

# Outils OpenSource

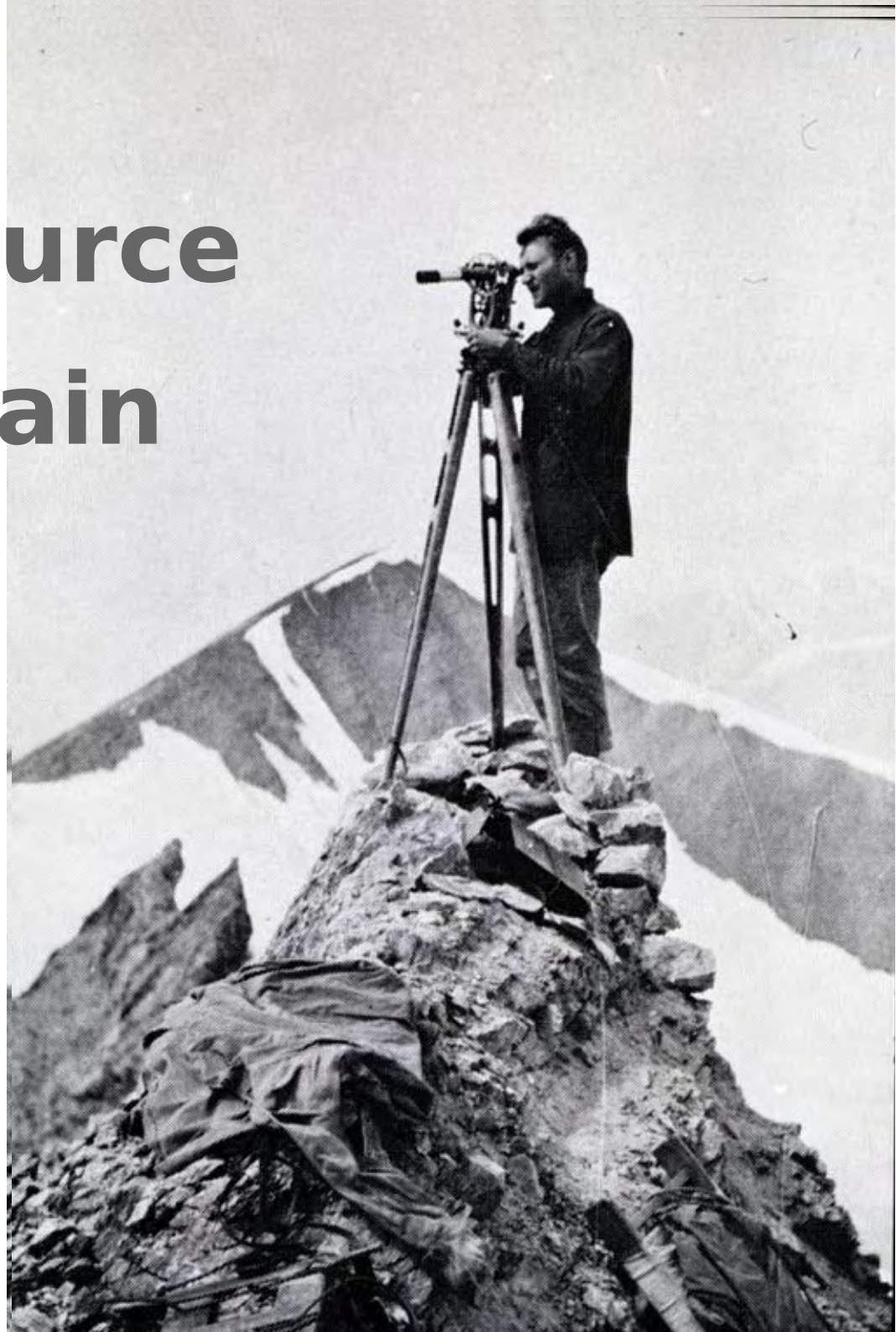
pour le

# Travail de terrain

**Olivier Courtin**

**Vincent Picavet**

**Oslandia**





## **SIG OpenSource depuis 2009**

**Conseil, audit, développement, formation,  
assistance, support...**

**Environnement, transport, eau, énergie,  
smartcity, logistique, geomarketing...**

**PostGIS, QGIS, MapServer, Mapnik, Routing,  
calculs, simulation...**

**[www.oslandia.com](http://www.oslandia.com)**

# PLAN



**Contexte**

**Besoin**

**SIG**

**Données**

**Terrain**

- **Matériel**
- **Logiciel**

**Versionnement**

**Simulation**

**Futur**



# CONTEXTE





# Valcea County, Roumanie

300 000 hab

## Projet Européen Rénovation des réseaux d'eau

### Remise à niveau du SIG

29 stations de captation  
19 stations d'épuration  
1000km distribution  
350km assainissement





# BESOIN



**SIG bureautique**  
**Modèle métier**  
**Données centralisées**  
**Levés terrain**  
**Gestion de versions et hors-ligne**  
**Couplage simulation**  
**Rendus carte + web**  
**Matériel + logiciel + expertise**



