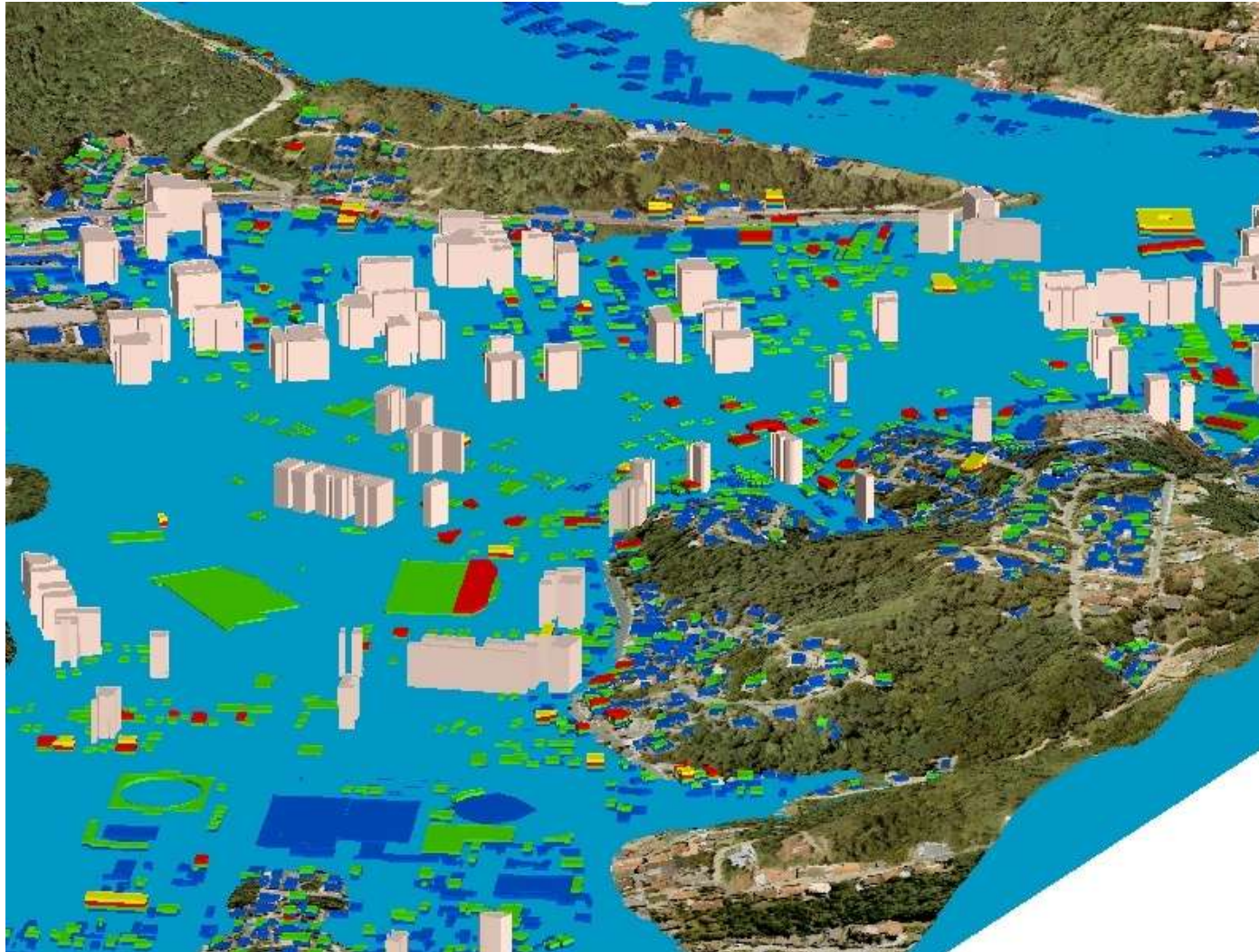


2nd International Workshop on 3D Cadastres
16-18 November 2011, Delft, The Netherlands

Preliminary Analysis of the possibilities for the implementation of 3D Cadastre in Brazil

