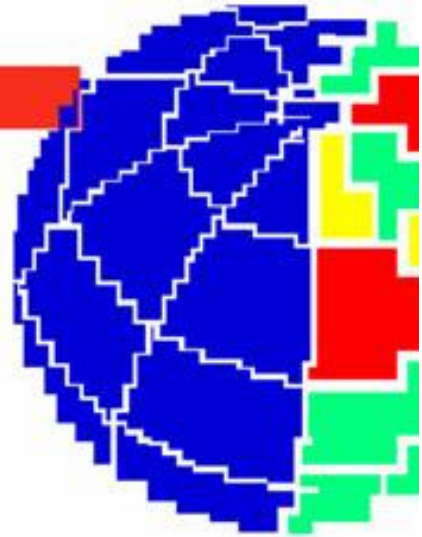




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Palermo.*



Introduction

Natural waters are characterized by ratios, difference which mainly depend on and climatic features. On a local environment can significantly influence waters. Such effects can be quantified by gradients and can also be analyzed along geological paths. The aim of this study is to create a precipitation map that covers all the composition of groundwater.



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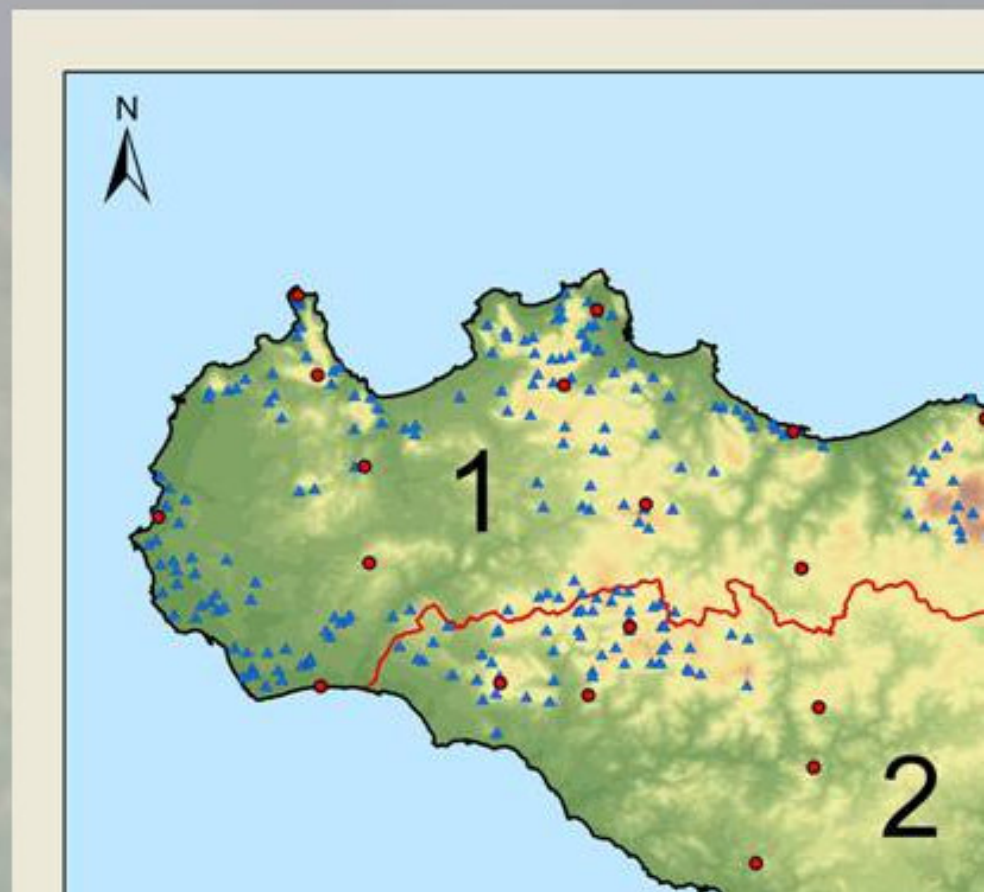
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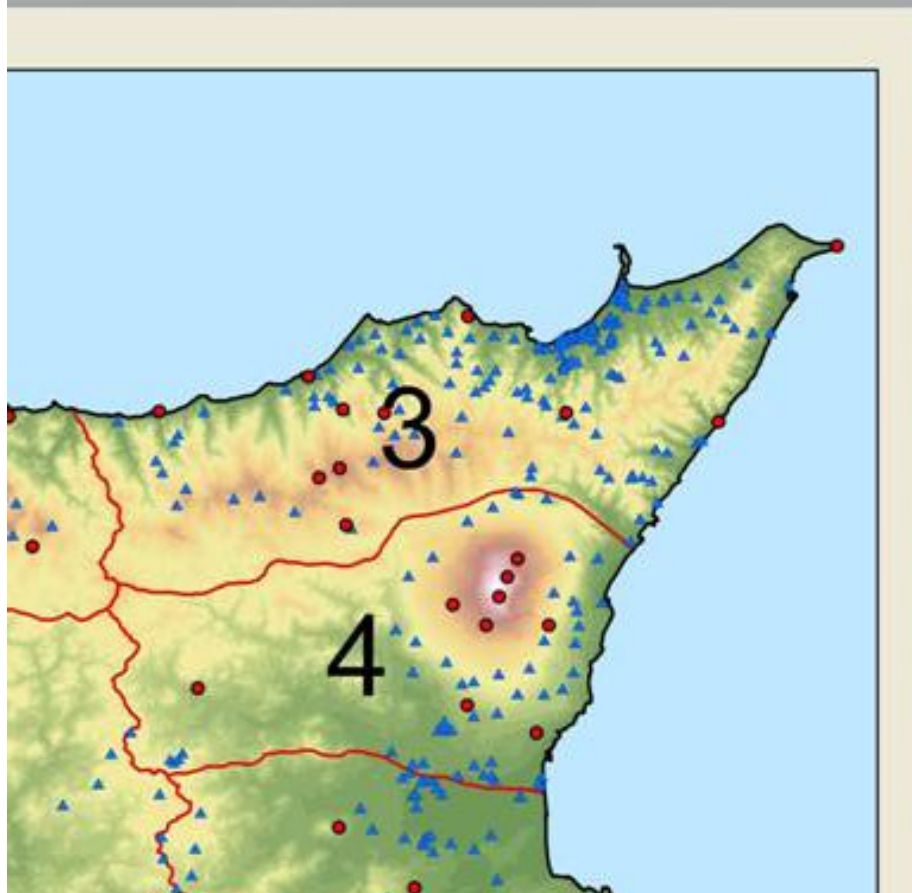


