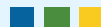


Stereo Scientific Meeting  
Agriculture and Vegetation at a local scale  
Habay-la-Neuve, 20 September 2005



# **Integration of traceability and geographical information for the development of farm advisory systems and the control of agro-environmental measures**

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Walloon Agricultural Research Centre



REGION WALLONNE

# General context (1/4)



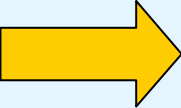
- Changes of management practices at the farm level
- New technological methods related to high and specific quality characteristics of products
- The compulsory nature of national and European agri-environmental regulations.
- Educational initiatives
- The voluntary use of global assessment or management tools
- The need to qualify the final products or the production process

# General context (2/4)

## European Directives

### CAP

- 1<sup>st</sup> Pillar & 2<sup>nd</sup> Pillar:
  - => Good Agricultural and Environmental Conditions (**GAEC**)
  - => Good Farming Practices (**GFP**)
- Introduces single payment scheme and cross compliance
- EU25 MS must implement **IACS** & digital **LPIS** (Cons. Reg. 1593/00 & 1782/03)
- Farm Advisory System (**FAS**)

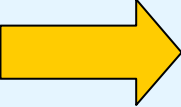
- 
- Annual information flux from farmers to administrative bodies
  - Geographical and temporal information
  - Exchanges of information between the different control bodies (agriculture, environment...)
  - GIS and unique reference for declarations and cross compliance + CwRS
  - Feed-back to farmers

