NEMO TOOLS

Next-generation monitoring & mapping tools to assess marine ecosystems & biodiversity

Milestone M1.1

Collection of satellite images

Greece 2.0
NATIONAL RECOVERY AND RESILIENCE PLAN

Funded by the European Union
NextGenerationEU

This project is carried out within the framework of the National Recovery and Resilience Plan Greece 2.0, funded by the European Union – NextGenerationEU (Implementation body: HFRI).

DOCUMENT INFORMATION AND VERSION CONTROL

Project Acronym	NEMO-Tools
Project Title	Next-generation monitoring and mapping tools to assess marine ecosystems and biodiversity
Project Number	016035
Work Package	WP1
Related Task(s)	T1.1
Deliverable Number	Milestone M1.1
Deliverable Name	Collection of satellite images
Due Date	14/02/2025
Date Delivered	23/01/2025
Dissemination Level	Public — fully open (automatically posted online on the Project Results platforms)

VERSION CONTROL

Revision-N°	Date	Description	Prepared By	Reviewed By
Final	23/01/2025	Final	Dimitris Poursanidis	

Executive Summary

High-resolution satellite imagery from PlanetLabs was selected for mapping Cystoseira spp. forests due to its 1m resolution and daily availability. A total of 31 tiles from 11 imagery datasets were visually chosen for further processing and workflow development.

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CONTRIBUTORS

TABLE 1 NAMES AND ROLES OF CONTRIBUTORS TO THIS MILESTONE.

Name	Affiliation	WP Lead	Task Lead
Dimitris Poursanidis	University of the Aegean		

Collection of satellite images

For the needs of WP1, the use of satellite imagery from PlanetLabs has been selected as a unique provider offering high resolution data (1m pixel size), with daily availability, and unique spectral characteristics that are suitable for the development (figure 1, 2).

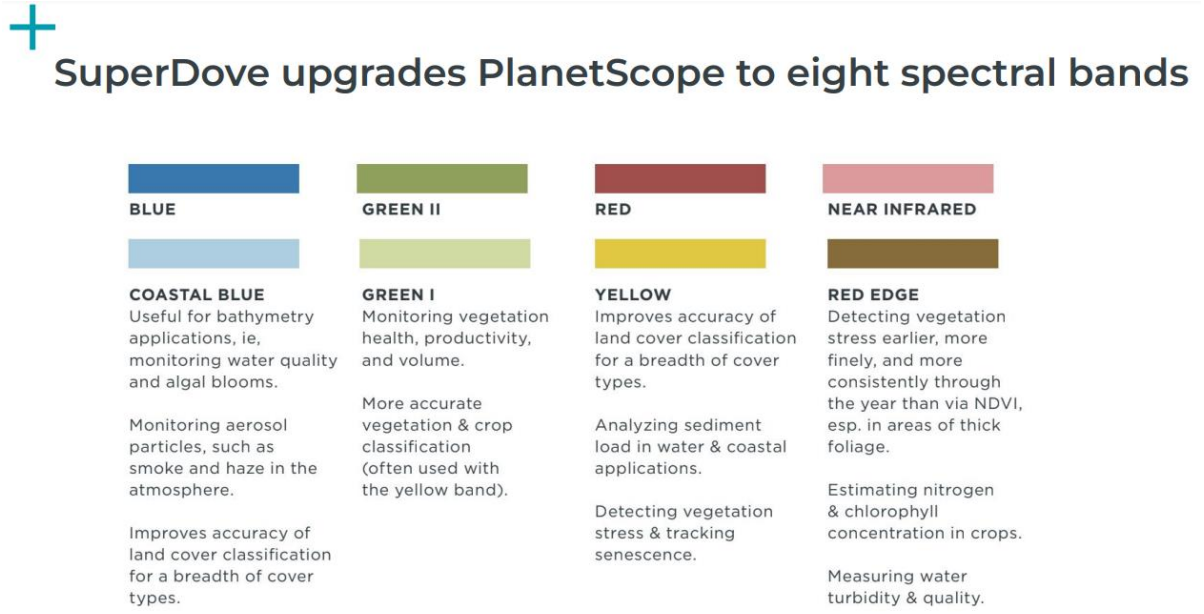

Figure 1. The spectral bands that have been added to the SuperDove swarm fit the needs of the WP1 development. Source: https://assets.planet.com/docs/superdove_bands_infographic.pdf

