

SPI Utility

Step-by-Step User Guide

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OSGEO

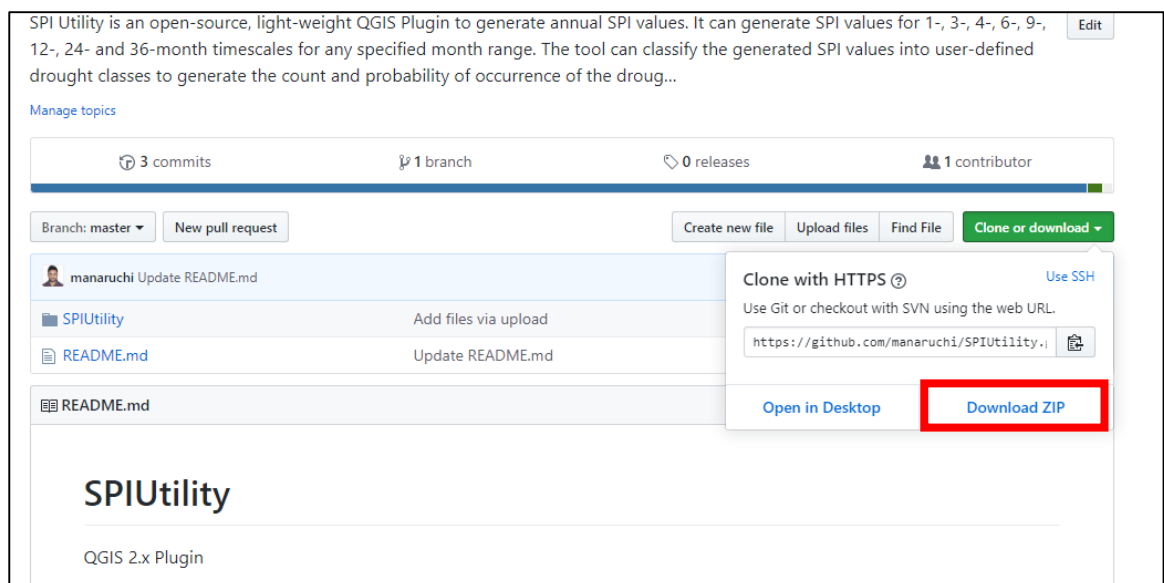


Github

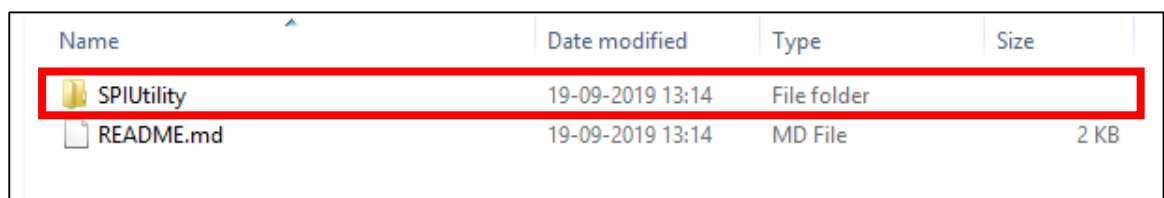


Installing SPI Utility

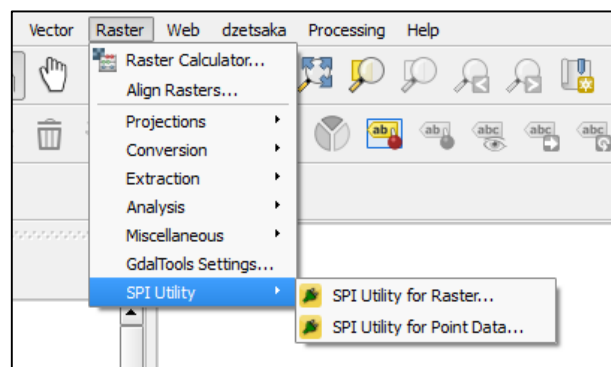
1. Get SPIUtility from <https://github.com/manaruchi/SPIUtility>



2. Extract the downloaded compressed file. Copy the SPIUtility folder and paste it at `C:\Users\<username>\.qgis2\python\plugins`. <username> is the user name.



