



II-7997 der Beilagen zu den Stenographischen Protokollen
des Nationalrates XVIII. Gesetzgebungsperiode

DIE BUNDESMINISTERIN
für Umwelt, Jugend und Familie
MARIA RAUCH-KALLAT
GZ 70.0502/191-Pr.2/92

A-1031 WIEN, DEN. 2. Dezember 1992.....
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1992 -12- 11
zu 3626/J

An den
Herrn Präsidenten
des Nationalrates

Parlament
1017 Wien

Die Abgeordneten zum Nationalrat Dr. Keppelmüller und Genossen haben am 14. 10. 1992 an mich eine schriftliche Anfrage mit der Nr. 3626/J betreffend Operational Modelling System gerichtet, die folgenden Wortlaut hat:

1. Beteiligt sich Österreich oder österreichische Firmen an dem EUREKA-Projekt OPMOD?
2. Wenn nicht halten Sie eine derartige Beteiligung nicht für sinnvoll?
3. Welche anderen modernen Technologien, wie z.B. Satellitendaten, werden in Österreich derzeit eingesetzt, um die Aufgaben der Gewässeraufsicht besser wahrnehmen zu können?

ad 1

Am gegenständlichen EUREKA-Projekt EU 429 beteiligen sich unter der koordinierenden Projektleitung der deutschen Firma

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Hydromod 16 Firmen und Forschungsinstitutionen aus folgenden Ländern: Deutschland, Finnland, Frankreich, Italien, Norwegen, Portugal, Spanien, Schweden. Österreich oder österreichische Firmen nehmen nicht teil.

ad 2

OPMOD wurde 1990 im Rahmen des EUREKA-Schirmprojektes EUROMAR mit einer 4-jährigen Laufzeit und einem operationalen Budget von ca. 6 Mio. Ecu eingerichtet. OPMOD (Operational Modelling System) zielt ab auf vernetztes "on-line" Monitoring und integriertes Modelling hydrologischer, meteorologischer und physikalischer Parameter und soll darüberhinaus insbesondere der zeitlich/räumlichen Vorhersehbarkeit bzw. Prävention von Naturkatastrophen, natürlichen Risiken und anthropogenen Störfällen in marinen und brackischen Ökosystemen (Mittelmeeren, Randmeeren, küstennahen marinen Regionen und Estuaren) dienen. OPMOD wurde gemeinsam von Hydromod und dem deutschen Institut für Meereskunde entwickelt, wird in 2 Phasen abgewickelt (I. Systemkonzeption, Entwicklung des Prototyps und Optimierung; gegenwärtig im Abschluß; II. Feldversuch: "In situ"-Applikation und regionale Optimierung; bis Ende 1994) und in enger Zusammenarbeit mit einer Reihe weiterer EUROMAR-Projekte (Fiesta; Mermaid; Seamos; Isle; Seastars; Visimar etc.) durchgeführt. Das Ziel von OPMOD ist die Entwicklung und spätere Vermarktung eines effizienten und über PC-Applikationen ausgesprochen benutzerfreundlich gestalteten Überwachungs- und Umweltkontrollsystems für ökologisch relevante hydrodynamische und physikalische Prozesse (Strömungs-, Salinitäts- und Temperaturverteilungsmuster etc.), natürliche Risikofaktoren (Sturm- und Springfluten, Treibgut, Eisbildungs- und Verbreitungsprozesse etc.) sowie anthropogene Störfälle und Umweltkatastrophen (Ölkatastrophen, Chemieunfälle etc.) in marinen Gewässern.

- 3 -

Wie wohl es eine der weiterführenden Ziele von OPMOD darstellt, das System in Zukunft auch für die Zwecke der Gewässeraufsicht und des Gewässerschutzes in großräumigen Binnengewässern und Flußsystemen verfügbar zu machen bzw. entsprechend zu adaptieren, dokumentiert der Umstand, daß am gegenständlichen Projekt ausschließlich Institutionen aus Meer- esanrainerstaaten teilnehmen, die primäre Intention und den Hauptanwendungsbereich des gegenständlichen Vorhabens.

Aufgrund der oben stehenden Ausführungen und angesichts des fortgeschrittenen Projektzeitpunktes messe ich einer möglichen Beteiligung Österreichs keine vorrangige Bedeutung bei.

