

NPS NIGHT SKIES PROGRAM DATA NIGHT REPORT

CEBB140922

Black Butte Lake R A

Buckhorn Group Camp

22-Sep-14



Data Night Attributes

Longitude:	-122.37608	Camera:	SBIG 1	Air temp. (C):	23.5	ZLM:	6.40	OBS_1:	D Duriscoe
Latitude:	39.81333	# of sets:	3	R. H. (%):	55.0	BORTLE:	4	OBS_2:	J Sales
Elevation (m):	178	Exposure (secs):	14	Wind Speed (mph):	3	SQM:	21.77	OBS_3:	

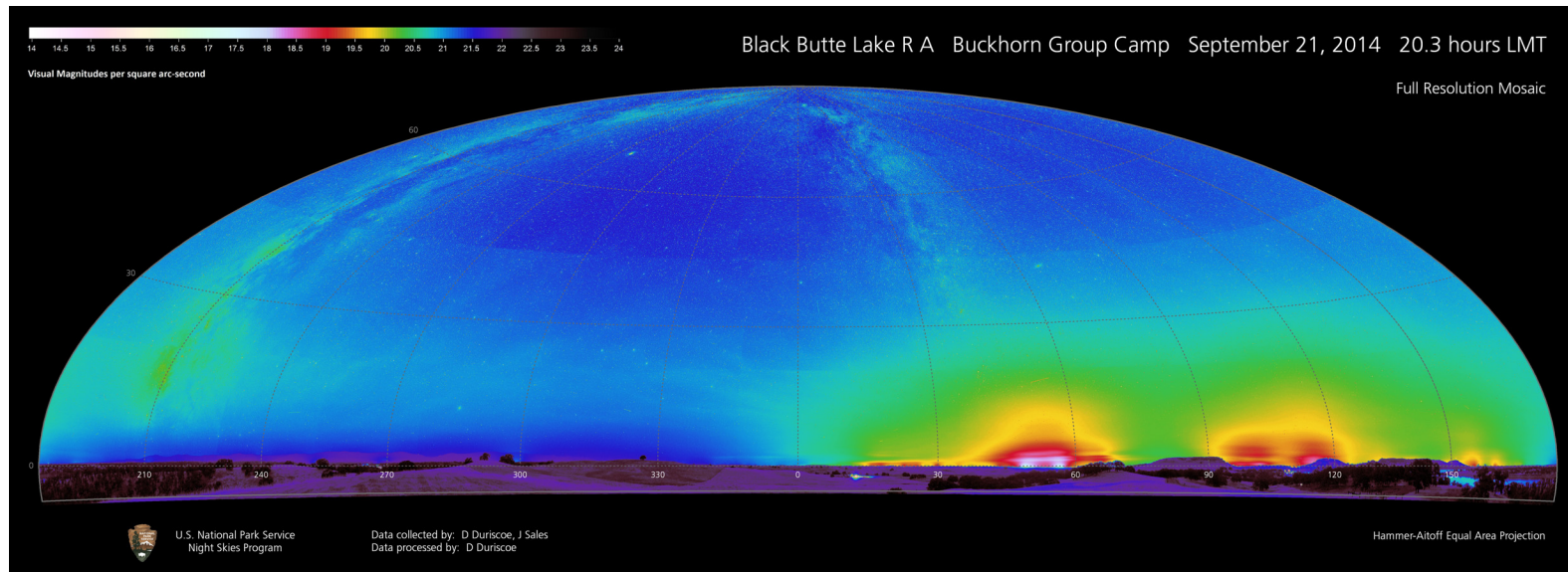
NARRATIVE: Site on a knoll just northwest of the group camp, excellent monitoring site with easy access. Seeing excellent, transparency poor. Lingering smoke and haze from wildfire, humid. Despite high extinction, an excellent sky near the zenith, with the dark lane in the Cygnus star cloud visible. Northeast through south along the horizon has numerous bright light domes, the brightest of which definitely affects dark adaptation. Early evening sky is much brighter overhead than late, presumably because of outdoor lights being shut off, but airglow decrease also a factor. By early morning, the light domes are seen to extend to less than 45 degrees above the horizon, while in early evening to at least 60 degrees, with only a small area near the zenith lacking a distinct brightness gradient. SQM 21.44 at 9:30 PM (Sales), 21.77 (Duriscoe) 12:30 AM LMT.

