

Geographic Data Format

STUDY ON GEOGRAPHIC DATA FORMAT RELEVANT TO NUCLEAR CONTROL

150

가
 . (Geospatial Information System,
 GIS) 가 .
 GIS
 가 Shapefile
 geodatabase .

Abstract

More than half of the information relevant to the nuclear control is considered to be geospatially related. Therefore the need for building a geospatial information system (GIS) in the field of the nuclear control is increased. High resolution commercial satellite images with positional information covering wide areas such as nuclear sites are regarded as one of the fundamental information for building a relevant GIS. This paper discusses the geographic file formats, the Shapefile and the geodatabase in regard to the Additional Protocol.

1.

(IAEA) (safeguards) 30
 . 1997 5 IAEA
 'Model Protocol for Additional to Safeguards Agreement'(
 ' 가 ') . IAEA 가
 [1][2][3][4]. 가 Article

2.a.(iii) “general declaration of each building on each site, including its use and, if not apparent from that description, its contents. A map of the site is to be included.”

(commercial satellite imagery) () IAEA가 가 [1][2][3][4]. 1999 6
가 2004 2 19 . 가
IAEA
Shapefile [2][3]. Shapefile
geodatabase (geographic database) file .

2.

2-1 (Geospatial Information System, GIS)

가

(relational) (object oriented) [5].
Shapefile , geodatabase
(real world)
[5][6].

-
-
- 가
- Feature가
- 가
- feature가
- Feature
- Feature
-

[5].

- Polymorphism
- Encapsulation
- Inheritance

(intelligent) feature

geodatabase . Geodatabase personal geodatabase multiuser geodatabase . Multiuser geodatabase 가 .

GIS , static GIS dynamic GIS , dynamic GIS moving GIS mobile GIS [7].

GIS static GIS . geodatabase [5].

- GIS applications
- Spatial applications
- Database applications

static GIS web database application [10]. [8] .JPG

export . web database application URL , web database application UNION SQL (Structured Query Language) geodatabase [1]. Personal geodatabase database file Microsoft Access MDB web database application database file Microsoft Access MDB SQL 가 .

2-2 Shapefile [9]

Shapefile ESRI 가 . Shapefile feature 非位相 (non-topological geometry) (attribute) data set . Shapefile directory . Feature (geometry) shape . Shapefile point feature, line feature, area feature (polygon feature) . dBASE . shape record

Shapefile export , digitizing , GPS (Global Positioning System)

Shapefile main file (.shp), index file (.shx), dBASE file (.dbf)

Main file (direct access) 가

vertex 가 shape . Index file main file
file record (main file)offset

dBASE file feature
(geometry) (attributes) 가 . dBASE
main file 가

8.3 main file, index file, dBASE file
가 . shape 1 (value)
value 0, 1, 3, 5, 8

- Shapefile 數
- Integer: Signed 32-bit integer (4bytes)
 - Double: Signed 64-bit IEEE double-precision floating point number (8bytes)

Shapefile positive infinity, negative infinity, Not-a-number가
measure “no data” . 10^{-38} “no
data” . Shapefile 1 shape (type)

1. Shape

Value	Shape Type	Value	Shape Type
0	Null Shape	15	PolygonZ
1	Point	18	MultiPointZ
3	PolyLine	21	PointM
5	Polygon	23	PolyLineM
8	MultiPoint	25	PolygonM
11	PointZ	28	MultiPointM
13	PolyLineZ	31	MultiPatch

dBASE

- (attribute name) 12 . 12
- (Integer) (Real), (String) . (list)
(binary field type)

- .dbf (field width) (precision)
가 가
- 가 가 11
- 가 가 15 24
- 가 80 가

Shapefile 2

2. Shapefile

.shp	feature geometry (required)
.shx	feature geometry (required)
.dbf	feature dBASE (required)
.sbn .sbx	Feature spatial index (optional)
.ain .aih	Table attribute index (optional)
.prj	(optional)
.xml	Shapefile ArcInfo 8.0 metadata (optional)

2-3 Geodatabase

Geodatabase

- 가
- Vector,
- Raster,
 - Thematic data,
 - Spectral data,
 - Pictures
- Triangulation ()

Geodatabase 가 dataset

- Feature dataset,
 - Simple feature class (topological associations)

points line, polygon, (annotation)

- Topological feature class (integrated topological unit)
- feature class graph
- Raster dataset,
- TIN(Triangulated Irregular Network) dataset.

