Appendix A. DGGRID Metafile Parameters

Parameter Name (Type)	Description	Allowed Values (*v*)	Default	Notes	Used When
`bin_coverage` (**choice**)	are values distributed over most of the globe or only a relatively small portion?	`GLOBAL` `PARTIAL`	`GLOBAL`	allows **DGGRID** to determine how to trade-off speed vs. memory usage	`dggrid_operation` is `BIN_POINT_VALS` or `BIN_POINT_PRESENCE`
`cell_output_control` (**choice**)	designates which cells to output	`OUTPUT_ALL` `OUTPUT_OCCUPIED`	`OUTPUT_ALL`	`OUTPUT_ALL` - output all cells, even if no input values were associated with them `OUTPUT_OCCUPIED` - output only cells with associated input values	`dggrid_operation` is `BIN_POINT_VALS` or `BIN_POINT_PRESENCE`
`cell_output_file_name` (**string**)	cell boundary output file name prefix	any	"cells"		`cell_output_type` is `AIGEN`, `SHAPEFILE`, or `KML`
`cell_output_gdal_format` (**string**)	cell boundary output file format	GDAL-compatible vector file format (see gdal.org)	`GeoJSON`		`cell_output_type` is `GDAL`

`cell_output_type` (**choice**)	cell boundary output file format	`NONE`
		`AIGEN`
		`SHAPEFILE`
		`KML`
		`GEOJSON`
		`GDAL`
		`GDAL_COLLECTION`
			`AIGEN`		`dggrid_operation` is `GENERATE_GRID`

`children_output_type` (**choice**)	output cell spatial children?	`NONE`
		`TEXT`
		`GDAL_COLLECTION`
			`NONE`		`dggrid_operation` is `GENERATE_GRID`

`children_output_file_name` (**string**)	spatial children output file name	any	"chd"		`dggrid_operation` is `GENERATE_GRID` and `children_output_type` is `TEXT`
`clip_cell_res` (**integer**)	resolution of clipping cells	`0` < *v* < *r*, where *r* is the currently specified DGG resolution	`1`		`dggrid_operation` is `GENERATE_GRID` and `clip_subset_type` is `COARSE_CELLS`

Parameter Name (Type)	Description	Allowed Values (*v*)	Default	Notes	Used When
`clip_cell_densification` (**integer**)	number of points-per-edge densification for clipping cell boundaries	$0 \le v \le 500$	`1`	*v* of `0` indicates no densification	`dggrid_operation` is `GENERATE_GRID` and `clip_subset_type` is `COARSE_CELLS`
`clip_cell_seqnums` (**string**)	sequence number(s) of coarse clipping cells	*`seqNum1 seqNum2 ... seqNumN`*		cell resolution given by `clip_cell_res`	`dggrid_operation` is `GENERATE_GRID` and `clip_subset_type` is `COARSE_CELLS`
`clip_region_files` (**string**)	space delimited list of files that specify grid clipping	any	`"test.gen"`		`dggrid_operation` is `GENERATE_GRID`

`clip_subset_type` (**choice**)	specifies how portion of DGG to generate will be determined	`WHOLE_EARTH`
		`AIGEN`
		`SHAPEFILE`
		`GDAL`
		`SEQNUMS`
		`COARSE_CELLS`
			`WHOLE_EARTH`		`dggrid_operation` is `GENERATE_GRID`; `SEQNUMS` is not supported if `dggs_aperture_type` is `SEQUENCE`; `COARSE_CELLS` is only supported for hexagon grids

`clip_type` (**choice**)	method for determining whether a cell is included by a clipping polygon	`POLY_INTERSECT`	`POLY_INTERSECT`		`dggrid_operation` is `GENERATE_GRID`
`clipper_scale_factor` (**integer**)	number of cell inclusion tests to perform between outputting status updates	$1 \le v$	`1000000`		`dggrid_operation` is `GENERATE_GRID`
`collection_output_file_name` (**string**)	collection output file name prefix	any	`"cells"`	see the last paragraph of **Section 6**	
`collection_output_gdal_format` (**string**)	collection output file format	GDAL-compatible vector file format (see gdal.org)	`GeoJSON`	see the last paragraph of **Section 6**	
`densification` (**integer**)	number of points-per-edge densification to use when generating cell boundaries	$0 \le v \le 500$	`0`	*v* of `0` indicates no densification	`dggrid_operation` is `GENERATE_GRID`

