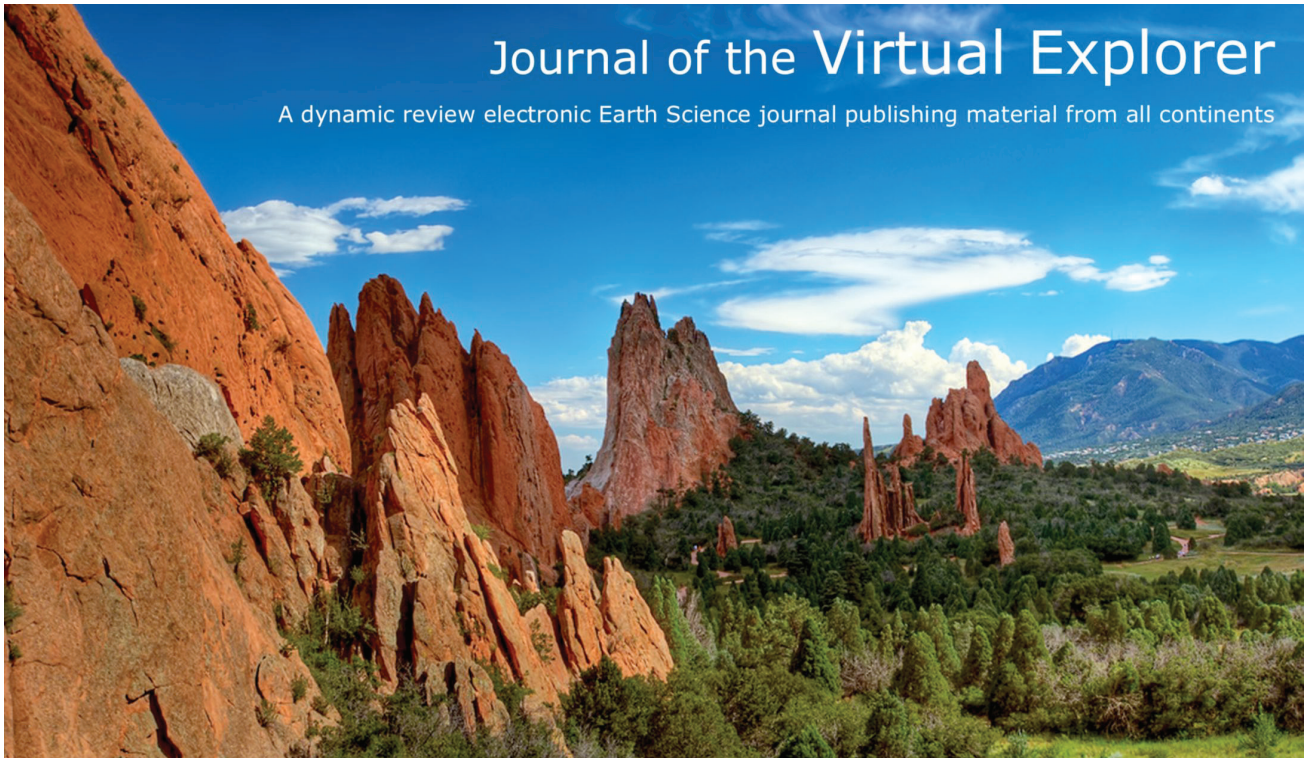

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A methodological proposal for the assessment of cliffs equipped for climbing as a component of geoheritage and tools for Earth Science education: the case of the Verbano-Cusio-Ossola (Western Italian Alps)

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IN THIS ARTICLE

Subduction-collision mountain chains are regions where complex geological and geomorphological features due to several Earth-forming processes are exposed. They are characterized by high geodiversity with respect to other geological regions. The sites representing the best examples of these features are referred to as "geodiversity sites", and, if assessed as valuable for geoconservation and/or popularization, are called "geosites" and form the "geoheritage" of a region. In particular cases, as cliffs equipped for climbing, the observations of geological and geomorphological elements are highly favored by the cleanliness of the outcrops and site accessibility. At these sites, the popularization of Earth Science may be mediated by a sport activity that is strictly dependent on their physical features. The Verbano-Cusio-Ossola Province (VCO; Western Italian Alps) is a region characterized by a long mountaineering tradition and occurrence of several cliffs equipped for climbing located in a relatively narrow area. In the present paper, the most suitable climbing sites to be considered part of the geoheritage of the VCO have been detected through a quantitative assessment. The 14 identified geodiversity sites were evaluated using a methodology already tested on other geosites and slightly modified to fit the aim of the present analysis. In order to test the efficacy of the assessment procedure, a pilot educational project aimed at lower secondary school students was developed at three specific climbing sites, based on the ranking results. The test of the applied methodology has been inserted in a wider educational application that considers the use of rock samples and virtual strategies that introduce students to the three major families of rocks (igneous, metamorphic, and sedimentary) and landscape modeling. The educational project results confirm the efficacy of the assessment methodology proposed here for selecting the most valuable climbing geosites suitable for Earth Science education.