

THE GIRMED DATABASE PROJECT : PRESENT STATUS AND FUTURE PROSPECTS

Hervé Thebault^{1*}, Mireille Arnaud¹, Anne-Sylvie Pruchon¹, Dominique Calmet²

¹ Institut de Protection et de Sûreté Nucléaire (IPSN), Laboratoire d'Etudes Radioécologiques Continentales et de la Méditerranée, BP 330, 83507 La Seyne/mer Cedex, France

² Institut de Protection et de Sûreté Nucléaire, Laboratoire de Mesure de Radioactivité de l'Environnement, Bt 501, Bois des Rames, 91400 Orsay Cedex, France

Abstract

During the CIESM congress in 1988, the Marine Radioactivity Committee decided to launch a co-ordinated research program called Global Inventory of Radioactivity in the MEDiterranean Sea (GIRMED). It was then decided in 1990 to set up a database of radionuclide concentrations for the most representative Mediterranean marine indicators and for the time period preceding and following to the Chernobyl accident (1986-1992). The current status of the database is reported and the data volume and distribution are discussed. Recommendations for a further step in the GIRMED project, including user-friendly information access implementation, are proposed.

Keywords: radionuclides, Mediterranean Sea

Introduction

During the Congress of the International Commission for the Scientific Exploration of the Mediterranean Sea (CIESM) held in Athens in 1988, the Marine Radioactivity Committee decided to launch a co-ordinated research program called Global Inventory of Radioactivity in the MEDiterranean Sea (GIRMED) (1). Such a programme seems essential in the context of the Barcelona Convention in particular after the major event represented by the Chernobyl accident. The original main objectives of GIRMED were:

- intercalibration of sampling and measuring procedures from laboratories involved in monitoring networks of radionuclides in the marine environment at national scale.
- selection of bioindicators reflecting radioactivity levels in the Mediterranean Sea
- status reports on time trends and distribution of artificial radionuclides present in the sea water, sediments, and marine organisms.
- evaluation of partition coefficients of radionuclides between water, sediments and organisms,
- study of radionuclide transfer to human populations from the marine environment.

During the 1990 Marine Radioactivity Committee meeting in Perpignan (France), the GIRMED progress report pointed out that quality assurance of radionuclide measurements was achieved through the intercalibration exercises regularly organised by the International Atomic Energy Agency (IAEA) with the participating laboratories (2). In parallel, a complete inventory of existing land-based nuclear activities around the Mediterranean Sea (and the Black Sea) was set up, as potential sources of radionuclide releases to the marine environment (3). It was also decided during this meeting to set up a data base of radionuclide concentrations for the most representative and common Mediterranean marine indicators. The collection of data starts from 1st January 1986, showing the impact of Chernobyl fallout and the subsequent evolution of radioactivity in the selected indicators. The expected information might help to identify the main processes and areas of scientific interest, and to validate the indicators selected for the Mediterranean and the Black seas (4, 5). The 1992 progress report indicated qualitative distribution of data collected during the database constitution phase and proposed a further step concerning dose assessment to relevant populations from data on marine components in relation with the MARINA-MED project (6).

The aim of the present paper is then to report on the present status of the database, as the collection of data sets went on until 1995 (7), to show quantitatively the results gathered up to now (number, distribution, activities), to evaluate fulfilment of the initial GIRMED objectives, and to propose further evolution of the database content and access of end-users (including data producers).

Material and method

Following the GIRMED founding act in Athens, a questionnaire was sent by the CIESM Secretariat to all potential participating laboratories in the Mediterranean countries addressing staff composition, scientific experience and objectives in this topic, recent publications, current techniques, lab facilities

and study area. From the replies, participating laboratories were invited to a round table (during the 1990 meeting in Perpignan) to present their national monitoring networks and methodological approaches. From this discussion, a first selection of potential indicators was suggested and a new questionnaire was sent out by the IAEA on behalf of the CIESM Marine Radioactivity Committee. It contained a data reporting form and a guideline document specifying for each sample type (sea water, sediment, suspended matter and biota) a full description of essential database fields to be filled in, with coding prescription, unit, and data format. For biota, a non restrictive list of bioindicators was proposed, including: *Posidonia oceanica*, *Padina pavonia*, *Mytilus sp.* and finfish.

The collected data were then directed to the IPSN Marine Radioecology Laboratory in Toulon as a support institution, validated for data coherence and integrity with the contributing laboratories and stored in a computer. The present database is implemented on a dedicated PC machine using Microsoft Access 2.0 software as a relational database management system (RDBMS).

Results and discussion

The first inquiry revealed that 15 laboratories, distributed among 8 Mediterranean countries could collaborate in the GIRMED project. Up to 1995, however, only 9 laboratories from 7 countries have actually participated in the constitution of the database by sending their results. Most of the data concern samples collected essentially in the coastal zone where the monitoring networks are regularly operated. The most abundant results are represented by sediments and molluscs samples and ¹³⁷Cs is the radionuclide most frequently reported in the database. Almost all these data are subsequent to the Chernobyl accident, so the missing baseline information make any estimate of the inventory of the Chernobyl fallout on a global scale uncertain. In addition, the spatial distribution of the sampling locations is quite patchy (Fig. 1), making aerial extrapolation to the whole Mediterranean to a difficult exercise. Reports on radionuclide concentrations measurements are missing, in particular from the eastern and southern countries, and are scarce from Italy, Spain, and Greece where monitoring and research activities are known to exist. From a review of published data, an inventory of ¹³⁷Cs and ^{239,240}Pu in the Mediterranean Sea was recently compiled (8), also highlighting the lack of measurements from the

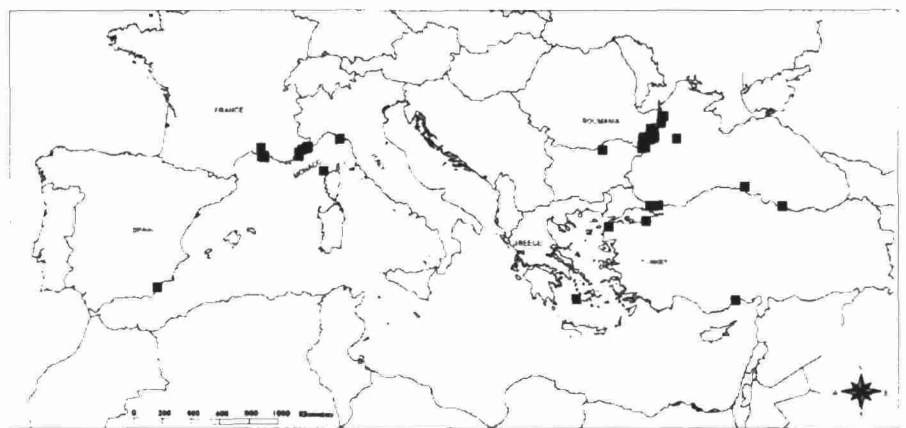


Fig. 1. Samples locations in the GIRMED database.