Format Conversion Tool for JERS-1

Operation Manual for Users

15/2/2017

Changes and status paragraphs

Revision	Date	Reason for change	Modified or added paragraphs
1.0	15/2/2017	Creation	-

1. Introduction	
2. Conversion target products	2
3. Supported operating systems (OSs)	2
4. Operation description	
4.1 Basic procedures of the Format Conversion Tool for JERS-1	
4.2 Format conversion process (basic)	4
4.3 Main screen	
4.4 Folder selection screen	9
4.5 Options screen	
4.6 Help screen	
5. Input file	12
5.1 List of URL to get input files	12
5.2 List of URL written about input file format	
6. Output file	12
6.1 Output file name	
6.2 GeoTIFF Output Specification	
6.2.1 GeoTIFF header part output specification	
6.2.2 GeoTIFF data part output specification	
6.3 KMZ output specification	14
6.3.1 KML output specification	
6.3.2 TIFF Output specification	14
7. Examples of using Format Conversion Tool	15
7.1 Use by GIS Software	15
7.2 Use by GIS Software	
7.3 How to edit and analyze with GIS Software (ArcMap)	

1. Introduction

This document is written for users who use Format Conversion Tool for JERS-1.

JERS-1 dataset can be converted into GeoTIFF file format and KMZ file fomat by using this format conversion tool.

JERS-1 dataset is made as CEOS file format. CEOS File format is restricted to use with GIS software. Moreover there is few GIS software to use CEOS file format in the world. (Fig. 1)



Fig. 1 CEOS Data Handling without Format Conversion Tool for JERS-1

By using this format conversion tool, JERS-1 dataset is able to convert into GeoTIFF file format and KMZ file format more easily.

So, JERS-1 data can be used with various softwares such as Arc GIS, QGIS, and Google Earth.

We hope to increase the ways to us JERS-1 dataset by using this tool. (Fig. 2)



Fig. 2 Expanding Data Utilization after Format Conversion Tool for JERS-1

2. Conversion target products

The conversion target products are listed in Table 1.

Table 1 List of conversion target products

Target products	Product type	Input format	Output format
JERS-1 products	SAD Lovel 2.1	CEOS	GeoTIFF
	SAK Level 2.1		KMZ
	OPS VNIR Level 2		GeoTIFF
			KMZ
	OPS SWIR Level 2		GeoTIFF
			KMZ

3. Supported operating systems (OSs)

The OSs supported by the Format Conversion Tool are listed below.

- ➢ Windows 7
- ➢ Windows 8
- ➢ Windows 10

4. Operation description

The basic procedures of the Format Conversion Tool are listed in "4.1" quick explanation of Format conversion process(basic) are listed in "4.2" and detailed explanations of each screen are listed in "4.3–4.6"

4.1 Basic procedures of the Format Conversion Tool for JERS-1

- ① Execute FormatConversionTool_JERS-1_Setup v1.0.exe
- ② Click "Next" button on Installer page.



③ Click "Install" button on Installer Preparation page.



④ Click "Finish" button on Install completed page.

BrormatConversionTool_for_JERS-1 - InstallShield Wizard	FormatConversionTool_for_JERS-1 - InstallShield Wizard		
Installing FormatConversionTool_for_JERS-1 The program features you selected are being installed.	InstallShield Wizard Completed		
Please wait while the InstallShield Wizard installs FormatConversionTool_for_JERS-1. This may take several minutes. Status:	The InstallShield Wizard has successfully installed FormatConversionTool_for_JERS-1. Click Finish to exit the wizard.		
InstallShield < <u>Back</u> Cancel	< Back Finish Cancel		

* If you execute FormatConversionTool_JERS-1_Setup v1.0.exe on the computer not installed .NET Framework, .NET Framework will be installed at first.

- 4.2 Format conversion process (basic)
- ① Run FormatConversionTOOL_JERS-1.exe and launch this tool.

