

APPENDIX C

RESULTS FOR NORTHWEST-FACING PV ARRAYS

Glare Analysis Results

Summary of Results Glare with low 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 6	10.0	283.0	22,586	376.4	0	0.0	-	10,151
PV array 7	10.0	283.0	29,422	490.4	0	0.0	-	117,809

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
1000Ft- GA_5L23R_05L- L_23R-R	0	0.0	0	0.0
1000Ft- GA_5L23R_05L- R_23R-L	7,917	131.9	0	0.0
1000Ft- GA_5R23L_05R- L_23L-R	0	0.0	0	0.0
1000Ft- GA_5R23L_05R- R_23L-L	7,062	117.7	0	0.0
1500Ft- CA_5L23R_05L- L_23R-R	0	0.0	0	0.0
1500Ft- CA_5L23R_05L- R_23R-L	13,728	228.8	0	0.0
Approach_05L	0	0.0	0	0.0
Approach_05R	0	0.0	0	0.0
Approach_23L	0	0.0	0	0.0
Approach_23R	0	0.0	0	0.0
1-ATCT	0	0.0	0	0.0
OP 2	848	14.1	0	0.0
OP 3	895	14.9	0	0.0
OP 4	1,068	17.8	0	0.0
OP 5	1,586	26.4	0	0.0
OP 6	2,892	48.2	0	0.0
OP 7	2,488	41.5	0	0.0
OP 8	967	16.1	0	0.0
OP 9	943	15.7	0	0.0
OP 10	971	16.2	0	0.0

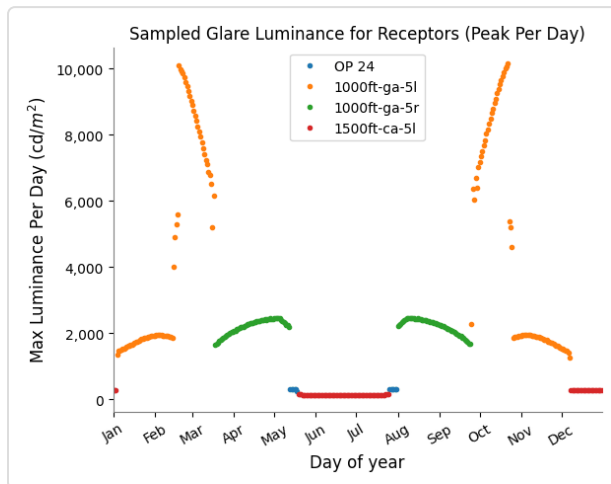
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 11	1,125	18.8	0	0.0
OP 12	1,306	21.8	0	0.0
OP 13	712	11.9	0	0.0
OP 14	2,373	39.5	0	0.0
OP 15	272	4.5	0	0.0
OP 16	0	0.0	0	0.0
OP 17	1,668	27.8	0	0.0
OP 18	995	16.6	0	0.0
OP 19	144	2.4	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	1,503	25.1	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	545	9.1	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV: PV array 6 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
1000Ft-GA_5L23R_05L-R_23R-L	2,879	48.0	0	0.0	10,151
1000Ft-GA_5R23L_05R-R_23L-L	2,906	48.4	0	0.0	2,473
1500Ft-CA_5L23R_05L-R_23R-L	6,739	112.3	0	0.0	293
1000Ft-GA_5L23R_05L-L_23R-R	0	0.0	0	0.0	0
1000Ft-GA_5R23L_05R-L_23L-R	0	0.0	0	0.0	0
1500Ft-CA_5L23R_05L-L_23R-R	0	0.0	0	0.0	0
Approach_05L	0	0.0	0	0.0	0
Approach_05R	0	0.0	0	0.0	0
Approach_23L	0	0.0	0	0.0	0
Approach_23R	0	0.0	0	0.0	0
OP 2	403	6.7	0	0.0	94
OP 3	413	6.9	0	0.0	136
OP 4	483	8.1	0	0.0	193
OP 5	707	11.8	0	0.0	224
OP 6	1,303	21.7	0	0.0	162
OP 7	1,140	19.0	0	0.0	91
OP 8	447	7.5	0	0.0	109
OP 9	425	7.1	0	0.0	160
OP 10	415	6.9	0	0.0	233
OP 11	466	7.8	0	0.0	342
OP 12	558	9.3	0	0.0	254
OP 13	301	5.0	0	0.0	121
OP 14	1,098	18.3	0	0.0	117
OP 17	569	9.5	0	0.0	775
OP 18	409	6.8	0	0.0	347
OP 19	47	0.8	0	0.0	143
OP 24	627	10.4	0	0.0	325
OP 38	251	4.2	0	0.0	357
1-ATCT	0	0.0	0	0.0	0
OP 15	0	0.0	0	0.0	0
OP 16	0	0.0	0	0.0	0
OP 20	0	0.0	0	0.0	0
OP 21	0	0.0	0	0.0	0
OP 22	0	0.0	0	0.0	0
OP 23	0	0.0	0	0.0	0
OP 25	0	0.0	0	0.0	0

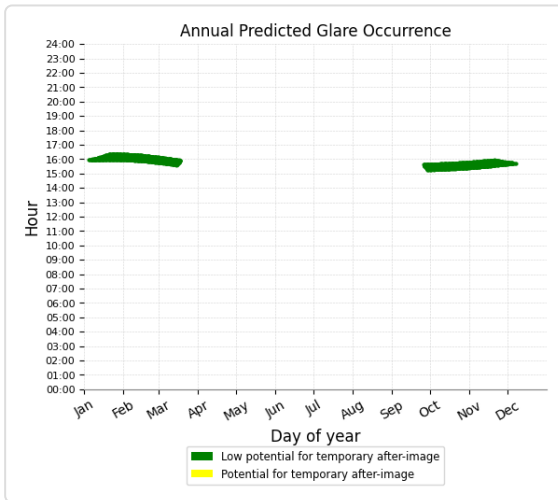
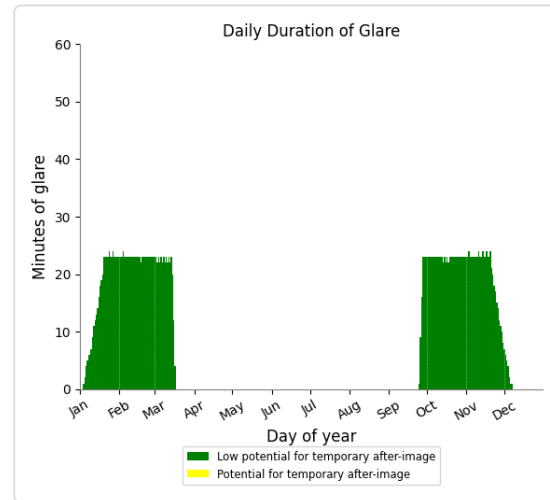
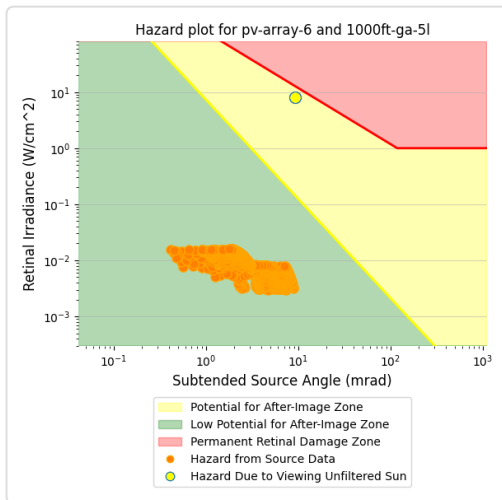
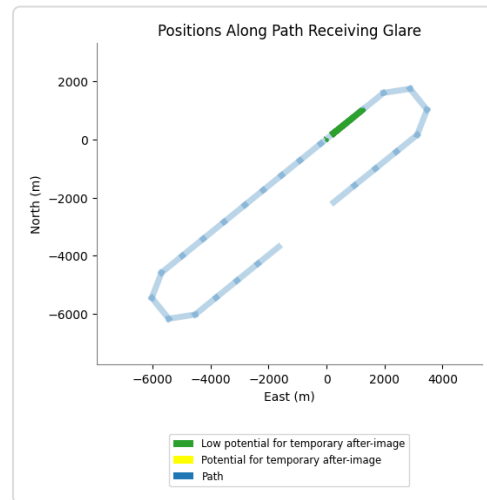
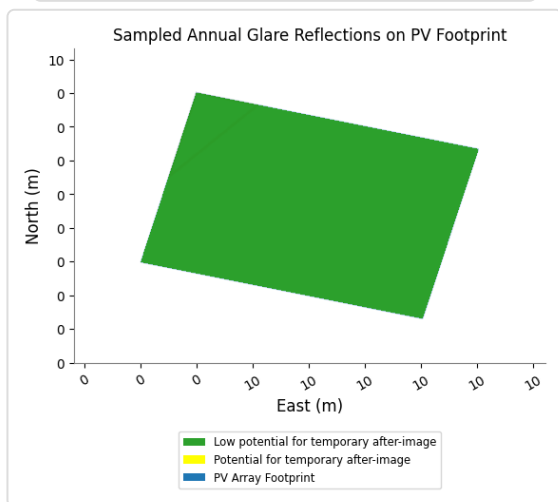
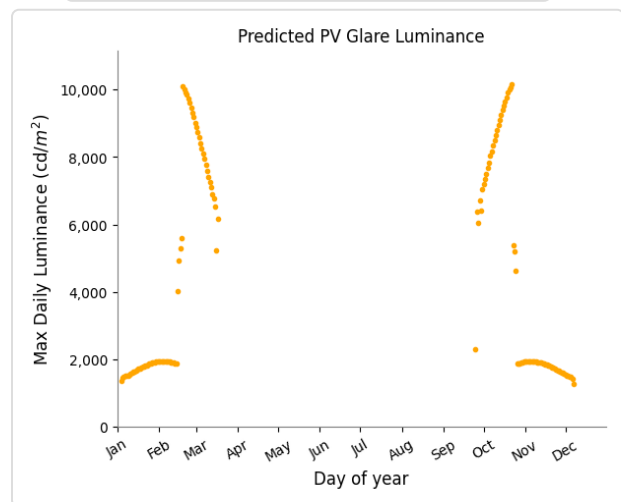
Receptor	Annual Green Glare		Annual Yellow Glare		Peak Luminance
	min	hr	min	hr	cd/m ²
OP 26	0	0.0	0	0.0	0
OP 27	0	0.0	0	0.0	0
OP 28	0	0.0	0	0.0	0
OP 29	0	0.0	0	0.0	0
OP 30	0	0.0	0	0.0	0
OP 31	0	0.0	0	0.0	0
OP 32	0	0.0	0	0.0	0
OP 33	0	0.0	0	0.0	0
OP 34	0	0.0	0	0.0	0
OP 35	0	0.0	0	0.0	0
OP 36	0	0.0	0	0.0	0
OP 37	0	0.0	0	0.0	0
OP 39	0	0.0	0	0.0	0
OP 40	0	0.0	0	0.0	0



PV array 6 and Route: 1000Ft-GA_5L23R_05L-R_23R-L

Yellow glare: none

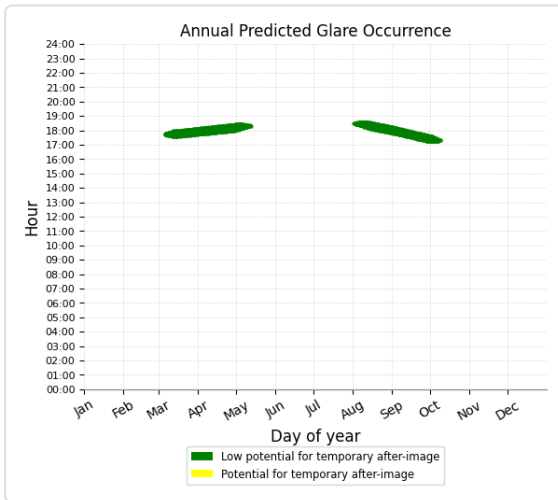
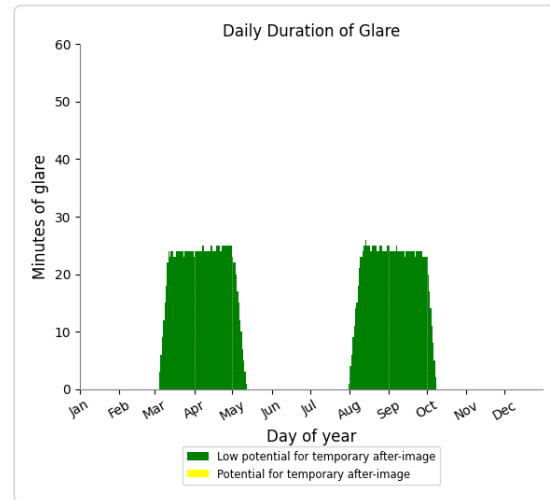
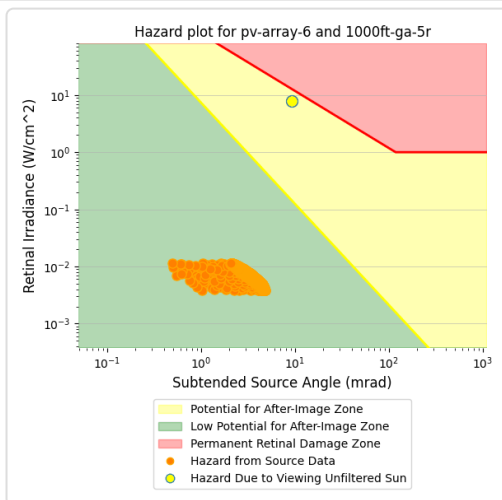
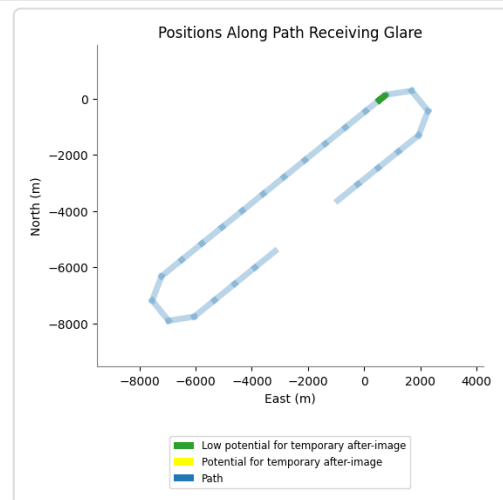
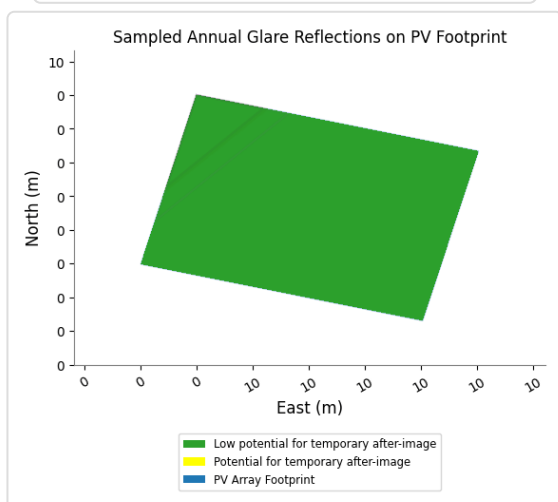
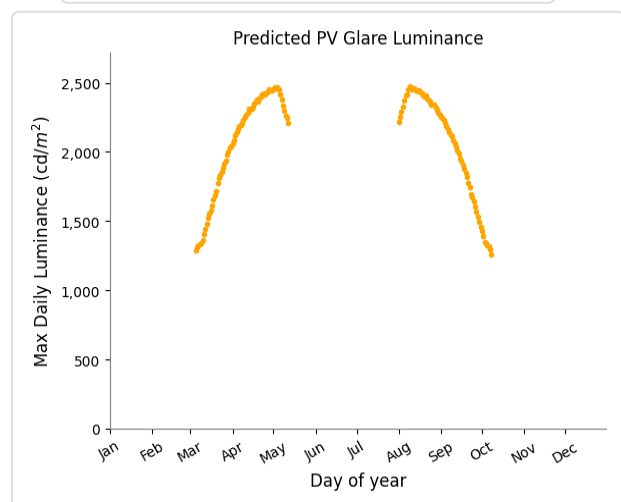
Green glare: 2,879 min.



PV array 6 and Route: 1000Ft-GA_5R23L_05R-R_23L-L

Yellow glare: none

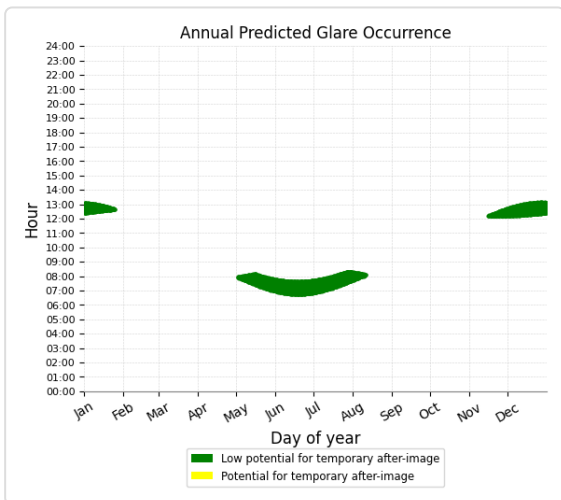
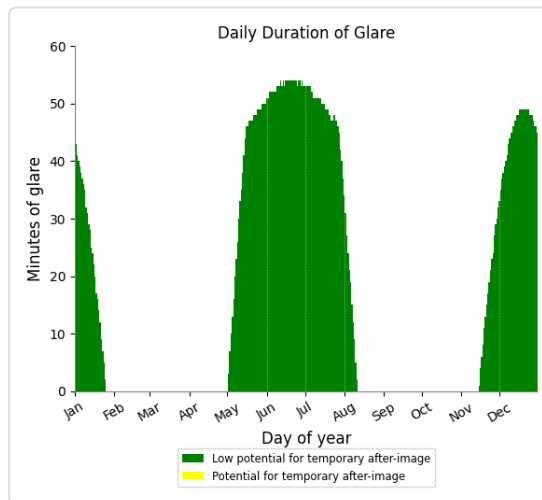
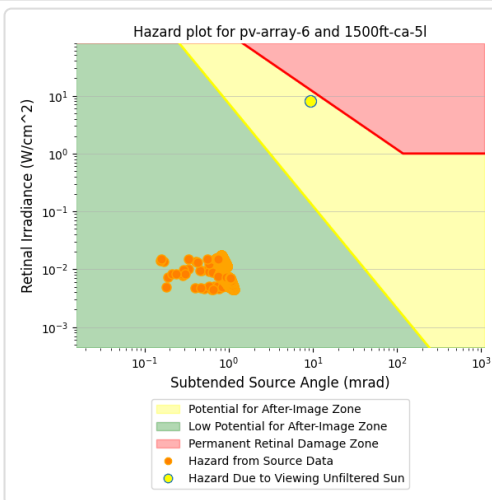
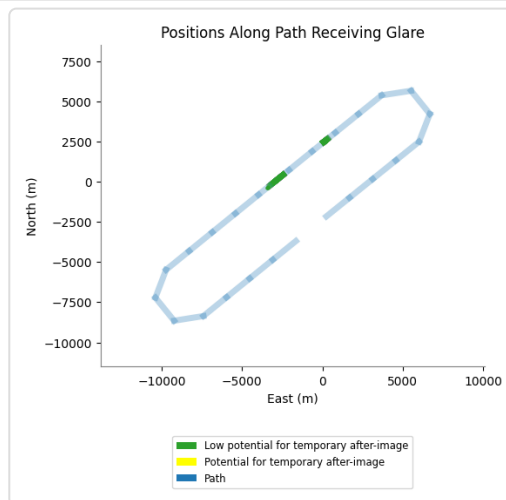
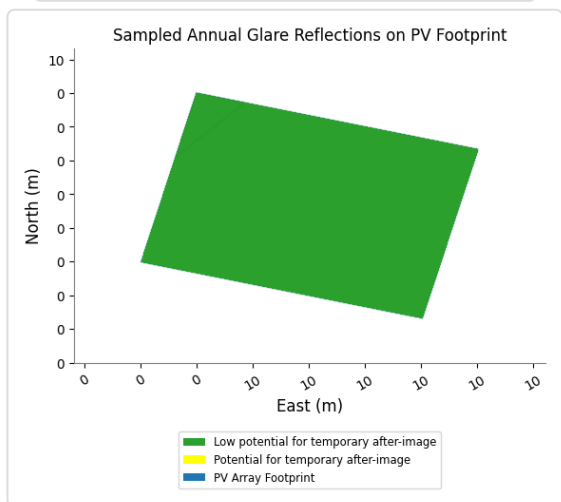
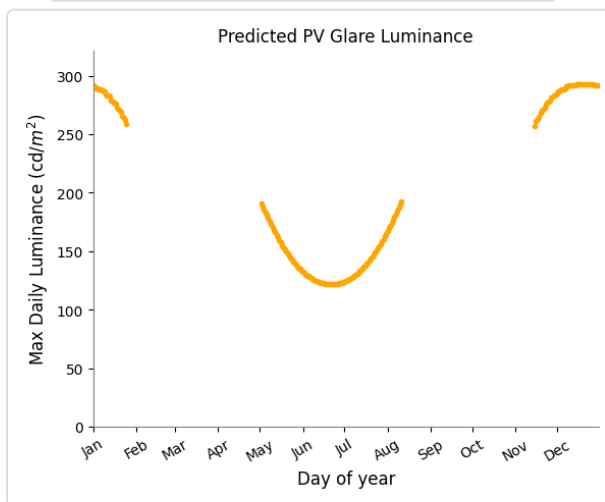
Green glare: 2,906 min.



PV array 6 and Route: 1500Ft-CA_5L23R_05L-R_23R-L

Yellow glare: none

Green glare: 6,739 min.



PV array 6 and Route: 1000Ft-GA_5L23R_05L-L_23R-R

No glare found

PV array 6 and Route: 1000Ft-GA_5R23L_05R-L_23L-R

No glare found

PV array 6 and Route: 1500Ft-CA_5L23R_05L-L_23R-R

No glare found

PV array 6 and Route: Approach_05L

No glare found

PV array 6 and Route: Approach_05R

No glare found

PV array 6 and Route: Approach_23L

No glare found

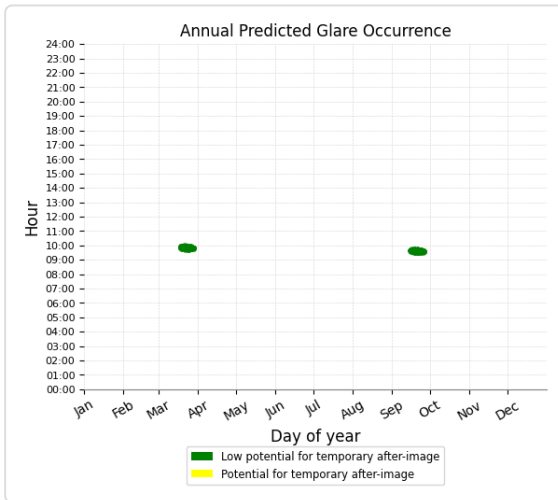
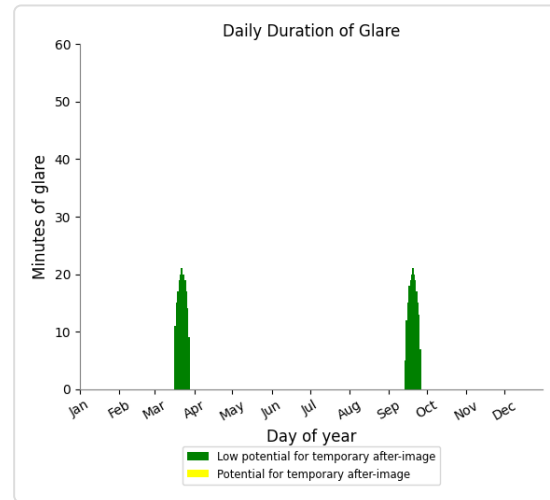
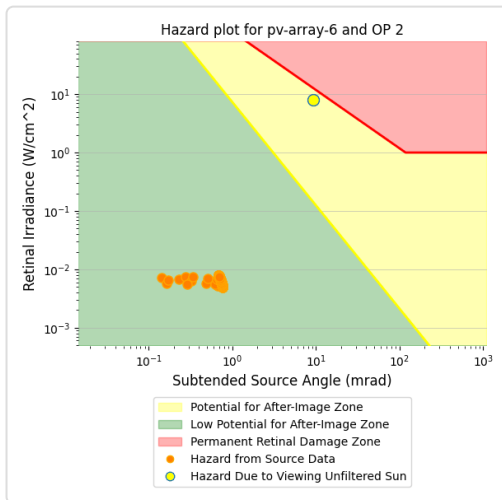
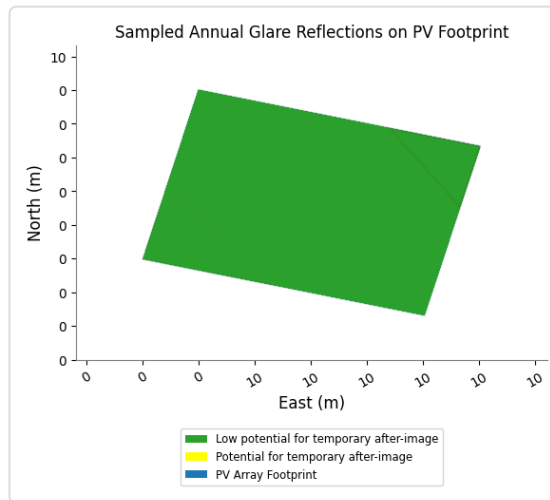
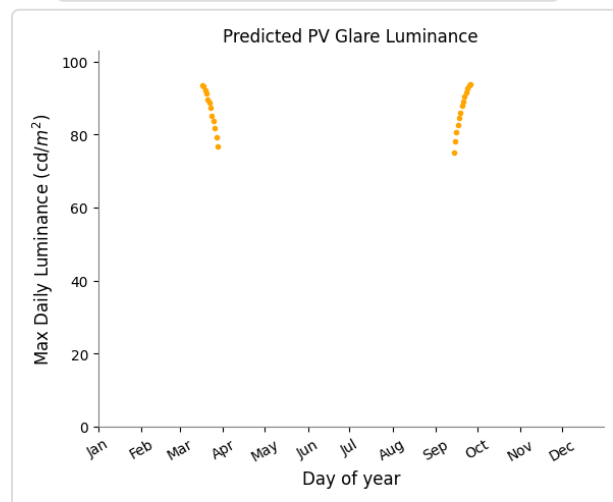
PV array 6 and Route: Approach_23R

