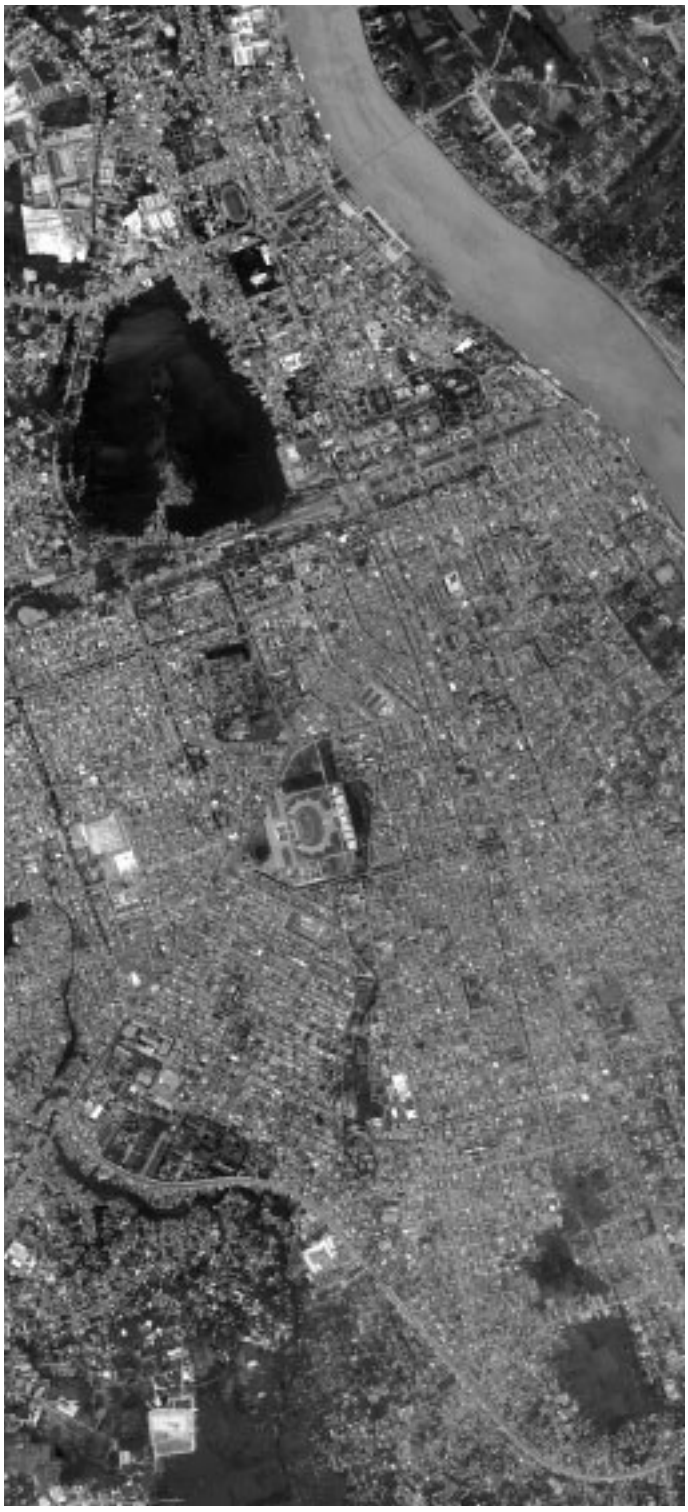
DIMAP

DIMAP, which stands for Digital Image Map, is the Spot product data format introduced in mid-2002 for the launch of the Spot 5 satellite.



5-metre black-and-white (subscene) - Phnom Penh, Cambodia – 14/06/2002

Why this format was needed?

To make life easier for Spot data users, Spot Image decided to develop a format that supports all Spot products. Although designed foremost for Spot products, DIMAP is an open format that supports products derived from other sources of satellite data distributed by Spot Image. DIMAP is not a proprietary format and is therefore in the public domain.

DIMAP makes Spot products easier to use. To display descriptive product information, users simply click on the DIMAP file. Development of new on-line services was also a key factor driving the design of the new format. To support on-line data delivery, DIMAP had to allow users to access technical information and metadata, such as the product description, reference number, production date, conditions of use and so on.

DIMAP was thus designed to be:

- **Simple**
- **Easy to use**
- **All digital**

SPOT IMAGE

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DIMAP technical features

DIMAP is a public-domain format for describing geographic data, developed in partnership with CNES, the French space agency. Voluntarily open, this format is ready to be integrated in the international standards like ISO 19115 (standardized description of the metadata).

DIMAP is a two-part format comprising image data and metadata.

