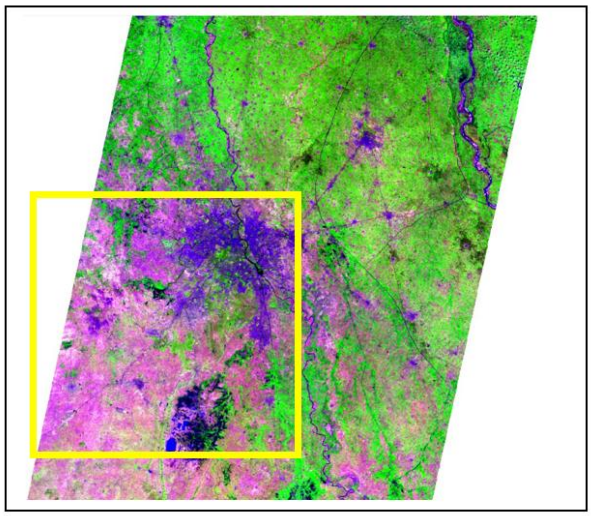
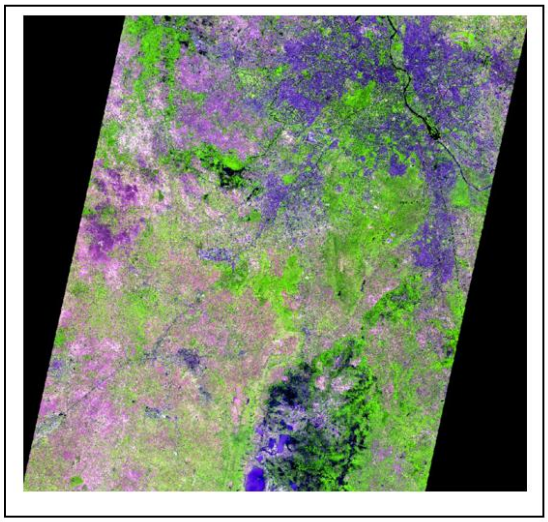
User Manual

SWIR Band synthesis Utility for IRS RS2 L4Mx Data



Input L3 Image B543



Synthesised L4 Image B543

National Remote Sensing Centre

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Cover Page: Synthesised SWIR band for Resourcesat-2 L4Mx data using Resourcesat-2 L3 SWIR band.

1.Introduction

SWIR band finds its uses in many applications (snow and cloud detection etc.), Resourcesat Series satellites carry LISS-4 sensor which provides data at a spatial resolution of 5.8m in 4, 3, 2 bands. The SWIR band of in LISS-4 is synthesized using the spatial and spectral knowledge from LISS-3.

This module generates synthesised SWIR band at a spatial resolution of LISS-4, by taking the inputs as LISS-3 (Layer stacked as B234), LISS-4 (Layer stacked as B2345) images along with their Meta files. The module accepts inputs in Geo-Tiff format and provides output in Geo-Tiff format.

The S/W module has been developed using the coefficients derived from spectral transformation method to establish a relationship between B234 and B345 of LISS-3 image and applying these coefficients on B234 of LISS-4 Image to derive synthesized SWIR band.

2. Downloading the program

The program and the user manual can be downloaded from the location: http://www.nrsc.gov.in/Satellite_Data_Products_Overview?q=Download_Softwares_1

3. Hardware and software requirements:

Desktop computer system with minimum 4 GB RAM and any operating system with 50 GB Hard disk space, preinstalled Java SE JRE 8 (Build 1.8.0_65 or higher) with *GDAL libraries (Ver 2.0 or above)*

Update Environment Variable Settings:

Add Java Installation directory at the end of 'path' variable inside Environment Variable settings of your system. Also add GDAL installation, gdal-data and gdalplugins folder paths to path variable.

Input and Output requirement:

Input file should be in GeoTiff format along with their Meta files. LISS-III, LISS-IV Mx data sets should be layer stacked. LISS-III image should comprise of 2345 bands and LISS-IV data set should comprise of 234 bands stacked in that order. Input LISS-III, LISS-IV Mx data sets should be co registered.