No glare found

PV array 6 and OP 2

Yellow glare: none

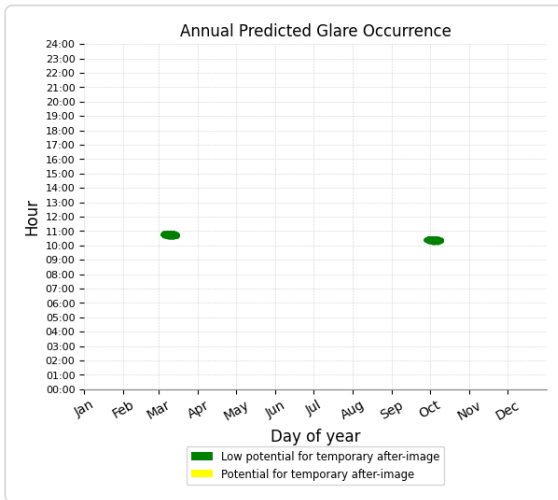
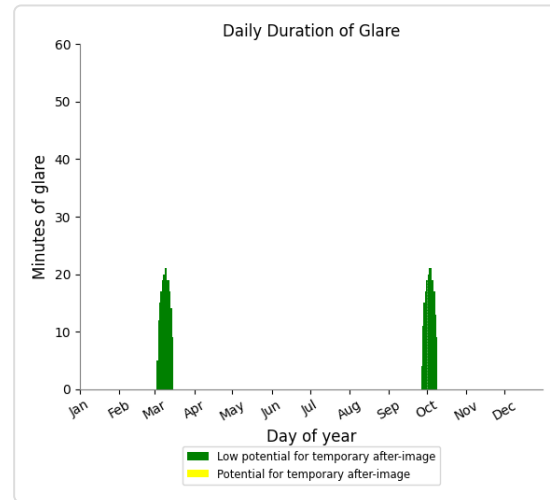
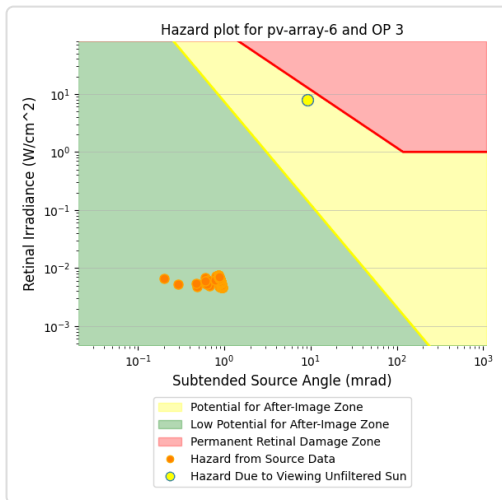
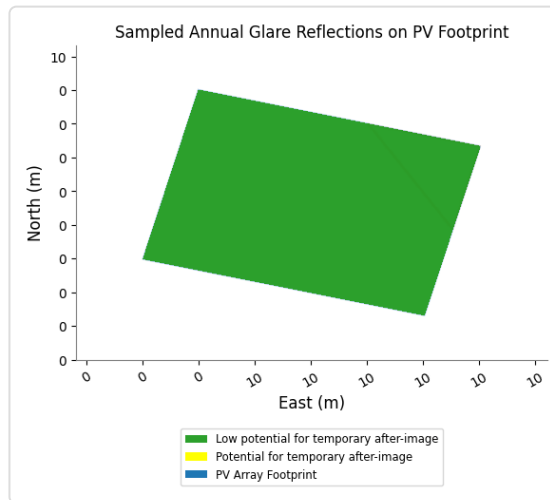
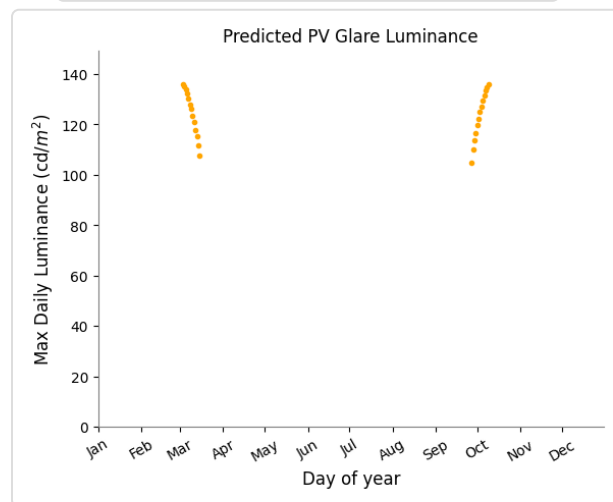
Green glare: 403 min.



PV array 6 and OP 3

Yellow glare: none

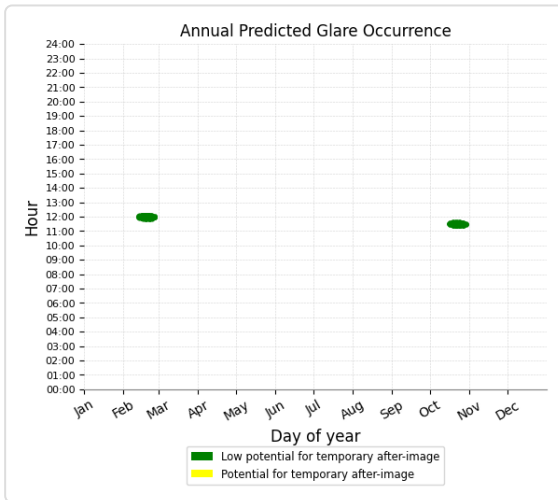
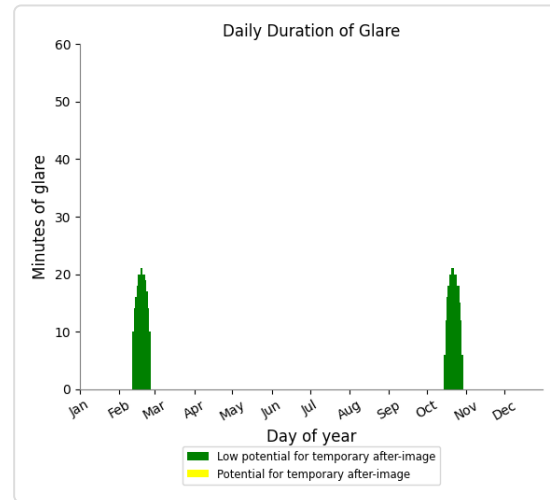
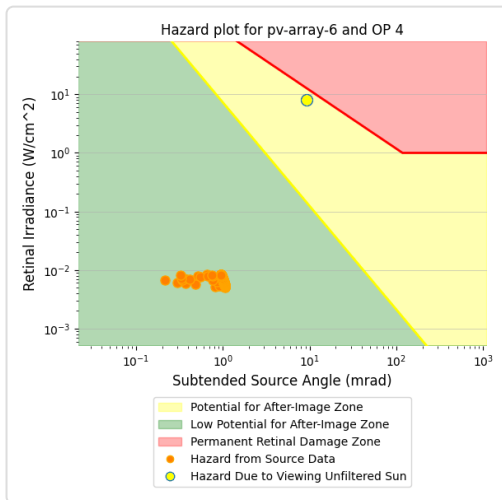
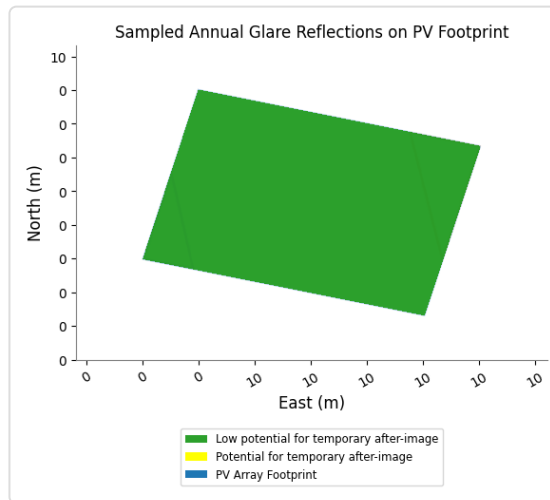
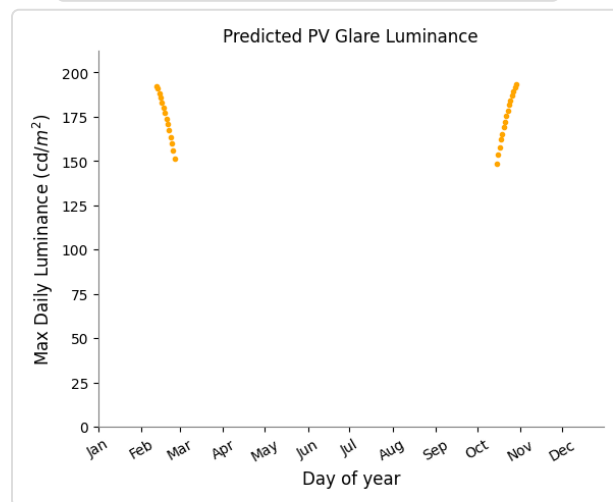
Green glare: 413 min.



PV array 6 and OP 4

Yellow glare: none

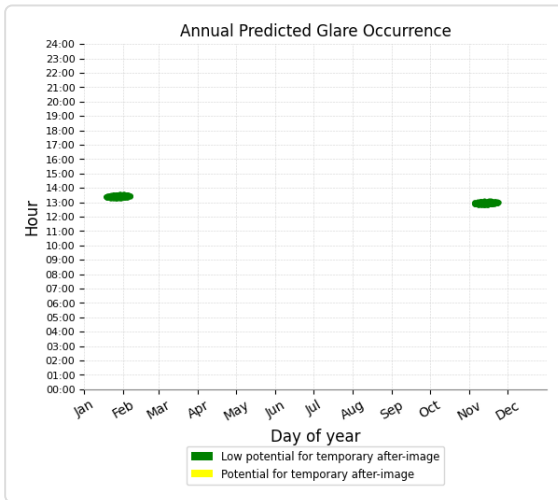
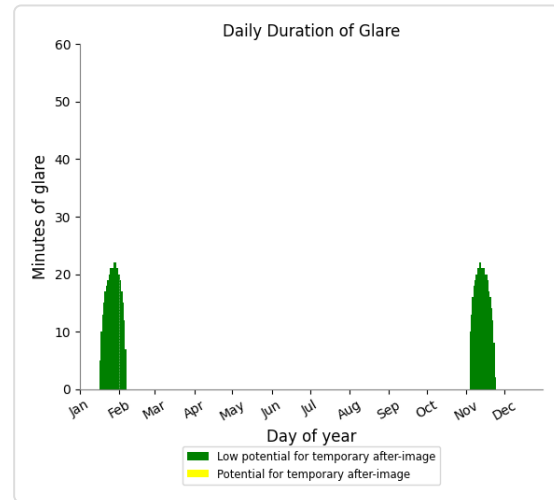
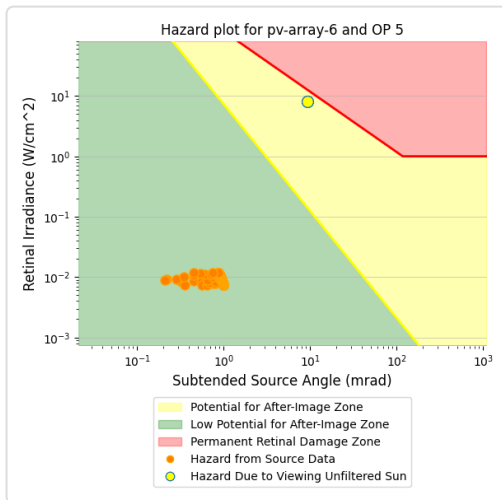
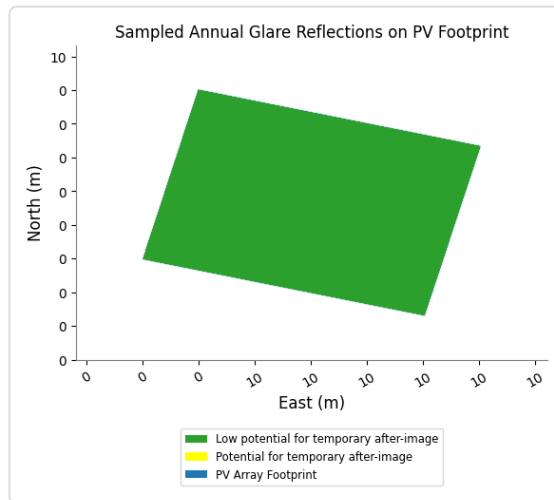
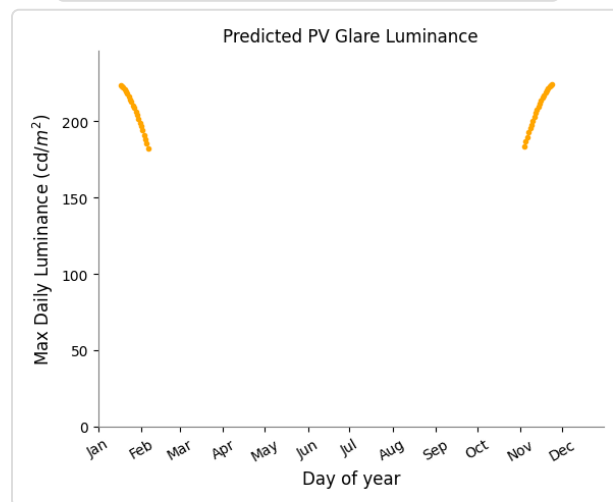
Green glare: 483 min.



PV array 6 and OP 5

Yellow glare: none

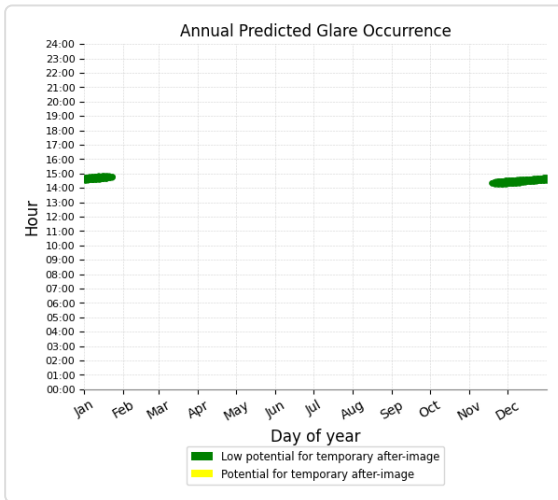
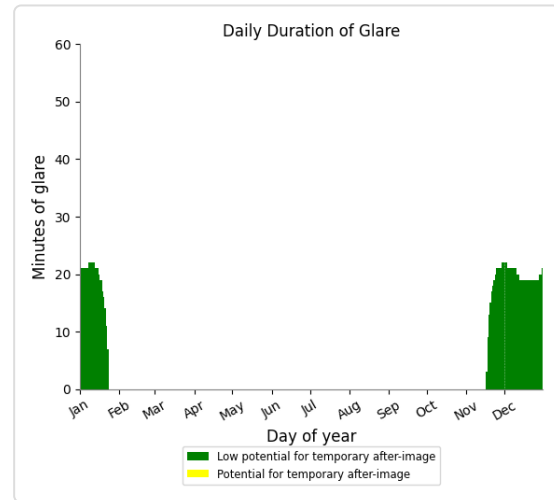
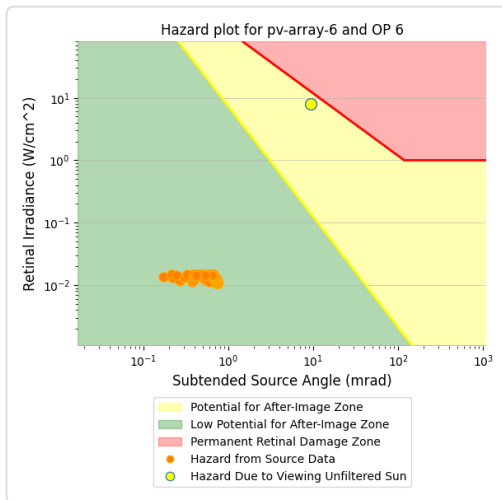
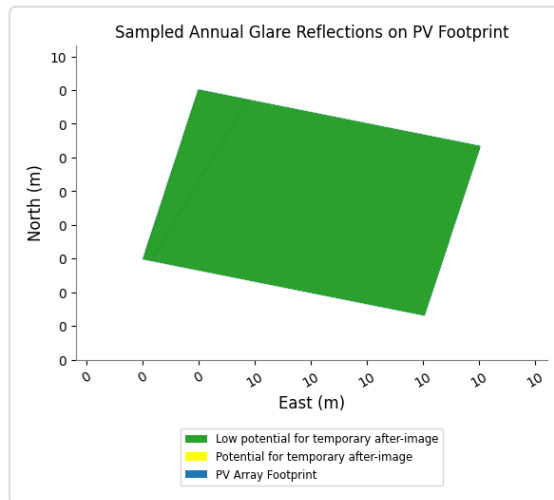
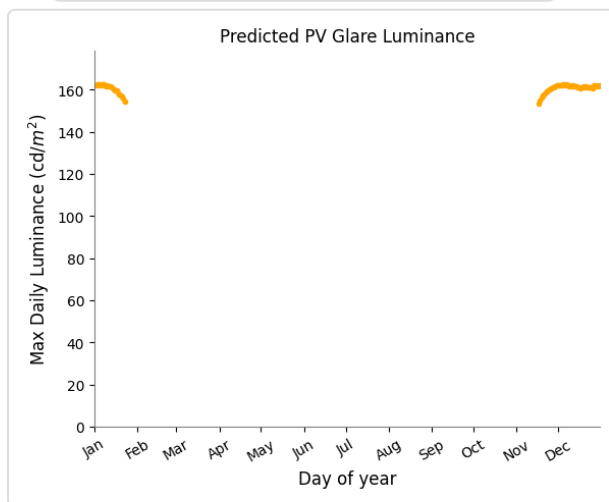
Green glare: 707 min.



PV array 6 and OP 6

Yellow glare: none

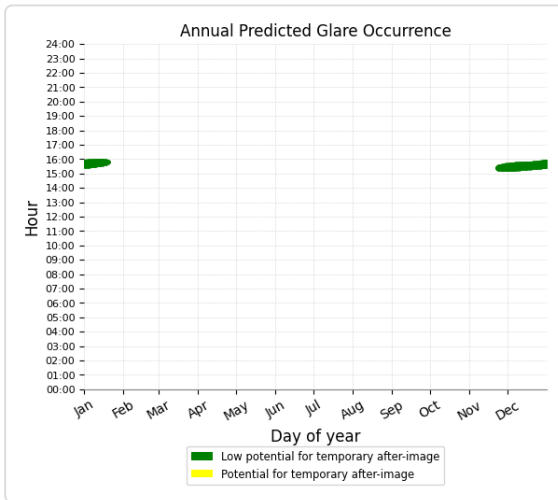
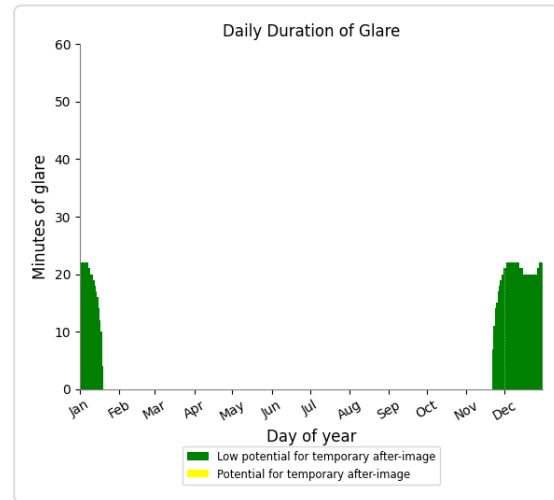
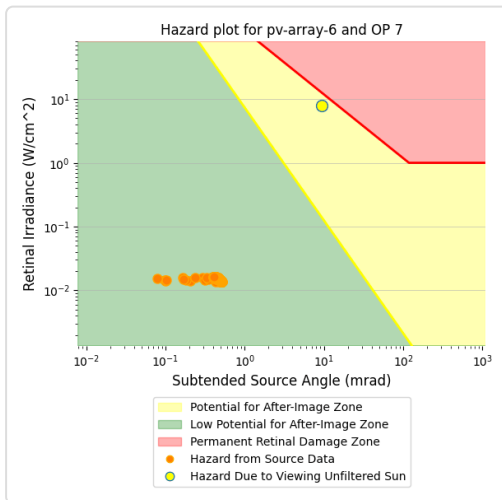
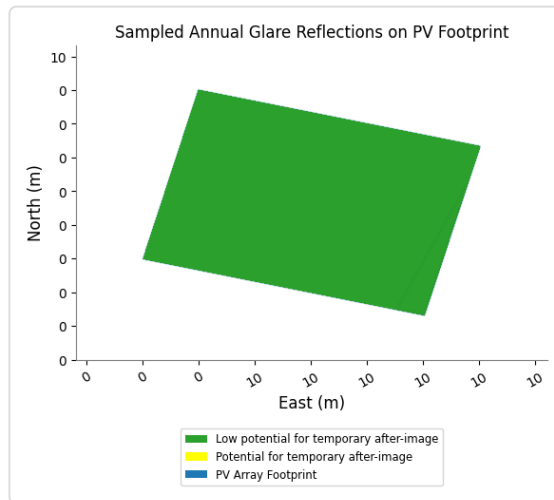
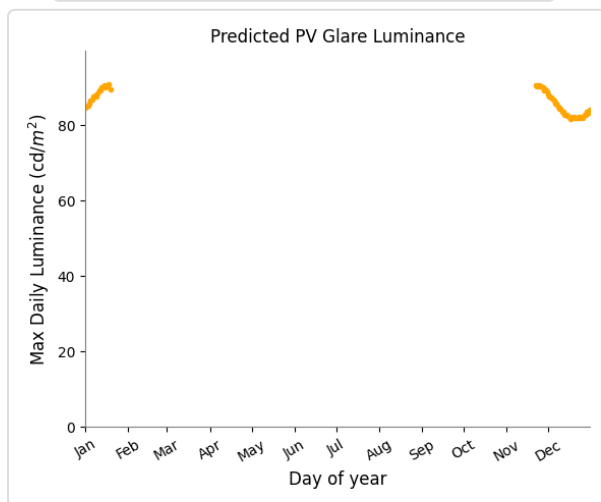
Green glare: 1,303 min.



PV array 6 and OP 7

Yellow glare: none

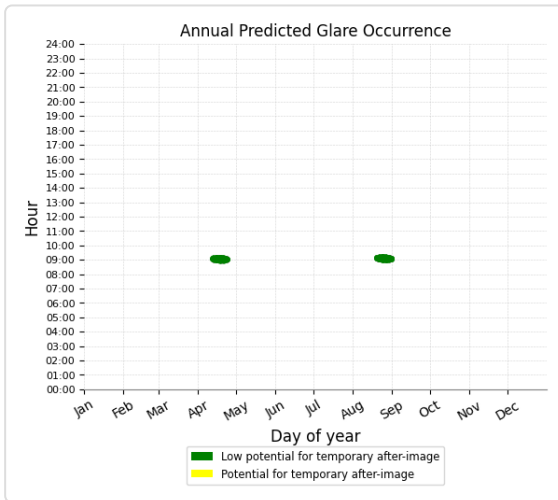
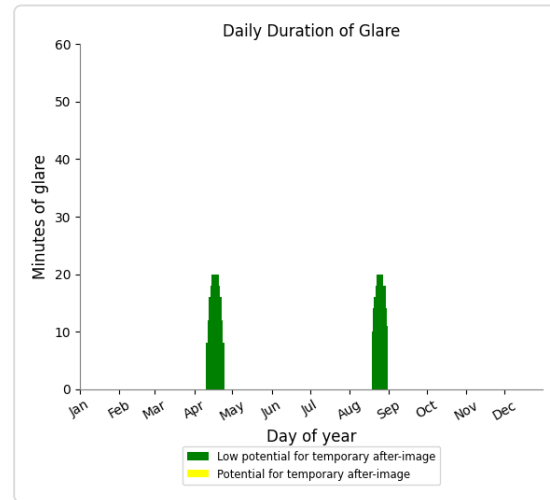
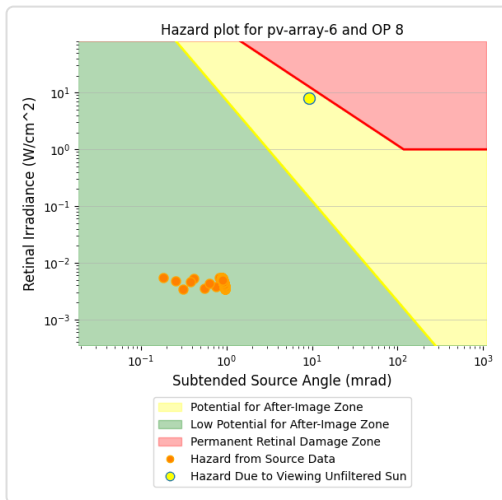
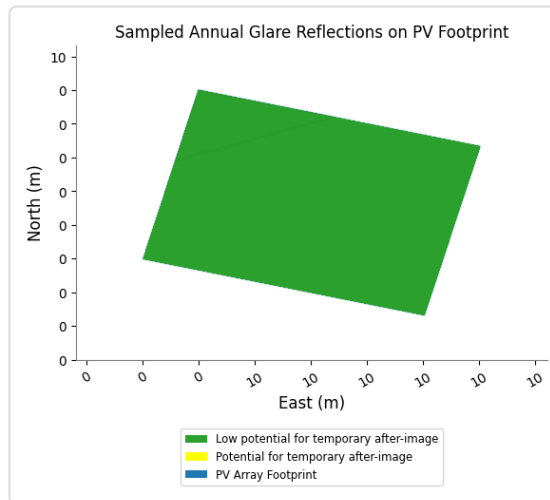
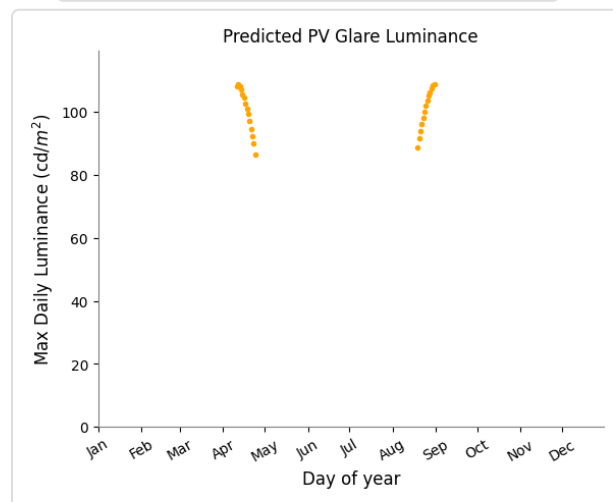
Green glare: 1,140 min.



