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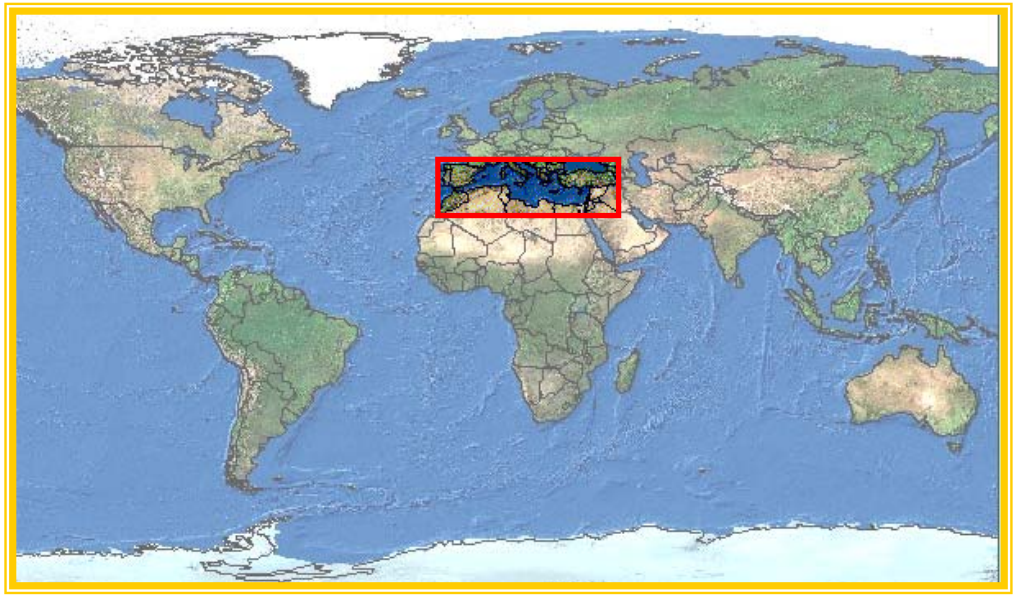
Agriculture & Fisheries Unit
MARS – FOOD sector

Bulletin № 4, 2004

CROP MONITORING for FOOD SECURITY

South and East Mediterranean Countries

Situation at the End of September 2004
Agro-meteorological overview for summer crops



MARS-FOOD
Crop Monitoring for Food Security

Introduction

The present Bulletin is dedicated to the analysis of the agro-meteorological situation in the non-European countries of the Mediterranean basin during the period from the beginning of August to the end of September 2004. This is a period for summer crops maturing and harvesting. Summer crops are irrigated practically everywhere. Fruit and citrus trees, vegetables, and potatoes are grown in irrigated conditions in all countries of the region. Dominant irrigated summer crops in Egypt are maize, rice and cotton. Potatoes are the dominant irrigated summer crop in Algeria, Tunisia, and Libya. In Morocco and Lebanon potatoes and sugar beet are dominant, as well as cotton and maize in Syria, barley and potatoes in Jordan, and sorghum in Saudi Arabia.
The Bulletin is devoted to the analysis of the agro-meteorological conditions for the main summer irrigated field crops.

The monitoring of the agro-meteorological situation is based on the analysis of the following dekadal data: minimal, maximal and average air temperature, sums of precipitation and global radiation, dekadal values of the climatic water balance, dekadal maps of the Normalized Difference Vegetation Indexes (NDVI), dekadal maps of the Dry Matter Production. Meteorological data are derived from the outputs of the numerical meteorological model from ECMWF (UK), and were prepared for analysis by METEOCONSULT (NL). SPOT-VEGETATION data were used as a basis for calculation of the remote sensing indicators of crop growth. Data were preprocessed by VITO (BE). After that, dekadal maximal NDVI values were weighted for pixels, within which summer crops are cultivated, and then – were weighted again at country level. Thus, weighted NDVI values were used as an indicator of crop status. Dry Matter Production maps were calculated by VITO based on SPOT-VEGETATION data and information about global radiation, applying the Monteith approach.

country	Production and Yield in 2003		
	rice	maize	potato
Morocco	8 (3,5)	139 (0,6)	1435 (22,3)
Algeria	0,3 (1,5)	1 (3,3)	1300 (18,0)
Tunisia	No crop	No crop	0,3 (13,8)
Libya	No crop	2 (2,0)	195 (19,5)
Egypt	5800 (9,4)	6400 (7,7)	1900 (23,8)
Syria	No crop	240 (4,0)	283 (23,8)
Lebanon	No crop	3 (3,1)	350 (20,7)
Israel	No crop	60 (12,0)	395 (32,9)
Jordan	No crop	11 (23,3)	122 (32,2)
Palestine Auth.	No crop	No data	55 (27,5)
Saudi Arabia	No crop	4 (1,3)	310 (23,8)

The first figure is a production (1000t), the second is a yield (t/ha).
Green color indicates figures which are higher than normal, red color indicates figures which are lower than normal, and black – close to normal.

