



DISCOBIOL

Dispersants and response techniques for shoreline areas: biological impact assessment and contributions to the regulation.

Project funded by the French "Agence Nationale Pour la Recherche".

3 years project

Current French policy for the use of dispersant

- Mainly offshore
- Restriction in coastal areas

Definition of
geographic
limits



France : Limits for dispersing 3

- Dilution is related to the volume of water available; the volume of water is related to depth and distance to the shore.

- France requirements :

1) dispersed oil with concentration ≤ 10 ppm

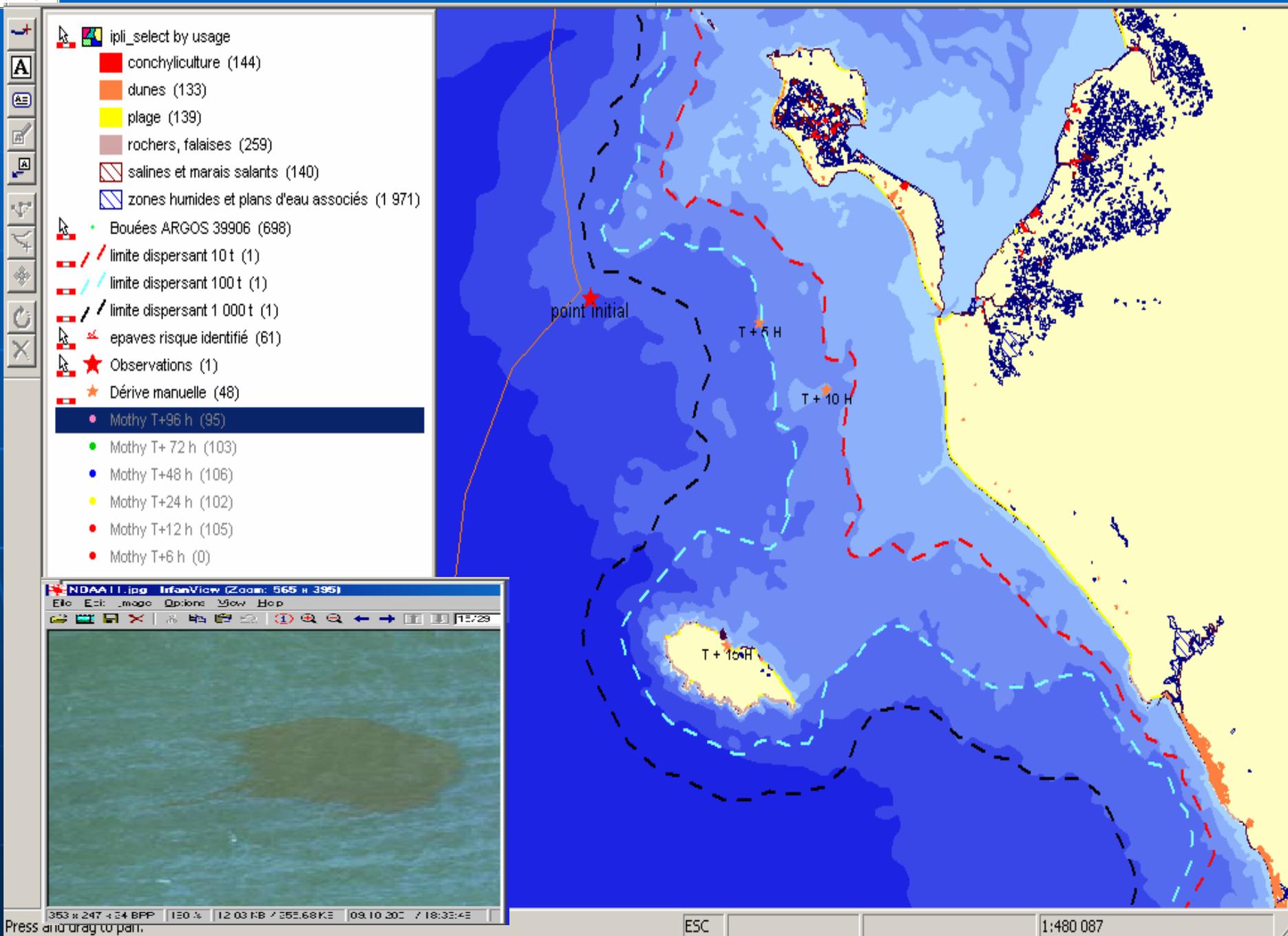
- *2) the potential of dilution = f (amount of oil)*

