Week#10 Image ClassificationProblems

Download and unzip **Week10_Classification_Problems.zip** from the class website
http://nrm.salrm.uaf.edu/~dverbyla/nrm338/blackboard_data/

Fire Severity Classification

The image is from 2010-Aug-15 following the 2010 Missippi Fire near Delta. What percentage of pixels inside the fire perimeter actually burned?

1) Create training polygons inside burned, unbured areas of image

	SHAPE *	BurnClass	PolygonID
1	Polygon	Unburned	1
2	Polygon	Unburned	2
3	Polygon	Unburned	3
4	Polygon	Unburned	4
7	Polygon	Burned	7
8	Polygon	Burned	8
9	Polygon	Burned	9
10	Polygon	Burned	10
11	Polygon	Burned	11
12	Polygon	Burned	12

2) Classify raster as unburned/burned

- ☑ Unburned_Burned
  - 0
  - 1
- ☑ MLClassifyOutput
  - 1
  - 2
  - 3
  - 4
  - 7
  - 8
  - 9
  - 10
  - 11
  - 12

3) Clip pixels with burn perimeter

4) Compute percentage burned..varies depending on training polygons used

Unburned_Burned_Clip   ×

	Value	Count	Class	Percent
	0	1903	UnBurned	14.4%
	1	11300	Burned	85.6%

Unburn_Burned_Clip

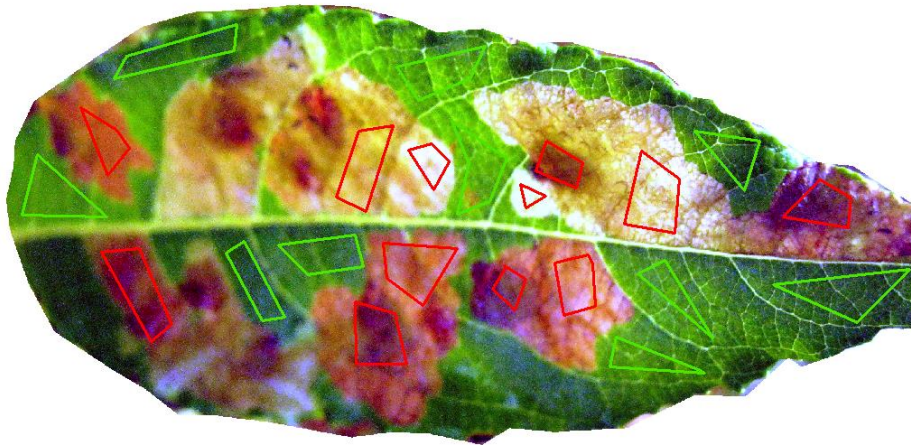|	Count	Percent
	3313	25.1%
	9890	74.9%

Value	Count	Percent
0	3548	26.9%
1	9655	73.1%

Photo Classification

The brown areas are area mined by the willow leaf blotch miner. What percentage of the willow leaf as been mined by this insect.

1) Create training polygons

2) Use training polygons to classify leaf image

3) Compute percentage mined

WillowLeaf_Mined.tif

Count	LeafMined	Percent
1871495	YES	48.9%
1953031	NO	51.1%

Statistics of WillowLeaf_Min

Field

Percent

Statistics:

Count: 2
Minimum: 48.934038
Maximum:51.065962
Sum: 100
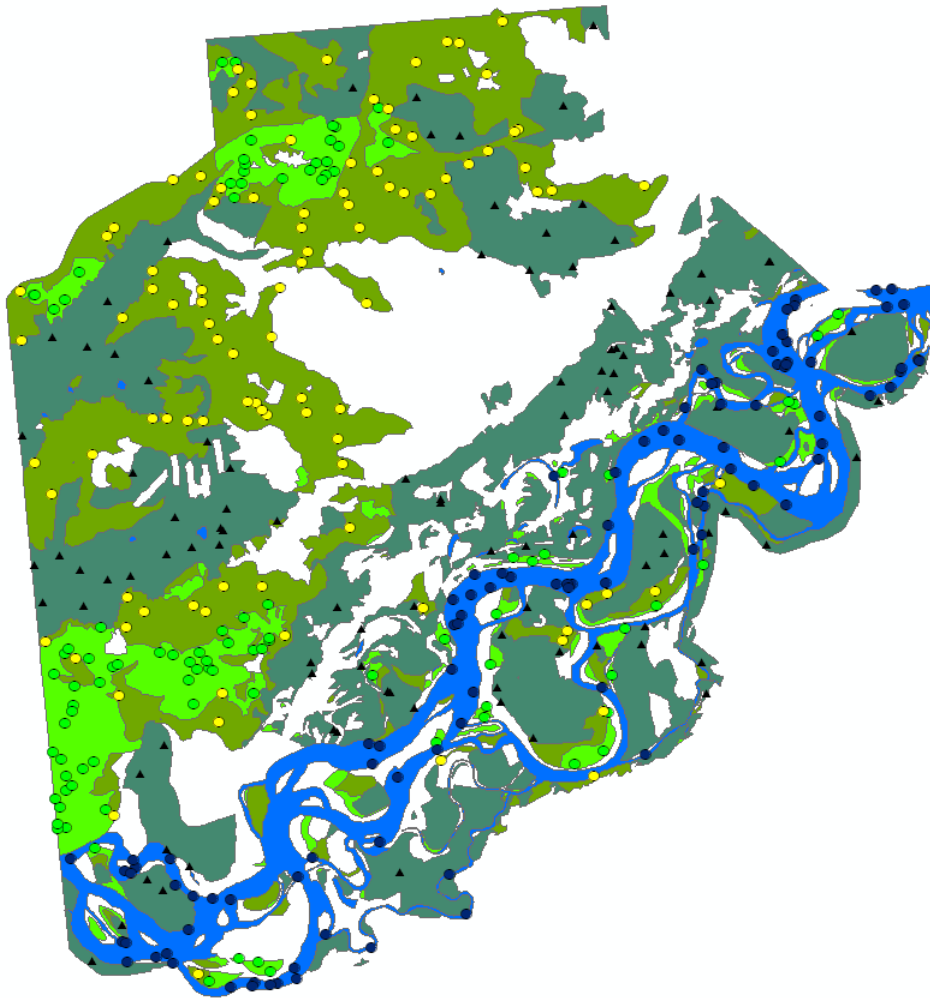Mean: 50