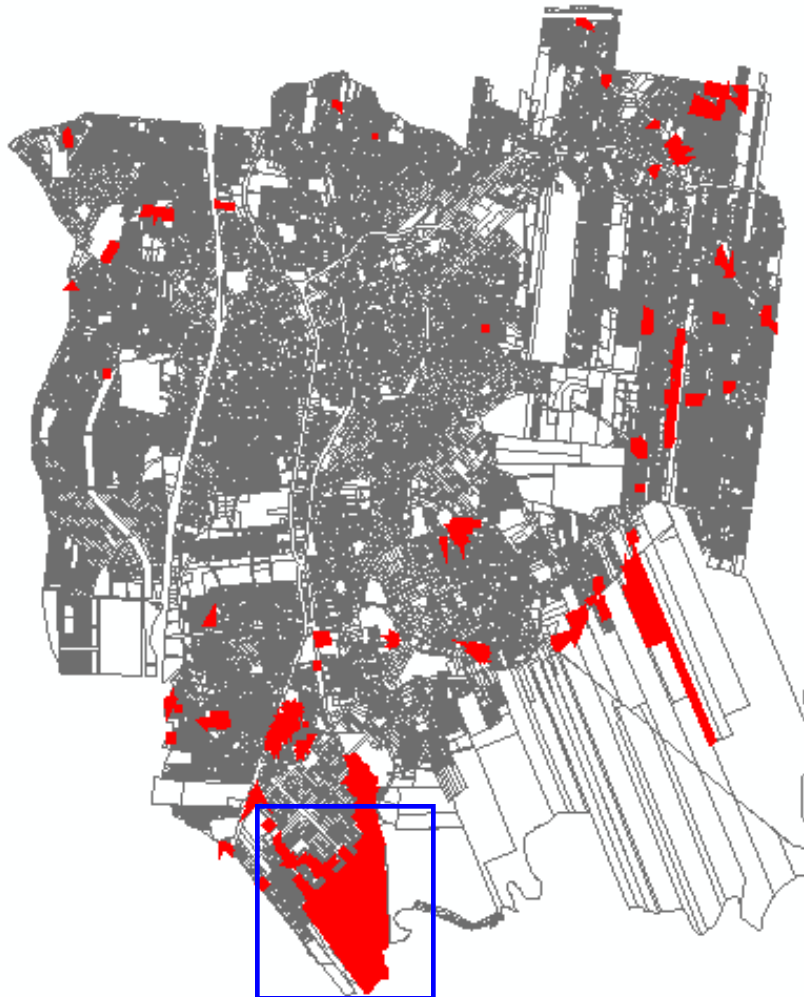
- **Andrea F.T. Carneiro, Diego A. Erba, Eduardo A.A. Augusto**

