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NEWSLETTER #2

MedCyclones

COST Action
CA19109

All the latest updates from Working Groups

The European network for Mediterranean cyclones in weather and climate

The objective of MedCyclones Cost Action 19109 is to establish an efficient networking between stakeholders, operational weather forecasters and researchers, which is timely and essential to address both challenges of research coordination and operational implementation of scientific results into weather and climate services.

The Action coordinates the activities of researchers in meteorology and climatology and scientists from weather/climate services with the main aims to provide a deeper understanding of Mediterranean cyclones and to improve significantly the European capacity to predict their environmental and climate impacts.

In this context, the network aims to identify and involve relevant stakeholders with different backgrounds (e.g. civil protection, re-insurance companies) to co-develop cyclone prediction products tailored to their needs.

29 COST countries have signed the Memorandum of Understanding and joined the Management Committee:

Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Lithuania, Malta, The Netherlands, The Republic of North Macedonia, Norway, Poland, Portugal, Romania, Serbia, Slovenia, Spain, Switzerland, Turkey and United Kingdom.

MedCyclones also accounts with the participation of a number of researchers of International Partner Countries (IPCs) from America.

https://www.medcyclones.eu

https://twitter.com/medcyclones

https://youtube.com/medcyclones

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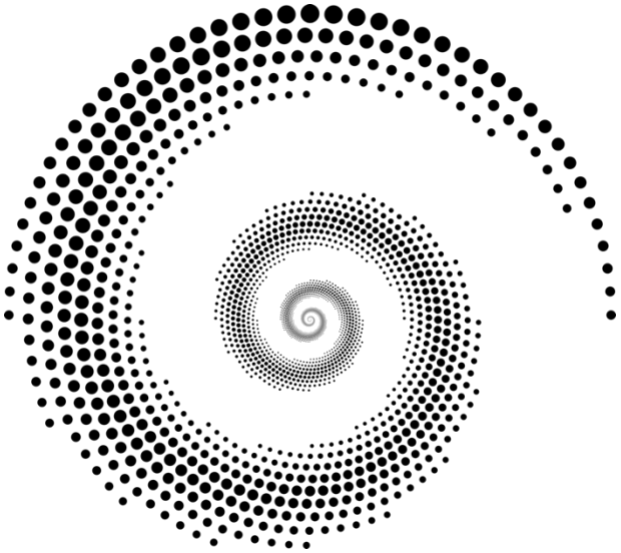
INTRODUCTION

Cyclones are the main weather modulators in the Mediterranean region and constitute a major environmental risk, often producing windstorms and heavy rainfall. Moreover, cyclones play a key role in the regional climate variability by controlling the oceanic circulation and regional water cycle, and by mobilizing and transporting large amounts of dust from North Africa.

Despite the recent achievements of the scientific community to provide deeper insight into the atmospheric processes and impacts associated with Mediterranean cyclones, there are still unaddressed scientific challenges that require a coordinated approach. In addition, the lack of direct interaction between academic researchers and weather/climate prediction scientists working in operational centres inhibits the efficient exploitation of fundamental research results to improve atmospheric models in a tangible way. Therefore, it is undeniable that there are potentially large societal benefits from improving cyclone predictions for weather and climate timescales.

Efficient networking between stakeholders, operational weather forecasters and researchers is timely and essential to address both challenges of research coordination and operational implementation of scientific results into weather and climate services. This Action will coordinate the activities of researchers in meteorology and climatology and scientists from weather/climate services with the main aims to provide a deeper understanding of Mediterranean cyclones and to improve significantly the European capacity to predict their environmental and climate impacts. In this context, the network will identify, and involve in the network, relevant stakeholders with different backgrounds (e.g. civil protection, re-insurance companies) and co-develop cyclone prediction products tailored to their needs.



STRUCTURE OF MEDCYCLONES

The Action Management Committee (Action MC)

The Action Management Committee (Action MC) is the group of representatives of the COST Full or Cooperating Members having accepted the Memorandum of Understanding (MoU). They are in charge of the coordination, implementation, and management of an Action's activities as well as supervising the appropriate allocation and use of the COST funding with a view to achieving the Action's scientific and technological objectives.

https://www.cost.eu/actions/CA19109/#tabs+Name:Management%20Committee

The Working Group (WG) and members

The Working Group (WG) is a group of Action Participants whose activity, composition and leadership shall be defined by the Action MC in order to achieve the Action objectives. The objectives of Working Groups (WG) are to perform the tasks required for a COST Action to fulfil its scientific objectives in line with those objectives defined in the COST Action's MoU. It is expected that every Action MC Member actively participates in at least one WG.

https://www.cost.eu/actions/CA19109/#tabs+Name:Working%20Groups%20and%20Membership

The Core Group (CG)

The Core Group typically consists of key leadership position holders and any other leadership positions within the COST Action deemed necessary by the Action MC. The Core Group can take decisions on matters for which it has been mandated by the MC. The Core Group should assist the Action Chair in determining, on behalf of the Action MC, from amongst eligible participants those who are entitled to be reimbursed. Whenever issues arise, which can directly impact the Work and Budget Plan and are not in the mandate of the Core Group, or for any other key decision regarding the COST Action's management, the Core Group must first consult with the Action MC and by no means must decide exclusively.

https://medcyclones.eu/core-group/

UPDATES ON WORKING GROUP 1

As of September 2023, there are 3 initiatives within the Working Group 1 (WG1): a) **DynForMed,** b) **Medicane definition,** and c) **Model Intercomparison Project (MIP)**.

The online platform for the operational forecasts using an ensemble of numerical simulations from the WG1 participants will soon be published on our website.