Results vary depending on training polygons used..

Value	Count	Percent
1	1746637	45.7%
2	2077889	54.3%

Value	Count	Percent
0	1805926	47.2%
1	2018600	52.8%

Random Points By Vegetation Class

Use the LandCover Polygons to create 100 random points within four classes:

1) deciduous forest,
2) mixed forest,
3) coniferous forest
4) water.

Create zone values of 1,2,34 for Deciduous,Mixed, Conifer, Water

LandCover_Polygons

Shape *	Id	Level_I	zone
Polygon	4	White Spruce	3
Polygon	5	Deciduous	1
Polygon	6	White Spruce	3
Polygon	7	White Spruce	3
Polygon	8	Deciduous	1
Polygon	9	White Spruce	3
Polygon	12	White Spruce	3
Polygon	13	Mixed Forest	2
Polygon	14	White Spruce	3
Polygon	15	Black Spruce	3
Polygon	18	Deciduous	1
Polygon	19	Deciduous	1

Dissolve based on zone field…

dissolved_LandCover_Polygons

zone	Class
1	Deciduous Forest
2	Mixed Forest
3	Conifer Forest
4	Water

Create 100 points in each class.

File   Edit   View   Bookmarks   Insert   Selection   Geoprocessing   Cus

Create Random Points

Output Location

C:\temp\week10_classification

Output Point Feature Class

Random_Points

Constraining Feature Class (optional)

