



“ONE HAS TO WATCH OUT FOR ENGINEERS — THEY BEGIN WITH THE SEWING MACHINE AND END UP WITH THE ATOMIC BOMB.”

MARCEL PAGNOL, CRITIQUES DES CRITIQUES
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CIVILREMARKS

CIVIL AND ENVIRONMENTAL ENGINEERING

REPORT FINDS HURRICANE PROTECTION SYSTEM PROVIDED INCONSISTENT LEVELS OF PROTECTION DURING KATRINA

A newsletter for the alumni and friends of the Department of Civil & Environmental Engineering

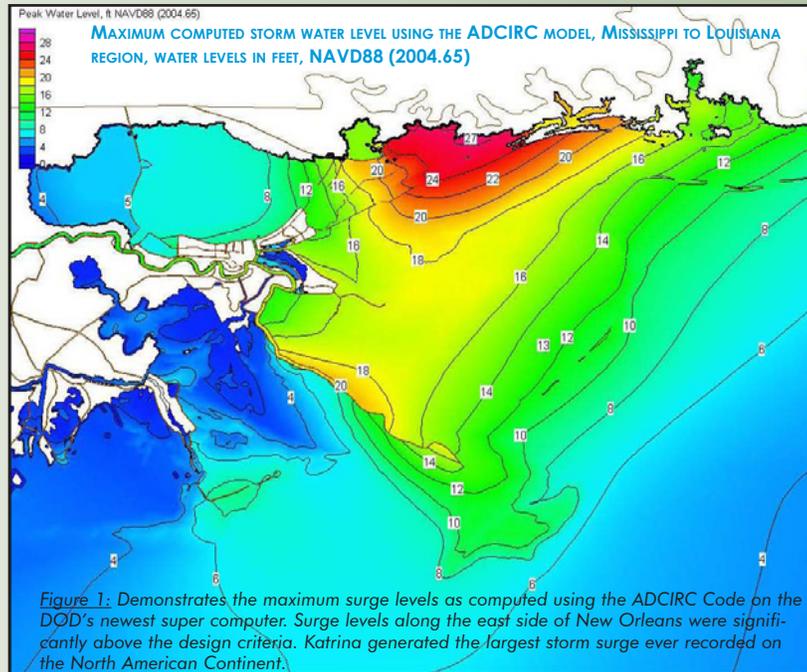


Figure 1: Demonstrates the maximum surge levels as computed using the ADCIRC Code on the DOD's newest super computer. Surge levels along the east side of New Orleans were significantly above the design criteria. Katrina generated the largest storm surge ever recorded on the North American Continent.

● ● ● “WHAT THIS REPORT POINTS OUT IS THAT YOU HAVE TO LOOK AT THIS AS A SYSTEM AND NOT JUST AS COMPONENTS OF THAT SYSTEM. YOU MUST PLAN IT, DESIGN IT AND CREATE IT WITH ALL THE PIECES WORKING TOGETHER IN A CONSISTENT WAY. IF A SINGLE LEVEE OR FLOODWALL FAILS, THE ENTIRE AREA IS IMPACTED.”
– Lewis E. (Ed) Link

The failure of the hurricane protection system in New Orleans was the fact that it was really not a system at all. That's the finding of the Hurricane Katrina Interagency Performance Evaluation Task Force (IPET) in the final draft of its report.

“The system was a system in name only,” says Lewis E. (Ed) Link, a senior research engineer with CEE and leader of IPET. IPET was established in October by the Chief of Engineers and is comprised of experts from government, industry and academia. The goal of the task force is to learn what happened with regard to flood protection and damage reduction capability in New Orleans during Hurricane Katrina, preventing similar destruction in the future.

According to Link, hurricane protection in New Orleans was designed and developed in a “piecemeal fashion,” resulting in inconsistent levels of protection. “What this report points out is that you have to look at this as a

system and not just as components of that system,” says Link. “You must plan it, design it and create it with all the pieces working together in a consistent way.” In other words, he adds, “If a single levee or floodwall fails, the entire area is impacted.”

These inconsistent levels of protection, says Link, were caused by differences in the quality of materials used in levees; differences in the conservativeness of floodwall designs; and variations in structure protective elevations due to subsidence and construction below the design intended as a result of error in interpretation of datums.

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CHAIR'S MESSAGE

Greetings to our readers. With this issue, as with issues in the past, I am proud to share with you the quality of our faculty, students, staff and alumni. Each segment of our departmental population brings with them something unique and valuable, and we benefit greatly from it.

From Ahmet Aydilek, one of our young faculty members who has been honored by ASCE for his teaching and his research, to the determination of graduate student Anubha Goel to recover from a life-altering accident and continue her important work in environmental engineering, to the continuing dedication of senior research engineer Ed Link to better understanding the impact of Hurricane Katrina and

in the article, is a reflection of the cutting-edge and highly regarded education in project management that we offer graduate students. I am also pleased to announce that our project management citation for undergraduate students has received approval to be converted to a minor. This will serve our undergraduate population well.

Then, on a more personal level, we introduce our readers to one of our talented graduate students who was gravely injured in a car accident just as she was finishing her Ph.D. and heading out into the professional world. Anubha Goel is an inspiration. After many weeks in a coma and numerous injuries including partial loss of her eyesight, Anubha is coming back. She intends to finish her degree and graduate this December.



helping spare others from the same fate, CEE brings together some of the best of individuals. It is my intent and the intent of this newsletter to better familiarize you with these individuals and their accomplishments.

More specifically, in this issue we continue to monitor the developments of IPET, the Hurricane Katrina Interagency Performance Evaluation Task Force which was established by the Chief of Engineers and is lead by our own Ed Link. The task force recently completed the final draft of its report on Hurricane Katrina. Our article shares the findings and what the future holds for not only New Orleans but other areas that could be impacted by such a storm.

In this issue we also focus on our faculty, junior and senior. We profile the environmental engineering research of Alba Torrents, an accomplished researcher and senior faculty member, who has spent the last two decades attempting to better understand the impact of organic pollutants on us and our environment. She and her research group are making important contributions to this field. And, we profile Ahmet Aydilek, an assistant professor, who was recently honored not once but twice by ASCE – once for his teaching and once for his research. He brings with him an enthusiasm for both, and I think our readers will enjoy learning more about him.

Of course, we are always eager to share the activities and accomplishments of our students and our dedication to providing them the best education possible. We are better helping to prepare them for the professional world with our ENCE 320: Introduction to Project Management course, taught by John Cable, director of our Engineering Project Management Program. This course, as readers will learn

Her life is different now, as she says, but she is no less determined to live it fully. No doubt she will do just that.

