



BLUEWATER
SATELLITE, INC

Blue Water Satellite, Inc.

“Harnessing the power of Satellite Imaging
to Protect the World’s Water Resources”

HQ Bowling Green, OH

2/24/10

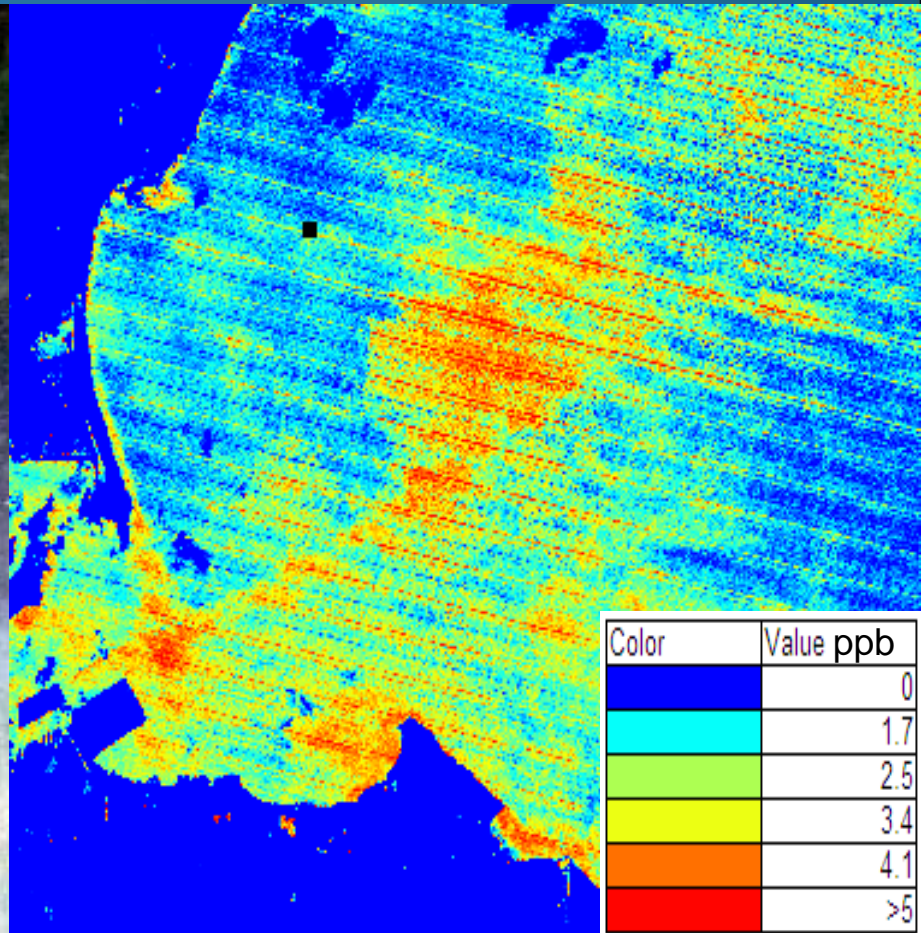
Overview

- Blue Water Satellite, Inc. uses images from the government's Landsat satellites (5&7) and patented algorithm to detect water pollution constituents to parts per billion levels.
 - US Patent 7,132,254 Nov 2006; 4 applied for.
 - Dr. R. Vincent CTO expert remote sensing 44 years experience.
 - Correlations established through 2 years of monitoring Great Lakes for NASA and NOAA.
- Today monitoring lakes and rivers in FL, AZ, MI, IA, OH, IN, AL, NC, OR, Europe, Canada, China, Singapore Australia. (WW capability)

Cyanobacteria Western Lake Erie, OH



Landsat Natural Color Image



Landsat processed Image

Applications

- Cyanobacteria

- Produces significant toxins (rash to death) linked to Alzheimer's, Lou Gehrig's, & Parkinson's diseases
- Made worse by global warming
- Testing mandated in Australia now, EU 2010, US EPA candidate

- Phosphorus

- Detect on land to pinpoint run off into water, manure; detect in water

- E-Coli

- Regulated by most states

- Chlorophyll-A & Total Vegetation Coverage

- TMDL compliance and early warning invasive species

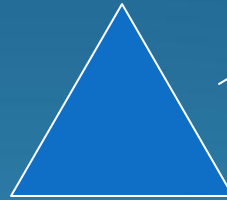
- Many other future applications possible

- Ex: Red Tide, Farming (only add phosphorus where needed)

Science



Light



Prism



1.7

1.3

.9

Band 1

Band 2

Band 7

Ratios of reflected light intensity is “fingerprint” for the constituent

Our Business

- Blue Water Satellite sells a monthly monitoring service
- Results posted on a secure website
- Measurement every 16 days (every 8 days additional cost). (Every other day with new satellite)
- Measurement in the parts per billion range (ppb).
- 30 m X 30 m pixel resolution, 5 samples/acre. (New satellite 2 m X 2 m resolution 1,000 samples/acre, 50 cm B/W)
- Vegetation to a depth of 4 feet.
- Output is concentration, GPS coordinates, GIS files.

