



Teaching, Research Subjects dealing with Oceanography and Marine Pollution in Sfax University

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HEADLINES

- ④ **Local Contexte :The gulf of Gabès area (Sfax)**
 - ④ **Sfax University**
 - ④ **Teaching in marine science**
 - ④ **Research Laboratories**
 - ④ **An example of local and International network**
 - ④ **Possibilities and perspectives at the euro Mediterranean level**



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BIOMONITORING IN TUNISIA



➤ **1300 Km of Coast**

➤ **National monitoring program**

➤ (INSTM, Inst Pasteur, In rech Vétérinaire)

➤ **Exists since 1995**

➤ **Frequency : monthly, twice amonth, and weekly in case of alert**

➤ **60 sites (30 in the north and 30 in the south)**

➤ **5 categories of**

• **REPHY toxic phytoplankton**

• **REMI microbiology**

• **RECNO metals, Hydrocarbons, pesticides**

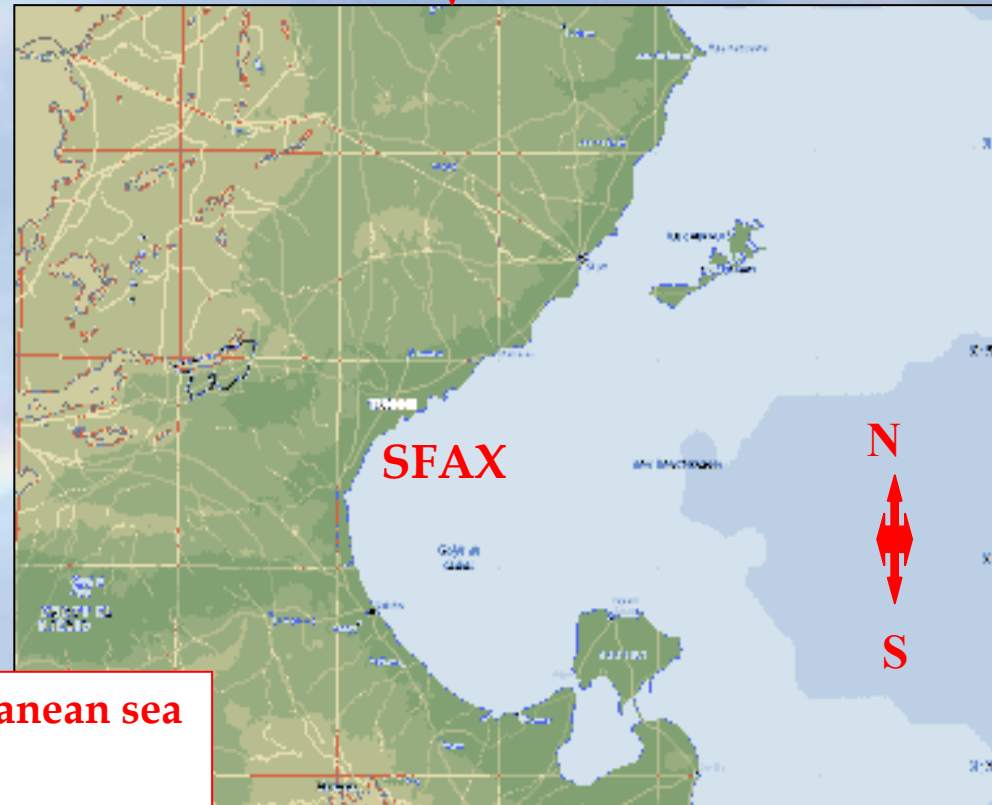
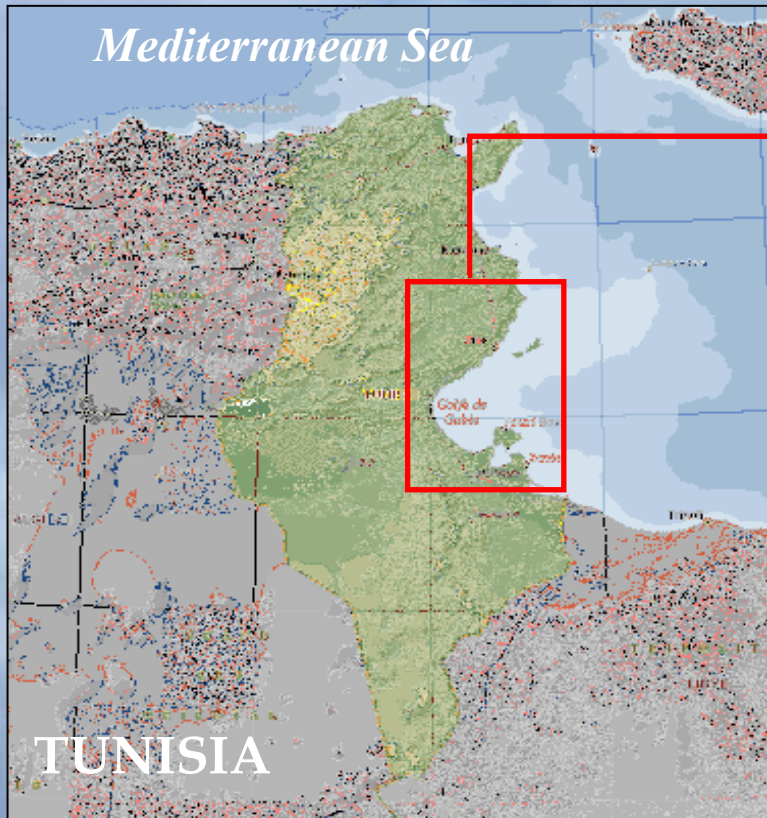
• **REBI biotoxins (in case of alert)**

