User Manual

NCC Generation Utility for IRS Data



National Remote Sensing Centre January, 2016

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Cover Page : NCC created from Resourcesat-2 L4Mx, DOP : 30Dec2015, Covering part of Indira Gandhi International Airport, New Delhi

1. Introduction

Remote sensing satellites view the earth in different spectral bands, viz. near infrared (NIR), red, green, and blue bands. In the absence of a blue channel from IRS-1C/1D onwards, interpreter creates color images using near infrared, red, and green bands in what is known as a false color composite(FCC).

FCC does not look like natural representation of earth system as we view the earth with the naked eye. e.g. Green vegetated areas appear Red in FCC whereas on real world we see it as green. For a trained interpreter, this does not pose any problem. However, for the non-remote sensing professional, this becomes a handicap. To overcome this, there is a requirement to generate natural color composites (NCC) from the given false color composite. This needs the simulation of a blue band and create NCC by combining it with green and red bands.

The NCC S/W module has been developed using the coefficients derived using spectral transformation method to establish a relationship between false color and true color image pairs provided by a sensor with all the four bands. These coefficients seem to work on a large number of images of different seasons, provided similar spectral bands and terrain are used.

With the demand from the users for the Natural Color Conversion software, the software utility is developed at NRSC for users to create NCC at their end by using different sensors data sets from IRS-Resourcesat-1 and Resourcesat-2 Multispectral data.

2. Hardware and software requirements:

Desktop computer system with minimum 1 GB RAM and any operating system with preinstalled Java SE JRE 8 (Build 1.8.0_65 or higher).

Update Environment Variable Settings:

Add Java Installation directory at the end of 'path' variable inside Environment Variable settings of your system.

Input and Output requirement:

Input file should be in GeoTiff format and can be individual band files or layer stacked. Software utility can take stacked files with more than 3 band, but while using user should be aware of position of individual band. Output file format will always be in GeoTiff file with same projection parameter as that of input. Input files should contain Infra Red, Red and Green. These individual band file should be co registered.

Select appropriate bits, before proceeding to NCC. It will support any multispectral data. InfraRed band is Band 4, Red is Band 3 and Green is Band 2 in Indian remote Sensing (IRS) satellites. Use following as Bits Per Pixel for IRS data:

Resourcesat-1 LISS-III and LISS-IV: 8 Bit AWiFS: 10 Bit **Resourcesat-2** LISS-III and LISS-IV: 10 Bit AWiFS: 12 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-1 and Resourcesat-2 data.

3. Downloading the program

The program and the user manual can be downloaded from the location: http://www.nrsc.gov.in/DataProducts.services.satellite.html

4. Salient Features of software

- 1. Platform independent JAVA program and does not require any library.
- 2. Software can take input as individual bands or multiple bands combined as stacked layer.
- 3. It does not require any installation as program can run by invoking it through double click or through command mode.
- Software provides option to user to use his own Co-efficient in place of default value provided in the utility. It Offers selection of coefficients in two modes 1. Default Mode and 2. Edit mode.

Default Mode: Software uses default coefficients.

Edit Mode : User can enter his own coefficients in place of default values. Software uses user entered coefficients to generate NCC.

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

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

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

(Example: to allocate 4GB of memory:"java –Xmx4096m –jar irsncc.jar")

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

| 🕫 Natural Color Image Generator for IRS Satellite Datasets | ſ |
|--|---|
| Input File Type Selection Individual Bands File type Selection | |
| Input Selection IR Band Red Band Green Band StacketFile StacketFil | |
| Output Selection Output File Output File Generate NCC | |
| Blue Band Co-Efficients Panel Bits Per Pixel 10 ▼ Bias 55.6215 Manage Coeff Infra Red O Edit O Default User can change these default values in Edit mode | |
| Progress Coefficients Selection | |
| www.nrsc.gov.in Help & Disclaimer bhuvan.nrsc.gov.in This is Beta version for user evaluation and feedback | |