Parameter Name (Type)	Description	Allowed Values (*v*)	Default	Notes	Used When

`dggrid_operation` (**choice**)	specifies the operation to be performed by this run of **DGGRID**	`GENERATE_GRID`
		`BIN_POINT_VALS`
		`BIN_POINT_PRESENCE`
		`TRANSFORM_POINTS`
		`OUTPUT_STATS`
			`GENERATE_GRID`		always

`dggs_aperture` (**integer**)	desired DGGS aperture	`3, 4, 7`	`4`		`dggs_aperture_type` is `PURE`
`dggs_aperture_sequence` (**string**)	the DGGS aperture sequence	string of `3`'s, `4`'s, and `7`'s in any order	`"333333333333"`		`dggs_aperture_type` is `SEQUENCE`

`dggs_aperture_type` (**choice**)	is the aperture sequence pure or mixed?	`PURE`
		`MIXED43`
		`SEQUENCE`
			`PURE`		`dggs_topology` is `HEXAGON`

`dggs_num_aperture_4_res` (**integer**)	number of aperture 4 resolutions in a mixed aperture sequence	$0 \leq v \leq 35$	`0`		`dggs_aperture_type` is `MIXED43`
`dggs_num_placements` (**integer**)	number of grid placements to use	$1 \leq v$	`1`	if `dggs_orient_specify_type` is not `RANDOM` all placements will be the same	`dggrid_operation` is `GENERATE_GRID`
`dggs_orient_output_file_name` (**string**)	name of file for output of multiple DGGS placement parameter values	any	"`grid.meta`"		`dggs_num_placements` `> 1`
`dggs_orient_rand_seed` (**integer**)	seed for orientation random number generator	$0 \leq v$	`77316727`		`dggs_orient_specify_type` is `RANDOM`

`dggs_orient_specify_type` (**choice**)	how is the DGG orientation specified?	`RANDOM`
		`SPECIFIED`
		`REGION_CENTER`
			`SPECIFIED`		`dggrid_operation` is `GENERATE_GRID`

`dggs_proj` (**choice**)	projection used by the DGGS	`ISEA` `FULLER`	`ISEA`		all operations

Parameter Name (Type)	Description	Allowed Values (v)	Default	Notes	Used When
`dggs_res_spec` (**integer**)	specified DGG resolution	$0 \le v \le 35$	`9`	if `dggs_type` is `SUPERFUND` then $0 \le v \le 9$; if `dggs_aperture_type` is `SEQUENCE` then $0 \le v \le n$, where n is the length of `dggs_aperture_sequence`)	`dggs_res_specify_type` is `SPECIFIED`
`dggs_res_specify_area` (**double**)	desired cell area	$1.0 \le v$	`100`		`dggs_res_specify_type` is `CELL_AREA`
`dggs_res_specify_intercell_distance` (**double**)	desired intercell distance (measured on the plane)	$1.0 \le v$	`100`		`dggs_res_specify_type` is `INTERCELL_DISTANCE`
`dggs_res_specify_rnd_down` (**boolean**)	should the desired cell area or intercell distance be rounded down (or up) to the nearest DGGS resolution?	`TRUE` `FALSE`	`TRUE`		`dggs_res_specify_type` is `CELL_AREA` or `INTERCELL_DISTANCE`

`dggs_res_specify_type` (**choice**)	how is the DGGS resolution specified?	`SPECIFIED`
		`CELL_AREA`
		`INTERCELL_DISTANCE`
			`SPECIFIED`		`dggrid_operation` is `GENERATE_GRID`

`dggs_topology` (**choice**)	desired cell shape	`HEXAGON`
		`TRIANGLE`
		`DIAMOND`
			`HEXAGON`		all operations

`dggs_type` (**choice**)	specify a preset DGG type	`CUSTOM`
		`SUPERFUND`
		`PLANETRISK`
		`ISEA3H`
		`ISEA4H`
		`ISEA7H`
		`ISEA43H`
		`ISEA4T`
		`ISEA4D`
		`FULLER3H`
		`FULLER4H`
		`FULLER7H`
		`FULLER43H`
		`FULLER4T`
		`FULLER4D`
			`CUSTOM`	see Appendix **B** for preset parameter value details	all operations

