



**ODYSSEA**

Operating a network of integrated observatory  
systems in the Mediterranean Sea

## Project Deliverable Report

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Deliverable Title: Reports of thematic workshops

Author(s): Georgios Sylaios

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Approvals				
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## 1 Executive Summary

In order to define user requirements and guide platform development activities, including required data and services, several validation workshops were organised during the implementation of the ODYSSEA project.

The main purpose of these workshops was to promote user uptake and at the same collect and leverage adequate feedback that would effectively inform relevant activities and contribute to the development of robust outputs.

This report describes and documents this process that stimulated the generation of services and products tailored to user needs across the Mediterranean.

## 2 Introduction

The overall aim of ODYSSEA is to facilitate access to and use of marine data for a broad range of end-users to help them make better informed decisions that support the development of a sustainable blue economy and the effective conservation of marine ecosystems and biodiversity in the Mediterranean Sea.

To this end, ODYSSEA has developed and currently operates an interoperable and cost-efficient platform, named “Marinomica” ([marinomica.com](http://marinomica.com)), that combines observing and forecasting systems across the Mediterranean Sea. The mission of the Marinomica platform is to transform generated data into valuable information that can be used by industry, society and government to make better informed decisions for safer and more cost-efficient operations at sea, for increased revenues while reducing the environmental footprint of economic activities, to attract investments to the region, to manage environmental issues more effectively, and to protect and restore healthy marine ecosystems and biodiversity.

In this context, the ODYSSEA consortium identified (see D9.1: Map of platform data and services to targeted end-user needs) the potential stakeholders and end-users per Observatory. Then, a series of workshops were organized in the various Mediterranean partner countries to define user requirements and guide platform development activities, including required data and services.

Deliverable 9.4 documents and concludes Task 9.2: “Organise and run user validation workshops”. This Report presents the effort made to demonstrate the novelties of the Marinomica platform and of the monitoring and modelling systems deployed by the ODYSSEA consortium to the North African stakeholders and users.

In effect, the ODYSSEA consortium recognised early on the synergies that could be leveraged by pooling together the resources allocated to ensure that the ODYSSEA platform, the Observatories, and the associated services are developed. It soon became clear to all partners that mapping and understanding users’ requirements could produce outputs in line with a long-term strategy for ensuring the sustainability of these services. Emphasis was placed on North African stakeholders and end-users where a need for increased capacity on operational oceanography was identified by the consortium.



### 3 Platform validation and capacity development workshop: hydrodynamical and water quality modeling based on the MARINOMICA platform (Egypt) Wednesday-Thursday, 14 - 15 July 2021

#### 3.1 Summary

A training workshop on the use of the Marinomica platform was held online by partners of the EU-funded ODYSSEA project on 14-15 July 2021, focusing on boosting the capacity development among Egyptian end-users in carrying out hydrodynamical and water quality modelling, analyze and process modeling results, and introduce participants into operational oceanography, sustainable development and blue growth, in general.

Participants recognized in Marinomica a unique tool that eases access to knowledge, by providing a single portal that applies advanced algorithms to organize, homogenize and fuse the large quantities of data, in common standard type. The training focused on the products accessible via the Marinomica platform and the data and information the system offers in support of the sustainable use and management of ecosystems. This training was placed in the context of the broader Mediterranean's challenges, such as vulnerable ecosystems, overexploitation, pollution, extreme events, renewable energies and coastal protection.

Participants had the opportunity to work with a range of data-based oceanographic information products developed by ODYSSEA, being accessible to stakeholders via the Marinomica platform, including mapping and monitoring of hydrodynamic parameters (such as wave conditions) and eutrophication.

The training session was also a valuable exercise in user validation of the Marinomica platform. With both goals in mind, the workshop targeted the Egyptian port authority professionals, the public administration staff, researchers and academics, and other stakeholders active in fisheries, aquaculture, and in bodies protecting the marine environment.

The workshop was hosted by the ODYSSEA partners, the United Nations Environmental Program Mediterranean Action Plan [Regional Activity Centre for Specially Protected Areas](#) (UNEP/ MAP SPA/RAC) and the [Arab Network for Environment and Development](#) (RAED).

Katerina Spanoudaki, oceanographer, representing the [Foundation for Research and Technology – Hellas](#) (FORTH) gave instructions on the use of the Marinomica products, providing hydrodynamics / wave information, and Hydrodynamics Modelling Training (theory and exercises).

Lórinč Mészáros of Deltares lectured on the Marinomica services related to water quality (such as eutrophication) as well as on the water quality model (DELWAQ) in theory and practical exercises.

Simon Keeble of [Blue Lobster IT](#) gave a Demonstration of the most recent update (carried out in June 2021) of the Marinomica platform.

