

BIODIVERSITY PROJECTS

UNIVERSIDAD DEL NORTE

Topic	Medicinal plants
Project	Fitochemical study of ethonolic extract of the leaves of the Chromolaena barranquillensis (Hieron) R.M. King & H. Rob.; Study and chemical characterization of principal secondary metabolites present in leaves and roots of the Manihot cartagenensis; Chemical study of the total ethanolic extract of the flowers and stems of the Chromolaena barranquillensis (hieron) R.M. King & H. Rob; Compositional analysis of the volatile and essential oils in the flowers of the plumeria rubra and plumeria alba isolated by distillation – simultaneous extraction with solvent and water-vapor distillation. Determination of the chemical composition of the volatile and essential oils of the leaves and flowers of the chromolaena barranquillensis isolated by simultaneous distillation-extraction with solvent and water-vapor distillation. Evaluation of the biological activity and chemical composition of the volatile and essential oil fraction of the bark and leaves of the Croton niveus Jacq. (silver).
Contact	Rubén Jiménez Cuentas, M.Sc ; Amner Muñoz Acevedo, Ph.D.
Area	Biology – Natural Products
Telephone	3509312-3509284
E-mail	rjimenez@uninorte.edu.co; amnerm@uninorte.edu.co

Observations

Various projects are presented here in their initial phase; two are in the final phase. The nearly-completed projects are: Compositional analysis of the volatile and essential oils of the flowers from the plumeria rubra and plumeria alba isolated by simultaneous distillation-extraction with solvent and water-vapor distillation. Determination of the chemical composition of the volatile and essential oils from the leaves and flowers of the Chromolaena barranquillensis isolated by simultaneous distillation-extraction with solvent and water-vapor distillation. The projects will allow researchers to earn their undergraduate degree in Chemistry or Chemistry and Pharmacy; additionally, they will present in conferences and publish articles in scientific journals.

Topic	Water
Project	Specialization in Environmental Analysis and Management
Contact	Amelia Escudero de Fonseca, Engineer / Nury Logreira, Engineer
Area	Institute for Sustainable Development (IDS)/Engineering Division
Telephone	3509747-3509770
E-mail	afonseca@uninorte.edu.co - ids@uninorte.edu.co
Observations	
Training specialists on the causes of water deterioration and how to prevent and mitigate it.	

Topic	Water
Project	Evaluation of alternatives for water management at the University of the North.
Contact	Amelia Escudero de Fonseca, Engineer
Area	Institute for Sustainable Development (IDS)/Engineering Division
Telephone	3509747-3509770
E-mail	afonseca@uninorte.edu.co - ids@uninorte.edu.co
Observations	
Two options will be evaluated in this project: the University of the North will continue waste water treatment in their own plants, or will turn it over to the water management system in the city.	

Topic	Water
Project	Interinstitutional Doctorate in Ocean Sciences
Contact	Juan Carlos Ortiz Royero, Ph.D.
Area	Division of Basic Sciences
Telephone	3509509 Ext.4547
E-mail	jortiz@uninorte.edu.co
Observations	
<p>Given the complex nature of this field, in which natural and human problems intersect and demand that we understand and can integrate fundamental concepts, the Doctorate in Ocean Sciences proposes an interdisciplinary vision. This integrated knowledge can be achieved only through high-level research, thereby justifying the creation of a doctorate that combines the different aspects of knowledge in this area and proposes solutions according to Colombian and international reality.</p>	
<p>This program, which will award the degree of Doctorate in Ocean Sciences, has the support of the University of Giessen, the University of Kiel, the Center for Marine Biodiversity at Bremen University through DAAD (the German Academic Exchange Service) and is offered jointly with the following institutions: University of the North, University National, Antioquia University, El Valle University, Jorge Tadeo Lozano University, Magdalena University, along with the cooperation of INVEMAR (Colombian Marine and Coastline Research Institute) and the National Ocean Commission.</p>	
<p>The program draws support from the research areas of the pertinent groups from the affiliated institutions. These groups will interact with the scientific communities and will lead different research processes, thus creating a valid base for the development of possible doctoral thesis topics:</p>	
OCEANOGRAPHY	
SOCIETY, ECONOMICS AND POLITICS	
PRODUCTIVE USE OF MARINE RESOURCES	
ENVIRONMENTAL IMPACT	

