



# Cefn Park Solar Farm

## Cefn Park Solar Farm Residential Receptors 20deg

**Created** Oct. 1, 2021  
**Updated** Oct. 1, 2021  
**Time-step** 1 minute  
**Timezone offset** UTC0  
**Site ID** 59444.10566

**Project type** Advanced  
**Project status:** active  
**Category** 10 MW to 100 MW



### Misc. Analysis Settings

**DNI:** varies (1,000.0 W/m<sup>2</sup> peak)  
 Ocular transmission coefficient: 0.5  
 Pupil diameter: 0.002 m  
 Eye focal length: 0.017 m  
 Sun subtended angle: 9.3 mrad

#### Analysis Methodologies:

- Observation point: **Version 2**
- 2-Mile Flight Path: **Version 2**
- Route: **Version 2**

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

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
Eastern Array	20.0	180.0	1,304	10,087	-
Western Array	20.0	180.0	11	7,471	-

# Component Data

## PV Array(s)

Total PV footprint area: 81,383 m<sup>2</sup>

**Name:** Eastern Array  
**Axis tracking:** Fixed (no rotation)  
**Tilt:** 20.0 deg  
**Orientation:** 180.0 deg  
**Footprint area:** 38,044 m<sup>2</sup>  
**Rated power:** -  
**Panel material:** Light textured glass with AR coating  
**Vary reflectivity with sun position?** Yes  
**Correlate slope error with surface type?** Yes  
**Slope error:** 9.16 mrad



Vertex	Latitude deg	Longitude deg	Ground elevation m	Height above ground m	Total elevation m
1	53.033280	-2.941460	36.31	3.10	39.41
2	53.033220	-2.943170	36.74	3.10	39.84
3	53.033120	-2.943600	36.31	3.10	39.41
4	53.032950	-2.943700	35.74	3.10	38.84
5	53.032800	-2.943620	35.23	3.10	38.33
6	53.032710	-2.943870	35.28	3.10	38.38
7	53.032500	-2.943810	34.59	3.10	37.69
8	53.032350	-2.943940	34.41	3.10	37.51
9	53.032010	-2.943770	34.08	3.10	37.18
10	53.031900	-2.943460	34.00	3.10	37.10
11	53.031730	-2.943360	34.00	3.10	37.10
12	53.031590	-2.943060	34.00	3.10	37.10
13	53.031230	-2.942950	34.00	3.10	37.10
14	53.031110	-2.942620	34.00	3.10	37.10
15	53.030930	-2.942570	34.00	3.10	37.10
16	53.030860	-2.942670	34.14	3.10	37.24
17	53.030610	-2.942670	34.03	3.10	37.13
18	53.030650	-2.942110	34.12	3.10	37.22
19	53.030920	-2.941510	34.77	3.10	37.87
20	53.031090	-2.941540	34.81	3.10	37.91
21	53.031170	-2.941850	34.47	3.10	37.57
22	53.031380	-2.941930	34.23	3.10	37.33
23	53.031550	-2.941790	34.15	3.10	37.25
24	53.031580	-2.940870	33.99	3.10	37.09
25	53.032520	-2.941170	35.52	3.10	38.62
26	53.032660	-2.941390	35.83	3.10	38.93
27	53.032770	-2.941400	35.88	3.10	38.98
28	53.032950	-2.941330	35.94	3.10	39.04

**Name:** Western Array  
**Axis tracking:** Fixed (no rotation)  
**Tilt:** 20.0 deg  
**Orientation:** 180.0 deg  
**Footprint area:** 43,339 m<sup>2</sup>  
**Rated power:** -  
**Panel material:** Light textured glass with AR coating  
**Vary reflectivity with sun position?** Yes  
**Correlate slope error with surface type?** Yes  
**Slope error:** 9.16 mrad



Vertex	Latitude deg	Longitude deg	Ground elevation m	Height above ground m	Total elevation m
1	53.032150	-2.944740	34.67	3.10	37.77
2	53.032130	-2.945440	35.85	3.10	38.95
3	53.031990	-2.945990	37.02	3.10	40.12
4	53.031900	-2.946940	38.64	3.10	41.74
5	53.031630	-2.947230	38.32	3.10	41.42
6	53.031620	-2.947840	39.98	3.10	43.08
7	53.031500	-2.948580	41.57	3.10	44.67
8	53.031170	-2.948550	40.10	3.10	43.20
9	53.030420	-2.945650	34.91	3.10	38.01
10	53.030410	-2.944680	34.00	3.10	37.10
11	53.030640	-2.943650	34.00	3.10	37.10
12	53.030950	-2.943440	34.00	3.10	37.10
13	53.031540	-2.943890	34.00	3.10	37.10

## Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	m	m	m
OP 1	53.038985	-2.955200	65.16	2.00	67.16
OP 2	53.038269	-2.954503	60.61	2.00	62.61
OP 3	53.037811	-2.957813	70.65	2.00	72.65
OP 4	53.036211	-2.961364	61.86	2.00	63.86
OP 5	53.035789	-2.960339	60.72	2.00	62.72
OP 6	53.035134	-2.961015	60.70	2.00	62.70
OP 7	53.035095	-2.962067	60.64	2.00	62.64
OP 8	53.034801	-2.961825	59.08	2.00	61.08
OP 9	53.034830	-2.962533	59.56	2.00	61.56
OP 10	53.034201	-2.954388	54.52	2.00	56.52
OP 11	53.032718	-2.955112	54.07	2.00	56.07
OP 12	53.032401	-2.955643	55.46	2.00	57.46
OP 13	53.031762	-2.949389	44.98	2.00	46.98
OP 14	53.030026	-2.947136	36.05	2.00	38.05
OP 15	53.029910	-2.946868	35.87	2.00	37.87
OP 16	53.025312	-2.959957	60.05	2.00	62.05
OP 17	53.025228	-2.958992	59.02	2.00	61.02
OP 18	53.025393	-2.958289	58.24	2.00	60.24
OP 19	53.024751	-2.957897	58.51	2.00	60.51
OP 20	53.024386	-2.958230	59.38	2.00	61.38
OP 21	53.026714	-2.933584	37.94	2.00	39.94
OP 22	53.028986	-2.937983	33.74	2.00	35.74
OP 23	53.033047	-2.936915	38.78	2.00	40.78
OP 24	53.033818	-2.936288	39.00	2.00	41.00
OP 25	53.034154	-2.936609	39.00	2.00	41.00
OP 26	53.033515	-2.937945	38.20	2.00	40.20
OP 27	53.033921	-2.938825	38.00	2.00	40.00
OP 28	53.034683	-2.937977	38.35	2.00	40.35
OP 29	53.035405	-2.936298	38.17	2.00	40.17
OP 30	53.035899	-2.934437	37.00	2.00	39.00
OP 31	53.034644	-2.935842	38.89	2.00	40.89
OP 32	53.034260	-2.935917	39.00	2.00	41.00
OP 33	53.034931	-2.933267	35.88	2.00	37.88
OP 34	53.035270	-2.933026	35.74	2.00	37.74

# Summary of PV Glare Analysis

PV configuration and total predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
Eastern Array	20.0	180.0	1,304	10,087	-	-
Western Array	20.0	180.0	11	7,471	-	-

## Distinct glare per month

Excludes overlapping glare from PV array for multiple receptors at matching time(s)

PV	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
eastern-arra (green)	0	0	7	0	0	0	0	0	9	0	0	0
eastern-arra (yellow)	0	0	300	689	692	314	620	683	559	1	0	0
western-arra (green)	0	0	0	0	0	0	0	0	0	0	0	0
western-arra (yellow)	0	0	302	462	1131	1181	1190	702	446	12	0	0

# PV & Receptor Analysis Results

Results for each PV array and receptor

## Eastern Array potential temporary after-image

Component	Green glare (min)	Yellow glare (min)
OP: OP 1	0	0
OP: OP 2	0	0
OP: OP 3	0	0
OP: OP 4	0	0
OP: OP 5	0	0
OP: OP 6	0	0
OP: OP 7	0	0
OP: OP 8	0	0
OP: OP 9	0	0
OP: OP 10	0	0
OP: OP 11	403	549
OP: OP 12	501	700
OP: OP 13	16	4145
OP: OP 14	0	2439
OP: OP 15	0	2177
OP: OP 16	384	0
OP: OP 17	0	0
OP: OP 18	0	0
OP: OP 19	0	0
OP: OP 20	0	0
OP: OP 21	0	0
OP: OP 22	0	0
OP: OP 23	0	77
OP: OP 24	0	0
OP: OP 25	0	0
OP: OP 26	0	0

