**CanDCS-M6-Quality-Control Workplan**

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**Background**

The Canadian Downscaled Climate Scenarios – Multivariate CMIP6 (CanDCS-M6, or "M6") dataset was developed by PCIC for ECCC and features a multi-model ensemble of 26 GCMs, and 9 additional realizations of CanESM5. It features a new target dataset that blends the PNWNAmet dataset with ANUSPLINv2 (for temperatures) and ANUSPLIN Adjusted (for precipitation), and a new multivariate downscaling methodology using Climate Imprinting plus MBCn. Data is currently available upon request from PCIC and on ECCC servers.

**Objective**

This document outlines the proposed steps to undertake the quality control of the M6. PCIC has outlined previous checks with the daily data, but further investigation is required before the data can be served to users. The following lists near term tasks to complete before starting the QC process, and some preliminary suggestions to checks that can be performed.

**Near-term action items and questions:**

**Updates on the progress of these checks will be given at the data working group**

* Ken to get admin access for old U6 repo from Jeremy and grant access to everyone
  + CCCS will start QC of daily data
* Stephen to try and put together an itemized list of issues/characteristics of the M6
* Travis is obtaining the M6 data from James Hiebert to have accessible on PAVICS
  + It'll take time to calculate indices after Ouranos has the data, so analysis can start with indices calculated by PCIC. Looking at xclim indices can be part of second phase
* CRD has calculated monthly statistics – Benita can point CCCS to the data
* CRD is also calculating indices, and can share with CCCS when they are complete

**Initial proposed list of quality control checks**

|  |  |
| --- | --- |
| Health Checks | |
|  | Check for missing days and consistent frequency/timesteps |
|  | Check dimensions/matrix size of NetCDFs |
|  | Perform non-valid data checks on temperature and precipitation fields, as documented [here](https://github.com/Ouranosinc/xclim/issues/65) |
|  | Check metadata for CF conventions compliance |
| Compare M6 against Target (1951-2012) | |
|  | Compute statistics (mean bias, Perkins' score) for indices and evaluate performance (maps) |
|  | Check for regional anomalies (based on statistics) |
|  | Construct Canada-averaged timeseries spaghetti plots to identify any outliers |
| Comparison between U6 and M6 datasets/indices | |
|  | Compare the multi-model ensemble ranges between U6/M6 (time series) |
| … | … Additional checks to be added as needed |

**Additional notes:**

Codes and scripts will be committed the Github repository as was done for the QC of CanDCS-U6. Organization-specific activities (PCIC, Ouranos, CCCS, CRIM, etc.) can be separated into branches as needed. Likewise, all issues and checks will be documented under "Issues".

**Updates on the progress of these checks will be given at the data working group**

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