CoHemis... Update

15th Anniversary

Overcoming through cooperation

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In an effort to combine the interdisciplinary aspects found in Biotechnology and its importance as an instrument or platform in Puerto Rico's economic development and education; CoHemis developed a summer camp: Learning Biotechnology in Teams through Research and Interdisciplinary Centers (BETTeR-IC), which took place during July 10-16, 2006 in the University of Puerto Rico at Mayagüez (UPRM). One of the innovative aspects was first time combination of high school students (20), Puerto Rican teachers (4) and international educators (4) that formed educative teams (ET). Each ET consisted of 4 students, 2 local and 2 international teachers. The ET also counted with Industrial Biotechnology (IB) Students of the UPRM that served as mentors.

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CoHemis fifteenth anniversary

Transition of CoHemis' directors from the founders to the present

Ahead of the future. Fifteen years ago, when globalization was hardly mentioned, an endeavor was beginning at UPRM thanks to the collaboration of educational and research institutions with a multidisciplinary focus aiming to improve the quality of life in countries located in the occidental hemisphere. This vision, still in the 21st Century, served as a guide to impulse at the beginning of the last decade a group of educators and academics committed in starting labors in the Center of Hemispherical Cooperation in Research and Education in Engineering and Applied Science (CoHemis) with a main office in the University of Puerto Rico at Mayagüez (UPRM). According to its current director, Dr. Fernando Gilbes, the most overwhelming success of the organization is that it currently has a consortium that includes 48 institutions in 19 countries of the Americas, Caribbean and Spain, of which 35 are universities and 13 are science and technology institutions. "The main goal during these past 15 years has been the formation of a consortium where institutions collaborate through mutual agreements", stated Gilbes while accepting the challenge of maintaining a network due to distance barriers, although technology has helped reduce them. The director explained that what was first envisioned as a project for countries of the hemisphere has recently expanded with the inclusion of two affiliates in Spain. Likewise, among its trajectory, CoHemis has been responsible for organizing countless conferences, workshops, courses and forums of local and international relevance, as part of its mission to promote the development of human resources, technology, programs that benefit research, and educative initiatives in science and engineering.

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Fourth meeting of remote sensing and GIS

To develop more efficient planning, obtain a balance between urbanism and the forest and to facilitate research experiences are just a few contributions made by Remote Sensing and Geographic Information System's tool. The multidisciplinary use demonstrates just how relevant they are in order to understand natural processes and the accelerated changes the country is confronting. This was confirmed at the Fourth Meeting for Remote Sensing and Geographic Information System organized by CoHemis at the University of Puerto Rico in Mayagüez (UPRM) on September 29, 2006. The event gathered representatives of academia, government and the private sector where they offered conferences concerning recent studies, services and projects in which this technology is used. "It's an example of how to different people from the society unite in a common forum" commented Dr. Fernando Gilbes, Director of

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IN THIS EDITION:

Forum of renewable energy

The Forum for Sustainable Development: renewable sources of energy was celebrated with the purpose of creating awareness in regard to existing excessive development and to offer opinions to prevent deteriorating natural resources. The educative event, that was organized by CoHemis, took place on March 29, 2006, in the Auditorium of the Department of Civil Engineering of the University of Puerto Rico at Mayagüez (UPRM). "We should start accepting that the development of our planet should endure sustainability. In other words, to achieve, not only economic goals, but social and environmental ones that increase equality and reduce the pressure on the environment and non-renewable resources", emphasized Dr. Fernando Gilbes Santaella, Director of CoHemis, while highlighting the importance of this type of activity.

The forum gathered approximately 200 participants that demonstrated great interest in each of the presentations offered by the experts. The informative session started off with talks by Drs. Gerson Beuchamp and Agustín Irizarry (Department of Electrical Engineering) and Dr. Jorge González (Department of Mechanical Engineering). Dr. Beuchamp's talk was about the Solar House project and its perspective for the island.

Dr. Irizarry spoke about the generation of eolic energy (by wind). Meanwhile, Dr. González's presentation was related to the generation and cogeneration distributed as sustainable alternative. Also, Dr. Neftalí García, Director of Scientific and Technical Services, Inc., talked about the environmental aspect of sustainability. In Dr. Irizarry's judgment, the lack of information and of defined goals in the energy policy of the government are the reasons why in Puerto Rico there is no alternate system of eolic energy. He mentioned that the main advantage of energetic generation by wind is that it doesn't contaminate. Another advantage is that it is free, abundant and renewable. On the other hand, he explained that one of the precaution factors is the possible impact of birds and bats in the windmills. Dr. José Colucci, Associate Dean for Research of the Engineering Faculty and who also participated in the forum, said that technology by wind can be implemented within the next five years.

Studies conducted by Dr. Irizarry suggest the feasibility of constructing wind parks that provide part of the electrical energy that the country consumes. Precisely, during his presentation, Dr. Javier Quintana, Director of the Administration for Energy Affairs in Puerto Rico; announced that an eolic park is being considered in Guayanilla. The investment for the project varies between 50-60 million dollars and it would be funded by the private sector. He also informed that his office is working in updating the wind maps of the island. Besides this effort, that is being, Irizarry commented that there are not enough windmills to impact the effect of generating electricity in Puerto Rico. He mentioned the efforts of some community members and agricultures that have opted for this alternative. During the forum, photographer and businessman Juan Luis Valentín explained his experience with windmills. In his case, the cost of bringing electricity to his residence surpassed $5,000. Juan Luis Valentín decided to consider other options and exhaustively investigated and learned about the topic. As a result, he acquired a windmill and solar plaques for a close investment of $12,000. "I prefer giving myself the money as a gift rather than paying it to the Electric Energy Authority". He added, that his house has been functioning with eolic and solar energy for three years.

