

## **College of Science and Technology Annual Report for 2011-2012**

The College of Science and Technology (CSAT) at Radford University (RU) was formed on July 1, 2007 by combining the Departments of Biology, Chemistry and Physics, Geology, and Mathematics and Statistics from the former College of Arts and Sciences and the Department of Information Technology from the former College of Information Science and Technology. On July 1, 2009, the Anthropology and Geography programs from the College of Humanities and Behavioral Science joined the Physics and Geology programs of the CSAT to form the School of Environmental and Physical Science (SEPS) in the CSAT. The Anthropology program was approved by SCHEV to become the Anthropological Sciences program on May 10, 2010. The Geography program was approved by SCHEV to become the Geospatial Science program on May 17, 2011. The faculty within the SEPS passed a motion to dissolve the SEPS with a director and to create departments with chairs on September 9, 2011. In a SEPS faculty meeting on November 11, 2011, Provost Minner announced that he had approved the proposal of the SEPS faculty members to form independent departments of Anthropological Sciences, Geology, Geospatial Science and Physics with individual department chairs as well as a laboratory coordinator position to serve the needs of the Anthropological Sciences, Geology, Geospatial Science and Physics Departments.

### **MISSION**

The College of Science and Technology prepares students with skills and expertise essential to the Commonwealth and the nation. The College emphasizes the theory and applications of science, mathematics, and technology. The College develops students' creative and critical thinking skills and teaches students to analyze problems and implement solutions to a vast array of challenges in our local, national and global communities. Students will be prepared to bring creative and socially responsible innovations to the workplace and to society.

### **UNDERGRADUATE DEGREES AND CONCENTRATIONS IN 2011-12**

- Anthropological Sciences - concentration in Forensic Anthropology
- Biology with concentrations in General Biology, Molecular Biology, Environmental Biology, Pre-health and Medical Technology
- Chemistry with concentrations in Professional Chemist, Pre-health Professional, Biochemistry and Forensics as well as an Environmental Science option
- Computer Science and Technology with concentrations in Computer Science, Database, Software Engineering and Networks
- Geology with concentrations in General Geology, Engineering and Environmental Geosciences and Earth Sciences
- Geospatial Science with concentrations in Environmental and Geoinformatics
- Information Science and Systems with concentrations in Information Systems and Web Development
- Mathematics with concentrations in Applied Math, Statistics and Secondary Education
- Physics with concentrations in Physics Education and Earth and Space Science

## GOALS AND ACCOMPLISHMENTS FOR 2011-2012

These goals are based on the roles and responsibilities of deans as described in section 4.1.3.1 on page 62 of the Radford University Teaching and Research Faculty Handbook.

**- to lead the faculty and staff of the college in developing and delivering educational opportunities of the highest quality possible for students, consistent with the mission of the College,**

**Goal:** continue to work with the faculty of the CSAT and the Office of Admissions to recruit more students into STEM fields within the CSAT and to enhance the academic profile of incoming students,

**Status:** CSAT faculty members and the CSAT Dean's Office made many contributions that are directly related to recruiting more students into the STEM fields. In addition to participation in Open House events and Highlander Days that are sponsored by the Office of Admissions, CSAT faculty members recruit prospective students into STEM fields through their science, technology and mathematics education outreach events.

- Science Days are a collaborative effort of the Science Alliance that consists of the RU Planetarium, Museum of the Earth Sciences (MES), RU Greenhouse, Department of Chemistry and Department of Physics. According to Dr. Rhett Herman, the RU Planetarium hosts over 150 separate shows per year, and on average K-12 school groups, ranging from 140 total visitors to small Head Start groups, visit the RU Planetarium at a rate of one every week.

- On June 20-24, 2012 the CSAT hosted Camp Invention for 66 rising first through sixth graders in Reed and Curie Halls. Assistant to the Dean Ann Brown served as Camp Invention Director for the third year.

- Summer Bridge Program welcomed 62 high school girls to campus on July 10-15, 2011. CSAT faculty members John McGee, Brenda Hastings, Beth McClellan, George Stephenson, Cliff Boyd, Donna Boyd and Prem Uppuluri taught three tracks that incorporated mathematics, physics, geology, anthropological sciences and information technology.

