



Cefn Park Solar Farm

Cefn Park Solar Farm Road Receptors 25deg

Created Sept. 30, 2021
 Updated Sept. 30, 2021
 Time-step 1 minute
 Timezone offset UTC0
 Site ID 59382.10147

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



Misc. Analysis Settings

DNI: varies (1,000.0 W/m² 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	25.0	180.0	143	14,850	-
Western Array	25.0	180.0	43	14,247	-

Component Data

PV Array(s)

Total PV footprint area: 81,273 m²

Name: Eastern Array
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Footprint area: 38,050 m²
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	53.033283	-2.941465	36.31	3.10	39.41
2	53.033219	-2.943170	36.74	3.10	39.84
3	53.033116	-2.943600	36.31	3.10	39.41
4	53.032948	-2.943696	35.74	3.10	38.84
5	53.032800	-2.943621	35.23	3.10	38.33
6	53.032709	-2.943868	35.29	3.10	38.39
7	53.032496	-2.943814	34.59	3.10	37.69
8	53.032354	-2.943943	34.41	3.10	37.51
9	53.032012	-2.943771	34.08	3.10	37.18
10	53.031903	-2.943460	34.00	3.10	37.10
11	53.031735	-2.943364	34.00	3.10	37.10
12	53.031587	-2.943063	34.00	3.10	37.10
13	53.031232	-2.942945	34.00	3.10	37.10
14	53.031109	-2.942623	34.00	3.10	37.10
15	53.030935	-2.942570	34.00	3.10	37.10
16	53.030857	-2.942666	34.00	3.10	37.10
17	53.030612	-2.942666	34.00	3.10	37.10
18	53.030651	-2.942108	34.12	3.10	37.22
19	53.030916	-2.941507	34.77	3.10	37.87
20	53.031090	-2.941540	34.81	3.10	37.91
21	53.031167	-2.941851	34.47	3.10	37.57
22	53.031380	-2.941926	34.23	3.10	37.33
23	53.031548	-2.941786	34.15	3.10	37.25
24	53.031580	-2.940874	33.99	3.10	37.09
25	53.032516	-2.941175	35.51	3.10	38.61
26	53.032664	-2.941389	35.83	3.10	38.93
27	53.032767	-2.941400	35.88	3.10	38.98
28	53.032948	-2.941325	35.94	3.10	39.04

Name: Western Array
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Footprint area: 43,223 m²
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	53.032147	-2.944742	34.67	3.10	37.77
2	53.032134	-2.945440	35.85	3.10	38.95
3	53.031992	-2.945987	37.02	3.10	40.12
4	53.031895	-2.946942	38.64	3.10	41.74
5	53.031631	-2.947231	38.32	3.10	41.42
6	53.031624	-2.947843	39.98	3.10	43.08
7	53.031495	-2.948583	41.57	3.10	44.67
8	53.031173	-2.948551	40.10	3.10	43.20
9	53.030424	-2.945654	34.91	3.10	38.01
10	53.030411	-2.944678	34.00	3.10	37.10
11	53.030637	-2.943648	34.00	3.10	37.10
12	53.030947	-2.943444	34.00	3.10	37.10
13	53.031541	-2.943895	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	53.036308	-2.961107	62.59	1.50	64.09
OP 2	53.035605	-2.958565	62.60	1.50	64.10
OP 3	53.034502	-2.956172	58.42	1.50	59.92
OP 4	53.033599	-2.953318	51.64	1.50	53.14
OP 5	53.032586	-2.951140	48.33	1.50	49.83
OP 6	53.031231	-2.949145	42.64	1.50	44.14
OP 7	53.030205	-2.946731	35.58	1.50	37.08
OP 8	53.029760	-2.943813	34.81	1.50	36.31
OP 9	53.029611	-2.940991	34.03	1.50	35.53
OP 10	53.028863	-2.939027	34.03	1.50	35.53
OP 11	53.026845	-2.938427	34.09	1.50	35.59
OP 12	53.033716	-2.940111	36.96	1.50	38.46
OP 13	53.031994	-2.939424	35.09	1.50	36.59
OP 14	53.030342	-2.938555	33.03	1.50	34.53
OP 15	53.031697	-2.937247	37.00	1.50	38.50
OP 16	53.033374	-2.935916	39.56	1.50	41.06
OP 17	53.034374	-2.933685	36.68	1.50	38.18
OP 18	53.035651	-2.931410	34.80	1.50	36.30
OP 19	53.036974	-2.929586	32.79	1.50	34.29

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	25.0	180.0	143	14,850	-	-
Western Array	25.0	180.0	43	14,247	-	-

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	3	0	0	0	0	0	4	0	0	0
eastern-arra (yellow)	0	0	296	1028	1208	1172	1216	1159	607	0	0	0
western-arra (green)	0	0	1	0	0	0	0	0	2	0	0	0
western-arra (yellow)	0	0	402	1388	1724	1757	1771	1607	799	0	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	96	87
OP: OP 5	40	1198
OP: OP 6	7	3696
OP: OP 7	0	2370
OP: OP 8	0	0
OP: OP 9	0	0
OP: OP 10	0	0
OP: OP 11	0	0
OP: OP 12	0	0
OP: OP 13	0	2862
OP: OP 14	0	2549
OP: OP 15	0	2087
OP: OP 16	0	1
OP: OP 17	0	0
OP: OP 18	0	0
OP: OP 19	0	0

Eastern Array - OP Receptor (OP 1)

No glare found

Eastern Array - OP Receptor (OP 2)

No glare found

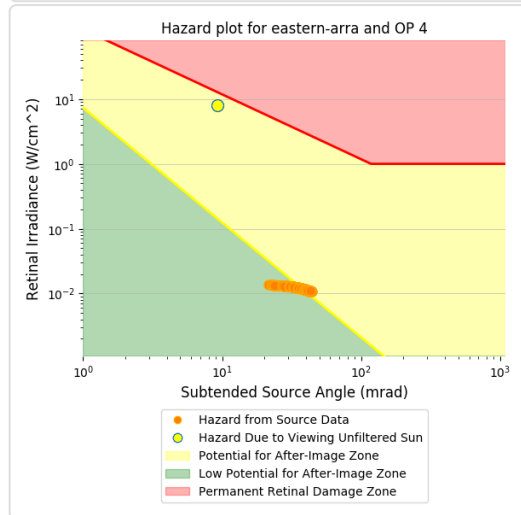
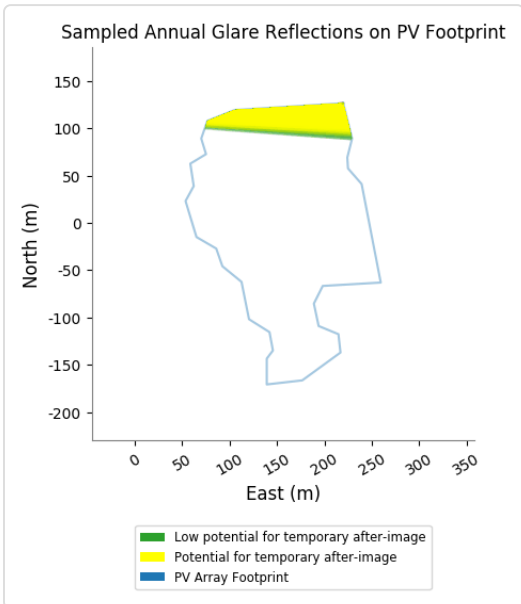
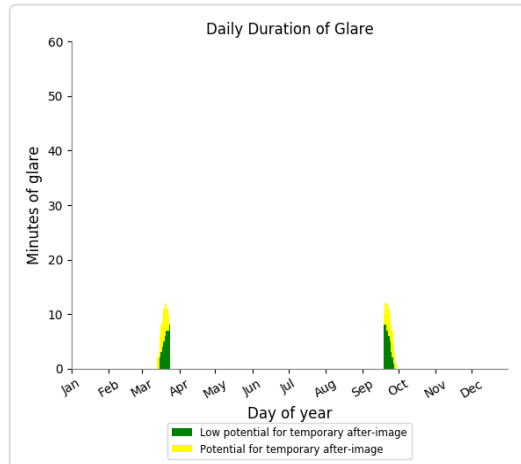
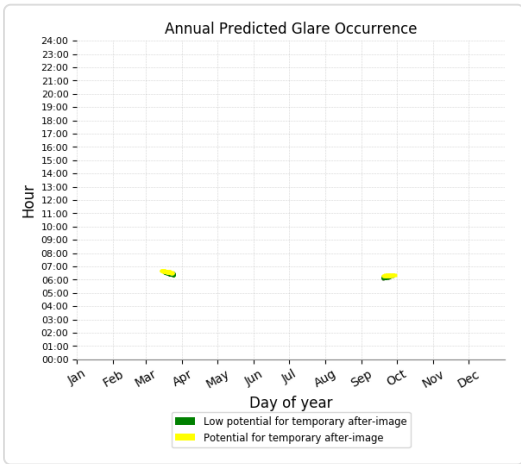
Eastern Array - OP Receptor (OP 3)