## 3.2 Agenda



Mediterranean  
Action Plan  
Barcelona  
Convention



**PLATFORM VALIDATION AND CAPACITY DEVELOPMENT WORKSHOP:  
HYDRODYNAMICAL AND WATER QUALITY MODELING BASED ON THE MARINOMICA PLATFORM  
Wednesday-Thursday, 14 - 15 July 2021**

**Venue: Online - Join Zoom Meeting using this link:**

<https://spa-rac-org.zoom.us/j/93715337808?pwd=Y0prL3M2bm85ZDJxUy8zeTkrUW1PdZ09>

Meeting ID: 937 1533 7808 / Passcode: kbbK79

### WORKSHOP AGENDA

<b>Day 1: Wednesday 14<sup>th</sup> July. 10:00-16:45 EG or CEST time</b>	
1. ODYSSEA general introduction: project, sensors development, platform usage and services to end-users.	<b>10:00 – 10:45</b> Dr. Emad Adly, RAED (15min)
2. General introduction on modeling and data assimilation	Prof. Georgios Sylaios, DUTH (15min) Prof. Ghada El Serafy, DELTARES (15min)
3. Demonstration of the last update (June 2021) of the Marinomica platform	<b>10:45 – 11:15</b> Simon Keeble, BLIT
4. Marinomica products providing hydrodynamics / wave information	<b>11:15 – 11:45</b> Dr. Katerina Spanoudaki, FORTH
<b>Coffee Break</b>	<b>11:45 – 12:30</b>
5. Hydrodynamics Modelling Training – Theory	<b>12:30 – 14:30</b>
6. Hydrodynamics Modelling Training - Exercise	<b>14:30 – 16:30</b> Dr. Katerina Spanoudaki, FORTH
<b>Discussion and Evaluation</b>	<b>16:30 – 16:45</b>
<b>Moderator: Eng. Essam Nada, RAED Technical Consultant</b>	
<b>Day 2: Thursday 15<sup>th</sup> July. 10:00-16:45 EG time or CEST time</b>	
1. Recap of day 1, remaining questions on day one	<b>10:00 – 10:30</b> Dr. Katerina Spanoudaki, FORTH
2. Marinomica Water quality related services (e.g. eutrophication)	<b>10:30 – 12:00</b> Lőrinc Mészáros, Deltares

Coffee Break	12:00 – 12:30
<b>Delwaq - Theory</b> <ul style="list-style-type: none"> <li>a) Basic concepts in water quality modelling</li> <li>b) Selection of substances/parameters and processes (e.g. Oxygen, Nutrients (cycles of N, P and Si), Algae modelling)</li> <li>c) Introduction to the Graphical User Interface. Short description of Delwaq components and tools implemented in the user interface.</li> <li>d) File formats and file structure</li> </ul>	<b>12:30 – 14:30</b> Lőrinc Mészáros, Deltares
Questions and Answers	<b>14:30 – 14:45</b> Lőrinc Mészáros, Deltares
<b>Delwaq - Practical Exercises</b> <ul style="list-style-type: none"> <li>a) Setting up a sample model (coupling to hydrodynamics, grid aggregation)</li> <li>b) Working with the Processes Library Configuration Tool</li> <li>c) Simulation and handling of error messages</li> <li>d) Interpreting and using the output files (QUICKPLOT / Matlab)</li> </ul>	<b>14:45 – 16:15</b> Lőrinc Mészáros, Deltares
Questions and Answers	<b>16:15 – 16:30</b> Lőrinc Mészáros, Deltares
<b>Closing and Evaluation of the 2 days training</b> <b>Moderator:</b> Eng. Essam Nada, RAED Technical Consultant	<b>16:30 – 16:45</b>

### 3.3 Presentations

ODYSSEA > Platform Validation and Capacity Development Workshop: Hydrodynamical and Water Quality Modeling based on the Marinomica Platform

<https://odysseaplatform.eu/platform-validation-and-capacity-development-workshop-hydrodynamical-and-water-quality-modeling-based-on-%CF%84%CE%B7%CE%B5-marinomica-platform/>

### 3.4 Results

Participant List

#	Name	#	Name
1	Dr. Abla Abdelrahman Abdullah El Sheikh	15	Dr. Asmaa Ahmed Awad
2	Dr. Mohamed Omer Taqi Aboubakr	16	Dr. Essra El-Masry
3	Dr. Eman Ebashry	17	Dr. Asmaa Nazir Mogahed
4	Dr. Enas Ahmed Farghaly	18	Dr. Mohamed Adel
5	Dr. Hagar Mahmoud mohamed	19	Dr. Mohamed Abdelfattah Mohamed
6	Dr. Mai Fath Allah Gebril	20	Dr. Arafa Nagy Mohammed
7	Dr. Nafesa Thabet Thabet	21	Ms. Aliaa elkasheif
8	Dr. Nahla Zakarya Taher	22	Dr. Rasha Stohy

9	Ms. Nora Omar Elsayed	23	Ms.Aya Emam
10	Dr. Rania Hussein Abd Elsamie Elsayy	24	Ms.Zahraa Raafat
11	Dr. Wael Attia Hamed	25	Dr.Ghada Hassan
12	Mr. Mohamed Reda Helal	26	Doaa Mohammed Naguib
13	Dr. Ahmed Refaat Mohamed	27	Mahmoud Sami Lashin
14	Dr. Alaa El Din Mahmoud	28	Mr. Khaled Hatem Atya

## 4 ODYSSEA platform User Validation and Operational Oceanography Training Workshop for End-Users in Morocco, 2-3 June 2021.

### 4.1 Summary

A Training Workshop was held on 2-3 June 2021 to promote User Validation of the Marinomica Platform and to foster capacity development in Operational Oceanography, amongst Moroccan stakeholders.

