



Introduction to WISDOM Project

ADB Headquarter. Manila

9 April 2010

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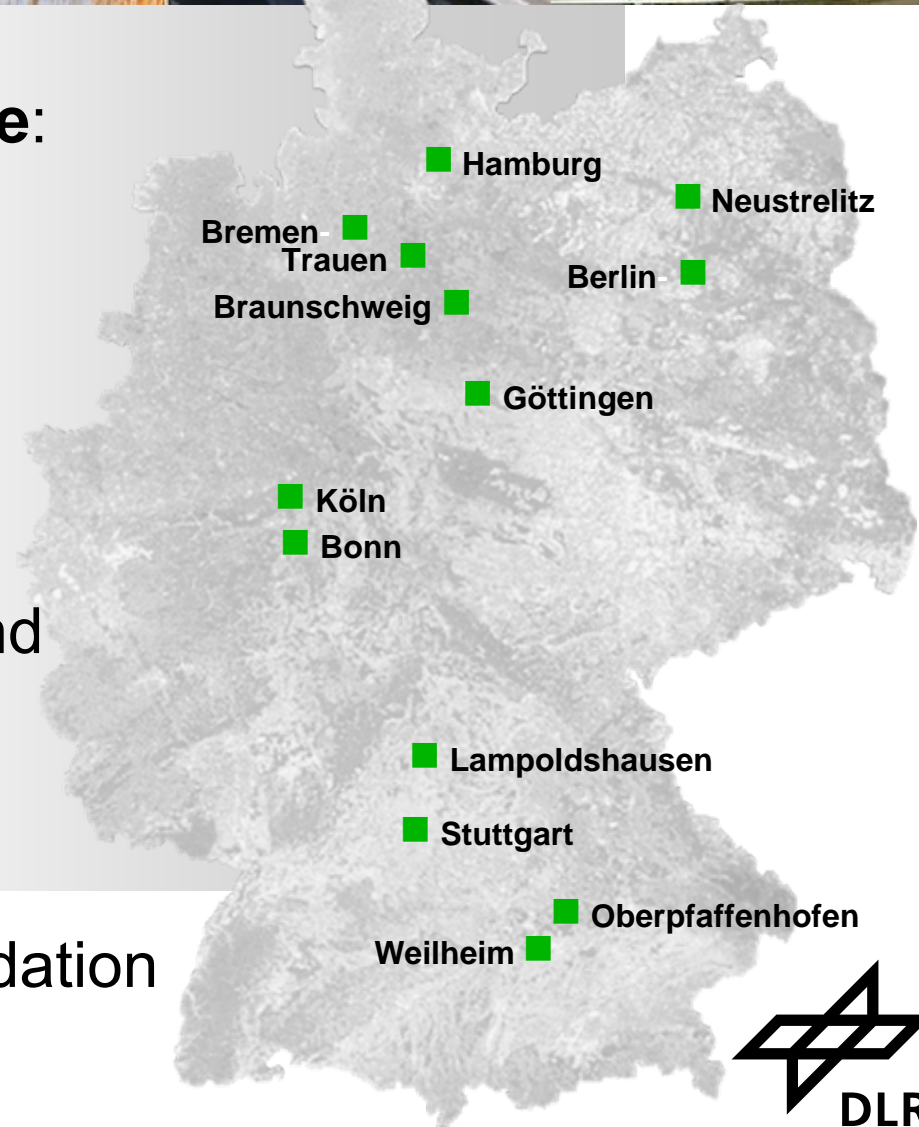
German Aerospace Centre:

6300 employees working
in 29 institutes and facilities

at 13 sites within Germany

offices in Brussels, Paris and
Washington, planned
office in Singapore

belongs to Helmholtz Foundation
2,2 Bio € annually



DLR

German Remote Sensing Data Centre (DLR-DFD)



- Founded in 1980
- 270 staff in 8 Departments
- Core activities of Department DFD-LA:
 - R+D Projects, Environment, Security / Remote Sensing / Geo-IT
 - Development of Information System Infrastructures
 - Centre f. Satellite based Crisis Information
 - Capacity Building and Training

Overview:

- 💧 **System Purpose**
- 💧 **System Concept**
- 💧 **Application Examples**
- 💧 **Progresss to Enrich the System**
- 💧 **Challenges**
- 💧 **Interest**

WISDOM: Water Related Information System for the Sustainable Development of the Mekong Delta

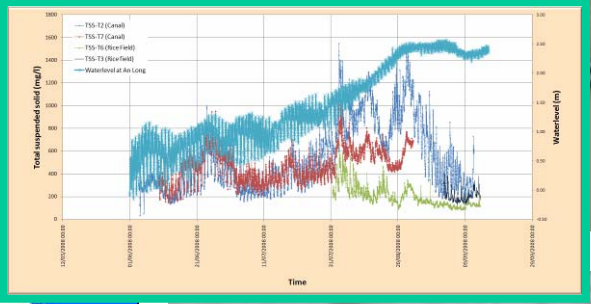
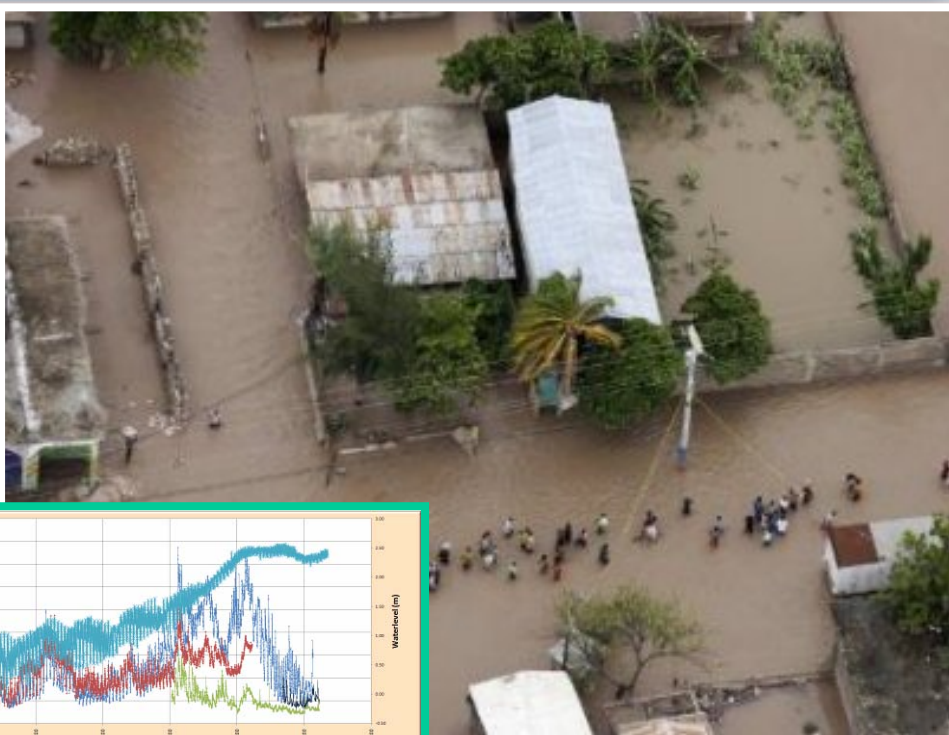
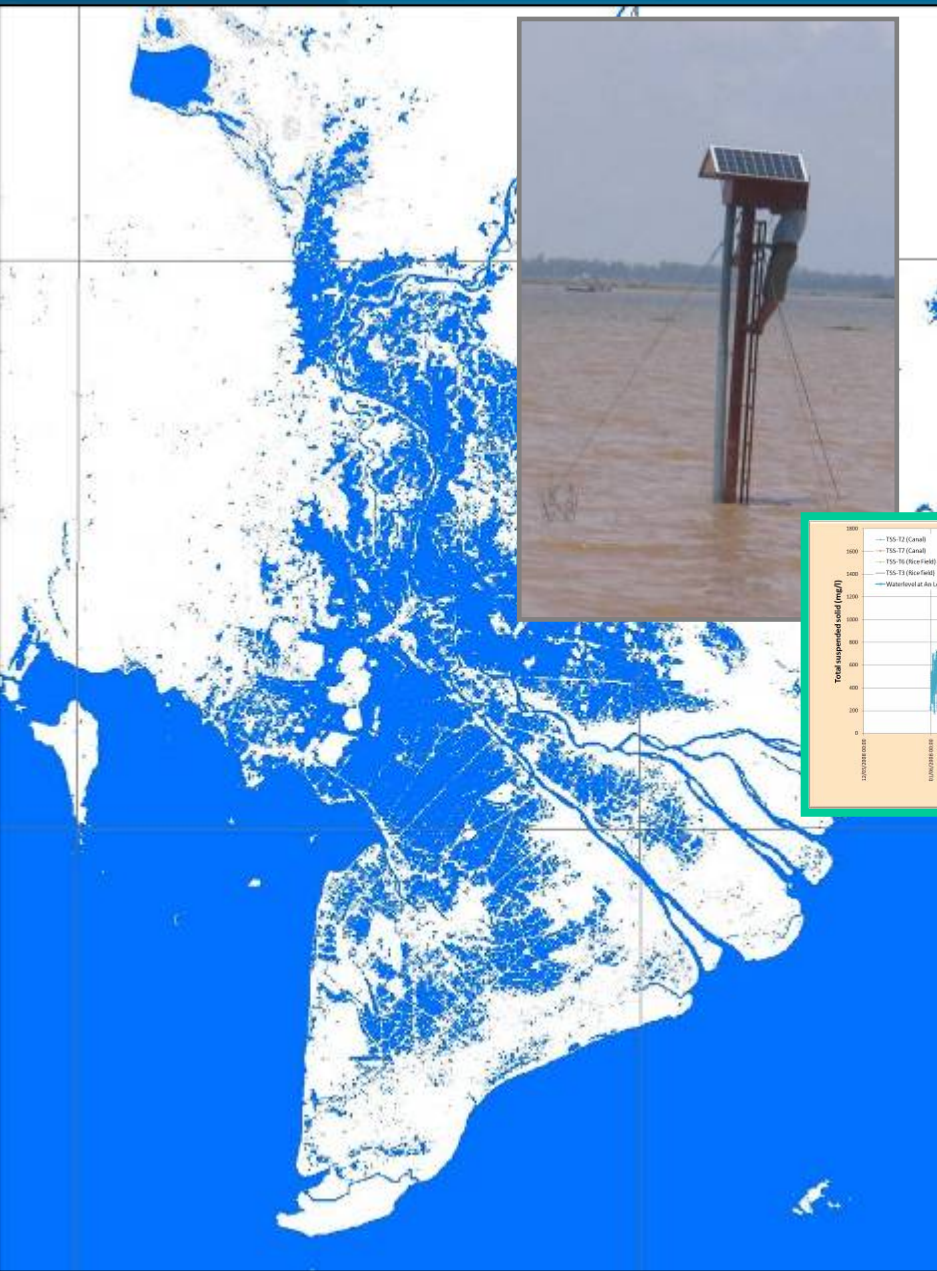


