Evaluating and mapping avalanche hazard with JTX

Presentation at ESRI UC 2010

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NGI

Agenda

About NGI

Background on avalanche hazard

Using Job tracking for hazard mapping

Experiences

Conclusion

NGI today

Leading international centre for research and consulting in the geosciences

Main office and laboratories in Oslo

- Branch office in Trondheim, Norway
- Daughter company in Houston, Texas, USA

Private foundation

200 employees from more than 25 nations

20-30 guest researchers every year

Leading institution of CoE - "International Centre for Geohazards" (ICG)

Markets and services

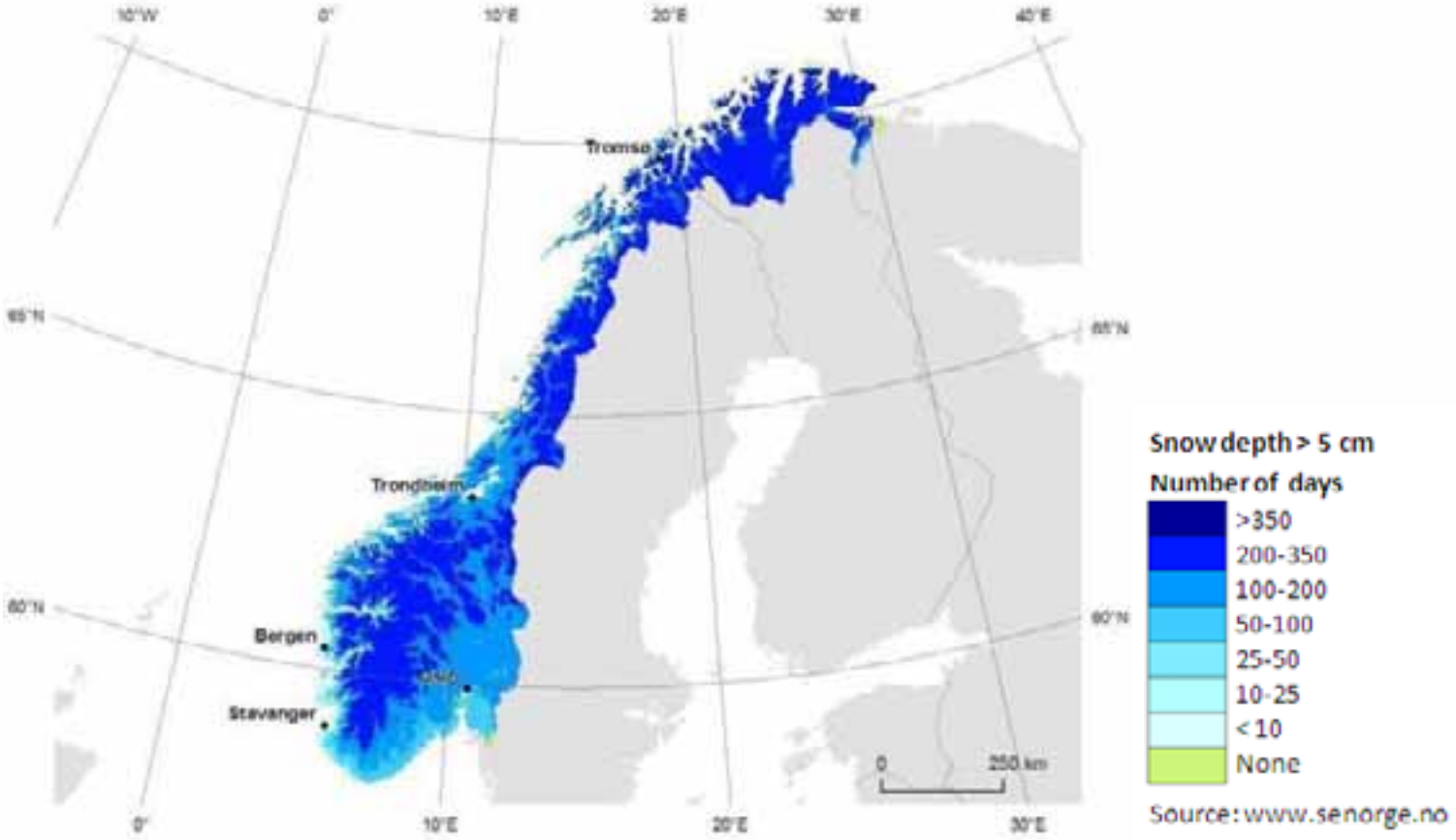
- leading international competence centre