Select appropriate files for generating the synthesized SWIR band by selecting the appropriate inputs. The utility will prompt if the data sets given are not valid data sets.

Resourcsesat-2 LISS-III: 10 Bit	**Resourcesat-2** LISS-IV: 10 Bit

This software utility may also work with any other sensor data provided they meet the above requirement. However its functionality is tested only with NRSC supplied Resourcesat-2 LISS-III, LISS-IV Mx data sets.

4. Salient Features of software

1. Platform independent JAVA program and require GDAL library (Ver 2.0 or above).
2. Software will take input LISS-III and LISS-IV Mx data sets as stacked layer.
3. It does not require any installation as program can run by invoking it through double click or through command mode.
4. Software provides option for the user to show the path of the metafile where it is located.

5. Steps in Running the Program : Invoke program by double clicking on "*swir4l4.bat*" in windows system or type the following command in the terminal window of your operating system ***"java –Xms4096m –jar swir4l4.jar"*** the GUI appears

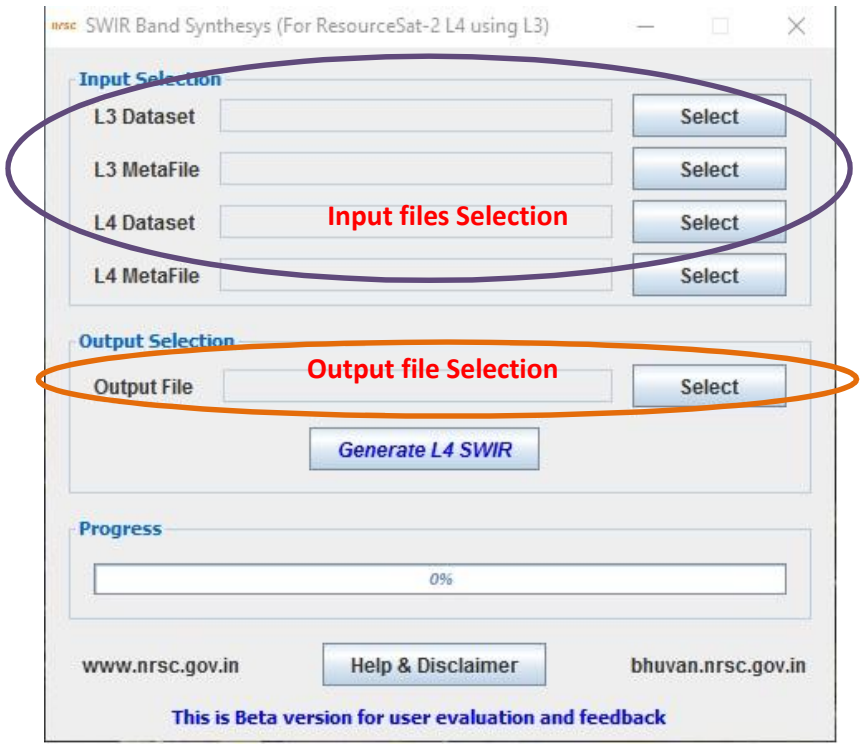
(Give full path of Java command and full path of swir4l4.jar incase if above command does not work)

If your system is having more memory try allocating more memory to JVM using –Xms argument in command mode.