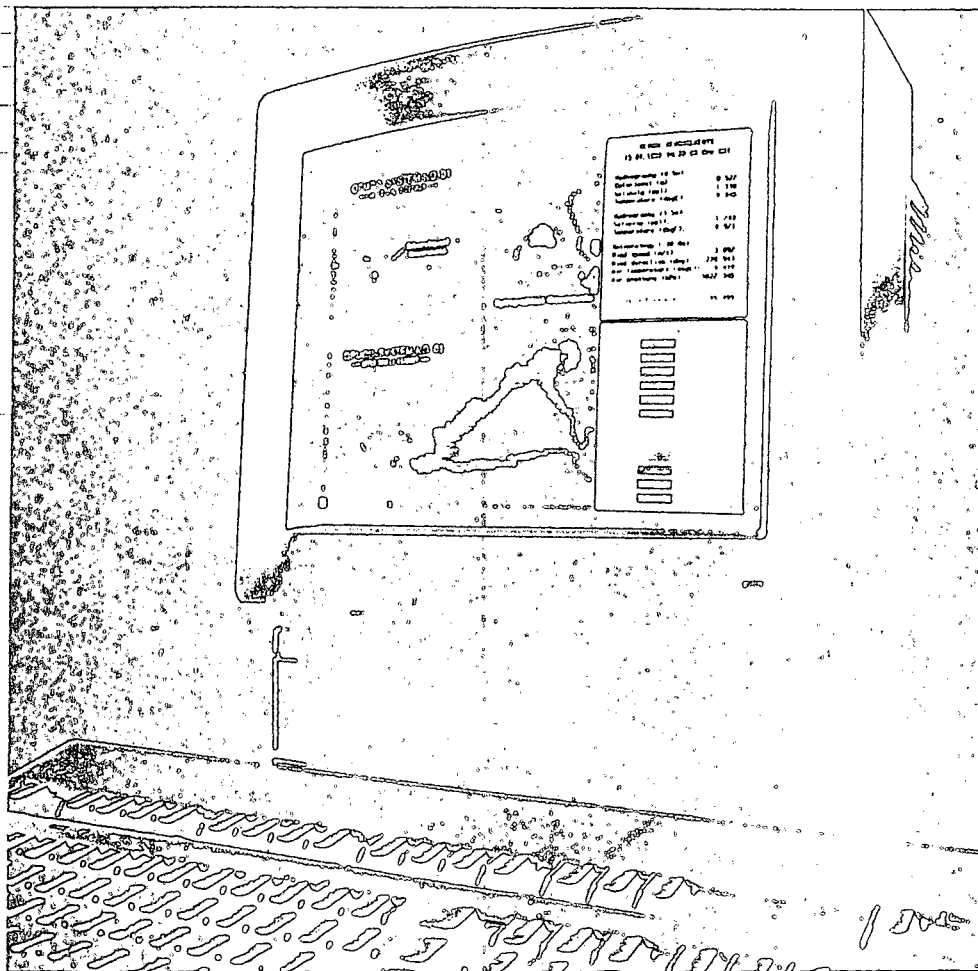
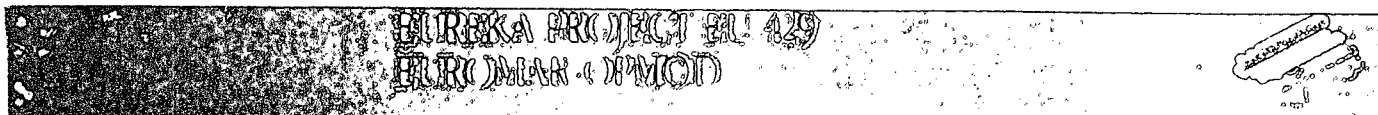
ad 3

Nach meinem Wissensstand spielen Satellitendaten für die Aufgaben der Gewässeraufsicht im nationalen Bereich eine eher untergeordnete Rolle.

Ich darf darauf hinweisen, daß für die Durchführung der Gewässeraufsicht gem. §§ 130 ff WRG primär der Landeshauptmann zuständig ist.