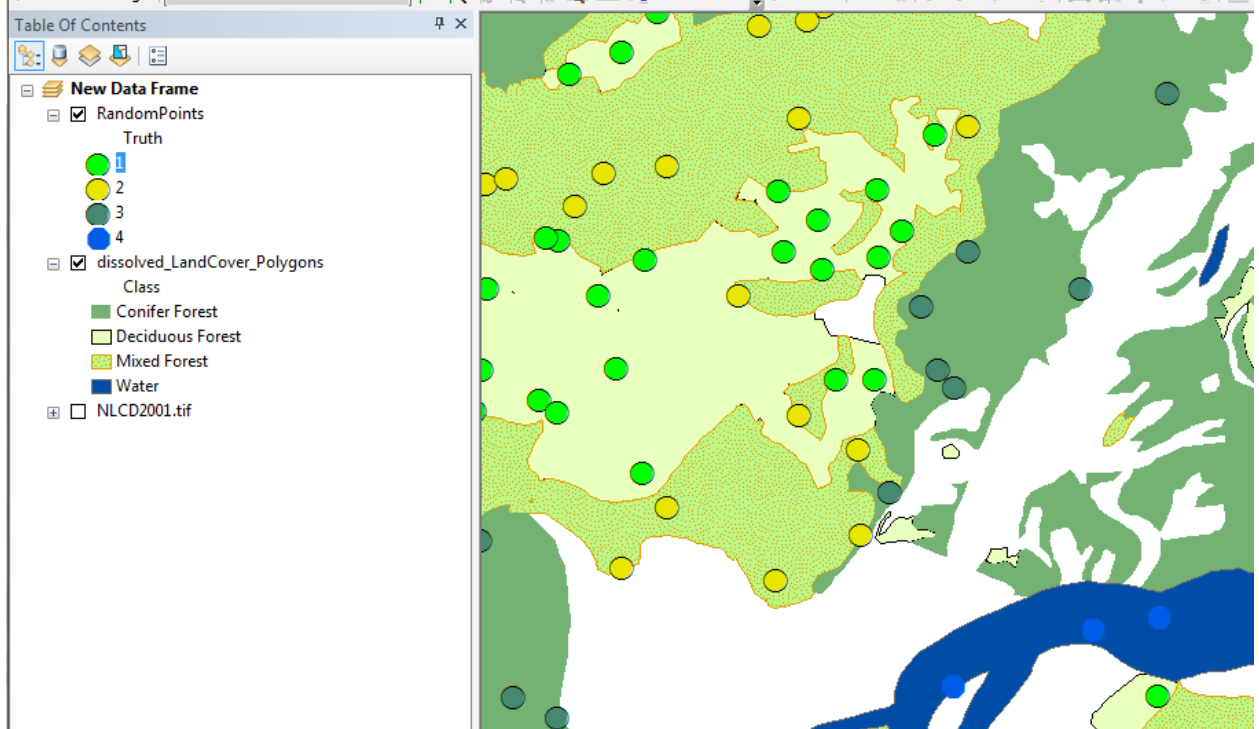dissolved_LandCover_Polygons

Constraining Extent (optional)

| | Top | |
| | 250.000000 | |

| Left | | Right |
| 0.000000 | | 250.000000 |

| | Bottom | |
| | 0.000000 | Clear |

Number of Points [value or field] (optional)

◉ Long

100

National Land Cover Classification

The entire US has been classified using Landsat imagery
(http://www.mrlc.gov/nlcd01_data.php

Use your 400 random points to assess the overall classification accuracy of
NLCD2001.tif.

NLCD2001.tif

Value	Count	Land_Cover
11	21060	Open Water
22	951	Developed, Low Intensity
31	3914	Barren Land
41	55931	Deciduous Forest
42	133661	Evergreen Forest
43	22283	Mixed Forest
51	7	Dwarf Shrub
52	9997	Shrub/Scrub
72	91	Sedge/Herbaceous
81	9	Pasture/Hay
82	281	Cultivated Crops
90	79367	Woody Wetlands
95	1843	Emergent Herbaceous Wetlands

Step 1) Determine Land_Cover of each of the 400 points

Extract_RandomP1

Shape *	CID	RASTERVALU	Land_Cover	Truth
Point	1	42	Evergreen Forest	Conifer
Point	1	42	Evergreen Forest	Conifer
Point	1	11	Open Water	Conifer
Point	1	42	Evergreen Forest	Conifer
Point	1	42	Evergreen Forest	Conifer

Step 3) Use Frequency tool to create summary table:

Extract_RandomP1_Frequency

Land_Cover	Truth	FREQUENCY
Barren Land	Water	7
Deciduous Forest	Conifer	2
Deciduous Forest	Deciduous	90
Deciduous Forest	Mixed Forest	34
Deciduous Forest	Water	1
Developed, Low Intensi	Deciduous	1
Emergent Herbaceous	Water	1
Evergreen Forest	Conifer	65
Evergreen Forest	Deciduous	4
Evergreen Forest	Mixed Forest	29
Evergreen Forest	Water	1
Mixed Forest	Conifer	7
Mixed Forest	Deciduous	2
Mixed Forest	Mixed Forest	34
Open Water	Conifer	6
Open Water	Deciduous	1
Open Water	Mixed Forest	1
Open Water	Water	90
Shrub/Scrub	Mixed Forest	2
Woody Wetlands	Conifer	20
Woody Wetlands	Deciduous	2

(279 correct points/400 total points) * 100= percent overall classification accuracy

Extract_RandomP1_Frequency ✕

Land_Cover	Truth	FREQUENCY
Barren Land	Water	7
Deciduous Forest	Conifer	2
Deciduous Forest	Deciduous	90
Deciduous Forest	Mixed Forest	34
Deciduous Forest	Water	1
Developed, Low Intensi	Deciduous	1
Emergent Herbaceous	Water	1
Evergreen Forest	Conifer	65
Evergreen Forest	Deciduous	4
Evergreen Forest	Mixed Forest	29
Evergreen Forest	Water	1
Mixed Forest	Conifer	7
Mixed Forest	Deciduous	2
Mixed Forest	Mixed Forest	34
Open Water	Conifer	6
Open Water	Deciduous	1
Open Water	Mixed Forest	1
Open Water	Water	90
Shrub/Scrub	Mixed Forest	2
Woody Wetlands	Conifer	20
Woody Wetlands	Deciduous	2

Selection Statisti

Field

FREQUENCY

Statistics:

Count: 4
Minimum: 34
Maximum: 90
Sum: 279
Mean: 69.75
Standard Deviation:

Results will vary depending on random points:

FREQUENCY	Truth	Predict
86	1	1
35	2	2
73	3	3
82	4	4

Statistics:

Count: 4
Minimum: 35
Maximum: 86
Sum: 276
Mean: 69
Standard Deviation:
Nulls: 0

ErrorMatrix

Name	Truth1	Truth2	Truth3	Truth4
1) Broadleaf Forest	86	43	0	3
2) Mixed Forest	8	35	7	0
3) Spruce	3	21	73	0
4) Water	0	1	4	82

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