

## Seamless Digital Chart of the World Base Map Version 10.0

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## Introduction

The Seamless Digital Chart of the World is worldwide, general purposed vector base map, with a variety of enhancements and updates which make it more easily usable, at a broader range of scales, and with better cartographic results than the freely available Digital Chart of the World from which it largely derives.

## Features

- Based on the latest base map in the DCW series (Vector Smart Map Level 0, Edition 5)
- All features appear in global-extent ESRI shapefiles or file geodatabases.
- Features customarily drawn with borders (countries, states/provinces, inland water areas, etc. are merged across DCW tiles and libraries
- First-level political subdivisions (states/provinces) are periodically updated, and country polygons (not included in VMAP 0) are created from the updated subdivisions. Second-level subdivisions have been added for India and China.
- Inland water areas and watercourse lines have relative-flow attributes, allowing appropriate amounts of water to be shown at different scales and for different cartographic requirements.
- A line layer created from inland water areas and watercourse lines (usually drawn invisibly) allows improved labeling of river systems with labels following features and many duplicates eliminated.
- The original DCW populated place points (over 200,000 points, but fewer than 80,000 with names and none with populations) have been supplemented with a GMI-developed set of nearly 200,000 places, all with names and over 142,000 with populations. This allows display of scale-appropriate sizes of towns and greatly improves labeling.
- ArcGIS sample map projects and layer files simplify map creation.

## What's New in Version 10.0.2

Changes between 3.2 and 10.0.2 (See [Release History](#) for earlier version changes)

- Modeled relative flows have been added to watercourses and inland water areas to allow selection of appropriate amounts of water detail.
- DCW-derived populated places are now supplemented by a [proprietary GMI superset of the DCW populated place points](#) which are ranked by population, include USBGN names. Places designated as provincial capitals have been updated to reflect revised first-level administrative divisions.
- A set of [30 arc-second topography grids](#) formerly included in the World Language System and used in the base map wizard is now also included in the WLMS
- Internal political borders have been updated for over 60 (40 since version 10.0 countries). Codes and names for over 30 additional provinces were updated. Second-level subdivisions have been added for India, China, and Sri Lanka.

- Kosovo as a country has been separated from Serbia. Some adjustments (reassigning islands to correct countries and adjusting borders) were made to 10 countries.
- Minor adjustments have been made to water features. In oceansea.shp shape file, Japan Sea was changed to East Sea/Japan Sea (South Korea feels Japan Sea is incorrect). Lake Victoria coastline was adjusted in inwatera.shp and a small adjustment was made to watrcrsl.shp.
- Several adjustments have been made to the original DCW populated places and built up areas.

## Installation

The seamless DCW data is shipped compressed in three self-installing Windows .exe files: setup.exe, hydro.exe, and elev.exe in the downloadable zip file or CD-ROM, which must be executed on a Windows system. Setup.exe will prompt for an installation password, which is provided by the WorldGeoDatasets.com store on the download page and confirmation email. If the SDCW is being installed for use in conjunction with GMI's World Language Mapping System (WLMS) data product, the installation directory chosen should be the same as that chosen for the WLMS; the two products may be installed in either order. For normal first-time installation, start setup.exe and choose Typical or Complete installation. Either of these installations will continue automatically with hydro.exe and elev.exe. If you need to restore a fresh copy of a part of the data at some later time, run the appropriate file (hydro.exe contains hydrologic features (rivers and lakes), elev.exe contains elevation points and contour lines, and setup.exe contains all other features) and select Custom installation. This allows you to select individual feature classes to be reinstalled.

## Licensing

This data set is covered by an [End-User License](#), and is subject to both copyright and license restrictions. In particular, redistribution of the data is not allowed except as specifically permitted in the End User License Agreement or by explicit, prior, written permission of Global Mapping International.

## About the Digital Chart of the World (VMap Level 0)

The Vector Map (VMap) Level 0, Edition 5 database (published September 2000 by the U.S. National Imagery and Mapping Agency [NIMA]\* and distributed by the U.S. Geological Survey) represents the sixth edition of the Digital Chart of the World (DCW) and the fifth published under the Vector Smart Map Level 0 title. The product is dual named to show its lineage to the original Digital Chart of the World, published in 1992, while positioning the revised product within a broader family of VMap products. VMap Level 0 (VMap0) is a comprehensive 1:1,000,000 scale vector base map of the world. The primary source for the database is the National Imagery and Mapping Agency's (NIMA) Operational Navigation Chart (ONC) series of air navigation charts. This is the largest scale unclassified map series available that provides consistent, continuous global coverage of essential base map features. The original database contains more than 1,900 megabytes of vector data and is organized into 10 thematic classes. The data include major road and rail networks, major hydrologic drainage systems, major utility networks (cross-country pipelines and communication lines), major airports, elevation contours (metric equivalent of 1000 foot (ft),

with 500ft and 250ft supplemental contours), coastlines, international and first order boundaries and populated places.

Since publication of VMap0 edition 5, NIMA has been incorporated into the National Geospatial-Intelligence Agency (NGA). See <http://www.nga.mil/>

## Conversion Process

VMap Level 0 is published in a format called VPF (Vector Product Format). GMI has converted the data from the VPF form into shapefile format so it will work more efficiently with the ArcView mapping software, and in order to allow us to merge the libraries and tiles of the DCW into seamless global coverages. In the process of converting, some things were adjusted or omitted. These are generally supplementary items not for cartography. Items which were totally omitted include depthl and polbndp from the \bnd directory, dqline from the \dq and other directories, the libref directory, and cutfill from the \phys directory; see the [DCW Military Specification](#) for descriptions of the omitted items. The various text annotation files (e.g. bndtxt, dqtxt, hydrotxt, etc.) were omitted due to their limited usefulness (features are generally labeled more easily using labels generated from the feature attributes) and the struggle of making them work well in ArcView (we were unsuccessful in getting the critical rotation and size information supposedly contained in the VPF text to display in ArcView).

GMI has added three types of geographic data to the converted DCW data:

**Updated First-Level Administrative Division Polygons:** VMap 0 Ed 5 first-level administrative division (province) polygons were updated.

**Country Polygons:** The updated first-level administrative division polygons were merged to form country polygons, a feature which was not present in VMap 0.

**District Polygons:** Second level administrative division polygons (districts) for India updated to 2001 census have been added. These polygons derived from districts digitized into a World Data Bank II base. They were aligned to DCW coastlines, international borders, and province borders.