From left to right: Dr. Agustín Irizarry, Dr. Gerson Beauchamp and Dr. Jorge González

The forum established the importance of education. "We want to create conscience about all the changes that are occurring in our island and in the planet from a development point of view. We are participating in excessive development, destroying natural resources and losing the perspective that our planet has renewable resources", insisted the Director of CoHemis. He also sustained that "education is crucial in order to start moving towards establishing specific goals that allow us to improve". The energetic problem is very complex and various methods of renewable energy should be combined. "The beauty of these forums is that all of the sectors that have to interact are represented so they each know the role they have to perform", concluded Colucci.

In this section we publish news and events carried out by members of the CoHemis Consortium

Study of hurricanes in PR and Colombia

In July 2005 we received the visit of Dr. Juan C. Ortiz Royero, professor of the Universidad del Norte, Barranquilla, Colombia. Dr. Ortiz worked in a jointed research with the Physical Oceanography Laboratory of the Department of Marine Sciences of the University of Puerto Rico at Mayagüez (UPRM) with Prof. Aurelio Mercado, developing the research proposal and conference topic Surveying Bathymetry Data and Preliminary Results of the Impact of Hurricanes Category 1, 3 and 5 in the Atlantic Ocean Coastal Zone (Costa Caribe Colombia) under the agreement between UPRM and the "Universidad del Norte".

In the conference, Dr. Ortiz discussed the purpose of his study, which was based on evaluating the exposure of the coastal zone at a preliminary level of the Atlantic Department vs. the impact produced by the extreme winds of a hurricane category 1, 3 & 5 according to the Saffir-Simpson Scale, starting from bathymetry measures up to 10 m deep and waves supplied at high seas by DIMAR (Dirección General Marítima del Gobierno Nacional de Colombia) in order to provide the direction and determine the circumstances and probable impact of this kind of threat in the beaches of the Atlantic Department, giving those responsible for helping and potential victims, an idea of the magnitude of the threat.

In order to simulate the impact of this type of event, mathematical models for hurricanes (like HURWIN) and parameters of extreme conditions (Young, 1988) are used. Once established in the areas of interest, they are utilized as data entry for wave models (like SWAN), that produce a mesh of results of the studied area where physical variables such as: the height of the wave, period, wave turbulence, etc. are specified.

The fourth LACCEI conference was celebrated at the UPRM

The University of Puerto Rico at Mayagüez (UPRM) hosted of the Fourth Annual Conference of Engineering and Technology of Latin America and the Caribbean that is offered by the Latin American and Caribbean Consortium for Engineering Institutions (LACCEI). The activity took place during June 21-23, 2006 in our campus under the slogan "Breaking Frontiers and Barriers in Engineering: Education, Technology and Practice". In the event, the Chancellor of the UPRM and past Co-Director of CoHemis, Dr. Jorge I. Vélez Arocho, took on the presidency of the Governing Board of the organization that includes 50 educative institutions from America and Spain. The trajectory of other academics was also acknowledged.

"It is a unique opportunity to advance in our agenda in research and education" said the Chancellor after thanking the Municipality of Mayagüez for their support in the organization of this event. Meanwhile, he expressed feeling honored in accepting the presidency of this educative entity that represents an important number of countries in Latin America, the Caribbean and Spain. "It is recognition for our Institution and for Puerto Rico" affirmed Vélez Arocho during a press release held at the Research and Development Center of the UPRM, accompanied by the Mayor of Mayagüez, Hon. José Guillermo Rodríguez. "The Municipality of Mayagüez joins as city host in this event in close collaboration with the College of Agricultural and Mechanical Arts and the group that is organizing the activity", expressed the Mayor. The Municipality designated a support committee, presided by Esq. Víctor Negrón, to coordinate the events that complemented the congress' workshops. "It is another opportunity so that the "Colegio" can stand out for its milestones" concluded the Mayor.

Dr. Ramón Vásquez, Dean of Engineering and Dr. Ismael Pagán Trinidad, co-organizer of the event LACCEI and Director of the Civil Engineering Department at UPRM

UPRM and the municipality of Mayagüez join forces to celebrate LACCEI 2006. From left to right, Esq. Víctor Negrón, Mayagüez Mayor's assistant; Dr. Fernando Gilbes-Santaella, CoHemis' Director; Dr. Jorge I. Vélez Arocho, UPRM Chancellor; Hon. José Guillermo Rodríguez, Mayagüez Mayor; Dr. Ismael Pagán-Trinidad, president of LACCEI 2006 Organization Committee; Dr. Ramón Vásquez, UPRM College of Engineering Dean; and Dr. Luis A. Godoy, Tech. Committee Director.

The fourth conference provided for the discussion of topics like bioengineering, sustainable engineering, biotechnology, agricultural engineering, infrastructure engineering, academic curriculum in this discipline, among others. Dr. Ismael Pagán Trinidad, Director of the Department of Civil Engineering and President of the organizing committee stated that they received more than 200 participants from 15 countries among them, graduate and undergraduate students from Puerto Rico and other countries. The engineer's opinion is that the purpose is to motivate and facilitate the collaboration among universities in the areas of research, teaching and service. "We want to impulse the exchange of faculty and students, joint research and the support of standard educative initiatives such as accreditations affirmed Pagán Trinidad.

The Director of CoHemis indicated that this activity allows for the establishment of collaboration agreements with LACCEI. "We are very committed with this activity and have already started conversations of collaboration that will benefit both organizations" said Dr. Fernando Gilbes. CoHemis was the local organizer of the event.

