

# SPI Utility

## Step-by-Step User Guide

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OSGEO

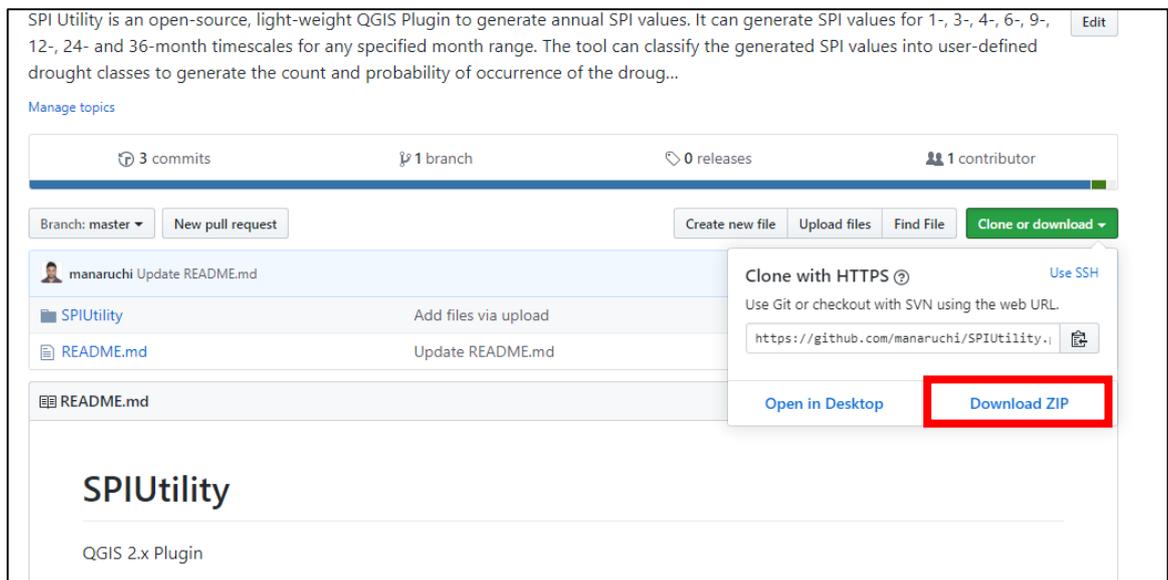


Github

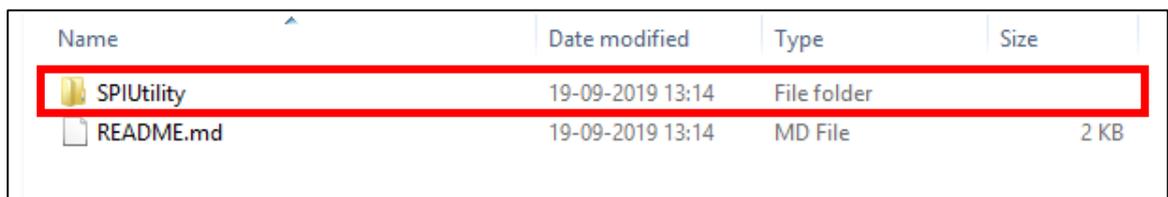


## Installing SPI Utility

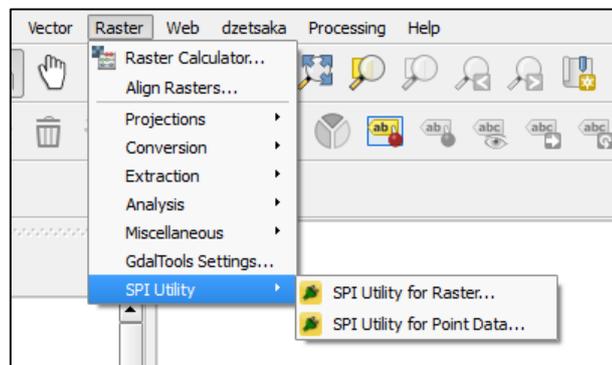
1. Get SPIUtility from <https://github.com/manaruchi/SPIUtility>



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*.

