Manual for Satellite Data Analysis

eCognition Developer

PNGFA.



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Chapter 1. Introduction

1. Object-Based Classification

There are two method of classification by remote sensing. Pixel-Based Classification will assign pixel to landcover. Object-Based will generate segments by integrating similar pixels at first, and then segments will be assigned to landcover. Object-Based Classification is suitable for classification based on high resolution satellite imagery.



Original Image

Pixel-Based Classification

Object-Based Classification

2. Region grow

At first, smaller segments are generated. Then smaller segments which have similar digital information will be integrated as below.



Original Image

Level 1 Scale Parameter: 50 Level 2 Scale Parameter: 100



Automatic Classification (by Statistics)

Manual Modification (by Interpretation)

3. Algorisms

eCognition has many algorithms as below. Generally, 'execute child processes', 'multiresolution segmentation' and 'classification' are used.

Algorithms



Operation to perform





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delete scenes
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Chapter 2. Characteristics of Spectrums

1. Characteristics of spectrums for each landcover materials

Satellite imagery has some spectrums. Each spectrums has characteristics on each landcover materials as below.



Bands of RapidEye







Reflection characteristics of Vegetation

Reflection characteristics of Water

2. Band combinations

Satellite	Bands	True Color	False Color	Natural False Color
RapidEye	Band1: Blue	Blue		
	Band2: Green	Green	Blue	Blue
	Band3: Red	Red	Green	Red
	Band4: Rededge			
	Band5: NIR		Red	Green

ALOS/AVNIR-2	Band1: Blue	Blue		
	Band2: Green	Green	Blue	Blue
	Band3: Red	Red	Green	Green
	Band4: NIR		Red	Red
SPOT4/5 MS	Band1: NIR		Red	Green
	Band2: Red	Red	Green	Red
	Band3: Green	Blue , Green	Blue	Blue
	Band4: SWIR			

Chapter 3. Differences between Regular Ver. and Trial Ver. of Developer

Function	Regular Ver.	Trial Ver.
Batch Process (Workspace)	Available	Not Available
Export Result	Available	Not Available
Save Rule Sets	Available	Not Available

Chapter 4. Start eCognition Developer

1. Boot eCognition Developer

Click the of the click the eCognition Trail Developer folder. Click

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eCognition Developer Trial 64 8.64	Help and Support
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Search programs and files	Shut down 🕨

You will see the following images



3. Create new projects

- Click File on menu bar and select New Project



- Visible Two windows in the workspace (if two are showing at once)



- Under *the Import Image Layers window* select a Raster file (e.g. **img, tiff**) to open e.g. **rapid_5536707.img** as shown below and Click **Open** button.

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Visible is the Create Project window

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- Under the *Create Project window*, double-click each layer at a time; the *Layer Properties window* becomes visible (as shown below on the right). Change corresponding layers in the *Layer Properties window* under *Layer Alias* then click **OK** after changing each layer names:
 - ✓ For RapidEye (this case)
 - i. Layer 1: blue
 - ii. Layer 2: green
 - iii. Layer 3: red
 - iv. Layer 4: rededge
 - v. Layer 5: nir
 - ✓ For SPOT4/5
 - i. Layer 1: nir
 - ii. Layer 2: red
 - iii. Layer 3: green
 - iv. Layer 4: swir

✓ For ALOS/AVNIR-2

- v. Layer 1: blue
- vi. Layer 2: green
- vii. Layer 3: red
- viii. Layer 4: nir

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- Once completed changing the layer names (as shown below), if you would like to add more Raster file, click **Insert button** (shown below), now visible is the *Import Image Layers window* (as shown below).

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- Under the *Import Image Layers window*, select the following files with *ext. img* one at time and click **Open button**. Double- clicking each layer opens the *Layer Properties window* change the name under *Layer Alias* (repeat the same steps on the five layer bands done earlier on):

(DEM file) dem_gsar_5536707.img: Layer 6: dem

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(NDVI file) nd_re_5536707.img: Layer 8: ndvi

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Under the Create Project Window, if you would like to add Vector file, click the Insert button on the right side of the heading; *Thematic Layer Alias* (as shown below).

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Now visible is the _ Import Thematic *Layer* window (as shown below).

- Under the *Import Thematic Layer window*, select *data folder* and select **wsd5536707_shp** and click the **Open button** (as shown below).

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- Under the **Create Project window**, double click layer 1 under the **Thematic Layer Alias** and the **Layer Properties window** is shown, change the layer name as **wsd** in this case. Then click **OK to** close the **Layer Properties** window.

Thematic Layer 1		
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watershed	-	watershed
Multidimensional M	ap Pa	arameters
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Slice distance	1	
Slice start	0	
Number of frames	1 Cale	
Frame distance	1	
Frame start	0	

Click **OK** to close the **Create Project Window** (as shown below).

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ingen mingeniyer	Thematic Layers Metadata	
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Visible is the image on the workspace.

- If you want to focus on specific area of imagery, you can subset the imagery.
- Click File on the menu bar and Select Modify Open Project (as shown).

