Reproducible Research Repository

Satellite-Based Measures For Tracking Atmospheric Co And Ch At National, Subnational And Urban Scales

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This review verifies the reproducibility of the exhibits included in the paper *"Satellite-Based Measures For Tracking Atmospheric Co And Ch At National, Subnational And Urban Scales"*.

Contents in this review:

Main findings

- **Every exhibit has been reproduced accurately.**
- The code was successfully executed on a new computer after:
  1. Running renv::init() to initialize the R programming environment
  2. Updating the file paths for the main R script.
- The output demonstrates consistent stability across multiple runs. Specifically, executing the code two times consecutively yielded identical results.
- The code takes approximately 30 minutes to run.
- We conducted our reproducibility analysis based on the paper shared by the authors in the reproducibility package.
- **Verification Process and Data Handling**:
  - The reproducibility package relies on 2 types of data: open, accessible (public but not included in the reproducibility package).
  - Open data is included in the public reproducibility package.
  - Reviewers used data provided directly by the authors to conduct the reproducibility verification, and this is not included in the public reproducibility package.
  - *data_hash_report.csv* lists the SHA256 hashes of all files in the Data folder to support data integrity checks. Users who acquire the forthcoming/accessible/limited-access/restricted data can use this file to verify that the data has not been altered.

- **Reproducibility Summary**:
  - **Data**: Some data is restricted and has not been included in the reproducibility package. For more details, please refer to the README file.
  - **Code**: All code files (from cleaning to analysis) are included in the reproducibility package.
  - **Outputs**: All outputs are generated by code included in the reproducibility package.
  - **Dependencies environment**: The reviewers created a new environment using the latest versions of dependencies available at the moment of the review.

List of exhibits and reproducibility status

Results in the Main Section of the Paper

- **Table 1a** Reproduced.
- **Table 1a** Reproduced.
- **Table 2** Reproduced.
- **Figure 1** Reproduced.
- **Figure 2** Reproduced.
- **Figure 3** Reproduced.
- **Figure 4** Reproduced.
- **Figure 5** Reproduced.
- **Figure 6** Reproduced.
- **Figure 7** Reproduced.
- **Figure 8** Reproduced.
- **Figure 9** Reproduced.
- **Figure 10** Reproduced.
- **Figure 11** Reproduced.
- **Figure 12** Reproduced.

Reproduction Environment

Paper exhibits were reproduced on a computer with the following specifications:

- OS: Windows 11 Enterprise
- Processor: Intel(R) Core(TM) i5-1145G7 CPU @ 2.60GHz
- Memory available: 15.7 GB
- Software version: R version 4.3.1