Data Set Attributes

Data Set	Quality Flags				Natural Sky Model			Extinction				Collection Properties			
	Use-able	Col-lection	Pro-cessing	Atmo-sphere:	Zenith airglow ($\mu\text{cd}/\text{m}^2$)	Fit quality	Natural sky model fit notes	Ext. coeff. (mag/airmass)	Std err Y	# stars used	# stars reject	% Clouds	Ave. Point Error	Max Point Error	total bias drift
1	Y	5	4	2	153	3	varying airglow, very high	0.379	0.05	87	14	0	0.22	0.62	2.4
2	Y	2	5	3	95	4	airglow diminished, more steady	0.347	0.04	102	8	0	1.68	2.16	1.9
3	Y	2	5	3	95	4	decent fit with high extinction	0.342	0.05	108	11	0	1.70	2.47	2.1

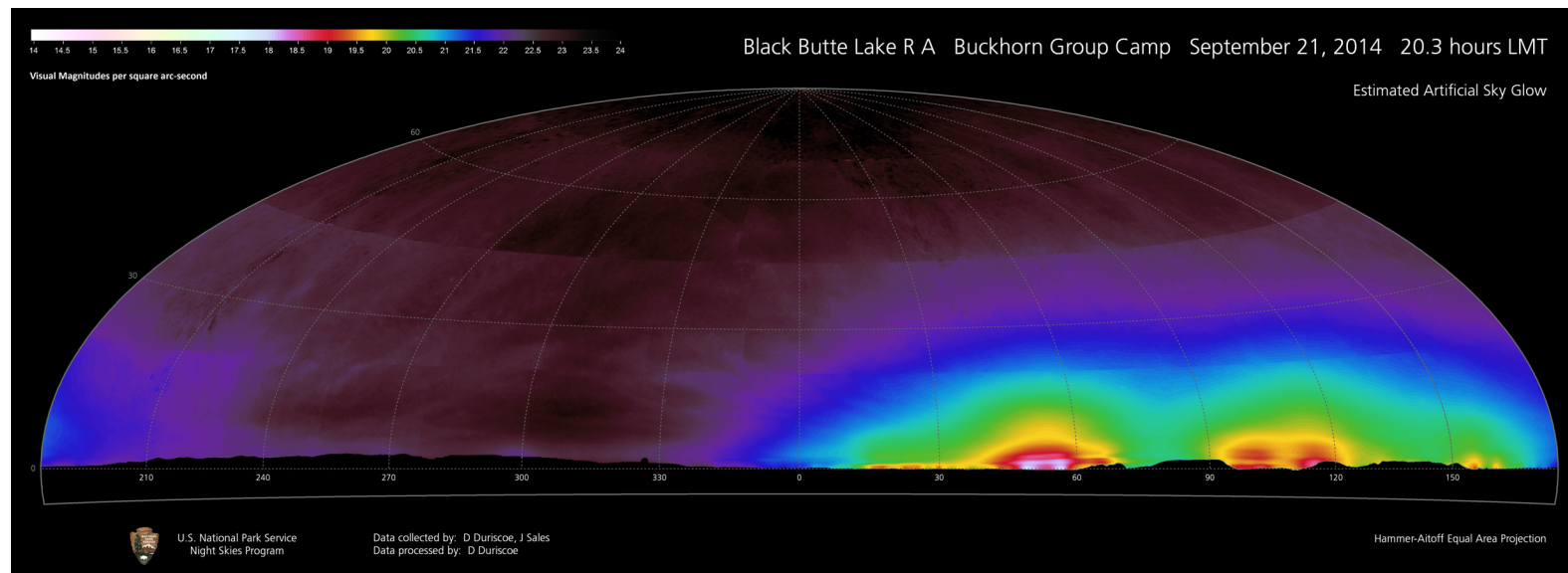
Populated Places

Place	Population (2010)	Distance (km)	Azimuth	Walker's	Apparent Half-Width (degrees)
Chico city	86,187	48.0	98	0.539	6.2
Orland city	7,291	17.9	115	0.537	5.0
Corning city	7,663	20.9	52	0.384	4.7
Sacramento city	466,488	159.1	150	0.146	3.2
Redding city	89,861	83.8	1	0.140	4.8
Red Bluff city	14,076	41.6	16	0.126	3.4
San Francisco city	805,235	238.7	194	0.091	1.5
Willows city	6,166	36.5	155	0.077	2.4
Paradise town	26,218	66.1	95	0.074	3.4
San Jose city	945,942	283.8	170	0.070	2.4
Rancho Tehama Reserve C	1,485	21.6	347	0.068	8.2
Yuba City city	64,925	98.5	140	0.067	2.0
Santa Rosa city	167,815	154.5	191	0.057	2.2
Oakland city	390,724	227.4	177	0.050	1.7
Roseville city	118,788	148.5	141	0.044	2.1
Stockton city	291,707	223.9	155	0.039	1.8
Elk Grove city	153,015	177.4	151	0.037	1.9
Magalia CDP	11,310	65.6	89	0.032	3.0
Los Molinos CDP	2,037	33.5	45	0.031	2.3
Hamilton City CDP	1,759	32.0	104	0.030	0.9
Oroville city	15,546	77.4	116	0.030	2.4
Reno city	225,221	225.6	99	0.029	2.3
Arden-Arcade CDP	92,186	159.5	147	0.029	1.4
Citrus Heights city	83,301	155.6	143	0.028	1.3
Vacaville city	92,428	165.5	168	0.026	1.7
Fairfield city	105,321	175.4	170	0.026	1.8
Durham CDP	5,518	54.0	112	0.026	8.6
Woodland city	55,468	137.9	157	0.025	1.5
Davis city	65,622	150.1	158	0.024	1.1
Vallejo city	115,942	189.8	177	0.023	1.5
Anderson city	9,932	71.1	5	0.023	1.8