- I met with Dean James Pennix and the Office of Admission Counselors on August 19, 2011 to provide college updates and current CSAT literature on academic programs and plans for the future.

- Through the invitation and support of Provost Minner, faculty members of the Southwest Virginia Governor's School (SWVGS) were invited to campus for a luncheon on September 2, 2011 where a Memorandum of Understanding was signed that allows SWVGS students to dual enroll in MATH 140 and PHYS 231 and receive credit from RU. A visit to SWVGS on December 12, 2011 allowed RU representatives to tour SWVGS facilities. Meetings were conducted with SWVGS faculty and RU representatives to co-author a Virginia Department of Education College/University Partnership Laboratory School Planning Grant proposal on January 18 and 25, 2012. An additional meeting was conducted with SWVGS faculty on February 28, 2012 to discuss future collaborations and possible co-authored grant proposals.

- CSAT faculty members from Mathematics and Statistics, Anthropological Sciences and Information Technology participated in the Sixth Annual S.T.E.M. Conference at the Southwest Virginia Higher Education Center in Abingdon on November 18, 2011, and the CSAT Dean's

Office supported this event by providing funds for the transportation.

- Faculty members in the Information Technology Department sponsored the 36<sup>th</sup> Mid-Atlantic Region ACM International Collegiate Programming Contest on November 5, 2011, and I provided welcome remarks. A programming and gaming competition for high school and community college students was sponsored by the Information Technology Department on March 16 and 17, 2012.

- Dr. Bernd Kuennecke and I conducted a telephone conference call with Prince William County Public School (PWCS) officials on January 20, 2012 to explore a Geospatial Science partnership Agreement with PWCS and the RU Department of Geospatial Science. This partnership could involve training of PWCS teachers and recruiting prospective GEOS majors from PWCS to RU.

- Science Exploration Day was sponsored by the CSAT STEM Club on February 18, 2012. Over 120 Boy Scouts, Girl Scouts and other prospective students attended courses taught by RU faculty members Ann Brown – Communications, Joe Chase – Computers, Rhett Herman – Electronics, Joe Wirgau and Department of Chemistry faculty and students - Chemistry, Cassady Yoder and Anthropology Club members – Indian Lore, and guest faculty member Dr. Melissa Chase – Personal Management.

- Through the NSF S-STEM grant a CSAT STEM Open House event was conducted on February 25, 2012 and over 50 prospective CSAT students attended with their families. Welcome remarks were provided by Mr. David Bradshaw, President of InteractiveGIS, and a 1990 Geography graduate of RU. Faculty members from CSAT departments, the Pre-health Advisory Committee Chair Dr. Georgia Hammond, and a representative from the Office of Financial Aid participated and provided information sessions for prospective students and their families. In addition to campus tours, Planetarium shows, MES tours and a robotics demonstration were also provided for these prospective STEM majors.

- On March 2 and 3, 2012, Dr. Christine Hermann and Dr. Kimberly Lane, along with assistance from the faculty and students in the Department of Chemistry, directed the Blue Ridge Highlands Regional Science Fair at RU. This event attracted prospective majors in science and technology from 20 high school and middle schools to the RU campus.

- On March 6 and 8, 2012 Dr. Jill Stewart, Dr. Neil Sigmon, Mr. John McGee and two majors in the Department of Mathematics and Statistics visited the SWVGS and talked about opportunities for majors in the RU Department of Mathematics and Statistics as well as undergraduate research on elliptical curves.

- On March 12, 2012, the CSAT sponsored the SuperMACC Tournament where nine high schools brought science, mathematics, social studies, English and all-around teams to campus.

- Thanks to assistance from Dean James Pennix and the CSAT Dean's Office, Dr. Andrew Foy, Ryan Gillespie and Christopher Peterson from the Department of Geospatial Science and I plan to attend the USA Science and Engineering Festival in Washington, D.C. on April 27-29, 2012 to recruit prospective students and discuss opportunities available to majors in the CSAT at RU.