About us - CoHemis ...Update

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Making the difference: alumni 2011

With the purpose of providing undergraduate students of our campus with educative instruments and experiences to develop leadership, civil consciousness, social commitment and professional excellence, a group of professors have joined together to create **ALUMNI 2011**. The expectation is to start with freshman students 2006-07 (which will be graduating between 2010 and 2011), and motivate them in the development of initiatives towards the formation of professionals with ethical principles in diverse social-cultural contexts. The motto of ALUMNI 2011 is "Towards educative, professional, and personal success". The multidisciplinary team of professors is composed by Prof. Luisa Seijo Maldonado (Social Sciences), Dr. José I. Padovani (Chemistry), Dr. Camille Cruz (Hispanic Studies), and our Co-Director, Dr. Carlos Ríos Velázquez (Biology). During August, meetings with the freshman students were being offered two times per week, since the students had received a prior appointment with one of the participating professors of ALUMNI 2011 during the orientation week.

Team Azairus

In the first meeting, faculty explained the concept of ALUMNI 2011, offered a workshop entitled **"My Life Goals: Contract of Dreams"**, in which the students prepared a model of their personal life project related to their student life and professional future, besides participating in visualization and verbalization exercises for their future, and of what they want to achieve. After this exercise, the students were asked to form an ALUMNI 2011 team in which they chose a name and described the ways the faculty can support them. Six teams were formed, among them, Azairus (in Latin: New Destiny) and Bajarí (in Taíno: Excellence). The students received another workshop entitled **"Planning my Academic Success",** where they had to prepare a program with time distribution and strategies that would help them academically succeed. In CoHemis, we consider that this activity can serve as a model offering support to freshman students in educative, international centers, allowing the discussion of topics related to personal academic and professional aspects; strengthening and valuing academic and professional integrity and common well being.

Team Bajarí

SciTeCC 2006– Computational systems biology (CSB)

Last April 27, 2006, CoHemis offered the First Science and Technology Congress (SciTeCC) in the auditorium of the Department of Biology at the University of Puerto Rico at Mayagüez (UPRM). The SciTeCC 2006 theme was ***"Computational and Systems Biology (CSB): An interdisciplinary and integrative discipline in research and education".***

The activity united researchers and directors of the initiatives for Computational and Systems Biology (CSBi) of the Massachusetts Institute of Technology (MIT) and faculty and researchers of the UPRM in disciplines such as engineering, mathematics, computer science, chemistry, among others involved in projects related to this topic. The congress emphasized the applications of CSB, the development and use of new technology and educational aspects at faculty undergraduate and graduate level.

SciTeCC had two discussion sessions about new tools and strategies for the understanding of systems to global level, in research and education in System Biology

SciTeCC 2006 had visitors (students & faculty) of diverse educational centers such as the Pontifical Catholic University of Puerto Rico (Ponce), Inter American University of Puerto Rico (San Germán & Arecibo) and the University of Puerto Rico (Arecibo, Bayamón, Humacao & Utuado). As a result, SciTeCC fulfilled one of its most important goals: serve as platform for communication networks and collaboration initiatives in science and education. The participating speakers in SciTeCC expressed how satisfied they were of being part of such an important forum, and especially, for the active and strong participation of the students present among the audience.

As part of the activities of SciTeCC 2006, a poster presentation was exhibited in the corridor of the New Biology Building by student associations: Biology Students Association, Industrial Biotechnology Students Association, Biology Honor Society, Industrial Microbiology Student Association, and Puerto Rican Society for Mycology Student Chapter. The activity was transmitted via Internet, allowing members of the CoHemis Consortium from all over the hemisphere to see it live.

Dr. Nika Stoop, she's a scientist developing resources in the initiative of CSB at MIT; she informed the students about opportunities available at MIT to study System Biology .

Dr. Bruce Tidor; Director of the PhD Program in CSBi at MIT.

Activities co-sponsored by CoHemis

ACEER promotes renewable energy in Puerto Rico

On October 18, 2006, an initial meeting took place in the CoHemis Conference Room where the idea of ACEER (Community Alliance for Education in Renewable Energy) was developed. ACEER is a non-profit organization focused in educating the community about energetic affairs in Puerto Rico and the Planet, responding to the needs of residential, commercial, industrial and governmental consumers with renewable and sustainable solutions.

ACEER is composed of volunteers and entities that represent diverse communities, ecologic, civic, commercial, industrial, professional and academic sectors. Efforts are being made so that in the near future the organization can closely collaborate and interact with governmental sectors at state and municipal levels, in order to assure the efficiency in the generation and consumption of energy.

During years 2007-08, the main focus will be organizing and offering a series of conferences directed to a diverse audience throughout the island. The activities include commercial and industrial fairs with high visibility demonstrative projects in the area of renewable energy. The cycle will conclude with an International Congress for Renewable Energy organized by CoHemis. All of the events will take place in Mayagüez, Puerto Rico.

ORGANIZING TEAM

Dr. Fernando Gilbes Santaella, Director of CoHemis, UPRM; **Dr. Julia S. Mignucci**, Mayagüezanos Por la Salud y el Ambiente; **Dr. Ana Navarro**, Sea Grant, UPRM; **Prof. Ariel Ramírez**, Associate Dean, Agricultural Extension Service, UPRM, **Dr. Gerson Beauchamp and Dr. Sandra Cruz Pol**, Department of Electrical Engineering, UPRM; **Eng. Ernesto Rivera**, Renewable Solutions, VITEC; **Dr. Edwin Irizarry Mora**, Department of Economics, UPRM.

