**Geoscience and Remote Sensing Society
Annual Chapter Report**

Chapter Name: IEEE-GRSS Eastern North Carolina Chapter #03191

Chapter Officers:
     President: Dr. Linda B. Hayden
     Secretary: Jeffrey A. Wood

Reporting Period: January – December 2016

Date Submitted: January 8, 2017

Wish to be considered for Chapter Excellence Award: Yes

IEEE-GRSS Eastern North Carolina Chapter #03191
2016 Chapter Report

Please provide explanation on activities and accomplishments in each of the following categories. Provide backup documentation to properly justify each entry. To be considered for a Chapter Excellence Award, all categories must be addressed. Each category will receive a score of 1-3 (3 being the highest). The chapter with the highest overall score will win the award.

1. *Technical Seminars Organized: (for each seminar, provide speaker name, affiliation, date of visit, title of talk, number of people in attendance, location, whether the speaker was a GRSS Distinguished Lecturer, etc.)*

seminar	IEEE-GRSS Lecture Series
speaker name	Dr. Robert Y. George and Mr. Andrew Brumfield
affiliation	ECSU
date of visit	April 14, 2016, 5:30 pm
title of talk	Coastal Hazards Workshop"
number of people in attendance	28 participants
location	Room 229, Dixon-Patterson Hall, ECSU
GRSS Distinguished Lecturer	No

The distinguished lecture speaker, Dr. Robert Y. George, presented the importance and urgency to increase the awareness for coastal hazards. Dr. George discussed integrating information on coastal hazards and cirrocumuli coastal ecosystems into his research. Other key points from Dr. George's presentation were that the North Carolina coast is very fragile and that ECSU serves as a valuable intellectual reference in addressing environmentally sensitive needs for North Carolina. Andrew Brumfield came forward to present his research on the Sargasso Sea. Mr. Brumfield discussed the oil spill in 2011 and how oil affects the sargassum in the ocean. Mr. Brumfield's research used satellite data utilizing ocean color indexes such as the floating algae index and Normalized Differential Vegetation Index (NDVI) to detect floating algae in open environments using Moderate Resolution Imaging Spectroradiometer (MODIS) instruments.

seminar	IEEE-GRSS Lecture Series
speaker name	Mr. Justin Waddell
affiliation	Federal Aviation Administration Contractor
date of visit	Tuesday November 29, 2016 5pm
title of talk	View of the FAA Small Unmanned Aerial Systems (UAS) Rule and related FAA Order Jo 7200.23 on Operation/Coordination of UAS in the National Airspace System (NAS)
number of people in attendance	25 participants
location	Room 229, Dixon-Patterson Hall, ECSU
GRSS Distinguished Lecturer	No

A distinguished lecture featuring Mr. Justin Waddell, was held on Tuesday November 29, 2016. The lecture presented a View of the FAA Small Unmanned Aerial Systems (UAS) Rule and related FAA Order Jo 7200.23 on Operation/Coordination of UAS in the National Airspace System (NAS). Highlights are shown below.

2. *Other Technical Activities (technology initiatives, development of focused technical topics, instrumentation, etc.)*

Our focused technical activity is Terascan Remote Sensing Ground Station Operations. In implementing that focus, we conducted several C++/Python and Terascan training events. See #3 elow for discussion of the Terascan training.

C++/Python Training
C++/Python syntax and structure, exception handling, functions, classes and Python's powerful object model. Performing common tasks in Python, including file layout, databases and web development, and some real-world examples of working Python code. Training was conducted on Tuesday and Thursday evenings October 4-13, 2016 and November 1-17, 2016 (2 hours/day)

3. *Education and Outreach (development or sponsorship of short courses, workshops, tutorials, open houses, etc.)*

The chapter organized a week-long training activity focused on operations of the TeraScan Satellite Receiving system. Twelve students participated in the event held December 12-15, 2016. A second training event focused on advanced topics is scheduled for January 3-6, 2017

December TeraScan Training Report
Monday Presented SeaSpace and Equipment, explained file system
- Intro to TeraScan
    Lectured on how the TeraScan hardware works for Geostationary Operational Environmental Satellite systems (GOES) and Polar-orbiting Operational Environmental Satellites (POES) operate, utilizing multispectral sensors aboard the satellites payload. How data is transmitted to the ground stations of ECSU, then processed and stored in the ECSU TeraScan System
- Practical intro to system
    Informed trainees on how the TeraScan System processes and stores data. What products each system can produce in batch processing and where to find important directories in the system. Each trainee was instructed on how to create & modify scripts in TeraScan's batch process scripts.
- Develop file paths
    Had the trainees create their own directories for global files and local files. These are locations created in the directories under products where their desired outputs would be housed.
- Create Master Files

Trainees utilized the Graphical user interface "Tmaster" to create master's for both global and local area of interest of a selected area to be used for processing raw data.