PV array 6 and OP 8

Yellow glare: none

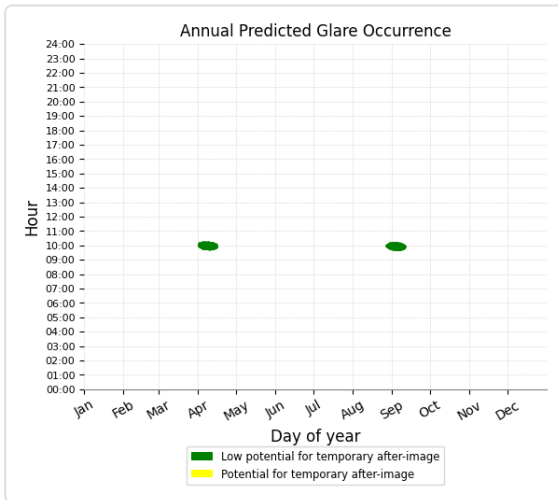
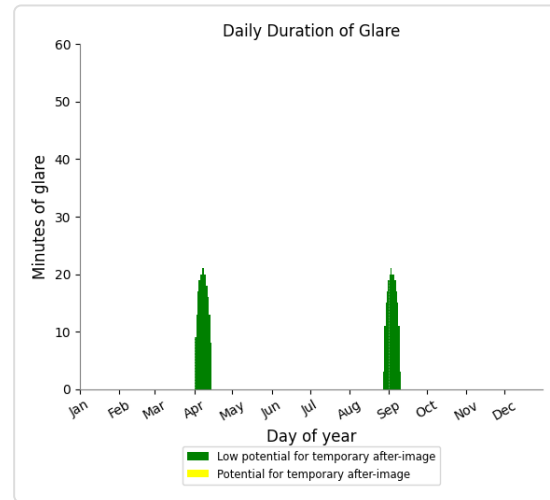
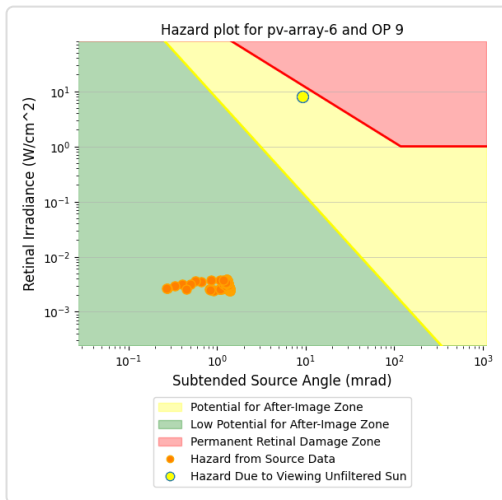
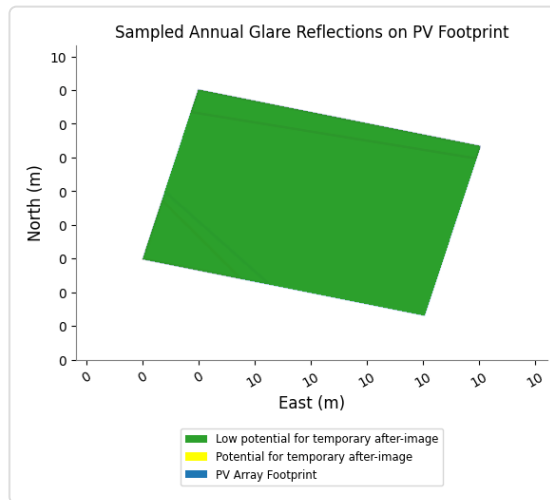
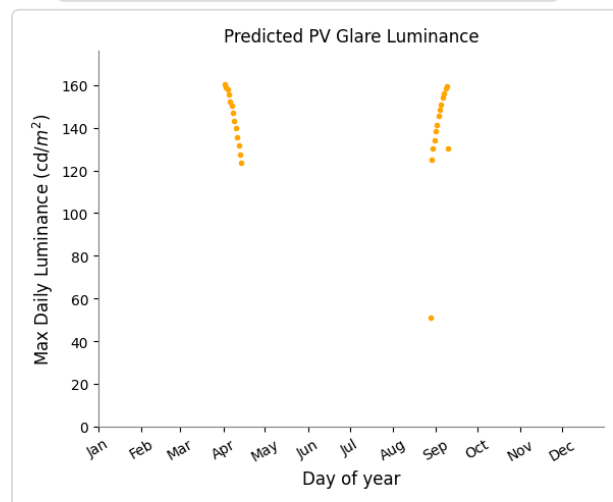
Green glare: 447 min.



PV array 6 and OP 9

Yellow glare: none

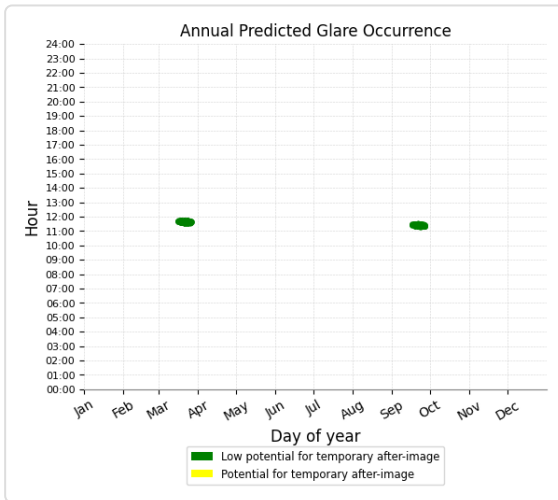
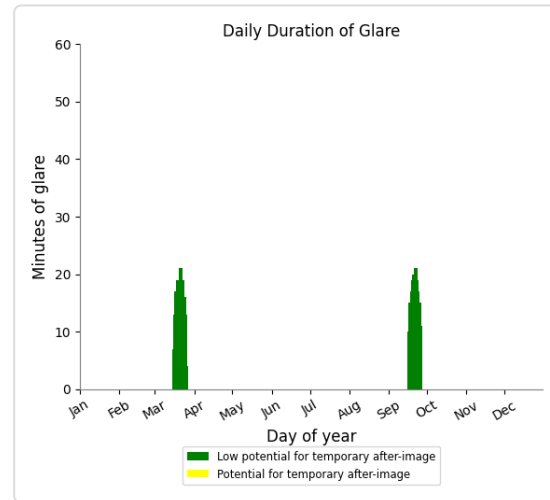
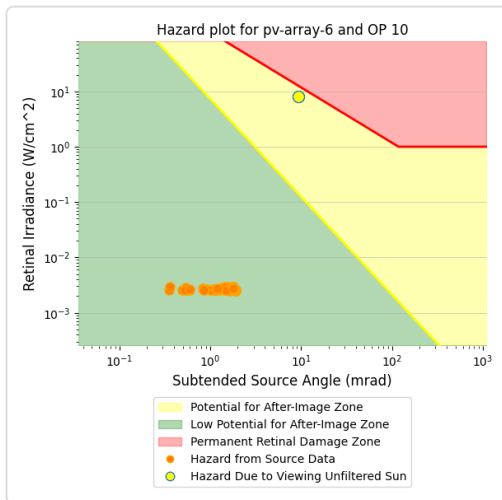
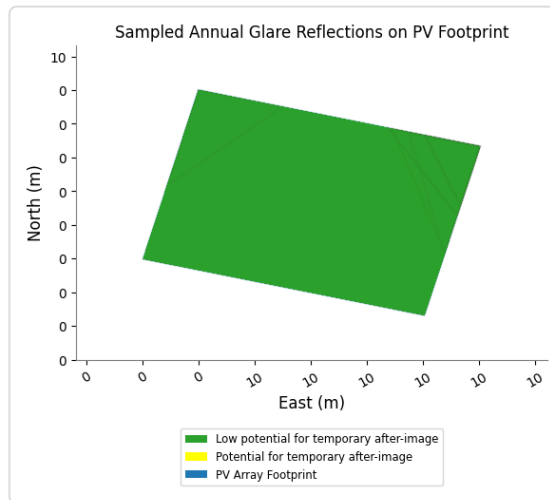
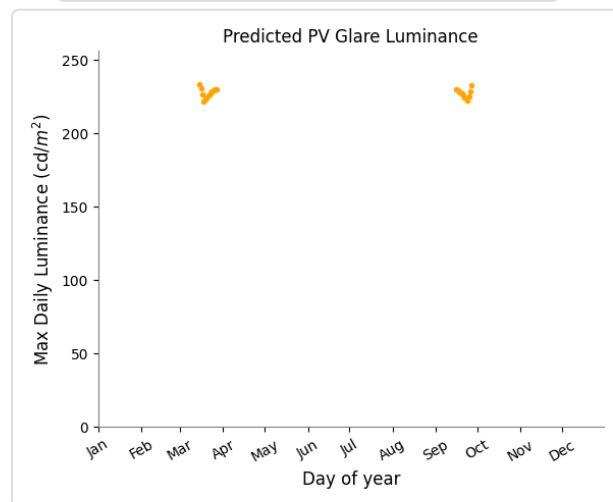
Green glare: 425 min.



PV array 6 and OP 10

Yellow glare: none

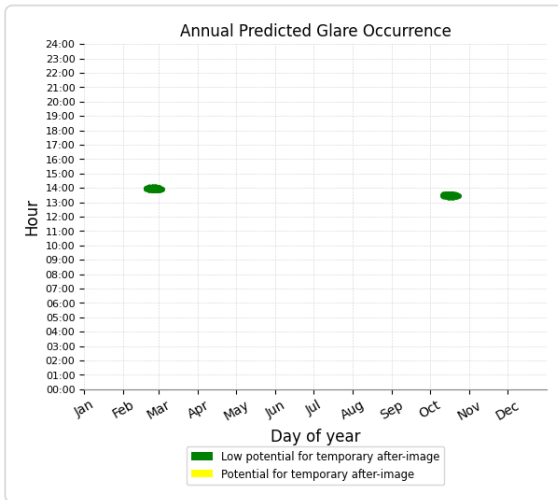
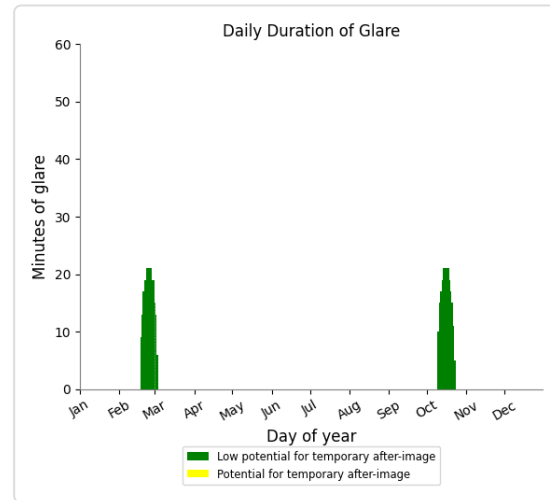
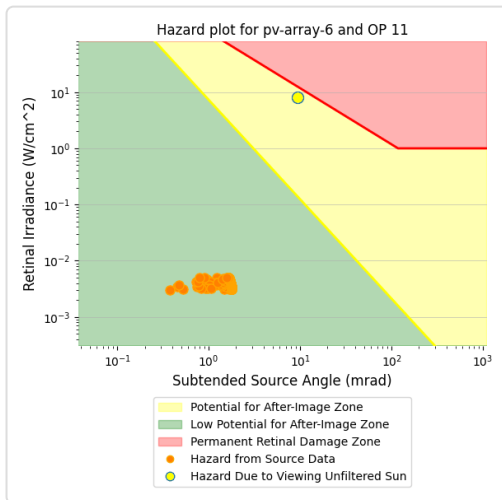
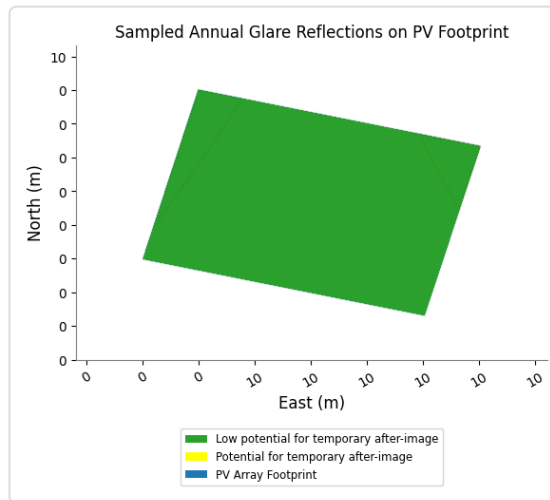
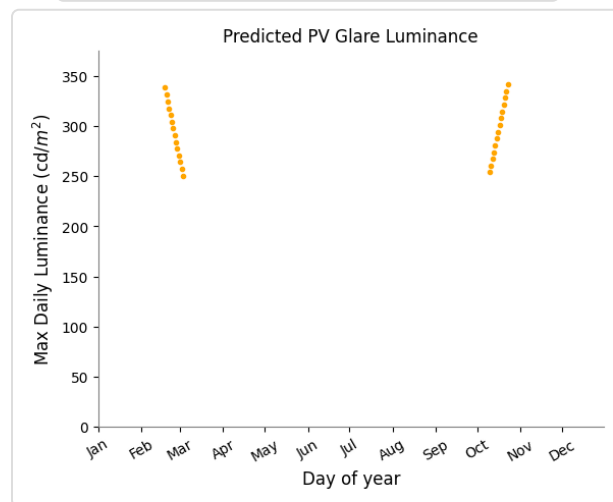
Green glare: 415 min.



PV array 6 and OP 11

Yellow glare: none

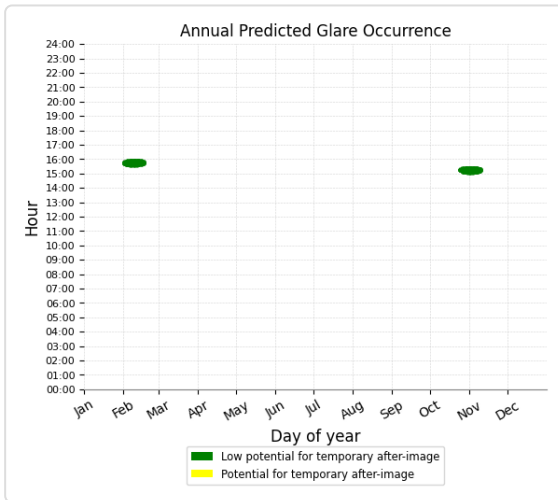
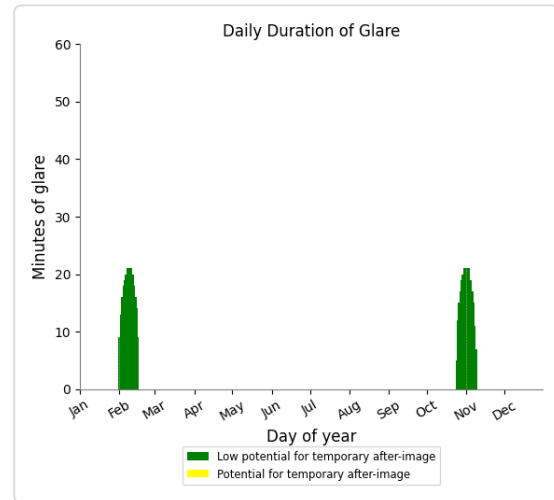
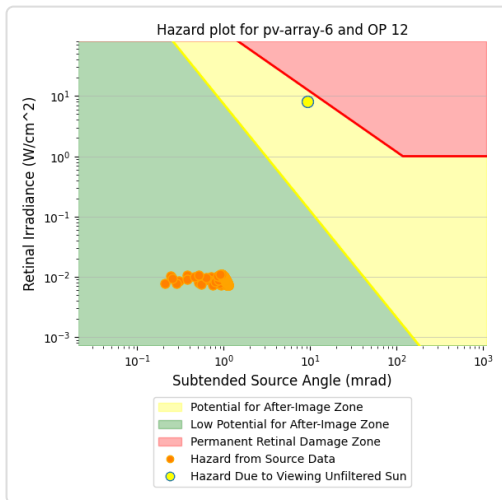
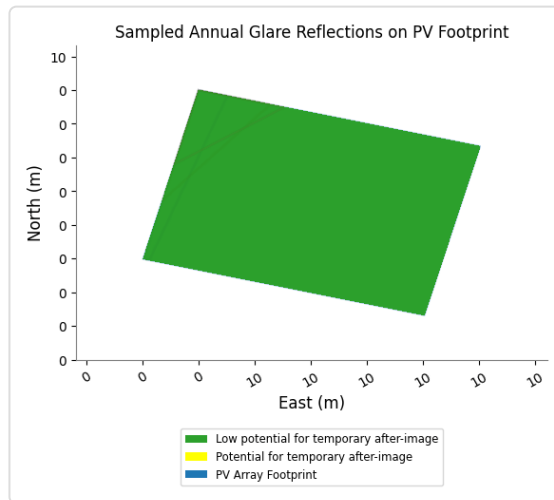
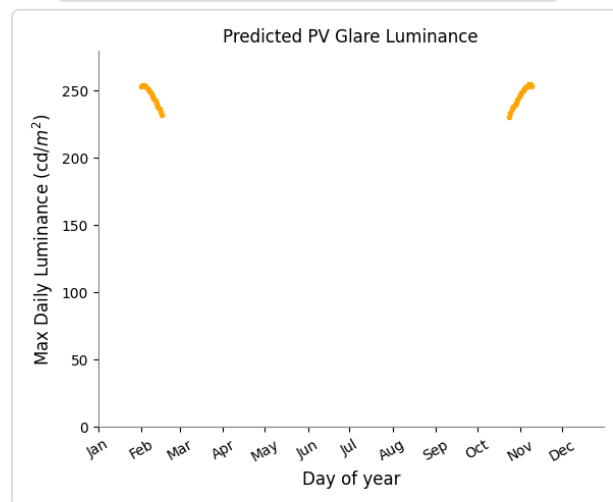
Green glare: 466 min.



PV array 6 and OP 12

Yellow glare: none

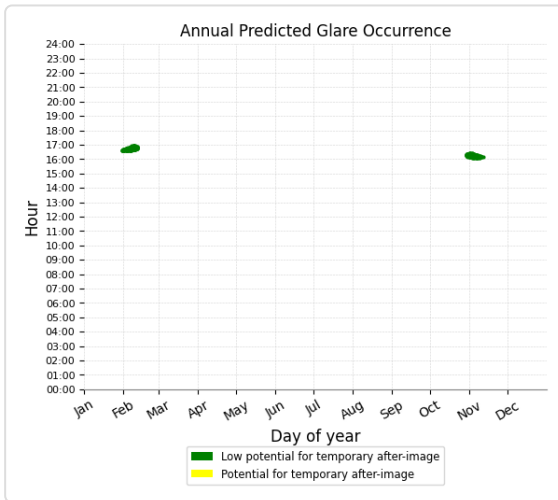
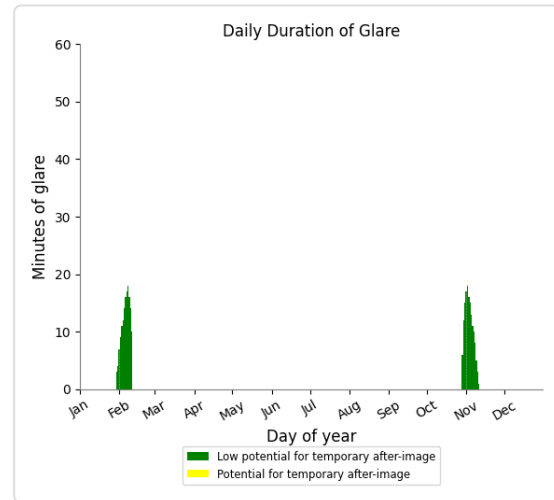
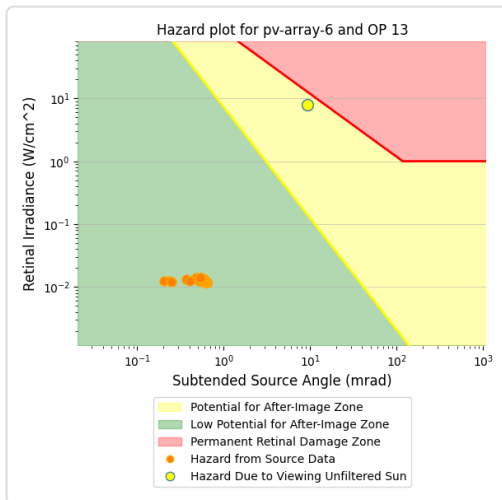
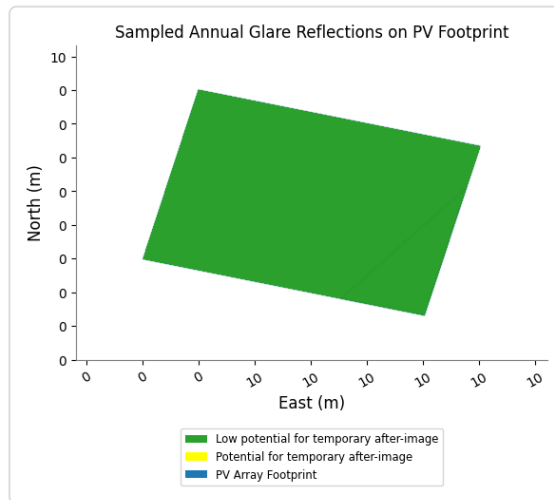
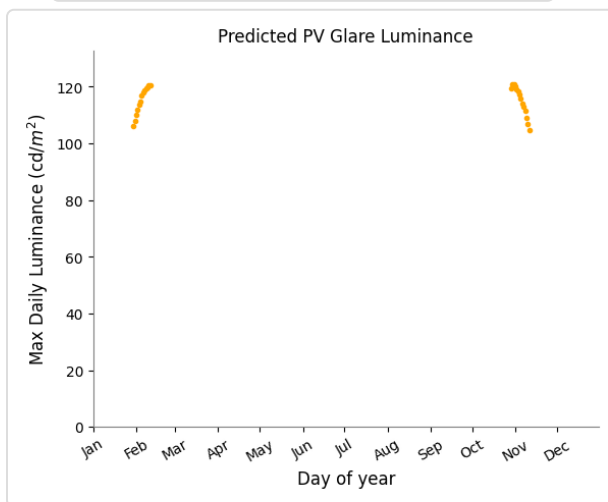
Green glare: 558 min.