• **REPIDEMIO parasites**

➤ **More informations in the INSTM web site**

www.213.150.167.49instmdefault.html

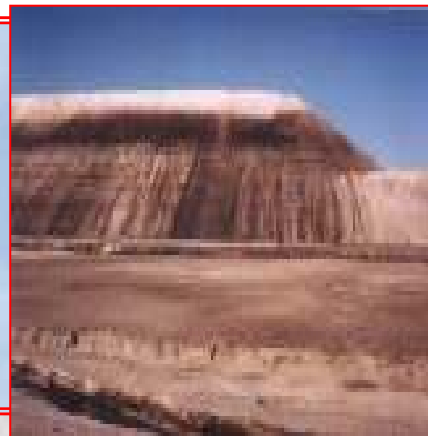
Strategic Mediterranean area



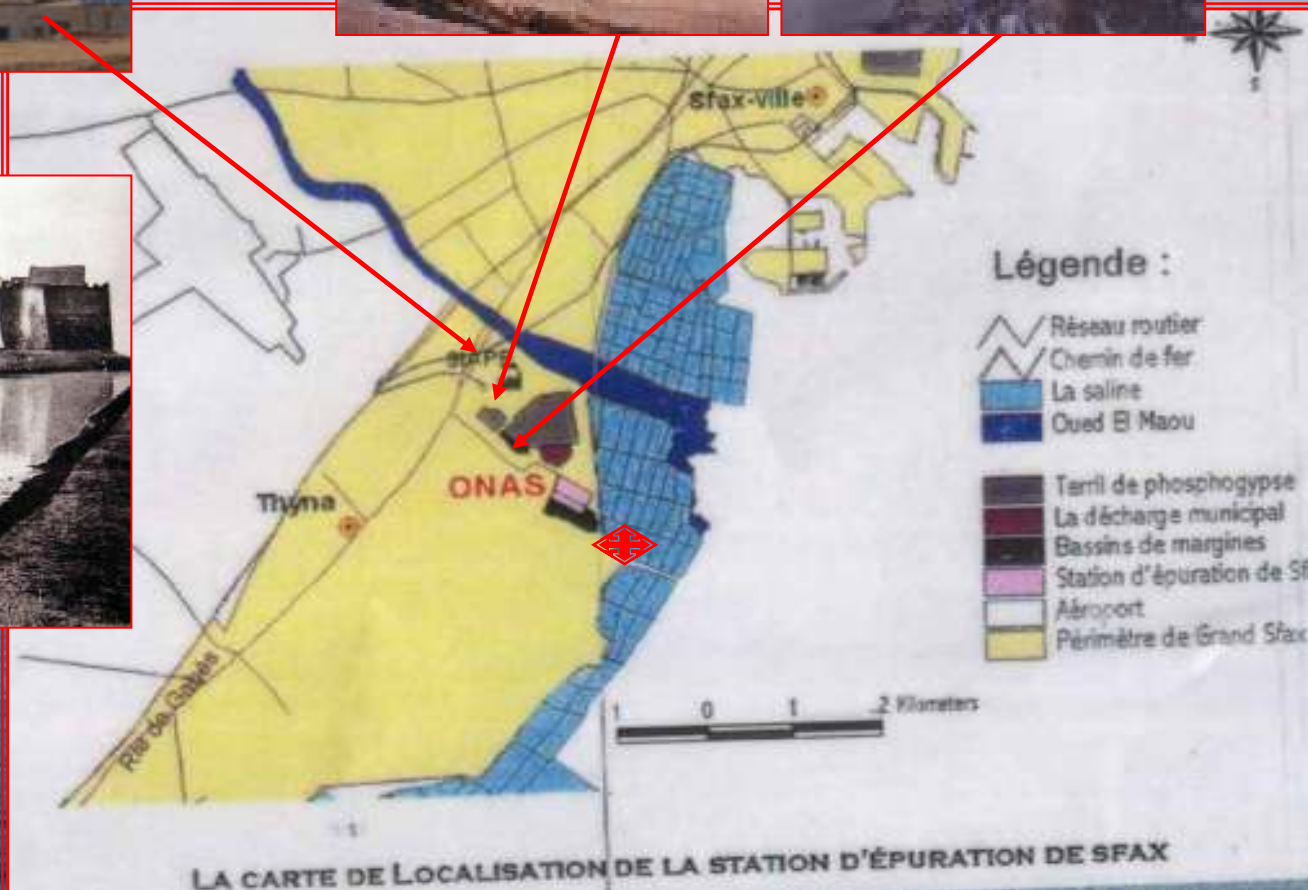
Importance : A unique Zone in the Mediterranean sea

- Shallow waters, tides
- Weak currents
- High salinity and T°
- Spawning and refuge area
- Important resources and Biodiversity
- 65% of the national fish Production
- 95% of the national Clam production

Industriel Activity and Effluents



« The sea door »
باب البحر



Industrial Activity and Effluents

- Sfax is an industrial city with 1 000 000 habitants.
- La STEP 10 millions of m³/ year ~24 000 m³ of Waste Water /day from 1700 industries and 209 000 habitants.
- Important anthropogenic pressure