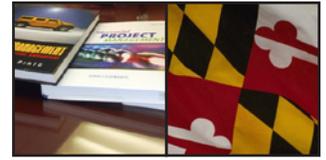
I am pleased to also introduce our readers to one of our staff members, Fabiola Oscal. After initially joining our department as a student worker while studying art, she returned and has remained with us, climbing up the ranks and is now a financial coordinator. She is a key player in the successful running and upkeep of this department. We are glad to have her here.

Finally, we always enjoy sharing with our readers the lives and accomplishments of our alumni. They reflect so well upon the school and this department. This issue we profile Charles (Chuck) Irish Jr. Charles is a second-generation alumnus of this department and engineering school and a member of our Board of Visitors. Charles comes from a long line of engineers and builders, going back to his early ancestors and more recently both his grandfather and father, Charles Irish Sr. Yet, he has made his own mark on the profession through his successful business, VIKA Inc. We are proud to call him one of our own.



Ali Haghami

COURSE PROFILE



ENCE 320: INTRO TO PROJECT MANAGEMENT

Course Helps Students Develop Professional and Life Skills



The A. James Clark School of Engineering and the Department of Civil and Environmental Engineering (CEE) have established a reputation for offering premier programs in project management. Earlier this year, the school and department earned accreditation for three of its graduate degree programs from the Project Management Institute's

Global Accreditation Center for Project Management. In fact, the Clark School was the first engineering school to have programs so accredited and one of only a handful of accredited schools in the United States and worldwide.

But the benefit of these programs is not confined to the graduate level. CEE offers a first-rate undergraduate program too by way of such courses as ENCE 320: Introduction to Project Management. "The undergraduate classes are derived from the graduate-level courses," says John Cable, director of the Project Management Program. "The undergraduate courses benefit from our experience of constantly refining the graduate courses and having that flow down to the undergraduate level."

Both programs, according to Cable, fill a real need in the professional world. "Project management is fast becoming an increasingly essential engineering skill as employers seek engineers who can consistently bring complex projects to fruition," he says.

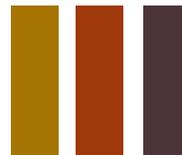
As such, courses like ENCE 320 are much in demand. "It's becoming more and more popular," says Cable, adding that students in his last class of 50 students represented 14 different majors, including architecture and business as well as engineering. The course has become so popular that it will be added to the summer session for the first time next year. "Students are seeing the real value of this course and spreading the word," says Cable.

Former student William Pines is convinced. "I did not realize how relevant the material covered would be until I actually entered into the professional world," says Pines, who graduated with honors in 2004 and is now a design engineer with the Maryland State Highway Administration's Office of Bridge Development. "The course provides the foundation for good people skills and the technical background to better understand the development of projects."

ENCE 320 focuses on the principles and techniques of managing engineering, IT and construction projects from the initiation phase, through planning and execution, to completion and close out. Students emerge from the course with the basic knowledge of the elements of a project, and an introduction to the knowledge and skills necessary to manage engineering and construction projects. Course topics include project initiation, estimating, budgeting, developing work plans, scheduling, tracking

work, design coordination, construction coordination, quality management, managing teams and close out. More specifically and additionally, the course covers such issues as conflict negotiation and meetings; ethics and professional responsibility; and leadership.

"These skills," says Pines, "prepare you for the basics on how to mesh into an organizational structure. Effectively understanding the goals and direction of an organization is very useful, particularly when communicating with managers. This course pushes you through the basics of management, interpersonal skills and project processes, which shifts you further along the learning curve more rapidly."



"STUDENTS

OFTEN TELL ME THAT THEY REALLY DO FEEL THE COURSE IS USEFUL TO THEM IN MANAGING THEIR PERSONAL LIVES AS WELL AS PREPARING THEM TO BE GOOD MEMBERS OF PROJECT TEAMS."

– John Cable, Director of the Project Management Program



And the skills learned are not only useful in the workforce, but outside of it as well. "This course offers two basic values," says Cable. "One, it's a good orientation to project management, of course. Second, a lot of what students are learning is good for life skills. Students often tell me that they really do feel the course is useful to them in managing their personal lives as well as preparing them to be good members of project teams."

Pines agrees. "Some of the personality profiling techniques," he says, "coupled with improving skills like time management, communication, etc., allow for you to be better prepared for both your personal and professional lives."



The Senate Committee on Programs, Curricula and Courses has approved a proposal to convert CEE's citation in project management to a minor. According to Ali Haghani, CEE chair, the minor "will provide students with an excellent overall understanding of the principles of project management." The approval to convert the citation to a minor became effective this past spring. The minor will require a total of 15 credits and include such courses as Introduction to Engineering Project Management; Engineering Contract Law; Project Cost Accounting and Economics; Project Planning, Scheduling and Control; and Decision Analysis for Engineering.



Hormoz Hematian-Borojeni is the recipient of the **2006 Clark School of Engineering Outstanding ASPIRE Student Research Award** for his research conducted under Dr. Ahmet Aydilek's supervision. As an undergraduate research assistant, Hormoz was involved in a project that investigates the spectral analysis of factors affecting roughness in flexible pavements.



A paper written by undergraduate student, **Xiah Kragie**, entitled "Introduction to Developing International Responsibility in Undergraduate Engineering Students," was accepted pending changes by the International Division for presentation at the 2006 ASEE Annual Conference, and publication in the conference proceedings.

Sabrina Golden, a graduate student, has received two scholarships, one from **CMAA National Capitol Chapter** and one from the **Harkins Fellowship**. **Larry Mitros**, an undergraduate student, also received a scholarship from CMAA. **Javier Ordonez**, a graduate student, received a scholarship from the **Stanley R. Zupnik Fellowship**. And, **Boo Young**



Chung, a graduate student, received a scholarship from the **Bechtel Foundation**. All are students of John Cable, director of the Project Management Program.

Correction Note:

In the last issue of Civil Remarks, we reported the following news item with the wrong picture of the student. Here is the correct picture of Andrew Churchill, as well as, the re-print of the accompanying text:



Graduate student **Andrew Churchill** was one of 10 Maryland students, including eight Clark School engineering students and Tau Beta Pi members, who visited the Mississippi Gulf Coast over winter break to help **Hands On USA**, a disaster relief organization. The Clark School helped fund the students' trip to the region. The duties the students performed

included sorting donated materials, gutting houses to be rebuilt and sifting through the debris at a historic mansion in search of lost artifacts.