**Goal:** explore the opportunities for a M.S. in Education with a concentration in Environmental Science degree program

**Status:** Numerous meetings were conducted with CSAT and College of Education and Human Development (CEHD) faculty members to explore the opportunities for a M.S. in Education with a concentration in Environmental Science degree program. The idea for this degree program proposal came from a CSAT Leadership Team meeting where proposals for new budget initiatives were discussed. It was discussed that the M.S. in Education with a concentration in Mathematics Education had been very successful and that the CSAT also had unique resources and faculty expertise in Environmental Science. It was proposed that a M.S. in Education with a concentration in Environmental Science degree program could be successful because of the potential contributions from the CEHD as well as the resources and faculty expertise in the CSAT Departments of Biology, Chemistry, Geology, Geospatial Science and Physics.

I conducted meetings with the following CSAT and CEHD faculty members to explore their interest and potential for involvement in the M.S. in Education with a concentration in Environmental Science graduate program.

September 6, 2011 – Dr. Rick Roth, Professor of Geospatial Science

September 9, 2011 – Dr. Judy Guinan, Associate Professor of Biology

September 12, 2011 – Dr. Chester “Skip” Watts, Professor of Geology

September 13, 2011 – Dr. Christine Small, Associate Professor of Biology and  
Mr. Darrell White, Greenhouse Manager and Instructor of Biology

September 13, 2011 – Dr. Joseph Wirgau, Associate Professor of Chemistry

September 16, 2011 – Dr. Pat Shoemaker, Dean of the CEHD and  
Dr. Sandy Moore, Director of the STEL in the CEHD

September 16, 2011 – Dr. Walter Jaronski, Professor of Physics

September 22, 2011 – Dr. Jon Tso, Associate Professor of Geology

September 23, 2011 – Dr. Greg Sherman, Associate Professor of Education

September 23, 2011 – Dr. Beth McClellan, Assistant Professor of Geology

September 23, 2011 – Ms. Libby Watts, Instructor of Chemistry and Physical Science

Summaries of my discussions with all of these faculty members were prepared and distributed for reference and discussion along with examples of other Environmental Science Master’s programs. Group meetings were conducted on November 17 and 18, 2011 with faculty members who had been interviewed to consider the information that had been provided.

It was discussed that a M.S. in Education with a concentration in Environmental Science program would face challenges that had not applied to the M.S. in Education with a concentration in Mathematics Education. Students enrolling in the M.S. in Education with a concentration in Mathematics Education all had undergraduate degrees in mathematics, and all the courses in the curriculum had a MATH, STAT or EDUC/EDEF/EDET prefix. There was also a demonstrated need for high school mathematics teachers with Master’s degrees, and the Mathematics Education graduate program had a faculty member who had invested significant time and effort to propose the program, recruit students for cohorts and explore partnerships with other institutions. Although the M.S. in Education with a concentration in Mathematics Education was an extremely successful model of what the M.S. in Education with a



concentration in Environmental Science could aspire to become, it was determined that faculty reassigned time would be required for a faculty member to conduct the needs assessment, explore grant proposals and funding sources, determine the appropriate courses in the curriculum and coordinate the proposal to ensure that students could be recruited and graduates would be employed. Reassigned time for a CSAT faculty member to coordinate the planning of the M.S. in Education with a concentration in Environmental Science was submitted as a CSAT new budget initiative for 2012-13.

**Goal:** in consultation with CSAT faculty, explore the reactivation of the Environmental Center and its organization within the CSAT and Radford University

**Status:** Dr. Richard Roth, Professor of Geospatial Science, has taken the leadership role in reactivating the Radford University Environmental Center (RUEC), and the CSAT Dean's Office as well as the deans of the College of Humanities and Behavioral Sciences and College of Graduate and Professional Studies have supported his efforts by providing funds for reassigned time for Dr. Roth to explore external grant funding opportunities for the RUEC.

I met with Dr. Roth on September 29, 2011 to discuss his ideas for the RUEC, and I offered CSAT funds to pay for brochures to be developed for advertising the RUEC as well as brochures for advertising the Certificate in Sustainability and Environmental Studies. I also offered to provide adjunct backfill funds from the CSAT for Dr. Roth to be granted reassigned time and pursue external grant funding for the RUEC. On October 6, 2011, Dr. Roth met with Dean Dennis Grady and me to discuss the RUEC. Dr. Roth had identified a prospective funding source, NSF Solicitation 11574 Sustainability Research Networks Competition (SRN), and Dean Grady expressed his continued support of the RUEC. Dean Hawkins has also provided adjunct backfill funds for reassigned time for Dr. Roth in spring 2012 to pursue external grant funding. Dr. Roth has created a two page information sheet describing the history of the RUEC as well as the activities and accomplishments of the RUEC since 2004.

