

FORGESOLAR GLARE ANALYSIS

Project: **Beacon Fen DCO**

Site configuration: **Beacon Fen DCO OP41-55**

Created 30 Jun, 2023

Updated 26 Jul, 2023

Time-step 1 minute

Timezone offset UTC0

Minimum sun altitude 0.0 deg

DNI peaks at 1,000.0 W/m²

Category 10 MW to 100 MW

Site ID 94373.16549

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	Peak Luminance cd/m ²
			min	hr	min	hr		
PV array 1	17.5	180.0	16,001	266.7	2,048	34.1	-	690,183
PV array 2	17.5	180.0	11,582	193.0	0	0.0	-	232,041
PV array 3	17.5	180.0	3,546	59.1	1,600	26.7	-	559,430
PV array 4	17.5	180.0	8,560	142.7	2,010	33.5	-	587,913

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
OP 1	3,885	64.8	262	4.4
OP 2	4,215	70.2	0	0.0
OP 3	5,674	94.6	0	0.0
OP 4	5,390	89.8	0	0.0
OP 5	1,150	19.2	0	0.0
OP 6	583	9.7	0	0.0
OP 7	1,023	17.1	0	0.0
OP 8	756	12.6	0	0.0
OP 9	1,043	17.4	0	0.0
OP 10	597	9.9	0	0.0
OP 11	750	12.5	0	0.0
OP 12	2,254	37.6	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 13	5,952	99.2	745	12.4
OP 14	5,105	85.1	1,331	22.2
OP 15	1,312	21.9	3,320	55.3

Component Data

PV Arrays

Name: PV array 1
Axis tracking: Fixed (no rotation)
Tilt: 17.5°
Orientation: 180.0°
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	53.031225	-0.285519	2.26	4.50	6.76
2	53.026413	-0.281434	1.69	4.50	6.19
3	53.015080	-0.309415	13.30	4.50	17.80
4	53.016397	-0.310702	11.40	4.50	15.90
5	53.017739	-0.311174	10.06	4.50	14.56
6	53.019108	-0.310015	8.00	4.50	12.50
7	53.020786	-0.305939	5.12	4.50	9.62
8	53.021483	-0.304780	6.00	4.50	10.50
9	53.022334	-0.305123	6.00	4.50	10.50
10	53.022928	-0.305166	5.76	4.50	10.26

Name: PV array 2
Axis tracking: Fixed (no rotation)
Tilt: 17.5°
Orientation: 180.0°
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	53.015648	-0.307956	10.18	4.50	14.68
2	53.024554	-0.285725	2.00	4.50	6.50
3	53.022399	-0.282914	1.47	4.50	5.97
4	53.012343	-0.305509	7.17	4.50	11.67

Name: PV array 3

Axis tracking: Fixed (no rotation)

Tilt: 17.5°

Orientation: 180.0°

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	53.023844	-0.279331	1.56	4.50	6.06
2	53.018378	-0.292173	4.00	4.50	8.50
3	53.012240	-0.305381	7.24	4.50	11.74
4	53.011749	-0.311260	8.96	4.50	13.46
5	53.008780	-0.311131	8.63	4.50	13.13
6	53.006320	-0.310112	9.60	4.50	14.10
7	53.003112	-0.309264	11.02	4.50	15.52
8	53.003951	-0.304801	8.81	4.50	13.31
9	53.004868	-0.300306	6.66	4.50	11.16
10	53.004719	-0.298809	7.23	4.50	11.73
11	53.005652	-0.296709	7.75	4.50	12.25
12	53.006133	-0.293171	8.00	4.50	12.50
13	53.007315	-0.289985	6.31	4.50	10.81
14	53.007880	-0.287619	5.88	4.50	10.38
15	53.008846	-0.284762	5.00	4.50	9.50
16	53.009136	-0.281961	5.00	4.50	9.50
17	53.010623	-0.282867	5.00	4.50	9.50
18	53.010908	-0.281637	5.00	4.50	9.50
19	53.010405	-0.280965	5.00	4.50	9.50
20	53.015957	-0.271409	2.09	4.50	6.59
21	53.019249	-0.273782	1.28	4.50	5.78
22	53.019208	-0.274090	1.00	4.50	5.50
23	53.021211	-0.276295	1.27	4.50	5.77

Name: PV array 4

Axis tracking: Fixed (no rotation)

Tilt: 17.5°

Orientation: 180.0°

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	53.031962	-0.286122	3.00	4.50	7.50
2	53.033381	-0.282249	2.97	4.50	7.47
3	53.031990	-0.280993	2.00	4.50	6.50
4	53.030275	-0.279768	2.00	4.50	6.50
5	53.026834	-0.277480	2.99	4.50	7.49
6	53.020208	-0.273012	1.28	4.50	5.78
7	53.019527	-0.274449	1.29	4.50	5.79
8	53.024203	-0.279696	2.00	4.50	6.50
9	53.026666	-0.281547	1.34	4.50	5.84

Discrete Observation Point Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (m)	Height (m)
OP 1	1	53.000282	-0.237992	2.25	1.80
OP 2	2	53.006596	-0.234044	3.00	1.80
OP 3	3	53.012296	-0.235101	2.15	1.80
OP 4	4	53.019653	-0.237558	2.57	1.80
OP 5	5	53.028801	-0.238177	3.91	1.80
OP 6	6	53.031756	-0.244121	4.15	1.80
OP 7	7	53.030466	-0.251137	4.22	1.80
OP 8	8	53.031498	-0.251309	6.44	1.80
OP 9	9	53.030853	-0.254571	5.77	1.80
OP 10	10	53.032337	-0.255751	9.38	1.80
OP 11	11	53.032040	-0.258626	9.02	1.80
OP 12	12	53.028917	-0.260622	4.53	1.80
OP 13	13	53.017219	-0.255571	2.00	1.80
OP 14	14	53.011627	-0.259014	2.22	1.80
OP 15	15	53.024606	-0.282832	3.37	1.80

Glare Analysis Results

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

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			min	hr	min	hr		cd/m ²
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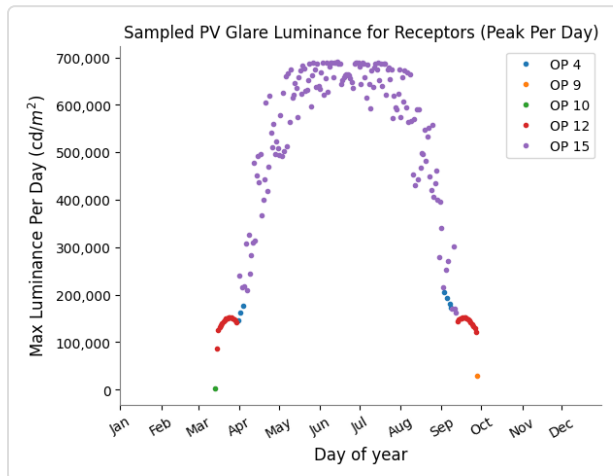
Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

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OP 5	1,150	19.2	0	0.0
OP 6	583	9.7	0	0.0
OP 7	1,023	17.1	0	0.0
OP 8	756	12.6	0	0.0
OP 9	1,043	17.4	0	0.0
OP 10	597	9.9	0	0.0
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OP 12	2,254	37.6	0	0.0
OP 13	5,952	99.2	745	12.4
OP 14	5,105	85.1	1,331	22.2
OP 15	1,312	21.9	3,320	55.3

PV: PV array 1 potential temporary after-image

Receptor results ordered by category of glare

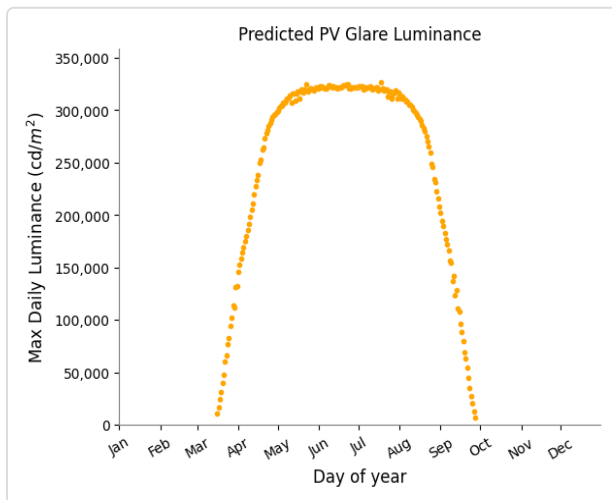
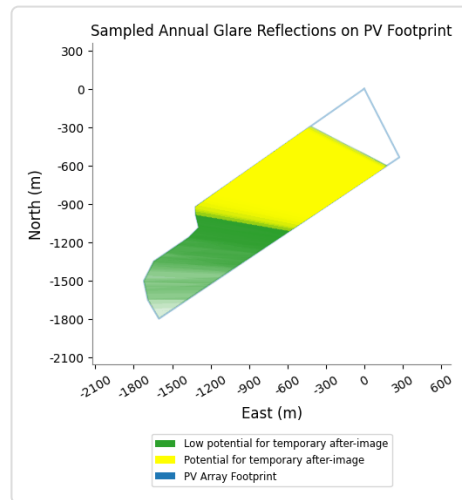
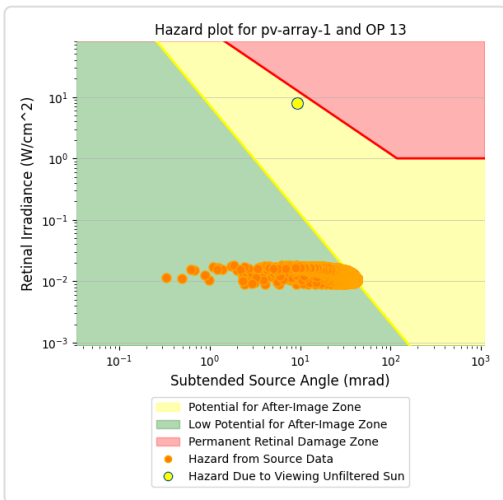
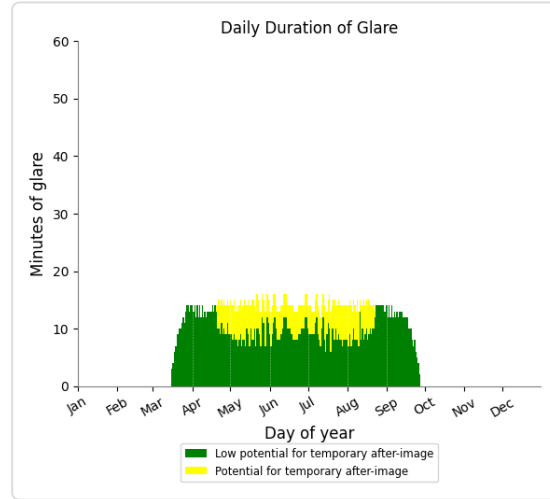
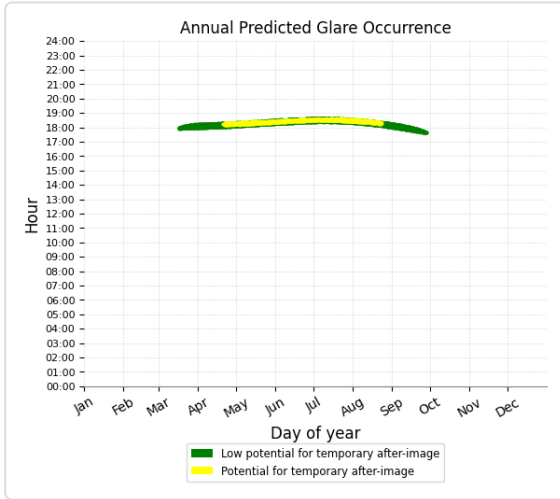
Receptor	Annual Green Glare		Annual Yellow Glare		Peak Luminance
	min	hr	min	hr	cd/m ²
OP 13	1,954	32.6	636	10.6	326,370
OP 14	2,045	34.1	102	1.7	295,169
OP 15	838	14.0	1,310	21.8	690,183
OP 1	1,203	20.1	0	0.0	156,778
OP 2	1,998	33.3	0	0.0	221,149
OP 3	2,385	39.8	0	0.0	246,922
OP 4	2,726	45.4	0	0.0	250,145
OP 5	535	8.9	0	0.0	102,342
OP 6	197	3.3	0	0.0	33,661
OP 7	433	7.2	0	0.0	70,361
OP 8	230	3.8	0	0.0	40,417
OP 9	369	6.2	0	0.0	61,350
OP 10	84	1.4	0	0.0	9,638
OP 11	119	2.0	0	0.0	15,925
OP 12	885	14.8	0	0.0	152,327



PV array 1 and OP 13

Yellow glare: 636 min.

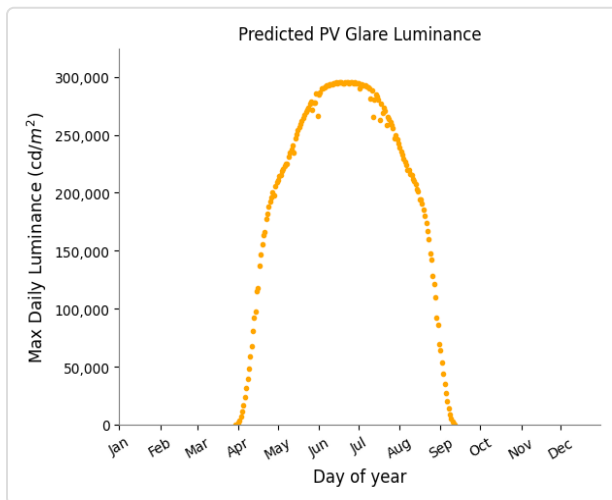
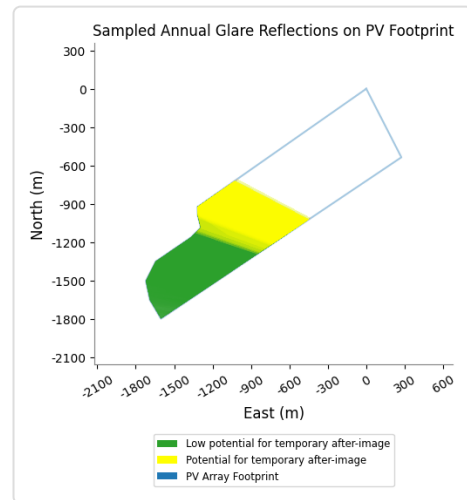
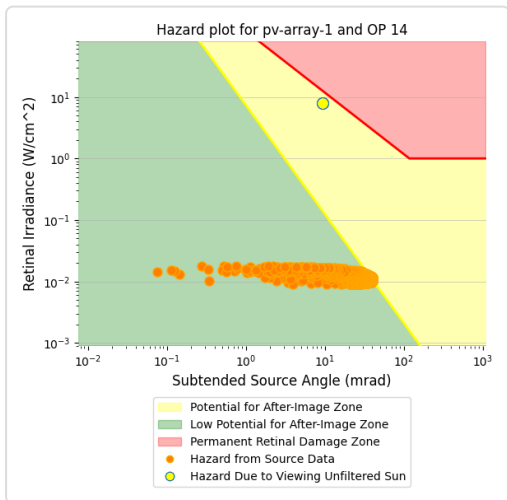
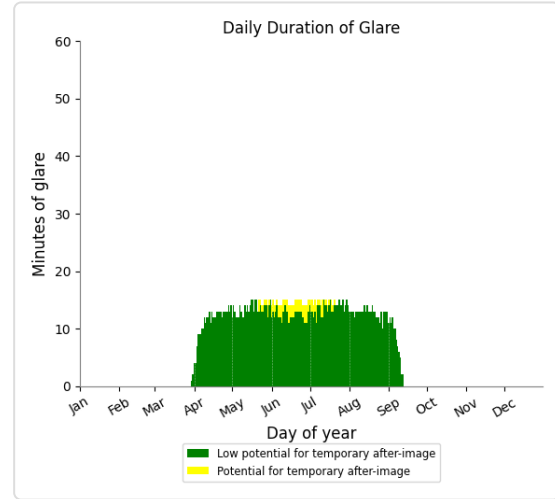
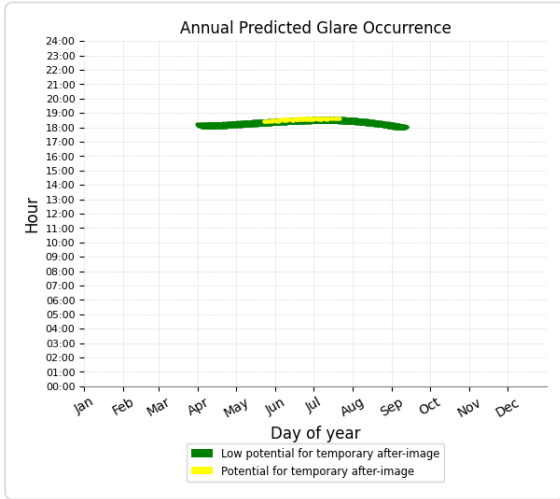
Green glare: 1,954 min.



PV array 1 and OP 14

Yellow glare: 102 min.

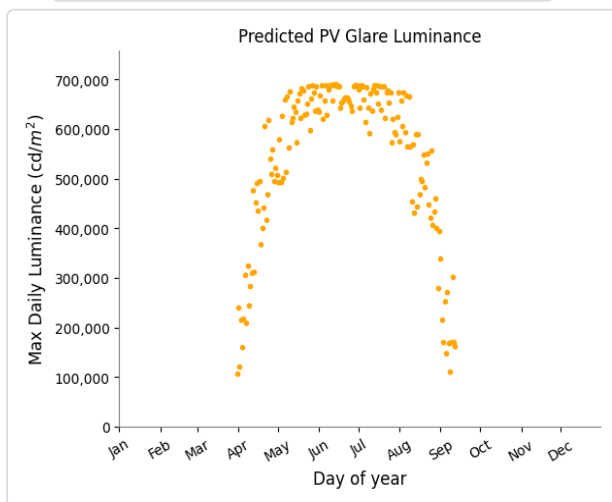
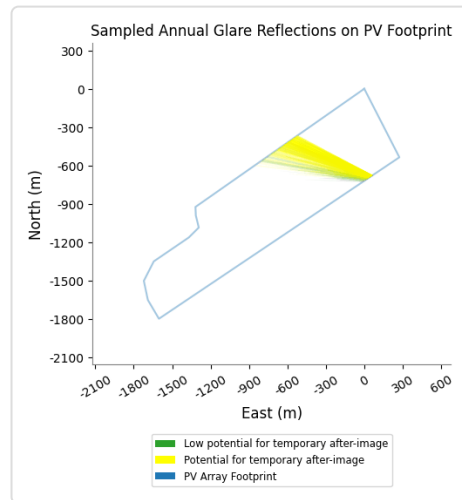
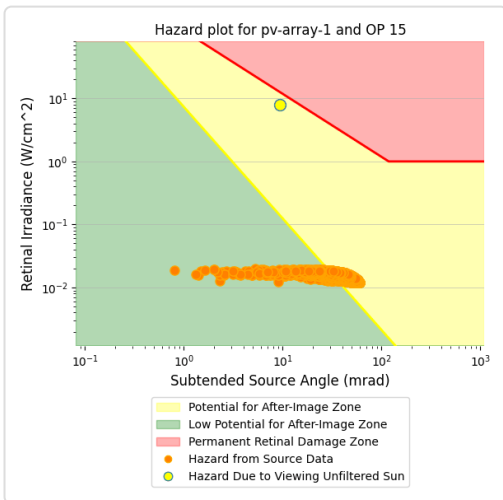
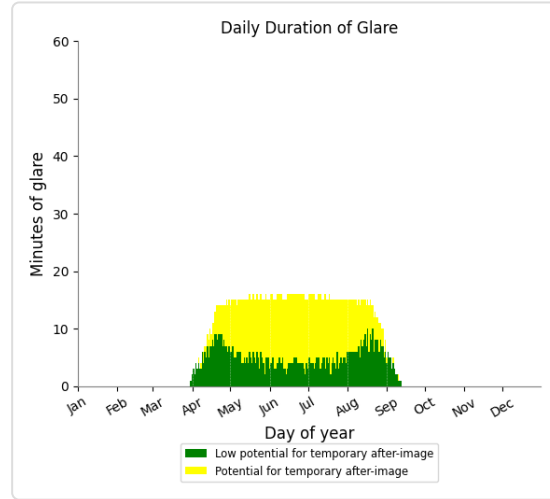
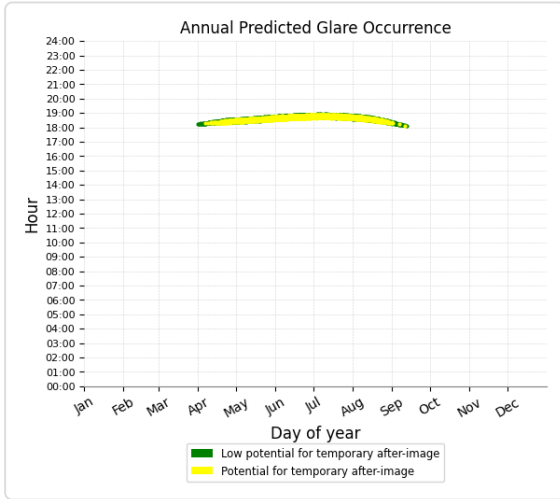
Green glare: 2,045 min.