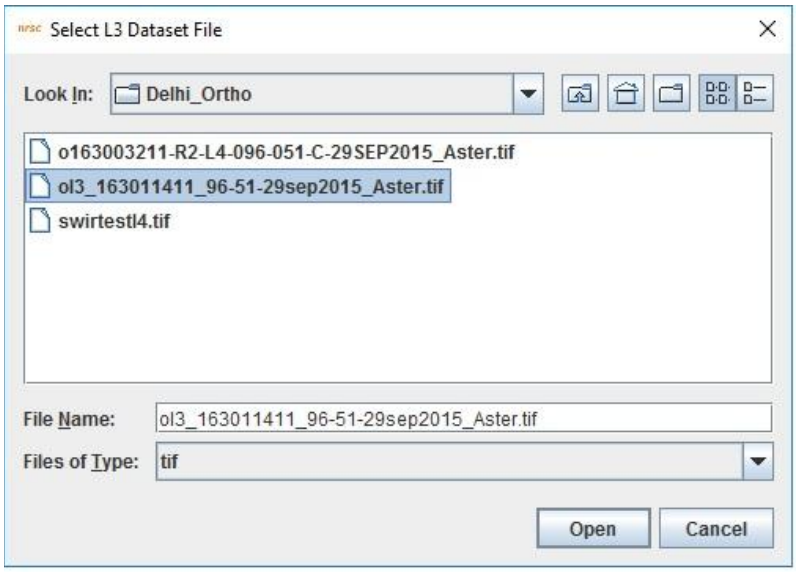
(Example: to allocate 4GB of memory: ***"java –Xms4096m –jar swir4l4.jar"***)

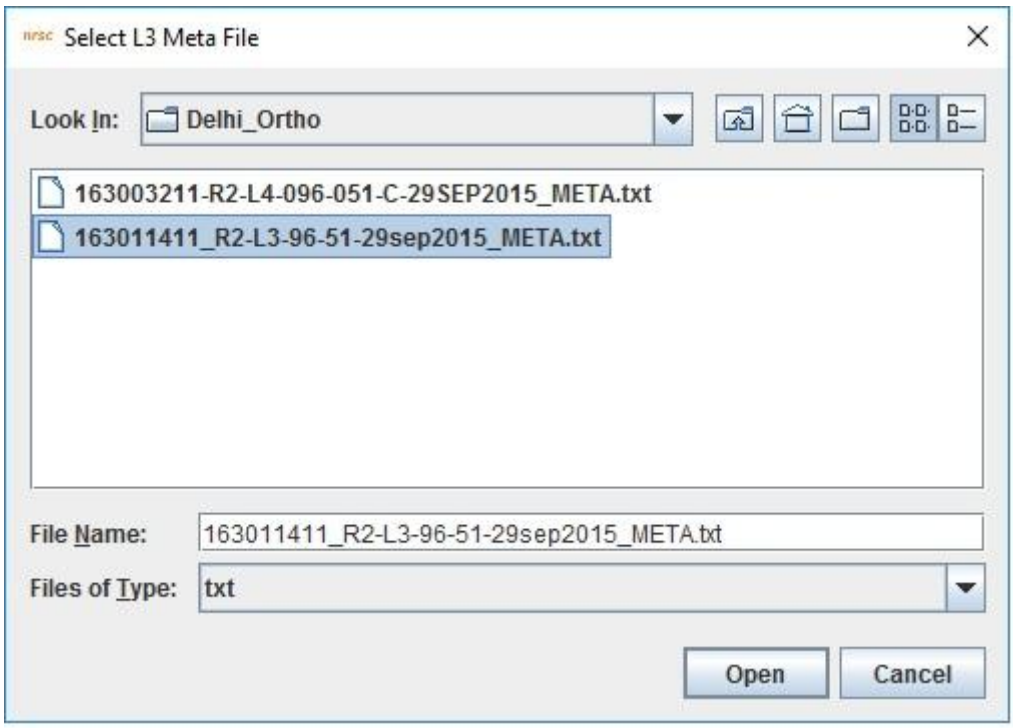
Download JRE: Java SE JRE can be downloaded and installed from Oracle website (www.oracle.com).

