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Addressing knowledge and know-how biases in the environmental sciences with modern data and compute services

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Environmental scientists typically need to access data from a variety of sources, analyze and process them with different tools, and model them on heterogeneous IT systems. Gathering all the necessary knowledge and executing the corresponding workflows repeatedly consumes a lot of the researcher's time, which leads to a problem we call the "knowledge and know-how bias": Scientists will generally prefer data from sources they are familiar with, and focus on computational methods and tools they know.
This undesirable situation can be improved by services that help scientists with their core workflows in data-driven research. We believe that optimizing scientific workflows – which in the environmental sciences typically involve data and metadata in diverse formats, as well as a vast variety of software stacks and libraries for data analysis – should not be the primary task of a scientist, but rather a central service of modern scientific data and computing centers. With their expertise in this area, they can provide scientists with specifically tailored, yet flexible solutions. With this aim in mind, we exemplarily discuss efforts to set up closer collaborations between scientists and the Leibniz Supercomputing Centre (LRZ, Garching, Germany). High-level IT services developed in such contexts will enable environmental scientists to shift the focus of their work away from the search for data and methods towards their actual research, and reduce the knowledge and know-how biases of their work.