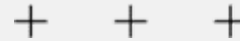




swisstopo



Bundesamt für Landestopographie
Office fédéral de topographie
Ufficio federale di topografia
Uffizi federal da topografia

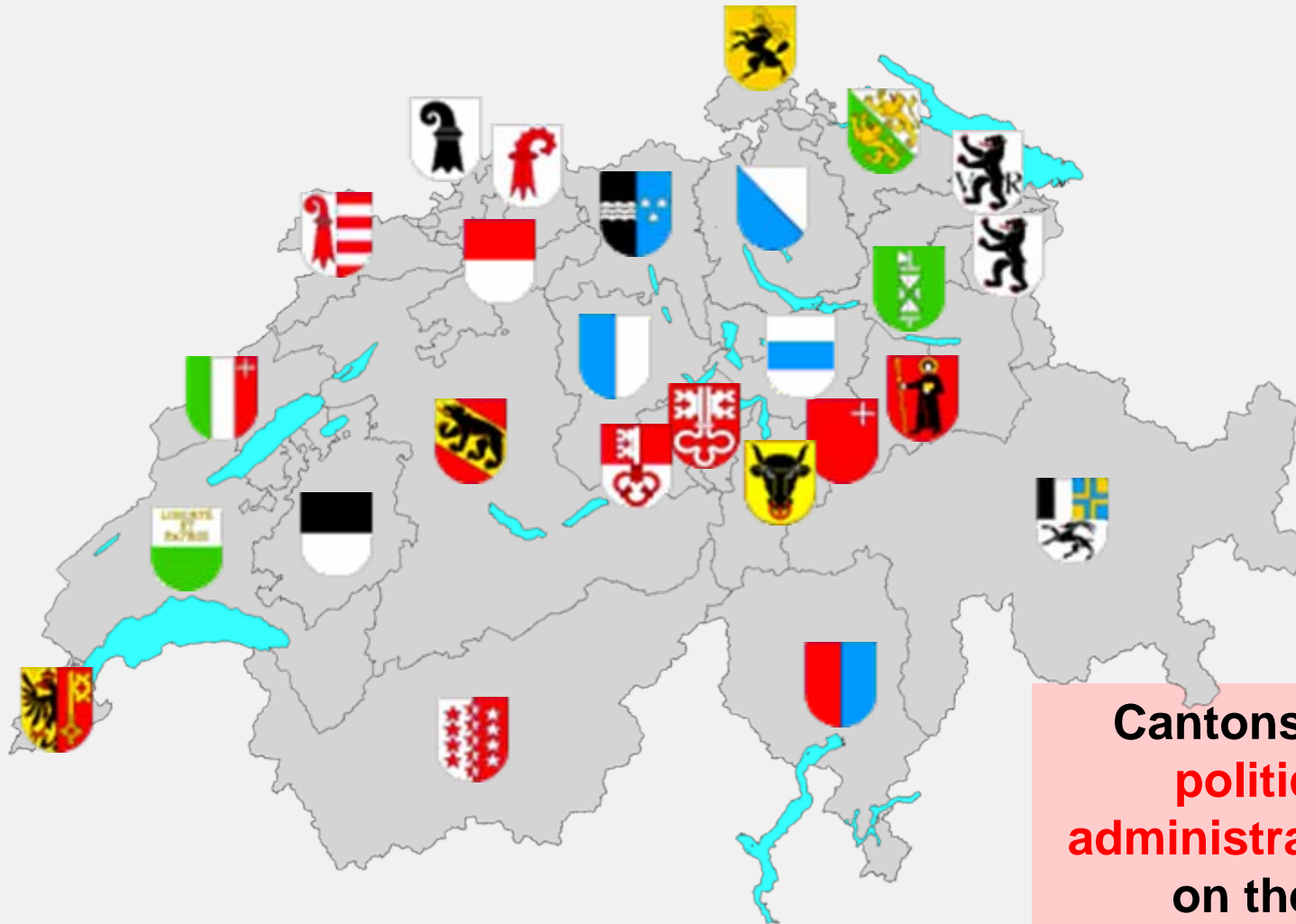
Swiss Cadastre Preparing for E-Government

Dr. Daniel Steudler
Swiss Federal Directorate of Cadastral Surveying

Table of Content

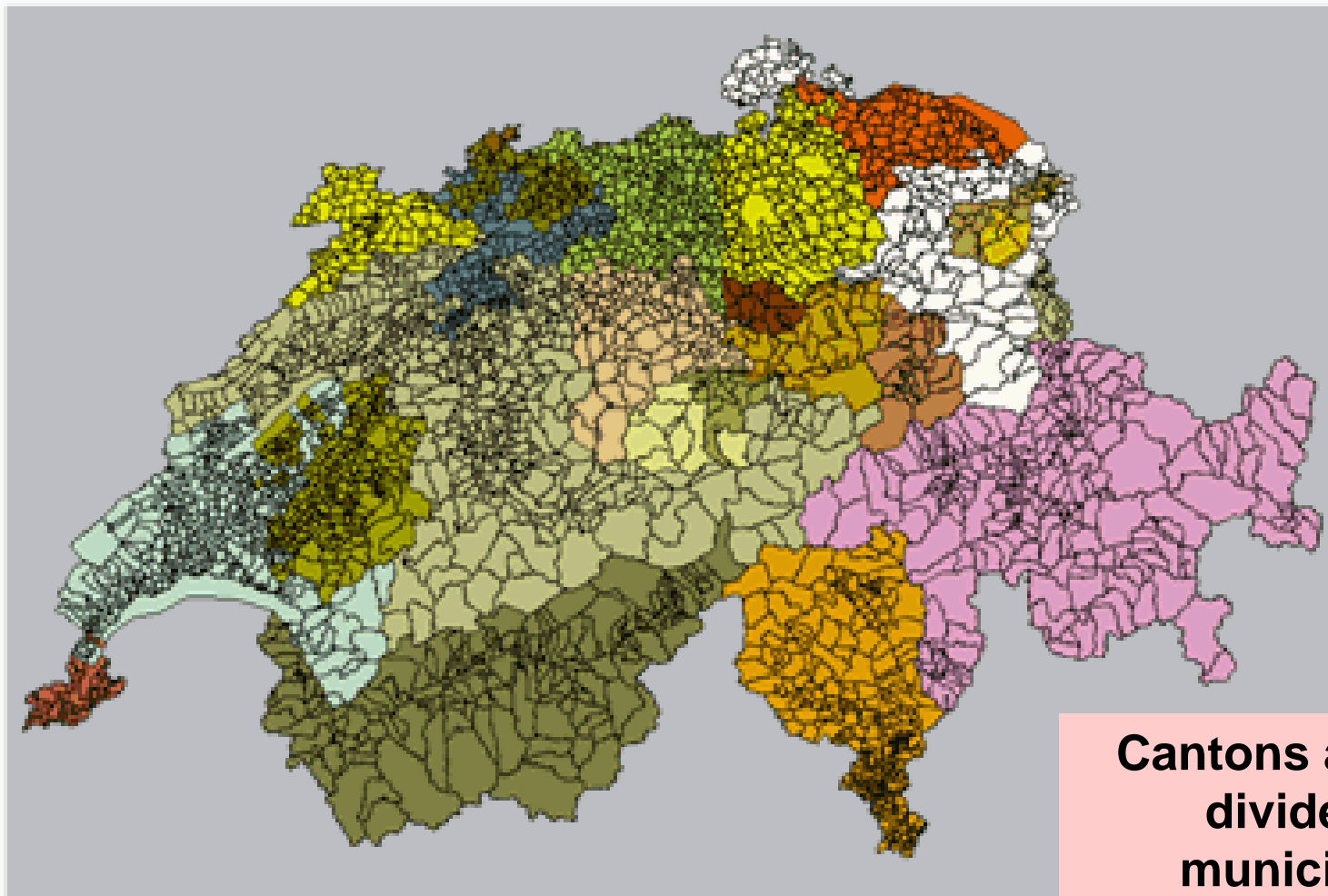
- **Swiss Cadastral System**
- **National Geodata Infrastructure**
- **Geodata Infrastructures on Local Government Level**
- **Examples**

Switzerland: 26 Cantons ...



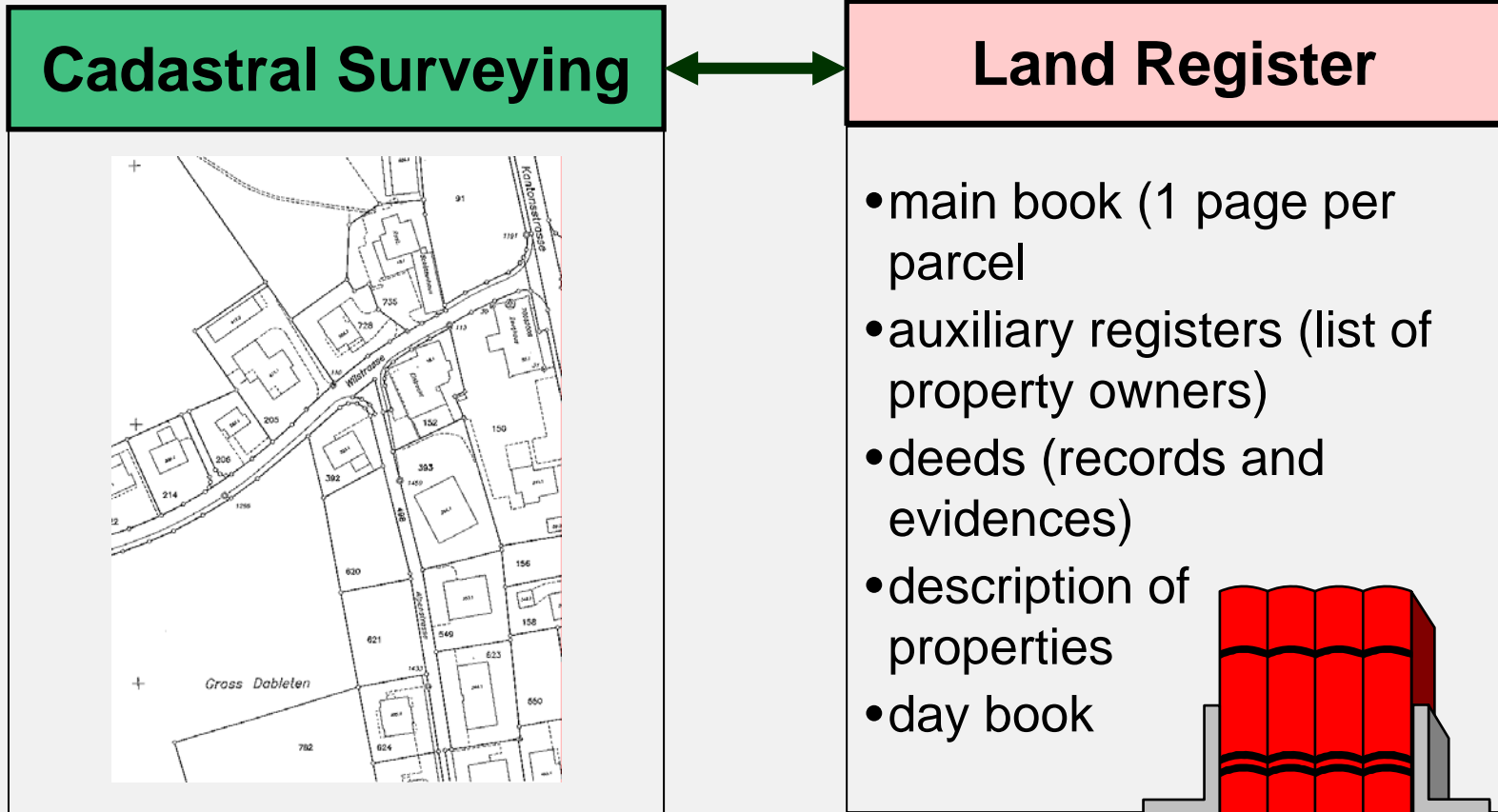
Cantons maintain
political and
administrative bodies
on their own