On February 29, 2012, Dr. Roth provided an e-mail update to faculty members reporting "News from the R.U. Environmental Center." This e-mail reported RUEC success with a grant in partnership with the Department of Interior Design and Fashion that paid for two busloads of students, faculty and staff to travel to Washington, D.C. and to see the sustainable homes at the Solar Decathlon. Among other news, Dr. Roth reported that the RUEC had collaborated with RU Facilities Management and received a grant for \$75,000 from the Jessie Ball DuPont Foundation. He also invited everyone to an RUEC Open Forum on March 13, 2012 where Woodrow Wilson Visiting Fellow Mr. Stephen Vetter would be the guest speaker.

It has been discussed that funding for the RU Environmental Center would be an appropriate new budget initiative, and this new budget initiative should include the support of more colleges than just the CSAT since the vision for the Environmental Center is to impact all colleges as well as other divisions of Radford University.

**- to lead the College in procuring and managing fiscal, human, and physical resources necessary to accomplish these goals,**

**Goal:** pursue new relationships with corporate partners and continue to pursue gifts to the CSAT

**Status:** A new corporate partnership has been established with the CSAT thanks to the efforts of Ms. Robyn Porterfield and the work of everyone who makes Summer Bridge program a success. The Pentair Foundation in Minneapolis, Minnesota has provided a gift of \$9,892 for Summer Bridge Program 2012, and Aspen Motion Technologies in Radford is a Pentair Company.

A total of \$69,250 in cash donations was provided to Summer Bridge Program in 2011, and these gifts were from Dominion Resources, \$25,000; Verizon, \$24,000; Project Discovery of Virginia, \$5,100; ATK Energetic Systems, \$4,250; Upward Bound of Patrick Henry Community College, \$4,250; Alpha Natural Resources, \$2,500; Novozymes Biologicals, \$2,300; and Areva, \$1,000. There was also a gift from an individual, Ms. Dale Lee, M.B.A. '85, who provided \$850.

There are several individual donors who have pledged gifts for Summer Bridge Program 2012, and these include Ms. Dale Lee, Dr. Jane Y. Lewis, Dr. John R. "Jack" Nelson and Ms. Nancy Adams.

Radford University and the CSAT also received two significant gifts for the Center for the Sciences in 2011. A \$50,000 pledge has been provided from Novozymes Biologicals for the Novozymes Biology Lab, and a \$50,000 pledge has been provided from Ms. Nancy Artis, a Biology alumna of 1973, and Dr. H. Pat Artis for the Artis Computing Laboratory for Biological Sciences.

The CSAT has also been the recipient of a gift from Dr. Ray Tuck, a Biology alumnus of 1994, who has pledged \$25,000 to establish the Dr. Nathaniel R. Tuck, Sr. Memorial Student Scholarship in the RU Foundation. This scholarship would support a pre-medical student who planned to attend chiropractic medical school, and preference would be given to students who plan to practice in Virginia.

**- to represent the college, its goals and needs to other external as well as internal constituencies, and**

**Goal:** continue to communicate with all constituents of the CSAT through the CSAT newsletter and alumni newsletter and by meeting with departments and faculty members

**Status:** The CSAT newsletter *From the Dean's Desk* that is written and designed by Ms. Ann Brown, Assistant to the Dean, continues to be successful in communicating news to CSAT faculty, staff and students. There have been 15 editions of *From the Dean's Desk* distributed from April 1, 2011 to March 29, 2012, and the faculty, staff and students of the CSAT make this newsletter possible by reporting their successes to Ann for inclusion in the newsletter. On February 9, 2012, *From the Dean's Desk* was published online instead of in pdf format, and this advance in technology will make the newsletter more readily accessible through the CSAT website.

Thanks to the efforts of Ms. Ann Brown, a CSAT alumni newsletter was created and distributed in December of 2011, and CSAT holiday greeting cards were mailed to donors who had made contributions to the CSAT in 2011.

