

Reconstructing spatial changes in the Bahamas

Using Machine Learning and vintage aerial photos to develop better models of the geological record

Department: Earth Sciences

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Project description

The Bahamas are THE carbonate platform, a classic sandbox for all carbonate sedimentologists and marine ecologists studying tropical environments. Models of reef growth and sediment formation originate from the Bahamas. They are a fantastic case for studying the interaction between organisms and the marine and terrestrial landforms. Corals, algae, mangroves and seagrass are ecosystem engineers, which transform the seabed and the coastline, stabilizing it and creating spatial patterns reflecting their habitat and dispersal.

But one element is missing: the temporal aspect. We know how the organisms and environments are distributed today, but how fast do they move? We have secured access to a unique archive of the first aerial photographs of the Bahamas, dating back to the forties, and digitized them in collaboration with Sam Purkis (Rosenstiel School of Marine, Atmospheric, and Earth Science, University of Miami).

The goal of the project is to quantify how the spatial distribution of environments changed at the time scale of a century. It is part of the ERC project MindTheGap: <https://mindthegap-erc.github.io/>

Be the first person to see how reefs are doing in the last 80 years!



We offer: training, intensive supervision with many contact hours, a closely-knit, diverse team, potential contribution to a publication, and experience with Machine Learning. We expect that you spend part of your project doing analysis using image processing software and are willing to read up about carbonate sedimentology and geomorphology. Part of the project can be done remotely, part might require using software available on computers in VMA and therefore on-site work.

Job requirements

We expect you to be accurate and pay attention to detail, because training a Machine Learning algorithm requires very carefully prepared training data. You need to be able to handle uncertainty. An interest in image processing, (satellite) photography, or carbonate sedimentology will be an asset.