PV array 1 and OP 15

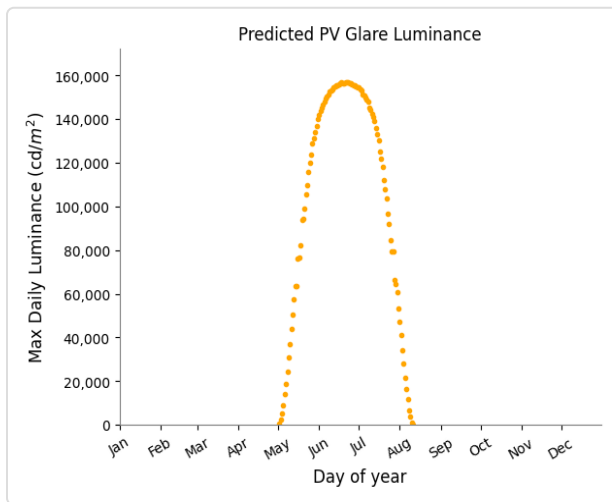
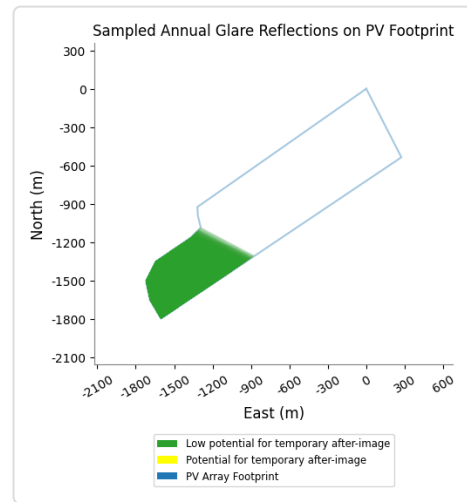
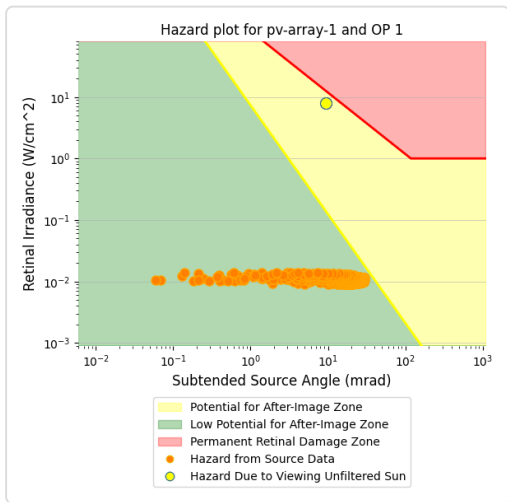
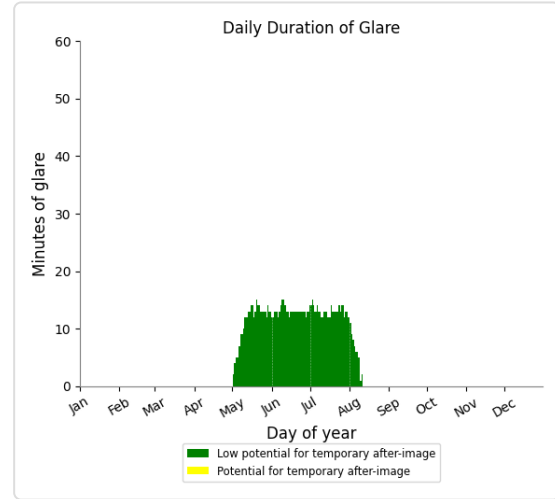
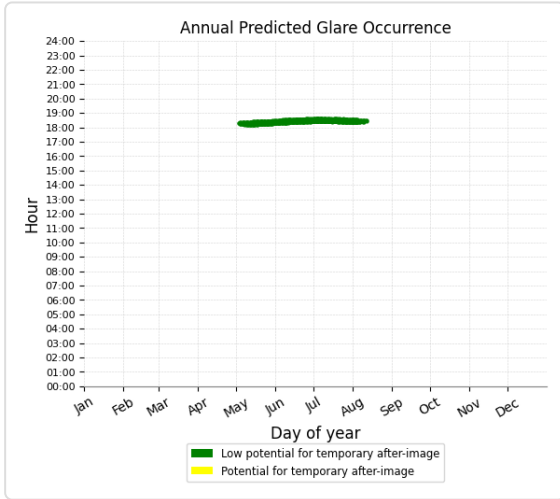
Yellow glare: 1,310 min.

Green glare: 838 min.



PV array 1 and OP 1

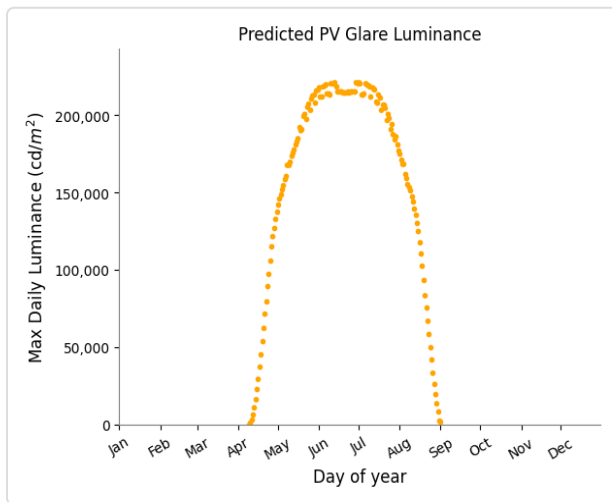
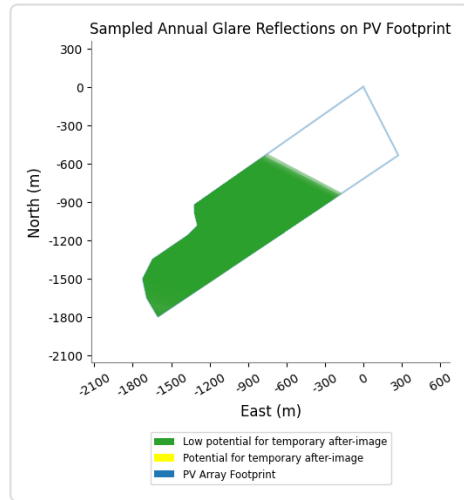
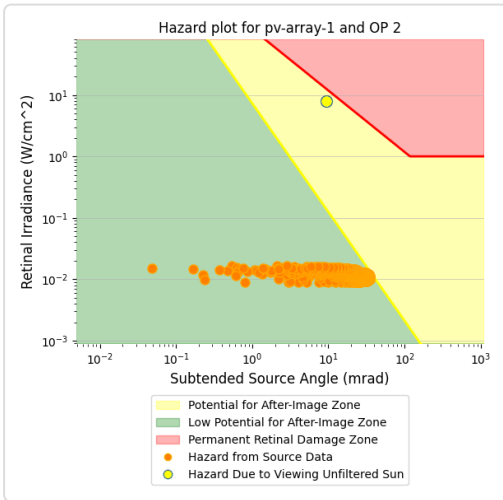
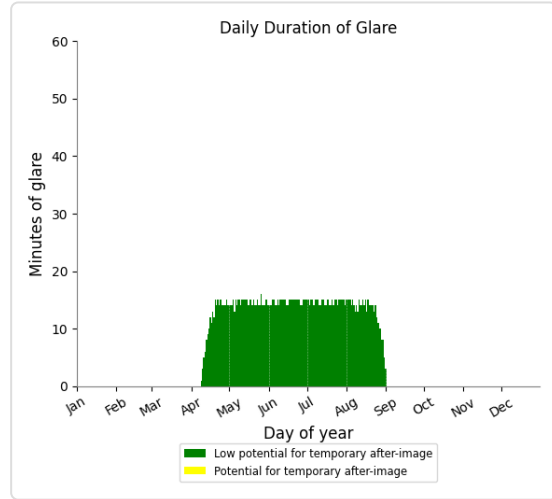
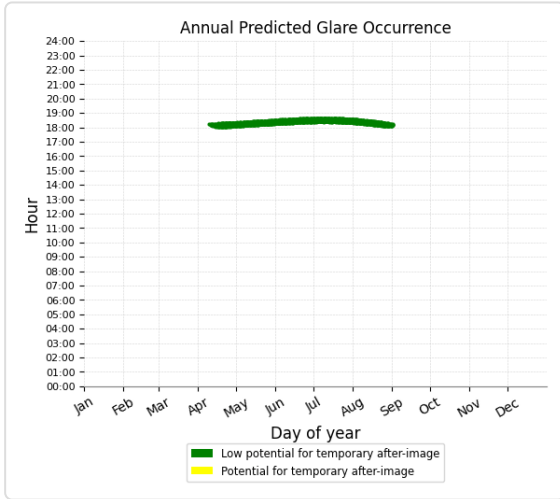
Yellow glare: none
 Green glare: 1,203 min.



PV array 1 and OP 2

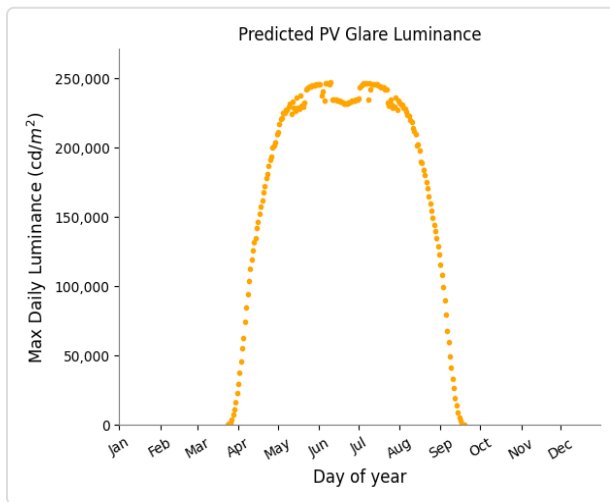
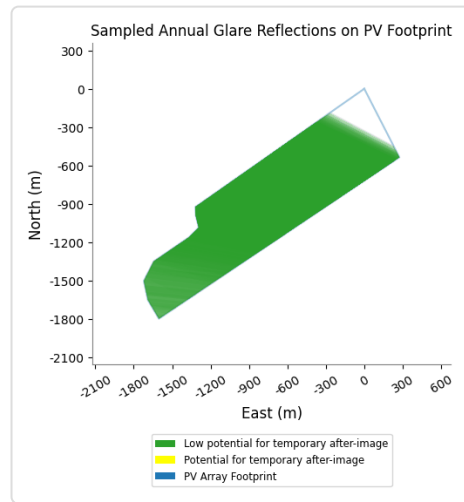
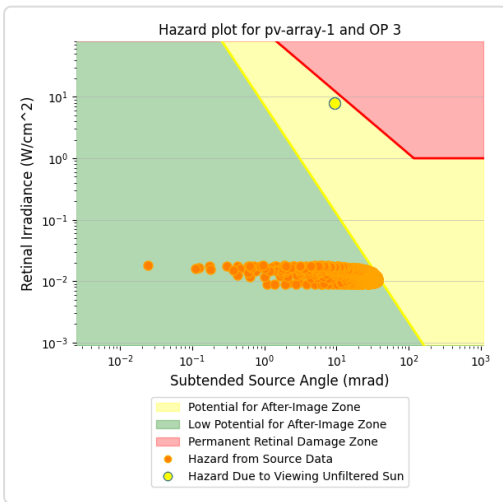
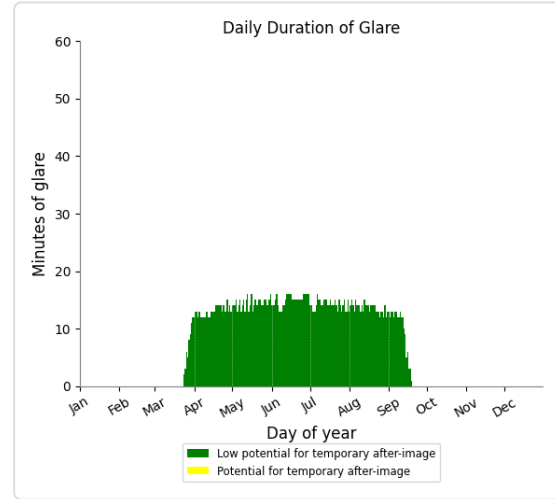
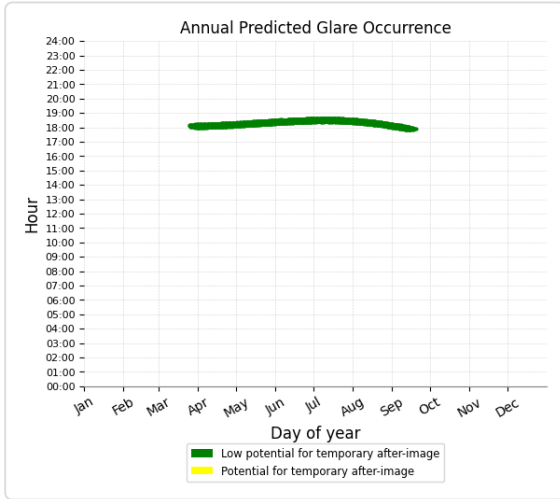
Yellow glare: none

Green glare: 1,998 min.



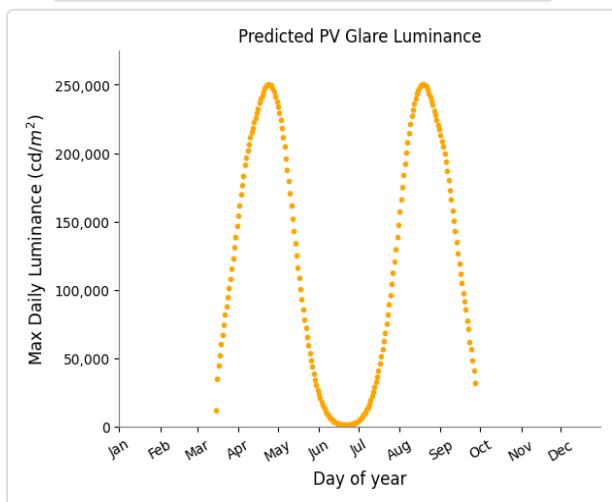
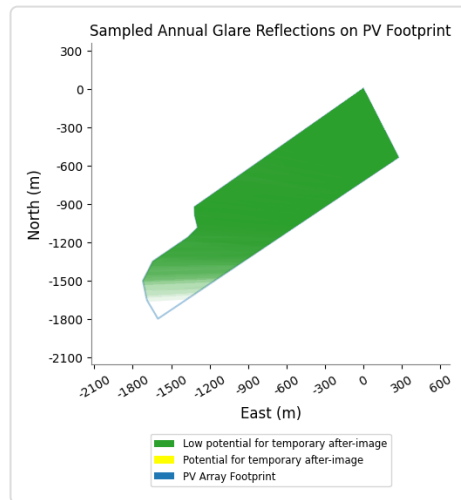
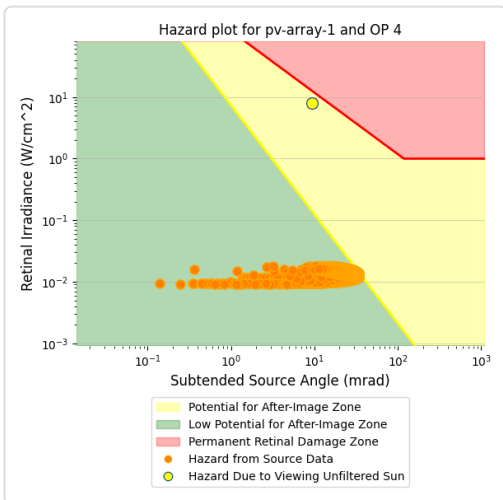
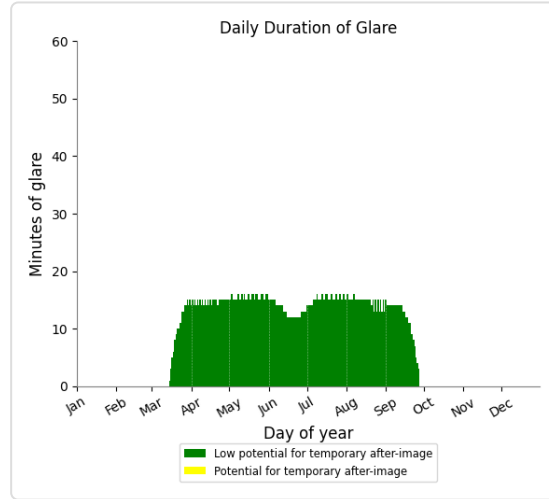
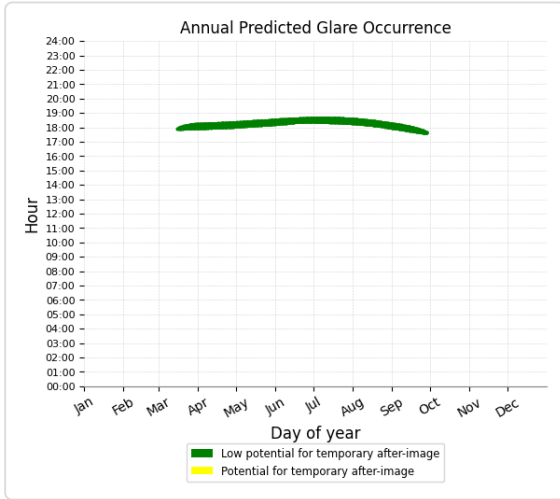
PV array 1 and OP 3

Yellow glare: none
 Green glare: 2,385 min.



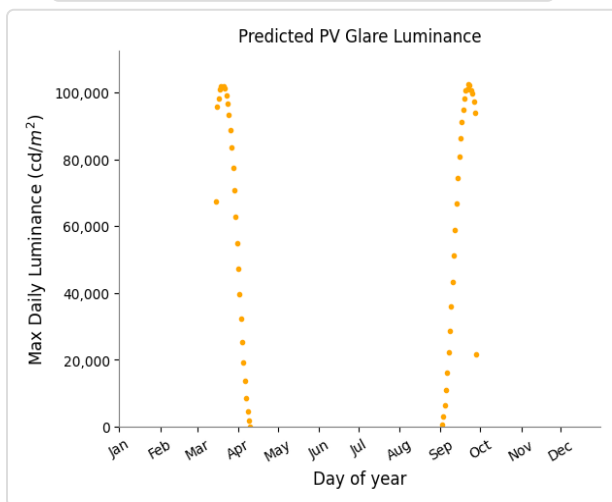
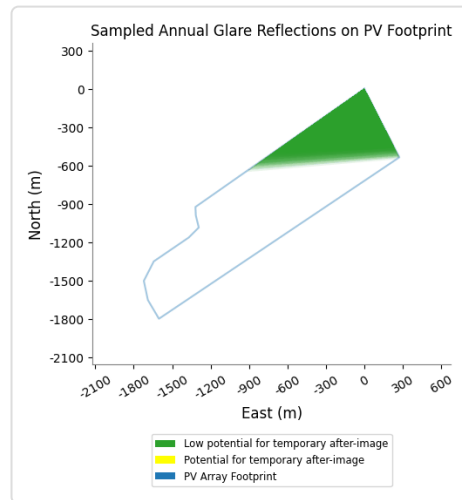
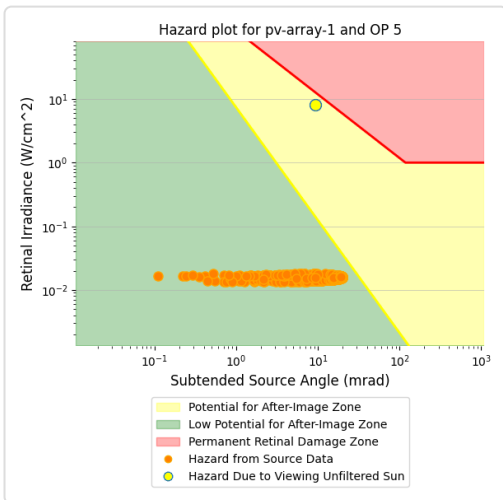
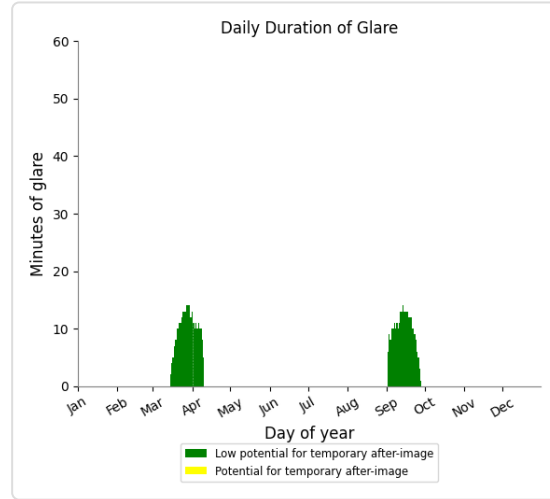
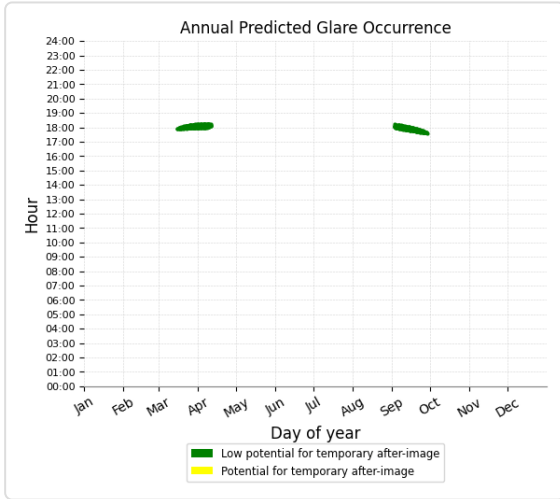
PV array 1 and OP 4

Yellow glare: none
 Green glare: 2,726 min.



