Experience of the General Organization of Remote Sensing in Water Resources Management Using Remote Sensing Techniques

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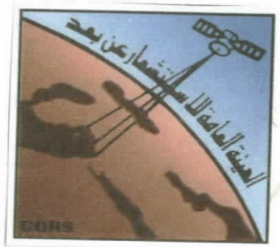

Introduction:

Many countries in the world complain of water problems especially our region complains of great water shortage. This problem increases greatly in result of great increasing of the population, agricultural projects and investments. That will make additional pressure on water resources. Also, the water storage had begun complaining of pollution problems.

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The General Organization of Remote Sensing sets to combat the water problems in Syria by the following directions:

1- Exploration of new sites of groundwater for providing the water needs.
2- Management of available water resources.
3- Protecting of water resources from the pollution.

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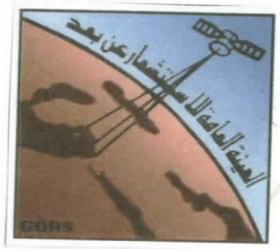
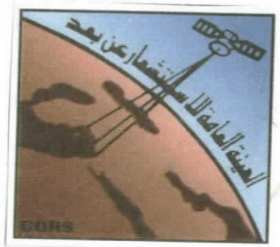


1- Exploration of Ground Water:

Ground water is concerned with water in the saturated zones beneath the surface of the Earth. Ground water information most useful to water resource managers includes: the presence or absence of ground water in designated areas, the depth to ground water, the quantity and quality of water available for development, recharge rates to aquifer, the possible impact of pumping on land subsidence, a real extent of the aquifer, locations of recharge and discharge areas, and the interaction between withdrawals at wells and natural discharge into rivers. Whereas this information is generally sought by hydrogeologists using conventional methods, remote sensing can help in the planning of conventional measurements and can be used to estimate some hydrogeological variables quantitatively and others qualitatively.



By processing , analyzing of space images, compiling thematic maps of drainage, lineaments and main faults with their intensity and crossing in addition to maps of all drilled wells with their discharge and existing springs in the study of each area, study of wet faults at the end of summer through thermal band in Landsat images, subsurface faults through radar images, cross of separated faults with their accurate coordinates by using GPS and carrying out geo-electrical sounding for perspective locations and analyzing the resulted curves and assurance of existing groundwater with their water table.

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We had identified many locations in Salamyeh, Sweida, Dara,a, Lattakia, Tartous and Damascus cities by using this methodology. We had drilled many of wells in the studied perspective locations, and we had good results.

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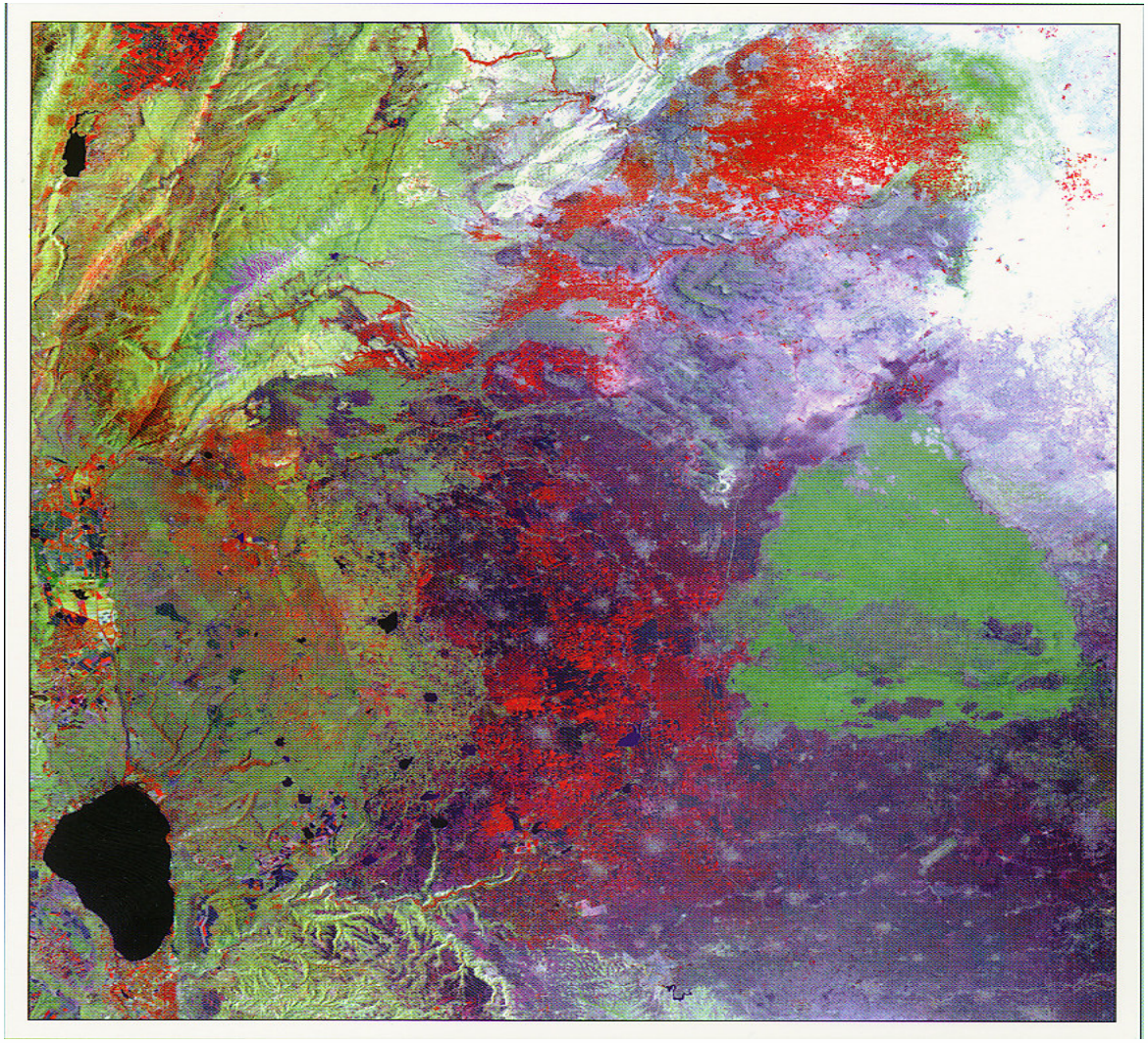

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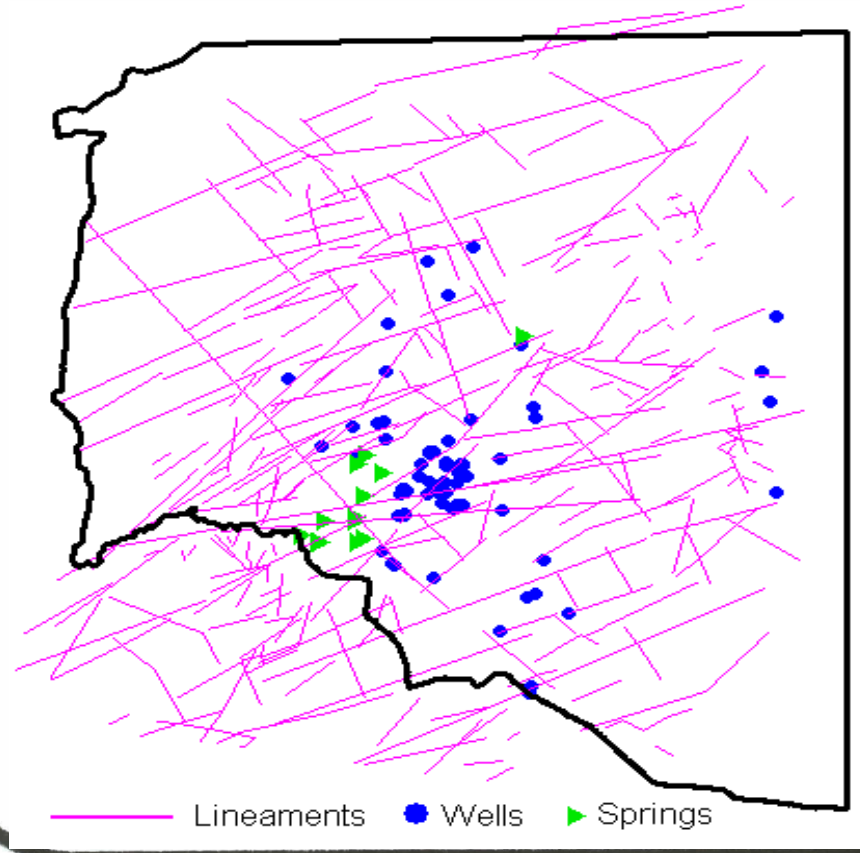

