

FORGESOLAR GLARE ANALYSIS

Project: **Postcombe & Lewknor Solar**
Site configuration: **Lewknor**

Created 09 Jan, 2024
Updated 05 Feb, 2024
Time-step 1 minute
Timezone offset UTC0
Minimum sun altitude 0.0° deg
DNI peaks at 1,000.0 W/m
Category 10 MW to 100 MW
Site ID 109411.18932

Ocular transmission coefficient 0.5
Pupil diameter 0.002 m
Eye focal length 0.017 m
Sun subtended angle 9.3 mrad
PV analysis methodology V2

Summary of Results Glare with potential for temporary after-image predicted

PV Array	Tilt °	Orient °	Annual Green Glare		Annual Yellow Glare		Energy kWh
			min	hr	min	hr	
Eastern parcel	SA tracking	SA tracking	47	0.8	0	0.0	-
Western parcel	SA tracking	SA tracking	822	13.7	42	0.7	-

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route 1	771	12.8	42	0.7
Route 2	0	0.0	0	0.0
Route 3	51	0.8	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	47	0.8	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

Component Data

PV Arrays

Name: Eastern parcel

Axis tracking: Single-axis rotation

Backtracking: Shade-slope

Tracking axis orientation: 180.0°

Max tracking angle: 60.0°

Resting angle: 0.0°

Ground Coverage Ratio: 0.5

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	51.686249	-0.975530	121.11	2.55	123.66
2	51.688410	-0.974028	110.41	2.55	112.96
3	51.689584	-0.972872	105.62	2.55	108.17
4	51.689059	-0.971383	107.78	2.55	110.33
5	51.688450	-0.970141	108.44	2.55	110.99
6	51.687033	-0.968006	111.86	2.55	114.41
7	51.684845	-0.972372	121.44	2.55	123.99
8	51.684612	-0.972158	120.65	2.55	123.20
9	51.686754	-0.967823	112.65	2.55	115.20
10	51.685151	-0.965903	114.02	2.55	116.57
11	51.683974	-0.964154	113.22	2.55	115.77
12	51.683229	-0.964229	114.49	2.55	117.04
13	51.682913	-0.963741	113.24	2.55	115.79
14	51.682334	-0.965130	115.33	2.55	117.88
15	51.682224	-0.965817	115.36	2.55	117.91
16	51.681686	-0.967020	115.84	2.55	118.39
17	51.681203	-0.968312	116.33	2.55	118.88
18	51.682214	-0.969368	117.09	2.55	119.64
19	51.681858	-0.970259	116.76	2.55	119.31
20	51.682983	-0.971647	119.18	2.55	121.73

Name: Western parcel

Axis tracking: Single-axis rotation

Backtracking: Shade-slope

Tracking axis orientation: 180.0°

Max tracking angle: 60.0°

Resting angle: 0.0°

Ground Coverage Ratio: 0.5

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	51.683867	-0.982461	122.35	2.55	124.90
2	51.687463	-0.977820	121.38	2.55	123.93
3	51.686565	-0.976914	121.37	2.55	123.92
4	51.685136	-0.975424	120.82	2.55	123.37
5	51.682489	-0.972196	118.18	2.55	120.73
6	51.680686	-0.969621	116.11	2.55	118.66
7	51.679948	-0.971219	111.73	2.55	114.28
8	51.678706	-0.972179	111.15	2.55	113.70
9	51.680423	-0.974829	110.28	2.55	112.83
10	51.680636	-0.975495	110.32	2.55	112.87
11	51.681395	-0.976568	110.40	2.55	112.95
12	51.680975	-0.980151	106.27	2.55	108.82
13	51.682639	-0.981393	112.51	2.55	115.06

Route Receptors

Name: Route 1
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	51.704565	-1.001150	89.20	1.50	90.70
2	51.702278	-0.996000	89.62	1.50	91.12
3	51.698181	-0.989134	105.05	1.50	106.55
4	51.695761	-0.985701	110.53	1.50	112.03
5	51.691265	-0.980808	112.83	1.50	114.33
6	51.687700	-0.977590	119.70	1.50	121.20
7	51.685439	-0.975272	120.02	1.50	121.52
8	51.682698	-0.972011	117.86	1.50	119.36
9	51.679851	-0.967590	117.04	1.50	118.54
10	51.678041	-0.965273	120.02	1.50	121.52
11	51.676099	-0.963256	121.61	1.50	123.11
12	51.673757	-0.961410	132.60	1.50	134.10
13	51.669712	-0.958793	154.01	1.50	155.51
14	51.666198	-0.954458	172.72	1.50	174.22

