

OCEAN DISCIPLINE PROCESSING SYSTEM (ODPS) LAND/WATER MASK FORMAT

1.0 Summary Description

The Ocean Discipline Processing System requires a land/water mask file as input for Level 2 processing. The mask is used to set the land mask flag for each pixel. The file is in binary format, and integers are big-endian.

The mask file was originally generated in 1993 based on the World Vector Shoreline (WVS) database. This database did not include any inland waterways, and so these areas were all flagged as land. In October 1997, shortly after the SeaWiFS launch, the file was modified to include inland waterways, based on the World Data Bank (WDB). The land-water determination is based on the grid point center.

The format was designed to be highly compact, with full-resolution land-water mask values stored only for those regions which contain both. Each mask point requires a single bit, so a 16-bit integer stores 16 points. The file requires software in order to be unpacked and interpreted. The original design was general enough to allow for different resolutions and geographic limits. The file has been built at one resolution, and with global extent, as indicated below.

2.0 Detailed Format Specifications

The file format is based on fixed-length records. This allows FORTRAN direct data access, so that the records can be read out of order. The file structure is specified in the header record. The remainder of the file consists of an array of pointers, which are based on 1x1 degree latitude/longitude bins, followed by individual mask records for those bins containing both land and water.

2.1 File Header

The header specifies the overall structure of the file. The values in this record were intended to be variable in order to allow for different resolutions and geographic limits. Only one structure has actually been implemented, with the values specified here. The resolution of 128 points per degree corresponds to about 0.9 km in longitude at the equator, and in latitude.

Type	Size	Value	Description
short	1	128	Mask resolution (grid points per degree of latitude or longitude).
short	1	9644	Number of fixed-length records in the file.
short	1	2048	Record length (bytes).
short	1	-180	Western boundary (degrees longitude).
short	1	180	Eastern boundary (degrees longitude).
short	1	-90	Southern boundary (degrees latitude).
short	1	90	Northern boundary (degrees latitude).
short	1017	0	Fill (for 2048-byte record).

2.2 Record Pointers

The file pointer records contain one pointer for each 1x1 degree latitude/longitude bin. Thus this is represented as a rectangular array, which spans 64 actual records. The pointers are used to indicate whether the bin is water, land, or both. The pointers are ordered with longitude varying more rapidly; order is West-to-East in longitude, and South-to-North in latitude.

Type	Size	Description
short	360 x 180	Land/water mask pointers: = 0, bin is all water; = 1, bin is all land; > 1, mask record number in file (0-base).
short	736	Fill (for 2048-byte records) .

2.2 Land Mask Records

Each land mask record contains a bit mask for the NxN grid of points within a 1-degree bin. The mask is compressed to 16 mask values per 2-byte integer. For the implemented mask file, each bin contains a 128x128 grid, with 16384 mask bits; this is packed into 1024 words. The order is the same as the for the pointer array (longitude varies more rapidly, from Southwest to Northeast).

Type	Size	Description
short	1024	Land/water mask (16384 mask bits packed 16 per word); = 0, point is water; = 1, point is land.