



With the contribution of the LIFE financial instrument of the European Community

R. Löwner, A. Souhel, J. Wächter, F. Krysiak and the SaDIN Working Group

Sahel – Doukkala Scientific Information Network



Realisation of an online geoinformation system in Morocco

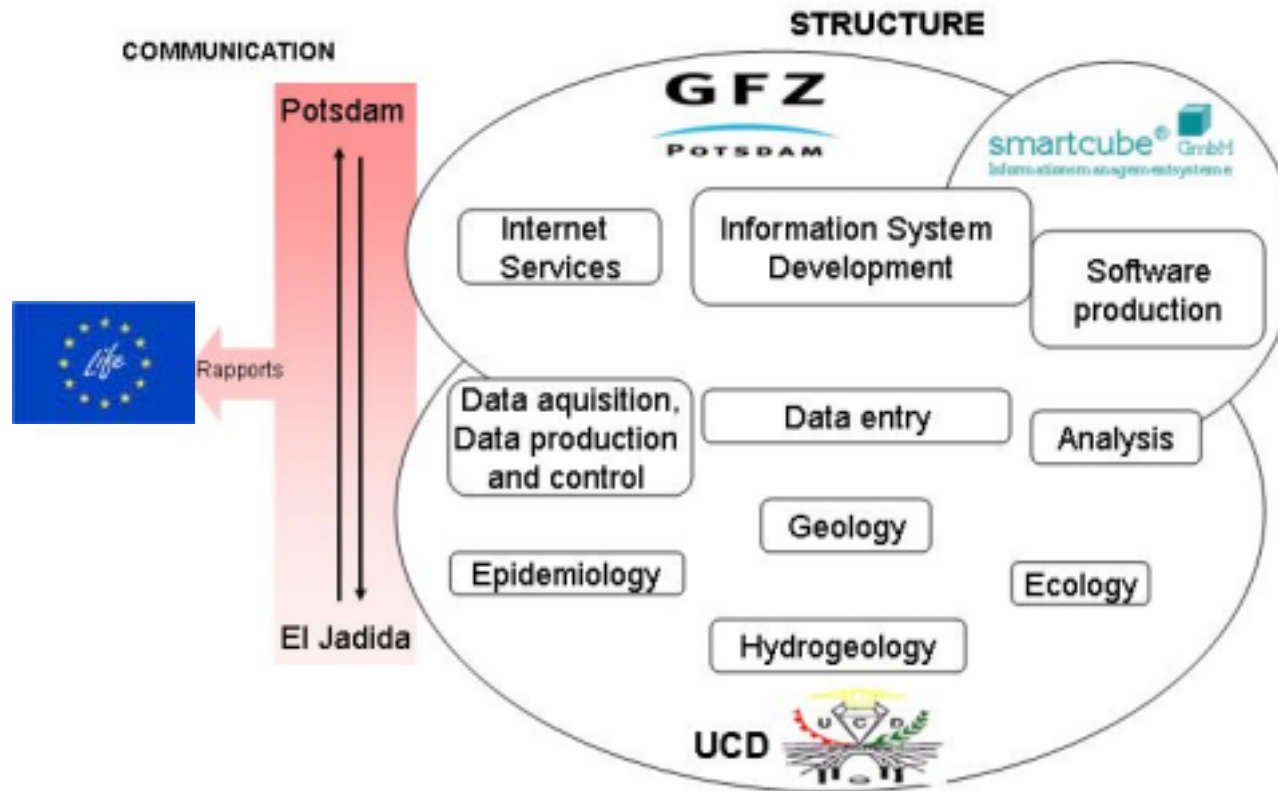
Sahel - Doukkala Scientific Information Network

Realisation of an online geoinformation system in Morocco

1. General set-up & Digital Divide
2. Environmental problems – the investigation area
3. The working groups and scientific results
4. The realisation of the data and information system
5. SaDIN – what could it be in the future

1. General set-up & Digital Divide

EU Projects
LIFE -Third countries
<http://ec.europa.eu/environment/life/>



Start	: January 2004
Total Costs	: 589 832,- € (with 70 % contribution from the EU)
Duration	: 2 Jahre
Employees	: 25

1. General set-up & Digital Divide

1160.0688	222.0000	71.9251	0.0025	432.0601	1061.1652	0.4006	2.4561	1.4141	5.1356	0.0249	94.4618	52.3887	0.1211	1160.0688	222.0000	71.9251	0.0025
1159.9164	222.0000	71.9251	0.0026	432.0257	1061.1652	0.4007	2.4564	1.4141	5.1356	0.0249	94.4618	52.3887	0.1211	432.0601	1061.1652	0.4006	2.4561
1159.7640	222.0000	71.9251	0.0026	431.9926	1061.1652	0.4007	2.4564	1.4141	5.1356	0.0249	94.4618	52.3887	0.1211	1159.9164	222.0000	71.9251	0.0026
1159.6116	222.0000	71.9251	0.0027	431.9346	1061.1652	0.4007	2.4568	1.4141	5.1356	0.0249	94.4618	52.3887	0.1211	432.0257	1061.1652	0.4007	2.4563
1159.4592	222.0000	71.9251	0.0028	431.8844	1061.1652	0.4007	2.4569	1.4141	5.1356	0.0249	94.4618	52.3887	0.1211	431.9926	1061.1652	0.4007	2.4564
1159.3068	222.0000	71.9251	0.0028	431.9630	1061.1652	0.4007	2.4566	1.4141	5.1356	0.0249	94.4618	52.3887	0.1211	1159.7640	222.0000	71.9251	0.0026
1159.1544	222.0000	71.9251	0.0029	431.9573	1061.1652	0.4007	2.4566	1.4141	5.1356	0.0249	94.4618	52.3887	0.1211	431.9926	1061.1652	0.4007	2.4564
1158.8496	222.0000	71.9251	0.0030	431.8766	1061.1652	0.4007	2.4571	1.4141	5.1356	0.0249	94.4618	52.3887	0.1211	431.9926	1061.1652	0.4007	2.4564
1157.6304	222.0000	71.9251	0.0036	434.0764	1061.1652	0.3995	2.4447	1.4141	5.1356	0.0249	94.4618	52.3887	0.1211	1159.1544	222.0000	71.9251	0.0029
1157.4780	222.0000	71.9251	0.0036	430.1323	1061.1652	0.4017	2.4671	1.4141	5.1356	0.0249	94.4618	52.3887	0.1211	431.9573	1061.1652	0.4007	2.4566
1157.3256	222.0000	71.9251	0.0037	436.8765	1061.1652	0.3980	2.4290	1.4141	5.1356	0.0249	94.4618	52.3887	0.1211	431.9573	1061.1652	0.4007	2.4566
1157.1732	222.0000	71.9251	0.0038	440.1890	1061.1652	0.3961	2.4107	1.4141	5.1356	0.0249	94.4618	52.3887	0.1211	431.9573	1061.1652	0.4007	2.4566
1157.0208	222.0000	71.9251	0.0038	442.1210	1061.1652	0.3950	2.4002	1.4141	5.1356	0.0249	94.4618	52.3887	0.1211	431.9573	1061.1652	0.4007	2.4566
1156.8684	222.0000	71.9251	0.0039	440.9926	1061.1652	0.3939	2.3897	1.4141	5.1356	0.0249	94.4618	52.3887	0.1211	1158.8496	222.0000	71.9251	0.0030
1156.7160	222.0000	71.9251	0.0040	440.9926	1061.1652	0.3956	2.4063	1.4141	5.1356	0.0249	94.4618	52.3887	0.1211	431.9926	1061.1652	0.4007	2.4564
1156.5636	222.0000	71.9251	0.0040	434.8168	1061.1652	0.3991	2.4405	1.4141	5.1356	0.0249	94.4618	52.3887	0.1211	431.9926	1061.1652	0.4007	2.4564
1156.4112	222.0000	71.9251	0.0041	433.1608	1061.1652	0.4000	2.4498	1.4141	5.1356	0.0249	94.4618	52.3887	0.1211	1158.8496	222.0000	71.9251	0.0030
1156.2588	222.0000	71.9251	0.0042	431.9926	1061.1652	0.4019	2.4689	1.4141	5.1356	0.0249	94.4618	52.3887	0.1211	431.8766	1061.1652	0.4007	2.4571
1156.1064	222.0000	71.9251	0.0042	422.3351	1061.6069	0.4060	2.5137	1.4141	5.1356	0.0249	94.4618	52.3887	0.1211	431.9926	1061.1652	0.4007	2.4564
1155.9540	222.0000	71.9251	0.0043	427.0148	1058.9504	0.4029	2.4799	1.4141	5.1356	0.0249	94.4618	52.3887	0.1211	1158.6972	222.0000	71.9251	0.0031
1155.8016	222.0000	71.9251	0.0043	424.1209	1057.3688	0.4041	2.4931	1.4141	5.1356	0.0249	94.4618	52.3887	0.1211	431.7485	1061.1652	0.4008	2.4578