REPORT FINDS HURRICANE PROTECTION...

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More so, four slightly different Standard Project Hurricanes or SPHs were used in the system and designs for specific structures were influenced by the local conditions. "For example," says Link, "the levee and I-wall system designed for the Orleans Canal was more conservative than that for the 17th Street Canal. The Orleans levee was broader and the I-wall freeboard less. Soil strength assumptions were also more conservative, using the weaker values at the toe instead of the stronger values under the centerlines as assumed for the 17th street levees."

As a result, sections of the hurricane protection system were in many ways overwhelmed by the conditions created by Hurricane Katrina. The initial designs were developed to deal with a specific hazard level as defined in 1965. "However, little consideration was given to the performance of the system if the design event or system requirements were exceeded," says Link. Hurricane Katrina generated water levels that for much of the system significantly exceeded the design criteria. Adds Link, "The SPH process is

outdated. More comprehensive probabilistic methods that consider a broader variety of storm characteristics and storm generated conditions should be used as a basis for planning and design."

In Link's view, this fact further strengthens the argument for

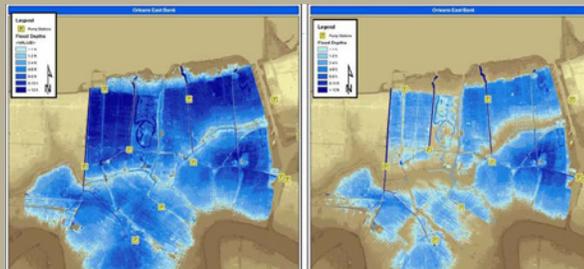


Figure 2: Demonstrates the reduced flooding that would occur if resilient levees and floodwalls were in place. For this section of Orleans Parish, approximately two thirds of the flood waters entered through breaches and one third from rainfall and overtopping. Resilient structures that would not breach when overtopped, would have reduced flooding by 2/3 and reduced losses by about one half.

a national water policy and a more systematic way of preparing for such disasters. "It is important to create a dialogue among scientists, academics and policymakers about these issues," he says. "The way we do this right now doesn't work. Every time we have a disaster like Katrina, we're forced to respond to it instead of being prepared for it."

New Orleans should be better prepared now, having benefited directly from IPET's work. Even as IPET was conducting studies

and preparing its findings, it was incorporating those findings into ongoing repairs to the system. This will continue as part of the planning and design process. And, while some areas remain at risk until the process is completed, "this system will be a much more resilient and effective hurricane protection system," says Link.

Link and his colleagues hope that what has been learned from New Orleans can be used to better prepare other areas around the

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COMING BACK

Graduate Student Anubha Goel Is Determined To Regain Her Life After Near-Fatal Car Accident

The day after Thanksgiving 2005 Anubha Goel was on top of the world. A talented student and eager achiever, she was finishing up her Ph.D. in environmental engineering and had already been approached about working for a top-notch research firm. Taking a break from her studies that November day, she decided to go shopping with a friend.

"I was returning home and my friend was in her car behind me," says Goel. "I was driving in one direction and this truck was coming from another direction. The truck lost control and landed on top of my car."

from them. I began to think about the important things in life. What really matters and spending time with family and friends. Before the accident, I was focusing too much on work and studies."

Admittedly, she was driven, but for a good cause and one that meant much to her – preserving the environment. Even as a teenager growing up in India, she was acutely aware of the environmental issues confronting her country. "I remember traveling to Delhi and seeing firsthand the air pollution problems," she says. "At that time it was very bad. And, I remember thinking to myself, what was causing this

treatment plants to degrade alkylphenol ethoxylates or toxic surfactants using miniaturized biofilm reactors.

"It was my first time out of India," she says. "I was all by myself and interacting with people from a different culture and a different country. It was my first time working in a lab, and I learned so much."

After receiving her master's degree, she knew that she wanted to continue her education and wanted to come to the United States to do so. In looking at schools, she contacted different faculty members. This is how she met CEE Professor Alba Torrents, her future advisor. "I was very interested in her research," says Goel. Goel was awarded a Graduate Fellowship by the University of Maryland and plunged into her studies and research.

Working with Torrents as a research assistant, Goel conducted a comprehensive study to characterize the presence of pesticides in the atmosphere of the Upper Delmarva Peninsula, a predominantly agricultural region in the Chesapeake Bay watershed. She was involved with the project for three years. "I learned a lot from this experience," she says, "from collecting samples to training people to being there as a troubleshooter as problems would arise."

Adding, "It is so rewarding when you understand where something comes from and why it's there," she says. "And then you find out how you can replace it and improve it."

She flourished in her work. The recipient of various awards from technical societies and the recipient of the Dean's Dissertation Fellowship, she is also the author of numerous published papers and has made numerous presentations. "Since I have been here at the university, for 13 years, she has been the student in our program that has received the most student awards at national and international conferences," says Torrents.

Most recently, Goel was the first place winner of the 2005 SETAC Best Student Platform Presentation for her work

● ● ● "THE BIGGEST STRENGTH I HAVE FOUND IS THE WAY THE PEOPLE AROUND ME TREAT ME. THEY TREAT ME AS A NORMAL PERSON. THAT MAKES ME FEEL THAT WHATEVER HAPPENED, WHATEVER I LOST, IT WILL NOT KEEP PEOPLE FROM TREATING ME AS A NORMAL PERSON. IT GIVES ME STRENGTH TO GO AND TRY TO DO WHAT I WANT TO DO. IF THESE PEOPLE BELIEVE I CAN, THEN I CAN."

– Anubha Goel

Firefighters would need to "cut me out of the car," says Goel. "They thought I wouldn't survive." She would. But, it would be a long road back. She had numerous broken bones and had to undergo an eight-hour surgical procedure on her brain. She was in a coma for six weeks, attached to breathing and feeding tubes, and would be hospitalized for the next two months.

Today, Anubha has resumed her studies and plans to graduate this December. But, she is the first to admit that her life is different now. She accepts this with determination and grace. "Sure, I asked why me? What have I done to deserve this? Anyone would," she says. But, "I believe that things happen so that you can learn



and what could be done to improve it?" That curiosity and concern would lead her to study environmental engineering.