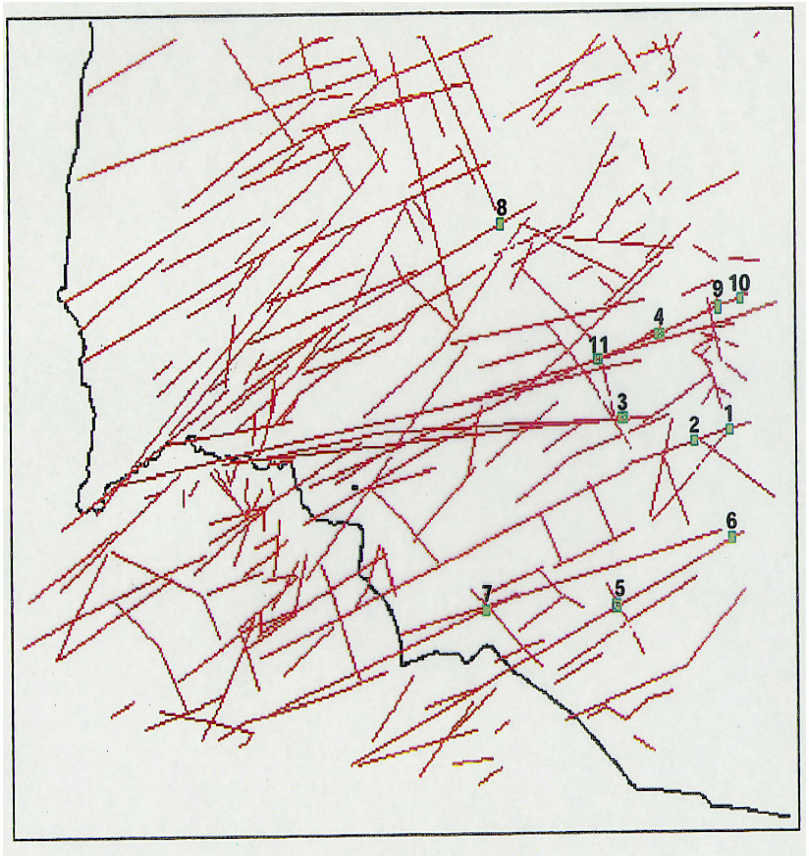

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This study has been carried out in cooperation with GORS, and FAO by using remote sensing techniques (Landsat and SPOT images). In Basalt Area.

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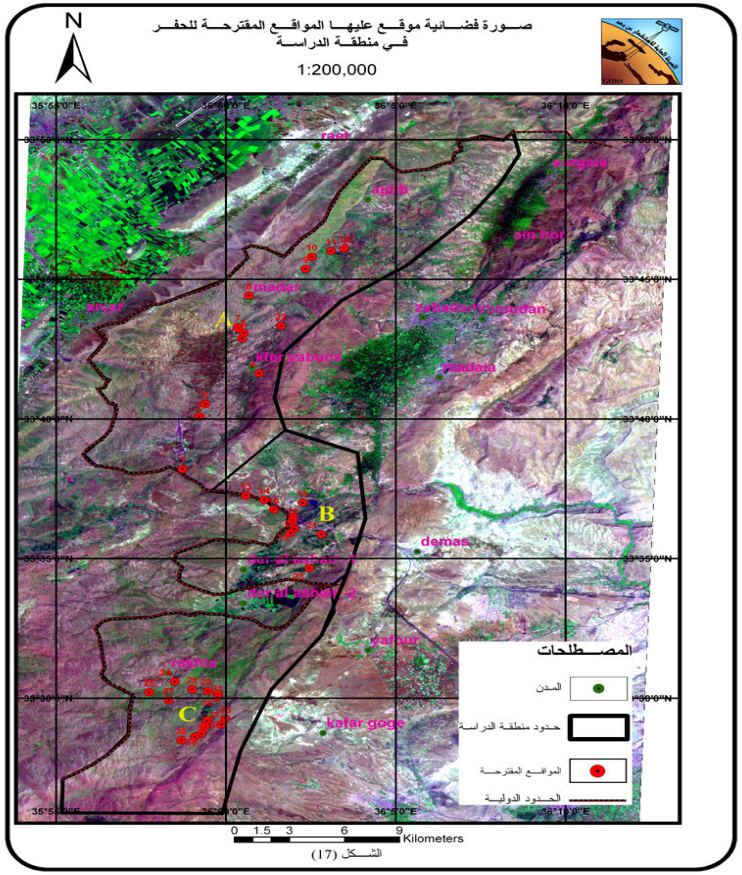
Providing New Water Resources to Damascus Area



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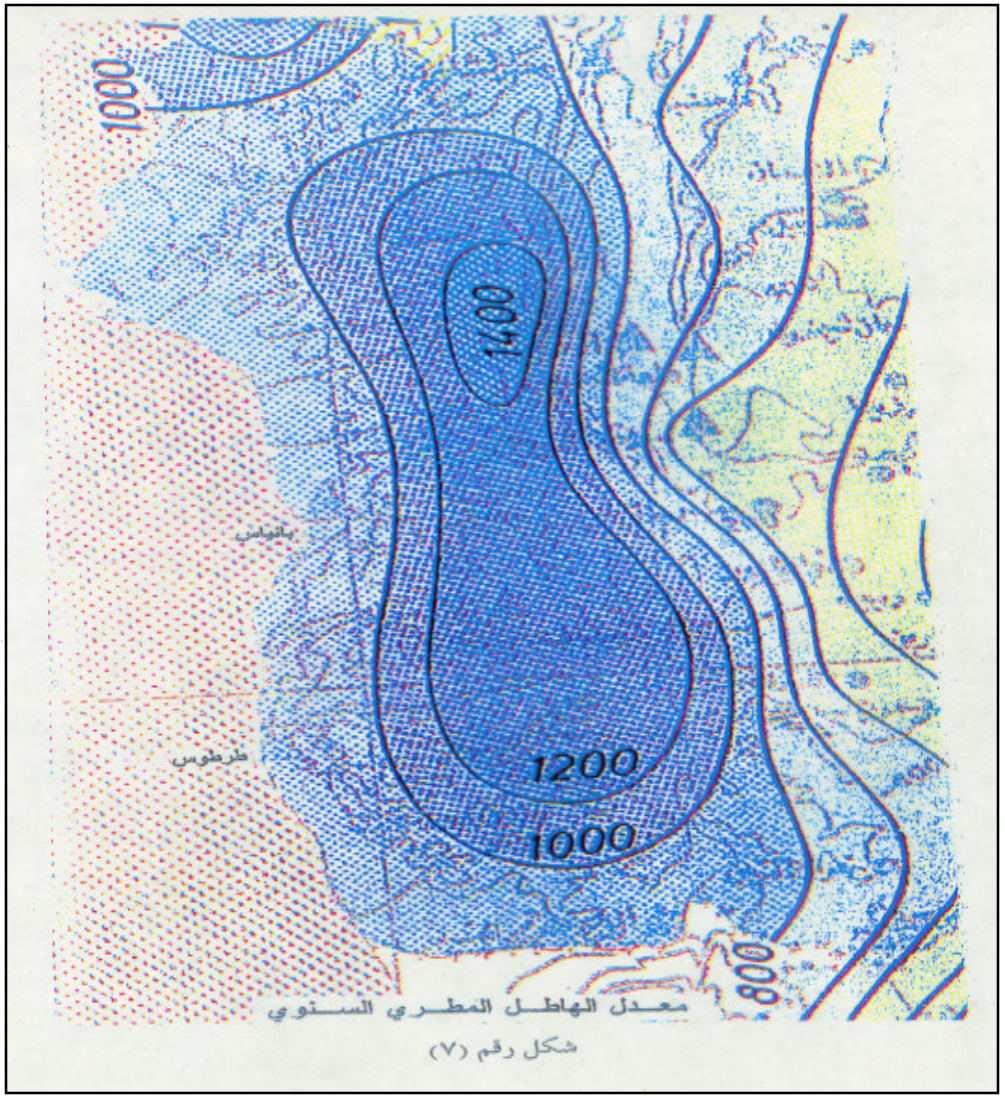

