

Cite this document as: Aldughairi, A. Climate change assessment in middle and northern Saudi Arabia: Alarming trends. DYSONA - Applied Science, 2025;6(1):60-69. doi: 10.30493/das.2024.477412

Supplementary Table 1. Weather indicators dataset in Al Jawf meteorological station

Year	Wind speed (m/s)		Temperature (°C)			Relative humidity (%)		
	Mean	Max	Mean	Max	Min	Mean	Max	Min
1978	6.9	15	21.4	28.6	13.5	31	48.1	17.8
1979	7.4	17.3	21.8	29.4	14.5	33.2	51.9	18.4
1980	7.5	17.3	21.4	28.6	14.1	32.9	50.6	18.5
1981	7.9	17.6	21.4	28.7	14.1	31.8	49.5	18.1
1982	7.5	17	20.2	27.2	13.4	37.6	56.6	22.1
1983	7.3	16.8	20.4	27.6	13.2	33.9	52.5	19.8
1984	7.4	16.7	20.9	28.1	13.6	29	46.2	16
1985	7.3	15.7	21.4	28.4	14.4	31.5	49.4	17.1
1986	7.3	16.6	21.4	28.5	14.1	36.1	53.1	19
1987	7.3	15.7	23.9	29.5	14.8	27.8	47.4	17.3
1988	7	15	23.9	28.5	14.5	28	49	18.7
1989	6.4	13.8	23.7	28.5	14.1	27.1	48.2	17.5
1990	7	15.2	22.5	29.1	14.4	28.8	46	16.8
1991	7.4	16.6	21.4	28.6	14.5	33.7	53.4	18.4
1992	8.6	17	20.2	27.2	13.3	32.2	49	17.8
1993	6.6	14.7	21.3	28.6	14.4	32.5	51.6	17.1
1994	7.5	16.6	21.6	28.6	14.9	34.3	53.7	18.9
1995	7.2	14.9	21.7	28.8	14.7	33.5	50.7	19.5
1996	8.2	16	22.5	29.9	15.2	33.4	49.9	20.4
1997	8.8	17.2	21.2	28.3	14.2	35.1	51.6	21.1
1998	7.6	15.2	23	30.4	15.9	31.7	47.8	18.2
1999	7.4	14.6	22.7	30	15.6	30.9	46.7	18.2
2000	8.1	16	22	28.9	15.3	31.1	45.5	19.5
2001	8.7	16.6	22.5	29.8	15.2	30.8	45.1	19.2
2002	8.6	17.8	22.1	29.1	15	31.7	47	19.1
2003	8.1	17.7	22.3	29.4	15.1	30.3	44.2	19.5
2004	7.2	16.3	22.2	29.1	15.1	30.8	45.4	18.9
2005	7.7	15.9	22.1	28.9	15.2	30.1	44.6	18.8
2006	7.4	16.1	22.7	29.5	15.8	34.4	49.8	22.1
2007	7.6	16.3	23	30	15.9	31.3	46	20
2008	7.1	15.5	23.2	29.8	16.3	27.3	42.2	16
2009	7.4	16.4	23.2	29.8	16.3	29.1	44.9	17.3
2010	7.3	15.9	25.2	32.2	17.9	24.6	39.5	13.8
2011	6.8	15.2	22.8	29.7	15.9	27.3	42.7	16.4
2012	7	15.9	23.8	30	17.4	26.3	40	16.1
2013	7.9	16.7	23.1	29.5	16.7	30.5	46.1	17.7
2014	7.4	16.4	23.6	30.2	17.1	30.4	46.6	17.9
2015	7.5	16.5	23.9	30.4	17.3	28.1	42.2	16.7
2016	7.4	16.4	24	30.7	17.3	26.7	41	15.7
2017	7.5	16.1	24.4	31.1	17.6	24.4	37.6	14.4
2018	8.2	18	22.4	28.9	15.7	28.8	45.4	15.9
Average	7.5	16.2	22.4	29.2	15.2	30.7	47.3	18.1
Maximum	8.8	18	25.2	32.2	17.9	37.6	56.6	22.1
Minimum	6.4	13.8	20.2	27.2	13.2	24.4	37.6	13.8

