ENVIRONMENT AGENCY AUSTRIA umweltbundesamt

Data management , interpretation and diffusion in Austria

by Arnulf Schönbauer

Mediterranean Joint Process; Water monitoring working group meeting
Safir Heliopolitan Hotel, Beirout (Lebanon), 6th October 2009

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Umweltbundsamt GmbH

- the expert authority for environmental protection of the federal government (legal basis Enviro. Control Act of 1998)
- Limited liability company; in ownership of the federal gov.
- The purpose of the work is:
  - Provision of information on the sources of environmental pressures
  - on ways of preventing or reducing such pressures.
  - producing proposals for technical-ecological rules and guidelines.
  - record, analyse and evaluate data on the state and development of the environment in all areas
- 482 staff members
- http://www.umweltbundesamt.at/en/

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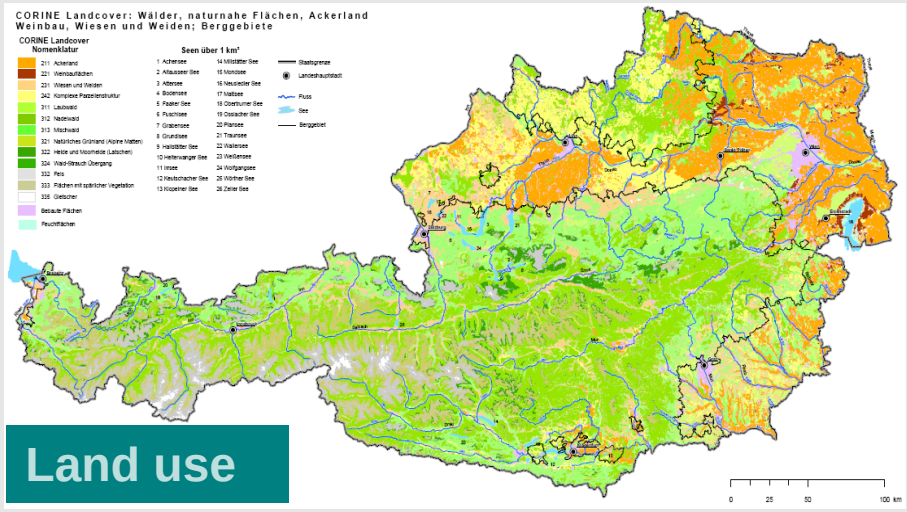
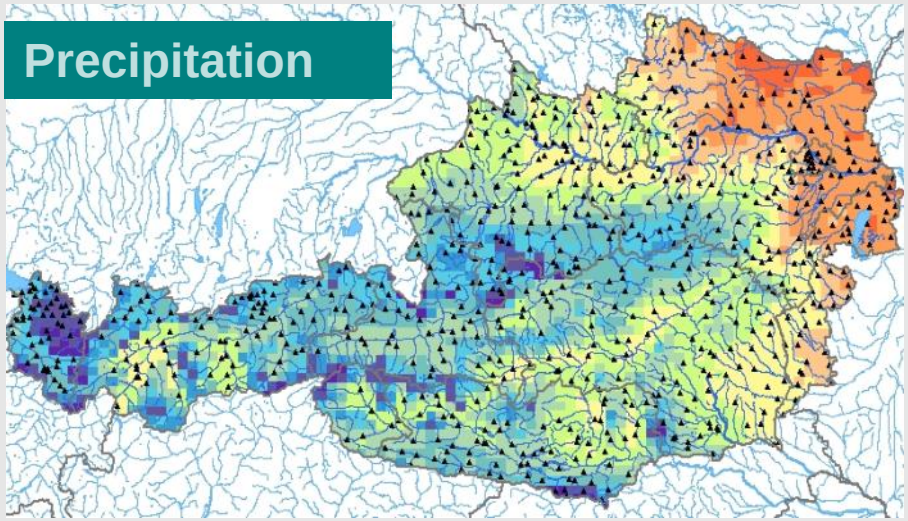
AUSTRIA

