



CoHemis... Update

Overcoming through cooperation

Founded with the sponsorship of the National Science Foundation (NSF)

Sponsored by the President's Office of the University of Puerto Rico and Mayagüez Campus

2005

University of Puerto Rico at Mayagüez (UPRM)

Vol. 14, No. 1



CoHemis and the Olé RUM Project: Open the doors to other side of the world

For those of you who according to your geographical location don't have boundaries with other countries (for example islanders), or because of small geographic area, a few hours can be "an eternity"; it is not until you take a trip to another country when your vision of the world changes completely. The relative differences in distances, languages, and not having borders with neighbors of different cultures, are among others circumstances to which we attribute the phenomena that some have called "regional relativity". These visions or circumstances have the tendency to completely change once you begin to experience "other sides" of the world through photographs, videos, movies, vacations, or educational exchange programs.

continues in page 7

CoHemis celebrates sustainable development forum



Left to right, Dr. Ivonne Diaz, UPRM Economics Department; Dr. Manuel Valdes Prizzini, UPRM Art and Science College Associate Dean of Research; and Joseph Vogel, Economics Department, University of Puerto Rico at Río Piedras.

CoHemis presented a forum on Sustainable Development in the morning of Wednesday, March 30th of 2005, at the Nursing Department Auditorium, UPRM. Around 70 participants from the university community, organizations, agencies and municipalities of the western region of Puerto Rico attended the proceedings. Dr. Fernando Gilbes Santaella, Director of CoHemis, was in charge of the opening and closing of the forum. The term Sustainable Development refers to obtaining a major growth and efficient economy and at the same time better equity and social justice which operates within the capacity of the environment to supply help and absorb waste without permanent damage or detriment to future generations. This is a subject of vital importance

respective fields.

Dr. Luis Pumarada O'Neill, professor of General Engineering at UPRM act out as the advisor for CoHemis. From August to December of 2004 while on sabbatical leave, he worked as Special Assistant to the President of the International Center for Sustainable Development (CIDES, in Spanish) located in Panama. The forum succeeded in getting representation of the subjects and processes that cover this wide interdisciplinary area. Complimenting the local scene there was a presentation from Brazil, the tropical country that has worked and succeeded the most in this field. Another presentation was on CIDES and the opportunities its offers for international and multi-perspective collaboration.

continues in page 3

New personnel in CoHemis

Since the last edition of our bulletin, on January 2004, CoHemis has had various organizational changes. We have recruited new personnel, which promise to do an excellent job to attain the goals of the center and unconditionally support our projects and proposals. Our new personnel is composed of: Zoraida Arroyo, Administrative Secretary, who started in February 2004; Yamarie Hernández, Coordinator, since

August 2004; Johanna V. Dávila Administrative Secretary, since January 2005; and Dr. Carlos Ríos Velázquez, Co-Director, since March 2005; See photo of the new CoHemis family on page 6.

This group is committed to empowering the hemispherical collaboration under the supervision of Dr. Fernando Gilbes Santaella, who has directed the center since July of 2003.

continues in page 6

IN THIS EDITION:

You will find articles about:

- ◊ Trips to Brazil and Colombia
- ◊ Interviews with students from Peru and Spain
- ◊ A study of eddies in the Caribbean Sea
- ◊ The use of Remote Sensing and Geographic Information Systems in Puerto Rico

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

CoHemis Consortium (Syndicate)

UPRM and Universidad del Norte collaborate on hurricane studies

The Universidad del Norte at Barranquilla, Colombia (UNBC), and active member of the CoHemis Consortium, in conjunction with UPRM is currently working on a project titled: "Levantamiento de Datos Batimétricos y Resultados Preliminares del Impacto de Huracanes Categoría 1, 3 y 5 en Litoral del Departamento del Atlántico". The project is directed by Dr. Juan Carlos Ortiz-Royero from UNBC and Professor Aurelio Mercado from UPRM. The project is being carried out at UNBC.

UPRM and UNBC established an academic, scientific and cultural collaboration through a cooperation agreement. It establishes an exchange of professors and students; the organization of seminars and a cycle of conferences, and exchange of

knowledge; the trade of books, publications and mutual information; the exchange of information and experiences in specific fields of study; the training of researchers; cultural exchange activities; activities to develop professionals on both sides by offering sabbaticals or other personal development programs; among other things.

The purpose of this study is to evaluate on a primary level, how the Atlantic Ocean coast is exposed to the impact produced by the extreme hurricane category 1, 3, 5 winds according to the Saffir-Simpson scale. The study is being done starting from bathymetric readings down to 10 m deep, open ocean waves supplied by the General Maritime Direction of the National Gov-

ernment of Colombia (DIMAR) to be able to provide the direction to determine the circumstances a probable impact of a threat of this kind on the beaches of the Atlantic Ocean, giving those responsible for aid and those potentially affected a vision of the magnitude of this threat.

For the simulation of an impact of this kind of event mathematical models for hurricanes are used (such as HURWIN) and extreme condition parameters, that once established for a specific area of interest the wave models (such as SWAN) are used as preliminary entries, that produce a net of results on the area studied, where physical variables are specified such as: the height of the wave, period, swells and others.

CoHemis promotes the use of remote sensing and GIS

The advance of technology has produced new and better study tools that facilitate the understanding of the natural processes and those produced by man. Examples of these tools are Remote Sensing (RS) and the Geographic Information Systems (GIS). Remote Sensing is the method of receiving information from an object without being in direct contact with it. RS includes the use of sensors located in different platforms such as satellites and airplanes to study the components of the planet Earth at different scales in space. On the other hand, GIS permit the creation of data based on different levels that facilitate the analysis and visualization of information about space. These can be applied during urban planning, especially in their use as land cover.