The recipient of a University Merit Scholarship, she received

her civil engineering degree in 1999 from the G.B. Pant University of Agriculture and Technology in India. She then went on to receive a master of technology in environmental engineering in 2001 from the Indian Institute of Technology. It was also during this time that she received a scholarship to attend the University of Karlsruhe in Germany and work as a research assistant. While there she was involved with researching the efficacy of

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FACULTY NEWS



Professor **Hani S. Mahmassani** received a **Distinguished Alumnus Award** from the Faculty of Engineering and Architecture of the American University of Beirut this past spring. Mahmassani was honored for his "excellence in research in the fields of transportation systems, transportation planning and

intelligent transportation systems, as well as his outstanding contributions to education." At the award ceremony he delivered a plenary lecture on "Virtually There: Evolving Perspectives on Telemobility and Intelligent Transportation Systems."



Professor **M. Sherif Aggour** is the recipient of this year's **Poole & Kent Outstanding Teaching Award** for Senior Faculty. Aggour, a Fellow of ASCE, was selected in recognition of both his long dedication to teaching and advising Clark School students and his exceptional commitment to educational outreach. He has

won four major departmental and university teaching awards in the last 11 years. At the same time he has developed and implemented an innovative program for training high school and middle school math and science teachers to present engineering concepts to their students. And, he has taught the professional engineering review course for practicing engineers.



Professor **Gang-Len Chang's** Traffic and Safety Operations Lab is working with the state of Maryland to develop new technologies for estimating travel times on sections of some of the state's busiest highways. Chang is collaborating with Maryland's State Highway Administration (SHA). Together they have posted

10 temporary roadside sensors that detect traffic speeds and volumes along a 20-mile segment of eastbound I-70, heading towards the beltway around Baltimore (I-695). As conditions change, estimated travel times are automatically updated on five portable message signs located along the route.

The project is jointly funded by SHA and the Federal Highway Administration. Upon completion of the pilot project, Chang's lab will analyze the data to measure its validity and usefulness to the traveling public.

Chang has also received a two-phase project of \$667,500 from the Maryland State Highway Administration for "Design and Demonstration of a Real-time Traffic Monitoring and Travel Time Prediction System for the Eastern Shore Region." The scope of work," says Chang, "includes setting up 32 sensor stations and communications, monitoring traffic conditions, providing

predicted travel time based on tourist requests, and guiding traffic distributions during hurricane attacks or other emergency evacuation."

Finally, Chang was recently quoted in *The Capital* newspaper of Annapolis in an article titled, "Red Light Cameras Haven't Cut Crashes – Did Collect Revenue." Chang was asked to review statistics and comment on whether cameras had reduced traffic accidents or improved traffic safety at five intersections.



John Cable, director of the Project Management Program, was the keynote speaker at the 2006 Project Management in Practice Conference at Boston University's Metropolitan College in May.

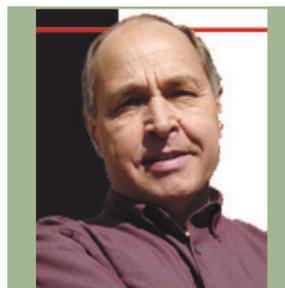
Donald Vannoy was appointed **one of the six governors in the ASCE Region 2 Board of**

Governors. The ASCE Board of Direction during the April 28 meeting approved formation of ASCE Region 2. Districts 4 and 5 will operate under Region 2. Vannoy was appointed to a three-year term beginning in October, but as a transition governor will be serving an additional five months. The first Board of Governors for Region 2 is charged to set the path for the Region.



Professor **Gerald Galloway** has been named an **honorary member of the American Society of Civil Engineers**, an honor bestowed on only 555 members since 1853. Galloway is a retired brigadier general in the Army Corps of Engineers and has served as an expert in the wake of the Katrina disaster, helping the government

assess the area and advising municipalities on how to prevent such calamities in the future.



Faculty members **Lewis E. (Ed) Link** and **Gerald Galloway** recently participated in a ASCE Summit on the Civil Engineer of 2025. The objective of the summit was to bring together leaders from both within and outside the profession to develop a vision of the civil engineer of the future.

"Civil engineering is likely the broadest area of engineering and it serves the public in areas that directly touch them everyday – the water we drink, roads we use, buildings we live in and infrastructure that supports our work and well being," says Link. "As the world and these critical life support systems change in the future, civil engineers must be prepared both in the tools we use and how we apply them to continue to meet these needs. The ASCE Summit was an important gathering of minds to explore what that civil engineering might be like in 2025."

Professor **Mirosław ("Mirek") Skibniewski**, A. James Clark Chair in Construction Engineering and Management, received two new honors for his activities in construction research and education. He was elected as a **Foreign Member of the**

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FACULTY PROFILE



MAKING AN IMPACT

FACULTY MEMBER AHMET AYDILEK HONORED BY ASCE FOR BOTH RESEARCH AND TEACHING

Ahmet Aydilek's life objective, he admits, was to be a teacher and a researcher. In other words, a faculty member. He has found that role as an assistant professor with CEE. "This is what I've always wanted," he says. And, Aydilek not only does the job, but does it very well. Recently, he was awarded two honors by the American Society of Civil Engineers (ASCE) – one for research and the other for teaching.

In recognition of his research, Aydilek received the prestigious 2006 ASCE Arthur Casagrande Award. He was given this award for his contributions to the area of image-based evaluation of geomaterials, geoenvironmental engineering dealing with flow through porous media and remediation of contaminated soils. The Casagrande Award is the highest ASCE research award given to a junior researcher in the area of geotechnical engineering. Previous recipients include faculty members from such leading engineering programs as MIT, UC-Berkeley, UT-Austin, Georgia Tech, Purdue and Illinois.

very popular area of work." After receiving his bachelor's degree in civil engineering from the Technical University of Istanbul in 1993, Aydilek came to the United States and studied at the University of Wisconsin-Madison. There he received his master's degree and Ph.D. in civil and environmental engineering in 1996 and 2000, respectively.

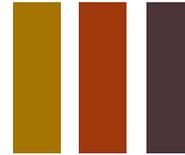
It was while a graduate student that he began to focus more and more on environmental engineering issues. "When I came here as a graduate student it was a very hot topic," he says. "It still is." Adding, "We have to care about our environment and care about sustainability by recycling materials and reusing waste materials in construction. This is going to be very important in the long run."

Aydilek's research focuses on geoenvironmental engineering and geosynthetics. Typical applications of the research include development of soil clean-up technologies and beneficial reuse of waste materials in geotechnical construction. Aydilek's research investigating the possible uses of waste and recycled materials in geotechnical construction have the potential to result in cost savings while simultaneously conserving valuable resources and energy.

His research has included using image-based methodologies to determine pore structure parameters of geotextiles as they relate to clogging and retention. In addition, his success in accelerating and automating an imaging technique has now made it possible to define strain distribution in geosynthetics during tensile strength testing.