- Oil, gas and energy
- Natural hazards
- Building, construction and transportation
- Environment

Norway


10°W
0°
10°E
20°E
30°E
40°E
70°N
60°N
Tromsø
Trondheim
Bergen
Oslo
Stavanger
0
250 km
Snow depth > 5 cm
Number of days
>350
200-350
100-200
50-100
25-50
10-25
< 10
None
Source: www.senorge.no

Snow avalanche hazard in Norway

Avalanche hazard in Norway

The largest geohazard in Norway

Danger to people and assets

- 1500 deaths since 1850
- 70.000 people in avalanche prone areas
- Exposed buildings and infrastructure
- Risk to outdoor activities

Building Act defines acceptable levels

- Residential housing: 1 aval. / 1000 yrs

Mitigation measures

Avalanche hazard mapping & evaluation

Expert evaluation

- Aided by field work, model calculations and various data sources
- E.g. remote sensing and geomorphology

Different scale/levels of detail

- Regional susceptibility maps
- Detailed large scale hazard maps
- Single object evaluations

Other data produced

- Avalanche occurrences, mitigation measure

Avalanche hazard mapping at NGI

Digital mapping and evaluation since early 1980's

- Several dynamic and statistical models

Pre-2009: Existing processes had shortcomings

- Inadequate data management
- Low reusability of data
- Multiple GIS used

A new workflow for avalanche mapping

Standardize and improve the evaluation and mapping

- Gather tools into a common set of tools
- Establish routines and guidelines
- ArcGIS introduced as the GIS for avalanche mapping

Data stored in an enterprise database

- Allowing for multi-user editing

The new workflow introduced 2009

Job Tracking: A key tool in the new workflow!

About Job tracking extension

An extension to ArcGIS Desktop

Organize, standardize and streamline GIS and non-GIS workflows

- Simplify creation and management of geodatabase versions
- Seamlessly integrate GIS and other business applications
- Centralize all job-related information

