Modelarea şi prelucrarea distribuită a datelor spațiale geografice şi de mediu

Dorian Gorgan, Cornelia Melenti, Alexandru Imbroane,
Victor Bâcu, Ovidiu Mureşan şi Rareş Bărbănțan
Universitatea Technica, Universitatea Babes-Bolyai din Cluj-Napoca
dorian.gorgan, cornelia.melenti@cs.utcluj.ro, victorbacu@yahoo.com

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- Modelarea si vizualizarea spatiului virtual geografic
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Cerinte, Obiective

- Prelucrarea paralela si distribuita a datelor masive (spatiale, aplicatie)
- Accesul simplu al utilizatorilor la informatii geografice si de mediu
- Accesul specialistilor la resurse de calcul si prelucrare de foarte mare putere
- Compatibilitatea cu tehnologiile existente (formate, unelte, baze de date etc)
- Arhitectura flexibila, distribuita cu utilizarea in comun a datelor si resurselor de calcul (Arhitectura bazata pe servicii Web, servicii Grid, servicii de Web Semantic)
- Prelucrari care necesita resurse de calcul specializate (modelarea spatiului virtual, vizualizare fotorealista, simulare situatii de criza, modelarea riscului, modelarea ecosistemica etc)

Solutii

- Utilizarea in comun a resurselor
- Prelucarrea distribuita in arhitecturi specializate
- Cooperarea interdisciplinara
- Utilizarea tehnologiilor actuale cu directiile moderne de cercetare

Infrastructura MedioGrid

MedioGrid

– Prelucrarea grafică paralelă și distribuită pe structura grid a datelor geografice și de mediu.

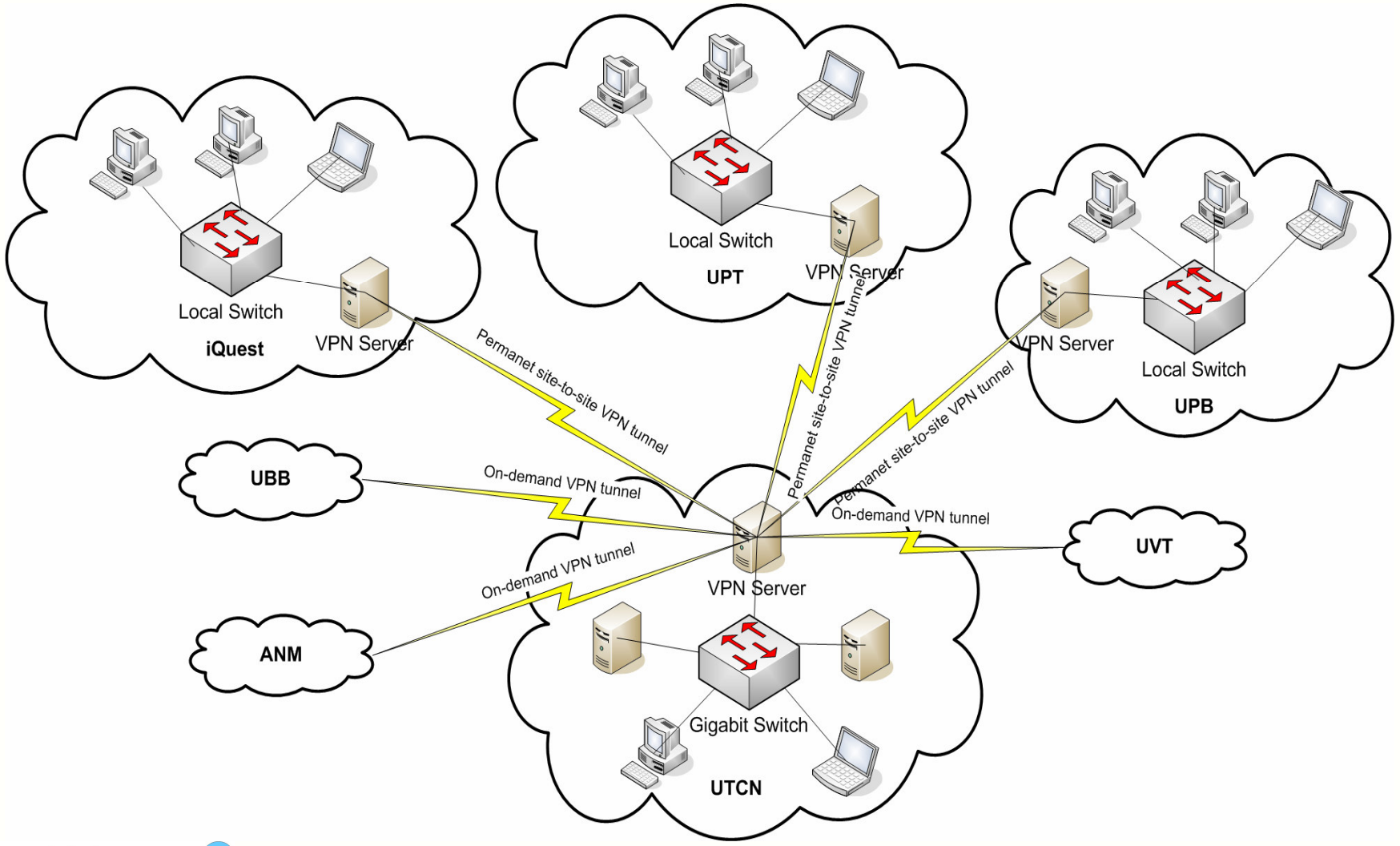
Consortiu de cercetare:

- Universitatea Tehnica din Cluj-Napoca
- Universitatea Babes Bolyai Cluj-Napoca
- Administratia Nationala de Meteorologie
- Universitatea Politehnica Bucuresti
- Universitatea de Vest Timisoara
- iQuest Technologies
- Universitatea Politehnica Timisoara

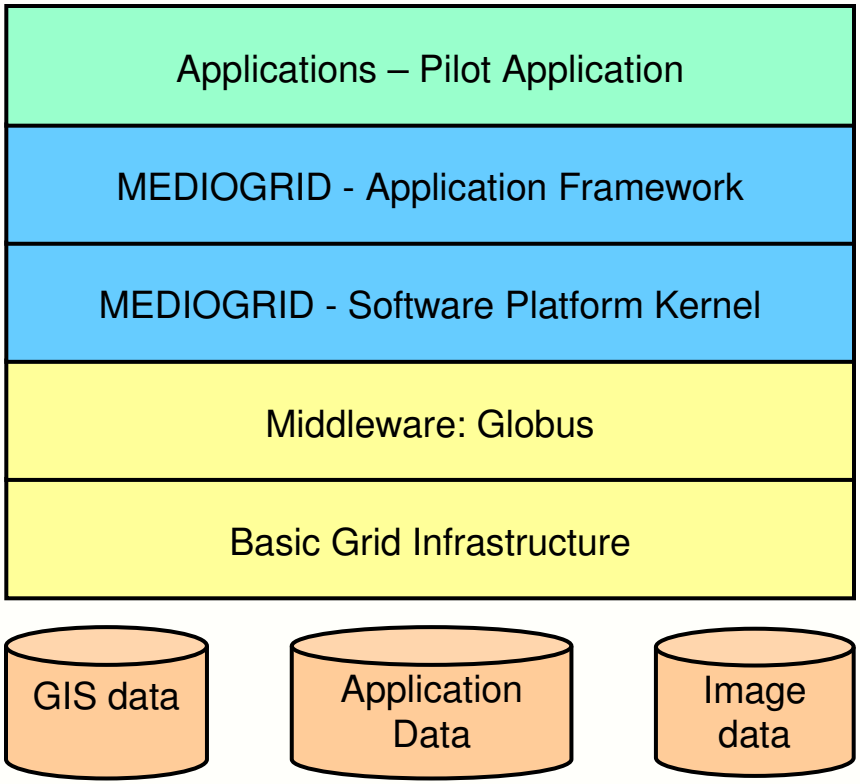
Infrastructura MedioGrid

- Obiective
  - Dezvoltarea unei structuri Grid care sa permita prelucrarea distribuita a datelor masive (geografice si de mediu)
  - Dezvoltarea unor algoritmi pentru prelucarea pe Grid a imaginilor satelitare si a datelor spatiale
  - Dezvoltarea si experimentarea unor aplicatii geografice si de mediu cu date extrase din emagini satelitare
  - Modelarea si vizualizarea spatiului virtual geografic

