

Surface Parameters - Grid (16, 30)
Study Area (10km x 10km - Centre of the Site)

Land Type	Area, km ²	Fraction
Low Residential Intensity	3	0.03
High Residential Intensity	2	0.02
Shrubland (Non-Arid Region)	47	0.47
Commercial/ Industrial/ Transportation (Airport)	22	0.22
Open Water	25	0.25

Study Area (1km radius from the Site)

Sector, degree	Land Use	Area (km ²)	Fraction of Area	Distance between centre of PATH grid and centre point of land use (km)	Weighting (area/dist)	Roughness, m	Total
75 - 225	High Residential Intensity	0.981	0.749	0.573	1.307	1.000	1.732
	Open Water	0.328	0.251	0.589	0.425	0.001	
225 - 75	Commercial/ Industrial/ Transportation (Airport)	0.874	0.479	0.577	0.830	0.070	1.677
	High Residential Intensity	0.179	0.098	0.633	0.155	1.000	
	Open Water	0.223	0.122	0.803	0.152	0.001	
	Open Water	0.060	0.033	0.270	0.121	0.001	
	Open Water	0.489	0.268	0.640	0.419	0.001	

Summary of Surface Parameters






Sector, degree	¹ Roughness, m	² Albedo	³ Bowen ratio
75 - 225	0.183	0.16	0.68
225 - 75	0.015	0.16	0.68

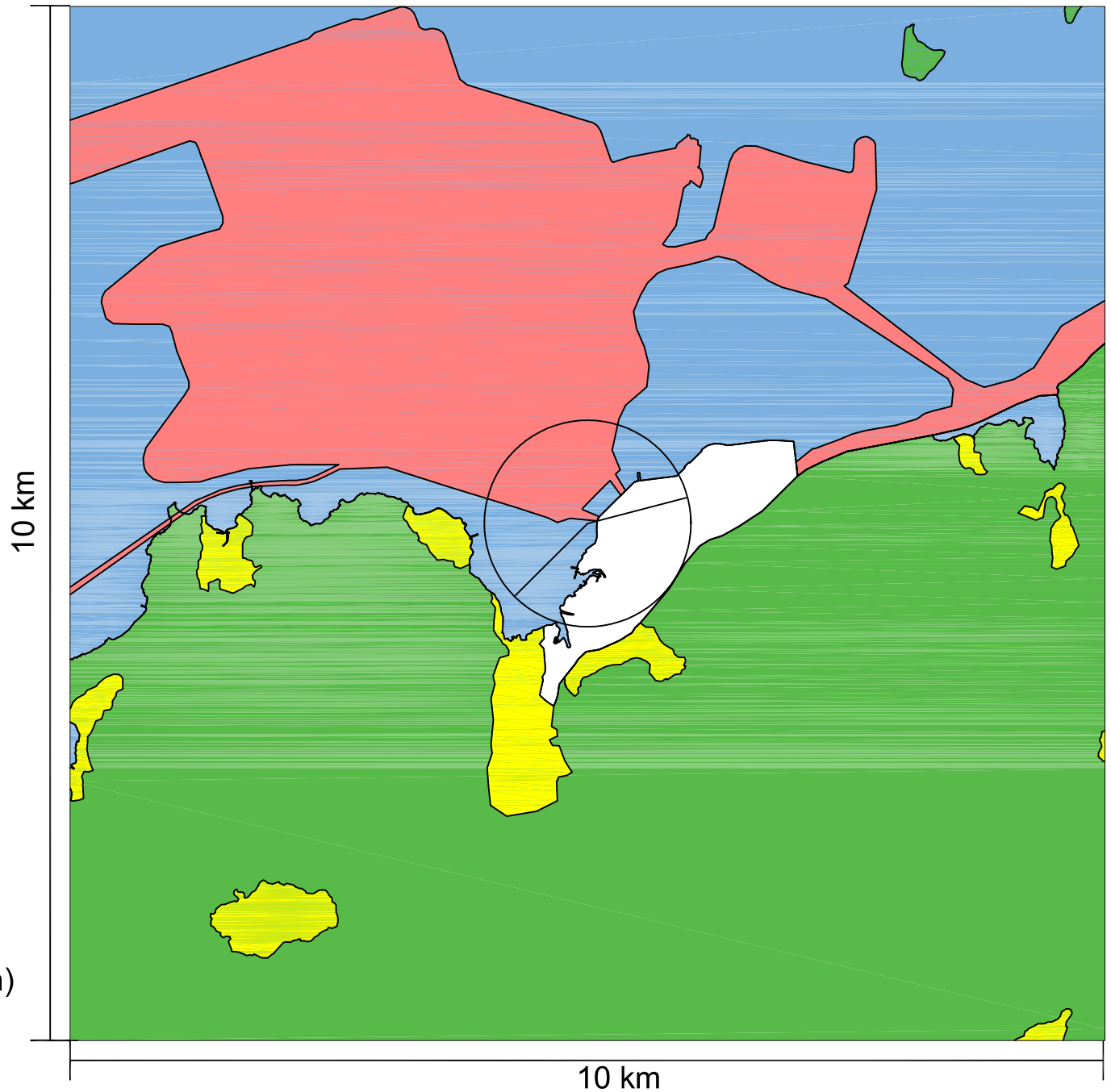
Note:

1. Average seasonal categories: 1, 2, 3 & 5 as per Table A-3 of USEPA's AERSURFACE user guide.
2. Average seasonal categories: 1, 2, 3 & 5 as per Table A-1 of USEPA's AERSURFACE user guide.
3. Average seasonal categories: 1, 2, 3 & 5 as per Table A-2 of USEPA's AERSURFACE user guide.

GRID 16,30

LEGEND

-  Commercial/ Industrial/ Transportation (Airport)
-  Low Residential Intensity
-  High Residential Intensity
-  Shrubland (Non-Arid Region)
-  Open Water



Surface Parameters - Grid (16, 31)
Study Area (10km x 10km - Centre of the Site)

Land Type	Area, km ²	Fraction
Low Residential Intensity	3	0.03
High Residential Intensity	2	0.02
Shrubland (Non-Arid Region)	37	0.37
Commercial/ Industrial/ Transportation (Airport)	22	0.22
Open Water	35	0.35

Study Area (1km radius from the Site)

Sector, degree	Land Use	Area (km ²)	Fraction of Area	Distance between centre of PATH grid and centre point of land use (km)	Weighting (area/dist)	Roughness, m	Total
192 - 28	Commercial/ Industrial/ Transportation (Airport)	1.710	1	0.385	2.596	0.07	2.596
28 - 127	Commercial/ Industrial/ Transportation (Airport)	0.267	0.309	0.461	0.670	0.070	1.674
	Open Water	0.597	0.691	0.688	1.004	0.001	
127 - 192	Commercial/ Industrial/ Transportation (Airport)	0.275	0.485	0.511	0.950	0.070	1.630
	High Residential Intensity	0.122	0.216	0.893	0.242	1.000	
	Open Water	0.127	0.224	0.645	0.347	0.001	
	Open Water	0.005	0.008	0.989	0.008	0.100	
	Open Water	0.038	0.067	0.805	0.083	0.100	