ACEER conferences will take place in the Mayagüez Cultural Center during the following dates: August 18, November 10, 2007 and February 23, 2008. For additional information, contact us at:

cacique.uprm.edu/aceer.

Promoting biological nitrogen fixation research in the Caribbean course in Dominican Republic

Biological Nitrogen Fixation (BNF) is the process by which certain bacteria can use atmospheric nitrogen (N_2) and produce a reduced form of N that can be assimilated by plants and other organisms. It is a process of fundamental importance in the cycling of N, both for aquatic and terrestrial ecosystems. Leguminous plants establish a symbiosis with bacteria of the family *Rhizobiaceae*, and either do not need N fertilizers or can provide soil nitrogen for non-fixing crops. Its application in agriculture involves natural nodulation by bacterial strains in soil or by artificial inoculation. The industry of inoculant production has been in existence for more than 100 years. However, many countries do not have inoculant production or the technical expertise to study the process.

In order to promote this research and technology in the Dominican Republic, a course was organized in Santo Domingo during November 21-26 of 2005. It took place at the School of Biology at Universidad Autónoma de Santo Domingo (UASD). It was sponsored by CoHemis,

Dr. Eduardo Shcröder (in the middle with glasses) with the participants of the course that he offered in Dominican Republic

the Caribbean Rhizobium Group (Proyecto ATLANTEA) and UASD. The course was organized by Dr. Eduardo C. Schröder (UPRM Department of Agronomy and Soils) and Lic. Altagracia Espinosa (UASD). Other invited professors included Dr. Brelles Mariño (California State University, USA), Dr. Germán Hernández (Suelos, Cuba) and Dr. María Valdés (IPN, México). Local professors included Lic. Elfrida Pimentel (UASD), Ms. Adriana Bueno, and Lic. Ricardo García (Jardín Botánico and UASD). Fourteen participants, mostly researchers at "Instituto Dominicano de Investigaciones Agrícolas y Forestales" (IDIAF), attended the course. Topics discussed during the course included nitrogen cycling, methods, free-living and symbiotic systems, mycorrizae and inoculant production and use. Future cooperation will be conducted through a local Committee responsible to stimulate training and research in BNF, and two of the participants (Glenny López and Feliciano Andujar) are now studying their M.S. in the Soils Program at UPRM.

Use of remote sensors in costal zones

This conference was offered by Dr. Carlos E. Del Castillo, oceanographer from Stennis Space Center of the National Aeronautics and Space Administration. Dr. Del Castillo is a distinguished alumnus of the University of Puerto Rico at Mayagüez (UPRM) who recently received the prestigious award "Presidential Early Career Award". This award is presented by the President of the United States for important contributions to scientific knowledge of our planet. The accelerated development in coastal zones has provoked these important regions to become vulnerable to natural processes. Therefore, it is necessary to develop new, low-cost instruments that allow monitoring in coastal zones in a more efficient and rapid manner. Remote Sensing expects to be one of these tools.

In his conference, Dr. Del Castillo exposed the most recent advances of this technology for coastal studies. He explained the advantages of using remote sensing and the limitations that scientists are still working. He also spoke about his perspective in regard to the marine sciences in Puerto Rico and of existing alternatives for promoting this discipline in our island.

CoHemis celebrates its fifteenth anniversary *(from page 1)*

Dr. Carlos Ríos-Velázquez, Co-Director, judges the entity's focus point to be "a platform that integrates diverse disciplines and that is directed to public in general and to all of the components of the academic community". "Its vision was ahead of its time".

"Today we are talking about integrating engineering and science, education and research, yet all of these levels of alliances is what CoHemis has been doing for the past 15 years and what expects to continue doing", assured Gilbes.

Its beginnings

Dr. Jorge I. Vélez Arocho, Chancellor of the UPRM explained that the project was born during a conference celebrated at campus in November 1991 and organized by the National Science Foundation (NSF) in which representatives of science and technology organizations from the United States, Canada, Latin America and the Caribbean were present. The Chancellor participated in the conference and eventually formed part of the team. He explained that Dr. Carlos Pesquera and Luis Pumarada were the precursors of the proposal to create a network that attended the needs of the hemisphere in education and technology, with emphasis in improvement, evaluation and transference. "The delegates agreed in establishing the center because they received institutional support, had capable researchers and the will to create it", stated the Chancellor. He added that the UPRM counted with experience and links with other universities in the entire hemisphere, factors that strengthened the unanimous decision of making it the main office.

Photos taken in the firsts years of CoHemis

With the motto "Towards improvement through cooperation", the center started being configured with support of an advisory board. Vélez Arocho remembered the first funds received by NSF and, from then on, the UPR assumed that responsibility with the collaboration of other institutions. In March 1992, the now Chancellor became Co-Director at CoHemis and with Dr. Pumarada as Director, both formed the team that dedicated a great deal of time and effort in creating a network, found by visits to universities and research centers interested in similar areas.

Dr. Jorge I. Vélez Arocho mentioned people that have been key players in the project such as John B. Scalzi, NSF Program Director, the members of the advisory board that provided strategic direction, doctors Antonio González; José López; Gabriela Sosa; Néstor Ortiz; as well as Dr. Leandro Rodríguez; Eng. Gisela González (first female coordinator); and Dr. Luz Vega, who collaborated in the administration. "CoHemis history is the history of these people and a tradition of very committed teams, the main goal was to promote global competitiveness and regional sustainable development while acknowledging the importance of protecting the environment ". The areas that were identified as major needs were water, energy, solid waste and sustainability, the four columns of CoHemis.