... and 2903 Municipalities

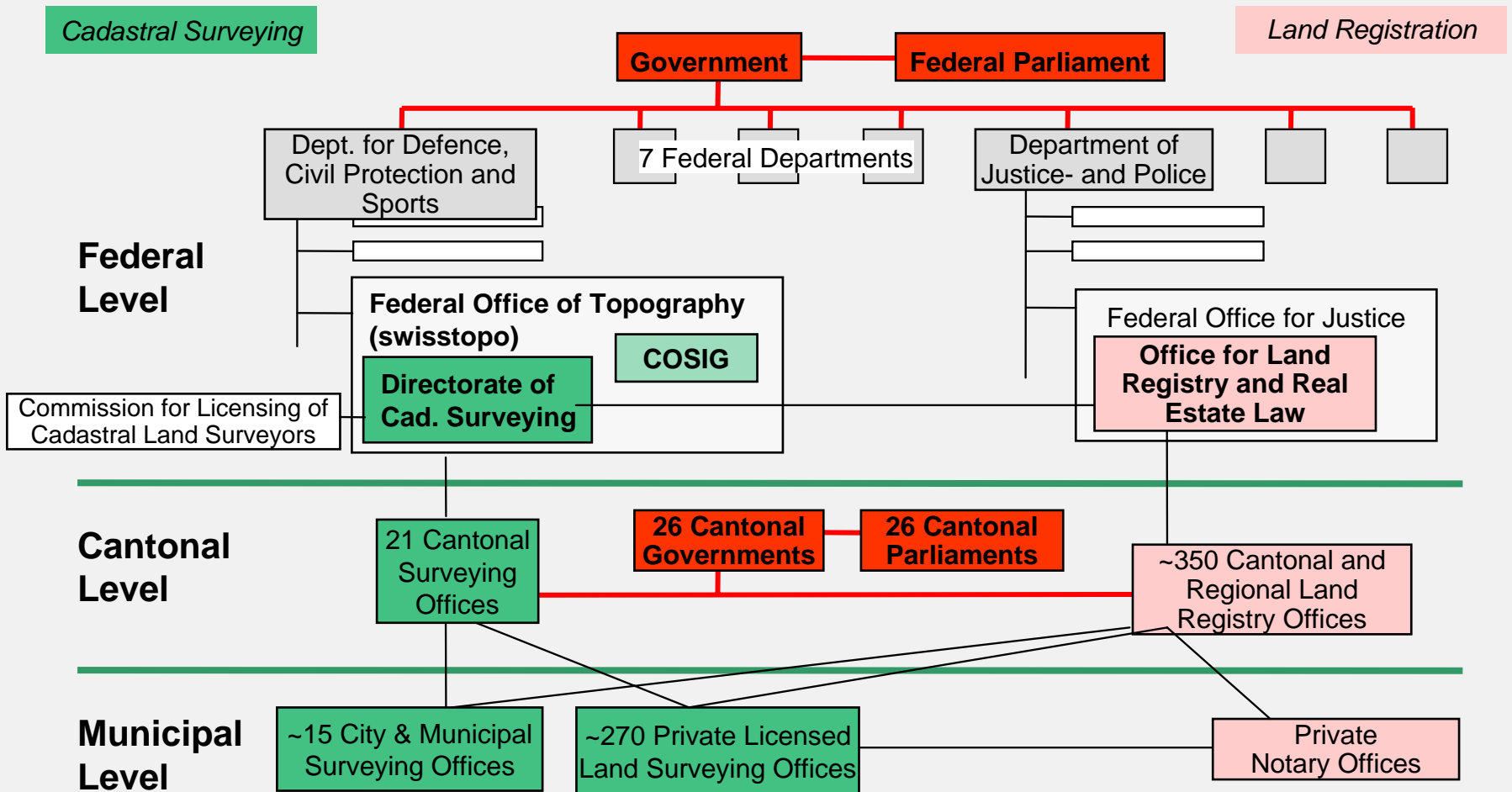


**Cantons are further
divided into
municipalities**

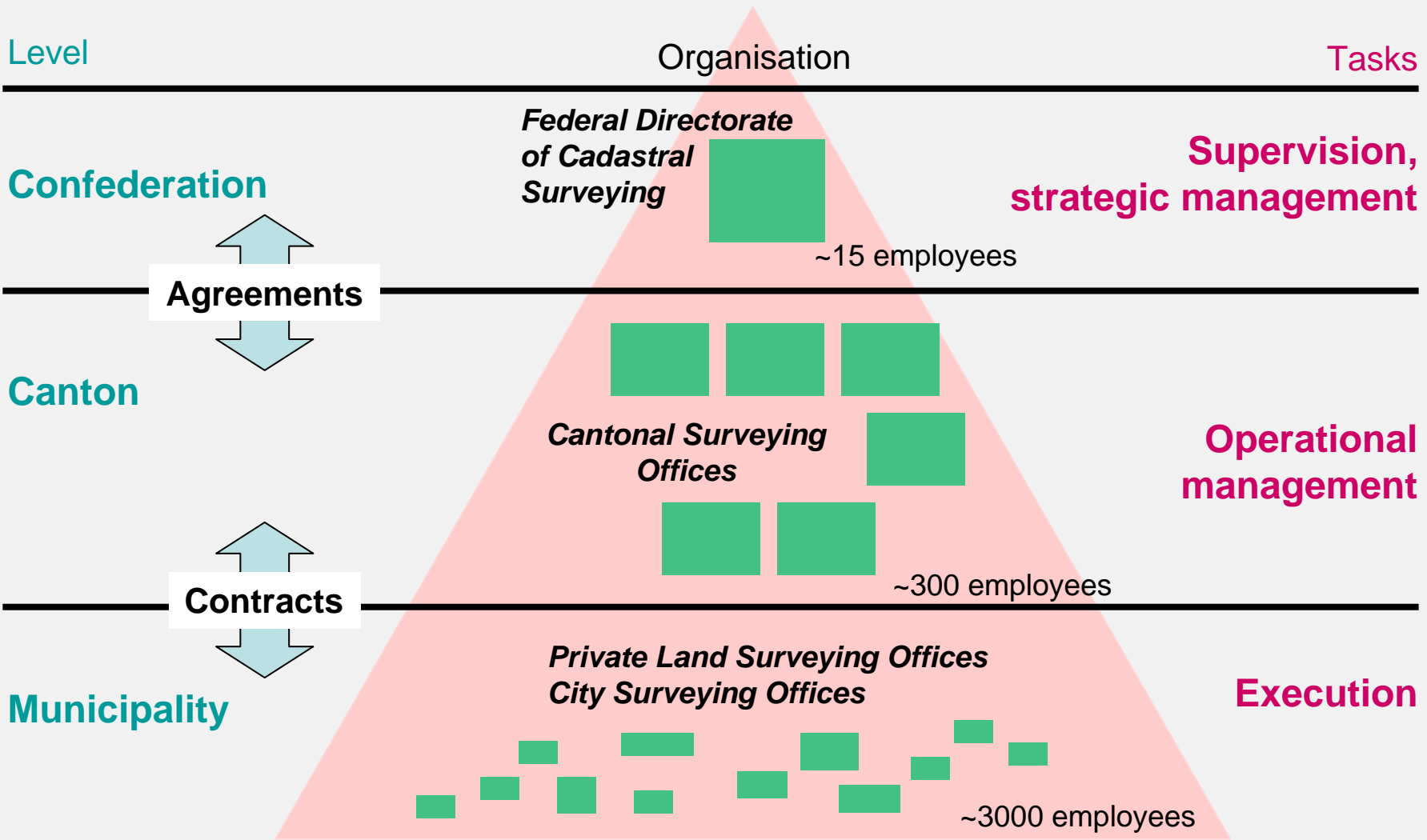
Swiss Cadastral System



Organizations Involved in Cadastral System



Organisation of Cadastral Surveying



Basic Principles of Cadastral Surveying



- **Partnership Confederation - Canton (- Communities)**



- **Public Private Partnership (PPP)**

- **Decentralized structure**

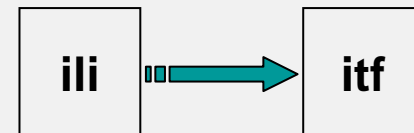
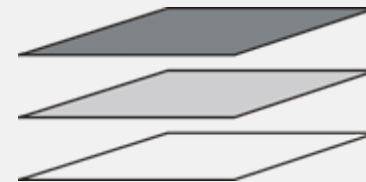
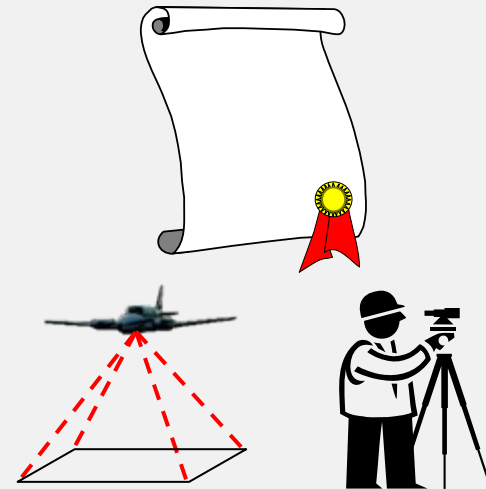
- **Free market, tendering**