Tuesday
- Produce script file for processing local and global master files
    Using each of their unique master files and personal directory location, trainees created a script to process raw data into remapped imagery and sea surface temperature

Wednesday
- Debugging
    Finding errors in scripting of the batch processing if images were not produced to their output folder.
- Intro to TeraVision
    Trainees were given an overview of the TeraVision components of the graphical user interface (GUI), and how to navigate opening files and saving files. How to select overlays, take survey points, change configuration of layers, and how to save images points and overlay configurations
    Add new data shelf to TeraScan

Thursday
- Loading images and data collection
    Created new data shelfs in TeraVision
    Selected points and documented the values in an Excel spread sheet to produce graphical visualization
- Modifying Visualization
    Trainees were instructed on how to select color pallets to visualize the changes in sea surface values on GOES imagery. As well the method of enhancing the imagery so that differences can be seen clearly.
    Trainees animated passes through three days to show as clouds move the sea surface temperature will either stay the same during mid-day hours or change between when the sun is directly radiating on the sea-surface.

Friday
- Built In Functions
    Trainees completed composites of a day's sea surface temperature for averaged values and for maximum values.
- Composite images and data
    Trainees loaded the images into TeraVision and annotated, enhanced and compared each other's selected values at predetermined points selected on Wednesday.

Highlights from SeaSpace TeraScan training are shown above

The GRSS chapter conducted a workshop on remote sensing during the Celebration of Women in Mathematics (CWM) Oct. 20, 2016. Over three hundred girls and their teachers from 14 middle and high schools participated in the CWM. The hands-on training presented use of visualization software and remote sensing data sets. Highlights are shown below.

4. *Involvement with GRSS (participation in IGARSS and other GRSS-sponsored conferences, number of papers vs. number of membership, sessions organized at such conferences, hosting conferences, etc.)*

seminar	IEEE-GRSS Distinguished Lecture Series
speaker name	Dr. Melba Crawford
affiliation	Past President GRSS
date of visit	April 8, 2016
title of talk	Hyperspectral Remotely Sensed Data: Opportunities and Challenges
number of people in attendance	60 participants
location	Room 3211 Engineering Bldg-2 Centennial NCSU Campus, 890 Oval Drive, Raleigh, NC
GRSS Distinguished Lecturer	Yes

On April 8th, 2016, the North Carolina State University (NCSU) Women in Engineering (WIE) Student Chapter and the Elizabeth City State University (ECSU) IEEE-Geoscience & Remote Sensing Society (IEEE-GRSS) Student Chapter held a joint meeting on the campus of North Carolina State University. The program was part of the Distinguished Lecture Series and featured Dr. Melba Crawford, Associate Dean of Engineering for Research, Purdue University who's presentation was titled: "Hyperspectral Remotely Sensed Data: Opportunities and Challenges." Support for this event was provided by the Professional Activities committee of GRSS and their Distinguished Lecture Program. Over 60 people attended.

Event Flyer: http://nia.ecsu.edu/ur/1516/160408wie/wie_IEEE_Flyer.pdf

Event Schedule: http://nia.ecsu.edu/ur/1516/160408wie/GRSS-WIE_Schedule_of_Events.pdf

Four student members and two faculty members participated in IGARSS 2016 in Beijing China July 10-15th. Three papers were presented. Participants attended the Technical committee and Chapters Dinner.

Ryan Lawrence: Automatic Chamber Measurements of Net Ecosystem (CO_2) Exchange at a Subarctic Mire in Northern Sweden

Kamberlin King: Validation of the Antarctic Snow Accumulation and Ice Discharge Basal Stress Boundary of the Southeastern Region of the Ross Ice Shelf, Antarctica

Cornelius Holness: Remote Sensing Archeological Sites through Unmanned Aerial Vehicle (UAV) Imaging

5. *Membership Diversity (involvement of under-represented groups including women, and activities to promote and increase engagement of underrepresented groups)*

Seventy (70%) of the membership is African American. The chapter is housed on the campus of a Historically Black College/University.