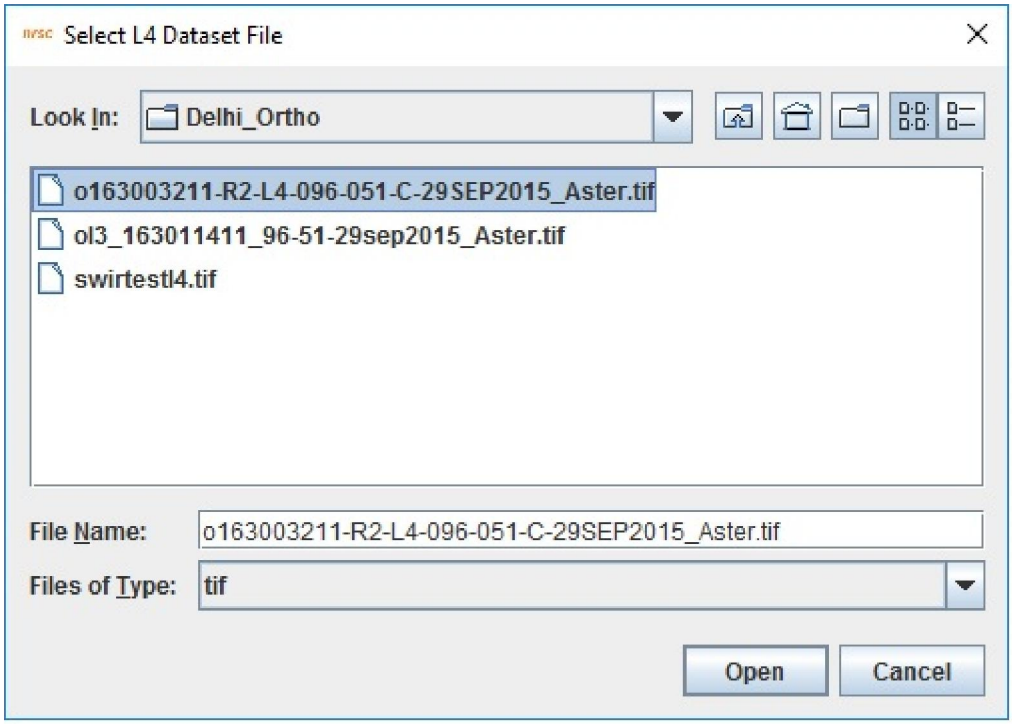
Download GDAL Libraries: Download GDAL libraries from the http://trac.osgeo.org/gdal/wiki/DownloadingGdalBinaries web site

