**The ‘WMO Stewardship Maturity Matrix for Climate Data’ Template**

Document ID: WMO-SMM-CD-0003; Version: v03r01 20190227

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| **Steps for carrying out a self-evaluation of data stewardship maturity of a dataset:**   1. Download the latest **WMO** Stewardship Maturity Matrix for Climate Data **(SMM-CD)** template file from doi:10.6084/m9.figshare.7003709; 2. Go over the whole file and read the disclaimer carefully before using the template; 3. Enter dataset and relevant Point-Of-Contacts (POCs) information in the **WMO SMM-CD** metadata section; 4. Read the content of **WMO SMM-CD**; for additional background information, download and read the guide for the SMM-CD from doi: 10.6084/m9.figshare.7002482; 5. Go through each Category with its relevant Aspects, identify the stewardship practices applied to the dataset, and document your rating and justifications; 6. Obtain any additional information if necessary and, if any, restrictions should be stated; 7. Review the results and fill in the matrix cells with the defined color scheme (provided in Table I); 8. Capture the assessment results in the **WMO SMM-CD** metadata section and in the header **‘Stewardship Maturity Ratings’** for each Aspect, along with the evidences.   **Assumptions:**   * Datasets are digital environmental data products that are publicly available online. * Evaluators who use this template have a basic knowledge of or are able to obtain information about conventions or standards relevant to practices examined in each key component in the community that datasets are produced for or/and provided to. |
| **Creative Commons License** – Attribution (BY)-NC (Non-Commercial) |
| **Disclaimer:** This template is provided “as is” without any representations or warranties, express or implied. WMO makes no representations or warranties in relation to this template or the information and materials provided on this template. Use for the template is intended for use as a preliminary stewardship maturity assessment of a dataset, utilizing the latest **WMO SMM-CD**. Examples in the SMM-CD manual for each category with its individual aspects are provided only to help users of the SMM-CD to better understand the meaning of the languages used in the matrix. No endorsement or preference is intended.  WMO will not be liable to you or a third party (data provider, data user, contractors, etc.) in relation to the contents of, or use of, or otherwise in connection with, this temple for any direct loss, for any indirect, special or consequential implications on business, reputation or goodwill or misinterpretation and misuse of the dataset for which maturity assessment was made using this template.  The layout or/and content of the matrix and template are subject to change any time without notification.  Subject Matter Experts (SME) who carried out their self-evaluations of the **WMO SMM-CD** of their datasets are encouraged to document justifications in detail (with URL links if applicable) and make them available to data users at the dataset web sites to allow transparency and feedback from the data users.  Any opinions or recommendations expressed here are those of the people who have carried out the assessment and do not necessarily reflect the views of WMO, CICS-NC, or NCEI. |

**WMO Stewardship Maturity Matrix for Climate Data (SMM-CD) Assessment as of <MM/DD/YYYY>**

**for <Dataset Short Name>**

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| **Dataset Title** |  |
| **Dataset Information URL** |  |
| **Data Provider POC (Name; E-mail; Affiliation)** |  |
| **Dataset POC (Name; E-mail; Affiliation)** |  |
| **WMO SMM-CD Version (Document ID and Version Number)** | WMO-SMM-CD-0001-v03r00-20190128 |
| **WMO SMM-CD POC (Name; E-mail; Affiliation)** | Christina Lief; Christina.lief@gmail.com; WMO and Ge Peng; [Ge.Peng@noaa.gov](mailto:Ge.Peng@noaa.gov); North Carolina State University, Cooperative Institute for Climate and Satellites, North Carolina (CICS-NC) at NOAA’s National Centers for Environmental Information (NCEI) |
| **WMO SMM-CD Template Version (Document ID and Version Numbers)** | WMO-SMM-CD-0003-v03r01-20190227 |
| **WMO SMM-CD Template POC (Name; E-mail; Affiliation)** | Christina Lief; Christina.lief@gmail.com; WMO |
| **Assessment Version (v<nn>r<mm>, e.g., v01r00)** |  |
| **Assessment Date (MM/DD/YYYY)** |  |
| **Assessment POC (Name; E-mail; Affiliation)** |  |
| **Stewardship Maturity Ratings**  (each category and associated aspects)  (c1a1, c1a2; c2a1, c2a2, c2a3; c3a1, c3a2, c3a3, c3a4; c4a1, c4a2, c4a3) |  |
| **Original Assessment Date (MM/DD/YYYY)** |  |
| **Original Assessment POC (Name; E-mail; Affiliation)** |  |

