**NASA DEVELOP National Program**

**Geoinformatics Archiving Worksheet**

**AirPIT**

**Sp20**

*Air Pollutant Identification Tool*

**Relevant Tags***: Google Earth Engine, JavaScript, GUI, particulate matter, ozone, nitrogen dioxide, sulfur dioxide, carbon monoxide, formaldehyde, methane, Sentinel-5, MODIS*

**Status Log**

*Each time this code is evaluated add a new bullet to the Status Log. Include date, current status (I.e. Zone 1, Zone 2, Zone 3) based on your evaluation, and any relevant notes about bugs, updates, etc. Descriptions for each zone are listed below.*

* **Date & Reviewer:** 12/6/2021 Erica Carcelen
  + **Status:** Zone 2
  + **Notes:**
    - Scientific Basis
      * Code does display pollutant layers for list of areas in the drop-down menu as described. Point inspector and options to change dates for layers to display also work. There is an error that comes up for the Particulate Matter when selecting dates outside of July – September, which was described/warned in the README. While layers do display, the visualization parameters are not best suited to display the layers. The range of values are automatically set 0-1, so the layers show up as all one color. User could edit the visualization parameters to a 100% Stretch to better view the data. Also the README includes lines of code to display the layers according to the EPA Air Quality Index guidelines, but they do not work and layers instead get displayed as multi-band image with values of 0 or 255.
      * No citations included in the code, but otherwise well documented. The code focuses on the GUI and mainly converts pollutant layers to micrograms per cubic meter for display on the map. I am not sure about the functions for particulate matter, I think they may actually be displaying AOD based on the equations in the tech paper and the original layer displayed in the code has no function applied to it. Not my area, so will consult with others to verify.
    - Code Novelty
      * Code’s GUI pulls from previous DEVELOP code (iMMOD), so novelty lies in functions for converting layers and estimating particulate matter.
    - Code Functionality
      * Code compiles, no issue with assets and no errors that aren’t expected and described in the README. Only issue with functionality is in the EPA AQI visualizations included as optional code in the README and range of values for the original visualization.
* **Date & Reviewer:**
  + **Status:**
  + **Notes:**
* **Date & Reviewer:**
  + **Status:**
  + **Notes:**

***Zone Key***

* **Zone 1A:** Code is novel, runs without issues, and produces expected outputs. It is written efficiently with a logical flow and a strong scientific basis. Should be posted on GitHub for future reference and public external use following software release.
* **Zone 1B**: Code is posted to the GitHub for partner handoff for 60 days. The partner should be emailed with instructions for download and notified of the time limit and any relevant functionality issues. After 60 days, the code status updates to Zone 2 or 3. It will be removed from the GitHub and archived on the Gitlab server.
* **Zone 2**:The code has issues compiling due to asset restrictions, package updates, or general bugs. Code may not do what it is supposed to do or has a faulty logical and/or weak scientific basis. Should be evaluated to see if issues can be corrected and updated to Zone 1(A/1B) or 3 following the evaluation.
* **Zone 3:** Code is not novel, does not run, or has a false logical and/or very weak scientific basis. Should be archived on the Gitlab server for internal reference only.

**Archiving Worksheet Directions**

*This worksheet will “live” with its accompanying code and will be updated during curation or other events such as software release, public inquiry, etc.*

***Scientific Basis***

*Even if the code compiles, the output may not be what the description says it is or may be based on faulty logic.*

* **Does the code do what it’s supposed to do?**
  + **Yes:** No action is needed.
  + **No:** Update status to Zone 2. Work to identify the logic errors. Provide a detailed description in the notes section of this document. Notify Dr. Ross of code issues and evaluate if changes can be made to generate the expected outcomes. If not, make a clear note to provide to the partners about code output issues. If partners still want code, update to Zone 1B after software release, but move to Zone 3 after the 60 days.
* **Is the scientific basis for the code strong?**
  + **Yes:** The code was well-documented and included citations for indices and techniques used. Models were well-developed and correctly constructed. No action needed.
  + **No:** Update Status to Zone 2. Provide a detailed description in the notes section of this document. Notify Dr. Ross of science issues and evaluate if changes can be made to correct issues. If not, make a clear note to provide to the partners about scientific basis. If partners still want code, update to Zone 1B after software release, but move to Zone 3 after the 60 days.

***Code Novelty***

* **Is the code a novel contribution or does it do the same thing as previous DEVELOP codes?** 
  + **Yes:** After software release, the code should be uploaded to the DEVELOP GitHub. Upload any known bugs or issues. Update status to Zone 1.
  + **No, but partners want it:** After software release, upload to DEVELOP GitHub for 60 days. Notify partner that code has been posted and will be available for next 60 days. Ask for confirmation when code and assets have been downloaded. Update to Zone 1, but move to Zone 3 after the 60 days.
  + **No:** After software release, archive internally with this sheet for teams to have access to for reference. Update status to Zone 3.

***Code Functionality***

*These questions address the code’s ability to run and produce expected outputs.*

* **Does the code compile?**
  + **Yes:** After Software release, if the code is novel, upload to DEVELOP GitHub. Update status to Zone 1A. If code is not novel, archive for internal use and update status to Zone 3.
  + **Yes, but warnings:** After software release, if the code is novel, update status to Zone 2 and try to resolve warnings. If warnings resolve, upload to DEVELOP GitHub. If warnings don’t resolve, upload note about warnings along with code. Update status to Zone 1A. If code is not novel, archive for internal use and update status to Zone 3.
  + **No, not all assets are present:** Detail missing assets in the notes section and update status to Zone 2. Reach out to the code POC (cc’ing the geoinformatics email) requesting assets. Give a week deadline. After a week, send reminder. Repeat once more, either transferring assets or assuming/confirming assets are not available. If assets are not available, archive for internal use and update status to Zone 3. Once assets are updated, review the code again to check for package issues and bugs and update the Status Log accordingly.
  + **No, a package is out of date:** Detail package issues in the notes section of the Status Log and update status to Zone 2. After software release, if bugs were not resolved, add to Zone 2 queue to resolve. Once packages are updated/resolved, if the code is novel, upload to DEVELOP GitHub. Update status to Zone 1A. If code is not novel, archive for internal use and update status to Zone 3.
  + **No, there are bugs:** Detail bugs in the notes section of the Status Log and update status to Zone 2. After software release, if bugs were not resolved, add to Zone 2 queue to resolve. Once bugs are resolved, if the code is novel, upload to DEVELOP GitHub. Update status to Zone 1A. If code is not novel, archive for internal use and update status to Zone 3.
  + **No, not sure what is going on:** If code is unintelligible, archive for internal use and update status to Zone 3. If code was supposed to be handed off to partner, follow handoff protocol for Zone 3 codes and manage partner expecations appropriately.
* **Are there any other concerns about the code?** 
  + **Yes, it isn’t optimally coded:** Add a note in this document with suggestions for optimization using best practices for future coders to employ.
  + **No:** No action is needed.