Delta: 70,000 km²

**Challenge: environmental
Challenges due to economic
Growth and climate change
Data dispersed, not shared,
Tools for decision makers
needed to support harmonized
planning process**

Funded by BMBF, 6 Mio €, 60 researchers, 3 years, first phase ends Sept 2010

Delivery of Information on Flood Situations



Results of Research:

Water Quality, Pollution

Basin characteristics
EO based Monitoring

Water quantity,
demand, reliability

Analyses of Legal System

Climate Change and
Vulnerability Analyses

Mekong
Information
System

Institutional
Mapping

Training, CB

Landuse Change

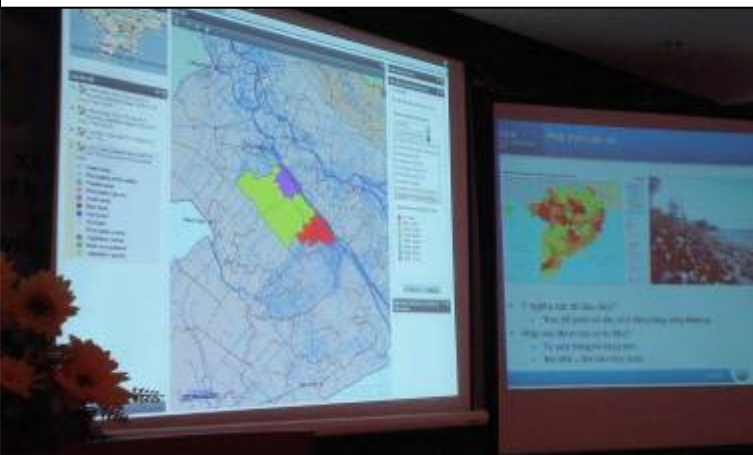
Social Change

Every partner: sustainability concept: how will data / answers
be generated, when project is over → Ownership, Implementation !!!

WISDOM Capacity Building and Training with young experts

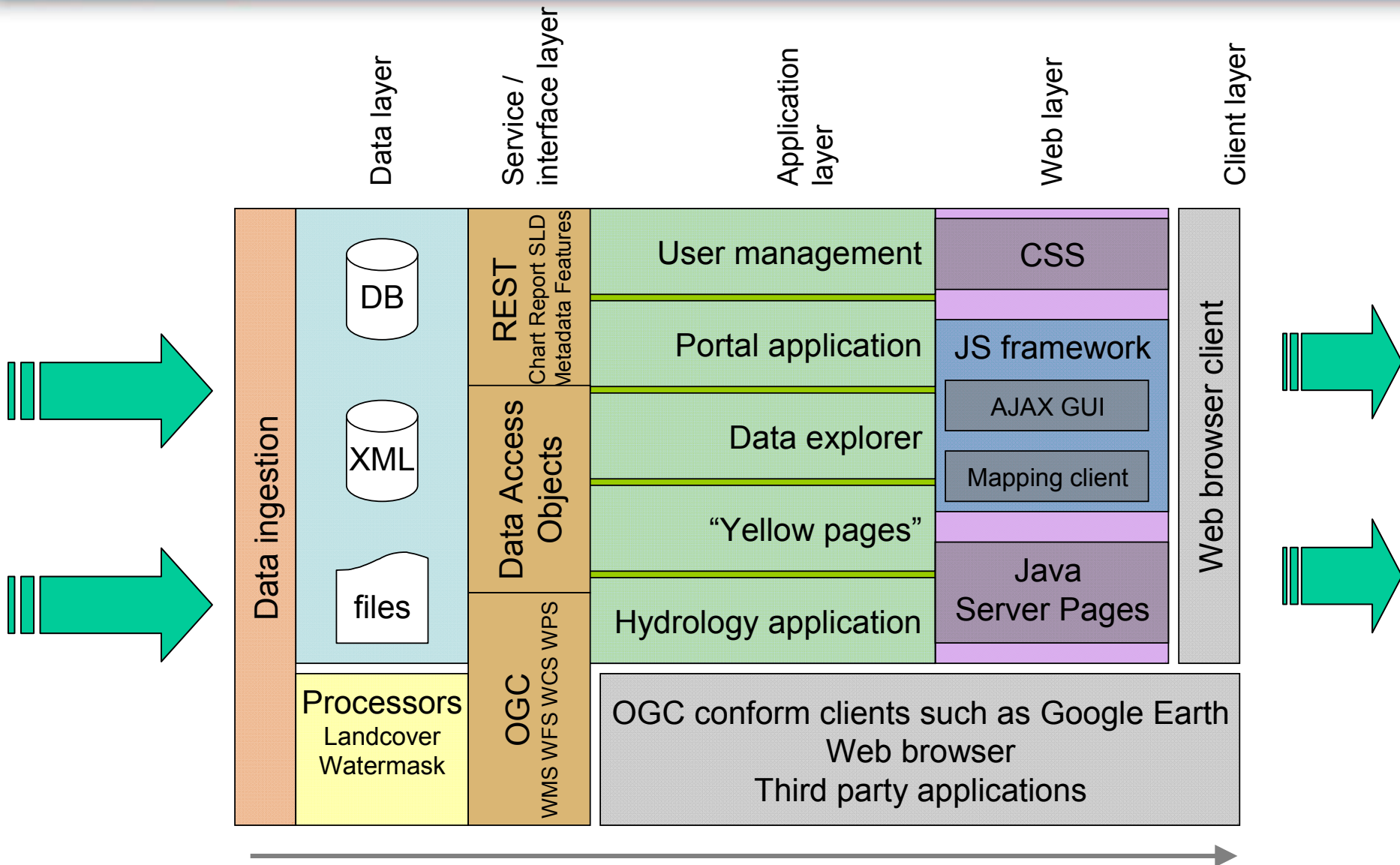


WISDOM Round Table Workshops with Provincial Decision Makers and Stakeholders



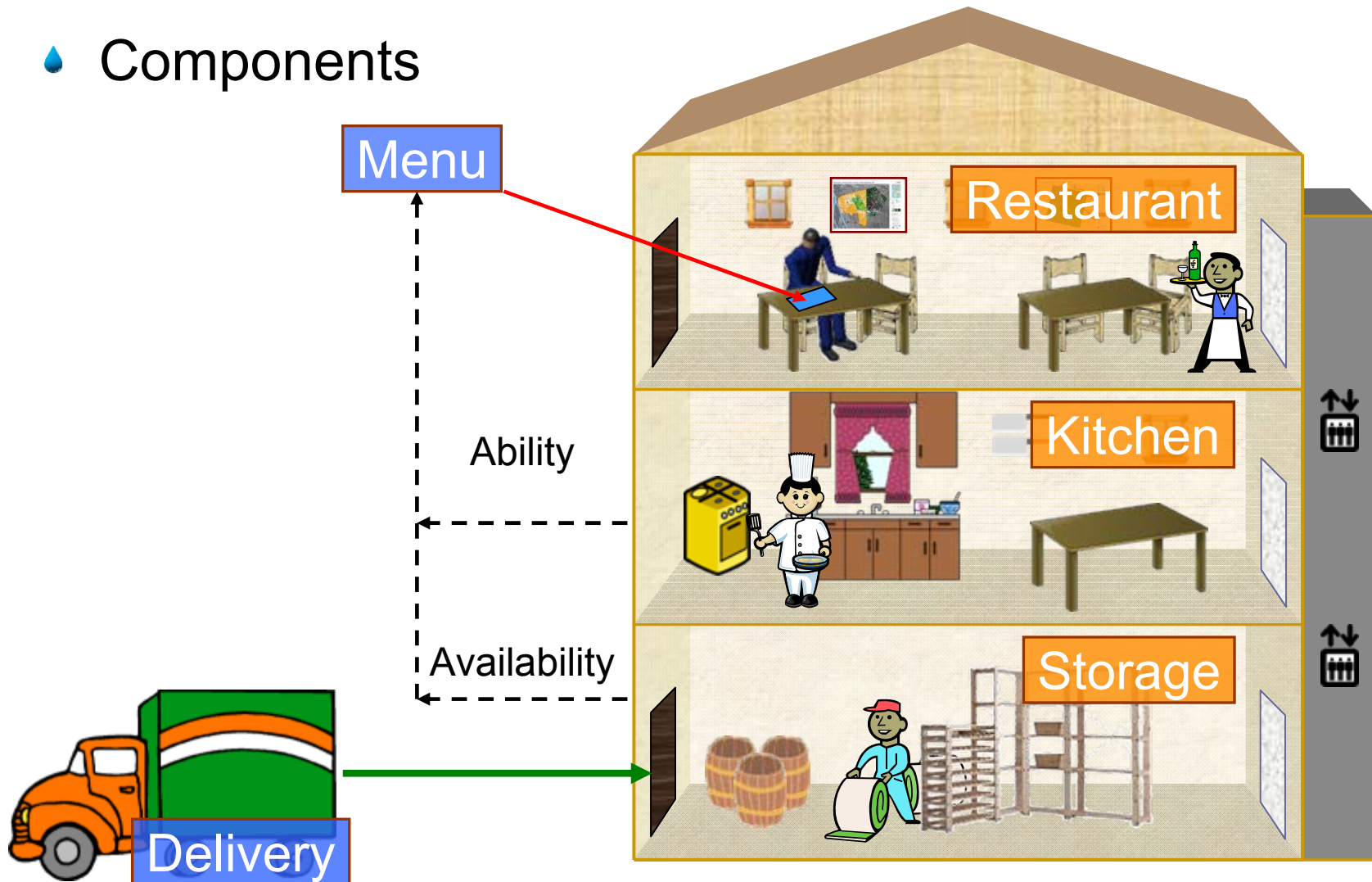
WISDOM Round Table Workshops with National Decision Makers and Stakeholders