- Topography
- Land use
- Precipitation



Land use

Precipitation



mm/a	< 500	- 600	- 700	- 850	- 1000	- 1250	- 1500	- 1750	- 2000	- 2500	- 3500

Austria – Background Data

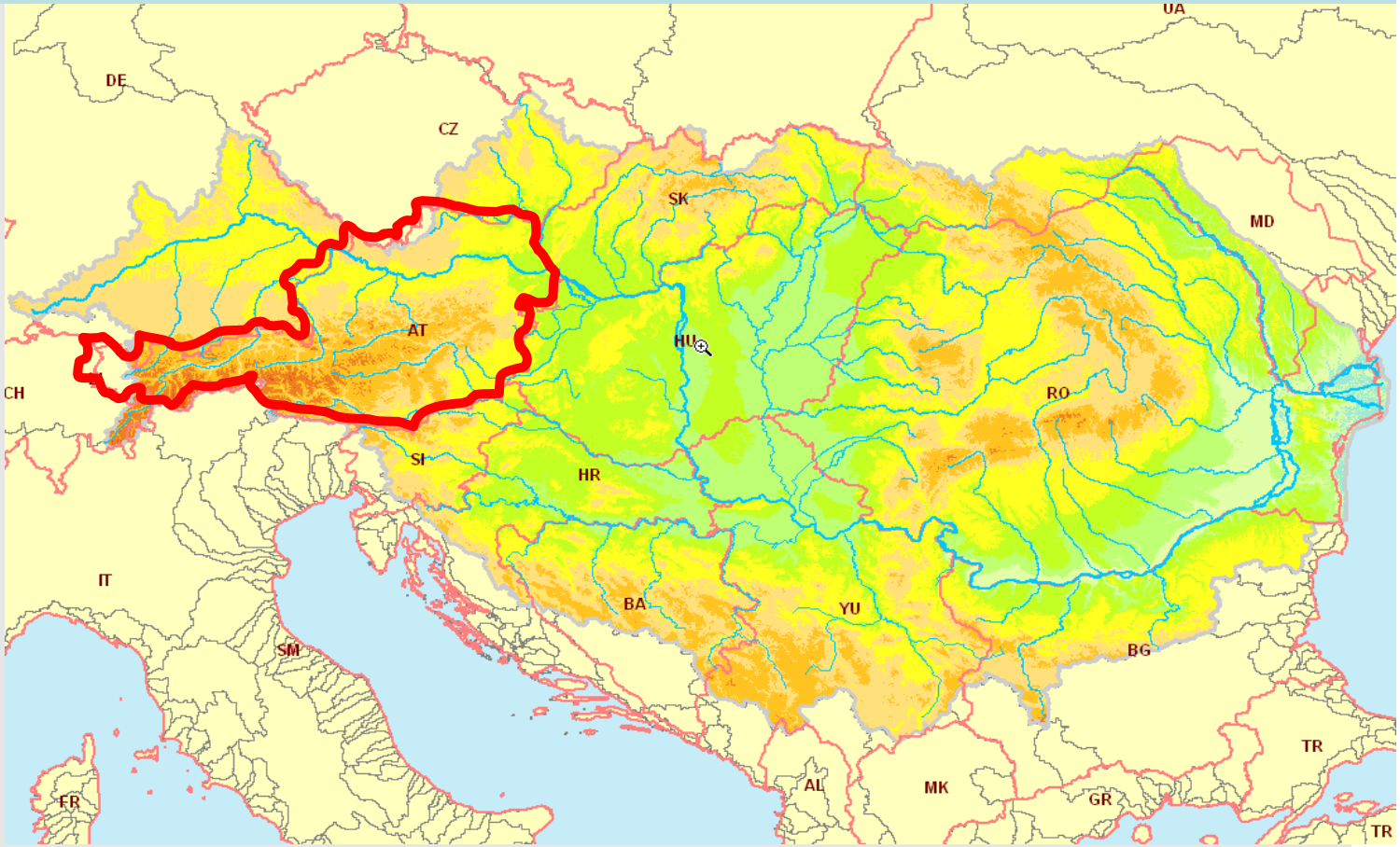
- Austria is a Federal State - with 9 “Länder” (Provinces)
- 8.3 Mio. inhabitants on 83,851 km²
- 96.1% of territory in Danube Basin, 2.8 % in Rhine Basin, 1.1 % in Elbe Basin
- Average annual precipitation: 1,170 mm/a
- yearly run-off from Austria: 596 mm/a
- Water consumption in homes: 145 l/person.day
- population linked to sewerage and biological WWT: 92 %

Danube River Basin District

2nd largest river basin of Europe

801,463 km²

18 states



samt

Schönbauer

Water Quality Monitoring System

- Several investigations in the 1980s indicated quality problems for groundwater and rivers
- The Umweltbundesamt performed case studies for e.g.
  - Pulp and paper mills, technology applied, waster water treatment and adverse effects to river water quality
  - Pilot investigation of rivers and streams concerning organic and inorganic pollutants
  - Investigations of private wells in several regions in Austria
  - Groundwater investigations close to contaminated sites
  - Summary reports based on existing investigations for surface water and groundwater
- ➔ elaboration of a nationwide monitoring strategy for groundwater and rivers in Austria in close cooperation with the Federal Ministry for Agriculture, Forestry, Environment and Water Management

Water Quality Monitoring System

- Monitoring System started 1991
- Main Goals are to
  - Show the situation
  - Show trends
  - Show problems (in relation to use)
  - Show effects of measures
  - Inform decision makers and the general public