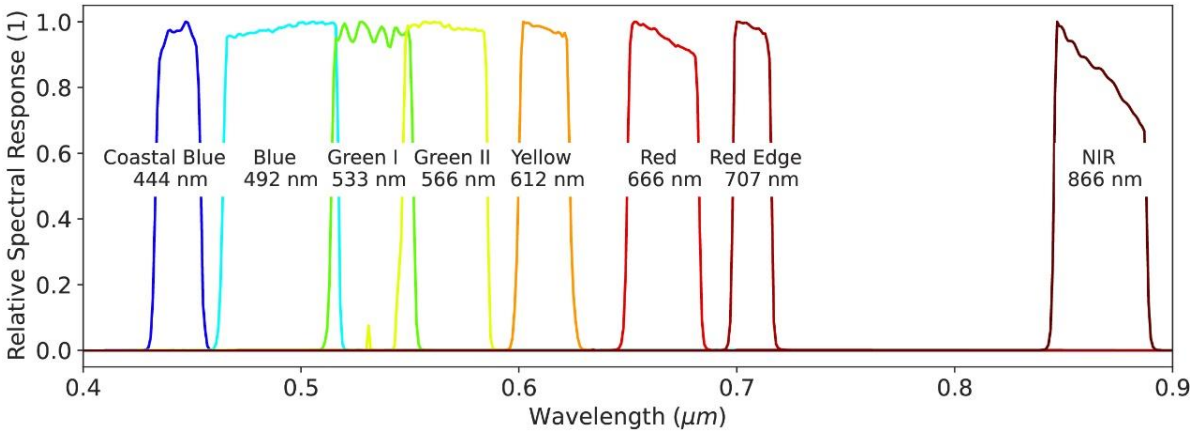

Figure 2. The position and width of the spectral bands of Planet SuperDove sensor. Source: https://opg.optica.org/oe/fulltext.cfm?uri=oe-31-9-13851&id=529038

SuperDove is the new generation of PlanetScope sensors. It rely on the newest PSB.SD instrument. It consists of the next generation "PSBlue" telescope with a larger 47 megapixel sensor and the same filter response as PS2.SD below, in the Red, Green, Blue and NIR bands. The PSB.SD payloads extend this capability so that in addition to the four bands that are identical to the PS2.SD spectral bands (Red, Green, Blue, and NIR), there are four additional bands. These additional bands are Red Edge, Green I, Yellow, and Coastal Blue. Red Edge is meant to be interoperable with Sentinel-2 band 5.

While the provider is of commercial interest, since its establishment period, a Education and Research Program has been established. This allows access to university users for research and development using specific quota per month. The access to the data is provided through the Planet Explorer portal (Figure 3).

