COST Action CA19109 "MedCyclones"

Deliverables D1.6, D2.6 and D3.5

Yearly internal report on dissemination strategies, stakeholders' involvement and products tailored to their needs (in WG1, WG2 and WG3)

3rd Year: October 2023

1. Common Communication Activities

Website

The **dedicated website** has been moved to a new server, since the appointment of a new Coordinator of the communication activities. The web site has been also renewed:
https://medcyclones.eu
And new pages have been added to "Resources" and "Media Room". In addition, a communication report was published about Storm Daniel in September 2023:
https://medcyclones.eu/storm-daniel/

Social media channels

The MedCyclones Twitter, Facebook and LinkedIn accounts have been used to publish news from WG activities and discuss with scientists and the general public events related to Mediterranean cyclones. So far, more than 300,000 users have interacted with the MedCyclones social media accounts.
On a dedicated YouTube channel we store all the videos related to Mediterranean cyclones:
https://www.youtube.com/@medcyclones
Three mailing lists, one for each WG, and a mailing list for the Management Committee, have been constantly updated with newcomers, to ensure information flows among the Action members:
WG1: medcyc_wg1@cyi.ac.cy
WG2: medcyc_wg3@cyi.ac.cy
WG3: medcyc_wg3@cyi.ac.cy
MC: medcyc_mc@cyi.ac.cy
Clear information on how to join the Action is provided on the website.
On the e-COST platform all the Action members are subscribed to the WGs.

Videos

A series of 5 videos have been created with interviews of MedCyclones scientists who actively work in advances of our understanding on Mediterranean cyclones. Soon available on the website.

Newsletter

A second Newsletter was published in September 2023, and it is publicly available on the website:
https://medcyclones.eu/wp-content/uploads/2023/09/Newsletter_MedCyclones_v2.pdf

The Newsletter summarized all the latest results from the active WGs and promoted funding opportunities for Young Researchers.

Shared Tools and Diagnostics

- An updated list of tools is available on the website: https://medcyclones.eu/tools/
- 3T initiative: A database of Mediterranean cyclone tracks is available at https://wcd.copernicus.org/articles/4/639/2023/wcd-4-639-2023-supplement.zip

2. Meetings

During the third year, online **WG meetings** have been organized to provide news on the ongoing research initiatives among the scientific community, to foster new initiatives and to better coordinate and steer the research activities of the Action participants, as well as to share new scientific findings and to promote collaborations and further involvements in the network. Moreover, as soon as each research initiative has started to be organized, specific meetings with the involved participants have been set up. As shown in the Table below and as detailed in the following, a number of meetings have been held.

2022

Date	Event/activity	No Participants
25 Nov	**WG3 3rd Meeting**	35
7 Dec	WG1 – Data Assimilation Initiative – Meeting	10
9 Dec	WG3-Socioeconomic impacts	12
14 Dec	**WG1 2nd Meeting**	45

2023

Date	Event/activity	No Participants
17 Jan	**WG2 2nd Meeting**	50
27 Feb	WG1 Model Intercomparison Initiative – Meeting	15
20 Apr	WG1-2 Medicane Definition Initiative - Meeting	25
26-30 Jun	**2nd TRAINING SCHOOL**	48
28-30 Jun	**2nd WORKSHOP**	100

In the following, some details about the meetings' scopes and outcomes.

WG Meetings

WG1 14 December 2022 (Leader: Florian Pantillon; Co-leader: Platon Patlakas)

The WG1 online meeting was dedicated to fostering activities aimed at a better process-based understanding of Mediterranean cyclones at weather time scales. The following initiatives were discussed:

Model Intercomparison Project (MIP):

- Consistency between models
- Dynamical analysis based on UM runs
- Comparison with observations

Coastal impacts (ImCyCoast): update

Operational forecasts (DynForMed)

- migration of the server to University of Athens
- attract more contributions, employ more tracking algorithm in order to apply the 3T method to filter out bogus tracks
- impact-based forecasts in collaboration with WG3
- become public
- possibility to include ocean forecasts

