



# RESPIL - Response means to chemicals spilled at sea and environmental damage



# Background and rationale

- Are the current **knowledge and practices** sufficient to monitor and assess the **environmental status** following **accidental chemical spill at sea** ?
  - Can we propose additional methods based on **actual biological effects** with ecological relevance ?
  - Can these methods be used for ***in situ* monitoring** and recovery assessment **post-spill**
  - How to use them in a way to **harmonise communication** of the environmental status to decision-makers at the European level ?
- ⇒ Recommend their use and integration in **environmental monitoring guidelines** at the European level



# Respil in brief ...

- **Task ID-2.** Selection of chemicals and knowledge of their environmental impact
  - ✓ Use existing information from projects like HASREP, classification and hazard criteria defined within IMO/GESAMP, Bonn agreement, recent accidents in European waters etc...
  - ✓ Problem encountered → data found in literature do not apply for seawater conditions



# Task IDA2: Criterion for selection

**Risk is based on :**

Sea Traffic  
extent

Chemical's  
behaviour

Chemical's  
toxicity

**3 criterion for  
the selection :**

Most transported in  
the European Waters  
(tonnage & shipping  
frequency)

Floater

Aquatic  
toxicity  
appraisal

**Tools :**

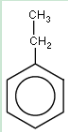
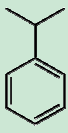
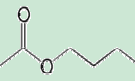
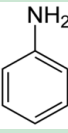
Chemical's sea traffic  
analysis:  
• Chemicals seaborne  
trade  
• Accidentology  
(HASREP, ECOPEL,...)

European  
Behaviour  
Classification  
(SEBC)

GESAMP/  
EHS  
Composite list  
of Hazard  
Profiles



# Task IDA2: suggestion for final selection

Nom	Chemical structure	SEBC Code	GESAMP					Mar-pol	Solubility g/100mL	Trafic Rank	Half-life in solution	BCF estimated from log kow	Acute Aquatic toxicity LC <sub>50</sub>
			A	B	C	D	E						
Ethyl benzene		FE	0	3	1	I	XX	Y	0,015	41	Half-life in marine mesocosm (Wakeham et al., 1983): •Spring (8-16°C): <b>20 days</b> •Summer (20-22°C): <b>2.1 days</b> •Winter (3-7°C): <b>13 days</b>	<b>Low</b> in aquatic organisms. BCF: 2.16	• <i>Daphnia magna</i> (24 h): <b>2.2</b> mg/L •Mysid shrimp (96 h): 5.1 mg/L
Cumene		FE	T	3	1	I	X	Y	0,0074	80	Half-life in an aerobic freshwater sediment/water test system (Williams et al. 1993): <b>2.5 days</b>	<b>Slight potential</b> to bioaccumulate in fish. BCF: 356	• <i>Daphnia magna</i> (24 h): <b>4.8</b> mg/L •Mysid shrimp (96 h): 1.2 mg/L
<i>n</i> -Butyl acetate		FED	0	2	0	I	X	Y	0,70	68	Half-life at 20 °C (HYDROWIN model US EPA, 2000): •at pH 9 <b>11,4 days</b> •at pH 8 <b>114 days</b> •at pH 7 <b>3,1 years</b>	<b>Unlikely</b> to be bioaccumulated. BCF for fish: 14	• <i>Daphnia magna</i> (24 h): <b>72,8</b> mg/L •Brine shrimp (24 h): 150 mg/L
Aniline		FD	0	3	2	II	XX	Y	3,4	24	<b>Short</b> half-life (i.e., up to a few weeks)	<b>Low</b> bioaccumulation potential	• <i>Daphnia pulex</i> (48 h): <b>0,1</b> mg/L

# Task IDA3

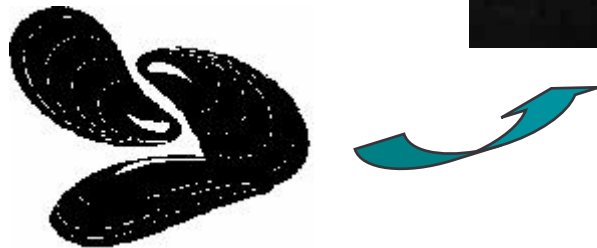
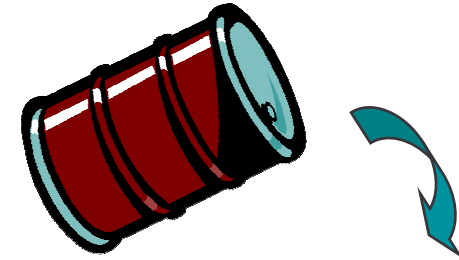
- **Task ID-3.** Experimental study in laboratory-controlled conditions
  - ✓ Realistic exposures of sentinel marine species to chemicals
  - ✓ Use of ecotoxicological methodologies (biological measurements) to assess environmental damage and recovery in sentinel species



