NEMO TOOLS

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

Milestone M3.2

Compilation of the GUV imagery dataset

Greece 2.0
NATIONAL RECOVERY AND RESILIENCE PLAN

Funded by the European Union
NextGenerationEU

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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	WP3
Related Task(s)	T3.2
Deliverable Number	Milestone M3.2
Deliverable Name	Compilation of the GUV imagery dataset
Due Date	14.02.2025
Date Delivered	14.02.2025
Dissemination Level	Public — fully open (automatically posted online on the Project Results platforms)

VERSION CONTROL

Revision-N°	Date	Description	Prepared By	Reviewed By
	14.02.2025	Final	A. Mazaris	

Executive Summary

A digital database of 100 aerial images was created to document the marine ecosystems of Koutavos Lagoon and the adjacent bay in Kefalonia Island, using UAS technology. Flights were optimized to minimize disturbance to sea turtles and maximize image quality, capturing key ecological data. Detailed records, including animal sightings and environmental conditions, were collected to support ongoing monitoring and research efforts.

TABLE OF CONTENTS

DOCUMENT INFORMATION AND VERSION CONTROL 3
VERSION CONTROL 3
Executive Summary 4
CONTRIBUTORS 6
The GUV imagery dataset 7

CONTRIBUTORS

TABLE 1 NAMES AND ROLES OF CONTRIBUTORS TO THIS MILESTONE.

Name	Affiliation	WP Lead	Task Lead
A. Mazaris	AUTH		

The GUV imagery dataset

A digital databased was compiled consisting of 100 images from the marine ecosystems of Koutavos, Kefalonia island. All flights were planned and carried out using Unmanned Aerial Systems (UAS). The flights covered the entire area of the Koutavos Lagoon, as well as the part of the bay that directly connects to it and extends up to the port of Argostoli, as these areas were identified as meeting all the necessary criteria for the implementation of the action:

(a) intense use by sea turtles, and

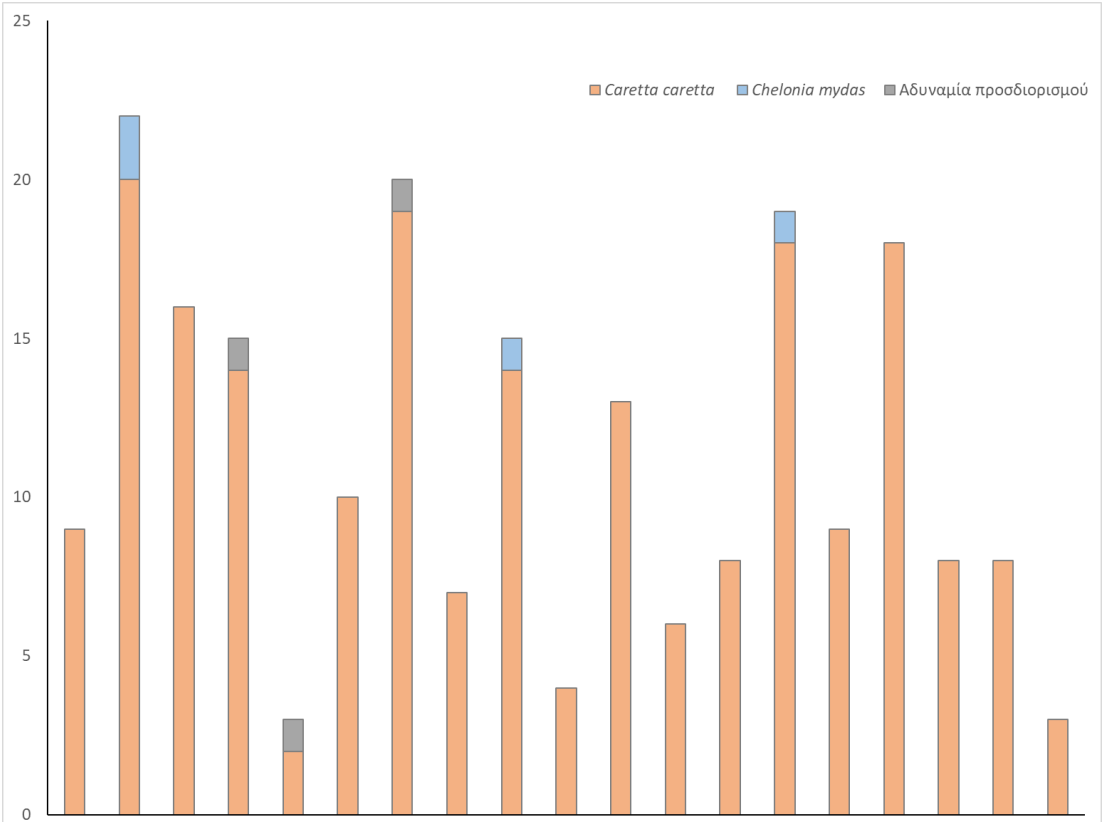
(b) significant anthropogenic pressures.