Medicane definition: update

Track Task Team (3T): almost completed, paper submitted, dataset available soon

Leashed simulations (lead: E.Flaounas):

- WRF simulations with cyclone-following high-resolution nested domain; strong nudging in the parent domain
- A 3-year ECMWF special project has been accepted! It will allow to run about 1500 cyclone cases and a huge dataset of cyclone simulations will be available for different studies (e.g.: process studies, trajectory computations to look for sting jets, etc)

Data Assimilation: update

The presentations are publicly available on the website https://medcyclones.eu/wg1-events/

WG2 17 January 2023 (Leader: Shira Raveh-Rubin; Co-leader: Assaf Hochman)

During the online meeting an update of the ongoing initiative was provided and a new one was launched. Also, some presentations provided an overview of possible new topics of collaboration. In more details:

Davide Faranda described a framework for attributing tropical and Mediterranean cyclones to climate change

Dor Sandler described a diagnostic for Localized Finite Amplitude Wave Activity and its application to the Mediterranean cyclones

Tracks Task Team (3T) initiative:

- Paper under review on WCD
- Database available
- Initiative has almost reached its scope

Process-based classification of Mediterranean cyclones (MedCyClass)

- Classification based on upper-level PV
- Classification describes all the mechanisms associated with cyclone and identify coherent types of cyclones (seasonality, distribution, rain, etc.)

- Paper to be submitted soon

A new initiative was proposed about tracking Medcyclones in regional climate models. It will exploit the 3T initiative results, database of RCM simulations (MedCordex and possibly others). In short, we would like to produce a valuable data set of cyclones tracks based on various tracking methods and model simulations.
The presentations are publicly available on the website https://medcyclones.eu/wg2-events/

WG3 25 November 2022 (Leader: Jonilda Kushta; Co-Leader: Samira Khodayar Pardo)
An online meeting was organized by WG3 members in order to present the latest work on the environmental and socio-economic impacts of Mediterranean cyclones. During the ~2.5-hour meeting, several presentations fostered vivid discussions with the community members.
Two invited presentations opened the meeting: Pieter Groeneimeijer "ESSL research on storms prediction and impacts" and Katerina Papagiannaki: "Methods and tools to record and analyze weather-related events causing socio-economic impacts (and fatalities)"
Interaction between WG1 and WG3: status of initiatives of WG1 (MIP, ImCyCoast, DynForMed) was presented
Interaction between WG2 and WG3: status of initiatives of WG2 (3T, MedCyClass) and the respective datasets were presented
WG3 progress and future steps were reported, in particular the need for interacting, providing information and developing suitable products for stakeholders. The involvement of stakeholders remains a challenge to be seriously tackled in the next two years. During the Workshop in Athens, many applications were presented, but unfortunately there was no follow up. For better interfacing with WG1 (and WG2), we need to step from hazard forecast to impact-based forecast. Some initiatives are still ongoing: i) Socio-economic impacts – a review paper has been submitted; ii) Dust mobilization; iii) Sea state – a paper has been published.
STSM reports were presented.
The presentations are publicly available on the website https://medcyclones.eu/wg3-events/

2nd MedCyclones Workshop
The second MedCyclones Workshop was held in Toulouse, hosted by Meteo-France, and organized together with the European Storm Workshop between 28-30 June 2023. The general objectives of the workshop were to present and discuss recent scientific progress in understanding and modelling dynamical processes and socio-economic impacts of cyclones from weather to climate time scales, in the mid latitudes in general and the Mediterranean in particular. The European storm workshop series was initiated in 2011 to bring together dynamical meteorologists, climatologists, statisticians, stakeholders and risk model developers from insurance and engineering consultant companies. These interdisciplinary workshops try to bridge state-of-the-art breakthroughs in science to practical implementation in risk modeling. The joint workshop aimed at better connecting Atlantic and Mediterranean cyclone communities, which in many ways share similar goals. The workshop programme consisted of oral and poster presentations in plenary but also breakout discussions devoted to promoting collaborations within and between the communities. On the website, oral presentations are available.