Oil (T)	Distance (NM)	Depth (m)
10	0.5	5
100	1	10
1000	2.5	15

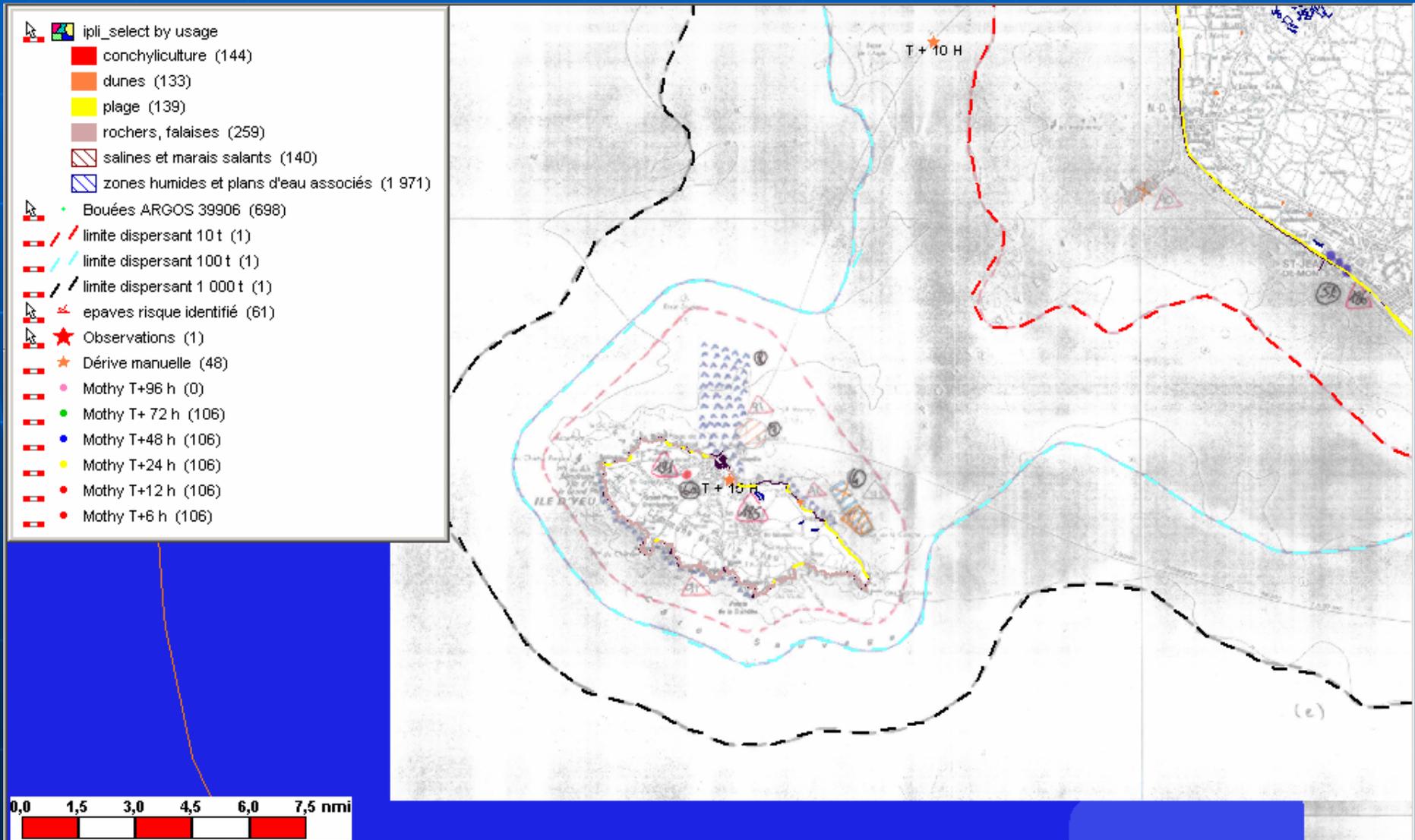
France : Limits for dispersing ⁴

- 3 sea lines are defined depending on
 - the depth and
 - the distance to the coast
- For 3 levels of pollution 10, 100 & 1000 T of oil to be dispersed





Limits for dispersing take into account specificity of areas





DISCOBIOL

Current policy for the use of dispersants : -
mainly offshore

-general restriction in coastal areas based on
dilution concept

Estuaries and bays more or less closed are not
considered in these general rules as they
require a real NEBA to take into account
simultaneously the different resources /
habitats which may be affected by the plume
of dispersed oil

Objective:

- 1) To bring to the responders the practical information needed to decide on the use of dispersants in estuaries and very coastal areas by assessing the **dispersed oil toxicity** and **impact** towards the different habitats of these locations.

To get the basic and robust information to carry out the NEBA in estuaries.

Process: experimental studies

- 2) Exchange of information about international practice and regulation on the use of dispersants

Process: forum – working group

DISCOBIOL

PART 1- Experimental work:

1.1- To assess the dispersed oil toxicity and impact towards the 3 main habitats of estuaries in temperate climates:

- Water column (pelagic and benthic organisms)
- Mudflats
- Salt marshes

Experimental works to be conducted with the same oil in order to get comparable data.

1.2- To assess the acute toxicity of different dispersed oil at different weathering stages in order to rank oils in terms of toxicity.

PART 2- Exchange of information:

By putting in place a technical forum via internet to allow the different persons involved to share the knowledge

Exchange between operational and scientific people on the impact of dispersed oil (from other researches and real case stories)

Other complements:

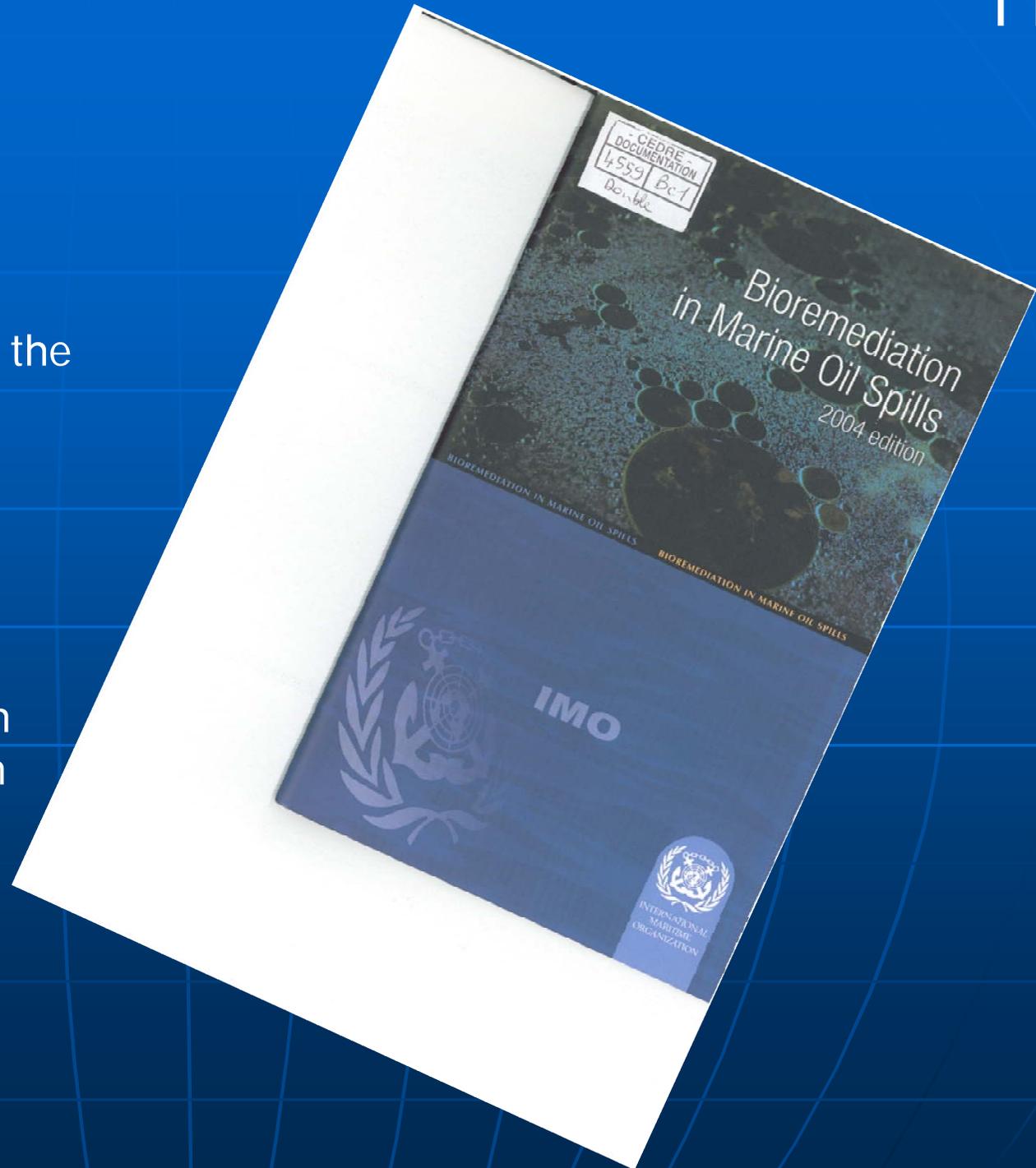
=> Possibility to enlarge the project to other climates or other issues
(OFI)

=> Possibility to harmonize protocols and methodologies to get comparable data

In the future, practical and widely accepted recommendations written by a working group in another context (IMO)

Previous work programme conducted on bioremediation :

- a) Working group to harmonize the technical procedures
- b) Then followed experimental programmes to validate the protocols
- c) Then wrote IMO Guideline on the technique of bioremediation





DISCOBIOL

Current status:

This work is supported at 37% by the ANR (French National Agency for Research).

Total current budget : 1 M€ / 3 years.

French partners involved:

Cedre

UPCI (University of Brittany)

CRELA (University of La Rochelle)

AFSSA (Agency for safety in the Foods)

Total & Inospec Gamlen Industry

Possibility of additional contribution in cash to cover the whole budget or in kind to improve or to enlarge the content of the project

As European additional contributors :

=> Interest expressed by: UK MCA, and Dutch authorities;

Possible : Germany, Norway (Sintef)

=> Outside Europe :

