

## Supplemental Information

Table 1 – Standard operating policy for a hypothetical reservoir system (All values are in Million M<sup>3</sup> (Mm<sup>3</sup>)  $S_{max} = 350$  Mm<sup>3</sup>)

<b>Months</b>	<b><math>Q_t</math></b>	<b><math>D_t</math></b>	<b><math>E_t</math></b>	<b><math>S_t</math></b>	<b><math>S_t+Q_t-E_t</math></b>	<b><math>R_t</math></b>	<b><math>O_t</math></b>	<b><math>S_{t+1}</math></b>	<b><math>D_t/(I_t+S_t-1)</math></b>	<b><math>R_t/(I_t+S_t-1)</math></b>
1	70.61	51.68	10.00	200.00	260.61	51.68	0.00	208.93	0.20	0.20
2	412.75	127.85	8.00	208.93	613.68	127.85	135.83	350.00	0.21	0.21
3	348.40	127.85	8.00	350.00	690.40	127.85	212.55	350.00	0.19	0.19
4	142.29	65.27	8.00	350.00	484.29	65.27	69.02	350.00	0.13	0.13
5	103.78	27.18	6.00	350.00	447.78	27.18	70.60	350.00	0.06	0.06
6	45.00	203.99	6.00	350.00	389.00	203.99	0.00	185.01	0.52	0.52
7	19.06	203.99	5.00	185.01	199.07	199.07	0.00	0.00	1.02	1.00
8	14.27	179.47	5.00	0.00	9.27	9.27	0.00	0.00	19.36	1.00
9	10.77	89.76	6.00	0.00	4.77	4.77	0.00	0.00	18.82	1.00
10	8.69	0.00	8.00	0.00	0.69	0.00	0.00	0.69	0.00	0.00
11	9.48	0.00	8.00	0.69	2.17	0.00	0.00	2.17	0.00	0.00
12	18.19	0.00	10.00	2.17	10.36	0.00	0.00	10.36	0.00	0.00

Table 2: Hedging operation of a hypothetical reservoir operation ( $\alpha = 0.9$ ) (All in Mm<sup>3</sup>)

<b>Months</b>	<b><math>Q_t</math></b>	<b><math>D_t</math></b>	<b><math>E_t</math></b>	<b><math>S_t</math></b>	<b><math>S_t+Q_t-E_t</math></b>	<b><math>R_t</math></b>	<b><math>O_t</math></b>	<b><math>S_{t+1}</math></b>	<b><math>D_t/(I_t+S_t-1)</math></b>	<b><math>R_t/(I_t+S_t-1)</math></b>
1	70.61	51.68	10.00	200.00	260.61	36.18	0.00	224.43	0.20	0.14
2	412.75	127.85	8.00	224.43	629.18	127.85	151.33	350.00	0.20	0.20
3	348.40	127.85	8.00	350.00	690.40	127.85	212.55	350.00	0.19	0.19
4	142.29	65.27	8.00	350.00	484.29	65.27	69.02	350.00	0.13	0.13
5	103.78	27.18	6.00	350.00	447.78	27.18	70.60	350.00	0.06	0.06
6	45.00	203.99	6.00	350.00	389.00	142.79	0.00	246.21	0.52	0.37
7	19.06	203.99	5.00	246.21	260.27	142.79	0.00	117.47	0.78	0.55
8	14.27	179.47	5.00	117.47	126.74	126.74	0.00	0.00	1.42	1.00
9	10.77	89.76	6.00	0.00	4.77	4.77	0.00	0.00	18.82	1.00
10	8.69	0.00	8.00	0.00	0.69	0.00	0.00	0.69	0.00	0.00
11	9.48	0.00	8.00	0.69	2.17	0.00	0.00	2.17	0.00	0.00
12	18.19	0.00	10.00	2.17	10.36	0.00	0.00	10.36	0.00	0.00

Table 3: Annual operation of the Falls Lake reservoir, NC (all values in acre-feet per year)

Year	$S_{t-1}$	$I_t$	$D_t$	$EF_t$	$S_t$
1983	8,180.00	25,515.49	20,917.26	815.65	11,962.57
1984	11,962.57	25,448.01	25,634.56	978.39	10,797.63
1985	10,797.63	16,592.91	14,739.33	1,037.92	11,613.29
1986	11,613.29	6,928.10	6,017.19	1,184.78	11,339.42
1987	11,339.42	17,442.30	16,973.94	1,208.60	10,599.18
1988	10,599.18	6,545.08	4,469.23	1,266.15	11,408.88
1989	11,408.88	29,498.50	27,716.36	1,228.44	11,962.57
1990	11,962.57	17,876.92	16,567.11	1,333.62	11,938.76
1991	11,938.76	10,668.99	10,760.28	1,387.21	10,460.26
1992	10,460.26	11,298.10	8,388.74	1,444.76	11,924.86
1993	11,924.86	19,196.65	18,898.96	1,553.91	10,668.64
1994	10,668.64	11,962.93	10,420.92	1,363.39	10,847.25
1995	10,847.25	18,781.88	16,354.76	1,355.45	11,918.91
1996	11,918.91	27,228.16	25,531.36	1,611.46	12,004.25
1997	12,004.25	14,167.77	12,613.86	1,782.13	11,776.02
1998	11,776.02	25,301.16	24,368.41	1,915.10	10,793.67
1999	10,793.67	22,143.72	18,345.27	2,012.34	12,579.77
2000	12,579.77	14,556.75	13,340.21	2,063.94	11,732.36
2001	11,732.36	9,123.02	7,940.22	2,018.30	10,896.86
2002	10,896.86	12,205.04	8,831.29	1,847.63	12,422.99
2003	12,422.99	30,076.01	28,283.95	1,883.35	12,331.70
2004	12,331.70	11,159.18	9,091.27	2,052.04	12,347.58
2005	12,347.58	9,277.82	8,458.19	2,125.46	11,041.74
2006	11,041.74	12,945.28	8,986.09	1,760.30	13,240.63
2007	13,240.63	8,122.80	9,571.53	1,869.46	9,922.44
2008	9,922.44	12,441.21	8,059.30	1,647.18	12,657.17
2009	12,657.17	18,879.12	16,422.23	1,718.63	13,395.42
2010	13,395.42	12,707.14	13,205.26	1,605.51	11,291.79
2011	11,291.79	4,485.11	3,105.84	1,476.51	11,194.55
2012	11,194.55	5,566.69	3,167.36	1,411.02	12,182.86
2013	12,182.86	15,713.75	13,173.51	1,393.16	13,329.93