3. Open QGIS Desktop 2.x. Go to *Plugins > Manage and Install Plugins*. Select SPIUtility from the list. Click on *Install Plugin*.
4. After Successful Installation, Go to *Raster > SPI Utility*.

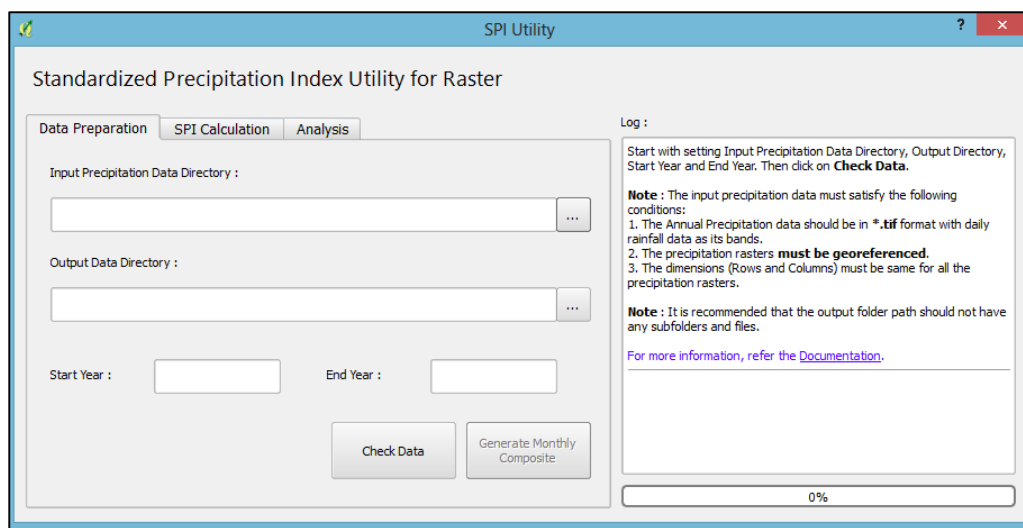


SPI Utility for Raster

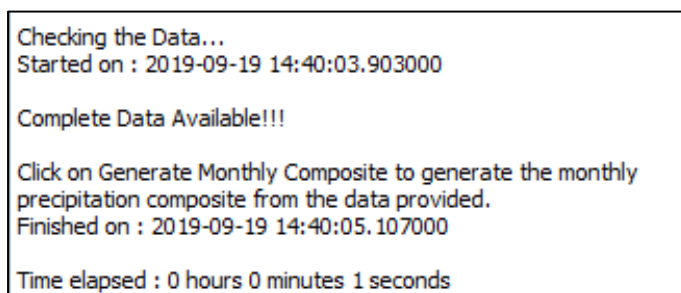
Data Preparation

For each year the daily precipitation data should be stacked into one raster and the file name for each raster should be “**RF_<year>.tif**” (for eg. RF_1901.tif). i.e. Each raster should have 365 or 366 number of bands. Each band should correspond to the precipitation values of the Julian Day same as the band number.

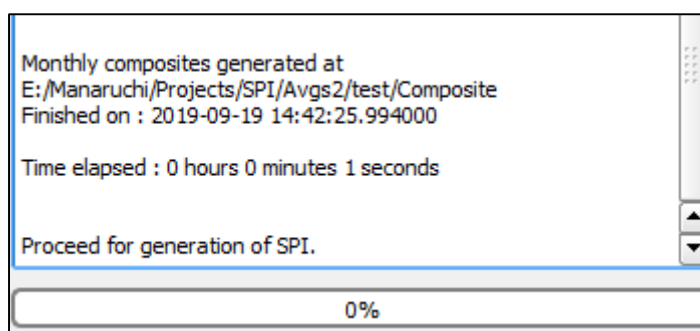
1. Open *SPI Utility for Raster*.



