The National Society of Black Engineers (NSBE) 35th Annual National Convention, March 28th, 2009, Las Vegas, Nevada

Geographic Information Systems (GIS), Global Positioning Systems (GPS), and Remote Sensing Applications in Support of Analyzing Urban Accessibility Issues and Emergency Preparedness and Response

Instructors:
Dr. David A. Padgett, Associate Professor of Geography and Director of the Geographic Information Sciences Laboratory, Tennessee State University.
Dr. Talia McCray, Assistant Professor of Community & Regional Planning, University of Texas at Austin

NSBE Liaison:
Ms. Pamela Bingham—Bingham Consulting Services, Silver Spring, Maryland.

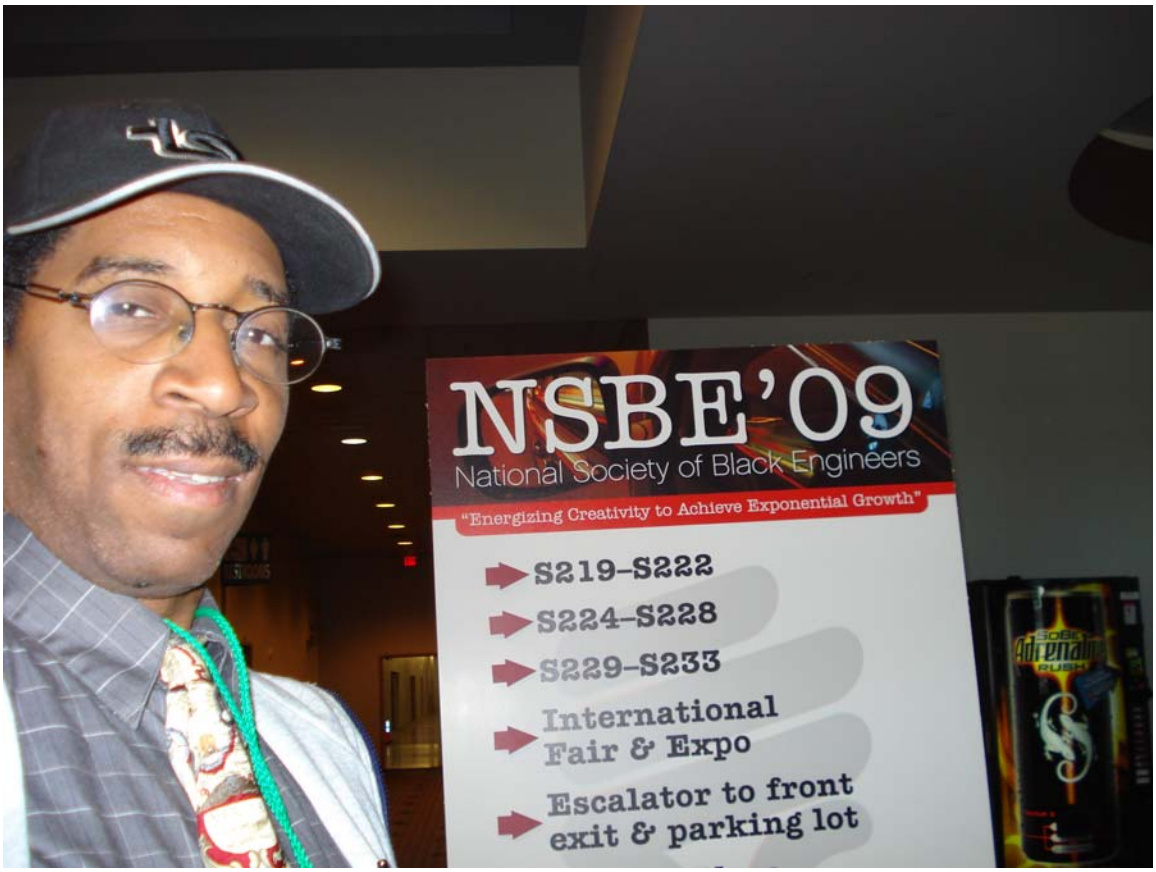

Figure 1. Workshop instructor David A. Padgett arrives at the 2009 NSBE convention.

Preliminary Networking with NSBE:
Ms. Pamela Bingham, former President of the NSBE Washington, DC Chapter, took the lead in negotiating for a slot on the conference program. During the planning phases we learned among other things that ESRI had not had a presence at any previous NSBE

conventions. Given the fact that the convention attendance is at about 10,000 each year, we saw this as an excellent opportunity to expose geospatial technology to a new, ethnically diverse audience. We were particularly interested in reaching out to college students and HBCU faculty.