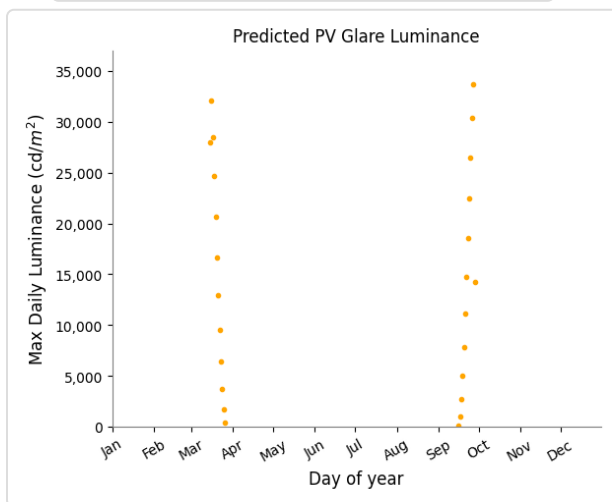
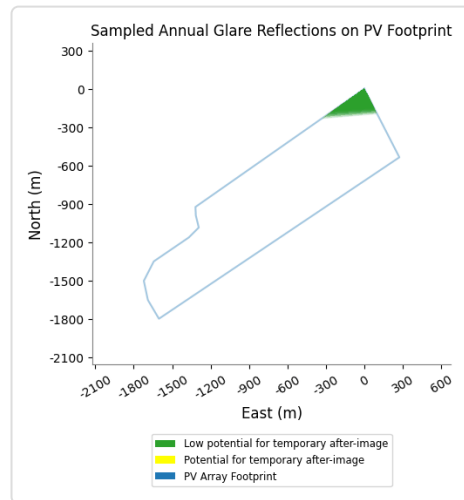
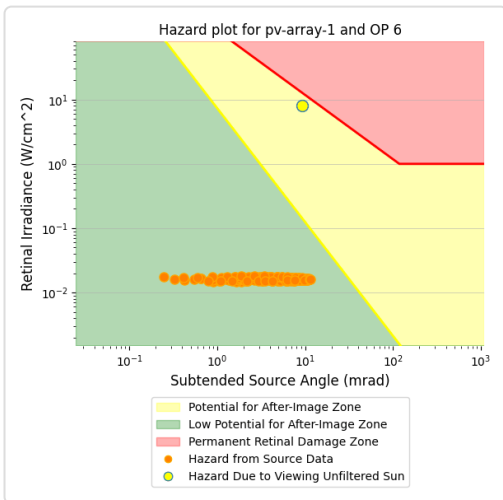
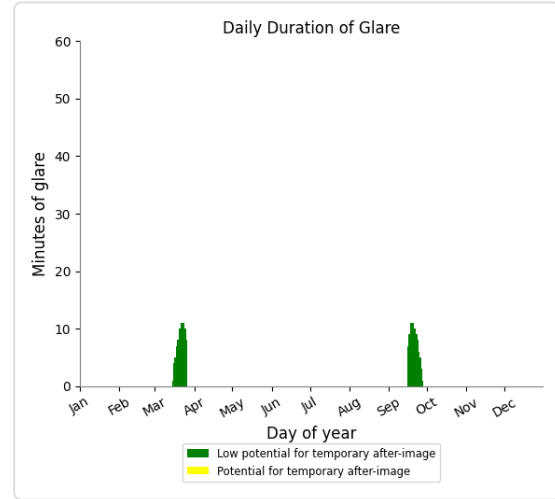
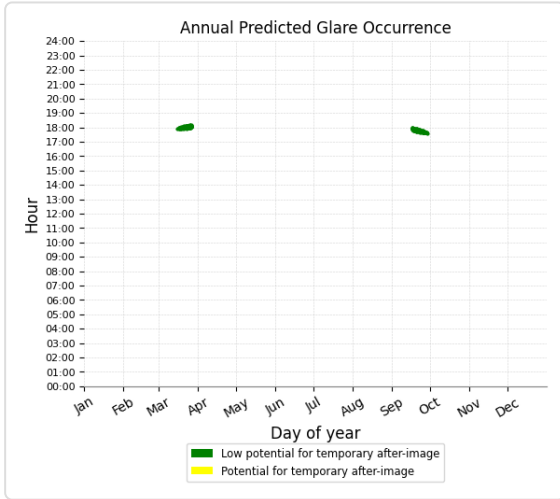
PV array 1 and OP 5

Yellow glare: none
 Green glare: 535 min.



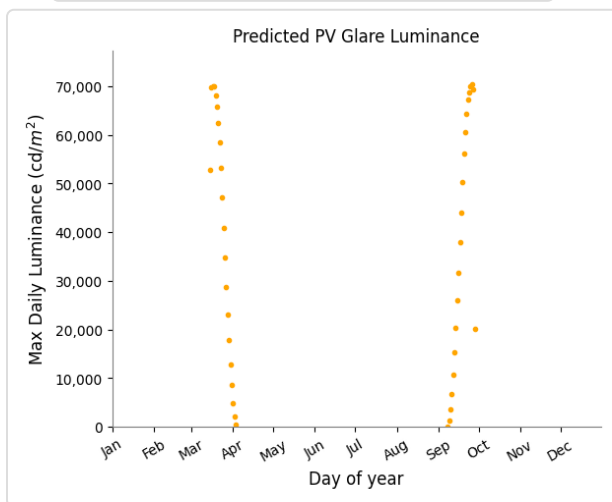
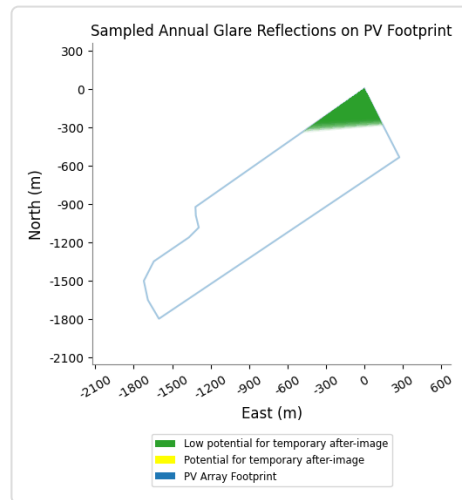
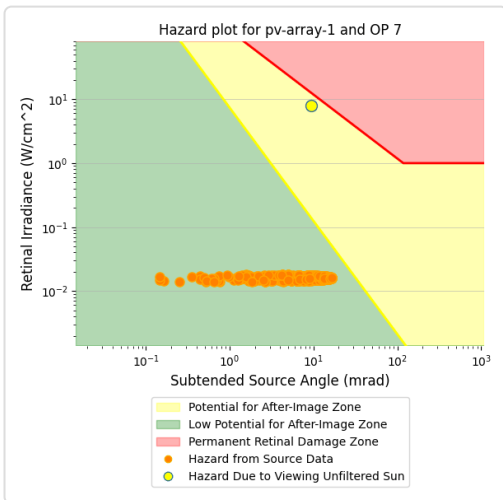
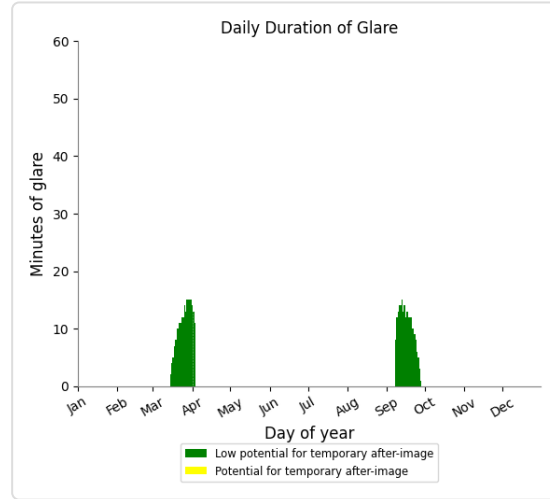
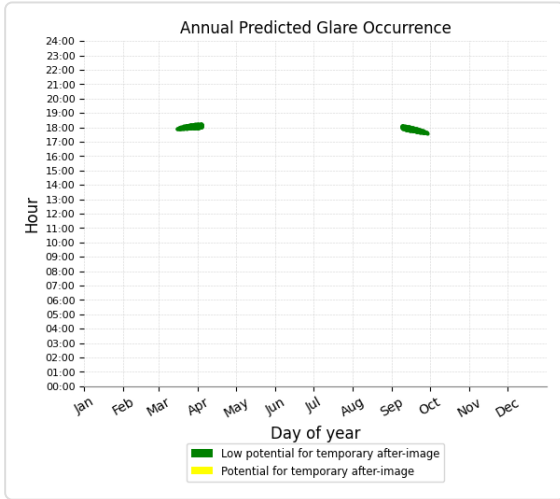
PV array 1 and OP 6

Yellow glare: none
 Green glare: 197 min.



PV array 1 and OP 7

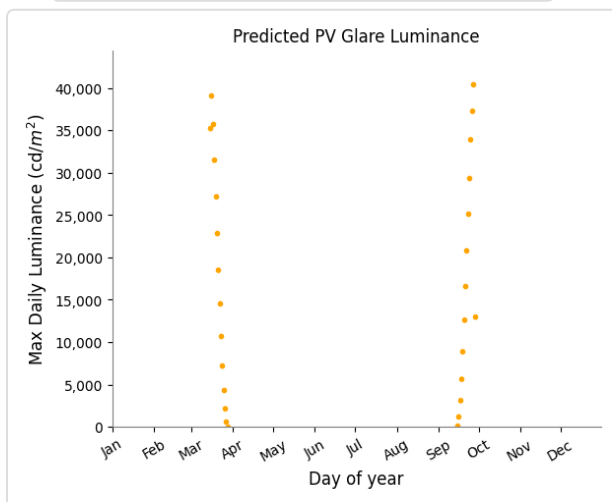
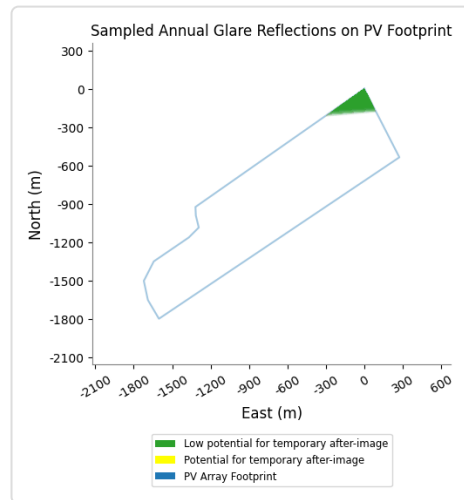
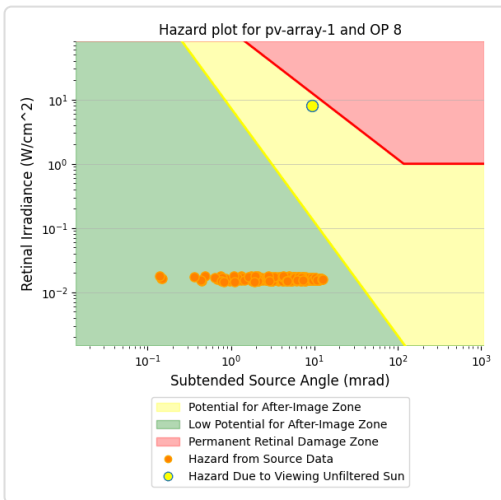
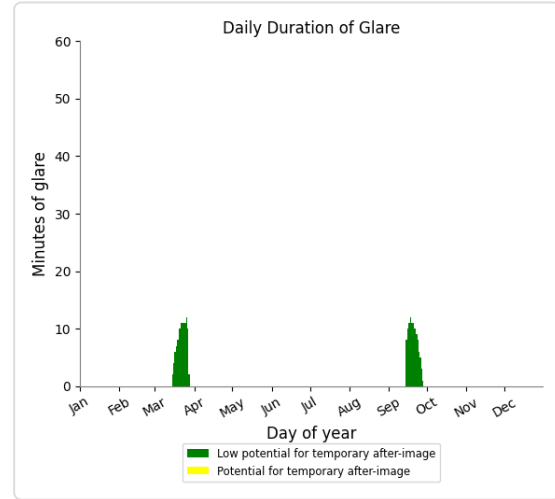
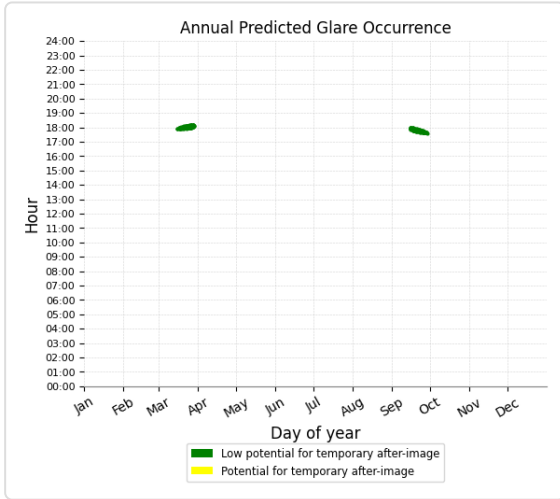
Yellow glare: none
 Green glare: 433 min.



PV array 1 and OP 8

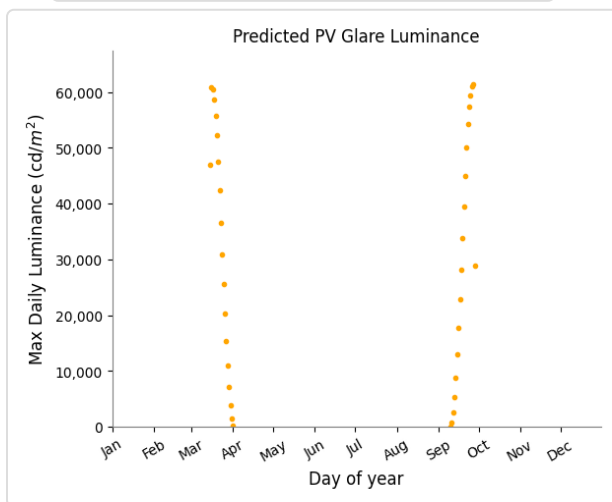
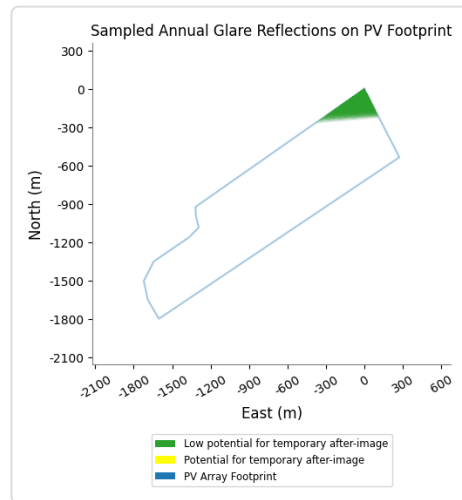
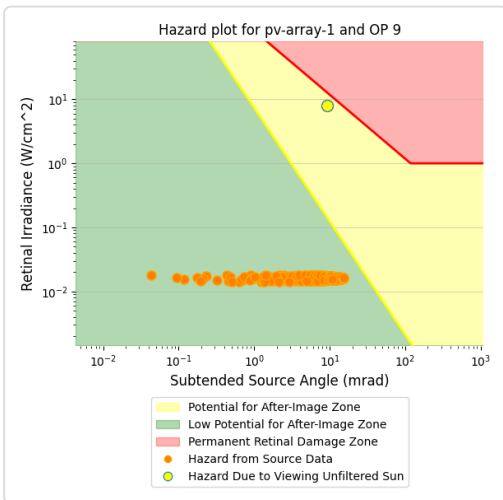
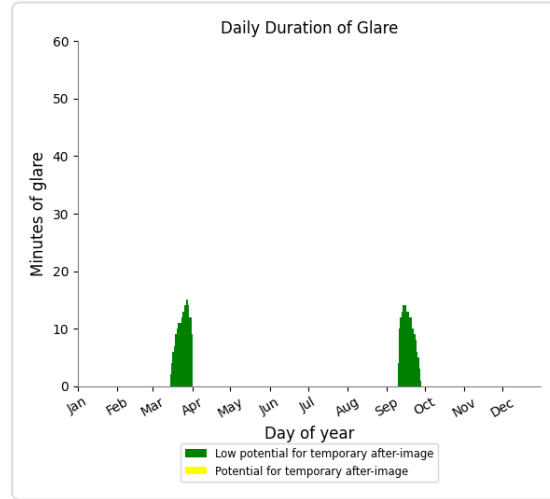
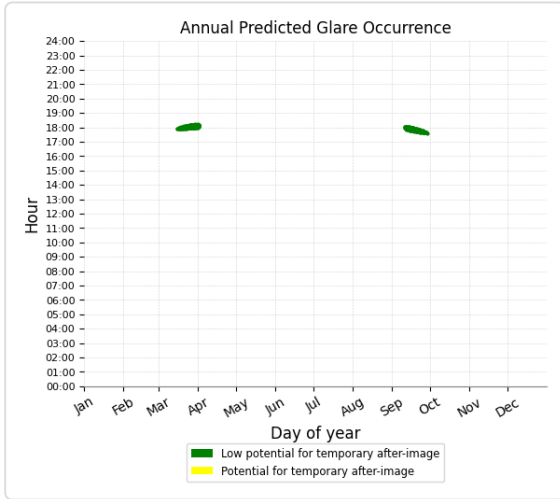
Yellow glare: none

Green glare: 230 min.



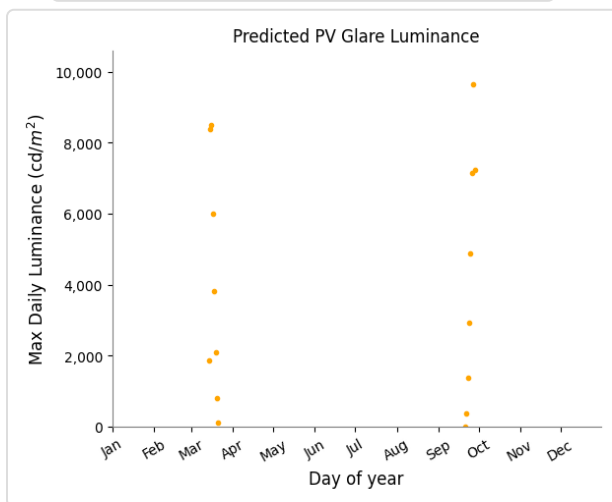
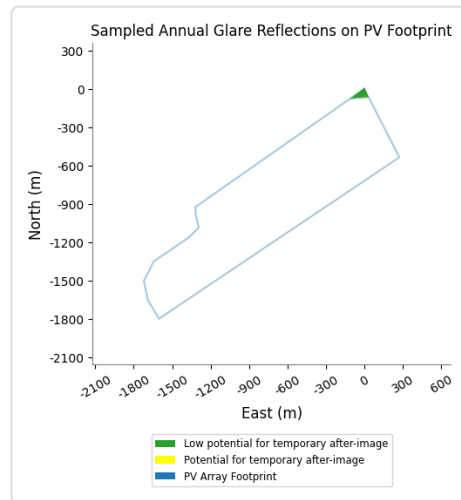
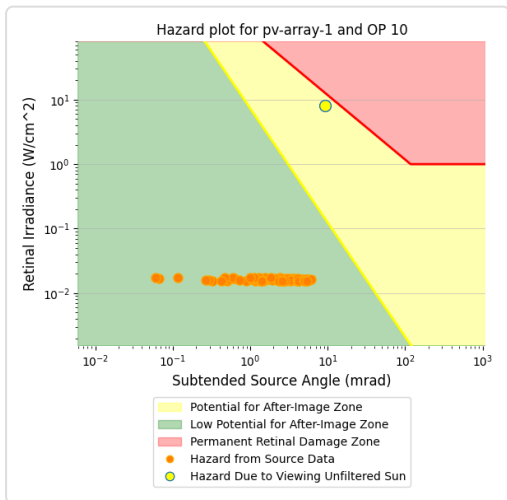
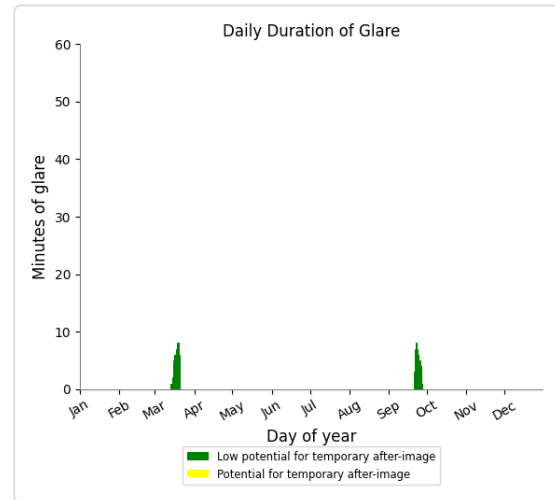
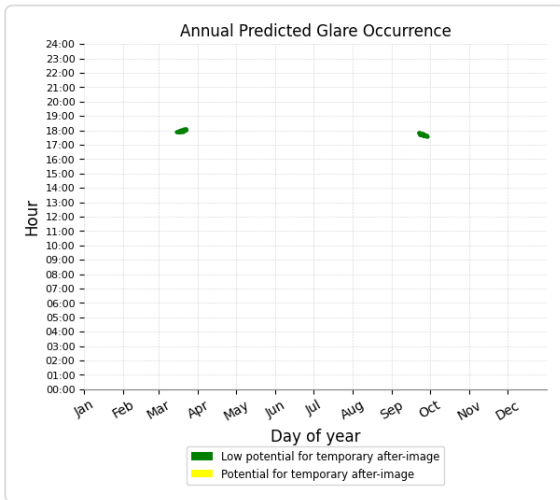
PV array 1 and OP 9

Yellow glare: none
 Green glare: 369 min.



