Table S1. Precipitation statistics of the upper catchment of the Red River Basin during 1998–2010. Precipitation units are in mm. The Q_{min} and Q_{max} refer to the minimum and the maximum precipitation at each time scale. The Q_1, Q_2, and Q_3 refer to the 25th, 50th (median), and 75th percentile of precipitation at each time scale. The μ refers to the mean precipitation over the record, σ is the standard deviation, CV is the coefficient of variation (equal to σ/μ), γ is the skewness, Z is the Mann–Kendal test statistic (Kendall, 1975), p is the probability value, and S is the Sen' s Slope (Sen, 1968).

Time series	Q_{min}	Q_1	Q_2	Q_3	Q_{max}	μ	$б$	CV	γ	Z	p	S
January	0.4	9.7	21.4	27.1	48.3	21.8	16.12	0.74	0.53	-1.77	0.08	-2.51
February	0.3	4.6	13.0	22.8	44.4	15.6	13.28	0.85	0.95	-0.92	0.36	-1.06
March	1.5	13.9	22.5	34.2	69.0	26.0	18.85	0.72	0.93	-1.40	0.16	-2.08
April	17.1	32.2	38.9	63.6	118.8	50.9	28.62	0.56	1.19	1.04	0.30	2.29
May	26.1	81.6	116.4	144.4	248.8	121.1	58.41	0.48	0.60	-1.40	0.16	-5.99
June	90.0	122.4	152.1	205.2	256.2	160.1	51.43	0.32	0.33	-1.40	0.16	-5.96
July	143.1	182.9	209.2	230.9	278.3	208.6	35.47	0.17	0.10	-1.28	0.20	-3.80
August	121.8	141.3	176.3	233.0	313.5	197.3	63.49	0.32	0.72	-0.79	0.43	-3.64
September	49.6	87.7	104.6	125.1	154.6	103.0	31.25	0.30	-0.15	0.31	0.76	1.24
October	21.3	43.4	79.5	139.5	191.6	89.8	55.76	0.62	0.60	-0.06	0.95	-0.32
November	3.1	17.5	27.7	35.0	97.7	35.6	25.63	0.72	1.40	-1.16	0.25	-1.42
December	0.8	2.5	11.7	22.5	42.9	14.5	12.91	0.89	1.00	0.79	0.43	-1.42
Wet season	665.7	783.3	869.3	963.5	1128.2	879.9	139.53	0.16	0.45	-1.04	0.30	-14.47
Dry season	106.2	152.2	176.7	186.8	222.5	164.3	33.94	0.21	-0.36	-0.55	0.58	-1.68
Year	771.8	935.8	1012.9	1143.2	1276.3	1044.2	147.68	0.14	-0.03	-1.53	0.13	-16.27

Table S2. Same as Table S1, but for discharge. Discharge units are in m^3/s.

Time scales	Q_{min}	Q_1	Q_2	Q_3	Q_{max}	μ	$б$	CV	γ	Z	p	S
January	57.2	113.3	119.2	161.6	200.9	132.7	40.2	0.30	0.11	-1.04	0.30	-3.06
February	58.0	75.0	103.3	123.1	186.9	105.1	35.7	0.34	0.84	-0.43	0.67	-1.59
March	42.1	53.9	80.6	96.1	145.8	80.8	32.0	0.40	0.75	-1.04	0.30	-2.93
April	42.8	53.4	81.5	101.4	119.4	77.8	26.0	0.33	0.04	-0.31	0.76	-1.11
May	41.2	122.8	149.3	238.1	276.2	163.2	79.1	0.48	0.02	-1.16	0.25	-9.90
June	104.0	176.8	285.5	353.5	1088.4	317.7	250.4	0.79	2.72	-2.26	0.02	-19.27
July	181.0	383.8	550.4	722.3	898.8	547.7	232.5	0.42	0.16	-2.26	0.02	-42.07
August	248.2	410.8	550.2	687.1	1305.5	636.5	330.3	0.52	0.99	-1.40	0.16	-27.46
September	215.9	324.8	443.5	605.4	1013.4	484.2	233.1	0.48	0.98	-1.89	0.06	-28.03
October	117.8	287.7	324.9	395.9	749.6	355.8	172.3	0.48	1.15	-0.06	0.95	-3.30
November	64.1	149.8	206.8	369.8	921.4	325.3	271.9	0.84	1.35	-0.92	0.36	-10.59
December	69.0	119.6	138.6	174.6	274.9	153.1	57.6	0.38	0.84	-1.40	0.16	-8.48
Wet season	193.1	294.2	402.0	537.0	695.4	417.5	151.3	0.36	0.27	-1.89	0.06	-21.94
Dry season	80.2	102.4	122.7	178.7	250.6	145.8	54.6	0.37	0.83	-2.01	0.04	-7.80
Year	136.7	208.4	257.7	343.8	450.6	281.7	97.2	0.34	0.24	-2.01	0.04	-14.80

S1 FAO Penman–Monteith method

The panel of FAO experts recommended the adoption of the Penman–Monteith combination method as a new standard for reference evapotranspiration and advised on procedures for calculation of the various parameters. By defining the reference crop as a hypothetical crop with an assumed height of 0.12 m having a surface resistance of 70 s m^{-1} and an albedo of 0.23, closely resembling the evaporation of an extension surface of green grass of uniform height, actively growing and adequately watered, the FAO Penman–Monteith method was developed. The FAO Penman–Monteith method to estimate ETo can be derived (Allen, et al., 1998):

$$ET_o = \frac{0.408\Delta(R_n - G) + \gamma \frac{900}{T + 273} u_2 (e_s - e_a)}{\Delta + \gamma(1 + 0.34u_2)}$$

where

ET_o reference evapotranspiration [mm day^{-1}],

R_n net radiation at the crop surface [MJ m^{-2} day^{-1}],

G soil heat flux density [MJ m^{-2} day^{-1}],

T mean daily air temperature at 2 m height [°C],

u_2 wind speed at 2-m height [m s^{-1}],

e_s saturation vapor pressure [kPa],

e_a actual vapor pressure [kPa],

e_s - e_a saturation vapor pressure deficit [kPa],

Δ slope vapor pressure curve [kPa $°C^{-1}$],

γ psychrometric constant [kPa $°C^{-1}$].

The FAO Penman–Monteith equation requires air temperature, humidity, radiation and wind speed data for daily, weekly, 10-day or monthly calculations. The computation of all of the data required for the calculation of the reference evapotranspiration is given in Allen et al. (1998). The ETo calculator provided by the FAO is used to assesses ETo from meteorological data by means of the FAO Penman–Monteith equation (http://www.fao.org/land-water/databases-and-software/eto-calculator/es).

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