

Determine the Dry Seasons to Some Selected Sites in Iraq Using (GIS)

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Abstract

Meteorological drought has been calculated for selected stations in Iraq (Baghdad, Nasiriyah, Mosul, Najaf, wet, Basra, Diwaniyah, Ramadi, Samawah, Hilla) for the period (1980-2013) using the percentage of natural rain (PN) which widely used, but used for the first time in Iraq. It is a good way to determine the drought area.. Through the account (PN) show Samawa station recorded the most number of seasons of drought (22), while the Baghdad station recorded the lowest seasons (15), drought was variable from moderately to severely. Identifying the location and quantity of the drought through the use of geographic information systems GIS).

Keywords: Drought for Iraq, Rain, Meteorological Drought and (GIS).

1-Introduction

Drought is a common phenomenon may occur in different climates that has special hydrological and meteorological characteristics in each area (United Nations Educational 2014) and drought according to a WMO definition is a sustained, extended deficiency in precipitation. Definitions of drought vary from place to place and are crucial to identify the beginning and intensity of drought. There are three main types of drought: meteorological, agricultural, and hydrological (Harpal S.Mavi et al. 2004)

For the importance of drought and its impact on human, plant and animal there are many studies estimate it . (Yasin Kazim al-Tamimi A. et al 2012) study on the detection of drought in Iraq by creating a map of the drought and agricultural Alanwaia using remote sensing and geographic information systems to Iraq techniques (GIS). (Asraa Khtan 2015) Calculate the dry season from the rainy season for the city of Baghdad. (Anass M. M. Rasheed 2010) standard precipitation index (SPI) was used to analyze rainfall records between 1941 - 2002 for nine metrological stations in the north of Iraq.

the aim of this study is to determine the quantity and location of drought by using (GIS)

2-The percent of normal precipitation (PN)

PN is one of the simplest measurements of drought for a location. it is calculated by dividing actual precipitation by the normal (considered to be a 30 or more years mean) and multiplying by 100 (AMS 1997)

$$I = (P_{ac} / P_{mean}) * 100\%$$

where:

I ----- drought index

P_{ac} ----- actual amount of rain .

P_{Mean} ----- rain rate and is usually taken for thirty years.

The drought conditions were classified in table (1). Analyses using the percent of normal are very effective when used for a single region or a single season. (Harpal S.Mavi et al. 2004)

table(1): classification of drought

Class	Range%
Moderate	50-100
Severe	25-50
Very Severe	Less than 25

3-Data

This study used data recorded of rainy season (mm) for the period (2013-1980) of selected stations in Iraq (Baghdad, Nasiriyah, Mosul, Najaf, wet, Basra, Diwaniyah, Ramadi, Samawah, Hilla) from Iraqi Meteorological Organization and Seismology .

Where the rainy season in Iraq begins from (September) to (June) according to Iraqi Meteorological Organization and Seismology .

4-Methodology

This study estimate meteorological drought by using PN method for study area and classification the Severe of drought according to table (1), as show in fig.(1) where moderate drought represented blue polygons and severe drought the red one