"Our research was focused towards problems, threats, and challenges in our communities. That was the vision, the illusion, the utopia, but 15 years later, it is still that ideal where we can keep improving through cooperation and that the world can be better" expressed the Chancellor that was Co-Director for 10 years.

The current group

Its slogan is teamwork. That is why when we talk about CoHemis, we speak collectively because the challenges and achieved milestones belong to everyone. With contagious enthusiasm, they believe that there mutual understanding, efficiency and love

in what they do is the continuity that has always distinguished that work center. We refer to the most recent team in CoHemis composed by Dr. Fernando Gilbes Santaella and Dr. Carlos Ríos-Velázquez (Directors), Yamarie Hernández (Coordinator), Johanna Dávila and Zoraida Arroyo (Administrative Assistants). "We have an excellent team and we all work towards a common goal, its an honor to be able to say that", expressed Hernández, responsible in coordinating all of the efforts done by CoHemis since August 2004. Gilbes, Associate Professor of the Department of Geology, first started as Co-Director in 2002 and as Director a year later, after the retirement of doctor Pumarada. "I truly believe in what CoHemis is and in this new stage", he assured.

In March 2005, Dr. Ríos Velázquez accepted the position as Co-Director and has contributed with his academic background linked with education, especially his certification in the Program for Teacher Preparation, "It is an honor for me, I feel mentally free, there are no limits of the ideas and creativity point of views", shared the Professor of the Department of Biology. The majority of the projects that are organized in CoHemis have a common denominator such as priority topics like global change, infrastructure, education improvement, sustainable development, bioprospects, computational and systems biology, remote sensing and geographic information systems.

Photos taken in recent activities of CoHemis

The center does not only coordinate activities related to these areas, but also offers administrative support for educative and research projects. Likewise, the endeavors are documented in publications of *CoHemis Update* y *El CoHemispherical*. Its four recurrent initiatives are: Forum for Sustainable Development, National Meeting for Remote Sensing, Science and Technology Conference and the Learning Factory (a program designed to provide students with direct exposure to design and manufacture). Recently, CoHemis welcomed a new project that gives UPRM student the opportunity to study at universities in Spain. The program is ascribed to the University of Puerto Rico (UPR), but CoHemis gave it a "toque collegial" by naming it Olé-RUM. Besides internationalizing the system and opening new doors the world, the student culture is developed, commented Ríos Velázquez. Gilbes Santaella added that the innovative factor is that it breaks the traditional exchange format and gives more opportunity for having an international study experience. In February 2007, the second group of students that have jointed the program which has been accepted will depart. On November 14, 2006, CoHemis started celebrating its 15th anniversary. As part of the activities, Dr. Vélez Arocho offered a brief summary about the center and an enactment was signed declaring a year of activities directed towards exalting its history.

The activity included the conference "Academic Integrity in Research and Education", offered by UPRM faculty José A. Cruz, Jorge Ferrer and William J. Frey. To expand activities towards an international extent, have representation of every country in the hemisphere as a member in the consortium, develop a platform that presents advanced science and technology, create a mentoring center to promote student and faculty interest, are just some of the goals of the collective CoHemis. "There are no limits in imagination for developing projects and promoting everything that is related to international collaboration, expressed Dr. Gilbes Santaella.

All CoHemis activities are now transmitted live by the University of Puerto Rico at Mayagüez Web Site:

www.uprm.edu

¡En Vivo! **¡Live!**

Fourth meeting of remote sensing and GIS (from page 1)

CoHemis and who added that the Center's endeavor is to promote these tools so that the community can understand and use them frequently. Furthermore, he explained that the exchange of ideas will improve the coordination of the efforts that are done in this discipline. During the conferences, diverse topics were discussed regarding the ways RSGIS tools can be used to improve water distribution, obtain data for scientific research, delimitate spaces, update maps and plans for physical directions and for the evaluation of licenses, among others. According to the director of CoHemis, one of the most important aspects of Remote Sensing and Geographic Information Systems is the form in which it facilitates work development "because we can see big regions in a fast, efficient and less expensive way".

In this years meeting, new tools and applications that are available were emphasized. The "**Western Hydraulic Model and the Info Water Application**" was precisely one of the subjects discussed by Roy Ruiz, from the Water Resources Institute of the UPRM. He explained that the application was created with the purpose of improving the distribution of drinking water in Mayaguez, in a common effort between the Sewage Authority, the Municipality of Mayaguez and the UPRM. Ruiz added that this is the first operational model at this scale in Puerto Rico that allows estimating precisions and fluids in the pipes. Although it is still at calibration stage, he pointed out that it can eventually have a national impact. On the other hand, William J. Hernández, of the Fish and Wild Life Service of the United States, presented how useful the Geographic Information System has been for the national wildlife refuges in the Caribbean islands, specifically the refuge located in Cabo Rojo. He explained that a series of maps have been elaborated and have been helpful in managing fires, restoration by seed-planting, geographic delimitation of the refuges and identification of species, among others. "Our purpose as an agency is to disseminate information in order for people to use the resources at the refuge, meaning that identifying space is essential", assured Hernández.

Some of the conferences presented were "New initiatives in Geographic Information Systems in the Municipality of Bayamón" offered by Javier Acosta from Geomática de Puerto Rico; Advances in the Digital Cadastre of Puerto Rico" by Ulises Feliciano of the Department of Cartography of CRIM; and "The Impact of Climatic Changes in the Hydrology of a Tropical River Basin" offered by Marcel Giovanni Prieto from the Department of Civil Engineering of the UPRM.

