About your team	
Idea name	SeaNet
Team name	Calypso
Challenge	Challenge 3: Tracking & Forecasting Ocean Health
Project Summary (250 words max)	
Description	SeaNet MVP delivers a scalable tool for tracking marine plastic pollution. Its core functions are to detect and localize macroplastics in near real-time and to forecast their drift over the following days, much like a weather prediction system. Results will be displayed on an interactive map resembling a meteoradar, allowing users to see evolving plastic hotspots at a glance. Beyond local predictions, SeaNet applies this knowledge globally, creating a unified forecast model. The system will also calculate the surface area of plastic-affected zones, offering stakeholders actionable insights to plan clean-up operations, assess ecological risks, and support evidence-based governance. Technically, SeaNet combines Blue-Cloud's Marine Environmental Indicators VLab (VLab 2) with the Virtual Research Environment (VRE) to run particle-drift models seeded by detections. We process Sentinel-2 Level-2A imagery in Google Earth Engine, applying masks and calculating indices such as FDI, NDPI, and NDWI to identify macroplastic patches. These detections are validated against hotspot studies and converted into polygons or centroids, serving as input for short-term forecasts. Innovation lies in correlating plastic accumulations with eutrophication indicators from Blue-Cloud datasets, enabling more holistic assessments. SeaNet leverages VLab 2 as its analytical core and the VRE as execution framework for reproducible simulations. Currents and wind fields from Blue-Cloud workbenches provide forcing for trajectories. Where relevant, outputs will align with EDITO for integration into Europe's Digital Twin Ocean. Additional resources include Sentinel-2 data and Mediterranean hotspot studies, ensuring a scientifically robust, scalable solution that bridges innovation, policy, and citizen engagement.

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