Organization:
The **National Society of Black Engineers (NSBE)** is one of the largest student-managed organizations in the country. The convention attracts students, academicians, and technical professionals from the U.S. and two dozen other nations. The agenda includes professional workshops, a career/college fair, and technical exhibits. To learn more about NSBE, see http://national.nsbe.org/.

Support from Environmental Systems Research Institute (ESRI):
Ann Johnson, Ann Masangcay, and Joseph Kerski of ESRI's GIS for Higher Education Program provided generous support for our workshop. They supplied us with ArcGIS demonstration software, informational handouts, and complimentary copies of the ESRI Press book Confronting Catastrophe.

Workshop Objective:
The primary objective of the workshop was to expose NSBE attendees to geospatial technology. The focus upon emergency preparedness and response served as an holistic educational approach, bringing together the technical aspects of engineering with the social issues involved in mitigating the impacts of natural and anthropocentric hazards. In the aftermath of Hurricane Katrina and the recent severe damage done to Haiti and other Caribbean nations during the 2008 hurricane season, the topic is of great general interest and one that is of special relevance to NSBE attendees.
We hoped to convince workshop participants that adding experience in interdisciplinary applications of GIS to their skill sets will make them much more employable and may open up new career avenues.

Workshop Attendees:
About 20 people attended the workshop representing industry, government, and higher education sectors.

Workshop Agenda:
Dr. Talia McCray led off the workshop with a presentation demonstrating innovative methods to address activity patterns of disadvantaged populations (Figure 2). She shared her research addressing mobility constraints and accessibility challenges for low-income women and youth. She emphasized the great potential for GIS applications in transportation planning and engineering work.

Figure 2. Dr. Talia McCray presents her research involving GIS applications assessing transportation equity access in South Africa to the NSBE attendees.

Dr. David Padgett followed with a presentation on the importance of geospatial technology in emergency planning and response, especially in inner-city areas. He then shared opportunities for - training in GIS, obtaining GIS software, and developing GIS-based curriculum. He then gave a "crash course" in the basics of GPS. Next, the group moved outside for a GPS exercise simulating inner-city community-based efforts to site and locate emergency shelters (Figure 3). Each participant had a chance to work with a hand-held GPS receiver. Point locations of "potential emergency shelters" were logged and pertinent shelter attribute data were recorded on a worksheet (Figure 4). Points were later mapped using ArcGIS and overlain onto a high resolution DOQQ covering Las Vegas, Nevada (Figures 5 and 6).

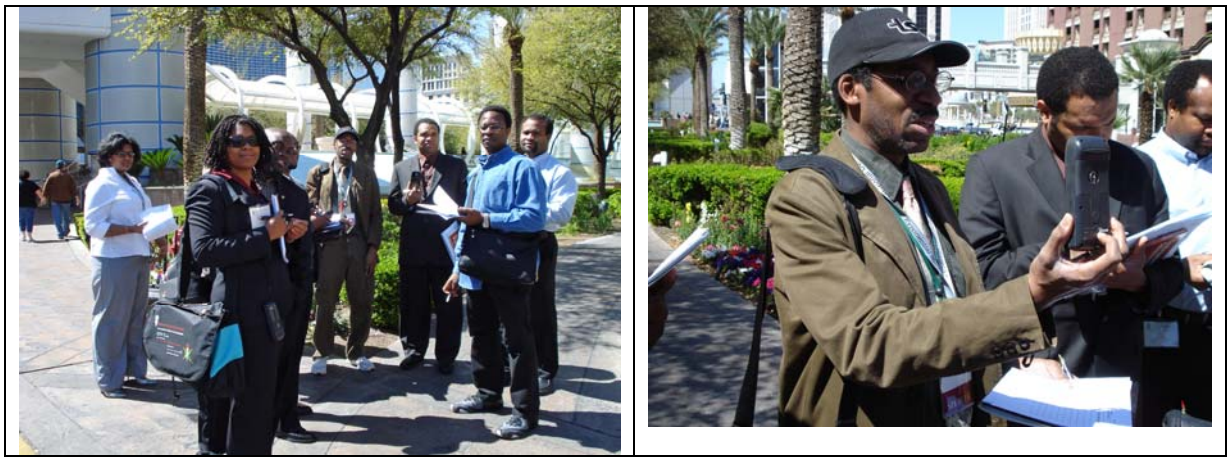

Figure 3. NSBE convention attendees participate in GIS/GPS emergency shelter mapping exercise led by Dr. David A. Padgett