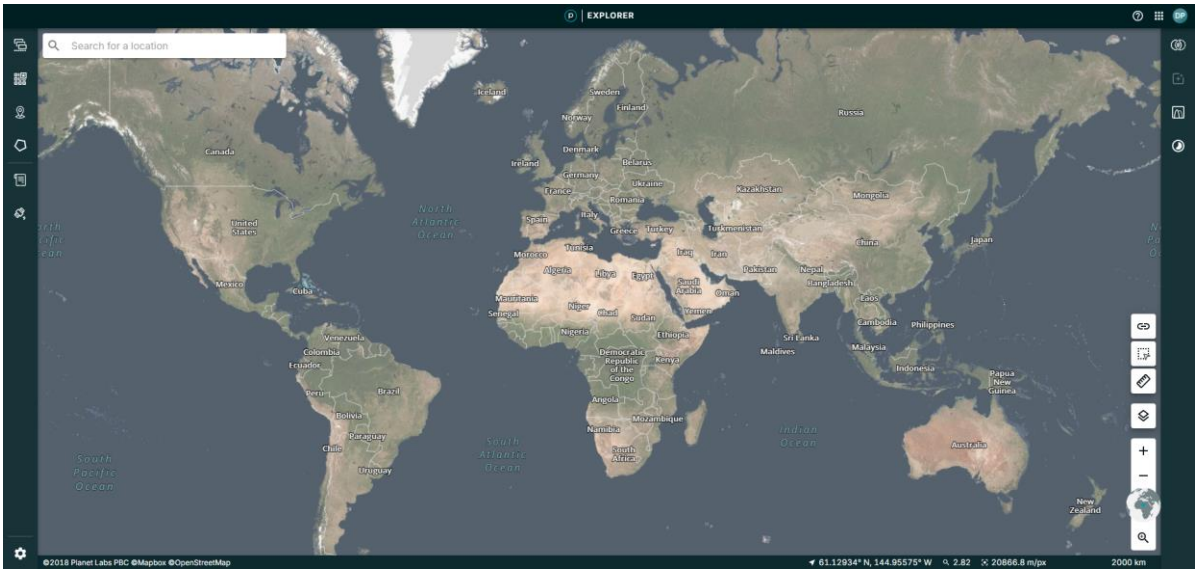

Figure 3. View of the Planet Explorer tool.

The user defines the Area of Interest (AoI), the time frame data are needed and criteria on cloud cover, sun angle and sun azimuth, percentage cover of the AoI and quick looks are loaded for visual inspections.

This step is necessary as effects like wave glint, white caps, sunglint and cirrus clouds are not part of the filtering process, since for this phenomena, no automated algorithm has been incorporated in the process.

From the archive we visually selected 31 tiles, corresponding to 11 imagery for the dates that data were visually suitable for ordering and further use in the analysis. Upon processing, the most suitable imagery will be selected for the development of workflow for the mapping of *Cystoseira* spp. forests.

The name of each downloaded PlanetScope image product is composed of the acquisition date (YYYYMMDD), acquisition time (in UTC), satellite ID, product level, product type, and file extension.

For example, a name "20230831_085531_51_2470_3B_AnalyticMS_8b_clip.tif" is composed of 2023-08-31 (acquisition date), 08:55:31 (acquisition time), 51_2470 (satellite ID), 3B (product level), AnalyticMS_8b_clip (product type), and .tif (file extension). Below table with the names of the selected imagery is provided and figure 4 provide a sample of an imagery.

Table 1. The selected imagery.

20230831_085531_51_2470_3B_AnalyticMS_8b_clip.tif	20230831_085533_64_2470_3B_AnalyticMS_8b_clip.tif
20230921_085527_36_248e_3B_AnalyticMS_8b_clip.tif	20230921_085821_62_241c_3B_AnalyticMS_8b_clip.tif
20231010_081930_36_2464_3B_AnalyticMS_8b_clip.tif	20231010_081932_43_2464_3B_AnalyticMS_8b_clip.tif
20231108_081958_95_2430_3B_AnalyticMS_8b_clip.tif	20231108_082001_00_2430_3B_AnalyticMS_8b_clip.tif
20231108_082200_81_24c0_3B_AnalyticMS_8b_clip.tif	20231108_082203_07_24c0_3B_AnalyticMS_8b_clip.tif
20231219_082414_14_2439_3B_AnalyticMS_8b_clip.tif	20231219_082416_11_2439_3B_AnalyticMS_8b_clip.tif
20231219_091920_38_24b7_3B_AnalyticMS_8b_clip.tif	20231219_091922_68_24b7_3B_AnalyticMS_8b_clip.tif
20240210_082144_47_24c9_3B_AnalyticMS_8b_clip.tif	20240304_082041_70_24b4_3B_AnalyticMS_8b_clip.tif
20240304_082043_85_24b4_3B_AnalyticMS_8b_clip.tif	20240304_082327_68_24c8_3B_AnalyticMS_8b_clip.tif
20240304_082329_80_24c8_3B_AnalyticMS_8b_clip.tif	20240304_082358_26_2423_3B_AnalyticMS_8b_clip.tif
20240304_082400_17_2423_3B_AnalyticMS_8b_clip.tif	20240406_091556_34_24dd_3B_AnalyticMS_8b_clip.tif
20240406_091650_27_24e1_3B_AnalyticMS_8b_clip.tif	20240406_091652_53_24e1_3B_AnalyticMS_8b_clip.tif
20240406_091851_48_24d2_3B_AnalyticMS_8b_clip.tif	20240506_091733_86_24f5_3B_AnalyticMS_8b_clip.tif
20240506_091736_16_24f5_3B_AnalyticMS_8b_clip.tif	20240602_082429_62_24a1_3B_AnalyticMS_8b_clip.tif
20240602_082431_93_24a1_3B_AnalyticMS_8b_clip.tif	20240702_083011_82_24c5_3B_AnalyticMS_8b_clip.tif
20240702_083013_90_24c5_3B_AnalyticMS_8b_clip.tif	20240804_091718_84_24fb_3B_AnalyticMS_8b_clip.tif
20240804_093333_91_248c_3B_AnalyticMS_8b_clip.tif	

