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V3Geo: A cloud-based platform for sharing virtual 3D models in geoscience

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V3Geo is a cloud-based repository for virtual 3D models in geoscience, allowing storage, searching tools and visualisation of 3D models typically acquired through photogrammetry (structure-from-motion), laser scanning or other laboratory-based 3D modelling methods. The platform has been developed to store and access 3D models at the range of scales and applications required by geoscientists – from microscopic, hand samples and fossils through to outcrop sections covering metres to tens of kilometres. A 3D web viewer efficiently streams the model data over the Internet connection, allowing 3D models to be explored interactively. A measurement tool makes it possible for user to measure simple dimensions, such as widths, thicknesses, fault throws and more. V3Geo differs from other services in that it allows very large models (consisting of multiple sections), is designed to include additional interpretations in future versions, and focuses specifically on geoscience through metadata and a classification schema.

The initial version of V3Geo was released in 2020 in reaction to the COVID-19 pandemic, with the aim of providing virtual tools in a time of cancelled field excursions, field-based courses and fieldwork. The repository has been accepting community contributions, based on a guideline for preparing and submitting high quality 3D datasets. Contributions are subject to a technical review to ensure underlying quality and reliability for scientific and professional usage. Model description pages give an overview of the datasets, with references, and datasets themselves are assigned Creative Commons licences. The 3D viewer can be embedded in webpages, making it easy to include V3Geo models in virtual teaching resources. V3Geo allows increased accessibility to field localities when travel or mobility is restricted, as well as providing the foundation for virtual field trips. The database currently includes around 200 virtual 3D models from around the world, and will continue to develop and grow, aiming to become a valuable resource for the geoscience community. Future updates will include tools to facilitate upload and technical review, interpretations and Digital Object Identifiers.