CoHemis has taken over the job of disseminating and promoting these tools already available for a few years in our hemisphere. In this first step we have focused our energy on Puerto Rico, so that the Puerto Rican community can better understand these concepts and use them with greater frequency and ease. This educative process began in 2003 with the first National Meeting of Remote Sensing and Geographic Information Systems. This meeting was the first step in the creation of a plan and work groups that would help

to coordinate the effort and the initiatives with these tools. It also allowed us to evaluate the interests towards these disciplines and its potential in Puerto Rico.

smaller islands to natural disasters and the use of GIS focusing on the stages of evaluation of risk, planning, visualization and recuperation, taking into consideration different natural disasters.

In June 2005, and for the third consecutive year, CoHemis hosted the Third National Meeting on RS-GIS in Puerto Rico; where we continued this educative process we started in 2003. The meeting gathered specialist in academia, government, and private industry. Also, all those interested in the subject were able to learn some more. This year the activity had more than 100 participants from all over the island. The seven presentations given that morning presented some of the most recent work in the area, and the workshops in the afternoon were designed to give participants direct experience with some of the tools available. The meeting also served as a venue to exchange ideas, the development of combined projects, and better coordination among the diverse jobs being carried out in Puerto Rico. This year we promoted the discussion of how these tools could help better public policy.



Mosaic of Puerto Rico using digital images

The success of the first meeting motivated us to have a second national meeting in May 2004. The activity had the participation of specialist in public health, agriculture, planning, geology and civil engineering, who spoke on the application of such technology in these areas with special emphasis on studies dealing with natural disasters. For that very reason, a research was presented on the vulnerability of the

continues in page 5

CoHemis celebrates sustainable development forum *(from page 1)*



Dr. Ivonne Díaz of UPRM's Economics Department spoke on the need to substitute the old industrial paradigm based on manufacturing for the new paradigm of ecological economics.

The first presentation, “*Sustainable Development: How do you apply the theoretical framework of the economy?*” was presented by Joseph Vogel from the Department of Economics, UPR-Río Piedras. He was followed by Manuel Valdez Pizzini, Associate Dean of Research and ex – director of Sea Grant of UPRM with: “*Challenges of Sustainable Development on Puerto Rican*

such as Bio Diesel and the Solar House”.

The presentation “*Sustainable Development*” was given by Dr. Ivonne Díaz of the Department of Economics at UPRM. Dr. Díaz spoke about the need to substitute the old industrial paradigm focused on manufacturing for the new ecological economy paradigm, which has as its goal the conservation of ecological bio diversity, the

Coasts”. Valdez explained, “There is a lot of experience with sustainable development in the university, projects such as The Institute for the Development of Communities, The Coastal Development Program by Sea Grant, Coral Reef Ecosystem Studies, the Agricultural Extension Services, and research on Technical Applications,

just distribution of resources and economic efficiency.

“The capacity of the ecological system to supply environmental services has diminished to 33% and if we continue with the present non supportable tendencies, irreparable damages to the natural infrastructure will be caused, as can be appreciated in the degradation of soils, reduction in bio diversity and the ozone layer” said Dr. Díaz. During his turn, Luis Mejía, Auxiliary Dean of the Office of Agricultural Extension, defined the elements of the agricultural support as integral management of pest, rotating pastures, soil conservation, quality of water and marsh, green fertilizers, diversity of crops, nutrient management, forestry, and the marketing of new alternatives to augment the profits of the farmers. He was followed by José Rivera Santana, Planner for Estudios Técnicos, Inc., with the presentation: “*Master Plan to Support the Development of Vieques and Culebra, and the way the plan was developed*”.

CIDES presents and obtains new contacts in Brazil

From the 7th to the 12th of November of 2004, Dr. Luis Pumarada O'Neill, who had been working at the International Center of Sustainable Development (CIDES, in Spanish), from August to December of 2004, on sabbatical from UPRM visited the cities of Curitiba, Rio de Janeiro and Brasilia to meet with members of the Brazilian government, university representatives and Non Governmental Organizations (ONG, in Spanish).

The purpose of the trip was to promote the affiliation of CIDES with entities of the Brazilian government with hopes of rounding out the internationality of the member-

ship of the governing body of the center, and include the country with the largest tropical watersheds and biodiversity in the world. Dr. Pumarada went as the president of CIDES's Special Advisor, Dr. Rodrigo Tarté. Dr. Pumarada talked about CIDES and The City of Knowledge to private and public universities who offer postgraduate studies in sustainable development, to research centers focusing on support, the Secretary of the Policies of Sustainable Development of the Ministry of Environment, and to CNPq, the national entity of Science and Technology. He also visited the Organization of the Amazon Cooperation Treaty (OTCA in Spanish), an interna-

tional group based in Brasilia. All of the organizations visited showed a lot of interest in the concept of CIDES and into the membership as well. As a result of the trip, the CNPq has asked that CIDES create a proposal for membership to initiate the process.

This trip revealed the long and fruitful Brazilian keenness in developmental support and the desire to learn from this experience. This started when Dr. Carlos Ferreira Abreu de Castro, of PNUD Brazil, was invited to summarize these experiences at the Sustainable Development Forum on March 2005 in UPRM.

continues page 5

About us - CoHemis ... Update

CoHemis...Up Date is the informative bulletin of The Center for Hemispherical Cooperation in Research and Education in Engineering and Applied Science. The Center is sponsored by the Office of the President of the University of Puerto Rico and the Mayagüez Campus. It is published in English and in Spanish and is distributed free of cost to groups and individuals who contribute to the cooperation, education, evaluation or technological research in the Americas.