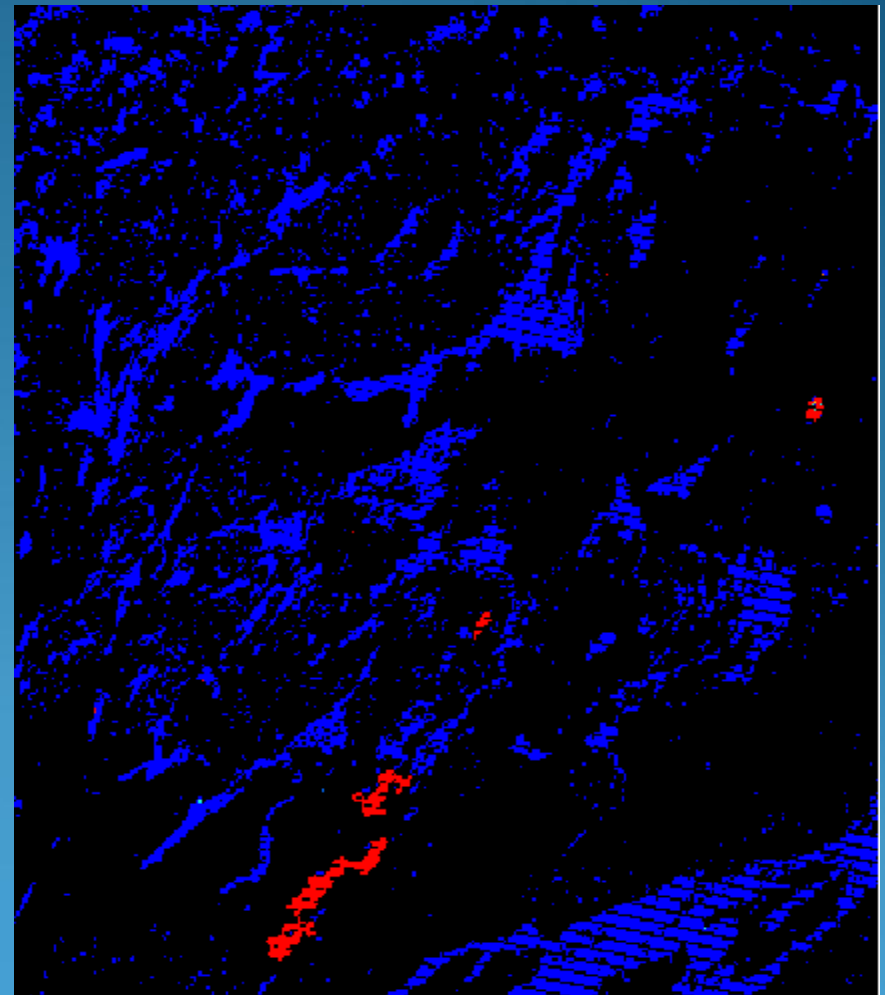
Advantages of Satellite Monitoring

- Cuts Sampling and TMDL compliance costs
 - Measure lake averages to lower TMDL compliance cost
 - Blue Water Satellite much lower cost than sampling from a boat (\$300/sample vs \$.40/sample)
 - Wide area ground sampling is not practical
- Cuts treatment costs
 - Early warning & know where to treat
- Aids in advisories for health and safety
- Look backward in time up to 27 yrs

730,000 acre watershed Natural Color Image (Left) and showing lakes containing high levels of Cyanobacteria (Right)



Landsat Natural Color Image



Landsat processed Image

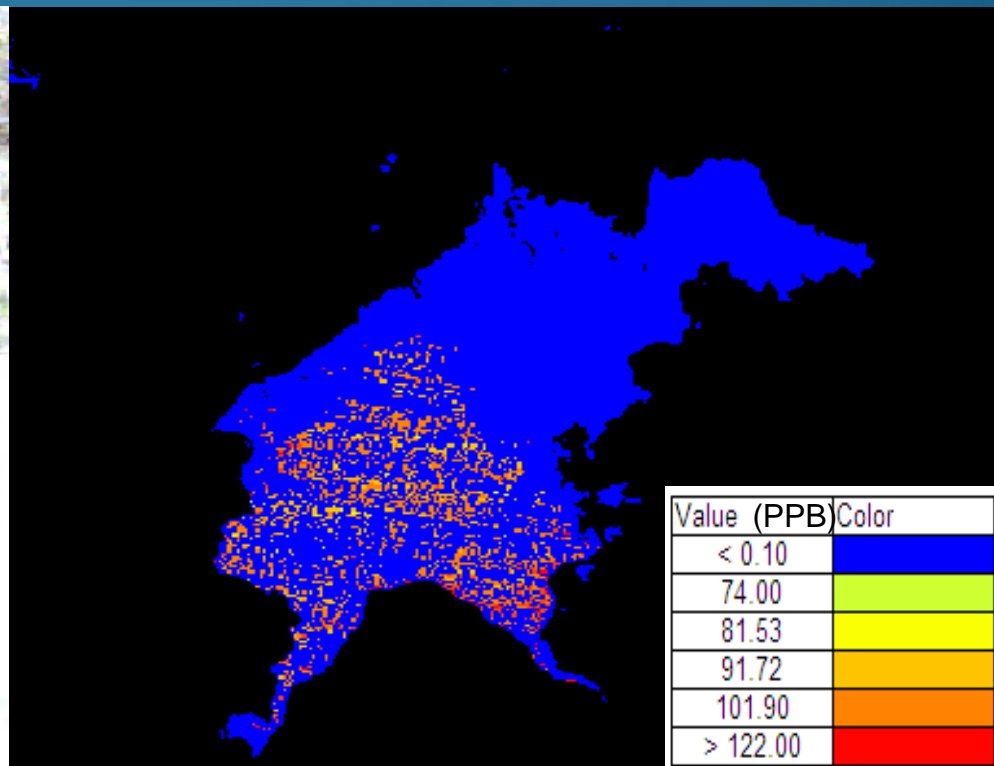
Examples of our Work

- Cyanobacteria
- Total Phosphorus Land
- Total Phosphorus Water
- Total Vegetation Coverage
- E Coli