Arhitectura MedioGrid

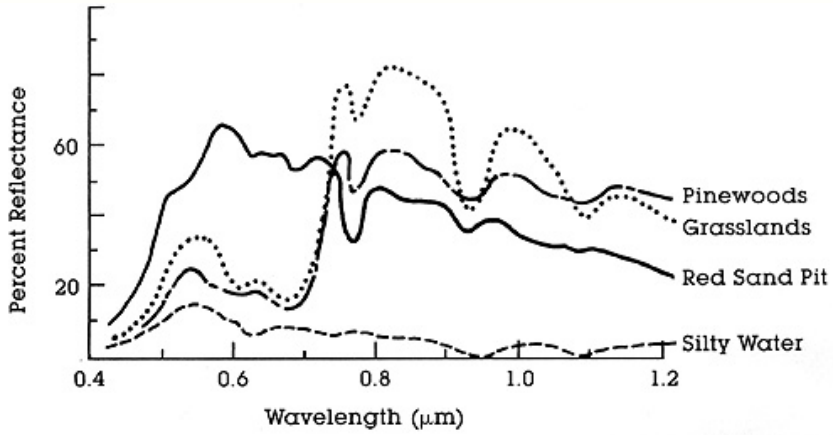


Nivelele functionale MedioGrid



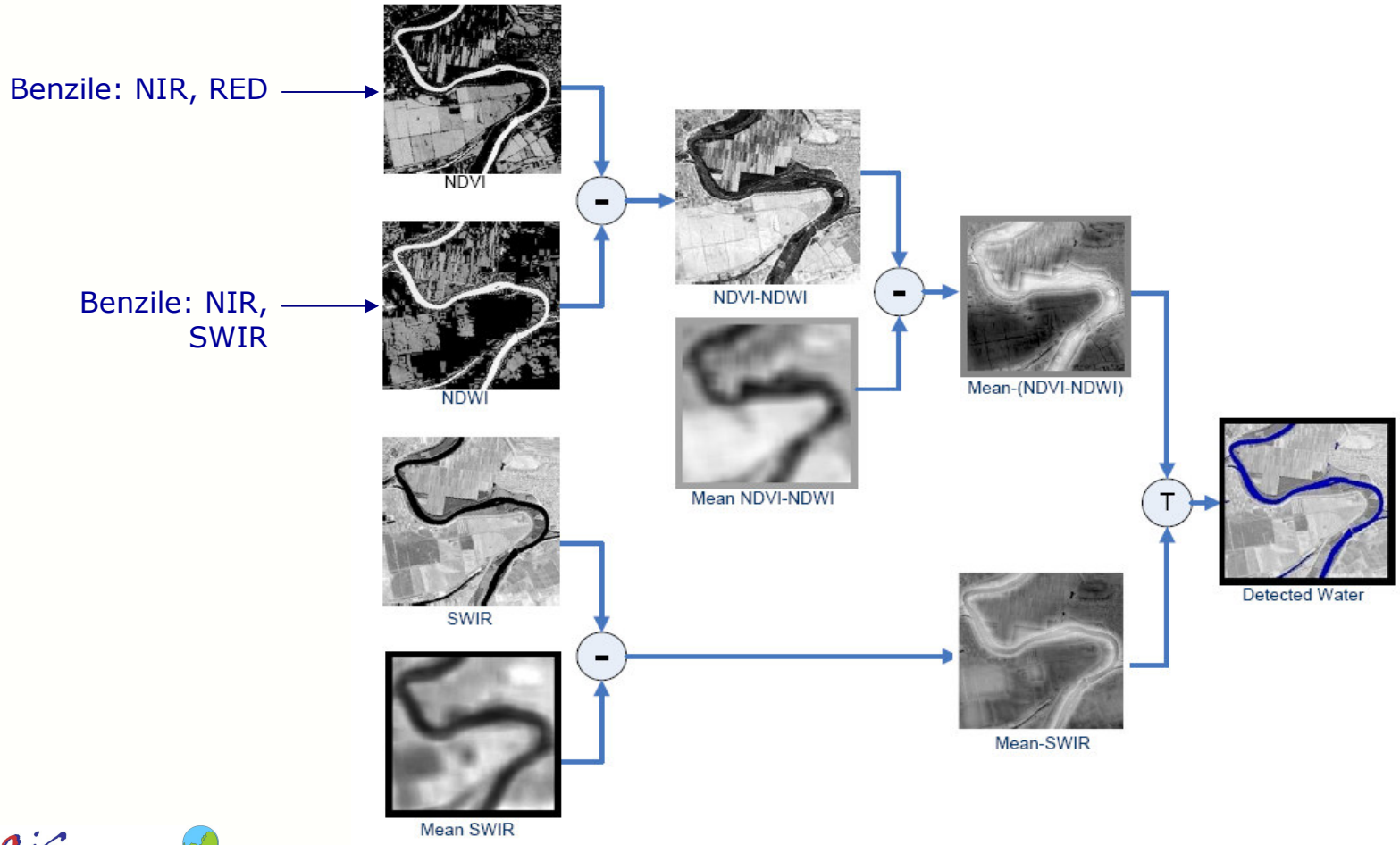
Platforma Software MedioGRID - Prelucrari

- Imagini satelitare: QuickBird, Ikonos, Modis, Aster, Landsat
- Imagini satelitare MODIS preluate on-line de pe server NASA
- Parametrii de intrare pentru prelucrare: fereastra de timp, aria geografica, tip prelucrare, …
- Detectie si supervizare: vegetatie, inundatii, incendii forestiere, …
- Semnatura spectrala