Data & Information producers

Natural Science

Human Science

Users

Scientists

Public

Local authorities

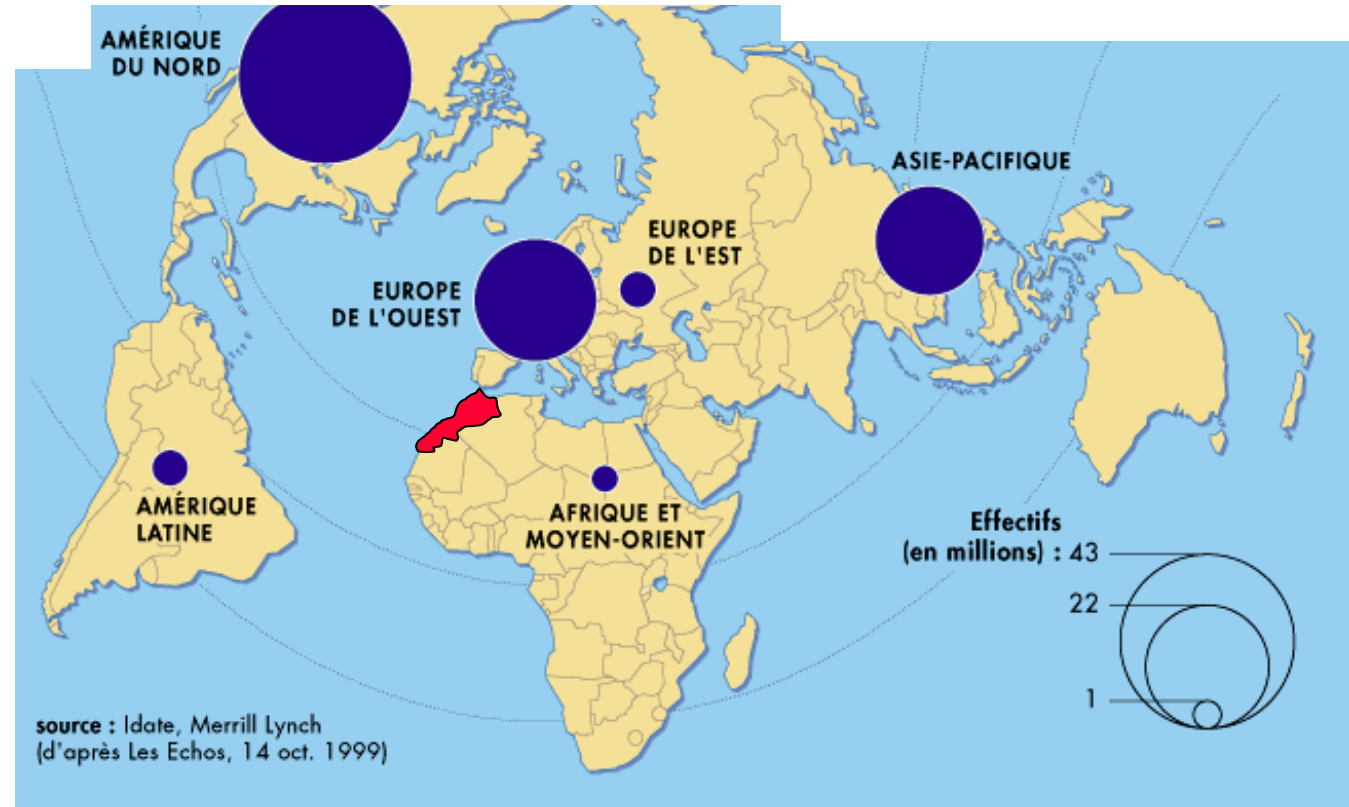
Decision makers



1. General set-up & Digital Divide

Internet users of large regions

for all
 worldwide
 real time



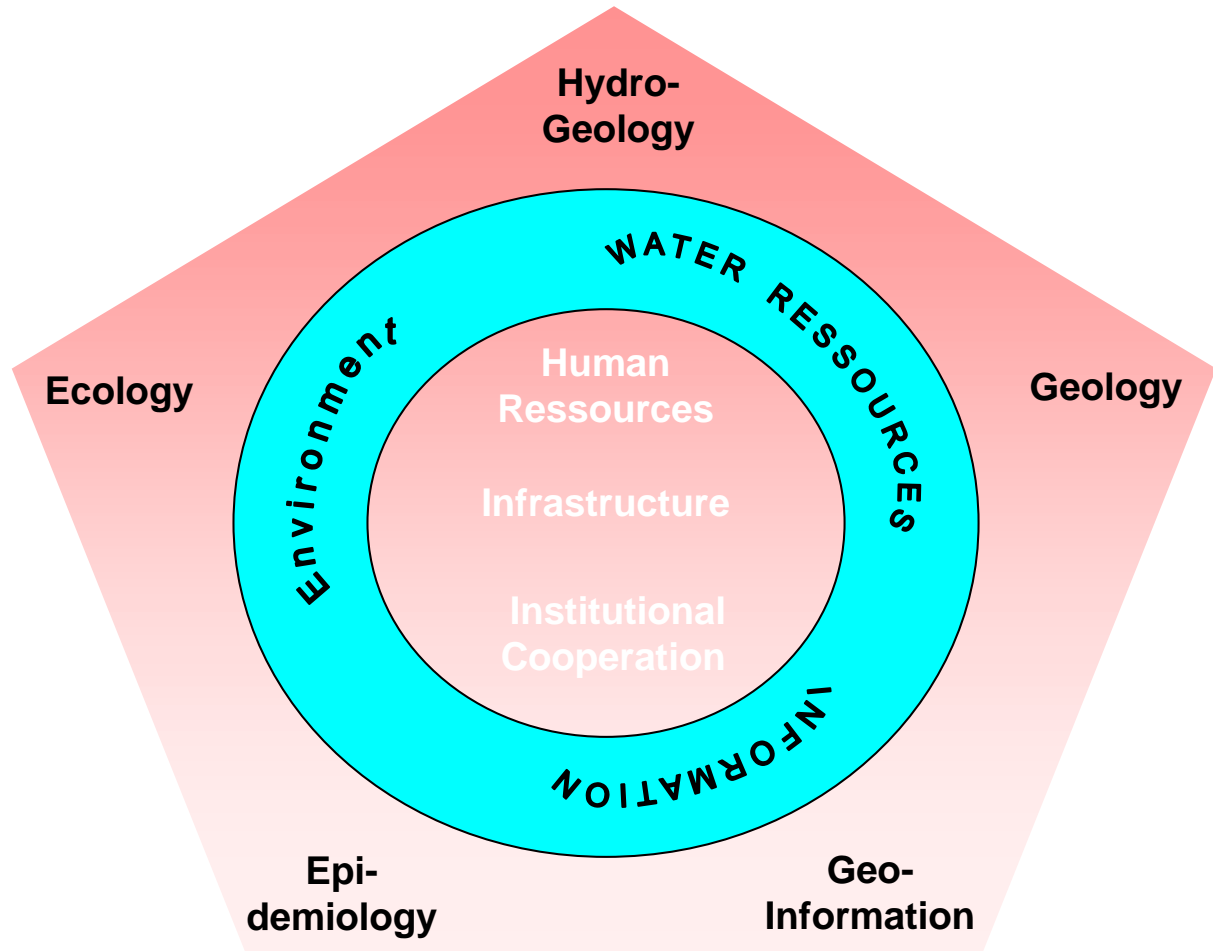
Internet Supported Scientific Information Network

2. Environmental problems – the investigation area

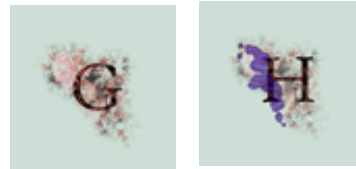


2. Environmental problems – the investigation area

1. Salty water infiltration
2. Ground water pollution
3. Desertification
4. Waste management – “illegal waste dumps”
5. Health

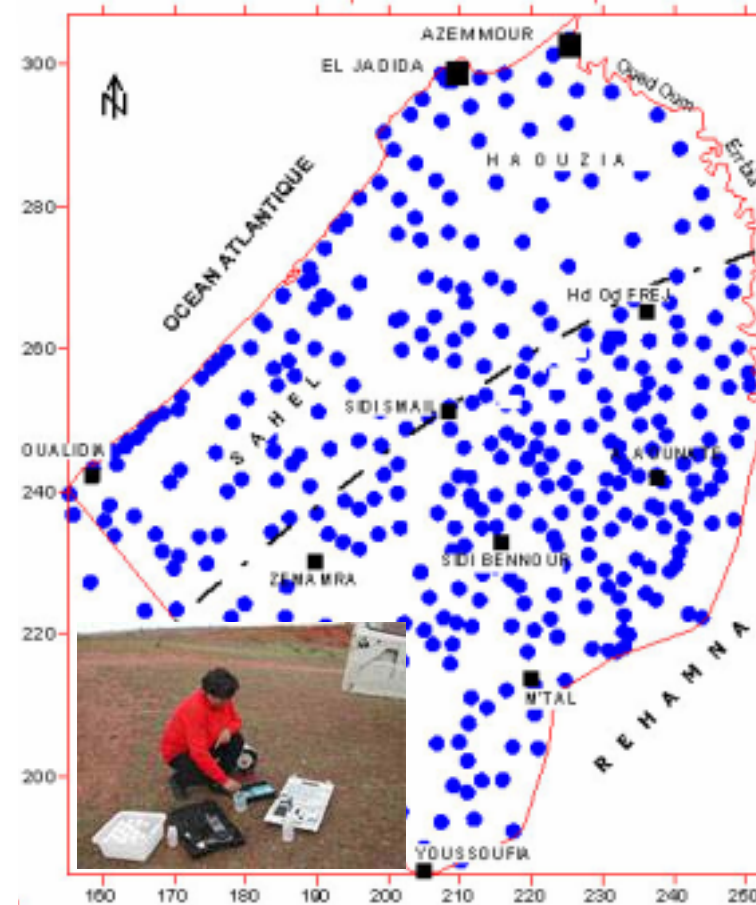


3. The working groups and scientific results



Geology & Hydrogeology

- Inventory, revising and update of the data from previous borehole analyses and their storage on digital support
- Acquisition of topographic and geological data and his digital processing
- Analyse of about 400 wells and interpretation of about 300 soundings
- Drilling investigations and measurements on sections vertical to the coastline
- Installations for the supervision of marin water intrusion