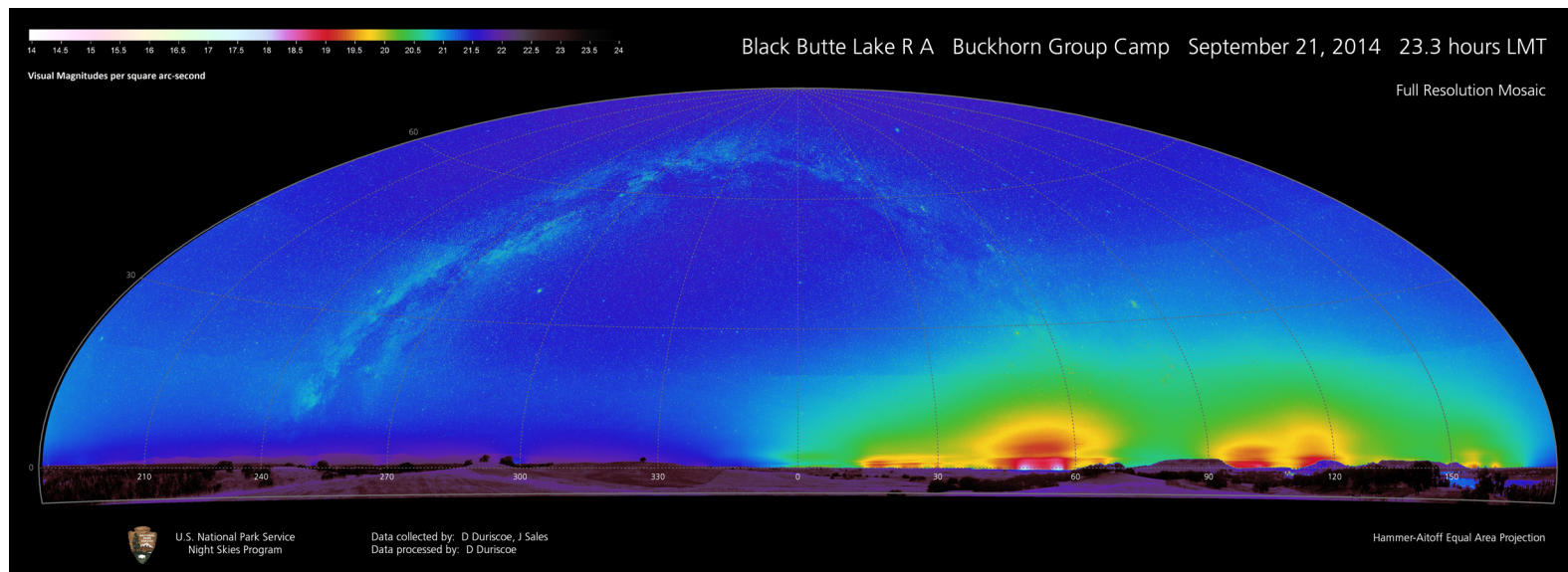
PHOTOMETRY OF ALL SOURCES

Average Sky Luminance (mag arcsec ⁻²)	Average Sky Luminance (μcd/m ²)	Zenith Luminance (mag arcsec ⁻²)	Zenith Luminance (μcd/m ²)	Brightest luminance (mag arcsec ⁻²)	Brightest luminance	Synthetic SQM (mag arcsec ⁻²)	Total luminous emittance (mags)	Illuminance (mlux)	
								Horizontal	Max Vert
20.83	503	21.37	307	17.34	12,568	21.26	-7.74	1.275	1.168



