

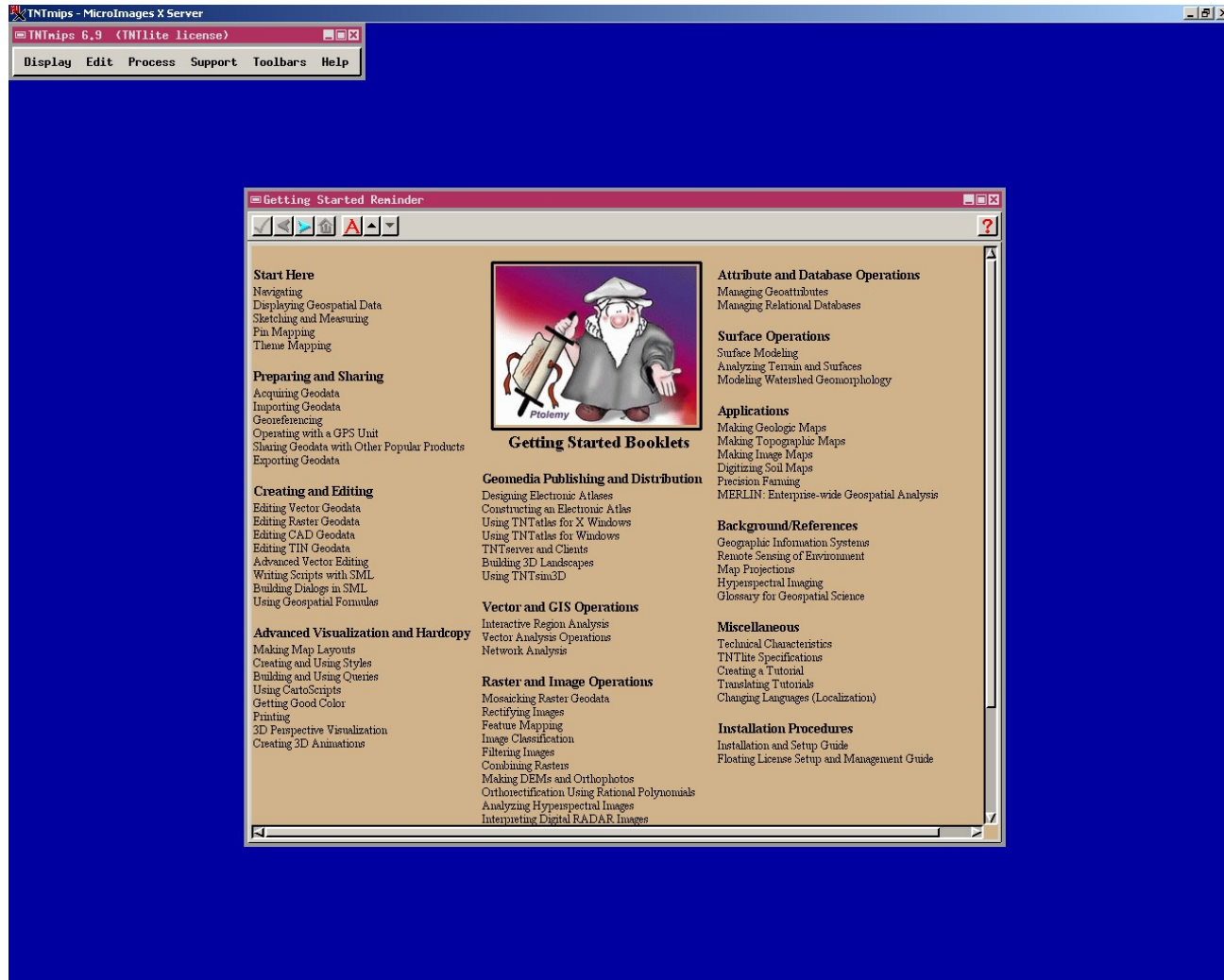
Sensoriamento remoto e SIG para Silvicultura Urbana

Aula prática

20 de outubro de 2005



TNT Mips – SIG completo, possui ferramentas para edição CAD, vetorização e trabalha com imagens RASTER

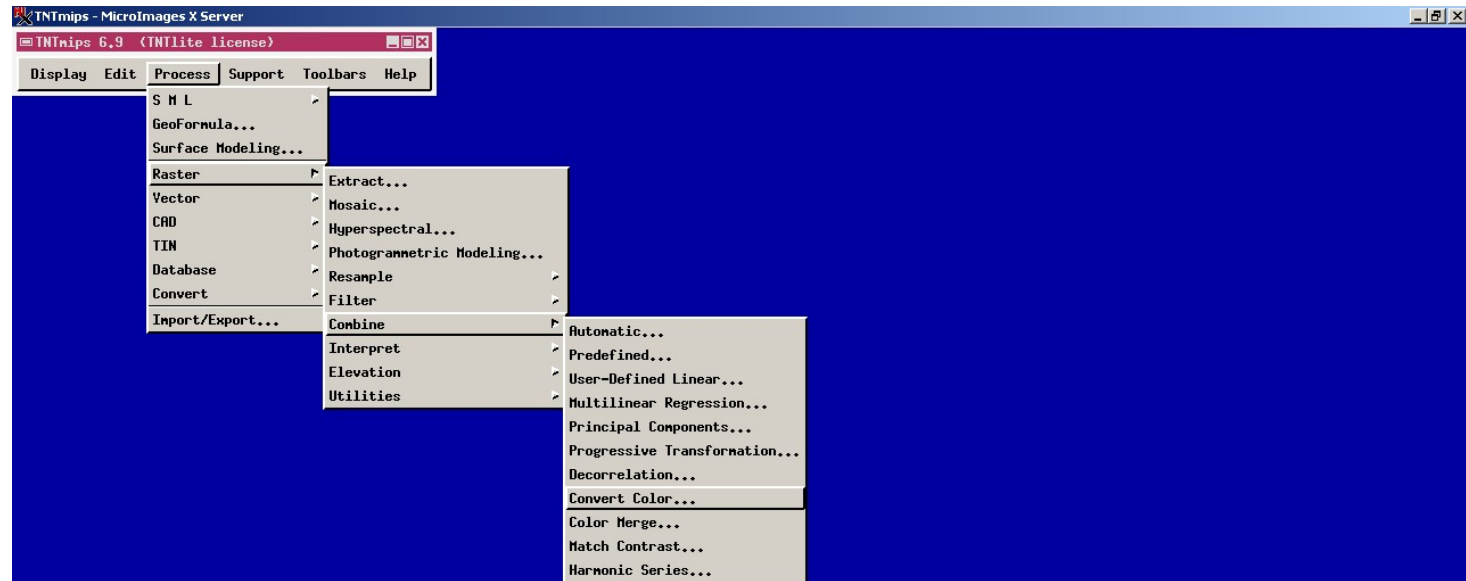


Limite de tamanho Geoespacial

“Project Files	No limit on size of .rvc files. No limit on number of objects in a file.
Rasters	314,368 totals cells, maximum dimension of 1024. Examples: 1024 x 307, 614 x 512, 307 x 1024.
Vectors	500 polygons, 1500 lines, 1500 points, 1500 labels. (no limit on nodes)
CADs	500 elements, 5 blocks
TINs	1500 nodes
Databases	10 tables, 1500 records per table”

Copiar e colar: ceet5s834h8rn5xwp6kk9kdp8
Email: dfsilva@esalq.usp.br

Como mensurar o verde urbano com imagens?
Usando classificação automática supervisionada.



Deve-se
desmembrar
a imagem
composta em
três bandas
RGB.

Raster Color Conversions

Input

Type: **Single** [v] Select Raster(s)...

Raster: [] Contrast: **None** [v]

[] Contrast: **None** [v]

[] Contrast: **None** [v]

Color Map: **None** [v]

Output

Type: **RGB Separate** [v]

Color Balance Select...

Match Color Map Select...

Hue Range: **0 to 360** [v]

Intensity/Brightness Range: **0 to 255** [v]

Saturation Range: **0 to 255** [v]

Create Pyramid Tiers

Compression: **None** [v] Quality: []

No null value

Null Value: **255,0000**

Run... Exit Help

Input

Type: **Single** Select Raster(s)...

R: **RGB Separate**
HIS Contrast:
HBS Contrast:
HSV (Munsell) Contrast:

Contrast:

Color Map:

Output

Type: **RGB Separate**

Color Balance

Match Color Map

Hue Range:

Intensity/Brightness Range:

Saturation Range:

Create Pyramid Tiers

Compression: Quality:

No null value

Null Value:

Run...

Exit

Help

Input

Type:

Raster:

Contrast:

Contrast:

Contrast:

Color Map:



Output

Type:

Color Balance

Match Color Map

Hue Range:

Intensity/Brightness Range:

Saturation Range:

Create Pyramid Tiers

Compression: Quality:

No null value

Null Value:

Input

Type: **Single** Select Raster(s)...

Raster: # 280 - CIRLITE.tif / pira4_280_...CIR

Contrast: **None**

Contrast: **None**

Contrast: **None**

Color

- Composite 4-bit
- Composite 8-bit
- Composite 16-bit
- Composite 24-bit

Output

Type: **RGB Separate**

Col HIS ...

Mat HBS ...

Hue R: HSV (Munsell)

CMY

Inten: **CMYK** Range: 0 to 255

Saturation Range: 0 to 255

Create Pyramid Tiers

Compression: **None** Quality:

No null value

Null Value: 255,0000

Run...

Exit

Help

TNTmips 6.9 (TNTlite license)

Display Edit Process Support Toolbars Help

Raster Color Conversions

Input

Type: Single Select Raster(s)...

Raster: 4 280 - CIRLITE.tif / pira4_280_...CIR

Contrast: None

Select Objects

Select output rasters:

Look in: dfsilva,FLORESTA

Path: C:\Documents and Settings\dfsilva,FLORESTA

Space free: 6.17 GB

- Menu Iniciar
- Meus documentos
- novosArtigos
- Piracicaba Faixas
- Senhas
- Silvicultura_Urbana
- System
- Vectoraster.rvc

Objects of Type: Raster

Show Overview

Red <None Selected>

Green <None Selected>

Blue <None Selected>

OK Cancel Help

Run... Exit Help

TNTmips 6.9 (TNTlite license)

Display Edit Process Support Toolbars Help

Raster Color Conversions

Input

Type: Single Select Raster(s)...

Raster: # 280 - CIRLITE.tif / pira4_280...CIR

Contrast: None

Select Objects

Select output rasters:

Look in: AulaGeo.rvc

Path: eus documentos\Pós-USP\Aula geopro video\AulaGeo.rvc

Space free: 6.17 GB

<No Objects>

Selections Preview

- Red
C:\Documents and Sett...
- Green
C:\Documents and Sett...
- Blue
<None Selected>

Objects of Type: Raster

Show Overview

OK Cancel Help

Run... Exit Help

TNTmips 6.9 (TNTlite license)

Display Edit Process Support Toolbars Help

Raster Color Conversions

Input

Type: Single Select Raster(s)...

Raster: # 280 - CIRLITE.tif / pira4_280_CIR

Contrast: None

Select Objects

Select output rasters:

Look in: Aula geopro video

Path: z:\FLORESTA\Meus documentos\Pós-USP\Aula geopro video

Space free: 6.16 GB

Aula Ana Maria

AulaGeo.rvc

ESAL

Noval

pira

pira

pira

pira

Objects of Type: Raster

Show Overview

Red

<None Selected>

Green

<None Selected>

OK Cancel Help

OK Cancel Help

New Project File

Name:

Description:

OK Cancel Help

Run... Exit Help

Input

Type:

Raster:
Contract:

Contract:

Contract:

Color Map:

Output

Type:

Color Balance

Match Color Map

Hue Range:

Intensity/Brightness Range:

Saturation Range:

Create Pyramid Tiers

Compression: Quality:

No null value

Null Value:

- S M L
- GeoFormula...
- Surface Modeling...
- Raster
 - Extract...
- Vector
 - Mosaic...
- CAD
 - Hyperspectral...
- TIN
 - Photogrammetric Modeling...
- Database
 - Resample
- Convert
 - Filter
- Import/Export...
- Interpret
 - Feature Map...
- Elevation
 - Auto-Classify...
- Utilities
 - Distance Raster...
 - Gradient Descent Path...
 - Hough Transform...

Automatic Classification

File View Help

Rasters...

Mask...

