

Grand Canyon South Rim Trip Report
NPS Night Sky Team
Dan Duriscoe
October 1, 2007

Accompanied by Cindy Duriscoe, I visited South Rim from September 12-14, 2007. Sky brightness data was collected at Powell Memorial and Lipan Point on September 13 and 14 (Universal Time). Five data sets from 9 PM to 1 AM local time were collected at Powell Memorial. At Lipan Point only two sets (at 9 and 10 PM) were collected before the winds reached a speed that forced discontinuing data collection. All data was processed and of excellent quality. Screen shots of the reports appear below. They verify the visual impression of a very dark sky with almost no natural airglow either night. There was some haze that I think was subduing the distant city light domes somewhat. Also included are compressed versions of photomosaics at each site presented in false color to emphasize the contrast with city light domes labeled.

Grand Canyon is in the unique situation in that these magnificent views of the night sky are available to millions of visitors a year with very little effort. Powell Memorial is only 3 kilometers from the Grand Canyon Village, and Lipan Point is near Desert View, perched on a high plateau with commanding views in all directions. Desert View area already has lots of developments including large parking lots and a campground, which make it ideal for a potential in-park observatory and night sky viewing area.

Grand Canyon Village, though containing lots of developments, has only a small effect on the night sky quality at South Rim. There is certainly room for improvement, but for an area that supports a high concentration of population, it is not bad. With some investment and effort retrofitting lights, the area could be displayed as a model for sensitive and efficient outdoor lighting in destination resorts.

Thank you for your assistance and I look forward to working with you again soon.

Dan Duriscoe
Physical Scientist
NPS Night Sky Team

National Park Service Night Sky Team

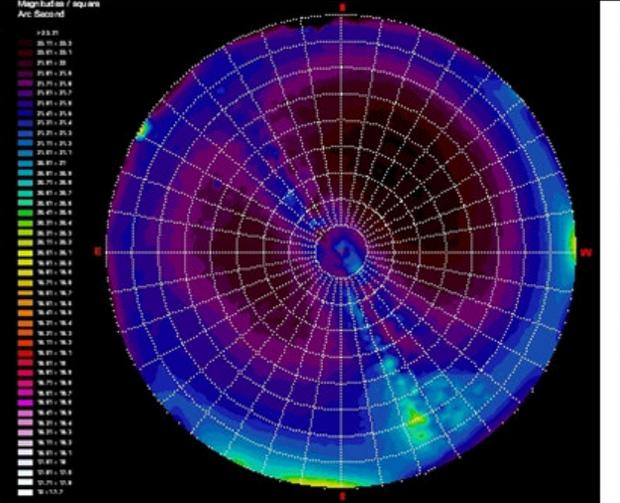
Night Sky Quality Monitoring Report



Report date:	10/11/2007	by:	D Duriscoe
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PARK:	GRCA	EQUIPMENT:	SBIG, 50mm f/2, 6084		
SITE NAME:	Powell Memorial	OBSERVERS:	D Duriscoe, C Duriscoe		
LONGITUDE:	-112.15123	AIR TEMP (°F):	74		
LATITUDE:	36.07324	REL HUMID (%):	12		
ELEVATION (m):	2153	WIND SP (mph):	8		
DATE (UT):	September 13, 2007	CCD TEMP (°C):	-20		
TIME START (UT):	3:50:05	EXP (seconds):	12		
DATA QUALITY:	excellent	BORTLE CLASS:	2	ZLM:	7.3

NARRATIVE: Very beautiful sky in an incomparable setting. Seeing fair, transparency good, not the most perfect of nights, zlm 7.3 by 11 pm. Phoenix brightest city dome, in the direction of Valle, G.C.Village not bad, Tusayan somewhat worse but of little consequence. Flagstaff barely visible, as is St. George, Las Vegas quite significant, North Rim lights seen but no towns to the north, maybe Tuba City to northeast. bortle class 2-3. sqm 21.75 between 3rd and 4th set, 21.82 at local midnight, among the darkest ever recorded with this instrument. Gegenschein easy at local midnight between Pisces and Aquarius, Zodiacal band seen from Pisces to Taurus.



SKY BRIGHTNESS DATA

LIGHT DOME DATA

Data Set Number	Time (UT)	Extinction coefficient (mag/air-mass)	Std Err Y Extinction Stars (mags)	Zenith (mag/sq arc-sec)	Whole Sky (mags)	Sky Above 20° Altitude (mags)	Brightest (mag/sq arc-sec)	Darkest (mag/sq arc-sec)	Link to Sky Maps	Light Dome Data			1st Data Set Brightness (mags)
										City	Distance (km)	Azimuth	
1st Start	3:50:05			21.66					PAN	Grand Canyon, AZ	3	184.1	-2.15
End	4:08:34	0.147	0.033	21.48	-6.93	-6.32	20.17	22.27	HEMI	Tusayan, AZ	11	168.4	
2nd Start	4:50:11			21.66					PAN	Valle, AZ	47	178.5	-1.17
End	5:08:40	0.147	0.036	21.54	-6.91	-6.30	20.22	22.25	HEMI	Phoenix	281	178.5	
3rd Start	5:50:19			21.88					PAN	Las Vegas, NV	277	273.9	-1.17
End	6:08:48	0.148	0.033	21.94	-6.88	-6.28	20.33	22.20	HEMI	Flagstaff	109	153.7	
4th Start	6:50:26			22.03					PAN	Total			-3.83
End	7:08:55	0.153	0.034	22.09	-6.84	-6.26	20.42	22.18	HEMI				
5th Start	7:50:33			22.19					PAN				
End	8:09:02	0.151	0.035	22.20	-6.76	-6.19	20.43	22.26	HEMI				
6th Start													
End													