PV array 1 and OP 10

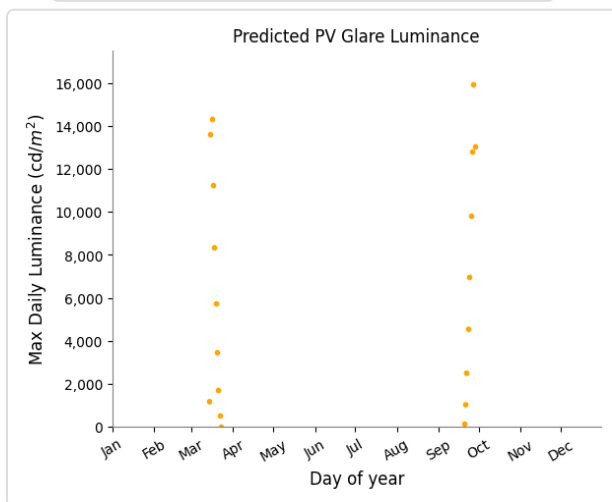
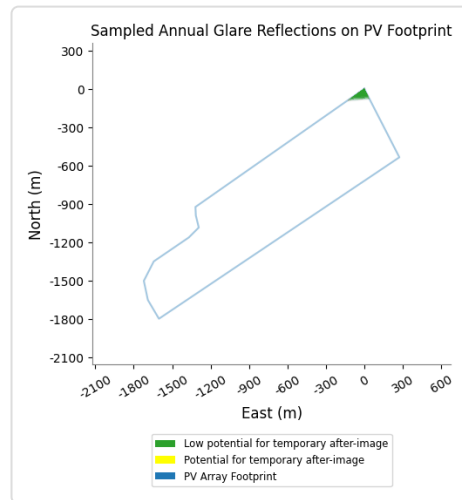
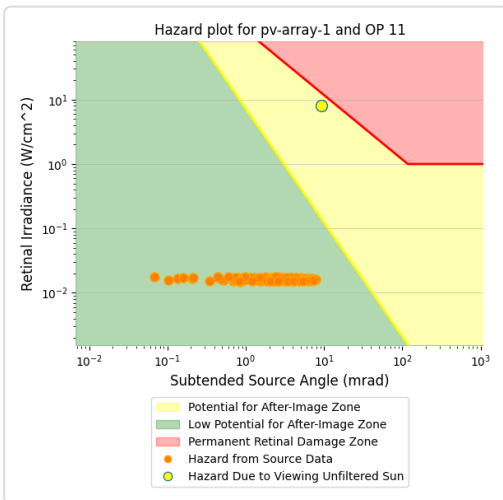
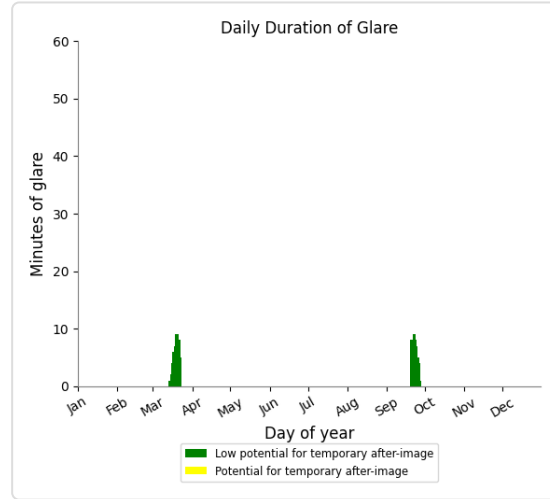
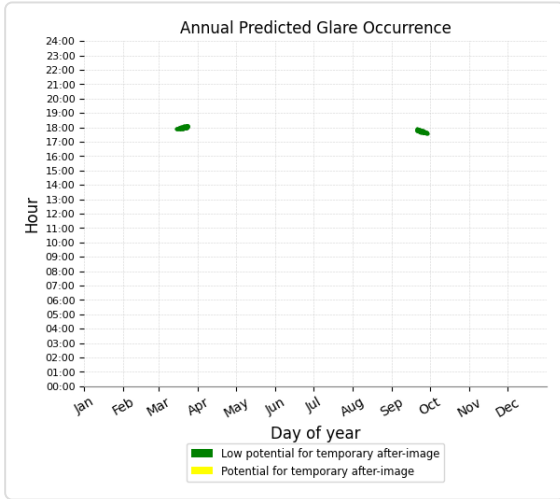
Yellow glare: none
 Green glare: 84 min.



PV array 1 and OP 11

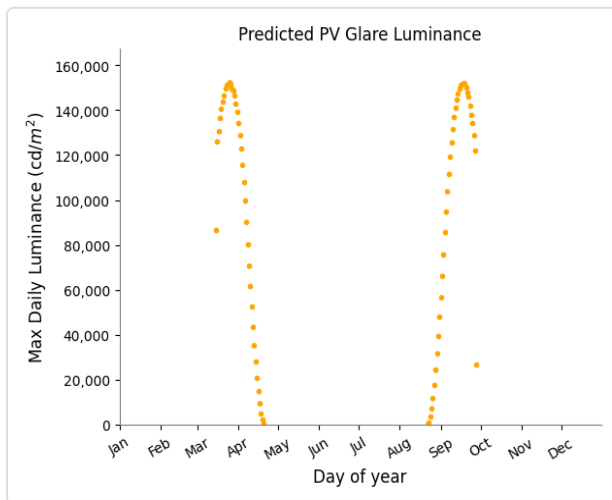
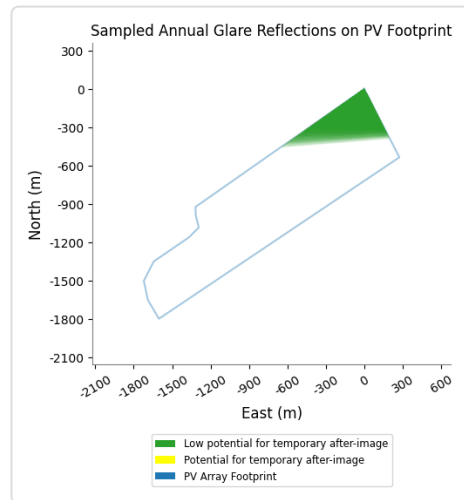
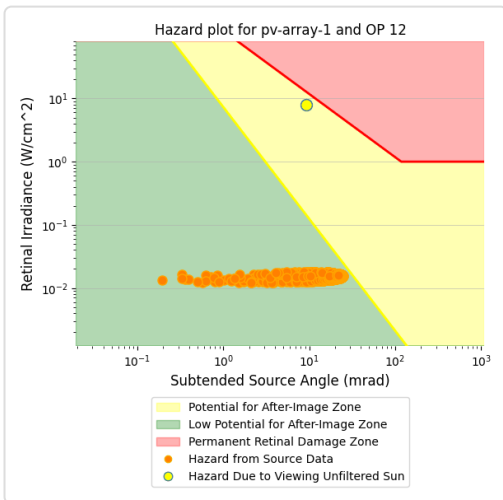
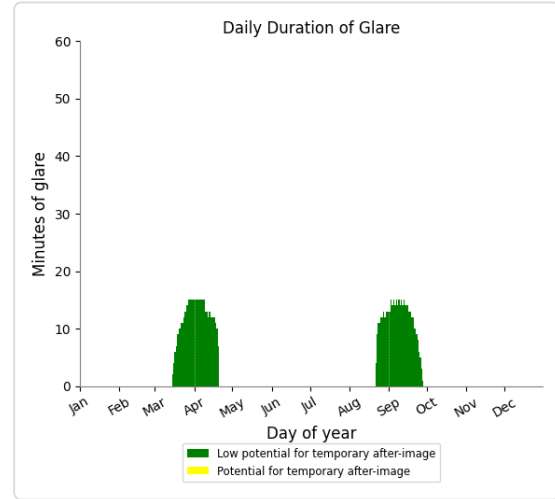
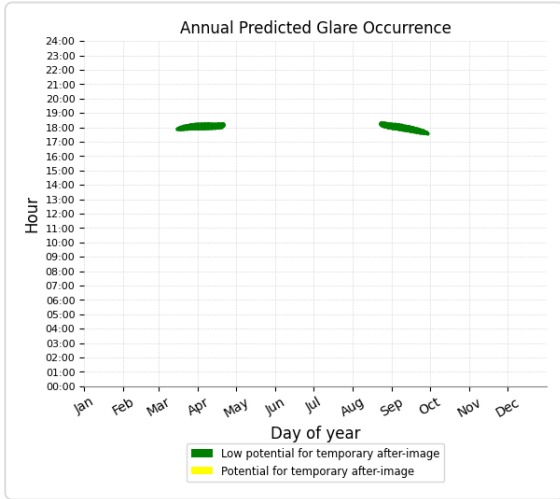
Yellow glare: none

Green glare: 119 min.



PV array 1 and OP 12

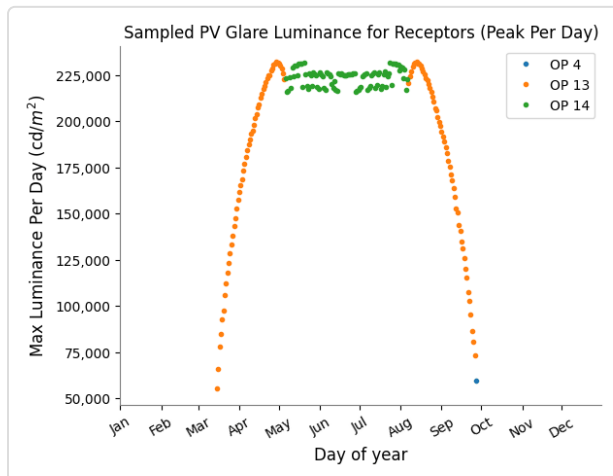
Yellow glare: none
 Green glare: 885 min.



PV: PV array 2 low potential for temporary after-image

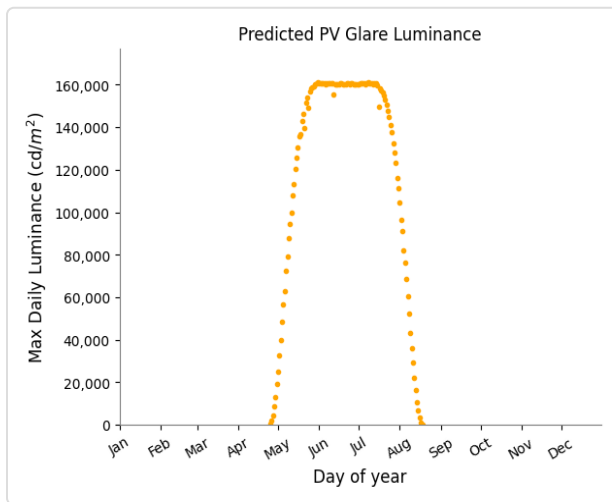
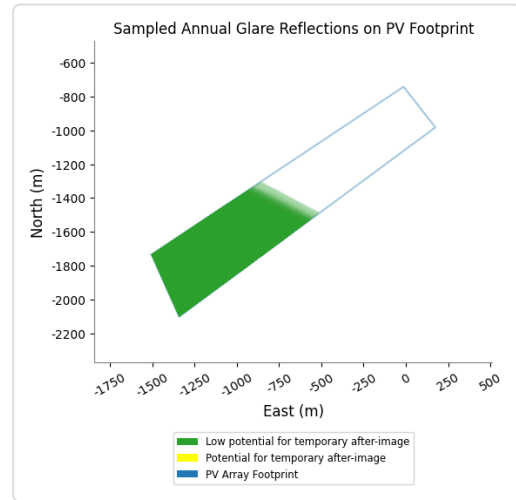
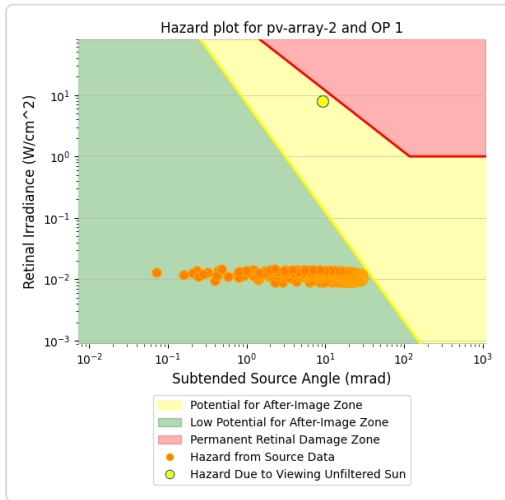
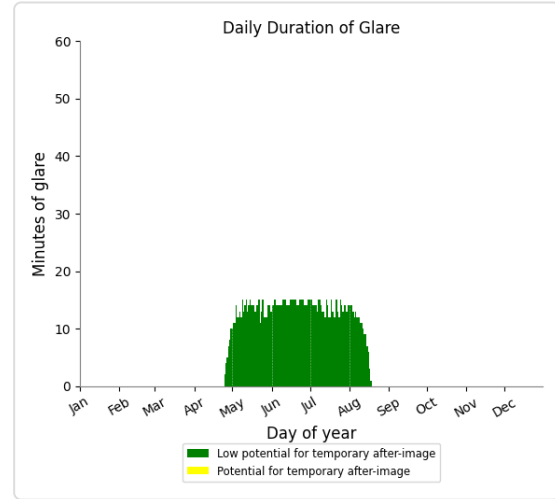
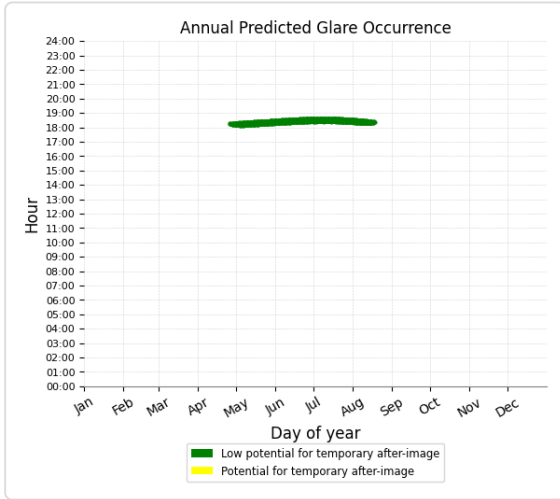
Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare		Peak Luminance
	min	hr	min	hr	cd/m ²
OP 1	1,484	24.7	0	0.0	161,062
OP 2	2,167	36.1	0	0.0	159,916
OP 3	2,378	39.6	0	0.0	163,532
OP 4	772	12.9	0	0.0	128,382
OP 13	2,542	42.4	0	0.0	232,041
OP 14	2,239	37.3	0	0.0	231,894
OP 5	0	0.0	0	0.0	0
OP 6	0	0.0	0	0.0	0
OP 7	0	0.0	0	0.0	0
OP 8	0	0.0	0	0.0	0
OP 9	0	0.0	0	0.0	0
OP 10	0	0.0	0	0.0	0
OP 11	0	0.0	0	0.0	0
OP 12	0	0.0	0	0.0	0
OP 15	0	0.0	0	0.0	0



PV array 2 and OP 1

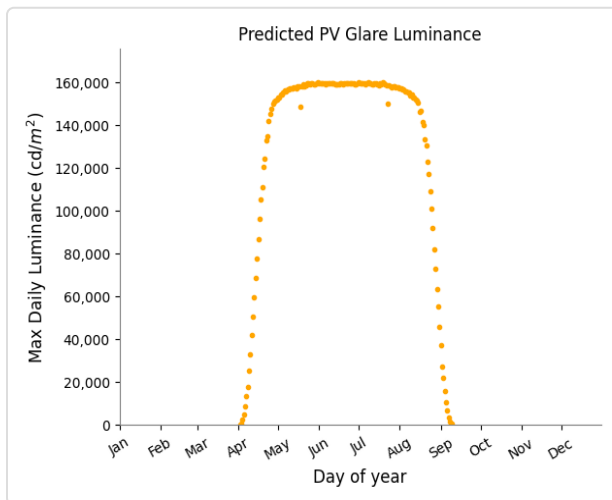
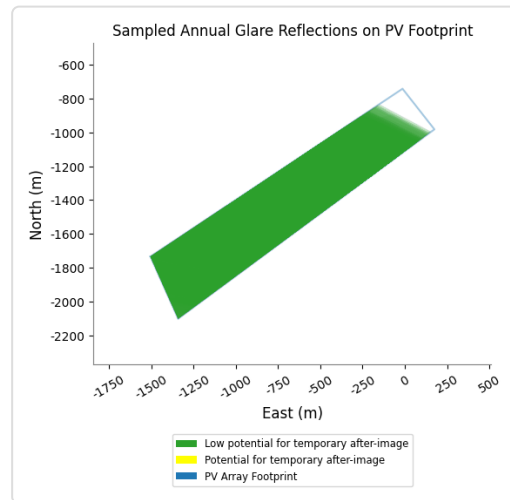
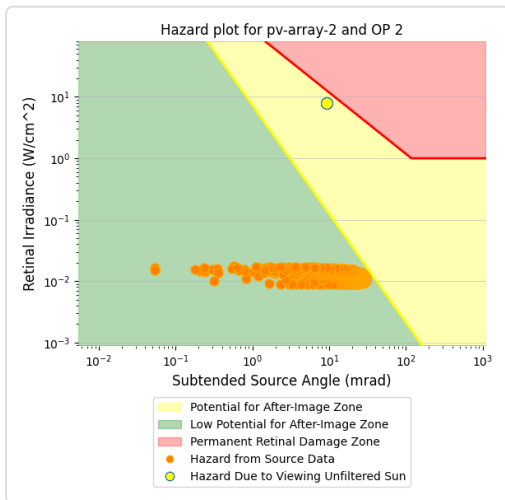
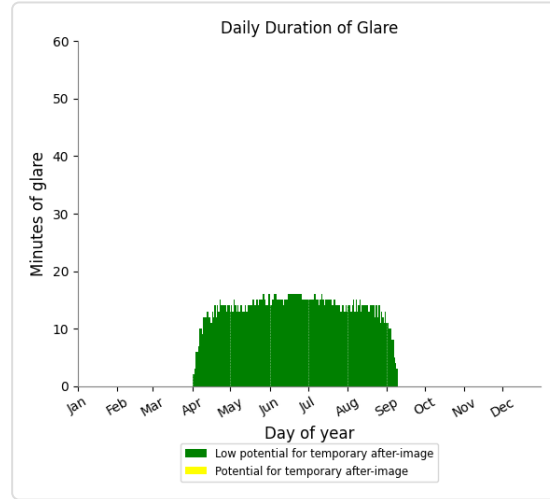
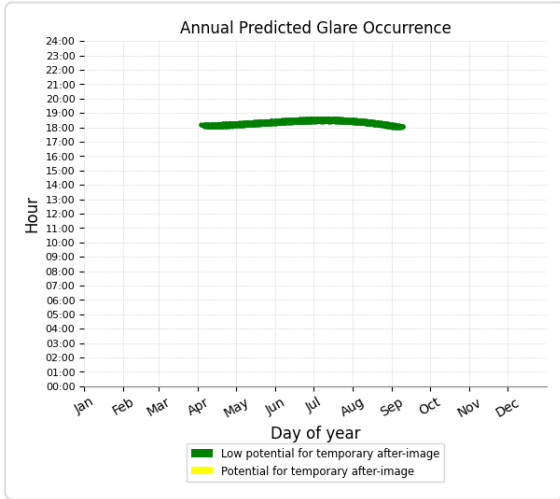
Yellow glare: none
 Green glare: 1,484 min.



PV array 2 and OP 2

Yellow glare: none

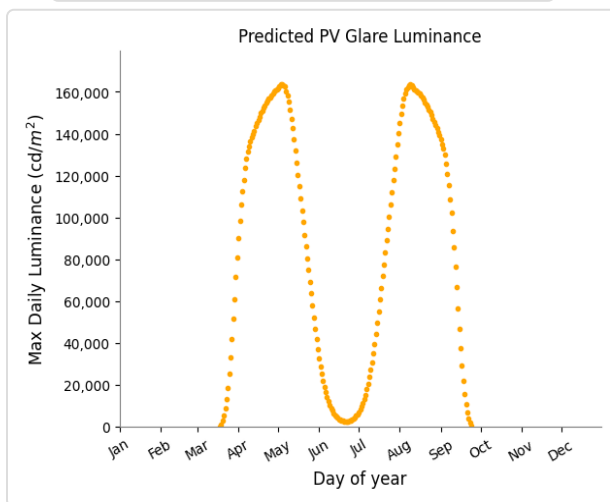
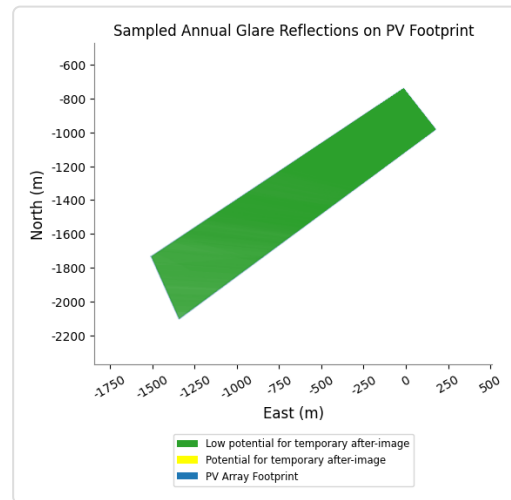
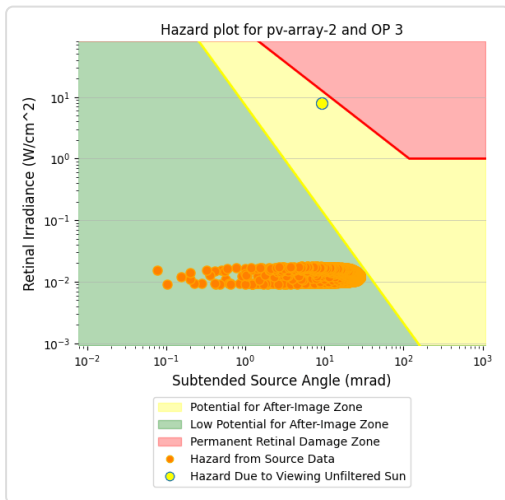
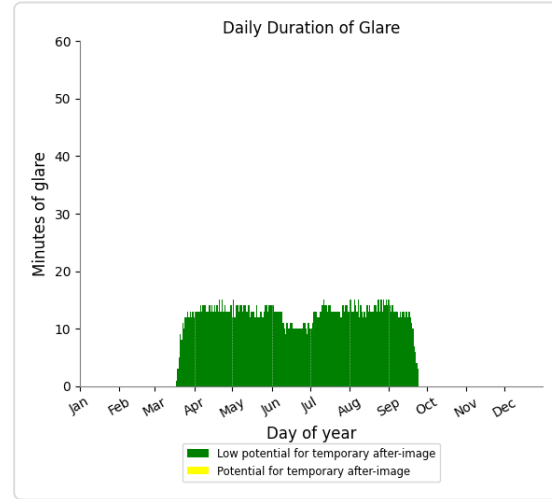
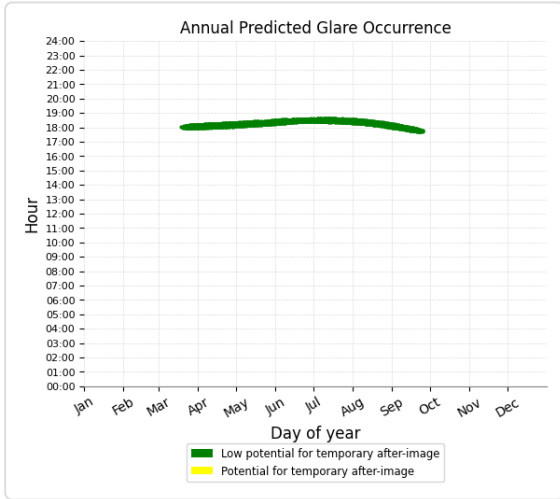
Green glare: 2,167 min.