I have represented the CSAT externally attending meetings such as the Virginia Bioscience Research Council meeting in Williamsburg on April 28, 2011 and the State Council of Higher Education for Virginia meeting at Randolph-Macon College on May 16 and 17, 2011 where Dr. Bernd Kuennecke and I answered questions about the Geospatial Science program proposal.

**- to promote the overall excellence and welfare of the University**

**Goal:** support positive morale among faculty and staff across the CSAT by listening to faculty concerns and soliciting faculty input in decisions affecting the CSAT

**Status:** I have met with CSAT faculty ranging from individuals with specific requests and concerns to departments and the entire SEPS. The meeting agendas ranged from requests for resources, to concerns raised by students and parents to a motion to dissolve the SEPS and create independent departments with chairs. I met with ten CSAT faculty specifically to discuss their interest in the M.S. in Education with a concentration in Environmental Science proposal, and I met with faculty in the Departments of Anthropological Sciences, Chemistry, Geology, Geospatial Science and Physics to conduct the chair selection process as directed by the RU Teaching and Research Faculty Handbook. I also met with the faculty members of the Biology Department and Chemistry Department to discuss their research laboratory design needs for the Center for the Sciences. I appreciate the opportunity to meet with my CSAT colleagues, and I highly value their advice and input in resolving the challenges that face our college. In a recent example, a problem was identified for providing office space in Reed or Curie Hall to a new tenure-track faculty member in Biology for fall 2012. I provided four possibilities of solutions to certain faculty members in Curie and Reed and asked for their input and recommendations on how to solve this office space challenge. The recommendation that they provide to me was not one of the four that I had proposed, but it was a far better solution that I could have identified.

I have supported numerous faculty proposals that will enhance the missions of the CSAT. For example, I accompanied Dr. Steve Lenhart, Executive Director and Curator of the RU Museum of the Earth Sciences (MES), on a trip to the Virginia Museum of Natural History (VMNH) in Martinsville on July 22, 2011. In collaboration with the VMNH, Dr. Lenhart proposed an affiliation agreement with the RU MES and the VMNH that was approved by President Kyle on September 15, 2011. The CSAT Dean's Office also provided funds for the transport of VMNH loaned exhibits including a model of the Rock of Ages Quarry and a fossil redwood log to RU for display in the MES.

In consultation with Dr. Bernd Kuennecke and the faculty members of the SEPS, the CSAT Dean's Office hosted lunch and refreshments for a SEPS retreat at Selu Conservancy on August 22, 2011 to discuss opportunities and concerns. This retreat also served as the opening faculty meeting of the SEPS where elections were conducted and the possibilities of multidisciplinary external grant proposals were discussed.

I supported positive morale of the SEPS faculty by supporting the motion that was presented to me in a SEPS faculty meeting on September 9, 2011 to dissolve the SEPS with a director and create departments with chairs. I provided an analysis of that motion to Dr. Minner including the financial resources that would be required to provide stipends to chairs, establish a full-time laboratory coordinator position, and create a second administrative assistant position for the departments that were proposed to be created from the SEPS. Dr. Minner met with the SEPS faculty members on October 21, 2011 to discuss their motion, and on November 11, 2011, Dr. Minner met with the SEPS faculty to announce that he had approved their request to create individual departments with chairs and establish a laboratory coordinator position to serve the Departments of Anthropological Sciences, Geology, Geospatial Science and Physics.

I also facilitated communication within the CSAT by inviting Dr. Minner to tour selected laboratories and facilities in Preston, Reed and Curie Halls to introduce him to some of the CSAT faculty members and students who were conducting research in Preston, Reed and Curie Halls. Dr. Minner accepted my invitation and devoted two hours of his day on February 3, 2012 for this tour. I am very thankful to all of the CSAT faculty and students who prepared diligently to make outstanding presentations to Dr. Minner as he toured some of our laboratories and facilities.