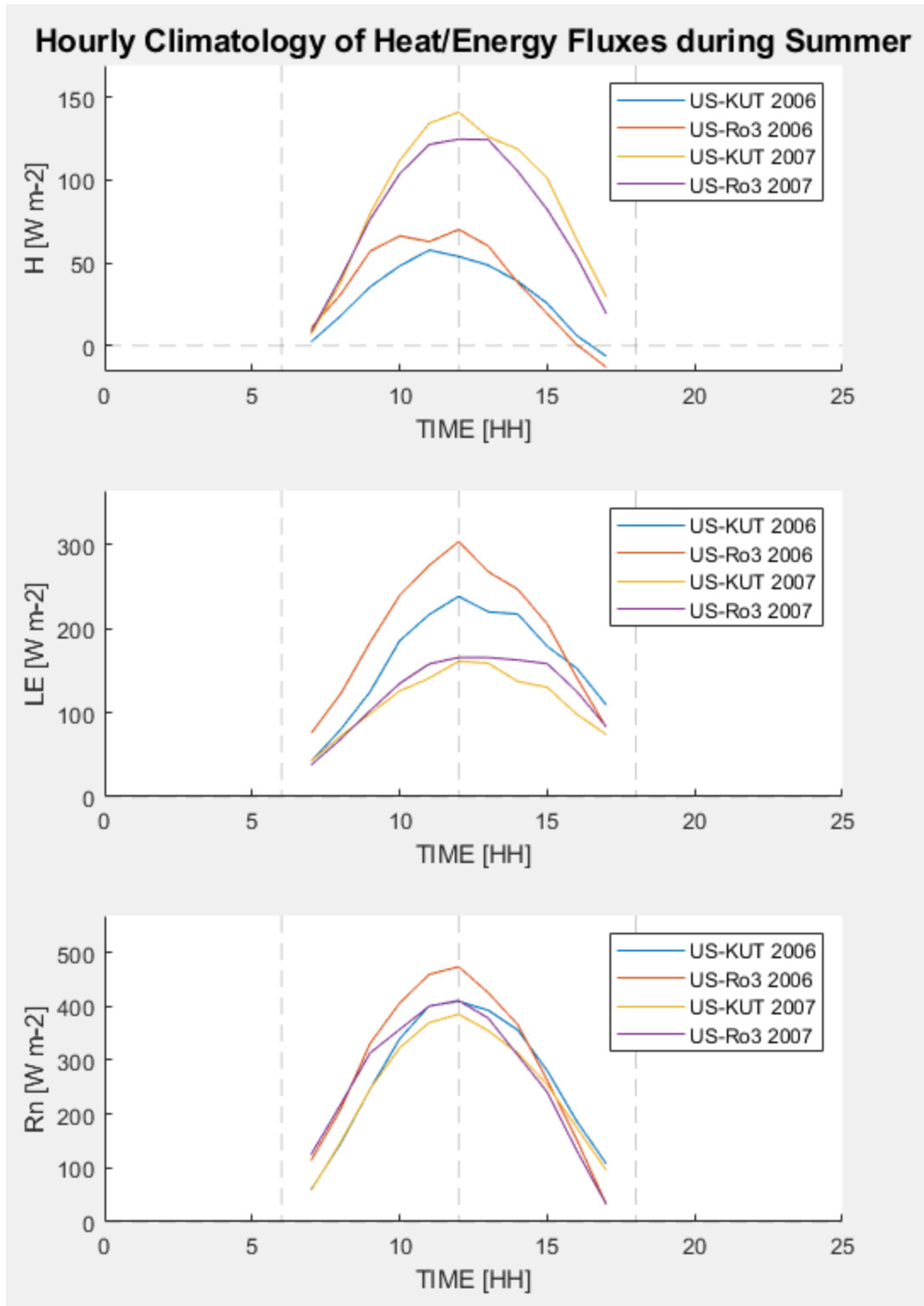


Figure SI-1: Hourly average of sensible heat (top), latent heat (middle) and net radiation (bottom) (in  $\text{W m}^{-2}$ ) in August 2006 and 2007 for the two FLUXNET towers, US-KUT and US-Ro3, during the day time 7 AM to 5 PM.