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Results

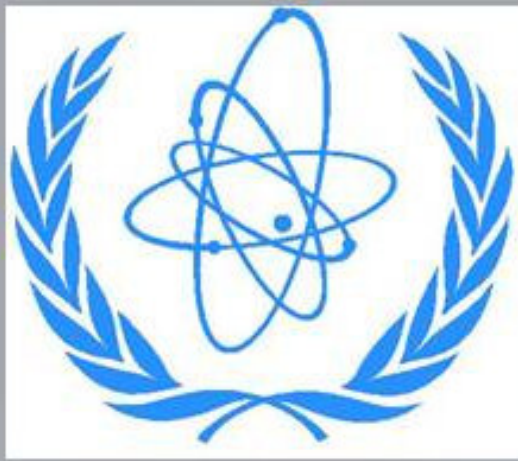
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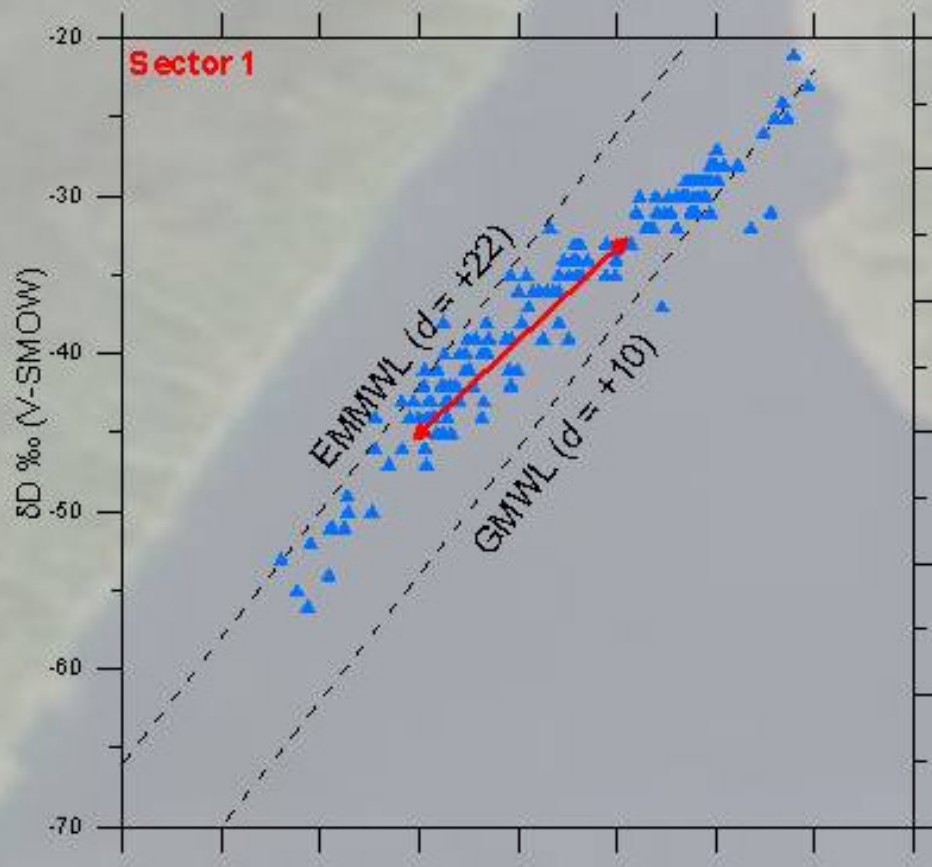
Palermo Italy

MWL computed for sectors 1, 2, and 3 are in similar ranges, while sectors 4 and 5 are significantly different, as they are characterized by a larger range and higher mean excess values respectively. Using the isotopic gradients, the isotopic map was drawn up. It highlights the morphological and climatic features explaining the marked differences in