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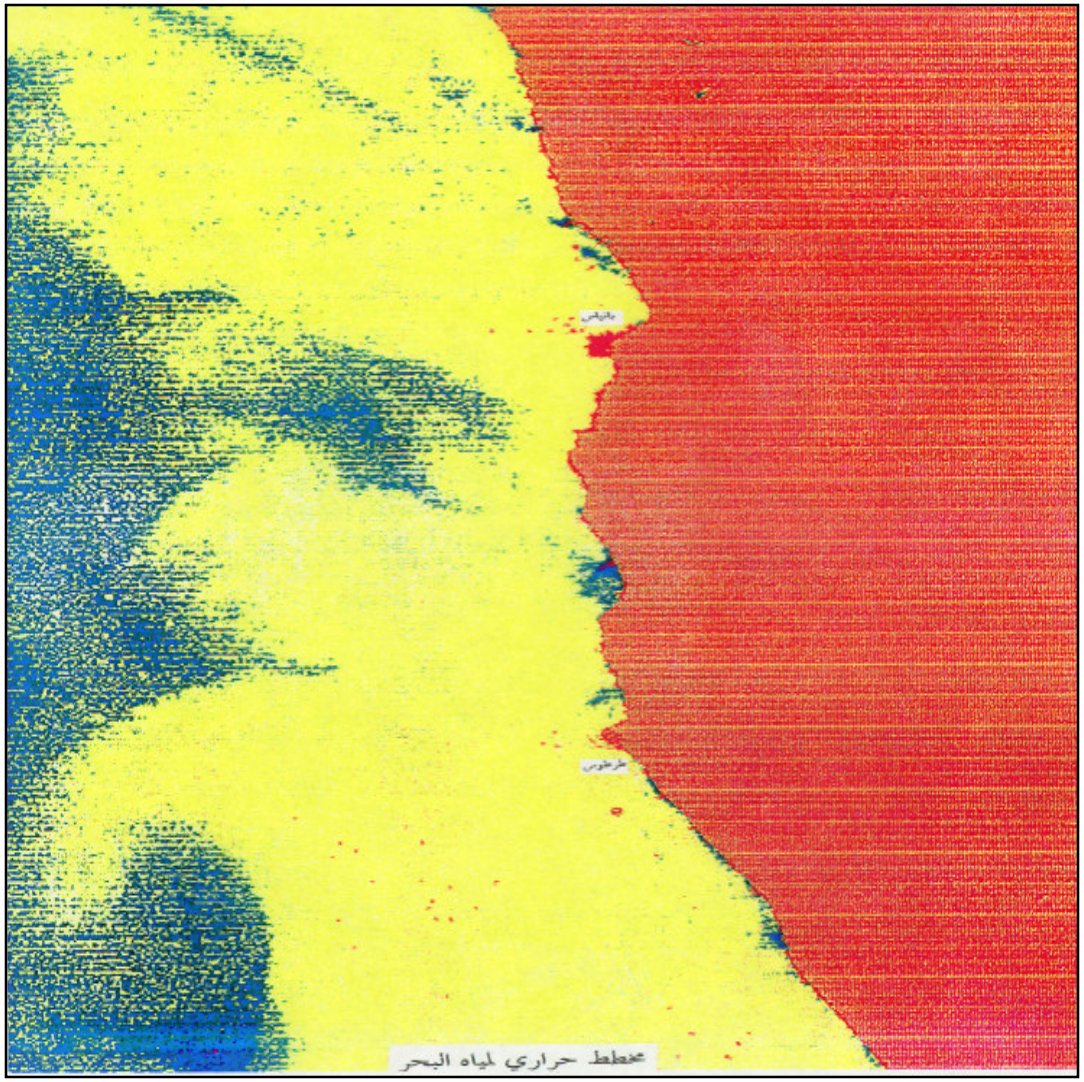

مخطط حراري لمياه البحر

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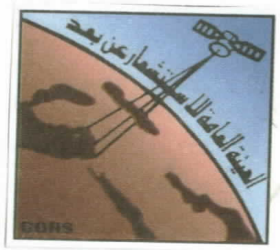

Thermal Survey of The Mediterranean Coast of Syria

The survey was aimed to find places of the unloading of fresh water springs under sea water according to supposed temperature anomalies at the sea surface.

There were discovered numerous (several dozens of) temperature anomalies, part of which coincides with the anomalies discovered earlier by space photography methods. Acquired results may serve as premises for industrial application of potential sources of fresh water.

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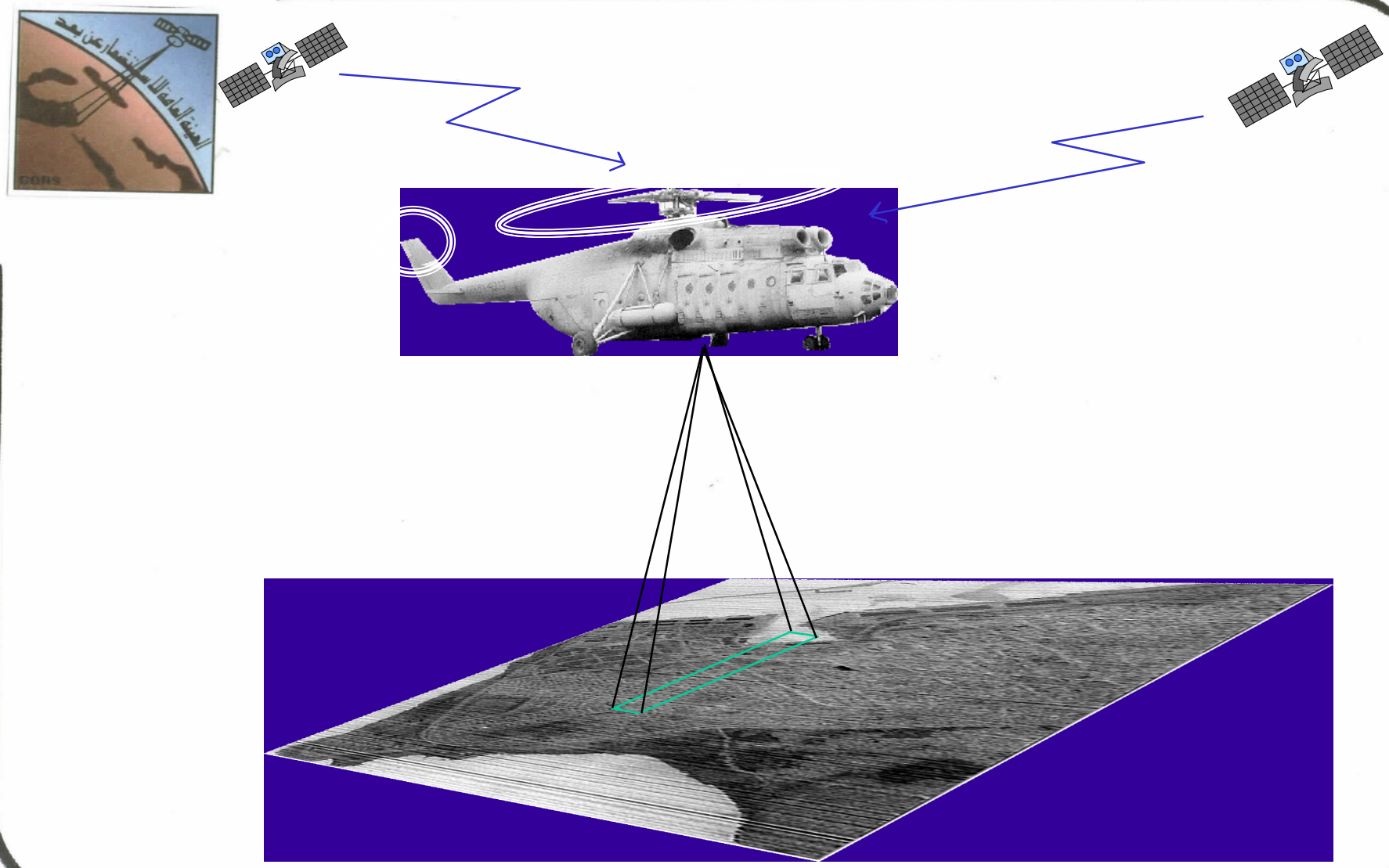

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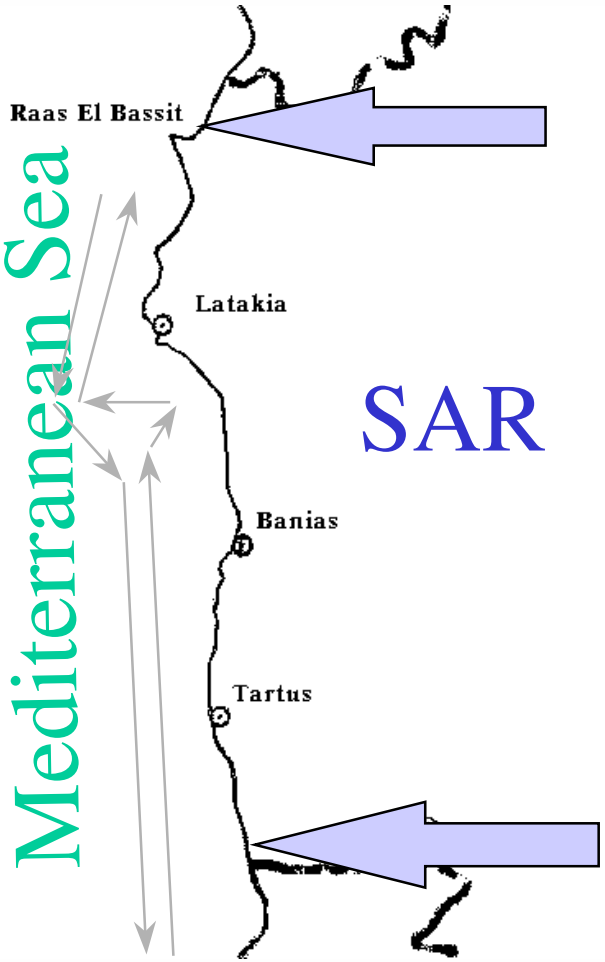
Map of the coastal strip