Publishing and Layout: Johanna V. Dávila Vélez
Editing and Publishing: Carlos Ríos Velázquez, Johanna V. Dávila Vélez, Fernando Gilbes Santaella, RUM Press Office, Luis Pumarada O'Neill
Photos: Fernando Gilbes Santaella, Raúl Lugo, Julio Matos Lantigua
Translation: Fernando Gilbes Santaella, Johanna V. Dávila Vélez, Luis Pumarada O'Neill and Roberto López
Co-Direction of CoHemis: Fernando Gilbes Santaella and Carlos Ríos Velázquez
Coordinator: Yamarie Hernández Bonet
Administrative Personnel: Zoraida Arroyo Figueroa

and Johanna V. Dávila Vélez
Postal Address: P.O. Box 9034, Mayagüez, P.R. 00681
Physical Address: Office 102, Main Building, Research and Development Center, Road 108 Km. 1 Miradero, Mayagüez, P.R.
Tel: 1-787-265-6380 (direct line), 1-787-832-4040 (switch board UPRM) x-2207, 3755
Fax: 1-787-265-6340
E-mail: cohemis@ece.uprm.edu, cohemis@uprm.edu
Internet page: www.cohemis.uprm.edu

Dr. Luis Pumarada O'Neil

Trip to Colombia to promote the UPRM and the sustainable development

Dr. Luis Pumarada O'Neil, special Advisor ad honorem to the President of the International Center for Sustainable Development (ICSD) and previous director of CoHemis, visited Colombia on March 28 and 29 of 2005. He carried out presentations and meetings in Bogotá and Bucaramanga with the purpose of empowering the international presence of the University of Puerto Rico and achieves the affiliation of Colombian groups to ICSD. He also hoped to fill ICSD's international membership with Colombian governmental groups and with perspectives that compliment those already represented in the membership of the Center. Colombia is the country from which hundreds of postgraduate students come from in the fields of science and engineering. The similitude, the nearness and affinity between Panama and Colombia would multiply the benefits of belonging to ICSD to their respective groups.

At the "Universidad Industrial de Santander" (UIS) in Bucaramanga, the doctor met with Edgar Castillo, of the Center for Environmental Research; Leonardo Acevedo, from "Nodo de Producción Más Limpia"; Consuelo Ordóñez, professor and advisor for German Cooperation (GTZ); and Clara Gómez, from the Office of External Relations. Among the topics mentioned, the following stand out:

- That the following proposal be considered a Latin-American inventory of sustainable development projects, done and in progress, to promote nature and the viability of the concept of sustainability.
- That ICDS and its base, The City of Knowledge in Panama, could be useful vehicles for a Ph.D. program in Environmental Sciences which the Colombian Net of Environmental Formation plans to create.

Add to the topics of the ICDS the public services of water and energy. These natural resources have as direct users, public and private businesses that generate a series of tension in the field of sustainable development.

That same afternoon they held a meeting in the Colombian Institute of Petroleum (ICP), the research center of the state petroleum company Ecopetrol. Those present along with Pumarada were: L. Dario Miranda, a Biologist working with "Proyectos de Responsabilidad Integral"; Industrial Engineer Avelino Perucho, Contract Coordinator for ICP's Technological Cooperation; and Chemical Engineer Luis

Javier Hoyos, the coordinator for the Petrochemical Research Projects.

The ICP is active in or supports various environmental projects or of sustainable character and it would benefit them to be in the CIDES. Their topics of interest within this framework are: energy, social conflicts, copy rights and biodiversity. It was agreed that the CIDES would send ICP a draft for membership proposals and later submit an official form so they can arrange the affiliation with the executive board.

The following morning 25 persons attended Dr. Pumarada's presentation in one of amphitheatres of Colciencias in Bogotá, in which the moderator was the director of the "Internationalization Division of Science", Dr. Juan Pablo Isaza Vargas. This time the introduction of the moderator and the introduction of the guest speaker also included the UPRM and the CoHemis Consortium. Among the points that were brought up in the discussion are the following:

- "La Red Colombiana de Formación Ambiental" (RCFA) is based on Environmental Ministry, Housing and Territorial Development. It is a program that includes universities and sectors such as industry and health. It is supported by the United Nations Program for Development, a member of CIDES.
- We are in the Educational Decade for Sustainable Development in UNESCO (2005-2015). The RCFA has qualified so far 5000 environmental promoters in the country.
- A relationship with CIDES would facilitate that the future Ph.D. program in Environmental Sciences of the network would receive international collaboration. UPRM would be able to collaborate with this program by means of agreements transmitted by CoHemis with Colciencias, the Science Academy or a university within the RCFA which is part of the Consortium. A relationship with CIDES would facilitate that the future Ph.D. program in Environmental Sciences of the RCFA, would



Dr. Luis Pumarada with a few of the attendees from ICP.

receive international collaboration.

After the presentation, Izasa organized a meeting with some of those present, with the participation of Dr. Pumarada to create a detailed strategy with CIDES. Besides these two, other participants were: Doris Yaneth Rodríguez Castro, advisor for the Program of Ocean Science and Technology at Colciencias; Mario Sarmiento Menseses, advisor to the Minister of Environment, Housing, Territorial Development The Office of Citizen Participation; Marco Tulio Espinosa López of the "Convenio Minamiente de la Universidad de Ciencias Aplicadas" (UDCA), Office of the Colombian Net of "Formación Ambiental"; Alvaro del Campo Parra, Vice Chancellor of Research of the "Universidad Autónoma de Occidente", Cali; Cristian Julián Díaz, Coordinator of the Research Center, Faculty of Engineering of the "Universidad Central"; and Margarita Botero, President of the "Colegio Verde" (member of CIDES).

- Dr. Isaza promised sponsorship from his Division (with money from the World Bank) for some Colombian project within the framework of CIDES and maybe with CoHemis/UPRM or in the field of biodiversity or in climate changes, or a combination of both. He suggested that the Colombian component be through the RCFA. We agreed to start with a one day meeting of the RCFA to agree upon a strategic plan which will include developing something in the suggested direction, followed by a meeting of experts in different aspects of the issue divided into workshops corresponding to both themes.

Co-Sponsored by Collemis Internacional dinner

On November 30, 2004, the University of Puerto Rico at Mayagüez celebrated the traditional International Dinner. The dinner was sponsored by the Office of Exchange Programs and co-sponsor by the Center for Hemispherical Cooperation in Research and Education in Engineering and Applied Science (CoHemis).

