remote sensing

MDPI

Supplementary Tables

Table 1. Dates, times, and locations of described UAV flights

Date	Site	Land Use	Times (EDT)	Latitude (°)	Longitude (°)	Altitude above Ground (m)	Altitude above Canopy (m)
7/27/2016	**Tully, NY**	Mixed Hardwood	11:10-12:10	42.77728	-76.08168	83	60
7/27/2016	**Tully, NY**	Mixed Hardwood	12:18-12:28	42.77728	-76.08168	83	60
7/27/2016	**Tully, NY**	Mixed Hardwood	13:04-13:14	42.77728	-76.08168	83	60
7/27/2016	**Tully, NY**	Mixed Hardwood	14:10-14:20	42.77728	-76.08168	83	60
7/27/2016	**Tully, NY**	Mixed Hardwood	15:08-15:18	42.77728	-76.08168	83	60
7/30/2017	**Tully, NY**	Mixed Hardwood	13:40-13:52	42.77613	-76.08541	31	8
7/30/2017	**Tully, NY**	Mixed Hardwood	14:00-14:11	42.77605	-76.08573	31	8
7/30/2017	**Tully, NY**	Spruce Plantation	14:36-14:46	42.77728	-76.08168	24	1
7/30/2017	**Tully, NY**	Spruce Plantation	15:09-15:20	42.77112	-76.08297	37	14
7/31/2017	**Geneva, NY**	Cropped Willow	12:43-12:52	42.88322	-77.00353	8	5
7/31/2017	**Geneva, NY**	Cropped Willow	13:02-13:13	42.88310	-77.00320	9	6
7/31/2017	**Geneva, NY**	Cropped Willow	13:29-13:40	42.88312	-77.00378	8	5

*Table 2. Latitude and Longitude of the northwest corner of each of the 500*500m satellite pixels retrieved for comparison to UAV estimates of albedo at Tully, NY. Satellite data retrieved using the LPDAAC APPEEARS tool and latitude and longitude of MODIS pixels retrieved using the MODLAND Pixel Calculator.*

Latitude	**Longitude**
42.77729	-76.08656
42.77729	-76.08044
42.77282	-76.08656
42.77282	-76.08044

*Table 3. Latitude and Longitude of the northwest corner of each of the 500*500m satellite pixels retrieved for comparison to tower estimates of albedo at Petersham, MA; Bartlett, NH; and Durham, NH.*

Tower site	**Latitude**	**Longitude**
Petersham, MA USA	42.53919	-72.17566
Bartlett, NH USA	44.06875	-71.29669
Durham, NH USA	43.11042	-70.95806

Table 4. Blue sky albedo estimates for sites in Tully, NY; Durham, NH; Bartlett, NH; and Petersham, MA. Estimates were created with high (0.5), low (0.1) and typical (0.2) estimates for optical depth to examine the sensitivity of the results to the assumption of 0.2.

Site	**OD**	**Mean**	**SE**

Tully	Low	0.152	0.001
Tully	Med	0.152	0.001
Tully	High	0.151	0.001
Bartlett	Low	0.148	0.002
Bartlett	Med	0.148	0.002
Bartlett	High	0.147	0.002
Durham	Low	0.151	0.001
Durham	Med	0.151	0.001
Durham	High	0.149	0.001
Petersham	Low	0.146	0.002
Petersham	Med	0.146	0.002
Petersham	High	0.145	0.002

Table 5 Current FAA requirements for UAV research within the United States

Requirement	**Approximate Cost**	**Location**	**Expiration**
Craft Registration	Registration Fee: $5	Form available online	3 years
Pilot Cert. Exam	Exam Fee: $150	One of 700 national test centers	2 years
Pilot Certification	No Cost	Form available online Includes security screening	2 years
Pilot Requirements/Restrictions			
• Be at least 16 years old • Be able to read, speak, write, and understand English (exceptions may be made if the person is unable to meet one of these requirements for a medical reason) • Be in a physical and mental condition to safely operate a small UAV • Pass the aeronautical knowledge exam at an FAA-approved testing center (above) • Undergo Transportation Safety Administration (TSA) security screening (above)			
Equipment Requirements/ Restrictions			
• Unmanned aircraft must weigh less than 25 kgs, including payload, at takeoff • The remote pilot in command must conduct a preflight check of the small UAV to ensure that it is in a condition for safe operation			
Operational Requirements/Restrictions			
• Unmanned aircraft must weigh less than 25 kgs, including payload, at takeoff • Fly in Class G airspace* • Keep the unmanned aircraft within visual line-of-sight; vision must be unaided except by corrective lenses* • Fly at or below 122 m* • Fly during daylight or civil twilight* • Fly at or under 161 kmh* • Yield right of way to manned aircraft* • Do not fly directly over people* • Do not fly from a moving vehicle, unless in a sparsely populated area* • Minimum weather visibility of 4.8 km from operator • Maintain line of sight with UAV at all times • No careless or reckless operations • No carriage of hazardous materials			

***These rules are subject to waiver.**