

# PROJECT ONEMAP

# The OneMap Project

- Background
- Objectives
- Project Profile
- Distributed Geodata Management
- Current Status
- Remarks

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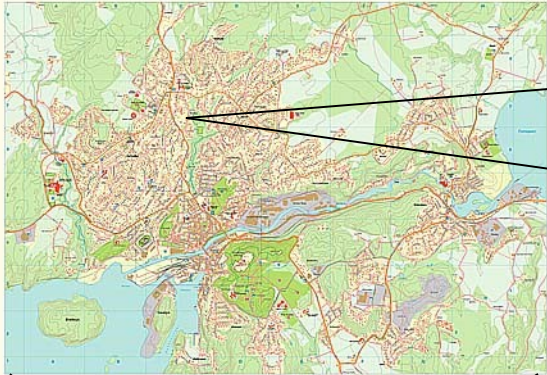
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**School of Computer Science**  
**Halden, Norway**

# Global Online Maps



**Global Spatial Data Infrastructure...**

**Digital Earth...**



**WMS/WFS...**

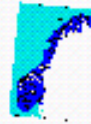
**GPS...**

**OGC...**

**Location based services...**

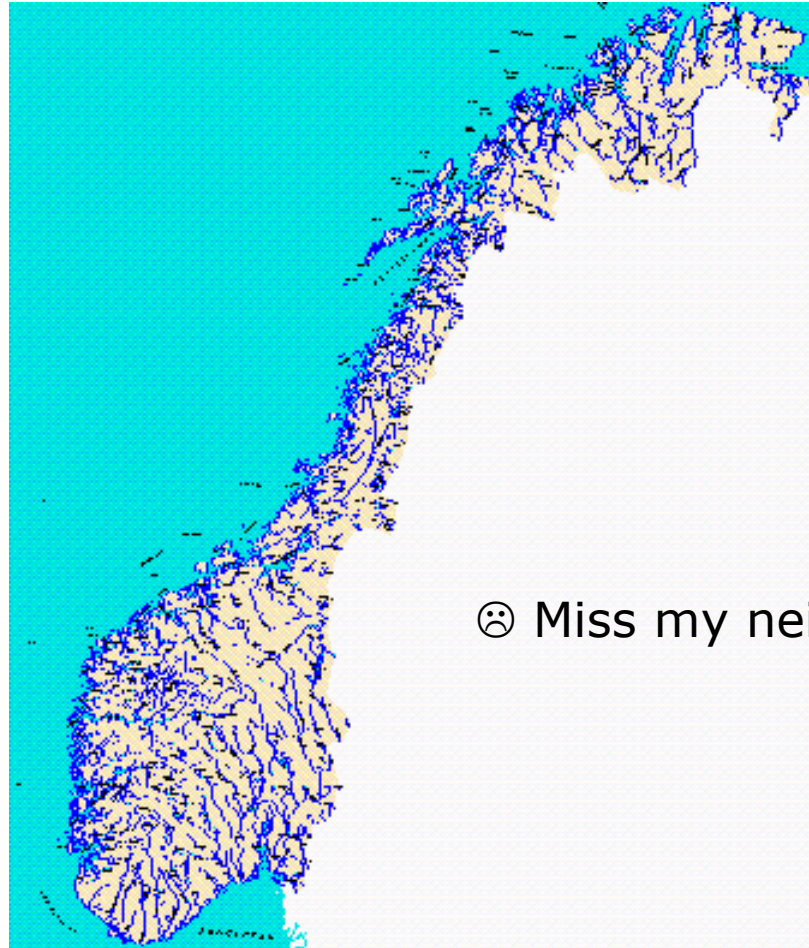
# NorgesGlasset – Global

☹ A small world...



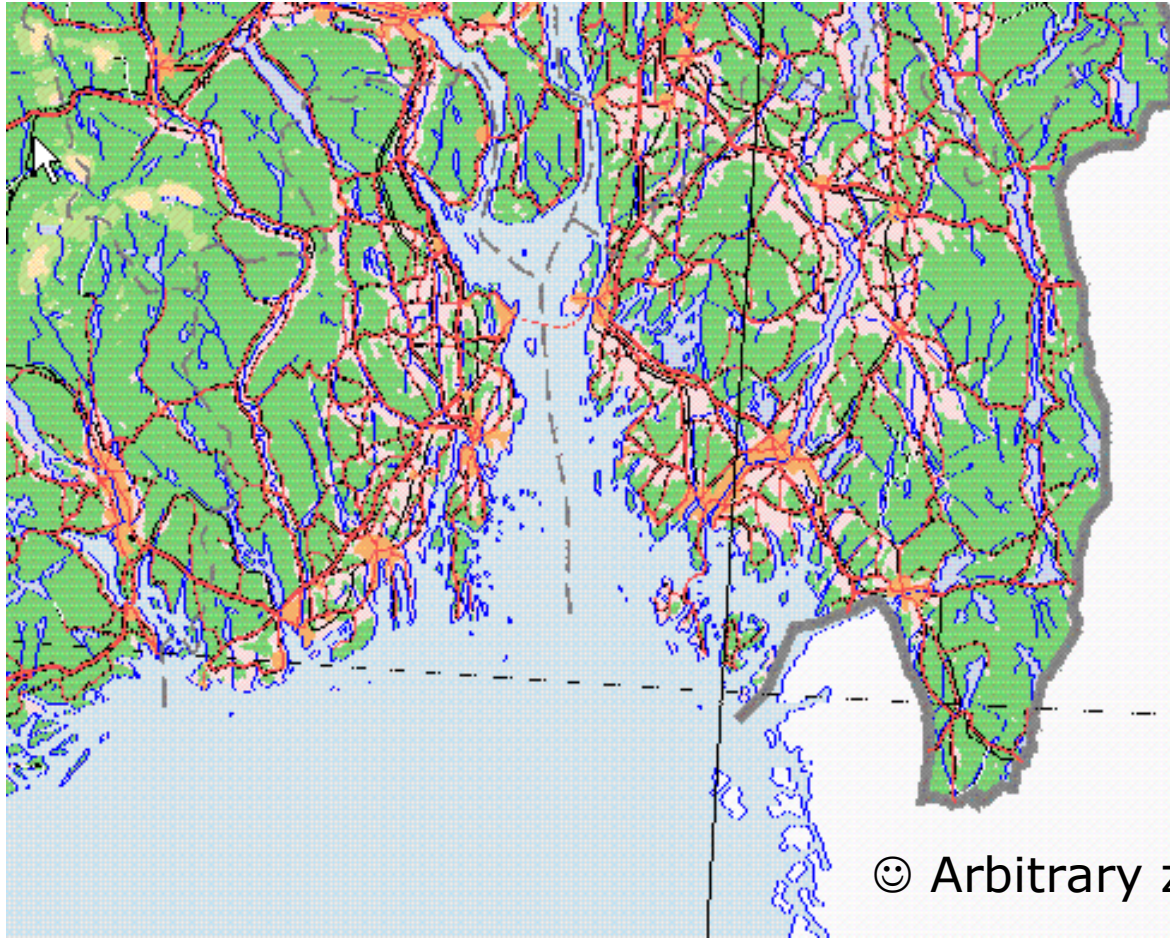
☹ Have to use a screen grabber...no download available, even "save picture as" is not an option...

# NorgesGlasset - National



☹ Miss my neighbours...