Name: Route 2
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	51.672349	-0.960907	138.16	1.50	139.66
2	51.670193	-0.966958	134.97	1.50	136.47
3	51.669767	-0.971207	126.09	1.50	127.59
4	51.669195	-0.973117	124.35	1.50	125.85
5	51.666999	-0.976743	125.03	1.50	126.53
6	51.666336	-0.978715	123.71	1.50	125.21
7	51.664353	-0.981944	120.69	1.50	122.19
8	51.663440	-0.983432	119.16	1.50	120.66

Name: Route 3
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	51.693869	-0.980184	108.80	1.50	110.30
2	51.691109	-0.976805	106.59	1.50	108.09
3	51.690557	-0.975829	104.65	1.50	106.15
4	51.689526	-0.972331	106.53	1.50	108.03
5	51.689114	-0.971183	107.71	1.50	109.21
6	51.687498	-0.968318	109.41	1.50	110.91
7	51.685576	-0.965883	112.95	1.50	114.45
8	51.683567	-0.962932	113.40	1.50	114.90
9	51.681656	-0.960632	113.56	1.50	115.06
10	51.680405	-0.959323	116.82	1.50	118.32
11	51.678097	-0.956158	122.78	1.50	124.28
12	51.676854	-0.953468	125.30	1.50	126.80

Discrete Observation Point Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (m)	Height (m)
OP 1	1	51.673662	-0.965229	121.77	4.50
OP 2	2	51.673399	-0.967439	117.09	4.50
OP 3	3	51.673383	-0.967709	116.84	4.50
OP 4	4	51.674387	-0.972278	115.68	4.50
OP 5	5	51.674447	-0.971296	115.36	4.50
OP 6	6	51.674234	-0.969896	116.07	4.50
OP 7	7	51.679999	-0.974640	110.86	4.50
OP 8	8	51.680245	-0.974900	110.29	4.50
OP 9	9	51.678535	-0.985176	102.51	4.50
OP 10	10	51.677564	-0.985471	103.56	4.50
OP 11	11	51.678619	-0.986002	102.79	4.50
OP 12	12	51.679499	-0.987324	107.92	4.50
OP 13	13	51.679657	-0.987689	109.19	4.50
OP 14	14	51.679444	-0.988649	109.08	4.50
OP 15	15	51.688764	-0.975472	108.95	4.50
OP 16	16	51.688986	-0.977188	109.92	4.50
OP 17	17	51.688930	-0.975080	108.41	4.50
OP 18	18	51.689021	-0.975882	109.56	4.50
OP 19	19	51.689304	-0.973441	108.29	4.50
OP 20	20	51.689178	-0.974643	108.02	4.50
OP 21	21	51.689251	-0.974560	108.10	4.50
OP 22	22	51.689375	-0.974412	108.51	4.50
OP 23	23	51.683214	-0.961605	114.10	4.50
OP 24	24	51.683321	-0.961985	113.45	4.50
OP 25	25	51.683690	-0.962667	114.55	4.50
OP 26	26	51.683614	-0.962168	113.19	4.50
OP 27	27	51.668822	-0.961271	148.31	4.50
OP 28	28	51.666453	-0.977300	124.95	4.50
OP 29	29	51.668444	-0.995482	107.71	4.50
OP 30	30	51.667639	-0.994838	108.17	4.50
OP 31	31	51.688522	-1.002032	102.53	4.50
OP 32	32	51.690512	-0.976455	109.43	4.50
OP 33	33	51.689870	-0.975348	107.29	4.50
OP 34	34	51.689948	-0.975616	107.22	4.50
OP 35	35	51.689992	-0.972633	107.89	4.50
OP 36	36	51.689619	-0.973215	106.97	4.50
OP 37	37	51.689240	-0.973988	109.11	4.50
OP 38	38	51.689644	-0.974170	107.33	4.50
OP 39	39	51.689330	-0.974100	108.54	4.50
OP 40	40	51.689236	-0.975171	107.50	4.50