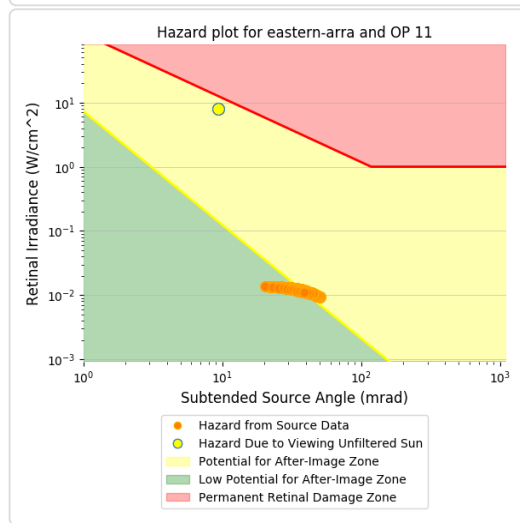
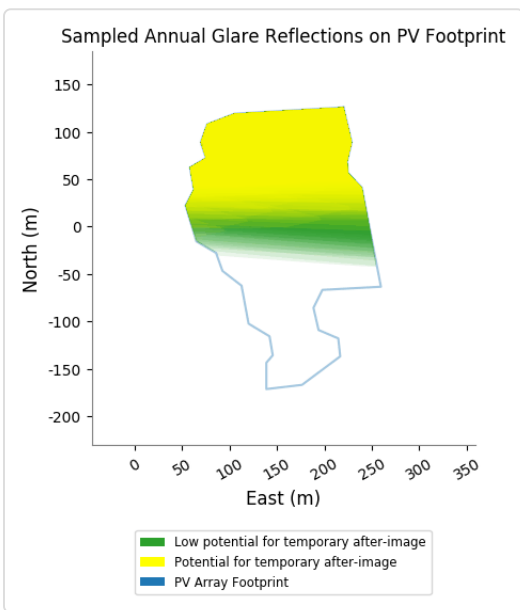
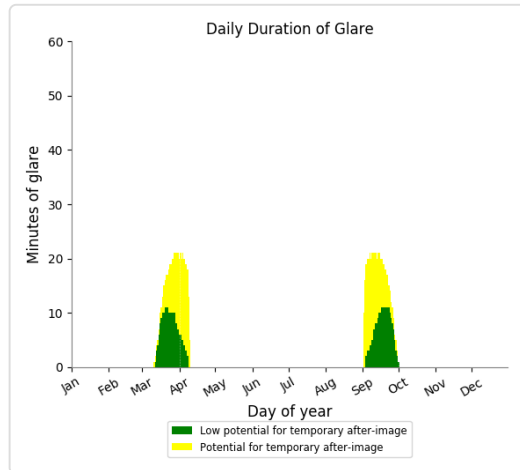
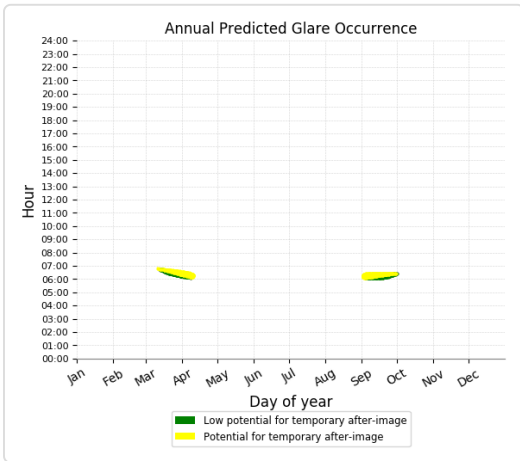
OP: OP 27	0	0
OP: OP 28	0	0
OP: OP 29	0	0
OP: OP 30	0	0
OP: OP 31	0	0
OP: OP 32	0	0
OP: OP 33	0	0
OP: OP 34	0	0

**Eastern Array - OP Receptor (OP 1)***No glare found***Eastern Array - OP Receptor (OP 2)***No glare found***Eastern Array - OP Receptor (OP 3)***No glare found***Eastern Array - OP Receptor (OP 4)***No glare found***Eastern Array - OP Receptor (OP 5)***No glare found***Eastern Array - OP Receptor (OP 6)***No glare found***Eastern Array - OP Receptor (OP 7)***No glare found***Eastern Array - OP Receptor (OP 8)***No glare found***Eastern Array - OP Receptor (OP 9)***No glare found***Eastern Array - OP Receptor (OP 10)***No glare found*

### Eastern Array - OP Receptor (OP 11)

PV array is expected to produce the following glare for receptors at this location:

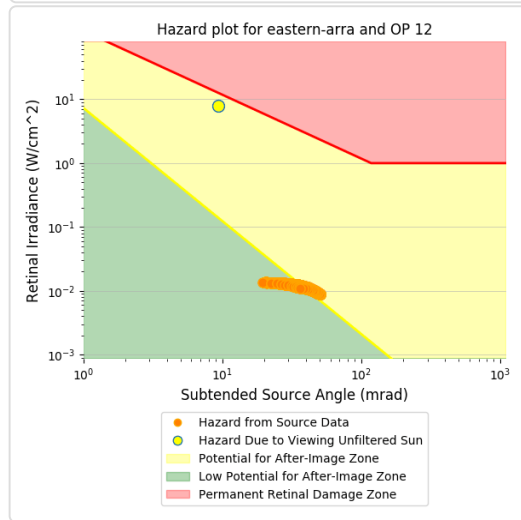
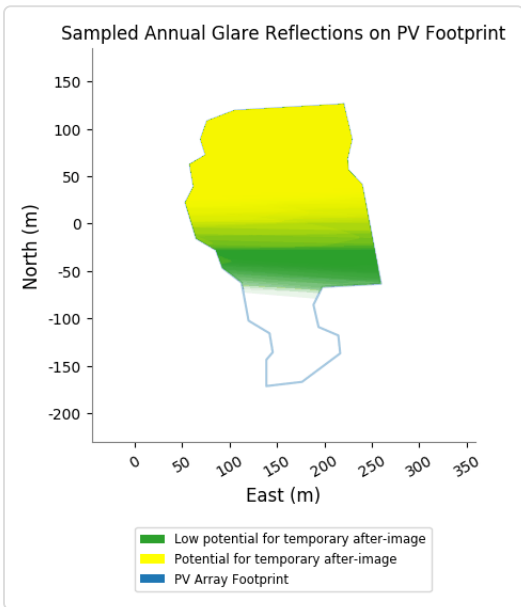
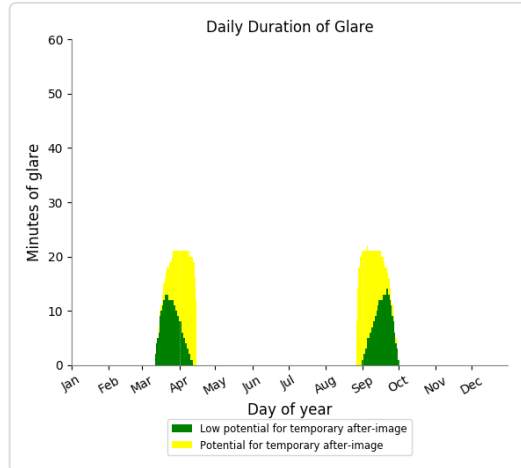
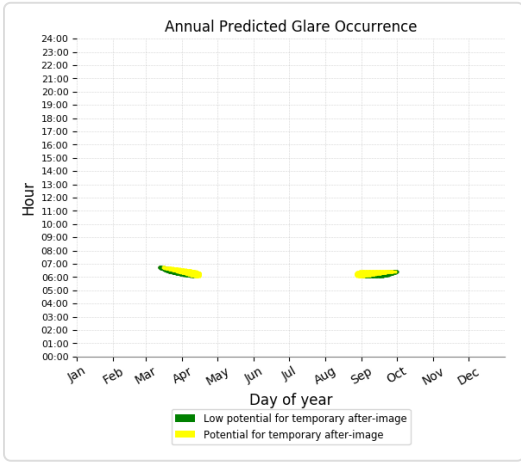
- 403 minutes of "green" glare with low potential to cause temporary after-image.
- 549 minutes of "yellow" glare with potential to cause temporary after-image.



