



G · A · B · B · S

geospatial data analysis building blocks

Remote Sensing Analysis on HUBzero

HUBbub

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Larry Biehl

Purdue University Research Computing

Scientific Solutions

Abdur Rahman Maud, Wei-Kang Hsu, Tsung Tai Yeh

Outline

- Background
- Current status
- How to access
- Demo
- Outreach
- Plans



What is MultiSpec?

- Freeware processing system for interactively analyzing multispectral/hyperspectral geospatial image data such as those collected by satellite and aircraft sensors, biomedical images, ...
 - Landsat 8 (10 multispectral bands)
 - AVIRIS (>200 multispectral bands; called hyperspectral)
- MultiSpec on Macintosh and Windows desktops have been used for teaching, research and by K-12 programs (GLOBE)
- Version being developed for Linux using wxWidgets; leads us to...



Relationship of MultiSpec and GABBs

- Web enable version being developed as tool on mygeohub for GABBs project
- Used in remote sensing pattern recognition for image analysis training
- MultiSpec on mygeohub can be used in workflows for image preview and verification, creating pictures
- Pictures can be displayed in the geoviewers being developed by GABBs from integer and real data types of 8 to 64-bit data values



MultiSpec Tool Page

MultiSpec  Edit


By Larry Biehl¹, [Abdur Rahman Maud¹](#), [Wei-Kang Hsu¹](#), [Tsung Tai Yeh¹](#)

1. *Purdue University*

Image processing application to display and analyze geospatial images

Launch Tool

Version **1.0** - published on 10 Aug 2015

 This tool is closed source.

[View All Supporting Documents](#)

About

Usage

Versions

Reviews

Questions

Wishlist

Supporting Docs

Category

[Tools](#)

Published on

10 Aug 2015

Abstract

MultiSpec is an image processing tool to display and analyze geospatial images. It is currently a small subset of the Macintosh and Windows application with the same name. More information can be found at the [MultiSpec site](#).

Tutorials on using the Processor->Display Image menu item are at:

- [Tutorial 1](#). Basic display of images.
- [Tutorial 2](#). Image enhancement features.

A tutorial on using the Processor->Cluster menu item is at:

- [Tutorial 3](#). Unsupervised Classification.

Other tutorials high lighting features in MultiSpec are:

- [Tutorial 5](#). Combining Separate Image Files into a Single Multispectral Image File

<https://mygeohub.org/tools/multispec>

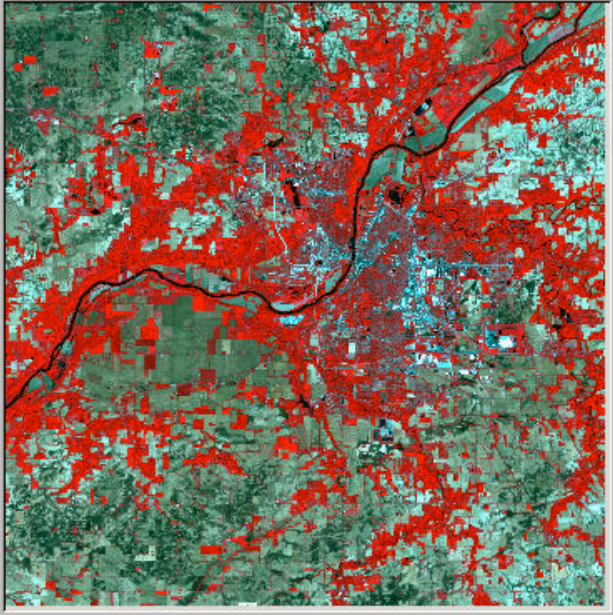


Example Image Windows

MultiSpec

File Edit View Project Processor Options Window Help

LC8_20130524_Lafayette_Area.tif... Lat-Long (Decimal) L C Scale 1:340,498



Text Output

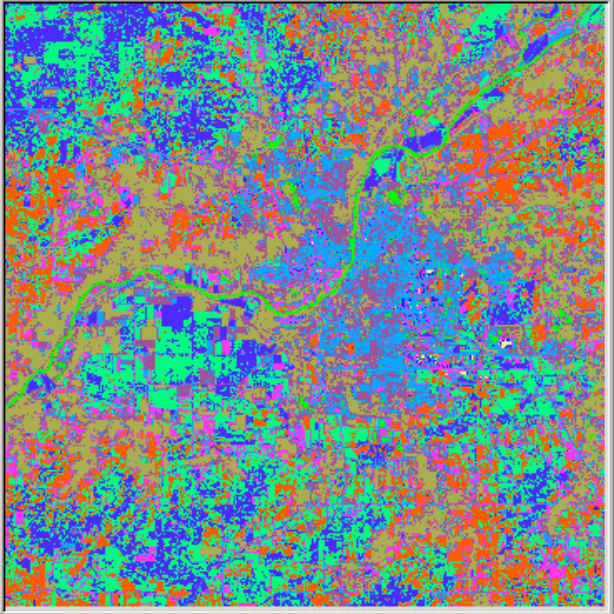
3	449.3	305.3
4	235.4	305.0
5	844.0	967.6
6	216.8	289.8
7	715.6	828.5
8	556.3	643.8
9	148.4	189.3
10	323.0	393.0

LC8_20130524_Lafayette_Area_clMask.tif Lat-Long (Decimal) L C Scale 1:340,498

Classes

- Cluster 1
- Cluster 2
- Cluster 3
- Cluster 4
- Cluster 5
- Cluster 6
- Cluster 7
- Cluster 8
- Cluster 9
- Cluster 10

ArcView .clr file



0524_Lafayette_ 15 14:50:12 (M 2

MultiSpec Text Output LC8_20130524_Lafayette_Are... LC8_20130524_Lafayette_Are...



