



BT5M production on a GIS environment

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de Catalunya



**Generalitat
de Catalunya**

Agenda

- Challenges
 - Data model
 - Production system
 - Quality system

Challenges

- Limitations in the data model:
 - No possibility of incremental updating: lack of unique and persistent element identifiers and life cycle attributes.
 - No metadata at feature level.
 - No explicit relationship between map names and topographic features

Data model enrichment



Challenges

- Limitations in the data model:
- Limitations in the ICGC data capture system:
 - ICGC applications were based on CAD commercial software, mainly MicroStation
 - Difficulties for the topology management with MicroStation, topology must be rebuilt in each updating process:

Production system based on a GIS

Challenges

- Limitations in the data model:
- Limitations in the ICGC data capture system:
- Limitations in the quality management:
 - Lineage per map sheet
 - Potential problems due to topology reconstruction

Quality system robustness



Challenges

- Limitations in the current data model:
- Limitations in the ICGC data capture system:
- Limitations in the quality management:
- Interoperability:
 - BTA, INSPIRE

Standards compatibility



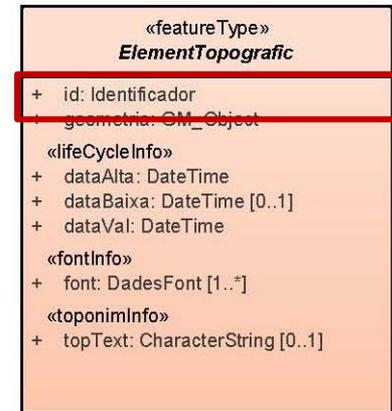
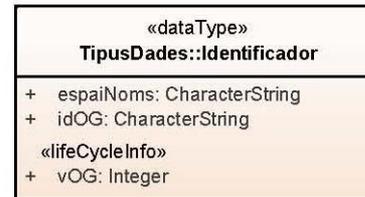
**Data model
&
Interoperability**

Changes

Feature identifier

➤ Unique and persistent:

- It facilitates the identification of changes
- It allows the incremental updating deliveries
- It makes possible the establishment of relationship with other databases



bt25mv20t.edifici_servei Properties

Name	Value
ID	257
IDO	00000004000339
IDR	1
IDV	0
DATA_ALTA	10/14/2013 11:07:04 AM
DATA_BAIXA	
DATA_VOL	5/1/2013 12:00:00 AM
TOP_ID	56748965
TOP_TEXT	Cal Batlle
TOP_DATA	10/25/2013 11:07:04 AM
DATA_REV	10/30/2013 11:07:04 AM
ESTAT_EDI	cas genèric
ORIENT_EDI	

Close

Life cycle

«featureType» <i>ElementTopografic</i>	
+	id: Identificador
+	geometria: GM_Object
«lifeCycleInfo»	
+	dataAlta: DateTime
+	dataBaixa: DateTime [0..1]
+	dataVal: DateTime
«fontInfo»	
+	font: DadesFont [1..*]
«toponimInfo»	
+	topText: CharacterString [0..1]

- Begin, validation and end dates per object version in the database
 - It facilitates the identification of changes
 - It allows the incremental updating deliveries



General		Attributes
Name	Value	
IDG	959	
IDO	00000000006774	
IDR	1	
IDT	0	
DATA_ALTA	12/10/2012 1:47:04 PM	
DATA_BAIXA	10/14/2013 11:07:04 AM	
DATA_VOL	3/17/2013 12:00:00 AM	
TOP_ID		
TOP_TEXT		
TOP_DATA		
DATA_REV	5/1/2013 12:00:00 AM	
ESTAT_EDI	cas genèric	
ORIENT_EDI		

Life cycle

«featureType» ElementTopografic
+ id: Identificador
+ geometria: GM_Object
«lifeCycleInfo»
+ dataAlta: DateTime
+ dataBaixa: DateTime [0..1]
+ dataVal: DateTime
«fontInfo»
+ font: DadesFont [1..*]
«toponimInfo»
+ topText: CharacterString [0..1]

- Begin, validation and end dates per object version in the database
 - Validation date means that there are no changes in the object.



Feature metadata

- Source date
- Source information
 - Source identifier
 - Source type
 - Source name

«featureType» <i>ElementTopografic</i>
+ id: Identificador
+ geometria: GM_Object
«lifeCycleInfo»
+ dataAlta: DateTime
+ dataBaixa: DateTime [0..1]
+ dataVal: DateTime
«fontInfo»
+ font: DadesFont [1..*]
«toponimInfo»
+ topText: CharacterString [0..1]

«dataType» <i>TipusDades::DadesFont</i>
+ fontInfo: DadesFontInfo
+ dataFont: DateTime

«dataType» <i>TipusDades::DadesFontInfo</i>
+ codi: Identificador
+ tipus: VTipusFont
+ nom: CharacterString

«codeList» <i>LlistesValors::VTipusFont</i>
+ volFotogrametric
+ projecteConstru ctiu
+ baseToponimia
+ altresFonts



Name	Value
IDG	237
IDO	00000004000339
IDR	1
IDT	6
DATA_ALTA	10/14/2013 11:07:04 AM
DATA_BAIXA	
DATA_VOL	5/1/2013 12:00:00 AM
TOP_ID	38743383
TOP_TEXT	Cal Battle
TOP_DATA	10/25/2013 11:07:04 AM
DATA_NEV	10/30/2013 11:07:04 AM
ESTAT_EDI	cas genèric
ORIENT_EDI	

Sources

- Main source (photogrammetric flight)
 - Flight date is the initial “main source” date
 - Revision date is the last “main source” date without changes
- Specific sources
 - Infrastructure projects
 - Geographical names
- Other sources



bt25mv20t.edifici_servei Properties

Name	Value
IDG	237
IDO	00000004000339
IDR	1
IDT	6
DATA_ALTA	10/14/2013 11:07:04 AM
DATA_BAJA	
DATA_VOL	5/1/2013 12:00:00 AM
TOP_ID	38745583
TOP_TEXT	Cal Battle
TOP_DATA	10/15/2013 11:07:04 AM
DATA_HLV	10/30/2013 11:07:04 AM
ESTAT_EDT	cas genèric
ORIENT_EDT	

Close

Map name relation

- Map name
- MapNames DB
 - Extraction date
 - Map name identifier

«featureType» <i>ElementTopografic</i>	
+	id: Identificador
+	geometria: GM_Object
«lifeCycleInfo»	
+	dataAlta: DateTime
+	dataBaixa: DateTime [0..1]
+	dataVal: DateTime
«fontInfo»	
+	font: DadesFont [1..*]
«toponimInfo»	
+	topText: CharacterString [0..1]



General		Attributes
Name	Value	
IDG	237	
IDO	00000004000339	
IDR	1	
IDT	6	
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DATA_BAIXA		
DATA_VAL	5/1/2013 12:00:00 AM	
TOP_ID	56748965	
TOP_TEXT	Cal Battle	
TOP_DATA	10/25/2013 11:07:04 AM	
DATA_REV	10/30/2013 11:07:04 AM	
ESTAT_ED	cas genèric	
ORIENT_ED		

**Production
system**

Changes

ICGC Data Capture application

System architecture

ICGC GM+ISSG application

GeoMedia
Object Library

ISSG Object
Library

GeoMedia

ISSG

Oracle Spatial

- It extends the functionalities of Geomedia and solves 3D shortcomings
- Ensure the most ergonomic and complete visualization mode and the same functionalities in the photogrammetric environment than in the standard one.
- Provide tools specifically designed for the data model.

ICGC Data Capture application

Extended functionalities on GIS

- Geometric primitives not existing in GM, as curve, circle 3D and ellipse 3D
- Auxiliary drawing geometries as orthogonal element, arc of ellipse and curve, stroking always as a polyline or polygon
- Possibility to combine the different drawing geometries in the same element compilation
- 2D/3D for snapping, modify, copy parallel, sharing geometry or sharing vertices
- UNDO of the full result of the command or of one step of the command
- Specific message fields for managing the command
- ...

Integration CAD + GIS

The screenshot displays the GeoMedia Professional interface with a 3D terrain map. The map shows a complex network of roads, buildings, and terrain features. A properties window is open for a selected road feature, displaying its attributes.