**SIG**



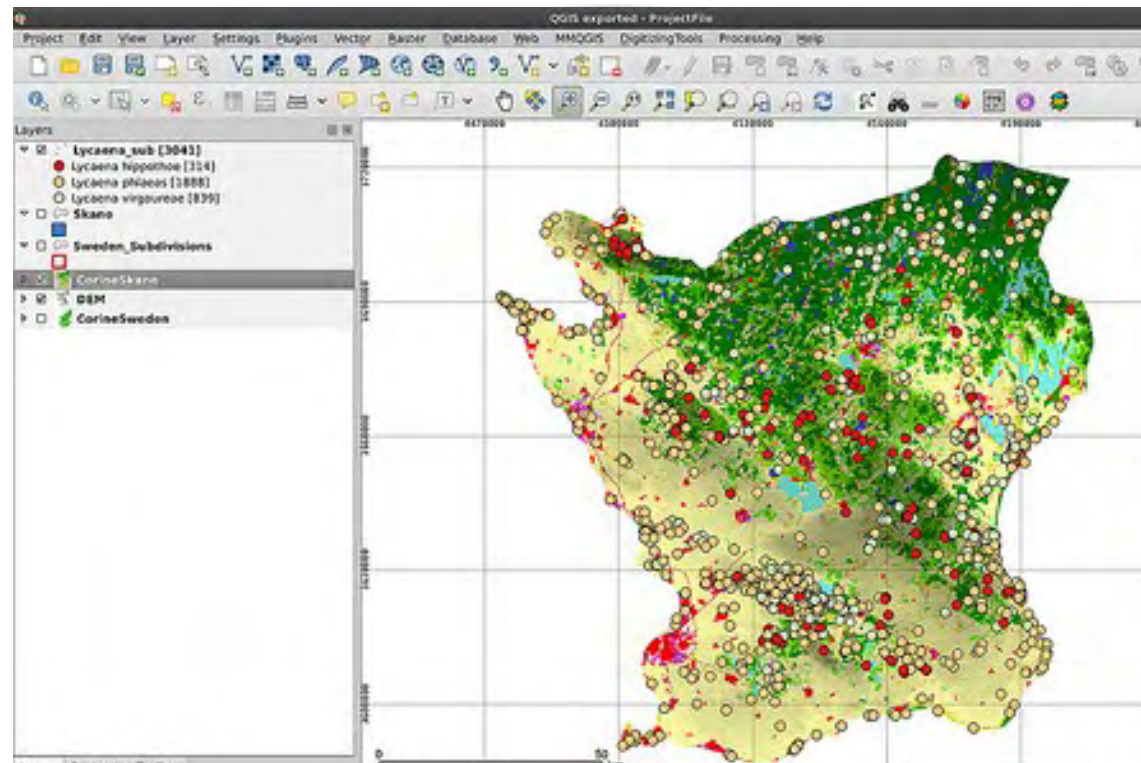


# SIG Bureautique : QGIS

## Développement des projets

- Objets
- Symbologie
- Compositions
- Formulaires

## Formation aux extensions

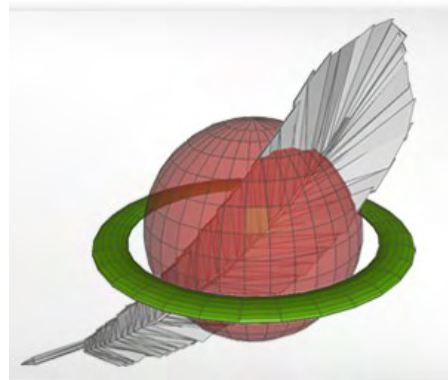




# Référentiel de données : PostGIS

- **Version 9.3**
- **Modélisation**
- **Formation**

**Embarqué : SpatiaLite**



PC

# QGIS

Client

Administration de données  
Gestion de la base  
Quantum GIS  
PgAdmin



(Desktop)

Data



Base de données spatiale

PostgreSQL + PostGIS

Couches raster (Photo satellite...)



Synchronisation  
Versionnement

Serveur

# ROAM

Client

(Mobile)