Students from different countries such as Argentina, Bolivia, Canada, Colombia, Ecuador, El Salvador, Spain, United States, Finland, France, Haiti, Mexico, Nicaragua, Peru, Dominican Republic and Venezuela attended the dinner. The main course was Puerto Rican food; but the students also brought samples of dishes from their respective countries. The Office of Dominican Republic Consul in Puerto Rico sponsored the music for the dinner.

Dr. Jorge Iván Vélez Arocho, Chancellor of UPRM, addressed the people at the dinner and congratulated the work of the CIU students.



Colombian Dish, Arepas

CIDES presents and ... (from page 3)

The following were our contacts:

Curitiba:

- * Dr. Eduardo Felga Gobbi
efgobbi@ufpr.br
Profesor de UFPA e investigador asociado de SIMEPAR
Universidade Federal do Paraná
SIMEPAR & Grupo de Ingeniería Ambiental
www.simepar.br
- * Paulo da Cunha Lana
lane@ufpr.br
Profesor de Ciencias Marinas
Universidade Federal do Paraná:
Nucleo Interdisciplinario en Medio Ambiente y Desarrollo; Prog. Doctoral en Medio Ambiente y Desarrollo
www.ufpr.br/nimad
www.reitoria.ufpr.br/doutmeio

Rio de Janeiro:

- * Marilene R. dos Santos
mramos@fgv.br
- * José Antonio Puppim de Oliveira
puppim@fgv.br
Profesores del CIDS
Fundación Getulio Vargas (FGV):
Escola Brasileira de Administração Pública y Empresas
Centro Internacional de Desarrollo Sostenible (CIDS)
- * Eduardo Marques – Relaciones Internacionales, FGV emarques@fgv.br
www.ebape.fgv.br/cids
- * Adão Benvindo da Luz
adao.luz@cetem.gov.br
Director

- * Zuleica Carmen Castillos
zcastilhos@cetem.gov.br
Jefa de Minería Sostenible
Ministerio de Ciencia y Tecnología:
Centro de Tecnología Mineral (CETEM)
www.mct.gov.br
www.cetem.gov.br

Brasilia:

- * Rosalía Arteaga Serrano
arteaga@otca.org.br
Secretaria General
Organización del Tratado de Cooperación Amazónica (OTCA)
www.otca.info/ep
- * Gilney Viana gilney.viana@mma.gov.br
Secretario de Políticas de Desarrollo Sostenible
Ministerio de Medio Ambiente
Secretaría de Políticas de Desarrollo Sostenible
www.mma.gov.br
- * Dr. José Augusto Drummond
jaldrummond@uol.com.br
Coordinador de Postgrado
Universidade de Brasilia
Centro de Desarrollo Sostenible
www.unb.br
www.unbcds.pro.br/cds
- * Rose Diogo rose.diegues@pnud.org.br
Asociada del Programa GEF
- * Jorge Oliveira
jorge.oliveira@pnud.org.br
Asistente de Programa
PNUD-Brasil
Programa de Naciones Unidas para el Desarrollo
www.undp.org.br

CoHemis promotes the use of remote sensing and GIS (from page 2)

During this third conference we were shown how Remote Sensing and GIS could be used for the conservation of birds in Puerto Rico, a better understanding of seismic activity in the Caribbean and a study of collective transport means in residential values. The participants were also exposed to the great potential of the diverse efforts to develop new and better data bases that include cartographic data and environmental documents through the Internet. The workshops focused on the use of ENVI, a program for the processing of digital images, ArcGIS, a GIS program, and "Interactive Puerto Rico", the data base generated by the Planning Board of Puerto Rico which is available

through the internet.

The accelerated changes in our planet require the use of tools to study and monitoring in order to generate a more efficient planning on a greater scale. Remote Sensing and GIS permit us better management of knowledge, from scientific to political, which permit us to make better decisions. CoHemis feels the obligation to continue promoting these tools and find a way to keep on promoting these national meetings. It also realizes that a hemispheric collaboration in these areas is necessary for a better understanding of our region. It is time we see thing on a real scale. That is why we also want to promote

activities on remote sensing and GIS for the whole region and in the near future count on the participation of other countries.



Conference attendees

New personnel in CoHemis *(from page 1)*

Zoraida Arroyo Figueroa received her bachelor's degree in Secretarial Sciences from Inter-American University in Aguadilla. She worked for eleven years in the manufacturing industry, and as an executive secretary for a private business.

Yamarie Hernández Bonet received her bachelor's degree from the Faculty of Business Administration at UPRM, with a major in Human Resources. She worked as an Administrative Assistant in the Office of External Resources of the Research and Development Center at UPRM, analyzing proposals and offering orientation on procedures and requirements for proposals. She has been a Human Resource Manager in a manufacturing business and was an Administrator for a government program. Yamarie provides support to the directors in the development and follow-up of proposals, in the management of the budget and the coordination of local and international activities. Yamarie is also the Coordinator of the Student Exchange Program with Spain (Olé-RUM).



From left to right (standing): Dr. Carlos Ríos Velázquez, Yamarie Hernández Bonet and Dr. Fernando Gilbes Santaella; (sitting) Johanna V. Dávila Vélez and Zoraida Arroyo Figueroa

Johanna V. Dávila Vélez graduated from the Faculty of Business Administration at UPRM with bachelor's degree in Office Administration. She worked with the Mechanical Engineering Department as Coordinator of Special Projects. Johanna is an active member of the International Association of Administrative Professionals (IAAP) and attended their 2004 International Convention and Educational Forum held in Washington D.C. on August of 2004, representing Puerto Rico and UPRM along with other UPRM students. She has experience in the manufacturing industry. Among her responsibilities at CoHemis she is the coeditor of the bulletin.

Carlos Ríos Velázquez is a graduate of UPRM in Industrial Microbiology. Not only did he receive his Bachelor's degree but his teaching license as well, from the Department of Education of Puerto Rico. He decided to stay at UPRM to study his Master's in Biology, later he continued his doctoral studies majoring in Bacteriology at the University of Wisconsin-Madison, where he was part of various programs and educational committees. He also did Post Doctoral studies in the National Institute of Health, in 2001.