GeoMedia Professional - zona3.gws

File Edit View Insert Tools Analysis Warehouse Legend Stereo Window Help

No Active Filter

ICC Feature: **Vialt**
 revestit / no separades / troncal / calçada única / no urbà / via convencional / xarxa bàsica /

ICC Command: **Dynamic Information**

ICC Coordinates: Snap 3D 426202.19 4685547.75 1172.94 H

Toolbar2

Stereo View 2 * Zoom: 1.998 RSet: 0 Scale 1:991

Attribute Query of BT25MV20T.MAI2 (21)

- Orografia
 - bt25mv20t.corba_mestra (2431)
 - bt25mv20t.corba_senzilla (3794)
 - bt25mv20t.corba_intercalada (0)
 - bt25mv20t.cota_s (473)
 - bt25mv20t.cota_singular_s (0)
 - bt25mv20t.cota_pic_s (42)
 - bt25mv20t.cota_coll_s (17)
 - bt25mv20t.desmunt (38)
 - bt25mv20t.terraple (5)
 - bt25mv20t.desmunt_amb_peu (1)
 - bt25mv20t.terraple_amb_peu (0)
- Vialitat
- Poblament
- Usos del sòl
 - bt25mv20t.pedrereres_salines (1)
 - bt25mv20t.abocador (0)
 - bt25mv20t.rocam (17)
 - bt25mv20t.platja_sorra (0)
 - bt25mv20t.Alguamoll_maresma (0)
 - bt25mv20t.bosc (428)
 - bt25mv20t.talafoc (88)
- Hidrografia
- Comunicacions
- Ferrocarrils
 - bt25mv20t.ferrocarril_NO_CLASSIFICAT (0)
 - bt25mv20t.ferrocarril_NOelevat (7)
 - bt25mv20t.ferrocarril_elevat (1)
 - bt25mv20t.ferrocarril_tunel_soterrat (0)
 - bt25mv20t.cremallera_funicular_tram (0)
 - bt25mv20t.cremallera_funicular_tram (0)
- Models
 - bt25mv20t.text_auxiliar (4)
 - BT25MV20T_AUX1 (4)
 - d_model (0)
 - emplaç (122)

Display Order Groups

D.Vol: D.Proj: D.Altres fonts:

Press F1 for Help.

1:3,041

bt25mv20t.vial_NO_elevat Properties

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IDR	0
IDT	3
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DATA_MODIF	
DATA_BAIXA	
DATA_VOL	6/1/2001 12:00:00 AM
DATA_PROJ	
FONT_ALTTIP	BT50M
DATA_ALTTIP	1/1/2004 12:00:00 AM
TOP_ID	
TOP_TEXT	
TOP_DATA	
DATA_REV	
REVEST_VIA	revestit
ESTAT_VIA	cas genèric
TIPNRE_VIA	no aplicable
SEP_VIA	no separades
TER_VIA	no elevat
ENTORN_VIA	cas genèric
TIPTRA_VIA	troncal
NCAL_VIA	calçada única
URBA_VIA	no urbà
CTEUC_VIA	via convencional
CFUNC_VIA	xarxa bàsica
ORGAN_VIA	
AMP_VIA	
CODI_VIA	
CODIEUR_VIA	

Close

start E:\usuari\bt25mv2... GeoMedia Profession... CA

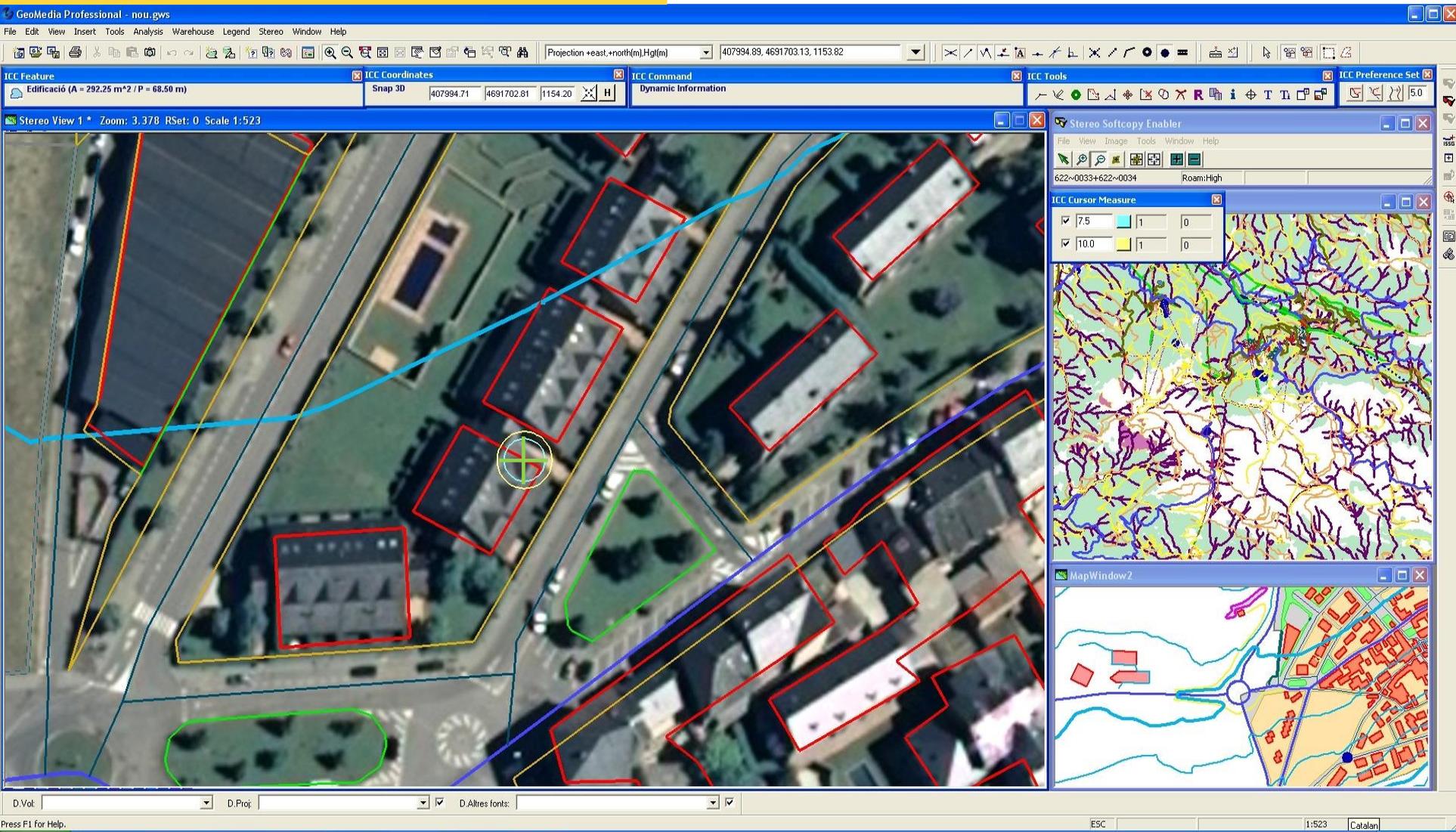
ICGC Data Capture application

Improvement of vector visualization on the photogrammetric environment

- Standard point symbology in the photogrammetric environment
- Window tracking capabilities in the standard environment
- Interaction between different views
- Specially designed cursor glyphs
- Auxiliary display geometries (halo) associated to the cursor for the visualization of minimum distances while drawing or editing
- ...

