

September 2013

## GEOSPATIAL NEWSLETTER

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**Welcome** to the eighth issue of the *Geospatial Newsletter*, reporting on all activities related to geospatial technology at BCC. In this issue we focus on geospatial projects, grant awards, and international collaborations, covering spring 2013 and summer 2013 activities. We extend a warm welcome to Dr. Claudia Schrader, who was recently appointed as BCC's Vice President of Academic Affairs and Provost.

### **1. BCC STUDENT PRESENTATIONS AT THE CUNY REMOTE SENSING AND EARTH SYSTEM (CREST) CONFERENCE.**

The CREST conference was held at Steinmann Hall, City College of New York on the 16<sup>th</sup> April, Spring 2013. The CREST Institute promotes education and training of students in geospatial technologies. CREST vision is to contribute to the development of world-class cadre of faculty, students and researchers that will gain knowledge and expertise in cutting-edge research in science; engineering and technology with special emphasis on satellites and remote sensing of the Earth.

CREST focuses on all aspects of remote sensing - sensor development, satellite remote sensing, ground-based field measurements, data processing and analysis, modeling, and forecasting. CREST recruits and train undergraduate, masters and doctoral students with a main focus on unrepresented minorities in National Oceanic and Atmospheric Administration (NOAA) related sciences and thus help increase the diversity in NOAA workforce. The program includes seminars, summer internships with NOAA, and with industrial partners, and school-year research assistantships. The overarching goal of CREST is to conduct research consistent with NOAA's interests of environmental assessment, prediction and environmental stewardship. This research creates a framework to recruit and train undergraduate and graduate students especially from underrepresented communities for professional opportunities.

BCC fielded a strong contingent of 7 students and a faculty at the event. They delivered poster presentations on various applications of geospatial technology to Science Engineering Technology and Math (STEM) disciplines. The BCC contingent was led by Prof. Therese Soosairaj a faculty from the Chemistry department. Student presenters at the event were Ms. Shakera Pringle, Mr. Mohammad Rahman, Ms Laura Risik, Ms. Elisa Bruno, Ms. Vielka Irizarry and Ms. Diamond Babbs. The students were excited with this opportunity and mad the most by interacting with scientists, researchers and academics form different

September 2013

CUNY institutions. They were exposed to new careers and opportunities in the emerging field of Geospatial Technology and its applications to the Science Technology Math and Sciences (STEM) streams.



**Training students to enter the workforce and succeed! - BCC Students at the CREST conference, City College, 2013**



**We are a happy bunch!  
BCC – Student  
presenters in front of the  
Grove School of  
Engineering, City  
College of New York– (  
from left to right) - Ms.  
Diamond Babbs, Ms  
Elisa Bruno, Ms. Laura  
Risik, Ms. Tanya  
Painter, Mr. Mohammad  
Rahman and Ms. Vielka  
Irrizary**

September 2013

## STUDENT PRESENTATIONS IN GEOSPATIAL APPLICATIONS AT THE BCC SCIENCE FAIR SPRING 2013.

The annual BCC Science fair was held in the Meister Hall Lobby on the 2 May, from 12:00–2:00pm. Over 12 students participated in Geospatial projects and showcased their presentations at the event. Faculty Mentors Profs Sunil Bhaskaran, Maryam Karimi and Therese Soosairaj worked with the students throughout the spring semester and ensured students conducted research and produced outcomes. A list of presentations and a brief description of projects by students is provided below:-

**Poster 1: Potential of airborne hyperspectral data (HyMap) for urban mapping. Student authors:** Mr. Jomar Estrella and Ms. Elisa Bruno

**Poster 2: Processing Synthetic Aperture Radar (SAR) for analysis and modeling. Student authors:** Mr. Mohammad Rahman

**Poster 3: Visualization of spatial relations between land cover and air pollution in New York City. Student authors:** Ms. Karolina Zapata and Ms. Aniqua Qayum

**Poster 4: Image enhancement of Polarimetric SAR data. Student authors:** Mr. Mohammad Rahman

**Poster 5: Mapping socio-economic indices from census data. Student authors:** Ms. Jezebel Arondo and Mr. Daniel Castellano