Summary of Surface Parameters






Sector, degree	¹ Roughness, m	² Albedo	³ Bowen ratio
192 - 28	0.070	0.15	0.53
28 - 127	0.005	0.15	0.53
127 - 192	0.043	0.15	0.53

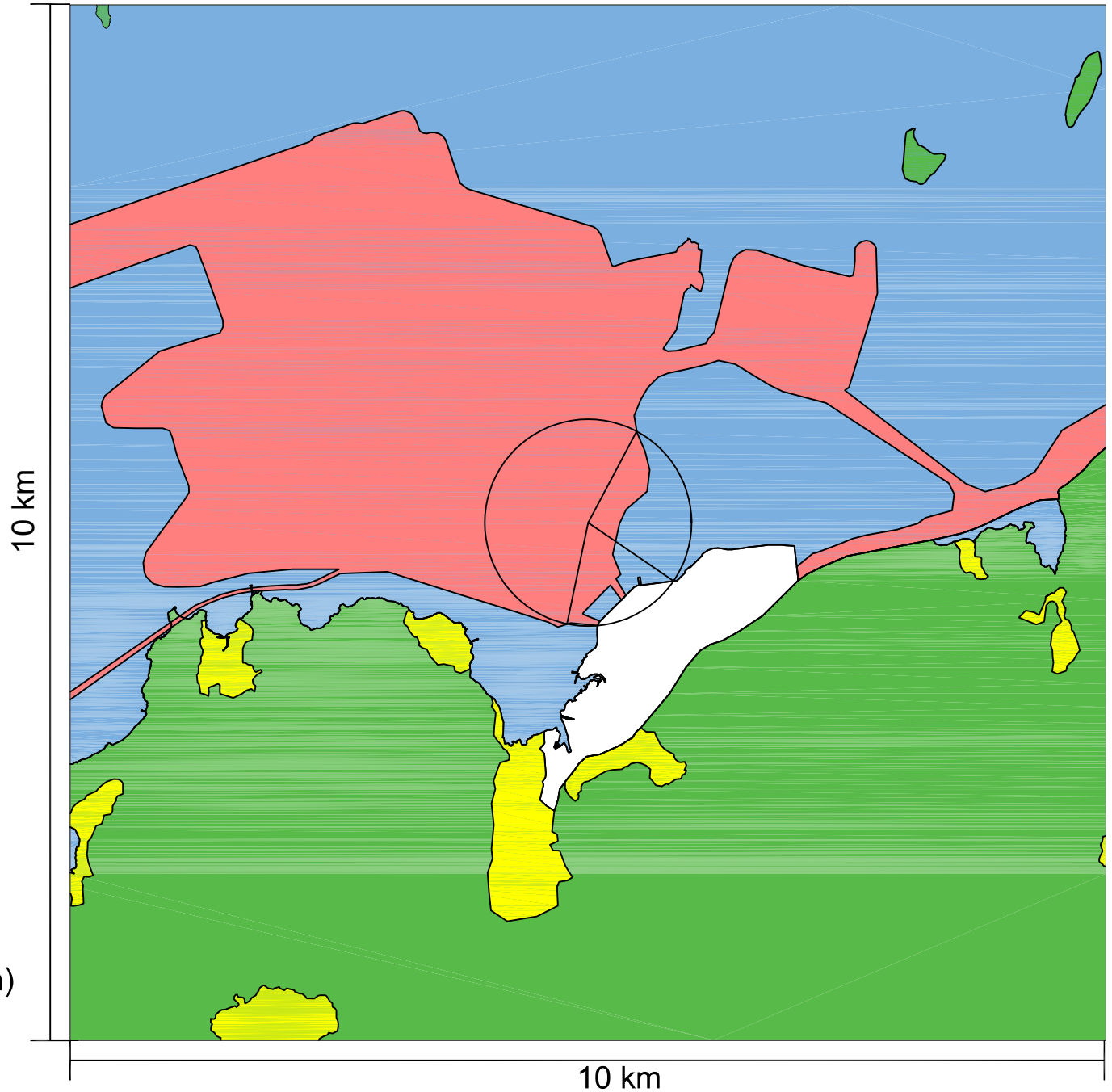
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3. Average seasonal categories: 1, 2, 3 & 5 as per Table A-2 of USEPA's AERSURFACE user guide.

GRID 16,31

LEGEND

-  Commercial/ Industrial/
Transportation (Airport)
-  Low Residential Intensity
-  High Residential Intensity
-  Shrubland (Non-Arid Region)
-  Open Water



Surface Parameters - Grid (16, 32)

Study Area (10km x 10km - Centre of the Site)

Land Type	Area, km ²	Fraction
Low Residential Intensity	2	0.02
High Residential Intensity	2	0.02
Shrubland (Non-Arid Region)	28	0.28
Commercial/ Industrial/ Transportation (Airport)	22	0.22
Open Water	46	0.46

Study Area (1km radius from the Site)

Sector, degree	Land Use	Area (km ²)	Fraction of Area	Distance between centre of PATH grid and centre point of land use (km)	Weighting (area/dist)	Roughness, m	Total
160 - 20	Commercial/ Industrial/ Transportation (Airport)	1.920	1.000	0.327	3.054	0.070	3.054
20 - 50	Commercial/ Industrial/ Transportation (Airport)	0.261	0.999	0.659	1.516	0.070	1.518
	Open Water	0.000	0.001	0.995	0.001	0.001	
50 - 160	Commercial/ Industrial/ Transportation (Airport)	0.493	0.513	0.411	1.248	0.070	1.907
	Open Water	0.467	0.487	0.738	0.659	0.001	

Summary of Surface Parameters






Sector, degree	¹ Roughness, m	² Albedo	³ Bowen ratio
160 - 20	0.070	0.14	0.41
20 - 50	0.018	0.14	0.41
50 - 160	0.016	0.14	0.41