For most of the shapefiles, GMI has added an attribute field, VMAP\_ID. This field contains a unique ID constructed for each feature. The ID was constructed as follows:

**V5** – indicating the feature is from edition 5 of VMap Level 0. Other letters, e.g. ADD, mean the features were added by GMI, usually from a merger of several VMap features; in these cases, the remainder of the identifier is undefined.

**One letter: N, E, A, or S** – indicating which VMap 0 library contained the features (N = V0NOA\_5, E = V0EUN\_5, A = V0SAS\_5, or S = V0SOA\_5)

First letter of the directory containing the VPF file (e.g. B for \bnd for barrierL.shp)

The first 5 letters of the VPF file name (e.g. barrierL = BARRI)

One letter: A for area features, L for line features, P for point features

A 1 to 6 digit right justified number, padded with zeros, referring to the record number of the feature.

## Release History

### Changes from 3.1 to 3.2 (See [Release History](#) for earlier version changes)

Internal political borders have been updated for over 50 countries.

Codes for several countries were updated and Montenegro was separated from Serbia.

Populated place point and built-up area names are now consistently rendered in mixed case.

An additional attribute field has been added to the DCW\_Provinces shapefile, giving the U.S. Board on Geographic Names approved name in Unicode.

Several populated places were added, and some names assigned to places and streams with unknown names, based on user reports from the field.

### Changes from 3.01 to 3.1

Quality fixes to some province and international borders. Some gaps between countries and provinces created during the conversion to DCW process were fixed.

First Level Administrative Division Codes: If the name of a first-level administrative division was duplicated between two or more countries, incorrect standard codes were frequently assigned in attributes.

Changes from version 3.0 to 3.01

Quality fixes to province and international borders.

Quality fixes in \bnd\oceansea.shp so extraneous lines will not be created if oceans or seas are merged with others

Major and large bodies of water in \hydro\inwatera.shp were merged across most tile lines

DCW\_districts.shp added to \bnd folder. This shapefile contains the second level administrative areas (districts) of India.

## Limitations

The conversion process used to convert the DCW from VPF format did not convert text annotation features. These are in most cases redundant with information contained in attributes of the corresponding feature, but some label size and placement information has been lost.

A few DCW feature classes for which we could find no cartographic use were omitted, including:

depthl and polbndp from the \bnd directory

dqline from the \dq and other directories

the libref directory

cutfill from the \phys directory.

In a few cases, the first-level administrative divisions of countries could not be merged into a single country polygon without exceeding the shapefile vertex limits of ArcView 8.x. In these cases, countries have been represented as multiple polygons. Where possible, we have

divided country polygons along lines of natural geographic discontinuity (e.g. separating offshore islands or dividing along major rivers).

## Data Organization

The data is installed in sub-directories under the user-selected installation directory (<installdir>, by default c:\gmi\_geodata). Directories with an \* are substantively different from the corresponding VPF format directories as noted.

<installdir>\bnd – Boundary: Political boundaries and names, ocean areas and names, coastlines, and Great Wall of China \*(missing bndtxt, depthl, polbndp; polbnda changed to DCW\_countries.shp and DCW\_provinces.shp)

<installdir>\docs – Documentation: User notes and specs (technical documents) written by NIMA or GMI\* (new directory)

<installdir>\dq – Data quality (included mostly for tile references, so can refer back to original data, several files were not converted from VPF since they had little usefulness) \*(missing dqline, dqtxt)

<installdir>\elev – Elevation: Contour lines and point elevations

<installdir>\hydro – Hydrography: Rivers, streams, canals, lakes, wet areas, wells, dams, rocks and wrecks in water \*(missing hydrotxt)

<installdir>\ind – Industrial: Mines, oil and gas fields, fisheries, storage features \*(missing indtxt)

<installdir>\phys – Physical: Ground surface, cliffs, depression, land and sea ice \*(missing cutfill, phystxt)

<installdir>\pop – Population Features: Cities, towns, villages, landmark buildings, settlements, monuments \*(missing poptxt)

<installdir>\Projects – Sample maps for ArcView 8.3 or 9: These are in the \Projects\Samples folder\* (new directory)

<installdir>\TopoGrid – Compressed 30 arc-second topography grids

<installdir>\trans – Transportation: Roads, railroads, trails, airports, airstrips, transportation structures \*(missing dqline, transtxt)

<installdir>\util – Utilities: Pipelines, utility lines, power plants, substations, pumping stations \*(missing dqline, utiltxt)

<installdir>\veg – Vegetation: Cropland, grassland, scrub/brush, swamps, bogs, forests, tundra

## Sample Map Projects

Sample map projects in ArcGIS 8.3 project format (.mxd) are included in the <installdir>\projects\Samples-dcw directory to illustrate use of the various DCW layers.

All DCW layers on.mxd – This project can be used to open all DCW layers with appropriate layer order and symbology.

All DCW layers zoomed to one million.mxd – Shows example of all DCW layers opened at scale of compilation (1:1,000,000). This project can be panned to show map of other areas.

Korean Peninsula political.mxd – Uses populated areas and countries.

land cover continent.mxd – Uses Europe as an example of how land cover layers can be used.

land cover India and Bangladesh.mxd – Example of land cover layers in zoomed in area.

land cover world.mxd – Land cover layers opened in map zoomed to whole world.

Additional projects illustrate the use of the data in combination with GMI's World Language Mapping System product are included in `<installdir>\projects\Samples-dcwstring`.

Kurds.mxd – Displays Kurdish languages in Middle East.

Myanmar-Thailand-1\_1mil\_dcw.mxd – Some Myanmar and Thailand languages including additional DCW data for geographic context.

SE Papua New Guinea zoom to 1\_5mill dcw.mxd – Papua New Guinea map zoomed in to southeast including additional DCW data for geographic context.

## Base Map Wizard

If the installer finds ArcGIS 9.3 or 9.3.1, it will install base map wizard allowing easy creation of base maps using the SDCW and other datasets. The wizard is installed in is installed in the wizards folder as GMI\_Basemap.mxd. The wizard will also use data from the World Language Mapping System and 80m SRTM topography from ESRI Data and Maps if these are installed. The Visual Basic for Applications programming language used to create the wizard requires certain features of ArcGIS 9.3 or 9.3.1, and is not compatible with ArcGIS 10 or 10.1, so the wizard is not installed if ArcGIS is not present or is present in a version other than 9.3.