The Bulletin has the following structure. The first pages contain the main results of the analysis. The following pages are dedicated to the analysis of separate indicators of the crop growth during the period of analysis.

Acknowledgements. *The following organizations were involved in data supply: VITO (BE), METEOCONSULT (NL), ECMWF (UK).*

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Highlights

In general, the main summer crops in the countries of the region are at the end of the season 2004 in similar conditions as compared with the same date of the previous year. The summer crops status is likely to be better than in last year in Egypt and Maghreb countries, and slightly worse in the Palestine Auth. and Saudi Arabia.

Country by Country

	**Morocco**	Status of maize and potatoes at the end of the season 2004 is slightly better comparing with the previous year; status of rice is close to the previous year.
	**Algeria**	Status of maize, potatoes and rice at the end of the season 2004 is better comparing with the previous year.
	**Tunisia**	Status of potatoes at the end of the season 2004 is better comparing with the previous year.
	**Libya**	Status of maize and potatoes at the end of the season 2004 is close to the previous year.
	**Egypt**	Status of maize, potatoes and rice at the end of the summer season 2004 is better than in previous year.
	**Syria**	Status of maize and potatoes at the end of the growing season 2004 is close to the previous year.
	**Lebanon**	Status of maize and potatoes at the end of the growing season 2004 is close to the previous year.
	**Israel**	Status of maize and potatoes at the end of the growing season 2004 is close to the previous year.
	**Jordan**	Status of potatoes at the end of the season 2004 is slightly worse comparing with the previous year, and status of maize is close to it.
	**Palestine Auth.**	Status of maize and potatoes at the end of the season 2004 is slightly worse comparing with the previous year.
	**Saudi Arabia**	Status of maize and potatoes at the end of the season 2004 is slightly worse comparing with the previous year.

The situation is detailed in the following pages.

Results of the analysis

Overall, the meteorological indicators, especially precipitation, are less important for summer crop growth monitoring than for winter crops due to the regulation of water regime throughout irrigation. The results of the analysis are based primarily on the monitoring of radiation sum, air temperature, remote sensing indicators, and dry matter production modeling.

The radiation sum during the current vegetative season was close to the value of the previous year and to the normal practically in all countries of the region. Everywhere the amount of radiation was close to the optimum for summer crops development.

Very high air temperatures had possibly affected summer crop growth (especially broad-leaf crops) in eastern Syria, southern Egypt, and Saudi Arabia.

In general the situation of summer crops is not extreme. NDVI curves show that the rice status at the end of the season 2004 was better than last year in Egypt and Algeria, and similar in Morocco. The status of maize at the end of the current season was close to the previous year in Libya, Syria, Lebanon, Israel and Jordan, slightly better in Morocco, Algeria, and Egypt, and slightly worse in Palestine Auth. and Saudi Arabia. The NDVI curves show a better potatoes status comparing with the previous year in Maghreb countries, and Egypt. The status of potatoes in other countries of the region is close to the previous year and slightly worse in the Palestine Auth., Jordan and Saudi Arabia. The situation with summer crops in Egypt is the best of the last 4 years.

The dry matter modeling results show, that the amount of dry matter which potentially can be produced in the current summer vegetative season, was higher by 10-20% comparing with the previous in Maghreb countries and Egypt and slightly lower in Saudi Arabia. The situation in other countries of the region was close to the previous year.

country	*Yield expectation (t/ha)*		
	rice	maize	potato
Morocco	3,6-3,8	0,6-0,8	23,2-23,6
Algeria	no data	3,5-3,7	18,3-18,7
Tunisia	no crop	no crop	15,6-16,0
Libya	no crop	1,9-2,1	19,4-20,0
Egypt	9,4-9,6	7,8-8,0	23,8-24,2
Syria	no crop	3,8-4,0	23,8-24,2
Lebanon	no crop	3,0-3,2	20,5-20,9
Israel	no crop	12,0-12,2	32,9-33,3
Jordan	no crop	23,0-23,4	31,8-32,2
Palestine Auth.	no crop	no data	27,0-27,4
Saudi Arabia	no crop	1,1-1,3	23,0-23,5

Green color indicates figures which are higher than normal, red color indicates figures which are lower than normal, and black – close to normal.