Data

Base de données spatiale embarquée



Spatialite  
RasterLite

Terrain



# DONNÉES



# Modèle de données

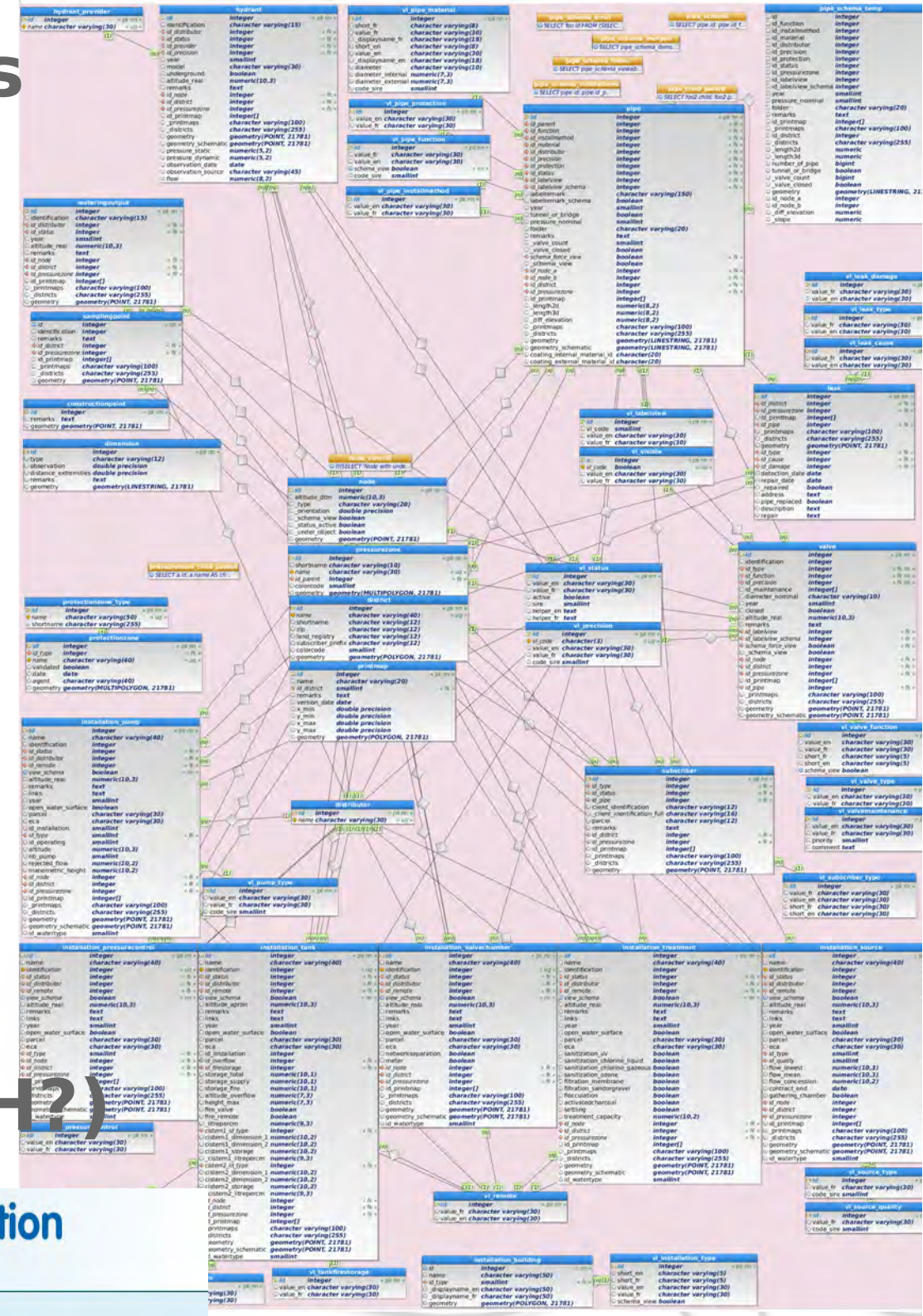
- Distribution
- Assainissement

## Distribution : modèle du SIGE

### Projet qWat

Noeuds, pompes, valves,  
fuites, tuyaux, stations,  
zones de pression,  
réservoirs...

## Assainissement : en cours (norme CH)



# TERRAIN - MATÉRIEL







# GPS



CS25

[http://leica-geosystems.com/downloads123/zz/gpsgis/Zeno\\_GG03/brochures-datasheet/Leica\\_Zeno\\_GG03\\_DAT\\_en.pdf](http://leica-geosystems.com/downloads123/zz/gpsgis/Zeno_GG03/brochures-datasheet/Leica_Zeno_GG03_DAT_en.pdf)

[http://leica-geosystems.com/en/Leica-Zeno-GG03\\_99885.htm](http://leica-geosystems.com/en/Leica-Zeno-GG03_99885.htm)



# Tablette





# PANASONIC FZ-G1

**Windows 8**

(ou 7, ouf)

**64b, 4GB RAM**

**128GB SSD**

**WIFI, Bluetooth**

**3G/4G**

**10" HD**

**tactile + stylet**

**Résistant**



# TERRAIN - LOGICIEL









**Support trames GPS NMEA**  
**Objets métier**  
**Saisie géométries**  
**Notes**  
**Caméra**  
**Ergonomie (touch / stylet)**  
**OpenSource**  
**Configurable**  
**Traduction**  
**« Compatible QGIS »**

# « ROAM »

**Application spécifique**  
**Motorisé par QGIS**  
**Même projets**  
**Même rendu**  
**Vecteur / Raster**  
**En ligne / hors ligne**  
**Données SpatiaLite ou autres**  
**Interface de gestion de projets**

IntraMaps Room: Mobile Data Collection

Map

Home View Aerial Photo Pan Zoom In Zoom Out Select Cam Capture Capture at GPS

Nr. 248  
Nr. 246  
Nr. 1  
Nr. 5  
Nr. 2  
Nr. 11A  
Nr. 11  
Nr. 7-9  
250 PVC STR. MEGA  
300 PVC  
315 PVC  
STR. STRAUBING  
300 PVC  
Nr. 2  
Nr. 6  
Nr. 8  
Nr. 10  
Nr. 10A  
Nr. 12  
Nr. 12A  
Nr. 14  
Nr. 16  
Nr. 16A  
Nr. 57  
Nr. 55  
Nr. 2  
Nr. 4

Projects  
Sync  
Settings  
Quit

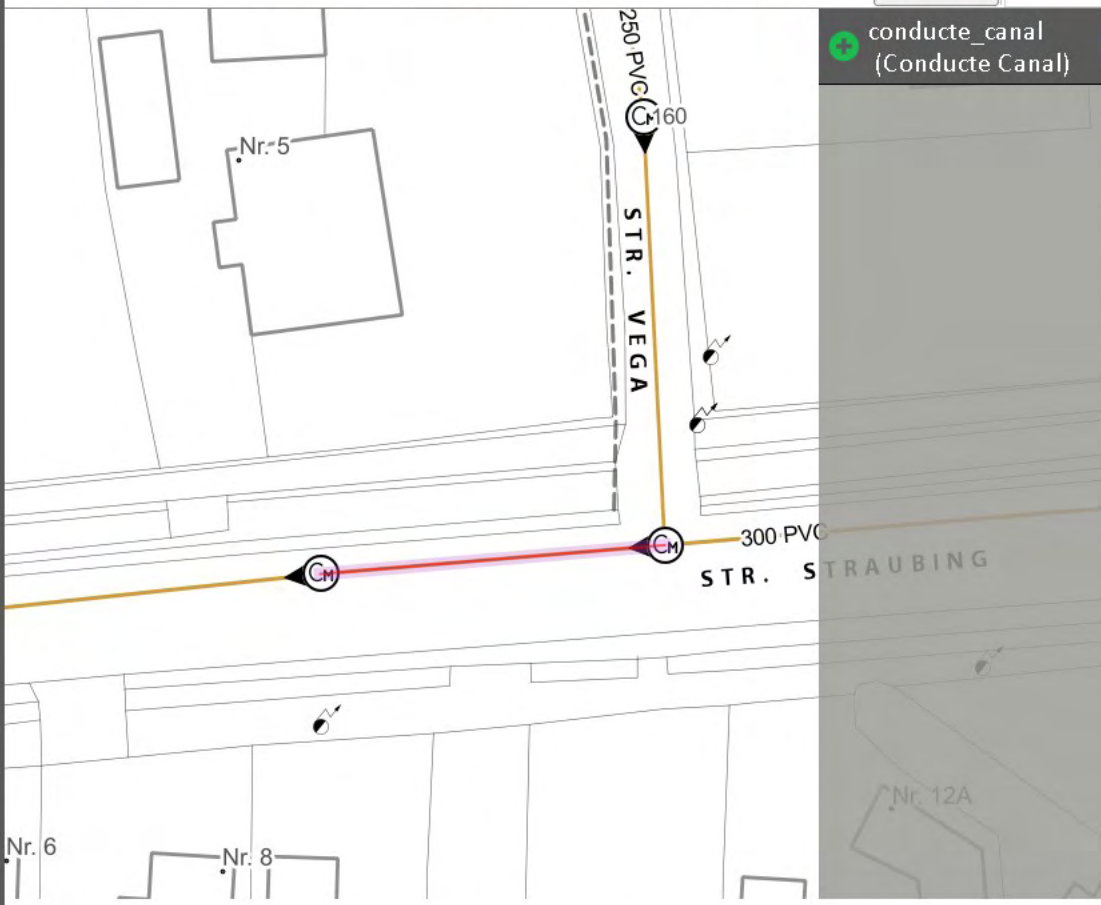
Project: Canalizare Valcea User: Tableta.04

