

HarmoNIA



Harmonization and Networking for contaminant assessment
in the Ionian and Adriatic Seas

Adriatic – Ionian regional strategy for a shared
and harmonized evaluation of the risk due to
contaminant dispersion
from different sources of pollution



2020

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1. General context and common challenges

Throughout European history, the Adriatic and Ionian seas have played an important and strategic role for the prosperity of coastal communities and the development of maritime trade and sea-based activities. Nowadays, activities such as maritime traffic, tourism, fishing, aquaculture and oil and gas exploration are considered to be of high economic value within the area. However, all these activities pose **serious threats and pressures** to the natural capital and may have adverse effects on the ecosystem functioning of both seas. **Marine pollution** may derive from the release of chemical substances in the environment from land-based sources as well as from specific sea-based sources, such as shipping, aquaculture, offshore oil and gas production, marine renewable energy devices, seabed mining, dredging of sediments, dumping of dredged material and historical dumping.

The ADRION area is characterized by foreseen increase in maritime transport, which may inevitably result in greater risk of oil spills and noise pollution; furthermore, in the Adriatic there are currently 138 operating oil and gas platforms for exploitation of hydrocarbons, both in Italian (123) and Croatian (15) waters. In addition, Montenegro, Albania and Greece have exploration and exploitation concessions along the Adriatic and Ionian coasts, which may increase the pollution dispersion risk in the region.

2. Common vision

Sustainable economic growth and prosperity can only become feasible through coordinated efforts and trans-national cooperation. Countries sharing the same marine space should **manage** marine natural resources and **preserve** ecosystem services with a **common approach**, as well as adopt **coordinated efforts** in case of pollution accidents. The EU macro-regional strategy EUSAIR is one of the main instruments to promote economic growth and prosperity in the Region and, at the same time, aiming at protecting the sea, the coastal and inland environment and ecosystems.

Within this framework, **the ADRION project HarmoNIA proposes an “Adriatic – Ionian regional strategy for a shared and harmonized evaluation of the risk due to contaminant dispersion from different sources of pollution”** to promote coordination of actions in case of pollution accidents.

3. Objectives & Goals

Within the framework of EUSAIR priorities concerning shared planning and capacity building to prevent and react to oil spills and other occurrences, HarmoNIA strategy has the following overall objective: to provide for the whole ADRION area a common framework of data and information required to evaluate vulnerability of coastal areas to contaminant dispersion risk and to assist organization and action of contingency plans.

The strategy is addressed to institutions involved in scientific research and monitoring to promote data and information sharing, to authorities in charge of marine and coastal management and planning and in contingency planning and intervention.

The overall aim is articulated in following specific objectives:

- Collect and organize existing information required to improve evaluation of vulnerability of coastal areas to contaminant dispersion risk.
- Exploit scientific knowledge for the management of emergencies.

- Strengthen synergies in the ADRION region and propose a model approach for the Mediterranean (ie.: spatial information on coastal vulnerability + hydrodynamic model outputs + operational near real time (NRT) data + risk analysis).
- Gather data and information after accidental oil spills occur.

Mid – term goals

- Promoting the use of **interoperable systems** to manage data and information required for the evaluation of the risk due to contaminant dispersion from different sources of pollution (HarmoNIA Geoportal represents an example).
- Promoting **sharing of existing data and information** required to manage environmental emergencies and strengthen national monitoring in frame of MSFD and WFD.
- Improve **exploitation of scientific and monitoring** results for environmental management.
- Identify research **needs** and observation capabilities to support a more efficient evaluation of the risk due to contaminant dispersion, and management of emergencies.

Long - term goals

- Improve **integrated operational observation systems** (eg. surface currents, waves, meteo, etc).
- **Share operational data.**
- Develop **high resolution operational models** addressing hydrodynamic and pollutants.
- Strengthen **collaboration** between research and management bodies of the marine environment.
- Identify the **financing** tools to implement and sustain the observation, analysis and data/information systems on the longer term.