Supplementary Table 2. Weather indicators dataset in Rafha meteorological station

Year	Wind speed (m/s)		Temperature (°C)			Relative humidity (%)		
	Mean	Max	Mean	Max	Min	Mean	Max	Min
1978	0	0	22.6	31.3	14	32.7	47.3	18.4
1979	0	1.8	23.7	32.2	15.3	32.3	46	18.7
1980	6.7	17.8	23.1	31	14.5	34.9	49.4	21.7
1981	6.7	17.6	23.3	31.1	15.2	36	50.6	23.5
1982	6.4	16.8	22	29.6	14.3	35.4	52.5	21.7
1983	7.1	17.6	22.3	30.5	14	33.2	46.8	22.7
1984	7.9	18	22.5	30.4	14.5	35.1	51.4	21.7
1985	7.6	20.3	23.4	31.6	15.2	36.4	51.7	22.9
1986	8.5	18.8	23.7	30.9	15.8	38.3	54.5	26.2
1987	7.6	16.7	23.8	31.2	16.1	36.2	53.2	22.8
1988	8	17.2	23.1	30.2	15.6	35.4	52.3	22.8
1989	8.5	15.1	25.4	30.5	15.3	30.5	48.4	21.2
1990	9.4	18.2	23.7	31.5	15.7	29.1	43.8	18.2
1991	8.3	17.3	23	30.8	15.7	37.4	54.5	23.2
1992	5.9	14.2	21.5	29.2	13.7	36.8	52.3	23.7
1993	8	20.2	22.7	30.8	15	38.6	55.7	24.1
1994	8.3	20.8	22.9	30.9	15.3	38.4	55.2	23.5
1995	7.6	18.5	23	30.6	15.3	38.8	55.4	24
1996	7.7	18.8	23.8	31.7	16.4	40.3	55.6	26.6
1997	8.2	19.6	22.7	30.1	15.4	40.5	55.4	27.2
1998	7.4	17.9	24.3	32.3	16.4	37	53.5	23.2
1999	7.2	17.3	24.2	32.1	16.4	36.2	50.9	23.4
2000	7.3	18.1	23.6	31.3	16.1	37.8	53.1	24.9
2001	7	16.3	24.1	32.1	15.3	36.5	51.1	24.7
2002	4.9	10.3	23.4	31.3	14.5	39.8	56.4	26.4
2003	7.6	16.9	23.5	31.4	15.5	38.1	53	25.9
2004	9.1	19.6	23.5	31.5	15.7	41	57.2	27.9
2005	5.9	12.8	23.5	31.2	16.3	43.5	57.7	31.3
2006	6.7	15.8	23.9	31.4	16.4	42.9	58	30.2
2007	7.3	16.7	24	31.7	16.3	39.7	53.9	28.9
2008	6.6	16.6	23.8	31	16.5	33.8	45.1	25.3
2009	7.2	16.9	24	31.1	16.8	35.6	46.7	26.6
2010	7.3	17.6	25.7	33.2	18.2	30.3	42.5	21.1
2011	7.5	18.2	23.5	30.9	16	28	40.4	18.6
2012	7.5	18.5	24.6	31.6	17.1	28.2	40	18.9
2013	7.4	18.9	23.7	30.6	16.5	32.6	45.2	24.5
2014	7.1	18.6	24.4	31.3	17.2	34.6	49.2	22.5
2015	7.4	18.5	24.8	31.8	17.4	30.2	42.6	19.6
2016	6.7	17.7	24.7	31.7	17.4	27.2	40.7	16
2017	7.2	18.3	25.3	32.3	17.8	22.8	34.5	13.8
2018	7.3	18.8	25.9	32.9	18.5	23.5	35.7	14.1
Average	7	16.7	23.7	31.2	15.9	35	49.7	23
Maximum	9.4	20.8	25.9	33.2	18.5	43.5	58	31.3
Minimum	0	0	21.5	29.2	13.7	22.8	34.5	13.8