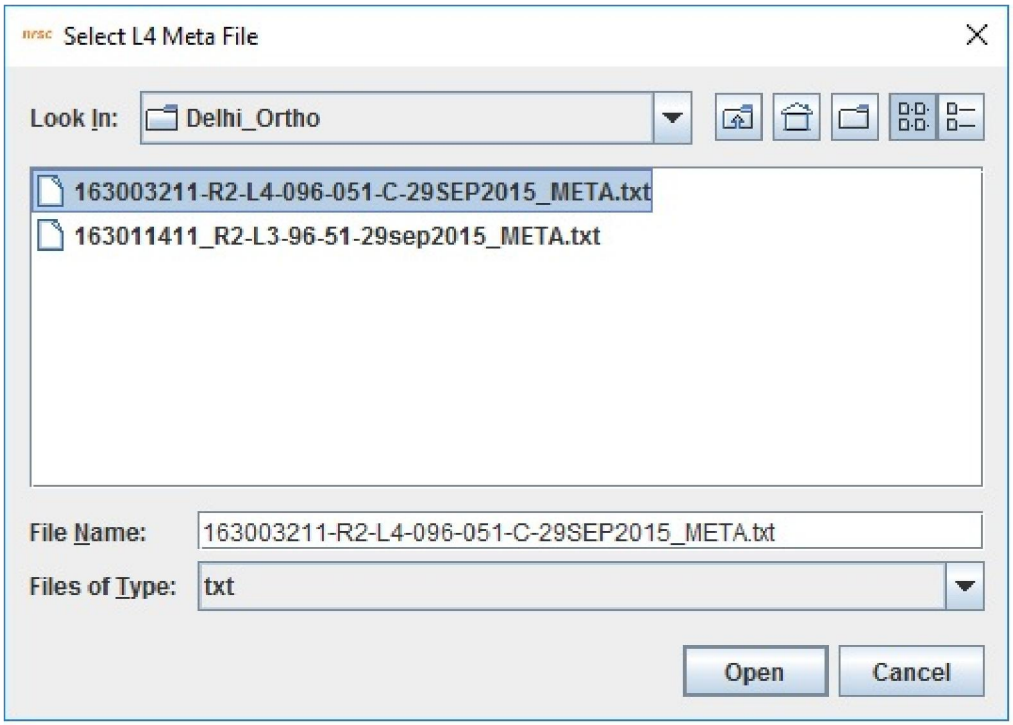


From "***Input Selection"*** panel, using respective "Select" button one can enter the required input files to the module. Each button opens a file selection dialogue for entering the locations of the input files as shown in the figure below:

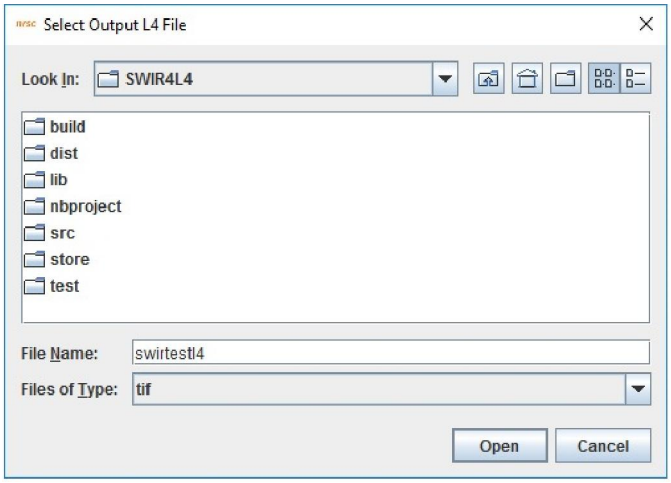




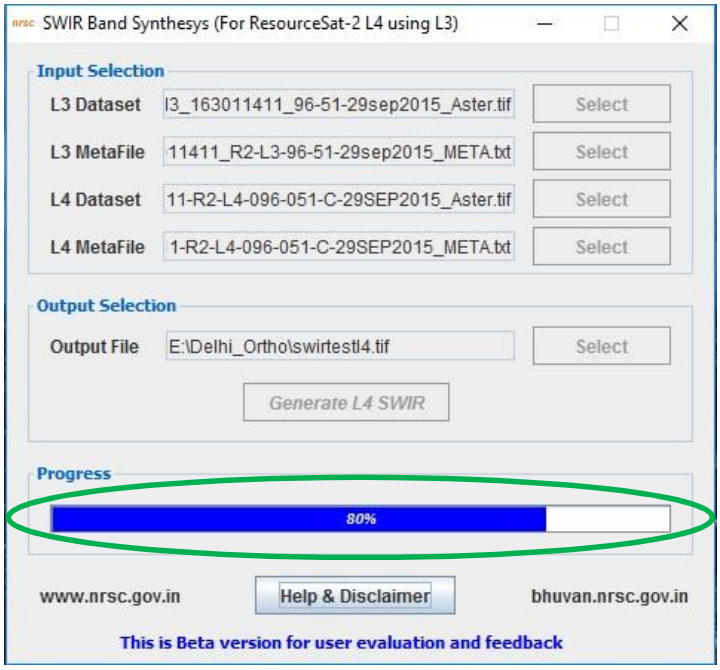

Select L4 Dataset File
Look In:
Delhi_Ortho
o163003211-R2-L4-096-051-C-29SEP2015_Aster.tif
ol3_163011411_96-51-29sep2015_Aster.tif
swirtestl4.tif
File Name:
o163003211-R2-L4-096-051-C-29SEP2015_Aster.tif
Files of Type:
tif
Open
Cancel


Select L4 Meta File
Look In:
Delhi_Ortho
163003211-R2-L4-096-051-C-29SEP2015_META.txt
163011411_R2-L3-96-51-29sep2015_META.txt
File Name:
163003211-R2-L4-096-051-C-29SEP2015_META.txt
Files of Type:
txt
Open
Cancel

