A web application for landslide inventory using data-driven SVG

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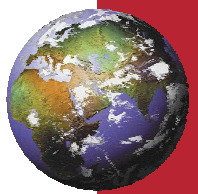


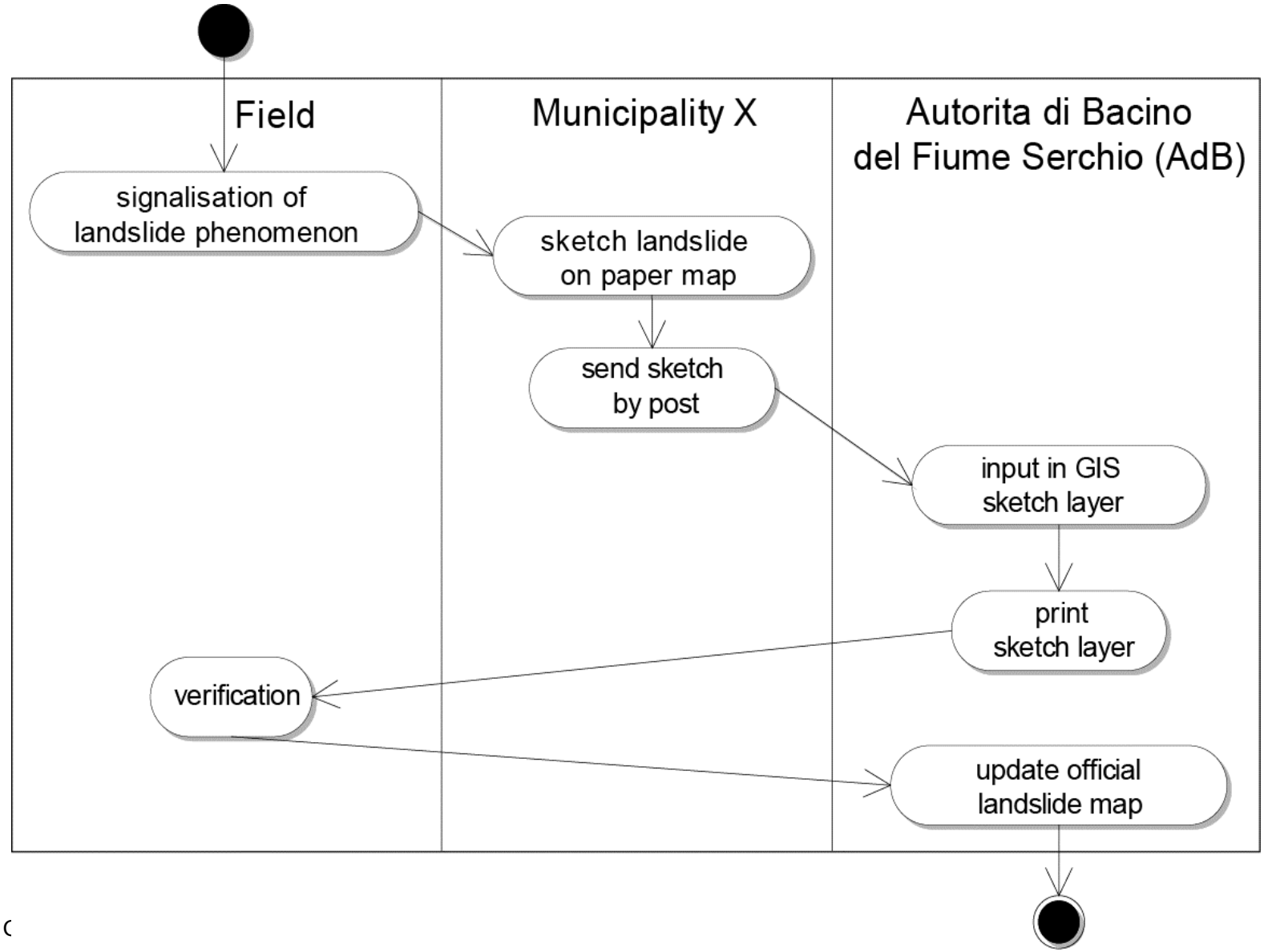
Overview

- Help municipalities with inventory of landslides for the landslide map of Serchio basin (Tuscany – Italy)
- Using simple, lightweight web application client-side [SVG-only]
- Using 'GDI-Light' setup server-side [open standards, open source]

