

# Guidance on how to release USGS model output files

This document provides guidance for release of output files from numerical models, in order to ensure the quality and integrity of these scientific products. USGS Mission Areas, Programs, and Science Centers may have additional requirements.

More complete guidance for the release of the complete model package is in development.

The way to release output files that USGS generates using computer models is through the data release process. The following data release requirements apply:

1. The process of review and approval for release of model output files is recorded in the Information Product Data System (IPDS), using the data release procedures. The output file, the metadata record, and the information presented on the landing page should all be reviewed, and the review documentation entered into IPDS to document and support the approval and compliance with USGS Fundamental Science Practices (FSP).
2. Approval for release is delegated to the Science Center Directors, because model output files are not interpretive products.
  - a. Interpretive aspects of the model that produced the output file should be described in an interpretive report, which must be released no later than the output file.
  - b. Metadata records, landing page text, and other materials that are released with the model output file should not discuss its meaning or consequences. Such interpretive topics should be published in an interpretive report that is released no earlier than the output file.
3. The released output file should be accompanied by a standard metadata record that is submitted to the USGS Science Data Catalog.
4. The released output file should be registered for a USGS DataCite DOI, which links to a landing page that provides access to the file, the metadata, additional descriptive information (see below), and any related publications. The DOI is in the online link field (citation section of the metadata) and the network resource field (distribution section of the metadata). The DOI is entered as the full URL (i.e., <https://doi.org/10.5066/xxxxxxx>).
5. The authoritative version of the output file, metadata record, and other descriptive materials should be preserved by USGS, although they may be distributed to the public by an acceptable non-USGS repository.

The following items are specific to the release of output files that are generated using computer models:

6. The landing page for release of the output files must provide access to complete information about the model version, configuration, settings and parameters used, and input data used in generating the output data file. The input data, configured model and any applicable model setting are often packaged in an archive bundle that is distributed as a single zip file.

7. The landing page must provide access to the model that was used to generate the output file, as well to publications about the model, especially those that explain the model's limitations and appropriate use.
8. Numerical model output files are sometimes so large that simple network download is unrealistic. This problem can be solved by use of a data server such as THREDDS or ERDDAP that allows subsets to be downloaded, or by offering a summary table or graphic for download, while providing alternative methods for obtaining the complete output file.
9. Model output files should be released in a format that preserves the original accuracy and precision while also being suitable for further automated processing. For example, original data in a curvilinear grid should be available, although derivative files that are converted to rectilinear coordinates can also be provided with accompanying metadata records that indicate the additional process step and resulting loss of precision.
10. Review of a model output file for release involves additional steps to verify that sufficient information is available to enable use of the model software to recreate the output data.