# General context (3/4)

## European Directives

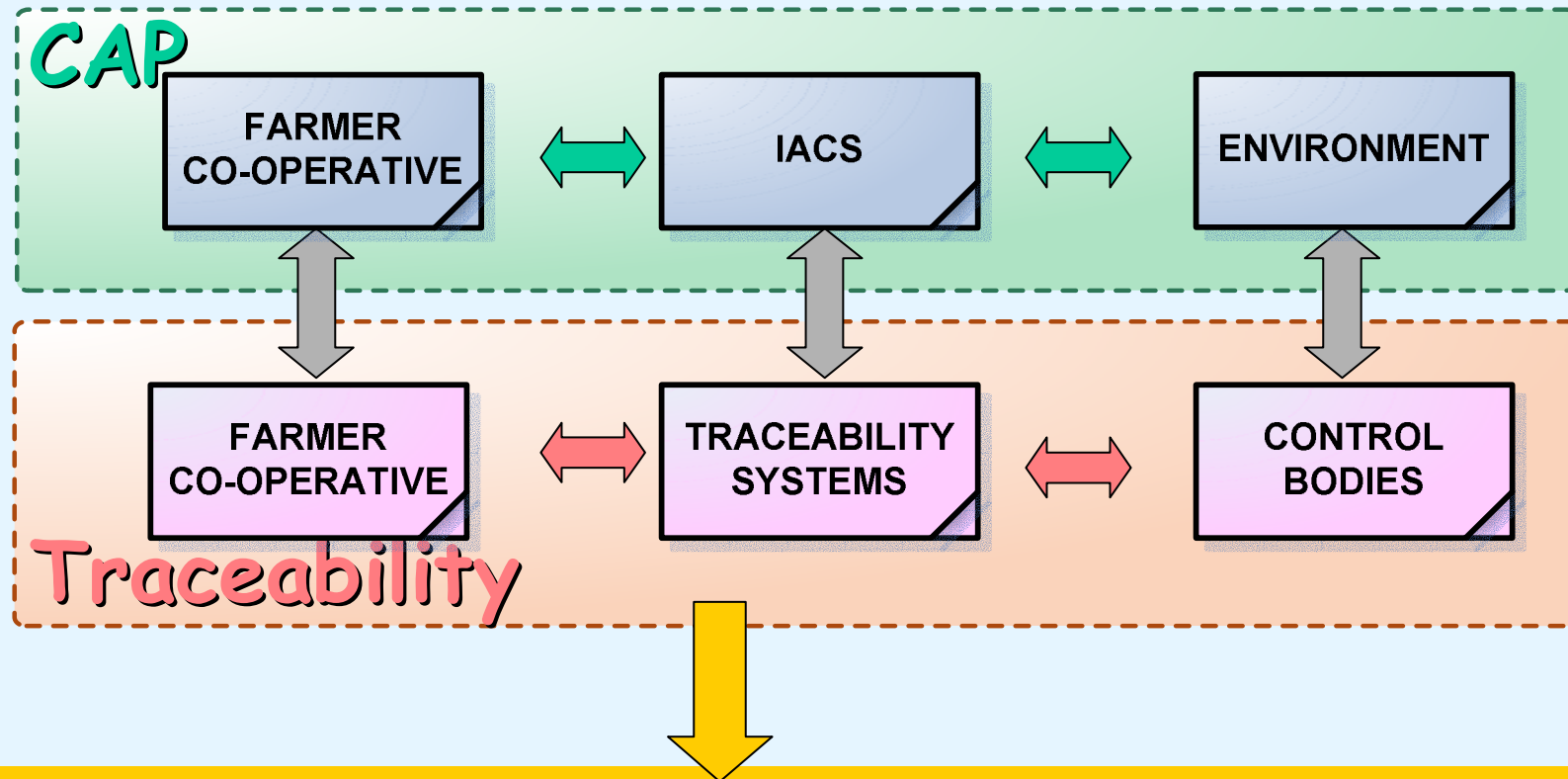
### Traceability

- Food & feeds quality, traceability and certification
- Introduces traceability concept in agriculture
- Coming in force with **General Food Law** (Reg. 178/02)

- 
- From farm to fork => along the agro-food chain => multi-actors
  - Traceability at the production level = field
  - Geographical & temporal information
  - Multi-Field Identification and Management Systems Interconnection needs.



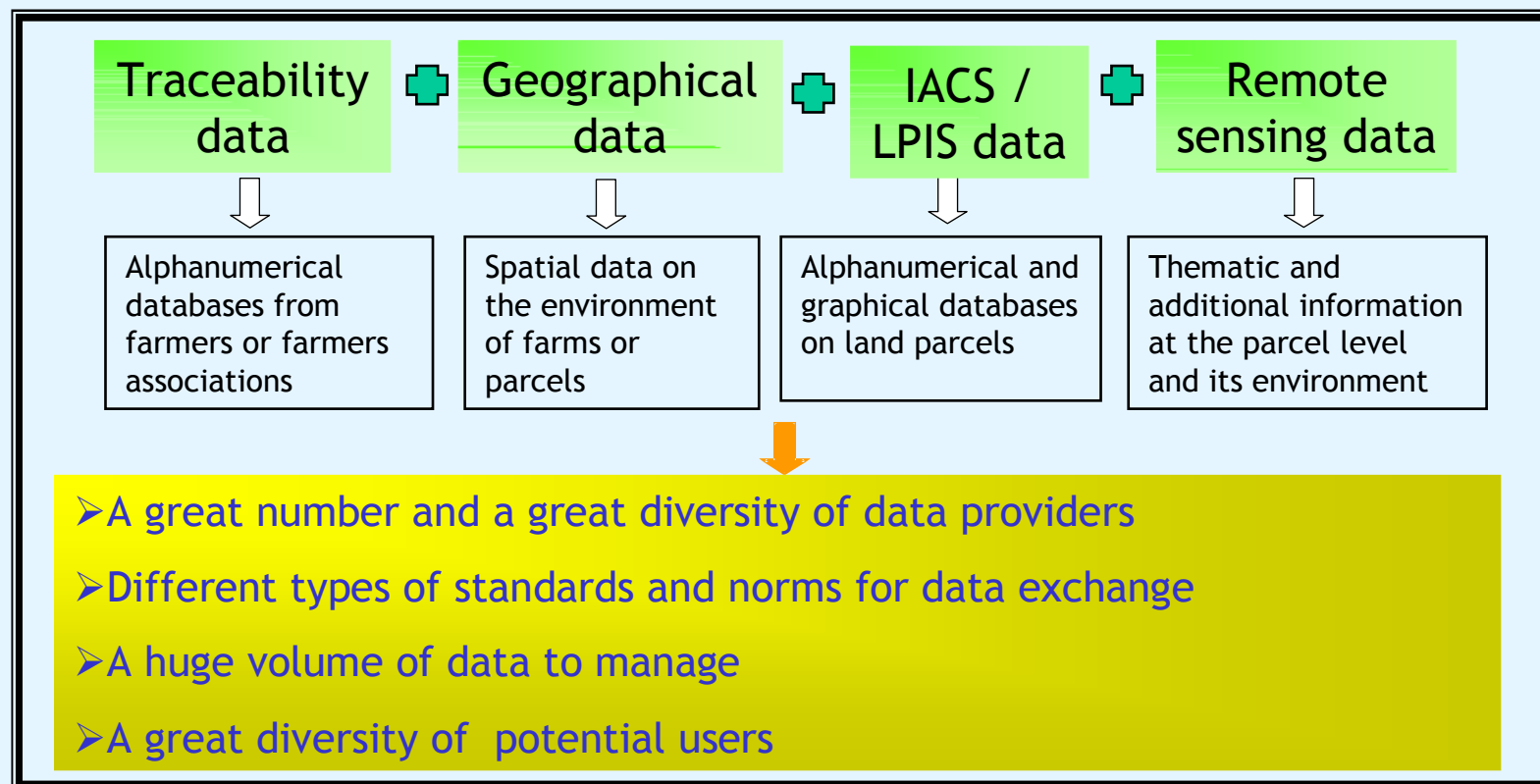
# General context (4/4)



