

Interview of the Month June 2015

Guest: Dr. Oula Amrouni

Dr. Oula Amrouni is a senior geology researcher at the National Institute of Marine Sciences and Technologies since 2008 in Tunisia. Her master and PhD thesis work started in 1999 to 2008, at the Faculty of Science of Tunis, University of Tunis El Manar, with developing a research axis on coastal and marine sediment dynamics. Dr. Amrouni was also an Associate Professor in “Geology applied to the Environment” at the University of Tunis El Manar and the University of Letters and Humanities, Sousse (Tunisia). She supervises PhD and M.Sc students in the field of Georesources (i.e, sedimentology, beach assessment, air pollution, climate change effects, modelling, etc.) and Integrated Coastal Zone Management Strategies. Dr. Amrouni published valuable and multidisciplinary manuscripts in International peer reviewed journals.

Since 2002, Dr. Oula Amrouni is participating in national and international projects related to the forecast sea level rise and the management purposes. Dr. Oula Amrouni joined the Government Agency of Coastal Protection as scientific expert since 2013. She contributes to the achievement of the national coastal projects and plans, and therefore, the initiatives to achieve practical solutions that ensure integrated and sustainable social, economic and environmental development. She was a Member of the Arab World Association of Young Scientists (ArabWAYS) and she had the opportunity to be a Member of the working group with the WCRP (World Climate Research Programme) team on the European Union conference, CORDEX 2013.

A. Environmental programs in Tunisia

1. Please explain to us your expertise which is sedimentological analyses and multi-scale coastal behavior models.

Since my master and thesis research, I was working on the coastal morpho - hydrodynamic and sedimentological process by quantification of dune / beach system and the interaction with the natural factors (wind, wave). My work involves the sedimentological analysis and *multi scale coastal behavioral models* under climate change effects. In the other part, I acquired ability on the different aspects of the aeolian dynamics flow of the coastal foredunes, of the methods of measures and interpretation of the conditional factors of these dynamics. My research was mainly on understanding the marine bar system undertaken by the

morphological and sedimentological investigations using simultaneously topobathymetric survey. My research undertaken with my scientific team (colleagues and undergraduate students) is also related to focus on natural hazards and associated risks. The state of the coastal environment is a major factor determining vulnerability to hazards. It is widely recognized that beach degradation is one of the main factors contributing to the increase of human, material and financial losses due to disasters. The spatial data and earth space applications are monitored and the morphodynamic study of the coastal system feature is completed (vegetation, socio-economic activities, human infrastructures, shoreline evolution, etc.). The knowledge acquired will bring citizens, stakeholders and the social community to Integrated Coastal Zone Management implementation.

2. What are the curriculum reforms that you see as priorities and what do you recommend as co-curricular activities in order to pursue a career in the environmental field?

The main objective, which represents the key of successful environmental sciences, aims to enhance synergy between Research, University and Industrial side. The perspective of my future research, including multidisciplinary fields, is to gain knowledge of present land use - coast structures, processes and relationships of the marine environment around coastal Mediterranean basin in order to provide a fundamental scientific understanding and facilitate:

- The understanding of hydrodynamic process and sedimentological characteristic to improved utilization of environmental information.
- The efficient exploration, exploitation and conservation of the systemic coastal ecosystem coastal.

The contribution of the policy and governance (according to the International legal ICZM framework) will be necessary to attain the scientific goal and to ensure the sustainable management of water resources at coastal bedforms, also to establish a systematic process of developing, allocating and monitoring the use of water resources and the assessment of the coastal zones.

3. What are the technologies and equipment that are lacking in Tunisia and that constitute an obstacle to the progress of researchers in this field?

The establishment of a Mediterranean scientific connection (ICT data base) related to coastal component (regional scale under short term event) to exchange experience, data, knowledge and the integrated coastal zone management protocol.

The administrative procedure to import equipment constitutes an obstacle to achieve field geological measurement. This problem isn't limited to the Tunisian workgroup. We have to find solutions to facilitate the acquirement of scientific materials and to encourage scientific team to maintain the geological investigations.

4. What are the environmental projects that you think could lift Tunisia to international standards?

The coastal region constitutes the backbone of Tunisia's economy with important agricultural activity, industry and ports offering access to external markets. As a result, the government of Tunisia has identified sea level rise and coastal development as a top priority for adaptation action. The APAL Agency (Ministry of Environment) funded projects aiming to promote innovative adaptation strategies, technologies, and financing options in Tunisia's most vulnerable coastal areas. The Agency, actively represented at the Mediterranean and International project, received several international funds to attain this goal. The latest Project has been achieved last December, 23, 2014 entitled : ***“Addressing Climate Change Vulnerabilities and Risks in Vulnerable Coastal Areas of Tunisia”*** financed by the PNUD (<http://www.undp-alm.org/projects/sccf-tunisia>) (APAL-PNUD, 2014).

The environmental projects adopted in Tunisia and related to the monitoring of the coastal ecosystem have important components. The national project outcomes are the replicable adaptation measures developed in the target coastal sites including shore protection practices and technologies to mitigate long-term risks; the institutional expertise and associated budgets for the maintenance, planning and expansion of the introduced shore protection and coastal adaptation practices; finally, the development of a coastal risk monitoring and early warning system.

B. Environmental issues in Tunisia

1. What are the issues that challenge the Tunisian geological environment and how do you see we can tackle these issues?

The environmental issues and their solutions could be summarized as follows:

- Quantification and comprehension of the morphodynamic system of the nearshore compartment.
- Monitoring of the sedimentary dynamics structures (submarine bars, shoreline) on regional and micro temporal scale (storm surge).
- Adaptation of modeling tools and simulation of coastal sedimentary structures.
- Identification and promotion of geological studies alternatives to cope with climate change impacts related to beach (river/nearshore system) that could contribute to national programs of action for adaptation or local programs.
- Construction of a shared Knowledge Database/Portal.

2. What are the predictions for the marine environment in Tunisia and what are the implications for citizens and the country? How do you think we can sensitize citizens in order to get involved in alleviating the risks in the future?

Our institutional marine researchers are focused on key strategic priorities of the national environmental programs related to integrated coastal zone management. Following those goals, the assessment of the marine environment will address the long term needs for shoreline protection in the face of climate change in Tunisia. It will provide support solutions for the environmental stakeholders in order to implement measures such as beach nourishment, dune system and coastal marshland restoration, controlled fishing exploration and the mitigation of the contaminated areas in the coastal zones. The awareness of citizens is achieved through environmental meetings, and the participation in NGO associations' activities. We provide valuable scientific inputs and we try to spread the environmental information and challenges throughout scholar meetings and college establishments. We facilitate also the vulgarization and diffusion of good lessons (learning from mistakes). The citizen is the main active executor in the Integrated Coastal Zone Management. The well informed citizen is a well protected one.

3. What are the geological problems that should get quick attention from the government and how do you think decision makers should intervene?

The geological surveys in marine system are great but hard to implement because the field measurement is complicated and needs equipment. The technical performing equipment and human services are strongly recommended to reach our common socio-economic goals. Examples of equipment, which are usually expensive, are sampling core, sounding bathymetry, laboratory analysis, MEB, scanning microscope and isotopic datation.