Obstruction Components

Name: Obstruction 1

Top height: 10.0 m



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)
1	51.678757	-0.971917	111.40
2	51.678884	-0.971595	111.66
3	51.678817	-0.970769	111.55
4	51.679788	-0.967979	116.79
5	51.680746	-0.969374	117.57
6	51.679921	-0.971091	112.47
7	51.678757	-0.971917	111.40

Name: Obstruction 10

Top height: 10.0 m



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)
1	51.689898	-0.973288	106.66
2	51.689819	-0.973023	106.38
3	51.689922	-0.972561	107.44
4	51.690099	-0.972414	107.56
5	51.690089	-0.972377	107.57
6	51.689893	-0.972543	107.24
7	51.689788	-0.973018	106.22
8	51.689873	-0.973326	106.03
9	51.689898	-0.973288	106.66

Name: Obstruction 2

Top height: 10.0 m



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)
1	51.679637	-0.974069	109.59
2	51.679754	-0.973908	110.41
3	51.678563	-0.972084	111.53
4	51.678337	-0.972320	109.38
5	51.679637	-0.974069	109.59

Name: Obstruction 3

Top height: 10.0 m



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)
1	51.682119	-0.969369	117.56
2	51.681793	-0.970153	116.58
3	51.680542	-0.968350	116.88
4	51.683030	-0.962106	113.62
5	51.683509	-0.962653	114.21
6	51.682205	-0.964820	115.78
7	51.681107	-0.968329	116.88
8	51.682119	-0.969369	117.56

Name: Obstruction 4

Top height: 12.0 m



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)
1	51.687869	-0.978066	118.08
2	51.683945	-0.982872	124.88
3	51.680526	-0.980276	106.70
4	51.680619	-0.979911	106.46
5	51.683905	-0.982551	123.32
6	51.687550	-0.977808	121.12
7	51.687869	-0.978066	118.08

Name: Obstruction 5

Top height: 10.0 m



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)
1	51.688352	-0.977798	117.86
2	51.688838	-0.976742	110.50
3	51.688814	-0.975797	108.89
4	51.687727	-0.977230	119.28
5	51.688352	-0.977798	117.86

Name: Obstruction 6

Top height: 10.0 m



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)
1	51.674754	-0.970330	113.46
2	51.674142	-0.969294	115.28
3	51.674148	-0.969058	115.04
4	51.673533	-0.969010	115.22
5	51.673503	-0.969273	115.01
6	51.674012	-0.969439	115.98
7	51.674657	-0.970523	114.01
8	51.675316	-0.971252	113.26
9	51.675386	-0.971075	113.09
10	51.674754	-0.970330	113.46

Name: Obstruction 7

Top height: 12.0 m



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)
1	51.679871	-0.984509	104.96
2	51.678993	-0.985667	101.91
3	51.678777	-0.984412	104.14
4	51.679695	-0.984182	103.75
5	51.680610	-0.981521	105.96
6	51.680793	-0.981655	106.28
7	51.679871	-0.984509	104.96

Name: Obstruction 8

Top height: 10.0 m



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)
1	51.689933	-0.984798	118.78
2	51.686461	-0.989712	120.56
3	51.684998	-0.986601	139.02
4	51.686036	-0.984712	146.61
5	51.687419	-0.986472	132.66
6	51.689787	-0.984155	121.06
7	51.689933	-0.984798	118.78

Name: Obstruction 9

Top height: 10.0 m



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)
1	51.689060	-0.973869	108.09
2	51.689019	-0.973892	107.97
3	51.689198	-0.974399	108.13
4	51.689232	-0.974364	108.09
5	51.689060	-0.973869	108.09

Glare Analysis Results

Summary of Results Glare with potential for temporary after-image predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
Eastern parcel	SA tracking	SA tracking	47	0.8	0	0.0	-
Western parcel	SA tracking	SA tracking	822	13.7	42	0.7	-

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route 1	771	12.8	42	0.7
Route 2	0	0.0	0	0.0
Route 3	51	0.8	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	47	0.8	0	0.0
OP 26	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV: Eastern parcel low potential for temporary after-image

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route 1	0	0.0	0	0.0
Route 2	0	0.0	0	0.0
Route 3	0	0.0	0	0.0
OP 25	47	0.8	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 35	0	0.0	0	0.0
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