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Sfax University

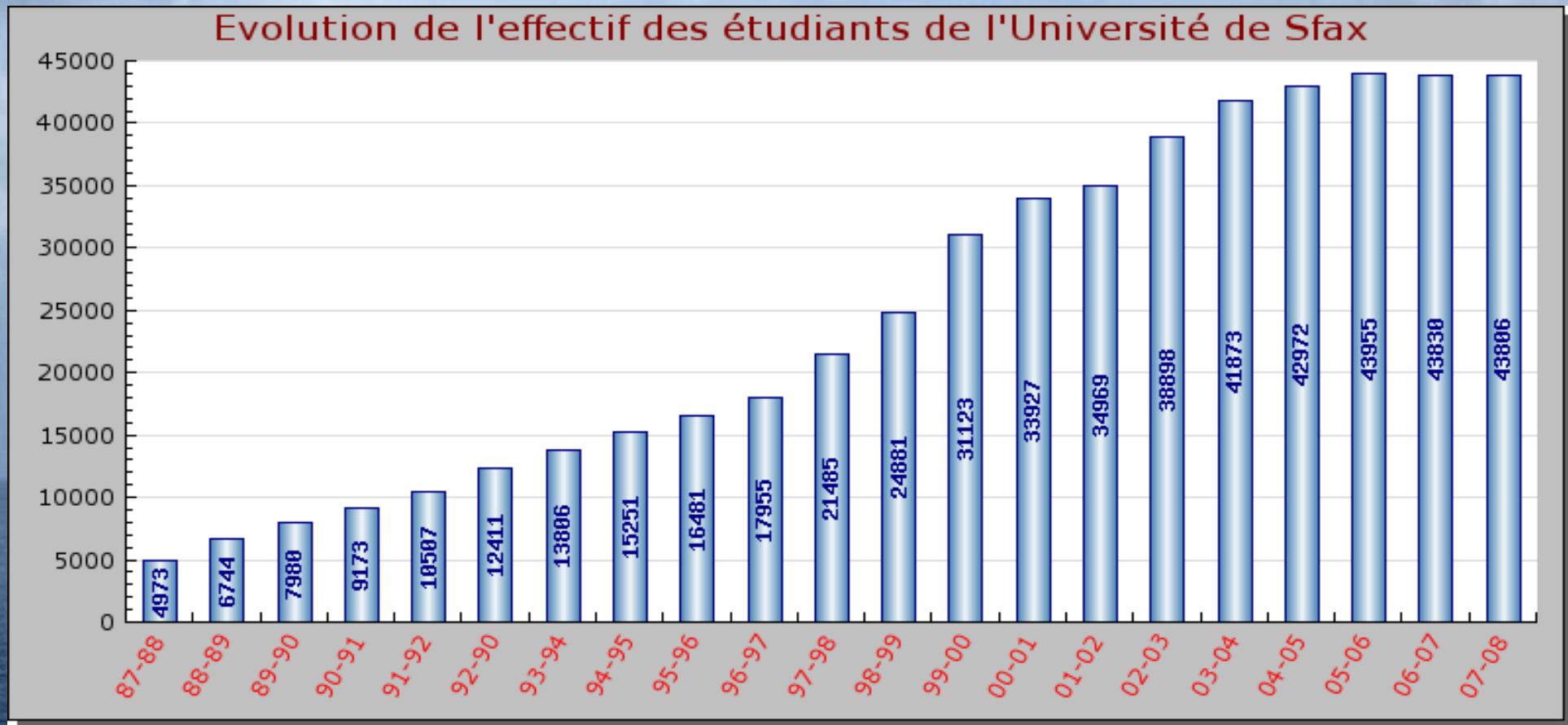


Created en 1986

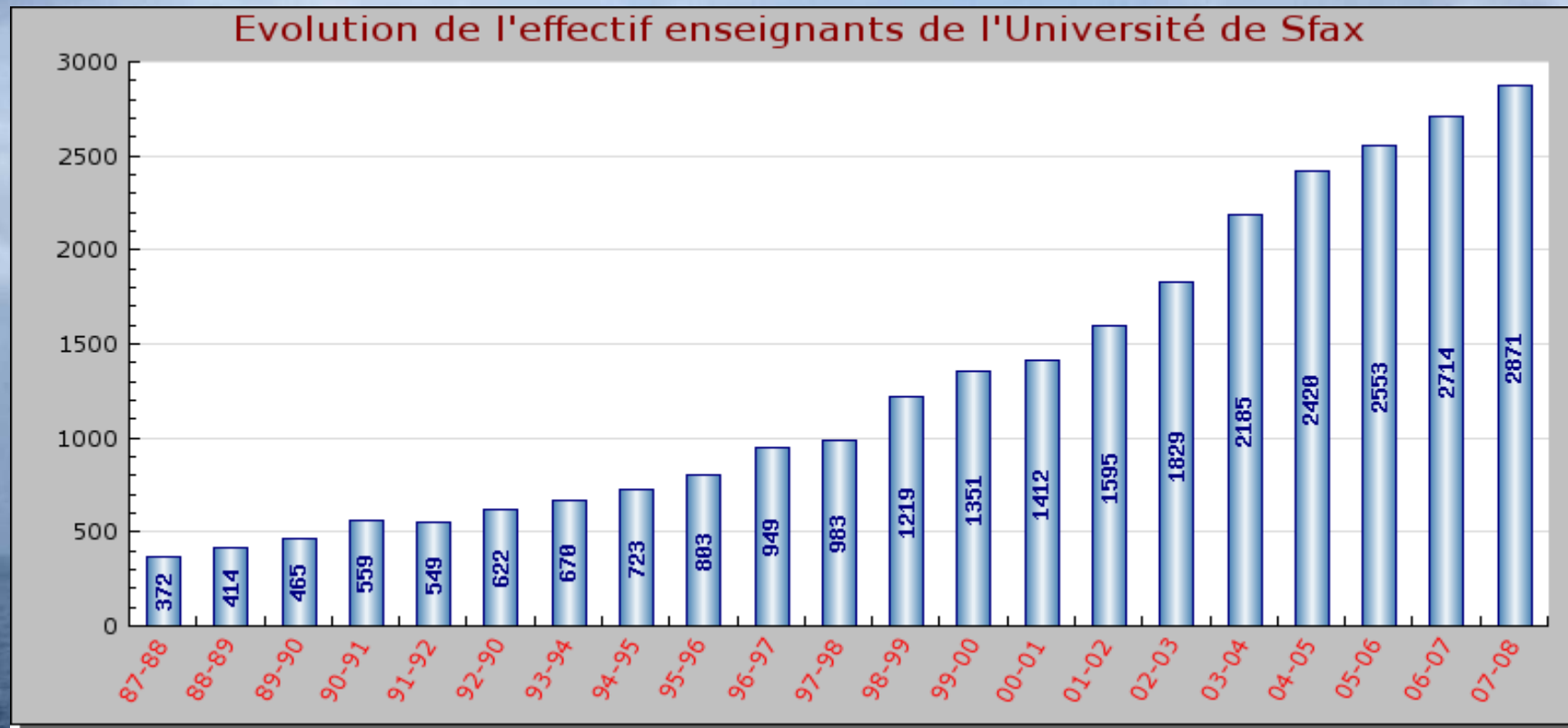
- **Université de Sfax (12 Univ)**
- **20 Institutions**
- **2210 Teachers**
- **45 223 Students (1/5)**
- **17 Res laboratories over 140**
- **91 Res Units over 450**
- **6800 diplômés par an**