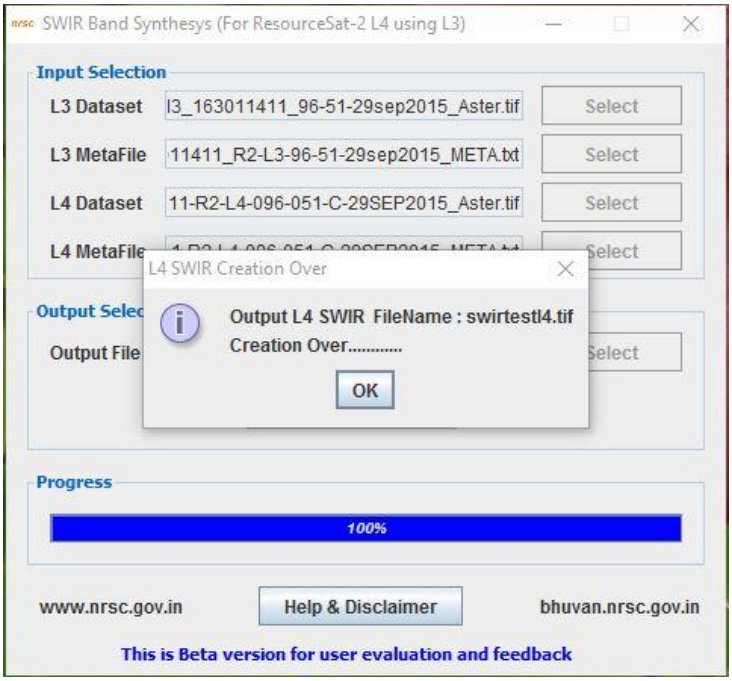
After selecting the L3 & L4 Datasets and respective META files, select the name of the output file to be created as shown in the figure below:



Then press “Generate L4 SWIR” button to create a synthesized L4 image from the given set of input image files. Progress of the module is displayed in a progress bar as shown in figure

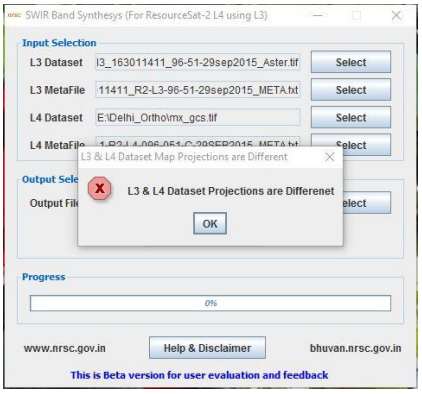


After completion of the conversion the completion status is reported as shown in the figure below:



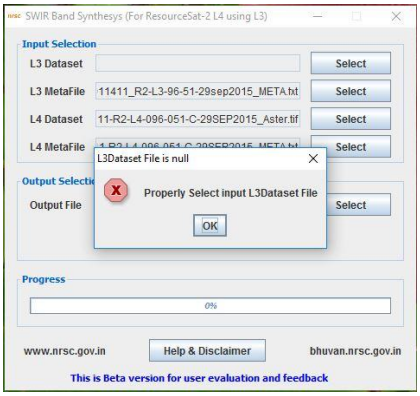
6. Error conditions and messages

1. ***Input files belongs to different Projection:*** If input files L3 & L4 Datasets does not corresponds to same Projection, an error message will be shown as in the figure



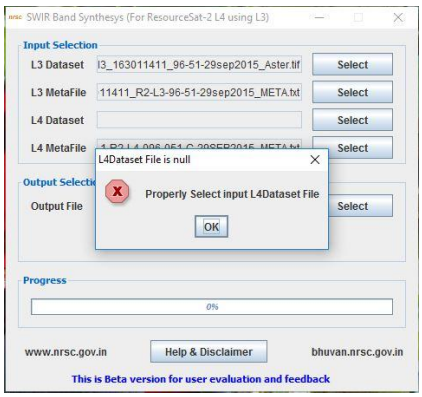
Solution: *Select input files that belongs to same Projection*

