Maintenance and Development of the Hungarian Land Parcel Identification System (LPIS-HU) for IACS

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- **LPIS Update+Orthophoto+DTM**
- **LPIS-thematic data**
- **Technical solutions of the publication**

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The elementary units of LPIS-Hu: orthophoto based physical blocks (MARD Regulation 115/2003)

Cadastral data

E8VQW-9-00

31.48 ha

Unique block ID number and net eligible area

Boundaries of eligible and non-eligible areas according to SAPS

Physical block boundaries

Ortophoto

Data sources of LPIS creation

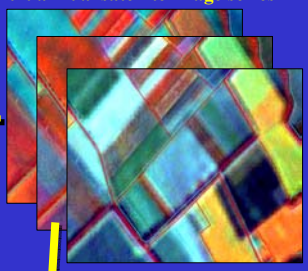
Orthophoto 2000 / (2003)

+

Topographic map

+

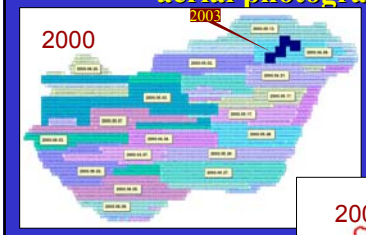
Multiannual satellite image series



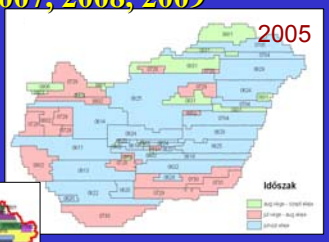
Integration of aerial and satellite data 13/03/2003-22/09/2003.

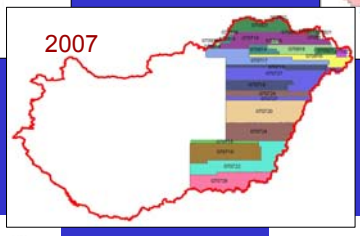
1. **Ortho-photography** - geographical base (+broad land use)
2. **topographic maps** - help in defining stable elements in time
3. **satellite imagery (multiannual)** - checking of block land use + and permanent boundaries

LPIS update rotation:
aerial photography 2000, 2005, 2007, 2008, 2009



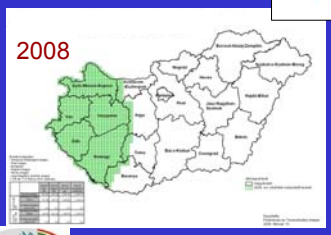
A)
Orthophoto from new aerial photography is developed for a planned part of the country.





B)
Revision of physical blocks, boundaries and updating eligible areas are based on new orthophotos.

C)
Updating unique block ID numbers if it is necessary



Orthophoto 2000-2007
in the neighborhood of Hajdúszoboszló

The highway is ineligible area since 2006

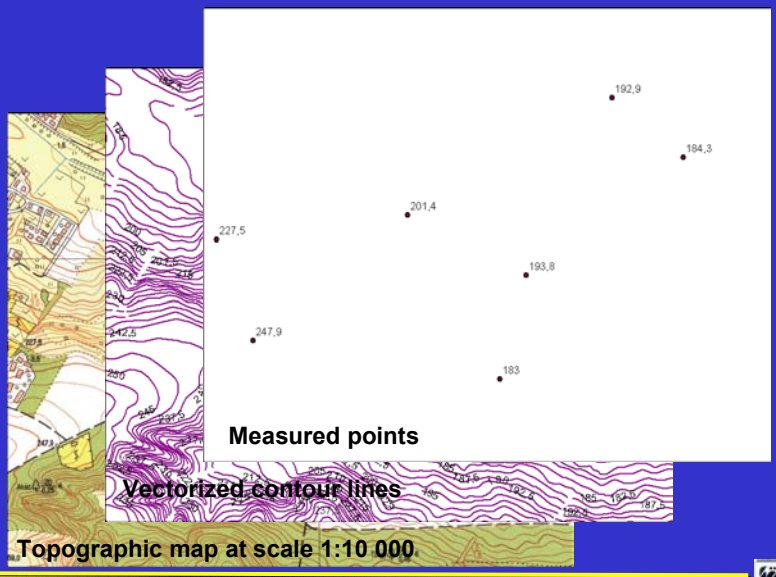
The new Vexcel Ultracam D digital camera provides a far better quality color and nir images. 0.5 m pixel size plus enhanced thematic `resolution`. This technology is a sound basis for the subsidy handling and control!