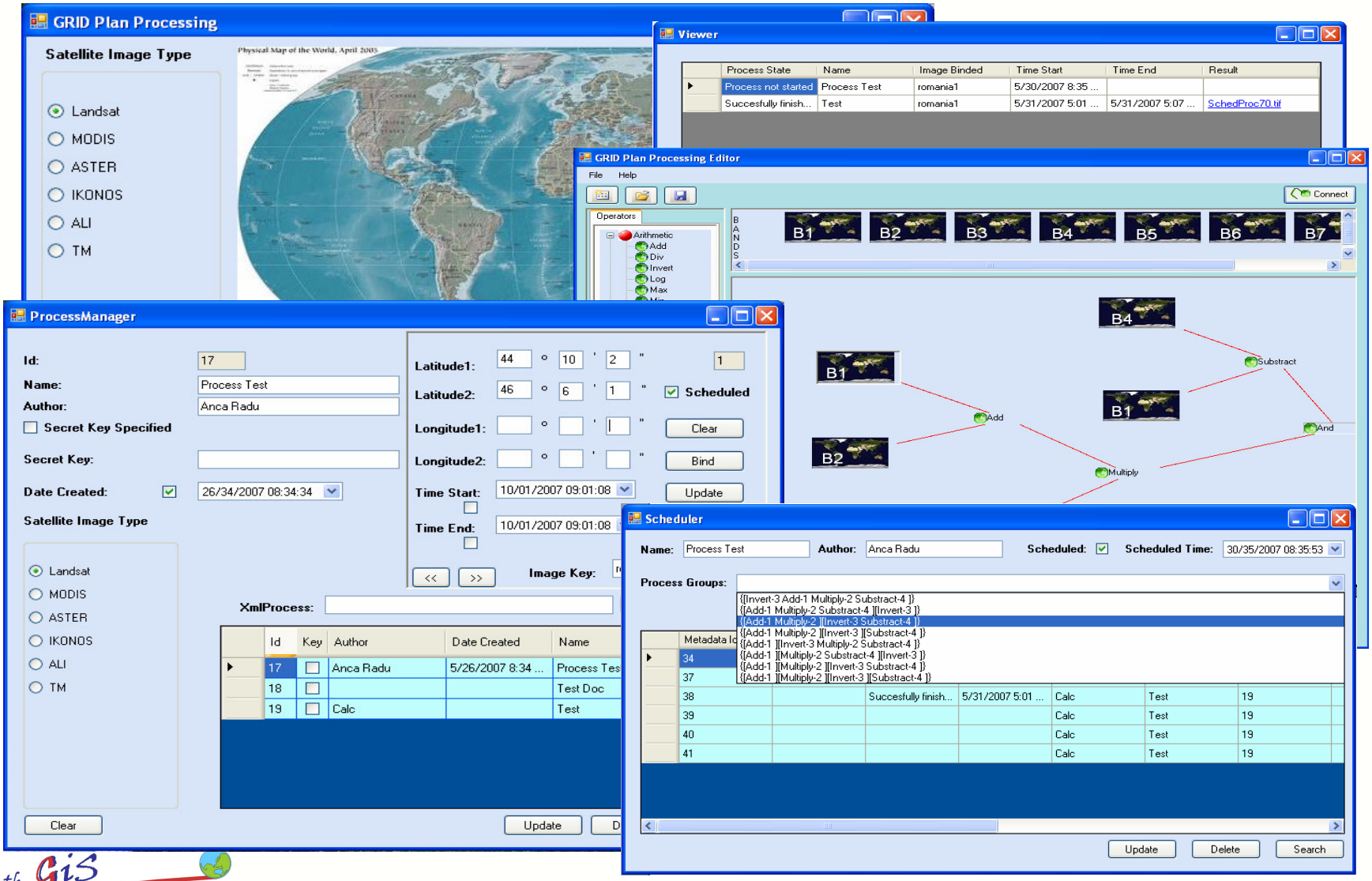


Algorithmul de detectie a apei

- Benzile spectrale: SWIR (5), Red (3) si NIR (4) spectral bands

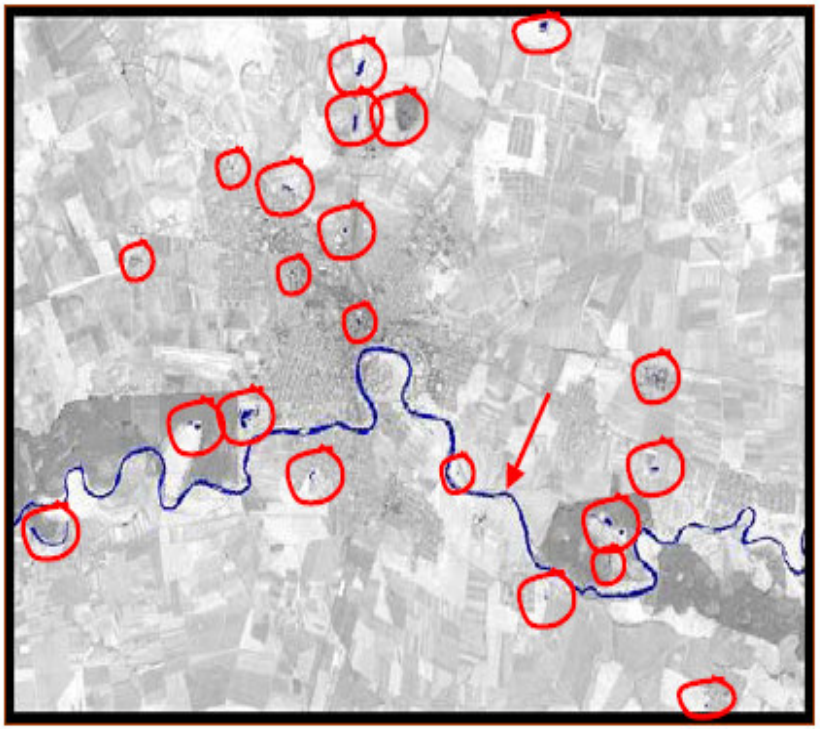


gProcess – Diagrammatic Process Description



Algorithmul de detectie a apei - Rezultate

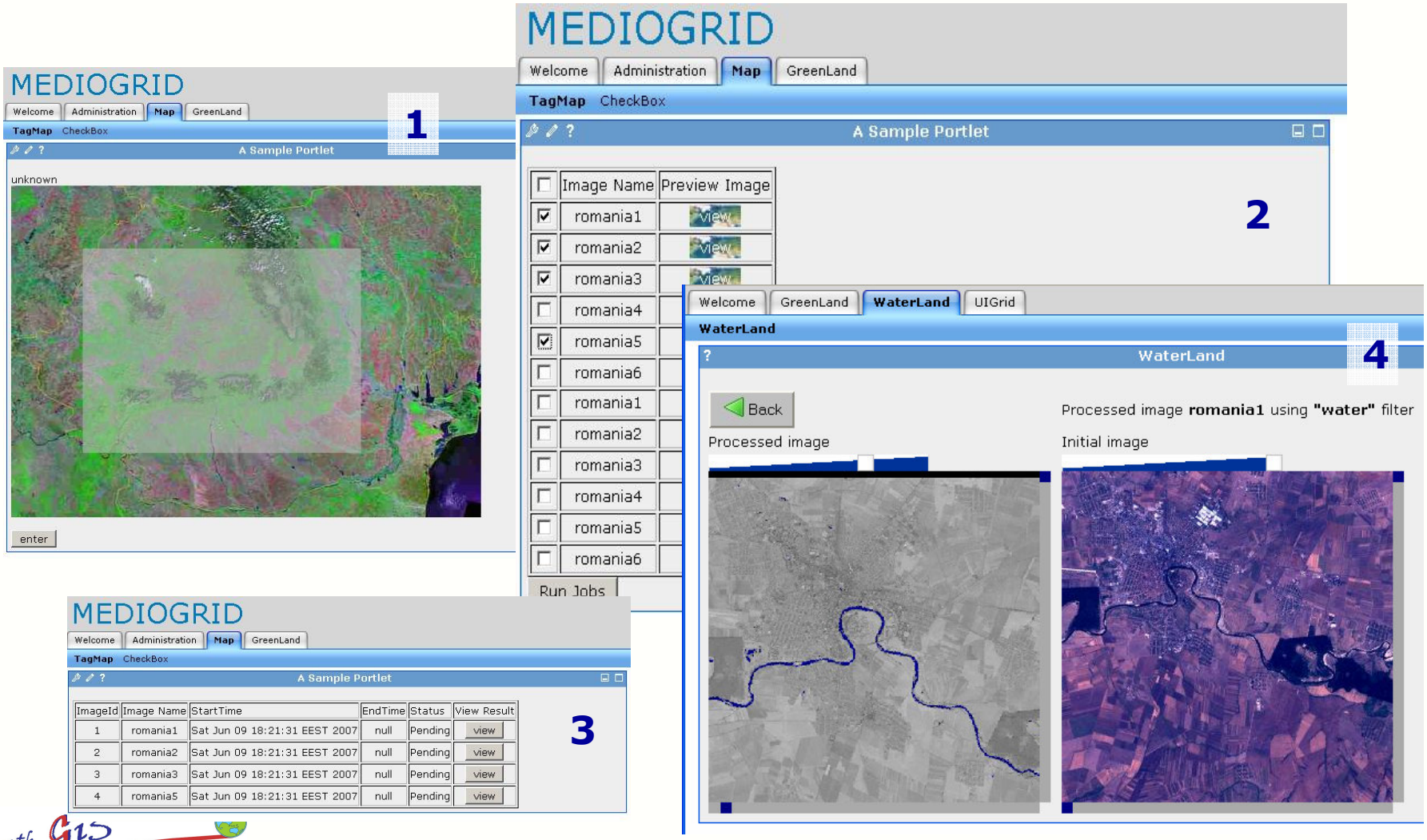
Imaginea initiala Landsat (pseudocolorata).



Zonele detectate cu apa.