The online workshop, targeting port authority professionals, public administration staff, researchers and academics, and other stakeholders active in marine environmental protection, fisheries and aquaculture, was hosted by the following ODYSSEA partners: AGIR (based in Morocco) and the Tunisia-based Regional Activity Centre for Specially Protected Areas (RAC/SPA).

From ODYSSEA, the coordinator Prof Georgios Sylaios, introduced participants on ODYSSEA's goals and applications in the context of the Mediterranean's challenges, such as vulnerable ecosystems, overexploitation, pollution, extreme events and coastal protection. In parallel, Sylaios presented ODYSSEA's central objective of making Mediterranean marine data accessible and operational to a broad range of end-users through its Marinomica platform and creating a network of observatories across the Mediterranean to engage local communities in activities related to sustainable Blue Growth.

Nicolas Granier and Claire Dufau of the Collecte Localisation Satellites (CLS) provided further details about the design, use and data access systems of the Marinomica platform, as well as on the specific services offered by Marinomica, including the provision of data on marine water quality parameters, jellyfish, coastal erosion, waves and currents, ballast water, and more. Particular mention was made of the fact that the data is being collected both in situ and by satellite.

Houssine Nibani of AGIR provided specific information about Morocco's own Al-Hoceima marine observatory and underlined that its main missions included expanding knowledge about the Mediterranean coast of the country, its marine habitats and biodiversity, as well as its physiochemical and marine sediment characteristics, microplastic pollution, marine mammals, acoustics, marine heritage and other assets, bringing all of this together into accessible digital cartography tools.

Daniel Cebrian of RAC/SPA gave a presentation on the synergy between ODYSSEA and the Integrated Monitoring and Assessment Program (IMAP) of the United Nations Environmental Program Mediterranean Action Plan (UNEP/ MAP), an outgrowth of the Barcelona Convention, including IMAP gaps addressed by the ODYSSEA data and models, with reference to the 2017 Mediterranean quality status report (2017 MED QSR).

Paulo Leitao of Hidromod gave a presentation on the Hydrodynamic Modelling results along the Moroccan coast in the Mediterranean, stressing the importance of validation as a "critical task". The validation is a complex process because the present volume of observations is quite large and the number of observations is continuously growing while the models used are being improved. "Validation is a critical component of any service. The end-user needs to know the forecast uncertainty," he explained.

Laurent Beguery and Orens de Fommervault of ALSEAMAR provided in-depth information on the glider technology used in the context of the parameters monitored by the Marinomica marine observatories, as well as how the data is processed and analysed, and specificities and constraints of the sensors. Einar Hauge Hansen of Develogic complemented this information with a presentation on oceanographic sensors for seawater quality monitoring, and Slim Gana of RAC/SPA made a presentation on methods for analysing historical wave data available via the Marinomica platform, explaining how to access the data using the web.

Turning to more specific applications, Sylaios demonstrated the platform's Web GIS tool kit being developed for mussel farmers, and Lorinc Meszaros of Deltares presented Marinomica's eutrophication indices and applications.

The working language of the Workshop was FR in order to facilitate communication with the local stakeholders and users with simultaneous interpretation from/to EN was provided by a professional team recruited by SPA/RAC.

## 4.2 Agenda

### ATELIER DE VALIDATION DE LA PLATEFORME DE DONNEES PAR LES UTILISATEURS ET DE FORMATION A L'OCEANOGRAPHIE OPERATIONNELLE Mercredi-Jeudi, 2-3 June 2021

(ODYSSEA PLATFORM USER VALIDATION & OPERATIONAL OCEANOGRAPHY TRAINING WORKSHOP)

**Public cible:** Parties prenantes et utilisateurs du Maroc : Universitaires (Étudiants, Chercheurs), Autorité portuaire, autorité publique dans le domaine de la protection de l'environnement marin, de la pêche, de l'aquaculture, industrie aquacole, etc

**Target Public:** Moroccan stakeholders : University (Students, Researchers) Port Authority, Public authorities active in the field of marine environmental protection, fisheries, aquaculture, ...

**Période:** Mercredi-Jeudi, 2-3 Juin 2021 (2 jours) - **Lieu :** En ligne / **Venue :** Online

Joindre le Meeting via Zoom: <https://spa-rac->

org.zoom.us/j/98358951838?pwd=RmoxU3IHY2Jkd3RjYUdRSi9zbUpVdz09

Meeting ID: 983 5895 1838 - Passcode: 8zV3cA

## AGENDA

*En heure locale du Maroc (GMT+1)*

**1ère journée : 2 Juin 2021 – présentation des acquis du projet aux institutions**

**Information sur les produits développés dans le cadre d'ODYSSEA et leurs applications**

### 1. Matinée (Morning Session : 09:00 – 11 :00 / Morocco time - GMT+1 )

- Mot de Bienvenue et présentation générale des objectifs : Houcine Nibani (AGIR, Maroc, 10min)

- Présentation générale des acquis du projet ODYSSEA et leur application opérationnelle / Project Overview and the role of the AI-Hoceima Observatory