Use Mask For: Analysis Output

Sample for Analysis: Lines: Columns:

Input Redistribution:

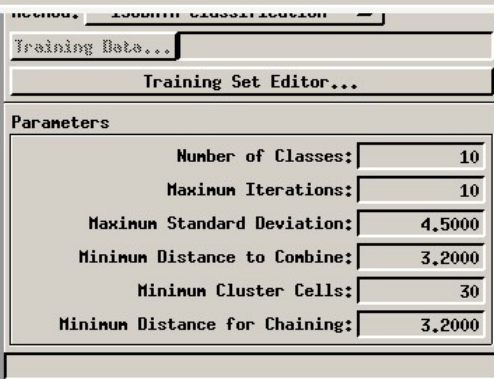
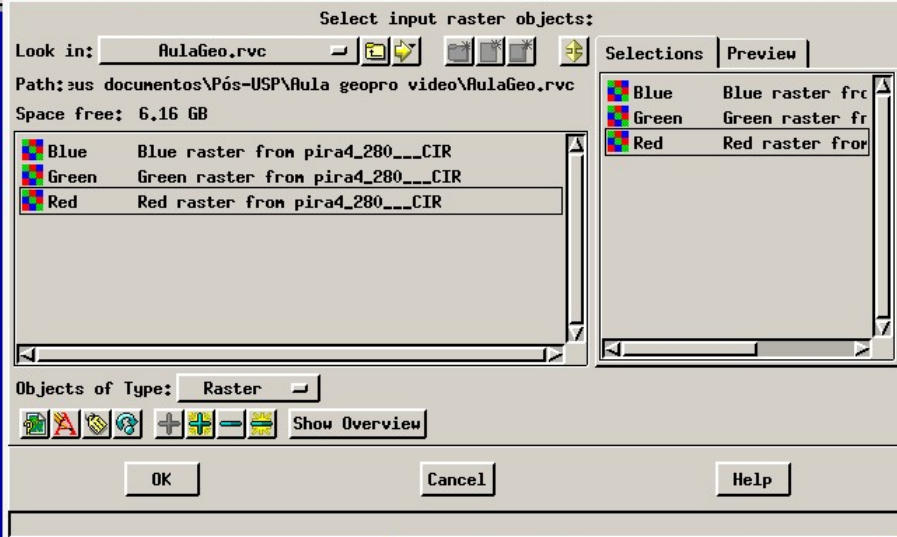
Method:

Training Date...

Training Set Editor...

Parameters

Number of Classes:	<input type="text" value="10"/>
Maximum Iterations:	<input type="text" value="10"/>
Maximum Standard Deviation:	<input type="text" value="4.5000"/>
Minimum Distance to Combine:	<input type="text" value="3.2000"/>
Minimum Cluster Cells:	<input type="text" value="30"/>
Minimum Distance for Chaining:	<input type="text" value="3.2000"/>



Automatic Classification

File View Help

Rasters...

AulaGeo / Blue
AulaGeo / Green
AulaGeo / Red

Mask...

Use Mask For: Analysis Output

Sample for Analysis: Lines: Columns:

Input Redistribution:

Method:

Training Data...

Parameters

Number of Classes:	<input type="text" value="10"/>
Maximum Iterations:	<input type="text" value="10"/>
Maximum Standard Deviation:	<input type="text" value="4.5000"/>
Minimum Distance to Combine:	<input type="text" value="3.2000"/>
Minimum Cluster Cells:	<input type="text" value="30"/>
Minimum Distance for Chaining:	<input type="text" value="3.2000"/>

Automatic Classification

File View Help

Rasters...

AulaGeo / Blue
AulaGeo / Green
AulaGeo / Red

Mask...

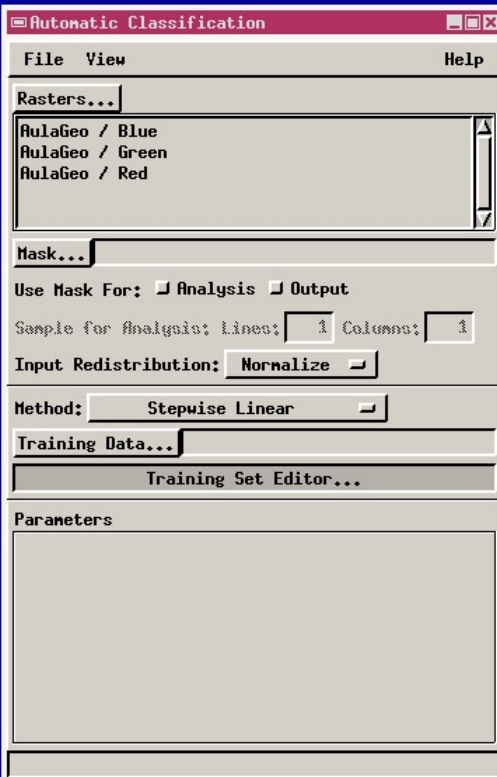
Use Mask: Simple One-Pass Clustering
K Means Columns: 1
Fuzzy C Means
Minimum Distribution Angle

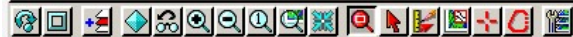
Method: ISODATA Classification

Training:
Self Organization
Adaptive Resonance

Parameters:
Minimum Distance to Mean
Maximum Likelihood
Stepwise Linear 10
Suits' Maximum Relative 10
Back Propagation 4.5000
Mahalanobis 3.2000

Minimum Cluster Cells: 30
Minimum Distance for Chaining: 3.2000





Training Set Editor



Classes: 0 Selected: 0
Trained: 0 Desired: 0



%	Class	Name	Tag
---	-------	------	-----

Import

Source...
Element Type: None [v] Apply
Class: All Same [v]
Value:



Training Set Editor

File View Tag Help

- Training Set ▾
 - New
 - Open...
 - Save... 0
 - Save As... 0
- Class ▾
- Mask ▾
- Close



Class	Name	Tag
-------	------	-----

Import

Source...

Element Type: None

Class: All Same

Value:



- Quick-Add...
 - Add from GeoCatalog...
 - Raster
 - Surface
 - Vector
 - CAD
 - TIN
 - shape
 - Database Pinnap...
 - Map Grid...
 - Region
 - SML...
 - GeoFormula

Training Set Editor



Classes: 0 Selected: 0
 Trained: 0 Desired: 0



Class	Name	Tag

Import

Source...
 Element Type: None Apply
 Class: All Same
 Value:



TRAIN

Training Set Editor

File View Tag Help

Classes: 0 Selected: 0

Select Objects

Select objects to display:

Look in: AulaGeo.rvc

Path: \us documents\Pos-USP\Aula geopro video\AulaGeo.rvc

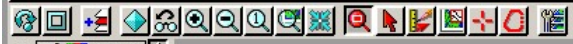
Space free: 6.16 GB

	Blue	Blue raster from pira4_280___CIR
	Green	Green raster from pira4_280___CIR
	Red	Red raster from pira4_280___CIR

Objects of Type: Selectable

Show Overview

OK Cancel Help



TRAIN

Training Set Editor

File View Tag Help

Classes: 0 Selected: 0

Select Objects

Select objects to display:

Look in: AulaGeo.rvc

Path: \us documents\Pos-USP\Aula geopro video\AulaGeo.rvc

Space free: 6.16 GB

	Blue	Blue raster from pira4_280___CIR
	Green	Green raster from pira4_280___CIR
	Red	Red raster from pira4_280___CIR

Selections Preview

	Blue	Blue raster from pira4_280___CIR
	Green	Green raster from pira4_280___CIR
	Red	Red raster from pira4_280___CIR

Objects of Type: Selectable

Show Overview

OK Cancel Help



TRAIN

pira4



Training Set Editor

File View Tag Help

Classes: 0 Selected: 0
Trained: 0 Desired: 0

Class	Name	Tag
-------	------	-----

Import

Source...

Element Type: None Apply

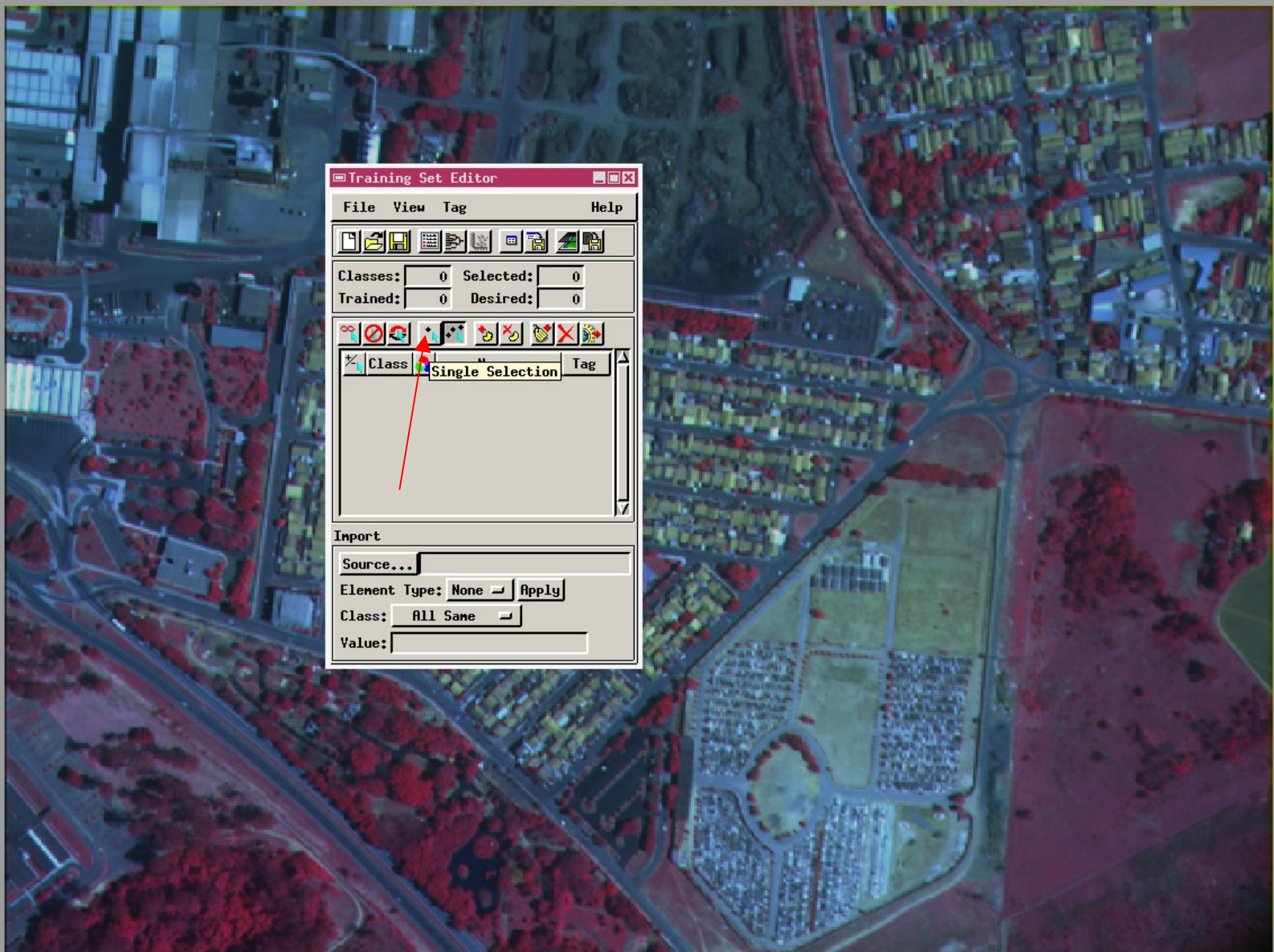
Class: All Same

Value:



TRAIN

pirad



Training Set Editor

File View Tag Help

Classes: 0 Selected: 0
Trained: 0 Desired: 0

Class Single Selection Tag

Import

Source...

Element Type: None Apply

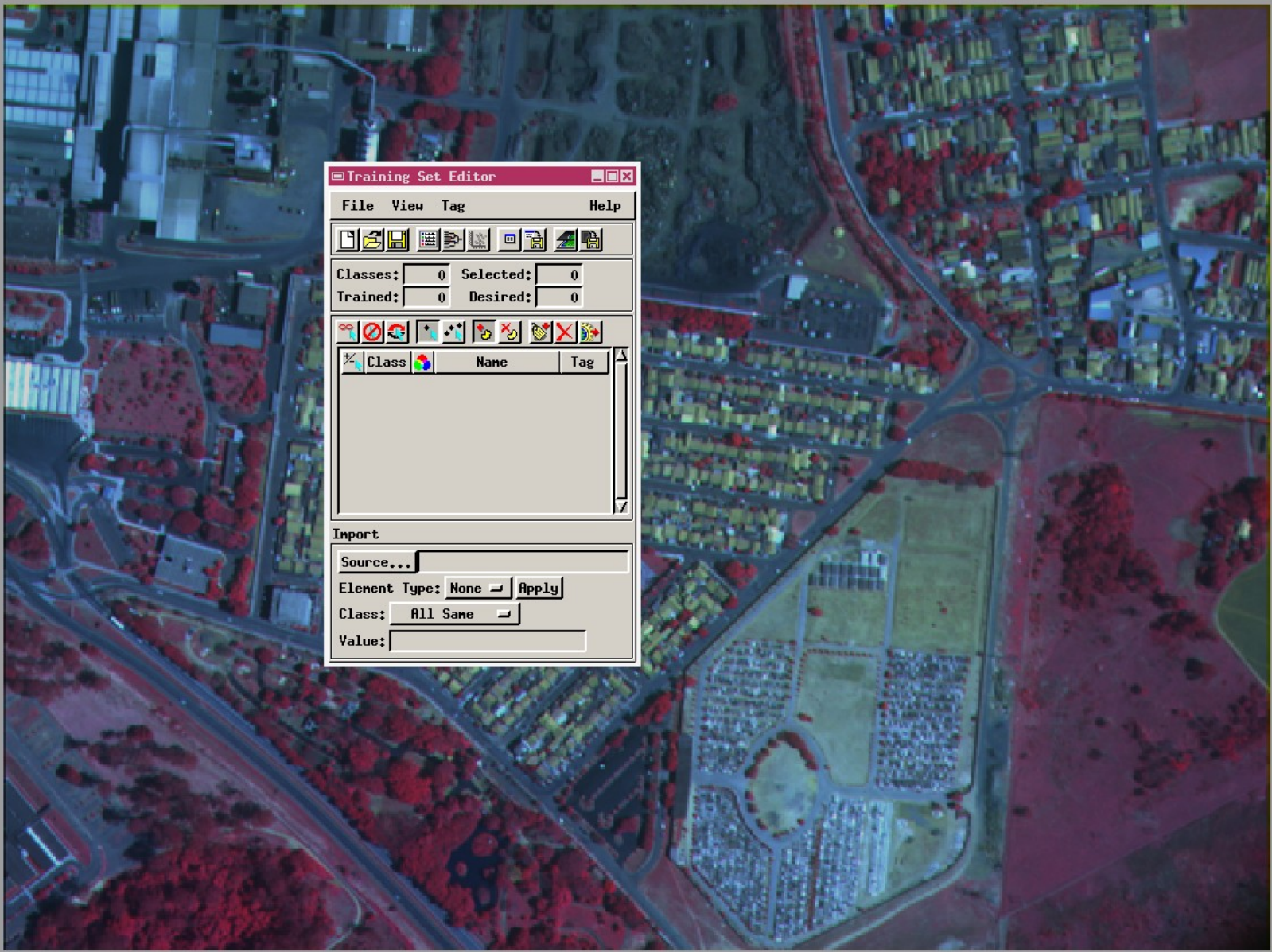
Class: All Same

Value:



TRAIN

- piral
- piral4



Training Set Editor

File View Tag Help

Classes: 0 Selected: 0
Trained: 0 Desired: 0

Class	Name	Tag

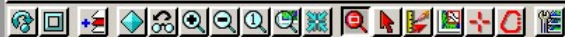
Import

Source...

Element Type: None Apply

Class: All Same

Value:



TRAIN

pira4



Training Set Editor

File View Tag Help

Classes: 4 Selected: 0
Trained: 0 Desired: 0

Class	Name	Tag
<input type="radio"/> 1	1	
<input type="radio"/> 2	2	
<input type="radio"/> 3	3	
<input type="radio"/> 4	4	

Class Name:
[1]

OK Cancel

Import

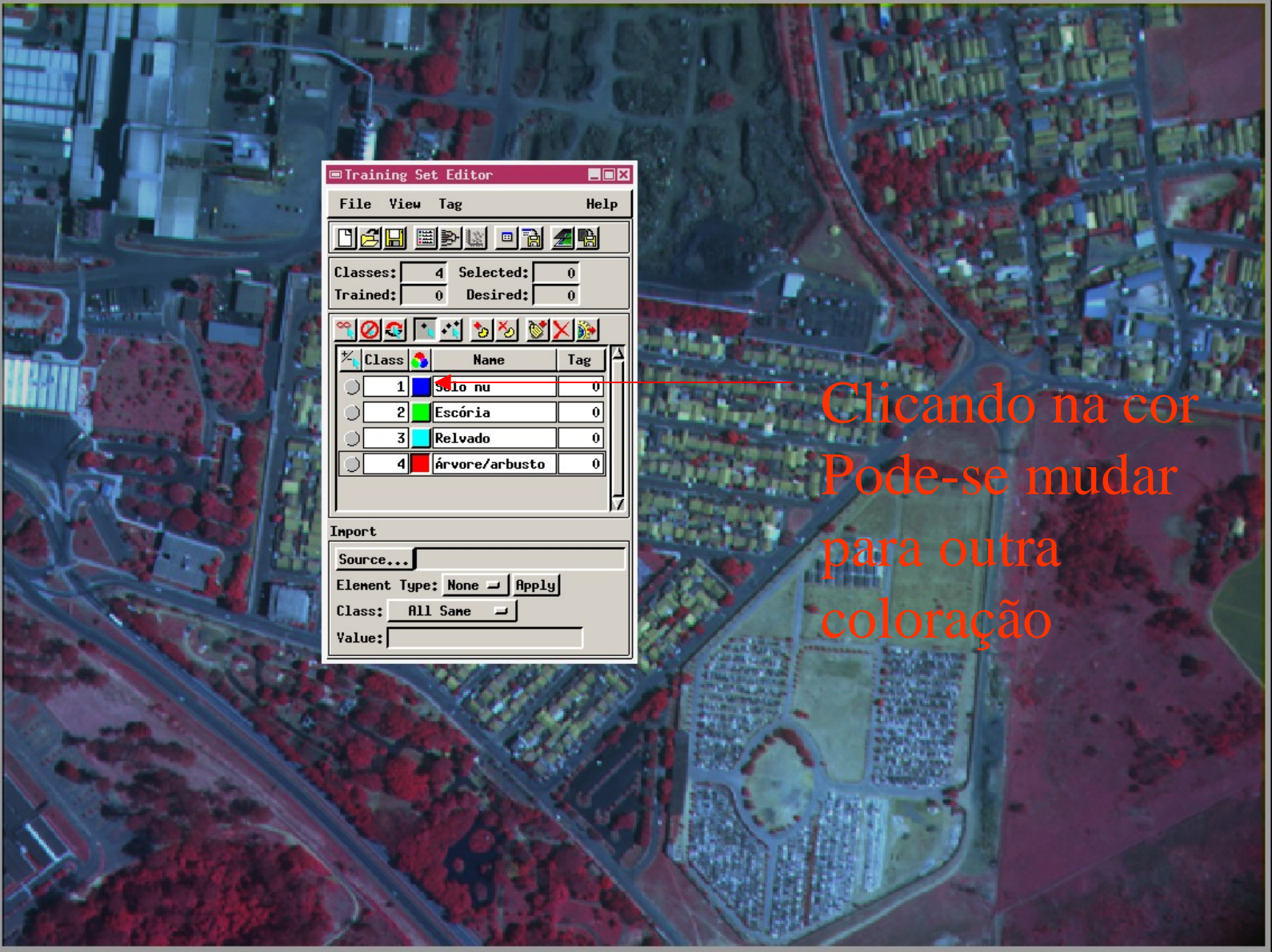
Source...
Element Type: None [Apply]
Class: All Same [Apply]
Value:

Para adicionar classes

Para modificar o nome



- TRAIN
- pira4



Training Set Editor

File View Tag Help

Classes: 4 Selected: 0
Trained: 0 Desired: 0

Class	Name	Tag
<input type="radio"/> 1	Solo nu	0
<input type="radio"/> 2	Escória	0
<input type="radio"/> 3	Relvado	0
<input type="radio"/> 4	Árvore/arbusto	0

Import

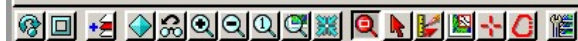
Source...

Element Type: None Apply

Class: All Same

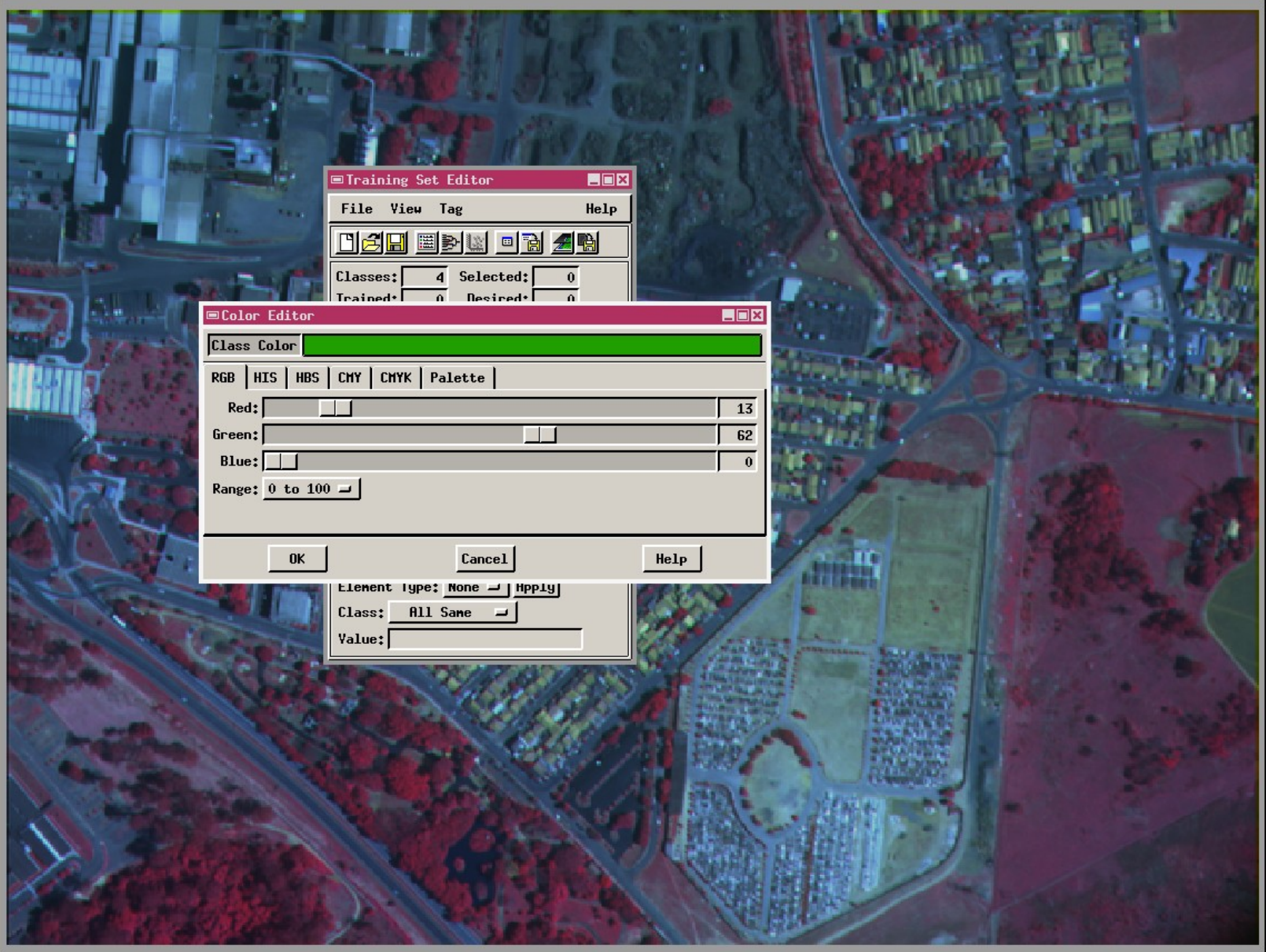
Value:

Clicando na cor
Pode-se mudar
para outra
coloração



TRAIN

pira4



Training Set Editor

File View Tag Help

Classes: 4 Selected: 0
Trained: 0 Desired: 0

Color Editor

Class Color:

RGB | HIS | HSB | CMY | CMYK | Palette

Red: 13

Green: 62

Blue: 0

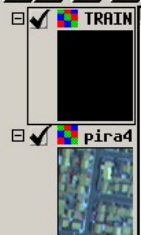
Range: 0 to 100

OK Cancel Help

Element type: None Apply

Class: All Same

Value:



Desenhar polígonos

Selecionar classe

Polígono desenhado

Training Set Editor

File View Tag Help

Classes: 4 Selected: 1
Trained: 1 Desired: 0

Class	Name	Tag
<input type="radio"/>	1 Solo nu	0
<input type="radio"/>	2 Escória	0
<input type="radio"/>	3 Relvado	0
<input checked="" type="radio"/>	4 Árvore/arbusto	0

Import

Source...

Element Type: None Apply

Class: All Same

Value:

Line/Polygon Edit Control

Operation	Mode	Action

Manual Entry

Apply

Help

Zoom: 1.0 Scale: 2367 214.16Y 562.38X n 214.16Y 562.38X n

Time to draw: 1 Second



Legend View:

- TRAIN
- pira4



Training Set Editor

File View Tag Help

Training Set: New, Open..., Save..., Save As...

Class	Name	Tag
<input type="radio"/> 8	Asfalto	0
<input type="radio"/> 9	Piso claro	0
<input type="radio"/> 10	Outro piso	0
<input type="radio"/> 11	Água lago	0
<input type="radio"/> 12	Água piscina	0

Import

Source...

Element Type: None Apply

Class: All Same

Value:

Line/Polygon Edit Control

Operation: [Icons]

Mode: [Icons]

Action: [Icons]

Manual Entry

Apply Help



TRAIN
 pira4



Training Set Editor

File View Tag Help

Training Set

Class

Mask

Close

Open...

Save...

Add Classes...

Delete Selected Classes

Class	Name	Tag
<input type="radio"/> 8	Asfalto	0
<input type="radio"/> 9	Piso claro	0
<input type="radio"/> 10	Outro piso	0
<input type="radio"/> 11	Água lago	0
<input type="radio"/> 12	Água piscina	0

Import

Source...