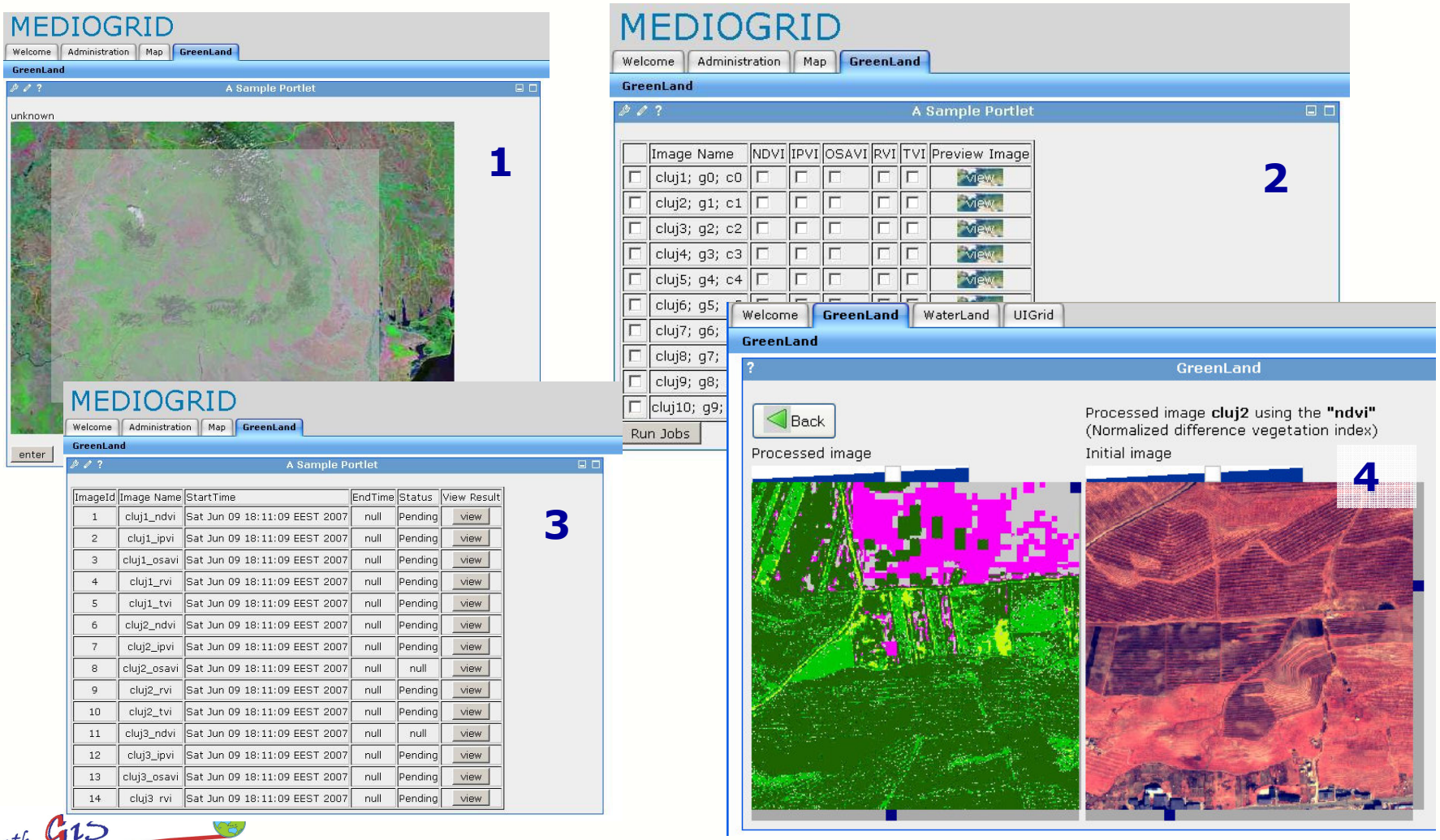
Aplicatia Waterland

Aplicatie disponibila pe Internet: greenland.mediogrid.utcluj.ro

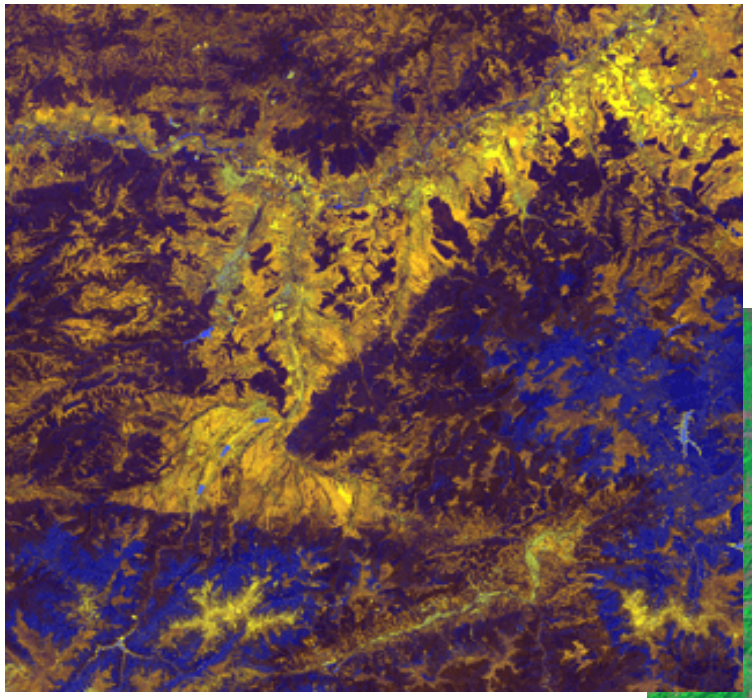


Aplicatia Greenland

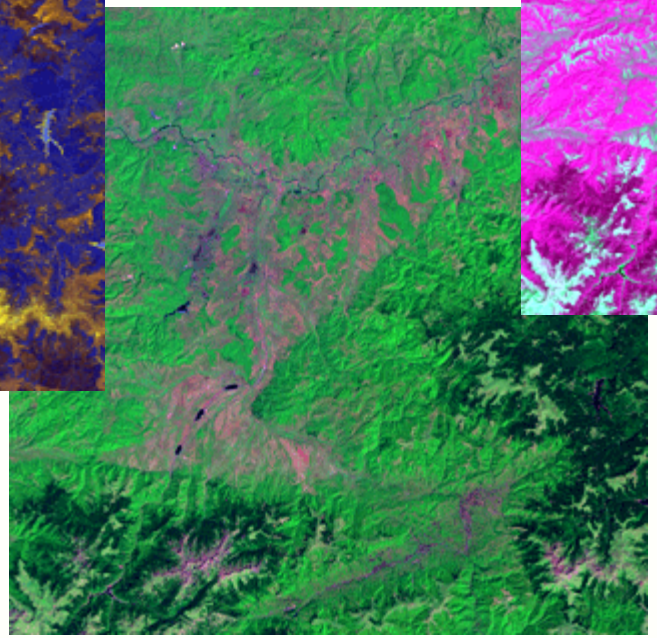
Aplicatie disponibila pe Internet: greenland.mediogrid.utcluj.ro



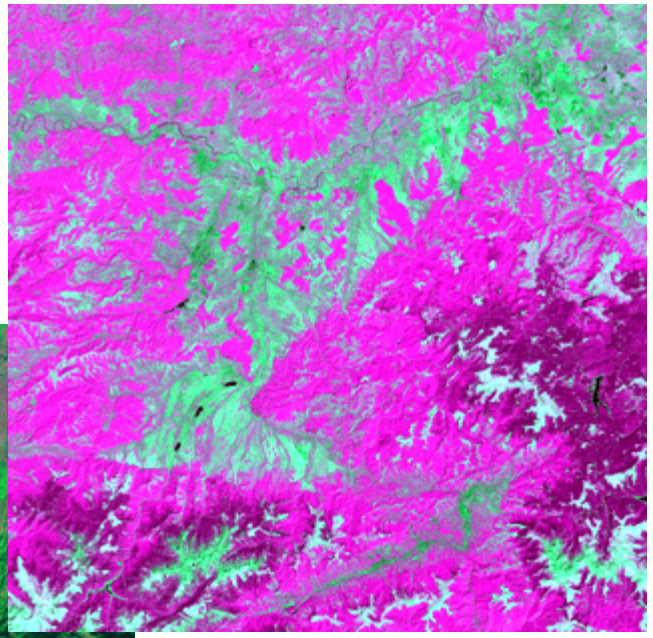
Aplicatia Minerals



Zone alterate hidrotermal.

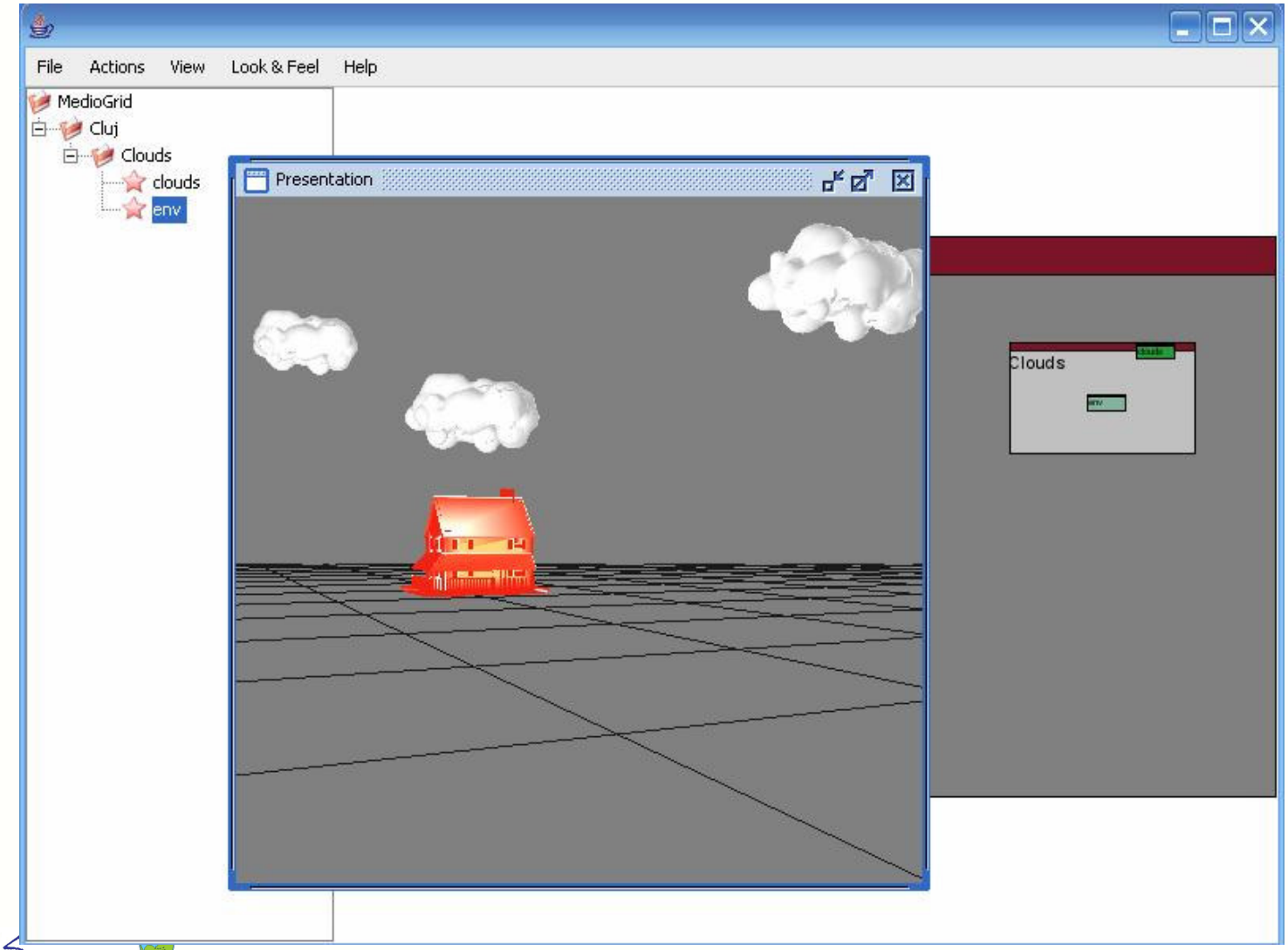


Muntii Metaliferi.
Imagine pseudocolorata folosind benzile spectrale: 7 R, 4 G si 2 B.