Crane Prairie Reservoir Oregon 5/30/2009

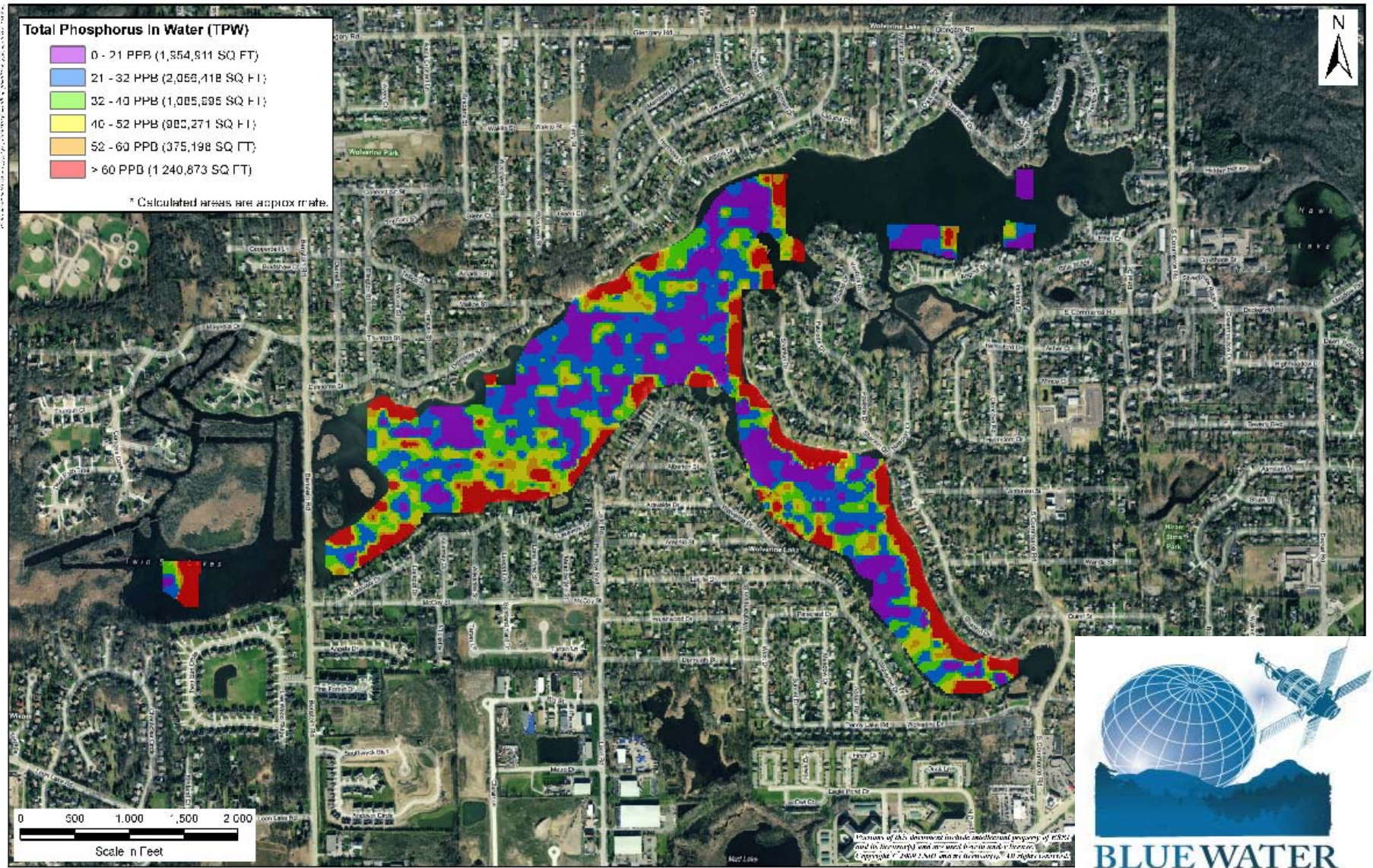


Landsat Natural Color Image



Landsat processed Image

Total Phosphorus Natural Color View

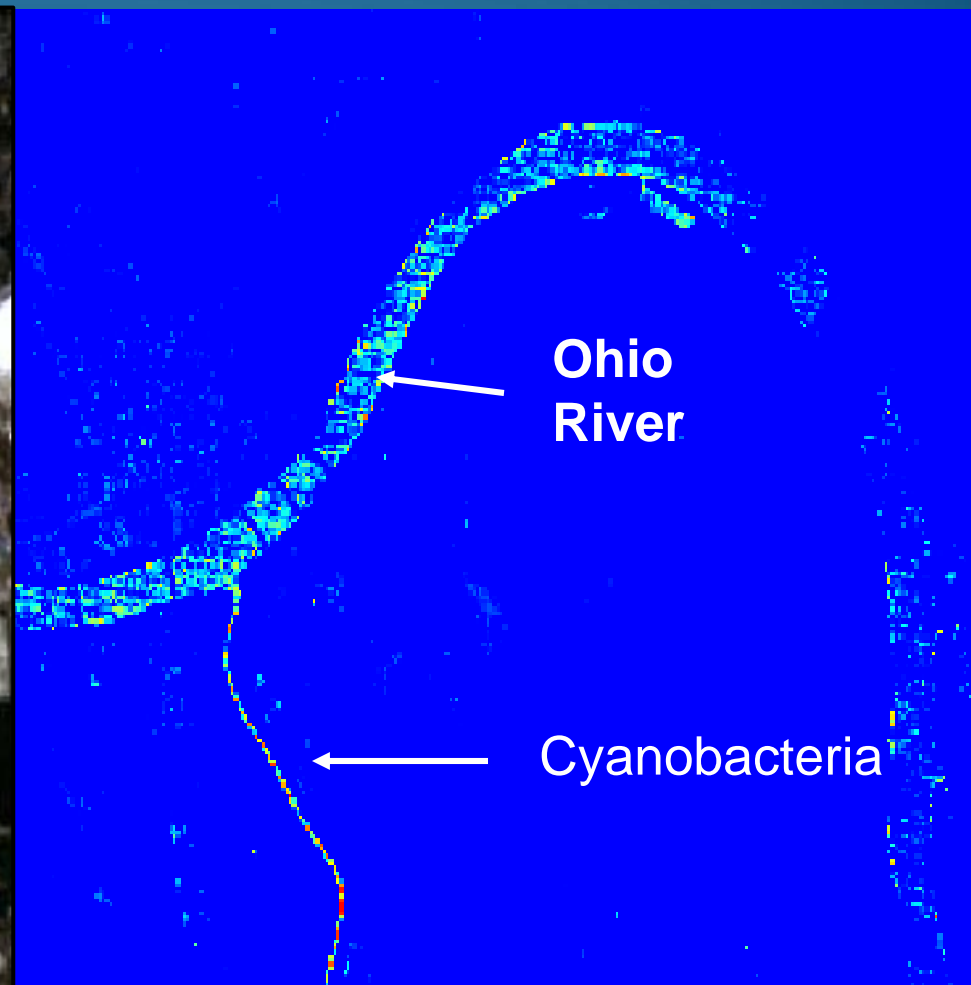


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Ohio River Cincinnati, OH 8/21/08