Element Type: None Apply

Class: All Same

Value:

Line/Polygon Edit Control

Operation Mode Action

Manual Entry

Apply Help



Automatic Classification

File View Help

Run...
 Open Class...
 Save Class...
 Exit

Mask...
 Use Mask For: Analysis Output
 Sample for Analysis: Line: 1 Column: 1
 Input Redistribution: **Normalize**
 Method: **Stepwise Linear**
 Training Data... **po\AulaGeo.rvc / TRAINING_SET**
 Training Set Editor...
 Parameters

Training Set Editor

File View Tag Help

Classes: 13 Selected: 0
 Trained: 13 Desired: 0

Class	Name	Tag
<input type="radio"/>	9 Piso cimento	0
<input type="radio"/>	10 Piso outro	0
<input type="radio"/>	11 Água lago	0
<input type="radio"/>	12 Água piscicna	0
<input type="radio"/>	13 Telha cinza	0

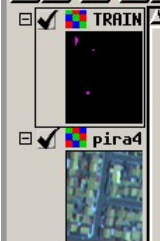
Import
 Source...
 Element Type: **None** Apply
 Class: **All Same**
 Value:

Line/Polygon Edit Control

Operation Mode Action

Manual Entry

Apply Help



Automatic Classification

Select Object

Select classification output raster:

Look in: AulaGeo.rvc

Path: eus documentos\Pós-USP\Aula geopro video\AulaGeo.rvc

Space free: 6,02 GB

	Blue	Blue raster from pira4_280___CIR
	Green	Green raster from pira4_280___CIR
	Red	Red raster from pira4_280___CIR
	TRAINING_SET	

Objects of Type: Raster

Show Preview Show Overview

OK Cancel Skip Help

New Object

Name: CLS_STEPWISELIN

Description: Class raster computed via Stepwise Linear

OK Cancel Help

Training Set Editor

File View Tag Help

Classes: 13 Selected: 0

Trained: 13 Desired: 0

Class	Name	Tag
<input type="radio"/>	9 Piso cimento	0
<input type="radio"/>	10 Piso outro	0
<input type="radio"/>	11 Água lago	0
<input type="radio"/>	12 Água piscicna	0
<input type="radio"/>	13 Telha cinza	0

Import

Source...

Element Type: None Apply

Class: All Same

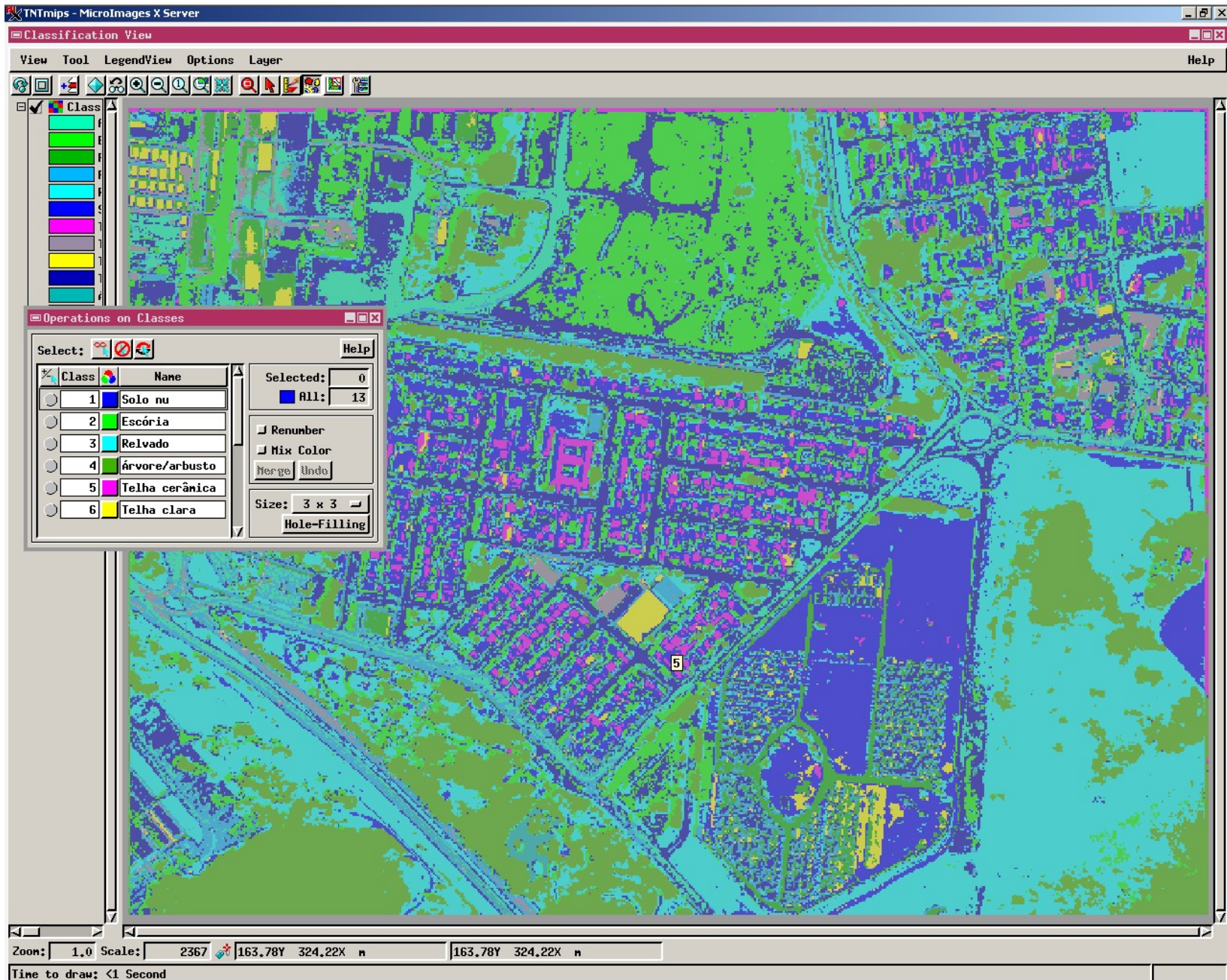
Value:

Line/Polygon Edit Control

Operation Mode Action

Manual Entry

Apply Help



TRAIN
 pira4

Automatic Classification

File View Help

Raster Output Statistics...
 Aulage Error Matrix...
 Aulage Co-occurrence...
 Aulage Dendrogram...
 Ellipse ScatterPlot...
 Distance Histogram...

Mask For: Analysis Output

Sample for Analysis: Line: Column:

Output Redistribution:

Method:

Training Data... po\Aulageo.rvc / TRAINING_SET

Training Set Editor...

Parameters

Time to process: 1 Second

Operations on Classes

Select:

Class	Name
<input type="radio"/>	1 Solo nu
<input type="radio"/>	2 Escória
<input type="radio"/>	3 Relvado
<input type="radio"/>	4 árvore/arbusto
<input type="radio"/>	5 Telha cerâmica
<input type="radio"/>	6 Telha clara

Selected:
 All:

Renumber
 Mix Color

 Size:

Training Set Editor

File View Tag Help

Classes: Selected:
 Trained: Desired:

Class	Name	Tag
<input type="radio"/>	9 Piso cimento	0
<input type="radio"/>	10 Piso outro	0
<input type="radio"/>	11 água lago	0
<input type="radio"/>	12 água piscicna	0
<input type="radio"/>	13 Telha cinza	0

Import

Source...

Element Type:

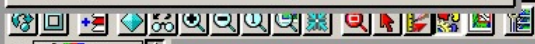
Class:

Value:

Line/Polygon Edit Control

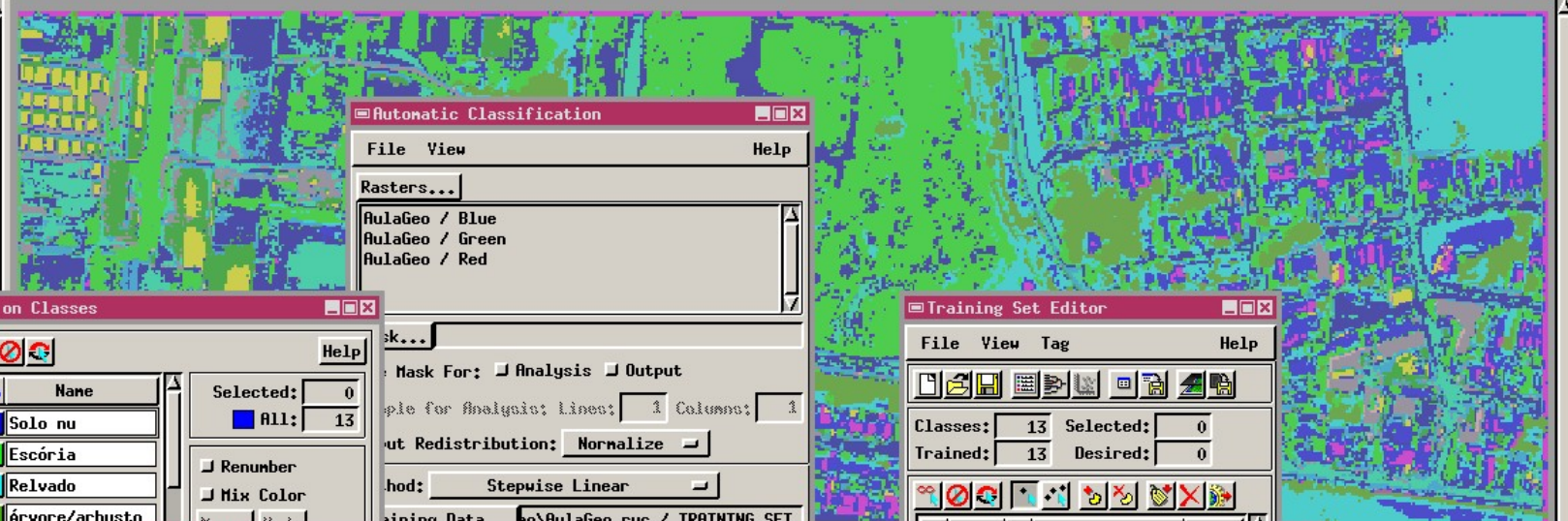
Operation Mode Action

Manual Entry



Class

- Class 1
- Class 2
- Class 3
- Class 4
- Class 5
- Class 6



Automatic Classification

File View Help

Rasters...

- AulaGeo / Blue
- AulaGeo / Green
- AulaGeo / Red

Mask For: Analysis Output

Sample for Analysis: Lines: 1 Columns: 1

Output Redistribution: **Normalize**

Method: **Stepwise Linear**

Operations on Classes

Select:

Help

Class	Name
<input type="radio"/>	1 Solo nu
<input type="radio"/>	2 Escória
<input type="radio"/>	3 Relvado
<input type="radio"/>	4 árvore/arbusto
<input type="radio"/>	5 Telha cerâmica
<input type="radio"/>	6 Telha clara

Selected: 0
All: 13

Renumber
 Mix Color

Training Set Editor

File View Tag Help

Classes: 13 Selected: 0
Trained: 13 Desired: 0

Error Matrix

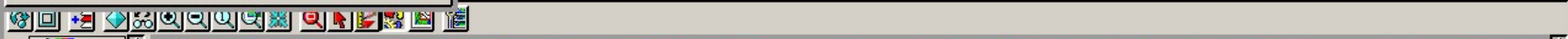
Ground Truth Raster... \dfsilva.FLORESTA\Meus documentos\Pós-USP\Aula geopro video\AulaGeo.rvc / TRAINING_SET Help Close

Ground Truth Data													
Name	Solo nu	Escória	Relvado	árvore/a	Telha ce	Telha cl	Telha es	Asfalto	Piso cin	Piso out	água lag	Total	Accuracy
Solo nu	770	1	35	2	18	0	0	0	0	0	0	826	93,22%
Escória	0	261	0	0	0	0	0	0	0	0	0	261	100,00%
Relvado	0	0	950	7	0	0	0	0	0	0	0	957	99,27%
árvore/a	0	0	0	617	0	0	0	0	0	0	0	617	100,00%
Telha ce	0	0	0	0	100	0	0	0	0	0	0	100	100,00%
Telha cl	0	0	0	0	0	167	0	0	0	0	0	167	100,00%
Telha es	0	14	0	0	0	0	38	1	0	0	0	53	71,70%
Asfalto	0	3	0	0	0	0	49	0	0	0	0	52	94,23%
Piso cin	0	0	0	0	0	0	0	9	0	0	0	9	100,00%
Piso out	0	0	0	0	0	0	0	0	33	0	0	33	100,00%
água lag	0	0	0	0	0	0	0	0	0	37	0	37	100,00%
água pis	0	0	0	0	0	0	0	0	0	0	0	5	100,00%
Telha ci	0	0	0	0	0	0	0	0	0	0	0	71	100,00%
Total	770	279	985	626	118	167	38	50	9	33	37	3188	
Accuracy	100,00%	93,55%	96,45%	98,56%	84,75%	100,00%	100,00%	98,00%	100,00%	100,00%	100,00%		