No glare found

Eastern Array - OP Receptor (OP 4)

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

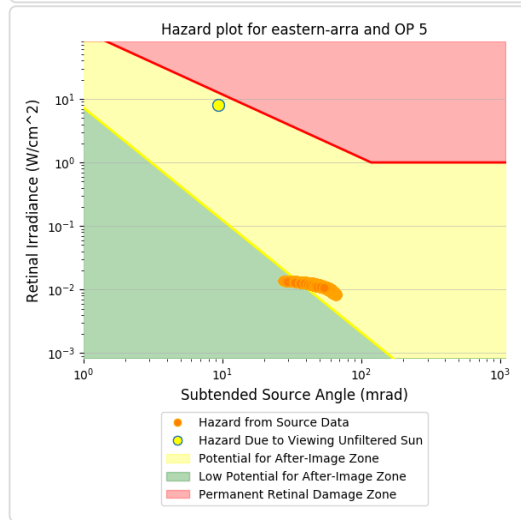
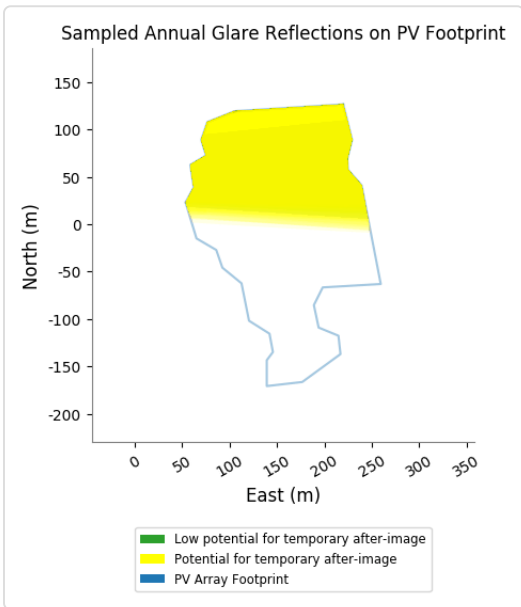
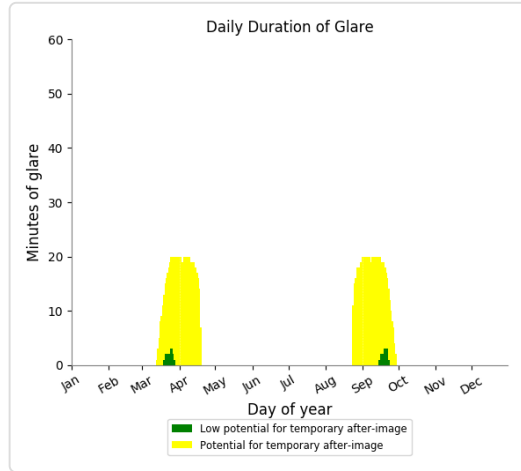
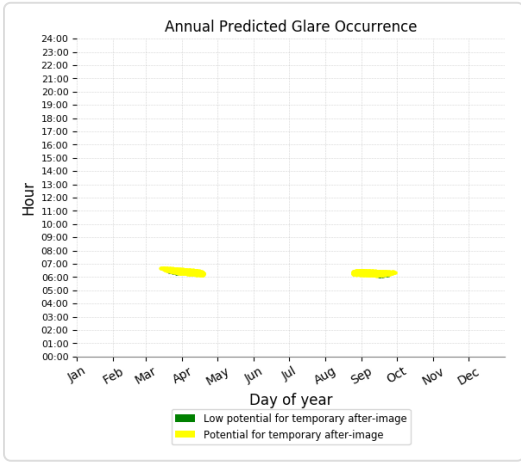
- 96 minutes of "green" glare with low potential to cause temporary after-image.
- 87 minutes of "yellow" glare with potential to cause temporary after-image.



Eastern Array - OP Receptor (OP 5)

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

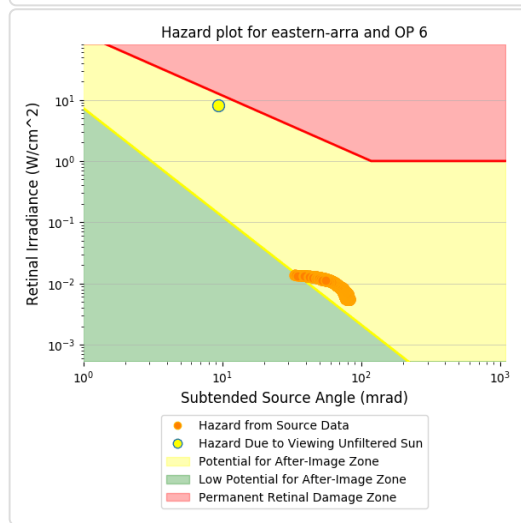
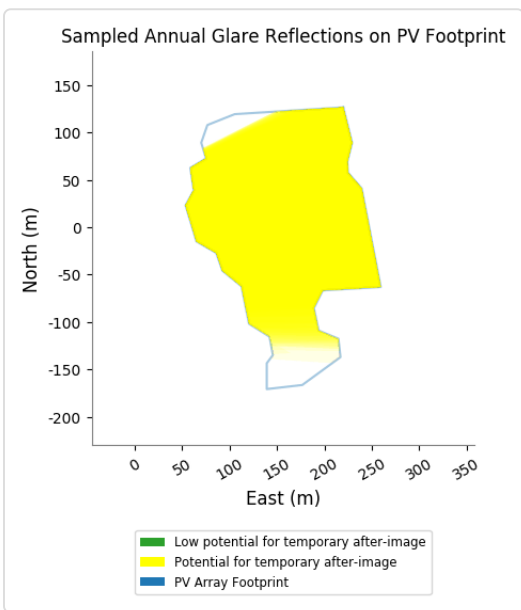
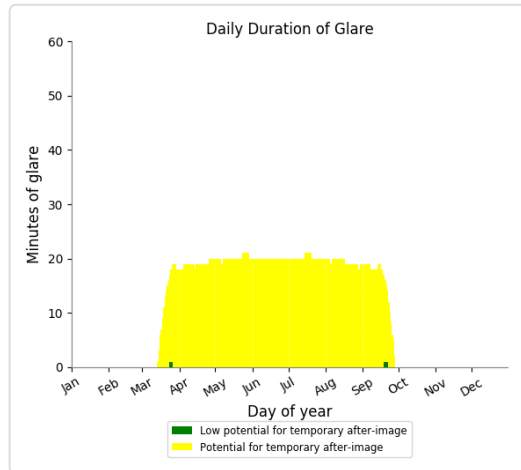
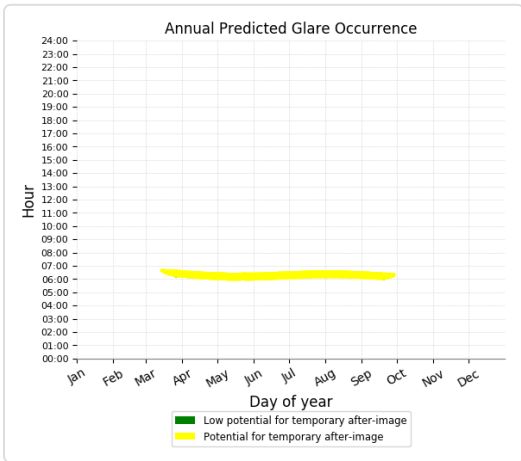
- 40 minutes of "green" glare with low potential to cause temporary after-image.
- 1,198 minutes of "yellow" glare with potential to cause temporary after-image.