2. Provide input precipitation data folder and output data folder by clicking on Browse (...). The Start year and End year field will be filled automatically. Click on *Check Data* and then *Yes* to check for any missing data. If the data is complete, you should get a success message in the *Log* as shown:



3. Click on *Generate Monthly Composites* to generate the monthly precipitation composites which will be further used for calculation of SPI. After the successful completion, the following message should appear in the *Log*:

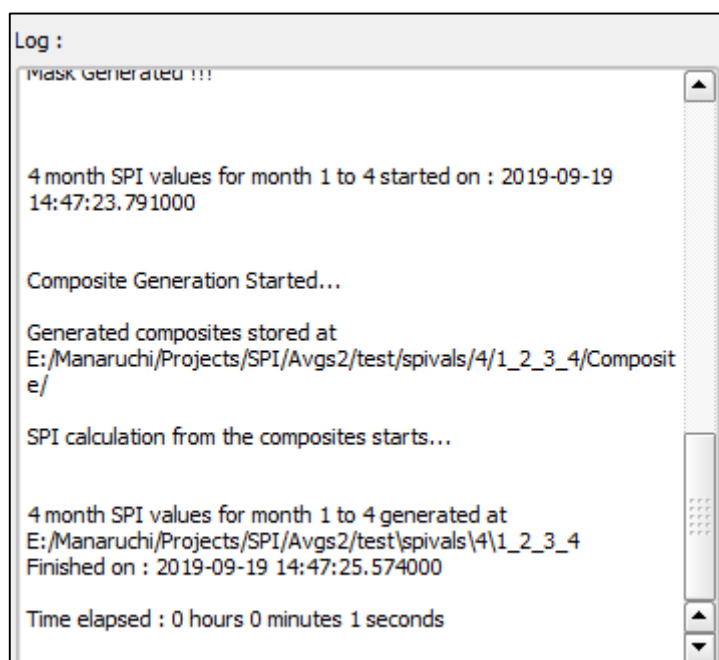


SPI Calculation

Monthly Composites folder and *Output* folder should be pre-filled. Select the required *Timescale*, *Start Month* and *End Month*. Click on *Generate SPI*.

For example, in order to generate 3 month SPI for months January to April. Select 3 months in *Timescale*, January in *Start Month* and April in *End Month*. This will generate 3 month SPI values for combinations: January-February-March, February-March-April.

After the successful completion, the following message should appear in the *Log*:

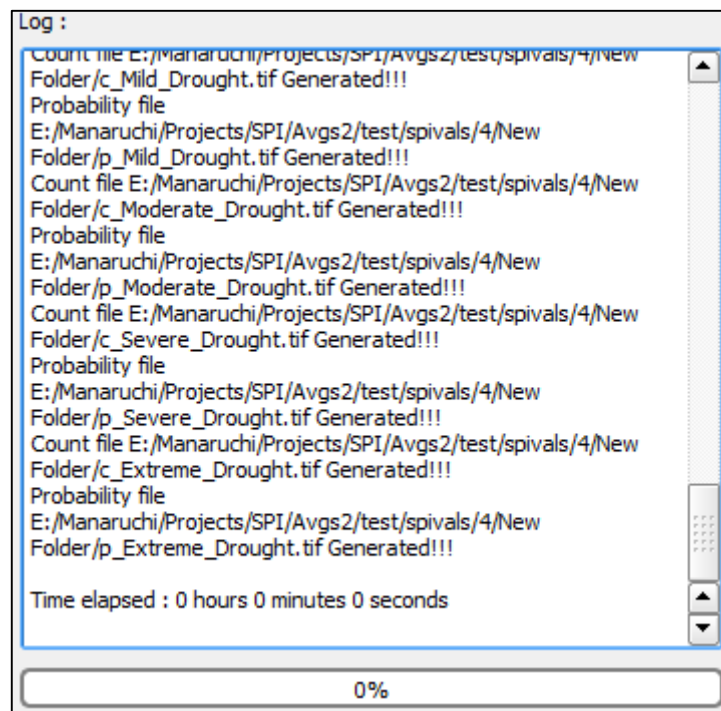


Analysis of SPI Values

In order to classify the SPI values into drought categories and to generate the pixel-wise number of times a specific type of drought has occurs and the corresponding probability, the *Analysis* tab can be used.