Map Center: 451919.853868, 400844.518249

Map

Home View Aerial Photo Pan Zoom In Zoom Out Select Cam Capture Capture at GPS

Projects  
Sync  
Settings  
Quit



conducte\_canal (Conducte Canal) 1 of 1

Id	1092
Tip Conducta	Menajera
Material	PVC
Diametru	300
Stare Functionala	Functional
Strada	STR. STRAUBING
Forma Conducta	Circular
An Executie	2010
Descriere	NULL
Ult Editor	postgres
Ult Data	2014-03-11 09:44:00
Ar Iesire	266
Ar Intrare	285

Project: Canalizare Valcea User: Tableta.04

Map Center: 451909,701333,400848,282672



Map  
Data Entry

  
Delete

 Cancel  Save

Diametru

Material

Stare Functionala

Forma Conducta

AR intrare

AR iesire

Descriere

 Projects  
 Sync  
 Settings  
 Quit

Cancel Save

- Map
- Data Entry
- Projects
- Sync
- Settings
- Quit

ID Conducta

Stare

Funcție

Precizie

Precizie alti

Tip

Observatii

Precizie alti

- Imprecisa
- Mai buna de 100 cm
- Mai buna de 50 cm
- Mai buna de 10 cm
- Mai buna de 5 cm
- Necunoscuta

IntraMaps Roam: Mobile Data Collection

Map  
Data Entry

Projects  
Sync  
Settings  
Quit

Function: Conducta de distributie  
Installation Method: Ingropare  
Material/Dimensions: Polietilena 80  
Distributor: APAVIL  
Precision: Precisa  
Status: Functional  
Pipe Type: Potabila  
Remark:

Cancel Save

2:26 PM  
4/8/2014



Map

Data Entry

Projects

Sync

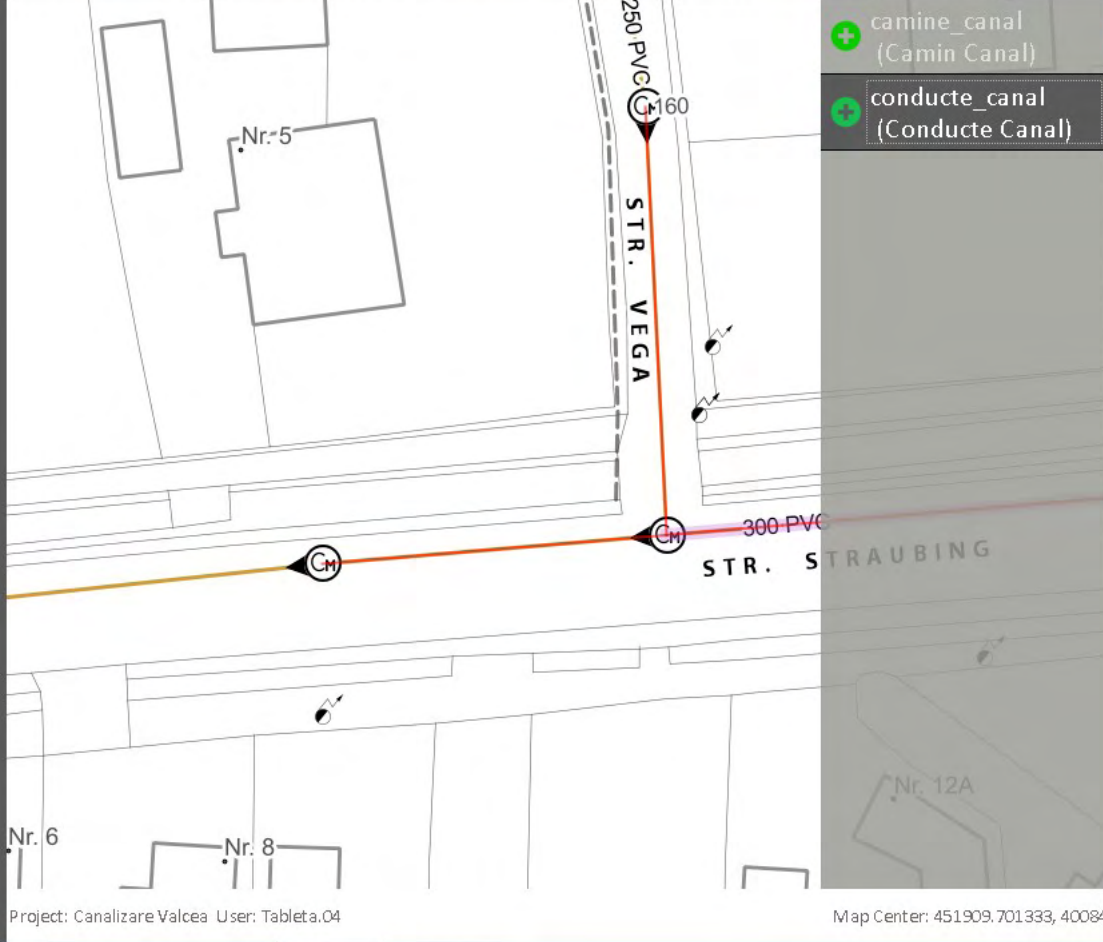
Settings

Quit

Home View Aerial Photo Pan Zoom In Zoom Out Select

Cam

Capture Capture at GPS



1 of 3

Id	1091
Tip Conducta	Menajera
Material	PVC
Diametru	300
Stare Functionala	Functional
Strada	STR. STRAUBING
Forma Conducta	Circular
An Executie	2010
Descriere	NULL
Ult Editor	postgres
Ult Data	2014-03-11 09:44:00
Ar Iesire	285
Ar Intrare	281

Map Center: 451909.701333, 400848.282672

IntraMaps Roam: Mobile Data Collection

Map | Data Entry

Home View | Aerial Photo | Pan | Zoom In | Zoom Out | Select | Cam+ | Capture | Capture at GPS

Projects | Sync | Settings | Quit

Project: Canalizare Valcea User: Tableta.04 | Map Center: 451909.701333, 400848.282672



IntraMaps Room: Mobile Data Collection

Map

Home View Aerial Photo Pan Zoom In Zoom Out Select Conduct Capture End Capture

AL. OLANESTI

Bloc 11

Bloc 11

Bloc 11

Bloc 12

Projects

Sync

Settings

Quit

Project: Valcea Apa/Canal User: Tableta GIS

Map Center: 450188.578369, 400151.935477



IntraMaps Roam: Mobile Data Collection

Map

Home View Aerial Photo Pan Zoom In Zoom Out Select Conduct Capture End Capture

Bloc 10

PT 11

Bloc 16

Bloc 17

Bloc 15

Project: Valcea Apa/Canal User: Tableta GIS

Map Center: 450096.528126, 400138.959405

The image shows a mobile GIS application interface. At the top, a blue title bar reads 'IntraMaps Roam: Mobile Data Collection'. Below it is a toolbar with icons for Home View, Aerial Photo, Pan, Zoom In, Zoom Out, Select, Conduct, Capture, and End Capture. The 'Capture' button is highlighted with a green line. The main map area displays a technical drawing of building footprints. A blue line with two orange dots is drawn across the map, connecting a point on 'Bloc 16' to a point on 'Bloc 10'. Other labeled areas include 'Bloc 17' and 'Bloc 15'. A purple crosshair is visible at the bottom center of the map. On the left side, a dark sidebar contains menu items: Projects, Sync, Settings, and Quit. At the bottom, status information shows 'Project: Valcea Apa/Canal User: Tableta GIS' and 'Map Center: 450096.528126, 400138.959405'.

# Interface de gestion



IntraMaps Config Manager

Tree Inspection (Sample)

Open Project Folder    Open In QGIS    Save Project

Project Title  
Tree Inspection (Sample)



Description  
Sample tree inspection module

Enable any layers that should be enabled for selection. Point selection layers can also be used for data capture.

- Main Roads
- Adjacent Councils
- Trees
- River
- House Number

Compatible Roam Version  
2.0.0    You are running IntraMaps Roam version 2.0.0

Splash





- +
- Roam
- Projects (1)
  - Tree Inspection (Sample)
- Map
- Forms (2)

### Tree Inspection (Sample)

Open Project Folder    Open In QGIS    Save Project



# Tree Inspection (Sample)

Open Project Folder    Open In QGIS    Save Project

Form folder [trees2](#)

Label

Capture Layer

Type

Form    Preview

Add Attribute   

- ID (Text)
- Ward (List)
- Photo (Image)
- Inspection Date (Date)
- Powerlines over head? (List)
- Suburb (List)
- Tree height (m) (Text)
- Condition (List)
- Botanical Name (List)

## Attribute

Field

Name

Control

Required?

Hidden?

Read Only

Default Value

Allow Null Value

From layer

From pre-defined list

Single item per line. Descriptions can be added after the item using a semicolon e.g Test ; My Testing

```

Sub Type;Como Beach
Sub Type2;Mill Point
Sub Type3;Moresby
Sub Type4;Manning

```

Roam

Projects (1)

- Tree Inspection (Sample)
  - Map
  - Forms (2)
    - Second Inspection
    - Tree Inspection