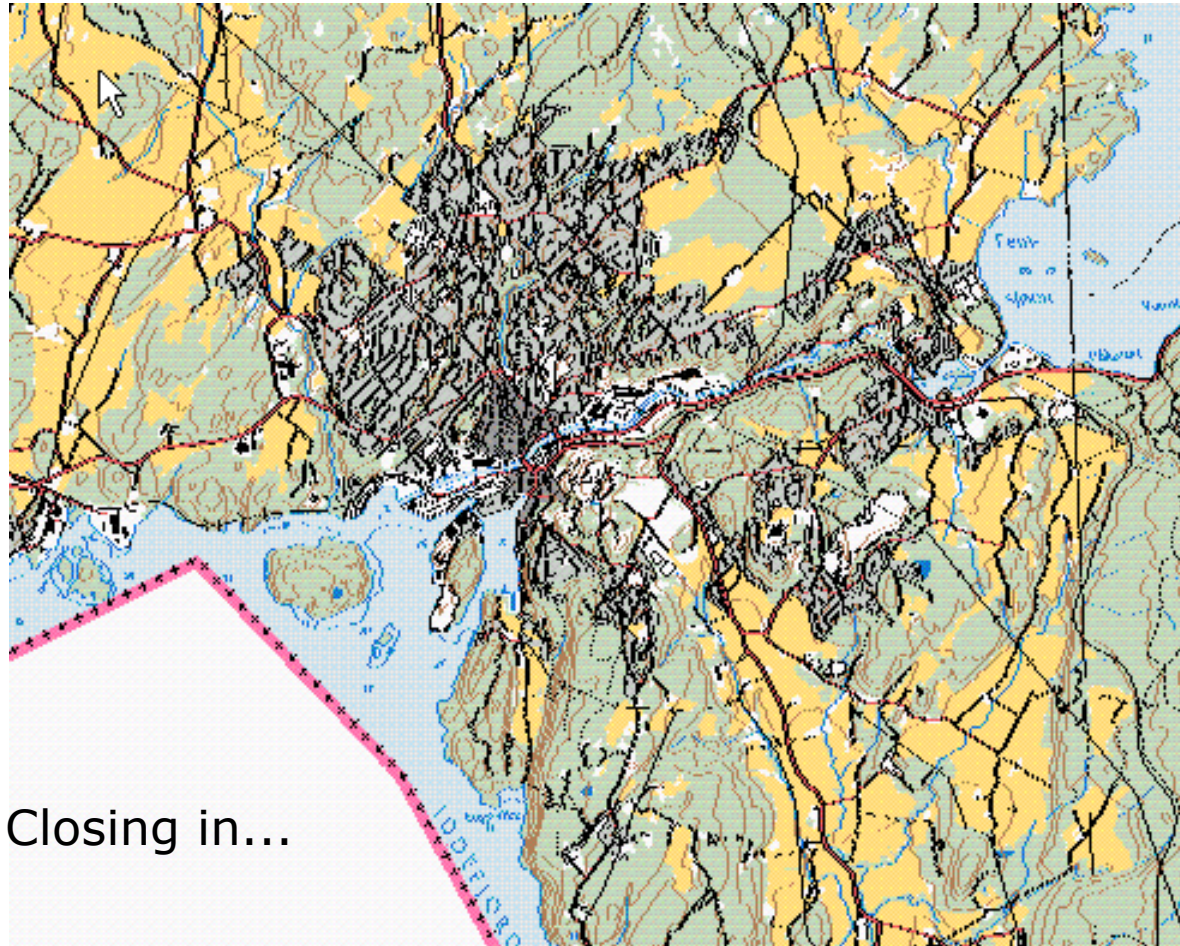
# NorgesGlasset - Regional



☹ Looks as scanned good old paper maps...

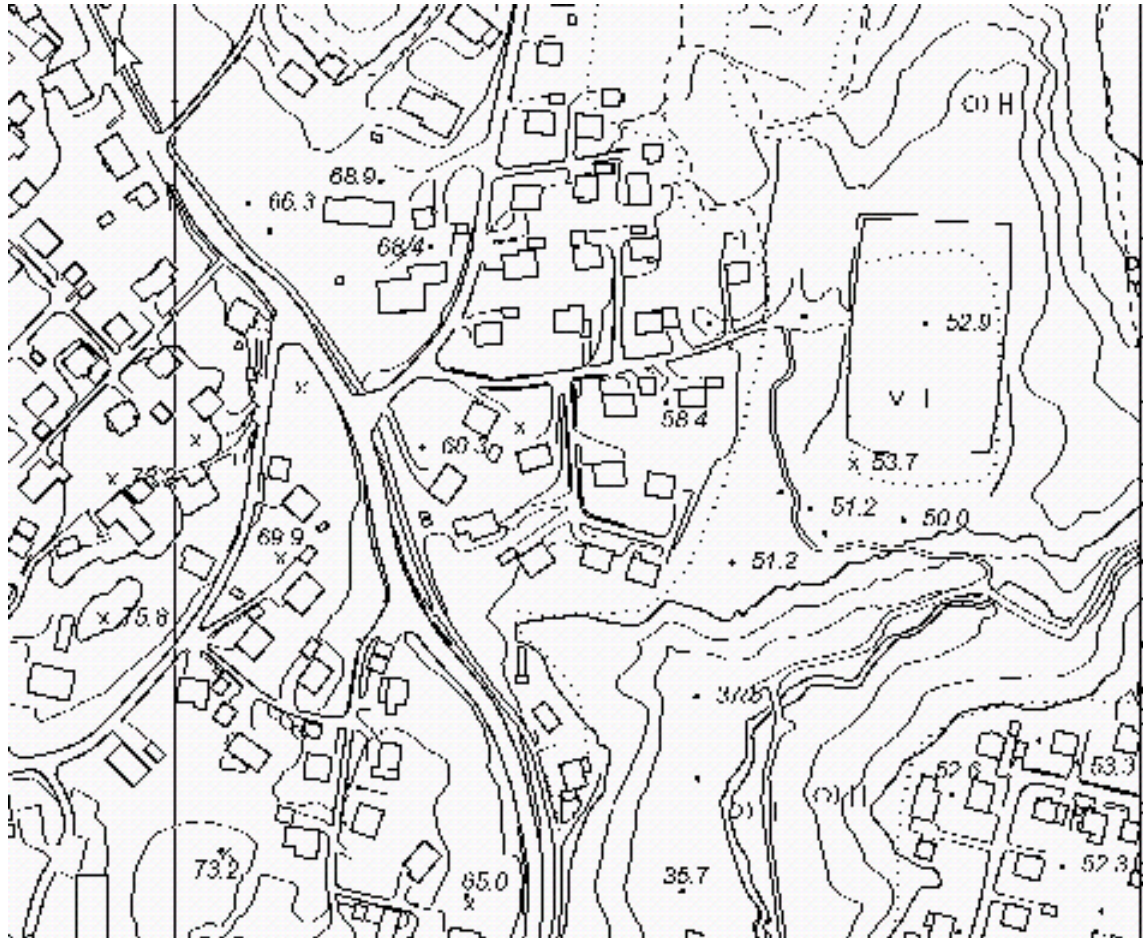
☺ Arbitrary zooming...and fast

# NorgesGlasset - Town



© Closing in...

