European Information System Soil and Groundwater

EUGRIS – A window to site cleanup practices in the EU

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Für Mensch und Umwelt

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- Situation in Europe
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Introduction

Political preferences

Economic conditions

Technological progress

Change of contaminated land management and remediation practices in Europe in the last 25 years

Remediation objectives changed

Remediation technologies modified/improved

Regulation instruments developed

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Late 1970s: How did it start?

Contaminated sites problem ⟷ Modern industrial and consumption oriented society

Rare incidents…

…with catastrophic consequences for human health and environment

e.g. Lekkerkerk, NL or
Georgswerder disposal site, DE

↓

Politicians wanted maximal risk control.

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Sources of soil contamination

- **Inadequate waste disposal in the past**
  - amount of waste increased
  - number of hazardous substances in the waste
- **Handling of hazardous substances within industrial processes**

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Situation in the 1990s

few severe incidents	Widespread infrastructural problem of varying intensity and significance
NL 1981: 350 sites	NL 1995: 350.000 sites Clean-up costs: 13 billion €
Risk control	Revision of strategies: „Fitness for use“ - concept

„Land is „fit for use“ when it can be used for a particular purpose without posing unacceptable risks to human health or the environment.“ [3]

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In more recent years …

… many European countries developed strategies to tackle these problems including

- **Legislative measures**
- **Assessment procedures**
- **Remediation**
- **Funding**

Examples from European countries follow.

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Example Germany I

Environmental protection tasks over the last 30 years:

- **Identification of contaminated sites**
- **Remediation of contaminated sites**
- **Unwanted legacies from the past**

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Example Germany II

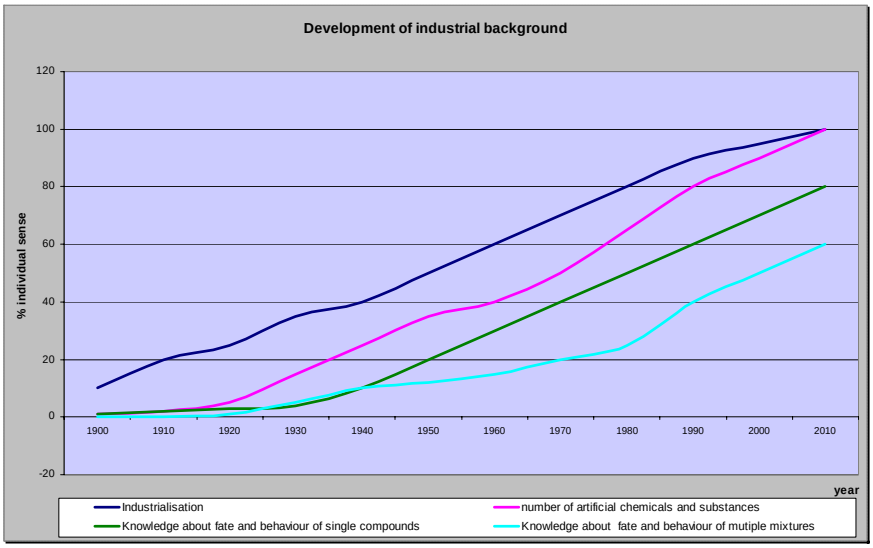
Suspected contaminated sites:

- Abondoned waste disposal sites
- Former industrial sites
- Locations former used by military or armament production

1999: German Soil Protection Act

- 360,000 suspected contaminated sites (in 2000) => 272,000 (in 2005)
- Stepwise risk assessment procedure (identification, investigation, risk assessment, remediation, aftercare) => bring contaminated land back into use
- Public funding to research and industry => development of high-standard soil treatment technologies
- 100 soil treatment plants with capacity of 4 million t/yr (in 2000)

Example Germany III



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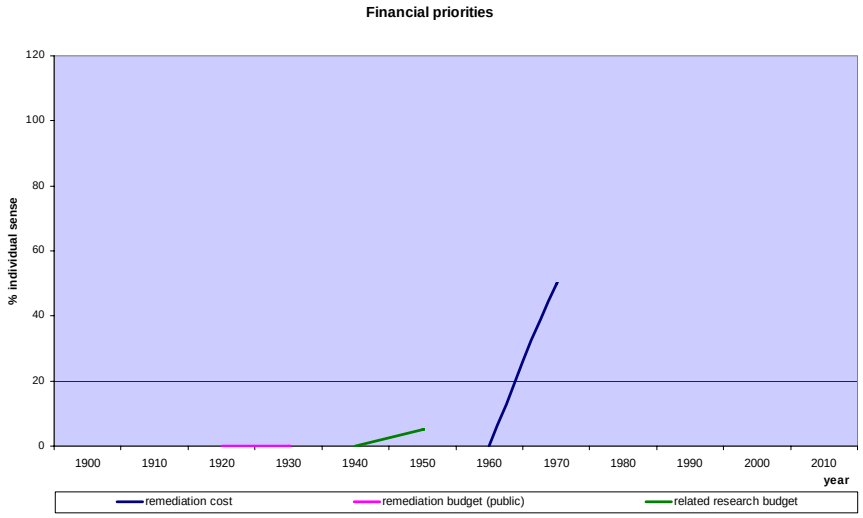
Example Germany IV