Multi-information type (geographic and/or non geographic)  
Multi-objects (objects are specific to agriculture and environmental features)  
Multi-users ( farmer, collectors, transformers, control bodies and consumers)  
Multi-systems (IACS for CAP but very heterogeneous for traceability systems)



# Traceability and geographical information: necessity to implement an integrated approach



# Objectives of an integrated approach



## Combine traceability and geographical information

- To provide added value for specific production methods
- To ensure improved risk management
- To promote the quality and the origin of products
- To facilitate control of cross compliance in the frame of the CAP reform
- To improve the management of agricultural activities



# Objectives of an integrated approach

## Combine traceability and geographical information



Traceability generally covers two basic principles :

***Tracking** is the possibility to locate a product at a certain moment in the food chain*

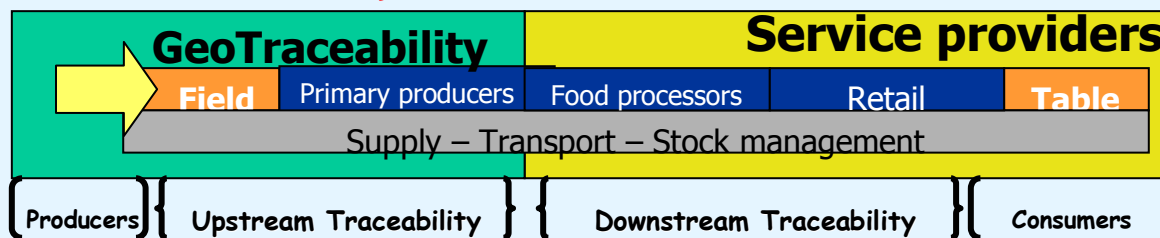
***Tracing** refers to the ability to describe the history of a product from the raw material to the final product*

- For agricultural products, traceability mainly concerns the upstream of the agro-food chain at the field or parcel level
- Traceability data may be used to describe the relationship between the production parcel and its environment.