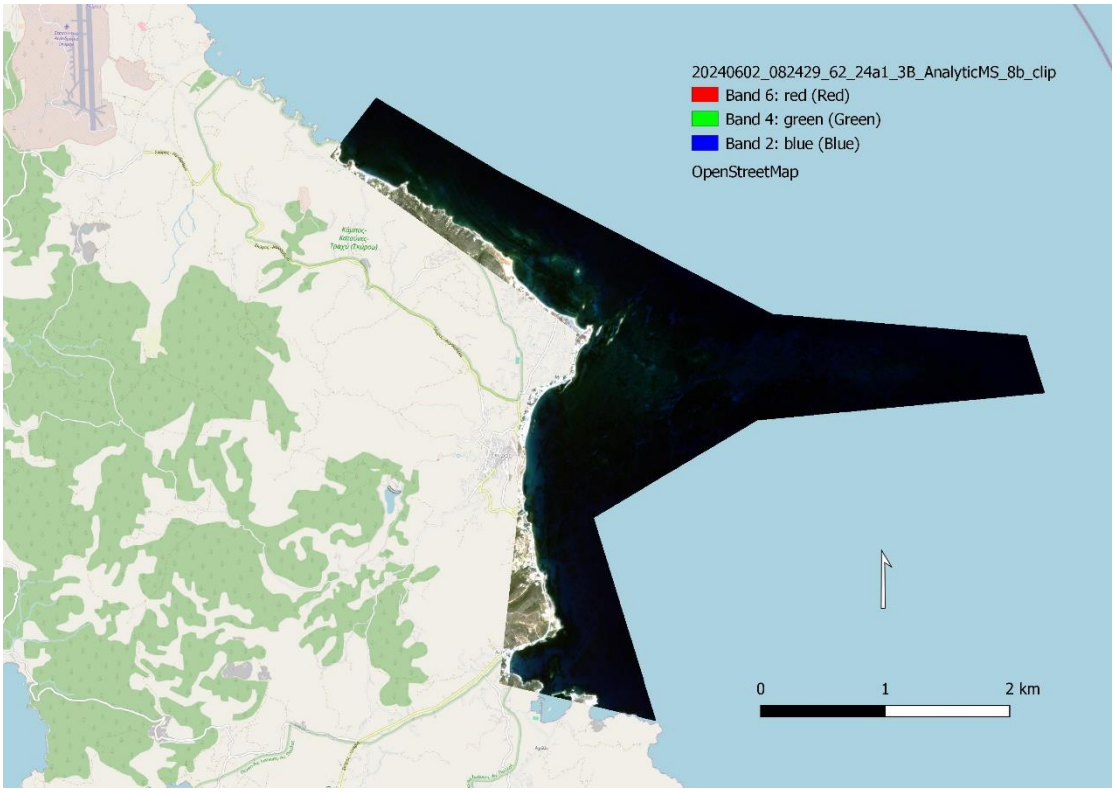

Figure 4. Example of the PlanetLabs imagery, from the case study area in Skyros island.