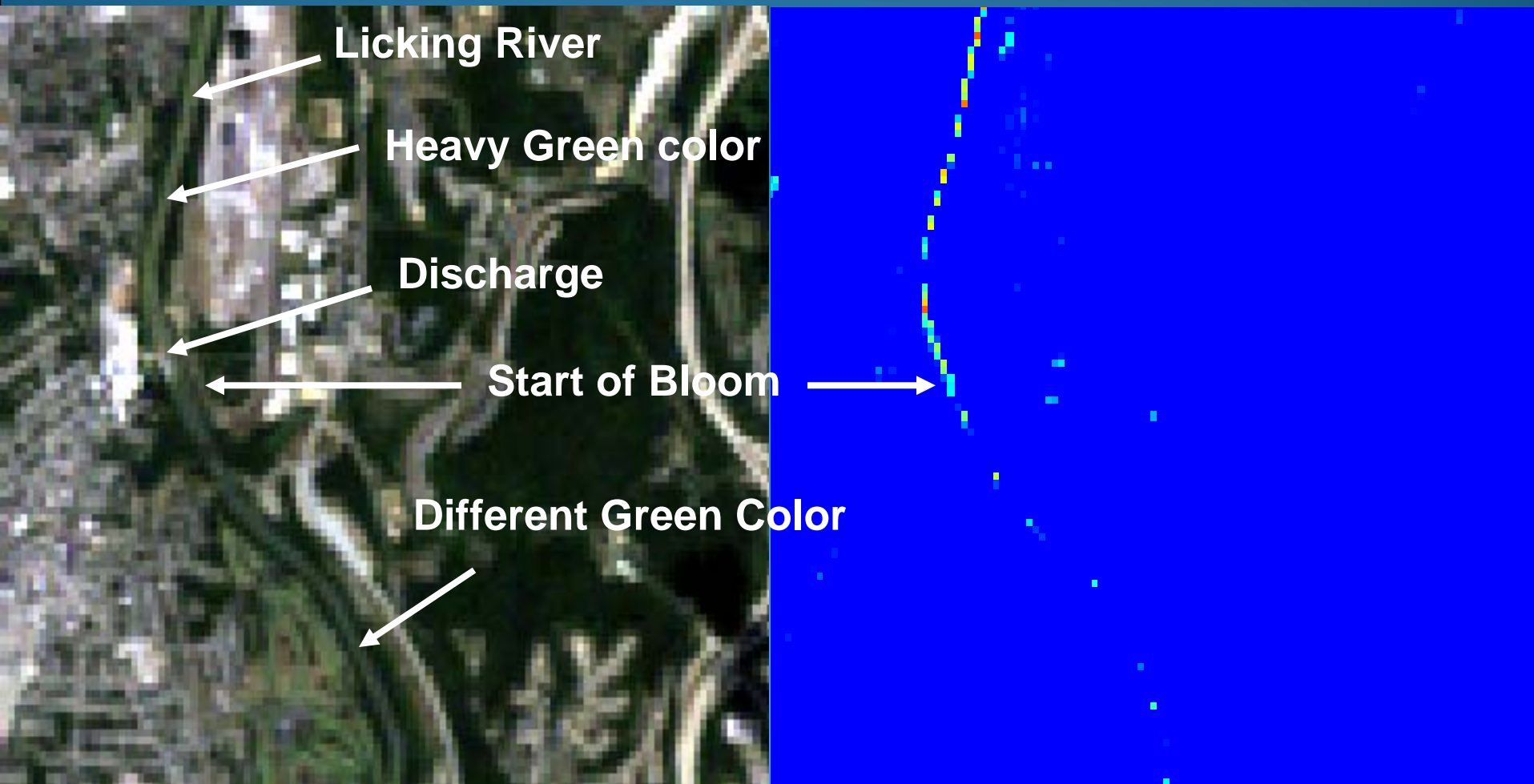
Landsat Natural Color Image



Landsat processed Image

Licking River Cincinnati, OH

Trace of the Licking River

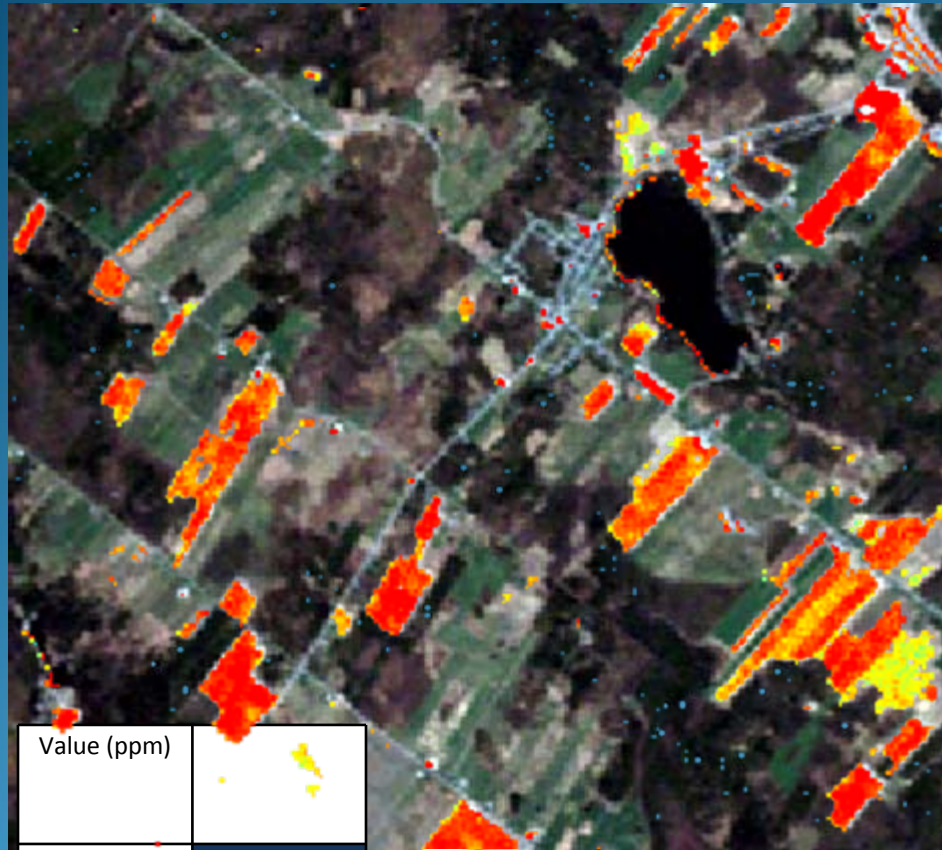