Overall Accuracy = 97,46% Khat Statistic = 96,80%

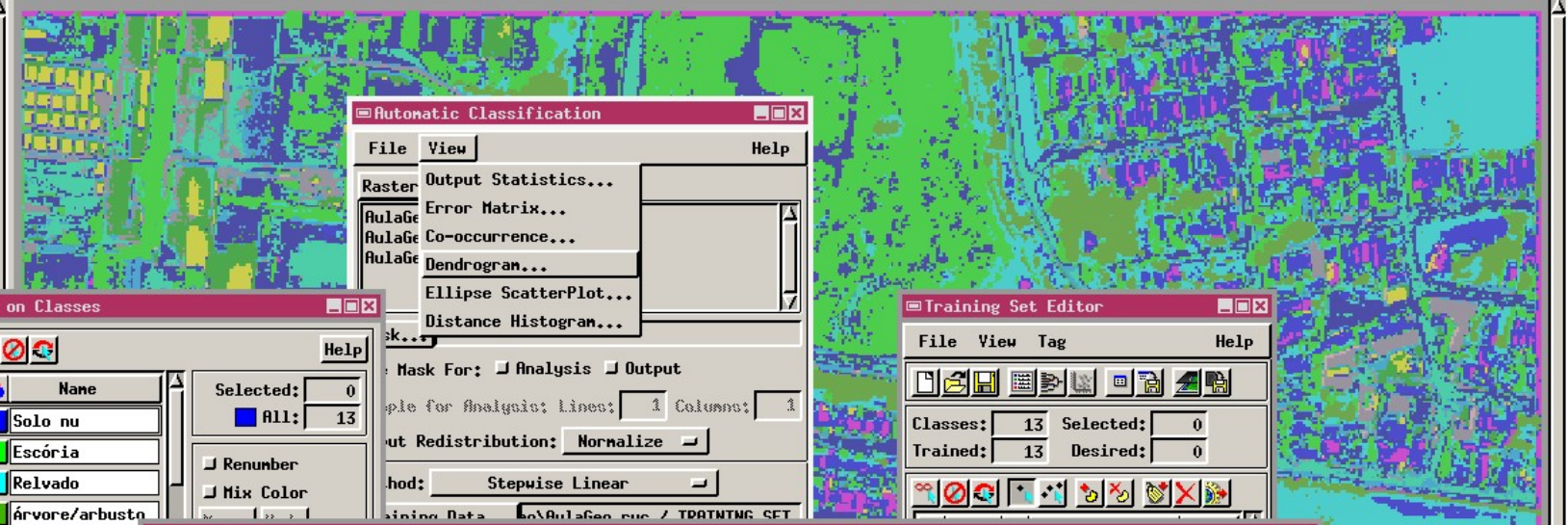
Operation Mode Action

Manual Entry



Class

- Class 1
- Class 2
- Class 3
- Class 4
- Class 5
- Class 6



Automatic Classification

File View Help

Raster

- Output Statistics...
- Error Matrix...
- Co-occurrence...
- Dendrogram...
- Ellipse ScatterPlot...
- Distance Histogram...

Mask For: Analysis Output

Sample for Analysis: Lines: Columns:

Output Redistribution: **Normalize**

Method: **Stepwise Linear**

Operations on Classes

Select:

Class	Name
<input type="radio"/>	1 Solo nu
<input type="radio"/>	2 Escória
<input type="radio"/>	3 Relvado
<input type="radio"/>	4 árvore/arbusto
<input type="radio"/>	5 Telha cerâmica
<input type="radio"/>	6 Telha clara

Selected: ALL:

Renumber Mix Color

Training Set Editor

File View Tag Help

Classes: Selected:

Trained: Desired:

Error Matrix

Ground Truth Raster... \dfsilva,FLORESTA\Meus documentos\Pós-USP\Aula geopro video\AulaGeo.rvc / TRAINING_SET

Ground Truth Data													Total	Accuracy	
Name	Solo nu	Escória	Relvado	árvore/a	Telha ce	Telha cl	Telha es	Asfalto	Piso cin	Piso out	Água lag	Água pis	Telha ci	Total	Accuracy
Solo nu	770	1	35	2	18	0	0	0	0	0	0	0	0	826	93,22%
Escória	0	261	0	0	0	0	0	0	0	0	0	0	0	261	100,00%
Relvado	0	0	950	7	0	0	0	0	0	0	0	0	0	957	99,27%
árvore/a	0	0	0	617	0	0	0	0	0	0	0	0	0	617	100,00%
Telha ce	0	0	0	0	100	0	0	0	0	0	0	0	0	100	100,00%
Telha cl	0	0	0	0	0	167	0	0	0	0	0	0	0	167	100,00%
Telha es	0	14	0	0	0	0	38	1	0	0	0	0	0	53	71,70%
Asfalto	0	3	0	0	0	0	0	49	0	0	0	0	0	52	94,23%
Piso cin	0	0	0	0	0	0	0	0	9	0	0	0	0	9	100,00%
Piso out	0	0	0	0	0	0	0	0	0	33	0	0	0	33	100,00%
Água lag	0	0	0	0	0	0	0	0	0	0	37	0	0	37	100,00%
Água pis	0	0	0	0	0	0	0	0	0	0	0	5	0	5	100,00%
Telha ci	0	0	0	0	0	0	0	0	0	0	0	0	0	71	100,00%
Total	770	279	985	626	118	167	38	50	9	33	37	5	71	3188	
Accuracy	100,00%	93,55%	96,45%	98,56%	84,75%	100,00%	100,00%	98,00%	100,00%	100,00%	100,00%	100,00%	100,00%		

Overall Accuracy = 97,46% Khat Statistic = 96,80%

Operation Mode Action

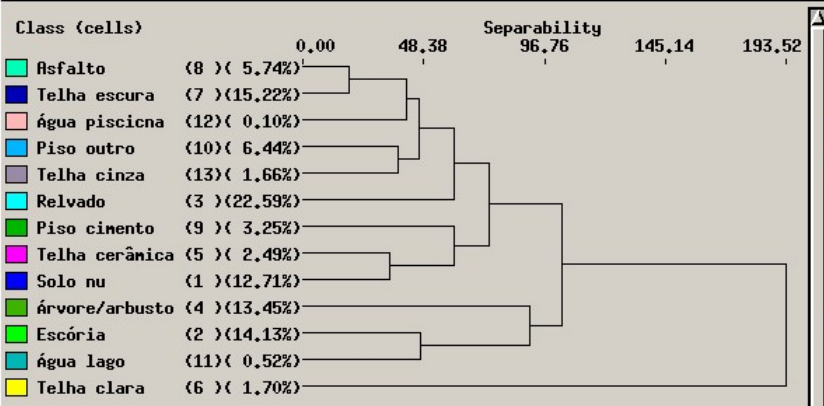
Manual Entry

Class

Operations on Classes

Select:

Class	Name
<input type="radio"/>	1 Solo nu
<input type="radio"/>	2 Escória
<input type="radio"/>	3 Relvado
<input type="radio"/>	4 árvore/arbusto
<input type="radio"/>	5 Telha cerâmica
<input type="radio"/>	6 Telha clara



tor

Help

Selected: 0

Desired: 0

RAINING_SET Help Close

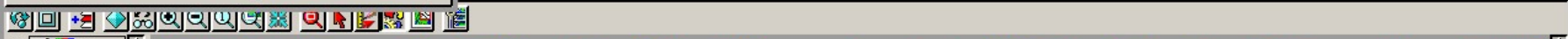
Class	Total	Accuracy
Solo nu	826	93.22%
Escória	261	100.00%
Relvado	957	99.27%
Árvore/arbusto	617	100.00%
Telha cerâmica	100	100.00%
Telha clara	167	100.00%
Telha escura	53	71.70%
Asfalto	52	94.23%
Piso cinento	9	100.00%
Piso outro	33	100.00%
Água lago	37	100.00%
Água piscicna	5	100.00%
Telha cinza	71	100.00%
Total	3188	100.00%

Polygon Edit Control

Operation Mode Action

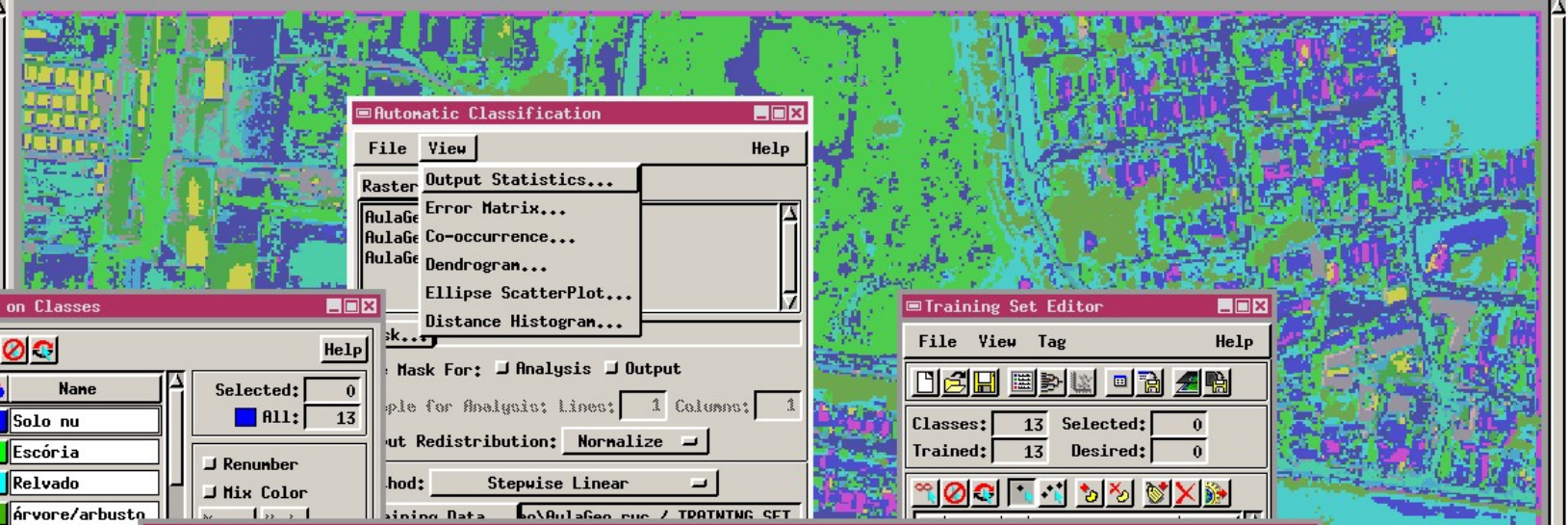
Manual Entry

Apply Help



Class

- Class 1
- Class 2
- Class 3
- Class 4
- Class 5
- Class 6



Automatic Classification

File View Help

Raster

- Output Statistics...
- Error Matrix...
- Co-occurrence...
- Dendrogram...
- Ellipse ScatterPlot...
- Distance Histogram...

Mask For: Analysis Output

Sample for Analysis: Lines: Columns:

Output Redistribution: **Normalize**

Method: **Stepwise Linear**

Training Data: C:\AulaGeo.rvc / TRAINING_SET

Operations on Classes

Select:

Class	Name
<input type="radio"/>	1 Solo nu
<input type="radio"/>	2 Escória
<input type="radio"/>	3 Relvado
<input type="radio"/>	4 árvore/arbusto
<input type="radio"/>	5 Telha cerâmica
<input type="radio"/>	6 Telha clara

Selected: ALL:

Renumber Mix Color

Training Set Editor

File View Tag Help

Classes: Selected:

Trained: Desired:

Error Matrix

Ground Truth Raster... \dfsilva.FLORESTA\Meus documentos\Pós-USP\Aula geopro video\AulaGeo.rvc / TRAINING_SET