Jobs and job types are essential in Job tracking

Source: ”Job Tracking for ArcGIS”, leaflet from ESRI

Job tracking at NGI

A central tool in the new workflow

Includes both avalanche experts and GIS experts

- GIS experts involved in data management

Avalanche hazard mapping established as a job type

One job per hazard mapping project

- Multiple jobs for larger projects

Creating a new job

4 mandatory fields

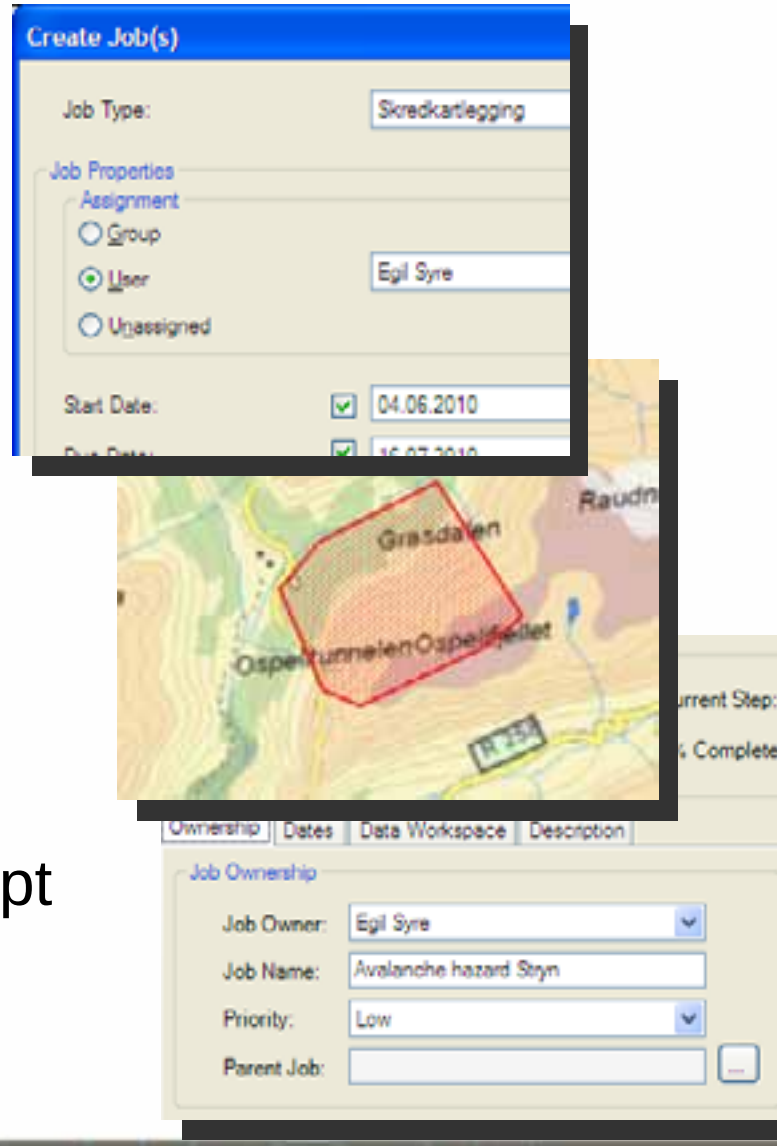
- Job assignment
- Project number
- Project title
- Project extent (AOI)