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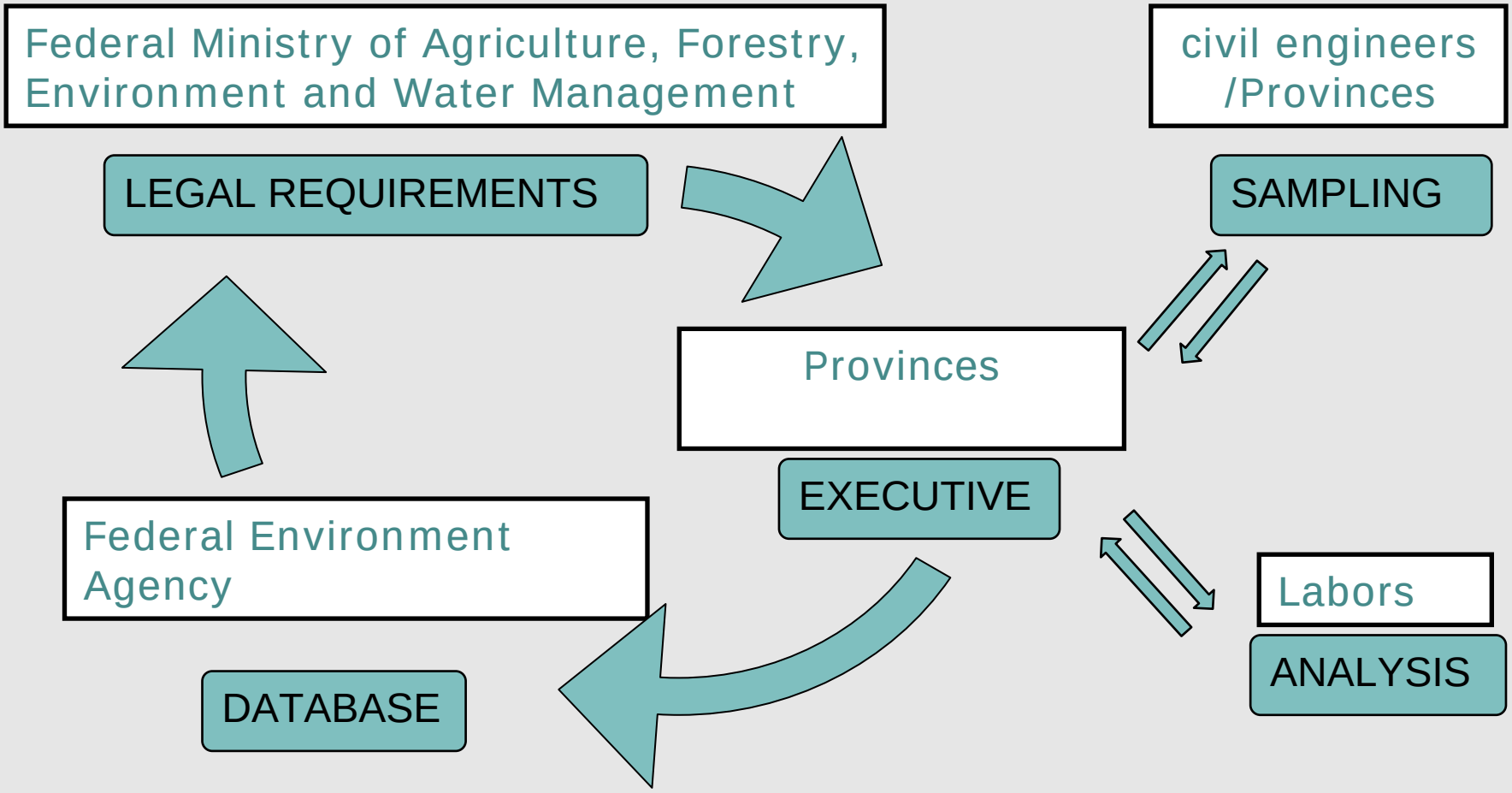
Organisation & Data flow



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Monitoring within a cyclic procedure

