
*

(// : // :)

Arc GIS

()

:

E-mail: ab_fa789@yahoo.com

Tele-connection

Large scale climate signals

Run Test

Digitize Elevation Model (DEM)

Stepwise

*

...

.()

.()

.()

.()

.()

.() NAO

.()

Pangraz

Nazemosadat & Cordery

La Nina

Vasqueze

Anupam

Anas

Lindesay

Farmer

Ropolwski & Halpert

Harzallah & Sadaourny

Nicholson & Selato

.()

.()

()

()

()

(

-
.()

.()

" "

.()

SST

()
.()

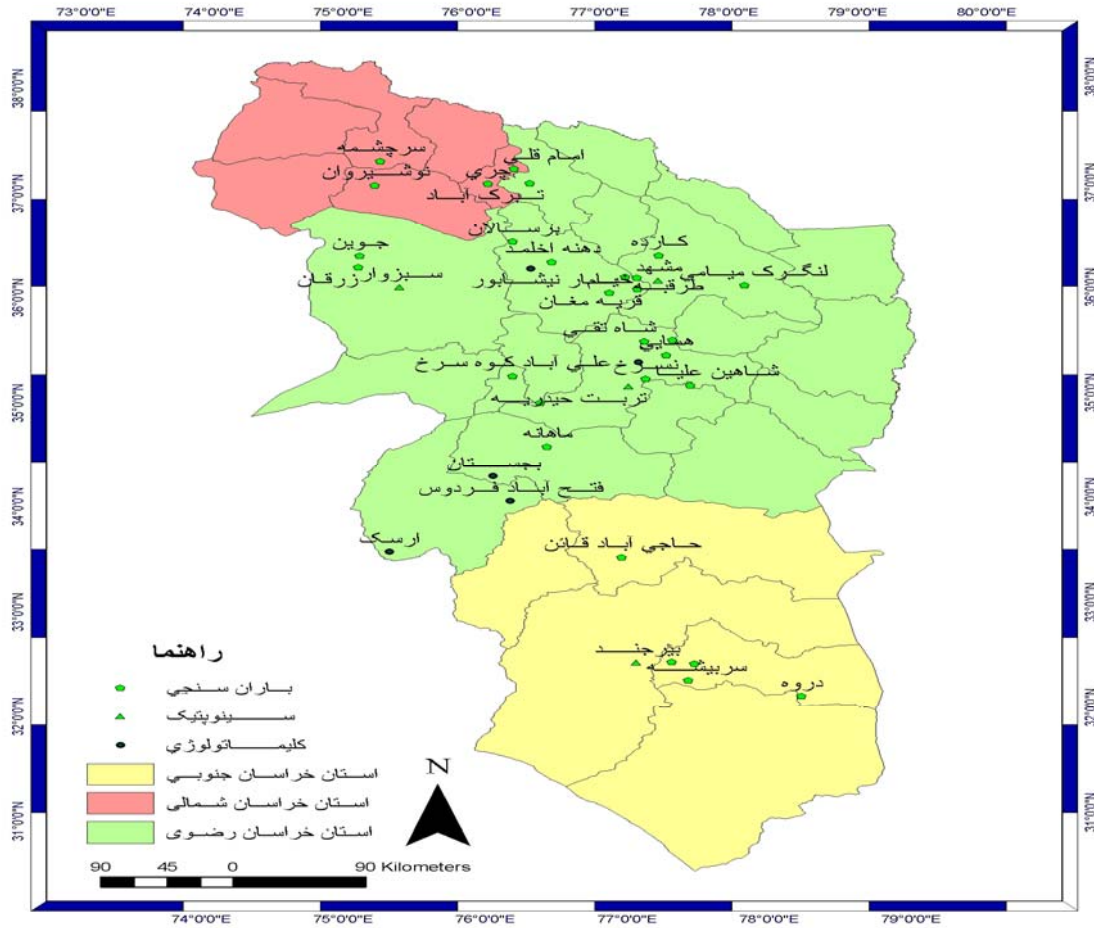
.()

()

()

()

()



Arc GIS

(DEM)

() ()

%

%

($r \geq /$) /

(SST)

:

(SST) Δ

(SLP)

(Δ SLP)

(SLP)

SLP

/ \times /

()

SLP

SLP

SLP

Sea Level Pressure

Sea Surface Temperature

EXELL

JMP 4

Noaa

()

()

				/	
				/	
				/	
			/		
/	/				

<	>		P-Value		
SLP<	SLP> /	/	/		
SLP< /	SLP> /	/	/		
SLP<	SLP> /	/	/		
SLP<	SLP>	/	/		
SLP< /	SLP> /	/	/		

*

<	>		P-Value		
$\Delta SLP < /$	$\Delta SLP < /$	/	/		
$/ < \Delta SLP <$	$\Delta SLP > /$	/	/		
$\Delta SLP >$	$\Delta SLP <$	/	/		
$\Delta SLP < /$	$\Delta SLP > /$	/	/		
$\Delta SLP < /$	$/ < \Delta SLP <$	/	/		

SST SST

()

SST SST

() ()

()

...

*

				/	

*

>	<		p-value		
-	/ SST>	/	/		
/ SST<	/ SST>	/	/		
/ SST<	/ SST>	/	/		
/ SST<	/ SST>	/	/		
-	/ SST>	/	/		
/ SST<	SST< / <	/	/		
/ SST<	/ SST>	/	/		

()

<	>		p-value		*
$\Delta SST<$ / $\Delta SST<$ <	/ $\Delta SST>$ $\Delta SST<$ <	/	/		
/ < $\Delta SST<$ / / $\Delta SST<$	/ $\Delta SST>$	/	/		
/ $\Delta SST<$	/ $\Delta SST>$	/	/		
/ $\Delta SST<$ <	/ $\Delta SST<$	/	/		

*

SPSS

Stepwise
Backward

Enter
Forward

...