Selection of "*Input File Type Selection*" as Individual bands prompts for entering the locations of the individual bands as shown in the figure below:

| msc Select Green | Band File | | | | | × |
|------------------|----------------------------------|-----------|--|---|---------|--------|
| Look in: | 14271431 | 1 | | ~ | b 📂 🛄 - | |
| Recent Items | BAND2 BAND3 BAND4 BAND5 | | | | | |
| Desktop | | | | | | |
| Documents | | | | | | |
| This PC | | | | | | |
| I | File <u>n</u> ame: | BAND2.tif | | | | Open |
| Network | Files of type: | tif | | | \sim | Cancel |

After entering the paths of the individual bands select the name of the output file to be created as shown in the figure below:

| msc Select Outou | t NCC File | | | | × |
|------------------|--|---------------|---|---------|--------|
| Look <u>i</u> n: | GreaterMu | ımbai | ~ | • 🖽 💙 🗊 | |
| Recent Items | 142714311 132909211 133275720 New | 1)1 | | | |
| Desktop | | | | | |
| Documents | | | | | |
| This PC | | | | | |
| | File <u>n</u> ame: | nccoutput.tif | | | Open |
| Network | Files of type: | tif | | \sim | Cancel |

The program prompts you about the number of Bits per pixel selected automatically, which does not required to be changed except for Resourcesat-1 AWiFS data, for which it needs to be changed from 12 to 10. Click **Yes** if the value chosen is correct



The progress status appears at the bottom of the progress bar as shown below:

| Input File Type | Selection | Individual Bar | nds 👻 | | |
|-----------------|----------------|--------------------|--------------------|--------------|-----------|
| Input Selection | | | | | |
| IR Band | NCCTest | tDatasets\RS2L3\16 | 52613011\BAND4 | tif | Select |
| Red Band | NCCTest | Datasets\RS2L3\1 | 52613011\BAND3 | tif | Select |
| Green Band | NCCTest | Datasets\RS2L3\1 | 52613011\BAND2 | tif | Select |
| StackedFile | | | | | Select |
| Blue Band Co-Ef | ficients Pane | Generate | NCC | | |
| Bits Per Pixel | 10 👻 | Bias | 55.6215 | Red | -0.138254 |
| Manage Coeff | | Infra Red | -0.100616 | Green | 0.873393 |
| 🔘 Edit 🍥 D | efault | User can change | these default valu | es in Edit m | ode |
| Progress | | 40 | 1Z | | |
| | | 40) | 70 | | |
| www.nrsc.go | v.in | Help & Disc | ainer | pnuvan.nr | sc.gov.in |

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



Similarly, If the Input file type chosen is **"Stacked Bands"** the GUI shown below appears for the input file selection, where in we need to select only one input file with bands stacked.

| wsc Natural Color In | nage Generator for IRS Satellite Datasets |
|---------------------------------|--|
| Input File Type Se | election |
| | |
| Input Selection | |
| IR Band | Select |
| Red Band | Select |
| Green Band | Select |
| StackedFile | Datasets\P6L3_100_55_04oct11\12-0012-22.tif Select |
| Output Selection Output File | Select |
| | Generate NCC |
| Blue Band Co-Effic | ients Panel |
| Bits Per Pixel | 8 v Bias 13.905375 Red -0.138254 |
| Manage Coeff | Infra Red -0.100616 Green 0.873393 |
| 🔘 Edit 💿 De | fault User can change these default values in Edit mode |
| Progress | |
| | 0% |
| www.nrsc.gov. | in Help & Disclaimer bhuvan.nrsc.gov.in |
| Th | is is Beta version for user evaluation and feedback |

Input file selection Window for Stacked bands case

| IR Red & Green Ba | nd indexes | in FCC File | \times |
|-------------------|------------|-------------|----------|
| | FCC Bands | Place | |
| | InfraRED | 3 🗸 | |
| | RED | 2 🗸 | |
| | GREEN | 1 🗸 | |
| | ОК | | |

Selection of the input file It will prompt for the band positions as shown below:

After choosing the appropriate band positions the rest of the steps remain same as that for Individual Bands case.

The positioning of the individual bands in the output NCC file will be in the order Red (original), Green(original) and Blue (synthesised).