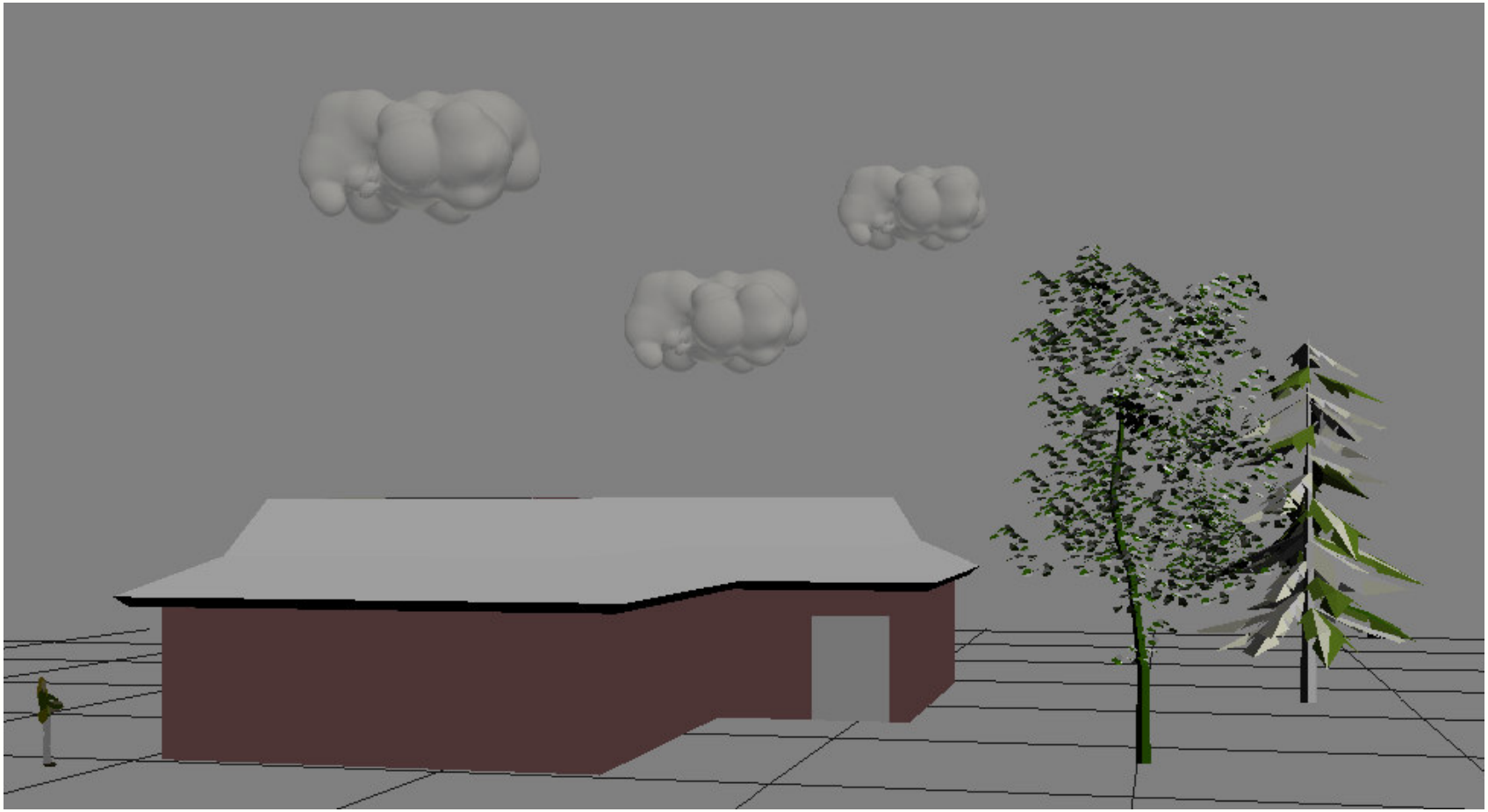


Zone cu oxizi de fier.