ICGC Data Capture application

Same functionalities: Auxiliary display geometries (halo)



ICGC Data Capture application

- Command management and interaction using the keyboard and both type of mouse (standard and photogrammetric)
- Specifically designed message fields informing the operator about the feature instance: class, attributes, perimeter, area

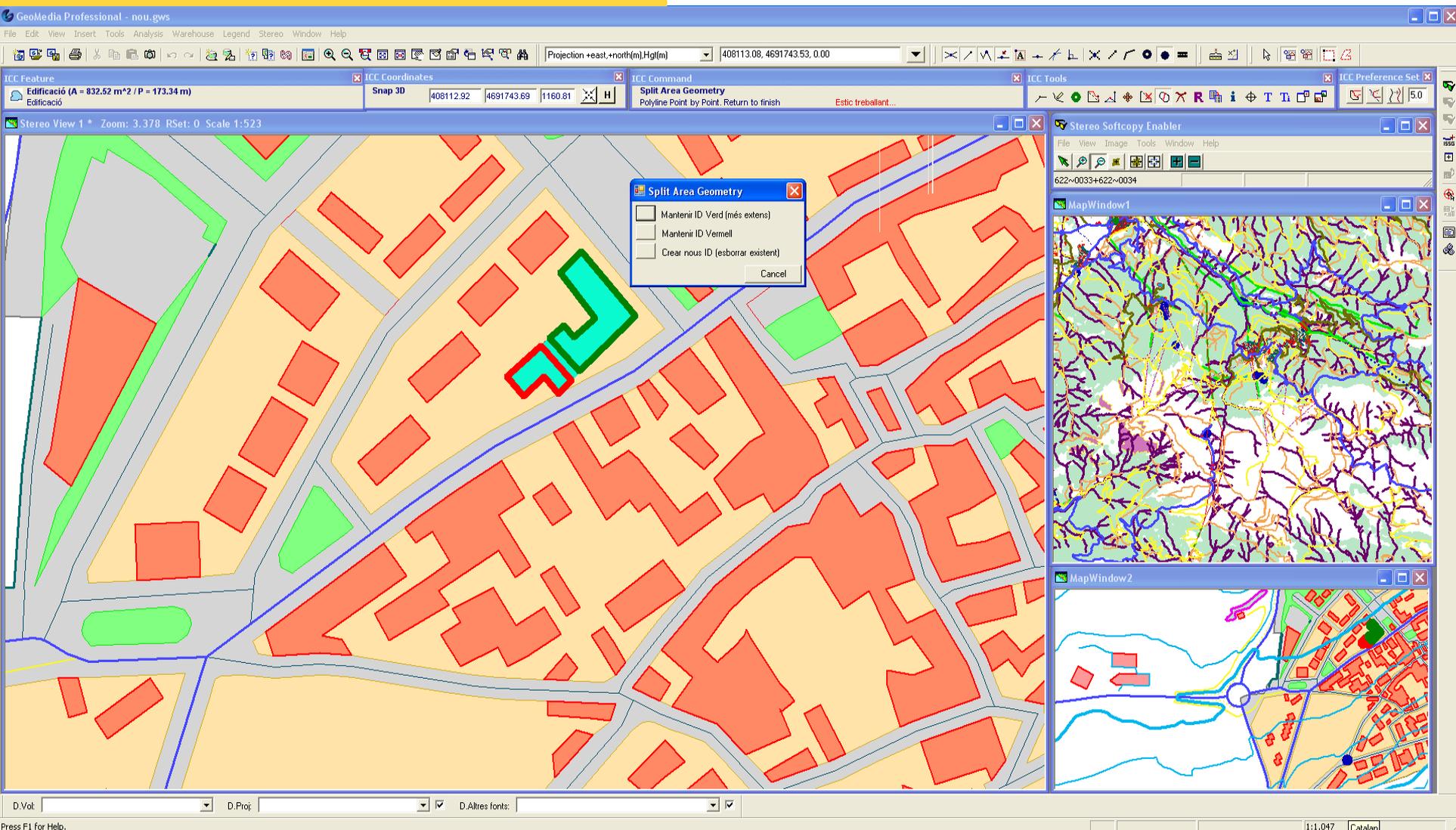


- Information about feature instance moving around it without clicking the element
- Specific coordinates field, including H, for showing and enter coordinate values using keyboard
- ...



ICGC Data Capture application

Management: Feature identifier



ICGC Data Capture application

Management: Map name and feature link

GeoMedia Professional - nou.gws

File Edit View Insert Tools Analysis Warehouse Legend Stereo Window Help

Projection east,north(m),Hgt(m) | 407965.65, 4691020.28, 0.00

ICC Feature: Curs fluvial (L = 1164.46 m)
sols per feix 7

ICC Coordinates: Snap 3D | 407968.72 | 4691025.62 | 1262.09 | H |

ICC Command: Dynamic Information

ICC Tools

ICC Preference Set

Stereo View 1 * Zoom: 1.076 RSet: 0 Scale 1:1521

The screenshot displays a map with several labeled locations: les Sales, la Font Trillans, els Prats de Sant Cristòfol, les Costes, SERRAT DELS COLLETS, T. de Font Trillans, Pla de la Baga, Torre de Riu, SERRA DELS GATS, T. de les Deveses, T. del Molí Nou, and Roca Castellana. A red circle highlights a feature on the map, and a data capture window is open over it.

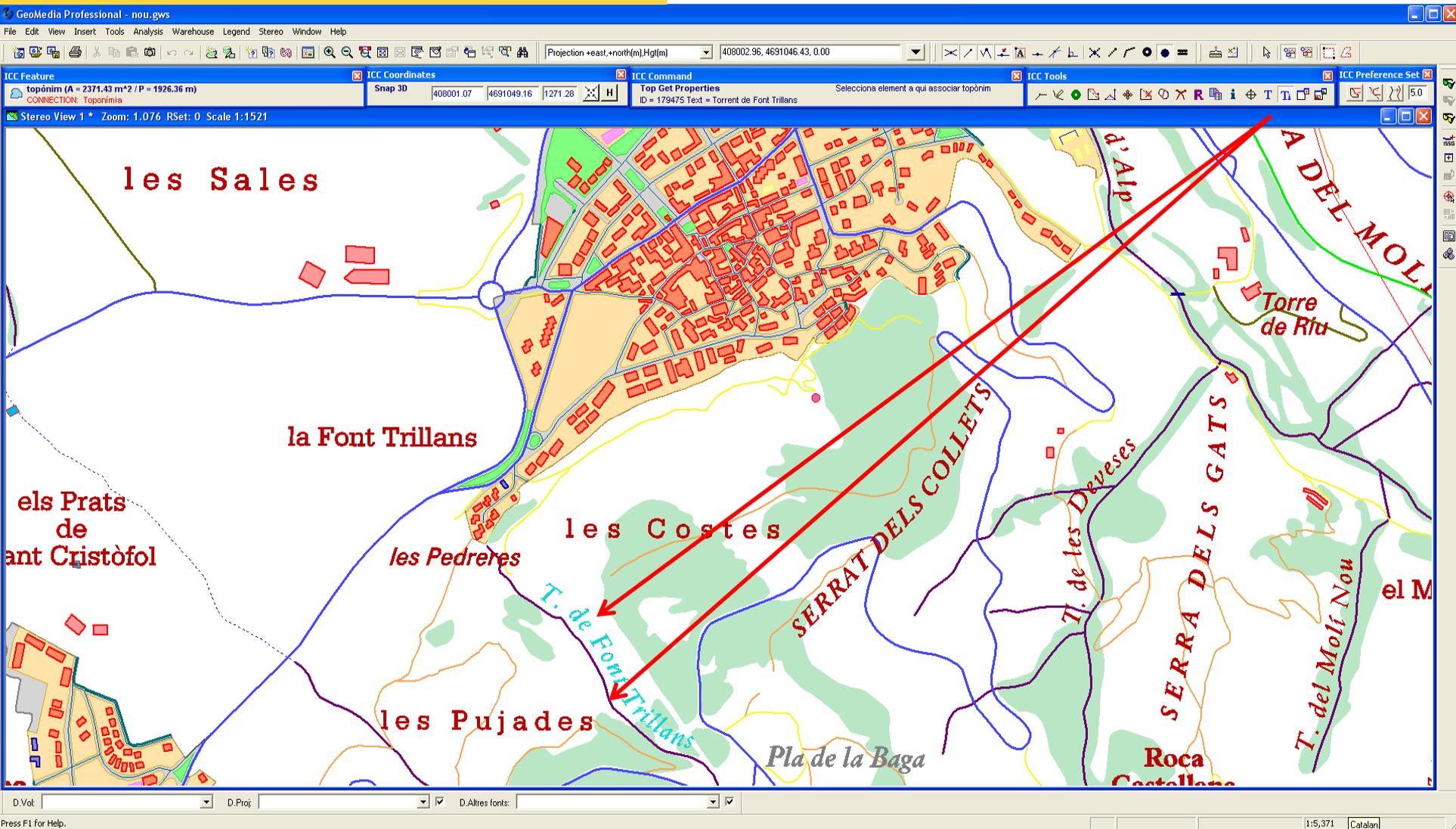
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DATA_MODIF	11/26/2013 5:18:
DATA_BAIXA	
DATA_VOL	6/1/2012 12:00:00
FONT_ALTIP	
DATA_ALTIP	
TOP_ID	
TOP_TEXT	
TOP_DATA	
DATA_REV	