🖸 Windows Media Player 🔺	P Format Conversion Tool for JERS-1
a Windows Update	O that Found
MinSCP	
🛹 XPS ビューアー	
📑 デスクトップ ガジェット 👘	InputOutput
🧶 フォト ギャラリー	
🚪 ムービー メーカー 🛛 🗉	Name Date Size Name Date Size
👦 既定のプログラム	
퉬 Android SDK Tools 🛁	
퉬 ArcGIS	
ArcGIS Explorer Desktop	
🔒 Dell	
🐌 FileZilla FTP Client	
FormatConversionTool	
FormatConversionTool_for_JERS-1	Fina Character Character
FormatConversionTool_JERS-1.exe	
GCOM-W1UserTool	Information
▲ 前に戻る	It is displayed at run time progress, error, etc.
プログラムとファイルの検索 👂	
	1

② Click "Option" button in Main screen, and set a prefix of target file to output and a prefix of output file in Option screen. (This operation can be skipped.)

🖳 Format Conversion Too	ol for JERS-1
Input	Output Format
2	💀 OptionForm
Name	SAR L2.1 / select output target Target V SAR SAR SAR
	OPS VNIR L2 Target
	RGB VNIR_RGB Red 3 Green 2 <
	OPS SWIR L2
Information	Target I Band5 (1.60-1.71 µm) SWIR_05 I Band6 (2.01-2.12 µm) SWIR_06
It is displayed at run time p	οε 🔽 Band7 (2.13-2.25 μm) SWIR_07 🔽 Band8 (2.27-2.40 μm) SWIR_08
	Save Close

Format Conversion Tool for JERS-1	ERT-LET- PROBE TO	
Input	Output Format GeoTIFF TKMZ Output	Option Help
Name D	Name	Date Size
Information	Exec Cancel	Close
It is displayed at run time progress, error, etc.		~

3 $% \label{eq:2.1}$ In the main screen, select the output format (GeoTIFF, KMZ).

Format Conversion Tool for JERS-1			
		Output Format	
		GeoTIFF 🔽 KMZ	Option Help
Iput		Output	
2			
Na	Date Size		Date Size
フォルダーの参照	Sheer Contraction of		
Select folder for satellite product data.			
> 10 20161028_test		^ 	
> 🍌 20161104_test			Cle
Þ 퉲 20161124			
▷ 퉬 20161128_CD			
Þ 퉬 20161129		E	
20161225			
Þ 퉬 20161228			
a 퉬 20161229			
\mu input			
li output			
_		OK +++>+UN	
			OptionHelp
nput		Outr	
Ci¥Users¥005847¥Desktop¥20161229¥input		C¥Users¥005847¥Desktop¥20161229¥o	utput
Name	Date Size	Name	Date Size
110VN19931123R01065206064241_2UCG26zip	2016/12/ 32.24 MiB		
110VN19940219R01074001064241_2UCG26zip	2016/12/ 33.26 MiB		
J1OVN19971001R01206004064241_2UCG26zip	2016/12/ 36.62 MiB		
	Exec	Cancel	Cl
formation			
There is no-files in Output folder.			
·			

④ In the main screen, select the input/output folders.

(5) Select conversion target file(s) from the main screen input file list and click "Exec".

💀 Format Conversion Tool for JERS-1		
Input	Output Format GeoTIFF FKMZ Output C¥Users¥005847¥Desktop¥201	Option Help
Name	Date Size Name	Date Size
J10VN19981123R01065206064241_2UCG26zip	2016/12/ 32.24 MiB	
J10VN19940219R01074001064241_2UCG26zip	2016/12/ 33.26 MiB	
J10VN19971001R01206004064241_2UCG26zip	2016/12/ 36.62 MiB	
	Exec Cancel	Close
Information		
There is no-files in Output folder.		•

(6) The converted format files will be output to the output folder. (Complete)

Format Conversion Tool for JERS-1			
Input		Output Format GeoTIFF Gr KMZ Output C:¥Users¥005847¥Desktop¥2016122	OptionHelp 9¥output
Name	Date Size	Name	Date Size 🔺
J10VN19931123R01065206064241_2UCG26zip	2016/12/ 32.24 MiB	J10VN19971001R01206004064241_2UCG2	6_VNIR_02.tif 2016/12 18.02 MiB
J10VN19940219R01074001064241_2UCG26zip	2016/12/ 33.26 MiB	J10VN19971001R01206004064241_2UCG2	6_VNIR_02 2016/12 0.52 MiB
J10VN19971001R01206004064241_2UCG26zip	2016/12/ 36.62 MiB	J10VN19971001R01206004064241_2UCG2	6_VNIR_03.tif 2016/12 18.02 MiB
		J10VN19971001R01206004064241_2UCG2	6_VNIR_03 2016/12 0.56 MiB
		J10VN19971001R01206004064241_2UCG2	6_VNIR_RG 2016/12 54.07 MiB
		J10VN19971001R01206004064241_2UCG2	6_VNIR_RG 2016/12 1.51 MiB
	Exec	Cancel	Close
Information			
KMZ file(J10VN19971001R01206004064241_2UCG26_ Reading product data Generate image files TIFF file(J10VN19971001R01206004064241_2UCG26_ KMZ file(J10VN19971001R01206004064241_2UCG26_ Completed.	VNIR_03kmz) is created. VNIR_RGBtif) is created. VNIR_RGBkmz) is created.		• •