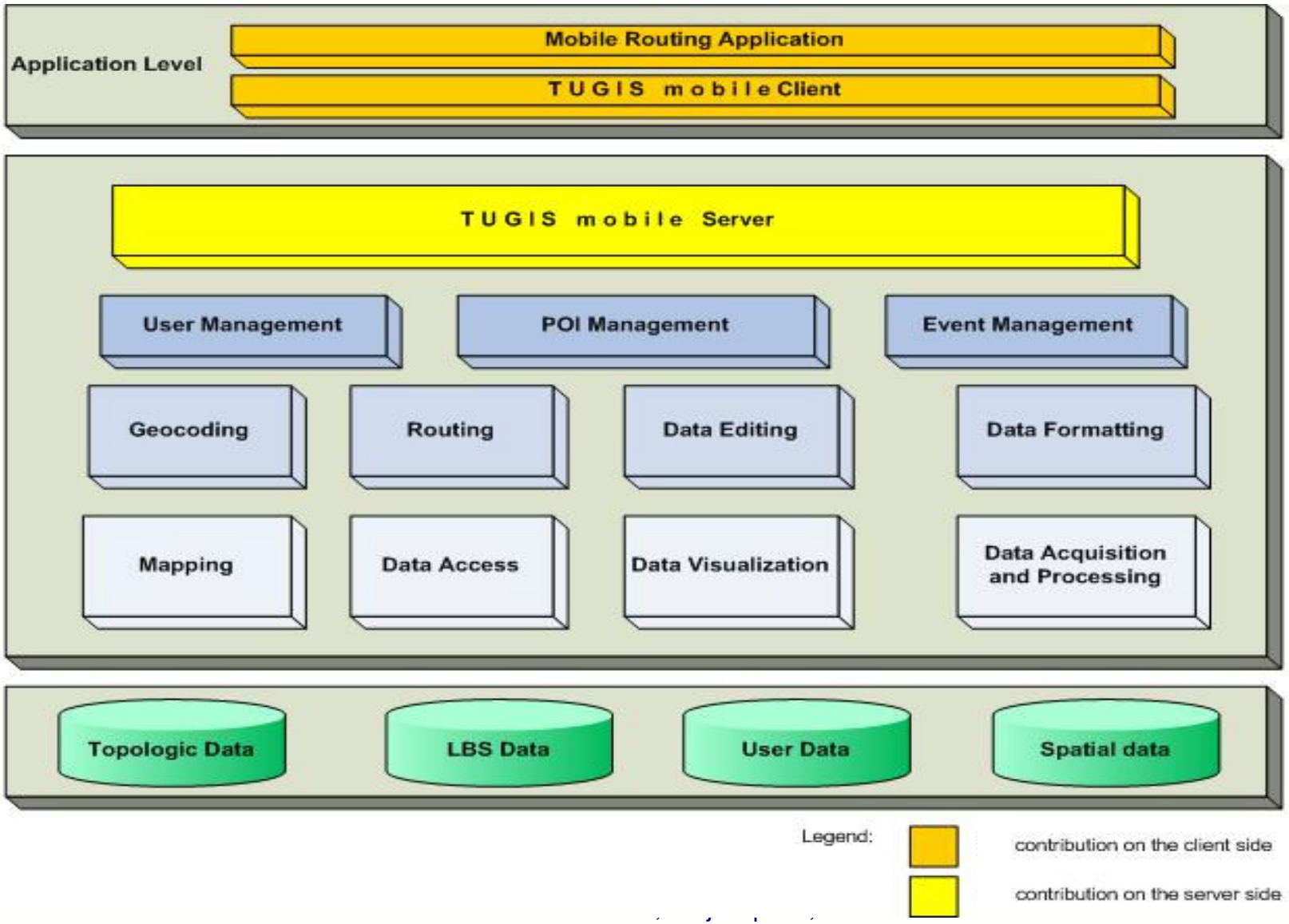
Modelarea spatiului virtual geografic



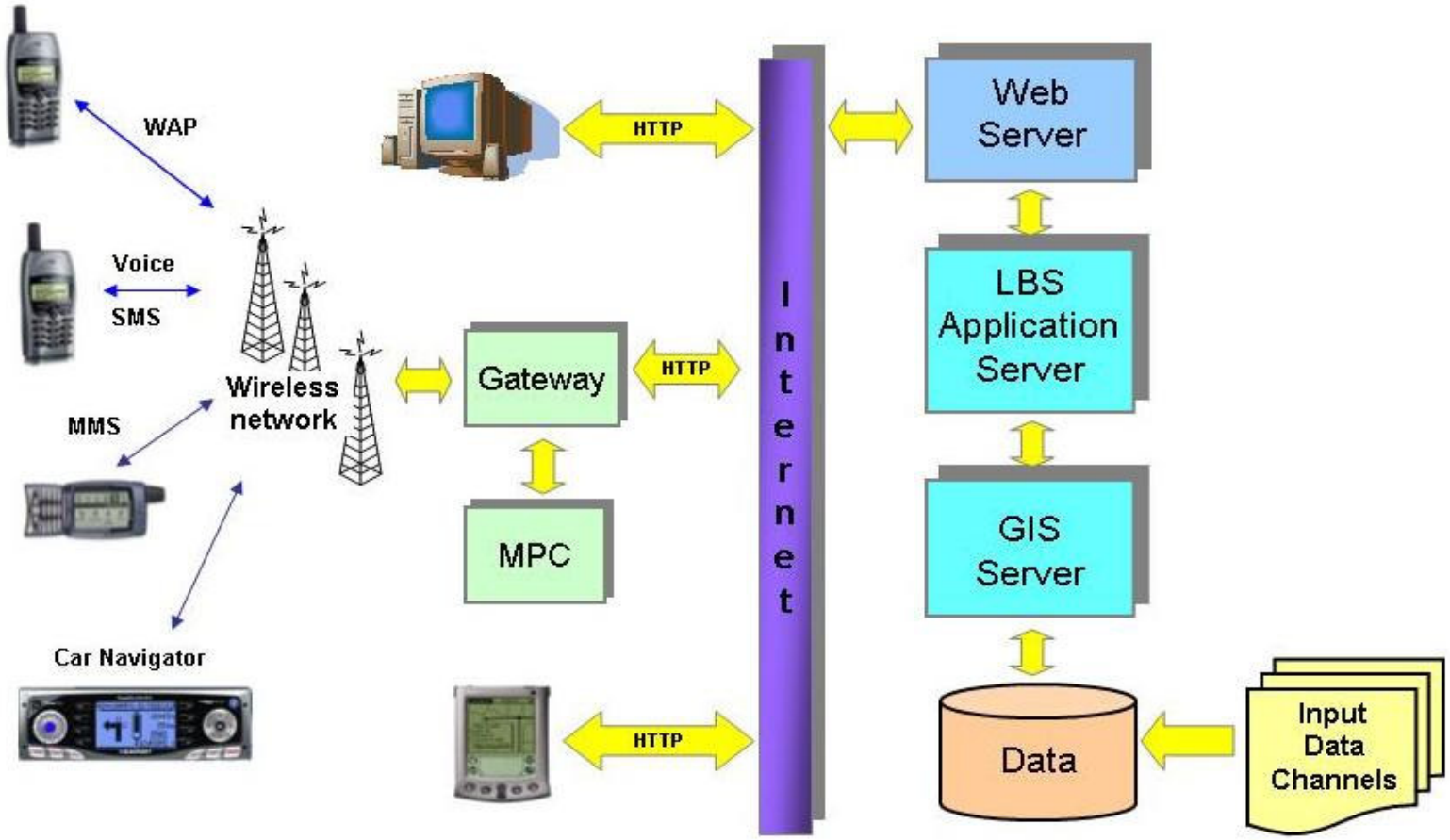
Vizualizarea spatiului virtual de catre utilizator



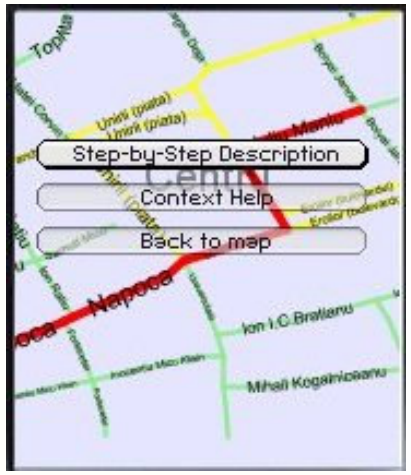
Platforma LBS (Location Based Services)

