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Criteria for the evaluation and certification of long-term digital archives in the earth sciences

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Digital information has become an indispensable part of our cultural and scientific heritage. Scientific findings, historical documents and cultural achievements are to a rapidly increasing extent being presented in electronic form - in many cases exclusively so. However, besides the invaluable advantages offered by this form, it also carries a serious disadvantage: users need to invest a great deal of technical effort in accessing the information. Also, the underlying technology is still undergoing further development at an exceptionally fast pace. The rapid obsolescence of the technology required to read the information combined with the frequently imperceptible physical decay of the media themselves represents a serious threat to preservation of the information content.

Many data sets in earth science research are from observations that cannot be repeated. This makes these digital assets particularly valuable. Therefore, these data should be kept and made available for re-use long after the end of the project from which they originated. Since research projects only run for a relatively short period of time, it is advisable to shift the burden of responsibility for long-term data curation from the individual researcher to a trusted data repository or archive. But what makes a trusted data repository?

Each trusted digital repository has its own targets and specifications. The trustworthiness of digital repositories can be tested and assessed on the basis of a criteria catalogue. This is the main focus of the work of the nestor working group "Trusted repositories - Certification". It identifies criteria which permit the trustworthiness of a digital repository to be evaluated, both at the organisational and technical levels. The criteria are defined in close collaboration with a wide range of different memory organisations, producers of information, experts and other interested parties. This open approach ensures a high degree of universal validity, suitability for daily practical use and also broad-based acceptance of the results. The criteria catalogue is also intended to present the option of documenting trustworthiness by means of certification in a standardised national or international process. The criteria catalogue is based on the Reference Model for an Open Archival Information System (OAIS, ISO 14721:2003)

With its broad approach, the nestor criteria catalogue for trusted digital repositories has to remain on a high level of abstraction. For application in the earth sciences the evaluation criteria need to be transferred into the context of earth science data and their designated user community.

This presentation offers a brief introduction to the problems surrounding the long-term preservation of digital objects. This introduction is followed by a proposed application of the criteria catalogue for trusted digital repositories to the context of earth science data and their long-term preservation.