3. The working groups and scientific results



Ecology

- Inventory of all available data
- Remote sensing and analyse of physical and ecological surface parameters
- Phytoecological surveying and mapping, determination of soil properties and land use
- Regional specification of marine fauna of the Sahel coastal area
- Detection and definition of the problem areas regarding to desertification and illegal waste dumps



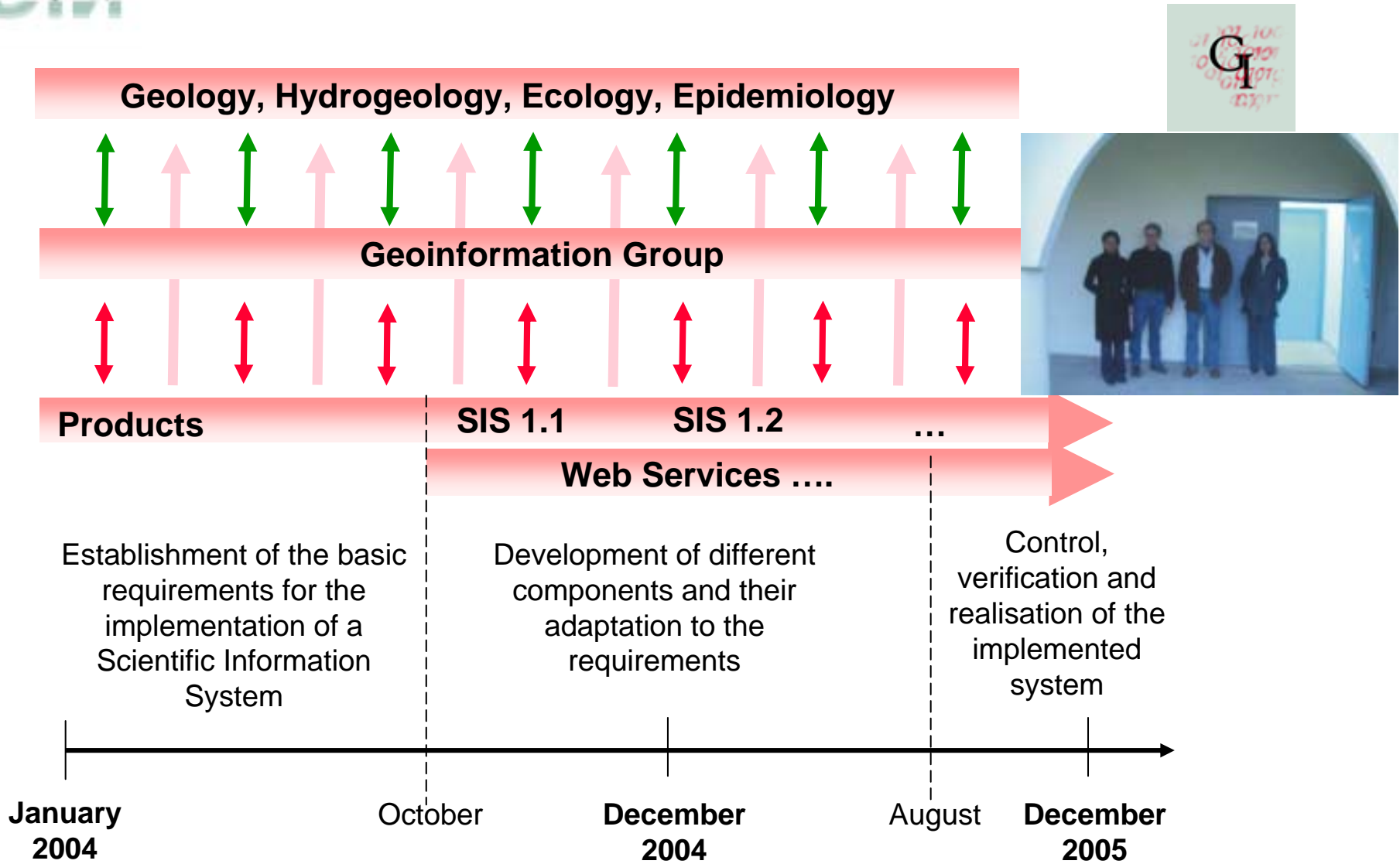
Epidemiology

- Analyse of the actual situation of the public health of the endangered population
- Analyse of the impact of solid and fluid waste on the population and of polluted water from illegal waste dumps
- Physical examination of about 800 people, living in endangered areas
- Cytogenetics: 30 persons