In fact, the Casagrande Award is not the first he has received for his research efforts. His work as a researcher and engineer in the remediation of a U.S. EPA Superfund site, studying the capping of high-water content wastes and investigating their interaction with geosynthetics, was recognized with the International Outstanding Achievement Award from the

Industrial Fabrics Association International and the Engineering Achievement Award from the ASCE-Wisconsin Section.



"WE HAVE TO CARE ABOUT OUR ENVIRONMENT AND CARE ABOUT SUSTAINABILITY BY RECYCLING MATERIALS AND REUSING WASTE MATERIALS IN CONSTRUCTION. THIS IS GOING TO BE VERY IMPORTANT IN THE LONG RUN."
– Ahmet Aydilek

As a faculty member conducting cutting-edge research, he is eager to share this experience with his students. Including undergraduate students. "This is a great way to provide students with a whole new dimension of learning," he says.

During his five years with CEE, he has had 13 undergraduate assistants working with him on 18 different projects. "Learning shouldn't be confined to the classroom," he says. But, when it is, he is determined to make certain that students understand the topic he is teaching on the "most basic level."

"What I enjoy most about being in the classroom is going back to the foundations," he says. "I try to be very simple in my teaching and speak to them on their level. I also interact with students, and encourage them to ask me questions. Often times they bring a fresh perspective to the subject, asking questions about what we know and how we know it. I believe in an active environment for teaching."

Even in a department that "immensely values teaching," as Aydilek puts it, he stands out. Described as an "intelligent and compassionate professor, Aydilek was nominated for the ExCEED award by his students. And, he has been the recipient of the 2004 Outstanding Civil Engineering Educator Award from the Maryland Section

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And, for his teaching, Aydilek received the 2006 ASCE ExCEED New Faculty Excellence in Teaching Award. This award was presented to him

for his outstanding teaching record as a junior faculty member; his contributions to the academic and surrounding community; and his proven commitment to civil engineering education.

"This has been a good year," he says with a smile.

Aydilek, who joined the faculty in 2000, became interested in civil engineering while growing up in Turkey. "Construction is a big business in Turkey," he says. "It is a



STUDENT PROFILE

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entitled, "Factors Influencing The Air Concentrations Of Polybrominated Diphenyl Ethers (PBDEs) In Rural Maryland And Delaware." SETAC, Society of Environmental Toxicology and Chemistry, is a global professional organization comprised of nearly 5,000 individuals from more than 70 countries in the fields of environmental chemistry and toxicology, biology, ecology, atmospheric sciences, health sciences, earth sciences and environmental engineering. This award represents the society's most prestigious award for graduate students.

Days before her accident, she had been planning her next move. With her Ph.D. in hand, she was preparing to go into the professional world, working as a researcher on environmental issues. She was talking to a top research firm and was scheduled for a final interview. "I really wanted it. Wanted it badly," she says of the position. And, just two days before the accident, she received an offer for a post-doctoral position at the University of Indiana with one of the top researchers in the field.

Then came the accident. She describes herself now as "perfectly normal." However, her eyesight has been compromised. She lost sight in one eye and is slowly regaining better sight in the other. "It has improved a little bit," she says of her vision. "But there is no guarantee it will continue. If it happens, it happens. If it doesn't, it doesn't."

Goel is adjusting. But, it is frustrating. "As a researcher, most of my work is on the computer and reading papers," she says. "My favorite pastime is reading books. Before the accident, I read all the time. Now, I have to change the way I do things. I don't want to stress my eye. So, I limit the time I read, and I do so on a bigger computer screen. I also listen to audio books, instead of reading them."

Adding, softly, "This has been very difficult to accept."

But, she draws strength, she says from those around her - family, friends and colleagues. "The biggest strength I have found is the way the people around me treat me," she says. "They treat me as a normal person. That makes me feel that whatever happened, whatever I lost, it will not keep people from treating me as a normal person. It gives me strength to go and try to do what I want to do. If these people believe I can, then I can."

"I am amazed at her strength and her determination," says Torrents.

Goel still intends to pursue her career as a research scientist in environmental engineering. And, even as she fights her own battle of recovery, she remains committed to her desire to fight for the environment. "It is so important for me," she says. "I want to bring the state of the environment to the focus of people. People don't pay as much attention as they should. I want to show people this is what is wrong and this is how we can improve it. I want to see cleaner water and cleaner air and a healthier environment. That is what I want to do."



FACULTY NEWS

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Russian Academy of Engineering, an organization similar in scope and mission to the National Academy of Engineering in the United States. Through its foreign members such as Professor Skibniewski, the Academy intends to intensify its contacts and exchanges, and to coordinate various leadership initiatives with counterparts in the United States and worldwide. Additionally, a title of

Honorary Professor was bestowed upon Professor Skibniewski by Moscow State Industrial University (MSIU). As stated in the letter by MSIU rector, "this is the university's highest honor awarded from time to time to internationally prominent academics whose leadership in scholarly work and education of students are of highest importance to the future development of human resources for the industrial base and the economy worldwide." Skibniewski also recently represented the university at a U.S. National Science Foundation invitational workshop in Dubai titled "Civil Engineering Infrastructure Systems: High Performance Materials, Monitoring and Management."



Professor **Deborah Goodings** was selected as a **member of the jury** to judge the World Bank 2006 Global Development Marketplace competition. The World Bank's Global Development Marketplace program identifies and supports innovative small-scale development projects. This year's theme is "Innovations in Water, Sanitation and Energy Services for Poor People."



Senior Research Engineer **Philip J. Tarnoff** has been awarded **\$1 million for a 21-month Urban Area Security Initiative** sponsored by the D.C. Office of the Deputy Mayor for Public Safety & Justice Agreement for Homeland Security. The award is for deployment of the Regional Integrated Transportation Information System (RITIS).

CONGRATULATIONS to Professors **Steven Gabriel** and **Elise Miller-Hooks** on their recent promotions to Associate Professor with tenure.



FACULTY PROFILE

CONTINUED from page 7

of ASCE and has been named a Lilly Teaching Fellow by the university's Center for Teaching Excellence.

For those students who have been in his classroom and his research lab, the experience leaves a lasting impression. As one student says, "I strongly feel that the time I spent with Dr. Aydilek, taking his class and performing research with him, will serve me well in the future."

Adding, "That is really the true test of a great teacher."