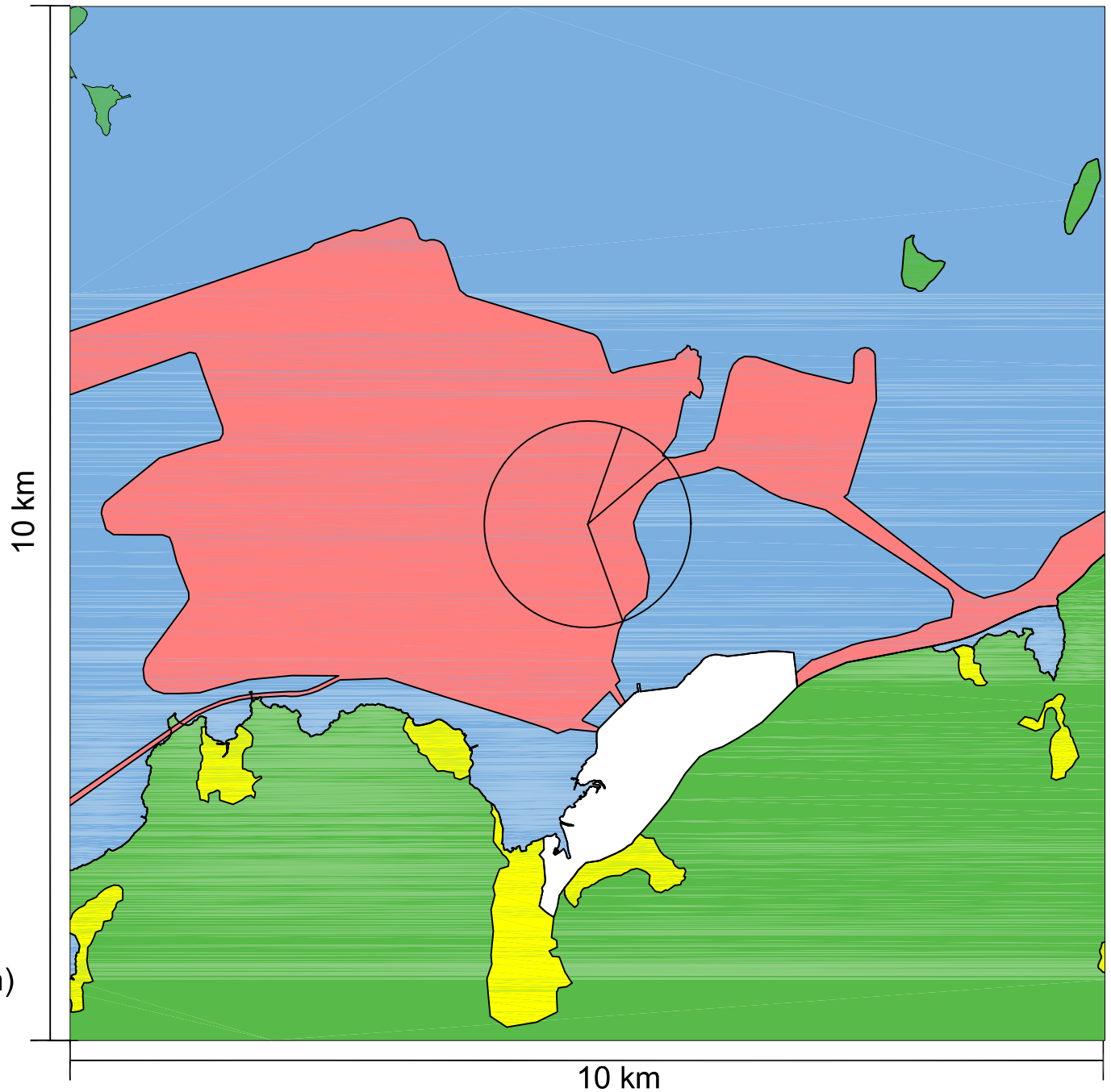
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3. Average seasonal categories: 1, 2, 3 & 5 as per Table A-2 of USEPA's AERSURFACE user guide.

GRID 16,32

LEGEND

-  Commercial/ Industrial/ Transportation (Airport)
-  Low Residential Intensity
-  High Residential Intensity
-  Shrubland (Non-Arid Region)
-  Open Water



Surface Parameters - Grid (17, 30)
Study Area (10km x 10km - Centre of the Site)

Land Type	Area, km ²	Fraction
Low Residential Intensity	4	0.04
High Residential Intensity	2	0.02
Shrubland (Non-Arid Region)	49	0.49
Commercial/ Industrial/ Transportation (Airport)	21	0.21
Open Water	23	0.23

Study Area (1km radius from the Site)

Sector, degree	Land Use	Area (km ²)	Fraction of Area	Distance between centre of PATH grid and centre point of land use (km)	Weighting (area/dist)	Roughness, m	Total
323 - 38	High Residential Intensity	0.308	0.471	0.468	1.007	1.000	1.688
	Open Water	0.346	0.529	0.777	0.681	0.001	
38 - 207	High Residential Intensity	0.495	0.336	0.409	0.821	1.000	1.949
	Shrubland (Non-Arid Region)	0.980	0.664	0.589	1.128	0.300	
207 - 237	High Residential Intensity	0.262	1.000	0.659	1.517	1.000	1.517
237 - 323	Commercial/ Industrial/ Transportation (Airport)	0.046	0.061	0.912	0.066	0.070	1.648
	Commercial/ Industrial/ Transportation (Airport)	0.005	0.006	0.962	0.007	0.070	
	High Residential Intensity	0.531	0.708	0.542	1.306	1.000	
	Open Water	0.106	0.141	0.802	0.176	0.001	
	Open Water	0.053	0.071	0.889	0.080	0.001	
	Open Water	0.000	0.001	0.997	0.001	0.001	
	Open Water	0.009	0.013	0.967	0.013	0.001	

Summary of Surface Parameters






Sector, degree	¹ Roughness, m	² Albedo	³ Bowen ratio
323 - 38	0.062	0.16	0.71
38 - 207	0.498	0.16	0.71
207 - 237	1.000	0.16	0.71
237 - 323	0.287	0.16	0.71

