Using GeoServer and spatial database for receiving and analyzing of georeferenced data

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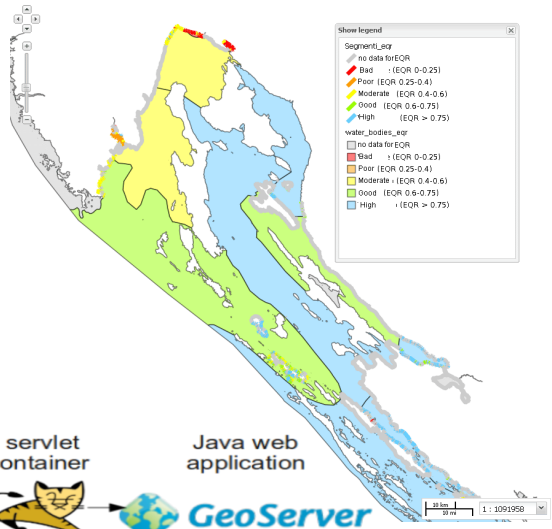
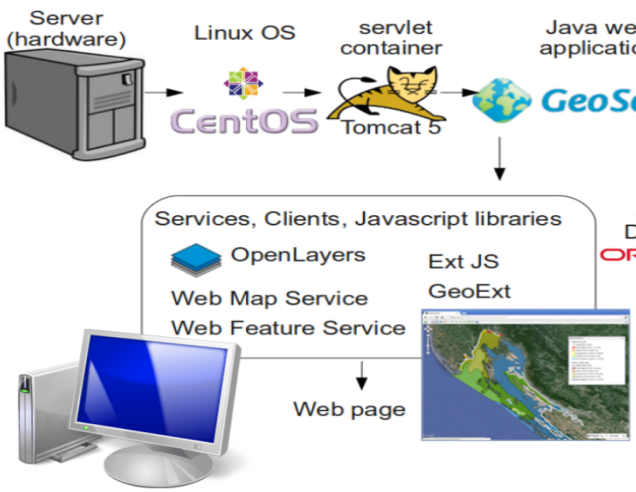
In the frame of operational monitoring according to Water Framework Directive benthic macroalgae were used as a biomonitoring tool in the Adriatic Sea using CARLIT method (Cartography of littoral rocky-shore communities). The result of CARLIT method application is assignation of water quality status expresed as EQR value (Ecological Quality Ratio) to coastline sectors and an average EQR to the whole water body. Each segment was predefined, and problem was how to enter acquired data and associate data to particular segment. As EQR have 5 classes (High, Good, Moderate, Poor and Bad) another problem was how to show segment EQR on the map and calculate and show EQR for water body (calculated as average from all segments that are inside in particular water body).



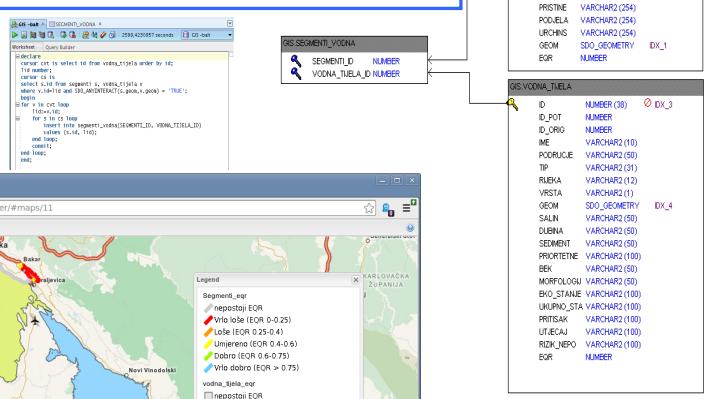
As server platform we choose CentOS 5.8, Linux operating system. For GIS publishing software we choose GeoServer, because of good references and easy implementation. GeoServer is running under Tomcat 5 application server. GeoServer allows users to share and edit geospatial data. Designed for interoperability, it publishes data from any major spatial data source using open standards. GeoServer functions as the reference implementation of the Open Geospatial Consortium Web Feature Service standard, and also implements the Web Map Service and Web Coverage Service specifications. GeoServer is open source free software.

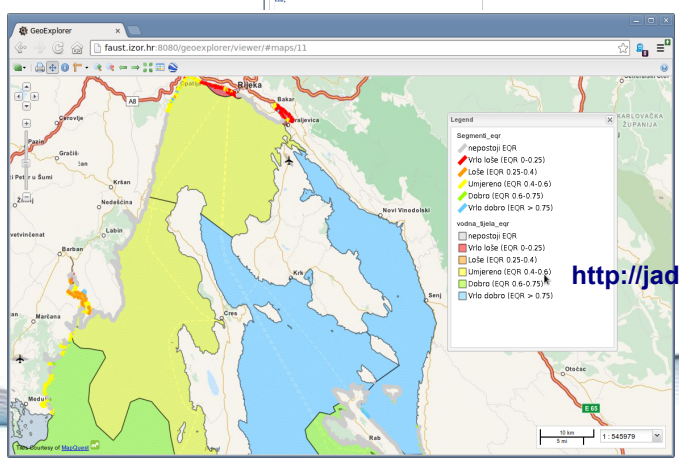


As we already use Oracle database on Institute, for storage and spatial analysis we use Oracle database (instead of files). Geoserver also can be used with open source spatial relational databases as is Postrgres database.

For data insertion and validation is very convenient to have web application because it supports field work and it is basically independent to client side hardware and OS. For georeferenced data maps are almost mandatory and web oriented GIS is native solution. Resulting layers can be shown and overlapped with many other layers and this adds possibilities for additional use of acquired data. Although Geoserver by itself has possibilities for spatial data analyses they become more easialy and quicker in case of using spatial database as data source.

To calculate average EQR for water bodys spatial analysis should provide connections beetwin segments and water bodies. For this purposes Oracle spatial operator SDO_ANYINTERACT were used. At the end using spatial function SDO_ANYINTERACT (segments_geom_column, water_bodies_geom_column) crossover table was populates in the way that for each water_body id all segments id's that have any interaction (spatial interaction) with that water body were found.After that average EQR for each water body was found (group by with crossover table).





http://jadran.izor.hr/geo/eqr.html

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