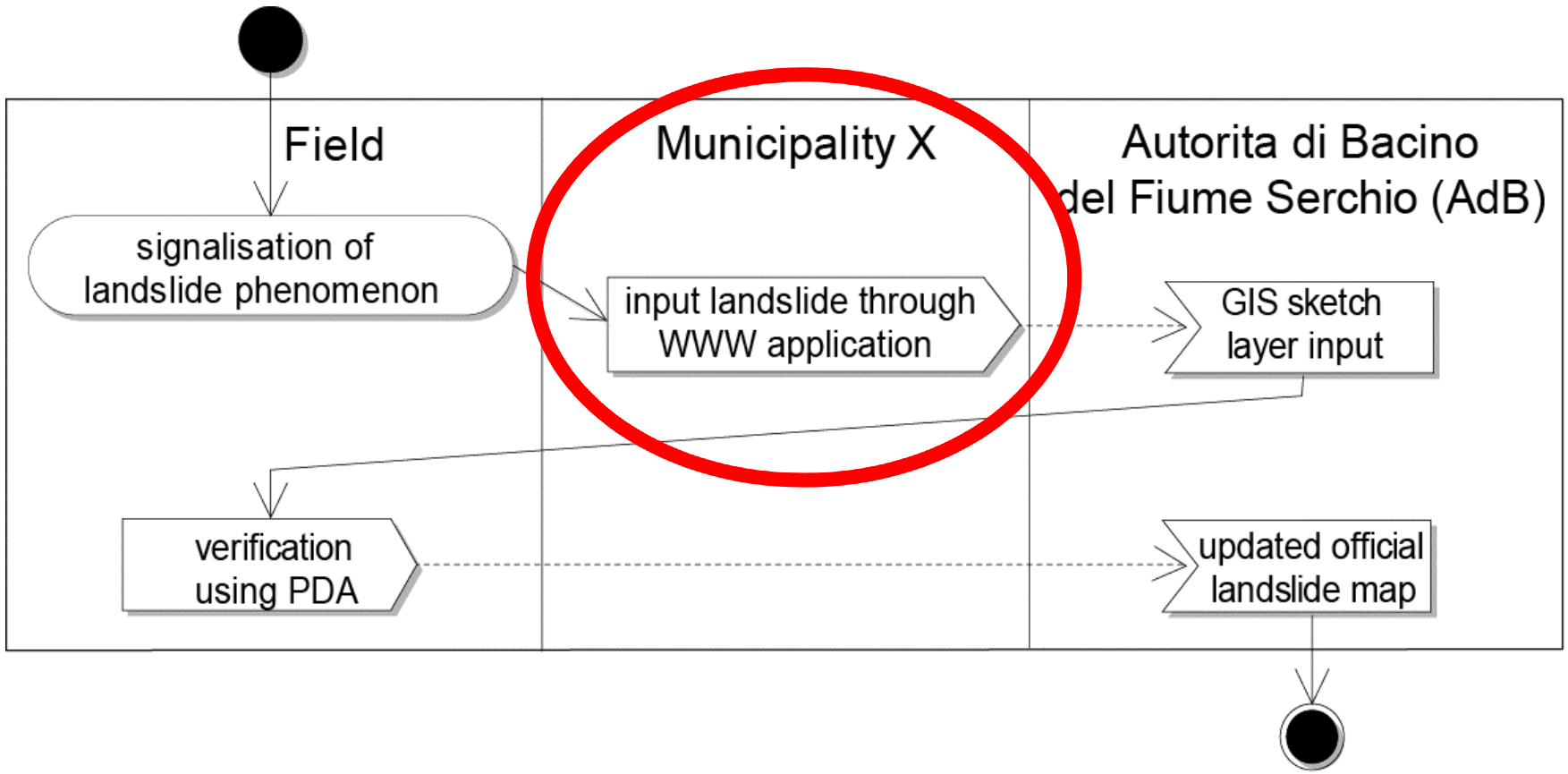
Italian official landslide maps

- Responsibility for publishing placed:
  - sometimes at central authority level (eg. Regions)
  - sometimes at local authorities level (Autorita' di Bacino)
- Local municipalities play an important "part in the middle": they inventory landslide events

Current update process



Future update process



Inventory application requirements

- speed up & simplify the process
- with the limited possibilities of the municipalities in mind:
  - (very) small, in size and manpower
  - located in sometimes inaccessible sites
  - no GIS capabilities
  - only limited bandwidth for web access