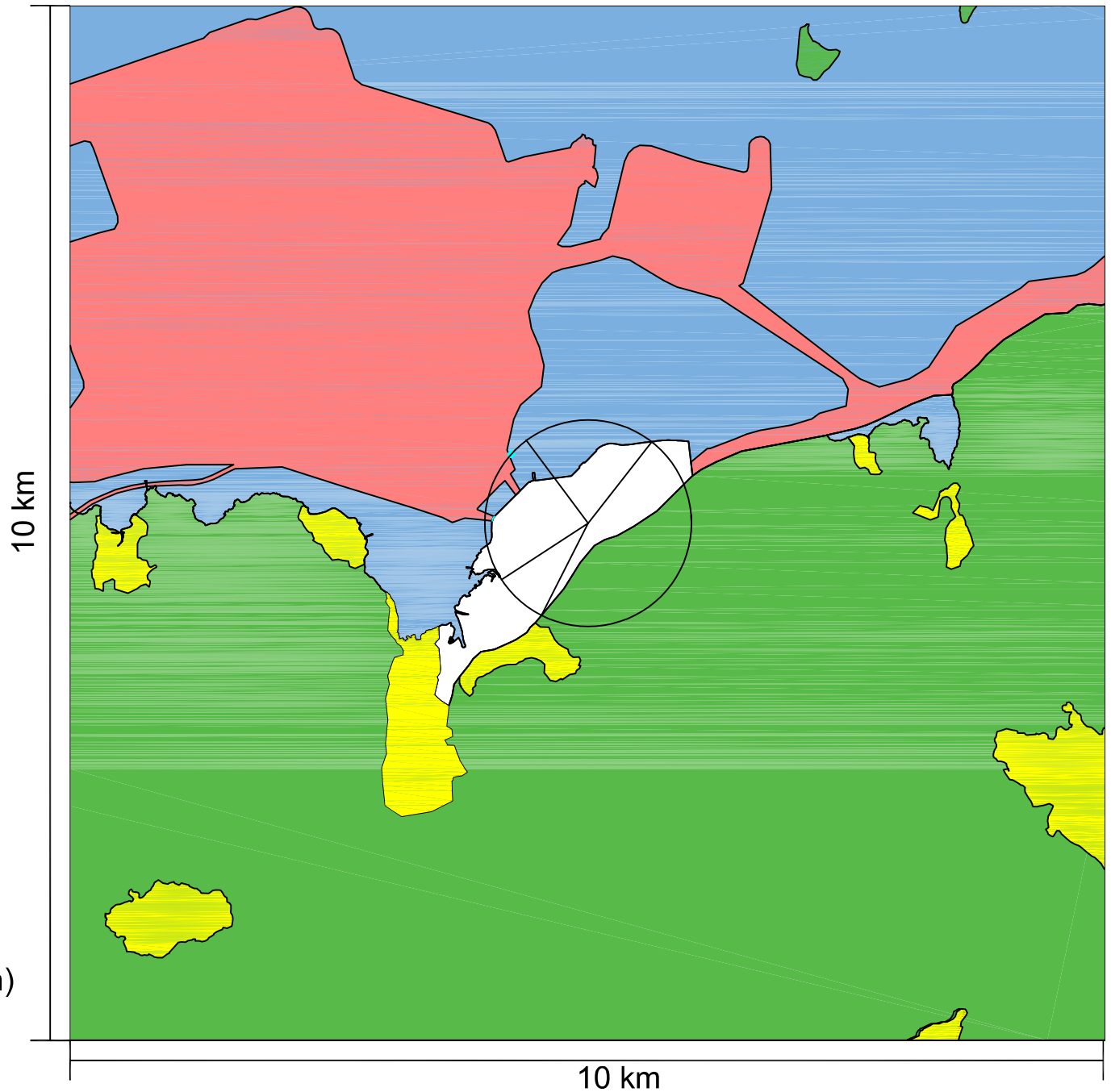
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3. Average seasonal categories: 1, 2, 3 & 5 as per Table A-2 of USEPA's AERSURFACE user guide.

GRID 17,30

LEGEND

-  Commercial/ Industrial/ Transportation (Airport)
-  Low Residential Intensity
-  High Residential Intensity
-  Shrubland (Non-Arid Region)
-  Open Water



Surface Parameters - Grid (17, 33)

Study Area (10km x 10km - Centre of the Site)

Land Type	Area, km ²	Fraction
Low Residential Intensity	2	0.02
High Residential Intensity	2	0.02
Shrubland (Non-Arid Region)	21	0.21
Commercial/ Industrial/ Transportation (Airport)	21	0.21
Open Water	54	0.54

Study Area (1km radius from the Site)

Sector, degree	Land Use	Area (km ²)	Fraction of Area	Distance between centre of PATH grid and centre point of land use (km)	Weighting (area/dist)	Roughness, m	Total
330 - 36	Commercial/ Industrial/ Transportation (Airport)	0.126	0.220	0.458	0.479	0.070	1.622
	Open Water	0.449	0.780	0.683	1.143	0.001	
36 - 211	Commercial/ Industrial/ Transportation (Airport)	0.890	0.582	0.534	1.089	0.070	2.474
	Open Water	0.048	0.031	0.911	0.034	0.001	
	Open Water	0.156	0.102	0.105	0.971	0.001	
	Open Water	0.437	0.285	0.752	0.379	0.001	
211 - 330	Commercial/ Industrial/ Transportation (Airport)	0.880	0.850	0.575	1.477	0.070	1.856
	Open Water	0.044	0.043	0.168	0.255	0.001	
	Open Water	0.111	0.108	0.861	0.125	0.001	

Summary of Surface Parameters






Sector, degree	¹ Roughness, m	² Albedo	³ Bowen ratio
330 - 36	0.004	0.14	0.33
36 - 211	0.006	0.14	0.33
211 - 330	0.029	0.14	0.33

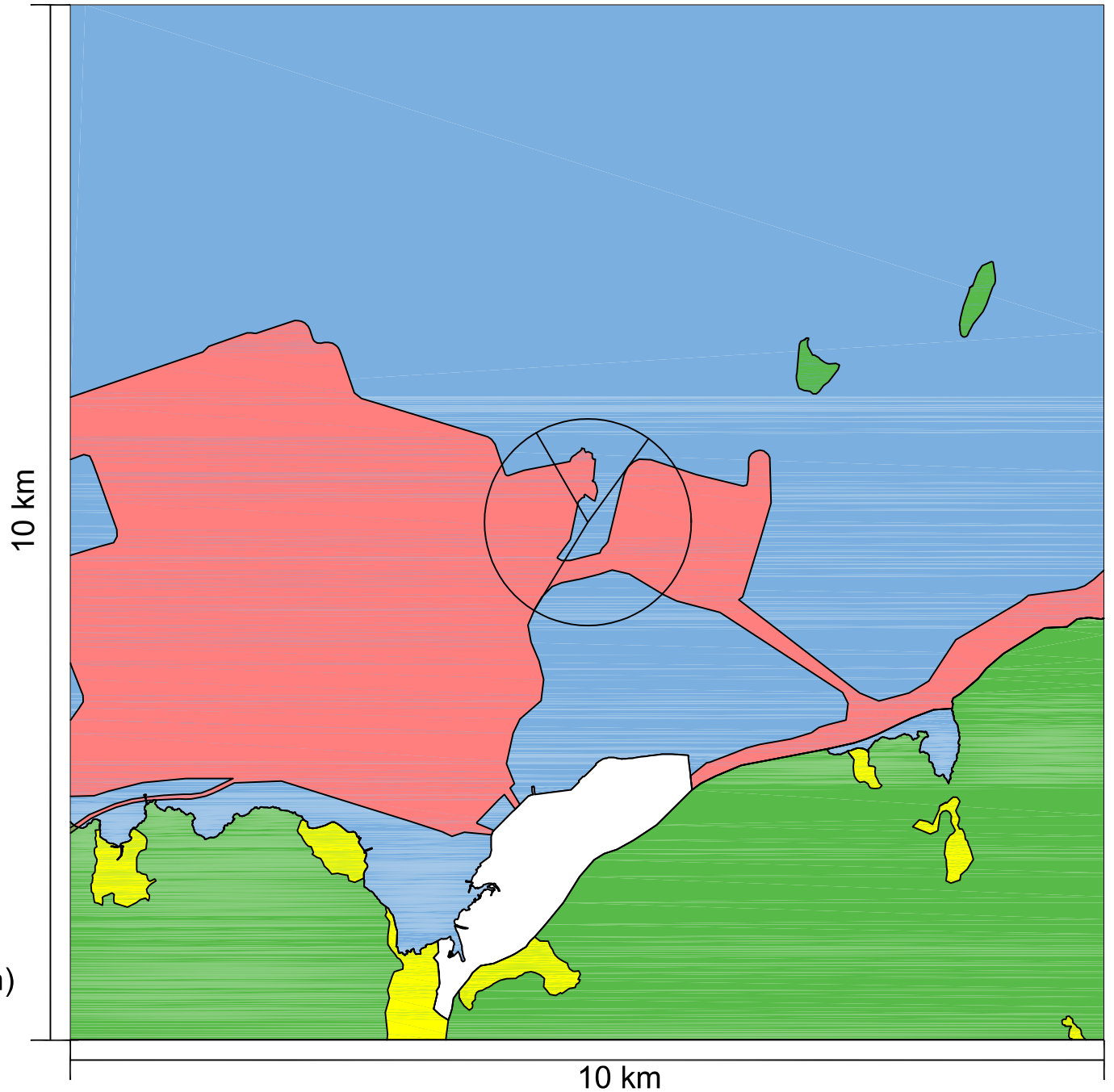
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3. Average seasonal categories: 1, 2, 3 & 5 as per Table A-2 of USEPA's AERSURFACE user guide.