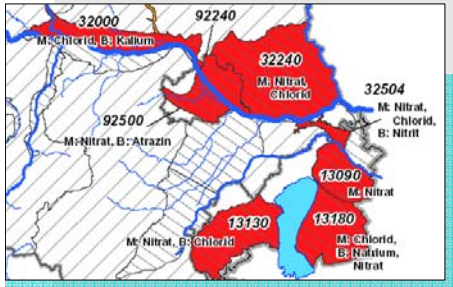
Reporting

conceptual model

modelling & assessment

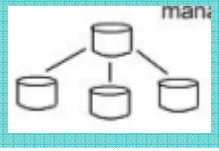
WFD and Management Objectives

monitoring design



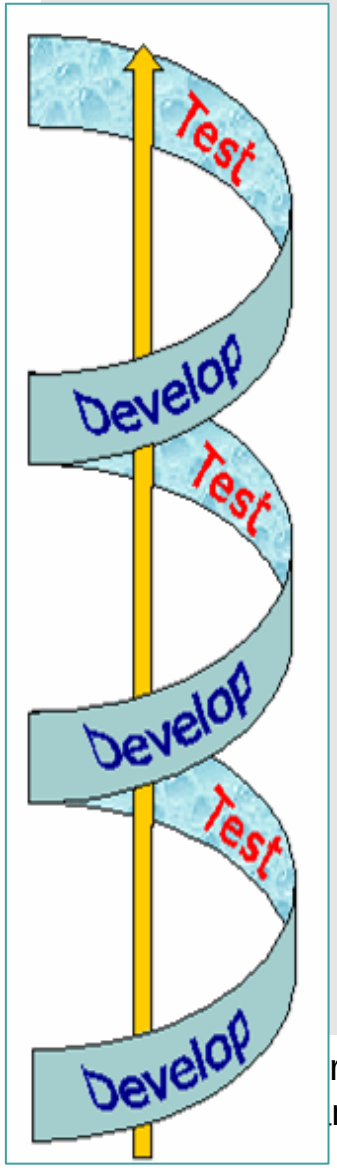
sampling & field measurements

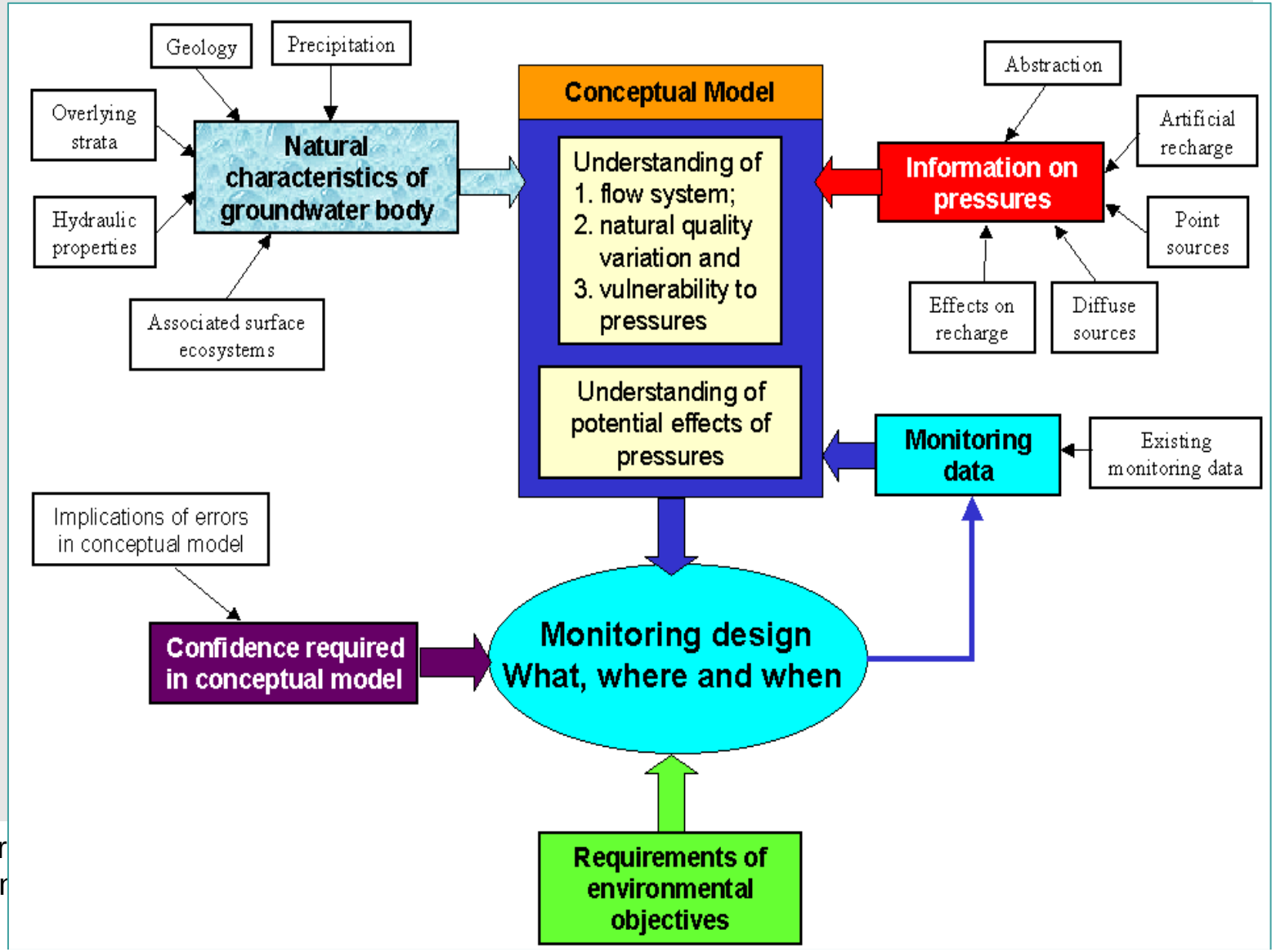
Data management & access



laboratory analyses

The Conceptual Model / Understanding
Key element for WFD implementation





Surface monitoring programme

Until 2006:

- rivers - about 285 monitoring sites (fixed)
  → selection of sites towards covering the impacts of chem. pollution

from 2007 onwards:

- surveillance monitoring network - few permanent monitoring sites („base monitoring network“)
- Operational monitoring network – not permanently
- → Basis : risk assessment (Art. 4 WFD) – water bodies at risk
- Emphasis on hydromorphological alterations

Surface monitoring programme

3 types of surveillance monitoring stations:

→ 31 monitoring stations type 1

→ 5 monitoring stations type 2

→ 40 monitoring stations type 3

- Coverage of river catchments of different size
- Biological, hydromorphological und physico-chemical quality elements
- Differences in parameters observed – harmful substances (incl. priority substances)

Importance of Groundwater in Austria

- Drinking water = 99 % from groundwater
  - **~ 50% from porous media** –
    mainly in the flat areas along the rivers in Austria
  - **~ 50% from karstic and fractured rock** –
    mainly in the alpine region of Austria
- Self-supply: 10% of population by private wells
- Groundwater quality = Health issue

Groundwater Monitoring Network

At least 1 monitoring point per groundwater body

- in porous media ~ 1640 monitoring stations
- karst and fractured rock ~ 340 monitoring stations
- ~ 25 monitoring stations in deep groundwater bodies

Delineation of groundwater bodies

- Whole territory of Austria is assigned to groundwater bodies (shallow groundwater)
- Individual groundwater bodies
  - > 50 km²
  - economic importance or with considerable risk potential
- Groups of groundwater bodies
  - Distinction by hydrogeological criteria
    - Porous media, karst, fractured rocks

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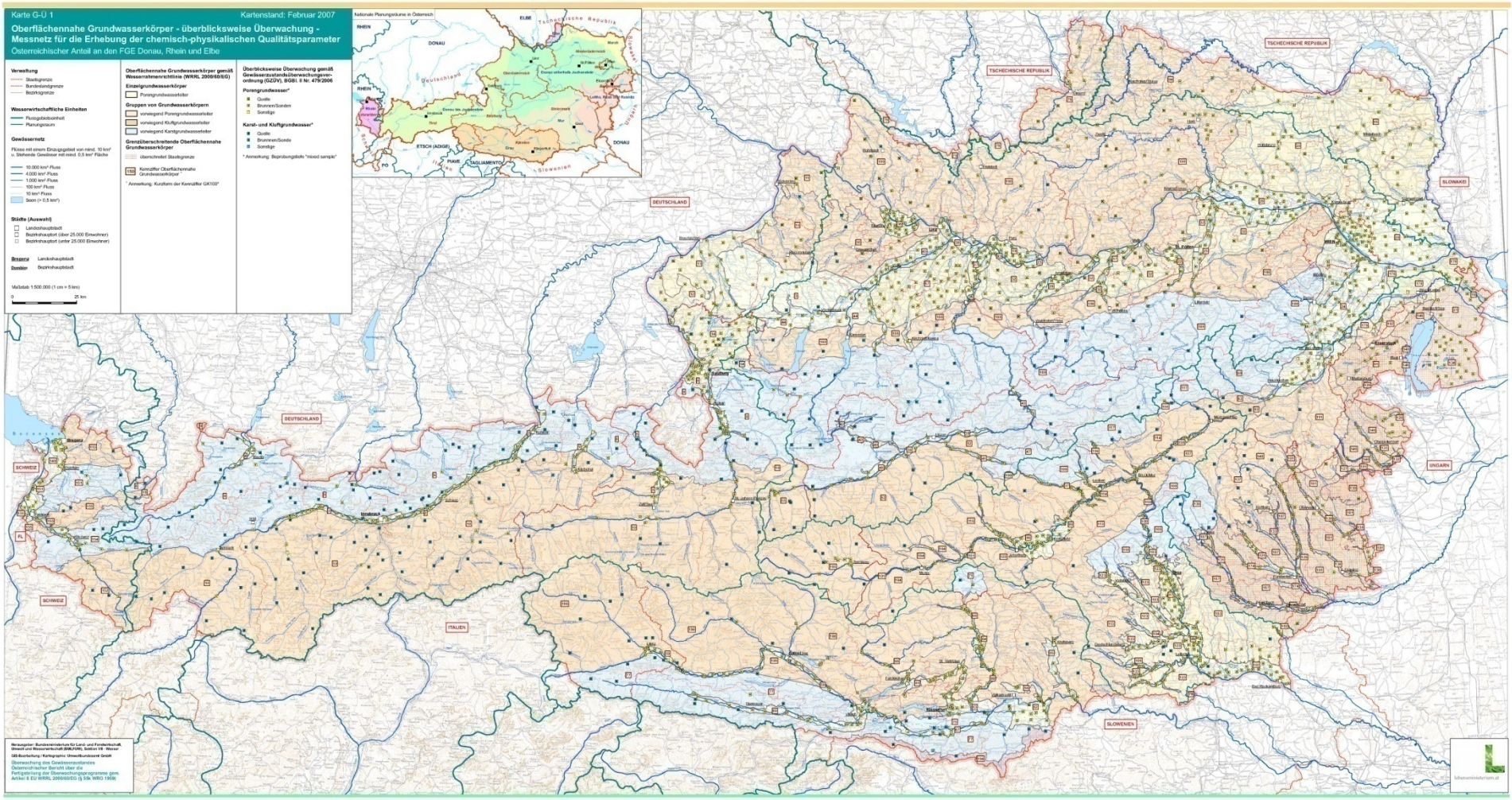
Groundwater bodies and Monitoring Network