**Goal:** support efforts to engage alumni in the work of the CSAT

**Status:** The CSAT Alumni Advisory Council met for lunch and presentations on September 30, 2011 in Hurlburt Hall. The Alumni Advisory Council members in attendance were:

Mr. Chris Flor, '00 – CGI Federal  
 Mr. Rob Mancini, '83 – CTO of Washington, D.C.  
 Dr. Racquel Collins-Underwood, '01 – St. Jude Children's Research Hospital  
 Mr. Mark Hanna, '84 – Johnson and Johnson  
 Dr. Earnest Paylor, '81 – WorldTech International, LLC  
 Dr. Seth Peery, '03 – Virginia Tech

The Alumni Advisory Council members heard presentations on new initiatives, faculty and student achievements and research projects from the department chairs, school director and program coordinators in the CSAT as well as presentations on the plans for the Center for the Sciences from members of the CSAT Building Committee. The Alumni Advisory Council members also provided us their advice, recommendations and suggestions for the CSAT. Alumni Advisory Council members also conducted a panel presentation for CSAT students in the Hurlburt Auditorium later that afternoon.

As previously stated, a CSAT alumni newsletter was created and distributed in December of 2011, and CSAT holiday greeting cards were mailed to alumni donors and others friends of the CSAT who had made contributions in 2011.

I met Mr. David Bradshaw, RU 1990 graduate in Geography and President of InteractiveGIS, for lunch on January 17, 2012 to discuss the Center for the Sciences and progress in the CSAT. Mr. Bradshaw accepted my invitation to provide the keynote remarks at the CSAT STEM Open House on February 25, 2012.

New members have been recommended and invited to join the CSAT Alumni Advisory Council. These new members are:

Ms. Heather Lineberry – Grayson County High School mathematics teacher  
 Ms. Catherine Inman – Christiansburg High School mathematics teacher  
 Ms. Abby Thompson Smith – Pulaski County High School mathematics teacher  
 Dr. Maher Nouredine – President of ForensiGen, LLC



**Goal:** work with faculty to promote interdisciplinary projects among colleges, departments and disciplines, and provide support for cross-disciplinary affiliated programs, courses, and student learning

**Status:** The M.S. in Education with a concentration in Mathematics Education is a vivid example of a successful project between the Department of Mathematics and Statistics in the CSAT and the School of Teacher Education and Leadership in the CEHD. Mathematics and Statistics Department faculty members teach the 18 semester hours of MATH and STAT courses that complement the 18 semester hours of Education Core and Mathematics Education courses that are taught by CEHD faculty members.

Another very successful interdisciplinary project is the NSF TUES SUMS4BIO grant that was funded for \$199,176 to support collaborative pedagogical efforts of the Department of Biology and the Department of Mathematics and Statistics. The new courses MATH 119 Mathematics for Biology and STAT 219 Statistics for Biology are being developed as requirements for Biology majors to enhance their understanding of mathematics and statistics in biology.

The RU Environmental Center is also supported as an interdisciplinary and cross-disciplinary opportunity that is directed by Dr. Rick Roth but has support from Dean Hawkins of the CHBS and Dean Grady of the CGPS as well as contributions from faculty members and other resource people across campus.

The Department of Physics and the Department of Geology have a long history of interdisciplinary collaborations that have provided students research experiences in geophysics, and the purchase of LiDAR equipment is an example of a resource that is being used by faculty members in Geospatial Science, Geology and Anthropological Sciences.

Dr. Tim Fuhrer and Dr. Kimberly Lane in Chemistry and Dr. Tara Phelps-Durr in Biology were awarded a CSAT faculty research grant for \$10,000 to develop a computer cluster for the investigation of protein interactions.

Summer Bridge Program also provides interdisciplinary approaches to teaching and learning, and the tracks in summer 2011 consisted of coordinated courses in anthropological sciences and information technology and mathematics and physics.

The CSAT STEM Club is a social support group for students in all majors within the CSAT, and one of the most successful interdisciplinary projects of the CSAT continues to be the Science Days events organized by faculty members in physics, geology, chemistry and biology.

### **Professional Development for 2011-12**

I attended the Council for Advancement and Support of Education meeting in Atlanta, Georgia on November 2-4, 2011. The topic of this session was “Development for Deans and Academic Leaders”, and this was one of the most informative professional development conferences that I have attended as a dean. I have used some of the knowledge that I gained from the sessions and colleagues at that meeting, and I expect to develop more skills as I gain more experience with raising funds for the Center for the Sciences and the CSAT.