Eastern Array - OP Receptor (OP 6)

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

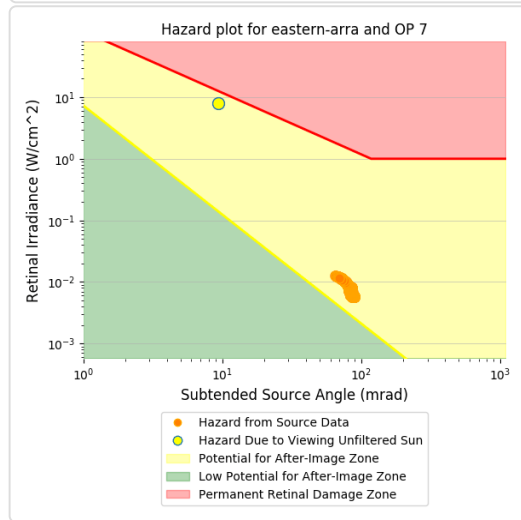
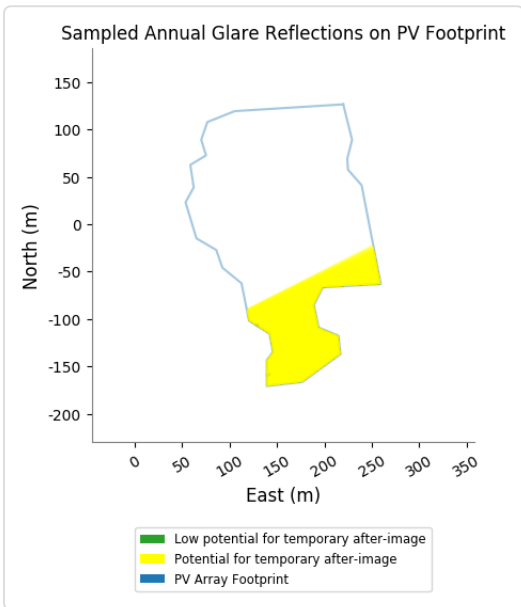
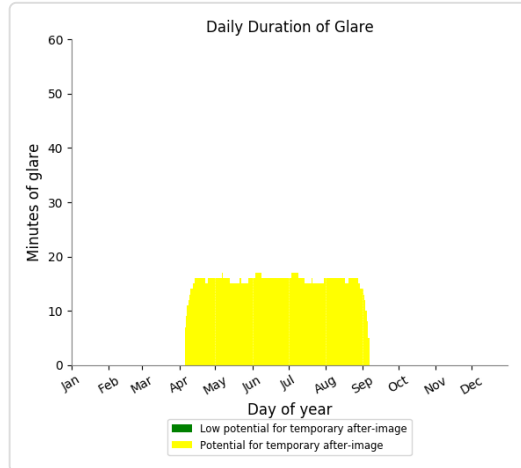
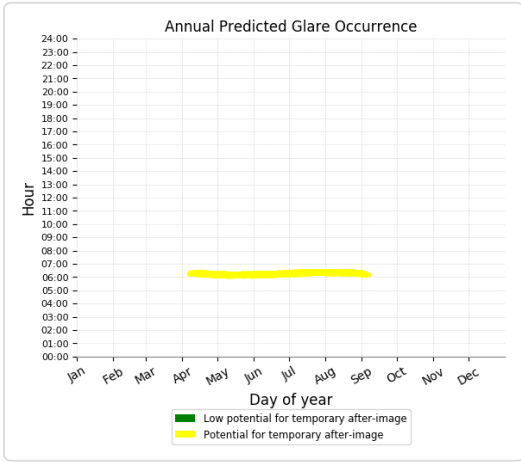
- 7 minutes of "green" glare with low potential to cause temporary after-image.
- 3,696 minutes of "yellow" glare with potential to cause temporary after-image.



Eastern Array - OP Receptor (OP 7)

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.
- 2,370 minutes of "yellow" glare with potential to cause temporary after-image.



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)

No glare found

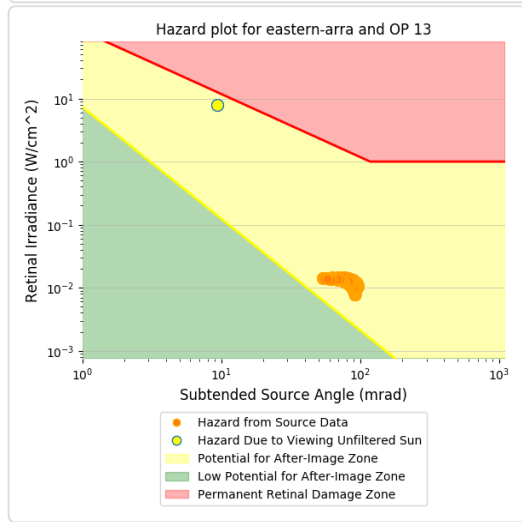
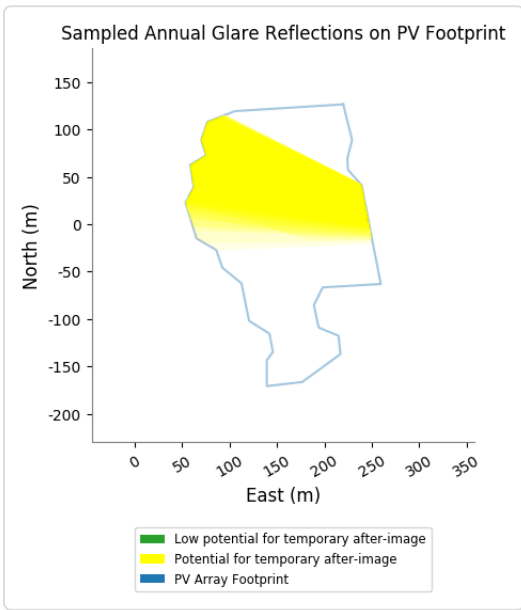
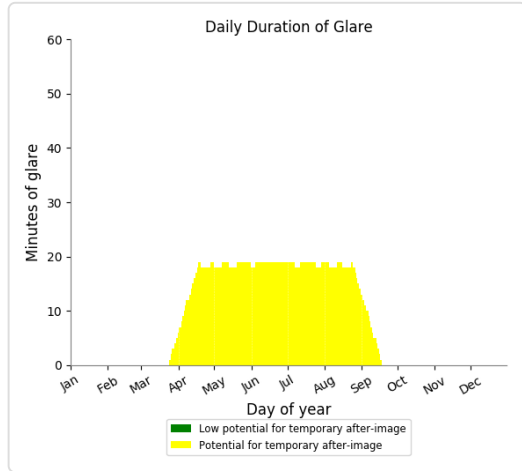
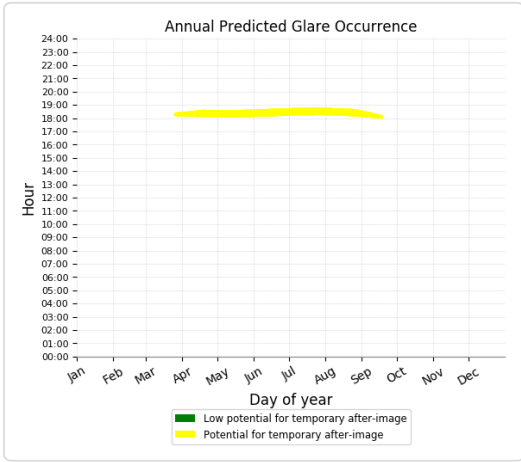
Eastern Array - OP Receptor (OP 12)

No glare found

Eastern Array - OP Receptor (OP 13)