2nd MedCyclones Training School

The second Training School was organized in Toulouse on the same week of the Workshop, between 26 - 30 June 2023. Primarily addressed to PhD students, PostDoc and early career investigators as well as professionals and scientists from regional and national meteorological agencies, the school covered several aspects of Mediterranean cyclones: dynamics, processes, forecasting, predictability and impacts. It consisted of frontal lectures and practical activities where the students performed specific analysis in small groups. The hands-on activities were coordinated by specialists of Meteo-France while each group was coached by a tutor of the Action core group. The final results were presented in the form of short talks on the last day of the Training School to trigger discussions and provide the opportunity to enhance the collaborative spirit and develop new skills. All the students also attended the plenary sessions of the workshop on 28-30 June.

3. Peer-reviewed papers

A review paper devoted to the analysis of the socio-economic impacts of Mediterranean cyclones was submitted to "Review of Geophysics".

Other papers, resulting from a collaboration among many Action participants were published:

- Ferrarin, C., F. Pantillon, S. Davolio, M. Bajo, M. M. Miglietta, E. Avolio, D. S. Carrió, I. Pytharoulis, C. Sanchez, P. Patlakas, J. J. González-Alemán, and E. Flaounas: Assessing the coastal hazard of medicane Ianos through ensemble modelling, Nat. Hazards Earth Syst. Sci., https://doi.org/10.5194/nhess-23-2273-2023, 2023
- Flaounas, E., Aragão, L., Bernini, L., Dafis, S., Doiteau, B., Flocas, H., Gray, S. L., Karwat, A., Kouroutzoglou, J., Lionello, P., Miglietta, M. M., Pantillon, F., Pasquero, C., Patlakas, P., Picornell, M. Á., Porcù, F., Priestley, M. D. K., Reale, M., Roberts, M. J., Saaroni, H., Sandler, D., Scoccimarro, E., Sprenger, M., and Ziv, B.: A composite approach to produce reference datasets for extratropical cyclone tracks: application to Mediterranean cyclones, Weather Clim. Dynam., 4, 639–661, https://doi.org/10.5194/wcd-4-639-2023, 2023.
- Panegrossi, G., D'Adderio, L.P., Dafis, S., Rysman, J.F., Casella, D., Dietrich, S., Sanò, P.: Warm Core and Deep Convection in Medicanes: A Passive Microwave-Based Investigation. Remote Sens. 15, 2838. https://doi.org/10.3390/rs15112838, 2023
- Menna, M., Martellucci, R., Reale, M. et al. A case study of impacts of an extreme weather system on the Mediterranean Sea circulation features: Medicane Apollo (2021). Sci Rep 13, 3870. https://doi.org/10.1038/s41598-023-29942-w, 2023
- Hatzaki M., Flaounas E., Davolio S., Pantillon F., Patlakas P., Raveh-Rubin S., Hochman A., Kushta J., Khodayar S., Dafis S., Liberato M.L.R.: MedCyclones: Working together towards understanding Mediterranean cyclones. Bulletin of the American Meterological Society, https://doi.org/10.1175/BAMS-D-22-0280.1, 2023
- Miglietta M.M., Buscemi F., Dafis S., Alvise Papa, Alessandro Tiesi, Conte D., Davolio S., Flaounas E., Levizzani V., Rotunno R.: A high-impact meso-beta vortex in the Adriatic Sea, Quarterly Journal of Royal Meteorological Society, https://doi.org/10.1002/qj.4432, 2023

A list of recent peer-reviewed papers published by MedCyclones members and related to scientific topics provides an up-to-date overview of the results of this Action. Recent publications are summarized, continuously updated and available on the website (https://medcyclones.eu/publications/).

4. Short Term Scientific Missions (STSM)

Dissemination of MedCyclones STSM calls and their results are communicated through the network. During the third Grant Period, seven STSMs were successfully accomplished.

