



Supplementary Materials

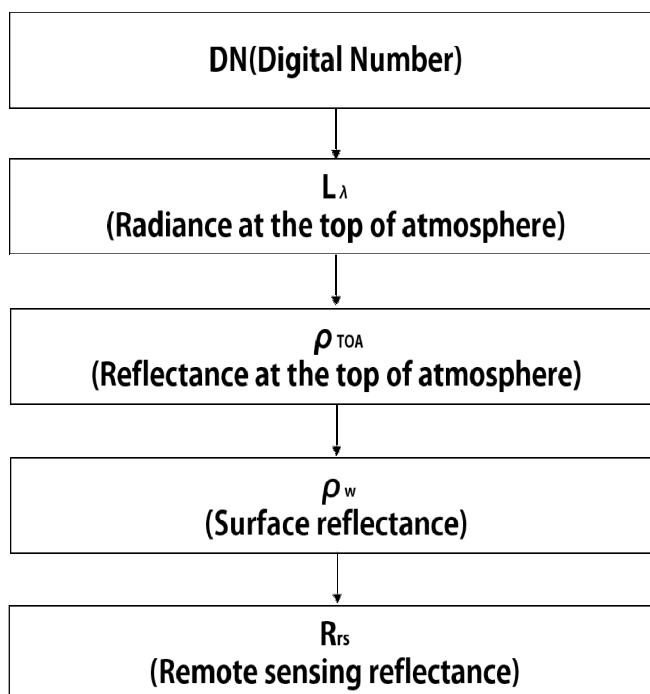


Fig. S1. Process of FLAASH tool

Table S1. Characteristics of each band on-board in Landsat 8

Sensor	Band	Wavelength(μm)	Spatial resolution(m)
OLI	Band 1(Coastal/Aerosol)	0.435 – 0.451	30m
	Band 2(Blue)	0.452 – 0.512	
	Band 3(Green)	0.533 – 0.590	
	Band 4(Red)	0.636 – 0.673	
	Band 5(NIR)	0.851 – 0.879	
	Band 6(SWIR-1)	1.566 – 1.651	
	Band 7(SWIR-2)	2.107 – 2.294	
	Band 8(Pan)	0.503 – 0.676	15m
	Band 9(Cirrus)	1.363 – 1.384	30m
TIRS	Band 10(TIR-1)	10.60 – 11.19	100m
	Band 11(TIR-2)	11.50 – 12.51	

Table S2. Seasonal-Latitude Surface Temperature Model*

Latitude(°N)	Jan	March	May	July	Sept	Nov
80	SAW	SAW	SAW	MLW	MLW	SAW
70	SAW	SAW	MLW	MLW	MLW	SAW
60	MLW	MLW	MLW	SAS	SAS	MLW
50	MLW	MLW	SAS	SAS	SAS	SAS
40	SAS	SAS	SAS	SAS	SAS	SAS
30	MLS	MLS	MLS	T	T	MLS
20	T	T	T	T	T	T
10	T	T	T	T	T	T
0	T	T	T	T	T	T

SAW : Sub-Arctic Winter, MLW : Mid-Latitude Winter, SAS : Sub-Arctic Summer

MLS : Mid-Latitude Summer, T : Tropical

※ Source : www.l3harrisgeospatial.com/docs/flaash

Table S3. Locations for the weather stations for the study area

Weather Station	Longitude	Latitude
Dalsung	128.4238	35.6901
Okpo	128.4455	35.8027
Habin	128.4463	35.9061
Daegu Seogu	128.5309	35.8650
Daegu Bukgu	128.5906	35.9084
Sinam	128.6185	35.8856

Table S4. Weather conditions for sampling days

Date	Temperature(°C)	Path/Row	Cloud cover (%)
2021/05/19	25.3	114/35	0.06
2021/06/20	27.4	114/35	12.44
2021/09/15	25.5	115/35	22.18
2021/10/01	24.5	115/35	12.94
2021/10/10	25.9	114/35	4.98
2021/10/17	9.3	115/35	0.04

