

Web Based Information System for Natural Hazard Analysis in an Alpine Valley

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Network for Natural Hazards at ETH Zurich

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A Platform for Hazard Assessment within ETHZ

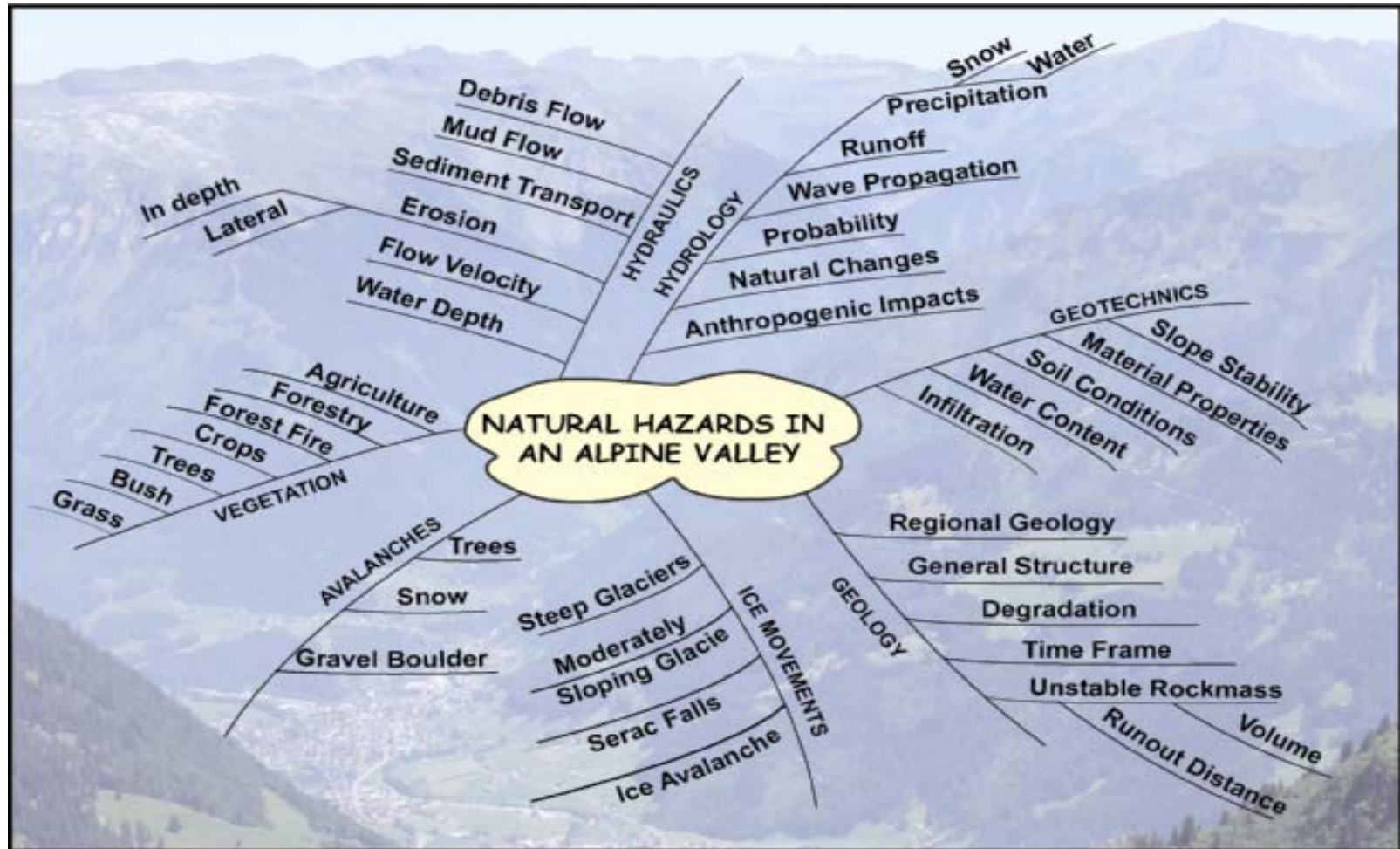
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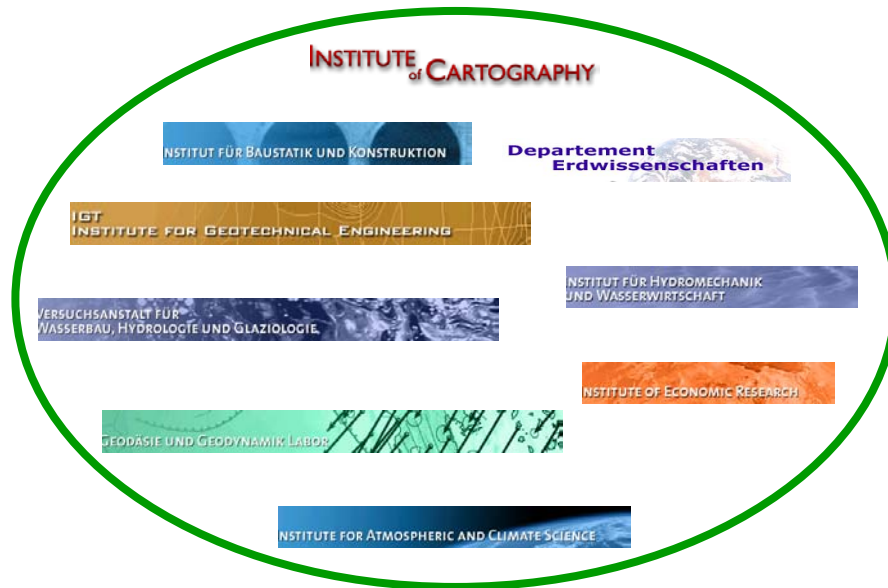
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Natural Hazards in an Alpine Valley