PV array 6 and OP 13

Yellow glare: none

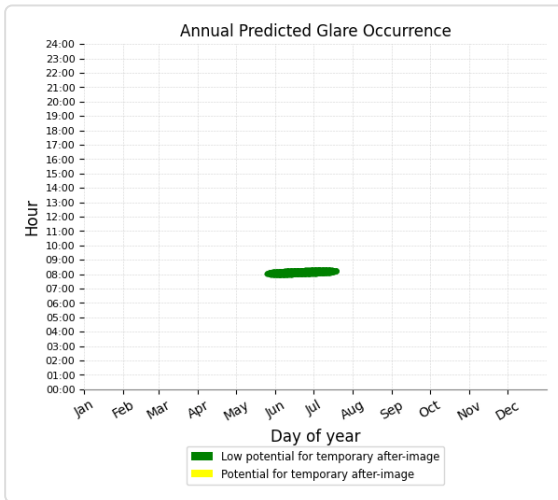
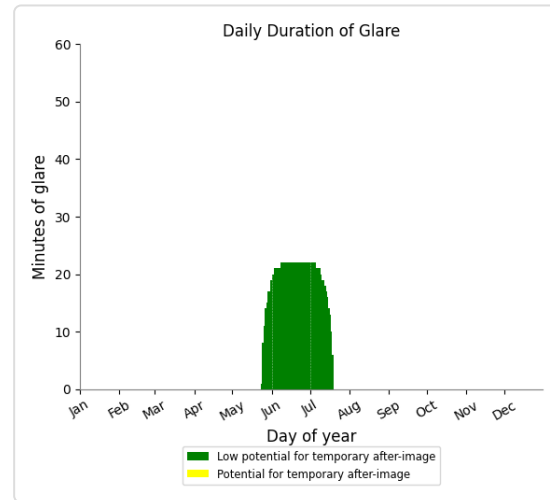
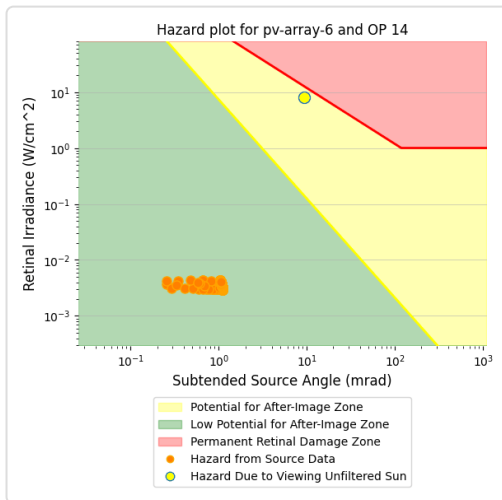
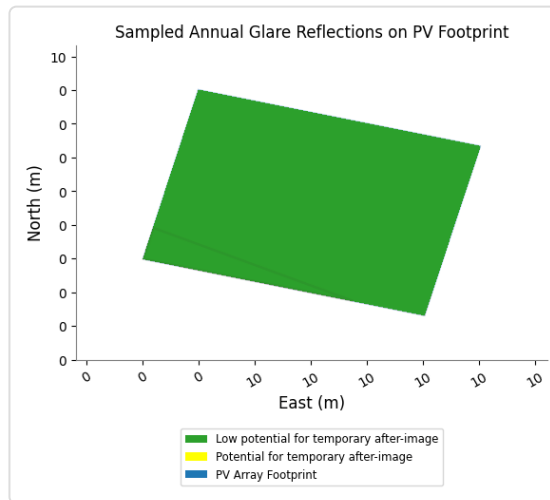
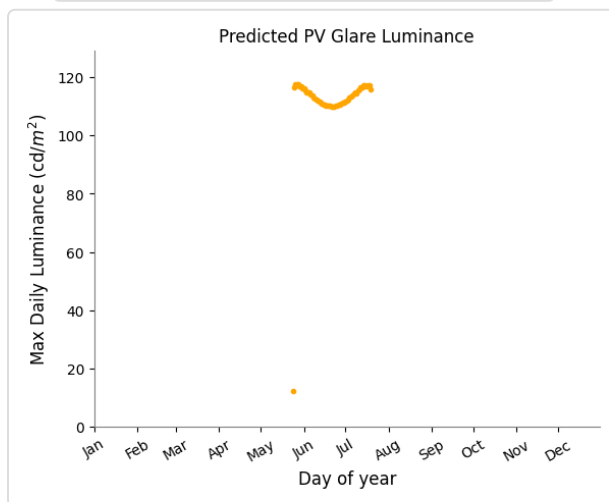
Green glare: 301 min.



PV array 6 and OP 14

Yellow glare: none

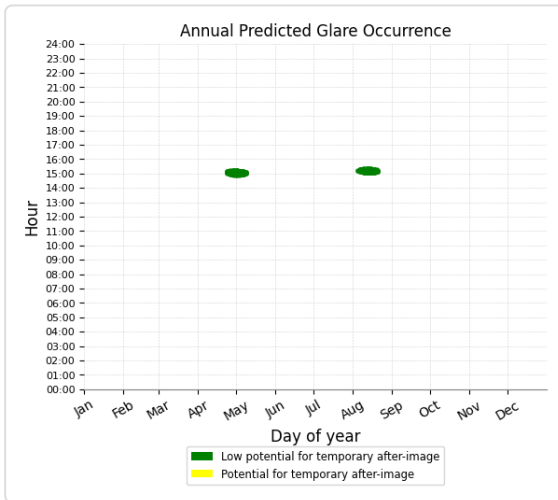
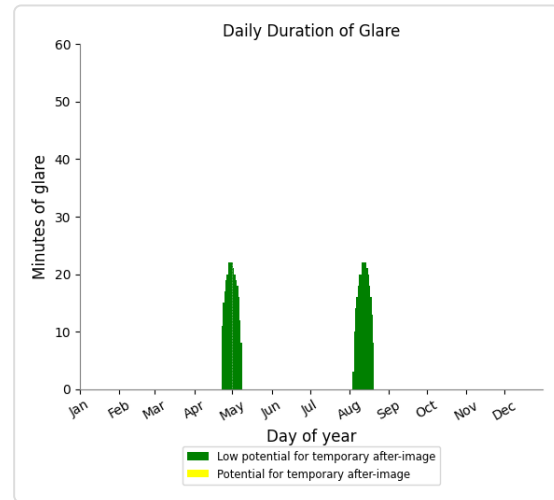
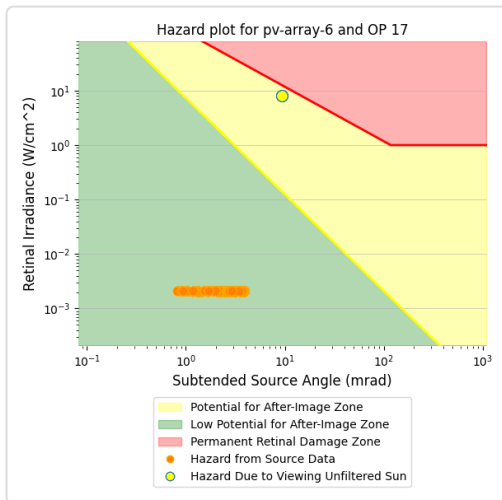
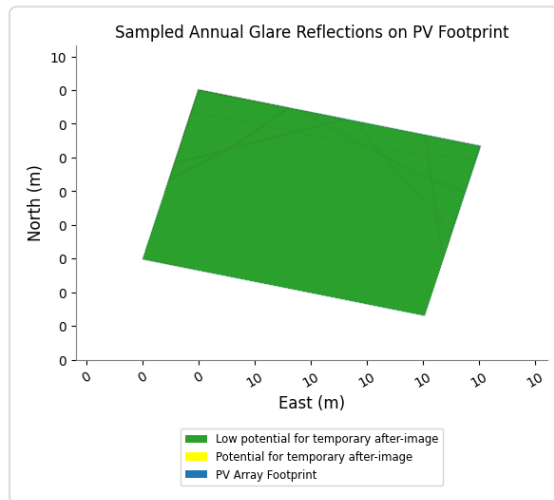
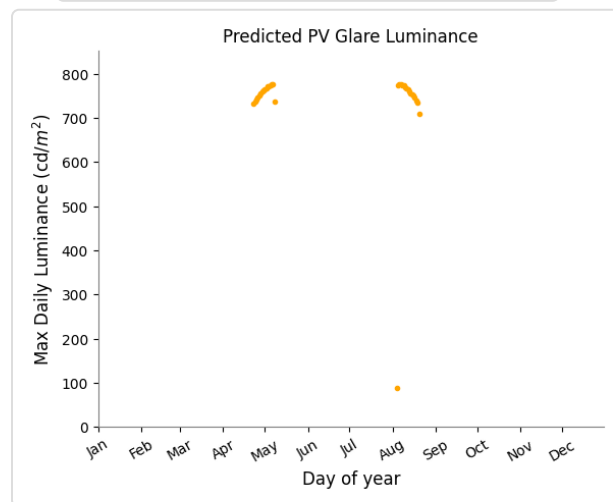
Green glare: 1,098 min.



PV array 6 and OP 17

Yellow glare: none

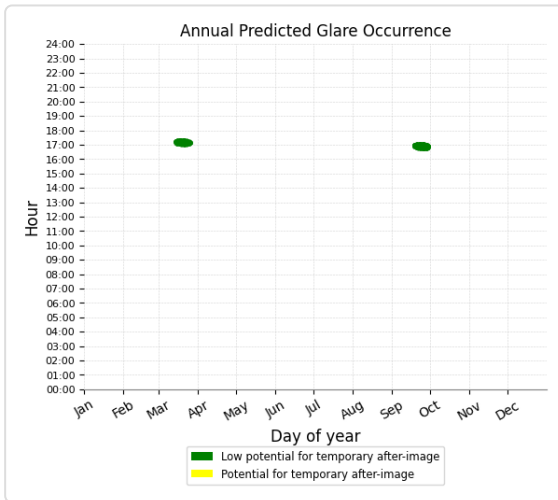
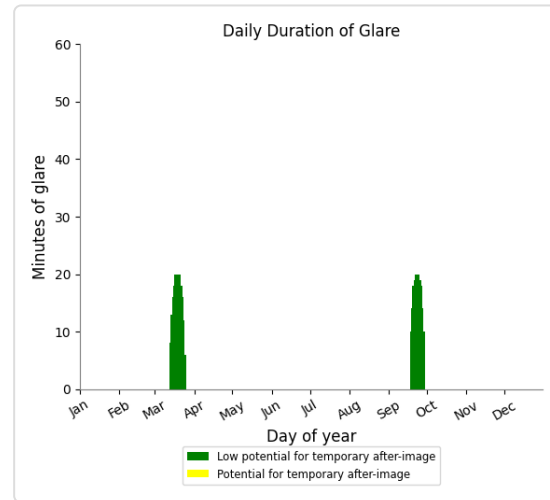
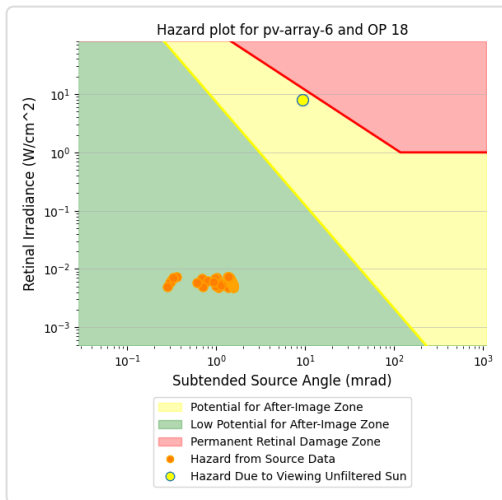
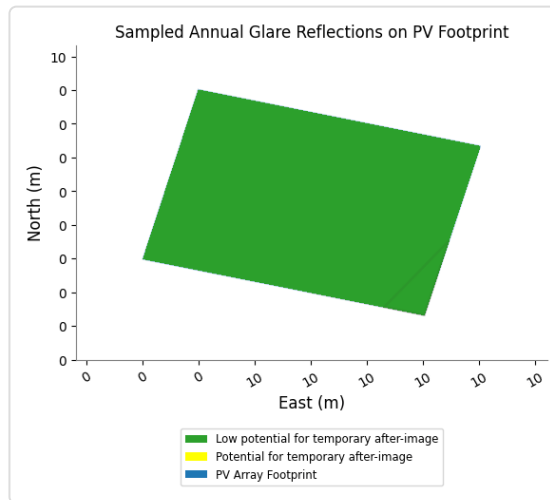
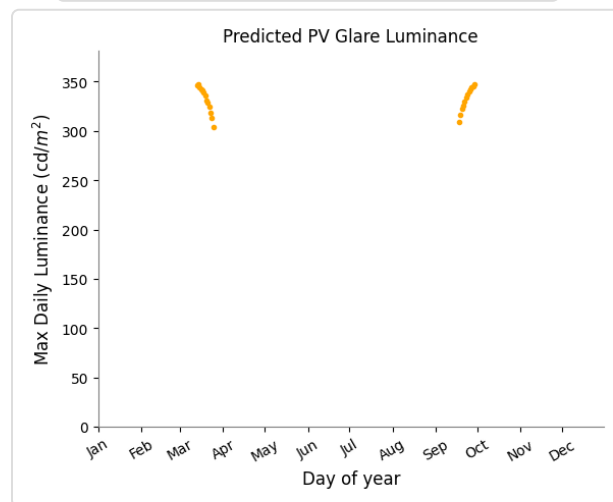
Green glare: 569 min.



PV array 6 and OP 18

Yellow glare: none

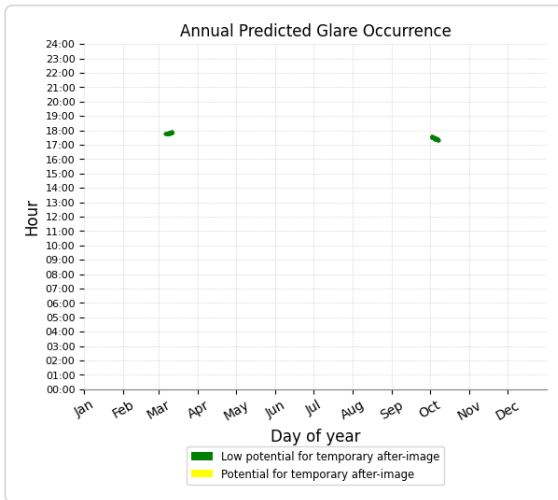
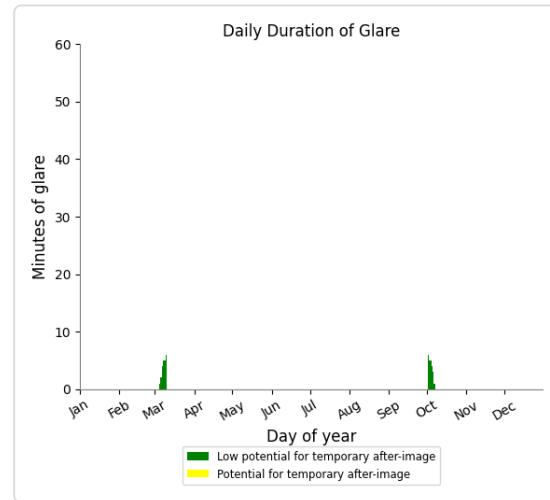
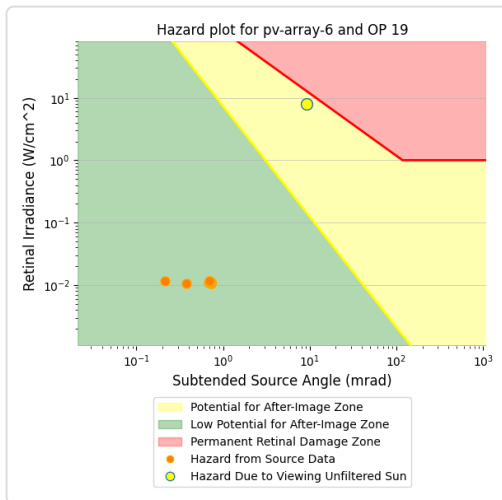
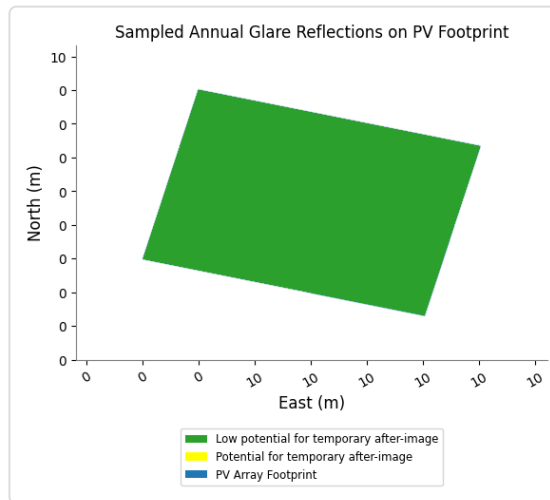
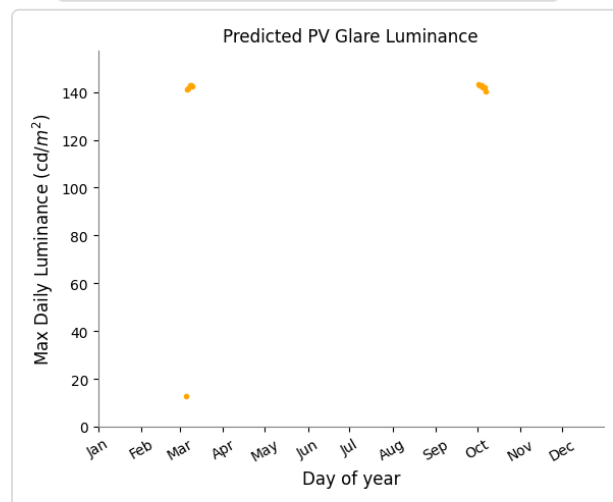
Green glare: 409 min.



PV array 6 and OP 19

Yellow glare: none

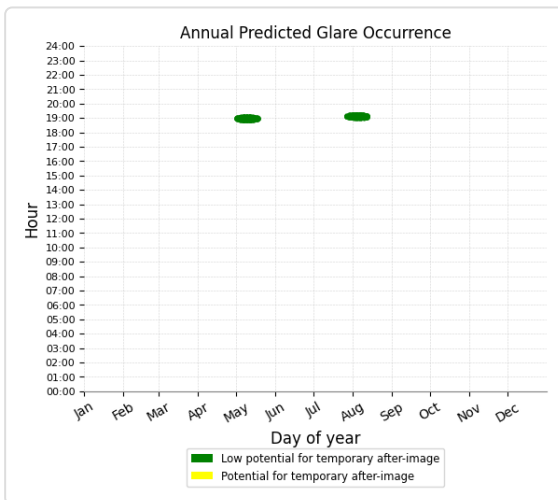
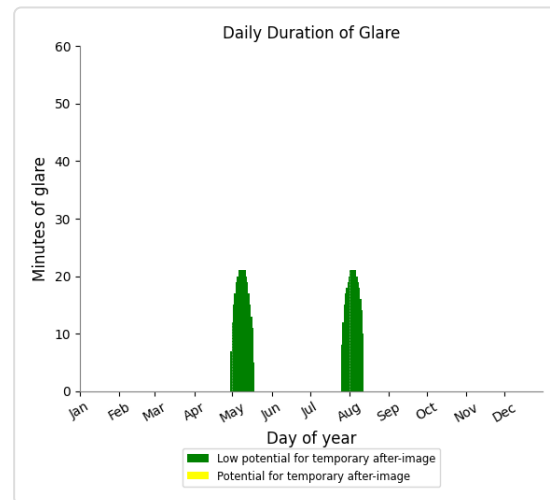
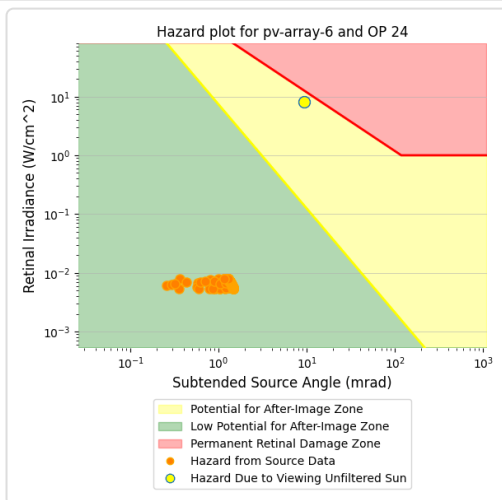
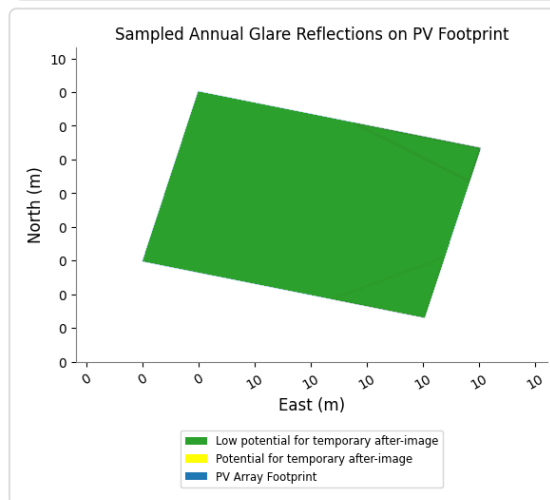
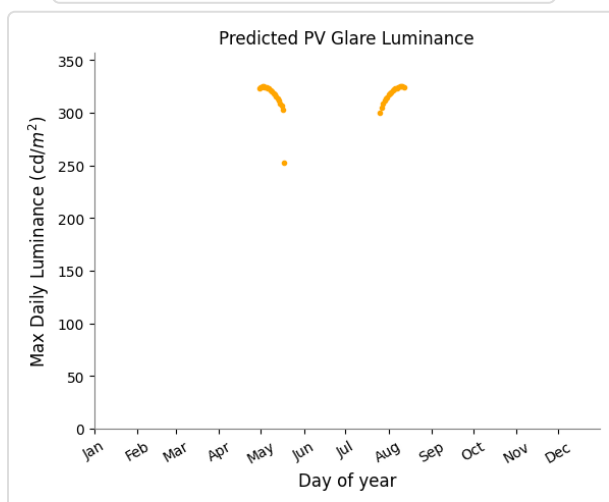
Green glare: 47 min.



PV array 6 and OP 24

Yellow glare: none

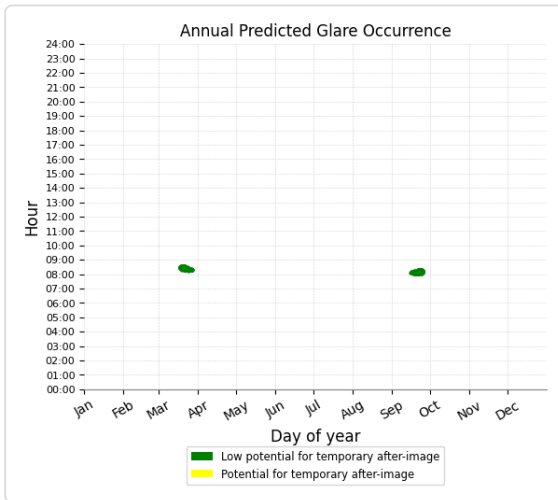
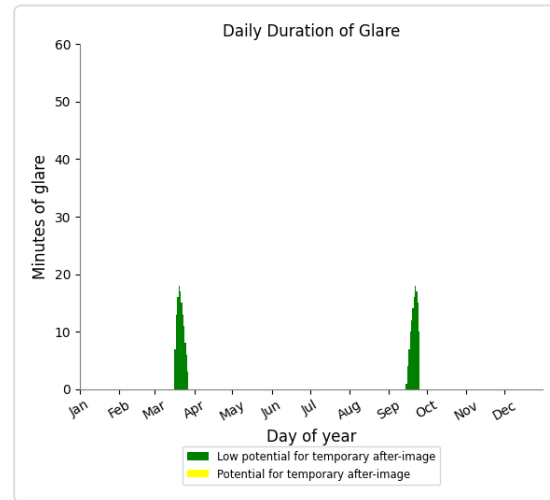
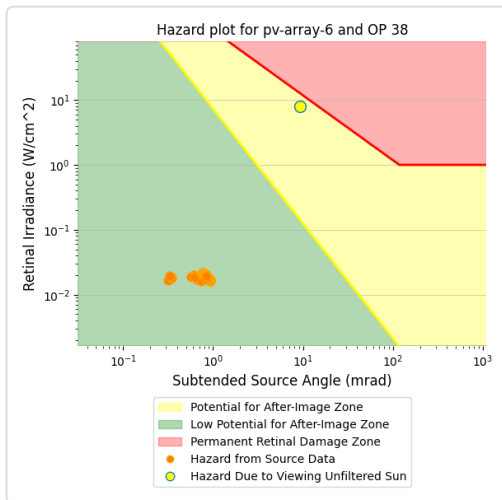
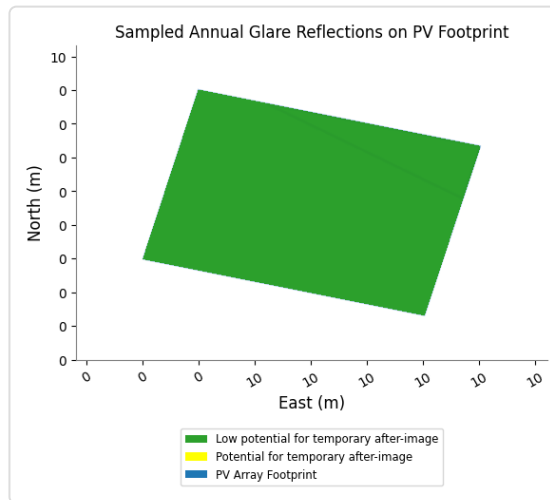
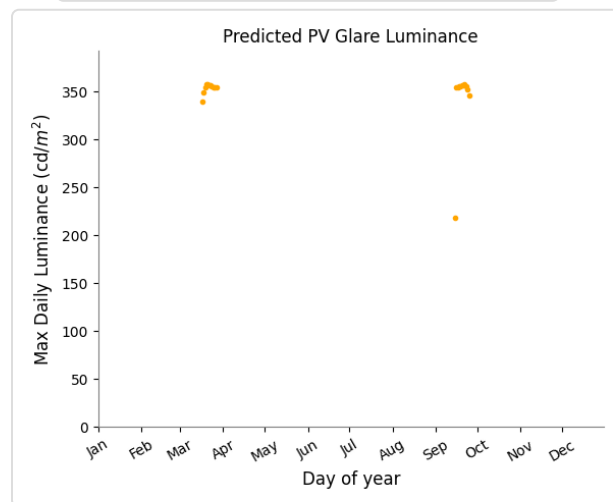
Green glare: 627 min.



PV array 6 and OP 38

Yellow glare: none

Green glare: 251 min.