Based on analysis of all crop growth indicators it seems possible to conclude that in general the main summer crops are at the end of the season 2004 in similar conditions as compared with the previous year. The summer crops status in Egypt and Maghreb countries is likely to be better than in the previous year, and slightly worse in Palestine Auth. and Saudi Arabia.

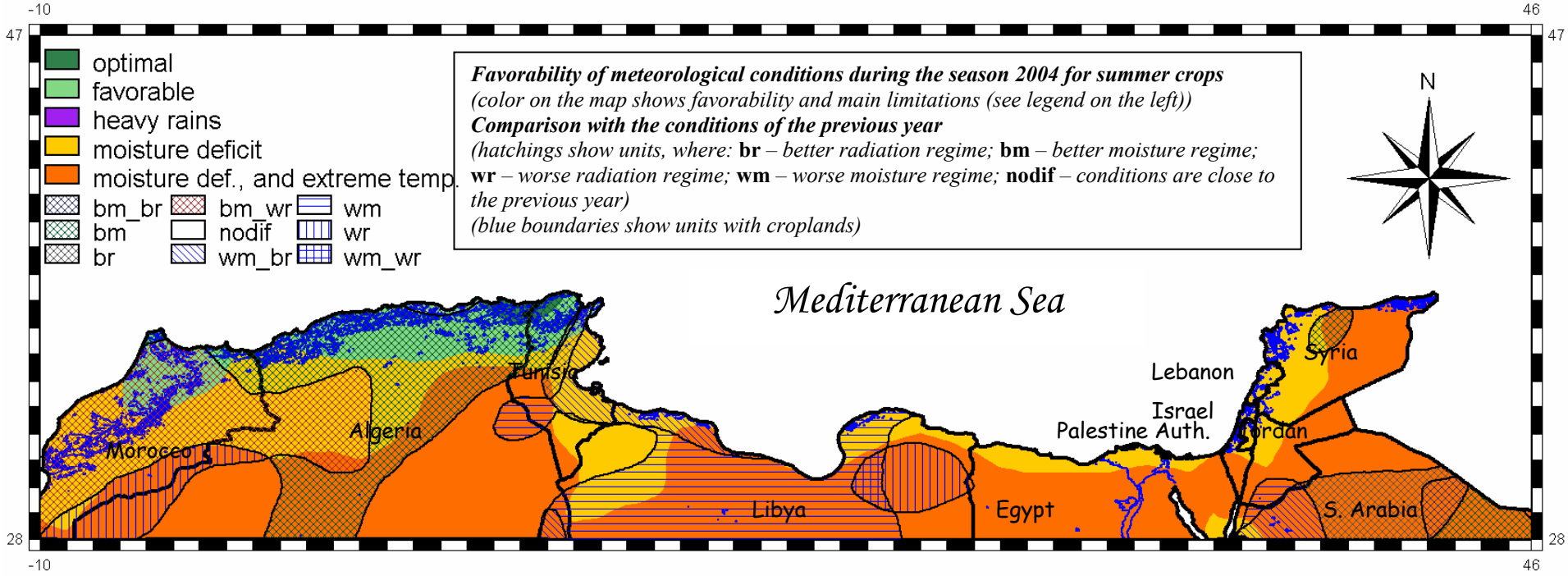
Analysis of the similarity of agro-meteorological conditions and remote sensing indicators of current season and other seasons with statistical data leads to the summer crops yield expectations presented in the table.

Meteorological Indicators

The meteorological conditions were favorable for summer crops in northern Tunisia, Algeria, and eastern Morocco. The amount of radiation was close to optimal for summer crop development everywhere. Precipitation was not enough for crop cultivation without irrigation practically in all countries of the region. Additionally extremely high air temperatures were observed in crop areas of eastern Syria, southern Egypt, and Saudi Arabia. However meteorological conditions are close to normal for most countries of the region. Overall, meteorological conditions were better than during the previous season in Maghreb countries, were worse in Libya, and were close to the previous season in other countries of the region.

Taking into consideration that summer crops in the region are irrigated it seems possible to conclude, that from all meteorological parameters only extreme air temperatures in eastern Syria, southern Egypt and Saudi Arabia are likely to have affected summer crop growth during the vegetative season. The summer crop status will mainly be determined by pests, diseases, and the regularity of water supply by the irrigation systems.