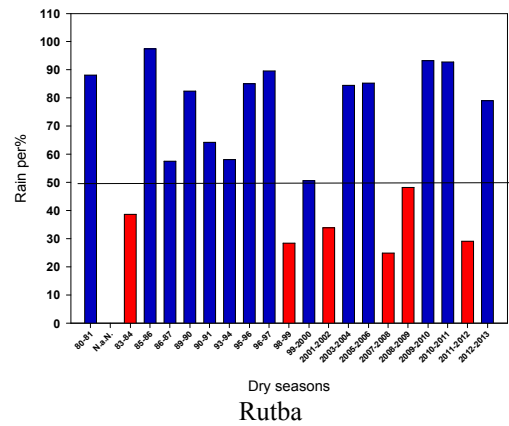
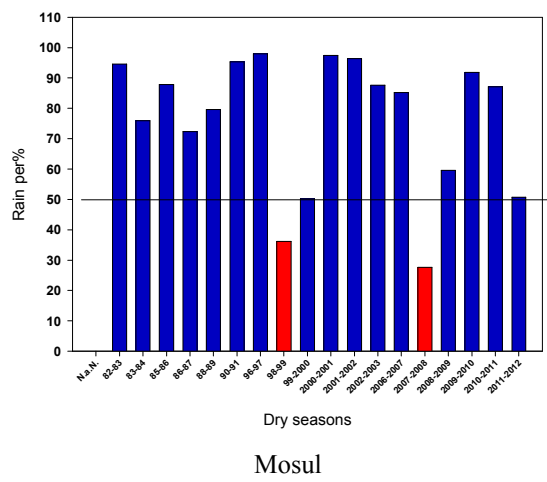
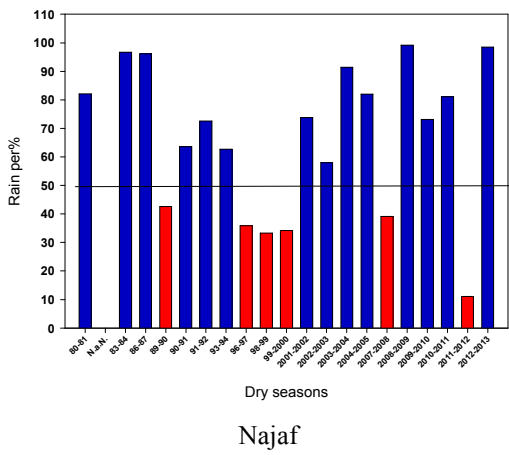
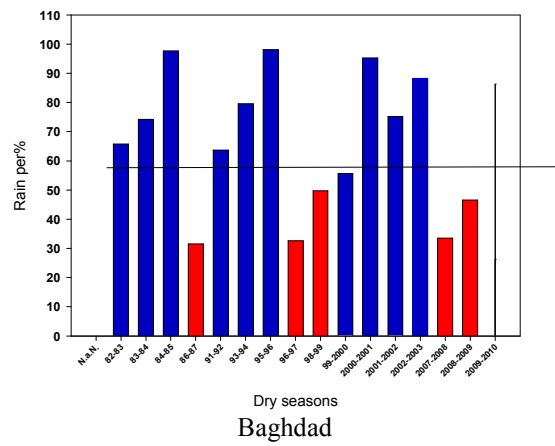
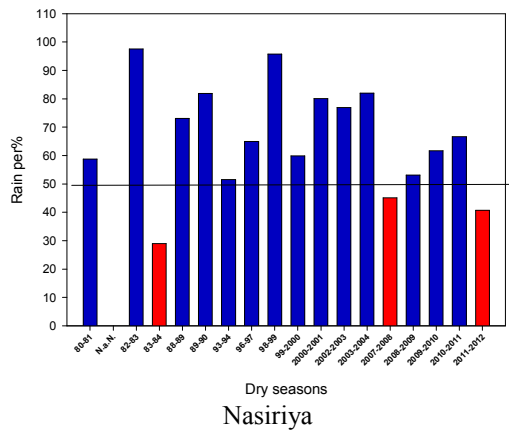
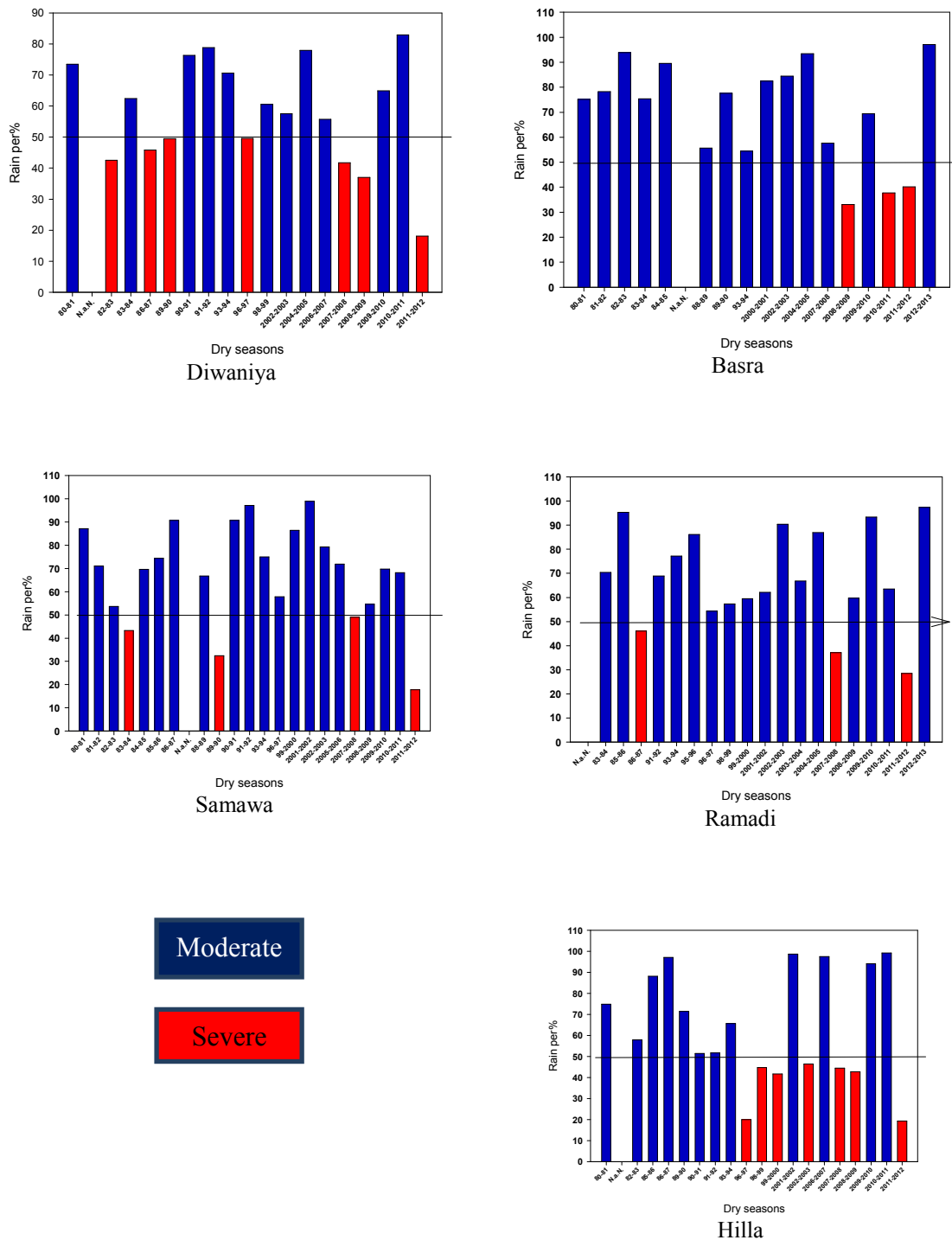