# VERSIONNEMENT





# Contraintes fortes du projet :

- **historisation**
- **travail déconnecté**
- **création de scénarios**

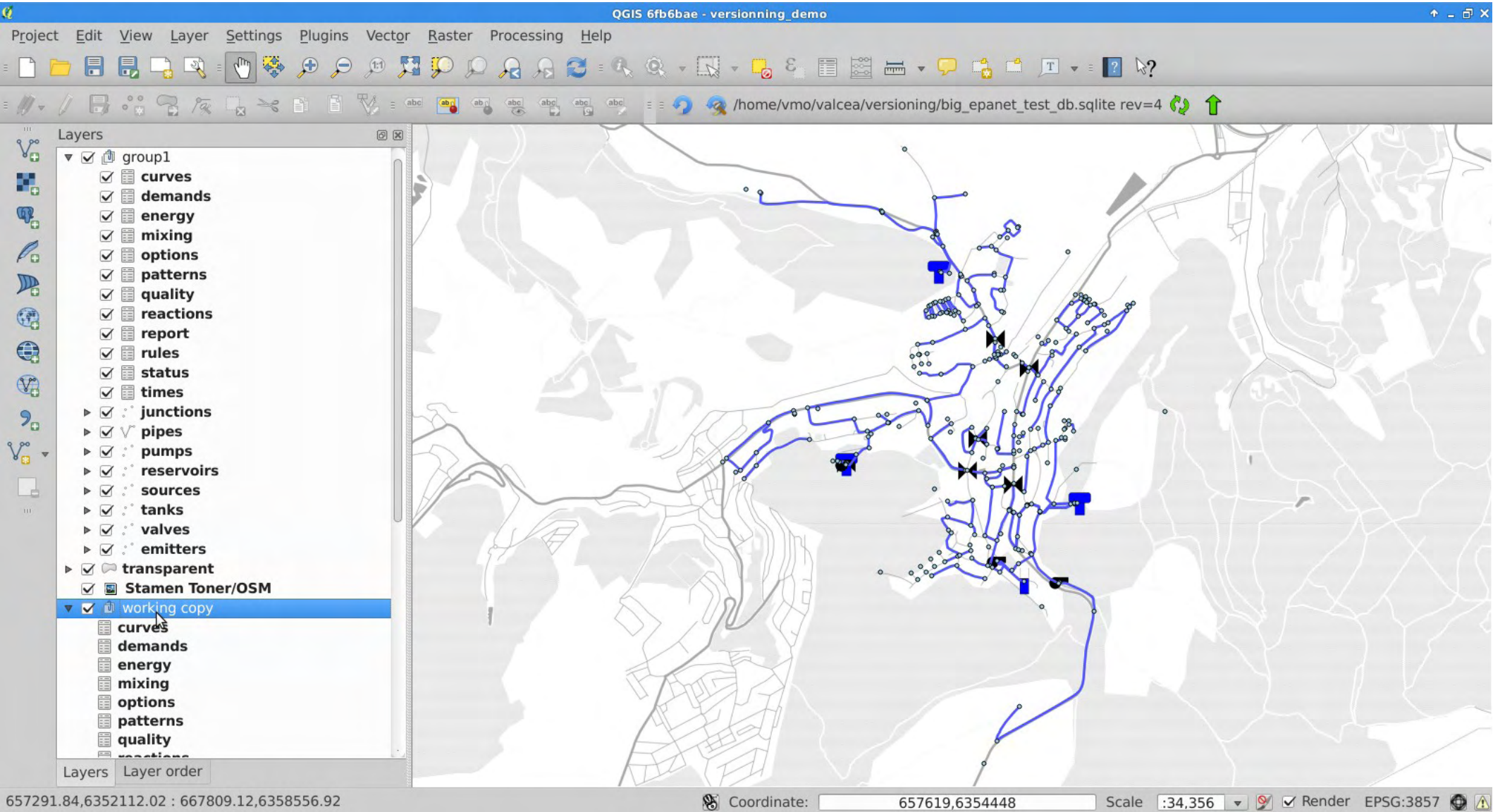
**=> versionnement de donnée**

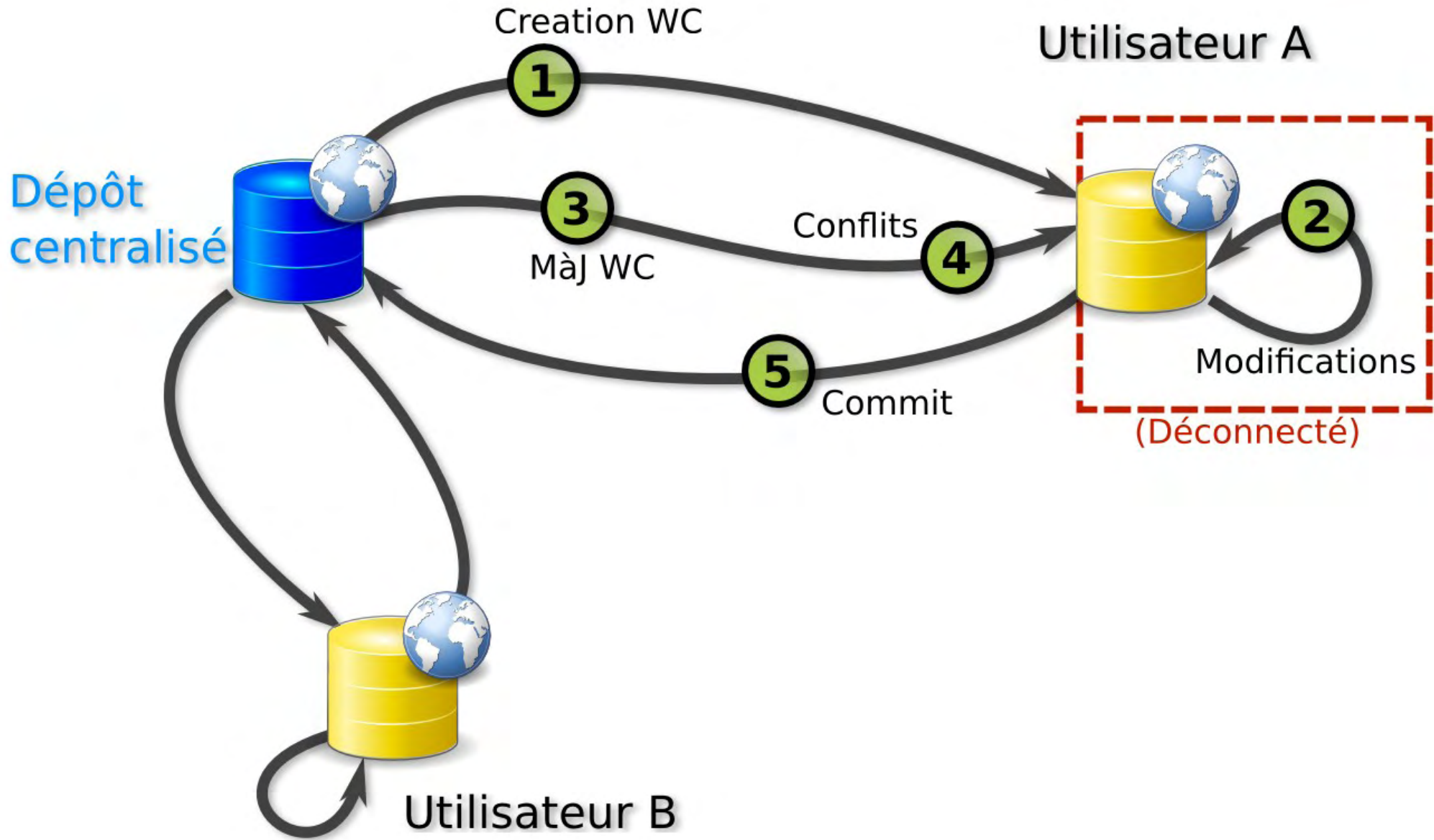
- **PostGIS / SpatiaLite**
- **commits**
- **branches**
- **résolution de conflits**



