

***WATER FRAMEWORK DIRECTIVE***  
***SHORT TERM ACTION***

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***LAND COVER CHANGE***  
***AND***  
***WATER QUALITY***

**DEMONSTRATION PROJECT**

***FINAL REPORT***

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## 1. INTRODUCTION

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This report describes methodologies and results of the working group coordinated by Ce.S.I.A.-Accademia dei Georgofili to carry out the task defined in the ESA-ESRIN contract n. 17753/03/I-LG.

Aims of the project were to define EO methodologies for:

1. the analysis of land change in the Cecina basin for the period 1984-2002;
2. the evaluation of sea pollution by means of different satellites;
3. the individuation of potential contribution of remote sensing in water quality evaluation.

The activity was performed in the respect of ESA-ESRIN requirements, which has defined E.O. resources, tools, time and spatial scale for analysis and evaluations.

Schematically the activities can be divided in two phases:

A. During the first phase image referencing and layers integration into a simplified geographical demonstration system was carried on. Database structure and geographic referencing were also carried out, following the progress in data collection and data quality evaluation. A first series of information was collected directly from available databases and archives or publications produced by the main regional and national authorities involved in land management and monitoring activities (ARPAT, LaMMA, Legambiente, etc). The aim of the work was to describe actual environmental status of the Cecina river basin and seawater pollution along the costal line.

B. The second phase was dedicated to data computation and interpretation, with particular interest in Landsat 5 and Landsat 7 image processing for a direct and indirect use of these procedures in operational water resource management. The evaluation of sea pollution was made by means of different sensors, taking into consideration three relevant factors: Dispersed Organic Matter (DOM), Total Suspended Matter (TSM) and Chlorophyll content (CHLc). Some observations on subsidence was also performed using SAR1 and SAR2 images, considering possible integration and future contribution of this tools in land management and water quality preservation.

Same consideration on political and technical trend for future system development are also given, but we have to remember that there are many national projects carried on the **Cecina River Basin and a series of important scientific studies that should be taken into consideration for a complete understanding of environmental situation and future perspectives.**

In particular, we remember:

- strategic project for the hydrological re-equilibrium of the **Cecina River basin** for the re-naturalisation of the riverbed and recovery of the fluvial ecosystems;
- the river basins *Piano Stralcio* related to hydrological assets;
- the river basins *Piano Stralcio* related to water resources.