STAFF PROFILE



FINDING HER PLACE

Financial Coordinator Fabiola Oscar Is A Great Asset To CEE

Fabiola Oscar initially planned to pursue a career in graphic arts. But fate had a different plan and today she is a financial coordinator with CEE. “I am the kind of person who is intrigued by all types of different careers,” she admits. “It seems so odd that I ended up working in a business office and not a graphic design firm. This just simply came to be.” But, Oscar would have it no other way now. And CEE is the better for it.

● ● ● **“I THINK WHAT I FIND MOST REWARDING AS FINANCIAL COORDINATOR IS WHEN AN ACCOUNT CLOSES WITH NO MAJOR ISSUES. WHAT THIS MEANS TO ME IS THAT WE AS A BUSINESS OFFICE DID A GOOD JOB IN OVERSEEING THE ACCOUNT.”**
– Fabiola Oscar



Originally from Guatemala, Oscar came to the United States when she was five years old and settled with her family in Maryland. As she prepared to further her education after high school, she visited the University of Maryland “on several occasions.” “I liked its size and the various degrees it offered,” she recalls.

Being creative and having a love of art, she decided to take “some architecture classes and eventually ended up with a B.A. in art.” She also began working for CEE her junior year, assisting with graduate student applications. After graduating from the university in 2002, “I went to live in Guatemala for a year,” she says. As the year came to a close, Oscar began applying for different jobs via the Internet in anticipation of her return to the United States.

But it was a visit to friends in the CEE department once she returned that would set her current career path in motion. “I just stopped by to say hello,” she says. She was informed that a job was open at the

department’s front desk. “I was told that I could work for CEE while looking for a permanent position related to my field,” says Oscar. She accepted and, “from there on, I never left the department.”

As different positions became available within CEE, Oscar moved up the ranks, going from office clerk to account clerk III and finally financial coordinator. She adjusted easily. After all, she had been a strong student in math growing up as well as having an eye for art. Gradually, the idea of leaving became

less and less of an option for her. “The major reason I did not leave was because I enjoyed working with the staff,” she says. “Everyone is a hard worker, and we work so

well as a team. We do not work for each other but with each other. It’s great!”

Described by colleagues as talented at juggling a variety of tasks competently and efficiently, Oscar’s job responsibilities make one dizzy at the thought. As financial coordinator, she is responsible for reconciling, preparing and distributing over 100 monthly financial reports; responding to special requests regarding

financial reports, salary summaries and tracking future expenditures; administering contract and grant post-award accounting; and properly accounting for expenditures on contracts and grants for accuracy and



compliance to federal and state regulations; among many, many other responsibilities. “Fabiola is a very hard-working individual and one that I can depend on to lend a hand when there are several important tasks with quick deadlines,” says Lisa Schuetz, CEE’s assistant director of administration. “She has a strong work ethic and is a very caring individual and a genuinely nice person. She always keeps a positive outlook on life.”

“I think what I find most rewarding as financial coordinator is when an account closes with no major issues,” says Oscar. “What this means to me is that we as a business office did a good job in overseeing the account.”

And, while she did not initially plan to pursue this career, “I plan to continue in this career path. I not only plan but look forward to continuing to work with contacts and grants,” she says, “I enjoy the university environment, the people, including faculty,



“FABIOLA IS A VERY HARD-WORKING INDIVIDUAL AND ONE THAT I CAN DEPEND ON TO LEND A HAND WHEN THERE ARE SEVERAL IMPORTANT TASKS WITH QUICK DEADLINES,” SAYS LISA SCHUETZ, CEE’S ASSISTANT DIRECTOR OF ADMINISTRATION.

staff and students. I think the university is a great place to work. It’s fun and it offers a variety of career opportunities. I like that.”



Norine Walker, B.S. '81 urban studies and '83 CE, was recently featured in a new book titled, Changing Our World: True Stories of Women Engineers. Walker was a **project manager for the Woodrow Wilson Bridge Project** and is now starting her own business. Three other Clark School alumnae were also featured in the book, including Judith Resnik, an astronaut who perished on the 1986 space shuttle Challenger.

Additionally, Norine also received the **Conference of Minority Transportation Officials Trailblazer Award**. The award recognizes women who have made significant contributions to the transportation industry in the Washington Metropolitan area.



Scott Anderson, who graduated from the university with bachelor degrees in mathematics and civil engineering in 1994, is project executive for Charles Pankow Builders, Ltd., in the San Francisco Bay Area. Anderson joined the company in 1995 immediately after receiving his master's degree in structural engineering from

Stanford. He also had the honor of being named to the advisory council for the Charles Pankow Foundation which is dedicated to "providing the public with improved quality, efficiency and value of buildings by advancing innovation in design and construction." The foundation, says Anderson, distributes over \$1 million dollars annually in support of its mission. Anderson is married to fellow former University of Maryland civil engineering student and former local ASCE chapter president **Sarvinder Manku**, who also received her degree in 1994, and the couple now have two sons.



Former Ph.D. student **Nur Yazdani** has been appointed **chair of the Civil and Environmental Engineering Department at the University of Texas at Arlington**. Yazdani was formerly with Florida A&M University - Florida State University, where he was a professor, the graduate coordinator and the director of

the Infrastructure Research Laboratory. His research interests include structural engineering; concrete/timber bridge design, evaluation and rehabilitation; concrete properties; and infrastructure disaster mitigation, preparedness, response and recovery. He is well known in Florida for his development of in-home hurricane shelters and his strengthening of coastal construction and building codes.



Peggy Johnson, who received both her master's and Ph.D. degrees in civil engineering from the university, has been named **department head for the Department of Civil and Environmental Engineering at Penn State**. Johnson's primary research interests are reliability and uncertainty analysis, river hydraulics, bridge scour, stream restoration, watershed modeling and probabilistic modeling. Johnson, who received her bachelor's degree in geology from New Mexico State, was an assistant professor with CEE prior to joining Penn State where she became a full professor in 2003. While at the University of Maryland, she was the recipient of a Lilly Teaching Fellow Award and the National Science Foundation Young Investigator Award; among other honors.



David Mongan, who received his bachelor's and master's degrees in civil engineering from the university, has been named **president-elect of ASCE**. Mongan is the president of the architecture and engineering firm Whitney, Bailey, Cox and Magnani in Baltimore. Mongan, who also holds an MBA from Loyola College, has served as

ASCE treasurer, Zone I vice president and District 5 director. The Maryland Section named him its 1998 Civil Engineer of the Year and the Engineering Society of Baltimore did the same the following year. In 2003, he was honored with ASCE's William H. Wisely American Civil Engineer Award.