D.Vol: 01/06/2012 (Vol 06/2012) | D.Proj: | D.Altres fonts: |

Press F1 for Help. | 1:5,371 | Catalan

ICGC Data Capture application

Management: Map name and feature link



ICGC Data Capture application

Management: Map name and feature link

GeoMedia Professional - nou.gws

File Edit View Insert Tools Analysis Warehouse Legend Stereo Window Help

Projection east,north(m),Hgt(m) 407952.58, 4691038.94, 0.00

ICC Feature: Curs fluvial (L = 1164.46 m)
sols per feix 7

ICC Coordinates: Snap 3D 407953.04 4691042.30 1257.80

ICC Command: Dynamic Information

ICC Tools

ICC Preference Set

Stereo View 1 * Zoom: 1.076 RSet: 0 Scale 1:1521

Name	Value
IDG	8208
IDO	0000000017D69
IDR	0
IDT	1
DATA_ALTA	12/10/2012 1:45:
DATA_MODIF	11/26/2013 5:25:
DATA_BAIXA	
DATA_VOL	6/1/2012 12:00:0
FONT_ALTIP	
DATA_ALTIP	
TOP_ID	179475
TOP_TEXT	Torrent de Font Tr
TOP_DATA	10/5/2013 12:00:
DATA_REV	

D.Vol: 01/06/2012 (Vol 06/2012) D.Proj: D.Altres fonts:

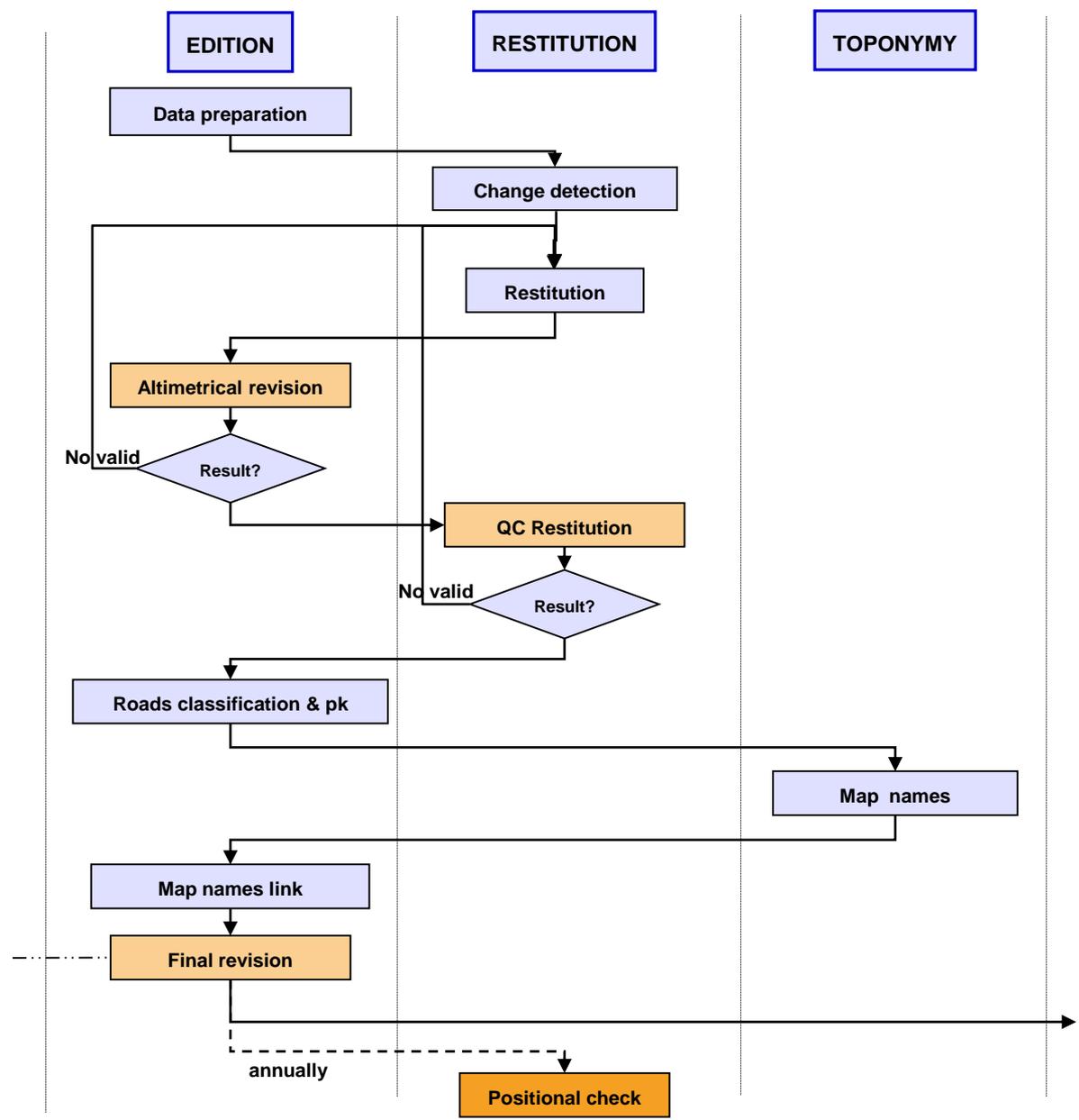
Press F1 for Help. 1:5,371 Catalan

**Quality
system**

Changes

Assurance by design

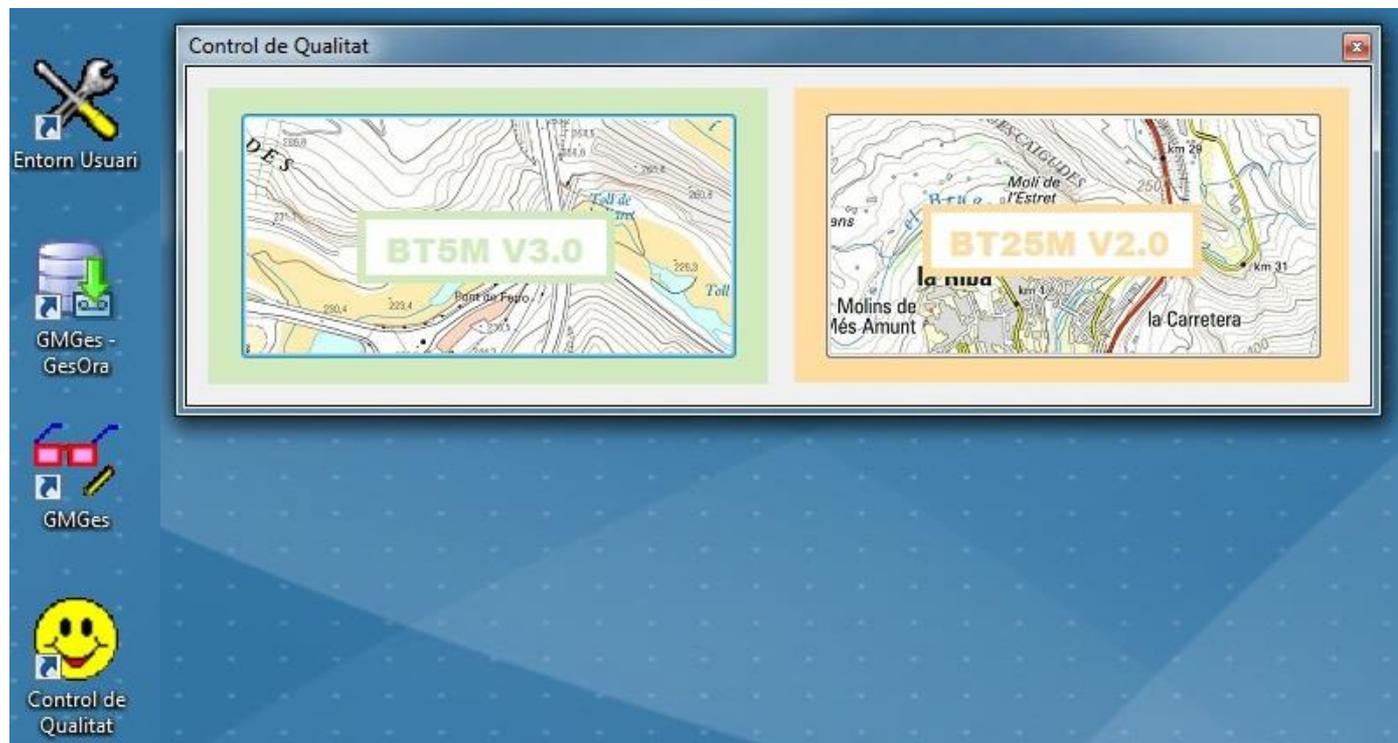
- Full control on feature catalogue: feature classes, authorized attribute combination, attributes domain ...
- Tools designed to ensure the minimum sizes and minimum distances between elements during data capture
- Implementation of the 2D/3D drawing mode for snapping, copy parallel, sharing geometries and sharing vertices
- Tools to force the isotonic or flatness characteristic of features
- Automatic orthogonality inside a range close to 90° in drawing time