PV array 6 and 1-ATCT

No glare found

PV array 6 and OP 15

No glare found

PV array 6 and OP 16

No glare found

PV array 6 and OP 20

No glare found

PV array 6 and OP 21

No glare found

PV array 6 and OP 22

No glare found

PV array 6 and OP 23

No glare found

PV array 6 and OP 25

No glare found

PV array 6 and OP 26

No glare found

PV array 6 and OP 27

No glare found

PV array 6 and OP 28

No glare found

PV array 6 and OP 29

No glare found

PV array 6 and OP 30

No glare found

PV array 6 and OP 31

No glare found

PV array 6 and OP 32

No glare found

PV array 6 and OP 33

No glare found

PV array 6 and OP 34

No glare found

PV array 6 and OP 35

No glare found

PV array 6 and OP 36

No glare found

PV array 6 and OP 37

No glare found

PV array 6 and OP 39

No glare found

PV array 6 and OP 40

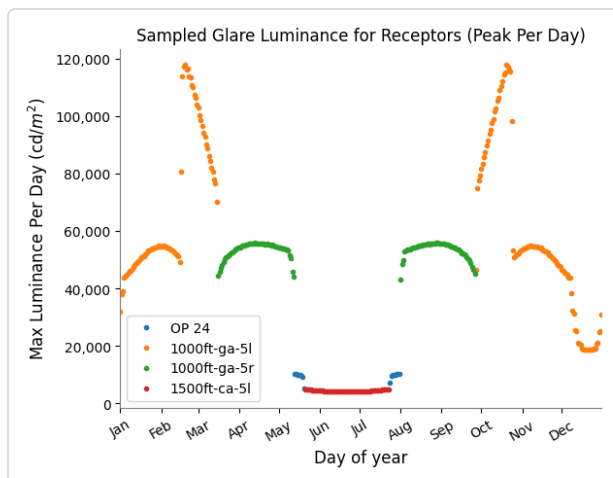
No glare found

PV: PV array 7 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
1000Ft-GA_5L23R_05L-R_23R-L	5,038	84.0	0	0.0	117,809
1000Ft-GA_5R23L_05R-R_23L-L	4,156	69.3	0	0.0	55,836
1500Ft-CA_5L23R_05L-R_23R-L	6,989	116.5	0	0.0	9,630
1000Ft-GA_5L23R_05L-L_23R-R	0	0.0	0	0.0	0
1000Ft-GA_5R23L_05R-L_23L-R	0	0.0	0	0.0	0
1500Ft-CA_5L23R_05L-L_23R-R	0	0.0	0	0.0	0
Approach_05L	0	0.0	0	0.0	0
Approach_05R	0	0.0	0	0.0	0
Approach_23L	0	0.0	0	0.0	0
Approach_23R	0	0.0	0	0.0	0
OP 2	445	7.4	0	0.0	3,185
OP 3	482	8.0	0	0.0	4,521
OP 4	585	9.8	0	0.0	6,361
OP 5	879	14.7	0	0.0	7,546
OP 6	1,589	26.5	0	0.0	5,648
OP 7	1,348	22.5	0	0.0	3,226
OP 8	520	8.7	0	0.0	3,607
OP 9	518	8.6	0	0.0	5,049
OP 10	556	9.3	0	0.0	6,952
OP 11	659	11.0	0	0.0	10,298
OP 12	748	12.5	0	0.0	8,602
OP 13	411	6.8	0	0.0	4,259
OP 14	1,275	21.2	0	0.0	3,836
OP 15	272	4.5	0	0.0	2,464
OP 17	1,099	18.3	0	0.0	19,737
OP 18	586	9.8	0	0.0	11,236
OP 19	97	1.6	0	0.0	5,041
OP 24	876	14.6	0	0.0	10,740
OP 38	294	4.9	0	0.0	11,645
1-ATCT	0	0.0	0	0.0	0
OP 16	0	0.0	0	0.0	0
OP 20	0	0.0	0	0.0	0
OP 21	0	0.0	0	0.0	0
OP 22	0	0.0	0	0.0	0
OP 23	0	0.0	0	0.0	0
OP 25	0	0.0	0	0.0	0
OP 26	0	0.0	0	0.0	0
OP 27	0	0.0	0	0.0	0

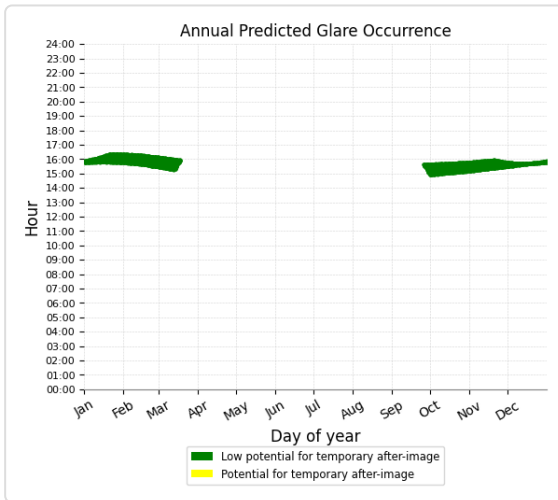
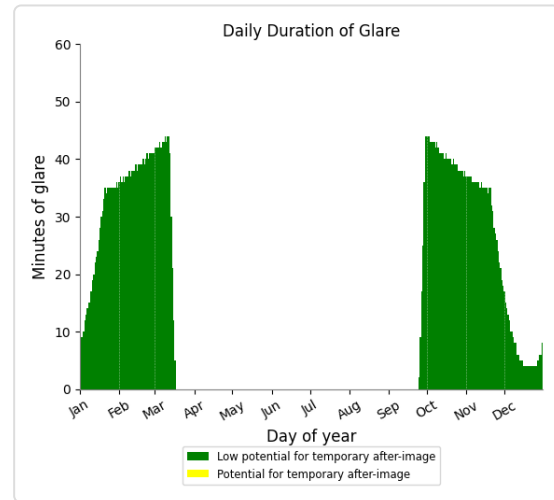
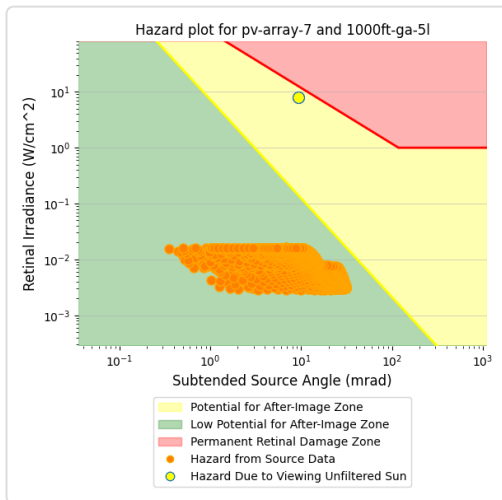
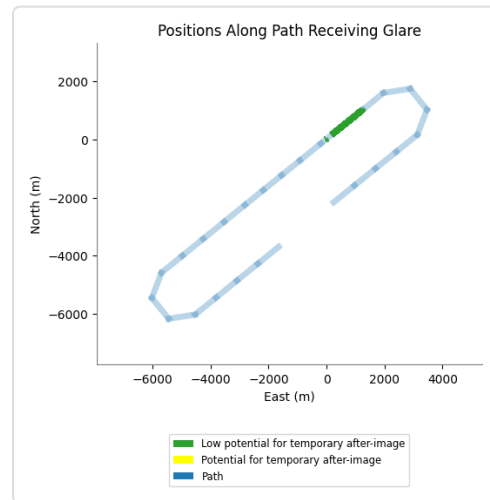
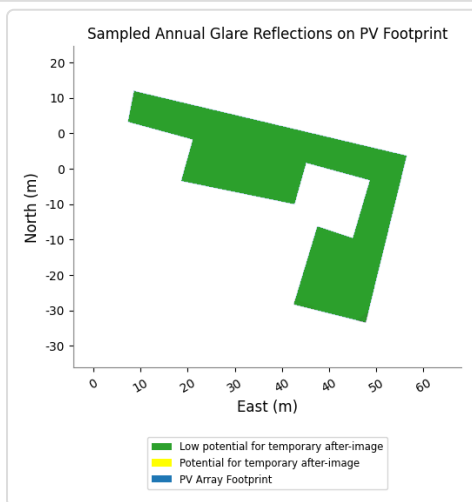
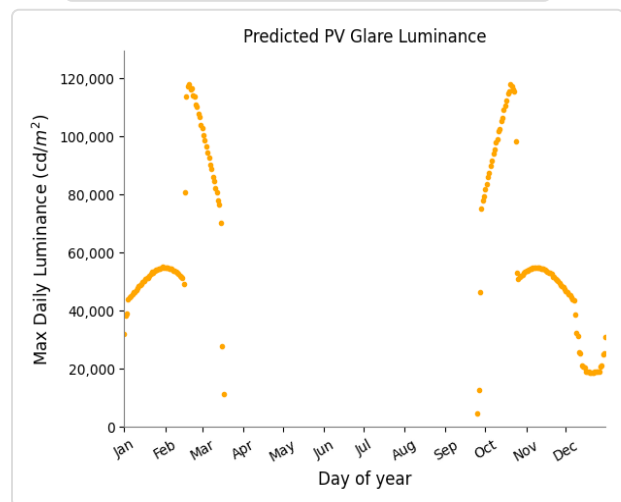
Receptor	Annual Green Glare		Annual Yellow Glare		Peak Luminance
	min	hr	min	hr	cd/m ²
OP 28	0	0.0	0	0.0	0
OP 29	0	0.0	0	0.0	0
OP 30	0	0.0	0	0.0	0
OP 31	0	0.0	0	0.0	0
OP 32	0	0.0	0	0.0	0
OP 33	0	0.0	0	0.0	0
OP 34	0	0.0	0	0.0	0
OP 35	0	0.0	0	0.0	0
OP 36	0	0.0	0	0.0	0
OP 37	0	0.0	0	0.0	0
OP 39	0	0.0	0	0.0	0
OP 40	0	0.0	0	0.0	0



PV array 7 and Route: 1000Ft-GA_5L23R_05L-R_23R-L

Yellow glare: none

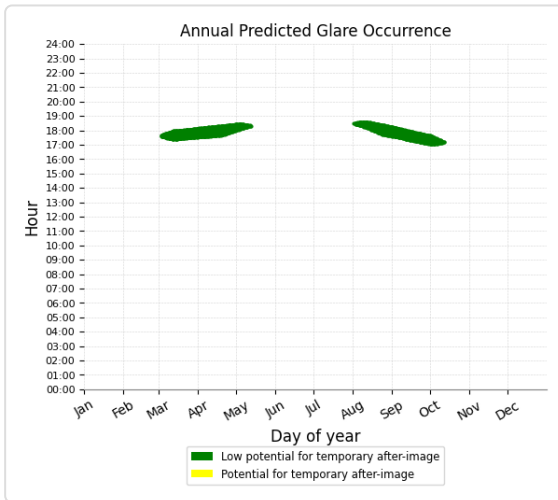
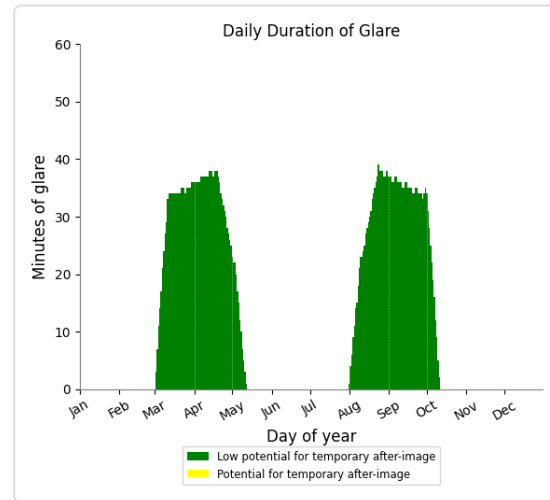
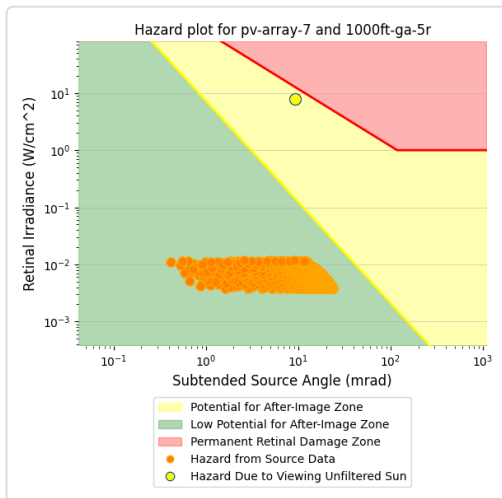
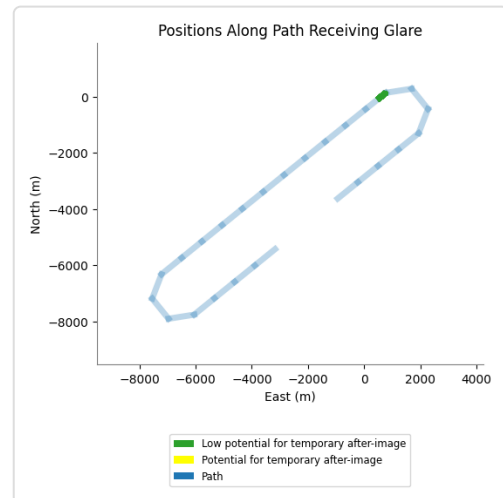
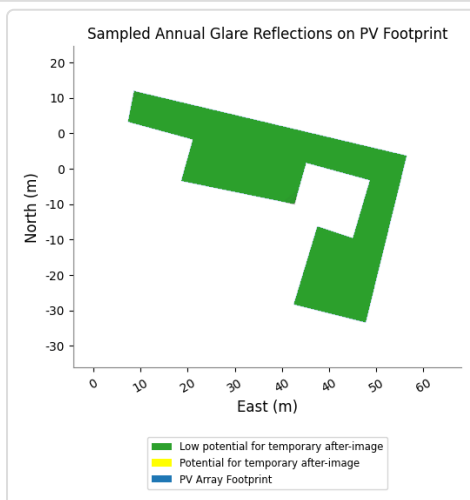
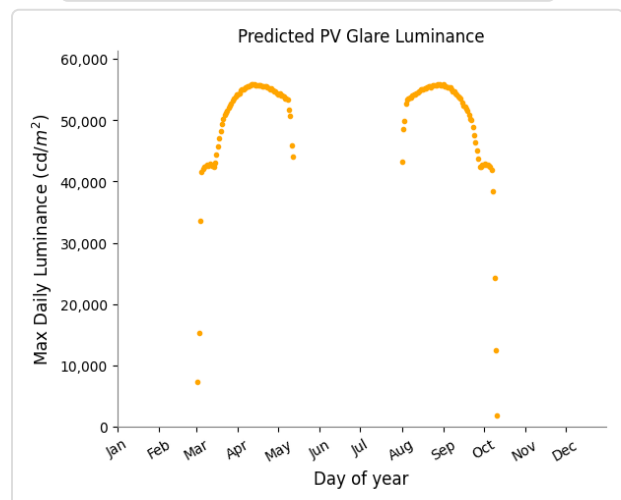
Green glare: 5,038 min.



PV array 7 and Route: 1000Ft-GA_5R23L_05R-R_23L-L

Yellow glare: none

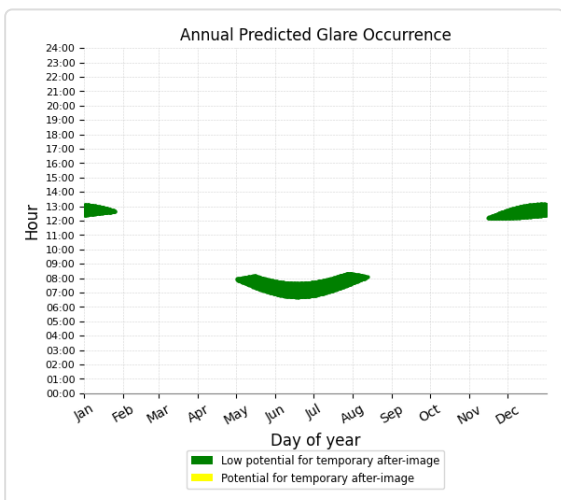
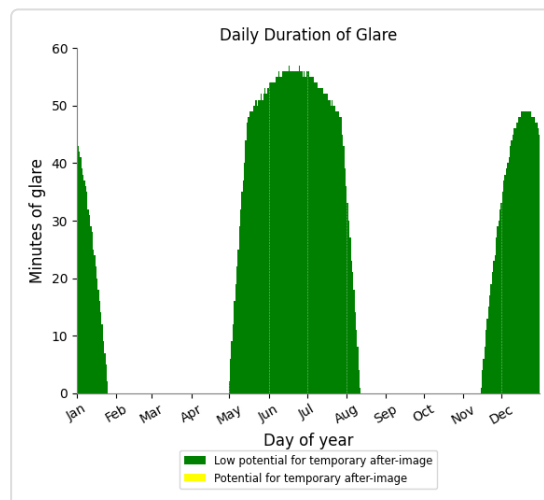
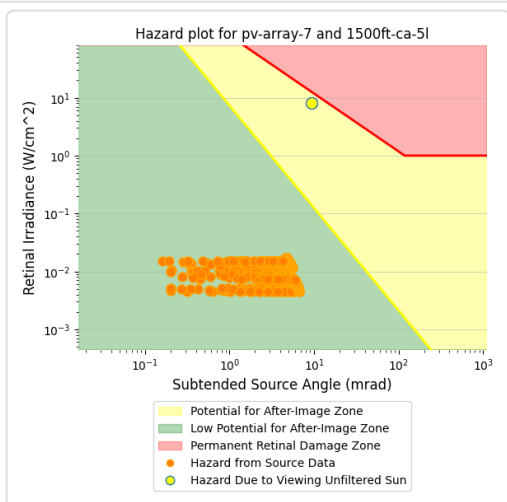
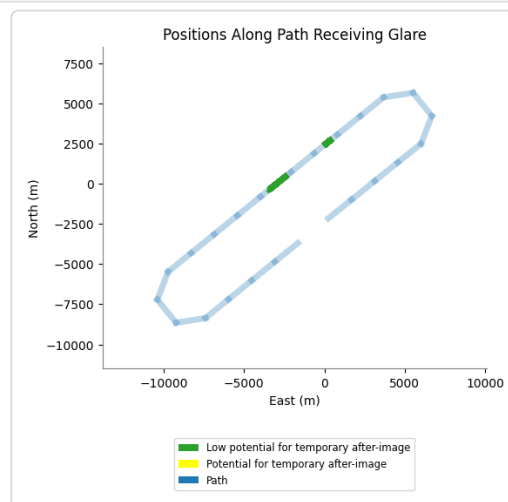
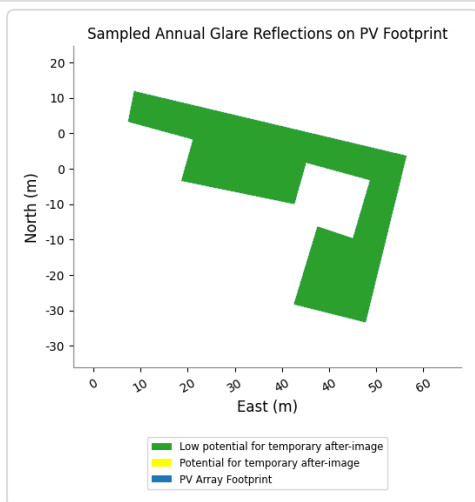
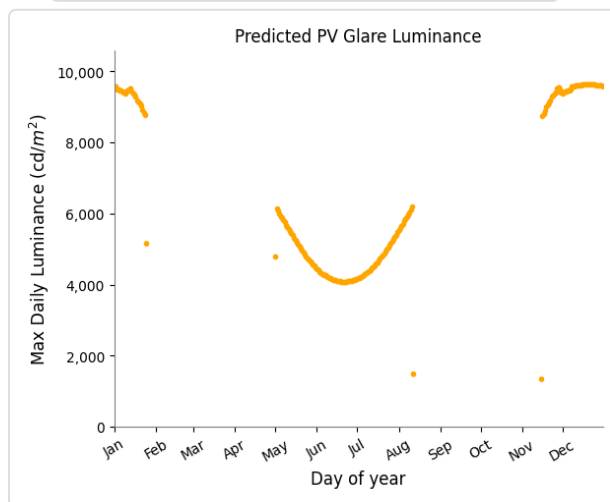
Green glare: 4,156 min.



PV array 7 and Route: 1500Ft-CA_5L23R_05L-R_23R-L

Yellow glare: none

Green glare: 6,989 min.



PV array 7 and Route: 1000Ft-GA_5L23R_05L-L_23R-R

No glare found

PV array 7 and Route: 1000Ft-GA_5R23L_05R-L_23L-R

No glare found

PV array 7 and Route: 1500Ft-CA_5L23R_05L-L_23R-R

No glare found

PV array 7 and Route: Approach_05L

No glare found

PV array 7 and Route: Approach_05R

No glare found

PV array 7 and Route: Approach_23L

No glare found

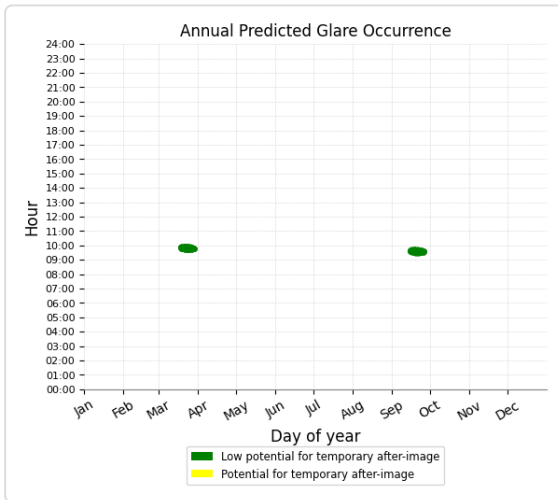
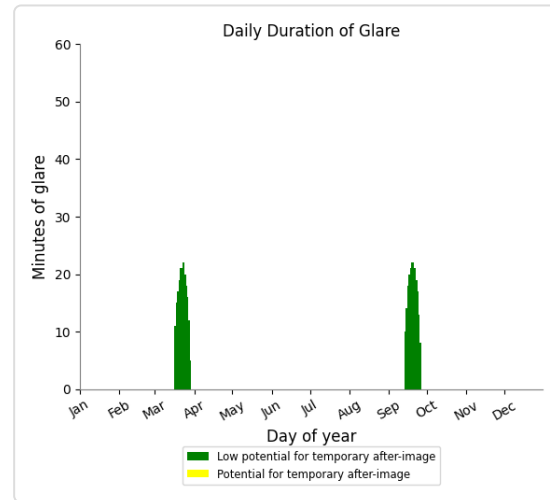
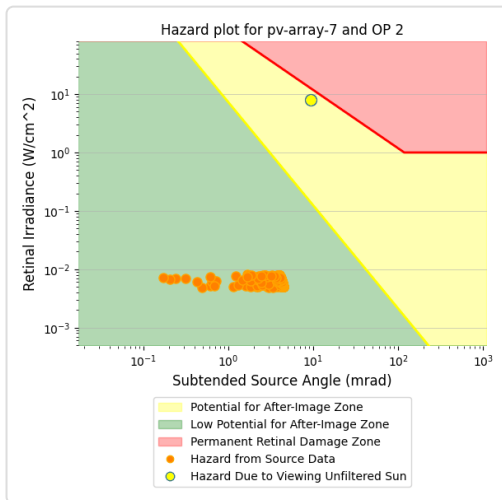
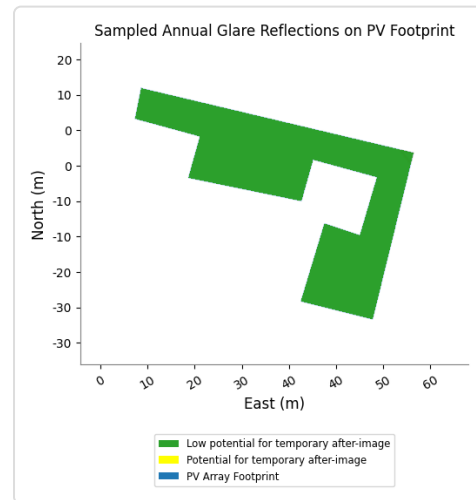
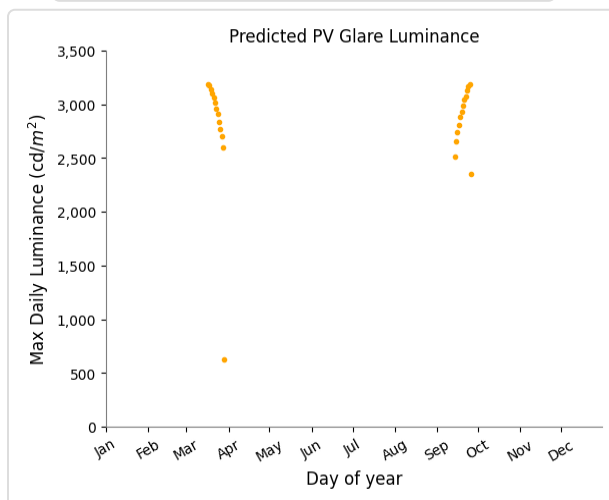
PV array 7 and Route: Approach_23R

No glare found

PV array 7 and OP 2

Yellow glare: none

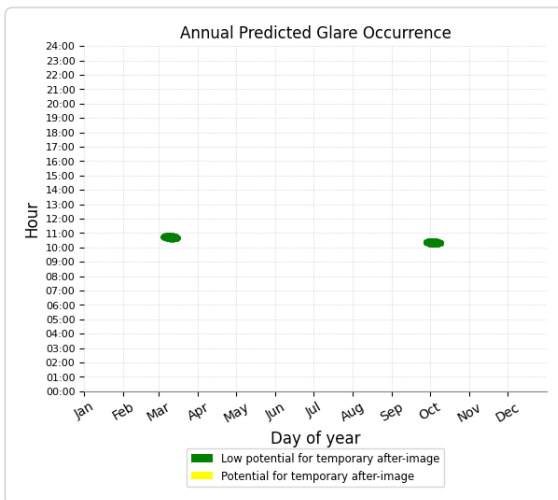
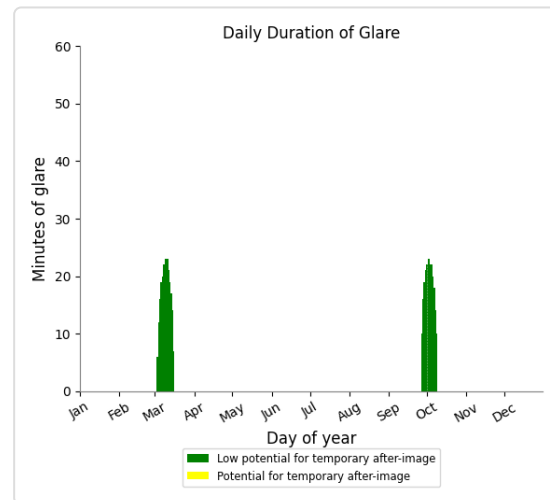
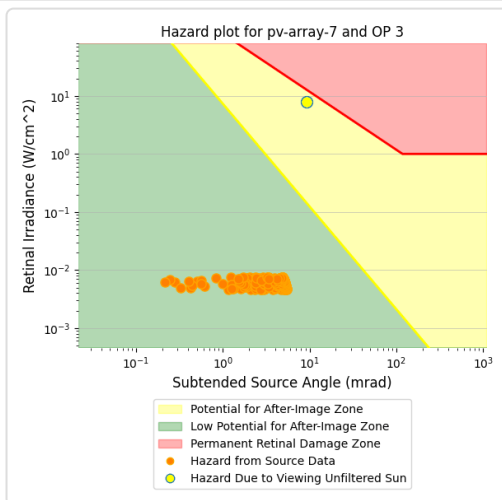
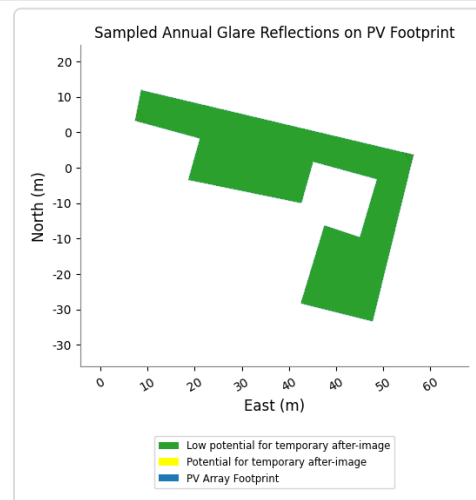
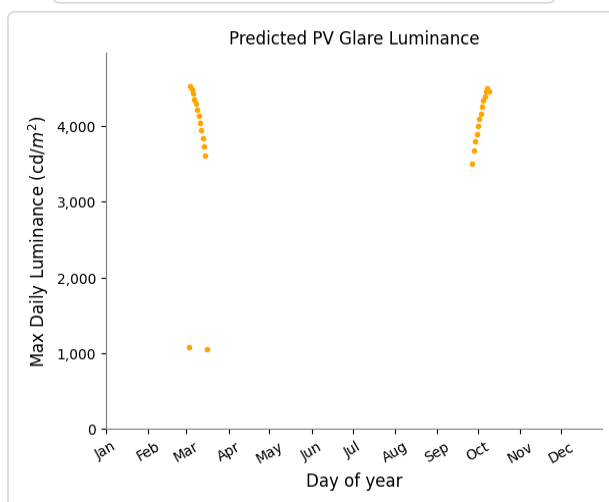
Green glare: 445 min.