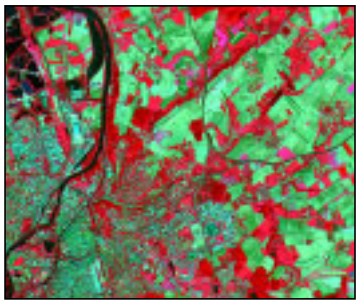

Image data is by default in GeoTIFF format **(www.geotiff.org)**, based on the Tagged Image File Format (TIFF) that is the most widely used today. This format is supported by all commercial software and is therefore easy to integrate. The Geographic extensions (Geo) part of the format is supported by all GIS software.

The Geo part of GeoTIFF basically adds georeferencing information from the image file to the TIFF file (geographic coordinates of the top-left corner and pixel sizes) and may also specify the map projection and geodetic system.

In DIMAP, GeoTIFF data include all this information and map projection codes are based on the EPSG geodetic parameters **(www.epsg.org)**, which refer to the World Geodetic System.

In rare cases where the user is unable to read GeoTIFF, DIMAP provides a feature for generating raw Band Interleaved by Line format (BIL). All information relating to image size, spectral bands and georeferencing is contained in the metadata part of the format.

Metadata are in XML format **(eXtensible Markup Language, www.w3c.org/xml)**. XML is like HTML, only its structure is better defined and it allows users to create their own keywords and associated values. Other advantages of XML are that it can be read directly by standard Web browsers and supports stylesheets in XSL **(eXtensible Stylesheet Language, www.w3c.org/style/xsl)**, which transforms and formats the information contained in an XML file.

Advantages of DIMAP over previous formats

As shown below, DIMAP requires a lot fewer files. Using two separate files for imagery and metadata also greatly simplifies the format. GeoTIFF makes image data immediately useable in GIS software, thus making products easier to use.

XML offers a full range of product description features, while XSL provides automatic display capability (see below). XML is widely used for delivering content on the Internet. A large number of developers now work with XML and the availability of common tools such as API and Javascript over the Internet further facilitates integration of XML metadata in GIS software.

How DIMAP differs from previous Spot product formats

CAP SPOT Scene: 5 files

- IMAG-xx.DAT: image file in BIL format
- NULL-xxDAT, LEAD-xx.DAT, VOL-xx.DAT, TRAI-xx.DAT: metadata in binary and ASCII format

GEOSPOT SPOTView: 5 files

- S-xx.BIL: image file in BIL format
- S-xx.HDR, S-xx.REP, S-xx.RSC, S-xx.STX: metadata in ASCII format

DIMAP: 2 files

- IMAGERY.TIF: image file in GeoTIFF format
- METADATA.DIM: XML metadata file

SPOT IMAGE

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Example product

The example below illustrates the various ways users can exploit DIMAP.