HazTOOL: A Platform for Hazard Assessment within Swiss Federal Institute of Technology

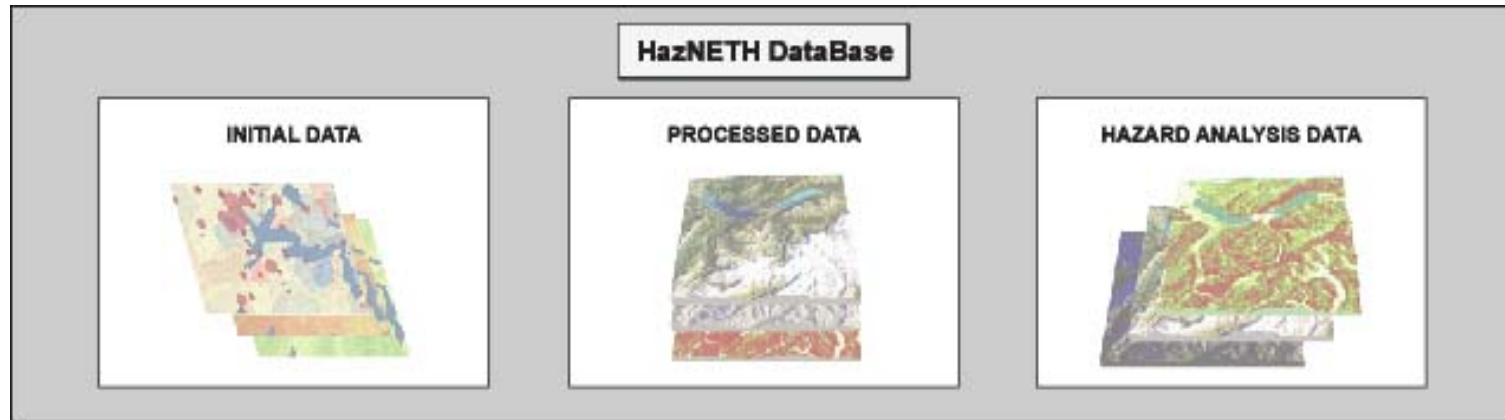
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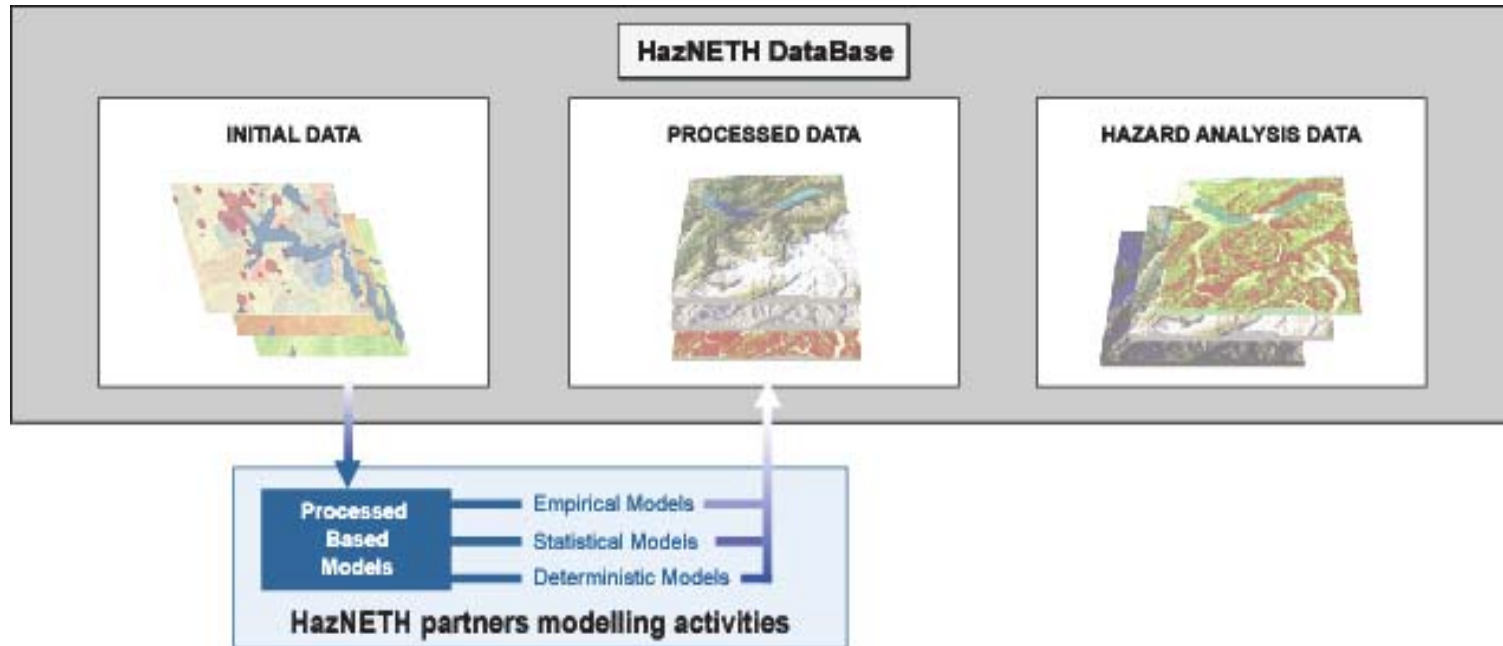
Platform for:

- Data querying
- Data visualisation
- Data retrieval
- Data “warehousing”
- Integrated Hazard Assessment

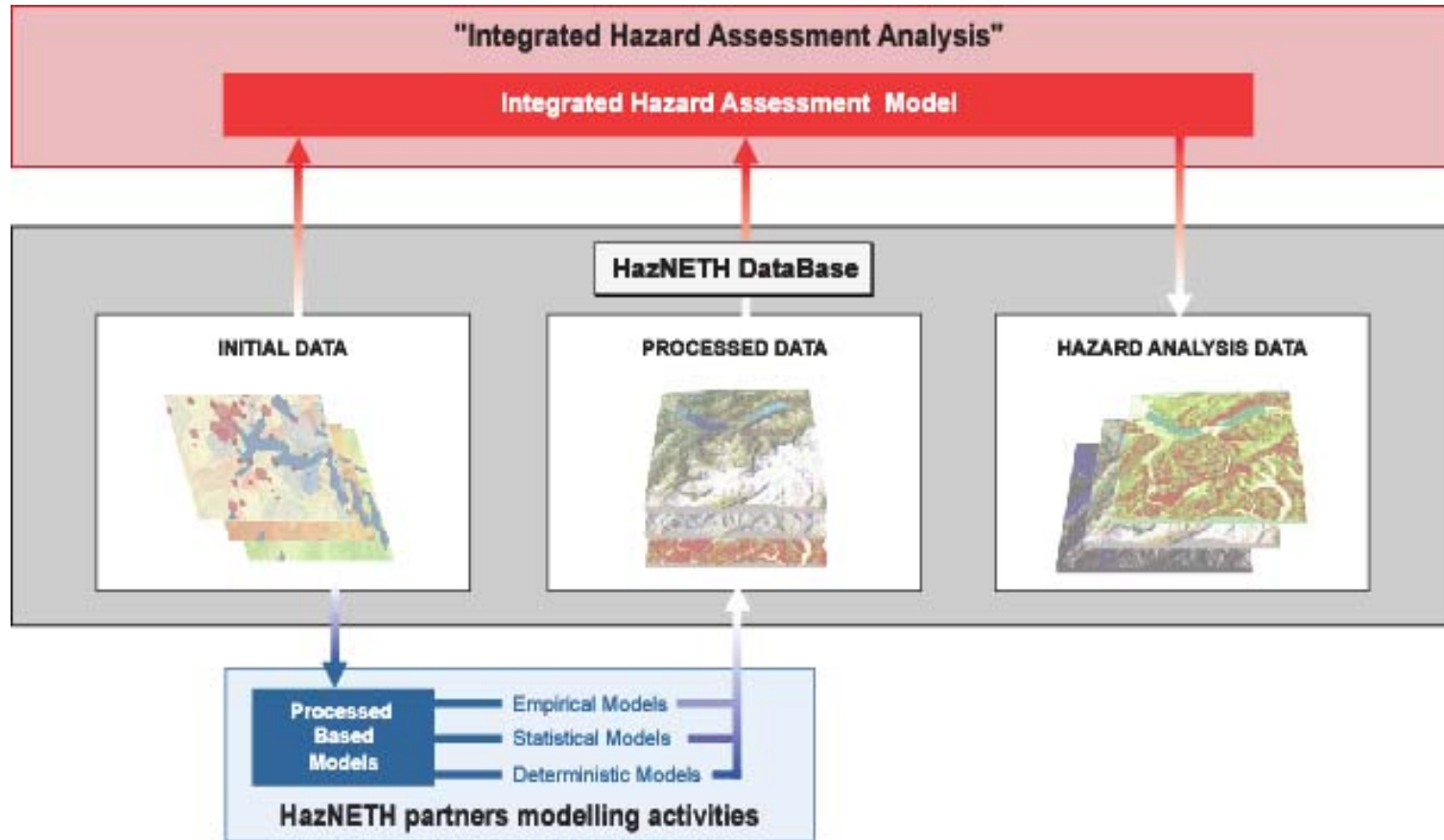
HazTOOL Overview



