

Conclusions of the congress GROUNDWATER AND GLOBAL CHANGE IN THE WESTERN MEDITERRANEAN

The congress has attracted a total of **148 participants from 9 countries**, and that have presented a total of **92 contributions** distributed in systems of Spain, France, Italy, Portugal, Morocco, Algeria, Tunisia and Mexico.

The results of the congress will be perpetuated in **two publications**:

- One of them is the digital book containing all the submitted **contributions**, edited by the International Association of Hydrogeologists and the Editorial Universidad de Granada, entities to which I also thank their collaboration.
- And the other, a **book edited by Springer** that will be titled **Groundwater and Global Change in the Western Mediterranean Area**, that will undoubtedly contribute to project internationally the results of this meeting. The book contains a selection of **35 papers**, it is finished and in final phase of printing and it is agreed with Springer that all the participants in this congress will have access to an electronic version.

We have, then, a **solid baggage of data** to be able to draw a series of conclusions from this congress:

1.- We urgently **need to improve two things** in order to make progress in the sustainable use of groundwater: improve **control networks** and start to **consider unconventional water** volumes, such as, for example, those coming from **desalination** and **wastewater treatment**

2.- Although hydrochemical and isotopic studies are of importance, **numerical modeling** becomes an increasingly useful and effective tool when **evaluating the quantitative** as well as the **qualitative changes** that are taking place in groundwater.

3.- **Population growth and changes in land use** in general are producing a severe **decrease in recharge**, although we have exceptional examples, no doubt to try to imitate and reproduce in which human intervention has led to positive results. I refer to the case of **Campo de Dalías**, with the appearance of the Sapo pond.

4.- In relation to the **impact of climate change on groundwater resources**, from the results of this congress we can obtain several interesting considerations:

- On the one hand, it is evident and palpable that future scenarios in most cases expose situations of **decline in recharge and worsening of groundwater quality**,
- In addition, the **importance of the time interval** considered in the analyzes is highlighted to correctly evaluate the impact of global change
- In order to evaluate the changes produced and the vulnerability of aquifers to these changes, **analyzes based on multi-criteria techniques** are very useful.
- The circum-Mediterranean **mountain areas are even more important** in their consideration, since they are the main water suppliers to aquifers and they are **particularly sensitive** to climate change.

- Two processes especially **threaten** coastal aquifers sensitive to **salt water intrusion** and are the **decrease in recharge** and **sea level rise**.
- The **artificial recharge** of aquifers is revealed as a very useful technique for the essential **adaptation to climate change**.

But if we can draw a **conclusion of direct social impact** from this meeting: we are in a region where our water resources are especially **vulnerable** to the phenomenon of global change. Whether we like or not the rivers of the western Mediterranean region, in the future will carry less water, or at least will carry it more sporadically and harder to use it. Thus, **groundwater** will stop being a mere complement, **to become a fundamental element for the sustainable development** of our economy.

Scientists have talked; now we ask our administrations to listen to us and do not hesitate to take advantage of our knowledge, because we are convinced that the responsible use of groundwater in the countries of the western Mediterranean and the sustainable exploitation of its aquifers will depend to a large extent the **well-being of our future generations**.