Topic	Water
Project	Adjustments to the CRA Project Environmental Impact Study: “Regulatory and System Management Projects for Ciénagas de Sabanagrande, Santo Tomás and Palmar de Varela, in the Department of Atlántico.
Contact	Amelia Escudero de Fonseca, Engineer
Area	Institute for Sustainable Development (IDS)/Engineering Division
Telephone	3509747-3509770
E-mail	afonseca@uninorte.edu.co - ids@uninorte.edu.co
Observations	Understand environmental protection measures that maintain the best characteristics of a man-made reservoir system based on natural swamps with the purpose of providing food, increasing the production of biotics, and improving irrigation.

Topic	Water
Project	Environmental impact study of the regeneration of Sound Bay beaches in San Luis on the San Andrés Islands.
Contact	Amelia Escudero de Fonseca, Engineer
Area	Institute for Sustainable Development (IDS)/Engineering Division
Telephone	3509747-3509770
E-mail	afonseca@uninorte.edu.co - ids@uninorte.edu.co
Observations	The Antioquia School of Engineering, as required in Colombia for any investment project that seeks to protect beaches, would work to recuperate the habitat for acuatic life and proposes hatcheries for the conservation of native biota.

Topic	Water
Project	Certificate program: Updates in instrumental chemical analysis I, II and III
Contact	Amelia Escudero de Fonseca, Engineer
Area	Institute for Sustainable Development (IDS)/Engineering Division
Telephone	3509747-3509770
E-mail	afonseca@uninorte.edu.co - ids@uninorte.edu.co
Observations	
<p>Oriented to advanced updating for those professionals interested in knowing about new technologies, techniques, methods and equipment being used today to support decision-making and the reduction of errors when dealing with problems that depend on matrix analysis. The program will be taught in 4 virtual modules through the University of the North website (64 hours), plus one 36-hour laboratory module (physical presence required).</p>	

Topic	Water
Project	Intensive International Course: Environmental Microbiology – Levels I, II and III
Contact	Amelia Escudero de Fonseca, Engineer
Area	Institute for Sustainable Development (IDS)/Engineering Division
Telephone	3509747-3509770
E-mail	afonseca@uninorte.edu.co - ids@uninorte.edu.co
Observations	
<p>The purpose is to provide professionals, technical workers, laboratory technicians, and others updated knowledge about the theory and innovative laboratory practices in environmental microbiology with the objective of applying this knowledge to the basic potable water and water clean-up projects that the participants might be responsible for, as well as compare experiences from other parts of the world with those from Colombia, to achieve a transfer of successful technologies.</p>	

Topic	Water
Project	Masters in Education for Sustainable Development
Contact	Amelia Escudero de Fonseca, Engineer / Diana Chamorro
Area	Institute for Sustainable Development (IDS)/Engineering Division
Telephone	3509747-3509770
E-mail	afonseca@uninorte.edu.co - ids@uninorte.edu.co
Observations	
<p>Proposal presented to the ALFA III Program in conjunction with the University of Augsburg, two additional European universities, and six Latin American universities. The expectation is to create the values about and motivate a change in attitude toward caring for the environment. The program would also provide advanced knowledge about sustainable development as a foundation for this motivation and attitude change. It would give tools to the professors about how to teach these new values and knowledge. It would look at solutions used around the world to reconcile the exploitation and conservation of natural resources. It would teach, among other things, how to prevent pollution and how to reuse waste in each process for the reincorporation of productive processes and/or for its inactivations, and in this way be able to deposit them without environmental problems.</p>	

Topic	Water
Project	Environmental Gathering on Cleaner Production
Contact	Amelia Escudero de Fonseca, Engineer
Area	Institute for Sustainable Development (IDS)/Engineering Division
Telephone	3509747-3509770
E-mail	afonseca@uninorte.edu.co - ids@uninorte.edu.co
Observations	
<p>Among other means of environmental protection, seek rationality in water consumption.</p>	