Infectious diseases  genetic modifications

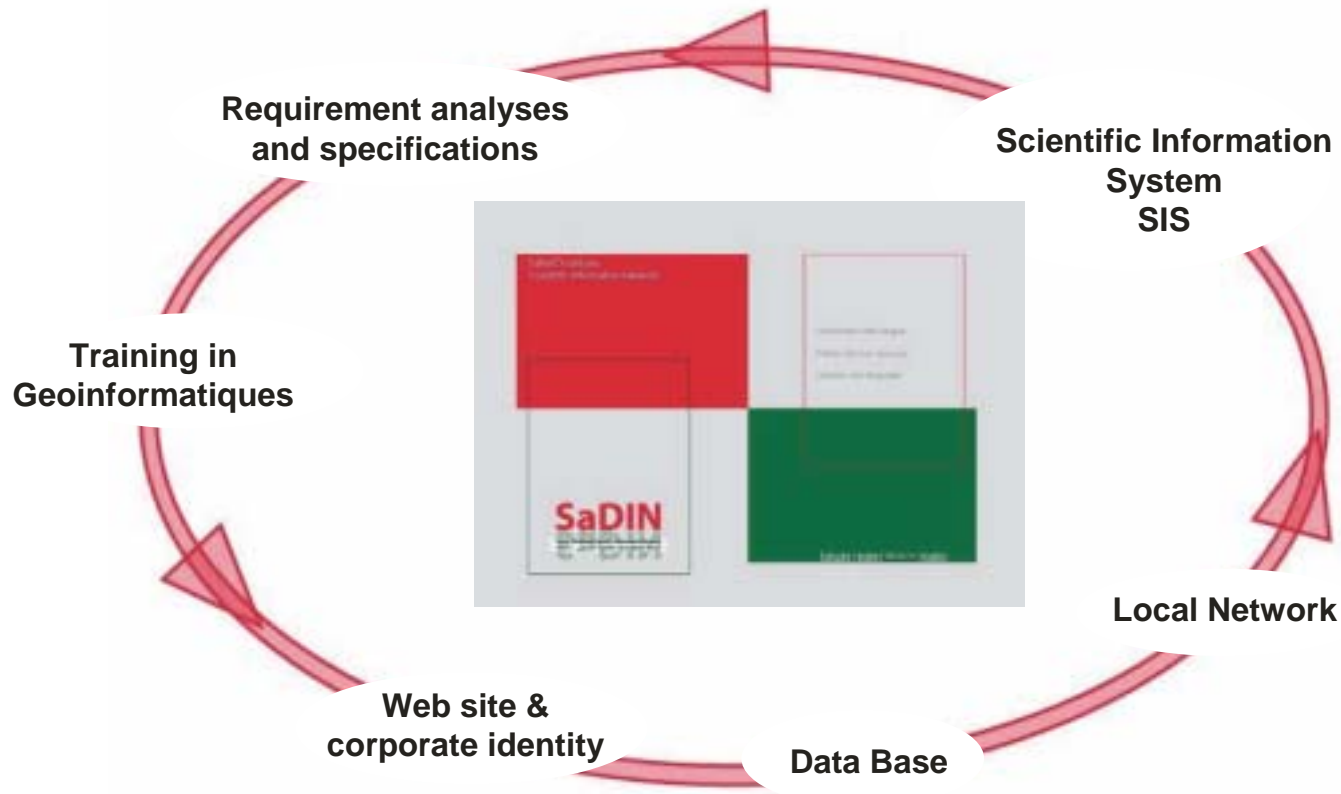


4. The data & information system



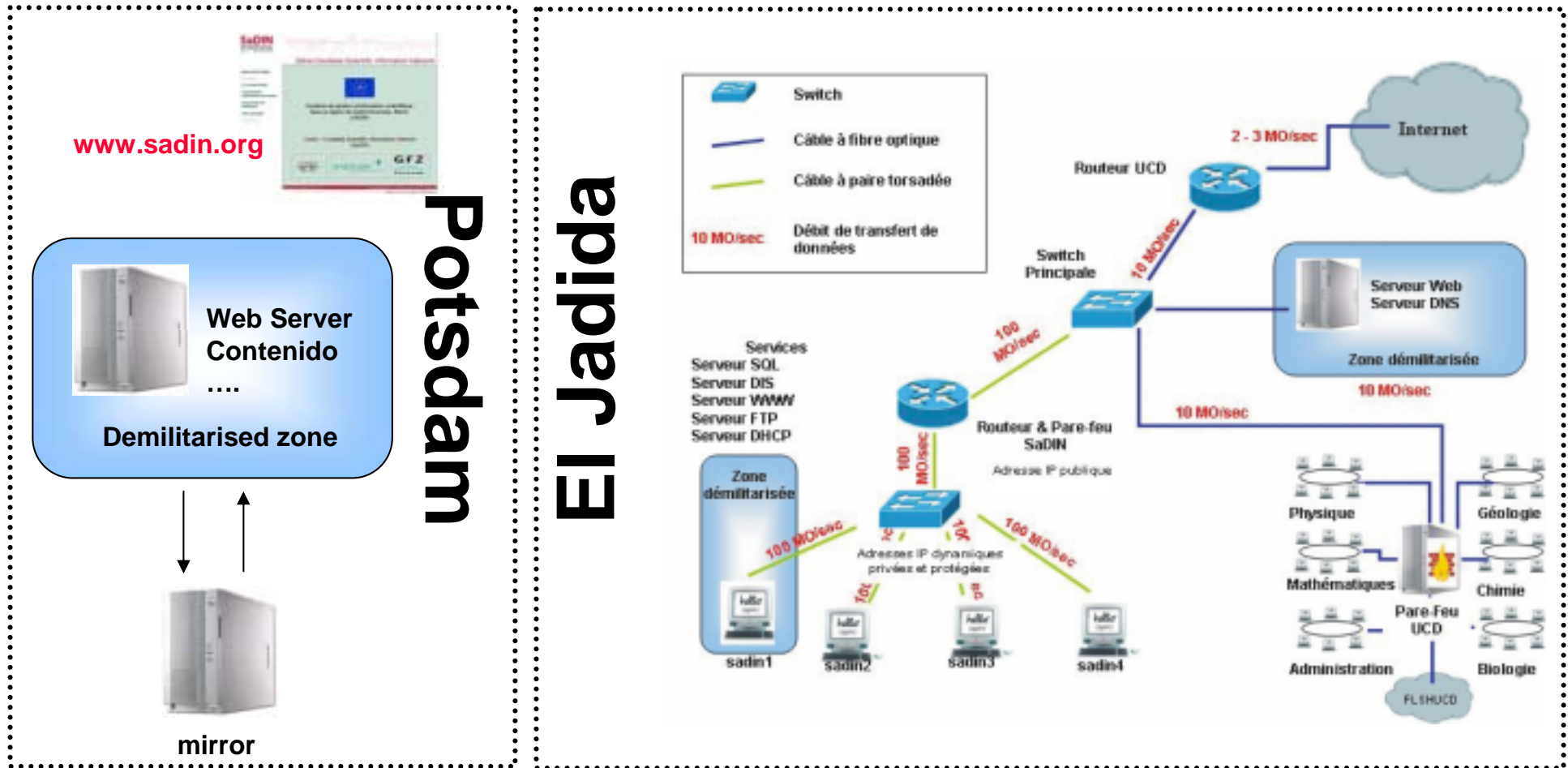
4. The data & information system

January – October 2004



Establishment of the basic requirements for the implementation of a Scientific Information System

