# SPI Utility

## Step-by-Step User Guide

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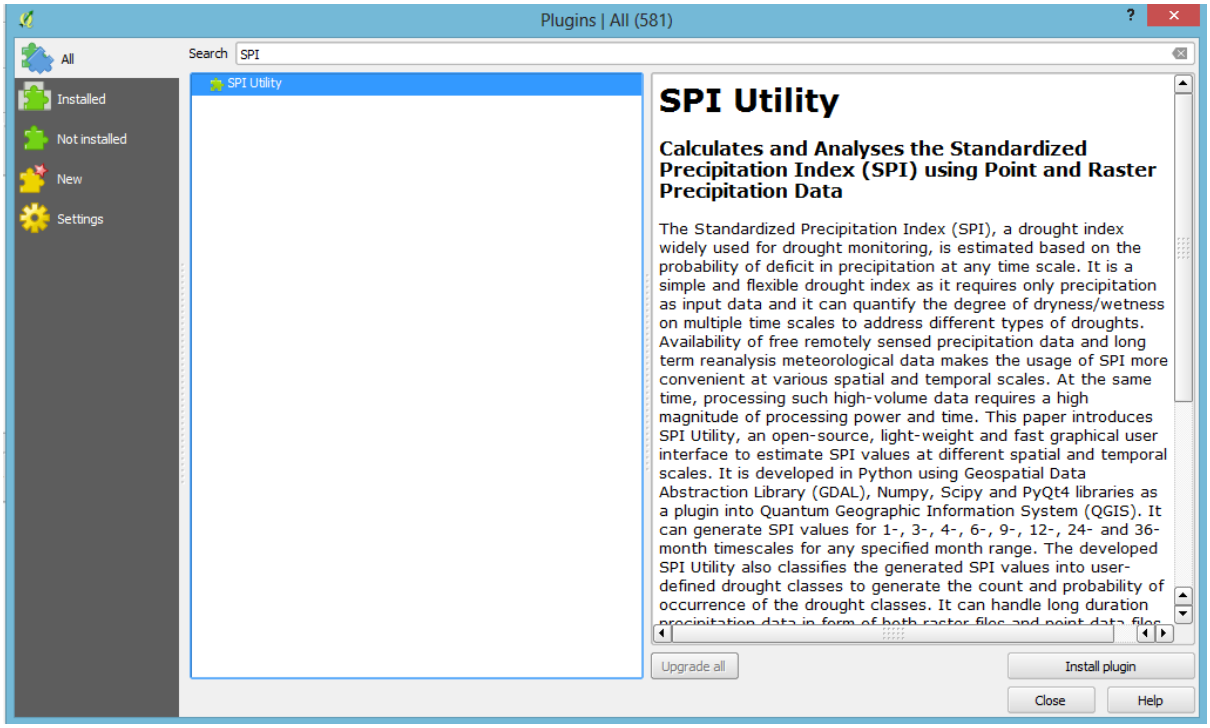
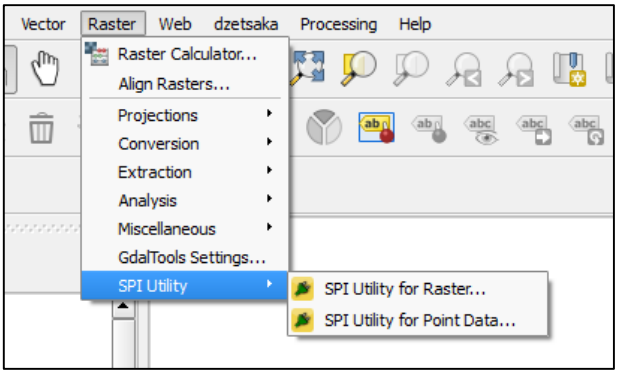
# Installing SPI Utility

1. Open QGIS Desktop 2.x. Go to *Plugins* > *Manage and Install Plugins*. Search SPIUtility from the list. Click on *Install Plugin*.