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| **Categories and Aspects** | **Level 1**  **Ad Hoc**  **Not Managed** | **Level 2**  **Minimal**  **Limit-Managed**  **Not Defined** | **Level 3**  **Intermediate**  **Managed**  **Defined, Partially Implemented** | **Level 4**  **Advanced**  **Well-Managed**  **Well-Defined, Fully Implemented** | **Level 5**  **Optimal**  **Level 4 +**  **Measure, Controlled, Audited** |  | The Data Access category refers to the ability to locate (Discoverability) and get to the dataset in question (Accessibility), with higher levels of maturity corresponding to the ease for a potential user to find and gain access to the dataset | | | |
| **Data Access** | **WMO SMM-CD Rating and Justification or Evidence** | | **Comments** | |
| ***Discoverability*** | By personal contact only; Dataset information not discoverable | Limited dataset information, such as scientific description of the methodology, in the literature | Minimal catalogue-level metadata; Dataset searchable online | Complete set of collection-level discovery metadata + minimal granular metadata | Level 4 + available on an international catalogue, prominently displayed online and routinely updated | * **Level** | |  | |
| ***Accessibility*** | Data not available publicly; Person-to-person contact needed | Basic online services available for data access (e.g. FTP/HTTP direct download) | Non-standard data services | Standard-based interoperability data services | Level 4 + full capability of sub-setting, aggregation and visualization | * **Level** | |  | |
| **Usability & Usage** | **Level 1**  **Ad Hoc**  **Not Managed** | **Level 2**  **Minimal**  **Limit-Managed**  **Not Defined** | **Level 3**  **Intermediate**  **Managed**  **Defined, Partially Implemented** | **Level 4**  **Advanced**  **Well-Managed**  **Well-Defined, Fully Implemented** | **Level 5**  **Optimal**  **Level 4 +**  **Measure, Controlled, Audited** | The Usability & Usage category describes how easily the data products may be understood and used by users and incorporated into the user’s own working environment | | | |
| **WMO SSM-CD Rating and Justification or Evidence** | | **Comments** | |
| ***Data Portability*** | Non-machine readable | Basic machine readable | Standards-based machine readable | Machine independent, self-describing, interoperable format | Level 4 + capability of providing user required format | * **Level** | |  | |
| ***Documentation*** | Product information not publicly available online | Limited online documentation (e.g., User Guide) | Document on how the data product was created and how to use it, is available online | Full documentation based on a standard template and available online | Level 4 + online tutorial on using and analyzing the dataset; Complete production system information available online | * **Level** | |  | |
| ***Usage*** | No or weak citation in scientific publication in peer-review journal or as institutional reports | Intermediate citations + referenced in institutional climate assessment reports (e.g., by NOAA) | Strong citations + referenced in national climate assessment reports (e.g., by USGCRP) | Level 3 + referenced in international climate assessment reports (e.g., by IPCC) | Level 4 + referenced in international decision/policy making published reports (e.g., by UNFCCC, UN-ISDR, World Bank, etc.) | * **Level** | |  | |
| **Quality Management** | **Level 1**  **Ad Hoc**  **Not Managed** | **Level 2**  **Minimal**  **Limit-Managed**  **Not Defined** | **Level 3**  **Intermediate**  **Managed**  **Defined, Partially Implemented** | **Level 4**  **Advanced**  **Well-Managed**  **Well-Defined, Fully Implemented** | **Level 5**  **Optimal**  **Level 4 +**  **Measure, Controlled, Audited** | The Quality Management category encompasses quality assurance procedures including quality monitoring, quality control, and quality assessment and communication of reliability | | | |
| **WMO SSM-CD Rating and Justification or Evidence** | | | **Comments** |
| ***Quality Assurance & Control*** | Ad hoc or no data quality assurance (QA) & control (QC) procedure or information unknown | QA/QC procedure are defined, documented, and partially implemented | QA/QC procedure are well-defined, according to community best practices, documented and fully applied | Level 3 + provision of error statistics published or tracked with results made available online and commutated to data providers; Procedure for user feedback, improvement prioritization in place | Level 4 +  Detailed analysis of errors and gaps at space-time unit level: (Station, grid points, daily, monthly and or annual time-scale, etc.) QA/QC procedure monitored. | * **Level** | |  | |