Initial considerations



Everton Silva

Initial considerations



Initial considerations



Initial considerations



Initial considerations



Initial considerations

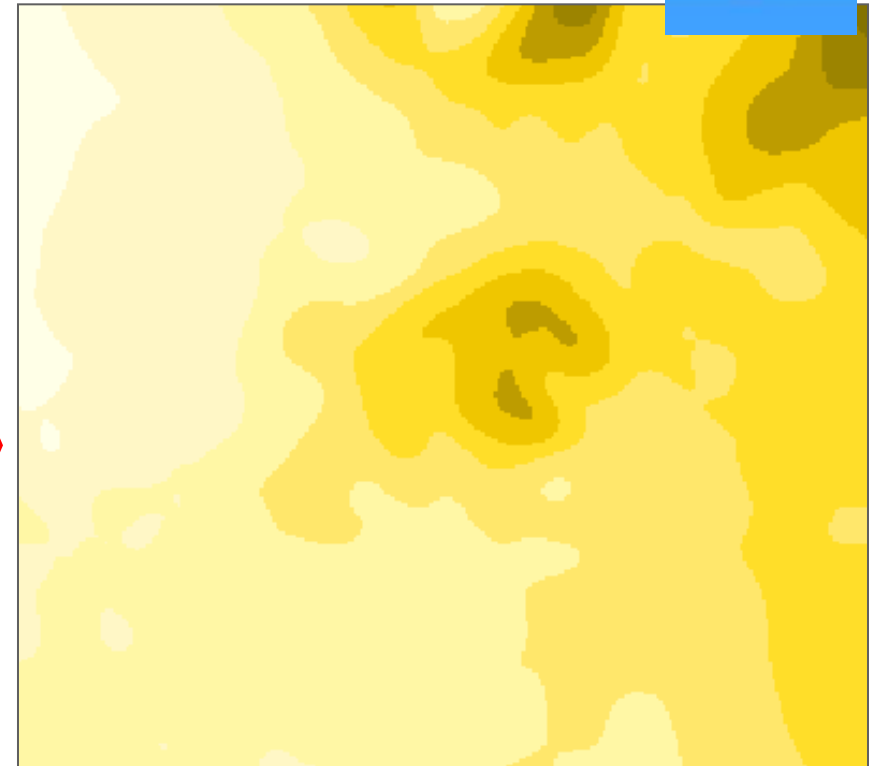
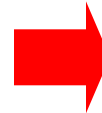
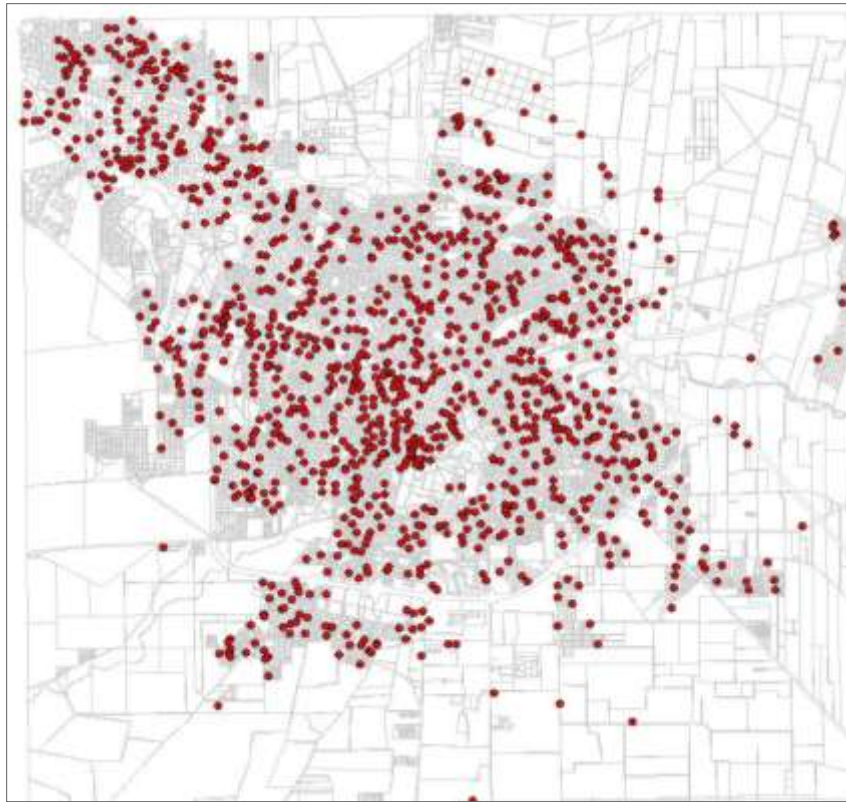