4. The data & information system



4. The data & information system



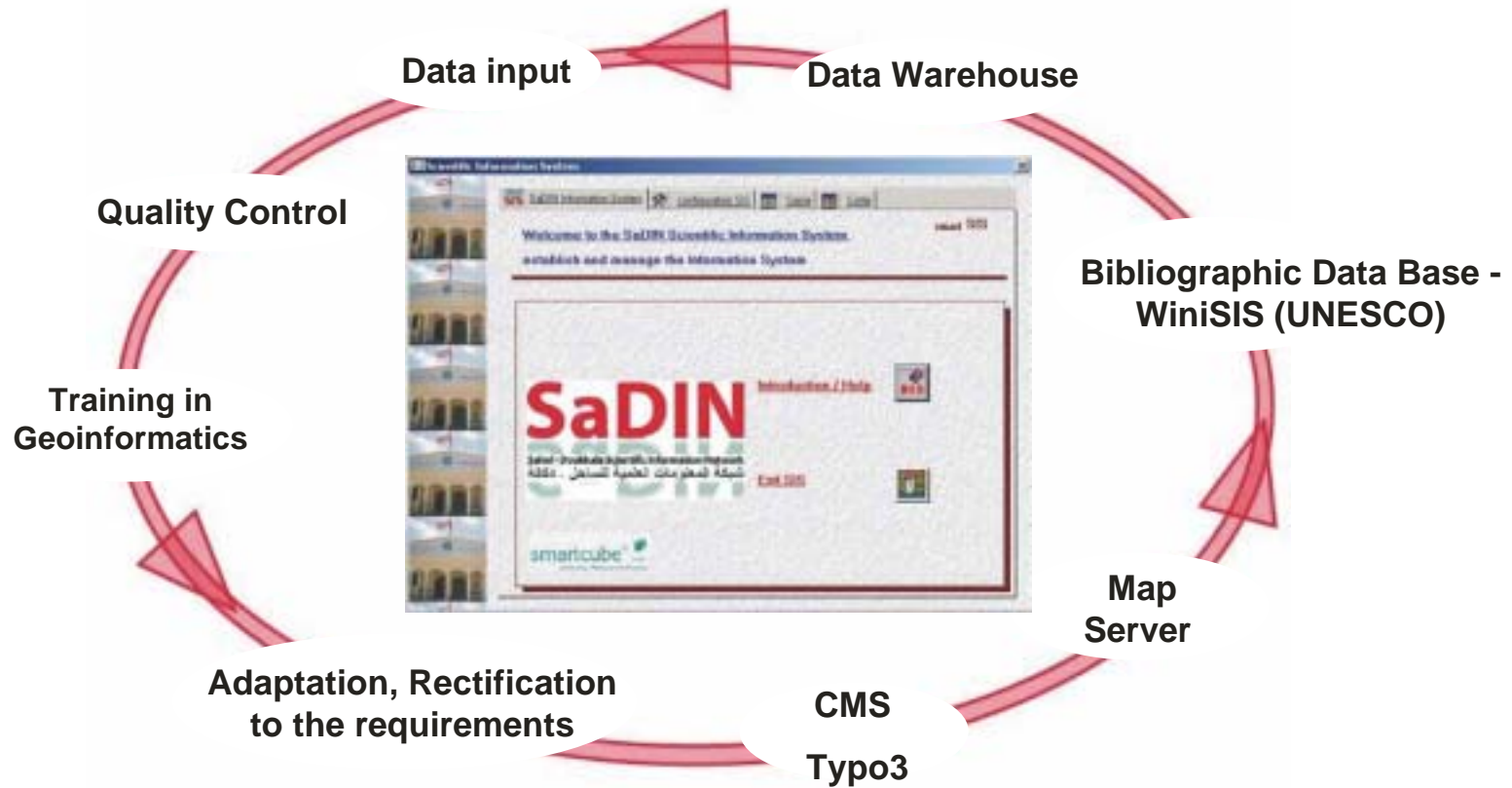
4. The data & information system

Training in
Geoinformatics



4. The data & information system

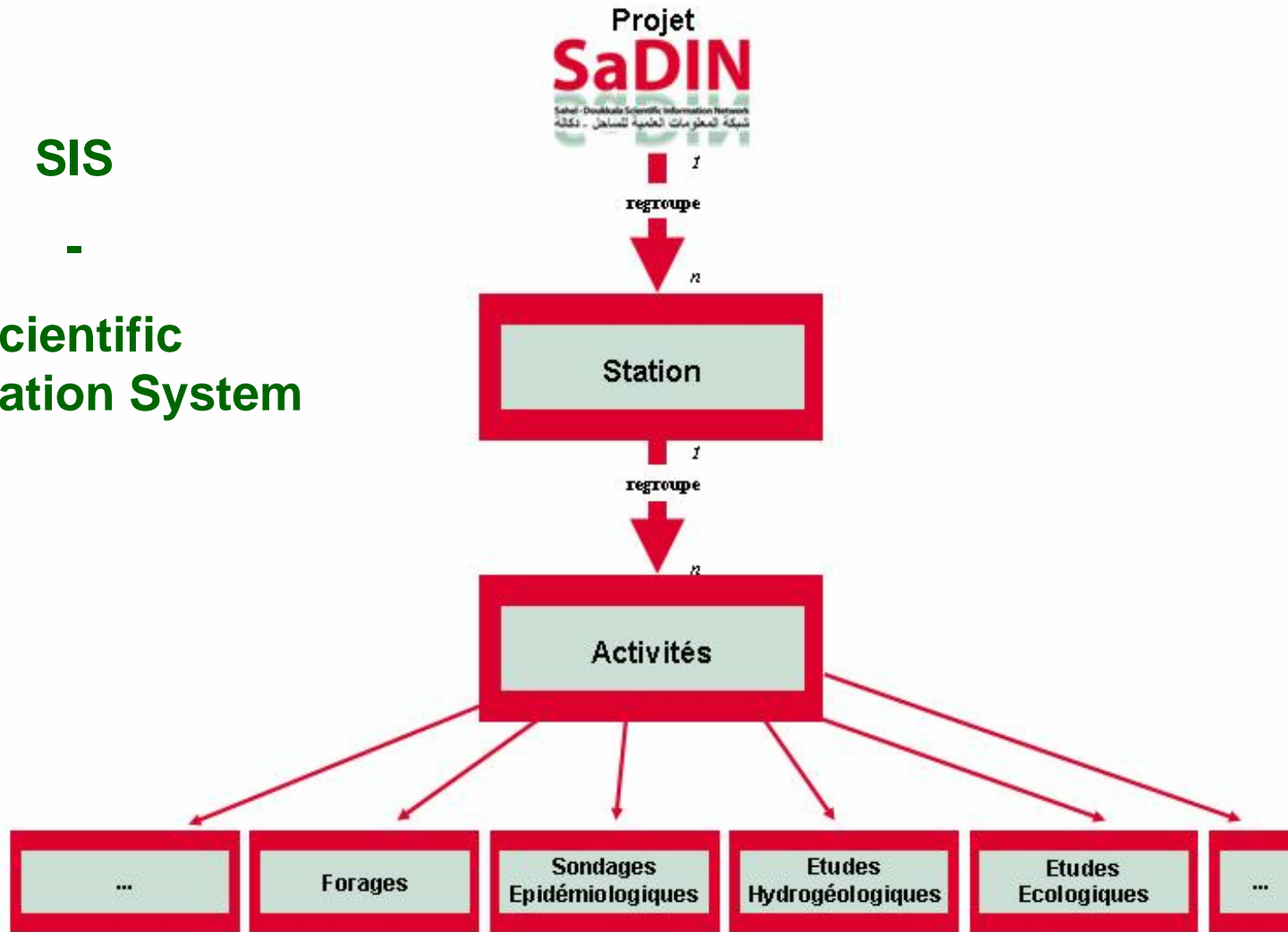
November 2004 – August 2005



Development of different components and their adaptation to the requirements

4. The data & information system

SIS
 -
Scientific Information System



4. The data & information system

Scientific Information System

SIS: officier d'entrée des données de SD_LITHOUNITES_GENERAL_INP

SIS: outil de la créer coupe lithologique

créer coupe lithologique

Forage / Activite: G0007

unité sommet: U0001 unité de la base: U0009

coupe coupe d'ensemble

0m

U0001
U0002
U0003
U0004
U0005
U0006
U0007
U0008

Coupe Lithologique

données de unité: U0001

lithologie: terre v[otale

profondeur: 0 - 1 interval profondeur: 1

classe de unité: roches s[ementaires type de unité: terre

carotte sommet: Quaternaire

unité du sommet de la section: n.a. unité de la base de la section: n.a.

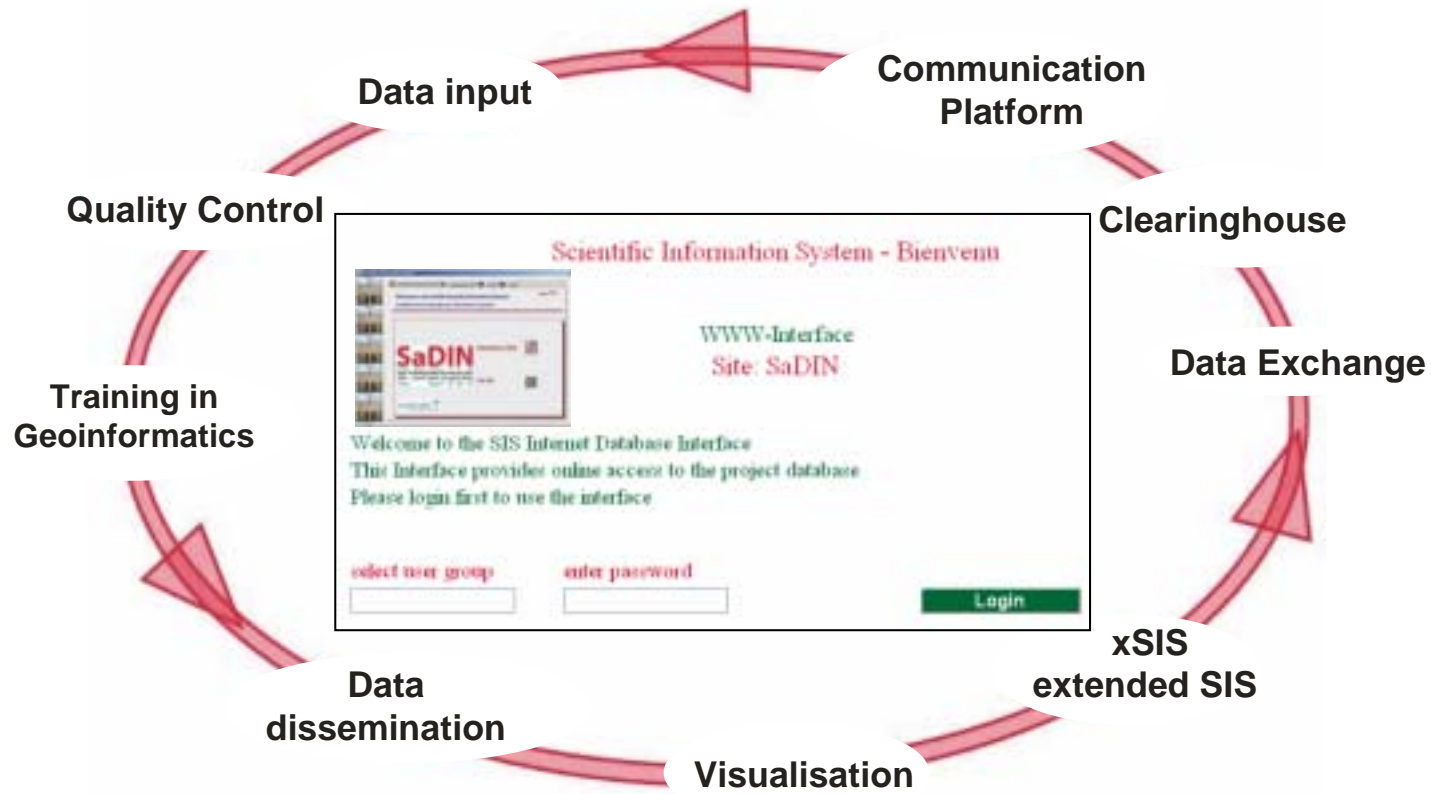
Contact du sommet: bioturbations

Contact de la base: bioturbations

*placez la suris sur le log qui se trouve dans le coche à gauche pour mise à jour l'information de l'unité sélectionnée