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Groundwater Monitored parameters

In total ~120 parameters, grouped into two blocks:

- Block 1: important inorganic parameters with relevance to the environment, e.g. NO3, NO2, NH4, PO4, B, alkali metal and alkaline earth metal (e.g. K, Ca, Mg);

- Block 2:
  - the heavy metal group (e.g. As, Hg, Cd) and
  - lightly volatile halogenated hydrocarbons,
  - the broad group of pesticide substances (~80) and
  - polycyclic aromatic hydrocarbons (PAHs).

Budget for monitoring

- Costs of analyses and data transfer are met by federal (2/3) and provincial (1/3) authorities
- Costs of selection and establishing sampling sites 100% by federal authorities

- Total costs for federal and provincial authorities from 1990 to 2004: 38.8 Million Euro
  - Costs for sampling sites: 2.8 Million Euro
  - Costs per year: 2.2 to 2.9 Million Euro

Political Responses over the years

- Development and Implementation of legislation
  - Austrian Federal Water Law
  - Ordinance on GW-Threshold Values
  - Water Quality Monitoring Ordinance
  - GW-protection ordinance
  - Action Programmes
  - .....
- Inventories, catastres
- Authorisation and licensing
- Monitoring, assessment and reporting
- Remediation
- Programmes of measures
- Bilateral agreements with neighbouring countries

Information kept

- General data (Master data)
- Quality data
- Geographic date (GIS)

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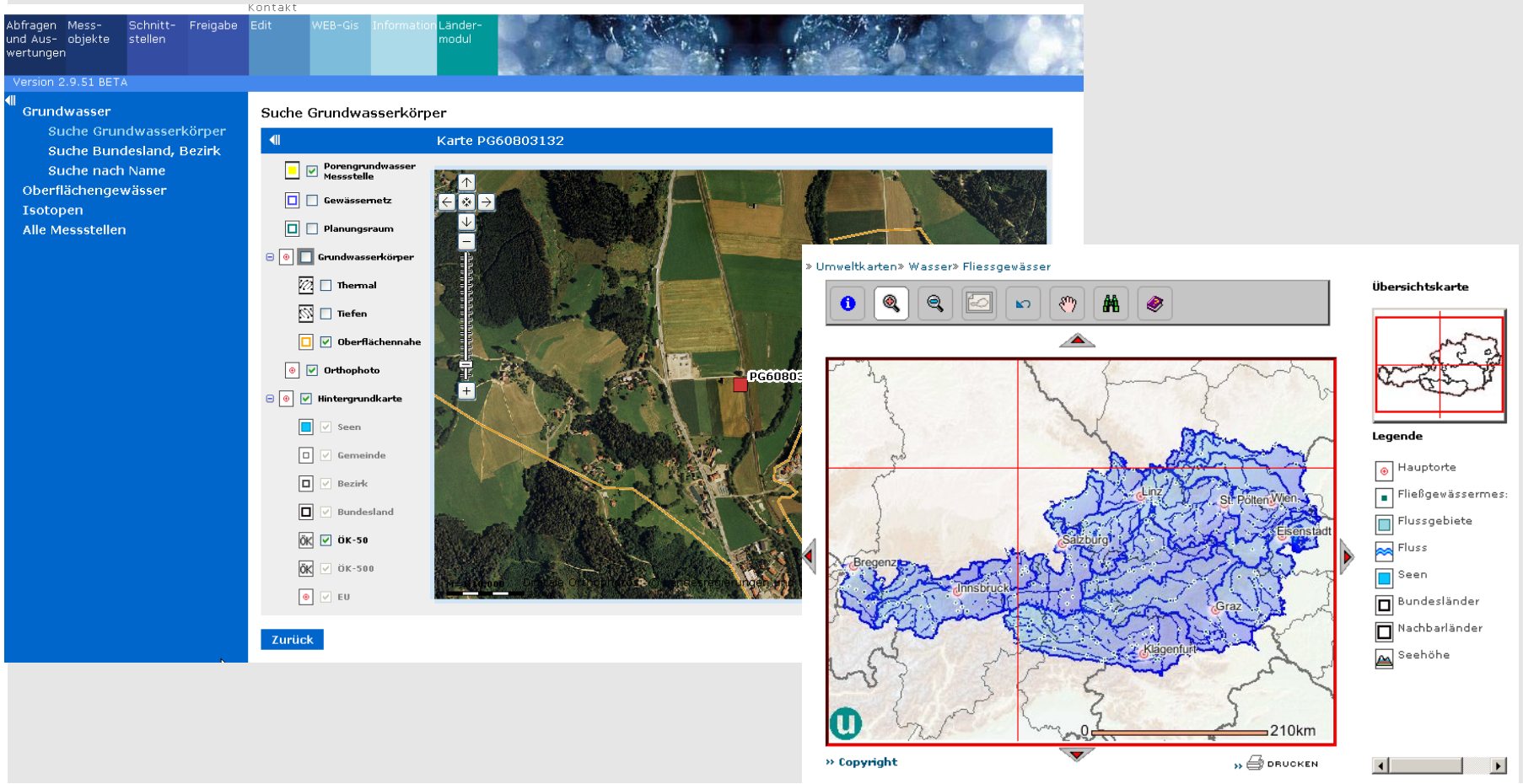
Geographic Information System



