



EUROPEAN COMMISSION  
Fifth RTD Framework Programme

Coordinator:  
CoNISMa  
Consorzio Nazionale  
Interuniversitario  
Per le Scienze del Mare

# BIOtechnologies from the DEEP

1. Consorzio Nazionale Interuniversitario per le Scienze del Mare (CoNISMa), 2. Istituto Sperimentale Talassografico - CNR Messina (IST-CNR), 3. TECNOMARE SpA di Venezia (TEC), 4. Laboratoire de Microbiologie Marine de Marseille (CNRS DR12), 5. PROTEUS Nimes (PROTEUS), 6. Department of Biological Sciences, University of Essex (VESSEX), 7. Natural Environmental Research Council, Southampton Oceanography Centre (NERC), 8. Technical University Braunschweig Institut für Mikrobiologie (TUBS), 9. Technische Universität of Berlin (TUB), 10. Technische Fachhochschule Berlin University of Applied Sciences (TFH-FBVIII), 11. Laboratory for Microbial Ecology Center for Ecological and Evolutionary Studies, University of Groningen (RUG), 12. University of Utrecht, Faculty of Earth Sciences (UTRECHT UNIVERSITY), 13. University of Patras, Department of Geology (UP), 14. Institute of Marine Biology of Crete (IMBC)

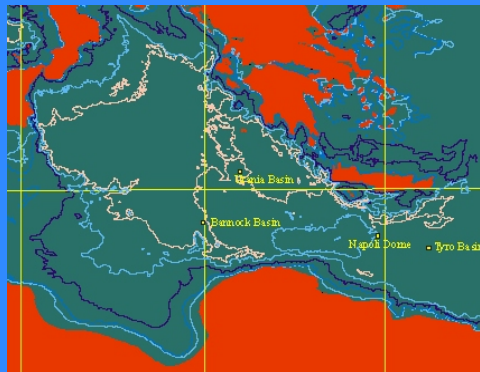
## OBJECTIVES

...before April 2004

The BIODEEP project aims at the exploration of unique habitats, namely the deep-sea, hypersaline anoxic basins (DHABs), and the isolation and culture of marine microorganisms, thereby offering new opportunities for discovery of novel chemicals with different potential applications of European interest. For such an aim, the project is based on a pluridisciplinary and integrated approach where several experienced laboratories from different countries offer their scientific and technical support in order to overcome the strategic and practical difficulties for DHABs monitoring and sampling, and for physiological, biochemical, genetic analyses of the samples as well as for fast contacting any interested end-user.

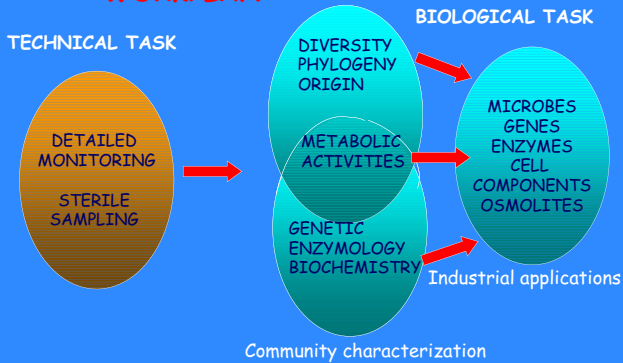
## THE DEEP SEA HYPERSALINE ANOXIC BASINS (DHABs)

The DHABs are unique deep-sea environments which originate from ancient subterranean salt deposits (evaporites) located at the bottom, that are the remains of hypersaline waters of the Miocene period (5.5 Million before present). The DHABs are characterised by a total salinity above 30%, absence of light, elevated pressure, variable pH values and ionic composition. The sharp density difference



between brines and normal seawater acted as a barrier for several thousand years, avoiding the oxygen exchange to the brines; therefore the brines become oxygen-free and rich in hydrogen sulfide. Some basins exhibit other environmental peculiarities (e.g. Urania basin has the highest concentration of sulfide among the Earth's aquatic environments; Discovery Basin has hydrocarbon seeps, and Urania west Basin has a mean temperature of about 45°C at the brine/sediment interface). Taken together, these factors make the DHABs among the most extreme environments on Earth.

## WORKPLAN



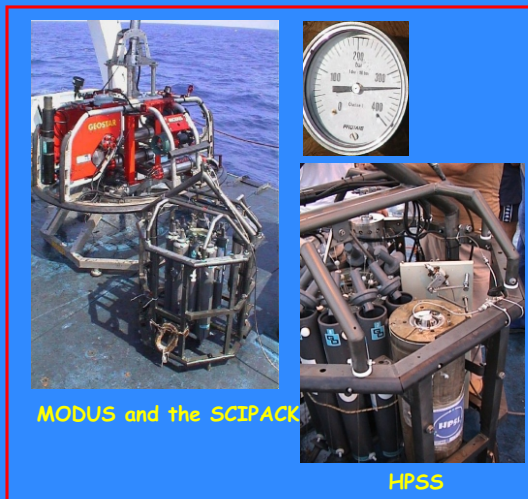
## TIME TABLE

WP	PHASE 1										PHASE 2										PHASE 3										PHASE 4									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
WP1	Detailed monitoring and sampling										Genetic analysis										Biochemical analysis										Industrial applications									
WP2	Detailed monitoring and sampling										Genetic analysis										Biochemical analysis										Industrial applications									
WP3	Detailed monitoring and sampling										Genetic analysis										Biochemical analysis										Industrial applications									
WP4	Detailed monitoring and sampling										Genetic analysis										Biochemical analysis										Industrial applications									
WP5	Detailed monitoring and sampling										Genetic analysis										Biochemical analysis										Industrial applications									
WP6	Detailed monitoring and sampling										Genetic analysis										Biochemical analysis										Industrial applications									
WP7	Detailed monitoring and sampling										Genetic analysis										Biochemical analysis										Industrial applications									

WP: Workpackage; C: Cruise; AR: Annual Report; Ws: Workshop

## RESULTS

...new INSTRUMENTS



BIOLOGICAL SAMPLES collected by maintaining the in situ conditions