➔light-weight webbased client-side

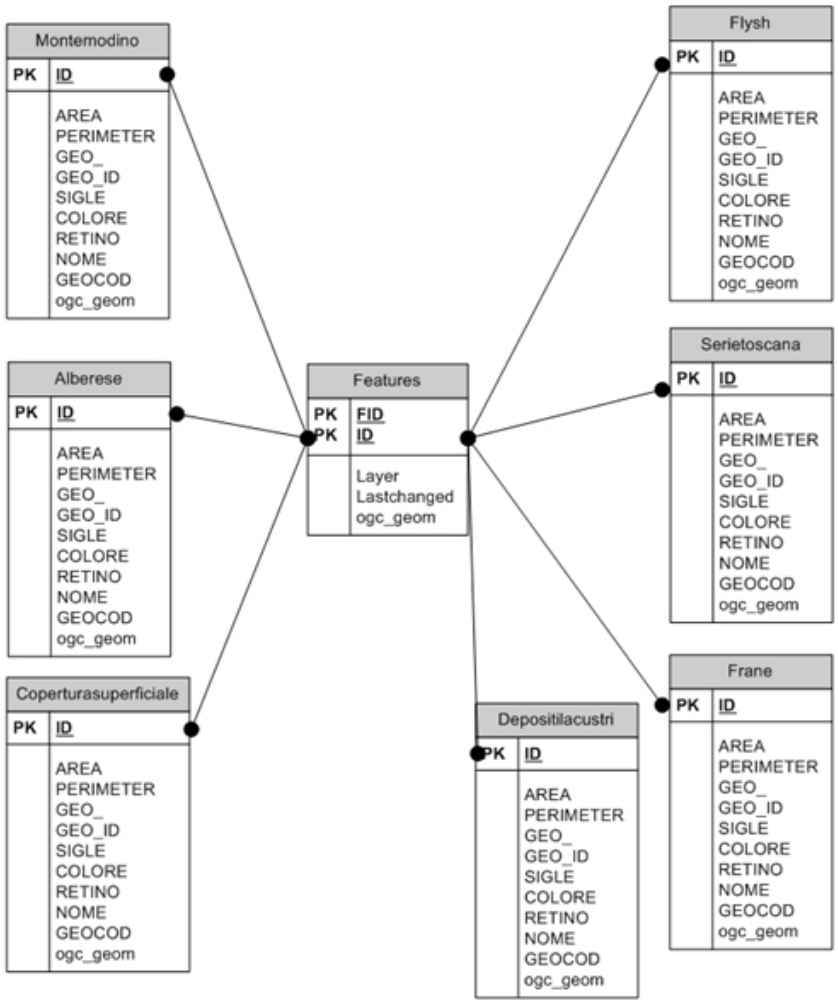
➔all bussiness logic server-side

GDI^{LIGHT}

- lightweight Geo-Data infrastructure based on Open Standards and Open Source software
- testbed/playing ground at ITC
- server-side focus on MySQL, Java, opensource OGC services
- client-side focus on SVG
- first result was “RIMapper”

  ➔used as starting point

serverside setup using RIMapper



- MySQL DB with OGC SFS support
- stores all features as objects with OGC geometry

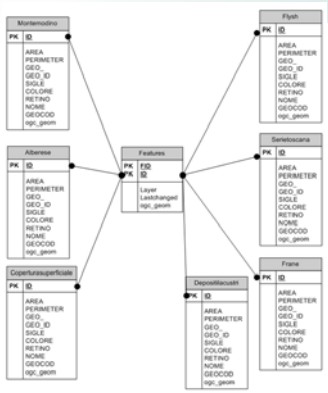
serverside setup using RIMapper

XML - configuration

```
<?xml version="1.0" encoding="iso-8859-1"?>
<!DOCTYPE RIM PUBLIC "" "/RIMapper/XML/RIM.dtd">
<RIM TYPE="SVG_STANDALONE" DB="rimapper" UN="un" PW="pw">
<HEADER>
      <FRAGMENT DBID="default" NAME="root" TYPE="SVG_ROOT"/>
      <STYLES>
      <STYLE DBID="default" NAME="defPoint" TYPE="CSS"/>
      <STYLE DBID="default" NAME="defLine" TYPE="CSS"/>
      <STYLE DBID="default" NAME="defArea" TYPE="CSS"/>
      </STYLES>
      <FRAGMENT DBID="default" NAME="init" TYPE="ECMASCRIPT"/>
      <FRAGMENT DBID="default" NAME="show" TYPE="ECMASCRIPT"/>
 </HEADER>
 <LAYERS>
   <LAYER DBID="default" NAME="ward" STYLETYPE="single"
          STYLE="defLine" />
   <LAYER DBID="default" NAME="river" STYLETYPE="single"
          STYLE="defArea" >
     <ACTION TYPE="simple" NAME="showRIM" SCOPE="feature"
          EVENT="onclick" PARAMS="evt, '', 'id'"/>
   </LAYER>
   <LAYER DBID="default" NAME="roads" STYLETYPE="single"
          STYLE="defArea" ATTRIBS="type" />
   <LAYER DBID="default" NAME="build" STYLETYPE="single"
          STYLE="defArea" />
 </LAYERS>
 <FOOTER/>
</RIM>
```