• Components





Ordering

Menu

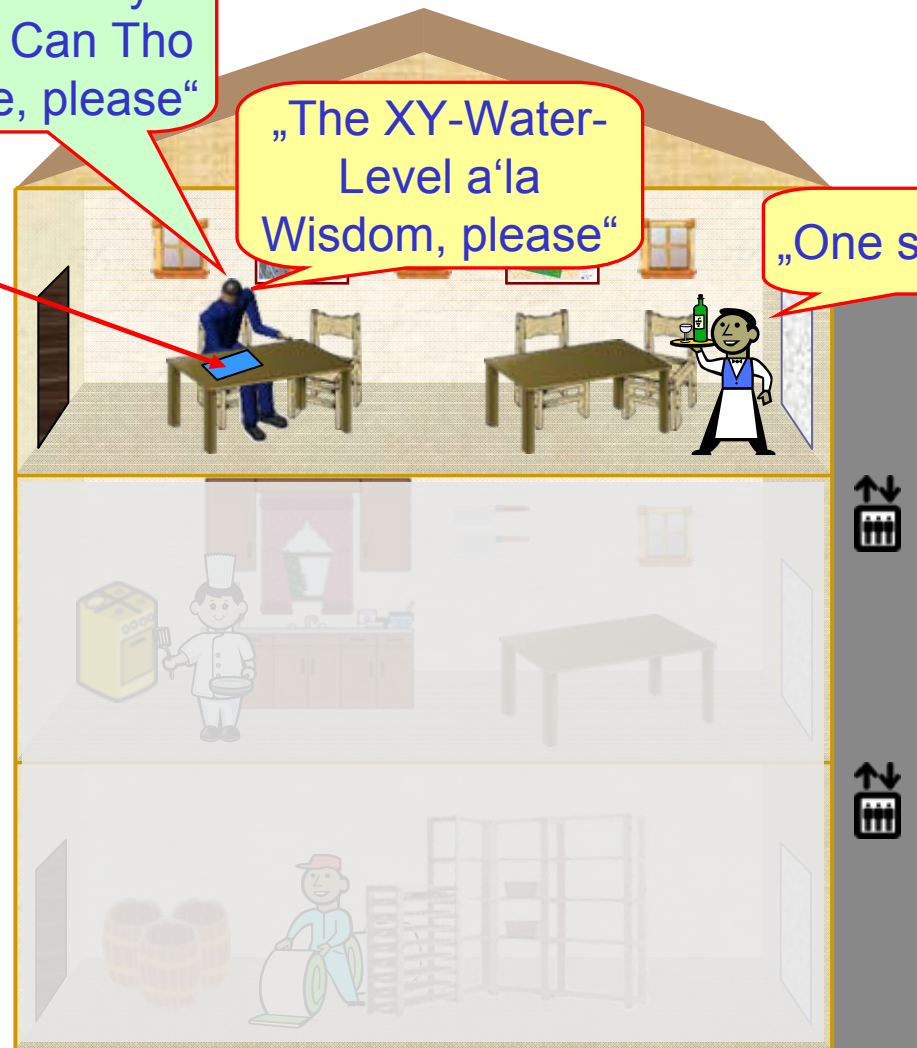
„Vulnerability
Map for Can Tho
Province, please“

„The XY-Water-
Level a'la
Wisdom, please“

„One second“

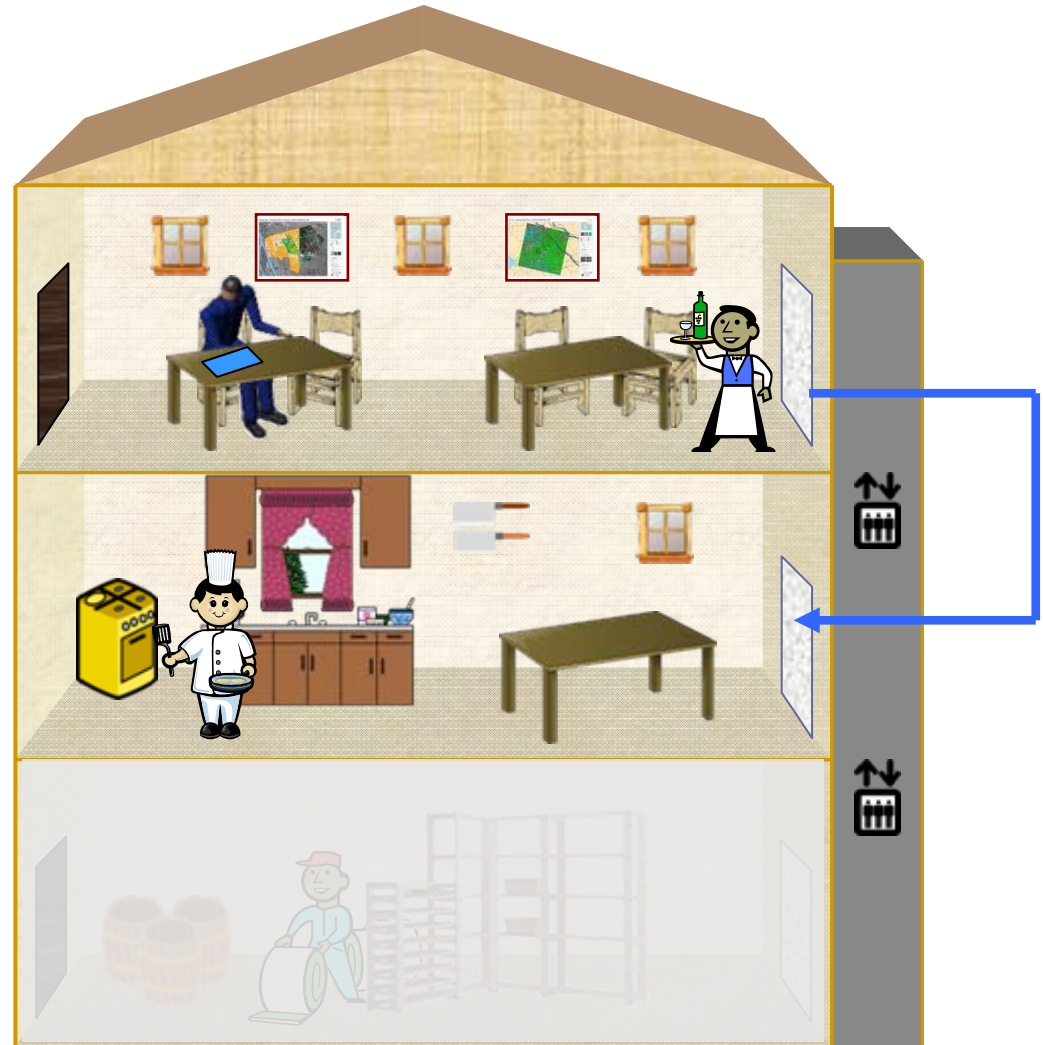
Menu

- Sensor data
 - Water level
 - Pesticides
- Thematic maps
 - Vulnerability
- Statistics
- Geographic data
- Yellow pages