Eastern parcel and Route: Route 1

No glare found

Eastern parcel and Route: Route 2

No glare found

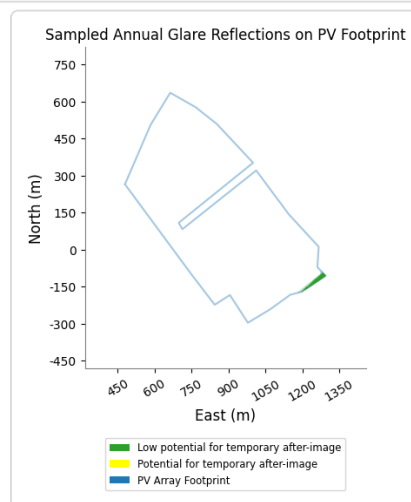
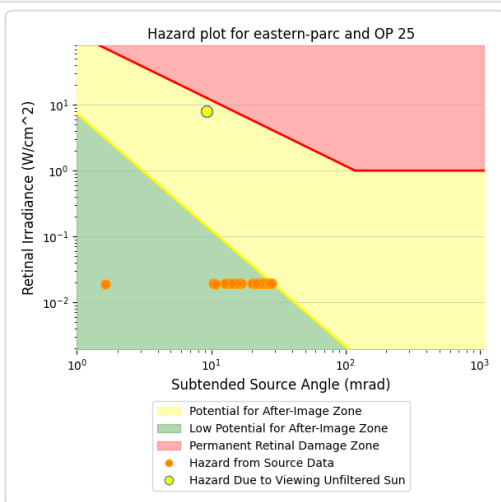
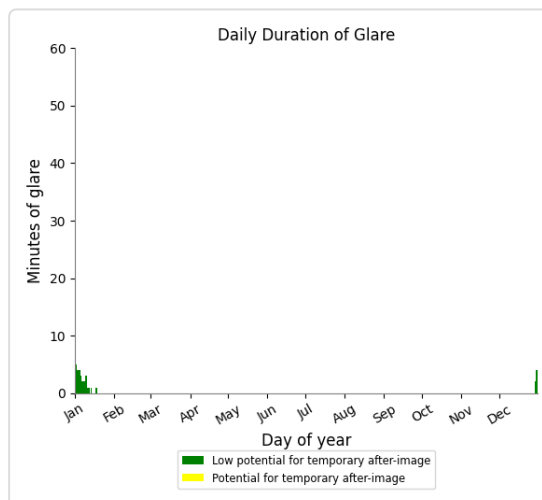
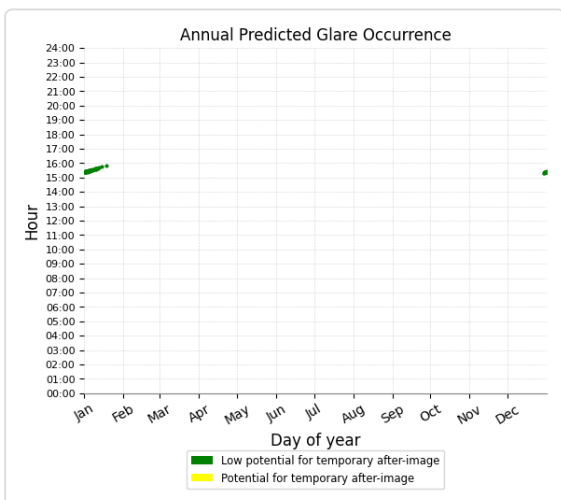
Eastern parcel and Route: Route 3

No glare found

Eastern parcel and OP 25

Yellow glare: none

Green glare: 47 min.