Position X=4.233,565  
Y = 2.586,5616  
Farmer: Dupont  
Type : winter wheat

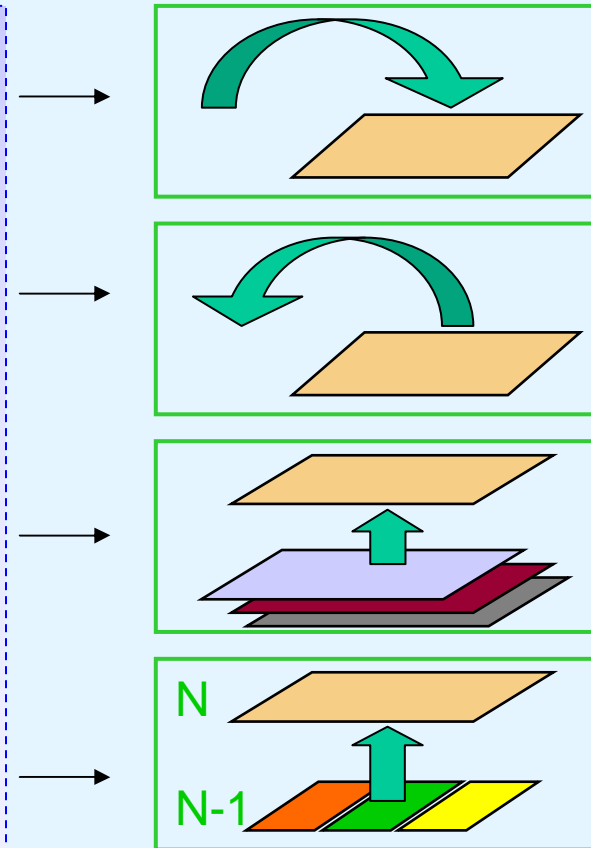
→ Geotraceability is the contribution of geographical data to classical traceability





# Traceability and geographical information : importance of geography for agricultural productions

- Impact of environment on the agricultural parcels
- Impact of agricultural practices on parcel environment
- Influence of parcel characteristics on the agricultural products
- Parcel history



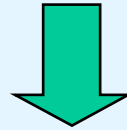
# Some difficulties to implement an integrated system for geotraceability

- **Great diversity of data for the qualification of agricultural products and their impact on the environment.**
  - Land use, topography, climatology
  - Soil type
  - Inter and intra-parcel agricultural practices (varieties, fertilization, harvest date).
- **All the data are not necessarily available**
  - Technical data from farms at the parcel level
  - Data on surrounding parcels
  - Environmental data in general
- **When available**
  - Data are seldom georeferenced
  - Data are not homogeneous or standardized

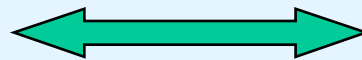
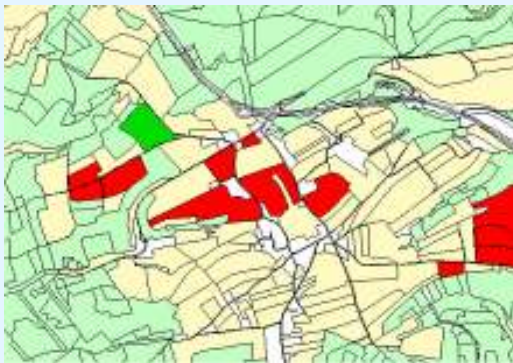


# Two opportunities (1/2)

The European regulation 1593/00 compels any member State that « provision should be made for the introduction of computerised geographical information system techniques for the identification of agricultural parcels » : Land Parcel Identification System (LPIS)



Land parcel identification system (LPIS) gives an unique parcel identification number and an access to the annual cartography of the arable lands on the whole territory of the European Union.



Multi annual  
cartography  
of arable land

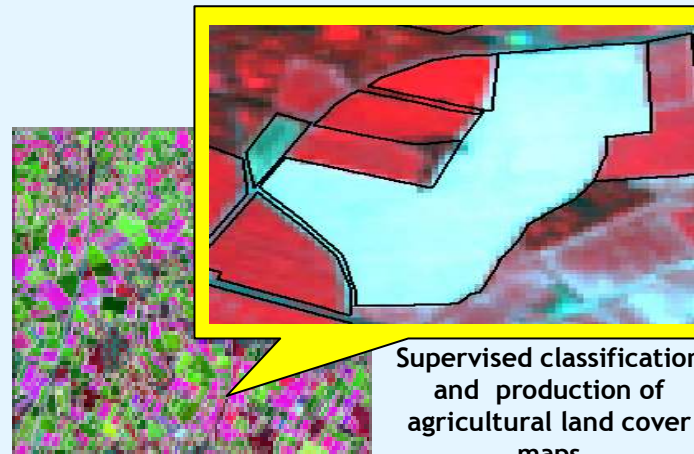


# Two opportunities (2/2)

2) Remote sensing imagery makes it possible to bring georeferenced, significant, factual and contextual information in association with LPIS and traceability data.

➤ Enables to share the information. There is no problem of information ownership rights. Therefore, a farmer can have access to his farm environment information.