6. Error conditions and messages

1. Individual Band files Bits per pixels are not matching: If all the band files given for ncc conversion does not belong to the same product / sensor, an error message will be shown as in the figure

Solution: Select the all the three band files with same bits / pixel

2. Forgot to enter one file : After selecting Input File type as Individual bands, if one forgets to enter all the three bands it will given an error message

Solution: Select the missing input file

| nput Selection | | |
|---|--|---|
| IR Band | BeansProjects\RSNCC\Datasets\fcc3_irtif | Select |
| Red Band | ansProjects'#RSNCC/Datasets/fcc2_red.tf | Select |
| Green Band | eansProjectsURSNCC/Datasets/BAND2.ff | Select |
| Stacked File | 3 | Select |
| Bits Par I | Pixel's Differ | × |
| Output 🙁 | Individual Band Files Bits Per Pixels are not mat IR Band Filename : fcc3_ir.tifBitsPer Pixel = 16 Rod Band Filename : fcc2_rod.tiBitsPer Pixel = Green Band Filename : BAND2.tifBitsPer Pixel = | thing ct |
| ilve tlan | OK | |
| Bits Per Pixel | 10 V Bias 55.6215 Red | 0.138254 |
| Manage Coeff | Infra Red -0.100616 Green | 0.873393 |
| O Edit 🖲 D | lefaolt | |
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| rogress | | |
| 100000 | | |
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| www.nrsc.gov. This is Natural Color in | in Help & Disclaimer bhuy a Beta version for user evaluation and feedback | wn.nrsc.gov |
| www.nrsc.gov. This is Natural Color In Japot File Type | in Help & Disclaimer bhav s Beta version for user evaluation and feedback sequences for IRS Satellite Datasets. Sclection | an.nrsc.gov |
| www.nrsc.gov. This b Natural Color in Japot File Type | in Help & Disclaimer bhave s Beta version for user evaluation and feedback mage Generator for IRS Satellike Datasets Selection Individual Bands | an.nrsc.gov |
| www.nrsc.gov. This is Natural Color in Input File Type | in Help & Disclaimer bhuv a Beta version for user evaluation and feedback mage Generator for IRS Satellite Datasets Selection | en.nrsc.gov |
| www.nrsc.gov. This is Natural Color In Input File Type Input Selection | in Help & Disclaimer bhave s Beta version for user evaluation and feedback nage Generator for IRS Satelite Datasets Selection Individual Bands | an Arsc.gov |
| www.nrsc.gov. This is Natural Color In Input File Type Input Selection IR Band | in Help & Disclaimer bhave s Beta version for user evaluation and feedback mage Generator for IRS Satellike Datasets Sciencian Individual Bands earnsProjectsURSINCCDutasets/BAND4 M | an.nrsc.gov – Select |
| www.nrsc.gov. This is Natural Color In Input File Type Input Selection IR Band Red Bland | In Help & Disclaimer bhave s Beta version for user evaluation and feedback mage Generator for IRS Satellite Datasets Selection Individual Banda earnsProjects/IRSNCCD/dasets/BAND4.Iff | an.nrsc.gov – Select Select |
| www.mrsc.gov. This is Natural Color (in Input File Type Input Selection IR Band Green Band | In Help & Disclaimer bhuv Is Beta version for user evaluation and feedback In age Cenerator for IRS Satellite Datasets Selection Individual Banda Image Cenerator for IRS Satellite Datasets Image Cenerator for IRS Satellite Datasets Selection Image Cenerator for IRS Satellite Datasets Selection Image Cenerator for IRS Satellite Datasets Image Cenerator for IRS Sa | en.nrsc.gov - Select Select Select |
| www.arsc.gov. This is Natural Color (in Input File Type Input Selection IR Band Red Band Green Band Stacked File | In Help & Disclaime blav S Beta version for user evaluation and feedback mage Generator for IRS Satellike Datasets Selection Individual Bands • ears:Projects/IRSINCC/Datasets/BAND4.M ears:Projects/IRSINCC/Datasets/BAND2.M | an.nrsc.gov - Select Select Select Select Select |
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| www.arsc.gov. This is Natural Color (m Input File Type Input Selection IR Band Red Band Green Band Stacked File Output Selectio Output File | In Help & Disclaime bhave Beta version for user evaluation and feedback rege Generator for IPS Statelike Datasets Selection eansProjectsIVERINCCIDatasets/BAND4.87 eansProjectsIVERINCCIDatasets/BAND4.87 Red Band File is null X Property Select input Red Band File | Select Select Select Select Select |
| www.arsc.gov. This is Natural Color in Input File Type Input Selection IR Band Red Band Green Band Stacked File Output File | In Help & Disclaime bhave In Help & Disclaime bhave Is Beta version for user evaluation and feedback Independent In IS Statilite Datasets Selection Individual Bands Generator for URS INCCO date to BAND 4 M ans Projects URSINCCO date to BAND 2 M Feed Band File is null | Select Select Select Select |