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

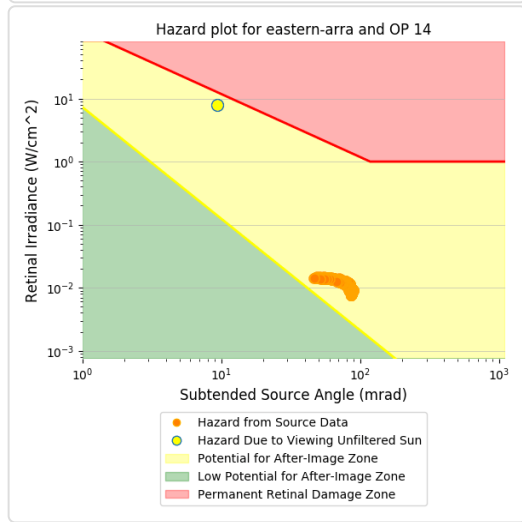
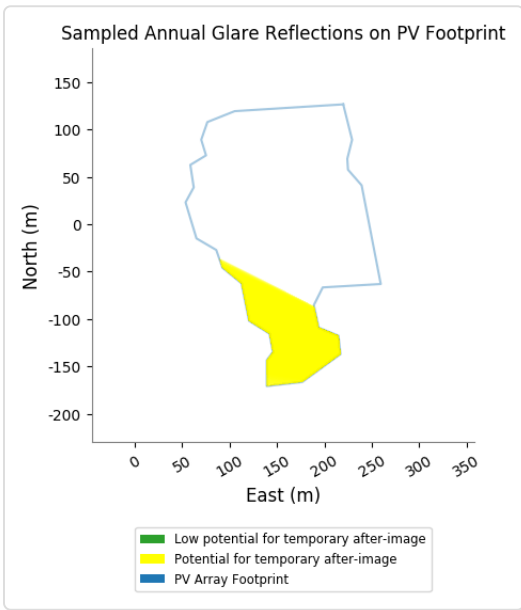
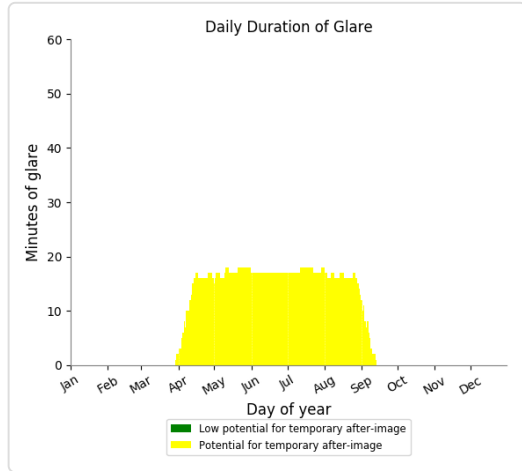
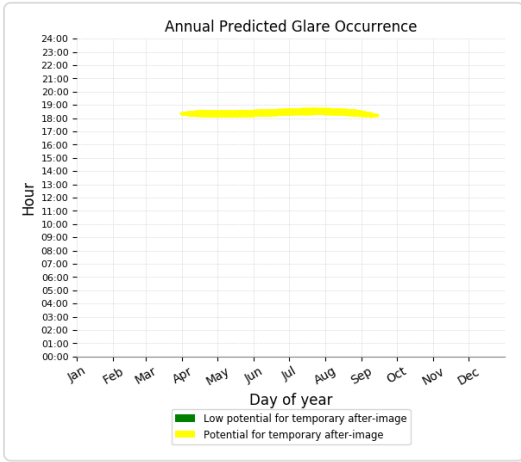
- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,862 minutes of "yellow" glare with potential to cause temporary after-image.



Eastern Array - OP Receptor (OP 14)

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

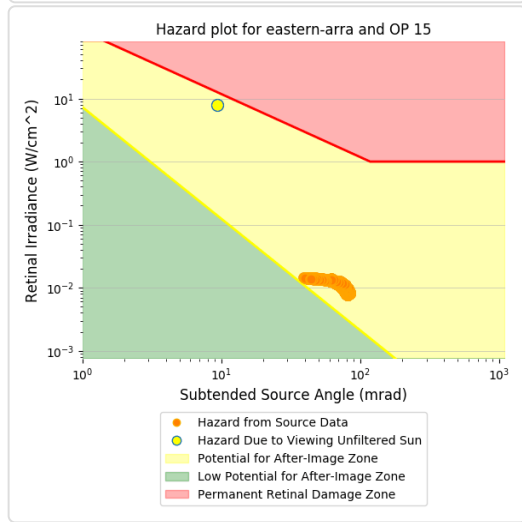
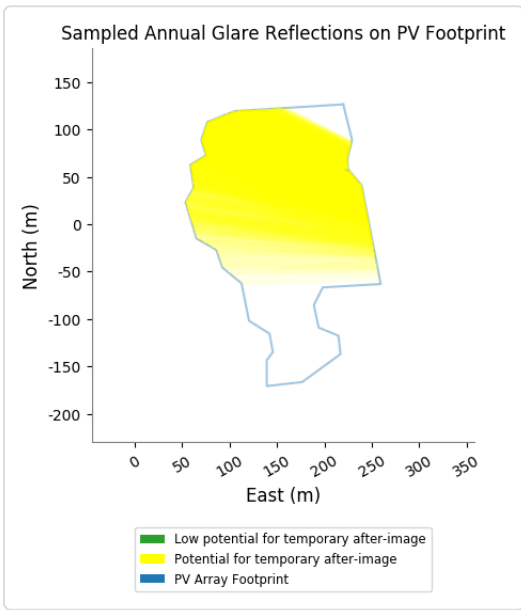
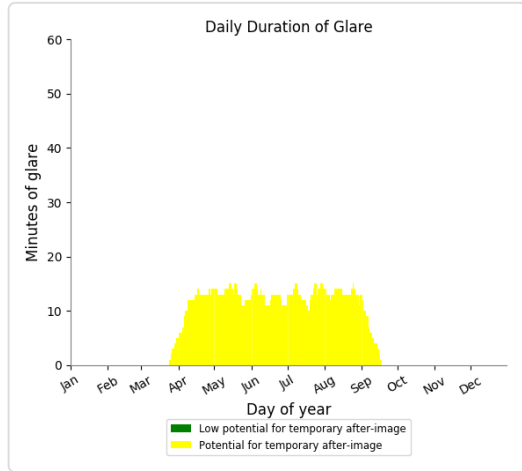
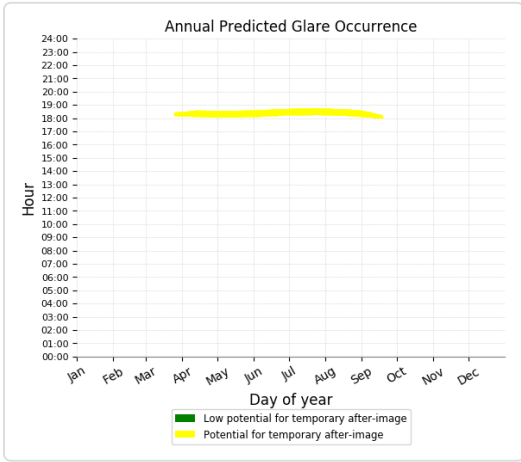
- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,549 minutes of "yellow" glare with potential to cause temporary after-image.