Devel	View Image Objects	- Pixels] Analysis	Library	Classific
: 📧 🛅	Load Image File	Ct	rl+N	
- 10 K	New Project			
B	Open Project	Ct	rl+0	
	<u>Close</u> Project			
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	Modify Open Project			
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- Now on visible is the *Modify Project window*

ladify Project		? X
Project Image Layers	Thematic Layers Metadata Maps	
Project Name	267/17	
		P.4.4
Map main	-	Selpction
Coordinate System	UTM Zone 55, Southern Hemisphere Transverse Merca	Preas Subset
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* m	-	
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		- insert
		Hemove
		Edit
		Preview
	Ok	Cancel

- Under the Modify Project window and click on *Subset Selection button* (as shown).

roject Image Layers Thermatic Layers Metadata Maps roject Name Training 2000/07 lep Training Trainin	Resolu 5 IV Us Pixel s auto Meter	Subset Selpction The Shine ation (m/psl ize geocodir ize (unit)
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Coordinate System UTM Zone 55, Southern Hemisphere Transverse_Merc Resolution (Meters) 5 Pixel Size 5 Project Size 5001x5001 pixels Geocoding (Lower Lett) (302497, 5 / 3423497, 5) Geocoding (Upper Right) (332502,5 / 3448502,5)	Resolu 5 V Us Pixel s auto Meter	ution (m/pxl e geocodir ize (unit)
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		Preview
nk	1 1	Cancel

On display is the *Subset Selection window*, select a small sample area of interest (AOI) by drawing a shape in the image (as shown). Then click **OK**.

_

ubset Selection	-		? X
Å.			
and and a second se Second second		1	
ia inage	t ing The sag		Wab.
Wed	- 70 - 70 - 70 1975 - 1975 - 1975 1977 -	196	***** *****
Minimum X 1934		Maximum X	2545
Minimum Y 2823		Maximum Y	3167
-Resolution - So	ene size	Active in	nage layer
5	344	blue	•
Use geocoding for	subset		

- Now visible is the image of the sample area selected (as shown).



- To return to the original image, go back to **File**, Select **Modify Project**, and Click the *Clear Subset button* (just below the Subset Selection button). Then click **OK** and original image is shown on the screen.
- To save the Project, Go to File and Select *Save Project* (as shown below) to an assigned folder.



4. Image layer mixing

Below the menu bar, click the **Edit Image Layer Mixing**, this window enables you to change the colour bands of each layer. Once selecting the appropriate bands then click **OK** (as indicated below).

dit Image Layer Mixing	100	?		x
Image Layer		R	G	E
blue		0		
green			0	
red				<
rededge				
nir				
dem				
slope				
ndvi				
- Equalizing	Layer Mixing		ihift-	
Linear (1.00%) Parameter	three layer mix		•	•

i. For *True Colour*, change the colour bands as: **blue- B**, green-G, red-R , image below



ii. For *False Colour*, change the colour bands as: **green- B**, **red-G**, **nir-R**, image shown below



iii. For *Natural (false) colour*, change colour bands as: **green-B**, **red-R**, **nir-G**, image shown below.



5. Split windows

Click the **Window Tab** on the menu bar and select '**Split Vertically' then 'Side by Side View'**, displaying two windows side by side with the same images (as shown below). This can be used to distinguish between the natural to false colour and also classifying the different features (one window can be used to do editing, etc).



Chapter 5. Management of Process Tree

- Click on '4' (as shown) in menu bar, then can see the **Process Tree Window** on the right hand side.

E Dev	elope	r Trial				
: 🚮 E	ile <u>\</u>	<u>/</u> iew	Image	Object	ts <u>A</u> r	nalysis
1	e []			10 B		

- On the right hand side of the workspace (if visible) is the **Process Tree Window**. Right-click in the **Process Tree Window**, select '**Append New**" (as shown).

s Tr	
-	Edit
	Execute
	Execute on Selected Object
	Append New
	Insert Child
	Сору
	Paste
	<u>G</u> o To
	Load Rule Set
	Save Rule Set
	Delete Rule Set
	Save As
	Delete
	Edit Customized Algorithm
	Edit Image Object Domain for Stepw
4	Active
~	Breakpoint
4	Update View

- On display is the *Edit Process* window on the screen.

Process		8 2
Name	Algorithm Description	1. Take 1. Tak
✓ Automatic	Execute all child processes	of the process.
do	Algorithm parameters	
Algorithm	Parameter	Value
execute child processes		
Image Object Domain		
execute _		
Parameter Value		
Threshold condition -		
Map From Parent		
Loops & Cycles	-	
Loop while something changes only		
Number of cycles 1		
	Ever	nite Dk Cancel Help

- When you click pull-down menu of *Algorithm*, you can choose any algorithms (as shown below)
- Normally we often use some algorithms, *'execute child processes'*, *'multiresolution segmentation'*, *'classification'* (as shown in below green box)



Uncheck 'Automatic' in the Edit Process window (if you want to assign a name) for instance,
 e.g. Madang Classification and under Algorithm select 'execute child processes' and click
 OK (as shown below). Now visible is Madang Classification under the Process Tree window.

it Process			8 2
Name	Algorithm Description Execute all child processes	of the process.	
Madang Classification	- Algorithm parameters		
Algorithm	Parameter	Value	
execute child processes	-		
Image Object Domain	_		
execute	-		
Parameter Value			
Threshold condition -			
топ гасяк			
- Loops & Cycles			
Loop while something changes only			
Number of cycles 1	3		
	Fxe	cute Ok N Cancel	Help

Right-click on Madang Classification under the Process Tree window and Select 'Insert Child' (as shown below).

cess tree	+ X U859 F
- • Madang	<u>E</u> dit
	Execute
	Execute on Selected Object
	Append <u>N</u> ew
	Insert Child
	Сору
	Paste
	<u>G</u> o To
	Load Rule Set
	Save Rule Set
	Delete Rule Set
	Save As
	Delete
	 Active
	Breakpoint
	Update View

_

- On display is the Edit Process window, under Name- e.g. *Segmentation*, under Algorithmexecute child processes and click OK (as shown below).

it Process			
Name	Algorithm Description Execute all child processes (of the process.	
Segmentation	Algorithm parameters		
Algorithm	Parameter	Value	
execute child processes			
Image Object Domain			
execute			
Parameter Value			
Threshold condition —			
- Loops & Cycles			_
Loop while something changes only			
Number of cycles 1			
	Exer	sute 0k Cancel	Help

- Now visible under the **Process Tree window** is *Segmentation* under *Madang Classification* (as shown below).