Initial considerations



Initial considerations

DVM

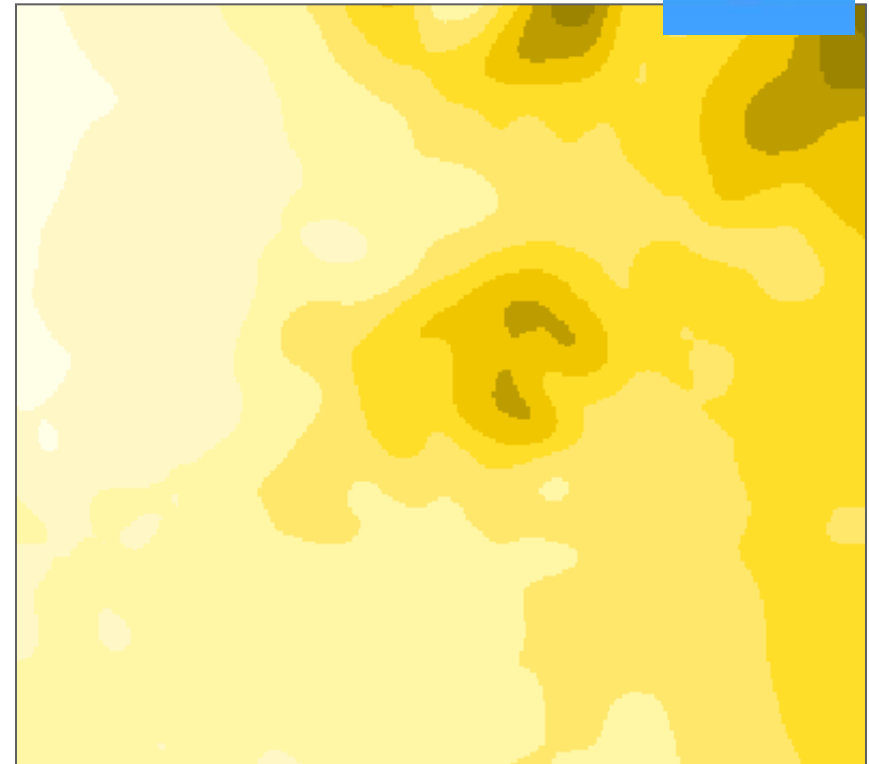


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Initial considerations