- Project overview, Prof. Georgios Sylaios (Democritus University of Thrace, Greece, coordinator, 10-15 min)
- Introduction à la plateforme Marinomica (Nicolas Granier, C.L.S., 20 min)
- Claire Dufau (Collecte Localisation Satellite, France) : Présentation des services dans différents secteurs d'activité (15 min)
- Introduction à l'observatoire d'El-Hoceima (H. Nibani, 20 min)
- Application de l'océanographie opérationnelle et de la modélisation numérique à la navigation et à la gestion portuaire : Adelio Da Silva (Hidromod, 20 min)
- Discussion (20 min)

## **2. Après-midi (Afternoon session : 13:30 – 15 :00 / Morocco time – GMT+1)**

Relation avec la protection de la biodiversité marine (Modérateurs :H. Nibani, S. Gana et G. Sylaios)

- Synergie entre ODYSSEA et le programme IMAP du Plan d'Action pour la Méditerranée (Daniel Cebrian, UNEP/MAP/SPA/RAC, 30 min)
- Biodiversity protection issues: Implementation of the Ballast Water convention. Detection invasive species in Harbor. Mercedes De Juan (Valencia Port Fundacion, 30 min)
- Discussion générale
- Paulo Leitão (Hidromod): Hydrodynamic Modeling results along the Moroccan coasts (30 min)

**2ème journée : 3 Juin 2021 – Aspects technologiques et scientifiques.**

**Formation aux outils d'analyse des données produites par ODYSSEA pour les doctorants, chercheurs et scientifiques (Capacity-Building for Scientists & Students)**

## **1. Matinée (Morning Session): 09:00-12:00**

Modérateur : Slim GANA (SPA/RAC – Sea-Gust)

- Présentation des campagnes Glider réalisées dans les eaux marocaines (09:00-10:40) a. Présentation de la technologie Glider (Laurent Beguery, ALSEAMAR, 15min)
- Préparation de la mission, Déploiement, Itinéraire, Opérations (Houcine Nibani, AGIR, 15min)
- Méthodes de traitement et d'analyse des données de Glider – Interprétation (40min)
- Exploitation des données de Glider (Orens de Fommervault, ALSEAMAR)
- Discussion (20 min)

## ***Pause – Break : 10:30 – 10:45***

- Méthodes d'acquisition, de traitement et d'analyse des données bouées de surface et de Lander (10:45 – 12:00) a. Oceanographic sensors for seawater quality and hydrodynamic monitoring - *Instruments de mesures des paramètres hydrologiques et hydrodynamiques in-situ* - (Einar-Develogic, 15 min)
- Processing and Analysis of CTD and hydrodynamic data using « R » (Georgios Sylaios, DUTH, 30 min)
- Demonstration of the webGIS toolkit (to be used by the mussel farmers) to illustrate the data from surface buoy (Georgios Sylaios, DUTH, 10 min)

d. Discussion (20 min)

## 2. Après-midi (Afternoon Session): 13:30 – 16:00

A. Méthodes d'analyse des données historiques de houles disponibles via la plateforme Marinomica : Extraction, Analyse d'une série temporelle, calcul des caractéristiques de houles en fonction des périodes de retour (S. GANA, 30 min)

B. Paulo Leitão (Hidromod): Hydrodynamic Modeling results along the Moroccan coasts (30 min) (voir 1ere journée, 15:00)

C. Discussion (20 min)

### ***Pause de 10min - Short- break (14:50-15:00)***

D. Eutrophication indices in Marinomica and applications (Lorinc Meszaros, DELTARES, 30 min)

E. Discussion (20 min)

F. General Conclusion of the workshop (10 min)

## 4.3 Presentations

ODYSSEA > Project Information > Training Materials > ODYSSEA Platform User Validation & Operational Oceanography Training Workshop

<https://odysseaplatform.eu/project-information/training-materials/odyssea-platform-user-validation-operational-oceanography-training-workshop/>

## 4.4 Results

### Participant List

1. Souhail Karim	21. Abdellaoui Ben Younes	41. Khadija Echogdali
2. Mostafa Layachi	22. Khalil Bouzid	42. Asma Damghi
3. Bekkach Mouna	23. Daniel Cebian	43. Jabran
4. Salih Amarir	24. Slim Gana	44. Claire Dufau
5. Orens de Fommervault	25. Houssine Nibani	45. Rhimou El Hamoumi
6. Hasnaa Nait Hammo	26. Ismail Bessa	46. Nicolas Granier
7. Mustapha Ait Omar	27. Bouchra Benyoub	47. Paaulo Leita
8. Mr Rabih	28. Mounia Hamdaoui	48. Adelio Silva
9. Jamal Chaimaa	29. Lorinc Meszaros	49. Mercedes De Juan
10. Iraqi Houssaini el Ghali	30. Menelaos Chatziapostolidis	Muñoyerro
11. Iliass Nibani	31. Ahmed Hamid	50. Khaili Aymane
12. Ilham	32. Georgios Sylaios	51. Hamza Ben Chaib
13. Hajar Idmoussi	33. Celine Ndong	52. Nouh Lahmam
14. Ghita Harrak	34. Hasna Buazzati	53. Naoufal Amarnis
15. Safaa Fetal	35. Einar House Hansen	54. Ilyas Sejli
16. Fatima Machay	36. Pr Hinde Cherkaoui Dekkaki	55. Abdelhadi Benis
17. El Menouar Btissam	37. Idrissi	56. Abdelmounim El Mrini
18. Abdellah Khouz	38. Zaroq Safae	57. Laurent Beguery