Eastern parcel and OP 1

No glare found

Eastern parcel and OP 2

No glare found

Eastern parcel and OP 3

No glare found

Eastern parcel and OP 4

No glare found

Eastern parcel and OP 5

No glare found

Eastern parcel and OP 6

No glare found

Eastern parcel and OP 7

No glare found

Eastern parcel and OP 8

No glare found

Eastern parcel and OP 9

No glare found

Eastern parcel and OP 10

No glare found

Eastern parcel and OP 11

No glare found

Eastern parcel and OP 12

No glare found

Eastern parcel and OP 13

No glare found

Eastern parcel and OP 14

No glare found

Eastern parcel and OP 15

No glare found

Eastern parcel and OP 16

No glare found

Eastern parcel and OP 17

No glare found

Eastern parcel and OP 18

No glare found

Eastern parcel and OP 19

No glare found

Eastern parcel and OP 20

No glare found

Eastern parcel and OP 21

No glare found

Eastern parcel and OP 22

No glare found

Eastern parcel and OP 23

No glare found

Eastern parcel and OP 24

No glare found

Eastern parcel and OP 26

No glare found

Eastern parcel and OP 27

No glare found

Eastern parcel and OP 28

No glare found

Eastern parcel and OP 29

No glare found

Eastern parcel and OP 30

No glare found

Eastern parcel and OP 31

No glare found

Eastern parcel and OP 32

No glare found

Eastern parcel and OP 33

No glare found

Eastern parcel and OP 34

No glare found

Eastern parcel and OP 35

No glare found

Eastern parcel and OP 36

No glare found

Eastern parcel and OP 37

No glare found

Eastern parcel and OP 38

No glare found

Eastern parcel and OP 39

No glare found

Eastern parcel and OP 40

No glare found

PV: Western parcel potential temporary after-image

Receptor results ordered by category of glare

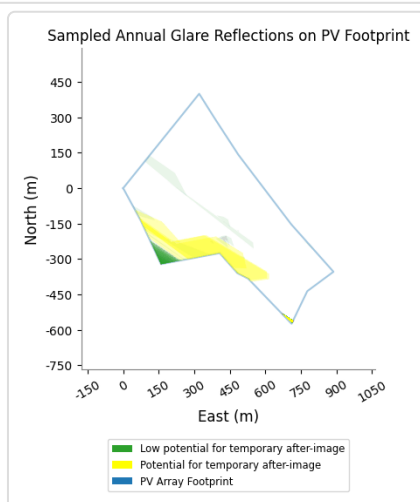
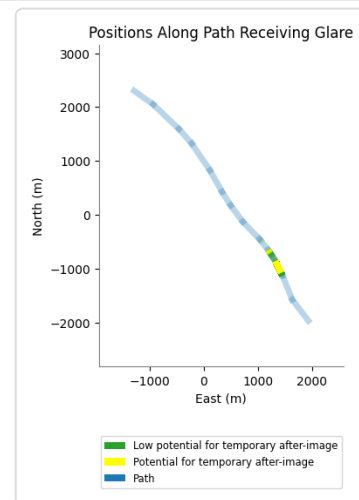
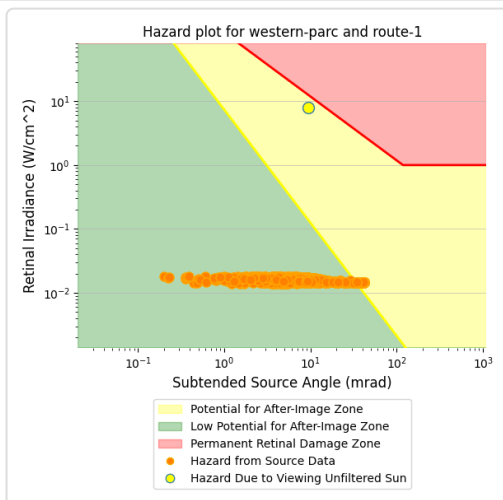
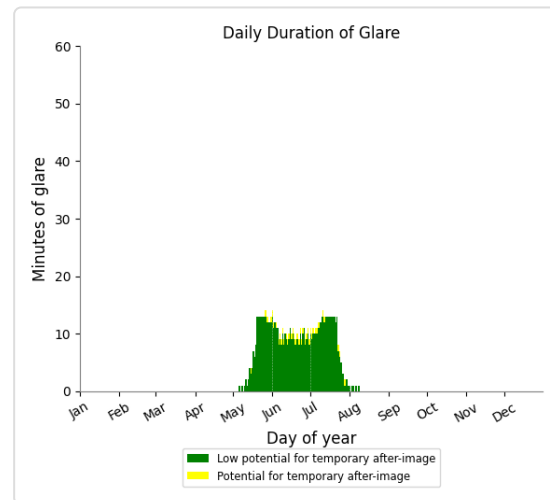
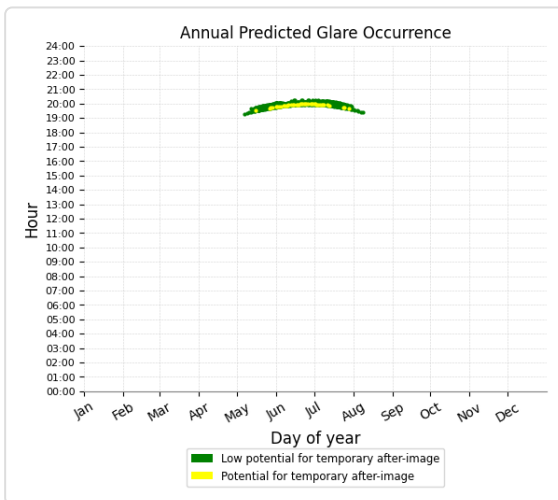
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route 1	771	12.8	42	0.7
Route 3	51	0.8	0	0.0
Route 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0
OP 36	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

