NTNU BRAIN Hackathon

Identifying ocean infrastructure and ecologically important areas using satellite data

18 -20 March 2022

Introduction

Satellite data has been a proven tool to supplement data gathered from the ocean. It can be used for various types of analyses, to calibrate and validate ocean data, as well as help identify important oceanographic features.

The goal of this hackathon is to create a framework for identifying specific ocean features. Once this is in place, others can build from that to create downstream value, such as monitoring and spatial planning.

Task

You will use the satellite data available from the Microsoft Planetary Computer to identify ocean features of your choice. This can include, but is not limited to: coral reefs, ports, oil platforms, aquaculture facilities, mangrove forests.

Remember it is always beneficial to start small. You can either pick a specific area to concentrate on (i.e. Norway, Bahamas) or you can even begin by picking out features that are not the ocean. As there may not be enough training data for a model built from scratch, we also encourage using pre-trained image classification models.

It can also be useful to extract specific features from the images (i.e. percent cover of mangroves, color, etc.)

Data Description:

Satellite data is available from different datasets in the Planetary Computer:
https://planetarycomputer.microsoft.com/catalog

Here is a list of data catalogs you can use for information on where other ocean features are located (of course feel free to explore additional databases on your own):

https://allencoralatlas.org/

https://databasin.org/

https://www.barentswatch.no/nedlasting/fishhealth/lice

https://kart.barentswatch.no/arealverktoy

Development environment:

You will be using the Microsoft Planetary Computer Hub to pull and analyse the images. You will need to sign-up ahead of time to log into the Hub.

There should be many pre-installed packages, but you can feel free to pip or conda install any additional packages. There are GPUs available to spin-up but you should limit that to one person per group to ensure there are enough resources to go around.

https://pccompute.westeurope.cloudapp.azure.com/compute/hub/spawn

Evaluation:

The score will be a weighted sum of:
Creativity, performance, ability to justify choices, and presentation of results.
Performance can be defined by the teams themselves, but must be justified.