Eastern Array - OP Receptor (OP 15)

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

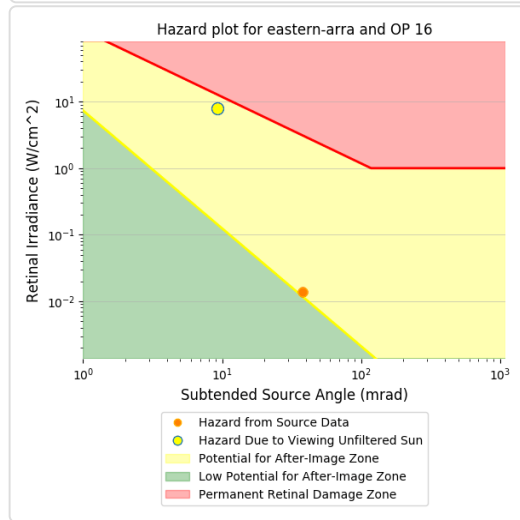
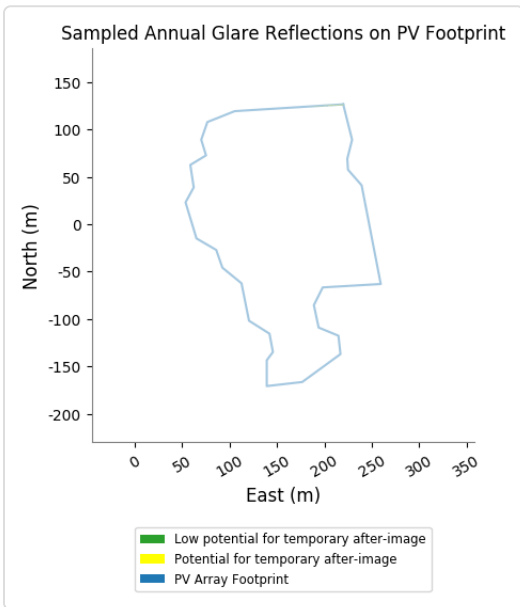
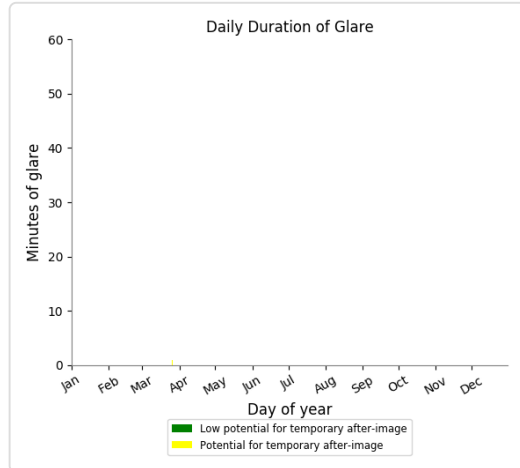
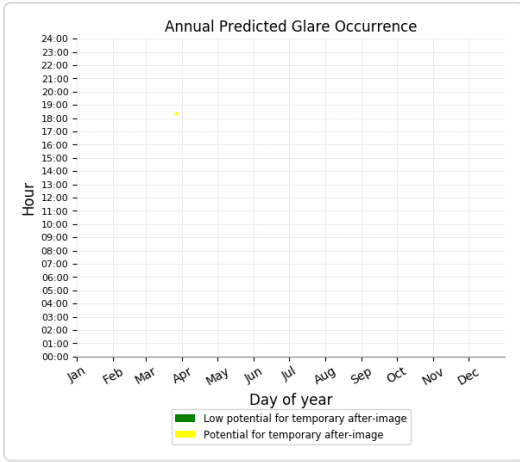
- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,087 minutes of "yellow" glare with potential to cause temporary after-image.



Eastern Array - OP Receptor (OP 16)

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

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

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	2885
OP: OP 7	0	3109
OP: OP 8	0	149
OP: OP 9	0	2103

OP: OP 10	0	1413
OP: OP 11	0	0
OP: OP 12	0	0
OP: OP 13	0	431
OP: OP 14	3	3328
OP: OP 15	40	829
OP: OP 16	0	0
OP: OP 17	0	0
OP: OP 18	0	0
OP: OP 19	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

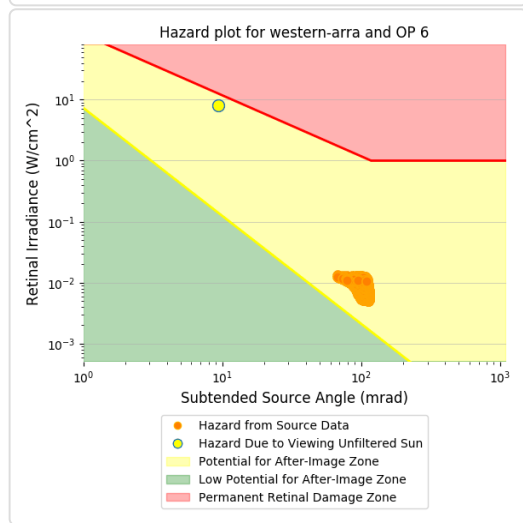
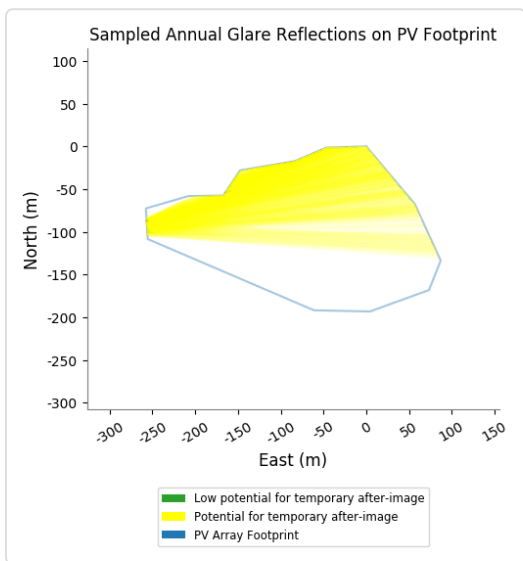
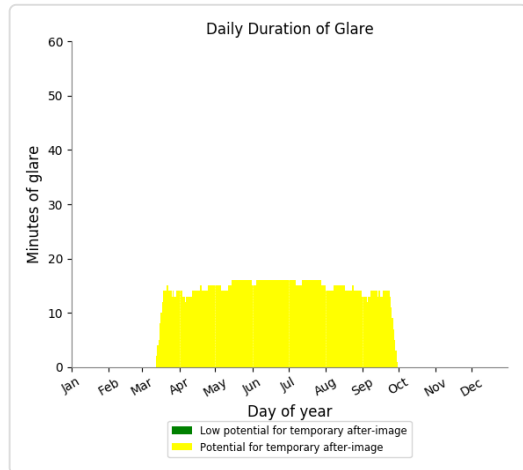
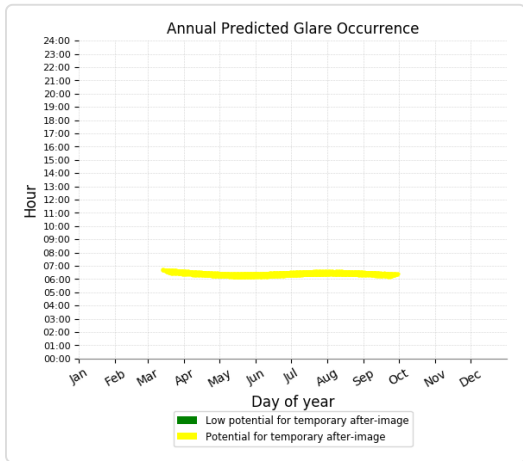
Western Array - OP Receptor (OP 5)

No glare found

Western Array - OP Receptor (OP 6)