PV array 2 and OP 3

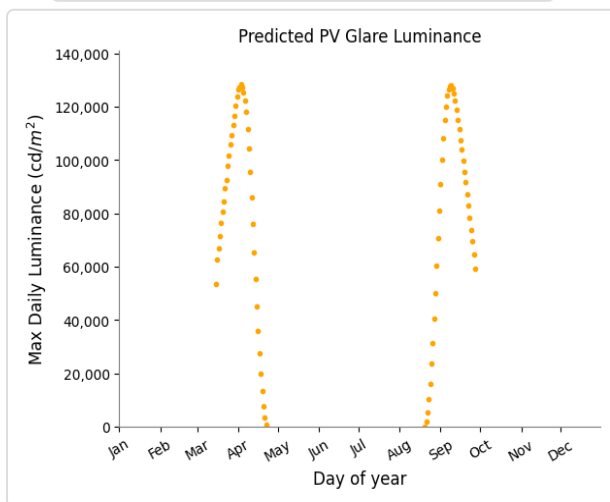
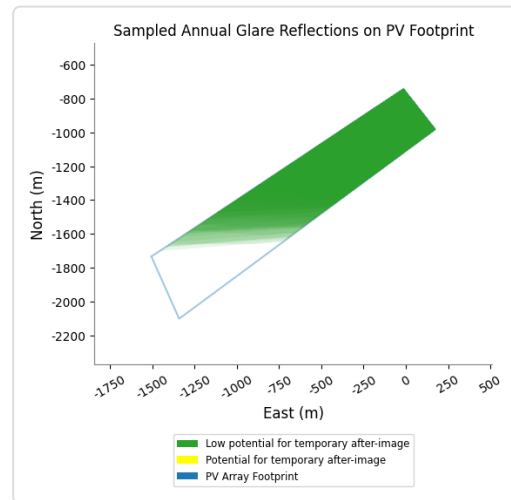
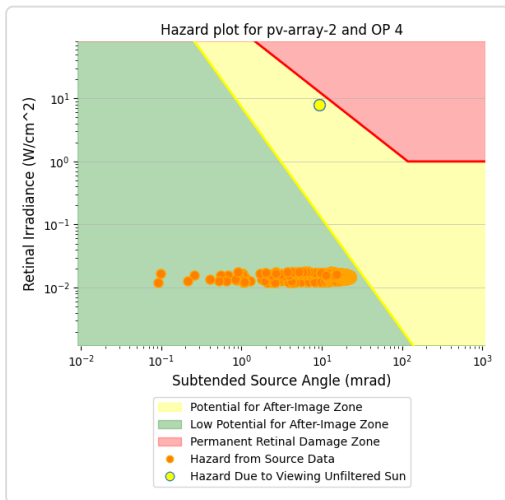
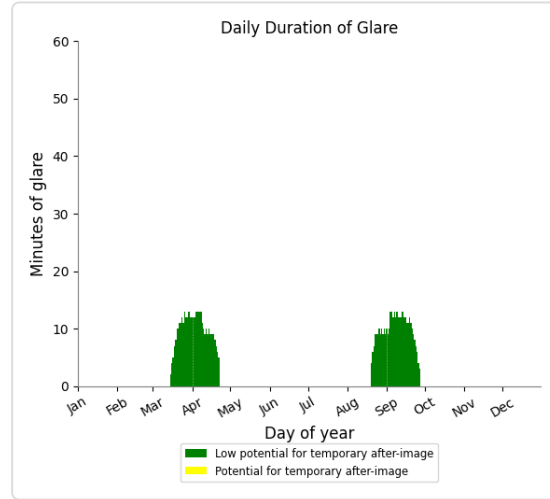
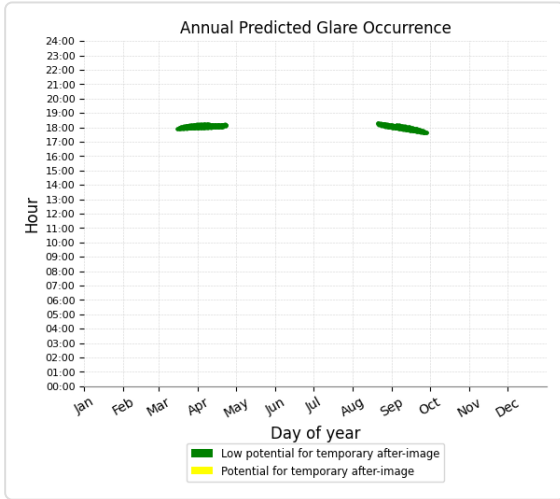
Yellow glare: none

Green glare: 2,378 min.



PV array 2 and OP 4

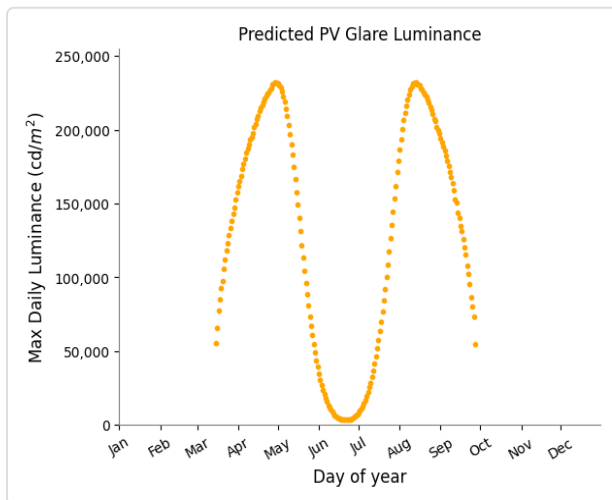
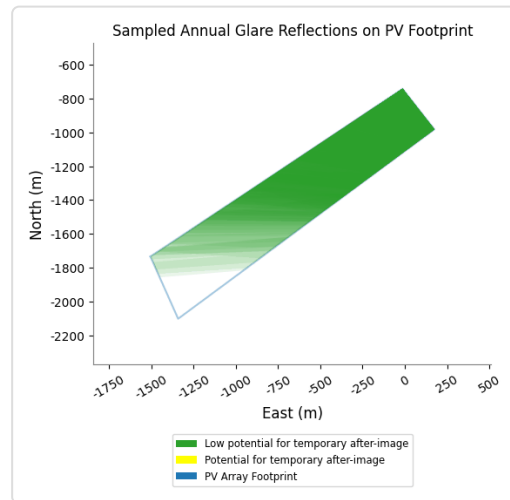
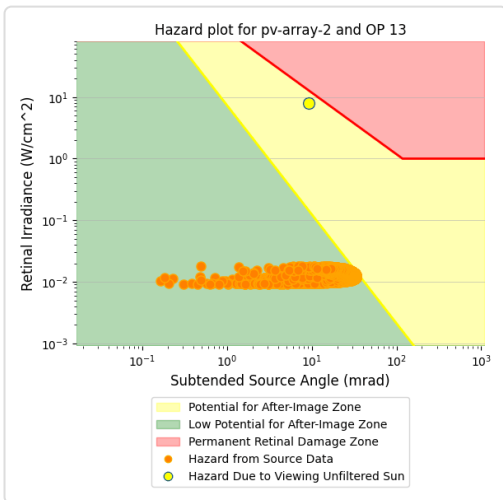
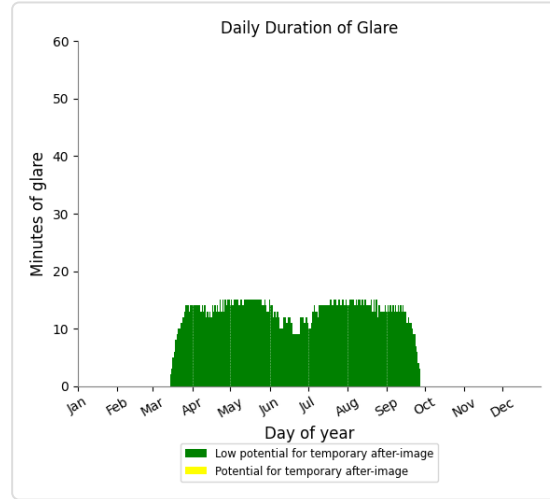
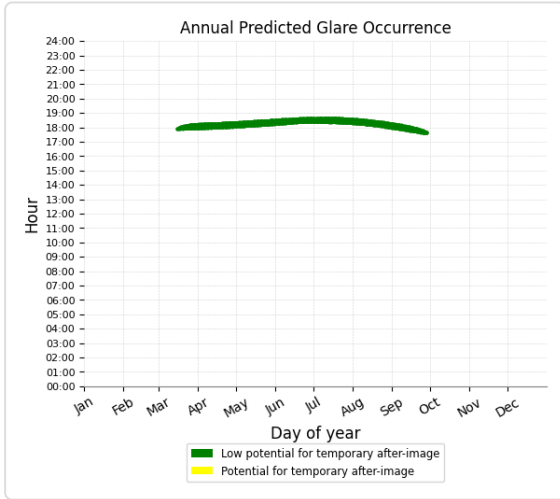
Yellow glare: none
 Green glare: 772 min.



PV array 2 and OP 13

Yellow glare: none

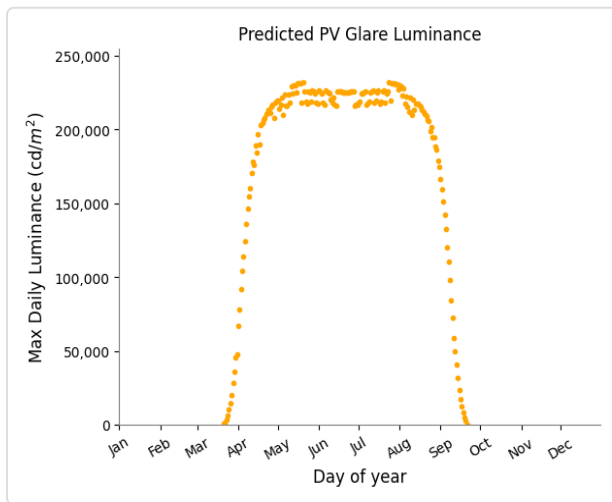
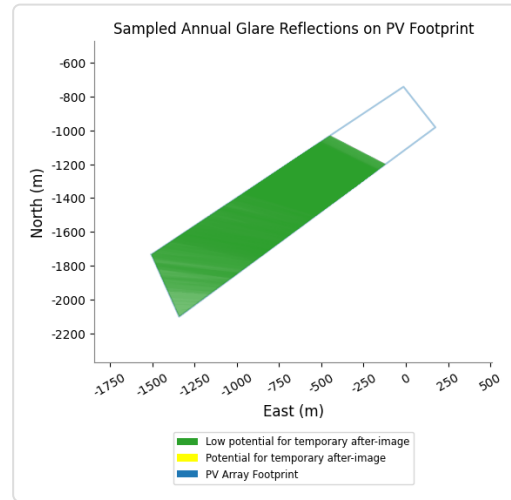
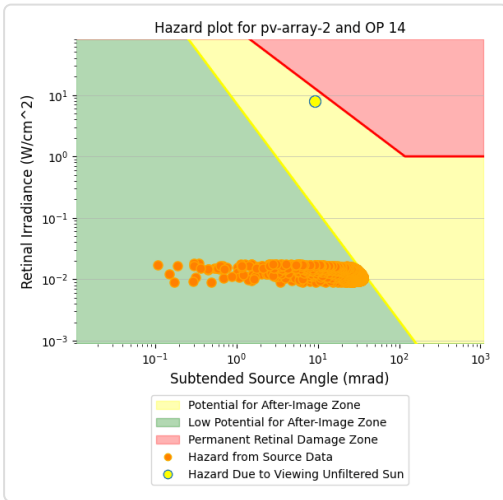
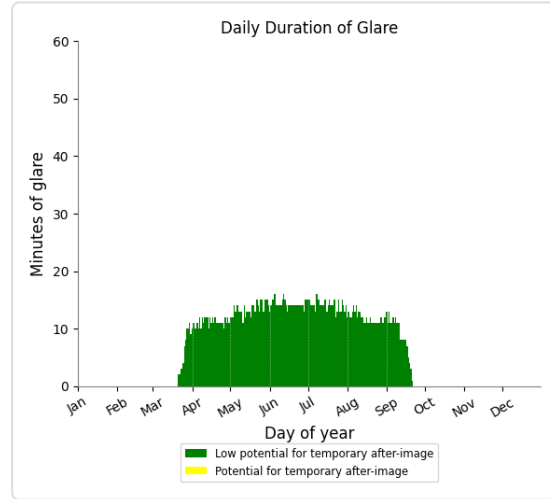
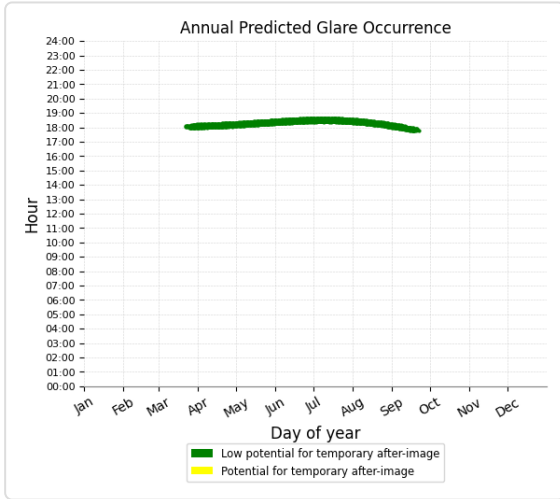
Green glare: 2,542 min.



PV array 2 and OP 14

Yellow glare: none

Green glare: 2,239 min.



PV array 2 and OP 5

No glare found

PV array 2 and OP 6

No glare found

PV array 2 and OP 7

No glare found

PV array 2 and OP 8

No glare found

PV array 2 and OP 9

No glare found

PV array 2 and OP 10

No glare found

PV array 2 and OP 11

No glare found

PV array 2 and OP 12

No glare found

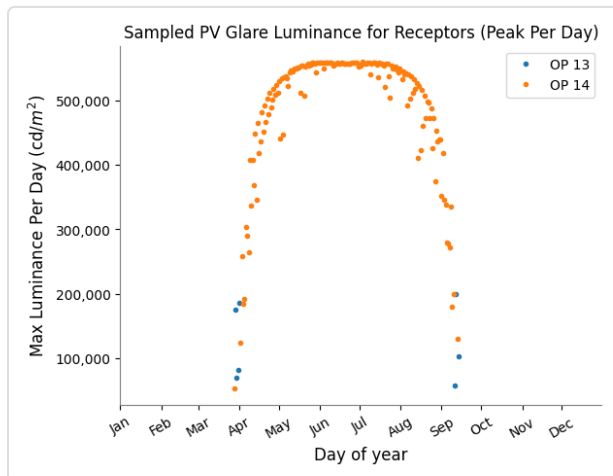
PV array 2 and OP 15

No glare found

PV: PV array 3 potential temporary after-image

Receptor results ordered by category of glare

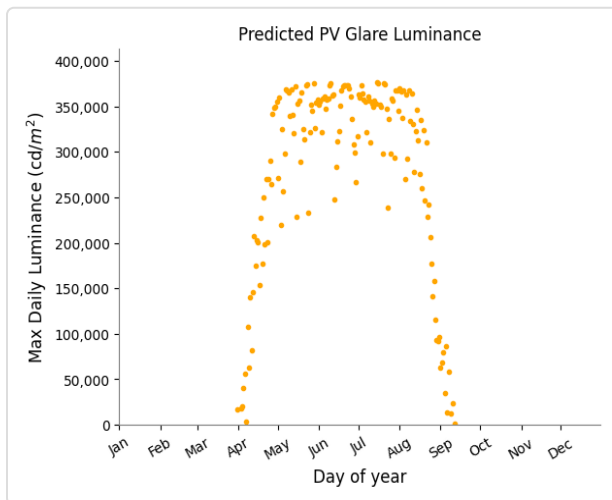
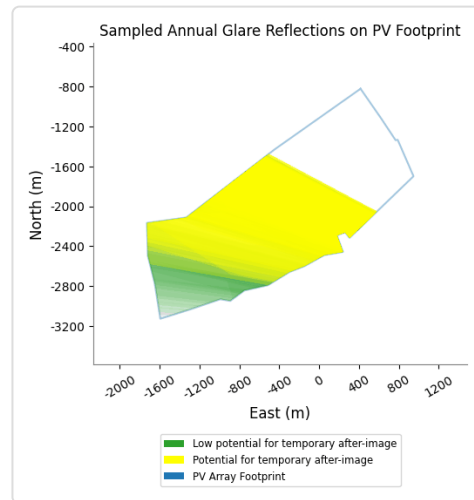
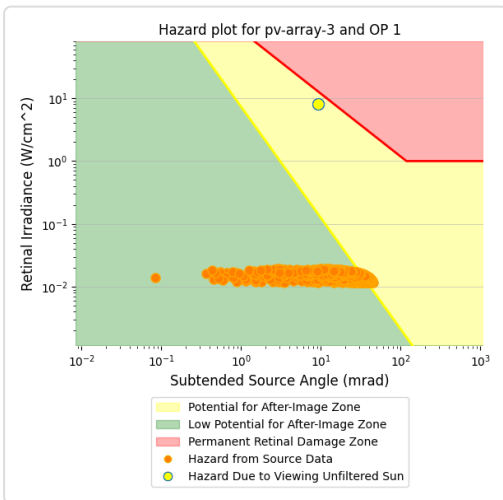
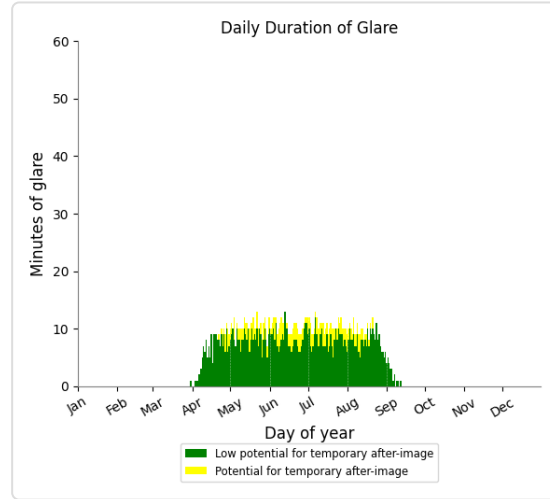
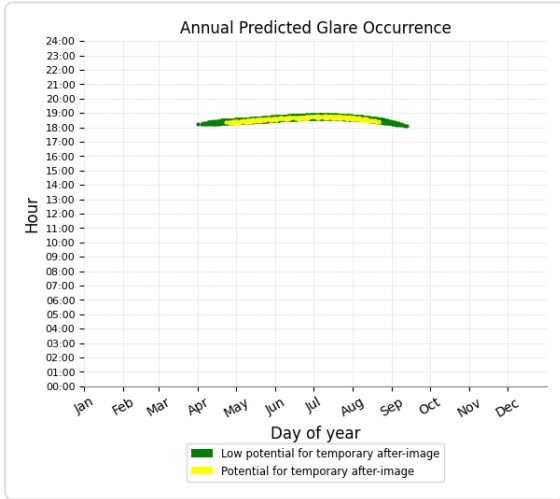
Receptor	Annual Green Glare		Annual Yellow Glare		Peak Luminance
	min	hr	min	hr	cd/m ²
OP 1	1,198	20.0	262	4.4	376,139
OP 13	1,456	24.3	109	1.8	362,824
OP 14	821	13.7	1,229	20.5	559,430
OP 2	50	0.8	0	0.0	98,172
OP 3	21	0.3	0	0.0	44,380
OP 4	0	0.0	0	0.0	0
OP 5	0	0.0	0	0.0	0
OP 6	0	0.0	0	0.0	0
OP 7	0	0.0	0	0.0	0
OP 8	0	0.0	0	0.0	0
OP 9	0	0.0	0	0.0	0
OP 10	0	0.0	0	0.0	0
OP 11	0	0.0	0	0.0	0
OP 12	0	0.0	0	0.0	0
OP 15	0	0.0	0	0.0	0



PV array 3 and OP 1

Yellow glare: 262 min.