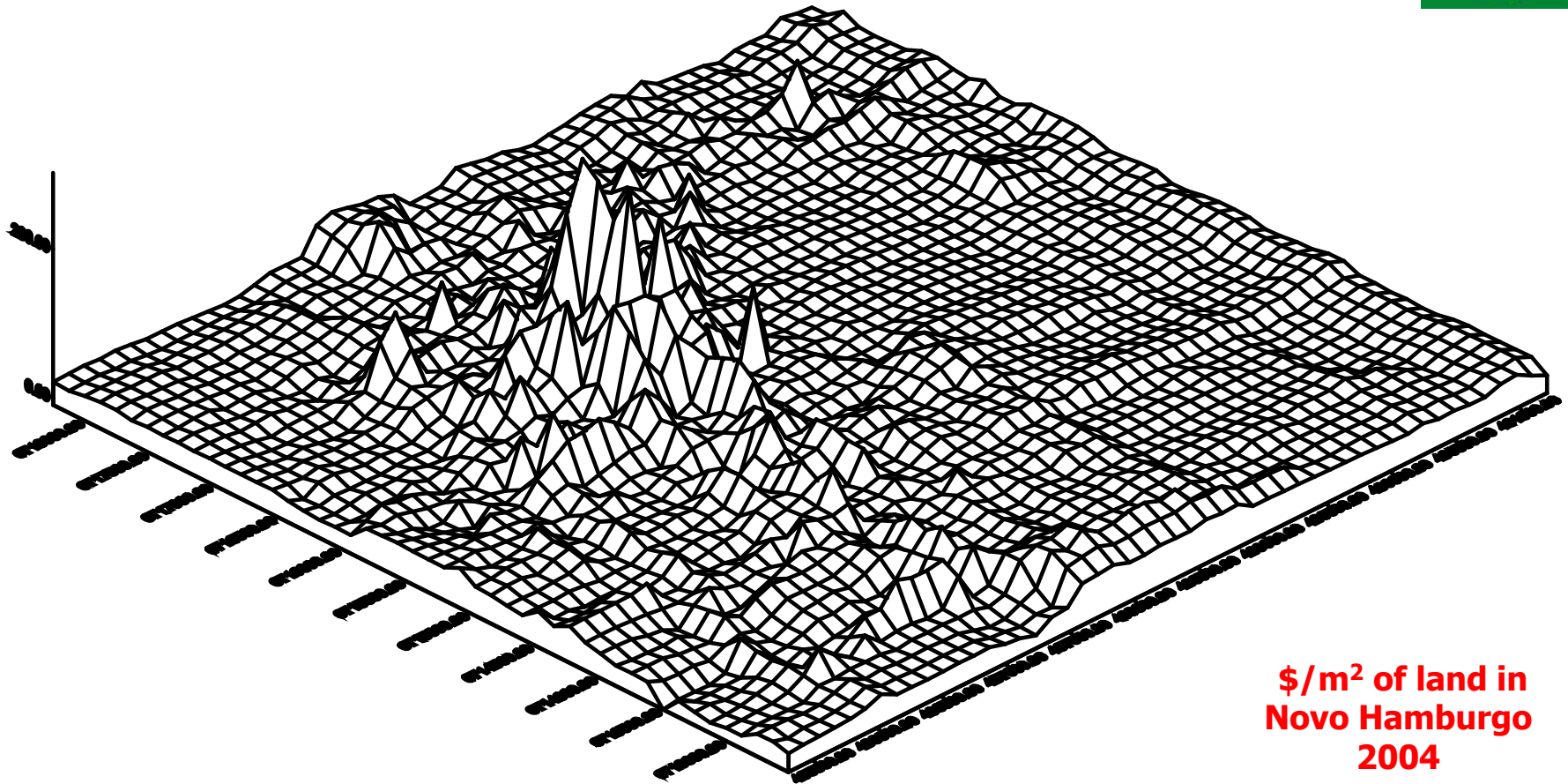
DVM



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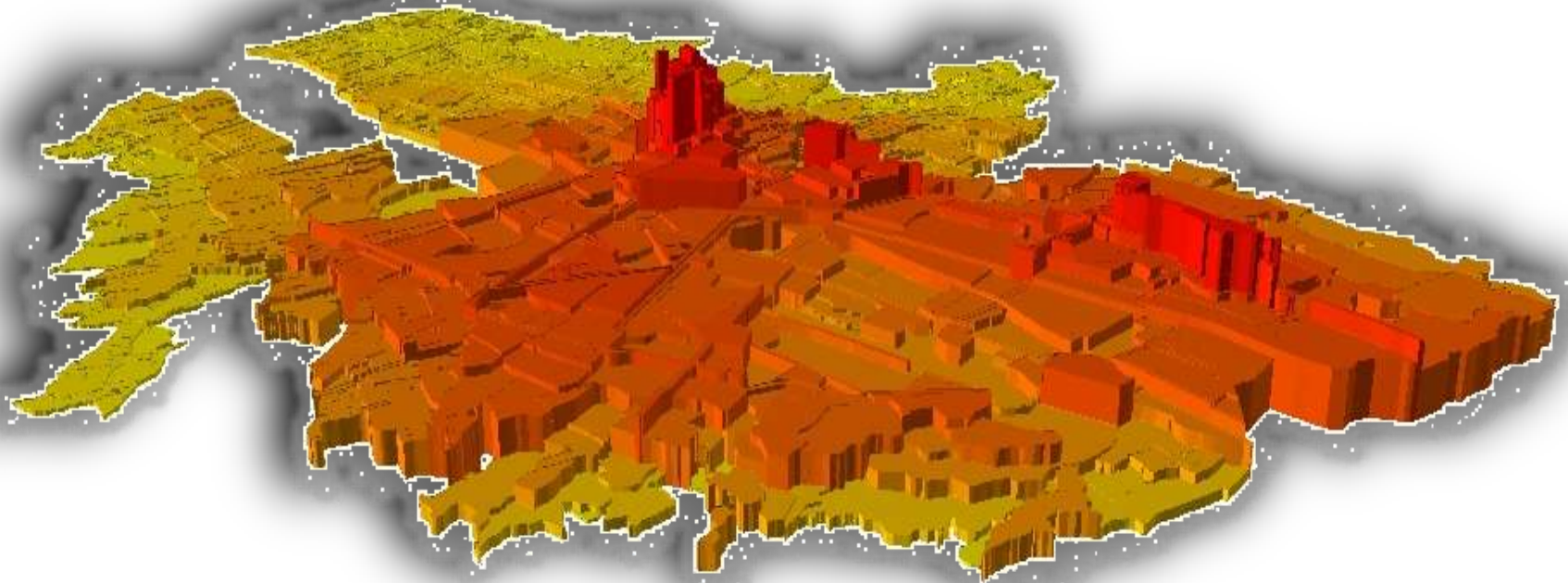
Initial considerations