Other fields are optional

- E.g. start and due date and priority

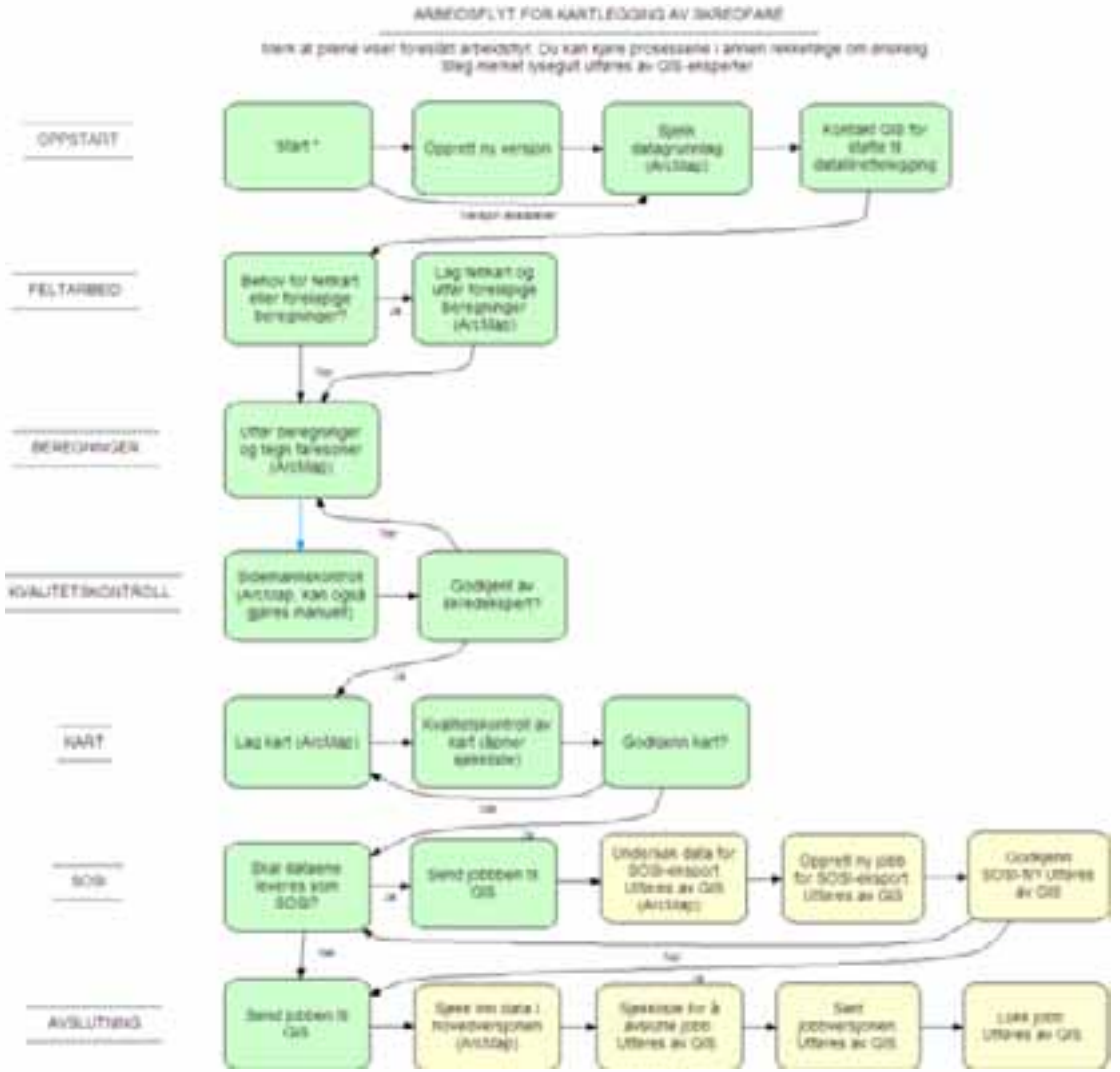
Some fields: Default values are kept

- DB version, job owner



Workflow

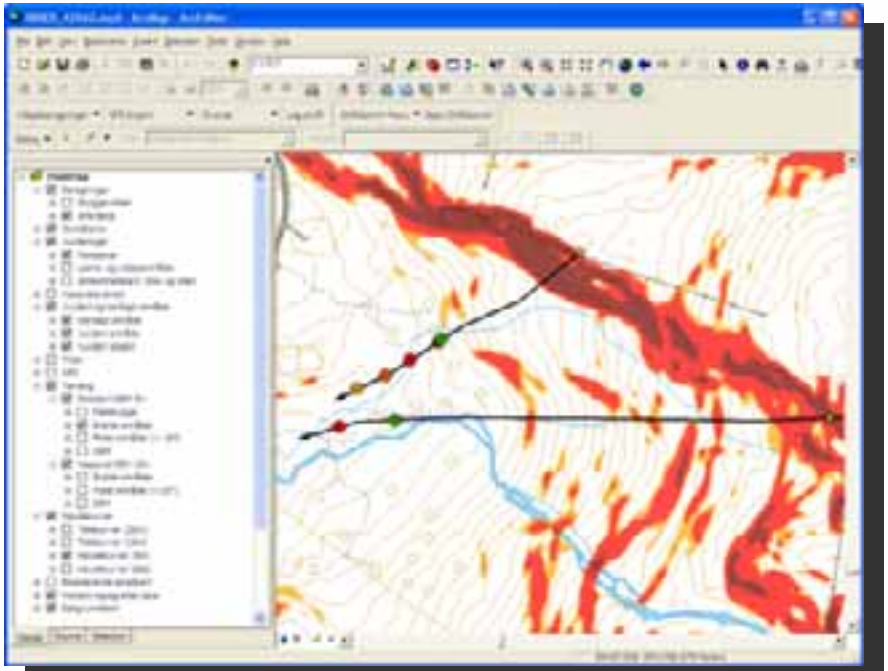
- Simple
- Flexible

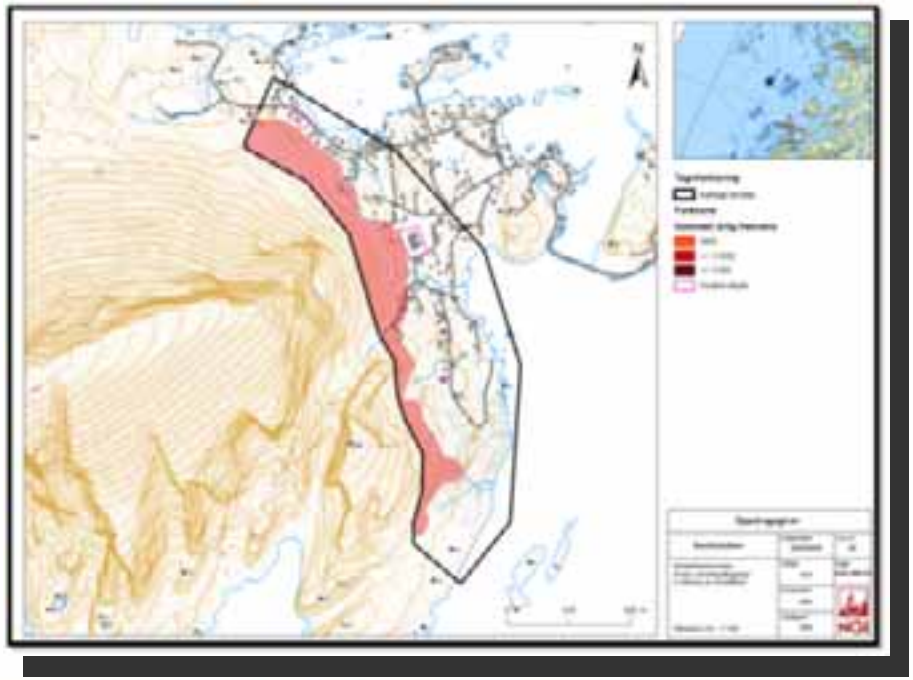


Job type map template

A common map template

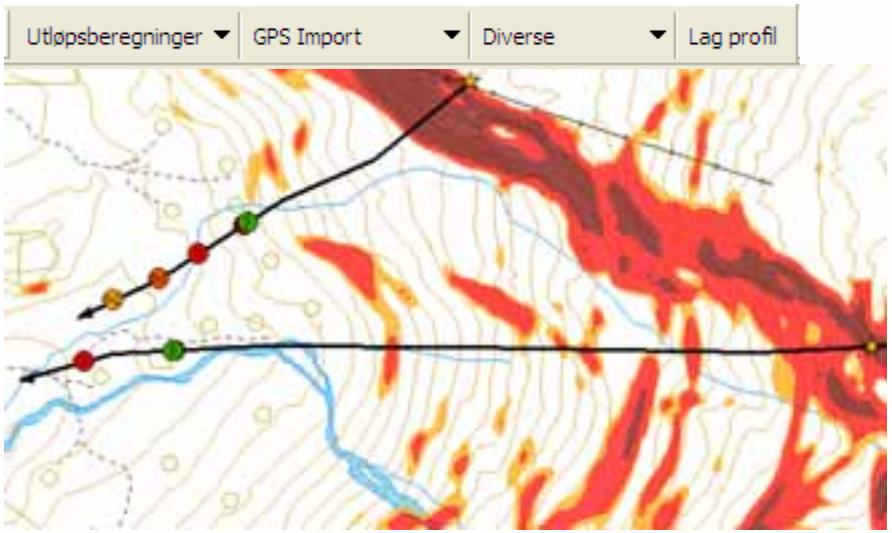
Includes a standard set of data

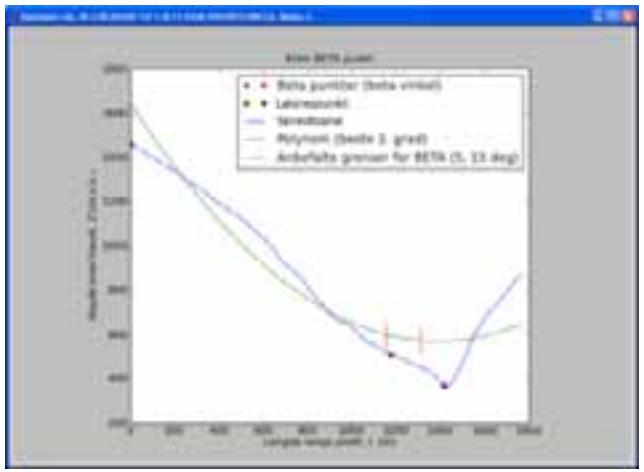




Job type map template

Tools integrated into the Avalanche toolbar





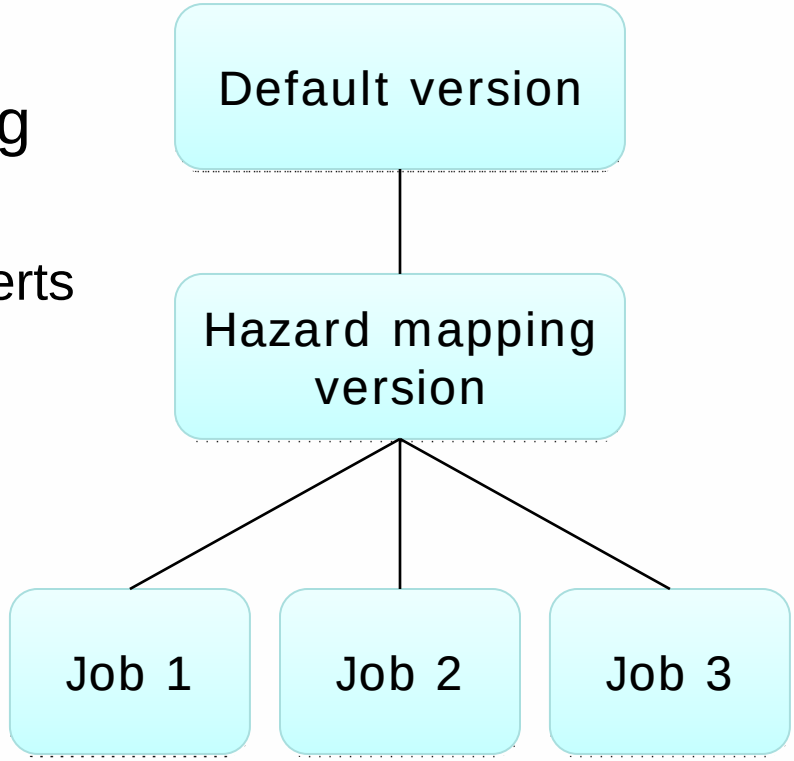
Geodatabase versioning

Versioning created by JTX

- Based on intermediate version