**Poster 6: Mapping Global Urbanization Trends. Student authors:** Ms. Diamond Babbs

**Poster 7: Optical and Textural data fusion of SAR and Landsat satellite data. Student authors:** Mr. Mohammad Rahman

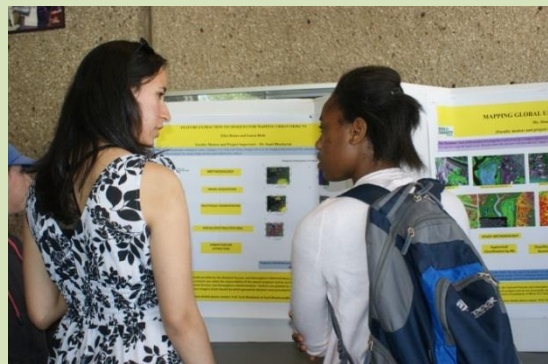
**Poster 8: Feature extraction techniques for mapping urban features. Student authors:** Ms. Elisa Bruno and Ms. Laura Risik

**Poster 10: Assessment and Evaluation of different classification methods. Student authors:** Mrs. Tanya Painter

**Poster 11: Assessment and Evaluation of IsoData and Mahalanobis Distance methods of classification methods. Student authors:** Ms. Munoz and Mr. Rabbi Ahmed

**Poster 12: Mapping pervious and impervious surfaces with Rapid Eye. Student authors:** Ms. Vielka Irizarry, Ms Laura Salazar and Mr. Johan-de-la-Cruz

**Poster 13: Geospatial Technology and applications to STEM. Student authors:** Ms. Tiara and Mr. Lovelle Stinette



**Diamond Babbs and Elisa Bruno at the fair**



September 2013



**BCC Science fair 2013 participants (from left to right – Mr. Mohammad Rahman, Ms. Carolina Zapata, Ms. Anika Quayum, Ms. Adriana Ramirez, Ms. Shakera Pringle, Ms. Samantha Robles, Ms. Diamond Babbs, Ms. Vielka Irizarry, Dr. Sunil Bhaskaran (faculty mentor), Mr. Dwayne Parker, Ms Tanya Painter, Ms. Laura Risik, Ms. Elisa Bruno, Ms. Catherine, Mr. Lovelle Stenette, Mr. Jomar Estrella and Mr. Rabbi Ahmed in the Meister Hall Lobby, Bronx Community College Campus. (Missing from the photo are Ms. Laura Salazar, and Mr. Johan-De-La-Cruz)**

## **2. COLLABORATION WITH THE NEW YORK CITY MAYOR’S OFFICE OF SUSTAINABILITY AND LONG TERM PLANNING**

Dr. Sunil Bhaskaran has been invited by the New York City Mayor’s Office of Sustainability and Long Term Planning along with other scientists from Columbia University, Princeton, CUNY to formulate City wide strategies for mitigating the Urban Heat Island Effects. The scientific committee has already several times since 2012 at the NYC Mayor’s Office and held discussions to design a collaborative strategy. Dr Bhaskaran provided detailed recommendations to the committee that includes a model to use multi-sensor geospatial satellite data and analysis methods for modeling the effects of heat island in urban environments.

September 2013

### **3. BCC SUCCESSFULLY HOSTS THE SUMMER TRANSPORT INSTITUTE FUNDED BY FEDERAL HIGHWAY ADMINISTRATION (FHWA) AND NEW YORK STATE DEPARTMENT OF TRANSPORTATION (NYSDOT)**

In an effort to address the need for a diverse workforce in the 21st Century and to create an awareness of the career choices and opportunities that exist in the transportation industry, the United States Department of Transportation (USDOT) and the Federal Highway Administration (FHWA) established various educational initiatives. One educational initiative of the National Summer Transportation Institute (NSTI) is championed through public and private partnerships, FHWA Division Offices (Division), State Transportation Agencies (STA), the private sector, community based organizations (CBOs) and colleges and universities. The purpose of the NSTI is to create awareness and stimulate interest in middle and high school participants, take maximum advantage of the career opportunities that exist in the transportation industry; attract a broad and diverse selection of bright minds, as well as acquaint and stimulate them with the various aspects of the transportation industry; and increase the number of participants who choose a career in the transportation industry. The USDOT FHWA, the funding and governing agency for the NSTI program, formally established the NSTI as a recognized educational initiative in 1998 when congress authorized funding for the STIs under Section 1208 of the Transportation Equity Act for the 21st Century (TEA-21). The FHWA's Office of Civil Rights (HCR) has primary responsibility for providing guidance, training, and support to participating colleges and universities (host sites), STAs, and Divisions involved in the administration of the NSTI program.