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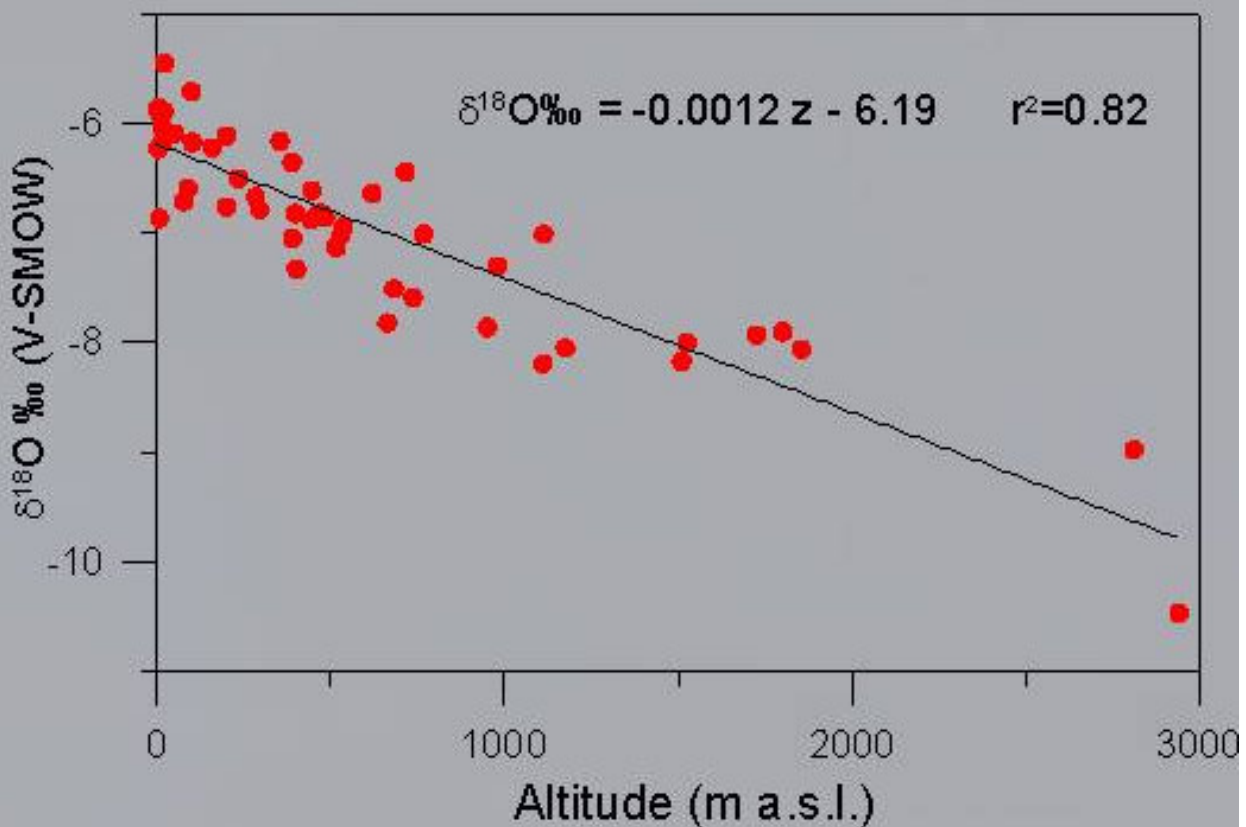
**International Symposium on Advances in
Isotope Hydrology and its Role in
Sustainable Water Resources Management
21-25 May 2007
Vienna, Austria**



Methods

A rain gauge network (50 sites) from May 2004 until June 2006 circulating groundwater was sampled in wells related to the main aquifers

Sector	Vertical gradient	r ²
1	$\delta^{18}\text{O} = -0.0015 z - 6.42$	0.80
2	$\delta^{18}\text{O} = -0.0016 z - 6.18$	0.75
3	$\delta^{18}\text{O} = -0.0013 z - 6.07$	0.82
4	$\delta^{18}\text{O} = -0.0014 z - 5.69$	0.93
5	$\delta^{18}\text{O} = -0.0016 z - 5.92$	0.87



s) was installed and sampled monthly. During the same period, most samples were collected from more than 560 springs across the region.

The water samples were analyzed for their oxygen and hydrogen isotopic compositions.

A Geographical Information System (GIS) was developed with the aim of which was to map the isotopic data. On the basis of hydro-graphical characteristics, the study area was divided into five main sectors. In order to estimate the recharge, mean weighted values were calculated. Since each sector is characterized by different Meteoric Water Lines (VLMW)



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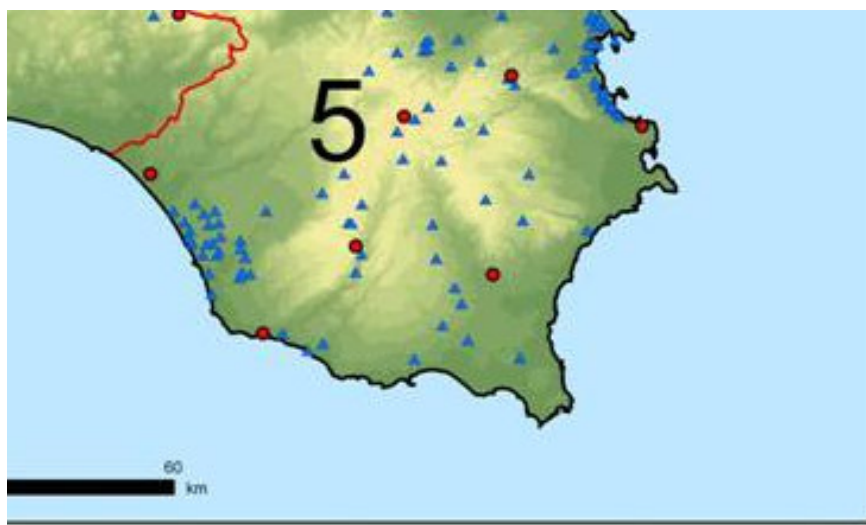
Legend