GRID 17,33

LEGEND

-  Commercial/ Industrial/ Transportation (Airport)
-  Low Residential Intensity
-  High Residential Intensity
-  Shrubland (Non-Arid Region)
-  Open Water



Surface Parameters - Grid (18, 32)
Study Area (10km x 10km - Centre of the Site)

Land Type	Area, km ²	Fraction
Low Residential Intensity	3	0.03
High Residential Intensity	2	0.02
Shrubland (Non-Arid Region)	32	0.32
Commercial/ Industrial/ Transportation (Airport)	18	0.18
Open Water	45	0.45

Study Area (1km radius from the Site)

Sector, degree	Land Use	Area (km ²)	Fraction of Area	Distance between centre of PATH grid and centre point of land use (km)	Weighting (area/dist)	Roughness, m	Total
302 - 108	Commercial/ Industrial/ Transportation (Airport)	0.940	0.649	0.527	1.231	0.070	2.826
	Open Water	0.268	0.185	0.807	0.229	0.001	
	Open Water	0.241	0.166	0.122	1.367	0.001	
108 - 302	Open Water	1.693	1.000	0.390	2.562	0.001	2.562

Summary of Surface Parameters






Sector, degree	¹ Roughness, m	² Albedo	³ Bowen ratio
302 - 108	0.006	0.14	0.41
108 - 302	0.001	0.14	0.41

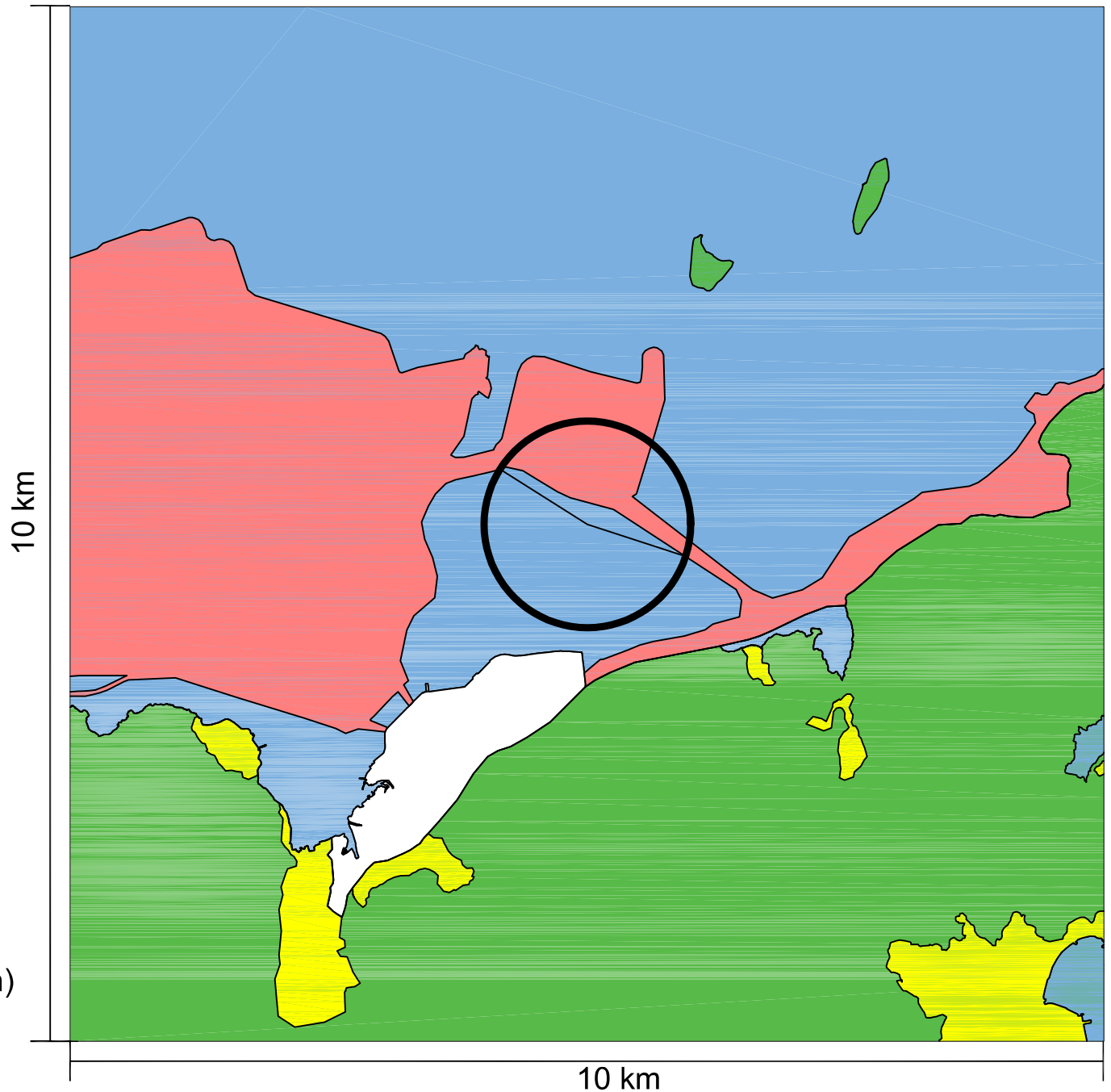
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GRID 18,32

