The Magnetics Information Consortium (MagIC) Data Repository: Status and Future Evolution

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MagIC (earthref.org/MagIC) is dedicated to improving research capacity in the Earth and Ocean sciences by maintaining an open community digital data archive for rock and paleomagnetic data with portals that allow users access to archive, search, visualize, download, and combine versioned datasets. We are a signatory of the Coalition for Publishing Data in the Earth and Space Sciences (COPDESS)'s Enabling FAIR (Findable, Accessible, Interoperable, and Reproducible) Data Commitment Statement and an approved repository for the Nature set of journals. In collaboration with EarthCube's GeoCODES data search portal, we have been adding schema.org JSON-LD headers to our data set landing pages and suggesting extensions to schema.org when needed. Collaboration with the European Plate Observing System (EPOS)'s Thematic Core Service Multi-scale laboratories (TCS MSL) is ongoing with MagIC sending its contributions' metadata to TCS MSL via DataCite records.

Improving and updating our data repository to meet the demands of the quickly changing landscape of data archival, retrieval, and interoperability is a challenging proposition. Most journals now require data to be archived in a "FAIR" repository, but exact specifications for FAIR are still solidifying. Some journals vet and have their own list of accepted repositories while others rely on other organizations to investigate and certify repositories. As part of the COPDESS group at Earth Science Information Partners (ESIP), we have been and will continue to be part of the discussion on the needed and desired features for acceptable data repositories.

We have made continued improvements to MagIC's data validation system and the PmagPy paleomagnetic analysis software suite. Datasets created with PmagPy (earthref.org/PmagPy/cookbook/) or other uploads with the correct method code descriptions can be downloaded from MagIC and viewed using PmagPy. We are actively developing our software and systems to meet the needs of our scientific community. Some current issues are: ensuring coordinated workflows with journals to simultaneously publish the journal article and data in MagIC, sustainability of data repository funding especially in light of the greater demands on repositories due to data policy changes at journals, and how to best share and expose metadata about our data holdings to organizations such as EPOS, EarthCube, and Google.

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