Madang Classi	fication	
Segmentati	ion	

- Right-click *Segmentation* and select '*Append New*' (as shown).

	Free + X
L	1adang Classification Segmentation
	Edit
	E <u>x</u> ecute
	Execute on Selected Object
	Append New
	Insert Child
	<u>С</u> ору
	Paste
	<u>G</u> o To
	Load Rule Set
	Save Rule Set
	Delete Rule Set
	Save As
	Delete
~	Active
	Breakpoint
	Update View

- Visible is the **Edit Process window** and under **Name**- type '*Classification*' and click *OK* (as shown below)

Algorium Description	
Execute all child processes	of the process.
Algorithm parameters	
Parameter	Value
1	
	Execute all child processes Algorithm parameters Parameter

- Now visible under the **Process Tree window** is '*Classification*' (as shown).



- These processes can be moved freely by left-click-hold (change order) and right-click-hold (change hierarchy) on each processes.

Chapter 6. Segmentation

- 1. Multi-resolution segmentation
- Right-click **segmentation** under **the Process Tree window** then select '*Insert Child*' (as shown below)



- Now visible is the **Edit Process window** (as shown).

Num -	Alexandre Description	
Name	Algorithm Description	es of the process
V Automatic		
do	Algorithm parameters	
Algorithm	Parameter	Value
execute child processes	-	
Image Object Domain		
execute	-	
Parameter Value		
Threshold condition -		
map From Farent		
Loops & Cycles		
I Loop while something changes only		
Number of cycles 1	-	
	E	xecute Ok Cancel He

- Under the Edit Process window, select the following parameters (as shown):
 - a. Algorithm- multi-resolution segmentation
 - b. Image Object Domain- pixel level (default)
 - c. *Algorithm Description* column (right side), change the '*Image Layer weights*', by clicking the + sign to make the layers visible. The different layers are now visible, change the values as:

For RapidEye: blue- 1 dem- 2 green- 3 ndvi- 3 nir-3 red- 2 rededge-2 slope- 1.

- d. Thematic layer usage, Click Yes (default)
- e. Set the *Scale parameter* to **200** (type the value 200) Click **OK**.

Name		Algorithm Description		
🔽 Automatic		Apply an optimization procedure image objects for a given resolu	which locally minimizes the average heter tion.	ogeneity of
do		Algorithm parameters		
Algorithm		Parameter	Value	
multiresolution segmentat	ion	✓ Level Usage	Use current (merge only)	
		Segmentation Settings		
Image Object Domain		Image Layer weights	1, 2, 2, 3, 3, 2, 2, 1	
pixel level		▼ blue	1	
		dem	2	
Parameter	Value	green	2	
Мар	From Parent	ndvi	3	
Threshold condition	1 1 1 1 1	nir	3	
		red	2	
		rededge	2	
		slope	1	-
		🖭 Thematic Layer usage	Yes	
		Scale parameter	200	*
		E Composition of home	ogeneity criterion	1.2
Loops & Cycles		Shane	Q 1	
V Loop while something	ı changes only	Scale parameter Scale parameter		

- Now visible is the *Algorithm segmentation* under the **Process Tree Window**. Right click the *Algorithm segmentation* and select **Execute** (as shown).

Process Tree	- X 🕻
 Madang Classification Segmentation 	on
200 [shap → □ Classification	Edit
	Execute
	Append <u>N</u> ew <u>C</u> opy <u>P</u> aste
	<u>G</u> o To
	Load Rule Set
	Delete Rule Set
	<u>S</u> ave As <u>D</u> elete
	<u>A</u> ctive
	<u>B</u> reakpoint Update View

- Now visible is the segmented image.



Segmented Image

- 2. Manage levels of segmentation
- If there are unnecessary segmentation levels, you can delete.
- Click File on the menu bar and *Select Modify Open Project* (as shown).
- 3. Manage aliases

Chapter 7. Classification

- 1. Check a characteristics of each layers for each classes
- 2. Adjust a threshold based on the mean value
- Right click *nir* in the **Feature view**, select **update range** and check ☑ (Feature view/Object Feature/ Layer values/Mean/nir; right click: update range).



~	Display in Image Object Information		
	Edit		
	Find		
Delete			
X	Manage Customize Features		
	<u>S</u> ave		
	Load		
	Edit U <u>n</u> it		
	Update Range		
vege	red rededge slope Standard devia		
	⊡		
	ti ↔ To neighbors		
	to superobject tries To Scene		
	Hue, Saturatio		

3. Classification

- Under the **Process Tree window**, right click **Classification** and select **Insert Child**.



- Now visible is the **Edit Process window**, change the following parameters (as shown):
 - i. Algorithm- classification
 - ii. Image Object Domain- image object level (default)
 - iii. Parameter-Class filter- unclassified
 - iv. Algorithm parameters: Active classes- none

v. Click **OK** to close **Edit Process window**.

Vame			Algorithm Description	
Automatic			Evaluate the membership value of an ima	ge object to a list of selected classes.
do			Algorithm parameters	
Algorithm		-	Parameter	Value
classification		- 1 .	Active classes	none
			Erase old classification, if there is no ne	. No
Image Object Domain			Use class description	Yes
image object level		*		
Parameter	Value			
Level	New Level			
Class filter	unclassified			
Threshold condition				
Мар	From Parent			
Region	From Parent			
Max. number of image obj	all			
Loops & Cycles		_		
V Loop while something cha	anges only			
Number of ourside 1				
Number or cycles		-		

- Now visible is the **Process Tree window**, under it is the *Classification algorithm*.

• •	Madang Classificati	on
	Classification	
		at New Level: r
*	III	
- Right click in Class Hierarchy window, select *Insert Class* (as shown).