1) Grantee name: Francesco MARRA, who visited the group of Assaf Ochman (Hebrew University of Jerusalem)
Title: Dynamic predictability of Mediterranean cyclones
Start and end date: 02/09/2023 to 23/09/2023
The overarching objective motivating this STSM is to advance our knowledge about the intrinsic dynamic predictability of Mediterranean cyclones. It aims at the definition of an objective methodology to quantify the dynamic predictability of Mediterranean cyclones. The method will be based on the concept of dynamical systems theory and will examine the predictability of atmospheric variables over a region of interest (sea level pressure, geopotential height, temperature, etc.) across different vertical layers. Also, it aims at the identification of the main covariates able to explain the dynamic predictability of Mediterranean cyclones. In particular, the impact of the Integrated water Vapor Transport (IVT) on the intrinsic predictability of geopotential height at different pressure levels and of precipitation at the ground during Mediterranean Cyclones was quantified, analysing an archive of over 900 cyclones identified between 1981 and 2018. The main result was that anomalies in IVT and IVT change during the cyclones and in the 48-hours preceding its peak, explaining a portion of the anomalies in intrinsic predictability, although the fraction of explained variance is relatively small.

2) Grantee name: Babita JANGIR, who visited the group of Milena Menna and Marco Reale (National Institute of Oceanography and Applied Geophysics – OGS)
Title: Cyclone Activity and Marine Biogeochemistry Dynamics in the surface circulation structures of the Mediterranean Sea
Start and end date: 01/09/2023 to 01/10/2023
The mission is focused on understanding the influence of Mediterranean cyclones on mesoscale eddies' physical and biogeochemical properties (mixed layer depth, nutricline dynamics, oxygen response, chl-a, and net primary production). The aim is to evaluate the response of the marine environment (temperature, salinity, turbulent fluxes, mixed layer depth, nutricline dynamics, dissolved oxygen, chl-a, and net primary production) to the passage of cyclonic systems in the presence/absence of an eddy using in situ (Argo floats) and daily reanalysis products (Copernicus Marine Service biogeochemistry and physics), and to find out if and how the response depends on the system's characteristics, the pre-existing conditions in the marine environment (cool pool) and characteristics of ocean eddies, or both.

3) Grantee name: Tair PLOTNIK, who visited the group of Jennifer Catto (University of Exeter)
Title: Mediterranean cyclones in regional climate simulations
Start and end date: 08/08/2023 to 27/08/2023
This STSM was intended to support the new initiative within WG2 "Mediterranean cyclones in regional climate simulations" and it aims at the preparation of a unified data protocol for regional climate model data which the Action participants can use to run their tracking algorithm.

4) Grantee name: Giulia PANEGROSSI, who visited the group of Derrick Herndon (University of Wisconsin -Madison)
Title: Satellite-based tools for the identification and characterization of Mediterranean Tropical-like Cyclones (Medicanes)
Start and end date: 20/07/2023 to 27/07/2023
Satellite-based diagnostics tools developed by the SSEC CIMSS Tropical Cyclone (TC) group which are used operationally for tropical and sub-tropical cyclone warm core identification and characterization, as well as for intensity estimation, and tracking. The purpose of this STSM was to investigate to what extent these tools are applicable to Mediterranean cyclones, in particular to those exhibiting tropical-like characteristics at some point during their evolution (including a warm core) and categorized as Medicanes. During the STSM some of these tools have been applied to two Medicane cases, Rolf and Zorbas, using a dataset of passive microwave radiometer overpasses developed at CNR-ISAC for all Medicanes that occurred between 2000 and 2022. The results have been compared to Medicane Ianos which was analyzed at CIMSS by Dr. Herndon prior to this STSM because of its marked TC-like characteristics and well-known extreme intensity. In addition, the PMW-based intensity estimation tool for AMSU, ATMS and SSMIS has been also used for Rolf and results have been compared to the minimum MSLP from reanalysis and best track information. Finally, the Automated Rotational Center Hurricane Eye Retrieval (ARCHER) tool for TC NRL tracking and monitoring has been also analyzed.