Fig.(1) severity of the drought for Baghdad, Mosul, Nasiriyah, Najaf and and Rutba



Fig(2): severity of the drought for (Basra , Diwaniyah, Samawa, Ramadi and Hilla)

In general ,Samawa station recorded the highest number of seasons of drought(22) season, Najaf and Rutba (20) season , Ramadi and Hilla (19) season , Diwaniya and Mosul (18) season , Nasiriyah and Basra (17) seasons while Baghdad station recorded the lowest seasons of drought (15) season. Stations Diwaniyah and Hilla recorded severe drought, the number more than the rest of the stations where each recorded seven severe droughts contained a severe dry season very station Diwaniya a season (2012-2011) and by ((18% mm and two seasons with severe too dry for Hilla two season (1997 -1996) increased (20% mm) and season (2012-2011) and by (19% mm), while Mosul station recorded the the least severity of the drought (two) seasons .

4-Determine the location and magnitude of drought by using GIS:

The drought mapping of the study area for the period(19 90-2000) using GIS program as shown in fig.(3,4,5). Note of these maps to the same region have over the severity of the drought type, while in the way of using (PN) record one type.for example station Baghdad in season (1990-1991) record no drought but in GIS map see that divided baghadada station two area no drought and moderate drought because the effect of nearest record stations of baghdhd