Landsat Natural Color Image

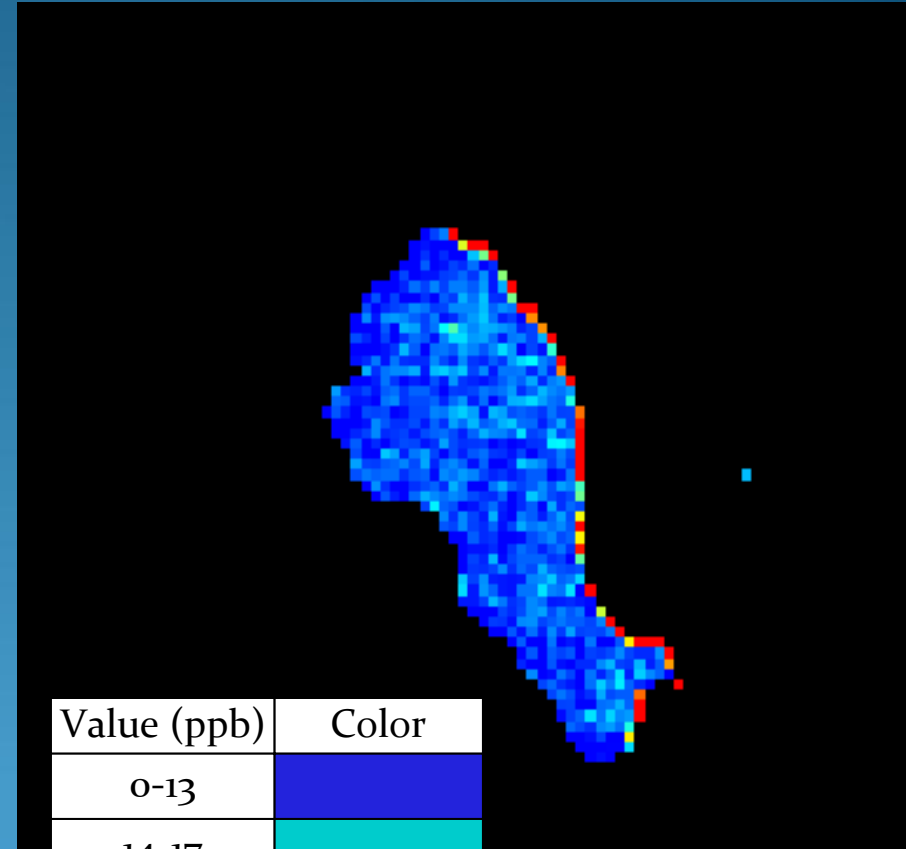
Landsat Processed image

5/11/09 LANDSAT 5 Image Petit Lac St. François, Quebec Canada

Total Soil Phosphorus (left) and Lake Phosphorus (right)