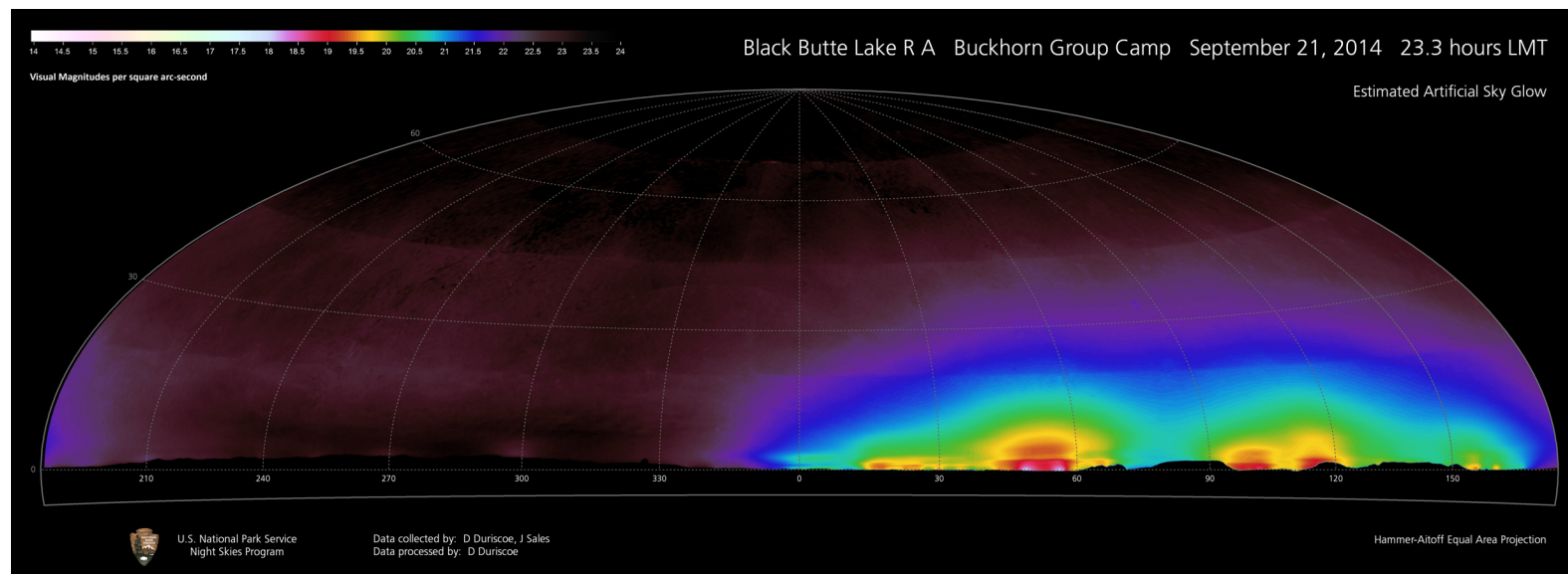
PHOTOMETRY OF ARTIFICIAL SKYGLOW

Sky Quality Index (SQI)	Average Sky Luminance (μcd/m ²)	Average Sky Luminance to zenith angle 80° (μcd/m ²)	Average Sky Luminance to zenith angle 70°	Zenith Luminance	Brightest luminance (μcd/m ²)	All-sky light pollution