Zur Information werden als Anlage 1 die EUREKA-Projekturzbeschreibung von OPMOD und als Anlage 2 der im Herbst 1990 auf EUREKA-Ebene eingebrachte Projektantrag beige-schlossen.

Maria Bauer-Kalchauer



PLOTTING COASTAL POLLUTION BEFORE IT SPREADS

Computer modelling of regional seas and coastal waters will provide continuous information about the state of the water along an entire stretch of coast.

Public authorities and major industrial concerns need early warning of natural catastrophes. In order to respond effectively to a catastrophe, whether a storm surge or an oil spillage, they also need to be able to monitor and forecast its progress over a wide area. This is the goal of OPMOD, a EUREKA project running under the EUROMAR umbrella.

Reliable data concerning currents, water levels, water temperature, drifting objects, the spread of pollutants, and other dynamic

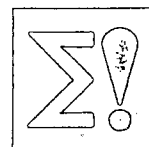
parameters is currently available only in limited areas, or over a limited time period. Devices capable of measuring these quantities have in many cases already been developed, but the cost of installing enough devices to provide continuous data along stretches of coastline is prohibitive.

Filling the gaps in existing technologies

The answer, according to a group of companies and research centres from eight European countries, is to use existing resources in new ways. Through EUREKA they have come together to develop a system which will combine proven and

ANLAGE 1

EUREKA



comparatively low-cost technologies to provide solutions to a range of problems in the management of rivers, estuaries, coastal waters and inland lakes and seas. OPMOD stands for operational modelling system, and will feed data received from a limited number of measurement devices into a computer model which will 'fill in the gaps' so as to provide a temporally and spatially continuous overview, on-line and in visual form.

As OPMOD was conceived as part of the wider EUROMAR umbrella, the partners envisage a close inter-relationship between it and as many as ten other EUROMAR projects, particularly cases where OPMOD may be valuable in verifying field data or filling the information gaps which occur in monitoring systems currently relying solely on measurement.

As well as routinely monitoring actual and forecast conditions, the system may be run interactively. The operator will be able to 'interrogate' the model as to the outcome of any possible event, providing a major new source of information to agencies responsible for disaster preparedness.

Dr Kurt Duwe of Hydromod, the German company which initiated the project, gives an example: "The system will be able to forecast the spreading of pollutants from outlets. So if you had a catastrophe in an estuary, you could make forecasts of where the polluted water will be in 6 or 12 hours." OPMOD is also likely to find a number of further applications in the study of long-term environmental changes to coastal regions.

A user-friendly system for wallet-friendly computers

OPMOD's operational system will consist of measuring devices, datalinks, data evaluation, numerical models, and graphic display. Data gathered at hydrographic stations in the field will be automatically collected and verified before being fed into the simulation computer. While today's modelling systems typically need large mainframe computers to support them, OPMOD will run on much cheaper microcomputers. And it will be easy to use for non-expert staff, with a windowing graphic display and operator interface. Each element of the system will be configured to meet the requirements of the specific environment being managed and the particular task to be performed.

Modular structures and open design are central to the system's development. Phase 1 of the project, which will be completed in 1991, has included the definition of a standard for the transfer of data between the various hardware and software components.

Co-ordinated by Hydromod, OPMOD brings together sixteen organisations with commercial and academic expertise in the fields of remote sensing, data transmission, and the numerical modelling and simulation of complex processes in a variety of marine environments. With so many organisations involved, trans-border co-operation is not without its own problems.

The benefits are substantial, however. Most important, say the company, has been the range of different experiences brought to the project by the various partners. "Different approaches are needed for modelling the North Sea and the Baltic, where there are no tides, for example. In a similar way a variety of models is needed to predict the movement of oil, of pollution, and of temperature and salinity gradients." Hydromod believes that the combination of these models will create a product with world-wide sales potential, to be on the market in 1993.