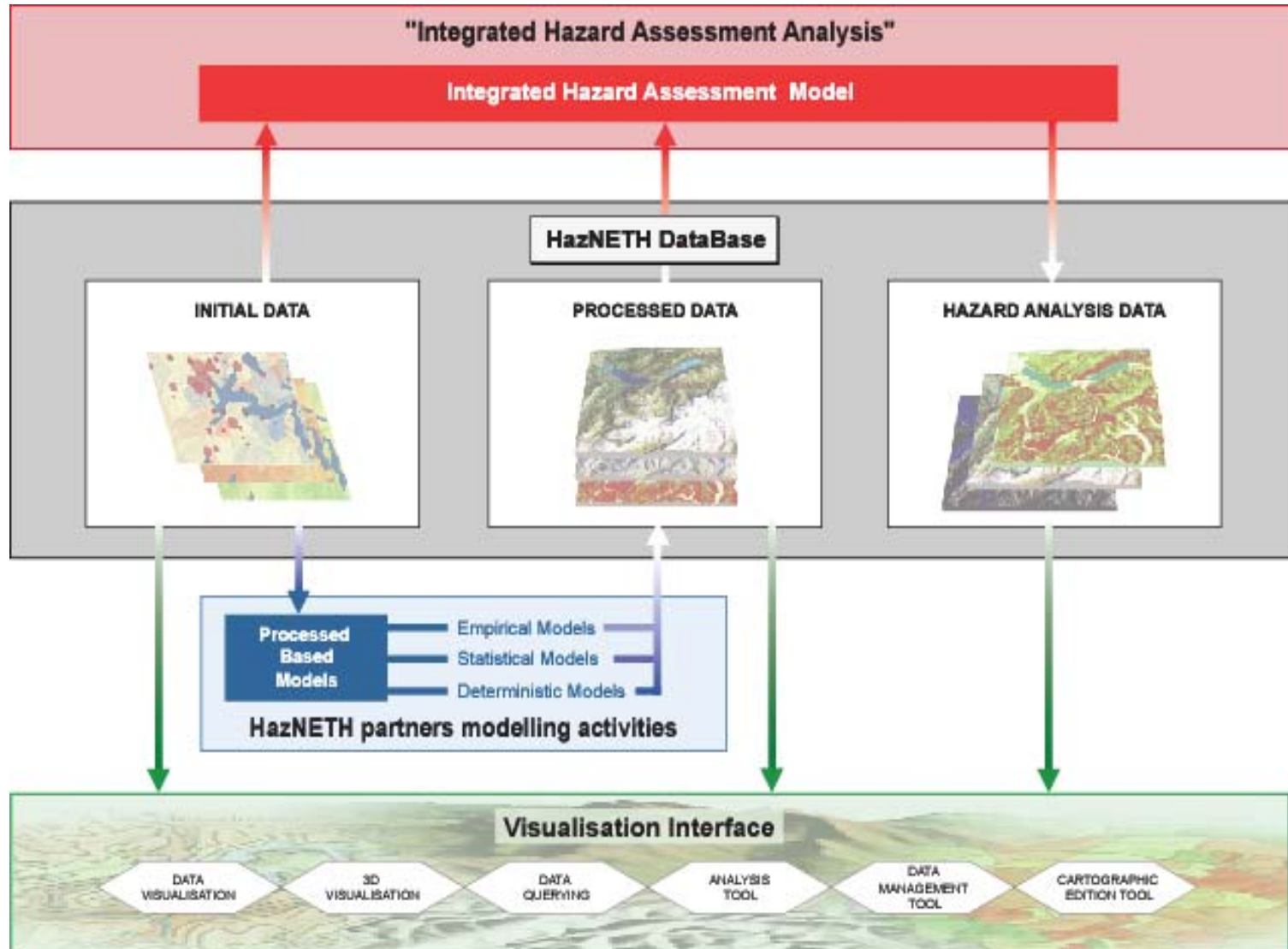
HazTOOL Overview



HazTOOL Overview



HazTOOL Overview



Data Organisation

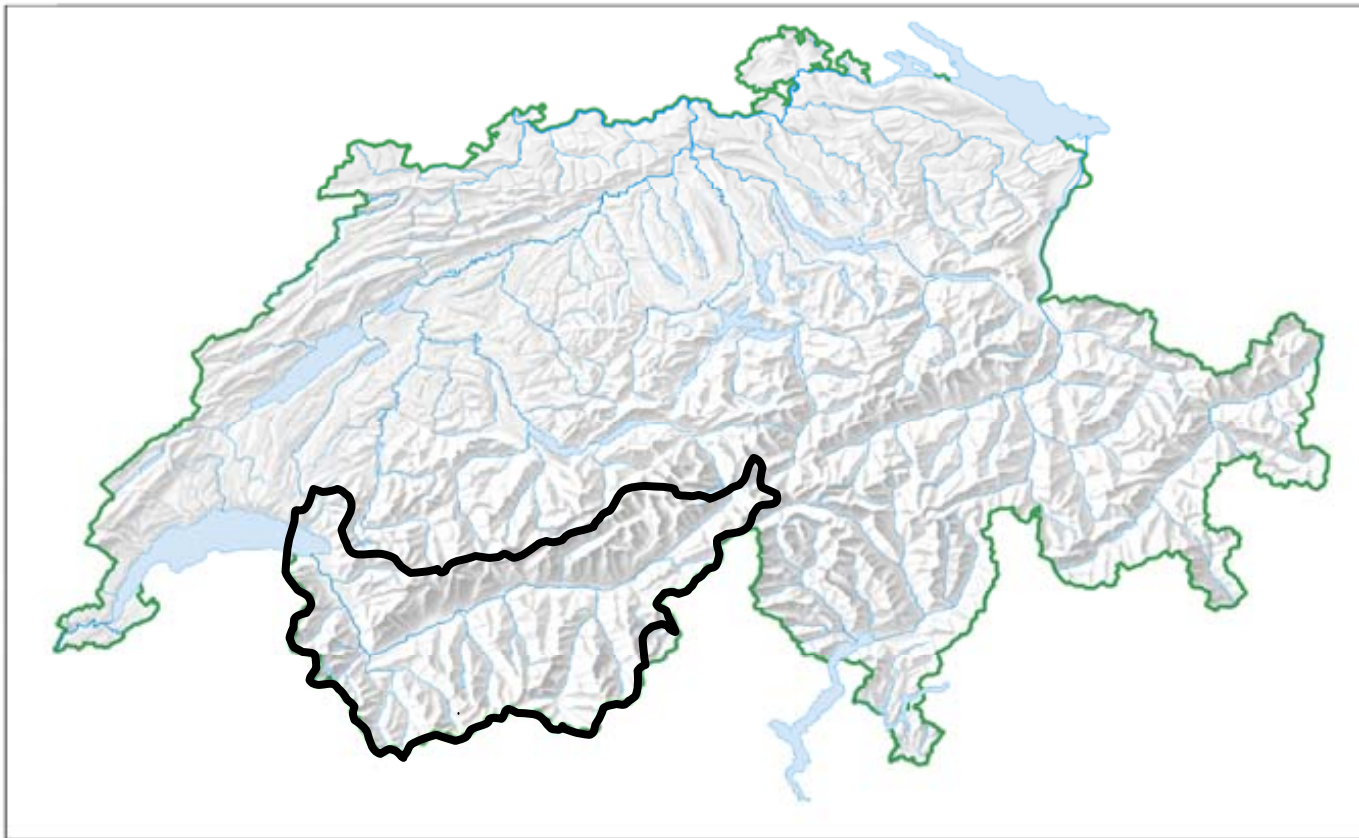