BCC was awarded grant by the FHWA and NYSDOT to host the summer transport institute. The BCC-Summer Transport Institute (BCC-STI) was a non-residential program and was offered from 12-19<sup>th</sup> July, 2013. The main goal of the program was to increase student interest in the transportation industry and expose them to exciting careers to meet a national workforce need. About 39 students, 1 counsellor, 2 faculty and one student administrative officer participated in the intensive week long institute. The students engaged in several activities that ranged from learning by presentations, hands-on computer based exercises and day long educational field trips all, of which were designed to stimulate their interest in the U.S transportation industry. Guest speakers including the Director of CUNY Transportation Institute and Federal Security officer from John F Kennedy Airport delivered interactive seminars that exposed the participants to key concepts in Transportation and careers in the Aviation Industry.

The BCC-STI concluded on the 19<sup>th</sup> July, 2013 and the closing ceremony was graced by Ms. Christine Thorkildsen (Program Manager at the Office of Civil Rights, FHWA) and Ms. Kara Parnett from FHWA. Both officials interacted with students and faculty and evaluated the site. Ms. Thorkildsen delivered a presentation on FHWA mission and objectives and presented a video message from FHWA Administrator, Mr. Victor Mendez, and new Secretary of Transportation, Mr. Anthony Foxx. Associate Dean for Student Success Neal Phillip delivered the closing remarks with a

September 2013

presentation on student projects at BCC. Mr. Michael Fondacaro (Manager – Department of Transportation, New York) supported the Director of BCC-STI Dr. Sunil Bhaskaran and provided valuable inputs which contributed to the events success. The event received support from President Dr. Carole M. Berotte Joseph, Senior Vice President of Administration and Finance Mary Coleman, Vice President of Institutional Advancement Dr. Eddy Bayardelle, Director of Collaborations Mr. Eugene Adams, Director of the Upward Bound Program Michelle A. Danvers as well as several other BCC colleagues and Staff who worked behind the scenes to help BCC stage the event successfully. The project team consisted of Dr. Sunil Bhaskaran and Prof. Neal Phillip (Directors), Ms Maryam Karimi and Dr. Sunil Bhaskaran (Instructional Faculty), Ms. Elisa Bruno, Jessica Colorado and Lina Quesada.



**Closing ceremony of the BCC-STI – Schwendler Auditorium. Participants with the Director of the BCC-STI – Dr. Sunil Bhaskaran. The Closing Ceremony was graced by special guests Ms. Christine Thorkildsen (Manager Office of Civil Rights) and Ms Kara Parnett**

**from the Federal Highway Administration.**

#### **4. COLLABORATIVE PROJECTS BETWEEN BCC AND CITY OF TOWNSVILLE, AUSTRALIA**

The President of BCC Dr. Carole M. Berotte Joseph approved a scientific visit to Townsville for research collaborations on sustainability with the city of Townsville, Australia. The visit to Townsville led by Associate Dean for student success Prof Neal Phillip was a follow up to the visit by the Mayor of Townsville Councilor. Jenny Hill and Mr. Greg Bruce to BCC in 2012. Dr. Aaron Socha and Sunil Bhaskaran accompanied were the other members on this trip (26<sup>th</sup> July – 4<sup>th</sup> August, 2013). The visit reemphasizes President Dr. Berotte Joseph's commitment and long term vision to transform BCC into a truly global and world class institution!