Web site www.uss.rnu.tn

Student evolution about 50 000 students



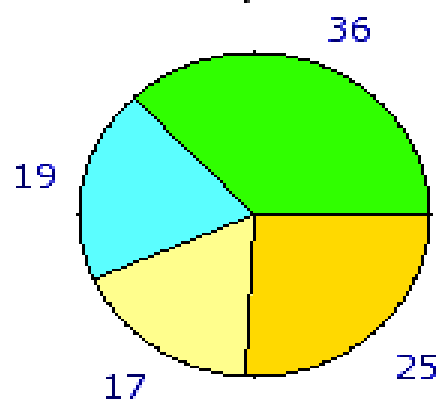
Teachers



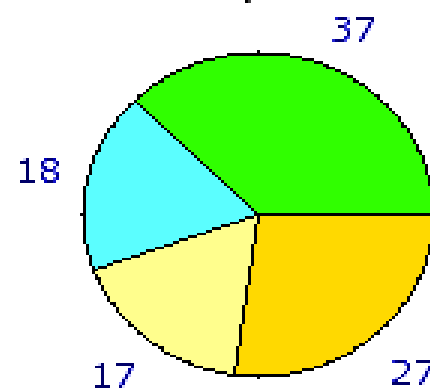
3^{ème} cycle

Nombre de certificats de 3eme cycle / Type

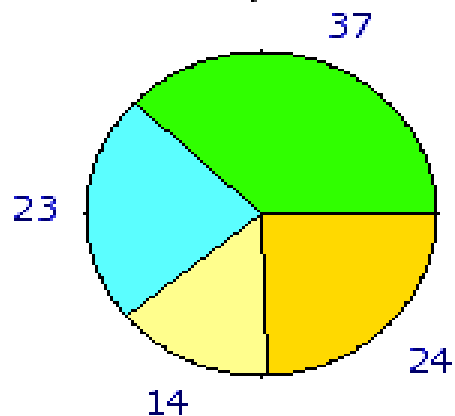
2004/2005



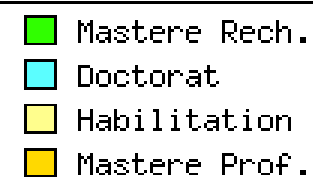
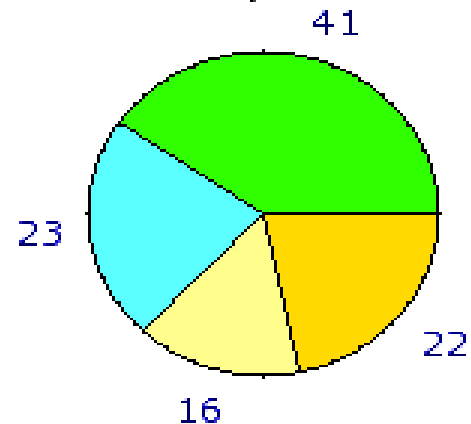
2005/2006



2006/2007



2007/2008



ACTIVE INTERNATIONAL COLLABORATION

Plus de 70 accords de coopération signés avec

- USA
- Europe (France, Allemagne, Espagne, Italie, Angleterre, Portugal, Grèce)
- Pays Arabes et Africains
- Le Japon

FINANCEMENT

- National (MES)
- Projets CEE
- Projets de Coopération (France, Portugal, Espagne, Allemagne, Canada, Maroc,....)
- JICA (Japan)

ORGANISATION OF RESEARCH IN TUNISIA

- **The budget > 1% PIB (gross internal product)**
- **Since 1998 research was organized in research labs and units. We have actually 140 laboratories and 450 Unites**