Working Level 1: General (Country)



0 100 km

Data Organisation

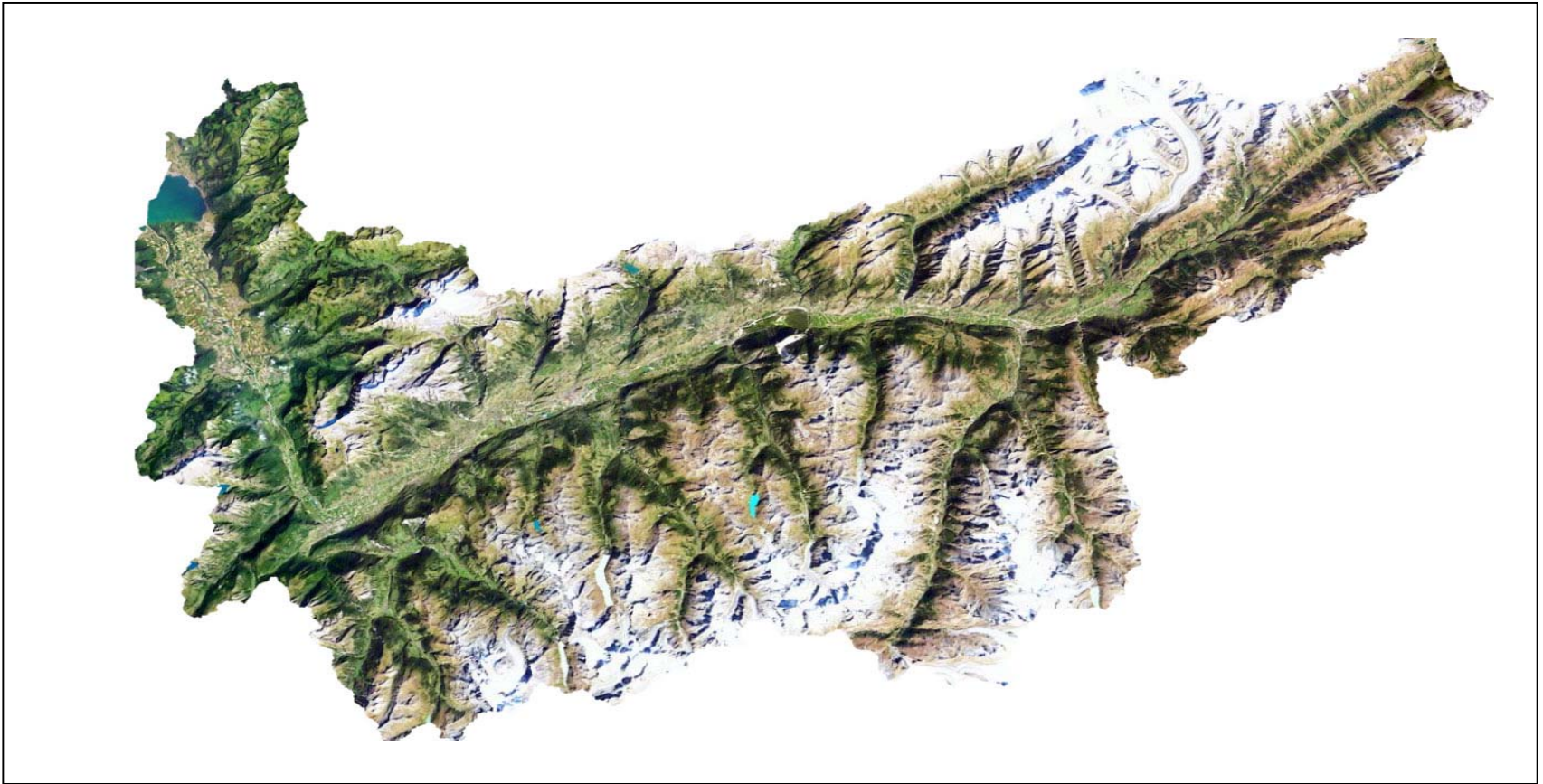
Working Level 1: General (Country)