Help & Dis

3. Scanlines of individual files are not matching : If the scanlines of individual files are not matching it will give an error message

Solution: Select all the three band files from the same data product

| barren the s | election | |
|--|--|---|
| | Individual Bands 💌 | |
| put Selection | | |
| IR Band | BeansProjectsWRSNCCIDatasetsIdcc3_ir.tif | Select |
| Red Band | ansProjects\IRSNCC/Datasets\fcc2_red.tif | Select |
| Green Band | eansProjects/RSNCC/Datasets/BAND2.tr | Select |
| Stacked File | | Select |
| Outper | Individual Band Files Image Heights are not mat IR Band Filename : fcc3_ir.tiffmage Height = 134 Red Band Filename : fcc2_red.tiffmage Height = Green Band Filename : BAND2.tiffmage Height = | tching 490 • 13490 • 7194 |
| Output X | Individual Band Files Image Heights are not mat IR Band Filename : fcc3_ir.tifimage Height = 134 Red Band Filename : fcc2_cred.tifimage Height = Green Band Filename : BAND2.tifimage Height = OK | tching 490 • 13490 • 7194 |
| Output X | Individual Band Files Image Heights are not mat IR Bend Filesame : Icc2_rcflmage Height = 13 Red Band Filesame : Icc2_rcd Tiltmage Height = Green Band Filesame : BAND2.tiltmage Height = OK 10 V Bias 55.0215 Red | 13490 • 13490 • 7194 • 7194 |
| Dutpur Nue llar Bits Per Pixel Manage Coeff O Edit ® D | Individual Band Files Image Height are not mail RI Band Tilename: Icc.2, ruitImage Height = 13 Red Band Filename: IcC.2, ruitImage Height = Green Band Filename: ILMUD2IIImage Height = CML Inf V Biss 55.5215 Red Infra Red -0.100616 Green User can change these default values in t | tching 13490 7194 0.138254 0.873393 Gdt mode |
| Outpur Use Bar Bits Per Pixel Manage Coeff O Edit ® D rogress | Individual Band Files Image Heights are not mai RI Band Tilename: Irc2. Jr. diffmage Height = 13- Green Band Filename: IC2. Jr. diffmage Height = | tching 490 - 13490 - 7194 - 0.138254 - 0.873393 (dit mode |
| Cutpu We Bar Bits Per Pixel Manage Coeff O Edit ® D rogress | Individual Band Files Image Heights are not ma IR Band Tilename: Icc3, ruitImage Height - 13 Red Band Tilename: IcC2, ruitImage Height - Green Band Filename: ILAND2.IIImage Height - CK Int - CK Int - CK Int - CK Intra Red -0.100616 Green User can change these default values in t On | tching 490 13490 7194 0.138254 0.873393 Lidit mode |

4. Pixels of individual files are not matching : If the pixels of individual files are not matching it will give an error message

