# Multimedia presentations of GIS outputs

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# What is Multimedia?

## Multimedia definitions:

- Applications and technologies that manipulate text, data, images, voice and full motion video objects.

- The combination of text, audio, video, animation, and graphics used in a computer presentation format. Multimedia productions presents information in all of these contexts.

- Presenting data in more than one medium, such as combining text, graphics and sound.

- A combination of several media types in a single digital object or collection, eg, images, audio, video.

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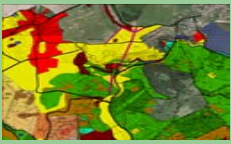
# Multimedia components

- **Graphics:**

  - **Vector graphics** – data structure using the point or node and the connecting segment as the basic building block for representing geographic features. Consist of many geometric objects with specific spatial distribution e.g. points, lines and polygons.

  - **Raster graphics** – collection of dots arranged in a regular grid e.g. digital picture. Each dot contains information about its colour and colour bit depth. Quality of the picture depends on its resolution indicated in the number of dots per inch (dpi).

- **Text** - in language, a broad term for something that contains words to express something, written document.

- **Audio –** relating to sound or its reproduction; used in the transmission or reception of sound. Sound is actually waves of air pressure that strike our eardrums and cause them to vibrate.

- **Video** – a series of framed images put together, one after another, to simulate motion and interactivity, which can be connected with the sound. A video can be transmitted by number of frames per second or the amount of time between switching frames. The usual video speed varied about 30 frames per second.

- **Animation** – sequence of generated pictures when inanimate objects seem to come alive by flashing a series of minutely changed images, it can be supplied with the sound too.

# Vector graphics

● The most used data formats in GIS: SHP (ArcGIS), DXF (AutoCAD), DGN (Microstation)

● For the presentation purposes usually conversion to different raster formats

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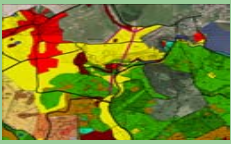
# Raster graphics

- Many different raster formats, the most used in GIS:

  **JPEG -** Joint Photographic Experts Group
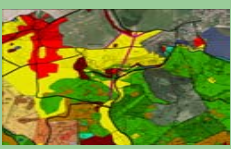
  **BMP -** MS Windows bitmap

  **GIF -** Graphics Interchange Format

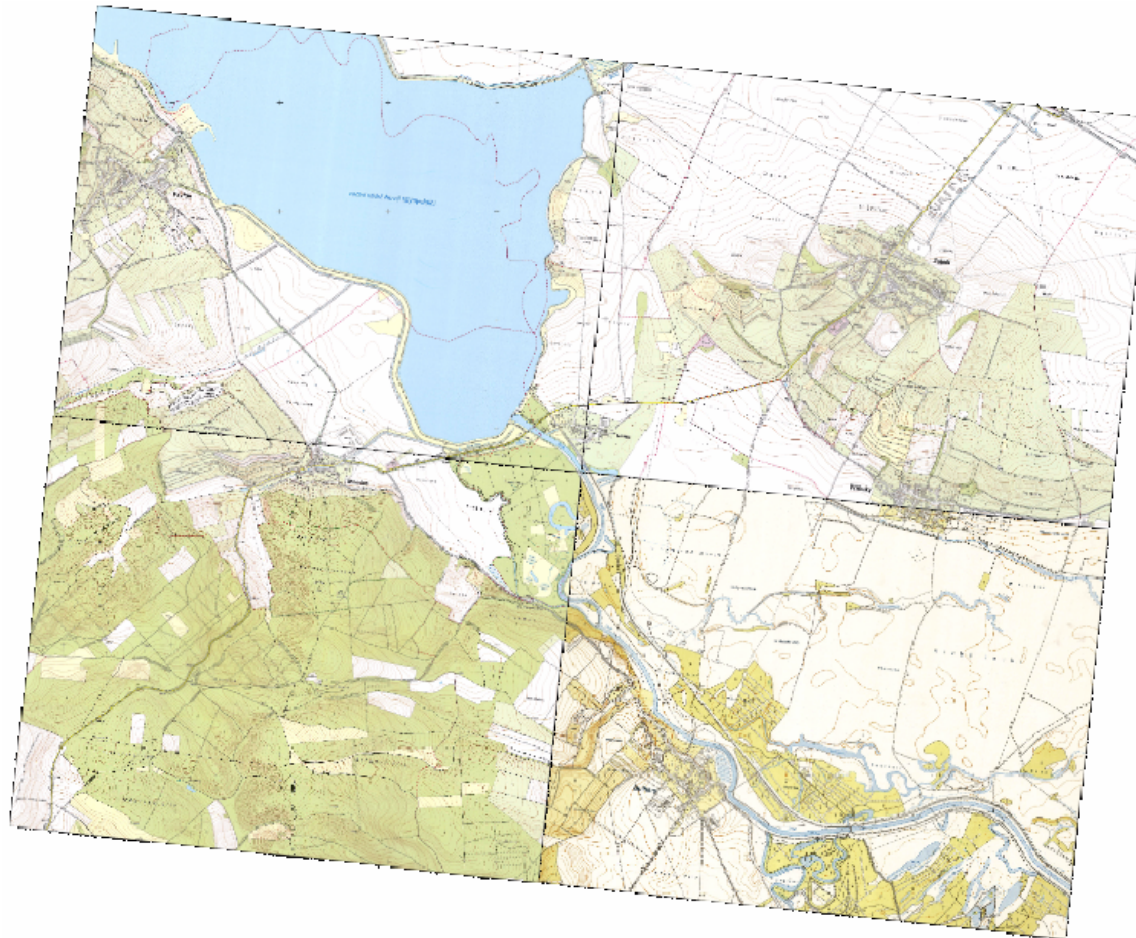  **TIFF -** Tag Image Format
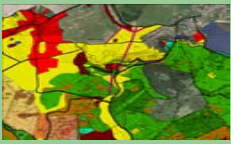
  **MrSID -** Multi-resolution Seamless Image Database