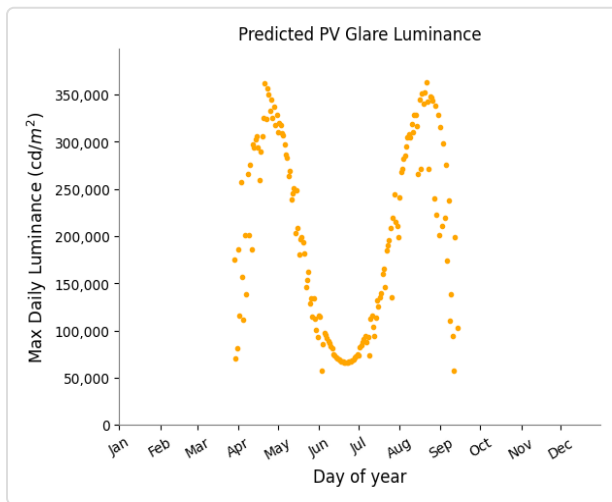
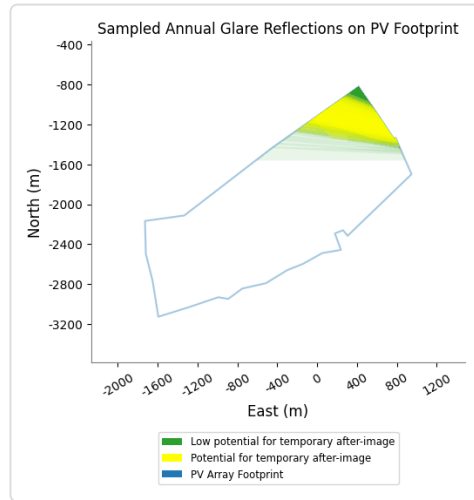
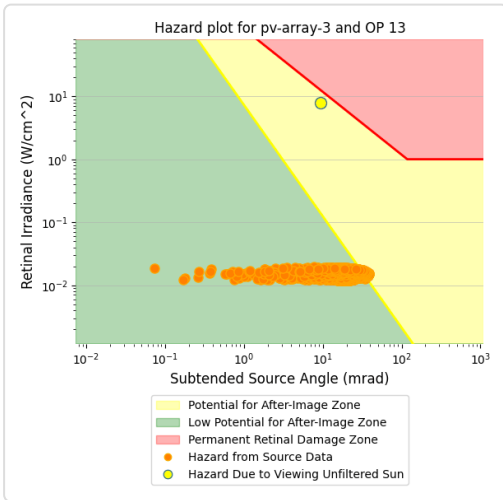
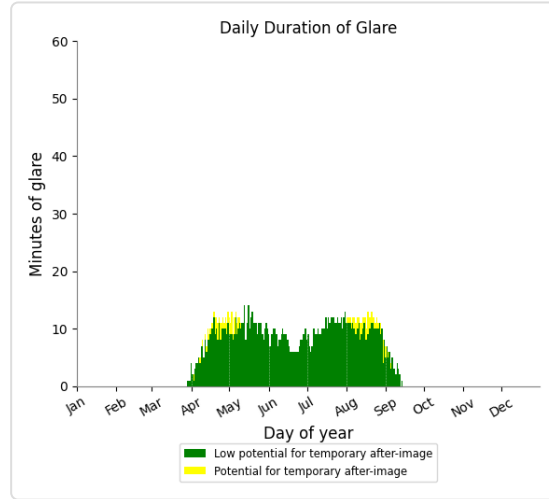
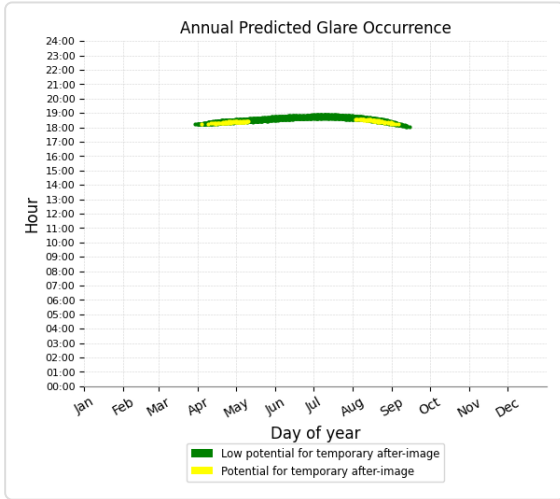
Green glare: 1,198 min.



PV array 3 and OP 13

Yellow glare: 109 min.

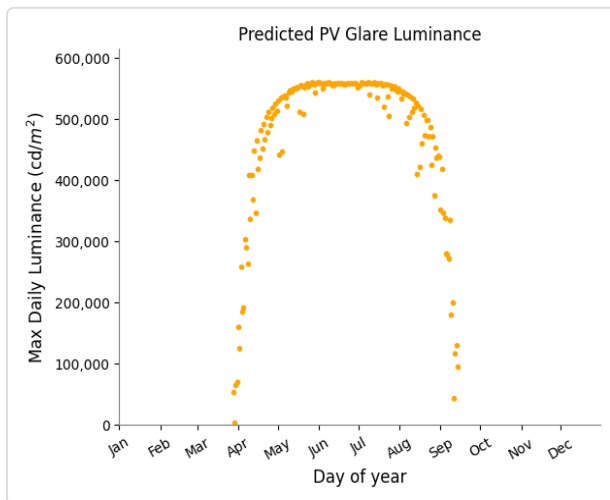
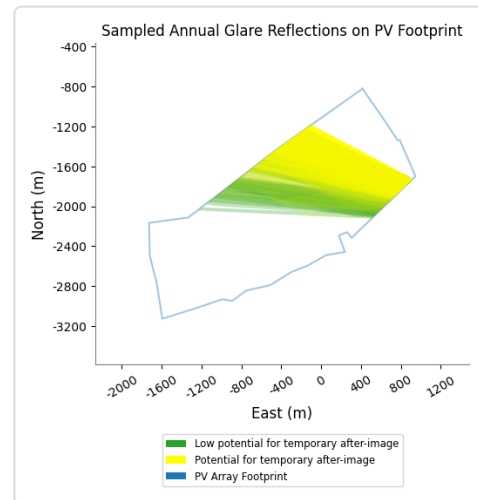
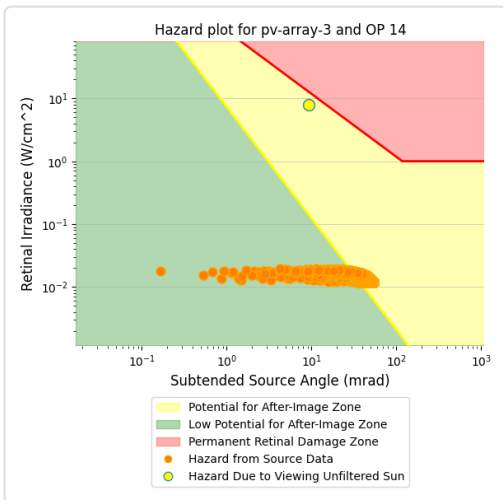
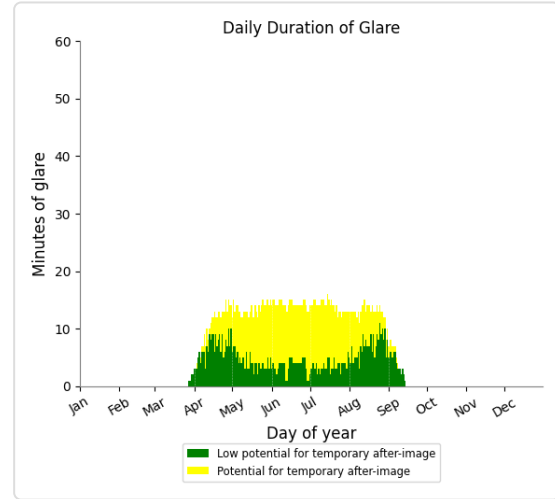
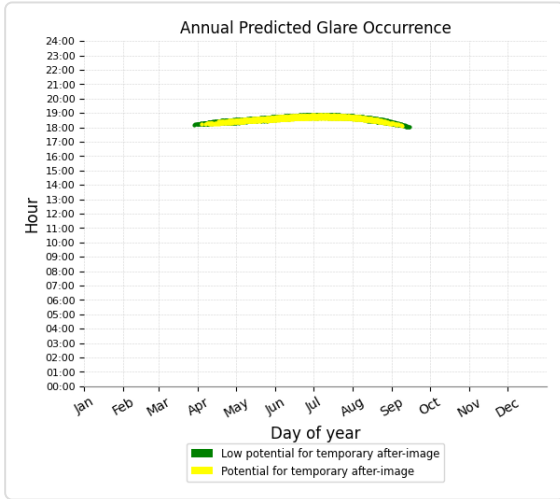
Green glare: 1,456 min.



PV array 3 and OP 14

Yellow glare: 1,229 min.

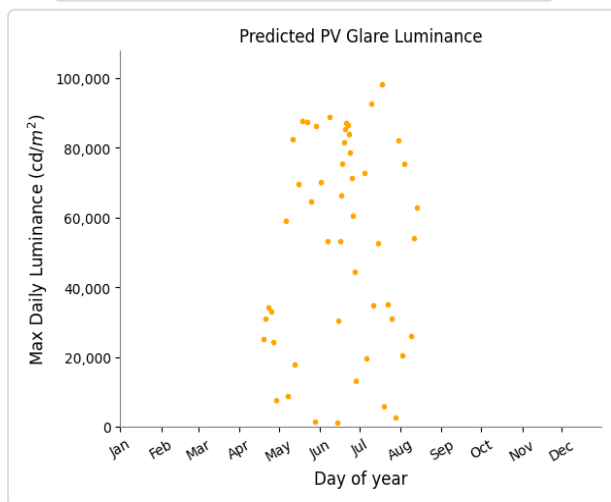
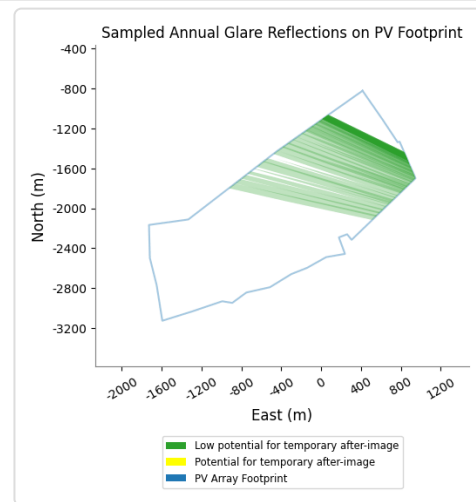
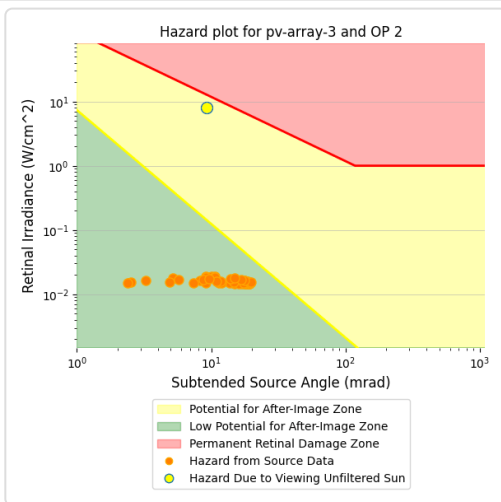
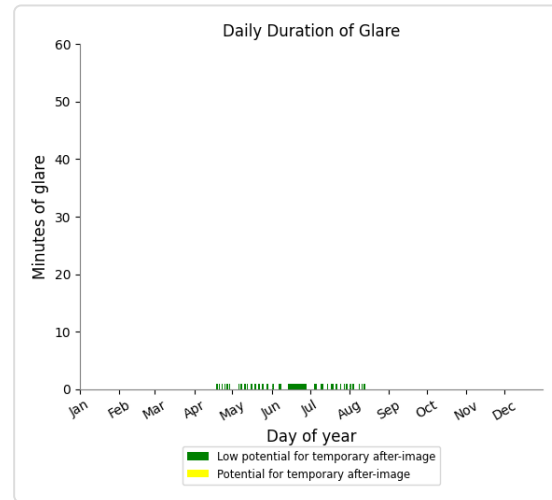
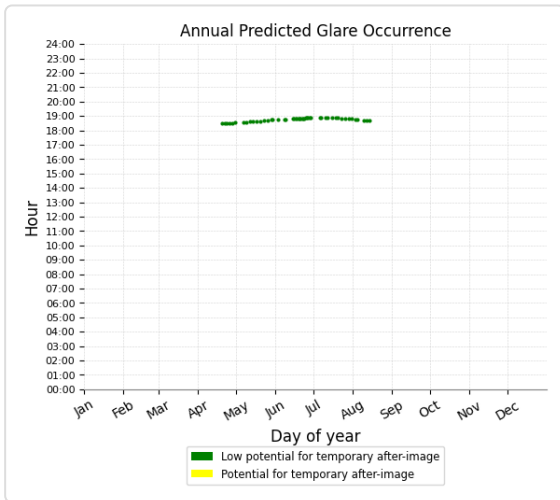
Green glare: 821 min.



PV array 3 and OP 2

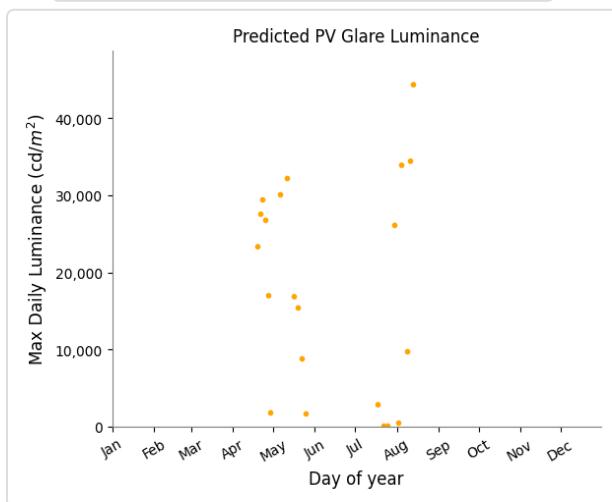
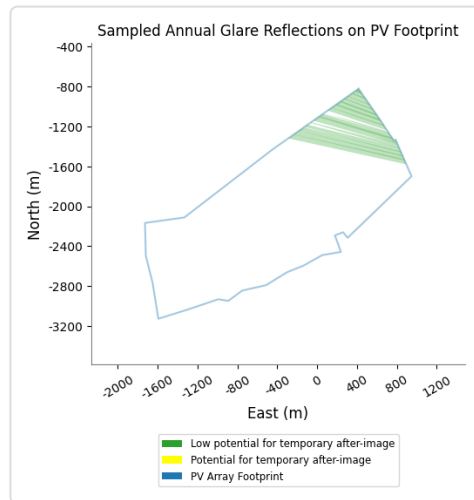
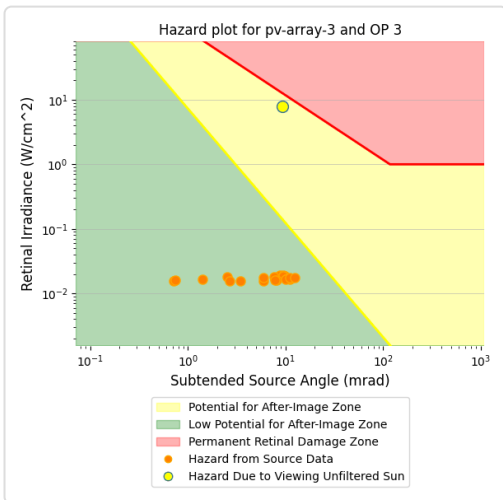
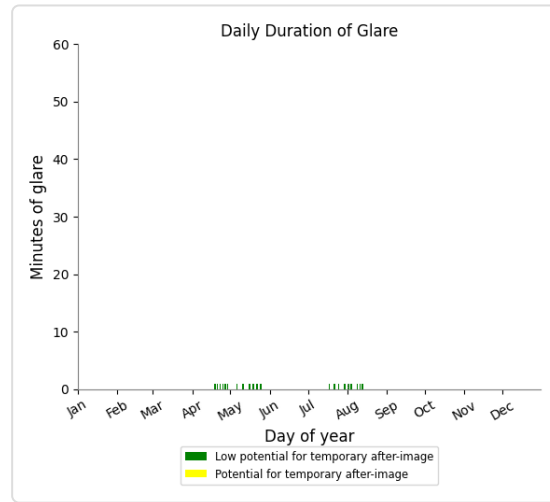
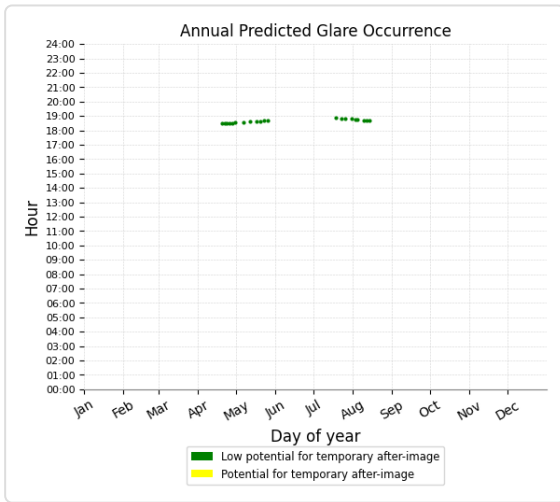
Yellow glare: none

Green glare: 50 min.



PV array 3 and OP 3

Yellow glare: none
 Green glare: 21 min.



PV array 3 and OP 4

No glare found

PV array 3 and OP 5

No glare found

PV array 3 and OP 6

No glare found

PV array 3 and OP 7

No glare found

PV array 3 and OP 8

No glare found

PV array 3 and OP 9

No glare found

PV array 3 and OP 10

No glare found

PV array 3 and OP 11

No glare found

PV array 3 and OP 12

No glare found

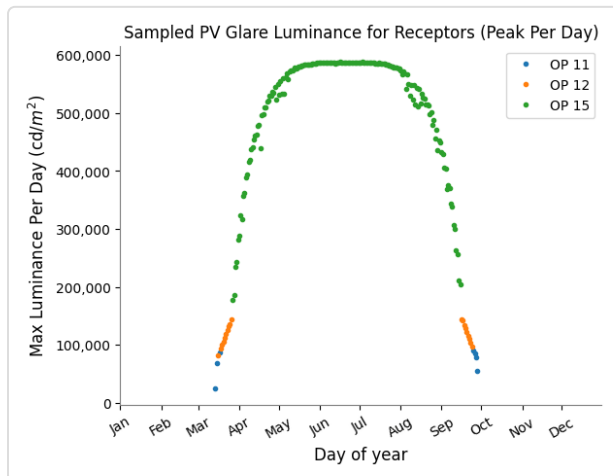
PV array 3 and OP 15

No glare found

PV: PV array 4 potential temporary after-image

Receptor results ordered by category of glare

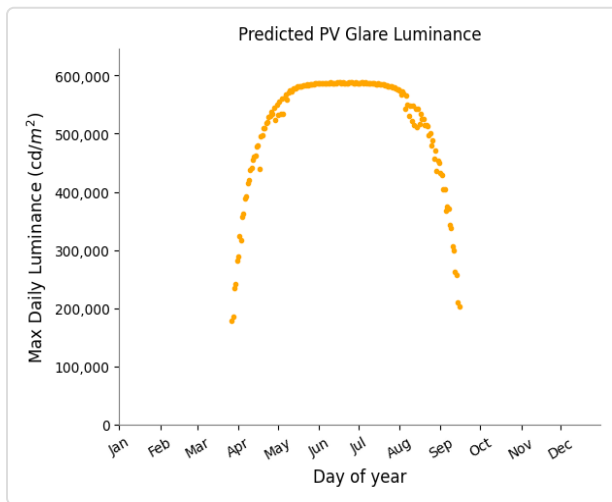
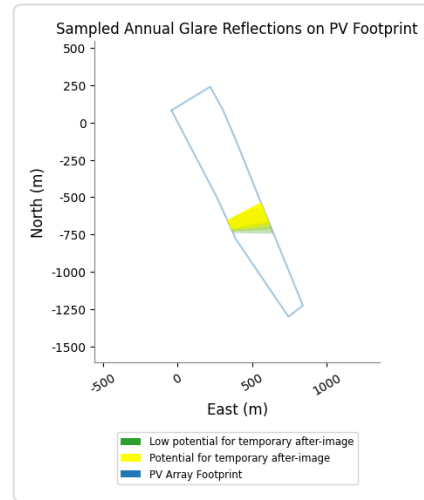
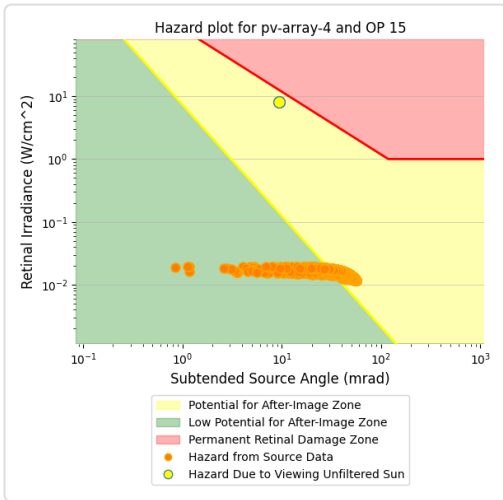
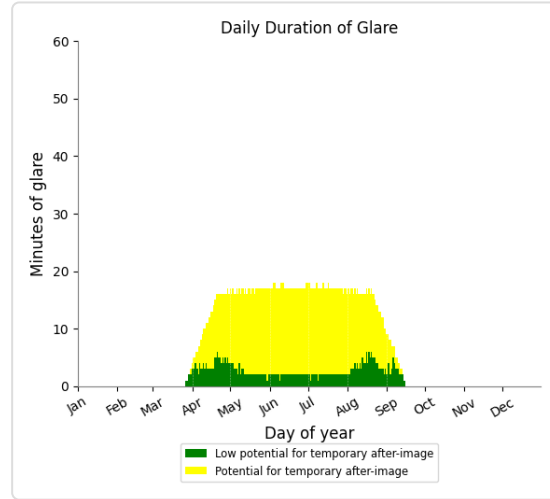
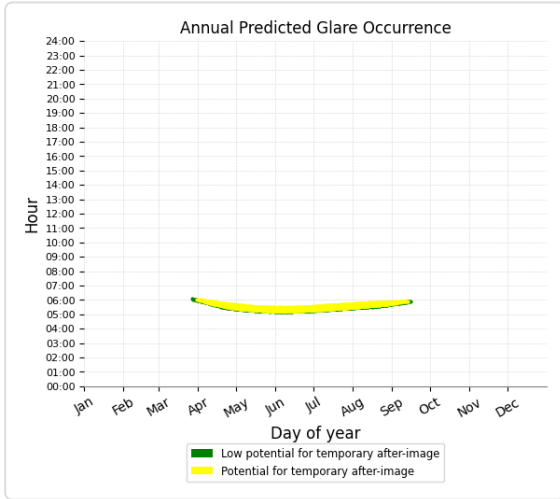
Receptor	Annual Green Glare		Annual Yellow Glare		Peak Luminance
	min	hr	min	hr	cd/m ²
OP 15	474	7.9	2,010	33.5	587,913
OP 3	890	14.8	0	0.0	183,967
OP 4	1,892	31.5	0	0.0	194,205
OP 5	615	10.2	0	0.0	109,768
OP 6	386	6.4	0	0.0	75,938
OP 7	590	9.8	0	0.0	126,244
OP 8	526	8.8	0	0.0	100,691
OP 9	674	11.2	0	0.0	132,999
OP 10	513	8.6	0	0.0	91,119
OP 11	631	10.5	0	0.0	113,099
OP 12	1,369	22.8	0	0.0	243,850
OP 1	0	0.0	0	0.0	0
OP 2	0	0.0	0	0.0	0
OP 13	0	0.0	0	0.0	0
OP 14	0	0.0	0	0.0	0



PV array 4 and OP 15

Yellow glare: 2,010 min.