2. ***Forgot to enter L3 Dataset file :*** After selecting Input Dataset & META files, if one forgets to enter L3 Dataset file it will given an error message



Solution: *Select input L3 Dataset file*

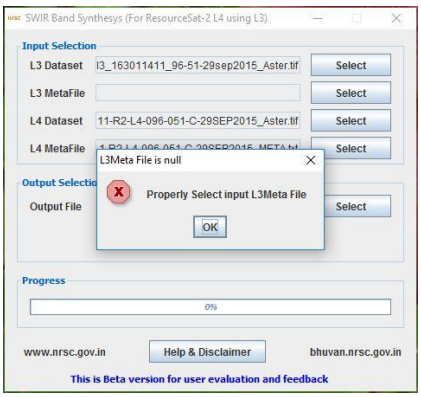
3. ***Forgot to enter L4 Dataset file :*** While selecting all Input Dataset & META files, if one forgets to enter L4 Dataset file it will given an error message



Solution: *Select input L4 Dataset file*

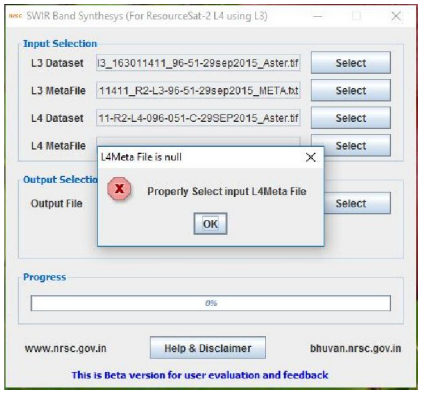
4. ***Forgot to enter L3 META file :*** After selecting Input Dataset & META files, if one forgets to enter L3 META file it will given an error message

Solution: *Select input L3 META file*



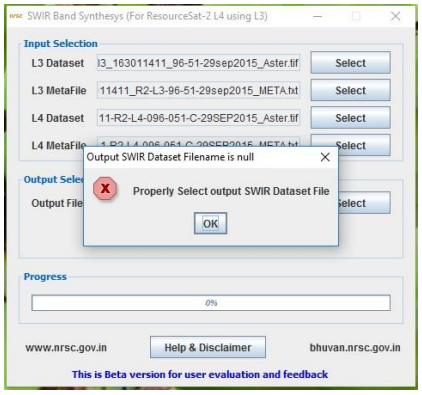
5. ***Forgot to enter L4 META file :*** While selecting all Input Dataset & META files, if one forgets to enter L4 META file it will given an error message

Solution: *Select input L4 META file*



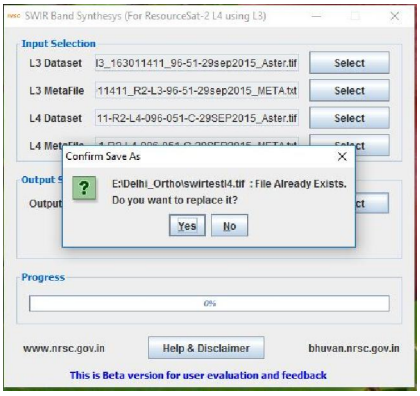
6. ***Forgot to enter output SWIR file :*** After selecting Input L3 & L4 Dataset and META files, if one forgets to enter output SWIR Dataset file it will given an error message

Solution: *Select output Fusion Dataset file*



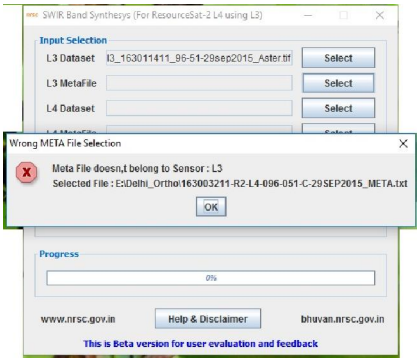
7. ***If output SWIR file already exists :*** if ouput SWIR Dataset filename already exists, program will prompt whether to overwrite the existing output file?

