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Plans and challenges for FAIR and open data and an enhanced transparency of the IPCC Seventh Assessment Report

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The Intergovernmental Panel on Climate Change (IPCC) has been providing climate Assessment Reports (ARs) since 1988, which document the state of climate change and future projections under various options for action. These ARs form the basis of international agreements and actions. UN Secretary-General Guterres described climate action as “the 21st century’s greatest opportunity to drive forward all the Sustainable Development Goals.” (Guterres, 2023). Data is an important basis for action and the transparency of data generation is a key contribution to trust in AR results.

Within the IPCC, the Task Group on Data Support for Climate Change Assessments (TG-Data) provides guidance on the curation, traceability, stability, availability and transparency of data and facilitates the availability and consistent use of climate change-related data through the work of the Data Distribution Centre (DDC) and the Working Group (WG) Technical Support Units (TSUs).

DDC Partners and WGI TSU made a concerted effort to improve the transparency of the IPCC’s Sixth Assessment Report (AR6) by documenting the generation of figures and archiving figure datasets, figure generation software, key intermediate data products and key input data collections (Pirani et al., 2022; Stockhause et al., 2024a). This work and the experiences of the WGI partners and the AR6 WGI authors were incorporated into the formulation of the IPCC TG-Data recommendations for AR7, involving WGII and WGIII (IPCC, 2023; Stockhause et al., 2024b). The recommendations include:

- Exhaustive treatment of figure generation for all reports including data and software preservation in the DDC;
- Support of authors with training and tools in providing figure data and documenting the figure generation process;
- Intensified collaboration with sibling platforms like the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and with related scientific and technical organizations like the Coupled Model Intercomparison Project (CMIP) and Coordinated Regional Climate Downscaling Experiment (CORDEX) of the World Climate Research Programme (WCRP) and the Research Data Alliance (RDA);
- Improved documentation and accessibility of input data citations and the provenance of figure generation in the AR7.

The AR6 WGI concept of open and FAIR data and traceable results was presented at the International Data Week (IDW) 2018 in Gaborone (Stockhause et al., 2019) and its implementation in AR6 at the IDW 2023 in Salzburg (Stockhause et al., 2023). The focus at IDW 2025 in Brisbane lies on the ongoing work for an improved and more comprehensive implementation:

Initial work on the workflow, metadata schema updates and Complex Citation/provenance was carried out under the condition of an uncertain funding situation of several DDC Partners. Therefore, every implementation plan includes a fallback solution in case no funding can be found for its (full) implementation. The Complex Citation/provenance plan is presented as an example for the ongoing implementations of TG-Data’s recommendations for AR7. The DDC has reached out to developers of key community frameworks (ESMValtool and CMIP Rapid Evaluation Framework), providers of common interactive data science tools (Jupyter and Notebooks Now! projects) and the RDA Complex Citation WG (Agarwal et al., 2025) to align IPCC requirements with these groups. Several technical challenges have already been identified, but the main challenge lies

in the coordination and collaboration across different and sometimes very large and diverse groups (IPCC, infrastructure, RDA) and the required acceptance by different stakeholders (including IPCC authors, DDC Partners, IPCC WGs, funders, indexers and publishers). Furthermore, the scale of IPCC AR7 brings additional challenges. This is relevant both in terms of number of authors, but also in the number of figures and the associated number of digital objects with complex interrelationships as well as the need for a stepwise implementation under multiple uncertainties (funding, national/institutional support, availability of technical solutions, etc.).

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