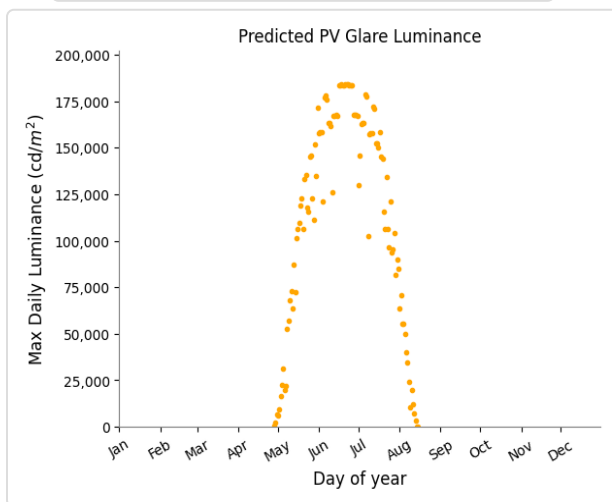
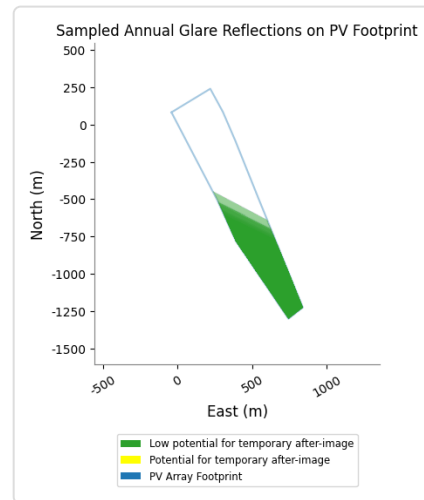
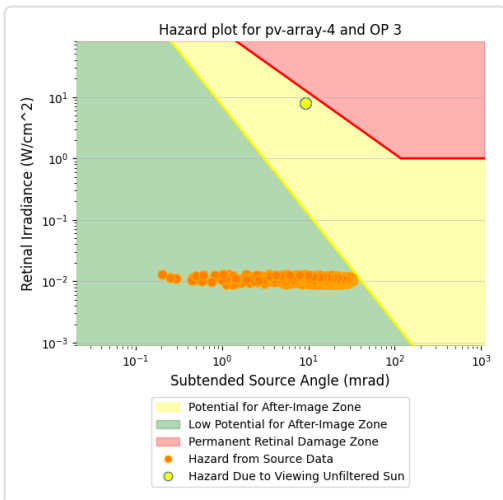
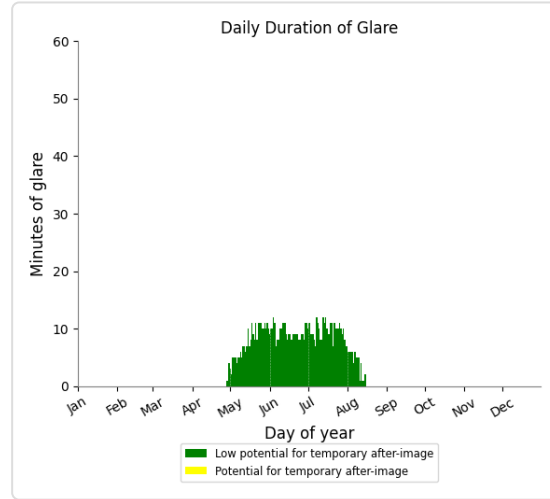
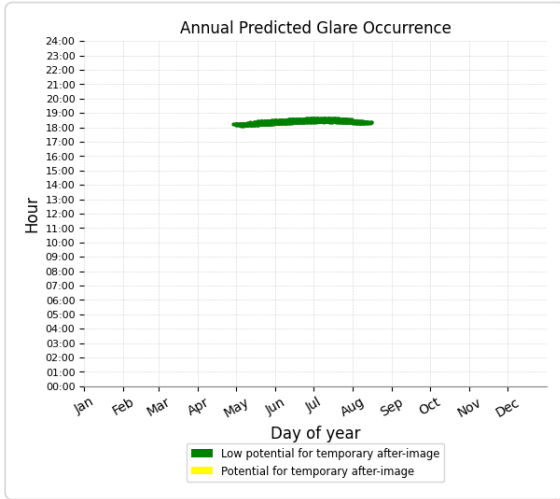
Green glare: 474 min.



PV array 4 and OP 3

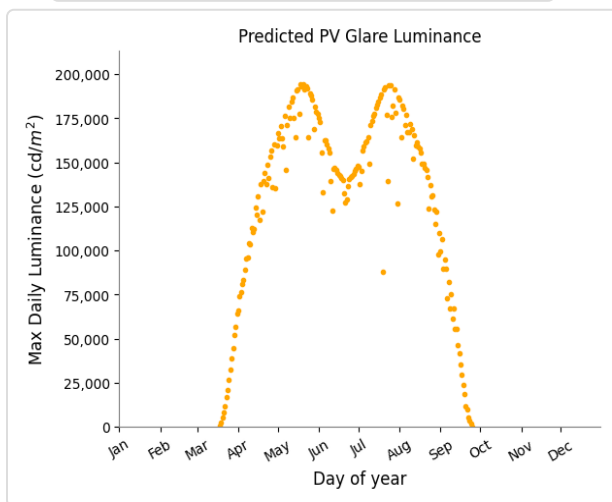
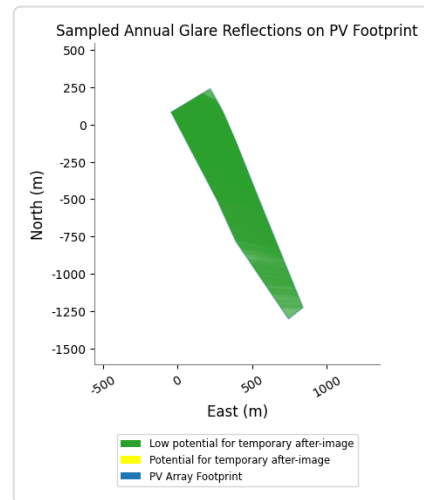
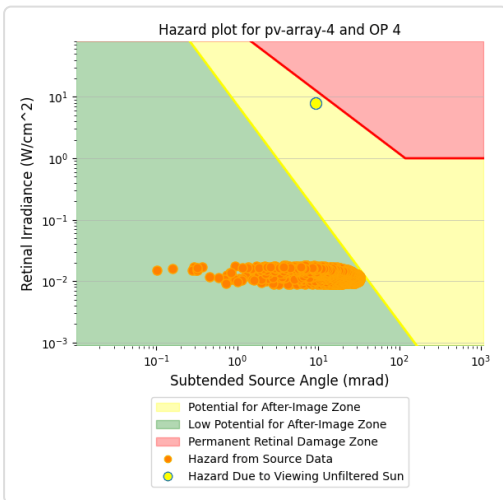
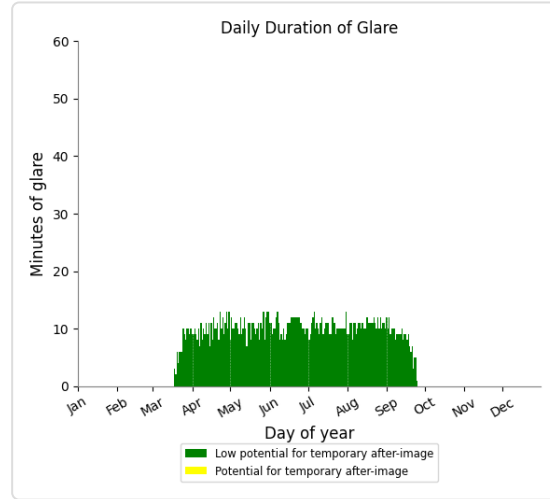
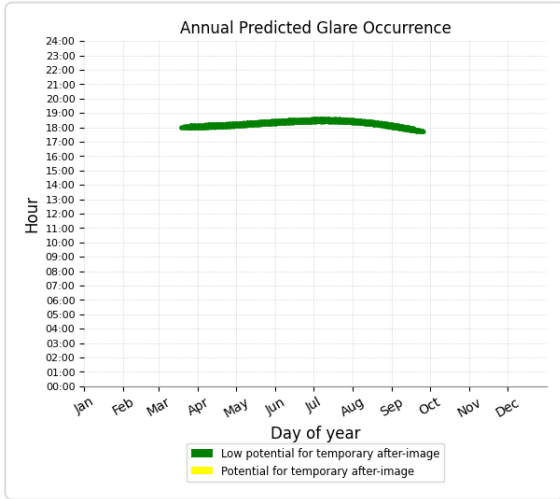
Yellow glare: none

Green glare: 890 min.



PV array 4 and OP 4

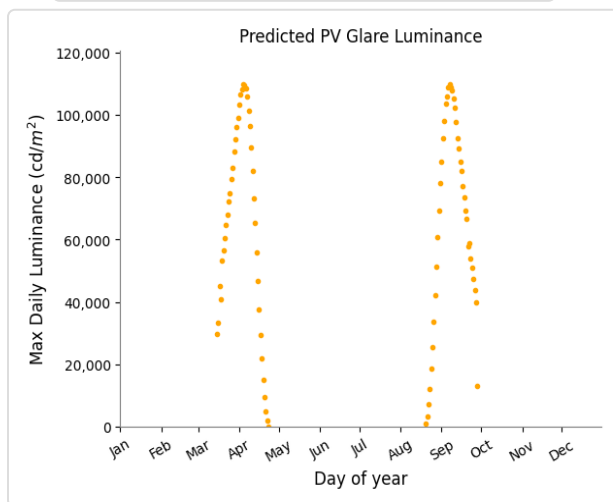
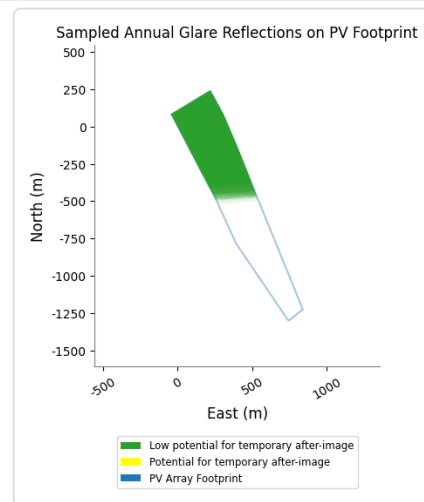
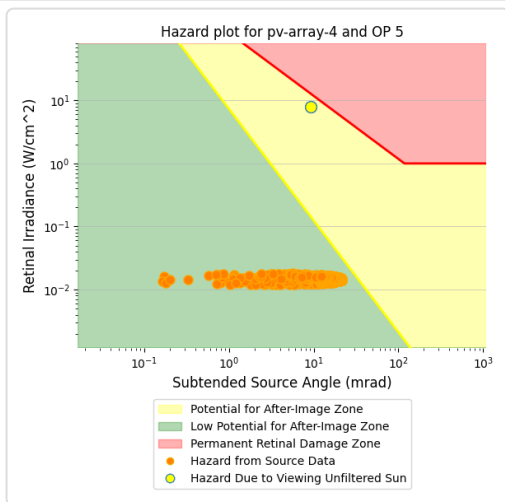
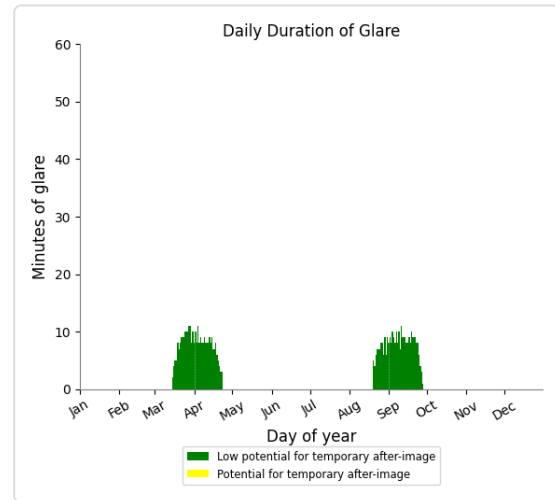
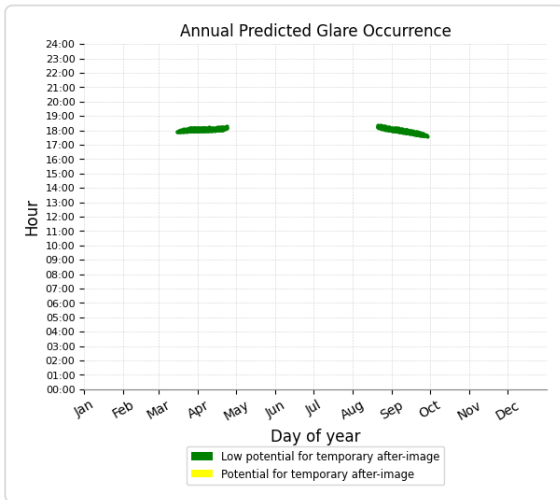
Yellow glare: none
 Green glare: 1,892 min.



PV array 4 and OP 5

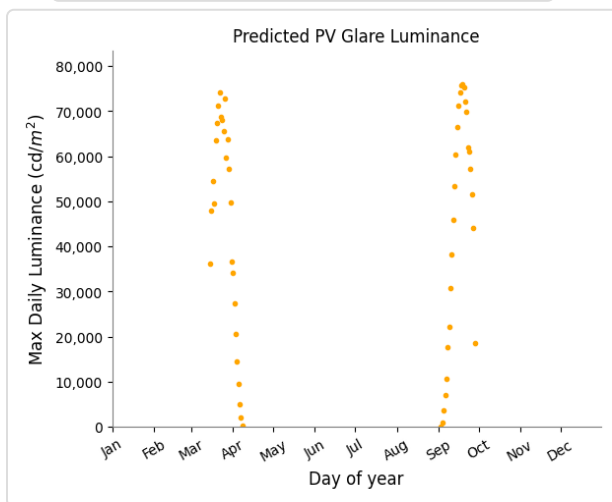
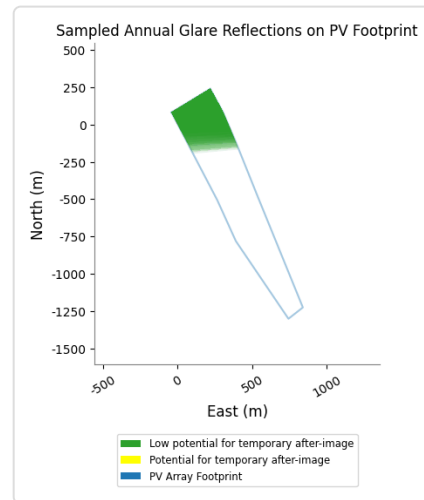
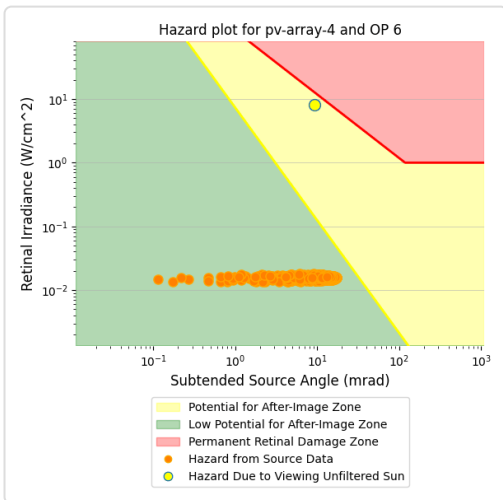
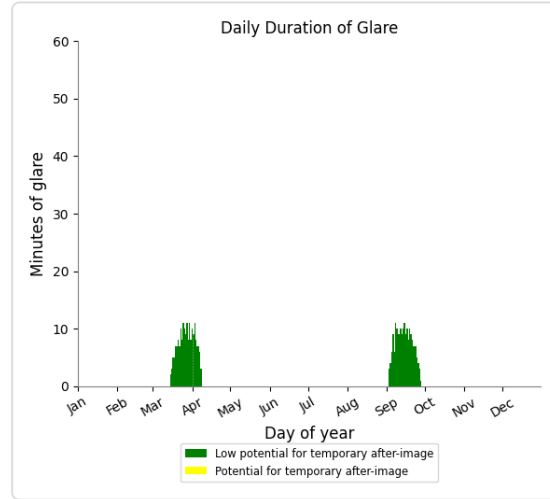
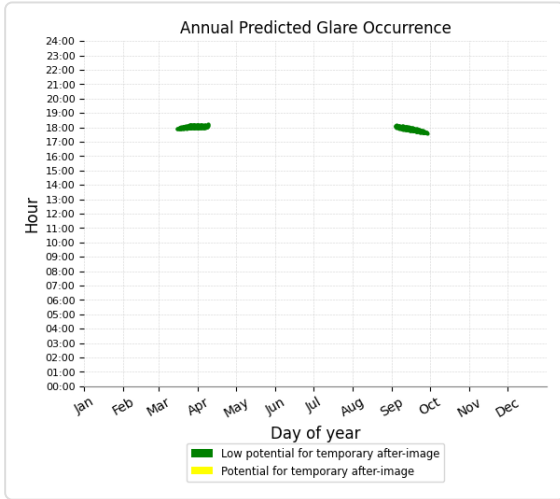
Yellow glare: none

Green glare: 615 min.



PV array 4 and OP 6

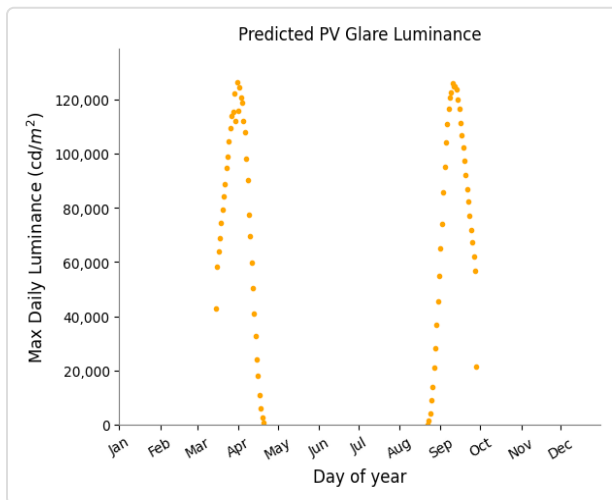
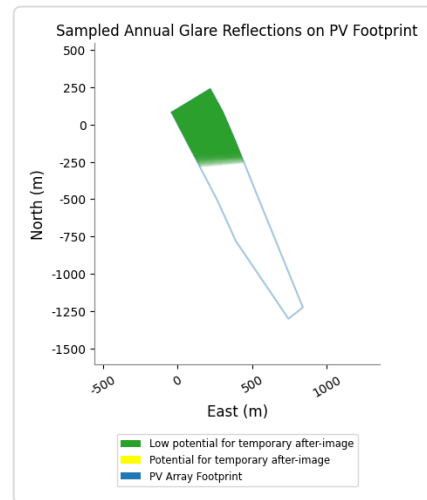
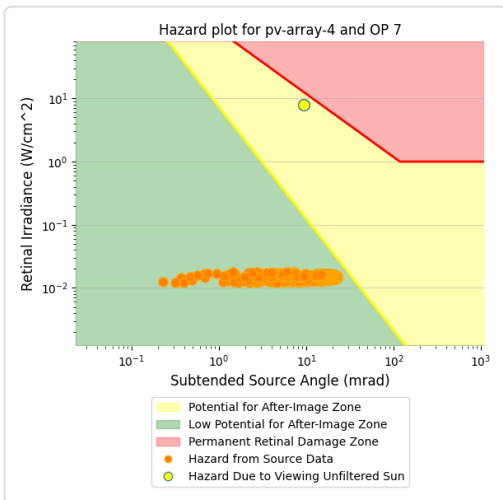
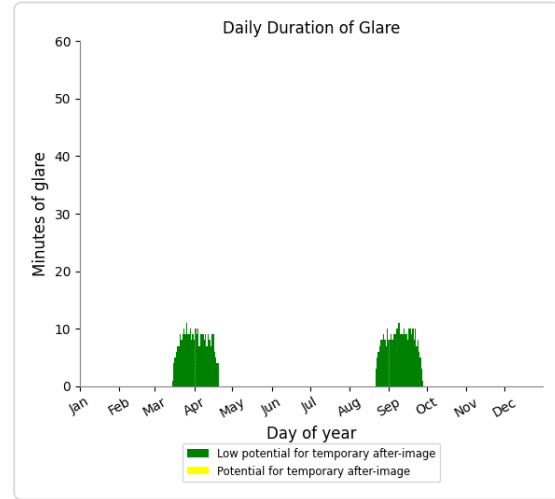
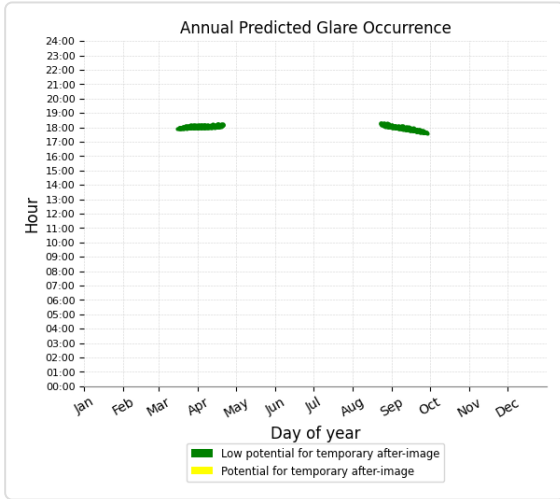
Yellow glare: none
 Green glare: 386 min.



