



Editorial

GEOLOGY TO ADVANCED GEOSCIENCES, THE EMERGING STRATEGIES FOR CRITICAL CHALLENGES

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The historical retrospective and the current state of knowledge on the various branches of geology evince an evolution from a pre-scientific geology (15th - 18th century) to a concise and multidisciplinary sciences based on vigorous concepts and application of specific principles and methods that developed since the 19th century. In about one century, geoscientist have used several tools (physics, chemistry, biology, chronology, mathematics and informatics) to understand the geology and the evolution of the dynamic Earth planet and how its system works in a broader context encompassing the atmosphere, biosphere and hydrosphere and how it evolved to its current state (Gundersen, *et al.*, 2011; Karagözoğlu, 2017). A revolution in the earth sciences started in 1960s with the emergence of the theory of plate tectonics which have been acknowledged and accepted few years later (Kious, Tilling, 1996). In fact, all geologic processes on local, regional and global scales are directly or indirectly influenced by plate tectonics; this latter is also blamed for slowly (and instantaneous) evolving environmental change and for many catastrophes over time (earthquakes, volcanoes, tsunamis and landslides...). The achieved developments resulted in a broad understanding of the Earth planet and led to expand the basis of geosciences education and then, open doors to the exploration and the extraction of major's natural resources (water, energy and mineral resources).

Indeed geosciences are involved in the main natural science challenges to endeavor economic, environmental and social issues facing the world today (Gundersen, *et al.*, 2011; Jouzel, 2009; Rowan, Leahy, Zoback, 2008). We believe that the current global topic of geosciences in a world with changing needs and growing population is, on the one side, to contribute in providing solutions to society's most challenging problems as much as insuring the main critical needs for natural resources, environmental quality, and resilience to hazards while sustaining the Earth system and, on the other side, to enhance further knowledge of the Earth planet in attempt to unveil some of the unsolved fundamental problems in earth sciences (Schopf, Hayes, Walter, 1983). Regrettably human activities (quarrying and mining industries, manufacturing, agriculture, landscaping...) have altered many terrestrial ecosystems (Crutzen, Stoermer, 2000) and continues to impact dramatically natural environments and habitats.

The community of geoscientists should be engaged in a global strategy to build consensus knowledge to face the current and future challenges and address the society's critical needs. In this issue many appointments and perfections are required and classic geosciences must evolve to a more Advanced Geosciences to resolve specific and critical issues. Advanced geosciences can be developed as outgrowth of cooperation and exchanges of ideas among geoscientists and other related disciplines. Independent and collaborative initiatives can bring the society beyond their global challenges if they are shared and discussed appropriately. *Consortium Publication* provides an open platform for geoscientist and interdisciplinary researchers who are motivated to participate in

knowledge building and sharing worldwide. The main goal targeted by all of these collaborations is to provide the knowledge and the ingenuity to insure the growing needs of society in term of natural resources while sustaining the Earth system through a successful conservation and management of earth ecosystems.

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