- simple XML map configuration files to define map layout and interactivity

serverside setup using RIMapper



- Java servlets to deliver SVG output (=application)

makeSVG

XML2SVG

parseXML

XML - configuration

```
<?xml version="1.0" encoding="iso-8859-1"?>
<!DOCTYPE RIM PUBLIC "" "/RIMapperXML/RIM.dtd" >
<RIM TYPE="SVG_STANDALONE" DB="rimapper" UN="un" PW="pw">
<HEADER>
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    <STYLES>
    <STYLE DBID="default" NAME="defPoint" TYPE="CSS"/>
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</HEADER>
<LAYERS>
  <LAYER DBID="default" NAME="ward" STYLETYPE="single"
        STYLE="defLine" />
  <LAYER DBID="default" NAME="river" STYLETYPE="single"
        STYLE="defArea" >
    <ACTION TYPE="simple" NAME="showRIM" SCOPE="feature"
        EVENT="onclick" PARAMS="evt, ", "id"/>
  </LAYER>
  <LAYER DBID="default" NAME="roads" STYLETYPE="single"
        STYLE="defArea" ATTRIBS="type" />
  <LAYER DBID="default" NAME="build" STYLETYPE="single"
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<FOOTER/>
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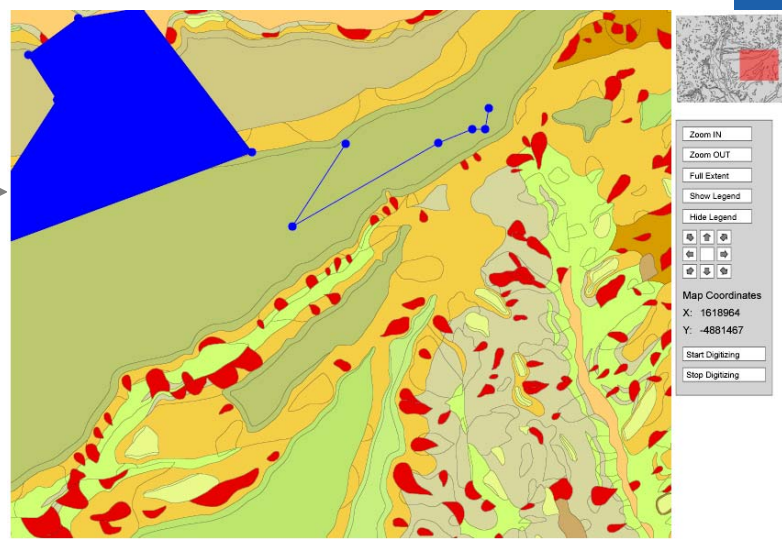


simplest XML configuration...

AdBsimple.xml

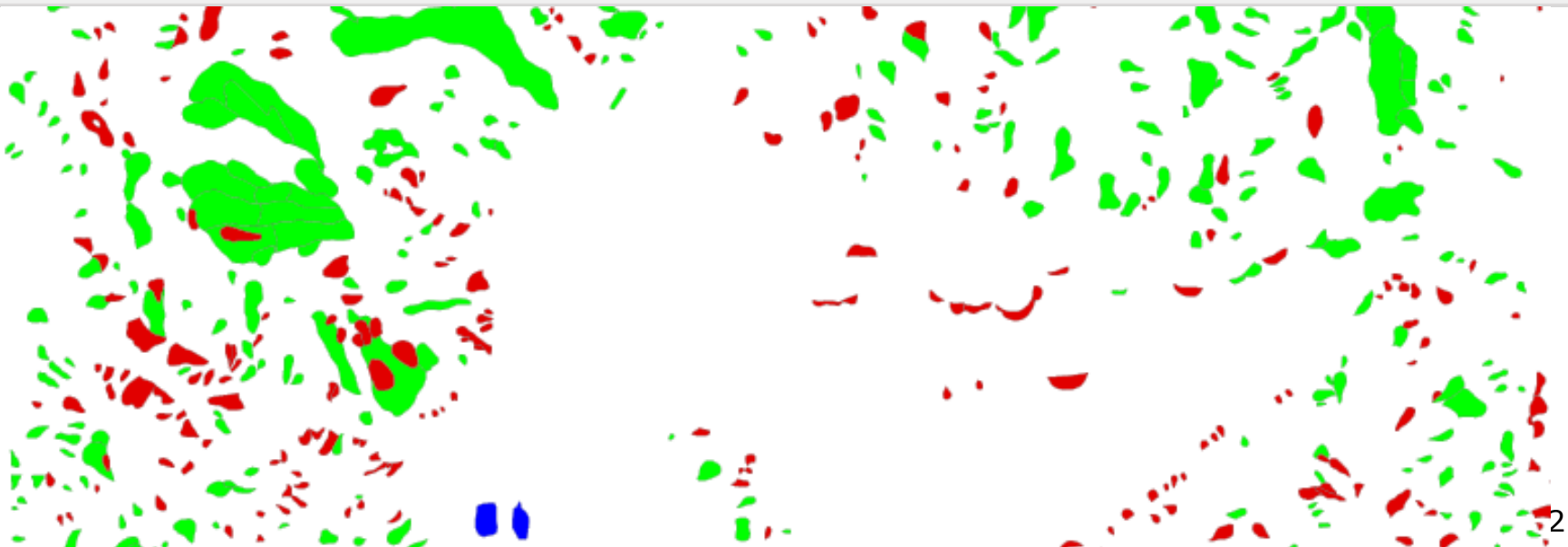
```
<?xml version="1.0" encoding="iso-8859-1"?>
<!DOCTYPE RIM PUBLIC "" "../RIM.dtd">
<RIM TYPE="SVG_STANDALONE" DB="adb" UN="adb" PW="latini">
  <TITLE>A map</TITLE>
  <AUTHOR>By me</AUTHOR>
  <HEADER>
    <STYLES>
    <FRAGMENT DBID="default" NAME="defSVGRoot" TYPE="SVG_ROOT"/>
      <STYLE DBID="default" NAME="defArea" TYPE="CSS"/>
    </STYLES>
    <FRAGMENT DBID="default" NAME="defInit" TYPE="ECMASCRIPT"/>
  </HEADER>
  <LAYERS>