PV array 7 and OP 3

Yellow glare: none

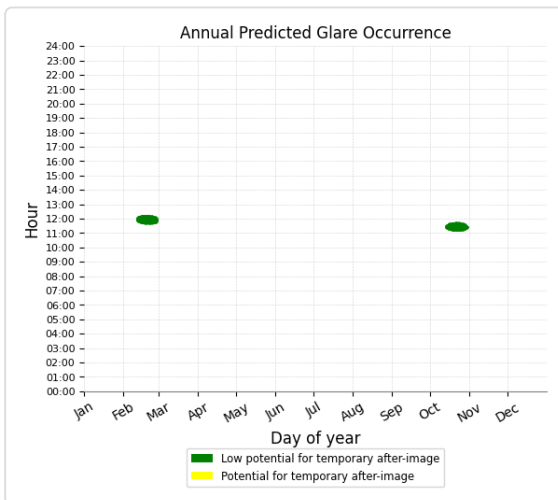
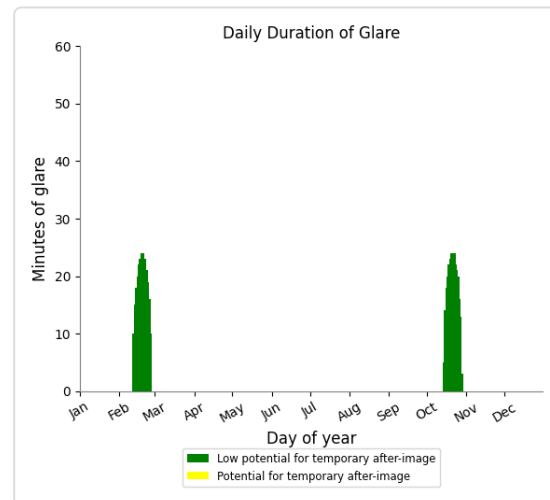
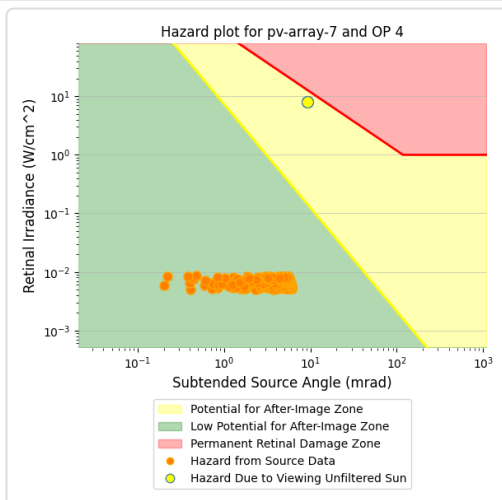
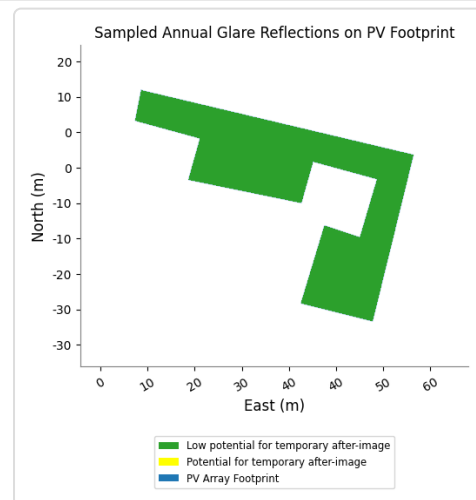
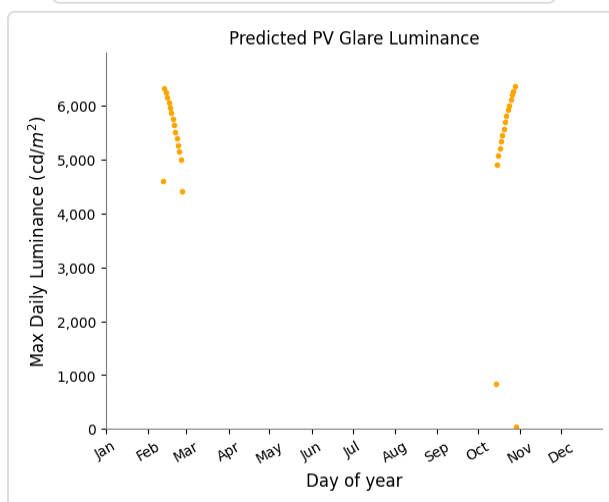
Green glare: 482 min.



PV array 7 and OP 4

Yellow glare: none

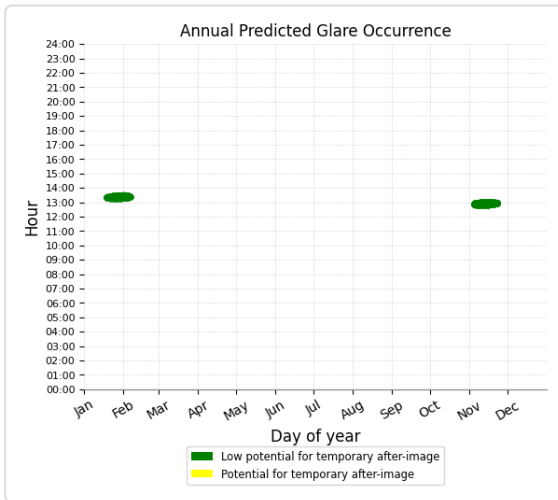
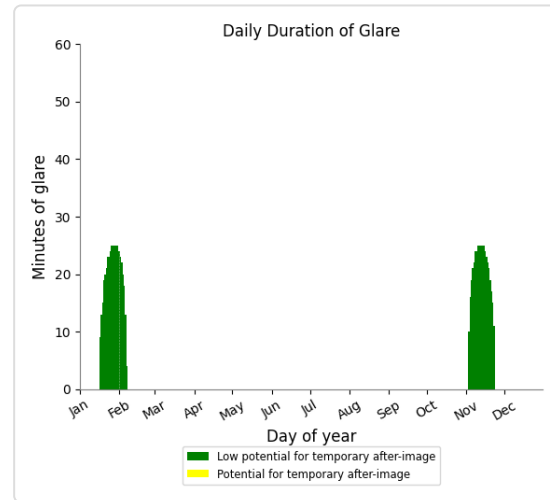
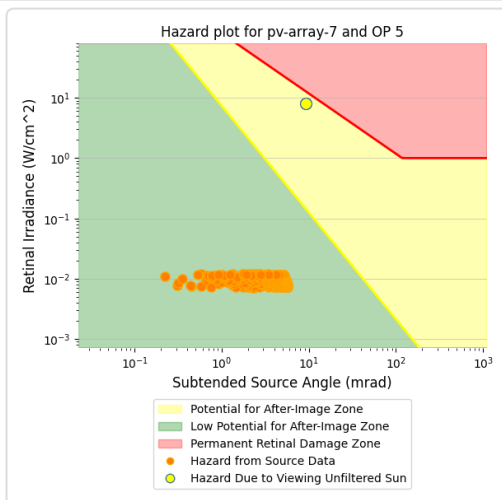
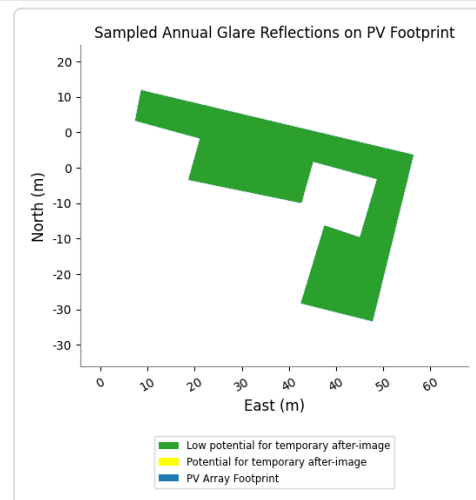
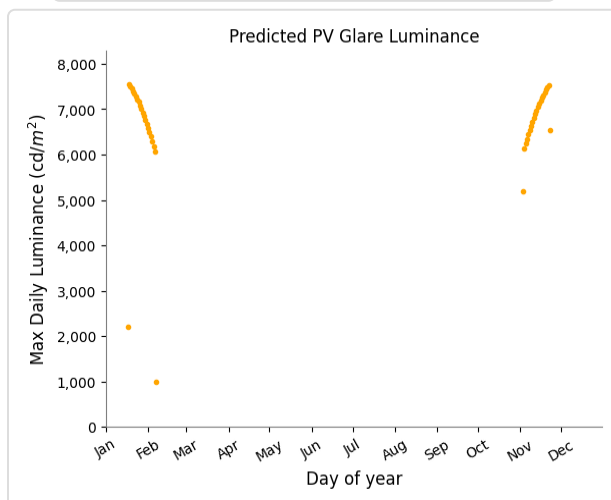
Green glare: 585 min.



PV array 7 and OP 5

Yellow glare: none

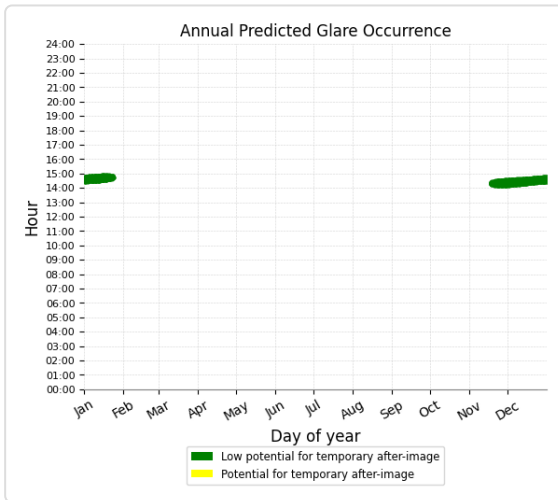
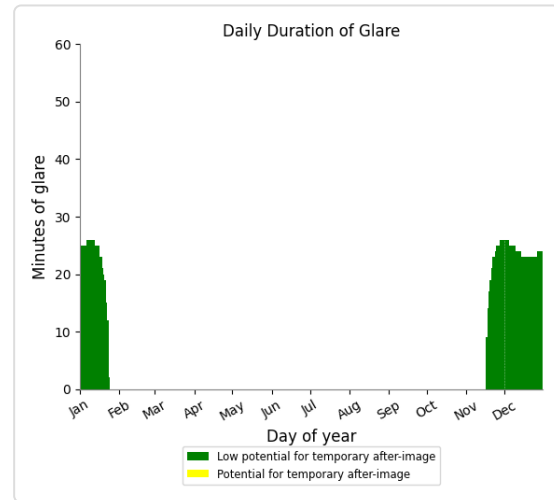
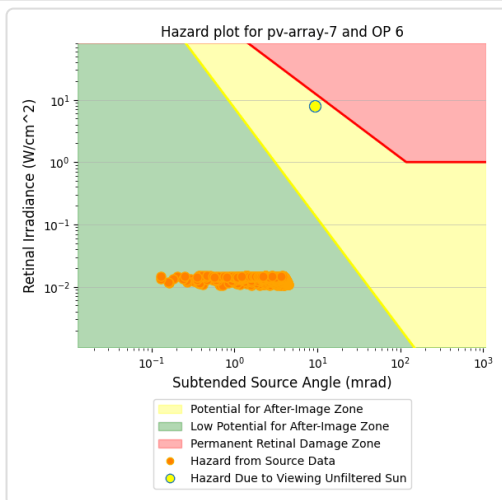
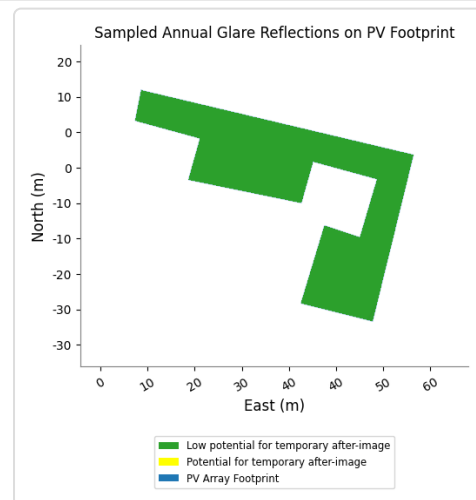
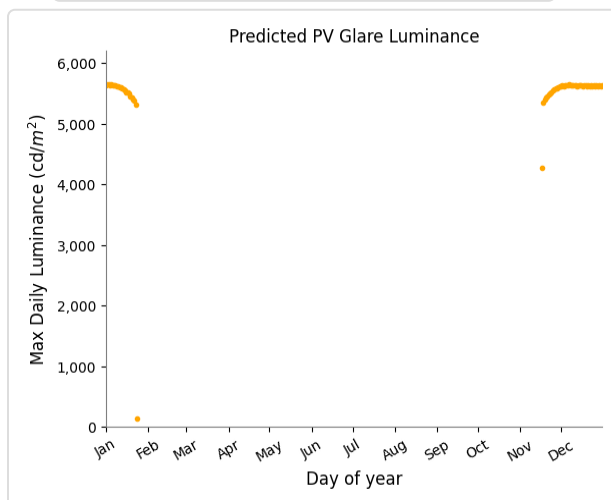
Green glare: 879 min.



PV array 7 and OP 6

Yellow glare: none

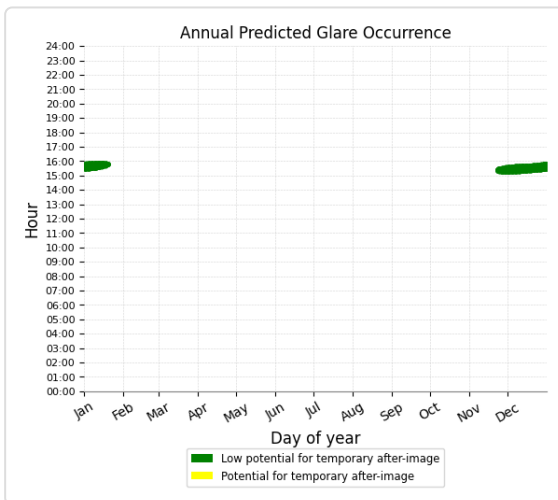
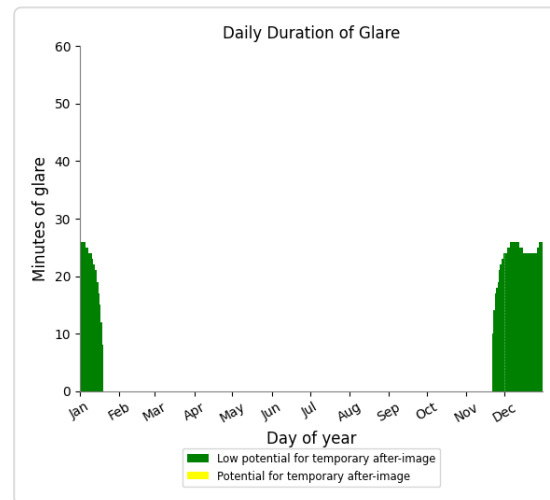
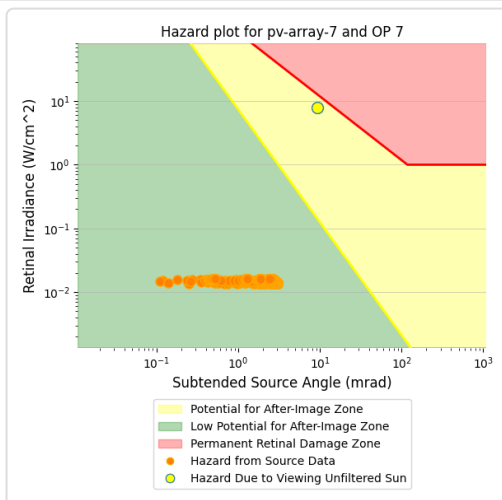
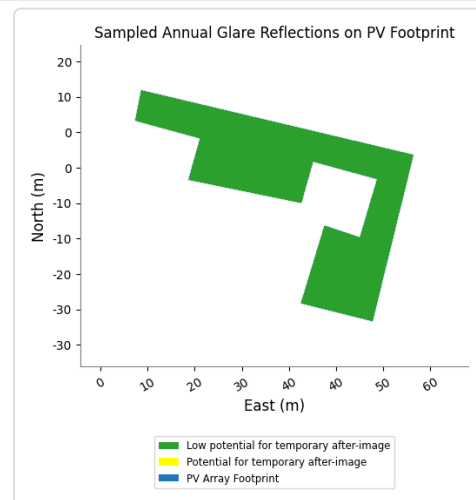
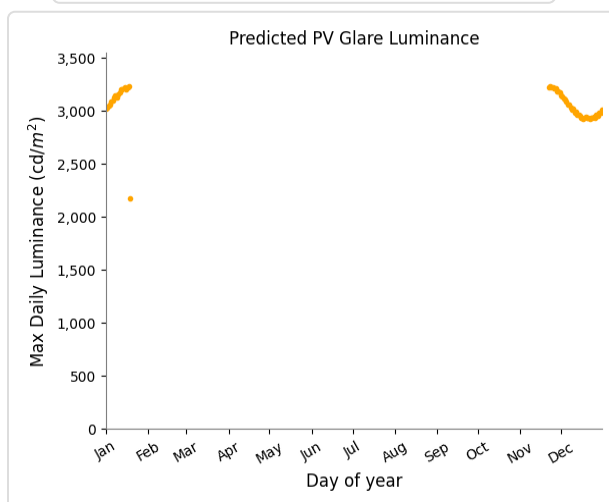
Green glare: 1,589 min.



PV array 7 and OP 7

Yellow glare: none

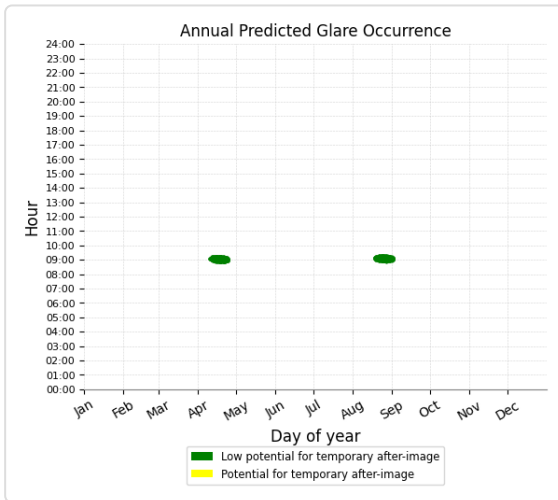
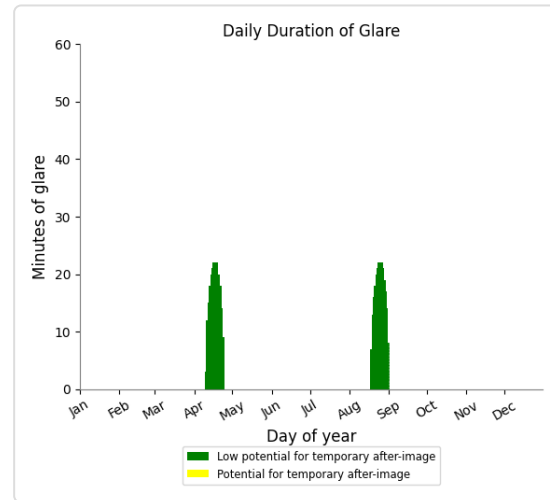
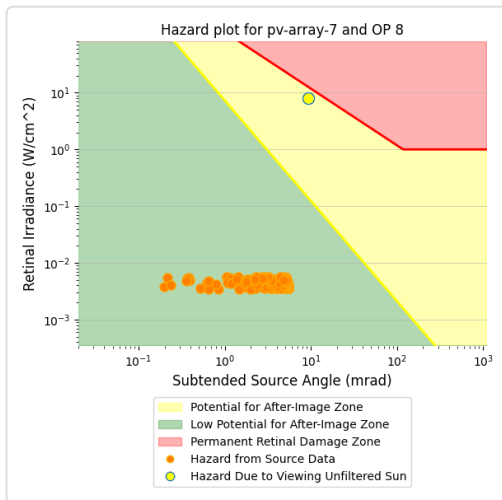
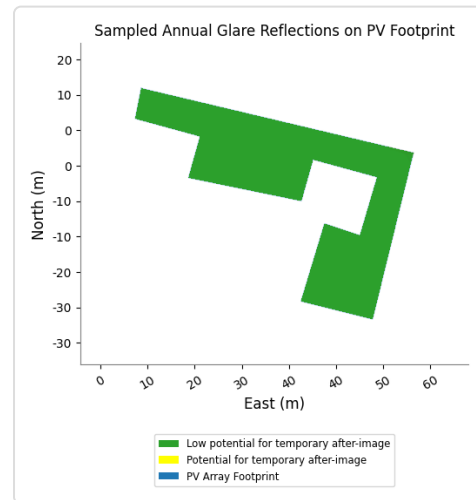
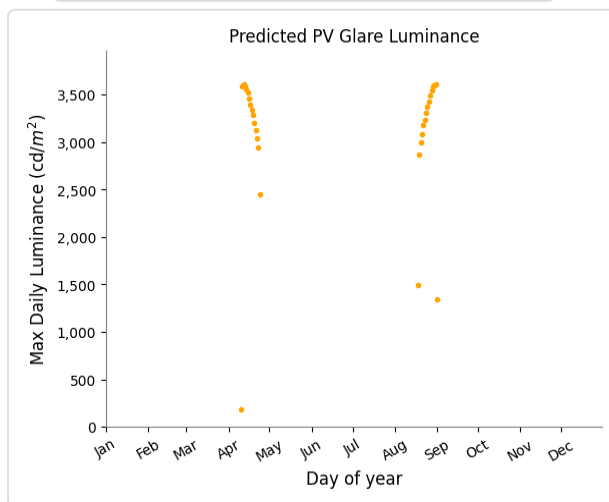
Green glare: 1,348 min.



