is strongly connected to the volcano, and impresses the visitors with its steaming hydrothermal craters, intensive smell of sulphur and fumarolic gases and hot springs on its northern and southern shores (Dietrich, 2018). Due to its volcanic morphology and geographical position, in the southeast corner of the Aegean Sea, which make it a rather inaccessible island, the cultural and historical heritage of the island have been unchanged in time. Nisyros Island combines the volcanic history and natural beauty with the splendor of art and civilization, expressed through prehistoric and historic locations and monuments. The interpretations vary regarding the names of the island: Porphyris, Kisiris and Nisyros. The first references are present from Early Neolithic times, in the form of relicts from the "Cycladic and Minoan" civilizations. Historical records start from the Hellenistic epoch continuing through Roman, Byzantine, Venetian and Ottoman eras till modern times (Dietrich, 2018). All these periods bequeath to the island plenty of churches, monasteries with hagiographic frescoes, castles, caves and spas.

In the presented application, the aim was to present the geodiversity, the cultural environment and the biodiversity (unique flora and fauna) along the paths of the volcano. Using Story Maps, this relative new geographical approach, having open source code, provides many possibilities, as it is easy to be used both from the developer and from the end user and allows integration of new functions combining many scientific fields in order to disseminate and understand scientific findings to broader non-technical audiences (Janicki et al., 2016; Wright et al., 2014). Furthermore it is

responsive, and it can be also as interactive as the developer wishes. Users can navigate easily through the content, using either the sequence of the predefined tabs or jumping from one to another according to their will.

The developed application can be an ideal way for presenting the geological, geomorphological and historical contents of other places, especially places which can be characterized as geotopes or protected areas worldwide (e.g. Natura 2000 areas) (Antoniou et al, 2018). Finally, as Nisyros volcano portrays a geotope, this application provides a quick access of the available information to a wide audience, developing the interest and possibly motivating the public to learn more about the volcanic landscape of Nisyros, or even to visit it.

Acknowledgements

References

Antoniou, V., Ragia, L., Nomikou, P., Bardouli, P., Lampridou, D., Ioannou, T., Kalisperakis, I. and Stentoumis, C., 2018. Creating a Story Map Using Geographic Information Systems to Explore Geomorphology and History of Methana Peninsula. ISPRS Int. J. Geo-Inf. 2018, 7(12), 484.

Dietrich W., 2018. Geography, Nature and Habitation of Nisyros Volcano. Editors: Dietrich, Volker Jörg, Lagios, Evangelos (Eds.), p. 1-12. Hardcover ISBN 978-3-319-55458-7

Janicki, J., Narula, N., Ziegler, M., Guénard, B. and Economo, E.P., 2016. Visualizing and interacting with large-volume biodiversity data using client–server web-mapping applications: The design and implementation of antmaps. org. Ecological Informatics, 32, 185-193.

Nomikou P. & Papanikolaou D. 2011. Extension of Active Fault Zones on Nisyros Volcano across the Yali-Nisyros Channel based on Onshore and Offshore data. Marine Geophysical Research, Special issue on «Seafloor Mapping for Geohazard Assessment», DOI 10.1007/s11001-011-9119-z.

Wright, D.J., Verrill, A., Artz, M. and Deming, R., 2014. Story maps as an effective social medium for data synthesis, communication, and dissemination. In Proceedings of the Fall Meeting 2014, San Francisco, CA, USA, 15–19 December 2014.