Interest expressed by DFO

Possible : CRRC

Experimental work



Water column
Acute toxicity (CL50)
Impact assessment

**Scale of toxicity
for different oils**
(Deltatox)

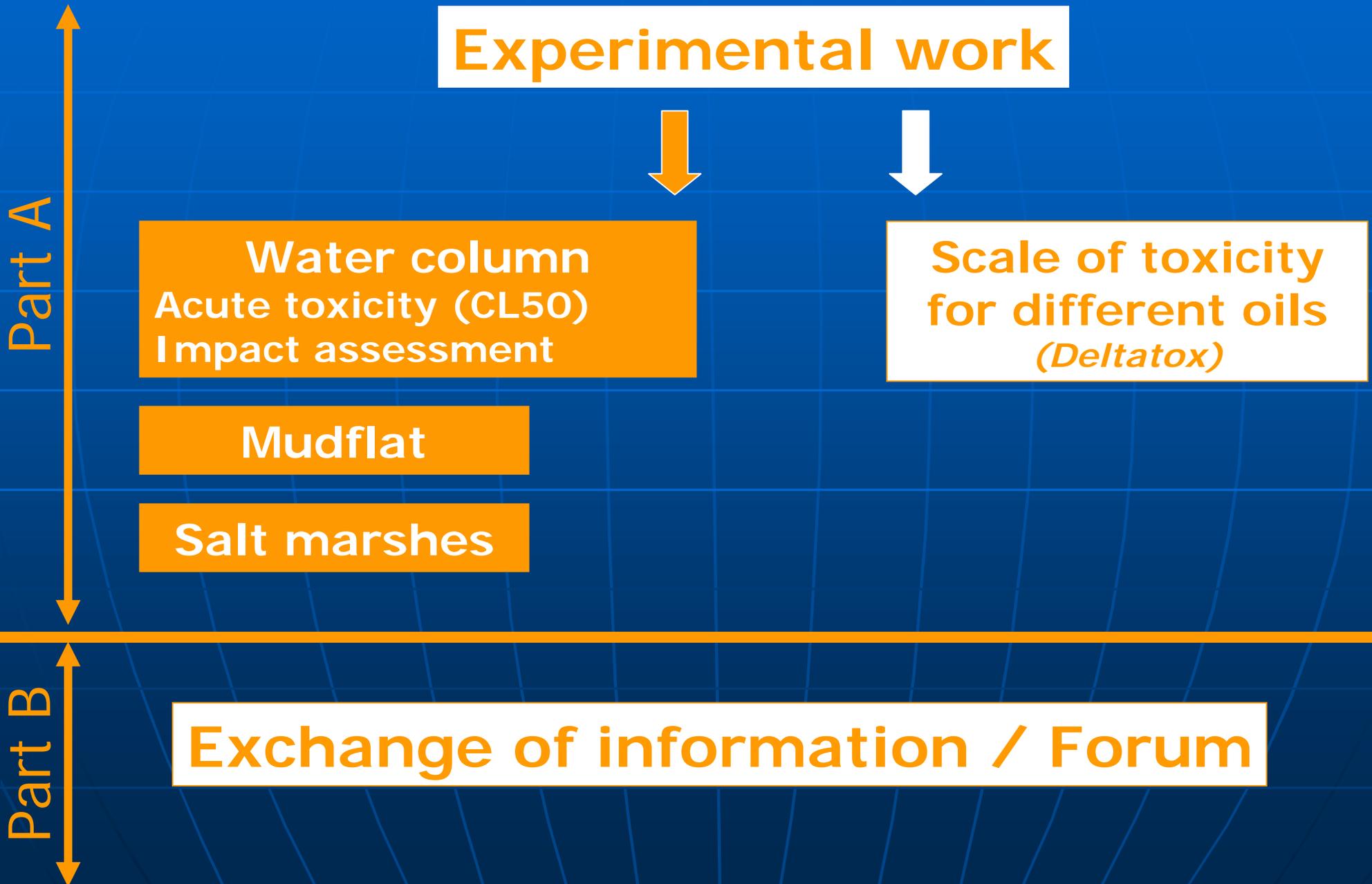
Mudflat

Salt marshes

Exchange of information / Forum

Part A

Part B





Part A- experimental work

A.1- Toxicity tests and impact assessment on fish (*pellagic & benthic*), Bivalves (*mussel – oysters*) and Crustaceum (?) (*shrimps*)

A.1.1- Water Column (Year n°1)

Toxicity:

⇒ *short term CL50 will be evaluate (1 oil + 2 dispersants);*

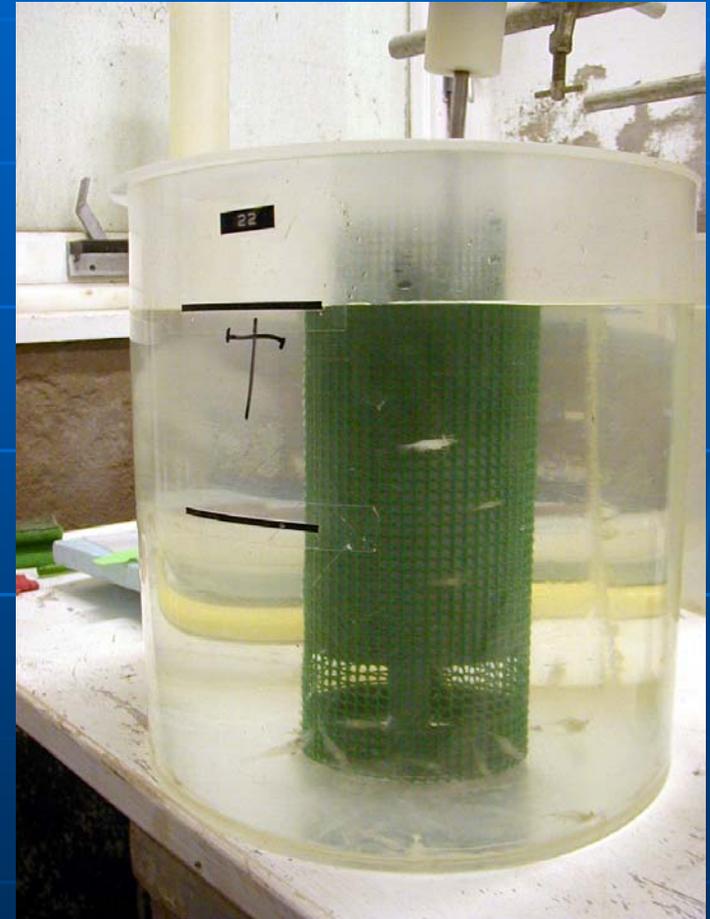
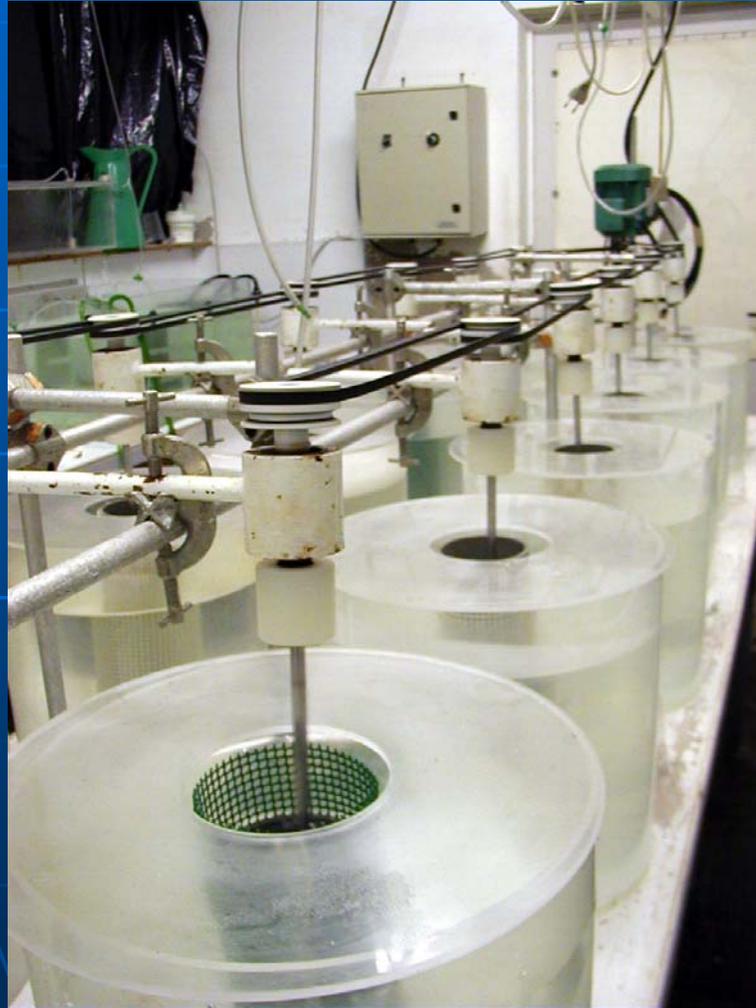
Impact:

⇒ *biomarkers (cellular mortality, enzymes –esterases, phenoloxydase...- lysozymes, phagocytose and glucose methabolism)*

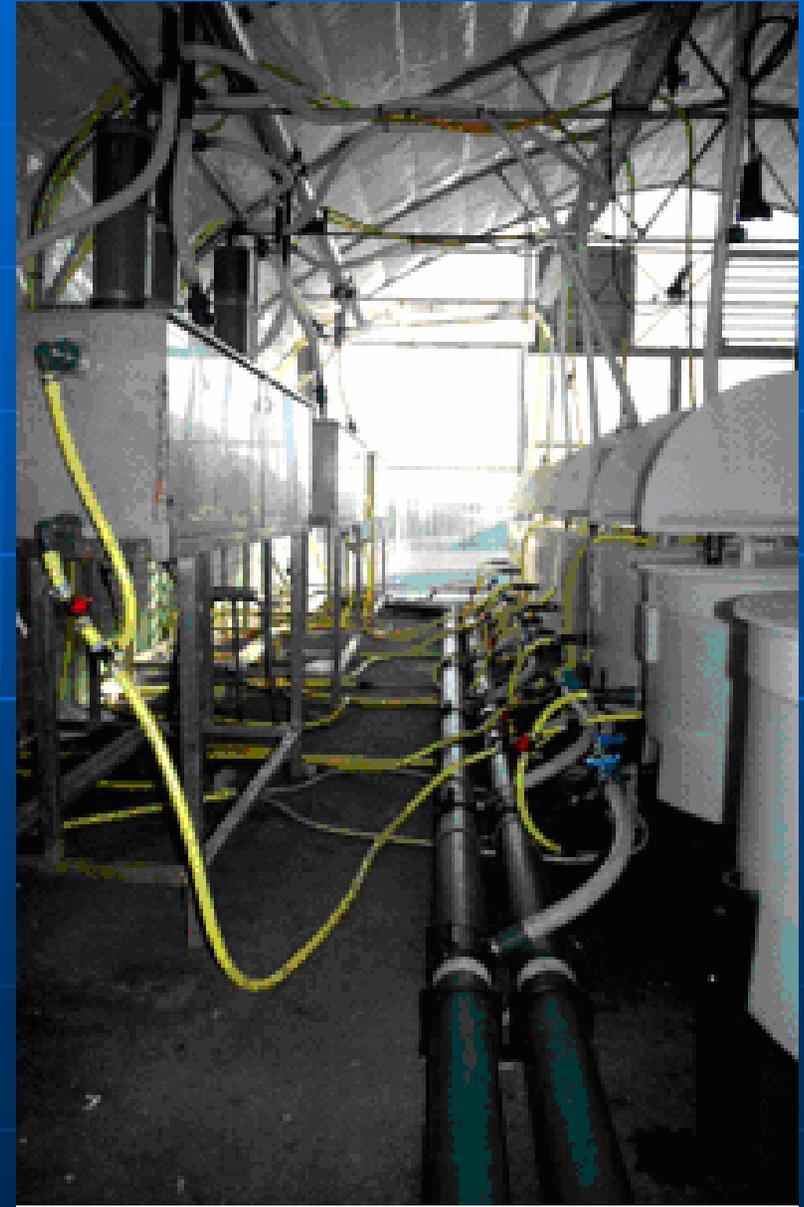
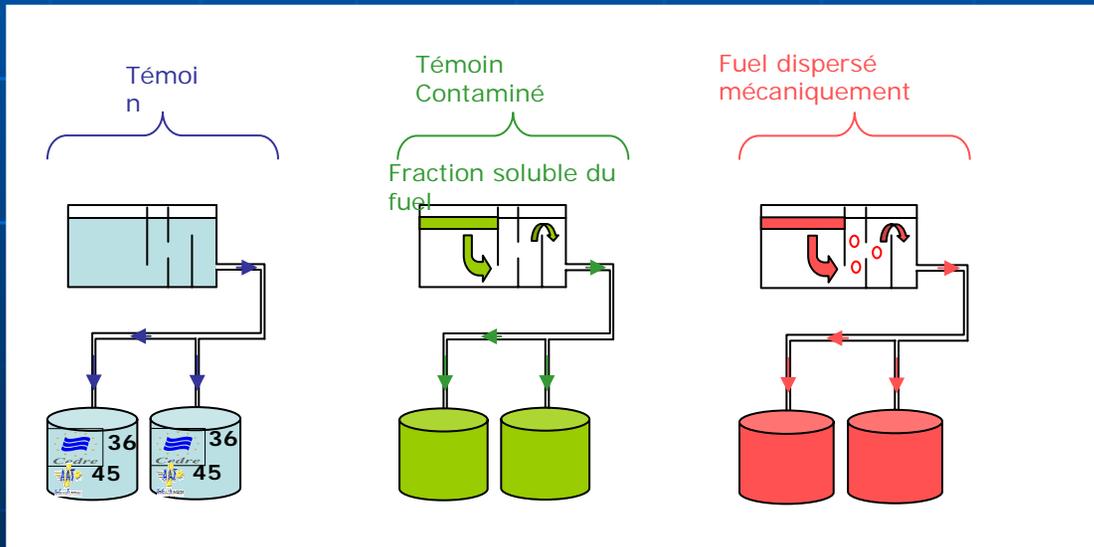
⇒ *2 weeks acclimatation; 24h of exposure; 2 weeks of recovery*