Topic	Water
Project	Environmental Gathering: Strategic Ecosystems in the Colombian Caribbean I, II, III, IV and V.
Contact	Amelia Escudero de Fonseca, Engineer
Area	Institute for Sustainable Development (IDS)/Engineering Division
Telephone	3509747-3509770
E-mail	afonseca@uninorte.edu.co - ids@uninorte.edu.co
Observations	
<p>This is an opportunity to reflect on the environmental profile of valuable ecosystems in the Colombian Caribbean, the natural and man-made pressures that they have been subject to – that can either benefited or caused deterioration, the measures that have been designed for sustainable development and the advances achieved in their implementation. The ecosystems that have been analyzed are: marine and coastal ecosystems of the Colombian Caribbean, the Sierra Nevada of Santa Marta, the Ciénaga Grande of Santa Marta, the Momposina Depression and the ecosystems in the Department Atlántico.</p> <p>In addition, a proposal for the management of industrial waste was presented to support the man-made environment and other advancements in sustainable development, as a starting point toward having a region that supports the environment.</p>	

Topic	Water
Project	Environmental Gathering on Cleaner Production
Contact	Amelia Escudero de Fonseca, Engineer
Area	Institute for Sustainable Development (IDS)/Engineering Division
Telephone	3509747-3509770
E-mail	afonseca@uninorte.edu.co - ids@uninorte.edu.co
Observations	
<p>Among other means of environmental protection, seek rationality in water consumption.</p>	

Topic	Water
Project	Environmental Gathering on Climate Change
Contact	Amelia Escudero de Fonseca, Engineer
Area	Institute for Sustainable Development (IDS)/Engineering Division
Telephone	3509747-3509770
E-mail	afonseca@uninorte.edu.co - ids@uninorte.edu.co
Observations	
<p>Among other consequences, we will have deterioration, loss and absence of water due to deterioration in the paramos, increases in sea levels with the resulting floods, coastal areas and varying behavior in the wet areas.</p>	

Topic	Water
Project	Environmental Gathering: Environmental Aspects of Hydraulics and Engineering in Rivers
Contact	Amelia Escudero de Fonseca, Engineer
Area	Institute for Sustainable Development (IDS)/Engineering Division
Telephone	3509747-3509770
E-mail	afonseca@uninorte.edu.co - ids@uninorte.edu.co
Observations	
<p>Seeks to deepen studies in river and sea hydraulics and other environmental topics that have been and are being conducted (since 1986) by the University of the North as part of the scientific operation of the Hydraulic Testing Laboratory of Las Flores (LEH-LF).</p>	

Topic	Water
Project	Environmental Gathering: New Technologies in the Water Sector
Contact	Amelia Escudero de Fonseca, Engineer
Area	Institute for Sustainable Development (IDS)/Engineering Division
Telephone	3509747-3509770
E-mail	afonseca@uninorte.edu.co - ids@uninorte.edu.co
Observations	
<p>Seeks to deepen the study and care of water in the environment and the identification of the priority problems in the study of water, in rural as well as in urban and industrial areas.</p>	

Topic	Water
Project	"Environmental Gathering: Potable Water and Environmental Clean-Up: Fulbright-University of the North Chair 2007"
Contact	Amelia Escudero de Fonseca, Engineer
Area	Institute for Sustainable Development (IDS)/Engineering Division
Telephone	3509747-3509770
E-mail	afonseca@uninorte.edu.co - ids@uninorte.edu.co
Observations	
<p>Seeks to discover the possibilities of complying, in our region, with the Johannesburg Summit 2002: providing drinking water to one billion people and basic sanitation to two billion people in the current century. To examine the international, national and local policies and regulations that regulate the potable water and basic sanitation; compliance and efficiency of those policies and regulations in reducing the deficit of potable water and basic sanitation; the economic resources and their results; the lack of water apt for potability; public works projects required in the region to reach the UN Millenium Development Goals, and what has been achieved to date; companies' social responsibility toward water management; technical aspects of water treatment (on-site, appropriate and in the rural sector) for potabilization or to adequate before final availability.</p>	