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

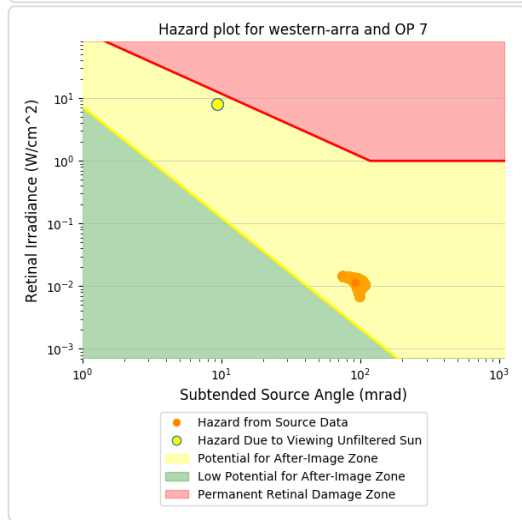
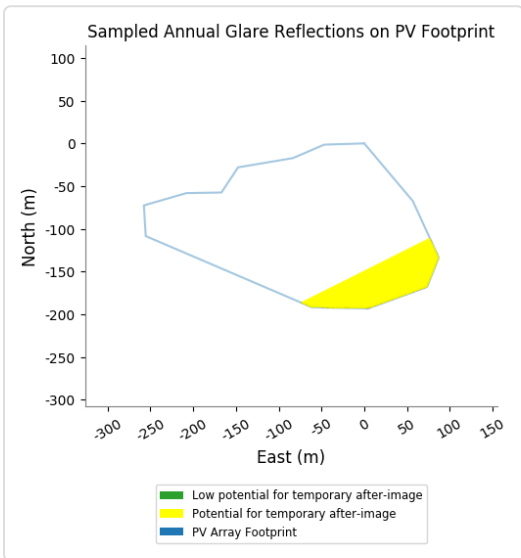
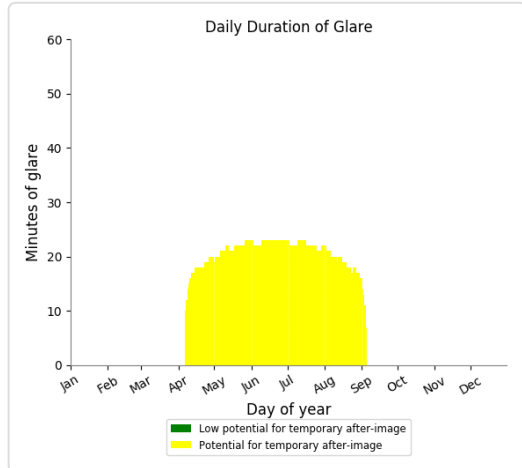
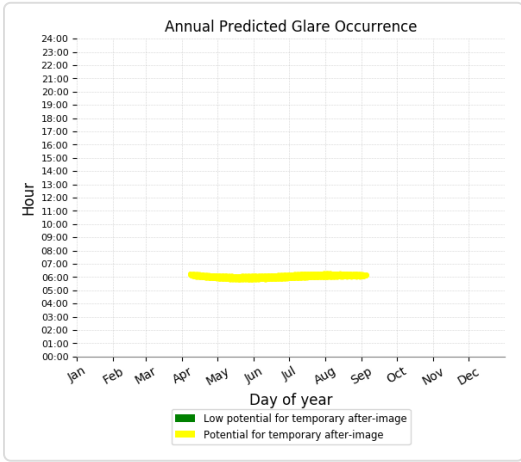
- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,885 minutes of "yellow" glare with potential to cause temporary after-image.



Western Array - OP Receptor (OP 7)

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

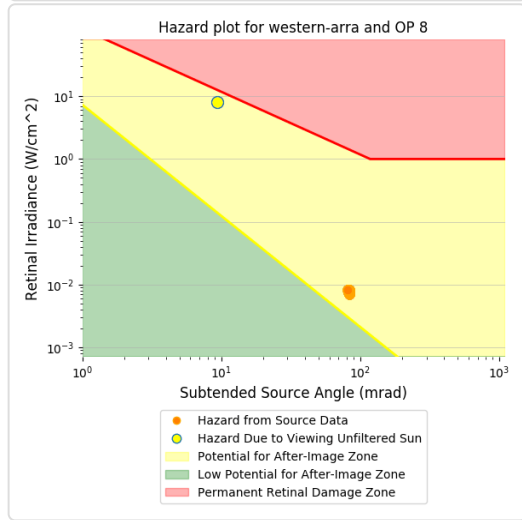
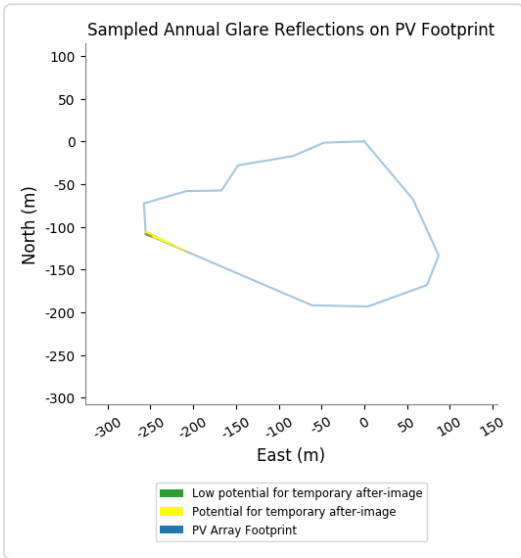
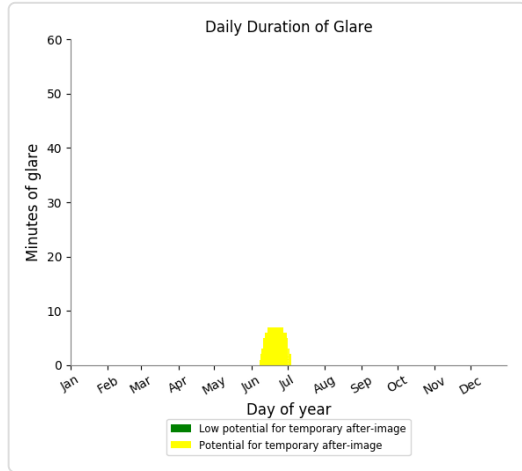
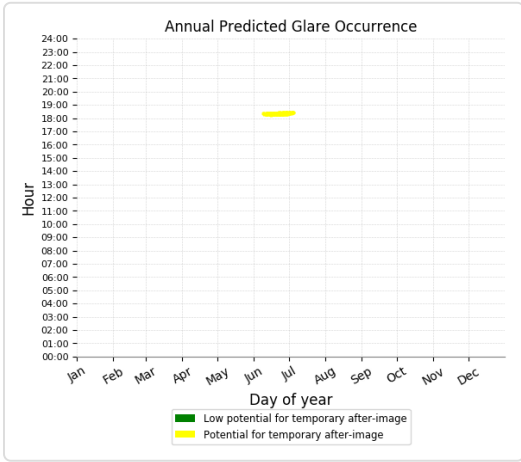
- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 3,109 minutes of "yellow" glare with potential to cause temporary after-image.



Western Array - OP Receptor (OP 8)

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

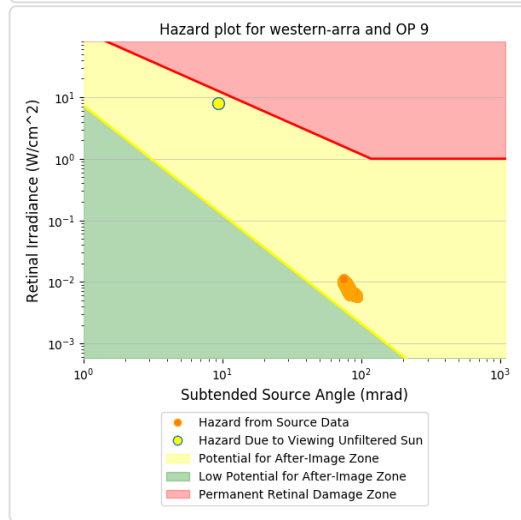
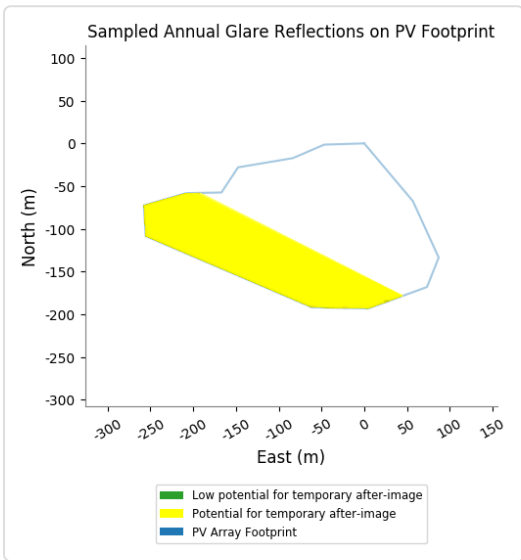
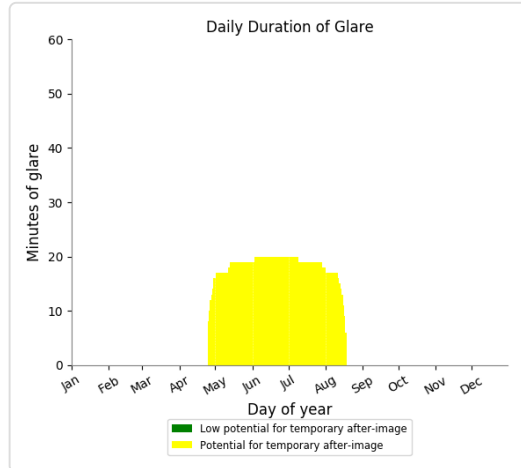
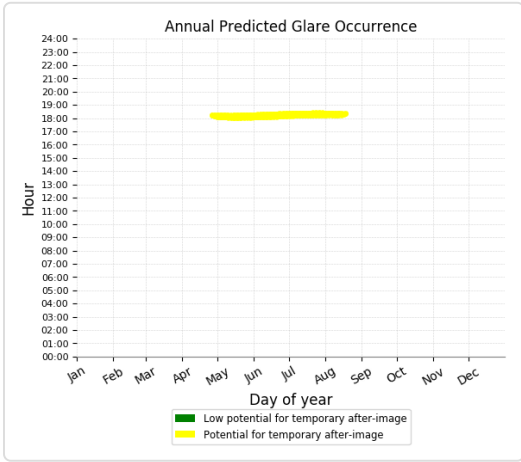
- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 149 minutes of "yellow" glare with potential to cause temporary after-image.