DVM



**$\$/\text{m}^2$ of land in
Novo Hamburgo
2004**

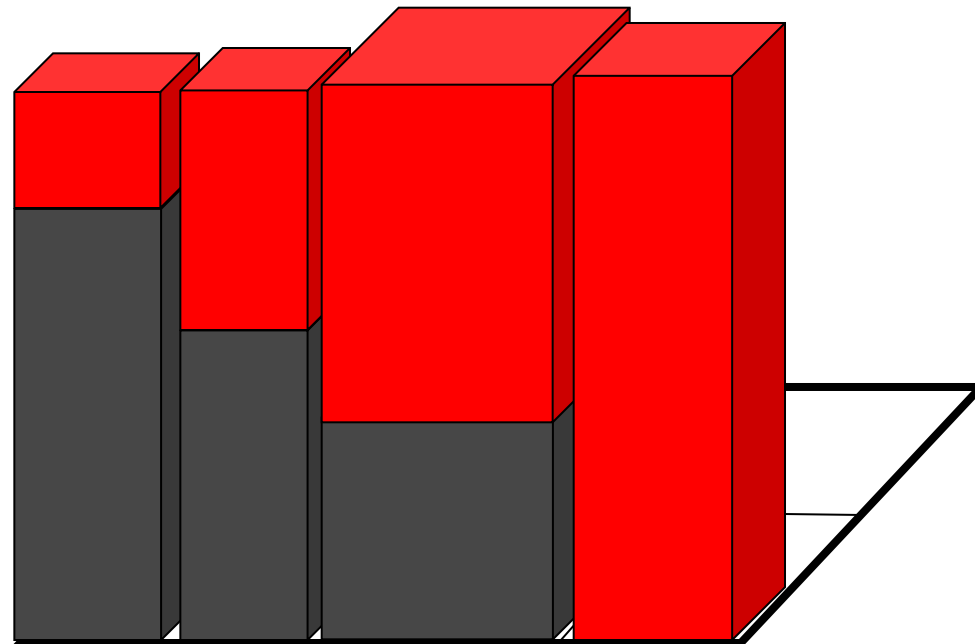
Initial considerations



Iván Darío Cardona, Medellín, Colombia

Initial considerations

Formal
Informal } Real city Legal city



Geometries are not geographies (Milton Santos)

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Preliminary Analysis of the possibilities for the implementation of 3D Cadastre in Brazil

- **Andrea F.T. Carneiro, Diego A. Erba, Eduardo A.A. Augusto**



Brasil

Area

8.514.877 km²

Population

190.732.694

Density

22 hab/km²

General considerations

- The Brazilian cadastre is not unified.
- The **rural cadastre is centralized** and managed by the Federal Government.
- The **urban cadastre** is the direct responsibility of the **municipal** (5,565).

General considerations

	Urban	Rural
Responsability	Local (municipality)	National (Reform Agrarian Institute)
Legislation	Guidelines	Federal legislation
Integration Cadastre and Registry	No	Not yet
Full 2D Cadastre	No	No

Rural Cadastre

1973 National Rural Cadastre System (**SNCR**), Art 3 of **Decree no. 72.106**.

Rural property is registered by a **declaration** from the owner, holder of useful domain or holder in any capacity, with **no control** over the accuracy of declarations.

2001 National Rural Property Cadastre (**CNIR**) **Law no. 10.267**

*“...managed **jointly** by INCRA and the Secretary of the Federal Revenue Service, produced and **shared** by the various federal and state public institutions that produce and use information about Brazilian rural areas.”*

The law characterized the CNIR as a multipurpose land registry base

Rural Cadastre

2001 Law no. 10.267 - National Rural Property Cadastre (CNIR)

Instituted a new legal framework for properties in Brazil.

The surveyor must be certified by INCRA (6,000)

The surveyor must submit technical papers and corresponding documentation to INCRA to certify the geometric definition of the rural property.

By September 2011, INCRA had certified a total of 30,051 georeferenced rural properties across Brazil.

Rural Cadastre

The rural unit has two distinct concepts:

- a) for **INCRA**: rural economic unit,
- b) for the **Property Registry**: the legally established “ real property ”.



Figure 2. Difference between the Incra cadastre and ownership status on the property registry

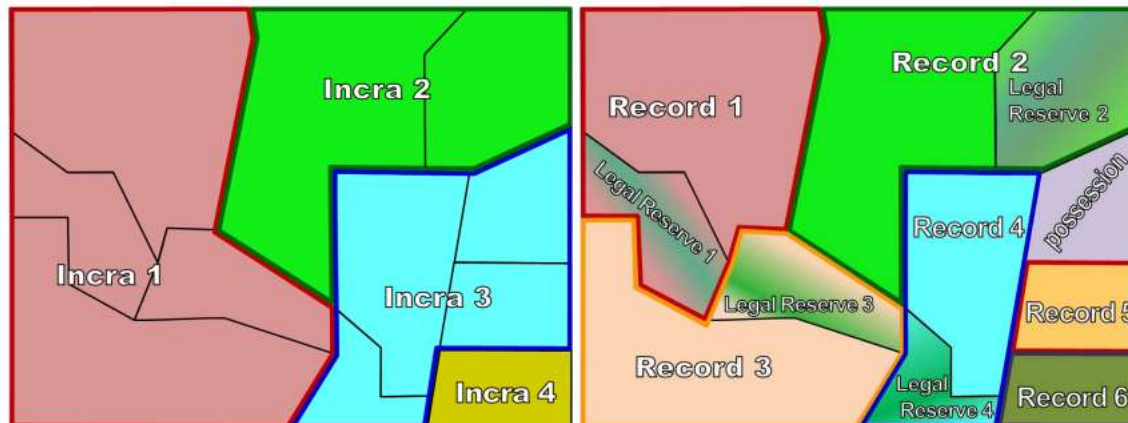


Figure 3. Definition of parcels that are adjusted perfectly in the arrangement of "rural agrarian property" and "real property"