1. Provide input *Folder of SPI Values* and *Output Folder*.
2. Change the classification scheme by double clicking on the fields.
3. Select *Start* and *End* year for the year range you wish to perform analysis on.
4. Click on *Classify*. Count and Probability files will be generated in the specified output folder.

After the successful completion, the following message should appear in the *Log*:



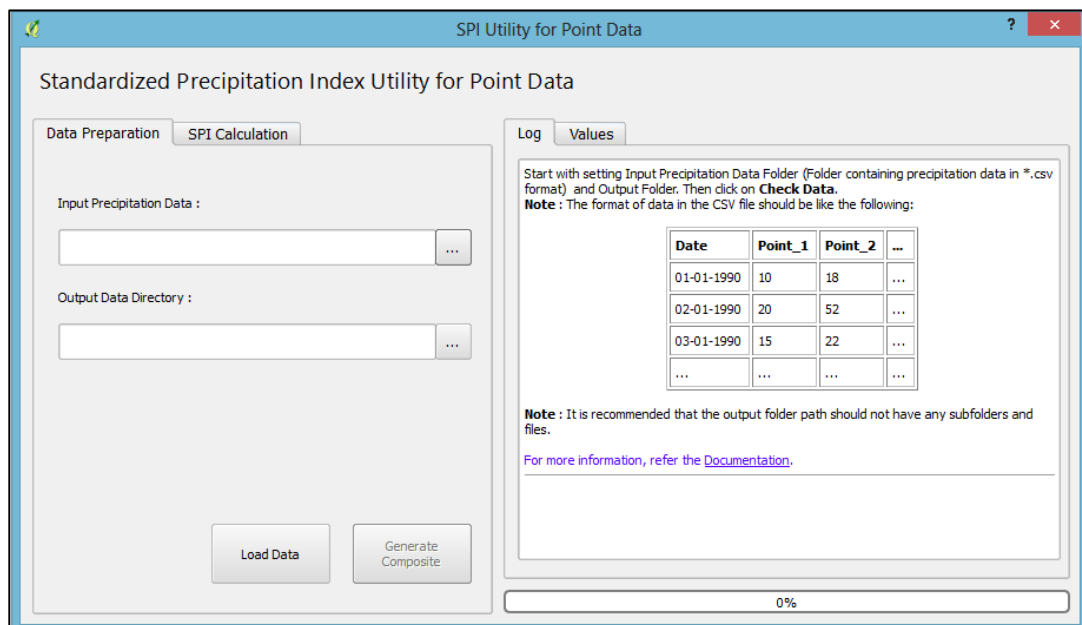
SPI Utility for Point Data

Data Preparation

The input precipitation should be in CSV format with the precipitation data of different stations represented in multiple columns as shown below:

| | | | | | | |
|-----|------------|----------|----------|----------|----------|--|
| 217 | 05-08-1951 | 4.423359 | 0.208249 | 0.208249 | 0.416497 | |
| 218 | 06-08-1951 | 2.052662 | 4.833621 | 4.833621 | 9.667241 | |
| 219 | 07-08-1951 | 0.101216 | 1.826649 | 1.826649 | 3.653298 | |
| 220 | 08-08-1951 | 7.668631 | 3.090693 | 3.090693 | 6.181386 | |
| 221 | 09-08-1951 | 5.048156 | 0.115399 | 0.115399 | 0.230797 | |
| 222 | 10-08-1951 | 2.476433 | 3.432304 | 3.432304 | 6.864609 | |
| 223 | 11-08-1951 | 0.166454 | 3.579311 | 3.579311 | 7.158621 | |