5) Grantee name: Nada SAYEDELAHL, who visited the group of Vassiliki Kotroni (National Observatory of Athens/IERSD-METEO)
Title: Simulating the effect of extreme weather events on the ocean waves during the Mediterranean Cyclone
Start and end date: 22/04/2023 to 13/05/2023
The main scientific contribution concerns the understanding of how the wind generates high ocean waves during Med cyclone events. This is done through simulation of the wind and the corresponding ocean waves' climate during a selected Mediterranean cyclone event, using coupling between (meteorology/ climate model) and Delft 3D hydrodynamic model (SWAN module) with high resolution. Also, this study focuses on two selected coastal areas; one in Greece (Athens) and one in Egypt (Alexandria). Moreover, the impact on the coastal areas bordering the cyclone limit regions.

6) Grantee name: Clara NALDESI, who visited the group of Davide Faranda (Laboratoire des Sciences du Climat et de l'Environnement, Université Paris-Saclay)
Title: Investigating the role of climate change in the 15-16 September 2022 Marche extraordinary flash flood
Start and end date: 17/04/2023 to 21/04/2023
This mission aims at exploring the contribution of anthropogenic climate change to a specific extreme event that occurred over Central Italy in September 2022. The relationship between analog large-scale weather patterns and precipitation over Central Italy needs to be thoroughly explored first. Then, using century-long reanalysis, climate simulations, and the analogs methodology, it will be determined the frequency and variability of such circulation patterns in factual and counterfactual climatic conditions. Finally, an analysis of the dynamic/thermodynamic properties of circulation analogs in factual/counterfactual climates is perfomed to assess to what extent they have changed as a consequence of global warming.

7) Grantee name: Remi BOUFFET who visited the group of xxx (xxx)
Title: Sensitivity of a Mediterranean tropical-like cyclone to diabatic processes
Start and end date: 27/03/2023 to 09/07/2023
This mission aims at the analysis of the dynamic and morphological structures of the Medicane Ianos, which is the strongest Mediterranean cyclone ever recorded, by means of WRF model numerical simulations from the cyclogenesis to the dissipation. Characteristics during the cyclogenesis and the mature stage are investigated to understand how it formed and how intense it became. Then, the morphological characteristics are analyzed, as well as the dynamical structure such as baroclinic and diabatic forcings during the cyclogenesis, the intensification of the cyclone and its mature stage. The objective is to determine in which aspects Ianos was similar to a mid-latitude cyclone and in which ones it was similar to a tropical cyclone. Another goal of the STSM is to understand the influence of the diabatic processes on the trajectory and the intensity of the cyclone through numerical experiments including stochastic perturbations on the diabatic processes. This activity contributed to the MIP initiative of WG1 that investigates the reproduction of Ianos' lifestages and track from the perspective of different models.

5. Dissemination Conference Grant

- Florian Pantillon was supported by a Dissemination Conference Grant to give an oral presentation of recent results concerning MIP initiative (WG1) at the 28th IUGG General Assembly in Berlin (Germany) between 12/07/2023 and 16/07/2023, Topic Area: IAMAS (Meteorology) - Diagnosing and Reducing Errors and Biases in Weather and Climate Models. Title of the presentation: A model intercomparison project to improve predictions of Mediterranean cyclones. Co-authors: Florian Pantillon, Silvio Davolio, Elenio Avolio, Diego Carrió, Stavros Dafis, Emmanouil Flaounas, Juan Jesus Gonzalez Aleman, Suzanne Gray, Mario Marcello Miglietta, Platon Patlakas, Ioannis Pytharoulis, Didier Ricard, Antonio Ricchi, Claudio Sanchez, Gert-Jan Steeneveld.
Besides presenting results on the dynamics and predictability of Mediterranean cyclones, which are of interest for both academic researchers interested in Mediterranean cyclones, but also for national weather services to guide their model development, the IUGG conference represents an opportunity to attract additional participants to the COST Action MedCyclones, specifically to actively contribute to the MIP with state-of-the-art mesoscale models not yet involved.