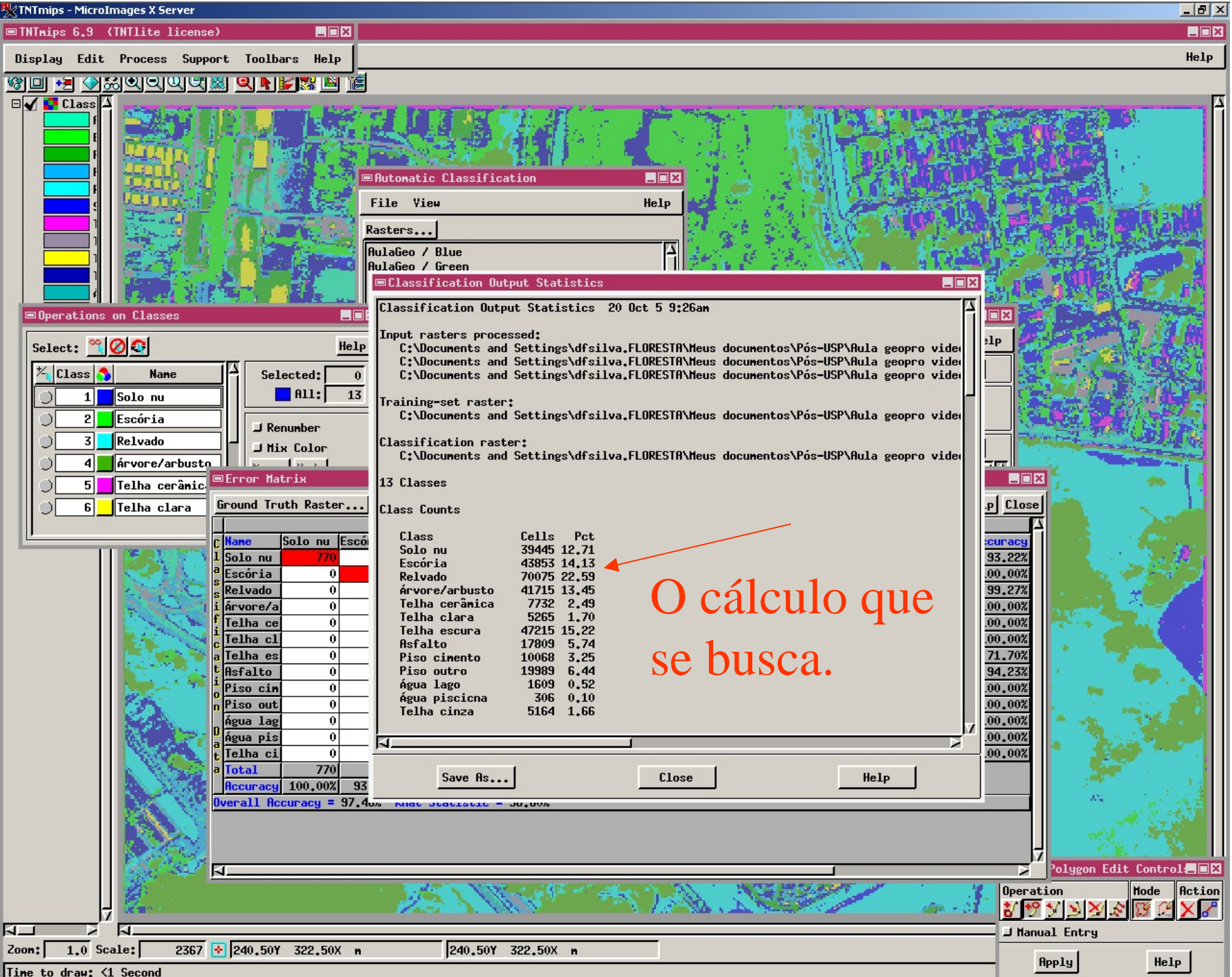
Ground Truth Data													
Name	Solo nu	Escória	Relvado	árvore/a	Telha ce	Telha cl	Telha es	Asfalto	Piso cin	Piso out	Água lag	Total	Accuracy
Solo nu	770	1	35	2	18	0	0	0	0	0	0	826	93,22%
Escória	0	261	0	0	0	0	0	0	0	0	0	261	100,00%
Relvado	0	0	950	7	0	0	0	0	0	0	0	957	99,27%
árvore/a	0	0	0	617	0	0	0	0	0	0	0	617	100,00%
Telha ce	0	0	0	0	100	0	0	0	0	0	0	100	100,00%
Telha cl	0	0	0	0	0	167	0	0	0	0	0	167	100,00%
Telha es	0	14	0	0	0	0	38	1	0	0	0	53	71,70%
Asfalto	0	3	0	0	0	0	0	49	0	0	0	52	94,23%
Piso cin	0	0	0	0	0	0	0	0	9	0	0	9	100,00%
Piso out	0	0	0	0	0	0	0	0	0	33	0	33	100,00%
Água lag	0	0	0	0	0	0	0	0	0	0	37	37	100,00%
Água pis	0	0	0	0	0	0	0	0	0	0	0	5	100,00%
Telha ci	0	0	0	0	0	0	0	0	0	0	0	71	100,00%
Total	770	279	985	626	118	167	38	50	9	33	37	3188	
Accuracy	100,00%	93,55%	96,45%	98,56%	84,75%	100,00%	100,00%	98,00%	100,00%	100,00%	100,00%		