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MASTERE DE BIODIVERSITE ET RESSOURCES AQUATIQUES

Faculté des sciences de Sfax

Modules	Volume Horaire
Statistiques	20H
Langues (Anglais+Français)	30H
Etude d'impact et aires protégées	15H
Bases de données et outils d'analyse	25H
Notions d'océanographie	20H
Les générateurs de la matière	25H
Taxonomie des végétaux aquatiques	20H
Taxonomie des animaux aquatiques	20H
Diversité des vertébrés marins	35H
Ecosystèmes marins	30H
Dynamiques des populations	35H
Option 1 : Biologie moléculaire et génétique des populations	20H
Option 2 : Parasitologie	20H
Option 3 : Techniques des pêches	20H
TOTAL	345H

ISBS

Master en Biotechnologie Environnementale PROGRAMME D'ETUDES

MODULES	Coefficient	Volume horaire
Module : M1 BIOREMEDIATION	4	65
Module : M2 GENIE DES PROCEDES, BIOPRODUCTION	4	65
Module : M3 BIOTECHNOLOGIE MICROBIENNE ET MOLECULAIRE	4	65
Module : M4 OUTILS D'ANALYSES CHIMIQUES APPLIQUES A L'ENVIRONNEMENT	3	55
Sous Module : SM1 Normes, Audit et droit de l'environnement		
Sous Module : SM2 Bio-statistique, Bio-informatique, Plan d'expérience	2	30
Sous Module : SM3 Anglais	1,5	30
Sous Module : SM4 Séminaires bibliographiques & Ateliers pratiques	1,5	30



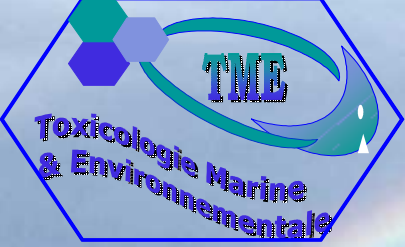

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Laboratories and UR	Subjects
<p>“Biodiversity and Aquatic Systems” (Faculty of sciences)</p>	<p>Phytoplankton Zooplanktons/ Microbial loop /Population Dynamic/Parasitological/Ichthyology</p>
<p>UR Marine and environmental Toxicology (IPEIS)</p> 	<p>Biomonitoring/ Biomarkers/ Endocrinedisruptors/ Toxic metals/ Pollution and human Health</p>
<p>Laboratoire des ressources marines vivantes</p> 	<p>Evaluation des stocks de ressources exploitables Eco-biologie des principales espèces marines exploitées Abondance et distribution des œufs et des larves des poissons Technologies des engins de pêche Etude économique et sociale des principales pêcheries</p>



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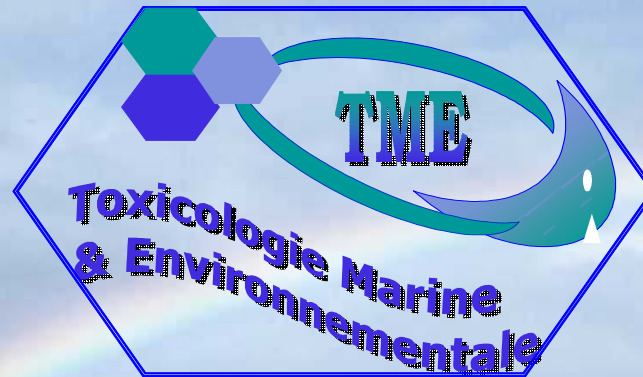
Research Laboratories

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Université de sfax-Tunisie

Unité de Recherche



- Crée en 2000
- Membres (2Pr, 2MC, 6 Doctorantes, 1 Post Doc, 2 mastères, 1 administratif)
- Collaboration nationale et Internationale (Co-direction)
- Ouverture sur l'environnement (GCT, TAPARURA)

RESEARCH PROJECTS AND FINANCIAL SUPPORT

» **Ministry of Higher education (Tunisia) ARUB**

» **3 AUF/FICU program**

Université de Nantes / Université de Sfax / Université du Québec

» **FIS program (Sweden)**

International Foundation of Science

» **SERST (Tunisia)**

University of Sfax (Tunisia) / University of Algarve (Portugal)

