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Improved Usability in Modern Geochemical Data Systems: Lessons Learned from Usability Benchmark & Beta Testing EarthChem Search

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EarthChem Synthesis, known to users as PetDB, contains approximately 6,000,000 individual chemical analyses from natural physical samples, and is widely used by geochemical, petrological, mineralogical, and related communities. In this presentation, we will share best practices in User Interface design applicable to similar data systems that support the (FAIR) Findability, Accessibility, Interoperability, and Reuse of geochemical data. These best practices are grounded in user feedback and design improvements resulting from early testing of PetDB in 2020 and follow up beta testing of EarthChem Search Version 0.1 at AGU in 2021. Specifically, we highlight the importance of visibility of search status and selections, using the user community's language for user interface elements, supporting corrective actions when users make accidental selections, providing consistency of search query inputs and displayed outputs, and promoting information recognition over recall as users navigate through the search workflow. Each of these principles will be illustrated with “before” and “after” views comparing the PetDB search to the newly minted EarthChem search.