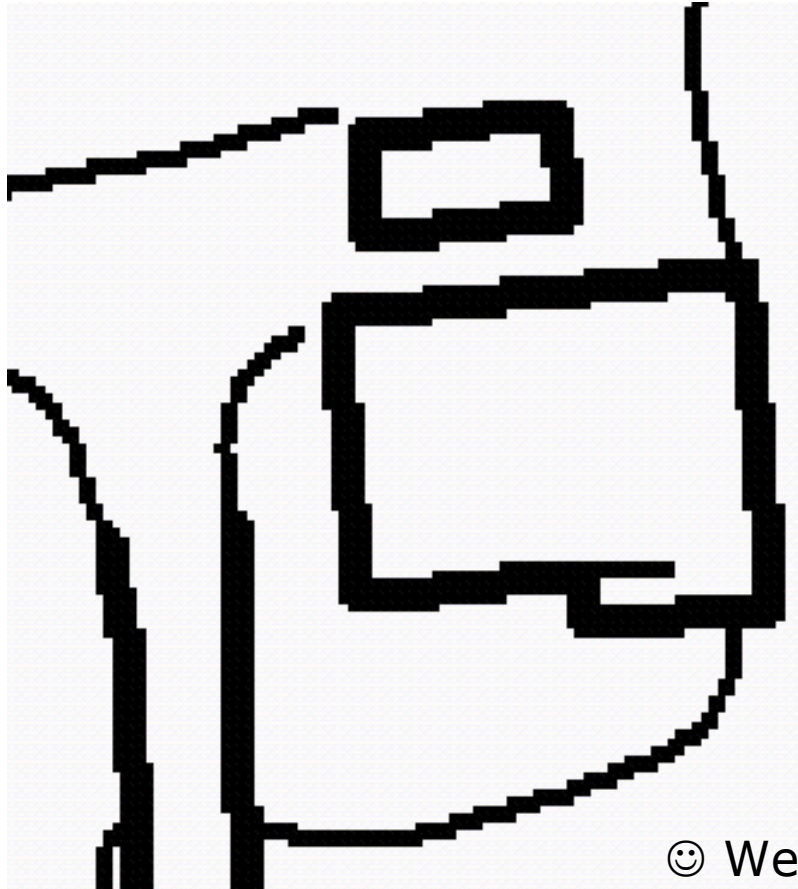
# NorgesGlasset - Neighbourhood



☺ Can see the forest track I'm using when walking to the office



# NorgesGlasset - House



☹ Definitely scanned paper map

😊 We're ready to knock on my door...

# MapQuest – Global

☹ Where's the rest of the world?



# MapQuest – National

☹ Only fixed set of detail levels



☺ ...but it's fast...and they serve tens of millions of map requests per day!

