REGIONAL-SCALE ANALYSIS OF DUNE-BEACH SYSTEMS USING GOOGLE EARTH ENGINE

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CONTEXT

Coastal sand dunes are providers of ecosystem services…

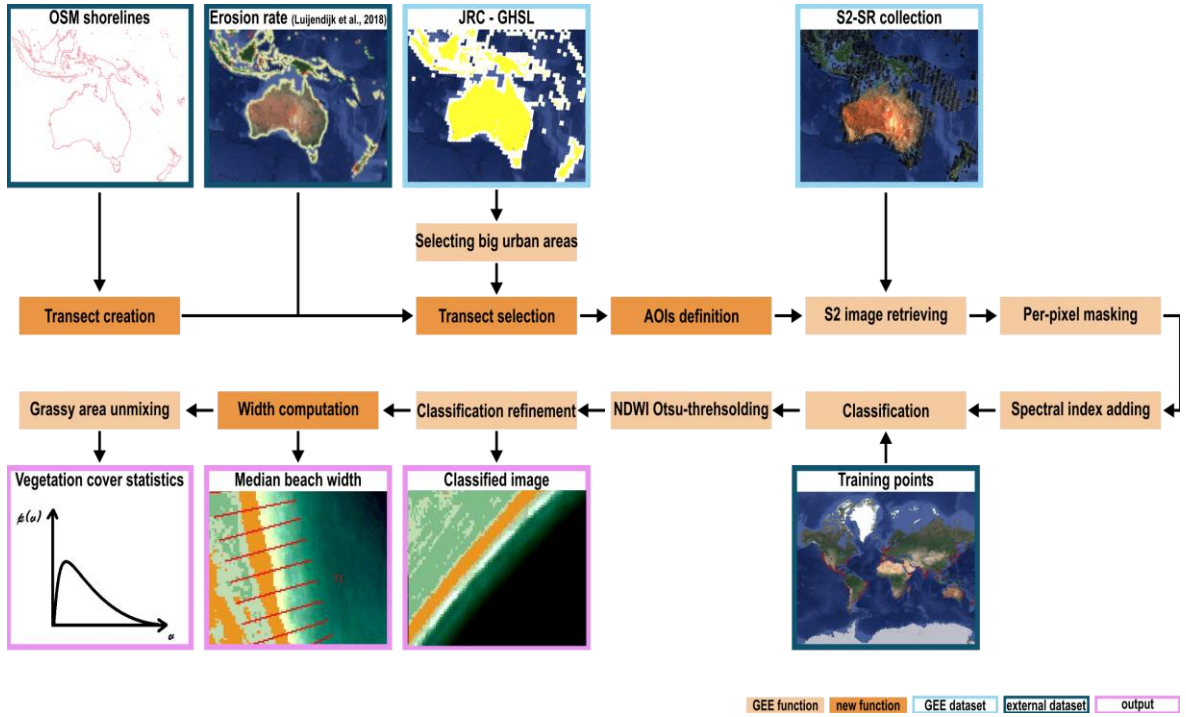
... but are currently threatened by «coastal squeeze»

Ashdod, Israel, created with Google Earth Engine.

This increases the need for reliable tools for coastal modelling, monitoring and planning.

AIM & PROPOSED SOLUTION

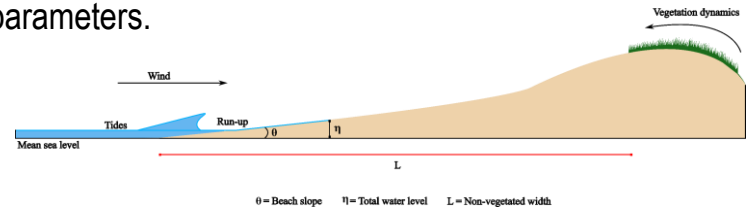
We aim integrate the study and monitoring of beach-dune systems with satellite image. Thus, we propose an algorithm based on Google Earth Engine (GEE) python API to provide valuable data for coastal modelling and investigation.



Key features	Limitations
Versatile and flexible	Memory limits in GEE service
From one-time to time series analysis	Programming skills required
From local to regional scale analysis	

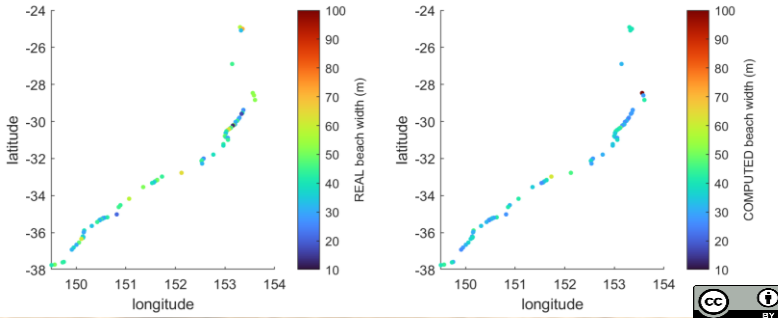
EXAMPLE APPLICATION

Calibration of a stochastic model for dune-building vegetation dynamics. The model provides the beach width and the vegetation cover statistics, as a function of wind speed, sea level fluctuations and biological parameters.



We calibrated the biological parameters for SW Australia through satellite image processing, by using real physical data from global datasets, and machine learning techniques.

Model validation returned an accuracy greater than 70% for both the computed beach width and mean vegetation cover, and provided insights about relationships among biological parameters and external forcing.



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