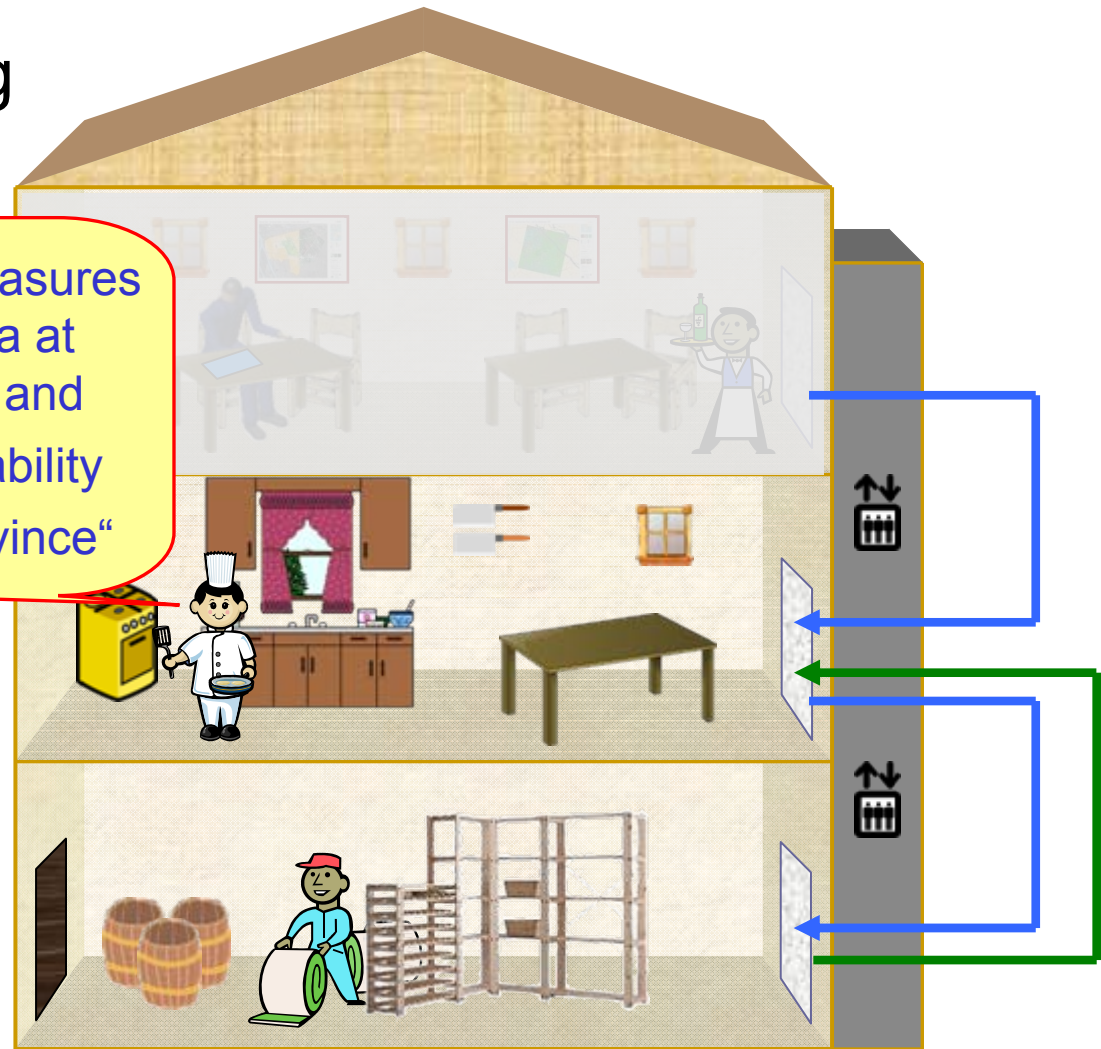
Order taking





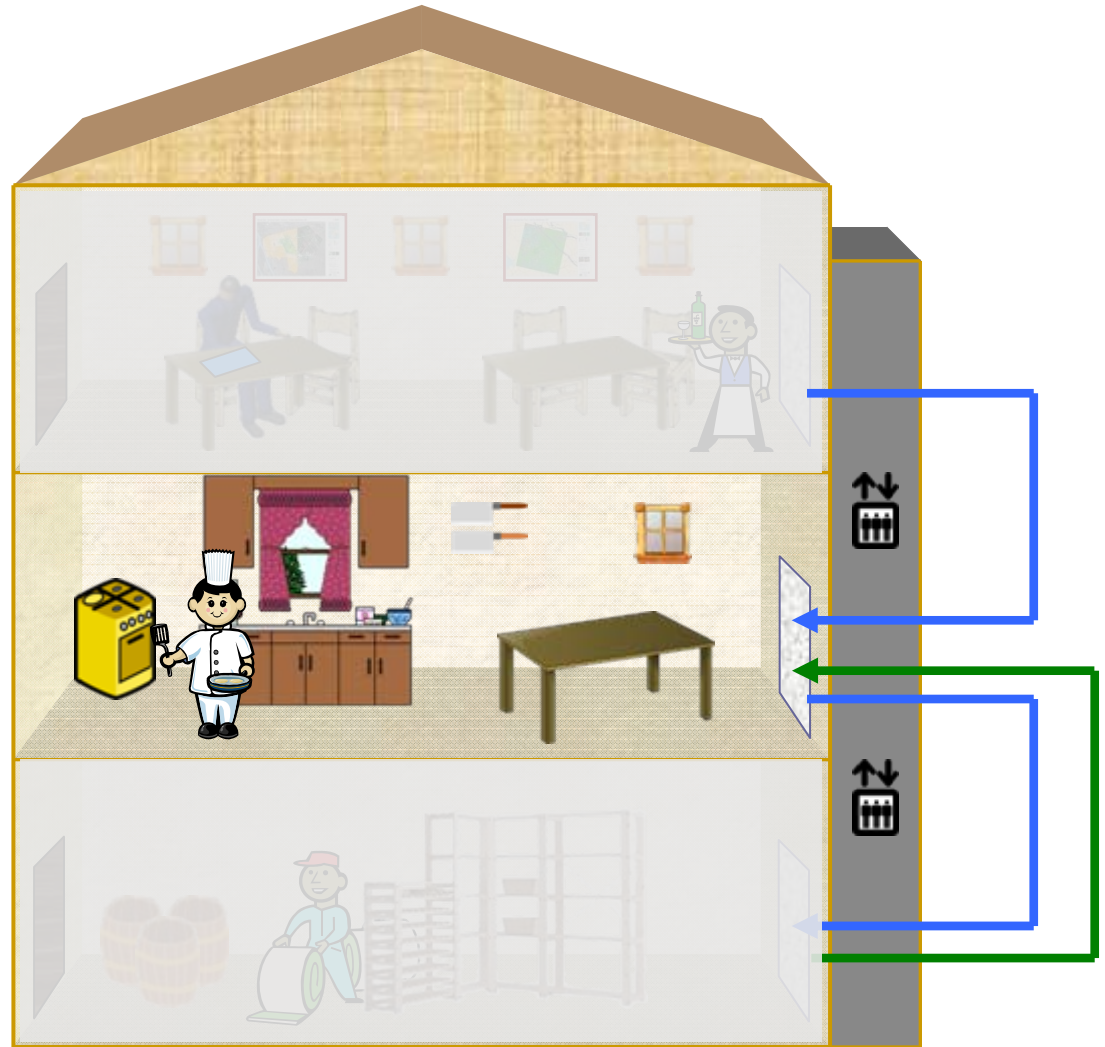
Ingredients gathering

„Fresh Water Level Measures
for the Mekong Delta at
position XY, please; and
additionally a Vulnerability
Map for Can Tho Province“





💧 Cooking





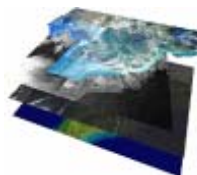
💧 Delivery





Components

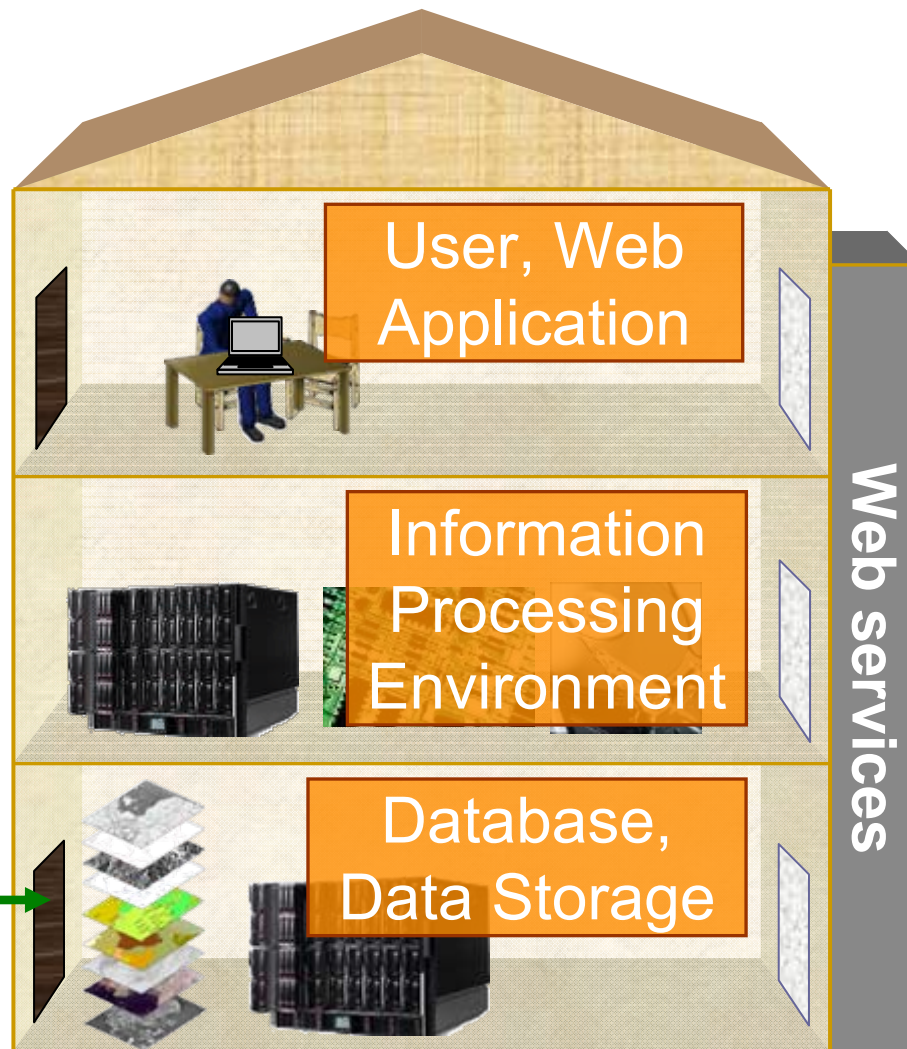
Data



ID	Name	Age	Gender	Height	Weight	Eye Color	Hair Color	Birth Date	Address
1	John	25	Male	1.75	70	Brown	Black	1990-01-01	123 Main St
2	Jane	30	Female	1.60	55	Blue	Brown	1985-05-15	456 Oak Ave
3	Mike	40	Male	1.80	85	Green	Grey	1975-03-10	789 Pine Rd
4	Sarah	28	Female	1.65	60	Blue	Blonde	1992-08-20	101 Elm St
5	David	35	Male	1.70	75	Brown	Black	1988-11-05	202 Cedar Ln



Data
Entry
Portal



WISDOM Portal, Vision for the Information System: Knowledge Hub for the Mekong Delta / Basin & TRANSFER !

Welcome

Hello DLR DLR

Last login: 2009-06-22 15:17:15

welcome to the WISDOM prototype portal. From here you can access the main applications or jump to the WISDOM homepage. You can check your last editing session and view your last datasets you worked with. You can also get other accompanying information.

START WISDOM INFORMATION SYSTEM

START WISDOM METADATA CATALOGUE

Featured datasets

- GFZ: Hydrological sensor measures during 2008 in the Tam Nong area
- Historical Water levels and -discharge in the Mekong Delta
- EOMAP: Watermasks from satellite imagery for 2007 and 2008 in Mekong Delta
- Water turbidity in rivers and coastal areas from satellite imagery for the Mekong Delta in 2007 and 2008
- Landcover classifications in the Mekong Delta since 2001
- Pesticide measures in the Cai Rang area in 2008
- Statistics on livelihoods in the Mekong delta since 2000
- Statistics on aquaculture development in the Can Tho province since 2004
- Organisations working in the water sector

WISDOM Documents

- Geodata Exchange Standard Document
- WISDOM Classification Scheme

Links

- WISDOM homepage
- Can Tho Portal
- Dong Thap Portal

Credits

Impressum

Recently integrated products

Dataset name	Product group	Creation date
Land Cover Classification 2009 from Can Tho Province from Spot 5 data	Landcover	06.02.2009
Watermask from Envisat ASAR-Wide Swath Mode satellite image 2008-06-17 Mekong Delta	Watermask	25.12.2008
Watermask from Envisat ASAR-Wide Swath Mode satellite image 2008-06-17 Mekong Delta	Watermask	15.12.2008
Watermask from Envisat ASAR-Wide Swath Mode satellite image 2008-06-17 Mekong Delta	Watermask	20.11.2008

Integrated Modules
or close Link with
MRC System

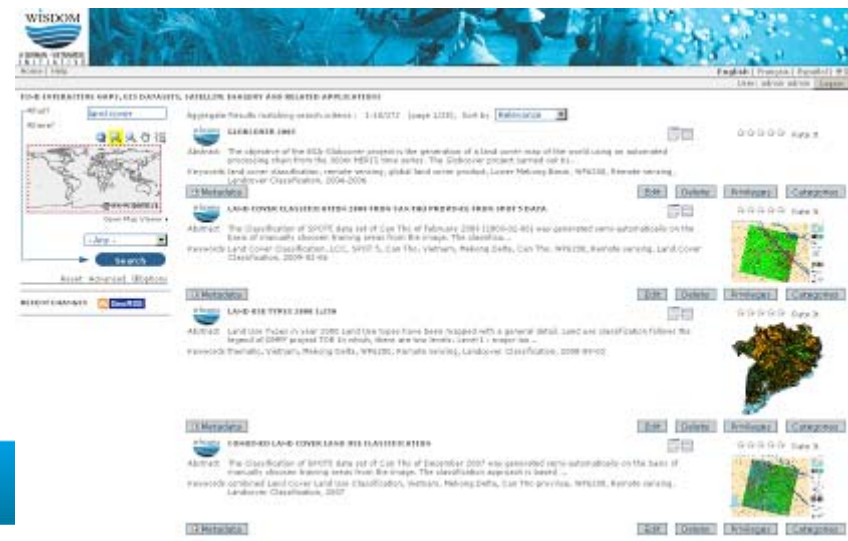
Integrated Modules
or close Link with
SRHMC System

Association with
other Projects
and Initiatives

Modules for other
Projects (ADB,
WB etc.)

Data Types and Requirements

- Raster Data (Satellite Maps, Aerial data, Map Scans)
- Vector Data (GIS Data, Canal Networks, Roads...)
- Sensor Data (In-situ Network Data, e.g. Hydrology)
- Text Data (Literature Database, Yellow Pages)
- Grafics (Excel Graphs, Statistics etc.)
- Geolocated Movie sequences
- Standardized OGC conformous data in pre-defined formats; including Metadata





The screenshot displays the WISDOM software interface with two main panels: 'Regional' and 'Thematic'.