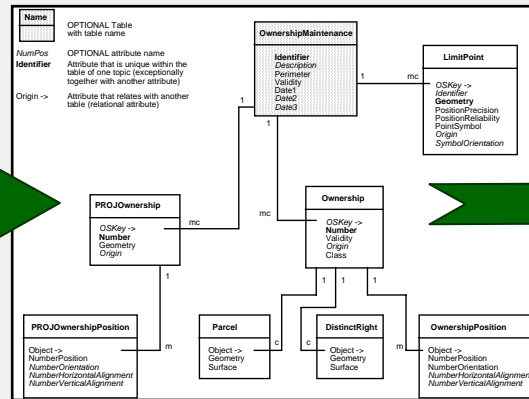
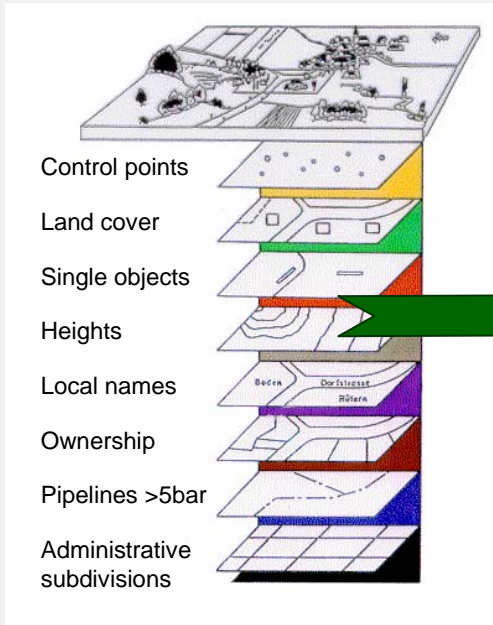
- **Costs are borne mainly by Confederation**

Conceptual Elements of Cadastral Surveying

- Clear definition of the product (not the method)
- Freedom of methods and systems (as basis for tendering)
- Independent information layers (link between layers only through geographic location)
- Standardized way of description and transfer of data (INTERLIS)



Standardized Data Modelling



```
TRANSFER Data_Catalogue;
MODEL Basic_Data_Set
DOMAIN
  LKoord = COORD2 480000.000 70000.000
             840000.000 300000.000;
  HKoord = COORD3 480000.000 70000.000 0.000
             840000.000 300000.000 5000.000;
  Height = DIM1 0.000 5000.000;
  Precision = [0 .. 300];
  Reliability = (yes, no);
  LetterOrientation = GRADS 0.0 400.0;
  Status = (planned, valid);

TOPIC Control_Points =
  .....
END Control_Points;

TOPIC Land_Cover =
  .....
END Land_Cover;

TOPIC Ownership =
  DOMAIN
  Monumentation = (border_stone, plastic_peg, cross,
                    not_monumented);
  OwnershipType = (parcel, distinct_right,
                  construction_right, water_source_
                  right);





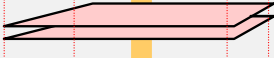

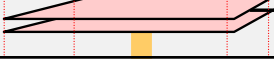

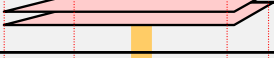




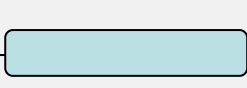
TABLE LimitPoint =
  OSKey: OPTIONAL -> OwnershipMaintenance;
  Identifier: OPTIONAL TEXT*12;
  Geometry: LKoord;
  PositionPrecision: Precision;
  PositionReliability: Reliability;
  Origin: OPTIONAL TEXT*30;
  SymbolOrientation: OPTIONAL LetterOrientation;
  !! Default: 0.0
  IDENT
  Geometry;
END LimitPoint;
END Ownership.
END Basic_Data_Set.
```

Information Layers
(Possibility to realise the
layers separately)

Data Model per layer
(Entity-Relationship-Diagram)

Data Description Language
XML / INTERLIS
(system independent)

Cadastral Data as Basis for any LIS

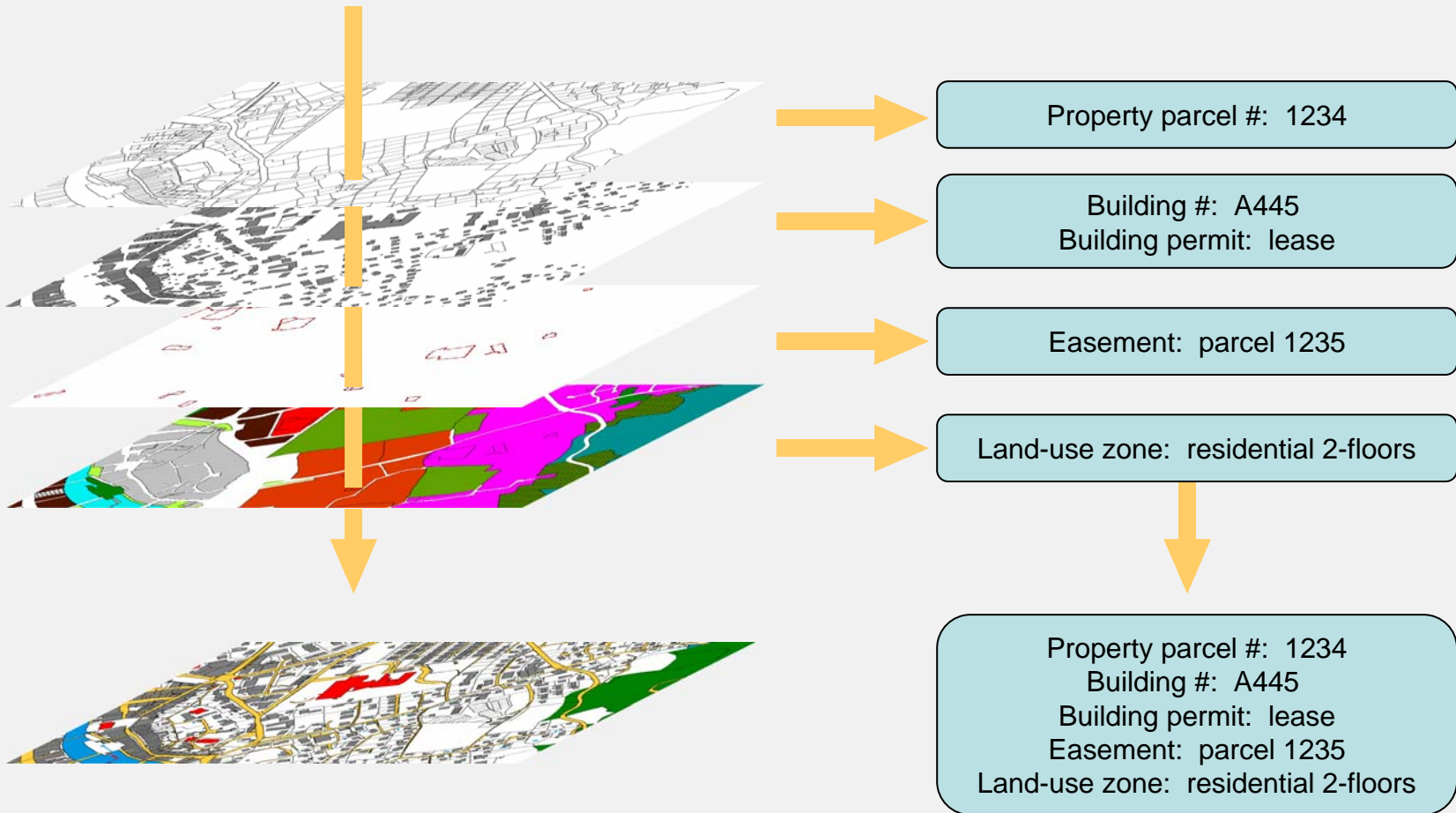
Legal topic	spatial data	textual data	Stakeholders (data owners)
Water protection			Local government
Noise protection			Local government
Environmental protection			Environmental department
Land use planning			Planning department
Indigenous land rights			Tribe, clan
Collective land rights			Corporations
Land ownership, cadastre			National government State government Local government

Two requirements:



..... common geodetic reference framework
..... common data modelling concept

Drilling the Topics from Different Stakeholders



National Geodata Infrastructure (NGDI)

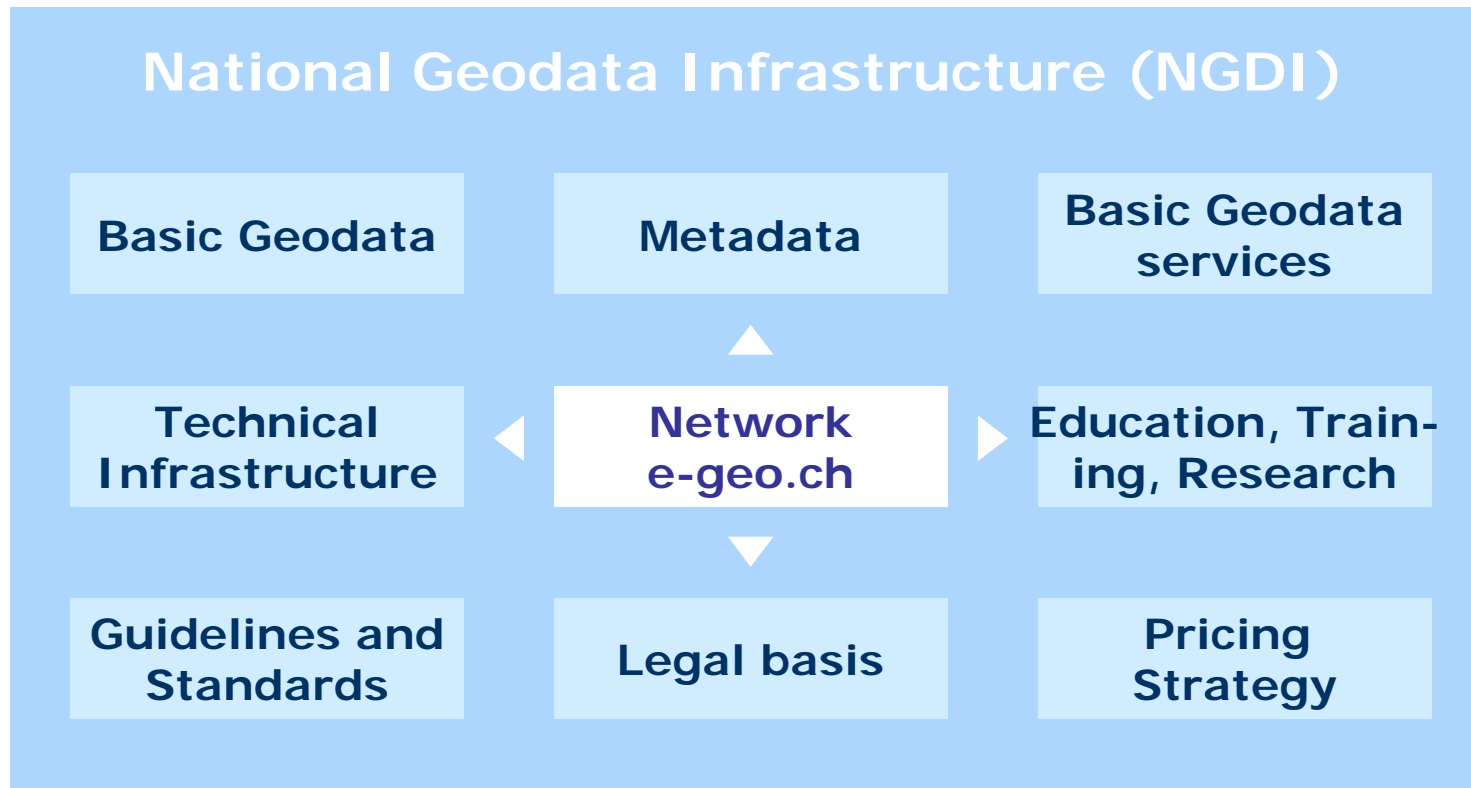
An ongoing process: → simple digital data sets → land information systems

→ national geodata infrastructures (NGDI)

Goals of NGDI:

- to add value to geoinformation;
- to assure for the administration, the politics, the economics and citizens at all times and from anywhere an easy and reliable access to geoinformation;
- to set-up a Federal strategy with a set of measures in political, organizational, financial, legal and technical terms.