# Copie de travail (WC)

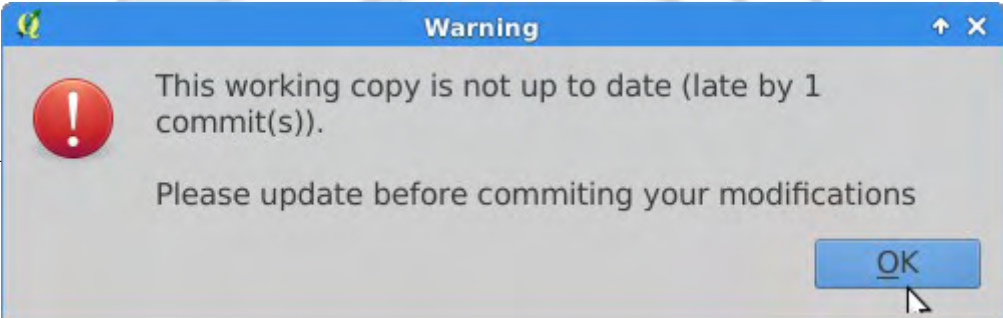
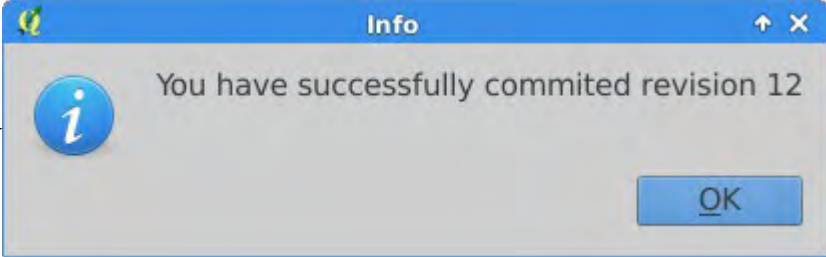
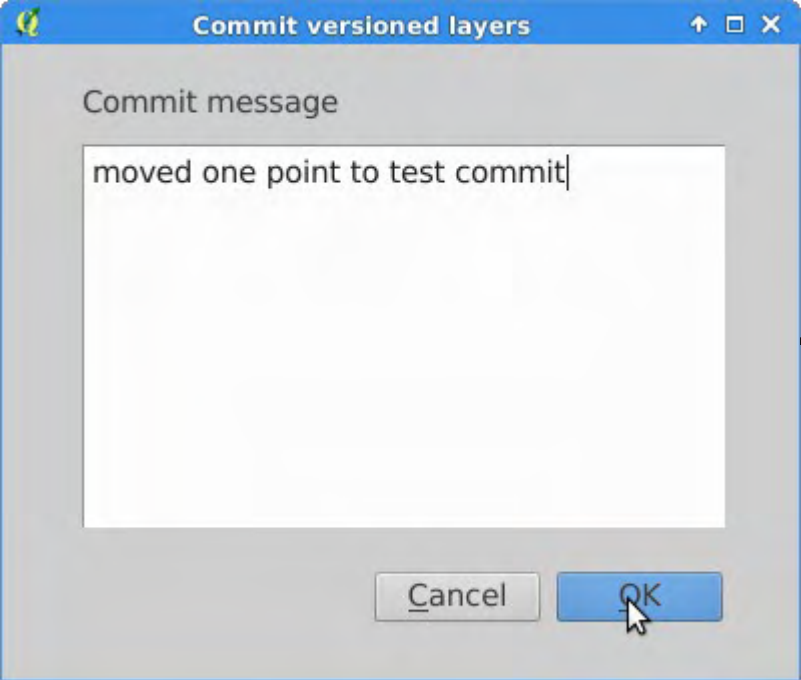
- déconnectée (SpatiaLite) → Tablette
- en base







# Commit





# SIMULATION





# Intégration EPANET

## Simulation hydraulique

### Processing = géotraitements

QGIS 6fb6bae - demo

Project Edit View Layer Settings Plugins Vector Raster Processing Help

Layers

- Link output table (time...)
- Node output table (tim...)
- Link output table
- Node output table
- ✓ JUNCTIONS
  - high pressure
  - low pressure
- ✓ PIPES
  - stagnation
- ✓ PUMPS
- ✓ RESERVOIRS
- ✓ SOURCES
- ✓ TANKS
  - stagnation
  - overflow
  - empty
- ✓ VALVES
- ✓ EMITTERS
- \* CURVES
- DEMANDS
- ENERGY
- MIXING
- OPTIONS
- PATTERNS
- QUALITY

Processing Toolbox

Search...