GMI is working on re-coding the wizard in a language compatible with ArcGIS 10.x; check the WorldGeoDataSets.com website periodically starting in the 4<sup>th</sup> quarter of 2011 for progress on this work.

## Classification and Symbology

Within any feature layer in VMap 0, individual features are classified by an elaborate numerical classification system. When ArcView converts these features from the original VPF format, it uses a lookup table to convert the numerical classification to a more understandable character string. Both the numerical and string forms from the VPF data are preserved in the shapefile attribute tables. A full explanation of the classification system is included in appendix of the [VMap 0 military specification](#). To simplify application of cartographic symbology to the converted data, we have provided both layer files (.lyr files in the same directories as the corresponding shapefiles) and map project files(.mxd files in the Projects\Samples-DCW directory). You will generally want to use the .lyr files if you wish to add additional DCW detail to an existing map, or create a new map with a relatively small number of layers. The map projects will be most useful if you want to start a new map containing most of the DCW layers. (Hint: the sample projects are zoomed in to arbitrary locations at scales suitable for displaying all DCW layers. If you zoom to full extent (the whole world), the map will take a very long time to draw. It is best to stop drawing (Esc in ArcView) when you have enough of the world drawn to allow you to zoom back in to your area of interest.

## Detailed Data Documentation

Note: use Acrobat's Bookmarks pane or Find (Ctrl-F) features to find specific data in this section. Titles indicate point, line, or area (polygon) features.

**Source: NIMA VMap0, Edition 5**

**Boundary (see also [boundaries updated by GMI](#))**

*Barrier line features*

### **bnd\barrierl.shp**

**Abstract:** This shapefile contains wall features present in Asia, Europe, and North Africa. Most of the features are the Great Wall of China.

**Notes:** Other than the Great Wall of China, the file will not have much use.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd

*Coastline line features*

### **bnd\coastl.shp**

**Abstract:** Coastlines of seas, oceans, and extremely large lakes.

**Notes:** This is a very fast drawing shapefile, so can be useful to quickly zoom to the whole world. FIPS10\_4 field added to indicate what country the coastline borders, but currently is only coded for India.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd, Korean Peninsula political.mxd

*Ocean area features*

### **bnd\oceansea.shp**

**Abstract:** This shapefile contains the ocean areas of the world. It can be useful to draw oceans and the NAM field is a good source for names of oceans and seas.

**Notes:**

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd, Korean Peninsula political.mxd, land cover India and Bangladesh.mxd

## Data Quality

*Data Quality area features(used for tile references)*

### **dq\dq\area.shp**

**Abstract:** This shapefile is included mostly as a source for tile references in the data so a user can refer back to the original data.

**Notes:** The most useful fields are TILE\_ID and FAC\_ID. Not included in Typical installation due to lack of cartographic usefulness.

**Used in Projects:** None

## Elevation

### *Contour line features*

#### **elev\contourl.shp**

**Abstract:** Contour lines

**Notes:** The layer file uses the HQC\_DESCRI field to create 5 classifications:

- Regular (intermediate, supplementary)
- Depression
- Approximate
- Approximate depression
- Unknown

The ZV2 field is useful to label the contours, since elevation in meters is given. Since hillshades are included which show topography, contours are not part of the installer's Typical data installation. Due to the large size of the data, over 500 megabytes, it is best to use it only when mapping small areas. Not included in Typical installation due to large size and limited usefulness.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd

### *Elevation point features*

#### **elev\elevp.shp**

**Abstract:** Point elevations

**Notes:** The layer file uses the ELA\_DESCRI field to create 3 classifications:

- Accurate
- Approximate
- Unknown

Features in the Unknown category are spot elevations on inland water features. The ZV2 field is useful to label point elevations, since it contains elevation in meters.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd

## Hydrography

### *Aqueduct/Canal/Flume/Penstock line features*

#### **hydro\aquecanl.shp**

**Abstract:** Various man-made water features are in this shapefile.

**Notes:**

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd

### *Danger point features*

#### **hydro\dangerp.shp**

**Abstract:** Navigational hazards near ocean and navigable lake coastlines.

**Notes:** The layer file uses the F\_CODE\_DES field to create 2 classifications:

- Rock
- Wreck

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd

## *Inland Water area features*

### **hydro\inwatera.shp**

**Abstract:** This shapefile contains lakes and various inland water area features.

**Notes:** The layer file uses the HYC\_DESCRI field to create 2 classifications:

- Non-Perennial/Intermittent/Fluctuating
- Perennial/Permanent

The NAM field can be useful to label the features, though not all are named. UNK is used to designate features that have no name available. Fields added by GMI:

- NETWORK – Numeric identifier used to indicate rivers from same system. If rivers are from same system, they will have the same value.
- FAR\_END\_PN – Number of segments from ocean or lowest elevation of river
- WATERFLOW – relative waterflow modeled as number of upstream water elements (i.e. tributaries). This field is used in the SDCW wizard to display a larger number of streams when the map is zoomed in than when the map is zoomed out further.
- ELEVATION – Lowest nearby elevation using radius of buffer of feature

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd, land cover continent.mxd, land cover India and Bangladesh.mxd, land cover world.mxd

## *Land Subject to Inundation area features*

### **hydro\inunda.shp**

**Abstract:** These are areas that may be flooded frequently.

**Notes:** The layer file uses a hatch pattern to draw the shapefile, which can lead to a slow drawing time. The shapefile was derived from the inwatera VPF source file, and is presented as a separate shapefile since it is often desirable to draw other water areas with shorelines, while the indefinite edges of inundated areas are best depicted without edges. Unlike other water areas, these features have not been tiled.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd, land cover continent.mxd, land cover India and Bangladesh.mxd, land cover world.mxd

## *Miscellaneous line features*

### **hydro\miscl.shp**

**Abstract:** This shapefile contains various line features which are located near water features. The features include breakwaters/groynes, seawalls, and dams/weirs.

**Notes:** Some dams/weirs are located in miscp.shp. The layer file uses the F\_CODE\_DES field to create 2 classifications:

- Breakwater/Groyne; Seawall
- Dam/Weir

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd

## *Miscellaneous point features*

### **hydro\miscp.shp**

**Abstract:** Some features that are located near water features have been located as points. This includes features such as islands, rapids, springs/water-holes, waterfalls,

dams/weirs, locks, and sluice gates. The islands located here are not represented in coastl.shp, so this may be a means to portray the presence of small islands.