Urban Cadastre

1970 The model currently used in Brazilian municipalities follows a model proposed by the **CIATA** (Technical-Administrative Improvement Incentive Agreement for Cities):

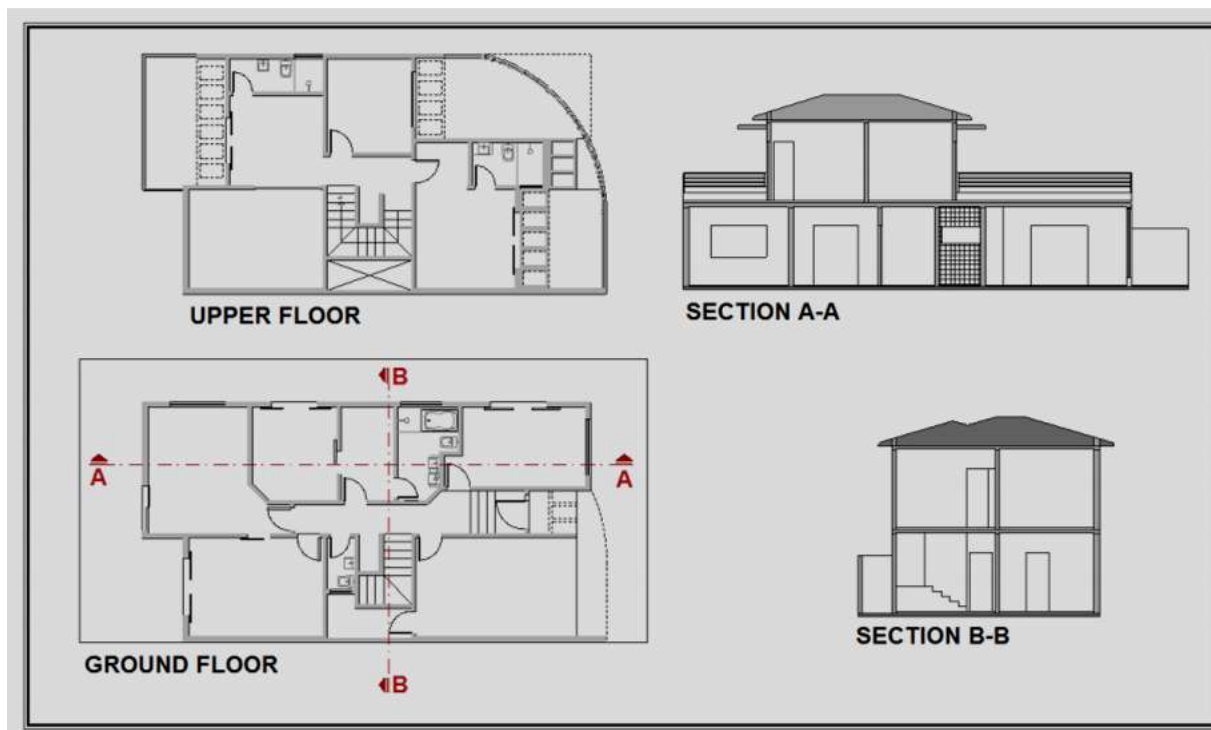
Street Bulletin (BL)

Real Estate Cadastre Bulletin (BCI)