- Recently used algorithms
  - Mean coordinate(s)
  - Statistics by categories
  - Simulate flow in drinking water network
  - v.voronoi - Creates a Voronoi diagram fr...
  - Return result of an SQL query on any la...
- Epanet (Drinking water flow simulation) [1...
  - Simulation
    - Simulate flow in drinking water netw...
- GDAL/OGR [32 geotools]
- GeoServer/PostGIS tools [8 geotools]
- GRASS commands [157 geotools]
- Models [4 geotools]
- Orfeo Toolbox (Image analysis) [76 geotools]
- QGIS geotools [67 geotools]
- SAGA [243 geotools]
- Scripts [10 geotools]
- Spatialite (Drinking water flow simulation/...

Coordinate: 663640,6355491 Scale 1:23,496 Render EPSG:3857

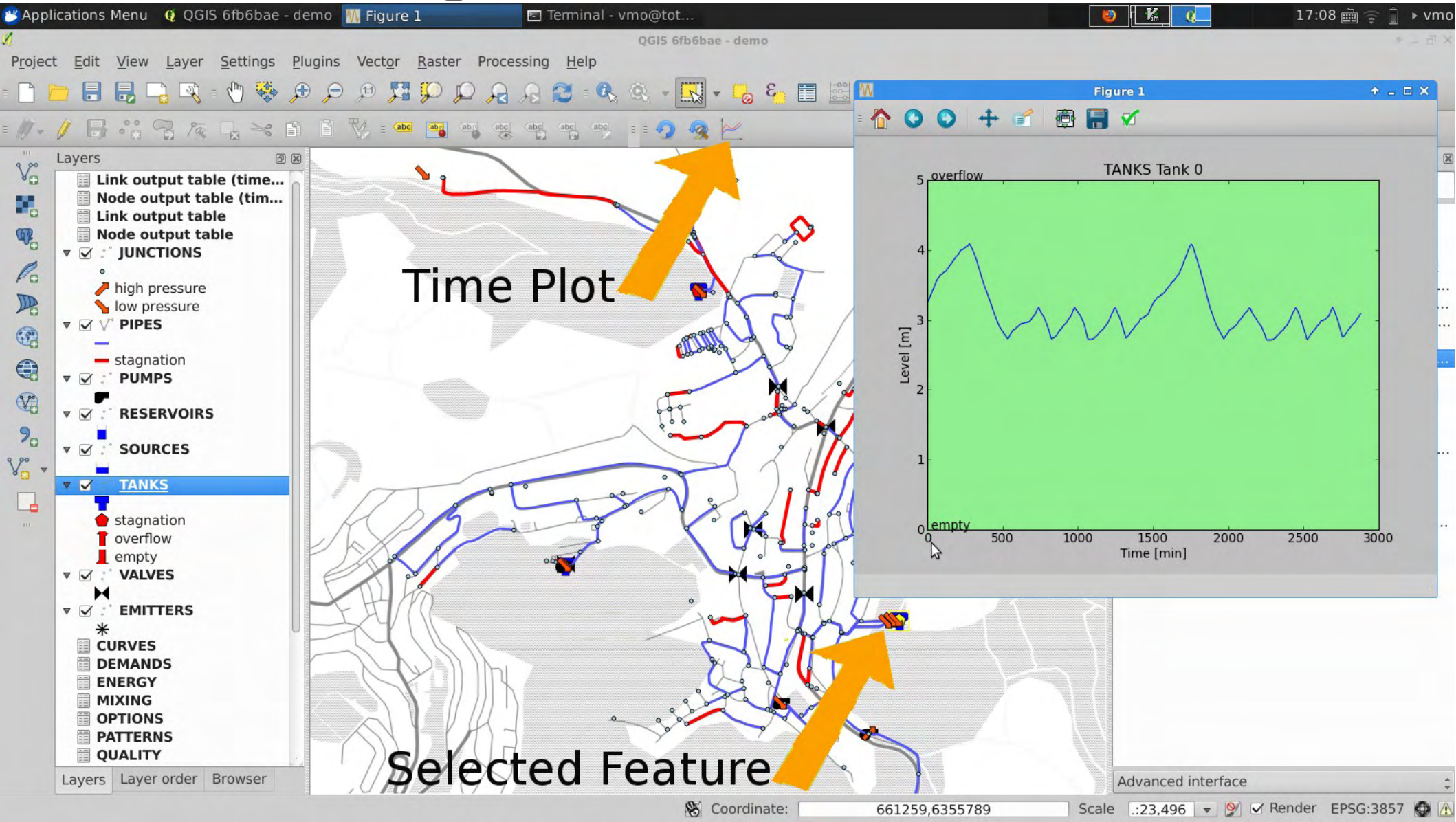


# Cartographie des résultats

## Plugin de visualisation temporelle

### Intégration BdD

### Intégration SWMM à venir



# FUTUR





# **Amélioration objets métier**

**Modèle de données (+assainissement), interface QGIS**

# **Amélioration logiciel terrain**

**Suivi et infos GPS, capture sur canvas...**

# **Connexions SCADA**

# **Webservices Carto, SOS**

# **Pile applicative intégrée**

# **Communauté**

**Utilisateurs, contributeurs, financeurs**

# Questions ?

**@vpicavet**

**@Oslandia\_fr**

**infos@oslandia.com**

**www.oslandia.com**

**Merci à**

**Vincent Mora**

**Hugo Mercier**

**Tudor Barascu**

**Denis Rouzaud**

**GIS Office of Apavil**