Insert Class Variable Duplicate Eind Delete Classification	y'		
Duplicate <u>F</u> ind Delete Classification			
<u>F</u> ind Delete Classification			
Delete Classification			
Select <u>C</u> olor			
Mark as Shared			
Delete			
Delete Samples			
Load Class Hierarchy			
Save Class Hierarchy			
Export Class Hierard	:hy		
Delete Class Hierard	thy		

- Now visible is the **Class Description** window

new class	Display
Parent class for display	Modifiers ☐ Shared ☐ Abstract ☐ Inactive ☐ Use parent class color
All • Contained • Inherited	

- Under the Class Description window, change the following parameters (as shown):
 - i. Name: High Vegetation
 - ii. Change the colour to green
- Double click and (min) under Contained

ass Description	3 X
Name High Vegetation	Display Always
Parent class for display	Modifiers
All • Contained • Inherited	
]	DK. Cancel

- Now visible is the **Insert Expression** window



- Click **Object features** drop-down (+), select **Layer Values** then click **Mean** and double click *Create new 'Mean'*



- Now visible is the **Create Mean** window, click the drop-down list under **Value** and select all the layer bands one at time and click **OK**.

For instance; select blue then click OK and so forth, until all layers are selected blue dem green ndvi nir red rededge slope

- The same process can be done in the **Feature view** window (on the workspace; right-side)



Parameter	Value	
Layer	blue	
	blue	
	dem	
	green ndvi nir red rededge slope	
Layer Layer		
		ana i

- Under Mean, all the layers are now visible (as shown below)

isert Expression	? ×
Nearest neighbor Standard nearest neighbor Standard nearest neighbor Threshold ⊡	À
Layer Values Mean Create new 'Mean' Brightness Max diff Max diff dem Green nir red red rededge	ž
	Ŧ
Invert expression Insert	Close

Putting Threshold values, for example, right **ndvi** and select *Insert Threshold*



click

Now visible is the Edit threshold condition window, for example, adding threshold values,
 i.e. click >= button and type 0.5 (as shown) then click OK to close.

Feature	
	vlean ndvi
Threshold settings	
< <= =	
0.5	▼ No Unit ▼
Entire range of	not limited

- To modify double click, *Mean ndvi* >=0.5 under the Class Description window. By double clicking will open the Edit threshold condition window for further modification.

Class Description	2
Name High Vegetation	Display Always
Parent class for display	Modifiers Shared T Abstract T Inactive Use parent class color
All Contained Number Inherited	
	OK Cancel

- Double click *Classification algorithm* under the **Process Tree window** (as shown).



- Now visible is the **Edit Process window**, click *Active classes* under **Algorithm parameters** (as shown).

TIOCES					
Name		-	Algorithm Description		_
V Automatic		M	Evaluate the membership value of an ima	ge object to a list of selected classes.	
unclassified at New Level: n	io active classes, is th	is intende	- Algorithm parameters		
Algorithm		_	Parameter	Value	
classification		-	Active classes	none	
a		-	Erase old classification, if there is no ne	No	
Image Object Domain			Use class description	Yes	
image object level					
Parameter	Value				
Level	New Level				
Class filter	unclassified				
Threshold condition					
Мар	From Parent				
Region	From Parent				
Max. number of image obj	all				
Loops & Cycles		_			
✓ Loop while something ch	anges only		Active classes		
Number of cycles 1		-			
			Turne 1	or I own I a	1.15

- On display is the **Edit Classification Filter** window, Check the *High Vegetation* class (as shown). Then click **OK** to close.

Edit Classification Filter	8 X
18 × III	
Classes unclassified Figh Vegetation	
Always use all classes	_
Deselect All	OK Cancel

- Right click Classification Algorithm and select *Execute*



- Once executed, the images are now visible on the workspace (two images)



- Right click *High Vegetation* under the **Class Hierarchy** window and Select *Delete Classification*, this does not delete any information but only deletes the class.



shown).

-	Right click <i>classes</i> under Class Hierarchy Window and	
	select Edit	



- Now on display is the Class **Description** window. Right click and **(min)**, select **Edit Expression**.

Name			Display
High Vegetation			T Always
Parent class for displa	y	Modifiers	
High Vegetation	<u>.</u>	Shared F	Abstract 🔽 Inactive
		Use parent of	class color
All . Contained	d 🝾 Inherited		
E-• Contained			
in and (m	Insert new Fx	pression	1
Inherited	Insere new Ex	pressionin	
- milenced	Edit Expression.		
	Invert Expressio	n	
	Expression Is ac	tive	

- The Select Operator for Expression is now visible (displaying all Operators), select the Operator then click OK. For instance select and (*). Click OK to close the Class Description window.



- Right click under Process Tree window and select Append New



- In the Edit Process window, under Name; type No Vegetation and click OK to close.

dit Process		? <mark></mark> ?
Name	Algorithm Description Execute all child processes	of the process.
No Vegetation	Algorithm parameters	
Algorithm	Parameter	Value
execute child processes		
Image Object Domain		
execute		
Parameter Value		
Threshold condition		
- Loops & Cycles		
Number of cycles 1		
	Exe	cute Ok Cancel Help

- Right click *No Vegetation* under the **Process Tree window** and select *Insert Child*

Process Tree	- ×	Class Hierarchy 🕤 🕤
Madang Classification Segmentation 200 [shaped 1st Classification 0.059 at N No Vegetation	tion 0.5 compct.:0.5] (on Jew Level: High \	⊡ • classes High Vegeta
	<u>E</u> dit	
	E <u>x</u> ecute	
	Execute on !	Selected Object
	Append New	V.
	Insert Child	N
	<u>С</u> ору	13
	Paste	
	<u>G</u> o To	
	Load Rule Se	et
	Save Rule Se	et
	Dele <u>t</u> e Rule :	Set
	Save As	
	Delete	
	✓ <u>A</u> ctive	
	Breakpoint	
	Update View	i l

- In the Edit Process window, type classification, click Class filter under Parameter (as shown).

ame Automatic		D	Algorithm Description Evaluate the membership value of an imag	ge object to a list of selected classes.
do		-	Algorithm parameters	
Algorithm			Parameter	Value
classification		1.	Active classes	none
			Erase old classification, if there is no ne	No
mage Object Domain			Use class description	Yes
image object level				
Parameter	Value			
Level	New Level			
Class filter	none	()		
Threshold condition	-			
Мар	From Parent			
Region	From Parent			
Max. number of image obj	all			
_oops & Cycles		_		
Loop while something ch	anges only		1	
Number of cycles 1		•		

- Check Z No Vegetation (as shown) and Click OK to close.