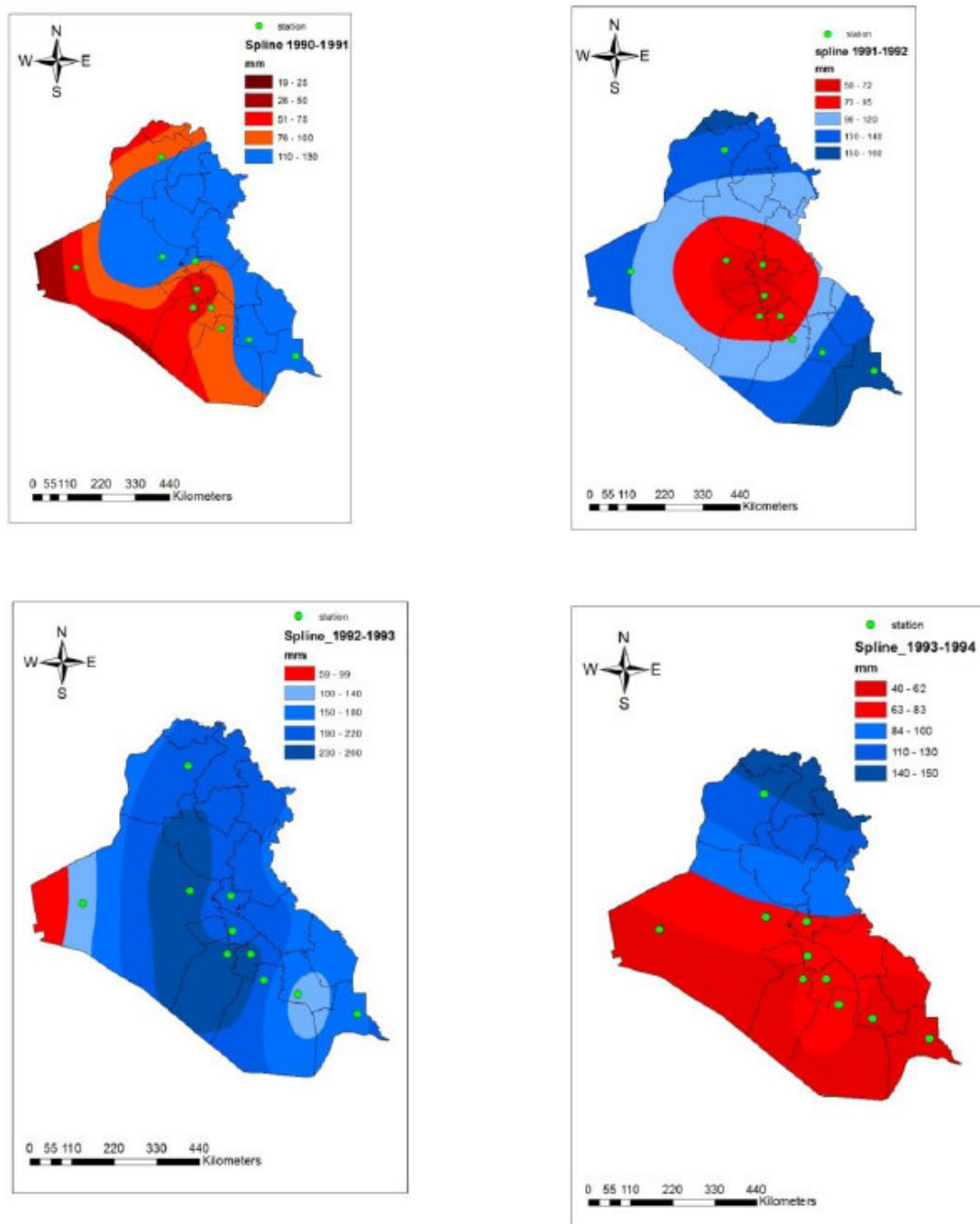


Figure 3: drought for the period (1994-1990).