6. *Web Presence (web site development and evidence that it is widely used, especially to enhance the above activities)*

The chapter has maintained a website since its beginning. The website is used by members to access event highlights, upcoming events and minutes from its chapter meetings. The site is: http://nia.ecsu.edu/ieee/

7. *The Chapter wishes to be considered for the Chapter Excellence Award based on the information included in this report and in the chart below.*
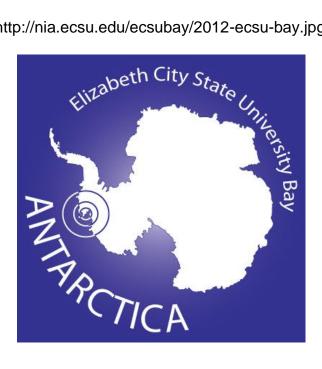
Award Criteria	Rational
Technical Seminars Organized	Joint meeting with NCSU WIE Society featuring Dr. Melba Crawford supported by the GRSS Distinguished Lecture Program. Other Lectures featuring Dr. Robert George and Mr. Justin Waddell (See #1)
Other Technical Activities	Python and TeraScan Ground Receiving Station Operation training. See #3 above.
Education and Outreach	Remote Sensing workshops conducted during the annual Celebration of Women in Mathematics involving 400 girls and their teachers. Fourteen middle and high schools participated. See http://nia.ecsu.edu/nrts/2016events/161020cwm/2016_CWM_Schedule.pdf
Professional Development	Chapter hosted professional development seminars for students and faculty related to summer opportunities. Seminar was held at Port Discover's Science Café by Chapter members related to "bronze-age signatures" that place the catastrophic event at the time period when biblical patriarch Abraham lived. See http://nia.ecsu.edu/ur/1516/2016lecompte_swindell/ for more information. The Annual AISES National Conference was a three-day event focusing on educational, professional and workforce development held in Minneapolis, Mn, November 10-12, 2016. Joel Gonzales-Santiago presented his research from his 2016 work with the Juneau Icefield Research Program titled "Temporal Changes of Surface Elevation and Velocity of Taku Glacier, Juneau Icefield." http://nia.ecsu.edu/ur/1617/161110aises/
Involvement with GRSS	Four student members and two faculty members participated in IGARSS 2016 in Beijing China July 10-15th. Three papers were presented. Participants attended the Technical committee and Chapters Dinner. The chapter has previously made presentations during the chapter dinner three times. http://nia.ecsu.edu/ur/2016/igarss16/op-participants.html
Membership Development	Two new GRSS members were recruited including Dr. Jasper Lewis who also served as a session chair during IGARSS 2016. TU1.L11 Clouds and Precipitation: TRMM/GPM. http://nia.ecsu.edu/ur/2016/igarss16/chairs.html The other new member recruited was Dr. Johnny Houston
Fundraising	The chapter received a grant from GRSS Professional Activities to support the Joint WIE-GRSS meeting. The chapter was included in a proposal to NASA to support remote sensing outreach and education activities. The NASA MUREP NNX16AC89A proposal was funded for 2-years. See http://nia.ecsu.edu/pimers/
Membership Diversity	Seventy (70%) of the membership is African American
Web presence	Chapter website contains photos and highlights from chapter activities and minutes from meetings. See http://nia.ecsu.edu/ieee/

*** Exceptional Research Results produced by Chapter members was published as Temporal Reduction and Loss of an Ice Shelf in Pine Island Bay, Antarctica: 1972 – 2003 IEEE-GRSS Journal of Selected Topics in Applied Earth Observations and Remote Sensing (GRSS-JSTARS) GRSL-00258- 2012, IEEE- JSTARS-2012-00405.R1.

Student and faculty members of our chapter conducted a research project to

quantify ice margin changes in the Amundsen Sea region using LIMA as a benchmark. They discovered a small ice shelf that had gradually shrunk from 1972 to 2003 and has failed to reform.

The feature is a former ice shelf occupying an embayment along the southern side of Canisteo Peninsula 12.5 miles north of Suchland Islands and approximately 20 miles north northwest of Cranton Bay. The feature was named by US-Advisory Committee on Antarctic Names (ACAN) Board of Geographic Names (BGN) for Elizabeth City State University in Elizabeth City, North Carolina. The ACAN recommended Elizabeth City State University Bay for approval at its meeting on January 5, 2012 to the U.S. Board on Geographic Names The name Elizabeth City State University Bay has been approved for use on maps and other products of the Federal government. The name was approved officially at the meeting of the U.S. Board on Geographic Names on April 17, 2012 and was entered into the Geographic Names Information System (GNIS), the nation's official geographic names repository on April 19, 2012.

http://nia.ecsu.edu/ecsubay/2012-ecsu-bay.jpg