- Rain Gauge
- ▲ Groundwater Sampling Site
- Boundary Line

0 15 30

Base map of the studied area (red circles) and groundwater sampling sites (red triangles) are also plotted.

ystem was carried out by using ES
isotopic composition of Sicilian rains
al and hydro-geological frameworks
evaluate the average isotopic com
ues regarding the whole period w
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mean isotopic compositions. The map of the groundwater isotopic composition has also been drawn up. The main water bodies identified

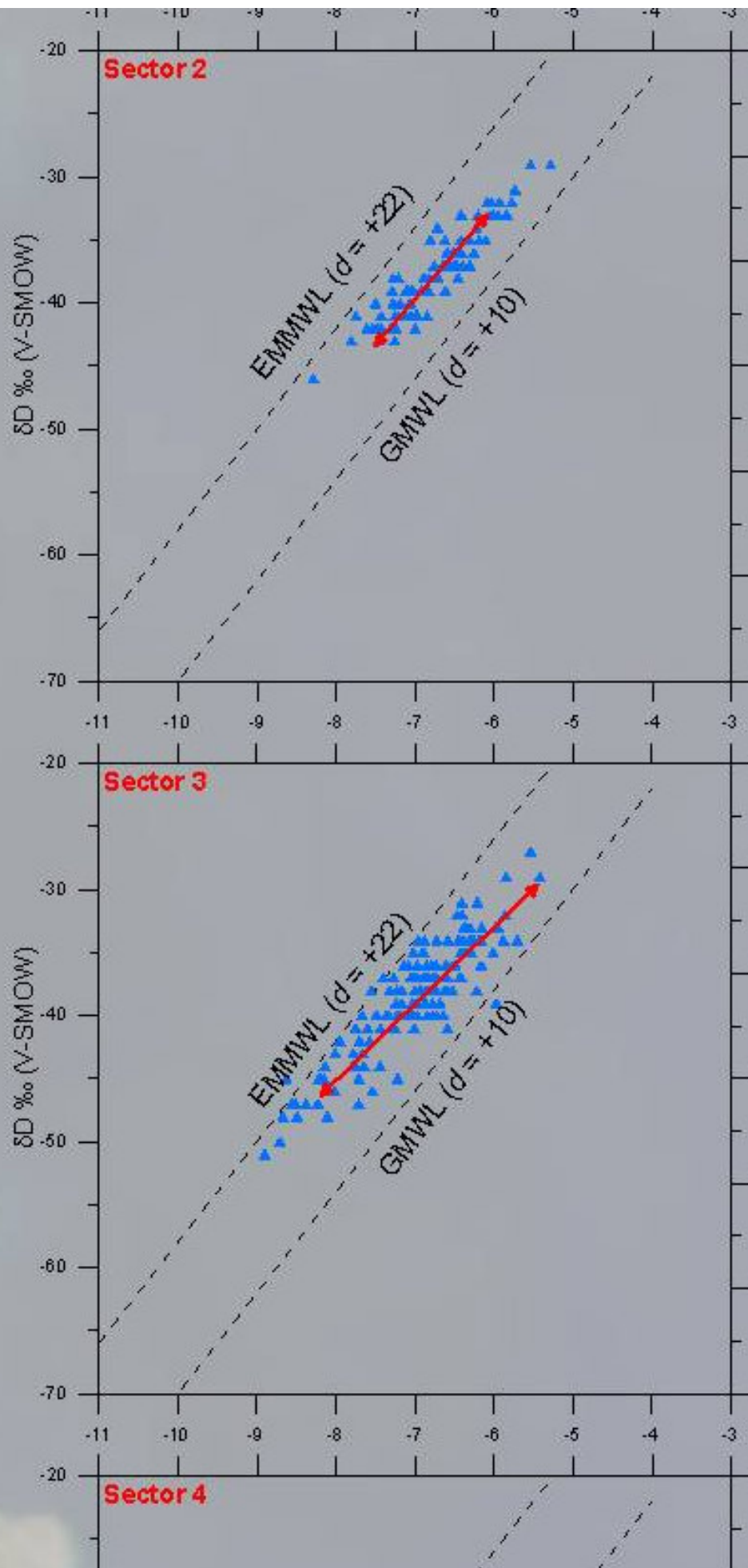
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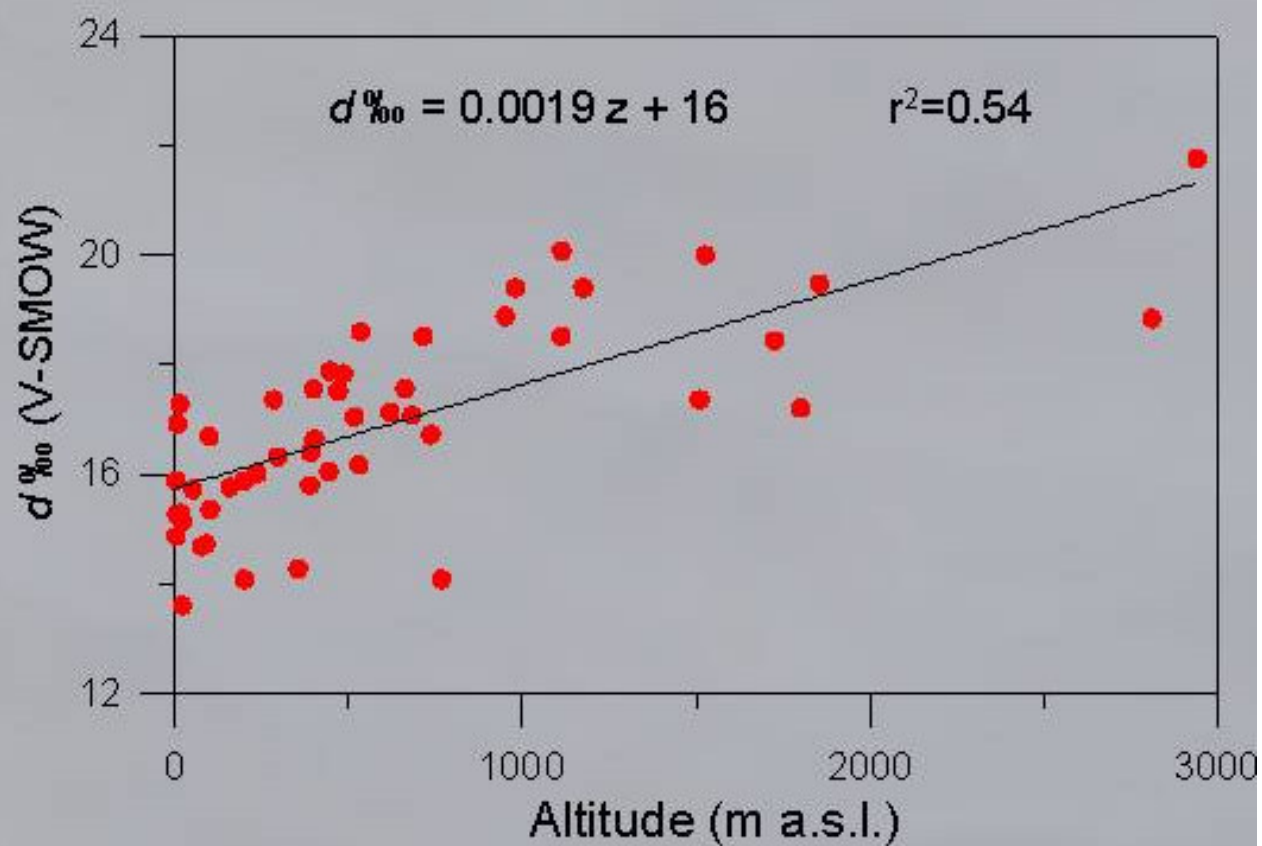
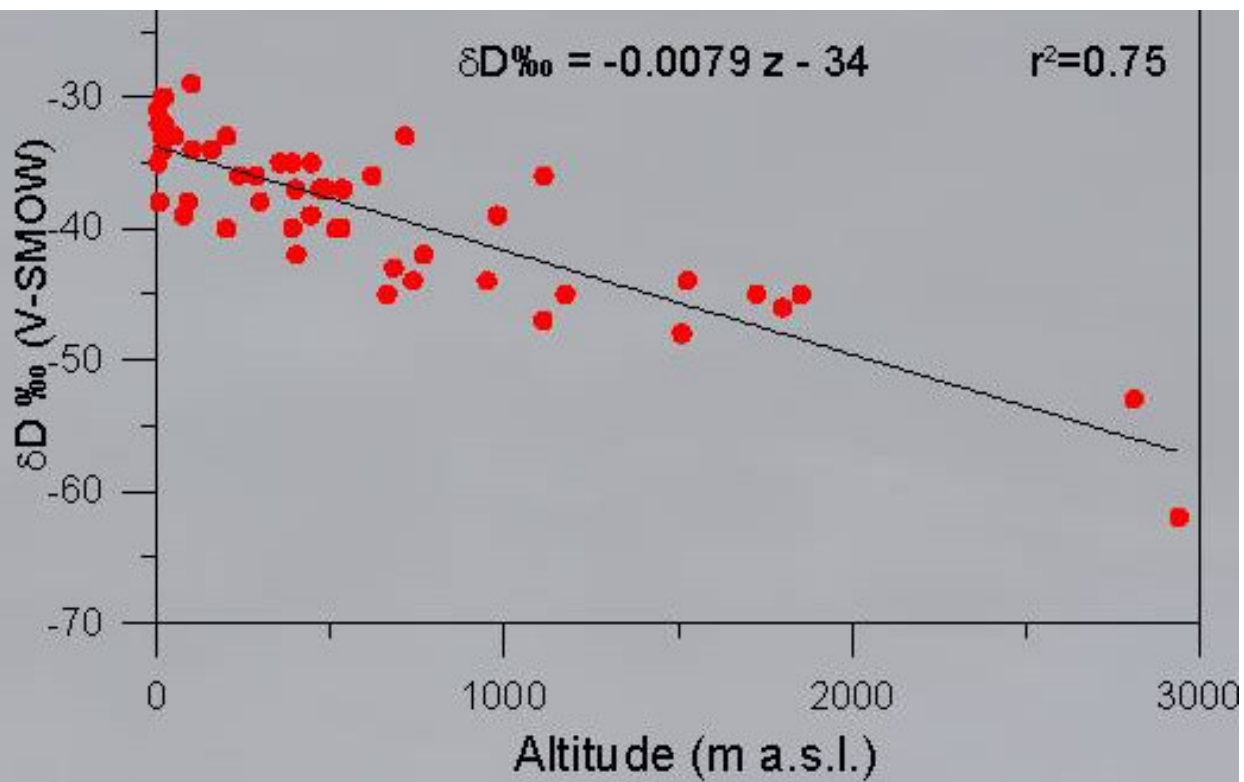
Use of GIS tools, coupled with isotopic gradients, allowed us to design a contour map of precipitation in Sicily. The mean meteoric compositions fitted with most of the groundwater samples in the sector. However, in some areas, evaporation processes occurring during recharge slightly modify the isotopic composition of the groundwater.