0 100 km

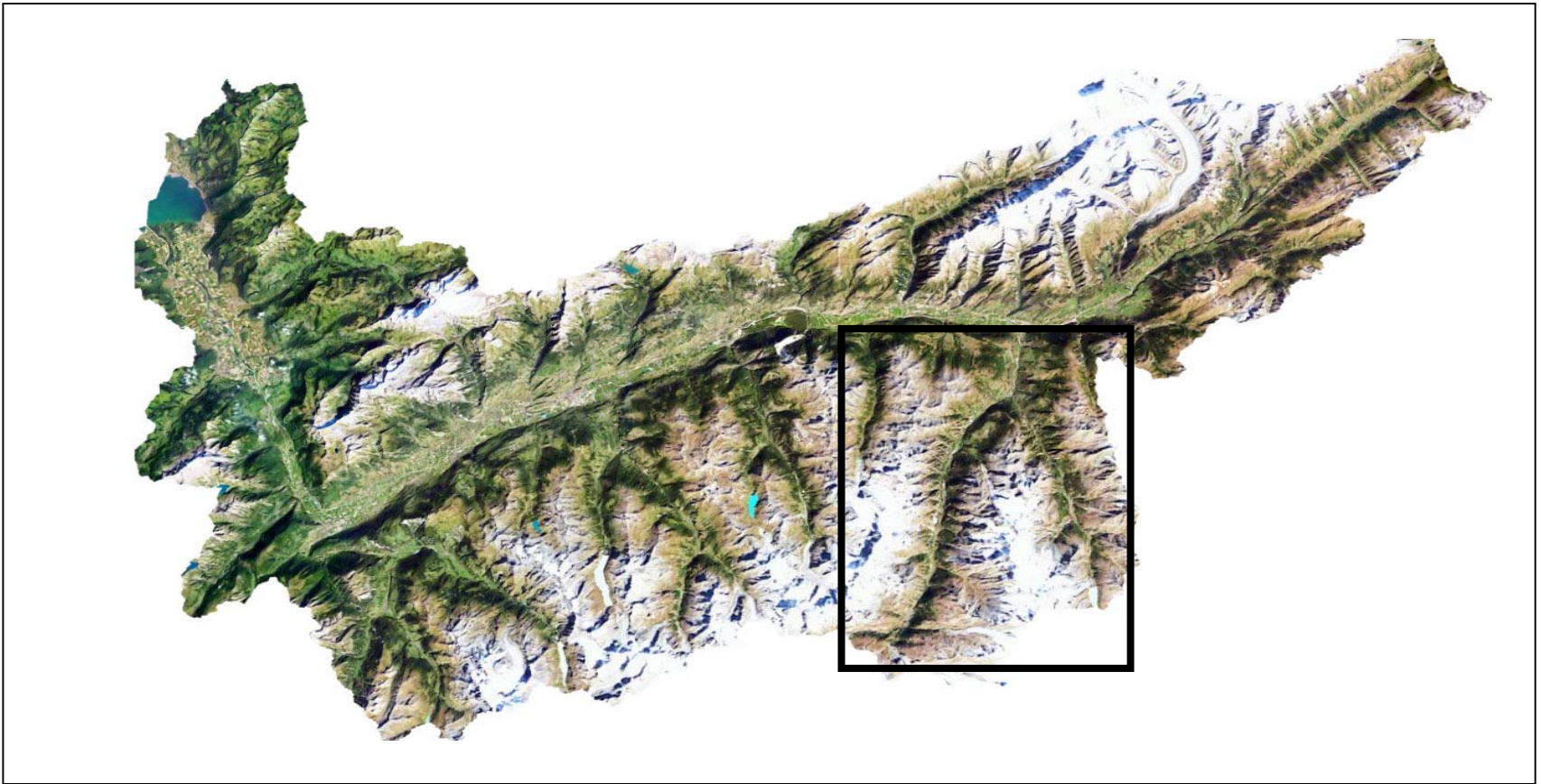
Data Organisation

Working Level 2: Regional (River Basin)