Personal geodatabase multiuser geodatabase dataset 가

Personal geodatabase Shapefile non-topological feature

GIS feature non-topological feature

Non-topological feature feature (topological dependency)가

feature feature Multiuser

geodatabase raster dataset

personal geodatabase raster

dataset URL Geodatabase

3. Shapefile to geodatabase geometry type mapping (ArcGIS Help)

Shapefile feature	Geodatabase feature
point	point
point M	point with measures
point Z	point with Zs
polyline	line (polyline)
polyline M	line (polyline) with measures
polyline Z	line (polyline) with Zs
polygon	polygon
polygon M	polygon with measures
polygon Z	polygon with Zs
multipoint	multipoint
multipoint M	multipoint with measures
multipoint Z	multipoint with Zs

Geodatabase field type Shapefile dBASE field type

Shapefile feature (type) geodatabase geometry mapping

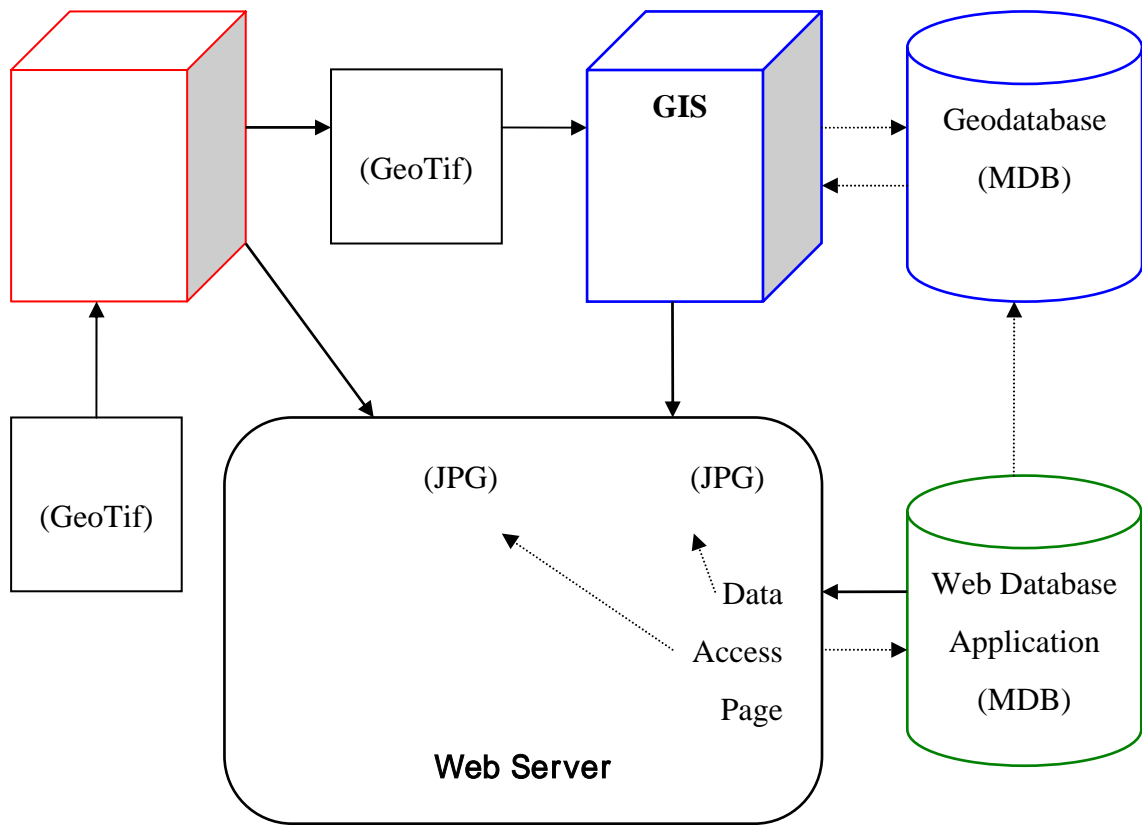
Shapefile feature geodatabase feature 3 .
 Number field type shapefile field dBASE field
 geodatabase field mapping . 4 Shapefile geodatabase mapping
 field .

4. Shapefile, dBASE field to geodatabase field type mapping (ArcGIS Help)

Shapefile, dBASE field type	Shapefile, dBASE field width	Geodatabase field type
date	-	date
string	1-255	text
boolean	-	short integer
number	1-4 (decimals=0)	short integer
number	5-9 (decimals=0)	long integer
number	10-19 (decimals=0)	double
float	1-13	float
float	14-19	double
number	1-8 (decimals>0)	float
number	9-19 (decimals>0)	double

2.4 Personal geodatabase [10]

1 .
 Microsoft Access MDB (1
) Personal Geodatabase Microsoft Access MDB (1
) UNION SQL . GIS static GIS
 web server export . GIS
 UNION SQL web database application . Web
 database application user interface DAP(Data Access Page) . DAP
 form report . DAP Pivot table, Pivot
 chart .
 GIS 가 [2].



1. DAP 2-

([10] 2.)

3.

가

가

IAEA

가

IAEA

shapefile

Shapefile DOS

.dbf

field

geodatabase

geodatabase

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, 2003 ,
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