Besides the presentations, the meeting included various workshops about basic training for the participants in areas such as information management, digital image processing and geographic information systems. This year, a total of 150 attendees received a certificate for continuous education and the activity was transmitted directly via Internet.

Participants of the ArcGIS in Water Resources Workshop

UPRM International Students:

A citizen of the world

CoHemis... Update includes in each edition interviews with international student visiting our campus

At 25 years of age and born in Madrid (Spain), Sara Rivero Calle came to Puerto Rico as an exchange student in the Department of Marine Sciences. This graduate student of the "Universidad Complutense de Madrid" (UCM) decided to study Marine Sciences because it was what she always dreamed of doing. Without worrying about living right in the center of Spain and that the ocean was hundreds of miles away, she would apply.

Sara had already experienced being an exchange student. Before choosing the University of Puerto Rico at Mayagüez (UPRM) for Academic Year 2005-06, she was in an exchange program in Italy. As she explains, "it was a challenge to learn the language and the food was Mediterranean and somehow similar to Spanish food. The people from where I lived were much less open and it took me a lot more time to make friends compared to Puerto Rico. The education over there was more focused in memorizing concepts and few laboratories; here it is just the opposite". "I chose to study at the UPRM because it is one of the few campuses that offer graduate studies in Marine Biology and the education is bilingual. By being a tropical island, I would have the opportunity to study tropical coral reefs, which was my main goal for the exchange experience". Her stay in Puerto Rico has been so good that she has decided to finish her master's degree at our campus.

Sara tells us that the best thing that has happened at UPRM is being able to dive everyday and the most difficult aspect was finding housing. Concerning the education at graduate level, the UPR has been excellent for her. "The classes have a lot less students and I like feeling that at campus, I really feel like home, being able to use the university facilities 24 hours, something that doesn't occur at my university. The installations, in general, are modern at the UPR as well". Comparing Spain and Italy to Puerto Rico, the student says "Puerto Rico is summer all year long, people are pretty quiet and very nice, with a desire to help in any way possible, one feels very comfortable from the beginning. I'm actually going to stay a little longer in Puerto Rico. I've made many friends, not just Puerto Ricans, but other students from other countries that are also studying". We asked the student if she has had the opportunity to visit the island. She answered visiting almost every town including the islands Culebra and Mona. She hasn't been able to visit Vieques, although it is already in her plans.

Finally, we asked if she'd recommend the project Studies in Spain Ole RUM and she said "yes I recommend it, as a matter of fact, I'm staying. Being able to live at least one exchange experience in your life is almost necessary; learning other cultures, other ways of thinking, other climates make you grow as a person and as a professional, but it should be under the support of an organization, then there should be no excuses. Although it seems incredible, an experience in the exterior will help you know more about yourself, your culture and your country and you will become a more open, tolerant and respectful person. You will become an authentic citizen of the world".

Accreditation workshop in Piura, Perú

"We are interested in a workforce that has necessary knowledge and skills to perform in distinct work groups. In order to obtain this, we must guarantee and validate that the quality of professionals that have passed the Engineering programs and extensive technology sessions, and assure they have qualities and knowledge guaranteed by their peers". These statements were made by Lueny Morell, Director and Coordinator of Inter-University Relations in Hewlett Packard (HP) after concluding the international workshop "Towards Excellence through a Culture of Quality and Innovation", which took place on October 1-4, 2006 at the University of Piura, Perú, with the sponsorship of Microsoft Corporation and coordinated by CoHemis. Dr. Morell emphasized the need to validate the quality of university programs, so that personnel recruited by Hewlett Packard be recognized by peers around the world. Furthermore, she noted that HP was born from the alliance between University and Industry, which must be strengthened today.

University-Fundamental Business for Accreditation

In the university, there are two very important factors: the programs that are developed based on the mission of the university and those that occur for its own market. Therefore, the relationship University-Business is essential in every accreditation process. Likewise, a solid formation in ethics and social responsibility is fundamental, assured Dr. Jorge I. Vélez Arocho, Chancellor of the UPRM.

Accreditation vs. Competitiveness

Dr. Anand Sharma, Director of the Office for Continuous Improvement and Assessment of the UPRM said that in order to improve the Faculty of Engineering, the academic preparation of the professors must be taken into account. The professors need to be informed that in every subject, we should incorporate certain aspects their learning topics improve them in learn-

Accreditation Workshop participants

Welcome activity for the students of Olé RUM

Their boats casted off its ropes and took off for a trip to unknown land for them, but with great expectations, dreams and goals. This is how the academic year 2005-2006 began, the discovery of the other side of the world by the group of participants of the Studies Project in Spain: Olé-RUM. On their return to the Island, CoHemis prepared a welcome activity, to not only celebrate their successes in this important participation, but also to evaluate the process, their experiences, to learn and grow from them.

The activity began with a welcome from our Director, followed by a reflection titled "A reminisce of Spain" by our Co-director. Then, we talked about their experiences in Spain and their studies. At the end of the meeting we gave each students a certificate of participation and they enjoy a lunch. At the present moment, some of participants of this project have joined the CoHemis team, specially to act as resources in Olé-RUM and to inject the program with great energy, creativity and overall, helping and preparing the new participants of this project.

CoHemis directors travel to Spain

During February 26 thru March 3, 2006, the Directors of CoHemis, doctors Fernando Gilbes Santaella and Carlos Ríos Velázquez traveled to Spain with the purpose of visiting universities that are components of the exchange program of the University of Puerto Rico (UPR), denominated as Olé-RUM in our campus. This experience allowed them to enter in direct contact with different aspects that our students confront when they decide to study in Spain and also helped them to better understand the process.