4.3 Main screen

This is the screen for executing format conversions according to the selected mode.

Select the input file, the output format, and the output folder and pressing the Exec button. The converted format file will be output to the output folder.

A screenshot of the main screen is shown in Fig. 3, and descriptions of screen elements are listed in Table 2.

				- 0 X
Input 2 C:¥Users¥005847¥Desktop¥20161229¥input 3	¢	Output Format GeoTIFF Gr KMZ Output C¥Users¥005847¥Desktop4	(D) Option 420161229¥output (6)	Help
Name (4)	Date Size	Name	🕖 🛛 Date	Size 🔺
J10VN19931123R01065206064241_2UCG26zip	2016/12/ 32.24 MiB	J10VN19931123R0106520606424	1_2UCG26_VNIR_01 2016/12	2 0.45 MiB
J10VN19940219R01074001064241_2UCG26zip	2016/12/ 33.26 MiB	J10VN19931123R0106520606424	1_2UCG26_VNIR_01.tif 2016/12	2 18.02 MiB 💻
J10VN19971001R01206004064241_2UCG26zip	2016/12/ 36.62 MiB	J10VN19931123R0106520606424	1_2UCG26_VNIR_02 2016/12	2 0.48 MiB
		J10VN19981123R0106520606424	1_2UCG26_VNIR_02.tif 2016/12	2 18.02 MiB
		J10VN19981123R0106520606424	1_2UCG26_VNIR_03 2016/12	2 0.50 MiB
		J10VN19931123R0106520606424	1_2UCG26_VNIR_03.tif 2016/12	2 18.02 MiB
		.110VN19931123B0106520606424	1 2UCG26 VNIR RG 2016/12) 1.38 MiB 💌
Information	8 Exec	Cancel 9		Close
It is displayed at run time progress, error, etc.				*
				~

Fig. 3 Screenshot of the main screen

Table 2 Main screen elements

No.	Name	Description
1	Output format	Selects the output file format (GeoTIFF, KMZ).
	selection checkbox	
2	Input folder selection	Opens the folder selection screen.
	button	
3	Input folder box	Displays the folder path selected in the folder selection screen.
4	Input file list	It is possible to add to the list by dragging and dropping.
		Multiple files can also be selected using Shift and Ctrl.
		Displays a list of files in the selected folder path.
5	Output folder	Opens the folder selection screen.
	selection button	
6	Output folder box	Displays the folder path selected in the folder selection screen.
7	Output file list	It is possible to perform conversions by dragging and dropping from the list of input files.
		It is possible to change file name by choosing file.
		Displays a list of files in the selected folder. (Black)
		Displays the output files created after conversion. (Red)
8	Run button	Runs the conversion process. Outputs converted files to the output folder based on the
		input file and output format.
9	Cancel button	Stops the conversion process.
10	Options button	Opens the options screen.
11	Help button	Displays the help screen.
12	Close button	Exits tool.
13	Information box	Displays the activity log and errors

4.4 Folder selection screen

This is the screen for selecting folders. The selected folder will be reflected in the main screen's input folder and output folder.

A screenshot of the folder selection screen is shown in Fig. 4, and descriptions of screen elements are listed in Table 3.

フォルダーの参照	x
Select folder for satellite product data.	
» 30161028_test	^
>]] 20161104_test	
» 🌗 20161124	
> 📙 20161128_CD	
» 📙 20161129	
20161225	
» 퉬 20161228	
a 🎍 20161229	
\mu input	
🔒 output	Ŧ
2 3 OK ¥+v>t	۱

Fig. 4 A screenshot of the folder selection screen

Table 3 Folder selection screen elemen	Table 3 Fol	der selecti	on screen	elements
--	-------------	-------------	-----------	----------

No.	Name	Description
1	Folder selection box	Selects the output folder.
2	OK button	Closes the folder selection screen.
		Select the main screen input/output folder box to display the folder path, and all files
		contained in that path will be displayed as a list of input/output files.
3	Cancel button	Closes the folder selection screen.