2. After Successful Installation, Go to *Raster* > *SPI Utility*.



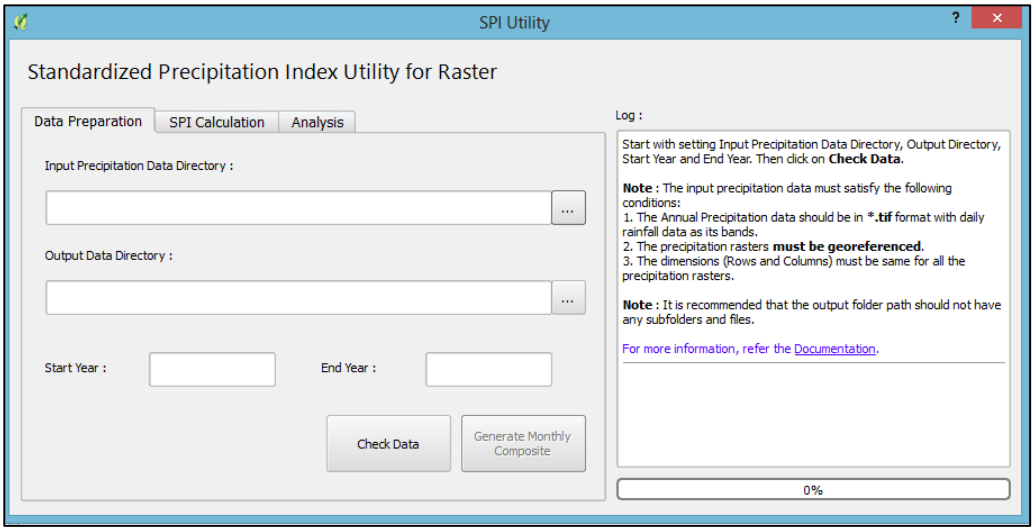

# SPI Utility for Raster

## Data Preparation

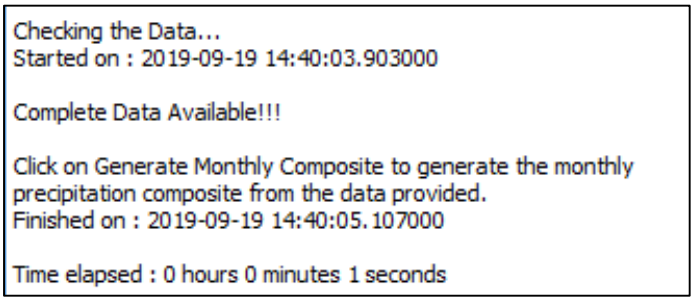
For each year the daily precipitation data should be stacked into one raster and the file name for each raster should be "**RF_<year>.tif**" (for eg. RF_1901.tif). i.e. Each

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.

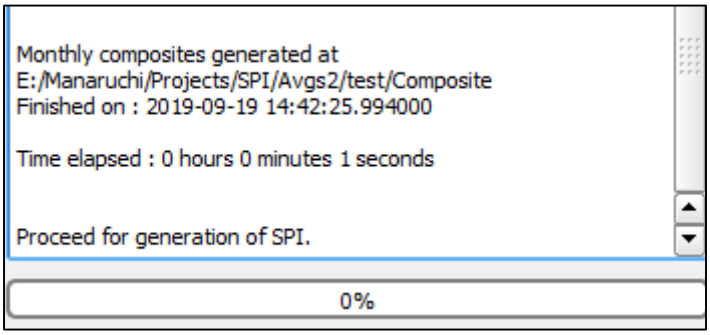
1. Open *SPI Utility for Raster*.