  </LAYERS>
  <FOOTER/>
</RIM>
```

..adding data-driven colours

AdBcolore.xml

```
<?xml version="1.0" encoding="iso-8859-1"?>
<!DOCTYPE RIM PUBLIC "" "../RIM.dtd">
<RIM TYPE="SVG_STANDALONE" DB="adb" UN="adb" PW="latini">
  <HEADER>
    <STYLES>
    <FRAGMENT DBID="default" NAME="defSVGRoot" TYPE="SVG_ROOT"/>
      <STYLE DBID="default" NAME="defArea" TYPE="CSS"/>
    </STYLES>
    <FRAGMENT DBID="default" NAME="defInit" TYPE="ECMASCRIPT"/>
  </HEADER>
  <LAYERS>
        <LAYER DBID="default" NAME="frane"  STYLE="colore" ATTRIBS="colore, sigle">
        </LAYER>
  </LAYERS>
  <FOOTER/>
</RIM>
```



...adding interactivity

AdBcoloreClick.xml

```
<?xml version="1.0" encoding="iso-8859-1"?>
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<RIM TYPE="SVG_STANDALONE" DB="adb" UN="adb" PW="latini">
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    <STYLES>
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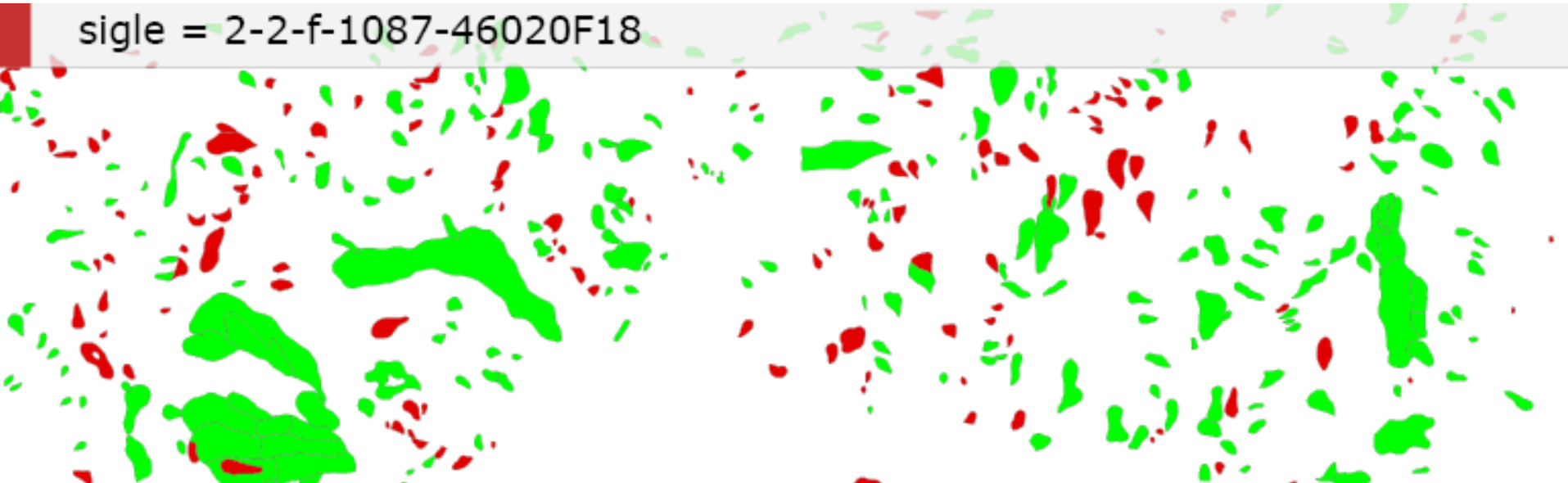
      <STYLE DBID="none" NAME="franecolore2" TYPE="CSS"><![CDATA[fill:rgb(0,255,0); stroke-width:0.323; stroke:rgb
      <STYLE DBID="none" NAME="franecoloreD" TYPE="CSS"><![CDATA[fill:rgb(0,0,255); stroke-width:0.323; stroke:rgb
    </STYLES>
    <FRAGMENT DBID="default" NAME="defInitPlusRIMmessage" TYPE="ECMASCRIPT"/>

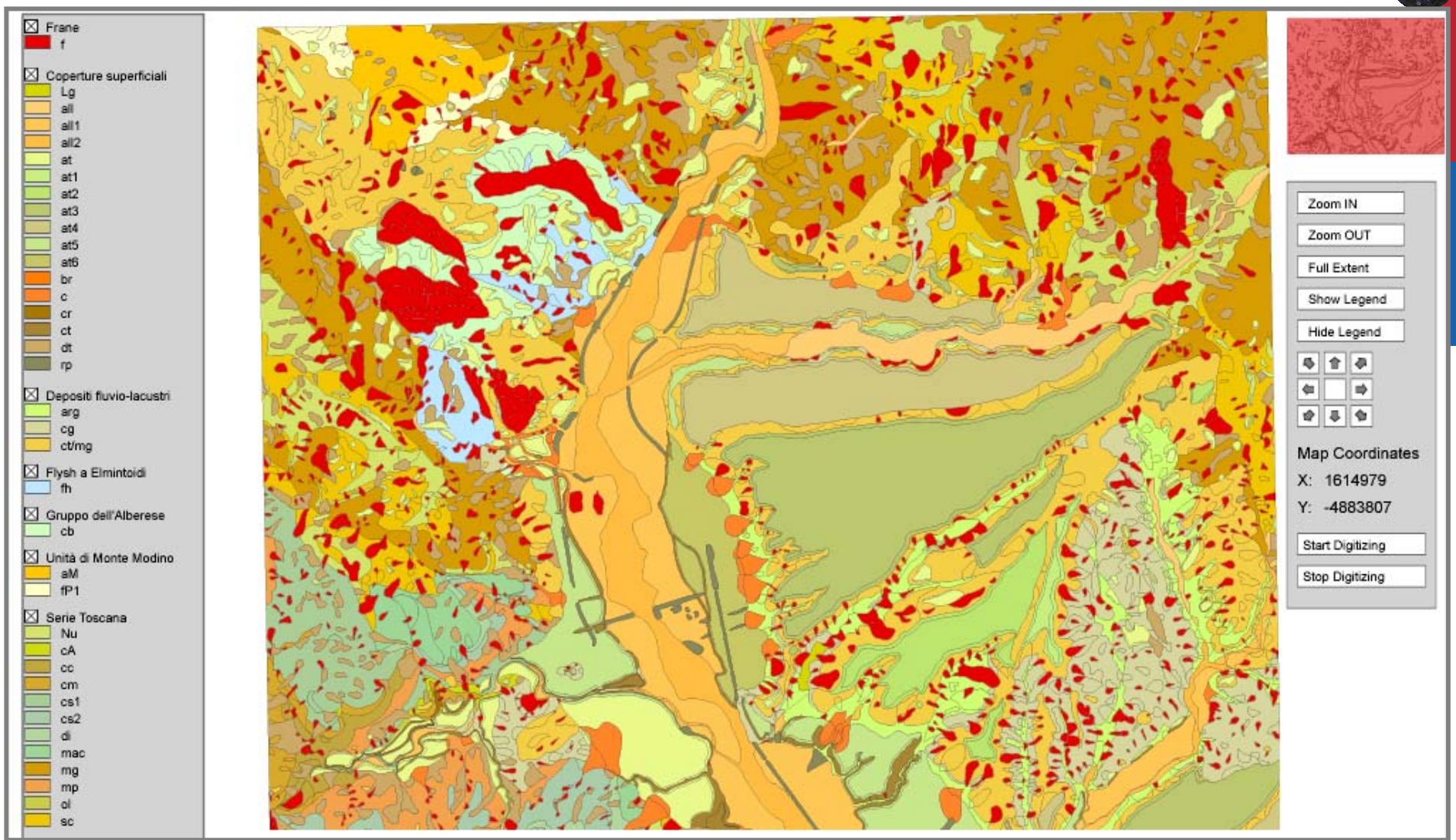
  </HEADER>
  <LAYERS>
        <LAYER DBID="default" NAME="frane" STYLETYPE="chorochromatic" STYLE="colore" ATTRIBS="colore, sigle">