4.5 Options screen

You can set the target to output and prefix of outputted file (end of outputted file name) in this screen. If you set it in this screen, format conversion will be done according to your setting.

Screenshot is shown in Fig. 5, explanation of elements is shown in Table 4.

P OptionForm	- • ×
SAR L2.12 Target IV SAR SAR	
OPS VNIR L2	
Target 🔽 Band1 (0.52-0.60 μm) VNIR_01 🔽 Band2 (0.63-0.69 μm) VNIR_02 🖾 Band3 (0.76-0.86 μm)	VNIR_03
RGB VNIR_RGB Red 3 Green 2 Blue 1 3	
OPS SWIR L2	
Target 🔽 Band5 (1.60-1.71 μm) SWIR_05 🔽 Band6 (2.01-2.12 μm) SWIR_06	
🔽 Band7 (2.13-2.25 μm) SWIR_07 🕼 Band8 (2.27-2.40 μm) SWIR_08	
(4) Save	Close

Fig. 5 Screenshot of options screen

Table 4 Options screen elements

No.	Name	Description
1	Check box of target file	Select the band(s) of target file to output.
	to output	
2	Prefix of output file	Input prefix of every output file. Output file name is determined by using inputted
		prefix in this phase.
		Output file name: input file (no extension) + prefix +.tif OR .kmz
3	Selecter of the band to	Select the band to apply to RGB parameters (red, green and blue).
	apply to RGB	
	parameteres	If you want to use False color, please apply Band3 to Red color, Band2 to Green color, and Band1 to Blue color.
		False color displays vegetation such as trees and grasses as Red color.
		It is used to watch the condition of forests and fields on earth.
		If you want to use Natural color, please apply Band2 to Red color, Band3 to Green color, and Band1 to Blue color.
		Natural color displays vegetation such as trees and grasses as Green color.
		It looks like natural image for human being.
4	Save button	Save the parameter you inputed in option screen and close the screen.
5	Close button	Closes the screen.

4.6 Help screen

This screen explains basic operation procedures for this tool.

A screenshot of the help screen is show in Fig. 6.

	👔 Help		-				
	(日本)	(つ 民る)		聞 ・ オブジョン(0)			
	Lotro duo					*	
R Help	Introduc	tion					
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表示反应	そう 印刷	オプション(0)				<u>^</u>
Option W	indow					X	
	5. m.						Help
表示 戻る 日	画 オブション(<u>0</u>)					=
Satellite Product							Size
Relp			9-02			 	
(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)] - 3)(0)						-
Format Conversion To	ol for JER	S-1			^		
							Chr
Introduction							•
Marin Mondani							
• Main Window							
Option Window							-
<u>Satellite Product</u>							
						-	
					-		

Fig. 6 A screenshot of the help screen

5. Input file

- 5.1 List of URL to get input files
- JERS-1 Product G-Portal: <u>https://www.gportal.jaxa.jp/gp/top.html</u>

5.2 List of URL written about input file format

JERS-1 Product

SAR

http://www.eorc.jaxa.jp/hatoyama/satellite/list/format/format_sar_j.pdf

OPS

http://www.eorc.jaxa.jp/hatoyama/satellite/list/format/format_ops_j.pdf

6. Output file

6.1 Output file name

The following is displayed concerning the naming conventions for output file names.

GeoTIFF

(Input file name [not extension])_(Output prefix).tif

> KMZ

(Input file name [not extension])_(Output prefix).kmz

* Output prefix : it is inputted parameters on Options screen (reference to Fig. 5 (2)).