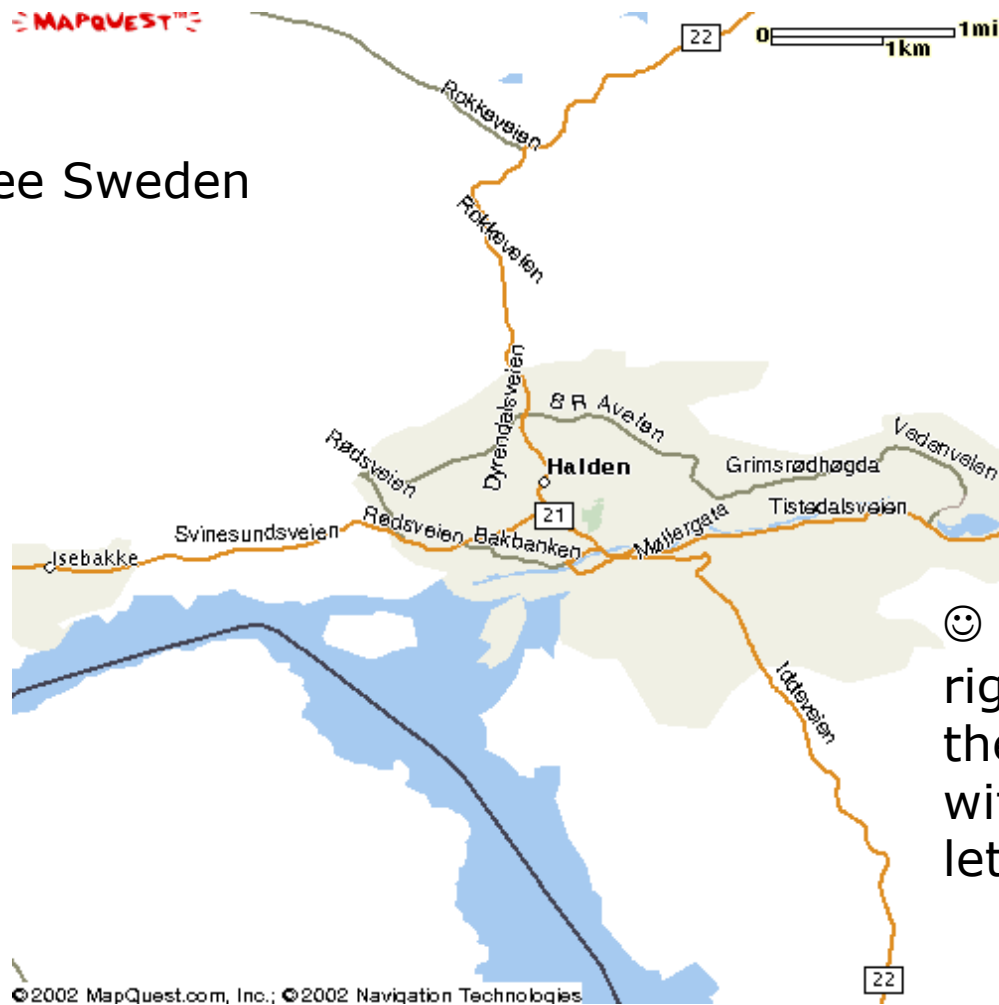
# MapQuest - Regional



☺ Lots of detail

# MapQuest - Town

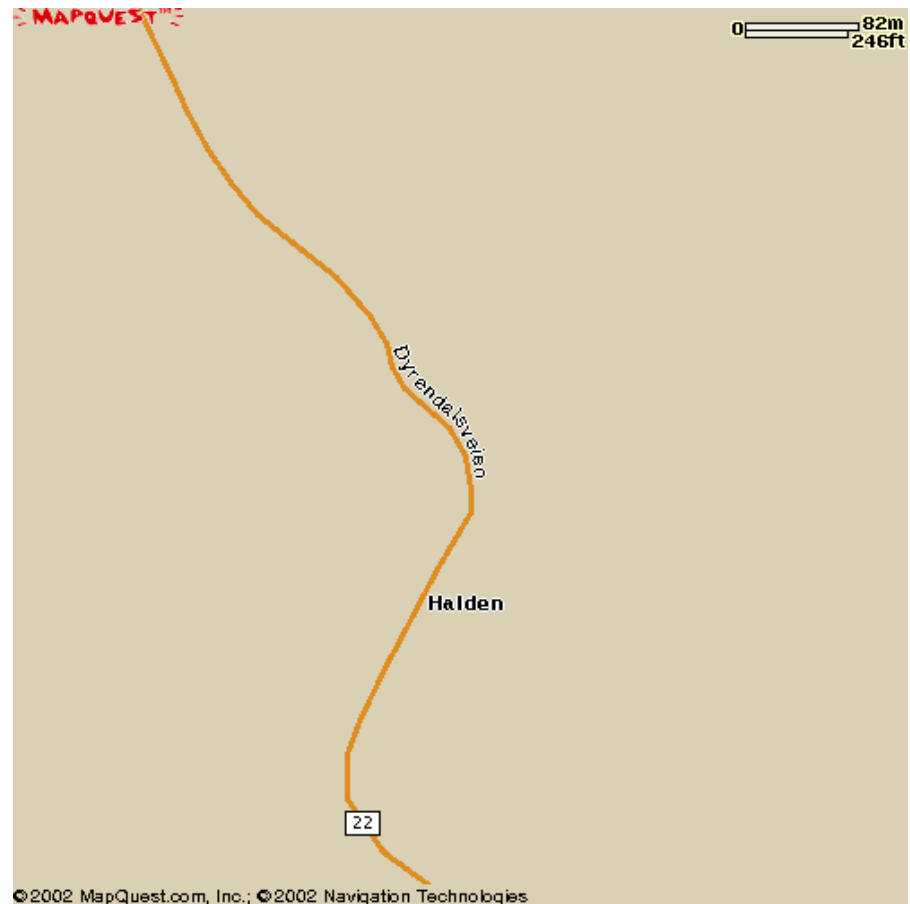
☺ We can see Sweden



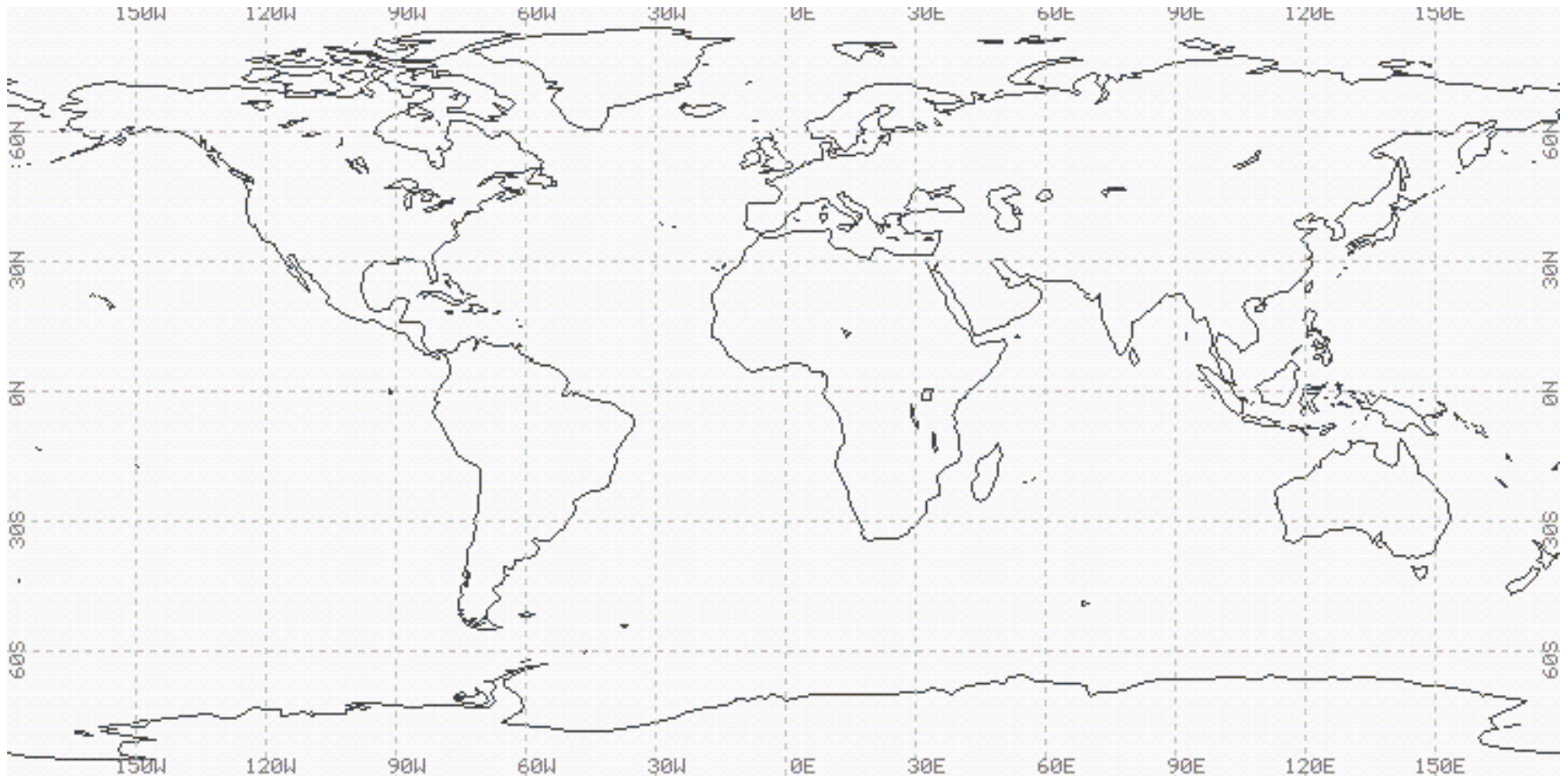
☺ Even got the right names on the roads, with Norwegian letters...

# MapQuest – Neighbourhood

☹ Got the main road at least...



# Coastline Extractor – Global



☺ Here we have "real" geodata...

# Coastline Extractor - National

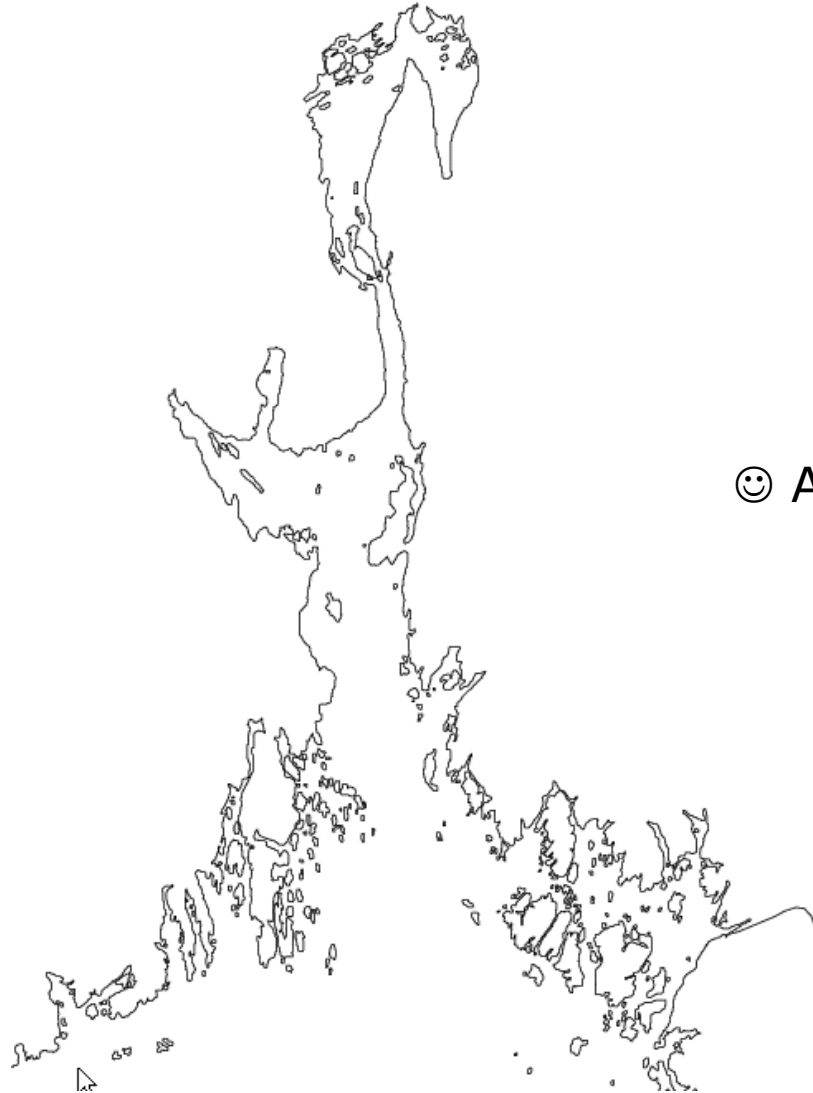
☹ But no topology,  
and obvious inconsistencies

☹ Only 3 (4) levels of detail





# Coastline Extractor - Regional

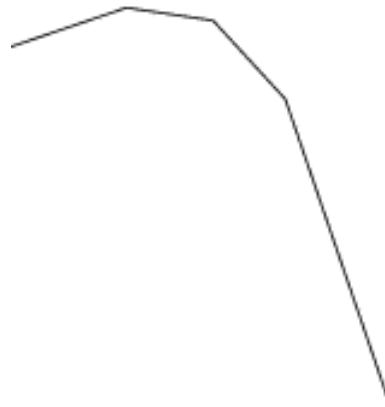


☺ Fast server

☺ Arbitrary zooming

# Coastline Extractor– Town

☹ Not much to see  
in Halden, today...