... tissue diagnose & bioaccumulation levels

# Task IDA4

- **Task ID-4.** *In situ* validation using pilot mesocosm studies
  - ✓ Validate methodologies used in laboratory controlled-conditions for actual field operation
  - ✓ Carry-out exposures with sentinel species in floating cells using the selected chemicals –
    - ⇒ Physico-chemical behaviour in sea conditions
    - ⇒ biological measurements

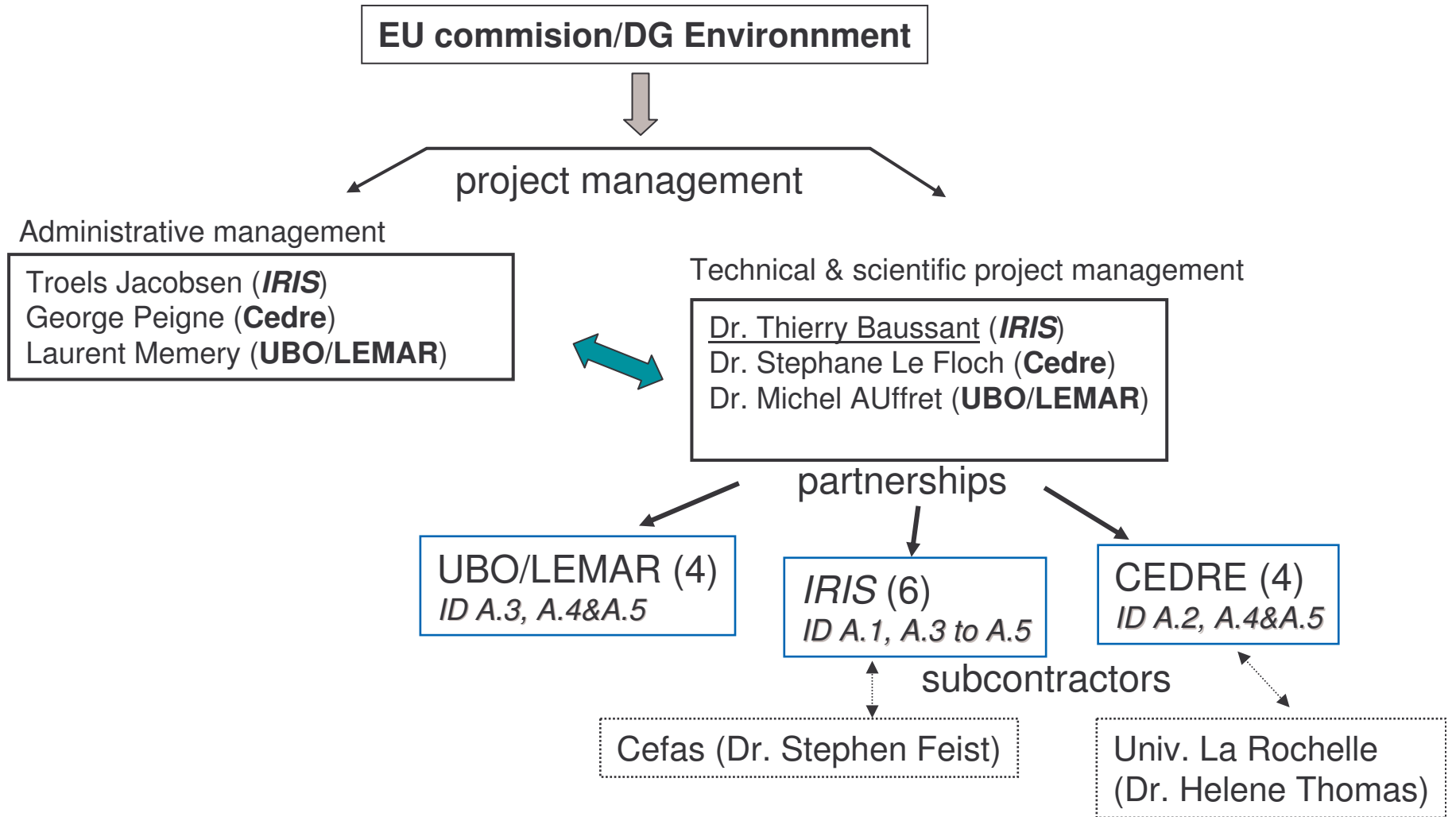


# Task IDA5

- **Task ID-5.** Dissemination and input to EU environmental guidelines
  - ✓ Integration of methodologies in current guidelines
  - ✓ Communicate results in a simplified way in a view to harmonise practises within EU Member States
  - ⇒ link with on-going EU-PRAGMA - <http://www.iris.no/pragma>)



# Organisation of the project



# Acknowledgements



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