- Shira Raveh-Rubin was supported by a Dissemination Conference Grant to give a solicited oral presentation at the 9th International Conference on Meteorology and Climatology of the Mediterranean (MetMed, Genoa-Italy 22-24 May 2023). Title of the presentation: Process-based classification of Mediterranean cyclones. Co-authors: Shira Raveh-Rubin, Yonatan Givon, Or Hess, Jennifer Catto, Michael Sprenger, and Emmanouil Flaounas.
The contribution to MetMed summarizes the outcomes of collaborative efforts taken in WG2 to classify Mediterranean cyclones by the mechanisms governing their development. In the talk, the COST Action and particularly WG2 will be introduced, to motivate our aim to enhance cyclone understanding on climate time scales. It represents a valuable opportunity to inform a wide audience, comprising of meteorologists, climatologist researchers and operational scientists, on our latest research findings, and the outlook of the work and its value for the evaluation of climate models. The presentation is planned in the opening of the Processes and Mechanisms session, thus

allowing good visibility for central activities of the COST Action. It is expected that links with members of the COST Action will be strengthened and that new links and collaborations with researchers will be established.

- Emmanouil Flaounas was supported by a Dissemination Conference Grant to give a solicited talk at the European Geosciences Union (EGU) General Assembly that it took place in Vienna (Austria) between 23-28 April 2023, in the section "Cyclones, Storms and Circulation in the mid-latitudes and subtropics: Diagnostics of Observed and Future Trends, and related Impacts". He presented an overview of the state-of-the-art in Mediterranean cyclones that covered dynamics, climatology and prediction aspects, although mainly focusing on the dynamics of the systems. Most of the talk was devoted to the analysis of the cyclones under the prism of potential vorticity diagnostics, highlighting scientific achievements, outcomes of collaborative work that took place within the Action. A presentation of the Action was provided, explaining that this is an open community where all interested individuals or institutions are welcome to join.

6. Virtual Mobility Grant

Maria Hatzaki was granted for Virtual Networking Support (VNS). MedCyclones Action has already enabled a range of networking tools (two workshops, two training schools, multiple short-term scientific missions (STSMs)) and dissemination activities in order to satisfy its objectives and deliverables. In particular, during the 3rd year of the Action, MedCyclones underwent a great demand for STSMs. This VNS grant will contribute to further promoting the Action by supporting all current networking tools and mainly by involving new ones, such as Virtual Mobilities among the Working Groups leaders. Therefore, VNS will mainly coordinate upcoming virtual mobility (VM) grants (evaluation and development) and ensure harmonization among STSM/VM results and the efforts of research initiatives which are carried out within the context of the 3 WGs of the Action.

Silvio Davolio was granted for a Virtual Mobility (VM) aimed at collecting information from the WG leaders and co-leaders for i) a better coordination of the follow up of the activities; ii) a proper organization of the results in the deliverables; iii) efficient dissemination within the Action community and communication to the general public. In fact, with the completion of the second training school and of the workshop, jointly organized with the European Storm Community, MedCyclones has grown further, now coordinating the efforts of more than 200 members, organized in three WGs whose activities have been based upon research initiatives. The timely sharing of information and of the main results is of remarkable importance to coordinate and promote the follow-up of the Action. Therefore, the VM has the goal of collecting information on ongoing activities and results produced so far, especially during the last year, including the outcomes of the STSMs that were especially planned to contribute to advance research and capacity building objectives. Also, several diagnostic tools have been produced, and it is necessary to assure that they will be shared and readily available to the community. Through collaboration with scientists leading the WGs and the Action's core group, a clear picture of the state of the art of the Action is provided, through the writing, collection and harmonization of the deliverables.

Stavros Dafis was granted for a Virtual Mobility (VM) aimed at supporting the dissemination activity, boosting MedCyclones dissemination material. Using a variety of tools, the main findings of MedCyclones will be made accessible to the general public and the main stakeholders. Some of these dissemination tools are rather innovative and they have not been used yet for MedCyclones. First, a scientific publication for kids on the journal "Frontiers for Young Minds" is expected to draw children's interest to MedCyclones activities and learn new things through dedicated graphics. Second, a quick-look database for cyclones between 1979-2020 has been set up and will be progressively developed, exploiting the "best-track data" from Flaounas et al. (2023 - https://doi.org/10.5194/wcd-4-639-2023) and including numerical and satellite data. It will provide an unprecedented tool for researchers, to check thousands of cyclones with a few clicks. Finally, both the newsletter and the reports of STSMs, available on the web site, will give a glimpse to the general public and to the scientific community of the results that MedCyclones working groups have produced so far.