4. The data & information system

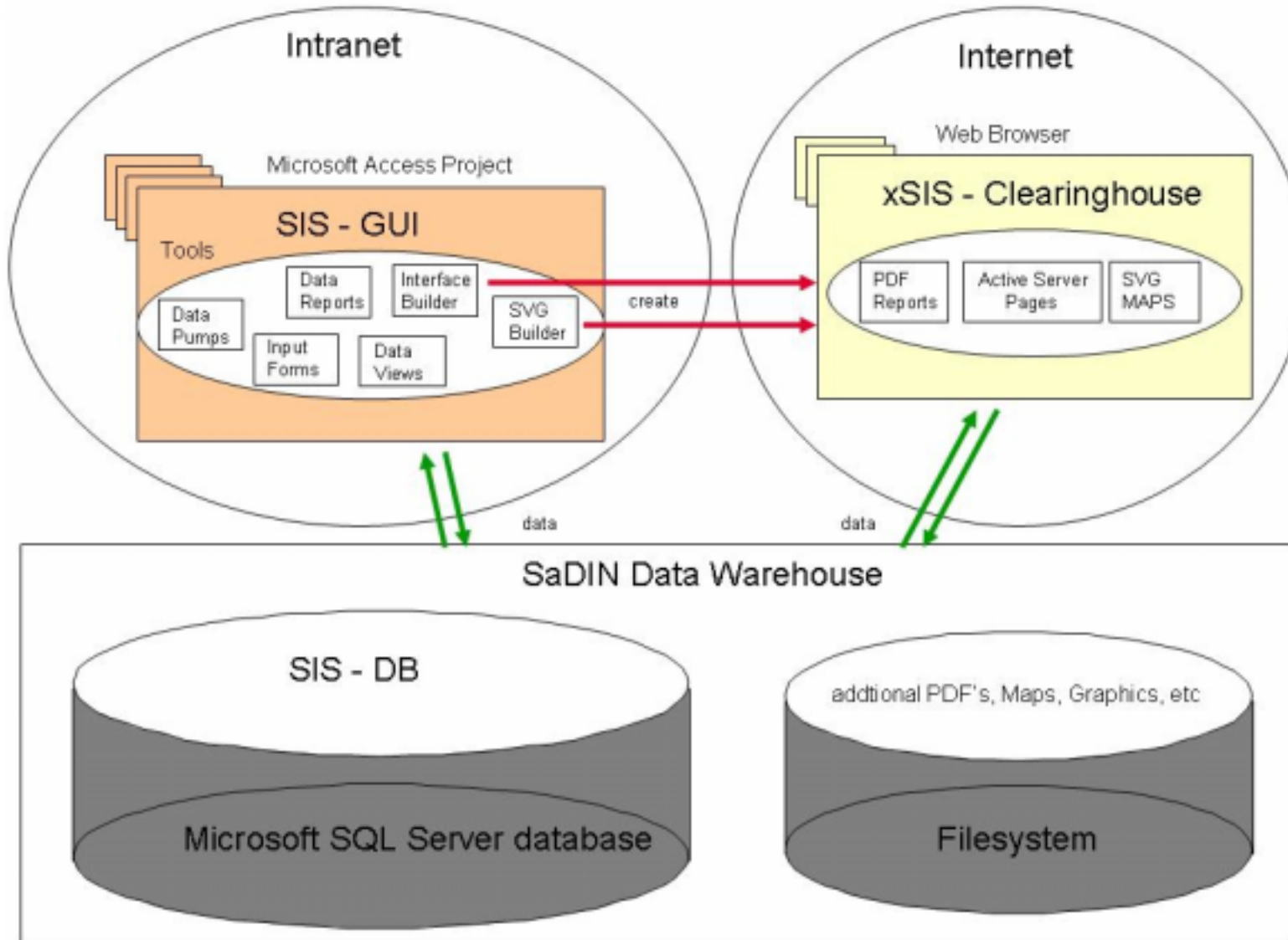
September - December 2005



Control, verification and realisation of the implemented online system

4. The data & information system

SIS
Scientific Information System



extended Scientific Information System

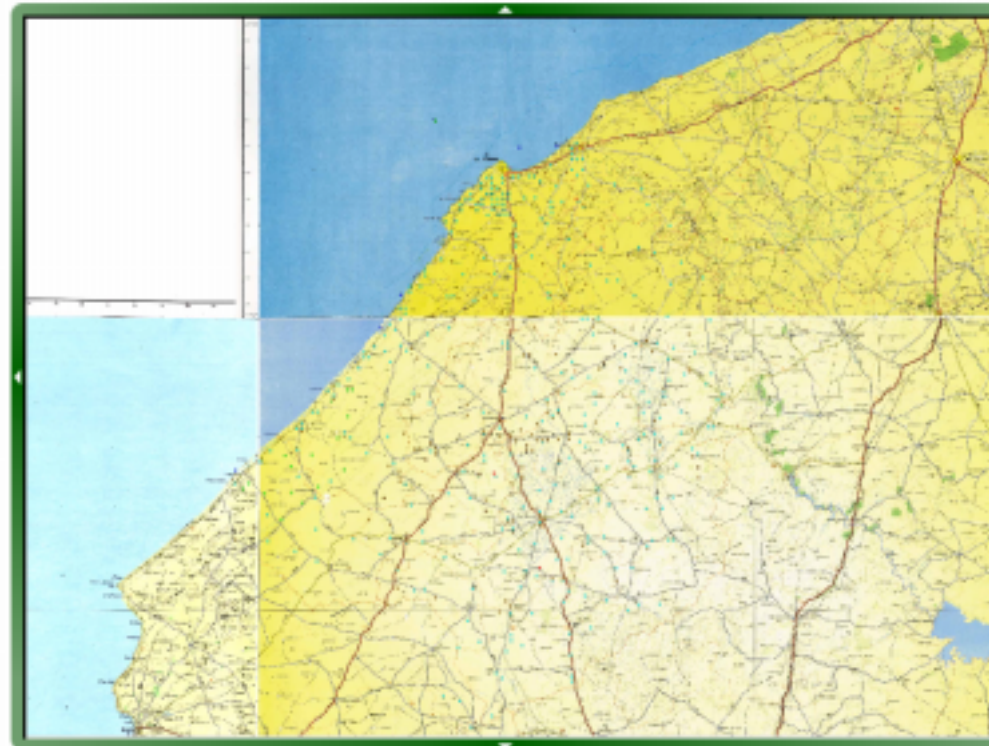
xSIS

4. The data & information system

Geographic Information System

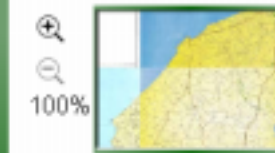
Site: SaDIN

- PROJET
 - DataViews
 - STATIONS ACTIVITES VIEW
 - DataReports
 - STATION REP
 - ACTIVITES REP
 - STATIONS ACTIVITES REP
 - InputForms
- INVENTAIRE
 - DataViews
 - ECO GEN VIEW
 - EPI IDENTIFICATION VIEW
 - FORAGES VIEW
 - HDG GEN VIEW
 - LITHO UNITES VIEW
 - OCG GEN VIEW
 - DataReports
 - FOR LITHO REP
 - HDG TER REP
 - EPI IDENT REP
 - HDO GEN REP
 - EPI CYTO REP
 - HDO BCH REP
 - InputForms
- Carte de la région
- get help
- mail admin



0 10 20
km

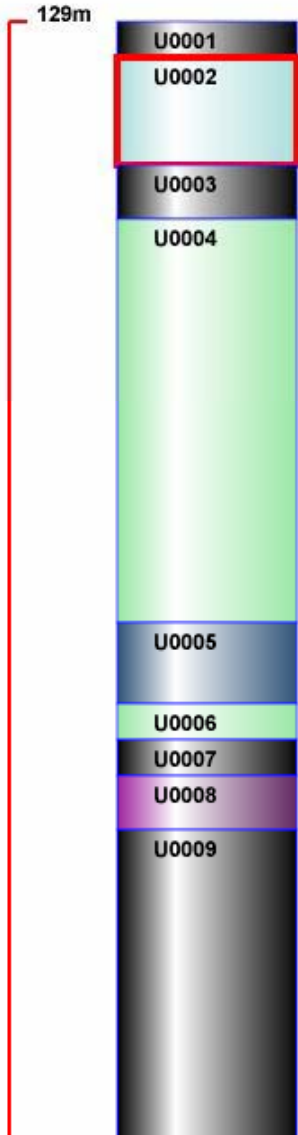
Zoom Overview Map



Layer Control

- grid de stations
- base_map
- Station pas d' activité
- Forages
- Epidémiologique
- Ecologique
- Hydrogéologie
- Océanographique

http://196 LithoFrameSet - Microsoft Internet Explorer



Coupe Lithologique

Station / Forage : 185151 / G4154

unité : U0002

Lithologie : argile

altitude : 128 - 124 m épaisseur : 4 m

classe lithologique : roches sédimentaires type lithologique : argile

système stratigraphique : Quaternaire

série stratigraphique : Quaternaire

couleur : rougeâtre

description : Argile marneuses rougeâtre avec quelques passages de calcaires silicifiés

*déplacez la souris au-dessous le coupe dans l'armature gauche pour mettre à jour l'information pour l'unité choisie



Overview

Zoom

300%

- Layer Control
- grid de statio
 - base_map
 - Station pas d
 - Forages
 - Epidémiologi
 - Ecologique
 - Hydrogéologi
 - Océanograph

Echantillons

Na : 236.33 mg/l 10.28 méq/l



Ca2 : 92 mg/l 4.6 méq/l



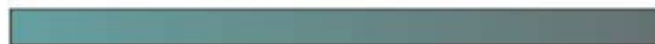
Mg2 : 34.8 mg/l 2.88 méq/l



K : 2.75 mg/l .14 méq/l



CL : 497 mg/l 14 méq/l



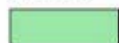
HCO3 : 274.5 mg/l 4.5 méq/l



SO4 : 70.12 mg/l 1.46 méq/l



NO3 : 60.48 mg/l .98 méq/l



Hydrogéologie

station / analyse : 185158 / HG0038

province : El Jadida

commune : Mogress

point de prélènant : puits

date : 27/04/2004 16:35:10

niveau statique : 75.8

usage : Domestique

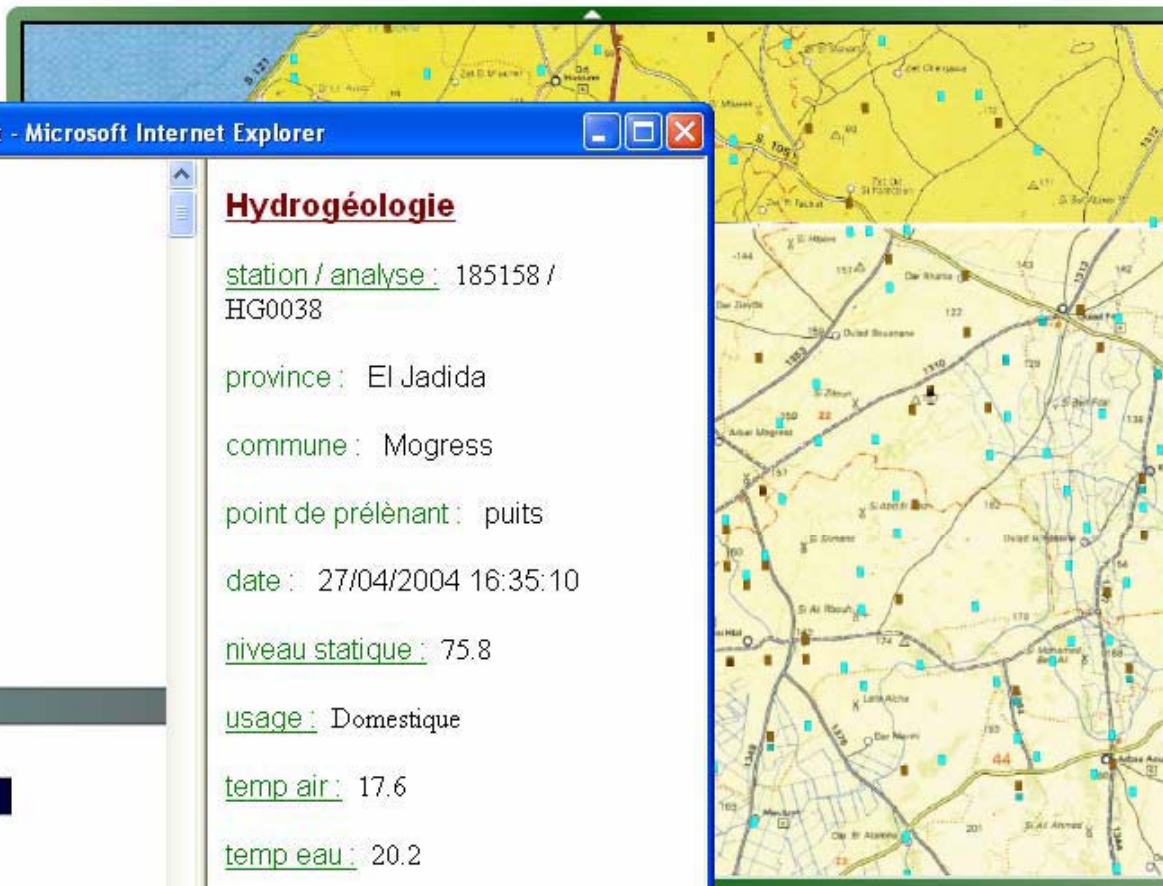
temp air : 17.6

temp eau : 20.2

pH : 7.55

condition electr. : 1.79

*déplacez / clique la souris au-dessous le coupe dans l'armature gauche pour mettre à jour l'information pour l'unité choisie