Western parcel and Route: Route 1

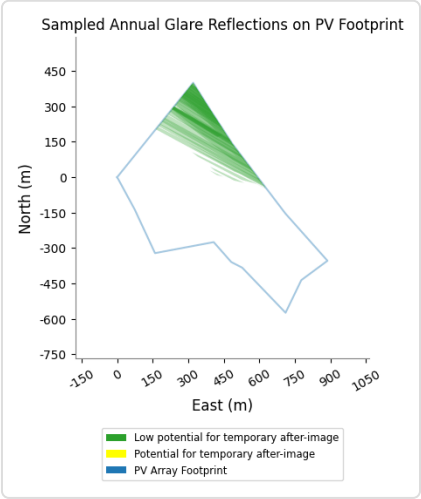
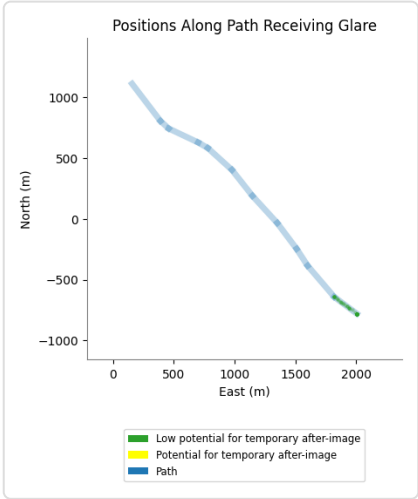
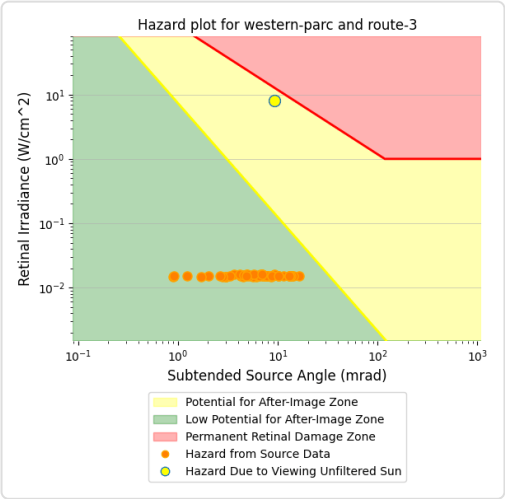
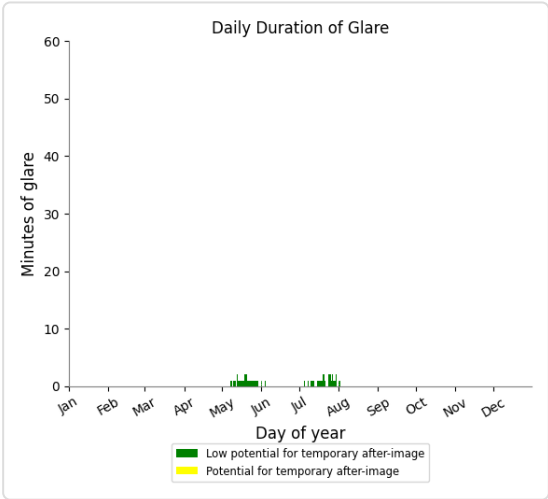
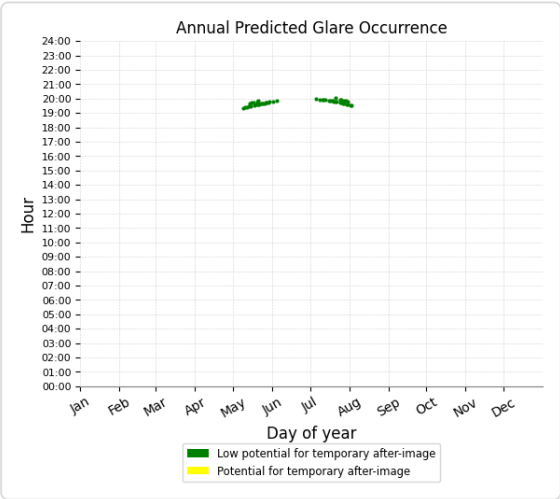
Yellow glare: 42 min.