September 2013

**Overall Experience:** The visit to Townsville, Australia was an enriching experience. The most important learning from the visit was the different strategies used by project team members to design, develop and implement projects in sustainability. The critical role played by different types of communication, collective learning and community involvement in sustainability projects were highlighted. These approaches and strategies would be highly relevant and useful in the Bronx given the socio-economic and behavioral challenges that the target population presents. Another important outcome was the connections made and the genuine interest from the Australians in fostering collaborative projects which is truly in line with the vision of BCC's President Dr. Carole M. Berotte Joseph and Mayor Jenny Hill from the Townsville City Council. On the Geospatial research front there were many impromptu positive responses to our presentations which are listed below.

- Presentation Title:-*Applications of Geospatial Technology for Hazard Categorization and Disaster Management*. Presentation made to Mayor Jenny Hill, Greg Bruce (Townsville City Council). Presenter–Dr. Sunil Bhaskaran.
- Presentation Title:-*Hyperspectral remote sensing and thermal mapping for mapping urban materials*. Presentation made to Profs. Ian Atkinson and Jeremy Vanderwal (James Cook University) Presenter–Dr. Sunil Bhaskaran.
- Presentation Title:-*Automated methods of classification for Land cover and Land use*. Presentation made to Mr. Kenneth Melchert and Lief Hickey (Planning and Development Division, Townsville City Council). Presenter–Dr. Sunil Bhaskaran.

Presentations by the officials from the Queensland Emergency Services (Mr. Steve Barker, Mr. Gerard Byrne, Ron and others) described the use of a range of geospatial data for Disaster Management and design of early warning system for disaster preparedness. Discussions with Julie (Community engagement manager-Ergon Energy) revealed the use of remote sensors (Lidar) mounted on drones for mapping utility networks and loads in near-real time. There were also some expressions of interest to collaborate with BCC from the Industry. Red Hat Innovations is a company based in Brisbane that specializes in knowledge management and integration of human behavior in geospatial analysis. All the above presentations and discussions underlined the scope of collaborating in multidisciplinary geospatial projects at an institutional level. Due to the multidisciplinary nature of all projects there may be many opportunities for interdepartmental collaboration at BCC, particularly in disciplines such as environmental sciences, social sciences, physics and engineering, Biology, Environmental and Earth Sciences and Center for Sustainable Energy. Since all projects are driven by data the use of geospatial data in analysis and modeling is inevitable.

September 2013



Assoc. Dean for student success— Prof. Neal Phillip with Mayor of Townsville Cr. Jenny Hill and Drs. Sunil Bhaskaran and Aaron Socha at a banquet hosted by the Mayor.

## 5. GRANTS ACTIVITY – AWARDS

**Workforce Development Initiative (WDI) funds for BCC:** A proposal by Dr. Sunil Bhaskaran was nominated for funding by WDI award. The award will enable BCC to acquire 25 seats of lab license for state of the art image analysis software – Environmental for Visualizing Imagery – Interactive Data Language. Since the software is used both by the federal and private industry, BCC students will be able to get hands on training in an emerging national priority field of geospatial technology. The purpose of WDI funds is to increase the University's capacity to prepare students and members of the City's workforce for current job opportunities and for career growth; to foster the development of career pathways initiatives within CUNY; and to partner with employers or organizations in fields where there is need for new workers and/or incumbent worker training.

## 6. PUBLICATIONS IN PEER-REVIEWED JOURNALS

Karolyn Jimenez., Kaba Aboubakar., Eric Nez., Leroy Brown., and Sunil Bhaskaran, 2013, *Research Experiences in Geospatial Science and Technology Project at the Bronx Community College*. Current status - Perspectives of undergraduate Research and Mentoring (PURM) – Tentatively accepted

Dan Hagrman., Sanjiv Bhatia., Nancy Podger., Sunil Bhaskaran, 2013, *Programmatic verification of automatic cloud cover assessment using albedo*, submitted to the Journal of Selected Topics in Applied Earth Observations and Remote Sensing. (Current status – In review)

Sunil Bhaskaran., Swaroopa., Sanjiv Bhatia, 2013, *Mapping shadows in very high resolution satellite data using HSV and edge detection techniques*, submitted to the Journal of Applied Geomatics. Current Status – In review