Emergency Shelter GPS Mapping Data Work Sheet

Name of Person Collecting Data DWHITE Date 3/28/09
Neighborhood Covered BALLY HEIGHTS GPS Unit Serial Number 89310275
Datum NAD 83 GPS Unit Brand Name and Model GARMIN GPS 72

SHELTER NAME	ADDRESS	SQ FT	CAPACITY	SHOWERS	TOILETS	LATITUDE	LONGITUDE	TIME	SATS	PIC
BALLYS	CUB + FLAMINGO	50,000	200	12M 12F	12M 12F	36.11445	115.17130	1145	5	1

Notes:

27
83 SAT BASED DATA DATUM

Figure 4. Sample emergency shelter GPS mapping worksheet used by workshop participant to record attribute data and lat/lon coordinates during outdoor exercise.

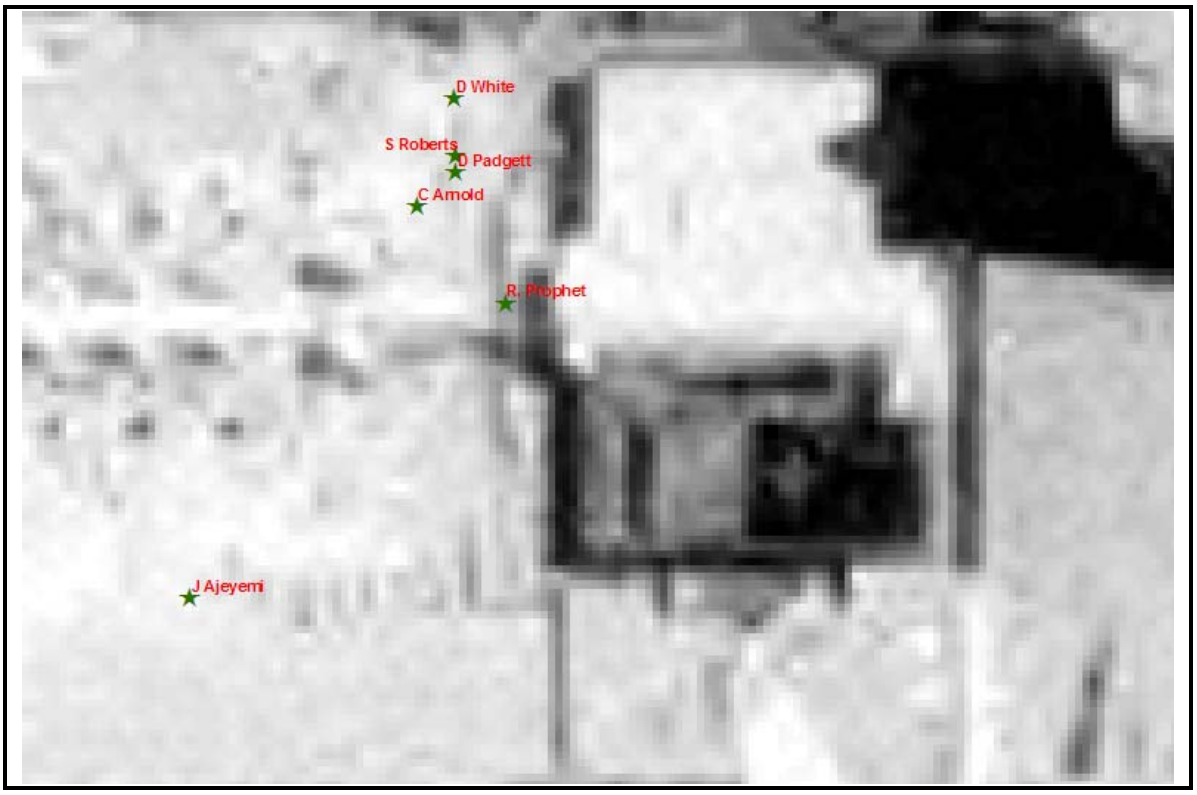

Figure 5. Positions of proposed emergency shelters plotted onto a Las Vegas SW Digital Ortho Quarter Quadrangle (DOQQ), MrSID format image. Mock shelter locations are labeled with the name of the workshop participant collecting the data. The image is dated 1994, thus point appear on the roof of the former hotel. The DOQQ data source - http://keck.library.unr.edu/