The Nine Topics of NGDI



Steering Committee

4 delegates from Confederation
4 from cantons + 2 from municip.
5 delegates from organizations

Office

- President
- 2 Vice-Presidents
- chief executive officer

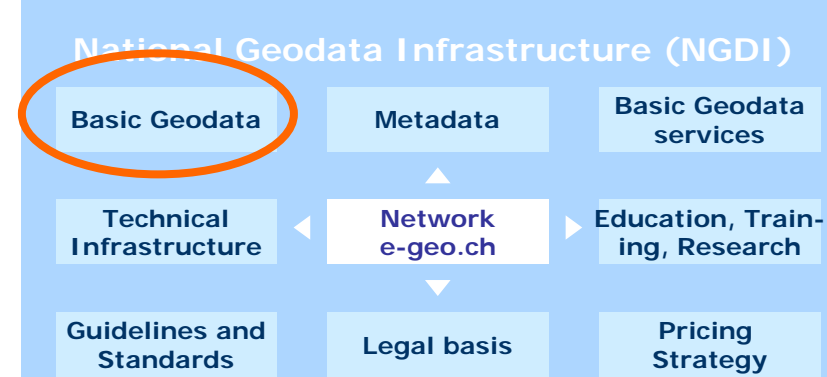
Operational centre e-geo.ch

opérationnel (INDG)

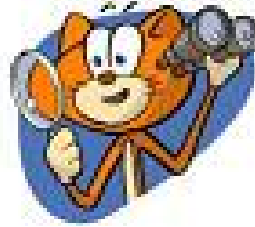
projects

domaines

Basic Geodata

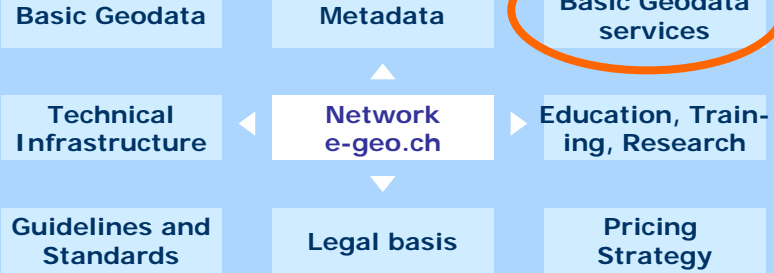


- An inventory has been made for all Federal offices dealing with geodata.
- This inventory is being extended to include all basic geodata of national interest handled by the cantons.
- The complete inventory then has to be transferred into a data catalogue.



Metadata

- "geocat.ch" is the Swiss portal for searching for geodata.
- Online since January 2005.
- Searches are carried out on decentralized servers of the different geodata providers.
- 17 providers participate so far.



Basic Geodata Services

- The geoportal of swisstopo/COSIG has been initiated in mid-2005.
- The portal consists of basic geodata and metadata of the Federal administration.
- Similar developments are under way on the cantonal level.

Koordinationsstelle des Bundes für Erdbebenvorsorge



Navigation Themen Suchen



Kartengrösse

610 x 420

Masstab

1:4'000'000

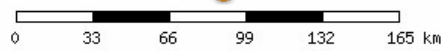
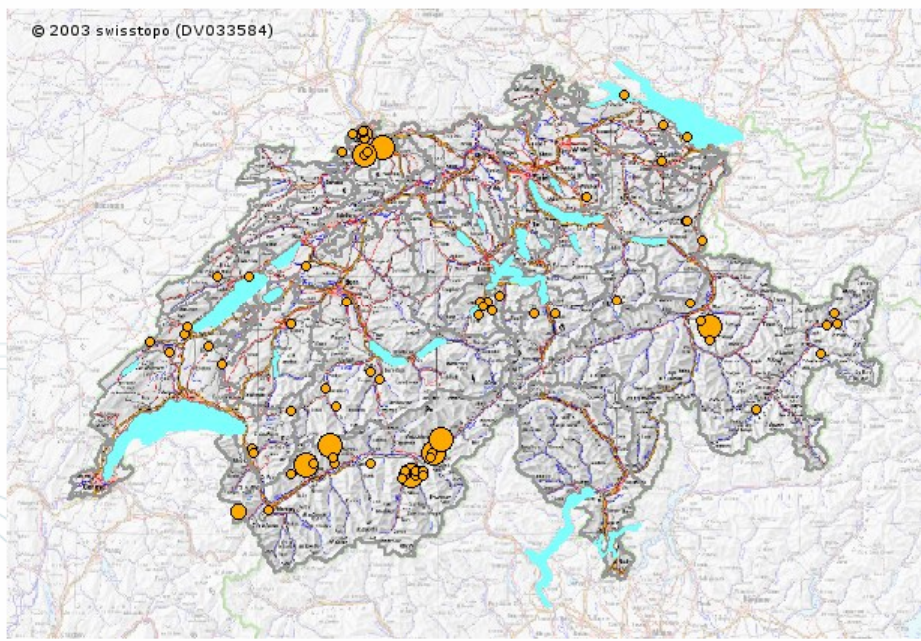
Direkter Zugang

Direkter Zugang

Epizentren von Schadenbeben in der Schweiz Jahr 250 - 2000



Quelle : ECOS 2002



[Kontakt / Contact](#)

Basic Geodata

Metadata

Basic Geodata
servicesTechnical
InfrastructureNetwork
e-geo.chEducation, Train-
ing, ResearchGuidelines and
Standards

Legal basis

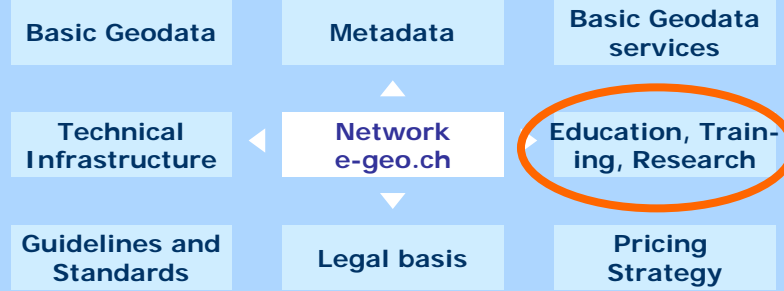
Pricing
Strategy

Technical Infrastructure

- In view of the on-going technical evolution, it is too early to define the basic elements of the technical infrastructure. However, one of the most important elements is the network.
- It is therefore of highest priority to study and prepare the network as early as possible.
- It has been agreed to rely on the IT strategy of the Federal administration, which however has to better include the requirements of the geodata infrastructure.

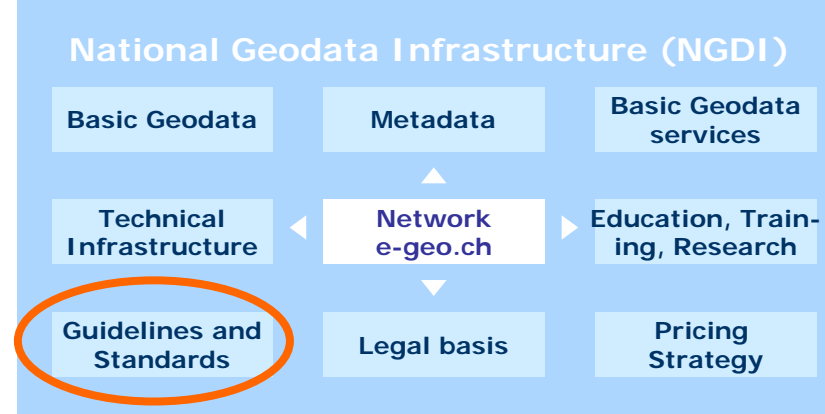
Education, Training, Research

National Geodata Infrastructure (NGDI)



- A working group is in the process to develop a concept for an award of excellence in the field of education and research in geoinformation.

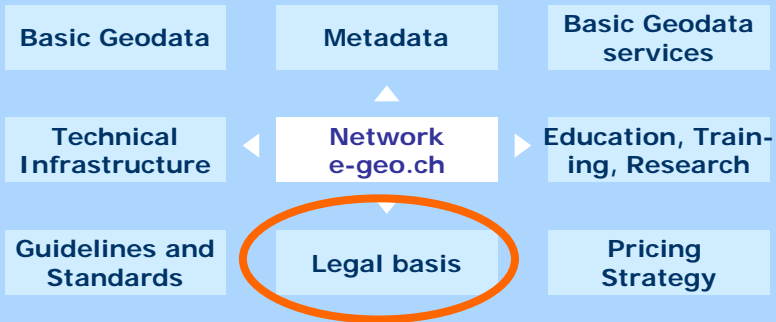
Guidelines and Standards



- A working group is establishing application profiles for geodata services based on existing standards.
- These profiles will be adopted as Swiss standards.