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*:

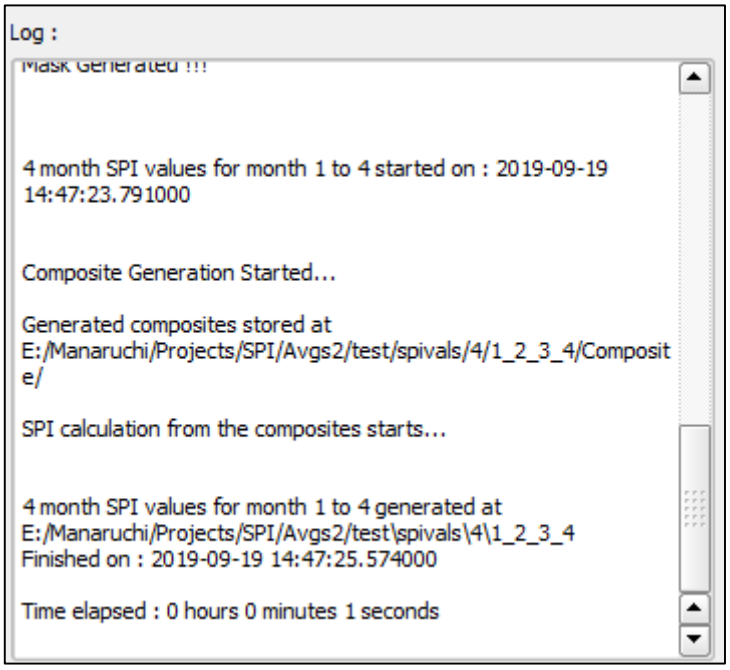


## SPI Calculation

*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*:



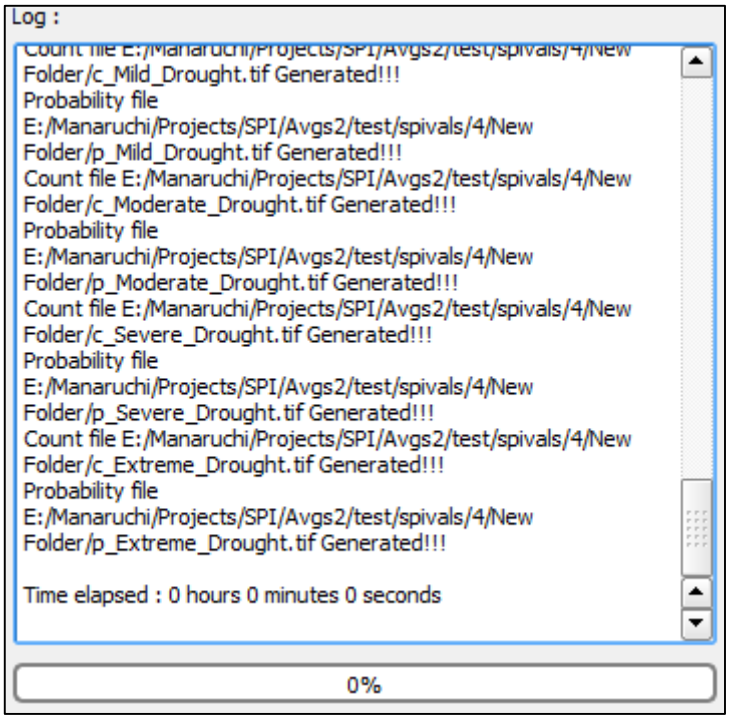

## Analysis of SPI Values

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*:



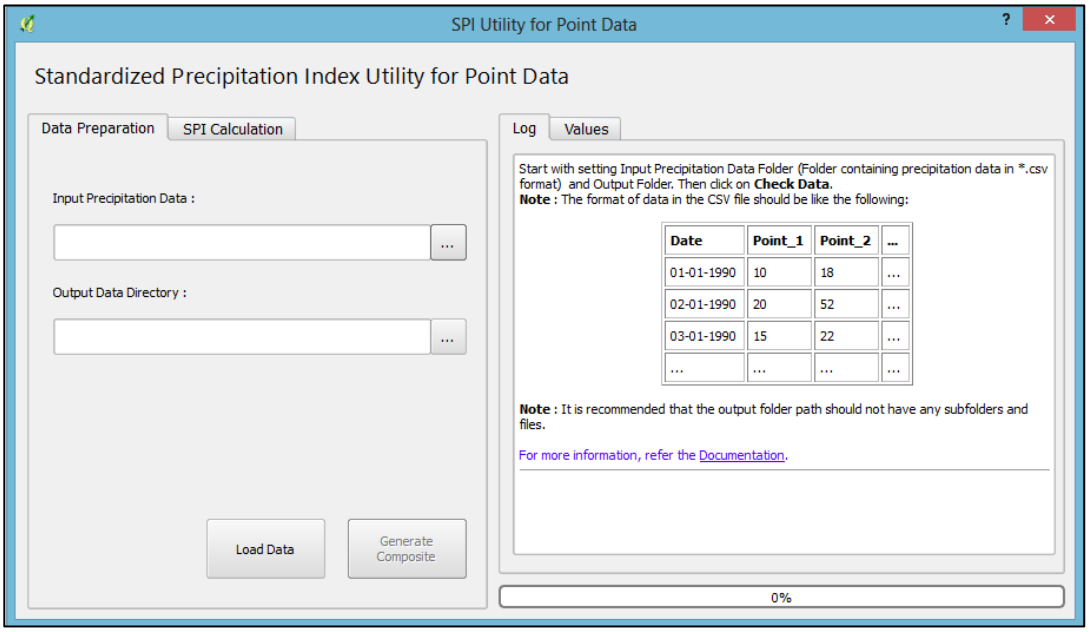
# SPI Utility for Point Data

## Data Preparation

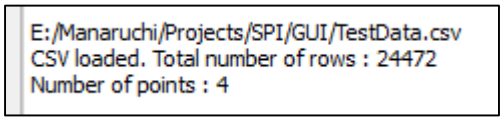
The input precipitation should be in CSV format with the precipitation data of different stations represented in multiple columns as shown below:

| | | | | | |
|---|---|---|---|---|---|
| 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 |

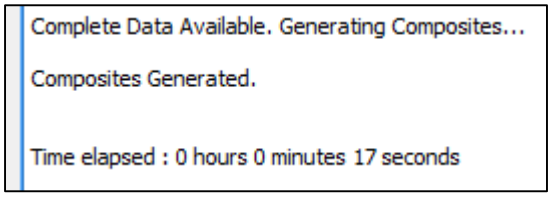
1. Open *SPI Utility for Point Data*.




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*.

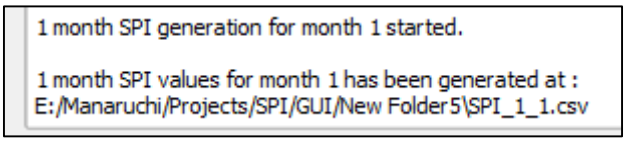



4. Click on *Generate Composite* to generate the monthly precipitation composite. After successful completion, the following message should appear in the *Log*.

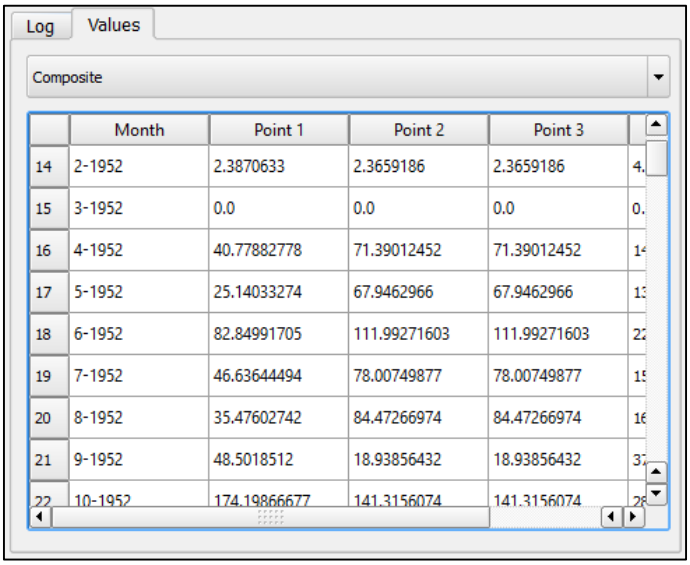



### SPI Calculation

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




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




## 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.