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PROCESSED IMAGES

All anomalies can be divided into four groups:

-submarine springs,
-river outfalls,
- pollutions at the sea surface,
- “hot” anomalies

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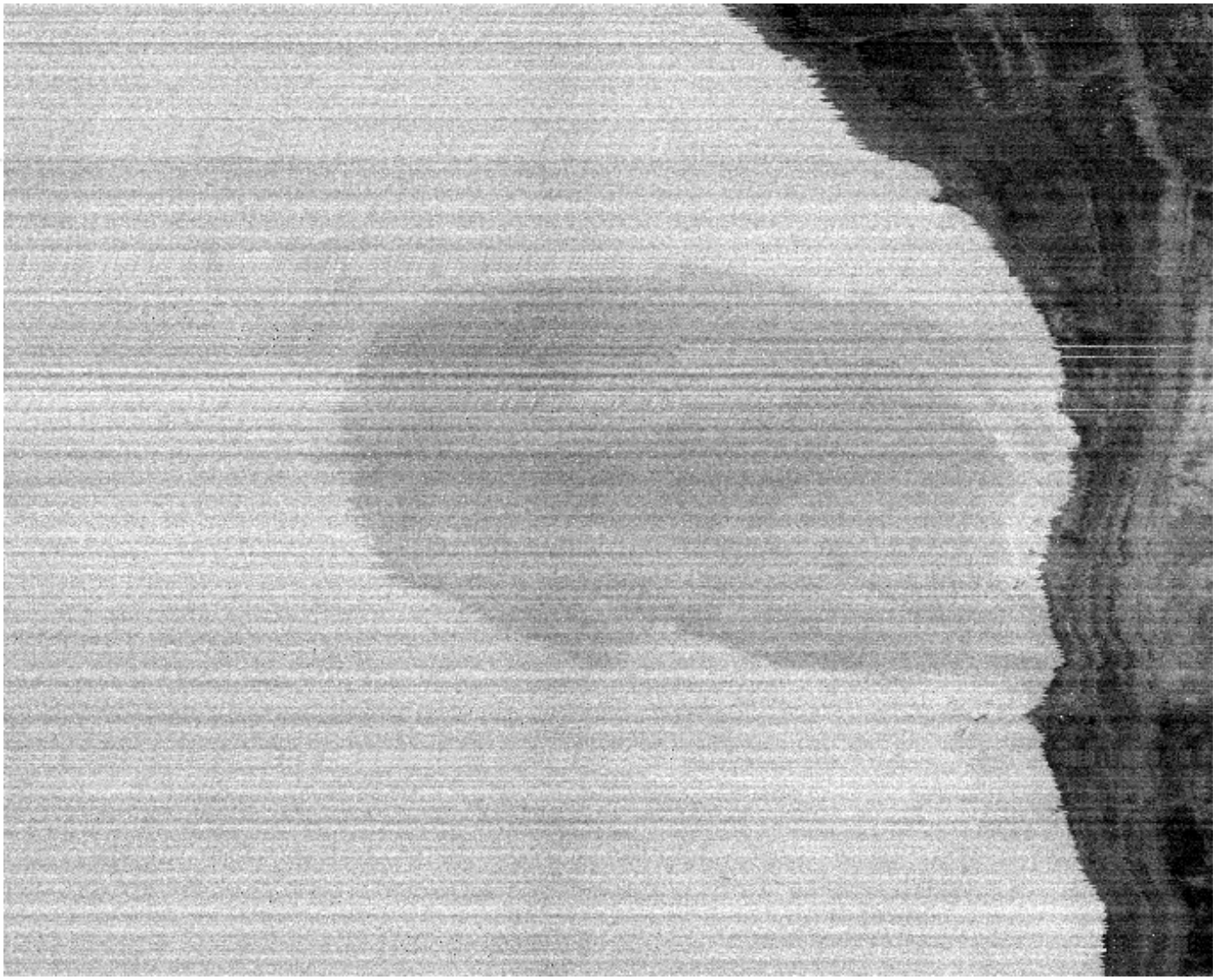

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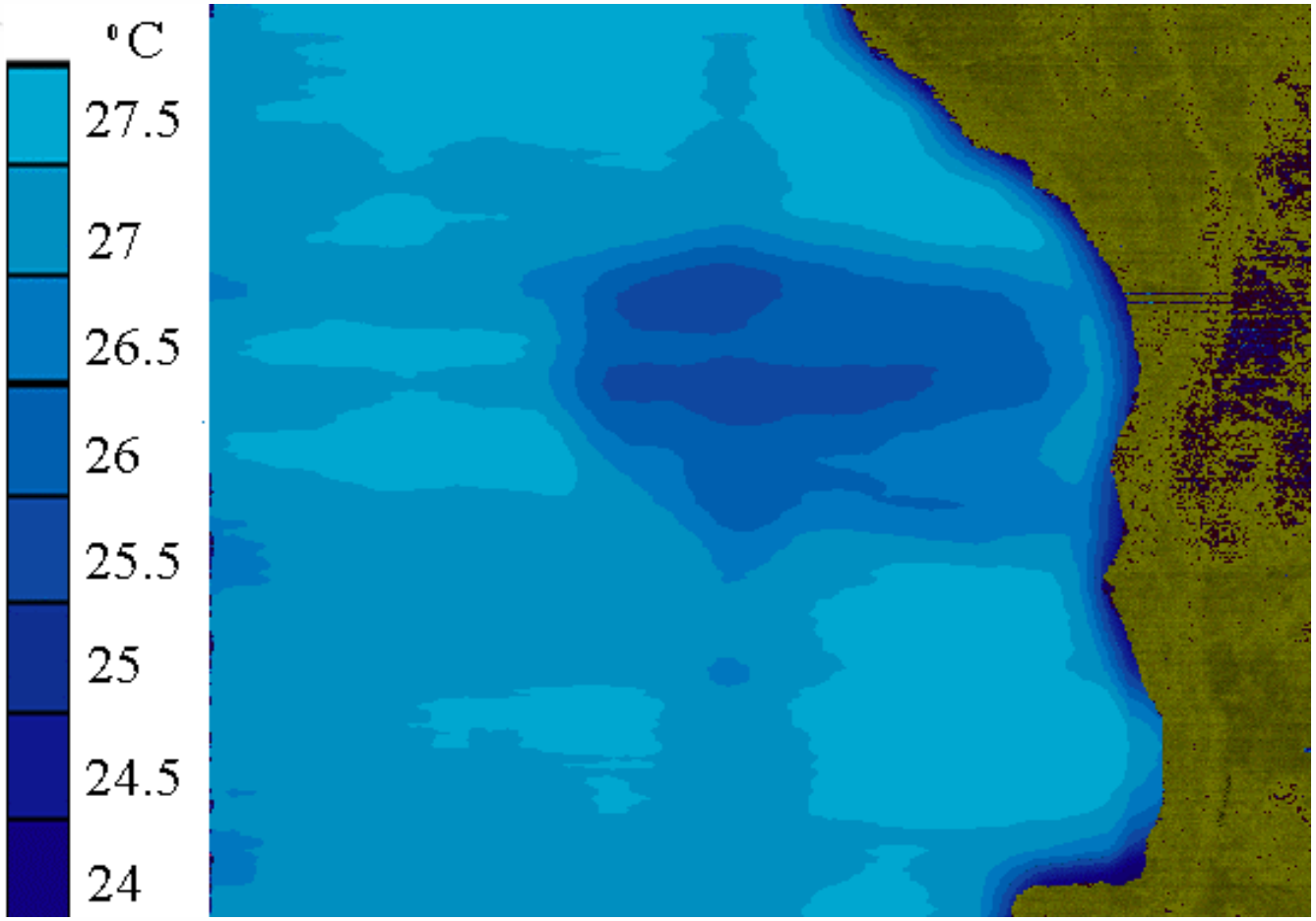
SUBMARINE SPRINGS