Legal Basis

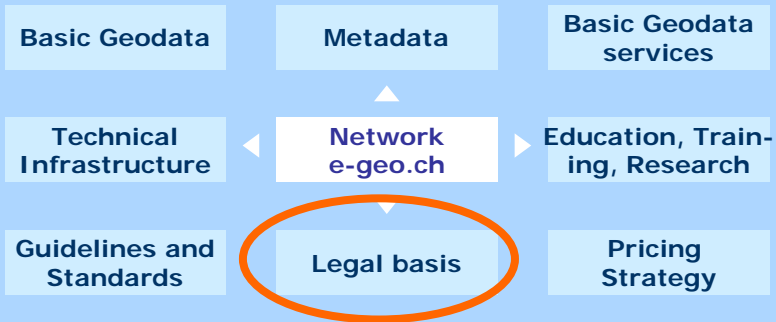
National Geodata Infrastructure (NGDI)



- New Law on Geoinformation
- Background:
 - new article in constitution on geoinformation
 - one law for all aspects of geoinformation (geodetic, topographic, cadastral)
 - introduction of cadastre for public rights & restrictions
- Time schedule: implementation planned for January 2007
- Main problem: collaboration between federal and cantonal levels (competences, financing, pricing)

Cadastre of public restrictions of private property rights

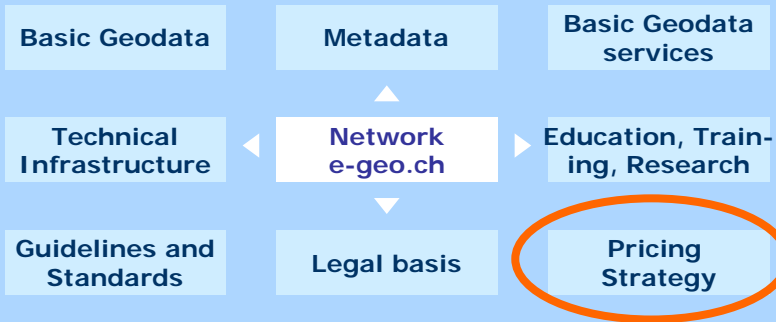
National Geodata Infrastructure (NGDI)



- Definition: systematic and public inventory of geographic objects that carry public restrictions.
- swisstopo commissioned a study to look into the costs and benefits of such an inventory (Jan. 2006).
- **Estimated costs:** 0.6-2.7 million Euro to establish the data model and the legal basis on cantonal level / 54-215 million Euro for acquiring data for 10 most important restrictions.
- **Estimated benefits:** 63 million Euro per year.

Pricing strategy

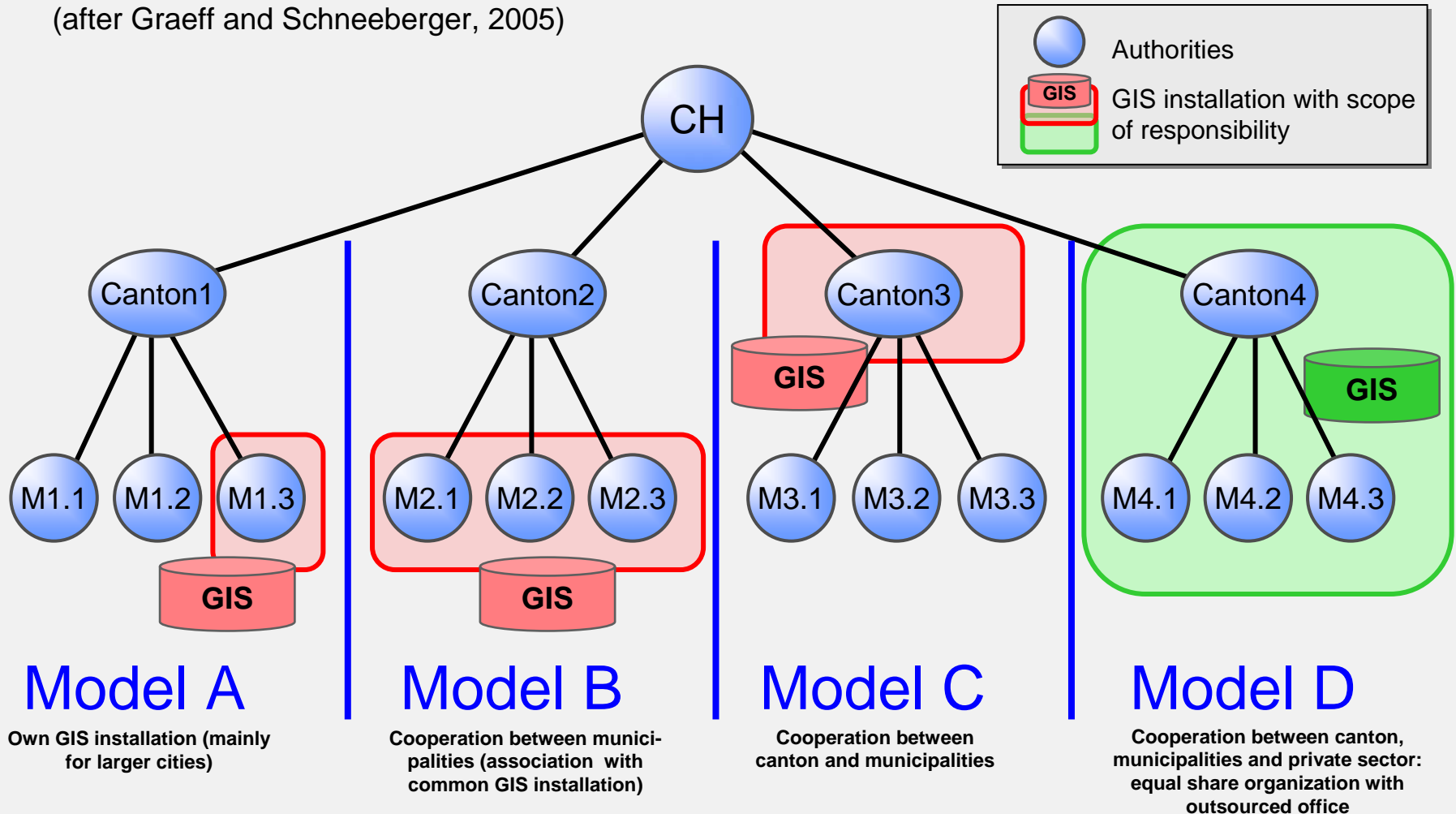
National Geodata Infrastructure (NGDI)



- As long as the Law on Geoinformation is not enacted, it would be illusionary to implement a pricing strategy for all partners.
- A prototype, however, will be put in place.

Models of Cooperation on Local Gov. Level

(after Graeff and Schneeberger, 2005)



LIS Nidwalden - Microsoft Internet Explorer

Adresse <http://www.lis-nw.ch/xml/index.xml> Wechseln zu [Google](#)



Landinformations-System Nidwalden



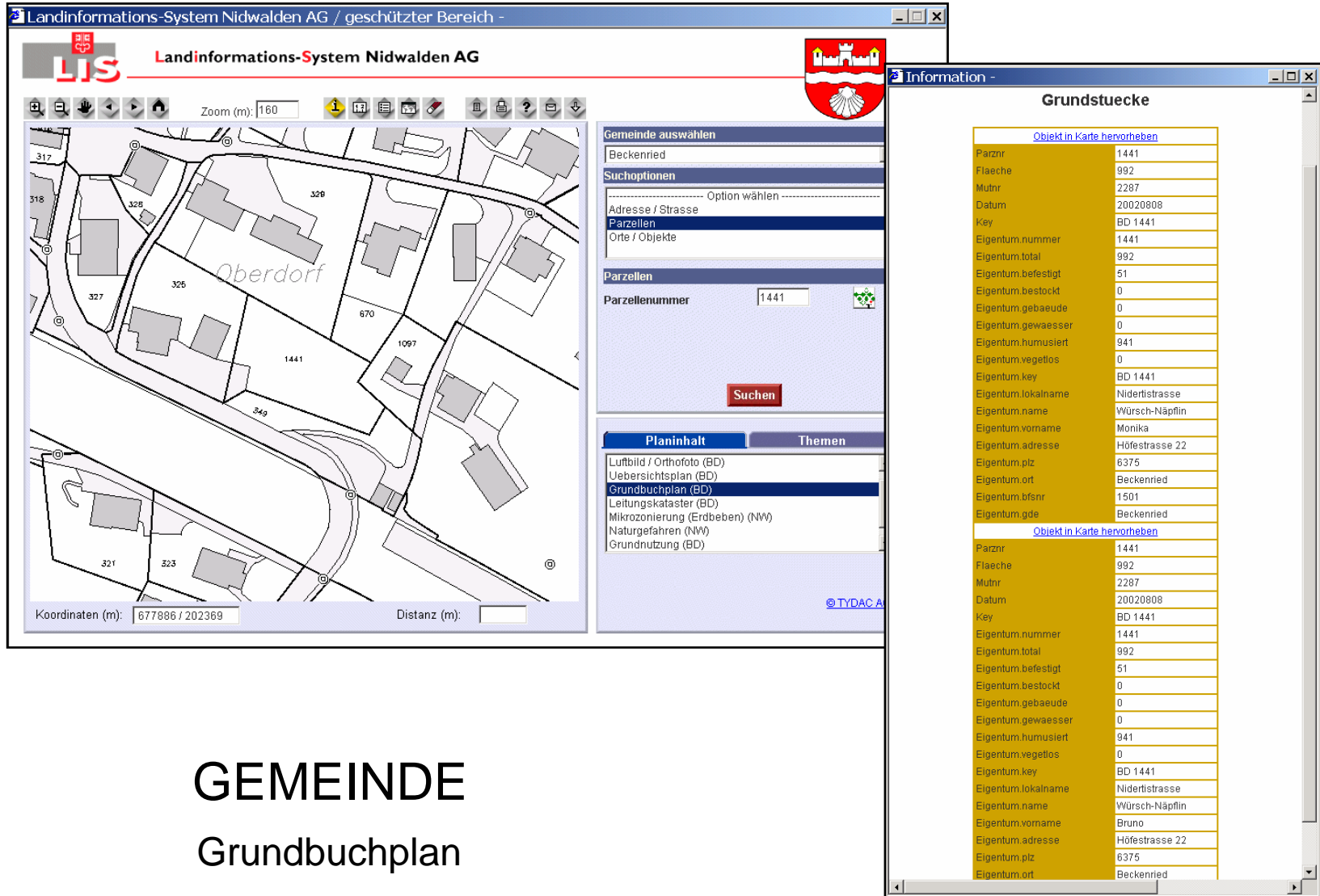
Startseite

- Geodaten-Dienste
- Geodaten-Infos
- Informationen
- Organisation/Porträt
- Links
- Datenmodelle
- Dokumente/Merkblätter

LIS Nidwalden AG
 Aemättlistrasse 2
 CH-6370 Stans [\[Plan\]](#)
 Switzerland
 Tel. +41 41 618 61 11
 Fax. +41 41 618 61 12
lis@lis-nw.ch

Beim Anklicken der Gemeindewappen können Sie direkt den Geodatenviewer ArcIMS (öffentlicher Bereich) starten.
 >> [Umschalten auf ArcIMS \(geschützter Bereich\)](#) <<

Fertig Internet



Landinformations-System Nidwalden AG / geschützter Bereich -

Landinformations-System Nidwalden AG

Zoom (m): 160

317, 318, 328, 329, 327, 325, 670, 1097, 1441, 349, 321, 323

Oberrdorf

Koordinaten (m): 677886 / 202369 Distanz (m):