### Eastern Array - OP Receptor (OP 12)

PV array is expected to produce the following glare for receptors at this location:

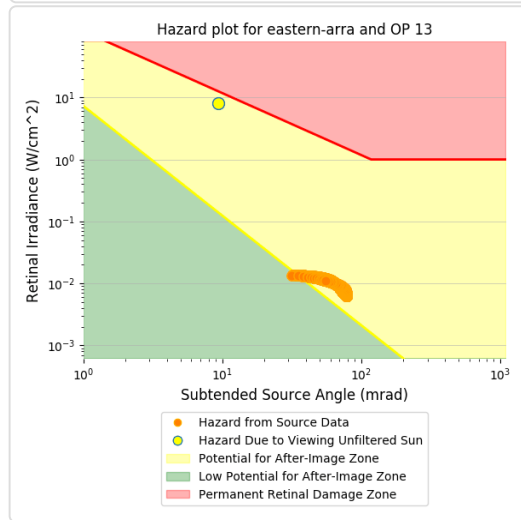
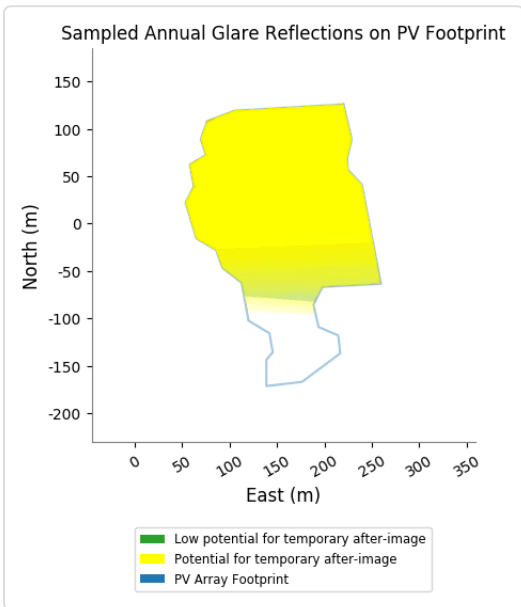
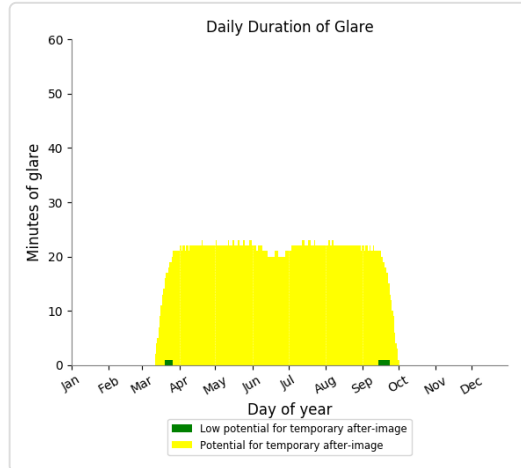
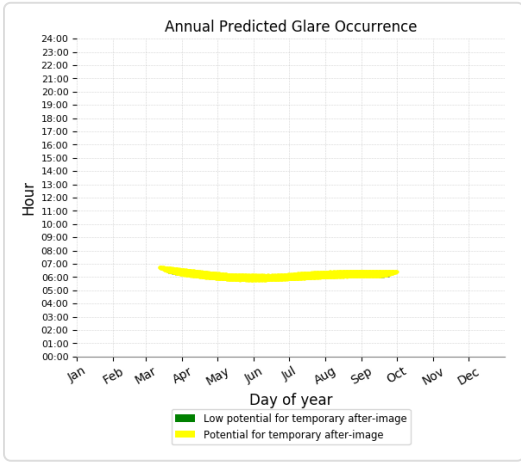
- 501 minutes of "green" glare with low potential to cause temporary after-image.
- 700 minutes of "yellow" glare with potential to cause temporary after-image.



### Eastern Array - OP Receptor (OP 13)

PV array is expected to produce the following glare for receptors at this location:

- 16 minutes of "green" glare with low potential to cause temporary after-image.
- 4,145 minutes of "yellow" glare with potential to cause temporary after-image.

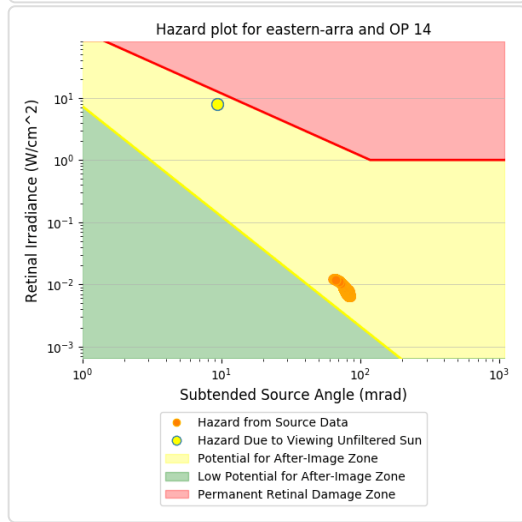
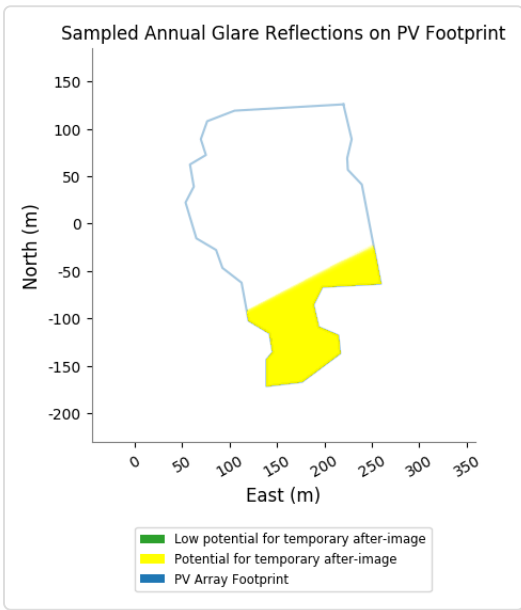
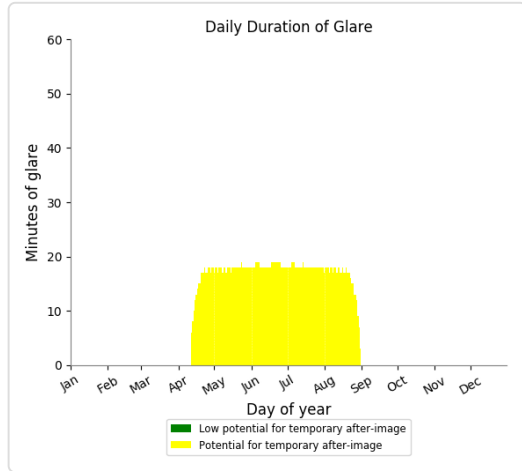
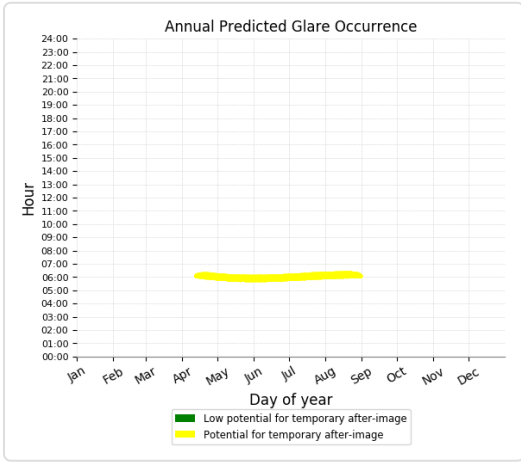




### Eastern Array - OP Receptor (OP 14)

PV array is expected to produce the following glare for receptors at this location:

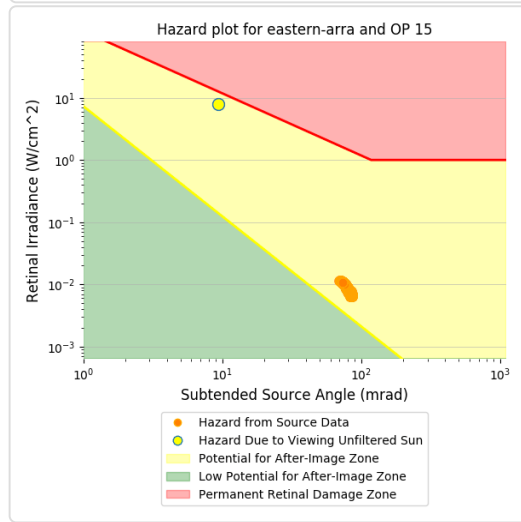
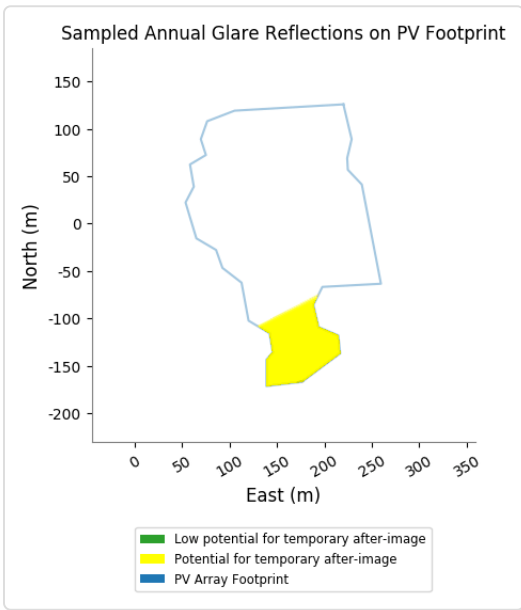
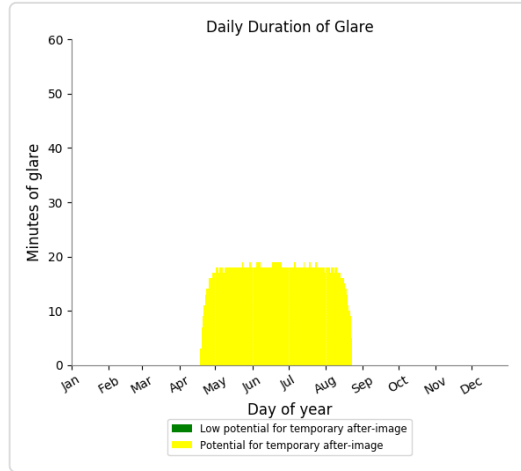
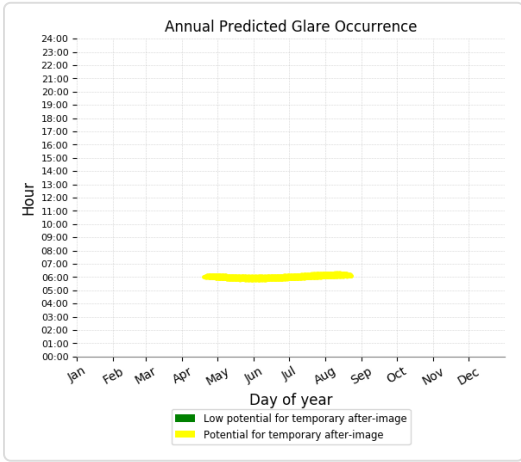
- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,439 minutes of "yellow" glare with potential to cause temporary after-image.



### Eastern Array - OP Receptor (OP 15)

PV array is expected to produce the following glare for receptors at this location:

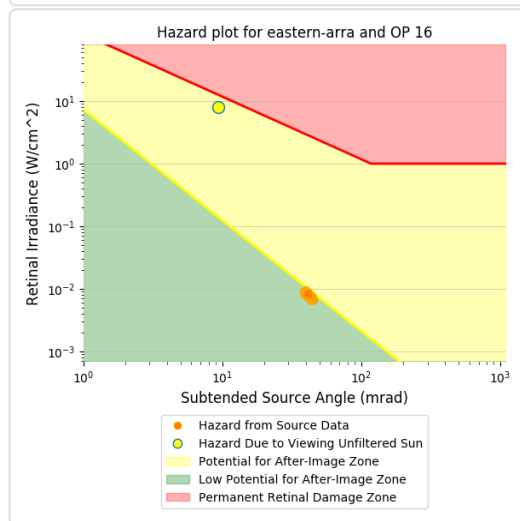
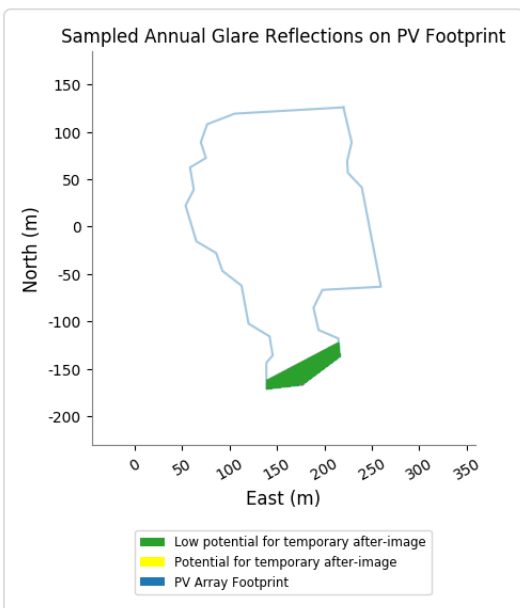
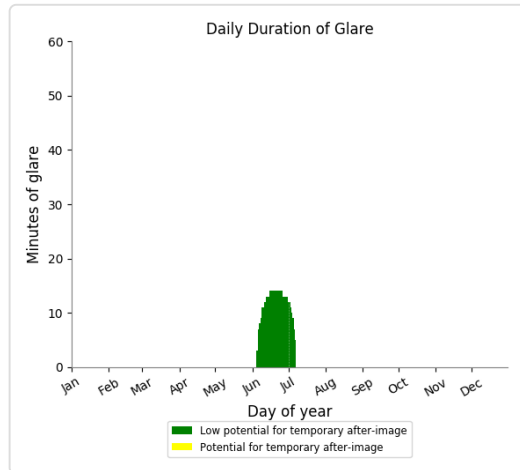
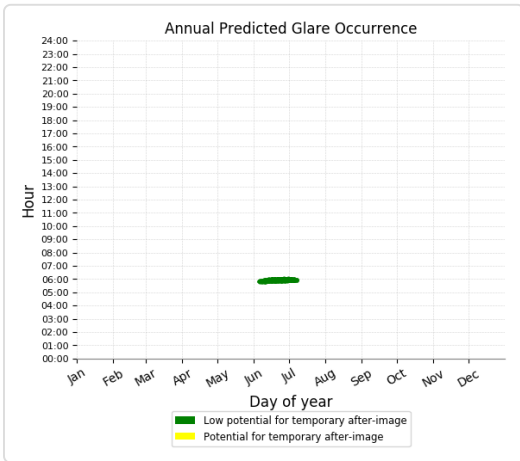
- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,177 minutes of "yellow" glare with potential to cause temporary after-image.



### Eastern Array - OP Receptor (OP 16)

PV array is expected to produce the following glare for receptors at this location:

- 384 minutes of "green" glare with low potential to cause temporary after-image.
- 0 minutes of "yellow" glare with potential to cause temporary after-image.