Overview

Zoom



300%



Layer Control

- grid de statio
- base_map
- Station pas d
- Forages
- Epidémiologi
- Ecologique
- Hydrogéologi
- Océanograph

http:// Scientific Information System - EPI_IDENTIFICATION_VIEW - Microsoft Internet Explorer

SIS Aperçu: Epidémiologie

Projet: Station: Activité: Apply Select a Field: Apply Set PageSize: Apply Get XmlData

1 177178 1 Get Data Numéro de Dossier Show/Hide 20 set Pagesize Get AsciiData

ID Station	ID Activité	Numéro de Dossier	nom	prénom	code	commune	type de commune	date	sexe	classe d'âge	âge exacte	durée résidence	etat civil	nombre enfants	enfants vivants masculin	enfants vivants feminins	enfants décédés masculin	enfant décédé femini
177178	1	2				Sidi Smail	R	17/03/2004	m		57	5 à 9	marie(e)	7				
177178	1	16				Sidi Smail	R	05/05/2004	m		16	+15	celibataire	0				
177178	1	17				Sidi Smail	R	05/05/2004	m		24	-5	marie(e)	0				
177178	1	18				Sidi Smail	R	05/05/2004	f		24	5 à 9	marie(e)	2				
177178	1	19				Sidi Smail	R	05/05/2004	f		46	+ 15	marie(e)	6				
177178	1	20				Sidi Smail	R	05/05/2004	f		68	+ 15	marie(e)	4				
177178	1	21				Sidi Smail	R	05/05/2004	m		15	10 à 14	celibataire	0				
177178	1	103				Sidi Smail	R	28/04/2004	f		13	10 à 14	celibataire	0				
177178	1	106				Sidi Smail	R	23/03/2004	m		2	-5	celibataire	0				
177178	1	108				Sidi Smail	R	23/03/2004	m		10	5 à 9	celibataire	0				
177178	1	110				Sidi Smail	R	05/05/2004	m		44	+ 15	marie(e)	6				
177178	1	111				Sidi Smail	R	05/05/2004	m		10	5 à 9	celibataire	0				
177178	1	112				Sidi Smail	R	05/05/2004	f		13	10 à 14	celibataire	0				
177178	1	113				Sidi Smail	R	05/05/2004	m		2	-5	celibataire	0				

Prev Next

CurrentPage = 1 Pagecount = 1 Show numeric pager

Select a Field1: Criterion: Value: Sorted by: Field: Apply:

Numéro de Dossier = Numéro de Dossier ASC Apply Filter

Overview

Control

- id de statio
- se_map
- ation pas d
- rages
- idémiologi
- ologique
- ydrogéologi
- céanograph

4. The data & information system

Landsat



4. The data & information system

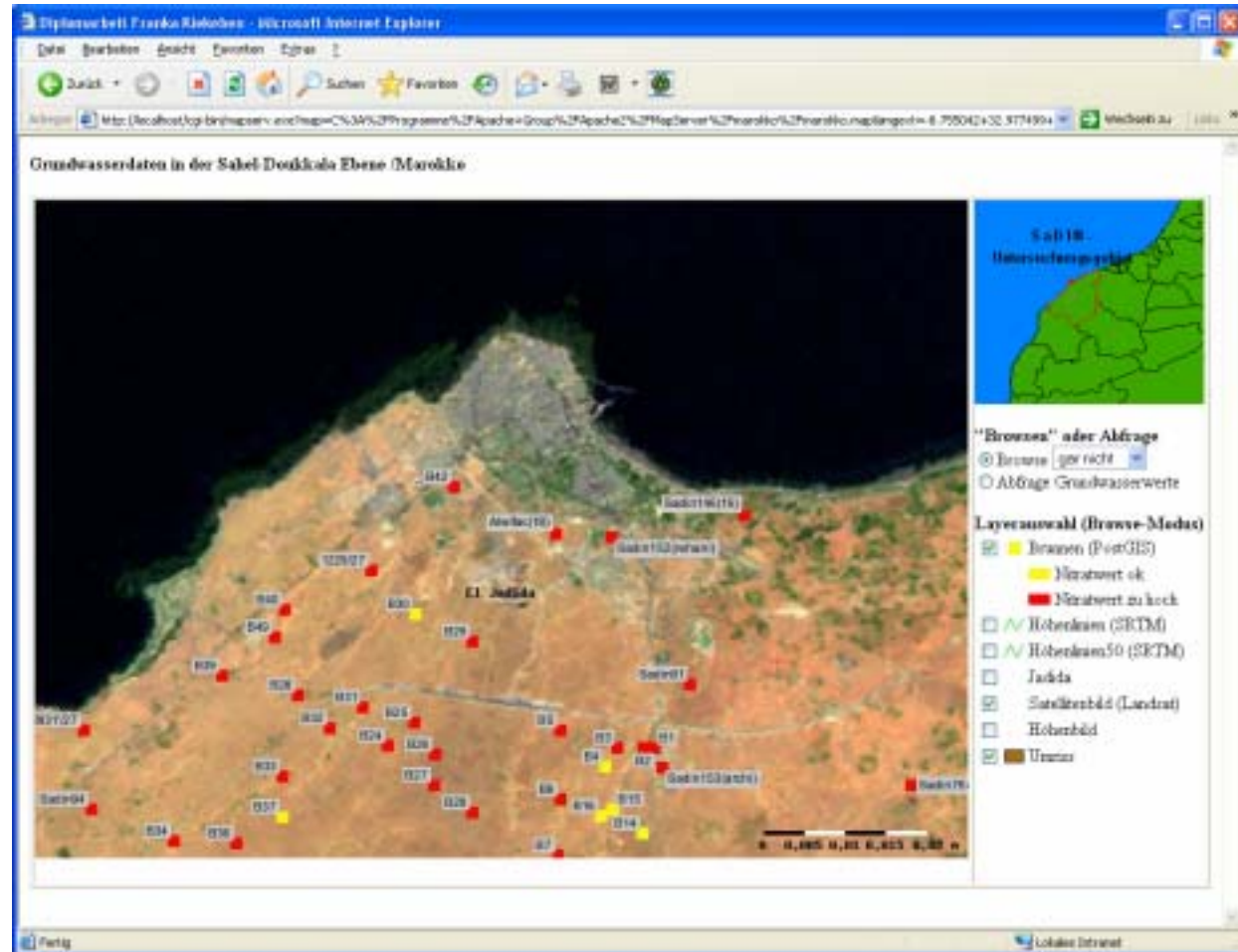
SIS - xSIS



PostgreSQL



UMN
Mapserver



Problems

- Technical Problems
- Administratif problems
- Traditional / heritated reserach structures
- “Acceptance” of New Technologies (*Not only in Morocco*)

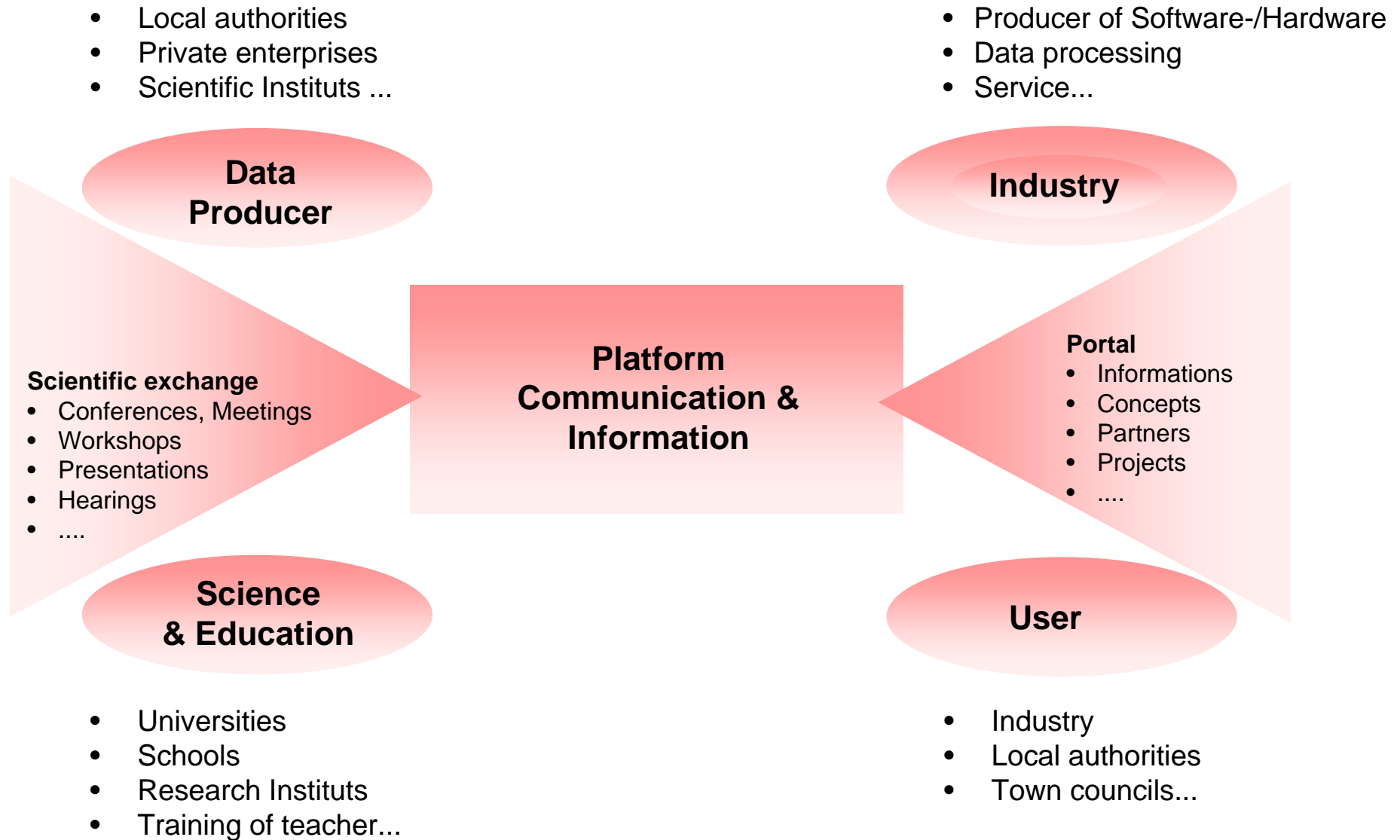
Results

- **Data and Information Center**
“La salle SaDIN”
- **Scientific Information System (SIS)**
- **A first collection/archive of all available data of the Sahel-Doukkala region**
- **Bibliographic Database (Winisis)**
- **Bridging the gab between research and local authorities**
- **Introducing New Media for professional research management**