Supplementary Table 3. Weather indicators dataset in Qaysumah meteorological station

Year	Wind speed (m/s)		Temperature (°C)			Relative humidity (%)		
	Mean	Max	Mean	Max	Min	Mean	Max	Min
1978	16.2	25.4	13.5	16.4	10.1	27.6	40.1	16.9
1979	19.1	25.5	13.9	16.9	10.8	31.4	47.7	18
1980	19.9	24.8	13	15.7	9.9	31.1	45.9	18
1981	18.1	24.6	12.6	15.5	9.3	28.8	43.8	16.4
1982	18.3	23.4	12.7	15.1	9.9	36.5	54.6	20.5
1983	18.8	25	12.9	15.7	9.9	30.3	47.6	17
1984	18.7	24.1	11.3	13.6	8.7	28.8	44.2	16.4
1985	17.1	24.8	13.1	15.6	10.3	30.1	44.8	17.1
1986	16	25.1	13.1	16	10.2	33.5	51.1	18.3
1987	17.3	25.6	13.6	16.3	10.7	29.1	45.1	16.7
1988	17.6	25.1	12.7	15.5	9.7	29.4	45.2	16.8
1989	18.7	24.8	12.8	15.3	10	29.7	40.5	16.8
1990	18.7	25.8	13.1	15.6	10.2	25.6	44.9	14.3
1991	19	24.4	12.1	14.7	9.3	31.5	46.6	17.7
1992	18.3	24.1	12.6	15	9.9	28.5	43.9	15.8
1993	16.9	25.3	13	15.6	10.3	33.1	50.6	18.3
1994	16.4	24.7	13.9	16.2	11.2	32.4	48	19.1
1995	15.9	25	13.6	16	10.9	35.2	50.1	21.2
1996	16	25.4	13.5	16	10.6	34.9	51.6	20.7
1997	16.6	24.8	14.5	16.9	11.7	37.3	53.4	23.4
1998	12.4	26.6	14.3	16.9	11.5	32.8	49	19.5
1999	14.7	26.1	13.1	15.7	10.1	30	45.4	17.3
2000	13.6	25.9	13.8	16.2	11	30.6	44.1	19
2001	15	26	13.5	16.1	10.6	30.5	45.4	18.4
2002	15.3	25.9	13.3	15.9	10.6	28.7	43.5	16.9
2003	14.5	26	13.8	16.4	11.1	30.1	44	18.7
2004	14.6	25.3	12.6	15.3	9.8	26.4	38.8	16
2005	14.5	25.7	13.7	16.4	11	28.9	42.3	18.1
2006	15	25.5	13.3	16.1	10.4	31.6	46.3	19
2007	15.1	26.1	13.3	16.1	10.3	27.6	39.8	17.4
2008	14.4	25.8	13.7	16.9	10.6	28.5	41.9	18.1
2009	13.9	26.6	15.8	19	12.6	35.1	49	25.2
2010	13.5	26.4	14.4	17.6	11.2	31.7	45.8	20.3
2011	14.3	25.3	13.4	16.7	10.4	31.4	45.3	21.4
2012	14.5	27.1	15.2	18.1	12.1	32.5	45.3	23.2
2013	15.3	25.4	15.4	18.1	12.6	40.3	57	27.5
2014	14.7	26.7	17	19.8	13.8	45	63.2	30
2015	14.7	26.6	16.5	19.3	13.6	43.9	59.8	29.8
2016	15.1	26.4	16.1	18.7	13	41.4	56.4	29.1
2017	16.2	27.9	16.4	19.3	13.4	38	54.7	26
2018	17.9	23.7	22.7	24.3	15.3	37.2	52.3	25.1
Average	16.2	25.5	14	16.6	10.9	32.4	47.5	19.9
Maximum	19.9	27.9	22.7	24.3	15.3	45	63.2	30
Minimum	12.4	23.4	11.3	13.6	8.7	25.6	38.8	14.3