        </LAYER>
  </LAYERS>
  <FOOTER/>
</RIM>
```

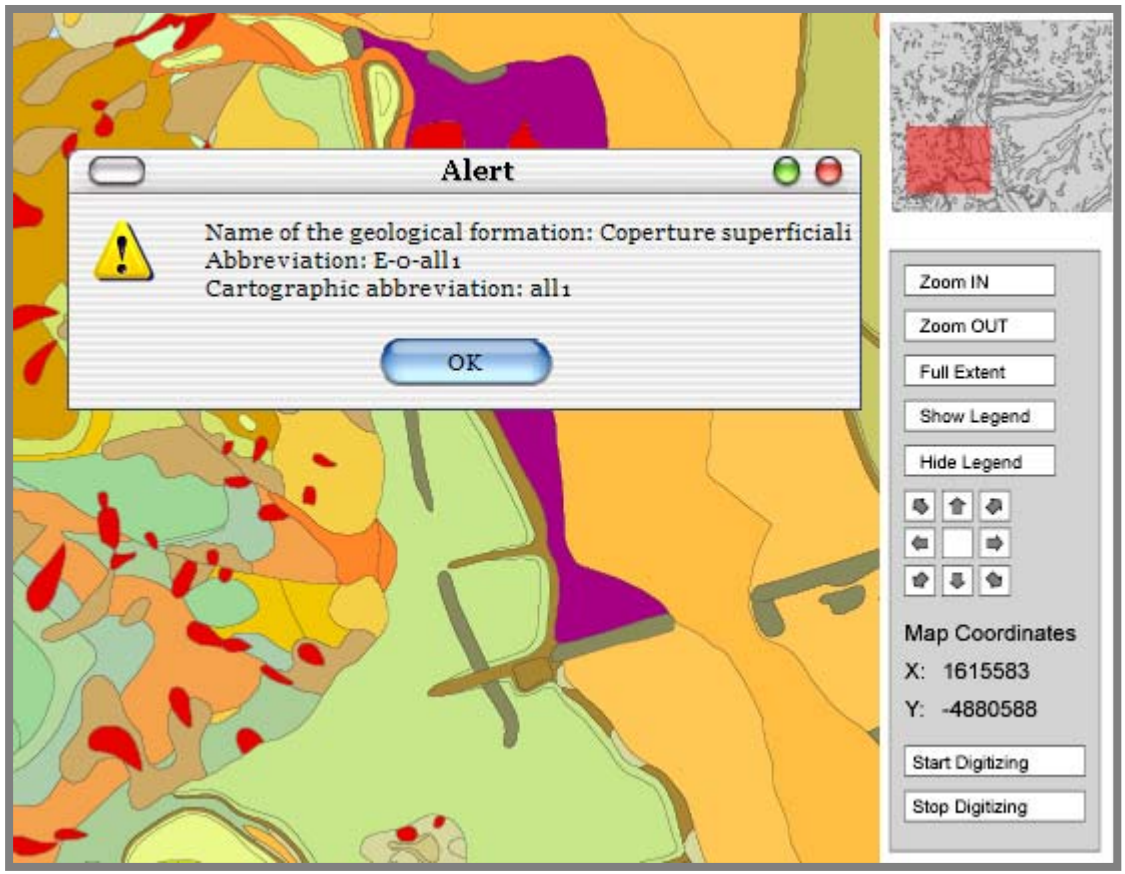
sigle = 2-2-f-1087-46020F18



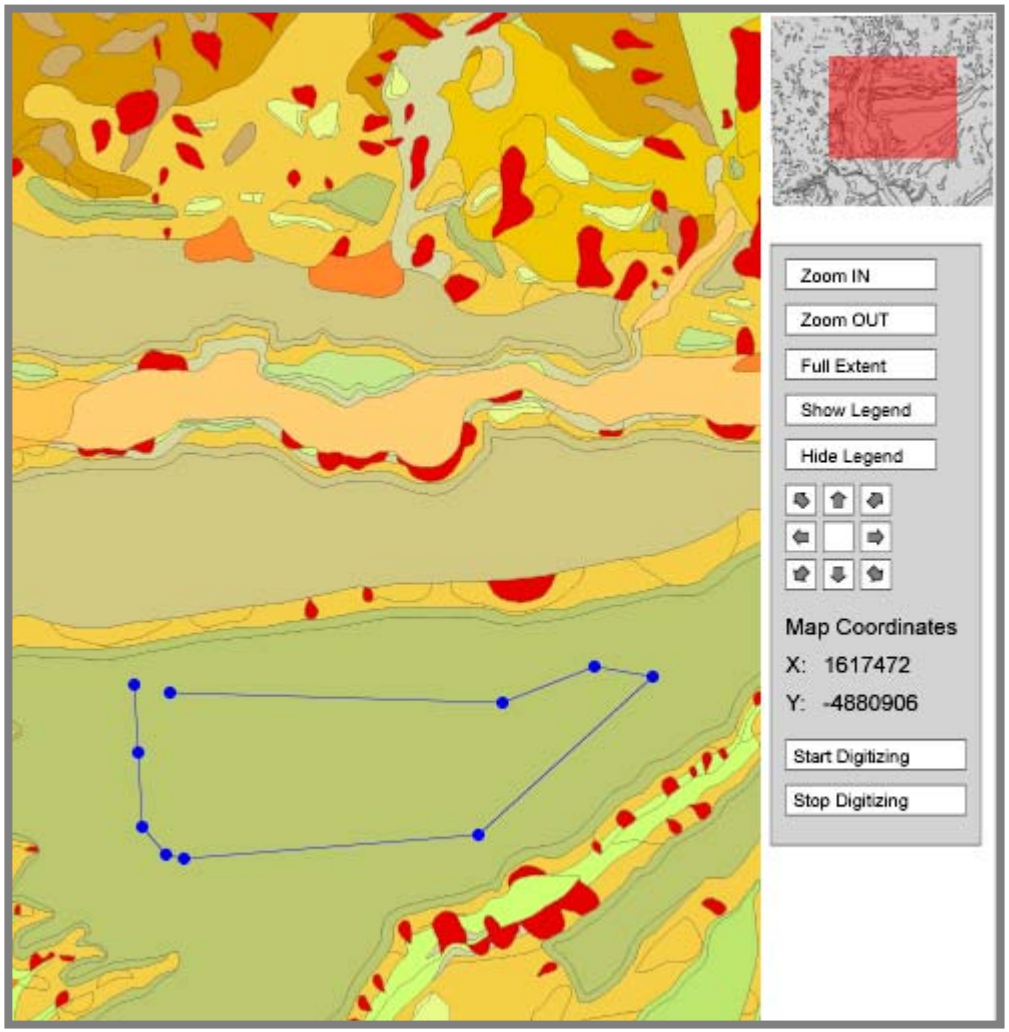
resulting application



resulting application



resulting application



conclusions and further work

- only first step towards “Landslide Web Map” for AdB
- improvements planned are:
  - tiling (only load data needed) and client-side caching
  - more appropriate map backgrounds
  - vertex-level editing