**Notes:** Some dams/weirs are located in miscl.shp. The layer file uses the F\_CODE\_DES field to create 6 classifications:

- Dam/Weir
- Island
- Lock; Sluice gate
- Rapids
- Spring/Water-Hole
- Waterfall

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd

## *Watercourse line features*

### **hydro\watrcrsl.shp**

**Abstract:** These are rivers, streams, and linear water features.

**Notes:** The layer file uses the HYC\_DESCRI field to create 2 classifications:

- Non-Perennial/Intermittent/Fluctuating
- Perennial/Permanent

The NAM field can be useful to label the features, though not all are named. UNK is used to designate features that have no name available. Fields added by GMI:

- NETWORK – Numeric identifier used to indicate rivers from same system. If rivers are from same system, they will have the same value.
- FAR\_END\_PN – Number of segments from ocean or lowest elevation of river
- WATERFLOW – relative waterflow modeled as number of upstream water elements (i.e. tributaries). This field is used in the SDCW wizard to display a larger number of streams when the map is zoomed in than when the map is zoomed out further.
- ELEVATION – Lowest nearby elevation using radius of buffer of feature

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd

## **Industrial**

### *Extraction area features*

#### **ind\extracta.shp**

**Abstract:** This shapefile shows areas where natural resources are being extracted from the earth. Items symbolized include mines/quarries, oil/gas fields, and salt evaporators.

**Notes:** The layer file uses the F\_CODE\_DES field to create 3 classifications:

- Mine/Quarry
- Oil/Gas Field
- Salt Evaporator

Some of these features may be symbolized as points in extractp.shp.

The MIN\_DESCRI field gives a little information about the type of mining, but only has 3 categories: Peat Cutting, other, unknown. Thus it won't be too helpful.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd

### *Extraction point features*

#### **ind\extractp.shp**

**Abstract:** This shapefile shows points where natural resources are being extracted from the earth. These features represented by points will be mines/quarries, oil/gas fields, salt evaporators, and oil/gas wells.

**Notes:** The layer file uses the F\_CODE\_DES field to create 4 classifications:

- Mine/Quarry
- Oil/Gas Field
- Salt Evaporator
- Oil or Gas Well

These features, except oil/gas wells, may be symbolized as areas in extracta.shp.

The TXT field may give more information about the feature such as being more specific about the type or even the name of the feature.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd

### *Fishery Industrial area features*

#### **ind\fishinda.shp**

**Abstract:** These are fish hatcheries, fish farms, or marine farms.

**Notes:** There are only a few of these shown in the world.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd

### *Miscellaneous Industry point features*

#### **ind\misindp.shp**

**Abstract:** This shapefile uses points to locate industrial point features. These include processing/treatment plants and oil/gas facilities.

**Notes:** The layer file uses the F\_CODE\_DES field to create 2 classifications:

- Oil/Gas Facilities
- Processing Plant/Treatment Plant

The TXT field may give more information about the specific type of facility or plant.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd

### *Storage point features*

#### **ind\storagep.shp**

**Abstract:** These are depots, tanks, and water towers which are represented as points.

**Notes:** The layer file uses the F\_CODE\_DES field to create 3 classifications:

- Depot (Storage)
- Tank
- Water Tower

The TXT field may give more information about the specific type of storage facility. NULL is used if no further description is available.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd

## Physical

### *Ground area features*

#### **phys\grounda.shp**

**Abstract:** This shapefile specifies the type of ground surface, if known, of an area. The different classifications are distorted surface, lava, sand, or unknown

**Notes:** The layer file uses the SMC\_DESCRI field to create 4 classifications:

- Distorted Surface
- Lava
- Sand
- Unknown

SWC\_DESCRI can give some further classification of the wetness of Sand, whether it is Wet or Unknown. This will probably not be too useful.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd, land cover continent.mxd, land cover India and Bangladesh.mxd, land cover world.mxd

### *Land Ice area features*

#### **phys\landicea.shp**

**Abstract:** These are snow fields or ice fields which are on land.

**Notes:** Most of these are located in the polar areas or the high mountain ranges of the world. **Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd, land cover continent.mxd, land cover world.mxd

### *Landform line features*

#### **phys\ndfrml.shp**

**Abstract:** This shapefile contains linear landform features. These include bluffs/cliffs/escarpments, embankments/fills, ice cliffs, and depressions.

**Notes:** The layer file uses the F\_CODE\_DES field to create 2 classifications:

- Bluff/Cliff/Escarpment; Embankment/Fill; Ice Cliff
- Depression

There are only 28 of these in the shapefile.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd, land cover continent.mxd, land cover India and Bangladesh.mxd

### *Sea Ice area features*

#### **phys\seaicea.shp**

**Abstract:** Ice features located in the ocean and sea are ice shelves, pack ice, and polar ice.

**Notes:** The layer file uses the F\_CODE\_DES field to create 3 classifications:

- Ice Shelf
- Pack Ice
- Polar Ice

These are primarily located in the polar areas of the world. Due to a low probability of users using the data, it is not installed in a Typical data installation. Tile lines have not all been removed since this shapefile will usually be drawn without an outline.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd, land cover continent.mxd, land cover world.mxd

## Population

### *Built Up Area features*

#### **pop\builtupa.shp**

**Abstract:** This shapefile shows towns and cities which have an urban expanse large enough to be shown as an area.

**Notes:** The NAM field contains the name of the town or city. The characters UNK indicate that the name is not available.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd, Korean Peninsula political.mxd

### *Built Up Area point features*

#### **pop\builtupp.shp**

**Abstract:** These are built up areas which are symbolized by a point. These cities are different from builtupa.shp. This file contains only 166 cities while builtupa.shp includes many thousands of areas.