4. Strategy duration and periodic revisions

Most of the HarmoNIA project partners have a long history of collaboration in the framework of previous projects and are involved in ongoing long - term European initiatives, a fact which guarantees that collaboration will continue towards the pre-defined goals. The proposed strategy is meant to last for at least 3 years after HarmoNIA project ends in order to reach the mid-term goals. In addition, and in order to adapt and update the strategy to the changing needs of the society, it is necessary to promote and consolidate dialogue with stakeholders and to revise periodically the priorities.

5. Approach

- Maintain and further implement tools developed by HarmoNIA. Further development and long term sustainability should be assured through future EU projects in order to find a way to create permanent support as part of national and some future EU level marine monitoring.
- Establish synergies with similar initiatives.

- Establish formal long-term cooperation among ADRION authorities to share updated information and make use of the tools to tackle environmental vulnerability and safeguard ecosystem services.
- Promote a network among EU and other countries to strengthen cooperation between authorities and institutions in charge of environmental management and intervention-response in case of emergencies.

6. Model approach for the Mediterranean

In the framework of HarmoNIA project and in the field of risk management we identified some key points and also problems related to these points, regarding risk management:

- Spatial information regarding coastal and marine vulnerability and sources of potential pollution.

Spatial information regarding marine environment can be obtained from the results of previous projects and also national services databases. Problems arise when attempting to merge information from different sources and approaches as the type of information is different in each country and area, and therefore, spatial information should be harmonized. In addition to the existing harmonization of measurements, priority should be given to propose harmonization in some general issues for spatial information, within the framework of INSPIRE (Infrastructure for Spatial Information in Europe). This EU directive can also help in more efficient data discovery and reuse.

- Knowledge of potential pollution risk sources is very important for risk management.

Information about oil and gas platforms and hydrocarbon concessions should be available from national agencies. Marine routes and traffic are also generally available. It is harder to collect detailed information about ports, terminals, and especially precise amount of hazardous substances transport.

- Operational near real-time data

For efficient risk assessment and accident management, operational measurements are highly valuable. High-frequency (HF) radars for measuring surface currents, and also meteo-oceanographic stations are considered as priority equipment. Installing and managing HF radars and near real-time stations is very demanding by means of finance and logistics. Future initiatives should consider investments in Mediterranean monitoring network, thus sharing not only real time data but also a common approach in logistics and maintenance of those systems.

- Hydrodynamic modeling, oil spill and pollutant modeling

In case of general risk assessment, hydrodynamic modeling of “extreme weather” conditions can be used for a number of typical scenarios of sea accidents. For operational risk assessment, an accurate hydrodynamic forecast is essential. Efficient short term forecast hydrodynamic modeling requires also good meteorological modeling and near real time data assimilation. In case of oil spill, for the local authorities the most valuable information is prediction of spill spreading. The HarmoNIA Geoportal provides animated spreading models for hypothetical oil spills using averaged surface currents. An operational portal should be able to produce such prediction for any spill location (defined according to the accident position) and using operational hydrodynamic forecast.