DEM and it`s derivatives as used in the subdidy control Production of slope category maps, 2009

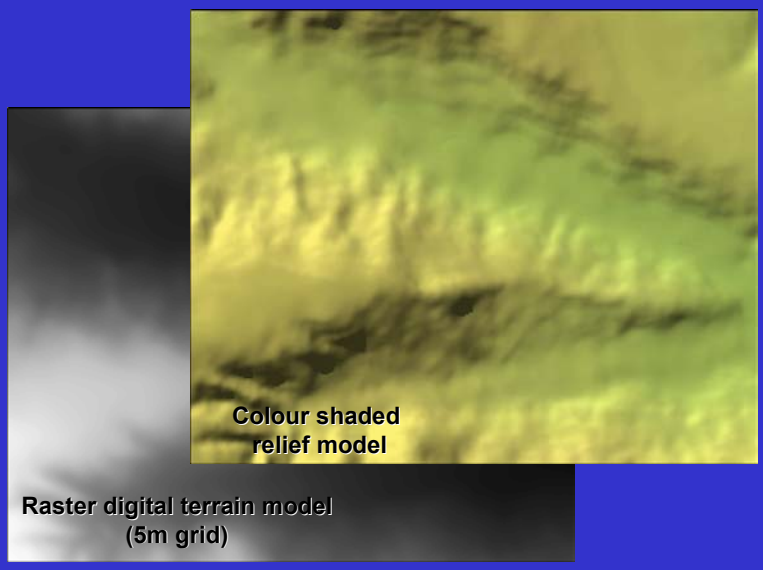
Main steps:

1. Collection of vectorized contour lines and measured points from topographic maps at scale 1:10 000
2. Production of raster digital terrain model with ArcInfo Topogrid procedure (5x5 m cell size <1 m height accuracy)
3. Production of raster slope category map
4. Production and smoothing of vector slope category map

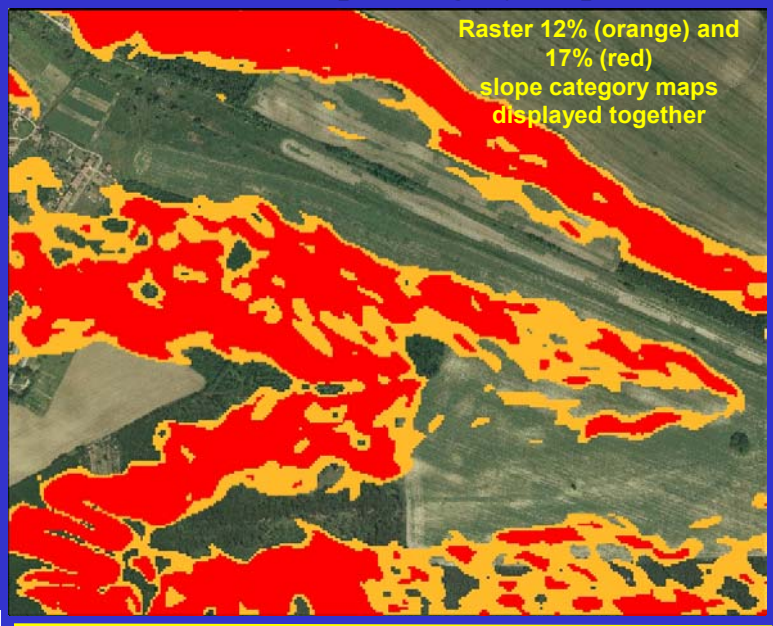
Vectorized contour lines and measured points from topographic maps at scale 1:10 000



Raster digital terrain model (DTM) produced with ArcInfo Topogrid routine



Raster slope category map



Vectorization of raster slope category map

The fertilisation on a slope, > 17% is forbidden.
On site controls check this requirement.
Other intervals of slope imply specific restictions in cross compliance or AEM* eligibility (e.g. 5-12%).