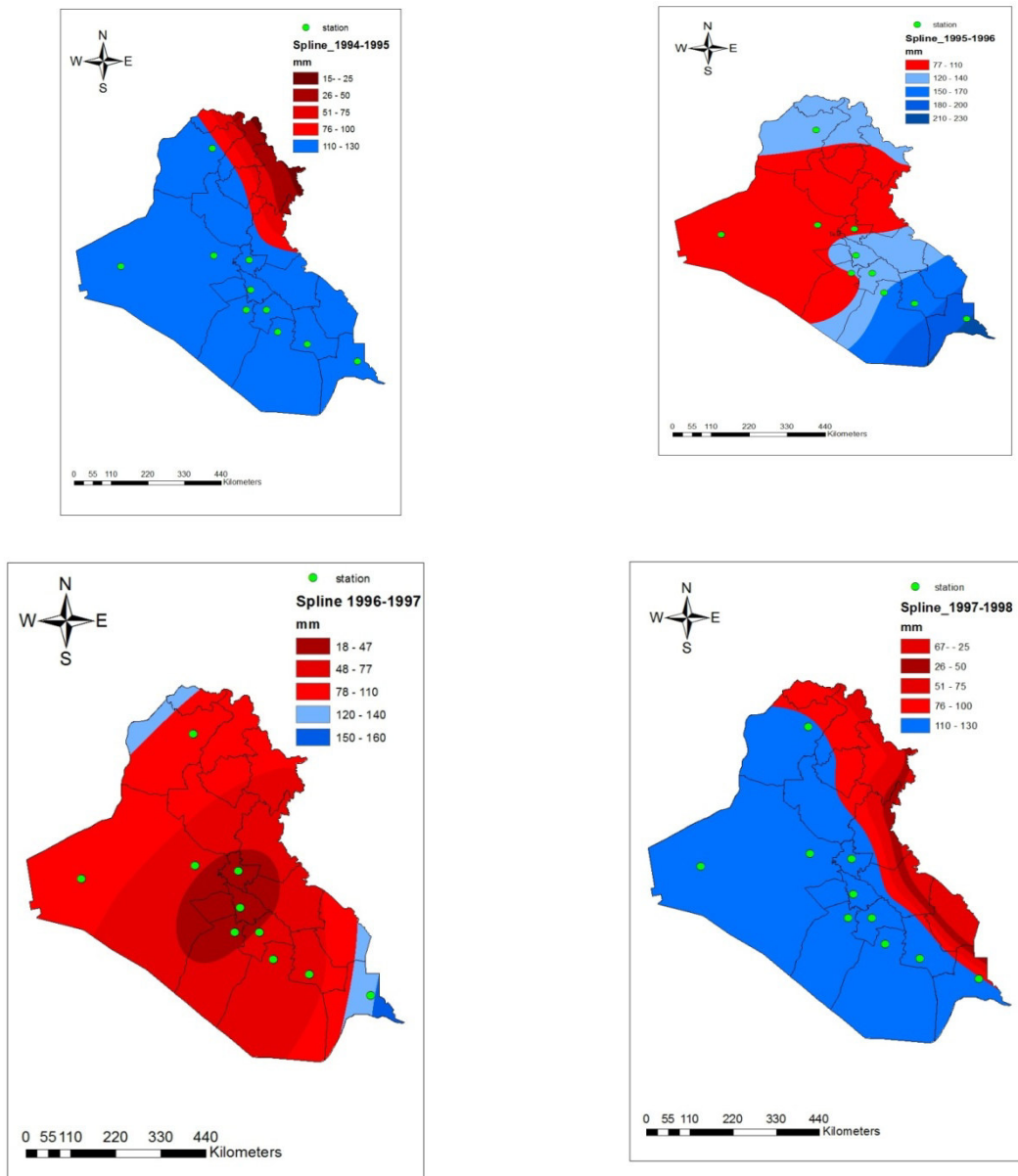


Figure 4: drought for the period (1998-1994).

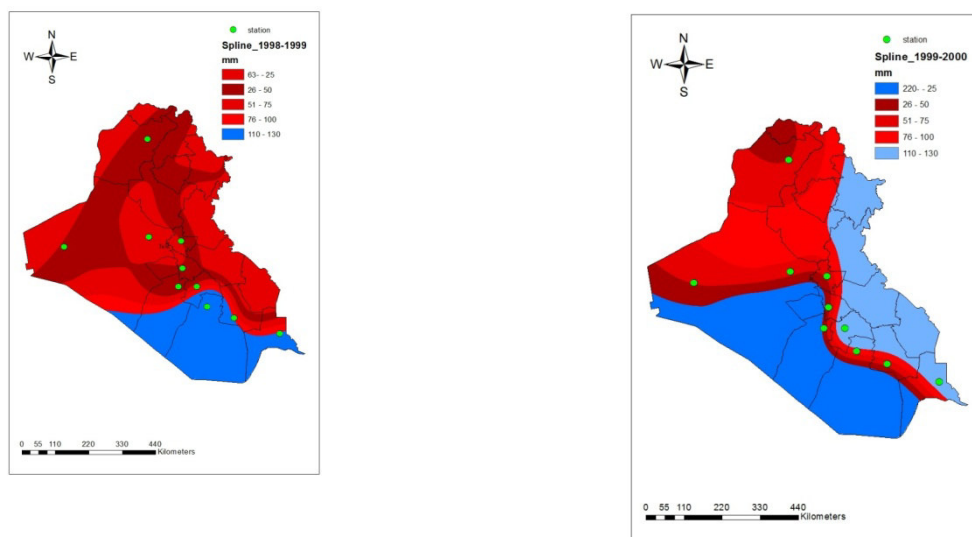


Figure 5: drought for the period (2000-1998).

5-Conclusions

drought was variable in no. seasons and sever in study area. where Samawa station recorded the most number of seasons of drought (22), while the Baghdad station recorded the lowest seasons (15) and Diwaniyah and Hilla recorded severe drought with (7) season more than the others stations. the use of GIS is a good way to Identifying the location and quantity of the drought.

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