Project Profile

EU 429	
Title:	EUROMAR-OPMOD Operational modelling of regional seas and coastal waters
Announced at:	Rome 1990
Participants:	Germany: HYDROMOD / Institut für Meereskunde (Universität Hamburg) / Salzgitter Elektronik GmbH France: Laboratoire d'Hydrau- lique de France Finland: Finnish Institute of Marine Research / Environmental Assessment Centre of Finland Norway: OCEANOR A/S / Nansen Remote Sensing Centre Portugal: Instituto Superior Tecnico Lisboa Sweden: Swedish Meteorological and Hydrological Institute Spain: Centre d'est Av. de Blanes / Europroject, S.A.
Main contact:	HYDROMOD Dr Kurt Duwe Tel: +49 41 03 130 57
Estimated cost:	6 MECU
Time scale:	4 years

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Project number 429

EUREKA PROJECT/PROPOSAL
(Circulated project)

PART I : PROJECT INFORMATION

Project title

EUROMAR-OPMOD.

OPERATIONAL MODELLING OF REGIONAL SEAS AND COASTAL WATERS.

Project description or technological area of interest

The task of the project is to develop an operational system consisting of measurement devices, data links, data evaluation and numerical models. The system should provide on-line visual overviews and information of acquired data, the actual state of dynamic quantities (e.g. water levels, currents, oil spills, ice, drifting objects, spreading of chemicals as a result of accidents) as well as short term forecasts of the a.m. quantities.

The system will be developed for estuaries, coastal waters and marginal seas individually by the participants but with close coordination as individual tasks, dynamic processes as well as fields of application, standards and interests vary locally. Each participating group (e.g. scientific institute and commercial partner) will use their own models, data acquisition and evaluation software but a standard will be defined to ensure routine data transfer between the different OPMOD components as well as being able to combine model modules from different participants.

The system will acquire routinely hydrographic and meteorological data, control values and additional data, if required. They will be transmitted by data link measures for further automatic evaluation, error correction and control. These data will then be transformed in order to use them as input data (boundary conditions, forcing and control data) to operate numerical models continuously and simultaneously. Numerical models will calculate the actual state of the parameters of interest and well as short term forecasts (12-24 hours).

In the event of interest or an emergency, an operator may start additional dispersion models which will use the forecasted data as input.

Continuous checking of system status, breakdowns, failures and the quality of incoming data will be carried out via alarm, breakdown buffer and emergency routines. The quality of model results will be checked by routine comparisons with the control data acquired and an automatic model restart in the event of miscalculation of the actual state will be included.

The system will be flexibly designed to cover a broad range of application interests. It will be built up using already developed and tested hardware and by incorporating existing and verified numerical models. Continuous incorporation of new ideas and techniques both in data acquisition and numerical modelling will be possible.

The information acquired by measurement devices and model

ANWAE 2

calculations should be routinely displayed using colour graphics and multi-window software.

The following development phases are planned:

Phase I (Planning, set-up and dry tests) - 2 years

- system architecture and design
- planning of internal organisation and interfacing
- construction of data link and transfer hardware
- development of evaluation and control software
- incorporation of models
- incorporation of display software
- office tests with simulated data acquisition.

Phase II (Operational tests with field data) - 2 years

- adaptation to natural areas
- individual problem definition
- individual hardware layout
- set-up and installation
- operative system test runs
- incorporation of individual interactive control modules
- incorporation of individual display and information spreading
- routine operation.

Participants

F. R. GERMANY: HYDROMOD (Modelling Dept.) (main)
 F. R. GERMANY: INSTITUT FUER MEERESKUNDE (UNIVERSITY OF HAMBURG)
 F. R. GERMANY: SALZGITTER ELEKTRONIK GMBH
 FINLAND: FINNISH INSTITUTE OF MARINE RESEARCH
 FINLAND: TECHNICAL RESEARCH CENTRE OF FINLAND (Reactor Laboratory)
 FRANCE: LABORATOIRE D'HYDRAULIQUE DE FRANCE (LHF)
 ITALY: ARS
 ITALY: ISTITUTO DI FISICA DELL'ATMOSFERA (IFA)
 ITALY: ISTITUTO UNIVERSITARIO NAVALE (IUN)
 NORWAY: NANSSEN REMOTE SENSING CENTRE (NRSC)
 NORWAY: OCEANOR AS
 PORTUGAL: INSTITUTO NACIONAL DE METEOROLOGIA E GEOFISICA (INMG)
 PORTUGAL: INSTITUTO SUPERIOR TECNICO LISBOA (IST)
 SPAIN: CENTRE D'ESTUDIS AVANCATS DE BLANES (CEAB)
 SWEDEN: SWEDISH METEOROLOGICAL AND HYDROLOGICAL INSTITUTE (SMHI) (Hydrological and Oceanographical Division).