- Under the Algorithm parameters, click *Active classes* (as shown).

agona in parameters		
Parameter	Value	
Active classes	none	
Erase old classification, if there is no ne	No	
Use class description	Yes	
Active classes		

- In the Edit Classification window, Check 🗹 Cloud (as shown) and click OK to close.

Edit Classification Filter		2 X
Always use all classes		
Deselect All	ОК	Cancel

.

- Click **OK** to Close the **Edit Process** window.
- 4. Delete classification

Chapter 8. Export Results

- Click the **Export** on the Menu Bar and select *Export Results* (as shown).

😹 Developer Trial - [Madang Classification.dpr - New Level of 1: Classification]					
Ele View Image Objects Analysis Library Classification Process Tools	Export <u>W</u> indow <u>H</u> elp				
: 🗃 🗳 😫 : 🚓 15, 15, 🖳 🤏 12 🚰 12 🖉 📓 12 12 12 12 12 12 12 12 12 12 12 12 12	Export Results		▼ New Leve ▼ ↓ ↑	0 0 K * K * 🐚 🕯 🗄 👼	66 🛠 📐
Participant and the second	<u>G</u> enerate Report	11 *	3. 1	- (200	No. Shee
127 Carlos Carlos Carlos Carlos	Current <u>V</u> iew	27	State 1 .	-	158
	Copy current view to Clipboard		RALPH I		1.

- Now visible is the Export Results window and select the following parameters (as shown):

- i. Export Type: Shape file
- ii. The others as default; Polygon raster, shapefile (*.shp), New Level

Export Type:	Classes	Features
Shape file	E	
Shape file Raster file Statistics Polygormaster		
Format:		
Shapefile (*.shp)	-	
Level:		
New Level	•	
□ Write shape attributes to .csv file		
Export File Name:	- Constant Constant	
{:Scene.Name}	Select classes	Select features

- Under the Export Results window, click *Select classes button* and now visible is the Select Classes for Shape Export. Click the All ---->> button (as shown)

Select Classes for Shape Export	and the second s	? ×
Available classes	All>>	
	DK	Cancel

- Now all the Available classes have been moved to the **Selected classes** column and click **OK** button to close the window (as shown).

Available classes	All>>	Selected classes
	< All	unclassified High Vegetation No Vegetation Cloud

- ? X Export Results Export Type: Features Classes Shape file * classes unclassified Content Type: High Vegetation No Vegetation Polygon raster -Cloud Format: Shapefile (*.shp) -Level: New Level -┌── Write shape attributes to .csv file Export File Name: Select classes Select features {:Scene.Name} Export. Preview Close
- Under the Export Results window, click the Select features button (as shown)

Now visible is the *Select Features for Export as Attributes window*. Click the Class-Related features drop-down (+), click drop-down list for Relations to Classification and select *Class name*. Double click *Create new 'Class name'* (as shown below)

_

Available	Selected
 Diject features Class-Related features ↔ Relations to neighbor objects ↔ Relations to sub objects ↔ Relations to Classification ← Membership to ← Classification value of ← Class name ← Class name ← Class color ← Class color ← Class Related features ← Region features ← Registration features 	
, [.	DK Cance

- Now visible is the **Create Class name window**, leave all parameters as default and Click **OK** button to close.

Parameter	Value
Distance in class hierarchy	0
listance in image object hi	0

- Under the **Selected column**, the *Class name* is now visible. Click **OK** to return to the **Export Results** Window

⊡ ■ Class-Related features
Class name

- The **Export File Name**: {*Scene.Name*}, click the **Export** button to start exporting the information.

Shape file 💽 💽	 classes unclassified High Vegetation 	Class name(0,0)	
Polygon raster 📃 💌	Cloud		
ormat:			
Shapefile (*.shp)			
evel:			
New Level 💌			
Write shape attributes to .csv file			
xport File Name:	-	[Barrage of]	
:Scene.Name}	Select classes	Select features	

Since it's a trail version of the software it's not possible to export (as shown below). However, with the license version it can be exported and saved under the desired folder.

_

	C	lasses	Features	
Shape file Content Type:		 classes unclassified High Vegetation 	Class name(0,0)
Polygon raster	Developer Trial	A line		
Shapefile (*.shp) Level:		ure is not supported by this ver using our products.	rsion.	
New Level	51		ок	
Export File Name:	-	Select classes	Sele	ect features

Simple operation manual for mis-classification detection by ArcMap

1. Execute ArcMap



Double click to execute ArcMap (You must turn on GIS_PC_01 as License server).