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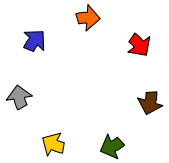
Example Germany V

Remediation strategy changed:

1970s:
Soil decontamination

2000+:
Process of land development for it‘s reuse



More complex & interdisciplinary

Clean-up procedure:
effective technologies
at reasonable prices

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Situation in Europe

Differences from country to country in

- **Responses of governments, industry and public to the problems posed by contaminated land**
- **Practices of dealing with land contamination**
- **Development of legislation for contaminated land,**
- **Data availalability of potentially and definitive contaminated sites**
- **Remediation practices**
- **Monitoring contaminated sites**
- **Additionally regional differences in countries with federal structures**

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European legislation

- **No EU directive or regulation addressing contaminated land as a whole**
- **Range of policy documents: Water Framework directive, Groundwater Directive**

  => demand to register the number of point sources but no other specific indicators
- **First draft of Soil Framework directive in preparation**

  => not expected to have detailed regulations for contaminated site management. The execution will also be covered and backed by national law in future.

National legislation in Europe

Table 1: Most relevant type of legislation addressing contaminated sites management

	AT	BE[1]	CH	DE[2]	DK	ES	FI	FR	GR	IC	IE	IT	LU	NL	NO	PT	SE	UK
Environmental Protection	●							●	●	●	●			●		●	●	●
Waste legislation						●	●	●			●	●	●					
Groundwater legislation	●							●										
Soil protection				●	●	●								●	●			
Soil clean-up		●	●	●	●										●			

1) the Flemish Region
2) at the Länder level.

Extracted from [1]

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Data availability in Europe

Table 2: Available data on the number of potentially contaminated and definitely contaminated sites, regarding the categories waste sites, industrial sites, military sites (as of August 1999)

	Industrial sites		waste sites		milit. sites	potentially contaminated		Contaminated sites	
	abandoned	operating	abandoned	operating		identified	estimated total	identified	estim. tot.
Austria	●	●	●	●	●	28 000	~80 000	135	~1 500
Belgium[1]	●	●	●	●	●	7 728	14 000	8 020	n.i.
Denmark[2]	●	●	●		●	37 000	~40 000	3 673	~14 000
Finland	●	●	●	●	●	10 396	25 000	1 200	n.i.
France	●	●	●	●	●	n.i.	700 000-800 000	896	n.i.
Germany[3]	●	●	●		●	202 880	~240.000	n.i.	n.i.
Greece						n.i.	n.i.	n.i.	n.i.
Iceland			●			n.i.	300-400	2	n.i.
Ireland	●	●	●	●		n.i.	~2 000	n.i.	n.i.
Italy	●	●	●	●		8 873	n.i.	1 251	n.i.
Luxemb.			●	●		616	n.i.	175	n.i.
Netherl.	●	●	●	●	●	n.i.	110 000-120 000	n.i.	n.i.
Norway	●	●	●	●	●	2 121	n.i.	n.i.	n.i.
Portugal						n.i.	n.i.	n.i.	n.i.
Spain	●	●	●	●		4 902	n.i.	370	n.i.
Sweden	●	●	●	●	●	7 000	n.i.	2 000	n.i.
Switzerl.	●	●	●	●	●	35 000	50 000	~3 500	n.i.
UK						n.i.	~100 000	n.i.	~10 000

n.i. = no information available

[1] PCS identified: 5,528/Flamish Region + 2 200/Walloon Region, PCS estimated: 9 000/Flamish region + 5 000/Walloon Region, CS identified: 7 870/Flamish region + 150/Walloon Region. Figures of the Flemish Region regard contamination generated before 1994 and refer to grounds, one site can consist of several grounds or 'cadastral lots'

[2] includes contamination generated before the mid 1970's,

[3] military sites are not included in this figure

Extracted from [1]