**Notes:** The NAM field contains the name of the town or city. The characters UNK indicate that the name is not available. More towns can be found as settlements in misspopp.shp

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd, Korean Peninsula political.mxd

### *Miscellaneous Population area features*

#### **pop\mispopa.shp**

**Abstract:** This shapefile contains native settlements and race tracks which are symbolized as areas. More native settlements are in misspopp.shp

**Notes:** The layer file uses the F\_CODE\_DES field to create 2 classifications:

- Native Settlement
- Race Track

The NAM field may contain the name of the settlement. The characters UNK indicate that the name is not available. The NAM field is blank for all race tracks.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd, Korean Peninsula political.mxd

### *Miscellaneous Population point features*

#### **pop\misspopp.shp**

**Abstract:** A large variety of man-made features are in this shapefile. These can be as small as a cairn or monument and as large as a settlement or military base. A few native settlements are in mispopa.shp

**Notes:** The layer file uses the F\_CODE\_DES field to create 9 classifications:

- Building
- Cairn or Monument
- Camp
- Lighthouse
- Military Base
- Native Settlement
- Ruins or Wall
- Settlement
- Stadium/Amphitheatre

The TXT field may contain the name of the settlement. It more rarely may contain a description for features in other classifications. The characters UNK indicate that the name or description of feature is not available. The TXT field is blank for all native settlements (i.e. no names are available).

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd

## Transportation

### *Airport point features*

#### **trans\erofacp.shp**

**Abstract:** This shapefile contains airports or airstrips symbolized as points.

**Notes:** The layer file uses the USE\_DESCR1 field to create 4 classifications:

- Civilian/Public
- Joint Military/Civilian
- Military
- Other or Unknown

The NAM field contains the name of the airport or airstrip. The ZV3 field contains the elevation in meters of the airfield. A value of 29999 indicates the elevation is unknown. Two other fields have data in them, but probably will not be too valuable for mapping. The IKO field contains the ICAO designator. The NA3 field contains the classification name. UNK in the ICAO or NAM3 fields means these values are unknown.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd

### *Miscellaneous Transportation line features*

#### **trans\mistranl.shp**

**Abstract:** This shapefile contains some miscellaneous mountain and ocean transportation features. These features include aerial cableway lines/ski lift lines and piers/wharfs/quays.

**Notes:** The layer file uses the F\_CODE\_DES field to create 2 classifications:

- Aerial Cableway Lines/Ski Lift Line
- Pier/Wharf/Quay

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd

### *Railroad line features*

#### **trans\railrdl.shp**

**Abstract:** Various kinds and types of railroads are included in this shapefile.

**Notes:** The layer file uses the EXS\_DESCR1 and FCO\_DESCR1 fields to create 4 classifications:

- Operational, Multiple
- Operational, Single; Operational, Unknown
- Unexamined/Unsurveyed
- Doubtful; Not Usable; Under Construction

The Unexamined/Unsurveyed category includes railroads which go through built up areas. These were not on the original source maps, but were added using approximate location to ensure continuity of the railroad feature.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd, Korean Peninsula political.mxd

### *Railroad Yard point features*

#### **trans\ryardp.shp**

**Abstract:** This shapefile uses points to symbolize railroad yards.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd

## Road line features

### trans\roadl.shp

**Abstract:** Various kinds and types of roads are included in this shapefile.

**Notes:** The layer file uses the RTT\_DESCRI, EXS\_DESCRI and MED\_DESCRI fields to create 6 classifications:

- With Median (includes Primary Route, Secondary Route or Unknown, With Median)
- Primary Route, Operational (includes all Primary Routes except Under Construction and Without Median)
- Primary Route, Under Construction (includes all Primary Routes and Under Construction)
- Secondary Route or Unknown, Operational, Without Median
- Secondary Route or Unknown, Under Construction or Doubtful
- Unexamined/Unsurveyed

The Unexamined/Unsurveyed category includes roads which go through built up areas. These were not on the original source maps, but were added using approximate location to ensure continuity of the road feature.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd, Korean Peninsula political.mxd

## Trails and Tracks line features

### trans\trail.shp

**Abstract:** This shapefile contains trails and tracks.

**Notes:** The layer file uses the EXS\_DESCRI field to create 2 classifications:

- Operational
- Doubtful or Under Construction

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd

## Transportation Structure point features

### trans\transtrc.shp

**Abstract:** These transportation structure features symbolized by point locations include bridges, ferry crossings and fords, and tunnels.

**Notes:** The layer file uses the F\_CODE\_DES field to create 3 classifications:

- Bridge/Overpass/Viaduct; Causeway
- Ferry Crossing; Ford
- Tunnel

More of these features are included in transtrl.shp. The TUC\_DESCRI field identifies whether the feature is associated with a road or railroad.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd

## Transportation Structures line features

### trans\transtrl.shp

**Abstract:** These transportation structure features symbolized by lines include bridges, ferry crossings and fords, and tunnels.

**Notes:** The layer file uses the F\_CODE\_DES field to create 3 classifications:

- Bridge/Overpass/Viaduct; Causeway
- Ferry Crossing; Ford
- Tunnel

More of these features are included in transtrl.shp. The TUC\_DESCRI field identifies whether the feature is associated with a road or railroad.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd

## Utility

### *Pipeline line features*

#### **util\pipel.shp**

**Abstract:** This shapefile shows locations of pipelines.

**Notes:** The LOC\_DESCRI field tells if the pipeline is above or below ground.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd

### *Utility line features*

#### **util\util.shp**

**Abstract:** Power lines, telephone lines, and telegraph lines.

**Notes:** The layer file uses the F\_CODE\_DES field to create 2 classifications:

- Power Transmission Line
- Telephone Line/Telegraph Line

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd

### *Utility point features*

#### **util\utilp.shp**

**Abstract:** This shapefile shows where structures or yards associated with utilities are located. These features are symbolized by points.

**Notes:** The layer file uses the F\_CODE\_DES field to create 4 classifications:

- Communication Building
- Power Plant
- Pumping Station
- Substation/Transformer Yard

The TXT field may give a further description of the feature. If a further description is not available, the letters NULL will be in the field.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd

## Vegetation

### *Cropland area features*

#### **veg\cropla.shp**

**Abstract:** This shapefile shows areas used for cropland.

**Notes:** The layer file uses the VEG\_DESCRI field to create 2 classifications:

- Dry Crops
- Other; Unknown

Tile lines were not all removed since this shapefile will usually be drawn without an outline.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd, land cover continent.mxd, land cover India and Bangladesh.mxd, land cover world.mxd

### *Grassland area features*

#### **veg\grassa.shp**

**Abstract:** These are areas of land which are grassland or scrub/brush.

**Notes:** The layer file uses the F\_CODE\_DES field to create 2 classifications:

- Grassland
- Scrub/Brush

Tile lines were not all removed since this shapefile will usually be drawn without an outline.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd, land cover continent.mxd, land cover India and Bangladesh.mxd, land cover world.mxd

