

()

*

(// : // :)

()

()

(W NW)

WRPlot
(S E)

(/)

/

)

(/

/

(SW)

(NW)

(SWW)

(W)

(RDD)

(NEE)

(V.U)

()

(/)

Archive of SID

()

(W.E.Meter)

(.)

()

(RDP)
(RDD)

WRPLOT ver3.5

()

()

() Sabawind Convert1

WRPLOT

() WRPLOT

(/)

)

()

(

(/)

()

()

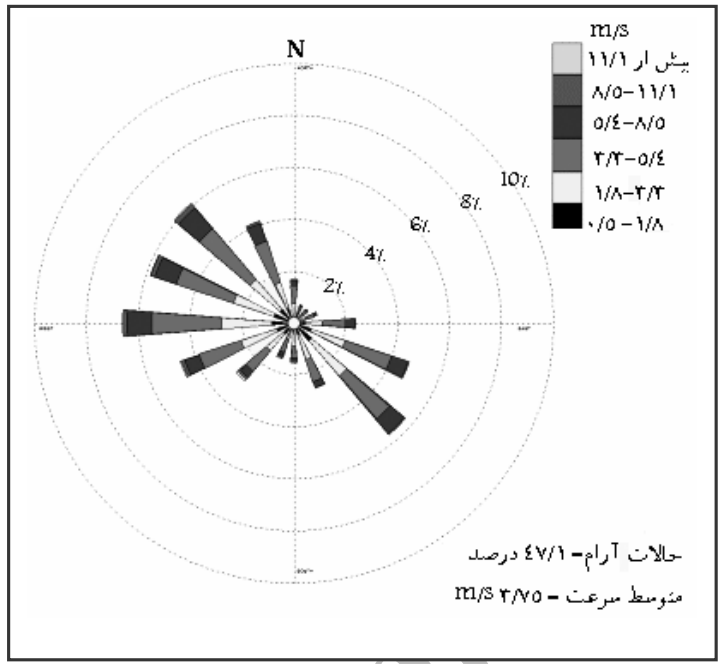
()

()

(DP)

Resultant Drift Potential
Direction Drift Potential
Sand Rose Graph

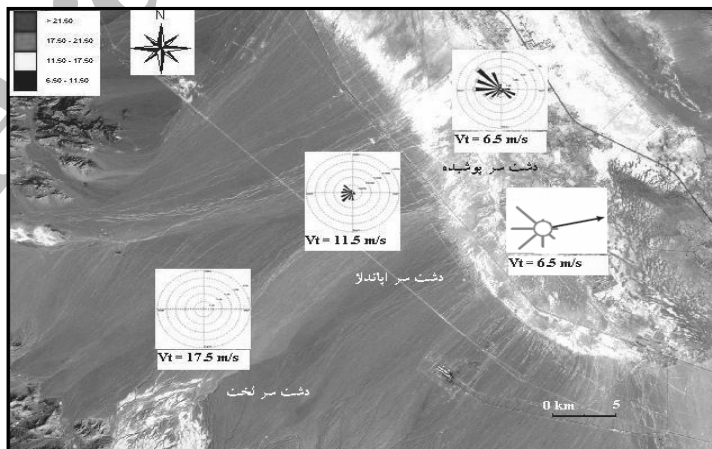
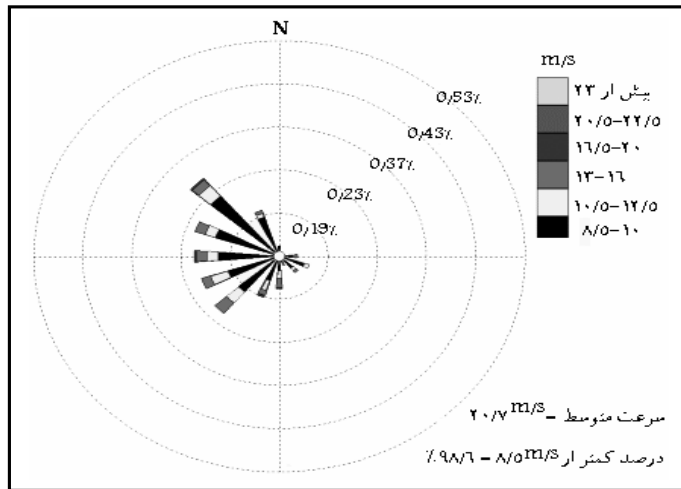
Wind Rose Plot
Drift Potential



(W.E.meter)