Gemeinde auswählen
Beckenried

Suchoptionen
Option wählen
Adresse / Strasse
Parzellen
Orte / Objekte

Parzellen
Parzellennummer: 1441

Suchen

Planinhalt | Themen

- Luftbild / Orthofoto (BD)
- Uebersichtsplan (BD)
- Grundbuchplan (BD)**
- Leitungskataster (BD)
- Mikrozonierung (Erdbeben) (NW)
- Naturgefahren (NW)
- Grundnutzung (BD)

©TYDAC A

Information - Grundstuecke

[Objekt in Karte hervorheben](#)

Parznr	1441
Flaeche	992
Mutnr	2287
Datum	20020808
Key	BD 1441
Eigentum.nummer	1441
Eigentum.total	992
Eigentum.befestigt	51
Eigentum.bestockt	0
Eigentum.gebaeude	0
Eigentum.gewaesser	0
Eigentum.humisiert	941
Eigentum.vegetos	0
Eigentum.key	BD 1441
Eigentum.lokalname	Nidertstrasse
Eigentum.name	Würsch-Näpflin
Eigentum.vorname	Monika
Eigentum.adresse	Höfestrasse 22
Eigentum.plz	6375
Eigentum.ort	Beckenried
Eigentum.bfsnr	1501
Eigentum.gde	Beckenried

[Objekt in Karte hervorheben](#)

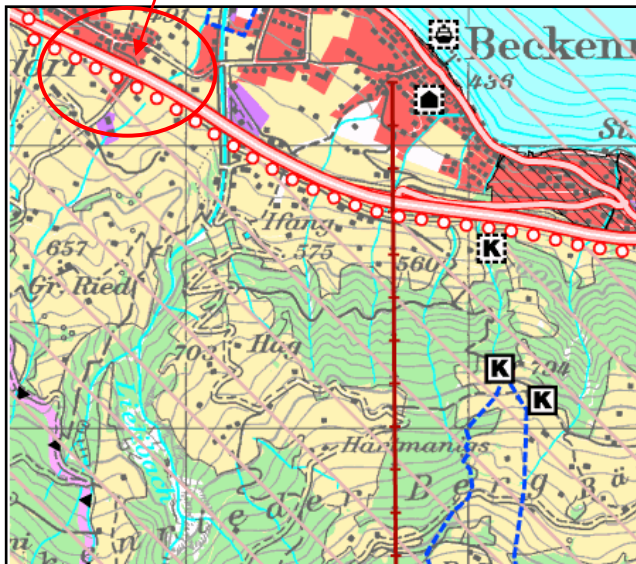
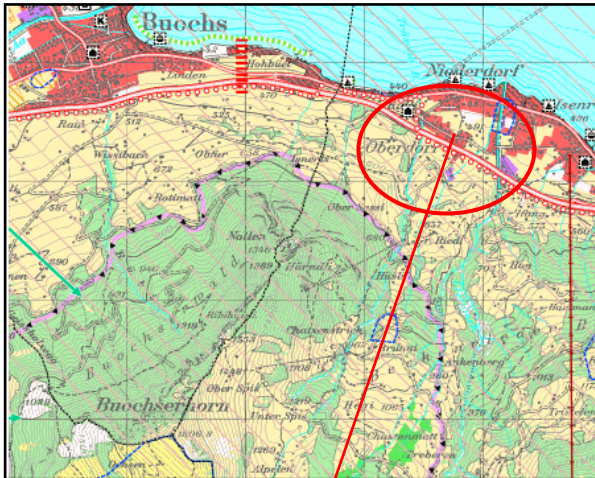
Parznr	1441
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Eigentum.gebaeude	0
Eigentum.gewaesser	0
Eigentum.humisiert	941
Eigentum.vegetos	0
Eigentum.key	BD 1441
Eigentum.lokalname	Nidertstrasse
Eigentum.name	Würsch-Näpflin
Eigentum.vorname	Bruno
Eigentum.adresse	Höfestrasse 22
Eigentum.plz	6375
Eigentum.ort	Beckenried

GEMEINDE

Grundbuchplan

KANTONAL

Richtplan



Legende - Richtplan Nidwalden -

Datei Bearbeiten Ansicht Favoriten Extras ?

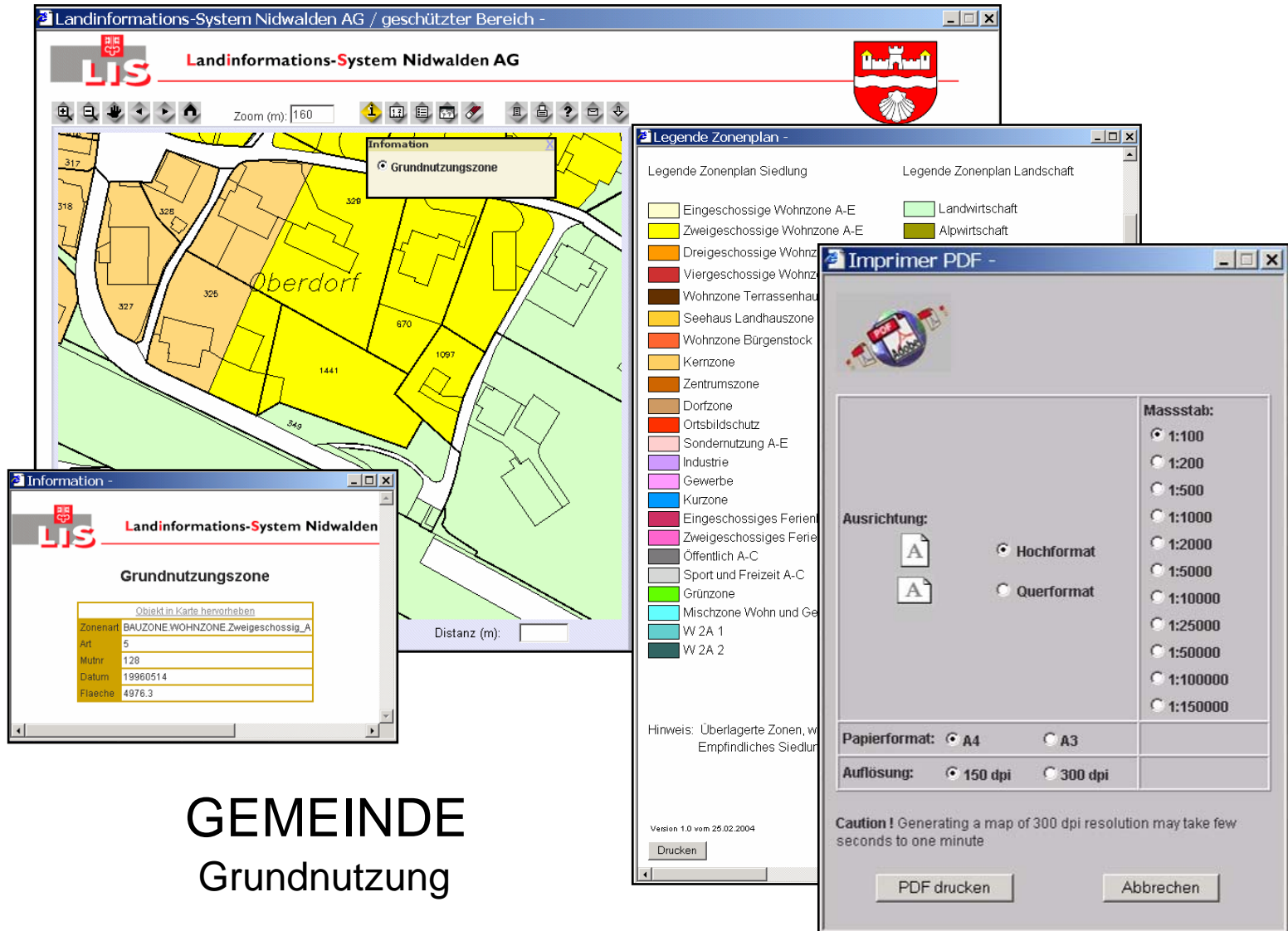
Siedlung

Ausgangslage	Koordinationsaufgabe	Siedlungsgebiet:
[Red Box]		- Wohnzone / übrige Zone
[Purple Box]		- Industrie- und Gewerbezone
[Brown Box]		- Zone für Sport und Freizeit
[Blue Hatched Box]		Arbeitsgebiet von kantonalen Bedeutung
[Black Dotted Box]		Einkaufszentrum
[Red Dotted Line]		Siedlungsbegrenzungslinie / Trenngürtel
[White Hatched Box]		Landschaftlich empfindliches Siedlungsgebiet
[Black Dotted Box]		Ortsbild von nationaler Bedeutung

Wechsel zu: **Landschaft** **Verkehr** **Versorgung, Entsorgung** **Orientierender Inhalt**

Landschaft

Ausgangslage	Koordinationsaufgabe	Landwirtschaftsgebiet:
[Light Yellow Box]		- Landwirtschaftszone
[Yellow Box]		- Alpwirtschaftszone
[Orange Hatched Box]		Fruchtfolgefläche
[Green Dotted Line]		Kantonales Flachwassermanagement



Information - Grundnutzungszone

Objekt in Karte hervorheben	
Zonenart	BAUZONE.WOHNZONE.Zweigeschossig_A
Art	5
Mutnr	128
Datum	19960514
Flaeche	4976.3

Distanz (m):

Legende Zonenplan -

Legende Zonenplan Siedlung

- Eingeschossige Wohnzone A-E
- Zweigeschossige Wohnzone A-E
- Dreigeschossige Wohnzone
- Viergeschossige Wohnzone
- Wohnzone Terrassenhaus
- Seehaus Landhauszone
- Wohnzone Bürgenstock
- Kernzone
- Zentrumszone
- Dorfzone
- Ortsbildschutz
- Sondernutzung A-E
- Industrie
- Gewerbe
- Kurzzone
- Eingeschossiges Ferienobjekt
- Zweigeschossiges Ferienobjekt
- Öffentlich A-C
- Sport und Freizeit A-C
- Grünzone
- Mischzone Wohn und Gewerbe
- W 2A 1
- W 2A 2

Legende Zonenplan Landschaft

- Landwirtschaft
- Alpwirtschaft

Hinweis: Überlagerte Zonen, wie z.B. Empfindliches Siedlungsgebiet

Version 1.0 vom 25.02.2004

Drucken

Imprimer PDF -

Masstab:

- 1:100
- 1:200
- 1:500
- 1:1000
- 1:2000
- 1:5000
- 1:10000
- 1:25000
- 1:50000
- 1:100000
- 1:150000

Ausrichtung:

A (Portrait) Hochformat Querformat

Papierformat: A4 A3

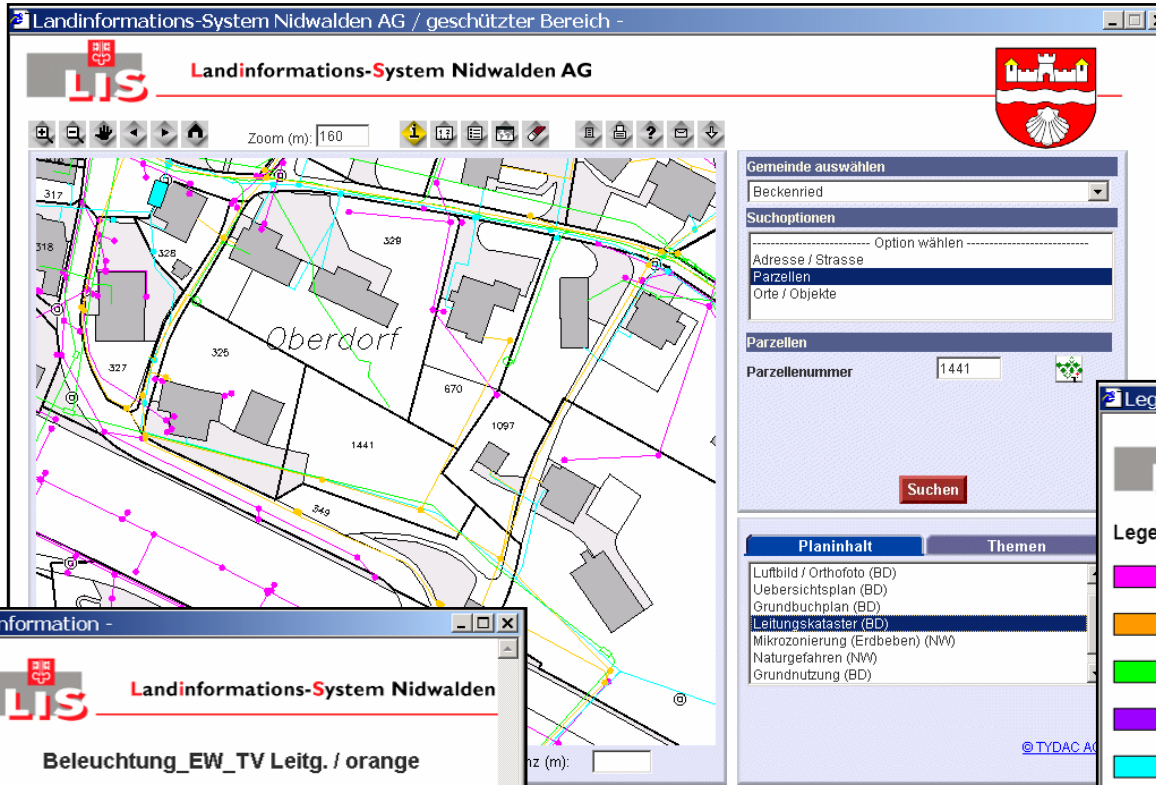
Auflösung: 150 dpi 300 dpi

Caution ! Generating a map of 300 dpi resolution may take few seconds to one minute

PDF drucken Abbrechen

GEMEINDE Grundnutzung

GEMEINDE Leitungskataster



Landinformations-System Nidwalden AG / geschützter Bereich -

Landinformations-System Nidwalden AG

Zoom (m): 180

Gemeinde auswählen
Beckenried

Suchoptionen
Adresse / Strasse
Parzellen
Orte / Objekte

Parzellen
Parzellennummer: 1441

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Grundbuchplan (BD)
Leitungskataster (BD)
Mikrozonierung (Erdbeben) (NW)
Naturgefahren (NW)
Grundnutzung (BD)

Themen

© TYDAC AG

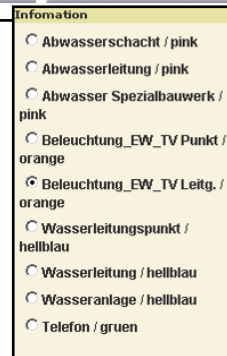


Information -

Landinformations-System Nidwalden

Beleuchtung_EW_TV Leitg. / orange

Objekt in Karte hervorheben	
Name_nr	2861
Art	Kabeltrasse.EW_TV__GWB
Artnr	3
Breite	-99
Lagebest	genau
Speispkt	Gemeinde.Beckenried.unkannt
Baujahr	-99
Status	in_Betrieb
Mutnr	0
Mutdatum	20040101
Laenge	22000



Information

- Abwasserschacht / pink
- Abwasserleitung / pink
- Abwasser Spezialbauwerk / pink
- Beleuchtung_EW_TV Punkt / orange
- Beleuchtung_EW_TV Leitg. / orange
- Wasserleitungspunkt / hellblau
- Wasserleitung / hellblau
- Wasseranlage / hellblau
- Telefon / gruen



Legende Leitungskataster -

Landinformations-System Nidwalden AG

Legende Leitungskataster


- Abwasser
- Beleuchtung
- Telefon
- TV
- Wasser
- Elektrizität

Wichtiger Hinweis:

Technische Kopie: keine Rechtswirkung
Leitungskataster: Abweichungen zum eingetragenen Leitungsverlauf sind möglich. Die genaue Lage der Leitungen muss bauseits zu Lasten der Bauherrschaft durch Sondagen überprüft werden.
Für Schäden, die wegen fehlerhaften Plänen entstehen, übernimmt sowohl der Webbetreiber (Dateneigentümer) als auch der Planesteller keine Haftung.
Bei Projektierung von Webleitungen ist das EW und die Swisscom zu benachrichtigen; betreffend einer Grabenmitbenutzung.

Drucken

GEMEINDE Naturgefahren



The screenshot displays the LIS web application interface. The main map shows a geographical area with various hazard zones color-coded according to the legend. Several windows are open:

- Information - Gefahrenprozess:** A pop-up window showing details for a specific hazard process.
- Information - Gefahrenprozess (Table):** A table listing hazard types and their assessment status.
- Legende Gefahrenkarte:** A legend window explaining the color coding for hazard levels.
- Suche:** A search interface for finding specific locations or objects.

Gefahrenprozess	
Objekt in Karte hervorheben	
Gefcode	15
Synoptisch	mittel (mittel, mittlere Intensität (5))
Seehochst	nicht beurteilt
Talfluss	nicht beurteilt
Wildbach	mittel (mittel, mittlere Intensität (5))
Rutsch_rs	nicht beurteilt
Rutsch_rp	nicht beurteilt
Sturz	nicht beurteilt
Lawine	nicht beurteilt
Doline	nicht beurteilt

Legende Synoptische Prozessgefahrenkarte

Verschnitt aus den Gefahrenprozessen:
 Seehochstand (WS) / Talfluss (WT) / Wildbäche (WW)
 spontane Rutschung (RS) / permanente Rutschung (RP)
 Sturz (S) / Lawinen (L) / Doline (D)

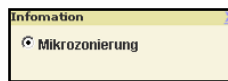
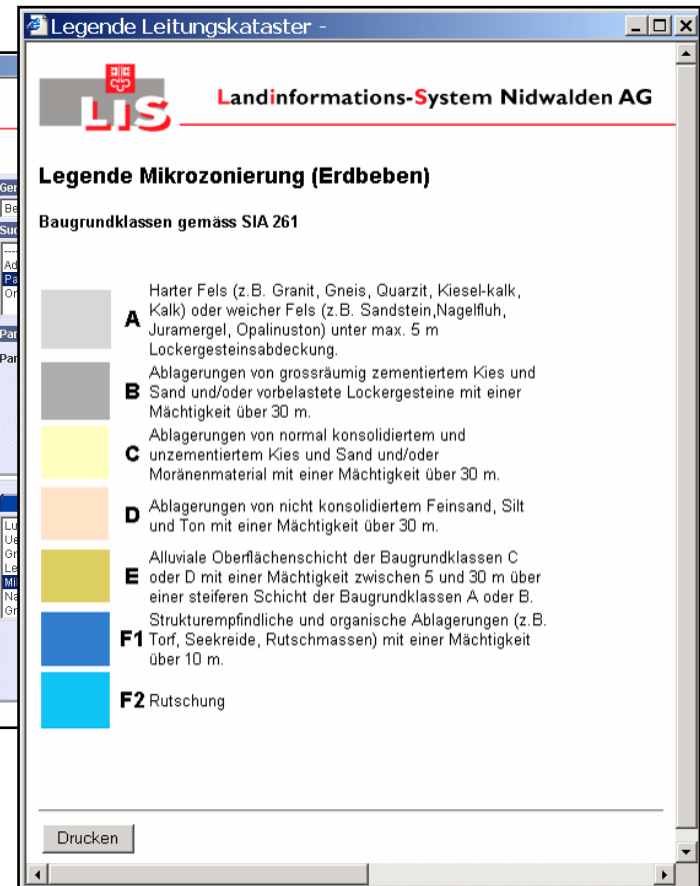
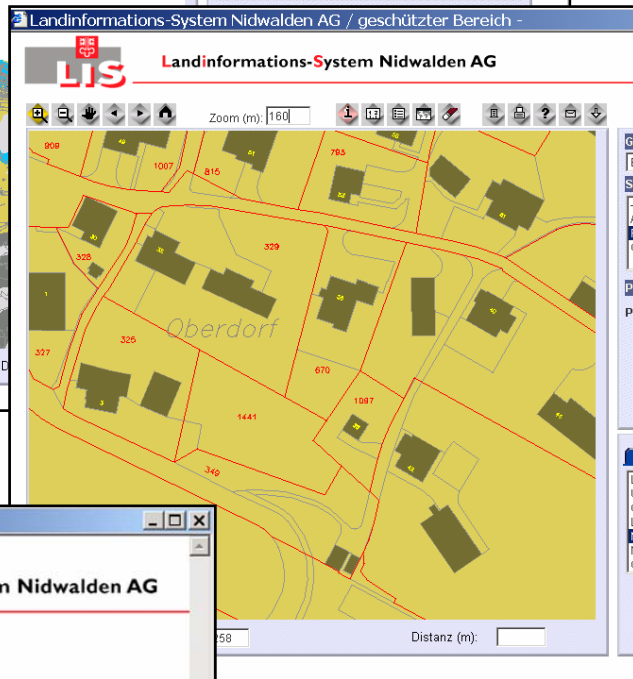
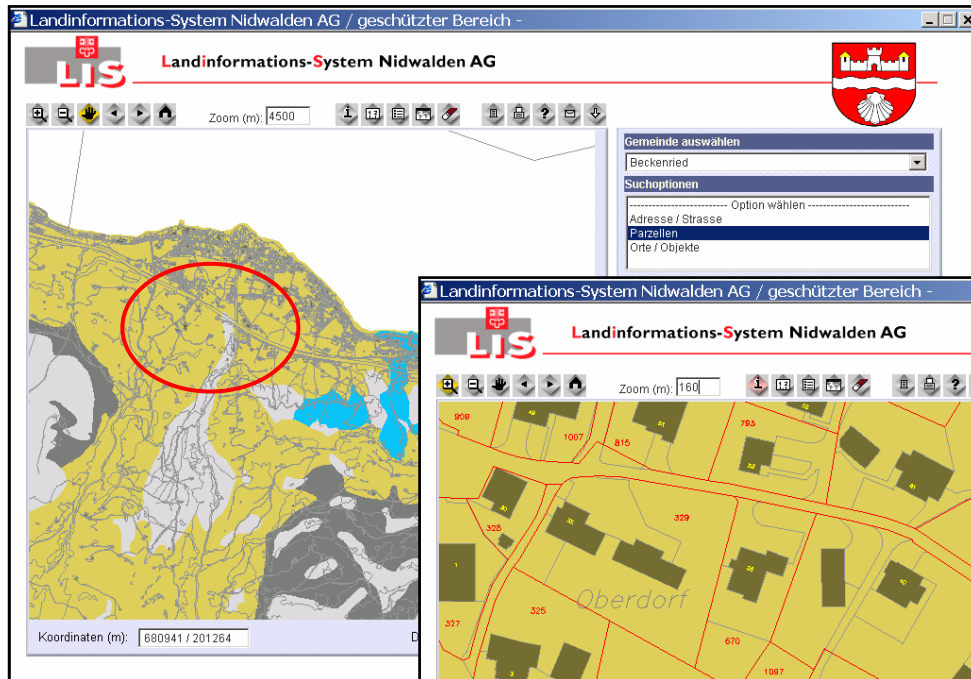
- erhebliche Gefährdung
- mittlere Gefährdung
- geringe Gefährdung
- Restgefährdung
- gefährlos / nicht beurteilt