### *Swamp area features*

#### **veg\swampa.shp**

**Abstract:** This shapefile displays areas of land which are boggy or swampy.

**Notes:** The layer file uses the F\_CODE\_DES field to create 2 classifications:

- Bog
- Marsh/Swamp

Tile lines were not all removed since this shapefile will usually be drawn without an outline.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd, land cover continent.mxd, land cover India and Bangladesh.mxd, land cover world.mxd

### *Trees area features*

#### **veg\treesa.shp**

**Abstract:** These are forested areas of land.

**Notes:** The layer file uses the VEG\_DESCRI field to create 3 classifications:

- Deciduous
- Evergreen
- Mixed Trees

Tile lines were not all removed since this shapefile will usually be drawn without an outline.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd, land cover continent.mxd, land cover India and Bangladesh.mxd, land cover world.mxd

### *Tundra area features*

#### **veg\tundraa.shp**

**Abstract:** This shapefile shows locations of areas of tundra.

**Notes:** Tile lines were not all removed since this shapefile will usually be drawn without an outline.

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd, land cover continent.mxd, land cover India and Bangladesh.mxd, land cover world.mxd

## **Source: GMI and NIMA VMap0, Edition 5**

## **Boundary Features Updated by GMI**

### *Country area features*

#### **bnd\DCW\_countries.shp**

**Abstract:** This shapefile contains countries of the world and their names. It was derived by dissolving the provinces of DCW\_provinces.shp into countries. Due to this, it has some of the same fields as the VPF polbnda. However the province areas were merged to create country areas. GMI has updated the countries

to represent what is commonly considered the current political situation. Updated province areas have been created in DCW\_provinces.shp.

**Notes:** Some data fields from the VPF form of polbnda have been changed to more intuitive names:

- NA2 changed to FIPS10\_4
- NA2\_DESCRI changed to COUNTRY
- NA3 changed to CONTCODE
- NA3\_DESCRI changed to CONT

The ID field has been added. It is a two letter continent code, a hyphen, and the two letter ISO 3166 country code.

**Attributes:**

Field	Field Name	Type	Width	Description
1	ID	Character	16	Unique identifier
2	FIPS10_4	Character	2	FIPS 10-4 code
3	COUNTRY	Character	44	Country name
4	CONTCODE	Character	1	Continent/Region code
5	CONT	Character	15	Continent/Region name
6	F_CODE	Character	5	Feature code
7	F_CODE_DES	Character	19	Feature code description
8	OW_ABBREV	Character	4	Patrick Johnstone, Operation World, Country Code
9	ISO_A2	Character	4	ISO 3166 2 letter country code
10	ISO_A3	Character	3	ISO 3166 3 letter country code
11	VMAP_ID	Character	15	Unique ID
12	FACTBK_CTY	Character	44	Country name as given in World Factbook

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd, Korean Peninsula political.mxd, land cover continent.mxd, land cover India and Bangladesh.mxd, land cover world.mxd

*Political Boundary line features*

**bnd\polbndl.shp**

**Abstract:** These are various types of political border lines and the International Date Line. Types of political borders include international and first level administrative political boundaries for most countries of the world.

**Notes:** The layer file uses the F\_CODE\_DES and USE\_DESCRI fields to create 4 classifications:

- Administrative Boundary, International
- Administrative Boundary, Primary/1st Order
- International borders which are: Armistice Line, Cease-Fire Line, Claim Line, Defacto Boundary
- International Date Line

This boundary lines have been extensively updated by GMI. A VMAP\_ID which begins with ADD indicates a record which has been edited or added by GMI. The TILE\_ID and EDG\_ID for these records will usually not correctly refer back to the VMAP form of the data. A field named FIPS10\_4 was added to provide a country code for all province borders and some international borders (currently mostly in south Asia).

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd, Korean Peninsula political.mxd

## Province area features

### bnd\DCW\_provinces.shp

**Abstract:** This shapefile was derived from the polbnda VPF file. This contains the first order administrative areas of most countries of the world. For some tiny countries (often island countries) first order administrative borders were not available, so the country exists as one polygon. GMI has updated province borders, codes, and names using a variety of sources. We welcome input from users on the field, who frequently become aware of changes in sub-national political borders long before these are reflected in our various global sources.

**Notes:** The HISCODE and NAM\_UPLOW fields have been added to allow more options for data to link to the file. The HISCODE is the FIPS 10-4 code for the country plus the two number or letter code (FIPS 10-4) for the province. Where there is no FIPS code for the province, a code has been manufactured beginning at zz (note lower case) and working backwards through the alphabet. The NAM\_UPLOW field contains the NAM field (which is all upper case) in mixed case.

#### Attributes:

Field	Field Name	Type	Width	Description
1	ID	Character	16	Unique identifier
2	F_CODE	Character	5	Feature code
3	F_CODE_DES	Character	19	Feature code description
4	HISCODE	Character	5	HIS code
5	NAM	Character	57	Province name
6	NAM_UPLOW	Character	57	Province name - upper/lower case
7	NAM_UNICOD	Character	60	USBGN approved name with full diacritics in Unicode. Use Arial Unicode MS will display most names correctly; a few may require TITUS Cyberbit Basic font to display correctly.
8	NA2	Character	2	FIPS 10-4 code
9	NA2_DESCRI	Character	44	Country name
10	NA3	Character	1	Continent/Region code
11	NA3_DESCRI	Character	15	Continent/Region name
12	PROVCAP	Character	31	Province Capital
13	ISOCODE	Character	6	ISO Province Code
14	VMAP_ID	Character	16	Unique ID

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd, Korean Peninsula political.mxd

## District area features

### bnd\DCW\_districts.shp

**Abstract:** Second level political areas of India, Sri Lanka according to 2001 census and China.

**Notes:** For India and Sri Lanka they were derived from districts in the GMMS but have been adjusted to the DCW coastlines, international, and province borders. China districts (prefectures) were derived from merging 3<sup>rd</sup> level administrative areas. Local\_code is the numeric 2001 India census code for the state and district. The HISCODE is the FIPS 10-4 code for the country, plus the two number or letter code (FIPS 10-4) for the province, plus a two number code for the district (usually determined alphabetically).