# Existing Online Global Map Servers

- Huge number of web map sites
- Mostly with limited geographical and thematic scope
- Very rarely "real" geodata
  - ...and most of these servers are
    - commercial, and/or requires use of
    - expensive software
- Most often picture maps
- Little metadata information
- Difficult to find the right server

# Future(?) Online Global Map Servers

- Easy online access to maps and geodata
- Easy zooming and navigation, both geographically and thematically
- A rich set of featuretypes, and good coverage down to house level (or better) precision
- Free usage of downloaded data
- Geodata on a few standard formats
- Free software for presentation and analysis
- Sufficient metadata supply

# The Web Feature Server Approach

- Very promising
- One obvious limitation: Integration of heterogenous sources:
  - Talking the same language don't necessarily mean that we understand each other!
  - Geometric inconsistencies:
    - Overlapping data
    - Gaps
    - Broken topology
  - Thematic inconsistencies (different Information Communities)
    - Halden Nuclear Reactor: "powerplant" or "environmental hazard"?
- Need for Clearinghouse functions!

# OneMap Gateway Alpha

Single Server

Dispatcher +  
Distributed Storage Nodes

Dispatcher +  
Distributed Assisted Storage Nodes

# The OneMap Project: Profile

- Open/free source
- Open/free content
- Open management
- Open standards/formats

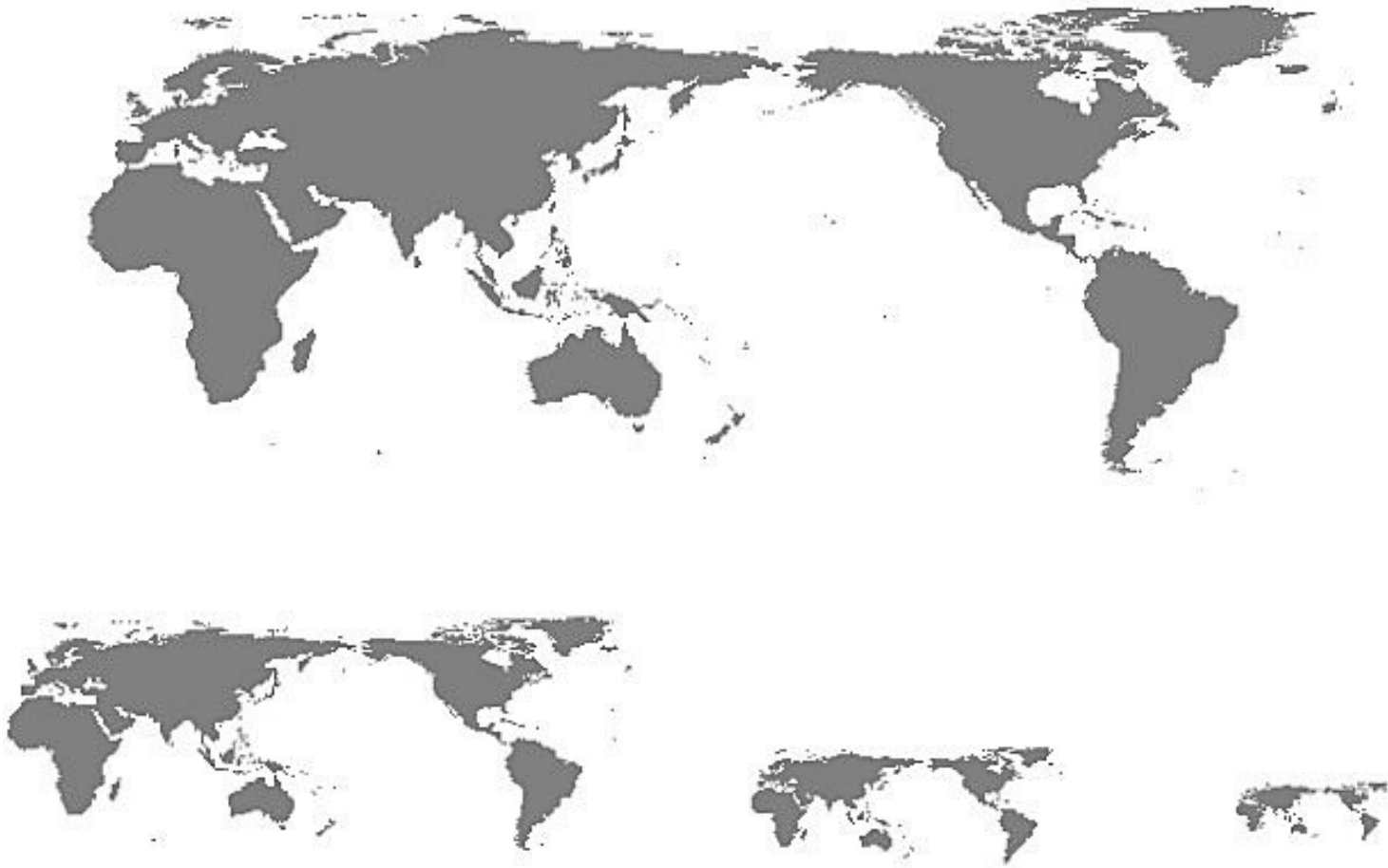
# Objectives

- Provide public access to free-of-charge geodata with global, consistent coverage of high detail by
  - Building a large, global map, rich with feature types and detail
  - Implementing a scalable, redundant and distributed architecture, both for storage and processing
  - Compiling the map incrementally and uncoordinated by many submissions
  - Combining efforts from several contributing parties
- Offer a testbed and focalpoint for further development of methods and tools needed for reaching the primary goal
- Offer an environment for education and training in the construction, maintenance, management and use of the GeoWeb
- Have fun 😊

**...piece of cake, eh?**



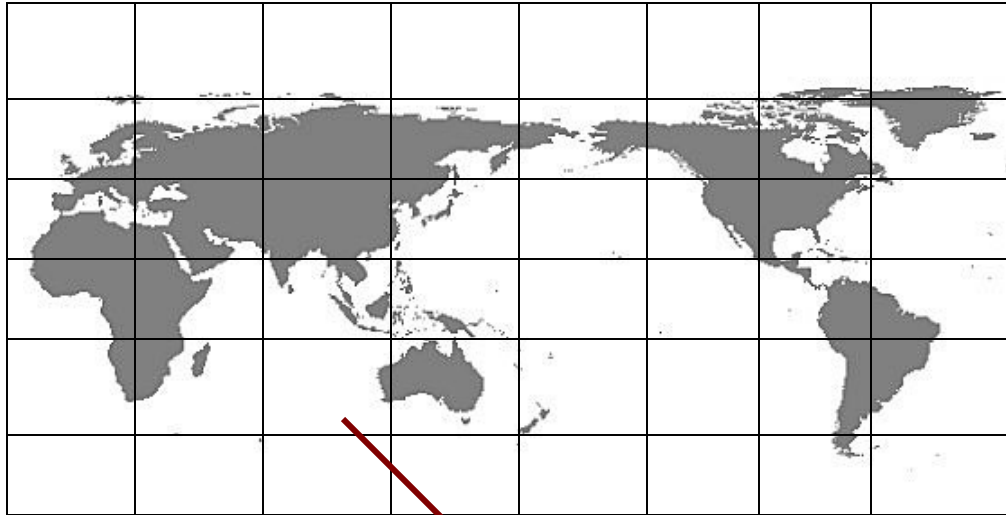
# Extreme Generalization I



# Extreme Generalization II

Computers have finite precision

Displays have finite precision



Naive method?