| ***Quality Assessment*** | Product quality assessment not done or done internally and information not available | Assessed by Principal Investigator (PI) or data producer; Assessment results available online | Level 2 + Product validation and evaluation done by PI published in peer-reviewed journal | Level 3 + Independent product validation and evaluation published in peer-reviewed journal | Level 4 +  The complete product provenance is captured and publicly available | * **Level** | |  | |
| ***Uncertainty Analysis*** | Uncertainty estimates not available | Uncertainty estimates presented without explanation | Uncertainty estimates presented with partial explanation | Full uncertainty budget available with all assumptions; Estimates of accuracy of trend available | Full uncertainty assessment published in peer reviewed journal | * **Level** | |  | |
| ***Data Integrity*** | Unknown or no data integrity check | Random data integrity check. | Data integrity verified systematically but methodology not commonly known. | Data integrity systematically verified and following well known practices but not necessarily consistent across platforms. | All steps in data integrity check systematically verified and adhering to well-known practices and reported. | * **Level** | |  | |
| **Data Management** | **Level 1**  **Ad Hoc**  **Not Managed** | **Level 2**  **Minimal**  **Limit-Managed**  **Not Defined** | **Level 3**  **Intermediate**  **Managed**  **Defined, Partially Implemented** | **Level 4**  **Advanced**  **Well-Managed**  **Well-Defined, Fully Implemented** | **Level 5**  **Optimal**  **Level 4 +**  **Measure, Controlled, Audited** | The Data Management category refers to the processes undertaken to ensure the data and the contextual metadata are securely archived. It covers not just the preservation of the data and metadata with appropriate safeguards, but well defined and informed governance processes to endure that the right procedures are followed at the right times by the right people. | | | |
| **WMO SSM-CD Rating and Justification or Evidence** | | | **Comments** |
| ***Preservation*** | Any storage location; Data only; Data not backed up | Non-designated repository; a backup copy of electronic data is made | Designated archive; Basic retention policy publicly defined. Routine backups made, including offsite copy. | Level 3 + Conforming to community archiving standards. Comprehensive retention policy defined and implemented | Level 4 + Archiving process performance controlled, measured, and audited; Future archiving standard changes planned | * **Level** | |  | |
| ***Metadata*** | Metadata not publicly available and/or not usable | Limited Metadata publicly available; Conforming to community-standard; Basic characteristic of dataset | Level 2 + Conforming to international standards in most aspects; limited quality and provenance metadata | Fully compliant with international standards; Rich metadata content; Basic granular-level metadata; Support dataset provenance | Level 4 + complete granular-level metadata; Metadata QC-ed and regularly update | * **Level** | |  | |
| ***Governance*** | Responsibility is not defined; No person is assigned | Responsible entity is identified; Accountability and competency are not well-defined | Responsibility/accountability and compliance mechanism are defined; Good competency; Process established conforming to community standards | Level 3 + competency defined; conforming to international standards; auditable | Level 4 + accountability and responsibility well-defined and fully compliant with international standards; Transparent; Monitored and audited | * **Level** | |  | |

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| **Recommended citation for the WMO SMM-CD template:**  Lief, C. and G. Peng, 2019: The WMO Stewardship Maturity Matrix for Climate Data (SMM-CD) Template. Document ID: WMO-SMM-CD-0003. Version: v03r01 20190227. Figshare. doi:10.6084/m9.figshare.7003709.  **References:**  The SMM-CD Working Group, 2019: The Guidance Booklet on the WMO-Wide Stewardship Maturity Matrix for Climate Data. Document ID: WMO-SMM-CD-0002. Version: v03r00 20190131. Figshare. doi:10.6084/m9.figshare.7002482.  The SMM-CD Working Group, 2019: A WMO-Wide Stewardship Maturity Matrix for Climate Data. Document ID: WMO-SMM-CD-0001. Version: v03r00 20190128. Figshare. doi: 10.6084/m9.figshare.7006028.  Peng, G., 2015: The Scientific Data Stewardship Maturity Assessment Model Template, Version: NCDC-CICS-SMM-0001-Rev.1 v4.0 6/23/2015. doi:10.6084/m9.figshare.1211954. |
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