- Risk analysis

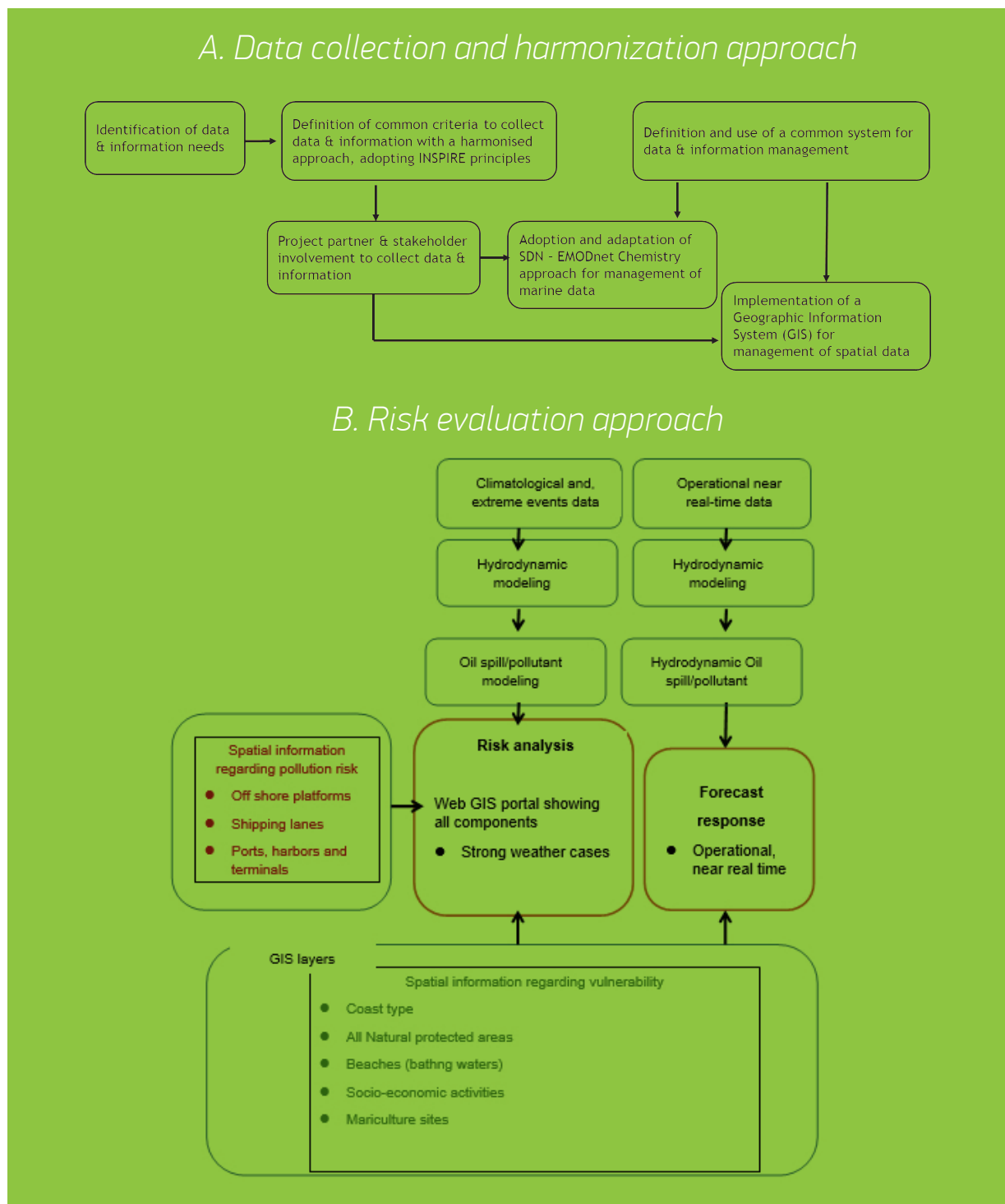
Risk analysis methods to calculate the risk for some areas adopt the general Source-Pathway-Receptor-Consequence (S-P-R-C) model. Within HarmoNIA the risk analysis is based on the probabilistic estimation of the frequency of occurrence and magnitude of the hazard and on the sensitivity of the environmental and so-

cio-economic receptors. The proposed Risk analysis approach can target a specific (point) source or an array of sources, and address specific and extreme meteo-marine conditions.

- Modelling in response situations.

Operational models enable to predict the trajectory and the fate of oil (or of other pollutants) when the accident occurs. They can support the assets of vessels and aircrafts to the likely location of pollution and enable to foresee the expected impacts on targets.

Taking in account all the above, we can summarize the approaches for data collection and harmonization (A) and for risk evaluation (B) as follows:





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