`dggs_vert0_azimuth` (**double**)	azimuth from icosahedron vertex 0 to vertex 1 (degrees)	$0.0 \le v \le 360.0$	`0`		`dggs_orient_specify_type` is `SPECIFIED`
`dggs_vert0_lat` (**double**)	latitude of icosahedron vertex 0 (degrees)	$-90.0 \le v \le 90.0$	`58.28252559`		`dggs_orient_specify_type` is `SPECIFIED`

Parameter Name (Type)	Description	Allowed Values (*v*)	Default	Notes	Used When
`dggs_vert0_lon` (**double**)	longitude of icosahedron vertex 0 (degrees)	-180.0 ≤ *v* ≤ 180.0	`11.25`		`dggs_orient_specify_type` is `SPECIFIED`
`geodetic_densify` (**double**)	maximum degrees of arc for a clipping polygon line segment	0.0 ≤ *v* ≤ 360.0	`0`	`0.0` indicates no densification	`dggrid_operation` is `GENERATE_GRID`

`input_address_type` (**choice**)	cell address form in input file(s)	`GEO`
		`Q2DI`
		`SEQNUM`
		`Q2DD`
		`PROJTRI`
		`VERTEX2DD`
			`GEO`	see **Appendix C**	`dggrid_operation` is `TRANSFORM_POINTS`, `BIN_POINT_VALS`, or `BIN_POINT_PRESENCE`; `SEQNUM` is not allowed if `dggs_aperture_type` is `SEQUENCE`

`input_delimiter` (**string**)	character that delimits address components and additional data in the input files	*v* is any single character in double quotes	`" "` (a single space)		`dggrid_operation` is `TRANSFORM_POINTS`, `BIN_POINT_VALS`, or `BIN_POINT_PRESENCE`
`input_file_name` (**string**)	name of file containing input addresses	*`fileName`*	`valsin.txt`		`dggrid_operation` is `TRANSFORM_POINTS`
`input_files` (**string**)	name(s) of files containing lon/lat locations with associated values	*`fileName1`* *`fileName2 ...`* *`fileNameN`*	`vals.txt`		`dggrid_operation` is `BIN_POINT_VALS` or `BIN_POINT_PRESENCE`
`kml_default_color` (**string**)	color of cell boundaries in KML output	any valid KML color	`ffffffff`		`cell_output_type` is `KML`
`kml_default_width` (**integer**)	width of cell boundaries in KML output	1 ≤ *v* ≤ 100	`4`		`cell_output_type` is `KML`
`kml_description` (**string**)	description tag value in KML output file		`Generated by DGGRID 6.3`		`cell_output_type` is `KML`
`kml_name` (**string**)	name tag value in KML output file		the output file name		`cell_output_type` is `KML`

`longitude_wrap_mode` (**choice**)	how handle vertex longitude for cells that straddle the anti-meridian?	`WRAP`
		`UNWRAP_EAST`
		`UNWRAP_WEST`
			`WRAP`		`dggrid_operation` is `GENERATE_GRID`

`max_cells_per_output_file` (**integer**)	maximum number of cells output to a single output file	0 ≤ *v*	`0`	`0` indicates no maximum	`dggrid_operation` is `GENERATE_GRID`

`neighbor_output_type` (**choice**)	output cell neighbors?	`NONE`
		`TEXT`
		`GDAL_COLLECTION`
			`NONE`	triangle grids not supported	`dggrid_operation` is `GENERATE_GRID`