Water monitoring working group meeting
Beirout (Lebanon), 6th October 2009

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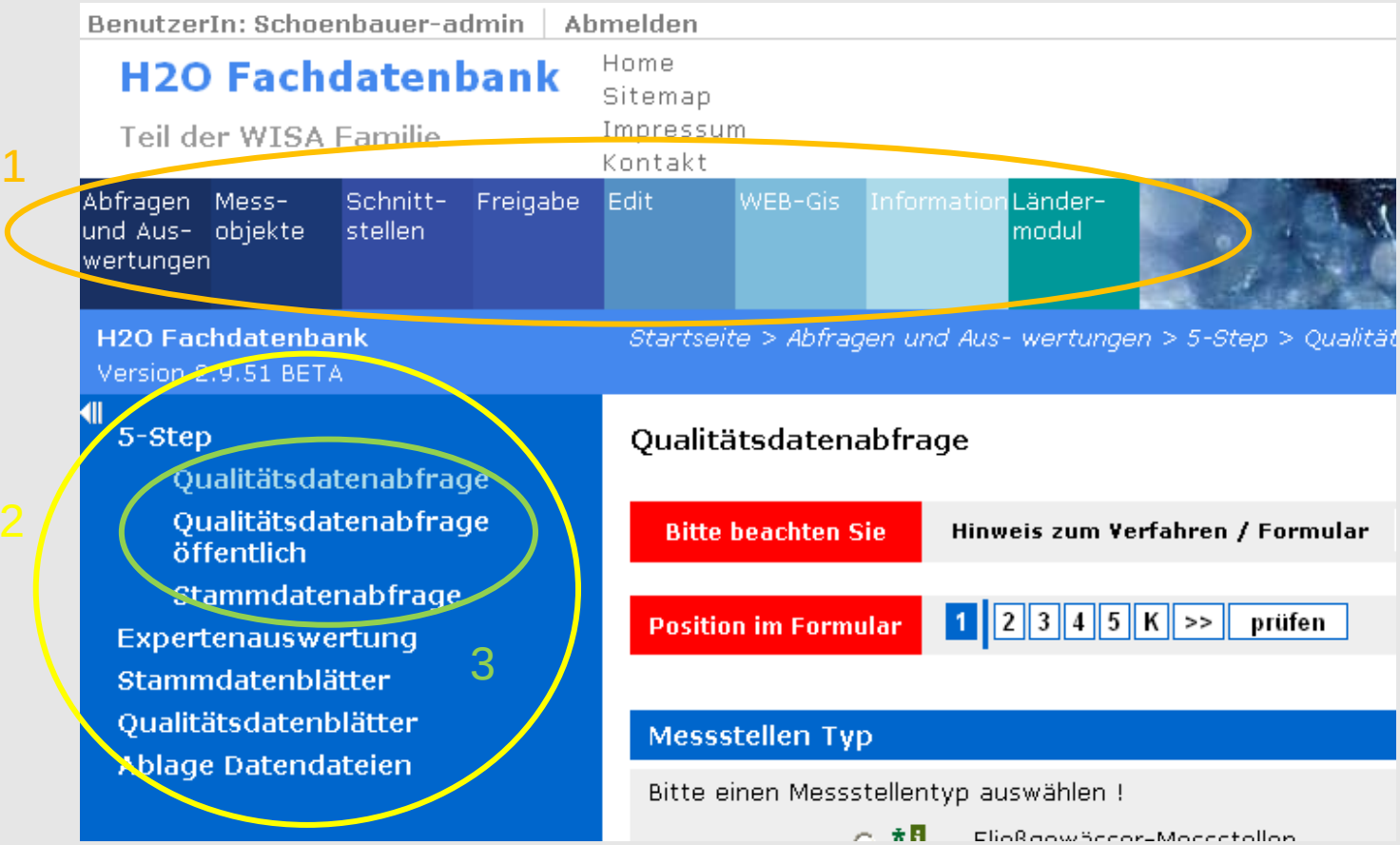
Modular Structure of data base