LEGEND

-  Commercial/ Industrial/ Transportation (Airport)
-  Low Residential Intensity
-  High Residential Intensity
-  Shrubland (Non-Arid Region)
-  Open Water



Surface Parameters - Grid (16, 33)

Study Area (10km x 10km - Centre of the Site)

Land Type	Area, km ²	Fraction
Low Residential Intensity	2	0.02
High Residential Intensity	2	0.02
Shrubland (Non-Arid Region)	18	0.18
Commercial/ Industrial/ Transportation (Airport)	22	0.22
Open Water	56	0.56

Study Area (1km radius from the Site)

Sector, degree	Land Use	Area (km ²)	Fraction of Area	Distance between centre of PATH grid and centre point of land use (km)	Weighting (area/dist)	Roughness, m	Total
340 - 55	Commercial/ Industrial/ Transportation (Airport)	0.372	0.569	0.486	1.170	0.070	1.702
	Open Water	0.282	0.431	0.811	0.532	0.001	
55 - 125	Commercial/ Industrial/ Transportation (Airport)	0.541	0.886	0.587	1.510	0.070	1.635
	Open Water	0.070	0.114	0.915	0.125	0.001	
125 - 155	Commercial/ Industrial/ Transportation (Airport)	0.238	0.908	0.629	1.445	0.070	1.540
	Open Water	0.024	0.092	0.962	0.096	0.001	
155 - 340	Commercial/ Industrial/ Transportation (Airport)	1.614	1.000	0.412	2.427	0.001	2.427

Summary of Surface Parameters






Sector, degree	¹ Roughness, m	² Albedo	³ Bowen ratio
340 - 55	0.019	0.13	0.31
55 - 125	0.051	0.13	0.31
125 - 155	0.054	0.13	0.31
155 - 340	0.001	0.13	0.31

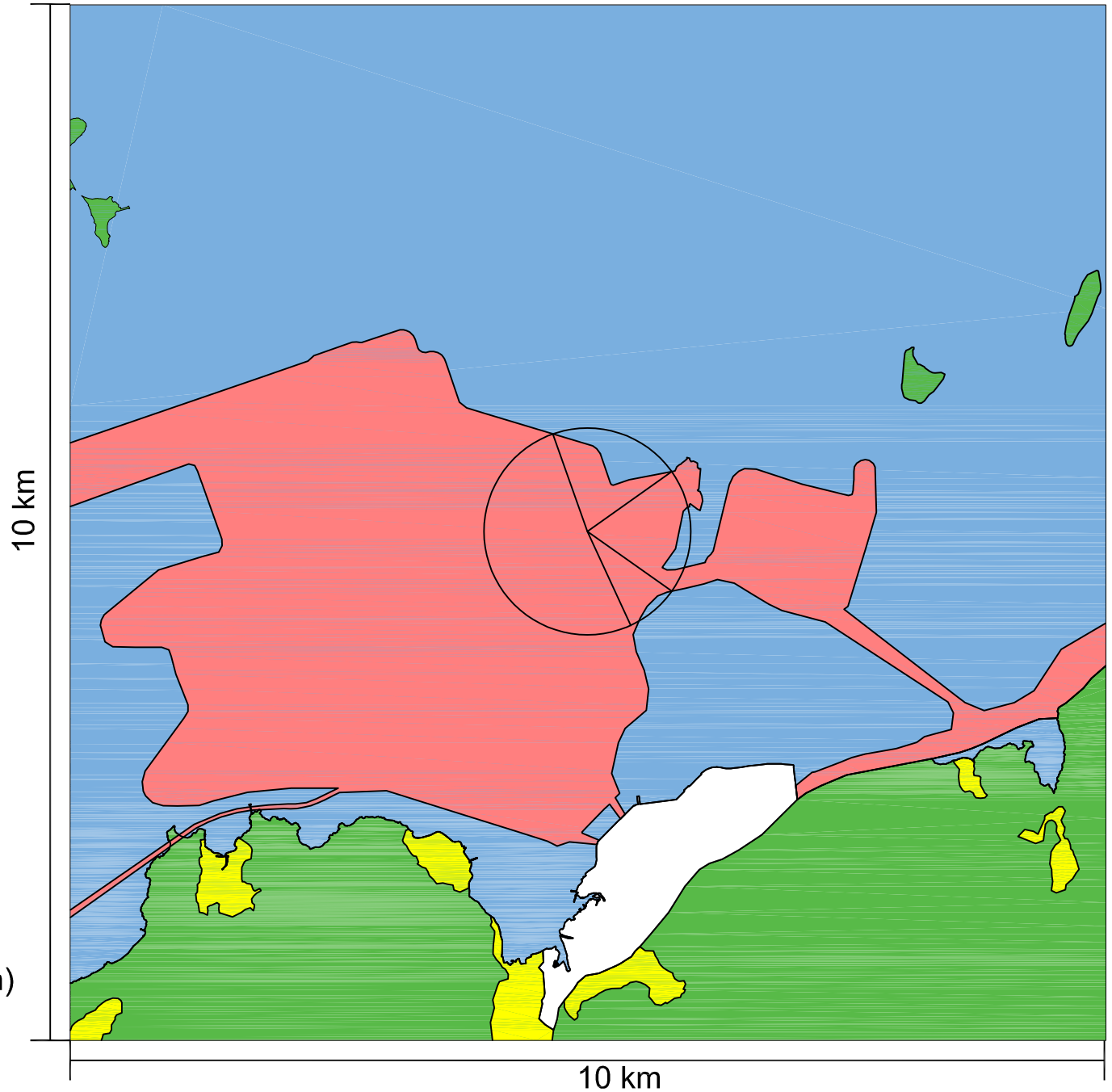
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GRID 16,33

LEGEND

-  Commercial/ Industrial/ Transportation (Airport)
-  Low Residential Intensity
-  High Residential Intensity
-  Shrubland (Non-Arid Region)
-  Open Water



Surface Parameters - Grid (17, 31)

Study Area (10km x 10km - Centre of the Site)

Land Type	Area, km ²	Fraction
Low Residential Intensity	3	0.03
High Residential Intensity	2	0.02
Shrubland (Non-Arid Region)	40	0.40
Commercial/ Industrial/ Transportation (Airport)	21	0.21
Open Water	33	0.33

Study Area (1km radius from the Site)