PV array 4 and OP 7

Yellow glare: none

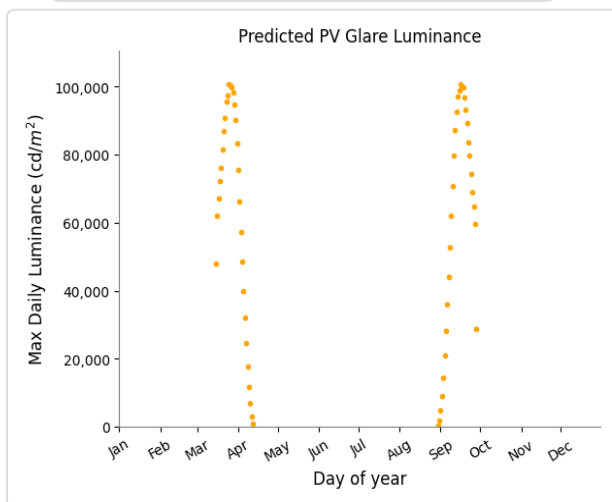
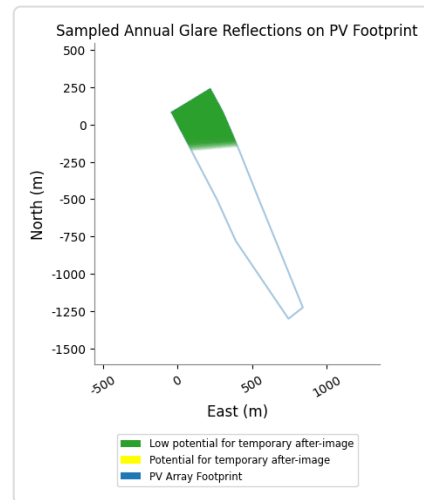
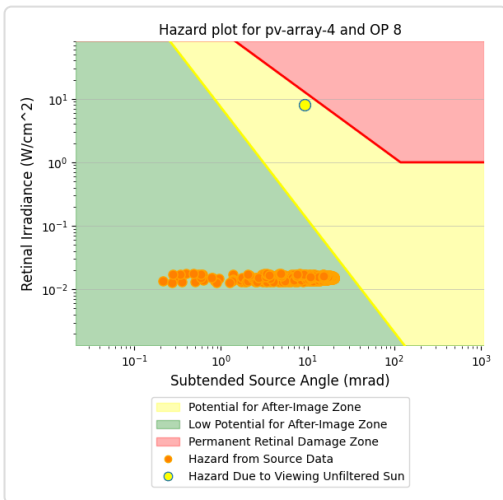
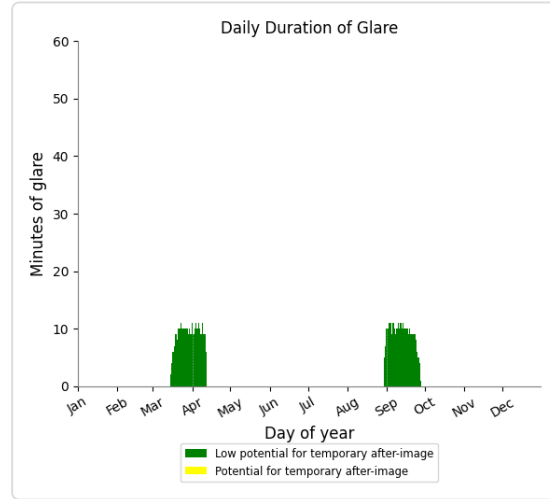
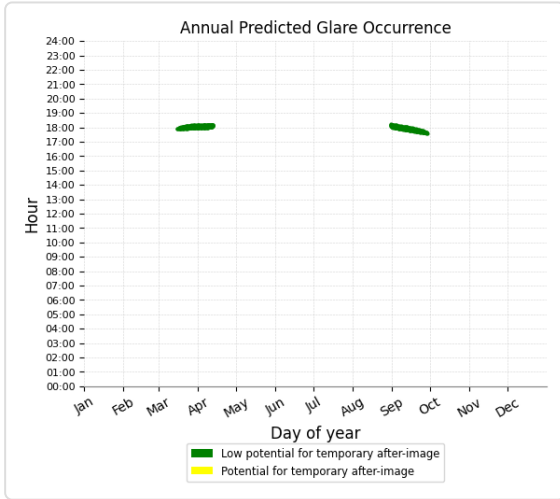
Green glare: 590 min.



PV array 4 and OP 8

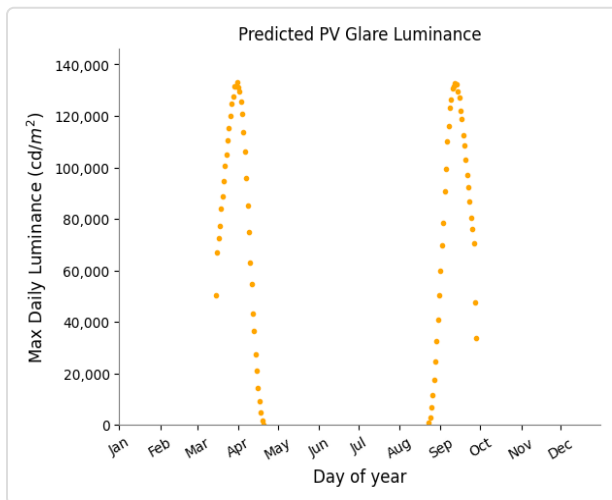
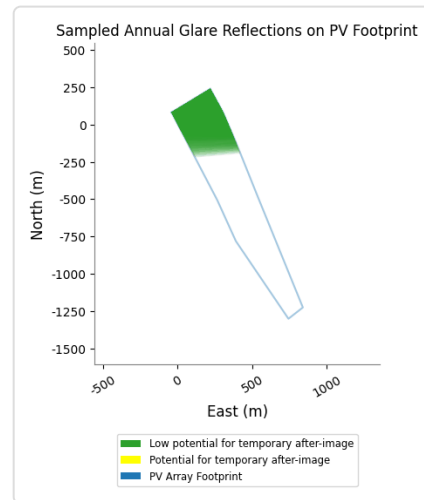
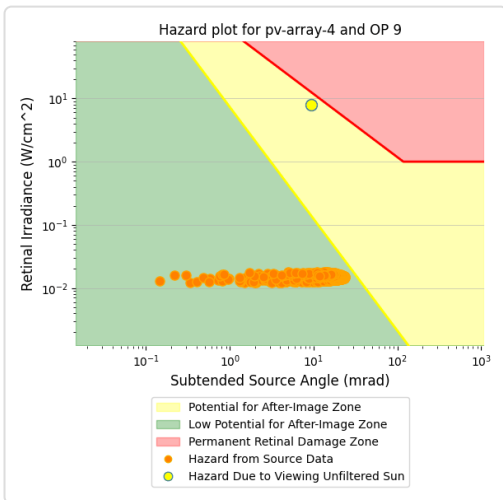
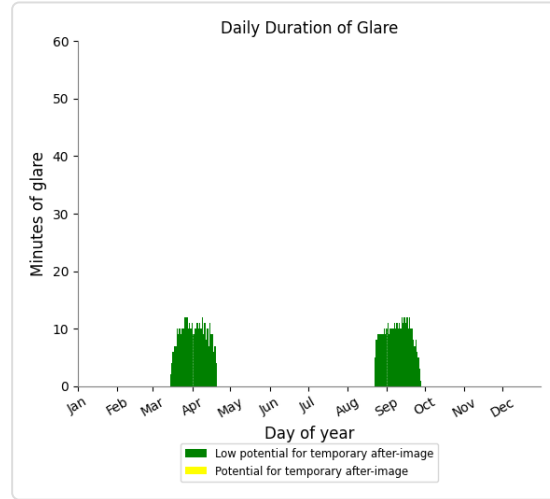
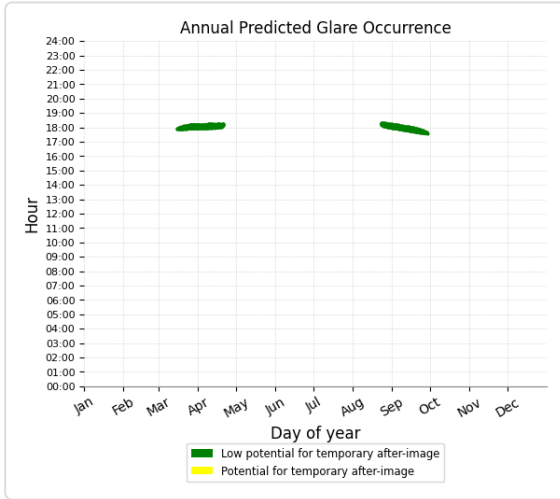
Yellow glare: none

Green glare: 526 min.



PV array 4 and OP 9

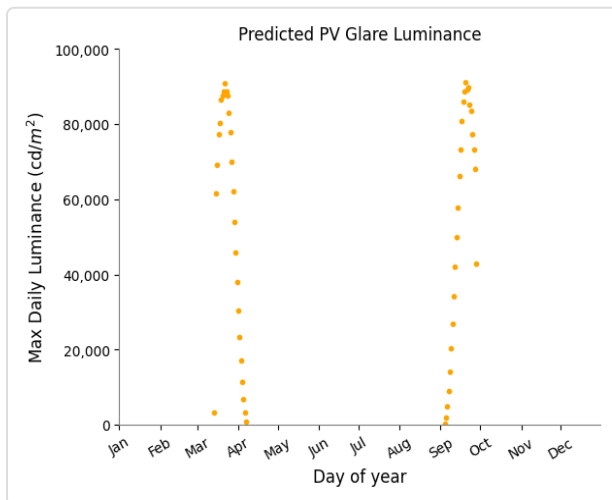
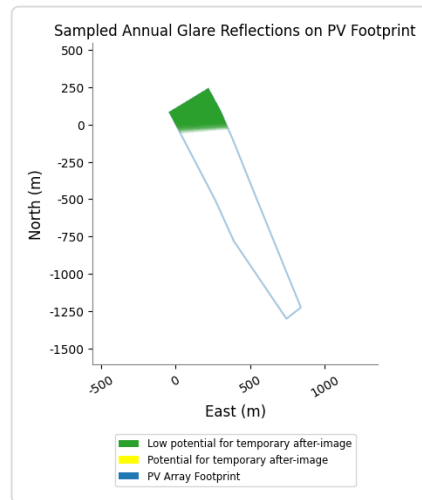
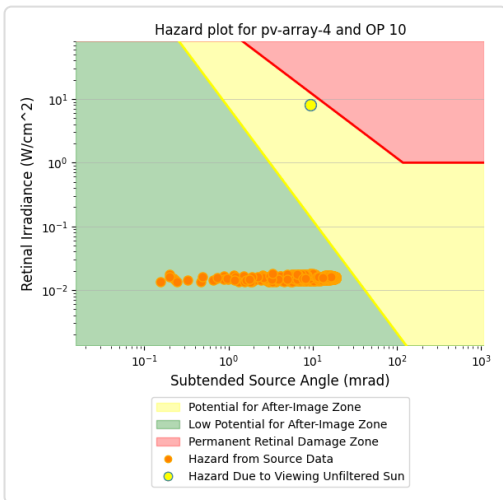
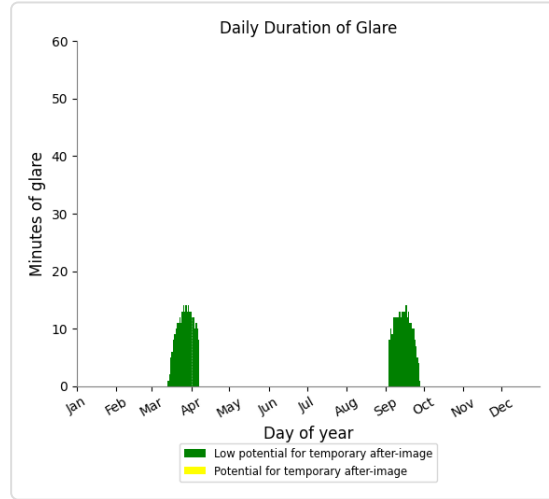
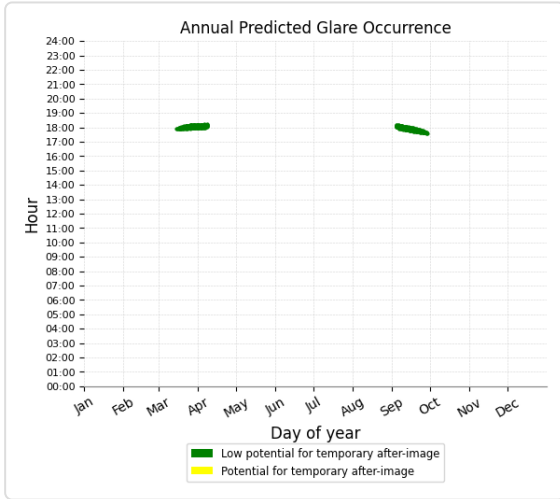
Yellow glare: none
 Green glare: 674 min.



PV array 4 and OP 10

Yellow glare: none

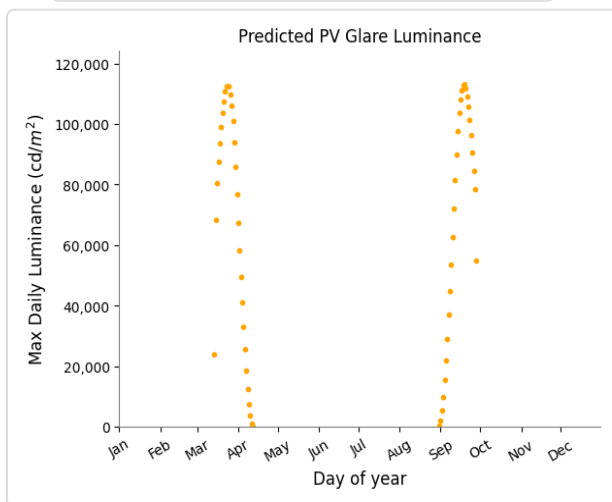
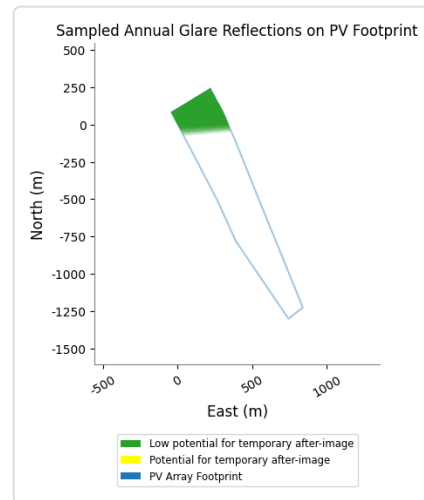
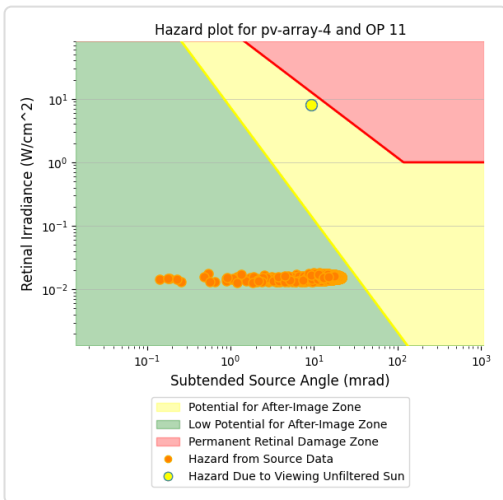
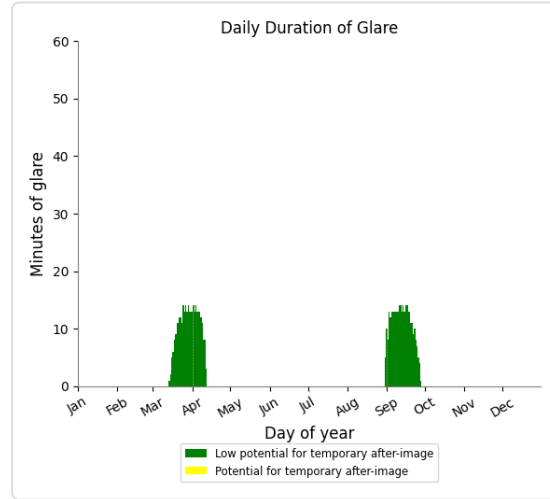
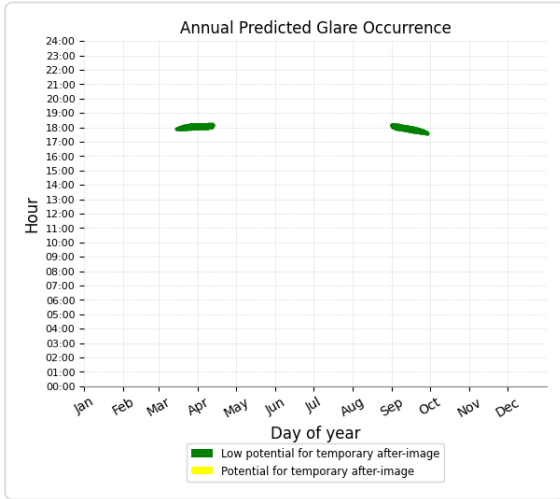
Green glare: 513 min.



PV array 4 and OP 11

Yellow glare: none

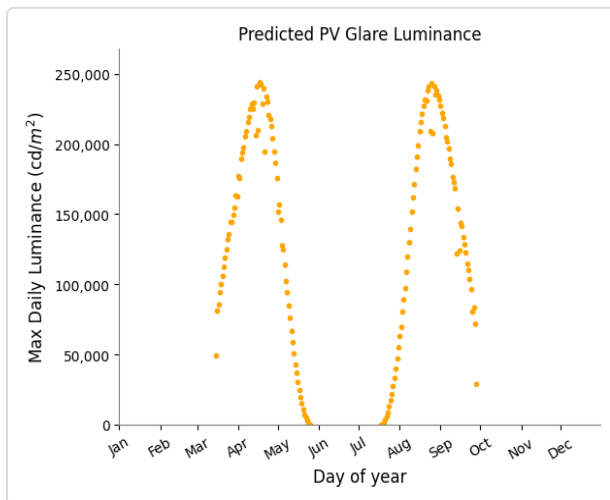
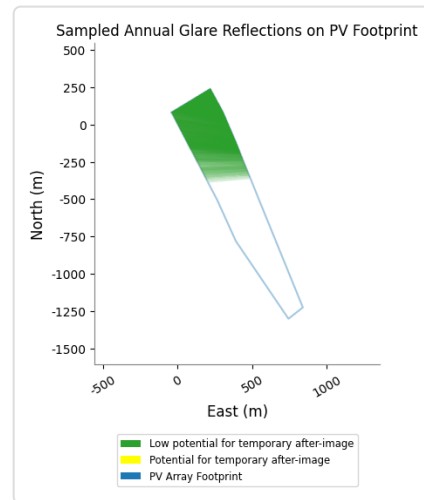
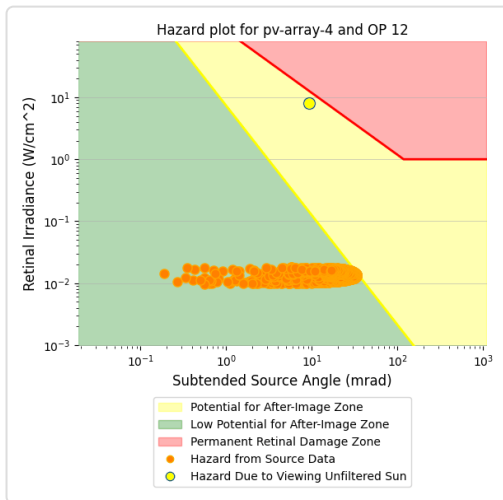
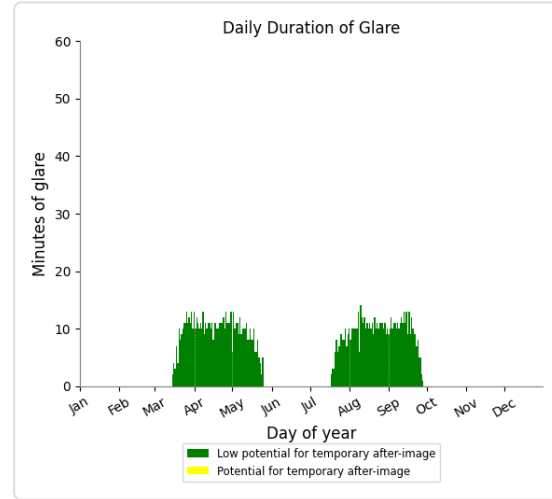
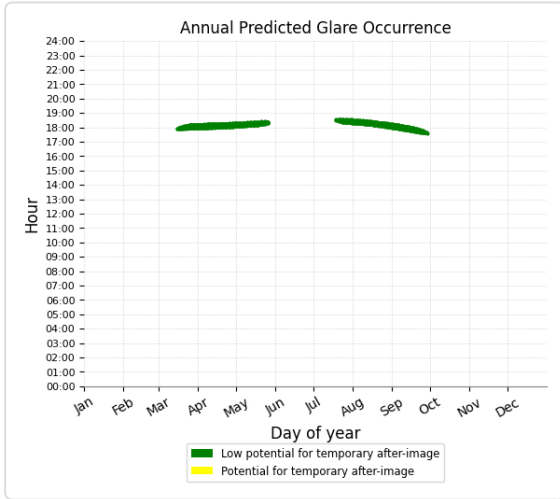
Green glare: 631 min.



PV array 4 and OP 12

Yellow glare: none

Green glare: 1,369 min.



PV array 4 and OP 1

No glare found

PV array 4 and OP 2

No glare found

PV array 4 and OP 13

No glare found

PV array 4 and OP 14

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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