*** AEM- Agro Environmental Measures**

Control of GAEC within CwRS

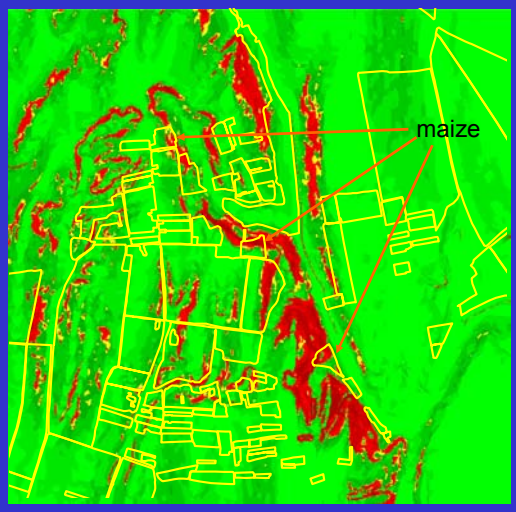
Minimum level of maintenance:

1. Keep **arable land** in good agricultural condition, avoid weed infestation
2. Avoid the encroachment of scrubs on **grasslands**
3. Do not cultivate row crops on field with **slope** greater than 12%

Digital Elevation Model (HUN_DEM)
↓
Slope category map
↓
Parcels with high elevation angle ← Polygons of measured parcels
↓
Parcels with high elevation angle, cultivated with row crops **(G12)** ← Observed crop for measured parcels

Control of GAEC within CwRS

example



Area of prohibition for row crops

Eligibility check for the farmers parcels

(combined GIS analysis of LPIS+cadastre+farmers parcels+Land User Registry/LUR)

1) GIS comparison of claims in two years

Claim in 2007
Claim in 2008

2) Focus to the new parcels

New claim

3) New claim elements (surface) link to the entitled farmers in the LUR

Correlation to the cadastre parcel

Analysis:

- comparison √
- sanctions

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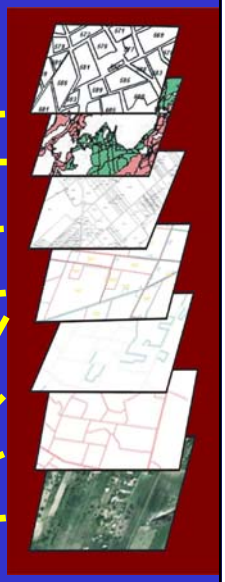
Distribution of LPIS thematic data

	Name	Availability from year
Thematic layer	<17% slopes (Nitrate Directive)	2009-
	High Nature Value Areas	2009-
	Areas under the responsibility of Ministry of Defence	2009-
	Reedbeds	2009-
	Floodplains	2009-
	Areas under "Plan Vasarhelyi" (flood management)	2009-
	Areas affected by wind erosion	2009-
	Afforestation (EAGGF, Guidance)	2009-
	Natura 2000 (2008)	2008-2009
	Afforestation (EAFRD)	2008-
	GAEC non compliance (30. June 2003.)	2008-
	Bare karst	2006-
	Vulnerable water base areas	2006-
	Nitrate Directive Annex B areas	2006-
	LFA	2005-2009
	Environmentally Sensitive Areas (ESA)	2005-2009
	Areas affected by soil erosion (<12% slopes)	2005-
	Cadastral coverage	2004-
LPIS raw data	Unique block ID number and net eligible area	-
	Boundaries of eligible and non-eligible areas according to SAPS	-
	Physical block boundaries	-
	Orthofoto (2000,2005,2007,2008)	-



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LPIS-Thematic data

EMVA layer

Nitrat

Reedbeds

GAEC non compliance

Afforestation (EAGGF, Guidance)

Afforestation (EAFRD)