Western Array - OP Receptor (OP 9)

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

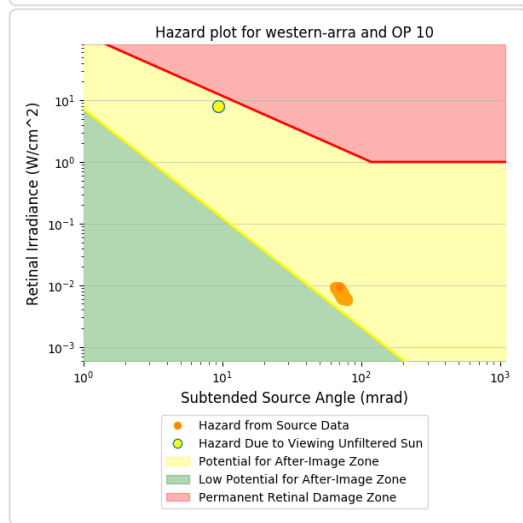
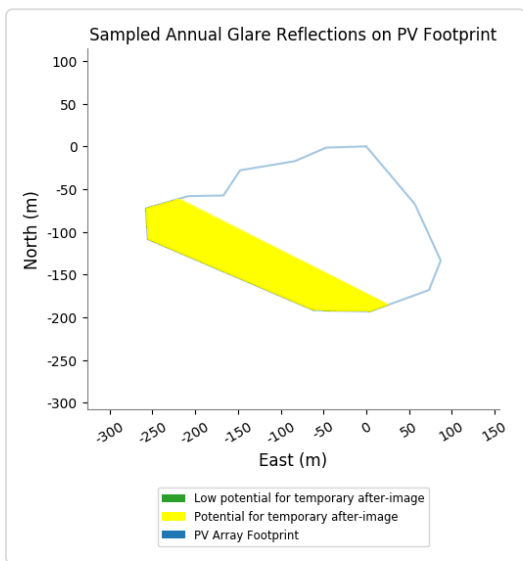
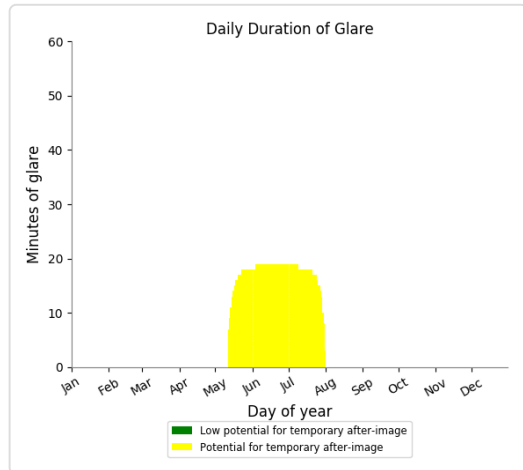
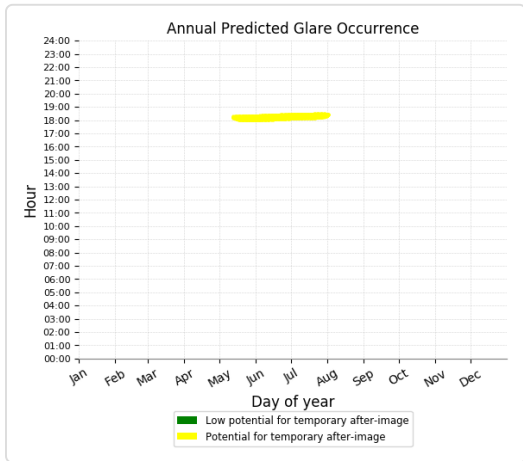
- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,103 minutes of "yellow" glare with potential to cause temporary after-image.



Western Array - OP Receptor (OP 10)

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.
- 1,413 minutes of "yellow" glare with potential to cause temporary after-image.



Western Array - OP Receptor (OP 11)

No glare found

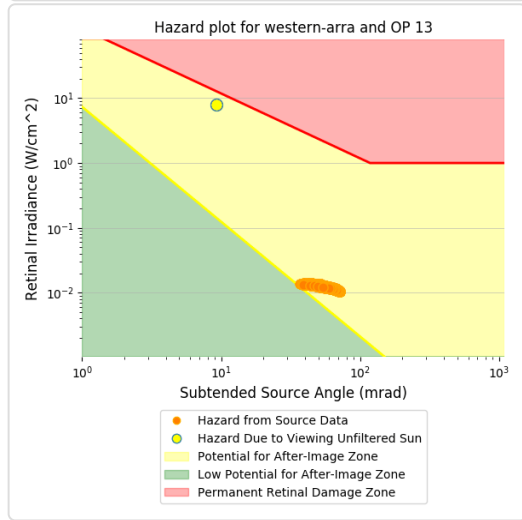
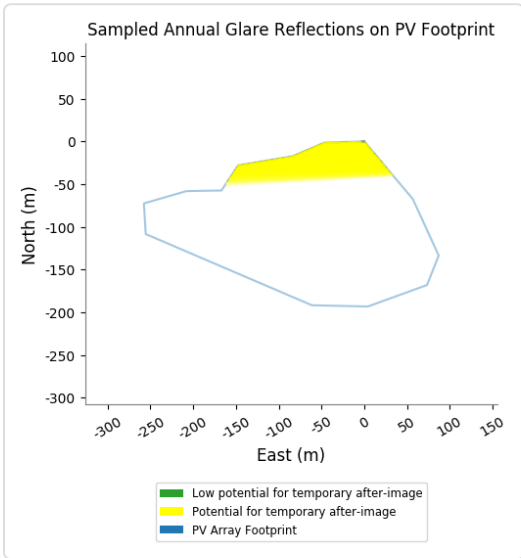
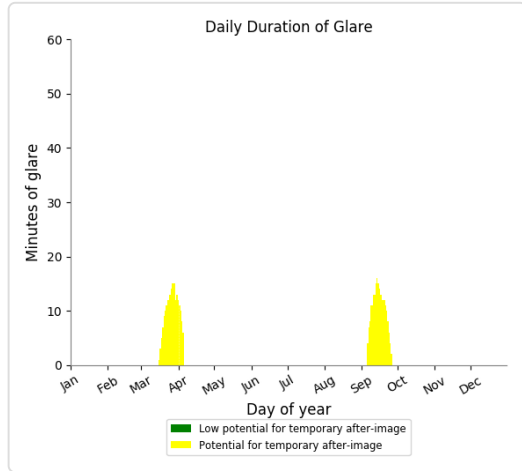
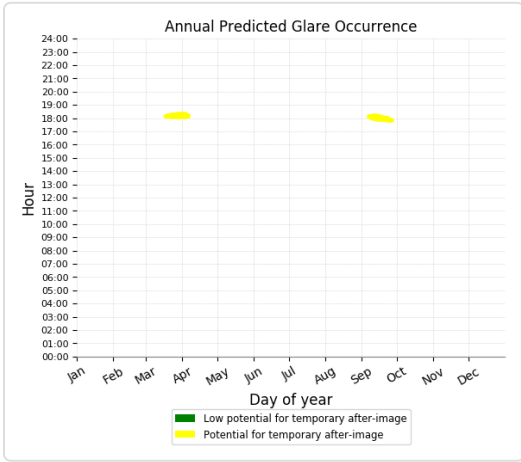
Western Array - OP Receptor (OP 12)