19. Mustapha Sidi Ben Salah	39. Lorenza Babbini	58. Younes El Azzouzi
20. Hajar Idmoussi	40. Amani	59. Jamal Chioua

## 5 Geospatial analytics and Remote Sensing for Climate Change Impact on Marine and Coastal Ecosystems, 22 – 24 February 2021, Cairo- Egypt

### 5.1 Summary

The training and validation workshop entitled “Geospatial analytics and Remote Sensing for Climate Change Impact on Marine and Coastal Ecosystems” was held in hybrid mode (physical and online) 24-27 February.

The background for this workshop can be summarised as follows: (a) The gap of knowledge and understanding of the impacts of climate change on marine environment, which results in a wide range of impacts including increased flood risk and submergence, salinization of surface and groundwaters, and morphological change, such as coastal erosion and wetland loss; (b) Additionally, there is a strong role for young scientists / researchers from Egypt to provide best response to climate change and sea-level rise in the coastal zone, as well as to give an overview of recent researches on climate change impacts on the marine environment and identify key scientific gaps and priorities for future research and necessary actions; (c) a participatory approach, including relevant stakeholders was deemed as essential to achieve expected results, thus involvement of active CSOs and representatives of environmental protection public authorities added value.

The target audience were 24 university student leaders, representing 3 targeted governmental universities. In addition to 6 post graduate students, who should have a previous background in remote sensing activities, volunteering, or communal responsibility experience. 5 members from NGO and 5 governmental official from Ministry of Environment and protected area sector

The training offered a set of methods and techniques that use GIS and Remote Sensing for the analysis and monitoring the climate change effects on the marine environment.

## 5.2 Agenda



Mediterranean  
Action Plan  
Barcelona  
Convention



### Geospatial analytics and Remote Sensing for Climate Change Impact on Marine and Coastal Ecosystems

22 – 24 February 2021

Cairo- Egypt

#### Course Curriculum

Day 1: Monday 22 <sup>nd</sup> Feb. 10:00-16:00 EG time	
1. Introduction and welcome remarks to the ODYSSEA Project	10:00 – 11:00 Dr. Emad Adly, RAED Professor. Georgios Sylaios, DUTH
2. The importance of Environmental Monitoring for compliance with the Integrated Assessment and Monitoring Programme (IMAP) of the Barcelona Convention	11:00 - 12: 00 Dr. Daniel CEBRIAN, (UNEP/MAP-SPA/RAC)
<b>Coffee Break</b>	12:00 – 12:15
3. Using remote sensing and GIS to study coastal erosion and shoreline evolution, Part I	12:15 - 13:30 Mr. Konstantinos Zachopoulos, DUTH Dr. Esraa El Masry, Faculty of Science Department, Alexandria University
<b>Lunch Break</b>	13:30 - 14:30 Lunch Break
4. Using remote sensing and GIS to study coastal erosion and shoreline evolution, Part II	14:30 – 15:30 Mr. Konstantinos Zachopoulos, DUTH Dr. Esraa El Masry, Alexandria University
<b>Discussion and Evaluation</b>	15:30 – 16:00 Eng. Essam Nada, RAED Technical Consultant

<b>Day 2: Tuesday 23<sup>rd</sup> 10:00-16:00 EG time</b>	
1. Accessing data from marine database	10:00 – 11:100 Ms. Maria Zoidou, DUTH
2. Forecasting models for ocean circulation and waves in Marinomica (Nile zone of influence).	11:00-12:00 Dr. Katerina Spanoudaki, FORTH
<b>Coffee Break</b>	12:00 – 12:15
3. Introduction to Marinomica	12:15 – 13:15 Dr. Simon Keeble, Blue Lobster IT
4. Analyzing historical trends of eutrophication indices using Marinomica	13:15 – 14:30 Mr. Lorinc Meszaros, Deltares
<b>Lunch Break</b>	14:30 - 15:30 Lunch Break
<b>Discussion and Evaluation</b>	15:30 - 16:00 Eng. Essam Nada, RAED Technical Consultant

<b>Day 3: Wednesday 24th 10:00-16:00 EG time</b>	
<b>Climate Change International Conventions and Global Initiatives</b>	<b>10:00 – 10:45</b> <b>Dr. Sayed Sabry Mansour,</b> <b>International Climate</b> <b>Change Expert, ESDF</b> <b>Founding member</b>
<b>Climate Data Acquisition</b>	<b>10:45 – 12:00</b> <b>Dr. Esraa El Masry,</b> <b>Alexandria University</b>
<b>Coffee Break</b>	<b>12:00 – 12:15</b>
<b>Role of GIS applications and RS in Climate Change Impact Assessment, Part I</b>	<b>12:15 – 13:15</b> <b>Dr. Esraa El Masry,</b> <b>Alexandria University</b>
<b>Role of GIS applications and RS in Climate Change Impact Assessment, Part II</b>	<b>13:15 – 14:15</b> <b>Dr. Esraa El Masry,</b> <b>Alexandria University</b>