Sector, degree	Land Use	Area (km ²)	Fraction of Area	Distance between centre of PATH grid and centre point of land use (km)	Weighting (area/dist)	Roughness, m	Total
328 - 103	Open Water	1.178	1.000	0.522	1.915	0.001	1.915
103 - 238	High Residential Intensity	0.780	0.662	0.648	1.023	1.000	2.019
	Commercial/ Industrial/ Transportation (Airport)	0.020	0.017	0.951	0.018	0.070	
	Open Water	0.377	0.320	0.327	0.978	0.001	
238 - 328	Commercial/ Industrial/ Transportation (Airport)	0.397	0.505	0.775	0.652	0.070	1.813
	Open Water	0.389	0.495	0.426	1.161	0.100	

Summary of Surface Parameters






Sector, degree	¹ Roughness, m	² Albedo	³ Bowen ratio
328 - 103	0.001	0.15	0.55
103 - 238	0.034	0.15	0.55
238 - 328	0.088	0.15	0.55

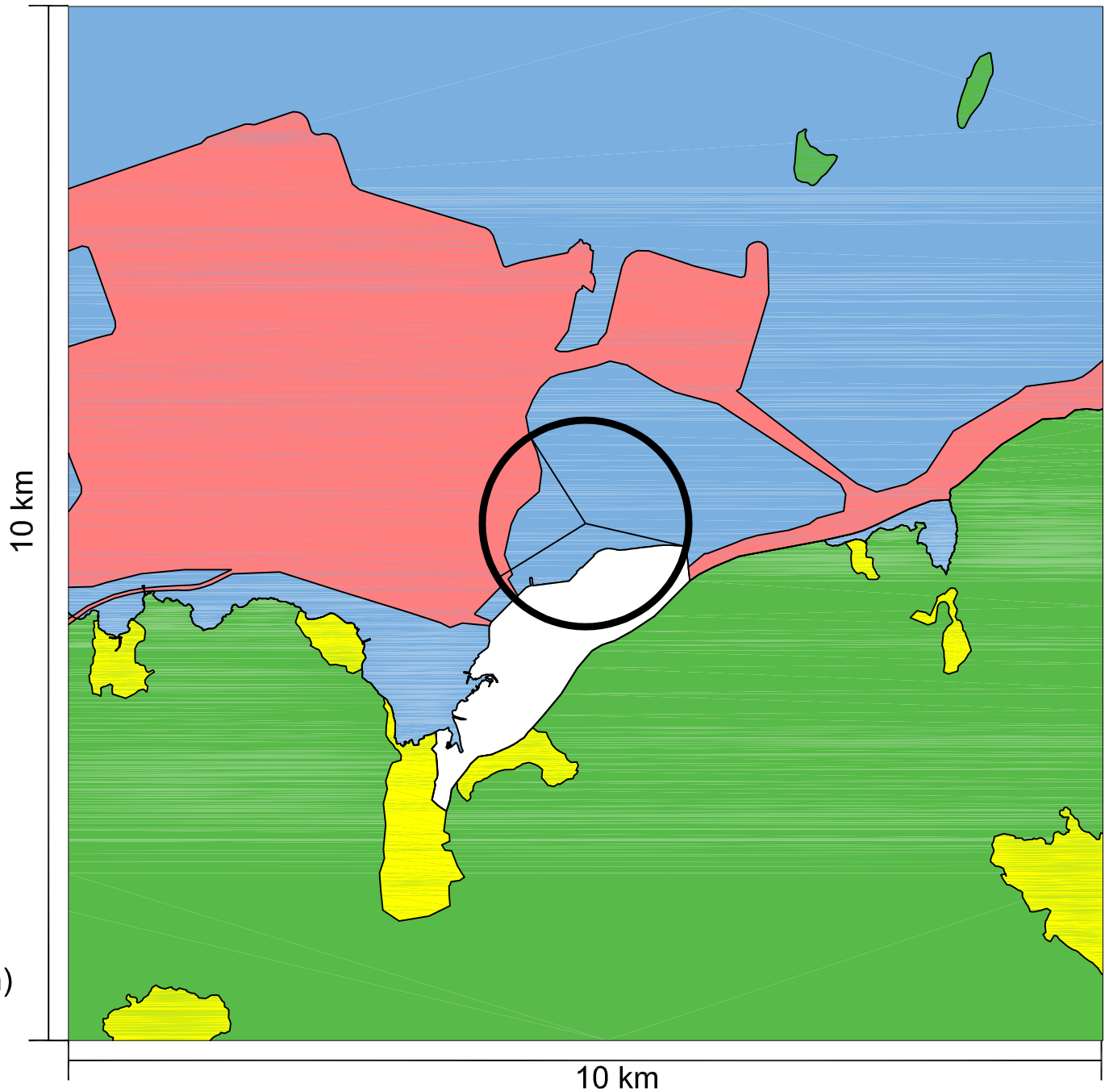
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GRID 17,31

LEGEND

-  Commercial/ Industrial/ Transportation (Airport)
-  Low Residential Intensity
-  High Residential Intensity
-  Shrubland (Non-Arid Region)
-  Open Water



Surface Parameters - Grid (17, 32)

Study Area (10km x 10km - Centre of the Site)

Land Type	Area, km ²	Fraction
Low Residential Intensity	3	0.03
High Residential Intensity	2	0.02
Shrubland (Non-Arid Region)	30	0.30
Commercial/ Industrial/ Transportation (Airport)	21	0.21
Open Water	43	0.43

Study Area (1km radius from the Site)

Sector, degree	Land Use	Area (km ²)	Fraction of Area	Distance between centre of PATH grid and centre point of land use (km)	Weighting (area/dist)	Roughness, m	Total
336 - 77	Commercial/ Industrial/ Transportation (Airport)	0.044	0.050	0.900	0.056	0.070	1.785
	Commercial/ Industrial/ Transportation (Airport)	0.367	0.416	0.726	0.573	0.070	
	Open Water	0.121	0.137	0.831	0.165	0.001	
	Open Water	0.349	0.397	0.400	0.991	0.001	
77 - 180	Open Water	0.899	1.000	0.581	1.722	0.001	1.722
180 - 336	Commercial/ Industrial/ Transportation (Airport)	0.728	0.535	0.659	0.811	0.070	1.980
	Open Water	0.633	0.465	0.398	1.169	0.001	

Summary of Surface Parameters






Sector, degree	¹ Roughness, m	² Albedo	³ Bowen ratio
336 - 77	0.004	0.14	0.43
77 - 180	0.001	0.14	0.43
180 - 336	0.006	0.14	0.43

