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Collaboration between Port of Rotterdam and Deltares continues on Porto Central

Model output showing erosion (red) and accretion (green). The bars are exaggerated to make the patterns clearer.

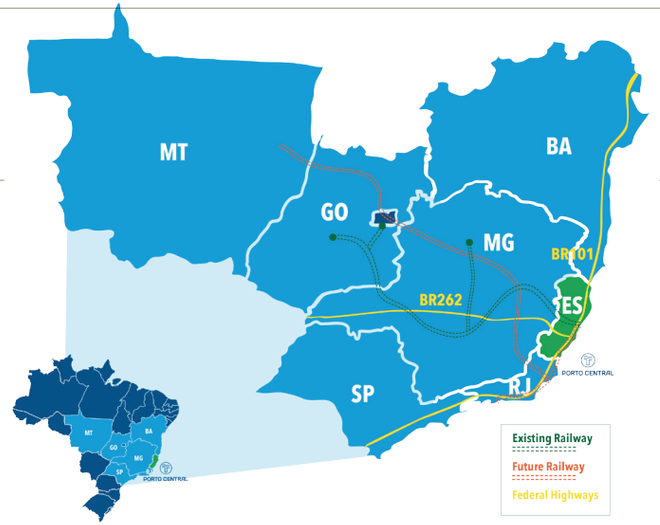
Porto Central (PoC) is a new private industrial port complex located midway along the Brazilian coast in the south of the state of Espírito Santo. This port is being developed in a joint venture involving TPK Logística S.A (TPK, Brazil) and the Port of Rotterdam Authority (PoR, Netherlands). The project will allow PoR to continue with the establishment of its World Port Network, which also includes Sohar Port and Freezone in Oman. Deltares is contributing its expertise on sediment transport and wave modelling to these developments.

In the past, Deltares was involved in the PoR World Port Network by producing a number of advisory studies for Sohar Port on coastal impact and on the assessment of local wave and current conditions for basin berths and exposed jetty berths. That successful international collaboration between PoR and Deltares has now been continued for Porto Central.

Porto Central is a 'greenfield' port development. It is a completely new port that will be built at a previously unoccupied coastal site. This involves different and more extensive considerations than when expanding existing ports in 'brownfield' developments. As part of several ongoing investigations and preparatory studies commissioned by Porto Central, Deltares performed detailed wave computations for this port, applying offshore wave information to the planned port site and its surroundings. The resulting wave patterns were used by Deltares to calculate the expected coastal impact of the new port, that is to say the effect of the port on sediment transport patterns in the area, including sedimentation and erosion patterns.

The new port is planned at a site with fairly limited net sand transport along the coast. Close to the port location, large-scale coastal sediment transport changes direction from northbound to southbound. As a result, the potential impact of the port on the coastal morphological system is expected to be limited. To check the impact, it is crucial to establish an accurate picture of the transport directions and particularly the location of this reversal point. In addition, the local wave conditions are dominated by two wave systems from different directions, which, when averaged for a full year, largely offset each other. Subtle differences in the net annual effect of these wave systems should therefore be taken into account as well.

The reliable and accurate information on the wave conditions and sediment transport were provided to Porto Central as requested on the basis of the expertise and experience of Deltares and using detailed modelling with our Delft3D and Unibest software packages. The figure shows an example of the model results in terms of relative erosion and the accumulation of sediment. The outcome of the computations has confirmed the limited impact of the port on the environment in terms of the coastal morphology. Porto Central is using the results of the study to design the port.



▲ *Artist's impression of the final layout of Porto Central (Source: Porto Central)*

◀ *Planned location of Porto Central in Brazil and its main hinterland connections (Source: Porto Central)*

Further reading:
http://www.portocentral.com.br/en/