<b>General Discussion, Networking and way forward</b>	<b>14:15 – 14:45</b> <b>Dr. Emad Adly, RAED</b> <b>General Coordinator</b>
<b>Lunch Break and Departure</b>	<b>14:45</b>

### 5.3 Presentations

See:

(ODYSSEA > Geospatial analytics and Remote Sensing for Climate Change Impact on Marine and Coastal Ecosystems, 22 – 24 February 2021, Cairo- Egypt

<https://odysseaplatform.eu/geospatial-analytics-and-remote-sensing-for-climate-change-impact-on-marine-and-coastal-ecosystems-22-24-february-2021-cairo-egypt/>)

### 5.4 Results

#### Participant List

#	Name	#	Name
1	Dr. Abla Abdelrahman Abdullah El Sheikh	12	Dr. Wael Attia Hamed
2	Dr. Mohamed Omer Taqi Aboubakr	13	Mr. Mohamed Reda Helal
3	Ms. Eman Ebashry	14	Dr. Ahmed Ali Mustafa
4	Ms. Enas Ahmed Farghaly	15	Dr. Ahmed Refaat Mohamed
5	Ms. Hagar Mahmoud mohamed	16	Dr. Alaa El Din Mahmoud
6	Ms. Mai Fath Allah Gebril	17	Dr. Asmaa Ahmed Awad
7	Ms. Nafesa Thabet Thabet	18	Dr. Essra El-Masry
8	Ms. Nahla Zakarya Taher	19	Dr. Asmaa Nazir Mogahed
9	Ms. Nora Omar Elsayed	20	Dr. Mohamed Adel
10	Ms. Rania Hussein Abd Elsamie Elsayy	21	Dr. Mohamed Abdelfattah Mohamed
11	Dr. Abla Abdelrahman Abdullah El Sheikh	22	Dr. Arafa Nagy Mohammed

## 6 Virtual school “Satellite Observations & Data Processing in Operational Oceanography”, 23 - 27 November 2020 (Tunis)

### 6.1 Summary

ODYSSEA conducted a week-long Virtual School on the topic “Satellite Observations & Data Processing in Operational Oceanography” from 23-27 November 2020. The event was co-organized with: a) the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), b) the Spanish company ORBITAL EOS, and c) the Laboratoire d'Etude en Géophysique et Oceanographie Spatiale in Toulouse (LEGOS).

The focus of the Virtual School was on the synergies between satellite observations of the sea surface and in situ measurements and to link this process with the development of the Marinomica platform. Satellite observations are essential to monitor and study the oceans dynamic and water quality. They provide an unmatched spatial and temporal coverage of such key oceanic variables as sea surface temperature and salinity, sea level, ocean colour, surface winds and even floating debris distribution. Most ocean satellite data are freely available on the web for research studies.

Complemented with in situ observing platforms, oceanographers can perform validation/calibration of satellite data and then accurate estimates of selected key sets of biophysical variables, with the intention of either making operational predictions across time and spatial boundaries or advancing fundamental knowledge through development of empirical relationships and theoretical models.

The virtual school gave an overview of existing satellite products and their relevance to understand the physical and biological oceanographic processes occurring in the Mediterranean. The main goal of the school was, through theoretical lectures, hands-on training and tutorials, to give technical skills to the participants in handling satellite and in-situ data in synergy, and to develop marine research approach based on multi-sources information, especially for the Southern Mediterranean countries, allowing them to become ready to face the challenges of the next decade 2021-2030, which has been declared by UN as the decade of Oceans.

#### 6.1.1 Objectives of the virtual school

The objective of this 3<sup>rd</sup> ODYSSEA School was to familiarize students with the "Sentinel Satellites" ocean observation system, to explain the usefulness of each sensor and the bio-geophysical parameters to which they give access and to reinforce their capacity to apply, or even develop, tools analysis of satellite observations, and interpret them in complementarity with in-situ data and numerical models' outputs available on the Marinomica platform. Also, emphasis was given on the synergy between remote sensing and in-situ data, calibration/validation procedures and data assimilation schemes in numerical model.

After the end of the program, the trainees were able to:

- Understand satellite sensors measurements principles and what environmental observations they provide;
- Retrieve and use oceanographic datasets, especially satellites and numerical models' output, and explore international databases on the marine environment;
- Use the Marinomica platform for retrieving, managing and processing oceanographic, environmental and satellite data of the Mediterranean Sea, along with other processing tools;
- Understand data calibration/validation procedures;
- Understand how satellite data are assimilated in numerical models;
- Use the knowledge that have been acquired in their research and work and promote the use of satellite data and the Marinomica platform in their countries.

### 6.1.2 Programme novelty

Monitoring and forecasting of the marine environmental status are a challenge for oceanographers, as in the last few decades marine ecosystems have been subject to intense pressure under the action of human activities (pollution, extensive fishing and aquaculture, coastal erosion, tourism, etc.) and under the effects of climate change. Therefore, a sustainable blue economy (reconciling marine resources protection and exploitation) requires enhancing the capacity of young marine scientists on real-time monitoring and operational prognostic modelling, in order to be able to assess objectively the environmental status and help in marine spatial planning strategies and in decision-making. On top of that, the volume of data concerning the marine environment collected both by satellites and on-site monitoring instruments is becoming more and more enormous. All these data need to be retrieved, processed, interpreted and then fed into numerical models for reanalysis and forecasting by skilled observatories scientists, focusing on different areas of the Mediterranean.