CQ manager

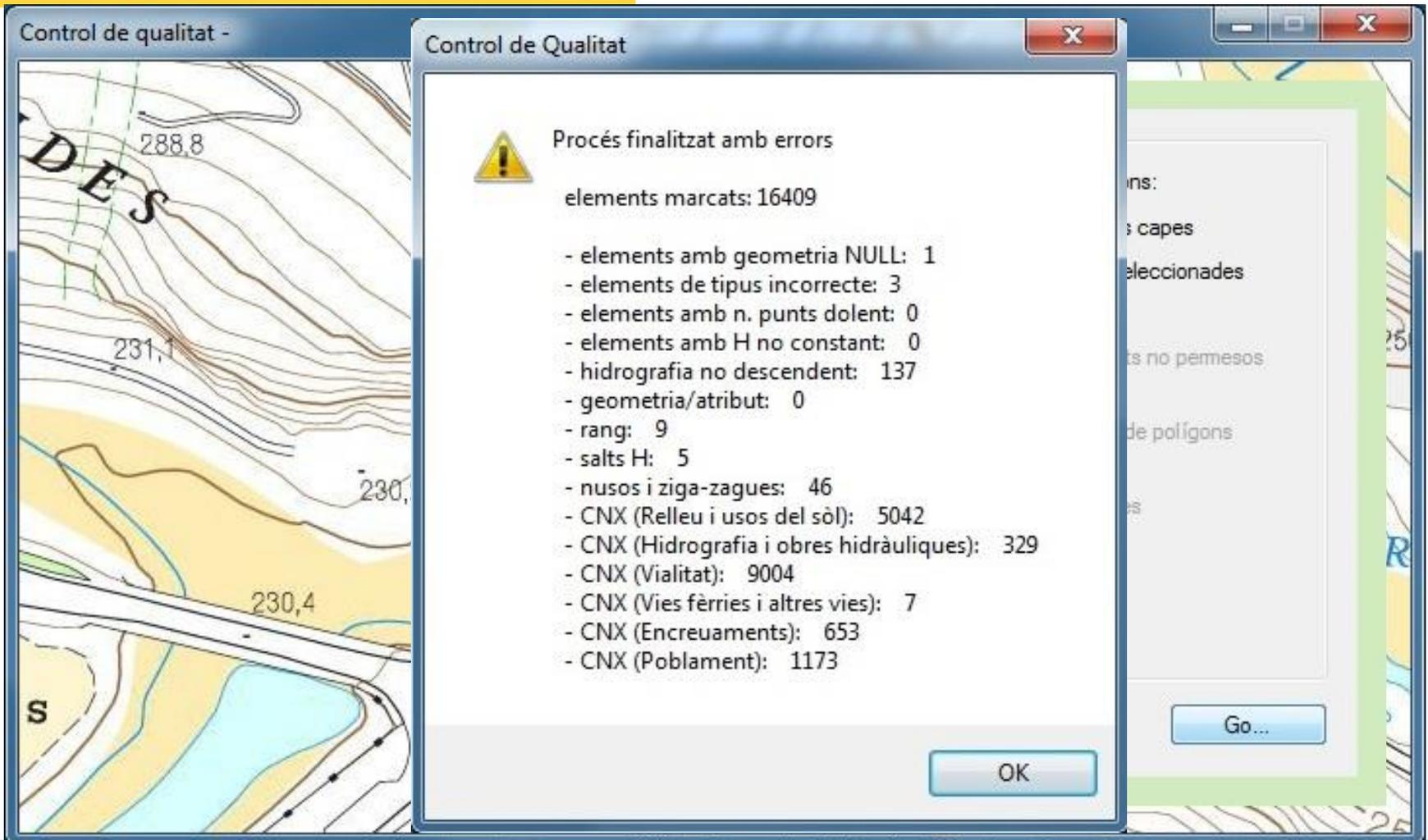
Integrated in the work environment

- Off-line quality control processes for testing the topology constraints, the altimetrical coherence between elements...