Regional Panel:

- Mekong Delta
 - An Giang
 - Bạc Liêu
 - Bến Tre
 - Cà Mau
 - Cần Thơ
 - Bình Thủy
 - Cai Rang
 - Cố Đơ
 - Ninh Kiều
 - O Mon** (selected)
 - Phong Điền
 - Thốt Nốt
 - Vĩnh Thán
 - Đồng Tháp
 - Hậu Giang
 - Kiên Giang
 - Long An
 - Sóc Trăng
 - Tiền Giang
 - Trà Vinh
 - Vĩnh Long
- North Central Coast
- North East
- North West
- Red River Delta
- South Central Coast
- South Eastern
- Western Highlands

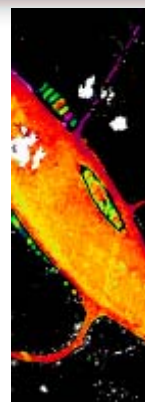
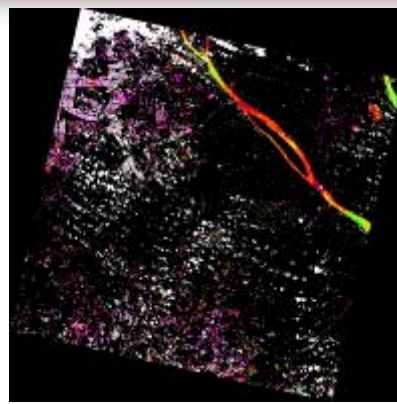
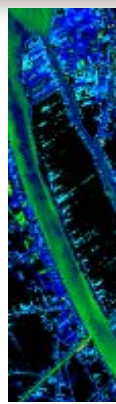
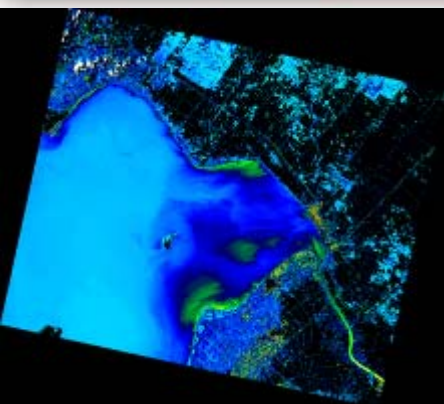
Thematic Panel:

- Hydrology
 - Flood Scenarios
 - Inundation Monitoring
 - Water Distribution
 - Water Depth
 - Water Quality Monitoring
 - Organic
 - Physical
 - Chemical
 - Rivers, Canals and Lakes
 - Constructions
 - Station Network
- Landcover and Landuse
 - Landcover
 - Landuse
 - Agriculture** (selected)
 - Aquaculture
 - Forestry
 - Animal production
 - Ecology
- Climate
- Infrastructure
- Population and Economy
- Governance and Administration
- Natural Disasters
- Fauna
- Base data
 - Satellite Images
 - Optical Sensor Images
 - Radar Sensor Images
 - Elevation
 - Maps

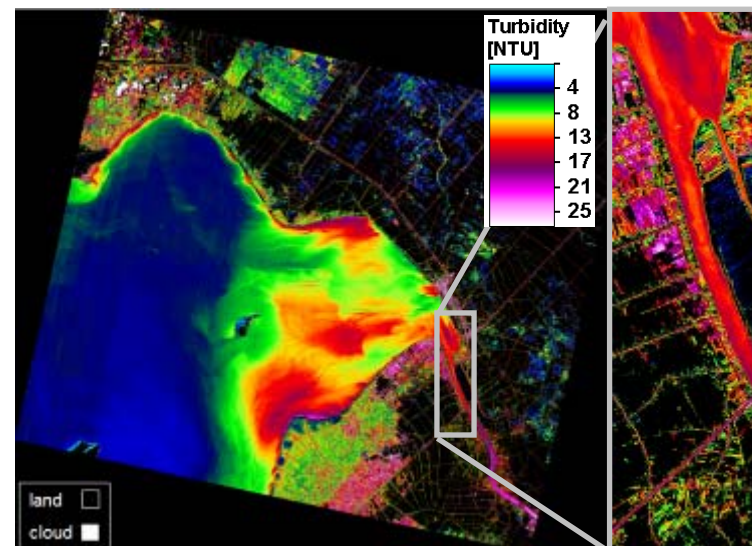
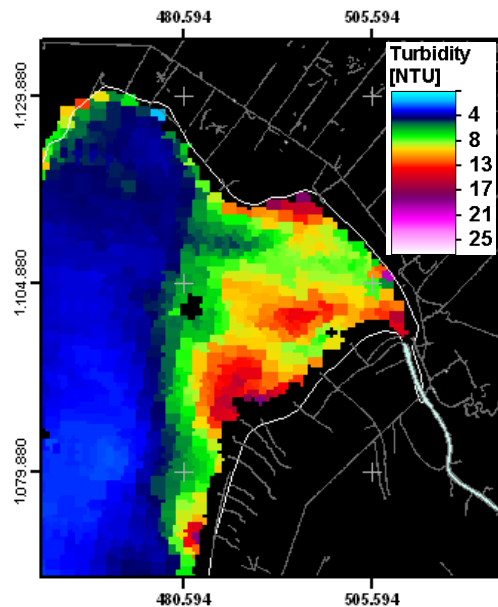
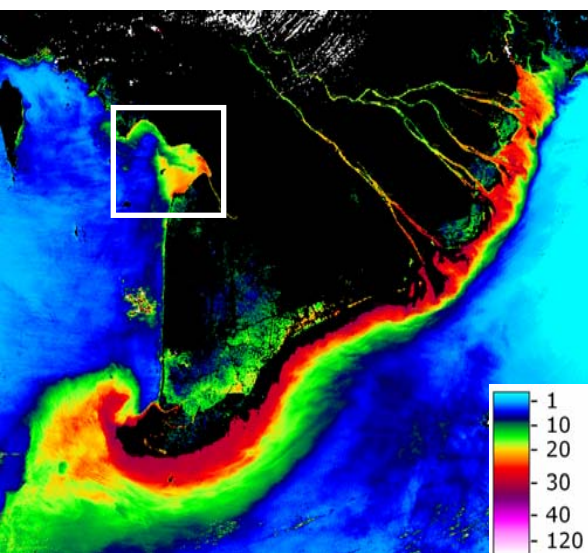
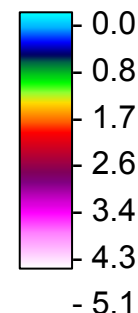
- **Water Quality Issues in Mekong Delta**
- **Impact of Extreme Events (Floods, Climate Change related Sea Level Rise)**
- **Policy Driven Socio-Economic Changes**

Water quality parameters from remote sensing

Turbidity, Suspended Matter, Yellow Matter, Phytoplankton



Phytoplankton
[$\mu\text{g/l}$]



Turbidity from MODIS, 250m
22 July 2007

Turbidity from MODIS 500m
08 January 2008

Turbidity from SPOT, 10m
08 January 2008

Water quality analyses in-situ in canals



Pesticide	Active ingredients	Chemical group
Insecticide	Buprofezin	Insect growth regulator
	Cypermethrin	Pyrethroid
	α -, β -Endosulfan	Organochlorine
	Endosulfan sulphate	Organochlorine
	Fenobucarb	Carbamate
	Fipronil	Pryazole
	Profenofos	Organophosphate
Herbicide	Butachlor	Amide herbicide
	Pretilachlor	Amide herbicide
	Propanil	Amide herbicide
Fungicide	Difenoconazole	Conazole
	Hexaconazole	Conazole
	Isoprothiolane	Unclassified
	Propiconazole	Conazole

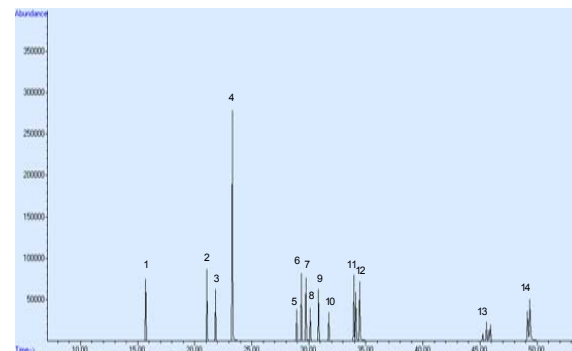
Sampling



Solid Phase Extraktion (C18E)



Analysis by GC-MS (Gas Chromatograph with mass spectrometry)



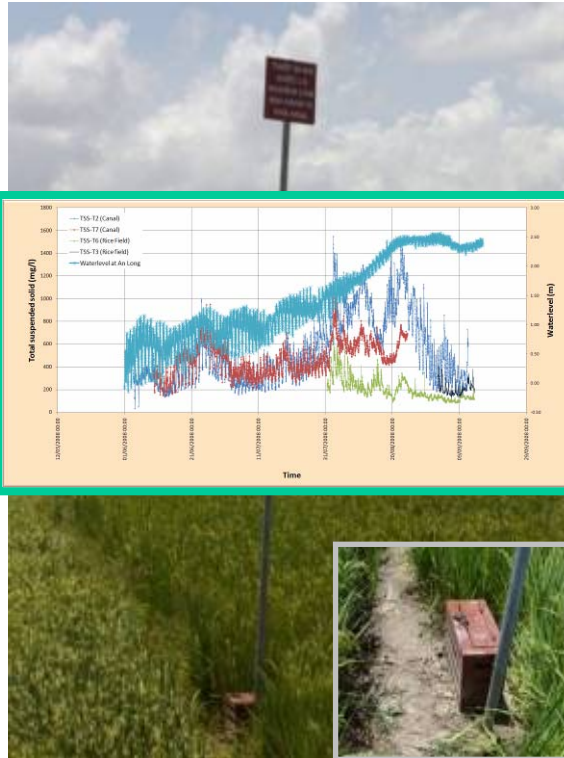


- A: pesticide use “as usual” – strong over-application
- B: pesticide use reduced by 50%, if harvest loss compensation
- C: no pesticide use, if harvest loss compensation
- -> expected outcome: B reaches nearly same output as A; word of mouth will spread, reduced costs and less impact on water resources; establishment of application limits

Water level, suspended solids measurement



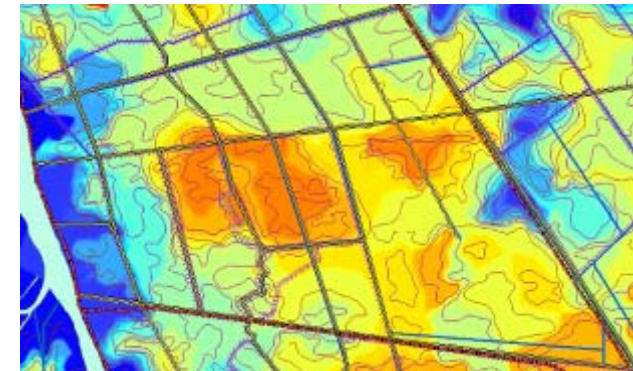
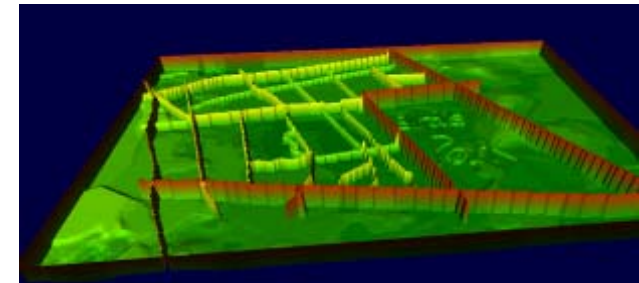
Traditional technique
23stations x 2 = 46man!