### Eastern Array - OP Receptor (OP 17)

No glare found

### Eastern Array - OP Receptor (OP 18)

No glare found

### Eastern Array - OP Receptor (OP 19)

No glare found

### Eastern Array - OP Receptor (OP 20)

No glare found

### Eastern Array - OP Receptor (OP 21)

No glare found

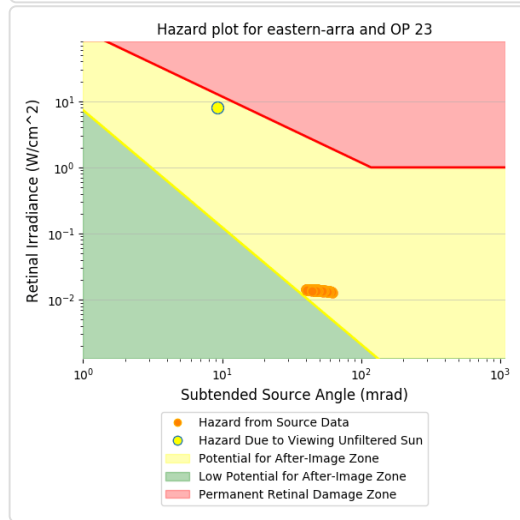
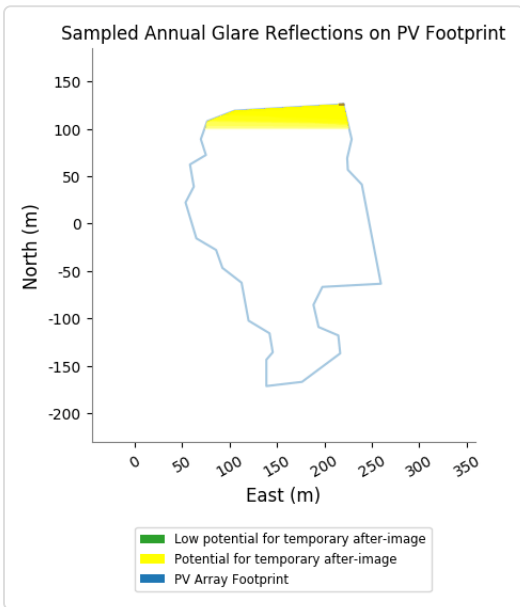
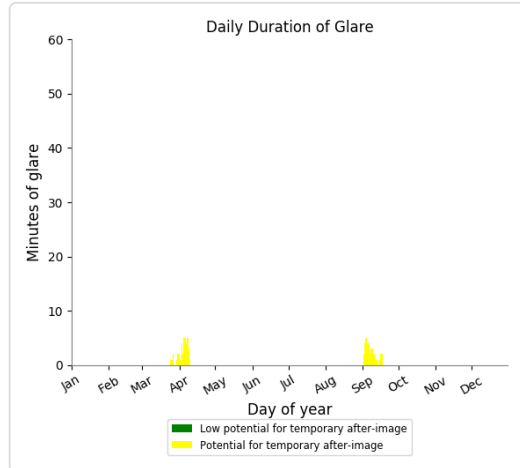
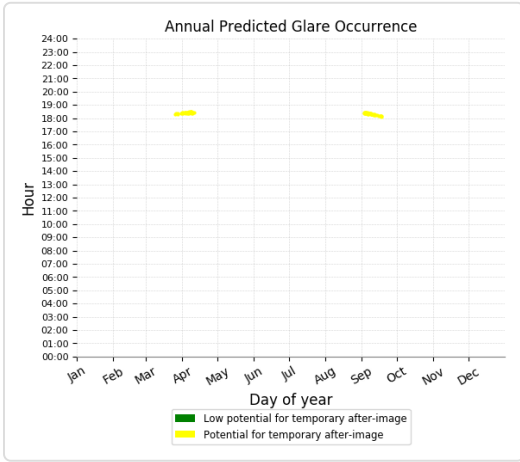
### Eastern Array - OP Receptor (OP 22)

No glare found

### Eastern Array - OP Receptor (OP 23)

PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 77 minutes of "yellow" glare with potential to cause temporary after-image.



### Eastern Array - OP Receptor (OP 24)

No glare found

### Eastern Array - OP Receptor (OP 25)

No glare found

### Eastern Array - OP Receptor (OP 26)

No glare found

### Eastern Array - OP Receptor (OP 27)

No glare found

### Eastern Array - OP Receptor (OP 28)

No glare found

### Eastern Array - OP Receptor (OP 29)

No glare found

### Eastern Array - OP Receptor (OP 30)

No glare found

### Eastern Array - OP Receptor (OP 31)

No glare found

**Eastern Array - OP Receptor (OP 32)**

*No glare found*

**Eastern Array - OP Receptor (OP 33)**

*No glare found*

**Eastern Array - OP Receptor (OP 34)**

*No glare found*

**Western Array** potential temporary after-image

Component	Green glare (min)	Yellow glare (min)
OP: OP 1	0	0
OP: OP 2	0	0
OP: OP 3	0	0
OP: OP 4	0	0
OP: OP 5	0	0
OP: OP 6	0	0
OP: OP 7	0	0
OP: OP 8	0	0
OP: OP 9	0	0
OP: OP 10	0	0
OP: OP 11	0	42
OP: OP 12	11	199
OP: OP 13	0	1204
OP: OP 14	0	2062
OP: OP 15	0	1351
OP: OP 16	0	0
OP: OP 17	0	0
OP: OP 18	0	0
OP: OP 19	0	0
OP: OP 20	0	0
OP: OP 21	0	458
OP: OP 22	0	2155
OP: OP 23	0	0
OP: OP 24	0	0
OP: OP 25	0	0
OP: OP 26	0	0
OP: OP 27	0	0
OP: OP 28	0	0
OP: OP 29	0	0
OP: OP 30	0	0
OP: OP 31	0	0
OP: OP 32	0	0
OP: OP 33	0	0
OP: OP 34	0	0

**Western Array - OP Receptor (OP 1)**

*No glare found*

**Western Array - OP Receptor (OP 2)**

*No glare found*

**Western Array - OP Receptor (OP 3)**

No glare found

**Western Array - OP Receptor (OP 4)**

No glare found

**Western Array - OP Receptor (OP 5)**

No glare found

**Western Array - OP Receptor (OP 6)**

No glare found

**Western Array - OP Receptor (OP 7)**

No glare found

**Western Array - OP Receptor (OP 8)**

No glare found

**Western Array - OP Receptor (OP 9)**

No glare found

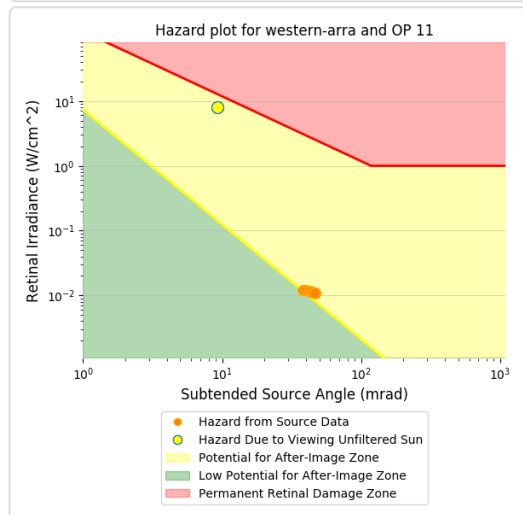
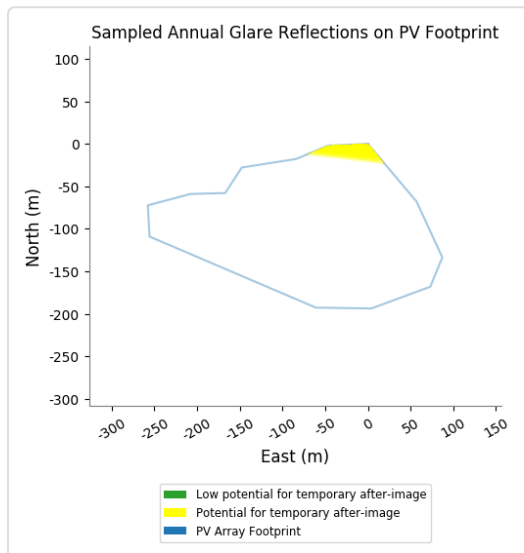
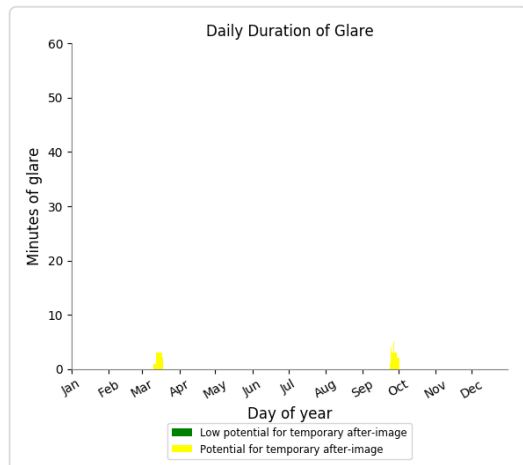
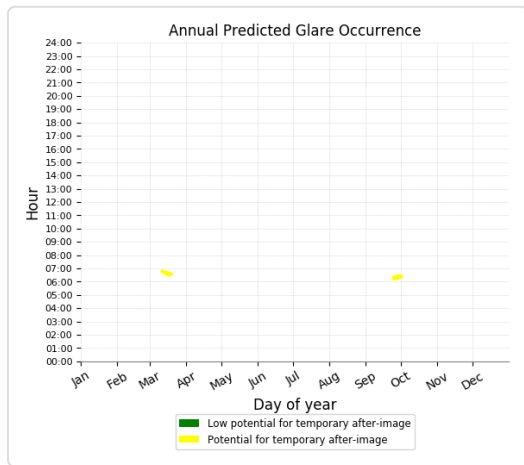
**Western Array - OP Receptor (OP 10)**