Solution: Select all the three band files from the same data product

| Input File Type Se | lection | Individual Ban | ds 💌 | | |
|--|--------------------|--|--|---|-------------------------------------|
| Input Selection | | | | | |
| IR Band | eans | ProjectsVRSNC | CiDatasets/BAN | ID4.1f | Select |
| Red Band | eans | ProjectsWRSNC | CIDataseta/BAN | ID3.M | Select |
| Green Band | ansP | rojects\RSNCC | Datasets/fcc1_ | gm sr | Select |
| Stacked File | | | | | Select |
| | INC EXAMPLE | 1008ame : HAN | sa ninimade vvid | th = 7171 | |
| Bits Per Pixel Hanage Coeff C Edit ® Do | Red Ban Green B | Hename : LIAN Id Filename : BA and Filename : f O Bias Infra Red | ND3.titimage Wit ND3.titimage Wit cc1_grn.titima K 13.905375 -0.100616 | nth = 7171 Aidth = 717 ge Width = Rød Green | -0 138254 0.873393 |
| Bits Per Pixel Hanage Coeff C Edit ® Do Progress | Red Ban Green B | I Rename : LANK Id Filename : BA and Filename : T O Blas Infra Red User can char | Ja. timmage Wit ND3.tiftmage Wit cct_grn.tiftma K 13.905375 -0.100516 age these default | nn = 7171 Aidth = 7171 ge Width = Red Green values in Ed | 0 138254 0.873393 |
| Blue Ba Bits Per Pixel Hanage Coeff G Edit (*) Do Progress | Red Ban Green B | i Hename : LAVI Id Filename : EA and Filename : I O Blas Infra Red Uner can char | Valutimage Vid NO3.tiffmage Vid No3.tiff | nn = 7171 Adth = 717 ge Width = Red Green values in Ed | 1 13426 -0 138254 0.873393 |

5. If the available disk space is not sufficient for writing the output file the program gives an error message

Solution: Clear disk space in the output drive or create output files in a disk where sufficient space is available

| Input file Type Sei | Section \$ | tacked Bands | | | |
|--|--|---|---|---|---|
| Input Selection | | | | | |
| IR Band | | | | | Select |
| Red Band | | | | | Select |
| Green Band | | | | | Select |
| Stacked File | F115423 | 89851-533-33 | 31-310CT13-F | 10.00 | Select |
| Out Drive(Partition Out X Log doe Rec | n) has not er gical Drive(F ssn't have e quired Free | ough Free Dis Partition) corr nough space Disk Space - | sk Space responding to to create outp 2112 MB | output file : put NCC File | Fince.tif |
| Out Drive(Partition Ou X Log doe Rec | n) has not er gical Drive(f esn't have e guired Free | Partition) com nough space Disk Space - OP Bias | sk Space responding to to create out 2112 MB | output file : put NCC File Red | -0.138254 |
| Out Convertige of the second s | n) has not er gical Drive(F csn't have e guired Free | Partition) corr nough space Disk Space Disk Space Bias Infra Red | ek Space responding to to create outg - 2112 MB | output file : put NCC File Rød Grøen | × Fincc.10 -0.138254 0.073393 |
| Out Drive(Partition Ou Not Log doe Rec Ibue Bits Per Pixel Hanage Coeff O Edit * De | n) has not er gical Drive(F csn"t have e guired Free 10 • fault | Partition) corr nough space Disk Space - Disk Space - Bias Infra Red User can chan | ek Space responding to to create outg 2112 MB 55.6215 -0.100616 ge these default | output file : put NCC File Red Green values in Ed | Finec.Iff 0.138254 0.873393 a mode |
| Outp Drive(Partition Ou Ou Log doe Rec Bits Per Pixel Hanage Coeff O Edit ® De Progress | n) has not er gical Drive(f sm't have e quired Free flout | Partition) corn nough space Disk Space - Disk Space - Bias Bias Infra Red User can chan | ex Space responding to to create outp 2112 MB 55 6215 -0.100616 ge these default | output file : put NCC File Red Green values in Ed | -0.138254 0.873393 8 mode |
| Out Drive(Partition Out Control Log doe Rec alue Bits Per Pixel Planage Coeff O Edit ® De Progress | n) has not er pical Drive(F rsn't have e quired Free | Partition) corn Partition) corn ough space Disk Space - Disk Space - Bias Intra Rad User can chan | ck Space responding to to create outp - 2112 MB - 35.6215 - 0.100616 ge these default | output file : put NCC File Red Green values in Ed | C 138254 |
| Output Drive(Partition Out Log doc Rec Bits Per Pixel Planage Coeff C Edit @ De Progress | n) has not er pical Drive(F san't have e quired Free flault | ough Free Dis Partition) corr nough space Disk Space = Disk Space = Bias Bias Infra Red User can chan | ck Space responding to to create outp 2112 MB 55.5215 -0.100515 ge these default | output file : put NCC File Red Green values in Ed | × Fincc.tif 0.138254 0.873393 a mode |