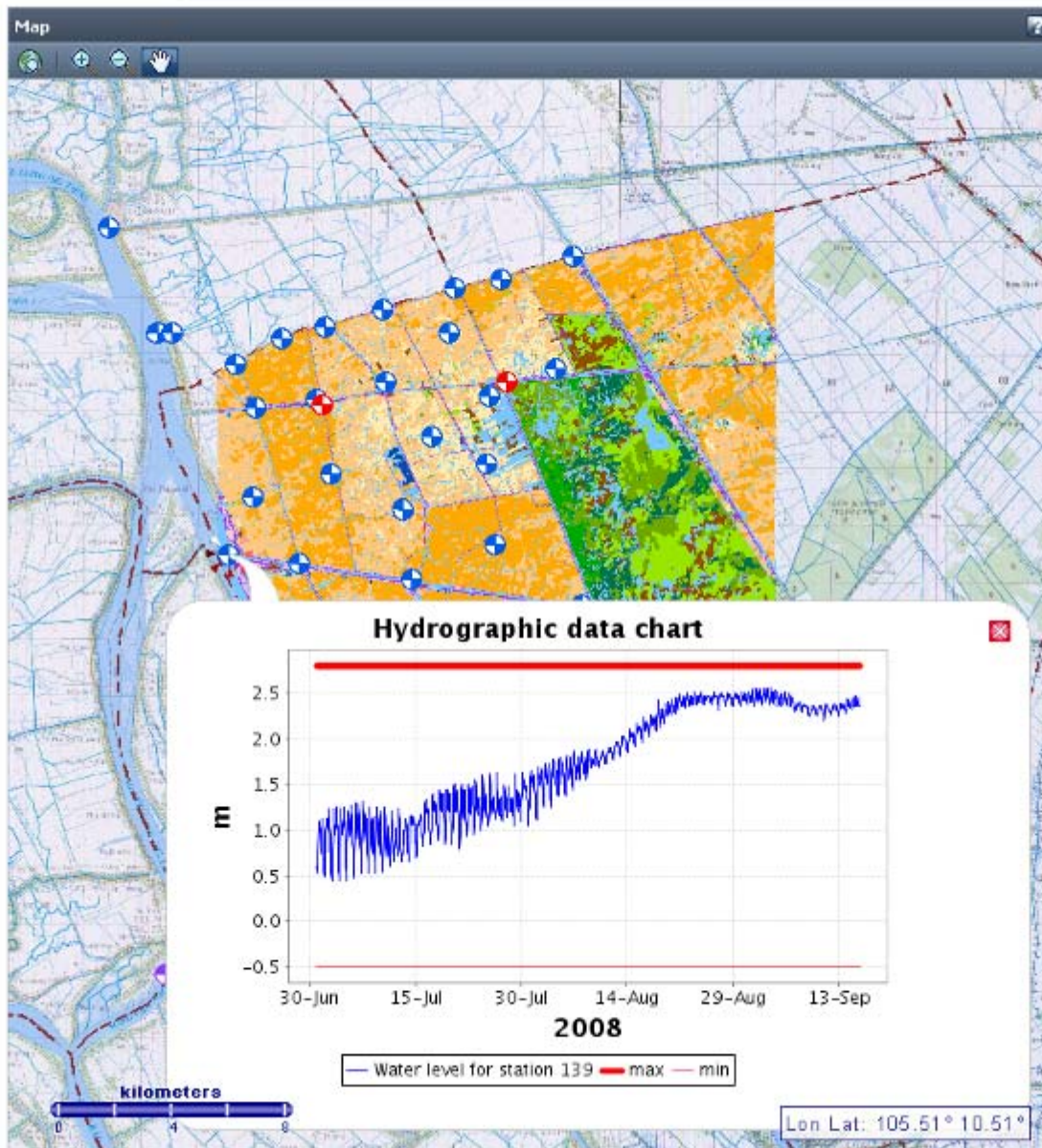
Modern equipment
23stations = 1 man!

Modelling

- Inundation and
- sediment transport
- Simulating floods
- Predicting inundation patterns



Map explorer Dataset explorer Yellow pages Field data explorer



Sensor Toolbox

Initialization

☒ Start/Stop Toolbox

Sensor measurement

Hydrology
Water level

Temporal range

07/01/2008
12/01/2008

Chart types

☒ Line chart
☐ Bar chart

Legend

- Active sensors
- GFZ survey stations
- UNU survey stations
- INRES survey stations
- SRHMC survey stations

Load Reset

Thematic Mapping Toolbox

Geo statistical Reporting Toolbox

Water level long term from 70-year time series:

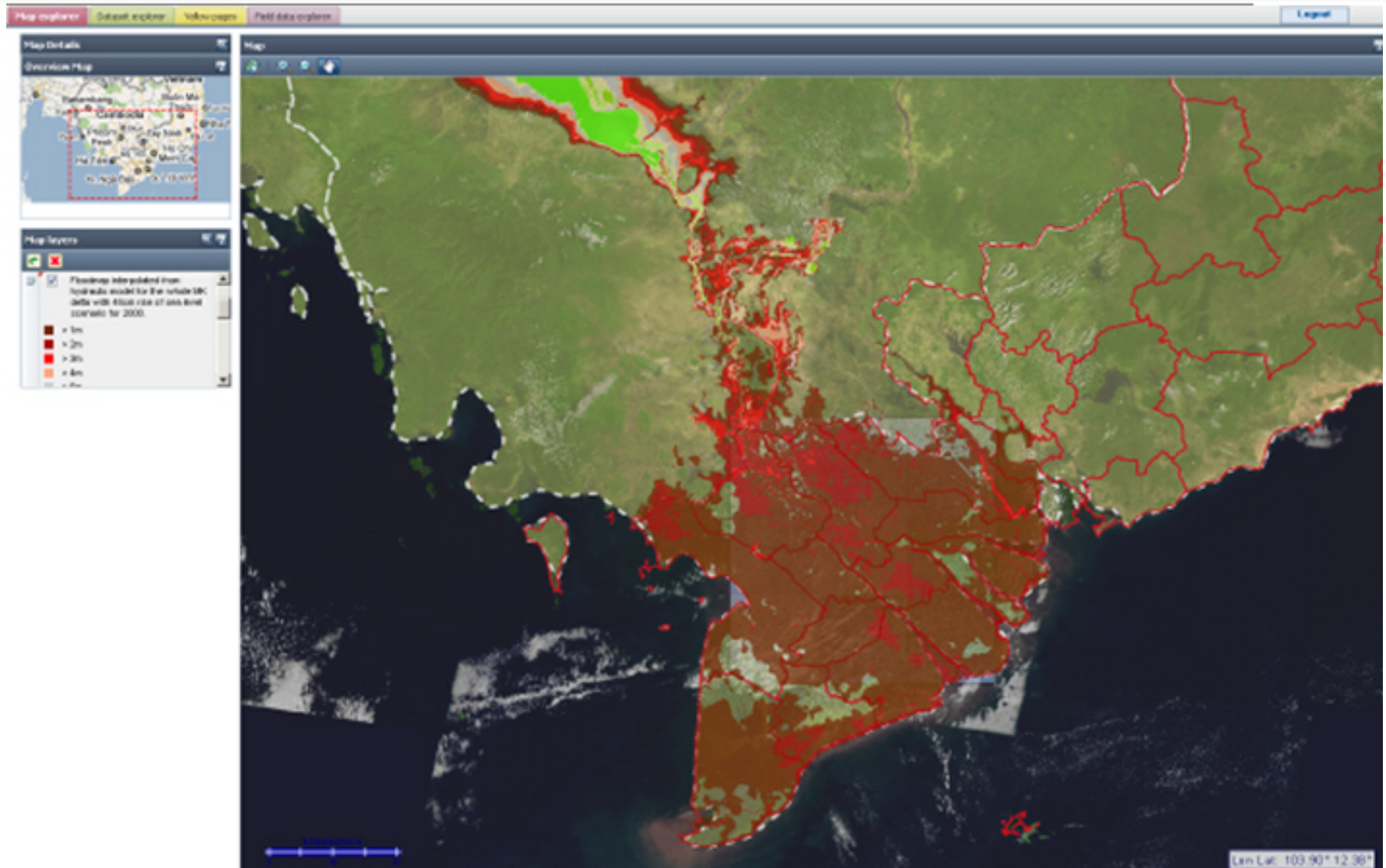
- **Variability from year to year strongly increasing, more extreme events, drought years often followed by extreme floods etc.**

Short term water level analyses based on stations and buoys:

- Tidal influences very strong even in Tam Nong 170km away from the coast, water level 6h rhythm
- Turbidity also mainly influences by tide: low during high tide, high during low tide
- Acidity of water strongly influences turbidity: high (lot of Al) then less turbid