Recent Ph.D. graduate, **Jose Fariá** has accepted a position as an **assistant professor with the Department of Construction Management at Florida International University**. He will be teaching graduate and undergraduate courses in the areas of cost estimation, scheduling and operations research. Faria says that

he will "continue the research on land development started at the University of Maryland but with a new focus from the point of view of construction management."



Sarmad (Sam) A. Rihani, M.S. '02 CE, has been elected to serve as **chairman-elect** for 2005-2006 of the Structural Engineers Association of Metropolitan Washington, D.C.



“ENGINEERING IS IN OUR BLOOD”

Charles Irish Jr. Continues Family Legacy in Building Industry

Charles Irish Jr. comes from a long line of engineers and builders. “Tracing our lineage back to the 1700s and our earliest ancestors in this country, so many were involved with building one way or another, as carpenters, builders, surveyors or engineers,” says Irish.

Irish is the latest chapter in that family legacy that includes his grandfather, a carpenter, and his father, Charles Irish Sr., who has built a successful career with the Whiting-Turner Contracting Company during the past five decades and is the company’s chief operating officer.

“Engineering is in our blood. I really believe that,” says Irish.

For Irish, who followed his father, a 1952 graduate, to the University of Maryland’s Civil Engineering program and graduated with honors in 1974, the allure of civil engineering was the ability “to basically design your community,” he says. “I have always been the type of person that wanted to do things for himself. If I saw a better way of doing things, I wanted to do it that way.”

Irish has been doing just that for over 25 years as the co-founder of VIKA Inc., which provides engineering, planning, landscape architecture, surveying and GPS services. Irish, who is the company’s chief operating officer, helped create the company in 1980 at the tender age of 27. Today, the company has two offices, one in McLean, Va., and one in Germantown, Md.; employs 140 people; and has annual billings in excess of \$20 million. VIKA is listed 20th on the [Washington Business Journal](#)’s list of the largest engineering firms in the Washington, D.C. area, and its client list includes government, commercial, industrial and residential developers.

The success of the company, whose name was formed from the acronyms of each of its founders last names, has “far exceeded my expectations,” says Irish.

But, Irish was on a career path early on. And, it would have been hard for success

not to have found him. Even while a student at the university he went to work. “I worked as a laborer for the field operations of Whiting-Turner and then joined Maddox & Associates in Bethesda, Md., as a project surveyor and engineer,” he says. He would remain with Maddox & Associates Inc., after graduation, working there from 1973 to 1980. His duties would expand such that by 1976 he was responsible for the firm’s field survey and computing operations.



As a student, Irish found his college experience beneficial. He says he received a top-rate education at the university and something more. Irish, who was inducted into the Tau Beta

Pi and Chi Epsilon honor societies, was also president of the Resident Hall Association on campus, the governing body for all dorm students. “It offered this broad-range, cross-section of experiences,” he says. “It prepared me well.”

Shortly after graduating and even though he was already working with Maddox & Associates, Irish interviewed with Whiting-Turner, his father’s company. Although, his father was and is still a known-name in the industry, he never “pushed me into this business,” says Irish. Irish Sr. did see potential in his first-born child and only son. In an effort to avoid the appearance of nepotism, however, “he suggested that I interview as Charles Allen, my middle name,” recalls Irish with a grin. “No one knew I was his son.”

But, “I wasn’t as interested in construction as the design side,” says Irish. While he may not have joined his father at Whiting-Turner, Irish credits the elder Irish with letting his son find his own way, while always “being there, nurturing and encouraging me. My way of doing business, this idea of exceeding our clients’ expectations and focusing on their needs, all came from him,” says Irish.

In 1977 Irish’s career path took a temporary detour. He joined the Peace Corps. “I wanted to give something back,” he says. “I feel that it should be a part of our spending time here. We all need to find our own way of giving back and doing something for the world we live in.”

Working as a civil engineer and planner with the mayor’s office in the city of Cagayan de Oro in the Philippines, Irish was responsible for the creation of the Slum Improvement and Resettlement Program, which included procurement of topographic surveys of slum areas and schematic design of the rehabilitation program. Under Irish’s direction, a funding request was prepared and presented to the World Bank for the program.

The experience was in many ways life-changing. Irish saw the world in a different way. He recalls staying in a two bedroom hut with a local family. “The husband and wife and four kids stayed in one bedroom. They gave me the other,” he says.

Meals consisted mostly of rice and fish, with Irish being given the fish, while the family ate just rice. These events disturbed Irish. “Then I realized that it was an insult not to take the fish. It was an insult not to take the bedroom,” he says. “These people with their relatively modest accommodations were proud to share. They wanted to give the best of what they had to me.”

Irish returned home and resumed his work with Maddox & Associates as a project manager, responsible for many of the firms engineering design projects. But, for some time he and several colleagues had talked of starting their own business. In mid-1980 they decided to take the plunge. Irish recalls those days fondly. “I was a little young and relatively new to the business,” he says. “In order to make this succeed you had to be chief cook and bottle washer, and you name it. We grew, but by the seat of our pants.” Their approach to seeing the “big picture,” as Irish puts it, was and is valued by those working with them. “We’re not just focused on our little part of a project, but how our part fits into the overall scheme of things. We’re an integral part of the team,” he says.

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PICTURE PROFILE

ENGINEERS WITHOUT BORDERS

THAILAND AND ECUADOR - 2006

ENGINEERS WITHOUT BORDERS UMCP HAS TAKEN ON THE



Baan Bo Mai, Thailand 2006

Many hill tribes who live in northern Thailand are refugees, pushed out of Burma/Myanmar by the footsoldiers of that repressive regime. They are among the poorest in the world, industrious, yet with little opportunity in a non-cash economy, living as subsistence farmers, seldom owning the land they farm.

Baan Bo Mai is one village of 200 Lahu people, 10 miles from the Burmese border. The village includes 30 orphans, sheltered by Japhu and Naomi. Baan Bo Mai gets its water now from an agricultural line that draws water from a reservoir in which water buffalo drink. The contamination from the buffalo and the silt from runoff in the rainy season, make the water unsuitable for drinking – although drink it, they must – and unreliable, clogging the pipeline with silt.

An assessment team — two students (Tom Wild and Eli Goldstein); an environmental engineer (Teresa DiGenova with Black and Veatch); and one civil engineering professor (Deborah Goodings) — traveled to Thailand last January to evaluate the problem, and to collect engineering data for design of a water line from a mountain stream. In June, they returned with a third student, Emily Kloc, and they started the phase 1 implementation. Phase 1 involved construction of the water collection system and the start of the pipeline. All excavation is done manually, using hoes, picks and machetes; picking cobbles out of the riverbed by hand; and moving boulders with levers and sweat. Villagers, both women and men, toiled with the students – and more ably than the students, to install the uppermost section of the system.