**Attributes:**

Field	Field Name	Type	Width	Description
1	ID	Character	16	Unique Identifier
2	NAME	Character	64	HISCODE
3	NAME2	Character	64	District Name
4	Local_code	Character	10	Local code (India Census code)
5	OMIDCODE	Character	7	OMID district code
6	VMAP_ID	Character	16	Unique ID

**Used in Projects:** None

*Disputed province area features*

**bnd\DCW\_Prov\_disp.shp**

**Abstract:** Polygons which can be used to show a country's claim which isn't recognized by adjacent countries

**Notes:** This includes India/Pakistan/China (Jammu Kashmir/Azad Kashmir/Aksai Chin), U.A.E and Qatar, Guyana/Suriname/French Guiana (headwaters of Lawa and headwaters of Courantyne), Palestine/Israel/Syria (Gaza Strip, West Bank, Golan Heights), Azerbaijan and Armenia (Nagorno-Karabakh), Egypt/Sudan (Halib region), and Kenya/Sudan (Ilemi triangle).

**Attributes:**

Field	Field Name	Type	Width	Description
1	ID	Character	16	Unique identifier
2	HISCODE	Character	5	HIS code
3	NAM	Character	57	Province name
4	NAM_UPLOW	Character	57	Province name - upper/lower case
5	NAM_UNICOD	Character	60	USBGN approved name with full diacritics in Unicode. Use Arial Unicode MS will display most names correctly; a few may require TITUS Cyberbit Basic font to display correctly.
6	NA2	Character	2	FIPS 10-4 code
7	NA2_DESCRI	Character	44	Country name
8	NA3	Character	1	Continent/Region code
9	NA3_DESCRI	Character	15	Continent/Region name
10	ISOCODE	Character	6	ISO Province Code
11	VMAP_ID	Character	16	Unique ID

**Used in Projects:** None

## Source: Populated Place Merge Project

A subset of nearly 200,000 populated places (ranks 0-7 plus selected places from ranks 8 and 9) of GMI's Populated Place Merge Project.

This data set merges nine of the largest and most widely used sets of populated place point data, either freely available on the Internet or included with GMI datasets or redistributable ESRI datasets. These sources each have distinct advantages and disadvantages; some sources have good coordinate accuracy, some have good population data, some have a very large number of places, etc. The objective of the project was to produce a data set with a single point for each distinct place, and with each attribute of the point chosen from the most reliable of the nine sources for that attribute. For example, a single point might derive its identifying code from the Geonet Names Server (which has the most comprehensive code set), its coordinate location from the Digital Chart of the World (which has very good coordinate accuracy), its population from world-gazetteer.com (which has an unusually comprehensive and up-to-date set of populations), and its status as a national and provincial capital from ESRI Data and Maps (which has very good coverage of these attributes).

The core of the merging process involved a phonetic comparison of each alternate name of each place with each alternate name of each other place within a reasonable distance (variable depending on the population of the place and the general coordinate accuracy of the source) to determine whether two places in the source data may be presumed to represent the same actual place. With 2.75 million place entries (and 3.87 million names of those places) in the nine input data sets, the merge process was computationally demanding; the first attempt at a full merge attempt took 8 weeks of 24-hour processing. With further optimization, but a more sophisticated algorithm, the final merge took only nine days and produced 2.26 million merged records.

The nine sources included in this version of the Populated Places Data Supplement are as follows. The three-character abbreviation listed is the prefix of the source ID codes which allow the origin dataset of various components of a merged entry (code, name, coordinates, and population) to be identified.

- **CDE** – Population of the major cities and agglomerations for each country, downloaded from the City Population website, <http://citypopulation.de>
- **DCW** – Digital Chart of the World (Vector Smart Map Level 0, edition 5). The DCW has been developed by the National Geospatial-Intelligence Agency of the U.S. government (<http://www.nga.mil/>), and may be downloaded in Vector Product Format (VPF) from the Raster Roam portion of their website.
- **ESR** – Cities in ESRI Data and Maps distributed with ArcView 9.2. Produced by ESRI, <http://www.esri.com/data/data-maps/overview.html>.
- **G32** – Global Ministry Mapping System version 3.2. Produced by Global Mapping International, <http://www.gmi.org/products/gis/gmms>. Data originally from Habitats Project and Digital Chart of the World.
- **G33** – Global Ministry Mapping System populated place updates after version 3.2. This undistributed data set primarily repairs code inconsistencies in metroplex hierarchy relationships.
- **GNS** – GEOnet Names Server. This is the National Geospatial-Intelligence Agency and U.S. Board on Geographic Names database of foreign geographic feature names, <http://earth-info.nga.mil/gns/html/index.html>
- **MEX** – A database containing population and other selected census items for Mexican States, Municipalities and Localities from the Instituto Nacional De Estadistica Geografia E Informatica, downloaded from <ftp://ftp.ciesin.columbia.edu/pub/data/Mexico/geo.pop.db.mex/>
- **USG** - Geographic Names Information System, <http://geonames.usgs.gov/domestic/index.html>, is developed by the USGS and maintained by U.S. Board on Geographic Names. Its data extent includes the U.S. and its associated territories.
- **WGZ** – World Gazetteer, <http://world-gazetteer.com>, provides a comprehensive set of population data and related statistics.

## Merged Populated Places, Ranks

### pop\PopPlaceGMMS.gdb\PopPlacesGMMS

1969-2008

**Abstract:** Cities and towns with population data or coordinates derived, representing merged cities of ranks 1-7 and some rank 8 and 9 (those with DCW and WGZ sources)(approximately 200,000 places) from GMI's Populated Place Merge Project.

**Notes:** Populated Places were merged using geographic and fuzzy matching from eight widely-available populated place data sets. For complete methodology and additional information, see <http://www.gmi.org/products/gis/gmms/databases/ppd>

#### Attributes:

Field Name	Type	Wid	Dec	Description
OBJECTID	OID	4		Internal feature number.
pp_id	String	20		Populated Place ID
name	String	100		Populated Place standard name
unicode_name	String	100		Populated Place standard name, Unicode
name_src_id	String	20		ID of name source in unmerged
population	Integer	4		Population (best source)
pop_src_id	String	20		ID of population source in unmerged
pop_date	String	10		Year of population, if known
pop_agglom	Integer	4		Urban agglomeration population
rank	SmallInteger	2		Relative rank (see notes)
adm1	String	4		FIPS/HIS code of ADM1 where located Y=National Capital, A=Administrative Capital, J=Judicial Capital, L=Legislative Capital
national_capital	String	1		
provincial_captial	String	1		Y=Provincial capital
lat	Double	8		Centroid Latitute, decimal degrees
lon	Double	8		Centroid Longitude, decimal degrees
coordinate_src_id	String	20		ID of coordinate source in unmerged
Shape	Geometry	0		Feature geometry.