Yes, but:

It's fast

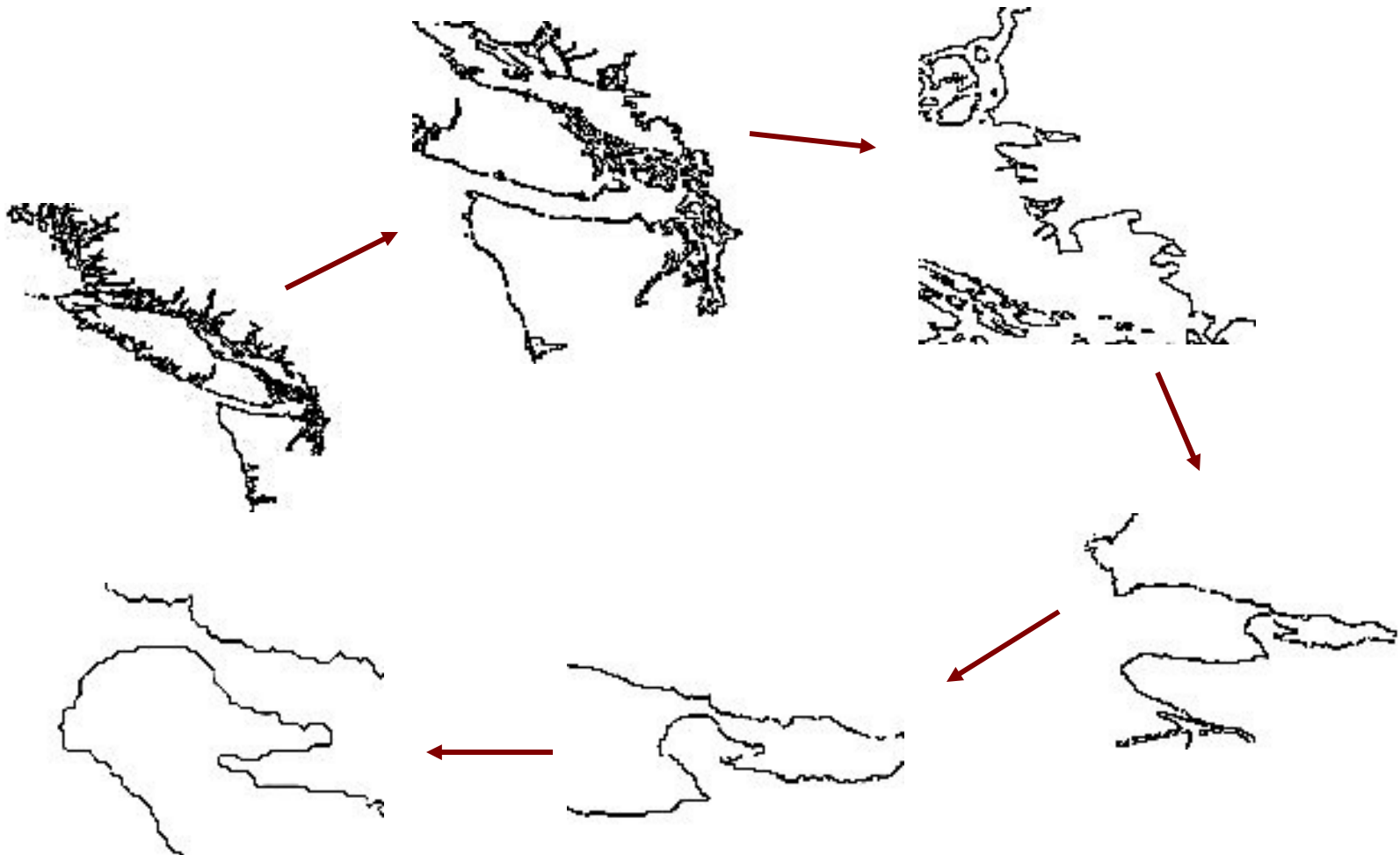
It is local

Invariant with respect to certain parameters

Automatic feature selection

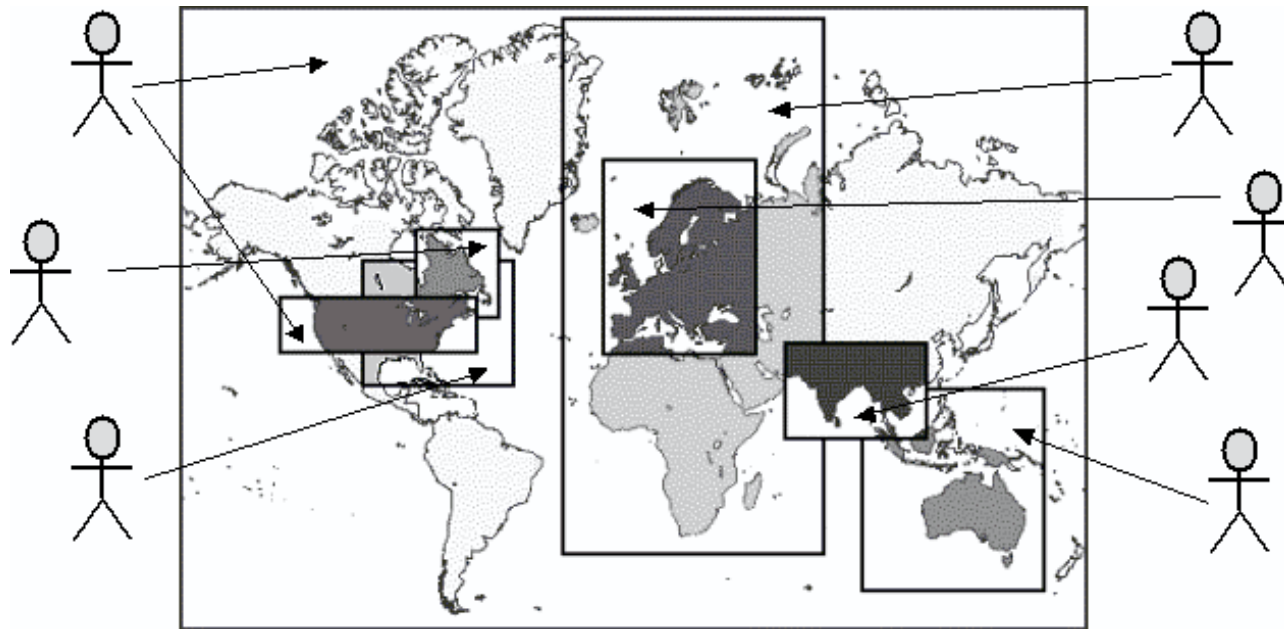
Preservation of topology (in a specific sense)

# 5 Best Levels in OneMap (so far)



# Incremental Map Construction - I

Submissions will be harmonized and accepted/rejected in peer review processes.