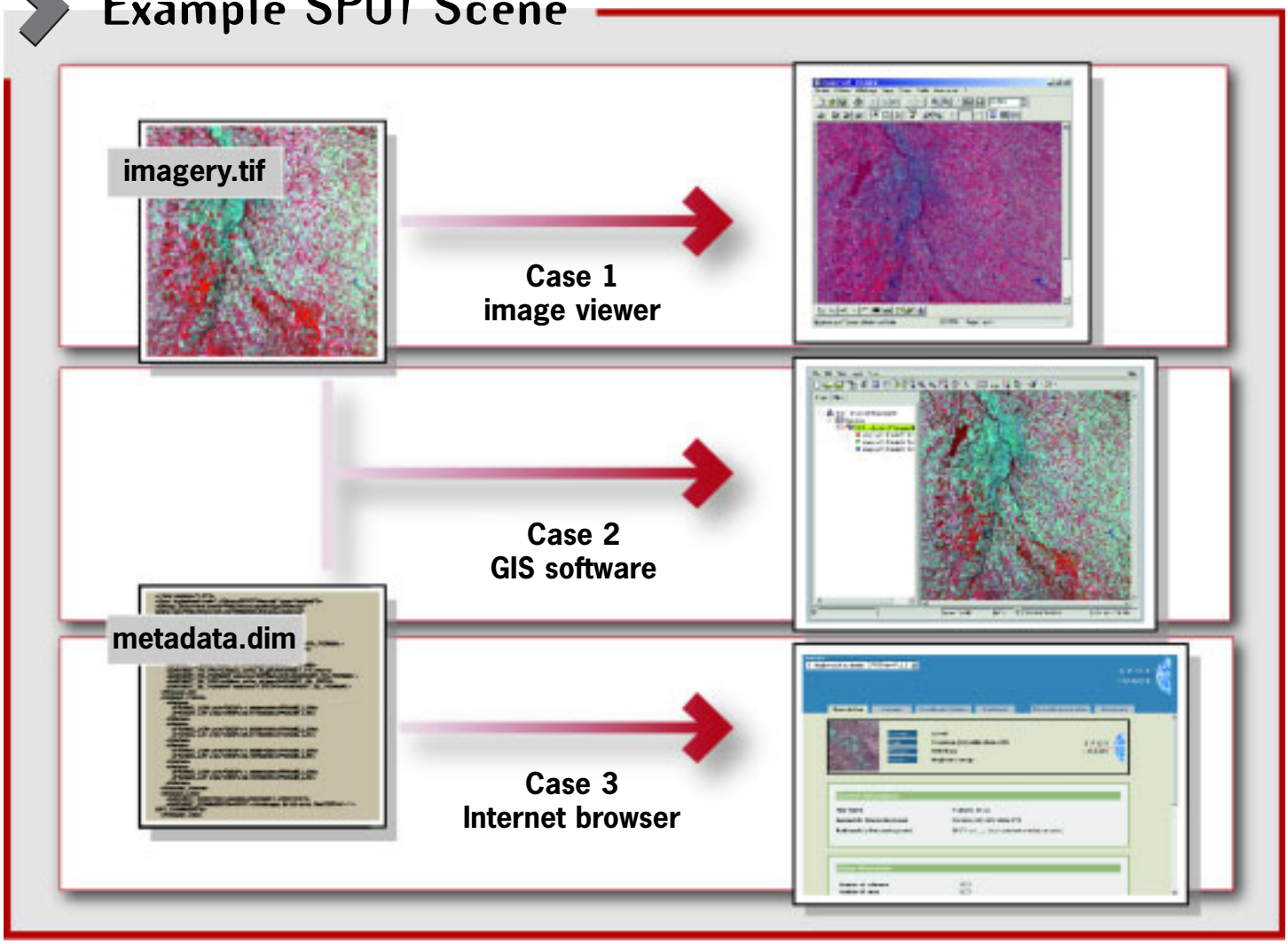
The product in this example is a level 1A SPOT Scene. The DIMAP format therefore consists of two files: a GeoTIFF image file called Imagery.tif and an XML metadata file called Metadata.dim. The three cases in the example represent different user profiles.

Case 1 is a user **who does not have GIS software.** S/he therefore opens the image file using the default software identified by the operating system (for example, MS Imaging in Windows 2000). The image is displayed on screen but without georeferencing information or dynamic adjustment.

Case 2 is a user **with GIS software.** Here, the image is displayed in its correct geographic position and map projection information is available in GeoTIFF format. The software also automatically reads the keywords in the metadata file, enhances the contrast and displays bands in the order defined.

Case 3 is a user **who wants to display the metadata directly on screen.** S/he opens the XML file in the Web browser to view the product data, which are transformed and formatted for display by XSL.

Example SPOT Scene



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DIMAP product folder

In the example opposite, the folder contains the DIMAP product (GeoTIFF and XML files) and three additional files needed for automatic display of the accompanying metadata (image icon, quicklook and stylesheet for applying HTML formatting to the XML file). The folder is self-contained and therefore requires no accompanying information to describe its contents. The product can therefore be delivered or consulted immediately on line by reading the XML file directly.

DIMAP folder contents:

Imagery.tif: image file
Icon.jpg: image icon
Preview.jpg: quicklook
Metadata.dim: XML file
Style.xsl: stylesheet used to apply HTML formatting to XML file

DIMAP profiles

DIMAP is a flexible format that adapts to specific product features using a "profile" concept. A DIMAP profile is a description of a product or range of products with identical features. There are two profiles for Spot products:

SPOT Scene and SPOTView.

The SPOT Scene profile describes elementary product features (satellite, acquisition date, viewing angle, brightness statistics, etc.) and information relating to viewing geometry. The SPOTView profile describes elementary product features only. XSL stylesheets generate HTML pages dynamically whichever DIMAP profile is used, thus ensuring that all Spot p roducts and other products display automatically in the same way.

2.5-metre colour (subscene) - Surabaya, Indonesia – 27/06/2002

DIMAP system requirements

DIMAP requires:

- a Web browser supporting XML and XSL for the metadata file (e.g., Microsoft Internet Explorer or Netscape Navigator 6),
- a TIFF or GeoTIFF image editor for the image file.

The easiest solution is obviously to use software able to read both the image and metadata files.

Upgrading of commercial GIS software applications to support this requirement has been done by ESRI, Leica Geosystems, PCI, ER Mapper, Intergraph, MapInfo, Fleximage and Geoimage. For more information about software support for DIMAP, go to **www.spotimage.com**