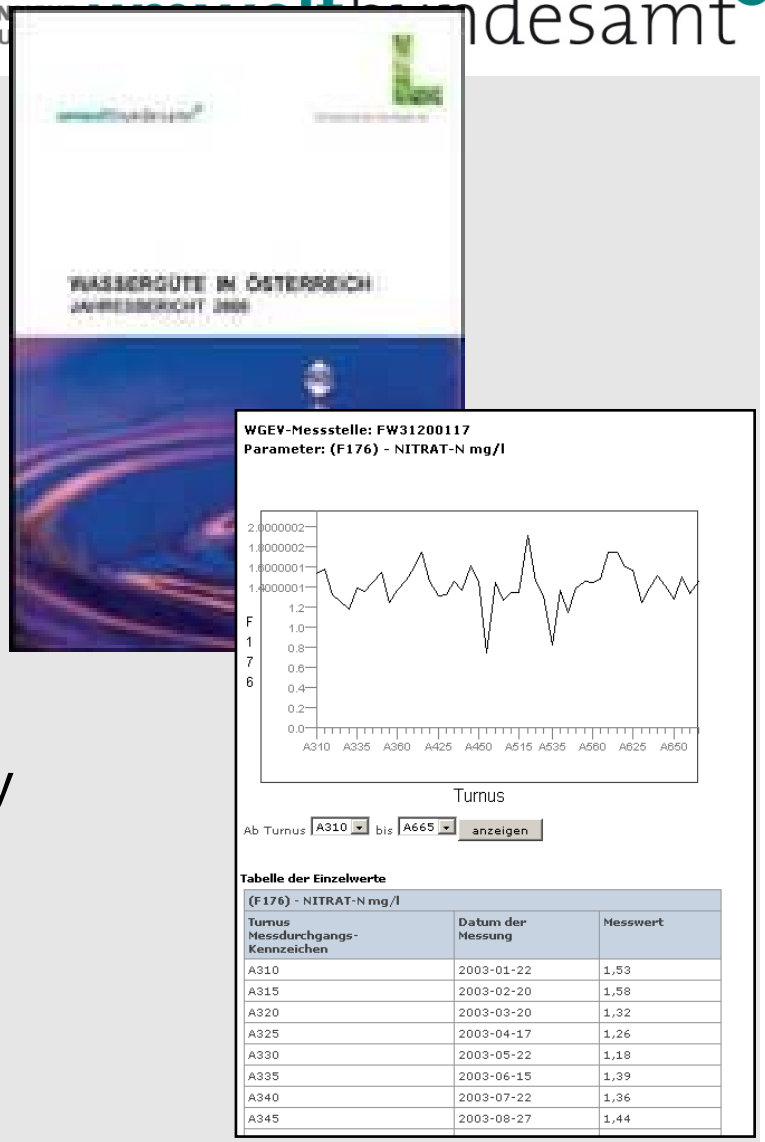


Beneficiaries of data

- Federal and Provincial Authorities
- Private Consultant
- Researcher
- Public User
- European Union

Data Access

- Internet – online queries
- Reports and other publications
- Presentations
- Data provision due to request by interested parties (enquiry by telephone or email)



Reports

National Reports

- Bi-annual Water Quality Report
- Environmental Monitoring Report

International Reports

- European Commission; e.g. WFD, Nitrate Directive; Urban Wastewater Directive
- EEA: State of the Environment Reporting
- International River Basin Commissions
- OECD

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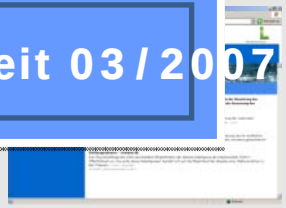
Linkage with Water Information System Austria

WISA

online seit 03/2007



Gewässernetz

operativ seit 2003

H2O Controlling

H2O Ländermodul

H2O Fachdatenbank inkl. Seen und ANIP

online 2008

EMREG-OG

geplant 2008/2009

FischDB-Bund

geplant 2008

Anwendungen

WIS Bundesländer

Links to the data base

Link to Umweltbundesamt

http://www.umweltbundesamt.at

Link Water Quality Data Base at Umweltbundesamt

https://secure.umweltbundesamt.at/h2o

Link via Water Information System Austria

http://wisa.lebensministerium.at/h2o/

WEB- Geographic Information System (GIS)

http://umweltbundesamt.at/

http://gis.umweltbundesamt.at/austria/wasser