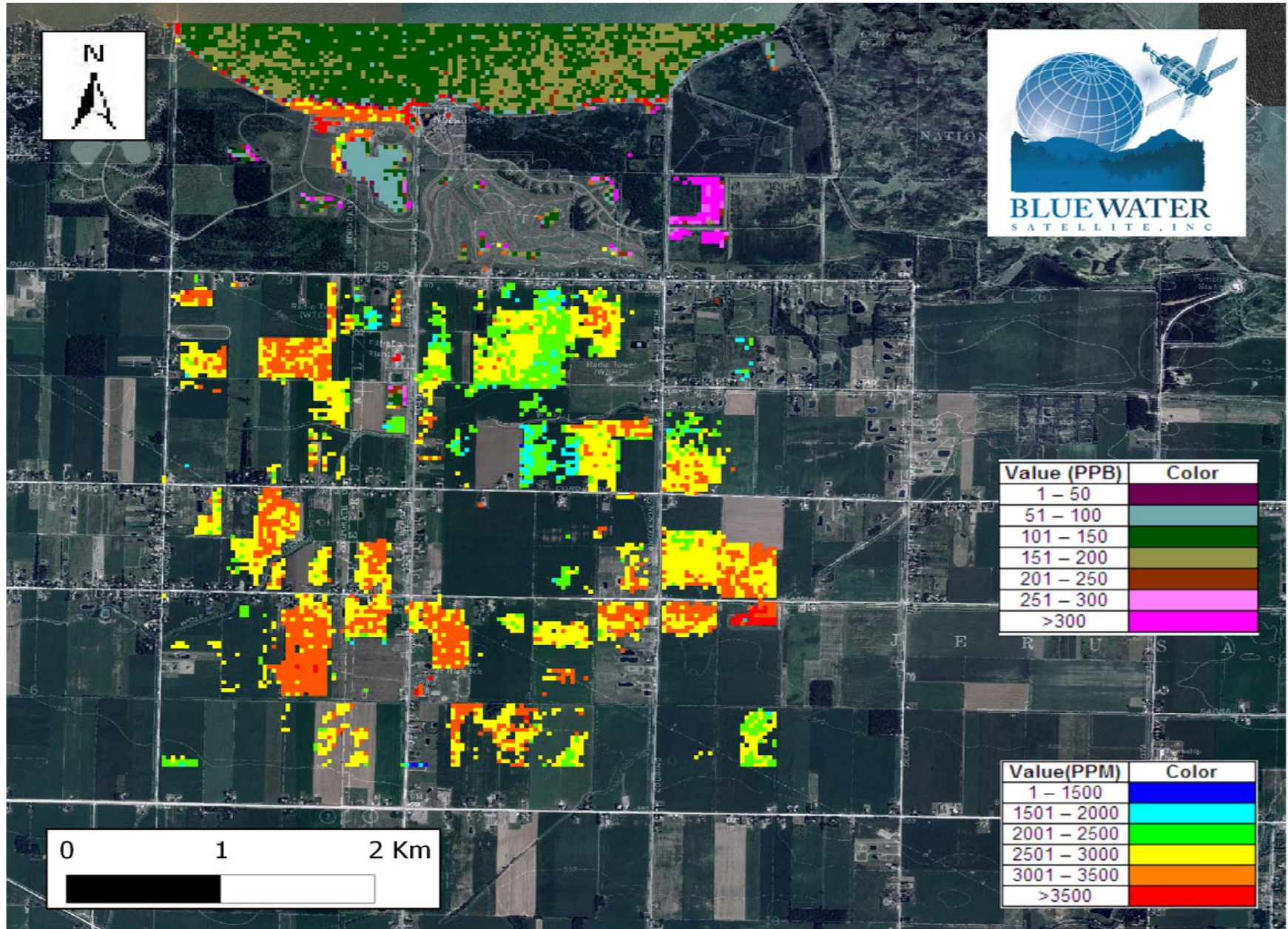


Value (ppm)	Color
0	Blue
1900	Green
2400	Yellow
2700	Orange
3800	Red

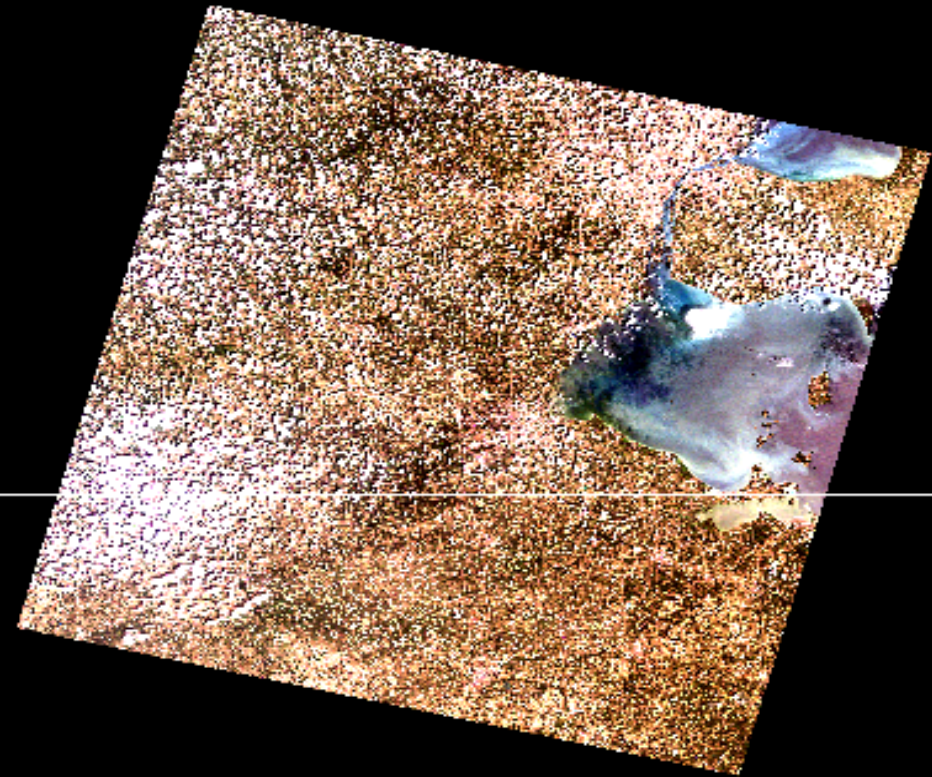


Value (ppb)	Color
0-13	Blue
14-17	Cyan
18-21	Green
22-26	Yellow
27-49	Orange
>50	Red