PV array 7 and OP 8

Yellow glare: none

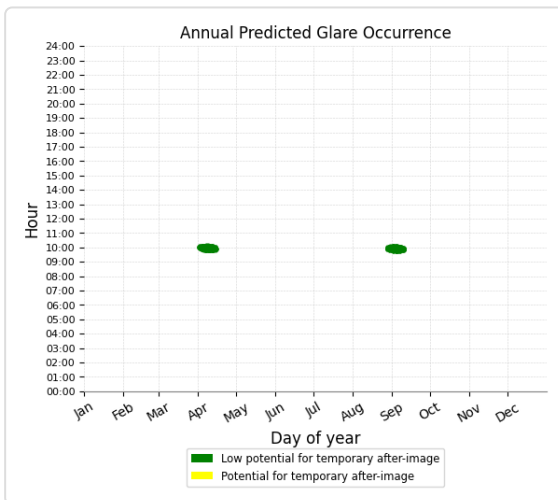
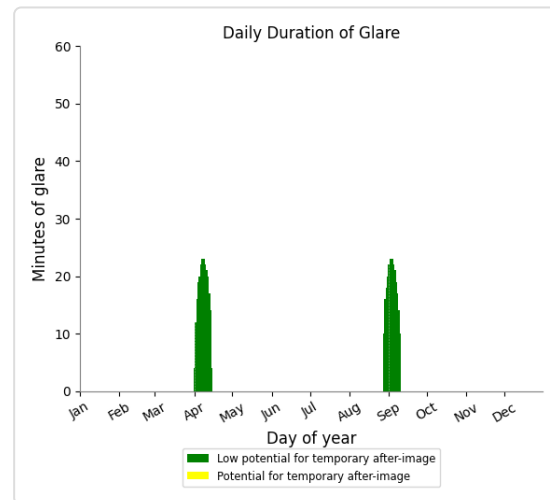
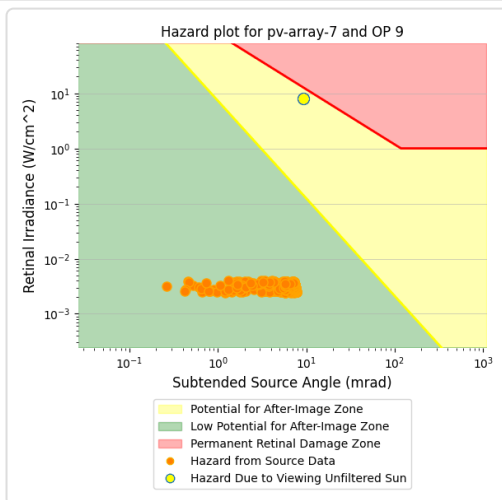
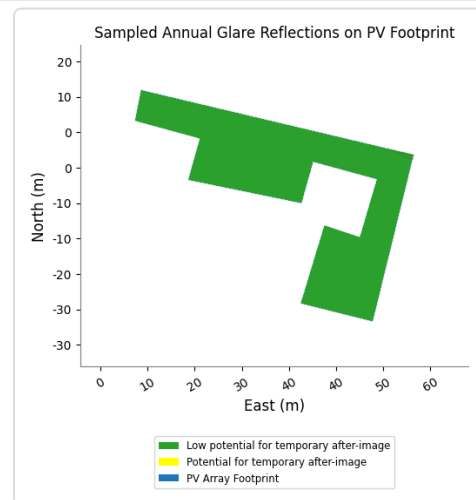
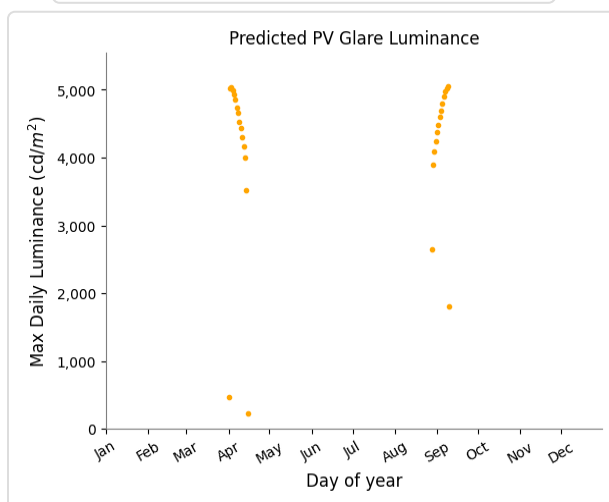
Green glare: 520 min.



PV array 7 and OP 9

Yellow glare: none

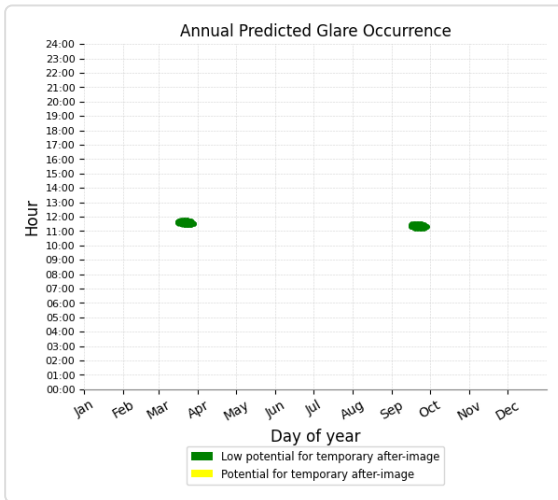
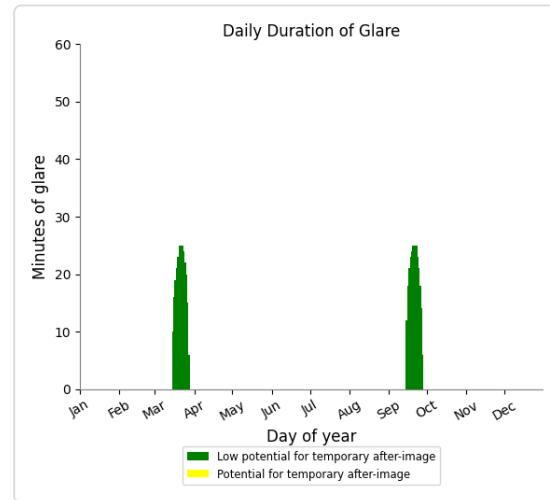
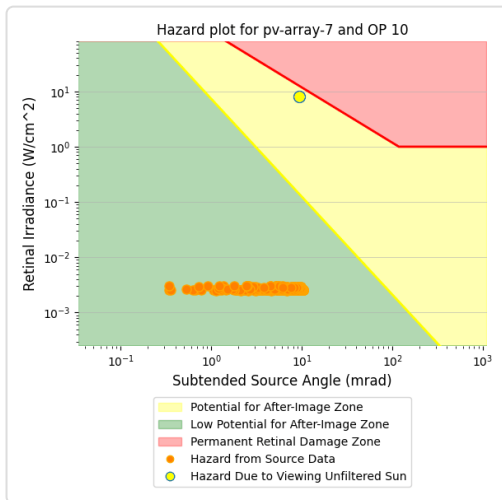
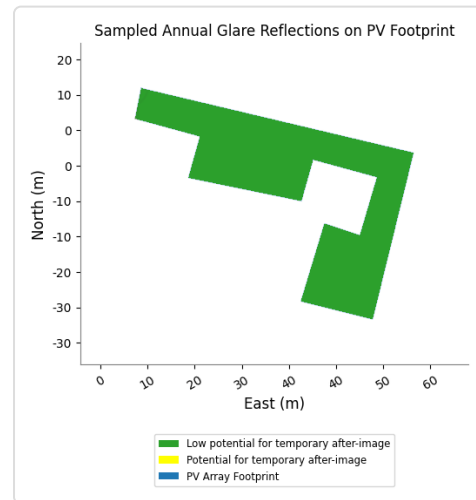
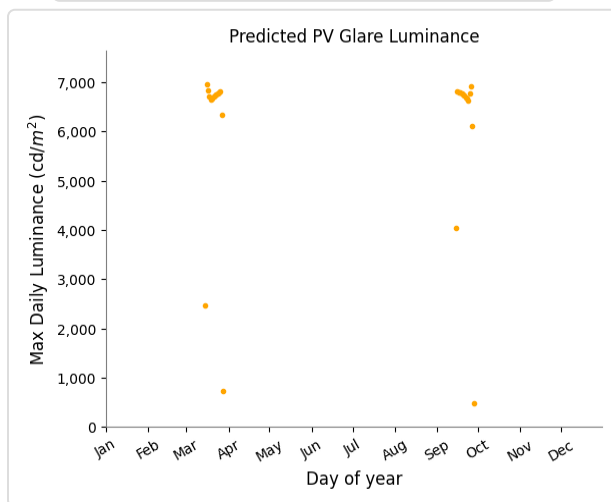
Green glare: 518 min.



PV array 7 and OP 10

Yellow glare: none

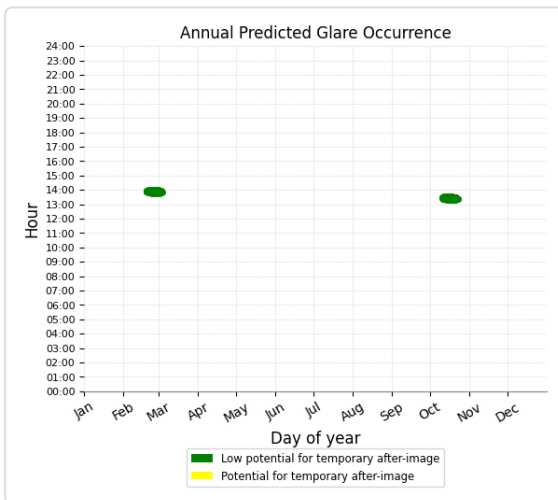
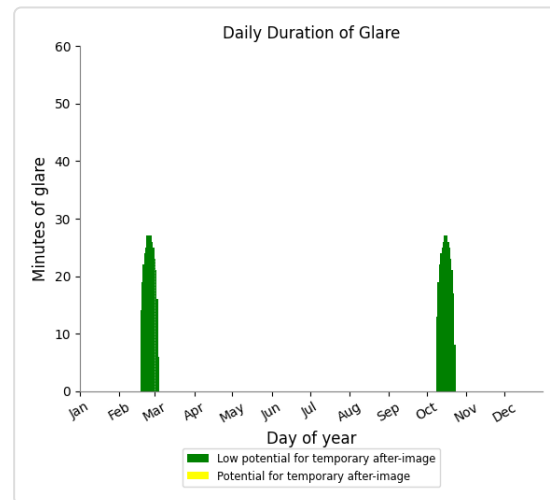
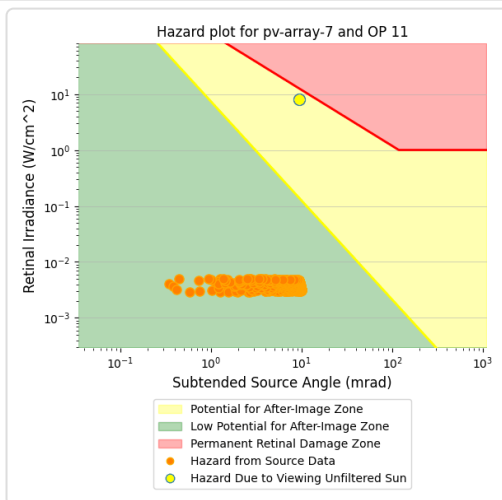
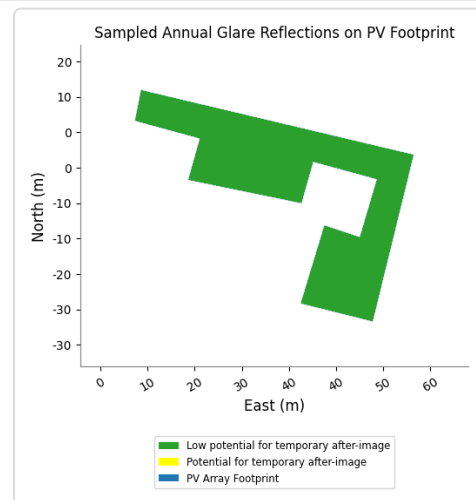
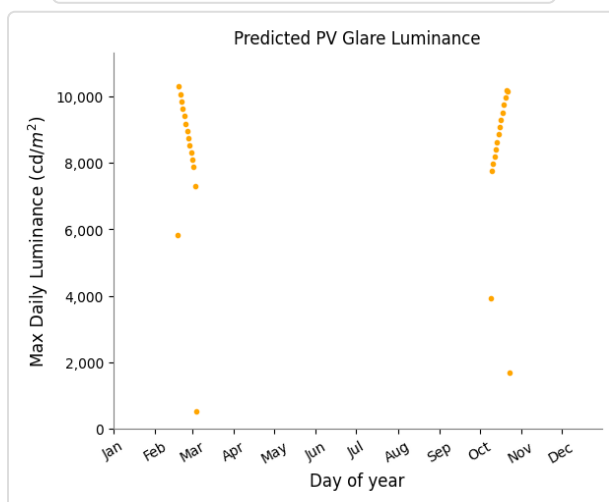
Green glare: 556 min.



PV array 7 and OP 11

Yellow glare: none

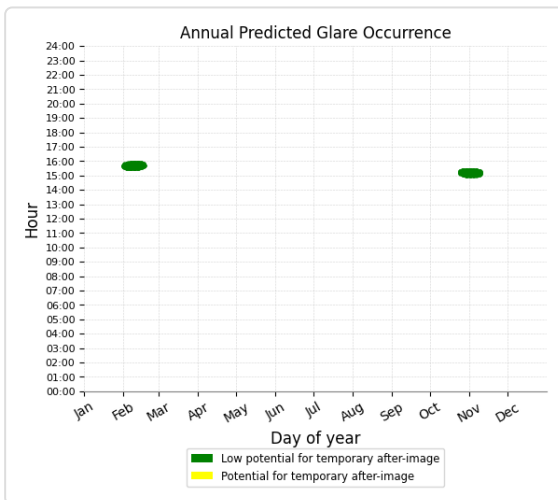
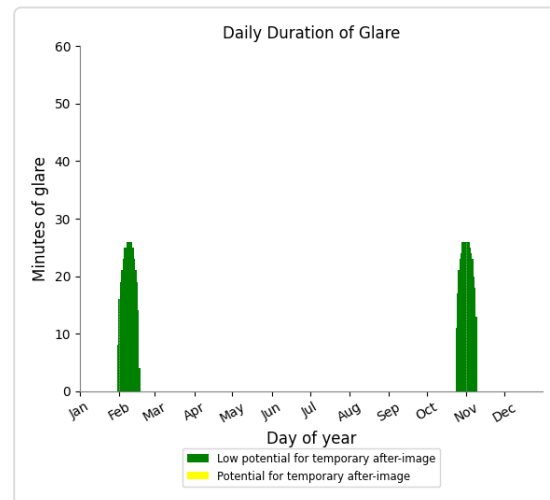
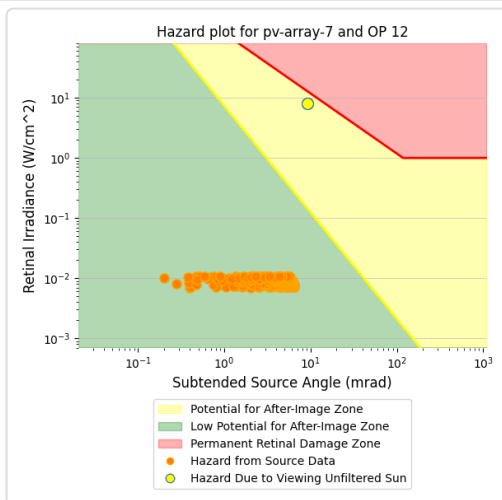
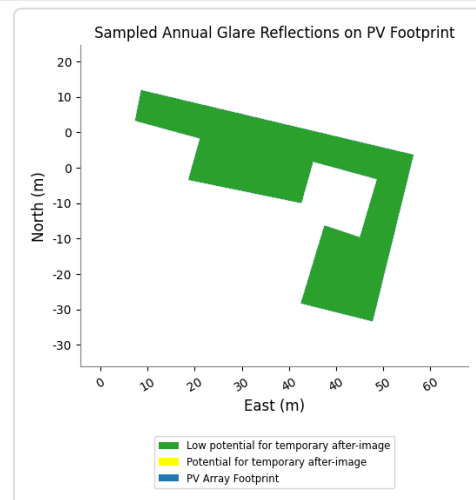
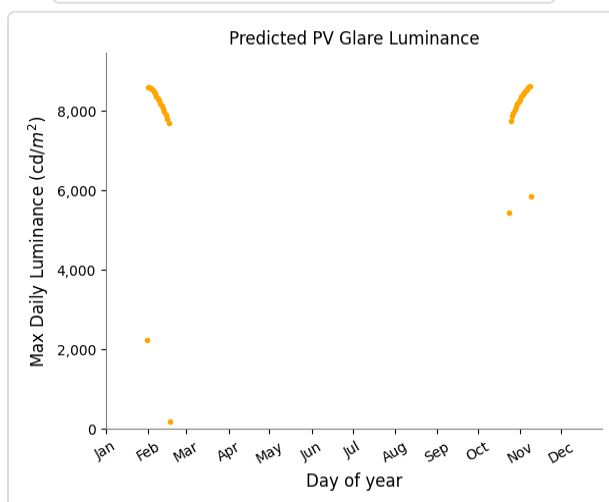
Green glare: 659 min.



PV array 7 and OP 12

Yellow glare: none

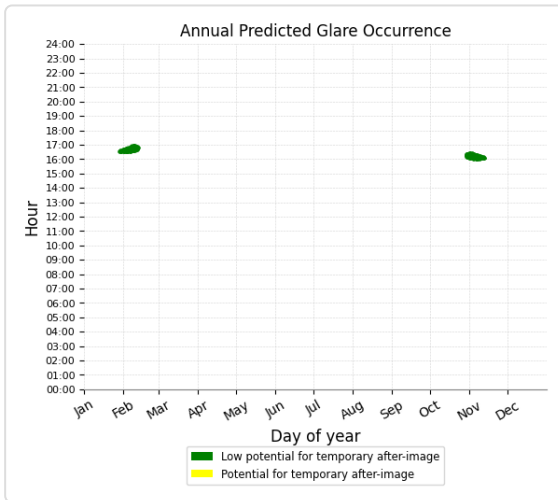
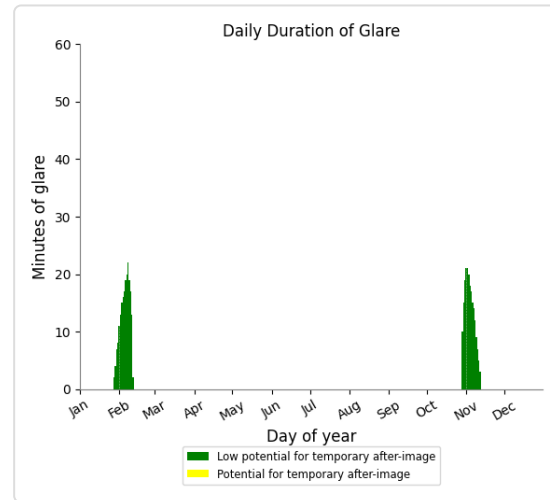
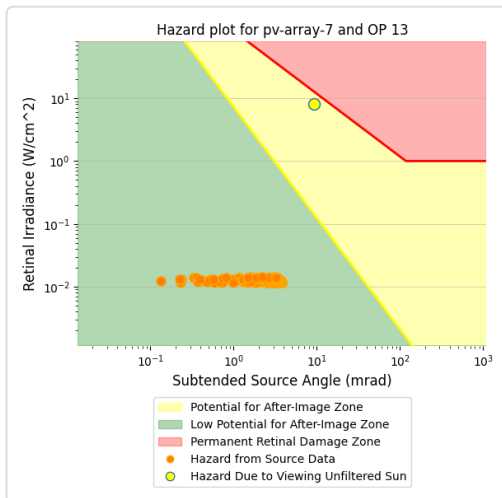
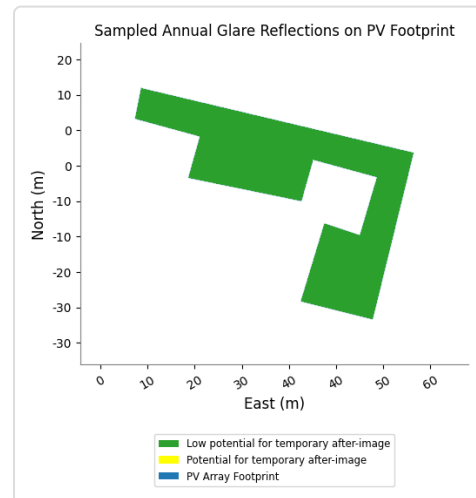
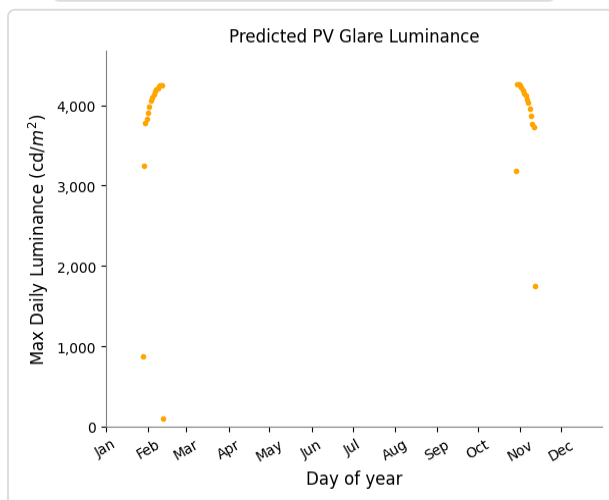
Green glare: 748 min.



PV array 7 and OP 13

Yellow glare: none

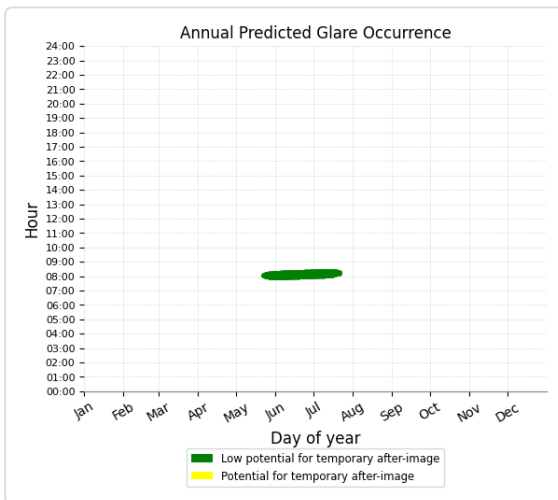
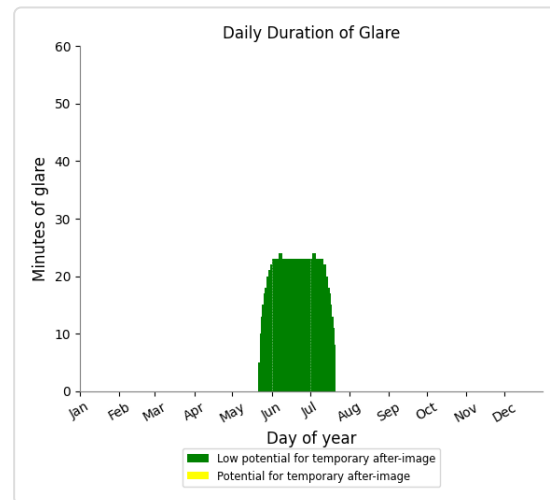
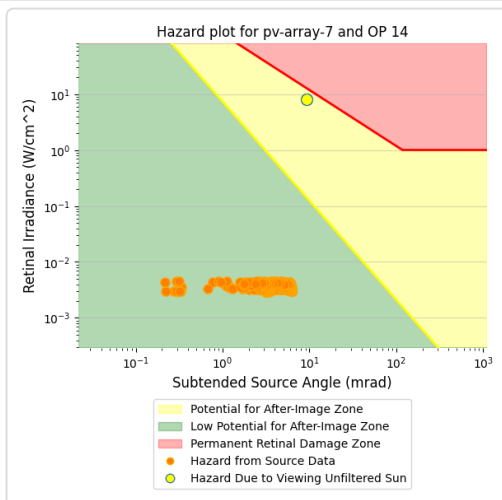
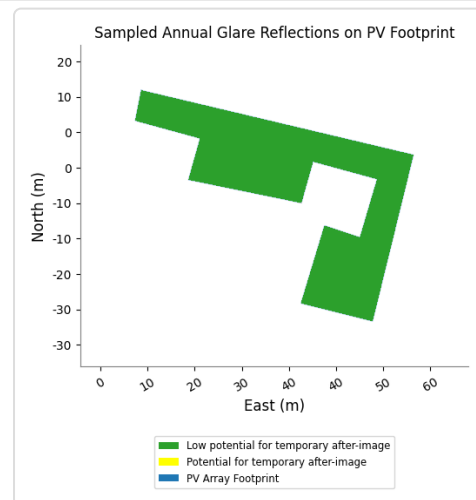
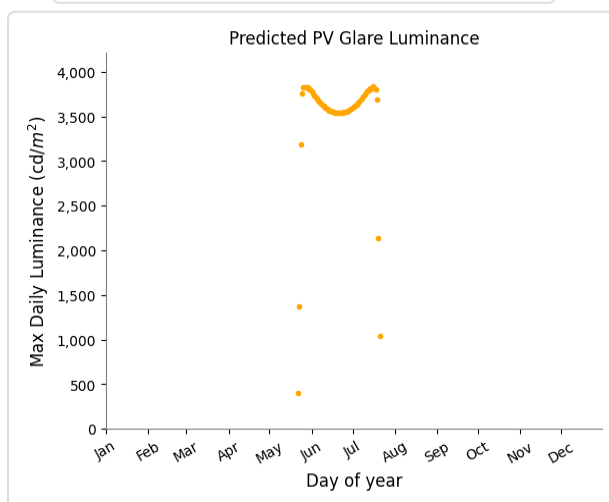
Green glare: 411 min.