Meteorological conditions for summer crops	*Comparing with previous season (April-September)*
Morocco	+
Algeria	+
Tunisia	+
Libya	-
Egypt	=
Syria	=
Lebanon	=
Israel	=
Jordan	=
Palestine Auth.	=
Saudi Arabia	=

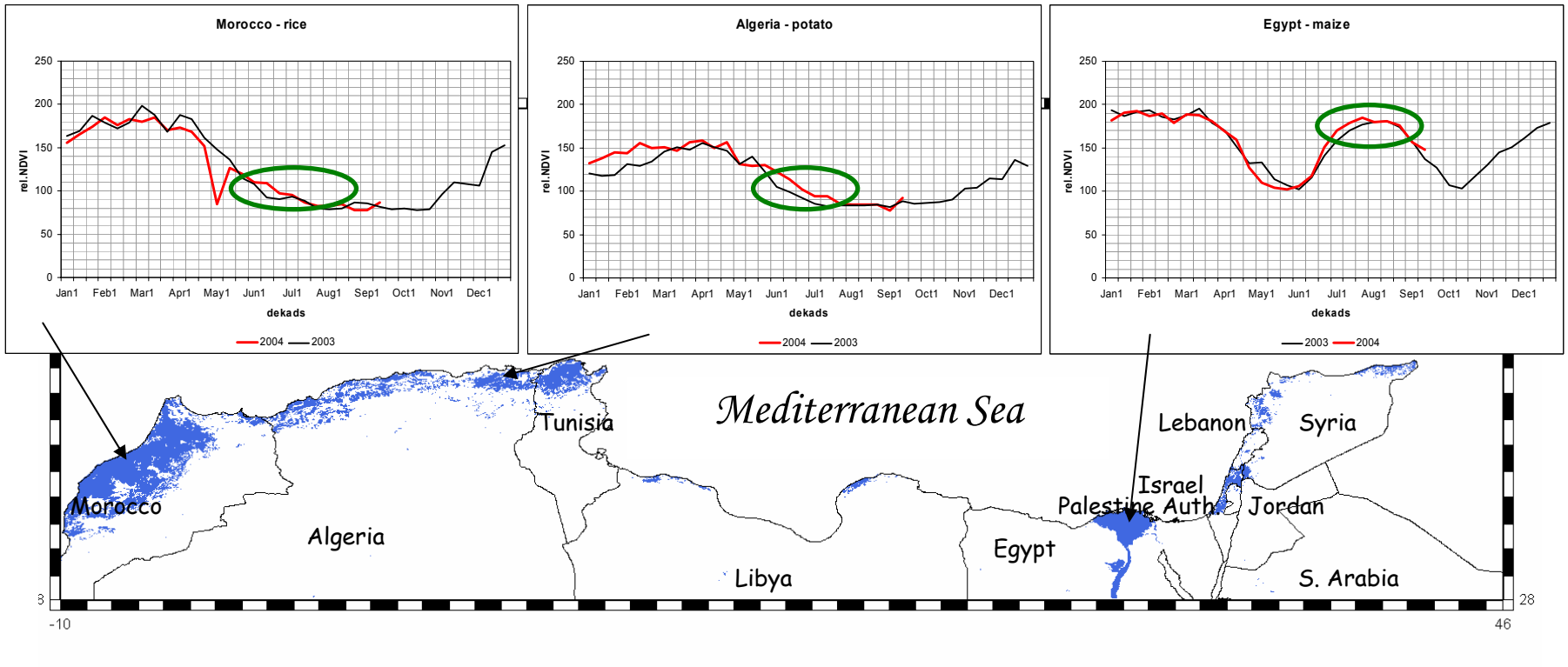


Remote Sensing Indicators

The NDVI curves show that the rice status at the end of current vegetation season was better than in the previous season in Egypt and Algeria and close to the previous season in Morocco. The status of maize at the end of the current season was close to the previous year in Libya, Syria, Lebanon, Israel and Jordan, slightly better in Morocco, Algeria, and Egypt, and slightly worse in Palestine Auth. and Saudi Arabia. The NDVI curves show a better potatoes status comparing with the previous year in Maghreb countries, and Egypt. The status of potatoes in other countries of the region is close to the previous year and slightly worse in the Palestine Auth., Jordan and Saudi Arabia. Thus in general the summer crops situation is likely to be not extreme comparing with the previous year. The situation in Algeria and Egypt is better than in previous season for all crops under consideration, and slightly worse in Palestine Auth., and Saudi Arabia.