Table S5. Linear relationship of the Pearson's correlation coefficient ranges

Coefficient ranges of determination	Description of linear relationship	Note
$-1.0 \leq R < -0.7$	Very strong negative	(R=-1) Perfect line with negative
$-0.7 \leq R < -0.3$	Strong negative	
$-0.3 \leq R < -0.1$	Weak negative	
$-0.1 \leq R < +0.1$	Negligible	(R=0) Non Linear
$+0.1 \leq R < +0.3$	Weak positive	(R=1) Perfect line with positive
$+0.3 \leq R < +0.7$	Strong positive	
$+0.7 \leq R < +1.0$	Very strong positive	

Table S6. The water quality concentration of Kumho River during study period

	Sampling point	Temperature (°C)	Turbidity (NTU)	T-N (mg/L)	T-P (mg/L)	Chl-a (mg/L)
May 19 th 2021	Kumho 4(S1)	20.5	2.97	2.50	0.051	9.39
	Kumho 5(S2)	20.0	5.68	3.10	0.047	13.26
	Kumho 6(S5)	18.0	3.91	2.30	0.018	18.45
Jun. 20 th 2021	Kumho 4(S1)	19.3	4.70	7.70	0.020	77.65
	Kumho 5(S2)	22.2	5.92	2.90	0.033	36.25
	Waryong(S3)	21.9	5.85	2.90	0.022	31.76
	Haeryang(S4)	19.2	7.63	1.70	0.020	59.05
	Kumho 6(S5)	18.5	5.54	11.70	0.024	67.58
Sep. 15 th 2021	Kumho 4(S1)	23.1	3.62	2.26	0.027	10.97
	Kumho 5(S2)	18.6	4.20	2.44	0.036	11.34
	Waryong(S3)	22.5	4.01	2.41	0.026	12.66
	Haeryang(S4)	22.5	3.50	2.35	0.025	9.19
	Kumho 6(S5)	20.3	2.44	2.33	0.029	16.60
Oct. 1 st 2021	Kumho 4(S1)	22.0	1.63	1.96	0.006	3.56
	Kumho 5(S2)	22.2	4.20	2.18	0.010	4.02
	Waryong(S3)	21.9	3.61	2.10	0.010	3.56
	Haeryang(S4)	21.7	2.70	2.23	0.011	4.40
	Kumho 6(S5)	21.4	3.83	2.17	0.010	7.96
Oct. 10 th 2021	Kumho 4(S1)	21.7	1.61	2.04	0.003	7.58
	Kumho 5(S2)	20.5	3.08	2.18	0.009	4.48
	Waryong(S3)	21.8	2.07	2.14	0.008	4.03
	Haeryang(S4)	21.8	1.72	2.27	0.008	4.40
	Kumho 6(S5)	19.5	3.40	2.20	0.009	5.80
Oct. 17 th 2021	Kumho 4(S1)	15.3	2.89	1.67	0.012	1.48
	Kumho 5(S2)	12.8	3.59	1.86	0.011	1.86
	Waryong(S3)	16.3	2.87	1.79	0.013	2.41
	Haeryang(S4)	16.1	2.44	1.92	0.009	4.86
	Kumho 6(S5)	15.2	3.62	1.97	0.013	5.89
	Average	19.88	3.69	2.69	0.019	15.73

Table S7. Correlation coefficients between observed turbidity and reflectance values

	Band2	Band3	Band4	Band5	Band6	Band7
Band2	1					
Band3	0.982	1				
Band4	0.956	0.991	1			
Band5	0.97	0.981	0.973	1		
Band6	0.948	0.963	0.954	0.986	1	
Band7	0.947	0.963	0.954	0.985	0.998	1
Turbidity	0.584	0.607	0.613	0.609	0.644	0.648 *
T-N	0.806	0.809 *	0.801	0.806	0.781	0.777
T-P	0.263	0.235	0.205	0.193	0.261	0.287 *
Chl-a	0.878	0.856	0.833	0.886	0.889 *	0.883

* : the selected optimal band for the regression model