The WG on Medicane definition has drafted and will soon submit a paper regarding a comprehensive definition on Mediterranean tropical-like cyclones. After the acceptance of the paper, the members will contact the World Meteorological Organization (WMO) to officially submit a definition for Medicanes.

Another study of Medicane Ianos is almost completed by MIP, and two collaborative papers will be submitted soon: the first one concerns numerical model intercomparison for the case study, led by Dr. Florian Pantillon; the second one, led by Dr. Claudio Sanchez, investigates the connection between near-surface diabatic processes and upper level flow in the intensification of the medicane.

The 2nd WG1 online meeting took place on 14 December 2022 with 45 attendees, and it was led by Dr. Florian Pantillon and Dr. Platon Patlakas. The 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 the Unified Model runs
    - Comparison with observations
- Operational forecasts (DynForMed)
    - migration of the server to the University of Athens (completed)
    - attract more contributions, employ more tracking algorithms in order to apply the 3T method to filter out bogus tracks;
    - impact-based forecasts in collaboration with WG3
    - possibility to include ocean forecasts

Updates on “Medicane definition” initiative, and a possible new initiative “Data Assimilation” was discussed. The presentations are publicly available on the website: https://medcyclones.eu/wg1-events/

An additional online meeting was held on 27 February 2023 dedicated to MIP with 15 attendees. The Medicane definition online meeting was organized on 20 April 2023 with 25 attendees.

UPDATES ON WORKING GROUP 2

As of September 2023, there are 2 main initiatives within the Working Group 2 (WG2): a) **3T,** and b) **MedCyClass**.

The WG 3T has published a paper in Weather and Climate Dynamics (WCD - https://doi.org/10.5194/wcd-4-639-2023), on cyclone tracking algorithms of extratropical cyclones in the Mediterranean. The database of tracks is also available for the community.

The WG MedCyclass has submitted a paper entitled "Process-based classification on Mediterranean cyclones uding potential vorticity", which is in review at present (https://doi.org/10.5194/egusphere-2023-1247)

During the 2nd online meeting of WG2 on 17 January 2023 led by Dr. Shira Raveh-Rubin and Dr. Assaf Hochman, 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:

- Dr. Davide Faranda described a framework for attributing tropical and Mediterranean cyclones to climate change.
- Dr. Dor Sandler described a diagnostic for Localized Finite Amplitude Wave Activity and its application to the Mediterranean cyclones.

Tracks Task Team (3T) initiative:

- Paper published on WCD
- Database available
- Initiative has almost reached its scope
- 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)

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 published as a preprint

The presentations of the meeting are publicly available on the website https://medcyclones.eu/wg2-events/

Two new initiatives have recently started in WG2:

1) The first concerns tracking MedCyclones in regional climate model simulations. It will exploit the 3T initiative results, database of RCM simulations (MedCordex and possibly others). In short, we would like to produce a valuable dataset of cyclone tracks based on various tracking methods and model simulations. First step is the preparation of a unified data protocol for which the Action participants can use to run their tracking algorithm. It is expected by the end of the 3rd Grant Period (October 2023). This initiative is led by Dr. Assaf Hochman and Dr.Tair Plotnik. The latter has just completed an STSM at University of Exeter (UK) for supporting the initiative.

2) The second new initiative aims at building a first inventory of cyclone simulations in convection-permitting scales. The main scope is to attain a better understanding of dynamics and impacts of cyclone systems through the creation of a unique comprehensive dataset of very high spatial resolution (convection-permitting) cyclone simulations. A large ensemble of simulations will be produced for a wide number of cyclones in the Euro-Atlantic domain, giving priority to cyclones making landfall in Europe. All simulations will be performed by the WRF model version 4.4 in a moving nest framework. An ECMWF special project is supporting this initiative which will soon involve all the users interested in exploiting the database.

UPDATES ON WORKING GROUP 3

As of September 2023, there are 2 active initiatives within the Working Group 3 (WG3): a) **Mediterranean cyclones impacts** and d) **ImCyCoast**.

An online meeting was organized by WG3 members on 25 November 2022, led by Dr. Jonilda Kushta and Dr. Samira Khodayar Pardo, 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:

- Dr. Pieter Groenemeijer “European Severe Storm Lab research on storms prediction and impacts”
- Dr. Katerina Papagiannaki: “Methods and tools to record and analyze weather-related events causing socio-economic impacts (and fatalities)”

The interaction between WG1 and WG3 was discussed: status of initiatives of WG1 (MIP, ImCyCoast, DynForMed) was presented, as well as the interaction between WG2 and WG3: status of initiatives of WG2 (3T, MedCyClass). STSM reports were also 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. 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.

The presentations are publicly available on the website:
https://medcyclones.eu/wg3-events/

The main running initiative within WG3 concerns the creation of a reference database of weather hazards and associated impacts in the Mediterranean Basin. The main goal of this initiative will be achieved through the collection of existing relevant regional and local databases across Mediterranean countries to a single common database, which will serve as an info tool for stakeholders and targeted audiences.

THE MEDCYCLONES WORKSHOP AND TRAINING SCHOOL 2023

2nd MedCyclones Workshop 28 - 30 June 2023

The second MedCyclones Workshop was held in Toulouse, hosted by Météo-France, and organized together with the European Storm Workshop. 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:
https://medcyclones.eu/medcyclones-and-european-storm-workshops-2023/

2nd MedCyclones Training School 26 - 30 June 2023

The second Training School was organized in Toulouse on the same week of the Workshop. 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 Météo-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.
We deeply thank Dr. Ferry Frédéric and Dr. Kreitz Michaël (Météo-France) for the preparation of the tutorials and the coordination of the hand-on during the training school.

You can find the first MedCyclones Newsletter by clicking here

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