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Estimated costs

The total costs are estimated to be 4 MECU.
 The contribution of each participant to phase 1 is currently agreed as follows:

FINLAND:

- FINNISH INSTITUTE OF MARINE RESEARCH: 9.5%
- TECHNICAL RESEARCH CENTRE: 5.3%

FRANCE: LHF: 9.2%

F. R. GERMANY:

- HYDROMOD: 6.9%
- INSTITUT FUER MEERESKUNDE: 4.7%
- SALZGITTER ELEKTRONIK: 5.0%

ITALY:

- ARS/IUN/ISTITUTO DI FISICA: 21.1%

NORWAY:

- NRSC: 10.6%
- OCEANOR: 10.6%

PORTUGAL: IST: 2.6%

SPAIN: CENTRE D'ESTUDIS AVANCATS DE BLANES: 13.2%

SWEDEN: SWEDISH METEOROLOGICAL AND HYDROLOGICAL INSTITUTE: 1.3%.

Timescale

The overall time scale is as follows:

Phase 1:

- system architecture and design: 8 months
- development of a prototype: 14 months
- dry tests and optimization: 4 months.

Phase 2:

- set-up of a field prototype: 6 months
- adaptation to regional requirements: 8 months
- field tests and optimization: 10 months.

Technological developments envisaged

Presently running and rarely existing operational systems usually operate in large research centres or governmental authorities on large (main frame) computers. For routine control and management purposes no operational combination of models and measurement devices are known. OPMOD will operate on smaller and cheaper computers (micros, work stations, Personal Computers (PCs) and will be individually adapted to regional requirements.

The main advances in technology aimed for OPMOD are:

a) routine operating control and measurement devices with a broad band of application possibilities. As models alone are able to calculate back forecasts or case studies only and have very limited forecast possibilities due to the lack of data, OPMOD will significantly enhance forecasting ability.

b) Synoptic and permanent information with a comparatively low and cheap measurement effort. The acquisition of synoptic information with measurement devices alone is very costly as well as equipment and personnel intensive. This can be done for a singular task only. Facing the high variability of flow parameters and transport patterns in coastal waters, estuaries and regional seas, a continuous monitoring on the relevant space and time scales is an impossible attempt which cannot be financed.

c) Reliable forecast data as well as the actual distribution of flow parameters for accident control and catastrophe management. Accidents occur randomly in space and time and therefore it is almost impossible to acquire reliable information for decision making. OPMOD will provide such information optionally by running interactive operated transport models.

d) Combination of field and case studies. OPMOD will provide operational back forecasts and forecasts for a respective area and defined tasks but is also designed to be open for additional requirements by using interactive operated model segments (e.g. for case studies).

e) Reliable field data and model results for further information processing, spreading and display. The data acquired and produced by OPMOD are useful for many other tasks which are not directly involved during the set-up of an OPMOD system. The system will be designed for additional hardware and software which can use the information produced.

f) Individually designed information display. The data produced by OPMOD will be processed and displayed according to individual tasks and necessities. The information will be displayed by high-resolution colour graphics in such a way as to be easy to understand and capable of interpretation by users who are not necessarily experts in geo or hydraulic sciences.

g) Open for individual and future developments in modelling and measurement techniques. The data acquisition hardware and software will be designed open for interfacing additional and newly developed instruments. Standardization of data transfer between instruments and models of the various OPMOD components and systems according to international and EUROMAR standards is planned. The modular construction of the system will easily enable hardware or software to be added or included. This considerably enhances the application possibilities.

Relationship to other European technological co-operation programmes
According to present knowledge and the state of EUROMAR projects, relationships are envisaged with:

- FIESTA (with respect to field data quality standards)
- MERMAID (as the information gaps naturally present in pure measurement monitoring systems can be filled by including interfacing to the OPMOD model section)
- SEAMOS (as for MERMAID)
- ISLE (similar tasks)
- SEASTARS (inclusion of remote sensing data)
- ATOMAR (inclusion of airborne pollutants as external sources and boundary conditions)
- MARSIS (as for SEASTARS)
- VISIMAR (inclusion of visualization techniques into the display section)
- MARACOUS (input data for sediment and suspended matter model modules)
- BIMS (as for MARACOUS).