Open existing map or make new map using a template Existing Maps Recent Revent Www Maps My Templates Standard Page Sizes Architectural Pag Iso (A) Page Siz North American (Instructural Page Sizes) North American (Instructural Page Sizes) USA World Browse for more Tutorial3-2b Slope of central suau Tutorial3-2b Tutorial3-2b Slope of central suau Tutorial3-2b Tutorial3-2b Tutorial4-1 Tutorial3-AsiansBlacks				(a-a-)(2	
Existing Maps Browse for more New Maps My Templates - Standard Page Sizes - Architectural Page - Standard Page Sizes - Architectural Page - Standard Page Sizes - Traditional Layouts - Undustry - USA World Browse for more * Itt * Tutorial9-2 Tutorial9-1 <th>en existing map or make new ma</th> <th>p using a template</th> <th></th> <th></th> <th></th>	en existing map or make new ma	p using a template			
Browse for more New Maps My Templates Templates Architectural Page Sizes Architectural Page Sizo (A) Page Size Architectural Page Size Architectural Page Size Architectural Page Size Architectural Page Size Tutorial3-2b slope of central suau Tutorial9-2 Tutorial9-2 Tutorial3-2b Tutorial9-2 Tutorial4-1 Tutorial3-AsiansBlacks Tutorial3-2b.mxd	∃- Existing Maps <mark>Recent</mark>	Recent			^
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USA 	Architectural Pac ISO (A) Page Siz North American (Traditional Layouts	Tutorial3-2b	slope of central suau	Tutorial9-2	
Tutorial9-2 Tutorial4-1 Tutorial3-AsiansBlacks		۲	Q		
III ESRIPress\GIST1\MyExercises\Chapter3\Tutorial3-2b.mxd Default geodatabase for this map: What is the second se		Tutorial9-2	Tutorial4-1	Tutorial3-AsiansBlacks	
C:\ESRIPress\GIST1\MyExercises\Chapter3\Tutorial3-2b.mxd Default geodatabase for this map: What is the second seco					
Default geodatabase for this map: What is the second secon	:\ESRIPress\GIST1\MyExercises\	Chapter3\Tutorial3-2b.mxd			
	Default geodatabase for this may			What is this?	1128
C; Jusers Write Porest Authonity (pocuments) Arctats (perault.gop	C: Users Prive Forest Authority	Pocuments (Arcuis (Default.gdb		Ť	

Click "Cancel" to open new map.



New blank map is appeared.

2. Display all data (Classification result, RapidEye image, FIMS data)

All Data are stored "D:/ PNG Classification/" folder.

	In library Share with	Burn	New folder		
Favorites	Name		Date modified	Туре	Size
E Desktop	DTM		23/11/2012 10:29	File folder	
📕 Downloads	📕 FIMS		23/11/2012 1:20 PM	File folder	
🔚 Recent Places	📕 RapidEye		23/11/2012 10:26	File folder	
	📕 Result		23/11/2012 12:08	File folder	
Jibraries	🔷 legend.lyr		23/11/2012 9:30 AM	ArcGIS Layer	15 KB
Documents					
J Music					
E Pictures					
Videos					
Computer					
🚢 OS (C:)					
Local Disk (D:)					
Sources (\\Pngfa-ł	nc				



Drag and drop data file from following folders.

- 1. Classification result from "D:/ PNG Classification/Result/" folder. (ex. 5536707.shp) Chap.3
- RapidEye image from "D:/ PNG Classification/RapidEye/" folder. (ex. rapid_5536707.img) Chap.4
- 3. FIMS data from "D:/ PNG Classification/FIMS/" folder. (All_PNG_Veg_region.shp) Chap.5

See below Chapter 3, 4, 5 in detail.

3. Import classification result and applied to "legend" layer

Drag and drop xxxxxx.shp (xxxxxxx is Tile ID).



Classification result is shown but not colored with legend.



Then, Legend layer is applied to classification result as following procedure.

Show: Features Categories Unique values Unique values many	Draw categories using unique Value Field stv_slope	values of one field. Color Ramp	Import	P •
en click here Charts Multiple Attributes	Symbol Value	Label <all other="" values=""></all>	Count.	
	Add All Values Add Values	Remove Remov	e Ali Adva <u>n</u> ced	•

Click "Symbology" tab and click "Categolies", then click "Import" button.

Import Symbology	8 23
Import symbology definition from another layer in	n the map or from a layer file:
Import symbology definition from an ArcView 31	egend file (*.avl):
Layer:	-
What do you want to import?	
Complete symbology definition	
⊘ Just the symbols	
O Just the classification	OK Cancel

Import Symbology window appeared. Click Folder Icon and Import layer.

ook in:	PNG	Classification	*	金 🔐 🗔	•	
DTM						
FIMS	Eye					
Result						
the second second second second	1 1 2 2 2					
legen	Liyi					
legen	Liyi					
legen	a.iyi					
legen	Liyi					
legen	1.191					
Name:	leg	jend.lyr				Add

Select "legend.lyr" then click "Add" button.

(If you can't find "legend.lyr", you should go to "D:\PNG Classification\" folder.)

nport Symbology	-	8 52	1
Import symbology definition from another another in the symbology definition from another a	er layer in the map or i	rom a layer file:	
Import symbology definition from an Arc	View 3 legend file (*.	avl):	
Layer: Highlands_5536502A		- 🖻	
What do you want to import?			
Complete symbology definition			
Just the classification	-		
	ОК	Cancel	
			Then Click OK .
Select field(s) from the current layer to match n the imported symbology definition: Value Field	n to the field(s) used		
Class_name			
Class_name	•		
Value Field			
Value Field	Ŧ		
Value Reld	Ŧ		
Value Field Value Field	÷		
Value Field	T Cancel		