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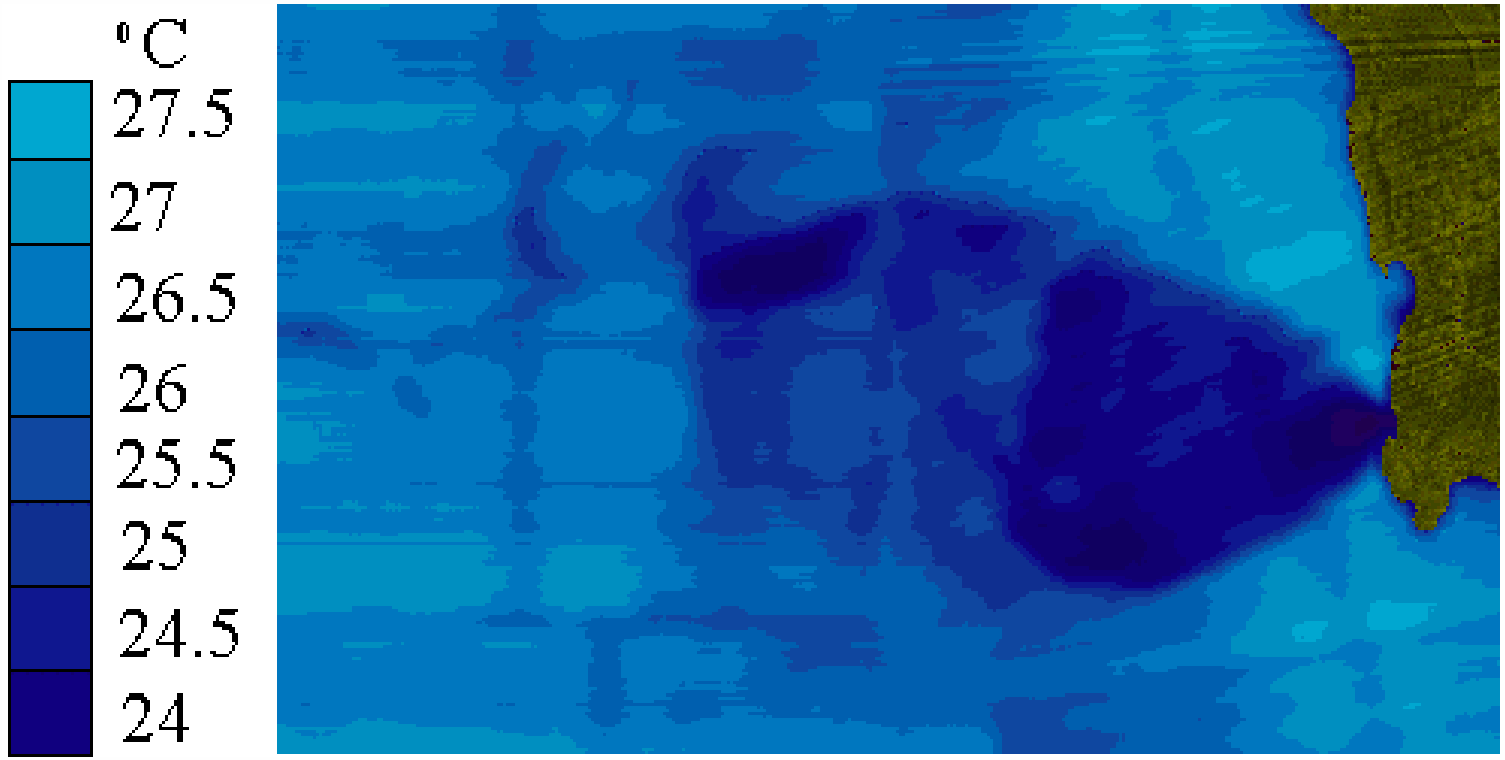
RIVER OUTFALLS



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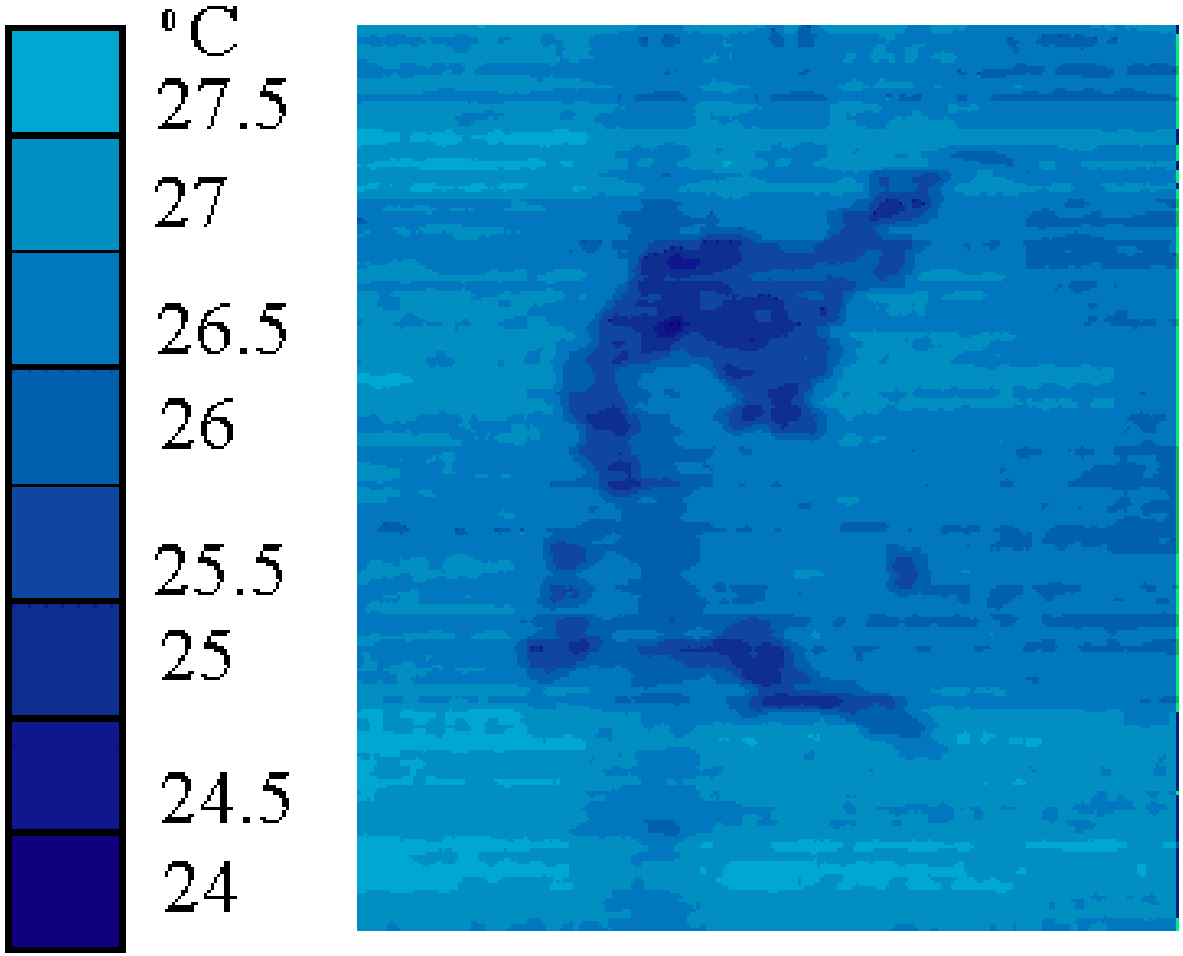
POLLUTIONS AT THE SEA SURFACE



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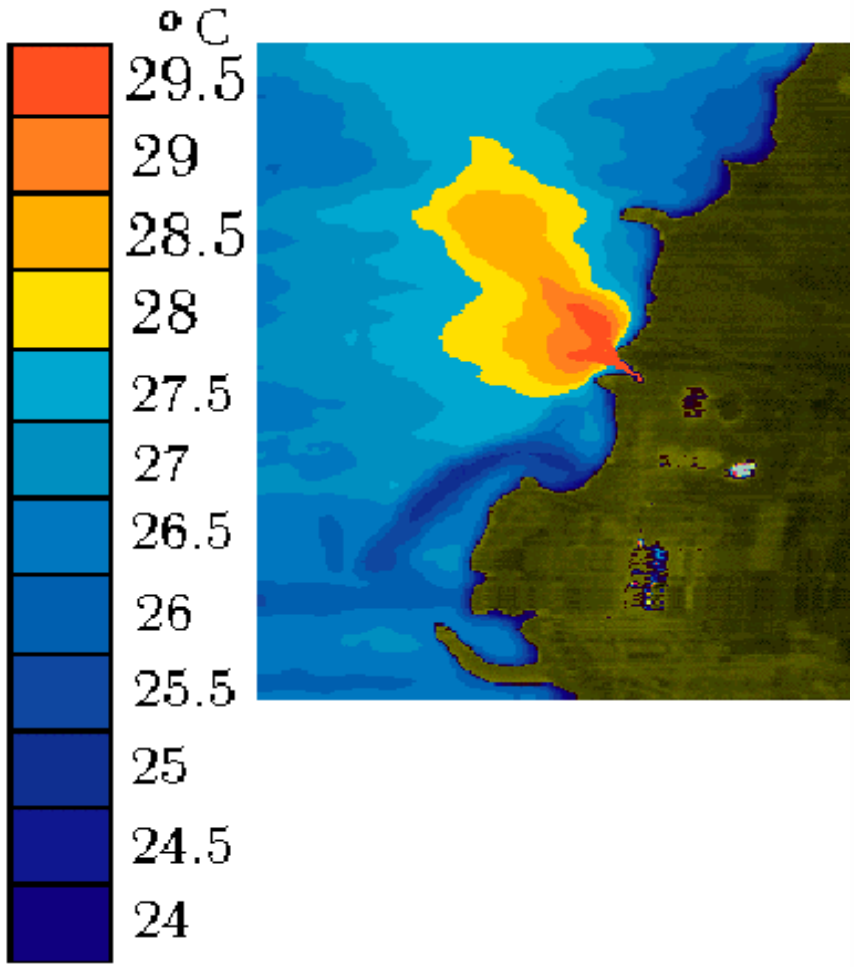
"HOT" ANOMALIES