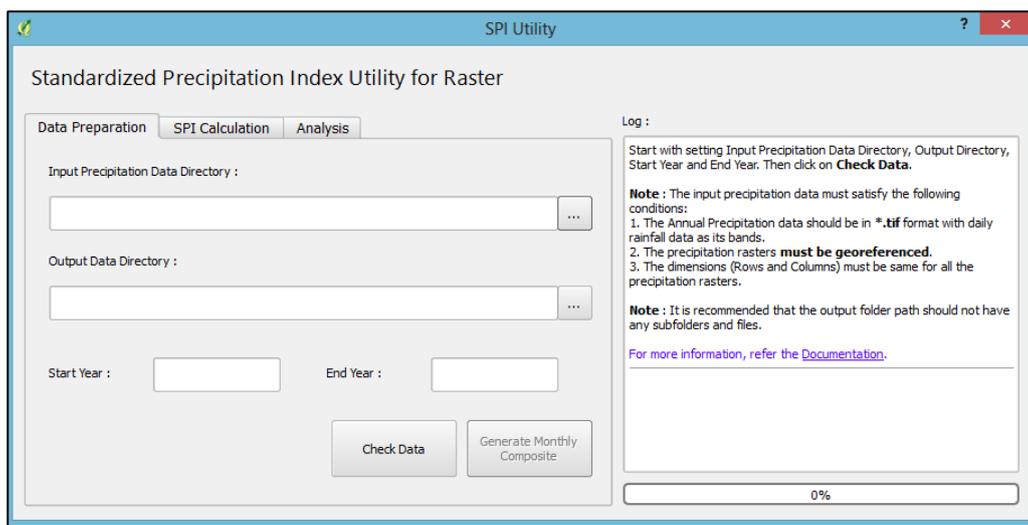


# SPI Utility for Raster

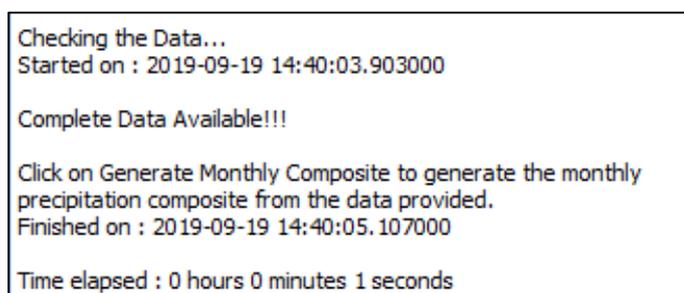
## Data Preparation

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.

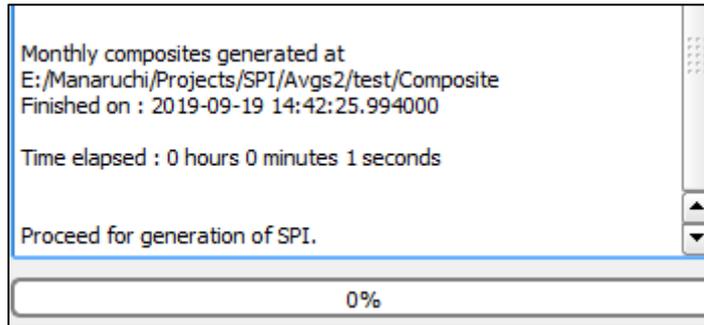
1. Open *SPI Utility for Raster*.



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*:

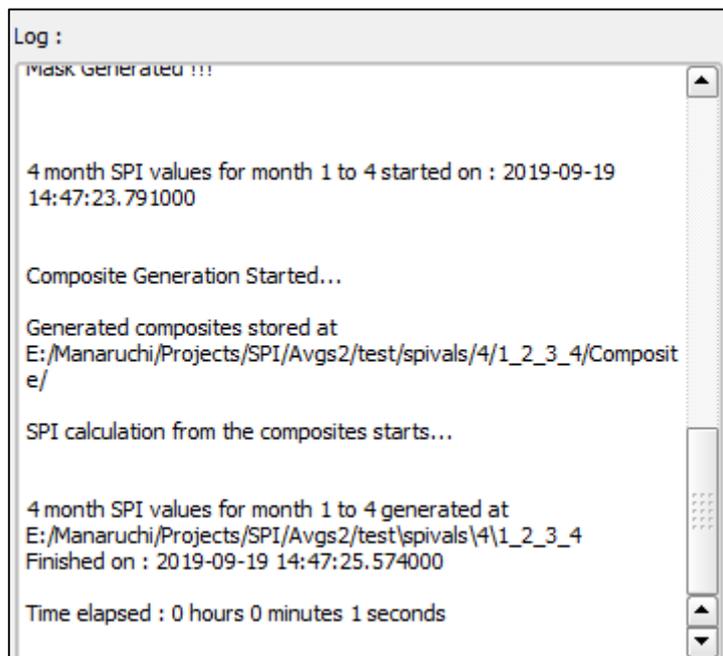


### SPI Calculation

*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*:

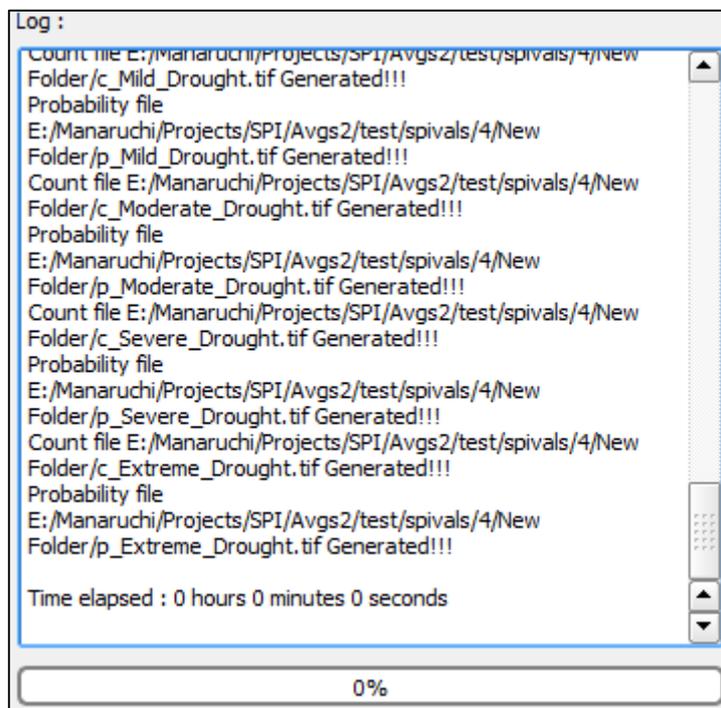


## Analysis of SPI Values

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*:



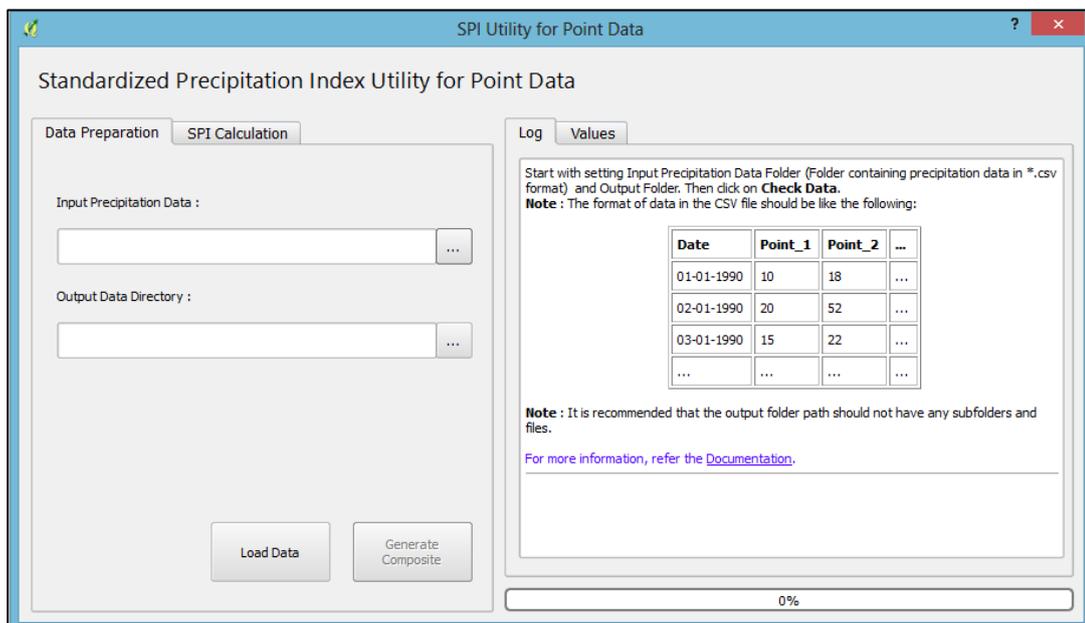
# SPI Utility for Point Data

## 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.

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

## 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](mailto: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.