The directors visited the "Universidad de Salamanca", "Universidad Autónoma de Madrid", "Universidad Complutense de Madrid", and "Universidad Carlos III de Madrid". During the visit, they had the opportunity to meet the coordinators of the exchange programs from each institution. The diverse meetings provided discussion for several administrative aspects concerning student's exchange, areas of improvement, and alternatives for exchange programs for professors and students to do research. Doctors Gilbes-Santaella and Ríos-Velázquez also visited the office of the UPR and the Commercial Office of Puerto Rico, both in Madrid.

Two meetings were coordinated with UPRM students that are currently in Spain; one in Salamanca and the other in Madrid. The purpose of the meeting was to learn about their impression of the study experience in different Spanish institutions.

CoHemis' directors at Universidad Politécnica de Madrid

Winners of the CEAL and Benjamin Gilman

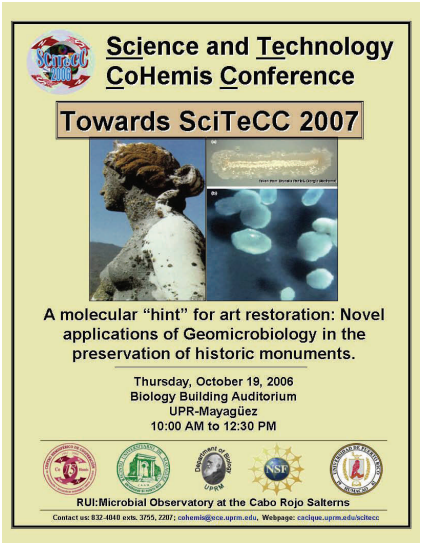
CoHemis congratulates the students that won grants to study in Spain. This is a great achievement and they should feel proud for receiving these awards. Hundreds of students applied for the CEAL grant, which is only awarded to six students throughout the University of Puerto Rico System and thousands of students apply for the Benjamin Gilman Grant through Internet, in order to proceed international studies, not only in Spain but in universities around the world.

Student Nadja Fúster Pérez from the Department of Hispanic Studies was the happy winner of the Grant from the Latin American Study Center for studies in the "Universidad Autónoma de Madrid". Students Amarylis Vélez Pérez of the Department of Psychology and Francisco Valentín Rodríguez of the Department of Mechanical Engineering received the Bejamin Gilman grant for studies during one semester in the University of Salamanca, Spain.

Geomicrobiology in the restoration of the historical monuments

CoHemis offered a series of conferences related to **Geomicrobiology**, another important discipline that is characterized for its multidisciplinary nature and its impact in areas such as Astrobiology, Biotechnology and Microbiology, among others.

On this occasion, Dr. Lilliam Casillas, Associate Professor of the University of Puerto Rico at Humacao presented research projects in Geomicrobiology that have been started in Puerto Rico by the Microbial Observatory with hypersaline microbial mats at the Cabo Rojo Salterns. This Observatory is the result of a proposal funded by the National Science Foundation (NSF) in which Dr. Casillas is the primary investigator and Dr. Carlos Ríos-Velázquez the co-primary investigator. The speaker, Mr. Massimiliano Marvani of the Department of Animal and Genetic Biology, who is a doctoral candidate. Leo Pardi, of the University of Florencia in Italy, presented the conference **"A Molecular Hint for Art Restoration: Novel Applications of Geomicrobiology in the Preservation of Historic Monuments".** The activity finalized with a short talk about new applications in Geomicrobiology, by a renowned Geomicrobiologist and Astrobiologist, Dr. Pieter Visscher of the University of Connecticut - Department of Marine Science, followed by a session in which the audience had the opportunities to express their ideas and ask questions. This conference took place on October 16, 2006, in the auditorium of the New Biology Building and was presented via Internet for the benefit of our consortium. The event was sponsored by the Microbiology Society of Puerto Rico and the theme of the next **SCiTeCC** will be **"Drug design using distinct strategies and diverse disciplines"**, a modern theme with much importance at all levels of the planet.



IN OUR NEXT EDITION:

- **Renewable Energy Conferences**
- **PRYSIG 2007**
- **CoHemis Symposium: Mayagüez Bay**
- **Biotechnology Summer Camp 2007**
- **International Collaboration Forum**
- **Olé RUM Project**

Research cruise around the Caribbean

On August 26, 2006, a group of scientists of the University of Puerto Rico at Mayagüez (UPRM) started an expedition around the Caribbean with the purpose of studying oceanic eddies in the zone. The scientific crew, composed by 14 members (5 professors and 9 master and doctoral students of the Department of Marine Sciences), departed in the R/V Pelican ship from Isla Magueyes in La Parguera (Lajas, Puerto Rico) in an adventure that lasted two weeks.

The expedition, denominated as CaVort Ex (Caribbean Vorticity Experiment), included Puerto Rico to Aruba and covered 23 sampling stations, where multiple oceanography properties were measured, informed Dr. José Manuel López Díaz, principal investigator and professor of the Department of Marine Sciences at the UPRM. Professors Jorge Corredor, Julio Morell and Jorge Capella of Marine Sciences and our Director, Dr. Fernando Gilbes Santaella are the co-investigator in the project.

Scientific data was obtained by working with modern equipment. Some of the instruments measured the water salinity and temperature, which helps distinguish one water mass from the other, while other instruments quantify the velocity and direction of the currents, as well as optical properties in waters, light absorption by dissolved organic material among other aspects. A submersible undulating vehicle, highly instrumented and controlled by an onboard computer that gathered information from the oceans, surface down to 100 meters deep, was tied to an electro mechanic cable while they navigated without the need to stop.