➤ To provides a global and spatial vision of the environment which is required to complete the analysis of the impact of agricultural production on the parcels surroundings and its consequences on the environment.



Supervised classification and production of agricultural land cover maps

# Objectives of an integrated approach

- To provide added value for specific production methods
- To ensures improved risk management
- To promotes the quality and the origin of produce
- To facilitate control of cross compliance in the frame of the CAP reform
- To improve the management of agricultural activities



# Objectives of an integrated approach

To facilitate control of cross compliance

Cross compliance : A set of standards and requirements which farmers have to meet as a condition of receiving their Single Farm Payment

There are two main elements of Cross Compliance:

- **Statutory Management Requirements (SMRs)**
  - Public, animal and plant health
  - Environment
- **Good Agricultural and Environmental Conditions (GAECs)**
  - Soil erosion (soil protection).
  - Soil organic matter (maintenance of soil organic matter levels).
  - Soil structure (maintenance of soil structure).
  - Minimum level of maintenance





# Possible use of Remote Sensing to Control GAECS and AEM

- Reinforcement of rapid field visit for cross compliance
- Parcel net area (VHR imagery )
- General land use and status of maintenance (Set aside or pasture land)
- Support for regional fraud detection on specific GAECS issues
- Support for regional control of AEM
  - Conservation of features of the ecological network and landscape (hedges and woody strips isolated trees or shrubs, standard fruit trees and groves, ponds)
  - Soil winter cover
  - Extensive grassy headland (grassy headlands next to crop, extensive grazing strips)



# Objectives of an integrated approach

- To provide added value for specific production methods
- To ensure improved risk management
- To promote the quality and the origin of produce
- To facilitate control of cross compliance in the frame of the CAP reform
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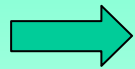


# Objectives of an integrated approach

## To improve the management of agricultural activities



By January 2007, EU Member States shall set up a “**Farm Advisory System**” operated by one or more designated authorities or by private bodies.



To help farmers to meet the standards of modern, high-quality agriculture, it is necessary that Member States establish a comprehensive system offering advice on land and farm management.

Farmers will participate in the farm advisory system on a voluntary basis

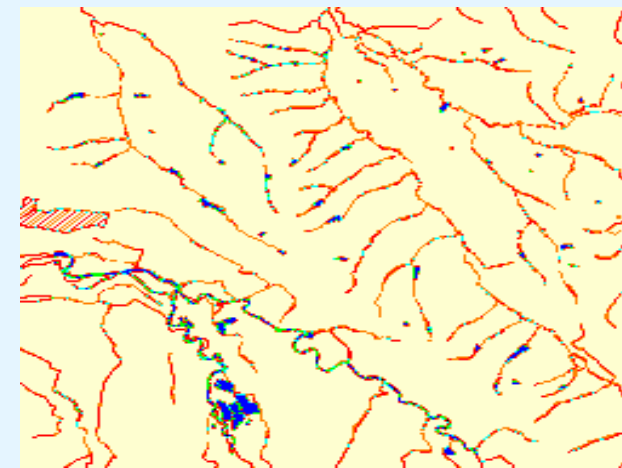
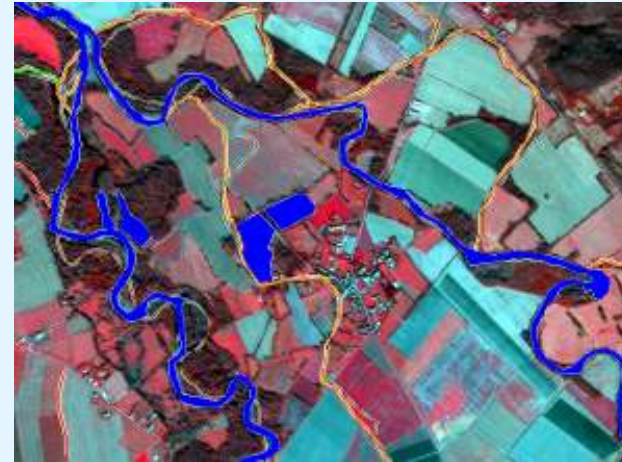
# Objectives of an integrated approach :

Improve the management of agricultural activities



Four major inputs of integrated systems can be obtained with remote sensing data.