Stand der Gemeinden

Vollständig: Beckenried, Buochs, Dallenwil, Emmetten, Ennetmoos, Hergiswil, Wolfenschiessen

Unvollständig: Ennetbürgen, Oberdorf, Stans, Stansstad

GEMEINDE Mikrozonierung



GEMEINDE

Grundlagedaten

- Orthophotos (OPP)
- Digitales Höhenmodell (DHM)



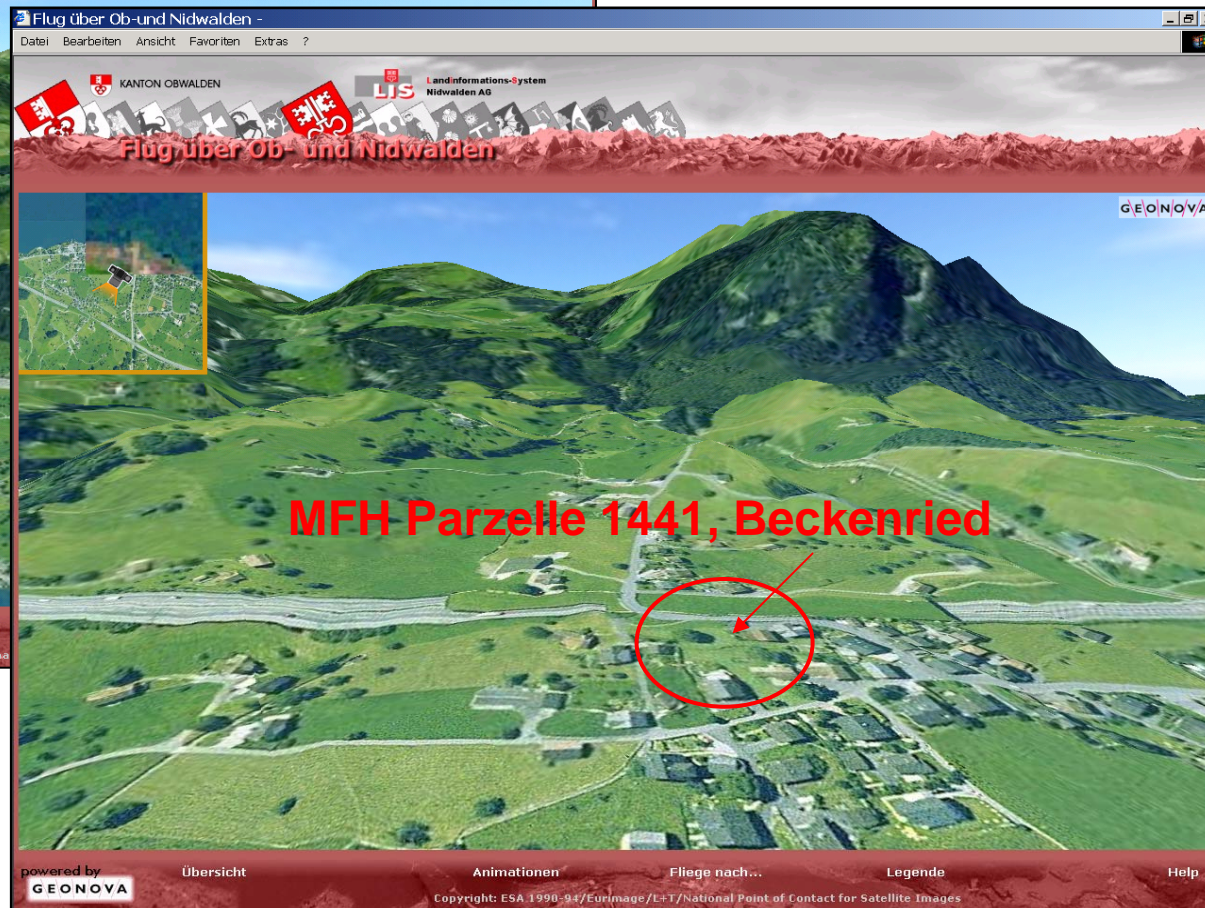
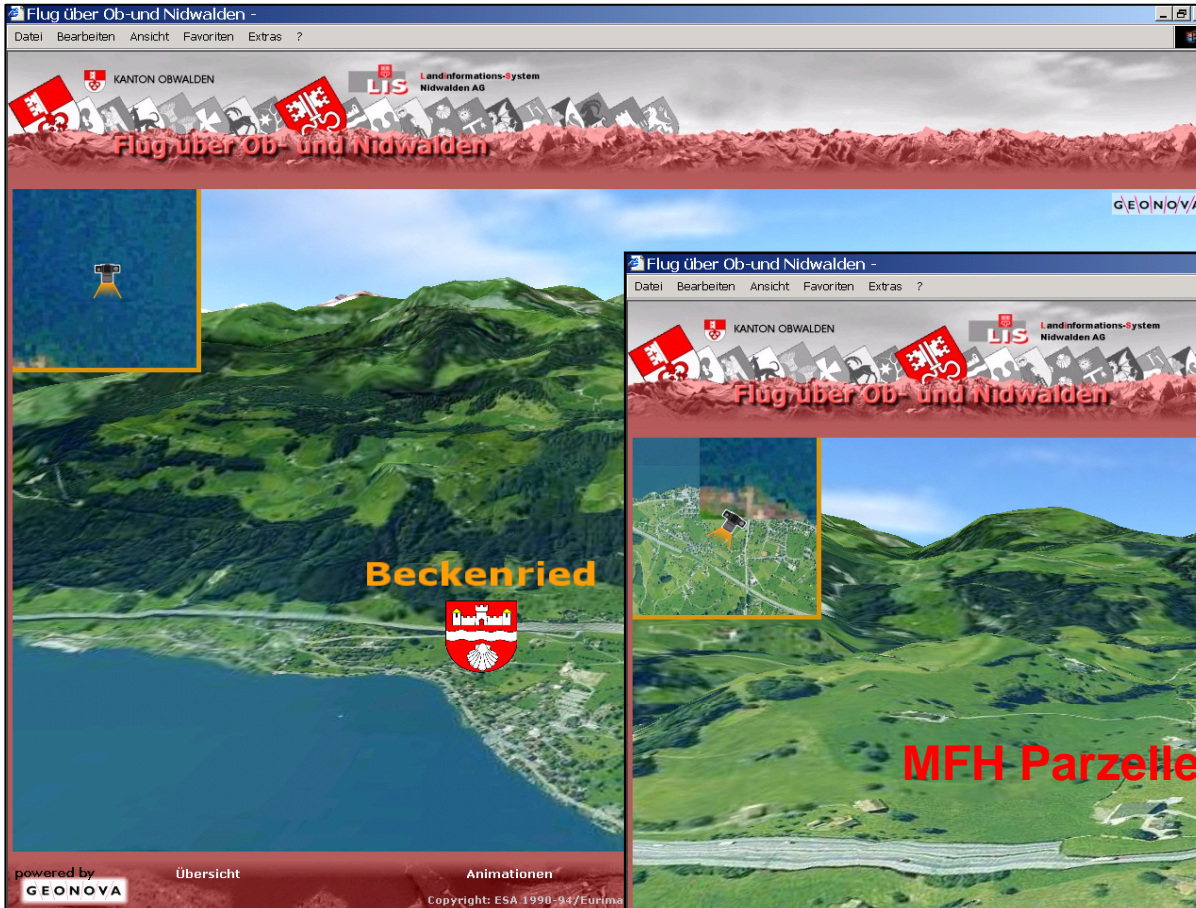
OPP 50cm

MFH Parzelle 1441, Beckenried



OPP 10cm

KANTONAL 3D-Visualisierung



KANTONAL 3D-Visualisierung

The screenshot displays a 3D visualization of a mountainous region in the Canton of Nidwalden, Switzerland. The main window shows a 3D terrain model with various hazard zones overlaid. The title bar of the application reads "G-Vista 3.0 Demo -". The address bar shows the URL "D:\GEONOVA\Naturgefahr_Mikro\szene\index.htm". The main content area features a red header with the text "KANTON NIDWALDEN NATURGEFAHREN" and "Mikrozonierung". The 3D view shows a large mountain peak with a greyish-blue hazard zone on its slopes, and a yellowish-brown hazard zone in the valley below. The terrain is rendered in shades of green and brown, representing different geological and topographical features. The interface includes a menu bar with options like "Datei", "Bearbeiten", "Ansicht", "Favoriten", and "Extras". A search bar is located at the top of the main window. On the right side, there is a legend panel with a "Layer" section containing checkboxes for "Wildbach", "Talfluss", "See", "Permanente Rutschung", "Spontane Rutschung", "Lawine", "Sturz", and "Mikrozonierung" (which is checked). Below the legend is a "Legende" section with a "Gefahrenkarte" and "Mikrozonierung" sub-section, listing various hazard types and their corresponding colors and symbols. The bottom of the interface features logos for "trigonet", "LIS", "NIDWALDNER SACHVERSICHERUNG NSV", and a "Bitte auswählen" dropdown menu.

Geoinformation in der Raumplanung, 21. April 2005