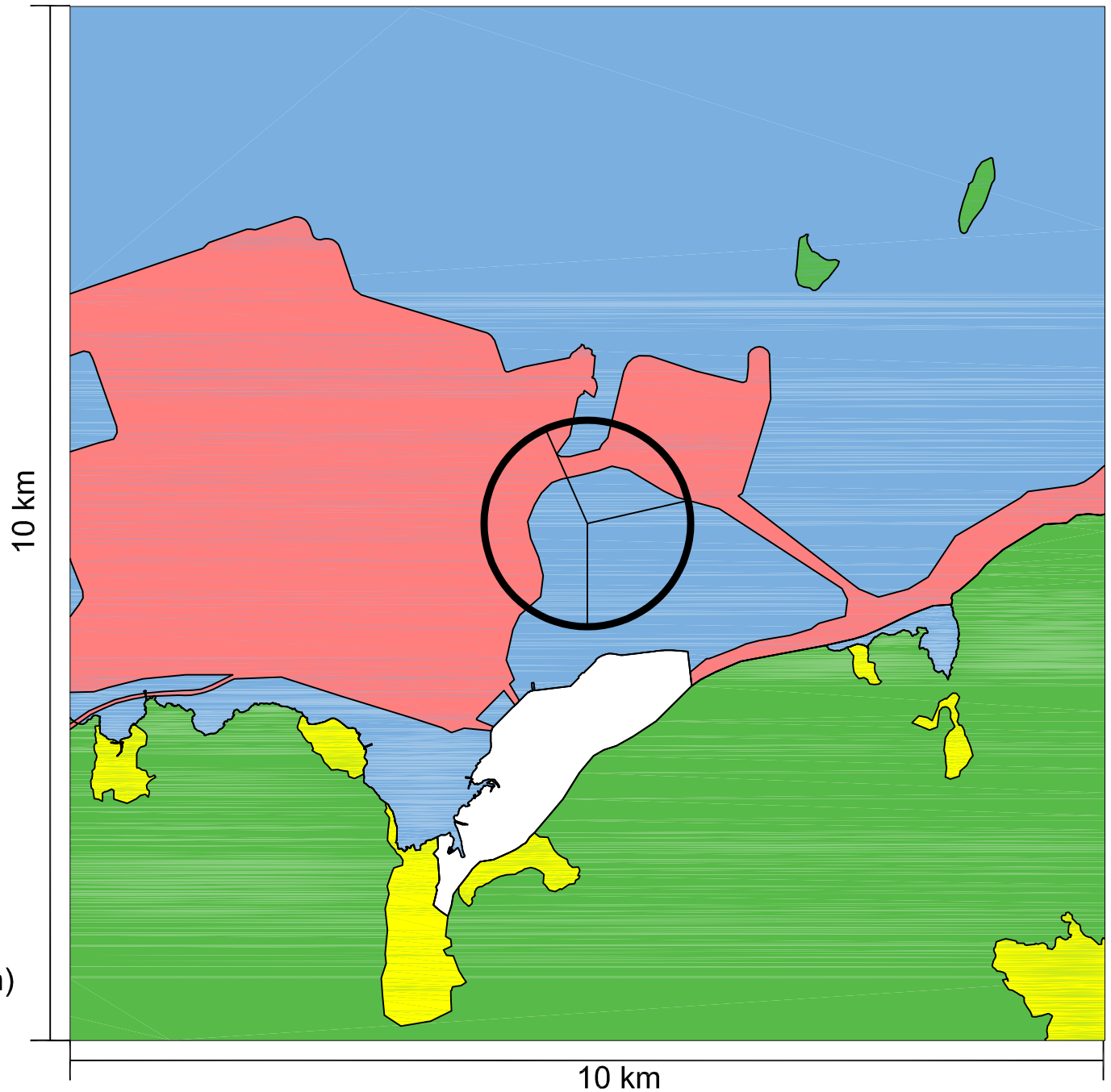
Note:

1. Average seasonal categories: 1, 2, 3 & 5 as per Table A-3 of USEPA's AERSURFACE user guide.
2. Average seasonal categories: 1, 2, 3 & 5 as per Table A-1 of USEPA's AERSURFACE user guide.
3. Average seasonal categories: 1, 2, 3 & 5 as per Table A-2 of USEPA's AERSURFACE user guide.

GRID 17,32

LEGEND

-  Commercial/ Industrial/ Transportation (Airport)
-  Low Residential Intensity
-  High Residential Intensity
-  Shrubland (Non-Arid Region)
-  Open Water



Surface Parameters - Grid (18, 33)

Study Area (10km x 10km - Centre of the Site)

Land Type	Area, km ²	Fraction
Low Residential Intensity	1.4	0.01
High Residential Intensity	2.3	0.02
Shrubland (Non-Arid Region)	23.8	0.24
Commercial/ Industrial/ Transportation (Airport)	18.2	0.18
Open Water	54.4	0.54

Study Area (1km radius from the Site)

Sector, degree	Land Use	Area (km ²)	Fraction of Area	Distance between centre of PATH grid and centre point of land use (km)	Weighting (area/dist)	Roughness, m	Total
315 - 55	Commercial/ Industrial/ Transportation (Airport)	0.268	0.307	0.334	0.921	0.070	1.885
	Commercial/ Industrial/ Transportation (Airport)	0.048	0.055	0.832	0.066	0.070	
	Open Water	0.557	0.638	0.710	0.898	0.001	
55 - 159	Commercial/ Industrial/ Transportation (Airport)	0.547	0.603	0.437	1.379	0.070	1.880
	Open Water	0.360	0.397	0.793	0.501	0.001	
159 - 241	Commercial/ Industrial/ Transportation (Airport)	0.462	0.645	0.491	1.316	0.070	1.737
	Open Water	0.254	0.355	0.841	0.422	0.001	
241 - 315	Commercial/ Industrial/ Transportation (Airport)	0.452	0.699	0.520	1.344	0.070	1.693
	Commercial/ Industrial/ Transportation (Airport)	0.003	0.004	0.987	0.004	0.070	
	Open Water	0.191	0.296	0.862	0.344	0.001	

Summary of Surface Parameters






Sector, degree	¹ Roughness, m	² Albedo	³ Bowen ratio
315 - 55	0.009	0.14	0.33
55 - 159	0.023	0.14	0.33
159 - 241	0.025	0.14	0.33
241 - 315	0.030	0.14	0.33

Note:

1. Average seasonal categories: 1, 2, 3 & 5 as per Table A-3 of USEPA's AERSURFACE user guide.
2. Average seasonal categories: 1, 2, 3 & 5 as per Table A-1 of USEPA's AERSURFACE user guide.
3. Average seasonal categories: 1, 2, 3 & 5 as per Table A-2 of USEPA's AERSURFACE user guide.

GRID 18.33

LEGEND

-  Commercial/ Industrial/ Transportation (Airport)
-  Low Residential Intensity
-  High Residential Intensity
-  Shrubland (Non-Arid Region)
-  Open Water