Features Currently Available

- Read many formats (tiff, geotiff, hdf4, hdf5, netcdf, img, lan, arcview, envi, png, jpeg, ...) [use gdal library]
- Display multispectral & thematic Images
- Create histogram information
- List selected data (to csv file)
- Reformat (change image file format, mosaic, rectify, convert shape file to thematic image)
- Unsupervised classification (clustering)
- Principal component analysis (to linearly uncorrelated bands)
- List image description
- Edit image map parameters (image projection)
- Save image window as a 'picture' (tiff RGB image)



Video Of Using MultiSpec tool

https://mygeohub.org/resources/multispec/supportingdocs/20150911_MultiSpec_9.5min.mp4



Outreach

- MultiSpec Tool used for GLOBE teacher training workshop in July
 - Introduced 8 HS teachers to remote sensing and how tool could be used in classroom for HS students
- A couple in AmericaView plan to use this fall and spring semester
- Ideas being developed for use in Indiana Bicentennial in 2016 (with GENI)
 - Landsat county data



Items to be Aware Of

- Need to set up accounts ahead of time
- Speed of network link defines size of images reasonable to work with
 - Up to 1500 by 1500 lines and columns works well on most links.

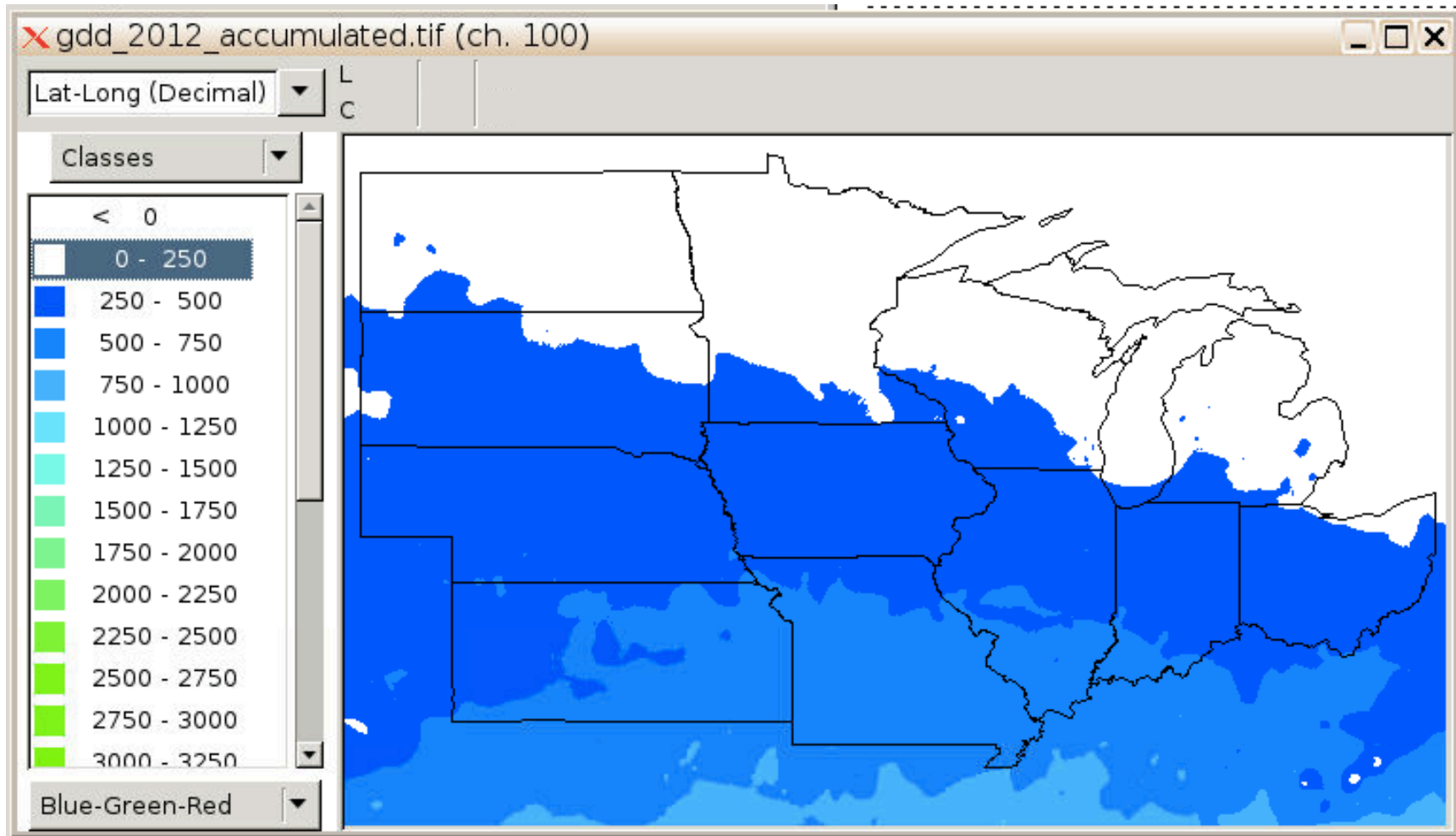


Plans for Future

- Add linkage with iData to allow user to access image files in that data base
- Add additional analysis capabilities including supervised classification processes.
 - Classify (Quadratic Likelihood, Fisher Linear Discriminant, Minimum Distance, ECHO, Correlation, Matched Filter, Parallel Piped); in next update
 - Feature Selection
 - Feature Extraction
 - Statistics Enhancement
 - Ability to select training/test areas for supervised classification analyses
 - Draw graph of selected pixels in the image (response vs channel [or wavelength]); in next update



Questions



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