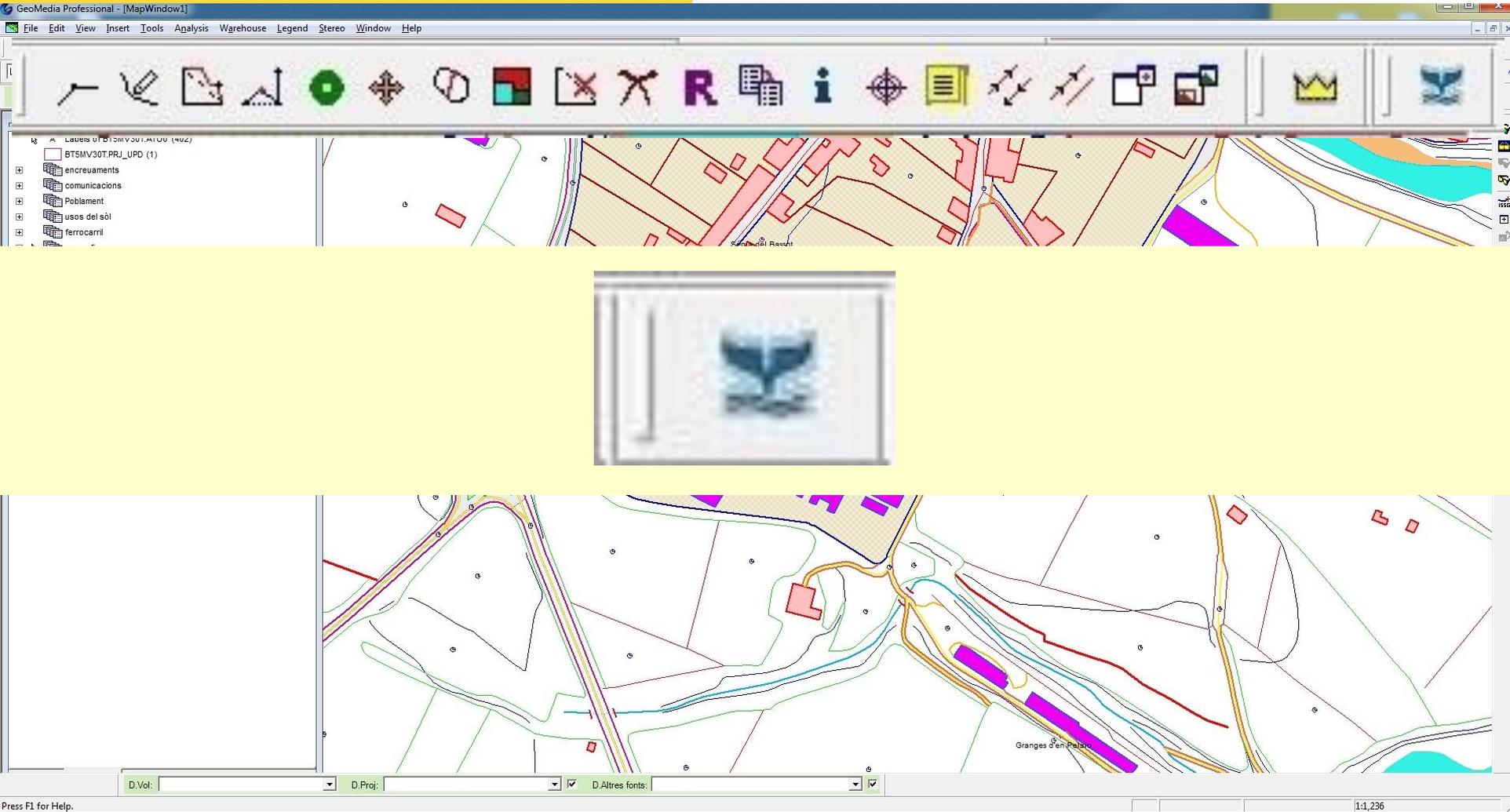


Detection

Warning results marked in the DB

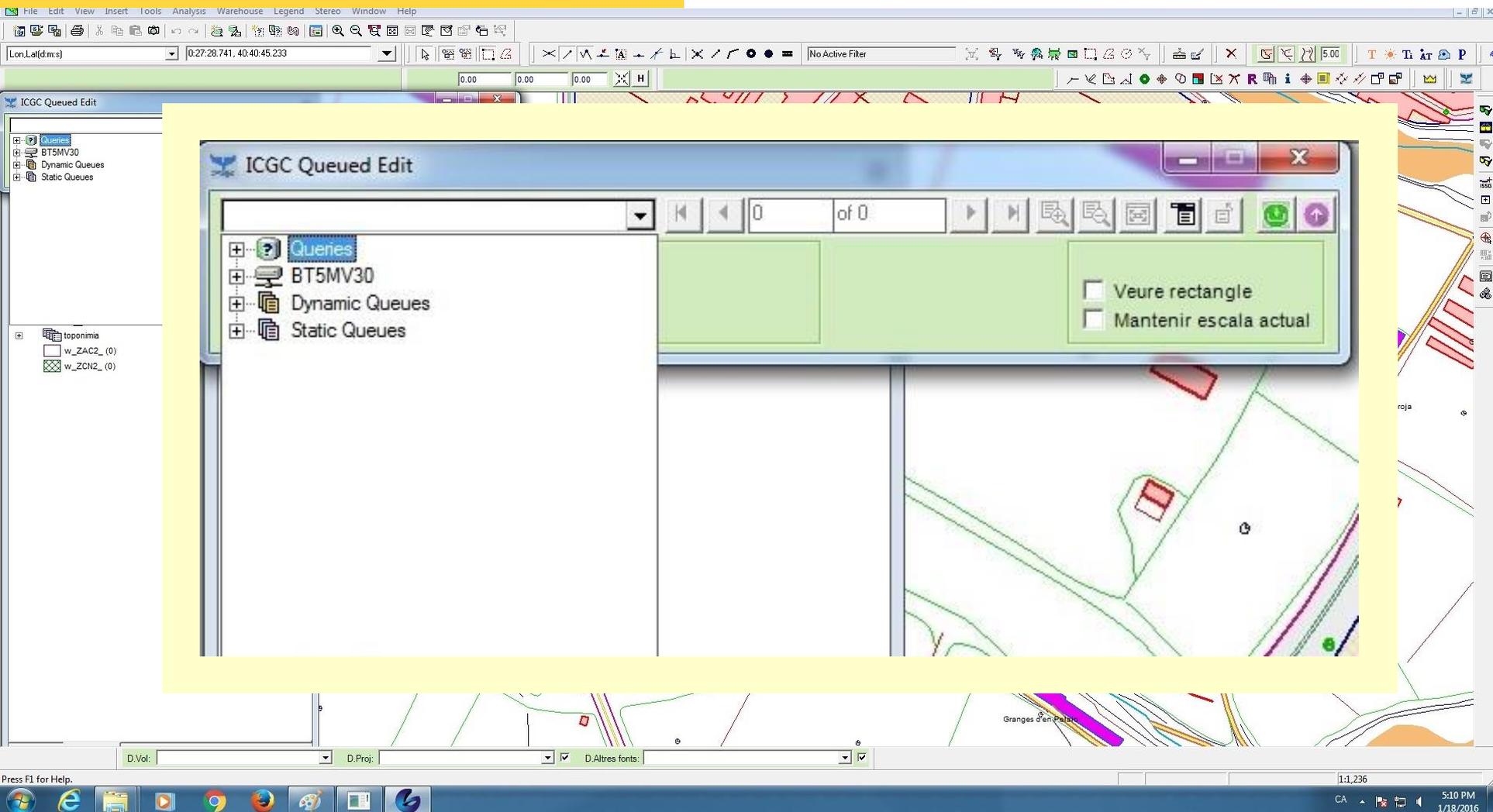


Revision



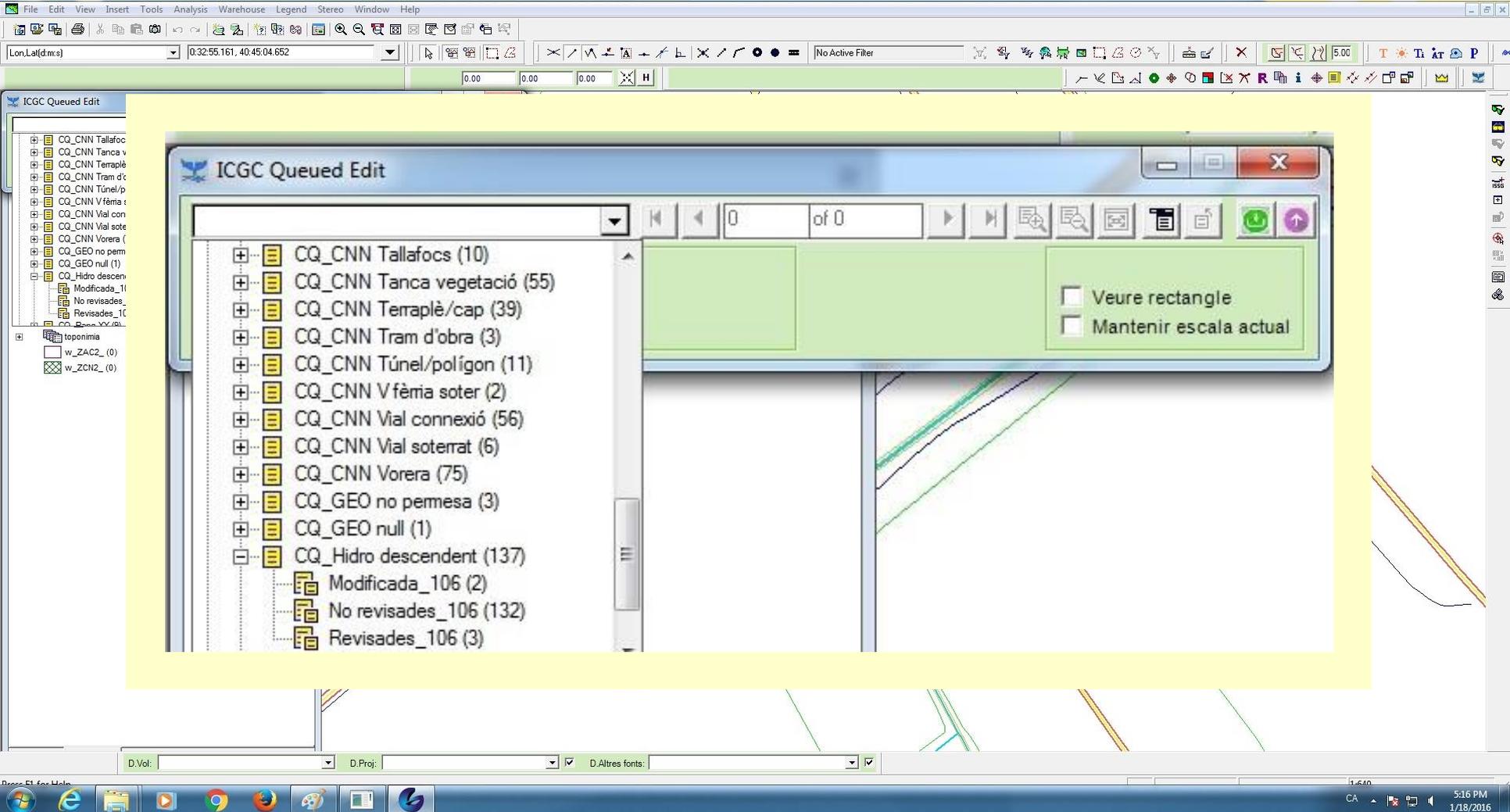