6. If, by mistake same files is chosen twice the program will give an error message

Solution: Carefully select all three band files

| | Individual Bands 💌 | |
|---|---|--|
| Input Selection | | |
| IR Band | eansProjects/RSNCC/Datasets/EAND4.tif | Select |
| Red Band | eansProjects/IRSNCC/Datasets/8AND3.tif | Select |
| Green Band | eansProjects\RSNCC/Datasets\BAND3.tif | Select |
| Stacked File | | Select |
| | Individual Band File names are same OK | |
| Blue Band Coeffic | Individual Band File names are same | |
| Blue Band Coeffic Bits Per Pixel | Individual Band File names are same OK Bias 13.905375 Re | d -0.13825- |
| Blue Band Coeffic Bits Per Pixel Manage Coeff | Individual Band File names are same OK Blas 13.905375 Ro Infra Red -0.100615 Gree | d -0 13825 n 0.873393 |
| Blue Band Coeffic Bits Per Pixel Manage Coeff O Edit @ C | Individual Rand File names are same OK Bus 13.805375 Re Infra Red -0.100515 Gree User can change these default values in | d -0.13825- n 0.873393 Fdit mode |
| Blue Band Coeffic Bits Per Pixel Manage Coeff O Edit ® C Progress | Individual Rand File names are same OK Bus 13.805375 Re Infra Red -0.100516 Gree Ouer cas change these default values in | d -0.13825 n 0.873393 Edit mode |
| Blue Band Coeffic Bits Per Pixel Hanage Coeff O Edit ® C Progress | Individual Rand File names are same OK Bus 13.905375 Re Infra Red -0.100516 Gree User cas change these default volves to | d -0.13825- n 0.873393 Edit mode |

7. While converting NCC from Individual bands / stacked bands, if same file name is chosen for input and output it will give an error

Solution : Give a different name to output file

| | Stacked Bands | |
|--|--|-----------------------------------|
| nput Selection | | |
| IR Band | | Select |
| Red Band | | Select |
| Green Band | 1 | Select |
| Stacked File | ts/1542389851-533-331-310CT13-FCC.tr | Select |
| Incut & Cu | And Filmman and have from | 100 |
| Output Output | Input (Stacked) & output(NCC) File names can't be OK | same 1 |
| Output Output | Input Frenzimes Can't de Jame Input(Stacked) & Output(NCC) File names can't bi OK Input(Stacked) & Output(NCC) File names can't bi OK Input Stacked & Stacke | -0.136254 |
| Output Rue Band Coeffici Bits Per Pixel Hanage Coeff Q Edit ® Di | Input Freedmes Can't be same Input(Stacked) & output(NCC) File names can't be OK Infor Panel Infor Bias 55.6215 Red Infor Red 0.100015 Green User cas charge these default values in t User cas charge these default values in t | -0.138254 0.873393 dit mode |
| Dutput Output Nove Band Coeffici Bits Per Pixel Hanage Coeff O Edit ® Di Yogress | Input Freedmes Can't be same Input (Stacked) & output (NCC) File names can't be OK ients Panel Io v Bias 55.5215 Red Infra Red © 100015 Green User can change these default values in f | -0.138254 0.873393 dit mode |

 Different bands are chosen from different products and if they are having different Image corners it will give an error

Solution: Select all the three band files from the same data product



 In edit mode, if coefficient values entered are other than numeric values the program gives an error message

Solution: Enter only the numerical values

- Individual Bands 💌 IR Band 3eansProjectsWRSNCC\Datasets\fcc3_ir.tif Select ansProjects/IRSNCC/Datasets/Icc2_red.tif Red Band Select Green Band sURSNCC/Datasets/icc1 orn.tif Select Stacked Fil P Net De × Enter Only D ОК Bias 55.62abcd Red -0.138254 Bits Per Pixel fra Red -0.100616 Green 0.873393 Edit sc.gov.in Help & Disclaimer bhuyan nrsc. nov.i This is Beta v sion for user evaluation
- If output folder is specified as the CD-ROM /DVD-ROM/BD-ROM drive, an error message appears.
- **Solution:** Change output Folder to local disk drives.

