



Plankton Genomics

The aim of the plankton genomics demonstrator is to assess plankton functional distribution through a deep mining of biomolecular correlated with environmental data, through cutting edge machine learning.

Partners:



Data sources through Blue-Cloud:

EBI (MATOU version 1, MAGs), World Ocean Atlas

Main target users:

Plankton researchers, ocean modellers, data product developers and Blue Data infrastructures, for their data products catalogues and as use cases.

Services introduction:

The Vlab offers two notebooks. One explores the clustering of a massive genomic dataset and its taxonomic and functional annotation. The other uses machine learning to relate those clusters to the environment (and their parameters such as longitude/latitude, temperature, pH) and extrapolate their potential distribution worldwide.

UN SDGs addressed



SERVICES

Genomics Notebook

The genomics notebook provides an extensive network of protein clusters from the ocean microbiome based on DNA sequences collected by the Tara Oceans expedition. The clustering is based on similarity of sequences found in Metagenomes Assembled Genomes (MAGs). Sequences are taxonomically and functionally annotated but the building of clusters also highlights the large proportion of sequences that cannot be annotated (i.e. 1/2 of the sequences).

Habitat Modelling Notebook

The habitat modelling notebook queries the protein clusters for a list of functions/enzymes involved in certain biogeochemical processes. The relative abundance of the target clusters is related to environmental variables through Multivariate Boosted Regression Trees (MBRT) and the fitted model is used to predict the potential proportions of each over the world's ocean.

"Computing remotely is becoming more and more common and makes it easier to reach other users. It should also increasingly place computing power close to the data from big repositories and hence allow researchers to be much more efficient in exploring vast datasets."



JEAN-OLIVIER IRISSON
Associate professor at Sorbonne Université

Test the VLab now!