ratio (ALR)	Total luminous emittance (mags)	Illuminance (mlux)	
								Horizontal	Max Vert
68.3	220	144.7	103.9	31	12,411	0.89	-6.81	0.379	0.718



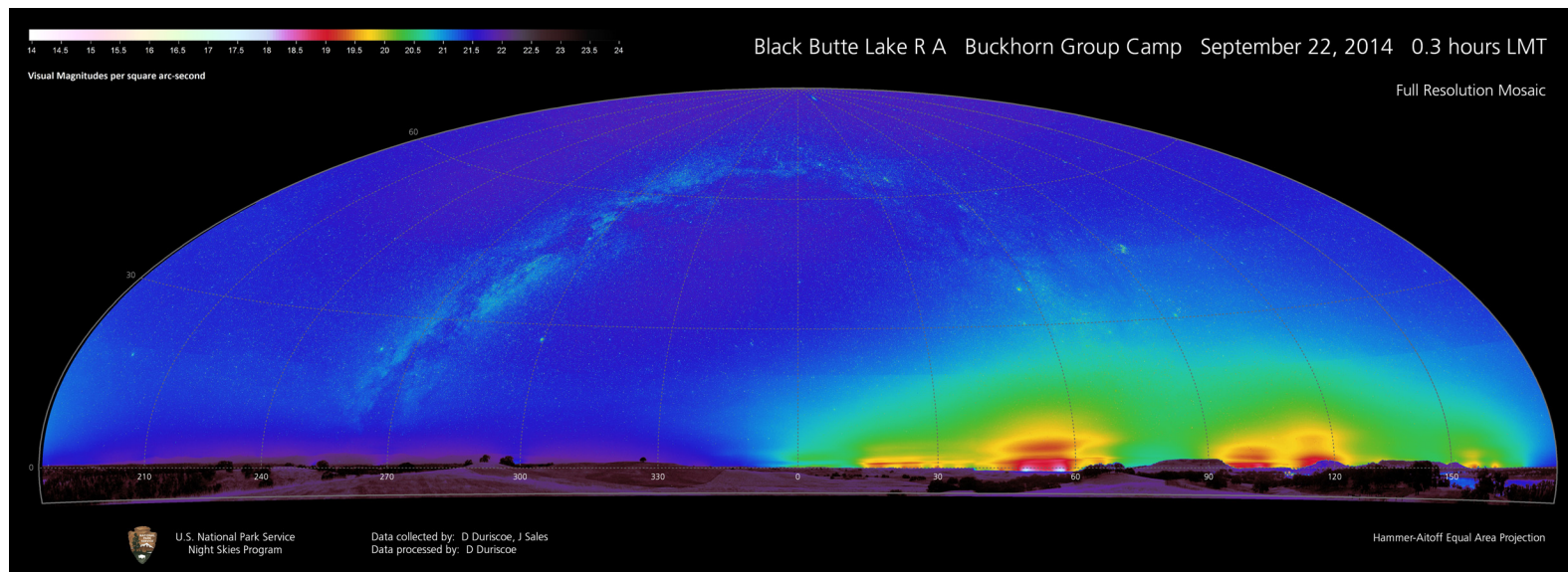
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21.07	406	21.72	223	17.62	9,755	21.48	-7.51	1.014	0.982