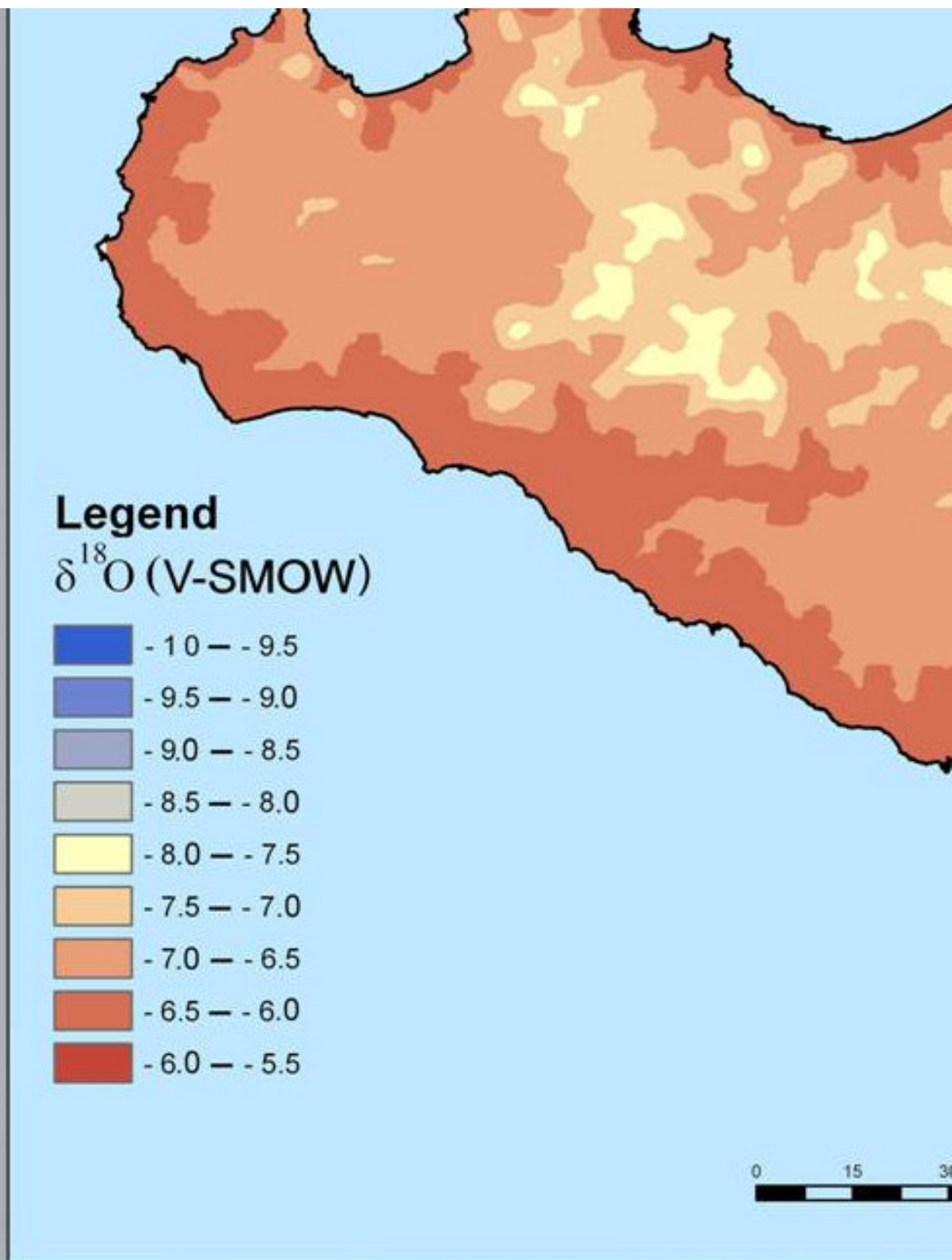


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