No glare found

**Western Array - OP Receptor (OP 11)**

PV array is expected to produce the following glare for receptors at this location:

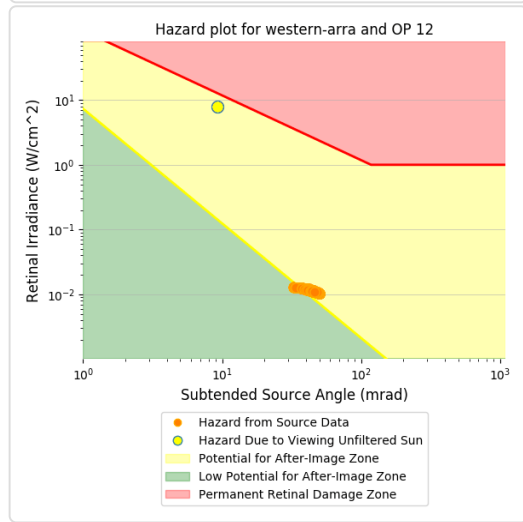
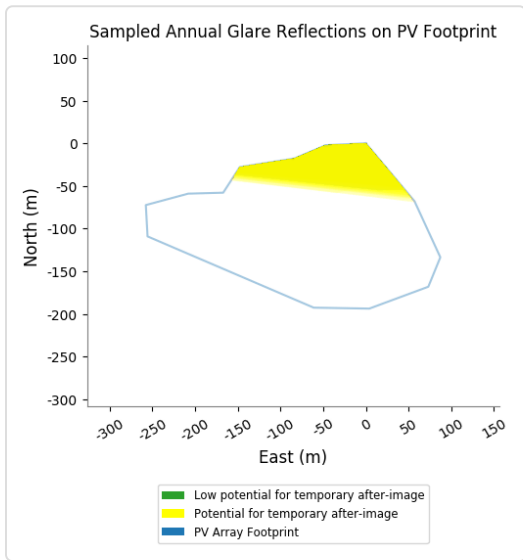
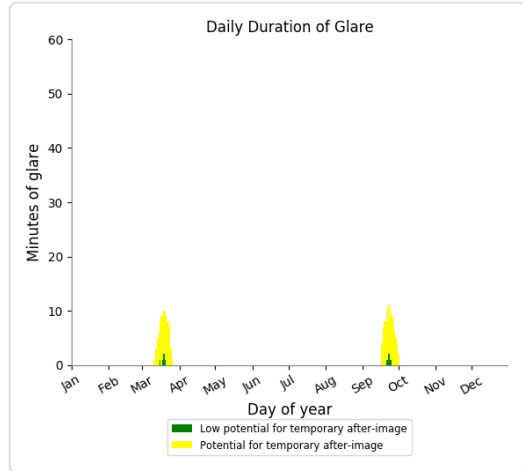
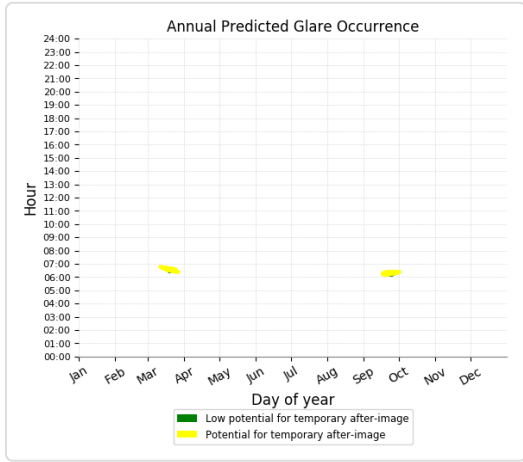
- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 42 minutes of "yellow" glare with potential to cause temporary after-image.



### Western Array - OP Receptor (OP 12)

PV array is expected to produce the following glare for receptors at this location:

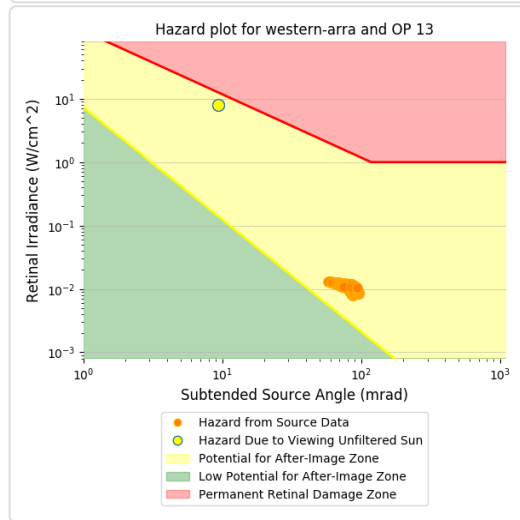
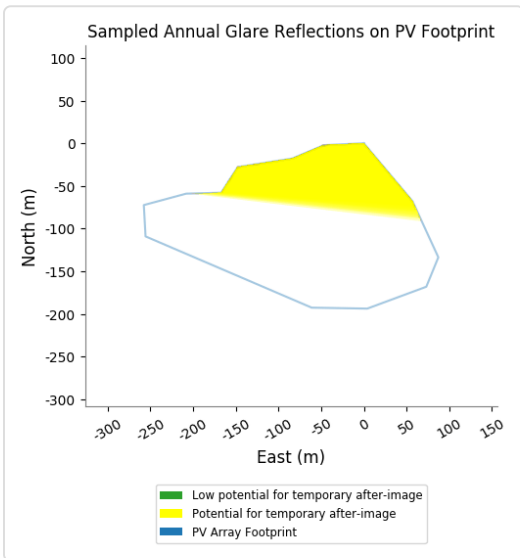
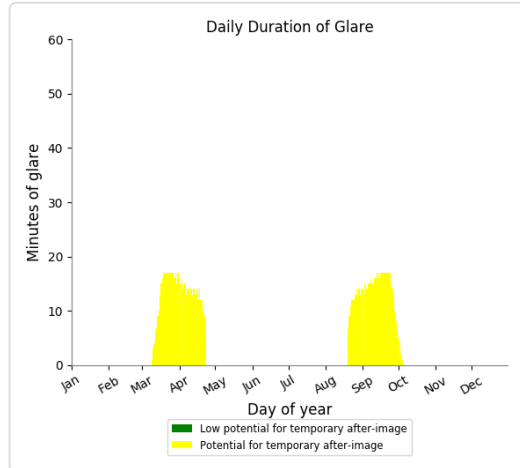
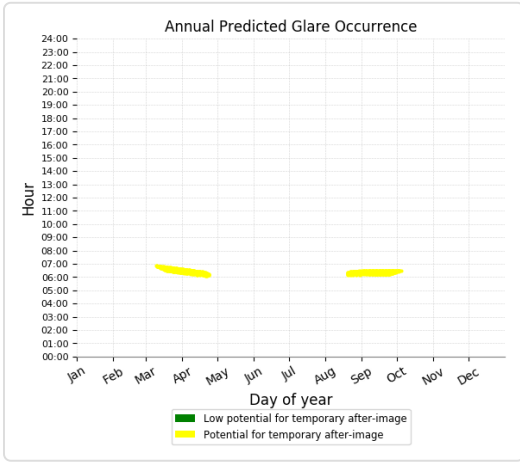
- 11 minutes of "green" glare with low potential to cause temporary after-image.
- 199 minutes of "yellow" glare with potential to cause temporary after-image.