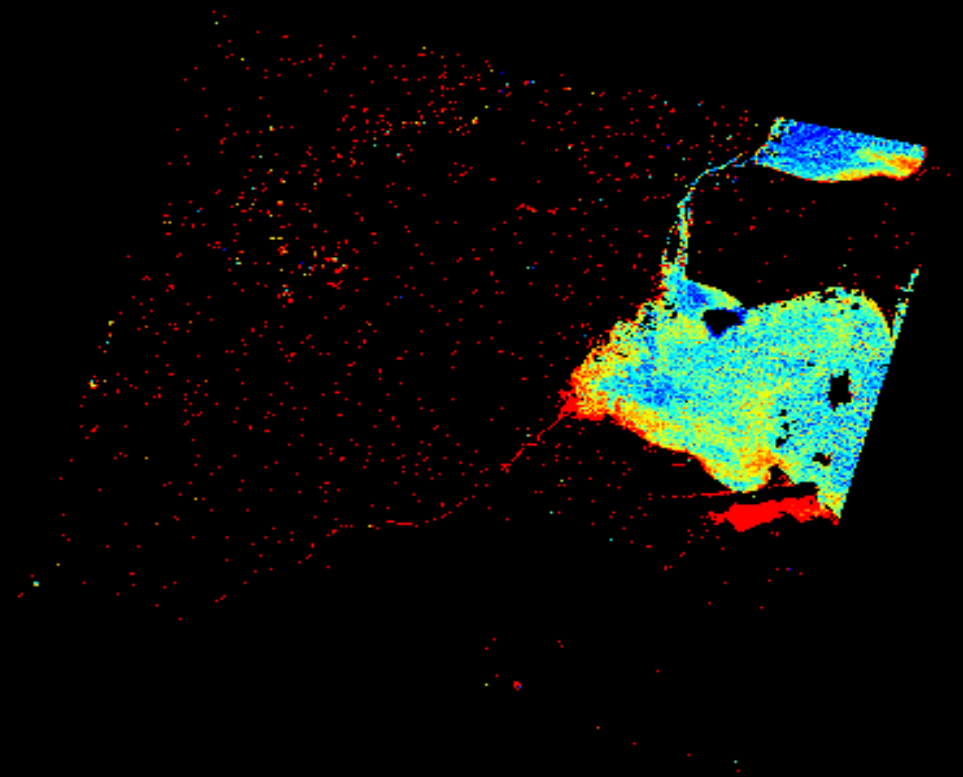
Total Phosphorous Natural View



Total Watershed Analysis (TPW&TPL) Lake Erie, OH

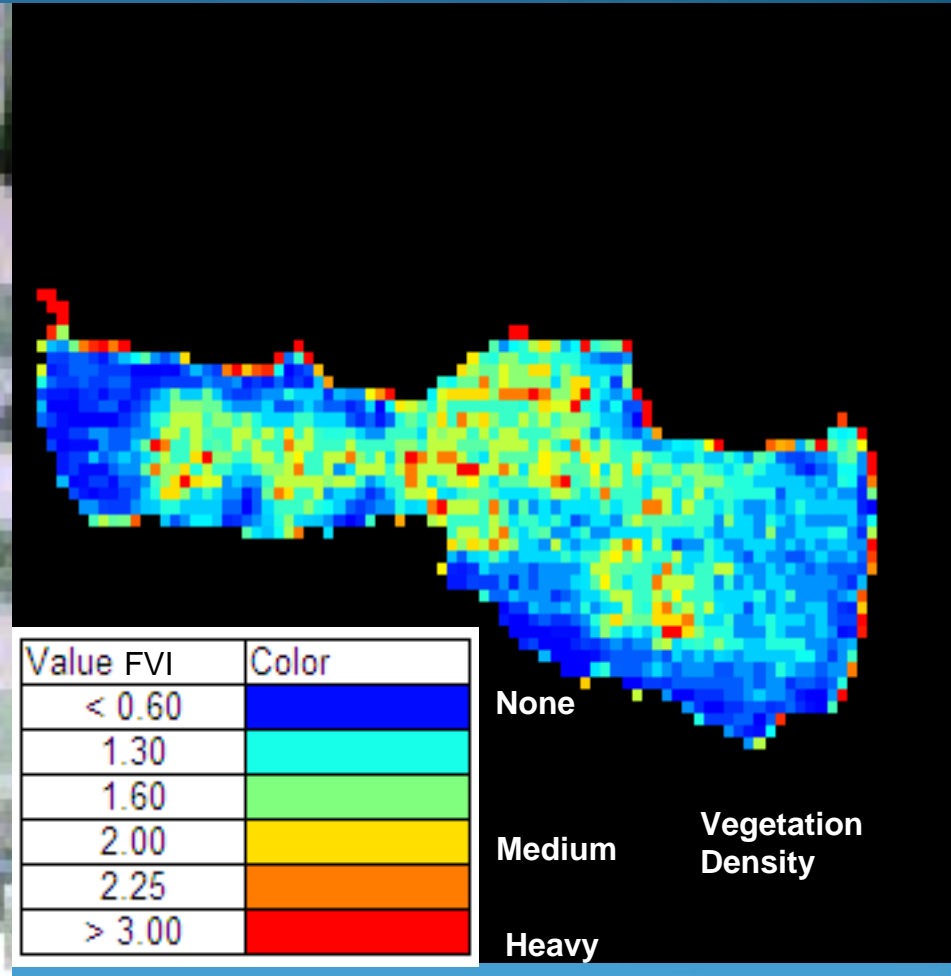


Landsat Satellite Natural Color



Landsat Satellite Processed

Vegetation Density Pleasant Lake, IN



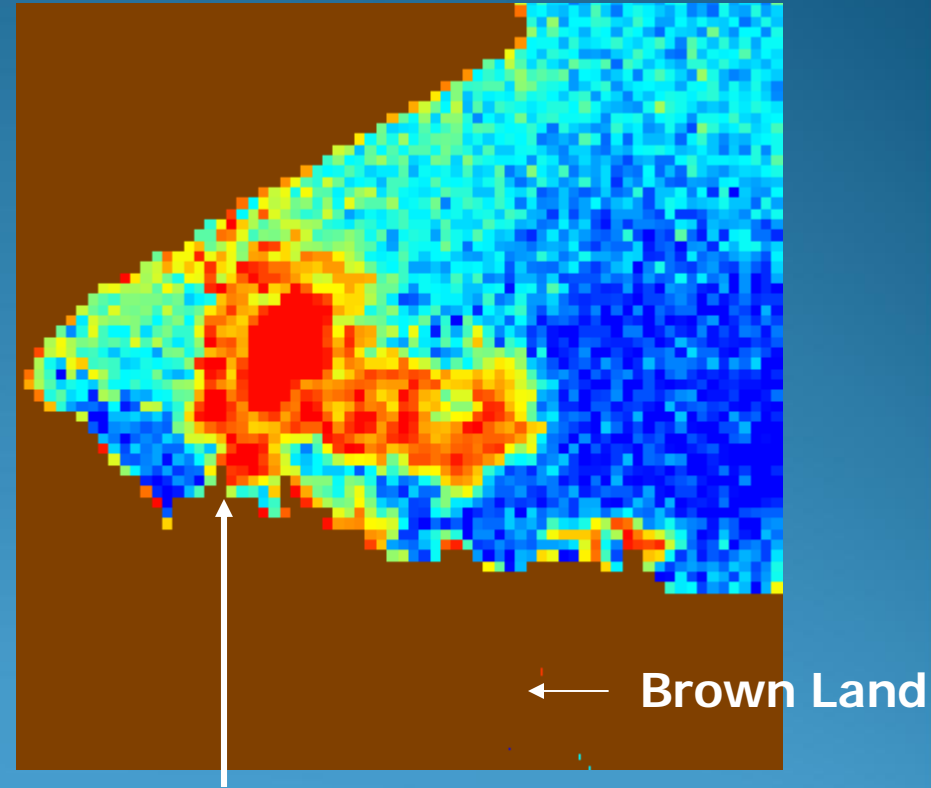
Landsat Natural Color Image

Landsat processed Image

LANDSAT 7 Overpass, 21 Aug 01; (Left) Natural Color Image, (Right) E. Coli Image, with Blue-Red Over Water = 194-384 colonies/ml,