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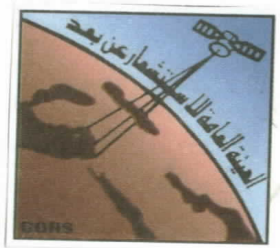

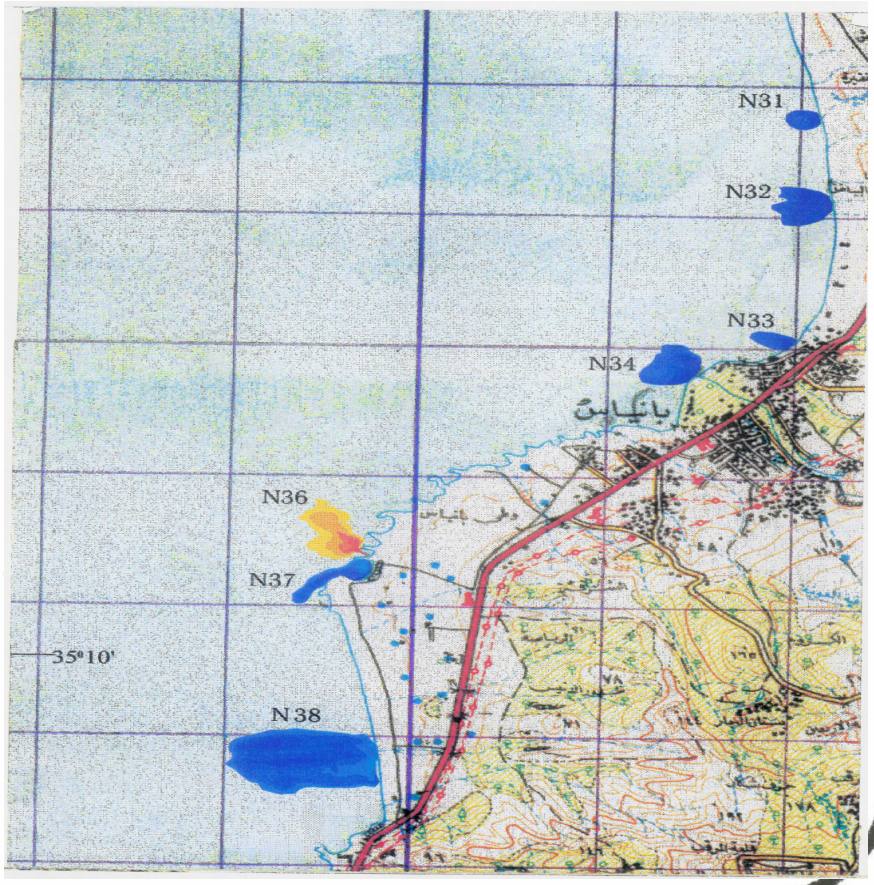

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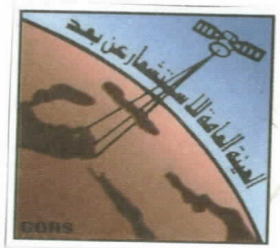

المخطط التكتوني

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Water Resources Management of EL- Zabadani Basin

Zabadani sub-basin is one of the most important basin in Syria, it is considered as a strategic source of drinking water for Damascus City.The historical Barada spring is flowing this basin an average rate of 3m3/sec.

This study aims to build a mathematical model, to simulate the groundwater flow system and produce a tool for the decision maker to manage and set up proper plan for the basin water resources. This was carried out by defining the water balance components and predicting the effect of the present and proposed plans on the water system of the aquifer.

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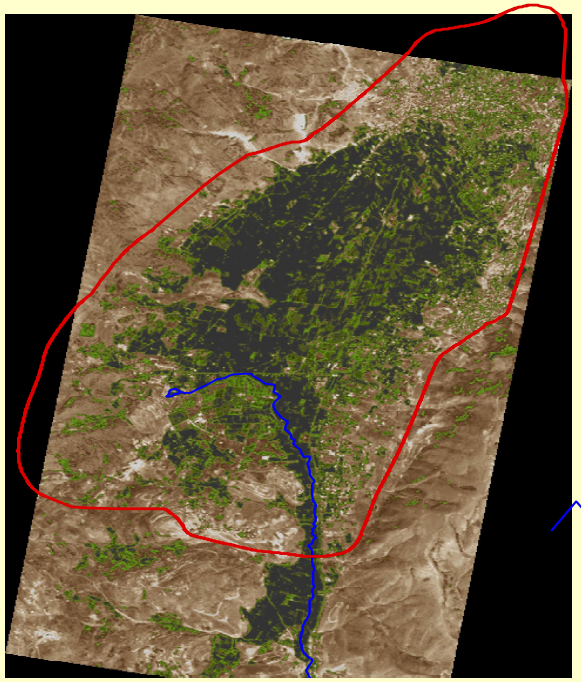

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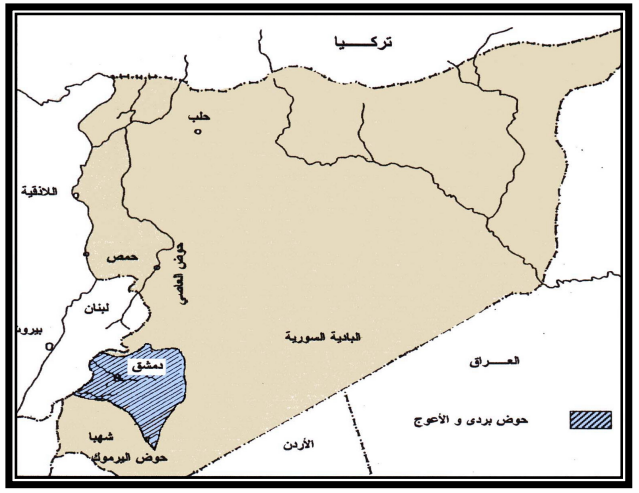
Barada River

2 0 2 4 Kilometers



الأحواض الهيدروجيولوجية في حوض بردى والأعوج

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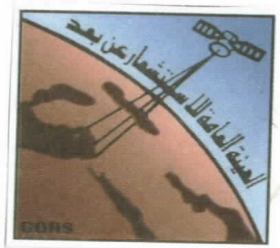

The work plan is implemented according to following five consecutive phases:

- **Collection of the available data and evaluation of the present status.**

-Performing field survey to fill the gaps of present status. This included the periodical measurements of water levels during the calibration

period.

-Establishing databases linked to GIS so the data will be readily available to the mathematical model.

-Running and calibrating of the model, and

-Testing the response of the aquifer water system according the various scenarios of the future plans.

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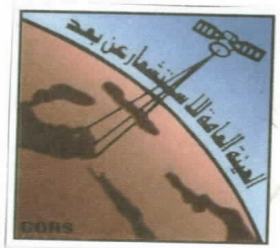