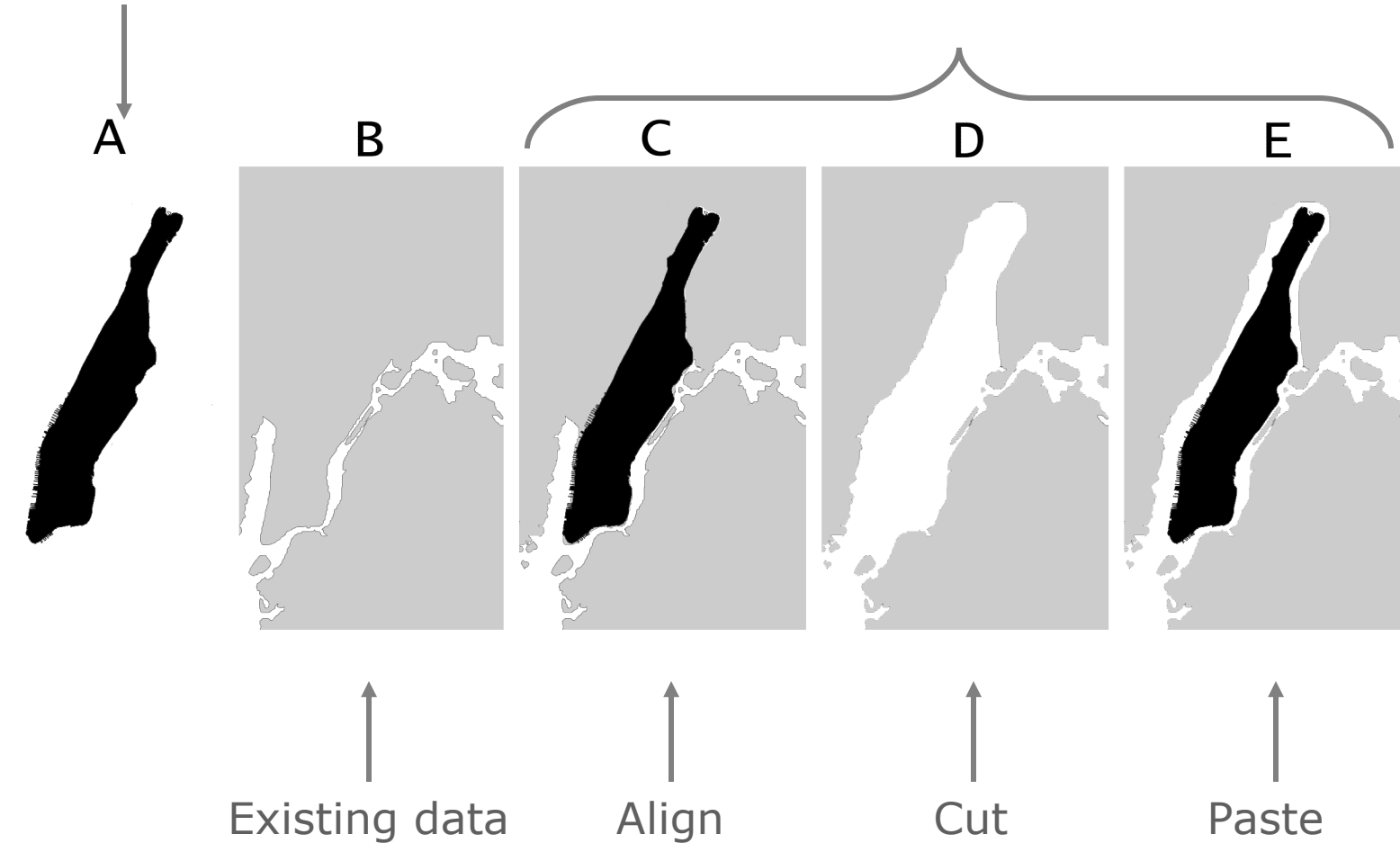


The Feature Catalog will be dynamically constructed and maintained...also by peer review processes.