X1
X2 :

$$(Y=a+ b_1x_1+ b_2x_2 +.....+ b_ix_i)$$

b a

Y x

()

()

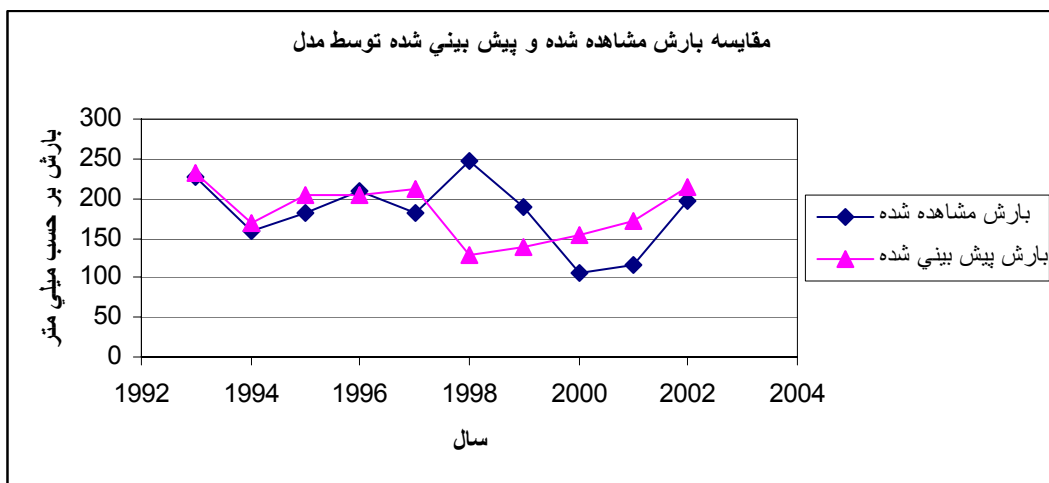
()

()

()

:

$$Y=209.8+28.3x_1-22.2x_2$$



			R^2	R^2	R	
P-value	F					
/	/	/	/	/	/	

()

() ()
SST

SST SST

()

"()ENSO"

7-Anupam, K. Ervin, Z. Andras & B. Franz, N., 2005, Prediction of monsoon rainfall for a mesoscale Indian catchment based on stochastic downscaling and objective circulation patterns, *Journal of Hydrology and Earth System Sciences*, 2: 1961–1993.

8-Farmer, G., 1988, Seasonal Forecasting of the Lenya Coast Short Rains , *Journal of Climatology*, 8: 489-497.

9- Harzallah, A.& Sadourny, R., 1997, Observed Lead-Lag Relationship Between Indian Summer Monsoon and Some Meteorological Variables , *Clim. Dn*, 13: 637-648.

10- Lindsay, J.A., Harrison, M.S.J. & Haffner, M.P., 1986, The southern Oscillation and South African Rainfall, *South Africa Journal of Science*, 82:197-198

11- Nazemosadat, M.J., & Cordery, I., 2000, On the Relationship Between ENSO and Autumn Rainfall in Iran, *Journal of climatology*, 1: 47-62.

12- Nicholson, S.E. & Selato, J.C., 2000, The Association Between ENSO and Winter Atmospheric Circulation and Temperature in the North Atlantic Region, *Journal of Climate*, 14: 3408-3420.

13- Vasqueze, D., 2001, The Relationship Between California Rainfall and ENSO Events, *Journal of Climate*, 2: 1258-1269

14- R, pongracz & J, Bartholy, 2006, Regional Effects of ENSO in Central/Eastern Europe, *Journal of advances in Geosciences*, 6:133-137.

15- Ropelewski, C.F., & Halpert, M.S., 1989, Precipitation Patterns Associated With the High Index Phase of the Southern Oscillation, *Journal of Climate*, 2: 268-284.

Annual rainfall forecasting based on synoptic patterns of tele-connection using statistical models

Gh. A. Fallah Ghalhary*¹, M. Mousavi Baygi², M. Habibi Nokhandan³ and J. Khoshhal⁴

¹ Ph.D. Student of Meteorology, University of Isfahan, I.R.Iran

² Scientific Member, Ferdowsi University of Mashhad, Mashhad, I.R.Iran

³ Scientific Member, Meteorological Research Institute, I.R.Iran

⁴ Scientific Member, Natural Geography-climatology Department, University of Isfahan, I.R.Iran

(Received: 06 October 2007, Accepted: 29 November 2008)

Abstract

The research show that global climate changes and atmospheric general circulation are affected by large scale phenomena that occurred in the sea surface. These large scale phenomena are often named "climate large scale signals". These signals are calculated based on criteria such as sea Level Pressure (SLP), Sea Surface Temperature (SST) and so on. A method for weather forecasting is a special approach based on statistical modeling. In this study, data of 37 rainfall stations were used to model the relation between precipitation and Sea Level Pressure (SLP), Sea Surface Temperature (SST), Sea Level Pressure gradient (Δ SLP) and the difference between sea surface temperature and air temperature at 1000 HP. The results show that statistical modeling can successfully predict the amount of annual rainfall. The mean root square error for stepwise model were obtained 49 millimeters.

Keywords: Synoptic pattern, Digital Elevation Model, Meteorological signals, Stepwise model