Overall Accuracy = 97,46% Khat Statistic = 96,80%

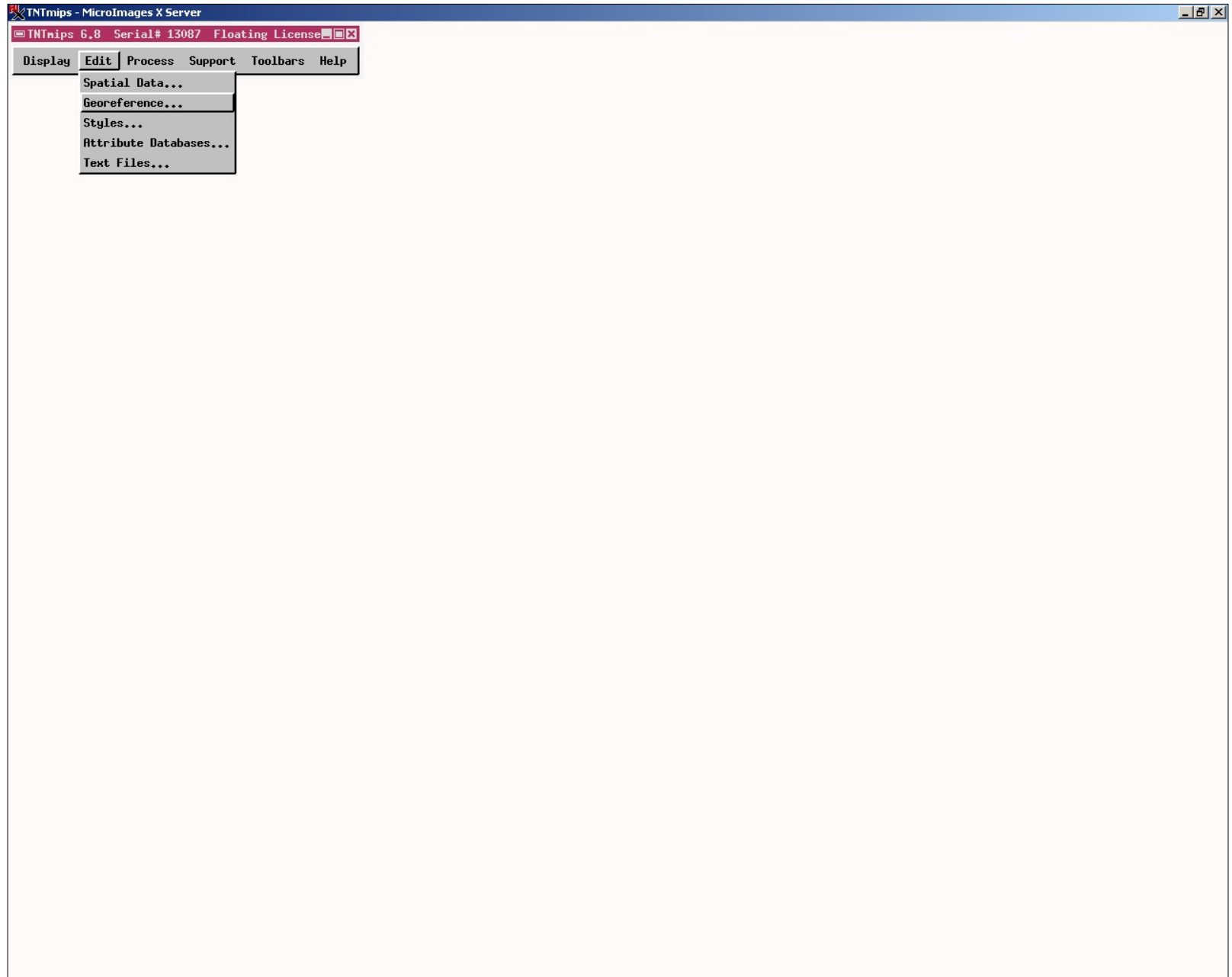
Operation Mode Action

Manual Entry

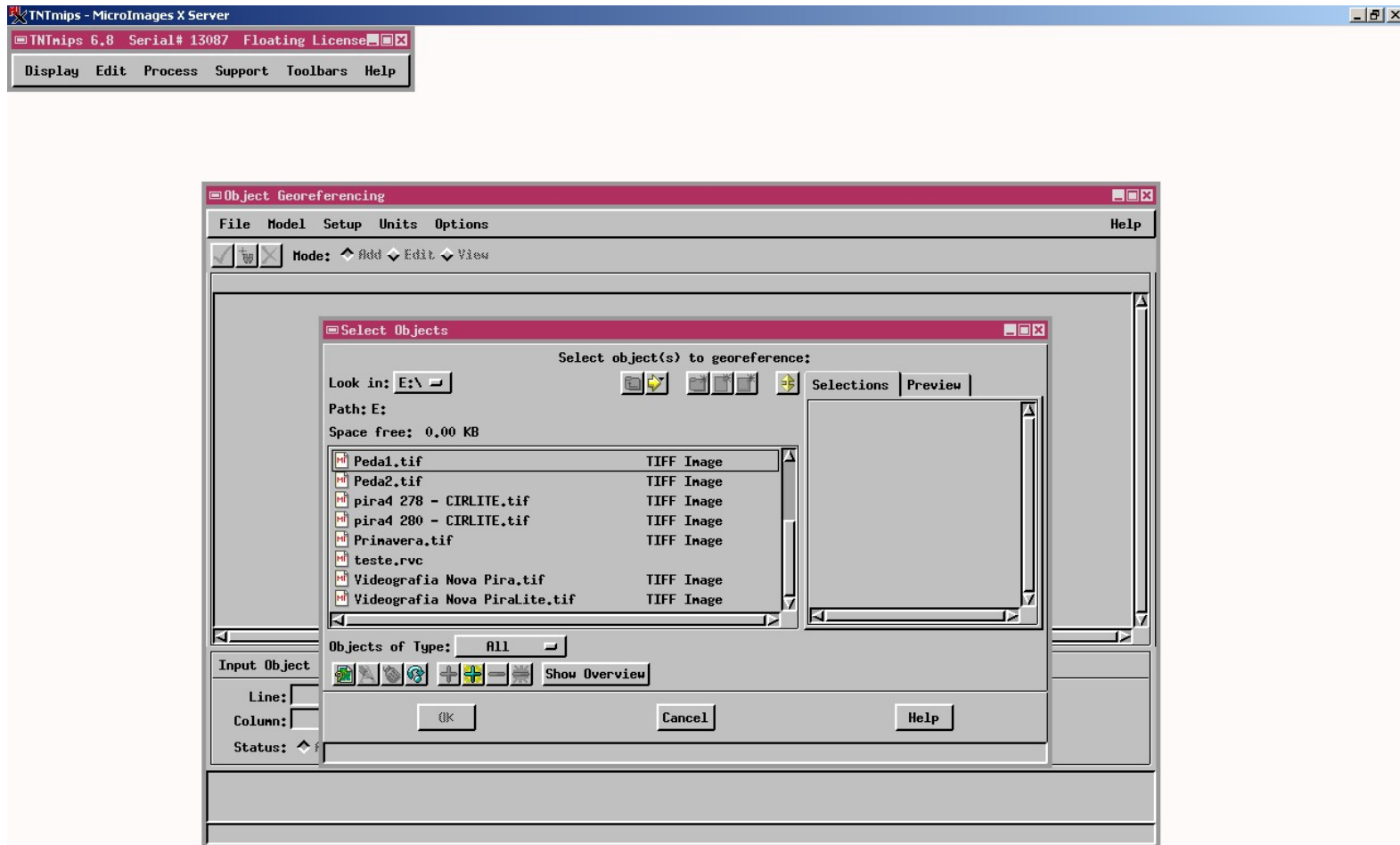
Apply Help



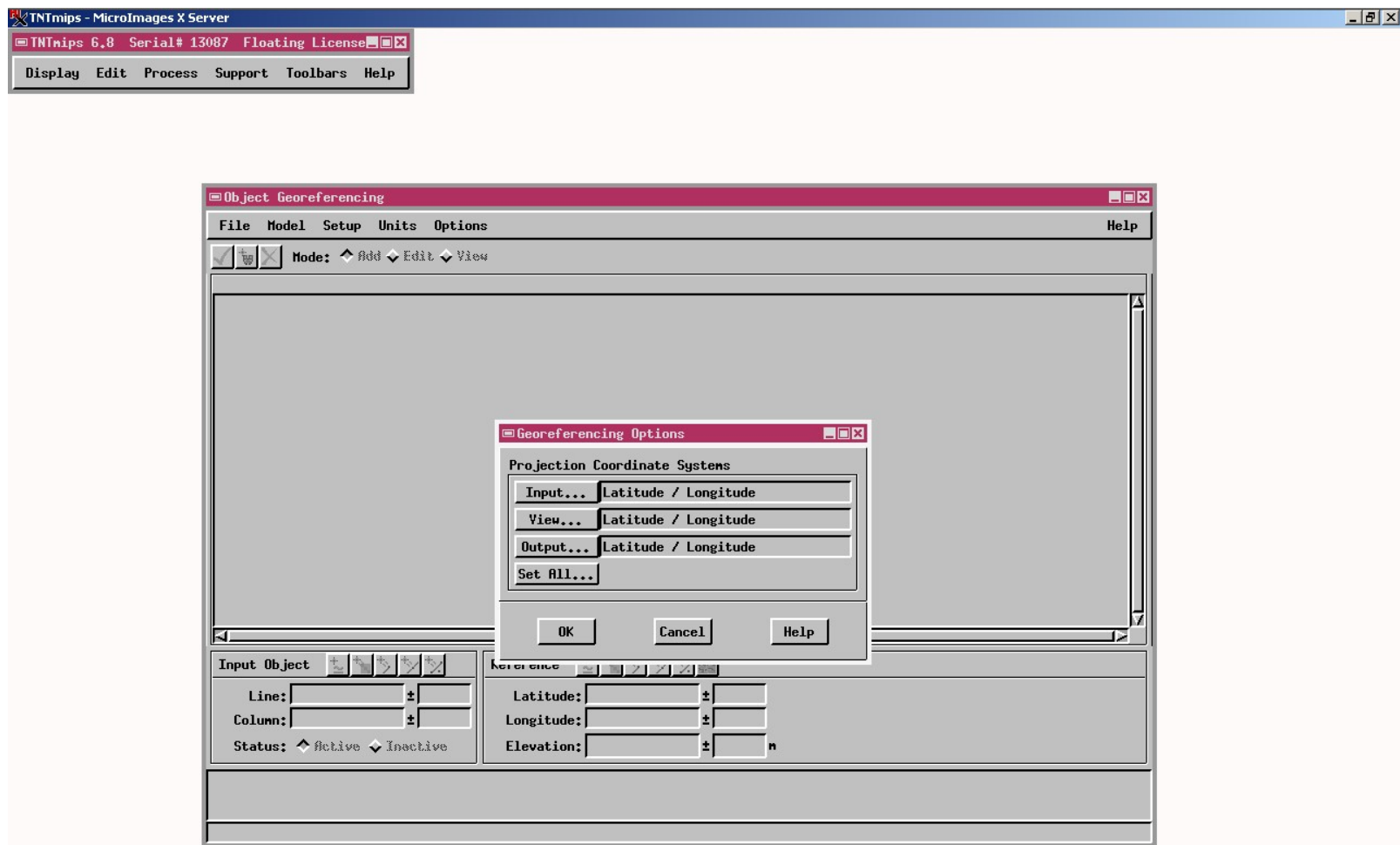
Como georreferenciar imagens no TNT Mips



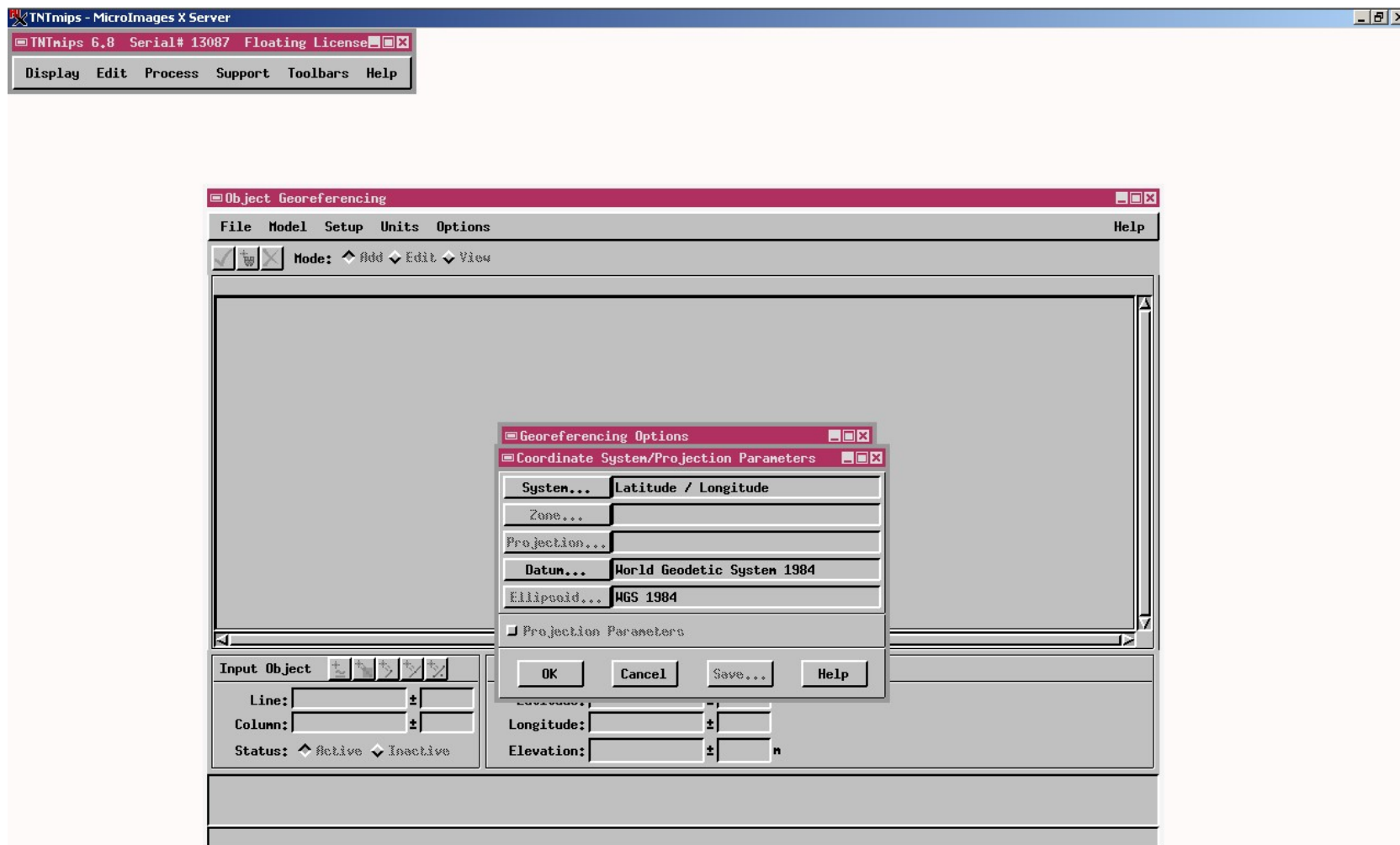
Seleciona e arquivo para georreferenciar



Selecionar o sistema de projeção de coordenadas




Selecionar o sistema de projeção de coordenadas



Object Georeferencing [min] [max] [close]

File Model Setup Units Options Help

Mode: Add Edit View



Input Object [add] [edit] [delete] [undo] [redo]

Line: ±

Column: ±

Status: Active Inactive

Reference [add] [edit] [delete] [undo] [redo]

Latitude: ±

Longitude: ±

Elevation: ± m

Object Georeferencing

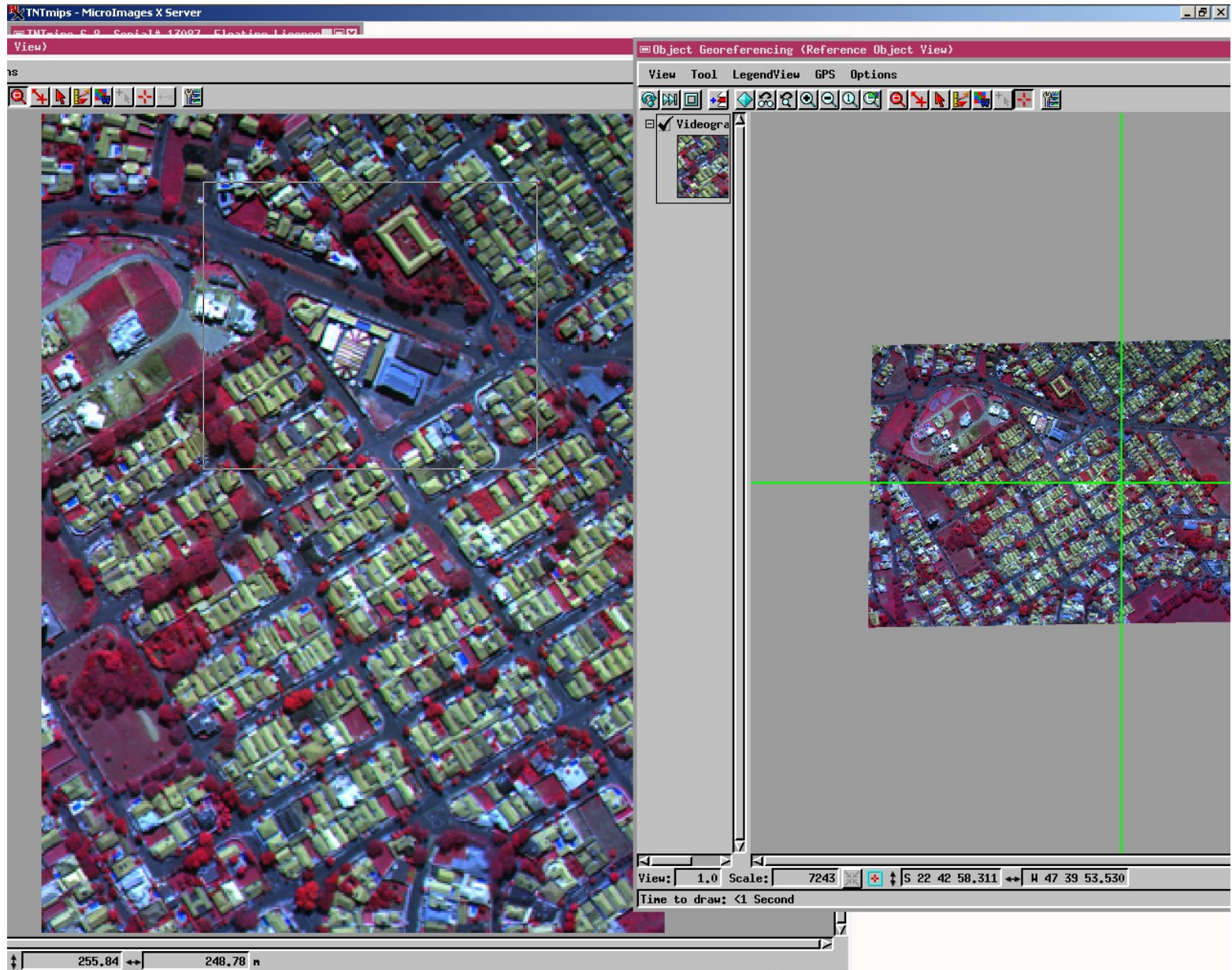
File Model Setup Units Options Help

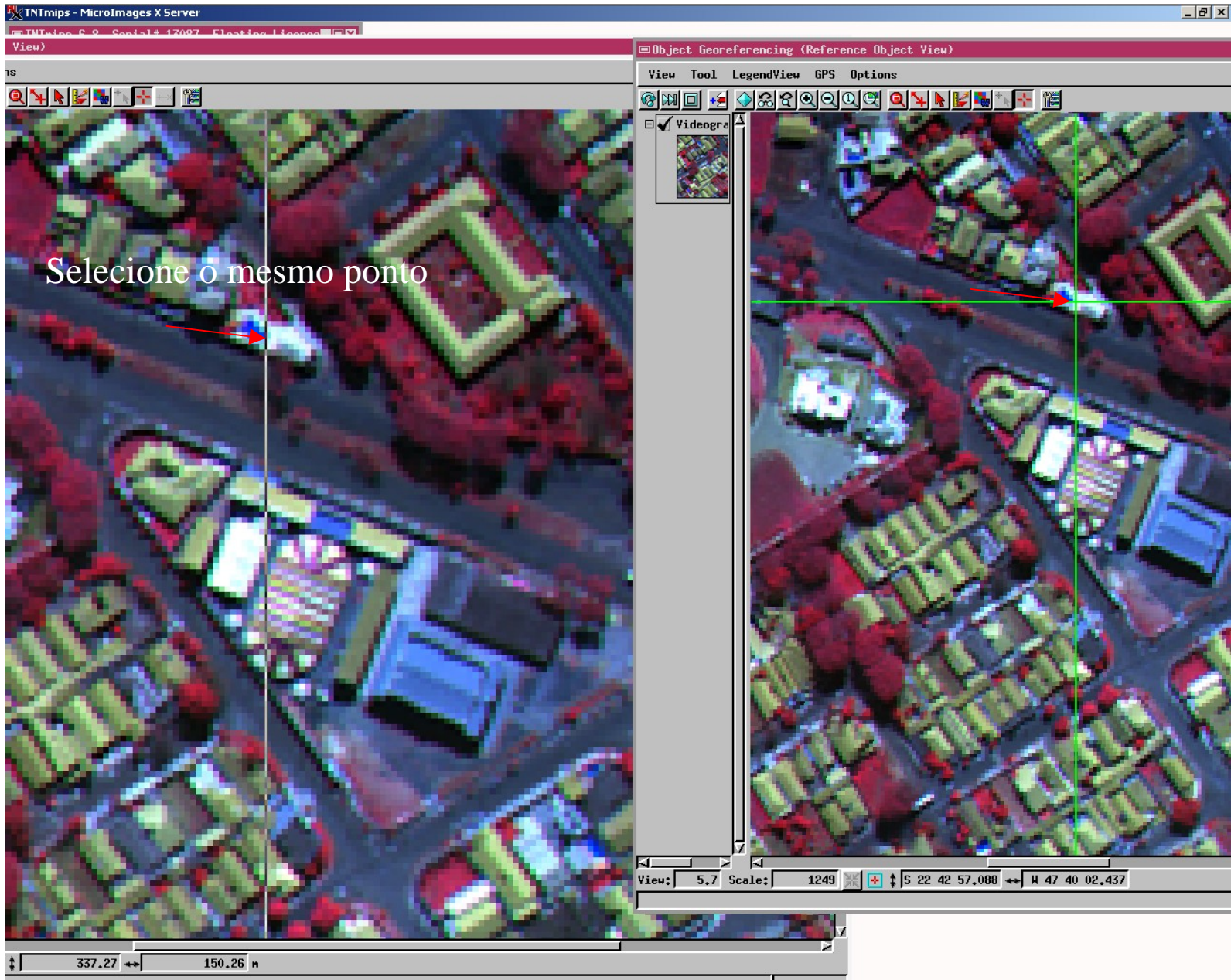
Open... Edit View
Open RGB Rasters...
Save
Save As...
Make Implied...
Make Simple...
Read Control Points...
Save as Text...
Exit