» **CNRS-DGRST (Tunisia-France)**

Université de Nantes / Université de Sfax

» **CMCU project (Tunisia-France)**

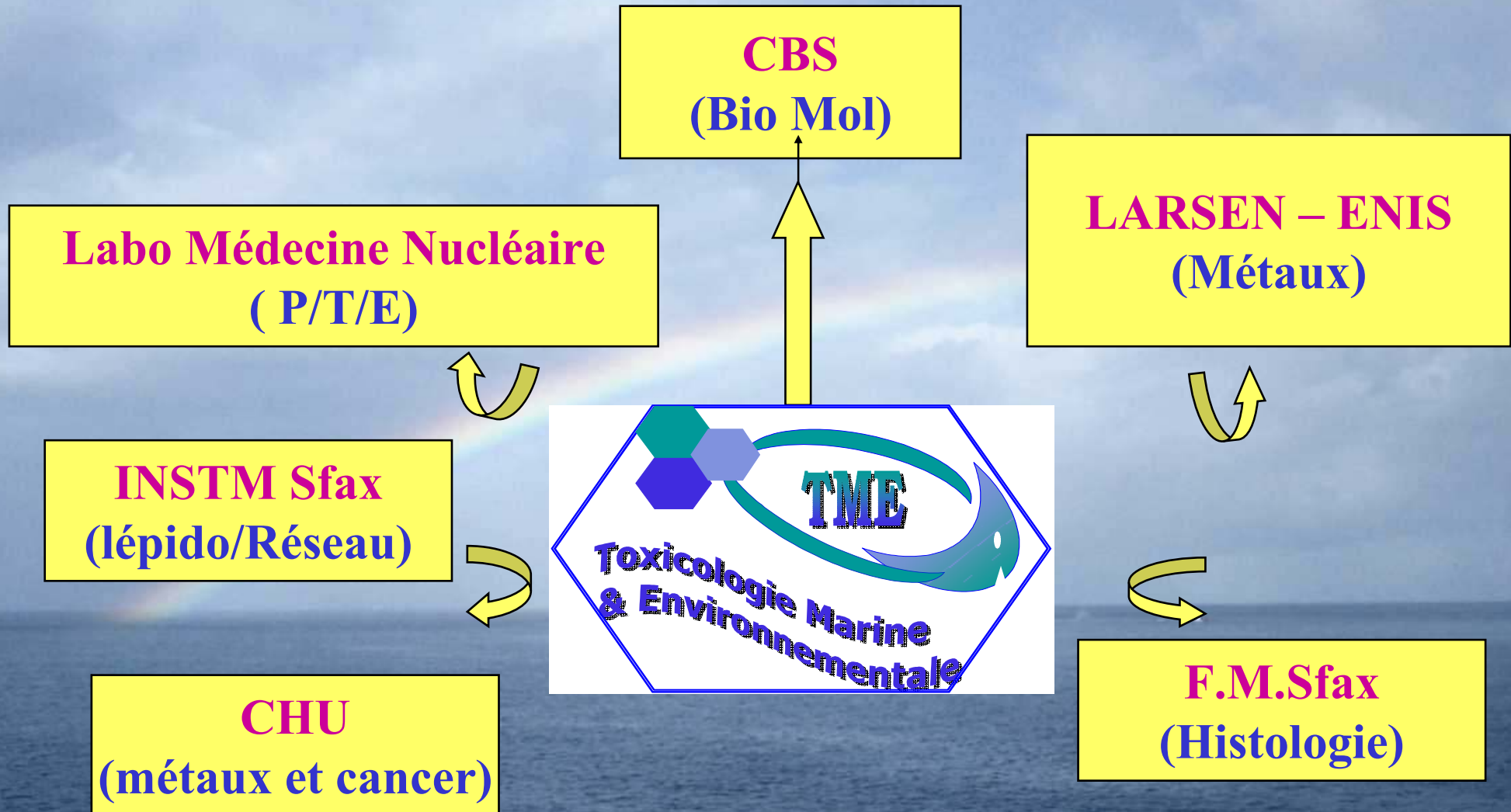
Université de Nice / Université du centre

» **UNEP/FAO (MED POL)**

» **Akita-Sfax agreement (Tunisia-Japan)**

» **Future Collaborations France-Spain-Portugal**

Local Network (Sfax University)



Local Network (Sfax University) SKILLS and KNOW-HOW

Centre de Biotechnologie de Sfax

Molecular Biology And new technical tools
LC MS/MS – HPLC - GC-MS –Automatico DNA sequencer
Real Time PCR - 2-D gel electrophoresis
Confocal microscopy

Faculty of medicine of Sfax

•Hormone quantification RIA
•Histology

Institut National des Sciences et Technologies de la Mer

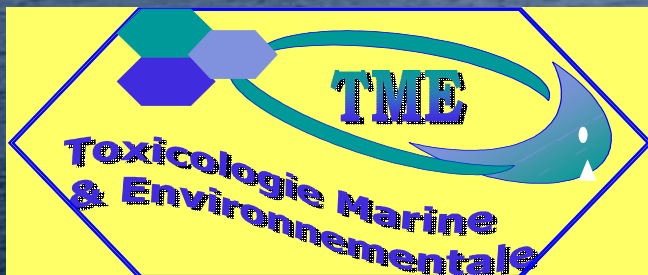
Monitoring program

LARSEN – ENIS

Metal Analysis (SAA)