Dr. López explained that the cyclonic eddies act similar to a hurricane because the water found in the center and the velocity of the currents is greater while moving away from the center, while in the wall of the hurricanes eye, the winds velocity is higher and starts lowering as it is farther away from the center. Dr. Corredor commented that it's a known phenomenon in the atmosphere and it serves as "food for hurricanes" because it is a mass of turning water that converts into a heat reserve available for these atmospheric phenomenons. "This allows meteorologists to improve their predictions because there is bonding between these oceanic systems and the atmospheric ones, stated López. Prof. Morell also said there are more matters that can be studied about eddies. An example is that cyclonic ones can result in fertilizers because they bring nutrients to the surface and therefore, control the quantity of atmospheric carbon dioxide that causes the greenhouse effect. The researcher explained that there is so much interest now because it helps the ocean remediate parts of the excess of carbon dioxide in the atmosphere.

Dr. José López (center) explained the expedition trajectory, joined by professor Julio Morell (left) Dr. Jorge Corredor.

Summer camp 2006: biotechnology (from page 1)

The Chemistry and Ethics team shows their poster which resume what they learned on the camp.

BETTeR-IC was sponsored by NASA's educative center and by the Puerto Rico Math and Science Partnership (AlaCiMa in Spanish). Various schools have an alliance with the PRMSP program and are representative of where the students and local teachers were selected from.

The ET had the opportunity to visit Interdisciplinary Centers (IC) for a week emphasizing in Discovering Biotechnology through Interdisciplinary Centers such as (1) Ethics and Chemistry (2) Engineering (3) Marine Biotechnology and Business Administration (4) Microbial, Environmental and Plant Biotechnology. At the IC, the teams received conferences and workshops by faculty and researchers representing diverse educative centers throughout out the island. One of the camp's main goal was to develop teaching modules in biotechnology to be implemented in Puerto Rico's educational curriculum. One of the workshops offered to the participating teachers was aimed at Planning Scientific Fairs. Meanwhile, students received workshops in active learning and poster preparation. Altogether, the ET received techniques in Genetic Engineering and Bioinformatics Workshops. The participants also received a presentation by an IB Alumni and by members of the IB Student Association. During the final activity, "a virtual classroom" was prepared so that the participating teachers could present their Biotechnology class to their students (BETTeR-IC participants), followed by poster presentations by students with the theme **"Learning Biotechnology in Teams through…".**

The BETTeR-IC model has already been presented in the Third Latin American and Caribbean Biotechnology Congress and we hope to present in other educational and research forums like the Educative Congress of Microbiology of the American Society of Microbiology.

We are ready for BETTeR-IC 2007 and we expect that all the participating educators of our consortium participate in this event. Two of the participating educators say that one of the most important contributions derived from this project is that "biotechnology can perfectly be integrated in every discipline in elementary, intermediate and high school levels", as expressed by Rosa Olivencia, teacher at the Eugenio María de Hostos High School in Mayagüez. Claudia Tapia, a UPRM graduate and the international representative of her team, added that she enjoyed "interacting with students and learning about what their needs were". Both of them expressed their interest and commitment in continuing the projects mission in their schools.

The participating students assured that this summer camp helped them define the discipline of biotechnology as a career option. "It helps you to confirm your idea of what you will study and will be doing with your life", expressed Michelle López of the Catalina Morales Flores High School in Moca. Grace Marie González and Christian Muñoz of Patria La Torre and Dr. Carlos González's High Schools, respectively, agreed that the camp expanded their vision of what Biotechnology is. "It is a way of entering into what I hope to do as a career", assured Dana Alvelo from Eugenio María de Hostos High School in Mayagüez. These students participated in sports and social activities that allowed them to interact with other students helping them "share ideas and opinions" expressed Walter Gabriel Rivera of Patria La Torre High School in San Sebastián.

Group of the Biotechnology Summer Camp BETTeR-IC participants. Sitting in the front row are the CoHemis Directors.

UPR farewell activity for the students of the project studies in Spain

On Sunday, January 14, 2007 a farewell activity took place at the University of Puerto Rico at Carolina. The farewell was for students that participated in the Studies Project in Spain throughout the entire UPR System. Dr. Jorge I. Vélez Arocho, UPRM Chancellor, expressed his gratitude to the UPRM delegation, the participating students and members of CoHemis, for having a perfect attedance.

Yamarie Hernández Bonet, UPRM Spain Studies Project Coordinator, received our campus students. The photo was taken by Dr. Jorge I. Vélez Arocho, UPRM Chancellor.

The audience was addressed to by different campus representatives such as Dr. Edwin Hernández (UPR-Arecibo), Dr. Victor Borrero (UPR-Carolina and host of the event), Dr. Ram Lamba (UPR-Cayey), Dr. Hilda Colón (UPR-Humacao), Dr. Jorge I. Vélez Arocho (UPR-Mayagüez), Prof. Jaime Marrero (UPR-Ponce), Dr. Gladys Escalona (UPR-Río Piedras), and Dr. César Cordero (UPR-Utuado). The President of the UPR, Esq. Antonio García Padilla expressed the importance of participating in projects like these and how the exchange experience will enrich the student's life.

During the event, students and parents each received workshops about financial details and the adaptation needed for the change in Spain. While enjoying a delicious lunch, the group was entertained by a Flamenco Dance offered by Mrs. Annette del Judise and by a musical act from La Tuna de Bardos, so as to make the group start feeling the atmosphere of the Spanish culture.

We would like to congratulate the organizing team for all of the help offered to our students and for planning such a wonderful social activity.