This number of relationships also illustrates OPMOD's wide application possibilities as well as its very open design. In addition, close relationships are possible with a considerable amount of MAST proposals. Possible cooperation should be sought after the respective MAST projects are in operation and according to their progress. Relationships with international, national or local programmes related to the tasks and possibilities of OPMOD will be sought by the participants on an individual basis.

Financial or other contribution of each participant to project

- Terms of reference: all participants
- Market: HYDROMOD
- Evaluation of total system: HYDROMOD
- Conceptual design: all participants
- Test conceptual components: HYDROMOD
- Integration: all participants
- Project coordination: HYDROMOD.

The financial contribution (MECU) of each participant during Phase I (development) will be shared as follows (percentages denote the government funding shares):

FINLAND:

- FINNISH INSTITUTE OF MARINE RESEARCH: 0.36 MECU = 80%
- TECHNICAL RESEARCH CENTRE OF FINLAND: 0.20 MECU = 80%

FRANCE: LHF: 0.35 MECU = 50%

F. R. GERMANY:

- HYDROMOD: 0.26 MECU = 50%
- INSTITUT FUER MEERESKUNDE: 0.18 MECU: 100%
- SALZGITTER ELEKTRONIK: 0.19 MECU = 50%

ITALY: ARS/IUN/ISTITUTO DI FISICA: 0.18 MECU = 50%

NORWAY:

- NRSC: 0.40 MECU = 30%
- OCEANOR: 0.40 MECU = 30%

PORTUGAL: IST: 0.10 MECU = 100%

SPAIN: CENTRE D'ESTUDIS DE BLANES: 0.50 MECU = 0%

SWEDEN: SWEDISH METEOROLOGICAL AND HYDRAULIC INSTITUTE: 0.05 MECU = 30%.

The financial cost of Phase II (field installation and tests) cannot yet be defined as it will depend on the local requirements and tasks of the OPMOD systems to be installed.

0.2. Relevant qualifications of participants

Hydromod was founded in 1987 as an independent German company and is involved in all kinds of numerical modelling in regional seas, estuarine waters, estuaries and inland waters as well as in system

development, consulting services for the off-shore industry, project management, consulting and technical services for water quality, coast and environmental management. The company initiated the OPMOD project together with the IFM.

The company has developed, verified and tested two and three-dimensional current, transport and dispersion models which are available for inclusion into the OPMOD system.

INSTITUT FUER MEERESKUNDE (IFM) - a university institute involved in all kinds of ocean research and modelling such as (but not limited to) ocean, marginal seas, coastal waters and estuarine modelling, climatological research, oceanographic surveys, polar research and remote sensing techniques. Three-dimensional models of marginal seas, coastal waters and estuaries were widely applied and can be included in OPMOD.

SALZGITTER ELEKTRONIK - the company was founded in 1948 and is active in the fields of ship automation, microelectronics, cable measuring technique and measuring technology in oceanography and environmental fields. In this field particularly there is close cooperation with scientific institutes such as the UNIVERSITY OF KIEL and the KIEL MARITIME RESEARCH INSTITUTE. In 1984, the company strengthened with its own scientists their development activities from which today a new generation of CTD profilers with high speed and precise sensors as well as controlled samplers, acoustic current meters and other products for marine research and measuring are the result. SALZGITTER ELEKTRONIK has been participating in EUROMAR-MERMAID since 1988.

FINNISH INSTITUTE OF MARINE RESEARCH carries out basic and applied research on marine sciences in the fields of physical, chemical and biological oceanography. Following the construction of a new 1,600 g.r.t. ice-strengthened research vessel in 1989, its activities have been extended from the Baltic Sea towards the study of other seas, in particular polar and sub-polar regions. The main research areas in physical oceanography are dynamics and hydrography, wind wave generation, heat balance studies and the study of sea ice. Numerical modelling of the respected processes are included in the programmes as well as the use of satellite remote sensing. Chemical oceanography includes studies of the bio-geochemical cycle of nutrients, organic compounds and trace elements. All the models are available for inclusion in OPMOD.