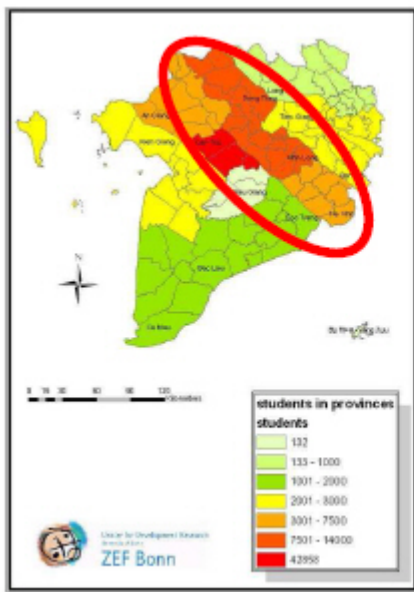
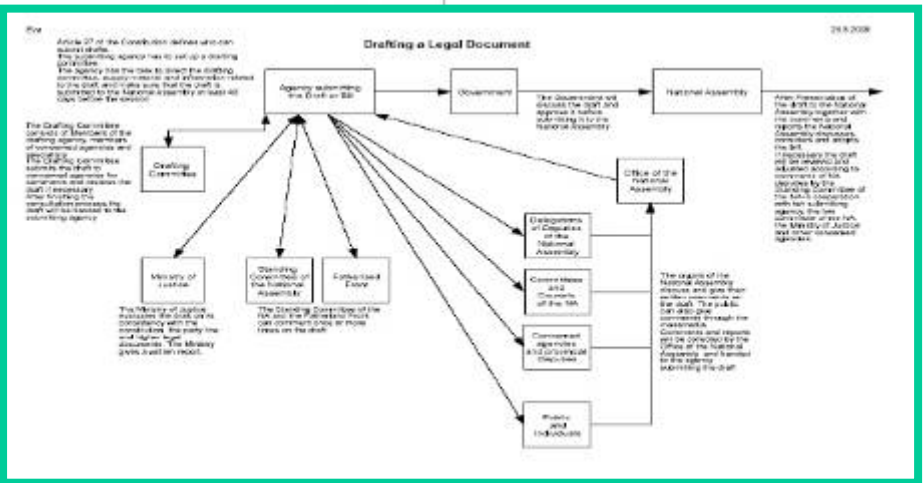
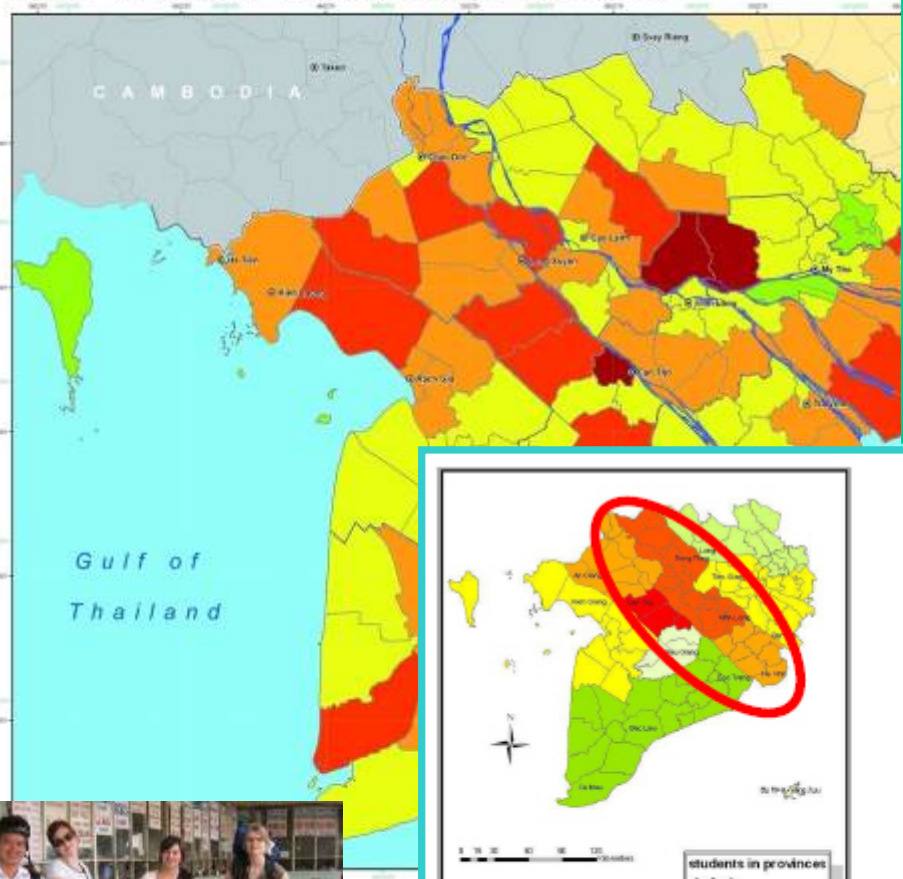
Modelling:

- **Impact of flood, sea level rise, salt intrusion**

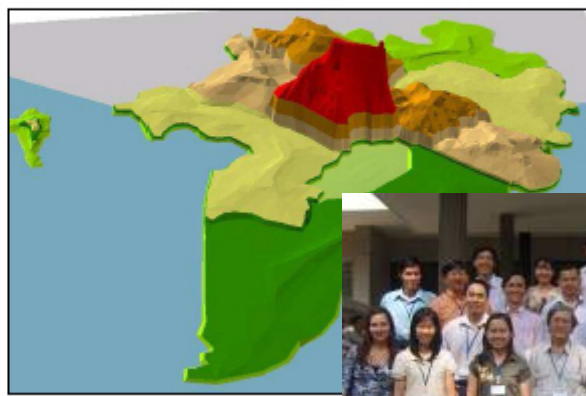


Socio-economic Data Generation f. Stat. Yearbooks, Analyses of Legal Documents, Institutional Mapping

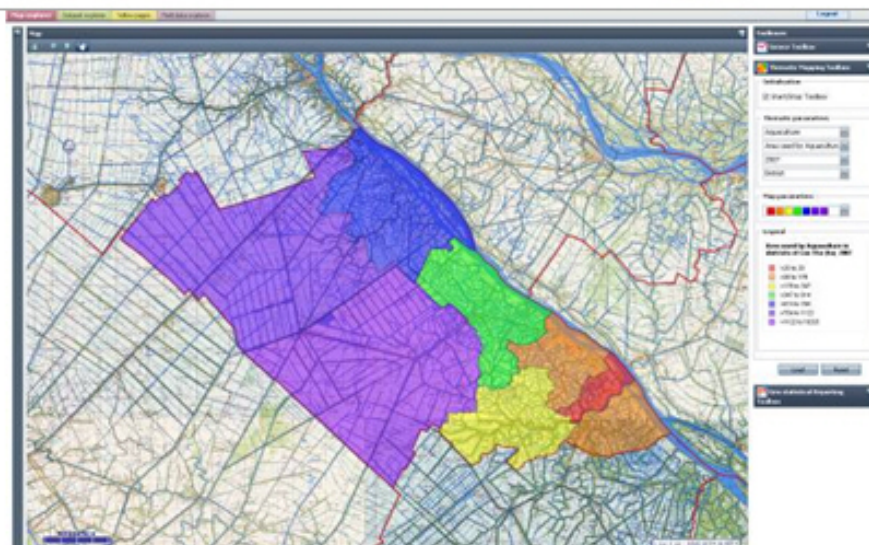
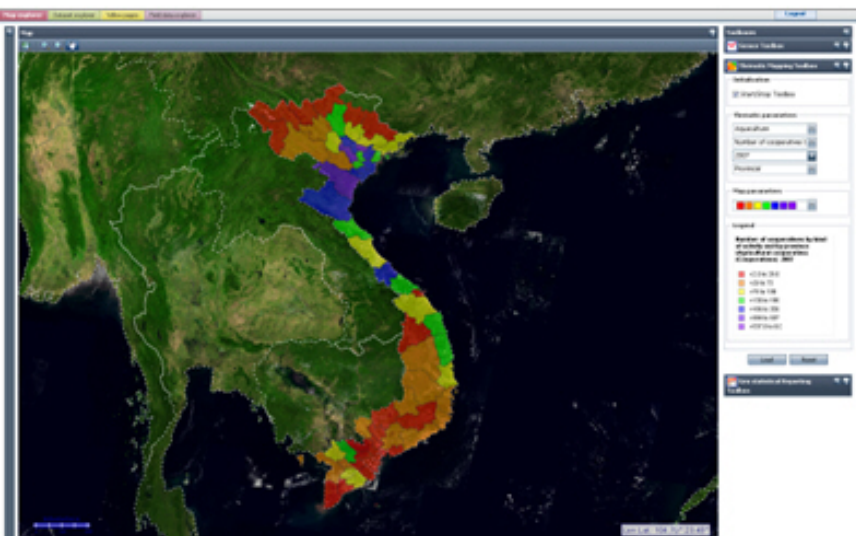
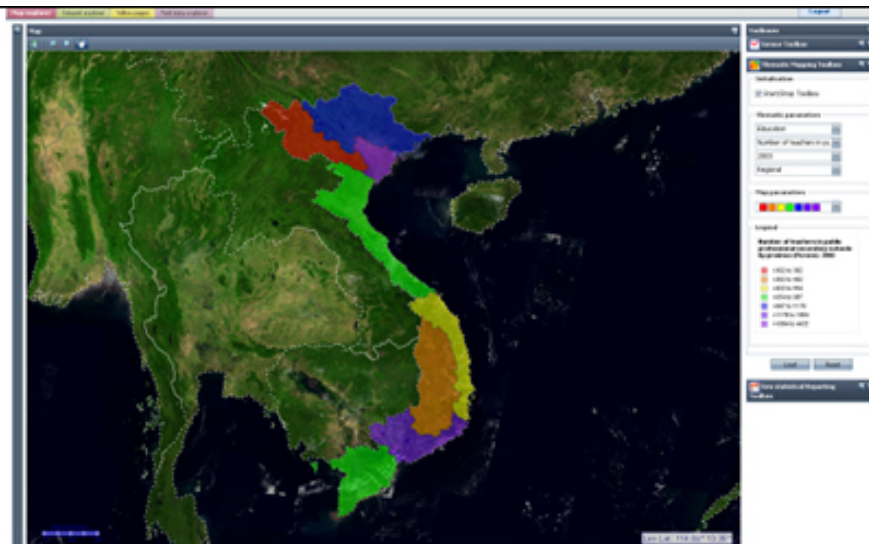
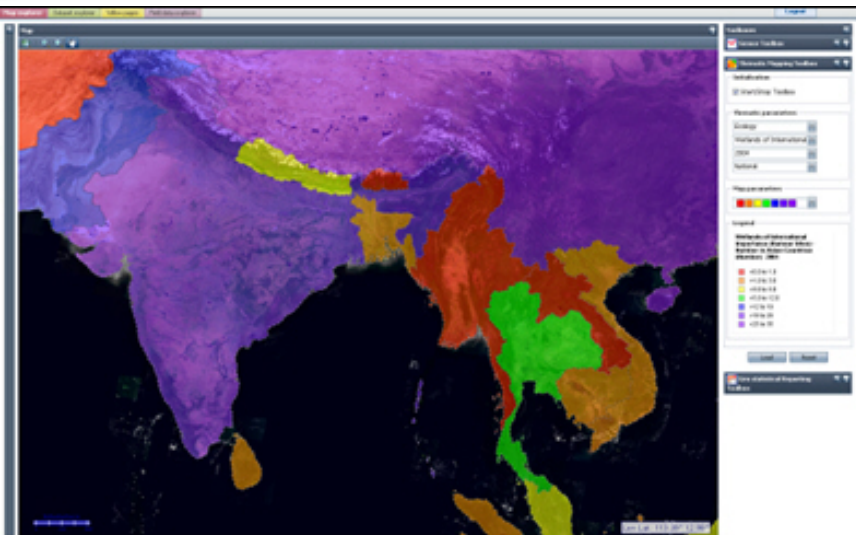
Vietnam - Mekong Delta - Population Density for District