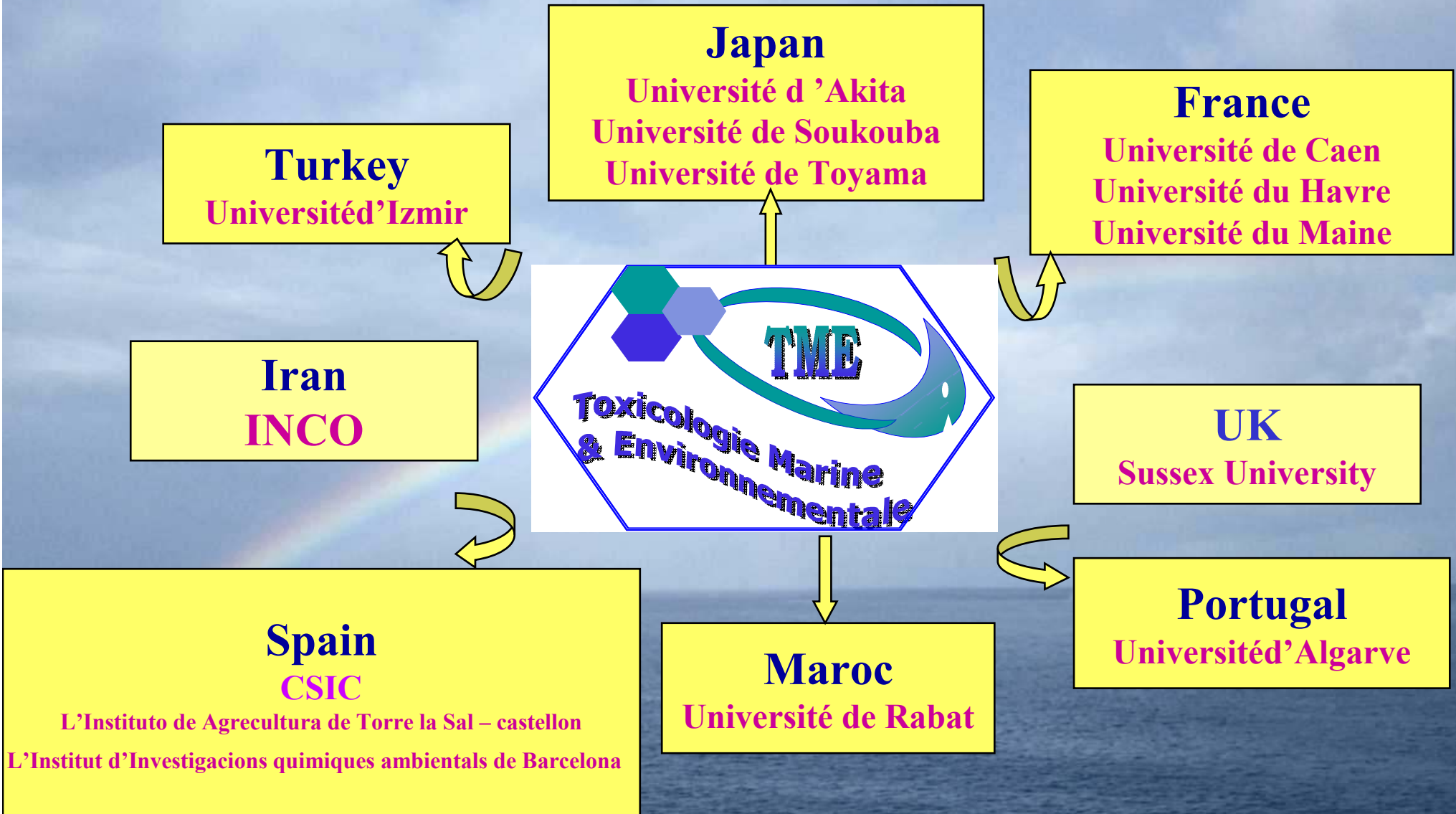
Sfax Hospital

**Cancer Pathologies
Epidemiology**

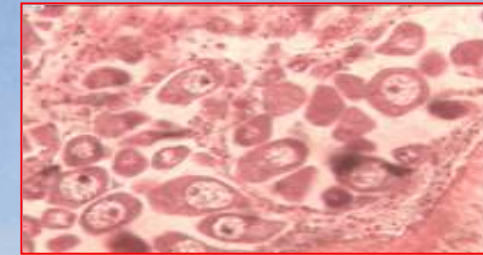
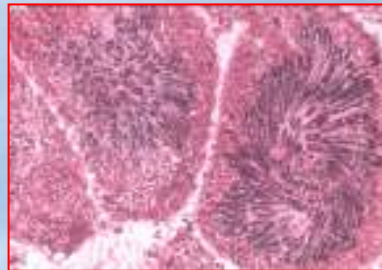


•Biomarkers
•*In vivo, in situ* experiments
•Quantitative Histology
•Lepidochronology
•Endocrine disruptors
•YES/YAS...