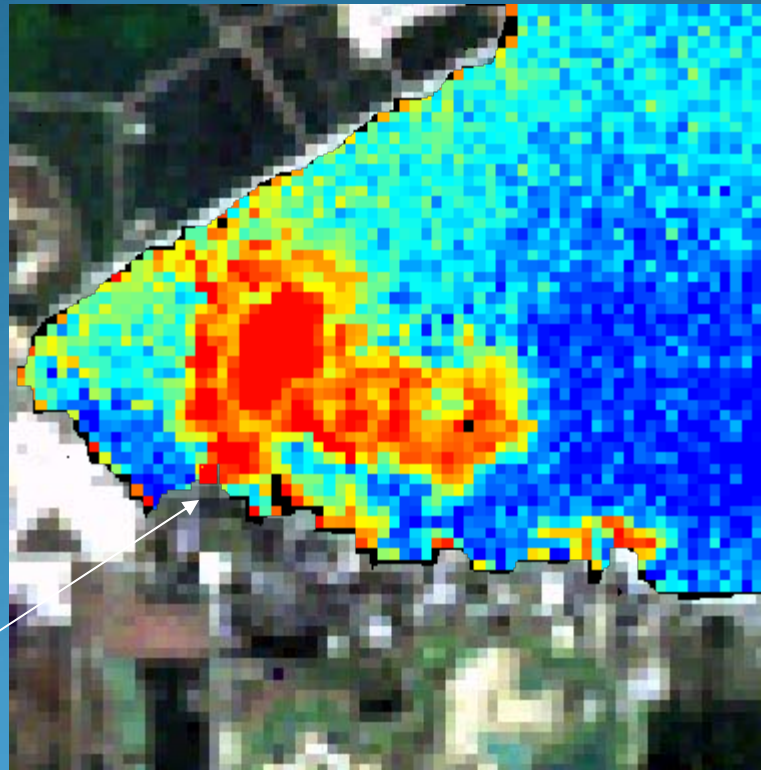


Waste water treatment plant discharge point



E. Coli shown in water, Blue 194 c/ml, Red 384 c/ml

LANDSAT 7 Overpass, 21 Aug 01; Natural Color Image,
with E. Coli Image Overlay
Blue-Red Over Water = 194-384 colonies/ml, Resp.



E. Coli image overlay with natural color image showing
E. Coli from waste water treatment plant outfall.

Discussion

- How can Blue Water Satellite collaborate with you to deploy satellite based remote sensing technology that will benefit both partners?