1. Open *SPI Utility for Point Data*.



2. Select input precipitation data and the output data directory.
3. Click on *Load Data*. It will check for any missing data. After successful completion, the following message should appear in the *Log*.

```
E:/Manaruchi/Projects/SPI/GUI/TestData.csv
CSV loaded. Total number of rows : 24472
Number of points : 4
```

4. Click on *Generate Composite* to generate the monthly precipitation composite. After successful completion, the following message should appear in the *Log*.

```
Complete Data Available. Generating Composites...
Composites Generated.
Time elapsed : 0 hours 0 minutes 17 seconds
```

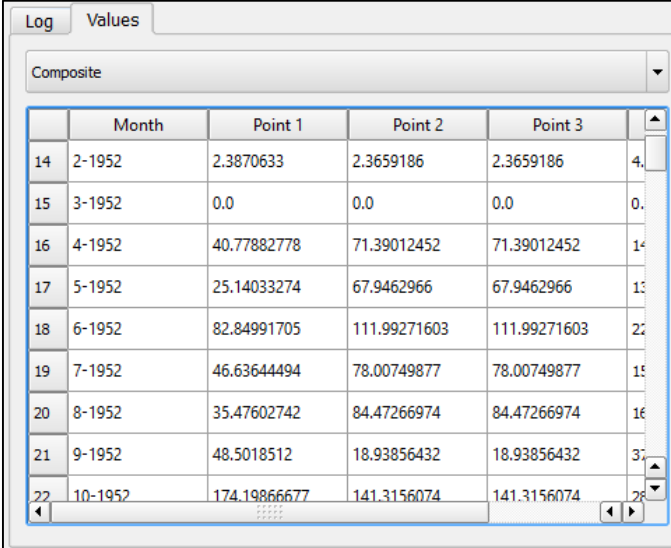
SPI Calculation

Monthly Composites folder and *Output* folder should be pre-filled. Select the required *Timescale*, *Start Month* and *End Month*. Click on *Generate SPI*. After the successful completion, the following message should appear in the *Log*:

```
1 month SPI generation for month 1 started.

1 month SPI values for month 1 has been generated at :
E:/Manaruchi/Projects/SPI/GUI/New Folder5\SPI_1_1.csv
```

The output can also be viewed using the *Values* tab.



| | Month | Point 1 | Point 2 | Point 3 | |
|----|---------|--------------|--------------|--------------|----|
| 14 | 2-1952 | 2.3870633 | 2.3659186 | 2.3659186 | 4. |
| 15 | 3-1952 | 0.0 | 0.0 | 0.0 | 0. |
| 16 | 4-1952 | 40.77882778 | 71.39012452 | 71.39012452 | 14 |
| 17 | 5-1952 | 25.14033274 | 67.9462966 | 67.9462966 | 13 |
| 18 | 6-1952 | 82.84991705 | 111.99271603 | 111.99271603 | 22 |
| 19 | 7-1952 | 46.63644494 | 78.00749877 | 78.00749877 | 15 |
| 20 | 8-1952 | 35.47602742 | 84.47266974 | 84.47266974 | 16 |
| 21 | 9-1952 | 48.5018512 | 18.93856432 | 18.93856432 | 37 |
| 22 | 10-1952 | 174.19866677 | 141.3156074 | 141.3156074 | 28 |

Miscellaneous Information

The SPI Utility plugin is maintained by Manaruchi Mohapatra, Indian Institute of Remote Sensing (IIRS-ISRO), Dehradun. For feedbacks, supports and queries please drop a mail at manaruchimohapatra@gmail.com. The tool is free to use, but an acknowledgment to SPI Utility will be appreciated.

Note - The plugin is currently available for QGIS 2.x versions. The plugin will be ported to QGIS 3.x versions soon.