The EWB team will return in January 2007 to implement phase 2. EWB will take more students, practising engineers, the generosity of gifts to the chapter for travel and materials, and the power of engineering. For more information on EWB, please visit their website at www.eng.umd.edu/ewb or contact Dr. Deborah Goodings via email at goodings@umd.edu.

Join us.



Chancellor Brit Kirwan hosted a Chautauqua event at his Hidden Waters home for EWB students and practising engineers in May 2005. The students showed off their accomplishments – building an award winning clinic for hill tribes in northern Thailand; and constructing a water supply, storage, and chlorination system for a village in Ecuador – and they sketched out their plans for three new projects in Thailand, Ecuador, and Brazil. Over lunch, they talked about project logistics and practical design issues they have faced and solved. The engineers were uniformly impressed with the energy and the dedication of the students, and the engineering challenges they have overcome.

CHALLENGE OF PROVIDING SAFE AND RELIABLE WATER TO THE VILLAGE AS ITS SECOND PROJECT IN THAILAND.



Uduzhapa and Conseco, Ecuador 2006

In June 2006, an Engineers Without Borders-University of Maryland team successfully completed the implementation of 39 pour-flush latrines in Uduzhapa and Conseco, Ecuador.

The two villages, located in the Andes Mountains and home to approximately 180 people, previously lacked any type of potable water supply and sanitation system. Local governments are in the process of providing suitable drinking water, but EWB-UMCP was able to solve the sanitation issue by constructing individual latrines at each house in the communities.

The latrines built contain human waste in rock-lined pits in the ground which will greatly reduce the contamination of the ground water supply and the current water source, irrigation ditches that run throughout the villages.

“TO THE VILLAGERS, CLEAN WATER, WHICH WE ENJOY EVERYDAY IN AMERICA, IS A PREVIOUSLY UNACHIEVABLE DREAM. THE GRATITUDE OF THE VILLAGERS WHEN WE ENGINEERS ARRIVE IS EQUALLED BY THE COMMITMENT OF THE STUDENTS. THIS IS IMPORTANT, IF SIMPLE, YET TRANSFORMING ENGINEERING – FOR THE VILLAGERS AND FOR OUR STUDENTS.”

— Dr. Deborah Goodings





CURRENT RESEARCH

AN ENVIRONMENTAL IMPACT

RESEARCH FOCUSES ON BETTER UNDERSTANDING PERSISTENT ORGANIC POLLUTANTS IN THE ENVIRONMENT

Seemingly harmless day-to-day items, such as antibacterial soap, are in fact having a grave impact on the environment and we as its inhabitants, says Professor Alba Torrents. “In the last decade, the increased use of antibacterial agents in soaps, pharmaceuticals for human and animal consumption and surfactants and flame retardants in consumer products has increased in the concentration of such chemicals in the environment.”

Of particular concern is the affect of organic pollutants on the endocrine system, referred to as endocrine disrupters. The affect of these pollutants on the network of glands and tissues that secrete hormones has resulted in such oddities as the feminization of male fish in rivers that received significant inputs of municipal wastewater effluents.



According to Torrents, a recent study by the USGS reported that a variety of compounds

classified as endocrine disrupters are present in U.S. streams. “These compounds,” says Torrents, “are considered emerging organic pollutants because many of them are not yet regulated as water contaminants and their affects widely unknown. Yet, they are known to pose threats to aquatic life and human health.”

With no apparent end in sight. “As our dependence on synthetic chemicals increases, the quantity and variety of synthetic chemicals being used and released into the environment rises rapidly,” says Torrents.

Through her research, Torrents is attempting to better understand the persistence, mobility and toxicology of these organic pollutants. “There are so many unanswered questions,” says Torrents, who has been conducting research in this area for the past 20 years. “But, we are learning more and more as we develop new analytical methodologies to detect lower and lower levels of these chemicals.”

Torrents’ work is focused primarily on the presence of persistent organic pollutants in natural waters and the capability of wastewater treatment plants to remove such chemicals from their effluents. “The world’s water supply is a finite resource and an increasing and significant fraction of the flow of many rivers consists of municipal and industrial wastewater effluents,” explains Torrents. “The discharge of large volumes of wastewater can result in the exposure

of humans and aquatic organisms to a variety of different wastewater-derived contaminants including several carcinogens and endocrine-disrupting compounds.”



“AS OUR DEPENDENCE ON SYNTHETIC CHEMICALS INCREASES, THE QUANTITY AND VARIETY OF SYNTHETIC CHEMICALS BEING USED AND RELEASED INTO THE ENVIRONMENT RISES RAPIDLY.”
– Professor Alba Torrents

Torrents and her research team working with researchers at ARS-USDA are currently conducting several case studies. These include the study of alkylphenol ethoxylates, a widely used family of surfactants in wastewater treatment plants and their fate and transport in a sub-estuary of the Chesapeake Bay that receives significant water treatment plant effluent; and a study of brominated flame retardants and their introduction to the environment through the land application of biosolids and the use of wastewater treatment plant effluents for irrigation.

“The results from these studies will help to determine the fate of wastewater-derived contaminants after they are discharged,” says Torrents, who has a bachelor’s in chemistry and a master’s in organic chemistry from the University of Barcelona and a master and Ph.D. from Johns Hopkins University in environmental engineering.

Adding, “Ultimately, it also may be possible to use our knowledge to identify ways of using natural treatment systems, such as engineered wetlands to remove contaminants from wastewater effluents or altering the wastewater treatment plant’s process to optimize their removal.”

Torrents stresses that there is a real need to systematically develop protocols to study the fate of such chemicals through a wastewater treatment plant and their eventual release and fate in the environment. However, “Most of the regulations that should be in place with respect to the use and discharges of such chemicals are not there yet,” she says.

“We all as consumers need to be educated. Companies manufacture what they sell,” says Torrents. “We all feel that we need to buy antibacterial soaps for our daily consumption without a clear indication that they provide much additional protection. Yet, we don’t think that we may be contributing to the development of antibacterial-resistant bugs. We and our policymakers also need to learn from the past. We ban one chemical and replace it by another, creating a whole new set of environmental concerns. We don’t seem to be able to learn or to be able to anticipate the environmental impact of so-called new chemicals introduced in consumer products. We all need to be educated as consumers on what we use and the final destination of the products that we use.”

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