### 6.1.3 Target audience

The training program targeted Mediterranean oceanographers and marine engineers, young researchers, PhD students or professionals at the early stages of their careers who are interested in learning to manage the available marine environmental, oceanographic and satellite data to provide targeted and understandable information to the relevant end-users.

### 6.1.4 Selection procedure

The selection of the trainees was carried out by an ad-hoc scientific committee composed of specialists in physical oceanography and remote sensing applied to the marine domain.

### 6.1.5 Prerequisites

Attendees had an academic background or/and professional experience on the following topics:

- Physical Oceanography (waves, currents, tides)
- Marine environmental Sciences

- Remote Sensing, use of radiometric and radar data
- Geospatial data processing and scientific computing (Qgis, MatLab, Python)

In view of the fact that the ODYSSEA project focuses on developing a wide and inclusive network of marine scientists across the Mediterranean, candidates from North Africa were given priority.






#### 6.1.6 Programme structure – Thematic modules – Description

Remote sensing experts and physical oceanographers guided students through a combination of lectures and tutorials covering the following topics:

- 1) Introduction to dynamic oceanography;
- 2) Ocean Dynamic using Altimetry;
- 3) Modelling primary production;
- 4) Ocean colour applications for ecosystem state assessment;
- 5) Climate impacts and feedbacks;
- 6) Ocean colour and Altimetry in data assimilation;
- 7) Waves and Winds;
- 8) Datasets archive, management, visualisation and analysis using the ODYSSEA Platform;
- 9) Ocean data retrieval and post-processing.






## 6.2 Agenda


   <b>VIRTUAL SCHOOL « OCEANOGRAPHY FROM SPACE »</b>  						
GMT+1 time	10:00-11:00	11:00 - 11:15	11:15 - 12:15	12:15 - 14:30	14:30-15:30	15:30-16:30
<b>Monday 23/11/2020</b>	1- Welcome to the Virtual School by UNEP/MAP-SPA/RAC 2- Introduction to the Webinar and Odyssea (Georgios Sylaios (ODYSSEA Coordinator, DUTH University) 3 - Introduction to Oceanography from Space ( Hayley Evers-King, EUMETSAT)	SHORT BREAK	Satellite Data Retrieval from Copernicus (Hayley Evers-King)	LUNCH BREAK	Overview of ODYSSEA project activities and outcomes Georgios Sylaios (ODYSSEA Coordinator)	
<b>Tuesday 24/11/2020</b>	1- Measuring Sea Surface Temperature from Space 2- Working with SST data from Satellites (Hayley Evers-King)	SHORT BREAK	1 - Measuring Ocean Color from Space 2 - Working with ocean color data from satellites (Hayley Evers-King)	LUNCH BREAK	Introduction to Marinomica Services and Products (Simon Keeble, BLIT)	
<b>Wednesday 25/11/2020</b>	- Measurement of Sea Surface Level using altimeter sensors in the open ocean - Retrieval of Tides, currents, waves and winds (Florence Birol, LEGOS)	SHORT BREAK	Satellite altimetry in the coastal zone (Florence Birol, LEGOS)	LUNCH BREAK	Meso-scale eddies and their dynamics using Marinomica (Cori Pegliasco, CLS)	
<b>Thursday 26/11/2020</b>	Exercises on satellite altimetry data - Session 1 (Florence Birol, LEGOS)	SHORT BREAK	Exercises on satellite altimetry data – Session2 (Fernando Nino and Fabien Léger)	LUNCH BREAK	Forecasting tools for wind and waves in Marinomica (Katerina Spanoudaki, FORTH)	Automatic detection of Offshore Oil Spill using Satellite data. (Juan Peña Ibanez, EOS-Orbital)
<b>Friday 27/11/2020</b>	Monitoring coastal erosion patterns from space: Coastal erosion 'hotspots' and trend analysis –(Konstantinos Zachopoulos, DUTH)	SHORT BREAK	Freshwater fluxes and SPM data products in river plumes - Nikolaos Kokkos (DUTH)	LUNCH BREAK	Eutrophication indices in Marinomica (Lorinc Meszaros, Deltares)	

ODYSSEA is a Research and Innovation project, funded by European Union's Horizon 2020 program under grant agreement No 727277.