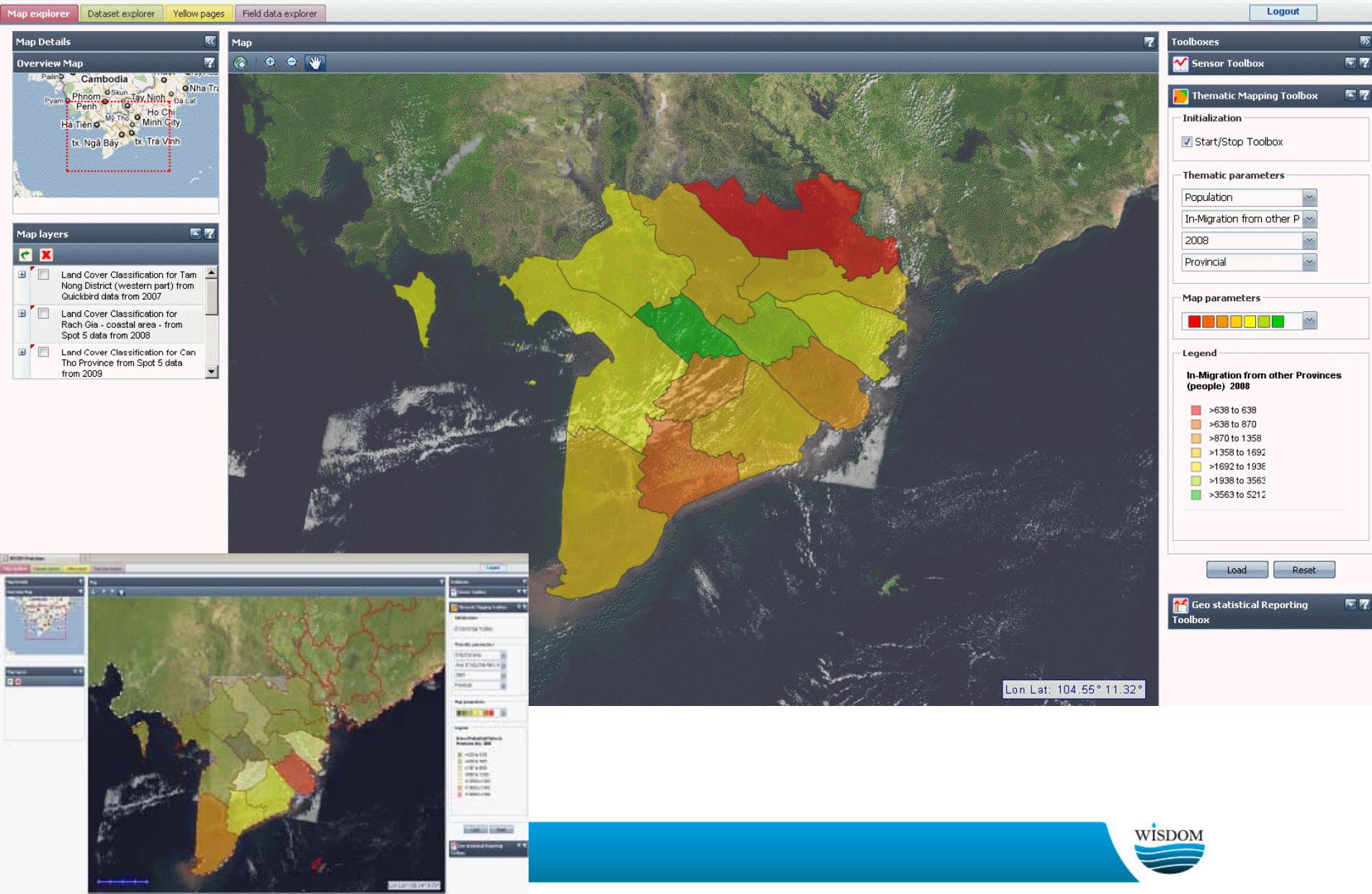
Epistemic landscapes
(high or low Knowledge Density)



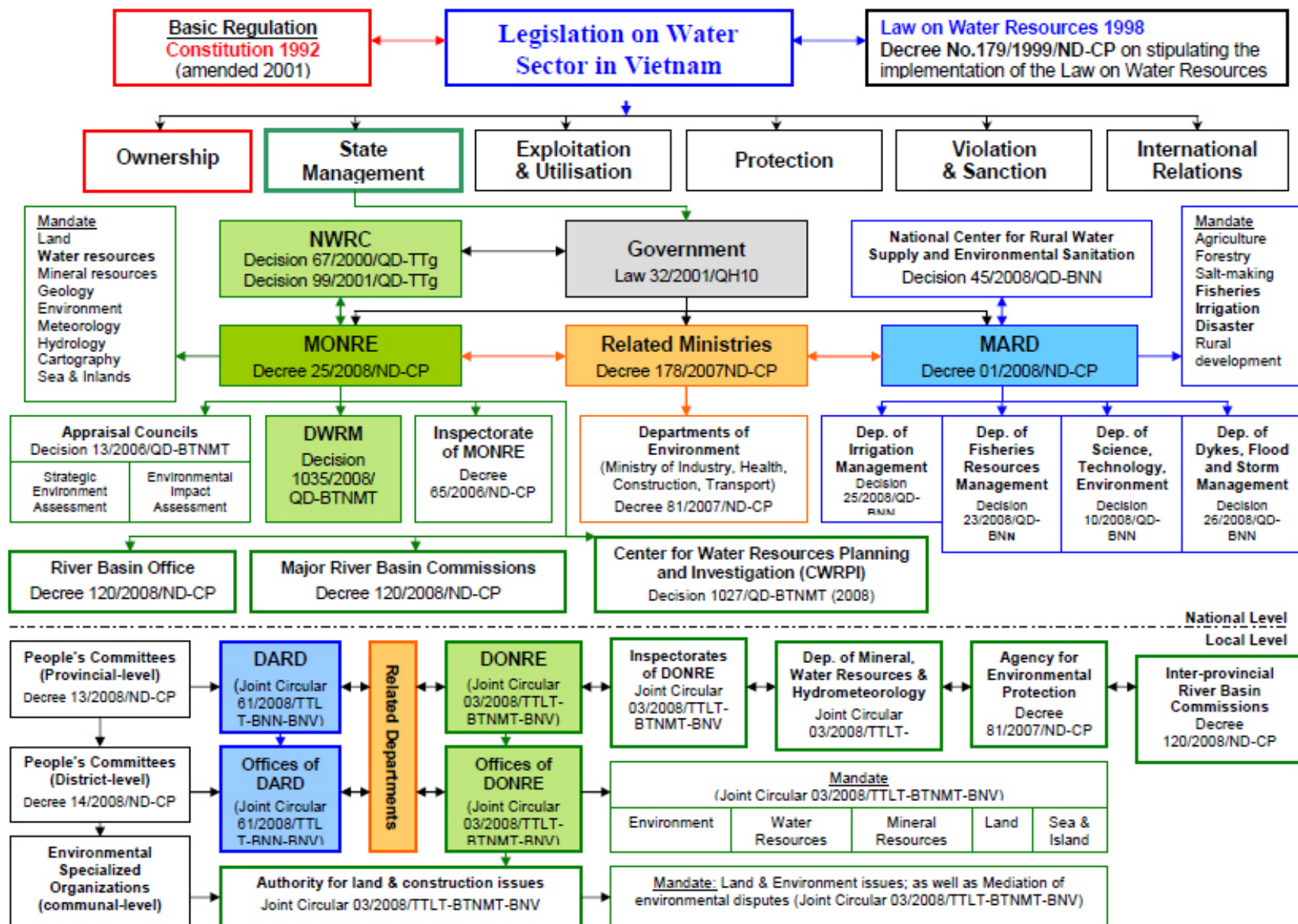
Multitemporal Analyses of Statistical Data at Differing Spatial Scales (Asia, Basin, Vietnam, Delta, Province ...)



Socio-Economic Data in the Information System; e.g. Population Migration



Legal Framework in the Water Sector



WISDOM Prototype

Map explorer Dataset explorer **Yellow pages** Field data explorer Logout

Search

Search text:

Search Parameters

☒ Name ☒ City
☒ Abbreviation ☒ Email
☒ Address

Search Clear

Search results

Name	Docs
Center for Rural Water Supply and Environmental Sanitation	1
Center for Rural Water Supply and Environmental Sanitation of Can Tho (DARD)	1
Centre for Rural Water Supply and Sanitation	0
Department of Water resources	2
Address: No. 2 Ngoc Ha Street, Ba Dinh District, Hanoi Phone: -7335627 Fax: -7335622 City: Hanoi	
Department of Water Resources Management	1
Hanoi Water Resources University	0
Institute of Water and Environmental Technology	
Institute of Water Resources and Environmental Technology	
Institute of Water Resources Planning	

Legal documents

Title
Quy định chức năng, nhiệm vụ, quyền hạn và tổ chức bộ máy của Cục Thủy lợi
Quy định chức năng, nhiệm vụ, quyền hạn và tổ chức bộ máy của Cục Thủy lợi

Legal Documents

QUYẾT ĐỊNH CỦA BỘ TRƯỞNG BỘ NÔNG NGHIỆP VÀ PHÁT TRIỂN NÔNG THÔN

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc
----- o o o -----
Hà Nội, Ngày 04 tháng 09 năm 2003

Số: 93/2003/QĐ-BNN

QUYẾT ĐỊNH CỦA BỘ TRƯỞNG BỘ NÔNG NGHIỆP VÀ PHÁT TRIỂN NÔNG THÔN

*Quy định chức năng, nhiệm vụ, quyền hạn
và tổ chức bộ máy của Cục Thủy lợi*

BỘ TRƯỞNG BỘ NÔNG NGHIỆP VÀ PHÁT TRIỂN NÔNG THÔN

Căn cứ Nghị định số 86/2003/NĐ-CP ngày 18 tháng 7 năm 2003 của Chính phủ quy định chức năng, nhiệm vụ, quyền hạn và cơ cấu tổ chức của Bộ Nông nghiệp và Phát triển nông thôn;

Căn cứ Điều 19 Nghị định số 86/2002/NĐ-CP ngày 05 tháng 11 năm 2002 của Chính phủ quy định chức năng, nhiệm vụ, quyền hạn và cơ cấu tổ chức của Bộ, cơ quan ngang Bộ;

Xét đề nghị của Vụ trưởng Vụ Tổ chức cán bộ,

QUYẾT ĐỊNH:

Data Addition

- Data needs to be available and standardized
- Personnel would have to be trained
- Data entry through online available Data Entry Portal (DEP)
- Metadata needs to be given through Warehouse like online form

Application Addition

- Request of demanded application
- Realization through IT experts in coop. w. DLR

Ideal overarching WRM Information System for Vietnam (according to Vice Minister Lai) but...

- **Data Availability, Accuracy and Formats**
- **Limited Human Resources to Input Datasets to Cover Broader Themes and Regions**
- **Inadequate Institutional Capacity / Interest to Input Data and Keep the System Updated**
- **Absence of Regulatory Framework to Encourage / Enforce Application Use**
- **Competitive Mentality of Donor Driven Projects that are Developing Sub-Systems**
- **Need to achieve a Coverage Critical Mass to Kick-off Self-Driven Widespread Use**

1: In Vietnam (Information Sharing to Demonstrate Deployability as Overarching WRM DSS and User Friedliness):

- **New Datasets for other areas / themes issued from recent / future ADB projects outcomes**
- **Additional Application to Explore Opportunity for Testing New Functionalities**
- **Additional DSS Methodologies to enrich DSS Capacity and System Added Value**

2: In other Mekong Riparian Countries (to Demonstrate Capacity to Contribute MWRAS Objectives):

- **Datasets, Applications, Methodologies out of recent / future ADB projects in the Region**



www.wisdom.caf.dlr.de