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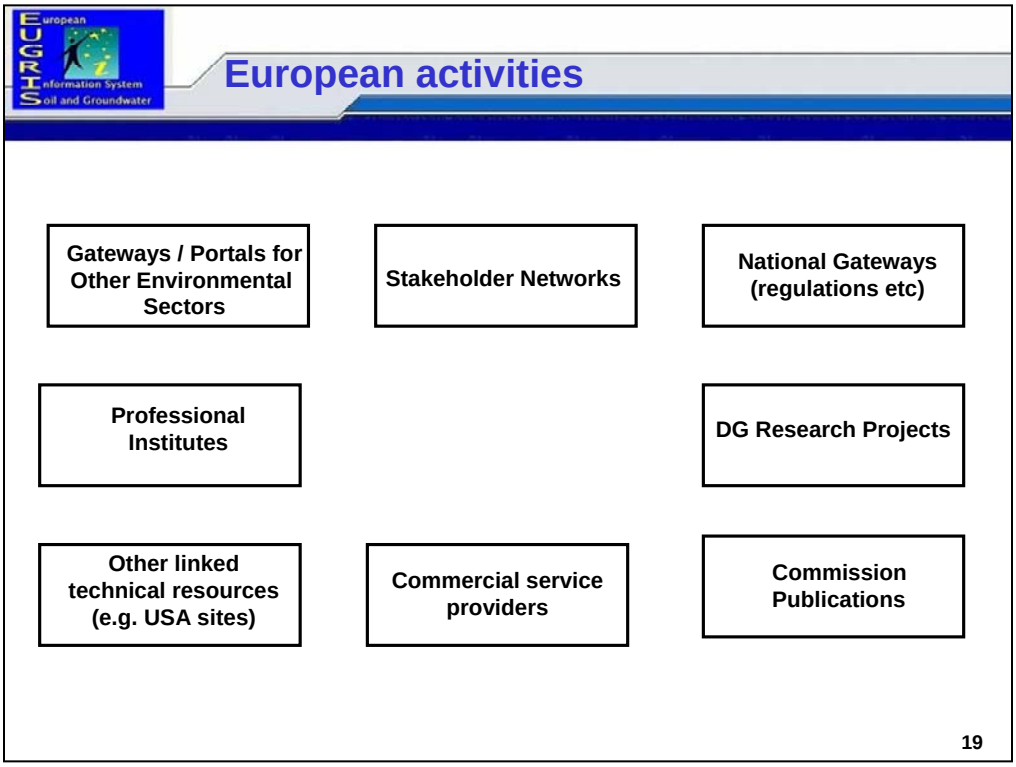
European principles

- Almost all countries regard land use, groundwater and survace waters as potential targests for contamination
- Each of the Western European countries supports the polluter-pays-principle, however problems to implement this principle (liable parties cannot be traced back or are not able to cover the clean-up costs)
- Most countries establised a public budget to finance major clean-up measures
- Several countries developed special funding tools (waste taxes, loan systems, agreements with industry)

European Initiatives and Networks

- **The Common Forum for Contaminated Land** in the European Union, established 1994 by Member States, the European Commission and the European Environmental Agency (EEA).
- **Ad Hoc International Working Group for Contaminated Land**: initiated in 1993, participants are representatives from environmental ministries and agencies from 20 different countries worldwide and international organisations such as FAO and OECD.
- **European Environment Agency** - European Topic Centre on Soil (ETC/S): The European Environment Agency (EEA) was established to collect, generate and provide objective, reliable and comparable information and data on environmental issues in Europe. It's ETC/S started its work in 1996.
- **ISO TC 190/SC 7 Soil Quality – Soil and Site Assessment**: ISO is the worldwide federation of national standardisation bodies. ISO Technical Committee (ISO) 190 deals with the standardisation of soil quality, including classification, definitions, sampling, analysis and reporting of soil characteristics. Subcommittee SC7 within TC 180 was established in 1995.
- **NATO/CCMS Pilot Studies**: The Committee for Challenges to Modern Society (CCMS), established in 1969, seeks to transfer technological and scientific solutions and experiences among nations with similar environmental challenges. The Pilot Study is the principal operating mechanism of the CCMS; there is a serious of Pilot Studies examining remediation technologies, which began in 1986 and lasts until today (Phase IV).
- **CARACAS**: Concerted Action on Risk Assessment for Contaminated Sites in Europe, 1996-1998.
- **CLARINET**: Contaminated Land Rehabilitation Network for Environmental Technologies, 1998-2001.
- **NICOLE**: Network for Industrially Contaminated Land in Europe, established in 1996.


