

## **Coast Indentation Index - a tool for quantifying different expressions of Oman's coastline.**

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The presented study is embedded in a project dealing with short- and long-term changes along the coastline of Oman. The Sultanate of Oman is located on the eastern part of the Arabian Peninsula and borders the Gulf of Oman as well as the Indian Ocean. The plate tectonic setting is characterized by a north-drift of the Arabian Plate, which results in a continent-continent collision in the west and a continent-ocean collision in the east. This special setting implies differential land movement, which can be observed in the different expressions of the coastline. The northern coastline of Oman (Musandam), an area which is known to be subsiding, is characterized by an extremely fragmented coastline. The more southern parts of Oman's northern coastline around the Sur-region on the other hand comprise wave-cut terraces which indicate uplift of the landmasses.

In order to quantify and interpret those characteristics a tool has been developed, following Spagnolo's approach (Spagnolo et al. 2008). The coast indentation index (CII) calculates the proportion between the Euclidian distances and the actual distance of the coastline between two points along the coastline. The tool has been implemented in ArcGIS, using C#. As input data a polyline delineating the coastline's course is needed. The Euclidian distance (D) is set as a constant value, used as the length of radius for a circle, determining the next intersection point along the coastline. The computation starts with the first point along the coastline as a circumcentre and is repeated until no more valid intersection points along the coastline can be found.

The aim is to detect and identify different sectors along Oman's coastline in a semi-automated way. Those sectors reflect differences in coastal morphology (i.e. subsidence, uplift) and therefore provide a tool for understanding recent vertical land movement.

Spagnolo, M., Arozarena Llopis, I., Pappalardo, M. & Federici, P.R. (2008): A New Approach for the Study of the Coast Indentation Index. - *Journal of Coastal Research* 246: 1459-1468.