

Web access and dissemination of Andalusian coastal erosion rates: viewers and standard/filtered map services.

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The accessibility to environmental information via web viewers using map services (OGC or proprietary services) has become more frequent since newly information sources (orthophotos, LIDAR, GPS) are of great detailed and thus generate a great volume of data which barely can be disseminated using either analogue (paper maps) or digital (pdf) formats. Moreover, governments and public institutions are concerned about the need of facilitates provision to research results and improve communication about natural hazards to citizens and stakeholders. This information ultimately, if adequately disseminated, it's crucial in decision making processes, risk management approaches and could help to increase social awareness related to environmental issues (particularly climate change impacts).

To overcome this issue, two strategies for wide dissemination and communication of the results achieved in the calculation of beach erosion for the 640 km length of the Andalusian coast (South Spain) using web viewer technology are presented. Each of them are oriented to different end users and thus based on different methodologies. Erosion rates has been calculated at 50m intervals for different periods (1956-1977-2001-2011) as part of a National Research Project based on the spacialisation and web-access of coastal vulnerability indicators for Andalusian region.

The 1st proposal generates WMS services (following OGC standards) that are made available by Geoserver, using a geoviewer client developed through Leaflet. This viewer is designed to be used by the general public (citizens, politics, etc) by combining a set of tools that give access to related documents (pdfs), visualisation tools (panoramio pictures, geo-localisation with GPS) are which are displayed within an user-friendly interface. Further, the use of WMS services (implemented on Geoserver) provides a detailed semiology (arrows and proportional symbols, using alongshore coastline buffers to represent data) which not only enhances access to erosion rates but also enables multi-scale data representation.

The 2nd proposal, as intended to be used by technicians and specialists on the field, includes a geoviewer with an innovative profile (including visualization of time-ranges, application of different uncertainty levels to the data, etc) to fulfil the needs of these users. For its development, a set of Javascript libraries combined with Openlayers (or Leaflet) are implemented to guarantee all the functionalities existing for the basic geoviewer. Further to this, the viewer has been improved by i) the generation of services by request through the application of a filter in ECQL language (Extended Common Query Language), using the vendor parameter CQL_FILTER from Geoserver. These dynamic filters allow the final user to predefine the visualised variable, its spatial and temporal domain, a range of specific values and other attributes, thus multiplying the generation of real-time cartography; ii) by using the layer's WFS service, the Javascript application exploit the alphanumeric data to generate related statistics in real time (e.g. mean rates, length of eroded coast, etc.) and interactive graphs (via HighCharts.js library) which accurately help in beach erosion rates interpretation (representing trends and bars diagrams, among others).

As a result two approaches for communicating scientific results to different audiences based on web-based with complete dataset of geo-information, services and functionalities are implemented. The combination of standardised environmental data with tailor-made exploitation techniques (interactive maps, and real-time statistics) assures the correct access and interpretation of the information.