Catures Draw categories using unique values of one field. Import Value Field Color Ramp Unique values, many Cass_name Color Ramp Match to symbols in a Symbol Value Label Count Charts Symbol Value Call other values> C#O(他の他ので) Count Charts Gass_name Cloud Cloud ? Bareland Bareland ? Cloud ? Cloud Cloud Cloud ? ? Objectsonal Forest Dy Seasonal Forest ? ? Glassland and Harbland Glassland and Harbland ? . Glassland and Harbland Clausdid and Harbland ? . Add All Values Add Values Remove Remove All Advagced *	General Source Selecti how:	ion Displa	ay Symbology	Fields	Definition Query	Labels	Joins & Relate:	s Time	HTML Popup
Unique values, many Match to symbols in Quantities Class_name Count Symbol Value Label Count Value Label Count Charts Glass_name Class_name Match to symbols in Quantities Call other values> <#@(他)(直すべて> Cloud Cloud Cloud ? Cloud Cloud ? ? Cloud Cloud ? ? Cloud2 Cloud2 ? ? Classiand and Harbland Glassiand and Harbland ? ? Glassiand and Harbland 3 Glassiand and Harbland 3 ? Claud3 Claud4 ? ? Match and Harbland 3 Glassiand and Harbland 3 ? Claud4 Claud2 ? ? Claud5 Claud2 ? ? Claud4 Claud2 ? ? Claud5 Claud3 Claud2 ? Claud4 Claud2 ? ? Claud4 Claud2 ? ? Claud5 ? ? ? Claud6 ? ? ? Claud7 ? ? ? Claud8 ? ? ?	Features	Draw ca Value Fie	ategories usin	ig unique	values of one	e field. Ramp		Import	
- Match to symbols in a Quantities Charts Multiple Attributes * 『 『 』 ・ 「 (all other values > くその他の値すべて>	- Unique values - Unique values, many	Class_n	ame		•			•	
Charts Multiple Attributes	Match to symbols in a Quantities	Symbol	Value	_	Label		Count	*	
Creating> Class_name Bareland Bareland ? Cloud Cloud	Charts		call other value	8>	<その他の値*	すべて>			
Cloud Cloud ? Cloud ? Clo	Multiple Attributes		<neading></neading>		Bareland	e	2	E	
Cloud2 Cloud2 ? Dry Seasonal Forest Dry Seasonal Forest ? Glassland and Harbland Glassland and Harbland ? Glassland and Harbland 2 Glassland and Harbland 2 ? Glassland and Harbland 3 ? Litoral Litoral ? Add All Values Add Values Remove Remove All Advanced *			Cloud		Cloud		2		() () () () () () () () () () () () () (
Dry Seasonal Forest Dry Seasonal Forest Glassland and Harbland Glassland and Harbland 2 Glassland and Harbland 2 Glassland and Harbland 2 Glassland and Harbland 3 Classland and Harbland			Cloud2		Cloud2		?		
Glassland and Harbland Glassland and Harbland ? Glassland and Harbland 2 Glassland and Harbland 2 ? Glassland and Harbland 3 Glassland and Harbland 3 ? Litoral Litoral ? Add All Values Add Values Remove Remove All Advagced •	4 111 1		Dry Seasonal F	orest	Dry Seasonal	Forest	?	+	
Glassland and Harbland 2 Glassland and Harbland 2 ? Glassland and Harbland 3 Glassland and Harbland 3 ? Litoral Litoral ? - Add All Values Add Values Remove All Advanced •			Glassland and	Harbland	Glassland and	d Harbland	?	_	
Glassland and Harbland 3 Glassland and Harbland 3 ? Litoral Litoral ? - Add All Values Add Values Remove All Advanced •	1 41		Glassland and	Harbland 2	Glassland and	d Harbland	2 ?		
Add All Values Add Values Remove All Advanced •			Glassland and	Harbland 3	Glassland and	d Harbland	3 ?		
Add All Values Add Values Remove All Advanced •			Litoral		Litoral		?	-	
	1 2 cm	Add All V	alues Add \	/alues	Remove	Remove	All Adv	anced •	I I
					1.0000010			-11	ł.

Label and Color are added every classes. Then click "OK".



Legend is applied to classification result.

4. Import RapidEye Image



Drag and drop rapid_xxxxxx.img (xxxxxxx is Tile ID).

RapidEye image is displayed.

If RapidEye image is displayed as "false color" (different color composite like this), you should change color composite to "true color" as following:



Layer Properties	Click first			<u>?</u> ×
General Source Extent I Show:)isplay Symbology	composite	1	1
Stretched RGB Composite	Channel 🗹 Red	Band Layer_1		Then click here and change to "Layer_3"
	✔ Green ✔ Blue ▲ Alpha	Layer_2 Layer_3 Layer_1		Then click here and change to "Layer_1"
	Display Background (5, B) Stretch Type: Standard	Value:(R, 0 0 D Deviations	0 as • isplay NoData as • Histograms	
When image is bright/o you should change the value from 1 to 3.	dark, <u>Gamma Stre</u> ics	2 tch:	Invert	
	Uses the statistics I	from the entire raster dataset.	OK 3	・ Fヤンセル 道用(A)

Click "Symbology" tab and click and change the layer. Then click "OK".



Then RapidEye image is displayed as true color (forest area is displayed green).

5. Import FIMS vegetation boundary

Drag and drop All_PNG_Veg_region.shp.



If this warning window is appeared, you should change the coordinate system of FIMS data as follow.

eographic Coordinate Sys	tems Warning		? ×
The following data sources use a the one used by the data frame	a geographic coordinate sy you are adding the data in	stem that is different fr nto:	rom
Data Source	Geographic Coo	rdinate System	
All_PNG_Veg_region	GC5_Australian	_1984	
Alignment and accuracy problem between geographic coordinate	s may arise unless there is systems.	a correct transformatic	n
/ou can use this button to speci ransformation(s) used by this d	fy or modify the 🛛 🤇	Iransformations	Click first
The Transformations dialog can dialog's Coordinate Systems tab	also be accessed from the after you have added the	Data Frame Properties data.	
Don't warn me again in this s	ession		
🗖 Don't warn me again ever		⊆lose	

Geographic Coordinate System Transformations	<u>? × </u>
Convert from:	and the second se
GC5_Australian_1984 GC5_WG5_1984	OK Cancel
Into: World¥WG5 1984	Click here and choose "World\WGS 1984" in the bottom of list.
Using:	
AGD_1984_To_WG5_1984_1	Click here and choose
Method: Geocentric Translation - dx=-134,000000 dy=-48,00000	"AGD_1984_To_WGS_1984_1".
dz=149.000000	Then click "OK".