Dr. Ríos has been a professor in the Biology Department since 2001, where he teaches undergraduate and post graduate courses such as: Microbial Physiology, Bacterial Genetics, Molecular Genetics and Gene Regulation in Prokaryotes. He is also in charge of the supervision of student teachers in the Teacher Training Program.

Finally, we like to acknowledge all the part time students who work with us from day to day for their excellent work: Julio C. Matos Lantigua and Raúl A. Lugo Serrano whom we congratulate upon graduating and we wish him a lot of success in the future!

UPRM researchers study eddies in the Caribbean Sea

On March 12, 2005 about 2 p.m. a group of UPRM researchers set sail from Magueyes Island, in Lajas Puerto Rico on an oceanographic expedition towards the central Caribbean aboard the R/V Pelican. Professors José M. López (principle researcher), Jorge Corredor, and Julio Morell from the Marine Sciences Department participated with their graduate students Alvaro Cabrera, Miguel Canals, Ana Lozada, Ramón López, María Méndez, Milton Muñoz, and Wilson Rovira.

Jorge Capella, a researcher hired to work in this project, and Fernando Gilbes, from the Geology Department and Director of CoHemis, also participated in the expedition. Part of the trip was in Jamaican waters therefore doctoral student from the Biology Department of the University of the West Indies (UWI), Ava Maxam, was present as an observer for the Jamaican Government. For this Marine Biology student the adventure represented a unique learning experience and marked the beginning of other possible oceanographic collaborations between USI and UPRM.

These could be coordinated through a collaboration agreement with CoHemis. The expedition named CaVortEx IV is the fourth of a series of oceanographic expeditions to study the formation and development of eddies that are formed in the Caribbean Sea.

continues in page 9

CoHemis and the Olé-RUM

Project: Open the doors ... (from page 1)

The exchange program with Spanish universities "Complutense", "Autónoma", "Politécnica" of Madrid and "Salamanca": came about as an initiative of the president of the University of Puerto Rico to "open the doors" of the UPR to the world and develop initiatives that propel permanent internationalization of our educational system. This program is currently being carried out throughout the UPR system and on our campus we have call it the Olé-RUM Project.

The students on our campus can participate in the Olé-RUM exchange project for a semester (February – June), or a year (September – June). The administration of the project is coordinated directly by CoHemis personnel. Students interested in participating should at least be third year students, and after meeting with the academic counselors of their respective faculties, they prepare a list of the courses they want to take during their exchange, and then send their formal application to the participating universities in Spain.

Once admission has been received the students apply for their student visas and then they are ready to participate. From the economic point of view, those students who have scholarships can still use them for their exchange, they can also request loans, and economic packages, or scholarships developed by different financial institutions created specially for the project Olé-RUM, such as the Santander Scholarship.

Among the activities developed and coordinated by CoHemis to permit an effective process of orientation and application for Olé-RUM for our students, is the creation of the Collaboration team for Project Olé-RUM. It is composed of CoHemis personnel, and at least one representative per faculty. As well as discussing the process of orientation, we have initiated a project to develop an institutional guide for equivalences, which will speed and facilitate the process of selecting courses when filling out the application.

In addition to the support offered in the orientation process which is carried out by each faculty during the semester, CoHemis has organized follow-up meetings for the purpose of: 1) attending to the needs of the interested students, 2) maintaining an uniform process of orientation and 3) providing orientation for those students who do not know the project. Mr. José Cruz and Ms. Alessandra Otero, students who have participated in the exchange, have collaborated with us as resources and active participants.

The creation of a virtual community for the Olé-RUM project is another of the initiatives developed by CoHemis and in this case, in collaboration with Mario Núñez Molina, Director of the Institute for the Development of Teaching and Learning Online (IDEAL in Spanish). It function through an internet platform known as WebCT (www.webct.com) and the students interested in this project participate in it, those who have and are participating in the project, CoHemis personnel and their

Studying seismic threat in the caribbean

Hoping to detect sources of possible earthquakes and submarine land slides in the Caribbean, a submarine geophysics study was carried out on board the Spanish vessel Hesperides.

The participating institutions were The Puerto Rico Seismic Net (PRSN), of the Mayagüez Campus (RUM), the University of Madrid, the University of Barcelona, The Royal Observatory of the Spanish Armada, The U. S. Geological Survey (USGS), The Seismological Institute of the Autonomous University of Santo Domingo, The Dominican Institute of Hydraulic Resources.

Christa G. Von Hillebrandt-Andrade, director of PRSN, explained during a press conference that the project, that began March 20, 2005 and ended April 17 of the same year, will help define what the real seismic threat to the Caribbean region is, particularly in the zones of El Sombrero and the "Depresión de Muertos".

As part of the study, the USGS and the Seismic Net installed 10 seismometers at the bottom of the ocean in the regions north of Icacos, of Culebra and the Virgin Islands.

"This investigation is going to help us associate the tremors with faults. We know there are earthquakes in this region, but we don't know with which faults they are associated with, especially in the zone of El Sombrero, affirmed the geologist. She maintained that until the present it is an enigma.

The question is to what magnitude can the earthquakes in this zone reach? If the quakes are greater than 6.5 it means they can also generate tsunamis," said Von Hillebrandt.

During the conference preliminary data was presented of the studies made to the south of Santo Domingo and the "Depresión de Muertos". According to Von Hillebrandt, the technologies used in the project are those known as gravimetric magnetism, sonar, and seismic reflection and refraction. The data compiled was analyzed in conjunction with that of the 30 PRSN stations and the 10 submarine stations recently installed at the bottom of the sea.

In the GEOPRICO project scientist from all the universities and entities mentioned participated and it covered the regions south of Santo Domingo, the south of Puerto Rico in the "Depresión de Muertos", the El sombrero seismic zone and the "Depresión de Muertos".