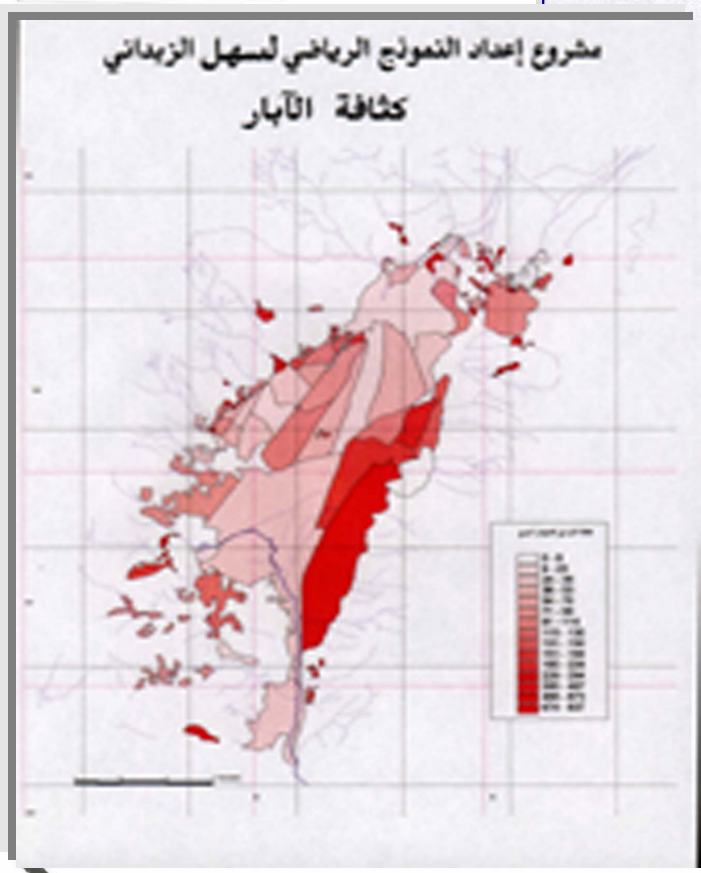

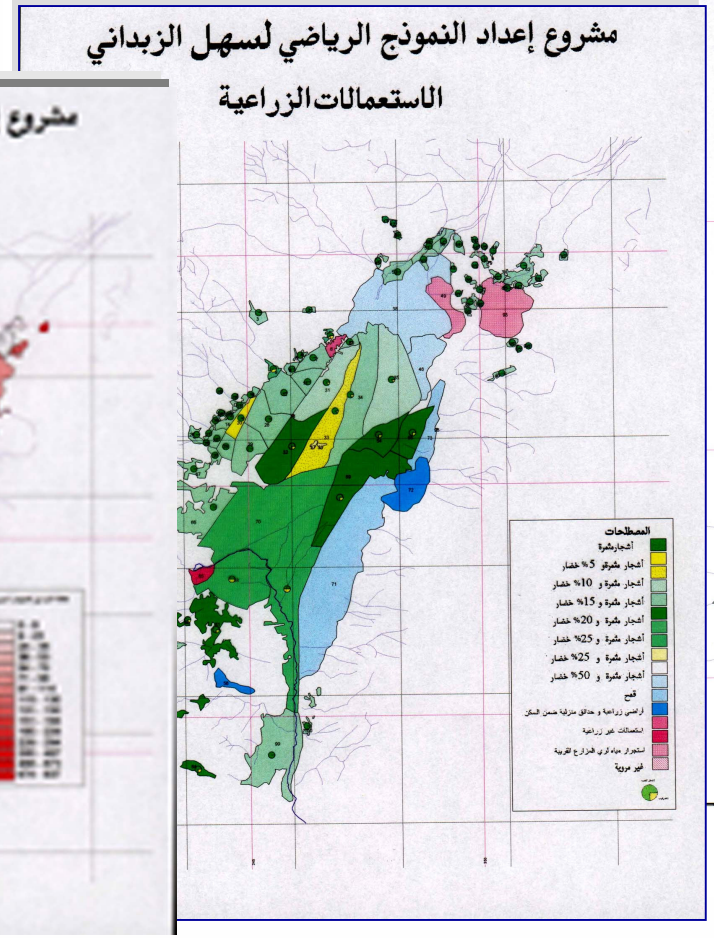

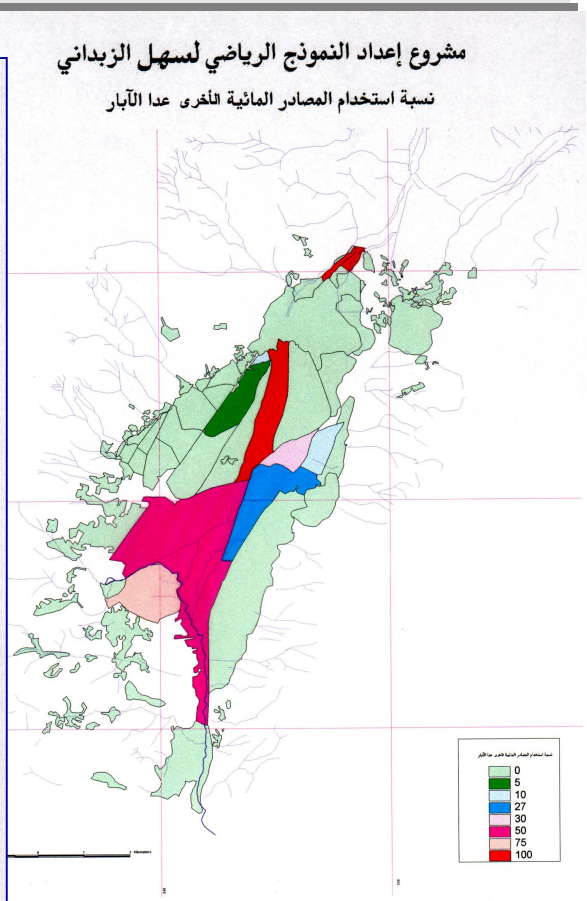

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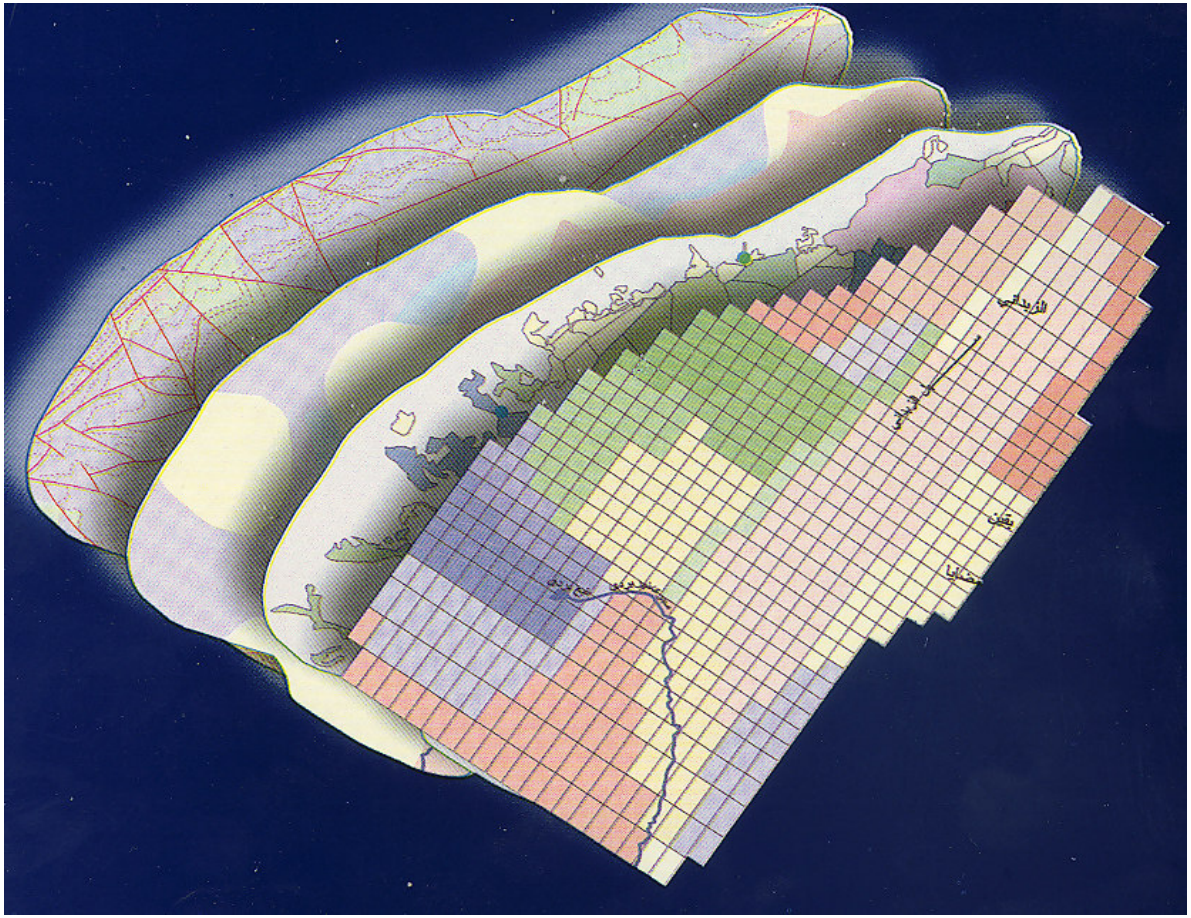
MATHEMATICAL MODEL OF AL_ZABADANI BASING



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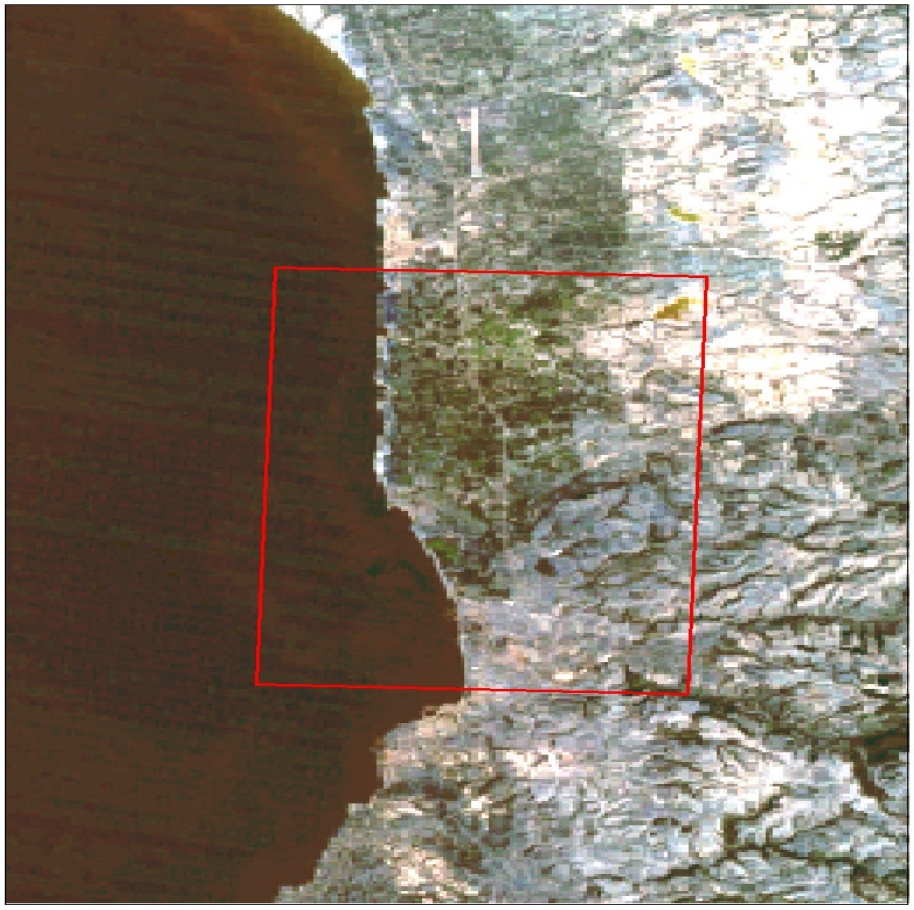
Protecting the Water Resources from Pollution in the Coastal Area