European
Information System
Soil and Groundwater
European activities
Gateways / Portals for Other Environmental Sectors
Stakeholder Networks
National Gateways (regulations etc)
Professional Institutes
DG Research Projects
Other linked technical resources (e.g. USA sites)
Commercial service providers
Commission Publications
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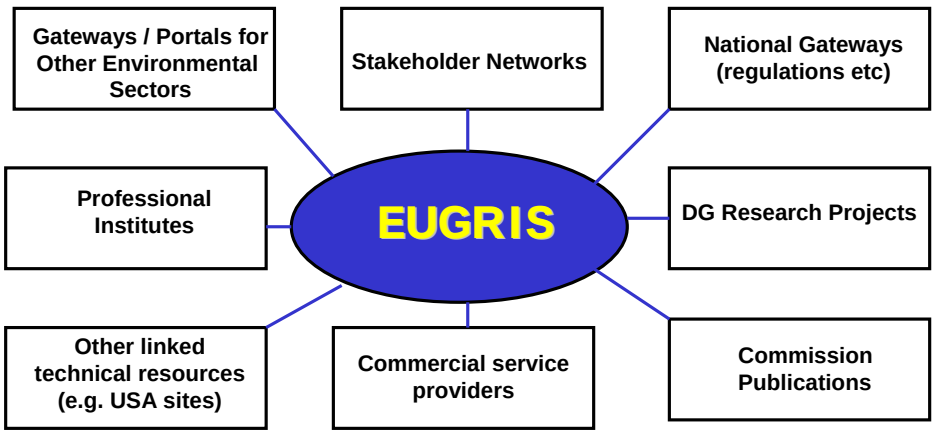
Link of European activities



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EUGRIS: one-stop information system

1. Reliable, structured, contextually meaningful **information**

2. Stakeholders: Target-oriented access for different user needs to support research and practical contaminated land management

3. Summary information and **meta-information** (links to the primary sources - library)

www.EUGRIS.info

EUGRIS is free

4. Technical information:
- Topics (basic principles, best practice)
- Country (policy, regulations, etc.)
- Research (projects, outputs, funding)

5. Service information:

library, who does what, glossary, news, training, what's new.

6. Dissemination tool: Visitor as information user and provider - EUGRIS Toolbox

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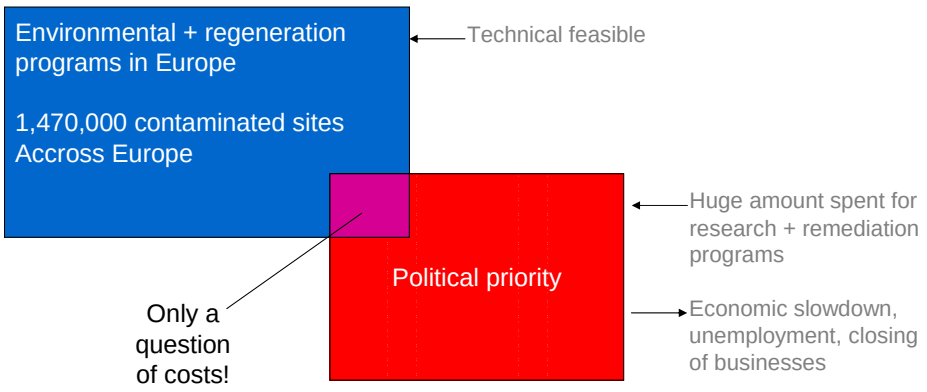
Conclusions I



- **Need for new technical concepts, management solutions, applied technologies => to solve with a lower budget even more complex problems**

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Conclusion II

Future needs for

- **Further research results with a short cycle of transition into appliance**
- **Well trained execution authorities**
- **Innovative consultants**
- **Consequent usage of synergy effects**
- **Cross national dissemination of experiences, research results, reliable information (EUGRIS provides the basis for that)**

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- [1] European Environmental Agency (ed) (2000): Management of contaminated sites in Western Europe. EEA Topic Report 13/1999.
- [2] Ferguson, C., Kasamas, H. (ed.) (1999): Risk Assessment for Contaminated Sites in Europe. Volume 2. Policy Frameworks. LQM Press, Nottingham.
- [3] Ferguson, C (1999): Assessing Risks from Contaminated Sites: Policy and Practice in 16 European Countries. In: Land Contamination & Reclamation, 7 (2), 1999.
- [4] Hauschild, M., Bardos, A., Brunet, JF, Jensen, B (2005): EUGRIS System Report. Available from http://www.eugris.info.
- [5] International Centre for Soil and Contaminated Sites (2002): Manual for Management and Handling of Contaminated Sites, ICSS at UBA Germany, http://www.icss-uba.de.
- [6] International Centre for Soil and Contaminated Sites (2004): Management and Remediation of Contaminated Sites. 30 years of German Experience, http://www.icss-uba.de.

- Further information available via EUGRIS www.eugris.info.