TECHNICAL RESEARCH CENTRE OF FINLAND. Founded in 1942, 34 laboratories, 2,700 employees, 78% of costs financed by external commissions. Reactor Laboratory founded in 1962 to utilise and promote applications of radiation technology equipped with a 250 kW research reactor. Since 1971 about 60 tracer studies have been carried out to show and estimate the transport and dispersion of waste water in water bodies. 2D models for water currents, dispersion and environmental effects developed and applied since 1974 to more than 50 case studies in FINLAND and abroad, 3D models since 1983 to about 20 case studies. Close cooperation with THE NATIONAL BOARD OF WATERS AND THE ENVIRONMENT has coupled the applications to meet practical needs and has facilitated the careful validation of models.

LABORATOIRE D'HYDRAULIQUE DE FRANCE. LHF is a consulting firm set up in 1987 by industrial and university partners in Grenoble, FRANCE. Its major activity is the conception, development and integration of advanced modelling systems for the numerical simulation of complex hydraulic and environmental processes. It is deeply involved in 2D and 3D modelling of coastal, estuarine and riverine waters. It has developed and is continuing to

develop industrial software available for inclusion in the OPMOD framework.

NANSEN REMOTE SENSING CENTRE. NRSC is a non-profit making Environmental Research Centre affiliated to the UNIVERSITY OF BERGEN. The overall aim of NRSC is to perform interdisciplinary research emphasising remote sensing and modelling of natural scientific problems. NRSC is the owner of a limited company, TERRA ORBIT A/S which has been set up to commercialize the results of research projects conducted at the NRSC.

NRSC experience in short term semi-operational modelling includes application of a quasi-geostrophic layered ocean model to the Norwegian Continental Current/the Norwegian Continental Shelf and a dynamic thermodynamic ice model covering the Barents Sea. Techniques for proper assimilation of in situ and remote sensing data into such models is a focused area of research at NRSC. OCEANOR is a private company founded in 1984 for environmental monitoring, analysis and forecasting services. It has developed one, two and three dimensional models of ocean currents and oil spill simulation models. These have been applied for the North Sea and Norwegian coastal waters.

INSTITUTO SUPERIOR TECNICO LISBOA (IST) is the engineering faculty of LISBON TECHNICAL UNIVERSITY, being the largest engineering faculty in PORTUGAL. In the Civil Engineering Department (Fluid Mechanics Division) work is presently being carried out on hydrodynamics of tides by 2D and now also 3D models, hydrodynamics of surface waves and transport models using Lagrangian and Eulerian/Lagrangian schemes.

The CENTRE D'ESTUDIS AVANCATS DE BLANES (CEAB) is a research institute, part of the SPANISH CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS under the supervision of the MINISTRY OF EDUCATION AND SCIENCE. The activities of the CEAB cover four different fields: Oceanography, Marine Ecology, Artificial Intelligence and Astrophysics. The staff numbers about 50, half of whom are scientists and graduate students carrying out their Ph.D. research. The Oceanography Department specializes in the study of bio-geochemical cycles of nutrients, carbon and oxygen, covering all the aspects of relevance to determine sources, sinks and cycling within the water column, the air and the sediments. Phytoplankton, bacterioplankton and microzooplankton are also being studied as part of the biota responsible for most of the cycling of such elements.

One main line of research is the modelling of the pelagic system, particularly nutrient/carbon/oxygen fluxes and their influence on the plankton populations, the physical factors that contribute to such fluxes and their impact on processes that control the global climate. A second topic receiving great attention is the development of expert systems used by database systems for the purpose of both model building and validation and of plankton taxonomy.

The SWEDISH METEOROLOGICAL AND HYDROLOGICAL INSTITUTE (SMHI) is a government agency subordinated by the MINISTRY OF COMMUNICATIONS. Its main functions include meteorological, hydrological and oceanographical services to other government bodies, industry and commerce, local authorities, new media, etc. SMHI staff is about 900, 475 of whom work at the headquarters in Norrköping. The institute has about 200 specialists in meteorology, hydrology, oceanography, computer programming, measurement techniques and instrumentation. In the oceanographical field, SMHI specializes in the study of

water transport, water stratification as well as the physical and chemical characteristics of the waters surrounding SWEDEN (the Baltic Sea, the Kattegat and the Skagerrak). The institute participates in the monitoring of these waters through regular cruises with the research vessel R/V ARGOS. Remote sensing techniques are developed at the institute.