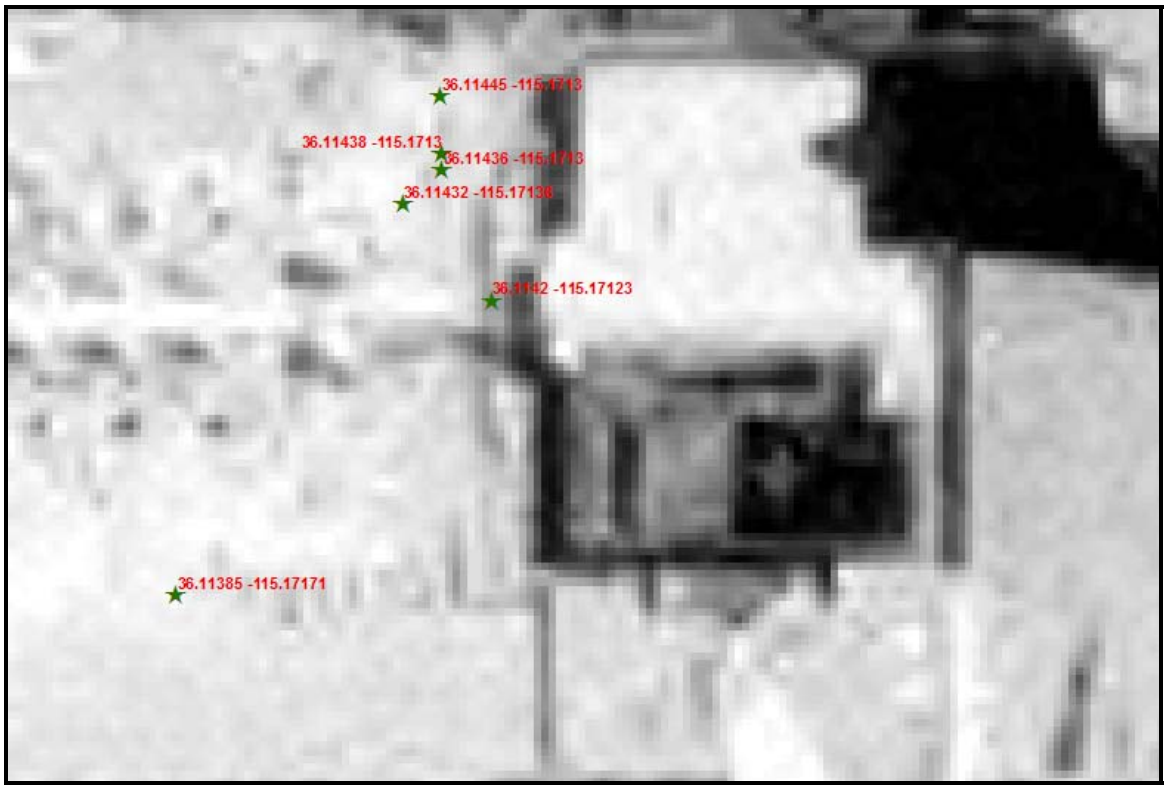

Figure 6. Positions of proposed emergency shelters labeled with latitude/longitude coordinates. Workshop participants were informed that the high buildings in the area coupled with relatively poor satellite geometry resulted in somewhat of a lack of accuracy.

Lessons Learned and Future Plans:
The NSBE convention is organized into four major tracks – high school students, undergraduate students, graduate students, and working professionals. Our target groups were the college students and professionals. However, for a variety of reasons beyond our control, we were unable to engage the students directly. We were somewhat successful in having informal conversations with students during the career fair. In future events we will be certain to situate the workshop within the students' conference tracks. We also will make a concerted effort to involve HBCU faculty.

We definitely will continue to work with NSBE on future opportunities to expose Black engineers to opportunities in geospatial technology. We may perhaps hold workshops at the organization's smaller regional meetings, and/or at individual HBCU campus chapters. We have definitely opened the door for a working relationship to be fostered between NSBE and ESRI. Ms. Bingham, the current organizer for the HBCU Faculty GIS Workshop series, will be the lead contact in this effort.

Feedback from workshop attendees was very positive; many of them expressed interest in future training opportunities. Several participants requested to be included on the HBCU GIS User Listserve maintained by Dr. Padgett.