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Overcoming the challenges of terminological diversity within different scientific fields to enhance the accessibility, discoverability, and collaborative potential of ESS data

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The integration of scientific data across disciplines and stakeholders is crucial for advancing Earth system sciences (ESS) and ensuring data accessibility and usability. One of the primary challenges in this context is the terminological diversity found within different scientific fields, as well as between stakeholders with varying levels of expertise. Standardized metadata and effective metadata (MD) mappings are essential tools for overcoming this challenge, serving as a "translation" layer that enhances the visibility and usability of ESS data across language barriers and scientific domains. In our contribution we highlight the BITS project as a pioneering pilot initiative aimed at the integration of terminologies and services within ESS, with a focus on standardizing metadata and improving data interoperability. The project leverages key frameworks such as provided by NFDI4Earth, base4NFDI, and TS4NFDI, ensuring alignment with international best practices in data integration and sharing. By examining the role of standardized metadata in connecting diverse ESS stakeholders, we demonstrate how terminological harmonization and service integration can bridge disciplinary gaps, enhancing the accessibility, discoverability, and collaborative potential of ESS data. This opens new opportunities for data centers to contribute with their data to transdisciplinary research on sustainability challenges.