PV array 7 and OP 14

Yellow glare: none

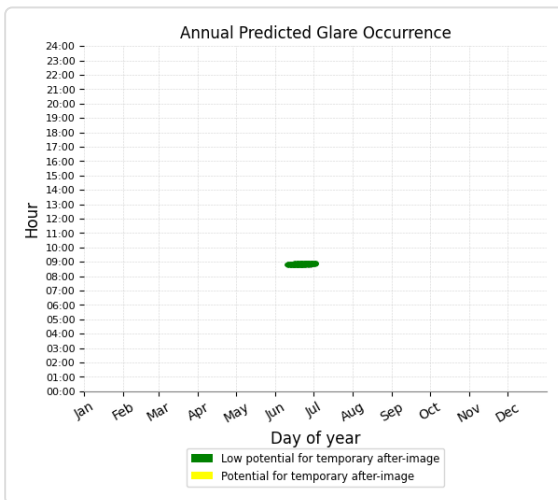
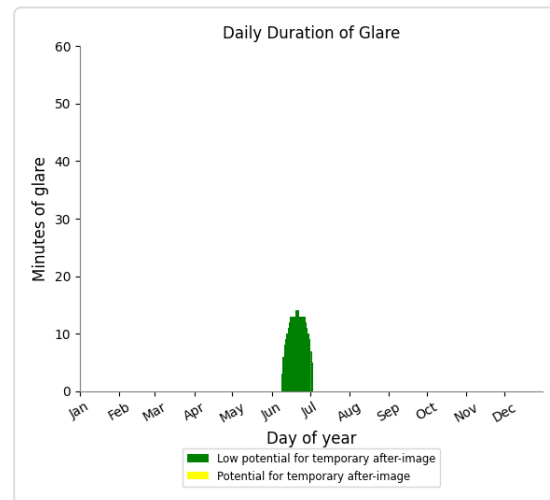
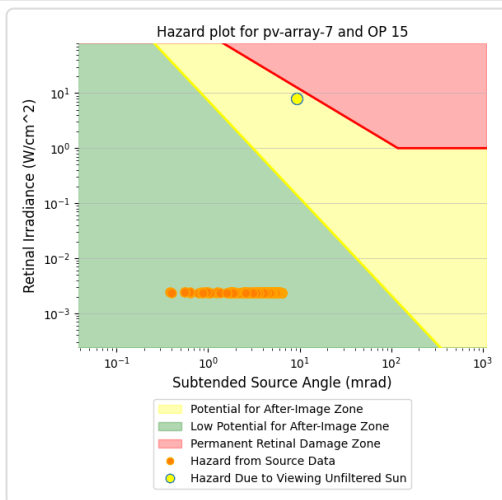
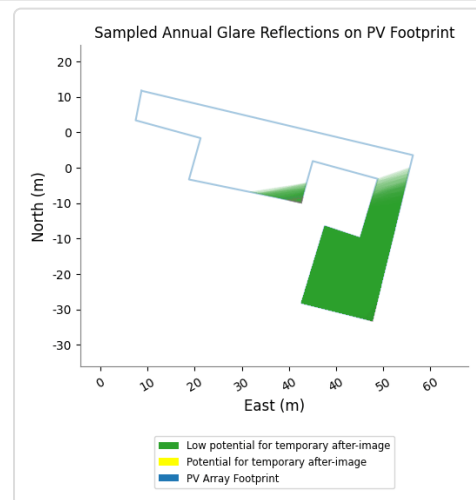
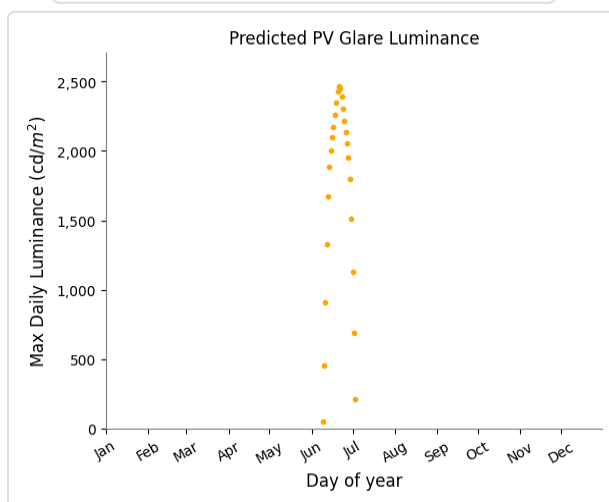
Green glare: 1,275 min.



PV array 7 and OP 15

Yellow glare: none

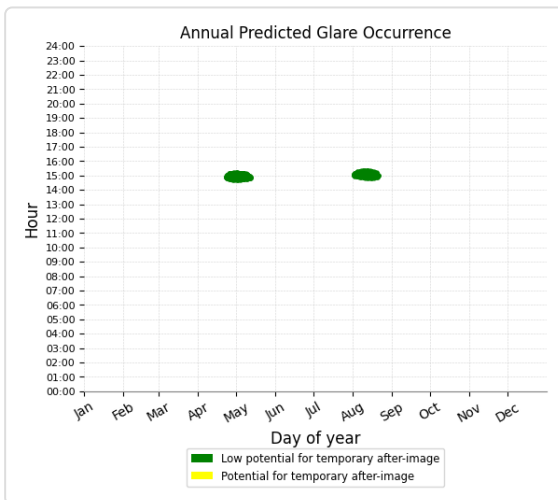
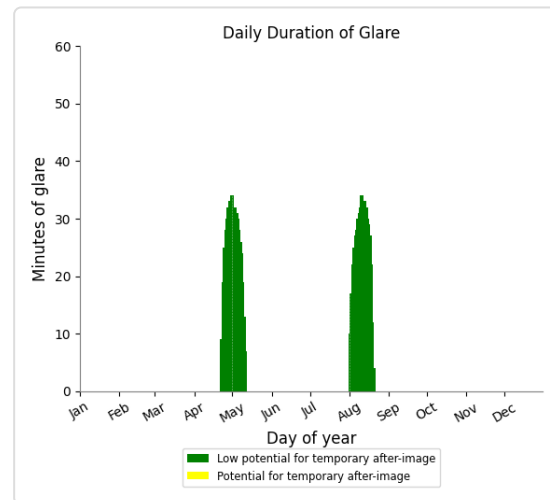
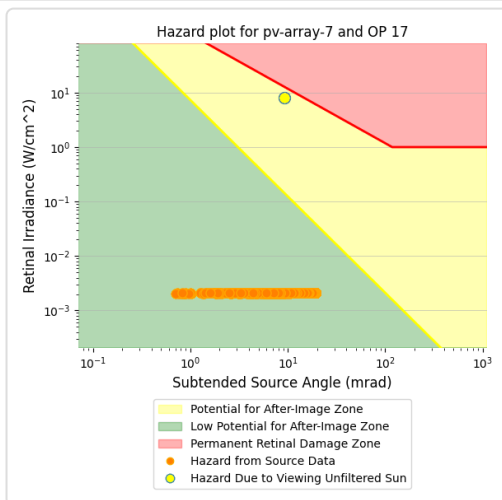
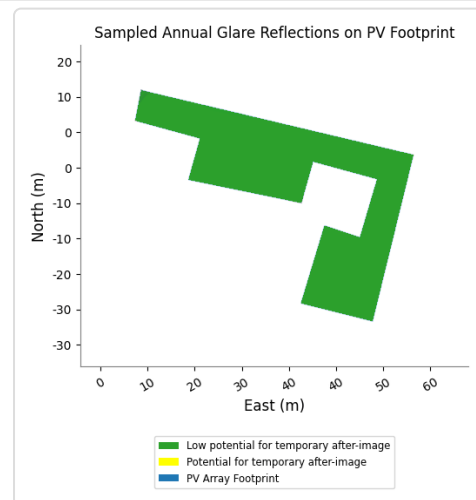
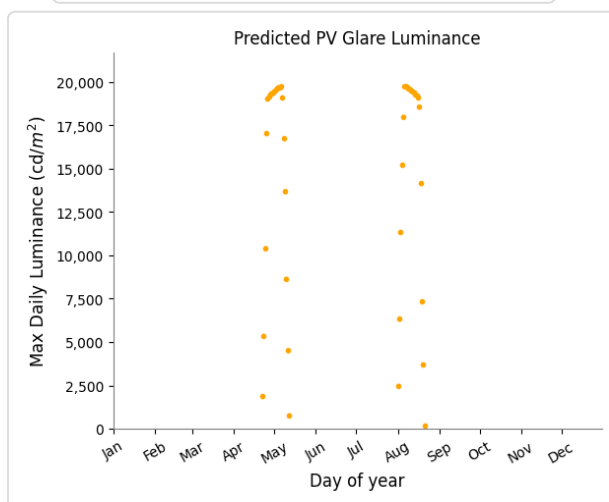
Green glare: 272 min.



PV array 7 and OP 17

Yellow glare: none

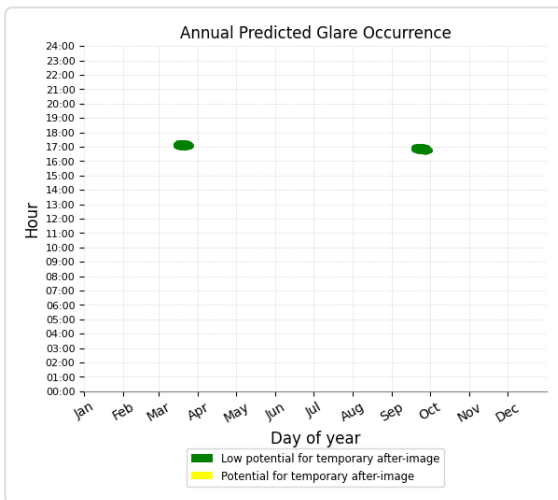
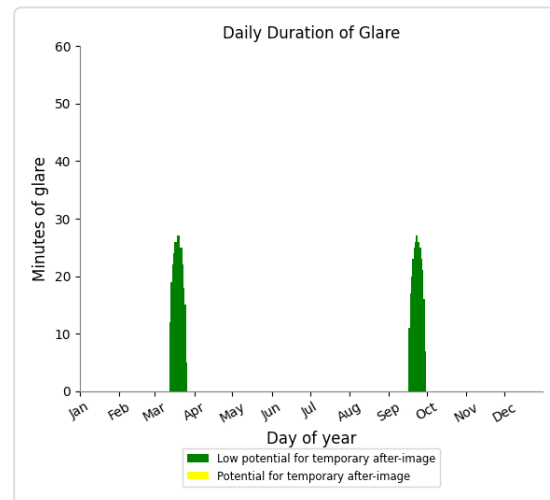
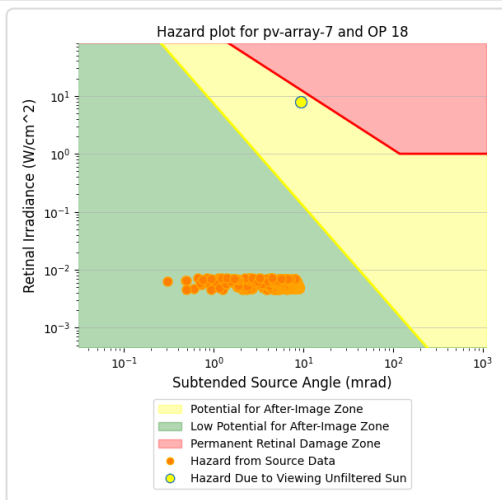
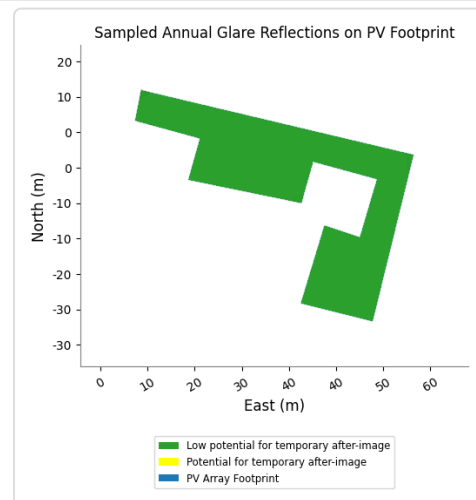
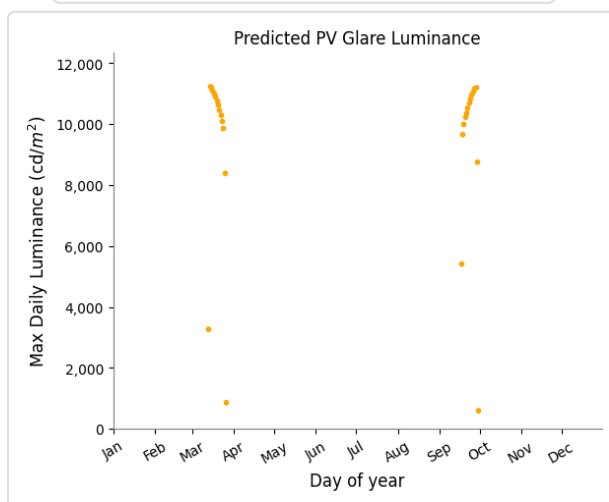
Green glare: 1,099 min.



PV array 7 and OP 18

Yellow glare: none

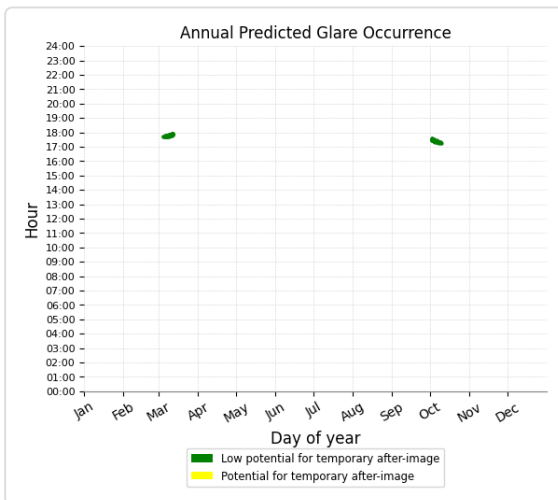
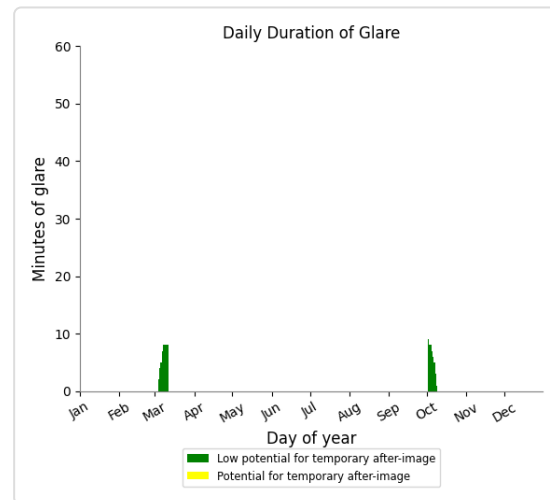
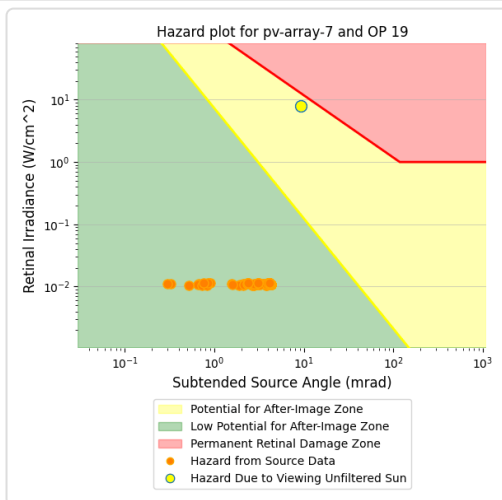
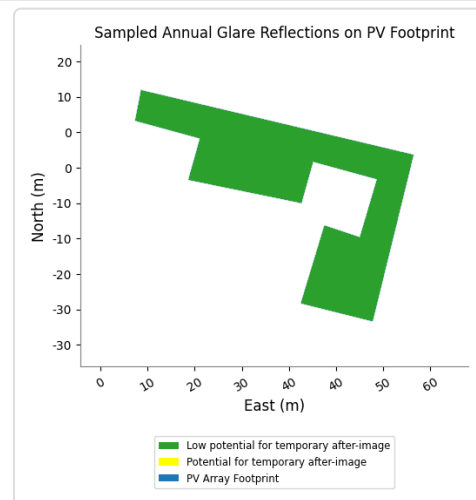
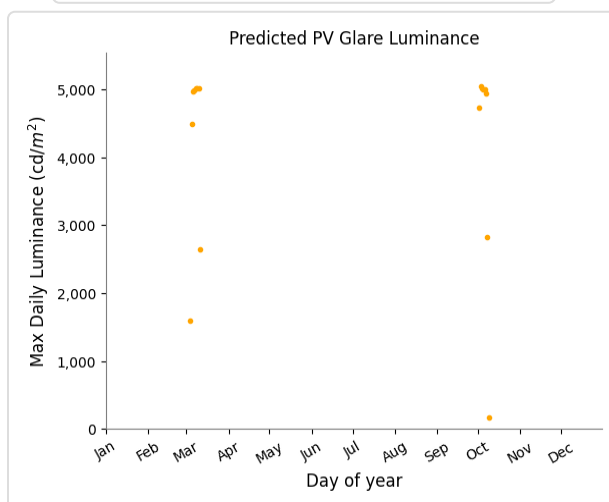
Green glare: 586 min.



PV array 7 and OP 19

Yellow glare: none

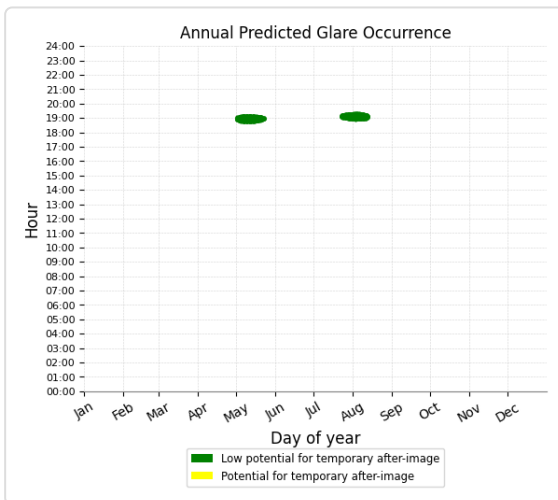
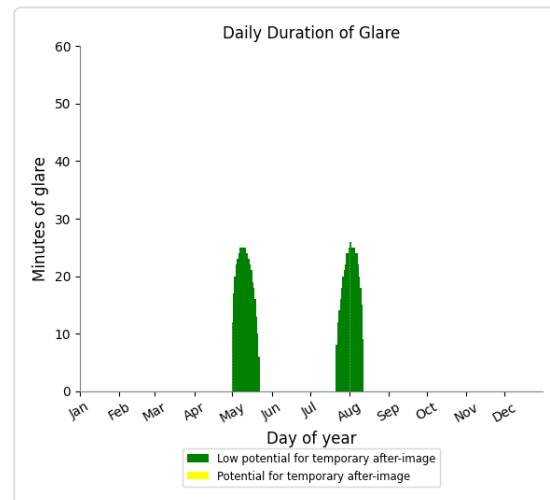
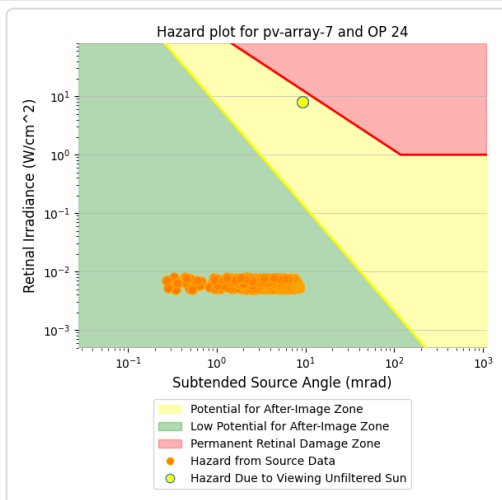
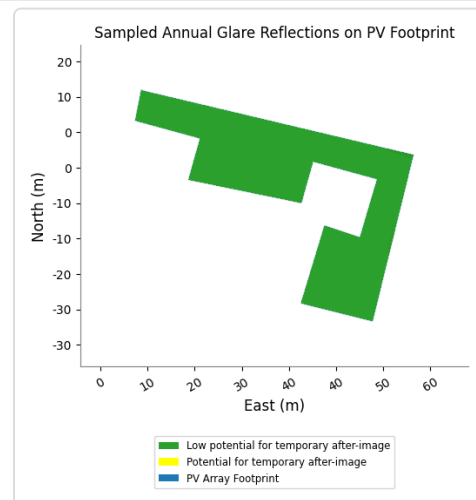
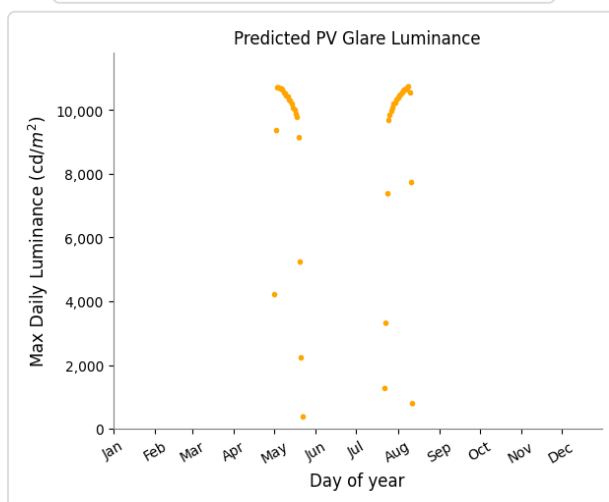
Green glare: 97 min.



PV array 7 and OP 24

Yellow glare: none

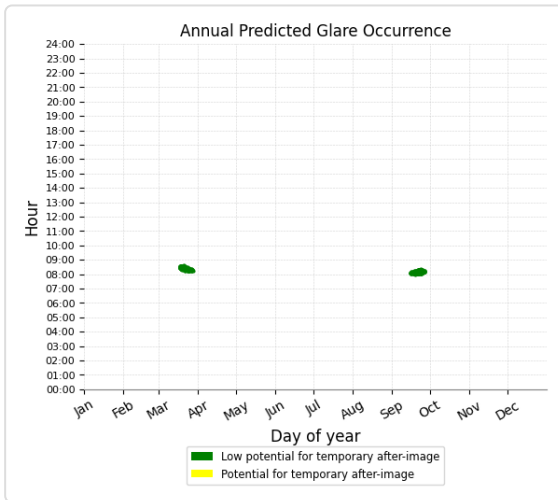
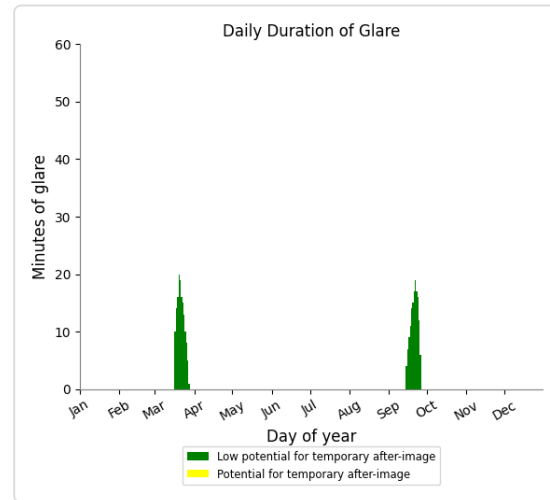
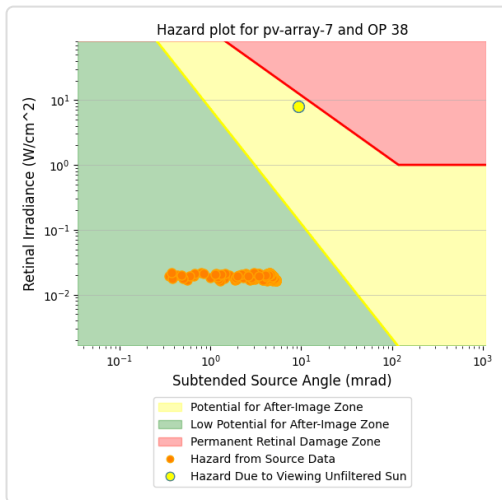
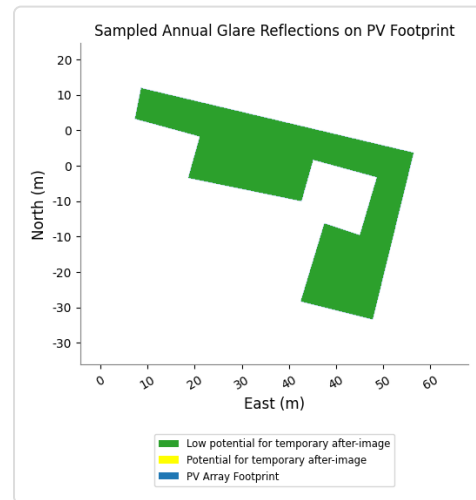
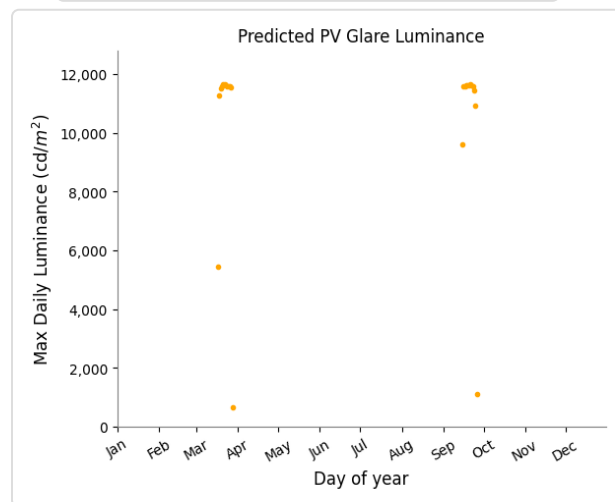
Green glare: 876 min.



PV array 7 and OP 38

Yellow glare: none

Green glare: 294 min.



PV array 7 and 1-ATCT

No glare found

PV array 7 and OP 16

No glare found

PV array 7 and OP 20

No glare found

PV array 7 and OP 21

No glare found

PV array 7 and OP 22

No glare found

PV array 7 and OP 23

No glare found

PV array 7 and OP 25

No glare found

PV array 7 and OP 26

No glare found

PV array 7 and OP 27

No glare found

PV array 7 and OP 28

No glare found

PV array 7 and OP 29

No glare found

PV array 7 and OP 30

No glare found

PV array 7 and OP 31

No glare found

PV array 7 and OP 32

No glare found

PV array 7 and OP 33

No glare found

PV array 7 and OP 34

No glare found

PV array 7 and OP 35

No glare found

PV array 7 and OP 36

No glare found

PV array 7 and OP 37

No glare found

PV array 7 and OP 39

No glare found

PV array 7 and OP 40

No glare found

Assumptions

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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