SUBMERGED AQUATIC VEGETATION HABITAT PRODUCT DEVELOPMENT: AN INTERDISCIPLINARY GIS EXPERIENCE

Elizabeth Brinker, Patrina Bly, Chelsea Vick, Michael Jefferson, Dr. Benjamin Branch and Dr. Jinchun Yuan

Departments of Mathematics and Computer Science and Biology
Elizabeth City State University, Elizabeth City, North Carolina 27909

1. INTRODUCTION

Geographic Information Systems (GIS), a tool of spatial thinking, is a powerful modality in education that may be optimized in interdisciplinary experiences. Furthermore, efforts by United States Department of Labor, 1991, Hill, 1995, Jacobs, 1989, Furner and Ramirez, 1999 and Sarnoff, 2000 (as cited in [1] Kerski's 2000) indicated, "Interdisciplinary education, rather than teaching each subject in isolation from the others, may be a more effective means to help students solve problems (Jacobs 1989). Implementing GIS into the curriculum may encourage students to examine data from a variety of fields" (Furner and Ramirez 1999; Sarnoff 2000). "Thus, the notion of a student being able to know where to go to get information on a problem, prepare it for analysis, render a conclusion and invite discussion among peers or community might be a vital global citizen skill" [2].

GIS facilitates federal and state natural resource agencies, academia and local communities to work together to protect fisheries and wildlife habitats. For example, an Elizabeth City State University (ECSU) GIS project, in collaboration with NOAA and the US Fish and Wildlife Service (USFWS), engages students and faculty from various disciplines in an environmental study to assess the distribution and abundance of submerged aquatic vegetation (SAV) in North Carolina's estuaries. Healthy SAV means habitat and food for economically important waterfowl and fisheries [3]. Submerged aquatic plants oxygenate the water column, absorb nutrients and reduce turbidity which means good water quality [4]. By delineating SAV coverage in the sounds and coastal bays and developing a GIS database easily accessible to the local communities and natural resources agencies, best management practices can be applied and critical estuarine habitats protected. During this process, the formal practice of GIS across disciplines benefits math, computer science and marine biology students in their undergraduate research development and provides a reality check of how important these natural resources are for productive ecosystems [5].

2. METHODS

Utilizing ArcGIS and on-screen digitizing, students develop skills and get hands-on experiences delineating SAV beds to assess vegetative cover. Data that was remotely sensed via aerial photography supports effective interdisciplinary pedagogy with multiple perspectives engaging in data procurement and analysis to ensure that an environmental study may reach a professional conclusion. Aerial photography of North Carolina's coastal waterbodies was taken at 12,000 feet AMT, scale 1:24,000. Using the NOAA guidelines and criteria for benthic habitat mapping using aerial photography for image acquisition and analysis, photo interpretation, development of polygon habitat data, and data validation methods, students delineate SAV beds and develop a GIS spatial database [6]. "The term GIS includes the use of global positioning satellites (GPS) technology, which can be considered a medium or tool that conducts and generates the data collection into GIS and such databases" [7].

3. CONCLUSION

In this time of funding cuts, creative interdisciplinary efforts across the college campus and collaborations with multiple funding partners are essential. Students use their skills, experiences and education to provide GIS maps and quantitative statistics of SAV habitat to local communities and resource agencies, seeing firsthand how applying remote sensing and GIS to environmental issues can connect minds. Future efforts to continue these collaborations include spatial analyses by the students to look at the change of habitat coverage over time, with specially attention to global climate and sea level rise.

4. REFERENCES

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