Parameter Name (Type)	Description	Allowed Values (*v*)	Default	Notes	Used When
neighbor_output_file_name (**string**)	neighbors output file name	any	"nbr"	triangle grids not supported	dggrid_operation is GENERATE_GRID and neighbor_output_type is TEXT
output_address_type (**choice**)	address form to use in output	GEO Q2DI SEQNUM INTERLEAVE PLANE Q2DD PROJTRI VERTEX2DD AIGEN	SEQNUM	see **Appendix C**	dggrid_operation is TRANSFORM_POINTS, BIN_POINT_VALS, or BIN_POINT_PRESENCE
output_cell_label_type (**choice**)	output form for generated cell indexes	GLOBAL_SEQUENCE ENUMERATION SUPERFUND	GLOBAL_SEQUENCE		dggrid_operation is GENERATE_GRID
output_count (**boolean**)	output the count of classes which are present between the cell address and the presence vector	TRUE FALSE	TRUE		dggrid_operation is BIN_POINT_PRESENCE
output_delimiter (**string**)	character that delimits address components and additional data in the output file	*v* is any single character in double quotes	"" (a single space)		dggrid_operation is TRANSFORM_POINTS, BIN_POINT_VALS, or BIN_POINT_PRESENCE
output_file_name (**string**)	name of file to use for output		valsout.txt		dggrid_operation is TRANSFORM_POINTS, BIN_POINT_VALS, or BIN_POINT_PRESENCE
output_first_seqnum (**integer**)	begin generating with this cell ID	$0 \le v \le$ MAX_INT	0		dggrid_operation is GENERATE_GRID and clip_subset_type is WHOLE_EARTH
output_last_seqnum (**integer**)	last cell ID to generate	$0 \le v \le$ MAX_INT	MAX_INT		dggrid_operation is GENERATE_GRID and clip_subset_type is WHOLE_EARTH
pause_before_exit (**boolean**)	pause program execution before exiting	TRUE FALSE	FALSE		
pause_on_startup (**boolean**)	pause program execution at program start	TRUE FALSE	FALSE		
point_output_file_name (**string**)	cell point output file name prefix	any	"centers"		point_output_type is AIGEN, SHAPEFILE, KML, or TEXT
point_output_gdal_format (**string**)	point output file format	GDAL-compatible vector file format (see gdal.org)	GeoJSON		point_output_type is GDAL

Parameter Name (Type)	Description	Allowed Values (v)	Default	Notes	Used When
point_output_type (**choice**)	cell point output file format	NONE AIGEN KML SHAPEFILE TEXT GEOJSON GDAL GDAL_COLLECTION	NONE		dggrid_operation is GENERATE_GRID
precision (**integer**)	number of digits to right of decimal point when outputting floating point numbers	$0 \leq v \leq 30$	7		all operations
proj_datum (**choice**)	desired earth radius datum	WGS84_AUTHALIC_SPHERE WGS84_MEAN_SPHERE CUSTOM_SPHERE	WGS84_AUTHALIC_SPHERE		all operations
proj_datum_radius (**double**)	desired earth radius	$1.0 \leq v \leq 10{,}000.0$	6371.00718091847		proj_datum is CUSTOM_SPHERE
randpts_concatenate_output (**boolean**)	put random points for multiple DGG placements in a single file?	TRUE FALSE	TRUE		randpts_output_type is AIGEN, KML, SHAPEFILE, or TEXT
randpts_num_per_cell (**integer**)	number of random points to generate per cell	$0 \leq v$	0		randpts_output_type is AIGEN, KML, SHAPEFILE, or TEXT
randpts_output_file_name (**string**)	random points-in-cell output file name prefix	any	"randPts"		randpts_output_type is AIGEN, KML, SHAPEFILE, or TEXT and randpts_num_per_cell > 0
randpts_output_type (**choice**)	random points-in-cell output file format	NONE AIGEN KML SHAPEFILE TEXT GEOJSON	NONE		dggrid_operation is GENERATE_GRID
randpts_seed (**integer**)	seed for cell points random number generator	$0 \leq v$	77316727		randpts_output_type is RANDOM
region_center_lat (**double**)	latitude of study region (degrees)	$-90.0 \leq v \leq 90.0$	0		dggs_orient_specify_type is REGION_CENTER
region_center_lon (**double**)	longitude of study region (degrees)	$-180.0 \leq v \leq 180.0$	0		dggs_orient_specify_type is REGION_CENTER

Parameter Name (Type)	Description	Allowed Values (*v*)	Default	Notes	Used When
`rng_type` (**choice**)	specifies the random number generator to use	`RAND` `MOTHER`	`RAND`	`RAND`: C standard library rand `MOTHER`: George Marsaglia's multiply-with-carry "Mother" function	
`shapefile_id_field_length` (**integer**)	number of digits in Shapefile output cell index strings	$1 \leq v \leq 50$	`11`		`cell_output_type`, `point_output_type`, or `randpts_output_type` is `SHAPEFILE`
`wrap_points` (**boolean**)	output point longitudes using `longitude_wrap_mode`?	`TRUE` `FALSE`	`TRUE`		`dggrid_operation` is `GENERATE_GRID`
`update_frequency` (**integer**)	number of cell inclusion tests to perform between outputting status updates	$0 \leq v$	`100000`		`dggrid_operation` is `GENERATE_GRID`
`verbosity` (**integer**)	amount of debugging output to display	$0 \leq v \leq 3$	`0`		all operations