Green glare: 771 min.



Western parcel and Route: Route 3

Yellow glare: none
Green glare: 51 min.



Western parcel and Route: Route 2

No glare found

Western parcel and OP 1

No glare found

Western parcel and OP 2

No glare found

Western parcel and OP 3

No glare found

Western parcel and OP 4

No glare found

Western parcel and OP 5

No glare found

Western parcel and OP 6

No glare found

Western parcel and OP 7

No glare found

Western parcel and OP 8

No glare found

Western parcel and OP 9

No glare found

Western parcel and OP 10

No glare found

Western parcel and OP 11

No glare found

Western parcel and OP 12

No glare found

Western parcel and OP 13

No glare found

Western parcel and OP 14

No glare found

Western parcel and OP 15

No glare found

Western parcel and OP 16

No glare found

Western parcel and OP 17

No glare found

Western parcel and OP 18

No glare found

Western parcel and OP 19

No glare found

Western parcel and OP 20

No glare found

Western parcel and OP 21

No glare found

Western parcel and OP 22

No glare found

Western parcel and OP 23

No glare found

Western parcel and OP 24

No glare found

Western parcel and OP 25

No glare found

Western parcel and OP 26

No glare found

Western parcel and OP 27

No glare found

Western parcel and OP 28

No glare found

Western parcel and OP 29

No glare found

Western parcel and OP 30

No glare found

Western parcel and OP 31

No glare found

Western parcel and OP 32

No glare found

Western parcel and OP 33

No glare found

Western parcel and OP 34

No glare found

Western parcel and OP 35

No glare found

Western parcel and OP 36

No glare found

Western parcel and OP 37

No glare found

Western parcel and OP 38

No glare found

Western parcel and OP 39

No glare found

Western parcel and OP 40

No glare found

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.

"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.

Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.

The algorithm does not rigorously represent the detailed geometry of a system; detailed features such as gaps between modules, variable height of the PV array, and support structures may impact actual glare results. However, we have validated our models against several systems, including a PV array causing glare to the air-traffic control tower at Manchester-Boston Regional Airport and several sites in Albuquerque, and the tool accurately predicted the occurrence and intensity of glare at different times and days of the year.

Several V1 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare. This primarily affects V1 analyses of path receptors.

Random number computations are utilized by various steps of the annual hazard analysis algorithm. Predicted minutes of glare can vary between runs as a result. This limitation primarily affects analyses of Observation Point receptors, including ATCTs. Note that the SGHAT/ ForgeSolar methodology has always relied on an analytical, qualitative approach to accurately determine the overall hazard (i.e. green vs. yellow) of expected glare on an annual basis.

The analysis does not automatically consider obstacles (either man-made or natural) between the observation points and the prescribed solar installation that may obstruct observed glare, such as trees, hills, buildings, etc.

The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)

The variable direct normal irradiance (DNI) feature (if selected) scales the user-prescribed peak DNI using a typical clear-day irradiance profile. This profile has a lower DNI in the mornings and evenings and a maximum at solar noon. The scaling uses a clear-day irradiance profile based on a normalized time relative to sunrise, solar noon, and sunset, which are prescribed by a sun-position algorithm and the latitude and longitude obtained from Google maps. The actual DNI on any given day can be affected by cloud cover, atmospheric attenuation, and other environmental factors.

The ocular hazard predicted by the tool depends on a number of environmental, optical, and human factors, which can be uncertain. We provide input fields and typical ranges of values for these factors so that the user can vary these parameters to see if they have an impact on the results. The speed of SGHAT allows expedited sensitivity and parametric analyses.

The system output calculation is a DNI-based approximation that assumes clear, sunny skies year-round. It should not be used in place of more rigorous modeling methods.

Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.

Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.

Refer to the Help page at www.forgesolar.com/help/ for assumptions and limitations not listed here.

Default glare analysis parameters and observer eye characteristics (for reference only):

- Analysis time interval: 1 minute
- Ocular transmission coefficient: 0.5
- Pupil diameter: 0.002 meters
- Eye focal length: 0.017 meters
- Sun subtended angle: 9.3 milliradians

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