On behalf of the PRSN undergraduate students, graduate, and technical personnel and researcher from the Net and the Department of Geology participated. The director of CoHemis, Dr. Fernando Gilbes Santaella was present at this activity representing Dr. Jorge I. Vélez Archo, Chancellor of RUM. We were told that the Hesperides recently concluded similar studies in the Antarctic region.

collaborators. This virtual community has served as a forum, not only to provide the student with documentation and information of the project, but it has served as a liaison between those interested and those who already participated.

Having the opportunity to know other cultures, experience a different educational systems and live day by day the adventure of Olé-RUM for a semester or for a whole year, definitely permits us to see life from a larger and different perspective. At the same time it is a personal, educational and professional enrichment that the student obtain, this source will serve as an instrument that will make a difference. All of this is added to the indispensable role we play as ambassadors of the smallest of the Greater Antilles, and the Mayagüez Campus of the UPR, upon discovering another side of the world.

Internacional Students in UPRM:

Spanish student in Puerto Rico

María Fernández Arribas is 25 years old and a native of Madrid, Spain. She is a post graduate student from "Universidad Autónoma" of Madrid (AUM), she is majoring in Ecology since she likes everything related to the management of the coastal environment.

María is a veteran when it comes to student exchange programs. Before choosing UPRM and studying the academic year 2004-2005 in a research project with Sea Grant, she had been in exchange programs in universities in England, Italy and Australia. According to her, "the fundamental difference I've found between the countries I've studied in and Puerto Rico, is the kindness of the people and the warmth and hospitality in which I've been received from the beginning, makes everything easier."

"I decided to study in UPRM because it has always called my attention. I could have picked Canada, Australia, the U.S. or any other country in Latin America, but the idea of Puerto Rico, according to what I had read, was what most attracted me. I was looking for educational opportunities in my area of interest and I found Sea Grant as an excellent choice. So, Puerto Rico and Sea Grant together became the perfect exchange program."

Sea Grant is a program dedicated to conservation and the sustainable use of the coast and the marine resources of Puerto Rico, the American Virgin Islands and the Caribbean region. Their mission, to conduct excellent scientific research in the areas of water quality, fishing, marine culture, seafood, marine recreation, coastal tourism, coastal hazards, and the economic development of coastal communities; apply their scientific knowledge to solve a variety of problems faced by those who use these resources in our communities day by day. For more than two decades the Sea Grant Program of the University of Puerto Rico at Mayagüez, has been working to promote the sustainable development and the intelligent use of the marine resources in Latin America and the Caribbean region.

María told us that in Spain it is not a requirement to attend class at all, everything depends on a final exam, while in Puerto Rico, attendance to class is necessary and they are constantly giving quizzes

and exams, "but you just have to get use to it", she says. In respect to post graduate work, its excellent, "The professors are aware of your needs and they make an effort to help you learn the most you can. They also offer many opportunities to get financial aid by doing research projects.

María thinks that Puerto Ricans treats the visitor very politely, "you notice the happiness and the need to have a good



María Fernández, post graduate student in Marine Sciences from the Autonomous University of Madrid, participate in the Olé-RUM Project

time, its important to get to a place and not feel lonely, to know that if you need help of any kind someone is going to provide it, you feel this way when you get here. Between Spain and Puerto Rico the differences are not many. The people and the customs are similar and that's why I feel very much at home here., I will definitively return. Such has been my campaign in favor of Puerto Rico that twelve of my friends organize an expedition to visit the island (with the excuse of coming to see me) and I have spoken with the Student Exchange Office at UAM and I told them about all the advantages studying in UPRM has, so they can promote it and more people can have the same experience I have had here.

She would like to live in Puerto Rico for a year or two, but she says that her mother country is calling her and would pick Spain as a permanent residence. She told us that she made many friends and has visited many places on the Island.

In February, María received the Santander Scholarship in the office of the President of the University of Puerto Rico, a scholarship given to those students who participate in the Student Exchange

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

Project with Spain. The student was accompanied to the presentation of the scholarship ceremony by Mrs. Yamarie Hernández Bonet, CoHemis' Coordinator. She also enjoyed an invitation to lunch with UPRM Chancellor, Dr. Jorge I. Vélez Arocho. Among those invited to lunch were Dr. Laura Bravo, from the Hispanic Studies Department, Dr. Fernando Gilbes Santaella, Director of CoHemis and the chancellor's wife, Prof. Digna Hernández Guzmán. It was a privilege for María to be in the company of those invited and she felt grateful for the opportunity to do so.

María has attended various meetings offered by the Student Exchange Project with Spain Ole-RUM. She recommends this program to interested students, although she has notice that some are scared to take the step. "According to my experience, I enthusiastically recommend that you participate, there are many things to learn, the experiences you get support your educational, professional and personal growth. About choosing Spain as a destination, you are going to definitely have a good time, the customs are similar and the people have the same desire to enjoy life as it is here. In reference to the universities, the academic recognition is going to be pretty good and useful."

We finally asked María, if she wanted to add anything else to the interview. She wanted to thanks to Ilia, Myrna and Gildreth, of the UPRM Student Exchange Office; to Yamarie, Johanna and Zoraida, of CoHemis; to Chapa, Migdalia and María, Sea Grant; to Robin Williams, Marine Sciences Department; to Peter Vander Meer, Electrical Engineering Department; and to all the students she met at UPRM, for letting her take home wonderful memories!

IN THE FOLLOWING EDITION:

You will find articles about:

- ◊ Learning Factory Workshop in Mexico
- ◊ Olé-RUM Project - Visit to Spain and farewell activity for students
- ◊ And a lot more...

Internacional Students in UPRM:

A Peruvian in love with research

Like the majority of Latin American students at the Mayagüez Campus of the University of Puerto Rico, Ms. Yvette Ludeña Hinojosa was recommended by a friend who graduated from this institution. Yvette enrolled at UPRM in August of 2003 following the advice of her present sister in law, who was then a doctoral graduate student in Chemistry at the Río Piedras Campus.