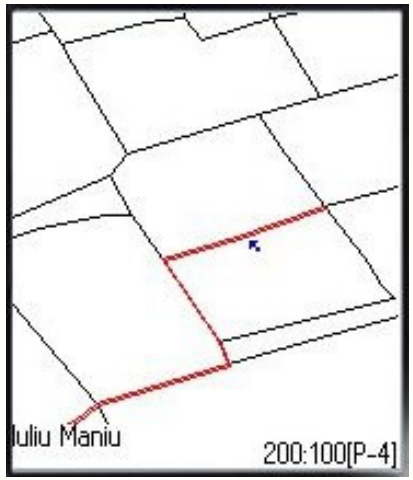


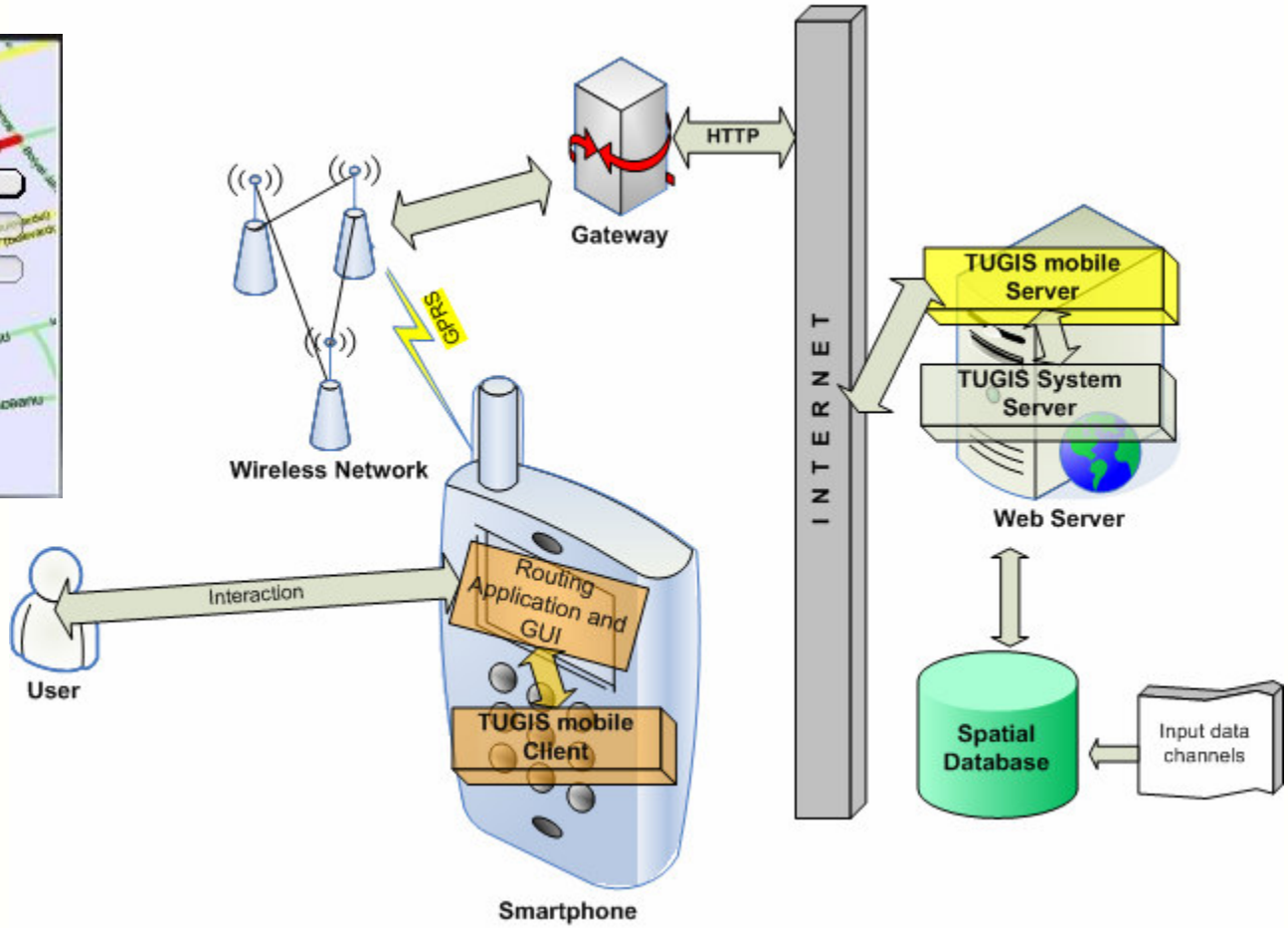
Architectura LBS



Aplicatii Wireless

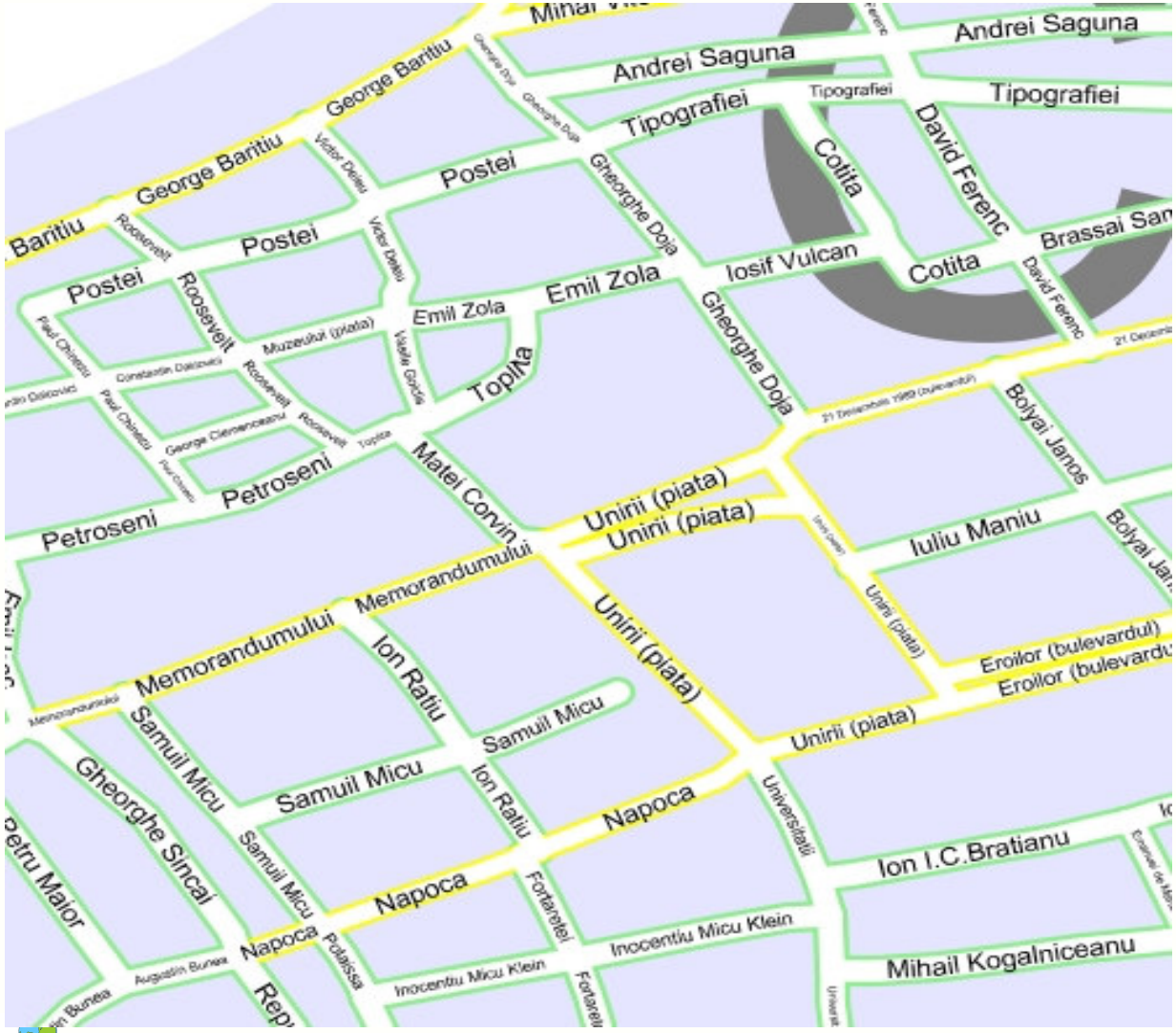




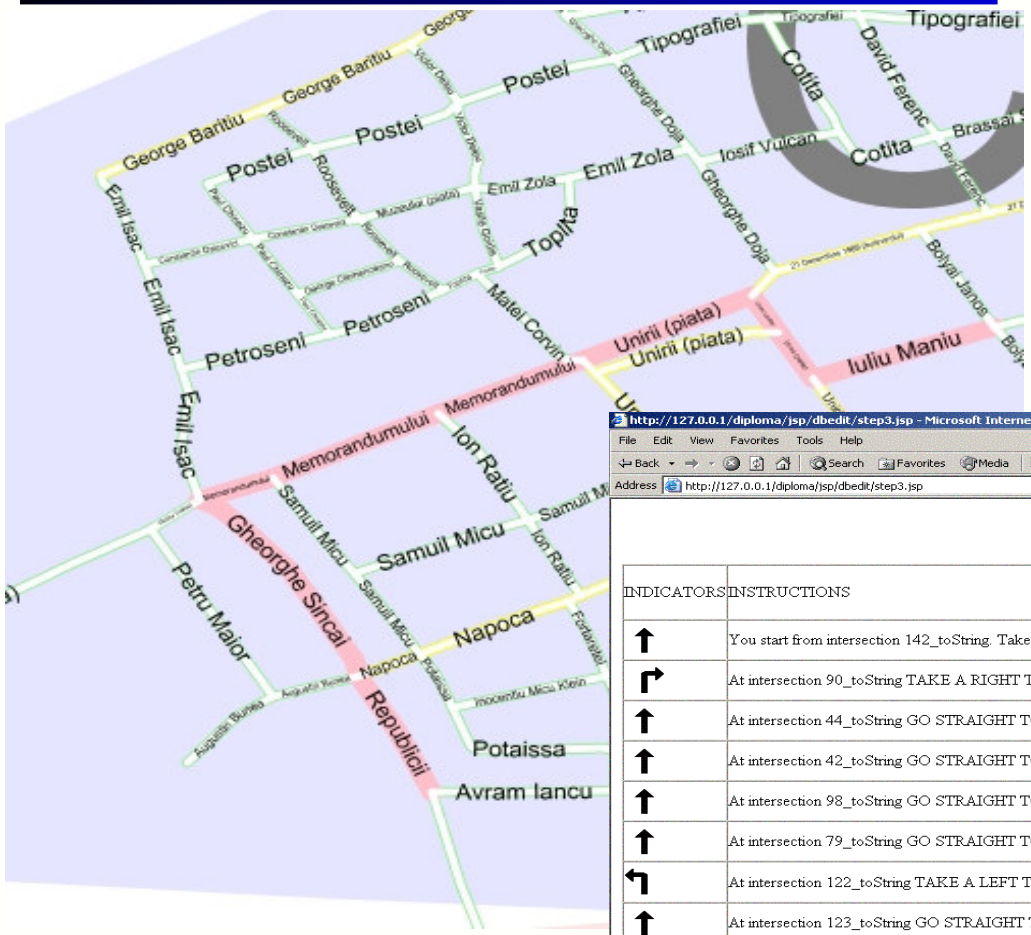


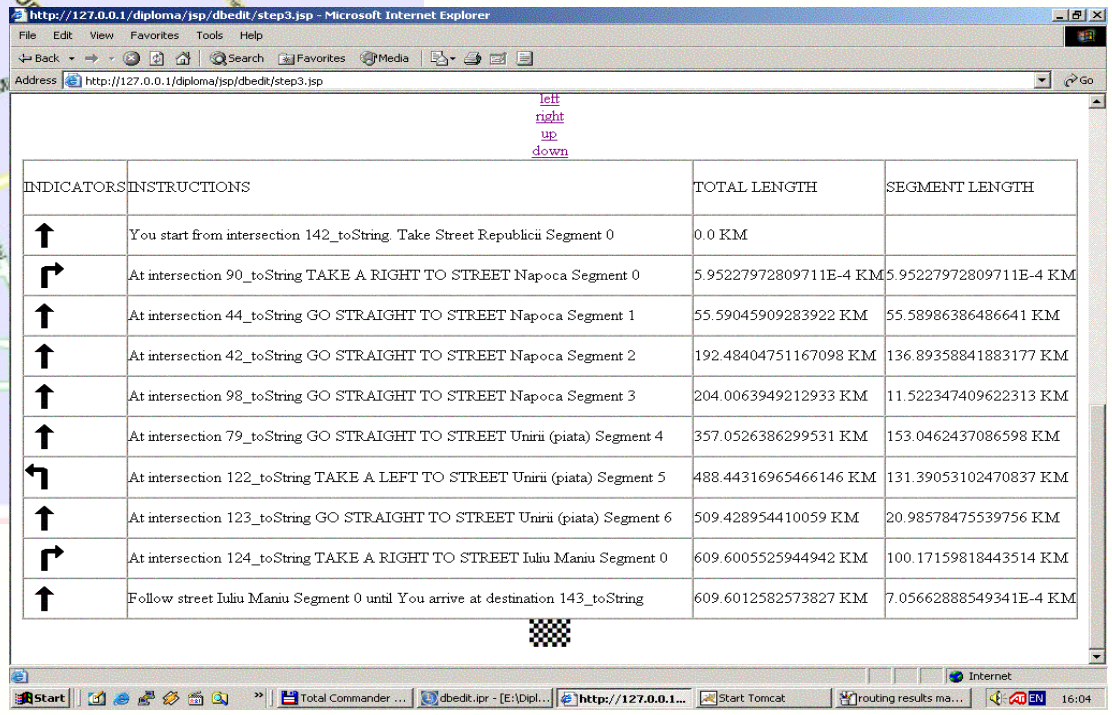
Extention of the TUGIS platform by a software package based on SVG and JavaScript to support the development of the interactive web applications