ICGC Queued Edit

Revision



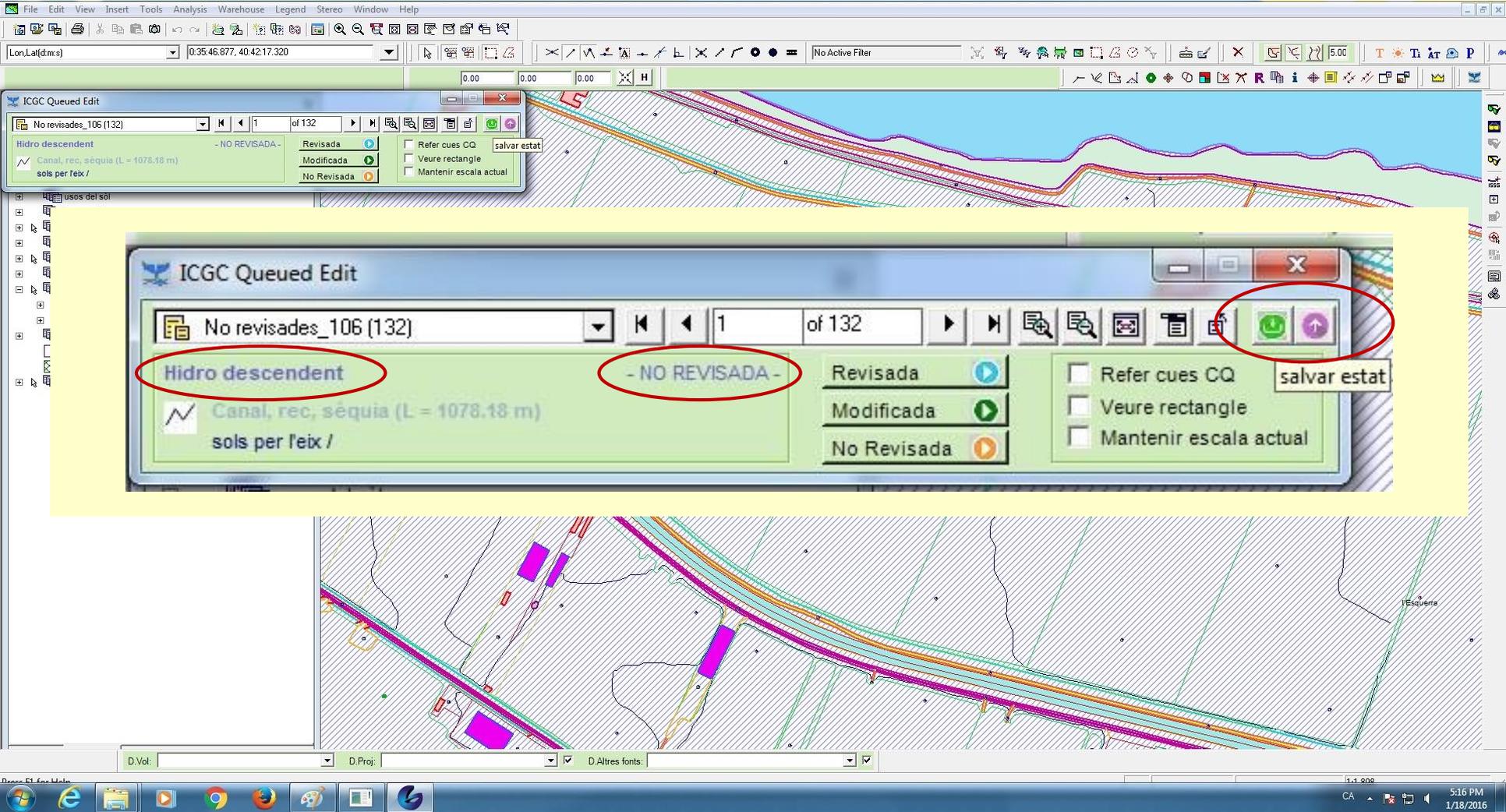
Revision

Classified and Queued Edit

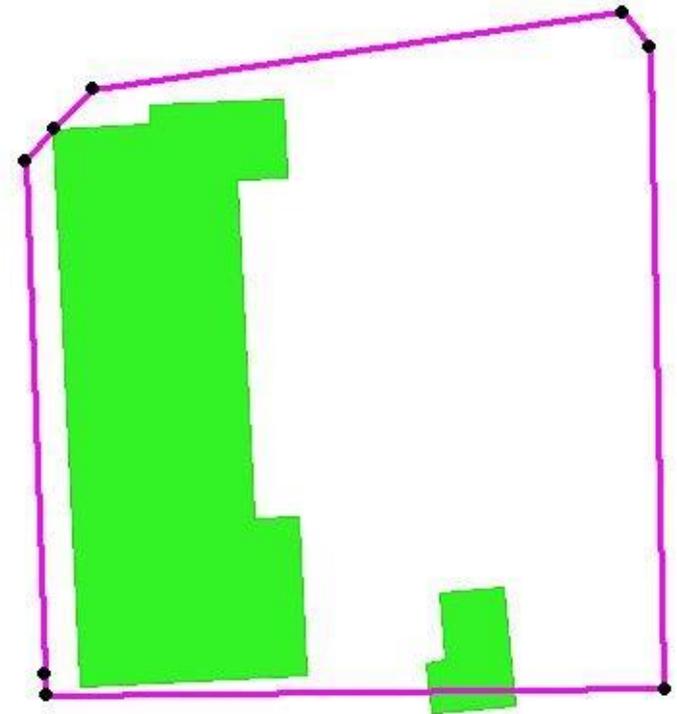
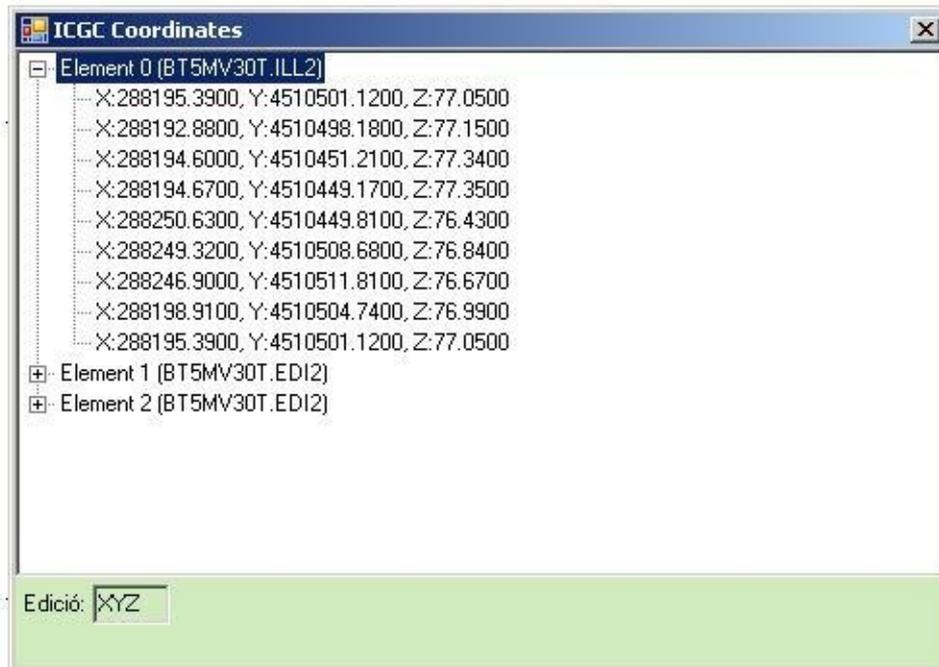