| | la la | ndividual Ban | ids 💌 | | |
|---|----------------------|------------------------------------|--|------------------------------|---------------------------------|
| Input Selection | | | | | |
| IR Band | EIPROD | UCTIBAND | 4.TIF | | Select |
| Red Band | E1PRODUCT11BAND3.TIF | | | Select | |
| Green Band | EPROD | UCTINBAND | 2.TIF | | Select |
| Stacked File | | | | | Solect |
| _ | | 0 | к | | |
| llue Band Coeffy | | 0 | к | | |
| live Band Coeffs Bits Per Pixel | 8 - | Bias | 13 905375 | Red | -0.138254 |
| live Band Coeffi Bits Per Pixel Manage Coeff | 8 - | Bias Infra Red | н 13.905375 -0.100516 | Red Green | -0.138254 0.873393 |
| Bits Per Pixel Manage Coeff O Edit ® D | 8 💌 efault | Bias Infra Red User can char | 13 905375 -0.100616 | Red Green values in Ed | -0. 138254 0.873393 |
| Blue Band Coeffe Bits Per Pixel Planage Coeff O Edit ® D Progress | 8 💌 | Bias Infra Red User can char | 13.905375 -0.100616 nge these default | Red Green values in Ed | -0.138254 0.873393 A mode |
| Bits Per Pixel Planage Coeff O Edit ® D | 8 💌 | Bias Infra Red User can char | K 13 905375 -0.100516 mge these default | Red Green values in Ed | -0.138254 0.873393 A mode |
| Bits Per Pixel Planage Coeff O Edit ® D Progress | 8 💌 | Bias Infra Red User can char | K 13.905375 -0.100616 nge these default | Red Green values in Ed | -0.138254 0.873393 8 mode |

- Instead of Individual Band files if a multiband input file is selected the program gives an error message.
- **Solution :** Select input file with appropriate number of bands

| nput File Type Selection | Individual Bands 💌 | |
|--|---|---|
| input Selection | | |
| IR Band | | Select |
| Red Band | | Select |
| Green Band | | Select |
| Stacked File | | Select |
| kot A Single Band File Select Single Selected File | Band File. 1542389851-533-331-310CT13 | × |
| Act A Single Band File Select Single Selected File Bits Per Pixel 10 Manage Coeff C Edit * Default | Band File. 1542389851-533-331-310CT13 OK Biles 55.6215 Inftra Red -0.100615 | X I-FCC.ttl is having : 3 Bands Red -0.138254 Green 0.87393 |
| A Single Band File Select Single Select File Bits Per Poxel Manage Coeff Ett * Default Yrogress | Band File. 1542389851-533-331-310CT13 OK Bies 55.5215 Infra Red -0.100515 User can change these defau | × I-FCC.tif is having : 3 Bands Red -0.130254 Green 0.073393 It values is Edit mode |
| Interface of the second | Band File. 1542389851-533-331-310CT13 OK Bios 55.5215 Infra Red -0.100515 User can change these defact | × I-FCC.tif is having : 3 Bands Red 0.130254 Green 0.873393 It values is Edit mode |

14. If the output file is not appearing like NCC

Solution: Check the given band combinations, Ensure that the input bands are arranged in the following order: Band1 - Red, Band2 - Green, Band3 - Blue



Sample NCC converted Images from FCC



NCC output Image (RS2 LISS III)



FCC Input image (RS2 L4MX)



NCC Output image (RS2 L4MX)

7. Disclaimer

- 1. This software product is provided by NRSC "as is" and conveys no license or title under any patent, copyright, or mask work right to the product. NRSC reserves the right to make changes in the software without notification. NRSC also make no representation or warranty that such application will be suitable for the specified use without further testing or modification. There are inherent risks in the use of any software, and you are solely responsible for determining whether this software product is compatible with your computer and other software installed on your computer. You are also solely responsible for the protection of your system and backup of your data, and NRSC will not be liable for any damages you may suffer in connection with using, modifying, or distributing this software.
- 2. This software utility is one of the modules implemented based upon the technical paper given in the reference. Apart from this, many other techniques are also available in the literature. User on his sole discretion may adopt this utility for creating NCC.
- 3. This software generates synthesized blue band, and is not a replacement of originally acquired blue band.