#### Rank Definitions:

- 1 National Capitals
- 2 Provincial (and other 1st level administrative division) Capitals
- 3 Urban Agglomerations  $\geq$  1M, Cities  $\geq$ 500K
- 4 Urban Agglomerations  $\geq$ 250K, Cities  $\geq$ 100K
- 5 Urban Agglomerations  $\geq$ 100K, Cities  $\geq$ 50K
- 6 Places  $\geq$ 10K
- 7 Places  $\geq$ 1K
- 8 Other places with coordinate sources having typical precision better than 1 minute. (DCW, USG, etc)
- 9 Other places with coordinate sources having typical precision of 1 minute or less (Currently GNS, WGZ)

**Used in Projects:** All DCW layers on.mxd, All DCW layers zoomed to one million.mxd, Kurds.mxd, Myanmar-Thailand-1\_1mil\_dcw.mxd

**Layer Files:** PopPlacesGMMS for wizard.lyr – used in SDCW wizard. Symbology uses rank to categorize cities

PopPlaces labels.lyr – used in SDCW wizard to label cities

PopPlaces GMMS - Scaled Visibility.lyr – cities become visible according to scale of map. The more detailed the scale, the more cities appear.

**Source: GLOBE/GMI**

## Topography Grids

*Global Elevation/Bathymetry Colors compressed raster*

### **TopoGrid\elelevation.ecw**

**2003**

**Abstract:** Elevation.ecw is a highly-compressed, high-resolution raster image applying conventional elevation colors (shades of blue/cyan for ocean depths, dark green at low elevations, browns at mid elevations, and gray values lightening to white at high elevations).

**Notes:**

A. Two Digital Elevation Models were used:

1. Land elevations were produced from GMI's WorldDTM90 DEM. This was created as follows:
  - a. We started with the GTOPO30 30 arc-second DEM (<http://edcdaac.usgs.gov/gtopo30/gtopo30.html>) as assembled for latitudes above 60 degrees south and converted to ESRI GRID format by Chris Deckert of Campus Crusade's Jesus Film project.
  - b. Additional elevation data for latitudes south of 60S were added from the GLOBE Project DEM (<http://www.ngdc.noaa.gov/seg/topo/globe.shtml>).
  - c. The Caspian Sea was converted to an ocean area by converting all cells at -28 meters elevation to NoData values. This is known to have added a few spurious NoData cells in land areas elsewhere having elevations of -28 meters, notably in areas north of the Caspian, near the Dead Sea, and in Death Valley, California.

2. Ocean depths (bathymetry) were produced with data from the ETOPO2 2-minute DEM (<http://www.ngdc.noaa.gov/mgg/fliers/01mgg04.html>).

Both DEMs were converted to ERMapper binary format, and colors from the ERMapper "elevation" color ramp were applied separately to land elevation and bathymetric DEMs using an ERMapper algorithm file. The color ramps are using several linear segments to increase color distinctions at low land elevations and ocean depths, and reduce distinctions at very high elevations and extreme depths. The resulting ERMapper algorithm and binary data were compressed at full resolution and 20:1 target compression using ERMapper 6.0 by Dawn Wise at San Diego State University.

**Attributes:** RGB color components

**Used in Projects:** Kurds.mxd

*Global Hillshades compressed raster*

### **TopoGrid\hillshades.ecw**

**2003**

**Abstract:** hillshades.ecw is a highly compressed, high-resolution grayscale hillshade raster image. The image was calculated using the hillshade algorithm of ESRI

ArcView spatial analyst applied to GMI's worlddtm90 grid dataset (derivation described under elevation.ecw above).

**Notes:**

- A. Hillshades were calculated at a sun elevation of 60 degrees and vertical scale factor of .00005, chosen to avoid black saturation in all but the steepest mountainsides. The resulting grayscale grid was converted to ERMapper binary format and compressed using ERMapper 6.0 by Dawn Wise at San Diego State University.
- B. The hillshade settings chosen for this image give good terrain definition in mountainous areas, but do not clearly distinguish terrain in areas of lower relief. This may be improved somewhat with the existing image by adjusting the maximum and minimum values of the color ramp. Greatly improved rendering of low relief requires recalculation with lower sun angles and higher vertical scale factors.

**Attributes:** RGB color components

**Used in Projects:** Kenya and Tanz Language.mxd, Kurds.mxd, Languages in South Africa.mxd, Languages of Papua New Guinea.mxd, SE Papua New Guinea.mxd, SE Papua New Guinea zoom to 1\_5mill.mxd

*Global Elevation/Bathymetry Colors+Hillshades compressed raster*

**TopoGrid\elev-hs.ecw**

**2003**

**Abstract:** This file is the hillshades.ecw file overlaying the elevation.ecw file at 70% transparency for use as a background in ArcView 3.x or other systems not supporting layer transparency.

**Source: GMI**

**Hydro**

*Watercourse and inland water area labels*

**hydro\watrlabl.shp**

**2009**

**Abstract:** Line layer used to label watercourses and inland water area features.

**Notes:** Line layer created from watrcrsl.shp and inwatera.shp to allow labeling of water features which have a name associated. Since the layer is a line layer, the text can be made to follow the curvature of rivers. Fields added by GMI:

- NETWORK – Numeric identifier used to indicate rivers from same system. If rivers are from same system, they will have the same value.
- FAR\_END\_PN – Number of segments from ocean or lowest elevation of river
- WATERFLOW – relative waterflow modeled as number of upstream water elements (i.e. tributaries). This field is used in the SDCW wizard to display a larger number of streams when the map is zoomed in than when the map is zoomed out further.
- ELEVATION – Lowest nearby elevation using radius of buffer of feature
- NAM\_CASE - Contains upper/lower case name of water feature The WATERFLOW field allows the labels to be visible when the water feature they refer to is visible.

**Used in Projects:** SDCW wizard

## Projects

*Source and note text*

**projects\Basemap\_note\_text.shp**

**2010**

**Abstract:** Shapefile is used to place source and credit text on maps in SDCW wizard and sample project maps. A data frame was created and labels from the fields of this shapefile provide the text.

**Notes:** This allows the opportunity to change text in the mxd's when a new version of the SDCW is released without resaving mxd files.

**Used in Projects:** All