  **etc.**

- Formats different from:  file size – different encoding and compression
  quality – colour scheme
  compatibility with softwares

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# Raster example

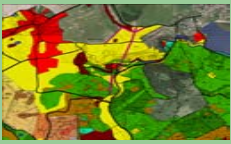Tomáš Mikita, Mendel University of Agriculture and Forestry in Brno

# Text

- Fonts – character height and form, line width, scheme and colour, using of fonts according to the language and computer environment

- Text formats – according to application

- Effects – twisting, colour changing

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# Audio

- Many different data formats, the most used:

  **MP3 -** MPEG Audio Layer-3 - A widely used technology for the compression and decompression of music. Music is stored as an MP3 file.

  **WMA -** Windows Media Audio. An audio compression format similar to MP3, but with digital rights management (copy protection and usage restrictions) built-in by Microsoft.

  **WAV -** the most common file format for Windows sounds, storing digital audio data in waveform.

  **AAC -** Advanced Audio Coding. An audio codec used increasingly for downloaded music files, streaming-media, and satellite-radio applications.

- Different from quality, rate of compression and file size

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# Video

- The most used video formats:

  **MPEG -** Moving Picture Experts Group - the standard for compression and storage of motion video, for example, videos available though the World Wide Web.

  **DVI -** Digital Visual Interface - the standard that defines the digital interface between digital devices such as projectors and personal computers.

  **Quicktime –** A digital audio and video file-format and architecture developed by Apple Computer, Inc.. Can be viewed on most computing platforms.

  **AVI -** Audio-Video Interleaved. Microsoft's standard format for digital video.

  **INDEO -** A digital video compression format developed by Intel.

- Again all formats different from quality, rate of compression and file size

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# Animation

- Collection of consequential static pictures collected into one sequence.

- Almost every GIS software includes application for animation creating from visible datas (ArcScene Animation, GRASS Animation, IDRISI Fly throught)

- Final animation saved in same data formats like video files.

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# Multimedia presentations of GIS outputs

- In the most of contemporary used GIS software is possible to export and present our GIS outputs in some kind of documents, images or presentations combining multimedia types mentioned above.

- The most used still remains graphic presentation in different formats as a map of the certain area with the specific content. Anyway especially in 3D visualisations and digital elevation models can be these outputs very well-represented with animations of flights above location.

- Electronic Desktop presentation – different document formats – the most used DOC (Microsoft Word), PDF (Adobe Acrobat) or ODT (Open Office Writer document).

- Web site presentation – HTML, mapping servers and mapping services

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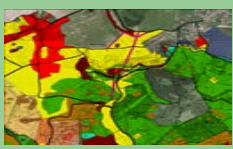
- PDF (Portable Document Format) - a file format that has captured all the elements of a printed document as an electronic image that you can view, navigate, print, or forward to someone else. PDF files are created using Adobe Acrobat, Acrobat Capture, or similar products. To view and use the files, you need the free Acrobat Reader, which you can easily download. Once you've downloaded the Reader, it will start automatically whenever you want to look at a PDF file.

- Internet map services and mapping servers - On-line internet map presentations, applications which working on client-server architecture, processing the data with geographic and spatial relationships. We can distinguish  commercial mapping servers (ESRI) and non-commercial servers (the most popular and used so called MapServer of University of Minnesota).

- WMS – The Web Mapping Service, a standard defined by the OpenGIS consortium that provides a standard interface for querying and  accessing map layers from a mapping server. Clients and  Servers that adhere to the WMS standard can communicate     with one another regardless of their underlying implementation.

- WFS - The Web Feature Server is an interface allowing requests for geographical features across the web being highly interoperable. It uses the XML-based GML (Generalized Markup Language) for data exchange.

# Mapping servers examples

- In Czech Republic used especially by governmental and non-governmental organisations to show spatial information of certain area and sphere of human activities e.g. forestry, nature protection, geology etc.

- Examples:
    - www.uhul.cz – mapping server of Forestry management Institute, provides many layers of forestry data (altitudinal vegetation zones, forest spatial distribution, species composition etc.)
    - www.env.cz -  mapping server of Ministry of Environment, contains layers e.g. Nature protection areas, Natura2000, refuse dumps etc).
    - http://mapserver.mendelu.cz – mapping server of University forest enterprise Křtiny, contains also foresty data

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