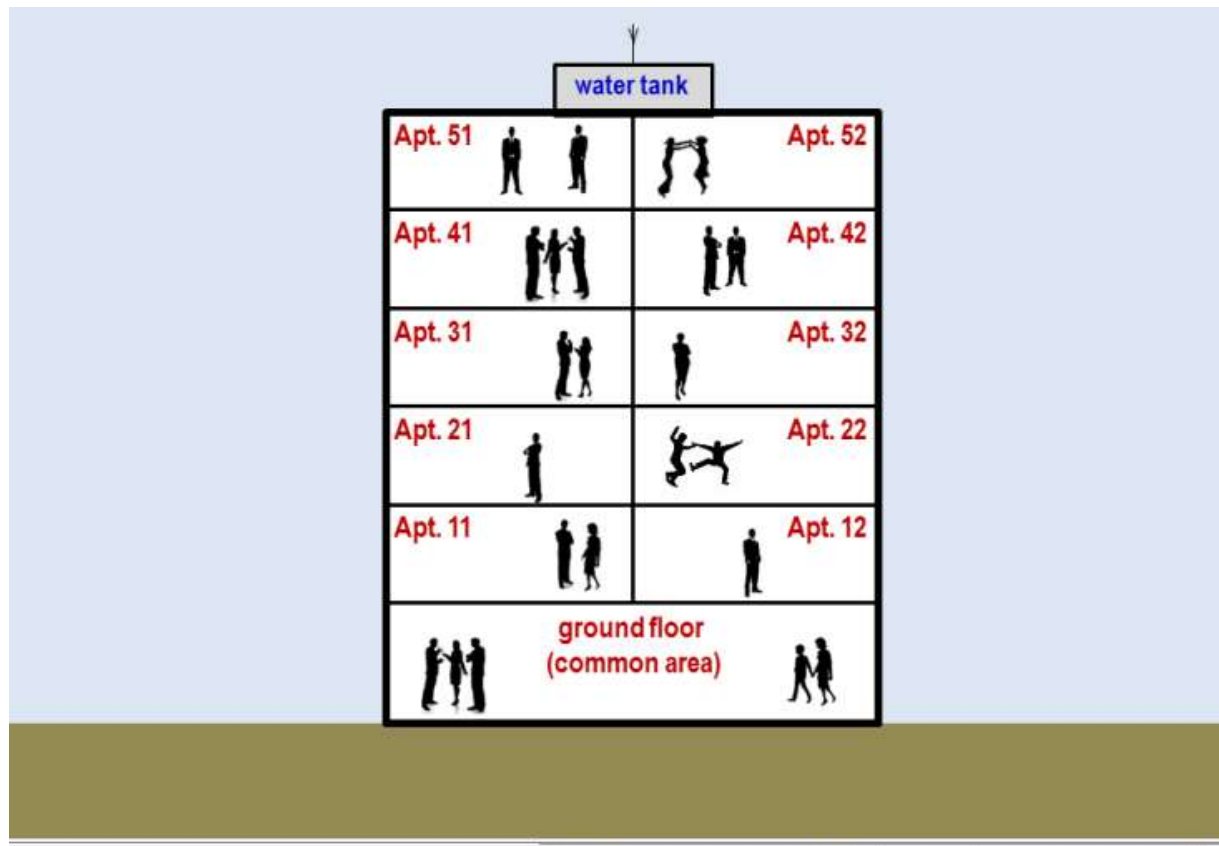
(existing urban services and market value per square meter of land, and physical characteristics of the property, location and personal characteristics of the taxpayer).

Urban maps were/are normally obtained by aerial photogrammetry or topographic surveys.

Urban Cadastre



Urban Cadastre



Multipurpose Cadastre Urban

Greatest limitation to the urban cadastre was the lack of laws to standardize its implementation and uniformity across the country.

Ministry of Cities in Brazil began work to define a new strategy to reverse the situation.

Administrative Directive no. 511 (7 December 2009) - **Guidelines** for the creation, institution and implementation of the **Multipurpose Territorial Cadastre – CTM** in Brazilian cities.

Focused on issues related to cartography, the multipurpose aspect of the cadastre, its management and funding and property appraisal.

Multipurpose Cadastre Urban

Guidelines for CTM

- Establishment of a single identifier for each parcel.
- Each parcel must be referenced on the Brazilian Geodetic System, creating a Unified Base Map.

Multipurpose Cadastre Urban



Conclusions

- ❑ The implementation of a 2D Multipurpose Cadastre is in course.
- ❑ It is clear the growing of the geo-technology popularity throughout the country and the gradual development of the data sharing concept.
- ❑ In Rural field, ten years after the law was published, many obstacles still exist and adjustments are sorely needed.
- ❑ The 3D Cadastre in Brazil depends on the success of the multipurpose cadastre model and consolidation of the INDE.

Muito obrigado!