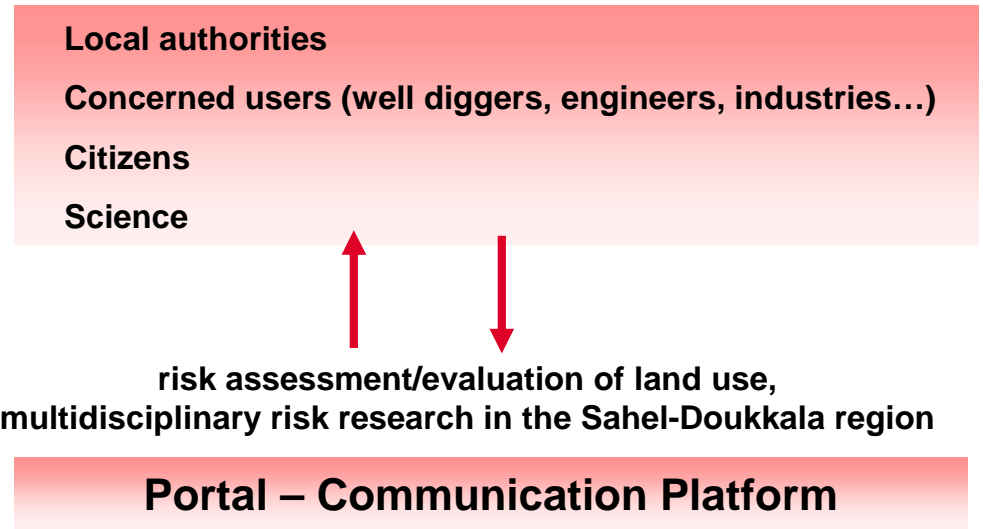
5. SaDIN – what could it be in the future



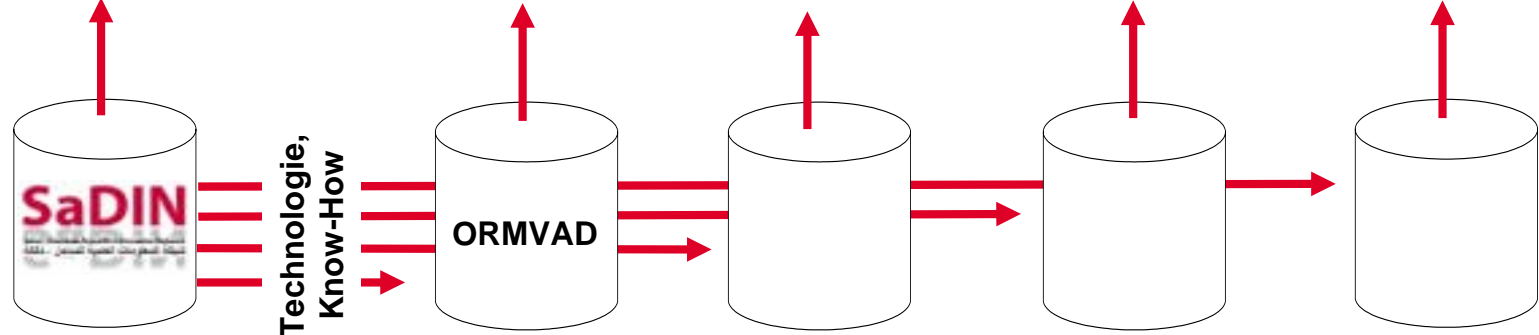
5. SaDIN – what could it be in the future



5. SaDIN – what could it be in the future



Technology - Infrastructure

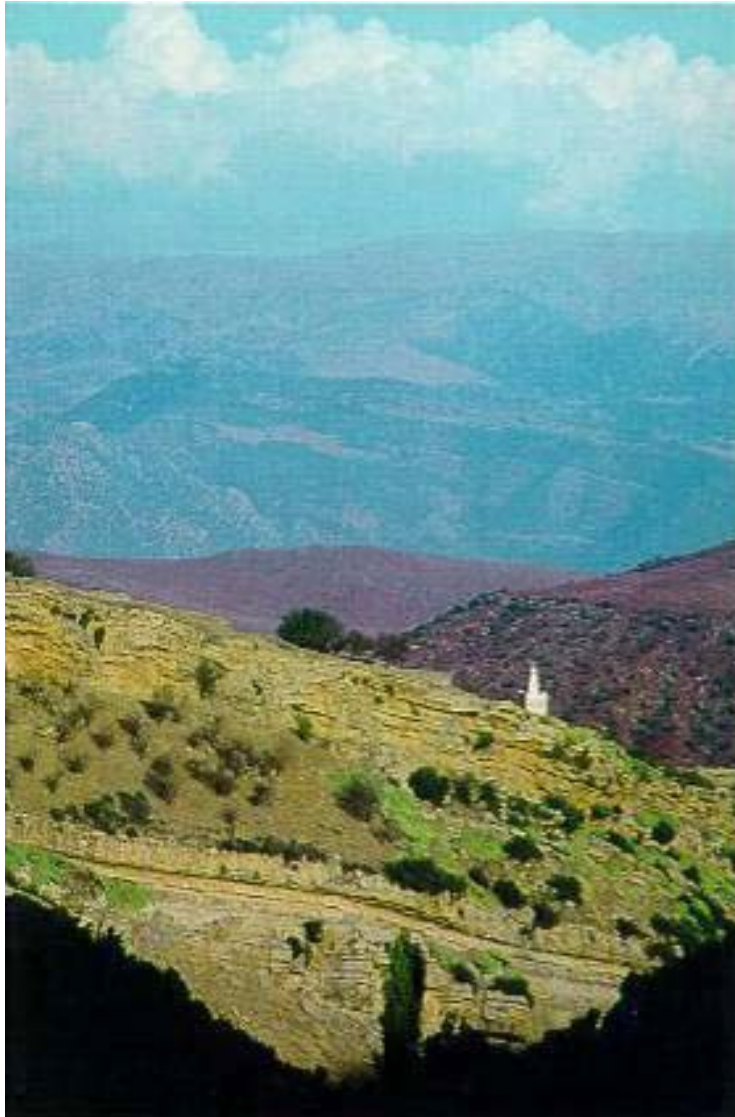


UCD El Jadida

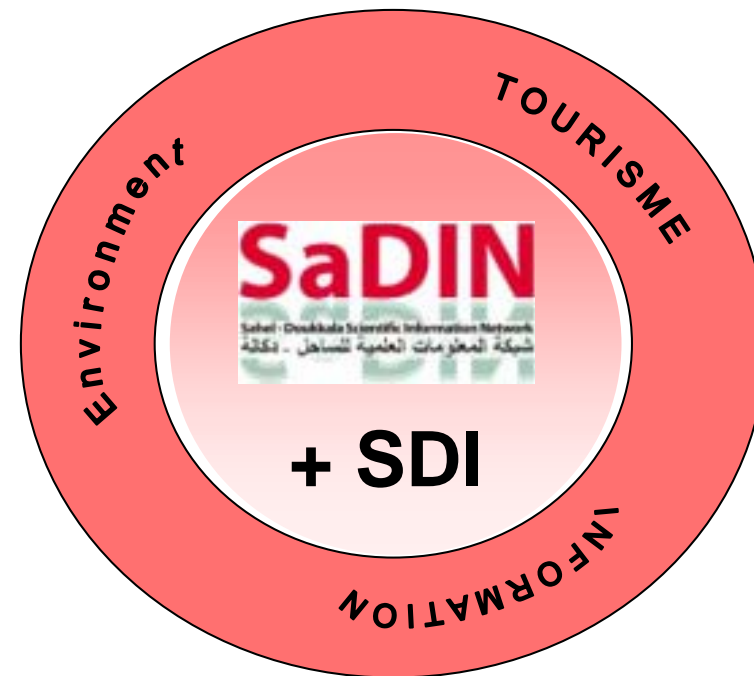
Local Partner / Local Authorities

- Geology
- Hydrogeology
- Ecology
- Epidemiology
- Social Sciences
- ...

5. SaDIN – what could it be in the future



**Application:
 GeoPark in the
 High Atlas
 Mountain**





www.sadin.org

Contact

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References

www.ucd.ac.ma/fs/departements/geologie
www.gfz-potsdam.de
www.icdp-online.de
www.smartcube.de