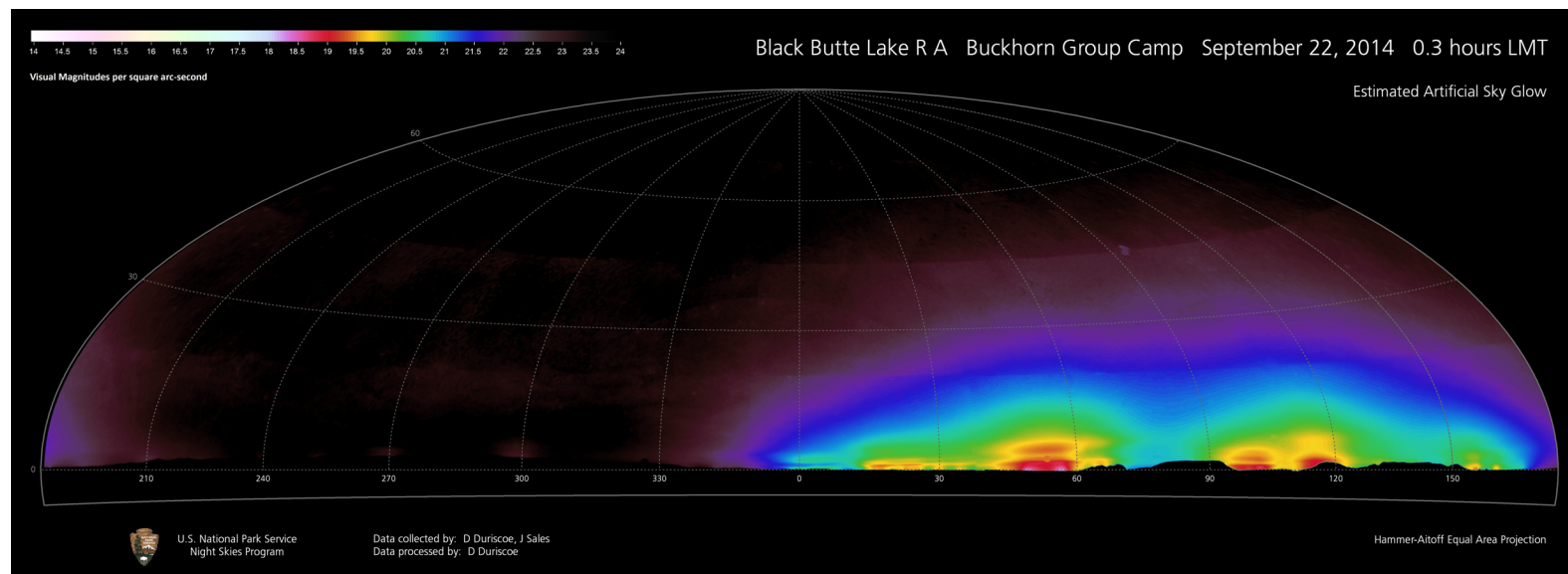
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74.9	172	108.3	75.7	27	9,453	0.69	-6.54	0.281	0.591



PHOTOMETRY OF ALL SOURCES

Average Sky Luminance (mag arcsec ⁻²)	Average Sky Luminance (μ cd/m ²)	Zenith Luminance (mag arcsec ⁻²)	Zenith Luminance (μ cd/m ²)	Brightest luminance (mag arcsec ⁻²)	Brightest luminance (mag arcsec ⁻²)	Synthetic SQM (mag arcsec ⁻²)	Total luminous emittance (mags)	Illuminance (mlux) Horizontal	Illuminance (mlux) Max Vert
21.14	378	21.80	207	17.73	8,739	21.55	-7.43	0.944	0.932



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81.1	142	81.5	52.5	13	6,548	0.57	-6.34	0.207	0.529