Sisseton Wahpeton College Student Internship –Learning About Water Quality Assessment, Geospatial Technologies, Landuse Classification and Statistical Analysis

Brendon Barker, Destinee Eastman, & Steven Farmer, Jr.

Sisseton Wahpeton College *Agency Village, SD*

Nature Precedings : doi:10.1038/npre.2010.5340.1 : Posted 29 Nov 2010

Introduction

Sisseton Wahpeton College was granted internships through SDSU by NASA in order to work and assist with a water quality and research program. Many methods were used in order to gather the current data; methods including, Secchi disk, water quality sampling, land use, statistical data, remote sensing, and geographical information. These methods were tied together in order to present what you see today.

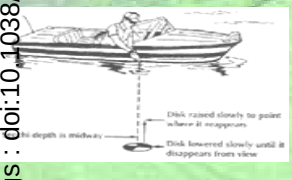
Hopefully, future grants can bring new technology to the Lake Traverse reservation for studies like this to insure better water quality and preserve for future generations. LILA WASTE, VERY GOOD.

Building Secchi Disks

Macro Invertebrate Sampling

Secchi Disk

The Secchi disk is used to measure the clarity of a body of water and is then recorded and compared with other lake Secchi disk measurements (Destinee).



WATER SAMPLING WITH THE VAN DORN BOTTLE:

Van Dorn bottles are made to take a water sample at any given depth. They can take samples at horizontal or vertical position, In the Pickerel and Clear Lake water assessment horizontal method was used on the Surface and Bottom for collection (Steve).

Taking lake samples and measurements are vital when trying to understand a current standing of a lake. Some lakes are better then others, therefore, comparing and contrasting is important to understanding its nutrient value (Destinee).

Dissolved oxygen is a common measurement in water and waste water, lakes and pounds, rivers and other water systems. It is a indicator of the health of the water (Steve).

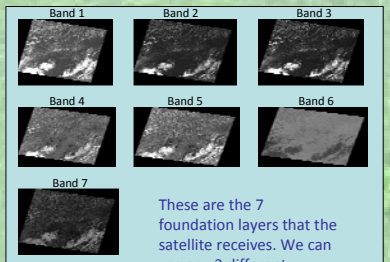
LAND USE, GPS AND REMOTE SENSING

The quality of lakes reflect the condition of the watershed. Collecting both water quality data and land use data helps identify the source of degradation.

Future generations need our concern today to help the environment be available for the recreation, self sustained ecosystems (Steve).

Filtering water samples

Brendon Learning to Use ERDAS and ArcGIS



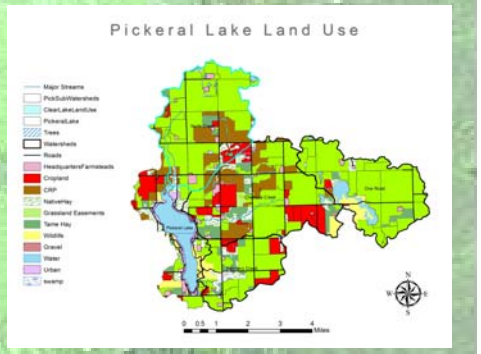
These are the 7 foundation layers that the satellite receives. We can use any 3 different combination at one time to see the different array of colors (pixels) as the satellite receives it (Brendon).

GPS

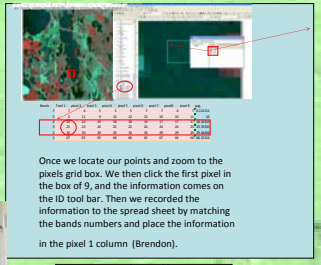
Garmin GPSMap 60 CSx GPS units were used for marking waypoints. They are capable of storing up to 500 waypoints and up to 20 user-programmable routes. The track log can store up to 10,000 saved points or 10 saved tracks (Steve).

REMOTE SENSING

The landuse within a watershed directly influences the quality of water within the watershed. For this reason, a landuse map of the Pickerel Lake watershed was constructed to better understand the water quality data acquired for Pickerel Lake. The landuse map was constructed using aerial photo interpretation, Farm Service Agency cropland information, satellite imagery, and ground observations. A geographic information system (GIS) was used to integrate the various types of information and create the landuse map pictured below.

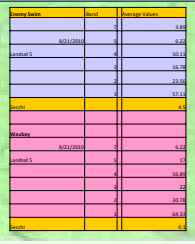


Classroom discussions, understandings, and uses of environmental technologies



Once we locate our points and zoom to the pixels grid box. We then click the first pixel in the box of 9, and the information comes on the ID tool bar. Then we recorded the information to the spread sheet by matching the bands numbers and place the information in the pixel 1 column (Brendon).

Understanding the information and data that was gathered from the lakes is important when putting this information into charts and graphs. These charts and graphs help us compare data with past year information about the lake and land quality (Destinee).



Funding Provided By:

South Dakota Space Grant Consortium Project Initiation Grant

Additional Support Provided By:

SouthDakotaView

Sisseton Wahpeton Tribal College

SDSU Water Resources Institute

Day County Conservation District