6.2 GeoTIFF Output Specification

- 6.2.1 GeoTIFF header part output specification
 - A) JERS-1 product (WGS84 UTM) Tag names and parameters about GeoTIFF Header part of JERS-1 product are written on Table 5.
 Table 5 List of tag names and parameters about GeoTIFF header part of JERS-1 product (WGS84 UTM)

No.	Tag name	Parameter
1	TIFFTAG_ImageWidth	Pixel
2	TIFFTAG_ImageLength	Line
3	TIFFTAG_BitsPerSample	SAR : 16
		OPS : 8
		OPS RGB : 8,8,8
4	TIFFTAG_Compression	Uncompressed
5	TIFFTAG_PhotometricInterpretation	SAR/OPS : BlackIsZero
		OPS RGB : RGB
	TIFFTAG_StripOffsets	8

No.	Tag name	Parameter
6	TIFFTAG_SamplesPerPixel	SAR/OPS: 1
		OPS RGB : 3
7	TIFFTAG_SampleFormat	SAR/OPS : Unsigned Integer
		OPS RGB : Unsigned Integer, Unsigned Integer, Unsigned
		Integer
8	Metadata.ModelTransformationTag	Tag to convert pixel and line coordinates into map
		coordinates.
9	Metadata.GeoKeyDirectory.	ModelTypeProjected
	GTModelTypeGeoKey	
10	Metadata.GeoKeyDirectory.	RasterPixelIsArea
	GTRasterTypeGeoKey	
11	Metadata.GeoKeyDirectory.	PCS_WGS84_UTM_zone_(Zone of conversion file)N
	ProjectedCSTypeGeoKey	
12	Metadata.GeoKeyDirectory.	Linear_Meter
	ProjLinearUnitsGeoKey	

B) JERS-1 product (Porar Stereo)

Tag names and parameters about GeoTIFF Header part of JERS-1 product are written on Table 6.

Table 6 List of tag names and parameters about GeoTIFF header part of JERS-1 product (Porar Stereo)

No.	Tag name	Parameter
1	TIFFTAG_ImageWidth	Pixel
2	TIFFTAG_ImageLength	Line
3	TIFFTAG_BitsPerSample	OPS : 8
		OPS RGB : 8,8,8
4	TIFFTAG_Compression	Uncompressed
5	TIFFTAG_PhotometricInterpretation	OPS : BlackIsZero
		OPS RGB : RGB
6	TIFFTAG_StripOffsets	8
7	TIFFTAG_SamplesPerPixel	OPS : 1
		OPS RGB: 3
8	TIFFTAG_SampleFormat	OPS : Unsigned Integer
		OPS RGB : Unsigned Integer, Unsigned Integer, Unsigned
		Integer
9	Metadata.ModelTransformationTag	Tag to convert pixel and line coordinates into map
		coordinates.
10	Metadata.GeoKeyDirectory.	ModelTypeProjected
	GTModelTypeGeoKey	
11	Metadata.GeoKeyDirectory.	RasterPixelIsArea
	GTRasterTypeGeoKey	
12	Metadata.GeoKeyDirectory.	Linear_Meter
	ProjLinearUnitsGeoKey	
13	ProjOriginLatGeoKey	60.0
14	ProjFalseEastingGeoKey	0.0
15	ProjFalseNorthingGeoKey	0.0
16	ProjScaleAtOriginGeoKey	1.0
17	ProjStraightVertPoleLongGeoKey	139.0

6.2.2 GeoTIFF data part output specification

The Setting parameters of data parts are the same values as original image data.

6.3 KMZ output specification

KMZ file is consisted of KML file and TIFF file.

6.3.1 KML output specification

Tag names and Parameters about JERS-1 product's KML file are written on Table 7.

Table 7 List of tag names and parameters about JERS-1 product's KML file

No.	Tag name	Parameter
1	kml- GroundOverlay-name	TIFF file name (Not extension)
2	kml- GroundOverlay-Icon-href	TIFF file path
3	kml- GroundOverlay-LatLonBox-north	Northernmost coordinate
4	kml- GroundOverlay-LatLonBox-south	Southernmost coordinate
5	kml- GroundOverlay-LatLonBox-east	Easternmost coordinate
6	kml- GroundOverlay-LatLonBox-west	Westernmost coordinate

6.3.2 TIFF Output specification

The Setting parameters of data parts are the same values as original image data.

7. Examples of using Format Conversion Tool

7.1 Use by GIS Software

GeoTIFF format data is readable as image data by popular viewers such as the Paint and the photo viewer. This image data is easy for editing itself and uploading SNS.

> Use case of viewing and editing JERS-1 product



Fig. 7 Example of viewing and editing JERS-1 Data by Viewers

7.2 Use by GIS Software

It is easily to refer the GeoTIFF and KMZ data by mapping on world map, analyze, and edit values of data.