Shira Raveh Rubin was granted for a Vitual Mobility (VM) to harness the initial results of the Mediterranean Cyclone Classification project and implement the classification approach into weather and climate datasets within the Action. This research initiative is a key initiative of WG2 and it has recently reached high maturity level, through the submission of a dedicated paper. Its overarching aim is to classify Mediterranean cyclones, throughout the basin and year-round, according to the processes governing the cyclones' development. To finalize the results obtained so far, the VM focuses on (i) the revision of the scientific article summarizing the cyclone classes, (ii) investigating air-sea interaction by cyclone class, and (iii) creating a generic interface for adapting the results to any weather or climate data, given the regional distribution of an upper-tropospheric geopotential or potential vorticity field. This will contribute to several tasks and deliverables in WG2.

Florian Pantillon was granted for a Virtual Mobility (VM) to finalize the comparison of the different models in the framework of the Model Intercomparison Project (MIP) of WG1, and proceed with the preparation of an overview paper. This includes data analysis, writing, and coordination tasks. The MIP investigates the dynamics and predictability of Mediterranean cyclones using modelling setups that are not yet available to operational forecasting systems. The focus has been on tropical-like cyclone (Medicane) Ianos that hit Greece in mid September 2020 and was poorly predicted by operational forecasts. The MIP is crucial not only for academic researchers interested in Mediterranean cyclones, but also for national weather services to guide their model development. Therefore, it is of paramount importance to publish and disseminate the scientific results.

Platon Patlakas was granted for a Virtual Mobility (VM) to foster the cyclone forecasting initiative through the further development of the website collecting real-time model output from several partners. The user-friendly MedCyclones forecasting website addresses the needs of the general public, scientific organizations, and stakeholders, and the main goal is to create a Community-Based Multi-Model Ensemble Forecasting System specifically designed for Mediterranean Cyclones. The final aim is to increase awareness of cyclones and their impacts, ultimately contributing to the expansion of weather forecasting and scientific networks across multiple countries. This endeavour will not only address existing challenges in cyclone forecasting but also bolster early warning systems, disaster preparedness, and foster international collaboration among

researchers, policymakers, and stakeholders. Moreover, it will enhance visibility in the field of weather forecasting and facilitate knowledge-sharing across various disciplines.

Samira Khodayar was granted for a Virtual Mobility (VM) to create a database of weather hazards' related impacts in the Mediterranean Basin. This can be achieved through the collection of existing related regional and local data bases across Mediterranean countries to a single common database. Access to data or related links will be made available to the public including targeted audiences. By doing so, the COST ACTION will contribute to the fulfilment of one of the main research gaps for a better understanding of the impacts of weather hazards in general and Mediterranean cyclones in particular. This can be helpful in the research and analysis of the characteristics of different types of weather hazards, the trends and patterns in their occurrence, and the variability of impacts on different populations and regions. Additionally helping to identify potential risk factors and vulnerabilities and to develop strategies for reducing the likelihood and severity of future hazards. This VM develops in the framework of WG3, devoted to the improved understanding of the environmental and socio-economic impacts of Mediterranean cyclones. There is a growing interest in understanding Mediterranean cyclones' impacts. However, the lack of systematic quantification of cyclones' contribution to Mediterranean socio-economic losses is complex and currently under-addressed challenges. Furthermore, operational databases of weather hazards and related impacts are useful because they provide essential information about past and current weather-related impacts on societies. Thus, the benefit and value of operational databases of weather hazards and related impacts are unquestionable allowing a deeper understanding of trends and threats. Therefore, the contribution of this VM towards a harmonization of selection criteria and datasets is of great importance in order to facilitate data processing and to draw robust conclusions.