Topic	Water
Project	Evaluation of the risk and early-warning model in urban areas associated with the phenomenon of sudden rain erosion currents
Contact	HUMBERTO AVILA
Area	WATER RESOURCE ENGINEERING
Telephone	57 5 3509236
E-mail	havila@uninorte.edu.co
Observations	
<p>The project seeks to evaluate the risk and impact of the sudden trends in vehicular and pedestrian mobility in urban areas. The flow conditions will be evaluated with CFD models, statistical and hydrological models associated with the risk, interaction with urban transport and response models for early warning systems.</p>	

Topic	Water
Project	Management of river basins to control increases through the evaluation of the effectiveness of Low Impact Development (LID) technologies in consolidated urban areas.
Contact	HUMBERTO AVILA
Area	WATER RESOURCE ENGINEERING
Telephone	57 5 3509236
E-mail	havila@uninorte.edu.co
Observations	
<p>The objective is to model the application of LID technologies in cities that have had urban planning problems as they have grown, typically in developing countries, allowing the adaptation of a rain drainage system via management and alternative and sustainable practices. This research will allow the exploration of new forms for the control of urban growth integrating the massive use of LID technologies, the characteristics of river basins, and the urban dynamic associated with the city. Mitigation policies will be developed and the management of urban basins based on effectiveness and cost-benefit analysis in terms of hydraulic response.</p>	
Topic	Water

Project	Evaluation of massive use of low impact technologies in urban areas with multifamily properties for the control of the quantity and quality of rain erosion.
Contact	HUMBERTO AVILA
Area	WATER RESOURCE ENGINEERING
Telephone	57 5 3509236
E-mail	havila@uninorte.edu.co
Observations	To evaluate and propose models and policies for risk-management in vulnerable populations threatened by flood during the winter season. The project considers hydrologic, statistical, hydraulic and economic models and the integrated effect of public health and the environment in a decision-making model for investment and mitigation.

Topic	Water
Project	RISK MANAGEMENT MODELS AND POLICIES FOR FLOOD SCENARIOS IN VULNERABLE POPULATIONS
Contact	HUMBERTO AVILA
Area	WATER RESOURCE ENGINEERING
Telephone	57 5 3509236
E-mail	havila@uninorte.edu.co
Observations	To evaluate and propose risk management models and policies in vulnerable populations at risk of flooding during the winter season. The project considers hydrologic, statistical, hydraulic and economic models along with the integrated effect on public health and the environment in a decision-making model for investment and mitigation.

Topic	Water
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Project	"THE GUAJARO RESERVOIR: HYDRAULIC AND ENVIRONMENTAL DIAGNOSIS OF CURRENT CONDITIONS
Contact	HUMBERTO AVILA
Area	WATER RESOURCE ENGINEERING
Telephone	57 5 3509236
E-mail	havila@uninorte.edu.co
Observations	<p>A study was conducted of the environmental diagnosis of the current condition of the El Guájaro reservoir to evaluation the changes on the shores over time, the volume of available water, the possible ciruculation of the reservoir, the water quality in those sites with fish cages, and contributions to rain water and sediments.</p>

Topic	Medicinal Plants
Project	Integrated Waste Management Plan (<i>Plan de Gestión Integral de Residuos – PGIR</i>)
Contact	Amelia Escudero de Fonseca, Engineer
Area	Institute for Sustainable Development (IDS)/Engineering Division
Telephone	3509747-3509770
E-mail	afonseca@uninorte.edu.co - ids@uninorte.edu.co
Observations	<p>To understand the design, training and implementation of adequate management of liquid and solid waste and air emissions, both ordinary and dangerous, at the University of the North.</p>

Topic	Medicinal Plants
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Project **Design of a Masters in Water in conjunction with the Department of Civil and Environmental Engineering and the Humanities Department**

Contact **Amelia Escudero de Fonseca, Engineer**

Area **Institute for Sustainable Development (IDS)/Engineering Division**

Telephone **3509747-3509770**

E-mail **afonseca@uninorte.edu.co - ids@uninorte.edu.co**

Observations

Seek to study water, an essential element for life, from all known perspectives (anthropology, history, engineering, ethics, law, among others).