Input Object Reference

Line: [] ± [] Latitude: [] ± []
Column: [] ± [] Longitude: [] ± []
Status: Active Inactive Elevation: [] ± [] m

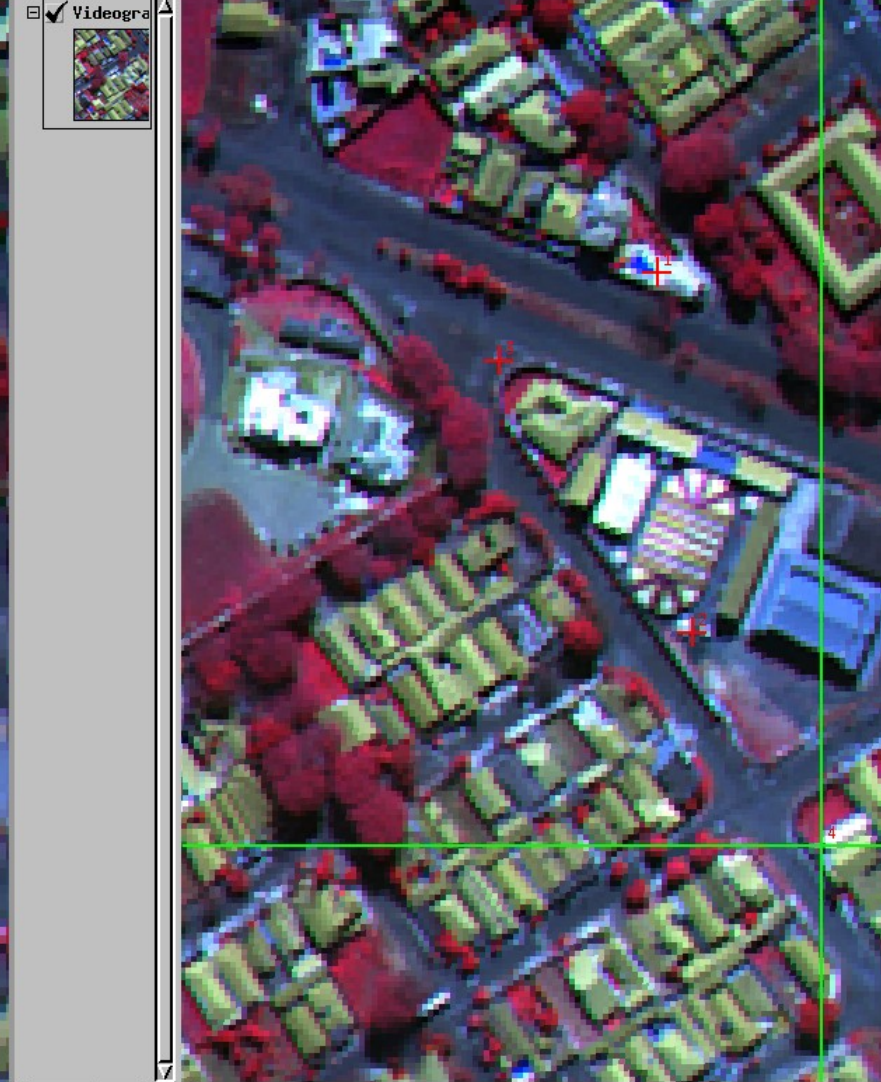
Selecione pontos e escolha o mesmo ponto da imagem de referência





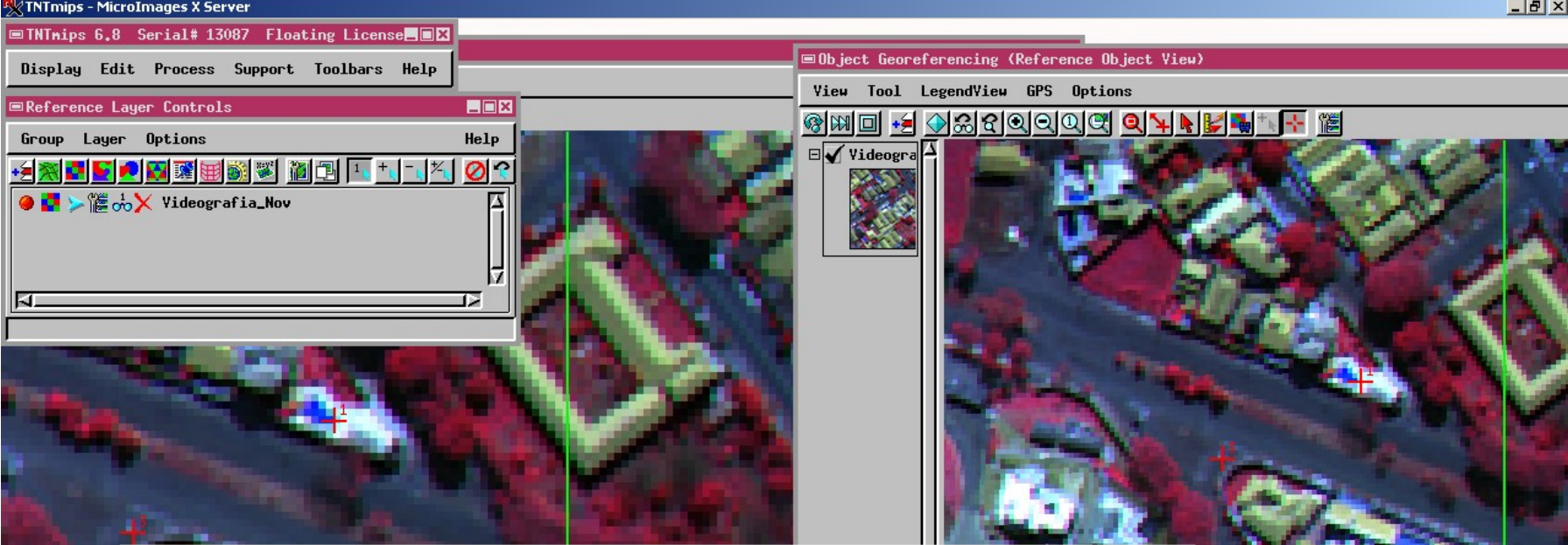
ns

View Tool LegendView GPS Options



View: 5.7 Scale: 1249 S 22 42 57.088 W 47 40 02.437

256.85 166.87 n



Georeference (E:\Peda1.tif / Peda1)

File Model Setup Units Options Help

Mode: Add Edit View

##	Column	Line	Latitude	Longitude	Residual (n)
1	150.26	73.73	S 22 42 55.1	W 47 40 04.5	0.034
2	157.74	136.20	S 22 42 58.1	W 47 40 02.3	0.659
3	123.01	88.85	S 22 42 56.6	W 47 40 05.6	0.252
4	181.83	173.75	S 22 42 59.3	W 47 39 59.9	0.374

Observar os erros diferenciais

Input Object Reference

Line: [] ± [] Latitude: [] ± []

Column: [] ± [] Longitude: [] ± []

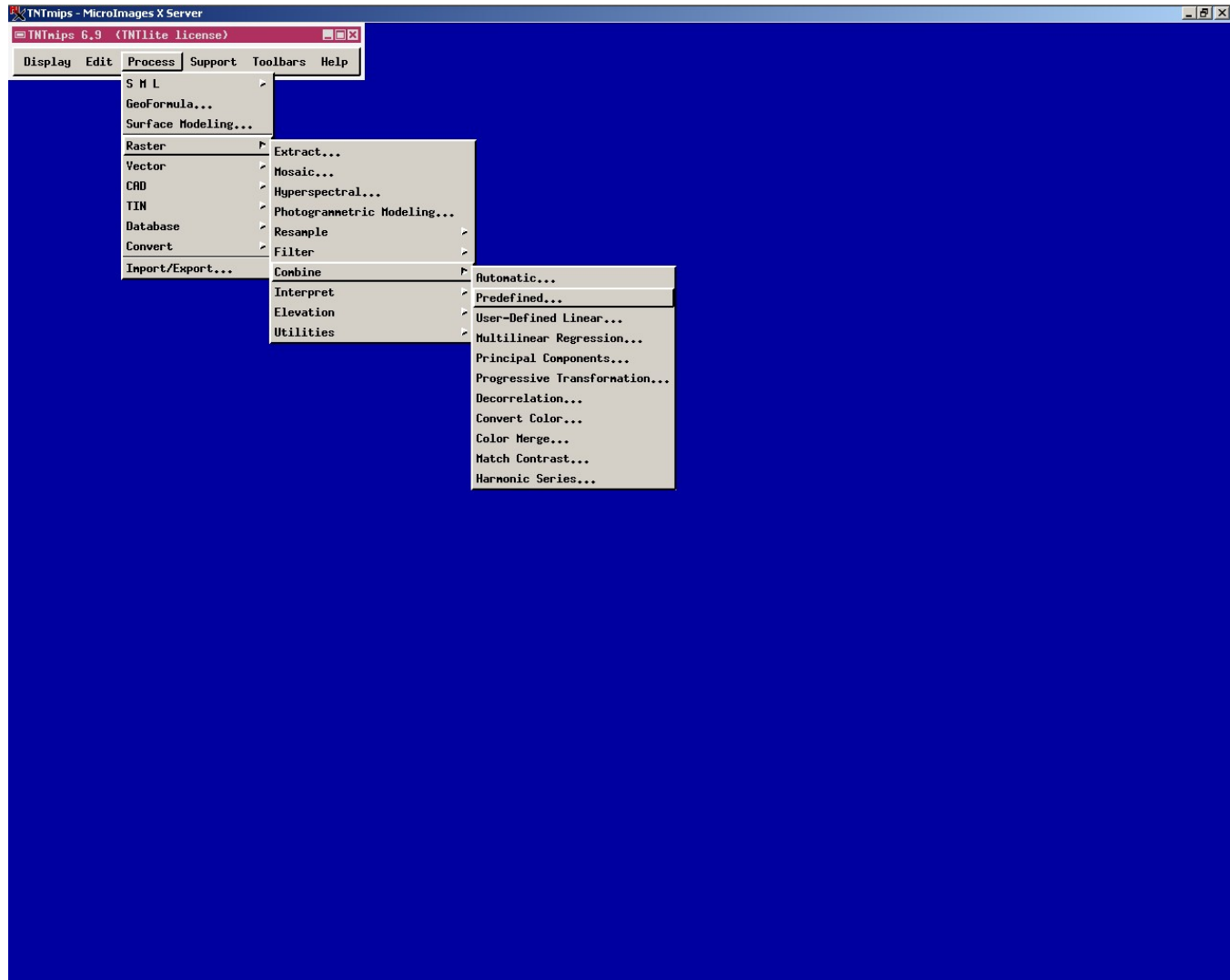
Status: Active Inactive Elevation: [] ± [] n



Índice de diferença normalizado de vegetação

$$\text{NDVI} = (\text{Infravermelho} - \text{vermelho}) / (\text{infravermelho} + \text{vermelho})$$

Foi concebido para ressaltar o efeito da vegetação nos solos (Ippoliti-Ramillo, 1999)



Display Edit Process Support Toolbars Help

Raster Combination

Type: Algebraic

Operation: Add

Add set of rasters

 $C = R1 + R2 + \dots + Rn$

Rasters...

Parameters

None

Output Raster Type: 8-bit unsigned integer

 Pyramid Output

Run...

Exit

Help

Raster Combination

Type:	Algebraic	Operation:	Add
Add s	Logical		
C = R	Indices	Rn	
	Indices - TM		
	Indices - MSS		
Raste	Enhancement		

Parameters

None

Output Raster Type: 8-bit unsigned integer

Pyramid Output

Run... Exit Help

Raster Combination

Type: **Indices** Operation: **ND**

Normalized Difference Index

NormalDiff = $(B - A) / (B + A) * \text{Scale factor}$

Rasters...

Parameters

Scale Factor: 130,0000

Output Raster Type: **8-bit signed integer**

Pyramid Output

Run... Exit Help

Raster Combination

Type: Indices Operation: ND

Normalized Difference Index

$$\text{NormalDiff} = (B - A) / (B + A) * \text{Scale factor}$$

Rasters...

Parameters

Scale Factor: 130.0000

Output Raster Type: 8-bit signed integer

Pyramid Output

Run... Exit Help



Muito obrigado !