Réseau International

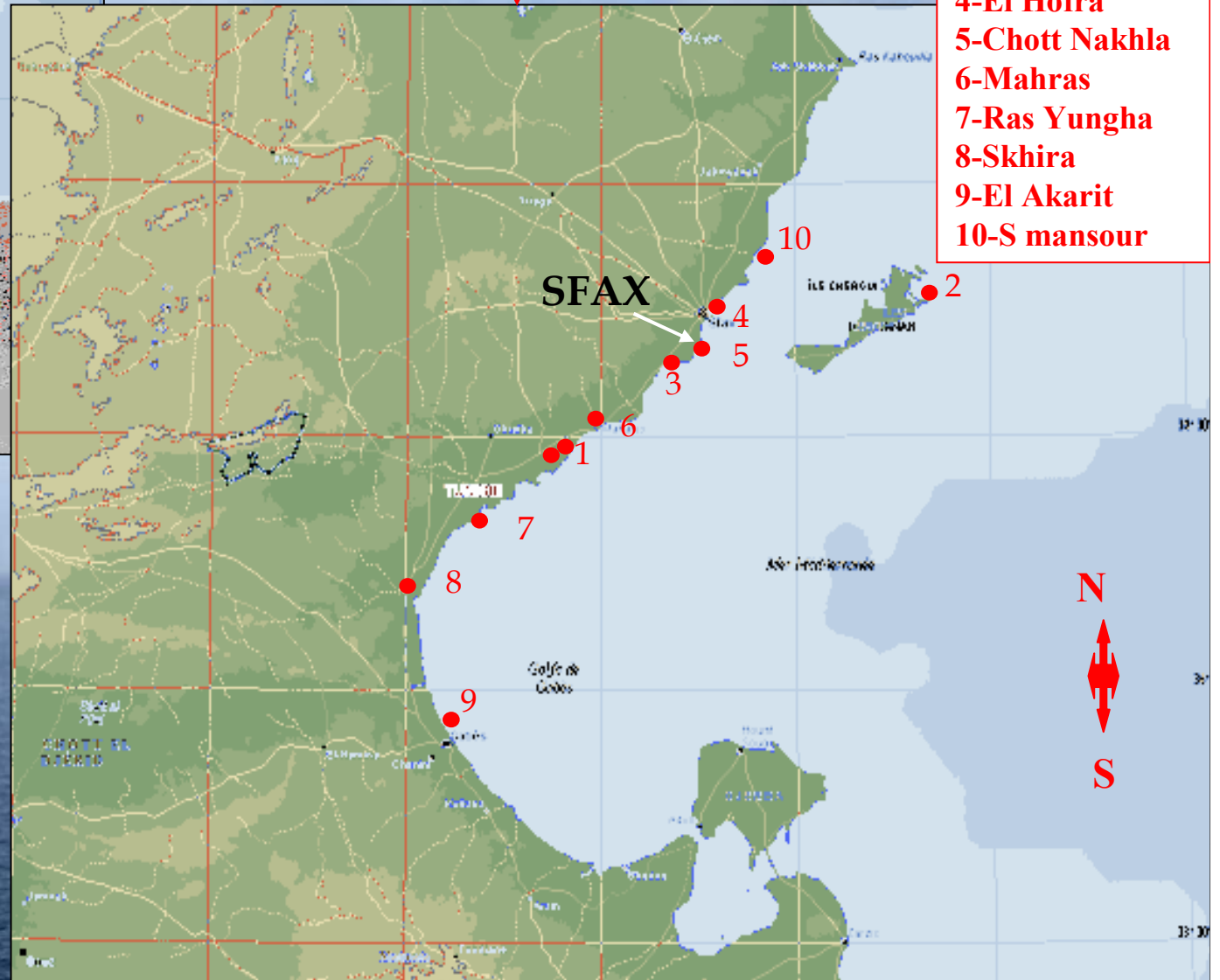
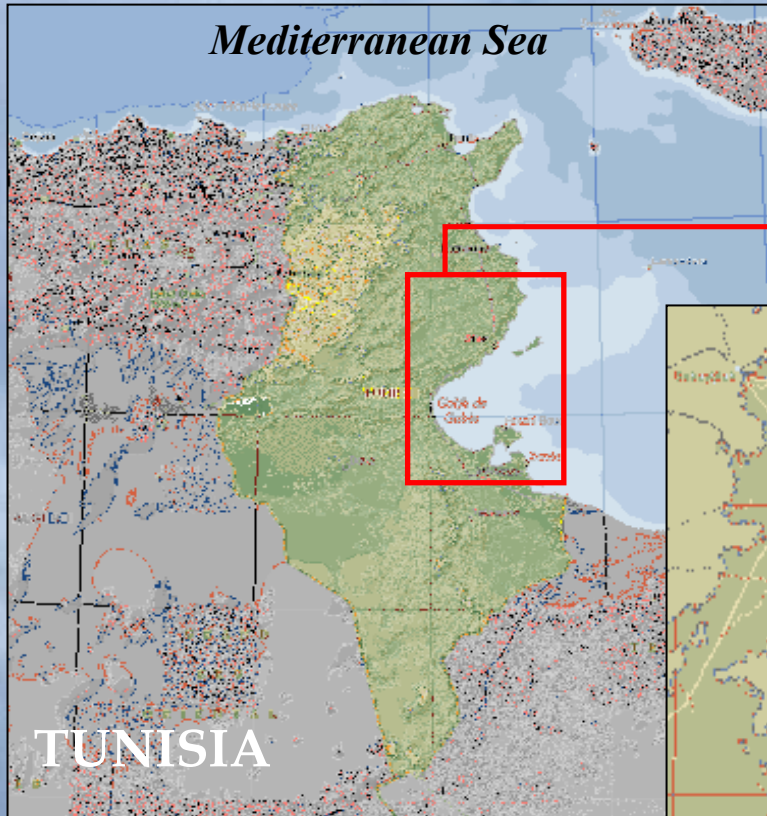


Available equipments



OUR CONTRIBUTION

- 1-Borj Ungha
- 2-Kerkenah
- 3-Zarb El Ain
- 4-El Hofra
- 5-Chott Nakhla
- 6-Mahras
- 7-Ras Yungha
- 8-Skhira
- 9-El Akarit
- 10-S mansour



The gulf of Gabès region

- Shallow waters, tides
- Weak currents
- High salinity and T°
- Spawning and refuge area
- Important resources

Bivalves étudiés



APPROCHES

- Etudes *in situ*
- Etudes *in vivo*
- Transplantation *in situ*
- Transplantation *in vivo*

Hg

Chaînes trophiques

HISTOLOGIE

Qualitative
quantitative

POLLUANTS

Cd, Cu, Zn, Pb, Hg
xéno estrogènes

BIOMARQUEURS

MTs/AChE/MDA/
Glyco/Stress on stress

PERTURBATEURS

YES/YAS
P/T/E

ETUDE MOLECULAIRE

- Différentiation génétique
C glaucum/C edule
- Clonage du cDNA MTs
- Quantification de l'exp du gène

- 
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FP7 Capacities Work Programme: Regions of Knowledge

FP7-REGIONS-2009-1

Project Water Link: Integrated Research for Integrated Water Management

- University of Algarve -

Create common teaching in marine Science

“Co-Diplomation” is highly encouraged

Ecole Doctorale new System

On line teaching

Thank you