⇒ *control, non dispersed oil; dispersant alone; dispersed oil (with dispersant)*

Experimental setup for acute toxicity



Experimental setup for impact assessment



DISCOBIOL

PART A-experimental work

A.1.2- Tests on mudflats (Year n°2)

Using mesocosms held by the Crela

(with the experience of the current study « DHYVA »)



Views from a previous study on bioremediation on mudflat : EC pilot program 1997

Part A-experimental work

A.1.3- Tests on salt marshes (Year n°3)

In situ with DFO



Views from DFO bioremediation test 2002



1.1.4- In addition, possible link with another planned programme on the impact of dispersed oil in mangroves (French Antigua)

Experimental work



Water column
Acute toxicity (CL50)
Impact assessment

**Scale of toxicity
for different oils**
(Deltatox)

Mudflat

Salt marshes

Exchange of information / Forum

Part A

Part B



Part A-experimental work

**A.2-To assess the acute toxicity of several oils
(during year n° 1)**

A.2.1- Comparative assessment of the toxicity of different dispersed oils (Deltatox)

A.2.2- Tentative of classification of the oils according to their measured toxicity with consideration on their chemical composition

Experimental work



Water column
Acute toxicity (CL50)
Impact assessment

**Scale of toxicity
for different oils**
(Deltatox)

Mudflat

Salt marshes

Exchange of information / Forum

Part A

Part B

PART B- Exchange of information - Forum

Large exchange of the information issued from this experimental work and others in order to discuss the results, to enrich the knowledge, and to implement reliable robust and practical recommendations on the use of dispersant in estuaries and near shore areas: how to implement a NEBA in these areas.

Participation of responders to bring in the practical experience and real world observations.

This program opens on the definition of accepted criteria for the use of dispersants in coastal area....

..... and possibly IMO recommendations.