KMZ format file is used for Google Earth.

Reference of JERS-1 product



Fig. 8 JERS-1 product using by GIS software

> Use GIS software to analyze and edit JERS-1 product



Fig. 9 Case of analyzing and editing JERS-1 product by using GIS software

7.3 How to edit and analyze with GIS Software (ArcMap)

The examples of how to use edit and analyze the JERS-1 dataset with GIS Software (ArcMap 10.3,10.4) written in Chapter 7.2 Fig. 9. are shown below.

How to display histogram

① Right-Click on the target file and Select [Properties] in Contents window.



2 Press [Histgrams] button in Layer Property window.

レイヤ プロパティ				X
一般 ソース キー メタデータ ま=(c)	2 範囲 表示 シンボル 時間			
マクトル場 個別値	カラー ランプに沿って値をストレッチ	します。	2	
分類 ストレッチ 不通行カラー	A	(本 二 2 1 1		
1 200000	E	道 シベル 35678 <u>高: 35678</u>		
		272		=
	カラー ランプ(R):	373 1氏:373		
			•	
	□ 省景表示(B) 省景値:	7:1	省景巴:	
Serie and	▲ 時間にはいかまでは用いの	-		
N.C.S. 20		最大値: 0.25		
シンボルについて		1.90016	<u>9</u> 1	-
			0K ***`d711.	
				× 13(1)/



③ Histogram winodw will be diplayed on the screen.

- ⊳ How to use display swipe.
 - ① Select [Menu] [Windows] [Image Analysis]. Image Analysis Screen will be opened.



② Select the target image to swipe in Image Analysis Screen and Press [Swipe layer] button.

画像解析	
V 🗇 J10VN19931123R01065206064241_2UCG26_VNIR_RGB.tif	=
🔲 🧇 J1SAR19980224R01038006064242_21UNG416_SAR.tif	_
✓	-
	•
	- I
0	
γ 1.59	
DRA Top Up	
「「「「「」」「「」」「「」」「」」「「」」「」」「」」「」」「」」「」」「」	
割合クリップ 🗸 🔟	
最近隣内挿法	
レイヤのスワイプ	
処理	
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γ γ	
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3 You can swipe the image on the layer by using Left-Clicking and moving cursor.



\succ How to use extract

① Select [Cusotmize]-[Toolbars]-[Draw]. Draw Menu will be displayed.



② Select the extract pattern on Draw Menu.



③ Select the range to extract on the layer.





(4) Select [Menu]-[Winodws]-[Imagae Analysis]. Imagae Analysis Screen will be opened.

(5) Select the image to extract on Imagae AnalysisScreen, and press the [Clip] button.

] @www.iborth.tif			
67.			21	
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•	0	0		
§ n		0		
γ —		1.59		
DRA 背景	🛄 TopUp			
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最近国际内接	9.			
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	京範囲または遅沢 コングラフィック ゴンフィーチャを 溜沢レイヤの一部 り、各選択セット ラリレイヤを作品			

⑥ Extracted layer will be created.



- ➢ How to convert projection
- Double-click [ArcToolBox] [Data Management Tools] [Projections and Transformations] -[Raster] - [Project Raster]. Convert projection of raster Screen will be opened.



② Set inputted raster dataset, outputted raster dataset, and outputted raster coordinate, press the [OK] button on Convert projection of raster Screen.

(JAGON REAL (PIOJECT RASIET)	
٨,	出力データの座標系 ^
C#Users#005847#Desk.top#20161229#output#J10VN19971001R01206004064241_2UCG26_VNIR_RGB.tif	1 カニフカの扱影生をたて広博系
入力データの座標系(オブション)	デフォルト値は、[出力データの座標
WGS_1984_UTM_zone_54N	系]環境設定に基づいて設定され ます。
出力ラスタ データセット	
C¥Users¥005847¥Desktop¥20161229¥output¥After.tif	
出力データの座標系	
World Sinusoidal	
地理座標系変換(オブション)	
T T	
4	
日本に対しが手法(オポント))	
NEAREST	
出力セルサイズ (オキルン)	
X Y	
20.6742189837669 21.1108923896873 🔻	
OK キャンセル 環境 ペヘルプを非表示	ツール ヘルプ



3 Projection of raster image you inputted will be conveted and outputted.