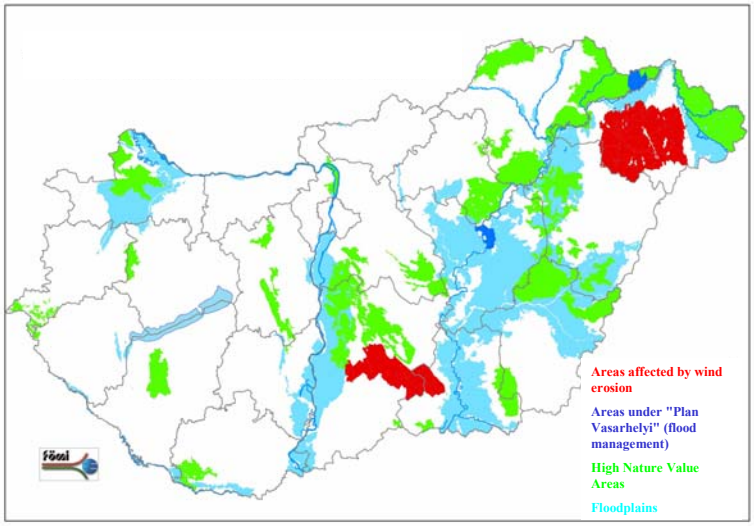
<17% slopes

<12% slopes

Natura2000

LFA

ESA



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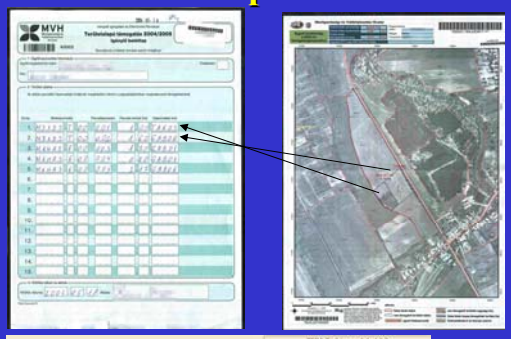
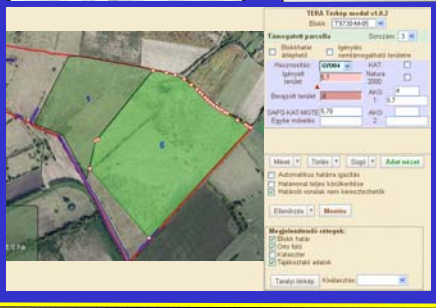
Technical solutions of the publication of LPIS GIS data

In the period 2004-07: submission on paper map sheets scale (1:4000- and smaller)

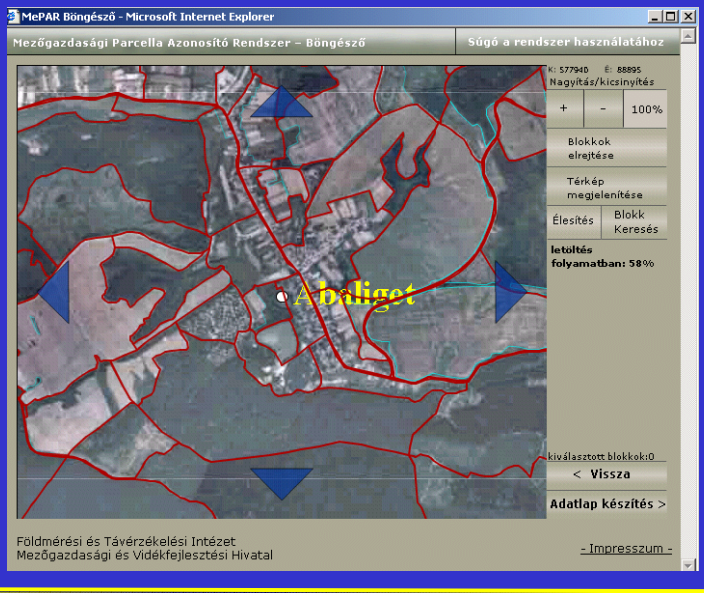


From 2008 and on: E-submission of the claims



~1 million parcel
~180 000 client
~360 000 physical block

Public browser of LPIS-Hu http://www.mepar.hu/



Conclusion I.

- The EU CAP provides a real challenge to geodesy, cartography, remote sensing an GIS, GPS techniques
- Although the requirements for the LPIS and different controls are regulated well, the quality products yield benefits in return
- High quality orthophotos determine the LIPS plus the control and therefore the risk (and penalties) of EU subsidies
- The combination of traditional data bases –cadastre, maps, DEM etc- plus new ones –updated standard orthos, claims database, - clearly demonstrate the complexity of the CAP

Conclusion II.

- The sharply increasing number of thematic layers in the LPIS-Hu clearly show the intersectorial, environmental and rural development importance of the quality spatial data infrastructure.
- This update rotation and spatial resolution (0,5 m) can serve an ideal common platform for a lot of programs in the future.

Thank you for your attention!