A native from Cusco, Perú, Yvette received her professional degree in Biology with a major in Microbiology at the National University of San Antonio Abad del Cusco in March of 2003. For some unknown reason, the beautiful and ancient capital of the Incan Empire is the Peruvian region from which the majority of Peruvian student that study here come from.

At present she is studying her fourth semester at a post graduate level majoring in Biology and she began working on her thesis under the guidance of Dr. Fernando Gilbes Santaella. The subject of her thesis is the determination of the abundance of cyanobacteria in Mayagüez Bay – Puerto

Rico in relation to the biotic properties of its waters. The cyanobacteria are prokary-



Yvette Ludeña is a graduate student in Biology under the supervision of Dr. Fernando Gilbes Santaella

ote organisms (that don't have a nucleus or organelles, its genetic material (DNA) is found free in the cytoplasm) capable of realizing the photosynthesis process thanks to its pigments, mainly chlorophyll. According to history, during the process of evolution of the earth, the cyanobacteria was responsible for converting the anoxic

conditions of the earth to oxic, thanks to the process of photosynthesis. At present, they are responsible for the high percent of oxygen on earth, while the rest is produced by plants.

Yvette thinks UPRM offers major opportunities for research than those at her university in Cusco. She lives in the center of Mayagüez, where she shares an apartment with two Colombian friends, who study agronomy. She likes the way people are in Puerto Rico; they are very warm and friendly.

Yvette is the second of two siblings. Her parents, retired professionals, feel very proud that she is studying her master's. Once she finishes her master in Microbiology, she'd like to start on a doctoral degree. For that she'd have to pick between in UPRM's Marine Science Department or Molecular Biology at the Río Piedras Campus. She would then consider working in Puerto Rico or return to Peru and work in the Navy as a researcher, or maybe as a researcher at the University of Cusco, where she obtain her undergraduate degree. We think Yvette is in love with research!

UPRM researchers study eddies in the Caribbean Sea *(from page 6)*

The main objective of this expedition was to study an anti-cyclone eddy (clock wise), located south of Haiti and Jamaica. This research is part of a three year project sponsored by the Office of Naval Research (ONR) of the United States to this group of researchers.

The project hopes to study the chemical-physical parameters, the bio-optic properties, and the oceanographic factors associated with these eddies. It also provides the opportunity so that students receive practical training in oceanographic procedures and can develop their thesis projects. Through an additional proposal submitted to the National Science Foundation (NSF), this fourth expedition was able to be realized for the first time on the R/V Pelican, an oceanographic ship that belongs to the UNOLS ships and which visited the Caribbean Sea for the first time.

During the intense fourteen day of work the researchers visited ten sampling stations from which they took samples of water for different biological and chemical analysis, measure the chemical-physical parameters and the bio-optical properties of the column of water. Also a underwater vehicle measured various parameters throughout the route. Expensible bathythermographs were also dropped along the route to characterize the temperature of the water column. Midway through the journey, March 18, 2005, the ship arrived to Port Antonio, a small town on the northeast of Jamaica. For a day and a half the researchers were able to get to know the town and be in

direct contact with this Caribbean culture. They left very early Sunday March 20th for the second week of work. The interesting expedition returned to Puerto Rico March 25, 2005.



Some of the researchers who participated on CaVortEx IV. From left to right Julio Morel, Jorge Corredor, José M. López, Jorge Capella. In the back you can see the R/V Pelican at the Port Antonio dock, Jamaica.

Farewell to the students participating in the exchange project with Spain



The University of Puerto Rico at Mayagüez (UPRM) hosted the ceremony of farewell for the students participants of the Student Exchange Project with Spain

They are leaving, but will come back! A group of students from the University of Puerto Rico (UPR) that attended to the farewell activity for the exchange project participants between UPR and Spain. The activity was held on Saturday, September 10th 2005, at the Rafael Luis Mangual Coliseum, located at the University of Puerto Rico at Mayagüez, in order to benefit from seminars, and enjoy a series of special activities for the parting “UPR exchange ambassadors” before leaving to Spain. They are around 100 young students from the eleven colleges of the UPR educational system, which will begin their studies in Spain for one year or one semester as part of the exchange project.

In addition, UPRM was the host of the pre-farewell event which began on Friday, September 9th 2005 at the Student Center with a student get-together. The activity was in charge of CoHemis Co-director, Dr. Carlos Ríos-Velázquez. The students participated in team-building and “icebreaking” activities in order to know each other, and began the communication and support networking before initiating their international exchange experience.

To the farewell activity at UPRM attended the UPR president, Antonio García-



Students participating of the get-together planned for them on Friday, September 9th, 2005

Padilla, the UPR chancellors, the Spain consul in Puerto Rico, Mr. Gabino Iglesias, and representatives from the Santander Bank, which attended to the event to award a chosen group of participants with educational scholarships.

The farewell activity began with seminars and workshops not only to the students, but to their parents. Some of the topics included: “Financial As-

pects”, workshop given by Lilliam Arroyo and Ramón García, Santander Bank representatives. Also, Prof. Sara Irizarry, the Special Assistant to the UPR President in International Affairs was in charge of the workshop “Adjustment to Change” in collaboration with former international exchange students whom shared their testimonies and anecdotes about their experience, for the benefits of this year participants.

The activity also had a musical interpretation from the “Tuna de Bardos” and a dance performance from “Ballet Flamenco de Puerto Rico”.



The President of the UPR, Antonio García Padilla

During his speech, the UPRM chancellor, Dr. Jorge I. Vélez Arocho, congratulated the young students for taking advantage of such great opportunity, while the UPR president pointed out the importance in the life experience the exchange program participation will represent.

“The decision to explore other spaces and the academic culture of other universities have a tremendous life value”, said García-Padilla. He added that the university acts as a platform in such initiative, and it serves in the development of Puerto Rico as a country, because Puerto Rico will have thousands of young students through the years that will know Europe much bet-

ter, its culture, economy and politics.

The personnel of the Center for Hemispheric Cooperation in Research and Education in Engineering and Applied Sciences (CoHemis) were in charge of the event organization both days.