- **Agricultural land cover maps** (Choice of seeds crops implantation)
- **Slope maps** (Choice of land management practices)
- **River network** (Choice of grassy strips implantation zones)
- **VHR and hyperspectral images** (Precision farming)



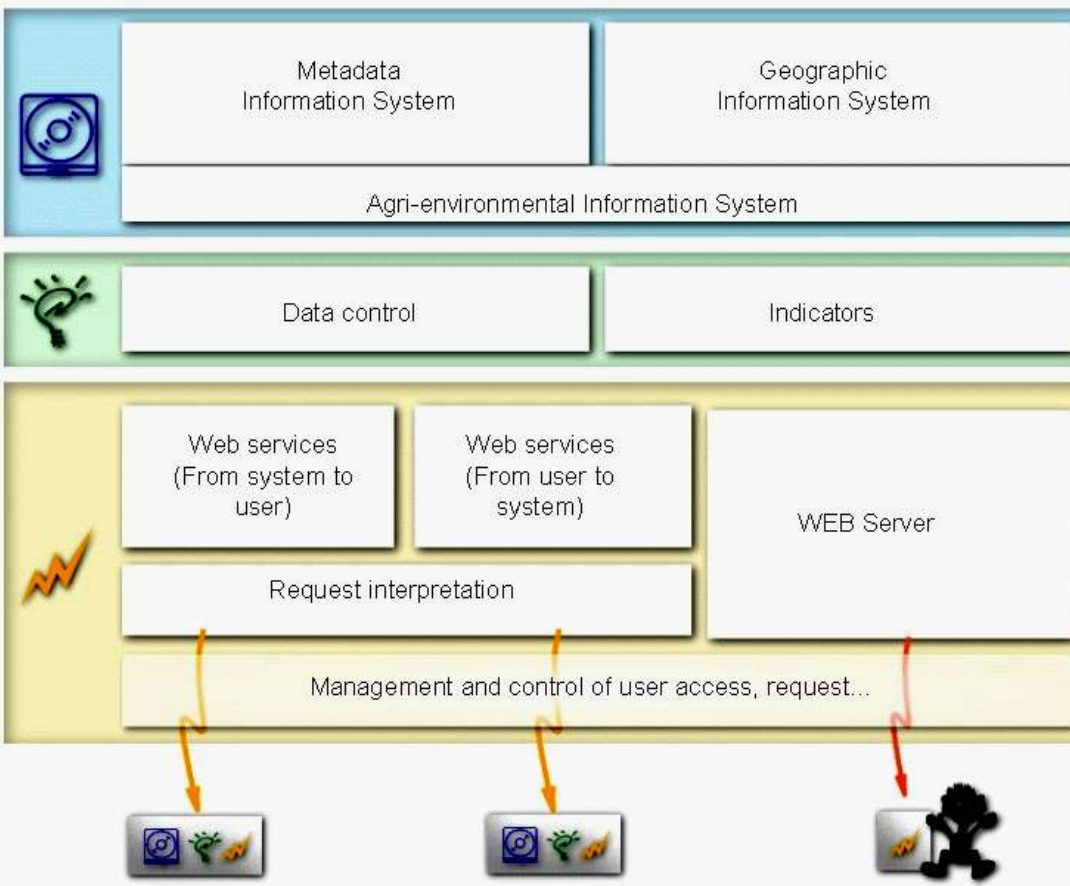
# Setting up an integrated system : main constraints

A system which:

- Is related to various fields of activity (control, management, products certification...)
- Is designed for multiple actors (administration, farmers, industry...)
- Is able to manage various types of data (geographical and non geographical data...)
- Is made up of various data sources (LPIS, remote sensing imagery...)
- Is made up of cross-cutting functionalities (farm management)
- Enables a fast, easy access to data and services (internet information access)

# Setting up an integrated system :

based on shared information infrastructures  
→FP6 Specific Support Action GTIS-CAP



➤ **Interoperable** computer infrastructures based on data standards able to ensure the exchange of geographical, traceability and CAP data through the internet

➤ Provide extended GIS capabilities such as **spatial data analysis, web mapping and services**

➤ Based on **metadata catalogues**





*Thanks for your attention*

<http://www.gtis-cap.net/>  
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