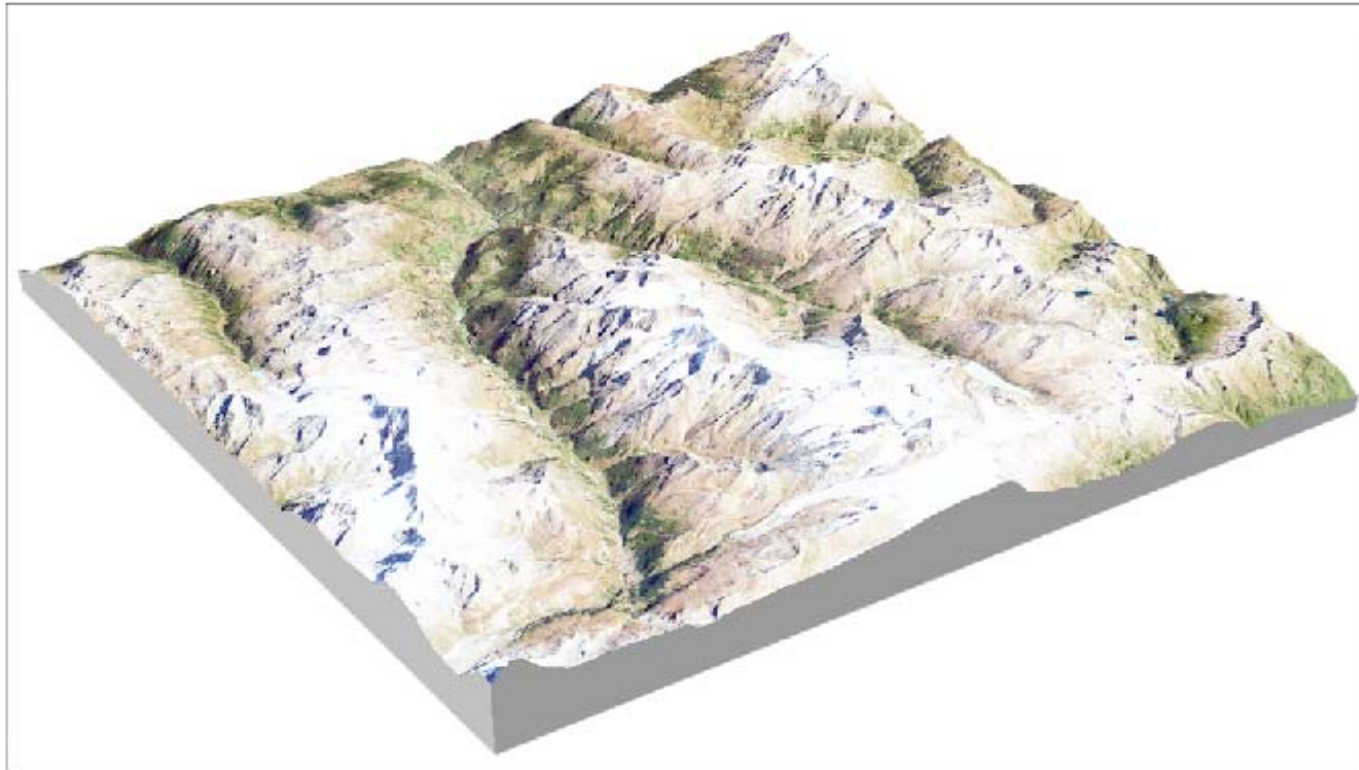
Data Organisation

Working Level 2: Regional (River Basin)



Data Organisation

Working Level 3: Local (Vispa Water Catchment Area)