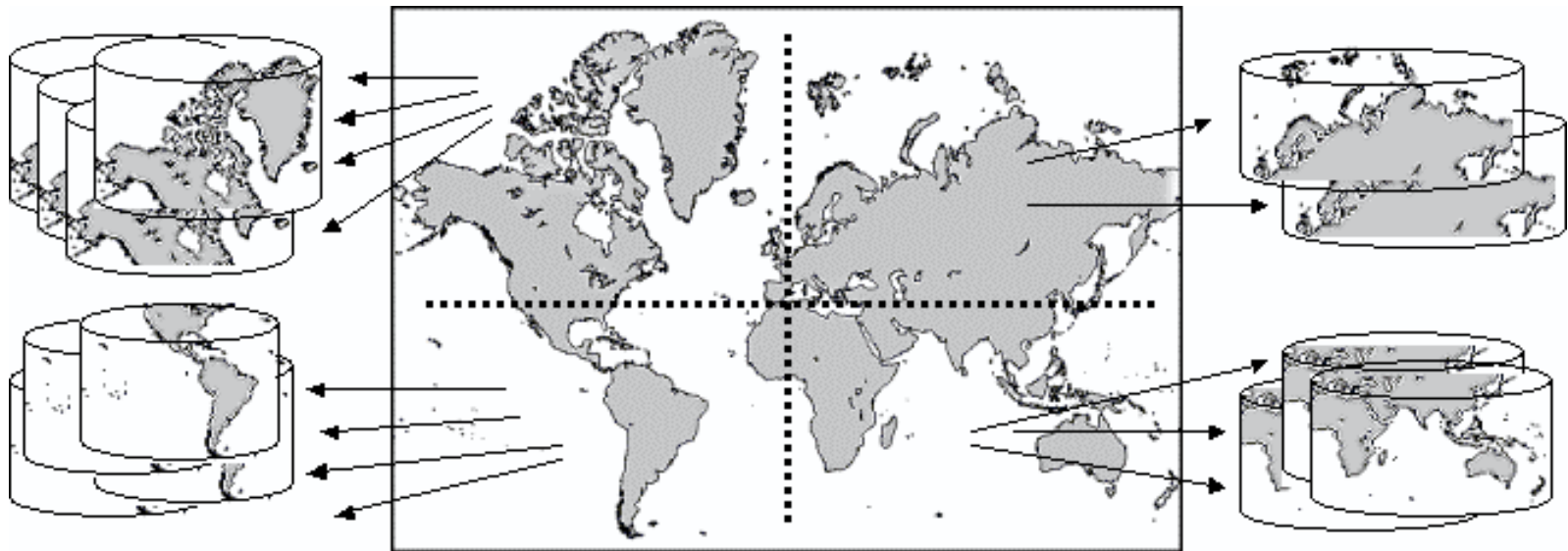
# Incremental Map Construction - II

Contribution

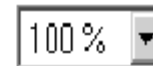
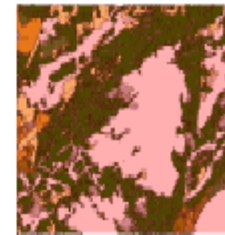
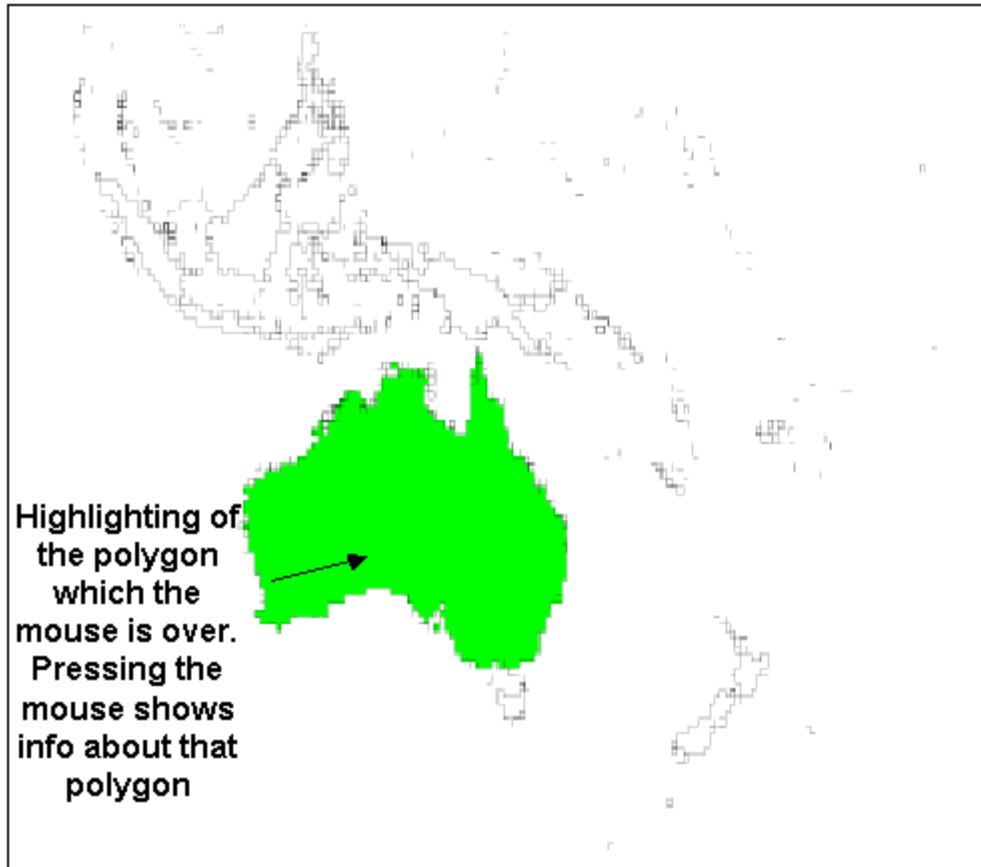
Peer review harmonization



# Redundant Storage and Processing

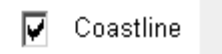


# GateWay



Simple zooming capabilities

Visible layers:



Turn off and on features, and change the color of them



Dynamic scalebar

Main map window

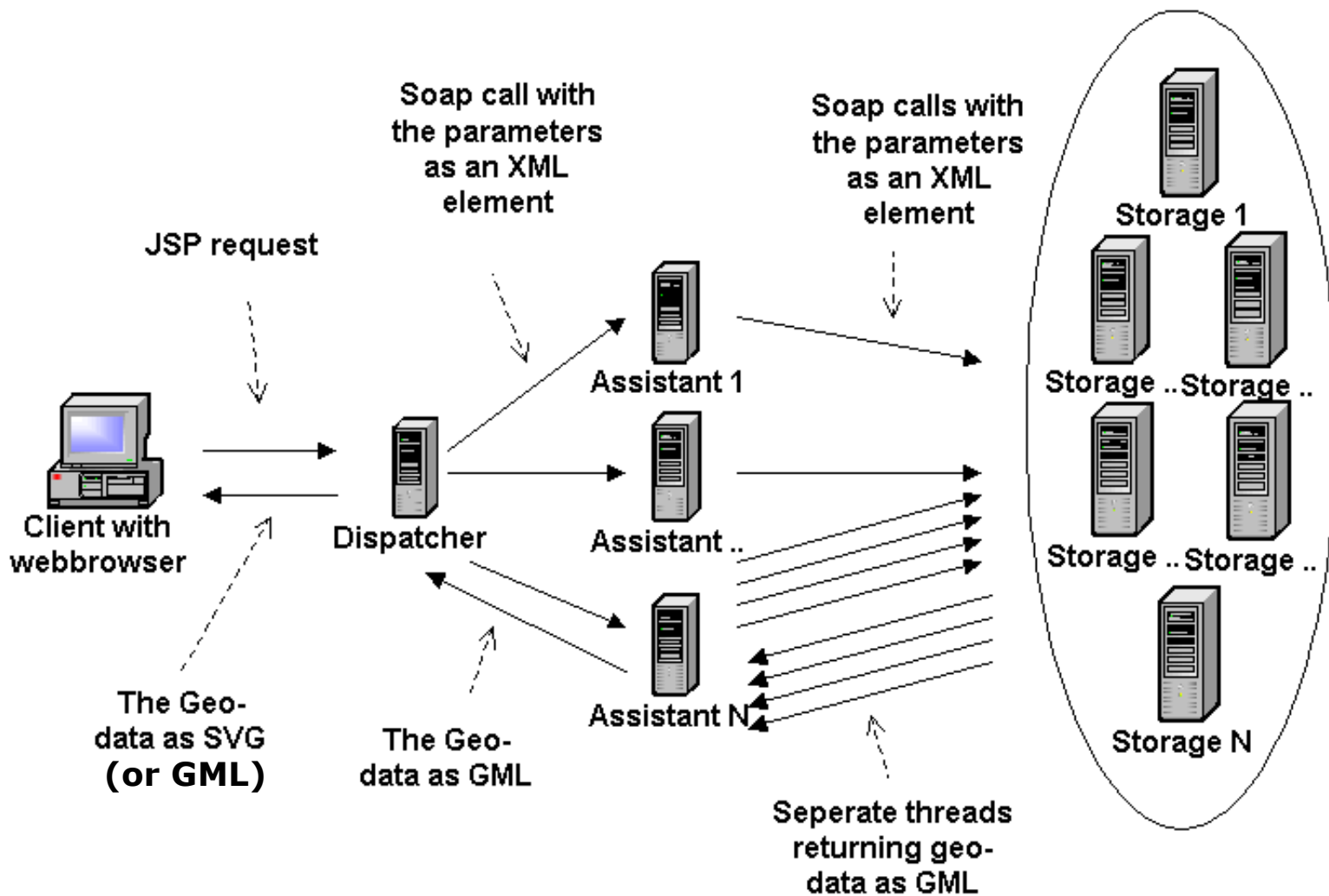
# Repository



# Repository

Client side

Server side



# Remarks

- Adopting XML and related technologies has been significantly speeding up the OneMap development process.
  - We use the same tools and patterns for a multitude of different purposes, from data parsing and conversion to user interfaces. It also makes it easier to reuse software, both home made and public domain.
- The XML performance issue must be dealt with seriously, through the whole process from design to runtime environments.
  - The OneMap distributed storage strategy is one way to deal with the volume problem. By releasing the parallel potential in the distributed retrieval and processing we also are able to speed up processing.
- All tools used, from editors to server software are open source and/or free.
- Databases are not used.

# DO YOU...

- Have some free geodata?
- Have some free, open software?
- Have some ideas?
- Have some students in need of interesting topics for their projects and theses?
- Have a spare server or two?
- Want to have some fun?



**THEN: WE NEED YOU!**

Project OneMap will be officially launched later this winter.  
Until then, please contact:

**[gunnar.misund@hiof.no](mailto:gunnar.misund@hiof.no)**