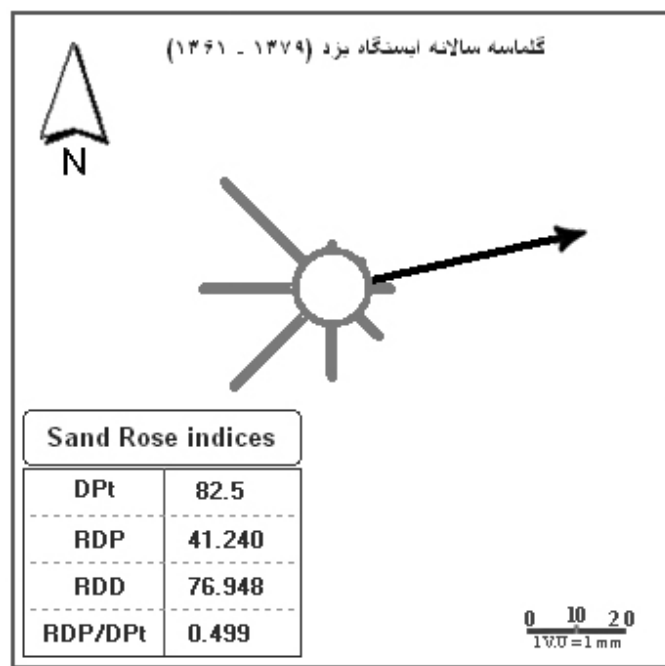
/	

() ()



/ / /

(DP)



DPt

()	N	W	SW	S	SE	E	NE	N	
/	/	/		/	/	/	/	/	
/	/		/	/		/	/	/	
/	/	/	/			/		/	
/		/	/	/		/	/	/	
/	/	/	/	/	/	/	/	/	

(RDP)

()

(DP)

)

(RDD)

(NW)) (()
(DP

(RDD) (RDP) ()

Archive of SID

(Sabawind)

...

8-Bagnold.R.A, The physics of blown sand and desert dunes, Champman and Hall, London, 265pp, 1941.

9-Bullard.J.E,Tomas.D.S.G,Livingston.L,Wigges,G.F.S, Wind energy variations in the south western Kalahari desert and implications for linear dune field activity, earth surface processes and landforms, vol.21,263-278, 1996.

10-Fryberger.S.G., H.Lettau, Dune forms and wind regimes, in E.D.makee(ed), A study of global sand seas, 137-140, United States Geological Survey, professional paper1052, 1979.

11-United Nation, UNCCD, UNEP, Global Alarm :dust and sand storms from the worlds drylands, 2001.

Archive of SID

An Application of Wind Rose, Storm Rose, and Sand Rose in the Analysis of Wind Erosion and Determining the Direction of Moving Sands (Case Study Area: Yazd – Ardakan Basin)

M.R.Ekhtesasi^{*1}, H.Ahmadi², A.Khlili³, M.A.Saremi Naeini⁴, M.R.Rajabi⁵

¹ Assistant Professor, Yazd University, I. R. Iran

^{2,3} Professors, University of Tehran, I. R. Iran

⁴ Graduate Student, Dedesertification, University of Tehran, I. R. Iran

⁵ Staff Member, Sanati Esfahan University, I. R. Iran

(Received: 15 Jan 2005, Accepted: 6 Aug 2005)

Abstract

Yazd –Ardakan basin is one of the areas exposed to wind erosion and dust storms. This basin is located in the center of Iran, northwest of Yazd. Since analysis of anemometric data has a special importance for evaluating and distinguishing erosive storm winds, so in this survey, anemometric data of a duration period of about 20 years (1982-2000) from synoptic station of Yazd have been taken and analyzed through different methods. Results obtained from analysis of data through "WRPLOT"(Wind rose plot software) indicated that the direction of prevailing winds in Yazd basin is generally from west to north-west (W-NW). The southeast (SE) direction comes next in level. Among the anemometric data employed in this research, the frequency percentage of calm winds with a velocity of less than one knot (0.54meter per second) was estimated to be 47.6%. Results obtained, after determining and drawing storm rose, indicate that based on minimum threshold velocity (about 6.5 m/s on the fine grain plain), dust storm winds in yazd plain have been generally directed northwest. The other west sector winds, including those towards west and south west direction, were almost of the same nature, while southeast winds played a less important role. Based on storm rose, frequency of wind of less velocity less than 6.5 m/s (threshold velocity) is 97% as observed from yazd station. So the frequency of dust stormy winds is reduced to 3%. The obtained results indicate that the NW, SW and W winds have the most drift potential (DP) respectively while other winds are of less power for carrying sands. The resultant drift direction (RDD), has been determined as from southwest-west (SWW) towards northeast-east (NEE). The angular direction in this respect estimated as is 77 degrees, measured clockwise from the geographical north.

Keywords: Wind rose, Dust storm rose, Sand rose, Wind erosion, Threshold velocity, Wind tunnel, Wind erosion meter, Yazd, Iran

* Corresponding author:

Tel:

, Fax:

E-mail: mr_ekhtesasi@yazduni.ac.ir