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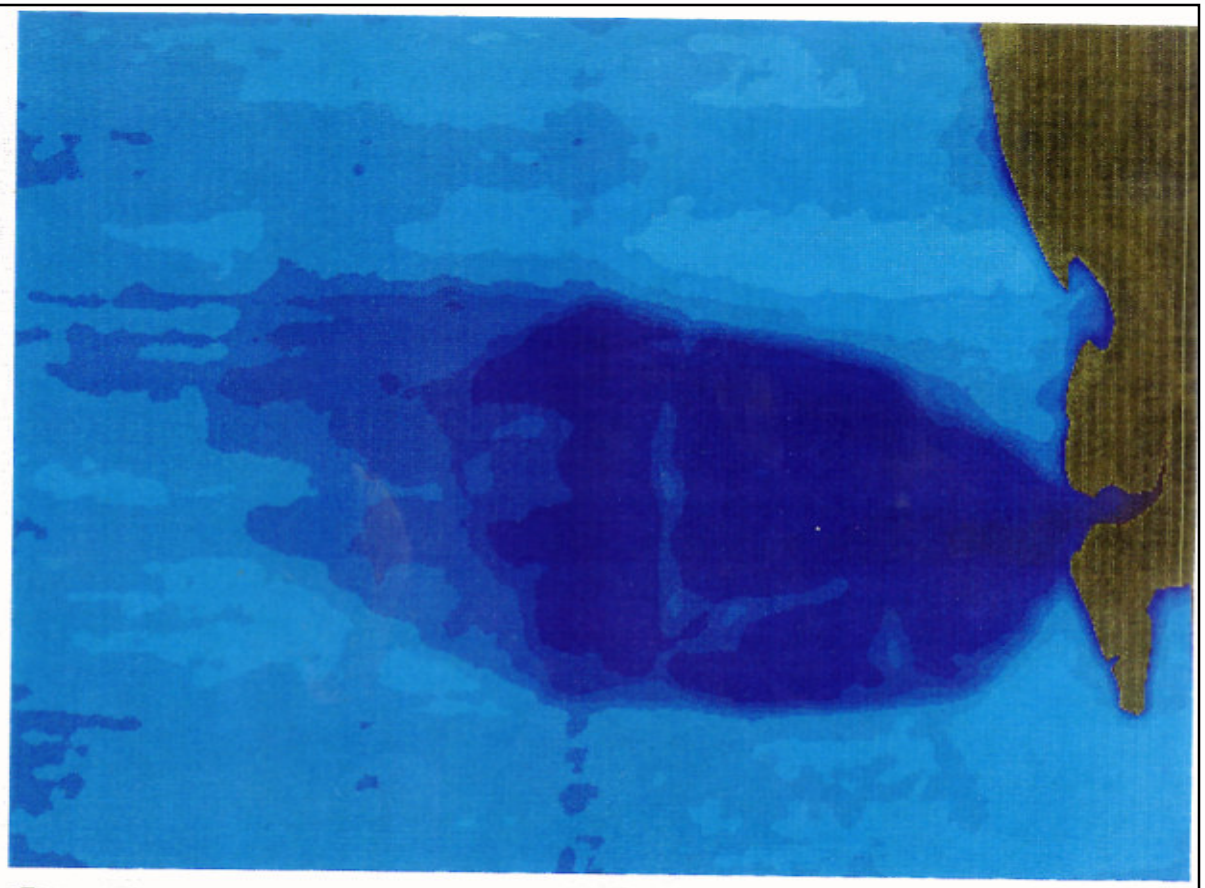

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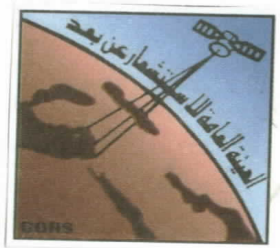

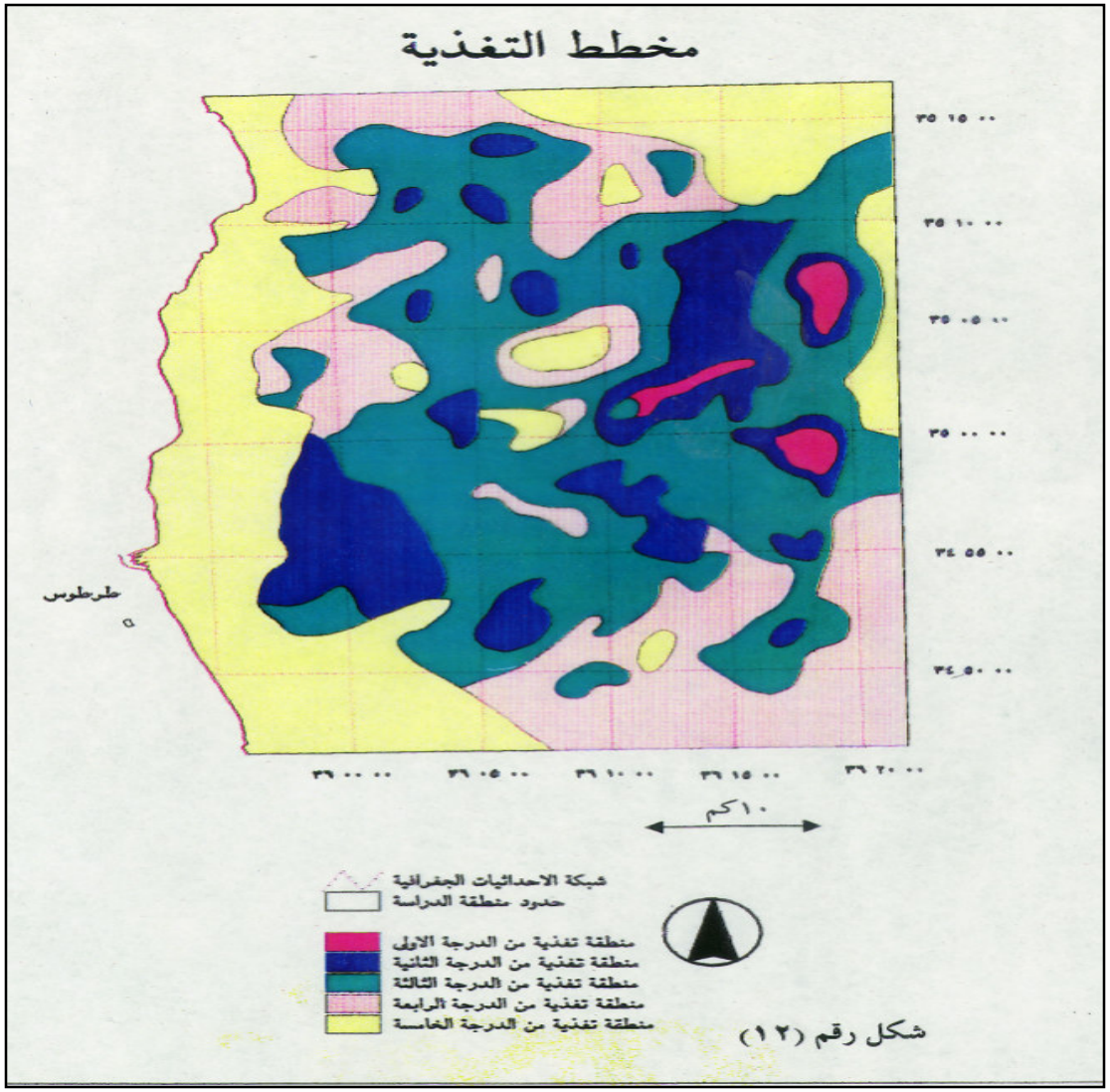

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THANK YOU VERY MUCH FOR YOUR ATTENTION

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