Some of the Spain educational systems participating in the exchange project include: “Universidad Complutense”, “Universidad Politécnica” and “Universidad Autónoma” of Madrid, and the universities of Málaga, Salamanca, Sevilla, and Murcia among others.



Approximately a 100 students from the UPR colleges are participating in the student exchange program with Spain

Former co-director of CoHemis will be the next president of LACCEI

The University of Puerto Rico at Mayagüez (UPRM) will be the host of the fourth Latin-American and Caribbean Conference of LACCEI, which will be organized by CoHemis. In this activity, our former Co-Director and now Chancellor of the campus, Dr. Jorge Iván Vélez Arocho, will take charge as new president of the organization.

The Latin American and Caribbean Consortium of Engineering Institutions (LACCEI), a consortium of higher education institutions that offer academic programs in engineering, will also have in the Island the fourth annual meeting of the Executive Board. Presidents, chancellors, and other important academic people from Latin-American that belong to the organization will participate. This meeting will be in June 19 and 20 of 2006 at the Turabo University (TU) followed by the conference in June 21 to 23 of 2006 at UPRM.

TU and UPRM will co-host both activities because they are the only two institu-

continues in page 11

As a researcher at MIT the CoHemis co-director

The Associate professor of the Biology Department and CoHemis Co-director, Dr. Carlos Ríos-Velázquez, was awarded as the first research investigator in participating in the Computational and Systems Biology initiative (CSBi) at the Massachusetts Institute of Technology (MIT) in Cambridge, Massachusetts.

Dr. Ríos-Velázquez participated as a researcher in the CSBi, a program that combine education and scientific investigation in order to integrate disciplines such as Biology, Engineering and Computer Sciences to develop computational modeling of complex biological phenomena.

To facilitate the curricular enrichment in Computational Sciences and Systems Biology, to develop collaborations between the visiting faculty and MIT faculty, and to initiate research collaborations between the educational institutions are some of the main CSBi objectives said Dr. Ríos-Velázquez.

The graduate student Josué Malavé and Alana Toro, Industrial Microbiology undergraduate student, both doing research at Dr. Ríos-Velázquez's lab, were part of the CSBi UPR-RUM team. The CSBi UPR-RUM team was involved in a toxic genomic research project trying to develop a monitoring system to analyze the dynamics of the cell's responses upon exposure to genetic material



From left to right: Josué Malavé, Biology graduate student; Alana Toro, Industrial Microbiology undergraduate student; Dr. Carlos Ríos Velázquez, CSBi UPRM Research Team

(DNA) toxic agents. The systems developed was one of rapid screening (high throughput) in collaboration with the Bioengineering Department, specifically the Health and Environmental Sciences Center at MIT.

Besides the participation at the CSBi, Dr. Ríos-Velázquez was also invited as a speaker to the panel entitled: Professional Development Seminar Series on Academic Careers, and also collaborated in the development of an introductory and interdisciplinary course in Computational and Systems Biology, where he plans to integrate, using a team teaching pedagogical strategy, faculty from the Biology, Engineering, Chemistry, Math and Computer Science faculty from UPR-Mayagüez, and faculty and researchers from MIT.

Former co-director of CoHemis ... (from page 10)

tions in Puerto Rico, out of five that have engineering schools, which belong to the consortium. Last year the Executive Board Meeting of LACCEI took place in Spain, while the annual conference was in Colombia.

Under the slogan of "Braking Barriers and Frontiers in Engineering: Education, Research and Practice", the conference will set the beginning of the presidency of Chancellor Vélez Arocho during the night of Thursday, June 22 of 2006, at the gala dinner of the event. According to Dr. Ismael Pagán Trinidad, general coordinator of this year LACCEI conference and meeting, the track of other distinguished academics in education will be honored during the same night.



Dr. Jorge I. Vélez Arocho address students from Cartagena

In fact, at the last year consortium conference our Chancellor was recognized for his work and leadership in developing alliances between Latin-American Universities, task that he mainly carried out through CoHemis. "A tribute to Dr. Vélez Arocho is a tribute to the institution and to Puerto Rico and it is very well deserve for all his lifespan efforts and commitment toward this organization and other educational Latin-American organizations that he belongs to", pointed out Pagán Trinidad.

Dr. Pagán Trinidad, who is also director of the Civil Engineering Department at UPRM, said that the purpose of the conference and annual meeting of LACCEI is to motivate and facilitate the collaboration in research, education, and service among the universities. "We are particularly trying to promote the faculty and student exchange, joint research and support to initiatives for educational standards like accreditation", he said. Based on these activities, he added, alliances of joint degrees and mixed curriculums have been created, among others.

UPRM student receives the CEAL Scholarship

Until now a total of 36 students from UPRM have performed exchange studies with Spanish universities in the past 3 years. New orientation strategies and more promotion efforts about this Exchange Project with Spain have produced that over 20 students get ready to start their studies exchange through this project during the second semester of academic year 2005-2006.

As part of the orientation process and in order to help the students in their final arrangements toward this new experience, CoHemis organized a farewell activity in December 14 of 2005. Fourteen students from different UPRM faculties that will start their studies exchange in Spain during mid January and February of 2006 attended the activity. Various administrative processes that are required before the students are leaving to Spain were also discussed.

It is important to point out that one of our participating students, Deborah M. Carrero Pardo from the Arts and Sciences



Deborah M. Carrero Pardo, sponsored student that will study in the "Universidad Autónoma de Madrid"

Faculty, Department of Hispanic Studies, has been selected to receive one of seven CEAL Scholarships. This prestigious scholarship is offered by "Banco Santander Central Hispano and the Universidad Autónoma de Madrid" to students of the University of Puerto Rico. Deborah will carry studies in the Faculty of Philosophy y Literature of the "Universidad Autónoma de Madrid".



**University of Puerto Rico
Mayagüez Campus**

**Center for Hemispheric Cooperation in Research and
Education in Engineering and Applied Science (CoHemis)
P.O. Box 9034
Mayagüez, PR 00681**