Generare si afisare harti



Calculare traseu optim in reteaua stradala din Cluj





http://127.0.0.1/diploma/jsp/dbedit/step3.jsp - Microsoft Internet Explorer

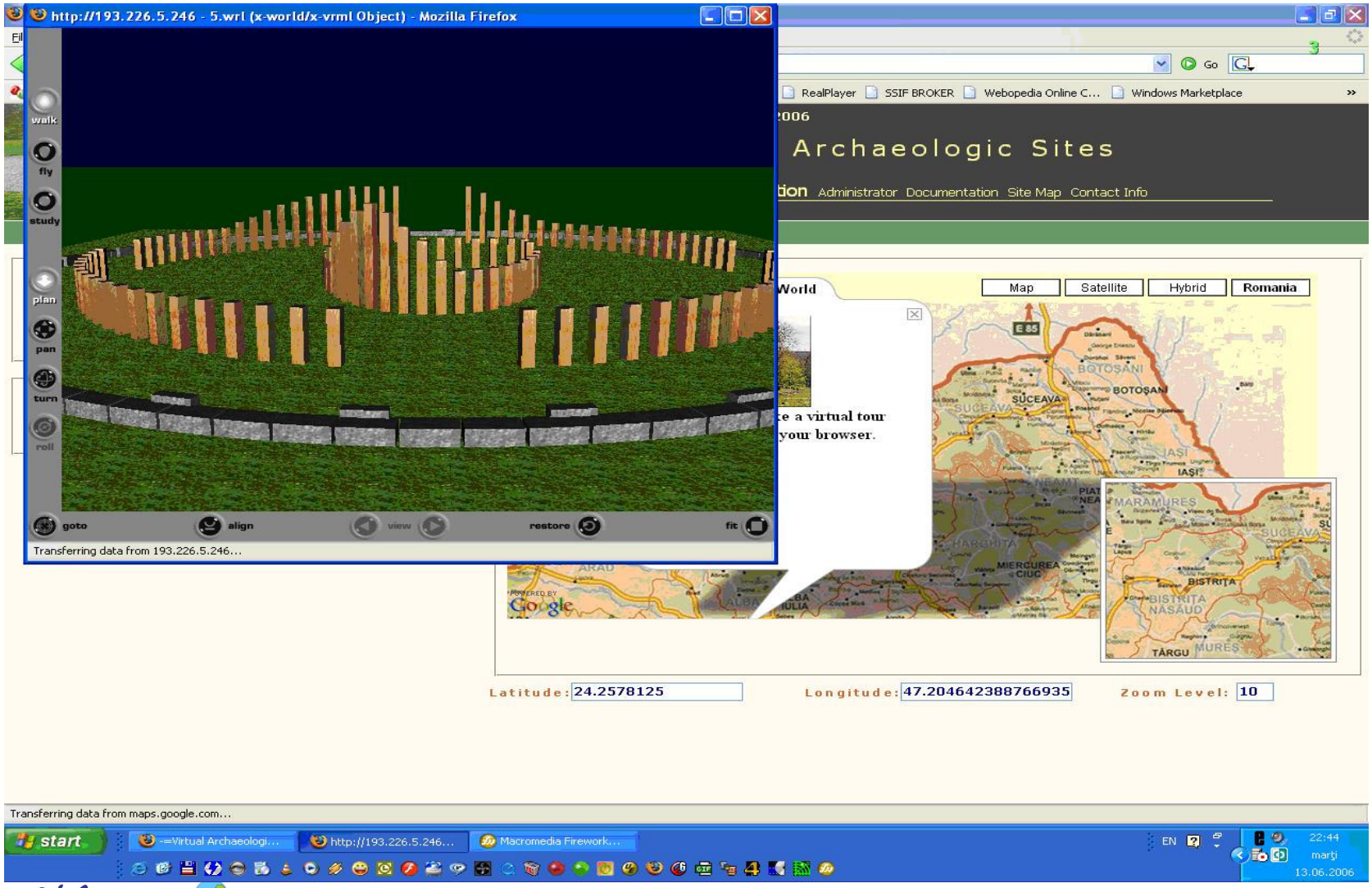
File Edit View Favorites Tools Help

Address http://127.0.0.1/diploma/jsp/dbedit/step3.jsp

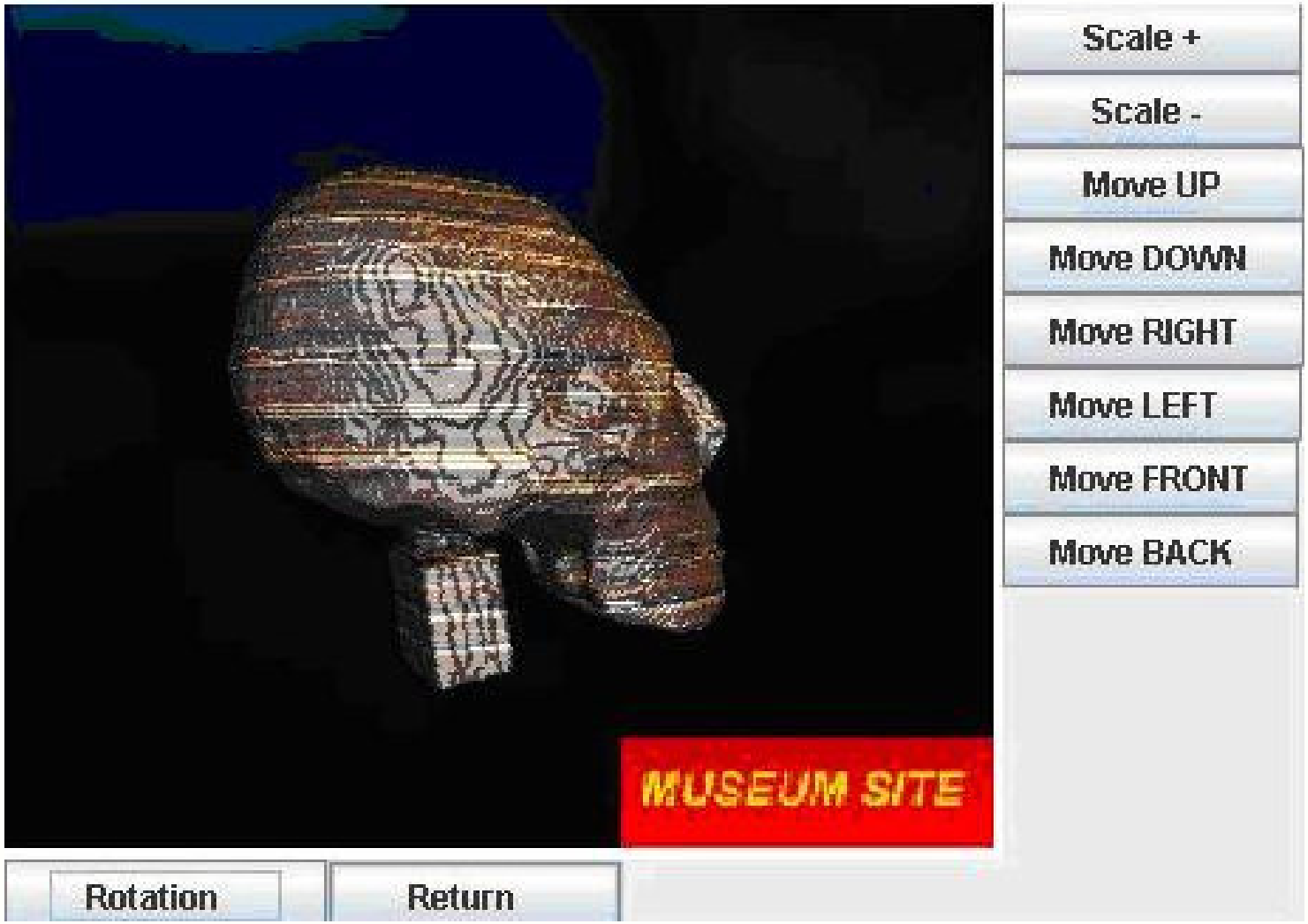
left
right
up
down

INDICATORS	INSTRUCTIONS	TOTAL LENGTH	SEGMENT LENGTH
↑	You start from intersection 142_toString. Take Street Republicii Segment 0	0.0 KM	
↱	At intersection 90_toString TAKE A RIGHT TO STREET Napoca Segment 0	5.95227972809711E-4 KM	5.95227972809711E-4 KM
↑	At intersection 44_toString GO STRAIGHT TO STREET Napoca Segment 1	55.59045909283922 KM	55.58986386486641 KM
↑	At intersection 42_toString GO STRAIGHT TO STREET Napoca Segment 2	192.48404751167098 KM	136.89358841883177 KM
↑	At intersection 98_toString GO STRAIGHT TO STREET Napoca Segment 3	204.0063949212933 KM	11.522347409622313 KM
↑	At intersection 79_toString GO STRAIGHT TO STREET Unirii (piata) Segment 4	357.0526386299531 KM	153.0462437086598 KM
↰	At intersection 122_toString TAKE A LEFT TO STREET Unirii (piata) Segment 5	488.44316965466146 KM	131.39053102470837 KM
↑	At intersection 123_toString GO STRAIGHT TO STREET Unirii (piata) Segment 6	509.428954410059 KM	20.98578475539756 KM
↱	At intersection 124_toString TAKE A RIGHT TO STREET Iuliu Maniu Segment 0	609.6005525944942 KM	100.17159818443514 KM
↑	Follow street Iuliu Maniu Segment 0 until You arrive at destination 143_toString	609.6012582573827 KM	7.05662888549341E-4 KM

Vizualizare si navigare intr-un sit arheologic



Piesa de muzeu



Multumesc. Intrebari?

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