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Architecture solution for air quality management through a dedicated SDI

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Applications for atmospheric pollution monitoring and modelling are fundamental tools to develop environmental policies oriented to control and possibly reduce pollution impact on both ecosystems and human health. However, spatial and temporal discrepancies (in terms of acquisition, transmission, storage and resolution) among systems monitoring very different environments is an important limitation in environmental management. In order to standardize protocols and procedures, the EU directives (i.e. INSPIRE, Air Quality Directive) and international programs (i.e. GEOSS) have oriented the scientific community to develop advanced interoperable systems able to assure data integration for real time analysis and dissemination within the scientific community as well as to stakeholders and policy makers. To coordinate national earth and cross-disciplinary systems for promoting GEOSS and to support the INSPIRE implementation, CNR promoted the GIIDA project (Integrated and Interoperable Management of Environmental Data). Among the GIIDA working groups, that on air quality is addressed to develop an interoperable system for air quality information management and dissemination at national level. The system is based on open-source tools compliant with standards (WMS, WFS, CSW....) and oriented to develop an integrated system (i.e. Spatial Data Infrastructure (SDI)) that facilitate data storage, mining and visualization. The SDI (see figure) contains information on air quality collected at ground-based monitoring sites as well as at off-shore sites. It will support modelling activities and environmental assessments for different scenarios aiming at the evaluation of the impact of atmospheric pollution on terrestrial and aquatic ecosystems and human health. As processes of data input, classification (through metadata), publishing and visualization are fundamental steps of a SDI implementation, an integrated and simple tool is required. Here we discuss the application of the IT framework and methodologies to build the SDI for air quality management and the development of a ICT pluggable framework (GeoInt), which was proposed in order to integrate data, metadata and measures from different sources and to hide to final users the SDI complexity. GeoInt is a framework developed as Web Application and deployed in a Servlet Container providing to final user a friendly user interface to SDI. In addition, it is a wrapper for complex tools like PostGis and GeoServer.