With the kind participation of :

Sea Gust


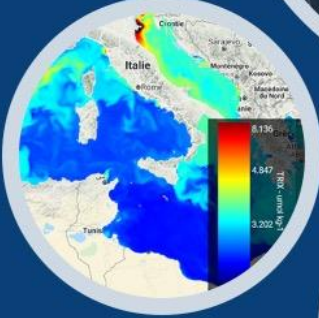
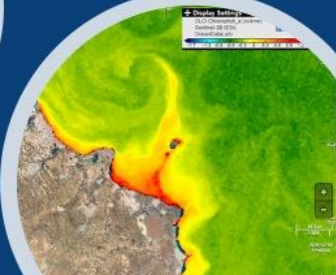


# ODYSSEA VIRTUAL SCHOOL

## « OCEANOGRAPHY FROM SPACE »

*"Webinar on Satellite Observations and Data Processing in Operational Oceanography"*

**23-27 November 2020**

### 6.3 Presentations

<https://odysseaplatform.eu/project-information/training-materials/virtual-school-on-oceanography-from-space-vsos/>

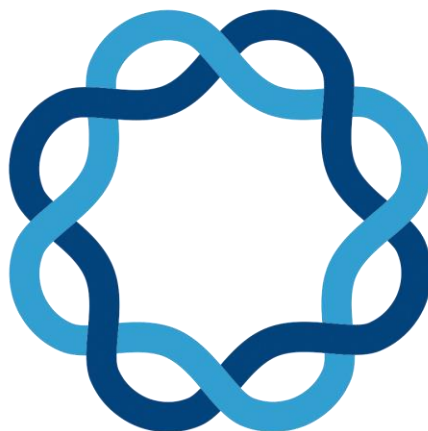
<https://www.youtube.com/watch?v=l6VMs14nz8E>

### 6.4 Results

#### Participant List

#	Name	#	Name	#	Name
1	Khadidja Wissal ABDALLAH	43	Eliad C	85	mohamed hasan besar
2	Abdellah KHOUZ	44	Fadoua Ben Salah	86	Mohamed Helal
3	Abdellaoui	45	Fateme Sadat Sharifi	87	Mohamed Hussein
4	ADOULI Abdelkarim	46	Fatima Machay	88	Mohamed keznine
5	Afef Boussadia	47	Federico Cali	89	Mohamed Reda
6	Ahmed ELAZZAOU	48	Gandy Maria Rosales Quintana	90	Mohamed Abdou Helal
7	Ahmed Fathi	49	George Karyatis	91	Mouna BEKKACH
8	Ahmed Nofal	50	GEORGE OTIENO OKOKO	92	Mouna El qendouci
9	Ahmed ZAYANI	51	George Tsioulkas	93	Muhammad Shahinur Rahman
10	Aikaterini Marina Synanidou	52	Ghezali Yousra	94	Mustapha AIT OMAR
11	Sonia AKROUR	53	Gianluca Coidessa	95	NH Anggraeni
12	Amal ELouardy	54	Hayet Baccouche	96	Nidhal trabelsi
13	AMARIR Salih	55	Hichem Izeboudjen	97	Nikola Djordjevic
14	Amine Kabrane	56	Hinde CHERKAOU	98	Nikolaos Kokkos
15	Anabel Gammaru	57	Ilaria Campana	99	Nour DAMMAK
16	Anastasia Mirli	58	Iliass Nibani	100	Nour Eutamene
17	Anoia Dridi	59	Imane Benazzouz	101	Olajide Oladipo
18	Antonella Arcangeli	60	Ioannis Mintourakis	102	Omar Mahadalle
19	Aref Farhangmehr	61	Irene Morell Rodriguez	103	Paschal Amaechi
20	Asher Manor	62	Islam Kamal Elbestawi	104	Philomena Asuquo
21	Asma Damghi	63	jhon mojica	105	Reda EL KAMCHA
22	Asma KHOUAJA	64	Kenza Meyssa	106	rida derdabi
23	Aysu	65	Keramea Panagiota	107	Riliwan Damilola Abioye
24	Azeez Olaide	66	Khadija Echogdali	108	Salih AMARIR
25	Azeez Yusuf Olaide	67	Kmar Attaya	109	SAMAHA Ziad
26	Beatriz Gonzalez	68	KOUBAA Zakaryae	110	Samuel Ukpang Okon

#	Name	#	Name	#	Name
27	Benazzouz	69	Kris Powell	111	Slim GANA
28	BENMOKHTAR SALMA	70	Laama C	112	Soraya Muheya
29	CARLO ZAMPIERI	71	Linzi	113	Susana Requena
30	Cherkaoui Hinde	72	Lucy Mokaya	114	Synanidou Aikaterini Marina
31	Chiamaka Linda MGBECHIDINMA	73	Luis Escudero	115	Valentino Pintar
32	Cumhur Haldun YARDIMCI	74	Lynda-Uta Okon	116	VINCENZO OSSO
33	Cyrine Chenaoui	75	Maria Zoidou	117	Wael BEDOUI
34	Daassi Sabri	76	Massimo	118	Wafa Nour El Yakine Medjoubi
35	Damilola Abioye	77	Massimo Di Stefano	119	Wessam fayz
36	Daniel CEBRIAN-MENCHERO	78	Maurizio Ingrosso	120	Winnie Bett
37	Dieu Anh Dinh	79	MEDJOUBI Wafa Nour El Yakine	121	Yelda Aktan Turan
38	Dimitris Tsianis	80	Mehdi BEN HAJ	122	Yelena Bogdanova
39	El HALLABI meriem	81	Messaoudi Anis	123	Yevheniia Barylo
40	EL KAMCHA REDA	82	MKHININI Nadia	124	Yiannis Mintourakis
41	EL YOUSOUFI Fatima	83	Mohamed Abdelwarith	125	Yusuf Azeez
42	Eleftheria Siula	84	Mohamed BEN HADDAD	126	Konstantinos Zachopoulos



# ODYSSEA



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