GIS experts perform reconciling and posting

- Simpler for the avalanche experts



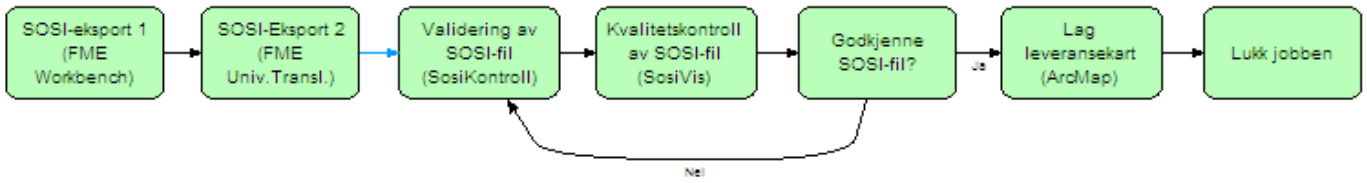
Other workflows

Other workflows established

- Quick clay mapping
- Several GIS data management

Example: Export to a standard interchange format

- Integrates 5 different SW tools



Experiences

Quick and easy to create a new project
- Data and templates available
- Assigning jobs

Easy to use
- Hides complex database issues for users
- Simplifies avalanche mapping

Integrates well with ArcGIS and other products

Quick overview of all jobs
- Good documentation of each job

Enhanced and standardized mapping process
- Improved data storage/archive
- Standardizes maps and outputs
- Increased quality of maps and reports

However…

Job tracking: An additional piece of software

- Performance issues

No local Job tracking community

Remaining SW shortcoming

- Regional settings not supported
- Few possibilities of adjusting GUI
- Database locks issues

Lacking multiple layouts

Additional use of JTX

Not only snow avalanches

Other applications

- FME

Avoid use of complex job steps

Conclusion

Introduction of Job tracking has in avalanche hazard mapping process

Still improvements to be done Job tracking

JTX/WMX 10 release summer 2010

Thank you for
your attention!