The DJI Air 2S model was used for the flights. The flight plans were created with the help of the Dronelink software. The flight altitude was set at 70 meters, determined after trial flights, allowing for the identification of turtles and the coverage of the necessary study area within a time frame that was energy-efficient with respect to flight autonomy criteria. It is important to note that at this altitude, auditory or visual disturbance to the turtles is avoided.

The interval between successive photo captures was set at five seconds, with the camera positioned vertically above the water surface, and the photos having a minimum overlap of 10%. The optimal time of day for conducting flights was observed to be shortly after sunrise, successfully avoiding haze in parts of the photos under ideal weather conditions. In cases where water glare was intense due to atmospheric cloud cover, the flight time was adjusted accordingly. Similarly, flights were conducted during the afternoon hours or postponed when heavy rainfall or strong winds prevailed at the scheduled flight time.

For each flight the following information was collected and became available: date / time / duration / weather conditions / number of animals identified / sex of individuals / age class of individuals.

Bellow a summary of the data:


25
20
15
10
5
0
Caretta caretta
Chelonia mydas
Αδυναμία προσδιορισμού

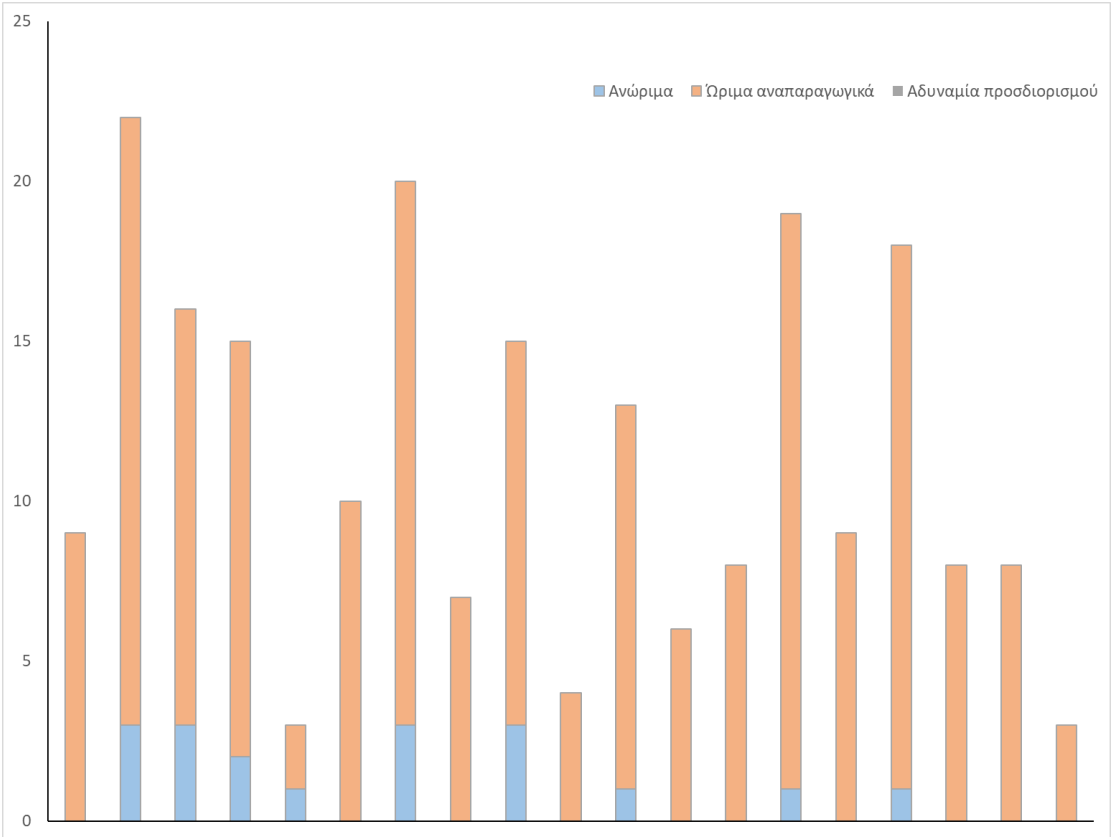

25
20
15
10
5
0
Ανώριμα
Ώριμα αναπαραγωγικά
Αδυναμία προσδιορισμού

Figure 1. A heatmap on the presence of sea turtle detected thought the flights

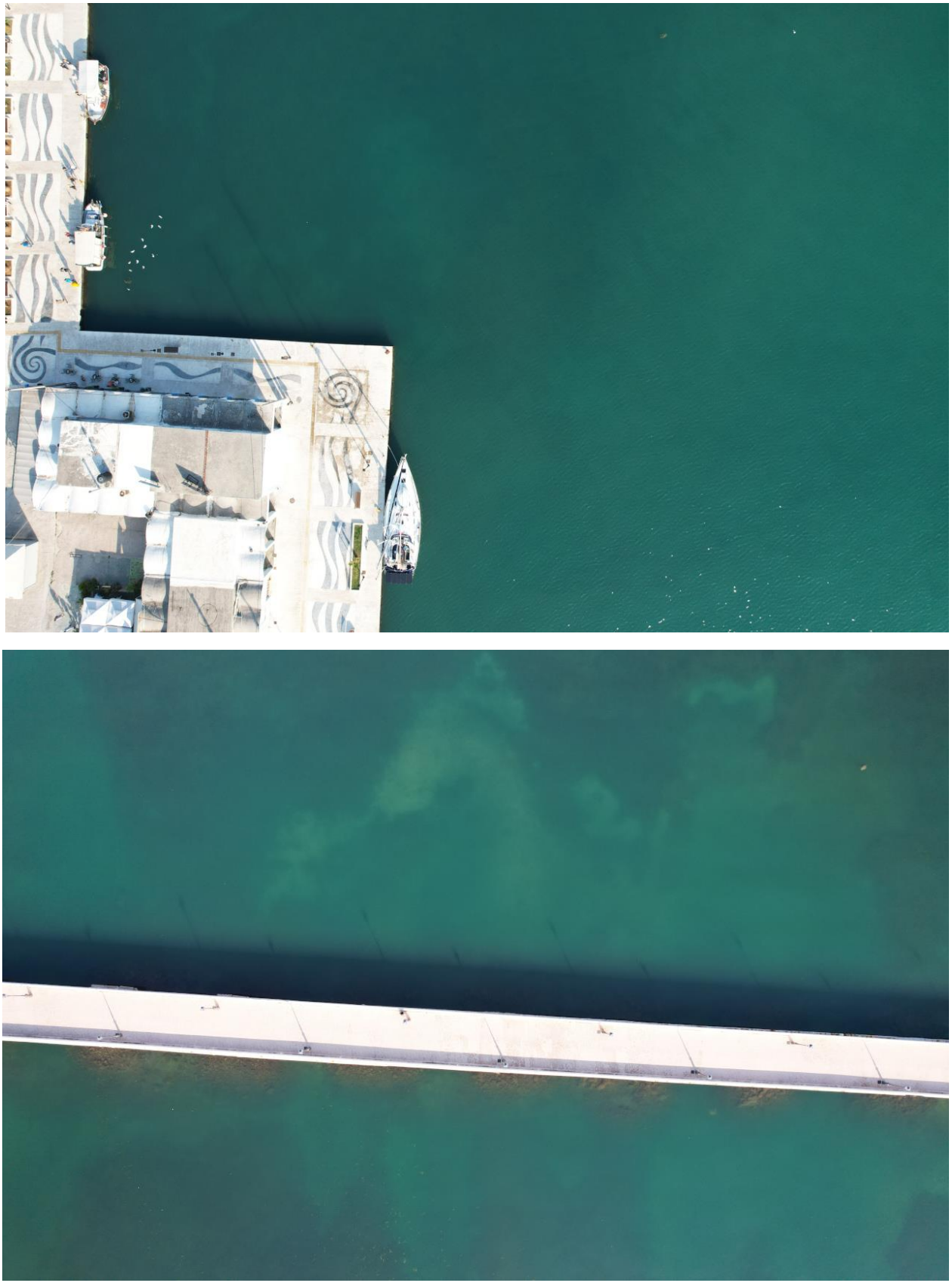


Figure 2. Example of images collected and analysed

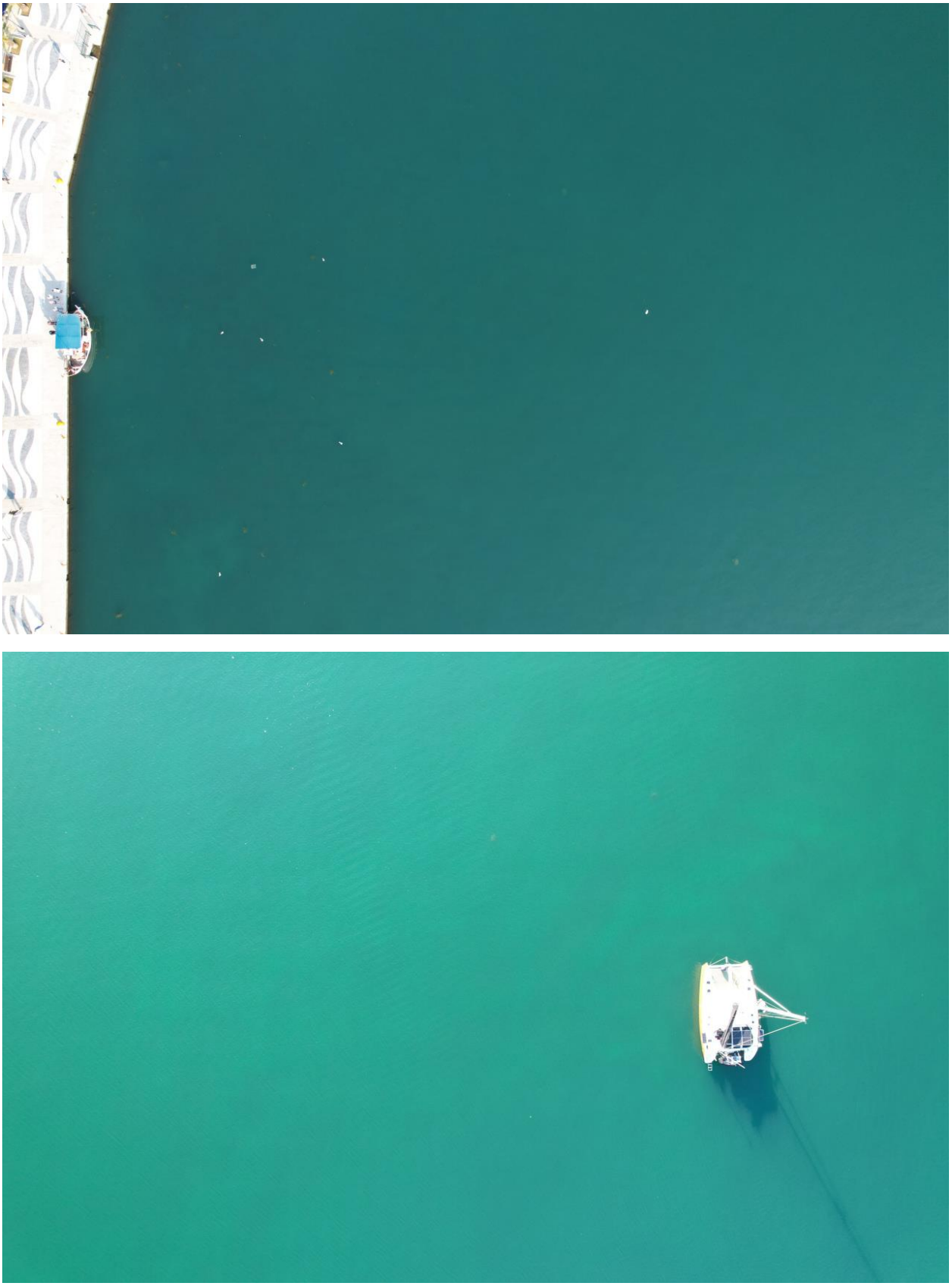


Figure 3. Example of images collected and analysed (continue)

Figure 4. Example of image collected and analysed (continue)