Geographic Coordinate Sys	tems Warning		? ×
The following data sources use the one used by the data frame	a geographic coordinat you are adding the da	e system that is differer ta into:	nt from
Data Source	Geographic	Coordinate System	
All_PNG_Veg_region	GC5_Austra	ilian_1984	
Alignment and accuracy problen between geographic coordinate	ns may arise unless the systems,	re is a correct transform	nation
You can use this button to spec transformation(s) used by this o	ify or modify the lata frame:	Transformations	5
The Transformations dialog can dialog's Coordinate Systems tab	also be accessed from after you have added	the Data Frame Propert the data.	ties
Don't warn me again in this :	session		
🔲 Don't warn me again ever			ose



FIMS forest/vegetation boundary is displayed like this.



To display forest/vegetation code and change the color of polygon, click "Properties...".

now: Features Dincle symbol Categories Quantities Charts Multiple Attributes	Draw all features using the same symbol.	import Advanced -
The second	Legend Then Click this Label appearing next to the symbol in table of con Description Additional description appearing next to the symbol	ol in your map's legend

mbol Selector	-	-		-	?	
Type here to search				Current Symbol		
Search: 💽 All	Styles	C Referenced Sty	/les			
ESRI				-		
Green	Blue	Click and	choose "No color"	. E	jill Color:	
		Click and	enter "1".		Dutline Width	
Lake	Rose	Click and	choose "Red color	". <u> </u>		
					Edit Symbol	
Olive	Green	Jade	Blue	5	ave As <u>R</u> eset	
					Style References	
Med Blue	Lilac	Violet	Grey		OK Cancel	
				Las	stly, Click "OK".	

Next, to display FIMS code, click "Labels" tab.

Method:	Label all the features the same way.	
Text String Label <u>F</u> ield:	VEGTYPE	Click and choose "VEGTVPE"
— Text Symbol —	AaBbYvZz	symbol
Other Options	Properties Scale Range Pre-defined	I Label Style Label Styles



Polygon color is changed and FIMS code is appeared.

6. Change display order(arrangement) of three layers

You can change layer order like this.



You can also display/undisplay result/image/data by turn on/off.


7. Comparing between classification result and RapidEye image

Before using "Swipe layer" function, you have to tick "Effects" and display "Effects" toolbar.



First, you should choose swipe destination layer.



Then, click swipe icon.





You can swipe Classification result/RapidEye image like this (keep clicking left mouse button).

8. Capturing the misclassification area

To display another viewer for capturing the misclassification area, you click [windows]-[viewer].





Then move to misclassification area using 🕎 icon, and fitting window size.



For capturing this window, you should execute "WinShot" capturing application once.



Double click "WinShot" icon on the desktop.



WinShot is executed.



To capture Viewer window, click "Window capture" icon.

And Click on the "Viewer" and capture it.





"WinShot Image Preview" window is appeared.

Click "Copy image to the clipboard" icon.

After that, you can paste this image to the "Mis-classification process of documentation.doc".

Tile ID			0
Province			R
Veg. Type			
Acq. Date	of RapidEye		D
	Classification F	Result	
Calif B	bri + 11 I 王 妙 - <u>A</u> Cut Copy	· A* A* 律律 • 逊 • • 到	
	Paste Options:	÷	
1	Sele <u>c</u> t Split Cells	- Fr	

Right click and click the "Paste" icon.

Tile ID	Officer(s)
Province	Region
Veg. Type	
Acq. Date of RapidEye	Date of Doc.
Classification Resu	t RapidEye image
Viewer Q Q Q (1) 0 11 0 4 + 150,000	

Classification image is pasted to the table.

Repeat same procedure for capturing RapidEye image and FIMS vegetation.







9. Capturing the "Parameters" window

Q 54	35717.r	nxd - Ar	cMap - ArcVie	w					
File	Edit	View	Bookmarks	Insert	Selection	Geoprocessing	Customize	Windows	Help
10	28	0	· 御島×	50	• • 1	:50,000	• 🖌	•	
1 Q	I 2001	0	(53 🔶 🚸	- 12		🗿 / 🗐 🔛	M 🛍 🕺		Layer:
:國)	则。原		麗 國 麗) 🖹 🕯 🕒 🖕	Editor	Palet 1	- 41- 1

Click the 🔍 button.

Next you click misclassification polygon (area) and you capture appeared "Identify" window.

Identify from:	\$ 5435717	-
⊡- 5435717 Mangr	ove	
		×.
Location:	553,372.174 9,196,727.606 Meters	
Field	Value	
FID	4391	
Shape	Polygon	
stv_slope	2.753067	
stv_rededg	188.15279	
stv_red	169.384673	
stv_nir	381.759309	
stv_ndvi	0.057495	
stv_green	157.548747	
stv_dem	0.804143	
stv_blue	157.167868	
GB	-56.928693	
Max_diff	2.91068	
Mean_Slope	2.791204	
Mean_RedEd	1849.193851	
Mean_Red	1121.320666	
Mean_NIR	3838.527327	
Mean_NDVI	0.547467	
Mean_Green	1173.515798	
Mean_DEM	8.908625	
Mean_Blue	1230.444492	
Class_name	Mangrove	
Brightness	1317.814566	

<Important>



Please select a classification result layer. (Left image)

Do not click(select) some polygons. If you select some polygons, you can see some class on the Identify window like this. (Right image)