### Western Array - OP Receptor (OP 13)

PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,204 minutes of "yellow" glare with potential to cause temporary after-image.

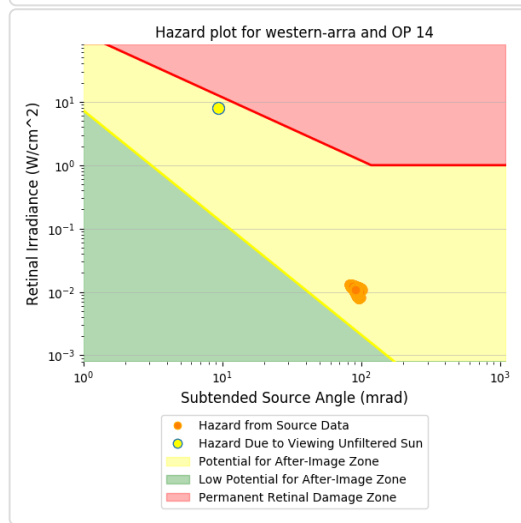
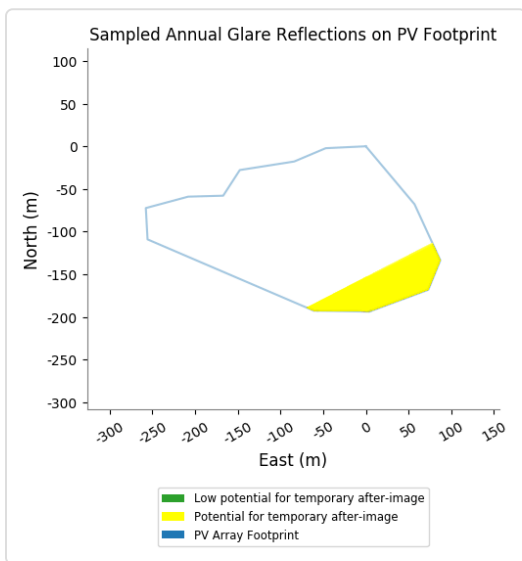
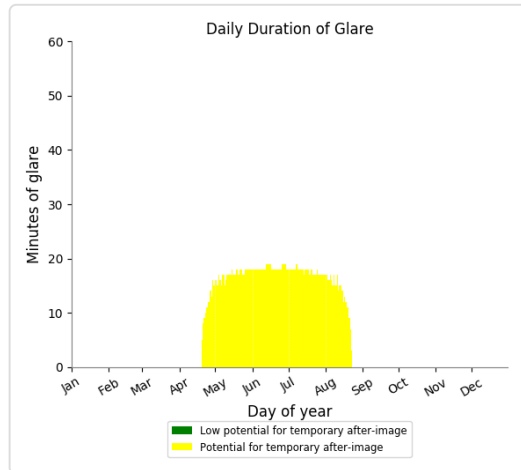
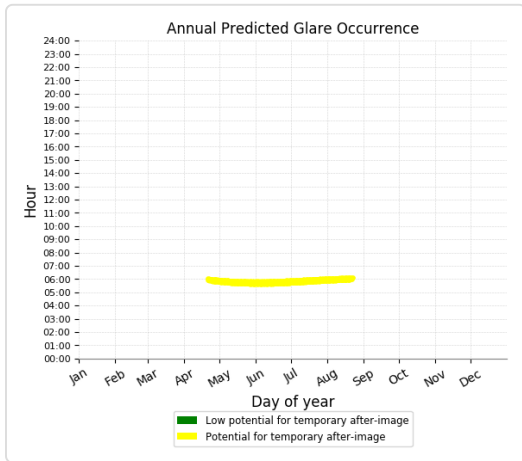




### Western Array - OP Receptor (OP 14)

PV array is expected to produce the following glare for receptors at this location:

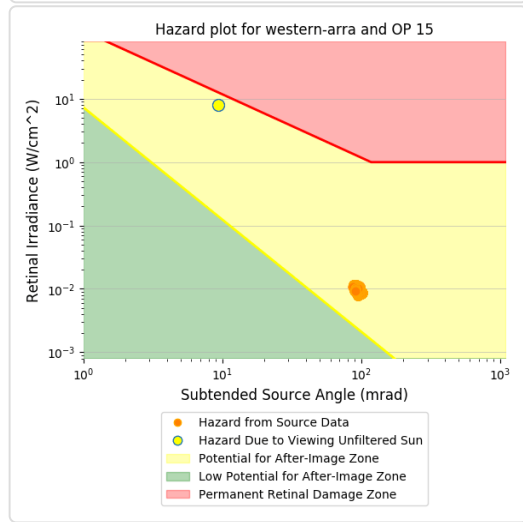
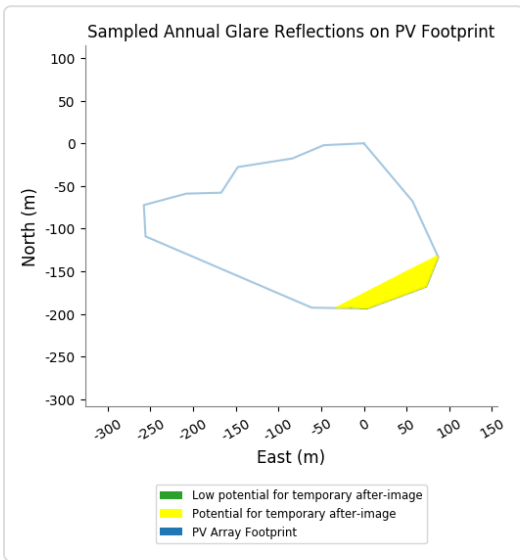
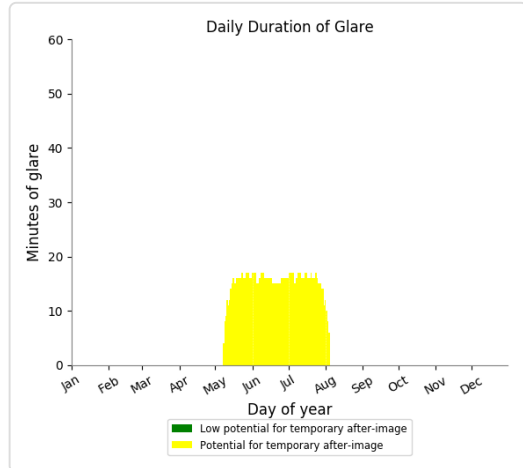
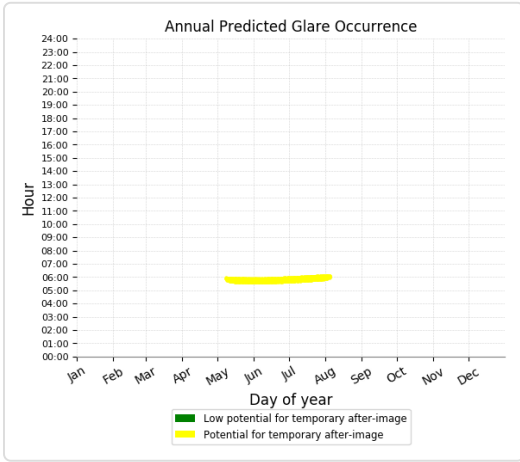
- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,062 minutes of "yellow" glare with potential to cause temporary after-image.



### Western Array - OP Receptor (OP 15)

PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,351 minutes of "yellow" glare with potential to cause temporary after-image.