NDVI as an indicator of summer crops status	*Comparing with previous year*		
	rice	**maize**	**potatoes**
Morocco	=	+	+
Algeria	+	+	+
Tunisia	no crop	no crop	+
Libya	no crop	=	=
Egypt	+	+	+
Syria	no crop	=	=
Lebanon	no crop	=	=
Israel	no crop	=	=
Jordan	no crop	=	-
Palestine Auth.	no crop	-	-
Saudi Arabia	no crop	-	-

Examples of NDVI behavior for Morocco, Egypt, and Algeria. Values are aggregated at country level, only for summer crop areas (green circles indicate the part of the curves corresponding to the crop development season)



Dry Matter Production modeling

It is necessary to stress out that this indicator refers to all types of vegetation within the elementary unit of the analysis (pixel of the SPOT-Vegetation image (1 km^2), and thus does not concern a specific crop.
Dry matter production modeling shows that in general the dry matter accumulation in May and September was lower comparing with the previous season in all countries of the region. The situation was more positive during June, July and August. The amount of dry matter, which potentially can be produced in the current summer vegetative season, was higher at the end of the season by 10-20% comparing with the previous year in Maghreb countries and Egypt and slightly lower in Saudi Arabia. The situation in other countries of the region was close to the previous year. The spatial and temporal variability of dry matter production was high in Morocco, Algeria and Syria. The latter should lead to the high variability of the yield of summer crops in the mentioned above countries.

Dry matter production during April-September 2004	*Comparing with previous year*
Morocco	+
Algeria	+
Tunisia	+
Libya	=
Egypt	+
Syria	=
Lebanon	=
Israel	=
Jordan	=
Palestine Auth.	=
Saudi Arabia	-

Region : Mediterranean basin
Period : September, 2004, Decade 2/3
Theme : Daily production of Dry Matter (DM)
Relative difference w.r.t. previous year: 100% x (Act. – Prev.)/Prev.
Source : SPOT–VEGETATION

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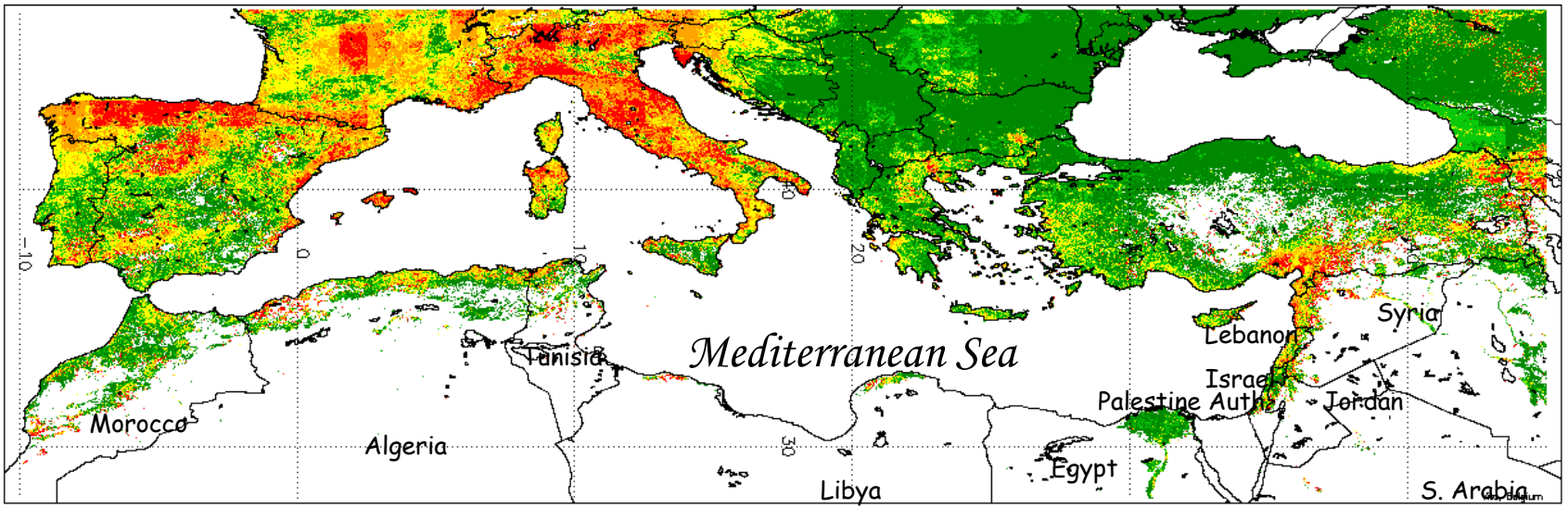

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