0 9 km

Data Organisation

N°	Data category	Data groups and represented features	Data-sets (selective)
1	TOPOGRAPHY	topographical features and raster maps	buildings, road network, railways, etc
2	REMOTE IMAGERY	aerial and terrestrial photography, satellite imaging	images (various resolutions)
3	MULTIMEDIA	static images, dynamic images, text	
4	DIGITAL ELEVATION MODELS	Digital Elevation Models	
5	GEOLOGICAL INFORMATION	geology 2D/3D	geological map layers (+attribute data), geological maps (raster)
		geo-mechanical data	rock classification/site classification, rock strength, cohesion, deformability
		formation (lithology... etc.)	weathering, lithology, geometry, coherence, heterogeneity
		structure (tectonic, fractures 1D/2D/3D)	type (faults, joints, bedding, foliation), intensity, size, surface conditions, displacements, strength
		transient data (1D/2D + time)	water content, temperature, pressure (pore + lithostatic)
		geomorphological features/information 2D/3D	maps, surface features (moraine, landslide deposits...), events (landslide, rock-fall, torrent)
6	SOIL	soil cover: characteristics (polygon)	type, granulometry, depth, soil layer thickness
		soil properties (boreholes – points)	strength, deformability, water content, infiltration, porosity, grain size distribution, ...
7	GROUND COVERING	ground covering, vegetation cover – time, dead wood, forestation	
8	BOREHOLES	geology group, hydrogeology group, geophysical group	geometrical features with attribute scheme for each group
9	HYDROLOGY	hydrogeology	cross-sections, quarries-mines, galleries, springs, karstic points
		surface hydrology	hydro network, drainage, hydrography, channel
		sedimentology	erodable volumes
		glaciers	inventory, satellite images, glacier hazards, DEM
10	METEOROLOGY	evaporation, water-vapour distribution, radio sounds	
		radar data(grid, image), wind (storm), SMA datasets, balloon soundings	
11	GEOPHYSICS	gravimetry, deformation, active seismicity, electric	
12	SEISMICITY	focal mechanisms, hypocentres, Moho depth, historic records, data streams	
13	HAZARD OBSERVATION SYSTEMS	historic data (record and description), monitoring (systems types and location)	torrent streams, debris flows, deep/shallow landslides, rock-falls
14	PROTECTION MEASURES	mitigation systems types: location and influence + design assumptions	

Data Organisation

Identified user groups :

1. HazNETH partners: good GIS knowledge; access to all datasets with unlimited download/upload possibilities.

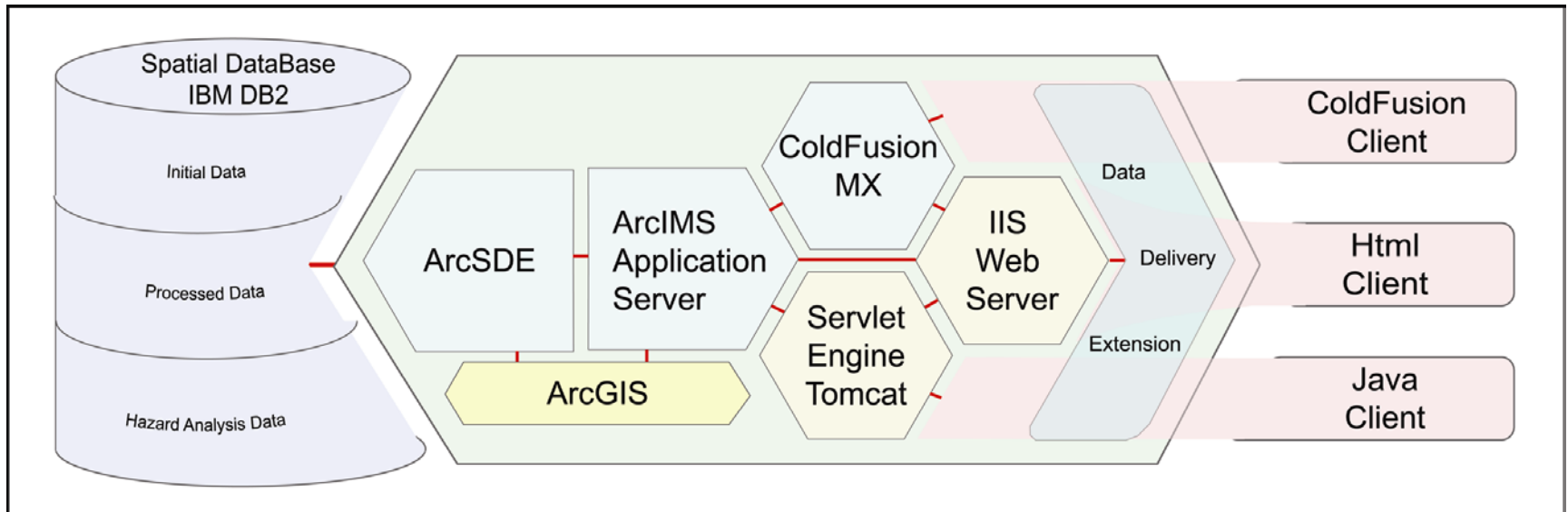
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2. Natural Hazard Office & Division of Roads and Rivers of Canton Wallis and - consult the HazTool system; they need access to all datasets with visualisation/download permissions.

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3. Guest users: limited visualisation permissions.

Technique Used



Data and Server Standards

HazNETH will try to follow the current tendency for Community Environmental Policy overseen by INSPIRE (Infrastructure for Spatial Information in Europe) concerning spatial data and data server harmonisation

... through the establishment of integrated spatial information services, based upon a distributed network of databases, linked by common standards and protocols to ensure compatibility.



OGC standards:

- Web Map Service standard (WMS)
- Web Feature Service standard (WFS)
- Web Coverage Service standard (WCS)

ISO standards:

- ISO 19115: Metadata standard
- ISO 19139: Metadata Implementation Specification standard
- ISO 19136: Geographic Markup Language (GML) standard

Many Thanks for Your Attention !!

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