Solution: *take appropriate decission whether to overwrite output swir file or not*



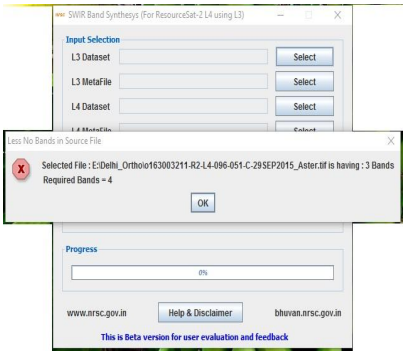
8. ***If selected META file does not corresponds to specific sensor*** *the program gives an error message*

Solution*: select correct META file corresponding to respective sensor*



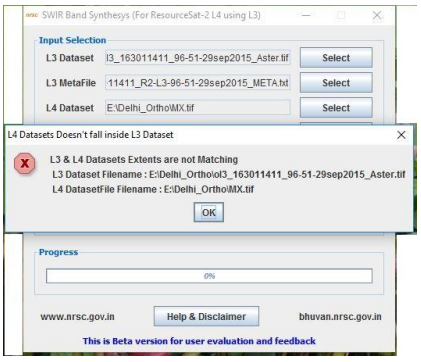
9. **If selected input file is having less no of bands than required**, program will give an error message

Solution: *Select correct input file with specified no of band*

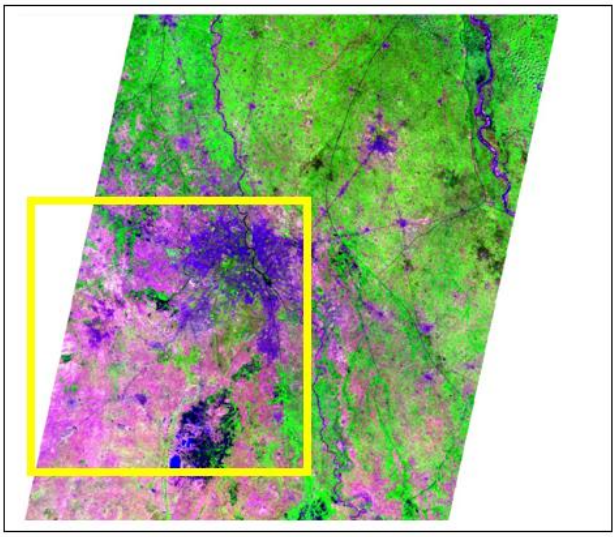


10. **If selected input files extents are not matching**, program will give an error message

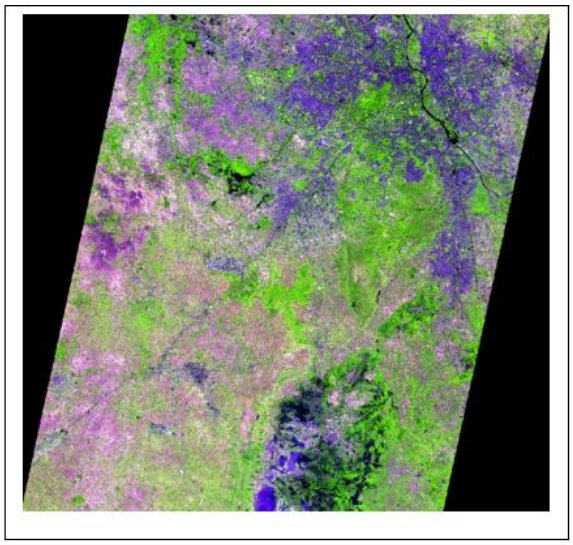
Solution: *Select correct file with specified no of band*



Sample NCC converted Images from FCC



Input L3 Image B543



Synthesised L4 Image B543

7. Disclaimer

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2. This software utility is implemented based on block based calculation of multiple regression coefficients to synthesise SWIR band. Apart from this, many other techniques may also be available in the literature. User on his sole discretion may adopt this utility for creating SWIR band.
3. This software generates synthesized SWIR band, and is not a replacement of originally acquired SWIR band.