SMHI frequently uses advanced one, two and three dimensional mathematical models in the study of, for example, water exchange, circulation and pollution dispersion in regional seas, coastal waters and inland waters. SMHI give consultancy and technical services to e.g. industries and municipalities. Research is being carried out in the oceanographic field regarding the modelling of various variables. Daily forecasts are made of wave heights, currents and ice conditions.

A.R.S. Founded in 1975, A.R.S. is a joint-stock company of the ENI Group (ENTE NAZIONALE EDROCARBURI - Hydrocarbon National Corporation), involved in the modelling of atmospheric and marine pollution. Three dimensional models for regional seas and for the treatment of coastal waters are under development to be included in the OPMOD project.

The ISTITUTO DI FISICA DELL'ATMOSFERA (I.F.A.) (Institute of Atmospheric Physics of the C.N.R.) is involved in the studies of physical processes of the atmosphere and ocean. Its scientists are particularly skilled in marine modelling of coastal circulation.

The NAVALE UNIVERSITY INSTITUTE (I.U.N.) works on oceanographic studies, particularly in the acquisition and processing of data gathered by marine campaigns. In this context, I.U.N.'s presence in OPMOD is well justified.

1. Status of agreement between participants

Agreements between some of the participants are being prepared and will be finalized when the individual project contributions have been defined.

PART II : ADDITIONAL MEASURES REQUESTED

2. Additional measures requested

For Phase 1:

Additional funds should be acquired from the local participants to enable them to perform professional coordination and standardization of the individual OPMOD components and contributions. In particular, this implies travel expenses, costs for the organisation of meetings and visits and refunds for coordination efforts.

Initially (1987) OPMOD was planned and calculated to become operative with considerably fewer participants. The applied funding of the participants now operative were calculated according to the previous constellation of 4 to 5 participants. During the MODELS working group meeting in Copenhagen in spring 1989, several EUROMAR projects proposed separately were joined

under the roof of OPMOD, which dramatically enhanced the

coordination effort.

Additionally, specific funding proposals for the coordination and running of meetings and for the coordination and standardization of even the smaller OPMOD project were totally cut by the local funding authorities. As this task is not

primarily of commercial interest, private companies should receive 100% refunding.

The OPMOD participants wish to recommend that EUREKA, EUROMAR and national funding authorities support the coordination tasks and standardization proposed as otherwise the chances of achieving a real common European project with joint work and results will be considerably reduced or limited to selected participants.

For Phase 2:

To be defined with the area and task of application has been clarified.

3. Competent authorities
Not applicable.
4. Authorities responsible for progress report to High Level Group
The INSTITUT FUER MEERESKUNDE will report to the EUREKA Secretariat which is responsible for issuing reports to the High Level Group.

PART III : OPTIONAL SUPPLEMENTARY INFORMATION

5. Application/market
Applications:
 - operational monitoring of regional seas, coastal waters and estuaries, extendable to inland waters
 - general purposes and special tasks in coastal, water quality and environmental management
 - control purposes
 - catastrophe control and management
 - supervision and control
 - routine information systems
 - engineering design and construction purposes
 - general consulting and decision-making.
 Market:
 - a promising market for governmental authorities and private industry
 - a limited market for scientific research.
 There is a recognised world need for operational, low cost systems.
6. Location of development work
OPMOD systems will be developed in the local facilities and in the countries of the participants.
Coordination between the participants and the definition of standards will be carried out during meetings, visits and probably exchange of staff.
7. Where and by whom is development to be exploited initially
The idea, preliminary design and feasibility developed and proposed by HYDROMOD and the INSTITUT FUER MEERESKUNDE.
8. Partners sought
Yes: For Phase 2 (field installations and tests), governmental authorities or private companies are sought who are interested in installing an OPMOD system and defining specifications and requirements according to their individual interests and tasks.
Integration into existing monitoring nets or measurement devices

and telemetric systems which can be upgraded according to the OPMOD requirements is preferred, to lower hardware, set-up, calibration and installation efforts and costs.