No glare found

Western Array - OP Receptor (OP 13)

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

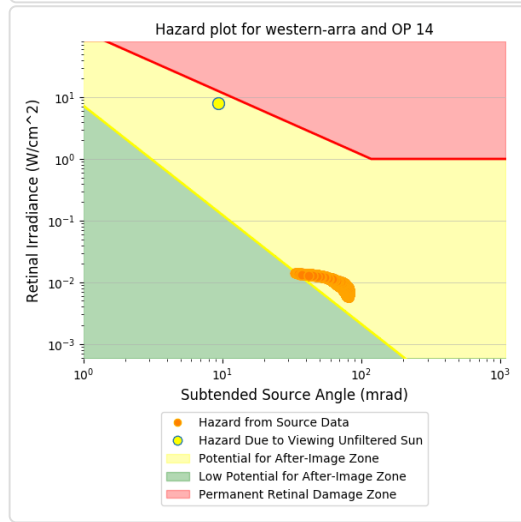
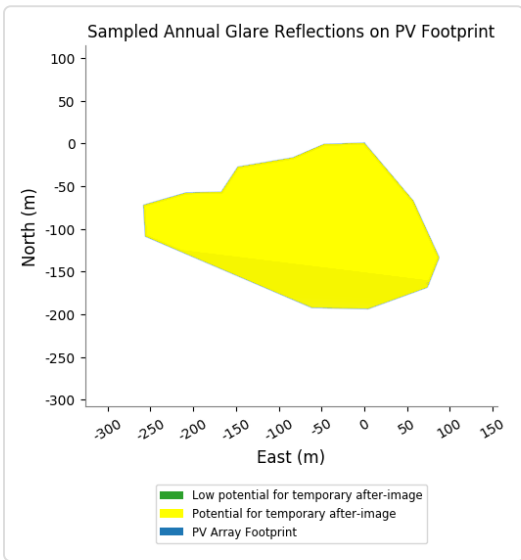
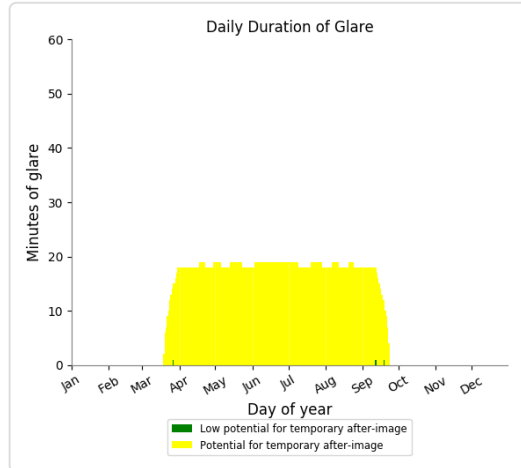
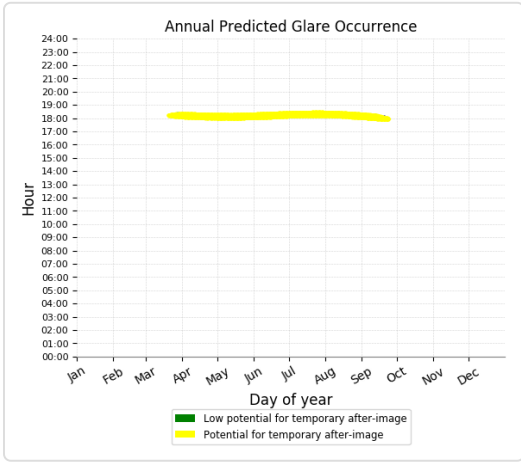
- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 431 minutes of "yellow" glare with potential to cause temporary after-image.



Western Array - OP Receptor (OP 14)

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

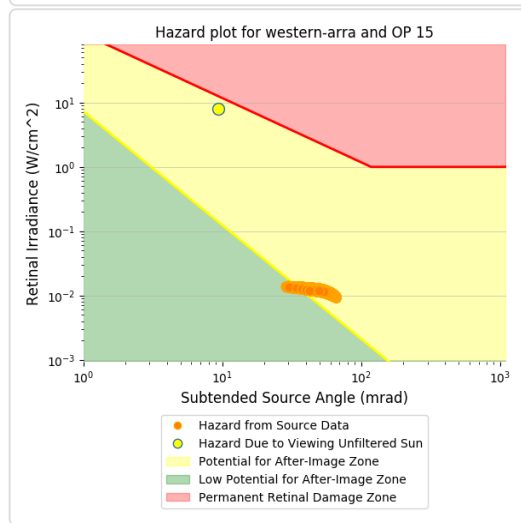
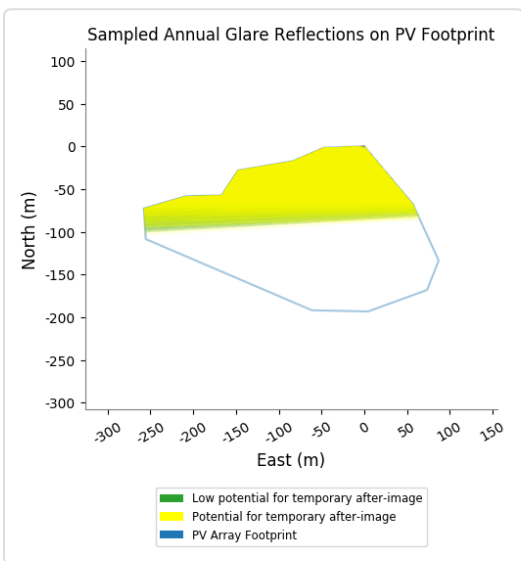
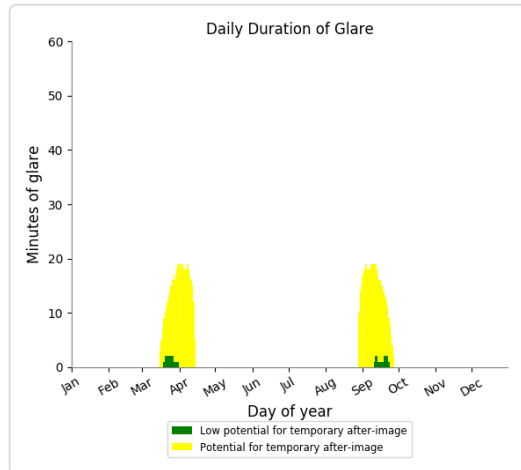
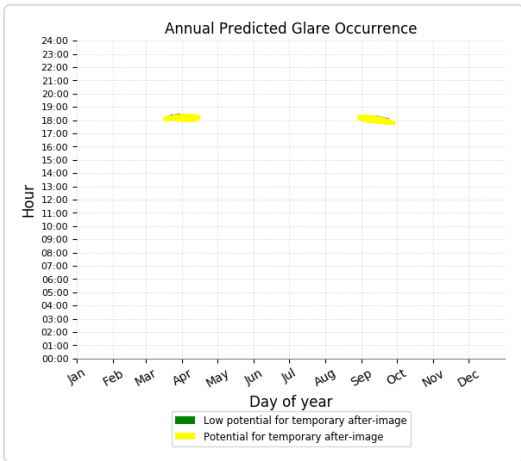
- 3 minutes of "green" glare with low potential to cause temporary after-image.
- 3,328 minutes of "yellow" glare with potential to cause temporary after-image.



Western Array - OP Receptor (OP 15)

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

- 40 minutes of "green" glare with low potential to cause temporary after-image.
- 829 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

Assumptions

- 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.