Please complete and review this document to ensure that it is comprehensive and accurate to the best of your ability. The information contained here will be used to submit the New Technology Report (NTR) and the NASA Software Release Request Authorization (SRRA), along with other documents. Before completing this document, you should have already completed the Software Definition Document (SDD). Much of the information from the SDD can be reutilized here.

The NTR is an online form whose purpose is to document all individuals responsible for the innovation and manage rights to the software. Once the creator of the document has submitted it, each individual listed as an “innovator” will receive a verification email that they must respond to before the document can be submitted for NASA approval. It is important for multi-term projects to get current email addresses for past contributors and ensure everyone involved is aware so the document doesn’t stall at that stage.

The SRRA, also known as the LF-7, is the primary culminating form for software release. It cannot be submitted until the NTR and the SDD have been approved. When submitted, the following documents are included as attachments: Software Assurance Classification Report, Software Plan, Compliance Matrix, approved NTR, and any software documentation (i.e. tutorials, instructions, etc.).

**Project Title: BIOMASS (Batch Input Operation iMAge StatiStics)**

For the next three sections, you may want to number the entries to maintain continuity between sections:

**Innovators and Contributions**

**Innovators**

Dane Coats

ISU GIS TRec

921 S. 8th Ave stop 8104

Pocatello, ID 83209

LRES05

(208) 275-9302

[coatdane@isu.edu](mailto:coatdane@isu.edu)

Software design and testing

Jake Ramthun

ISU GIS TRec

921 S. 8th Ave stop 8104

Pocatello, ID 83209

LRES05

(304) 910-6961

[Jake.ramthun@gmail.com](mailto:Jake.ramthun@gmail.com)

Software testing

Brandon Crawford

ISU GIS TRec

921 S. 8th Ave stop 8104

Pocatello, ID 83209

LRES05

(530)219-0686

Crawbra2@isu.edu

Software testing, editing

**Employers**

SSAI

**Technical and Management Point(s) of Contact**

Dane Coats

ISU GIS TRec

921 S. 8th Ave stop 8104

Pocatello, ID 83209

LRES05

(208) 275-9302

**Total Work Hours**

120

**Code Details**

**Type of Code:** BothExecutable Code and Source Code

**Will the software include any embedded computer databases and/or usernames/passwords?** No

**Does the software use or call any open software or libraries?** EasyGUI is an open source module

List the software or libraries used, under what license they were obtained, and the URL for the license in the table below:

|  |  |  |
| --- | --- | --- |
| **Name** | **License** | **License URL** |
| Arcpy module | Group license through ArcGIS | http://www.esri.com/software/arcgis |
| Python | Open source license | http://opensource.org/licenses/Python-2.0 |
| EasyGUI module | Modified BSD license | <http://easygui.sourceforge.net/>  https://opensource.org/licenses/bsd-license.php |

**Brief Abstract**

BIOMASS is intended to allow batch processing of raster files and output statistics for those raster files. The code uses a RECOVER geodatabase to build shapes, re-project the raster and shape, clip the raster down to a smaller size to insure quick processing, and process raster statistics for the shape.

**Description of the Problem or Objective that Motivated the Innovation**

Our team was looking to batch processing hundreds of NDVI files to look at how vegetation changes over time with relation to wildfires.

**Purpose and Description of Innovation/Software**

BIOMASS batch automates retrieval of mean and standard deviation for raster values in a polygon. The program uses easyGUI pop-up menus to identify and change variables and streamline use. Users are prompted to select: workspace folder, projection file, file type to look for, choose whether to delete old outputs, select resolution. Statistics are output into a text file and placed in the FINAL OUTPUT subfolder.

**Advantages and Novel Features**

Makes doing statistics for a large number (>100) of NDVI’s much faster and user friendly. This is useful for taking MODIS preprocessed NDVI’s and choosing a small area of interest and being able to output a statistical graph for the whole year.

**Additional Documentation**

List any documentation produced which aids in the understanding or application of the innovation, i.e. tutorials, help files, etc. Include the title, date last updated, and number of pages, as appropriate. This documentation will need to be submitted with the LF-7.

README.txt contains instructions for setup.

**Development Timeframe**

BIOMASS was conceived in September of 2017 and final coding concluded in November of 2017.

**Development History, Stage of Development**

At ISU GIS TReC:

* First disclosure to others: 9/11/2017
* First sketch, drawing, logic chart or code: 9/12/2017
* First written description: 10/10/2017
* First successful alpha version: 9/25/2017
* Completion of first beta version: 10/10/2017

**Testing**

I ran the software many times to catch as many errors as I could come up with. I’ve given this to my colleagues for test runs to catch errors and help develop the readme file that would be helpful for users. Manually generated statistics in ARCmap to validate outputs. Use of standard deviation and several types of control polygons to show that the mean value is representative of relatively homogenous zones rather than skewed by outliers.