Revision

ICGC Queued Edit Mark as classified for further updates

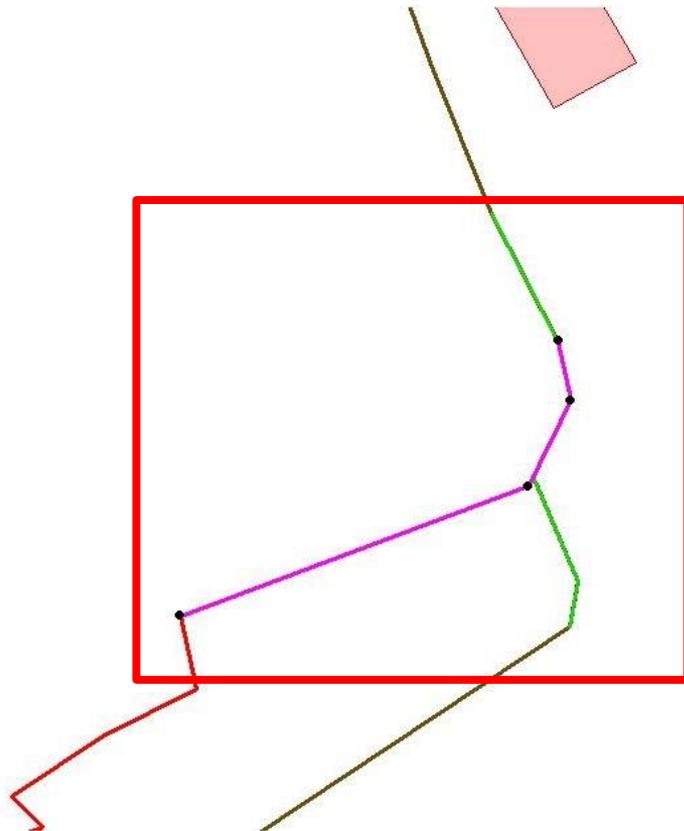


Revision



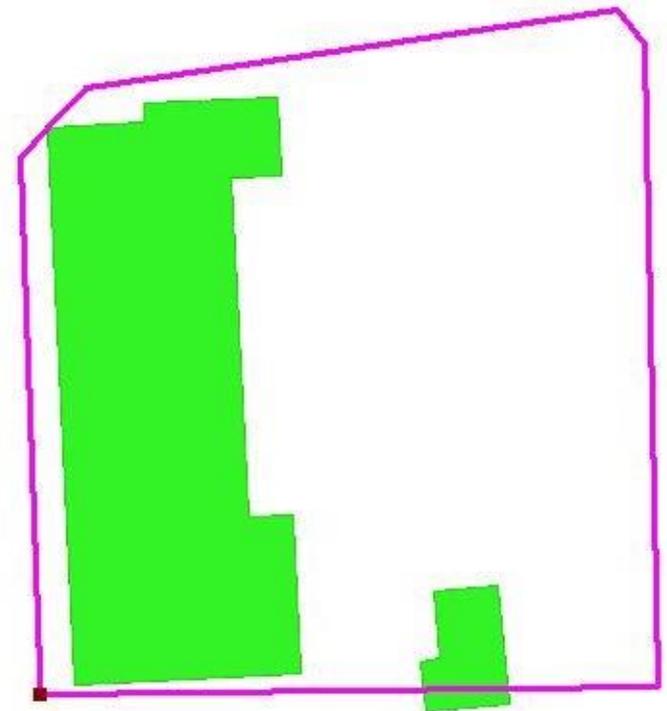
ICGC Coordinates

Revision



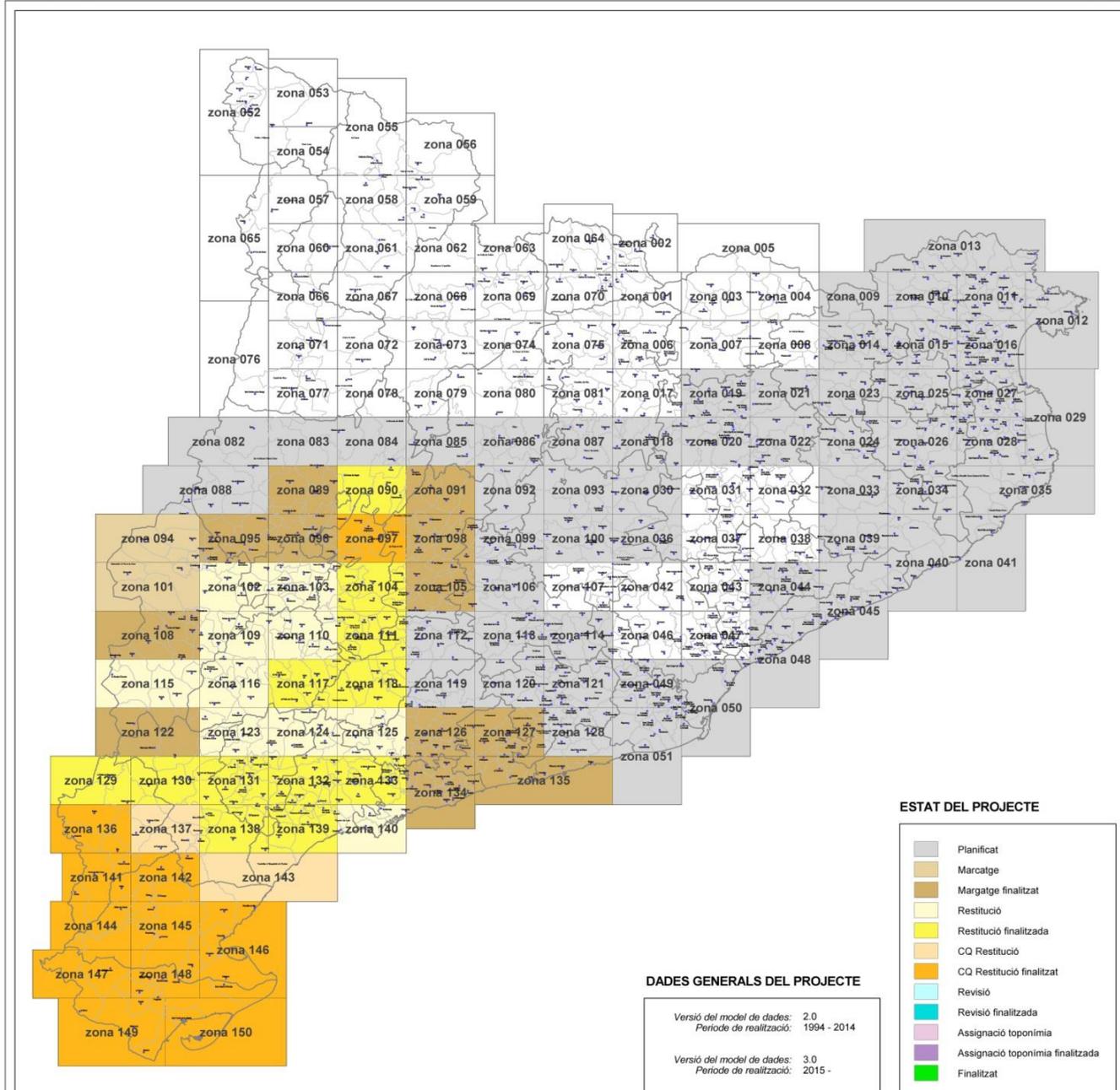
ICGC Coordinates

Revision



Up to the min

- Achievements
- ICGC Data ca
- Workers has
- Production of
- In progress
- Design of dist and thematic
- Content of me



Thank you!

Ευχαριστώ πολύ!

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