### Western Array - OP Receptor (OP 16)

No glare found

### Western Array - OP Receptor (OP 17)

No glare found

### Western Array - OP Receptor (OP 18)

No glare found

### Western Array - OP Receptor (OP 19)

No glare found

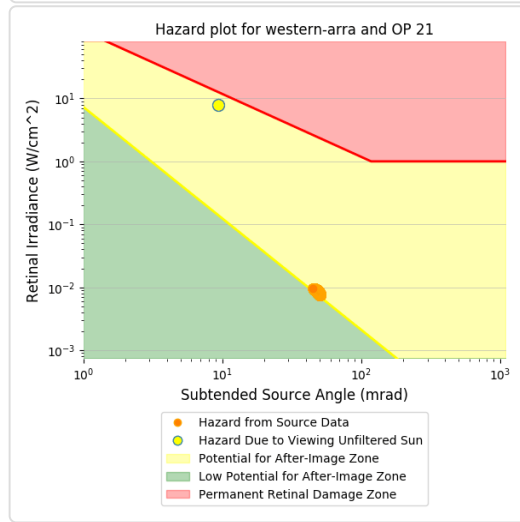
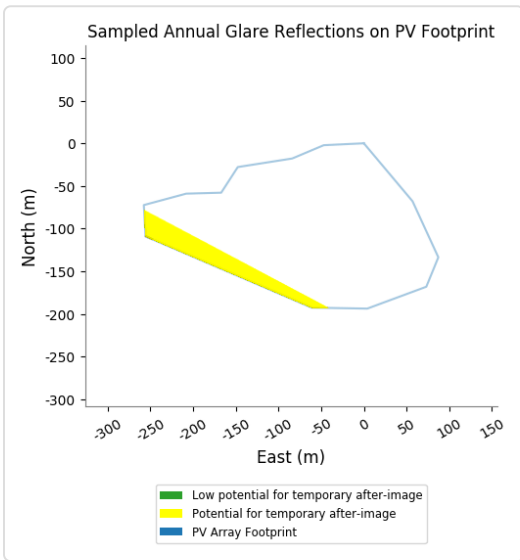
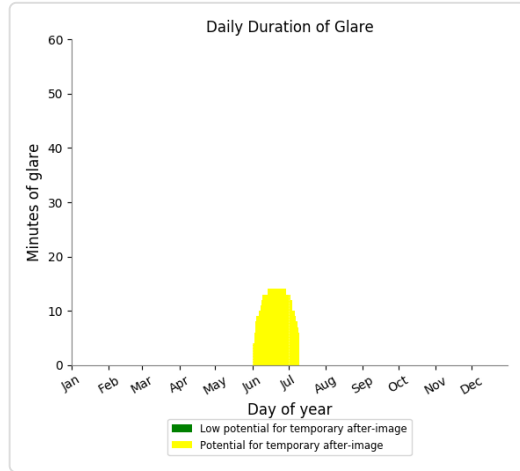
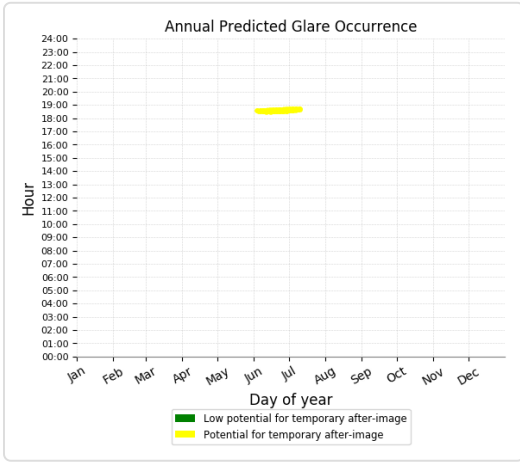
### Western Array - OP Receptor (OP 20)

No glare found

### Western Array - OP Receptor (OP 21)

PV array is expected to produce the following glare for receptors at this location:

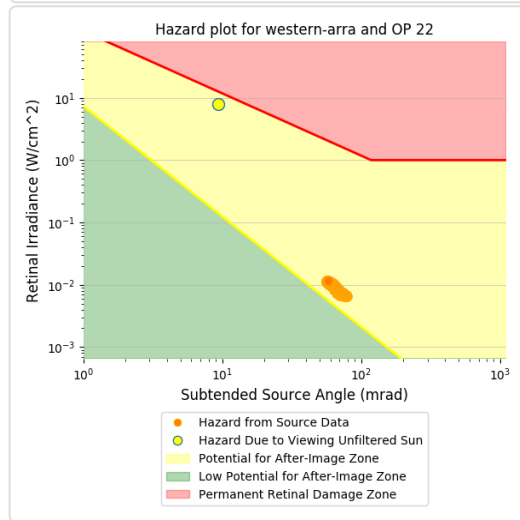
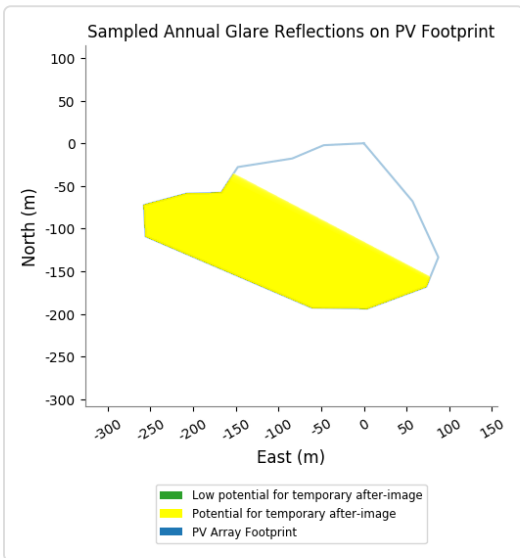
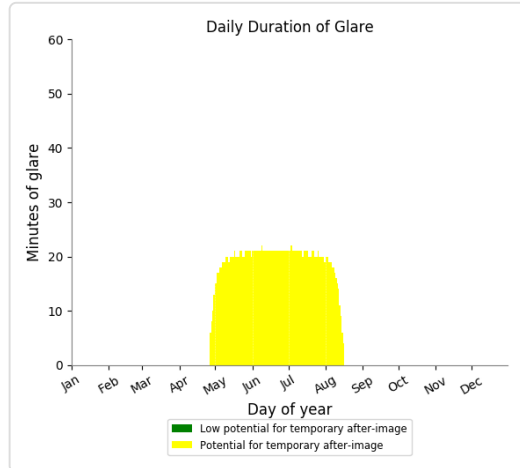
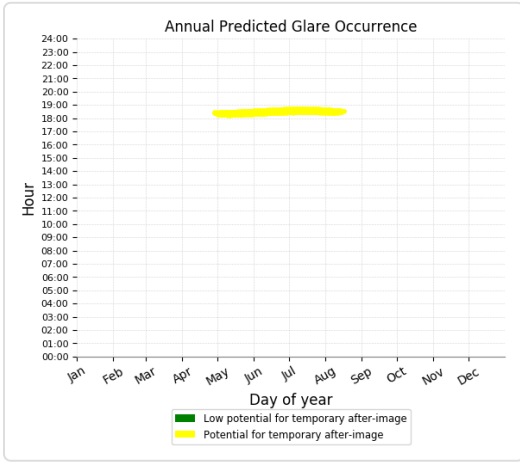
- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 458 minutes of "yellow" glare with potential to cause temporary after-image.



### Western Array - OP Receptor (OP 22)

PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,155 minutes of "yellow" glare with potential to cause temporary after-image.



### Western Array - OP Receptor (OP 23)

No glare found

### Western Array - OP Receptor (OP 24)

No glare found

### Western Array - OP Receptor (OP 25)

No glare found

### Western Array - OP Receptor (OP 26)

No glare found

### Western Array - OP Receptor (OP 27)

No glare found

### Western Array - OP Receptor (OP 28)

No glare found

### Western Array - OP Receptor (OP 29)

No glare found

### Western Array - OP Receptor (OP 30)

No glare found

### Western Array - OP Receptor (OP 31)

*No glare found*

### Western Array - OP Receptor (OP 32)

*No glare found*

### Western Array - OP Receptor (OP 33)

*No glare found*

### Western Array - OP Receptor (OP 34)

*No glare found*

## Assumptions

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- Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
- Glare analyses do not account for physical obstructions between reflectors and receptors. This includes buildings, tree cover and geographic obstructions.
- Detailed system geometry is not rigorously simulated.
- The glare hazard determination relies on several approximations including observer eye characteristics, angle of view, and typical blink response time. Actual values and results may vary.
- 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.
- 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.
- 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.)
- Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
- Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
- Glare vector plots are simplified representations of analysis data. Actual glare emanations and results may differ.
- Refer to the **Help page** for detailed assumptions and limitations not listed here.